A G E N D A
ISLE OF WIGHT COUNTY PLANNING COMMISSION
October 24, 2023

1. CALL TO ORDER

INVOCATION

PLEDGE OF ALLEGIANCE

2. ROLL CALL/DETERMINATION OF A QUORUM

BRIAN CARROLL, CHAIRMAN
BOBBY BOWSER, VICE-CHAIRMAN
CYNTHIA TAYLOR
JAMES FORD
JENNIFER S. BOYKIN
GEORGE RAWLS
THOMAS J. DISTEFANO
RICK SIENKIEWICZ
RAYNARD GIBBS
MATTHEW SMITH

3. ACTION ON REQUESTS TO WITHDRAW OR TABLE PENDING AGENDA ITEMS

4. APPROVAL OF AGENDA

5. CONSENT AGENDA

A. September 26, 2023 Planning Commission Regular Meeting Minutes

B. October 19, 2023 Board of Supervisors Work Session Action List

6. CITIZENS' COMMENTS

7. PUBLIC HEARINGS

A. CUP-03-23 New Leaf Energy Utility Scale Solar Energy Generation Facility

Application of Courthouse Hwy Solar 1, LLC, applicant, and Micheal S. Doggett, property owner, for a conditional use permit for a major utility service, specifically a 3 MW utility-scale solar energy generation facility, on eighteen acres located at 16419 Courthouse Highway with tax parcel number 39-01-017 in the Rural Agricultural Conservation (RAC) zoning district. The application includes a request to withdraw eighteen acres from the Courthouse Agricultural/Forestal District.

B. Proposed Short-Term Rental Ordinance Revisions

An ordinance to amend the following sections of Appendix B. Zoning: Article III, Section 3-6000 (Use Types), for the purpose of defining short term rental as a commercial use, Article IV (Zoning Districts and Boundaries) for the purpose of allowing short term rentals as a permitted or conditional use in certain zoning districts, and Article V (Supplementary Use Regulations), Section 5-5005, for the purpose of including performance criteria for short term rental uses in the commercial supplemental

use type regulations

C. Proposed Revisions to the Enforcement Provisions of the Zoning and Chesapeake Bay Preservation Area Ordinance

Proposed Revisions to Appendix B. Zoning: Article I (General Provisions), Section 1-1011, to clarify the power to conduct inspections, Section 1-1013, to clarify penalties and remedies for zoning violations, and to Appendix B-1. Chesapeake Bay Preservation Area Ordinance: Article 5 (Administrative Procedures and Enforcement), Section 5003, to clarify penalties and remedies for violations

8. OLD BUSINESS

A. ZA-6-19 Sweetgrass Conditional Planned Development - Mixed Use Rezoning Request

Application of NVR, Inc., applicant, and, Henry Layden, special trustee for the William Grover Yeoman, III Trust, property owner, for a Conditional Rezoning (ZA-06-19) of approximately 250 acres of property with tax map number 32-01-009 located on Benns Grant Boulevard (Rte. 10) from the Rural Agricultural Conservation (RAC) zoning district to the Conditional - Planned Development - Mixed Use (C-PD-MX) zoning district

9. NEW BUSINESS

A. COUNTY ATTORNEY'S REPORT

B. PLANNING DIRECTOR'S REPORT

10. CLOSED MEETING

11. ADJOURNMENT

PLANNING REPORT

ATTACHMENTS:

Description	Type	Upload Date
September 26, 2023 Planning Commission Regular Meeting Minutes	Minutes	10/19/2023

MINUTES OF THE MEETING OF THE ISLE OF WIGHT COUNTY PLANNING COMMISSION HELD ON THE TWENTY-SIXTH DAY OF SEPTEMBER IN THE YEAR TWO THOUSAND AND TWENTY-THREE

CALL TO ORDER

Brian Carroll, Chairman, called the Isle of Wight County Planning Commission meeting to order at 6:00 PM on September 26, 2023, in the Board of Supervisors Room at the Isle of Wight County Courthouse, Isle of Wight, Virginia.

INVOCATION

Raynard Gibbs delivered the invocation.

PLEDGE OF ALLEGIANCE

Chairman Carroll invited everyone present to join in the Pledge of Allegiance.

ROLL CALL/DETERMINATION OF A QUORUM

PRESENT
Brian Carroll, Chairman
Bobby Bowser, Vice-Chairman
James Ford
Jennifer Boykin
George Rawls
Thomas Distefano
Rick Sienkiewicz
Raynard Gibbs
Matthew Smith

ABSENT
Cynthia Taylor

A quorum was determined.

ALSO IN ATTENDANCE
Bobby Jones, County Attorney
Amy Ring, Community Development Director
Amanda Landrus, Secretary

ACTION ON REQUESTS TO WITHDRAW OR TABLE PENDING AGENDA ITEMS

Chairman Carroll asked if there were any requests to table or withdrawal agenda items. Amy Ring, Community Development Director, stated there were no requests.

APPROVAL OF AGENDA

Chairman Carroll called for a vote to approve the agenda. Commissioner Bowser made a motion to approve the agenda. Commissioner Boykin seconded the motion. Chairman Carroll asked for all in favor to signify by saying aye. The motion passed unanimously.

APPROVAL OF CONSENT AGENDA

Chairman Carroll called for a vote to approve the consent agenda. Commissioner Bowser made a motion to approve the consent agenda. Commissioner Smith seconded the motion. Chairman Carroll asked for all in favor to signify by saying aye. The motion passed unanimously.

CITIZENS' COMMENTS

Chairman Carroll called for any citizen comment on any item not up for public hearing.

Walter Freeman, 12215 Keaton Avenue, Windsor, shared concerns about lighting, buffer area and noise that is associated with an industrial use such as Tidewater Logistics Center that is proposed right next to his house.

James Villers, 12262 Keaton Avenue, Windsor, shared his concerns with the proposed Tidewater Logistics Center and hopes to work with the County for a mutual agreement.

Jill Milton, 2407 North Shore Drive, Rushmere Shores, expressed her concern with the impact of short-term rentals in her neighborhood. Ms. Milton stated a home in her neighborhood is being used as an event center for weddings and bachelor parties. Ms. Milton added it is booked every other day. She asked the Planning Commission to take the neighbors' opinions into consideration before passing the short-term rental ordinance.

Larry Morris, 2451 North Shore Drive, expressed his concerns with his neighbor who is operating a short-term rental allowing loud parties on weeknights and foul language and behavior. He added his concern with not knowing who is coming and going on the private drive.

PUBLIC HEARINGS

Chairman Carroll called for the public hearing on the following item:

> Application of NVR, Inc., applicant, and, Henry Layden, special trustee for the William Grover Yeoman, III Trust, property owner, for a Conditional Rezoning (ZA-06-19) of approximately 250 acres of property with tax map number 32-01-009 located on Benns Grant Boulevard (Rte. 10) from the Rural Agricultural Conservation (RAC) zoning district to the Conditional - Planned Development - Mixed Use (C-PD-MX) zoning district.

Amy Ring, Community Development Director, gave the following presentation:

Sweetgrass Mixed Use Development
Conditional Rezoning Request
ZA-6-19

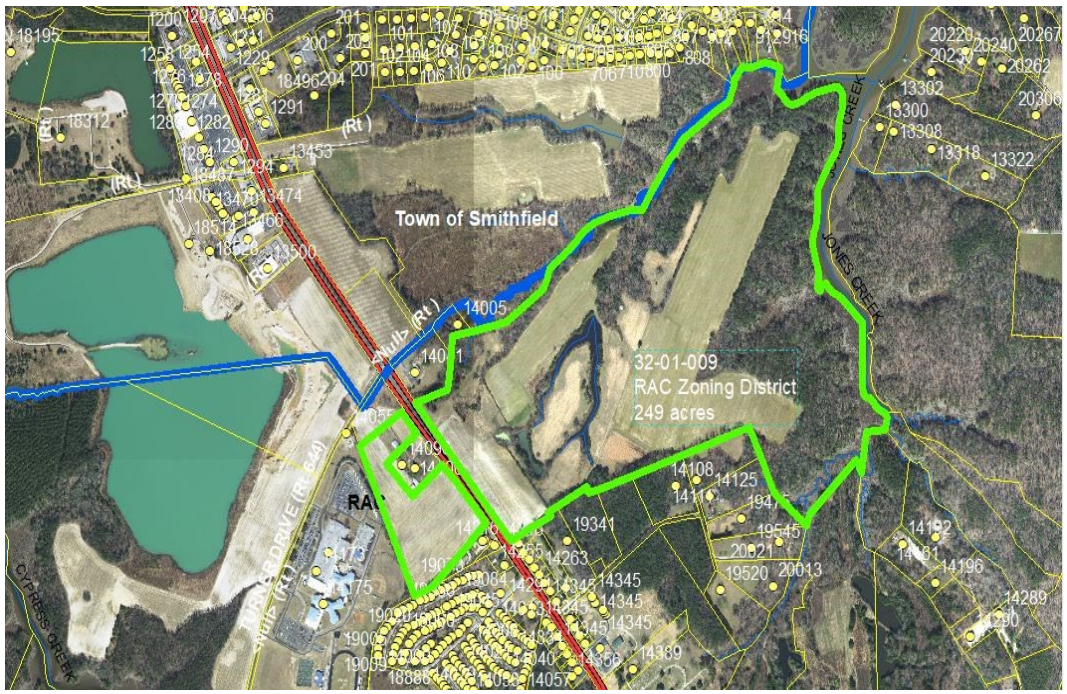
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Planning Commission Regular Meeting
September 26, 2023

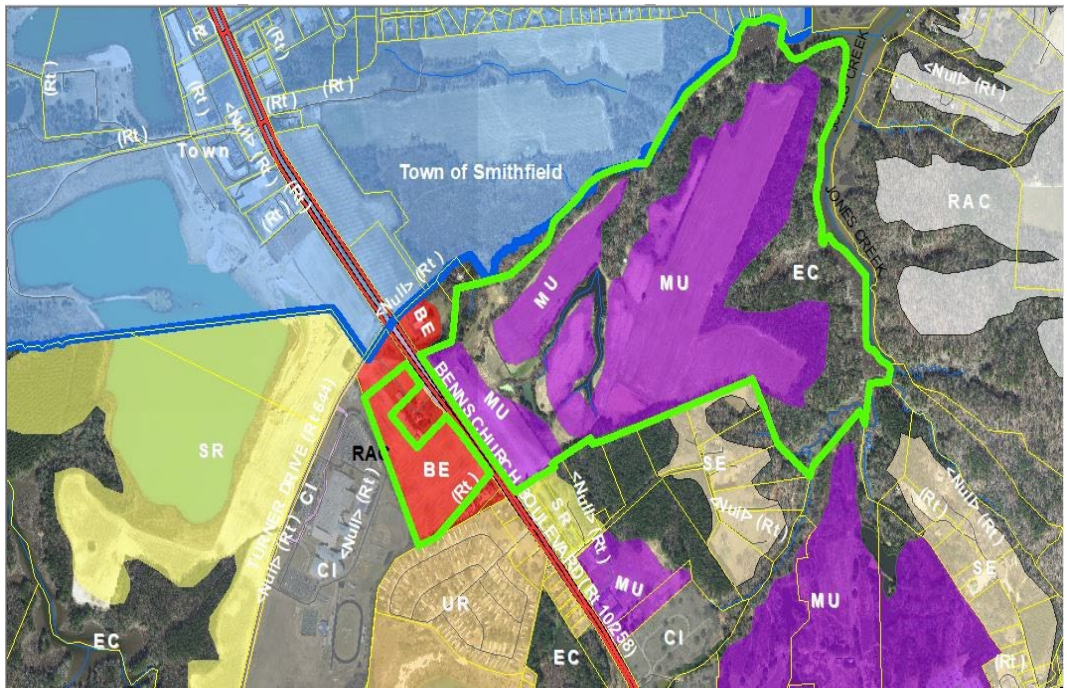
SITE DESCRIPTION

Tax Map ID#:	32-01-009
Location:	East Side of Benns Church Boulevard (Rte. 10) adjacent to Sherwin Williams Paint Store and Smithfield Town Limits
Current Zoning:	RAC, NDSO, and CBPA Overlay District
Election District:	District 1
Request:	To allow up to 390 age-restricted single family detached residential units, 225 residential townhomes, and approximately 5 acres of commercial uses up to 18,000 SF of retail & commercial uses & up to 55,000 SF of office

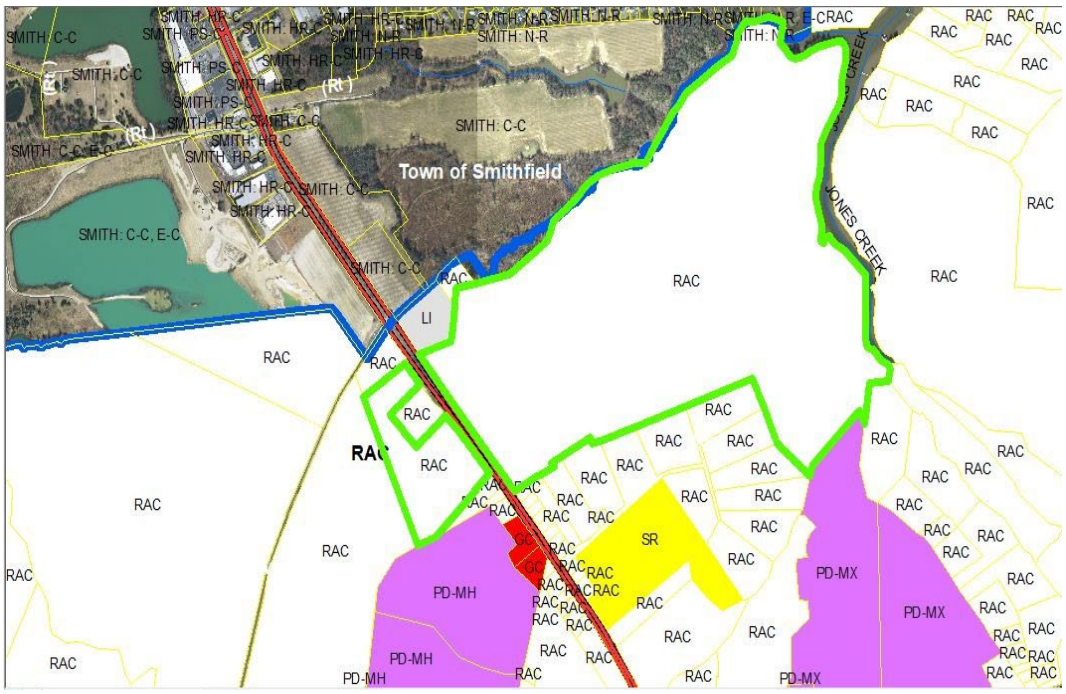
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Property Location Map



Future Land Use Map



Zoning District Map

BACKGROUND

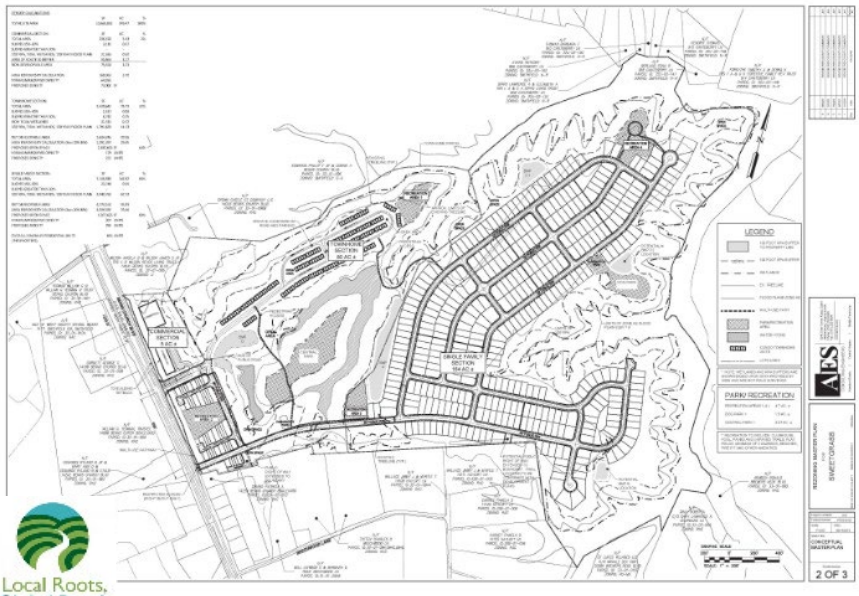
- Approx. 250 acre project site currently in agricultural and silvicultural use.
- Remaining 20 acres on west side of Route 10 is also currently in agricultural use.
- CUP currently under review for a convenience store and gasoline station on approximately 3.8 acres of the property at the southwest corner of the Turner Drive and Benns Grant Boulevard intersection.
- Historically been used for agricultural and silvicultural uses.

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PROJECT DESCRIPTION

- Up to 390 age-restricted single family detached residential units
- Up to 225 unrestricted residential townhomes
- 5 acres of commercial uses to include up to 18,000 SF of retail and commercial uses and up to 55,000 SF of office uses
- Proffered master bedroom on the first floor of age-restricted units
- Fiscal impact analysis (2019) - average sales price of an age-restricted unit to be $305,200 and townhomes to be $258,875
- Permitted commercial uses in the PD-MX zoning district - Antique shop; Business support service; Event center; Garden center; Golf course; Itinerant merchant; Micro-brewery; Motor vehicle parts/supply; Retail; Peddler; Personal improvement service; Personal service; Drive-in fast food; Fine Art Studio; Veterinary hospital/clinic; and Wholesale sales
- Enforcement of the age-restriction condition and the maintenance for all open space, recreational amenities, stormwater facilities, and landscaping shall be the responsibility of the property owner's association.

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Concept Plan
August 2023



Age-Restricted Single Family Model



Non-Restricted Townhome Model Example



Benns Grant Townhome Models



Benns Grant Townhome Models

STAFF ANALYSIS – ENVIRONMENTAL RESOURCES

- Site lies within the Chesapeake Bay watershed area and has several wetland areas and tributary streams to Jones Creek within it which have been confirmed by the US Army Corps of Engineers.
- RPA buffer has been confirmed by the Virginia Department of Environmental Quality. Department of Conservation and Recreation has classified the areas containing the streams, wetlands, and Jones Creek as having a "high" (C3) ecological core area score. National Fish and Wildlife Service information shows the possibility of several endangered and rare species and species of concern in the general including the Bald Eagle, the northern long-eared bat, tri-colored bat, red-headed woodpecker, and several other migratory species.
- USFWS information does not identify the property as critical habitat for any of these species. Future construction on the property may be subject to time-of-year restrictions based on the breeding and migratory needs of critical species.
- Project proposes to retain and restore the full extent of the RPA and floodplain areas that are within the ecological core area except for several access road crossings.
- Lot area will not contain RPA buffer areas.

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STAFF ANALYSIS – HISTORICAL RESOURCES

- Property falls within the high probability area for archeological resources according to County records.
- Applicant provided a Phase 1A Cultural Resources Analysis study with their initial application that states that there are no known archeological resources on the site, however, several of the existing out buildings may be of an historic nature and recommends that a Phase I be conducted.
- Proffer statement commits to a Phase I study with further Phase II and Phase III studies as appropriate in the proffer statement.
- Studies shall be submitted prior to subdivision or site plan submittal and shall be subject to review by the Virginia Department of Historic Resources.
- County Historic Resources staff concerns are satisfied with the proffered condition.

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STAFF ANALYSIS – TRANSPORTATION

- All of the streets will be public streets, except for the private drive aisles within the townhome phase which are proposed for a condominium style of ownership.
- All public roads will be required to be built to VDOT standards in order to be accepted into the state secondary street system maintenance program.
- The project proposes two entrances to serve the development from Benn's Church Boulevard (Rte. 10).
- The main entrance will be closest to the Smithfield Town boundary and will utilize an existing median cut.
- The second southern entrance will be a right in/right out entrance only with no signal.
- TIA shows an average of 6,685 new vehicle trips per day.
- Average number of new peak hour morning (6 AM to 8 AM) trips would be 521 trips and new peak hour evening (2:30 PM to 5:30 PM) trips would average 692.

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STAFF ANALYSIS – TIA RECOMMENDED IMPROVEMENTS

- Construct northbound right turn lane (200' storage plus 200' taper) into right in/right out development entrance off of US 258/Rt 10 (Benns Church Boulevard).
- Construct northbound right turn lane (200' storage plus 200' taper) into main entrance off of US 258/Rt 10 (Benns Church Boulevard).
- Lengthen southbound left turn lane to provide 200' storage plus 200' taper into main entrance off of US 258/Rt 10 (Benns Church Boulevard).
- Install traffic signal at intersection of US 258/Rt 10 (Benns Church Boulevard) and main entrance.
- Install signal infrastructure to provide a protected eastbound right turn overlap at US 258/Rt 10 (Benns Church Boulevard) and Turner Drive.
- Install flashing yellow arrows for the northbound and southbound left turn lanes at the intersection of US 258/Rt 10 (Benns Church Boulevard) at Canteberry Lane, Cypress Run Drive, Turner Drive and the main entrance to allow lead/lag operation.
- Optimize signal timings along the corridor.

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STAFF ANALYSIS – PUBLIC FACILITIES

- Capital Impact Model does not show that the proposed development will generate a need for additional capacity at existing fire and rescue or public safety facilities in the northern service area
- Fire and Rescue found that the department will see a significate increase in calls for service with a projected annual increase of 349 calls for service - 296 additional EMS calls and 53 additional Fire calls
- Model projects approximately 52 new school students - 30 elementary school students, 7 middle school students, and 15 high school students. The model results demonstrate a need for capacity expansion at the middle school.
- The new Westside, planned to function as a new middle school, is in the CIP with an estimated total cost of $38 million. According to the proportionate share of the costs for a new middle school generated by the model is $318,367 for seven additional students, or $1,414.96 per household (225), after a credit is applied for future debt service contributions made as a portion of future tax payments.
- Model does not show operational impacts, such as additional staff, equipment or supply needs

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STAFF ANALYSIS – PARKS AND RECREATION

1. Capital Impact Model shows that the proposed development will generate approximately 1,297 new people which will create a need for additional regional park, neighborhood park, recreational center, community center, and event center recreational facility space.
2. Proposed development will include 9.87 acres of pocket park and central park space as well as a community clubhouse facility, pool, play equipment and pedestrian trails throughout the community to help meet this need.
3. The development will also be required to install its portion of the multipurpose trail along its road frontage with Benn's Church Boulevard.
4. Applicant also proposes to preserve the RPA buffer and floodplain to the maximum extent possible which greatly increases the amount of open space in the neighborhood.

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STAFF ANALYSIS – ECONOMIC IMPACT

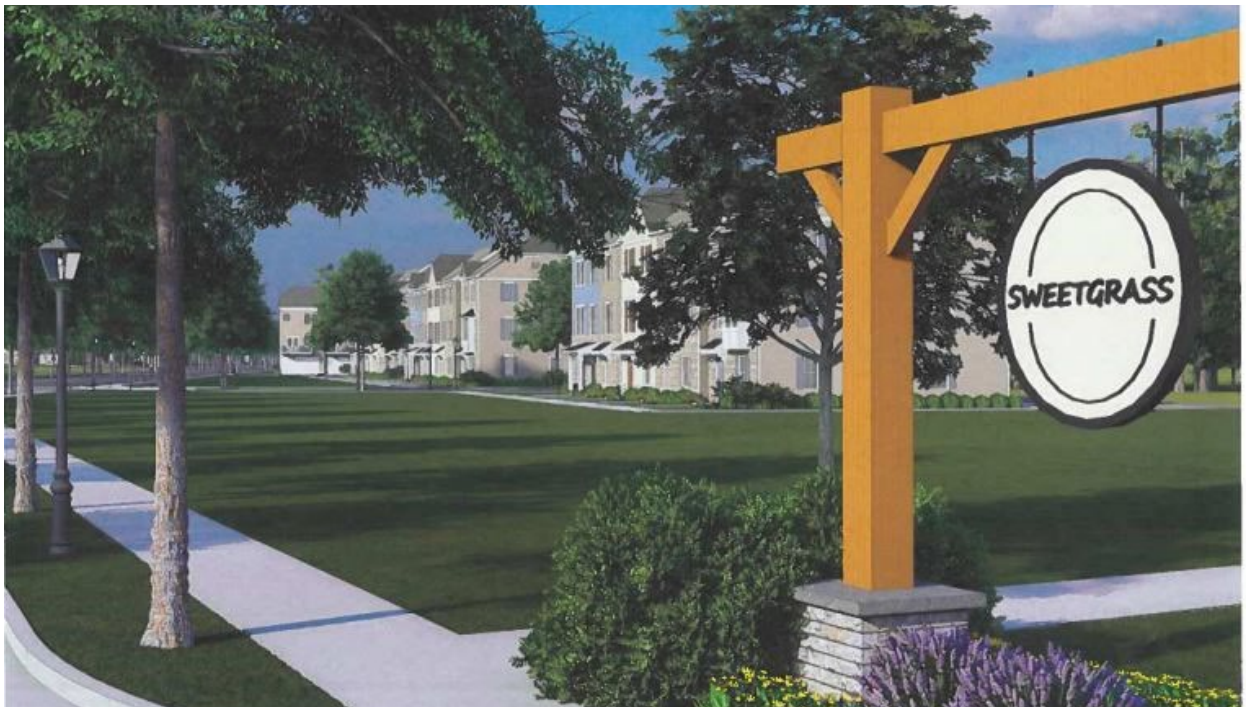
1. FIA assumes an annual absorption of 65 age -restricted single family and 38 townhouses per year with a six year build-out.
2. Average projected price of an age -restricted unit will be $305,200 and townhomes will be $258,875.
3. FIA concludes that the proposed development, to include both the residential and commercial uses, will generate $43.6 million in revenue compared to $22.7 million in expenditures over a 20 -year period, generating a $20.9 million net surplus.
4. Costs include ongoing annual operating expenditures and capital costs that include debt financing with payments that continue beyond the last year in the model projection period.
5. Average annual revenues are estimated at $1.05 million per year.
6. No job creation data was included in either the FIA or community impact statement.
7. Market analysis states census data shows 61,234 persons over the age of 55 in the market area. An average of 13% of this population will desire a living or lifestyle change every year. That produces 6,665 potential buyers per year and the developer maintains they can expect to capture 10% of this market, or 67 units.

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STAFF ANALYSIS – VIEWSHED IMPACT

- According to the applicant, many of the residential buildings will be similar to the styles Ryan Homes built in Benn's Grant. Examples of a commercial facade are included in the commercial design guidelines.
- Conceptual site plan also includes a recreational greenspace along Route 10 which will preserve a terminal vista down to the pond and woodland at the rear of the property, preserving a portion of the historical landscape within the proposed development.

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SWEETGRASS


LEGACY
AT
SWEETGRASS



COMPREHENSIVE PLAN CONSISTENCY

- Property located in the Newport Development Service District (DSD) area described in the Comprehensive Plan as a focus area for future growth in the County. Mixed use areas are described generally in the plan as comprised of "housing mixed with office, commercial, and other uses…located on major transportation routes and at major intersections."
- Plan describes future residential development anticipated in these areas as "a mix of detached and attached single family residences, multiplexes, townhomes, and apartment style residences, [having] community amenities and preserved natural features" up to density of 14 dwelling units per acre or higher.
- The project as conceptually designed accomplishes several Comprehensive Plan policies regarding the preservation of natural resources. The Plan states that mixed -use areas should include abundant open spaces which preserve natural features (e.g., mature forest cover, wetlands, etc.) and create active - and passive -use recreational amenities such as walking and multi -use trails, playgrounds, open spaces, and natural areas for residents of the community.

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DEPARTMENT AND AGENCY REVIEW

Staff distributed the application to the following departments for review and comment.

- Economic Development: No concerns.
- Emergency Services: Comments have been incorporated in the project description aboveA copy of the comments are also attached to this staff report.
- Utility Services: No concerns.
- Isle of Wight County Museum: No concerns with the application, provided that the proffered archeology condition is followed.
- Virginia Department of Transportation (VDOT): No concerns with the application, provided that the proffered transportation conditions are followed.

Please note that, should the conditional rezoning request be approved, the project will be subject to site plan review and approval from all necessary agencies.

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STAFF ANALYSIS

Strengths:

1. Application is generally consistent with the Comprehensive Plan and can meet all ordinance requirements.
2. Project proposes to preserve the RPA buffer area and floodplain to the greatest extent possible.
3. Proposed development will provide over 9.89 acres of park, trails, community center, pool and play areas to provide parks and recreation services.
4. Applicant proffers that all age-restricted units will have a first floor master bedroom and bathroom which will help facilitate age-friendly housing.
5. Development will include up to 18,000 square feet of retail and commercial uses as well as 55,000 square feet of office which will create employment opportunities and additional revenues to meet public facility and service needs.
6. Conceptual site plan includes a recreational greenspace along Route 10 which will preserve a terminal vista down to the pond and woodland at the rear of the property, preserving a portion of the historical landscape within the proposed development.

Weaknesses:

1. The proposed residential uses may negatively impact existing public facilities and services, such as fire and rescue services and school facilities, until such time as public expenditures are made to increase facility and operational capacity.
2. It is unclear what existing historical and cultural resources exist on the project site which may impact the final layout and design of the community.



Chairman Carroll opened the public hearing and invited the applicant to speak.

Tim Trant, Kaufman & Canoles, representing the applicant, gave a description of his client's project.

Chairman Carroll called for any citizen wishing to speak on this application.

Terry Kelpien, 14125 Hayloft Lane, shared his concerns about the density and traffic this subdivision will bring and asked the Planning Commission to deny the application.

Linwood Bell, 19341 Beechwood Lane, shared his concerns about an increase in crime and vandalism and asked for an enhanced barrier between this property and his. He also stated concerns with the Route 10 traffic.

Mary Ellen Bebermeyer, 355 Grace Street, Smithfield, stated she is not opposed to development at this site, but is opposed to six-hundred housing units due to the traffic concerns. She added she also had concerns with the ability of Emergency Services to handle the additional homes and asked the Planning Commission to deny the application.

Dustin Askew, 14041 Black Oak Drive, stated he was against the application due to traffic concerns.

Dr. Coleman, Deputy Superintended of Operations for Isle of Wight Public Schools, stated the schools' concern is not for capacity but for operational costs. He stated the schools will receive a significant impact. He added the schools have the building space for the additional students but do not have enough staff. This would require one additional teacher, one bus and bus driver, special needs bus and driver and one additional special education teacher and teacher assistant

along with additional teacher resources, devices, furniture, textbooks, and technology. Dr. Coleman added that the new Westside school will possibly be able to help with the additional students in the fall of 2027 or spring 2028, if all target dates are met with no delays.

Chairman Carroll invited the applicant to respond.

Mr. Trant stated they are committed to working with the neighboring property owners and are hypersensitive to the additional landscape buffer requests. He started the County currently has growth pressure and developing in a concentrated area prevents the negative effects from spawl. Mr. Trant stated with the age restrictions, fifty-five and older, with no residents under eighteen, their commuting patterns are during a different time. Mr. Trant added that this is developed in a way to produce a net positive fiscal impact at build out.

Chairman Carroll closed the public hearing and called from discussion from the Commission.

Bobby Jones stated the County is allowed to accept cash proffers for capital improvements only and this does not include school resources.

Commissioner Gibbs asked if there was a cap to the proffer.

Bobby Jones stated it had to be reasonable and directly attributable to the development's impact on the school.

Commissioner Gibbs stated that in 2019, the cost of the proposed houses was $305,000 and town homes were $258,000, and asked what the current estimate is.

Mr. Trant stated that it is still the expectation that the town houses are in the $200,000 price range, and the single-family homes in the $300,000 price range, possibly higher than the estimated original but still in those ranges.

Commissioner Boykin asked why a current fiscal impact analysis was not done.

Mr. Trant stated that a supplemental memo was prepared the summer of 2023, which stated the net positive cash flow was more than adequate to offset the operational cost of the project.

Commissioner Smith asked what the starting price was of similar homes and townhomes in Benns Grant.

Adam Edbauer, representing the applicant NVR, Inc., stated that currently there are no comparable townhomes for sale currently, but they were previously sold starting in the $270,00's.

Commissioner Bowser asked for clarification if the townhomes were three stories or four and the square footage for the single-family dwelling.

Mr. Trant stated the townhomes would be three stories, and the single-family homes would be 1,500- 2,000 square feet.

Commissioner Bowser asked for clarification on how the age restriction would be enforced.

Mr. Trant stated that fair housing law prevents discrimination of age, sex, etc. However, with senior citizens having unique needs, congress passed a law to allow age restrictions specifically for senior citizens, and it is enforced by the fair housing law and homeowners' association.

Commissioner Distefano asked whether their rules allow for temporary housing of underage children.

Mr. Trant stated that he is willing to work with the County to prevent the possible situation of children living in the age restrictive homes.

Commissioner Bowser asked when the commercial portion would be built. He added that the townhomes at Benns Grant are an eyesore.

Mr. Trant stated there is not a timeline, and it is driven by market demand. Mr. Trant offered additional landscaping until the commercial area is built out.

Commissioner Smith asked for the elevations of the townhomes facing Route 10 and has concerns with the viewshed.

Mr. Trant stated that the townhomes proposed in the front are rear loaded and the end units include upgraded architecture along with landscaping.

Mr. Edbauer stated the end units have upgraded architecture and additional landscaping.

Commissioner Ford asked how many age-restricted housing units are in the County.

Ms. Ring stated that in the south end of the County, there are about 24 units. South Harbor has 340 units, and Church Square in Smithfield is age-restricted, but she is not sure how many units are in there.

Commissioner Ford asked how enforcement is done with the current age restricted housing.

Ms. Ring stated that there have not been any issues reported.

Commissioner Ford asked if there have been bus routes needed in age restricted housing.

Dr. Coleman stated he was unsure but would pull the report.

Commissioner Smith asked what the phases or timeframe looks like.

Jason Grimes, AES Consulting & Engineers, representing the applicant, stated there will be seven phases spread out over time. Amenities will be built first, and the impacts are addressed during construction.

Commissioner Boykin asked if Benns Grant has a park or trail.

Ms. Ring stated they have neighborhood parks, a clubhouse with a pool, and trails.

Commissioner Boykin asked if Ryan homes has shown a history of what they proffer is what gets built.

Ms. Ring stated that history shows that the market has caused developers to amend their original proposed proffers.

Chairman Carroll stated that the fire and EMS departments are more than able to meet the current demand and will continue to meet the demand as the population grows.

Commissioner Boykin shared her concerns with overwhelming the police departments, fire and EMS with new calls.

Commissioner Ford stated that this corridor will be popular and needs orderly planned growth and the decision should be based on data.

Commissioner Boykin asked if this is considered orderly development.

Chairman Carroll stated that the EMS predictions seemed high, and added that in order for businesses to come, we need more houses.

Commissioner Gibbs asked how many projected units are in the pipeline.

Ms. Ring stated about 2,500.

Commissioner Gibbs stated the presentation was good but feels like it needs work.

Commissioner Smith stated his concern for affordable housing and the ability for police officers and teachers to live in the community. Commissioner Smith asked how the six year build out effects schools.

Dr. Coleman stated that schools is working on a new area report, and he will provide the information after it is presented to the school board.

Commissioner Smith said he is in favor of the project but would like more data.

Commissioner Boykin asked for the numbers of children and buses coming out of the Benns Grant community and asked what Benns Grant estimated for children compared to actual numbers.

Commissioner Bowser stated people want to work in Isle of Wight County and will travel.

Chairman Carroll stated he was disappointed there was no comments from Economic Development and would like to get one with the impact on the County.

Commissioner Distefano stated he would like an updated impact assessment.

Commissioner Distefano made the motion to table the application until next month. Commissioner Gibbs seconded the motion. Chairman Carroll asked for all in favor to signify by saying aye. The motion passed unanimously.

The motion passed, and will be under Old Business next month on October 24, 2023

OLD BUSINESS

Amy Ring Confirmed there were no items to discuss in old business.

NEW BUSINESS

Amy Ring Confirmed there were no items to discuss in new business.

COUNTY ATTORNEY'S REPORT

Bobby Jones confirmed there were no items to discuss for the County Attorney's Report.

PLANNING DIRECTORS REPORT

Amy Ring gave a brief description of the changes made to the proposed short-term rental regulations since the last meeting.

Commissioner Boykin asked about the short-term rental complaint in Rushmere Shores.

Ms. Ring stated she was aware of the complaint and the property currently had multiple violations.

Bobby Jones stated this property just received its third violation letter and will now come to him for enforcement action that he believes will cover all the violations on this property.

Commissioner Boykin asked when the first complaint came in.

Ms. Ring stated she was not sure but would research.

Commissioner Ford asked if they were approved for a short-term rental.

Ms. Ring stated they are not approved for anything but a single-family dwelling.

Commissioner Rawls asked if the owner lives in the County.

Ms. Ring stated yes, the owner lives in the County.

Commissioner Smith asked what the levels of enforcement are once Bobby Jones has the violation.

Mr. Jones stated there is injunctive relief and criminal unclassed misdemeanor. Mr. Jones stated that the County typically goes with the civil route to gain compliance.

Commissioner Ford stated maybe the ordinance should be stricter on numbers and events. Heasked how enforcement is possible.

Bobby Jones stated enforcement will be complaint based.

Commissioner Distefano asked if this process will increase resource demand to follow up on complaint activity.

Ms. Ring stated that once the process is in place it will be smoother, because there will be clear expectations along with new software to make the complaint and application process easier and there will be less demand for staff.

Commissioner Distefano asked if this adds any enforcement on the sheriff's office.

Ms. Ring stated they regulate disorderly conduct and noise complaints and do so already, so it does not add any new requirements.

The Planning Commission directed staff to advertise the short-term ordinance for public hearing.

Ms. Ring then gave the Planning Commission a brief introduction on the application for Tidewater Logistics Center in Windsor, since it has been in the news after being discussed at the Windsor Planning Commission meeting. Ms. Ring added that the first submittal was submitted on August 1, 2023, and a comment letter was sent back to the applicant around the first of September. Ms. Ring added that there is also conversation on what type of application needs to be submitted, so this application is premature to be reviewed by Planning Commission. Ms. Ring added that the Planning Commission will see it eventually, but most likely won't be ready for a public hearing until the end of the year due to the number of changes that need to be made.

Ms. Ring also gave a brief introduction to a recently submitted development located in the Town of Smithfield behind Tractor Supply, known as The Promontory, which is currently under review by staff.

CLOSED MEETING

Chairman Carroll confirmed there were no items to discuss in closed meeting.

ADJOURNMENT

There being no further information to discuss, Chairman Carroll adjourned the meeting at 8:32 PM.

Adopted this _____day of _____, 2023.

_____

Brian Carroll, Chairman, Isle of Wight County Planning Commission

Attest: _____

Amanda Landrus, Secretary

PLANNING REPORT

PLANNING REPORT

APPLICATION:

Application of Courthouse Hwy Solar 1, LLC, applicant, and Micheal S. Doggett, property owner, for a conditional use permit for a major utility service, specifically a 3 MW utility-scale solar energy generation facility, on eighteen acres located at 16419 Courthouse Highway with tax parcel number 39-01-017 in the Rural Agricultural Conservation (RAC) zoning district. The application includes a request to withdraw eighteen acres from the Courthouse Agricultural/Forestal District.

ELECTION DISTRICT:

District 3

LOCATION:

The proposed project address is 16419 Courthouse Highway (Rte.258). The access road to the site is located on Poorhouse Road. To the West of the site is the county complex. The current use of the property is agriculture. There are few parcels of residential development to the northwest of the site along Courthouse Highway. There is additional agriculture land with scattered residential development to the east along Poorhouse Road. A property location map is attached to this staff report.

BACKGROUND:

The project is sited on a parcel consisting of approximately 148 acres primarily consisting of pastures and agricultural fields. The property is in the RAC zoning district. Not all acreage comprising this parcel is proposed for the solar facility. The remaining 130.97 acres not proposed as part of the facility will continue to be used for agriculture.

On October 4, 2023, the Agricultural and Forestal District Advisory Committee held a public meeting to consider the withdrawal approximately eighteen acres of land from the Courthouse Agricultural/Forestal District. The Committee recommended approval of the request.

DESCRIPTION:

The applicant has proposed a three megawatt (MW) solar energy generation facility the northwest portion of the property. Any acreage of the property not within the project area will remain in their current uses. An existing electric line that bisects the project area will also serve as the interconnection point. The project will consist of solar panels along with their racking systems and metal posts, inverters, and fencing.

A perimeter fence containing approximately 14.8 acres will encompass the solar panels and ancillary equipment and will be harmonious with the rural agricultural and historical character of the County. An existing access road will be stabilized to serve the solar facility and the remaining agricultural operation. The site will bolster the existing vegetation present and provide screening around the site in accordance with the County's requirements.

Public Facility Impacts:

There is some concern from the Virginia Department of Transportation (VDOT) with the ability of the existing secondary road infrastructure to support the construction traffic loads for projects of this nature.

Any roadway damage within the right-of-way which occurs after project construction begins will be documented and analyzed by both the applicant and VDOT. All costs for damage repairs will be paid by the applicant. The approved truck route will be monitored and enforced as a condition of approval, with permit revocation an option if violations occur.

In establishing the use, the enjoyment of neighboring properties may also be temporarily impacted by construction traffic and noise generation.

In order to ensure adequate provision of emergency services, the Fire/EMS Department has reviewed this application and has no concerns. The applicant has proposed to submit an Emergency Response Plan with the submission of the Preliminary Site Development Plan. The plan shall include a training program to be provided, at the discretion of the County, to County emergency responders with regard to safety for on-site emergency response. The applicant shall install Knox Box or other remote access technology at the facility access gates. The facility perimeter fencing will be equipped with push bar pedestrian gates to permit emergency exits from the facility. A laminated Emergency Response Poster will be mounted near the front gate. The poster will include a general site map, evacuation routes and muster points, emergency response chain of command, directions to the closest hospital, coordinates to closest designated life flight landing area, and other

pertinent information associated with the facility during an emergency response.

Environmental Assessment:

The project lies within the in the County's Chesapeake Bay Preservation Area (CBPA) Overlay District. There are no impacts proposed to any wetlands, resource protection area or floodplain with this project.

Courthouse Hwy Solar retained Labella to prepare an Environmental Protected Resources Assessment for the project in November 2022. The project is situated within an existing hay field that will not require any deforestation which will not remove any potential habitat to the Northern Long-Eared, Little Brown and Tricolored bats. State agency responses to the submitted assessments have been attached to this staff report

Cultural Resources Assessment:

A Phase 1 Cultural Resources Survey of the project area was conducted by Hurt & Proffitt (H&P). This report was sent by the applicant to the Virginia Department of Historic Resources (VDHR) for their review and concurrence with the survey findings and recommendations. A letter from VDHR was provided with the application and is included as an attachment to this staff report. The letter was provided as technical assistance to assess potential impacts to historic properties.

The archaeological survey identified three previously unrecorded sites with nineteenth- and twentieth-century diagnostic materials, seven isolated post-colonial historic artifact loci, and two isolated pre-colonial Native American artifacts. The isolated finds are not considered archaeological sites and are not eligible for listing in the Virginia Landmarks Register (VLR) or the National Register of Historic Places (NRHP). A phase II evaluation is necessary for DHR to provide a formal recommendation of eligibility for an archaeological site. Therefore, there is insufficient information to evaluate the eligibility of the three sites (44IW0397, 44IW0398, and 44IW0399) for listing in the VLR and NRHP. However, DHR concurs with the consultant's recommendation that the archaeological deposits within the area of potential effects (APE) do not appear to retain sufficient integrity to contribute significant information to the understanding of history. These deposits are unlikely to contribute to the overall eligibility of any of the identified archaeological sites. No additional archaeological investigations are recommended.

The architectural survey included one previously recorded resource and thirteen newly identified resources within the APE for the project. None of the newly identified resources are recommended to be eligible for National Register of Historic Places (NRHP) and Virginia Landmarks Register (VLR) listing. H&P recommends Wilson House (DHR ID # 046-0052) eligible for VLR/NRHP listing, and it is DHR's opinion that the resource is potentially eligible and further survey is needed to formally determine the eligibility status. DHR recommends an intensive level survey, although this is likely outside the scope of this project. H&P recommends no adverse impact to 046-0052 and DHR concurs.

Economic Impact Assessment:

The proposed project area is 18.23 acres consisting of 14.21 acres within the fenced area, 1.8 acres within landscape/buffer areas, and the remaining 2.22 acres as open and unfenced areas within an easement. The remaining 130 acres (88%) of the parcel will continue to be used for agricultural purposes.

Per the applicants analysis, the land is assessed at $334 per acre in Land Use with a tax rate of 0.85 per $100. The current taxes generated from the facility (18.23 acres) is around $51 to the County. The County currently receives approximately $51 per year in real estate taxes from the proposed facility area.

Staff sent the project's fiscal impact analysis to the Commissioner of Revenue for review. The Commissioner of Revenue stated that because of the wattage, the project will not be assessed by the State Corporation Commission. Instead, the assessment will be performed locally by the Commissioner of the Revenue.

The real estate tax estimate appears to be based on the entire parcel being subject to rollback taxes. Rollback taxes are assessed on property that is either rezoned or has a change in use. The conditional use application is for 18.23 acres of land, and the rollback taxes will be assessed once construction on the project begins. Courthouse Hwy Solar will be assessed only for the 18.23 acres and not the entire 148.97 acres of the parcel. The study incorrectly estimates the one-time rollback taxes to be $2,700. Based on the 18.23 acres for the conditional use permit, the rollback taxes will be $238.12. Additionally, the study estimates the real estate taxes based on the $0.85 tax rate, which was in effect prior to July 1, 2023. The current tax rate has been reduced to $0.71, resulting in a reduction in revenue from $2,384.31 to $1,966.00 annually. The corrected tax will have a negative impact on the 2% per year increase in real estate taxes, as presented in their fiscal study, since the base year revenue will be lower than estimated. The County's July 1, 2023, general reassessment of real estate changed the assessment methodology

for solar farm projects. The change resulted in the buffer area of the solar projects being assessed at $15,000 per acre and not $3,500 per acre. The entire area of the conditional use permit will be assessed at $15,000 per acre. The result is additional revenue from the buffer area.

In regard to personal property tax revenue projections, the Commissioner of Revenue stated the personal property revenue estimates on the solar equipment appear to be in line with the current assessment methodology and rates.

Viewshed Analysis:

A viewshed analysis of present-day conditions was provided by the applicant of various vantage points. Visual renderings were also provided showing proposed landscaping buffers. A conceptual-only landscape screening plan has been included with the proposed concept plan. A detailed landscape screening plan will be included with the Preliminary Site Development Plan and approved with the Final Site Plan. All proposed landscape screening will require a Landscape Surety Agreement between the property owner, applicant, and the County to ensure enforcement, and a Certificate of Occupancy for this use will not be issued until a final landscape installation inspection is conducted by staff. The surety will be held for two years to ensure viability of all plantings, and any plantings determined to be not viability must be replaced at the applicant's expense. Both the agricultural-style fence and the Landscape Plan must be approved by the Zoning Administrator prior to final site plan approval.

COMPREHENSIVE LAND USE PLAN:

The future recommended land use designation for these properties is Rural Agricultural Conservation (RAC) and Environmental Conservation (EC) under the adopted Comprehensive Plan. Appropriate uses for the RAC land use designation include agriculture, horticulture, forest lands, and scattered low-density residential uses. Other uses such as resource extraction and utility-scale solar facilities are also permitted when appropriately sited with a Conditional Use Permit. Appropriate uses for the EC land use designation include wetlands, farms, forest uses, open space, and limited park facilities.

Solar energy facilities are considered compatible with the RAC land use when properly sited and with the application of appropriate development criteria. The areas designed as EC are outside of the proposed project area and should be preserved due to environmental constraints unless site-specific analysis

demonstrates there are no environmental concerns in a specific area. The proposed use will be required to use screening landscaping and appropriate fencing to minimize its visual impacts on the surrounding area.

ORDINANCE REVIEW:

The zoning district classification for the subject parcels is RAC. The RAC zoning district is intended to preserve and protect areas of the County that are predominantly in agricultural and forestal uses and to maintain the existing land base to support those activities.

The applicant proposes to establish a three MW utility scale solar energy facility which is classified as a major utility service use type in the Zoning Ordinance. These facilities are permitted as conditional uses in the RAC zoning district and may be considered compatible with appropriate conditions to mitigate any potential negative impacts on the surrounding community.

The parcel is located just outside of 500-foot Highway Corridor Overlay District (HCOD) boundary line. Equipment is shown outside of the HCOD boundary line. At a minimum, the project will be required to meet the minimum setbacks of 75 feet from adjacent property lines and 125 feet from residential use parcels as required by the Zoning Ordinance. There is also a 250-foot setback requirement for all inverters and electrical equipment.

Following approval of the CUP request, the applicant will be required to submit a site plan application for review and approval that demonstrates compliance with all current plan criteria contained in Section 5-5003.M.4, supplemental use regulations for utility scale solar energy facilities, of the Zoning Ordinance.

The parcel is located in the Courthouse Agricultural/Forestal District and have been recommended by the Agricultural and Forestal District Advisory Committee for withdrawal at their meeting on October 4, 2023.

Section 1-1017 of the Zoning Ordinance provides standards for review of a conditional use permit application that the Planning Commission and Board of Supervisors shall consider before granting a conditional use permit. They are as follows:

1. That the establishment, maintenance, and operation of the conditional use will not be detrimental to or endanger the public health, safety, and general

welfare;
2. That the conditional use will not be injurious to the use and enjoyment of other property in the immediate vicinity for the purposes already permitted, nor substantially impair the use of other property within the immediate proximity;
3. That adequate utilities, water, sewer or septic system, access roads, storm drainage and/or other necessary public facilities and improvements have been or will be provided;
4. That adequate measures have been or will be taken to provide ingress and egress so designated as to minimize traffic congestion on the public streets;
5. That the proposed conditional use is not contrary to the goals and objectives of the Isle of Wight County Comprehensive Plan;
6. That the conditional use shall, in all other respects, conform to the applicable regulations of the zoning district classification in which it is located and to the special requirements established for the specific use; and,
7. That the use(s) at the location proposed will not result in a multiplicity or saturation of similar uses in the same general neighborhood of the proposed use.

In addition to the standards and other guidelines described in the Zoning Ordinance, the Board may impose conditions or limitations on any approval, including the posting of performance guarantees. Such conditions may include, but are not necessarily limited to:

1. The number of persons living or working in the immediate area and the proposed hours of operation, as may be applicable;
2. Traffic conditions, including facilities for pedestrians, such as sidewalks and parking facilities; the access of vehicles to roads; peak period of traffic; and proposed roads, but only if construction of such roads will commence within the reasonably foreseeable future;
3. The orderly growth of the neighborhood and community and the fiscal impact of the County;
4. The effect of odors, dust, gas, smoke, fumes, vibration, glare, and noise upon the use of surrounding properties;
5. Facilities for police, fire protection, sewerage, water, trash and garbage collection and disposal, and the ability of the County or persons to supply such services;
6. The degree to which the development is consistent with generally accepted engineering and planning principles and practices;
7. The structures in the vicinity such as schools, houses of worship, theatres, hospitals, and similar places of public use;

8. The purposes set forth in this ordinance, the County's Comprehensive Plan, and related studies for land use, roads, parks, schools, sewers, water, population, recreation, and the like;
9. The environmental impacts, the effect on sensitive natural features, and opportunities for recreation and open space; and,
10. The preservation of cultural and historic resources or landmarks.

Following approval of the CUP, the applicant will be required to submit a site plan for review and approval in accordance with the Zoning Ordinance requirements and conditions of approval.

AGENCY REVIEW:

The application was forwarded to the following departments for their review:

- Economic Development: No concerns
- Environmental Planner: All concerns addressed.
- Emergency Services: Staff will work with applicant during site plan review on required Emergency Response Plan to include annual training.
- Utility Services: Staff will review site plan for compliance with State Stormwater regulations.
- Isle of Wight County Museum: No Concerns.
- Virginia Department of Transportation (VDOT): Recommends that all roads be inspected prior to starting construction and after construction is complete and video documented in accordance with Isle of Wight Zoning Ordinance 5-5003, Section M – 4.G.ii. All roads damaged by solar farm construction to be repaired by the applicant. We additionally recommend that this provision be clearly stated in a conditions document included with the application materials.
- Commissioner of Revenue: Review comments are included in the project description section and are attached to the staff report.

  Please note that, should the conditional use permit be approved, the project will be subject to site plan review and approval from all necessary agencies.

STAFF CONCLUSIONS:

Strengths:

1. The proposed use is consistent with the County's adopted Comprehensive Plan for the Rural Agricultural Conservation (RAC) future land use

designation.

2. The proposed use is consistent with the County's Conditional Use Permit criteria as set forth in the Zoning Ordinance.
3. The amount of acreage for the proposal is minimal and a majority of the site will continue to be agricultural.

Weaknesses:

1. The proposed use would remove agricultural land from production.
2. Temporary impact to residential development in the area from construction traffic and noise is expected during the construction phase.
3. There is a concern with the ability of the secondary roads to handle the type of traffic related to the construction of this nature.

STAFF RECOMMENDATION:

Staff recommends approval of the CUP and the Courthouse AFD withdraw request with the following conditions: 1. Topsoil shall be stockpiled on the site and shall be stored out of view from adjacent properties and public roads. 2. The applicant shall submit an invasive species management plan as recommended by DCR with the submission of the final site plan. 3. The applicant will work directly with Isle of Wight County's Chamber of Commerce the Paul D. Camp Community College, and the Economic Development Department to ensure inclusion of local contractors in the bidding process. 4. The applicant shall submit a seed mix for site groundcover that includes native pollinators blooming in spring/summer as recommended by DCR. 5. A sign shall be installed at the entrance of the site with contact information for the facility. 6. A laminated Emergency Response Poster will be mounted near the front gate. The poster will include a general site map, evacuation routes and Muster Points. Emergency Response Chain of Command, directions to the closest hospital, coordinates to closest designated life flight landing area, and other pertinent information associated with the facility during an emergency response. 7. Adherence to the proposed Transportation Plan shall be required for all facility traffic. Truck traffic shall be limited to only the routes shown in the transportation plan. No other local routes in Isle of Wight County may be used. 8. Excluding the bufferyards, the ground between the panels and in areas not otherwise covered by gravel or infrastructure shall be planted and maintained with a vegetative cover. This vegetative cover will be managed with moving and/or grazing. 9. Hours of operation for construction and post-construction operation shall be limited to Monday through Friday, 7:00 a.m. to 6:00 p.m. Saturdays from 7:00 a.m. to 5:00 p.m. No construction is to occur on Sundays by any party involved with the

project. 10. As part of the site plan review, the Applicant shall provide documentation that the selected panels and all power-generating equipment onsite are “Tier 1” modules, as established by the most recent “PV Module Tier 1 List” issued by Bloomberg NEF or a similar third party analysis widely accepted in the solar industry. Additionally, the make and model of the selected panels and all power-generating equipment initially installed and replaced on the site mut qualify, for disposal purposes only, as non-hazardous waste under applicable U.S. Environmental Protection Agency tests (e.g., TCLP). 11. The applicant shall implement a program for the collection of baseline data establishing pre-construction soil conditions for the production of row crops for the agricultural areas within the project area. The program shall establish the relevant characteristics of the topsoil. The baseline data shall be derived from field and laboratory testing of soil conditions, including depth, density and quality from representative locations. Laboratory testing shall be conducted by an accredited laboratory. Parameters for assessing soil quality may include the following: infiltration rate, bulk density, water holding capacity, pH, percent organic matter, cation exchange capacity, Phosphorous/Phosphate (P), Nitrogen (N), and Potassium/Potash (K). After 30 years of operation and again after 35 years of operation, soil conditions shall be determined for the same sampling locations using the same parameters and the results used to plan soil restoration activities. After equipment is removed as part of decommissioning, soil conditions shall be determined for the same sampling locations using the same parameters. Soil restoration activities shall be performed as necessary during operations or decommissioning to return soil conditions to at least baseline conditions. The County will be provided with data of soil conditions within 30 days after the receipt of results. 12. The facility perimeter fencing will be equipped with push bar pedestrian gates to permit emergency exits from the facility.

ATTACHMENTS:

Description	Type	Upload Date
Narrative	Backup Material	10/17/2023
Application	Backup Material	10/17/2023
Visual Impact Analysis	Backup Material	10/17/2023
Economic Impact Analysis	Backup Material	10/17/2023
Transportation Plan	Backup Material	10/17/2023
Concept Plan	Backup Material	10/17/2023
Phase 1 Study	Backup Material	10/17/2023
Phase 1 Study	Backup Material	10/17/2023
VDHR Response	Backup Material	10/17/2023
Commissoner of Revenue Response	Backup Material	10/17/2023
Location Map	Backup Material	10/17/2023

Location Closeup Map	Backup Material	10/17/2023
Zoning Map	Backup Material	10/17/2023
Land Use Map	Backup Material	10/17/2023
PC Resolution	Resolution	10/18/2023

EXECUTIVE SUMMARY

Courthouse Hwy Solar 1, LLC (Courthouse Hwy Solar) selected a Tax Parcel 39-01-017 on the lands now or formerly of Michael S. Doggett within Isle of Wight County's Rural Agricultural Conservation District as the ideal location for a 3-MW Solar System. The project is sited approximately 1.87 mile from a major transmission line, and on a parcel consisting of ±148 acres primarily consisting of pastures and agricultural fields. The property owner is proposing to diversify his land by allocating his worst performing farmland, approximately 18.23 acres, on the property for the proposed solar site while continuing to raise cattle and cultivate crops on the remaining ±130 acres of land.

Courthouse Hwy Solar retained a professional archaeological firm and an engineering firm to perform a due diligence review of the site and surrounding area for cultural resources, threaten and endangered species, and stream/wetlands delineation. The project area is not located within any mapped cultural resource areas per DHR's VCRIS. A field survey was performed and being coordinated with DHR for concurrence of eligibility/no effect. The project will not require any tree clearing, as a result will not impact any threatened and endangered species. A stream and wetland delineation was performed within the project area and no jurisdictional aquatic resources were identified.

Courthouse Hwy Solar is proposing to site the 3-MW Solar Facility within the northwest portion of the property, where the present landowner's poorest farmland is located. The site encompasses approximately 18.23 acres, which includes an existing electric line, that bisects the project area that will also serve as the interconnection point. The project area does not directly abut any residential property to the east, north or west. Ingress/Egress to the facility is proposed along Poorhouse Road (Rte 692), and for permitting purposes,the anticipated vehicle traffic generated from the project will be 1-2 vehicles per day, which is similar to a single-family home. Once the facility is operational, the average daily traffic should be reduced to periodic visits, equating to less than 1 ADT. The site will be designed to comply with the Virginia Code's Virginia Stormwater Management Program, including DEQ's additional guidance / recommendations pertaining to solar projects, where applicable.

A bisected (Utility ROW) perimeter fence containing approximately ±14.21 acres will encompass the solar panels and ancillary equipment and will be harmonious with the rural agricultural and historical character of the County. The height of the mounted solar panels and ancillary equipment is approximately 14ft and will not exceed the maximum 15 feet. The panels and all power generating equipment initially installed and replaced will qualify for disposal purposes as nonhazardous waste under applicable US EPA regulation using a Toxicity Characteristics Leaching Procedure or equivalent laboratory analysis. The power generated from the facility will interconnect into the existing 3-phase Dominion line bisecting the site, further reducing the project's footprint, and isolating the site to a single property.

The project's proposed landscaping will utilize best management practices in the design and execution of the County's landscaping and screening requirements. The site will bolster the existing vegetation present and provide screening around the site in accordance with the County's requirements. Based on the site's proximity to the public roadways, coupled with the County's landscape requirements, the site should blend with the abutting silvicultural properties.

The proposed Solar Facility will provide both direct/indirect benefits to the County and property owner by utilizing a portion of the landowners underperforming land to generate electricity that will interconnect to the local grid and diversify the property owner's income while increasing the tax revenue to the County as part of the Virginia Clean Economy Act. The project will provide additional job opportunities to the local community during construction, operation and maintenance, without bearing additional strain on the existing infrastructure and public utilities.

CONDITIONAL USE PERMIT APPLICATION

Courthouse Hwy Solar 1, LLC (applicant) is requesting the County to approve the following Conditional Use Permit Application (CUP) for a 3 MW Solar Facility, which is considered a Major Utility Service Utility Scale Solar Energy Facility per the County's definition. The project is approximately 23.33 acres consisting of 18.23 ac for the lease area, 14.21 ac for the fenced in solar facility, 3.29 ac for temporary construction area, and 1.81 ac access easement.

The 3 MW Solar Facility is located within Election District 3 and entirely on a Tax Parcel 39-01-017, which consists of approximately 148 acres and owned by Michael Doggett, and approximately 1.87 mile from a major transmission line. The property is a large irregular piece of land that abuts Courthouse Highway (US Rte 258) and Poorhouse Road (Rte 692) with an assigned physical address of 16419 Courthouse Highway. The parcel is located within the Rural Agricultural Conservation (RAC) zoning district and within the Courthouse Agricultural/Forestal District. A separate letter from Mr. Doggett (landowner) was submitted to the Agricultural / Forestal District Committee on July 18,2023 to remove the aforementioned 18.23 acres from the district, which should be conditioned on the CUP approval.

Access to the site is proposed along the previously established farm road, approximately 2,390 ft, across the parcel and intersects with Poorhouse Rd, approximately 2,355 ft from the intersection of Courthouse Highway and Poorhouse Road. A Land Use Permit will be obtained from VDOT after Site Plan approval for the entrance to the existing farm road. The farm road will be improved and stabilized in accordance with the County's Site Plan requirements and DEQ/Industry Standards to ensure safe ingress/egress throughout the life of the project. The access road will serve as a dual use for continued use of agricultural crops / livestock on the remaining 130 acres.

The following pages contain the Conditional Use Application and permit fee (Check No. 1723) in the amount of **$1,200.00** for the County's review. A list of the adjacent property owners is provided in **Appendix A** and records of our community outreach efforts regarding the project is in **Appendix B**.

ISLE OF WIGHT
COUNTY, VIRGINIA
DEPARTMENT OF PLANNING AND ZONING

APPLICATION FOR CONDITIONAL / SPECIAL USE PERMIT

This application should be used to petition for a permit for certain uses which, because of their unique characteristics or potential impacts on adjacent land uses, are not generally permitted in certain zoning districts as a matter of right, but which may, under the right set of circumstances and conditions be acceptable in certain specific locations. The following application requirements are consistent with the procedures set forth in Section 1-1017, *Conditional Uses,* and Section 1-1018, *Special Use Permits for Uses Not Provided For,* of the Isle of Wight County Zoning Ordinance, as amended.

A. APPLICATION FOR (CHECK ALL THAT APPLY):

☑ Conditional Use Permit (Are applicant proposed conditions attached?): ☐ Yes ☑ No

The proposed use or activity is listed as a conditional use in the RAC zoning district as per Section 4-2003(C) in Article IV of the Isle of Wight County Zoning Ordinance.

☐ Special Use Permit (Are applicant proposed conditions attached?): ☐ Yes ☐ No

Proposed Use or Activity: Proposed Major Utility Service - Utility Scale Solar Energy Facility for a 3MW Solar Facility.

B. PROJECT DESCRIPTION:

Project Name: Courthouse Highway - Isle of Wight - VA DG

Property Address (if any): 16419 COURTHOUSE HWY, SMITHFIELD

Election District: District 3

Comprehensive Plan Designation: Rural Agricultural Conservation

The use permit will apply to ~~28~~ 18 acres out of 148.97 total acres

Tax Parcel Identification # 39-01-017 Number of acres to be effected: ~~28~~ 18

Tax Parcel Identification # _____ Number of acres to be effected: _____

Tax Parcel Identification # _____ Number of acres to be effected: _____

Proposed Utilities (check all that apply): Public Water ☐ Private Well ☐

Public Sewer ☐ Private Septic ☐

The project will not support human habitation and water / sewer services are not required.

C. APPLICATION INFORMATION:

Applicant(s) Name(s): Courthouse Hwy Solar 1, LLC

Address: 55 Technology Dr. Suite 102

City, State, Zip Code: Lowell, MA 01851

Phone No.: 757-377-2405 Email: qwood@newleafenergy.com Fax No.:

Property Owner(s) Name(s): Michael S Doggett

Address: 11553 Central Hill Rd.

City, State, Zip Code: Windsor, VA 23487

Phone No.: Email: Fax No.:

Applicant Signature 3/14/2025 **Date**

Owner Signature *if different* 3-14-23 **Date**

NOTICE: THE ATTACHED CHECKLIST MUST BE COMPLETED, CERTIFIED, AND SUBMITTED OR THE APPLICATION WILL BE CONSIDERED INCOMPLETE.

Remit Application to: Isle of Wight County Central Permitting, 17140 Monument Circle, Suite 100
P. O. Box 80, Isle of Wight, Virginia 23397

FOR OFFICE USE ONLY:

Complete Application Received On: Fees Paid:
Tax Query: ☐ Current ☐ Delinquent Distribution Date:
Posted/Date to Post:

AGENCIES REFERRALS:

☐ Department of Conservation & Recreation
☐ Economic Development
☐ Emergency Services
☐ General Services
☐ Environmental Planner
☐ Health Department
☐ Transportation Manager
☐ Commission of Revenue
☐ Other

☐ Inspections
☐ Sheriff's Office
☐ Town of Smithfield
☐ Town of Windsor
☐ VDOT
☐ Schools
☐ Budget & Finance
☐ County Attorney

Verified By: Date:

COUNTY OF ISLE OF WIGHT
DISCLOSURE OF REAL ESTATE HOLDINGS

Applicant Courthouse Hwy Solar 1, LLC

Address 55 Technology Dr. Suite 102
Street

Lowell MA 01851
City State Zip

REAL ESTATE HOLDINGS TO BE AFFECTED

Location or Address	Description
16419 Courthouse Highway, Smithfield VA	148.97 Acre Parcel Zoned Rural Agricultural Conservation

OTHER OWNERS OF AFFECTED REAL ESTATE
(Not Required for Corporation whose stock is traded on a national or local stock exchange or having more than 500 shareholders.)

Name of Individuals Corporation/Partnership Business Association	Address

Does any member of the Isle of Wight County Planning Commission or governing body have any interest in such property, either individually, by ownership of stock in a corporation owning such land, partnership, as the beneficiary of a trust, or the settlor of a revocable trust, or whether a member of the immediate household of any member of the Planning Commission or governing body has any such interest? Yes ○ No ◉
If yes, names of members:

I do solemnly swear that the foregoing statement(s) and attachments(s), if any, are complete, correct, and true.

Owner ~~Applicant~~: Michael S Doggett Owner ~~Applicant~~: Michael S Doggett Date: 3-14-23
Printed or Typed Name Signature

Commonwealth of Virginia
County of Isle of Wight

Subscribed and sworn to before me Christine M Cooper,
A Notary Public in and for the County of Isle of Wight, Commonwealth of Virginia, this 14 day of March, 20 23.

Christine M Cooper
Notary Public

My Commission Expires 08/31/2026

CHRISTINE M. COOPER
NOTARY PUBLIC
REG. #7585377
MY COMMISSION EXPIRES
AUG. 31, 2026
COMMONWEALTH OF VIRGINIA

COUNTY OF ISLE OF WIGHT
DISCLOSURE OF REAL ESTATE HOLDINGS

Applicant Courthouse Hwy Solar 1, LLC

Address 55 Technology Dr. Suite 102
Street

Lowell MA 01851
City State Zip

REAL ESTATE HOLDINGS TO BE AFFECTED

Location or Address	Description
16419 Courthouse Highway, Smithfield VA	148.97 Acre Parcel Zoned Rural Agricultural Conservation

OTHER OWNERS OF AFFECTED REAL ESTATE
(Not Required for Corporation whose stock is traded on a national or local stock exchange or having more than 500 shareholders.)

Name of Individuals Corporation/Partnership Business Association	Address

Does any member of the Isle of Wight County Planning Commission or governing body have any interest in such property, either individually, by ownership of stock in a corporation owning such land, partnership, as the beneficiary of a trust, or the settlor of a revocable trust, or whether a member of the immediate household of any member of the Planning Commission or governing body has any such interest? Yes ◯ No ◉
If yes, names of members:

I do solemnly swear that the foregoing statement(s) and attachments(s), if any, are complete, correct, and true.

Applicant: Quentin T. Wood (Printed or Typed Name) Applicant: [signature] (Signature) Date: 3/14/2023

Commonwealth of Virginia
County of Isle of Wight

Subscribed and sworn to before me Christine M Cooper,
A Notary Public in and for the County of Isle of Wight, Commonwealth of Virginia, this 14 day of March, 2023.

Christine M Cooper
Notary Public

My Commission Expires 08/31/2026

CHRISTINE M. COOPER
NOTARY PUBLIC
REG. #7585377
MY COMMISSION EXPIRES
AUG. 31, 2026
COMMONWEALTH OF VIRGINIA

SUBMITTAL CHECKLIST FOR CONDITIONAL / SPECIAL USE PERMIT APPLICATIONS

In conjunction with Section 1-1017, *Conditional Uses*, and Section 1-1018, *Special Uses Permits for Uses Not Provided For*, of the Isle of Wight County Zoning Ordinance, as amended, the following information shall be submitted for a Conditional / Special Use Permit Application. Please note that it is the applicant's responsibility to ensure that the application is in compliance with all Federal, State and County regulations.

No application for a Conditional / Special Use shall be certified as complete unless the following information is provided**. The required number of copies may be reduced with permission of the Zoning Administrator.**

- ☐ Application: Ten (10) copies of the original, executed application, one (1) digital copy of all application documents, and one (1) original executed application. Both the applicant(s) and the property owner(s) must have their signature(s) notarized on page 3 of the application.

- ☐ The appropriate fees have been submitted with the application. Checks should be made payable to: Treasurer, Isle of Wight County.

- ☐ Ten (10) copies of a statement of the reasons for seeking such permit and if applicable, a statement of conditions.

- ☐ Ten (10) copies of a narrative description of the property which shall include the Tax Parcel Identification

- ☐ Ten (10) copies of a concept plan of the property showing all existing and proposed physical improvements and such other information as is necessary to clearly indicate to the Planning Commission and Board of Supervisors that adequate provisions shall be made for compliance with all standards for that particular use and the extent of the property to be so used on a given parcel or parcels. Such document shall be drawn to scale and shall include the following information:
  - A vicinity map at a scale of no less than one (1) inch equals two thousand (2,000) feet
  - Title of drawing
  - Date of drawing
  - Existing wood line
  - North arrow
  - Scale bar
  - Current zoning of parcel(s) to be rezoned, including tax map number(s) and owner(s)
  - Current zoning of adjacent parcel(s), including tax map number(s) and owner(s)
  - Street names including route number and width(s) of the right-of-way(s)
  - Ten (10) full size copies, with one (1) reduced 11-inch X 17-inch copy and a digital copy shall be submitted

- Please note that additional information on the site layout may be requested by the Zoning Administrator during the review process to **review the application and prepare the staff reports for the Planning Commission and Board of Supervisors more effectively**.

☐ Ten (10) copies of such supplemental material as may be necessitated by the proposal itself or the district in which located or proposed to be located, and in accordance with Section 5-5000, *Supplementary Use Regulations,* of the Isle of Wight County Zoning Ordinance.

☐ A WQIA (Water Quality Impact Assessment) if located in the Chesapeake Bay Preservation Area.

☐ All real estate taxes must be paid and current at the time of submittal; otherwise, the submittal will be refused at the counter. Proof of the most recent tax payment to the County must accompany the application.

I, the undersigned, certify that this application is complete, accurate and contains all required and requested information, documents and other submittals, and that all statements made herein are, to the best of my knowledge, true and correct. I further certify that I have exercised due diligence to obtain the most recent, complete and correct information available. I understand that any section not completed in its entirety may delay processing of this application and the date of the Planning Commission public hearing and that the submittal of a complete application does not guarantee the application will be placed on the next available Planning Commission agenda.

Quentin Wood

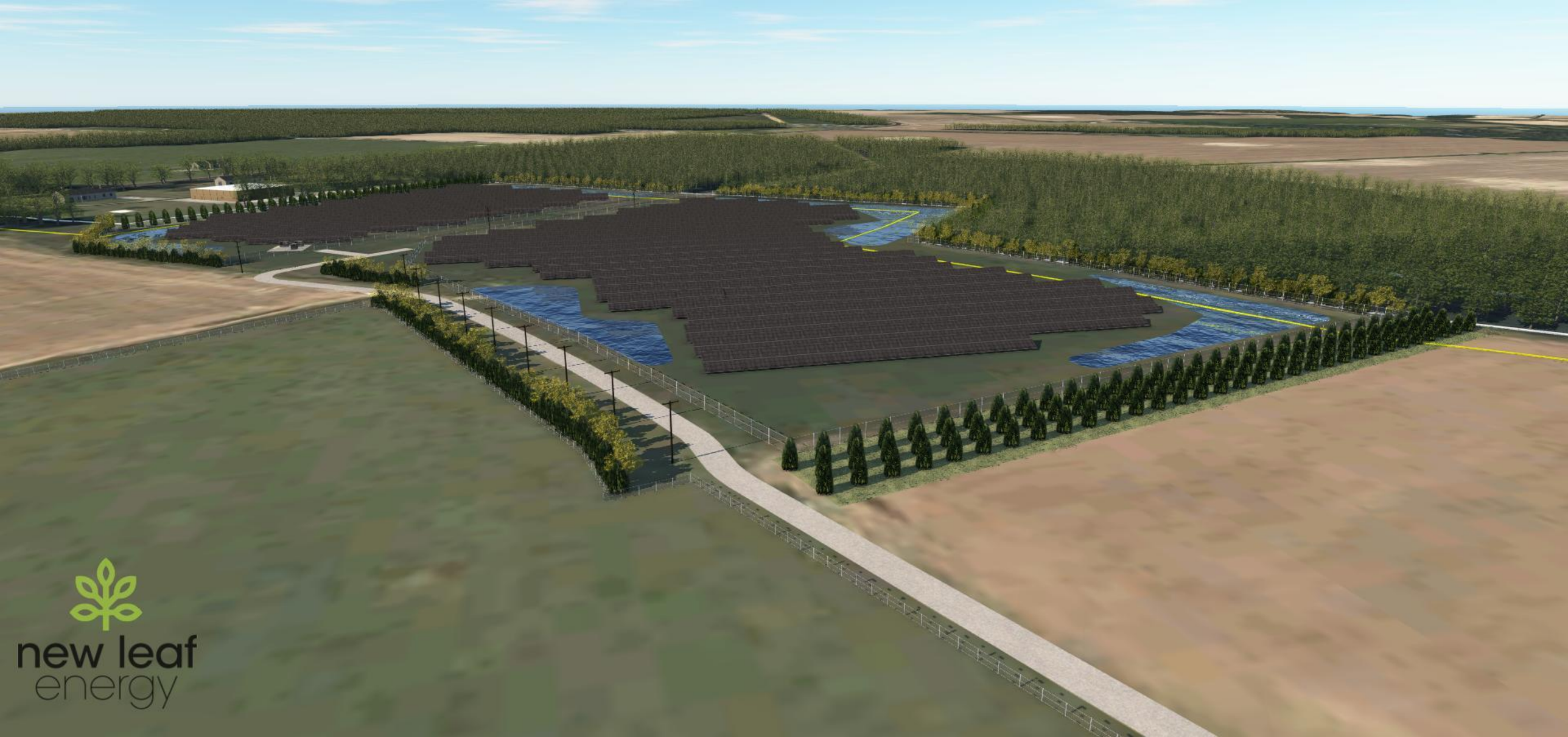
Printed or Typed Name

Signature

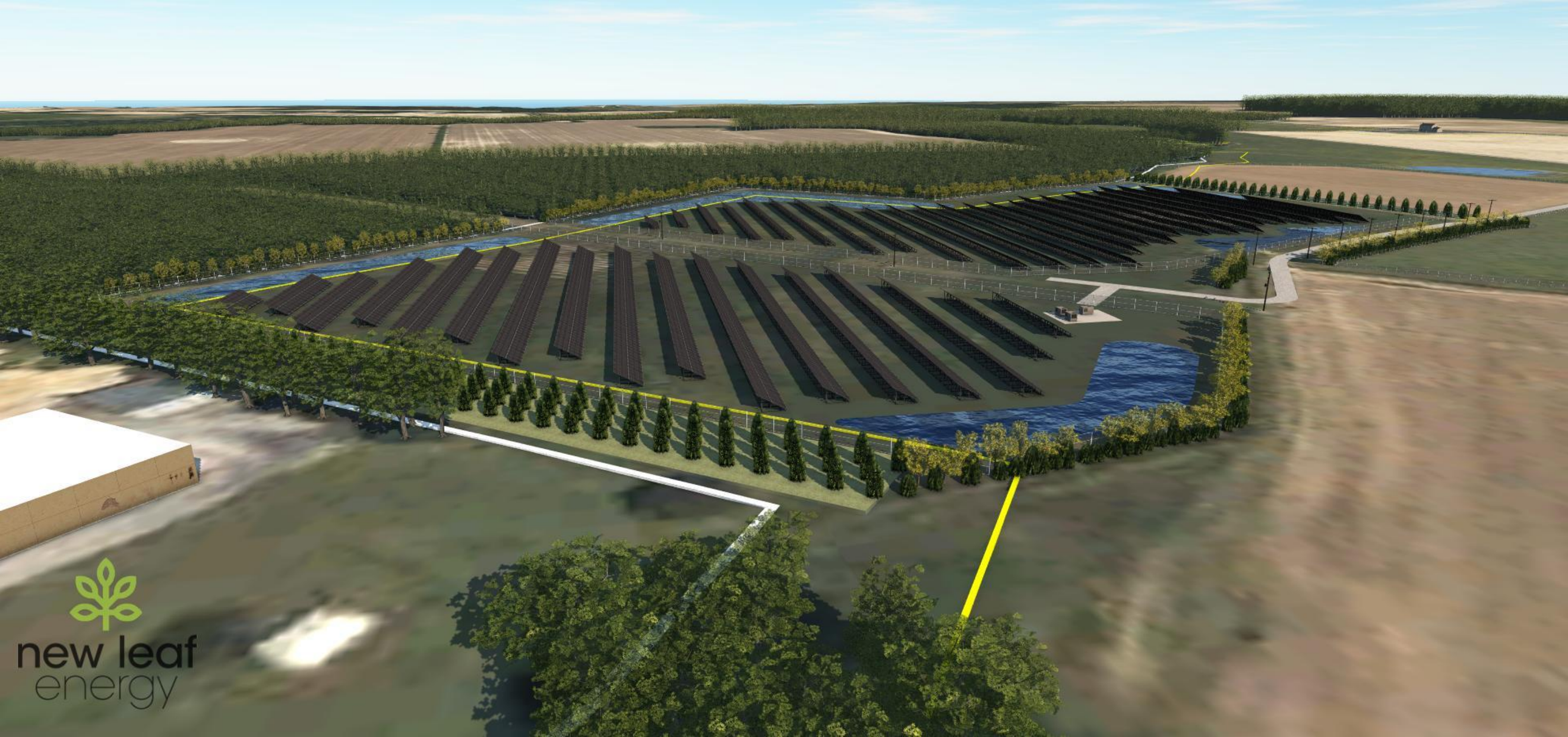
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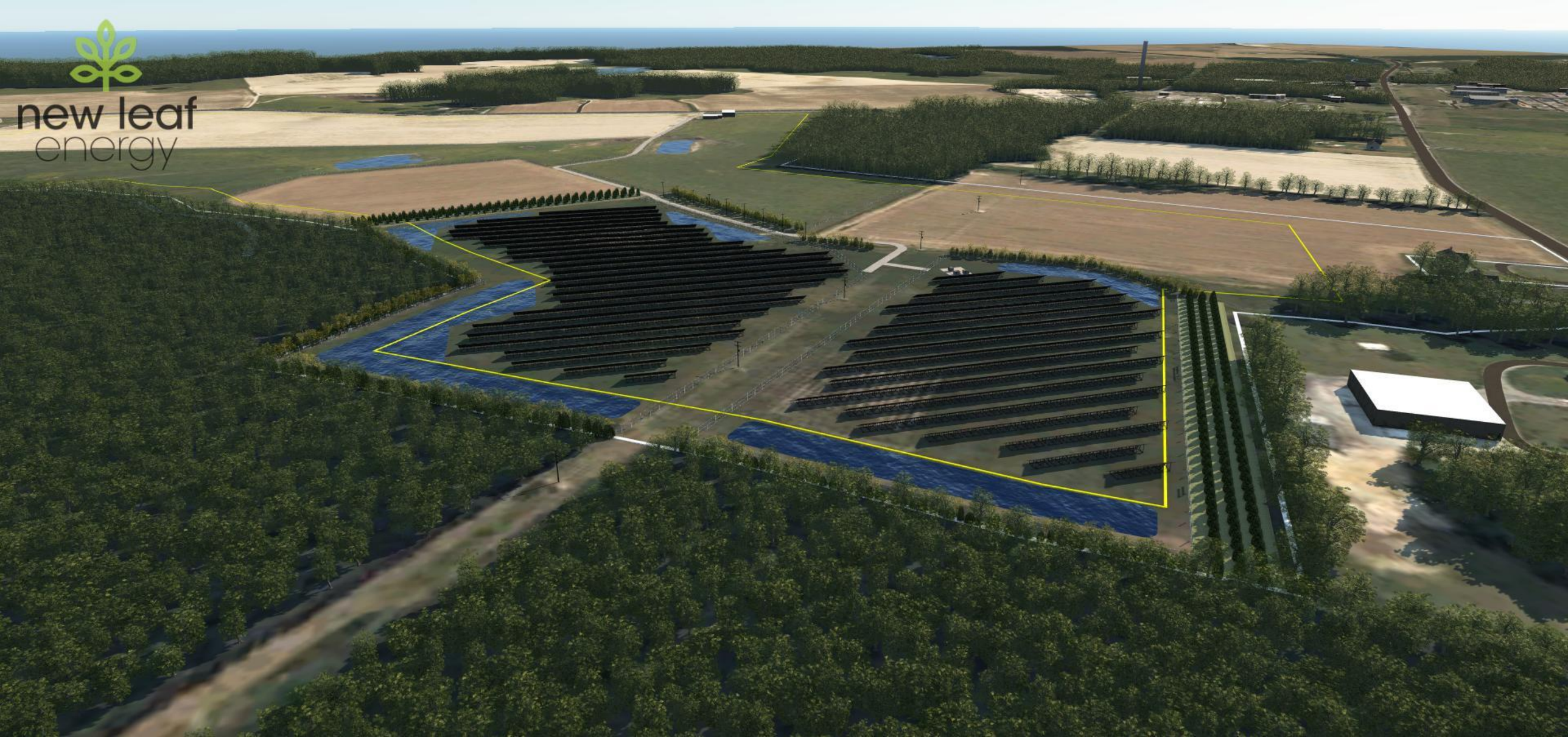
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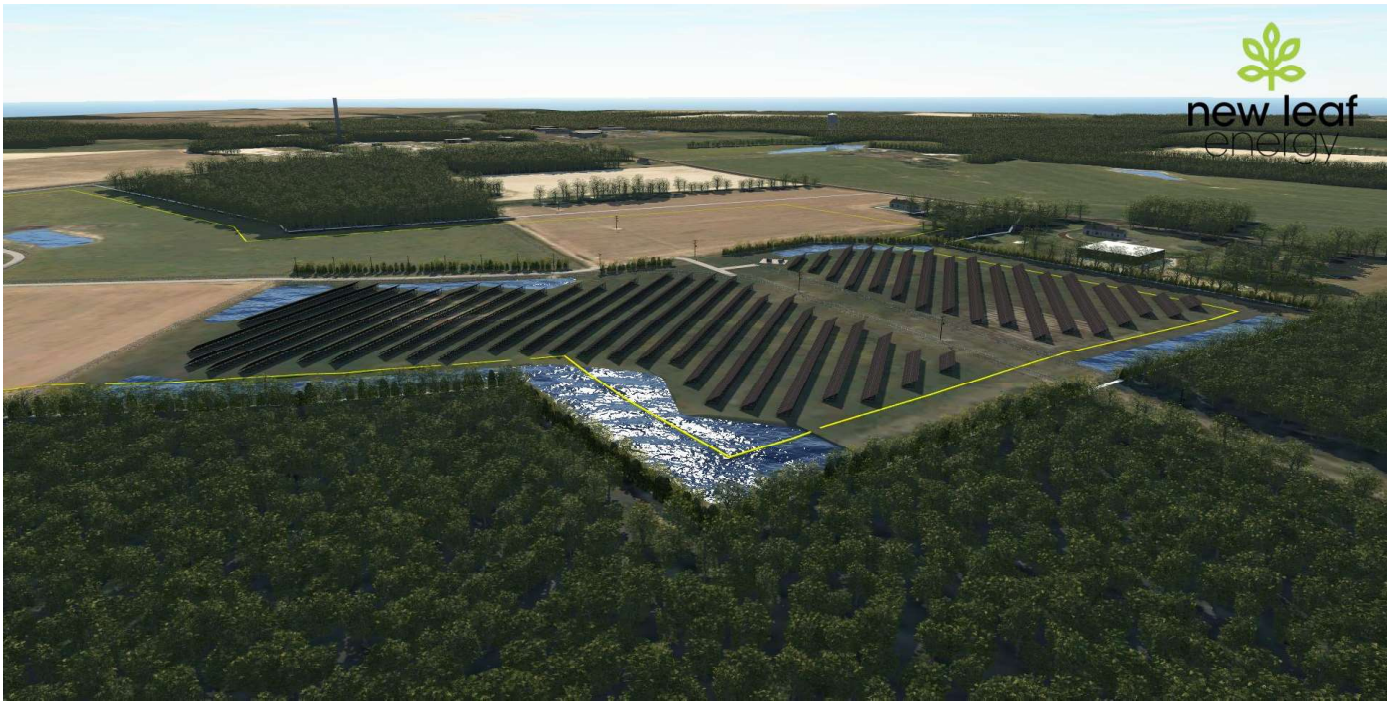

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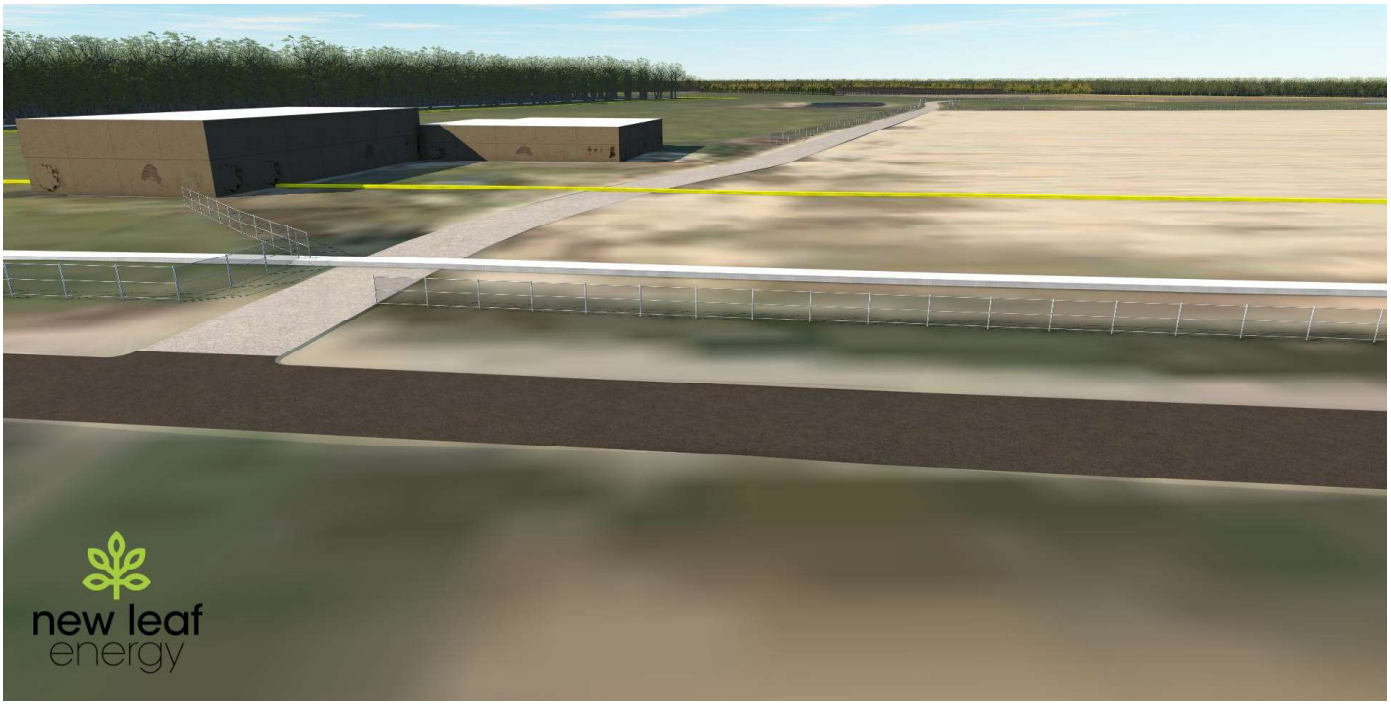

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Courthouse Highway Solar 1 – SW Facing County Facilities



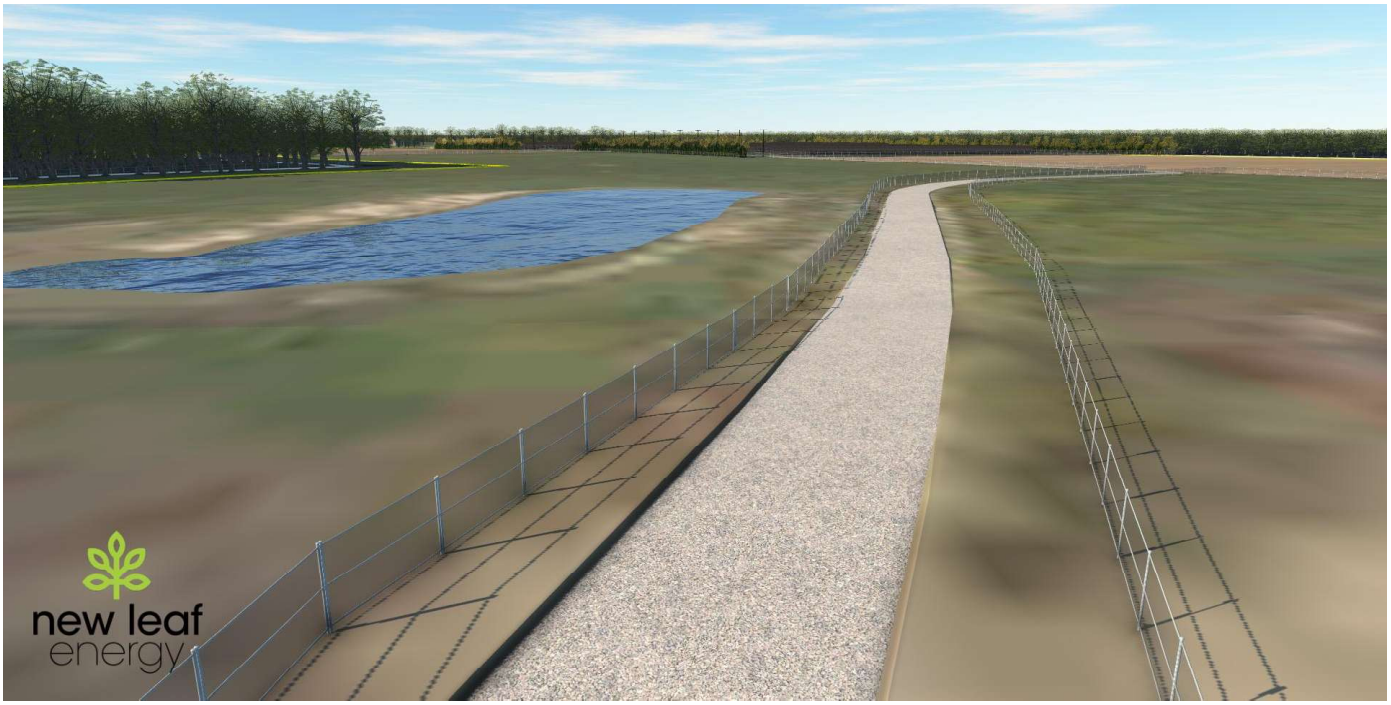
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Poorhouse Road – Site Access Road Entrance



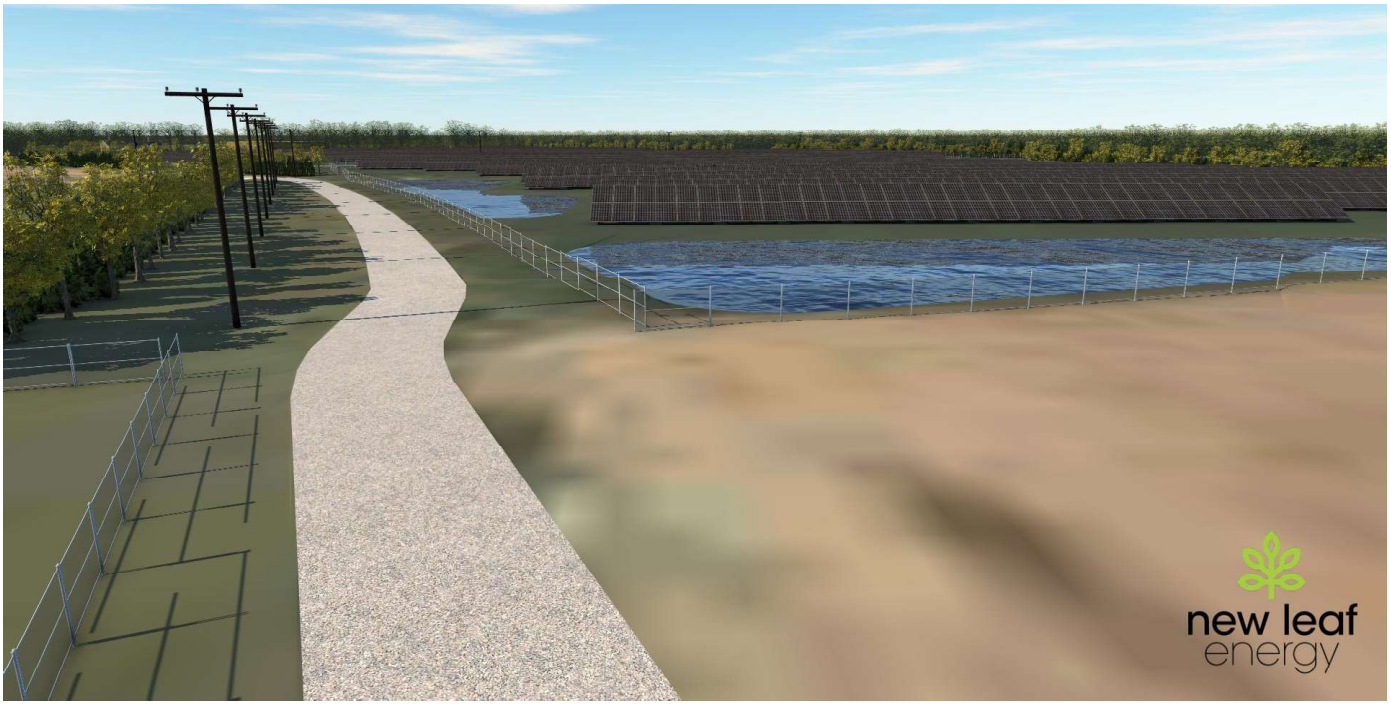
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Site Access – Approach Along Pasture/Watering Hole



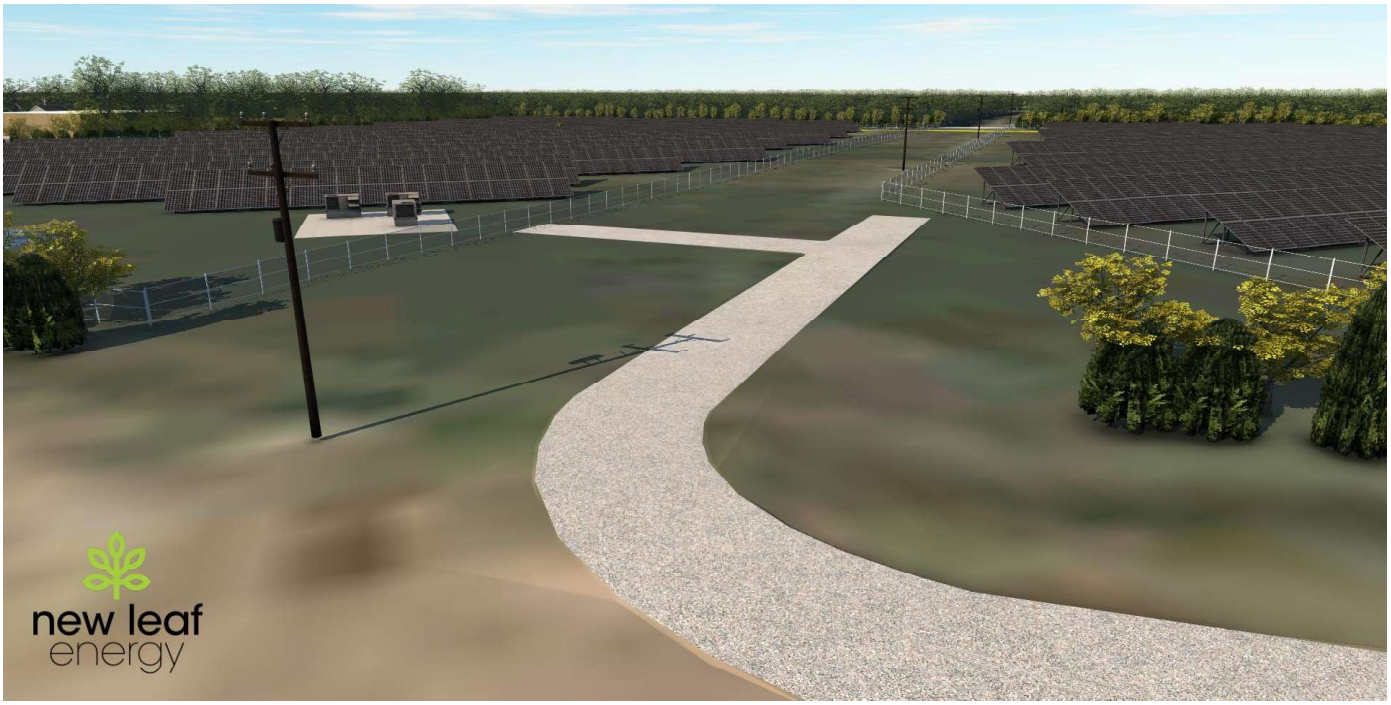
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Site Access – Approach Along Pasture/Pole Farm



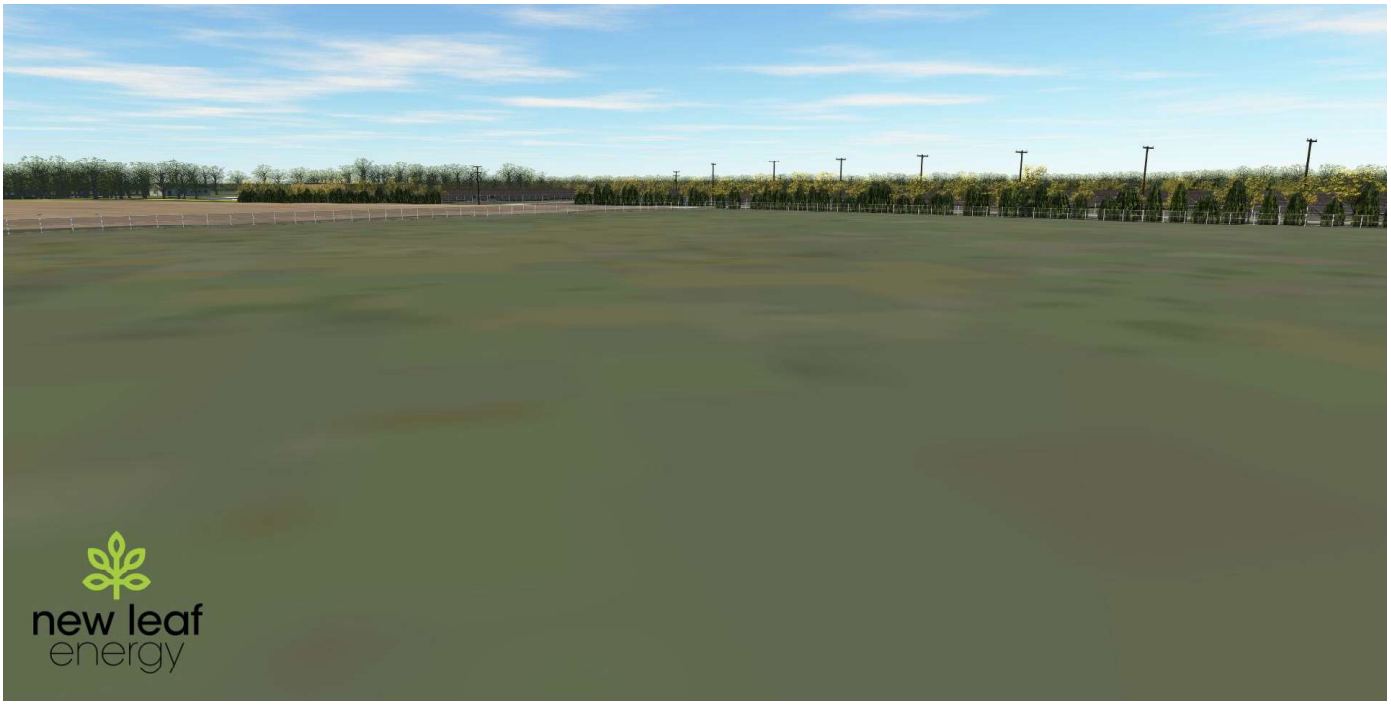
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Site Access – Solar Array Entrance Along Utility ROW



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Cattle Pasture – NE Facing Solar Array/Pole Farm



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County Communications Tower – NE Facing Solar Array



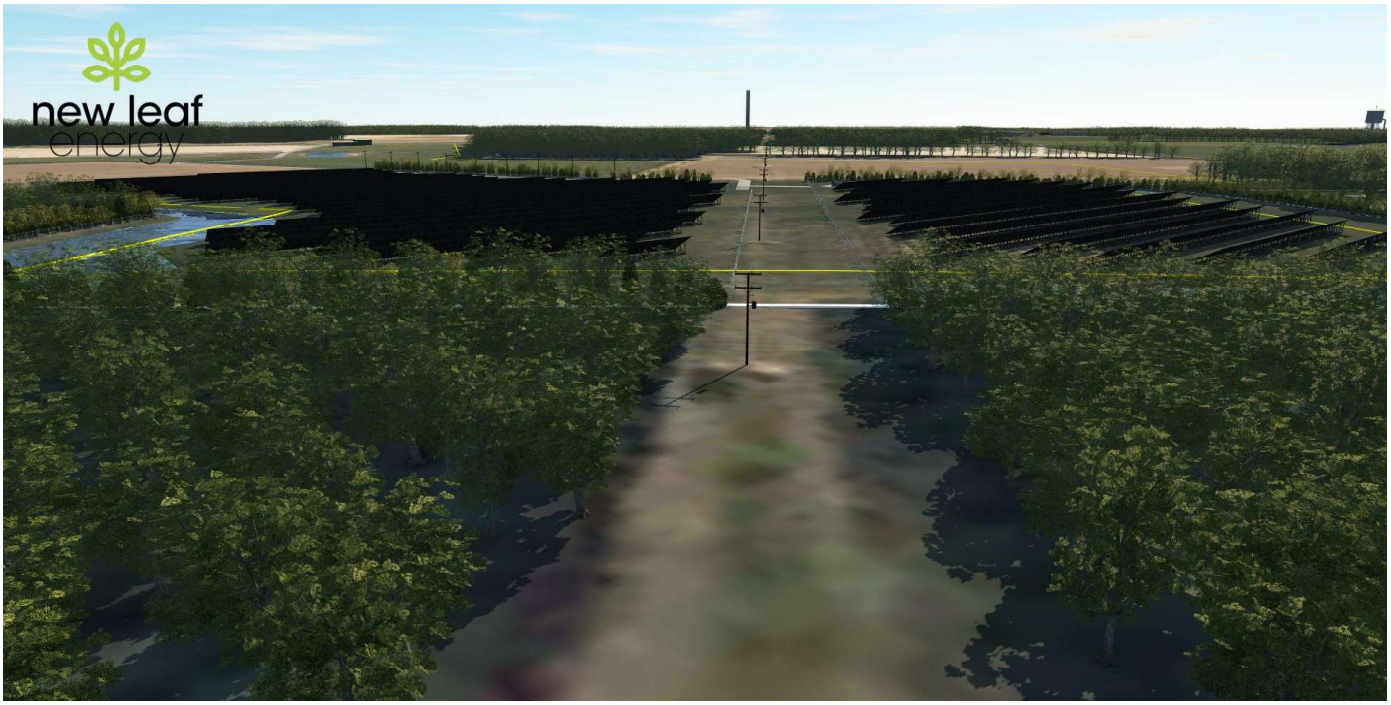
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County Water Tower – SE Facing Solar Array



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Utility ROW – SW Facing County Communications Tower



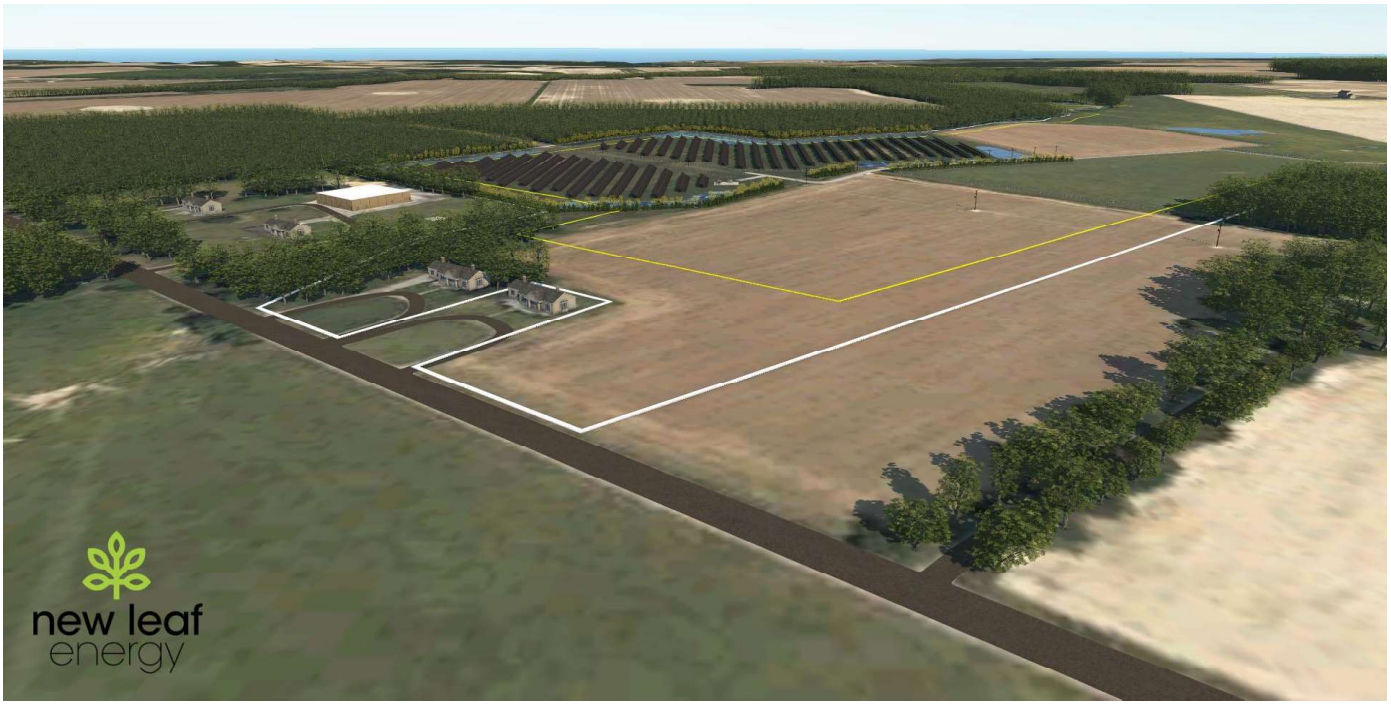
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Courthouse Highway – SE Facing Solar Array & Comms Tower



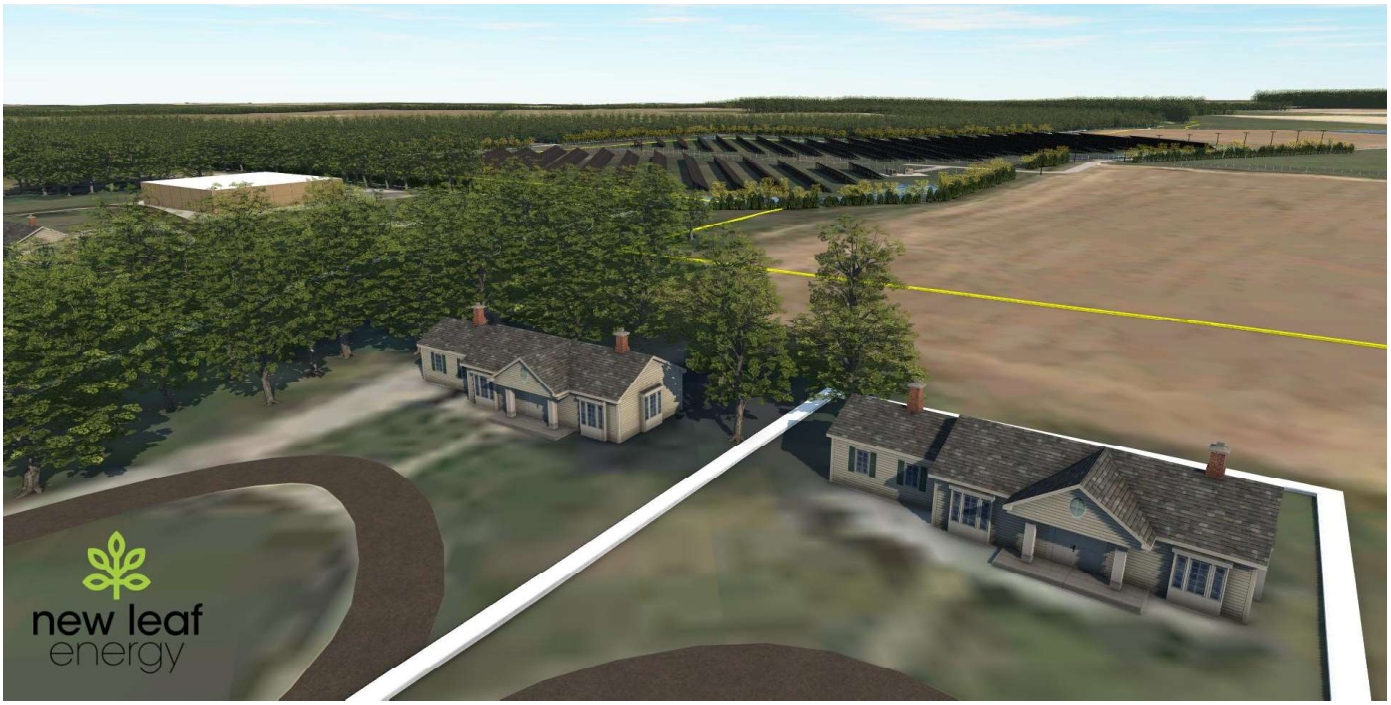
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Courthouse Highway - Aerial



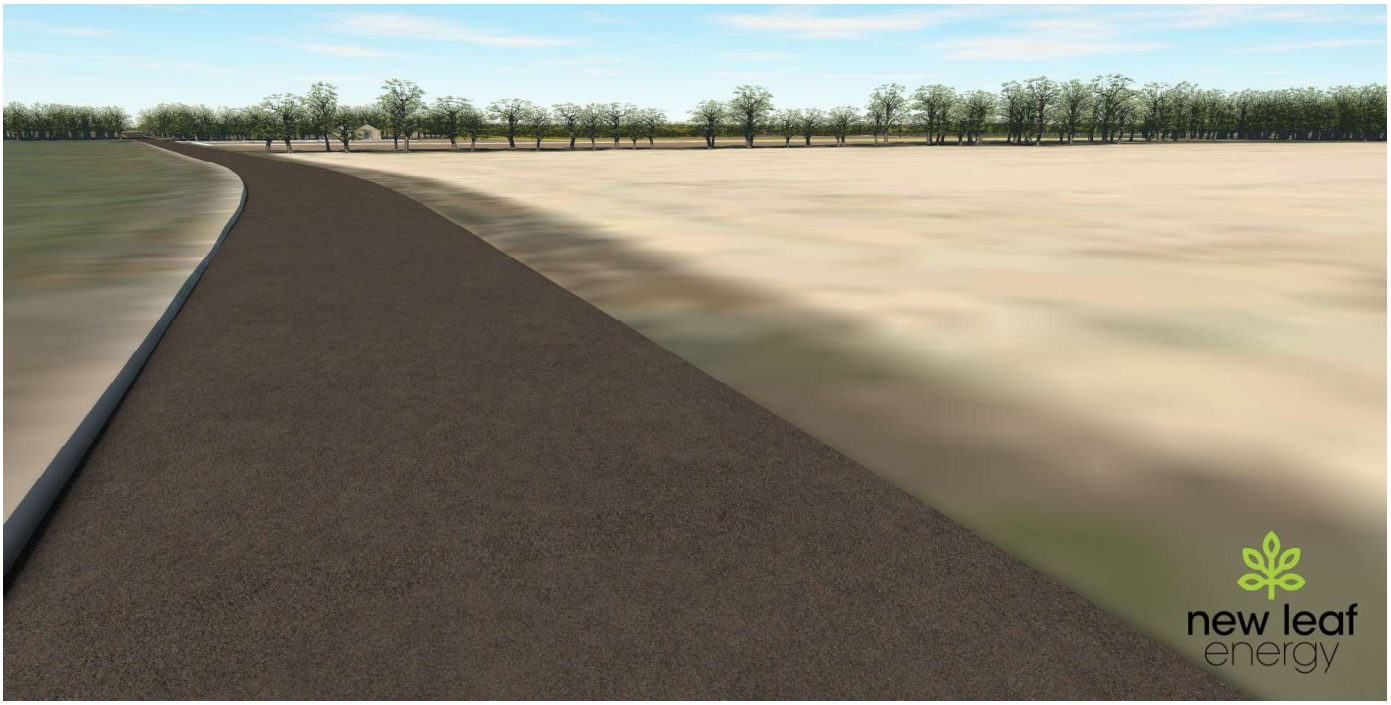
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Courthouse Highway – Residence Aerial



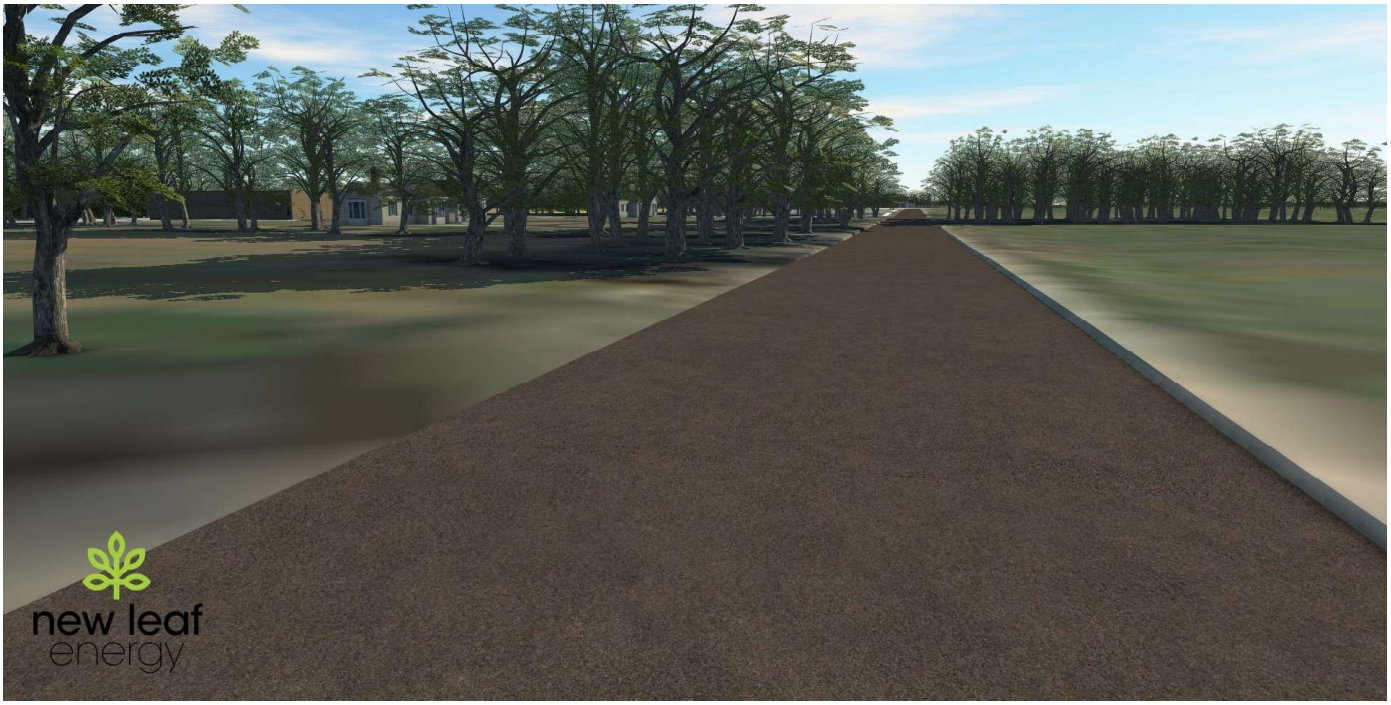
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Courthouse Highway – Traveling NE Facing Solar Array



 © New Leaf Energy, Inc. 2022

Courthouse Highway – Taveling SW



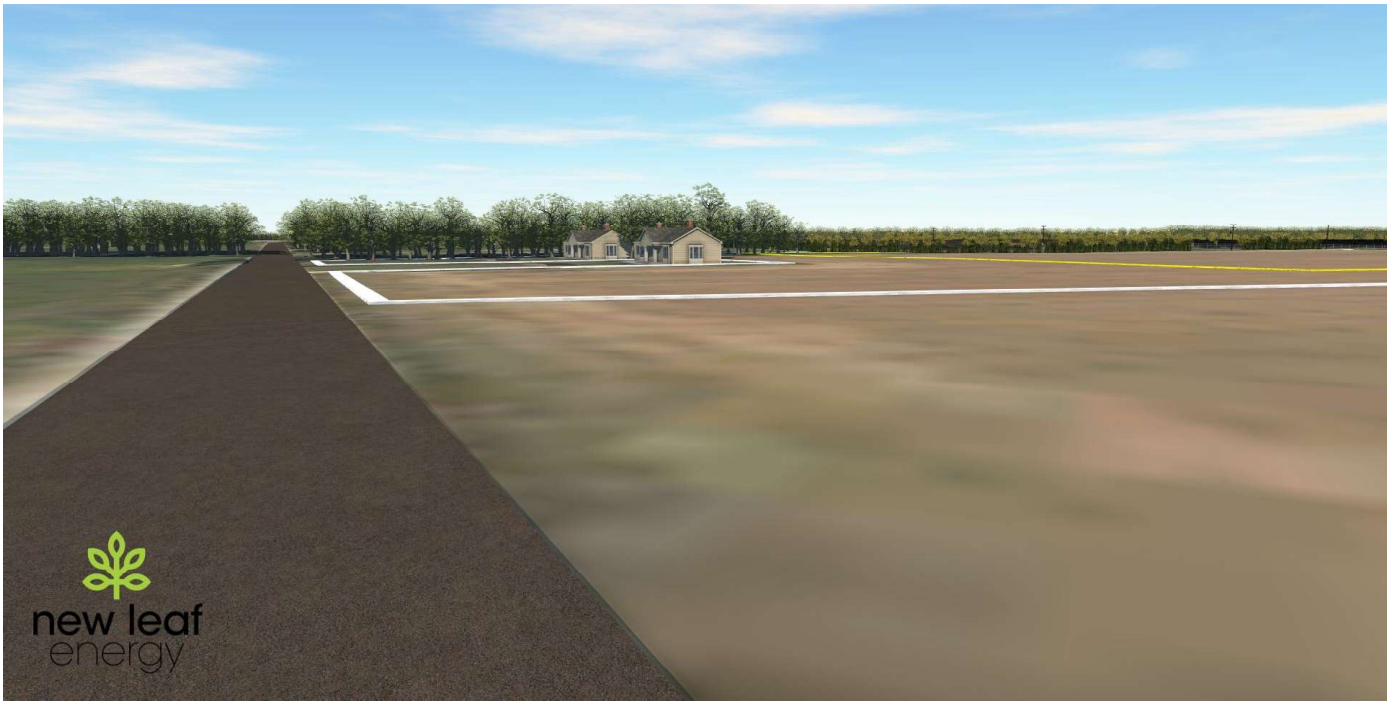
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Courthouse Highway – East Facing towards Solar Array



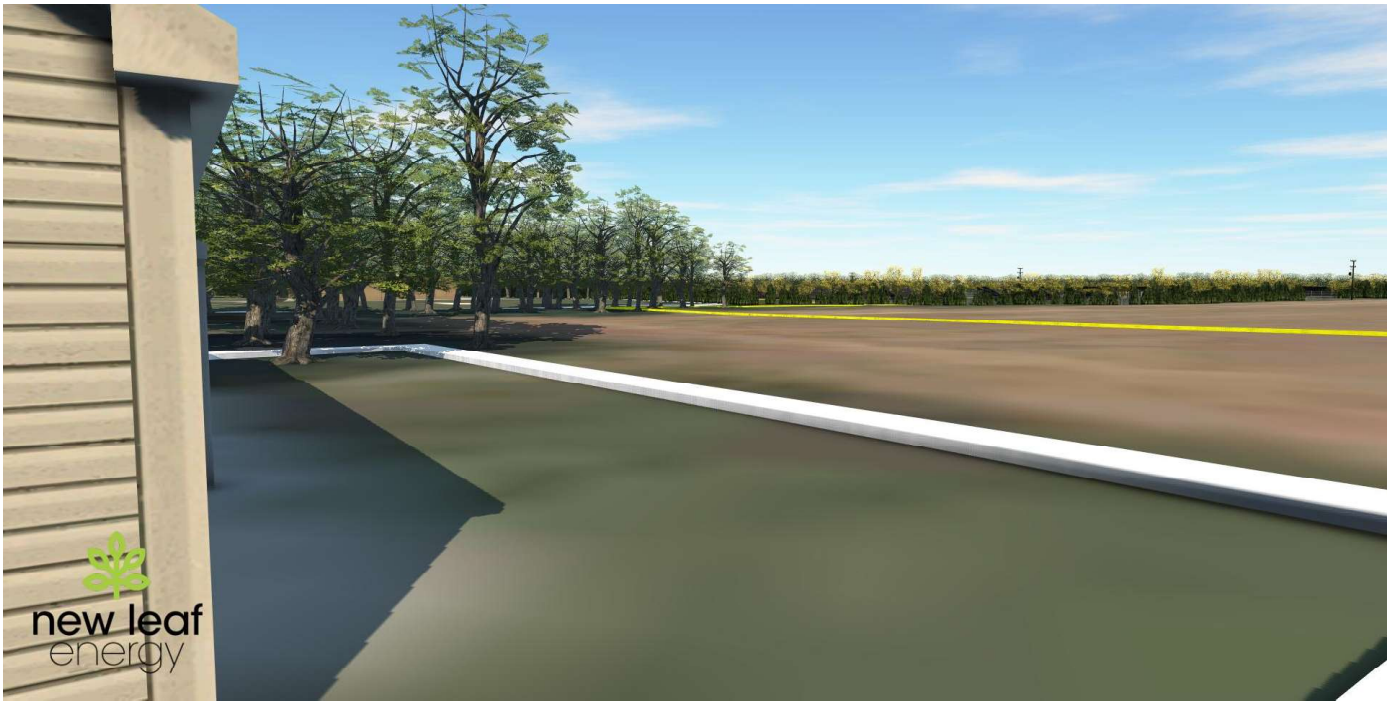
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Courthouse Highway – NE Facing Solar Array



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Couthouse Highway – NE Facing Solar Array



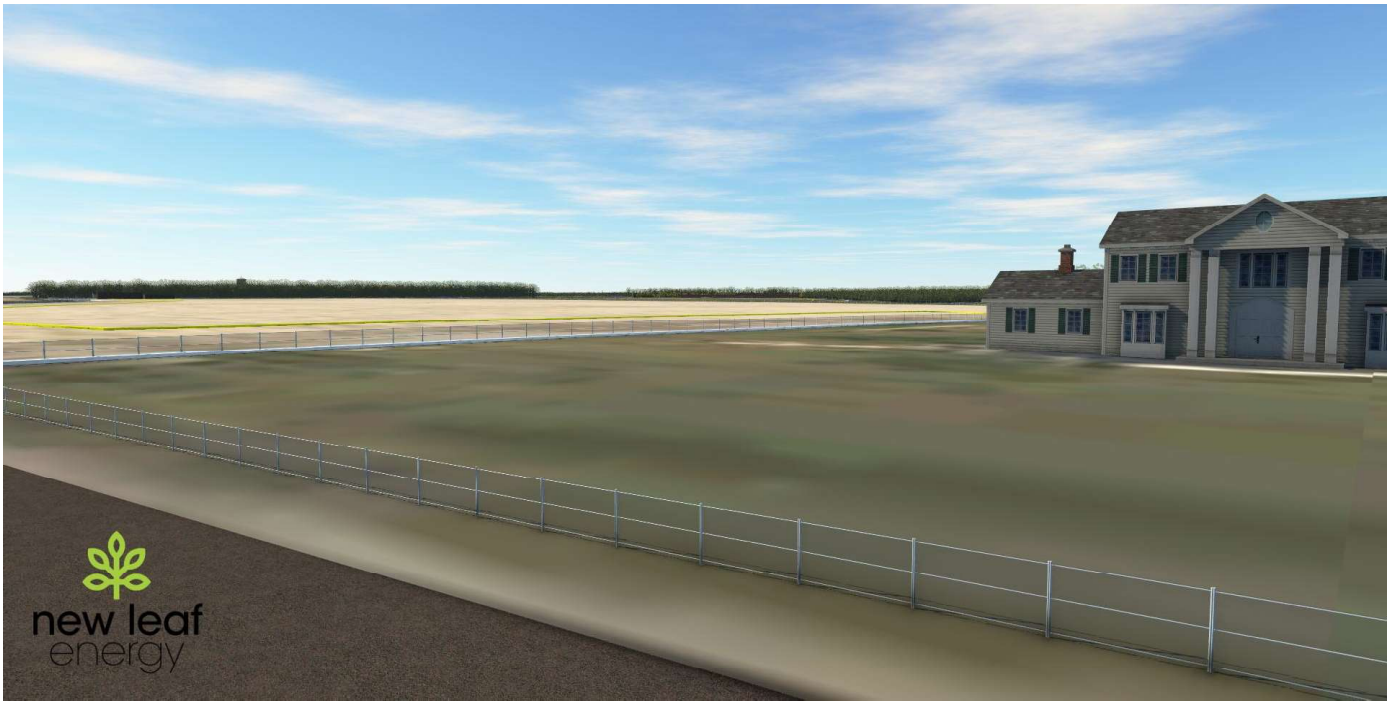
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Poorhouse Road – North Facing Residence Arial



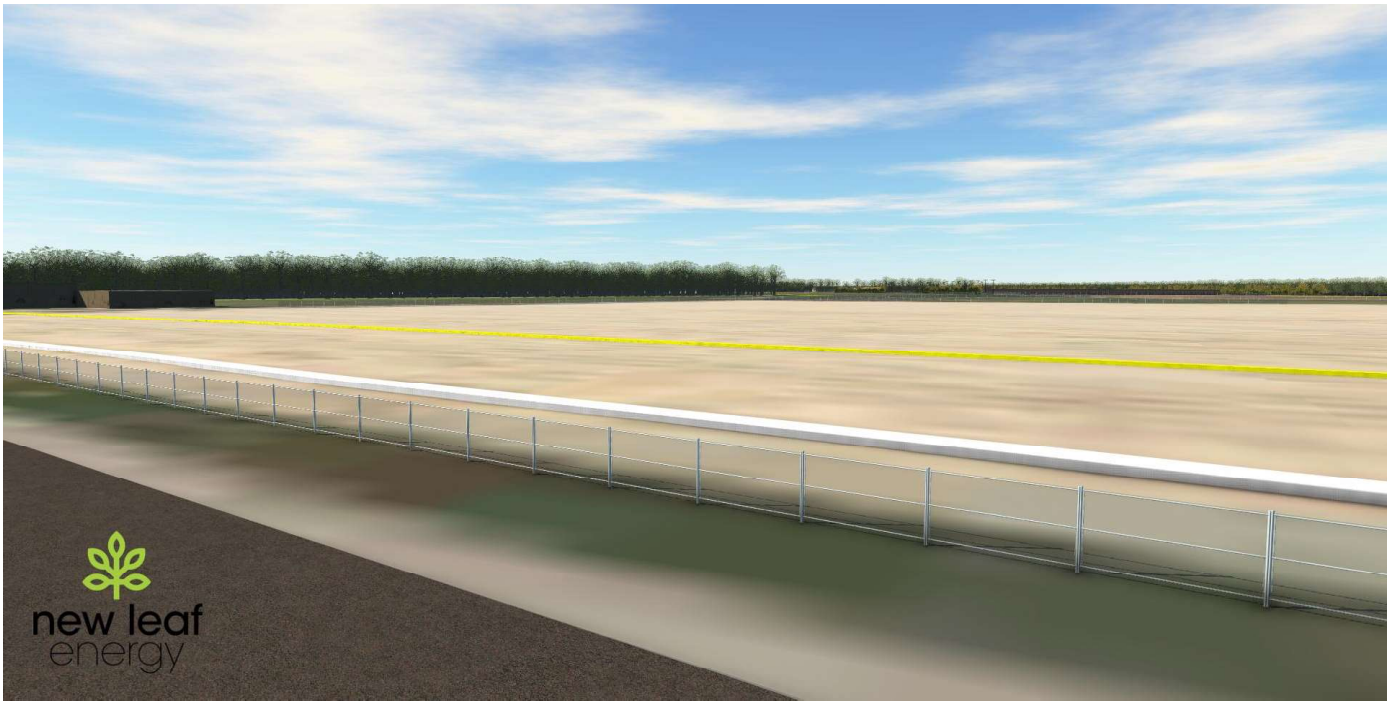
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Poorhouse Road – North Facing Solar Array from Residence



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Poorhouse Road – North Facing Solar Array



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Construction Operations
Article V, Sec. 5-5003 M-4,a,iv

Courthouse Hwy Solar will coordinate with the School District and County Offices to arrange deliveries and typical start/end times around the bus route and County's workday to minimize the potential for congestion along Poorhouse Road. Our anticipated hours of operation for construction and post-construction shall be limited to Monday through Friday 7:00am to 6:00pm and Saturdays from 7:00am to 5:00 pm. No construction is to occur on Sundays. In addition, Courthouse Hwy Solar will coordinate with VDOT regarding proper Work Area Protection Plan where the site accesses Poorhouse Road. All construction traffic/deliveries will be limited to Poorhouse Road via Courthouse Highway and will not use Bob White Road, nor any other route. Refer to map at top of page.

The construction of the facility is estimated to take 6-9 months. Upon completing construction of the site, field inspections will continue until the site is fully vegetated and the permits are closed out. During this time, weekly/rain events inspections are expected and occasionally landscaping equipment may be needed to repair/reseed areas around the facility, as needed.

Economic Impact Analysis
Article V, Sec. 5-5003 M-4,a,v

Current Economics:

The Doggett family has farmed the subject property 16419 Courthouse Hwy (Parcel 39-01-017) for 60 years. The property is part of the Courthouse Agricultural/Forestal District, and is farmed by the property owner, Michael Doggett, for corn, soybeans, and raising cattle. The entire layout of this proposed solar array was determined by the landowner to utilize his least productive land to generate supplement income. The proposed project area is 18.23 acres (ac) consisting of 14.21 acres within the fenced area, 1.8 acres within landscape/buffer areas, and the remaining 2.22 acres as open and unfenced areas within the easement. The remaining 130 acres (88%) of the parcel will continue to be used for agricultural purposes. This project area currently generates about 50 bales of hay per year and employs three people, including the landowner. These three folks will continue working on the land even if the solar project is built.

Courthouse Hwy Solar contacted the County in March of 2023, near the time of initial application to determine the property taxes, and with the property enrolled within the Agricultural / Forestal District. The land is assessed at $334 per acre in Land Use with a tax rate of 0.85 per $100. The current taxes generated from the facility (18.23 acres) is around $51 to the County. See **Appendix D** for email from County Commissioner of Revenue regarding property value assessment based on current and future landuse.

Projected Economics:

The proposed project will provide an economic and fiscal contribution to the County and community. The proposed project will stimulate the local economy during construction, provide long-term jobs during operation of the facility, provide the County with increased real estate and personal property tax, and improve the resiliency of the local grid.

During construction of the project we anticipate 30 to 40 construction workers for approximately 6 months. While the project is under construction, the local economy should see increased spending as the workers travel to/from the worksite and eat locally, and some may require lodging. In addition to increased spending by the construction workers, various construction materials should be sourced locally. While it is difficult to estimate the amount of money that will be spent locally during construction, the total amount of money spent as part of the construction of the project is likely greater when comparing to the current conditions of three employees who maintain the land.

When the project transitions from construction to operation, the project will require two to four long term jobs associated with the operation and maintenance of the facility and landscaping of the surrounding areas. During the operation of the facility, the employees with continue to contribute to the local economy from meals to miscellaneous supplies/tools, and the County will see increase real estate and personal property tax. Similar to the construction phase, since the project will not eliminate any jobs and create additional jobs to the local area, the project will only increase both economic and fiscal contribution to the county and local community.

The County will also benefit fiscally from the project. The County currently receives approximately $51 per year in real estate taxes from the facility area. Once the project is approved, the land will be removed from the Agricultural and Forest District the assessed value for the land will change from $334/acre to $3,000/acre, and the rollback taxes will be calculated based on this value change. The county will receive approximately $2,700 as part of the rollback taxes.

Once the project is under construction, the solar project will be subject to real estate taxes and personal property taxes each year until the project is decommissioned, which is anticipated for 40 years. The project will be assessed for real estate tax at $15,000/acre each year and will continue till the project is decommissioned for an estimated total of $146,717. The project will also be assessed for personal property tax using M&T stepdown, generating an estimated total of $274,085 over the project lifetime. The project will generate approximately $429,090 in taxes total over the 40 year period. Please refer to Table 1. Increased Tax Revenue and the Courthouse Hwy Taxes spreadsheet in **Appendix D** for a breakdown of the taxes over the 40-year period.

Table 1. Increased Tax Revenue	Real Estate Tax							Personal Property Tax		Total 40 Year Revenue
	Assessment Rate per acre (Land)	Assessment Rate per acre (Solar)	Assessment Rate per linear foot (Fencing)	Year 1 Assessed Value (Acres * Assessment Rate)	Tax rate	Annual Real Property Tax	Rollback Tax	Tax over 40 years	Notes	
Current	$334.00	*$0.00*	*$0.00*	$6,012.00	$0.85/$100	$51.10	*$0.00*	*$0.00*	*n/a*	$3,081
Courthouse Hwy Solar 1, LLC	$3,000.00	$15,000.00	$15	$285,545.00	$0.85/$100	$2,522	$2,700	$274,085	Follows § 58.1-2606.1for M&T tax stepdown (See Appendix D for calculations)	$429,090
									Increase in Taxes	**$426,009**

Courthouse Hwy Solar retained CohnReznick LLP to perform an Adjacent Property Value Impact Report, which determined whether proximity to a renewable energy use (solar farm) has an impact to adjacent property values. The firm prepared two separate reports, both included within **Appendix D**. The addendeum report is solely focused on this project, which cannot be understood without reviewing the primary report first. The firm concluded that the solar facility would not have a negative impact on adjacent property values.

Aside from the fiscal and economic benefits from the project when compared to its current economics. This solar project will generate clean energy that will go directly into the local utility grid. Any neighbors or local businesses connected on the same circuit could feasibly be pulling this clean energy. In addition, we will be required to make utility upgrades along the circuit, improving the resiliency of the local grid and reducing likelihood of brownouts for community members.

Environmental Resource Impact Analysis
Article V, Sec. 5-5003 M-4,a,vi

Aquatic Resources:

The project is located within FEMA's Firm Map Panel 51093C0150E Zone X and is primarily located within the Western Branch Reservoir with a portion being within Cypress Creek. Both watersheds eventually flow into the James River Basin, which are part of the Chesapeake Bay Watershed.

Enclosed within **Appendix E** is a copy of the Wetland and Stream Delineation Report conducted and prepared by Labella Associates, D.P.C. to perform a wetland and stream delineation of the project area to identify aquatic resources. Labella conducted their field investigation in October 2022 and March 2023. Labella staff identified a non-jurisdictional Pond and one 0.22-acre Palustrine Emergent (PEM) Wetland, currently assumed to be non-jurisdictional based on the new Waters of the US definition. The PEM wetland is situated within an existing drainage ditch that is adjacent to an existing field road, south of the fenced area. The wetland / ditch drains off in a general west/northwesterly direction, whose hydrologic regime is driven by drainage and precipitation. The wetland is not connected to a

APPENDIX D

PROJECT'S PROJECTED TAXES

COURTHOUSE HWY - ISLE OF WIGHT - VA DG

System Metrics

System size	3	MWac
System size	3,586,800	W dc (estimate)
Fenced acres	14.8	acres
Buffer/Easement acres	3.2	acres

Increase in Land Taxes

Total acres	148.97	acres
Current Land tax assessment (Land Use)	$334	per acre
Future Land tax assessment (Buffer area)	$3,500	per acre
Increase in Land Taxes (Buffer area)	**$86.12**	**increases annually**

Real Estate Tax

Ag Rollback Estimate	$2,700	estimate
Commercial Land Assessment	$15,000	per acre
Fencing assessment	$15	per linear ft
Fencing - linear feet	4,230	linear ft
County tax rate	0.85	per $100
Increase in Real Estate Tax - County	$2,384.31	annually
One time Rollback	$2,700.00	one-time
Increase in Total RE tax	**$5,084.31**	**Year 1**

Personal Property Tax

DC Size (Watt)	3,586,800.00	
EPC Cost ($/W)	1.55	
Cost Basis	$5,559,540.00	
Depreciation Rate	40%	of build cost
Assessed Value	$2,223,816.00	
Year 1 to 5 (80% exemption)	**$3,780.49**	
Year 6 to 10 (70% exemption)	**$5,670.73**	
Year 11+ (60% exemption)	**$7,560.97**	

2% Esc.

Years	Increase in Land Taxes on Buffer area	Increase in Real Estate Tax (on solar project)	Personal Property Tax (on solar project)	Total Annual Increase in Taxes	Cumulative Increase in Taxes
1	$86.12	$5,084.31	$3,780.49	$8,950.91	$8,950.91
2	$87.84	$2,431.99	$3,780.49	$6,300.32	$15,251.23
3	$89.59	$2,480.63	$3,780.49	$6,350.72	$21,601.94
4	$91.39	$2,530.25	$3,780.49	$6,402.12	$28,004.06
5	$93.21	$2,580.85	$3,780.49	$6,454.55	$34,458.62
6	$95.08	$2,632.47	$5,670.73	$8,398.28	$42,856.89
7	$96.98	$2,685.12	$5,670.73	$8,452.83	$51,309.72
8	$98.92	$2,738.82	$5,670.73	$8,508.47	$59,818.19
9	$100.90	$2,793.60	$5,670.73	$8,565.23	$68,383.42
10	$102.92	$2,849.47	$5,670.73	$8,623.11	$77,006.53
11	$104.97	$2,906.46	$7,560.97	$10,572.41	$87,578.94
12	$107.07	$2,964.59	$7,560.97	$10,632.63	$98,211.57
13	$109.21	$3,023.88	$7,560.97	$10,694.07	$108,905.64
14	$111.40	$3,084.36	$7,560.97	$10,756.73	$119,662.37
15	$113.63	$3,146.04	$7,560.97	$10,820.65	$130,483.02
16	$115.90	$3,208.96	$7,560.97	$10,885.84	$141,368.86
17	$118.22	$3,273.14	$7,560.97	$10,952.34	$152,321.19
18	$120.58	$3,338.61	$7,560.97	$11,020.16	$163,341.35
19	$122.99	$3,405.38	$7,560.97	$11,089.35	$174,430.70
20	$125.45	$3,473.49	$7,560.97	$11,159.91	**$185,590.62**
21	$127.96	$3,542.96	$7,560.97	$11,231.89	$196,822.51
22	$130.52	$3,613.82	$7,560.97	$11,305.31	$208,127.82
23	$133.13	$3,686.09	$7,560.97	$11,380.20	$219,508.02
24	$135.79	$3,759.81	$7,560.97	$11,456.58	$230,964.60
25	$138.51	$3,835.01	$7,560.97	$11,534.49	**$242,499.10**
26	$141.28	$3,911.71	$7,560.97	$11,613.97	$254,113.06
27	$144.11	$3,989.94	$7,560.97	$11,695.02	$265,808.09
28	$146.99	$4,069.74	$7,560.97	$11,777.71	$277,585.79
29	$149.93	$4,151.14	$7,560.97	$11,862.04	$289,447.83
30	$152.93	$4,234.16	$7,560.97	$11,948.06	$301,395.89
31	$155.99	$4,318.84	$7,560.97	$12,035.80	$313,431.70
32	$159.11	$4,405.22	$7,560.97	$12,125.30	$325,557.00
33	$162.29	$4,493.32	$7,560.97	$12,216.59	$337,773.58
34	$165.53	$4,583.19	$7,560.97	$12,309.70	$350,083.28
35	$168.84	$4,674.86	$7,560.97	$12,404.67	**$362,487.96**
36	$172.22	$4,768.35	$7,560.97	$12,501.55	$374,989.50
37	$175.67	$4,863.72	$7,560.97	$12,600.36	$387,589.86
38	$179.18	$4,960.99	$7,560.97	$12,701.15	$400,291.01
39	$182.76	$5,060.21	$7,560.97	$12,803.95	$413,094.96
40	$186.42	$5,161.42	$7,560.97	$12,908.81	**$426,003.77**
	$5,201.53	$146,716.92	$274,085.32		

and location will be determined as part of the site plan and land disturbance permitting process. The landscape plan enclosed within the concept plan generally depicts the location in relation to the site. The appropriate selection of native vegetation, shrubs and trees will be determined as part of the site and approved by the County and a Landscape Surety Agreement will be in place to ensure the longevity and maintenance.

Transportation Analysis / Public Facility Impacts Article V, Sec. 5-5003 M-4,a,iii

Water & Sewer Services:

The project will have minimal impacts to the County's Public Services. The project does not support human habitation and water/sewer services are not required.

Fire and Emergency Management Services:

Courthouse Hwy Solar will meet and coordinate with the County and local Emergency Management Services and Fire Department to ensure proper training, familiarity with the site layout and review of the equipment onsite. An Emergency Response Plan (ERP) will be prepared and submitted to the County's Emergency Management Services for review/approval. A laminated placard will be posted outside the entrance to the fence, or as deemed appropriate, and will contain at a minimum:

- A Facility Map noting the location of the equipment, disconnect any other pertinent information, as needed to correspond with the ERP.
- Facility Emergency Contact Information including Local, County, State and Federal Agency contact information.
- Vicinity Map, including site coordinates, 911 address, and turn by turn directions to the nearest Hospital and Helicopter LZ.
- Facility Evacuation Map depicting the various routes out of the facility to the designated muster point.
- General Responsibilities/Duties of the First Responder, Operations Manager, Environmental Coordinator, and any other role as determined by the ERP.

A draft example of the Facility Emergency Response Plan Placard is enclosed in **Appendix I** as a placeholder and will be completed/refined as the project progresses the permitting/construction process.

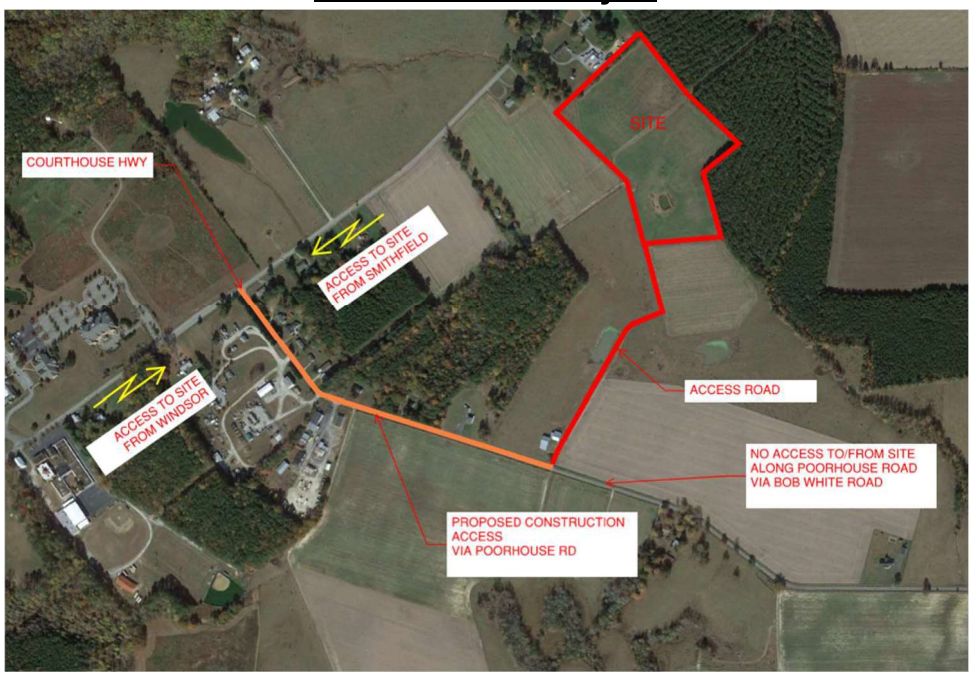
Transportation Analysis:

The project will have minimal impacts to the County and surrounding roadways. Access to the project is along Poorhouse Road (Rte 692), approximately 2,355 ft from the intersection of Courthouse Highway (US 258) and Poorhouse Road (Rte 692). Construction traffic to the

site will utilize Courthouse Highway (US 258) and Poorhouse Road (Rte 692) only and **not through Bob White Road**, see map on the following page.

The largest amount of truck traffic to the facility will occur during the construction of the facility. The project was sited within close proximity to US Route 258, one of Isle of Wight's main roadways connecting Windsor and Smithfield. US Route 258 is listed as one of Virginia's Designated Truck Route with an Average Daily Traffic of 5,500 vehicles traveling through Segment 150, which includes the intersection to Poorhouse Road (Rte 692). The entrance to the site is along the northern side of Poorhouse Road (Rte 692) about a half mile from the intersection with Courthouse Highway. The access road to the site will utilize the existing field road that will be widened, stabilized and generally improved.

Access Route to Project



The portion of Poorhouse Road that is proposed to access the site currently consists of civic, residential, and agricultural uses. Isle of Wight County primarily utilizes the southern portion of the road to service and store transportation busses, animal control, storage yards, roll-off containers, fueling station for County vehicles, maintenance garages, and a communication tower. Along the northern portion of the road, directly across from the County's complex, are residential properties. Poorhouse Road has an ADT of 360 vehicles, and the ADT of the road will slightly increase during the first year due to construction traffic. Upon completion of the site the traffic along Poorhouse Road will only increase by an estimated one/two vehicles per day, similar to a residential home.

Parking areas and laydown yards during construction will be confined to the site and adjacent pasture area, within the parcel. These areas will be restored to their pre-existing condition upon completion of construction.

CONDITIONAL USE PERMIT SET

16419 COURTHOUSE HWY, SMITHFIELD, VA 23430
3.00 MWAC RATED SOLAR ELECTRIC SYSTEM

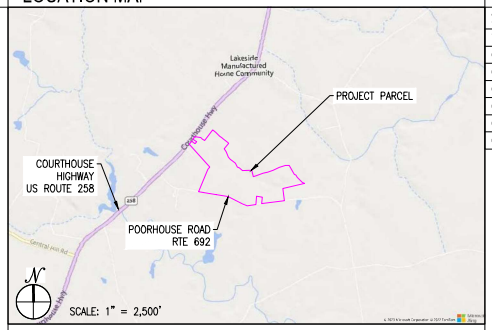
GENERAL NOTES

1. THE CONDITIONAL USE PLAN DEPICTS THE PROPOSED SOLAR FACILITY LOCATION, PROPOSED IMPROVEMENTS WITHIN THE PROPERTY, IDENTIFY AND DEPICT ANY ENVIRONMENTAL RESOURCES THAT ARE AFFECTED OR ADJACENT TO THE FACILITY, AND DEPICT THE DIMENSIONAL REQUIREMENTS/SETBACKS/STANDARDS APPLICABLE TO THE ZONING DISTRICT IN RELATION TO THE PROPOSED IMPROVEMENTS. UPON RECEIVING THE CONDITIONAL USE APPROVAL A FORMAL DESIGN OF THE PROJECT WILL BE PREPARED AND SUBMITTED TO COMPLY WITH THE APPLICABLE REQUIREMENTS AND ANY CONDITIONS IMPOSED BY THE COUNTY AS PART OF THE CONDITIONAL USE PERMIT.
2. THE EXISTING FEATURES, TOPOGRAPHY, PROPERTY LINES OR BOUNDARIES IS FOR INFORMATIONAL PURPOSES, UNLESS INDICATED OTHERWISE.
3. THE EXISTING FEATURES SHOWN ON THIS PLAN ARE BASED AERIAL PHOTOGRAPHY OBTAINED FROM VIRGINIA GEOGRAPHIC INFORMATION NETWORK (VGIN) AND SUPPLEMENTED BY FIELD SURVEYS PERFORMED BY AES CONSULTING ENGINEERS, MARCH 2023.
4. THE PROPERTY LINES FOR THE SUBJECT PARCEL SURROUNDING THE PROJECT IS BASED ON A BOUNDARY SURVEY. ALL OTHER BOUNDARY LINES DEPICTED WERE OBTAINED FROM ISLE OF WIGHT COUNTY'S TAX PARCEL INFORMATION.
5. THE CONTOURS ARE SHOWN AT 2 FOOT INTERVALS AND WERE GENERATED FROM PUBLICLY AVAILABLE LIDAR DATA TO PREPARE A CONCEPTUAL SITE PLAN. THE INFORMATION SHOWN ARE FOR INFORMATIONAL PURPOSES AND WILL NOT BE USED FOR THE DESIGN, MODIFICATION OR CONSTRUCTION OF IMPROVEMENTS TO REAL PROPERTY.
6. A WETLAND AND STREAM INVESTIGATION WAS PERFORMED BY LABELLA ASSOCIATES, D.P.C. OCTOBER, 2022. A SUPPLEMENTARY WETLAND AND STREAM INVESTIGATION WAS PERFORMED BY LABELLA ASSOCIATES, D.P.C. MARCH. 2023. WETLANDS, STREAM AND THEIR ASSOCIATED BUFFERS SHOWN BEYOND THE PROPERTY IS BASED ON GIS DATA OBTAINED FROM VIRGINIA GEOGRAPHIC INFORMATION NETWORK, WHICH INCORPORATE NATIONAL WETLAND INVENTORY AND FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) DATA.
7. THE HORIZONTAL AND VERTICAL DATUMS ARE AS FOLLOWS:
   HORIZONTAL: VIRGINIA STATE PLAN NAD 83 SOUTH ZONE US SURVEY FOOT
   VERTICAL: NAD83
8. UNLESS INDICATED AS EXISTING (E), ALL PROPOSED MATERIALS AND EQUIPMENT SHALL BE CONSIDERED TO BE NEW.
9. ALL EQUIPMENT AND COMPONENTS SHALL BE MOUNTED IN COMPLIANCE WITH THE MANUFACTURER'S REQUIREMENTS, CONSTRUCTION DETAILS, AND APPLICABLE STATE/FEDERAL CONSTRUCTION CODE REQUIREMENTS.
10. TO THE EXTENT THAT TRESS AND OTHER FEATURES AFFECT THE SYSTEM'S PRODUCTION, SUCH PRODUCTION MODELING IS BASED ON THE EXISTING APPROXIMATE HEIGHTS AND LOCATIONS RELATIVE TO THE SYSTEM AND MAY BE IMPACTED AS TREES GROW AND OTHER FEATURES CHANGE.
11. PROPOSED TREES ASSOCIATED WITH THE PROPOSED LANDSCAPING WILL BE PERIODICALLY MAINTAINED TO PREVENT SHADING THAT MAY RESULT IN A NEGATIVE AFFECT ON THE SYSTEM PRODUCTION.

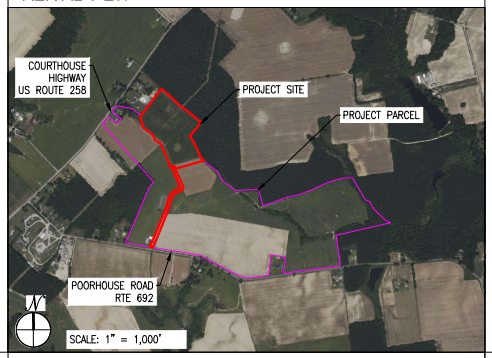
PROJECT SCOPE

THIS PROJECT CONSISTS OF THE INSTALLATION OF SOLAR MODULES INSTALLED ON A GROUND MOUNTED RACKING SYSTEM. THE MODULES WILL BE WIRED IN SERIES STRINGS AND CONNECTED IN PARALLEL TO THE INVERTER(S), WHICH CONVERT THE PHOTOVOLTAIC OUTPUT POWER FROM DC TO AC. THE SOLAR ELECTRIC SYSTEM WILL BE INTERCONNECTED WITH THE EXISTING SITE ELECTRICAL SYSTEM IN ACCORDANCE WITH THE APPLICABLE ELECTRICAL CODE AND DOMINION REQUIREMENTS.

LOCATION MAP



AERIAL VIEW



DRAWING LIST

Sheet Number	Sheet Title
T-1	TITLE PAGE
CIVIL	
C-1.0	EXISTING CONDITIONS PLAN
C-2.0	LAYOUT AND MATERIALS PLAN
C-3.0	CIVIL DETAILS
C-4.0	LANDSCAPE PLAN
C-5.0	PRE AND POST CONDITIONS PLAN

APPLICABLE CODES AND STANDARDS

2020 NATIONAL ELECTRICAL CODE
2021 INTERNATIONAL BUILDING CODE
UL-1703 – SOLAR MODULES
UL-1741 – INVERTERS, COMBINER BOXES
UL-2703 – RACKING MOUNTING SYSTEMS AND CLAMPING DEVICES FOR PV MODULES

PROJECT DIRECTORY

PROPERTY OWNER
DOGGETT, MICHAEL S
11553 CENTRAL HILL RD
WINDSOR, VA 23487

PROPERTY ADDRESS
16419 COURTHOUSE ROAD
SMITHFIELD, VA 23430

SYSTEM / PROJECT OWNER
COURTHOUSE HWY SOLAR 1, LLC.
55 TECHNOLOGY DRIVE, SUITE 102
LOWELL, MA 01851

AUTHORITY HAVING JURISDICTION
ISLE OF WIGHT COUNTY
17140 MONUMENT CIR #201
ISLE OF WIGHT, VA 23397

UTILITY
DOMINION

CIVIL ENGINEER
FIRM: NEW LEAF ENERGY, INC dba NEW LEAF ENERGY DEVELOPMENT, INC.
CONTACT: QUENTIN WOOD, PE
PHONE: 978-513-2608

DESIGN ENGINEER
FIRM: NEW LEAF ENERGY, INC dba NEW LEAF ENERGY DEVELOPMENT, INC.
CONTACT: AARON MILLER
PHONE: 978-953-2056

GENERAL ABBREVIATIONS

(E)	EXISTING	NS	NORTH-SOUTH
AHJ	AUTHORITY HAVING JURISDICTION	NTS	NOT TO SCALE
AL	ALUMINUM	OAE	OR APPROVED EQUAL
APPROX	APPROXIMATE	OC	ON CENTER
ARY	ARRAY	OD	OUTSIDE DIAMETER
BLDG	BUILDING	OFCI	OWNER FURNISHED CONTRACTOR INSTALLED
NLE	NEW LEAF ENERGY		
CL	CENTERLINE	PV	PHOTOVOLTAIC
DAS	DATA ACQUISITION SYSTEM	PVC	POLY VINYL CHLORIDE
DIA	DIAMETER	SCH	SCHEDULE
DO	DITTO	SS	STAINLESS STEEL
EW	EAST-WEST	SSS	SOLAR SUPPORT STRUCTURE
FBO	FURNISHED BY OTHERS	STC	STANDARD TEST CONDITIONS
FF	FORWARD FACING	TBD	TO BE DETERMINED
GALV	GALVANIZED	TP	TAMPER PROOF
HDG	HOT DIP GALVANIZED	TYP	TYPICAL
HVAC	HEATING VENTILATION AND AIR CONDITIONING	UON	UNLESS OTHERWISE NOTED
		VIF	VERIFY IN FIELD
ID	INSIDE DIAMETER	WP	WEATHER PROOF
MFR	MANUFACTURER		
MOD	SOLAR MODULE		

REV 1.0

new leaf energy
55 TECHNOLOGY DRIVE, SUITE 102
LOWELL, MA 01851
PHONE: (888) 896-6273
FAX: (888) 843-4778
WWW.NEWLEAFENERGY.COM

COMMONWEALTH OF VIRGINIA
QUENTIN JAMES WOOD
Lic. No. 0402064721
07/20/2023
PROFESSIONAL ENGINEER

IT IS A VIOLATION OF LAW FOR ANY PERSON TO ALTER ANY DOCUMENT WHICH BEARS THE SEAL OF A PROFESSIONAL ENGINEER, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER.

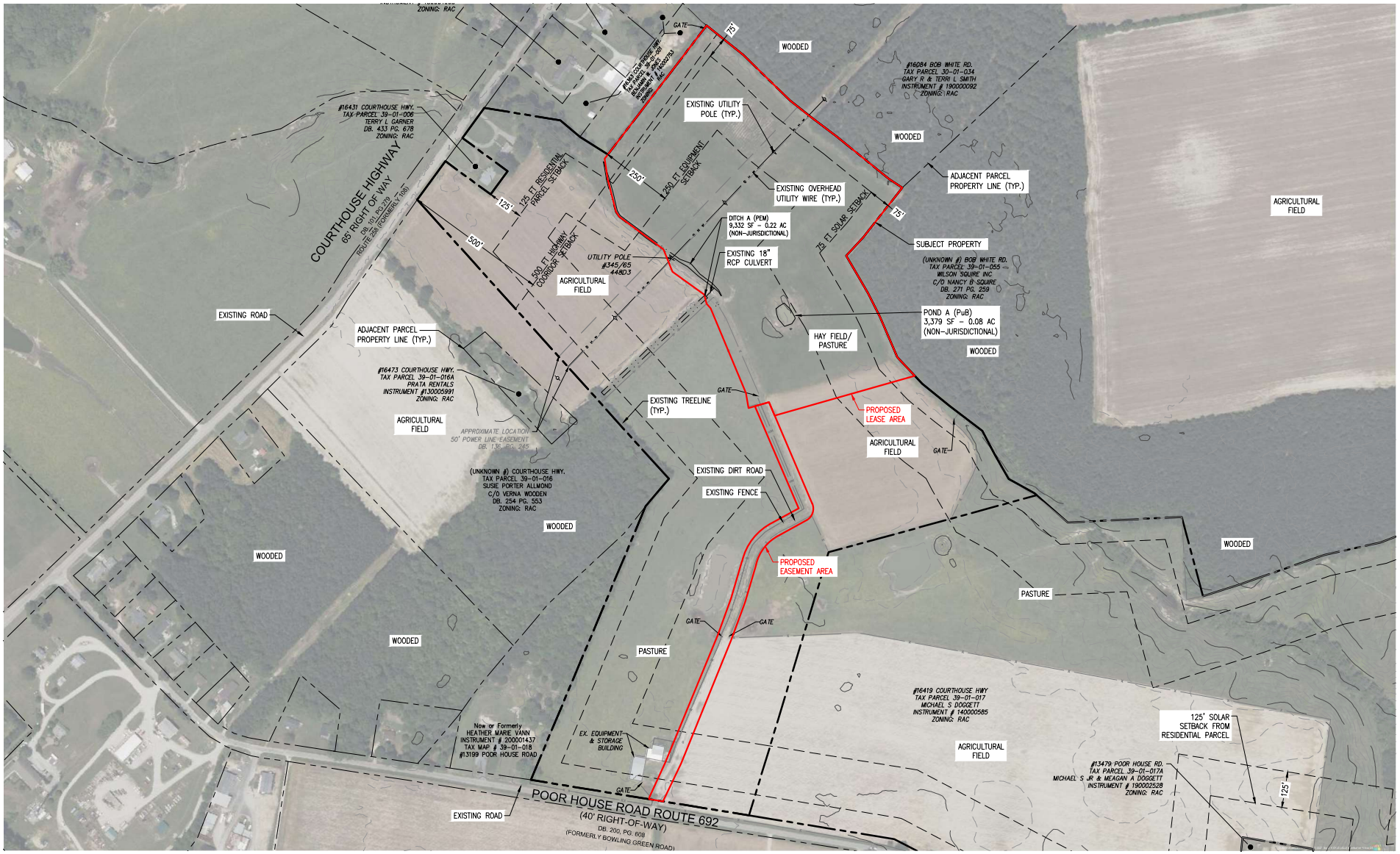
COURTHOUSE HIGHWAY - ISLE OF WIGHT
16419 COURTHOUSE HWY
SMITHFIELD, VA 23430

PROJECT NUMBER: 111-5287

REV	DATE	DRAWN	CHECKED	RELEASE LEVEL
	02/10/23	AM	DP	
	03/10/23	AM		SUP Revision – FT
	04/07/23	ATK	QJW	COUNTY COMMENT
	07/07/23	ATK	QJW	RESUBMITTAL

SCALES STATED ON DRAWINGS ARE VALID ONLY WHEN PLOTTED ARCH D 24" X 36"

T-1
TITLE PAGE



EXISTING CONDITIONS PLAN

SCALE: 1" = 150'

0 150' 300'

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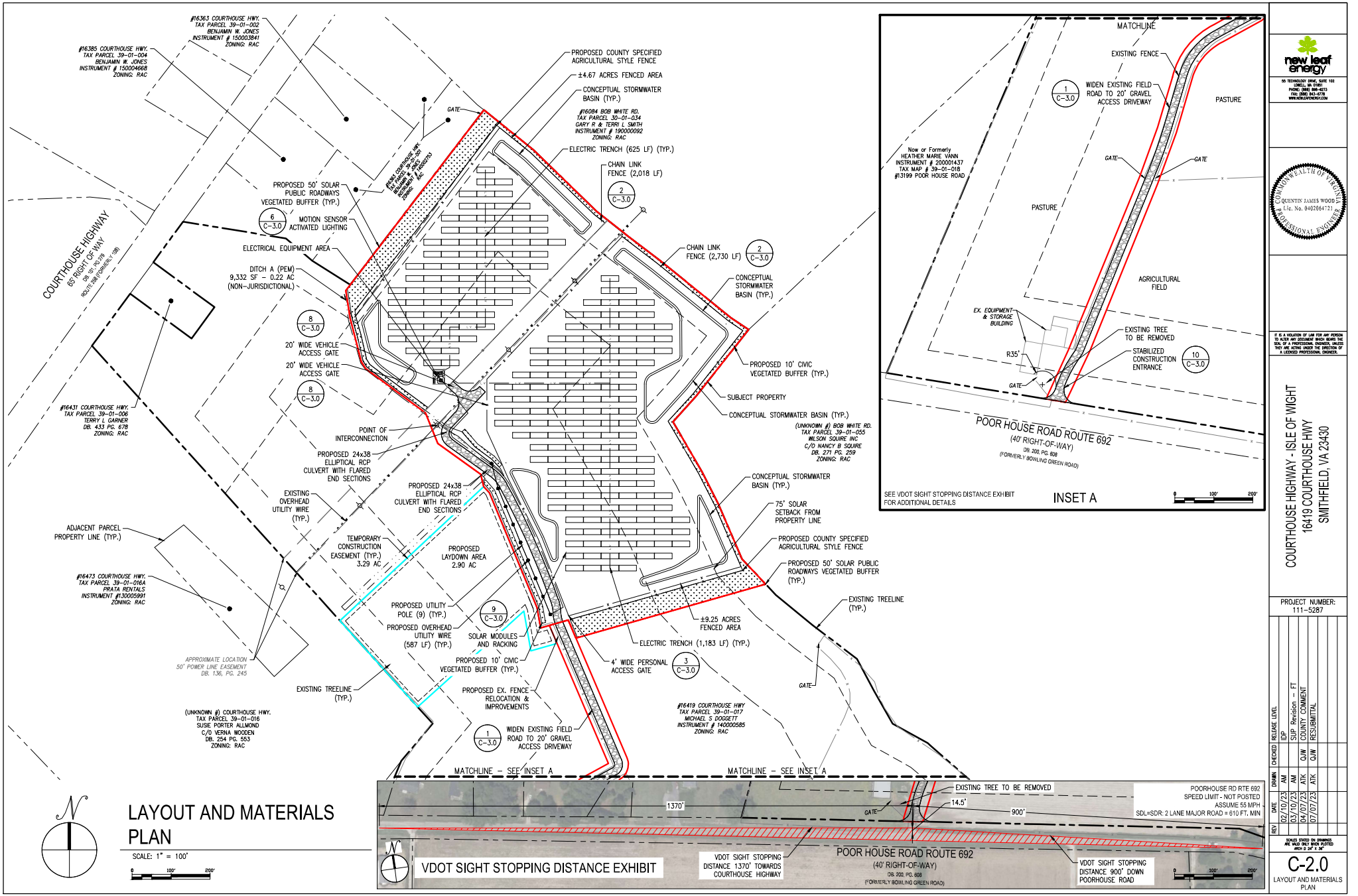
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	07/07/23	ATK	CJW	RESUBMITTAL

SCALES STATED ON DRAWINGS ARE VALID ONLY WHEN PLOTTED ARCH D 24" X 36"

C-1.0
EXISTING CONDITIONS PLAN



LAYOUT AND MATERIALS PLAN

SCALE: 1" = 100'

0 100' 200'

new leaf energy
55 TECHNOLOGY DRIVE, SUITE 102
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WWW.NEWLEAFENERGY.COM

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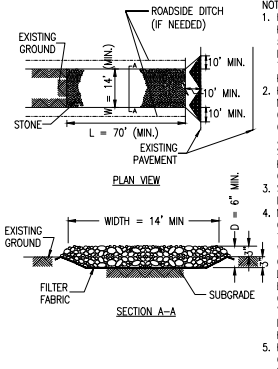
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16419 COURTHOUSE HWY
SMITHFIELD, VA 23430

PROJECT NUMBER:
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	04/07/23	ATK	QJW	COUNTY COMMENT
	07/07/23	ATK	QJW	RESUBMITTAL

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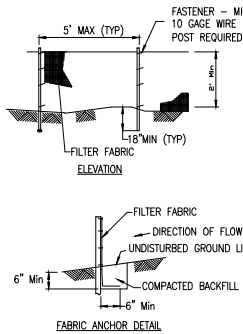
C-2.0
LAYOUT AND MATERIALS PLAN



NOTES:
1. FILTER FABRIC SHALL MEET THE REQUIREMENTS OF MATERIAL SPECIFICATION 592 GEOTEXTILE, TABLE 1 OR 2, CLASS I, II OR IV AND SHALL BE PLACED OVER THE CLEARED AREA PRIOR TO THE PLACING OF ROCK.
2. ROCK OR RECLAIMED CONCRETE SHALL MEET ONE OF THE FOLLOWING IDOT COARSE AGGREGATE GRADATIONS, CA-1, CA-2, CA-3, OR CA-4 AND BE PLACED ACCORDING TO CONSTRUCTION SPECIFICATION 25 ROCKFILL USING PLACEMENT METHOD 1 AND CLASS III COMPACTION.
3. SEE PLANS FOR CONSTRUCTION ROAD LOCATION, D AND W DIMENSIONS.
4. MINIMUM WIDTH IS 14 FEET FOR ONE-WAY TRAFFIC AND 20 FEET FOR TWO-WAY TRAFFIC. TWO-WAY TRAFFIC WIDTHS SHALL BE INCREASED A MINIMUM OF 4 FEET FOR TRAILER TRAFFIC. DEPENDING ON THE TYPE OF VEHICLE OR EQUIPMENT, SPEED, LOADS, CLIMATIC AND OTHER CONDITIONS UNDER WHICH VEHICLES AND EQUIPMENT OPERATE AN INCREASE IN THE MINIMUM WIDTHS MAY BE REQUIRED.
5. ROADWAY SHALL FOLLOW THE CONTOUR OF THE NATURAL TERRAIN TO THE EXTENT POSSIBLE.

10 STABILIZED CONSTRUCTION ENTRANCE

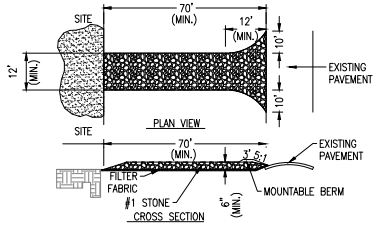
SCALE: NTS



NOTES:
1. TEMPORARY SEDIMENT FENCE SHALL BE INSTALLED PRIOR TO ANY GRADING WORK IN THE AREA TO BE PROTECTED. THEY SHALL BE MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD AND REMOVED IN CONJUNCTION WITH THE FINAL GRADING AND SITE STABILIZATION.
2. FILTER FABRIC SHALL MEET THE REQUIREMENTS OF MATERIAL SPECIFICATION 592 GEOTEXTILE TABLE 1 OR 2, CLASS I, II OR IV, EXCEPT WITH EQUIVALENT OPENING SIZE OF AT LEAST 30 FOR NONWOVEN AND 40 FOR WOVEN.
3. FENCE POSTS SHALL BE EITHER STANDARD STEEL POST OR WOOD POST WITH A MINIMUM CROSS-SECTIONAL AREA OF 3.0 SQ. IN.

7 SILT FENCE

SCALE: NTS

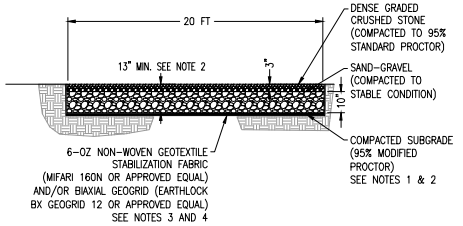


NOTES:
1. STONE SIZE - USE VDOT #1 COURSE AGGREGATE.
2. LENGTH- NOT LESS THAN 70 FEET.
3. THICKNESS-NOT LESS THAN 6 INCHES.
4. WIDTH-NOT LESS THAN 12 FEET WHERE MORE THAN ONE (1) ACCESS POINT TO THE SITE. WHERE ONE (1) ACCESS POINT A MINIMUM OF 24 FEET IS REQUIRED.
5. GEOTEXTILE-SHALL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE.
6. SURFACE WATER-SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCE SHALL BE PIPED BENEATH THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5: 1 SLOPES WILL BE PERMITTED.
7. MAINTENANCE-THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY, ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY SHALL BE REMOVED IMMEDIATELY.
8. WHEN WHEEL WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
9. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN.
7. ALL ROADS ARE TO MEET VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK CHAPTER 3 STANDARDS.

4 STABILIZED CONSTRUCTION EXIT

SCALE: NTS

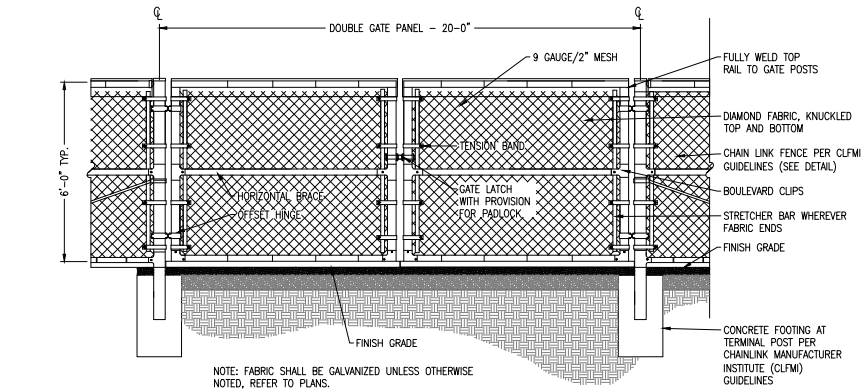
XD_CIVIL_TEMPORARY CONSTRUCTION_STABILIZED CONSTRUCTION EXIT_MY 2019-04-02



NOTES:
1. SUBCONTRACTOR SHALL EXCAVATE TO SUITABLE MATERIAL FOR SUBGRADE.
2. SUBCONTRACTOR SHALL COMPACT SUBGRADE TO PROVIDE SUITABLE SURFACE TO PLACE ROAD. REFER TO GEOTECHNICAL REPORT FOR SUBGRADE PREPERATION CRITERIA.
3. SUBCONTRACTOR SHALL FOLLOW MANUFACTURER INSTALLATION PROCEDURES.
4. WHERE OVERLAPPING OF GEOTEXTILE FABRIC IS REQUIRED, SUBCONTRACTOR SHALL OVERLAP A MINIMUM OF 24".
5. SUBCONTRACTOR SHALL INSTALL CONDUITS FOR ALL UTILITY CONDUITS, PIPES AND STORMWATER CULVERTS PRIOR TO INSTALLATION OF THE GEOGRID MATERIAL. THE GEOGRID SHALL NOT BE HORIZONTALLY CUT ONCE INSTALLED.
6. ALL ROADS ARE TO MEET VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK CHAPTER 3 STANDARDS.

1 GRAVEL ACCESS ROAD

SCALE: NTS

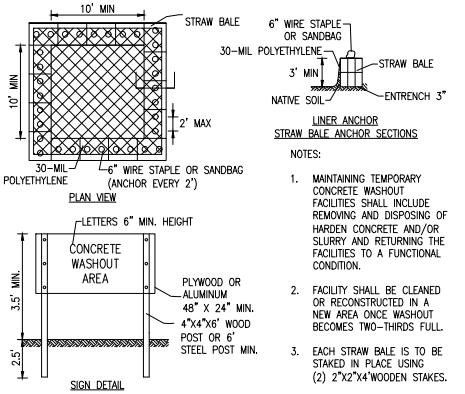


NOTE: FABRIC SHALL BE GALVANIZED UNLESS OTHERWISE NOTED, REFER TO PLANS.

8 VEHICLE GATE

SCALE: NTS

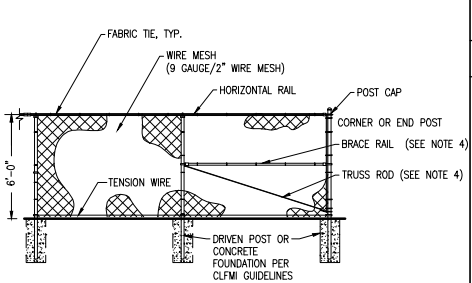
XD_CIVIL_FENCE_VEHICLE GATE 7' OR 8' 07-25-2017



NOTES:
1. MAINTAINING TEMPORARY CONCRETE WASHOUT FACILITIES SHALL INCLUDE REMOVING AND DISPOSING OF HARDEN CONCRETE AND/OR SLURRY AND RETURNING THE FACILITIES TO A FUNCTIONAL CONDITION.
2. FACILITY SHALL BE CLEANED OR RECONSTRUCTED IN A NEW AREA ONCE WASHOUT BECOMES TWO-THIRDS FULL.
3. EACH STRAW BALE IS TO BE STAKED IN PLACE USING (2) 2"X2"X4'WOODEN STAKES.

5 CONCRETE WASHOUT BASIN

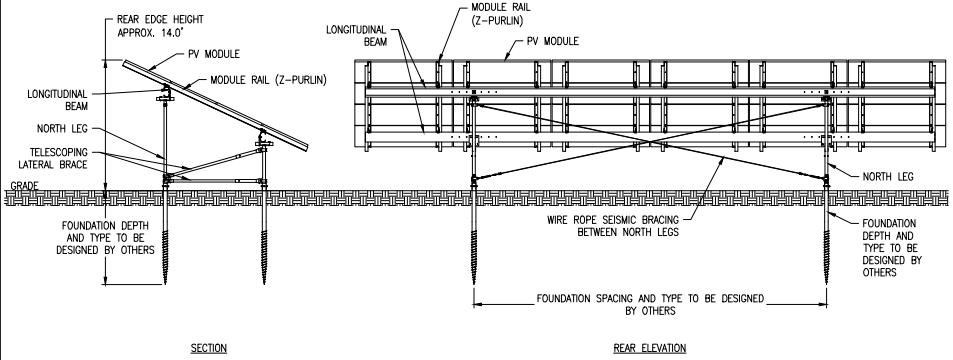
SCALE: NTS



NOTES:
1. THE FENCE SHALL MEET OR EXCEED THE CHAIN LINK FENCE MANUFACTURER INSTITUTE (CLFMI) GUIDELINES AND RELATED FEDERAL SPECIFICATIONS FOR SECURITY CHAIN LINK FENCE MATERIALS AND INSTALLATION.
2. ALL FENCE MATERIAL AND COMPONENTS SHALL BE GALVANIZED, UNLESS OTHERWISE NOTED.
3. THIS DETAIL NOT APPLICABLE FOR PRIVACY FENCE OR FENCE WITH SLATS.
4. ADJUSTABLE TRUSS ROD AND BRACE RAIL AT CORNER OR END POSTS ONLY, IF REQUIRED BY CLFMI GUIDELINES.

2 CHAIN LINK FENCE

SCALE:

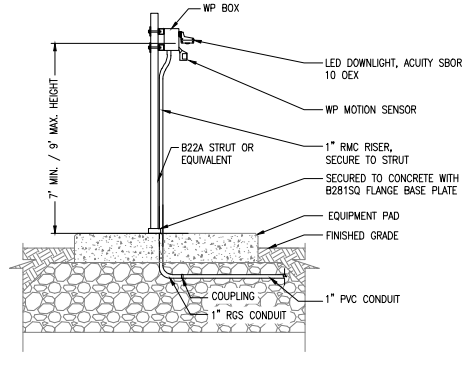


9 TYPICAL RACK SECTION & REAR ELEVATION

TO BE DESIGNED BY OTHERS

SCALE: NTS

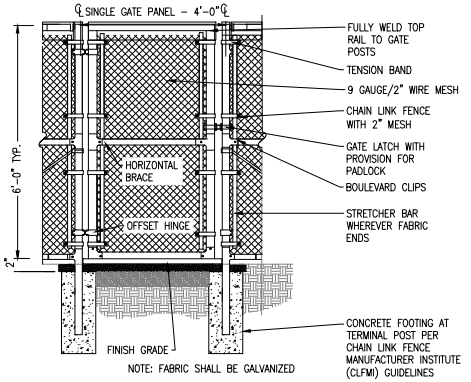
XD_STRUC_TERRYSMART_TF3_RACK SECT & REAR ELEV 2018-12-03



6 LIGHTING MOUNTING - DOWNLIGHT

SCALE: NTS

XD_ELEC_ LIGHT MOUNTING-DOWNLIGHT 2018-06-22 JPL



NOTE: FABRIC SHALL BE GALVANIZED

3 4' WIDE PERSONNEL GATE

SCALE: NTS

XD_CIVIL_SITE CONSTRUCTION_4' WALK THROUGH GATE 07-25-2017

new leaf energy
55 TECHNOLOGY DRIVE, SUITE 102
LOWELL, MA 01851
PHONE: (888) 998-6373
FAX: (888) 843-4778
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COMMONWEALTH OF VIRGINIA
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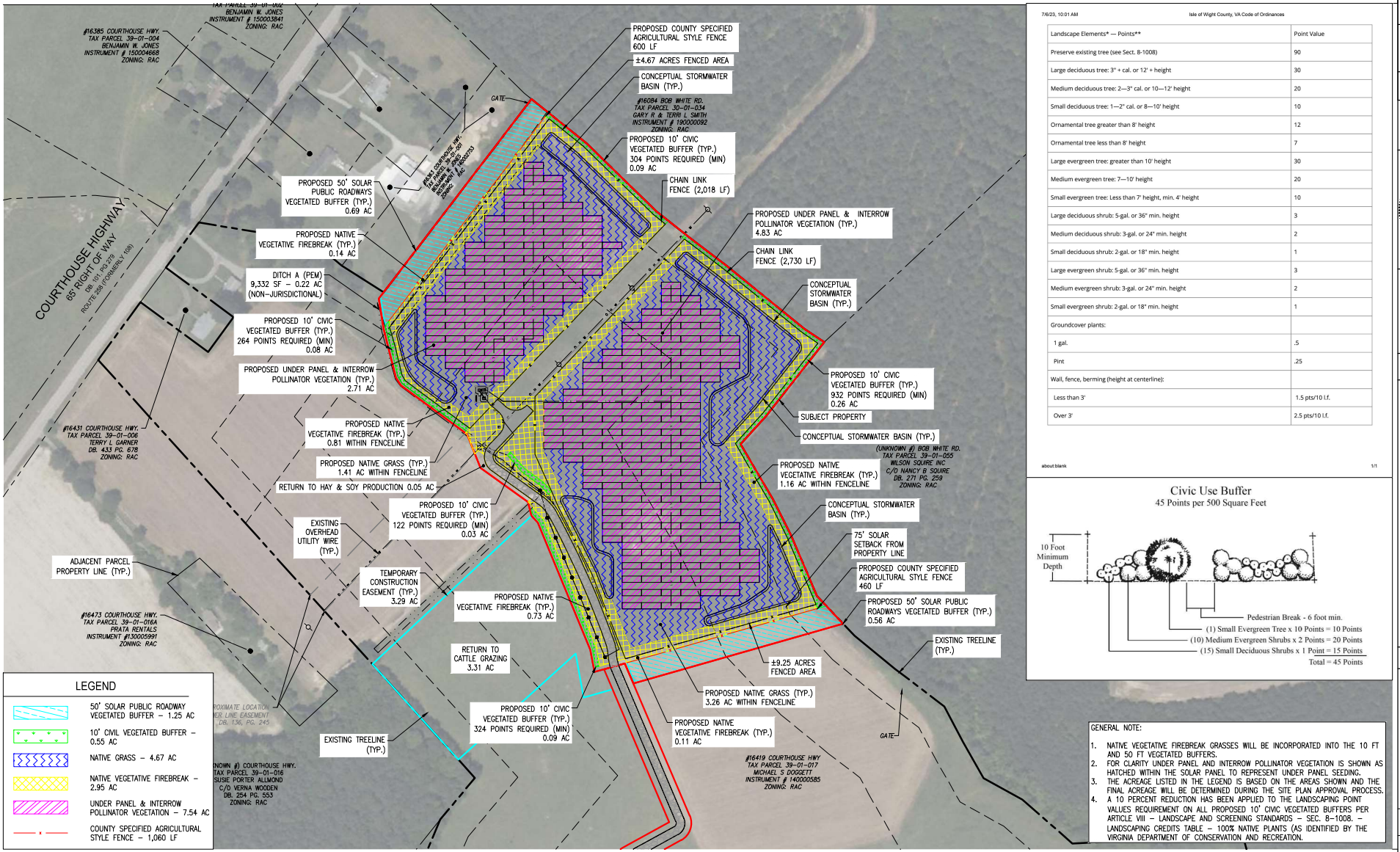
COURTHOUSE HIGHWAY - ISLE OF WIGHT
16419 COURTHOUSE HWY
SMITHFIELD, VA 23430

PROJECT NUMBER: 111-5287

REV	DATE	DRAWN	CHECKED	RELEASE LEVEL
	02/10/23	AM	DP	SUP. Revision - FT
	03/10/23	AM	QJW	COUNTY COMMENT
	04/07/23	ATK	QJW	RESUBMITTAL
	07/07/23	ATK		

SCALED STATED ON DRAWINGS ARE VALID ONLY WHEN PLOTTED ARCH D 24" X 36"

C-3.0
CIVIL DETAILS



7/6/23, 10:01 AM — Isle of Wight County, VA Code of Ordinances

Landscape Elements* — Points**	Point Value
Preserve existing tree (see Sect. 8-1008)	90
Large deciduous tree: 3" + cal. or 12' + height	30
Medium deciduous tree: 2—3" cal. or 10—12' height	20
Small deciduous tree: 1—2" cal. or 8—10' height	10
Ornamental tree greater than 8' height	12
Ornamental tree less than 8' height	7
Large evergreen tree: greater than 10' height	30
Medium evergreen tree: 7—10' height	20
Small evergreen tree: Less than 7' height, min. 4' height	10
Large deciduous shrub: 5-gal. or 36" min. height	3
Medium deciduous shrub: 3-gal. or 24" min. height	2
Small deciduous shrub: 2-gal. or 18" min. height	1
Large evergreen shrub: 5-gal. or 36" min. height	3
Medium evergreen shrub: 3-gal. or 24" min. height	2
Small evergreen shrub: 2-gal. or 18" min. height	1
Groundcover plants:	
1 gal.	.5
Pint	.25
Wall, fence, berming (height at centerline):	
Less than 3'	1.5 pts/10 l.f.
Over 3'	2.5 pts/10 l.f.

about:blank — 1/1

Civic Use Buffer

45 Points per 500 Square Feet

LEGEND

- 50' SOLAR PUBLIC ROADWAY VEGETATED BUFFER – 1.25 AC
- 10' CIVIL VEGETATED BUFFER – 0.55 AC
- NATIVE GRASS – 4.67 AC
- NATIVE VEGETATIVE FIREBREAK – 2.95 AC
- UNDER PANEL & INTERROW POLLINATOR VEGETATION – 7.54 AC
- COUNTY SPECIFIED AGRICULTURAL STYLE FENCE – 1,060 LF

GENERAL NOTE:

1. NATIVE VEGETATIVE FIREBREAK GRASSES WILL BE INCORPORATED INTO THE 10 FT AND 50 FT VEGETATED BUFFERS.
2. FOR CLARITY UNDER PANEL AND INTERROW POLLINATOR VEGETATION IS SHOWN AS HATCHED WITHIN THE SOLAR PANEL TO REPRESENT UNDER PANEL SEEDING.
3. THE ACREAGE LISTED IN THE LEGEND IS BASED ON THE AREAS SHOWN AND THE FINAL ACREAGE WILL BE DETERMINED DURING THE SITE PLAN APPROVAL PROCESS.
4. A 10 PERCENT REDUCTION HAS BEEN APPLIED TO THE LANDSCAPING POINT VALUES REQUIREMENT ON ALL PROPOSED 10' CIVIC VEGETATED BUFFERS PER ARTICLE VIII – LANDSCAPE AND SCREENING STANDARDS – SEC. 8–1008. – LANDSCAPING CREDITS TABLE – 100% NATIVE PLANTS (AS IDENTIFIED BY THE VIRGINIA DEPARTMENT OF CONSERVATION AND RECREATION.

LANDSCAPE PLAN

SCALE: 1" = 100'

0 150' 300'

new leaf energy
55 TECHNOLOGY DRIVE, SUITE 102
LOWELL, MA 01851
PHONE: (866) 906-6273
FAX: (866) 843-4778
WWW.NEWLEAFENERGY.COM

COMMONWEALTH OF VIRGINIA
QUENTIN JAMES WOOD III
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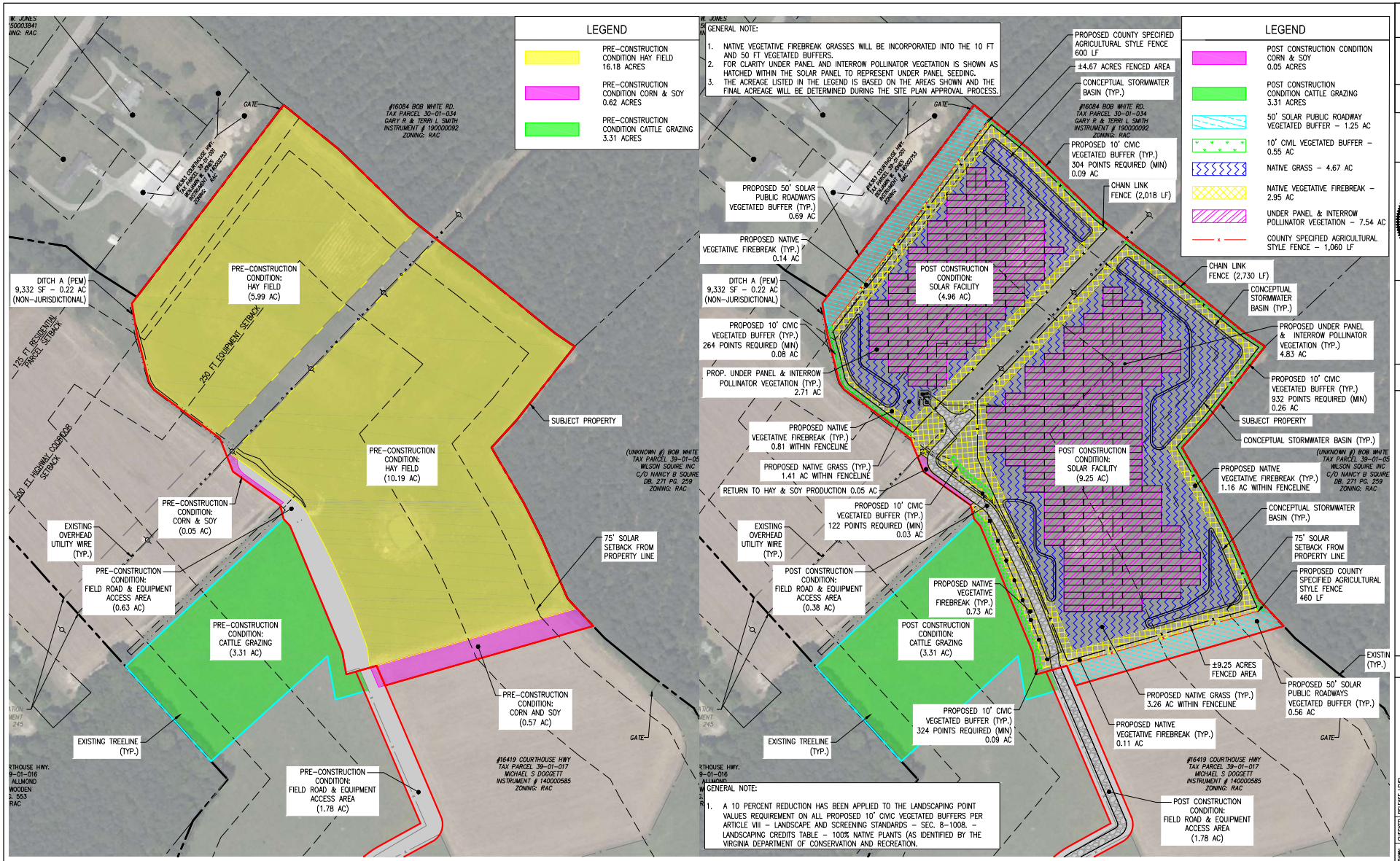
COURTHOUSE HIGHWAY - ISLE OF WIGHT
16419 COURTHOUSE HWY
SMITHFIELD, VA 23430

PROJECT NUMBER: 111-5287

REV	DATE	DRAWN	CHECKED	RELEASE LEVEL
	02/10/23	AM	DP	
	03/10/23	AM		SUP Revision – FT
	04/07/23	ATK	QJW	COUNTY COMMENT
	07/07/23	ATK	QJW	RESUBMITTAL

SCALES STATED ON DRAWINGS ARE VALID ONLY WHEN PLOTTED ARCH D 24" X 36"

C-4.0
LANDSCAPE PLAN



PRE-DEVELOPMENT AND POST-DEVELOPMENT PLAN

SCALE: 1" = 100'

0 100' 200'

Pre-Construction			Post Construction								
Type	Area	Total	Under Panel & Interrow Pollinator Vegetation	Native Grass	Native Vegetative Firebreak	50' Solar Public Roadway Vegetated Buffer	10' Civic Vegetated Buffer	Cattle Grazing	Field Road & Equipment Access Area	Total	Remaining AC
Cattle	3.31	**3.31**	-----	-----	-----	-----	-----	-----	-----	**0**	**3.31**
Corn & Soy	0.62	**0.62**	-----	-----	-----	0.55	-----	-----	0.02	**0.57**	**0.05**
Hay	16.18	**16.18**	7.54	4.67	1.97	1.54	0.46	-----	-----	**16.18**	**0**
Field Road & Equipment Access Area	2.41	**2.41**	-----	-----	0.16	-----	0.09	-----	-----	**0.25**	**2.16**

*Note: all units are in Acres (AC)

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SCALES STATED ON DRAWINGS ARE VALID ONLY WHEN PLOTTED ARCH D 24" X 36"

C-5.0
PRE-DEVELOPMENT AND POST-DEVELOPMENT PLAN

A RECONNAISSANCE ARCHITECTURE SURVEY

COURTHOUSE HIGHWAY SOLAR SITE

Isle of Wight County, Virginia



H&P PROJECT NO.

20221983-0431

SUBMITTED BY:

Melissa A. Schmidt

Architectural Historian

July 2023

SUBMITTED TO:

Courthouse Highway Solar 1, LLC
55 Technology Drive, Suite 102
Lowell, MA 01851

2524 Langhorne Road | Lynchburg, VA 24501
(434) 847-7796 | www.HandP.com

HURT & PROFFITT

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EXECUTIVE SUMMARY

This report presents the results of a reconnaissance survey of 14 architectural resources in Isle of Wight County, Virginia. The survey was completed by Hurt & Proffitt (H&P) on behalf of Courthouse Highway Solar 1, LLC. The fieldwork for this project was conducted on November 28, 2022.

The architecture survey conducted for this project resulted in the recordation of one previously recorded property and 13 newly identified architectural resources. The previously recorded property, known as the Wilson House (VDHR No. 046-0052) lies northeast of the project area and is an early 19th century dwelling which has been determined eligible for the National Register of Historic (NRHP). The 13 newly identified resources include mid to late 20th century dwellings, an early 20th century farm, an early 20th century tobacco barn, and a possible mid to late 19th century stable.

The proposed Courthouse Highway Solar Site lies in central Isle of Wight County, approximately one-half mile northeast of the county seat of Isle of Wight. The 150.88-acre parcel is located at 16419 Courthouse Highway (Parcel ID: 39-01-017). Courthouse Highway (Rte. 258) borders the property along its western edge, and Poor House Road (Rte. 692) on the southern border. The site is southeast of Courthouse Highway, set approximately 425 feet (130 meters) from the road, and is flat and slightly lower in elevation than surrounding areas. The access road will utilize a preexisting farm road with an entry from Poor House Road. The site is bordered on the northeast by dense woodland 820 to 1,410 feet (250 to 430 meters) deep, while the larger parcel is bordered by dense woodland on the southwest.

The APE for the architectural survey consists of the project footprint and those parcels within 0.5 miles (0.8 km) of the proposed location of the solar farm, considering the view shed as impacted by topography and the presence of other structures, specifically those parcels visible from the proposed solar farm and the vicinity where impacts to setting and feeling may occur.

The reconnaissance-level surveys completed for this project include background research at Isle of Wight County records and survey files at the Virginia Department of Historic Resources (VDHR). The fieldwork for the project entailed photographing and drawing site plans for each resource.

Based on the results of the survey, H&P recommends that the Wilson House (DHR No. 046-0052) remains eligible for the NRHP. H&P recommends that the 13 newly identified architectural resources are not eligible for the NRHP under Criteria A, B, or C. Finally, H&P recommends that the Wilson House will not be adversely impacted by the project.

1. INTRODUCTION

On behalf of Courthouse Highway Solar, LLC, Hurt & Proffitt, Inc. (H&P) has completed a Phase I architectural survey for a proposed solar farm on an approximately 151-acre tract located in Isle of Wight County, Virginia. The Area of Potential Effects (APE) for architectural resources was defined as those properties that fall within 0.5 miles of the proposed solar farm and have a potential view of the project area. The property consists of 151 acres of mildly sloping agricultural fields as well as an unutilized deciduous forest. The purpose of the survey was to identify all architectural properties 45-years of age or older that fall within 0.5 miles of the proposed site and determine whether any of the architectural resources are eligible for listing in the National Register of Historic Places (NRHP) (Figure 1).

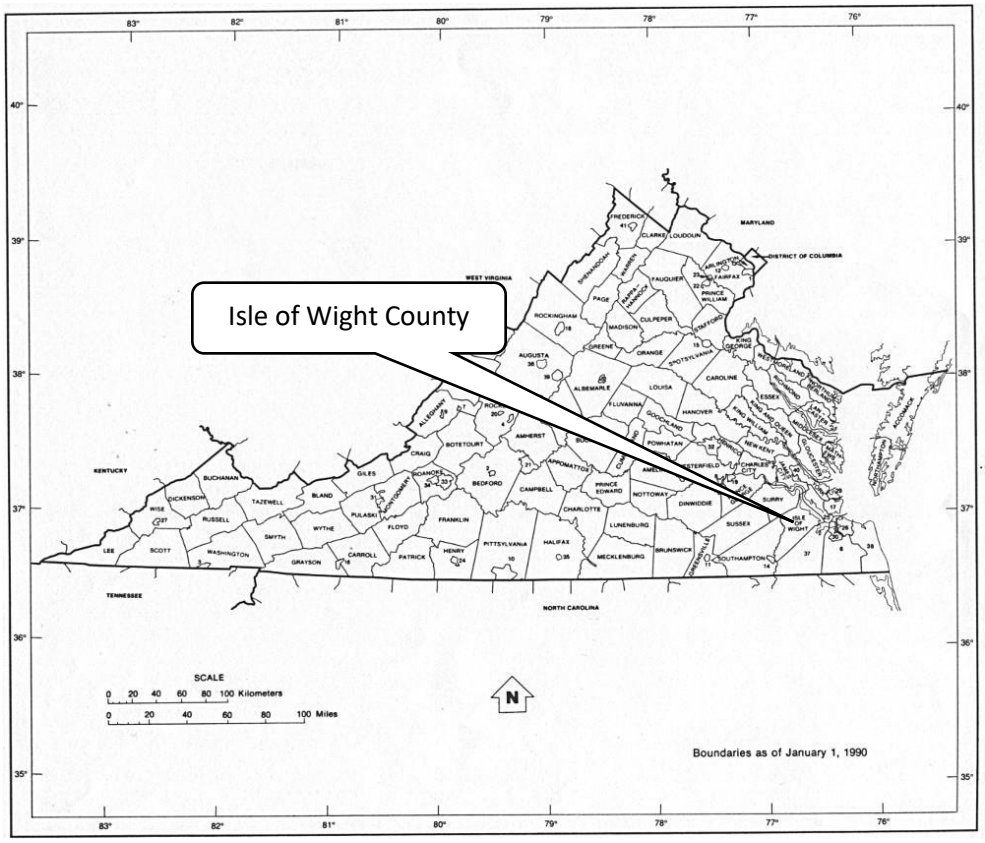


Figure 1. Project location.

Prior to beginning the fieldwork for the project, H&P completed background and historic research at VDHR and Isle of Wight County, which included a site file review of previously recorded architectural resources in the VDHR's Virginia Cultural Resources Information System (V-CRIS).

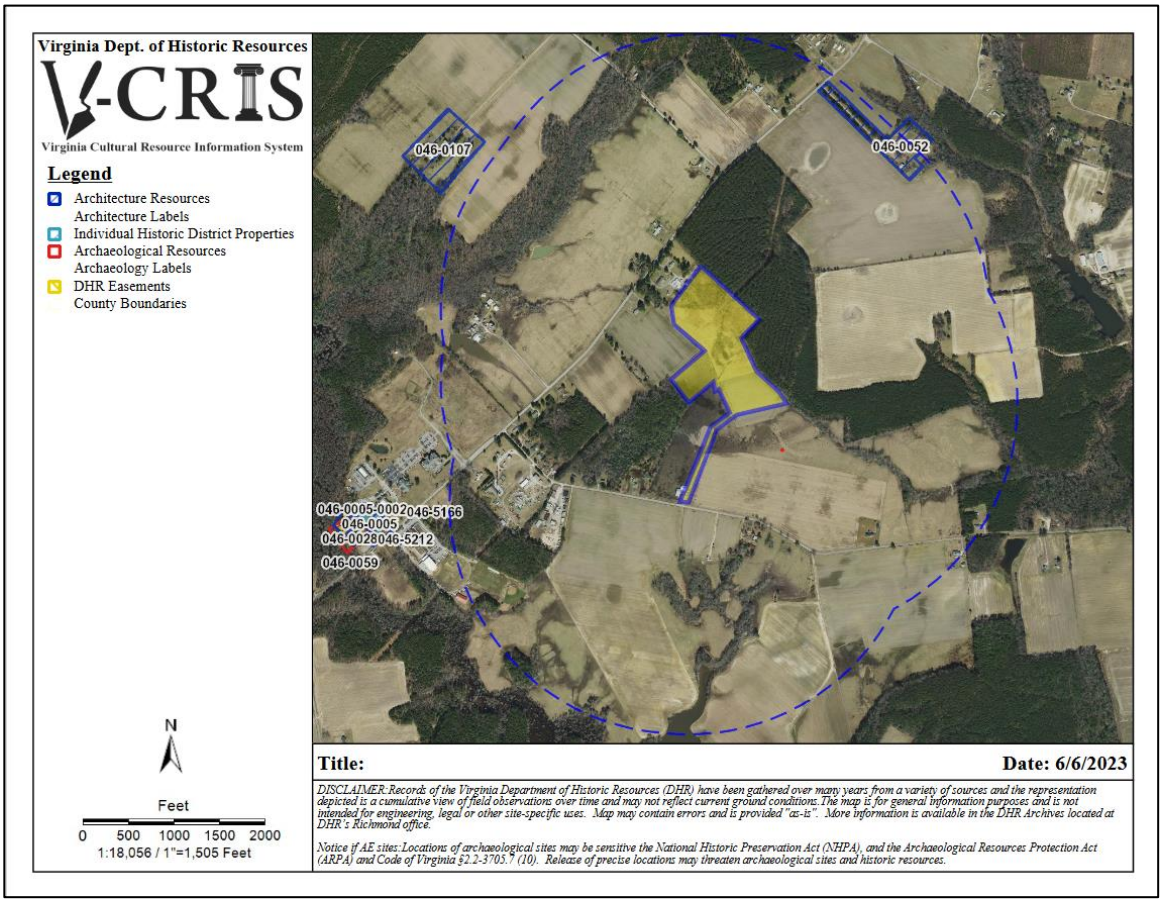


Figure 2. VCRIS map showing 0.5-mile architectural APE.

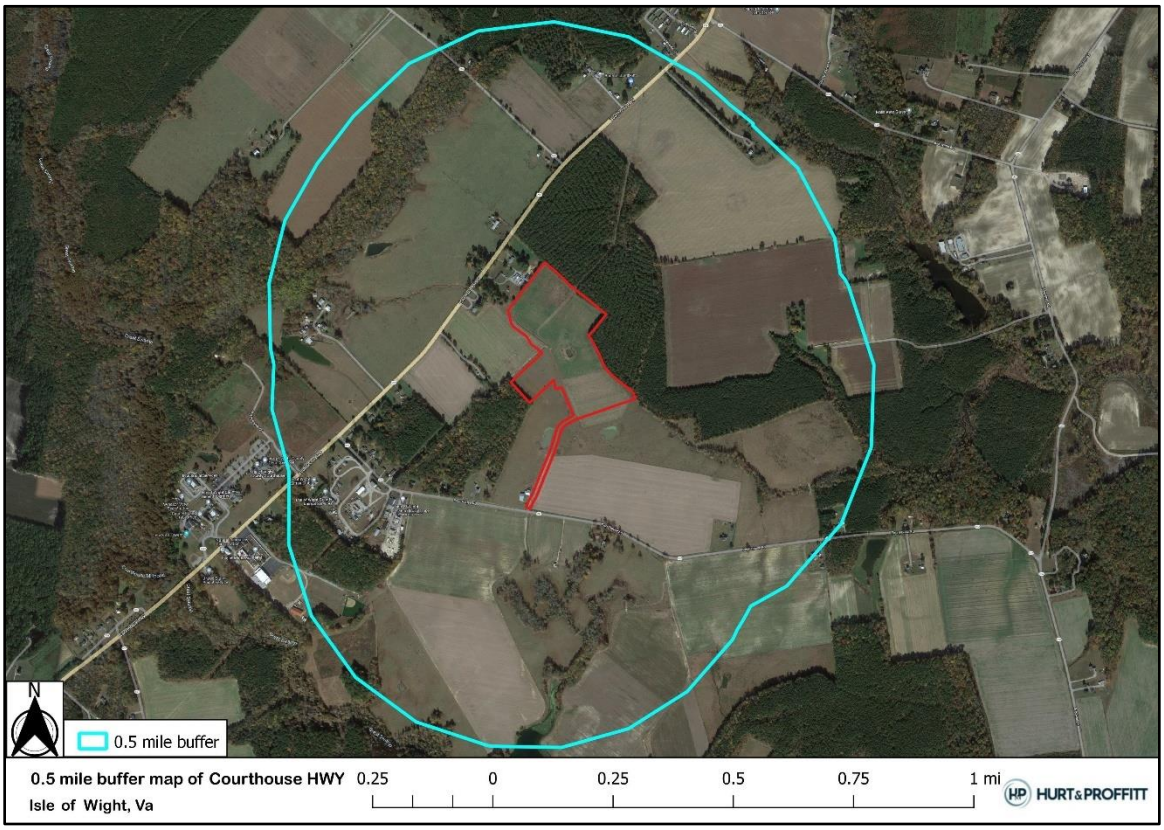


Figure 3. Project parcel with project footprint outlined in red as depicted in Isle of Wight County GIS (accessed December 2022).

The fieldwork for this project was completed by Melissa A. Schmidt, H&P Architectural Historian. The field investigations and technical report meet the requirements specified in the *Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation* (Federal Register 48:190:44716-44742) and the Virginia Department of Historic Resources (VDHR) *Guidelines for Conducting Cultural Resource Survey In Virginia* (2017). The Principal Investigator performing the cultural resource investigations meets or exceeds the qualifications described in the Secretary of the Interior's *Professional Qualifications Standards* (48 FR 44738-9).

2. SETTING

The proposed site lies in the western portion of Isle of Wight County, Virginia. The 150.88-acre parcel is located at 16419 Courthouse Highway (Parcel ID: 39-01-017). Courthouse Highway (Rte. 258) borders the property along its western edge, and Poor House Road

(Rte. 692) on the southern border. The site is southeast of Courthouse Highway, set approximately 425 feet (130 meters) from the road, and is flat and slightly lower in elevation than surrounding areas. It is surrounded by primarily agriculturally zoned areas to the east with residentially zoned properties running along the southern border.

The project area consists of gently sloping agricultural fields that comprise most of the landscape. Small clusters of deciduous trees are depicted in the southeast portion of the property. The topographic map of the area illustrates the flat nature of the agricultural fields. Unnamed intermittent tributaries of Champion Swamp cross the property from the west and east boundaries but are not depicted as entering the parcel. Field reconnaissance showed that the western stream creates a wetland area in the northwestern portion of the parcel. Two agricultural watering ponds lay on the property outside of the project area. An additional agricultural retention pond typically utilized to artificially lower the water table lies inside the southeastern portion of the parcel.



Figure 4 Project area depicted on 2021 aerial from Google Earth.

3. HISTORIC CONTEXT

Settlement to Society (1607-1750)

English settlement in the Tidewater region of Virginia began with the founding of the Jamestown colony in 1607. Soon thereafter, the Jamestown colonists began exploring the mouth of the Elizabeth River and Hampton Creek. During this exploration, the colonists eventually encountered Native Americans when they visited the town of Kecoughtan, part of the Powhatan Confederacy. The colonists continued their exploration of the area and eventually founded the Jamestown settlement at the mouth of the James River (Mansfield 1989).

The colonists did not explore the area of modern-day Isle of Wight County until 1608, when John Smith sought to trade with the Warrosquoyacke tribe for food (King 1993). The Warrosquoyacke lived around modern Fergusson's Wharf and hunted along the James River, as well as 20 miles inland (Morrison 1907). The settlers and Native Americans continued friendly relations for the next several years. The settlers continued to learn from the Native Americans and explore the land (King 1993).

Within a few years, the colonists began cultivating the crop of tobacco which led to both huge exports to England, as well as impressive growth in population. English settlement continued to expand, including the region that would become modern-day Isle of Wight County. Led by Captain Christopher Lawne, Sir Richard Worsley, Nathaniel Basse, and John Hobson, the colonists settled near the mouth of Lawne's Creek. Lawne's Creek is the modern dividing line between Isle of Wight and Surry Counties. The first settlement in this area was called Warrosquoyacke; however, the new residents of this area suffered greatly from disease, especially malaria with a majority dying within the year. In 1620, the settlement became known as the plantation of Isle of Wight. The area continued to grow, and two additional patents were granted that year (King 1993).

In 1619, the first Africans arrived in Virginia via a Dutch trader, a majority of which ended up at Governor Sir George Yeardley's Flowerdew Hundred Plantation. As the seventeenth century progressed enslaved individuals began to replace indentured servants as the primary source of labor in the Tidewater area. The first recorded slave within the modern boundary of Isle of Wight County was at Bennett's Welcome, a plantation that belonged to Edward Bennett (IWCM 2021).

The expanded settlement along the James River eventually led to conflict with the communities of the Powhatan Confederacy. On March 22, 1622, the tribes of the Powhatan Confederacy attacked the James River settlements, 347 colonists were killed. As a result, the management of the colony was transferred from the Virginia Company to the British

Crown in 1624. In 1634 eight counties or shires were established: Henrico, James City, Charles City, Warwick River, Charles River, Warrosquoyacke (Isle of Wight), Elizabeth City, and Accomack. In addition, county courts and officials, to include justices, sheriffs, clerks, and lieutenants of the militia were established (Dabney 1971).

In 1637 Warrosquoyacke officially became Isle of Wight and was bound on the north by Lawne's Creek, the east by the James River, and inland extended from Richard Hayes's plantation to the head of Colonel Pitt's creek, the southern boundary ran to the west for an undefined distance. In 1642, Isle of Wight was divided into the Upper and Lower Parish, Pagan Creek was the boundary between the two. Most of the settlements were along the southern shore of the James River and the shores of Pagan Creek (King 1993).

The project area is south of the James River, in the middle of Isle of Wight County, far from the larger established plantations on the James and York Rivers. The first town of Isle of Wight County was at Pate's Field near Pagan Point Creek and Warrosquoyacke Back Bay Creek. In 1680, a law was passed that required every county that exported tobacco and other goods to lay out a town of fifty acres with half-acre lots. Each lot had to include a dwelling and a storehouse. By 1681, all exports and imports had to pass through these established towns. However, Pate's Field, Patesfield, was considered too remote and inconvenient for trade (King 1993).

During this time, the transportation of enslaved individuals continued to increase. In fact, between 1700 and 1750, 45,000 enslaved people were brought to the colony. In addition, there was an increase in the number of American-born slaves. This increase in the number of enslaved peoples in the colony resulted in the need for housing for these individuals. Evidence of these quarters does not really appear until the eighteenth century. However, due to the sheer number of enslaved individuals and tension between planters and their workers, separate quarters became the norm (Upton 1984).



Figure 5. Figure 6. Project area depicted on Map of Virginia Smith, John, and William Hole. Virginia. London, 1624. (Library of Congress).

Colony to Nation (1750-1789)

By 1750, the second town was established in Isle of Wight County, Smithfield. Originally, Smithfield was part of the property owned by Captain Arthur Smith that sat along Pagan Creek. Due to its location, Smithfield was perfect because it contained a storehouse, a public landing, and had access to a ferry landing. Smith laid out 72 lots, with two proposed locations for a courthouse. One of these locations was accepted, and construction of the courthouse began in 1750. The courthouse and a contemporary tavern are still standing in the Town of Smithfield today. It was during this period that there was a transition away from the cultivation of tobacco. Tobacco was hard on the land and depleted the soil, so new crops were introduced like corn, other grains, orchards, and livestock. In addition, the pine forests in Isle of Wight were utilized for their tar, pitch, and turpentine (King 1993).

With the start of the Revolutionary War, many citizens of Isle of Wight County were divided in their loyalties. The loyalists had to abandon their homes and property. In 1775, many residents of Isle of Wight County joined the Princess Anne District Battalion to fight

at Kempsville and Portsmouth. These same men later joined the 7th, 8th, and 9th companies of the 4th Virginia Regiment of Foot. Eventually, these soldiers joined Washington's army and fought at Trenton and Germantown. No major battles were fought within Isle of Wight County; however, raids were led by British Lieutenant Colonel Tarleton. Including one on the courthouse in Smithfield, which severely damaged the building. In addition, the shoreline was under threat of invasion, which led to the closing of one of the tobacco warehouses (King 1993).

During the eighteenth century, enslaved peoples were still imported into Virginia. However, there was not a significant increase in the number in the Tidewater area. In fact, it appears that many of the enslaved were moved from Tidewater to other parts of Virginia, or other regions (Morgan 1988). Virginia passed the Emancipation Act in 1782. This new law allowed the enslaved to be freed by their owner through a deed of manumission or through a will after their death (IWCM 2021).

The proposed project area is within a mile of Boykin's Tavern (DHR No. 046-0005). Named for Francis Boykin, who served as a lieutenant with Patrick Henry and later camped with George Washington at Valley Forge, who purchased land on Courthouse Highway in 1780, as well as the house that had stood there since 1762. Located on one of the oldest thoroughfares in Virginia, Courthouse Highway/Route 258, the tavern provided accommodation for travelers during the 18th and 19th centuries when transportation was limited, and roadways were marginally functional.

The tavern is part of the Isle of Wight Courthouse Complex (DHR No. 046-0005). Boykin donated the land for the Isle of Wight Courthouse constructed in 1800. Adjacent to the courthouse, the tavern served as a meeting place for influential state and local government leaders as well as the center for social activity within the county. The courthouse complex served as the center of civic and social life for the county since the late 18th century.



Figure 6. Project vicinity depicted on Fry, Joshua, Peter Jefferson, Robert Sayer, and Thomas Jefferys, 1775, A Map of the Most Inhabited Part of Virginia (Library of Congress).

Early National Period (1789-1830)

In 1790, the population of Isle of Wight County was 9,028. This included 4,786 whites, 3,867 enslaved individuals, and 375 free blacks. The population of Isle of Wight County grew very slowly, by the 1830 census the number of individuals in the county only increased to 10,517 people (King 1993).

The population of Isle of Wight County began to move to the western parts of the county. Because of this, it was decided that the courthouse should be moved to accommodate the population shift. Around 1800, the new courthouse was constructed, it is still used and sits approximately 1.5 miles from the project area (King 1993).

Agriculture began to change during this period. Tobacco cultivation had been on the decline because of soil depletion. Therefore, the residents of Isle of Wight County began to grow new crops, specifically cotton. By the early-nineteenth century, Isle of Wight County had two functioning cotton factories (King 1993).

Additional changes came in the transportation network in Isle of Wight County. Residents long relied on ferries for the transportation of goods and people. This period also saw improvements of roads and bridges (King 1993).

Slavery continued during this period. Although the United States government outlawed the importation of enslaved people, the domestic slave trade continued. Due to the changes in crop cultivation mentioned above, less slave labor was required, which led to a surplus of slave labor (Berlin 2010).

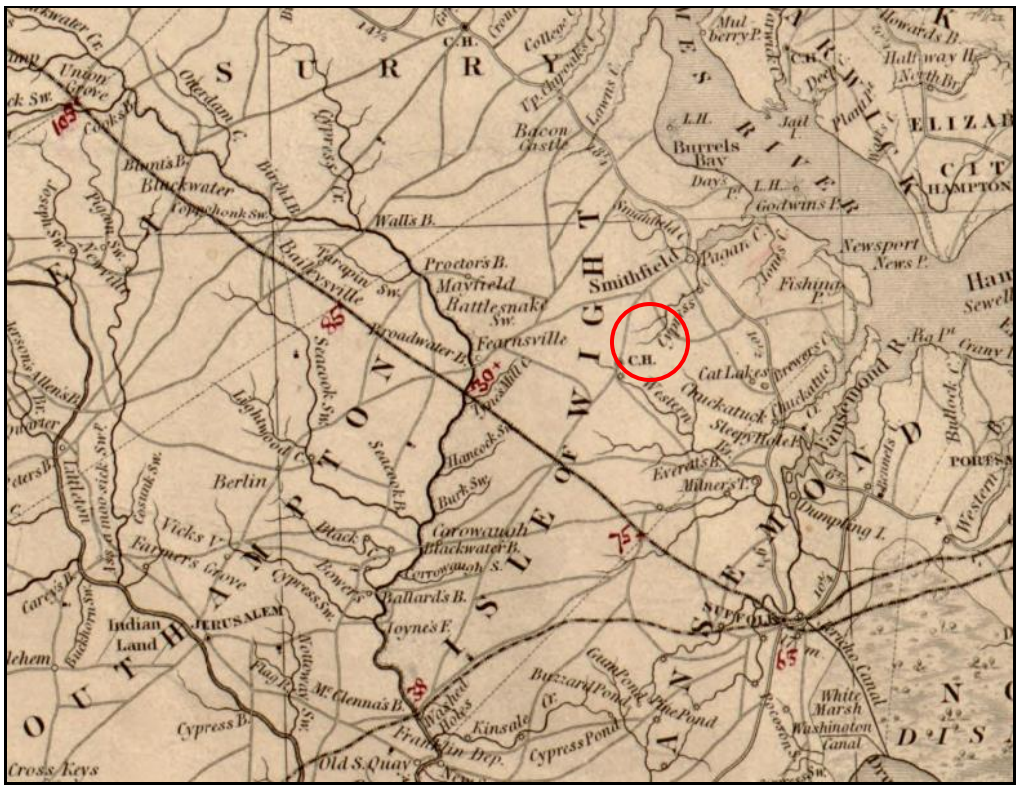


Figure 7. Project vicinity depicted on Boye, Herman, Henry Schenck Tanner, E.B. Dawson, and William Branch Giles, 1827 A Map of the State of Virginia (Library of Congress).

Antebellum Period (1830-1861)

The population of Isle of Wight County continued to decrease from 10,517 in 1830 to 9,977 in 1860. This is primarily due to the decrease in the number of enslaved peoples, which declined from 4,272 in 1830 to 3,570 in 1860. This is due to changes in farming and the crops cultivated during this time that did not rely as heavily on slavery (King 1993).

Most of the residents in Isle of Wight County were farmers. However, there was an agricultural depression in eastern Virginia in the 1820s and 1830s. This economic crisis is credited as one of the reasons for the population decline in the county (Mansfield 1989). Further problems stemmed from the Lower Tidewater cotton farmers could not compete with the cotton farmers of the Deep South. Despite these issues, agriculture continued with over 1,400 farms in Isle of Wight County. The focus was on new crops like corn, sweet potatoes, peas, watermelons, beans, and some cotton. It was also during this time that peanut cultivation began in Isle of Wight County (King 1993).

During the Antebellum period the railroad came to Isle of Wight County. The Norfolk and Petersburg Railroad, completed in 1858, provided access to new markets and injected some needed energy into the economy of the region. The railroad also opened the region for the lumber industry (King 1993).

The changes in agriculture resulted in the exportation of enslaved people from Virginia to the Deep South. Called "the second middle passage," more than one million slaves were sent to the Deep South. During this time, there was talk of ending slavery within Virginia; however, after Nat Turner's Rebellion in 1831, all talk ceased (Berlin 2010).

Civil War (1861-1865)

The area between the Nansemond and Blackwater Rivers witnessed at least 30 engagements during the Civil War between September 28, 1862, and March 17, 1863. In this area both the Confederates and Union troops had patrols between the two rivers. Specifically, the localities of Providence Church, Zuni, Windsor, and Joyner's Ferry. The Confederates attempted to prevent Union troops from crossing the Blackwater River.

The Union troops worked to prevent the Confederates from crossing the Nansemond River (Cormier 1989). Union Major-General John A. Dix estimated at least 5,000 Confederate troops fortifying the Blackwater River (Dix 1862).

One skirmish took place on December 12, 1862, at Joyner's Ford near the nearby community of Zuni. Captain J. H. Sikes of Company D of the 7th Confederate States Cavalry stated that at least 30 Confederate soldiers engaged with Union forces at Joyner's Ford. At first, the Confederates were able to hold off Union forces and kept them from crossing the river. Eventually, Union troops managed to cross the river on pontoon boats. The Confederate soldiers attempted to hold the Union soldiers but were soon overwhelmed and captured by Union forces (Dix 1862).

Union forces focused considerable attention along the Norfolk and Petersburg Railroad. In May 1863, Union troops were busy tearing up the railroad tracks between Suffolk and the

Blackwater River. Major General Dix stated that two regiments of Confederate troops with artillery pieces attacked the Union troops.

All this activity along the railroad interrupted the prosperity the railroad brought to Isle of Wight County. After the evacuation of Norfolk in May 1862, Union troops had control of the Norfolk and Petersburg Railroad from Norfolk to Zuni. To make that portion unusable, the railroad removed sections of track outside of what the Union troops occupied (Chabot 1938). The Confederates were still in possession of the western end of the railroad and continued to transport troops to the Blackwater River (Dix 1862).



Figure 8. Project vicinity depicted on Confederate States Of America. Army. Dept. Of Northern Virginia. Chief Engineers Office, Albert H Campbell, and J. Houston Patton. *Preliminary map of a part of the south side of James River*. [Chief Engineers Office D.N.V, 1864] Map. Library of Congress.

In 1864 a skirmish took place in nearby Smithfield. On Jan. 31, 1864, a unit of Union soldiers sailed up the Pagan River to investigate Confederate activity. After landing and heading inland, they encountered a small Confederate unit, and after a minor skirmish, the Union detachment headed back to Smithfield to leave the area. Their gunboat departed without them forcing the soldiers to spend the night. Confederate Maj. N.A. Sturdivant took the opportunity to capture the Union troops. On Feb. 1, a skirmish along Main Street

ensued. During the three-hour engagement, the Union gunboat Smith-Briggs arrived, and the Union troops attempted to escape. Capt. Joseph Norsworthy cut off the Union retreat with cavalry. The gunboat was destroyed by Confederate cannon fire, and the Union forces were captured (Isle of Wight County Museum).

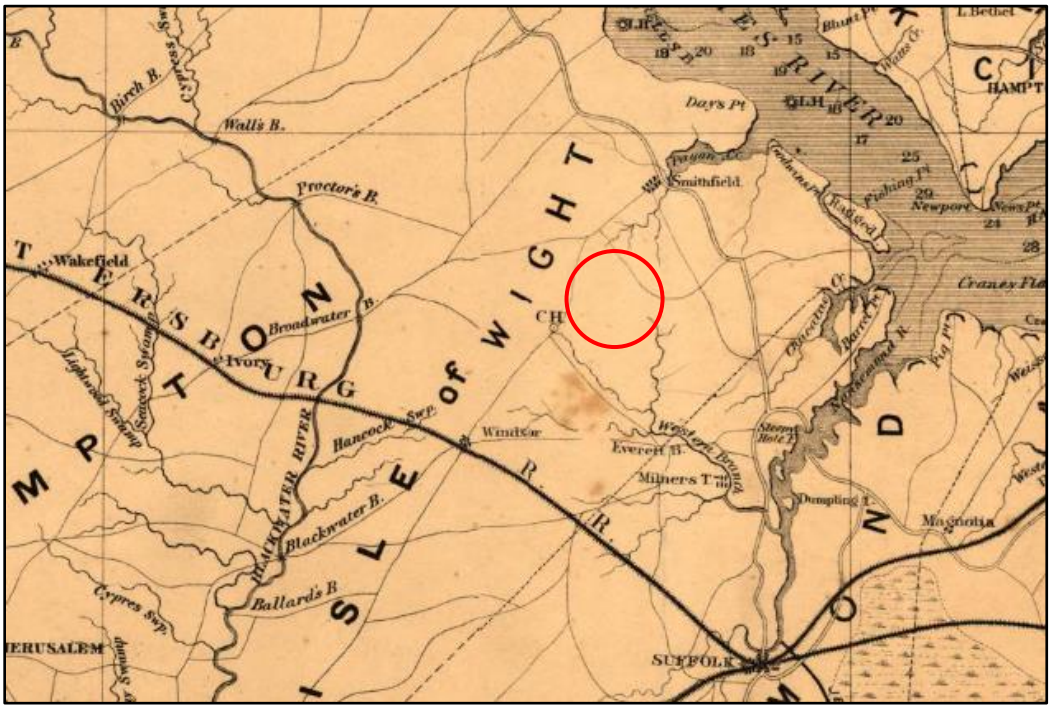


Figure 9. Project vicinity depicted on 1862 map. E & G.W. Blunt's corrected map of the seat of war near Richmond, July 10th, *1862*. Retrieved from the Library of Congress.

Reconstruction and Growth (1865-1917)

After the end of the Civil War, began the task of rebuilding the Norfolk and Petersburg Railroad. The goal was to connect Norfolk with the markets of the Mississippi Valley. In 1872, the Norfolk and Petersburg Railroad merged to form the Atlantic, Mississippi, and Ohio Railroad Company. A result of this merger was the creation of the Norfolk and Western in 1881 (Chabot 1907).

Prior to the start of the Civil War, was the start of peanut cultivation in the county. By the end of the Civil War, peanut farming was being encouraged in Isle of Wight County. In 1872, 40,000 bushels of peanuts were cultivated in the county, by 1890 it was over 200,000 bushels. A peanut factory was constructed in Smithfield, and in 1877 another factory was built in Windsor (King 1993).

Lumbering, an industry that began in the area with the construction of the Norfolk and Petersburg Railroad, also continued after the Civil War. In 1878, the Camp Manufacturing Company, a lumber company, was built on the east bank of the Blackwater River. Lumber operations were established in communities with wharves on the James River (King 1993).

Windsor benefited from its proximity to the railroad and became an important distribution point. By 1878, Windsor had the first two-room school in Isle of Wight County. By 1902, Windsor had a jail and a public school.

The Civil War brought the 13th Amendment which outlawed slavery in the United States. Freedman's Bureaus were established throughout the country to help newly freed blacks (Berlin 2010).

World War I to World War II (1917-1945)

The types of crops cultivated in Isle of Wight County remained mostly unchanged, with peanuts continuing to be the primary crop; however, soybeans were introduced to the county. In 1935, there were over 1,400 farms in Isle of Wight County, this number includes farms of both whites and blacks. Change came with the erection of power lines by the Community Electric Cooperatives, which provided electricity to rural parts of the county. In 1928, the James River Bridge opened, which connected Isle of Wight residents with the larger cities of Hampton and Newport News (King 1993).

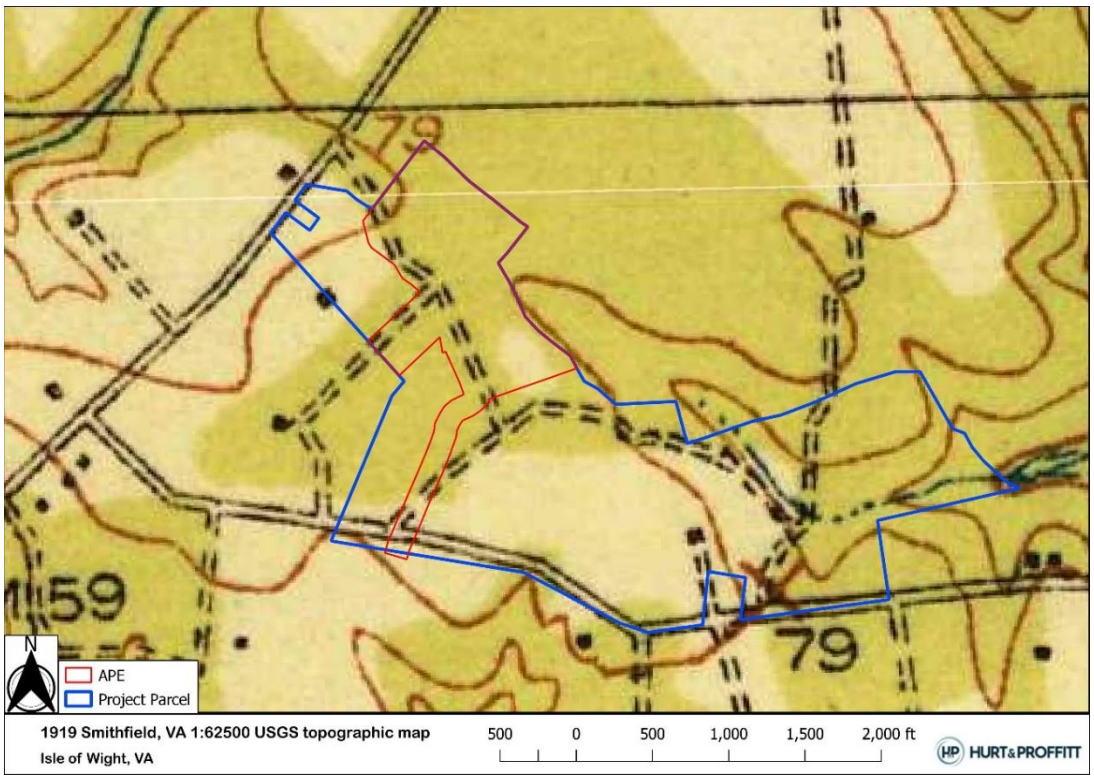


Figure 10. Project area depicted on 1919 Smithfield, VA 1:63500 USGS topographic map (USGS 2022).

The New Dominion (1945 to Present)

In 1950, the Isle of Wight population was over 14,000 people. Smithfield was the largest town and Windsor was the second largest town. In 1975, the Commonwealth of Virginia took over operation of the James River Bridge and removed the tolls on the bridge. The removal of tolls made Isle of Wight County an attractive place to move for people working in Newport News. This resulted in a population increase and new residential and commercial construction along Route 17 and in the Town of Smithfield.

The number of farms began to decline by the 1990s, and there was a transition from crops to beef cattle (King 1993). In the 2010 U.S. Census the population of Isle of Wight County was 35,270 and increase of 18.6 percent from the 2000 census. The Smithfield and Isle of Wight Convention and Visitors Bureau promotes the historic tourism and outdoor activity of the area.

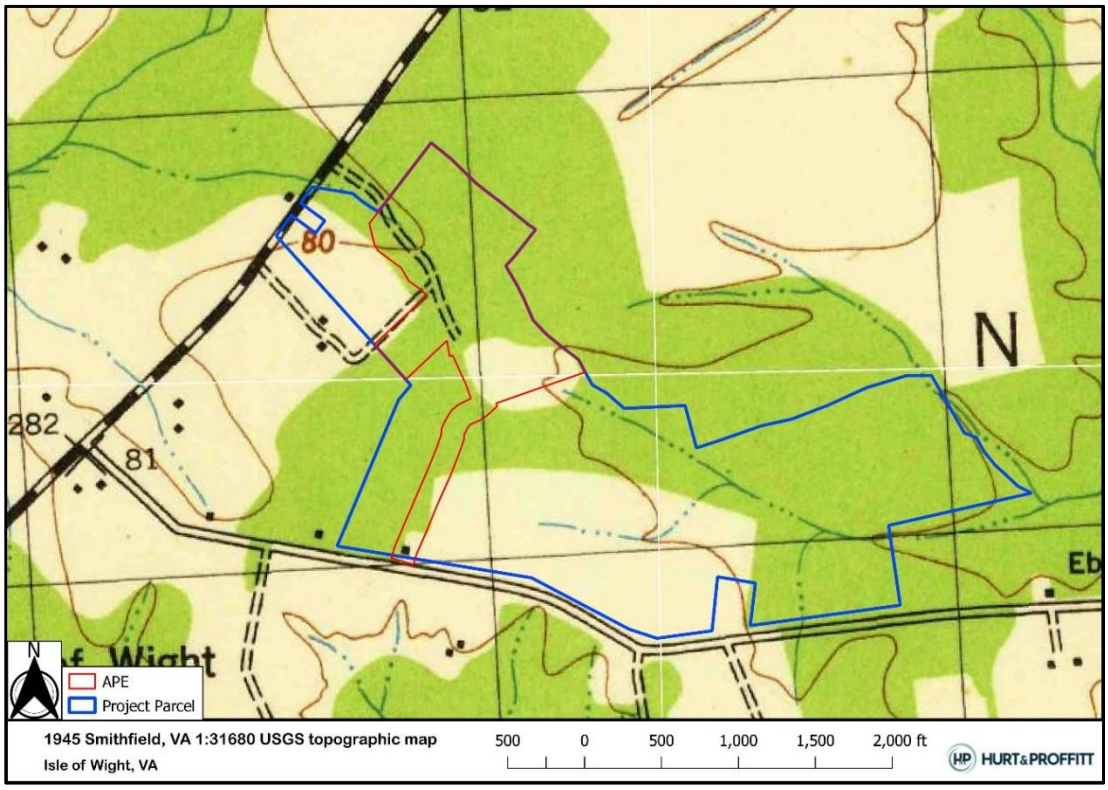


Figure 11. Project area depicted on 1945 Smithfield, VA 1:31680 USGS topographic map, APE in blue (USGS 2022).

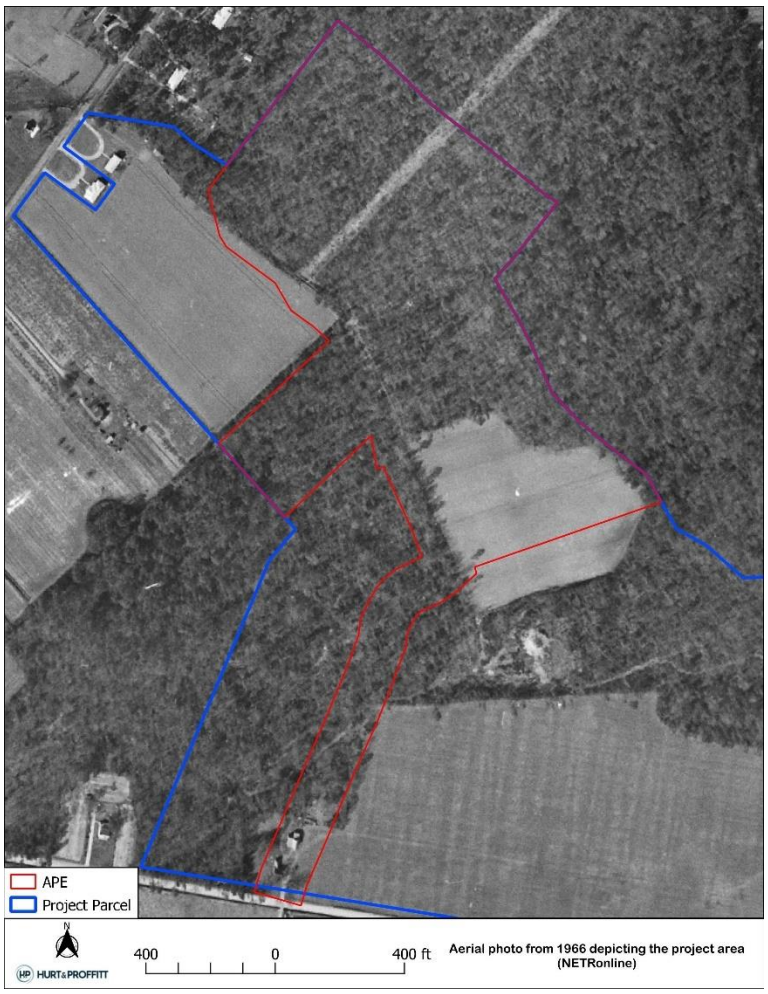


Figure 12. Aerial photo from 1966 depicting the project area, APE in blue (NETRonline).

Previously Recorded Architectural Resources

There is one previously recorded architectural resource within 0.5 miles of the proposed solar farm. The Wilson House (046-0052) is eligible for the NRHP. Figure 12 shows the location of the proposed solar farm and those previously recorded resources within 0.5 miles (Figure 12 and Table 1).

VDHR No.	Address	Date of Construction	NR Eligibility
046-0052	Wilson House, 16091 Courthouse Highway	Ca. 1830	Eligible
046-5790	House, 16342 Courthouse Highway	1977	Not Eligible
046-5791	House, 16363 Courthouse Highway	1962	Not Eligible
046-5792	House, 16385 Courthouse Highway	1961	Not Eligible
046-5793	House, 16386 Courthouse Highway	1947	Not Eligible
046-5794	House, 16419 Courthouse Highway	1962	Not Eligible
046-5795	House, 16431 Courthouse Highway	1964	Not Eligible
046-5796	House, 16473 Courthouse Highway	1948	Not Eligible
046-5797	House, 16553 Courthouse Highway	1974	Not Eligible
046-5798	Farm, 16562 Courthouse Highway	1913	Not Eligible
046-5799	House, 13334 Poor House Road	1967	Not Eligible
046-5800	House, 13199 Poor House Road	1943	Not Eligible
046-5801	House, 14065 Poor House Road	1952	Not Eligible
046-5802	Barn, Poor House Road	c. 1940s	Not Eligible

Table 1. Previously recorded architectural resources within 0.5 miles of the proposed solar farm.

4. FIELD METHODS

H&P staff conducted a site visit to photograph and survey each architectural resource within the 0.5-mile APE. Each resource was photographed, and site plans were drawn depicting the relationship of the resources to the landscape and to each other. The purpose of the architectural investigation was to survey and evaluate one previously recorded property and 13 newly identified properties within the APE for individual eligibility for listing in the NRHP.

The initial APE of 0.5 (0.8 km) miles from the boundaries of the installation was refined through an examination of topography and viewsheds obtained during the field survey and in consultation with the VDHR. The VDHR concurred with the refined APE via email dated July 7, 2023.

The refined APE includes the property parcels that are within 0.5 mile (0.8 km) of the APE and can see the proposed solar farm site within their viewshed and where alterations to feeling and setting may occur. Among the resources within a half-mile of the development area, 13 newly identified resources are located within the APE, based on terrain analysis and viewshed observations. Resources are visible along Courthouse Highway west of the proposed site and southeast of site along Poor House Road. Properties south of 16593 Courthouse Highway and north of 16342 Courthouse Highway do not have a view of the project area, due to dense woodland south and north of the site. Properties on Poor House Road, between 13055 and 13159 Poor House Road do not share a viewshed with the proposed site due to dense woodland between the proposed site and Poor House Road. Based on the field verification of viewshed, H&P recommends that 13 architectural resources are located within the architecture APE.

5. RESULTS

H&P completed reconnaissance level survey for 13 properties:

VDHR No.	Address	Date of Construction	Eligibility Recommendation
046-0052	16091 Courthouse Highway, Wilson House	Ca. 1830	Eligible
046-5790	16342 Courthouse Highway	1977	Not Eligible
046-5791	16363 Courthouse Highway	1962	Not Eligible
046-5792	16385 Courthouse Highway	1961	Not Eligible
046-5793	16386 Courthouse Highway	1947	Not Eligible
046-5794	16419 Courthouse Highway	1962	Not Eligible
046-5795	16431 Courthouse Highway	1964	Not Eligible
046-5796	16473 Courthouse Highway	1948	Not Eligible
046-5797	16553 Courthouse Highway	1974	Not Eligible
046-5798	16562 Courthouse Highway	1913	Not Eligible
046-5799	13334 Poor House Road	1967	Not Eligible
046-5800	13199 Poor House Road	1943	Not Eligible
046-5801	14065 Poor House Road	1952	Not Eligible
046-5802	Poor House Road	c. 1940	Not Eligible

Table 2: Potentially historic properties within the proposed APE.

046-0052: Wilson House, 16091 Courthouse Highway



Figure 13. Wilson House, 16091 Courthouse Highway (VDHR No. 046-0052).

Resource 046-0052, known as the Wilson House, is located at 16091 Courthouse Highway, north of the proposed solar site. The circa 1830 dwelling is a good example of the typical clerestory-style house found in Isle of Wight County between 1820 and 1850. The early portion dates to 1830 and is a one-and-one-half-story building featuring clerestory windows on the front and rear elevations. In 1850-1856 a two-story, three-bay addition was constructed to the south. Both sections are on a raised foundation and have exterior end brick chimneys. Visible fenestration includes six-over-nine and six-over-six double hung wood windows. Clerestory windows are two-over-two. The exterior is clad in wood siding. The original potion and the front porch have standing seam metal roofing and the circa 1850 portion has asphalt shingle roofing.

There is a kitchen northeast of the house with a brick pier foundation. It is wood -frame construction clad in weatherboard and a side gable roof. An exterior end brick chimney is situated on the north elevation. There is a barn on site north of the house. It has three

bays and rests on a brick pier foundation. The building is wood frame clad in weatherboard. There are animal pens on the east elevation.

H&P recommends that resource 046-0052, the Wilson House located at 16091 Courthouse Highway remains eligible for the NRHP under Criteria C.

The Wilson House is sited on the east side of Courthouse Highway, set far back from the road and shielded from view by a row of trees lining the straight driveway. The front elevation faces west. Because the resource is eligible for listing on the NRHP under Criteria C as a distinctive local representative of a clerestory house and is located within 0.5 miles of the proposed development area, an assessment of impacts was conducted. The assessment determined that the resource and the proposed site do not share a viewshed. Any view of the proposed solar site from the Wilson House is blocked by an area of dense woodland between the two sites. H&P recommends that the proposed project will have no impact on resource 046-0052.

046-5790: House, 16342 Courthouse Highway



Figure 14. House, 16342 Courthouse Highway (VDHR No. 046-5790).

Resource 046-5790 is located at 16342 Courthouse Highway, in Smithfield, Isle of Wight County. The resource is located on the west side of Courthouse Highway and west of the proposed solar site.

The one-story Ranch house, constructed in 1977, is a brick structure with a low-slope side gable roof covered in asphalt shingles and has a one-and-one-half-story garage addition on the north side. The asymmetrical façade faces east and is marked by an entry porch under a front gable roof supported by turned wood posts on a brick stoop. Windows are one-over-one vinyl double hung. A separate one-stall brick garage with front gable roof sits to the northwest. One additional outbuilding, visible from the driveway, appears to be a smokehouse. The tall, narrow wood frame structure has a front gable roof and is clad in wood siding, with a wood batten door.



Figure 15. Smokehouse at 16342 Courthouse Highway (VDHR No.

H&P recommends that resource 046-5790 is not eligible for listing on the NRHP under Criteria A, B, or C. The house and outbuildings are not associated with any important people or events in history and the design, workmanship and materials are commonplace. No further work is recommended.

046-5791: House, 16363 Courthouse Highway



Figure 16. House, 16363 Courthouse Highway (VDHR No.046-5791).

Resource 046-5791 is located at 16363 Courthouse Highway, in Windsor, Isle of Wight County. The resource is located on the east side of Courthouse Highway and east of the proposed solar site.

The one-story Ranch house, constructed in 1962 is a brick structure with a low-slope side gable roof with a prominent central projecting front gable covered in asphalt shingles. The asymmetrical façade faces west and is marked by a projecting front gable clad in vinyl siding above brick, containing an offset entry door on a brick stoop. An integrated one-stall garage occupies the north end of the structure. Windows are one-over-one vinyl double hung with four-over-four pane inserts.

H&P recommends that resource 046-5791 is not eligible for listing on the NRHP under Criteria A, B, or C. The house is not associated with any important people or events in history and the design, workmanship and materials are commonplace. No further work is recommended.

046-5792: House, 16385 Courthouse Highway



Figure 17. House, 16385 Courthouse Highway (VDHR No. 046-5792).

Resource 046-5792 is located at 16385 Courthouse Highway, in Windsor, Isle of Wight County. The resource is located on the east side of Courthouse Highway and east of the proposed solar site.

The one-story Ranch house, constructed in 1961 is a brick structure with a low-slope cross-hipped roof with a prominent central projecting front hipped gable covered in asphalt shingles. The asymmetrical façade faces west and is marked by a projecting front section containing an offset entry door on a brick stoop. A former integrated garage on the north end of the structure is now enclosed and contains a second entry door and an addition to the north. Windows are one-over-one vinyl double hung.

H&P recommends that resource 046-5792 is not eligible for listing on the NRHP under Criteria A, B, or C. The house is not associated with any important people or events in history and the design, workmanship and materials are commonplace. No further work is recommended.

046-5793: House, 16386 Courthouse Highway



Figure 18. House, 16386 Courthouse Highway (VDHR No. 046-5793).

Resource 046-5793 is located at 16386 Courthouse Highway, in Windsor, Isle of Wight County. The resource is located on the west side of Courthouse Highway and is directly west of the proposed solar site.

The one-and-one-half-story Tudor Revival house, constructed in 1947 is a wood frame structure with a high-slope cross-gable roof covered in asphalt shingles of irregular sizes. The west facing façade, clad in vinyl siding, is marked by the prominent central front gable with a bay window and front entry door. A tall, corbelled brick chimney is located on the front slope between the main body of the house and an enclosed porch on the south. An attached garage with a mid-slope front gable occupies the north side of the structure. Windows are one-over-one vinyl double hung with six-over-six pane inserts.

H&P recommends that resource 046-5793 is not eligible for listing on the NRHP under Criterion A, B, or C. The house is not associated with any important people or events in history. Although the house is a good local example of Tudor Revival style, it lacks exterior integrity, as evidenced in the vinyl siding and vinyl replacement windows. No further work is recommended.

046-5794: House, 16419 Courthouse Highway



Figure 19. House, 16419 Courthouse Highway (VDHR No. 046-5794).

Resource 046-5794 is located at 16419 Courthouse Highway, in Windsor, Isle of Wight County. The resource is located on the east side of Courthouse Highway and is southeast of the proposed solar site.

The one-story Ranch house, constructed in 1962, is a wood frame structure with a low-slope side gable roof covered in asphalt shingles. The asymmetrical façade faces west and is marked by an offset entry door on a brick stoop. The exterior is clad in brick on the lower half with vinyl siding above. A former integrated carport at the north end of the structure is now enclosed by screens. Windows are one-over-one vinyl double hung.

H&P recommends that resource 046-5794 is not eligible for listing on the NRHP under Criteria A, B, or C. The house is not associated with any important people or events in history and the design, workmanship and materials are commonplace. No further work is recommended.

046-5795: House, 16431 Courthouse Highway



Figure 20. House, 16431 Courthouse Highway (VDHR No. 046-5795).

Resource 046-5795 is located at 16431 Courthouse Highway, in Windsor, Isle of Wight County. The resource is located on the east side of Courthouse Highway and is southeast of the proposed solar site.

The one-story Ranch house, constructed in 1962, is a brick structure with a low-slope hipped roof covered in asphalt shingles. The asymmetrical façade faces west and is marked by a prominent front gable clad in vinyl siding with an integrated entry porch supported by vinyl clad posts on a brick pad. Windows appear to be eight-over-eight wood double-hung sashes with exterior aluminum storm windows.

H&P recommends that resource 046-5795 is not eligible for listing on the NRHP under Criteria A, B, or C. The house is not associated with any important people or events in history and the design, workmanship and materials are commonplace. No further work is recommended.

046-5796: House, 16473 Courthouse Highway



Figure 21. House, 16473 Courthouse Highway (VDHR No. 046-5796).

Resource 046-5796 is located at 16473 Courthouse Highway in Windsor, Isle of Wight County. The resource is located on the east side of Courthouse Highway, south of the proposed solar site.

The one-story Minimal Traditional house, constructed in 1948, is a wood frame structure with a concrete foundation. The moderate slope side gable roof is covered in asphalt shingles. The symmetrical façade, clad in vinyl siding, faces west, and is marked by a central entry door under an integrated, partial-width, shed-roof entry porch supported by wood posts on a concrete pad. Windows are vinyl double hung sashes with four-over-four pane inserts.

Outbuildings include a small wood frame shed, a small wood frame garage, and a potential mid-late 19th century stable. The one-story stucco clad stable has a mid-slope side gable roof and a central barn door flanked by four-over-one double hung wood windows. Window openings show Italianate influence in a segmented arch at the window head.

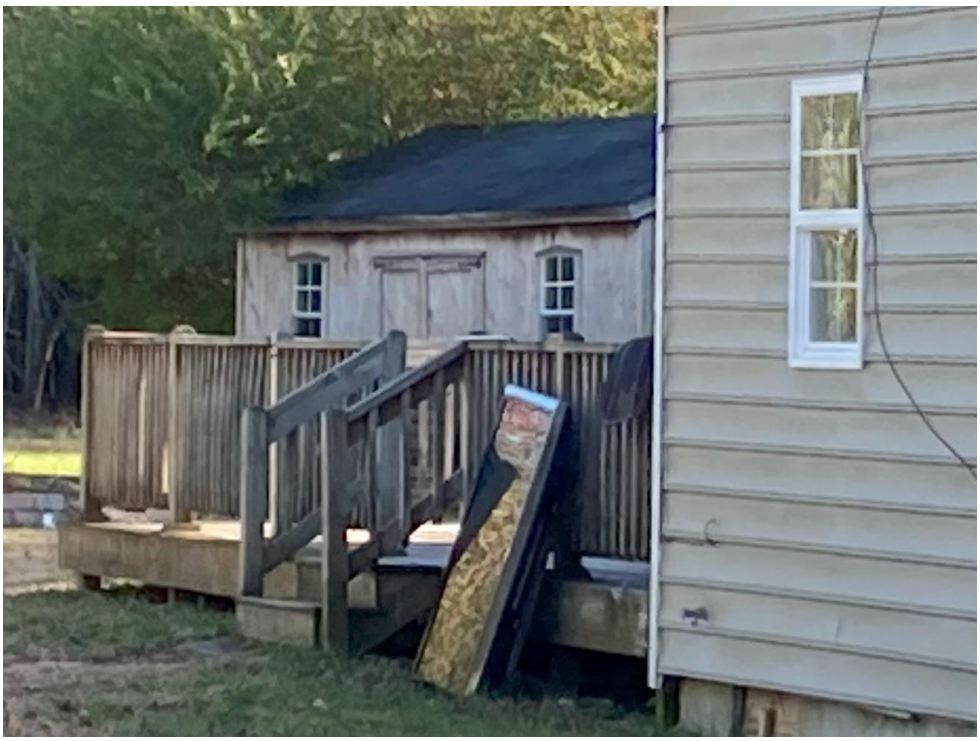


Figure 22. Stable at 16473 Courthouse Highway (VDHR No. 046-5796).

H&P recommends that resource 046-5796 is not eligible for listing on the NRHP under Criteria A, B, or C. The house and outbuildings are not associated with any important people or events in history and the design, workmanship and materials are commonplace. No further work is recommended.

046-5797: House, 16553 Courthouse Highway



Figure 23. House, 16553 Courthouse Highway (VDHR No. 046-5797).

Resource 046-5797 is located at 16553 Courthouse Highway, in Windsor, Isle of Wight County. The resource is located on the east side of Courthouse Highway and is southeast of the proposed solar site.

The one-story Ranch house, constructed in 1974, is a brick structure on a brick foundation with a low-slope side gable roof covered in asphalt shingles. The asymmetrical façade faces west and is marked by an offset entry door on a brick stoop. Windows are one-over-one vinyl double hung. Outbuildings, located behind the dwelling, include a metal carport and four small wood frame sheds, two with gambrel roofs, one with a front gable roof, and one with a low slope shed roof.

H&P recommends that resource 046-5797 is not eligible for listing on the NRHP under Criteria A, B, or C. The house is not associated with any important people or events in history and the design, workmanship and materials are commonplace. No further work is recommended.

046-5798: Farm, 16562 Courthouse Highway



Figure 24. Farm, 16562 Courthouse Highway (VDHR No. 046-5798).

Resource 046-5798 is located at 16562 Courthouse Highway, in Windsor, Isle of Wight County. The resource is located on the west side of Courthouse Highway and is southwest of the proposed solar site.

The two-and-one-half-story Colonial Revival house, constructed in 1913, is a wood frame structure on a brick foundation with a high-slope hipped roof with a front hipped gable covered in asphalt shingles. The symmetrical façade faces east and is marked by a full width entry porch supported by wood columns on a brick pad. The exterior is clad in vinyl siding. Two prominent side slope chimneys are covered in parging. Tall, narrow windows are vinyl replacement windows with nine-over-nine and four-over-four pane inserts.

Outbuildings on this farmstead are numerous, the county tax database lists 16 additional structures, although not all were visible from the public right of way. Visible structures include a shed roof barn, a side gable equipment shed, a wood frame garage, a wood frame domestic outbuilding, and three metal grain silos. Construction details for these outbuildings were not discernible from the right of way.

H&P recommends that resource 046-5798 is not eligible for listing on the NRHP under Criterion A, B, or C. The house is not associated with any important people or events in history. Although the house is a good local example of Colonial Revival style, it lacks exterior integrity, as evidenced in the vinyl siding, vinyl replacement windows, asphalt roof shingles, and parge coated brick chimneys. No further work is recommended.

046-5799: House, 13334 Poor House Road



Figure 25. House, 13334 Poor House Road (VDHR No. 046-5799).

Resource 046-5799 is located at 13334 Poor House Road in Windsor, Isle of Wight County. The resource is located on the south side of Poor House Road, east of Courthouse Highway and south of the proposed solar site.

The one-story Ranch house, constructed in 1967, is a wood frame structure with a raised concrete block foundation. The low slope side gable roof is covered in asphalt shingles with a rear slope brick chimney. The asymmetrical façade faces north, is clad in vinyl siding, and is marked by a central entry door under a projecting shed roof porch supported by wood posts, on a concrete block platform. Windows are horizontal two-over-two aluminum double hung sashes. Outbuilding visible from the right of way

include a wood frame shed with front gable roof and wood siding and a metal frame equipment shed clad in vertical metal siding with a flat roof.

H&P recommends that resource 046-5799 is not eligible for listing on the NRHP under Criteria A, B, or C. The house and outbuildings are not associated with any important people or events in history and the design, workmanship and materials are commonplace. No further work is recommended.

046-5800: House, 13199 Poor House Road



Figure 26. House, 13199 Poor House Road (VDHR No. 046-5800).

Resource 046-5800 is located at 13199 Poor House Road in Windsor, Isle of Wight County. The resource is on the north side of Poor House Road, east of Courthouse Highway and south of the proposed solar site.

The one-and-one-half story Colonial Revival Cape Cod house, constructed in 1943, is a frame structure with a belcast hipped gable roof with a large central front gable dormer and a shed dormer on the rear elevation. The foundation is raised brick under the main structure and a poured concrete foundation under a rear addition. The symmetrical

façade faces south and is marked by the large central front gable dormer and a full-width porch supported by wood posts on brick piers. Windows are one-over-one vinyl sashes with six-over-one and eight-over-one pane inserts. The exterior is clad in vinyl siding with asphalt shingle roofing.

H&P recommends that resource 046-5800 is not eligible for listing on the NRHP under Criteria A, B, or C. The house is not associated with any important people or events in history and the design, workmanship and materials are commonplace. No further work is recommended.

046-5801: House, 14065 Poor House Road



Figure 27. House, 14065 Poor House Road (VDHR No. 046-5801).

Resource 046-5801 is located at 14065 Poor House Road, in Smithfield, Isle of Wight County. The resource is located on the north side of Poor House Road and east of the proposed solar site.

The one-story Ranch house, constructed in 1952, is a wood frame structure with a raised brick foundation under a low-slope cross gable roof covered in asphalt shingles. The

asymmetrical façade faces south. A one-and-one-half story garage addition extends to the south, connected to the original dwelling by a breezeway with sliding glass doors, all integrated under one roof with a prominent front slope brick chimney. The dwelling is clad in vinyl siding. Windows are vinyl double hung sashes with six-over-six pane inserts. The outbuildings include a metal carport, a concrete block shed, and a two-story equipment shed.

H&P recommends that resource 046-5801 is not eligible for listing on the NRHP under Criteria A, B, or C. The house and outbuildings are not associated with any important people or events in history and the design, workmanship and materials are commonplace. No further work is recommended.

046-5802: Barn, Poor House Road, Parcel 39-01-021



Figure 28.Barn, Poor House Road, Parcel 39-01-021 (VDHR No. 046-5802)

Resource 046-5802 does not have a listed address and is located on the south side of Poor House Road on parcel 39-01-021, just to the west of 13334 Poor House Road. The parcel is across from the project parcel and the barn sits southeast of the existing farm road into the development area. The barn is the only structure on an agricultural parcel.

The small tobacco barn is post-frame construction, on brick pier foundation, with a high-slope front gable roof clad in standing seam metal. The barn is clad in vertical weatherboard.

H&P recommends that resource 046-5802 is not eligible for listing on the NRHP under Criteria A, B, or C. The house is not associated with any important people or events in history and the design, workmanship and materials are commonplace. No further work is recommended.

6. CONCLUSIONS AND RECOMMENDATIONS

As a result of the survey, H&P recommends that the Wilson House (VDHR No. 046-0052) remains eligible for the NRHP. None of the remaining architectural resources surveyed for this project are individually eligible for the NRHP under Criteria A, B, or C; Criterion D is not applicable.

H&P recommends that the proposed solar farm will not adversely impact the Wilson House. The house sits at the far northern edge of the 0.5-mile APE and will not be visible from the solar farm site due to the heavy woodland between the proposed site and the dwelling.

VDHR No.	Resource	Eligibility Recommendation	Project Impacts
046-0052	Wilson House, 16091 Courthouse Highway	Eligible	No Impact
046-5790	House, 16342 Courthouse Highway	Not Eligible	No Impact
046-5791	House, 16363 Courthouse Highway	Not Eligible	No Impact
046-5792	House, 16385 Courthouse Highway	Not Eligible	No Impact
046-5793	House, 16386 Courthouse Highway	Not Eligible	No Impact
046-5794	House, 16419 Courthouse Highway	Not Eligible	No Impact
046-5795	House, 16431 Courthouse Highway	Not Eligible	No Impact
046-5796	House, 16473 Courthouse Highway	Not Eligible	No Impact

046-5797	House, 16553 Courthouse Highway	Not Eligible	No Impact
046-5798	House, 16562 Courthouse Highway	Not Eligible	No Impact
046-5799	House, 13334 Poor House Road	Not Eligible	No Impact
046-5800	House, 13199 Poor House Road	Not Eligible	No Impact
046-5801	House, 14065 Poor House Road	Not Eligible	No Impact
046-5802	Barn, Poor House Road	Not Eligible	No Impact

Table 2. Eligibility Recommendations for Architectural Resources

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ARCHAEOLOGICAL SURVEY



Courthouse Highway Solar Site

Isle of Wight County, Virginia

July, 2023

H&P PROJECT NO.

20221983-0431

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HURT & PROFFITT

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EXECUTIVE SUMMARY

On behalf of Courthouse Highway Solar 1, LLC, Hurt & Proffitt, Inc. (H&P) has completed a Phase I archaeological survey of a 32.2-acre tract which is part of a larger 150.88-acre parcel located in the central part of Isle of Wight County in Virginia's Hampton Roads region.

The purpose of the survey was to identify all archaeological sites in the Area of Potential Effects (APE), to estimate site size and boundaries, and to preliminarily assess the eligibility of identified sites for listing in the National Register of Historic Places (NRHP). The total area surveyed was approximately 32.2 ac. (13.03 Ha). The archaeological survey of the APE was conducted by a crew led by Dwayne Pickett from May 31 to June 7, 2023.

H&P first completed a reconnaissance survey of the project corridor which consists of plowed fields, pasture and a field covered in tall grass. Parts of three plowed fields had very good surface visibility and were subjected to a pedestrian survey. The rest of the project area did not have any surface visibility which warranted completing a shovel test survey. Twenty-eight shovel test transects were laid out and spaced 50 feet (15.24m) apart running north to south across the APE. A total of 414 shovel test pits (STPs) were then placed at 50-foot (15.24m) intervals along those transects. Thirteen judgmental STPS were placed in areas that did not align with the STP grid and in the plowed fields. Another 26 STPs were placed at 25-foot (7.62m) intervals around STPs that were positive for cultural material. Due to ponds, slopes, and buildings, 32 STPs were not excavated. A total of 421 STPs were excavated with 33 being positive for cultural material.

These combined survey methods resulted in the discovery of three historic sites and nine isolated finds (by definition not NRHP eligible).

Site 44IW0397 is a concentration of late nineteenth to early twentieth-century artifacts located along a farm road that intersects with Poorhouse Road. Brick and domestic artifacts were recovered that are likely related to a house that was located on the west side of the farm road. That house is depicted within the APE on a 1945 USGS map and its location coincides with two extant modern farm buildings. The artifact concentration extends outside of the project area to the west and east.

Given the fact that any archaeological remains of the house once located in this area were likely destroyed by the modern farm buildings, it is unlikely that further excavations would yield any features or additional information. As such this leads H&P to recommend that the portion of Site 44IW0397 within the present APE does not contribute to the potential eligibility of the larger site.

Site 44IW0398 is a large surface scatter of late nineteenth to early twentieth-century artifacts covering approximately 4.5 acres of a cornfield at the northeastern end of the APE. Large amounts of brick, ceramics and glass were recovered during the pedestrian survey in an area where a 1966 aerial photograph shows a potential house. In addition, the landowner revealed that he was told there was a brick chimney in the vicinity which was knocked down and that the area has been metal detected. This appears to be the case since very few metal artifacts were recovered. The artifacts continue outside the APE to the east in the cornfield and it is also likely that they extend to the north into the woods.

Despite the large number of artifacts discovered, post occupation plowing has not only dispersed them but has likely destroyed any remnants of the building that was once there along with most of the stratigraphy. Three shovel tests placed judgmentally in the likely structure location indicated only plow zone overlying culturally sterile subsoil while a fourth shovel test contained plow zone and a thin cultural layer over subsoil. Also, metal detecting appears to have removed many of the metal artifacts associated with this site. Given this, it is unlikely that further excavations would yield any features or additional information. As such this leads H&P to recommend that the portion of Site 44IW0398 within the present APE does not contribute to the potential eligibility of the larger site.

Site 44IW0399 is a scatter of early to mid-twentieth-century artifacts located along the western edge of the APE. These artifacts consist mostly of bottle glass, nails, iron fragments, wire and fragments of wallpaper. They are likely related to nearby houses along Courthouse Highway.

The late date of the artifacts along with the fact that this material is probably the result of discard and not related to a structure, suggest it is unlikely that further excavations would yield any features or additional information. This leads H&P to recommend that this site is not eligible for the NRHP.

1. INTRODUCTION

On behalf of Courthouse Highway Solar 1, LLC, Hurt & Proffitt, Inc. (H&P) has completed a Phase I archaeological survey of a 32.2-acre tract which is part of a larger 150.88-acre parcel located in the central part of Isle of Wight County in Virginia's Hampton Roads region (Figure 1).

The Area of Potential Effects (APE) for archaeological resources was defined as those portions of the project where ground disturbance may occur. This consisted of 32.2 acres of relatively flat pasture and agricultural fields (Figure 2). The purpose of the survey was to identify all archaeological sites in the Area of Potential Effects (APE) of the proposed solar site, to estimate site size and boundaries and to preliminarily assess the eligibility of identified sites for listing in the National Register of Historic Places (NRHP). The total area surveyed was approximately 32.2 ac. (13.03 Ha).

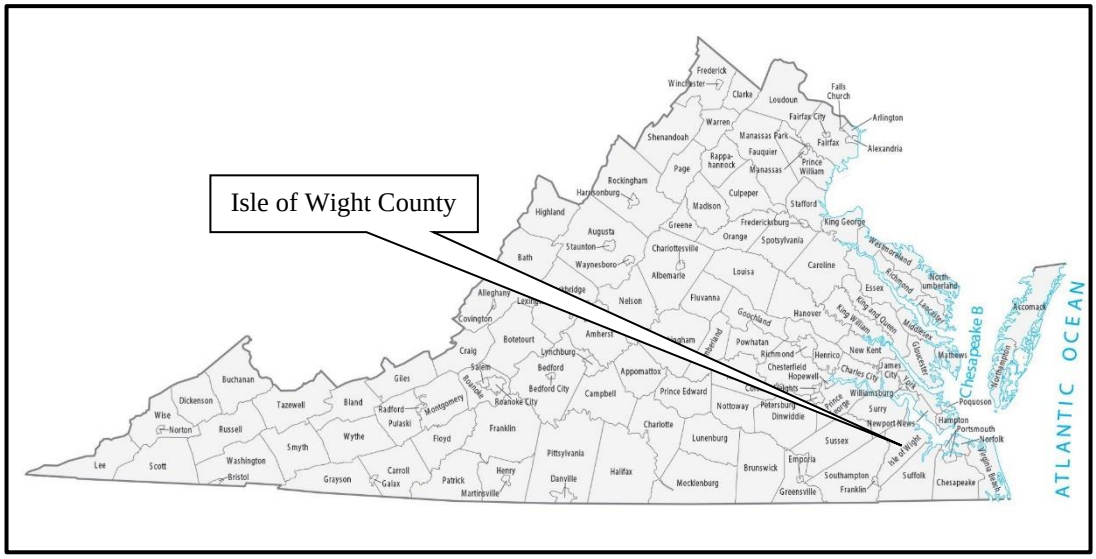


Figure 1. Project location.

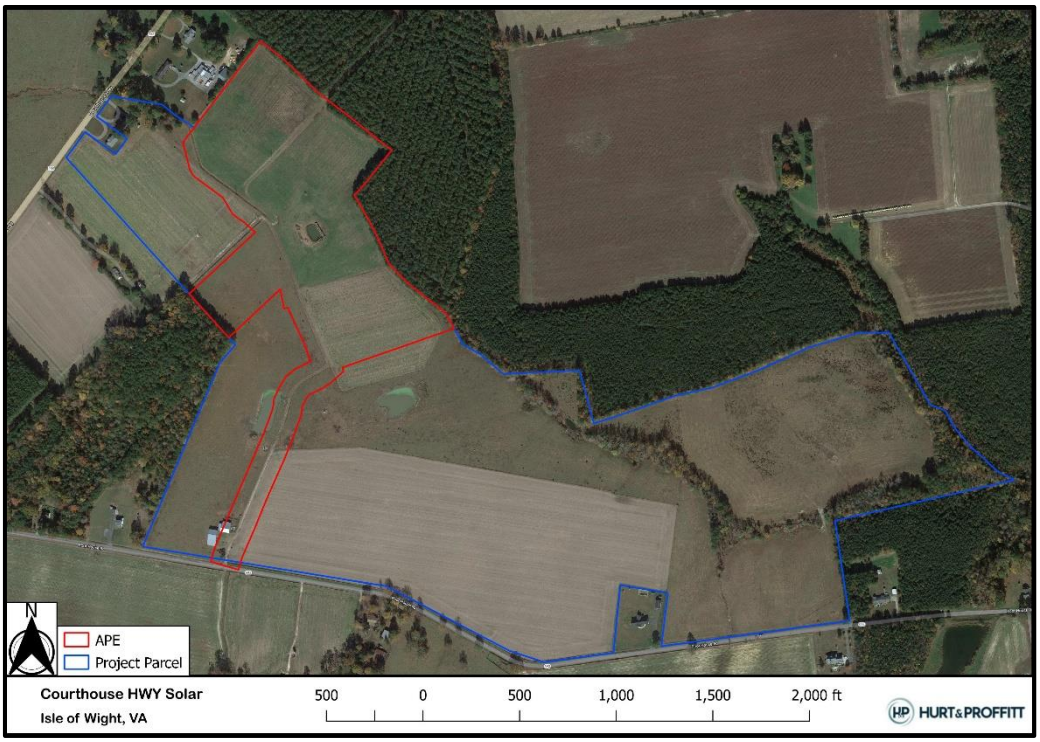


Figure 2. Project area map showing areas of potential ground disturbance in red.

Prior to initiating the field portion of the project, Hurt & Proffitt compiled historic and environmental data regarding the distribution of known and potential sites in the project vicinity. This research included a review of site files stored in the Virginia Department of Historic Resources' (VDHR's) Virginia Cultural Resource Information System (V-CRIS), VDHR archives, Library of Congress digital map and photographic archives and local histories. A summary of that research follows, including information on all previously recorded cultural resources within a 1-mile (1.6km) radius of the project area.

The archaeological survey of the APE was conducted by a crew led by Dwayne Pickett from May 31 to June 7, 2023. All work conducted as a part of this investigation was in accordance with the National Historic Preservation Act of 1966 (as amended), the Archeological and Historical Preservation Act of 1974, Executive Order 11593, and Title 36 of the Code of Federal Regulations, Parts 60-66 and 800 (as revised). The field investigations and technical report meet the requirements specified in the *Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation* (Federal Register 48:190:44716-44742) and the Virginia Department of Historic Resources *Guidelines for Conducting Historic Resources Survey In Virginia* (2011, rev. 2017). The Principal Investigator performing the cultural resource investigations meets or exceeds the qualifications described in the Secretary of the Interior's *Professional Qualifications Standards* (48 FR 44738-9).

2. SETTING

The proposed Courthouse Highway Solar site lies in central Isle of Wight County, approximately 0.5 miles (0.8km) northeast of the county seat of Isle of Wight. The 150.88-acre parcel is located at 16419 Courthouse Highway (Parcel ID: 39-01-017). Courthouse Highway (Rte. 258) borders the property along its western edge, and Poor House Road (Rte. 692) lies on the southern border.

The proposed (APE) consists of an approximately 32.2-acre development area in the western portion of the parcel, along with an access road running north from Poor House Road that will utilize a preexisting farm road. The proposed development area is southeast of Courthouse Highway, set approximately 425 feet (130m) from the road and consists mainly of gently sloping agricultural fields. The development area is bordered on the northeast by dense woodland 820 to 1,410 feet (250 to 430 meters) deep, while the larger parcel is bordered by dense woodland on the southwest (Figure 3).

The project area is located in the Embayed portion of Virginia's Coastal Plain geologic province. The Embayed portion is a narrow strip along Virginia's eastern edge stretching from the Fall Zone to the Atlantic Ocean. It is characterized by younger strata than the adjoining Piedmont province and is cut by large tidal rivers that flow into the Chesapeake Bay (Geology of Virginia 2021). The area between the Coastal and Piedmont provinces was an important area for cultural interaction (Thornbury 1965). The lack of lithic resources in the Coastal Plain such as quartz and quartzite meant that people had to either travel to areas near the Fall Line or trade with others for the material they needed (Egloff 1989).

Unnamed intermittent tributaries of Champion Swamp cross the property from the west and east boundaries, but they do not enter the APE. The western stream creates a wetland area in the northwestern portion of the project area. Two agricultural watering ponds lay on the property outside of the APE. An additional agricultural retention pond typically utilized to artificially lower the water table lies inside the southeastern portion of the project area. Elevations within the project area are between 79-80 ft AMSL.

There are three different soil types within the APE. Myatt fine sandy loam makes up 66.6 percent of the APE and covers 21.4 acres. It is considered prime farmland if drained. Yemassee fine sandy loam comprises 33 percent of the project area and covers 10.6 acres. It is formed from loamy marine deposits and is somewhat poorly drained. It is considered prime farmland if drained. Slagle fine sandy loam 0 to 2 percent slopes make up less than one percent of the APE. It is very deep, moderately well drained and moderately slow or slow permeable soil found within marine terraces and uplands of the Atlantic Coastal Plain (Figure 4, Table 1).

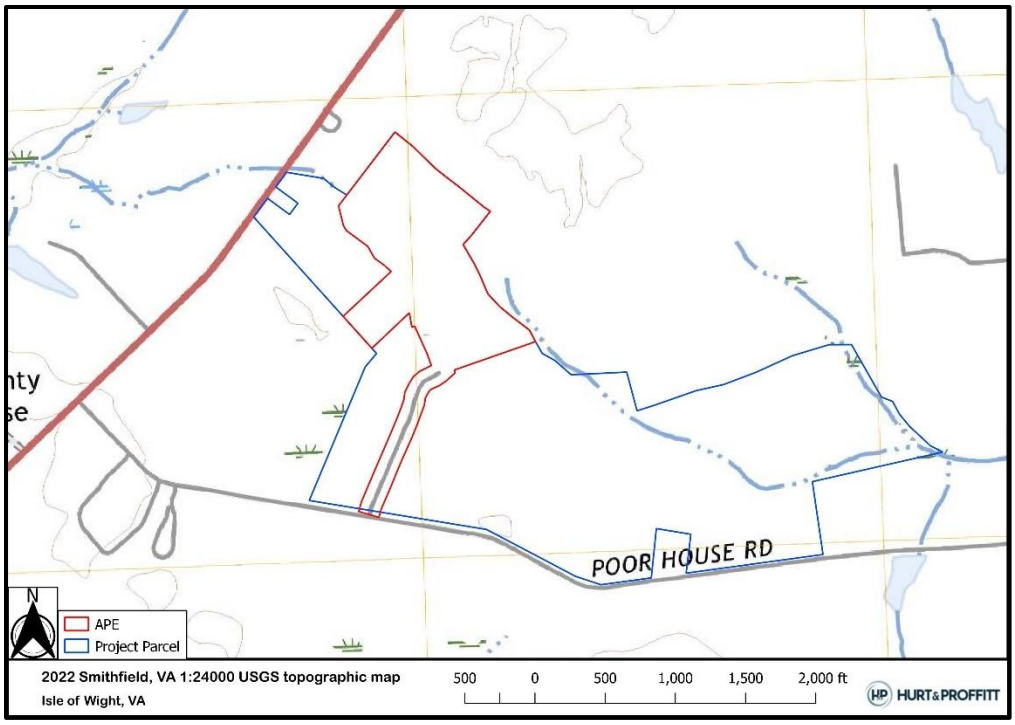


Figure 3. Project area depicted on 2022 USGS Isle of Wight 7.5-minute quadrangle. Scale 1:24000.



Figure 4. Limits of proposed ground disturbance depicted on Isle of Wight County Soil Map (NRCS 2023).

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
9	Myatt fine sandy loam	21.4	66.6%
18A	Slagle fine sandy loam, 0 to 2 percent slopes	0.1	0.4%
23	Yemassee fine sandy loam	10.6	33%
Total AOI		32.2	100%

Table 1. Project area soil map unit legend.

3. HISTORY

Project area pre-contact history

Paleoindian Period 15,000–8,000 B.C.

It is believed that the first people who entered the Western Hemisphere came from Asia at the end of the last great Ice (or Pleistocene) Age. Glaciers covered large areas of Canada and they lowered the sea level by 300 feet (91.4m), exposing an immense, 1,000-mile (1609.3km)-wide plain between Siberia and Alaska known as Beringia.

In 1927 a fluted point was discovered in Folsom, New Mexico, which was in the ribs of an extinct species of bison. Five years later near Clovis, New Mexico, a woolly mammoth kill site was found with associated stone tools dating to 11,200 years ago. The fluted points that were discovered are called Clovis points and they are the distinguishing feature of Paleo sites.

In the western plains, they used these points to hunt large game like the mastodons but along the east coast that does not appear to have been the case. The archaeological data from Virginia records numerous discoveries of fluted points, but no clear-cut association between extinct large game and fluted points (Boyd 1989:139). For this reason, many archaeologists now hold that eastern Paleoindians were generalized foragers (e.g., Grayson and Meltzer 2003; but see Fiedel and Haynes 2004).

The first people lived in groups that have been classified as bands, which were like an extended family. They camped along streams that ran through the tundra-like grasslands and the open pine, spruce and fir forests that covered Virginia at that time. Due to the severe climate, each band moved around seasonally to hunt and forage (Egloff and Woodward 2006).

Although it is clear that people entered the Western Hemisphere through Alaska some sites suggest that people may have been here earlier and possibly entered from elsewhere. These pre-Clovis sites such as Cactus Hill in southern Virginia, which has been dated to almost 17,000 years ago, suggests people could have been here much earlier than was previously thought (Egloff and Woodward 2006).

Current research of the Paleoindian time period is focused on the southeastern Coastal Plain area and the upper Roanoke River. The Nottoway River Survey has identified numerous Paleo sites along with the pre-Clovis Cactus Hill site in southeastern Virginia. One of the important sites discovered is the Williamson site which has shown evidence of intact Clovis-age deposits beneath a plow zone layer (Hall 1999; McAvoy and McAvoy 2003).

In the upper Roanoke River area stratified Paleoindian sites have been discovered in the Leesville/Smith Mountain Lake area (Childress and Blanton 1997; Gingerich 2016; Gingerich et al. 2015). The sites in this area have well-defined Paleoindian to Early Archaic components and are being studied for how lithic resources and the climate changed during the Younger Dryas and the Pleistocene/Holocene transition (Boyd 2020).

Two sites dating to the Paleoindian period have been found in Isle of Wight County. Both are located along the James River in the northern part of the county. Site 44IW0015 was a shell midden eroding into the river where fluted points were found. Also eroding into the river was site 44IW0081 where a Hardaway point was discovered.

Archaic Period (8000 – 1200 B.C.)

The Archaic period is generally divided into three phases, Early (8,000–6,000 B.C.), Middle (6000–2500 B.C.), and Late (2500–1200 B.C.). At the beginning of the Early Archaic was the dawn of the Holocene epoch at approximately 8,000 B.C. The climate began to warm and the glacial ice sheets retreated. The warming trend associated with the Holocene period fostered a diversity of flora and fauna throughout the eastern seaboard on land as well as within the gradually forming Chesapeake Bay.

The people of the Early Archaic settled a diverse area ranging from the mountains in the west to the coastline in the east. A look at the distribution of these sites shows that they are concentrated along the Ridge and Valley and the Fall Line. Both these environments provided natural resources such as stone for lithics. Groups of about 25-50 people would work as a unit at base camps and break up into smaller units to gather resources utilizing smaller camps (Barber 2020).

Diagnostic artifacts recovered from Early Archaic sites include Charleston Corner Notched, Palmer and Kirk, Amos, Warren, Big Sandy, Kessell and ending with Kirk Stemmed. During this time period, the bifurcate tradition was developed and thumb nosed scrapers continued to be used. Also, ground stone tools such as axes, celts, adzes and grinding stones make their first appearance. Towards the end of this period, there is an increased reliance on a wider range of lithic resources (Coe 1964; Custer 1990).

There are only seven sites recorded in Isle of Wight County that have an Early Archaic component. No sites dating to this time period are located within 3 miles (4.8 km) of the project area.

The Middle Archaic period coincided with a relatively warm and dry period. Sites dating to this time period are more numerous suggesting an increase in population and sites appear to be occupied for longer periods of time (Delcourt and Delcourt 1987; Stoltman and Baerreis 1983). The people of this time period were thought to comprise small groups of highly mobile hunter-gathers exploiting upland forests of oak and hickory which spread during this warmer dryer period. Because of this new forest growth nuts and berries began to play an important role in their diets. Despite the number of Middle Archaic sites located in the uplands they likely exploited resources over a vast area including the estuary system around the Chesapeake Bay (Egghart 2020a).

During this time period there was an increased use of ground stone tools, cobble tools and a shift to local lithics in crafting projectile points. Projectile points from this time period include Stanley Stemmed, Morrow Mountain Stemmed, Guilford Lanceolate and Halifax Side-Notched. LeCroy points are seen as coinciding with the beginning of the Middle Archaic with Savannah River points marking the end of the period (Egghart 2020a).

No sites dating to this time period are located within 3 miles (4.8 km) of the project area.

By the Late Archaic Period, the population in Virginia could have been in the tens of thousands. In order to feed the growing number of people, hunting and gathering practices had to intensify. At the beginning of the Late Archaic Period retreating glaciers led to higher sea levels on the Atlantic seaboard. This allowed for the development of large estuaries and tidal wetlands that were beneficial to the development of coastal resources such as fish and shellfish. Groups began settling along river valleys, the lower portion of the coastal plain tributaries of major rivers and near swamps. At riverside sites, large hearths of fire-cracked rock have been found suggesting Late Archaic people prepared large amounts of food there. Because of this, some archaeologists have hypothesized that fish began to play a larger role in

the diet. Platform hearths seen during this period are interpreted as being associated with fish processing (Dent 1995:185).

During this period, they may also have begun to domesticate plants such as goosefoot, squash and gourds (Yarnell 1976:268; Chapman and Shea 1981:70). They also used squash and gourds for food storage in addition to earthen pits (Egloff and Woodward 2006:22). Other characteristics of this time period is an increase in sedentism, the beginnings of long-distance trade networks and societies becoming less egalitarian (Egghart 2020b).

The projectile point technology of the Late Archaic Period is dominated by stemmed and notched point forms, many with broad blades, likely used as projectiles or knives. These points diminish in size towards the latter portion of this period (Dent 1995; Justice 1995).

No sites dating to this time period were located within 3 miles (4.8 km) of the project area.

Woodland Period (1200 B.C.– A.D. 1600)

Like the Archaic Period, the Woodland Period is also divided into three phases; Early (1,200 -500 B.C.), Middle (500 B.C.-A.D. 900) and Late (A.D. 900-1600). The beginning of the Woodland period is usually marked by the appearance of pottery in the archaeological record which was used for storing and cooking food. Also, the Native Americans of the Woodland period began to maintain a greater reliance on horticulture and agriculture which increased sedentism and the nucleating of societies (Klein and Klatka 1991; Mouer 1991).

In the Piedmont region of Virginia, Early Woodland settlements are located along rivers as well as in interior areas and there is evidence to suggest the Piedmont areas developed a more sedentary lifestyle during this time (Klein and Klatka 1991; Mouer 1991). A number of Early Woodland sites in the Piedmont are large permanent or semi-permanent villages. This corresponds with the domestication of plants such as the goosefoot and sunflower along intentionally cleared riverine areas. Also, long distance trade appears to decline with exotic items becoming less prominent. In the Coastal Plain, Early Woodland sites are scarce and appear to be seasonal in nature and occupied for short durations (Egghart 2020c). Early Woodland projectile points include various stemmed or lanceolate forms and include a variety of small, stemmed point types (Coe 1964; McLearen 1991).

In the Middle Woodland Period people moved away from smaller tributaries and began to settle along estuaries and major streams and also began to organize into larger groups (Hantman and Klein 1992). They became more sedentary and exploited riverine and estuarine resources such as fish, deer, waterfowl and turkey along with

nuts, amaranth and chenopod seeds. The spear was replaced by the bow and arrow for hunting and corn had transformed into the large ears familiar today (Egloff and Woodward 2006:25). During this time period, specialized crafts and increased trade over long distances is noted. With this comes evidence of rank societies and the spreading of religious and ritual behavior including symbols and regional styles in ceramics (Nash 2020).

Modification in ceramic manufacturing is characteristic of the Middle Woodland Period with Pope's Creek ceramics being associated with the beginning of this period and Mockley ceramics with the latter. Pope's Creek ceramics are tempered with medium to coarse sand, with occasional quartz inclusions, and interior scoring has also been recorded (Stephenson 1963:94; McLearen and Mouer 1989). The majority of Pope's Creek ceramics have net-impressed surfaces (Egloff and Potter 1982:99). Shell-tempered Mockley ceramics first appeared around 200 A.D. in Virginia to southern Delaware. There was a variation in surface treatments for Mockley that included plain, cord-marked and net-impressed (Egloff and Potter 1982:103). The pottery of the Piedmont was similar to that of neighboring regions, though it was tempered with quartz and sand, and fabric, net and cord markings were common (Egloff and Woodward 2006:35).

The highest concentration of Middle Woodland sites is east of the Fall Line (Nash 2020). However, no sites dating to this time period were found within 3 miles (4.8 km) of the project area.

The use of domesticated plants had assumed a major role in the prehistoric subsistence system by the Late Woodland Period. The arrival and cultivation of beans joined corn and squash as the three major crops (Egloff and Woodward 2006:26). The adoption of agriculture represented a major change in the prehistoric subsistence economy and settlement patterns. Expanses of arable land became a dominant settlement factor, and sites were located on fertile floodplain soils or, in many cases, on higher terraces or ridges adjacent to them. Native Americans in Virginia became more populous and developed strong identities to their local settings. They became more sedentary and organized into villages and small hamlets with more substantial housing that may have been placed in rows around a plaza. These villages were highly nucleated and occasionally fortified with palisades. The fortifications demonstrate inter-group conflict (Egloff and Woodward 2006:26; Means and Moore 2020).

No sites dating to this time period were found within 3 miles (4.8 km) of the project area.

Project area history

The Spanish were the first recorded Europeans to reside in what would become Virginia. A mission was established along the York River in 1570 that was short lived. Native Americans attacked the Jesuits there and killed all except an altar boy who was later rescued by the Spanish (Mallios 2006). It was not until 1607 when the English established the Jamestown colony on the James River. Despite many hardships, Jamestown prevailed and did not succumb to the failures that plagued the Roanoke and Popham colonies (Pickett and Pickett 2011).

The following year in 1608, Captain John Smith explored the area that would become Isle of Wight County. He traded beads and trinkets with the Warrosquoyacke for corn. The Warrosquoyacke inhabited land in an area that became known as Fergusson's Wharf and controlled an area that extended roughly 5 miles (8.05km) along the James River and 20 miles (32.2km) inland (Morrison 1907). Over the next few years, they maintained a peaceful relationship with the settlers, occasionally providing them with overnight accommodations and taking in two men for the purposes of exploration and learning (King 1993).

On April 27, 1619, a ship called the *Marygold* arrived at Jamestown with 100 settlers. They established a settlement near the mouth of Lawne's Creek which today is the dividing line between Isle of Wight and Surry Counties. The settlement was organized by Captain Christopher Lawne, Sir Richard Worsley, Nathaniel Basse, and John Hobson and was called Warrosquoyacke or Lawne's Plantation. Not long after its establishment the settlers fell ill and began to die. Within a year Lawne and about 80 others were dead. In 1620, the settlement was given more time by the London Company to establish itself. At the same time, the company also renamed the plantation Isle of Wight, most likely after the homeplace of Sir Richard Worsley. Patents for two additional plantations were granted the next year, further increasing the population of the colony (King 1993).

With the successful cultivation of tobacco, people began to move further away from the colonial center at Jamestown in search of land. Tobacco was grown by just about everyone from large landowners to tenant farmers (Kulikoff 1986: 4-5; Rutman and Rutman 1984: 41-43). In order to be financially successful, large landowners needed an abundance of labor. Indentured servants and slaves (African and Native American) were used to fulfill this need but by the second half of the 17th century, the labor force began to be dominated by African slaves (Morgan 1975).

The need for land in order to grow tobacco caused colonists to increasingly encroach on lands controlled by the Powhatan Confederacy. This led to increased conflict which resulted in the Powhatan uprising of 1622. On Good Friday, March 22, 1622, tribes belonging to the confederacy attacked settlements up and down the James River

killing 347 colonists. The Warrosquoyacke took part in the uprising and attacked two settlements in what would become Isle of Wight County. Basse's Choice and Bennett's Welcome were attacked resulting in the deaths of 53 colonists. Retaliation from the colonists and ongoing wars resulted in the Warraskoyack disappearing from colonial records by 1650. These attacks alarmed colonial officials and led to the British Crown taking over the colony from the Virginia Company in 1624. Ten years later in 1634 eight counties were established one of which was Warrosquoyacke (Isle of Wight) (Dabney 1971; Salmon and Campbell 1994).

In 1635, the population of Warrosquoyacke was 532 and by 1637, the name of the county was officially changed to Isle of Wight. The county was originally bound on the north by Lawne's Creek, on the east by the James River and an inland line that extended from the point of Richard Hayes's plantation to the head of Colonel Pitt's Creek, and on the south by a line that ran west for an undefined distance. In 1642, it was divided into the Upper and Lower Parish, with Pagan Creek as the dividing line (King 1993). Initial settlements centered on the south shore of the James River as well as the east and west shores of Pagan Creek (Figure 5).

The project area is south of the James River near the center of Isle of Wight County, removed from the major plantations on the James and York Rivers. The first town in the county was established at Pate's Field where the Pagan River enters the James River. It was established as the result of a law passed in 1680 that required every county that exported tobacco and other goods to lay out a town of fifty acres with half-acre lots. The lots were to include both a dwelling and a storehouse, and other stipulations were put in place to discourage people from developing and reselling the lots. After January 1681, all exports and imports were required to pass through these towns. The town at Pate's Field however was too remote and inconvenient for people to access and thus never fully succeeded (King 1993).

At the beginning of the eighteenth-century increasing numbers of African slaves were transported to Virginia. Between 1700 and 1750, approximately 45,000 slaves were brought to the colony bringing the estimated total population to around 230,000 (Isaac 1982:12). This period also saw a marked increase in American-born slaves. In 1728, three out of five adults were African born, but by 1740, less than half of all slaves were born in Africa (Kulikoff 1986:71).

The town of Smithfield was established in 1750 by Captain Arthur Smith from a portion of his farm that bordered Pagan Creek. That area already had a tobacco storehouse with a public landing that offered ferry access. A total of 72 lots were laid out and two center lots were set aside for the construction of a courthouse. In 1750 construction began on the new courthouse which still stands in Smithfield today (Dashiell 1996).



Figure 5. Project vicinity depicted on 1670 map "Virginia and Maryland as it is planted and inhabited this present year."Herrman, Augustine, Or, Henry Faithorne, and Thomas Withinbrook. 1673. (Library of Congress).

During this period, the economy of the county continued to rely on the production of tobacco. The crop, however, quickly depleted the land and was slowly replaced with corn and other grains, orchards, and livestock. The pine forests of the area were also harvested for tar, pitch, and turpentine (King 1993).

In 1756 Great Britain and France went to war which spilled over into North America. The French and Indian War lasted for seven years and ended in 1763. Following this conflict, Great Britain tried to recoup some of the costs for defending the American colonies by levying taxes and tightening the administration of trade through navigation acts. Additionally, King George forbade settlement of lands west of the mountains and trade with the Native Americans. All this was done without a representative from the colonies in Parliament and prompted many colonists to adopt the phrase no taxation without representation (Salmon and Campbell 1994).

At the onset of the Revolutionary War, many citizens in Isle of Wight County were divided. Some had immigrated from England and Scotland and were faced with choosing between their king and county or the new land in which they lived. In October of 1775, a number of local patriots joined the Princess Anne District Battalion and participated in battles at Kempsville and Portsmouth. Others joined the 7th, 8th, and 9th companies of the 4th Virginia Regiment of Foot, which eventually joined Washington's army and fought at Trenton and Germantown. Though no major

battles were fought in Isle of Wight County, British Lieutenant Colonel Tarleton led a raid on the courthouse in Smithfield that caused substantial damage. Residents also found the shoreline difficult to defend and at least one tobacco warehouse had to be closed due to an attempted invasion by British forces (King 1993).

The first federal census, taken in 1790, recorded the population of Isle of Wight County at 9,028 people. Out of that number 4,786 were of European descent, 3,867 were slaves, and 375 were freed slaves. In 1790, Virginians owned nearly half of the slaves in the nation (Berlin 2010:104). The United States outlawed the importation of slaves in 1808 but did not outlaw the domestic slave trade (Berlin 2010:70). During this period many Virginia farmers, especially in the Piedmont, began to diversify their crops, turning to those that required less labor. This led to a surplus of slave labor that was used for manufacturing or leased out to others (Sanford 1994:119).

The population of the county was slow to grow, as only 10,517 residents were recorded in 1830. Also, the geographical distribution of people began to shift with an increasing number moving to the western part of the county (King 1993). To accommodate the shift in population, a new courthouse was constructed closer to the center of the county around 1800. This courthouse, which is still in use today, is located approximately 0.5 miles (0.8km) southwest of the project area.

During the late eighteenth and early nineteenth centuries, farmers in Isle of Wight County began to move away from tobacco and began growing cotton. In the early nineteenth century, a gin and two cotton factories began to operate. Although ferries had long served the transportation needs of the county, bridges and roads also began to improve during this period (Figure 6). In 1818, the Corrowaugh Post Office was established in what is now the town of Windsor approximately 9 miles (14.5 km) south of the project area (King 1993).

At the start of the Antebellum Period, many in the coastal areas of Virginia were farmers. In the 1820s and 30s, there was an agricultural depression which caused a number of people to leave the area and look for opportunities elsewhere. (Mansfield 1989; Parramore et al. 1994). Cotton farmers could not compete with the cotton of the Deep South, and many inhabitants of the region moved west. This agricultural depression was exacerbated by cold weather that destroyed many cotton crops and contributed to the drastic reduction in cotton farming in Virginia (Crofts 1992).

Despite these setbacks, agriculture continued in Isle of Wight County with over 1,400 farms growing such crops as corn, sweet potatoes, peas, watermelons, beans and cotton (King 1993). However, in contrast with earlier periods, only 44 pounds of tobacco were reportedly produced in Isle of Wight County in 1850 (Whichard 1959). Neighboring Sussex County began growing peanuts which were introduced to Isle of Wight County as a commercial crop just prior to the Civil War (King 1993).



Figure 6. Project vicinity depicted on Böÿe, Herman, Henry Schenck Tanner, E. B Dawson, and William Branch Giles, 1827 "A map of the state of Virginia: reduced from the nine sheet map of the state in conformity to law." (Library of Congress).

One of the more significant developments in the county was the construction of the Norfolk and Petersburg Railroad in 1858. With its construction, people could ship items to market more readily which stimulated the economy. One of the stops on the railroad was at Windsor Station at the site of the Corrowaugh Post Office. The opening of this station spurred the lumber industry in the county, which resulted in land clearing and the construction of sawmills (Isle of Wight n.d.). From Windsor Station, farmers could send crops to market in Norfolk or Petersburg, giving those near the station an advantage over more remote parts of the county (King 1993; Maguire 1989).

Between 1830 and 1860, the total population of the county decreased from 10,517 to 9,977, with the number of enslaved persons decreasing from 4,272 to 3,570. Less reliance on slave labor was at the core of this decrease. The only group that saw an increase was free blacks whose numbers grew to 1,370 and comprised 13 percent of the total population (King 1993).

The beginning of the Civil War interrupted the economic prosperity brought by the railroad. William Mahone, the engineer of the railroad, joined the Confederate Army and served with distinction. In May 1862 Union forces took control of the railroad from Norfolk to Zuni after the evacuation of Norfolk. As a response, the railroad

company removed sections of track making the portion of the rail line under Union control unusable (Chabot 1938) (Figure 7).

The Confederates kept watch and sent out patrols to look for any Union attempts to cross the Blackwater River and the Union in the Suffolk area took similar steps to prevent a Confederate crossing of the Nansemond River. The area between the two rivers was the scene of small skirmishes between bands of opposing cavalry.

On December 12, 1862, an engagement took place at Joyner's Ford, near Zuni. According to Captain J. H. Sikes of Company D, Seventh Confederate Cavalry, the number of Confederates at the ford did not exceed 30 men. The opposing Union force, according to Captain Sikes, was much larger and used artillery. The Confederates successfully repelled attempts by Union infantry and cavalry to cross the river. Union troops eventually managed to cross the river below the ford on pontoon boats. The Confederate troopers made a last stand at the Joyner house but were overwhelmed by the Federal Army and captured. Confederate reinforcements arrived as Union soldiers retreated across the Blackwater River with their prisoners which included Captain Sikes (Sikes 1862).

The Union remained active along the Norfolk and Petersburg railroad. In May 1863, they tore up tracks between Suffolk and the Blackwater River. Major General Dix reported that two regiments of Confederate infantry with two artillery pieces tried to stop them about 5 miles (8.05km) east of Zuni (Wistar 1863).

Following the war, Mahone began the task of rebuilding the Norfolk and Petersburg Railroad, as well as repairing water stations and station buildings (Chabot 1938). Although the South was in economic ruin, Mahone wanted to connect Norfolk to the Mississippi Valley. In order to do this, he began consolidating railroads. The Atlantic, Mississippi and Ohio Railroad Company was formed from a merger with the Norfolk and Petersburg in 1872. From this, the Norfolk and Western was organized in 1881 (Virginia Writers' Program 1942).

In addition to rebuilding the railroad, peanut farming was also on the rise in Isle of Wight County after the war. Peanut production increased from 40,000 bushels in 1872 to over 200,000 bushels in 1890. In 1877, John King established a peanut factory in Windsor and a peanut cleaning factory was established in Smithfield in 1880 (King 1993).

Lumber also continued to be an important industry. In 1878 the Camp Manufacturing Company established itself along the Blackwater River and others opened up close to the James River. Because of the train station, Windsor became a center for those who used the railroad to ship their lumber. This caused the community to grow considerably (King 1993).

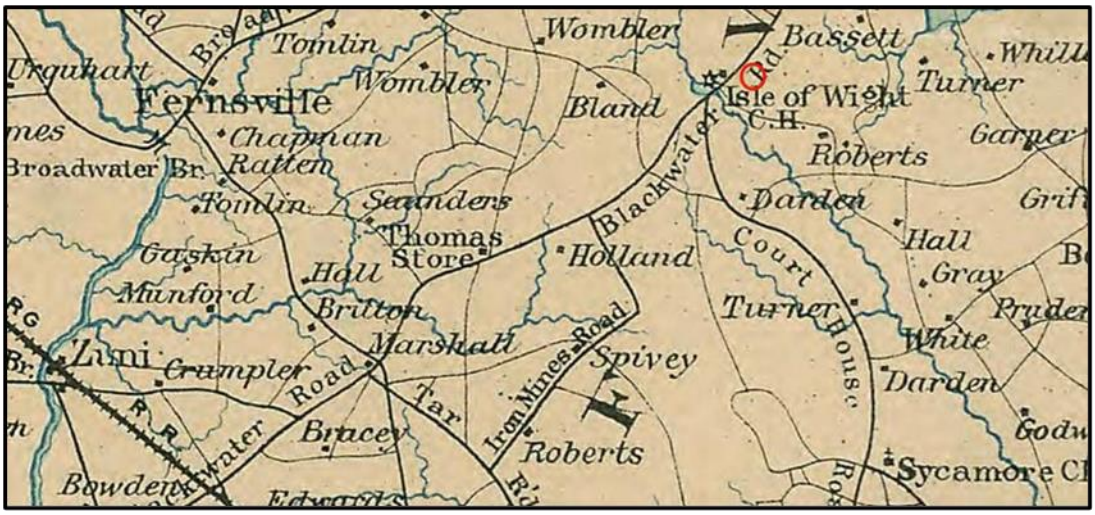


Figure 7. Project vicinity depicted on Civil War map. "Preliminary map of a part of the south side of James River, Va.: from surveys and reconnaissances." [Washington: GPO, between to 1893] (Library of Congress).

At the turn of the twentieth century, peanuts remained an important crop along with soybeans. As such, by 1935, the county had over 1,400 farms. A 1919 USGS map depicts three unimproved roads running through the project area which lead to other roads and houses outside the APE (Figure 8).

In 1939 the Community Electric Cooperative began erecting power lines and providing electricity to the more rural portions of the county. The construction of the James River Bridge, which opened on November 17, 1928, connected Isle of Wight residents with the growing urban centers of Hampton and Newport News. In order to pay for it, a toll was collected which discouraged many from using it (King 1993).

By 1945 there was a structure located within the APE along Poorhouse Road (Figure 9). That building along with a possible outbuilding appears on a 1966 aerial image and on a 1968 USGS map (Figures 10-11). The 1968 USGS map shows the structure as a clear square instead of a solid black square which indicates ruins.

By 1950, there were over 14,000 people living in Isle of Wight County. Smithfield was the largest town with Windsor being the second largest despite only having 451 inhabitants. At this time commercial forestry was still a leading industry along with the continued importance of agriculture (Whichard 1959). In 1975, the state took over the operation of the James River Bridge and removed its tolls. This encouraged people who worked in the Newport News area to move to Isle of Wight County. As a result, the population increased.

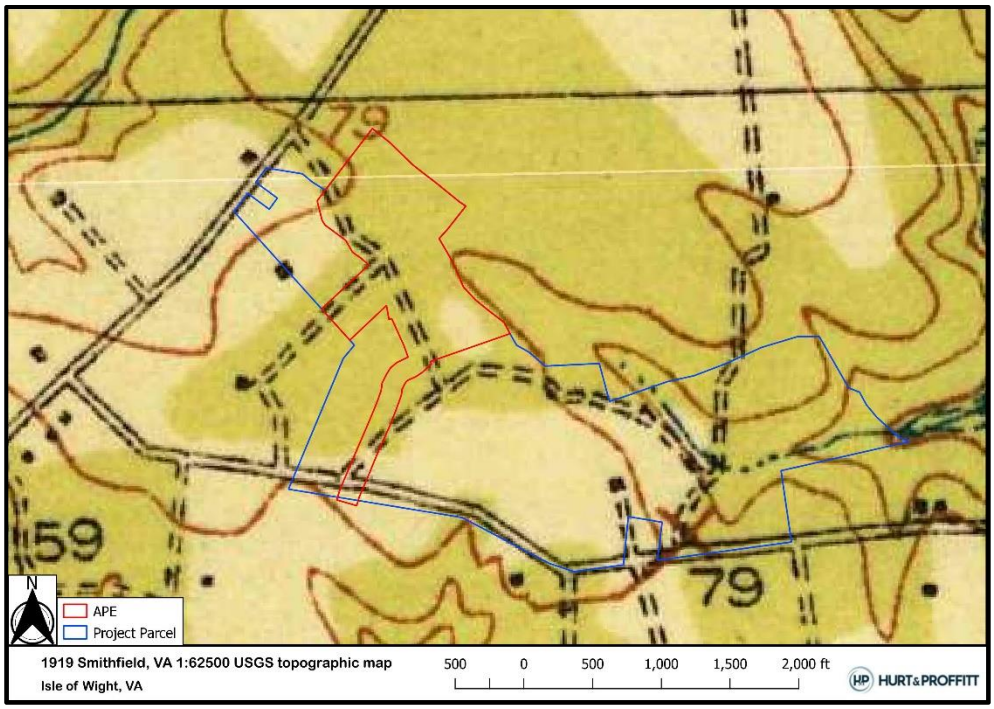


Figure 8. Project area depicted on 1919 Smithfield, VA 1:62500 USGS topographic map (USGS 1919).

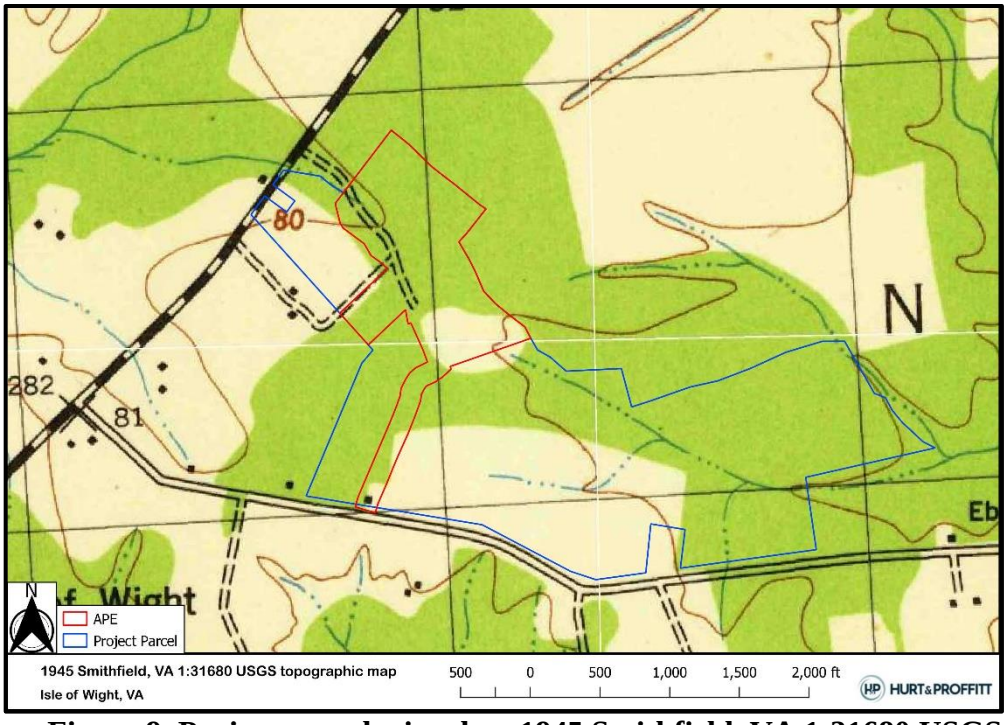


Figure 9. Project area depicted on 1945 Smithfield, VA 1:31680 USGS topographic map (USGS 1945).



Figure 10. Detail of 1966 aerial image depicting buildings within APE along Poorhouse Rd.

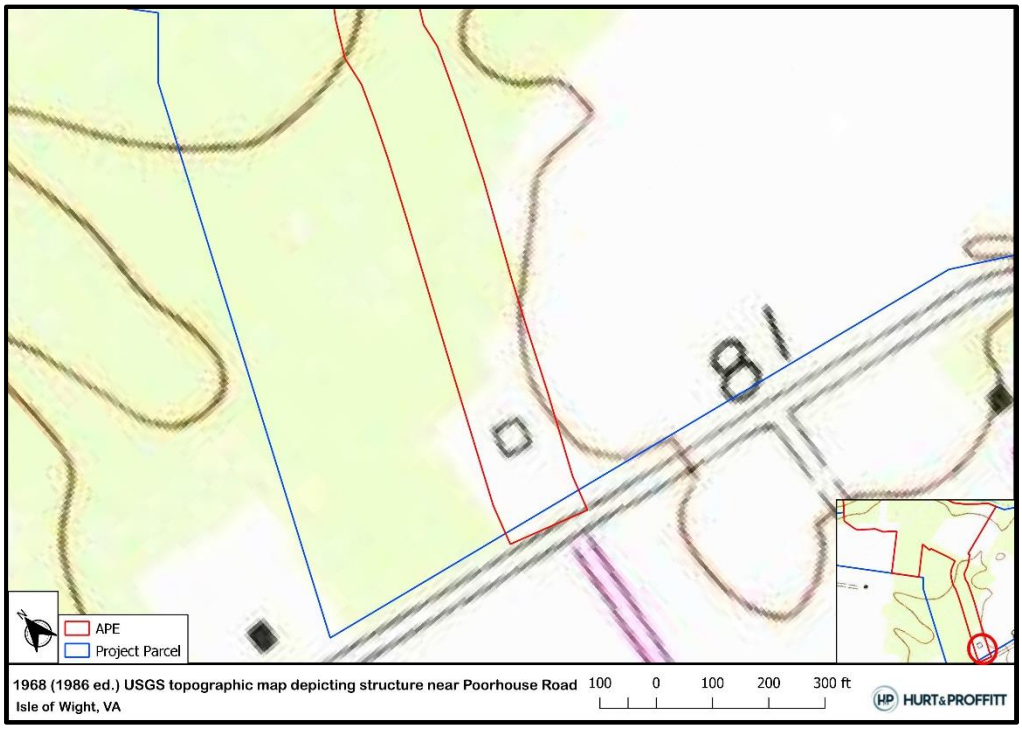


Figure 11. Detail of 1968 USGS map depicting building ruins along Poorhouse Rd. (USGS 1968).

The number of farms in the county declined greatly by the early 1990s, and many farmers shifted their focus from crops to beef cattle (King 1993). A 1994 aerial photo of the project area shows the northwestern section of the APE as wooded and a farm outbuilding along Poorhouse Road in roughly the same area as the structure depicted on the 1945 and 1968 USGS maps and the 1966 aerial image (Figure 12). According to the 2010 U. S. Census, the population of the county was 35,270, an 18.6 percent increase from 2000 and indicative of the continued growth of the area (USCB).



Figure 12. 1994 aerial view of the project area (Google Earth).

Previous Investigations

H&P reviewed the Virginia Department of Historic Resources' (VDHR) Virginia Cultural Resource Information System (V-CRIS) for previously recorded cultural resources and previously conducted Phase I Archaeological Surveys in the vicinity of the project area. A review of these resources within 0.5 miles (0.8 km) of the project parcel boundaries identified no previously recorded archaeological sites and no previous Phase I Archaeological Surveys. Four architectural resources have been recorded within 0.5 miles (0.8km) (Figure 13, Table 2).

Architectural resource 046-0052 is a circa-1830 dwelling which is located north of the project area along Courthouse Highway. Architectural resource 046-0107 is the Edward's House and the associated Edwards family cemetery, constructed circa-1879 and located due west of the project area. Architectural resource 046-5166 is a circa-1930 gas station located south of the project area along Courthouse Highway. Architectural resource 046-5272 is the Ebenezer Rosenwald School, constructed circa-1924 to the east of the project area along Poor House Road. Of these resources, only 046-0052 has been evaluated by DHR staff for NRHP listing, and it was deemed Eligible.

Expanding the V-CRIS search to 1 mile (1.6km) captures one previously recorded archaeological site and six additional architectural resources (Figure 14, Table 3).

Architectural resource 046-0005 is the Isle of Wight Courthouse Complex Historic District south of the project area along Courthouse Highway. It has been listed on the NRHP and VLR since 2018 as an example of the quintessential character of rural Virginia courthouse complexes. Architectural resource 046-0059 is located adjacent to the courthouse complex and is recorded as an archaeological site named Old Courthouse Mill Site, but no further information is available. Architectural resource 046-5212 is the Isle of Wight Christian Church that was constructed in 1891 directly facing the courthouse complex across Courthouse Highway south of the project area. Architectural resources 046-5226 and 046-5227 are circa-1900 commercial buildings located near the courthouse complex along Courthouse Highway south of the project area. The final four resources have not been evaluated for NRHP eligibility.

Site 44IW0232/Architectural resource 046-0028 is Boykin's Tavern, located in the Isle of Wight Courthouse Complex Historic District. The core of the structure was constructed in 1762 and began operating as Boykin's Tavern in 1802. The property is currently owned by Isle of Wight County. It is listed on the NRHP for architecture, but it has not been evaluated for archaeological significance.

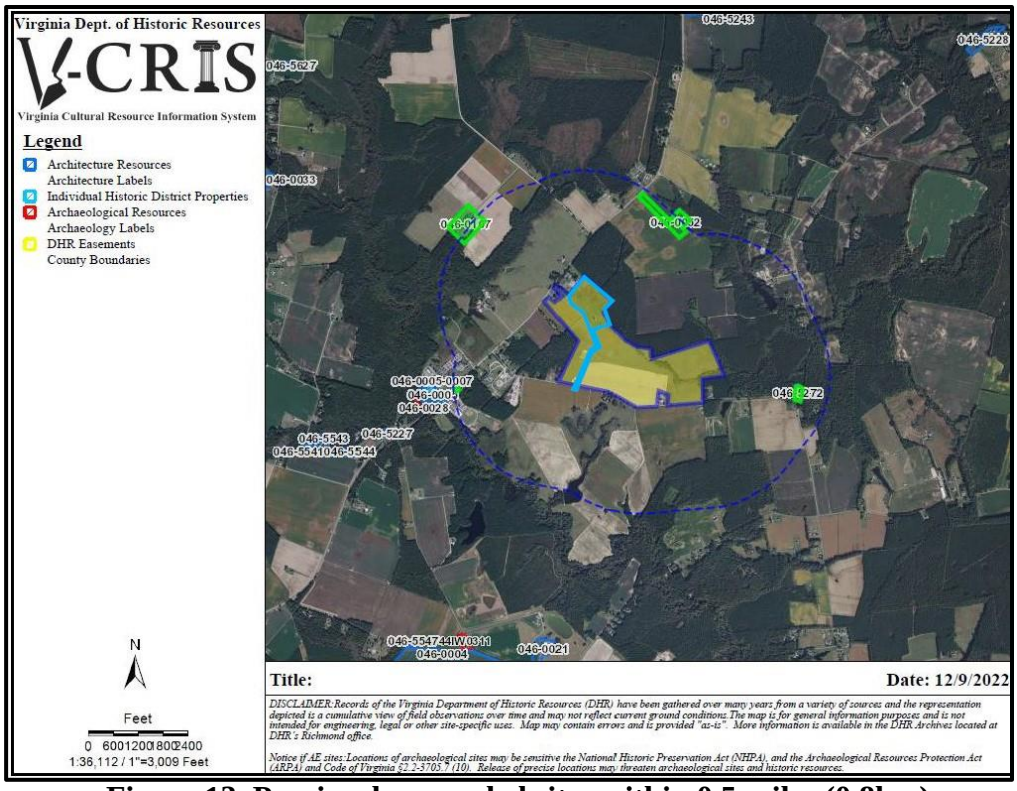


Figure 13. Previously recorded sites within 0.5 miles (0.8km) of the project area.

Site/Structure	Name	Type	Temporal Affiliation	NR Eligibility
046-0052	Elmwood /Wilson House	Single Dwelling	Circa-1830	Eligible
046-0107	Edwards House & Cemetery	Single Dwelling, Cemetery	Circa-1879	Not Evaluated
046-5166	17087 Courthouse Hwy	Gas Station	Circa-1930	Not Evaluated
046-5272	Ebenezer School	School	1924	Not Evaluated

Table 2. Historic resources recorded within 0.5 miles (0.8km) of the project area.

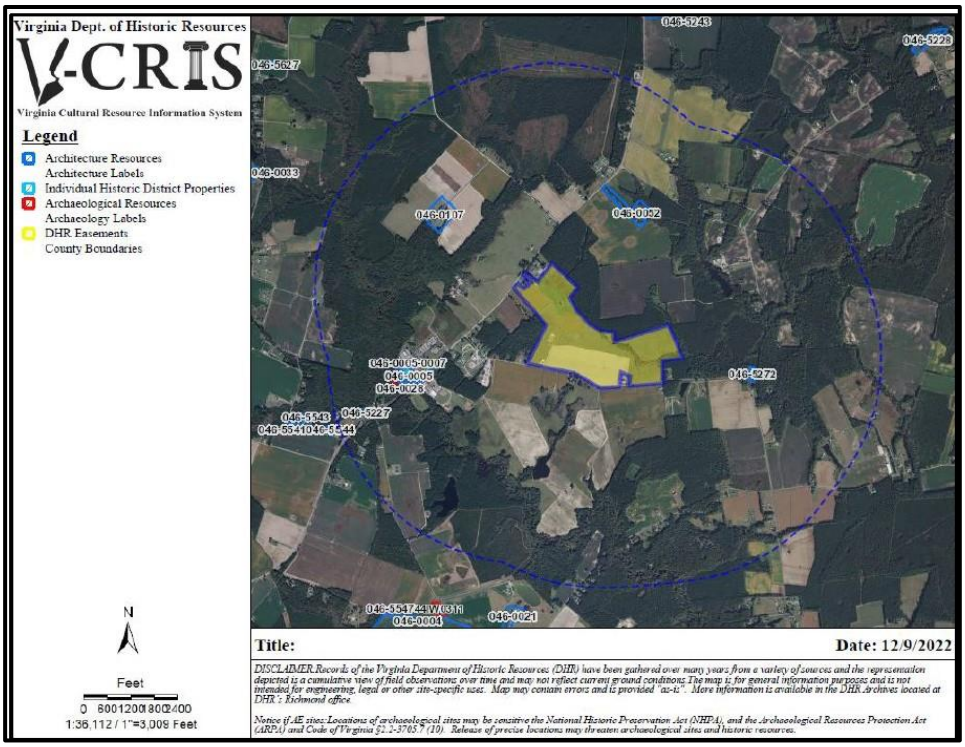


Figure 14. Previously recorded sites within 1 mile (1.6km) of the project area.

Site/Structure	Name	Type	Temporal Affiliation	NR Eligibility
046-0005	Isle of Wight Courthouse Complex	Historic District	Circa-1762	NRHP Listing/VLR Listing
046-0028/ 44IW0232	Boykin Tavern	Dwelling, Tavern	18th-20th Cen.	NRHP Listing/VLR Listing
046-0059	Old Courthouse Mill Site	N/A	N/A	Not Evaluated
046-5212	Isle of Wight Christian Church	Church	1891	Not Evaluated
046-5226	Store	Commercial	Circa-1900	Not Evaluated
046-5227	Store	Commercial	Circa-1900	Not Evaluated

Table 3. Historic resources recorded within 1 mile (1.6km) of the project area.

In addition to the V-CRIS database, Hurt & Proffitt also reviewed Isle of Wight cemetery data available as a separate layer in the county GIS. The cemetery mapping indicates that there are none present in the immediate vicinity of the project area.

Site Potential

The background research indicates the APE lies within a zone of moderate probability for the presence of prehistoric archaeological sites and a high potential for the presence of historic period archaeological sites. The area is relatively level, arable and close to water. Twentieth-century historical maps and aerial images show unimproved roads and possibly two structures in the APE.

4. FIELD AND LABORATORY METHODS

The goal of the present archaeological survey was to identify any archaeological sites in or eligible for listing in the NRHP within the project's APE. The survey methodology employed to meet this goal was chosen with regard to the project's scope (i.e., the project's potential to affect significant resources, should they be present), the potential of the APE to contain significant archaeological resources and local field conditions.

Prior to initiating the field study, H&P notified VA 811 and had utilities marked. Once in the field, the APE was subjected to a surface reconnaissance to assess conditions and identify any surface indications of archaeological sites. The cow pastures and grassy areas to the northwest and southwest had no surface exposure so it was determined that those areas would require shovel testing. Parts of three agricultural fields had approximately 75-80% surface visibility and it was determined that a pedestrian survey was warranted.

Shovel test pits (STPs) were excavated at 50-foot (15.24m) intervals along transects spaced 50 feet (15.24m) apart. The STPs measured 15 inches (38.1cm) in diameter and were excavated stratigraphically to 0.4ft. (12cm) into culturally sterile subsoil. All soil from the STPs was screened through 0.25-inch (0.64-cm) mesh to facilitate artifact recovery. Soil profiles were recorded using Munsell Soil Color charts and standard soil nomenclature (Kollmorgen Instruments Corporation 1992). All positive STPs were delineated using radial STPs excavated at half intervals or less. STPs were not excavated in areas with slopes greater than 15 percent, areas of previous construction disturbance and waterlogged areas. All shovel test locations were recorded and mapped.

The pedestrian survey was carried out by a crew of six people spaced arm's length apart walking parallel, straight transects at a slow pace. Each observed artifact was

marked with a pin flag. The artifacts' provenience information was noted on the bag and recorded using a GPS unit. When a site was encountered, artifacts were recorded that lay within a 25-foot (7.62m) area of the corresponding transect and STP line already established. At least two STPs were excavated at each site discovered in order to determine if intact stratigraphy or features were present.

All artifacts recovered as a result of this survey have been processed and prepared for curation by the Hurt & Proffitt Archaeological Materials Laboratory in accordance with the specifications in *Curation of Federally Owned and Administered Archaeological Collections* (36 CFR Part 79) and the VDHR's *State Curation Standards*. Artifacts retained during this investigation will be stored temporarily at the H&P laboratory and curated along with all original field records and photographs at the VDHR at the conclusion of the project.

5. RESULTS

The Phase I archaeological survey resulted in the excavation of 421 STPs with 33 being positive for cultural material and a pedestrian survey which resulted in the collection of numerous artifacts from two of the agricultural fields (Figures 15-17). Twenty-eight shovel test transects were laid out and spaced 50 feet (15.24m) apart running north to south across the APE. A total of 414 shovel test pits (STPs) were then placed at 50-foot (15.24m) intervals along those transects. Thirteen judgmental STPs were also placed in areas that did not align with the STP grid and in the plowed fields. Another 26 STPs were placed at 25-foot (7.62m) intervals around STPs that were positive for cultural material. Due to ponds, slopes, and buildings, 32 STPs were not excavated. The positive STPs and artifact concentrations in the fields were located in the eastern and western sections of the APE and all contained historic material with the exception of two pre-contact artifacts.

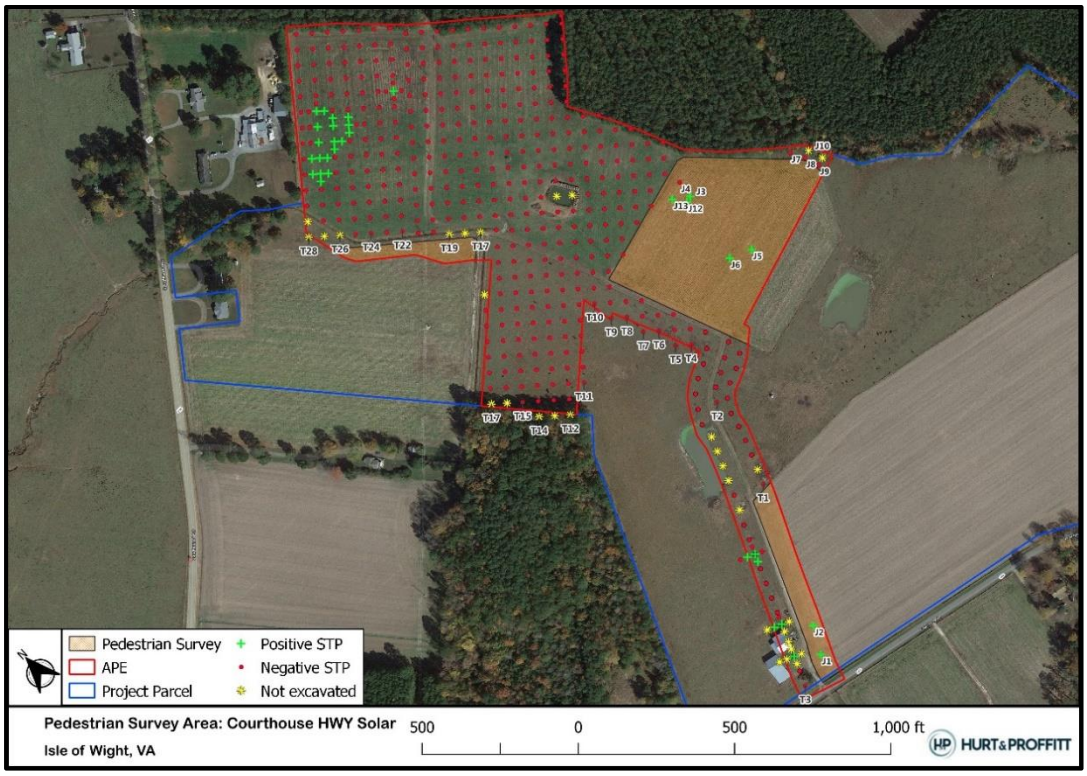


Figure 15. Shovel Test Pit (STP) and pedestrian survey location map.

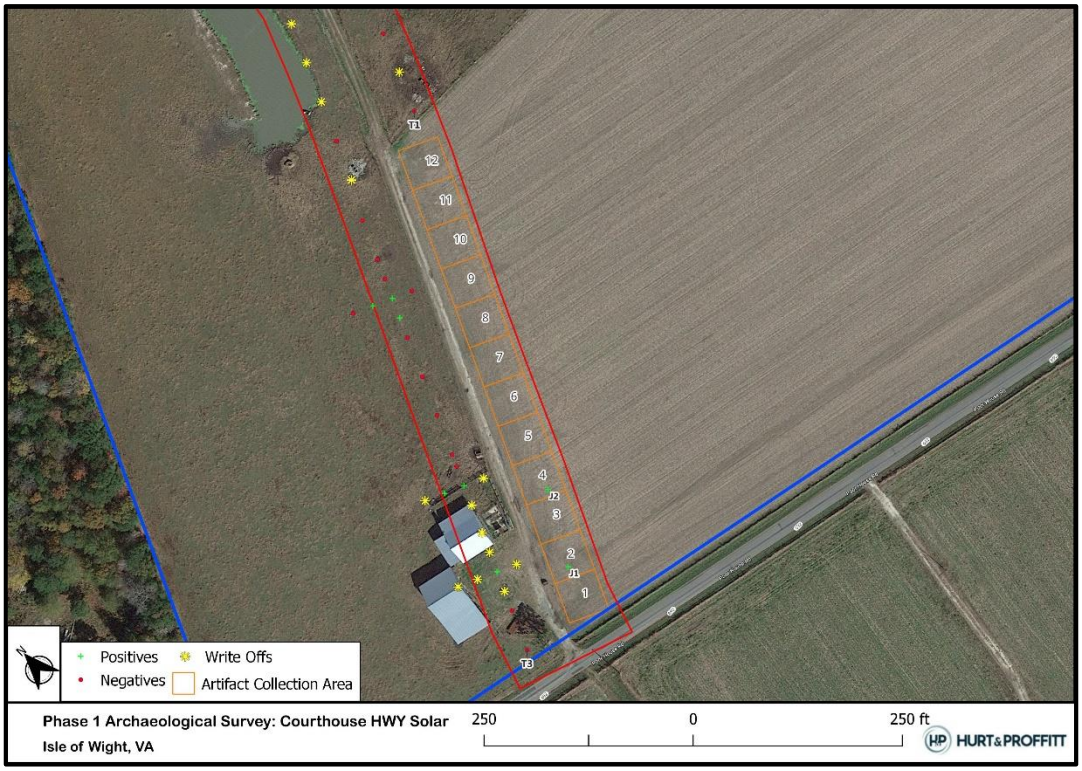


Figure 16. Location of collections areas in field next to Poorhouse Rd.

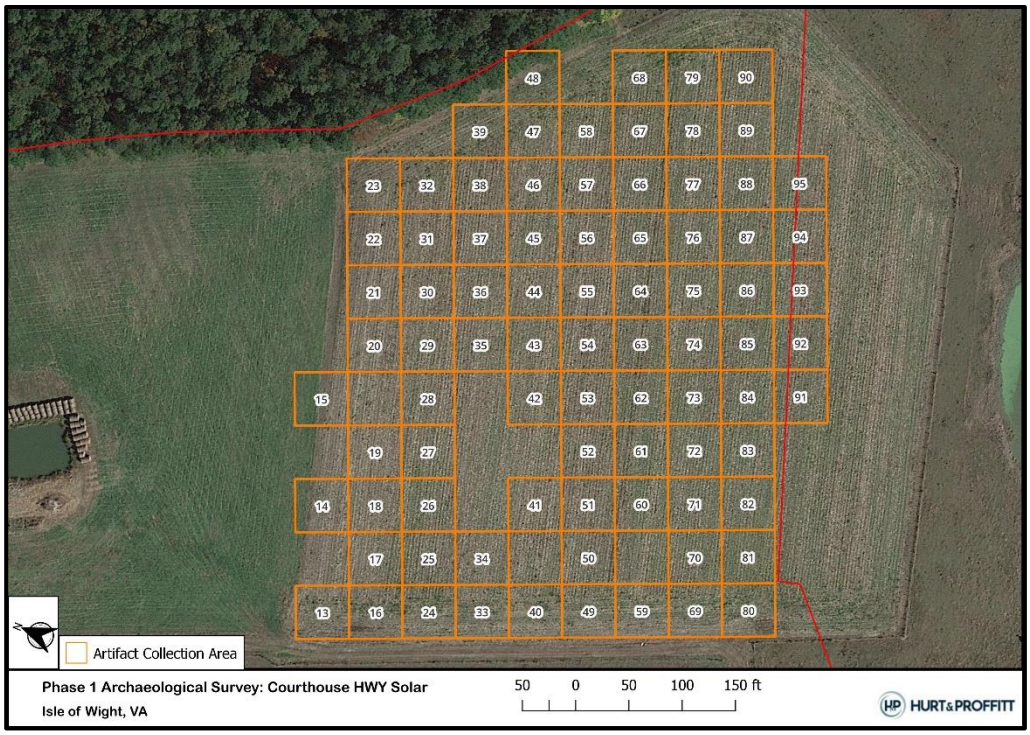


Figure 17. Location of collections areas in field in northeastern section of APE.

The stratigraphy in the pasture and grassy areas of the APE consisted of a topsoil layer over an abandoned plow zone. The typical STP in this section contained three layers. Layer A measured between 0.4-0.8 feet (12.2-24.4cm) deep. The soil was a very dark grayish brown (10YR 3/2) sandy loam. This layer was on top of a light yellowish brown (10YR 6/4) sandy loam that was between 0.25-0.9 feet (7.6-27.4cm) deep. Layer C was a yellow (10YR 7/8) clay loam subsoil (Figures 18-19).

In the agricultural fields, the stratigraphy consisted of a plow zone above subsoil although the STPs in the field next to Poorhouse Road contained a transitional layer to subsoil. Layer A measured between 0.7-1.0 feet (21.3-30.5cm) deep. The soil was a dark greyish brown (10YR 4/2) silty loam. In some areas this was on top of a light brownish grey (2.5Y 6/2) sandy loam that measured between 0.2-0.3 feet (6.1-9.1cm) thick. The subsoil consisted of a light yellowish brown (2.5Y 6/4) sandy clay (Figures 20-21).

The only exception to the standard stratigraphy in the agricultural fields was STP J3. It contained a plow zone layer with a thin cultural layer over subsoil. The plow zone was a dark grayish brown (10YR 4/2) sandy loam that measured 1.15 feet (35cm) thick. The cultural layer was a very dark grayish brown (10YR 3/2) silty loam that was 0.2 feet thick (6.1cm) which overlaid a yellowish brown (2.5Y 6/4) sandy clay subsoil (Figures 22-23). The only artifact recovered from this STP was a brick fragment from the plow zone layer.

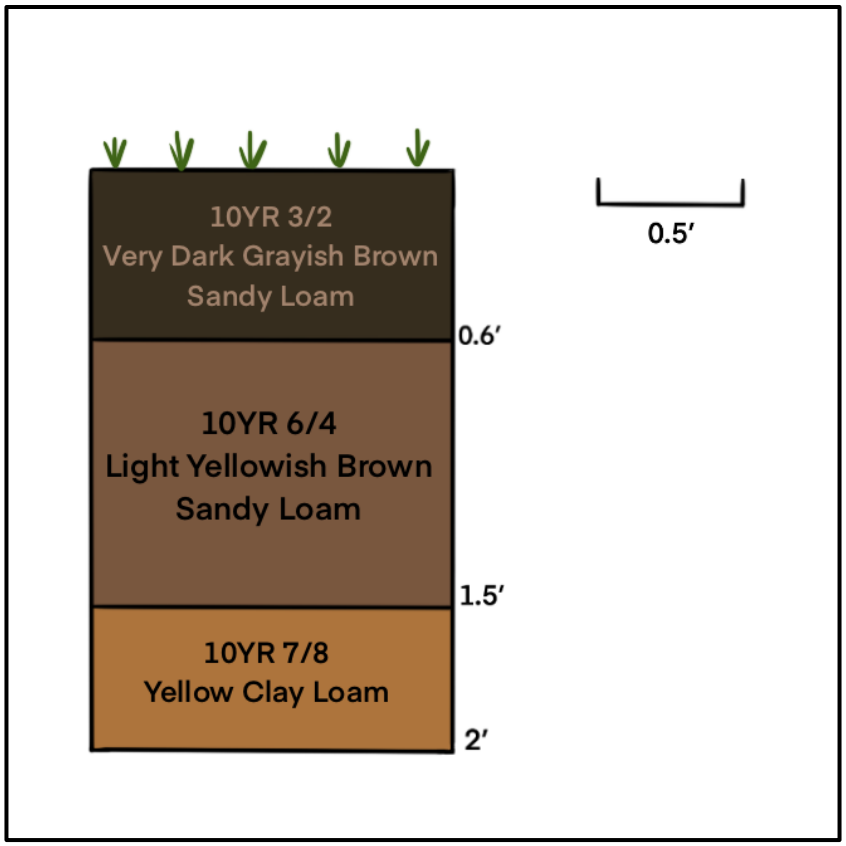


Figure 18. Representative STP profile in pasture, Transect 12 STP 19.



Figure 19. STP north profile, Transect 12 STP 19.

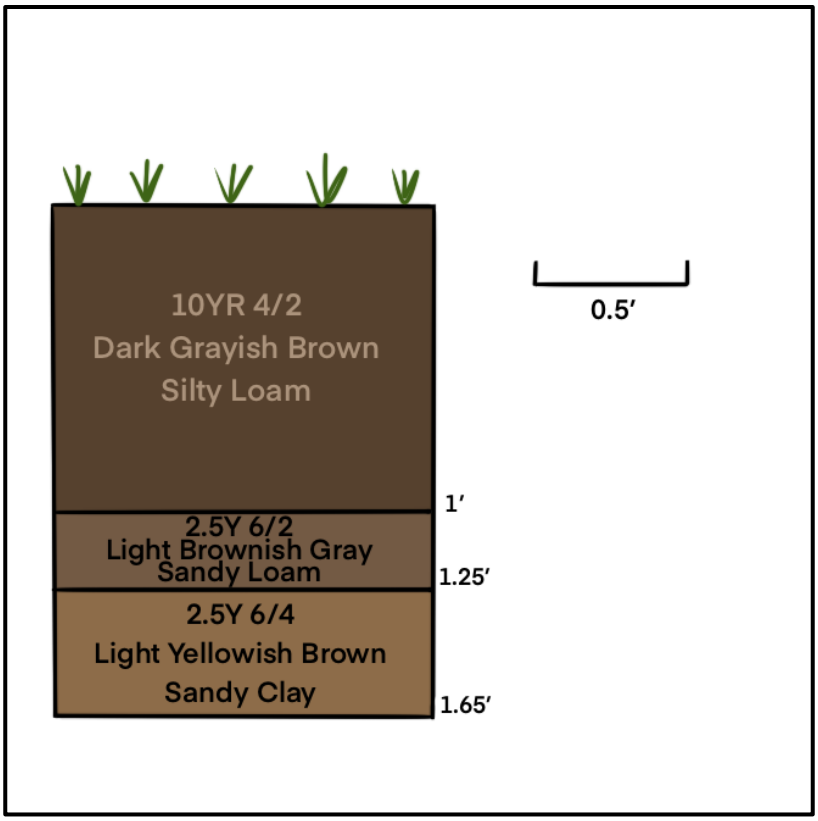


Figure 20. Representative STP profile in plowed field, J1.



Figure 21. STP north profile, J1.

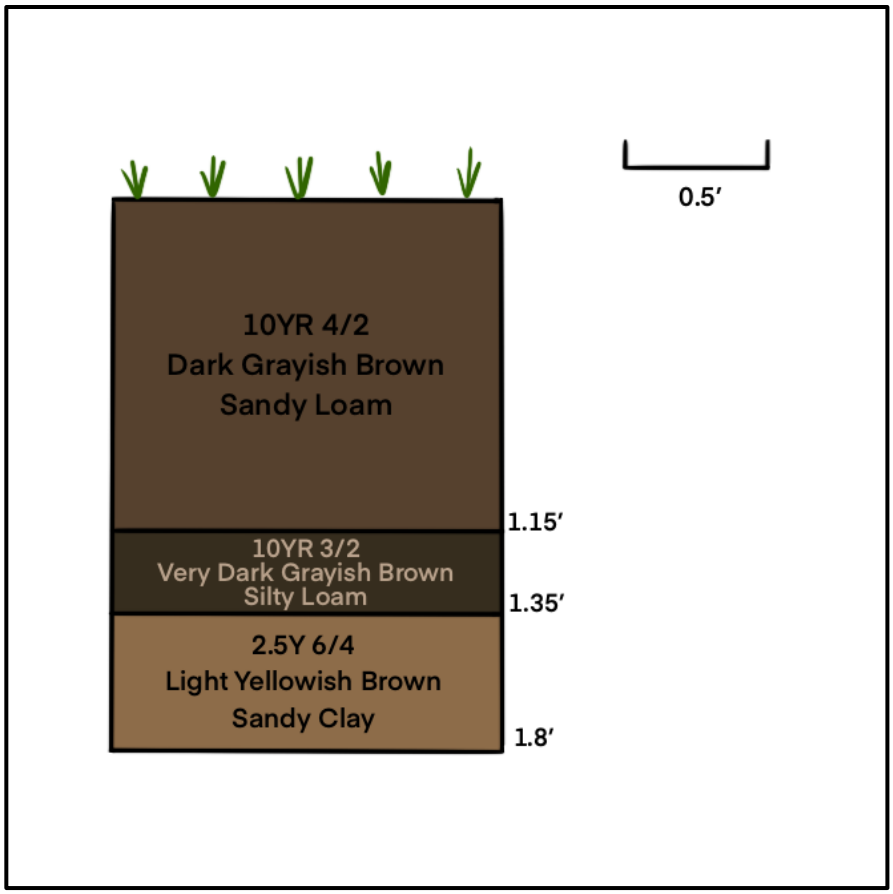


Figure 22. Profile of STP J3.



Figure 23. STP north profile, J3.

As a result of the survey, two isolated pre-contact artifacts and seven isolated historic artifacts (by definition not NRHP eligible) as well as three historic sites dating from the late nineteenth to mid-twentieth centuries were identified (Figure 24). In total, 1,063 artifacts and 76,796.9 grams (169.3 pounds) of brick were found in the APE.

The isolated pre-contact artifacts were a quartz projectile point found in collection area 87 and a quartz secondary flake discovered in T3 STP 5 (See Figures 15-16 for location). Unfortunately, the base of the point was missing making identification difficult (Figure 25). The historic isolated finds were found in T22 STP10 and consisted of seven shards of clear machine-molded bottle glass from a Wishbone Italian dressing bottle (See Figure 15 for location).

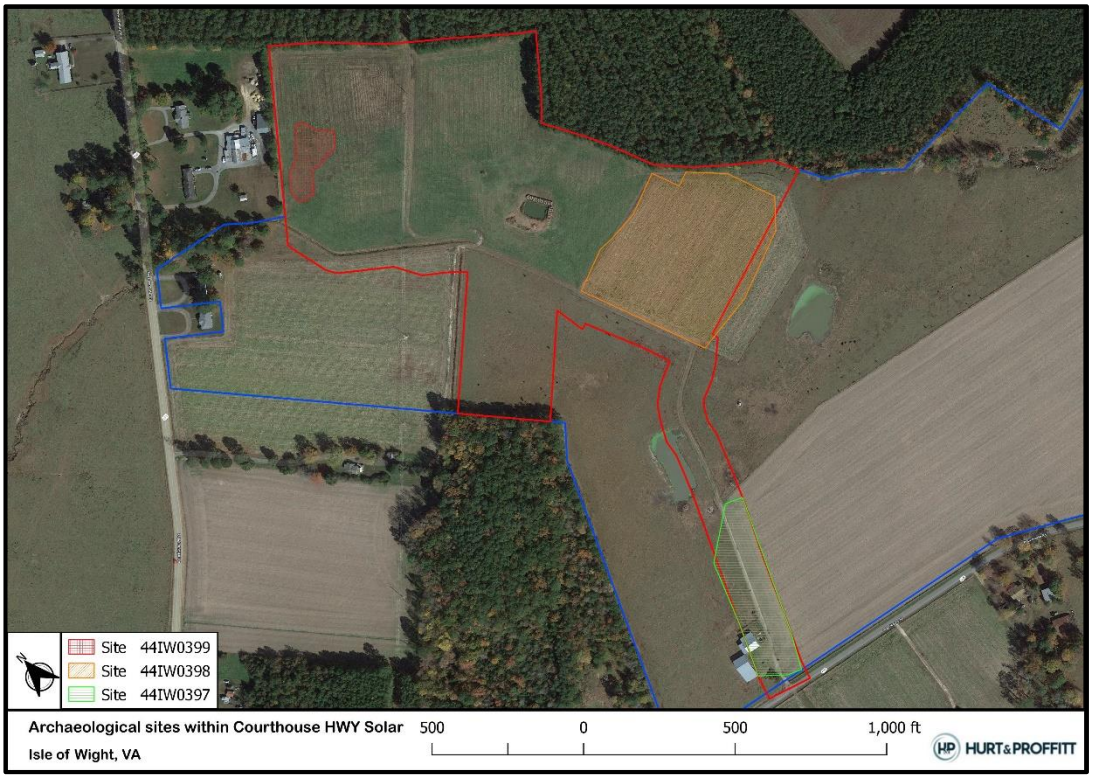


Figure 24. Site location map.



Figure 25. Quartz projectile point found in collection area 87. Photo by Jessica Gantzert.

Site 44IW0397

Site 44IW0397 is a concentration of late nineteenth to early twentieth-century artifacts located along a farm road that intersects with Poorhouse Road (Figures 24 and 26). This concentration extends outside the APE to the east and west. A house is depicted within the APE in this area on a 1945 USGS map and its location coincides with two extant modern farm buildings (Figures 9 and 27). Nothing is shown in this area on a 1919 USGS map but the building appears on a 1966 aerial photograph and a 1968 USGS map (Figures 10-11). The 1968 map depicts it as a ruin showing that it was delipidated by that date.

In total, 146 artifacts were found along with 41,041.4 grams (90.5 pounds) of brick. Besides brick, bottle glass was the most prevalent artifact type making up 74 percent (108) of the assemblage. Over 60 percent (65) of the bottle glass was machine molded with the rest being blown in mold (34) or unidentifiable (9). Ceramics made up only 15.1 percent (22) of the assemblage. Ironstone (7), whiteware (5), Bristol slip/Albany glazed stoneware (5), European hard paste Porcelain (4) and a terra cotta sewer pipe fragment comprised the ceramics found. In addition, six shards of flat glass, four vessel glass shards and one wire nail and one unidentifiable nail were recovered (Figure 28). The lack of metal at this site is likely due to the area being metal detected which the landowner said has been done in the fields.

A majority of the brick and other artifacts were concentrated in the southern section of the site in the agricultural field. Five STPs near where the house was depicted on the 1945 USGS map next to the modern farm buildings could not be fully excavated because of the presence of rocks and gravel suggesting this area has been disturbed.



Figure 26. Site 44IW0397 looking south. Photo by author.



Figure 27. Modern farm buildings at site 44IW0397 looking northwest. Photo by author.

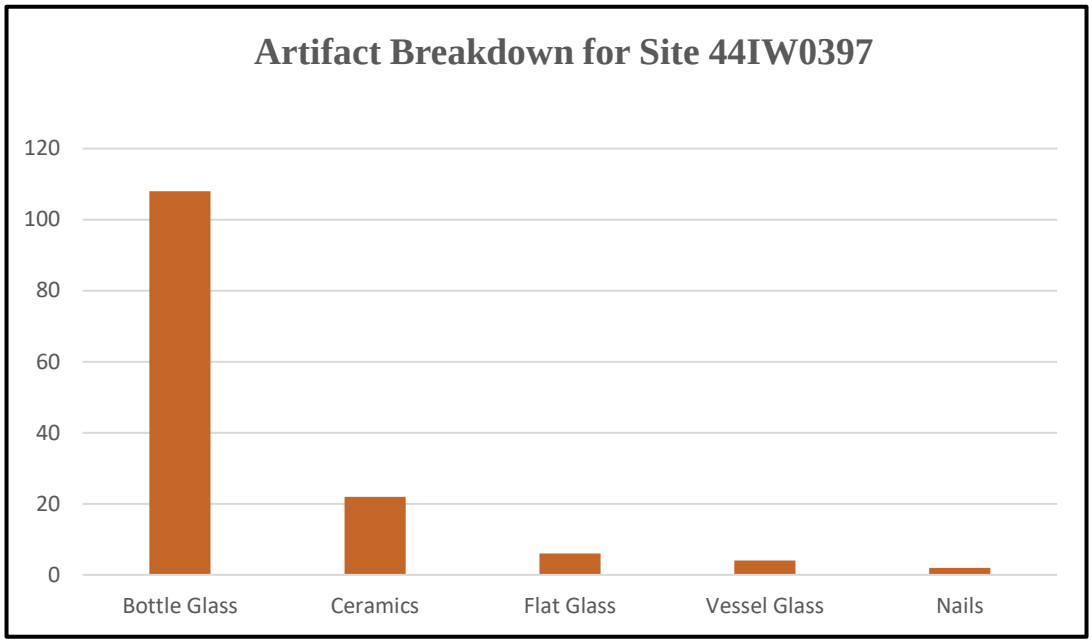


Figure 28. Breakdown of artifacts recovered from site 44IW0397.

44IW0398

Site 44IW0398 is a large surface scatter of late nineteenth to early twentieth-century artifacts covering approximately 4.5 acres of a cornfield at the eastern end of the APE (Figures 24 and 29). The landowner revealed that he was told there was a brick chimney in the vicinity of this site which was knocked down and that the field has been metal detected. A closer examination of the 1966 aerial image revealed a possible structure in the area where the landowner was told about the extant chimney (Figure 30).

In total 736 artifacts and 35,757.3 grams (78.8 pounds) of brick were recovered. Besides brick, ceramics and bottle glass were the most prevalent artifact type with ceramics comprising 41.4 percent (305) of the assemblage and bottle glass 39.6 percent (292) (Figure 31). The ceramics were made up mostly of whiteware (118) and ironstone (102) which together comprised 72.1 percent of the ceramic assemblage. Bristol slip/Albany glazed stoneware made up 16.7 percent (51) of the assemblage with European hard paste porcelain comprising 4 percent (11). There were also 28 terra cotta sewer pipe fragments found along with modern porcelain (4), American salt glazed stoneware (3), Rockingham (3), yelloware (1) and English soft paste porcelain (1) (Figure 32). One of the more interesting artifacts was a porcelain animal head and hand from a figurine (Figure 33).



Figure 29. Site 44IW0398 looking north. Photo by author.

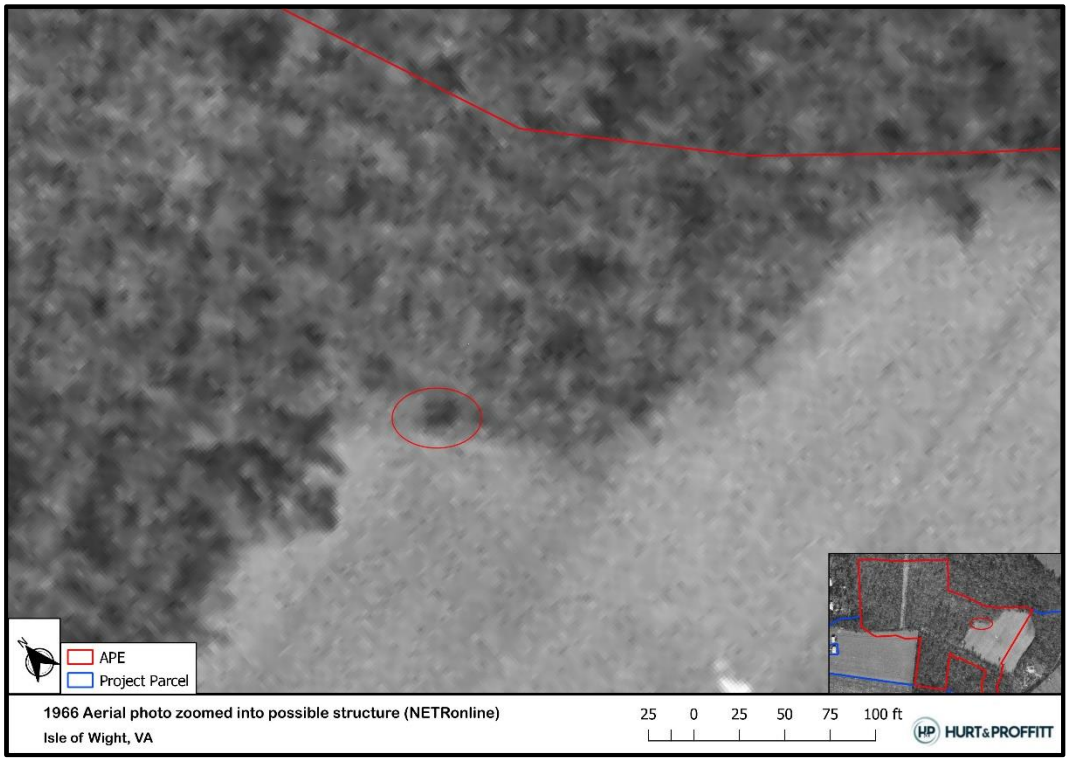


Figure 30. Closeup of 1966 aerial image showing possible structure at site 44IW0398.

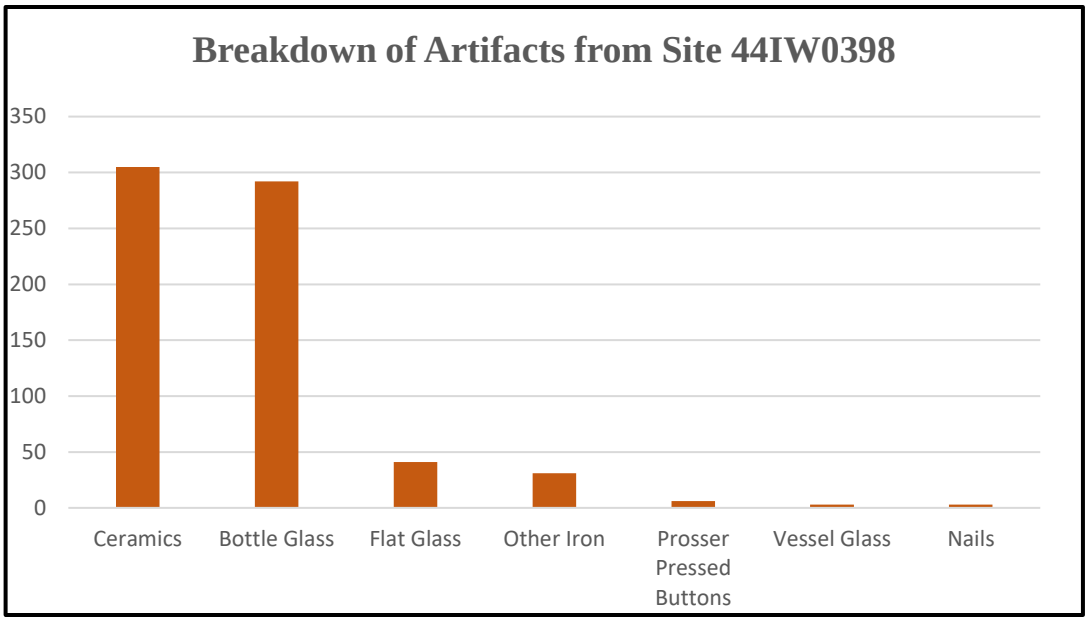


Figure 31. Breakdown of artifacts recovered from site 44IW0398.

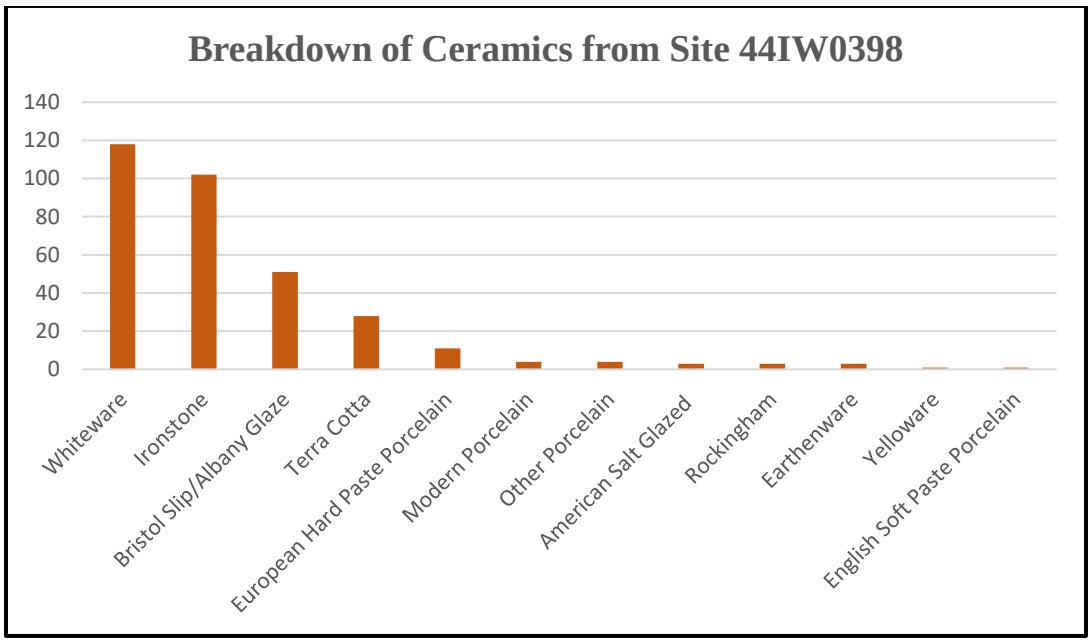


Figure 32. Breakdown of ceramics recovered from site 44IW0398.



Figure 33. Porcelain figurine animal head. Photo by Jessica Gantzert.

Over 74 percent (217) of the bottle glass was blown in mold with the rest being machine molded (64) or unidentifiable (11). A majority of the glass was either purple solarized (107) or light aqua in color (102) which comprised 71.6 percent of the bottle glass. Some of the other colors include clear (25) cobalt blue (23) and amber (18) (Figure 34). In addition, 41 shards of flat glass, six Prosser pressed buttons, three vessel glass shards and three unidentifiable nails were recovered. The lack a metal at this site is likely due to the area being metal detected which the landowner said has been done in the fields. Of the 31 other iron fragments found most of them were plow parts.

The distribution of artifacts shows that a majority of the brick was concentrated in the northwestern section of the site (Figure 35). This was the location of the brick chimney according to the landowner and where the 1966 aerial image shows a possible structure. Most of the other artifacts, however, were concentrated away from the brick concentration along the southeastern boundary of the site (Figure 36). This might indicate disposal activities taking place away from the house or possibly the redistribution of material when the house was demolished and plowed over or a combination of both.

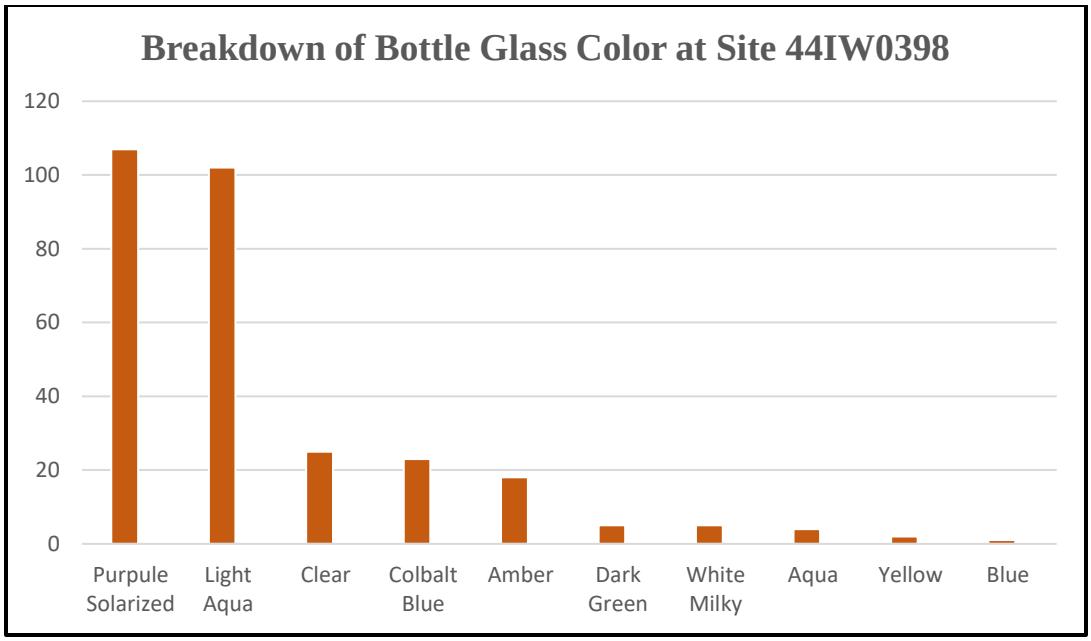


Figure 34. Breakdown of bottle glass color from site 44IW0398.

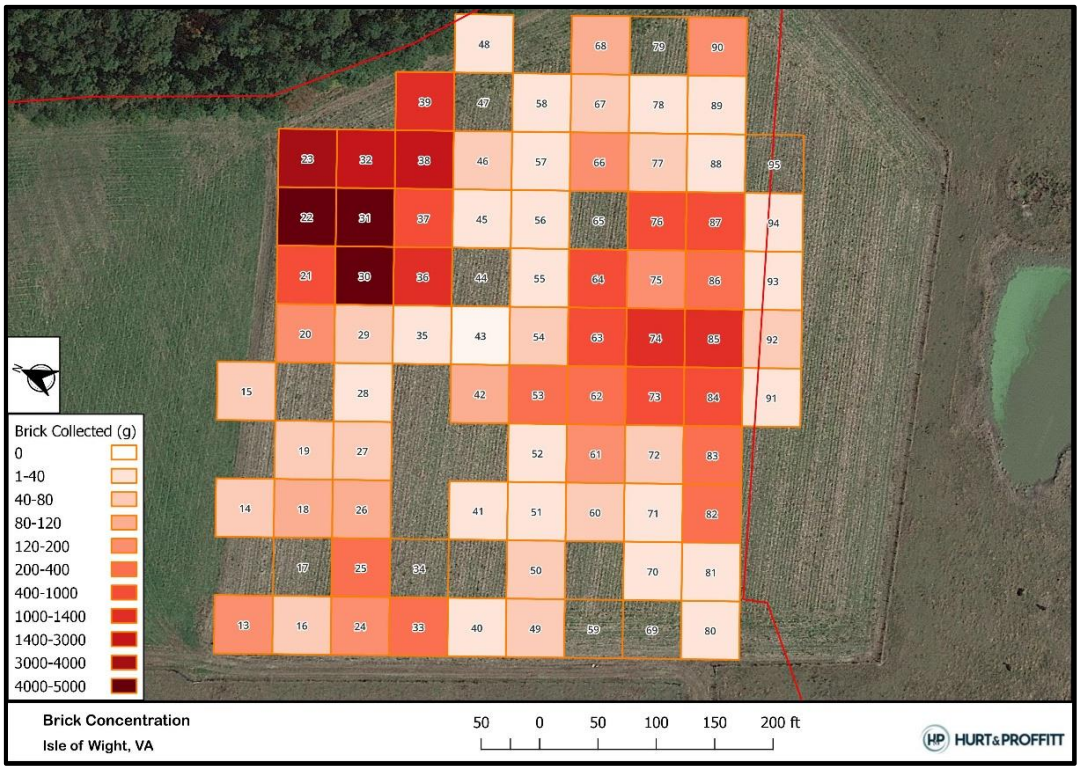


Figure 35. Distribution map of brick at site 44IW0398.

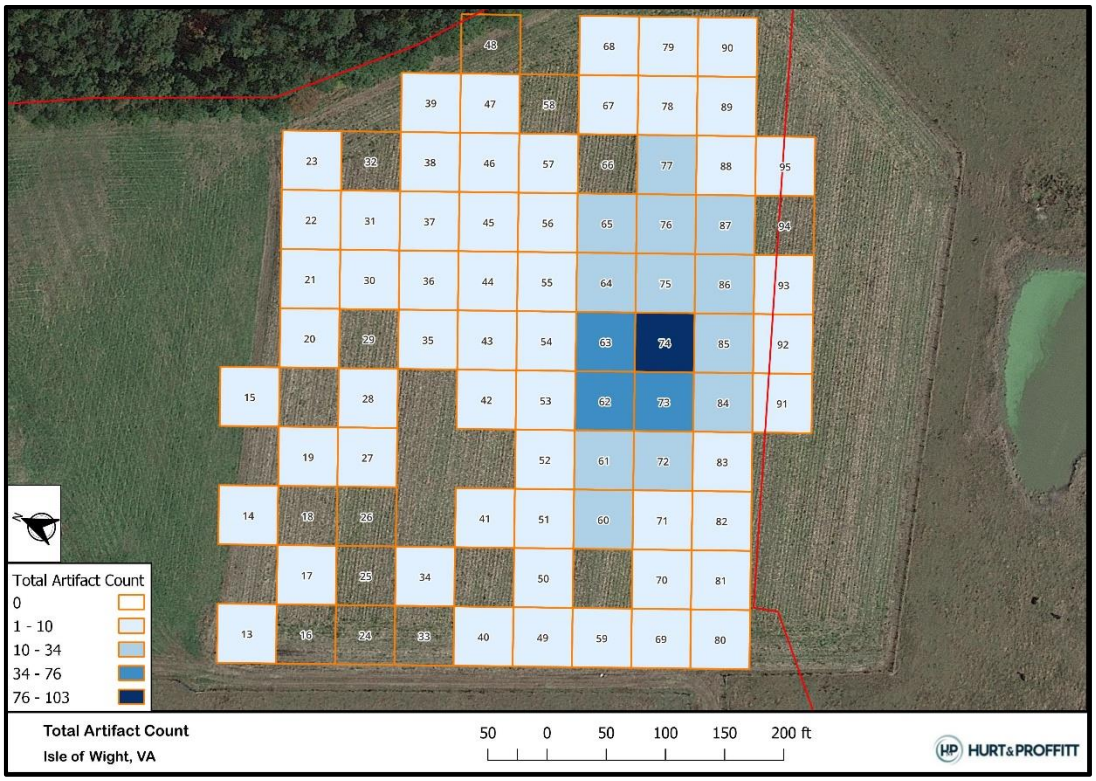


Figure 36. Distribution map of non-brick artifacts at site 44IW0398.

4IW0399

Site 44IW0399 is a scatter of early to mid-twentieth-century artifacts located along the western edge of the APE (Figures 24 and 37). A total of 171 artifacts and 4.6 grams of brick were recovered with 50.3 percent (86) of the assemblage consisting of bottle glass. Fifty seven percent (49) of the glass was machine molded with the rest being blown in mold (35) or unidentifiable (2). Over 75 percent of the glass was clear with the rest being amber (17), light aqua (2), light green (1), or milky white (1).

Nails made up 25.1 percent (43) of the recovered artifacts and included 37 unidentifiable nails, five wire nails and one cut nail. Other iron artifacts made up 21.6 percent (37) of the assemblage and consisted of mostly wire and iron fragments. In addition, three fragments of wallpaper, one glass marble and a sherd of brown, hand painted whiteware were recovered (Figure 38).

This site is located approximately 400 feet (122m) east of two houses along Courthouse Hwy that were constructed in the early 1960s. The artifacts discovered are probably related to disposal activities associated with those houses and most likely do not represent the presence of another structure.



Figure 37. Site 44IW0399 looking southwest. Photo by author.

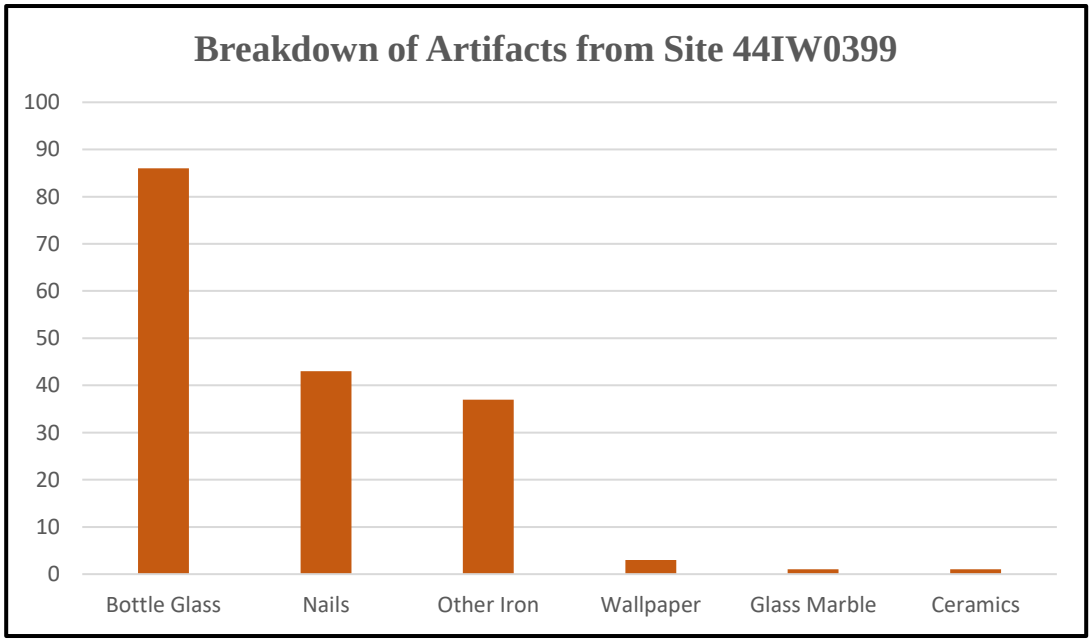


Figure 38. Breakdown of artifacts recovered from site 44IW0399.

6. CONCLUSIONS AND RECOMMENDATIONS

The Phase I archaeological survey resulted in the discovery of seven isolated historic artifacts and two pre-contact isolated artifacts (by definition not NRHP eligible) as well as three historic sites dating from the late nineteenth through mid-twentieth centuries.

Site 44IW0397 is a concentration of late nineteenth to early twentieth-century artifacts located along a farm road that intersects with Poorhouse Road. Brick and domestic artifacts were recovered that are likely related to a house that was located on the west side of the farm road. That house is depicted within the APE on a 1945 USGS map and its location coincides with two extant modern farm buildings. The artifact concentration extends outside of the project area to the west and east.

Given the fact that any archaeological remains of the house once located in this area were likely destroyed by the modern farm buildings, it is unlikely that further excavations would yield any features or additional information. As such this leads H&P to recommend that the portion of Site 44IW0397 within the present APE does not contribute to the potential eligibility of the larger site.

Site 44IW0398 is a large surface scatter of late nineteenth to early twentieth-century artifacts covering approximately 4.5 acres of a cornfield at the northeastern end of the APE. Large amounts of brick, ceramics and glass were recovered during the pedestrian survey in an area where a 1966 aerial photograph shows a potential house. In addition, the landowner revealed that he was told there was a brick chimney in the vicinity which was knocked down and that the area has been metal detected. This appears to be the case since very few metal artifacts were recovered. The artifacts continue outside the APE to the east in the cornfield and it is also likely that they extend to the north into the woods.

Despite the large number of artifacts discovered, post occupation plowing has not only dispersed them but has likely destroyed any remnants of the building that was once there along with most of the stratigraphy. Three shovel tests placed judgmentally in the likely structure location indicated only plow zone overlying culturally sterile subsoil while a fourth shovel test contained plow zone and a thin cultural layer over subsoil. Also, metal detecting appears to have removed many of the metal artifacts associated with this site. Given this, it is unlikely that further excavations would yield any features or additional information. As such this leads H&P to recommend that the portion of Site 44IW0398 within the present APE does not contribute to the potential eligibility of the larger site.

Site 44IW0399 is a scatter of early to mid-twentieth-century artifacts located along the western edge of the APE. These artifacts consist mostly of bottle glass, nails, iron

fragments, wire and fragments of wallpaper. They are likely related to nearby houses along Courthouse Highway.

The late date of the artifacts along with the fact that this material is probably the result of discard and not related to a structure, suggest it is unlikely that further excavations would yield any features or additional information. This leads H&P to recommend that this site is not eligible for the NRHP.

In summary, all three sites or portions thereof, identified within the APE during the current survey have little research potential because of post occupation disturbance or are the result of discard activities. H&P recommends no further work within the APE.

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Artifact Inventory

State Site #	Context Layer	Type	Form	Subform	Size (mm) gth (	Weight (g)	Count
44IW0397	CA 1	Brick				10478.0	
44IW0397	CA 1	Bottle Glass	White (Milky)	Machine Molded	15	2.8	1
44IW0397	CA 1	Bottle Glass	White (Milky)	Machine Molded	15	1.3	1
44IW0397	CA 1	Vessel Glass	White (Milky)	Machine Molded	15-25	3.5	2
44IW0397	CA 1	Bottle Glass	Light Aqua	Blown in mold	20	2.1	1
44IW0397	CA 1	Bottle Glass	Purple (Solarized)	Blown in mold	30	4.4	1
44IW0397	CA 1	Bottle Glass	Purple (Solarized)	Machine Molded	25	2.7	1
44IW0397	CA 1	Bottle Glass	Cobalt Blue		10	0.2	1
44IW0397	CA 1	Bottle Glass	Clear	Machine Molded	40	14.5	1
44IW0397	CA 1	Bottle Glass	Clear	Machine Molded	25-20	5.2	2
44IW0397	CA 1	Bottle Glass	Clear	Machine Molded	15-35	8.2	4
44IW0397	CA 1	Whiteware			20	2.0	1
44IW0397	CA 1	European Hard Paste Porcleain			15	0.7	1
44IW0397	CA 10	Brick				3.0	
44IW0397	CA 10	Bottle Glass	Purple (Solarized)	Blown in mold	20	1.14	1
44IW0397	CA 12	Brick				110.1	
44IW0397	CA 12	Bottle Glass	Clear	Machine Molded	15-20	2.71	2
44IW0397	CA 12	Bottle Glass	Purple (Solarized)	Machine Molded	15	1.08	1
44IW0397	CA 2	Bottle Glass	White (Milky)		10	0.67	2
44IW0397	CA 2	Bottle Glass	Cobalt Blue	Blown in mold	10-35	4.48	3
44IW0397	CA 2	Bottle Glass	Green	Machine Molded	25	1.82	1
44IW0397	CA 2	Bottle Glass	Light Aqua	Blown in mold	25	17.75	1
44IW0397	CA 2	Bottle Glass	Purple (Solarized)	Blown in mold	35	6.07	1
44IW0397	CA 2	Bottle Glass	Purple (Solarized)	Machine Molded	10-30	8.07	3
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44IW0397	CA 2	Bottle Glass	Light Green	Machine Molded	10-35	9.95	3
44IW0397	CA 2	Iron Other	Plow Tooth		40	20.33	1
44IW0397	CA 2	European Hard Paste Porcleain	Hand Painted	Brown	25	1.45	1
44IW0397	CA 2	Ironstone			30	2.73	1
44IW0397	CA 2	Brick				13437.7	
44IW0397	CA 2	Ironstone			25	5.33	2
44IW0397	CA 3	Brick				1406.1	
44IW0397	CA 3	Vessel Glass	White (Milky)	Machine Molded	20	0.99	1
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44IW0397	CA 3	Bottle Glass	Light Aqua	Machine Molded	20	2.42	3
44IW0397	CA 3	Bottle Glass	Light Green	Machine Molded	20	1.95	1
44IW0397	CA 3	Flat Glass	Light Aqua		15	0.28	1
44IW0397	CA 3	Bottle Glass	Purple (Solarized)	Blown in mold	25	3.27	1
44IW0397	CA 3	Bottle Glass	Clear	Blown in mold	20-25	3.63	2
44IW0397	CA 3	Whiteware	Transfer Printed	Blue	10	0.36	1
44IW0397	CA 3	Whiteware			15	0.41	1
44IW0397	CA 4	Bottle Glass	Purple (Solarized)	Machine Molded	20	1.39	1
44IW0397	CA 4	Bottle Glass	Purple (Solarized)	Blown in mold	35	11.07	1
44IW0397	CA 4	Bottle Glass	White (Milky)	Machine Molded	10-20	2.33	2
44IW0397	CA 4	Bottle Glass	Light Aqua	Machine Molded	10-35	8.82	3
44IW0397	CA 4	Bottle Glass	Light Aqua	Machine Molded	30	6.74	1
44IW0397	CA 4	Bottle Glass	Clear	Machine Molded	30	3.55	1
44IW0397	CA 4	Melted Glass	Clear		20-30	11.66	3
44IW0397	CA 4	Bristol Slip/Albany Glaze			25-35	12.94	2
44IW0397	CA 4	Ironstone			15-25	5.79	3
44IW0397	CA 4	European Hard Paste Porcleain			15	0.58	1
44IW0397	CA 5	Brick				46.7	
44IW0397	CA 5	Bottle Glass	Cobalt Blue	Blown in mold	10-15	1.5	2
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44IW0397	CA 5	Bottle Glass	Green	Blown in mold	25	2.3	1
44IW0397	CA 5	Whiteware			15	1.1	1
44IW0397	CA 5	Bristol Slip/Albany Glaze			35-30	26.7	2
44IW0397	CA 6	Brick				77.0	
44IW0397	CA 6	Flat Glass	Clear		20-30	5.7	2
44IW0397	CA 6	Bottle Glass	Clear		15	2.4	2
44IW0397	CA 6	Bottle Glass	Cobalt Blue	Blown in mold	10-15	1.6	3

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44IW0397	CA 6		European Hard Paste Porcleain			15	0.7	1
44IW0397	CA 7		Brick				2.6	
44IW0397	CA 7		Bottle Glass	Clear	Blown in mold	25-10	3.2	3
44IW0397	CA 7		Bristol Slip/Albany Glaze			30	3.4	1
44IW0397	CA 8		Bottle Glass	Aqua	Blown in mold	10	1.0	1
44IW0397	CA 8		Bottle Glass	Clear	Machine Molded	30	4.1	1
44IW0397	CA 8		Bottle Glass	Light Aqua	Blown in mold	20	2.3	1
44IW0397	CA 9		Brick				15422.1	
44IW0397	CA 9		Bottle Glass	Clear	Blown in mold	20	1.7	1
44IW0397	CA 9		Bottle Glass	Green	Machine Molded	25	1.7	1
44IW0397	CA 9		Terra Cotta	Sewage Pipe		75	130.1	1
44IW0397	CA 9		Whiteware			15	2.3	1
44IW0397	J1	B	Brick				15.6	
44IW0397	J1	B	Bottle Glass	Amber	Machine Molded	25	1.85	1
44IW0397	J1	B	Bottle Glass	Amber	Machine Molded	45	13.69	1
44IW0397	J1	B	Bottle Glass	Light Aqua	Machine Molded	5	0.1	1
44IW0397	J2	A	Iron Nail	Cut	Machine Headed	6.6	12.99	1
44IW0397	T3-10	A	Bottle Glass	Clear	Blown in mold	20	1.7	1
44IW0397	T3-10 RS	A	Bottle Glass	Clear	Machine Molded	60	29.7	1
44IW0397	T3-10 RS	A	Bottle Glass	Clear		10	0.4	4
44IW0397	T3-10 RW		Brick				36.1	
44IW0397	T3-10 RW	A	Bottle Glass	Clear	Machine Molded	50	35.66	1
44IW0397	T3-3	A	Flat Glass	Light Aqua		15	2.19	3
44IW0397	T3-3	A	Ironstone			25	2.37	1
44IW0397	T3-5	A	Bottle Glass	Clear	Machine Molded	10-20	1.8	2
44IW0397	T3-5	A	Bottle Glass	Clear	Machine Molded	25	2.3	1
44IW0397	T3-5	A	Bottle Glass	Clear	Blown in mold	35	5.5	1
44IW0397	T3-5	A	Bottle Glass	Amber	Machine Molded	45	4.1	1
44IW0397	T3-5	A	Secondary Flake	Quartz		15	0.8	1
44IW0397	T3-5	A	Iron Nail	Unidentified		40	6.8	1
44IW0397	T3-5 RW	A	Bottle Glass	Aqua	Machine Molded	15	0.68	1
44IW0397	T3-5 RW	A	Bottle Glass	Clear	Machine Molded	10-35	17.62	11
44IW0397	T3-5 RW	A	Iron Nail	Wire		2.9	1.68	1
44IW0398	CA 13		Brick				199.6	
44IW0398	CA 13		Bottle Glass	Amber	Machine Molded	30	5.65	1
44IW0398	CA 13		Bottle Glass	Clear	Machine Molded	15-20	1.65	2
44IW0398	CA 13		Bottle Glass	Clear	Blown in mold	25	4.3	1
44IW0398	CA 13		Ironstone			30	6.7	1
44IW0398	CA 14		Brick				45.4	
44IW0398	CA 14		Bottle Glass	Purple (Solarized)	Machine Molded	15-20	2.76	2
44IW0398	CA 15		Brick				45.4	
44IW0398	CA 15		Whiteware			15	0.49	1
44IW0398	CA 16		Brick				45.4	
44IW0398	CA 17		Iron Other	Sheet Fragment		30-40	10.36	2
44IW0398	CA 18		Brick				90.7	
44IW0398	CA 19		Brick				45.4	
44IW0398	CA 19		Bottle Glass	Cobalt Blue	Blown in mold	15	1.04	1
44IW0398	CA 20		Brick				181.4	
44IW0398	CA 20		Bottle Glass	Cobalt Blue	Blown in mold	20	1.62	1
44IW0398	CA 20		Porcelain, unknown			20	0.72	1
44IW0398	CA 21		Brick				453.6	
44IW0398	CA 21		Iron Other	Plow Blade Fragment		55-100	142.29	2
44IW0398	CA 22		Brick				4354.5	
44IW0398	CA 22		Vessel Glass	Clear	Machine Molded	60	34.0	1
44IW0398	CA 22		Porcelain, Modern			40	6.95	1
44IW0398	CA 23		Brick				3719.5	
44IW0398	CA 23		Iron Other	Rake Tooth		90	124.59	1
44IW0398	CA 23		Bristol Slip/Albany Glaze			45	17.71	1
44IW0398	CA 24		Brick				166.0	
44IW0398	CA 25		Brick				239.4	
44IW0398	CA 26		Brick				120.0	
44IW0398	CA 27		Brick				75.7	
44IW0398	CA 27		Bottle Glass	Purple (Solarized)	Blown in mold	30	12.86	1
44IW0398	CA 27		Ironstone			30	3.34	1
44IW0398	CA 28		Brick				3.1	
44IW0398	CA 28		Bottle Glass	Purple (Solarized)	Machine Molded	20	1.74	1
44IW0398	CA 29		Brick				67.2	

44IW0398	CA 30	Brick					4904.5	
44IW0398	CA 30	Bottle Glass	Amber	Blown in mold	25		3.11	1
44IW0398	CA 30	Iron Nail	Unidentified			2.5	2.8	1
44IW0398	CA 31	Brick					4167.4	
44IW0398	CA 31	Iron Other	Plow Blade Fragment		75		80.27	1
44IW0398	CA 31	Bristol Slip/Albany Glaze			35		9.04	1
44IW0398	CA 32	Brick					2126.2	
44IW0398	CA 33	Brick					223.4	
44IW0398	CA 34	Iron Other	Disk		30		12.08	1
44IW0398	CA 35	Brick					19.3	
44IW0398	CA 35	Bottle Glass	Purple (Solarized)	Machine Molded	25		2.07	1
44IW0398	CA 35	Bottle Glass	Light Aqua	Machine Molded	25		2.64	1
44IW0398	CA 35	Whiteware			20-40		10.86	3
44IW0398	CA 35	European Hard Paste Porcleain			30		3.08	1
44IW0398	CA 36	Brick					1240.8	
44IW0398	CA 36	Melted Glass	Clear		10		0.27	1
44IW0398	CA 36	Bottle Glass	Light Aqua	Blown in mold	15		1.36	1
44IW0398	CA 36	Bottle Glass	Purple (Solarized)	Blown in mold	30		4.21	1
44IW0398	CA 36	Iron Other	Plow Blade Fragment		35-45		27.35	2
44IW0398	CA 36	Ironstone			35		4.19	1
44IW0398	CA 36	Porcelain, Modern			40		8.78	1
44IW0398	CA 37	Brick					506.9	
44IW0398	CA 37	Ironstone			35		4.46	1
44IW0398	CA 38	Brick					2636.5	
44IW0398	CA 38	Coal					0.72	2
44IW0398	CA 38	Whiteware			25		2.17	1
44IW0398	CA 39	Brick					1125.5	
44IW0398	CA 39	Iron Other	Plow Blade Fragment		60		43.24	1
44IW0398	CA 40	Brick					17.6	
44IW0398	CA 40	Bottle Glass	Amber	Blown in mold	25		2.63	1
44IW0398	CA 41	Brick					9.2	
44IW0398	CA 41	Melted Glass	Clear		25		2.69	1
44IW0398	CA 41	Iron Other	Plow Blade Fragment		135		281.79	1
44IW0398	CA 42	Brick					82.8	
44IW0398	CA 42	Bottle Glass	Cobalt Blue	Machine Molded	10		0.78	1
44IW0398	CA 43	Bottle Glass	Purple (Solarized)	Machine Molded	30		3.47	1
44IW0398	CA 43	Whiteware			20		0.95	1
44IW0398	CA 44	Bottle Glass	Light Aqua	Machine Molded	15-25		3.05	2
44IW0398	CA 45	Brick					6.3	
44IW0398	CA 45	Bottle Glass	Light Aqua	Machine Molded	25		1.89	1
44IW0398	CA 46	Brick					44.6	
44IW0398	CA 46	Iron Other	Plow Part			17.5	599.29	1
44IW0398	CA 47	Ironstone			15		0.9	1
44IW0398	CA 48	Brick					37.8	
44IW0398	CA 49	Brick					49.4	
44IW0398	CA 49	Bottle Glass	Purple (Solarized)	Machine Molded	25		2.28	1
44IW0398	CA 49	Iron Other	Wire			20.2	48.79	1
44IW0398	CA 49	Ironstone			25		1.84	1
44IW0398	CA 50	Brick					57.1	
44IW0398	CA 50	Bottle Glass	Purple (Solarized)	Blown in mold	25		2.37	1
44IW0398	CA 50	Iron Other	Plow Blade Fragment		45		12.35	1
44IW0398	CA 51	Brick					16.4	
44IW0398	CA 51	Ironstone			25		4.42	1
44IW0398	CA 52	Brick					27.1	
44IW0398	CA 52	Whiteware			15		0.54	1
44IW0398	CA 52	Ironstone			20		0.85	1
44IW0398	CA 53	Brick					238.0	
44IW0398	CA 53	Bottle Glass	Yellow	Blown in mold	30		3.21	1
44IW0398	CA 53	Bottle Glass	Purple (Solarized)	Machine Molded	25		1.82	1
44IW0398	CA 53	Bottle Glass	Light Aqua	Blown in mold	20-35		9.77	3
44IW0398	CA 53	Porcelain	Animal Figurine		40		11.62	1
44IW0398	CA 53	Whiteware			20		2.73	1
44IW0398	CA 53	Whiteware			35		2.95	1
44IW0398	CA 54	Brick					44.5	
44IW0398	CA 54	Bottle Glass	Light Aqua	Blown in mold	25		4.54	2
44IW0398	CA 54	Bottle Glass	Amber	Machine Molded	15		1.36	1
44IW0398	CA 54	Bottle Glass	Dark Green	Blown in mold	40		7.87	1
44IW0398	CA 54	Bottle Glass	Purple (Solarized)	Machine Molded	30		1.48	1

44IW0398	CA 54	Bottle Glass	Purple (Solarized)	Blown in mold	30	25.63	1
44IW0398	CA 54	Bristol Slip/Albany Glaze			40	6.46	1
44IW0398	CA 54	Ironstone			30	5.76	1
44IW0398	CA 55	Brick				1.6	
44IW0398	CA 55	Iron Other	Plow Park		85	87.43	1
44IW0398	CA 55	Ironstone			30	2.14	1
44IW0398	CA 56	Brick				15.8	
44IW0398	CA 56	Bottle Glass	Light Aqua	Blown in mold	10	0.15	1
44IW0398	CA 56	Bottle Glass	Dark Green	Blown in mold	30	4.08	1
44IW0398	CA 56	Ironstone			15-30	3.8	2
44IW0398	CA 57	Brick				7.5	
44IW0398	CA 57	Whiteware			30	7.04	1
44IW0398	CA 57	Bristol Slip/Albany Glaze			45	17.39	1
44IW0398	CA 58	Brick				14.2	
44IW0398	CA 59	Bottle Glass	Purple (Solarized)	Machine Molded	30	3.32	1
44IW0398	CA 59	Bottle Glass	Clear	Machine Molded	30	4.0	1
44IW0398	CA 59	Bottle Glass	Light Aqua	Machine Molded	15	1.4	1
44IW0398	CA 60	Brick				59.8	
44IW0398	CA 60	Bottle Glass	Cobalt Blue	Blown in mold	15	0.6	1
44IW0398	CA 60	Bottle Glass	Light Aqua	Blown in mold	20	1.1	1
44IW0398	CA 60	Terra Cotta	Sewage Pipe		45-60	251.6	5
44IW0398	CA 60	Ironstone			15-35	15.5	4
44IW0398	CA 60	Whiteware			10	1.5	2
44IW0398	CA 61	Brick				139.8	
44IW0398	CA 61	Flat Glass	Clear		20	0.8	1
44IW0398	CA 61	Bottle Glass	Light Aqua	Blown in mold	20-10	4.2	4
44IW0398	CA 61	Bottle Glass	Light Aqua	Blown in mold	20	2.9	1
44IW0398	CA 61	Bottle Glass	Light Aqua	Blown in mold	25	2.2	1
44IW0398	CA 61	Bottle Glass	Cobalt Blue	Blown in mold	15	1.1	1
44IW0398	CA 61	Bottle Glass	Purple (Solarized)	Blown in mold	10-30	4.6	3
44IW0398	CA 61	Bottle Glass	Purple (Solarized)	Blown in mold	20	1.2	1
44IW0398	CA 61	Bottle Glass	Purple (Solarized)	Machine Molded	25	4.4	1
44IW0398	CA 61	Bottle Glass	Purple (Solarized)	Machine Molded	25	2.8	1
44IW0398	CA 61	Button	Four Hole	Prosser Pressed	15	1.2	1
44IW0398	CA 61	Terra Cotta	Sewage Pipe		40-20	24.0	2
44IW0398	CA 61	Whiteware			20	5.2	2
44IW0398	CA 61	Ironstone			25-20	14.7	3
44IW0398	CA 61	Bristol Slip/Albany Glaze			20-45	15.7	2
44IW0398	CA 61	European Hard Paste Porcleain			20	1.8	1
44IW0398	CA 61	Whiteware			25-10	2.2	2
44IW0398	CA 62	Brick				369.3	
44IW0398	CA 62	Bottle Glass	Purple (Solarized)	Blown in mold	15-25	5.9	6
44IW0398	CA 62	Bottle Glass	Purple (Solarized)	Machine Molded	15-30	17.1	5
44IW0398	CA 62	Bottle Glass	Purple (Solarized)	Blown in mold	25	4.4	1
44IW0398	CA 62	Bottle Glass	Purple (Solarized)	Blown in mold	30	10.1	1
44IW0398	CA 62	Bottle Glass	Clear	Blown in mold	20	3.1	1
44IW0398	CA 62	Bottle Glass	Amber		20	0.5	1
44IW0398	CA 62	Bottle Glass	Dark Green	Blown in mold	25	22.0	1
44IW0398	CA 62	Bottle Glass	Dark Green	Blown in mold	20	5.3	1
44IW0398	CA 62	Bottle Glass	Light Aqua		15	4.0	2
44IW0398	CA 62	Bottle Glass	Light Aqua		25-15	3.6	2
44IW0398	CA 62	Bottle Glass	Light Aqua	Machine Molded	15-25	5.9	4
44IW0398	CA 62	Bottle Glass	Light Aqua	Blown in mold	30-20	26.2	5
44IW0398	CA 62	Bottle Glass	Aqua	Blown in mold	35-60	46.7	2
44IW0398	CA 62	Bottle Glass	Light Aqua	Blown in mold	25	1.1	1
44IW0398	CA 62	Bottle Glass	Clear	Blown in mold	10-20	0.6	2
44IW0398	CA 62	Marine Shell			20	1.7	1
44IW0398	CA 62	Whiteware			35-20	10.4	3
44IW0398	CA 62	Ironstone			20	1.6	1
44IW0398	CA 62	Ironstone			50-15	28.4	11
44IW0398	CA 62	Ironstone			40-30	17.9	2
44IW0398	CA 62	Refined Earthenware			20	3.0	1
44IW0398	CA 62	Whiteware	Transfer Printed	Brown	15-20	3.0	2
44IW0398	CA 62	Whiteware			15-30	27.5	8
44IW0398	CA 62	Ironstone	Transfer Printed	Blue	30	9.3	1
44IW0398	CA 62	Bristol Slip/Albany Glaze			20-40	25.3	3
44IW0398	CA 62	Whiteware	ustrial Ware (Anular and Moc	Light Blue	20	1.5	1
44IW0398	CA 62	Whiteware			30-35	14.9	4

44IW0398	CA 63	Brick				803.2	
44IW0398	CA 63	Flat Glass	Clear		25-10	4.1	3
44IW0398	CA 63	Bottle Glass	Aqua	Blown in mold	55	18.4	1
44IW0398	CA 63	Bottle Glass	Light Aqua	Blown in mold	25-10	4.5	3
44IW0398	CA 63	Bottle Glass	Light Aqua	Blown in mold	15	2.1	1
44IW0398	CA 63	Bottle Glass	White (Milky)	Machine Molded	20	3.0	2
44IW0398	CA 63	Bottle Glass	Clear	Blown in mold	35	7.9	1
44IW0398	CA 63	Bottle Glass	Clear	Machine Molded	15-25	4.7	4
44IW0398	CA 63	Bottle Glass	Purple (Solarized)	Blown in mold	30	2.2	1
44IW0398	CA 63	Bottle Glass	Purple (Solarized)	Blown in mold	45-15	22.2	7
44IW0398	CA 63	Bottle Glass	Blue	Blown in mold	20	1.9	1
44IW0398	CA 63	Bottle Glass	Cobalt Blue	Blown in mold	20	0.8	1
44IW0398	CA 63	Bottle Glass	Cobalt Blue	Blown in mold	20	1.9	1
44IW0398	CA 63	Bottle Glass	Amber	Blown in mold	20	1.0	1
44IW0398	CA 63	Flat Glass	Dark Green	Blown in mold	15	2.7	1
44IW0398	CA 63	Button	Four Hole	Prosser Pressed	10	1.4	1
44IW0398	CA 63	Porcelain	Figurine, Hand		15	1.1	1
44IW0398	CA 63	Iron Other	Rake Tooth		45	15.4	1
44IW0398	CA 63	Whiteware			15-20	2.4	2
44IW0398	CA 63	Bristol Slip/Albany Glaze			35	6.8	1
44IW0398	CA 63	Bristol Slip/Albany Glaze			25	6.6	1
44IW0398	CA 63	Whiteware	ustrial Ware (Anular and Moc	blue	20	0.7	1
44IW0398	CA 63	Ironstone			30-15	15.7	5
44IW0398	CA 63	Ironstone			45	17.8	1
44IW0398	CA 63	Whiteware			15	0.5	1
44IW0398	CA 63	Whiteware			10-35	21.5	12
44IW0398	CA 63	Whiteware			35-20	5.6	2
44IW0398	CA 63	Whiteware			15	1.0	1
44IW0398	CA 63	Whiteware			15-20	9.3	3
44IW0398	CA 63	American Salt Glazed			25	6.3	1
44IW0398	CA 63	Bristol Slip/Albany Glaze			25	7.5	1
44IW0398	CA 63	Ironstone			20	4.7	2
44IW0398	CA 64	Brick				667.2	
44IW0398	CA 64	Vessel Glass	Purple (Solarized)	Machine Molded	30	7.5	1
44IW0398	CA 64	Bottle Glass	Purple (Solarized)	Blown in mold	45	33.6	1
44IW0398	CA 64	Bottle Glass	Purple (Solarized)		35	7.1	1
44IW0398	CA 64	Bottle Glass	Purple (Solarized)	Blown in mold	15-20	4.9	3
44IW0398	CA 64	Bottle Glass	Purple (Solarized)	Machine Molded	25	2.9	1
44IW0398	CA 64	Bottle Glass	Clear	Machine Molded	20	0.9	1
44IW0398	CA 64	Bottle Glass	Cobalt Blue	Blown in mold	30-10	2.4	1
44IW0398	CA 64	Bottle Glass	Light Aqua	Machine Molded	20	3.4	1
44IW0398	CA 64	Bottle Glass	Amber	Blown in mold	30	3.5	1
44IW0398	CA 64	Iron Other	Metal Fragment		25	12.1	1
44IW0398	CA 64	Iron Nail	Unidentified		45	10.5	1
44IW0398	CA 64	Whiteware			25	3.7	1
44IW0398	CA 64	Bristol Slip/Albany Glaze			30	5.0	1
44IW0398	CA 64	Ironstone			15	1.1	1
44IW0398	CA 64	Whiteware			15	0.6	1
44IW0398	CA 64	Whiteware			20-30	15.5	3
44IW0398	CA 64	Ironstone			15-30	16.8	1
44IW0398	CA 64	Ironstone			30	2.6	1
44IW0398	CA 65	Bottle Glass	White (Milky)	Machine Molded	40	19.9	1
44IW0398	CA 65	Bottle Glass	White (Milky)	Machine Molded	20	1.6	1
44IW0398	CA 65	Bottle Glass	Cobalt Blue	Machine Molded	20	1.9	1
44IW0398	CA 65	Bottle Glass	Light Aqua	Blown in mold	25-35	9.8	2
44IW0398	CA 65	Iron Other	Plow Tooth		90-50	151.4	3
44IW0398	CA 65	Ironstone			25	3.1	1
44IW0398	CA 65	Ironstone			20	3.4	2
44IW0398	CA 65	Whiteware			20	5.5	2
44IW0398	CA 65	Whiteware			25-30	13.5	2
44IW0398	CA 65	Refined Earthenware			20	1.2	1
44IW0398	CA 65	Bristol Slip/Albany Glaze			35-40	15.7	2
44IW0398	CA 66	Brick				127.9	
44IW0398	CA 67	Brick				41.2	
44IW0398	CA 67	Bottle Glass	Cobalt Blue	Blown in mold	15	0.8	1
44IW0398	CA 67	Iron Other	Plow Blade		100	278.7	1
44IW0398	CA 68	Brick				88.7	
44IW0398	CA 68	Iron Other	Stake		110	75.9	1

44IW0398	CA 68	Whiteware			25	2.5	1
44IW0398	CA 69	Flat Glass	Light Aqua		15	1.3	1
44IW0398	CA 69	Terra Cotta	Sewage Pipe		15	3.5	1
44IW0398	CA 70	Brick				27.4	
44IW0398	CA 70	Bottle Glass	Purple (Solarized)	Blown in mold	40	14.76	1
44IW0398	CA 70	Iron Other	Plow Blade Fragment			70	1
44IW0398	CA 70	Rockingham			15	0.38	1
44IW0398	CA 70	Earthenware			25	1.64	1
44IW0398	CA 71	Brick				13.4	
44IW0398	CA 71	Bottle Glass	Purple (Solarized)	Blown in mold	30	5.17	1
44IW0398	CA 71	Flat Glass	Light Aqua		20	1.08	1
44IW0398	CA 71	Terracotta	Sewer Pipe		30	3.58	1
44IW0398	CA 71	Iron Other	Plow Blade Fragment		40	14.5	1
44IW0398	CA 71	Whiteware			30	3.24	1
44IW0398	CA 71	Whiteware			30	8.19	1
44IW0398	CA 72	Brick				49.0	
44IW0398	CA 72	Bottle Glass	Purple (Solarized)	Blown in mold	10-40	13.94	5
44IW0398	CA 72	Vessel Glass	Purple (Solarized)	Machine Molded	15	0.78	1
44IW0398	CA 72	Flat Glass	Light Aqua		20	1.0	1
44IW0398	CA 72	Terracotta	Sewer Pipe		50-65	158.13	5
44IW0398	CA 72	Porcelain, Modern			10-5	1.88	2
44IW0398	CA 72	Whiteware			15	0.66	1
44IW0398	CA 72	Ironstone			45	21.72	2
44IW0398	CA 72	Ironstone			25-30	9.43	2
44IW0398	CA 73	Brick				720.5	
44IW0398	CA 73	Melted Glass	White (Milky)		25	5.31	1
44IW0398	CA 73	Lid	White (Milky)	Machine Molded	15	0.85	1
44IW0398	CA 73	Bottle Glass	Amber	Blown in mold	15-25	4.91	3
44IW0398	CA 73	Bottle Glass	Cobalt Blue	Blown in mold	20-25	3.86	2
44IW0398	CA 73	Bottle Glass	Purple (Solarized)	Blown in mold	45	26.99	1
44IW0398	CA 73	Bottle Glass	Purple (Solarized)	Blown in mold	10-50	30.19	14
44IW0398	CA 73	Bottle Glass	Purple (Solarized)	Blown in mold	25	3.64	1
44IW0398	CA 73	Bottle Glass	Light Aqua	Blown in mold	25-30	28.57	2
44IW0398	CA 73	Bottle Glass	Light Aqua	Blown in mold	20-35	15.59	5
44IW0398	CA 73	Flat Glass	Light Aqua		10-25	4.29	6
44IW0398	CA 73	Button	Four Hole	Prosser Pressed	10	0.33	1
44IW0398	CA 73	Slate	Slate Fragment		20	0.91	1
44IW0398	CA 73	Salt Glazed Stoneware	Sewer Pipe		55-65	98.82	2
44IW0398	CA 73	Iron Other	Plow Blade Fragment		35-60	71.24	2
44IW0398	CA 73	Bristol Slip/Albany Glaze			20-55	78.54	10
44IW0398	CA 73	Whiteware			15-20	2.32	2
44IW0398	CA 73	Ironstone			25-40	20.85	4
44IW0398	CA 73	Ironstone			20	1.77	1
44IW0398	CA 73	Ironstone			15-40	15.7	4
44IW0398	CA 73	Ironstone			10-55	55.5	11
44IW0398	CA 73	Rockingham			40	11.12	1
44IW0398	CA 73	Earthenware			40	7.68	1
44IW0398	CA 74	Brick				1036.6	
44IW0398	CA 74	Lid	White (Milky)	Machine Molded	30	3.8	1
44IW0398	CA 74	Bottle Glass	Amber	Machine Molded	20	0.85	1
44IW0398	CA 74	Bottle Glass	Yellow	Blown in mold	35	3.63	1
44IW0398	CA 74	Bottle Glass	Cobalt Blue		10	1.65	3
44IW0398	CA 74	Bottle Glass	Purple (Solarized)	Blown in mold	15-40	49.62	12
44IW0398	CA 74	Bottle Glass	Purple (Solarized)	Blown in mold	25	3.63	1
44IW0398	CA 74	Flat Glass	Light Aqua		15-30	19.47	17
44IW0398	CA 74	Bottle Glass	Light Aqua	Blown in mold	10-35	34.75	17
44IW0398	CA 74	Bottle Glass	Clear	Machine Molded	35-40	8.22	2
44IW0398	CA 74	Button	Four Hole	Prosser Pressed	15	0.69	1
44IW0398	CA 74	Button	Four Hole	Prosser Pressed	15	0.97	1
44IW0398	CA 74	Coal				7.92	2
44IW0398	CA 74	Terracotta	Sewer Pipe		20-50	45.15	4
44IW0398	CA 74	Porcelain	Insulator		55	48.86	1
44IW0398	CA 74	Iron Other	Plow Blade Fragment		60	57.29	1
44IW0398	CA 74	American Salt Glazed			40	14.34	1
44IW0398	CA 74	Bristol Slip/Albany Glaze			20-40	25.72	5
44IW0398	CA 74	Whiteware			50	23.94	1
44IW0398	CA 74	Whiteware			15-25	13.86	8
44IW0398	CA 74	Whiteware			15-40	15.07	5

44IW0398	CA 74	Whiteware			20-25	6.4	2
44IW0398	CA 74	Whiteware			35	7.32	1
44IW0398	CA 74	Ironstone			50	22.90	1
44IW0398	CA 74	Ironstone			20-30	9.23	3
44IW0398	CA 74	Ironstone			15-40	33.09	7
44IW0398	CA 74	European Hard Paste Porcleain			15-35	5.6	2
44IW0398	CA 74	European Hard Paste Porcleain			35	9.02	1
44IW0398	CA 74	Victorian Majolica	Hand Painted	Blue	40	8.98	1
44IW0398	CA 75	Brick				148.0	
44IW0398	CA 75	Bottle Glass	Cobalt Blue	Blown in mold	20	0.31	1
44IW0398	CA 75	Bottle Glass	Purple (Solarized)	Blown in mold	20-25	5.13	2
44IW0398	CA 75	Flat Glass	Light Aqua		10-25	3.06	4
44IW0398	CA 75	Bottle Glass	Light Aqua	Blown in mold	25-30	7.21	3
44IW0398	CA 75	Bottle Glass	Light Aqua	Blown in mold	25	2.94	1
44IW0398	CA 75	Terracotta	Sewer Pipe		35-65	80.33	3
44IW0398	CA 75	Iron Other	Plow Blade Fragment		65	59.07	1
44IW0398	CA 75	Bristol Slip/Albany Glaze			50	16.92	1
44IW0398	CA 75	Bristol Slip/Albany Glaze			40	9.2	1
44IW0398	CA 75	Rockingham			15	1.11	1
44IW0398	CA 75	Earthenware			20	1.54	1
44IW0398	CA 75	Whiteware			\20-30	12.14	5
44IW0398	CA 75	Ironstone			15-25	2.04	2
44IW0398	CA 76	Brick				478.4	
44IW0398	CA 76	Bottle Glass	Cobalt Blue	Machine Molded	10-15	1.0	2
44IW0398	CA 76	Bottle Glass	Amber	Blown in mold	10-20	1.95	2
44IW0398	CA 76	Bottle Glass	Light Aqua	Blown in mold	15-35	7.46	4
44IW0398	CA 76	Iron Other	Fragment		30-55	34.11	2
44IW0398	CA 76	Bristol Slip/Albany Glaze			25-30	8.54	2
44IW0398	CA 76	Bristol Slip/Albany Glaze			45	15.87	1
44IW0398	CA 76	Whiteware			35	4.14	1
44IW0398	CA 76	Ironstone			35	5.77	1
44IW0398	CA 77	Brick				51.7	
44IW0398	CA 77	Bottle Glass	Purple (Solarized)	Machine Molded	25	1.48	1
44IW0398	CA 77	Bottle Glass	Light Aqua	Blown in mold	15	0.68	1
44IW0398	CA 77	Bottle Glass	Light Aqua	Blown in mold	30	7.34	1
44IW0398	CA 77	Bristol Slip/Albany Glaze			30-40	33.34	4
44IW0398	CA 77	Whiteware			15-35	19.42	7
44IW0398	CA 78	Brick				0.7	
44IW0398	CA 78	Bottle Glass	Purple (Solarized)	Machine Molded	25	1.6	1
44IW0398	CA 78	Flat Glass	Light Aqua		20	0.65	1
44IW0398	CA 78	Iron Other	Bar Fragment		6.1	22.88	1
44IW0398	CA 78	Bristol Slip/Albany Glaze			35	12.13	1
44IW0398	CA 78	Ironstone			40	8.53	1
44IW0398	CA 79	Flat Glass	Light Aqua		25	1.64	1
44IW0398	CA 79	Ironstone			20	1.39	1
44IW0398	CA 80	Brick				6.3	
44IW0398	CA 80	Bottle Glass	Dark Green	Blown in mold	25	2.8	1
44IW0398	CA 80	Terra Cotta	Sewage Pipe		45	47.6	1
44IW0398	CA 80	Iron Other	Stake		80	87.5	1
44IW0398	CA 80	Bristol Slip/Albany Glaze			20	8.7	1
44IW0398	CA 81	Brick				27.2	
44IW0398	CA 81	Bottle Glass	Clear		10	0.6	1
44IW0398	CA 81	European Hard Paste Porcleain			20	1.4	1
44IW0398	CA 82	Brick				210.0	
44IW0398	CA 82	Bottle Glass	Light Aqua	Blown in mold	25	1.9	1
44IW0398	CA 82	Bottle Glass	Purple (Solarized)	Blown in mold	15	1.6	1
44IW0398	CA 82	Tooth	Other Mammal		15	3.3	1
44IW0398	CA 82	Ironstone			60	15.8	1
44IW0398	CA 83	Brick				351.5	
44IW0398	CA 83	Bottle Glass	Purple (Solarized)	Blown in mold	25	1.51	1
44IW0398	CA 83	Bottle Glass	Amber	Blown in mold	20	2.12	2
44IW0398	CA 83	European Hard Paste Porcleain	Decal	Pink, Green	20-40	5.02	2
44IW0398	CA 83	Ironstone			15-20	3.21	2
44IW0398	CA 84	Brick				410.4	
44IW0398	CA 84	Bottle Glass	Amber	Blown in mold	20	1.9	1
44IW0398	CA 84	Bottle Glass	Clear	Blown in mold	20-30	12.0	2
44IW0398	CA 84	Bottle Glass	Aqua	Blown in mold	35	7.1	1
44IW0398	CA 84	Bottle Glass	Purple (Solarized)	Blown in mold	30-10	8.8	4

44IW0398	CA 84	Bottle Glass	Purple (Solarized)	Blown in mold	50	13.1	1
44IW0398	CA 84	Bottle Glass	Light Aqua	Blown in mold	35-10	19.8	9
44IW0398	CA 84	Porcelain	Figurine Part		15	0.9	1
44IW0398	CA 84	Iron Other	Metal Fragments		50-35	231.9	3
44IW0398	CA 84	Whiteware			15-20	1.9	2
44IW0398	CA 84	Bristol Slip/Albany Glaze			35	15.2	1
44IW0398	CA 84	European Hard Paste Porcleain			25	2.6	1
44IW0398	CA 84	Whiteware			15	0.7	1
44IW0398	CA 84	Ironstone			55	20.1	1
44IW0398	CA 84	Ironstone			15-25	10.7	4
44IW0398	CA 84	Bristol Slip/Albany Glaze			45-50	25.8	2
44IW0398	CA 85	Brick				1260.0	
44IW0398	CA 85	Bottle Glass	Purple (Solarized)	Blown in mold	20	3.8	2
44IW0398	CA 85	Flat Glass	Purple (Solarized)	Blown in mold	25	6.5	1
44IW0398	CA 85	Bottle Glass	Purple (Solarized)	Machine Molded	20	1.7	1
44IW0398	CA 85	Bottle Glass	Light Aqua	Blown in mold	25	2.2	1
44IW0398	CA 85	Bottle Glass	Light Aqua	Machine Molded	35	6.1	1
44IW0398	CA 85	Bottle Glass	Light Aqua	Blown in mold	45	16.8	1
44IW0398	CA 85	Bottle Glass	White (Milky)	Machine Molded	20	1.0	1
44IW0398	CA 85	Bottle Glass	Light Aqua	Blown in mold	30-15	6.7	2
44IW0398	CA 85	Bottle Glass	Clear	Blown in mold	15	1.7	1
44IW0398	CA 85	Bottle Glass	Light Aqua	Blown in mold	15-20	4.2	4
44IW0398	CA 85	Bottle Glass	Clear	Machine Molded	15	1.4	1
44IW0398	CA 85	Button	Four Hole	Prosser Pressed	10	0.5	1
44IW0398	CA 85	Terra Cotta	Sewage Pipe		45	36.2	1
44IW0398	CA 85	Clay	Marble		10	2.9	1
44IW0398	CA 85	Terra Cotta	Sewage Pipe		50	28.9	1
44IW0398	CA 85	Iron Other	Plow Tooth		70	62.4	1
44IW0398	CA 85	Bristol Slip/Albany Glaze			40	20.9	1
44IW0398	CA 85	Bristol Slip/Albany Glaze			15-45	17.9	4
44IW0398	CA 85	Ironstone			20	3.5	2
44IW0398	CA 85	Whiteware			15-25	8.9	5
44IW0398	CA 86	Brick				325.2	
44IW0398	CA 86	Bottle Glass	Cobalt Blue		15-10	1.3	4
44IW0398	CA 86	Bottle Glass	Light Aqua	Blown in mold	20	1.6	1
44IW0398	CA 86	Bottle Glass	Purple (Solarized)	Machine Molded	15-20	3.6	2
44IW0398	CA 86	Bottle Glass	Purple (Solarized)	Blown in mold	25-30	4.2	2
44IW0398	CA 86	Bottle Glass	Purple (Solarized)		15	2.4	1
44IW0398	CA 86	Bottle Glass	Light Aqua	Blown in mold	25	4.5	1
44IW0398	CA 86	Bottle Glass	Clear		10	0.1	1
44IW0398	CA 86	Terra Cotta	Sewage Pipe		65	79.5	1
44IW0398	CA 86	Iron Other	Metal Fragment		75-30	155.6	3
44IW0398	CA 86	Bristol Slip/Albany Glaze			25	11.3	1
44IW0398	CA 86	European Hard Paste Porcleain			15-10	1.4	2
44IW0398	CA 86	Whiteware			25	6.1	1
44IW0398	CA 86	American Salt Glazed			25	10.9	1
44IW0398	CA 86	Whiteware			15	0.8	1
44IW0398	CA 87	Brick				462.9	
44IW0398	CA 87	Bottle Glass	Light Aqua	Blown in mold	25-35	10.5	3
44IW0398	CA 87	Bottle Glass	Purple (Solarized)	Blown in mold	40	9.0	1
44IW0398	CA 87	Bottle Glass	Amber	Blown in mold	45	14.9	1
44IW0398	CA 87	Projectile Point	Quartz		25	4.1	1
44IW0398	CA 87	Iron Other	Metal Fragment		35	7.4	1
44IW0398	CA 87	Whiteware			15-25	3.1	2
44IW0398	CA 87	Whiteware			25	3.4	1
44IW0398	CA 87	English Soft Paste Porcleain			15	0.4	1
44IW0398	CA 88	Brick				27.6	
44IW0398	CA 88	Bottle Glass	Clear	Blown in mold	15	1.3	1
44IW0398	CA 88	Bottle Glass	Purple (Solarized)	Blown in mold	25	9.1	1
44IW0398	CA 88	Bottle Glass	Cobalt Blue	Blown in mold	20	2.5	1
44IW0398	CA 88	Terra Cotta	Sewage Pipe		50	34.6	1
44IW0398	CA 89	Brick				27.6	
44IW0398	CA 89	Terra Cotta	Sewage Pipe		40-30	39.9	2
44IW0398	CA 90	Brick				148.7	
44IW0398	CA 90	Bottle Glass	Purple (Solarized)	Blown in mold	30	3.97	1
44IW0398	CA 90	Ironstone			30	3.31	1
44IW0398	CA 91	Brick				22.2	
44IW0398	CA 91	Bottle Glass	Purple (Solarized)	Machine Molded	25	2.13	1

44IW0398	CA 91		Yellowware			45		9.01	1
44IW0398	CA 92		Brick					61.8	
44IW0398	CA 92		Bottle Glass	Light Aqua	Blown in mold	20-30		3.34	2
44IW0398	CA 92		Ironstone			15-35		6.08	2
44IW0398	CA 92		Whiteware			20		2.39	2
44IW0398	CA 92		Bristol Slip/Albany Glaze			50		31.99	1
44IW0398	CA 93		Brick					9.2	
44IW0398	CA 93		Bottle Glass	Purple (Solarized)	Blown in mold	30		4.2	1
44IW0398	CA 93		Iron Other	Metal Fragment		50		21.6	1
44IW0398	CA 93		Iron Nail	Unidentified			25	4.4	1
44IW0398	CA 94		Brick					34.4	
44IW0398	CA 95		Bottle Glass	Light Aqua	Blown in mold	25		1.41	1
44IW0398	CA 95		Bottle Glass	Purple (Solarized)	Blown in mold	20		2.2	1
44IW0398	J12	A	Brick					6.5	
44IW0398	J13	A	Brick					4.3	
44IW0398	J3		Brick					51.5	
44IW0398	J5		Brick					5.0	
44IW0398	J5	A	Flat Glass	Light Aqua		15		0.53	1
44IW0398	J5	A	Bottle Glass	Light Aqua		10		0.21	1
44IW0398	J5	A	Bottle Glass	Clear	Machine Molded	25		1.33	1
44IW0398	J6	A	Brick					9.7	
44IW0398	J6	A	Flat Glass	Clear		10		0.4	2
44IW0398	J6	A	Bottle Glass	Clear		15		0.2	1
44IW0398	J6	A	Bottle Glass	Clear	Machine Molded	10		0.5	1
44IW0398	J6	A	Bottle Glass	Amber	Blown in mold	25		1.3	1
44IW0398	J6	A	Iron Other	Fragments		25-50		69.3	2
44IW0398	J6	A	Whiteware			15-10		0.6	2
44IW0398	J6	A	Ironstone			20		0.6	1
44IWI0399	T25-8	A	Bottle Glass	Amber	Machine Molded	55-60		44.5	2
44IWI0399	T25-8	A	Bottle Glass	Clear	Machine Molded	25-40		3.61	2
44IWI0399	T25-8	A	Bottle Glass	Light Green	Machine Molded	30		2.95	1
44IWI0399	T25-8 RN	A	Paper	Wallpaper		35-55		1.3	3
44IWI0399	T25-8 RN	A	Iron Nail	Wire			40-85	21.1	3
44IWI0399	T25-8 RN	A	Iron Nail	Unidentified			50	3.3	1
44IWI0399	T25-8 RS	A	Bottle Glass	Clear	Machine Molded	50		16.0	1
44IWI0399	T25-8 RS	A	Bottle Glass	Clear	Machine Molded	25		2.8	1
44IWI0399	T25-8 RS	A	Bottle Glass	Clear	Machine Molded	20-35		8.0	6
44IWI0399	T25-8 RS	A	Bottle Glass	Amber	Machine Molded	15		1.1	2
44IWI0399	T25-8 RS	A	Bottle Glass	Amber	Blown in mold	40		3.2	1
44IWI0399	T25-8 RS	A	Bottle Glass	Clear		10		0.2	2
44IWI0399	T25-8 RS	A	Iron Other	Fragments		10		1.9	3
44IWI0399	T25-8 RS	A	Iron Other	Wire		65-30		18.1	7
44IWI0399	T25-8 RS	A	Iron Other	Staple		25		3.1	1
44IWI0399	T25-8 RS	A	Iron Nail	Unidentified			25-40	3.9	2
44IWI0399	T26-7	A	Bottle Glass	Clear	Machine Molded	20-35		7.54	2
44IWI0399	T26-7	A	Bottle Glass	Clear	Machine Molded	40		9.15	1
44IWI0399	T26-7 RE	A	Brick					1.5	
44IWI0399	T26-7 RE	A	Bottle Glass	Clear	Machine Molded	40		10.1	1
44IWI0399	T26-7 RE	A	Bottle Glass	Clear	Machine Molded	40-20		17.1	8
44IWI0399	T26-7 RE	A	Bottle Glass	Clear	Blown in mold	20-30		6.5	4
44IWI0399	T26-7 RE	A	Iron Other	Wire		40-30		2.9	2
44IWI0399	T26-7 RE	A	Iron Nail	Unidentified			25-50	6.3	2
44IWI0399	T26-7 RS	A	Bottle Glass	Clear	Blown in mold	30-10		8.6	8
44IWI0399	T26-7 RS	A	Bottle Glass	Clear	Blown in mold	55		6.1	1
44IWI0399	T26-7 RS	A	Bottle Glass	Clear	Blown in mold	40		2.4	1
44IWI0399	T26-7 RS	A	Bottle Glass	White (Milky)	Machine Molded	15		0.1	1
44IWI0399	T26-7 RS	A	Iron Other	Metal Fragments		10-35		17.2	3
44IWI0399	T26-7 RS	A	Iron Other	Wire		50-30		3.3	2
44IWI0399	T26-7 RS	A	Iron Nail	Wire			55	3.6	1
44IWI0399	T26-7 RS	A	Iron Nail	Cut			40	2.6	1
44IWI0399	T26-7 RS	A	Iron Nail	Unidentified			10-55	25.7	15
44IWI0399	T26-7 RS	A	Whiteware	Hand Painted	Brown	20		1.2	1
44IWI0399	T26-8	A	Bottle Glass	Light Aqua	Blown in mold	30-20		4.4	2
44IWI0399	T26-8	A	Glass	Black Marble		10		3.1	1
44IWI0399	T26-8 RN		Brick					3.1	
44IWI0399	T26-8 RN	A	Bottle Glass	Clear	Machine Molded	10-25		1.2	3
44IWI0399	T26-8 RN	A	Bottle Glass	Amber	Blown in mold	15-30		12.8	6
44IWI0399	T26-8 RN	A	Iron Other	Fragment		30		3.9	1

44IWI0399	T26-8 RN	A	Iron Other	Wire		50-30	10.6	3
44IWI0399	T26-8 RN	A	Iron Nail	Unidentified		15-35	8.3	7
44IWI0399	T27-5	B	Bottle Glass	Clear	Machine Molded	60	19.8	1
44IWI0399	T27-5 RE	A	Bottle Glass	Clear	Blown in mold	20	0.9	1
44IWI0399	T27-5 RE	A	Bottle Glass	Clear	Machine Molded	25-10	1.9	2
44IWI0399	T27-5 RE	A	Bottle Glass	Clear	Machine Molded	15	0.5	1
44IWI0399	T27-5 RE	A	Bottle Glass	Clear	Blown in mold	25-20	10.0	4
44IWI0399	T27-5 RE	A	Iron Other	Wire		100	3.5	1
44IWI0399	T27-5 RE	A	Iron Other	Wire		60-30	4.6	2
44IWI0399	T27-5 RE	A	Iron Nail	Unidentified		25	0.8	1
44IWI0399	T27-5 RE	A	Iron Nail	Unidentified		45	3.4	1
44IWI0399	T27-5 RS	A	Bottle Glass	Clear	Machine Molded	20	0.77	1
44IWI0399	T27-5 RS	A	Iron Other	Wire		15.5	21.29	1
44IWI0399	T27-5 RS	A	Iron Nail	Unidentified		2.1-4.:	9.25	4
44IWI0399	T27-6	A	Bottle Glass	Clear	Machine Molded	35	4.82	1
44IWI0399	T27-6 RE	A	Bottle Glass	Clear	Blown in mold	30	4.3	1
44IWI0399	T27-6 RW	A	Bottle Glass	Amber	Blown in mold	25	2.0	1
44IWI0399	T27-6 RW	A	Bottle Glass	Clear	Machine Molded	55	4.7	1
44IWI0399	T27-6 RW	A	Iron Other	Metal Fragments		15	1.3	2
44IWI0399	T27-7	B	Bottle Glass	Amber	Machine Molded	15-25	2.0	2
44IWI0399	T27-7	B	Bottle Glass	Amber	Machine Molded	30	1.3	1
44IWI0399	T27-7	B	Bottle Glass	Clear	Machine Molded	35-10	5.8	1
44IWI0399	T27-7	B	Bottle Glass	Clear	Machine Molded	25	0.7	1
44IWI0399	T27-7	B	Bottle Glass	Clear	Machine Molded	25	1.2	1
44IWI0399	T27-7	B	Bottle Glass	Clear	Blown in mold	10-15	1.1	2
44IWI0399	T27-8	A	Bottle Glass	Clear	Machine Molded	20	1.8	1
44IWI0399	T27-9	A	Bottle Glass	Clear	Machine Molded	40	6.5	1
44IWI0399	T27-9 RE	A	Bottle Glass	Clear	Machine Molded	15-30	3.1	3
44IWI0399	T27-9 RE	A	Bottle Glass	Clear	Blown in mold	30	2.0	1
44IWI0399	T27-9 RE	A	Bottle Glass	Amber	Blown in mold	20-30	2.3	2
44IWI0399	T27-9 RE	A	Iron Other	Wire		70-35	21.6	9
44IWI0399	T27-9 RE	A	Iron Nail	Wire		60	5.4	1
44IWI0399	T27-9 RE	A	Iron Nail	Unidentified		10-35	3.3	4
	T22-10	A	Bottle Glass	Clear	Machine Molded	80	32.5	1
	T22-10	A	Bottle Glass	Clear	Machine Molded	10-45	34.0	6

1063

DWAYNE W. PICKETT, RPA
34 St Simons Dr.
Bluffton, SC 29910
Phone: (843) 422-5556
Email: dwayne.pickett@gmail.com

EDUCATION:

M.A. in Anthropology, The College of William & Mary

EMPLOYMENT:

2023-Present **Assistant Director of Cultural Resources**, *Hurt & Proffit, Lynchburg, VA*

- Plan, coordinate, and manage numerous archaeological projects.
- Successfully bid on archaeological projects by coming up with competitive budget proposals.
- Direct and organize field excavations as well as supervise archaeological technicians and Crew Chiefs.
- Compile background research in publishable format.
- Author detailed reports as well as proposals and marketing material.
- Coordinate with clients, landowners, and review agencies resulting in the timely completion of projects.

2007-Present **Director,** *Pickett Educational Resources LLC, Bluffton, SC*

- Develop, schedule, and teach educational programs for K-12 students and adults with museums, local schools and homeschool groups.
- Work with museums to create unique and insightful programs using real and replica artifacts.
- Prepare written lesson plans for teaching interdisciplinary history and archaeology courses as well as for educational DVDs.
- Write and present lectures for mainstream and academic audiences.
- Maintain website and conduct online marketing as well as use social media to promote educational DVDs that the company produced.
- Create proposals and cost-effective budgets for programs.

2002-2023 **Cultural Resource Specialist**, Self-Employed, Bluffton, SC

- Successfully bid on archaeological projects by coming up with competitive budget proposals.
- Direct and organize field excavations as well as supervise archaeological technicians and volunteers.
- Catalogue artifacts and prepared them for curation in accordance with federal standards set by the National Park Service's 36 CFR Part 79.
- Help local historical sites with identifying, cataloging and preserving collections including a letter by Thomas Jefferson valued at $700,000.
- Conduct historical research, author reports as well as give lectures.
- Coordinate efforts between multiple agencies and landowners resulting in assured cooperation and the timely completion of projects.

2000-2002 **Project Manager**, *TRC Garrow and Associates, Inc., Durham, NC*

- Team leader who arranged, organized and directed multiple archaeological projects.
- Complied information from various sources, wrote reports and proposals.
- Prepared artifacts for curation in accordance with federal standards.
- Presented research findings at professional conferences and to the public.

1998-2000 **Assistant Director**, *CHRS, Inc., North Wales, PA*

- Planned, coordinated, and managed numerous archaeological projects as a team leader.
- Complied background research in publishable format.
- Prepared artifacts for curation in accordance with federal standards set forth by the National Park Service's 36 CFR Part 79.
- Authored detailed reports as well as proposals and marketing material.
- Presented research findings at professional conferences and to the public.
- Coordinated with clients, landowners, and review agencies resulting in the timely completion of projects.

1993-1998 **Project Director**, *Colonial Williamsburg, Williamsburg, VA*

- Planned, organized and managed multiple archaeological projects.
- Conducted intensive historical research and wrote reports.
- Developed and lead educational programs.
- Cataloged and accessioned artifacts and prepared them for curation.
- Gave public and professional lectures.
- Taught advanced archaeological field school.

VOLUNTEER EXPERIENCE:

2013-2020 **Instructor**, *Osher Lifelong Learning Institute at University of South Carolina Beaufort, SC*

- Taught classes on 16th and 17th history of the southeastern United States and Beaufort County, South Carolina.
- Classes were based on two books that I have written or co-authored.

2018-2019 **President Board of Directors**, *Lowcountry Montessori, Beaufort, SC*

- Provided direction for achieving the school's mission statement.
- Served on Fundraising Committee.
- Strengthen programs and services to achieve academic goals.
- Evaluated performance of the Director.

MEMBERSHIPS:

Register of Professional Archaeologists (RPA)
Society for Historical Archaeology
National Trust for Historic Preservation

SELECT PUBLICATIONS:

Phase III Archaeological Excavation of the Mead's Tavern Basement (44CP0244), Campbell County, Virginia. Prepared for Liberty University, Lynchburg, Virginia. In progress.

Phase I Archaeological Survey of the Proposed Springfield Solar Site. Westmoreland County, Virginia. Prepared for Springfield Solar LLC, Charlottesville, Virginia. October 2021. Archaeological Survey of the Banister River, Pittsylvania County, Virginia. Prepared for the Virginia Department of Historic Resources, Richmond. September 2021.

Phase I Archaeological Survey of the Proposed Dry Bridge Energy Center, LLC Chesterfield County, Virginia. Prepared for Dry Bridge Energy, LLC Charlottesville, Virginia. January 2021.

Captain William Hilton and the Founding of Hilton Head Island. The History Press. July 1, 2019

Archaeological Survey in Advance of Construction Activities at the Morris Center for Lowcountry Heritage Ridgeland, South Carolina. Prepared for The Morris Center for Lowcountry Heritage. June 2018.

Going Green at Jamestown. *Dig Magazine*. July 1, 2014

The European Struggle to Settle North America: Colonizing Attempts by England, France and Spain, 1521-1608. McFarland. Feb 8, 2011

Pivotal Decisions in American History: Revolution or Resolution? Bacon's Rebellion in Virginia 1676. Educational DVD. © Pickett Educational Resources LLC. 2008

Meet Joan Peirce "an honest, industrious woman" Living History at Historic Jamestowne. Educational DVD. © Pickett Educational Resources LLC. 2007

Archaeological Excavations and Monitoring of Construction Activities at Historic Elk Landing, Elkton, Maryland. Aug. 2004.

Historical and Archaeological Research into the Entrance Avenue to Tryon Palace Historic Sites & Gardens New Bern, North Carolina. Tryon Palace research publication. Oct. 2003

Limited Archaeological Testing Within the Foundation of the Log Structure at Historic Elk Landing, Elkton Maryland. For the Historic Elk Landing Foundation, Inc. Oct. 2002.

Archaeological Survey and Testing at Historic Elk Landing, Elkton Maryland. For the Historic Elk Landing Foundation, Inc. Aug. 2002.

Maryland's War of 1812 Battlefield Sites: An Archaeological Assessment. *Maryland Humanities*. Sept 2001

Archaeology of the Tucker House Revisited: Recent Excavations of the Kitchen. *Bermuda Journal of Archaeology and Maritime History*. Volume 10. Oct. 1998

Phase III Data Recovery in Advance of Waterproofing Activities at Site 44YO755, the Thomas Pate House, Yorktown, Virginia. Department of Archaeological Research Publications, Colonial Williamsburg Foundation. Jan. 1998

The John Page House Site: An Example of the Increase in Domestic Brick Architecture in Seventeenth-Century Tidewater Virginia. Masters Thesis. Dec. 1996

Changing Landscapes: Recent Excavations at the John Page House Site. *The Colonial Williamsburg Interpreter*, volume 16 number 4, pages 9-13. Dec. 1995

CONFERENCE PAPERS:

"It was a busy bustling place": The Rise and Decline of Commerce at Elk Landing. Paper presented at the Society for Historical Archaeology conference, January 2003, Providence, Rhode Island.

Frenchtown to Elkton: Upland Investigations of the War of 1812 in Maryland. Paper presented at the Society for Historical Archaeology conference, January 2001, Long Beach California.

Mr. Madison's War: An Archaeological Assessment of Maryland's War of 1812 Battlefield Sites. Paper presented at the American Battlefield Protection Program conference, November 2000, Baltimore Maryland.

The John Page House Site: An Artifactual Analysis of a Colonial Chesapeake Home. Paper presented at the Society for Historical Archaeology Conference, January 1997, Corpus Christi, Texas.

The John Page House Site: 1996 Update. Paper presented at the Jamestown Conference, November 1996, Jamestown, Virginia.

Changing Landscapes: The Adoption of Brick Architecture in Seventeenth-Century Tidewater Virginia. Paper presented at the Society for Historical Archaeology Conference, January 1996, Cincinnati, Ohio.

Excavations at the John Page House Site. Paper presented at the Jamestown Conference, November 1995, Jamestown, Virginia.

COMMONWEALTH of VIRGINIA

Travis A. Voyles
Acting Secretary of Natural and Historic Resources

Department of Historic Resources
2801 Kensington Avenue, Richmond, Virginia 23221

Julie V. Langan
Director
Tel: (804) 367-2323
Fax: (804) 367-2391
www.dhr.virginia.gov

August 10, 2023

Melissa Schmidt
Hurt & Proffitt
2524 Langhorne Road
Lynchburg, VA 24501

RE: Courthouse Highway Solar
Isle of Wight County, VA
DHR File No. 2023-4205

Dear Ms. Schmidt:

DHR received for review two reports titled *A Reconnaissance Architecture Survey, Courthouse Highway Solar Site Isle of Wight County, Virginia*, and *Archaeological Survey, Courthouse Highway Solar Site Isle of Wight County, Virginia,* prepared by Hurt & Proffitt (H&P), on behalf of Courthouse Highway Solar 1, LLC. There is no indication in the submission that the applicant will apply to the Department of Environmental Quality for a Permit-by-Rule to construct and operate a small solar project or seek a Certificate of Public Convenience and Necessity (CPCN) from the Virginia State Corporation Commission (SCC). We provide the following comments as technical assistance to assess potential impacts to historic properties.

Archaeology

H&P submitted a phase I archaeological survey report to DHR for review. The archaeological survey identified three (3) previously unrecorded sites with nineteenth- and twentieth-century diagnostic materials, seven (7) isolated post-colonial historic artifact loci, and two isolated precolonial Native American artifacts. The isolated finds are not considered archaeological sites are not eligible for listing in the Virginia Landmarks Register (VLR) or the National Register of Historic Places (NRHP). A phase II evaluation is necessary for DHR to provide a formal recommendation of eligibility for an archaeological site. Therefore, there is insufficient information to evaluate the eligibility of sites 44IW0397, 44IW0398, and 44IW0399 for listing in the VLR and NRHP. However, DHR concurs with the consultant's recommendation that archaeological deposits with the APE associated with these resources do not appear to retain sufficient integrity to contribute significant information to the understanding of history. These deposits are unlikely to contribute to the overall eligibility of any of the identified archaeological sites. No additional archaeological investigations are recommended.

Architecture:
H&P submitted an architectural survey to DHR for review and this survey met DHR's QA/QC standards on July 11, 2023. The architectural survey included one (1) previously recorded resource and thirteen (13) newly identified resources within the area of potential effects (APE) for the project. None of the resources are recommended to be eligible for National Register of Historic Places (NRHP) and Virginia Landmarks Register (VLR) listing.

H&P recommends Wilson House (DHR ID # 046-0052) eligible for VLR/NRHP listing and it is DHR's opinion that the resource is potentially eligible and further survey is needed to formally determine the eligibility status. DHR recommends an intensive level survey, although this is likely outside the scope of this project. H&P recommends no adverse impact to 046-0052 and DHR concurs. Please see eligibility and impact details in the Architectural Table below.

If you have any questions or comments regarding the project in general or our review of this project, please do not hesitate to contact me via email at adrienne.birge-wilson@dhr.virginia.gov or via telephone at (804) 482-6092.

Sincerely,



Adrienne Birge-Wilson, Architectural Historian
Review and Compliance Division

Architectural Table

DHR ID #	Resource Name	H&P Eligibility	DHR Eligibility	H&P Impact	DHR Impact
046-0052	Wilson House	**Eligible**	**Potentially Eligible**	No Adverse	No Adverse Impact
046-5790	House	Not Eligible	Not Eligible	N/A	N/A
046-5791	House	Not Eligible	Not Eligible	N/A	N/A
046-5792	House	Not Eligible	Not Eligible	N/A	N/A
046-5793	House	Not Eligible	Not Eligible	N/A	N/A
046-5794	House	Not Eligible	Not Eligible	N/A	N/A
046-5795	House	Not Eligible	Not Eligible	N/A	N/A
046-5796	House	Not Eligible	Not Eligible	N/A	N/A
046-5797	House	Not Eligible	Not Eligible	N/A	N/A
046-5798	Farm	Not Eligible	Not Eligible	N/A	N/A
046-5799	House	Not Eligible	Not Eligible	N/A	N/A
046-5800	House	Not Eligible	Not Eligible	N/A	N/A
046-5801	House	Not Eligible	Not Eligible	N/A	N/A
046-5802	Barn	Not Eligible	Not Eligible	N/A	N/A

TABLE KEY:	Warrants Mitigation	Needs Attention	**DHR does not concur**

TABLE KEY:	Warrants Mitigation	Needs Attention	**DHR does not concur**

Western Region Office
962 Kime Lane
Salem, VA 24153
Tel: (540) 387-5443
Fax: (540) 387-5446

Northern Region Office
5357 Main Street
PO Box 519
Stephens City, VA 22655
Tel: (540) 868-7029
Fax: (540) 868-7033

Eastern Region Office
2801 Kensington Avenue
Richmond, VA 23221
Tel: (804) 367-2323
Fax: (804) 367-2391

COUNTY OF ISLE OF WIGHT

OFFICE OF THE COMMISSIONER OF THE REVENUE
Post Office Box 107
Isle of Wight, Virginia 23397
(757) 365-6222

Gerald H. Gwaltney
Commissioner of the Revenue

MEMORANDUM

TO: Trenton Blowe
Planner/Planning & Zoning

FROM: Gerald H. Gwaltney,
Commissioner of the Revenue

DATE: October 9, 2023

RE: **New Leaf Energy Courthouse Highway,**
Conditional Use Permit Application (CUP-03-23)
Tax Map/Parcel #39-01-017

I have reviewed the Conditional Zoning Application documents for the above-referenced project and am providing the following information.

- Real Estate Taxes

  Courthouse Hwy Solar Facility is a 3 MW solar project. Because of the wattage, the project will not be assessed by the State Corporation Commission. Instead, the assessment will be performed locally by the Commissioner of the Revenue.

  The real estate tax estimate appears to be based on the entire parcel being subject to rollback taxes. Rollback taxes are assessed on property that is either rezoned or has a change in use. The conditional use application is for 18.23 acres of land, and the rollback taxes will be assessed once construction on the project begins. Courthouse Hwy Solar will be assessed only for the 18.23 acres and not the entire 148.97 acres of the parcel.

  The study incorrectly estimates the one-time rollback taxes to be $2,700. Based on the 18.23 acres for the conditional use permit, the rollback taxes will be $238.12. Additionally, the study estimates the real estate taxes based on the $0.85 tax rate, which was in effect prior to July 1, 2023. The current tax rate has been reduced to

$0.71, resulting in a reduction in revenue from $2,384.31 to $1,966.00 annually. The corrected tax will have a negative impact on the 2% per year increase in real estate taxes, as presented in their fiscal study, since the base year revenue will be lower than estimated.

The July 1, 2023, General Reassessment of real estate changed the assessment methodology for solar farm projects. The change resulted in the buffer area of the solar projects being assessed at $15,000 per acre and not $3,500 per acre. The entire area of the conditional use permit will be assessed at $15,000 per acre. The result is additional revenue from the buffer area.

- Personal Property Taxes

The personal property revenue estimates on the solar equipment appear to be in line with the current assessment methodology and rates.

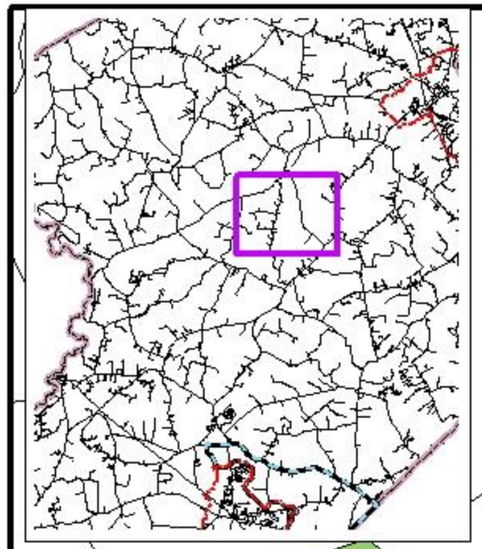
CUP-3-23 - Conditional Use Permit- Location Map



CUP-3-23 - Conditional Use Permit- Location Closeup Map



CUP-3-23 - Conditional Use Permit - Zoning Map



HARRY WILSON ROAD

COURTHOUSE HIGHWAY

BOB WHITE ROAD

POOR HOUSE ROAD

JOLLY CIRCLE

SITE

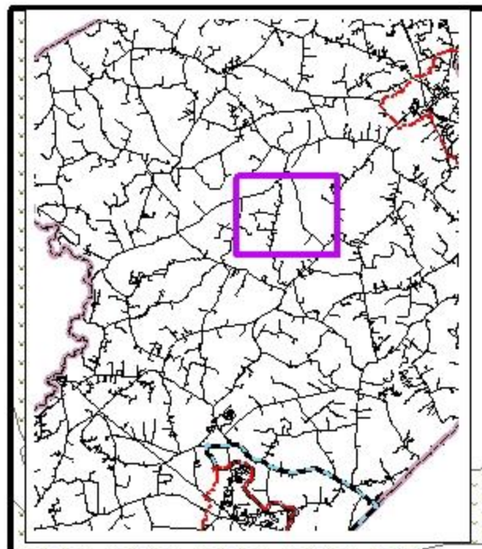
N

0 500 1,000 Feet

Legend

- C-GC
- C-UR
- GC
- GI
- GIC
- LC
- LI
- NC
- PD-MH
- PD-MX
- PD-R
- RAC
- ROAD
- RR
- SE
- SR
- TOWN
- UR
- VC

CUP-3-23 - Conditional Use Permit - Land Use Map



HARRY WILSON ROAD
COURTHOUSE HIGHWAY
BOB WHITE ROAD
POOR HOUSE ROAD
JOLLY CIRCLE
SITE
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EC
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SR
VC

RESOLUTION NUMBER PC-23-12

ISLE OF WIGHT COUNTY PLANNING COMMISSION
A RESOLUTION TO PRESENT A REPORT AND RECOMMENDATION TO THE BOARD OF SUPERVISORS FOR CONDITIONAL USE PERMIT REQUEST CUP-03-23 TO ALLOW A MAJOR UTILITY SERVICE, SPECIFICALLY A THREE MW UTILITY SCALE SOLAR ENERGY GENERATION FACILITY ON APPROXIMATELY EIGHTEEN ACRES WITH TAX MAP NUMBER 39-01-017 AND TO WITHDRAW THE EIGHTEEN ACRES FROM THE COURTHOUSE AGRICULTURAL AND FORESTAL DISTRICT

WHEREAS, Courthouse Solar Highway 1, LLC, applicant, on behalf of Micheal S Doggett, property owner, has requested issuance of a conditional use permit for approximately eighteen acres of a certain tract of land with tax parcel number 39-01-017 situated in Isle of Wight County and to withdraw the same portion of land from the Courthouse Agricultural and Forestal District; and

WHEREAS, the specific request is to permit a major utility service, specifically a three MW utility scale solar energy generation facility as defined in the Zoning Ordinance, in accordance with sections 1-1017 and 4-2003 of the Zoning Ordinance; and

WHEREAS the procedural requirements for the consideration of this request by the Planning Commission have been met; and

NOW, THEREFORE, BE IT RESOLVED by the Planning Commission of Isle of Wight County, that:

Section 1. Findings.

_____ A. The Isle of Wight County Planning Commission finds that the proposed conditional use permit is reasonable and has considered the following factors and finds that the proposed use does not conflict with:

1. the existing use and character of property within the County;

2. the Comprehensive Plan;

3. the suitability of the property for various uses;

4. the trends of growth or change;

5. the current or future requirements of the community as to land for various purposes as determined by population and economic studies and other studies;

6. the transportation requirements of the community;

7. the requirements for airports, housing, schools, parks, playgrounds, recreation areas, and other public services;

8. the conservation of natural resources;

9. the preservation of floodplains;

10. the preservation of agricultural and forestal land;

11. the conservation of properties and their values; and

12. the encouragement of the most appropriate use of land throughout the County.

_____ B. The Isle of Wight County Planning Commission does not find that the conditional use is reasonable based on the consideration of the factors listed herein.

Section 2. Recommendation to Board of Supervisors.

The Planning Commission recommends to the Board of Supervisors that the request, CUP-03-23, be:

___ a. Granted as submitted, and that the Board of Supervisors adopt the proposed Ordinance without modification.

___b. Denied, and that the Board of Supervisors not adopt the proposed Ordinance.

___c. Granted with the modifications set forth on the attached listing of specific recommendations, and that the Board of Supervisors adopt the proposed Ordinance with such modifications.

DATE: _____

READ AND PASSED: _____
Chairman, Isle of Wight County Planning Commission

TESTE: _____
Secretary, Isle of Wight County Planning Commission

Approved as to Form:

_____
Robert W. Jones, Jr., County Attorney

PLANNING REPORT

APPLICATION:

An ordinance to amend the following sections of Appendix B. Zoning: Article III, Section 3-6000 (Use Types), for the purpose of defining short term rental as a commercial use, Article IV (Zoning Districts and Boundaries) for the purpose of allowing short term rentals as a permitted or conditional use in certain zoning districts, and Article V (Supplementary Use Regulations), Section 5-5005, for the purpose of including performance criteria for short term rental uses in the commercial supplemental use type regulations

ELECTION DISTRICT:

All

LOCATION:

County-wide

BACKGROUND:

The Planning Commission began its initial discussion of the proposed short-term rental ordinance revisions at their July 25, 2023, regular meeting. Commission members indicated they would like to continue their discussion at their next regular meeting prior to advertising the changes for public hearing.

At their August 22, 2023, regular meeting, the Planning Commission continued their discussion on the proposed ordinance revisions and made several other suggested changes. The Planning Commission then decided to review the proposed ordinance as a general discussion item at their next regular meeting.

Following additional discussion of the proposed ordinance revisions at their September 26, 2023, regular meeting, the Planning Commission directed staff to advertise the draft ordinance for public hearing at their October 24, 2023, regular meeting.

The Board of Supervisors initiated reconsideration of the proposed short-term rental regulations that were previously recommended for approval by the Planning Commission to the Board of Supervisors in November 2021. The Board discussed additional revisions at their June 1, 2023, worksession, to include the creation of a

short-term rental registry program, and requested that the most recent proposed changes be sent to the Planning Commission for their review and recommendation.

DESCRIPTION:

A redline copy of the proposed Ordinance changes are attached to the staff report.

ORDINANCE REVIEW:

Room rentals are currently regulated by Section 5-1005.B of the Zoning Ordinance which allows the rental of up to two rooms as an accessory use on residential properties as follows:

> The renting out of one (1) or two (2) rooms within a single-family residence (which one (1) or two (2) rooms do not themselves constitute a separate dwelling unit) to not more than two (2) persons who are not part of the family that resides in the single-family dwelling.

Short-term rentals as a stand-alone use type is not currently included in the Zoning Ordinance, and therefore is prohibited. Anyone wishing to utilize their property as a short-term rental outside of the current ordinance regulations would need to obtain a special use permit.

AGENCY REVIEW:

County staff worked with the County Attorney in developing the proposed subdivision ordinance changes.

STAFF RECOMMENDATION:

Staff recommends approval of the draft Ordinance changes relating to the Short-Term Rental use type.

ATTACHMENTS:

Description	Type	Upload Date
Draft STR Ordinance Redline rev 101823	Backup Material	10/19/2023
Use Table Redline	Backup Material	10/18/2023
Draft STR BOS Ordinance rev 101823	Ordinance	10/19/2023

Proposed Zoning Ordinance Revisions – Short Term Rentals
Revised October 18, 2023

New proposed changes are in red underlined text. Language proposed to be deleted is shown in red text with ~~strikethrough~~ markings. Changes made since July 2023 version are marked in blue.

1. Add Short Term Rentals as a commercial use type in Article III, "Use Types."

Sec. 3-6000. - Commercial use types.

Short Term Rental.\ the provision of a room or space that is suitable or intended for occupancy for dwelling, sleeping, or lodging purposes, for a period of fewer than thirty consecutive days, in exchange for a charge for the occupancy. A short term rental operator shall be further defined as the proprietor of any dwelling, lodging, or sleeping accommodations offered as a short-term rental, whether in the capacity of owner, lessee, sublessee, mortgagee in possession, licensee, or any other possessory capacity

2. The following changes are proposed for uses and bulk regulations for various zoning districts in Article IV, "Zoning Districts":

Sec. 4-1005. - Table of permissible uses.

Proposed changes to Section 4-1005, "Table of Permissible Uses," include adding reptile breeding as a conditional use in the General Commercial district, and adding short-term rentals as a permitted use in the Rural Agricultural Conservation and Rural Residential Districts and as a conditional use in all other residential zoning districts.

Table 1
Table of Permissible Uses (ATTACHED)

Sec. 4-2002. Permitted uses, Rural Agricultural Conservation District

The following uses are permitted by right subject to all other applicable requirements contained in this ordinance. An asterisk (*) indicates additional, modified or more stringent standards which are listed in section 5-5000, supplementary use regulations, for those specific uses.

D. Commercial uses:
* Commercial equipment repair, accessory to dwelling
* Construction office, temporary
Lawn and garden services
Real estate office, temporary
* Short-Term Rental
* Taxidermy
Veterinary hospital/clinic
E. Miscellaneous uses:

* Amateur radio tower
Hunt club
* Reconstructed wetland
* Turkey shoot

Sec. 4-3002. - Permitted uses, Rural Residential District

The following uses are permitted by right subject to all other applicable requirements contained in this ordinance. An asterisk (*) indicates additional, modified or more stringent standards which are listed in section 5-5000, supplementary use regulations, for those specific uses.

D. Commercial uses:

* Construction office, temporary
Real estate office temporary
* Short-Term Rental

Sec. 4-4003. - Conditional uses, Village Center District

E. Commercial uses:

* Antique shop
Auction establishment
Boarding house
Boating and fishing facilities
Business or trade school
Car wash
Commercial indoor amusement
Commercial indoor entertainment
* Commercial indoor sports and recreation
* Commercial outdoor swimming pool and tennis court
* Contractor office and storage facility
* Convenience store
* Crematorium
* Flea market
* Funeral home
* Garden center
* Gasoline station
* Golf course
* Golf driving range
Hotel/motel/motor lodge/inn
* Marina
Medical clinic
* Motor vehicle parts/supply retail
* Motor vehicle repair service/minor
Personal improvement service
Personal service
* Restaurant, drive-in fast food
Restaurant, general

Retail sales
* Short-Term Rental
Studio, fine arts
* Taxidermy
Veterinary hospital/clinic
Wholesale sales

Sec. 4-5003. - Conditional uses, Neighborhood Conservation District

D. Commercial uses:
* Bed and breakfast
Boarding house
* Commercial equipment repair, accessory to dwelling
* Commercial outdoor swimming pool and tennis facility
General store, country
* Golf course
* Marina
*Short-Term Rental

Sec. 4-6003. - Conditional uses, Suburban Estate District

D. Commercial uses:
* Bed and breakfast
Boarding house
* Commercial equipment repair, accessory to dwelling
* Commercial outdoor swimming pool and tennis facility
* Golf course
* Marina
* Short-Term Rental

Sec. 4-7003. - Conditional uses, Suburban Residential District

D. Commercial uses:
* Bed and breakfast
Boarding house
* Commercial equipment repair, accessory to dwelling
* Commercial outdoor swimming pool and tennis facility
* Golf course
* Marina
* Short-Term Rental

Sec. 4-8003. - Conditional uses, Urban Residential District

E. Commercial uses:
* Bed and breakfast
Boarding house

* Commercial indoor sports and recreation
* Commercial outdoor swimming pool and tennis facility
* Golf course
* Marina
Restaurant, general
Retail sales
* Short-Term Rental
Studio, fine arts

Sec. 4-15003. - Conditional uses, Planned Residential District

D. Commercial uses:
* Bed and breakfast
Boarding house
Commercial indoor entertainment
* Commercial indoor sports and recreation
* Commercial outdoor swimming pool and tennis facility
* Marina
*Short-Term Rental

Sec. 4-16003. - Conditional uses, Planned Mobile Home Park District

C. Commercial Uses
* Short-Term Rental

Sec. 4-18003. - Conditional uses, Planned Mixed Use District

E. Commercial uses:
* Bed and breakfast
Boarding house
Boating and fishing facilities
Business or trade school
Car wash
Catering
Commercial indoor amusement
Commercial indoor entertainment
* Commercial indoor sports and recreation
* Commercial outdoor entertainment/sports and recreation
* Commercial outdoor swimming pool and tennis facility
* Convenience store
* Funeral home
* Garden center
* Gasoline station
* Golf driving range
Hospital
Hospital, special care
Hotel/motel/motor lodge/inn

* Marina
Medical clinic
* Motor vehicle repair service/minor
*Short-Term Rental
Tattoo parlor

Sec. 5-1005. - Accessory uses to residential principal uses.

The following activities, so long as they satisfy the general criteria set forth above, are specifically regarded as accessory uses to residential principal uses:

A. Hobbies or recreational activities of a noncommercial nature.

~~B. The renting out of one (1) or two (2) rooms within a single-family residence (which one (1) or two (2) rooms do not themselves constitute a separate dwelling unit) to not more than two (2) persons who are not part of the family that resides in the single-family dwelling.~~

C. Yard sales or garage sales, so long as such sales are not conducted on the same lot more than three (3) days (whether consecutive or not) during any ninety-day period. (7-7-05; 9-17-15; 7-19-18; 11-15-18.)

Sec. 5-5005. - Supplementary use regulations for commercial use types.

(Note: new sections proposed since November 2022 version are highlighted in yellow.)

DD. Short Term Rentals

1. A zoning permit is required.
2. ~~Local Contact who is available to respond to and resolve complaints during the entire length of the rental period. Failure to respond and resolve complaints will result in the revocation of the permit~~. An authorized agent must be designated as a point of contact who is available to be contacted and to address conditions occurring at the short term rental within thirty (30) minutes. Physical responses to the site of the short term rental is not required. The Operator shall be notified in writing of failed attempts to receive timely responses from the authorized agent. Failure to respond in a timely manner shall result in a complaint subject to the penalties set forth below.
3. The Operator must register their short term rental unit with the Community Development Department and receive a registration number.
4. The Operator authorizes County employees to enter the subject property upon reasonable advanced written notice to the Operator, at least one (1) time during the calendar year for which registration is valid, to verify the short term rental is being operated in accordance with applicable regulations.
5. The zoning permit may not be transferred.
6. No more than one (1) short term rental may be operated on any lot.
7. Operators may enter into rental agreements with only one (1) party per legal dwelling unit per twenty four (24) hour period.
8. A residential dwelling unit located within a building that contains _three (3)____ or more dwelling units may not be operated as a short term rental.

9. The maximum number of lodgers per night, over the age of eighteen (18) years, shall not exceed two persons per bedroom but in no case shall exceed sixteen persons ~~six (6)~~. This number shall be reduced to conform to the occupancy requirements of the Virginia uniform Building code and/or the Virginia Department of Health.
10. The number of persons allowed to gather at a short term rental at any one time shall not exceed twice the maximum number of permitted overnight guests, including children. Only the maximum number of overnight guests shall be permitted at a short term rental between the hours of 10:00 PM and 7:00 AM. Short term rentals shall not be used as event centers as defined by the Zoning Ordinance.
11. Operators must obtain a business license and register for transient occupancy and state sales tax.
12. Short term rentals must meet current building and zoning regulations and be subject to a safety inspection from the County to confirm the installation of smoke alarms, fire extinguisher and a posted emergency exit plan prior to permit approval.
13. ~~$500 penalty for failure to obtain required permits. Repeated violations may result in the prohibition on rental of applicable properties.~~
14. One off-street space per guest room is required in addition to the parking required for the house.
15. ~~Rentals are limited to owner-occupied residences~~. No visible evidence of the conduct of a short term rental is allowed on the outside of the property.
16. The owner/operator shall not prepare meals for guests.
17. Operator shall provide proof of liability insurance to rental activity at registration and each subsequent renewal of at least one million dollars. Such insurance coverage must remain in place at all times the short term rental is being operated.
18. Accessory structures, not including permitted accessory dwelling units, shall not be used or occupied as short term rentals.
19. All advertisements for any short term rental shall include the short term rental registration number for such dwelling.
20. A zoning permit for a short term rental may be revoked by the Zoning Administrator, or designee, for the following reasons:
    i. In the event of three (3) or more substantiated complaints of violation of applicable state or local laws, ordinances and regulations, as they relate to short term rentals, within a calendar year; or
    ii. Authorized agent's failure to respond in a timely manner more than twice; or
    iii. Failure to maintain compliance with any regulation set forth in this section.

    An Operator whose short term rental zoning permit has been revoked shall not be eligible to receive any new short term rental zoning permit for the remaining portion of the calendar year in which the permit was revoked, and for the entire following year.
21. Except as provided in this section, nothing herein nor the issuance of a zoning permit shall be construed to prohibit, limit, or otherwise supersede existing local authority to regulate short term rental of property through general land use and zoning authority. Nothing in this section shall be construed to supersede or limit contracts or agreements between or among individuals or private entities related to the use of real

property, including recorded declarations and covenants; the provisions of condominium instruments of a condominium created pursuant to the Condominium Act (§ 55-79.39 et seq.) of the Code of Virginia, 1950, as amended; the declaration of a common interest community as defined in Code of Virginia, 1950, § 55-528, as amended; the cooperative instruments of a cooperative created pursuant to the Virginia Real Estate Cooperative Act (§ 55-424 et seq.) of the Code of Virginia, 1950, as amended; or any declaration of a property owners' association created pursuant to the Property Owners' Association Act (§ 55-508 et seq.).

Use Descriptions	RAC	RR	VC	NC	SE	SR	UR	LC	GC	LI	GI	GIC	PDR	PDMH	PDCP	PDMX	PDIP
AGRICULTURAL USE TYPES																	
Agricultural Crop Service Tower and Antenna (*)	P	C	P	C													
Agricultural Farm Equipment Sales and Service	C		C					P	P	P	P	P			P	C	P
Agricultural Farm Product Processing, Warehousing and Distribution Service	P		P					C		P	P	P			P		P
Agricultural Feed Seed and Farm Supply Service	C		P					P	P	P	P	P			P	C	P
Agricultural Service/Agent	P	P	P					P	P	P	P	P			P		P
Agriculture	P	P	P	C						C	C	C					C
Agritourism (See Part 2A)	P	P	P														
Aquaculture	P	P	P	C					C	C	C	C					C
Aquaculture, Waterfront Business	C	C	P						C	C	C	C					C
Commercial Feedlot (*)	P		C							C	P	C					C

Fair, Agricultural	P		C														
Family Burial Plot	P																
Farm Employee Housing (*)	C	C	C														
Farmer's Market	P		P					P	P				P			P	
Forestry Operation, Silvicultural and/or Timbering (*)	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
Greenhouse, Commercial and/or Nursery																	
• In conjunction with residence	P	C	P	C	C												
• Not in conjunction with residence	P		P					P	P	P	P	P			P	C	P
Greenhouse, Private	P	P	P	P	P	C	C	C	C				C			C	
Livestock Auction Market (*)	P		C							C	P	C			C		P
Reptile Breeding (*)	C								C	C	C						
Sawmill, Private (*)	P																
Stable, Commercial (*)																	
• In conjunction with residence	P	C	C	C	C								C			C	

• Not in conjunction with residence	P		C					C	C									
Stable, Private (*)	P	P	C	C	C								C					
Viticulture	P	P	P	C						C	C	C						C
Wayside Stand (*)	P	P	P	C														
RESIDENTIAL USE TYPES																		
Accessory Apartment (*)																		
• Residential Accessory Apartment	P	P	P*	C	P*	C	C						P*			P*		
• Commercial Accessory Apartment			C					P	P				P		C	P		
Boathouse (*)	P	P	P	P	P	P	C						C			C		
Community Recreation (*)		C		C	C	C	C						P	P		P		
Condominium (*)				C			P						P			P		
Congregate Housing (*)			C			C	P						P			P		
Dwelling, Multifamily Conversion (*)	C		C	C	C	C	P						C			C		
Dwelling, Single-Family	P	P	P	P	P	P	P						P			P		
Dwelling, Single-Family, Farm	P																	
Dwelling Two-Family Duplex (*)	C	C	C	C		P	P						P			P		
Family Day Care Home (*)	P	P	P	P	P	P	P						P			P		

Group Home	P	P	P	P	P	P	P	C					C			C	
Guest House (*)	P	P		C	C												
Home Occupation, Type I (*)	P	P	P	P	P	P	P						P	P		P	
Home Occupation, Type II (*)	P	P	C	C													
Kennel, Private (*)	P	P															
Manufactured Home, Class A (*)	P	P	C											P			
Manufactured Home, Class B (*)	P													P			
Manufactured Home, Class C																	
Manufactured Home, Family Member Residence (*)	P																
Manufactured Home, Temporary Residence (*)	P																
Manufactured Home Park														P			
Manufactured Home Subdivision														P			

Multifamily Dwelling (*)			C			C	P						P			P	
Temporary Emergency Housing (*)	P	P	P	P	P	P	P						P			P	
Townhouse (*)			C	C		C	P						P			P	
CIVIC USE TYPES																	
Administrative Service	P		P					P	P	P	P	P			P	P	P
Adult Care Center (*)	C		C					C	P	P	P	P	C		P	C	P
Assisted Living Facility	C		C					C	P				C			C	
Cemetery (*)																	
• Animal	C	C	C	C													
• Church	C	C	C	C	C	C	C	C	C				C			C	
• Private	C	C	C	C				C	C	C					C	C	C
• Public	C	C	C	C				C	C	C					C	C	C
Child Care Center (*)	C	C	C	C	C			P	P	P			C		P	C	C
Child Care Institution (*)	C	C	C					C	C				C			C	
Club	C	C	C	C	C	C	C	P	P				C		P	C	
Community Center (*)	C		P					P	P				P		P	P	
Correctional Facility	C										C	C					C
Crisis Center	C	C	C					P	P						P		
Cultural Service	C	C	P	C	C	C	C	P	P				P			P	
Educational Facility College/ University	C							C	C				C		C	C	
Educational Facility Primary/Secondary (*)	C	C	C	C	C	C	P	P	P				P		P	P	
Halfway House	C	C	C	C	C	C	C	P					C			C	
Life Care Facility	C	C	C	C	C	C	P	P	P				P			P	
Modular Classroom (*)	P	P	P	P	P	P	P	P	P				P		P	P	

Nursing Home (*)	C	C	C	C	C	C	C	P	P				P		P	P	
Park & Ride Facility	P		C					P	P	P	P	P	C	C	P	C	P
Post Office	P		P		C	C	C	P	P				P		P	P	
Public Sports/Event Facility	C		C					C	P	P					P	C	P
Public Maintenance & Service Facility (*)	C		C					C	C	P	P	P			P		P
Public Park and Recreational Area (*)	P	P	P	P	P	P	P	P	P				P			P	
Public Safety Service	P	C	P	C	C	C	C	P	P	P	P	P	C		P	P	P
Religious Assembly (*)	C	C	C	C	C	C	C	C	C				C			C	
Rehabilitation Service			C					P	P						P	P	
Transit Station	C		C					C	P	P	P	P			P	P	P
Utility Service/Major (*)	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	P
Utility Service/Minor (*)	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
OFFICE USE TYPES																	
Financial Institution			C					P	P						P	P	
General Office			C				C	P	P	P		P			P	P	C
Laboratory			C					P	P	P	P				P	C	P
Medical Office			C				C	P	P						P	C	
COMMERCIAL USE TYPES																	
Adult Entertainment Establishment (*)											C						
Auction Establishment	C		C					C	P	P	P	P			P		P
Bed and Breakfast (*)	C	C	P	C	C	C	C	C	C				C			C	

Boarding House	C	C	C	C	C	C	C						C			C	
Boating and Fishing Facilities	C		C					C	C	C	P	P			P	C	P
Business Support Service								P	P	C					P	P	P
Business or Trade School	C		C					C	P	P	P	P			P	C	P
Campground (*)	C																
Campground, Workforce (*)	C																
Car Wash			C					P	P	P	P				P	C	
Catering								C	P						P	C	
Commercial Equipment Repair, Accessory to Dwelling (*)	P	C	P	C	C	C											
Commercial Indoor Amusement			C					C	P	P					C	C	
Commercial Indoor Entertainment			C					C	P	P			C		P	C	
Commercial Indoor Sports & Recreation (*)	C		C				C	P	P	P			C		P	C	P
Commercial Outdoor Entertainment/ Sports & Recreation (*)	C							C	C	C	C				C	C	C
Commercial Outdoor Swimming Pool & Tennis Facility (*)	C	C	C	C	C	C	C	C	C				C		C	C	
Construction Office, Temporary (*)	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
Construction Sales & Service								C	P	P	P	P			C		P

Contractor Office and Storage Facility (*)	C		C					C	P	P	P	P			P		P
Convenience Store (*)	C		C					C	C	P	P				C	C	P
Crematorium (*)	C		C					C	C	C					C		C
Dance Hall								C	C	C							
Equipment Sales and Rental	C								C	P	P	P			C		P
Event center	C		P					P	P						P	P	
Flea Market (*)	C		C					C	C	C	C						
Funeral Home (*)	C		C					P	P	C					P	C	
Garden Center (*)	C		C					P	P	P	P	P			P	P	P
Gasoline Station (*)	C		C					C	C	C	C				C	C	C
General Store, Country	C	C	P	C													
Golf Course (*)	C	C	C	C	C	C	C	P	P				P		P	P	
Golf Driving Range (*)	C		C					P	P	P					P	C	
Hospital								C	P						C	C	
Hospital, Special Care								C	C						C	C	
Hotel/Motel/Motor Lodge/Inn			C					C	P	C					P	C	C
Itinerant Merchant								P	P						P	P	
Kennel, Commercial (*)	C							C	C	C	C				C		C
Laundry									C	P	P						P
Lawn and Garden Services	P							P	P	P	P						P
Manufactured Home Sales									C	C					C		
Marina (*)	C	C	C	C	C	C	C	C	P	C			C		P	C	P
Medical Clinic			C					C	P						C	C	

Micro-Brewery, Distillery, Cidery (*)								C	P	P	P	P			P	P	P
Mini-Warehouse (*)								C	C	P	P	P			P		P
Motor Vehicle Dealership/New (*)								C	P						P		
Motor Vehicle Dealership/Used (*)								C	C						C		
Motor Vehicle/ Outdoor Storage									C	P	P	P			C		P
Motor Vehicle Parts/ Supply, Retail (*)			C					P	P	P	P				P	P	P
Motor Vehicle/ Rental (*)								C	P	P	P				P		P
Motor Vehicle Repair Service/Major (*)			C					C	P	P	P				C		P
Motor Vehicle Repair Service/Minor (*)			C					C	P	P	P				C	C	P
Pawn Shop								C	P	P							
Peddler			P					P	P	P	P	P			P	P	
Personal Improvement Service			C					P	P	C					P	P	P
Personal Service			C					P	P	C					P	P	P
Real Estate Office, Temporary	P	P	P	P	P	P	P						P	P		P	
Recreational Vehicle Sales & Service								C	C						C		
Restaurant, Drive-In Fast Food (*)			C					C	P	C					P	P	P
Restaurant, General			C				C	C	P	C					P	P	P

Retail Sales			C				C	P	P	P					P	P	
Short Term Rental (*)	P	P	C	C	C	C	C						C	C		C	
Studio, Fine Arts	C		C				C	P	P	P					P	P	
Tattoo Parlor								C	P	P	P				P	C	P
Taxidermy (*)	P		C					C	P	P	P						
Truck Stop								C	C	P	P						P
Veterinary Hospital/ Clinic	P		C				P	P	P						P	P	
Wholesale Sales	C		C					P	P	P	P	P			P	P	P
INDUSTRIAL USE TYPES																	
Abattoir or Livestock Processing (*)	C										C	P					C
Asphalt or Concrete Plant (*)											C	C					C
Brewery, Distillery, Cidery										P	P	P					P
Construction Yard (*)	C								C	P	P	P			C		P
Custom Manufacturing	C		C					C	P	P	P				P	C	P
Industry, Type I	C									P	P	P			C		P
Industry, Type II										C	P	P					P
Industry, Type III											C	C					C
Landfill, Industrial (*)	C									C	C	C					
Landfill, Rubble (*)	C									C	C	C					C
Landfill, Sanitary (*)	C																
Meat Packing											P	P					P
Recycling Center (*)	C									P	P	P					P
Refuse and Recycling Center	C		C						C	P	P	P			C		P
Resource Extraction (*)	C										C	C					C

Sawmill, Commercial										C	P	P					
Scrap and Salvage Service (*)	C									C	C	C					C
Shipping Container (*)	C	C		C	C	C		C	C	P	P	P			C		P
Towing Service Storage										C	C	C					
Yard (*)																	
Transfer Station	C									P	P	P					P
Warehousing and Distribution	C									P	P	P					P
MISCELLANEOUS USE TYPES																	
Amateur Radio Tower (*)	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
Aviation Facility, Commercial (*)	C										C	C					C
Aviation Facility, General (*)	C										C	C			C		C
Aviation Facility, Private (*)	C	C									C	C			C		C
Communication Tower (*)	C	C	C	C				C	C	C	C	C			C	C	C
Composting System, Confined Vegetative Waste or Yard (*)	C																
Hunt Club	P		C														
Parking Facility, Surface/Structure								C	C	C	C	C			C	C	P
Reconstructed Wetland (*)	P	C	C	C	C	C	C	C	C	C	C	C	P	C	C	P	C
Shooting Range, Outdoor (*)	C										C	C					C

Turkey Shoot (*)	P										C	C					C

AN ORDINANCE
TO AMEND THE FOLLOWING SECTIONS OF APPENDIX B. ZONING: ARTICLE III, SECTION 3-6000 (USE TYPES), FOR THE PURPOSE OF DEFINING SHORT TERM RENTAL AS A COMMERCIAL USE, ARTICLE IV (ZONING DISTRICTS AND BOUNDARIES) FOR THE PURPOSE OF ALLOWING SHORT TERM RENTALS AS A PERMITTED OR CONDITIONAL USE IN CERTAIN ZONING DISTRICTS, AND ARTICLE V (SUPPLEMENTARY USE REGULATIONS), SECTION 5-5005, FOR THE PURPOSE OF INCLUDING PERFORMANCE CRITERIA FOR SHORT TERM RENTAL USES IN THE COMMERCIAL SUPPLEMENTAL USE TYPE REGULATIONS

WHEREAS, the Board of Supervisors of Isle of Wight County, Virginia, has the legislative authority to make reasonable changes to the ordinances that govern the orderly growth and development of Isle of Wight County; and

WHEREAS, the Isle of Wight County Board of Supervisors is also concerned about the compatibility of uses on public and private lands within Isle of Wight County and seeks to allow flexibility in the administration of the ordinance regulations while protecting the health, safety, and general welfare of present and future residents and businesses of the County.

NOW, THEREFORE, BE IT ORDAINED by the Isle of Wight County Board of Supervisors that the following specific sections of the Articles of Appendix B, Zoning, of the Isle of Wight County Code be amended and reenacted as follows:

Article III. Use Types.

Sec. 3-6000. Commercial use types.

Adult entertainment establishment.\ An establishment having a substantial or significant portion of its stock in trade books, magazines and other periodicals which are distinguished or characterized by their emphasis on matter depicting, describing or related to "specified sexual activities" or "specified anatomical areas," or an establishment with a segment or section devoted to the sale or display of such material. This use includes any adult bookstore, adult mini-motion-picture theater, adult picture theater, cabaret, drug paraphernalia store, and internet sweepstakes cafe.

Auction establishment.\ A structure or enclosure where goods are sold by auction on a recurring basis. Expressly excluded from this use are non-recurring auctions of property, possessions, estates, and other items located at the premises where the auction is being conducted.

Bed and breakfast.\ A dwelling or portion thereof, in which lodging is provided by the owner or operator who resides on the premises. This use offers short-term lodging rooms and meals for transient guests, none of who remain for more than fourteen (14) consecutive nights each. This definition shall include the term tourist home.

Boarding house.\ A single-family dwelling unit, or part thereof, with three (3) or more rooms that are rented individually or collectively by long-term residents (at least month-to-month

tenants) as opposed to overnight or weekly guests. A boarding house may make provisions for serving meals.

Boat repair yard.\ See "marina" listed under commercial use types.

Boating and fishing facilities.\ Facilities catering to the general public, whether an admission is charged or not, where provisions are made for fishing from the shoreline or from a pier and/or launching or rental of boats are available on-site.

Business support service.\ Establishment or place of business engaged in the sale, rental or repair of office equipment, supplies and materials, or the provision of services used by office, professional and service establishments. Typical uses include office equipment and supply firms, small business machine repair shops, convenience printing and copying establishments, mail and packaging stores, as well as temporary labor services.

Business or trade school.\ A use providing education or training in business, commerce, language, or other similar activity or occupational pursuit, and not otherwise defined as an educational facility, either primary and secondary, or college and university, or as a home occupation.

Campground.\ Any site, lot, parcel or tract of land on which accommodations for temporary occupancy are located or may be placed, including cabins, tents, and recreational equipment, recreational vehicles, and which is primarily used for recreational purposes and retains an open air or natural character.

Campground, workforce.\ A small campground facility intended for the temporary workforce routinely required by establishments in the community for periods of up to one hundred and twenty (120) days at a time, and are intended to have only the minimum essential services necessary for recreational vehicles.

Car wash.\ Washing and cleaning of vehicles. Typical uses include automatic conveyor machines and self-service car washes.

Catering.\ Any establishment engaged in the preparation of food and beverages, or where food containers or supplies are kept, handled, prepared, packaged or stored for off-site distribution to individuals, events, and satellite operations.

Commercial equipment repair, accessory to dwelling.\ The repair and/or maintenance of mechanical, electrical, or electronic devices and equipment, such as, computers, televisions, lawnmowers, household appliances, machine parts, and other similar devices.

Commercial indoor amusement.\ Establishments which provide games of chance, skill or scoring other than an incidental use of the premises. Games would include pinball and video machines, pool and billiard tables and other similar amusement or entertainment devices, whether or not they are coin-operated, and also card games, bingo, and off-track betting. Typical uses include game rooms, pool halls, video arcades, and bingo parlors.

Commercial indoor entertainment.\ Predominantly spectator uses conducted within an enclosed building. Typical uses include motion picture theaters, drama theaters, concert or music halls.

Commercial indoor sports and recreation.\ Predominantly participant uses conducted within an enclosed building. Typical uses include bowling alleys, ice- and roller-skating rinks, indoor

racquetball, squash courts, swimming, and/or tennis facilities, archery and indoor shooting ranges and similar uses.

Commercial outdoor entertainment/sports and recreation.\ Predominantly spectator uses conducted in open or partially enclosed or screened facilities. Typical uses include motor vehicle, boat, motorcycle or animal racing facilities/complexes, drive-in movies, miniature golf, amphitheaters and outdoor amusement parks, motorized cart and motorcycle tracks, and motorized model airplane flying facilities. Professional and semi-professional athletic fields shall also be included in this use.

Commercial outdoor swimming pool and tennis facility.\ Outdoor pools or tennis facilities operated by a commercial entity that are open to the general public usually requiring membership or some form of payment.

Construction office, temporary.\ A trailer used as a temporary office during a construction operation. This use includes construction office trailers occupied in conjunction with residential or nonresidential development.

Construction sales and service.\ Establishments or places of business primarily engaged in retail or wholesale sale, from the premises, of materials used in the construction of buildings or other structures, but specifically excluding motor vehicle or equipment supplies otherwise classified herein. Typical uses include building material stores and home supply establishments.

Contractor office and storage facility.\ An establishment or place of business engaged in the construction of residential or commercial structures including trades that assist in building construction or remodeling including carpentry, electrical, masonry, painting, metalworking, flooring installation, ductwork, plumbing, heating, au conditioning, roofing, and other similar trades.

Convenience store.\ Establishments primarily engaged in the provision of frequently or recurrently needed goods for household consumption, such as prepackaged food and beverages, limited household supplies and hardware.

Crematorium.\ A location used for cremation containing properly installed, certified apparatus for this process.

Dance hall.\ Any establishment open to the general public where dancing is permitted and a cover charge is directly or indirectly required for entry into the establishment. However, a restaurant licensed to serve food and beverages having a dance floor with an area not exceeding ten percent (10%) of the total floor area of the establishment shall not be considered a dance hall.

Equipment sales and rental.\ Establishments primarily engaged in the sale or rental of tools, trucks, tractors, construction equipment, and similar industrial equipment. Included in this use type is the incidental storage, maintenance, and servicing of such equipment.

Event center.\ A multipurpose facility with flexible indoor/outdoor space, typically used for activities such as weddings, conventions, meetings, job fairs, and trade shows.

Flea market.\ Occasional or periodic commercial activities held in an open area or enclosed structure where groups of sellers rent space on a short-term basis to display, barter, or sell goods to the general public. A fee may be charged for expected buyers for admission, or a fee may be charged for the privilege of offering or displaying such merchandise. A flea market is composed of semi-closed or outdoor stalls, stands, or spaces.

Funeral home.\ Establishments engaged in undertaking services such as preparing the dead for burial, and arranging and managing funerals. This use excludes crematorium, which is defined separately.

Garden center.\ Establishments engaged primarily in the retail sale of trees, shrubs, seeds, fertilizers, pesticides, plants, plant materials, and garden supplies, primarily for agricultural, residential and commercial consumers.

Gasoline station.\ A facility for the retail sale of motor vehicle fuels, oils, and accessories, where repair is incidental, where no more than two (2) abandoned vehicles or other motor vehicles shall be stored on the premises. May include the sale of propane or kerosene as an accessory use.

General store, country.\ A single store, the ground floor area of which is four thousand (4,000) square feet or less and which offers for sale, primarily, most of the following articles: bread, milk, cheese, candy, papers and magazines, and general hardware articles. Gasoline may also be offered for sale but only as a secondary activity of a country general store.

Golf course.\ A tract of land for playing golf, improved with tees, greens, fairways, hazards, and which may include clubhouses and shelters. Included would be executive or par three (3) golf courses.

Golf driving range.\ A limited area on which golf players do not walk, but onto which they drive golf balls from a common driving tee.

Hospital.\ A building or group of buildings having room facilities for one (1) or more patients, used for providing services for the inpatient medical or surgical care of sick or injured humans and which may include related facilities such as laboratories, outpatient departments, training facilities, central service facilities, ambulance stops and helicopter landing sites, and other incidental and subordinate uses integral to hospital operations.

Hospital, special care.\ A special care hospital shall mean an institution rendering care primarily for patients with mentally-related illness, or under treatment for alcoholism, substance abuse, etc.

Hotel/motel/motor lodge/inn.\ A building or group of attached or detached buildings containing lodging units intended primarily for rental or lease to transients by the day or week. Such uses generally provide additional services such as daily maid service, restaurants, taverns, or public banquet halls, ballrooms, and meeting rooms and/or recreation facilities.

Itinerant merchant.\ A person who shall engage in, do or transact any temporary or transient business in the county, either in one (1) locality or in traveling from place to place in the sale of goods, services, wares and merchandise, and who, for the purpose of carrying on such business, shall hire, lease, use or occupy any building or structure, motor vehicle, tent, car, boat or public room, or any part thereof, including rooms in hotels, lodging houses or houses of private entertainment, any street, alley or other public place in any city or town or any public road in any county, for a period of less than one (1) year, for the exhibition of or sale of such goods, wares or merchandise.

Kennel, commercial.\ The boarding, breeding, raising, grooming or training of two (2) or more dogs, cats, or other household pets of any age not owned by the owner or occupant of the premises.

Laundry.\ Establishments primarily engaged in the provision of laundering, cleaning or dyeing services other than those classified as personal services. Typical uses include bulk laundry and cleaning plants, diaper services, or linen supply services.

Lawn and garden services.\ Establishments primarily engaged in performing a variety of lawn and garden services, including Bermuda sprigging services, cemetery upkeep, garden maintenance, garden planting, lawn care, lawn fertilizing services, lawn mowing services, lawn mulching services, lawn seeding services, lawn spraying services, lawn sprigging services, mowing highway center strips and edges, seeding highway strips, sod laying and turf installation.

Manufactured home sales.\ Establishment primarily engaged in the display, retail sale, rental, and minor repair of new and used manufactured homes, parts, and equipment.

Marina.\ A use for docking or mooring of more than four (4) boats (excluding paddle or rowboats) or providing services to boats, including servicing and repair, sale of fuel and supplies, and provisions of lodging, goods, beverages. A yacht or boat club shall be considered a marina.

Medical clinic.\ A facility providing medical, psychiatric, or surgical service for sick or injured persons exclusively on an outpatient basis including emergency treatment, diagnostic services, training, administration and services to outpatients, employees, or visitors. This use may include ambulance stops, helicopter landing sites, and other incidental and subordinate uses integral to providing outpatient care. This would include medical offices in excess of ten thousand (10,000) square feet of floor area.

Micro-brewery, distillery, cidery.\ See "Brewery, distillery, cidery" listed under industrial use types. A micro-brewery, distillery, cidery shall not exceed fifteen thousand (15,000) barrels per year in production.

Mini-warehouse.\ A building designed to provide rental storage space in cubicles where each cubicle has a maximum floor area of four hundred (400) square feet. Each cubicle shall be enclosed by walls and ceiling and have a separate entrance for the loading and unloading of stored goods.

Motor vehicle dealership, new.\ The use of a building, land area or other premises for the display of new and used automobiles, trucks, vans, or motorcycles for sale or lease, including warranty repair work and other major and minor repair service conducted as an accessory use.

Motor vehicle dealership, used.\ Any lot or establishment where two (2) or more used motor vehicles, including automobiles, trucks, and motorcycles are displayed at one (1) time for sale or lease, including warranty repair work and other major and minor repair service conducted as an accessory use.

Motor vehicle/outdoor storage.\ The outdoor storage of ten (10) or more operable motor vehicles, and/or watercraft, except when used in conjunction with a bonafide agricultural operation. Motor vehicles in this use shall include such items as cars, trucks, sports utility vehicles, motorcycles, watercraft, motor homes or RVs. This use shall specifically include vehicle impound areas for operable vehicles.

Motor vehicle parts/supply, retail.\ Retail sales of automobile parts and accessories. Typical uses include automobile parts and supply stores which offer new and factory rebuilt parts and accessories, and include establishments which offer minor automobile repair services.

Motor vehicle/rental.\ Rental of motor vehicles and light trucks and vans, including incidental parking and servicing of vehicles for rent or lease. Typical uses include auto rental agencies and taxicab dispatch areas.

Motor vehicle repair service/major.\ Repair of construction equipment, commercial trucks, agricultural implements and similar heavy equipment, including automobiles, where major engine and transmission repairs are conducted. Typical uses include automobile and truck repair garages, transmission shops, radiator shops, body and fender shops, equipment service centers, machine shops and other similar uses where major repair activities are conducted.

Motor vehicle repair service/minor.\ Repair of automobiles, noncommercial trucks, motorcycles, motor homes, recreational vehicles, or boats, including the sale, installation, and servicing of equipment and parts. Typical uses include tire sales and installation, wheel and brake shops, oil and lubrication services, automobile glass repair and similar repair and service activities where minor repairs and routine maintenance are conducted.

Pawn shop.\ A use engaged in the loaning of money on the security of property pledged in the keeping of the pawnbroker and the incidental sale of such property.

Peddler.\ A person who shall carry from place to place any goods, wares or merchandise and offer to sell or barter the same or actually sell or barter the same. All persons who do not keep a regular place of business, whether it is a house or a vacant lot or elsewhere, open at all times in regular business hours and at the same place, who shall offer for sale goods, wares and merchandise, shall be deemed a "peddler."

Personal improvement service.\ Establishment primarily engaged in the provision of informational, instructional, personal improvements and similar services. Typical uses include driving schools, health fitness centers or gyms, reducing salons, dance studios, handicraft and hobby instruction, and baseball and basketball instruction facilities.

Personal service.\ Establishment or place of business engaged in the provision of frequently or recurrently needed services of a personal nature. Typical uses include beauty and barber shops; grooming of pets; seamstresses, tailors, or shoe repairs; florists; and laundromats and dry-cleaning stations serving individuals and households, massage therapy and chiropractic services.

Real estate office, temporary.\ A Class A or B manufactured home, single-family home or other structure used on a temporary basis as a real estate sales office in conjunction with residential development.

Recreational vehicle sales and service.\ Retail sales of recreational vehicles and boats, including service and storage of vehicles and parts and related accessories.

Restaurant, drive-in fast food.\ An establishment primarily engaged in the preparation of food and beverages, for either take-out, delivery or table service, primarily served in disposable containers at a counter, a drive-up or drive-through service facility or offers curb service.

Restaurant, general.\ An establishment engaged in the preparation of food and beverages. This use is characterized by table service to customers in nondisposable containers.

Retail sales.\ Sale or rental with incidental service of goods and merchandise for personal or household use which is not otherwise specifically described in the listing of commercial use types contained herein. Such uses include bakeries, drug stores, bookstores, furniture, gifts, hardware, grocery stores, clothing stores, and floral retail shops.

Short Term Rental.\ The provision of a room or space that is suitable or intended for occupancy for dwelling, sleeping, or lodging purposes, for a period of fewer than thirty consecutive days, in exchange for a charge for the occupancy. A short term rental operator shall be further defined as the proprietor of any dwelling, lodging, or sleeping accommodations offered as a short-term rental, whether in the capacity of owner, lessee, sublessee, mortgagee in possession, licensee, or any other possessory capacity.

Studio, fine arts.\ A building, or portion thereof, used as a place of business for visual art, which may include sculptors, artists or photographers.

Tattoo parlor.\ Any establishment placing designs, letters, scrolls, figures, symbols or any other mark upon or under the skin of any person with ink or other substance resulting in the permanent coloration of the skin, including permanent makeup or jewelry, by the aid of needles or any other instrument designed to touch or puncture skin, except when performed by a medical doctor, veterinarian, registered nurse or other medical professional licensed pursuant to Title 54.1 of the Code of Virginia in the performance of professional duties. Such establishment may also perform body piercing.

Taxidermy.\ A building where animal skins are prepared, stuffed and mounted for sale.

Truck stop.\ An establishment containing a mixture of uses which cater to the traveling public and in particular motor freight operators. A truck stop might include such uses as fuel pumps, restaurants, overnight accommodations, retail sales related to the motor freight industry, and similar uses.

Truck terminal.\ See "warehousing and distribution" listed under industrial use types.

Veterinary hospital/clinic.\ Any establishment rendering surgical and medical treatment of animals. Boarding of animals shall only be conducted indoors, on a short-term basis, and shall only be incidental to such hospital/clinic use, unless also authorized and approved as a commercial kennel.

Wholesale sales.\ Businesses engaged in the sale of goods primarily via mail order to other businesses and/or businesses engaged in the repackaging and resale of goods. Included in this use type are businesses that publish and operate mail order catalogues and wholesale operations that buy in large quantities for repackage or resale to mail order and internet sales customers. This use shall exclude warehousing and distribution, which is regulated as a separate use.

Article IV. - Zoning Districts and Boundaries.

Part 1. - Zoning Districts and Boundaries. Sec. 4-1005. - Table of permissible uses.

Table 1
Table of Permissible Uses

P = Permitted, C = Conditional Use, (*) = Supplementary Use Regulations																	
Use Descriptions	RAC	RR	VC	NC	SE	SR	UR	LC	GC	LI	GI	GIC	PDR	PDMH	PDCP	PDMX	PDIP
AGRICULTURAL USE TYPES																	
Agricultural Crop Service Tower and Antenna (*)	P	C	P	C													
Agricultural Farm Equipment Sales and Service	C		C					P	P	P	P	P			P	C	P
Agricultural Farm Product Processing, Warehousing and Distribution Service	P		P					C		P	P	P			P		P
Agricultural Feed Seed and Farm Supply Service	C		P					P	P	P	P	P			P	C	P
Agricultural Service/Agent	P	P	P					P	P	P	P	P			P		P
Agriculture	P	P	P	C						C	C	C					C
Agritourism (See Part 2A)	P	P	P														
Aquaculture	P	P	P	C					C	C	C	C					C
Aquaculture, Waterfront Business	C	C	P						C	C	C	C					C
Commercial Feedlot (*)	P		C							C	P	C					C
Fair, Agricultural	P		C														
Family Burial Plot	P																
Farm Employee Housing (*)	C	C	C														
Farmer's Market	P		P					P	P				P			P	
Forestry Operation, Silvicultural and/or Timbering (*)	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
Greenhouse, Commercial and/or Nursery																	
• In conjunction with residence	P	C	P	C	C												

• In conjunction with residence	P	C	P	C	C												
• Not in conjunction with residence	P		P					P	P	P	P	P			P	C	P
Greenhouse, Private	P	P	P	P	P	C	C	C	C				C			C	
Livestock Auction Market (*)	P		C							C	P	C			C		P
Reptile Breeding (*)	C									C	C						
Sawmill, Private (*)	P																
Stable, Commercial (*)																	
• In conjunction with residence	P	C	C	C	C								C			C	
• Not in conjunction with residence	P		C					C	C								
Stable, Private (*)	P	P	C	C	C								C				
Viticulture	P	P	P	C						C	C	C					C
Wayside Stand (*)	P	P	P	C													
RESIDENTIAL USE TYPES																	
Accessory Apartment (*)																	
• Residential Accessory Apartment	P	P	P*	C	P*	C	C						P*			P*	
• Commercial Accessory Apartment			C					P	P				P		C	P	
Boathouse (*)	P	P	P	P	P	P	C						C			C	
Community Recreation (*)		C		C	C	C	C						P	P		P	
Condominium (*)				C			P						P			P	
Congregate Housing (*)			C			C	P						P			P	
Dwelling, Multifamily Conversion (*)	C		C	C	C	C	P						C			C	

Dwelling, Single-Family	P	P	P	P	P	P	P						P			P	
Dwelling, Single-Family, Farm	P																
Dwelling Two-Family Duplex (*)	C	C	C	C		P	P						P			P	
Family Day Care Home (*)	P	P	P	P	P	P	P						P			P	
Group Home	P	P	P	P	P	P	P	C					C			C	
Guest House (*)	P	P		C	C												
Home Occupation, Type I (*)	P	P	P	P	P	P	P						P	P		P	
Home Occupation, Type II (*)	P	P	C	C													
Kennel, Private (*)	P	P															
Manufactured Home, Class A (*)	P	P	C											P			
Manufactured Home, Class B (*)	P													P			
Manufactured Home, Class C																	
Manufactured Home, Family Member Residence (*)	P																
Manufactured Home, Temporary Residence (*)	P																
Manufactured Home Park														P			
Manufactured Home Subdivision														P			
Multifamily Dwelling (*)			C			C	P						P			P	
Temporary Emergency Housing (*)	P	P	P	P	P	P	P						P			P	
Townhouse (*)			C	C		C	P						P			P	
CIVIC USE TYPES																	
Administrative Service	P		P					P	P	P	P	P			P	P	P
Adult Care Center (*)	C		C					C	P	P	P	P	C		P	C	P
Assisted Living Facility	C		C					C	P				C			C	
Cemetery (*)																	

• Animal	C	C	C	C													
• Church	C	C	C	C	C	C	C	C	C				C			C	
• Private	C	C	C	C				C	C	C					C	C	C
• Public	C	C	C	C				C	C	C					C	C	C
Child Care Center (*)	C	C	C	C	C	C		P	P	P			C		P	C	C
Child Care Institution (*)	C	C	C					C	C				C			C	
Club	C	C	C	C	C	C	C	P	P				C		P	C	
Community Center (*)	C		P					P	P				P		P	P	
Correctional Facility	C										C	C					C
Crisis Center	C	C	C					P	P						P		
Cultural Service	C	C	P	C	C	C	C	P	P				P			P	
Educational Facility College/ University	C							C	C				C		C	C	
Educational Facility Primary/Secondary (*)	C	C	C	C	C	C	P	P	P				P		P	P	
Halfway House	C	C	C	C	C	C	C	P					C			C	
Life Care Facility	C	C	C	C	C	C	P	P	P				P			P	
Modular Classroom (*)	P	P	P	P	P	P	P	P	P				P		P	P	
Nursing Home (*)	C	C	C	C	C	C	C	P	P				P		P	P	
Park & Ride Facility	P		C					P	P	P	P	P	C	C	P	C	P
Post Office	P		P		C	C	C	P	P				P		P	P	
Public Sports/Event Facility	C		C					C	P	P					P	C	P
Public Maintenance & Service Facility (*)	C		C					C	C	P	P	P			P		P
Public Park and Recreational Area (*)	P	P	P	P	P	P	P	P	P				P			P	
Public Safety Service	P	C	P	C	C	C	C	P	P	P	P	P	C		P	P	P
Religious Assembly (*)	C	C	C	C	C	C	C	C	C				C			C	
Rehabilitation Service			C					P	P						P	P	
Transit Station	C		C					C	P	P	P	P			P	P	P
Utility Service/Major (*)	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	P
Utility Service/Minor (*)	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
OFFICE USE TYPES																	
Financial Institution			C					P	P						P	P	
General Office			C				C	P	P	P		P			P	P	C

Laboratory			C					P	P	P	P				P	C	P
Medical Office			C				C	P	P						P	C	
COMMERCIAL USE TYPES																	
Adult Entertainment Establishment (*)											C						
Auction Establishment	C		C					C	P	P	P	P			P		P
Bed and Breakfast (*)	C	C	P	C	C	C	C	C	C				C			C	
Boarding House	C	C	C	C	C	C	C						C			C	
Boating and Fishing Facilities	C		C					C	C	C	P	P			P	C	P
Business Support Service								P	P	C					P	P	P
Business or Trade School	C		C					C	P	P	P	P			P	C	P
Campground (*)	C																
Campground, Workforce (*)	C																
Car Wash			C					P	P	P	P				P	C	
Catering								C	P						P	C	
Commercial Equipment Repair, Accessory to Dwelling (*)	P	C	P	C	C	C											
Commercial Indoor Amusement			C					C	P	P					C	C	
Commercial Indoor Entertainment			C					C	P	P			C		P	C	
Commercial Indoor Sports & Recreation (*)	C		C				C	P	P	P			C		P	C	P
Commercial Outdoor Entertainment/Sports & Recreation (*)	C							C	C	C	C				C	C	C
Commercial Outdoor Swimming Pool & Tennis Facility (*)	C	C	C	C	C	C	C	C	C				C		C	C	
Construction Office, Temporary (*)	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
Construction Sales & Service								C	P	P	P	P			C		P
Contractor Office and Storage Facility (*)	C		C					C	P	P	P	P			P		P

Convenience Store (*)	C		C					C	C	P	P				C	C	P
Crematorium (*)	C		C					C	C	C					C		C
Dance Hall								C	C	C							
Equipment Sales and Rental	C								C	P	P	P			C		P
Event center	C		P					P	P						P	P	
Flea Market (*)	C		C					C	C	C	C						
Funeral Home (*)	C		C					P	P	C					P	C	
Garden Center (*)	C		C					P	P	P	P	P			P	P	P
Gasoline Station (*)	C		C					C	C	C	C				C	C	C
General Store, Country	C	C	P	C													
Golf Course (*)	C	C	C	C	C	C	C	P	P				P		P	P	
Golf Driving Range (*)	C		C					P	P	P					P	C	
Hospital								C	P						C	C	
Hospital, Special Care								C	C						C	C	
Hotel/Motel/Motor Lodge/Inn			C					C	P	C					P	C	C
Itinerant Merchant								P	P						P	P	
Kennel, Commercial (*)	C							C	C	C	C				C		C
Laundry									C	P	P						P
Lawn and Garden Services	P							P	P	P	P						P
Manufactured Home Sales									C	C					C		
Marina (*)	C	C	C	C	C	C	C	C	P	C			C		P	C	P
Medical Clinic			C					C	P						C	C	
Micro-Brewery, Distillery, Cidery (*)								C	P	P	P	P			P	P	P
Mini-Warehouse (*)								C	C	P	P	P			P		P
Motor Vehicle Dealership/New (*)								C	P						P		
Motor Vehicle Dealership/Used (*)								C	C						C		
Motor Vehicle/ Outdoor Storage									C	P	P	P			C		P
Motor Vehicle Parts/ Supply, Retail (*)			C					P	P	P	P				P	P	P
Motor Vehicle/ Rental (*)								C	P	P	P				P		P
Motor Vehicle Repair Service/Major (*)			C					C	P	P	P				C		P

Motor Vehicle Repair Service/Minor (*)			C					C	P	P	P				C	C	P
Pawn Shop								C	P	P							
Peddler								P	P						P	P	
Personal Improvement Service			C					P	P	C					P	P	P
Personal Service			C					P	P	C					P	P	P
Real Estate Office, Temporary	P	P	P	P	P	P	P						P	P		P	
Recreational Vehicle Sales & Service								C	C						C		
Restaurant, Drive-In Fast Food (*)			C					C	P	C					P	P	P
Restaurant, General			C				C	C	P	C					P	P	P
Retail Sales			C				C	P	P	P					P	P	
Short Term Rentals(*)	P	P	C	C	C	C	C						C	C		C	
Studio, Fine Arts	C		C				C	P	P	P					P	P	
Tattoo Parlor								C	P	P	P				P	C	P
Taxidermy (*)	P		C					C	P	P	P						
Truck Stop								C	C	P	P						P
Veterinary Hospital/ Clinic	P		C				P	P	P						P	P	
Wholesale Sales	C		C					P	P	P	P	P			P	P	P
INDUSTRIAL USE TYPES																	
Abattoir or Livestock Processing (*)	C										C	P					C
Asphalt or Concrete Plant (*)											C	C					C
Brewery, Distillery, Cidery										P	P	P					P
Construction Yard (*)	C								C	P	P	P			C		P
Custom Manufacturing	C		C					C	P	P	P				P	C	P
Industry, Type I	C									P	P	P			C		P
Industry, Type II										C	P	P					P
Industry, Type III											C	C					C
Landfill, Industrial (*)	C									C	C	C					
Landfill, Rubble (*)	C									C	C	C					C
Landfill, Sanitary (*)	C																
Meat Packing											P	P					P
Recycling Center (*)	C									P	P	P					P
Refuse and Recycling Center	C		C						C	P	P	P			C		P

Resource Extraction (*)	C										C	C					C
Sawmill, Commercial										C	P	P					
Scrap and Salvage Service (*)	C									C	C	C					C
Shipping Container (*)	C	C		C	C	C		C	C	P	P	P			C		P
Towing Service Storage										C	C	C					
Yard (*)																	
Transfer Station	C									P	P	P					P
Warehousing and Distribution	C									P	P	P					P
MISCELLANEOUS USE TYPES																	
Amateur Radio Tower (*)	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
Aviation Facility, Commercial (*)	C										C	C					C
Aviation Facility, General (*)	C										C	C			C		C
Aviation Facility, Private (*)	C	C									C	C			C		C
Communication Tower (*)	C	C	C	C				C	C	C	C	C			C	C	C
Composting System, Confined Vegetative Waste or Yard (*)	C																
Hunt Club	P		C														
Parking Facility, Surface/Structure								C	C	C	C	C			C	C	P
Reconstructed Wetland (*)	P	C	C	C	C	C	C	C	C	C	C	C	P	C	C	P	C
Shooting Range, Outdoor (*)	C										C	C					C
Turkey Shoot (*)	P										C	C					C

Sec. 4-2002. Permitted uses

D. Commercial uses:
* Commercial equipment repair, accessory to dwelling
* Construction office, temporary
Lawn and garden services
Real estate office, temporary
* Short-Term Rental

* Taxidermy
Veterinary hospital/clinic
E. Miscellaneous uses:
* Amateur radio tower
Hunt club
* Reconstructed wetland
* Turkey shoot

Sec. 4-3002. - Permitted uses

D. Commercial uses:
* Construction office, temporary
Real estate office temporary
* Short-Term Rental

Sec. 4-4003. - Conditional uses

E. Commercial uses:
* Antique shop
Auction establishment
Boarding house
Boating and fishing facilities
Business or trade school
Car wash
Commercial indoor amusement
Commercial indoor entertainment
* Commercial indoor sports and recreation
* Commercial outdoor swimming pool and tennis court
* Contractor office and storage facility
* Convenience store
* Crematorium
* Flea market
* Funeral home
* Garden center
* Gasoline station
* Golf course
* Golf driving range
Hotel/motel/motor lodge/inn
* Marina
Medical clinic
* Motor vehicle parts/supply retail
* Motor vehicle repair service/minor
Personal improvement service
Personal service
* Restaurant, drive-in fast food
Restaurant, general

Retail sales
* Short-Term Rental
Studio, fine arts
* Taxidermy
Veterinary hospital/clinic
Wholesale sales

Sec. 4-5003. - Conditional uses

D. Commercial uses:
* Bed and breakfast
Boarding house
* Commercial equipment repair, accessory to dwelling
* Commercial outdoor swimming pool and tennis facility
General store, country
* Golf course
* Marina
*Short-Term Rental

Sec. 4-6003. - Conditional uses, Suburban Estate District

D. Commercial uses:
* Bed and breakfast
Boarding house
* Commercial equipment repair, accessory to dwelling
* Commercial outdoor swimming pool and tennis facility
* Golf course
* Marina
* Short-Term Rental

Sec. 4-7003. - Conditional uses, Suburban Residential District

D. Commercial uses:
* Bed and breakfast
Boarding house
* Commercial equipment repair, accessory to dwelling
* Commercial outdoor swimming pool and tennis facility
* Golf course
* Marina
* Short-Term Rental

Sec. 4-8003. - Conditional uses

E. Commercial uses:
* Bed and breakfast
Boarding house

* Commercial indoor sports and recreation
* Commercial outdoor swimming pool and tennis facility
* Golf course
* Marina
Restaurant, general
Retail sales
* Short-Term Rental
Studio, fine arts

Sec. 4-15003. - Conditional uses

D. Commercial uses:
* Bed and breakfast
Boarding house
Commercial indoor entertainment
* Commercial indoor sports and recreation
* Commercial outdoor swimming pool and tennis facility
* Marina
*Short-Term Rental

Sec. 4-16003. - Conditional uses

C. Commercial Uses
* Short-Term Rental

Sec. 4-18003. - Conditional uses

E. Commercial uses:
* Bed and breakfast
Boarding house
Boating and fishing facilities
Business or trade school
Car wash
Catering
Commercial indoor amusement
Commercial indoor entertainment
* Commercial indoor sports and recreation
* Commercial outdoor entertainment/sports and recreation
* Commercial outdoor swimming pool and tennis facility
* Convenience store
* Funeral home
* Garden center
* Gasoline station
* Golf driving range
Hospital
Hospital, special care

Hotel/motel/motor lodge/inn
* Marina
Medical clinic
* Motor vehicle repair service/minor
*Short-Term Rental
Tattoo parlor

Article V. - Supplementary Use Regulations.

Sec. 5-5005. - Supplementary use regulations for commercial use types.

DD. Short Term Rentals

1. A zoning permit is required.
2. An authorized agent must be designated as a point of contact who is available to be contacted and to address conditions occurring at the short term rental within thirty (30) minutes. Physical responses to the site of the short term rental is not required. The Operator shall be notified in writing of failed attempts to receive timely responses from the authorized agent. Failure to respond in a timely manner shall result in a complaint subject to the penalties set forth below.
3. The Operator must register their short term rental unit with the Community Development Department and receive a registration number.
4. The Operator authorizes County employees to enter the subject property upon reasonable advanced written notice to the Operator, at least one (1) time during the calendar year for which registration is valid, to verify the short term rental is being operated in accordance with applicable regulations.
5. The zoning permit may not be transferred.
6. No more than one (1) short term rental may be operated on any lot.
7. Operators may enter into rental agreements with only one (1) party per legal dwelling unit per twenty four (24) hour period.
8. A residential dwelling unit located within a building that contains three (3) or more dwelling units may not be operated as a short term rental.
9. The maximum number of lodgers per night, over the age of eighteen (18) years, shall not exceed two persons per bedroom but in no case shall exceed sixteen persons ~~six (6)~~. This number shall be reduced to conform to the occupancy requirements of the Virginia uniform Building code and/or the Virginia Department of Health.
10. The number of persons allowed to gather at a short term rental at any one time shall not exceed twice the maximum number of permitted overnight guests, including children. Only the maximum number of overnight guests shall be permitted at a short term rental between the hours of 10:00 PM and 7:00 AM. Short term rentals shall not be used as event centers as defined by the Zoning Ordinance.
11. Operators must obtain a business license and register for transient occupancy and state sales tax.

12. Short term rentals must meet current building and zoning regulations and be subject to a safety inspection from the County to confirm the installation of smoke alarms, fire extinguisher and a posted emergency exit plan prior to permit approval.
13. One off-street space per guest room is required in addition to the parking required for the house.
14. No visible evidence of the conduct of a short term rental is allowed on the outside of the property.
15. The owner/operator shall not prepare meals for guests.
16. Operator shall provide proof of liability insurance to rental activity at registration and each subsequent renewal of at least one million dollars. Such insurance coverage must remain in place at all times the short term rental is being operated.
17. Accessory structures, not including permitted accessory dwelling units, shall not be used or occupied as short term rentals.
18. All advertisements for any short term rental shall include the short term rental registration number for such dwelling.
19. A zoning permit for a short term rental may be revoked by the Zoning Administrator, or designee, for the following reasons:
    i. In the event of three (3) or more substantiated complaints of violation of applicable state or local laws, ordinances and regulations, as they relate to short term rentals, within a calendar year; or
    ii. Authorized agent's failure to respond in a timely manner more than twice; or
    iii. Failure to maintain compliance with any regulation set forth in this section. An Operator whose short term rental zoning permit has been revoked shall not be eligible to receive any new short term rental zoning permit for the remaining portion of the calendar year in which the permit was revoked, and for the entire following year.
20. Except as provided in this section, nothing herein nor the issuance of a zoning permit shall be construed to prohibit, limit, or otherwise supersede existing local authority to regulate short term rental of property through general land use and zoning authority. Nothing in this section shall be construed to supersede or limit contracts or agreements between or among individuals or private entities related to the use of real property, including recorded declarations and covenants; the provisions of condominium instruments of a condominium created pursuant to the Condominium Act (§ 55-79.39 et seq.) of the Code of Virginia, 1950, as amended; the declaration of a common interest community as defined in Code of Virginia, 1950, § 55-528, as amended; the cooperative instruments of a cooperative created pursuant to the Virginia Real Estate Cooperative Act (§ 55-424 et seq.) of the Code of Virginia, 1950, as amended; or any declaration of a property owners' association created pursuant to the Property Owners' Association Act (§ 55-508 et seq.).

DATE:_____

READ AND PASSED: _____
Chairman

TESTE: _____
Clerk

Approved as to Form:

_____
Robert W. Jones, Jr., County Attorney

PLANNING REPORT

APPLICATION:

Proposed Revisions to Appendix B. Zoning: Article I (General Provisions), Section 1-1011, to clarify the power to conduct inspections, Section 1-1013, to clarify penalties and remedies for zoning violations, and to Appendix B-1. Chesapeake Bay Preservation Area Ordinance: Article 5 (Administrative Procedures and Enforcement), Section 5003, to clarify penalties and remedies for violations

ELECTION DISTRICT:

All

LOCATION:

County-wide

BACKGROUND:

The County Attorney's Office proposes language to clarify enforcement provisions in the Zoning and Chesapeake Bay Preservation Area Ordinances.

DESCRIPTION:

The proposed text for the proposed Ordinance changes is attached to this staff report.

STAFF RECOMMENDATION:

Staff recommends approval of the proposed changes.

ATTACHMENTS:

Description	Type	Upload Date
Section 1-1011 Redline	Backup Material	10/19/2023
Section 1-1013 Redline	Backup Material	10/19/2023
CBPA Ordinance Redline	Backup Material	10/19/2023

Sec. 1-1011. Powers and duties of the zoning administrator.

A. The office of zoning administrator is hereby established. The primary responsibility for administering and enforcing this ordinance shall be assigned to the zoning administrator.

B. The zoning administrator shall be vested and charged with the following powers and duties:

1. Receive, process, and review complete applications under the provisions of this ordinance for transmittal and recommendation to the planning commission, board of zoning appeals, and board of supervisors.

2. Issue zoning permits pursuant to the provisions of this ordinance and suspend or revoke any zoning permit upon violation of any of the provisions of this ordinance or any approvals granted hereunder subject to the requirements of this ordinance.

3. The zoning administrator shall keep records of all zoning permits issued under this ordinance, maintain permanent and current records related to the ordinance, including the official zoning map, amendments, conditional use and special use permits, variances, appeals, and development site plans; and, make annual reports and recommendations to the planning commission and board of supervisors on matters pertaining to this ordinance.

   If this ordinance requires approval by another agency of certain site plan features, such approval shall be obtained prior to issuance of a zoning permit, unless deemed unnecessary by the zoning administrator due to the scope and nature of the proposed project or development.

4. Conduct inspections and surveys to determine whether a violation of this ordinance exists.

   The zoning administrator or his agent may present sworn testimony to a magistrate or court of competent jurisdiction and, if such sworn testimony establishes probable cause that a zoning ordinance violation within a dwelling unit has occurred, may request that the magistrate or court grant the zoning administrator or his agent an inspection warrant to enable the zoning administrator or his agent to enter the subject dwelling unit for the purpose of determining whether violations of the zoning ordinance exist. The zoning administrator or his agent shall make a reasonable effort to obtain consent from the owner or tenant of the subject dwelling prior to seeking the issuance of an inspection warrant pursuant to this section.

   Whenever the zoning administrator has reasonable cause to believe that any person has engaged in or is engaging in any violation of any provision of this chapter that limits occupancy in a residential dwelling unit, which is subject to a civil penalty as prescribed in subsection (c) below, and the zoning administrator, after a good faith effort to obtain the data or information necessary to determine whether a violation has occurred, has been unable to obtain such information, he may request that the county attorney petition the judge of the general district court for a subpoena duces tecum against any such person refusing to produce such data or information. The judge of the court, upon good cause shown, may cause the subpoena to be issued. Any person failing to comply with such subpoena shall be subject to punishment for contempt by the court issuing the subpoena. Any person so subpoenaed may apply to the judge who issued the subpoena to quash it.

5. Seek criminal or civil enforcement for any provision of this ordinance and take any action on behalf of the county, either at law or in equity, to prevent or abate any violation or potential violation of this ordinance.

6. Render interpretations, upon written request of an interested person whose property may be affected, as to the applicability of this ordinance to particular uses and its application to the factual

circumstances presented. When such request is made by an applicant which is not the owner of the property in question, written notice of the request shall be provided to the owner of the property within ten (10) days of receipt of the application.

7. Design and distribute applications and forms required by this ordinance and request information which is pertinent to the requested approval.
8. Perform such duties as are necessary for the proper enforcement and administration of this ordinance.
9. In appropriate cases, allow for the refund of fees paid pursuant to this zoning ordinance upon certification by the zoning administrator of the need for such refund and approval by the county administrator. (7-7-05; 1-22-09; Ord. No. 2011-14-C, 8-4-11; 7-19-18.)

Sec. 1-1013. Zoning permit and occupancy permit guidelines.

A. When is a zoning permit required.

1. A zoning permit shall be required for the erection, construction, reconstruction, moving, adding to, enlargement or alteration of any structure, or the establishment of any land use, except for bona fide agricultural uses, such as raising of crop or livestock, permitted by right under the provisions of this ordinance.

2. No permanent sign may be erected without first obtaining a zoning permit in accordance with this ordinance.

3. No building or other structure except accessory farm structures shall be razed, demolished, or removed, either entirely or in part, nor shall any of said activities be commenced, without a zoning permit.

4. Additional permits may be required to enforce the provisions of this ordinance.

B. Exemption from zoning permit. The following uses do not require a zoning permit for erection, construction, reconstruction, moving, adding to, enlargement or alteration:

1. Streets.

2. Electric power, telephone, cable television, gas, water, and sewer lines, street lights, wires or pipes, together with supporting, poles or structures, and traffic control signs located within a public right-of-way.

C. Zoning permit applications.

1. All applicants for a zoning permit shall be accompanied by such plans and information as the zoning administrator deems to be necessary and appropriate to determine compliance and provide for enforcement of this ordinance.

2. If this ordinance requires approval by another agency of certain site plan features, such approval shall be obtained prior to issuance of a zoning permit, unless deemed unnecessary by the zoning administrator due to the scope and nature of the proposed project or development.

3. If the zoning permit involves the subdivision of land, an approved subdivision plat shall be required.

D. Zoning permit approval. A zoning permit shall not be issued unless and until the site plan and project proposal complies with applicable established design criteria, construction standards, and specifications for all improvements as may be required by this ordinance.

E. Expiration of permits. All permits shall expire automatically if, within six (6) months after the issuance of such permits:

1. The use authorized by such zoning and/or other permit has not commenced, in circumstances where no substantial construction, erection, alteration, excavation, demolition, or similar work is necessary before commencement of such use; or

2. If, after some physical alteration to land or structures begins to take place, such work is discontinued for a period of six (6) months, then the permit authorizing such work shall immediately expire. However, expiration of the permit shall not affect the provisions of severability, subsection 1-1012.A.

F. General description of occupancy permit.

1. No person shall use or permit the use of any structure or premises or part thereof hereafter created, erected, changed, converted, enlarged or moved, wholly or partly, until an occupancy permit shall have been issued by the building official.

2. No building, or other structure, or land shall be used, nor shall any building, structure, or land be converted, wholly or in part, to any other use, except for bona fide agricultural uses permitted by right under the provisions of this ordinance, until an occupancy permit has been issued by the building official.

3. Such permits shall show that the structure or use, or both, or the premises, or the affected part thereof, are in conformity with the provisions of this ordinance.

4. It shall be the duty of the building official to issue such permit if it is found that all of the provisions of this ordinance have been met and to withhold such permit unless all requirements of this ordinance have been met. If an occupancy permit is not issued, written notice shall be given to the applicant stating why an occupancy permit cannot be issued.

5. Upon written request from the owner, and upon inspection to determine the facts in the case, the building official shall issue an occupancy permit for any building premises or use that is in conformity with the provisions of this ordinance or where a legal nonconformity exists, as determined by the zoning administrator.

G. Temporary or partial occupancy permit.

1. The building official at his discretion may issue a temporary occupancy permit with a recommendation from the zoning administrator for a period not exceeding six (6) months during alterations or partial occupancy of a building pending its completion in accordance with general rules or regulations concerning such additional conditions and/or safeguards as are necessary, in the circumstances of the case, to protect the safety of the general public. The occupancy permit recipient may be required to provide a performance bond or other security satisfactory to the zoning administrator and approved as to form by the county attorney to ensure that all of the requirements of this ordinance will be fulfilled within a reasonable period determined by the zoning administrator.

2. A final occupancy permit may be issued for any appropriate complete building or part of a building located in a part of the total area or any approved site plan, provided:

a. The other on-site construction and improvements included in the approved site plan for the section have been inspected and accepted by the county and other appropriate agencies and, at the discretion of the zoning administrator, a certified "as built" site plan has been submitted for review and approval prior to the proposed date of occupancy.

b. The off-site improvements related to and necessary to serve the section have been completed, inspected and accepted by the county, the Virginia Department of Transportation or other appropriate agencies; and the developer has submitted a certified "as built" drawing for the section; or the developer has provided surety acceptable to the zoning administrator and approved as to form the by the county attorney.

H. Enforcement and review.

1. Zoning permit authorization.

a. Zoning and occupancy permits issued on the basis of plans and applications approved by the zoning administrator shall authorize only the use, arrangement and construction set forth in such permits, plans, and certificates, and no other. The use, arrangement, or construction at variance with that authorization shall be deemed a violation of this ordinance.

b. All departments, officials and public employees of Isle of Wight County, which are vested with the duty or authority to issue permits or licenses, shall do so in conformance with the provisions of this ordinance. Such departments and personnel shall issue certifications or permits for uses, buildings or purposes only when they are in harmony with the provisions of this ordinance. Any such certification or permit, if issued in conflict with the provisions of this ordinance, shall be null and void.

I. Complaints regarding violations. Whenever the zoning administrator receives a written, signed complaint or a duly completed complaint form alleging a violation of this ordinance, he shall investigate the complaint, take whatever action is warranted, and inform the complainant of what actions have been or will be taken.

J. Persons liable. The owner, tenant, or occupant of any building or land or part thereof and any architect, builder, contractor, agent, or other person who participates in, assists, directs, creates, or maintains any situation that is contrary to the requirements of this ordinance may be held responsible for the violation and suffer the penalties and be subject to the remedies herein provided.

K. Procedures upon discovery of violations.

1. If the zoning administrator finds that any provision of this ordinance is being violated, a written notice shall be forwarded to the person responsible for such violation, indicating the nature of the violation and ordering the action necessary to correct it.

2. In cases when delay would seriously threaten the effective enforcement of this ordinance or pose a danger to the public health, safety, or welfare, the zoning administrator may seek enforcement without prior written notice by posting an order to "cease and desist", and by invoking any of the penalties or remedies authorized in this ordinance.

3. The zoning administrator in consultation with the county attorney may pursue other legal remedies as may be necessary.

L. Penalties and remedies for violations.

1. Violating, causing or permitting the violation of, or otherwise disregarding any of the provisions of this chapter by any person, firm or corporation, whether as principal, agent, owner lessee, employee or other similar position, shall be unlawful and is subject to the following:

a. ~~Criminal sanctions. Upon conviction, shall be guilty of a misdemeanor and shall be fined not less than ten dollars ($10.00), nor more than one thousand dollars ($1,000.00). Failure to remove or abate a zoning violation shall constitute a separate misdemeanor offense punishable by a fine of not less than ten dollars ($10.00) nor more than one thousand dollars ($1,000.00), and any such failure during any succeeding thirty-day period shall constitute a separate misdemeanor offense for each thirty-day period punishable by a fine of not less than ten dollars ($10.00) nor more than one thousand dollars ($1,000.00).~~

Criminal sanctions. Upon conviction, any such violation shall be a misdemeanor punishable by a fine of not less than ten dollars ($10.00) nor more than one thousand dollars ($1,000.00). If the violation is uncorrected at the time of the conviction, the court may order the violator to abate or remedy the violation in compliance with the zoning ordinance, within a time period established by the court. Failure to remove or abate a zoning violation within the specified time period shall constitute a separate misdemeanor offense punishable by a fine of not less than ten dollars ($10.00) nor more than one thousand dollars ($1,000.00), and any such failure during any succeeding ten (10) day period shall constitute a separate misdemeanor offense for each ten (10) day period punishable by a fine of not less than one hundred ($100.00) nor more than one thousand five hundred dollars ($1,500.00).

Any conviction resulting from a violation of the provisions regulating the number of unrelated persons living as a "family" in a residential dwelling shall be punishable by a fine of up to $2,000. Failure to abate the violation within the specified time period shall be punishable by a fine of up to $5,000, and any subsequent failure during any succeeding 10-day period shall constitute a separate misdemeanor offense for each 10-day period punishable by a fine of up to $7,500. However, no such fine shall accrue against an owner or managing agent of a single-family residential dwelling unit during the pendency of any legal action commenced by such owner or managing agent of such dwelling unit against a tenant to eliminate an overcrowding condition in accordance with Chapter 13 or Chapter 13.2 of Title 55, as applicable. A conviction resulting from

a violation of provisions regulating the number of unrelated individuals in a residential dwelling unit shall not be punishable by a jail term.

b. Injunctive relief. Any violation or attempted violation of this chapter may be restrained, corrected or abated as the case may be by injunction or other appropriate relief.

c. Civil penalties.

~~i. Each day during which a violation is found to exist shall be a separate offense. However, in no event shall specified violation arising from the same set of operative facts be charged more frequently than one (1) in a ten-day period and in no event shall a series of such violations result in civil penalties of more than five thousand dollars ($5,000.00). Such civil penalty shall be in lieu of criminal sanctions. However, in the event such civil penalties total five thousand dollars ($5,000.00) or more, the violation may be prosecuted as a criminal misdemeanor.~~

~~ii. The zoning administrator and his designee may issue a civil summons as provided by law for a scheduled violation. Any person summoned for a scheduled violation may make an appearance in person or in writing by mail to the county treasurer prior to the date fixed for trial in court. Any person as appearing may enter a waiver of trial, admit liability and pay the civil penalty established for the offense(s) charged. Such persons shall be informed of their right to stand trial and that a signature to an admission of liability will have the same force and effect as a judgment of court.~~

~~iii. If a person charged with a scheduled violation does not elect to enter a waiver of trial and admit liability the violation shall be tried in the general district court in the same manner and with the same right of appeal as provided by law. In any trial for a violation, it shall be the burden of the zoning administrator or his or her designee to show the liability of the violator by a preponderance of the evidence. If the violation remains uncorrected at the time of the admission of liability or finding of liability, the court may order the violator to abate or remedy the violation in order to comply with the zoning ordinance. Except as otherwise provided by the court for good cause shown, any such violator shall abate or remedy the violation within a period of time as determined by the court, but not later than six (6) months of the date of admission of liability or finding of liability. Each day during which the violation continues after the court-ordered abatement period has ended shall constitute a separate offense. An admission of liability or finding of liability shall not be a criminal conviction for any purpose.~~

~~d. [Offenses.]No provision herein shall be construed to allow the imposition of civil penalties for:~~

~~i. Enforcement of the Uniform Statewide Building Code;~~

~~ii. Activities related to land development or activities related to the construction or repair of buildings and other structures;~~

~~iii. Violations of the erosion and sediment control ordinance;~~

~~iv. Violations resulting in injury to any person or persons.~~

i. Any person summoned or issued a ticket for a violation of this chapter listed in subsection (b) below may make an appearance in person or in writing by mail to the county treasurer prior to the date fixed for trial in court. Any person so appearing may enter a waiver of trial, admit liability and pay the civil penalty established in this section for the offense charged, in lieu of criminal sanctions. Such persons shall be informed of their right to stand trial and that a signature to an admission of liability will have the same force and effect as a judgment of court. If a person charged with scheduled violation does not elect to enter a

waiver of trial and admit liability, the violation shall be tried in the general district court in the same manner and with the same right of appeal as provided by law.

ii. A civil penalty is hereby established for a violation of any offense listed below in the amount of two hundred dollars ($200.00) for any one (1) violation for the initial summons and five hundred ($500.00) for each additional summons:

1. Constructing, placing, erecting, installing, maintaining, operating, or establishing an accessory structure or use in violation of Sec. 5-1004 et seq.

2. Constructing, placing, erecting or displaying a sign in violation of Sec. 9-1001 et seq.

3. Erecting, altering, or changing use or occupancy of any building, structure, or premises without first obtaining a zoning certificate or certificate of zoning compliance in violation of Sec. 1-1013.

4. Failure to perpetuate and maintain all landscaping, screening, and fencing materials required by this chapter in violation of Sec. 8-1012.

5. Operating, conducting or maintaining a home occupation in violation of Article IV.

iii. Each day during which a violation is found to exist shall be a separate offense. However, in no event shall specified violations arising from the same set of operative facts be charged more frequently than once in a ten (10) day period and in no event shall a series of such violations result in civil penalties which exceed a total of more than five thousand dollars ($5,000.00). When such civil penalties total $5,000 or more, the violation may be prosecuted as a criminal misdemeanor.

iv. The above provisions notwithstanding, civil penalties shall not accrue or be assessed during the pendency of the 30-day appeal period allowable pursuant to the terms of Sec 1-1019(C).

v. No provisions herein shall be construed to allow the imposition of civil penalties for:

1. enforcement of the Uniform Statewide Building Code;

2. activities related to land development;

3. violations of the erosion and sediment control ordinance;

4. violations relating to the posting of signs on public property or public rights-of-way; or

5. violations resulting in injury to any person or persons.

(7-7-05; Ord. No. 2011-10-C, 6-16-11; 7-19-18.)

Sec. 5003. Enforcement, violation and penalties.

(a) The primary responsibility for administering and enforcing this ordinance shall be assigned to the zoning administrator or a duly authorized designee. The zoning administrator or his duly authorized designee, planning commission members and board of supervisors' members including other persons designated by the board of supervisors, shall have authority to conduct inspections and surveys upon the property affected by this ordinance to determine compliance with this ordinance. The zoning administrator shall seek criminal or civil enforcement for any provision of this ordinance and take any action on behalf of the county to prevent or abate any violation or potential violation of this ordinance. The zoning administrator, upon written request of an interested person whose property may be affected, shall render an opinion as to the applicability of this ordinance to particular uses in its application to the factual circumstances presented. The zoning administrator shall design and distribute applications and forms required for this ordinance and request information that is pertinent to the request of the approval and shall perform such other duties as are necessary for the proper enforcement and administration of this ordinance.

(b) Any person firm or corporation who violates any of the provisions of this chapter shall, on conviction, be guilty of a Class I misdemeanor as defined by Title 18.2 of the Code of Virginia as amended. Should any section or provision of this chapter be declared by the courts to be unconstitutional or invalid, such decision shall not affect the validity of this chapter as a whole or any part thereof, other than the part so declared invalid or unconstitutional.

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(c) In addition to any other remedies in subsection (~~a~~b) of this section, the following penalties are incorporated in this ordinance as follows:

1. Any person who: (i) violates any provision of the ordinance or (ii) violates or fails, neglects, or refuses to obey any board of supervisors' or the zoning administrator's final notice, order, rule, regulation, or variance or permit condition authorized under this ordinance shall, upon such finding by an appropriate circuit court, be assessed a penalty not to exceed five thousand dollars ($5,000.00) for each day of violation.

2. With the consent of any person who: (i) violates any provision of this ordinance or (ii) violates or fails, neglects, or refuses to obey any board of supervisors' or zoning administrator's, notice, order, rule, regulation, or variance or permit condition authorized under this ordinance, the board of supervisors' may provide for the issuance of an order against such person for the one (1) time payment of civil charges for each violation in specific sums, not to exceed ten thousand dollars ($10,000.00) for each violation. Such civil charges shall be paid into the treasury of Isle of Wight County for the purpose of abating environmental damage to or restoring Chesapeake Bay Preservation Areas in the county except that where the violator is the county or its agent, the civil charges shall be paid into the state treasury. The civil charges shall be in lieu of any appropriate civil penalty imposed under subdivision 1. of this subsection. Civil charges may be in addition to the cost of any restoration required or ordered by the board of supervisors or zoning administrator. (8-21-06; 11-18-21(2).)

PLANNING REPORT

APPLICATION:

Application of NVR, Inc., applicant, and, Henry Layden, special trustee for the William Grover Yeoman, III Trust, property owner, for a Conditional Rezoning (ZA-06-19) of approximately 250 acres of property with tax map number 32-01-009 located on Benns Grant Boulevard (Rte. 10) from the Rural Agricultural Conservation (RAC) zoning district to the Conditional - Planned Development - Mixed Use (C-PD-MX) zoning district

ELECTION DISTRICT:

District 1

LOCATION:

The proposed project is located on an approximately 249.47 acre portion of the property with tax map number 32-01-009, also known as the Yeoman tract. The property is bounded to the north by the Town of Smithfield jurisdictional boundary as well as a residential property in the RAC zoning district, and a property in the Conditional-Limited Industrial zoning district which is currently used by the Sherwin Williams Paint Store. The project site is bounded to the west by Benns Church Boulevard (Rte.10), and the remainder of tax map number 32-01-009 is directly across the Rte. 10. The property is bounded to the east by Jones Creek, residential and agricultural property in the RAC zoning district. To the south, it is adjacent residential and agricultural property in the RAC zoning district as well as one property, known as St. Luke's Village, in the C-PD-MX zoning district.

BACKGROUND:

The portion of the property on which the proposed project is located is currently in agricultural and silvicultural use. There is an approximately twenty acre remaining portion on the west side of Route 10 that is also currently in agricultural use. However, a conditional use permit is currently under review for a convenience store and gasoline station on approximately 3.8 acres of the property at the southwest corner of the Turner Drive and Benns Grant Boulevard intersection. The property has historically been used for agricultural and silvicultural uses.

<u>Current Project Status</u>:

The Planning Commission held a public hearing on the proposed application at their September 26, 2023, regular meeting. Following the public hearing, the Planning Commission discussed the application and moved to continue their discussion to their next regular meeting in order to allow staff time to provide additional information to the Commission. Staff subsequently sent the following list of questions from the Commission to Dr. Chris Coleman at Isle of Wight County Schools:

1. Has schools had any issues with school children coming from the age-restricted neighborhoods? During the meeting, you mentioned that you could pull a report to see if there were any school buses picking up or dropping off children in these neighborhoods.
2. The build-out for the Sweetgrass is six years with a projected 38 non-age restricted townhomes being built each year. How will this impact schools?
3. What is the actual number of school children generated by Benns Grant? Can you also give numbers for the Crossings condos and the Brewers Station apartments?
4. During the meeting, you mentioned that you were preparing an area plan for the school board that you could also share with the Planning Commission. Do you have a copy of this report available that I could share with the Planning Commission?
5. What are the per capita operational and capital expenses per student? This may require some stakeholder coordination (legal, school, etc.) to distinguish what can reasonably be attributed to a capital expense and may vary from our budgetary definitions. For example, is a student-issued electronic device, chair, desk, etc. capital? Obviously a bus addition would be, so the scope of this answer should include bus capacity and constraints. Also, please specifically address the increased transportation demand the proposed Sweetgrass project would bring.
6. Is there a reasonable projection of added SPED students per added student population (percentage) that require some added capital need? Also consider STEM, CTE, etc.
7. Is it possible to define a student per capita capital/operational expense projection considering all variables? If so, should this be established and updated at some frequency?
8. Request the school provide data of current student load, capacity, and projections based on county projected growth. Also, the school is requested to comment on any recent (last 5 years) mitigation efforts required to maintain adequate classroom occupancy levels (e.g. redistricting, grade level adjustments per school, etc.).
9. Request legal opinion on how much school "maneuvering" (redistricting,

school grade level service adjustments, etc.) is necessary before a capacity limit requires a significant capital investment in expansion.

Dr. Coleman responded that additional time was needed to provide responses to the questions.

Staff also met with Fire and Rescue staff to further discuss the operational impact of the projected 349 additional fire and rescue calls from the proposed development. Based on current call volume, staff determined that the additional calls can be absorbed without degradation of service. Staff analysis shows that the development could generate approximately one additional EMS call per day and one additional fire call per week for the northern service area.

In addition, staff also received additional review comments from the Town of Smithfield which are attached to this staff report. Because additional time is needed to provide the requested information, staff recommends no action at this time.

DESCRIPTION:

The purpose of the application is to allow for up to 390 age-restricted single family detached residential units, 225 residential townhomes, and approximately five acres of commercial uses to include up to 18,000 square feet of retail and commercial uses and up to 55,000 square feet of office uses.

The elevations and materials for the residential units are attached to the staff report as Sweetgrass Elevations. Although there are no examples of the single family detached models constructed in the County, there are examples of the townhome models located in the Benn's Grant community. Pictures are attached to the staff report. The proffer statement commits to a master bedroom on the first floor of the age-restricted single family homes. The fiscal impact analysis projects the average sales price of an age-restricted unit to be $305,200 and townhomes to be $258,875.

Retail uses are defined separately in the Zoning Ordinance and are considered a commercial use type. In addition to the proffered retail use, other permitted commercial uses in the PD-MX zoning district could include the following:

- Antique shop;
- Business support service;

- Construction office, temporary;
- Event center;
- Garden center;
- Golf course;
- Itinerant merchant;
- Micro-brewery, distillery, cidery;
- Motor vehicle parts/supply, retail;
- Peddler;
- Personal improvement service;
- Personal service;
- Real estate office, temporary;
- Restaurant, drive-in fast food;
- Restaurant, general;
- Retail sales;
- Studio, fine arts;
- Veterinary hospital/clinic; and
- Wholesale sales.

A copy of the proffered conditions, illustrative concept plan, and other supporting documents are attached to this staff report for your information. Among the proffered conditions are a set of residential and commercial design guidelines as well as a proffer that the age-restricted units will have a master bedroom and bathroom on the first floor. Enforcement of the age-restriction condition and the maintenance for all open space, recreational amenities, stormwater facilities, and landscaping shall be the responsibility of the property owner's association.

Staff assessed the application for its consistency with the County's plans and ordinances as well as potential impacts to natural and cultural resources, public facilities and services. The following is a summary of the projected benefits, potential impacts and any mitigation measures proposed by the applicant.

Environmental Assessment:

The project site lies within the Chesapeake Bay watershed area and has several wetland areas and tributary streams to Jones Creek within it which have been confirmed by the US Army Corps of Engineers. In addition, the Resource Protection Area (RPA) buffer has been confirmed by the Virginia Department of Environmental Quality. There is also a large farm pond created many years ago by a dam that still provides connectivity to the tributary stream.

The Department of Conservation and Recreation has classified the areas containing the streams, wetlands, and Jones Creek as having a "high" (C3) ecological core area score. Ecological core areas are classified into five categories of ecological integrity: C1 - Outstanding; C2 - Very High; C3 - High; C4 - Moderate; and C5 - General. Scores are enhanced if the core or habitat fragment is part of a larger complex of natural lands. Scores also increase for those cores and habitat fragments that contribute to water quality enhancement. In general, larger, more biologically diverse areas are given higher scores.

A review of information from the National Fish and Wildlife Service shows the possibility of several endangered and rare species and species of concern in the general including the Bald Eagle, the northern long-eared bat, tri-colored bat, red-headed woodpecker, and several other migratory species. Although it is not known whether there are any of these species present on the property, the USFWS information does not identify the property as critical habitat for any of these species.

The Sweetgrass project proposes to retain and restore the full extent of the RPA and floodplain areas that are within the ecological core area except for several access road crossings. The lot area as shown on the concept plan do not contain RPA buffer areas. Future construction on the property may be subject to time-of-year restrictions based on the breeding and migratory needs of critical species.

A review of the USDA soils information shows that the areas proposed for development will occur on soils designated either soils of statewide importance or prime farmland soils. Poorly drained soils occur in and near the wetland, stream and floodplain areas of the property. Prior to construction, all habitable structures will require a shrink/swell soils assessment for foundation design.

Even though the concept plan and water quality impact assessment (WQIA) submitted with the project propose impacts for road crossing and stormwater management impacts, these impacts are subject to a separate review and approval process. Although the concept plan notes these impacts are subject to additional review and approval, staff does not include the WQIA as part of the rezoning

approval request, because it will be submitted as part of a future RPA Buffer modification application.

Historic Resources Assessment:

The property falls within the high probability area for archeological resources according to County records. The applicant provide a Phase 1A Cultural Resources Analysis study with their initial application. A copy of the report is attached, however, the staff request for a final report without the word "draft" on it has gone unheeded as of the date of this report. The report states that there are no known archeological resources on the site, however, several of the existing out buildings may be of an historic nature and recommends that a Phase I be conducted. The applicant commits to a Phase I study with further Phase II and Phase III studies as appropriate in the proffer statement. These studies shall be submitted prior to subdivision or site plan submittal and shall be subject to review by the Virginia Department of Historic Resources. County Historic Resources staff concerns are satisfied with the proffered condition.

Transportation Facility Impacts:

All of the streets within the proposed project will be public streets, except for the private drive aisles within the townhome phase which are proposed for a condominium style of ownership. All public roads will be required to be built to the Virginia Department of Transportation (VDOT) standards in order to be accepted into the state secondary street system maintenance program. The project proposes two entrances to serve the development from Benn's Church Boulevard (Rte. 10).

The main entrance will be closest to the Smithfield Town boundary and will utilize an existing median cut. The Traffic Impact Analysis (TIA) recommends and the applicant proffers to a signal at this intersection. The second southern entrance will be a right in/right out entrance only with no signal.

The TIA shows the new development would add an average of 6,685 new vehicle trips per day. The average number of new peak hour morning (6 AM to 8 AM) trips would be 521 trips and new peak hour evening (2:30 PM to 5:30 PM) trips would average 692.

The TIA projects that traffic generated by the development will exceed current turn lane storage length at Turner Drive and Benns Church Boulevard as well as create a need for a new traffic signal and increased turn lane storage at the main

entrance of Sweetgrass. The TIA recommends the following traffic improvements be made to mitigate for the projected negative traffic impacts:

1. Construct northbound right turn lane (200' storage plus 200' taper) into right in/right out development entrance off of US 258/Rt 10 (Benns Church Boulevard).
2. Construct northbound right turn lane (200' storage plus 200' taper) into main entrance off of US 258/Rt 10 (Benns Church Boulevard).
3. Lengthen southbound left turn lane to provide 200' storage plus 200' taper into main entrance off of US 258/Rt 10 (Benns Church Boulevard).
4. Install traffic signal at intersection of US 258/Rt 10 (Benns Church Boulevard) and main entrance.
5. Install signal infrastructure to provide a protected eastbound right-turn overlap at US 258/Rt 10 (Benns Church Boulevard) and Turner Drive.
6. Install flashing yellow arrows for the northbound and southbound left turn lanes at the intersection of US 258/Rt 10 (Benns Church Boulevard) at Canterberry Lane, Cypress Run Drive, Turner Drive and the main entrance to allow lead/lag operation.
7. Optimize signal timings along the corridor.

The applicant has committed to making the recommended road improvements in the proffer statement. The proffered conditions address earlier concerns from VDOT and the County Transportation Manager.

As a matter for informational purposes, the County is currently coordinating a master TIA project for the Benn's Church Boulevard and Turner Drive intersection area that will assess needed road improvements to accommodate future commercial, residential and school development planned in both the County and Town of Smithfield. The Sweetgrass applicants are currently not participating in this project.

Emergency Services, Fire and Public Safety Facility Impacts:

The County Capital Impact Model does not show that the proposed development will generate a need for additional capacity at existing fire and rescue or public safety facilities in the northern service area where the project site is located. However, the capital impact model does not show operational impacts, such as additional staff, equipment or supply needs, to these services.

The County's Department of Fire and Rescue reviewed the proposed development as currently proffered and found that the department will see a significate increase

in calls for service. The projected annual increase is 349 calls for service with 296 additional EMS calls and 53 additional Fire calls. At current staffing levels, an increase for service of this size will more than likely have a notable impact on our service delivery.

School Facility Impacts:

The County Capital Impact Model shows that the proposed development will generate approximately 52 new school students with thirty new elementary school students, seven new middle school students, and fifteen high school students. The models shows Sweetgrass generating a need for capacity expansion at the middle school.

The new Westside, planned to function as a new middle school, remains in the CIP with an estimated total cost of $38 million. It is projected that the 225 non-age restricted residential units will generate seven middle school students in excess of the existing capacity of the middle school. According to the proportionate share of the costs for a new middle school generated by the model is $318,367 for seven additional students, or $1,414.96 per household (225), after a credit is applied for future debt service contributions made as a portion of future tax payments.

Please note the capital impact model does not show operational impacts, such as additional staff, equipment or supply needs, to these services. The County school division states that is has no further comment on the proposed development since its initial comments in 2020. The applicant has not included any sort of mitigation measures for additional students generated by the development.

Parks and Recreation Facility Impacts

The County Capital Impact Model shows that the proposed development will generate approximately 1,297 new people which will create a need for additional regional park, neighborhood park, recreational center, community center, and event center recreational facility space. However, the proposed development will include 9.87 acres of pocket park and central park space as well as a community clubhouse facility, pool, play equipment and pedestrian trails throughout the community to help meet this need. The development will also be required to install its portion of the multipurpose trail along its road frontage with Benn's Church Boulevard. The applicant also proposes to preserve the RPA buffer and floodplain to the maximum extent possible which greatly increases the amount of open space in the neighborhood.

Economic Impact Assessment:

While the County's Capital Impact Model reviews impacts to public facilities only, a fiscal impact analysis compares revenues generated from the project with both the operating and capital costs to a jurisdiction associated with the provision of public services and facilities to serve the new development. It includes all direct revenues and costs associated with the development proposal.

The June 2021 Fiscal Impact Analysis submitted with the application assumes an annual absorption of 65 age-restricted single family units per year and 38 townhouses is assumed in the analysis with a six year build-out. The report states that the average projected price of an age-restricted unit will be $305,200 and townhomes will be $258,875. The FIA concludes that the proposed development, to include both the residential and commercial uses, will generate $43.6 million in revenue compared to $22.7 million in expenditures over a 20-year period, generating a $20.9 million net surplus. Costs include ongoing annual operating expenditures and capital costs that include debt financing with payments that continue beyond the last year in the model projection period. The average annual revenues are estimated at $1.05 million per year. No job creation data was included in either the FIA or community impact statement.

To address staff's concern in regard to market saturation of age-restricted housing units in the County, the applicant submitted a market analysis report. The County currently has several age-restricted communities, including the 340 unit South Harbor development in Carrollton and Church Square in the Town of Smithfield. The 2021 market report states Sweetgrass will draw interest from a broad geographic area, and census data shows 61,234 persons over the age of 55 in that market area. An average of 13% of this population will desire a living or lifestyle change every year. That produces 6,665 potential buyers per year. The applicant's experience suggests that it will capture a minimum of 10% of this market equating to 67 units per year just for the age-restricted housing.

Viewshed Analysis:

The applicant provided several viewshed renderings showing the perspective from Route 10 as to what the proposed residential buildings will look like after project completion. According to the applicant, many of the residential buildings will be similar to the styles Ryan Homes built in Benn's Grant. Examples of a commercial facade are included in the commercial design guidelines. The renderings are included as an attachment to the staff report. The conceptual site plan also includes a recreational greenspace along Route 10 which will preserve a terminal

vista down to the pond and woodland at the rear of the property, preserving a portion of the historical landscape within the proposed development.

Staff Findings

After assessing the project's consistency with the County's Plans, Ordinances and current level of service of public facilities available to current County residents, staff found the application generally consistent with the future recommended land use found in the 2020 Comprehensive Plan and was capable of meeting ordinance requirements. However, staff found that the proposed residential uses may negatively impact existing public facilities and services, such as fire and rescue services and school facilities until such time as public expenditures are made to increase facility and operational capacity.

The Comprehensive Plan projects the County population to reach 45,200 people by 2040. To meet the housing needs of the County's growing population, there will be a need for an additional 2,567 residential units based on the 2022 average of 2.3 people per household.

According to the US Census Bureau, the County had 17,085 existing housing units in 2022 . County records that same year show approximately 2,497 additional units approved but not yet constructed. The County's 2022 total population is estimated to be 40,151 people, representing a 2% average growth rate since the 2020 Census. This rate is double the initial projected rate of 1% a year. Although the number of approved units appears to meet the currently projected future need, a reassessment of the number of housing units needed may be in order, if the future growth trend exceeds expectations, barring any economic downshifts similar to 2008. A table showing current residential projects is attached to the report.

COMPREHENSIVE LAND USE PLAN:

The subject property is located in the Newport Development Service District (DSD), an area described in the Comprehensive Plan as a focus area for future growth in the County. The Land Use Plan ("Envision the Isle" chapter) designates the property for future Mixed Use (MU) as part of the larger mixed-use activity center surrounding the intersection of Carrollton Boulevard and Benns Church Boulevard. Mixed use areas are described generally in the plan as comprised of "housing mixed with office, commercial, and other uses…located on major transportation routes and at major intersections." The plan describes future

residential development anticipated in these areas as “a mix of detached and attached single family residences, multiplexes, townhomes, and apartment style residences, [having] community amenities and preserved natural features” up to density of 14 dwelling units per acre or higher.

The project as conceptually designed accomplishes several Comprehensive Plan policies regarding the preservation of natural resources. The Plan states that mixed-use areas should include abundant open spaces which preserve natural features (e.g., mature forest cover, wetlands, etc.) and create active- and passive-use recreational amenities such as walking and multi-use trails, playgrounds, open spaces, and natural areas for residents of the community.

The proposed development and its proximity to commercial areas help implement policy statements and accomplish the purposes of the Plan's Newport DSD and Urban Development Area (UDA) designations with respect to housing. The Plan’s housing policies and actions aim to provide opportunities for a variety of housing types for people of all incomes, backgrounds, and ages, and to increase opportunities within DSDs for residences to be in close proximity to retail, employment, and public facilities such as schools and parks. The proposed rezoning, therefore, is considered consistent with the Comprehensive Plan.

ORDINANCE REVIEW:

The applicant requests a conditional zoning to the Planned Development-Mixed Use zoning district. In addition, the development also lies within the Newport Development Service and Chesapeake Bay Preservation Area Overlay Districts which require additional performance criteria over and above the underlying zoning district regulations. According to the Zoning Ordinance, all PD-MX areas are also designated urban development areas (UDA) which must meet minimum UDA and Traditional Neighborhood Design requirements in the Zoning and Subdivision Ordinances, such as minimum densities, floor area ratio, open space area, and pedestrian access facilities.

Staff reviewed the proffered residential and commercial design guidelines as well as the conceptual master plan for consistency with the County's Zoning and Subdivision Ordinances. Should the the zoning request be approved, the applicant will be required to submit subdivision plats, construction plans, signage plans, RPA buffer modification applications, and building plans in accordance with the proffered conditions, Zoning, and Subdivision Ordinances.

AGENCY REVIEW:

The application was forwarded to the following departments for their review:

- Economic Development: No concerns.
- Emergency Services: Comments have been incorporated in the project description above. A copy of the comments are also attached to this staff report.
- Utility Services: No concerns.
- Isle of Wight County Museum: No concerns with the application, provided that the proffered archeology condition is followed.
- Virginia Department of Transportation (VDOT): No concerns with the application, provided that the proffered transportation conditions are followed.

Please note that, should the conditional zoning request be approved, the project will be subject to subdivision and site plan review from all applicable agencies.

STAFF CONCLUSIONS:

Strengths:

1. The application is generally consistent with the Comprehensive Plan and can meet all ordinance requirements.
2. The project proposes to preserve the RPA buffer area and floodplain to the greatest extent possible.
3. The proposed development will provide over 9.89 acres of park, trails, community center, pool and play areas to provide parks and recreation services.
4. The applicant proffers that all age-restricted units will have a first floor master bedroom and bathroom which will help facilitate age-friendly housing.
5. The development will include up to 18,000 square feet of retail and commercial uses as well as 55,000 square feet of office which will create employment opportunities and additional revenues to meet public facility and service needs.
6. The conceptual site plan also includes a recreational greenspace along Route 10 which will preserve a terminal vista down to the pond and woodland at the rear of the property, preserving a portion of the historical landscape within the proposed development.

Weaknesses:

1. The proposed residential uses may negatively impact existing public facilities and services, such as fire and rescue services and school facilities, until such time as public expenditures are made to increase facility and operational capacity.
2. It is unclear what existing historical and cultural resources exist on the project site which may impact the final layout and design of the community.

STAFF RECOMMENDATION:

Because additional time is needed to provide the requested information as described in the background section of the report under current project status, staff recommends no action at this time. Staff's original recommendation was for denial of the request due to the development's potential to exceed the existing capacity of certain public facilities to provide an equivalent level of service to both existing and current community members.

ATTACHMENTS:

Description	Type	Upload Date
Application	Backup Material	9/6/2023
Land Use Narrative	Backup Material	9/6/2023
Community Impact Statement	Backup Material	9/6/2023
Sweetgrass Proffer Statement exec 090823	Backup Material	9/8/2023
Residential Design Guidelines Aug 18 2023	Backup Material	9/8/2023
Commercial Design Guidelines	Backup Material	9/8/2023
Sweetgrass Concept Plan Aug 2023	Backup Material	9/8/2023
Sweetgrass Traffic Impact Analysis 2023 Update	Backup Material	9/6/2023
Sweetgrass TIA 2021 Supplemental	Backup Material	9/6/2023
Sweetgrass TIA 2019	Backup Material	9/6/2023
Wetland Confirmation	Cover Memo	9/6/2023
Water Quality Impact Assessment	Backup Material	9/6/2023
Fiscal Impact Analysis	Backup Material	9/6/2023
Fiscal Impact Analysis Update	Backup Material	9/6/2023
Market Analysis	Backup Material	9/6/2023
Sweetgrass VIsual Impact Analysis June 15, 2023	Backup Material	9/19/2023
Sweetgrass Elevations	Backup Material	9/19/2023
Townhome model 1	Backup Material	9/19/2023
Townhome model 2	Backup Material	9/19/2023
Cultural Resources Assessment 2022	Backup Material	9/6/2023
VDOT Final Comments Aug 2023	Backup Material	9/6/2023
Residential Development Project list	Backup Material	9/19/2023
PC Resolution	Resolution	9/26/2023
Schools Revised Review Comments 092623	Backup Material	9/26/2023

ISLE OF WIGHT
COUNTY, VIRGINIA
DEPARTMENT OF PLANNING AND ZONING

APPLICATION FOR REZONING/CONDITIONAL ZONING AMENDMENT

This application should be used to petition for a change to the Official Zoning Map or for an amendment of zoning conditions. The following application requirements are consistent with the procedures set forth in Section 1-1015, *Amendments*, of the Isle of Wight County Zoning Ordinance, as amended.

A. APPLICATION FOR (CHECK ALL THAT APPLY):

[ ] Rezoning

[X] Conditional Rezoning (Are voluntary proffered conditions attached?): X Yes _____ No

Request to change the subject property(s) from the RAC to the PD-MX zoning district.

Proposed Use or Activity: Single Family Detached Homes and Townhomes with commercial outparcel as more particularly described in the accompanying submittal materials.

[ ] Amendment to Conditional Zoning

Request to change conditional zoning as follows (Attach current and proposed conditions): _____

B. PROJECT DESCRIPTION:

Project Name: Sweetgrass

Property Address (if any): 14096 Benns Church Boulevard

Election District: Windsor Legal Reference: _____

Deed Book#_____ Page#_____ Instrument #000000662

Comprehensive Plan Designation: _____

The rezoning will apply to 250 ** acres out of 250 ** total acres **North of Route 10

Tax Parcel Identification # 32-01-009 Number of Acres to be Rezoned: 250**

Requesting Zoning District Change from: RAC to PD-MX

Tax Parcel Identification # _____ Number of Acres to be Rezoned: _____

Requesting Zoning District Change from: _____ to _____

Tax Parcel Identification # _____ Number of Acres to be Rezoned: _____

Requesting Zoning District Change from: _____ to _____

Proposed Utilities (check all that apply): Public Water _____ Private Well _____

Public Sewer _____ Private Septic _____

C. **APPLICATION INFORMATION:**

Applicant(s) Name(s): NVR, Inc. Attn: Eric Shirey

Address: 860 Greenbrier Circle, Suite 100

City, State, Zip Code: Chesapeake, VA 23320

Phone No.: 757.603.0802 Email: eshirey@nvrinc.com Fax No.:

Property Owner(s) Name(s): Henry Layden, special Trustee of the William Grover Yeoman, III Trust, dated December 14, 2007, as amended

Address: 1801 S. Church Street, Suite 7

City, State, Zip Code: Smithfield, VA 23430

Phone No.: Email: Fax No.:

Applicants/Owners Affidavit (including compliance with all deed restrictions and covenants)

This application must be signed by the owner(s) of the subject property or must have attached written evidence of the owner's consent, which may be in the form of a binding contract of sale with the owner's signature or a letter signed by the owner(s), containing written authorization to act with full authority on the owner(s) behalf in filing this rezoning application. Signing this application shall certify the owner's compliance with all deed restrictions and covenants, and shall constitute the granting of authority of the County to enter onto the property for the purpose of conducting site analyses and compliance with Federal, State and County regulations.

Applicant: NVR, Inc. Attn: Eric Shirey
Printed or Typed Name

Applicant: _____ Date: _____
Signature

County of Isle of Wight, Commonwealth of Virginia

Subscribed and sworn to before me _____,
A Notary Public in and for the County of Isle of Wight,
Commonwealth of Virginia, this ___day of _____, 20___

_____
Notary Public

My Commission Expires_____

Henry Layden, special Trustee of the William Grover Yeoman, III Trust, dated December 14, 2007, as amended
Owner:
Printed or Typed Name

Owner: Henry Layden Date: 6/5/19
Signature

County of Isle of Wight, Commonwealth of Virginia

Subscribed and sworn to before me Elizabeth Dixon Jones,
A Notary Public in and for the County of Isle of Wight,
Commonwealth of Virginia, this 5th day of June, 2019

Elizabeth Dixon Jones
Notary Public

My Commission Expires Dec. 31, 2022

Owner: _____
Printed or Typed Name

Owner: _____ Date: _____
Signature

County of Isle of Wight, Commonwealth of Virginia

Subscribed and sworn to before me _____,
A Notary Public in and for the County of Isle of Wight,
Commonwealth of Virginia, this ___day of _____, 20___

_____
Notary Public

My Commission Expires_____

Owner: _____
Printed or Typed Name

Owner: _____ Date: _____
Signature

ELIZABETH DIXON JONES
NOTARY PUBLIC
Commonwealth of Virginia
Reg. # 7767629
Com. Exp. Dec. 31, 2022

County of Isle of Wight, Commonwealth of Virginia

Subscribed and sworn to before me _____,
A Notary Public in and for the County of Isle of Wight,
Commonwealth of Virginia, this __day of _____, 20__

_____
Notary Public

My Commission Expires_____

C. **APPLICATION INFORMATION:**

Applicant(s) Name(s): NVR, Inc. Attn: Eric Shirey

Address: 860 Greenbrier Circle, Suite 100

City, State, Zip Code: Chesapeake, VA 23320

Phone No.: 757.603.0802 Email: eshirey@nvrinc.com Fax No.:

Property Owner(s) Name(s): Henry Layden, special Trustee of the William Grover Yeoman, III Trust, dated December 14, 2007, as amended

Address: 1801 S. Church Street, Suite 7

City, State, Zip Code: Smithfield, VA 23430

Phone No.: Email: Fax No.:

Applicants/Owners Affidavit (including compliance with all deed restrictions and covenants)

This application must be signed by the owner(s) of the subject property or must have attached written evidence of the owner's consent, which may be in the form of a binding contract of sale with the owner's signature or a letter signed by the owner(s), containing written authorization to act with full authority on the owner(s) behalf in filing this rezoning application. Signing this application shall certify the owner's compliance with all deed restrictions and covenants, and shall constitute the granting of authority of the County to enter onto the property for the purpose of conducting site analyses and compliance with Federal, State and County regulations.

Applicant: NVR, Inc. Attn: Eric Shirey
Printed or Typed Name

Applicant: Eric Shirey Date: 6/13/19
Signature

County of Isle of Wight, Commonwealth of Virginia

Subscribed and sworn to before me Diane Renee Spieker,
A Notary Public in and for the County of Isle of Wight,
Commonwealth of Virginia, this 13 day of June, 2019

Diane Renee Spieker
NOTARY PUBLIC 7581566
Commonwealth of Virginia
My Commission Expires Mar. 31, 2022

Diane Renee Spieker
Notary Public

My Commission Expires March 31, 2022

Owner: Henry Layden, special Trustee of the William Grover Yeoman, III Trust, dated December 14, 2007, as amended
Printed or Typed Name

Owner: Date:
Signature

County of Isle of Wight, Commonwealth of Virginia

Subscribed and sworn to before me ,
A Notary Public in and for the County of Isle of Wight,
Commonwealth of Virginia, this day of , 20

Notary Public

My Commission Expires

Owner:
Printed or Typed Name

Owner: Date:
Signature

County of Isle of Wight, Commonwealth of Virginia

Subscribed and sworn to before me ,
A Notary Public in and for the County of Isle of Wight,
Commonwealth of Virginia, this day of , 20

Notary Public

My Commission Expires

Owner:
Printed or Typed Name

Owner: Date:
Signature

County of Isle of Wight, Commonwealth of Virginia

Subscribed and sworn to before me ,
A Notary Public in and for the County of Isle of Wight,
Commonwealth of Virginia, this day of , 20

Notary Public

My Commission Expires

NOTICE: THE ATTACHED CHECKLIST MUST BE COMPLETED, CERTIFIED, AND SUBMITTED OR THE APPLICATION WILL BE CONSIDERED INCOMPLETE.

Remit Application to: Isle of Wight County Department of Planning and Zoning, 17140 Monument Circle, Suite 201 P. O. Box 80, Isle of Wight, Virginia 23397

FOR OFFICE USE ONLY:

Complete Application Received On: _____ Fees Paid: _____
Tax Query: [ ] Current [ ] Delinquent Posted/Date to Post: _____

AGENCIES REFERRALS:

_____ Department of Conservation & Recreation
_____ Economic Development
_____ Emergency Services
_____ Engineering
_____ Environmental Planner
_____ Health Department
_____ Other _____

_____ Inspections
_____ Sheriff's Office
_____ Town of Smithfield
_____ Town of Windsor
_____ VDOT
_____ Budget & Finance
_____ County Attorney

Verified By: _____ Date: _____

SWEETGRASS
LAND USE NARRATIVE

14096 Benns Church Boulevard

February 21, 2020

The Applicant, NVR Inc. d/b/a Ryan Homes, was founded in 1948 in Pittsburgh, Pennsylvania to provide housing in the expanding post-war economy. For more than 70 years Ryan Homes has been building exceptional, award-winning homes – one home at a time. What began as a small, family-run business in Pittsburgh has evolved into one of the top builders in the nation. Today, Ryan Homes builds homes in 32 metropolitan areas in 14 states, as well as Washington D.C., and has constructed more than 400,000 homes. The success of Ryan Homes is built upon unparalleled customer service, innovative, award-winning designs, quality construction, affordable prices and unique communities in prime locations. It's no coincidence a large percentage of the homes Ryan Homes sells are a direct result of customer referrals.

Ryan Homes has been building new homes in Isle of Wight County for many years and is very attracted to the sound governance and quality of life the County has to offer its customers. Accordingly, Ryan Homes is excited to present "Sweetgrass" to Isle of Wight County and strongly desires to continue a mutually beneficial relationship with the County. Similar projects include Benn's Grant and Lakeview Cove in Isle of Wight, Stonehouse and Candle Station in James City County, Arbordale and Silverwood in York County, and Culpepper Landing in Chesapeake.

The property upon which Sweetgrass is envisioned is located at 14096 Benns Church Boulevard in the Windsor District of Smithfield. The site contains approximately 249.47 acres located on the East side of Benns Church Boulevard (Parcel ID # 32-01-009) and is currently zoned RAC – Rural Agricultural Conservation. The property is described by deed as lying on the East side of State Highway No. 10, and bounded by said Highway, the lands now or formerly of Daisy M. Bunkley, Philip F. Edwards, Jones' Creek, the lands now or formerly owned by George Yeoman, Christine Jordan, C. E. Johnson, J. F. Minton and others, and being a portion of the same land of which E. K. Batten and Maggie E. Batten, his wife, died seized and possessed, and is more particularly shown on the Applicant's Master Plan.

As the County's commercial hub in the Smithfield area evolves with the "new" economy, it is important to put consumers and employees in close and convenient proximity to such economic centers. Sweetgrass is strategically positioned on the fringe of the commercial hub for the area and will serve to ensure its success by avoiding sprawl and placing a population center with convenient access to one of the County's primary business districts.

The proposal consists of 400 age-restricted single family homes, 285 non age-restricted townhomes, and a parcel reserved for business/commercial uses. The Applicant's Master Plan, Elevations, and Proffers are intended to present a high quality aesthetic that will contribute to and enhance the appearance of the corridor. The proposed site design incorporates the property's natural beauty and ponds into the creation of view sheds and recreational areas for the project which include large contiguous areas of open space, walking trails, clubhouse and pool, and dog park. The Applicant's Traffic Study indicates that, with the proffered improvements, an acceptable level of service will be maintained on adjacent roadways. Finally, the Applicant's Fiscal Impact Analysis projects that the project, at build out, will generate net positive revenue to the County in the amount of approximately $1.2 million per year.

CONSULTING ENGINEERS

5248 Olde Towne Road, Suite 1
Williamsburg, Virginia 23188
Phone (757) 253-0040
Fax (757) 220-8994
aesva.com

Community Impact Statement

Conditional Rezoning

For

Sweetgrass Development

Prepared For

NVR, INC
860 Greenbrier Circle, Suite 100
Chesapeake, Virginia 23320

And
Timothy O. Trant II
Kaufman & Canoles
11815 Fountain Way, Suite 400
Newport News, Virginia 23606

April 2019
Revised October 2021

AES Project Number: W10516-00

Prepared by:

CONSULTING ENGINEERS

5248 Olde Towne Road Suite 1
Williamsburg, Virginia 23188
Phone: 757-253-0040
www.aesva.com

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Table 2 Projected Wastewater Flows

ATTACHMENTS

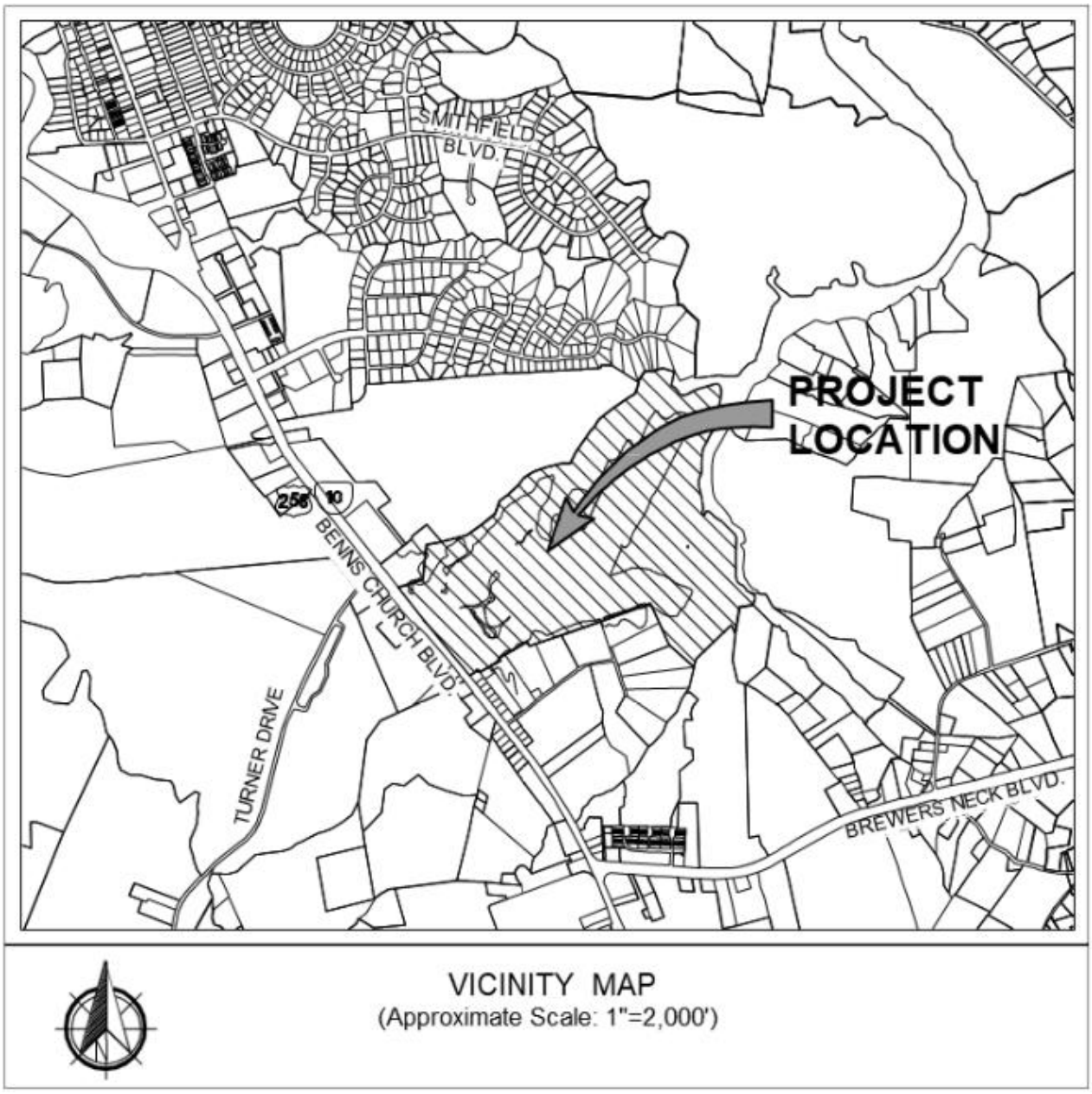
Appendix A Fiscal Analysis
Appendix B Wetlands, Water & CBPA Assessment
Appendix C WQIA
Appendix D Traffic Impact Analysis
Appendix E Phase Map
Appendix F Visual Impact Study

I. INTRODUCTION

The property owner, on behalf of NVR, Inc., proposes to request a conditional rezoning of their parcel within the Windsor Magisterial District containing 249.47 acres located on the east side of Benns Church Boulevard. The property is currently zoned RAC (Rural Conservation District) and the proposed zoning would be to convert the property to PD/MX (Planned Development Mixed Use) at 14096 Benns Church Boulevard, Smithfield Virginia.

The site is currently undeveloped, with a large portion of the property is in active crop land. The property is fully within the County of Isle of Wight but the property borders the Smithfield town limits to the North, Jones Creek to the East, single family subdivision to the South and Benns Church Boulevard (Route 10/Route 258) to the West. The site contains existing ponds which discharge to the existing Jones Creek. The average soils slope 2% to 6%. The site is within the Peanut Soil and Water Conservation District and has a hydrologic unit code of JL41 which represents the Pagan River-Jones Creek drainage areas.

Exhibit 1 – Location Map



II. THE PROJECT TEAM

The organizations that participated in the preparation of the information provided in this impact study are as follows:

- Developer - NVR, LLC
- Planning/Engineering - Jason Grimes, AES Consulting Engineers
- Legal - Tim Trant, Kaufman & Canoles
- Environmental - Bob Kerr, Wetlands Solutions
- Traffic - Kristen Tynch, VHB
- Fiscal - Julie Herlands, Tischler Bise

Key components of this Community Impact Study are:

- Planning Considerations, Project Description and Density Analysis
- Analysis of Impacts to Public Facilities and Services
- Environmental Inventory
- Traffic
- Fiscal Impact Study
- Visual Impact Study

III. PLANNING CONSIDERATIONS AND PROJECT DESCRIPTION

Planning Considerations

This parcel fronts on Benns Church Boulevard and contains 249.47 acres of wooded and cropland areas. Existing Zoning is currently Rural Agricultural Conservation (RAC). With this proposal, we are making a conditional request to rezone the property to Planned Development Mixed Use (PD-MX) zoning. According to the 2020 Comprehensive Plan this site is within the Newport Development Service District (DSD) and the Highway Corridor Overlay District. Additionally, the property falls within the Urban Development Area (UDA).

Project Description

The developer is proposing a development of the entire parcel of 249.47 acres. Under the conditional zoning, there will be a mixture of uses; from Commercial and Townhomes along Benns Church Boulevard to single family detached homes and Townhomes with multiple recreation areas and a large park area at the central core of the property. The development areas within the project will be built in a more urban nature in keeping with the proposed zoning; small lots, sidewalk lined grided streets, pocket parks, centrally located amenities and large perimeter open area will be provided.

Project Phasing

The developer is proposing to develop this project in phases over the course of the next 5 years and bring on to market a mix of unit types and price points of homes with the goal of bringing online 150 units a year. Amenities and offsite improvements will be brought online as the development size increases and as outlined in the project proffers. A phasing plan is provided showing a general anticipated phasing (Appendix E).

IV. ANALYSIS OF IMPACTS TO PUBLIC FACILITIES AND SERVICES

Public water and public sanitary sewer services (and other public services such as police, fire and life rescue) are presently provided to parcel within Benns Church Blvd.

A. Public Water Facilities

The subject property will be served with public drinking water by the existing water main along Benns Church Blvd as indicated on 2020 Comprehensive Plan (Water Service Areas). The general location of the water system and fire hydrants have been provided on the master plan.

Water consumption for the proposed project is estimated at 197,650 gallons per day. Peak Hour Water Demand for this project is estimated at 32,942.4 gallons per hour (approximately 549.04 gallons per minute). See Table 1 below for details of the projected water usage.

Table 1 – Projected Water Usage

Type of Development	No. of Units	Flow (GPD/Unit)	Average Flow (GPD)	Duration (hrs)	Avg Flow (GPM)	Peak Flow* (GPM)
Single-Family	390	310	120,900	24	83.96	335.84
Townhomes	225	310	69,750	24	48.44	193.76
Office/ Commercial	35,000	0.2	7,000	12	4.86	19.44
Total			197,650		137.26	549.04

*Peak Flow = 4 * Avg. Flow

B. Public Sewer Facilities

The subject property will be served with public sewer by the existing force main along Benns Church as indicated on 2020 Comprehensive Plan (Sewer Service Areas). A single centrally located sewage lift station is planned to service the community.

The estimated average daily flow generated from the proposed development is 197,650 gallons per day (GPD) with a peak flow rate of 345.57 gallons per minute (GPM). See Table 2 below for details of projected project wastewater flows.

Table 2 – Wastewater Flows

Type of Development	No. of Units	Flow (GPD/Unit)	Average Flow (GPD)	Duration (hrs)	Avg Flow (GPM)	Peak Flow* (GPM)
Single-Family	390	310	120,900	24	83.96	209.90
Townhomes	225	310	69,750	24	48.44	121.09
Office/ Commercial	35,000	0.2	7,000	12	4.86	14.58
Total			197,650		137.26	345.57

*Peak Flow = 2.5 * Avg. Flow (Residential)
*Peak Flow = 3 * Avg. Flow (Commercial)

C. Public Schools

The parcel is located within the Carrolton PK-3rd grade area, the Westside 4th -6 grades, Smithfield Middle School and the Smithfield high school zones. Projections indicate this development would be anticipated to generate 66 school age children (@ 0.23 students per unit of townhomes). For specific school capacity see the attached Fiscal Impact Analysis by Tischler Bise (See Attached Fiscal Impact Analysis report for additional information).

D. Fire Protection, Emergency Services and Law Enforcement

There are currently two Volunteer fire stations (VDF) located within Smithfield and Carrollton providing fire protection to the proposed development.

There also are two Volunteer Emergency Medical Services (EMS). The Isle of Wight Volunteer Rescue Squad services Smithfield as well as the Carrollton Volunteer Fire Department as backup for protection of the proposed development. Each station is placed within the County in such a way as to help achieve the response goal of 7.5 minutes or less.

Law Enforcement protection is provided by county's Sheriff Department along with the Virginia State Police.

E. Solid Waste

The proposed development on the subject property will generate solid wastes that will require collection and disposal to promote a safe and healthy environment. County approved, private contractors will handle the collection of the solid waste.

F. Utility Service Providers

Virginia Natural Gas, Dominion Energy, and Spectrum Communications provide, respectively, natural gas, electricity, cable TV service, and telephone service to this area. The current policy of these utility service providers is to extend service to the new development at no cost to the developer when positive revenue is identified; plus, with the new land development, these utility service providers are required to place all new utility service underground.

V. ANALYSIS OF ENVIRONMENTAL IMPACTS

A letter of findings dated November 30, 2017, Wetland, Water and CBPA Assessment by Kerr Environmental Services Corp. has been provided. Additionally, Wetlands Solutions has completed additional field observations to refine the limits of RPA resources, those have been incorporated into the master plan set and impacts to those environmental areas are noted in the Water Quality Impact Assessment included with the submitted zoning package. Impacts associated with roads and stormwater outfalls have been anticipated and noted in the environmental inventory sheet of the master plan.

VI. ANALYSIS OF STORMWATER MANAGEMENT (SWM) / BEST MANAGEMENT PRACTICES (BMP)

A conceptual stormwater management program, meeting the general criteria of the Commonwealth of Virginia and Isle of Wight County's stormwater requirements, was completed

as a component of the planning for the proposed Sweetgrass development. The goal of the stormwater management program is to meet and exceed local and state stormwater requirements.

In evaluating preliminary stormwater management solutions of the proposed development on the subject site, the site characteristics are considered. Preliminary site observations and mapping identify the following unique site characteristics to be considered in stormwater management planning:

- The property drains to an unnamed tributary of the Jones Creek watershed.
- The developable portion of the site is mostly active crop field, with limited forested land.
- All of the project area's existing drainage is surface runoff, ultimately converging to the existing farm pond and out to an unnamed tributary of Jones Creek, located in central and the North and the East of the project site.
- The project site largely consists of sloping of 2 to 6% slopes, with >10% slopes located within the RPA buffer. The site consists of mostly hydric soils.

A stormwater management plan is proposed as part of the master plan for this project to meet the general criteria of the Commonwealth of Virginia and Isle of Wight County stormwater requirements. Stormwater is to be managed by a series of best management practices and pipe drainage networks that ultimately discharge into downstream wetlands.

1. Stormwater ponds will be provided around the site as indicated on the master plan. These ponds may not be needed depending on final staff determination on the use of the existing farm ponds.
2. Low impact development measures such as bioretentions and dry swales (along with the possible purchasing of stormwater credits) will be used to meet the additional water quality requirements of the Virginia Runoff Reduction Method. Per compliance with the Virginia Runoff Reduction Method, all proposed site work will be managed by these stormwater measures to negate downstream wetlands impacts and pollution from entering into the Chesapeake Bay. Final design and placement will be determined by site specific geotechnical analysis when preparing the construction plans.
3. The existing wet ponds on the property have served as the primary means of water quality and quantity control for years. These existing ponds are located in the center of

the site and it is the design team's belief that these existing ponds are best suited to provide for stormwater control with the least potential adverse impact on the environment and to minimize long term HOA maintenance costs, however it is understood that this will have to be confirmed with County Staff bases upon CBPA regulations.

These conceptually planned facilities will be designed to detain and release the regulated design storm events for the on-site and the currently uncontrolled off-site drainage. Stormwater management will be accomplished in accordance with all current applicable standards including the Virginia Stormwater Management Handbook and the Virginia Erosion and Sediment Control Handbook. Our preliminary analysis of the Sweetgrass Development project indicates that the stormwater management plan proposed will improve the overall downstream water quality and will help to control the downstream erosion from uncontrolled runoff from the neighboring properties.

VII. ANALYSIS OF IMPACTS TO TRAFFIC

Based on a Traffic Impact Study was prepared by VHB dated March 14, 2019 and a memo update dated June 2021 outlining changes based on IofW and VDOT staff (along with adjustments to total units) has been provided with this submittal. The results show that the proposed site will still have modest impacts on the intersections within the study area. All intersections are expected to continue to operate at an acceptable LOS D or better. There are several offsite roadway improvements planned to address the proposed traffic as outlined in the traffic analysis and within the development proffers. See Attachment: "Yeoman's Tract Traffic Impact Analysis" as prepared by VHB dated March 14, 2019 and the summary memo dated June 25, 2021 for more details. for more details.

VIII. ANALYSIS OF FISCAL IMPACTS

A Fiscal Impact Analysis was prepared by Tischler Bise dated March 29, 2019. This analysis compares operating and capital costs to revenues generated over a 20-year period. The results of

the analysis show the project generates a $19.3 million net surplus over the 20-year projection period. See Attachments for detailed Fiscal Impact Analysis.

IX. ANALYSIS OF CULTURAL RESOURCES IMPACTS

An Archaeological Assessment to be prepared for Isle of Wight County has been included in the proffers for the development.

X. VISUAL IMPACTS

See Appendix F

XI. CONCLUSION

In summary, the Sweetgrass Development proposes 390 single family detached units, 225 townhomes, and approximately 35,000sf of commercial use under the new zoning, Planned Development Mixed Use (PD-MX). The development will provide a positive Fiscal Impact to the County and proposes traffic improvements to address the added traffic from the development.

- The development provides a significant tax benefit to the County.
- There is adequate capacity in the system of roads serving this project. Additional traffic improvements are proposed to offset any impacts and to address preexisting traffic. The improvements include extended turn lanes and traffic signal.
- The proposed stormwater management systems as proposed will protect downstream channels from erosion and the onsite low impact development measures will increase water infiltration and reduce uncontrolled runoff.
- Adequate public facilities (water, sewer and fire), and utility services (gas, electric cable TV, telephone), are available for the development.

PROFFERED CONDITIONS

August 18, 2023

Conditional Zoning Request ZA-6-19 (the "Application") has been filed by Henry Layden, as Special Trustee of The William G. Yeoman III Trust ("Owner"), the owner of certain real property located within the territorial confines of the County of Isle of Wight, Virginia (the "County") being a portion of that property located at 14096 Benns Church Blvd., Smithfield, VA 23430, Tax Parcel # 32-01-009 (the "Property") more particularly described on **Exhibit A** attached hereto and made part hereof. NVR, INC. ("NVR") is the contract purchaser of the Property. Yeoman and NVR (collectively, the "Owner") filed the Application requesting that the zoning of the Property be changed from RAC to C-PD-MX with proffers in order to permit the development of a mixed use planned development consisting of single-family dwellings, townhouses, and a commercial outparcel (the "Project").

The Owner and the County have carefully evaluated, among other things, a traffic impact analysis, community impact analysis, and fiscal impact analysis (copies of which are on file with the County's Community Development Department, hereinafter referred to as the "Department") and the on and off site impacts of the Project and have determined (i) the impacts specifically attributable to the Project (the "Impacts"), (ii) certain Impacts create a need (or identifiable portion of a need) for the expansion of existing capacity of public transportation facilities (the "Expansion of Existing Capacity"), (iii) the Project will receive a direct and material benefit from the Expansion of Existing Capacity and Proffer 6 below, and (iv) the provisions of the County's zoning ordinance ("Zoning Ordinance") are inadequate for addressing various of the Impacts and necessitate supplementation by these Proffers.

In furtherance of the Application, the Owner, for itself and its successors and/or assigns, hereby voluntarily proffers the conditions specifically set forth below, in addition to the regulations provided for by the Zoning Ordinance, which proffered conditions are determined by the Owner and, upon acceptance by the Board of Supervisors in connection with the approval of the Application, the County: (i) to be reasonable, (ii) to address impacts specifically attributable to the Project, (iii) to address the need (or identifiable portion of a need) for the Expansion of Existing Capacity, (iv) to directly and materially benefit the Project, (v) to have a reasonable relation to the proposed change in zoning, (vi) to be in conformity with County's adopted comprehensive plan, and (vii) to be in accordance with the provisions of Section 15.2-2296, et seq. of the Code of Virginia (1950), as amended (the "Virginia Code"), Sections 15.2-2303.2 through 15.2-2303.4 of the Virginia Code, and the County Zoning Ordinance. The following proffered conditions apply only to the Property.

1. Plan of Development. A conceptual development plan of the Project entitled "MASTER PLAN FOR SWEETGRASS", dated June 14, 2019, and last revised August 18, 2023, prepared by AES Consulting Engineers (the "Master Plan"), has been submitted to the County Planning Division for review by the County in connection with the Application. The Master Plan is on file with the Department. Development of the Property shall be in substantial conformance, as determined by the Community Development Director (the "Director") with the Master Plan.

2. Residential Units. There shall be no more than 615 residential dwellings (the "Residential Units") constructed on the Property, of which no more than 390 of the Residential Units shall be single-family (detached) dwellings, and no more than 225 of the Residential Units shall be townhouses.

3. Non-Residential Use Restrictions. The use of the portion of the Property designated as "COMMERCIAL SECTION 5 AC +/-" on the Mater Plan (the "Commercial Area") shall be limited to (a) inline retail and commercial uses (including accessory uses) comprising no more than 18,000 square feet of floor area, and (b) office uses (including accessory uses) comprising no more than 55,000 square feet of floor area. Notwithstanding the foregoing, the Owner shall not be permitted to develop an amount of non-residential floor area on the Commercial Area that would be projected to exceed 220 p.m. peak hour trips (as determined by the then current edition of the Institute of Transportation Engineers Trip Generation Manual) until the Owner submits for review and approval by the County and the Virginia Department of Transportation ("VDOT") an updated traffic impact analysis including such proposed additional square footage and includes in its site plan for such additional commercial square footage any traffic improvements recommended by the updated traffic impact analysis and not already contained in these Proffers.

4. Design. The Residential Units and clubhouse on the Property shall be constructed by the Owner in substantial conformance with the architectural elevations entitled "Sweetgrass Elevations", dated June 15, 2023 (the "Elevations") and the design guidelines entitled "Residential Design Guidelines for Sweetgrass Development", dated June 16, 2023 (the "Residential Guidelines"), as determined by the Director. The development within the Commercial Area shall be constructed by the Owner in substantial conformance with the design guidelines entitled "Commercial Center Design Guidelines for Sweetgrass Development", dated August 18, 2023 (the "Commercial Guidelines"), as determined by the Director. A copy of the Elevations, the Residential Guidelines, and the Commercial Guidelines are on file in the Department. The Elevations, Residential Guidelines, and Commercial Guidelines may be modified from time to time provided that such modifications do not alter the basic concept or character of the Elevations, Residential Guidelines, and Commercial Guidelines and provided that such amendments are approved by the Director for consistency with the terms of this proffer.

5. Age Restriction. All of the single-family (detached) dwellings Residential Units shall be occupied solely as "housing for older persons" as such term is defined in Virginia Code Section 36-96.7(A), provided no person under 19 years of age shall be housed or domiciled or shall reside in any Residential Unit. For purposes of the foregoing, a person shall be deemed to be housed, domiciled or to reside in a Residential Unit if he or she stays overnight for more than 75 days in any 90-day period or for more than 90 days in any 12-month period. Such restriction shall be set forth in the Declaration and enforced by the Association (as such terms are defined in Proffer 9 below). Unless otherwise approved by the Director, each age-restricted Residential Unit shall have a first-floor bedroom and full bath.

6. Traffic Improvements.

a. Prior to the issuance of the first certificate of occupancy for Residential Units on the Property (not including model homes), the construction, installation, and/or implementation of the following improvements shall be completed or guaranteed by the Owner in accordance with Virginia Code Section 15.2-2299 or such successor provision (a "Guarantee"):

i. Westbound right turn lane (200-foot storage plus 200-foot taper) into right in/right out proposed secondary Project entrance off of US 258/Rt 10 (Benns Church Boulevard);

ii. Westbound right turn lane (200-foot storage plus 200-foot taper) into proposed main Project entrance off of US 258/Rt 10 (Benns Church Boulevard);

iii. Lengthen the existing eastbound left turn lane to provide 200-foot storage plus 200-foot taper into proposed main Project entrance off of US 258/Rt 10 (Benns Church Boulevard);

iv. Lengthen the existing westbound left turn lane on US 258/Rt 10 to provide 250-foot storage plus 100-foot taper at the intersection of US 258/Rt 10 (Benns Church Boulevard) and Turner Drive (the "Rt. 10/Turner Drive Turn Lane Improvement");

v. Replace the existing 3 section signal head serving the dedicated right turn lane on eastbound Turner Drive at US 258/Rt 10 (Benns Church Boulevard) with a 5 section signal head to provide a protected eastbound right-turn overlap (the "Rt. 10/Turner Drive Signal Improvement 1"); and

vi. Install flashing yellow arrows for the eastbound and westbound left turn lanes at the intersection of US 258/Rt 10 (Benns Church Boulevard) and Canterberry Lane, Cypress Run Drive, and Turner Drive.

b. At such time as deemed warranted by VDOT, but in no event prior to issuance of the 50th certificate of occupancy ("CO") for Residential Units on the Property (or the commencement of construction of improvements on the Commercial Area, whichever occurs first), the Owner shall replace the existing 3 section signal head serving the dedicated right turn lane on eastbound US 258/Rt 10 (Benns Church Boulevard) at Turner Drive with a 5 section signal head to provide a protected eastbound right-turn overlap (the "Rt. 10/Turner Drive Signal Improvement 2"). In the event that the Rt. 10/Turner Drive Signal Improvement 2 is not warranted by VDOT prior to the issuance of the final CO for Residential Units on the Property, then Owner's development of the Property (and permits and approvals therefor) may proceed through to the issuance of the final CO for Residential Units on the Property; however, unless waived by the Director based on an agreed upon alternative, the Owner shall pay to the County the then estimated cost of Rt. 10/Turner Drive Signal Improvement 2 (including design, construction, labor, and materials) as approved by the County, and upon such payment shall be deemed to have satisfied all of its obligations under this Proffer 6(b).

c. Notwithstanding the preceding subsections a(iv), a(v), and b, if the County, prior to implementation of the Rt. 10/Turner Drive Turn Lane Improvement, Rt. 10/Turner Drive Signal Improvement 1, and/or the Rt. 10/Turner Drive Signal Improvement 2 (collectively, the "Rt. 10/Turner Drive Proffered Improvements") (i) approves or adopts plans for modification of the intersection of US 258/Rt 10 (Benns Church Boulevard) and Turner Drive that conflict with or supersede one or more of the Rt. 10/Turner Drive Proffered Improvements, or (ii) accepts proffers from or imposes conditions upon another developer(s) for substantially the same obligations as one or more of the Rt. 10/Turner Drive Proffered Improvements (each of such affected Rt. 10 Turner Drive Proffered Improvements being an "Affected Improvement"), then the Owner shall contribute to the County an amount of cash equal to the then estimated cost to complete the Affected Improvement(s) (including design, construction, labor, and materials) as approved by the County multiplied by the Project's proportionate share (assuming the Project's full buildout) of the vehicle trips associated with such Affected Improvements (as determined by the then current edition of the Institute of Transportation Engineers Trip Generation Manual) (the "Cash in Lieu Payment") no later than ninety (90) days after (1) the award of the construction contract for the construction of such conflicting, superseding, or substantially similar improvement(s), and (2) issuance a written request from the County to the Owner for such Cash in Lieu Payment; provided, however, under no circumstances shall the Cash in Lieu Payment be due prior to issuance of the 50th CO for Residential

Units on the Property (or the commencement of construction of improvements on the Commercial Area, whichever occurs first). The payment by the Owner to the County of such Cash in Lieu Payment shall be deemed satisfaction in full of the corresponding portion of the Rt. 10/Turner Drive Proffered Improvements.

d. At such time as deemed warranted by the VDOT, the Owner shall install a traffic signal at intersection of US 258/Rt 10 (Benns Church Boulevard) and the Project's main entrance. Prior to the issuance of the 150th CO for Residential Units on the Property, Owner shall submit to VDOT a traffic signal warrant analysis for the intersection of US 258/Rt 10 (Benns Church Boulevard) and the Project's main entrance. In the event the analysis concludes, and VDOT concurs, that a traffic signal is warranted at this intersection, then the Owner shall Guarantee a traffic signal (including flashing yellow arrows for the eastbound and westbound left turn lanes and any planned pedestrian accommodations at the signal at the intersection of US 258/Rt 10 (Benns Church Boulevard) and the Project's main entrance and shall complete the installation of such signal prior to the issuance of certificates of occupancy for more than 50 additional residences after the date upon which VDOT issues to Owner written confirmation that the signal is warranted.

i. In the event that such traffic signal is not warranted by VDOT in connection with the first traffic signal warrant analysis, then Owner's development of the Property (and permits and approvals therefor) may proceed above the foregoing thresholds; however, prior to the issuance of the 300th CO for Residential Units on the Property, Owner shall submit to VDOT a traffic signal warrant analysis for the intersection of US 258/Rt 10 (Benns Church Boulevard) and the Project's main entrance. In the event the analysis concludes, and VDOT concurs, that a traffic signal is warranted at this intersection, then the Owner shall Guarantee a traffic signal at the intersection of US 258/Rt 10 (Benns Church Boulevard) and the Project's main entrance and shall complete the installation of such signal prior to the issuance of certificates of occupancy for more than 50 additional residences after the date upon which VDOT issues to Owner written confirmation that the signal is warranted.

ii. In the event that such traffic signal is not warranted by VDOT in connection with the second traffic signal warrant analysis, then Owner's development of the Property (and permits and approvals therefor) may proceed above the foregoing thresholds; however, prior to the issuance of the 450th CO for Residential Units on the Property, Owner shall submit to VDOT a traffic signal warrant analysis for the intersection of US 258/Rt 10 (Benns Church Boulevard) and the Project's main entrance. In the event the analysis concludes, and VDOT concurs, that a traffic signal is warranted at this intersection, then the Owner shall Guarantee a traffic signal at the intersection of US 258/Rt 10 (Benns Church Boulevard) and the Project's main entrance and shall complete the installation of such signal prior to the issuance of certificates of occupancy for more than 50 additional residences after the date upon which VDOT issues to Owner written confirmation that the signal is warranted.

iii. In the event that such traffic signal is not warranted by VDOT in connection with the third traffic signal warrant analysis, then Owner's development of the Property (and permits and approvals therefor) may proceed above the foregoing thresholds; however, prior to the issuance of the 600th CO for Residential Units on the Property, Owner shall submit to VDOT a traffic signal warrant analysis for the intersection of US 258/Rt 10 (Benns Church Boulevard) and the Project's main

entrance. In the event the analysis concludes, and VDOT concurs, that a traffic signal is warranted at this intersection, then the Owner shall Guarantee a traffic signal at the intersection of US 258/Rt 10 (Benns Church Boulevard) and the Project's main entrance and shall complete the installation of such signal prior to the issuance of the final certificate of occupancy for the Residential Units on the Property.

iv. In the event that such traffic signal is not warranted by VDOT in connection with the fourth traffic signal warrant analysis, then Owner's development of the Property (and permits and approvals therefor) may proceed through to the issuance of the final CO for Residential Units on the Property; however, unless waived by the Director based on an agreed upon alternative, the Owner shall pay to the County the then estimated cost of the traffic signal (including design and construction labor and materials) as approved by the County, and upon such payment shall be deemed to have satisfied all of its obligations under this Proffer 6(d).

7. Timing of Recreational Amenities. The clubhouse and pool described on the Master Plan shall be completed prior to issuance of the 150th CO for Residential Units constructed on the Property. If not sooner constructed, the pedestrian amenities shown on the Master Plan shall be constructed sequentially by phase when the corresponding phase of the development in when such amenities are shown is constructed.

8. Archaeology. A Phase I Archaeological Site Assessment for the Property shall be submitted to the Director for their review and approval prior to preliminary site plan or subdivision plan submittal. A treatment plan or Phase II Archaeological Site Assessment shall be submitted to, and approved by, the Director for all sites in the Phase I study that are recommended for a Phase II evaluation, and/or identified as being eligible for inclusion on the National Register of Historic Places. If a Phase II study is undertaken, such a study shall be approved by the Director and a treatment plan or Phase III Archaeological Site Assessment for said sites shall be submitted to, and approved by, the Director for sites that are determined to be eligible for inclusion on the National Register of Historic Places and/or those sites that require a Phase III study. If in the Phase II study, a site is determined eligible for nomination to the National Register of Historic Places and said site is to be preserved in place, the treatment plan shall include nomination of the site to the National Register of Historic Places. If a Phase III study is undertaken for said sites, such studies shall be approved by the Director prior to land disturbance within the study area. All Phase I, Phase II and Phase III studies shall meet the Virginia Department of Historic Resources' Guidelines for Preparing Archaeological Resource Management Reports and the Secretary of the Interior's Standard and Guidelines for Archaeological Documentation, as applicable, and shall be conducted under the supervision of a qualified archaeologist who meets the qualifications set forth in the Secretary of the Interior's Professional Qualification Standards. All approved treatment plans shall be incorporated into the plan of development for the site and shall be adhered to during the clearing, grading and construction activities thereon.

9. Property Owners Association. The Owner shall form one or more Property Owners' Associations and/or a Condominium Unit Owners Associations (each an "Association"), which may include separate or sub-associations for the age restricted and non-age restricted Residential Units, in accordance with Virginia law, with the preparation and execution of a Declaration of Covenants, Conditions and Restrictions or Declaration of Condominium, as applicable (a "Declaration") with the members thereof being the owners of the portions of the Property designated for residential use (the "Residential Property"). The Declaration shall provide for, among other things, the qualifying age restrictions in Proffer 5 above, design review by a design review board, and the conveyance from the Owner to an Association of all of the common areas, open spaces, green areas, recreation areas and facilities and the stormwater management

system associated with the Residential Property (collectively, the "Common Elements"). The Owner agrees that it shall retain sole responsibility for the maintenance of the Common Elements until such time as the same are conveyed to an Association, at which time the obligation shall be assigned to an Association. Each Residential Unit owner within the Residential Property shall be a voting member of an Association and be subject to assessments as set forth in the Declaration. The Declaration shall be subject to the approval of the County Attorney for consistency with this proffer and upon approval shall be duly recorded in the Clerk's Office for the Circuit Court of Isle of Wight County. The Declaration shall be recorded in connection with the recordation of the first subdivision (or condominium) plat for the Residential Units on the Property.

10. Successors and Assigns. These Proffers shall run with the title to the Property and shall be binding on the parties hereto and their respective successors and assigns; provided, however once a party ceases to own any portion of the Property, such party shall have no continuing liability hereunder.

11. Severability. In the event that (i) the County's approval of the Application and/or acceptance of these Proffers is appealed within 30 days after the date of the Board of Supervisors' action on same, and (ii) any clause, sentence, paragraph, subparagraph, section or subsection of these Proffers shall be judged by any court of competent jurisdiction to be invalid or unenforceable for any reason, including a declaration that it is contrary to the Constitution of the Commonwealth of Virginia or the United States, or if the application thereof to any owner of any portion of the Property or to any government agency is held invalid, then the change in zoning intended to be accomplished by the County's approval of the Application and acceptance of these Proffers shall be deemed void and the zoning of the Property shall automatically revert to that which existed immediately prior to the date of such approval.

12. Headings. All paragraph and subparagraph headings of the Proffers herein are for convenience only and are not part of these Proffers.

13. Conflicts. In the event that there is any conflict between these Proffers and the Zoning Ordinance, the conflict shall be resolved by the County's Director subject to the appeal process to the Board of Zoning Appeals and the Courts as otherwise provided by law.

14. Void if Application not Approved. In the event that the Application is not approved by the County or is overturned by subsequent judicial determination, these Proffers and the Master Plan shall be null and void.

[SIGNATURES LOCATED ON FOLLOWING PAGES]

[SIGNATURE PAGE TO PROFFERS]

WITNESS the following signatures, thereunto duly authorized:

NVR, INC.

By: _____

Print Name: Jesse Faisant

Title: Vice President

COMMONWEALTH OF VIRGINIA
CITY/COUNTY OF Richmond, to wit:

The foregoing instrument was acknowledged before me this 8th day of September, 2023 by Jesse Faisant as VP of Operations of NVR, Inc.

Kimberly D. Hamrick
NOTARY PUBLIC

My commission expires: 8/31/2025
Registration No.: 7714267

Kimberly Denise Hamrick
Commonwealth of Virginia
Notary Public
Commission No. 7714267
My Commission Expires 8/31/2025

[SIGNATURE PAGE TO PROFFERS]

THE WILLIAM G. YEOMAN III TRUST :

Henry Layden, special Trustee of the William Grover Yeoman III Trust, dated December 14, 2007, as amended

COMMONWEALTH OF VIRGINIA
CITY/COUNTY OF Isle of Wight, to wit:

The foregoing instrument was acknowledged before me this 8th day of Sept, 2023 by Henry Layden, special Trustee of the William Grover Yeoman III Trust, dated December 14, 2007, as amended.

ELIZABETH D JONES STATE OF VIRGINIA NOTARY PUBLIC COMMISSION #7761629 EXPIRES DECEMBER 31 2027

Elizabeth D Jones
NOTARY PUBLIC

My commission expires: December 31, 2027
Registration No.: 7761629

ELIZABETH D JONES STATE OF VIRGINIA NOTARY PUBLIC COMMISSION #7761629 EXPIRES DECEMBER 31 2027

EXHIBIT A

All that certain tract, piece or parcel of land containing approximately 249.47 acres, situate, lying and being near Benns Church, in Newport Magisterial District, Isle of Wight County, Virginia; lying on the East side of State Highway No. 10, and bounded by said Highway, the lands now or formerly of Daisy M. Bunkley, Phillip F. Edwards, Jones' Creek, the lands now or formerly owned by George Yeoman, Christie Jordan, C.E. Johnson, J.F. Minton and others and being a portion of the same land of which E.K. Batten and Maggie E. Batten, his wife, died seized and possessed.

RESIDENTIAL

DESIGN GUIDELINES

FOR

SWEETGRASS DEVELOPMENT

DATED _____

BUILDING design guidelines seek to create a distinct yet coherent architecture that will foster a unique identity for Sweetgrass and form the backdrop to a rich street level experience. These guidelines will significantly help distinguish the community, help define its character and eventually raise its value in the marketplace. The following set of principles will be applied to each of the buildings, irrespective of its use or location.

1. Build in the tradition of simple yet elegant designs. Building architecture and elevations promote a more contemporary nature through use of simple unifying roof and window lines and careful selection of materials. The building aesthetic should emerge from elevation components and building details rather than from mere ornamentation.

2. Variety- Single family homes immediately adjacent to or across from one another shall have distinct and different elevations. No identical color schemes for single family detached houses shall be repeated within three consecutive lots.

3. Use traditional, high quality and durable materials throughout the community. When walls are constructed of more than one material, changes in material shall be permitted along a horizontal or vertical line and should reinforce a base, middle and top for the building. Building walls shall be of one or more of the following materials:

- Brick- A variety of traditional brick colors and modules and bonding variations are encouraged
- Stone- Natural stone and stone veneer are permitted and shall be laid predominantly rectilinear stones in a horizontal pattern. Cast stone shall be permitted as sills, headers and accents.
- Siding- Cement or fiber board siding or high-quality vinyl or its equivalent is the prescribed siding material where brick or stone is not utilized. Aluminum siding is not permitted. A variance in color and texture is encouraged.

4. Emphasize main entries of each home regardless of elevation. The main entrance to each home should be easily identifiable from the main travel ways through use of materials and forms.

Single Family Detached Lots Guidelines

"The architecture shown herein is a representation of builders' architecture that may be built in Sweetgrass, but does not represent the full sampling of architecture or builders that may be provided within the community."

In a development like Sweetgrass it is important to capture a broad buyer group including new buyers, upgrade buyers, move-down buyers, etc. Sweetgrass is offering 3 different minimum lot sizes within the community. The minimum lot size of a single family detached lot is 50' wide (measured at the front BSL) x 100'deep.

Minimum Building Setback Line (BSL)

20' front
15' rear
5' side

Architecture Treatments and Materials

Single Family Detached Highly Visible Lots (HV)

Lots on prominent corners will be designated as High Vis or "HV" lots. These prominent corners will be defined as those fronting on multiple public rights of way, or those that directly border any of the defined recreation areas. These lots will be required to have upgraded architectural features on the visible facades.

HV Features required:

- Masonry water table
- Storm shutters or Trimmed windows
- Gable vent or other similar trim

High Visibility "HV" lots must have landscaping placed along the side foundation that faces the street. The corner lot side setback will be 10 from public right of way'.

Elevations and Materials

Creating a unique and diverse streetscape throughout Sweetgrass is a high priority; to continue pursuing this there will be limitations placed on the frequency and location of elevations that can be used on adjacent lots. The following guidelines shall be followed:

- Builder elevations will be reviewed and approved by the developer prior to construction to ensure a cohesive theme throughout the community.
- Lots next to or across the street from each other cannot be the same elevation/model.
- Accent materials shall be varied to create more differentiation between lots.

Traditional, high-quality and durable building materials shall be used throughout the community. Building materials shall meet all current Local, State, and Federal building codes and regulations. Materials include:

- Brick; includes painted brick
- Natural stone
- Stone veneer
- High quality vinyl siding
- Cement or fiber board siding

Fencing, Landscaping, HVAC Equipment, and Height Restrictions

Fences

Fences will be permitted within the Sweetgrass community but must follow the guidelines below and in accordance with County Code:

- Fence material shall be vinyl.
- Vinyl fencing must be white and non-glossy; including vinyl covered picket fencing.
- Maximum fence height shall be six (6) feet.
- No front yard fencing shall be allowed.
- Fencing shall not be used to satisfy upgraded architectural requirements.

Landscaping

Lot landscaping and screening can add a lot of value and create and aesthetically pleasing streetscape throughout the community. The follow guidelines shall be considered:

- Foundation plantings must be included on every house prior to occupancy.
- Corner lots or high vis lots shall have landscape buffers to screen sides of houses from the street.
- Lots that back to other lots shall include landscaping at the rear of the property to create a visual screen between adjacent lots. Buffer shall be located outside drainage or utility easements.

Utility Equipment

- HV lots shall ensure the HVAC equipment is screened from view of the street with a fence or other opaque screen.
- No equipment shall be placed on the side of the house that abuts two public streets.

Height

- No single family detached dwellings median roof height will be taller than 45 feet in height.

Single Family Attached (SFA) Lots Guidelines

"The architecture shown herein is a representation of builders' architecture that may be built in Sweetgrass but does not represent the full sampling of architecture or builders that may be provided within the community."

In a development like Sweetgrass, it is important to capture a broad buyer group including new buyers, upgrade buyers, move-down buyers, etc. Sweetgrass is offering 2 single-family attached Products.

Minimum Lot Size:	Maximum Stories:
Interior Lot: 1400 square feet	3 levels
Exterior Lot: 1800 square feet	

Setbacks

SFA Fee Simple:

Rear Loading Town Home Building Restriction Line (BSL)

Front yard:	5 feet minimum (front door to front property line).
Side yard:	10 feet minimum; 20' minimum building separation between buildings
Rear yard:	Sufficient to accommodate an 18.5 ft parking space (Not to include, right of way or sidewalk)

Front Loading Town Home Building Restriction Line (BSL)

Front yard:	Sufficient to accommodate an 18.5 ft parking space (Not to include, right of way or sidewalk)
Side yard:	10 feet minimum; 20' minimum building separation between buildings
Rear yard:	10 feet minimum (From rear of unit to property line)

SFA Condominium Ownership:

Rear Loading Town Home Building Restriction Line (BSL)

Front yard:	5 feet minimum; 20' minimum building separation between buildings
Side yard:	10 feet minimum; 20' minimum building separation between buildings
Rear yard:	Sufficient to accommodate an 18.5 ft parking space (Not to include, right of way or sidewalk)

Front Loading Town Home Building Restriction Line (BSL)

Front yard:	Sufficient to accommodate an 18.5 ft parking space (Not to include, right of way or sidewalk)
Side yard:	10 feet minimum; 20' minimum building separation between buildings
Rear yard:	10 feet minimum; 20' minimum building separation between buildings

Setback guidelines:

- Every other lot shall be staggered by two (2) feet for each lot located
- The two (2) alternate setback lots must be separated by a Typical front yard setback lot.
- Front porches will be allowed to encroach over the front yard BSL by 3'.

Architecture Treatments and Materials

Single Family Attached (SFA) Highly Visible Lots (HV)

Lots on prominent corners will be designated as High Vis or “HV” lots. These prominent corners will be defined as those fronting on multiple public rights of way, the subdivision entrance road or those that directly border any of the defined recreation areas. These lots will be required to have upgraded architectural features on the visible facades. Features to be included on these lots are outlined below:

Single Family Attached High Vis 1 Lots (HV1)

Features required:

- Masonry water table
- Storm shutters
- Trimmed windows
- Gable vent
- Gable trim
- Siding located in reverse gable shall be architecturally different from main portion of the house. Options include:
    - Tighter spaced siding
    - Shake siding
    - Vertical siding

Elevations and Materials

Creating a unique and diverse streetscape throughout Sweetgrass is a high priority; to continue pursuing this there will be limitations placed on the frequency and location of elevations that can be used on adjacent lots. The following guidelines shall be followed:

- Builder elevations will be reviewed and approved by the developer prior to construction to ensure a cohesive theme throughout the community.
- Accent materials shall be varied to create more differentiation between elevations.

Traditional, high-quality and durable building materials shall be used throughout the community. Building materials shall meet all current Local, State, and Federal building codes and regulations.

- Materials include:
    - Brick; includes painted brick
    - Natural stone
    - Stone veneer
    - High quality vinyl siding
    - Cement or fiber board siding

Fencing, Landscaping and HVAC Equipment

Fences

Fences will be permitted within the Sweetgrass community but must follow the guidelines below and be in accordance with County Code.

- Fence material shall be vinyl.
- Vinyl fencing must be white and non-glossy
- Maximum fence height shall be six (6) feet.
- For end units side yard fencing shall not extend beyond the middle point of the house.
- Corner lot fencing layout shall be reviewed on a case by case basis, and must meet the minimum County ordinance requirements, to determine the appropriate fence location
- No front yard fencing shall be allowed.
- Fencing shall not be used to satisfy upgraded architectural requirements.

Landscaping

Lot landscaping and screening can add a lot of value and create and aesthetically pleasing streetscape through-out the community. The follow guidelines shall be considered:

- Foundation plantings must be included on every house once constructed.
- Lots with walk-out basements or exposed foundations shall include landscaping to break up large architecture planes.
    - Columnar or taller evergreens shall be used to “soften” the architecture.
- Corner lots or high vis lots shall have landscape buffers to screen rear or sides of houses from the street.
- Lots that back to other lots shall include landscaping at the rear of the property to create a visual screen between adjacent lots. Buffers shall be located outside of drainage and utility easements.

HVAC Equipment

- HVAC units shall be placed in the rear yard.
- High Vis 1 lots shall ensure the HVAC equipment is screened from view of the street with a fence or other opaque screen.
- No equipment shall be placed on the side of end units.

Height Restrictions

- No single family attached dwellings median roof height will be taller than 48 feet in height.

COMMERCIAL CENTER

DESIGN GUIDELINES

FOR

SWEETGRASS DEVELOPMENT

DATED JUNE 16, 2023

COMMERCIAL CENTER STANDARDS (Sweetgrass)

1. Introduction

The commercial center within Sweetgrass is located along the frontage of Route 10 on the Town limits of Smithfield. This commercial center establishes the first image and impression of the Sweetgrass Community and the Town of Smithfield to those who pass by or visit from other areas in the region. Architectural character, landscape requirements, parking and service areas, pedestrian interaction, vehicular movement, signage and lighting are all major factors which should be considered in the design of any commercial center.

2. Building Placement & Massing

2.1. Building Orientation

The orientation and massing of a group of buildings or single building within the commercial center should create a positive spatial ensemble rather than occur as free standing random elements. Buildings should be located so that they form an ordered relationship with one another, ideally through the creation of public open space.

2.2. Building Shape and Footprint

Buildings should be predominantly rectangular in shape or composed of simple rectangular pieces.

Where building footprints are larger than 10,000 sf the buildings should be broken up with alternating materials or architectural elements that give the appearance of multiple buildings. Additionally building depths may not be greater than 100' without being divided into what appears to be multiple buildings.

2.3. Building Height

An appropriate building height is desirable to establish a scale to the mixed-use Community and will not exceed the maximum or minimum heights as set forth in the County PDMX ordinance.

2.4. Building Setback Lines/Frontage Zone

- Benn's Church Boulevard BSL: 70' from Right of Way
- Main Entrance Road BSL: 25' from Right of Way
- All other BSL: 50' from Property Line.

3. Visual Character

3.1. Edge Definition and Screening

1. General Provisions

Walls, fences and planting are to be employed to improve the visual environment as well as to reinforce a streetwall condition. These elements are not intended to block views of the fronts of the buildings but to serve two functions: to define street edges and parking areas and to conceal undesirable views into service areas.

Parking lots and landscaped areas of the site should be defined with a continuous hedge, low walls or fences, combined with planting where appropriate, along the property line or established setback line. The walls and fences should be architecturally consistent with the adjacent buildings and should be limited to 60" in height. The canopy of trees planted within the parking areas or other positive features should dominate the view over such walls and fences to soften the effect of parking area along street rights-of-way.

Loading, service and trash areas, as well as mechanical equipment, are to be screened with high walls or fences, a minimum of 5' in height, combined with planting where appropriate, and consistent in character with the buildings or may be screened by the buildings themselves. Walls or fences should have a minimum opacity of 75%.

2. Mechanical Equipment

All roof mounted mechanical equipment, including ductwork, is to be screened from all public view and access.

3.2. Plantings

Planting is encouraged in all setback areas and throughout the parking areas. Within large areas of parking, planting should be designed to break down large parking lots into smaller parking areas. The preservation of existing mature trees within planting and parking areas is encouraged.

3.3. Scale and Articulation

Buildings in the commercial center should not appear monolithic, but should appear consistent with a village character. The use of articulation should be employed to help reduce the overall size of large buildings. Articulation may be expressed through two devices: building massing and architectural elements. Buildings with large profiles may be designed to appear smaller if the overall massing is articulated as a collection of component masses. The use of architectural elements such as bays, balconies, porches, loggias and arcades can add interest to building facades and aid in relating the scale of any building to human dimensions. Roofs may be articulated through the use of dormers, lanterns, monitors, windows watches and other roof-top elements. Each of these devices adds character and interest to the buildings of the town which, in turn, reinforces the village character intended by these guidelines.

The building height limitations will be determined by the applicable County ordinance and should utilize simple geometric shapes in plan and elevation, subject to required treatment of 1 story buildings set forth in Chapter 3, Section 3.3 above. The overall massing of any building should be a collection of small and medium simple volumes. Buildings are encouraged to have pitched roofs, especially if they contain residential uses, with attic

stories and dormers. Wings and additions should be simple rectangles in plan and oriented parallel or perpendicular to the main body of the building or toward a street frontage.

3.4. Site Lighting

All site lighting should prevent light from shining directly up and should be full cut-off fixtures with the light source fully shielded, except for low wattage and fossil fuel sources, temporary emergency lighting, seasonal lighting, sports field lighting and other special situations. Pedestrian luminaries that permit the limited and controlled visibility of indirect light from the source as an aid to way finding and spatial definition are permitted.

Acceptable light sources include incandescent, fluorescent and metal halide lamps, and should produce a color temperature close to daylight. Mercury vapor sources are not permitted.

The maximum height for on-site fixture poles is 20'.

3.5. Architectural Expression

1. Walls

- Recommended Materials

  - Building walls: brick, with limited use of stucco or synthetic stucco, wood or fiber cement shingle, wood or fiber cement clapboard, board and batten
  - Exposed Foundation Walls: Brick or brick facing, or stucco finished poured concrete block or cast-in-place concrete.

2. Building Elements

- Recommended Materials

  - Chimneys: brick, stucco or synthetic stucco.
  - Arcades and colonnades: brick, stucco, synthetic stucco, wood, or high grade synthetic wood alternative.
  - Porches, columns: painted wood, painted metal
  - Posts, spindles, balusters: painted wood, painted metal- Stoops, exterior stairs: brick, concrete
- Decks: wood
- Signs: wood, painted metal
- Awning and canopies: canvas-covered metal structure, designed to be compatible in configuration and color with the architecture of the buildings.

4. <u>Roofs</u>

- Recommended Materials

- Roofs: Wood shingles, metal standing seam, copper, lead-coated copper, slate, synthetic slate, 40-year architectural asphalt shingle
-Gutters and downspouts: painted metal, copper
-Flashing: copper, lead coated copper, anodized aluminum

- Configurational Standards

  Buildings should have a varied character of traditionally shaped roofs.

  Items to be considered are:

  - Principal Roofs: Gabled, hipped, hipped gables, gabled hips or gambrel in a symmetrical fashion with a slope of 4:12 to 8:12; Buildings with roof areas greater than 12,000 sf may have portions which are flat if concealed from view by sloped roofs of the character described above.
  - Secondary Roofs: Shed with minimum slope of 3:12.
  - Flat Roofs: Flat roofs are to have parapets or railings.
  - Parapets: Horizontal or gabled in elevation
  - Dormers: Pitched or eyebrow
  - Special roof-top elements: Symmetrically situated or aligned with the rhythm of structural bays and fenestration.
  - Roof-top mechanical enclosures: Concealed from view by sloped roofs of the character described above.

5. Openings

- Recommended Materials

  - Windows: wood, painted metal
  - Bay windows: wood, painted metal, with metal tops
  - Doors: painted wood, painted metal
  - Storefronts: painted wood, painted metal
  - Shutters: wood
  - Security doors and grilles: metal

The following photographs are not intended to represent actual users or layouts but merely illustrate the quality of materials and design that is intended to be required by these guidelines.





MASTER PLAN

FOR

SWEETGRASS

WINDSOR DISTRICT

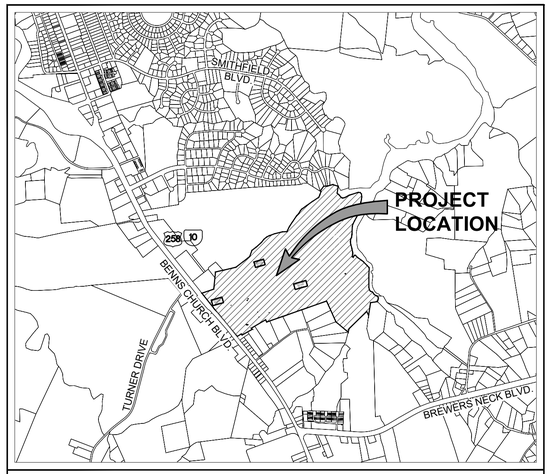
ISLE OF WIGHT, VIRGINIA

APPLICANT INFORMATION:

NVR, INC.
CONTACT: MR. ERIC SHIREY
860 GREENBRIER CIRCLE
CHESAPEAKE, VIRGINIA 23320
PHONE NO.: (757) 603-0802

SITE DATA:

PARCEL ID:	32-01-009
PROPERTY OWNER:	WILLIAM G. YEOMAN III TRUSTEE
PROPERTY ADDRESS:	14096 BENNS CHURCH BOULEVARD
CURRENT ZONING:	RAC, RURAL AGRICULTURAL CONSERVATION DISTRICT
PROPOSED ZONING:	C-PD-MX, CONDITIONAL PLANNED DEVELOPMENT MIXED USE DISTRICT
PROPERTY ACREAGE:	250 AC. ±
OVERLAY DISTRICTS:	NEWPORT DEVELOPMENT SERVICE OVERLAY DISTRICT (DSD) & CHESAPEAKE BAY PRESERVATION AREA OVERLAY DISTRICT



VICINITY MAP
(Approximate Scale: 1"=2,000')

INDEX OF SHEETS

SHEET NO.	SHEET DESCRIPTION
1	COVER SHEET
2	MASTER PLAN
3	ENVIRONMENTAL INVENTORY

County Project No.: ZA-06-19
Original Submittal Date: JUNE 14, 2019

Rev.	Date	Description	Revised By
5	8/18/23	REVISED PER COUNTY COMMENTS	JAG
4	2/15/23	REVISED PER COUNTY COMMENTS	JAG
3	7/22/22	REVISED PER COUNTY COMMENTS	JAG
2	6/01/21	REVISED PER COUNTY COMMENTS	JAG
1		REVISED PER COUNTY COMMENTS	JAG

AES CONSULTING ENGINEERS
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Phone: (757) 253-0040
Fax: (757) 220-8994
www.aesva.com
Middle Peninsula | Central Virginia | Hampton Roads

REZONING MASTER PLAN
FOR
SWEETGRASS
ISLE OF WIGHT COUNTY WINDSOR DISTRICT VIRGINIA

Project Contacts:	JAG
Project Number:	W10516-00
Scale: AS NOTED	Date: 6/14/19

Sheet Title:
COVER SHEET

Sheet Number
1 OF 3

DENSITY CALCULATIONS

	SF	AC	%
TOTAL SITE AREA	10,866,832	249.47	100%
COMMERCIAL SECTION:	SF	AC	%
TOTAL AREA	236,520	5.43	2%
SLOPES 15%-30%	3,110	0.07	
SLOPES GREATER THAN 30%	-	-	
100' RPA, TIDAL WETLANDS, 100 YEAR FLOOD PLAIN	21,585	0.50	
AREA OF ROUTE 10 BUFFER	50,863	1.17	
NON-DEVELOPABLE AREA	75,558	1.73	
AREA FOR DENSITY CALCULATION	160,962	3.70	
MINIMUM REQUIRED DENSITY	64,385		
PROPOSED DENSITY	73,000 SF		
TOWNHOME SECTION:	SF	AC	%
TOTAL AREA	3,429,642	78.73	32%
SLOPES 15%-30%	2,517	0.06	
SLOPES GREATER THAN 30%	6,742	0.15	
NON-TIDAL WETLANDS	31,513	0.72	
100' RPA, TIDAL WETLANDS, 100 YEAR FLOOD PLAIN	1,791,639	41.13	
NET DEVELOPABLE AREA	1,614,246	37.06	
AREA FOR DENSITY CALCULATION (less 20% RW)	1,291,397	29.65	
PROPOSED OPEN SPACE	2,180,625 SF		64%
MINIMUM REQUIRED DENSITY	178 UNITS		
PROPOSED DENSITY	225 UNITS		
SINGLE FAMILY SECTION:	SF	AC	%
TOTAL AREA	7,135,818	163.82	66%
SLOPES 15%-30%	23,748	0.55	
SLOPES GREATER THAN 30%	-	-	
100' RPA, TIDAL WETLANDS, 100 YEAR FLOOD PLAIN	2,949,782	67.72	
NET DEVELOPABLE AREA	4,174,162	95.83	
AREA FOR DENSITY CALCULATION (less 20% RW)	3,339,330	76.66	
PROPOSED OPEN SPACE	4,307,625 SF		60%
MINIMUM REQUIRED DENSITY	307 UNITS		
PROPOSED DENSITY	390 UNITS		
OVERALL MAXIMUM RESIDENTIAL UNITS (PER PROFFERS)	615 UNITS		

N/F
THOMAS BARBARA F
910 CANTEBERRY LN
PARCEL ID: 22J-02-150
ZONING: SMITHFIELD: N-R

N/F
EVANS ANTHONY
906 CANTEBERRY LN
PARCEL ID: 22J-02-152
ZONING: SMITHFIELD: N-R

N/F
DIPPO LAWRENCE A & ELIZABETH A
TRS L A & E A DIPPO LIVING TRUST
908 CANTEBERRY LN
PARCEL ID: 22J-02-151
ZONING: SMITHFIELD: N-R

N/F
BERLAND EDNA R
916 CANTEBERRY LN
PARCEL ID: 22J-02-147
ZONING: SMITHFIELD: N-R

N/F
HENDRIX THOMAS
912 CANTEBERRY LN
PARCEL ID: 22J-02-149
ZONING: SMITHFIELD: N-R

N/F
FORSYTHE TIMOTHY A & DEBRA K
TRS T A & D K FORSYTHE FAMILY REV TRUST
914 CANTEBERRY LN
PARCEL ID: 22J-02-148
ZONING: SMITHFIELD: N-R

N/F
EDWARDS PHILLIP F JR & CONNIE A
BENNS CHURCH BLVD
PARCEL ID: 32-01-096
ZONING: SMITHFIELD: C-C

N/F
CROWN CASTLE GT COMPANY LLC
14005 BENNS CHURCH BLVD
PARCEL ID: 32-01-096B
ZONING: RAC

N/F
WILSON ANGELA B & WILSON JAMES G JR
TRS A B WILCON REVOC LIVING TRUST
14041 BENNS CHURCH BLVD
PARCEL ID: 32-01-095
ZONING: LI

N/F
YEOMAN WILLIAM G III
WILLIAM G YEOMAN III TRUST
BENNS CHURCH BLVD
PARCEL ID: 32-01-007
ZONING: RAC

N/F
ISLE OF WIGHT COUNTY SCHOOL BOARD
14171 SMITHFIELD CIR, SMITHFIELD
PARCEL ID: 32-01-010A
ZONING: RAC

N/F
CORNETT GEORGE C
14106 BENNS CHURCH BLVD
PARCEL ID: 32-01-008
ZONING: RAC

N/F
WILLIAM G. YEOMAN, TRUSTEE
14096 BENNS CURCH BOULEVARD
PARCEL ID:32-01-009
ZONING: RAC

N/F
EDWARDS RYLAND B JR &
MARY ANN D &
EDWARDS RYLAND B & ETALS
14202 BENNS CHURCH BLVD
PARCEL ID: 32-01-062
ZONING: RAC

N/F
GIRARD PATRICIA A
14221 BENNS CHURCH BOULEVARD
PARCEL ID:32A-02-012
ZONING: RAC

N/F
TOTTEN CHARLES D
BEECHWOOD LN
PARCEL ID:32-01-094,094C,094D
ZONING: RAC

N/F
BELL LINWOOD E & BARBARA G
19341 BEECHWOOD LN
PARCEL ID:31-01-094B

N/F
WALLACE JIMMY J & MYRTLE T
14108 HAYLOFT LN
PARCEL ID:32-01-094A
ZONING: RAC

N/F
WALLACE JIMMY J & MYRTLE T
14111 HAYLOFT LN
PARCEL ID:32B-01-005
ZONING: RAC

N/F
CARNEY PAMELA D
14125 HAYLOFT LN
PARCEL ID:32B-01-006
ZONING: RAC

N/F
CARNEY PAMELA D
14125 HAYLOFT LN
PARCEL ID:32B-01-006
ZONING: RAC

N/F
BOWDEN RONALD
BREWERS NECK BLVD
PARCEL ID: 33-01-005
ZONING: RAC

N/F
GRAY ROBERTA
C/O GARY LAWRENCE N
CHAPMANS LN
PARCEL ID:33-03-006
ZONING: RAC

N/F
ST LUKES VILLAGES LLC
C/O MCCALE DEV COR
20081 BREWERS NECK BLVD
PARCEL ID: 33-01-012E
ZONING: PD-MX

TOWNHOME PARCEL

EXISTING TREELINE (TYP.)

RECREATION AREA 1

RECREATION AREA 2

RECREATION AREA 3

RECREATION AREA 4

APPROX. LIMITS OF EXISTING TREELINE

PRIVATE CONDOMINIUM ROAD AND PARKING

TOWNHOME SECTION 80 AC.±

"COMMERCIAL" SECTION 5 AC.±

SINGLE FAMILY SECTION 164 AC.±

OPEN AREA

OPEN SPACE

PEDESTRIAN ACCESS

BMP C1

BMP D

BMP A

POTENTIAL BMP C2 LOCATION

POTENTIAL BMP B LOCATION

DOG PARK

CENTRAL PARK

END OF PUBLIC ROAD

PARKING FOR PARK

LIMITS OF 100' RPA

LIMITS OF ZONE AE FLOOD PLAIN ELEV = 8

70' BUILDING SETBACK

MULTI-USE PATHWAY

RESTRICTED ACCESS (RIGHT IN/OUT ONLY)

PUBLIC RIGHT OF WAY EXTENDED TO BOUNDARY

POTENTIAL PUBLIC RIGHT OF WAY EXTENDED TO BOUNDARY. FINAL LOCATION TO BE CONFIRMED WITH DEVELOPMENT PLANS.

BEECHWOOD LANE

BENNS CHURCH BLVD (VARIABLE WIDTH PUBLIC R/W)

1220.51'

686'

60' PUBLIC R/W

53' PUBLIC R/W

S PUBLIC RW

LEGEND

- 100 FOOT RPA BUFFER TO PROPERTY LINE
- 100'RPA — 100 FOOT RPA BUFFER
- WETLANDS
- EX. TREELINE
- FLOOD PLANE ZONE AE
- MULTI-USE PATH
- PARK/RECREATION AREA
- WATER / POND
- CONDO TOWNHOME UNITS
- LOTS LINES

* NOTE: WETLANDS AND RPA BUFFERS ARE SHOWN BASED UPON DATA PROVIDED BY WSSI AND ARE NOT FIELD SURVEYED.

PARK/ RECREATION

RECREATION AREAS 1-4 =	4.7 AC. ±
DOG PARK =	1.5 AC. ±
CENTRAL PARK =	3.67 AC. ±

* RECREATION TO INCLUDE: CLUBHOUSE, POOL, PAVED AND UNPAVED TRAILS, PLAY FIELDS, MINIMUM OF 2 GAZEBOS, BENCHES, FIRE PIT AND OTHER AMENITIES

GRAPHIC SCALE
200' 0' 200' 400'
SCALE: 1" = 200'

Rev.	Date	Description	Revised By
5	8/18/23	REVISED PER COUNTY COMMENTS	JAG
4	2/15/23	REVISED PER COUNTY COMMENTS	JAG
3	7/22/22	REVISED PER COUNTY COMMENTS	JAG
2	6/01/21	REVISED PER COUNTY COMMENTS	JAG
1	11/1/2019	**REVISED PER COUNTY COMMENTS**	**JAG**

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AES CONSULTING ENGINEERS
Hampton Roads | Central Virginia | Middle Peninsula

REZONING MASTER PLAN
FOR
SWEETGRASS
ISLE OF WIGHT COUNTY | WINDSOR DISTRICT | VIRGINIA

Project Contacts:	JAG
Project Number:	W10516-00
Scale: 1"=200'	Date: 06/14/2019

Sheet Title:
CONCEPTUAL MASTER PLAN

Sheet Number
2 OF 3

SOIL CHARACTERISTICS

SOIL#	SOIL NAME	HYDROLOGIC SOIL GROUP	TYPICAL SLOPES	EROSION FACTOR (K)	EROSION FACTOR (T)
2	BOHICKET SILTY CLAY LOAM	D	0–1%	0.32	5
3	Chickahominy silt loam	D	0–2%	0.55	5
7	Kinston loam	B/D	0–4%	0.32	5
11E	Nevarc and Remlik soils	A	15–35%	0.55	5
12A	Peawick silt loam	D	0–2%	0.55	5
12B	Peawick silt loam	D	2–6%	0.55	5
16	Rumford loamy sand	A	0–4%	0.10	5
18B	Slagle fine sandy loam	C	2–6%	0.24	5

INFORMATION TAKEN FROM "SOIL SURVEY OF TIDEWATER CITIES AREA, VIRGINIA" ISSUED IN 2009 BY THE UNITED STATES DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE IN COOPERATION WITH VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY.

SOIL SUSCEPTIBILITY TO EROSION CLASSIFICATION (K)
0.23 AND LOWER – LOW ERODIBILITY
0.23 – 0.36 – MODERATE ERODIBILITY
0.36 AND UP – HIGH ERODIBILITY

THE MAP SHOWN IS A "BEST FIT MODEL" OF THE SCS MAPS WITH EXISTING BASE INFORMATION.

LEGEND

- SLOPES 15% TO 30%
- SLOPES 30% OR GREATER
- EXISTING WATER
- RPA BUFFER IMPACTS** ± 69,501 S.F.; ± 1.60 AC.
- WETLAND IMPACTS** ± 16,653 S.F. ; ± 0.38 AC.

** NOTE: THE PURPOSE OF THIS MAP IS TO SHOW REPRESENTATIVE IMPACTS BASED ON THE PROPOSED MASTER PLAN. THE APPROVAL OF THIS MASTER PLAN DOES NOT INTEND TO APPROVE THESE IMPACTS. ADDITIONAL PERMITS AND WAIVERS SHALL BE SOUGHT THROUGH THE PROPER REVIEWING AGENCIES.

ENVIRONMENTAL INVENTORY IMPACTS

TIDAL WETLANDS:	NONE IMPACTED
TIDAL SHORES:	NONE IMPACTED
NON-TIDAL WETLANDS IN RPA:	2,670 S.F./0.06 AC.
NON-TIDAL WETLANDS NOT IN RPA:	13,983 S.F./0.32 AC.
100 FT RPA BUFFER:	89,832 S.F./2.07 AC.
NON-TIDAL WETLANDS IN RMA:	NONE IMPACTED
HYDRIC SOILS:	NONE IMPACTED

* SEE WQIA SUBMITTED WITH REZONING APPLICATION FOR DETAILS.

LEGEND

SOILS BOUNDARY

19B SOILS TYPE

GRAPHIC SCALE
200' 0' 200' 400'
SCALE: 1" = 200'

THIS PROPERTY IS IN FLOOD ZONE "X" AND AE (EL 8) AS SHOWN ON MAP NUMBER 51093C0154E, PANEL 0154E AND 51093C0153E, PANEL 0153E FOR COMMUNITY NUMBERS 510303 & 510081, DATED 12/2/2015 OF THE FLOOD INSURANCE RATE MAPS FOR ISLE OF WIGHT COUNTY, VIRGINIA. ZONE "X" IS DEFINED AS AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOOD PLAIN. ZONE "AE" IS DEFINED AS SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD.

N/F THOMAS BARBARA F 910 CANTEBERRY LN PARCEL ID: 22J-02-150 ZONING: SMITHFIELD: N-R

N/F HENDRIX THOMAS 912 CANTEBERRY LN PARCEL ID: 22J-02-149 ZONING: SMITHFIELD: N-R

N/F EVANS ANTHONY 906 CANTEBERRY LN PARCEL ID: 22J-02-152 ZONING: SMITHFIELD: N-R

N/F BERLAND EDNA R 916 CANTEBERRY LN PARCEL ID: 22J-02-147 ZONING: SMITHFIELD: N-R

N/F DIPPO LAWRENCE K & ELIZABETH TRS L / A & E A DIPPO LIVING TRUST 908 CANTEBERRY LN PARCEL ID: 22J-02-151 ZONING: SMITHFIELD: N-R

N/F FORSYTHE TIMOTHY A & DEBRA K TRS T A & D K FORSYTHE FAMILY REV TRUST 914 CANTEBERRY LN PARCEL ID: 22J-02-148 ZONING: SMITHFIELD: N-R

RPA BUFFER IMPACT #7 6,734 S.F.±; 0.15 AC.±

TOWNHOME PARCEL

EXISTING TREELINE (TYP.)

N/F EDWARDS PHILLIP F JR & CONNIE A BENNS CHURCH BLVD PARCEL ID: 32-01-096 ZONING: SMITHFIELD: C-C

RECREATION AREA 1

RECREATION AREA 4

OPEN SPACE

BMP C1

APPROX. LIMITS OF EXISTING TREELINE

N/F CROWN CASTLE GT COMPANY LLC 14105 BENNS CHURCH BLVD PARCEL ID: 32-01-096B ZONING: RAC

PRIVATE CONDOMINIUM ROAD AND PARKING

TOWNHOME SECTION 80 AC.±

OPEN AREA

PEDESTRIAN ACCESS

WETLANDS IMPACT #1 1,540 S.F.±; 0.04 AC.±

55' PUBLIC R/W

POTENTIAL BMP C2 LOCATION

RPA BUFFER IMPACT #6 4,870 S.F.±; 0.11 AC.±

PARKING FOR PARK

DOG PARK

TURNER DRIVE

N/F WILSON ANGELA B & WILSON JAMES G TRS A B WILSON REVOCABLE LIVING TRUST 14041 BENNS CHURCH BLVD PARCEL ID: 32-01-095 ZONING: LI

N/F YEOMAN WILLIAM G III WILLIAM G YEOMAN III TRUST BENNS CHURCH BLVD PARCEL ID: 32-01-007 ZONING: RAC

RPA BUFFER IMPACT #1 1,756 S.F.±; 0.04AC.±

RPA BUFFER IMPACT #9 4,962 S.F.±; 0.11AC.±

RPA BUFFER IMPACT #5 5,330 S.F.±; 0.12 AC.±

OPEN AREA

BMP D

CENTRAL PARK

END OF PUBLIC ROAD

BMP A

LIMITS OF 100' RPA

LIMITS OF ZONE AE FLOOD PLAIN ELEV = 8

1220.51'

BENNS CHURCH BLVD

N/F ISLE OF WIGHT COUNTY SCHOOL BOARD 14171 SMITHFIELD CIR, SMITHFIELD PARCEL ID: 32-01-010A ZONING: RAC

COMMERCIAL SECTION 5 AC.±

SINGLE FAMILY SECTION 164 AC.±

N/F CORNELL GEORGE C 14106 BENNS CHURCH BLVD PARCEL ID: 32-01-008 ZONING: RAC

70' BUILDING SETBACK

RPA BUFFER IMPACT #2 12,872 S.F.±; 0.30 AC.±

RPA BUFFER IMPACT #10 1,539 S.F.±; 0.04 AC.± (SANITARY SEWER)

WETLANDS IMPACT #3 2,672 S.F.±;0.06 AC.±

RECREATION AREA 2

RECREATION AREA 3

WETLANDS IMPACT #2 3,041 S.F.±; 0.1 AC.±

60' PUBLIC R/W

53' PUBLIC R/W

OPEN SPACE

PARKING FOR PARK

LIMITS OF 100' RPA

RPA BUFFER IMPACT #3 12,149 S.F.±; 0.28 AC.±

RPA BUFFER IMPACT #4 26,023 S.F.±; 0.60 AC.±

EXISTING TREELINE (TYP.)

POTENTIAL PUBLIC RIGHT OF WAY EXTENDED TO BOUNDARY. FINAL LOCATION TO BE CONFIRMED WITH DEVELOPMENT PLANS.

WETLANDS IMPACT #4 9,516 S.F.±; 0.22 AC.±

POTENTIAL BMP B LOCATION

N/F WILLIAM G. YEOMAN, TRUSTEE 14096 BENNS CURCH BOULEVARD PARCEL ID: 32-01-009 ZONING: RAC

MULTI-USE PATHWAY

N/F EDWARDS RYLAND B JR & MARY ANN D & EDWARDS RYLAND B & ETALS 14202 BENNS CHURCH BLVD PARCEL ID: 32-01-062 ZONING: RAC

PUBLIC RIGHT OF WAY EXTENDED TO BOUNDARY

RESTRICTED ACCESS (RIGHT IN/OUT ONLY)

N/F GIRARD PATRICIA A 14225 BENNS CHURCH BOULEVARD PARCEL ID:32A-02-012 ZONING: RAC

N/F WALLACE JIMMY J & MYRTLE T 14111 HAYLOFT LN PARCEL ID: 32B-01-005 ZONING: RAC

N/F WALLACE JIMMY J & MYRTLE T 14108 HAYLOFT LN PARCEL ID: 32-01-094A ZONING: RAC

N/F CARNEY PAMELA D 14125 HAYLOFT LN PARCEL ID: 32B-01-006 ZONING: RAC

N/F BOWDEN RONALD BREWERS NECK BLVD PARCEL ID: 32-01-005 ZONING: RAC

N/F GRAY ROBERTA C/O GARY LAWRENCE 11 CHAPMANS LN PARCEL ID: 32C1-004 ZONING: RAC

N/F TOTTEN CHARLES D BEECHWOOD LN PARCEL ID: 32-01-094,094C,094D ZONING: RAC

N/F CARNEY PAMELA D 14125 HAYLOFT LN PARCEL ID: 32B-01-006 ZONING: RAC

N/F ST LUKES VILLAGES LLC C/O MCCALE DEV CORP 20081 BREWERS NECK BLVD PARCEL ID: 33-01-012E ZONING: PD-MX

BEECHWOOD LANE

N/F BELL LINWOOD E & BARBARA G 19341 BEECHWOOD LN PARCEL ID: 31-01-094B ZONING: RAC

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Rev	Date	Description
5	8/18/23	REVISED PER COUNTY COMMENTS
4	2/16/23	REVISED PER COUNTY COMMENTS
3	7/22/22	REVISED PER COUNTY COMMENTS
2	6/01/21	REVISED PER COUNTY COMMENTS
1	11/12/19	REVISED PER COUNTY COMMENTS

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Middle Peninsula | Central Virginia | Hampton Roads

REZONING MASTER PLAN
FOR
SWEETGRASS

Project Contacts:	JAG
Project Number:	W10516-0C
Scale: 1"=200'	Date: 06/14/2019

Sheet Title:
ENVIRONMENTAL INVENTORY

Sheet Number
3 OF 3

Memorandum

To: VDOT and Isle of Wight County

Date: March 17, 2023

Project #: 34417.00

From: Kirsten Tynch, PE, PTOE
Sean Becker, PE, PMP

Re: Sweetgrass Supplemental Memo to December 2019 Traffic Impact Study and June 2021 Memo

Introduction

Sweetgrass (previously referred to as Yeoman's Tract) is an undeveloped parcel located at 14096 Benns Church Boulevard in Isle of Wight County. The parcel is on the northeast side US 258/Rt (Benns Church Boulevard) between US 258/Rt 32 (Brewers Neck Boulevard) and Canteberry Lane. Ryan Homes is planning a development of single family, and multi-family living residential units as well as a shopping center on this parcel. The developer is in the process of rezoning the property to Conditional Mixed-Use Areas (C-PD-MX). This development is expected to be in full operation in 2026.

The Virginia Department of Transportation (VDOT) and Isle of Wight County require a traffic study in compliance with Chapter 527 Regulations. A traffic impact analysis (TIA) was completed in December 2019 and submitted for approval. This memorandum is a supplement and follow up to the December 2019 traffic impact study, as well as the Memo submitted June 2021. Modifications were made to the development and in response to requests to provide pedestrian signal timings at the proposed entrance to the development, which results in changes on trip generation and Synchro Build traffic analysis discussed herein. Only 2026 and 2032 Build conditions were updated for the purposes of this memo.

Trip Generation

The development plan has been modified since the 2019 TIA and June 2021 memo to reduce the shopping center area (using a different land use code that better reflects the type of development proposed) and adding general office space, summarized in Table 1. These changes result in a net reduction in trips compared to the previous June 2021 submission, shown in Table 2. December 2019 TIA trip generation is shown in Table 3.

Table 1. Trip Generation for Current Development Plan

Land Use	ITE Code	Size	Units	Daily	AM Peak Hour			PM Peak Hour		
					Enter	Exit	Total	Enter	Exit	Total
Conceptual Site Plan										
Single-Family Detached Housing	210	390	Dwelling Units	3,682	72	217	289	243	143	386
Multifamily Housing (Low-Rise)	220	225	Dwelling Units	1,660	24	80	104	79	47	126
Strip Retail Plaza (<40k)	822	18	1000 Sq. Ft. GLA	989	25	17	42	59	60	119
General Office	710	55	1000 Sq. Ft. GLA	690	88	12	100	17	84	101
Subtotal				**7,021**	**209**	**326**	**535**	**398**	**334**	**732**
Pass-by Trips (Shopping Center)	34%		% Pass-by	336	9	6	14	20	20	40
Total New Trips				**6,685**	**200**	**320**	**521**	**378**	**314**	**692**

Note: Used highest of average rate and fitted curve unless fitted curve unless R2<0.75

Table 2. Trip Generation from June 2021 Memo

Land Use	ITE Code	Size	Units	Daily	AM Peak Hour			PM Peak Hour		
					Enter	Exit	Total	Enter	Exit	Total
Conceptual Site Plan										
Single-Family Detached Housing	210	390	Dwelling Units	3,682	72	217	289	243	143	386
Multifamily Housing (Low-Rise)	220	225	Dwelling Units	1,660	24	80	104	79	47	126
Shopping Center	820	35	1000 Sq. Ft. GLA	2,944	20	13	33	120	130	250
Subtotal				**8,286**	**116**	**310**	**426**	**442**	**320**	**762**
Pass-by Trips (Shopping Center)	34%		% Pass-by	1,001	7	4	11	41	44	85
Total New Trips				**7,285**	**109**	**306**	**415**	**401**	**276**	**677**

Reference: Trip Generation, 10th Edition + Supplement, Institute of Transportation Engineers, Washington, DC. 2019.
Note: Used highest of average rate and fitted curve unless fitted curve unless R2<0.75

Table 3. Trip Generation from December 2019 TIA

Land Use	ITE Code	Size	Units	Daily	AM Peak Hour			PM Peak Hour		
					Enter	Exit	Total	Enter	Exit	Total
Conceptual Site Plan										
Single-Family Detached Housing	210	400	Dwelling Units	3,776	74	222	296	249	147	396
Multifamily Housing (Low-Rise)	220	285	Dwelling Units	2,144	30	101	131	101	59	160
Shopping Center	820	30	1000 Sq. Ft. GLA	2,651	17	11	28	107	116	223
Public Park	411	4	Acres	91	0	0	0	13	10	23
Fast Food with Drive-Thru	934	5	1000 Sq. Ft. GLA	2,355	102	99	201	85	78	163
Subtotal				**11,017**	**223**	**433**	**656**	**555**	**410**	**965**
Pass-by Trips (Fast Food only)	49%		% Pass-by	1,154	50	49	98	42	38	80
Pass-by Trips (Shopping Center)	34%		% Pass-by	901	6	4	10	36	39	76
Total New Trips				**8,962**	**167**	**380**	**548**	**477**	**333**	**809**

Reference: Trip Generation, 10th Edition, Institute of Transportation Engineers, Washington, DC. 2017.
Note: Used highest total between aveage rate and fitted curve unless R2<0.75

The site is estimated to generate 6,685 new daily trips with 521 trips in the morning peak hour and 692 trips during the evening peak hour. This is a reduction of 600 daily trips from the June 2021 memo submission, however, AM peak trips increase by 106 and PM peak trips increase by 15. Appendices for this memo include revised figures for trip generation, projected 2026 build volumes, and projected 2032 build volumes for the AM and PM peak.

As compared to the original December 2019 TIA submission, there are 2,277 fewer daily trips, with 27 fewer AM peak hour trips, and 117 fewer PM peak hour trips. Due to lower volumes and generally improved LOS compared to previous analyses, no modifications to mitigation measures are recommended.

Memorandum

Synchro Analysis

To accommodate pedestrian signal timing at the development main entrance, revisions are required to the phase splits along US 258/Rt 10 (Benns Church Blvd) to ensure corridor progression. Split adjustments shift cycle time to the side streets to provide sufficient timing for pedestrian crossings. Results of the updated synchro analysis and comparison to previous analysis are discussed in the following sections.

LOS Summary

A summary of LOS results with timing updates completed is shown in Table 4. Table 5 shows the summary of LOS as submitted in 2019.

In comparing the results from the original TIA against the updated results, LOS and delay is generally reduced across the board or minimally impacted due to the pedestrian timing updates. No approaches are below a LOS D in the updated model. In the 2019 TIA submission, the eastbound approach at US 258/Rt 10 (Benns Church Boulevard) & Canteberry Lane was project to be LOS E in both the 2026 and 2032 build conditions model. With the updated model reflecting lower trip generation and new signal timing for pedestrians, this movement is projected to maintain a LOS C or D in both build conditions.

Table 4. Level of Service Results Summary

Detailed Level of Service Results Summary

ID	Intersection and Approach	Control	2026 Build		2032 Build	
			AM	PM	AM	PM
1	**US 258/Rt 10 (Benns Church Boulevard) & Canteberry Lane**	Signalized	**B (14.9 sec/veh)**	**C (31.1 sec/veh)**	**B (19.9 sec/veh)**	**D (40.6 sec/veh)**
	Eastbound		C-24.9	D-45.3	D-38.8	D-49.5
	Westbound		D-44	D-35.6	D-52	D-37.6
	Northbound		B-10.9	C-32.3	B-17.8	D-47.1
	Southbound		B-14.1	C-27.4	B-17.1	C-32.7
2	**US 258/Rt 10 (Benns Church Boulevard) & Cypress Run Drive**	Signalized	**A (2 sec/veh)**	**A (9.1 sec/veh)**	**A (2.6 sec/veh)**	**A (7.8 sec/veh)**
	Eastbound		A-7.6	D-36.6	B-11.2	D-45.2
	Westbound		---	---	---	---
	Northbound		A-2	A-9.1	A-1.7	A-6.7
	Southbound		A-1.9	A-4.9	A-3	A-3.3
3	**US 258/Rt 10 (Benns Church Boulevard) & Turner Drive**	Signalized	**B (17.9 sec/veh)**	**C (22 sec/veh)**	**C (31.0 sec/veh)**	**A (9.1 sec/veh)**
	Eastbound		C-33.5	B-19.7	C-32.8	B-18.7
	Westbound		C-32.7	C-22.7	D-44.8	C-31.0
	Northbound		A-9	C-22.6	C-26.0	A-9.0
	Southbound		B-18.6	C-21.7	C-33.7	A-7.5
4	**US 258/Rt 10 (Benns Church Boulevard) & Proposed Main Entrance**	Signalized	**A (7.6 sec/veh)**	**B (11.6 sec/veh)**	**B (13.6 sec/veh)**	**B (18.6 sec/veh)**
	Eastbound		---	---	---	---
	Westbound		C-28.5	C-27.3	D-41.5	C-27.8
	Northbound		A-8.8	B-12.7	A-6.7	C-22.1
	Southbound		A-3	A-6.4	B-15	B-12
5	**US 258/Rt 10 (Benns Church Boulevard) & 258/Rt 32 (Brewers Neck Boulevard)**	Signalized	**A (8.6 sec/veh)**	**B (13.3 sec/veh)**	**B (10.6 sec/veh)**	**B (16 sec/veh)**
	Eastbound		---	---	---	---
	Westbound		A-4.9	B-13.9	A-8.1	C-22.6
	Northbound		B-18.3	D-36	C-23.4	C-33.3
	Southbound		A-9.3	A-8.2	B-10.1	A-4.6
6	**Queen Annes Court & 258/Rt 32 (Brewers Neck Boulevard)**	Signalized	**B (16.1 sec/veh)**	**B (19.8 sec/veh)**	**C (21.7 sec/veh)**	**C (21.4 sec/veh)**
	Eastbound		C-21.9	C-33.5	B-10.9	D-35.4
	Westbound		B-14.8	B-15.5	D-40	B-17.1
	Northbound		A-3.9	A-3.7	A-5.9	A-3.7
	Southbound		C-23.1	C-26.1	C-27.8	C-26.1
7	**US 258/Rt 10 (Benns Church Boulevard) & Proposed Secondary Entrance**	Unsignalized	**A (0.5 sec/veh)**	**A (0.3 sec/veh)**	**A (0.5 sec/veh)**	**A (0.3 sec/veh)**
	Eastbound		---	---	---	---
	Westbound		C-15.2	C-19.6	C-16.3	C-21.8
	Northbound		--0	--0	--0	--0
	Southbound		--0	--0	--0	--0

Table 5. Level of Service Results Summary from December 2019 Submission

ID	Intersection and Approach	Control	2026 Build		2032 Build	
			AM	PM	AM	PM
	US 258/Rt 10 (Benns Church Boulevard) & Canteberry Lane	Signalized	**B (16.6 sec/veh)**	**C (30.3 sec/veh)**	**B (18.5 sec/veh)**	**D (41.6 sec/veh)**
1	Eastbound		C-21.5	E-59	D-39.6	E-68.3
	Westbound		D-43.5	D-38.2	D-50.2	D-40
	Northbound		B-14.2	C-30.6	B-14.7	D-50.5
	Southbound		B-15.2	C-25.1	B-17	C-28.7
	US 258/Rt 10 (Benns Church Boulevard) & Cypress Run Drive	Signalized	**A (4.1 sec/veh)**	**A (9.5 sec/veh)**	**A (3.6 sec/veh)**	**B (10.9 sec/veh)**
2	Eastbound		A-6.6	D-36.1	B-11.2	D-39.2
	Westbound		---	---	---	---
	Northbound		A-3.4	A-9.4	A-2.6	B-11.2
	Southbound		A-4.5	A-5.6	A-4	A-6.2
	US 258/Rt 10 (Benns Church Boulevard) & Turner Drive	Signalized	**C (25.7 sec/veh)**	**C (23.1 sec/veh)**	**C (31 sec/veh)**	**C (27.6 sec/veh)**
3	Eastbound		C-27.5	B-17.4	C-31.2	B-18.2
	Westbound		C-28.5	C-22.7	C-29	C-22.7
	Northbound		C-22.2	C-23.3	C-27.7	C-27.9
	Southbound		C-27.8	C-23.7	C-33.9	C-28.7
	US 258/Rt 10 (Benns Church Boulevard) & Proposed Main Entrance	Signalized	**B (10.6 sec/veh)**	**B (18.7 sec/veh)**	**B (12.3 sec/veh)**	**C (21.5 sec/veh)**
4	Eastbound		---	---	---	---
	Westbound		C-24.3	C-31.8	C-21.1	C-32.2
	Northbound		B-10.1	C-20.2	B-13.2	C-25.8
	Southbound		A-7.7	B-13.1	A-9.6	B-13
	US 258/Rt 10 (Benns Church Boulevard) & 258/Rt 32 (Brewers Neck Boulevard)	Signalized	**A (8.8 sec/veh)**	**B (17.3 sec/veh)**	**B (10.3 sec/veh)**	**C (22.9 sec/veh)**
5	Eastbound		---	---	---	---
	Westbound		A-4.5	C-25.6	A-7.3	D-36
	Northbound		C-21.7	C-25.7	C-22.7	C-29.8
	Southbound		A-9.3	A-5.2	B-10.2	A-5
	Queen Annes Court & 258/Rt 32 (Brewers Neck Boulevard)	Signalized	**B (17.8 sec/veh)**	**C (20.1 sec/veh)**	**B (19.1 sec/veh)**	**C (22 sec/veh)**
6	Eastbound		C-23.4	D-35.4	B-12.3	D-40.5
	Westbound		B-17.1	B-15.1	C-32.2	B-15.7
	Northbound		A-5	A-3.4	A-5.6	A-3.5
	Southbound		C-25.6	C-23.7	C-27.8	C-26.1
	US 258/Rt 10 (Benns Church Boulevard) & Proposed Secondary Entrance	Unsignalized	**A (0.6 sec/veh)**	**A (0.4 sec/veh)**	**A (0.6 sec/veh)**	**A (0.4 sec/veh)**
7	Eastbound		---	---	---	---
	Westbound		C-15.3	C-20.8	C-16.4	C-23.4
	Northbound		A-0	--0	--0	--0
	Southbound		A-0	--0	--0	--0

Memorandum

Queue Summary

Results of the updated queue analysis are summarized in Table 5. For comparative purposes, queue results from the 2019 analysis are shown in Table 6. For both tables, queues exceeding available queue storage are shown in red. For the intersection of US 258/Rt 10 (Benns Church Boulevard) & Turner Drive, the 2032 Build AM peak eastbound right, 2026 Build PM peak southbound left, and 2032 AM peak southbound right appear to exceed the full storage length shown in the summary table. However, the effective storage length, as measurement in accordance to VDOT's Traffic Operations and Safety Analysis Manual (TOSAM), is sufficient to accommodate these projected queues under both the 2026 and 2032 build conditions. VDOT's TOSAM defines effective storage length as the turn bay length plus one-half taper length, which was utilized in the simulation model, therefore all build condition queue lengths are within effective storage length. The effective storage length was used in the Synchro analyses.

The addition of a right turn overlap at US 258/Rt 10 (Benns Church Boulevard) & Turner Drive during the 2032 Build condition reduces southbound right queue storage to remain within available effective storage. Further, the expansion of the northbound left queue storage at this same intersection to 250 feet as noted in the 2021 provide sufficient storage for the project queues in 2026 and 2032 build conditions.

No additional improvements over those defined in the 2019 TIA and 2021 memo are necessary to mitigate the projected traffic impacts of the revised proposed development and the addition of pedestrian signals at the main entrance into the site.

Table 5. Queue Results Summary

Queuing Analysis - 95th Percentile Queue										
Intersection	Movement	Link Distance	Storage Length	Existing (AM/PM Peak)	2026 No Build (AM/PM Peak)	2032 No Build (AM/PM Peak)	Link Distance	Storage Length	2026 Build (AM/PM Peak)	2032 Build (AM/PM Peak)
US 258/Rt 10 (Benns Church Boulevard) & Canteberry Lane	EBLT	277		56/162	50/170	58/178	277		47/145	50/201
	EBR	277		45/65	42/68	50/75	277		36/61	58/64
	WBLT	1172		137/103	147/101	162/110	1172		123/159	164/139
	WBR	1172		64/112	72/122	74/125	1172		64/102	107/122
	NBL		150	32/135	33/177	47/208		150	43/91	34/67
	NBT	663		175/348	197/404	210/546	663		126/322	224/277
	NBT	663		183/359	197/411	216/544	663		134/335	233/306
	NBR		225	35/47	36/93	45/271		225	36/55	45/52
	SBL		150	54/114	63/139	66/182		150	63/136	57/126
	SBT	1895		189/227	224/284	240/347	1895		212/246	270/287
	SBT	1895		198/241	230/290	252/355	1895		222/258	305/318
	SBR		325	24/39	26/40	25/41		325	22/40	23/44
US 258/Rt 10 (Benns Church Boulevard) & Cypress Run Drive	EBLT	1824		9/128	10/139	13/138	1824		12/135	11/160
	EBR	1824		31/96	38/101	38/103	1824		33/81	20/107
	WBLTR	1402		-/8	-/6	-/12	1402		-/10	-/14
	NBL		175	33/104	39/125	46/137		175	51/134	62/136
	NBT	1913		61/140	58/185	69/205	1913		37/148	48/86
	NBTR	1913		76/150	77/205	83/229	1913		51/161	72/106
	SBL		75	3/-	3/-	2/-		75	3/-	3/-
	SBT	663		56/81	61/86	75/89	663		68/81	84/89
	SBT	663		69/93	77/105	87/101	633		64/94	97/122
	SBR		150	9/46	14/45	14/49		150	9/44	10/53
US 258/Rt 10 (Benns Church Boulevard) & Turner Drive	EBLTR	1442		342/113	-	-			-	-
	EBLT	1440		-	174/91	220/100	1442		194/101	235/125
	EBR		200	-	168/66	197/73		200	183/73	216/98
	WBL		100	8/-	3/-	6/-	648		-/-	-/-
	WBTR	648		87/19	95/19	109/19	648		-/-	-/-
	WBLTR								94/15	121/16
	NBL		75	185/151	179/136	201/168		250	211/195	147/153
	NBT	1098		260/243	204/218	311/327	1065		174/326	356/160
	NBTR	1098		251/242	189/223	259/324	1065		152/330	310/49
	SBL		75	42/77	46/80	52/89		75	17/77	12/79
	SBT	1913		363/230	302/228	391/282	1913		249/251	334/192
	SBT	1913		378/240	307/237	401/288	1913		258/256	359/199
	SBR		175	200/57	153/59	248/93		175	126/60	252/58
US 258/Rt 10 (Benns Church Boulevard) & Proposed Main Entrance	WBL			-	-	-	816		127/127	145/152
	WBL			-	-	-	816		67/75	105/114
	WBR			-	-	-	816		69/106	138/132
	NBU		75	10/10	17/14	16/14		75	53/77	48/76
	NBT	3868	-	-	-/-	-	470		178/498	259/363
	NBT								161/496	234/360
	NBR							200	38/204	39/40
	SBU		100	5/-	4/-	3/-			-	-
	SBL							200	99/138	95/140
	SBT						1065		172/105	188/176
	SBT	1086		-	-	110/-	1065		191/121	190/194
US 258/Rt 10 (Benns Church Boulevard) & 258/Rt 32 (Brewers Neck Boulevard)	WBR	1008		104/227	134/284	158/337	1008		72/389	129/437
	WBR	1008		104/229	135/280	154/350	1008		76/418	116/426
	NBT	2766		72/71	64/78	73/92	2766		66/103	76/116
	NBT	2766		70/82	73/86	79/103	2766		90/117	80/141
	SBL		200	147/111	150/119	165/135		200	142/160	190/128
	SBL	3868		172/134	180/147	187/163	3191		175/182	214/137
	SBT	3868		4/-	9/-	-/-	3191		-/4	-/-
Queen Annes Court & 258/Rt 32 (Brewers Neck Boulevard)	EBL		125	25/25	24/24	28/27		125	17/27	26/30
	EBT	1008		240/200	265/223	324/260	1008		237/326	306/281
	EBTR	1008		249/217	273/233	327/267	1008		256/337	318/301
	WBL		500	150/242	166/300	183/350		500	156/311	164/396
	WBT	785		238/338	262/417	298/447	785		63/513	162/486
	WBT	785		200/327	235/403	275/460	785		46/525	130/531
	WBR		250	4/13	4/41	6/89		250	-/104	8/116
	NBLT	858		14/15	14/16	11/19	858		9/15	6/14
	NBR		250	171/96	187/106	220/127		250	170/122	193/131
	NBR		250	110/35	127/40	172/59		250	110/59	156/71
	SBLT	565		24/25	28/30	31/30	565		27/25	27/26
	SBR	565		33/27	34/31	38/32	565		29/34	24/28
US 258/Rt 10 (Benns Church Boulevard) & Proposed Secondary Entrance	WBR			-	-	-	1244		57/87	54/60
	NBT			-	-	-	3191		-/9	-/-
	NBT			-	-	-	3191		-/8	-/-
	NBR			-	-	-		100	-/-	-/-

Table 6. Queue Results Summary from December 2019 Submission

Queuing Analysis - 95th Percentile Queue										
Intersection	Movement	Link Distance	Storage Length	Existing (AM/PM Peak)	2026 No Build (AM/PM Peak)	2032 No Build (AM/PM Peak)	Link Distance	Storage Length	2026 Build (AM/PM Peak)	2032 Build (AM/PM Peak)
US 258/Rt 10 (Benns Church Boulevard) & Canteberry Lane	EBLT	277		56/162	50/170	58/178	277		52/190	55/198
	EBR	277		45/65	42/68	50/75	277		34/62	47/67
	WBLT	1172		137/103	147/101	162/110	1172		123/134	171/171
	WBR	1172		64/112	72/122	74/125	1172		68/108	91/113
	NBL		150	32/135	33/177	47/208		150	37/114	56/137
	NBT	663		175/348	197/404	210/546	663		171/321	231/396
	NBT	663		183/359	197/411	216/544	663		186/329	242/407
	NBR		225	35/47	36/93	45/271		225	47/78	42/154
	SBL		150	54/114	63/139	66/182		150	64/121	70/144
	SBT	1895		189/227	224/284	240/347	1895		199/250	271/276
	SBT	1895		198/241	230/290	252/355	1895		213/255	289/286
	SBR		325	24/39	26/40	25/41		325	25/38	24/41
US 258/Rt 10 (Benns Church Boulevard) & Cypress Run Drive	EBLT	1824		9/128	10/139	13/138	1824		9/133	11/169
	EBR	1824		31/96	38/101	38/103	1824		22/88	31/99
	WBLTR	1402		-/8	-/6	-/12	1402		-/12	-/11
	NBL		175	33/104	39/125	46/137		175	45/125	53/141
	NBT	1913		61/140	58/185	69/205	1913		58/151	58/164
	NBTR	1913		76/150	77/205	83/229	1913		81/169	86/180
	SBL		75	3/-	3/-	2/-		75	2/-	3/-
	SBT	663		56/81	61/86	75/89	663		59/89	91/96
	SBT	663		69/93	77/105	87/101	633		74/93	120/107
	SBR		150	9/46	14/45	14/49		150	14/49	10/58
US 258/Rt 10 (Benns Church Boulevard) & Turner Drive	EBLTR	1442		342/113	-	-			-	-
	EBLT	1440		-	174/91	220/100	1442		240/93	309/95
	EBR		200	-	168/66	197/73		200	184/87	240/90
	WBL		100	8/-	3/-	6/-	648		-/3	8/-
	WBTR	648		87/19	95/19	109/19	648		93/14	94/17
	NBL		75	185/151	179/136	201/168		75	192/171	204/201
	NBT	1098		260/243	204/218	311/327	1065		277/310	373/375
	NBTR	1098		251/242	189/223	259/324	1065		241/309	300/374
	SBL		75	42/77	46/80	52/89		75	53/95	63/105
	SBT	1913		363/230	302/228	391/282	1913		312/267	356/309
	SBT	1913		378/240	307/237	401/288	1913		315/272	356/314
	SBR		175	200/57	153/59	248/93		175	192/67	218/85
US 258/Rt 10 (Benns Church Boulevard) & Proposed Main Entrance	WBL			-	-	-	816		137/151	123/162
	WBL			-	-	-	816		88/108	71/126
	WBR			-	-	-	816		87/115	157/111
	NBU		75	10/10	17/14	16/14		75	54/60	64/54
	NBT	3868	-	-	-/-	-	470		191/314	221/390
	NBT								175/314	200/378
	NBR							200	38/96	42/156
	SBU		100	5/-	4/-	3/-			-	-
	SBL							200	111/191	108/212
	SBT						1065		142/102	151/118
	SBT	1086		-	-	110/-	1065		168/119	176/125
US 258/Rt 10 (Benns Church Boulevard) & 258/Rt 32 (Brewers Neck Boulevard)	WBR	1008		104/227	134/284	158/337	1008		82/442	94/536
	WBR	1008		104/229	135/280	154/350	1008		73/456	88/555
	NBT	2766		72/71	64/78	73/92	2766		80/83	84/101
	NBT	2766		70/82	73/86	79/103	2766		81/101	118/88
	SBL		200	147/111	150/119	165/135		200	165/118	189/121
	SBL	3868		172/134	180/147	187/163	3191		187/146	204/149
	SBT	3868		4/-	9/-	-/-	3191		13/4	5/16
Queen Annes Court & 258/Rt 32 (Brewers Neck Boulevard)	EBL		125	25/25	24/24	28/27		125	23/28	26/30
	EBT	1008		240/200	265/223	324/260	1008		299/253	317/297
	EBTR	1008		249/217	273/233	327/267	1008		303/259	321/304
	WBL		500	150/242	166/300	183/350		500	117/319	182/437
	WBT	785		238/338	262/417	298/447	785		86/513	82/614
	WBT	785		200/327	235/403	275/460	785		61/528	60/645
	WBR		250	4/13	4/41	6/89		250	4/55	6/98
	NBLT	858		14/15	14/16	11/19	858		6/14	3/16
	NBR		250	171/96	187/106	220/127		250	190/111	200/136
	NBR		250	110/35	127/40	172/59		250	147/43	154/68
	SBLT	565		24/25	28/30	31/30	565		31/25	34/28
	SBR	565		33/27	34/31	38/32	565		34/34	39/30
US 258/Rt 10 (Benns Church Boulevard) & Proposed Secondary Entrance	WBR			-	-	-	1244		71/101	70/137
	NBT			-	-	-	3191		-/4	-/14
	NBT			-	-	-	3191		-/4	-/16
	NBR			-	-	-		100	-/4	-/-

Memorandum

Appendix
Revised Network Figures

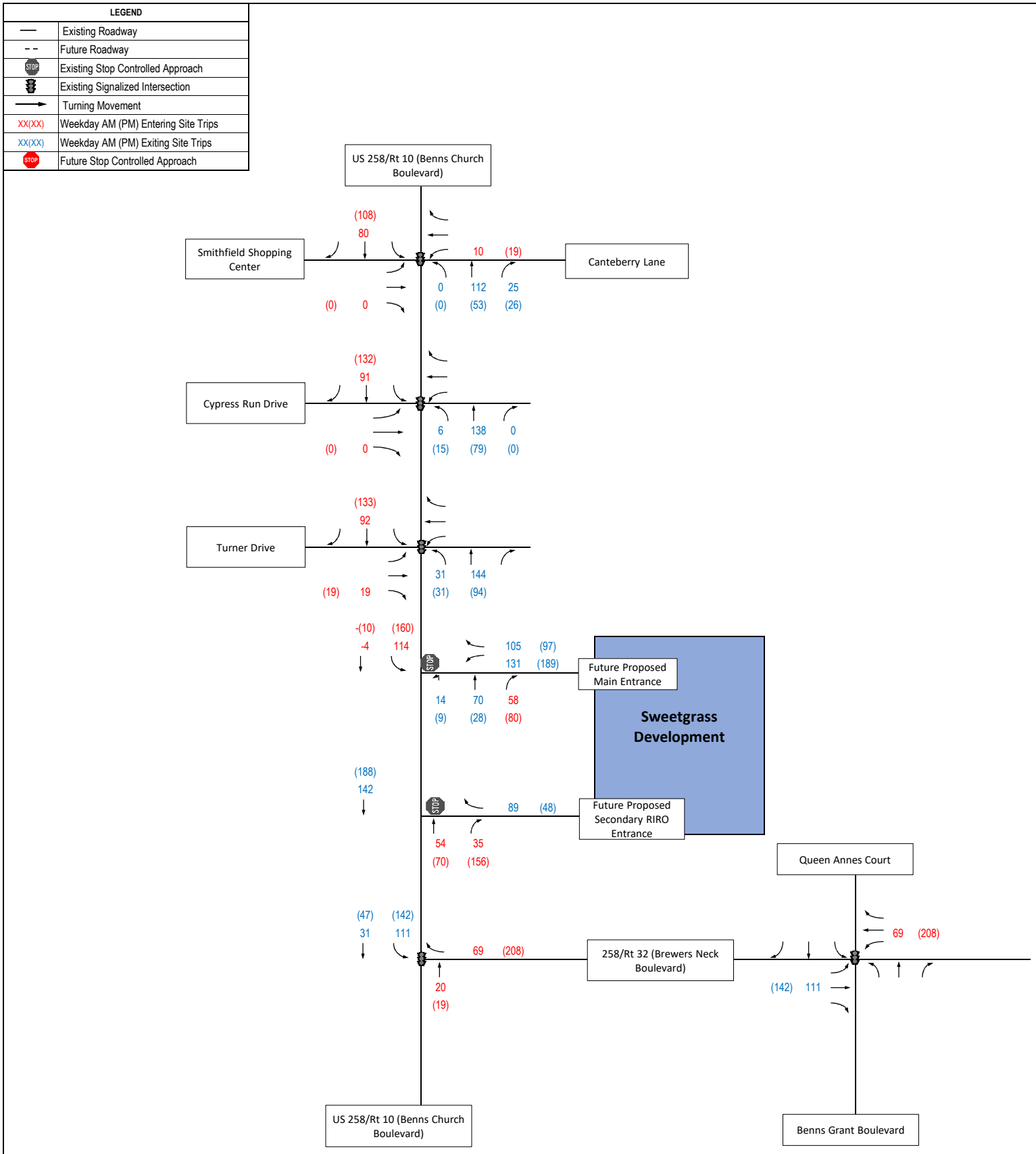


Figure 10
Combined AM and PM Peak Hour Site Trips

Sweetgrass
Isle of Wight County, VA

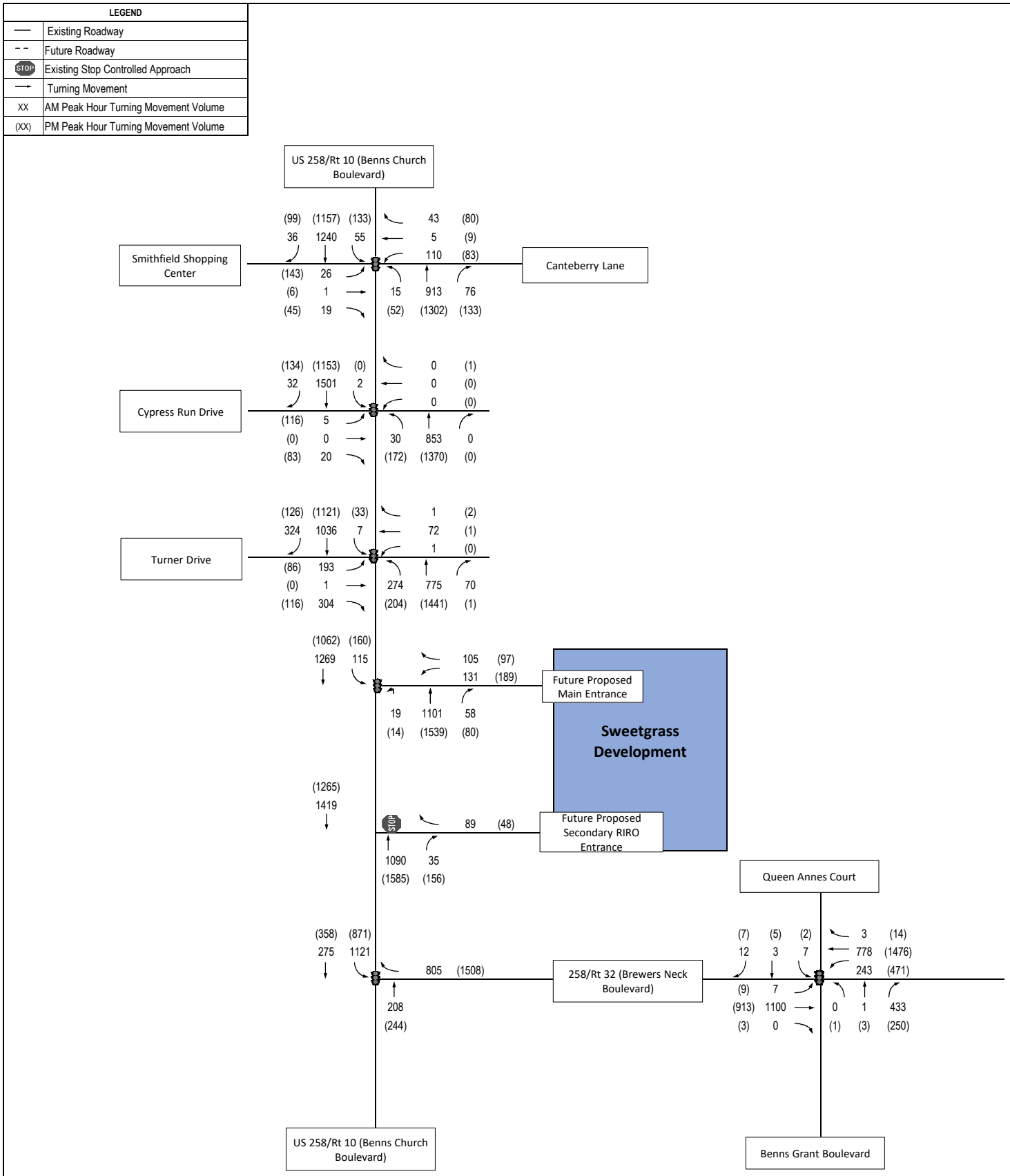


Figure 11
2026 Build AM and PM Peak Hour Traffic Volumes

Sweetgrass
Isle of Wight County, VA

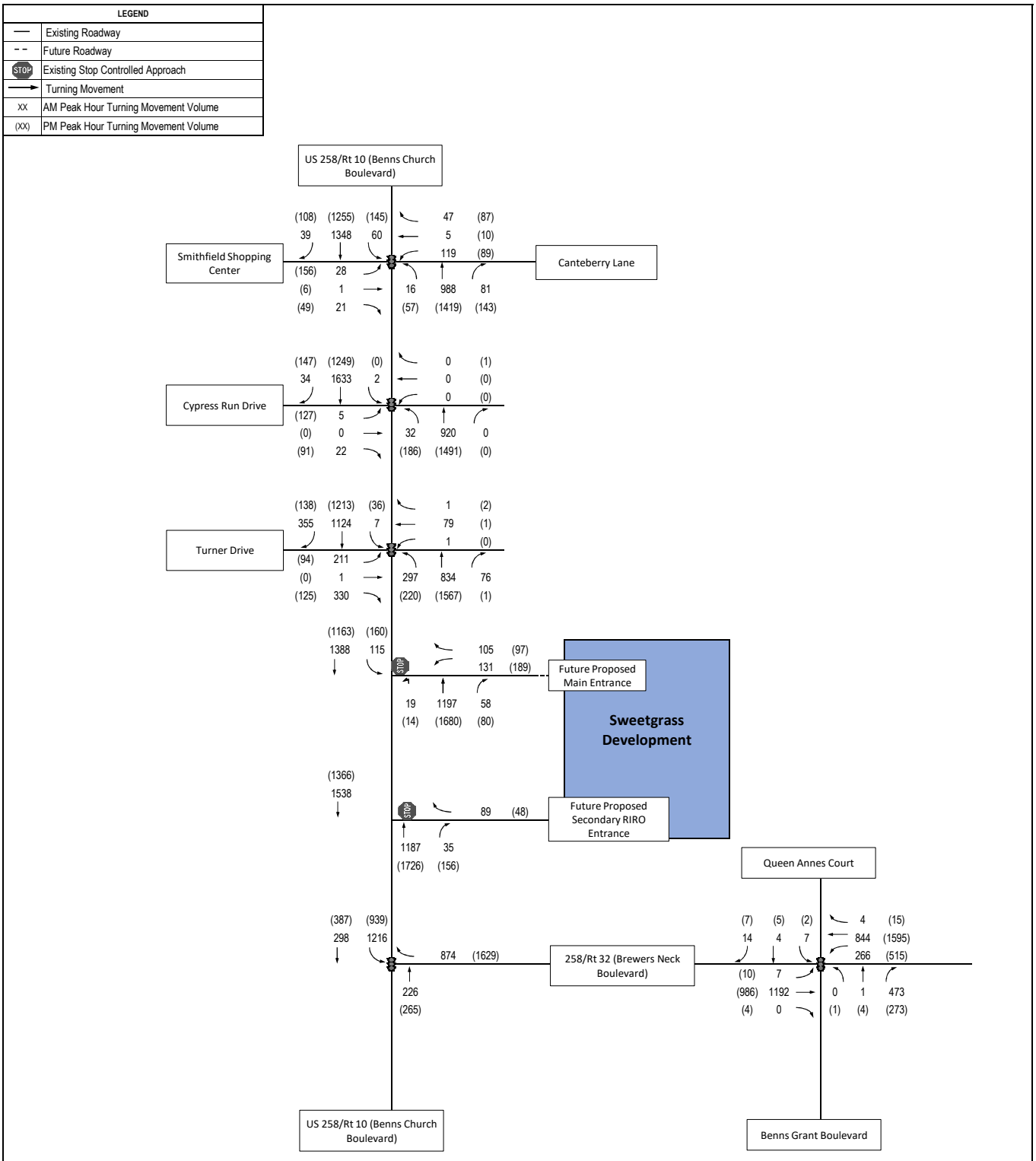


Figure 12
2032 Build AM and PM Peak Hour Traffic Volumes

Sweetgrass
Isle of Wight County, VA

Memorandum

To: VDOT and Isle of Wight County

Date: June 25, 2021
Project #: 34417.00

From: Kirsten Tynch, PE, PTOE

Re: Sweetgrass Supplemental Memo to December 2019 Traffic Impact Study

Introduction

Yeoman's Tract is an undeveloped parcel located at 14096 Benns Church Boulevard in Isle of Wight County. The parcel is on the northeast side US 258/Rt (Benns Church Boulevard) between US 258/Rt 32 (Brewers Neck Boulevard) and Canteberry Lane. Ryan Homes is planning a development of single family, and multi-family living residential units as well as a shopping center on this parcel. The developer is in the process of rezoning the property to Conditional Mixed Use Areas (C-PD-MX). This development is expected to be in full operation in 2026.

The Virginia Department of Transportation (VDOT) and Isle of Wight County require a traffic study in compliance with Chapter 527 Regulations. A traffic study was completed in December 2019 and submitted for approval. The proposed development is now referred to as Sweetgrass, and this memorandum is a supplement to the December 2019 traffic impact study.

Trip Generation

The development plan has been modified since the 2019 TIA to provide a lower number of housing units. It also eliminated the public park and the fast food restaurant with a drive thru. Table 1 shows the land use plan for the proposed development and trips generated by this updated plan, while Table 2 shows the trips that were to be generated from the December 2019 plan.

Table 1. Trip generation for current development plan

Land Use	ITE Code	Size	Units	Daily	AM Peak Hour			PM Peak Hour		
					Enter	Exit	Total	Enter	Exit	Total
Conceptual Site Plan										
Single-Family Detached Housing	210	390	Dwelling Units	3,682	72	217	289	243	143	386
Multifamily Housing (Low-Rise)	220	225	Dwelling Units	1,660	24	80	104	79	47	126
Shopping Center	820	35	1000 Sq. Ft. GLA	2,944	20	13	33	120	130	250
Subtotal				**8,286**	**116**	**310**	**426**	**442**	**320**	**762**
Pass-by Trips (Shopping Center)	34%		% Pass-by	1,001	7	4	11	41	44	85
Total New Trips				**7,285**	**109**	**306**	**415**	**401**	**276**	**677**

Reference: Trip Generation, 10th Edition + Supplement, Institute of Transportation Engineers, Washington, DC. 2019.
Note: Used highest of average rate and fitted curve unless fitted curve unless R2<0.75

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Table 2. Trip generation from December 2019 TIA

Land Use	ITE Code	Size	Units	Daily	AM Peak Hour			PM Peak Hour		
					Enter	Exit	Total	Enter	Exit	Total
Conceptual Site Plan										
Single-Family Detached Housing	210	400	Dwelling Units	3,776	74	222	296	249	147	396
Multifamily Housing (Low-Rise)	220	285	Dwelling Units	2,144	30	101	131	101	59	160
Shopping Center	820	30	1000 Sq. Ft. GLA	2,651	17	11	28	107	116	223
Public Park	411	4	Acres	91	0	0	0	13	10	23
Fast Food with Drive-Thru	934	5	1000 Sq. Ft. GLA	2,355	102	99	201	85	78	163
Subtotal				**11,017**	**223**	**433**	**656**	**555**	**410**	**965**
Pass-by Trips (Fast Food only)	49%		% Pass-by	1,154	50	49	98	42	38	80
Pass-by Trips (Shopping Center)	34%		% Pass-by	901	6	4	10	36	39	76
Total New Trips				**8,962**	**167**	**380**	**548**	**477**	**333**	**809**

Reference: Trip Generation, 10th Edition, Institute of Transportation Engineers, Washington, DC. 2017.
Note: Used highest total between aveage rate and fitted curve unless R2<0.75

The site is estimated to generate 7,285 new daily trips with 415 trips in the morning peak hour and 677 trips during the evening peak hour. This equates to a reduction of 1,677 daily trips, 133 AM peak trips and 132 PM peak trips. The Appendix includes figures with the site trips and the projected 2026 and 2032 Build volumes for the AM and PM peak.

Since the anticipated traffic volumes are expected to be lower than those studied in the December 2019 TIA, the mitigation measures recommended as part of that study are still appropriate. One additional recommendation has been included to address a comment received by VDOT in 2020 regarding queuing at Benns Church Boulevard and Turner Drive.

The TIA showed that queuing occurs at the intersection of Benns Church Boulevard and Turner Drive under existing conditions. The proposed development is expected to increase queuing for some movements. In order to address the queuing for the northbound left turn movement that experiences the most significant queuing under existing conditions, it is recommended that the turn lane storage be extended to 250' while maintaining the 100' taper. This would address any projected queuing deficiencies for any of the analyzed scenarios. For the Build conditions, it would allow a reduction in green time for northbound left turn movement which would reduce queuing on the southbound right turn.

Response to June 2020 Comments

VHB received comments on June 12, 2020 for the above referenced project. The project was placed on hold while a new development plan was developed. The following offers responses to the documented comments based on the June 2021 development plan:

Isle of Wight County Comments:

1. On page 1, two different AM peak trips are listed - one for 548 trips in the second paragraph and one for 380 in fifth paragraph. Last bullet refers to planned improvements to Turner Drive. Please note that these are now complete.

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- The total trips generated in the AM peak is 401 trips based on the current development plan. This volume is reflected in the TIA memo dated June 25, 2021.

2. Page 5 should refer to the proposed conditional planned mixed use development and delete the reference to the comprehensive plan amendment application.
    - Noted. Reference to the comprehensive plan amendment can be deleted and land use has been updated to reflect the Conditional Mixed Use Areas (C-PD-MX). This is reflected in the TIA memo dated June 25, 2021.
3. The TIA should not include an assumption that all network signal cycle lengths and splits will be optimized for the 2026 and 2032 build scenarios. There are no plans to do this, and who would perform and pay for this signal optimization?
    - As traffic grows on a state-maintained corridor, signal operations are periodically reviewed by VDOT. By 2026, a new statewide central signal system and controller should be implemented allowing easier review of traffic conditions and more frequent optimization of signal timings by VDOT.
4. Please address the degradation of capacity for the northbound through movement between the 2018-2026 build scenario for the Brewers Neck/Benns Church Blvd. intersection. Explain how capacity improves again in 2032.
    - Optimization of the signal timings for the 2026 and 2032 Build conditions influence the change in level of service from 2018 to 2026 and 2032. Since the background growth factor was applied to all movements, adjustments were made to provide improved traffic flow on individual movements throughout the corridor. By increasing green time for turning movements, there was minor increase in the anticipated delay for the northbound movement under the 2026 Build conditions. As traffic was projected to 2032, additional changes were made to intersection splits that improved the projected delay under the 2032 Build conditions for the northbound through movement. During all analysis periods, the northbound through movement is projected to continue to operate at an acceptable LOS (LOS D or better).
5. In table 7, there is improved queue storage for the northbound left at Benns Church Blvd and Turner Drive in the 2032 build scenario in the am. What changes to increase storage? Similar questions for Tables 8 and 9 where service levels seem to increase in the build scenarios. What accounts for these improvements?
    - The cycle length for 2026 was 90 seconds compared to 130 seconds for 2032. The optimization of signal timings in 2026 and 2032 provides different amounts of green time for the northbound left movement. The amount of green time allocated to movement impacts the expected queuing of stopped vehicles during each cycle.
6. On page 7 of signal warrant analysis, warrant 5 is not met due to no planned school crossing. Because the proposed development is located less than a mile from the assigned high school and middle school, it is a safe assumption that a school crossing will be in place on Route 10 and possibly Turner Drive in the future.

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- Current conditions do not have sidewalks along Benns Church Boulevard or Turned Drive. Without sidewalks, a school crossing is not recommended.

7. Warrant 6 is not met in the signal analysis due to an uncoordinated signal system; however, you assume a coordinated system throughout the rest of the analysis. Please explain.
   - During the initial screening of the signal warrants, the adjacent signal was not part of a coordinated system. Therefore, it did not meet that warrant. Once the modeling was completed, it was determined that coordination of the corridor provided better traffic flow. Since a signal was warranted by other criteria, it was not deemed necessary to modify the original signal warrant documentation.
8. Page 11 of Appendix I shows a 45 mph speed limit at the Queen Anne's Court and Brewers Neck intersection. Please revised to show the actual speed limit of 55 mph.
   - Correction of the speed limit is noted. However, the change doesn't impact analyses or proposed recommendations of the study.
9. Please provide a written narrative as to why a partial median U-turn cannot be used in place of a conventional signal. It appears to provide less conflict points and is considered safer for pedestrians. Copies of the worksheets are hard to read, and no written explanation of the results is provided. Please submit legible copies.

Phase 1 Use	No. of Units	Units
Single Family Detached Housing	400	dwelling units
Multi-Family Housing (Low-Rise)	285	dwelling units
Public Park	4	acres
Shopping Center	30	1000 sq. ft. GLA
Fast Food with Drive Thru	5	1000 sq. ft. GLA

   - Based on the width of the existing median and lane geometry, preliminary evaluations show that a loon, or bulb out of the pavement, would need to be provided to accommodate the U-turn movement of single unit and larger trucks. Based on AASHTO Guidelines, the minimum median width for U-turn crossovers to accommodate trucks varies between 49' to 64' (depending on truck size) without providing a loon, or bulb out, to accommodate the movement. Constructing a loon would require right of way acquisition on property not controlled/owned by the developer.

VDOT Comments:

1. We concur with the proposed trip generation rates as provided in the submitted study based on the following development schedule:

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Memorandum

The proposed uses have the potential to generate 11,017 daily, 656 AM peak hour, and 965PM peak hour trips on the roadway network. As outlined in the study, these trips are reduced by allowable pass-by and internal capture rates to represent new trips on the roadway network (8,962 daily, 548 AM peak, and 809 PM peak).

- Noted. The revised trip distribution provided in the TIA Memo dated June 25, 2021 uses the same methodology and equations as the previous analysis with the revised number of units resulting in a reduction of trips generated by the development. The new totals are 7,285 vpd, 415 vph in the AM peak and 677 vph in the PM peak. No new analysis was performed and the recommendations remain unchanged with the exception of item #2 below.

2. Although queuing is an existing issue for northbound left turns at the Benn's Church Blvd. and Turner Drive intersection, the development adds to the queues during the build scenarios. There are no recommended improvements at this intersection. We recommend providing improvements to mitigate the queuing situation, including the installation of a turn lane with sufficient storage to accommodate the queuing.
   - As discussed earlier in this memo, the development has minor increases in queuing for eastbound right and southbound left movements. These minor increases are less than a car length. No changes in storage based on development are recommended. There is additional storage required for the southbound right due to additional green time allocated to the northbound left to reduce queuing on this leg. The developer will increase the storage to 250' for the northbound left turn movement at Turner + 100' taper. This change would address an existing issue and allow for less green time in the future conditions which should reduce the queuing for the southbound right movement.
3. The construction of dual exiting left turns will likely impact the northbound U-turn lane at the main entrance, as the turn radius required will take up more of the median break. Reconstruction of this intersection shall include constructing the turn lanes to the minimum VDOT standards (100' storage x 100' taper).
   - Site plan will reflect the 100' storage and 100' taper.
4. Our previous recommendation of a 200' storage x 200' taper right turn lane was incorporated into the submitted traffic study. The submitted traffic improvement proffers, particularly Item 6(a)(i), still indicates using a 100' storage x 200' taper right turn lane.
   - Proffer has been adjusted to match traffic study recommendation.

4500 Main Street
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Memorandum

Recommendations

The following improvements are recommended to address impacts of the proposed development:

2026 Build:

- Construct northbound right turn lane (200' storage plus 200' taper) into right in/right out Proposed Secondary Entrance off of US 258/Rt 10 (Benns Church Boulevard).
- Construct northbound right turn lane (200' storage plus 200' taper) into Proposed Main Entrance off of US 258/ Rt 10 (Benns Church Boulevard).
- Lengthen southbound left turn lane to provide 200' storage plus 200' taper into Proposed Main Entrance off of US 258/Rt 10 (Benns Church Boulevard).
- Install traffic signal at intersection of US 258/Rt 10 (Benns Church Boulevard) and Proposed Main Entrance.
- Install signal infrastructure to provide a protected eastbound right-turn overlap at US 258/Rt 10 (Benns Church Boulevard) and Turner Drive.
- Construct a northbound turn lane with 250' storage and 100' taper at US 258/Rt 10 (Benns Church Boulevard) and Turner Drive.
- Install flashing yellow arrows for the northbound and southbound left turn lanes at the intersection of US 258/ Rt 10 (Benns Church Boulevard) at Canteberry Lane, Cypress Run Drive, Turner Drive and the Proposed Main Entrance to allow lead/lag operation.

2032 Build:

- Install signal infrastructure to provide a protected southbound right-turn overlap at US 258/Rt 10 (Benns Church Boulevard) and Turner Drive.

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Memorandum

Appendix
Revised Figures

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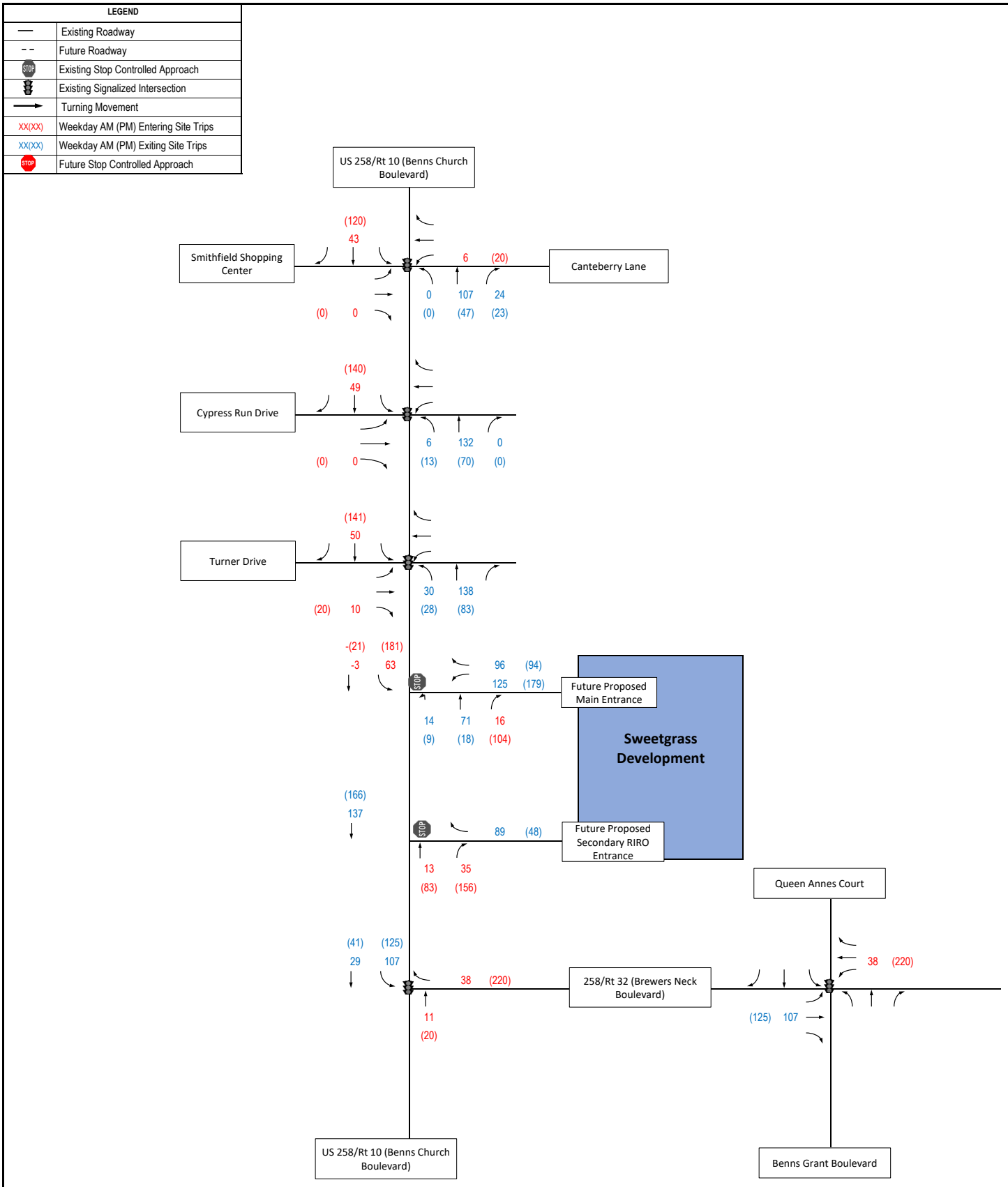


Figure 10
Combined AM and PM Peak Hour Site Trips

Sweetgrass
Isle of Wight County, VA

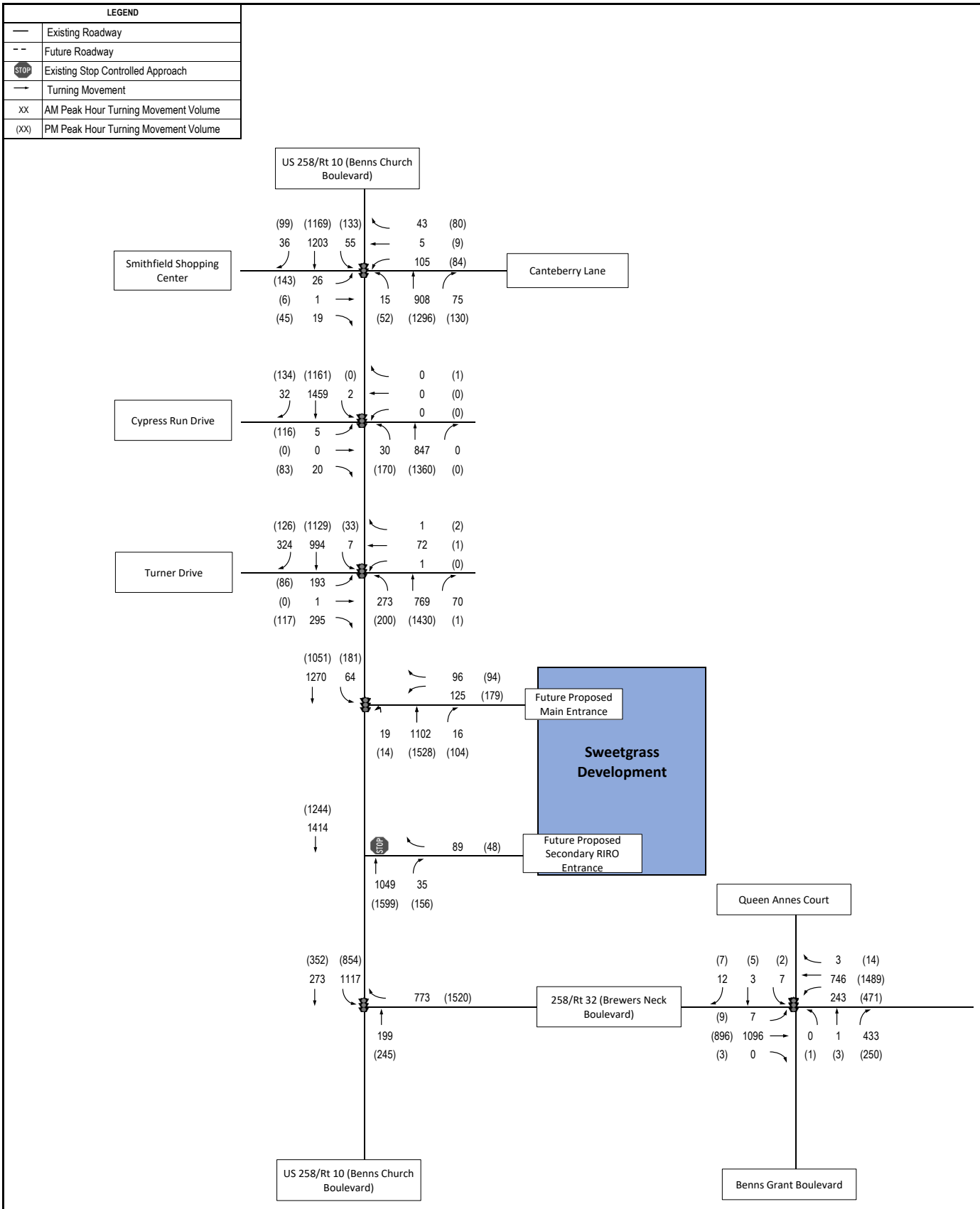


Figure 11
2026 Build AM and PM Peak Hour Traffic Volumes

Sweetgrass
Isle of Wight County, VA

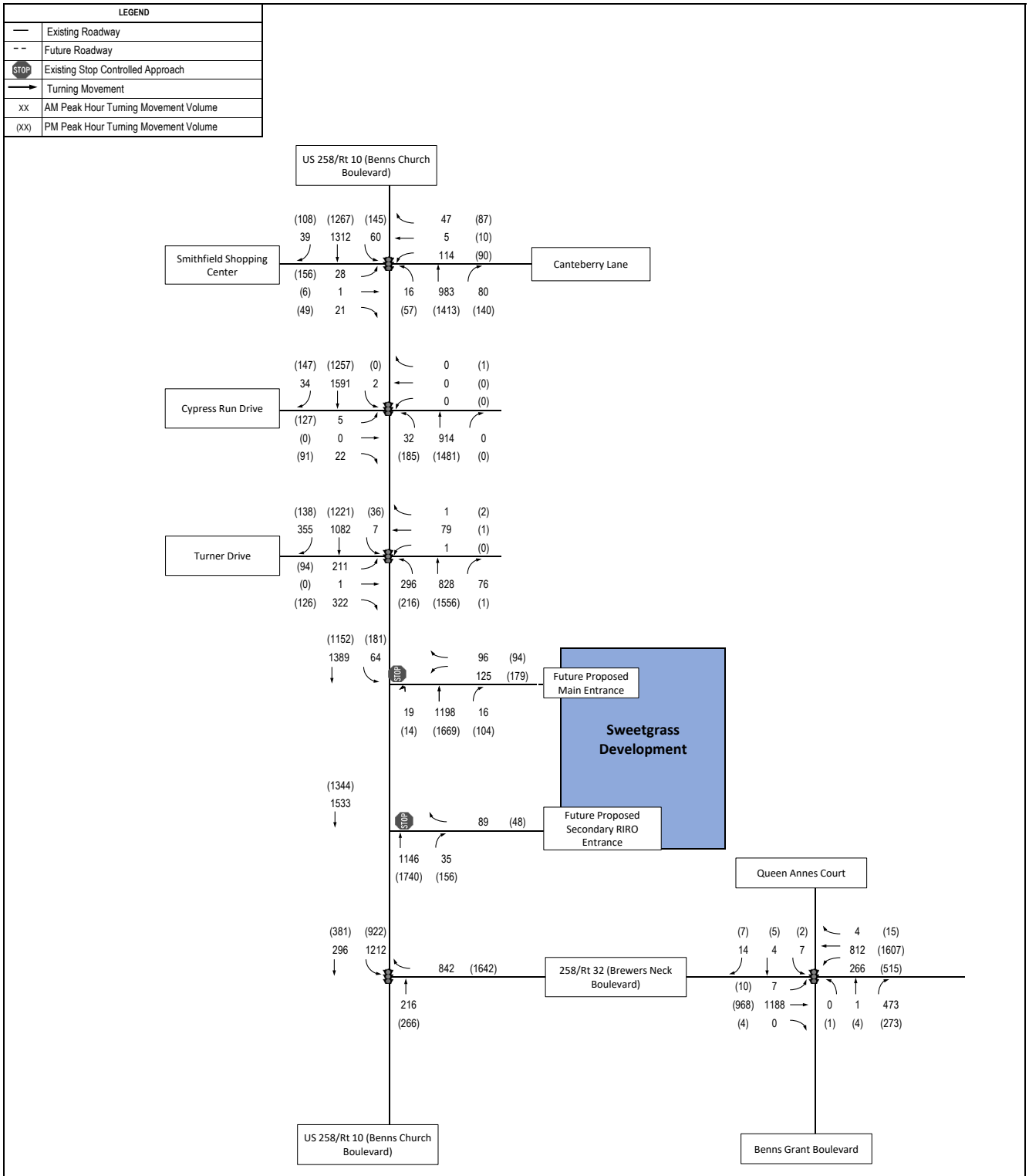


Figure 12
2032 Build AM and PM Peak Hour Traffic Volumes

Sweetgrass
Isle of Wight County, VA

Virginia Department of Transportation

TIA REGULATION SUBMITTAL INFORMATION SHEET

This sheet is a summary of information on a Chapter 527 submittal for entering into the LandTrack data base.

Submission Details

Project Name	Yeoman Tract TIA	Locality's Project ID	
VDOT District	Hampton Roads	Jurisdiction	Isle of Wight
Locality Contact		TIA Preparer	Lisa Simpson

Location

Route Number	Address	Principal Rte	ADT
10	14096 Benns Church Bl	☒	25000
		☐	
		☐	
		☐	
		☐	
		☐	
		☐	
		☐	
		☐	

Site Details

Submission Type	Zoning TIA Review		
Facility Type	Mixed Use - Commercial / Residential	Acreage	0
Residential Units	685	Commercial SqFt	35000
VPH (net)	809	VPD (net)	8962
Principal Parcel ID	32-01-009	Doubles Road VPD	NO
Other Parcel ID(s)			

Payment

Fee Waived	NO	Reason for Waiver	-- Select --
Payment Included	YES	Payment Type	Check
Check #		Check Holder	
Payment Amount		Received From	

Tracking

Date Received by Locality	Locality's Requested Due Date

Comments

December 2019

YEOMAN'S TRACT

Isle of Wight County, Virginia

Traffic Impact Study



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Appendix G	Turn Lane Warrant Analysis
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Appendix I	2026 Build Synchro Reports
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Appendix K	Queue Reports
Appendix L	Signal Justification Report

Introduction and Summary

Purpose

Yeoman's Tract is an undeveloped parcel located at 14096 Benns Church Boulevard in Isle of Wight County. The parcel is on the northeast side US 258/Rt (Benns Church Boulevard) between US 258/Rt 32 (Brewers Neck Boulevard) and Canteberry Lane. Ryan Homes is planning a development of single family, and multi-family living residential units as well as, a public park, a shopping center and a fast food restaurant on this parcel. The developer is in the process of rezoning the property. This development is expected to be in full operation in 2026.

The site is estimated to generate 8,962 new daily trips with 548 trips in the morning peak hour and 809 trips during the evening peak hour.

The Virginia Department of Transportation (VDOT) and Isle of Wight County require a traffic study in compliance with Chapter 527 Regulations. A scoping meeting was held with VDOT and Isle of Wight County on April 23, 2018. A copy of the approved Pre-Scoping Form is included in Appendix A.

Executive Summary

In order to project the expected impact of the proposed development, trips were generated base on the Institute of Transportation Engineers Trip Generation Manual and distributed to the adjacent roadway network based on anticipated travel patterns. The development plan for the site consists of:

- 400 Single-family Detached Homes
- 285 Multi-family Detached Homes
- 4-acre Public Park
- 30,000 sf Shopping Center
- 5,000 sf Fast Food with Drive-Thru

This development plan is estimated to generate 8,962 new daily trips with 380 trips in the morning peak hour and 809 trips during the evening peak hour. Based on the results of the auxiliary lane, capacity and queuing analyses performed in this study, the following improvements are recommended:

<u>2018 Existing:</u>

- VDOT to construct eastbound right turn lane at US 258/Rt 10 (Benns Church Boulevard) and Turner Lane as planned.

2026 No Build:

- VDOT should review and optimize signal timings along the corridor, if necessary.

2026 Build:

- Construct northbound right turn lane (200' storage plus 200' taper) into right in/right out Proposed Secondary Entrance off of US 258/Rt 10 (Benns Church Boulevard).
- Construct northbound right turn lane (200' storage plus 200' taper) into Proposed Main Entrance off of US 258/Rt 10 (Benns Church Boulevard).
- Lengthen southbound left turn lane to provide 200' storage plus 200' taper into Proposed Main Entrance off of US 258/Rt 10 (Benns Church Boulevard).
- Install traffic signal at intersection of US 258/Rt 10 (Benns Church Boulevard) and Proposed Main Entrance.
- Install signal infrastructure to provide a protected eastbound right-turn overlap at US 258/Rt 10 (Benns Church Boulevard) and Turner Lane.
- Install flashing yellow arrows for the northbound and southbound left turn lanes at the intersection of US 258/Rt 10 (Benns Church Boulevard) at Canterberry Lane, Cypress Run Drive, Turner Drive and the Proposed Main Entrance to allow lead/lag operation.
- Optimize signal timings along the corridor.

2032 No Build:

- No additional improvements required.

2032 Build:

- Install signal infrastructure to provide a protected southbound right-turn overlap at US 258/Rt 10 (Benns Church Boulevard) and Turner Lane.
- Optimize signal timings along the corridor.

Background Information

The intersections included in the study area are:

- US 258/Rt 10 (Benns Church Boulevard) and US 258/Rt 32 (Brewers Neck Boulevard) – signalized;
- US 258/Rt 32 (Brewers Neck Boulevard) and Queen Annes Court – signalized;
- US 258/Rt 10 (Benns Church Boulevard) and Cypress Run Drive – signalized;

- US 258/Rt 10 (Benns Church Boulevard) and Turner Drive – signalized;
- US 258/Rt 10 (Benns Church Boulevard) and Canteberry Lane – signalized;
- US 258/Rt 10 (Benns Church Boulevard) and the Proposed Main Entrance (unsignalized); and,
- US 258/Rt 10 (Benns Church Boulevard) and the Proposed Secondary Entrance (unsignalized).

The vicinity map is shown in Figure 1. Figure 2 shows the site location, study intersections and the street network serving the site. Figure 3 shows the existing lane configurations at each of the intersections.

Study Area Roadways – Existing and Programmed Conditions

US 258/Rt 10 (Benns Church Boulevard)
Benns Church Boulevard is a four-lane divided Minor Arterial which traverses in a north-south direction west of the study site. The posted speed limit in the vicinity of the site is 45 miles per hour (mph). The corridor includes retail and residential land uses.

US 258/Rt 32 (Brewers Neck Boulevard)
Brewers Neck Boulevards is a four-lane divided Principal Arterial south of the study site. It has a posted speed limit of 55 mph. US 258/Rt 32 (Brewers Neck Boulevard) runs east-west and intersects with US 258/Rt 10 (Benns Church Boulevard). Westbound left turns from Brewers Neck Boulevard onto US 258/RT 10 (Benns Church Boulevard) are restricted. South of the site, the corridor contains residential and civic land uses.

Canteberry Lane
Canteberry Lane is a four-lane divided local roadway. It provides access to residential land uses as well as commercial developments. The posted speed limit is 25 mph.

Turner Drive
Turner Drive is a two-lane Major Collector. It provides access to commercial land uses and Smithfield Middle School. A project is planned for summer 2018 to construct an eastbound right turn lane at US 258/Rt 10 (Benns Church Boulevard). The posted speed limit is 40 mph.

Cypress Run Drive
Cypress Run Drive is a two-lane local road with turn lanes. It provides access to commercial land uses. The posted speed limit is 15 mph.

Existing Traffic Volumes

The project area is within the Isle of Wight County. Traffic counts taken by VDOT in 2017 show the following average daily traffic volumes:

- US 258/Rt 10 (Benns Church Boulevard) – 25,000 vpd
- US 258/Rt 32 (Brewers Neck Boulevard) – 24,000 vpd
- Canteberry Lane – 1,300 vpd
- Turner Drive – 3,100 vpd
- Cypress Run Drive – 880 vpd

Historical data shows little or no traffic growth on US 258/Rt 10 or US 258/Rt 32 in the last 10 years.

Peak hour turning movement counts were taken on Tuesday, April 24th, Wednesday, April 25th and Thursday, April 26th, 2018 from 6:00 am to 8:00 am and from 2:30pm to 5:30pm at each intersection in the study area. Detailed count data is provided in Appendix B.

Actual AM and PM peak hour volumes were used in the capacity analysis to model existing traffic conditions.

Existing Pedestrian and Transit Services

The roadways within project area have paved shoulders, but the roadways within the project area do not have pedestrian facilities.

Senior Services of Southeastern Virginia provides transit access along the corridor on I-Ride. The I-Ride is a fixed route system, open to all, that provides access around Smithfield and connects to Hampton Roads Transit (HRT) in Newport News. The closest stop is at the Red Oak Mobile Homes on Benns Church Boulevard. The bus routes are shown on Figure 4.

Proposed Development

The Yeoman's Tract development includes a mixture of residential and commercial uses. The conceptual plan includes:

- 400 Single-family Detached Homes
- 285 Multi-family Detached Homes
- 4-acre Public Park
- 30,000 sf Shopping Center
- 5,000 sf Fast Food with Drive-Thru

Figure 5 shows the proposed site plan.

Currently the property is zoned for Rural Agricultural Conservation (RAC). However, it is being rezoned for Mixed Use Areas (PD-MX). This requires an amendment to Isle of Wight's Comprehensive Plan. In the Comprehensive Plan, the corridor is proposed to be a combination of mixed use areas and business and employment centers. Figure 6 shows the land use zoning for the project.

Site Access

There are two (2) planned access points to the proposed site. One right in/right out entrance off US 258/Rt 10 (Benns Church Boulevard) and one full access intersection at the existing median opening on US 258/Rt 10 (Benns Church Boulevard) south of Turner Drive as shown in Figure 5.

Proposed Pedestrian and Transit Services

Multipurpose trails will be provided within the development and along the US 258/Rt 10 (Benns Church Boulevard) street frontage. There will be no changes to transit services.

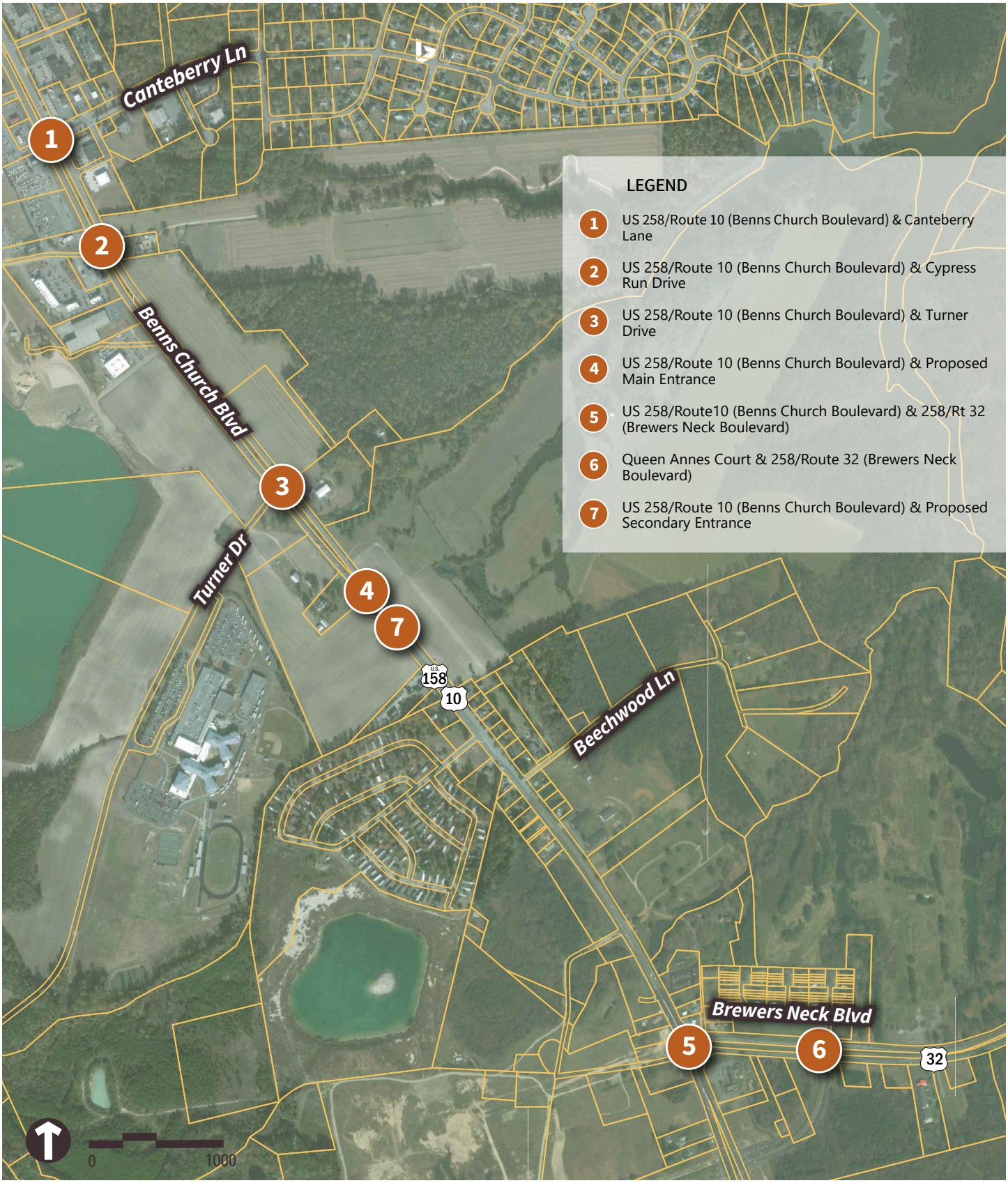


SOURCE: BING, (c) 2015 Microsoft Corporation and its data suppliers.

FIGURE 1

Vicinity Map

Yeoman Tract Traffic Impact Study
Isle of Wight County, Virginia

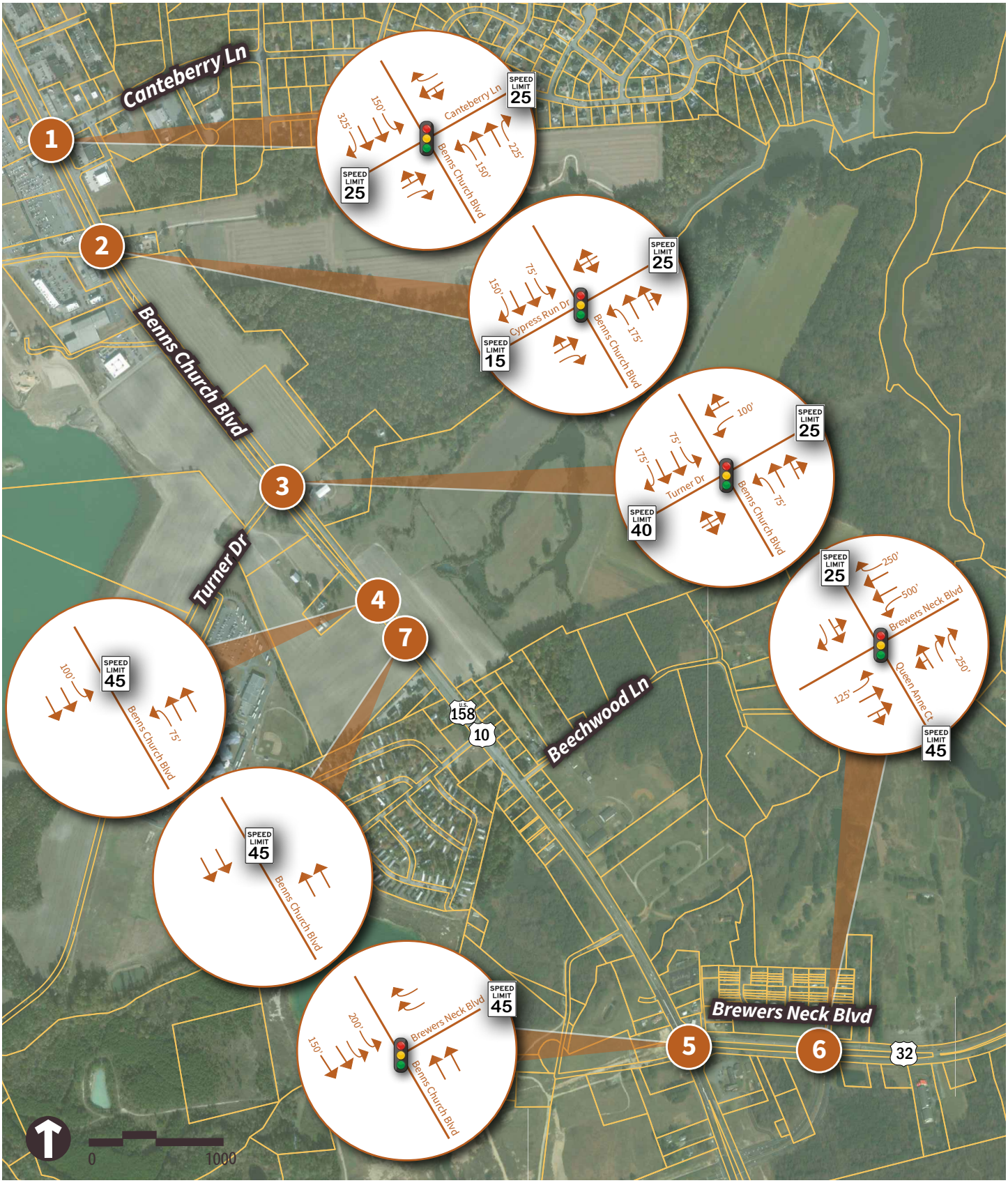


SOURCE: BING, (c) 2015 Microsoft Corporation and its data suppliers.

FIGURE 2

Study Area Map

Yeoman Tract Traffic Impact Study
Isle of Wight County, Virginia



SOURCE: BING, (c) 2015 Microsoft Corporation and its data suppliers.

FIGURE 3

Existing Lane Configuration

Yeoman Tract Traffic Impact Study
Isle of Wight County, Virginia



SOURCE: BING, (c) 2015 Microsoft Corporation and its data suppliers.

FIGURE 4

Bus Routes for Existing and No Build Conditions

Yeoman Tract Traffic Impact Study
Isle of Wight County, Virginia

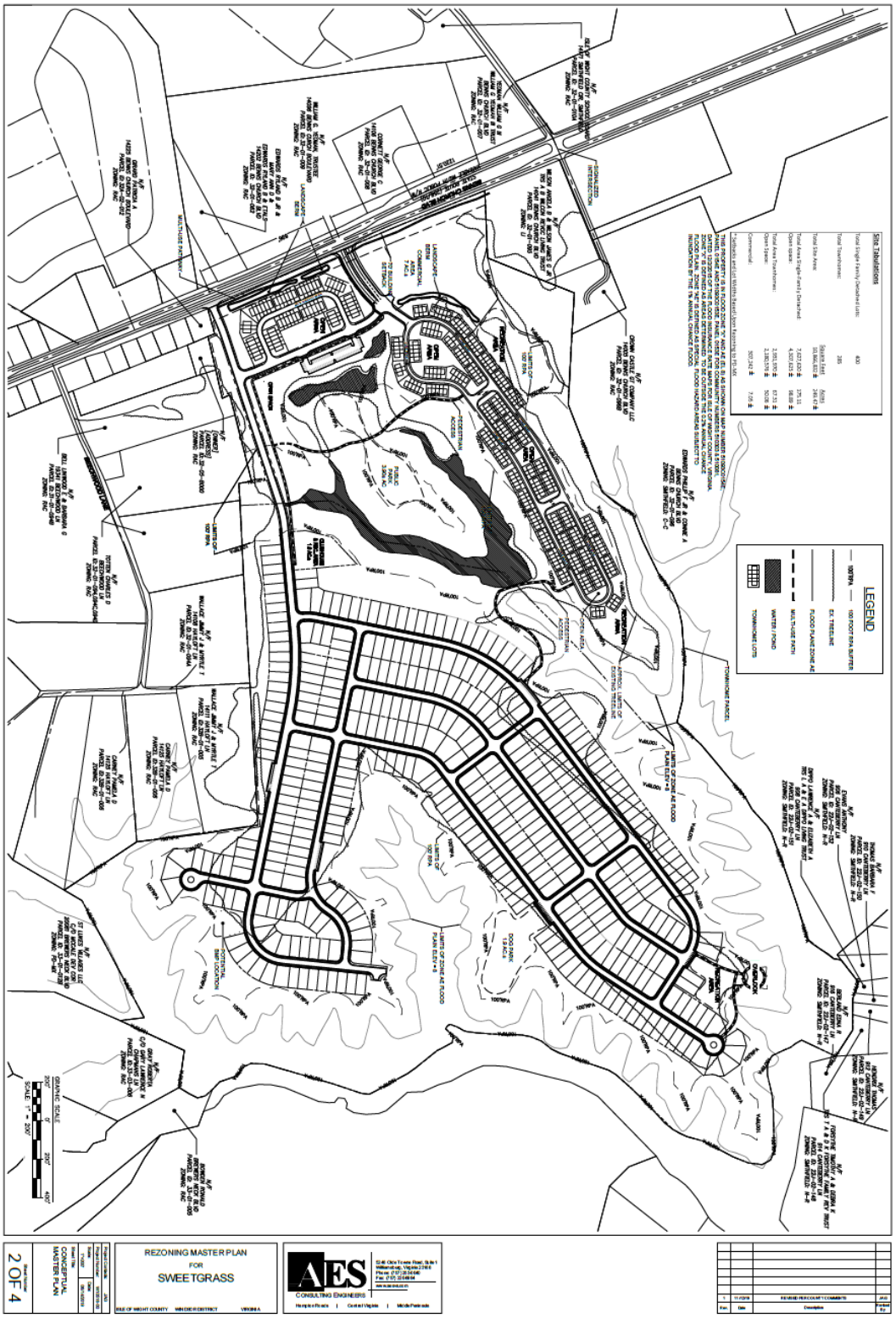


Figure 5. Conceptual Site Plan

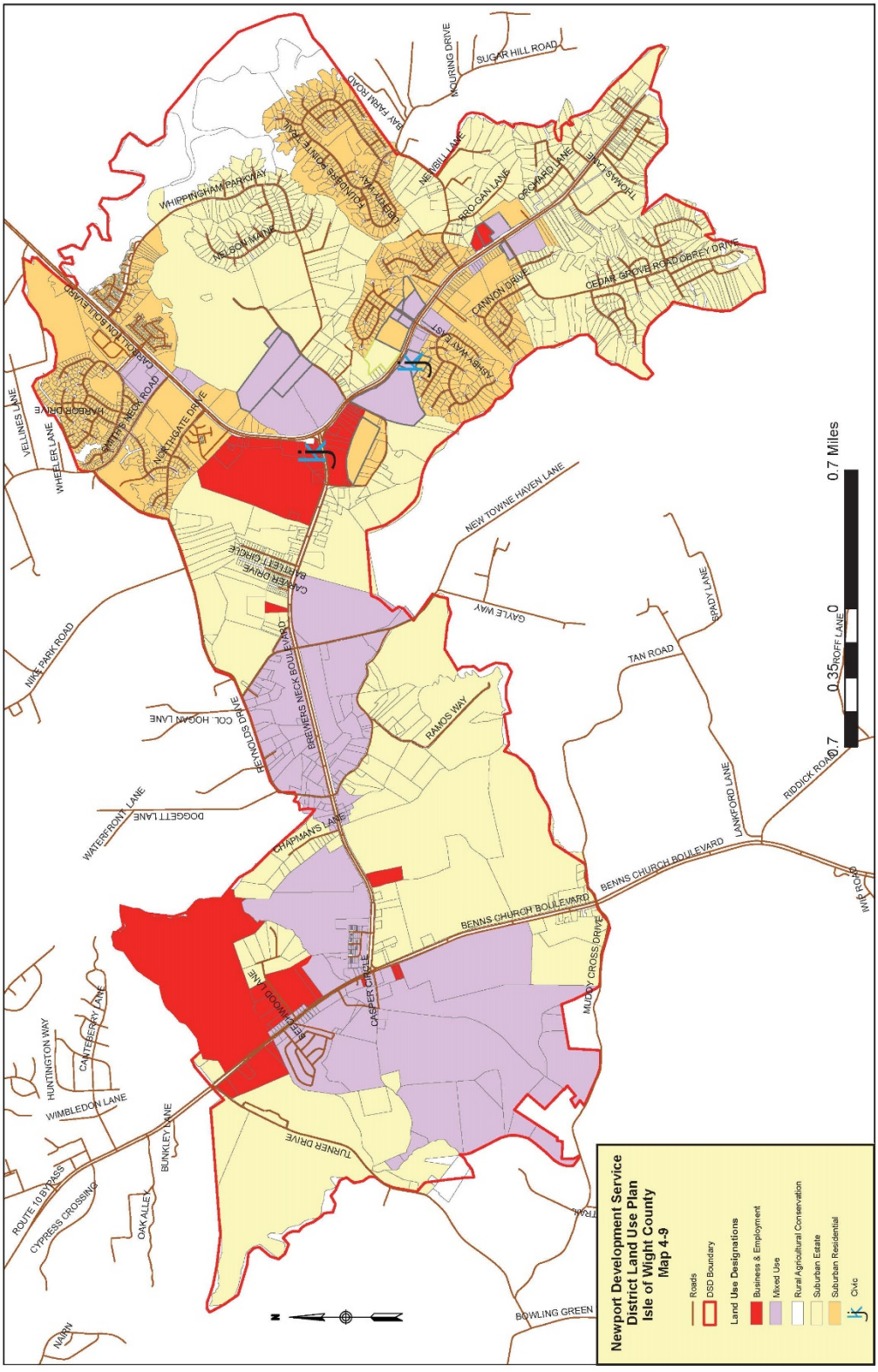


Figure 6. Existing and Proposed Land Use.

Analysis of Existing Conditions

Capacity Analysis

Capacity analysis results are expressed in terms of Level of Service (LOS). LOS is a qualitative measurement of traffic operations. It is translated from a measure of delay to drivers in units of time, seconds per vehicle. The Transportation Research Board's Highway Capacity Manual (HCM) defines six levels of service for intersections with LOS "A" representing operating conditions with minimal constraints on traffic movements and LOS "F" representing extremely congested operating conditions. LOS "D" is considered the threshold of acceptable operations for an overall intersection. Exhibit 18-4 of the HCM gives the criteria for signal controlled intersections, while HCM Exhibit 19-1 gives the criteria for unsignalized intersections.

HCM Exhibit 18-4: Level of Service Criteria

Signalized Level of Service	Signal Delay per Vehicle (sec/veh)
A	≤ 10.0
B	> 10.0 and ≤ 20.0
C	> 20.0 and ≤ 35.0
D	> 35.0 and ≤ 55.0
E	> 55.0 and ≤ 80.0
F	> 80.0

HCM Exhibit 19-1: Level of Service Criteria

Unsignalized Level of Service	Stopped Delay per Vehicle (sec/veh)
A	≤ 10.0
B	> 10.0 and ≤ 15.0
C	> 15.0 and ≤ 25.0
D	> 25.0 and ≤ 35.0
E	> 35.0 and ≤ 50.0
F	> 50.0

Synchro 9.1 was the software tool used in determining the delay, capacity and corresponding LOS of the study intersections. The delay and LOS information calculated in the analysis are presented in Table 1. Appendix C includes the Synchro reports for the 2018 Existing conditions.

Based on the existing conditions analyses, most of the corridor operates acceptably at LOS C or better, with the exception of the intersection of US 258/Rt 10 (Benns Church Boulevard) & Turner Drive. Currently, during morning peak hour, LOS at this intersection experiences an unacceptable LOS F with over 108 seconds per vehicle (sec/veh) in delay. Improvements are planned to improve operations at this intersection. Current plans were provided to VHB by VDOT and the future lane configuration was taken into the account in the future year No Build and Build analyses. Based on the planned improvements, no interim improvements are recommended.

Table 1. 2018 Existing Measures of Effectiveness.

Intersection and Approach	Control	2018 Existing	
		AM	PM
US 258/Rt 10 (Benns Church Boulevard) & Canteberry Lane	Signalized	**C (21.4 sec/veh)**	**C (25.4 sec/veh)**
Eastbound		C-28.2	D-43.3
Westbound		D-52.6	D-35
Northbound		B-13	C-23.4
Southbound		C-22.3	C-23.1
US 258/Rt 10 (Benns Church Boulevard) & Cypress Run Drive	Signalized	**A (3 sec/veh)**	**A (9.2 sec/veh)**
Eastbound		B-11.5	C-33.9
Westbound		---	---
Northbound		A-2.8	A-7.4
Southbound		A-2.8	A-6.1
US 258/Rt 10 (Benns Church Boulevard) & Turner Drive	Signalized	**F (108.1 sec/veh)**	**B (16.9 sec/veh)**
Eastbound		F-131.1	C-26.3
Westbound		C-33.1	C-28.3
Northbound		D-40.8	B-15.6
Southbound		F-152.7	B-16.5
US 258/Rt 10 (Benns Church Boulevard) & Proposed Main Entrance	Unsignalized	**-**	**-**
Eastbound		---	---
Westbound		---	---
Northbound		---	---
Southbound		---	---
US 258/Rt 10 (Benns Church Boulevard) & 258/Rt 32 (Brewers Neck Boulevard)	Signalized	**A (6.3 sec/veh)**	**A (7 sec/veh)**
Eastbound		---	---
Westbound		A-2.1	A-6.1
Northbound		C-21.8	C-20.6
Southbound		A-6.8	A-5
Queen Annes Court & 258/Rt 32 (Brewers Neck Boulevard)	Signalized	**B (18.1 sec/veh)**	**B (18.1 sec/veh)**
Eastbound		C-26.3	C-28.1
Westbound		B-15.6	B-16.2
Northbound		A-4	A-4.6
Southbound		C-20.7	C-22.8

Analysis of Future No Build Conditions

Background Traffic

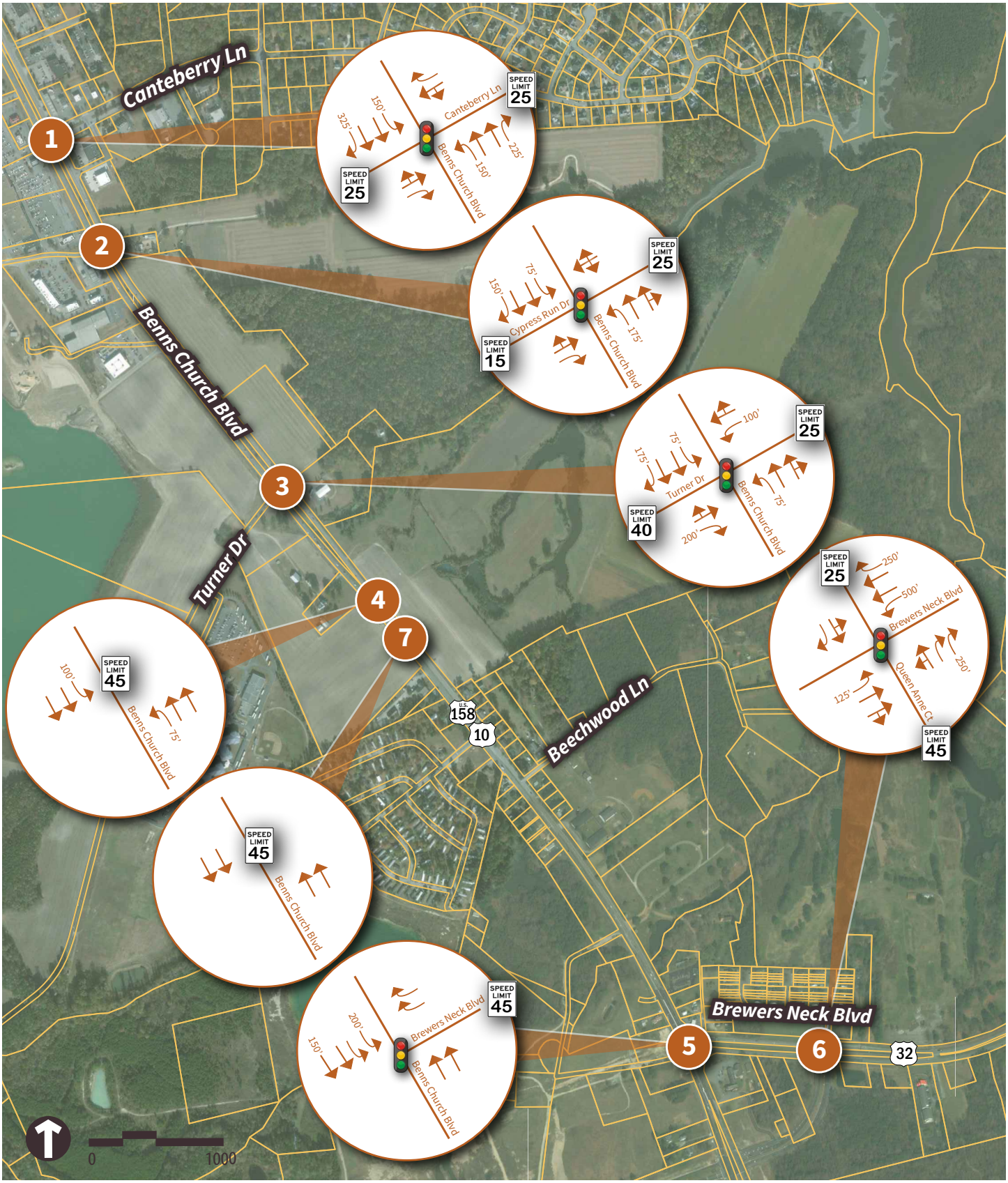
The 2018 am and pm peak hour volumes were projected to horizon years 2026 and 2032 using a growth factor approved by VDOT and Isle of Wight County. One and a half percent (1.5%) growth was used for all intersections within the study area.

Planned Transportation System Improvements

As mentioned earlier in the report, there are improvements planned for the intersection of US 258/Rt 10 (Benns Church Boulevard) & Turner Drive. An exclusive right turn lane, with 200 feet of storage, will be added to eastbound approach. Figure 7 shows the lane configurations for future 2026 and 2032 No Build and Build scenarios. The two (2) site entrances shown in Figure 7 apply to the Build conditions only. The lane configurations at all other intersections used in future conditions analyses are identical to those shown for the existing conditions.

Capacity Analysis

Synchro 9.1 was the software tool used in determining the delay, capacity and corresponding level of service of the study intersections using the projected traffic volumes. The results indicate that all intersections operate at an overall LOS C with the exception of US 258/Rt 10 (Benns Church Boulevard) & Turner Drive is expected to be E during morning peak hour with the constructed eastbound right turn lane. Tables 2 and 3 present the delay and LOS information calculated in the analysis for these conditions. Even though the overall LOS at the intersection of US 258/Rt 10 (Benns Church Boulevard) & Turner Drive is expected to be E during morning peak hour, the eastbound approach will continue to operate at unacceptable LOS F with almost 96 sec/veh in delay in 2026. With signal optimization the delay to the eastbound movement is reduced to 74 seconds (LOS F) in the 2032 AM No Build condition, however the northbound and southbound movements are reduced to a LOS E. Figures 8 and 9 show the projected traffic volumes for 2026 and 2032 No Build Conditions, respectively. The network signal cycle lengths and splits were optimized for the 2026 and 2032 No Build analyses. Appendix D includes the Synchro reports for the 2026 No Build conditions and Appendix E includes the Synchro reports for the 2032 No Build conditions.



SOURCE: BING, (c) 2015 Microsoft Corporation and its data suppliers.

FIGURE 7

2026 and 2032 Future No Build Lane Configuration

Yeoman Tract Traffic Impact Study
Isle of Wight County, Virginia

LEGEND	
——	Existing Roadway
- -	Future Roadway
STOP	Existing Stop Controlled Approach
⟶	Turning Movement
XX	AM Peak Hour Turning Movement Volume
(XX)	PM Peak Hour Turning Movement Volume

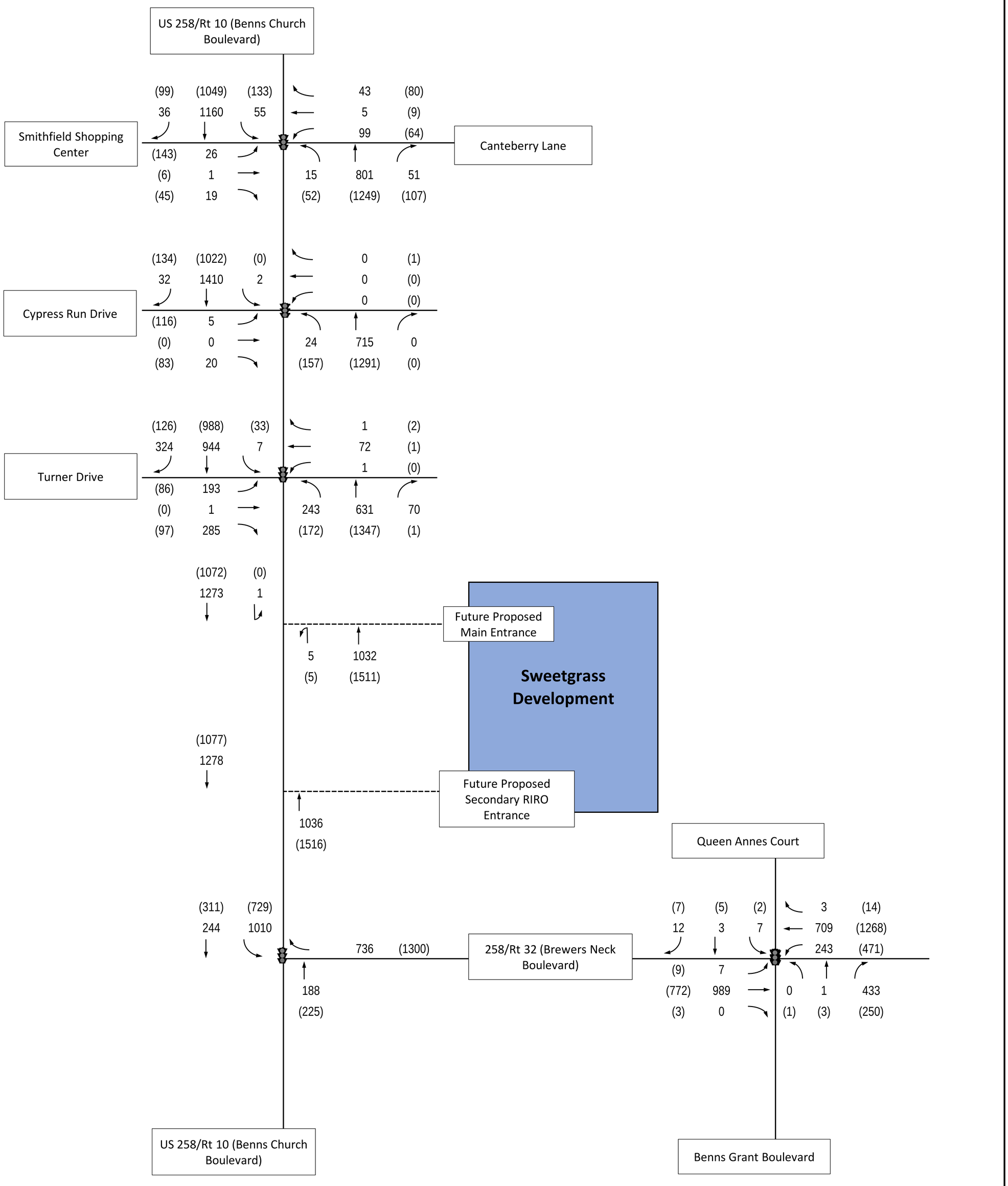


Figure 8
2026 No Build AM and PM Peak Hour Traffic Volumes

Sweetgrass
Isle of Wight County, VA

LEGEND	
——	Existing Roadway
- -	Future Roadway
STOP	Existing Stop Controlled Approach
→	Turning Movement
XX	AM Peak Hour Turning Movement Volume
(XX)	PM Peak Hour Turning Movement Volume

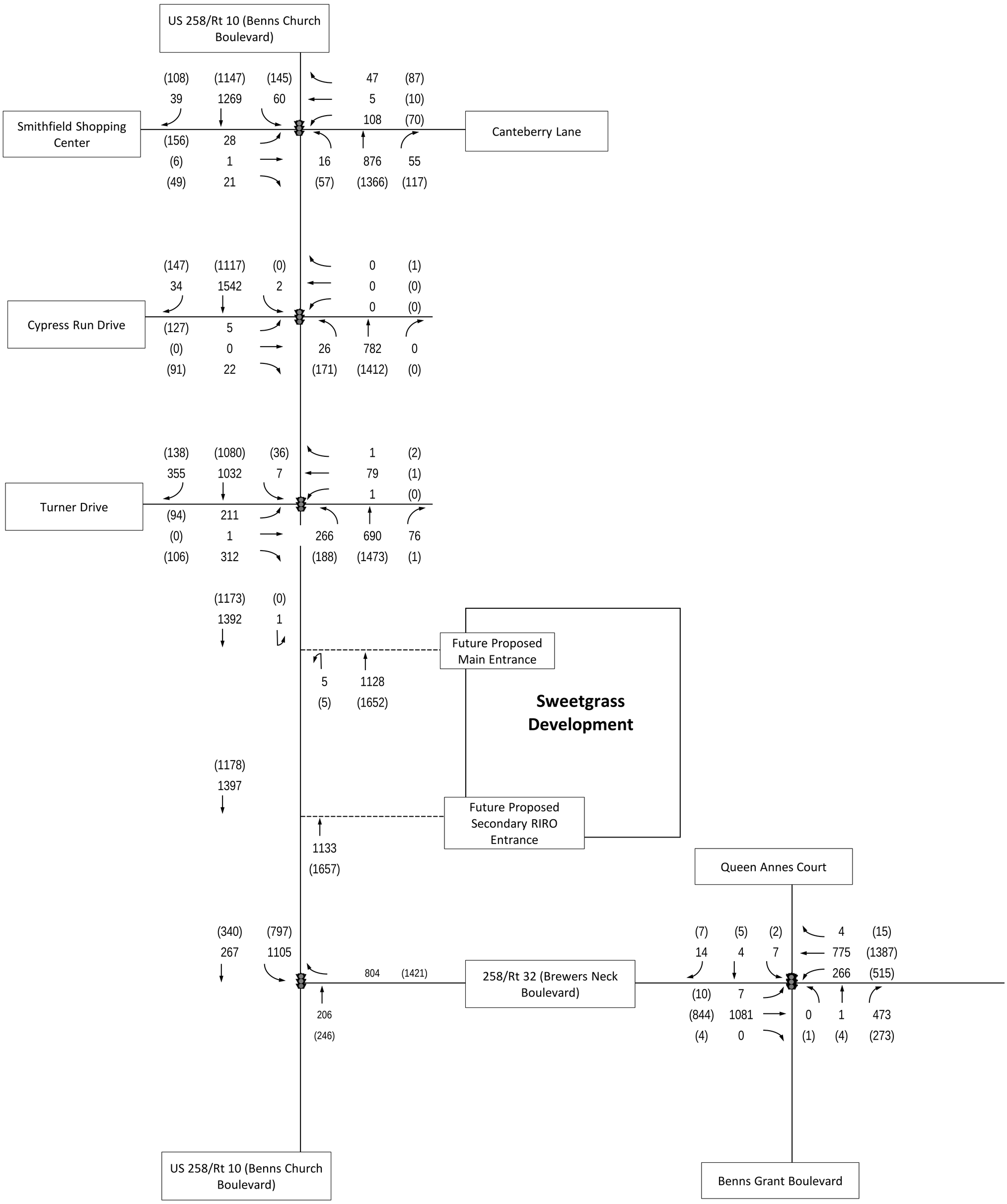


Figure 9
2032 No Build AM and PM Peak Hour Traffic Volumes

Sweetgrass, Isle of Wight County, VA

Table 2. 2026 No-Build Measures of Effectiveness.

Intersection and Approach	Control	2026 No-Build	
		AM	PM
US 258/Rt 10 (Benns Church Boulevard) & Canteberry Lane	Signalized	**C (25.3 sec/veh)**	**C (31.3 sec/veh)**
Eastbound		C-28.5	D-43.2
Westbound		E-57	D-35.6
Northbound		B-14.2	C-28
Southbound		C-27.5	C-32.4
US 258/Rt 10 (Benns Church Boulevard) & Cypress Run Drive	Signalized	**A (4.8 sec/veh)**	**A (9.9 sec/veh)**
Eastbound		B-12.5	C-34.4
Westbound		---	---
Northbound		A-3.1	A-8.9
Southbound		A-5.4	A-5.8
US 258/Rt 10 (Benns Church Boulevard) & Turner Drive	Signalized	**E (58.4 sec/veh)**	**B (18.4 sec/veh)**
Eastbound		F-95.9	C-26.8
Westbound		D-38.6	C-26.7
Northbound		D-47.4	B-17.8
Southbound		D-54.5	B-17.5
US 258/Rt 10 (Benns Church Boulevard) & Proposed Main Entrance	Unsignalized	**-**	**-**
Eastbound		---	---
Westbound		---	---
Northbound		---	---
Southbound		---	---
US 258/Rt 10 (Benns Church Boulevard) & 258/Rt 32 (Brewers Neck Boulevard)	Signalized	**A (7.1 sec/veh)**	**A (8.4 sec/veh)**
Eastbound		---	---
Westbound		A-3.4	A-8.5
Northbound		C-24	C-23.7
Southbound		A-7.1	A-4.8
Queen Annes Court & 258/Rt 32 (Brewers Neck Boulevard)	Signalized	**B (20 sec/veh)**	**B (19.9 sec/veh)**
Eastbound		C-31.1	C-28.6
Westbound		B-15.7	B-18.8
Northbound		A-3.7	A-4.4
Southbound		C-20.7	C-23.2

Table 3. 2032 No Build Measures of Effectiveness.

Intersection and Approach	Control	2032 No-Build	
		AM	PM
US 258/Rt 10 (Benns Church Boulevard) & Canteberry Lane	Signalized	**C (26.4 sec/veh)**	**D (36.9 sec/veh)**
Eastbound		D-44.3	D-43
Westbound		E-70.4	D-36.4
Northbound		B-15.3	D-35.2
Southbound		C-26.8	D-37.9
US 258/Rt 10 (Benns Church Boulevard) & Cypress Run Drive	Signalized	**A (2.8 sec/veh)**	**B (11.1 sec/veh)**
Eastbound		B-16.8	D-35.8
Westbound		---	---
Northbound		A-2.2	B-10.9
Southbound		A-2.7	A-5.8
US 258/Rt 10 (Benns Church Boulevard) & Turner Drive	Signalized	**E (73.9 sec/veh)**	**C (22.2 sec/veh)**
Eastbound		F-88.1	C-28.8
Westbound		D-45.2	C-29.7
Northbound		E-71.5	C-21.4
Southbound		E-73.4	C-21.7
US 258/Rt 10 (Benns Church Boulevard) & Proposed Main Entrance	Unsignalized	**-**	**-**
Eastbound		---	---
Westbound		---	---
Northbound		---	---
Southbound		---	---
US 258/Rt 10 (Benns Church Boulevard) & 258/Rt 32 (Brewers Neck Boulevard)	Signalized	**A (9.5 sec/veh)**	**A (9.8 sec/veh)**
Eastbound		---	---
Westbound		A-7.9	B-10.9
Northbound		B-19.2	C-25.8
Southbound		A-9.1	A-4.7
Queen Annes Court & 258/Rt 32 (Brewers Neck Boulevard)	Signalized	**C (21.6 sec/veh)**	**C (26.6 sec/veh)**
Eastbound		C-29	C-31
Westbound		B-19.5	C-28.6
Northbound		A-8.1	A-4.5
Southbound		C-25.9	C-24.9

Analysis of Build Conditions

Trip Generation

Traffic that may be generated by the proposed development was established using equations and rates available through the Institute of Transportation Engineer's (ITE) Trip Generation Manual, 10th Edition.

Trip generation for the site was prepared for each individual land use. ITE provides information for single-family detached housing (Land Use 210), low-rise multi-family housing (Land Use 220), public park (Land Use 411), shopping center (Land Use Code 820) and fast food with drive-through (Land Use 934).

The types of commercial development are unknown at this time, so shopping center was used. Pass-by trips to/from fast food restaurant were considered at a 49% rate and to/from the shopping center were considered at a 34% rate. Summary of all future site trips are presented in Table 4 below.

Table 4. Trip Generation.

Land Use	ITE Code	Size	Units	Daily	AM Peak Hour			PM Peak Hour		
					Enter	Exit	Total	Enter	Exit	Total
Conceptual Site Plan										
Single-Family Detached Housing	210	400	Dwelling Units	3,776	74	222	296	249	147	396
Multifamily Housing (Low-Rise)	220	285	Dwelling Units	2,144	30	101	131	101	59	160
Public Park	411	4	Acres	91	0	0	0	13	10	23
Shopping Center	820	30	1000 Sq. Ft. GLA	2,651	17	11	28	107	116	223
Fast Food with Drive-Thru	934	5	1000 Sq. Ft. GLA	2,355	102	99	201	85	78	163
Subtotal				**11,017**	**223**	**433**	**656**	**555**	**410**	**965**
Pass-by Trips (Fast Food only)	49%		% Pass-by	1,154	50	49	98	42	38	80
Pass-by Trips (Shopping Center)	34%		% Pass-by	901	6	4	10	36	39	76
Total New Trips				**8,962**	**167**	**380**	**548**	**477**	**333**	**809**

Reference: Trip Generation, 10th Edition, Institute of Transportation Engineers, Washington, DC. 2017.
Note: Used highest total between average rate and fitted curve unless R2<0.75

The site is estimated to generate 8,962 new daily trips with 548 trips in the morning peak hour and 809 trips during the evening peak hour.

Trip Distribution

Trip distribution was based on the existing traffic patterns and the understanding of the land uses within the surrounding area.

The site traffic distribution for the residential uses assumes 70% will enter from and exit to the south during the AM peak and 60% will enter from and exit to the south during the PM peak. For the shopping and fast-food used it is assumed that 55% will enter from and exit to the

south during AM peak hour and 55% will enter from and exit to the south during PM peak hour. Trip distribution percentages and traffic volumes for each land use are shown in Appendix F. Combined AM and PM peak hour site trips for all land uses are shown on Figure 10.

The resulting 2026 Build AM and PM traffic volumes are provided in Figure 11, while the 2032 Build AM and PM traffic volumes are provided in Figure 12.

LEGEND	
——	Existing Roadway
- -	Future Roadway
STOP	Existing Stop Controlled Approach
	Existing Signalized Intersection
⟶	Turning Movement
XX(XX)	Weekday AM (PM) Entering Site Trips
XX(XX)	Weekday AM (PM) Exiting Site Trips
STOP	Future Stop Controlled Approach

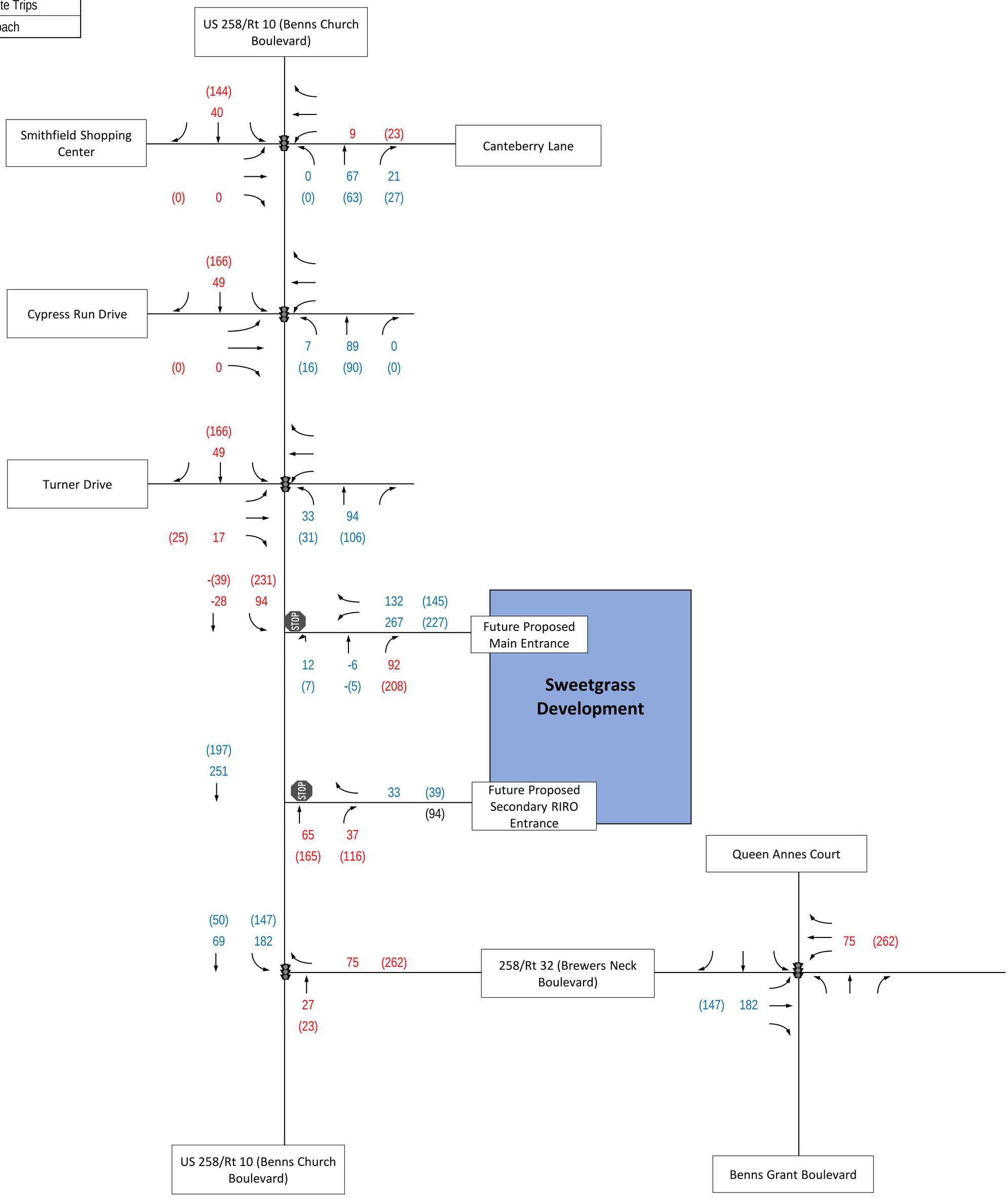


Figure 10
Combined AM and PM Peak Hour Site Trips

Sweetgrass
Isle of Wight County, VA

LEGEND	
——	Existing Roadway
- -	Future Roadway
STOP	Existing Stop Controlled Approach
→	Turning Movement
XX	AM Peak Hour Turning Movement Volume
(XX)	PM Peak Hour Turning Movement Volume

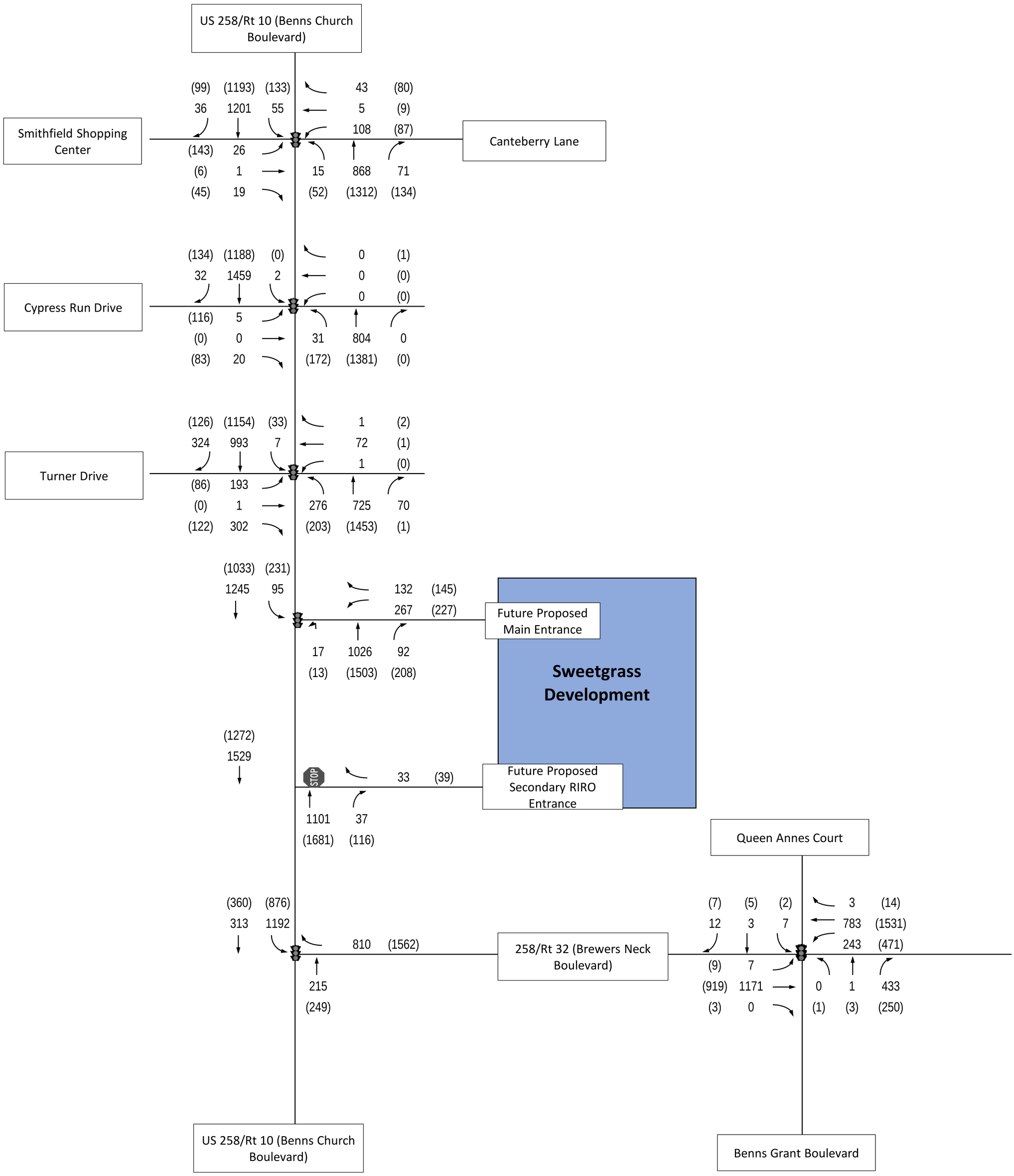


Figure 11
2026 Build AM and PM Peak Hour Traffic Volumes

Sweetgrass, Isle of Wight County, VA

LEGEND	
—	Existing Roadway
- -	Future Roadway
STOP	Existing Stop Controlled Approach
→	Turning Movement
XX	AM Peak Hour Turning Movement Volume
(XX)	PM Peak Hour Turning Movement Volume

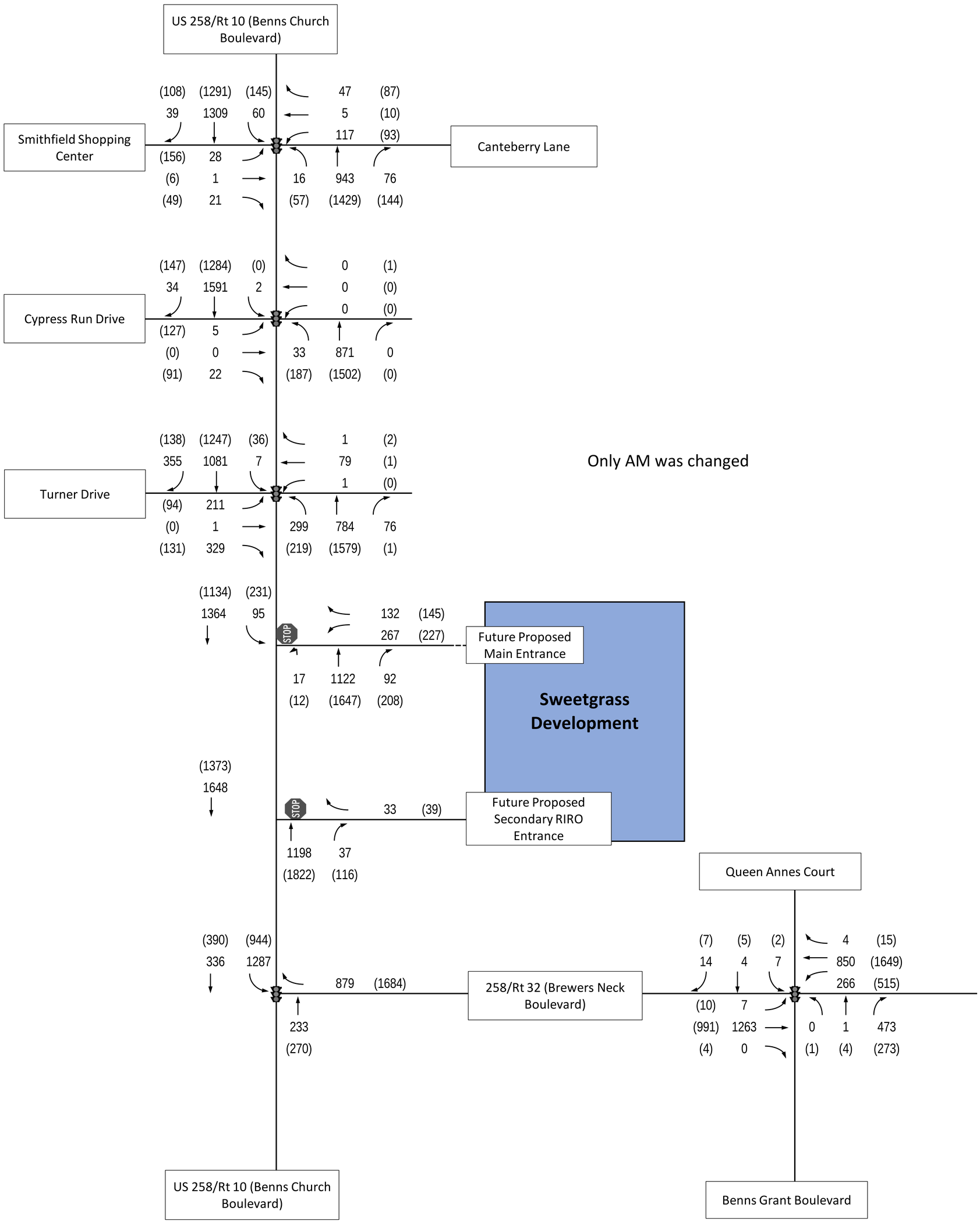


Figure 12
2032 Build AM and PM Peak Hour Traffic Volumes

Sweetgrass,
Isle of Wight County, VA

Auxiliary Lanes

There are two (2) entrances into the proposed site. The future Proposed Main Entrance allows all turning movements on to and off of US 258/Rt.10 (Benns Church Boulevard). The Proposed Secondary Entrance is right-in/right-out and allows limited ingress and egress from the development. Based on VDOT Road Design Manual and forecasted volumes, a 200-foot right turn lane with 200-foot taper is required for the northbound right turn lane at the Proposed Main Entrance. In addition, the southbound left turn lane at this intersection should be lengthened to provide 200' storage and a 200-foot taper. At the Proposed Secondary Entrance, a 200-foot right turn lane with a 200' taper is required. For the purpose of the Build analysis, the proposed left turn and right turn lanes at each entrance were taken into account. More detailed turn lane warrant analysis is shown in Appendix G.

Signal Warrant Analysis

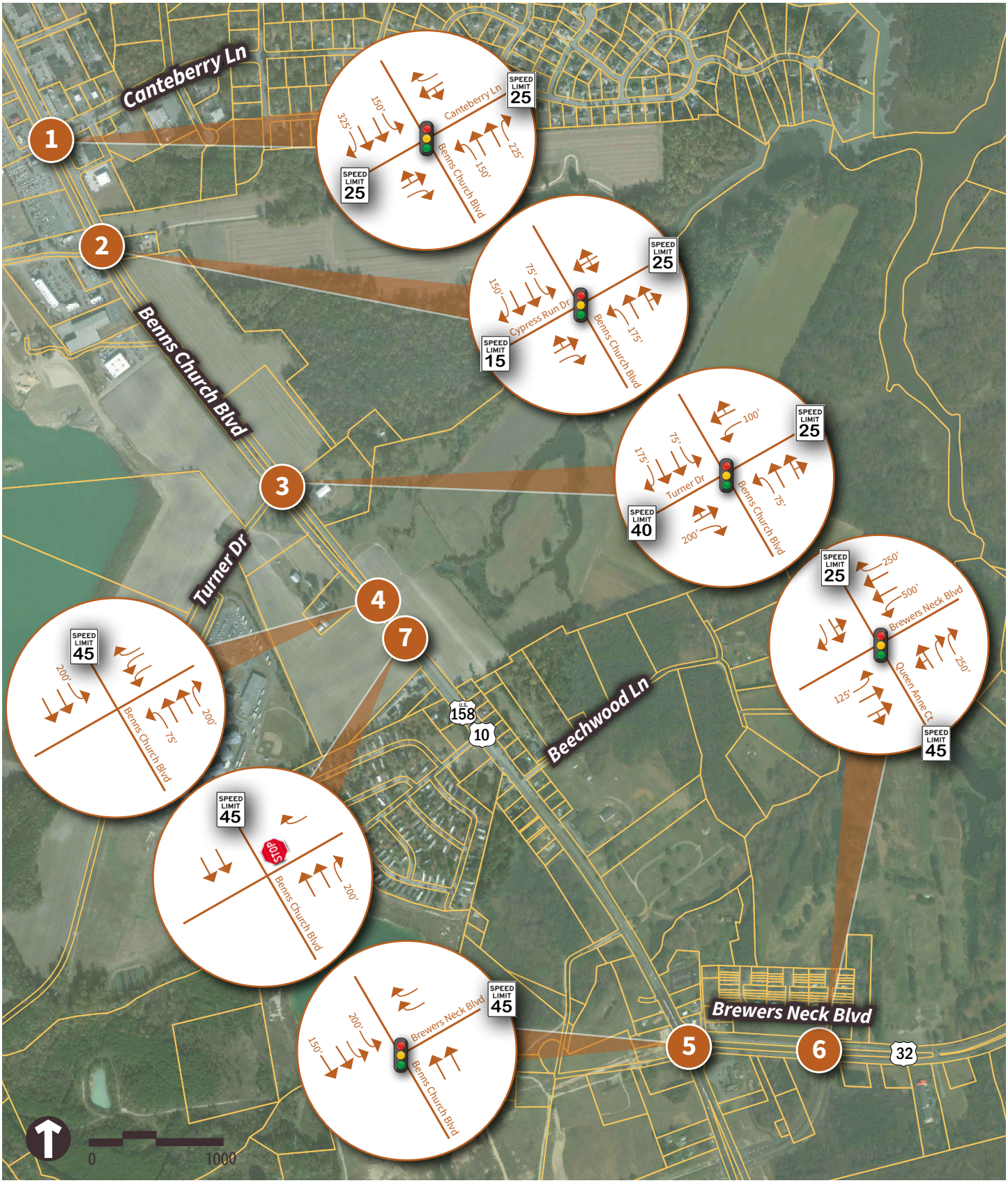
A Manual of Uniform Traffic Control Devices (MUTCD) signal warrant screening was performed based on projected volumes at the intersection of US 258 /Rt.10 (Benns Church Boulevard) and the future proposed main entrance to the development. Chapter 4C (Traffic Control Signal Needs Studies) of the MUTCD identifies nine (9) warrants. All nine warrants were analyzed as a part of this study and detailed results are presented in Appendix H.

The MUTCD allows some, or all, right turns to be combined with the left turns for the purpose of conducting the signal warrants. Engineering judgement should be applied based on the level of conflict and delay expected for the right turning traffic entering the roadway network.

Analysis was conducted based on the projected volumes and current posted speed limit on US 258/Rt 10 (Benns Church Boulevard) of 45 mph. Based on the available data and the signal warrant requirements included in the Virginia Supplement to the MUTCD, the analysis indicates that the eight-hour, four-hour, and peak hour vehicular volume warrants (Warrants 1, 2 and 3) were satisfied.

A signal is recommended at the subject intersection at full build out. A Signal Justification Report (SJR) has been generated and has been submitted to VDOT for review and approval.

For the purpose of this study, a signal at the Proposed Main Entrance and US 258/Rt.10 (Benns Church Boulevard) was assumed and incorporated into all Build scenarios.



SOURCE: BING, (c) 2015 Microsoft Corporation and its data suppliers.

FIGURE 13

2026 and 2032 Future Build Lane Configuration

Yeoman Tract Traffic Impact Study
Isle of Wight County, Virginia

Capacity Analysis

The 2026 and 2032 Build Condition volumes were analyzed using the Synchro 9.1 software. The network signal timings were optimized along with offsets and cycle lengths for the 2026 and 2032 Build analyses. Appendix I includes the Synchro reports for the 2026 Build conditions and Appendix J includes the Synchro reports for the 2032 Build conditions.

There are two (2) entrances into the proposed site. The Proposed Main Entrance is a full entrance on US 258/Rt 10 (Benns Church Boulevard). The Proposed Secondary Entrance is a right-in/right out entrance onto US 258/Rt 10 (Benns Church Boulevard) south of the Proposed Main Entrance.

At the intersection at the Proposed Main Entrance, signal control was assumed for the purpose of this analysis. In addition, the lengthened left turn lane on southbound approach with 200-foot storage and 200-foot taper along as well as the proposed 200-foot right turn storage lane and 200-foot taper on the northbound approach were also included. At the Proposed Secondary Entrance, stop control was assumed on the westbound approach and a 200-foot right turn storage lane with 200-foot taper on the northbound approach was included. Projected LOS and delay results at each intersection for 2026 and 2032 Build scenario are presented in Table 5 and 6 respectively.

Table 5. 2026 Build Measures of Effectiveness.

Intersection and Approach	Control	2026 Build	
		AM	PM
US 258/Rt 10 (Benns Church Boulevard) & Canteberry Lane	Signalized	**C (32.1 sec/veh)**	**C (32.1 sec/veh)**
Eastbound		D-45.3	D-45.3
Westbound		D-38.2	D-38.2
Northbound		C-33.3	C-33.3
Southbound		C-28.4	C-28.4
US 258/Rt 10 (Benns Church Boulevard) & Cypress Run Drive	Signalized	**A (9.3 sec/veh)**	**A (9.3 sec/veh)**
Eastbound		D-36.6	D-36.6
Westbound		---	---
Northbound		A-9.4	A-9.4
Southbound		A-5.1	A-5.1
US 258/Rt 10 (Benns Church Boulevard) & Turner Drive	Signalized	**C (21.1 sec/veh)**	**C (21.1 sec/veh)**
Eastbound		B-19.6	B-19.6
Westbound		C-22.7	C-22.7
Northbound		C-20.3	C-20.3
Southbound		C-22.5	C-22.5
US 258/Rt 10 (Benns Church Boulevard) & Proposed Main Entrance	Signalized	**B (15.1 sec/veh)**	**B (15.1 sec/veh)**
Eastbound		---	---
Westbound		C-29.2	C-29.2
Northbound		B-17.8	B-17.8
Southbound		A-7.4	A-7.4
US 258/Rt 10 (Benns Church Boulevard) & 258/Rt 32 (Brewers Neck Boulevard)	Signalized	**B (12.7 sec/veh)**	**B (12.7 sec/veh)**
Eastbound		---	---
Westbound		B-15.5	B-15.5
Northbound		D-36.7	D-36.7
Southbound		A-4.2	A-4.2
Queen Annes Court & 258/Rt 32 (Brewers Neck Boulevard)	Signalized	**B (19.9 sec/veh)**	**B (19.9 sec/veh)**
Eastbound		C-33.6	C-33.6
Westbound		B-15.5	B-15.5
Northbound		A-3.7	A-3.7
Southbound		C-26.1	C-26.1
US 258/Rt 10 (Benns Church Boulevard) & Proposed Secondary Entrance	Unsignalized	**B (13.8 sec/veh)**	**C (20.5 sec/veh)**
Eastbound		---	---
Westbound		B-13.8	C-20.5
Northbound		A-0	A-0
Southbound		A-0	A-0

Table 6. 2032 Build Measures of Effectiveness.

Intersection and Approach	Control	2032 Build	
		AM	PM
US 258/Rt 10 (Benns Church Boulevard) & Canteberry Lane	Signalized	**B (18.5 sec/veh)**	**D (42.5 sec/veh)**
Eastbound		D-38.8	D-49.5
Westbound		D-51.7	D-39.6
Northbound		B-14.7	D-49.6
Southbound		B-16.6	C-34.5
US 258/Rt 10 (Benns Church Boulevard) & Cypress Run Drive	Signalized	**A (2.4 sec/veh)**	**A (8.1 sec/veh)**
Eastbound		B-11.2	D-45.2
Westbound		---	---
Northbound		A-1.2	A-7.3
Southbound		A-2.9	A-3.5
US 258/Rt 10 (Benns Church Boulevard) & Turner Drive	Signalized	**C (32.1 sec/veh)**	**A (9.1 sec/veh)**
Eastbound		C-30.7	B-19.7
Westbound		D-43.1	C-26.3
Northbound		C-29.8	A-9.4
Southbound		C-33.9	A-7
US 258/Rt 10 (Benns Church Boulevard) & Proposed Main Entrance	Signalized	**B (11.6 sec/veh)**	**B (16.9 sec/veh)**
Eastbound		---	---
Westbound		C-24.4	C-33.6
Northbound		B-13.5	B-19.3
Southbound		A-6.6	A-8.9
US 258/Rt 10 (Benns Church Boulevard) & 258/Rt 32 (Brewers Neck Boulevard)	Signalized	**A (9.5 sec/veh)**	**B (19 sec/veh)**
Eastbound		---	---
Westbound		A-8.1	C-28.1
Northbound		C-24	C-33.6
Southbound		A-8.2	A-4.6
Queen Annes Court & 258/Rt 32 (Brewers Neck Boulevard)	Signalized	**C (21.1 sec/veh)**	**C (21.4 sec/veh)**
Eastbound		B-10.1	D-35.5
Westbound		D-39.8	B-17.1
Northbound		A-5.9	A-3.7
Southbound		C-27.8	C-26.1
US 258/Rt 10 (Benns Church Boulevard) & Proposed Secondary Entrance	Unsignalized	**B (14.6 sec/veh)**	**C (22.8 sec/veh)**
Eastbound		---	---
Westbound		B-14.6	C-22.8
Northbound		A-0	A-0
Southbound		A-0	A-0

All the intersections in the study area are expected to continue to operate under the acceptable LOS D or better under both 2026 and 2032 Build Conditions.

The network signal cycle lengths and splits were optimized for the 2026 and 2032 Build analyses, including a change to provide a protected/permissive eastbound left at the intersection of US 258/Rt 10 (Benns Church Boulevard) & Turner Drive. A flashing yellow arrow was included in the signal design for the northbound and southbound lefts to improve the efficiency of the intersection operation. Additional improvements to this intersection include an eastbound right turn overlap with the northbound left movement in the 2026 build condition and a southbound right turn overlap with the eastbound left movement in 2032 AM condition. With these improvements, the eastbound approach at the intersection of US 258/Rt 10 (Benns Church Boulevard) & Turner Drive is expected to operate at LOS C under 2026 Build Conditions 2032 during the morning peak. A LOS B I anticipated in the eastbound under 2032 Build Conditions during the evening peak hour. This is better than the expected No Build conditions.

Queue Analysis

SimTraffic was used to estimate the queues at the six (6) signalized intersections included in the project area. SimTraffic uses a hot spot, 20 feet in length, at the top of each lane or approach just prior to the adjacent intersection to help to identify possible queuing or spillback issues on adjacent intersections. If a vehicle is in that hot spot and is traveling less than 10 mph, it is assumed to be queued. The queuing and blocking reports are a result of the average of 10 runs.

Table 7 presents the estimated 95th percentile queue lengths for the 2018 Existing, 2026 No Build, 2026 Build, 2032 No Build and 2032 Build PM peak. The full Synchro queue reports can be found in Appendix K. Results and observations of queuing simulations show that most of the intersections are expected to queue within their storage capacities. However, the analysis of 2018 Existing Conditions has shown that at the intersection of US 258/Rt 10 (Benns Church Boulevard) & Turner Drive, the left turn queue on the northbound approach is currently 207 feet during morning peak hour and 148 feet during evening peak hour, exceeding existing storage capacity of 75 feet. Since this queuing issue is an existing condition and not a result of the proposed development, no changes to the existing storage lengths are proposed at this intersection.

The southbound right at the intersection of US 258/Rt 10 (Benns Church Boulevard) & Turner Drive is also anticipated to exceed the existing storage length in the 2032 AM peak hour. However, this movement is anticipated to operate at a LOS B with just over 10 seconds of delay. Therefore, it is anticipated this queue is the result of through vehicles blocking vehicles

from entering the right turn lane and is not an issue of available storage.

Table 7. Queue Analysis

Queuing Analysis - 95th Percentile Queue										
Intersection	Movement	Link Distance	Storage Length	Existing (AM/PM Peak)	2026 No Build (AM/PM Peak)	2032 No Build (AM/PM Peak)	Link Distance	Storage Length	2026 Build (AM/PM Peak)	2032 Build (AM/PM Peak)
US 258/Rt 10 (Benns Church Boulevard) & Canteberry Lane	EBLT	277		49/158	51/179	66/181	277		49/152	60/200
	EBR	277		39/59	42/63	46/74	277		37/60	50/64
	WBLT	1172		125/98	145/104	194/107	1172		134/158	173/131
	WBR	1172		59/112	67/113	86/116	1172		68/114	77/110
	NBL		150	31/108	35/167	51/222		150	38/108	53/190
	NBT	663		160/349	181/439	244/555	663		136/325	243/500
	NBT	663		168/364	186/445	249/563	663		145/335	258/509
	NBR		225	36/46	35/51	38/173		225	36/58	62/176
	SBL		150	52/119	59/144	60/176		150	62/141	75/164
	SBT	1895		187/235	209/275	248/330	1895		210/262	247/425
	SBT	1895		190/242	220/288	265/347	1895		230/268	267/341
	SBR		325	22/40	22/39	24/43		325	24/41	45/42
US 258/Rt 10 (Benns Church Boulevard) & Cypress Run Drive	EBLT	1824		10/131	11/146	9/141	1824		11/126	15/212
	EBR	1824		29/93	34/99	35/116	1824		28/91	28/101
	WBLTR	1402		-/8	-/8	/9	1402		-/9	-/13
	NBL		175	49/111	37/125	43/130		175	48/122	50/156
	NBT	1913		59/143	56/171	63/214	1913		35/142	62/97
	NBTR	1913		1/159	75/185	86/231	1913		51/163	89/110
	SBL		75	47/-	4/-	2/-		75	3/-	2/-
	SBT	663		62/90	62/91	103/92	663		58/90	95/128
	SBT	663		10/108	69/109	123/112	633		78/100	119/134
	SBR		150	9/44	12/44	13/46		150	12/42	12/61
US 258/Rt 10 (Benns Church Boulevard) & Turner Drive	EBLTR	1442		326/121	-	-			-	-
	EBLT	1440		-	195/89	269/100	1442		242/105	277/111
	EBR		200	-	149/68	219/71		200	158/84	231/93
	WBLTR	648		88/22	97/18	119/20	648		102/20	130/22
	NBL		75	207/148	205/139	251/180		75	222/161	135/192
	NBT	1098		238/258	199/212	329/280	1065		200/239	427/234
	NBTR	1098		233/264	178/220	266/295	1065		157/251	351/230
	SBL		75	59/69	39/80	57/81		75	19/88	41/62
	SBT	1913		366/243	302/226	414/319	1913		252/274	344/159
	SBT	1913		383/253	311/241	423/328	1913		257/283	361/162
	SBR		175	140/64	137/58	178/91		175	131/60	269/57
US 258/Rt 10 (Benns Church Boulevard) & Proposed Main Entrance	WBL			-	-	-	816		167/170	154/193
	WBL			-	-	-	816		132/138	114/175
	WBR			-	-	-	816		78/121	120/151
	NBU		75	10/11	13/15	14/12		200	50/61	63/54
	NBT	3868	-	-	-/-	-	470		206/340	197/412
	NBT								202/336	187/405
	NBR							200	42/83	49/129
	SBU		100	5/-	6/-	6/-			-	-
	SBL							200	98/167	87/181
	SBT						1065		181/99	155/151
	SBT	1086		-	-	-/-	1065		204/120	177/165
US 258/Rt 10 (Benns Church Boulevard) & 258/Rt 32 (Brewers Neck Boulevard)	WBR	1008		109/222	140/286	172/372	1008		104/451	118/531
	WBR	1008		109/225	141/291	172/373	1008		101/451	109/551
	NBT	2766		67/73	71/81	64/88	2766		66/109	84/104
	NBT	2766		70/80	74/86	72/99	2766		77/111	87/119
	SBL		200	149/116	152/128	169/138		200	150/155	196/146
	SBL	3868		175/135	177/150	193/160	3191		173/155	233/146
	SBT	3868		4/2	8/1	-/7	3191		5/-	-/6
Queen Annes Court & 258/Rt 32 (Brewers Neck Boulevard)	EBL		125	21/25	27/29	23/25		125	27/27	44/31
	EBT	1008		246/192	259/240	294/251	1008		267/304	308/315
	EBTR	1008		261/208	272/249	302/263	1008		277/314	318/319
	WBL		500	145/244	169/296	215/347		500	188/407	191/406
	WBT	785		236/344	283/406	318/471	785		135/568	147/630
	WBT	785		205/334	246/408	297/481	785		121/588	129/673
	WBR		250	4/12	5/16	4/81		250	4/115	4/152
	NBLT	858		9/14	8/15	12/17	858		9/11	7/21
	NBR		250	162/91	185/108	224/116		250	204/120	208/134
	NBR		250	99/38	137/43	191/45		250	163/56	174/64
	SBLT	565		26/21	32/26	31/22	565		31/25	34/30
	SBR	565		30/26	32/34	39/31	565		40/24	37/30
US 258/Rt 10 (Benns Church Boulevard) & Proposed Secondary Entrance	WBR			-	-	-	1244		43/71	39/72
	SBT			-	-	-	3191		-/-	3/-
	NBT			-	-	-	3191		-/1	-/-
	NBR			-	-	-		100	-/-	-/-

Recommended Improvements

Based on the results of the auxiliary lane, capacity and queuing analyses performed in this study, the following improvements are recommended:

2018 Existing:

- VDOT to construct eastbound right turn lane at US 258/Rt 10 (Benns Church Boulevard) and Turner Lane as planned.

2026 No Build:

- VDOT should review and optimize signal timings along the corridor, if necessary.

2026 Build:

- Construct northbound right turn lane (200' storage plus 200' taper) into right in/right out Proposed Secondary Entrance off of US 258/Rt 10 (Benns Church Boulevard).
- Construct northbound right turn lane (200' storage plus 200' taper) into Proposed Main Entrance off of US 258/Rt 10 (Benns Church Boulevard).
- Lengthen southbound left turn lane to provide 200' storage plus 200' taper into Proposed Main Entrance off of US 258/Rt 10 (Benns Church Boulevard).
- Install traffic signal at intersection of US 258/Rt 10 (Benns Church Boulevard) and Proposed Main Entrance.
- Install signal infrastructure to provide a protected eastbound right-turn overlap at US 258/Rt 10 (Benns Church Boulevard) and Turner Lane.
- Install flashing yellow arrows for the northbound and southbound left turn lanes at the intersection of US 258/Rt 10 (Benns Church Boulevard) at Canterberry Lane, Cypress Run Drive, Turner Drive and the Proposed Main Entrance to allow lead/lag operation.
- Optimize signal timings along the corridor.

2032 No Build:

- No additional improvements required.

2032 Build:

- Install signal infrastructure to provide a protected southbound right-turn overlap at US 258/Rt 10 (Benns Church Boulevard) and Turner Lane.
- Optimize signal timings along the corridor.

Summary and Conclusions

This study performed an evaluation of the 2018 Existing as well as No Build and Build scenarios for the future years of 2026 and 2032 peak hours. The study intersections included in the analyses were:

- US 258/Rt 10 (Benns Church Boulevard) and US 258/Rt 32 (Brewers Neck Boulevard) - signalized;
- US 258/Rt 32 (Brewers Neck Boulevard) and Queen Annes Court - signalized;
- US 258/Rt 10 (Benns Church Boulevard) and Cypress Run Drive - signalize;
- US 258/Rt 10 (Benns Church Boulevard) and Turner Drive - signalized;
- US 258/Rt 10 (Benns Church Boulevard) and Canteberry Lane - signalized;
- US 258/Rt 10 (Benns Church Boulevard) and the Proposed Main Entrance (unsignalized); and,
- US 258/Rt 10 (Benns Church Boulevard) and the Proposed Secondary Entrance (unsignalized).

The site is estimated to generate 8,962 new daily trips with 548 trips in the morning peak hour and 809 trips during the evening peak hour.

Under 2018 Existing Conditions, most of the corridor operates acceptably at LOS C or better, with the exception of the intersection of US 258/Rt 10 (Benns Church Boulevard) & Turner Drive. Currently, during morning peak hour, LOS at this intersection experiences an unacceptable LOS F with over 108 seconds per vehicle (sec/veh) in delay. Improvements are planned to improve operations at this intersection. Current plans were provided to VHB by VDOT and the future lane configuration was taken into the account in the future year No Build and Build analyses. Based on the planned improvements, no interim improvements are recommended.

The 2026 and 2032 No Build analyses showed that most of the intersections in the network are expected to continue to operate at an acceptable LOS D or better with the exception of US 258/Rt 10 (Benns Church Boulevard) & Turner Drive. Even though the overall LOS at this intersection is expected to be E during morning peak hour, the eastbound approach will continue to operate at unacceptable LOS F under 2026 and 2032 No Build conditions.

The Proposed Main Entrance allows all turning movements onto and off of US 258/Rt.10 (Benns Church Boulevard). The Proposed Secondary Entrance is right-in/right-out and allows limited access/exit to/from the development. Turn lane warrant analysis was performed to identify turn

lane storage lengths and tapers. For the purpose of the Build analysis, the proposed left turn and right turn lanes at each entrance were taken into account.

A signal warrant analysis was performed at the Proposed Main Entrance and a signal is recommended at this intersection. Signalized traffic control at this intersection was assumed for all Build Conditions.

The 2026 and 2032 Build analyses show that all intersections in the network are expected to continue to operate at an acceptable LOS D or better.

Results and observations of queuing simulations show that most of the intersections are expected to queue within their storage capacities. However, the analysis of 2018 Existing Conditions has shown that at the intersection of US 258/Rt 10 (Benns Church Boulevard) & Turner Drive, left turn queue on northbound approach is currently longer than the existing storage lane. Since this is an existing condition, no change to the storage length is proposed.

In conclusion, the results of the analyses indicate that the development of the site as proposed will have modest impact on the intersections within the study area.

Table 8. 2018 Existing, 2026 No Build and 2032 No Build LOS Summary

Intersection and Approach	Control	2018 Existing		2026 No-Build		2032 No-Build	
		AM	PM	AM	PM	AM	PM
US 258/Rt 10 (Benns Church Boulevard) & Canteberry Lane	Signalized	C (WB-D)	C (EB-D)	C (WB-E)	C (EB-D)	C (WB-E)	D (EB-D)
US 258/Rt 10 (Benns Church Boulevard) & Cypress Run Drive	Signalized	A (EB-B)	A (EB-C)	A (EB-B)	A (EB-C)	A (EB-B)	B (EB-D)
US 258/Rt 10 (Benns Church Boulevard) & Turner Drive	Signalized	F (SB-F)	B (WB-C)	E (EB-F)	B (EB-C)	E (EB-F)	C (WB-C)
US 258/Rt 10 (Benns Church Boulevard) & Proposed Main Entrance	Unsignalized	N/A	N/A	N/A	N/A	N/A	N/A
US 258/Rt 10 (Benns Church Boulevard) & 258/Rt 32 (Brewers Neck Boulevard)	Signalized	A (NB-C)	A (NB-C)	A (NB-C)	A (NB-C)	A (NB-B)	A (NB-C)
Queen Annes Court & 258/Rt 32 (Brewers Neck Boulevard)	Signalized	B (EB-C)	B (EB-C)	B (EB-C)	B (EB-C)	C (EB-C)	C (EB-C)

Table 9. 2026 Build and 2032 Build LOS Summary

Intersection Name	Control	2026 Build		2032 Build	
		AM	PM	AM	PM
US 258/Rt 10 (Benns Church Boulevard) & Canteberry Lane	Signalized	B (WB-D)	C (EB-D)	B (WB-D)	D (NB-D)
US 258/Rt 10 (Benns Church Boulevard) & Cypress Run Drive	Signalized	A (EB-A)	A (EB-D)	A (EB-B)	A (EB-D)
US 258/Rt 10 (Benns Church Boulevard) & Turner Drive	Signalized	B (EB-C)	C (WB-C)	C (WB-D)	A (WB-C)
US 258/Rt 10 (Benns Church Boulevard) & Proposed Main Entrance	Signalized	A (WB-C)	B (WB-C)	B (WB-C)	B (WB-C)
US 258/Rt 10 (Benns Church Boulevard) & 258/Rt 32 (Brewers Neck Boulevard)	Signalized	A (NB-B)	B (NB-D)	A (NB-C)	B (NB-C)
Queen Annes Court & 258/Rt 32 (Brewers Neck Boulevard)	Signalized	B (SB-C)	B (EB-C)	C (WB-D)	C (EB-D)
US 258/Rt 10 (Benns Church Boulevard) & Proposed Secondary Entrance	Unsignalized	(WB-B)	(WB-C)	(WB-C)	(WB-C)

APPENDIX A

Approved Pre-Scoping Data

PRE-SCOPE OF WORK MEETING FORM

Information on the Project
Traffic Impact Analysis Base Assumptions

The applicant is responsible for entering the relevant information and submitting the form to VDOT and the locality no less than three (3) business days prior to the meeting. If a form is not received by this deadline, the scope of work meeting may be postponed.

Contact Information				
Consultant Name: Tele: E-mail:	VHB 757.233.3223 ktynch@vhb.com			
Developer/Owner Name: Tele: E-mail:	Ryan Homes 757.905.5298 eshirey@nvrinc.com			
Project Information				
Project Name:	Yeoman Tract		Locality/County:	Isle of Wight
Project Location: (Attach regional and site specific location map)	Located off of Rt 10 between Rt 614 and Rt 32 (Brewers Neck Blvd)			
Submission Type	Comp Plan ☐	Rezoning ☒	Site Plan ☐	Subd Plat ☐
Project Description: (Including details on the land use, acreage, phasing, access location, etc. Attach additional sheet if necessary)	343 single family homes, 165 townhomes. 125 attached senior living residences, 20k sf general office, 20k sf shopping center, 5k sf fast food restaurant with drive thru and 4 ac public park.			
Proposed Use(s): (Check all that apply; attach additional pages as necessary)	Residential ☒	Commercial ☒	Mixed Use ☐	Other ☐
	Residential Uses(s) Number of Units: 633 ITE LU Code(s): 210 220 252 **Commercial Use(s)** ITE LU Code(s): 820 710 934 Square Ft or Other Variable:		**Other Use(s)** ITE LU Code(s): 411 Independent Variable(s):	
Total Peak Hour Trip Projection:	Less than 100 ☐	100 – 499 ☐	500 – 999 ☒	1,000 or more ☐

It is important for the applicant to provide sufficient information to county and VDOT staff so that questions regarding geographic scope, alternate methodology, or other issues can be answered at the scoping meeting.

Traffic Impact Analysis Assumptions			
Study Period	Existing Year: 2018	Build-out Year: 2026	Design Year: 2032
Study Area Boundaries (Attach map)	North: Canteberry Lane	South: Brewers Neck Blvd	
	East: N/A	West: Rt 10	
External Factors That Could Affect Project (Planned road improvements, other nearby developments)	New turn lane from high school (200' turn lane + 200' taper)		
Consistency With Comprehensive Plan (Land use, transportation plan)	No		
Available Traffic Data (Historical, forecasts)	2017 VDOT count 25,000 vpd, taking intersection counts with project		
Trip Distribution (Attach sketch)	Road Name: Rt 10 (distribution will be based on counts)	Road Name:	
	Road Name:	Road Name:	
Annual Vehicle Trip Growth Rate:	1.5%	Peak Period for Study (check all that apply)	☒ AM ☒ PM ☐ SAT
		Peak Hour of the Generator	4-5 pm
Study Intersections and/or Road Segments (Attach additional sheets as necessary)	1.Brewers Neck Blvd and Rt 10	6.Benns Neck Blvd and Benns Grant Blvd	
	2.Benns Church Blvd and Main Access to Site	7.	
	3.Benns Church Blvd and Canteberry Lane	8.	
	4.Benns Chuch Blvd and Secondary Access to Site	9.	
	5.Benns Church Blvd and Turner Dr	10.	
Trip Adjustment Factors	Internal allowance: ☐ Yes ☒ No Reduction: _____% trips	Pass-by allowance: ☒ Yes ☐ No Reduction: 49% trips	
Software Methodology	☒ Synchro ☐ HCS (v.2000/+) ☐ aaSIDRA ☐ CORSIM ☐ Other _____		
Traffic Signal Proposed or Affected (Analysis software to be used, progression speed, cycle length)	TBD		

It is important for the applicant to provide sufficient information to county and VDOT staff so that questions regarding geographic scope, alternate methodology, or other issues can be answered at the scoping meeting.

Improvement(s) Assumed or to be Considered	Signal, turn lanes
Background Traffic Studies Considered	None
Plan Submission	☐ Master Development Plan (MDP) ☐ Generalized Development Plan (GDP) ☒ Preliminary/Sketch Plan ☐ Other Plan type (Final Site, Subd. Plan)
Additional Issues to be Addressed	☒ Queuing analysis ☐ Actuation/Coordination ☐ Weaving analysis ☐ Merge analysis ☒ Bike/Ped Accommodations ☒ Intersection(s) ☐ TDM Measures ☐ Other _____

NOTES on ASSUMPTIONS: Developed as 1 phase. Recreational areas and club house serve rsidential community only, and will not generate additional traffic.

SIGNED: Kirsten B. Tynch DATE: 4/23/18
Applicant or Consultant

PRINT NAME: Kirsten B. Tynch
Applicant or Consultant

It is important for the applicant to provide sufficient information to county and VDOT staff so that questions regarding geographic scope, alternate methodology, or other issues can be answered at the scoping meeting.

Rezoning Package Checklist

Traffic Impact Analysis Regulations: 24 VAC 30-155-40

☑ **A COVER SHEET** containing:

- ☑ **Contact Information** for the
  - ☑ Locality,
  - ☑ Developer (or owner), if applicable;
- ☑ **Site Information**
  - ☑ Rezoning location,
  - ☑ Highways adjacent to the site,
  - ☑ Parcel number or numbers;
- ☑ **Proposal Summary** with the
  - ☑ Development's name,
  - ☑ Size (acreage),
  - ☑ Proposed zoning;
  - ☑ Proposed types of land uses, including maximum number of lots or maximum business square feet, and
- ☑ **A Statement** regarding the proposal's compliance with the comprehensive plan.

☑ **A TRAFFIC IMPACT ANALYSIS** prepared in accordance with 24-VAC-30-155-60.

☑ **A CONCEPT PLAN** of the proposed development.

☐ **ANY PROFFERED CONDITIONS** submitted by the applicant.

☑ **FEES** -

- ☑ **For the initial or second review** of a rezoning proposal, a single fee for both reviews will be determined by the number of vehicle trips generated per peak hour of the generator, as follows:
  - ☐ Low volume road submission 24VAC30-155-40 A 3 - $250
  - ☑ All other submissions - $1,000
- ☐ **For a third or subsequent submission** of a rezoning proposal that is requested by VDOT on the basis of the failure of the applicant to address deficiencies previously identified by VDOT, the fee is equal to the initial fee paid.

Site Tabulations

Total Single Family Detached Lots:	400	
Total Townhomes:	285	
	Square Feet	Acres
Total Site Area:	10,866,832 ±	249.47 ±
Total Area Single-Family Detached:	7,627,620 ±	175.11
Open space:	4,307,625 ±	98.89 ±
Total Area Townhomes:	2,931,970 ±	67.31 ±
Open Space:	2,180,576 ±	50.06 ±
Commercial:	307,242 ±	7.05 ±

* Setbacks and Lot Widths Based Upon Rezoning to PD-MX

THIS PROPERTY IS IN FLOOD ZONE "X" AND AE (EL 8) AS SHOWN ON MAP NUMBER 51093C0154E; PANEL 0154E AND 51093C0153E, PANEL 0153E FOR COMMUNITY NUMBERS 510303 & 510081, DATED 12/2/2015 OF THE FLOOD INSURANCE RATE MAPS FOR ISLE OF WIGHT COUNTY, VIRGINIA. ZONE "X" IS DEFINED AS AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOOD PLAIN. ZONE "AE" IS DEFINED AS SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD.

LEGEND

- 100'RPA — 100 FOOT RPA BUFFER
- EX. TREELINE
- FLOOD PLANE ZONE AE
- MULTI-USE PATH
- WATER / POND
- TOWNHOME LOTS

N/F
THOMAS BARBARA F
910 CANTEBERRY LN
PARCEL ID: 22J-02-150
ZONING: SMITHFIELD: N-R

N/F
EVANS ANTHONY
906 CANTEBERRY LN
PARCEL ID: 22J-02-152
ZONING: SMITHFIELD: N-R

N/F
DIPPO LAWRENCE A & ELIZABETH A
TRS L A & E A DIPPO LIVING TRUST
908 CANTEBERRY LN
PARCEL ID: 22J-02-151
ZONING: SMITHFIELD: N-R

N/F
BERLAND EDNA R
916 CANTEBERRY LN
PARCEL ID: 22J-02-147
ZONING: SMITHFIELD: N-R

N/F
HENDRIX THOMAS
912 CANTEBERRY LN
PARCEL ID: 22J-02-149
ZONING: SMITHFIELD: N-R

N/F
FORSYTHE TIMOTHY A & DEBRA K
TRS T A & D K FORSYTHE FAMILY REV TRUST
914 CANTEBERRY LN
PARCEL ID: 22J-02-148
ZONING: SMITHFIELD: N-R

N/F
EDWARDS PHILLIP F JR & CONNIE A
BENNS CHURCH BLVD
PARCEL ID: 32-01-096
ZONING: SMITHFIELD: C-C

N/F
CROWN CASTLE GT COMPANY LLC
14005 BENNS CHURCH BLVD
PARCEL ID: 32-01-096B
ZONING: RAC

N/F
ISLE OF WIGHT COUNTY SCHOOL BOARD
14101 SMITHFIELD CIR, SMITHFIELD
PARCEL ID: 32-01-010A
ZONING: RAC

N/F
WILSON ANGELA B & WILSON JAMES G JR
TRS A B WILCON REVOC LIVING TRUST
14041 BENNS CHURCH BLVD
PARCEL ID: 32-01-095
ZONING: LI

N/F
YEOMAN WILLIAM G III
WILLIAM G YEOMAN III TRUST
BENNS CHURCH BLVD
PARCEL ID: 32-01-007
ZONING: RAC

N/F
CORNETT GEORGE C
14106 BENNS CHURCH BLVD
PARCEL ID: 32-01-008
ZONING: RAC

N/F
WILLIAM G. YEOMAN, TRUSTEE
14096 BENNS CURCH BOULEVARD
PARCEL ID: 32-01-009
ZONING: RAC

N/F
EDWARDS RYLAND B JR &
MARY ANN D &
EDWARDS RYLAND B & ETALS
14202 BENNS CHURCH BLVD
PARCEL ID: 32-01-062
ZONING: RAC

N/F
GIRARD PATRICIA A
14225 BENNS CHURCH BOULEVARD
PARCEL ID: 32A-02-012
ZONING: RAC

N/F
[OWNER]
[ADDRESS]
PARCEL ID: 32-05-B000
ZONING: RAC

N/F
WALLACE JIMMY J & MYRTLE T
14108 HAYLOFT LN
PARCEL ID: 32-01-094A
ZONING: RAC

N/F
WALLACE JIMMY J & MYRTLE T
14111 HAYLOFT LN
PARCEL ID: 32B-01-005
ZONING: RAC

N/F
CARNEY PAMELA D
14125 HAYLOFT LN
PARCEL ID: 32B-01-006
ZONING: RAC

N/F
TOTTEN CHARLES D
BEECHWOOD LN
PARCEL ID: 32-01-094,094C,094D
ZONING: RAC

N/F
BELL LINWOOD E & BARBARA G
19341 BEECHWOOD LN
PARCEL ID: 31-01-094B
ZONING: RAC

N/F
ST LUKES VILLAGES LLC
C/O MCCALE DEV COR
20081 BREWERS NECK BLVD
PARCEL ID: 33-01-012B
ZONING: PD-MX

N/F
BOWDEN RONALD
BREWERS NECK BLVD
PARCEL ID: 33-01-005
ZONING: RAC

N/F
GRAY ROBERTA
C/O GARY LAWRENCE N
CHAPMANS LN
PARCEL ID: 33-03-006
ZONING: RAC

BENNS CHURCH BLVD
(VARIABLE WIDTH PUBLIC R/W)
(SLOPE EASEMENT VARIES WITH TOPOGRAPHY)
1220.51'
696'

SIGNALIZED INTERSECTION
TOWNHOME PARCEL
LIMITS OF ZONE AE FLOOD PLAIN ELEV = 8
APPROX. LIMITS OF EXISTING TREELINE
RECREATION AREA
OPEN AREA
PEDESTRIAN ACCESS
LIMITS OF 100' RPA
LANDSCAPE BERM
COMMERCIAL AREA 7 AC.±
70' BUILDING SETBACK
PUBLIC PARK 3.90± AC
OPEN SPACE
CLUBHOUSE & REC. AREA 1.0 AC.±
OVERLOOK
DOG PARK 1.9 AC.±
POTENTIAL BMP LOCATION
MULTI-USE PATHWAY
BEECHWOOD LANE

GRAPHIC SCALE
200' 0' 200' 400'
SCALE: 1" = 200'

Rev.	Date	Description	Reviewed By
1	11/1/2019	REVISED PER COUNTY COMMENTS	JAG

AES CONSULTING ENGINEERS
5248 Olde Towne Road, Suite 1
Williamsburg, Virginia 23188
Phone: (757) 253-0040
Fax: (757) 220-8994
www.aesva.com
Hampton Roads | Central Virginia | Middle Peninsula

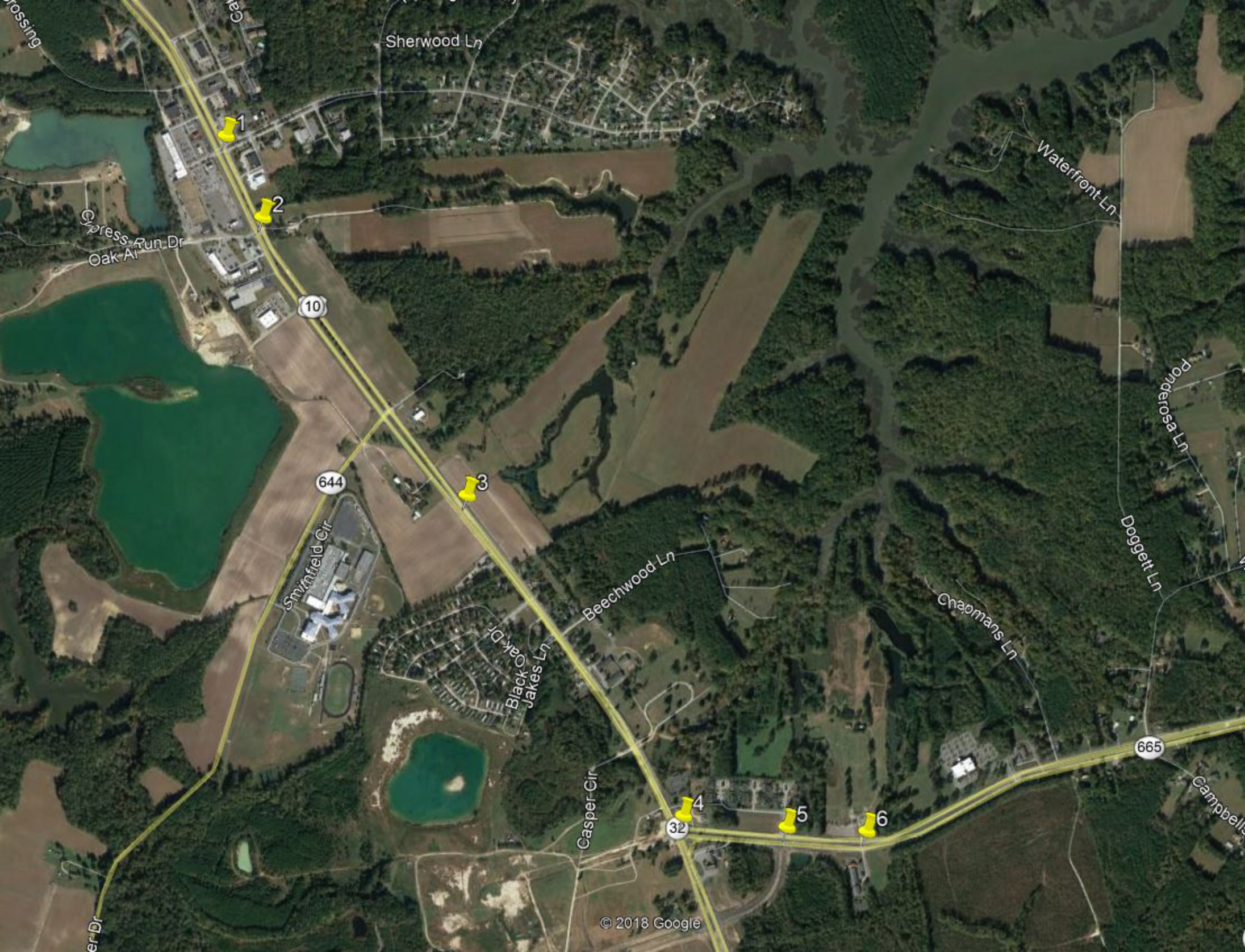
REZONING MASTER PLAN FOR SWEETGRASS

ISLE OF WIGHT COUNTY | WINDSOR DISTRICT | VIRGINIA

Project Contacts:	JAG
Project Number:	W10516-00
Scale: 1"=200'	Date: 06/14/2019

Sheet Title:
CONCEPTUAL MASTER PLAN

Sheet Number
2 OF 4


Sherwood Ln
Waterfront Ln
Cypress Run Dr
Oak Al
10
644
Smithfield Cir
Beechwood Ln
Black Oak Dr
Jakes Ln
Doggett Ln
Chaomans Ln
Ponderosa Ln
Casper Cir
32
665
Campbell
1
2
3
4
5
6
© 2018 Google

APPENDIX B

Traffic Data

4500 Main Street
Suite 400
Virginia Beach, VA 23462-3361
757.490.0132

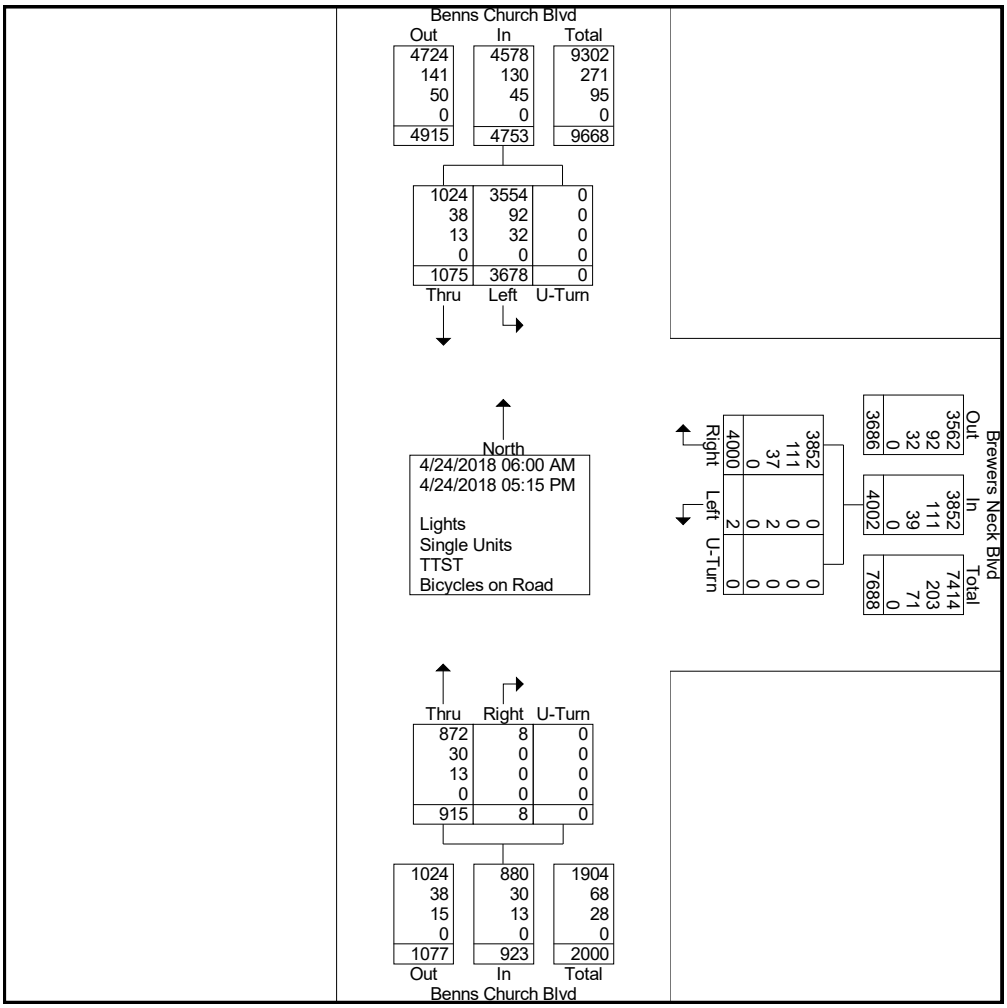
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Site Code :
Start Date : 4/24/2018
Page No : 1

Groups Printed- Lights - Single Units - TTST - Bicycles on Road

	Benns Church Blvd Southbound			Brewers Neck Blvd Westbound			Benns Church Blvd Northbound			
Start Time	Left	Thru	U-Turn	Left	Right	U-Turn	Thru	Right	U-Turn	Int. Total
06:00 AM	211	34	0	0	103	0	43	0	0	391
06:15 AM	225	32	0	0	117	0	34	0	0	408
06:30 AM	238	34	0	0	121	0	37	0	0	430
06:45 AM	191	39	0	0	140	0	34	0	0	404
Total	865	139	0	0	481	0	148	0	0	1633
07:00 AM	211	33	0	0	227	0	47	0	0	518
07:15 AM	224	42	0	0	181	0	29	0	0	476
07:30 AM	269	86	0	0	125	0	41	0	0	521
07:45 AM	193	56	0	0	120	0	49	1	0	419
Total	897	217	0	0	653	0	166	1	0	1934
02:30 PM	139	43	0	0	155	0	55	0	0	392
02:45 PM	167	35	0	0	185	0	36	0	0	423
Total	306	78	0	0	340	0	91	0	0	815
03:00 PM	182	50	0	2	189	0	44	0	0	467
03:15 PM	151	54	0	0	233	0	48	0	0	486
03:30 PM	109	58	0	0	228	0	49	1	0	445
03:45 PM	175	65	0	0	221	0	45	0	0	506
Total	617	227	0	2	871	0	186	1	0	1904
04:00 PM	163	62	0	0	311	0	51	2	0	589
04:15 PM	164	66	0	0	286	0	42	2	0	560
04:30 PM	162	81	0	0	278	0	47	1	0	569
04:45 PM	158	67	0	0	279	0	55	0	0	559
Total	647	276	0	0	1154	0	195	5	0	2277
05:00 PM	172	62	0	0	241	0	64	1	0	540
05:15 PM	174	76	0	0	260	0	65	0	0	575
Grand Total	3678	1075	0	2	4000	0	915	8	0	9678
Apprch %	77.4	22.6	0	0	100	0	99.1	0.9	0	
Total %	38	11.1	0	0	41.3	0	9.5	0.1	0	
Lights	3554	1024	0	0	3852	0	872	8	0	9310
% Lights	96.6	95.3	0	0	96.3	0	95.3	100	0	96.2
Single Units	92	38	0	0	111	0	30	0	0	271
% Single Units	2.5	3.5	0	0	2.8	0	3.3	0	0	2.8
TTST	32	13	0	2	37	0	13	0	0	97
% TTST	0.9	1.2	0	100	0.9	0	1.4	0	0	1
Bicycles on Road	0	0	0	0	0	0	0	0	0	0
% Bicycles on Road	0	0	0	0	0	0	0	0	0	0

4500 Main Street
Suite 400
Virginia Beach, VA 23462-3361
757.490.0132

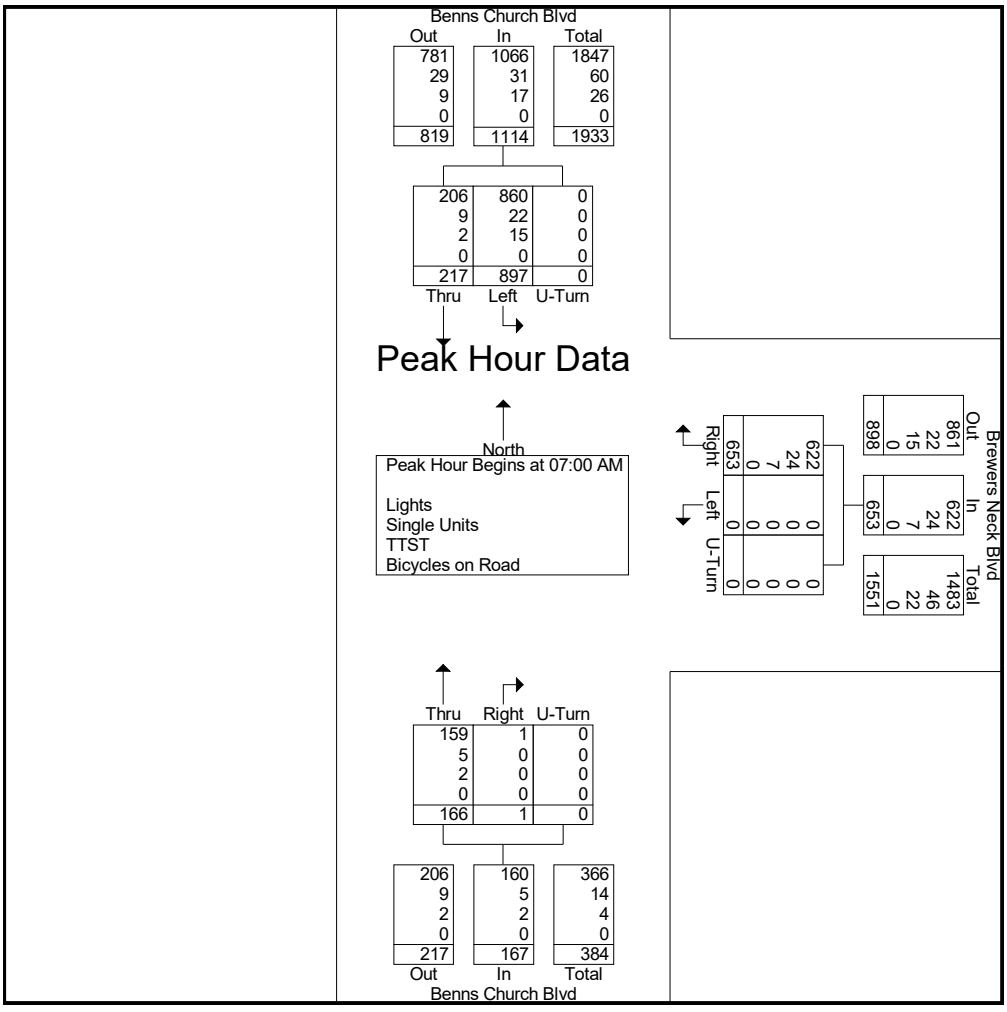
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Site Code :
Start Date : 4/24/2018
Page No : 2



4500 Main Street
Suite 400
Virginia Beach, VA 23462-3361
757.490.0132

File Name : Benns_Church_and_Brewers_Neck_514974_04-24-2018
Site Code :
Start Date : 4/24/2018
Page No : 3

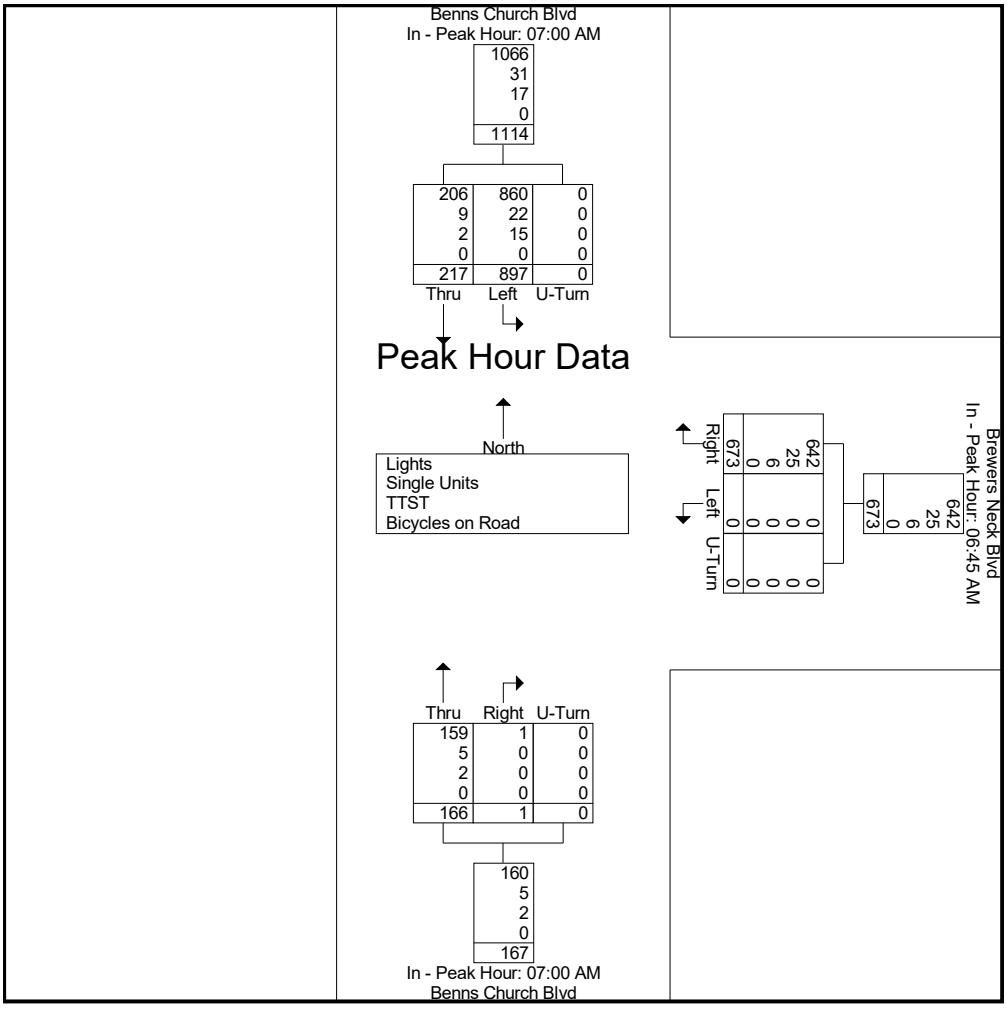
	Benns Church Blvd Southbound				Brewers Neck Blvd Westbound				Benns Church Blvd Northbound				
Start Time	Left	Thru	U-Turn	App. Total	Left	Right	U-Turn	App. Total	Thru	Right	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 11:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:00 AM													
07:00 AM	211	33	0	244	0	227	0	227	47	0	0	47	518
07:15 AM	224	42	0	266	0	181	0	181	29	0	0	29	476
07:30 AM	269	86	0	355	0	125	0	125	41	0	0	41	521
07:45 AM	193	56	0	249	0	120	0	120	49	1	0	50	419
Total Volume	897	217	0	1114	0	653	0	653	166	1	0	167	1934
% App. Total	80.5	19.5	0		0	100	0		99.4	0.6	0		
PHF	.834	.631	.000	.785	.000	.719	.000	.719	.847	.250	.000	.835	.928
Lights	860	206	0	1066	0	622	0	622	159	1	0	160	1848
% Lights	95.9	94.9	0	95.7	0	95.3	0	95.3	95.8	100	0	95.8	95.6
Single Units	22	9	0	31	0	24	0	24	5	0	0	5	60
% Single Units	2.5	4.1	0	2.8	0	3.7	0	3.7	3.0	0	0	3.0	3.1
TTST	15	2	0	17	0	7	0	7	2	0	0	2	26
% TTST	1.7	0.9	0	1.5	0	1.1	0	1.1	1.2	0	0	1.2	1.3
Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0



4500 Main Street
Suite 400
Virginia Beach, VA 23462-3361
757.490.0132

File Name : Benns_Church_and_Brewers_Neck_514974_04-24-2018
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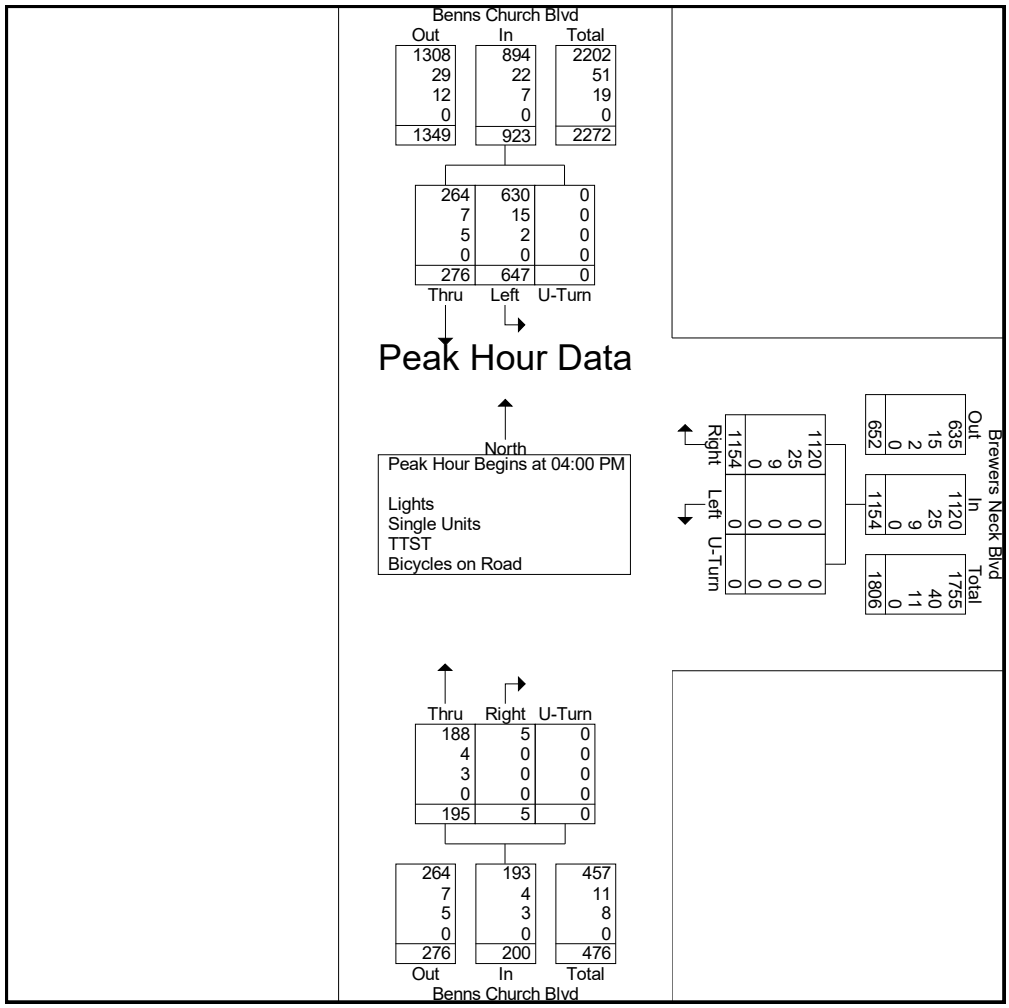
	Benns Church Blvd Southbound				Brewers Neck Blvd Westbound				Benns Church Blvd Northbound				
Start Time	Left	Thru	U-Turn	App. Total	Left	Right	U-Turn	App. Total	Thru	Right	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 11:45 AM - Peak 1 of 1													
Peak Hour for Each Approach Begins at:													
	07:00 AM				06:45 AM				07:00 AM				
+0 mins.	211	33	0	244	0	140	0	140	47	0	0	47	
+15 mins.	224	42	0	266	0	227	0	227	29	0	0	29	
+30 mins.	269	86	0	355	0	181	0	181	41	0	0	41	
+45 mins.	193	56	0	249	0	125	0	125	49	1	0	50	
Total Volume	897	217	0	1114	0	673	0	673	166	1	0	167	
% App. Total	80.5	19.5	0		0	100	0		99.4	0.6	0		
PHF	.834	.631	.000	.785	.000	.741	.000	.741	.847	.250	.000	.835	
Lights	860	206	0	1066	0	642	0	642	159	1	0	160	
% Lights	95.9	94.9	0	95.7	0	95.4	0	95.4	95.8	100	0	95.8	
Single Units	22	9	0	31	0	25	0	25	5	0	0	5	
% Single Units	2.5	4.1	0	2.8	0	3.7	0	3.7	3	0	0	3	
TTST	15	2	0	17	0	6	0	6	2	0	0	2	
% TTST	1.7	0.9	0	1.5	0	0.9	0	0.9	1.2	0	0	1.2	
Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	
% Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	



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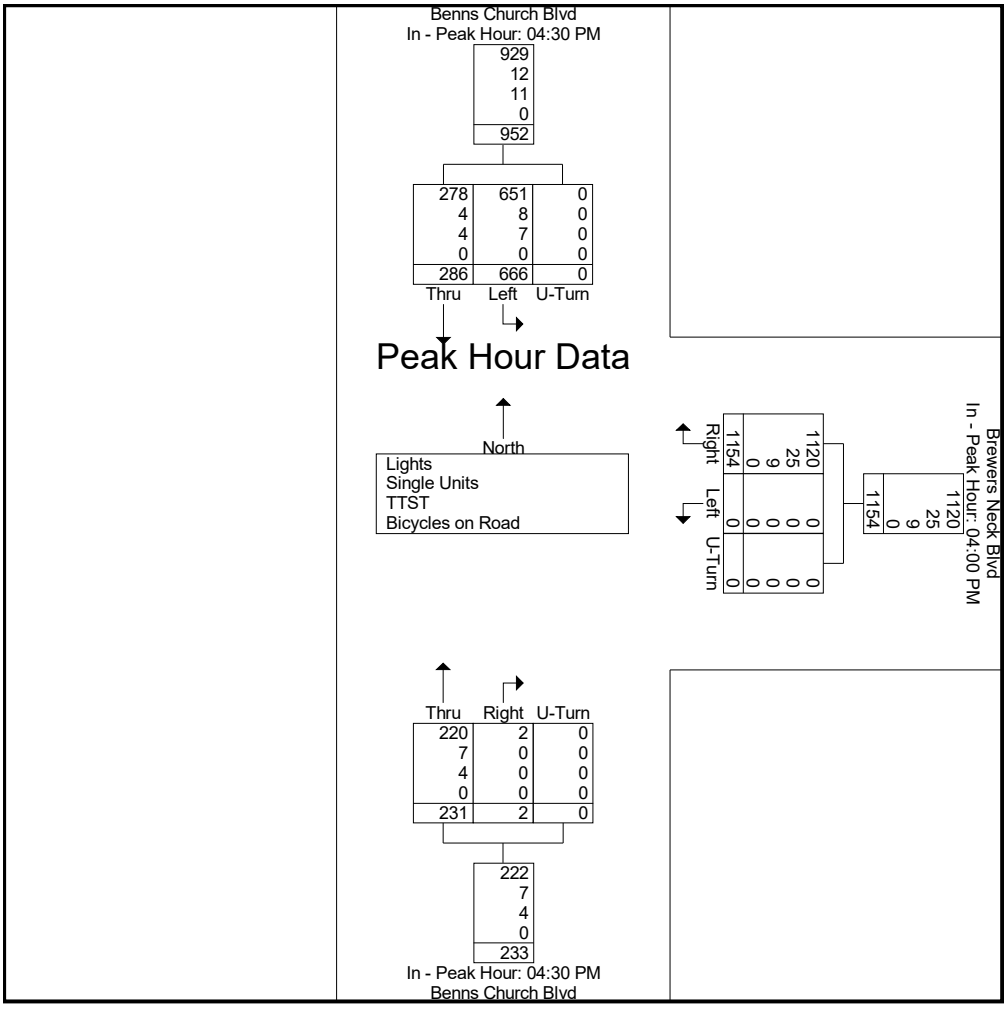
	Benns Church Blvd Southbound				Brewers Neck Blvd Westbound				Benns Church Blvd Northbound				
Start Time	Left	Thru	U-Turn	App. Total	Left	Right	U-Turn	App. Total	Thru	Right	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:15 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:00 PM													
04:00 PM	163	62	0	225	0	311	0	311	51	2	0	53	589
04:15 PM	164	66	0	230	0	286	0	286	42	2	0	44	560
04:30 PM	162	81	0	243	0	278	0	278	47	1	0	48	569
04:45 PM	158	67	0	225	0	279	0	279	55	0	0	55	559
Total Volume	647	276	0	923	0	1154	0	1154	195	5	0	200	2277
% App. Total	70.1	29.9	0		0	100	0		97.5	2.5	0		
PHF	.986	.852	.000	.950	.000	.928	.000	.928	.886	.625	.000	.909	.966
Lights	630	264	0	894	0	1120	0	1120	188	5	0	193	2207
% Lights	97.4	95.7	0	96.9	0	97.1	0	97.1	96.4	100	0	96.5	96.9
Single Units	15	7	0	22	0	25	0	25	4	0	0	4	51
% Single Units	2.3	2.5	0	2.4	0	2.2	0	2.2	2.1	0	0	2.0	2.2
TTST	2	5	0	7	0	9	0	9	3	0	0	3	19
% TTST	0.3	1.8	0	0.8	0	0.8	0	0.8	1.5	0	0	1.5	0.8
Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0



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	Benns Church Blvd Southbound				Brewers Neck Blvd Westbound				Benns Church Blvd Northbound				
Start Time	Left	Thru	U-Turn	App. Total	Left	Right	U-Turn	App. Total	Thru	Right	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:15 PM - Peak 1 of 1													
Peak Hour for Each Approach Begins at:													
	04:30 PM				04:00 PM				04:30 PM				
+0 mins.	162	81	0	243	0	311	0	311	47	1	0	48	
+15 mins.	158	67	0	225	0	286	0	286	55	0	0	55	
+30 mins.	172	62	0	234	0	278	0	278	64	1	0	65	
+45 mins.	174	76	0	250	0	279	0	279	65	0	0	65	
Total Volume	666	286	0	952	0	1154	0	1154	231	2	0	233	
% App. Total	70	30	0		0	100	0		99.1	0.9	0		
PHF	.957	.883	.000	.952	.000	.928	.000	.928	.888	.500	.000	.896	
Lights	651	278	0	929	0	1120	0	1120	220	2	0	222	
% Lights	97.7	97.2	0	97.6	0	97.1	0	97.1	95.2	100	0	95.3	
Single Units	8	4	0	12	0	25	0	25	7	0	0	7	
% Single Units	1.2	1.4	0	1.3	0	2.2	0	2.2	3	0	0	3	
TTST	7	4	0	11	0	9	0	9	4	0	0	4	
% TTST	1.1	1.4	0	1.2	0	0.8	0	0.8	1.7	0	0	1.7	
Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	
% Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	



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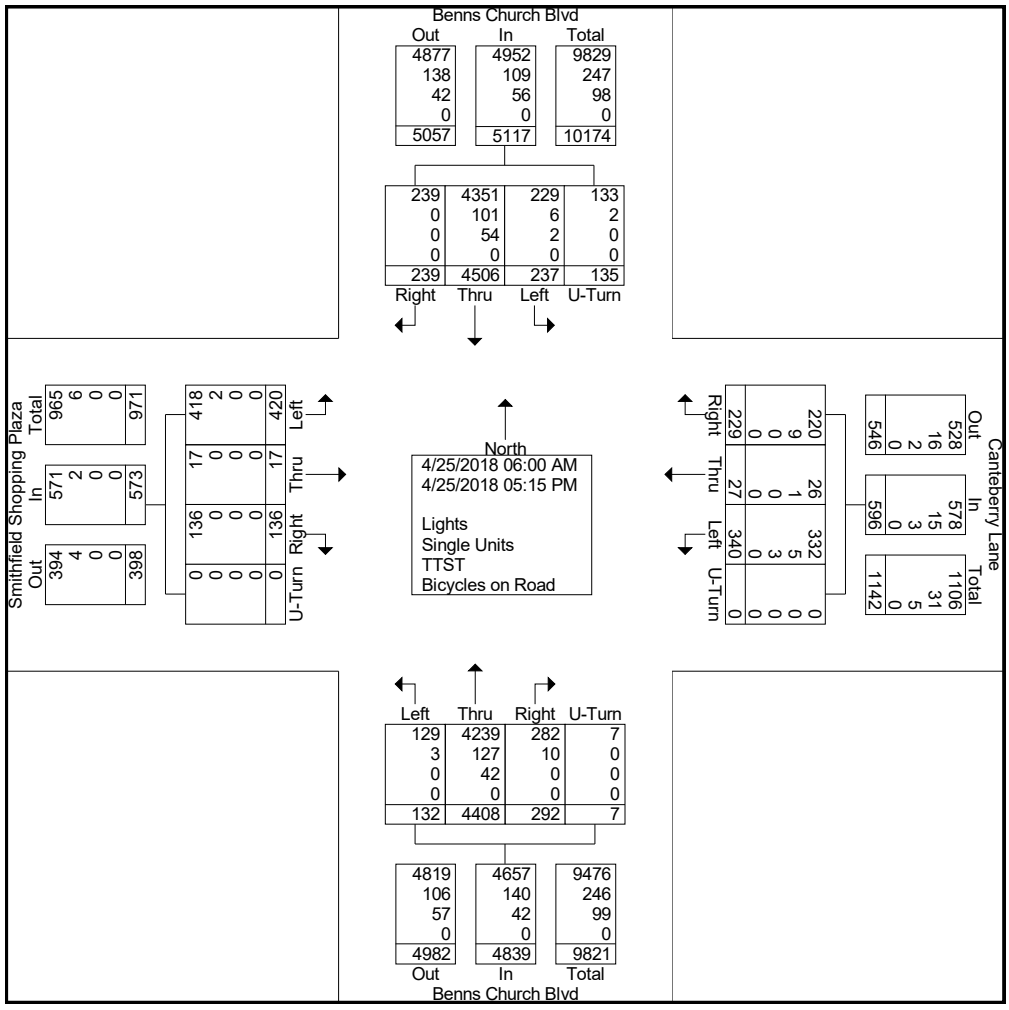
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Groups Printed- Lights - Single Units - TTST - Bicycles on Road

	Benns Church Blvd Southbound				Canteberry Lane Westbound				Benns Church Blvd Northbound				Smithfield Shopping Plaza Eastbound				
Start Time	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Int. Total
06:00 AM	1	204	3	4	7	2	5	0	1	146	2	0	0	0	4	0	379
06:15 AM	7	211	2	3	20	1	3	0	0	164	4	0	0	0	1	0	416
06:30 AM	11	260	2	6	20	0	7	0	4	126	8	0	4	0	3	0	451
06:45 AM	9	242	7	3	23	1	10	0	6	105	9	0	5	0	5	0	425
Total	28	917	14	16	70	4	25	0	11	541	23	0	9	0	13	0	1671
07:00 AM	7	408	7	1	29	2	9	0	5	140	9	0	3	0	4	0	624
07:15 AM	12	245	10	6	15	0	12	0	1	194	15	0	6	0	8	0	524
07:30 AM	9	192	7	3	25	1	5	0	0	192	13	0	7	0	4	0	458
07:45 AM	7	185	8	4	19	1	12	0	7	185	8	0	7	1	1	0	445
Total	35	1030	32	14	88	4	38	0	13	711	45	0	23	1	17	0	2051
02:30 PM	9	200	13	4	19	1	8	0	7	197	7	0	37	1	6	0	509
02:45 PM	12	182	10	6	13	4	8	0	5	246	18	2	25	1	12	0	544
Total	21	382	23	10	32	5	16	0	12	443	25	2	62	2	18	0	1053
03:00 PM	7	189	13	7	13	1	5	0	13	278	15	1	24	0	11	0	577
03:15 PM	11	205	13	7	9	0	13	0	8	248	19	0	37	1	8	0	579
03:30 PM	10	170	14	10	18	2	11	0	4	263	12	0	25	4	8	0	551
03:45 PM	22	218	11	6	23	1	11	0	8	264	18	1	32	2	14	0	631
Total	50	782	51	30	63	4	40	0	33	1053	64	2	118	7	41	0	2338
04:00 PM	15	244	31	7	16	3	17	0	11	269	28	2	31	2	6	0	682
04:15 PM	15	206	15	15	13	2	18	0	6	281	19	0	28	3	18	0	639
04:30 PM	21	233	20	7	19	2	19	0	18	265	11	0	35	0	5	0	655
04:45 PM	25	248	22	13	9	1	17	0	8	294	37	1	33	0	11	0	719
Total	76	931	88	42	57	8	71	0	43	1109	95	3	127	5	40	0	2695
05:00 PM	12	223	13	11	20	2	25	0	9	268	20	0	48	1	1	0	653
05:15 PM	15	241	18	12	10	0	14	0	11	283	20	0	33	1	6	0	664
Grand Total	237	4506	239	135	340	27	229	0	132	4408	292	7	420	17	136	0	11125
Apprch %	4.6	88.1	4.7	2.6	57	4.5	38.4	0	2.7	91.1	6	0.1	73.3	3	23.7	0	
Total %	2.1	40.5	2.1	1.2	3.1	0.2	2.1	0	1.2	39.6	2.6	0.1	3.8	0.2	1.2	0	
Lights	229	4351	239	133	332	26	220	0	129	4239	282	7	418	17	136	0	10758
% Lights	96.6	96.6	100	98.5	97.6	96.3	96.1	0	97.7	96.2	96.6	100	99.5	100	100	0	96.7
Single Units	6	101	0	2	5	1	9	0	3	127	10	0	2	0	0	0	266
% Single Units	2.5	2.2	0	1.5	1.5	3.7	3.9	0	2.3	2.9	3.4	0	0.5	0	0	0	2.4
TTST	2	54	0	0	3	0	0	0	0	42	0	0	0	0	0	0	101
% TTST	0.8	1.2	0	0	0.9	0	0	0	0	1	0	0	0	0	0	0	0.9
Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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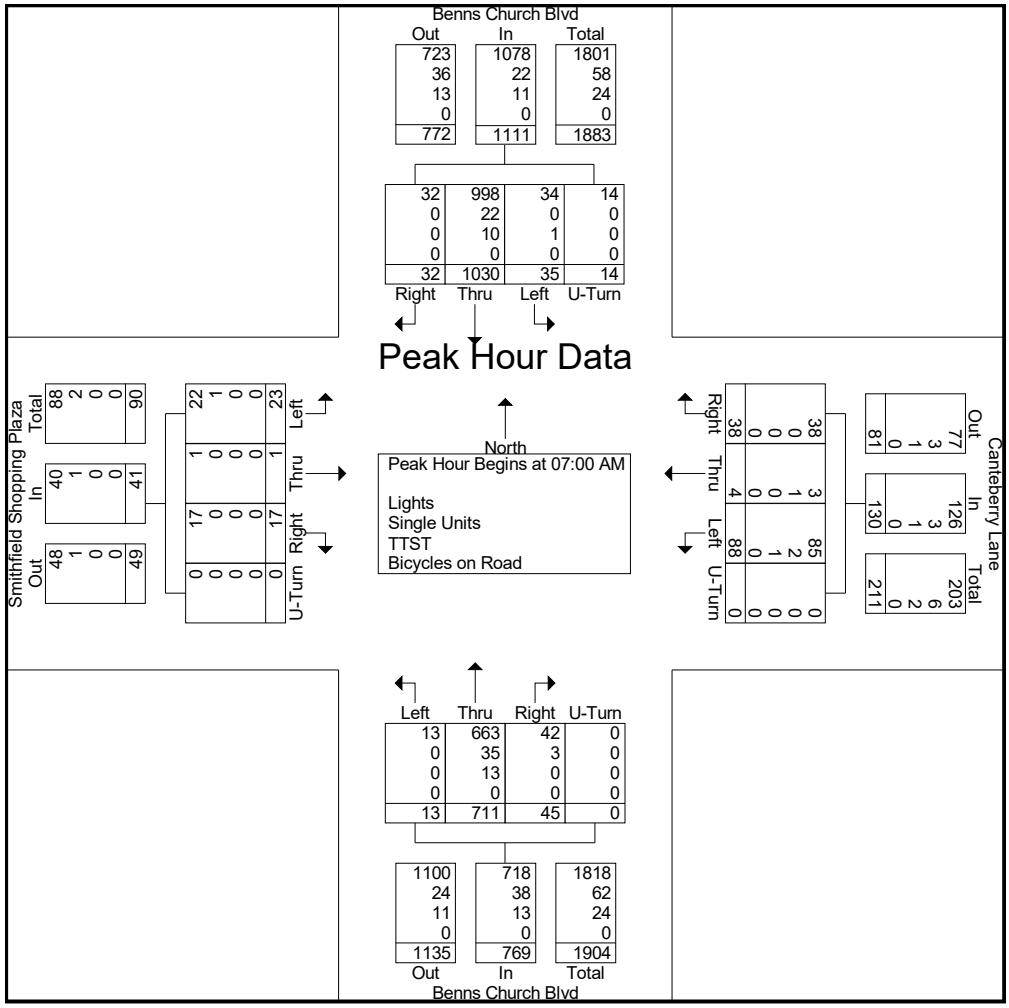
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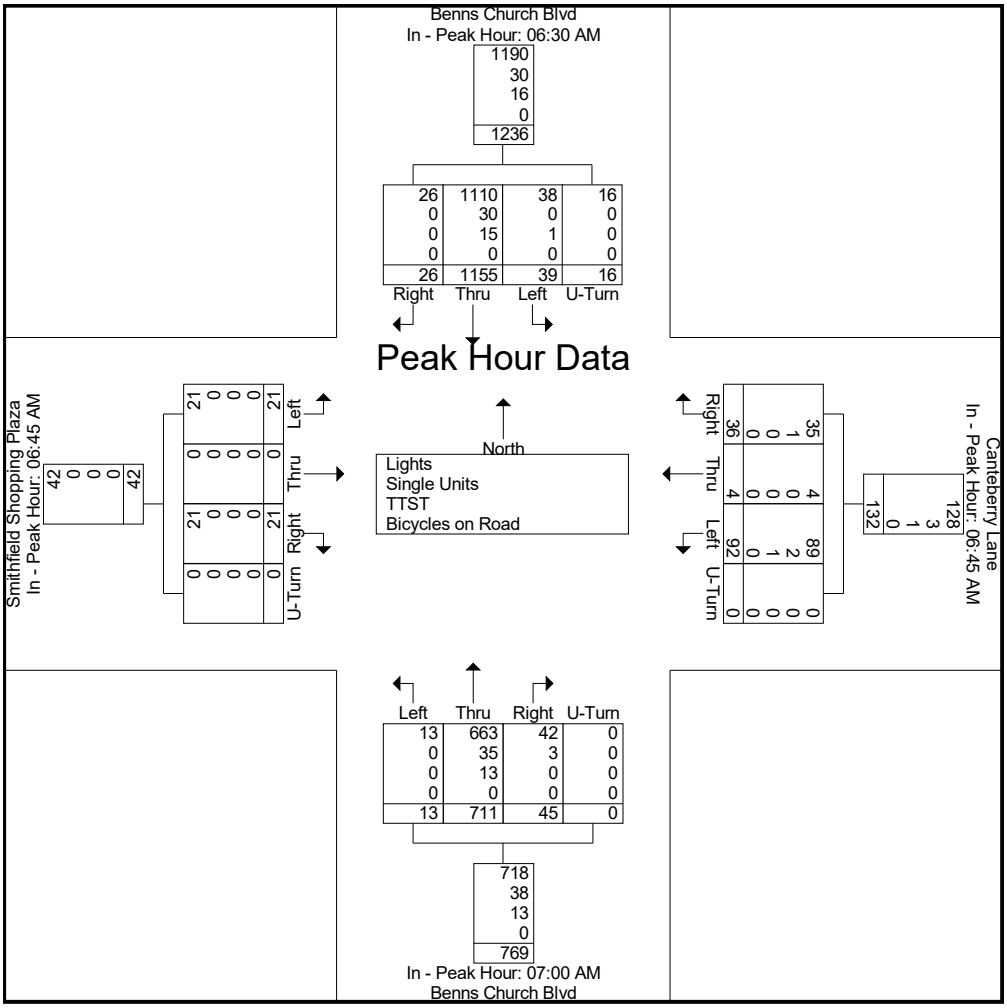
	Benns Church Blvd Southbound					Canteberry Lane Westbound					Benns Church Blvd Northbound					Smithfield Shopping Plaza Eastbound					
Start Time			Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	7	408	7	1	423	29	2	9	0	40	5	140	9	0	154	3	0	4	0	7	624
07:15 AM	12	245	10	6	273	15	0	12	0	27	1	194	15	0	210	6	0	8	0	14	524
07:30 AM	9	192	7	3	211	25	1	5	0	31	0	192	13	0	205	7	0	4	0	11	458
07:45 AM	7	185	8	4	204	19	1	12	0	32	7	185	8	0	200	7	1	1	0	9	445
Total Volume	35	1030	32	14	1111	88	4	38	0	130	13	711	45	0	769	23	1	17	0	41	2051
% App. Total	3.2	92.7	2.9	1.3		67.7	3.1	29.2	0		1.7	92.5	5.9	0		56.1	2.4	41.5	0		
PHF	.729	.631	.800	.583	.657	.759	.500	.792	.000	.813	.464	.916	.750	.000	.915	.821	.250	.531	.000	.732	.822
Lights	34	998	32	14	1078	85	3	38	0	126	13	663	42	0	718	22	1	17	0	40	1962
% Lights	97.1	96.9	100	100	97.0	96.6	75.0	100	0	96.9	100	93.2	93.3	0	93.4	95.7	100	100	0	97.6	95.7
Single Units	0	22	0	0	22	2	1	0	0	3	0	35	3	0	38	1	0	0	0	1	64
% Single Units	0	2.1	0	0	2.0	2.3	25.0	0	0	2.3	0	4.9	6.7	0	4.9	4.3	0	0	0	2.4	3.1
TTST	1	10	0	0	11	1	0	0	0	1	0	13	0	0	13	0	0	0	0	0	25
% TTST	2.9	1.0	0	0	1.0	1.1	0	0	0	0.8	0	1.8	0	0	1.7	0	0	0	0	0	1.2
Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



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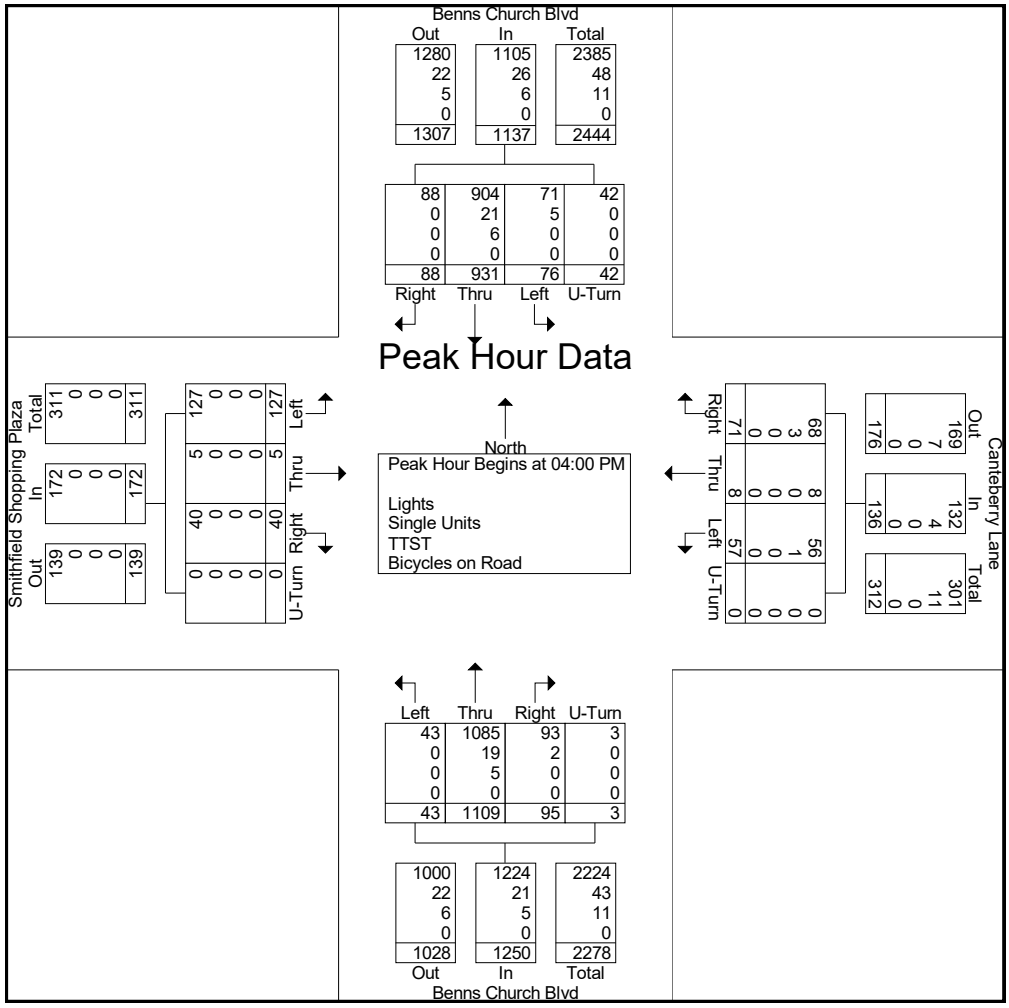
	Benns Church Blvd Southbound					Canteberry Lane Westbound					Benns Church Blvd Northbound					Smithfield Shopping Plaza Eastbound					
Start Time			Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Each Approach Begins at:																					
	06:30 AM					06:45 AM					07:00 AM					06:45 AM					
+0 mins.	11	260	2	6	279	23	1	10	0	34	5	140	9	0	154	5	0	5	0	10	
+15 mins.	9	242	7	3	261	29	2	9	0	40	1	194	15	0	210	3	0	4	0	7	
+30 mins.	7	408	7	1	423	15	0	12	0	27	0	192	13	0	205	6	0	8	0	14	
+45 mins.	12	245	10	6	273	25	1	5	0	31	7	185	8	0	200	7	0	4	0	11	
Total Volume	39	1155	26	16	1236	92	4	36	0	132	13	711	45	0	769	21	0	21	0	42	
% App. Total	3.2	93.4	2.1	1.3		69.7	3	27.3	0		1.7	92.5	5.9	0		50	0	50	0		
PHF	.813	.708	.650	.667	.730	.793	.500	.750	.000	.825	.464	.916	.750	.000	.915	.750	.000	.656	.000	.750	
Lights	38	1110	26	16	1190	89	4	35	0	128	13	663	42	0	718	21	0	21	0	42	
% Lights	97.4	96.1	100	100	96.3	96.7	100	97.2	0	97	100	93.2	93.3	0	93.4	100	0	100	0	100	
Single Units	0	30	0	0	30	2	0	1	0	3	0	35	3	0	38	0	0	0	0	0	
% Single Units	0	2.6	0	0	2.4	2.2	0	2.8	0	2.3	0	4.9	6.7	0	4.9	0	0	0	0	0	
TTST	1	15	0	0	16	1	0	0	0	1	0	13	0	0	13	0	0	0	0	0	
% TTST	2.6	1.3	0	0	1.3	1.1	0	0	0	0.8	0	1.8	0	0	1.7	0	0	0	0	0	
Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
% Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	



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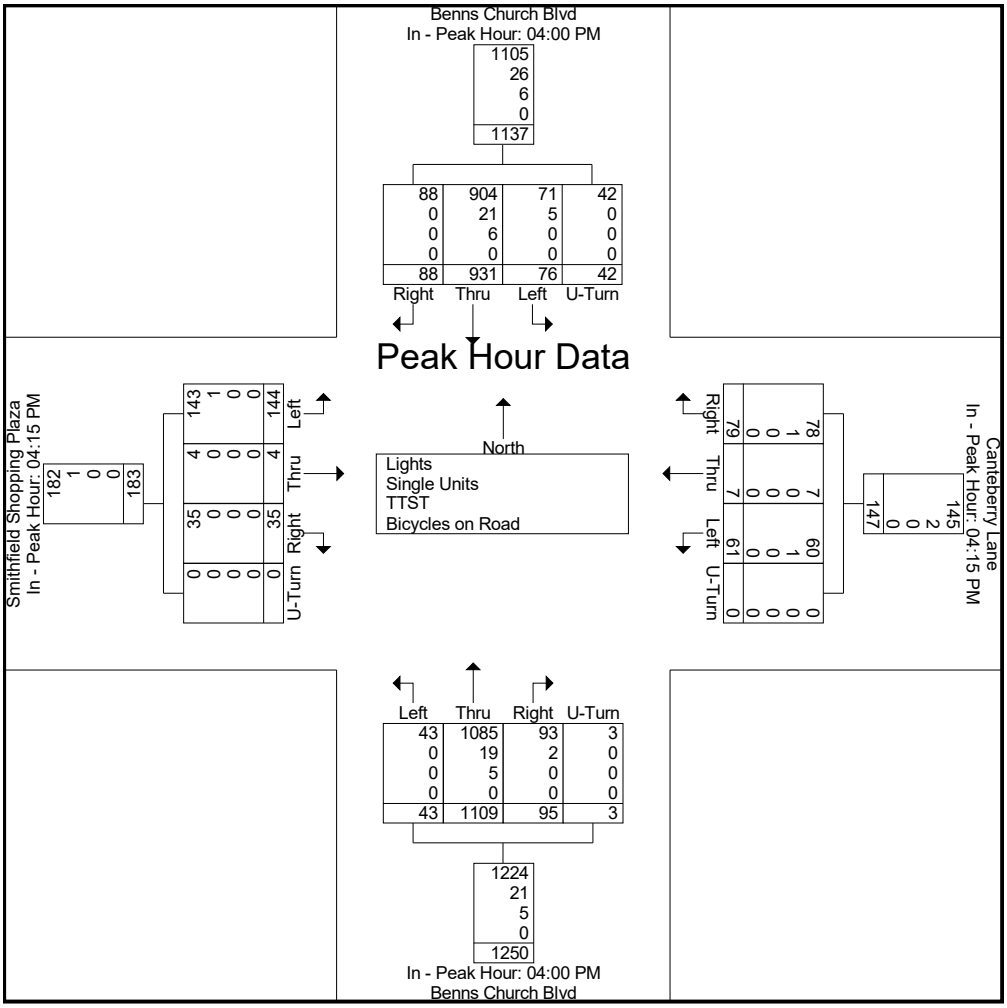
	Benns Church Blvd Southbound					Canteberry Lane Westbound					Benns Church Blvd Northbound					Smithfield Shopping Plaza Eastbound					
Start Time	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:15 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	15	244	31	7	297	16	3	17	0	36	11	269	28	2	310	31	2	6	0	39	682
04:15 PM	15	206	15	15	251	13	2	18	0	33	6	281	19	0	306	28	3	18	0	49	639
04:30 PM	21	233	20	7	281	19	2	19	0	40	18	265	11	0	294	35	0	5	0	40	655
04:45 PM	25	248	22	13	308	9	1	17	0	27	8	294	37	1	340	33	0	11	0	44	719
Total Volume	76	931	88	42	1137	57	8	71	0	136	43	1109	95	3	1250	127	5	40	0	172	2695
% App. Total	6.7	81.9	7.7	3.7		41.9	5.9	52.2	0		3.4	88.7	7.6	0.2		73.8	2.9	23.3	0		
PHF	.760	.939	.710	.700	.923	.750	.667	.934	.000	.850	.597	.943	.642	.375	.919	.907	.417	.556	.000	.878	.937
Lights	71	904	88	42	1105	56	8	68	0	132	43	1085	93	3	1224	127	5	40	0	172	2633
% Lights	93.4	97.1	100	100	97.2	98.2	100	95.8	0	97.1	100	97.8	97.9	100	97.9	100	100	100	0	100	97.7
Single Units	5	21	0	0	26	1	0	3	0	4	0	19	2	0	21	0	0	0	0	0	51
% Single Units	6.6	2.3	0	0	2.3	1.8	0	4.2	0	2.9	0	1.7	2.1	0	1.7	0	0	0	0	0	1.9
TTST	0	6	0	0	6	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	11
% TTST	0	0.6	0	0	0.5	0	0	0	0	0	0	0.5	0	0	0.4	0	0	0	0	0	0.4
Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



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	Benns Church Blvd Southbound					Canteberry Lane Westbound					Benns Church Blvd Northbound					Smithfield Shopping Plaza Eastbound					
Start Time	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:15 PM - Peak 1 of 1																					
Peak Hour for Each Approach Begins at:																					
	04:00 PM					04:15 PM					04:00 PM					04:15 PM					
+0 mins.	15	244	31	7	297	13	2	18	0	33	11	269	28	2	310	28	3	18	0	49	
+15 mins.	15	206	15	15	251	19	2	19	0	40	6	281	19	0	306	35	0	5	0	40	
+30 mins.	21	233	20	7	281	9	1	17	0	27	18	265	11	0	294	33	0	11	0	44	
+45 mins.	25	248	22	13	308	20	2	25	0	47	8	294	37	1	340	48	1	1	0	50	
Total Volume	76	931	88	42	1137	61	7	79	0	147	43	1109	95	3	1250	144	4	35	0	183	
% App. Total	6.7	81.9	7.7	3.7		41.5	4.8	53.7	0		3.4	88.7	7.6	0.2		78.7	2.2	19.1	0		
PHF	.760	.939	.710	.700	.923	.763	.875	.790	.000	.782	.597	.943	.642	.375	.919	.750	.333	.486	.000	.915	
Lights	71	904	88	42	1105	60	7	78	0	145	43	1085	93	3	1224	143	4	35	0	182	
% Lights	93.4	97.1	100	100	97.2	98.4	100	98.7	0	98.6	100	97.8	97.9	100	97.9	99.3	100	100	0	99.5	
Single Units	5	21	0	0	26	1	0	1	0	2	0	19	2	0	21	1	0	0	0	1	
% Single Units	6.6	2.3	0	0	2.3	1.6	0	1.3	0	1.4	0	1.7	2.1	0	1.7	0.7	0	0	0	0.5	
TTST	0	6	0	0	6	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	
% TTST	0	0.6	0	0	0.5	0	0	0	0	0	0	0.5	0	0	0.4	0	0	0	0	0	
Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
% Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	



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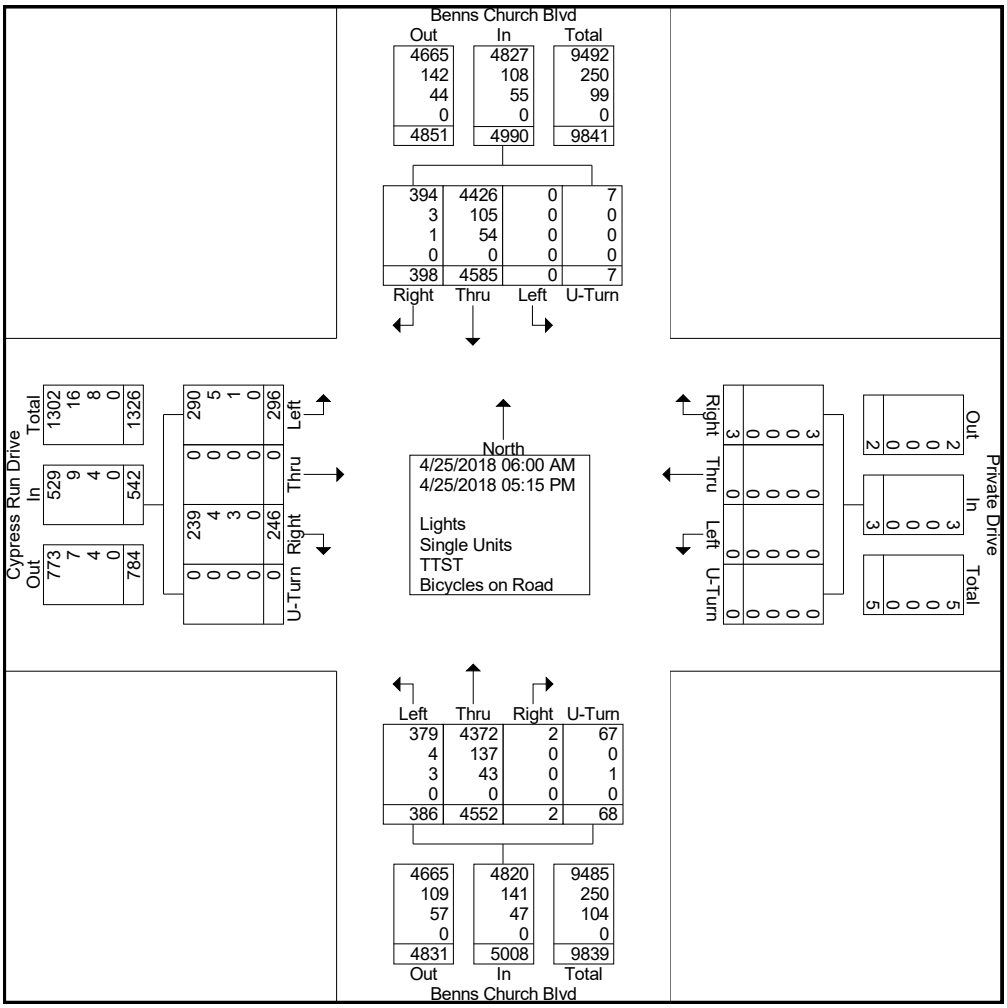
File Name : Benns_Church_and_Cypress_Run_Dr_514981_04-25-2018
Site Code :
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Groups Printed- Lights - Single Units - TTST - Bicycles on Road

	Benns Church Blvd Southbound				Private Drive Westbound				Benns Church Blvd Northbound				Cypress Run Drive Eastbound				
Start Time	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Int. Total
06:00 AM	0	205	7	0	0	0	0	0	2	136	0	0	1	0	4	0	355
06:15 AM	0	225	4	1	0	0	0	0	1	171	0	0	0	0	3	0	405
06:30 AM	0	278	9	1	0	0	0	0	2	149	0	4	0	0	3	0	446
06:45 AM	0	270	8	0	0	0	0	0	2	118	0	0	2	0	2	0	402
Total	0	978	28	2	0	0	0	0	7	574	0	4	3	0	12	0	1608
07:00 AM	0	433	4	0	0	0	0	0	2	157	0	2	0	0	5	0	603
07:15 AM	0	271	7	1	0	0	0	0	8	211	0	1	2	0	8	0	509
07:30 AM	0	209	9	1	0	0	0	0	3	191	0	2	4	0	3	0	422
07:45 AM	0	202	7	0	0	0	0	0	1	205	0	1	2	0	4	0	422
Total	0	1115	27	2	0	0	0	0	14	764	0	6	8	0	20	0	1956
02:30 PM	0	192	23	1	0	0	0	0	25	195	0	5	19	0	23	0	483
02:45 PM	0	179	33	0	0	0	1	0	31	256	1	2	21	0	22	0	546
Total	0	371	56	1	0	0	1	0	56	451	1	7	40	0	45	0	1029
03:00 PM	0	176	40	1	0	0	0	0	33	283	0	3	19	0	19	0	574
03:15 PM	0	197	29	0	0	0	1	0	26	244	1	6	28	0	13	0	545
03:30 PM	0	178	16	1	0	0	0	0	33	259	0	6	23	0	15	0	531
03:45 PM	0	234	16	0	0	0	0	0	36	264	0	8	22	0	18	0	598
Total	0	785	101	2	0	0	1	0	128	1050	1	23	92	0	65	0	2248
04:00 PM	0	230	40	0	0	0	0	0	40	284	0	4	26	0	17	0	641
04:15 PM	0	199	27	0	0	0	0	0	22	283	0	4	24	0	13	0	572
04:30 PM	0	240	27	0	0	0	0	0	25	269	0	4	25	0	11	0	601
04:45 PM	0	218	37	0	0	0	0	0	44	308	0	8	24	0	30	0	669
Total	0	887	131	0	0	0	0	0	131	1144	0	20	99	0	71	0	2483
05:00 PM	0	234	21	0	0	0	0	0	25	277	0	5	32	0	14	0	608
05:15 PM	0	215	34	0	0	0	1	0	25	292	0	3	22	0	19	0	611
Grand Total	0	4585	398	7	0	0	3	0	386	4552	2	68	296	0	246	0	10543
Apprch %	0	91.9	8	0.1	0	0	100	0	7.7	90.9	0	1.4	54.6	0	45.4	0	
Total %	0	43.5	3.8	0.1	0	0	0	0	3.7	43.2	0	0.6	2.8	0	2.3	0	
Lights	0	4426	394	7	0	0	3	0	379	4372	2	67	290	0	239	0	10179
% Lights	0	96.5	99	100	0	0	100	0	98.2	96	100	98.5	98	0	97.2	0	96.5
Single Units	0	105	3	0	0	0	0	0	4	137	0	0	5	0	4	0	258
% Single Units	0	2.3	0.8	0	0	0	0	0	1	3	0	0	1.7	0	1.6	0	2.4
TTST	0	54	1	0	0	0	0	0	3	43	0	1	1	0	3	0	106
% TTST	0	1.2	0.3	0	0	0	0	0	0.8	0.9	0	1.5	0.3	0	1.2	0	1
Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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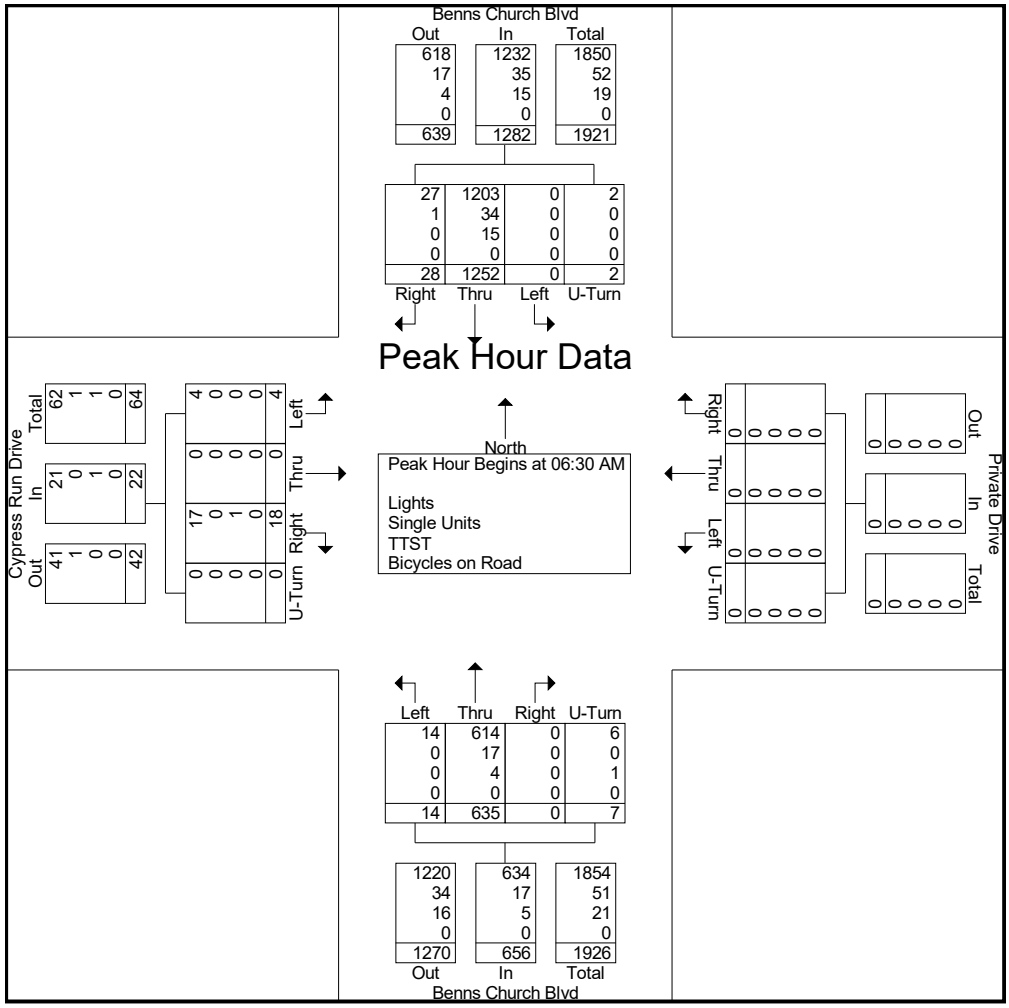
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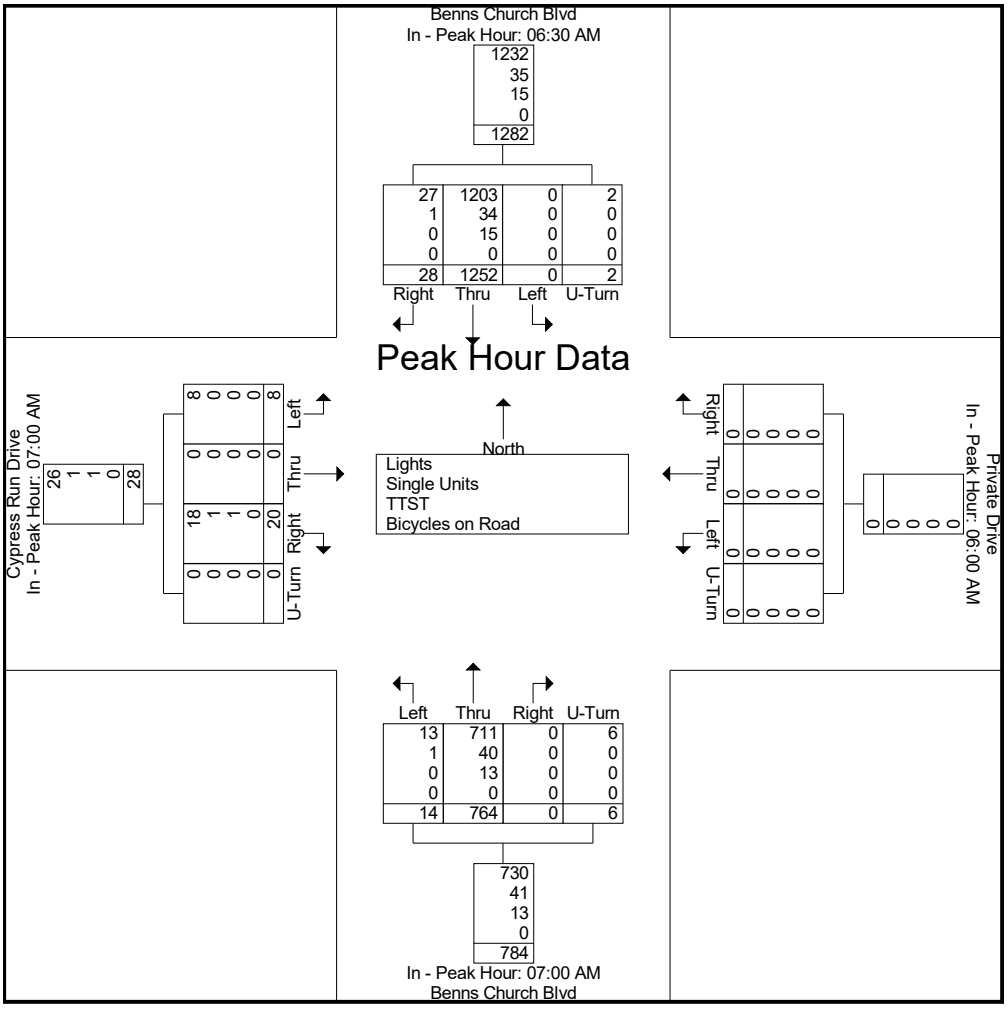
	Benns Church Blvd Southbound					Private Drive Westbound					Benns Church Blvd Northbound					Cypress Run Drive Eastbound					
Start Time			Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 06:30 AM																					
06:30 AM	0	278	9	1	288	0	0	0	0	0	2	149	0	4	155	0	0	3	0	3	446
06:45 AM	0	270	8	0	278	0	0	0	0	0	2	118	0	0	120	2	0	2	0	4	402
07:00 AM	0	433	4	0	437	0	0	0	0	0	2	157	0	2	161	0	0	5	0	5	603
07:15 AM	0	271	7	1	279	0	0	0	0	0	8	211	0	1	220	2	0	8	0	10	509
Total Volume	0	1252	28	2	1282	0	0	0	0	0	14	635	0	7	656	4	0	18	0	22	1960
% App. Total	0	97.7	2.2	0.2		0	0	0	0		2.1	96.8	0	1.1		18.2	0	81.8	0		
PHF	.000	.723	.778	.500	.733	.000	.000	.000	.000	.000	.438	.752	.000	.438	.745	.500	.000	.563	.000	.550	.813
Lights	0	1203	27	2	1232	0	0	0	0	0	14	614	0	6	634	4	0	17	0	21	1887
% Lights	0	96.1	96.4	100	96.1	0	0	0	0	0	100	96.7	0	85.7	96.6	100	0	94.4	0	95.5	96.3
Single Units	0	34	1	0	35	0	0	0	0	0	0	17	0	0	17	0	0	0	0	0	52
% Single Units	0	2.7	3.6	0	2.7	0	0	0	0	0	0	2.7	0	0	2.6	0	0	0	0	0	2.7
TTST	0	15	0	0	15	0	0	0	0	0	0	4	0	1	5	0	0	1	0	1	21
% TTST	0	1.2	0	0	1.2	0	0	0	0	0	0	0.6	0	14.3	0.8	0	0	5.6	0	4.5	1.1
Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



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File Name : Benns_Church_and_Cypress_Run_Dr_514981_04-25-2018
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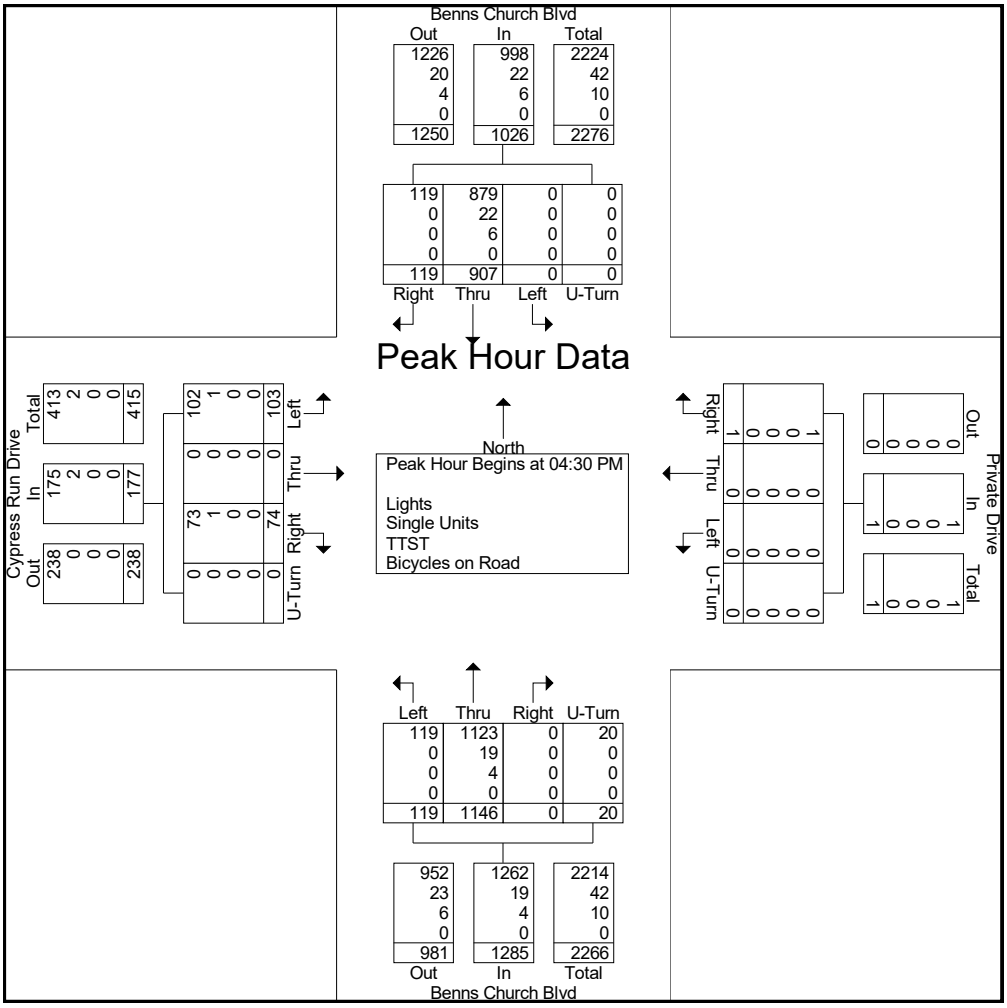
	Benns Church Blvd Southbound					Private Drive Westbound					Benns Church Blvd Northbound					Cypress Run Drive Eastbound					
Start Time			Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Each Approach Begins at:																					
	06:30 AM					06:00 AM					07:00 AM					07:00 AM					
+0 mins.	0	278	9	1	288	0	0	0	0	0	2	157	0	2	161	0	0	5	0	5	
+15 mins.	0	270	8	0	278	0	0	0	0	0	8	211	0	1	220	2	0	8	0	10	
+30 mins.	0	433	4	0	437	0	0	0	0	0	3	191	0	2	196	4	0	3	0	7	
+45 mins.	0	271	7	1	279	0	0	0	0	0	1	205	0	1	207	2	0	4	0	6	
Total Volume	0	1252	28	2	1282	0	0	0	0	0	14	764	0	6	784	8	0	20	0	28	
% App. Total	0	97.7	2.2	0.2		0	0	0	0		1.8	97.4	0	0.8		28.6	0	71.4	0		
PHF	.000	.723	.778	.500	.733	.000	.000	.000	.000	.000	.438	.905	.000	.750	.891	.500	.000	.625	.000	.700	
Lights	0	1203	27	2	1232	0	0	0	0	0	13	711	0	6	730	8	0	18	0	26	
% Lights	0	96.1	96.4	100	96.1	0	0	0	0	0	92.9	93.1	0	100	93.1	100	0	90	0	92.9	
Single Units	0	34	1	0	35	0	0	0	0	0	1	40	0	0	41	0	0	1	0	1	
% Single Units	0	2.7	3.6	0	2.7	0	0	0	0	0	7.1	5.2	0	0	5.2	0	0	5	0	3.6	
TTST	0	15	0	0	15	0	0	0	0	0	0	13	0	0	13	0	0	1	0	1	
% TTST	0	1.2	0	0	1.2	0	0	0	0	0	0	1.7	0	0	1.7	0	0	5	0	3.6	
Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
% Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	



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File Name : Benns_Church_and_Cypress_Run_Dr_514981_04-25-2018
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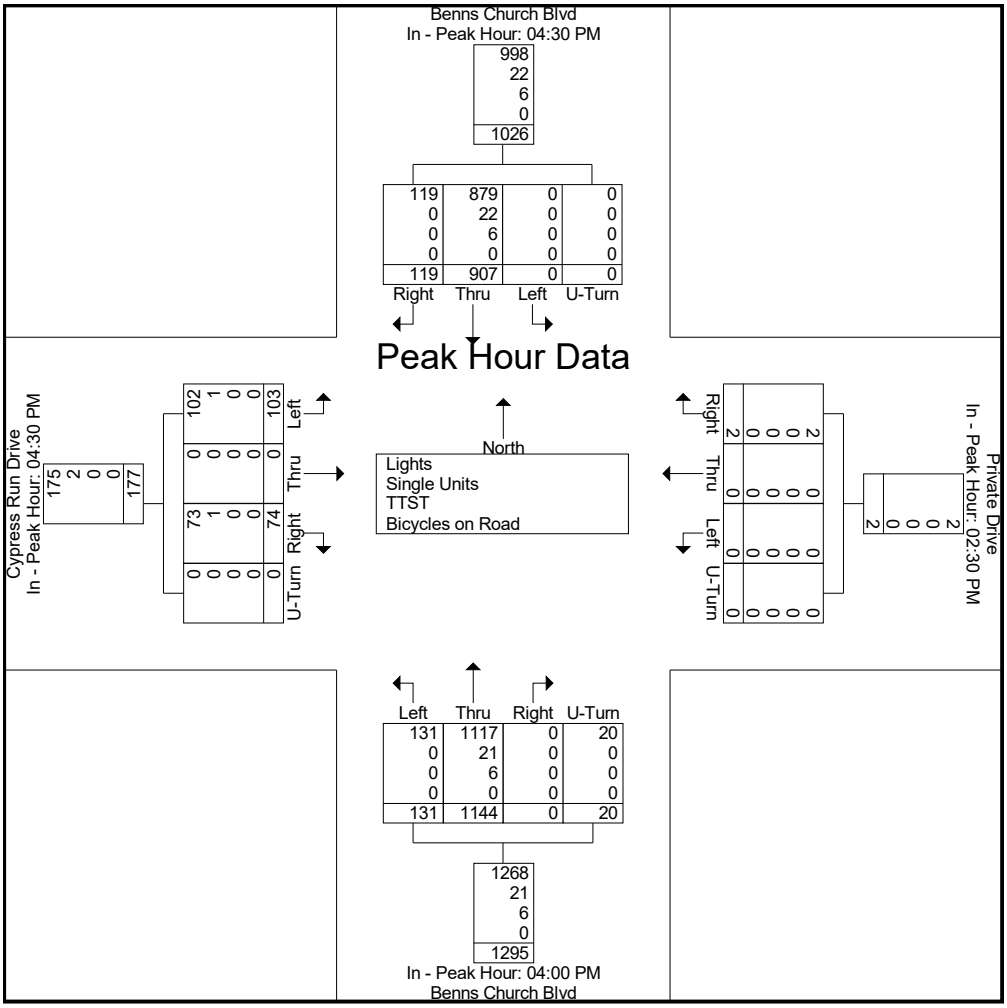
	Benns Church Blvd Southbound					Private Drive Westbound					Benns Church Blvd Northbound					Cypress Run Drive Eastbound					
Start Time	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:15 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	0	240	27	0	267	0	0	0	0	0	25	269	0	4	298	25	0	11	0	36	601
04:45 PM	0	218	37	0	255	0	0	0	0	0	44	308	0	8	360	24	0	30	0	54	669
05:00 PM	0	234	21	0	255	0	0	0	0	0	25	277	0	5	307	32	0	14	0	46	608
05:15 PM	0	215	34	0	249	0	0	1	0	1	25	292	0	3	320	22	0	19	0	41	611
Total Volume	0	907	119	0	1026	0	0	1	0	1	119	1146	0	20	1285	103	0	74	0	177	2489
% App. Total	0	88.4	11.6	0		0	0	100	0		9.3	89.2	0	1.6		58.2	0	41.8	0		
PHF	.000	.945	.804	.000	.961	.000	.000	.250	.000	.250	.676	.930	.000	.625	.892	.805	.000	.617	.000	.819	.930
Lights	0	879	119	0	998	0	0	1	0	1	119	1123	0	20	1262	102	0	73	0	175	2436
% Lights	0	96.9	100	0	97.3	0	0	100	0	100	100	98.0	0	100	98.2	99.0	0	98.6	0	98.9	97.9
Single Units	0	22	0	0	22	0	0	0	0	0	0	19	0	0	19	1	0	1	0	2	43
% Single Units	0	2.4	0	0	2.1	0	0	0	0	0	0	1.7	0	0	1.5	1.0	0	1.4	0	1.1	1.7
TTST	0	6	0	0	6	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	10
% TTST	0	0.7	0	0	0.6	0	0	0	0	0	0	0.3	0	0	0.3	0	0	0	0	0	0.4
Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



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File Name : Benns_Church_and_Cypress_Run_Dr_514981_04-25-2018
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Start Date : 4/25/2018
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	Benns Church Blvd Southbound					Private Drive Westbound					Benns Church Blvd Northbound					Cypress Run Drive Eastbound					
Start Time	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:15 PM - Peak 1 of 1																					
Peak Hour for Each Approach Begins at:																					
	04:30 PM					02:30 PM					04:00 PM					04:30 PM					
+0 mins.	0	240	27	0	267	0	0	0	0	0	40	284	0	4	328	25	0	11	0	36	
+15 mins.	0	218	37	0	255	0	0	1	0	1	22	283	0	4	309	24	0	30	0	54	
+30 mins.	0	234	21	0	255	0	0	0	0	0	25	269	0	4	298	32	0	14	0	46	
+45 mins.	0	215	34	0	249	0	0	1	0	1	44	308	0	8	360	22	0	19	0	41	
Total Volume	0	907	119	0	1026	0	0	2	0	2	131	1144	0	20	1295	103	0	74	0	177	
% App. Total	0	88.4	11.6	0		0	0	100	0		10.1	88.3	0	1.5		58.2	0	41.8	0		
PHF	.000	.945	.804	.000	.961	.000	.000	.500	.000	.500	.744	.929	.000	.625	.899	.805	.000	.617	.000	.819	
Lights	0	879	119	0	998	0	0	2	0	2	131	1117	0	20	1268	102	0	73	0	175	
% Lights	0	96.9	100	0	97.3	0	0	100	0	100	100	97.6	0	100	97.9	99	0	98.6	0	98.9	
Single Units	0	22	0	0	22	0	0	0	0	0	0	21	0	0	21	1	0	1	0	2	
% Single Units	0	2.4	0	0	2.1	0	0	0	0	0	0	1.8	0	0	1.6	1	0	1.4	0	1.1	
TTST	0	6	0	0	6	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	
% TTST	0	0.7	0	0	0.6	0	0	0	0	0	0	0.5	0	0	0.5	0	0	0	0	0	
Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
% Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	



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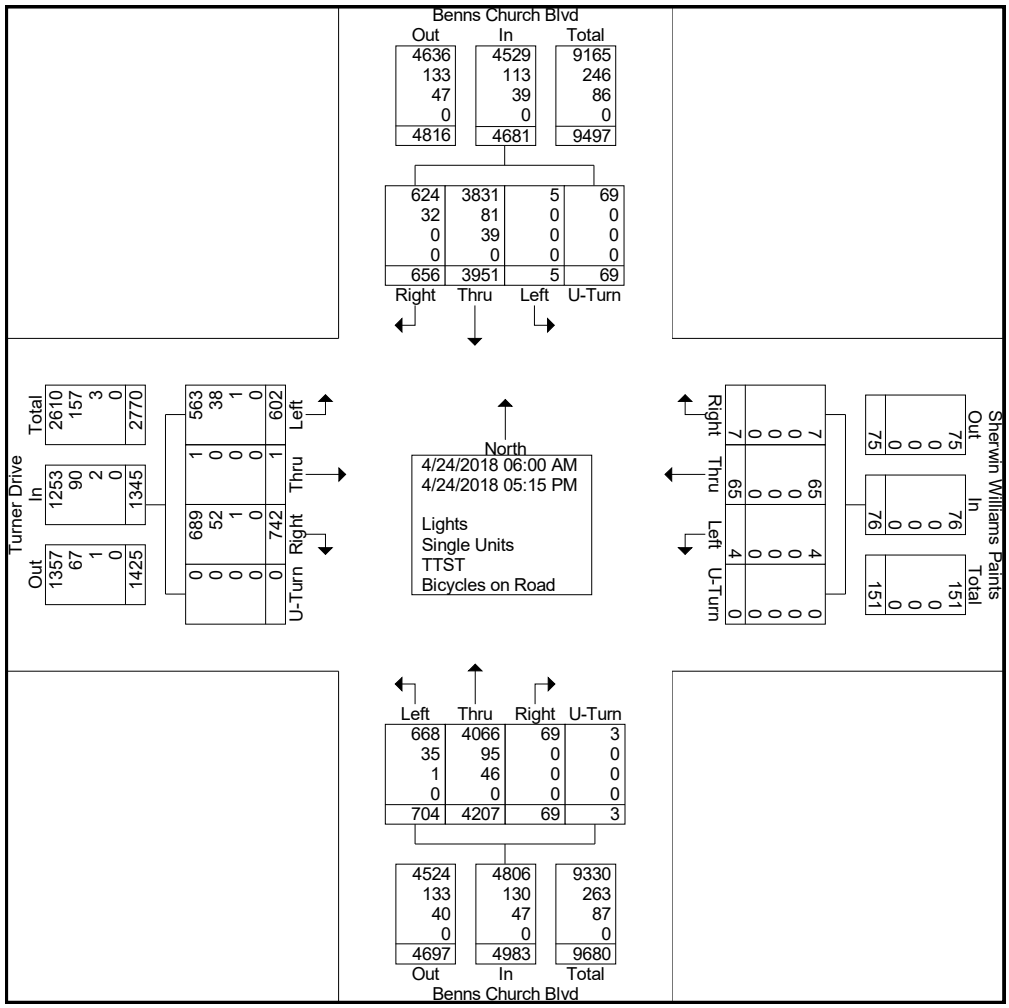
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Site Code :
Start Date : 4/24/2018
Page No : 1

Groups Printed- Lights - Single Units - TTST - Bicycles on Road

	Benns Church Blvd Southbound				Sherwin Williams Paints Westbound				Benns Church Blvd Northbound				Turner Drive Eastbound				
Start Time	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Int. Total
06:00 AM	0	216	8	0	0	0	0	0	7	134	0	0	3	0	30	0	398
06:15 AM	0	228	10	0	0	0	0	0	7	144	0	0	7	0	30	0	426
06:30 AM	0	233	16	0	0	0	0	0	19	150	1	0	10	0	21	0	450
06:45 AM	0	186	37	0	0	0	0	0	50	130	1	0	5	0	23	0	432
Total	0	863	71	0	0	0	0	0	83	558	2	0	25	0	104	0	1706
07:00 AM	0	192	142	1	0	23	1	0	103	104	34	0	30	0	56	0	686
07:15 AM	0	168	120	2	0	41	0	0	72	148	28	0	60	1	87	0	727
07:30 AM	0	288	13	0	0	0	0	0	18	152	0	1	67	0	74	0	613
07:45 AM	1	190	13	2	1	0	0	0	22	156	0	0	14	0	36	0	435
Total	1	838	288	5	1	64	1	0	215	560	62	1	171	1	253	0	2461
02:30 PM	0	170	44	0	1	0	1	0	32	179	0	1	26	0	23	0	477
02:45 PM	1	119	22	5	1	0	0	0	21	193	0	0	124	0	70	0	556
Total	1	289	66	5	2	0	1	0	53	372	0	1	150	0	93	0	1033
03:00 PM	1	168	18	4	0	0	0	0	18	208	0	1	83	0	70	0	571
03:15 PM	0	165	16	4	0	0	1	0	28	260	1	0	30	0	35	0	540
03:30 PM	0	150	26	4	0	0	0	0	31	258	0	0	19	0	19	0	507
03:45 PM	0	197	23	9	1	0	1	0	31	204	3	0	19	0	39	0	527
Total	1	680	83	21	1	0	2	0	108	930	4	1	151	0	163	0	2145
04:00 PM	0	207	21	5	0	0	0	0	38	330	0	0	21	0	19	0	641
04:15 PM	0	197	15	6	0	0	1	0	54	261	0	0	8	0	24	0	566
04:30 PM	0	223	18	2	0	0	0	0	32	317	1	0	2	0	20	0	615
04:45 PM	0	217	31	2	0	1	0	0	43	292	0	0	23	0	27	0	636
Total	0	844	85	15	0	1	1	0	167	1200	1	0	54	0	90	0	2458
05:00 PM	1	215	30	9	0	0	1	0	40	271	0	0	30	0	14	0	611
05:15 PM	1	222	33	14	0	0	1	0	38	316	0	0	21	0	25	0	671
Grand Total	5	3951	656	69	4	65	7	0	704	4207	69	3	602	1	742	0	11085
Apprch %	0.1	84.4	14	1.5	5.3	85.5	9.2	0	14.1	84.4	1.4	0.1	44.8	0.1	55.2	0	
Total %	0	35.6	5.9	0.6	0	0.6	0.1	0	6.4	38	0.6	0	5.4	0	6.7	0	
Lights	5	3831	624	69	4	65	7	0	668	4066	69	3	563	1	689	0	10664
% Lights	100	97	95.1	100	100	100	100	0	94.9	96.6	100	100	93.5	100	92.9	0	96.2
Single Units	0	81	32	0	0	0	0	0	35	95	0	0	38	0	52	0	333
% Single Units	0	2.1	4.9	0	0	0	0	0	5	2.3	0	0	6.3	0	7	0	3
TTST	0	39	0	0	0	0	0	0	1	46	0	0	1	0	1	0	88
% TTST	0	1	0	0	0	0	0	0	0.1	1.1	0	0	0.2	0	0.1	0	0.8
Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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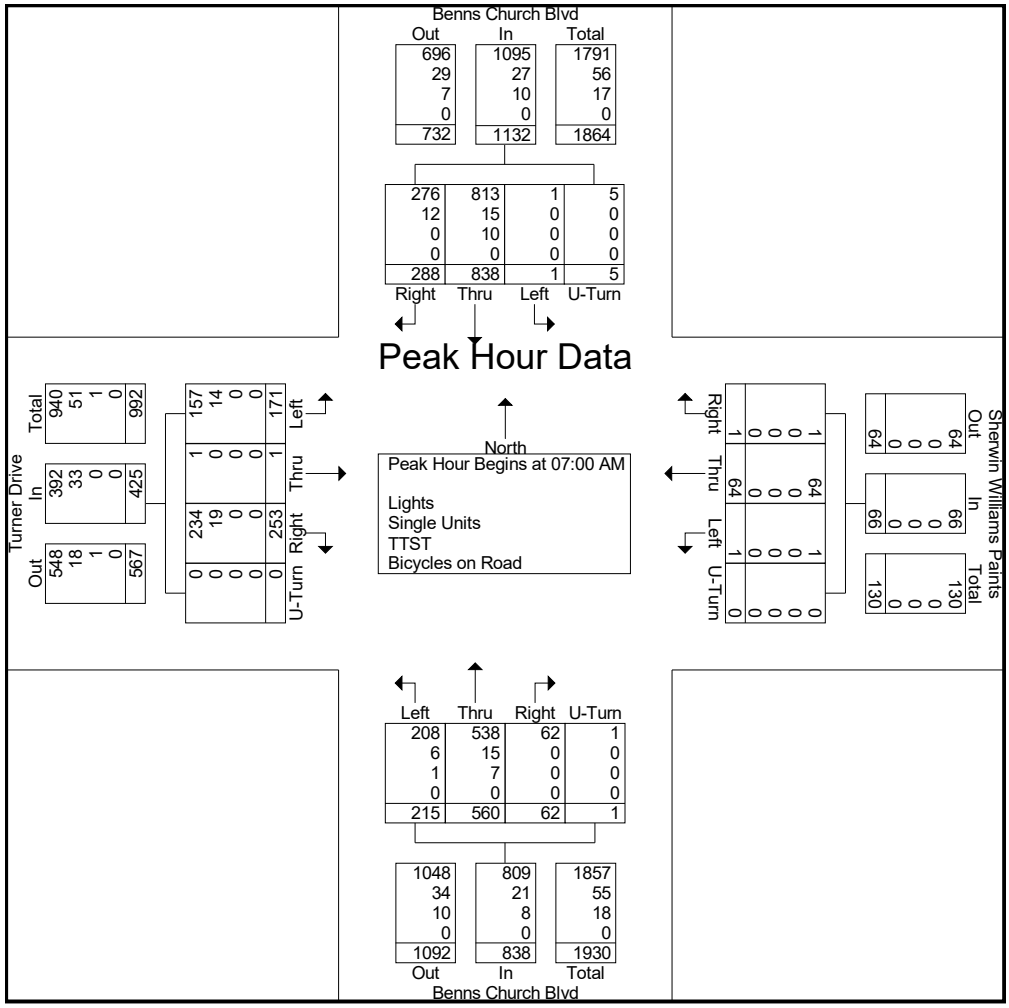
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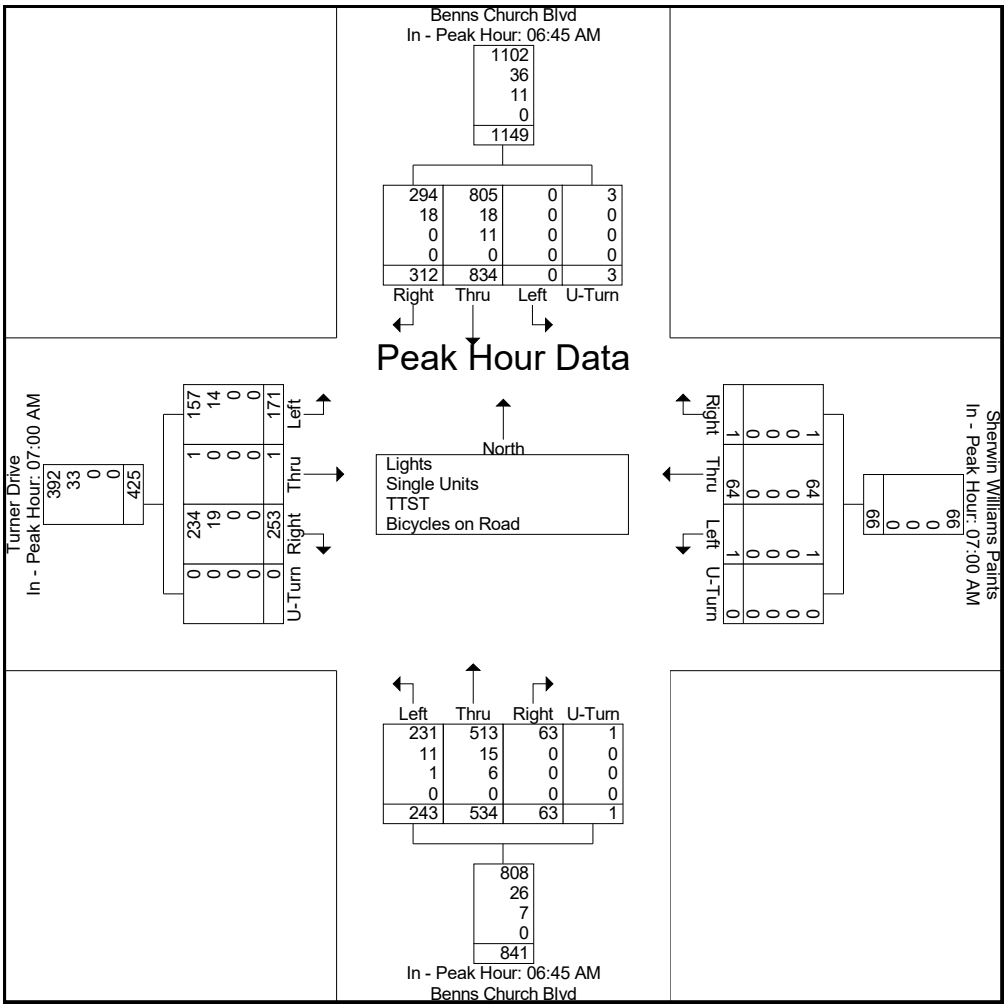
	Benns Church Blvd Southbound					Sherwin Williams Paints Westbound					Benns Church Blvd Northbound					Turner Drive Eastbound					
Start Time			Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	0	192	142	1	335	0	23	1	0	24	103	104	34	0	241	30	0	56	0	86	686
07:15 AM	0	168	120	2	290	0	41	0	0	41	72	148	28	0	248	60	1	87	0	148	727
07:30 AM	0	288	13	0	301	0	0	0	0	0	18	152	0	1	171	67	0	74	0	141	613
07:45 AM	1	190	13	2	206	1	0	0	0	1	22	156	0	0	178	14	0	36	0	50	435
Total Volume	1	838	288	5	1132	1	64	1	0	66	215	560	62	1	838	171	1	253	0	425	2461
% App. Total	0.1	74	25.4	0.4		1.5	97	1.5	0		25.7	66.8	7.4	0.1		40.2	0.2	59.5	0		
PHF	.250	.727	.507	.625	.845	.250	.390	.250	.000	.402	.522	.897	.456	.250	.845	.638	.250	.727	.000	.718	.846
Lights	1	813	276	5	1095	1	64	1	0	66	208	538	62	1	809	157	1	234	0	392	2362
% Lights	100	97.0	95.8	100	96.7	100	100	100	0	100	96.7	96.1	100	100	96.5	91.8	100	92.5	0	92.2	96.0
Single Units	0	15	12	0	27	0	0	0	0	0	6	15	0	0	21	14	0	19	0	33	81
% Single Units	0	1.8	4.2	0	2.4	0	0	0	0	0	2.8	2.7	0	0	2.5	8.2	0	7.5	0	7.8	3.3
TTST	0	10	0	0	10	0	0	0	0	0	1	7	0	0	8	0	0	0	0	0	18
% TTST	0	1.2	0	0	0.9	0	0	0	0	0	0.5	1.3	0	0	1.0	0	0	0	0	0	0.7
Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



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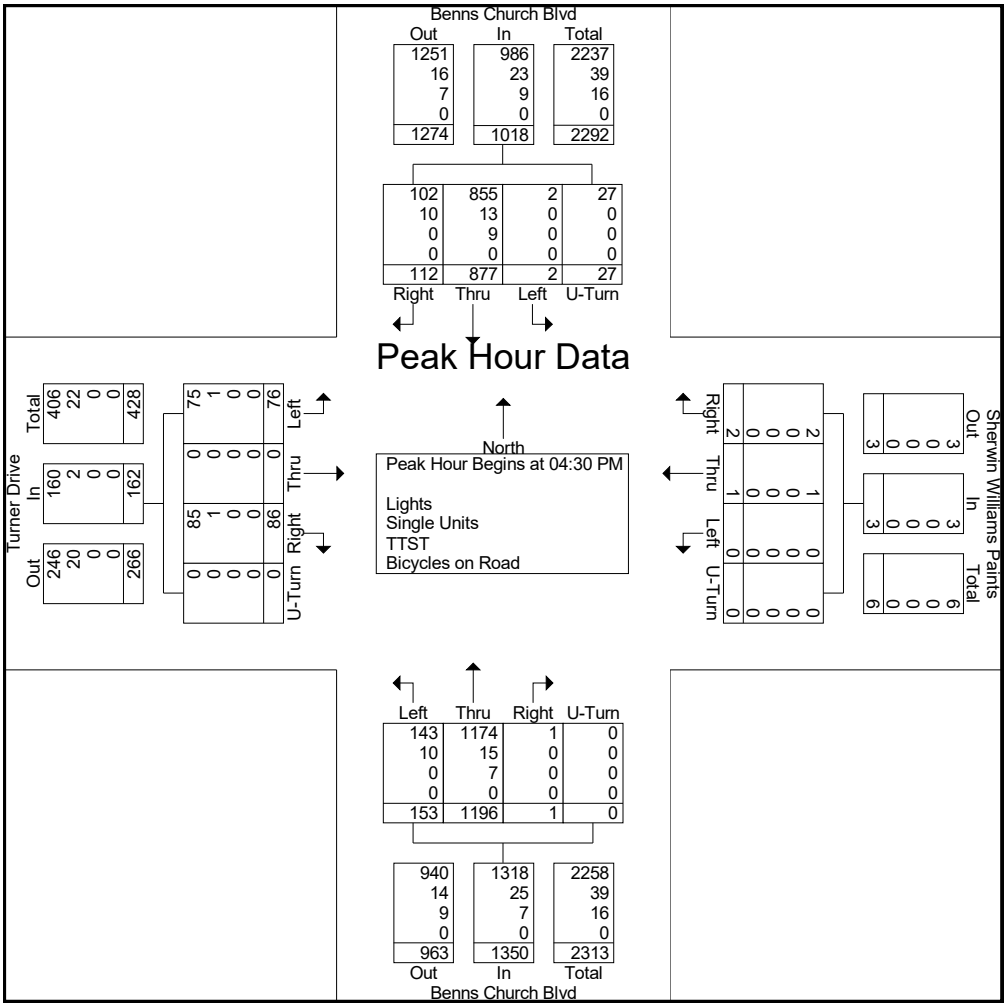
	Benns Church Blvd Southbound					Sherwin Williams Paints Westbound					Benns Church Blvd Northbound					Turner Drive Eastbound					
Start Time			Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Each Approach Begins at:																					
	06:45 AM					07:00 AM					06:45 AM					07:00 AM					
+0 mins.	0	186	37	0	223	0	23	1	0	24	50	130	1	0	181	30	0	56	0	86	
+15 mins.	0	192	142	1	335	0	41	0	0	41	103	104	34	0	241	60	1	87	0	148	
+30 mins.	0	168	120	2	290	0	0	0	0	0	72	148	28	0	248	67	0	74	0	141	
+45 mins.	0	288	13	0	301	1	0	0	0	1	18	152	0	1	171	14	0	36	0	50	
Total Volume	0	834	312	3	1149	1	64	1	0	66	243	534	63	1	841	171	1	253	0	425	
% App. Total	0	72.6	27.2	0.3		1.5	97	1.5	0		28.9	63.5	7.5	0.1		40.2	0.2	59.5	0		
PHF	.000	.724	.549	.375	.857	.250	.390	.250	.000	.402	.590	.878	.463	.250	.848	.638	.250	.727	.000	.718	
Lights	0	805	294	3	1102	1	64	1	0	66	231	513	63	1	808	157	1	234	0	392	
% Lights	0	96.5	94.2	100	95.9	100	100	100	0	100	95.1	96.1	100	100	96.1	91.8	100	92.5	0	92.2	
Single Units	0	18	18	0	36	0	0	0	0	0	11	15	0	0	26	14	0	19	0	33	
% Single Units	0	2.2	5.8	0	3.1	0	0	0	0	0	4.5	2.8	0	0	3.1	8.2	0	7.5	0	7.8	
TTST	0	11	0	0	11	0	0	0	0	0	1	6	0	0	7	0	0	0	0	0	
% TTST	0	1.3	0	0	1	0	0	0	0	0	0.4	1.1	0	0	0.8	0	0	0	0	0	
Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
% Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	



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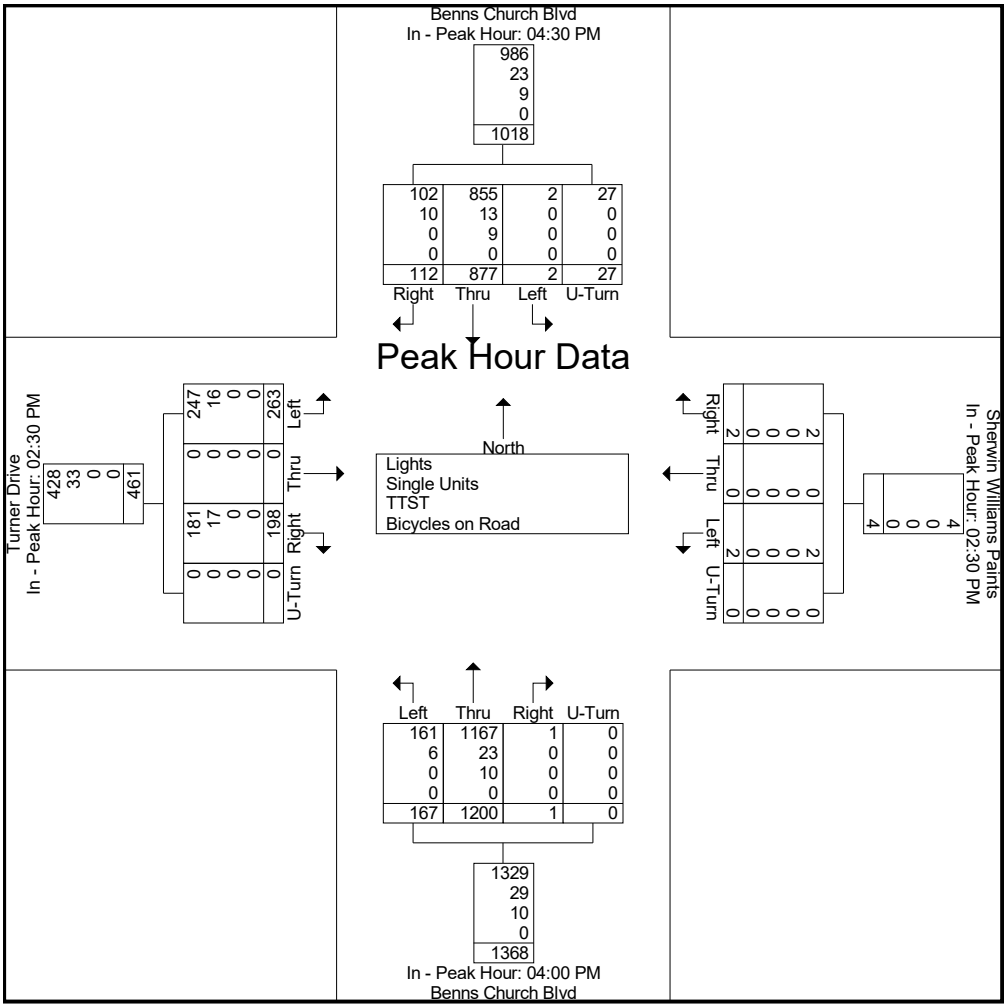
	Benns Church Blvd Southbound					Sherwin Williams Paints Westbound					Benns Church Blvd Northbound					Turner Drive Eastbound					
Start Time	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:15 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	0	223	18	2	243	0	0	0	0	0	32	317	1	0	350	2	0	20	0	22	615
04:45 PM	0	217	31	2	250	0	1	0	0	1	43	292	0	0	335	23	0	27	0	50	636
05:00 PM	1	215	30	9	255	0	0	1	0	1	40	271	0	0	311	30	0	14	0	44	611
05:15 PM	1	222	33	14	270	0	0	1	0	1	38	316	0	0	354	21	0	25	0	46	671
Total Volume	2	877	112	27	1018	0	1	2	0	3	153	1196	1	0	1350	76	0	86	0	162	2533
% App. Total	0.2	86.1	11	2.7		0	33.3	66.7	0		11.3	88.6	0.1	0		46.9	0	53.1	0		
PHF	.500	.983	.848	.482	.943	.000	.250	.500	.000	.750	.890	.943	.250	.000	.953	.633	.000	.796	.000	.810	.944
Lights	2	855	102	27	986	0	1	2	0	3	143	1174	1	0	1318	75	0	85	0	160	2467
% Lights	100	97.5	91.1	100	96.9	0	100	100	0	100	93.5	98.2	100	0	97.6	98.7	0	98.8	0	98.8	97.4
Single Units	0	13	10	0	23	0	0	0	0	0	10	15	0	0	25	1	0	1	0	2	50
% Single Units	0	1.5	8.9	0	2.3	0	0	0	0	0	6.5	1.3	0	0	1.9	1.3	0	1.2	0	1.2	2.0
TTST	0	9	0	0	9	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	16
% TTST	0	1.0	0	0	0.9	0	0	0	0	0	0	0.6	0	0	0.5	0	0	0	0	0	0.6
Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



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	Benns Church Blvd Southbound					Sherwin Williams Paints Westbound					Benns Church Blvd Northbound					Turner Drive Eastbound					
Start Time	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:15 PM - Peak 1 of 1																					
Peak Hour for Each Approach Begins at:																					
	04:30 PM					02:30 PM					04:00 PM					02:30 PM					
+0 mins.	0	223	18	2	243	1	0	1	0	2	38	330	0	0	368	26	0	23	0	49	
+15 mins.	0	217	31	2	250	1	0	0	0	1	54	261	0	0	315	124	0	70	0	194	
+30 mins.	1	215	30	9	255	0	0	0	0	0	32	317	1	0	350	83	0	70	0	153	
+45 mins.	1	222	33	14	270	0	0	1	0	1	43	292	0	0	335	30	0	35	0	65	
Total Volume	2	877	112	27	1018	2	0	2	0	4	167	1200	1	0	1368	263	0	198	0	461	
% App. Total	0.2	86.1	11	2.7		50	0	50	0		12.2	87.7	0.1	0		57	0	43	0		
PHF	.500	.983	.848	.482	.943	.500	.000	.500	.000	.500	.773	.909	.250	.000	.929	.530	.000	.707	.000	.594	
Lights	2	855	102	27	986	2	0	2	0	4	161	1167	1	0	1329	247	0	181	0	428	
% Lights	100	97.5	91.1	100	96.9	100	0	100	0	100	96.4	97.2	100	0	97.1	93.9	0	91.4	0	92.8	
Single Units	0	13	10	0	23	0	0	0	0	0	6	23	0	0	29	16	0	17	0	33	
% Single Units	0	1.5	8.9	0	2.3	0	0	0	0	0	3.6	1.9	0	0	2.1	6.1	0	8.6	0	7.2	
TTST	0	9	0	0	9	0	0	0	0	0	0	10	0	0	10	0	0	0	0	0	
% TTST	0	1	0	0	0.9	0	0	0	0	0	0	0.8	0	0	0.7	0	0	0	0	0	
Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
% Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	



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Groups Printed- Lights - Single Units - TTST

	Benns Church Blvd Southbound		Benns Church Blvd Northbound		
Start Time	Thru	U-Turn	Thru	U-Turn	Int. Total
06:00 AM	255	0	135	0	390
06:15 AM	263	0	174	0	437
06:30 AM	283	0	164	0	447
06:45 AM	265	0	167	0	432
Total	1066	0	640	0	1706
07:00 AM	246	0	268	0	514
07:15 AM	322	0	241	1	564
07:30 AM	314	1	213	3	531
07:45 AM	248	0	194	0	442
Total	1130	1	916	4	2051
08:00 AM	221	0	176	3	400
08:15 AM	187	0	190	1	378
08:30 AM	227	0	199	0	426
08:45 AM	194	0	194	0	388
Total	829	0	759	4	1592
09:00 AM	227	0	143	1	371
09:15 AM	188	0	159	2	349
09:30 AM	159	0	148	0	307
09:45 AM	160	0	140	3	303
Total	734	0	590	6	1330
10:00 AM	153	3	149	1	306
10:15 AM	174	0	155	0	329
10:30 AM	170	0	175	0	345
10:45 AM	152	0	171	2	325
Total	649	3	650	3	1305
11:00 AM	138	0	129	2	269
11:15 AM	175	0	179	0	354
11:30 AM	174	0	163	1	338
11:45 AM	167	0	182	0	349
Total	654	0	653	3	1310
12:00 PM	165	0	159	0	324
12:15 PM	194	1	195	2	392
12:30 PM	195	0	214	0	409
12:45 PM	181	0	200	2	383
Total	735	1	768	4	1508
01:00 PM	176	1	172	1	350
01:15 PM	211	0	195	1	407
01:30 PM	165	0	189	1	355
01:45 PM	185	1	210	3	399
Total	737	2	766	6	1511
02:00 PM	165	0	195	1	361
02:15 PM	170	0	210	0	380
02:30 PM	186	0	223	1	410
02:45 PM	230	1	241	0	472
Total	751	1	869	2	1623
03:00 PM	264	0	245	2	511
03:15 PM	229	1	294	3	527

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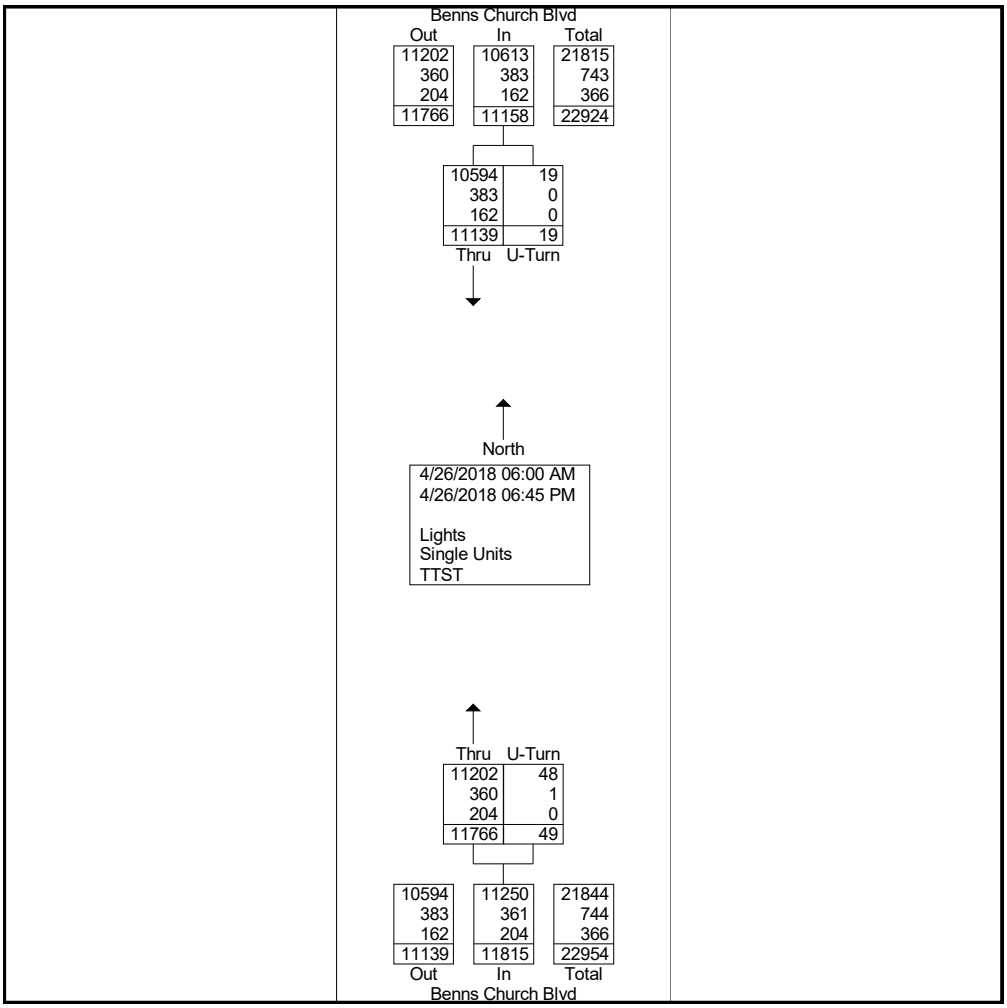
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Groups Printed- Lights - Single Units - TTST

	Benns Church Blvd Southbound		Benns Church Blvd Northbound		
Start Time	Thru	U-Turn	Thru	U-Turn	Int. Total
03:30 PM	234	0	280	0	514
03:45 PM	218	2	298	0	518
Total	945	3	1117	5	2070
04:00 PM	245	1	408	2	656
04:15 PM	239	2	338	1	580
04:30 PM	272	0	364	3	639
04:45 PM	282	1	376	0	659
Total	1038	4	1486	6	2534
05:00 PM	267	0	391	2	660
05:15 PM	270	0	361	1	632
05:30 PM	204	2	370	0	576
05:45 PM	213	1	403	0	617
Total	954	3	1525	3	2485
06:00 PM	219	0	342	0	561
06:15 PM	261	1	243	1	506
06:30 PM	251	0	236	1	488
06:45 PM	186	0	206	1	393
Total	917	1	1027	3	1948
Grand Total	11139	19	11766	49	22973
Apprch %	99.8	0.2	99.6	0.4	
Total %	48.5	0.1	51.2	0.2	
Lights	10594	19	11202	48	21863
% Lights	95.1	100	95.2	98	95.2
Single Units	383	0	360	1	744
% Single Units	3.4	0	3.1	2	3.2
TTST	162	0	204	0	366
% TTST	1.5	0	1.7	0	1.6

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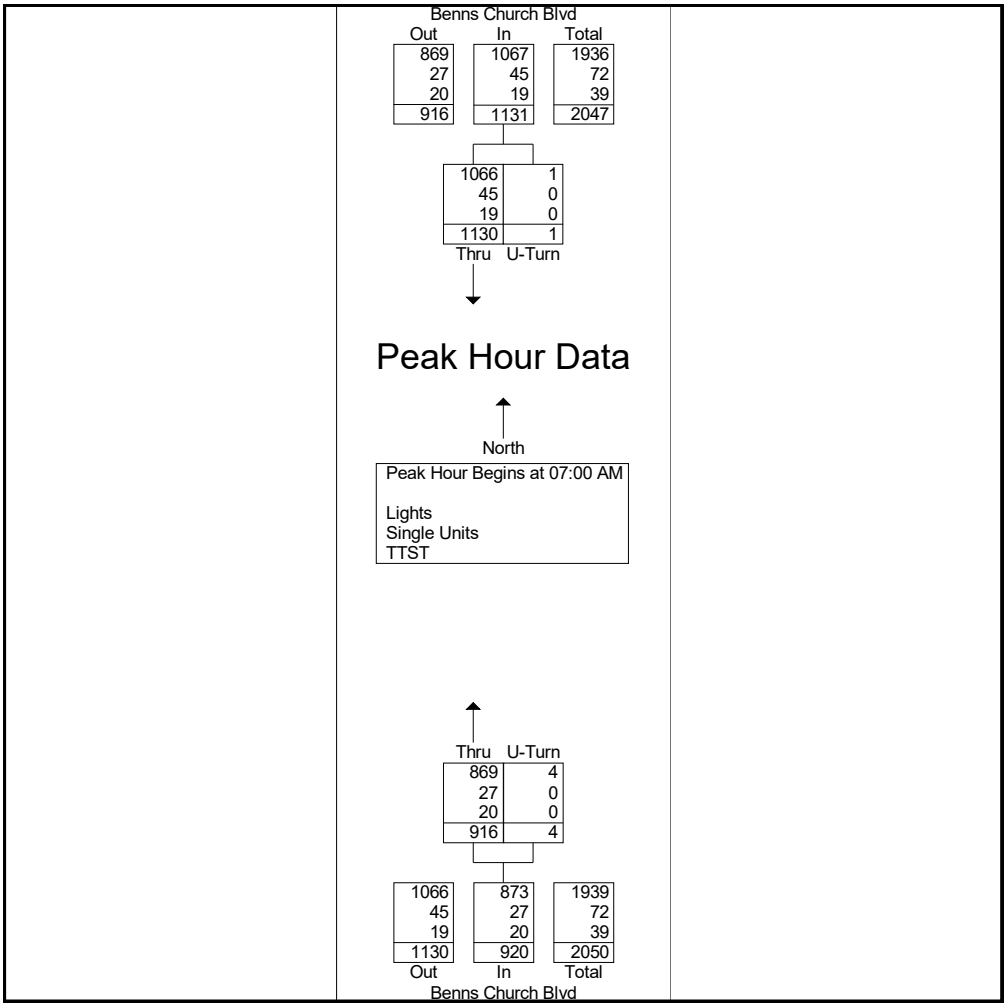
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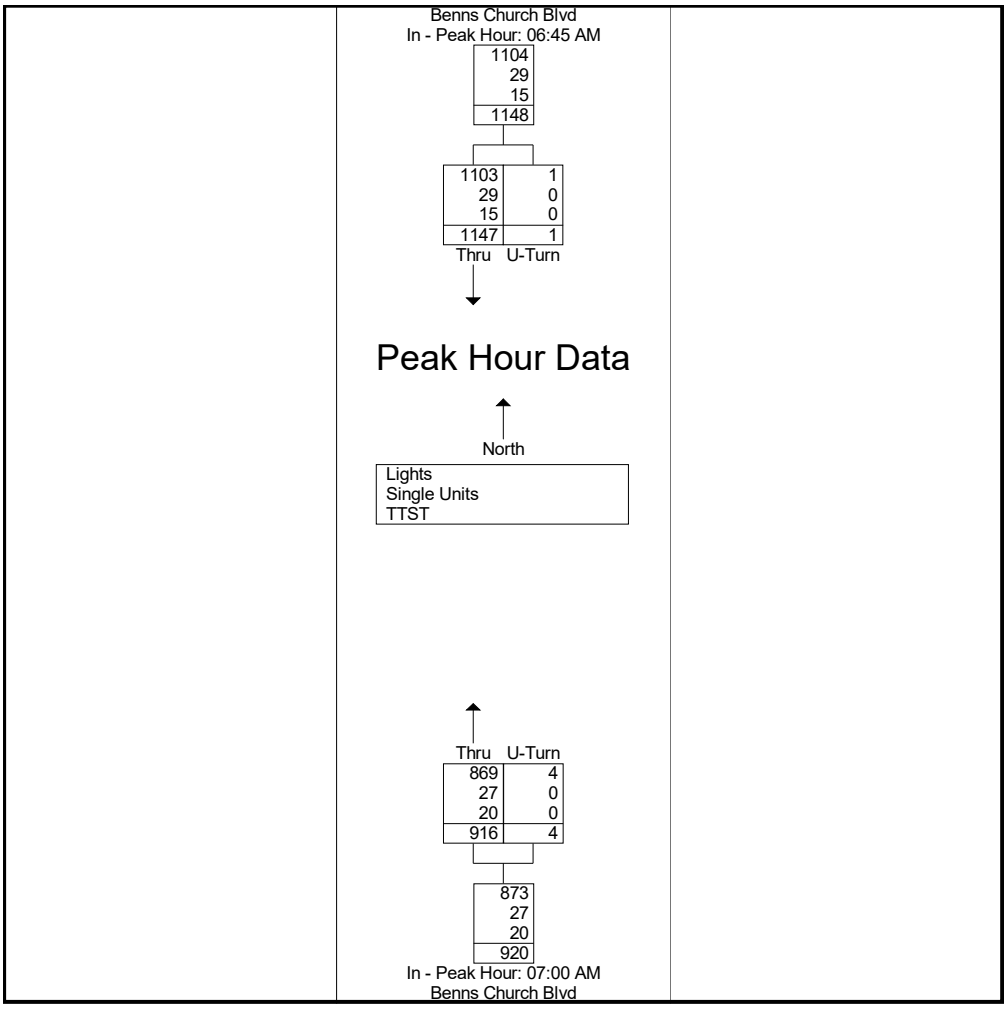
	Benns Church Blvd Southbound			Benns Church Blvd Northbound			
Start Time	Thru	U-Turn	App. Total	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 09:45 AM - Peak 1 of 1							
Peak Hour for Entire Intersection Begins at 07:00 AM							
07:00 AM	246	0	246	268	0	268	514
07:15 AM	322	0	322	241	1	242	564
07:30 AM	314	1	315	213	3	216	531
07:45 AM	248	0	248	194	0	194	442
Total Volume	1130	1	1131	916	4	920	2051
% App. Total	99.9	0.1		99.6	0.4		
PHF	.877	.250	.878	.854	.333	.858	.909
Lights	1066	1	1067	869	4	873	1940
% Lights	94.3	100	94.3	94.9	100	94.9	94.6
Single Units	45	0	45	27	0	27	72
% Single Units	4.0	0	4.0	2.9	0	2.9	3.5
TTST	19	0	19	20	0	20	39
% TTST	1.7	0	1.7	2.2	0	2.2	1.9



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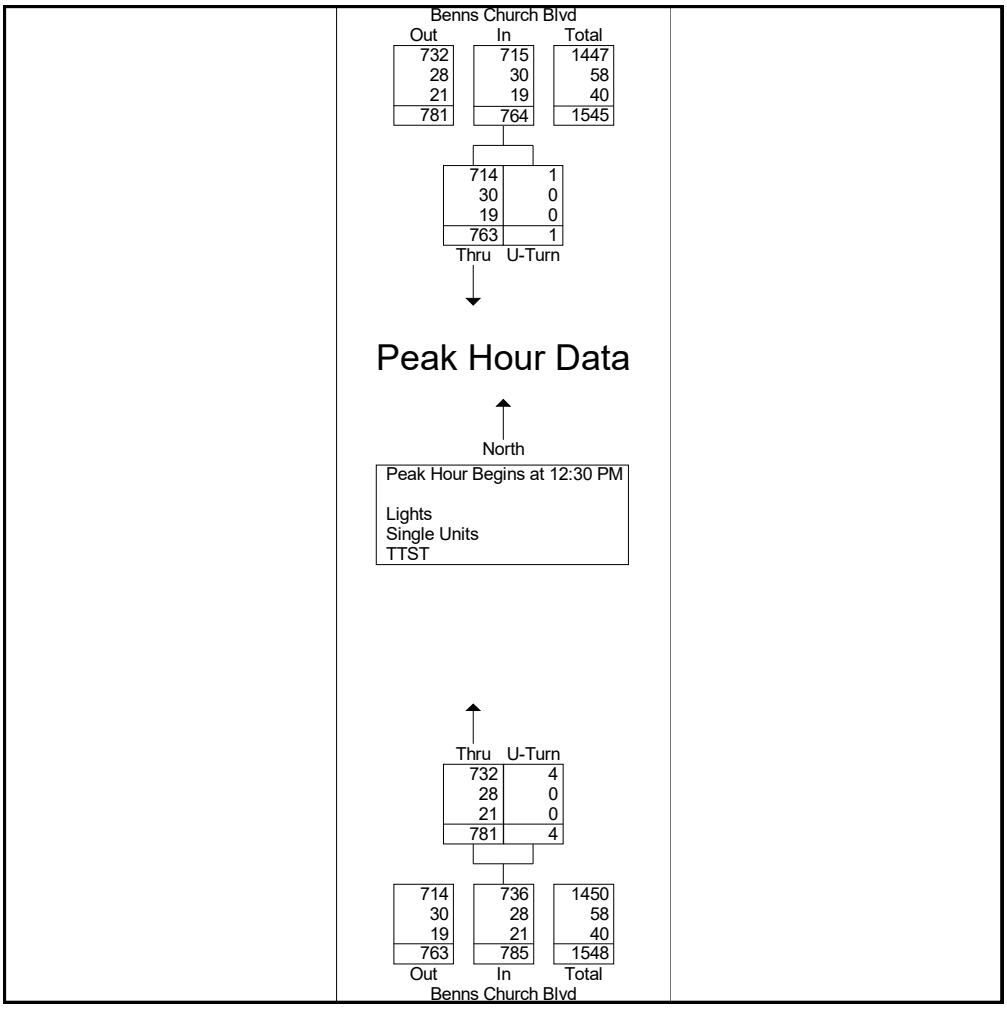
	Benns Church Blvd Southbound			Benns Church Blvd Northbound			
Start Time	Thru	U-Turn	App. Total	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 09:45 AM - Peak 1 of 1							
Peak Hour for Each Approach Begins at:							
	06:45 AM			07:00 AM			
+0 mins.	265	0	265	268	0	268	
+15 mins.	246	0	246	241	1	242	
+30 mins.	322	0	322	213	3	216	
+45 mins.	314	1	315	194	0	194	
Total Volume	1147	1	1148	916	4	920	
% App. Total	99.9	0.1		99.6	0.4		
PHF	.891	.250	.891	.854	.333	.858	
Lights	1103	1	1104	869	4	873	
% Lights	96.2	100	96.2	94.9	100	94.9	
Single Units	29	0	29	27	0	27	
% Single Units	2.5	0	2.5	2.9	0	2.9	
TTST	15	0	15	20	0	20	
% TTST	1.3	0	1.3	2.2	0	2.2	



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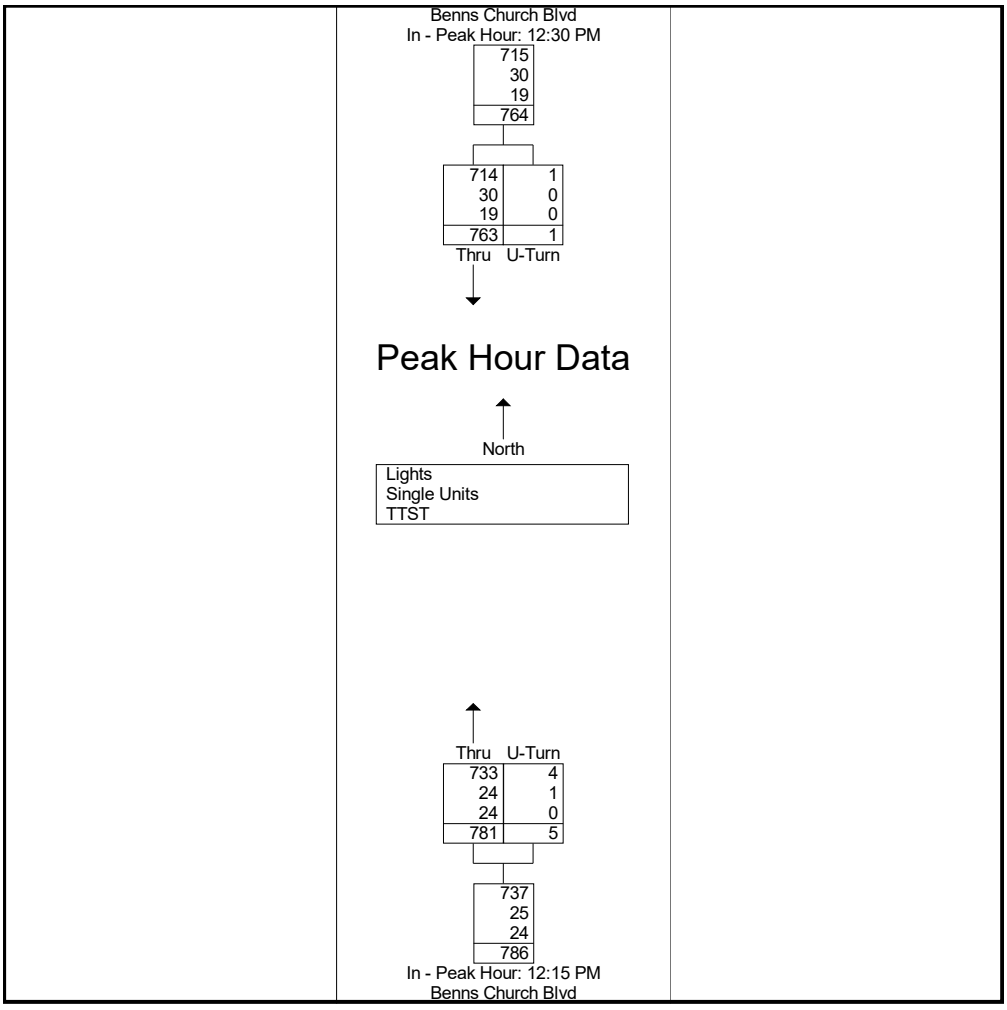
	Benns Church Blvd Southbound			Benns Church Blvd Northbound			
Start Time	Thru	U-Turn	App. Total	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1							
Peak Hour for Entire Intersection Begins at 12:30 PM							
12:30 PM	195	0	195	214	0	214	409
12:45 PM	181	0	181	200	2	202	383
01:00 PM	176	1	177	172	1	173	350
01:15 PM	211	0	211	195	1	196	407
Total Volume	763	1	764	781	4	785	1549
% App. Total	99.9	0.1		99.5	0.5		
PHF	.904	.250	.905	.912	.500	.917	.947
Lights	714	1	715	732	4	736	1451
% Lights	93.6	100	93.6	93.7	100	93.8	93.7
Single Units	30	0	30	28	0	28	58
% Single Units	3.9	0	3.9	3.6	0	3.6	3.7
TTST	19	0	19	21	0	21	40
% TTST	2.5	0	2.5	2.7	0	2.7	2.6



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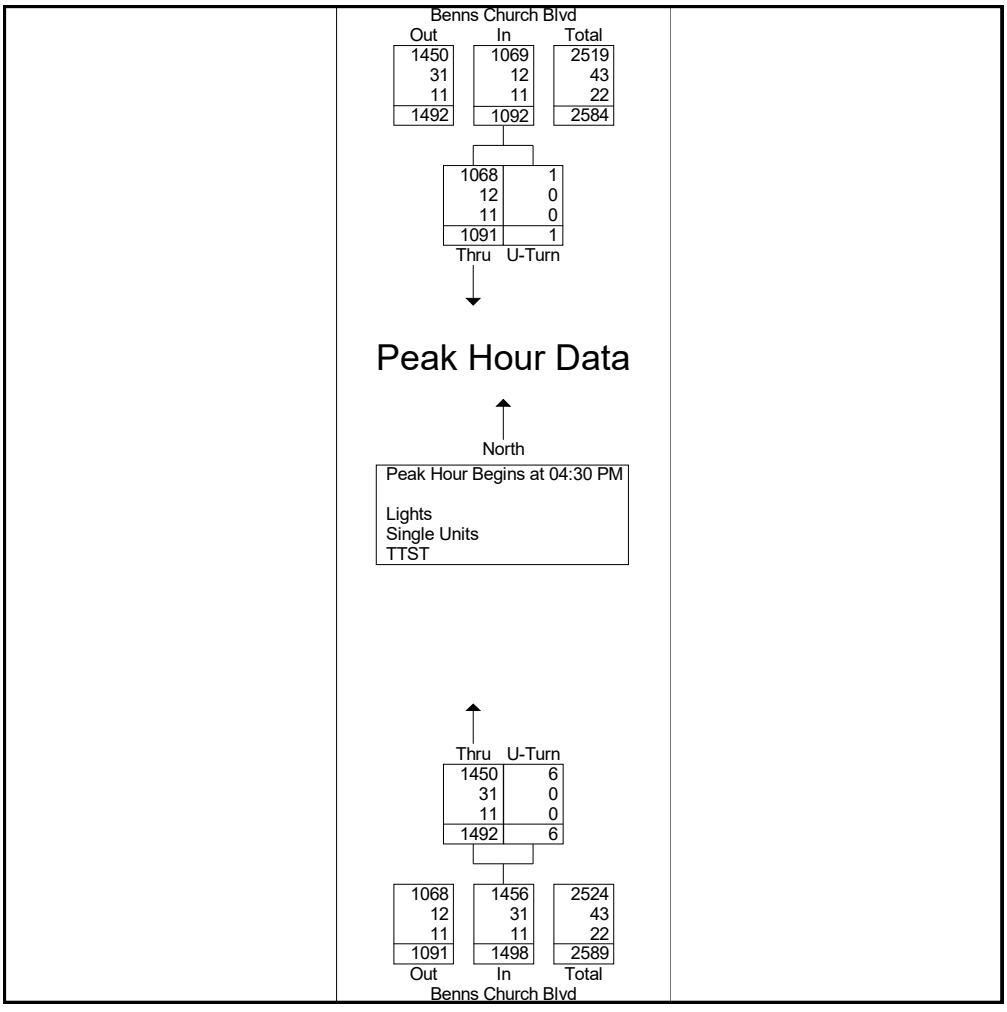
	Benns Church Blvd Southbound			Benns Church Blvd Northbound			
Start Time	Thru	U-Turn	App. Total	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1							
Peak Hour for Each Approach Begins at:							
	12:30 PM			12:15 PM			
+0 mins.	195	0	195	195	2	197	
+15 mins.	181	0	181	214	0	214	
+30 mins.	176	1	177	200	2	202	
+45 mins.	211	0	211	172	1	173	
Total Volume	763	1	764	781	5	786	
% App. Total	99.9	0.1		99.4	0.6		
PHF	.904	.250	.905	.912	.625	.918	
Lights	714	1	715	733	4	737	
% Lights	93.6	100	93.6	93.9	80	93.8	
Single Units	30	0	30	24	1	25	
% Single Units	3.9	0	3.9	3.1	20	3.2	
TTST	19	0	19	24	0	24	
% TTST	2.5	0	2.5	3.1	0	3.1	



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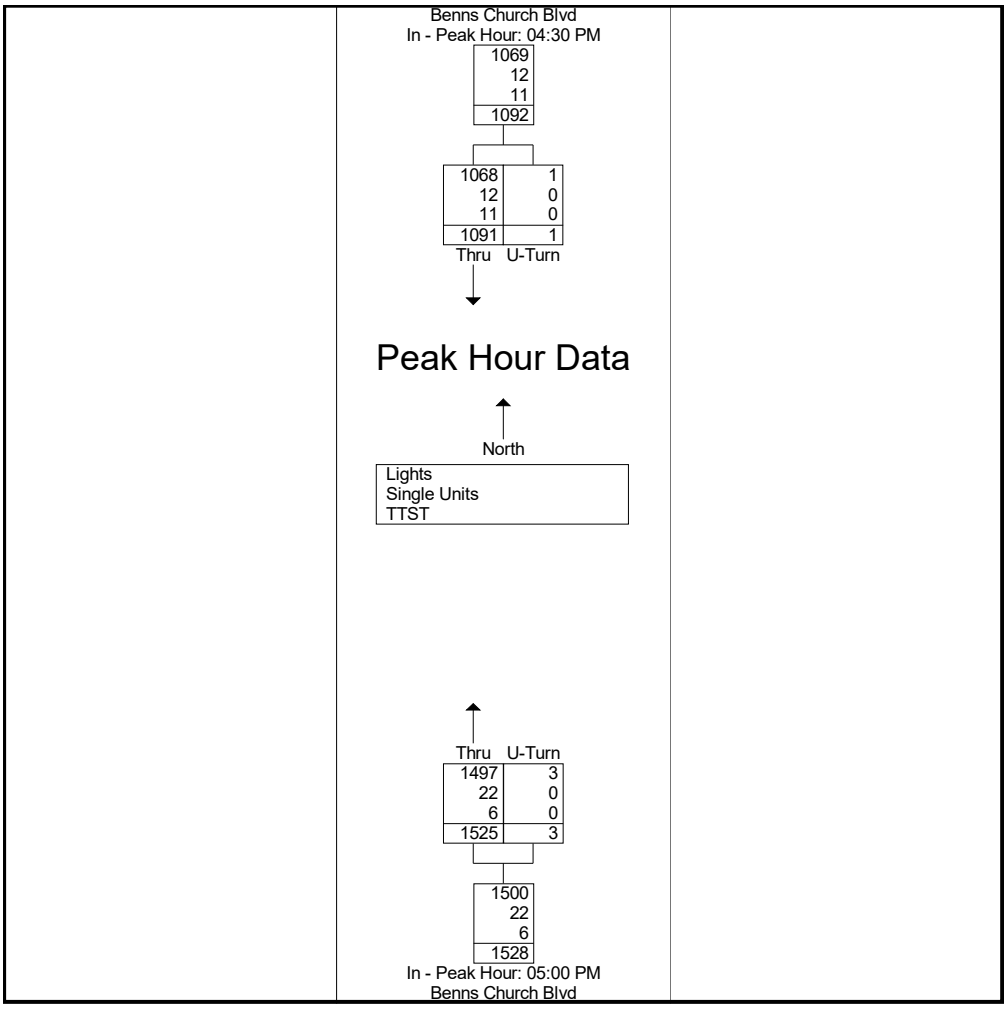
	Benns Church Blvd Southbound			Benns Church Blvd Northbound			
Start Time	Thru	U-Turn	App. Total	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 06:45 PM - Peak 1 of 1							
Peak Hour for Entire Intersection Begins at 04:30 PM							
04:30 PM	272	0	272	364	3	367	639
04:45 PM	282	1	283	376	0	376	659
05:00 PM	267	0	267	391	2	393	660
05:15 PM	270	0	270	361	1	362	632
Total Volume	1091	1	1092	1492	6	1498	2590
% App. Total	99.9	0.1		99.6	0.4		
PHF	.967	.250	.965	.954	.500	.953	.981
Lights	1068	1	1069	1450	6	1456	2525
% Lights	97.9	100	97.9	97.2	100	97.2	97.5
Single Units	12	0	12	31	0	31	43
% Single Units	1.1	0	1.1	2.1	0	2.1	1.7
TTST	11	0	11	11	0	11	22
% TTST	1.0	0	1.0	0.7	0	0.7	0.8



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	Benns Church Blvd Southbound			Benns Church Blvd Northbound			
Start Time	Thru	U-Turn	App. Total	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 06:45 PM - Peak 1 of 1							
Peak Hour for Each Approach Begins at:							
	04:30 PM			05:00 PM			
+0 mins.	272	0	272	391	2	393	
+15 mins.	282	1	283	361	1	362	
+30 mins.	267	0	267	370	0	370	
+45 mins.	270	0	270	403	0	403	
Total Volume	1091	1	1092	1525	3	1528	
% App. Total	99.9	0.1		99.8	0.2		
PHF	.967	.250	.965	.946	.375	.948	
Lights	1068	1	1069	1497	3	1500	
% Lights	97.9	100	97.9	98.2	100	98.2	
Single Units	12	0	12	22	0	22	
% Single Units	1.1	0	1.1	1.4	0	1.4	
TTST	11	0	11	6	0	6	
% TTST	1	0	1	0.4	0	0.4	

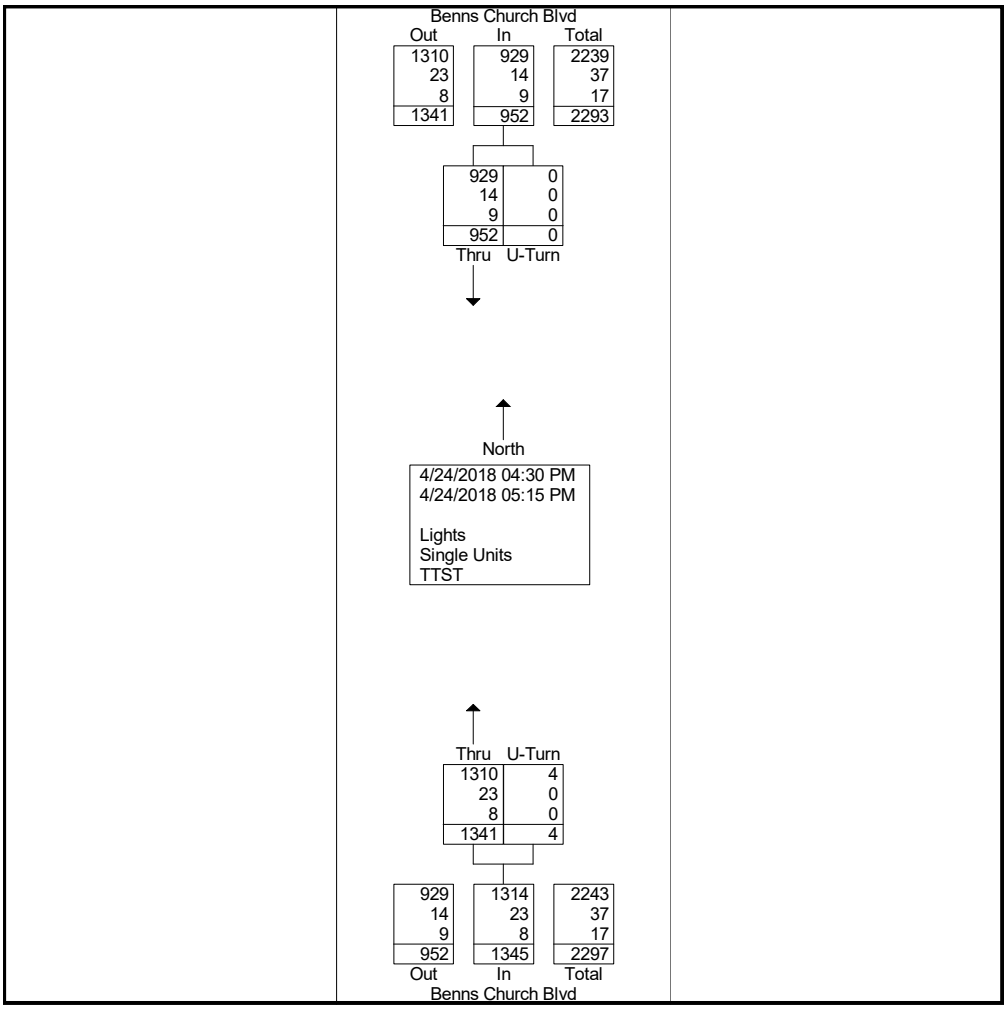


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File Name : Benns Church with Median Break Day 1
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Groups Printed- Lights - Single Units - TTST

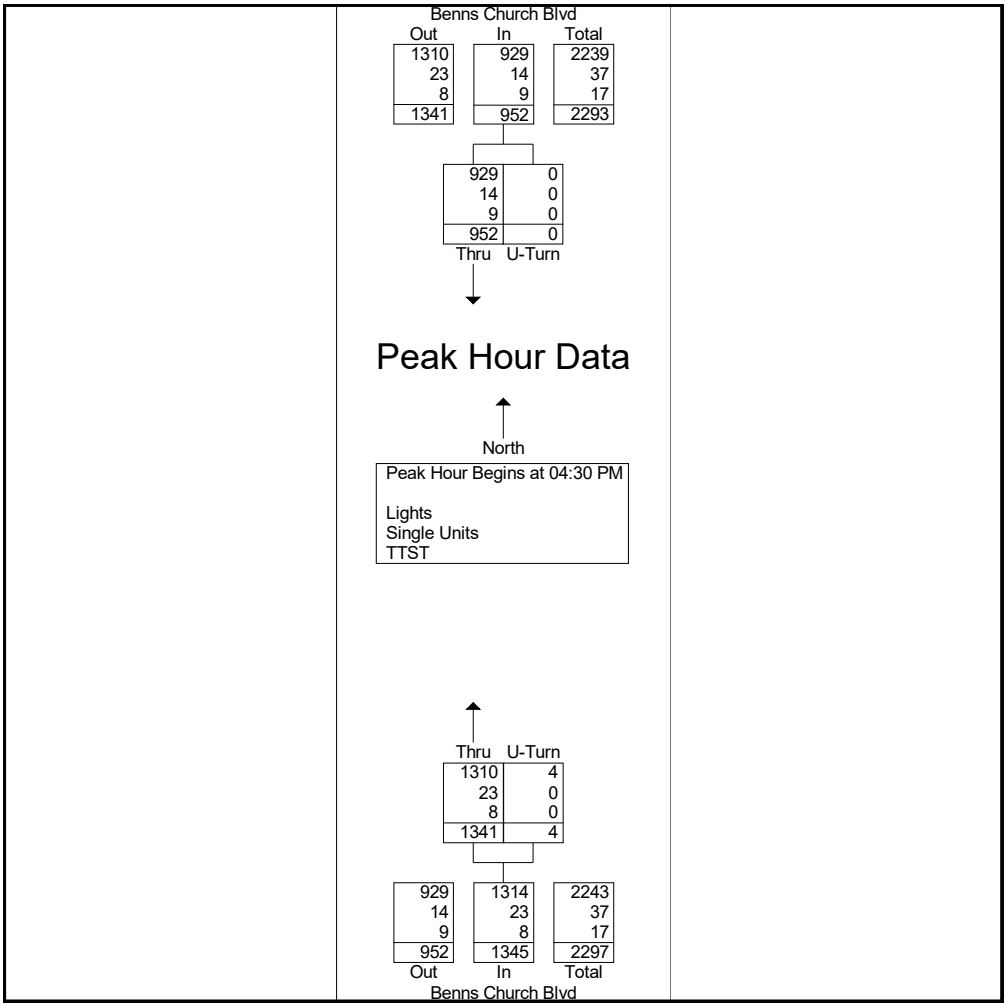
	Benns Church Blvd Southbound		Benns Church Blvd Northbound		
Start Time	Thru	U-Turn	Thru	U-Turn	Int. Total
04:30 PM	241	0	347	0	588
04:45 PM	236	0	347	1	584
Total	477	0	694	1	1172
05:00 PM	235	0	312	1	548
05:15 PM	240	0	335	2	577
Grand Total	952	0	1341	4	2297
Apprch %	100	0	99.7	0.3	
Total %	41.4	0	58.4	0.2	
Lights	929	0	1310	4	2243
% Lights	97.6	0	97.7	100	97.6
Single Units	14	0	23	0	37
% Single Units	1.5	0	1.7	0	1.6
TTST	9	0	8	0	17
% TTST	0.9	0	0.6	0	0.7



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File Name : Benns Church with Median Break Day 1
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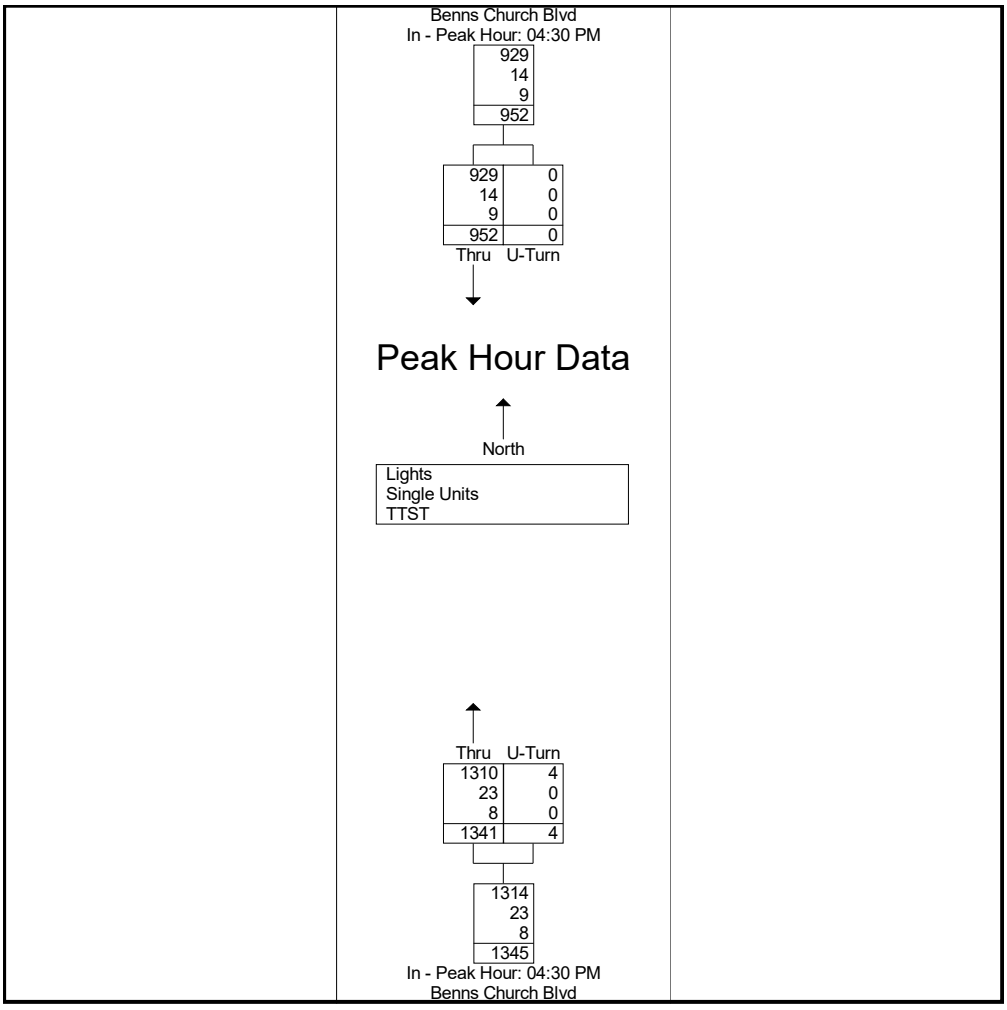
	Benns Church Blvd Southbound			Benns Church Blvd Northbound			
Start Time	Thru	U-Turn	App. Total	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1							
Peak Hour for Entire Intersection Begins at 04:30 PM							
04:30 PM	241	0	241	347	0	347	588
04:45 PM	236	0	236	347	1	348	584
05:00 PM	235	0	235	312	1	313	548
05:15 PM	240	0	240	335	2	337	577
Total Volume	952	0	952	1341	4	1345	2297
% App. Total	100	0		99.7	0.3		
PHF	.988	.000	.988	.966	.500	.966	.977
Lights	929	0	929	1310	4	1314	2243
% Lights	97.6	0	97.6	97.7	100	97.7	97.6
Single Units	14	0	14	23	0	23	37
% Single Units	1.5	0	1.5	1.7	0	1.7	1.6
TTST	9	0	9	8	0	8	17
% TTST	0.9	0	0.9	0.6	0	0.6	0.7



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File Name : Benns Church with Median Break Day 1
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	Benns Church Blvd Southbound			Benns Church Blvd Northbound			
Start Time	Thru	U-Turn	App. Total	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1							
Peak Hour for Each Approach Begins at:							
	04:30 PM			04:30 PM			
+0 mins.	241	0	241	347	0	347	
+15 mins.	236	0	236	347	1	348	
+30 mins.	235	0	235	312	1	313	
+45 mins.	240	0	240	335	2	337	
Total Volume	952	0	952	1341	4	1345	
% App. Total	100	0		99.7	0.3		
PHF	.988	.000	.988	.966	.500	.966	
Lights	929	0	929	1310	4	1314	
% Lights	97.6	0	97.6	97.7	100	97.7	
Single Units	14	0	14	23	0	23	
% Single Units	1.5	0	1.5	1.7	0	1.7	
TTST	9	0	9	8	0	8	
% TTST	0.9	0	0.9	0.6	0	0.6	



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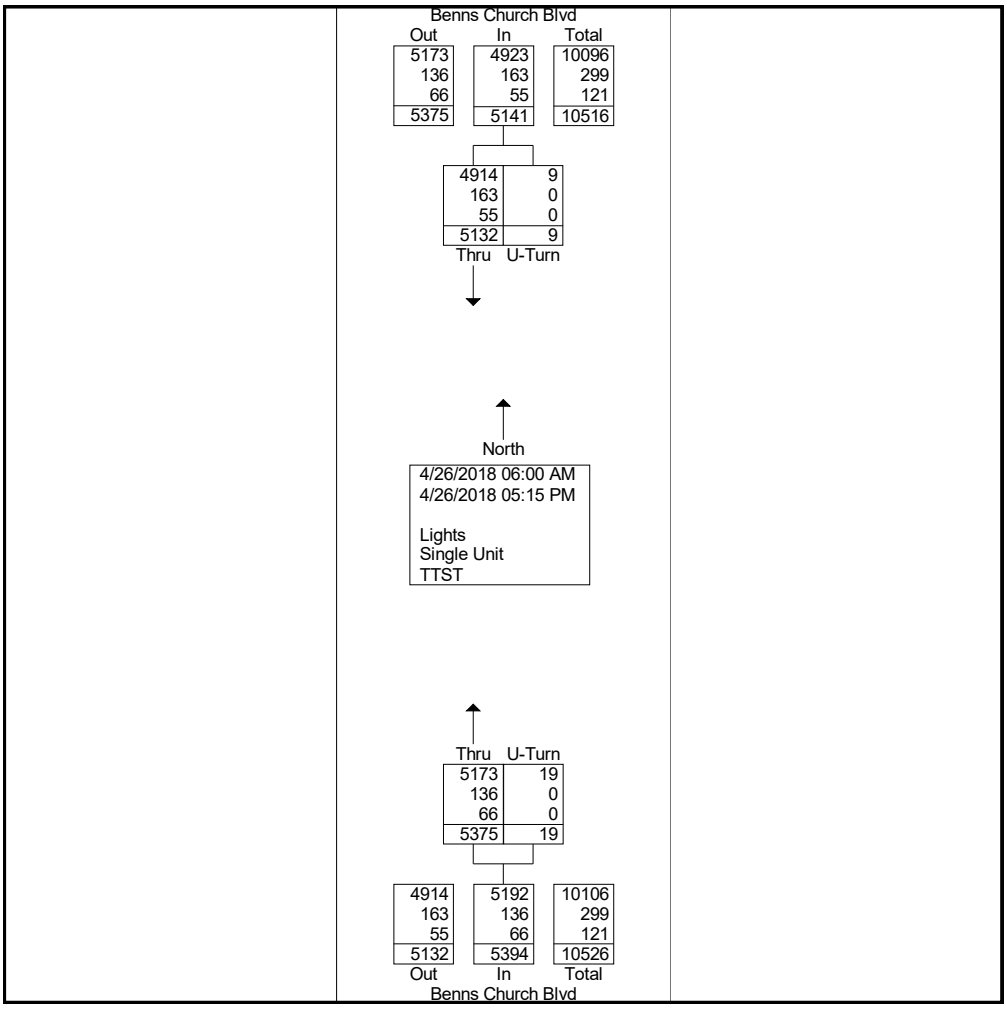
File Name : Benns Church with Median Break
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Groups Printed- Lights - Single Unit - TTST

	Benns Church Blvd Southbound		Benns Church Blvd Northbound		
Start Time	Thru	U-Turn	Thru	U-Turn	Int. Total
06:00 AM	255	0	135	0	390
06:15 AM	263	0	174	0	437
06:30 AM	283	0	164	0	447
06:45 AM	265	0	167	0	432
Total	1066	0	640	0	1706
07:00 AM	246	0	268	0	514
07:15 AM	322	0	241	1	564
07:30 AM	314	1	213	3	531
07:45 AM	248	0	194	0	442
Total	1130	1	916	4	2051
02:30 PM	186	0	223	1	410
02:45 PM	230	1	241	0	472
Total	416	1	464	1	882
03:00 PM	264	0	245	2	511
03:15 PM	229	1	294	3	527
03:30 PM	234	0	280	0	514
03:45 PM	218	2	298	0	518
Total	945	3	1117	5	2070
04:00 PM	245	1	408	2	656
04:15 PM	239	2	338	1	580
04:30 PM	272	0	364	3	639
04:45 PM	282	1	376	0	659
Total	1038	4	1486	6	2534
05:00 PM	267	0	391	2	660
05:15 PM	270	0	361	1	632
Grand Total	5132	9	5375	19	10535
Apprch %	99.8	0.2	99.6	0.4	
Total %	48.7	0.1	51	0.2	
Lights	4914	9	5173	19	10115
% Lights	95.8	100	96.2	100	96
Single Unit	163	0	136	0	299
% Single Unit	3.2	0	2.5	0	2.8
TTST	55	0	66	0	121
% TTST	1.1	0	1.2	0	1.1

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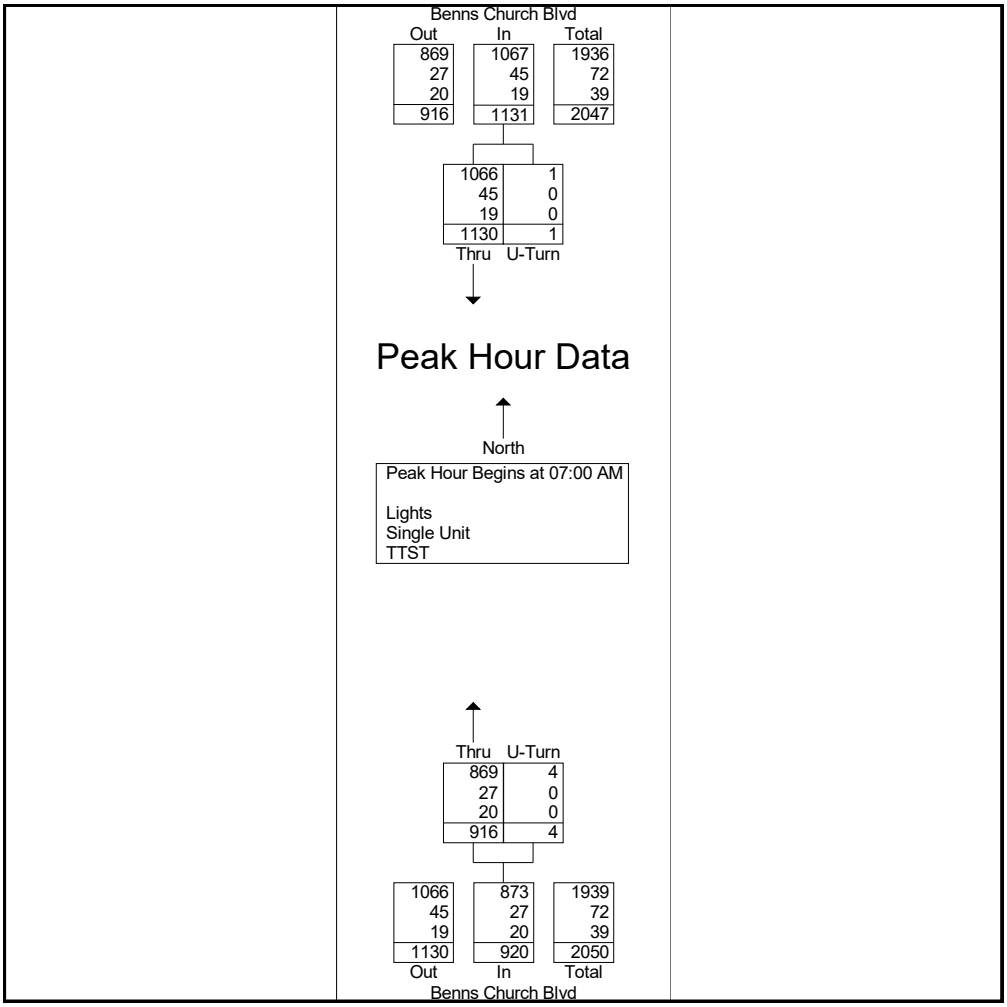
File Name : Benns Church with Median Break
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File Name : Benns Church with Median Break
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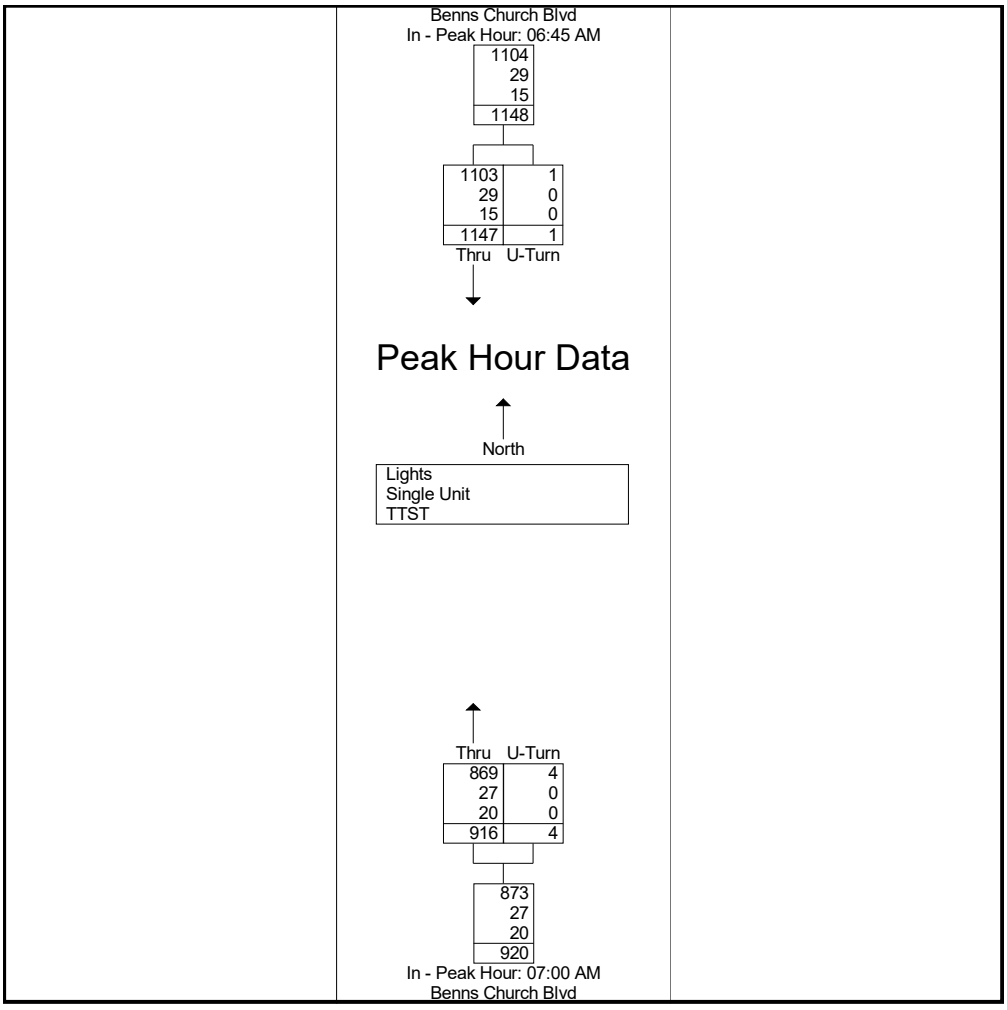
	Benns Church Blvd Southbound			Benns Church Blvd Northbound			
Start Time	Thru	U-Turn	App. Total	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 11:45 AM - Peak 1 of 1							
Peak Hour for Entire Intersection Begins at 07:00 AM							
07:00 AM	246	0	246	268	0	268	514
07:15 AM	322	0	322	241	1	242	564
07:30 AM	314	1	315	213	3	216	531
07:45 AM	248	0	248	194	0	194	442
Total Volume	1130	1	1131	916	4	920	2051
% App. Total	99.9	0.1		99.6	0.4		
PHF	.877	.250	.878	.854	.333	.858	.909
Lights	1066	1	1067	869	4	873	1940
% Lights	94.3	100	94.3	94.9	100	94.9	94.6
Single Unit	45	0	45	27	0	27	72
% Single Unit	4.0	0	4.0	2.9	0	2.9	3.5
TTST	19	0	19	20	0	20	39
% TTST	1.7	0	1.7	2.2	0	2.2	1.9



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File Name : Benns Church with Median Break
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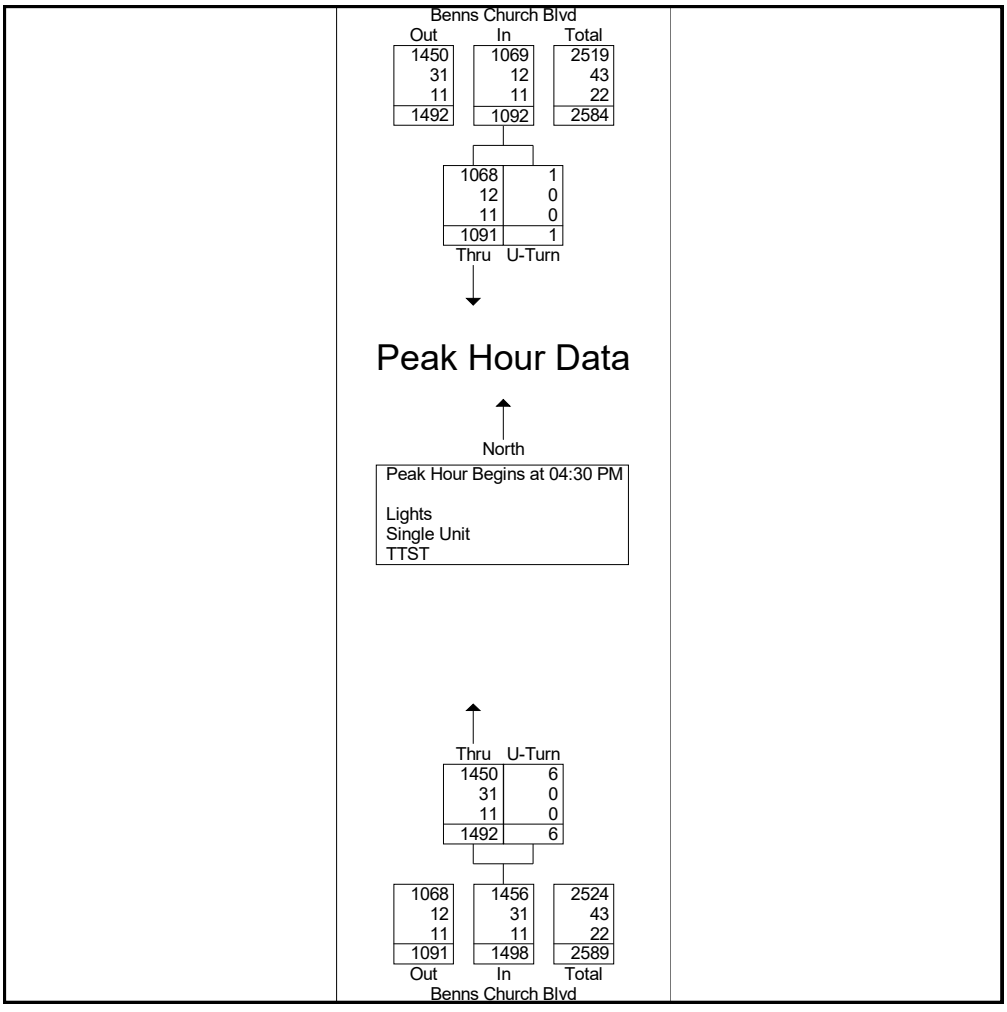
	Benns Church Blvd Southbound			Benns Church Blvd Northbound			
Start Time	Thru	U-Turn	App. Total	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 11:45 AM - Peak 1 of 1							
Peak Hour for Each Approach Begins at:							
	06:45 AM			07:00 AM			
+0 mins.	265	0	265	268	0	268	
+15 mins.	246	0	246	241	1	242	
+30 mins.	322	0	322	213	3	216	
+45 mins.	314	1	315	194	0	194	
Total Volume	1147	1	1148	916	4	920	
% App. Total	99.9	0.1		99.6	0.4		
PHF	.891	.250	.891	.854	.333	.858	
Lights	1103	1	1104	869	4	873	
% Lights	96.2	100	96.2	94.9	100	94.9	
Single Unit	29	0	29	27	0	27	
% Single Unit	2.5	0	2.5	2.9	0	2.9	
TTST	15	0	15	20	0	20	
% TTST	1.3	0	1.3	2.2	0	2.2	



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File Name : Benns Church with Median Break
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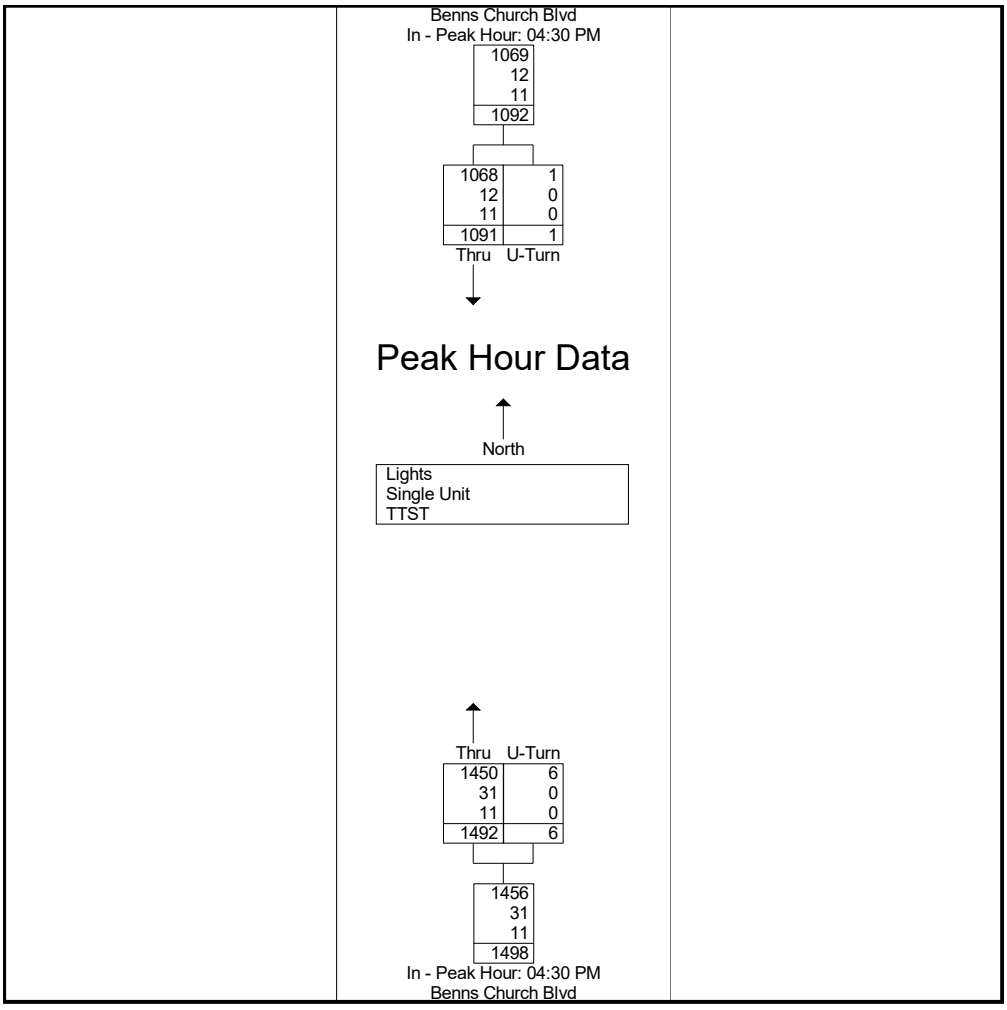
	Benns Church Blvd Southbound			Benns Church Blvd Northbound			
Start Time	Thru	U-Turn	App. Total	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:15 PM - Peak 1 of 1							
Peak Hour for Entire Intersection Begins at 04:30 PM							
04:30 PM	272	0	272	364	3	367	639
04:45 PM	282	1	283	376	0	376	659
05:00 PM	267	0	267	391	2	393	660
05:15 PM	270	0	270	361	1	362	632
Total Volume	1091	1	1092	1492	6	1498	2590
% App. Total	99.9	0.1		99.6	0.4		
PHF	.967	.250	.965	.954	.500	.953	.981
Lights	1068	1	1069	1450	6	1456	2525
% Lights	97.9	100	97.9	97.2	100	97.2	97.5
Single Unit	12	0	12	31	0	31	43
% Single Unit	1.1	0	1.1	2.1	0	2.1	1.7
TTST	11	0	11	11	0	11	22
% TTST	1.0	0	1.0	0.7	0	0.7	0.8



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	Benns Church Blvd Southbound			Benns Church Blvd Northbound			
Start Time	Thru	U-Turn	App. Total	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:15 PM - Peak 1 of 1							
Peak Hour for Each Approach Begins at:							
	04:30 PM			04:30 PM			
+0 mins.	272	0	272	364	3	367	
+15 mins.	282	1	283	376	0	376	
+30 mins.	267	0	267	391	2	393	
+45 mins.	270	0	270	361	1	362	
Total Volume	1091	1	1092	1492	6	1498	
% App. Total	99.9	0.1		99.6	0.4		
PHF	.967	.250	.965	.954	.500	.953	
Lights	1068	1	1069	1450	6	1456	
% Lights	97.9	100	97.9	97.2	100	97.2	
Single Unit	12	0	12	31	0	31	
% Single Unit	1.1	0	1.1	2.1	0	2.1	
TTST	11	0	11	11	0	11	
% TTST	1	0	1	0.7	0	0.7	



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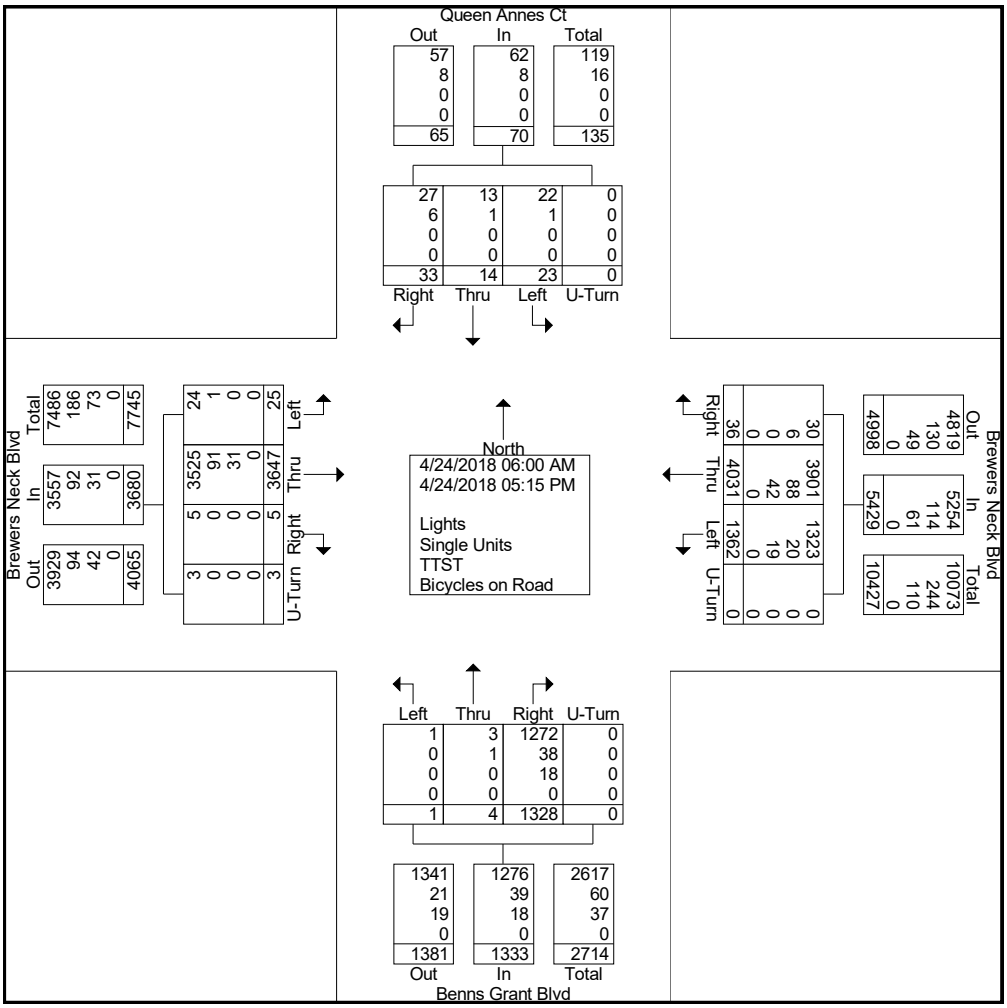
File Name : Brewers Neck and Benns Grant Blvd
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Groups Printed- Lights - Single Units - TTST - Bicycles on Road

	Queen Annes Ct Southbound				Brewers Neck Blvd Westbound				Benns Grant Blvd Northbound				Brewers Neck Blvd Eastbound				
Start Time	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Int. Total
06:00 AM	2	1	0	0	25	108	0	0	0	0	74	0	0	211	0	0	421
06:15 AM	1	0	1	0	30	122	0	0	0	0	90	0	1	224	0	0	469
06:30 AM	0	1	1	0	32	120	0	0	0	0	100	0	0	236	0	0	490
06:45 AM	1	0	3	0	33	132	3	0	0	0	95	0	0	190	0	0	457
Total	4	2	5	0	120	482	3	0	0	0	359	0	1	861	0	0	1837
07:00 AM	1	0	5	0	35	219	0	0	0	1	96	0	1	209	0	0	567
07:15 AM	2	0	3	0	59	161	1	0	0	0	108	0	0	203	0	0	537
07:30 AM	1	1	2	0	69	124	0	0	0	0	94	0	2	268	0	1	562
07:45 AM	2	2	1	0	53	125	2	0	0	0	86	0	1	198	0	1	471
Total	6	3	11	0	216	629	3	0	0	1	384	0	4	878	0	2	2137
02:30 PM	3	2	1	0	46	165	1	0	0	0	33	0	0	140	0	0	391
02:45 PM	2	1	2	0	57	179	1	0	0	0	33	0	5	153	0	0	433
Total	5	3	3	0	103	344	2	0	0	0	66	0	5	293	0	0	824
03:00 PM	1	0	0	0	51	196	0	0	0	0	55	0	2	193	0	0	498
03:15 PM	1	2	2	0	61	225	4	0	0	0	43	0	2	145	0	0	485
03:30 PM	0	0	1	0	75	241	2	0	0	0	51	0	0	110	1	0	481
03:45 PM	0	0	0	0	100	212	1	0	0	0	50	0	2	167	0	0	532
Total	2	2	3	0	287	874	7	0	0	0	199	0	6	615	1	0	1996
04:00 PM	3	0	4	0	109	303	4	0	0	0	48	0	1	160	1	0	633
04:15 PM	1	0	1	0	109	273	5	0	0	0	50	0	1	155	0	0	595
04:30 PM	0	1	2	0	94	294	2	0	0	0	41	0	1	172	2	0	609
04:45 PM	0	1	2	0	121	293	3	0	0	0	48	0	1	168	0	0	637
Total	4	2	9	0	433	1163	14	0	0	0	187	0	4	655	3	0	2474
05:00 PM	1	1	1	0	103	255	2	0	0	1	62	0	5	171	0	1	603
05:15 PM	1	1	1	0	100	284	5	0	1	2	71	0	0	174	1	0	641
Grand Total	23	14	33	0	1362	4031	36	0	1	4	1328	0	25	3647	5	3	10512
Apprch %	32.9	20	47.1	0	25.1	74.2	0.7	0	0.1	0.3	99.6	0	0.7	99.1	0.1	0.1	
Total %	0.2	0.1	0.3	0	13	38.3	0.3	0	0	0	12.6	0	0.2	34.7	0	0	
Lights	22	13	27	0	1323	3901	30	0	1	3	1272	0	24	3525	5	3	10149
% Lights	95.7	92.9	81.8	0	97.1	96.8	83.3	0	100	75	95.8	0	96	96.7	100	100	96.5
Single Units	1	1	6	0	20	88	6	0	0	1	38	0	1	91	0	0	253
% Single Units	4.3	7.1	18.2	0	1.5	2.2	16.7	0	0	25	2.9	0	4	2.5	0	0	2.4
TTST	0	0	0	0	19	42	0	0	0	0	18	0	0	31	0	0	110
% TTST	0	0	0	0	1.4	1	0	0	0	0	1.4	0	0	0.9	0	0	1
Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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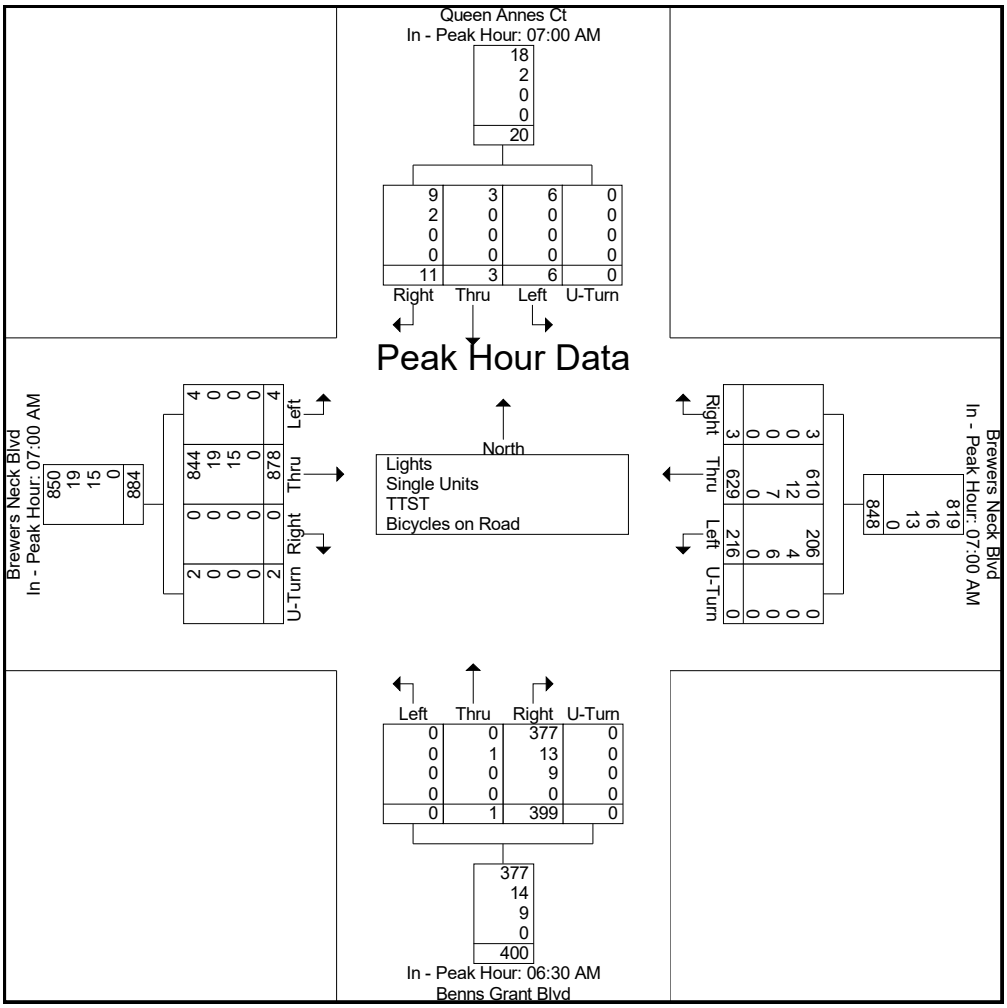
	Queen Annes Ct Southbound					Brewers Neck Blvd Westbound					Benns Grant Blvd Northbound					Brewers Neck Blvd Eastbound					
Start Time			Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	1	0	5	0	6	35	219	0	0	254	0	1	96	0	97	1	209	0	0	210	567
07:15 AM	2	0	3	0	5	59	161	1	0	221	0	0	108	0	108	0	203	0	0	203	537
07:30 AM	1	1	2	0	4	69	124	0	0	193	0	0	94	0	94	2	268	0	1	271	562
07:45 AM	2	2	1	0	5	53	125	2	0	180	0	0	86	0	86	1	198	0	1	200	471
Total Volume	6	3	11	0	20	216	629	3	0	848	0	1	384	0	385	4	878	0	2	884	2137
% App. Total	30	15	55	0		25.5	74.2	0.4	0		0	0.3	99.7	0		0.5	99.3	0	0.2		
PHF	.750	.375	.550	.000	.833	.783	.718	.375	.000	.835	.000	.250	.889	.000	.891	.500	.819	.000	.500	.815	.942
Lights	6	3	9	0	18	206	610	3	0	819	0	0	361	0	361	4	844	0	2	850	2048
% Lights	100	100	81.8	0	90.0	95.4	97.0	100	0	96.6	0	0	94.0	0	93.8	100	96.1	0	100	96.2	95.8
Single Units	0	0	2	0	2	4	12	0	0	16	0	1	19	0	20	0	19	0	0	19	57
% Single Units	0	0	18.2	0	10.0	1.9	1.9	0	0	1.9	0	100	4.9	0	5.2	0	2.2	0	0	2.1	2.7
TTST	0	0	0	0	0	6	7	0	0	13	0	0	4	0	4	0	15	0	0	15	32
% TTST	0	0	0	0	0	2.8	1.1	0	0	1.5	0	0	1.0	0	1.0	0	1.7	0	0	1.7	1.5
Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



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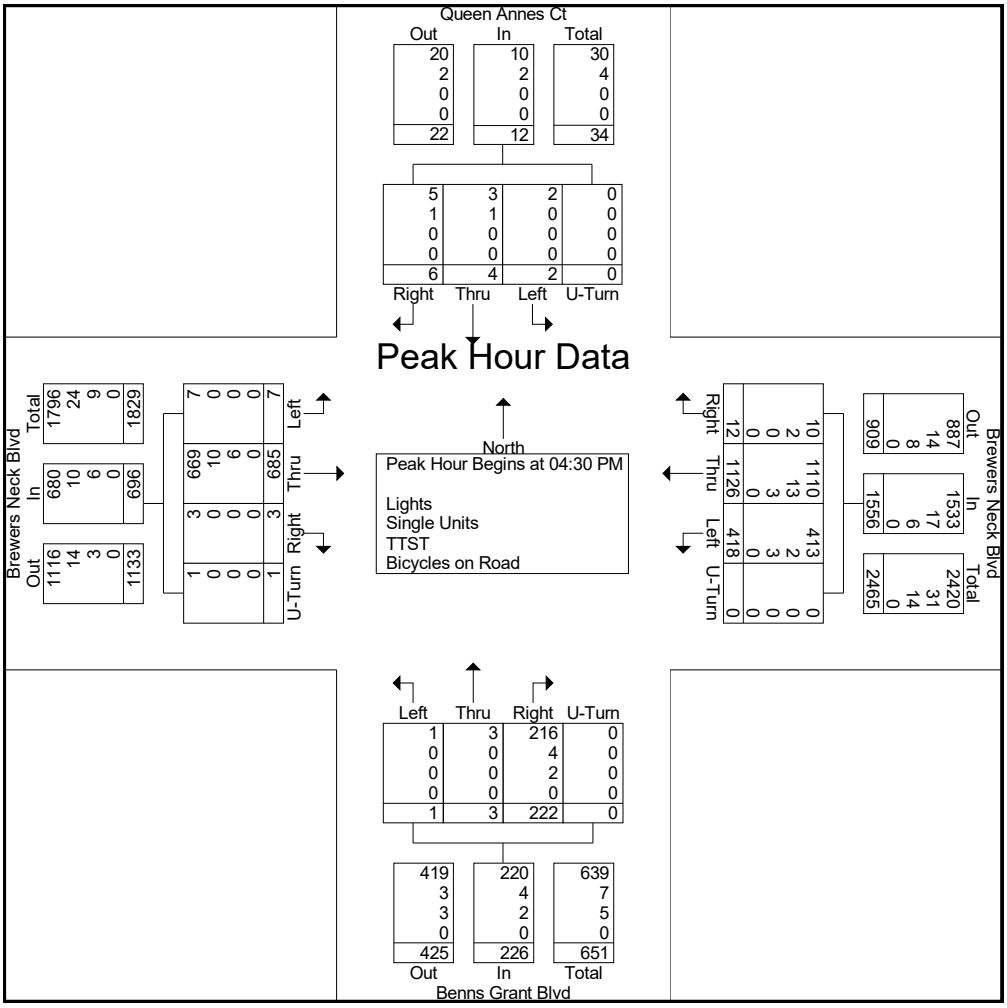
	Queen Annes Ct Southbound					Brewers Neck Blvd Westbound					Benns Grant Blvd Northbound					Brewers Neck Blvd Eastbound					
Start Time			Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Each Approach Begins at:																					
	07:00 AM					07:00 AM					06:30 AM					07:00 AM					
+0 mins.	1	0	5	0	6	35	219	0	0	254	0	0	100	0	100	1	209	0	0	210	
+15 mins.	2	0	3	0	5	59	161	1	0	221	0	0	95	0	95	0	203	0	0	203	
+30 mins.	1	1	2	0	4	69	124	0	0	193	0	1	96	0	97	2	268	0	1	271	
+45 mins.	2	2	1	0	5	53	125	2	0	180	0	0	108	0	108	1	198	0	1	200	
Total Volume	6	3	11	0	20	216	629	3	0	848	0	1	399	0	400	4	878	0	2	884	
% App. Total	30	15	55	0		25.5	74.2	0.4	0		0	0.2	99.8	0		0.5	99.3	0	0.2		
PHF	.750	.375	.550	.000	.833	.783	.718	.375	.000	.835	.000	.250	.924	.000	.926	.500	.819	.000	.500	.815	
Lights	6	3	9	0	18	206	610	3	0	819	0	0	377	0	377	4	844	0	2	850	
% Lights	100	100	81.8	0	90	95.4	97	100	0	96.6	0	0	94.5	0	94.2	100	96.1	0	100	96.2	
Single Units	0	0	2	0	2	4	12	0	0	16	0	1	13	0	14	0	19	0	0	19	
% Single Units	0	0	18.2	0	10	1.9	1.9	0	0	1.9	0	100	3.3	0	3.5	0	2.2	0	0	2.1	
TTST	0	0	0	0	0	6	7	0	0	13	0	0	9	0	9	0	15	0	0	15	
% TTST	0	0	0	0	0	2.8	1.1	0	0	1.5	0	0	2.3	0	2.2	0	1.7	0	0	1.7	
Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
% Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	



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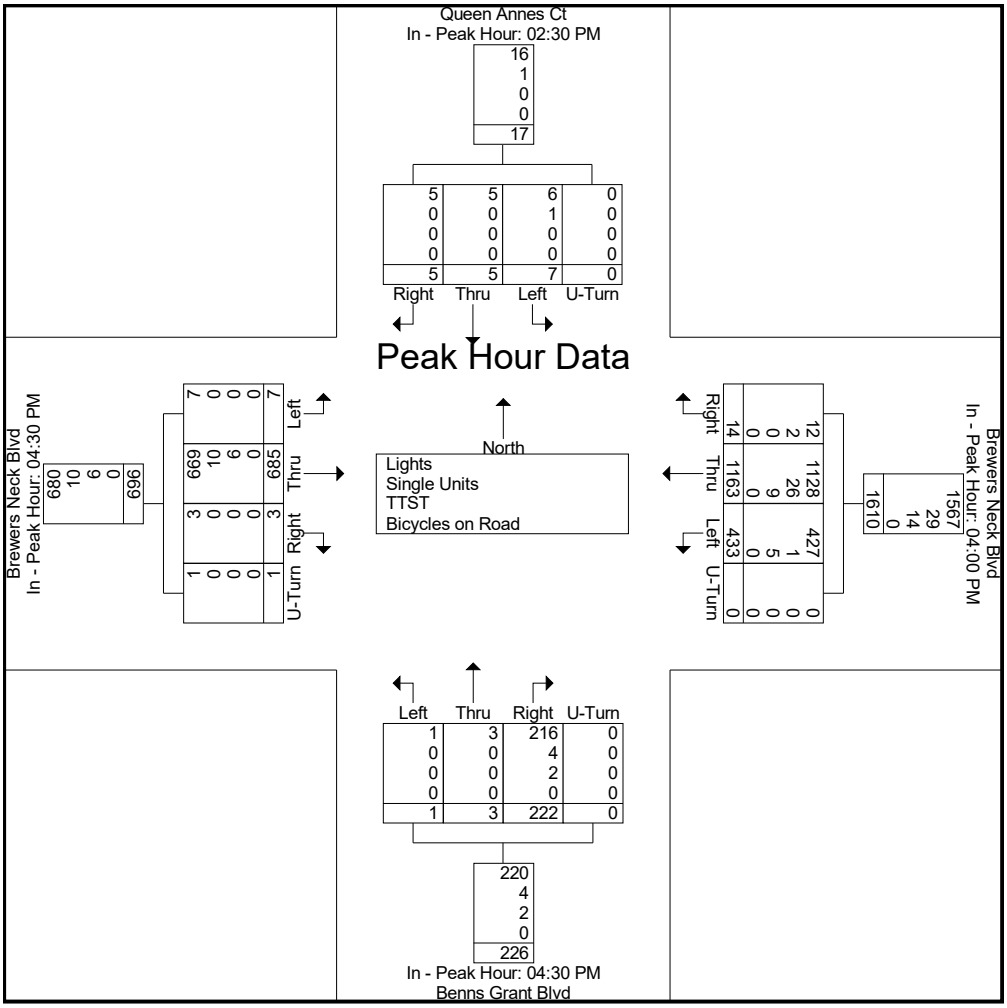
	Queen Annes Ct Southbound					Brewers Neck Blvd Westbound					Benns Grant Blvd Northbound					Brewers Neck Blvd Eastbound					
Start Time	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:15 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	0	1	2	0	3	94	294	2	0	390	0	0	41	0	41	1	172	2	0	175	609
04:45 PM	0	1	2	0	3	121	293	3	0	417	0	0	48	0	48	1	168	0	0	169	637
05:00 PM	1	1	1	0	3	103	255	2	0	360	0	1	62	0	63	5	171	0	1	177	603
05:15 PM	1	1	1	0	3	100	284	5	0	389	1	2	71	0	74	0	174	1	0	175	641
Total Volume	2	4	6	0	12	418	1126	12	0	1556	1	3	222	0	226	7	685	3	1	696	2490
% App. Total	16.7	33.3	50	0		26.9	72.4	0.8	0		0.4	1.3	98.2	0		1	98.4	0.4	0.1		
PHF	.500	1.00	.750	.000	1.00	.864	.957	.600	.000	.933	.250	.375	.782	.000	.764	.350	.984	.375	.250	.983	.971
Lights	2	3	5	0	10	413	1110	10	0	1533	1	3	216	0	220	7	669	3	1	680	2443
% Lights	100	75.0	83.3	0	83.3	98.8	98.6	83.3	0	98.5	100	100	97.3	0	97.3	100	97.7	100	100	97.7	98.1
Single Units	0	1	1	0	2	2	13	2	0	17	0	0	4	0	4	0	10	0	0	10	33
% Single Units	0	25.0	16.7	0	16.7	0.5	1.2	16.7	0	1.1	0	0	1.8	0	1.8	0	1.5	0	0	1.4	1.3
TTST	0	0	0	0	0	3	3	0	0	6	0	0	2	0	2	0	6	0	0	6	14
% TTST	0	0	0	0	0	0.7	0.3	0	0	0.4	0	0	0.9	0	0.9	0	0.9	0	0	0.9	0.6
Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



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	Queen Annes Ct Southbound					Brewers Neck Blvd Westbound					Benns Grant Blvd Northbound					Brewers Neck Blvd Eastbound					
Start Time	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:15 PM - Peak 1 of 1																					
Peak Hour for Each Approach Begins at:																					
	02:30 PM					04:00 PM					04:30 PM					04:30 PM					
+0 mins.	3	2	1	0	6	109	303	4	0	416	0	0	41	0	41	1	172	2	0	175	
+15 mins.	2	1	2	0	5	109	273	5	0	387	0	0	48	0	48	1	168	0	0	169	
+30 mins.	1	0	0	0	1	94	294	2	0	390	0	1	62	0	63	5	171	0	1	177	
+45 mins.	1	2	2	0	5	121	293	3	0	417	1	2	71	0	74	0	174	1	0	175	
Total Volume	7	5	5	0	17	433	1163	14	0	1610	1	3	222	0	226	7	685	3	1	696	
% App. Total	41.2	29.4	29.4	0		26.9	72.2	0.9	0		0.4	1.3	98.2	0		1	98.4	0.4	0.1		
PHF	.583	.625	.625	.000	.708	.895	.960	.700	.000	.965	.250	.375	.782	.000	.764	.350	.984	.375	.250	.983	
Lights	6	5	5	0	16	427	1128	12	0	1567	1	3	216	0	220	7	669	3	1	680	
% Lights	85.7	100	100	0	94.1	98.6	97	85.7	0	97.3	100	100	97.3	0	97.3	100	97.7	100	100	97.7	
Single Units	1	0	0	0	1	1	26	2	0	29	0	0	4	0	4	0	10	0	0	10	
% Single Units	14.3	0	0	0	5.9	0.2	2.2	14.3	0	1.8	0	0	1.8	0	1.8	0	1.5	0	0	1.4	
TTST	0	0	0	0	0	5	9	0	0	14	0	0	2	0	2	0	6	0	0	6	
% TTST	0	0	0	0	0	1.2	0.8	0	0	0.9	0	0	0.9	0	0.9	0	0.9	0	0	0.9	
Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
% Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	



APPENDIX C

2018 Existing Synchro Reports

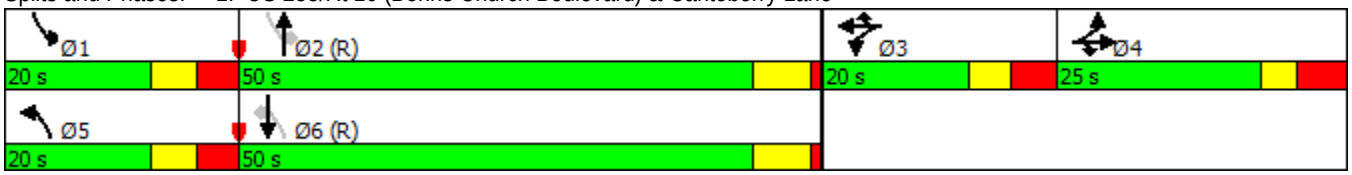
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	1	17	88	4	38	13	711	45	49	1030	32
Future Volume (vph)	23	1	17	88	4	38	13	711	45	49	1030	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	200		350	275		325
Storage Lanes	0		1	0		1	1		1	1		1
Taper Length (ft)	25			25			125			225		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected		0.958			0.955		0.950			0.950		
Satd. Flow (prot)	0	1759	1615	0	1738	1615	1805	3374	1509	1752	3505	1615
Flt Permitted		0.958			0.955		0.062			0.307		
Satd. Flow (perm)	0	1759	1615	0	1738	1615	118	3374	1509	566	3505	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			171			171			185			185
Link Speed (mph)		25			25			45			45	
Link Distance (ft)		335			1232			773			1937	
Travel Time (s)		9.1			33.6			11.7			29.3	
Peak Hour Factor	0.82	0.25	0.53	0.76	0.50	0.79	0.46	0.92	0.75	0.73	0.63	0.80
Heavy Vehicles (%)	4%	0%	0%	3%	25%	0%	0%	7%	7%	3%	3%	0%
Adj. Flow (vph)	28	4	32	116	8	48	28	773	60	67	1635	40
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	32	32	0	124	48	28	773	60	67	1635	40
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Split	NA	Prot	Split	NA	Prot	D.P+P	NA	Perm	D.P+P	NA	Perm
Protected Phases	4	4	4	3	3	3	5	2		1	6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases							6		2	2		6
Detector Phase	4	4	4	3	3	3	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	5.0	15.0	15.0	5.0	15.0	15.0
Minimum Split (s)	14.5	14.5	14.5	14.5	14.5	14.5	12.5	21.0	21.0	12.5	21.0	21.0
Total Split (s)	25.0	25.0	25.0	20.0	20.0	20.0	20.0	50.0	50.0	20.0	50.0	50.0
Total Split (%)	21.7%	21.7%	21.7%	17.4%	17.4%	17.4%	17.4%	43.5%	43.5%	17.4%	43.5%	43.5%
Maximum Green (s)	17.5	17.5	17.5	12.5	12.5	12.5	12.5	44.0	44.0	12.5	44.0	44.0
Yellow Time (s)	3.0	3.0	3.0	3.5	3.5	3.5	4.0	5.0	5.0	4.0	5.0	5.0
All-Red Time (s)	4.5	4.5	4.5	4.0	4.0	4.0	3.5	1.0	1.0	3.5	1.0	1.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		7.5	7.5		7.5	7.5	7.5	6.0	6.0	7.5	6.0	6.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	2.0	6.0	6.0	2.0	6.0	6.0
Minimum Gap (s)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	3.5	3.5	0.2	3.5	3.5
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.0	20.0	0.0	20.0	20.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0	15.0	0.0	15.0	15.0
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)		8.0	8.0		11.5	11.5	71.3	66.1	66.1	69.8	69.5	69.5
Actuated g/C Ratio		0.07	0.07		0.10	0.10	0.62	0.57	0.57	0.61	0.60	0.60
v/c Ratio		0.26	0.12		0.71	0.15	0.19	0.40	0.06	0.16	0.77	0.04
Control Delay		55.5	0.9		72.5	1.0	12.5	14.0	0.4	9.8	23.3	0.1
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		55.5	0.9		72.5	1.0	12.5	14.0	0.4	9.8	23.3	0.1
LOS		E	A		E	A	B	B	A	A	C	A
Approach Delay		28.2			52.6			13.0			22.3	
Approach LOS		C			D			B			C	

Intersection Summary

Area Type: Other
Cycle Length: 115
Actuated Cycle Length: 115
Offset: 0 (0%), Referenced to phase 2:NBSB and 6:NBSB, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.77
Intersection Signal Delay: 21.4 Intersection LOS: C
Intersection Capacity Utilization 61.9% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 1: US 258/Rt 10 (Benns Church Boulevard) & Canteberry Lane



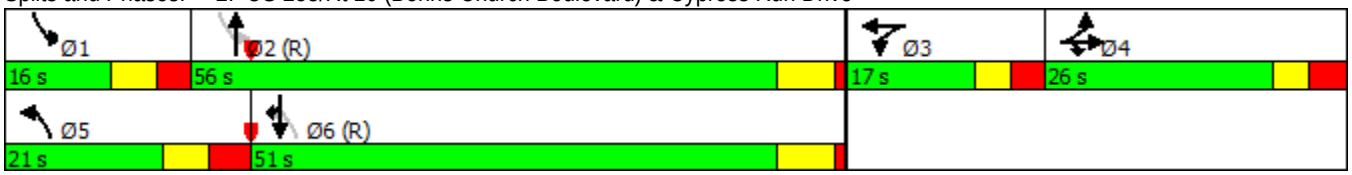
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	0	18	0	0	0	21	635	0	2	1252	28
Future Volume (vph)	4	0	18	0	0	0	21	635	0	2	1252	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	250		0	150		235
Storage Lanes	0		1	0		0	1		0	1		1
Taper Length (ft)	25			25			150			125		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt			0.850									0.850
Flt Protected		0.950					0.950			0.950		
Satd. Flow (prot)	0	1805	1524	0	1900	0	1805	3505	0	1805	3471	1553
Flt Permitted		0.950					0.099			0.326		
Satd. Flow (perm)	0	1805	1524	0	1900	0	188	3505	0	619	3471	1553
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			152									157
Link Speed (mph)		15			25			45			45	
Link Distance (ft)		1905			1451			1986			773	
Travel Time (s)		86.6			39.6			30.1			11.7	
Peak Hour Factor	0.50	0.25	0.56	0.25	0.25	0.25	0.44	0.75	0.44	0.50	0.72	0.78
Heavy Vehicles (%)	0%	0%	6%	0%	0%	0%	0%	3%	14%	0%	4%	4%
Adj. Flow (vph)	8	0	32	0	0	0	48	847	0	4	1739	36
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	8	32	0	0	0	48	847	0	4	1739	36
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100		20	100		20	100	20
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0	0	0	0		0	0		0	0	0
Detector 1 Size(ft)	20	6	20	20	6		20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Split	NA	Prot				D.P+P	NA		D.P+P	NA	Prot
Protected Phases	4	4	4	3	3		5	2		1	6	6

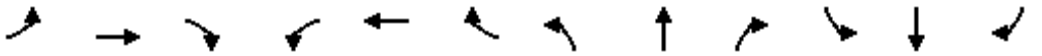
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases							6			2		
Detector Phase	4	4	4	3	3		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		5.0	14.0		5.0	14.0	14.0
Minimum Split (s)	13.5	13.5	13.5	13.0	13.0		12.5	20.0		12.0	20.0	20.0
Total Split (s)	26.0	26.0	26.0	17.0	17.0		21.0	56.0		16.0	51.0	51.0
Total Split (%)	22.6%	22.6%	22.6%	14.8%	14.8%		18.3%	48.7%		13.9%	44.3%	44.3%
Maximum Green (s)	19.5	19.5	19.5	11.0	11.0		13.5	50.0		9.0	45.0	45.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.0	5.0		4.0	5.0	5.0
All-Red Time (s)	3.5	3.5	3.5	3.0	3.0		3.5	1.0		3.0	1.0	1.0
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)		6.5	6.5		6.0		7.5	6.0		7.0	6.0	6.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		2.0	5.0		2.0	5.0	5.0
Minimum Gap (s)	0.2	0.2	0.2	0.2	0.2		0.2	3.5		0.2	3.5	3.5
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	18.0		0.0	18.0	18.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	15.0		0.0	15.0	15.0
Recall Mode	None	None	None	None	None		None	C-Min		None	C-Min	C-Min
Act Effct Green (s)		7.0	7.0				93.4	100.9		98.5	91.7	91.7
Actuated g/C Ratio		0.06	0.06				0.81	0.88		0.86	0.80	0.80
v/c Ratio		0.07	0.14				0.21	0.28		0.01	0.63	0.03
Control Delay		52.5	1.2				4.3	2.7		0.5	2.9	0.0
Queue Delay		0.0	0.0				0.0	0.0		0.0	0.0	0.0
Total Delay		52.5	1.2				4.3	2.7		0.5	2.9	0.0
LOS		D	A				A	A		A	A	A
Approach Delay		11.5						2.8			2.8	
Approach LOS		B						A			A	

Intersection Summary

Area Type: Other
Cycle Length: 115
Actuated Cycle Length: 115
Offset: 13 (11%), Referenced to phase 2:NBSB and 6:NBSB, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.63
Intersection Signal Delay: 3.0 Intersection LOS: A
Intersection Capacity Utilization 50.9% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 2: US 258/Rt 10 (Benns Church Boulevard) & Cypress Run Drive





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	171	1	253	1	64	1	216	560	62	6	838	288
Future Volume (vph)	171	1	253	1	64	1	216	560	62	6	838	288
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	125		0	125		275
Storage Lanes	0		0	0		0	1		0	1		1
Taper Length (ft)	25			25			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt		0.924			0.997			0.973				0.850
Flt Protected		0.979			0.999		0.950			0.950		
Satd. Flow (prot)	0	1719	0	0	1892	0	1752	3401	0	1805	3505	1553
Flt Permitted		0.755			0.987		0.105			0.277		
Satd. Flow (perm)	0	1325	0	0	1870	0	194	3401	0	526	3505	1553
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		48			1			19				348
Link Speed (mph)		40			25			45			45	
Link Distance (ft)		1498			695			1153			1986	
Travel Time (s)		25.5			19.0			17.5			30.1	
Peak Hour Factor	0.64	0.25	0.73	0.25	0.39	0.25	0.52	0.90	0.46	0.25	0.73	0.51
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	3%	4%	0%	0%	3%	4%
Adj. Flow (vph)	267	4	347	4	164	4	415	622	135	24	1148	565
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	618	0	0	172	0	415	757	0	24	1148	565
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100		20	100	20
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		D.P+P	NA		D.P+P	NA	Perm
Protected Phases		4			8		1	6		5	2	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2			6		2
Detector Phase	4	4		8	8		1	6		5	2	2
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		5.0	15.0		5.0	15.0	15.0
Minimum Split (s)	15.0	15.0		14.5	14.5		12.5	21.0		12.5	21.0	21.0
Total Split (s)	62.5	62.5		62.5	62.5		47.5	61.0		27.5	41.0	41.0
Total Split (%)	41.4%	41.4%		41.4%	41.4%		31.5%	40.4%		18.2%	27.2%	27.2%
Maximum Green (s)	55.0	55.0		55.0	55.0		40.0	55.0		20.0	35.0	35.0
Yellow Time (s)	3.5	3.5		3.5	3.5		4.0	5.0		4.0	5.0	5.0
All-Red Time (s)	4.0	4.0		4.0	4.0		3.5	1.0		3.5	1.0	1.0
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)		7.5			7.5		7.5	6.0		7.5	6.0	6.0
Lead/Lag							Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0		3.0	3.0		4.0	6.0		2.0	6.0	6.0
Minimum Gap (s)	3.5	3.5		0.2	0.2		0.2	3.5		0.2	3.5	3.5
Time Before Reduce (s)	20.0	20.0		0.0	0.0		0.0	20.0		0.0	20.0	20.0
Time To Reduce (s)	10.0	10.0		0.0	0.0		0.0	15.0		0.0	15.0	15.0
Recall Mode	None	None		None	None		None	Min		None	Min	Min
Act Effct Green (s)		55.1			55.1		68.2	69.3		71.3	35.1	35.1
Actuated g/C Ratio		0.38			0.38		0.47	0.48		0.49	0.24	0.24
v/c Ratio		1.17			0.24		0.90	0.47		0.08	1.36	0.89
Control Delay		131.1			33.1		66.2	26.9		17.3	212.2	37.4
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Delay		131.1			33.1		66.2	26.9		17.3	212.2	37.4
LOS		F			C		E	C		B	F	D
Approach Delay		131.1			33.1			40.8			152.7	
Approach LOS		F			C			D			F	

Intersection Summary

Area Type: Other
Cycle Length: 151
Actuated Cycle Length: 145.8
Natural Cycle: 120
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.36
Intersection Signal Delay: 108.1 Intersection LOS: F
Intersection Capacity Utilization 84.4% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 3: US 258/Rt 10 (Benns Church Boulevard) & Turner Drive

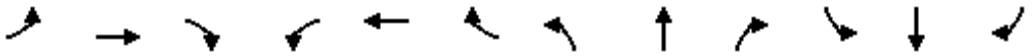


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	0	0	4	0	916	0	1	0
Future Volume (vph)	0	0	0	0	0	0	4	0	916	0	1	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0		125		0		140
Storage Lanes	0		0	0		0		1		0		1
Taper Length (ft)	25			25				25				75
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00
Frt												
Flt Protected							0.950				0.950	
Satd. Flow (prot)	0	0	0	0	0	0	1805	0	3438	0	1805	0
Flt Permitted							0.950				0.950	
Satd. Flow (perm)	0	0	0	0	0	0	1805	0	3438	0	1805	0
Link Speed (mph)		30			30				45			
Link Distance (ft)		810			872				3921			
Travel Time (s)		18.4			19.8				59.4			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.33	0.25	0.85	0.25	0.25	0.25
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	5%	0%	0%	0%
Adj. Flow (vph)	0	0	0	0	0	0	12	0	1078	0	4	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	0	12	0	1078	0	4	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	R NA	Left	Left	Right	R NA	Left
Median Width(ft)		0			0				12			
Link Offset(ft)		0			0				0			
Crosswalk Width(ft)		16			16				16			
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	9	15		9	9	15
Sign Control		Stop			Stop				Free			

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 34.6%		ICU Level of Service A	
Analysis Period (min) 15			

Lane Group	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	1130	0
Future Volume (vph)	1130	0
Ideal Flow (vphpl)	1900	1900
Storage Length (ft)		0
Storage Lanes		0
Taper Length (ft)		
Lane Util. Factor	0.95	1.00
Frt		
Flt Protected		
Satd. Flow (prot)	3406	0
Flt Permitted		
Satd. Flow (perm)	3406	0
Link Speed (mph)	45	
Link Distance (ft)	1153	
Travel Time (s)	17.5	
Peak Hour Factor	0.88	0.25
Heavy Vehicles (%)	6%	0%
Adj. Flow (vph)	1284	0
Shared Lane Traffic (%)		
Lane Group Flow (vph)	1284	0
Enter Blocked Intersection	No	No
Lane Alignment	Left	Right
Median Width(ft)	12	
Link Offset(ft)	0	
Crosswalk Width(ft)	16	
Two way Left Turn Lane		
Headway Factor	1.00	1.00
Turning Speed (mph)		9
Sign Control	Free	

Intersection Summary

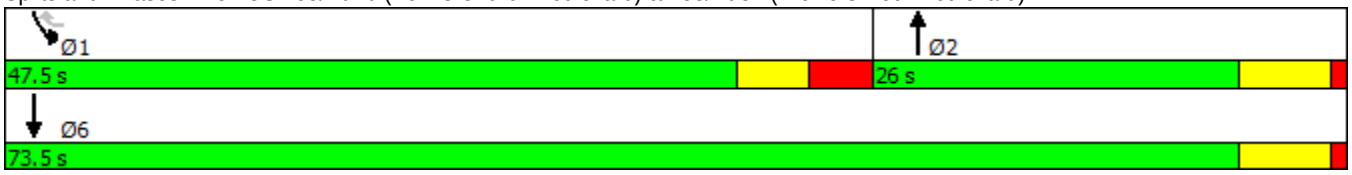


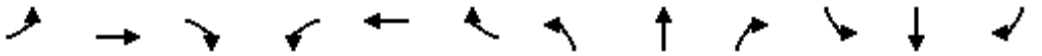
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	0	653	0	167	0	897	217	0
Future Volume (vph)	0	0	0	0	0	653	0	167	0	897	217	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		0	300		0
Storage Lanes	0		0	0		2	0		0	1		0
Taper Length (ft)	25			25			100			75		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.88	1.00	0.95	1.00	0.97	0.95	1.00
Frt						0.850						
Flt Protected										0.950		
Satd. Flow (prot)	0	0	0	0	0	2707	0	3471	0	3367	3438	0
Flt Permitted										0.950		
Satd. Flow (perm)	0	0	0	0	0	2707	0	3471	0	3367	3438	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						747						
Link Speed (mph)		30			45			45			45	
Link Distance (ft)		963			1126			2837			3921	
Travel Time (s)		21.9			17.1			43.0			59.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.72	0.92	0.84	0.25	0.83	0.63	0.25
Heavy Vehicles (%)	0%	0%	0%	0%	0%	5%	0%	4%	0%	4%	5%	0%
Adj. Flow (vph)	0	0	0	0	0	907	0	199	0	1081	344	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	907	0	199	0	1081	344	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors						1		2		1	2	
Detector Template						Right		Thru		Left	Thru	
Leading Detector (ft)						20		100		20	100	
Trailing Detector (ft)						0		0		0	0	
Detector 1 Position(ft)						0		0		0	0	
Detector 1 Size(ft)						20		6		20	6	
Detector 1 Type						Cl+Ex		Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)						0.0		0.0		0.0	0.0	
Detector 1 Queue (s)						0.0		0.0		0.0	0.0	
Detector 1 Delay (s)						0.0		0.0		0.0	0.0	
Detector 2 Position(ft)								94			94	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type						Perm		NA		Prot	NA	
Protected Phases								2		1	6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases						1						
Detector Phase						1		2		1	6	
Switch Phase												
Minimum Initial (s)						15.0		10.0		15.0	15.0	
Minimum Split (s)						22.5		16.0		22.5	21.0	
Total Split (s)						47.5		26.0		47.5	73.5	
Total Split (%)						64.6%		35.4%		64.6%	100.0%	
Maximum Green (s)						40.0		20.0		40.0	67.5	
Yellow Time (s)						4.0		5.0		4.0	5.0	
All-Red Time (s)						3.5		1.0		3.5	1.0	
Lost Time Adjust (s)						0.0		0.0		0.0	0.0	
Total Lost Time (s)						7.5		6.0		7.5	6.0	
Lead/Lag						Lead		Lag		Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)						3.5		2.5		3.5	5.0	
Recall Mode						Min		None		Min	Min	
Act Effct Green (s)						30.7		10.2		30.7	54.6	
Actuated g/C Ratio						0.56		0.19		0.56	1.00	
v/c Ratio						0.49		0.31		0.57	0.10	
Control Delay						2.1		21.8		8.9	0.1	
Queue Delay						0.0		0.0		0.0	0.0	
Total Delay						2.1		21.8		8.9	0.1	
LOS						A		C		A	A	
Approach Delay					2.1			21.8			6.8	
Approach LOS					A			C			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 73.5			
Actuated Cycle Length: 54.6			
Natural Cycle: 45			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.57			
Intersection Signal Delay: 6.3		Intersection LOS: A	
Intersection Capacity Utilization 43.9%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 5: US 258/Rt 10 (Benns Church Boulevard) & 258/Rt 32 (Brewers Neck Boulevard)





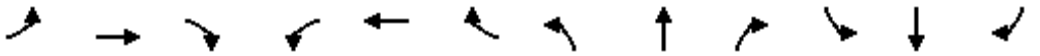
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	878	0	216	629	3	0	1	384	6	3	11
Future Volume (vph)	6	878	0	216	629	3	0	1	384	6	3	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	225		0	600		325	0		350	0		0
Storage Lanes	1		0	1		1	0		2	0		1
Taper Length (ft)	200			200			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	0.88	1.00	1.00	1.00
Frt						0.850			0.850			0.850
Flt Protected	0.950			0.950							0.976	
Satd. Flow (prot)	1805	3471	0	1719	3505	1615	0	950	2682	0	1854	1369
Flt Permitted	0.950			0.950							0.976	
Satd. Flow (perm)	1805	3471	0	1719	3505	1615	0	950	2682	0	1854	1369
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						171			431			160
Link Speed (mph)		45			45			45			25	
Link Distance (ft)		1126			846			914			623	
Travel Time (s)		17.1			12.8			13.8			17.0	
Peak Hour Factor	0.50	0.82	0.25	0.78	0.72	0.38	0.25	0.25	0.89	0.75	0.38	0.55
Heavy Vehicles (%)	0%	4%	0%	5%	3%	0%	0%	100%	6%	0%	0%	18%
Adj. Flow (vph)	12	1071	0	277	874	8	0	4	431	8	8	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	12	1071	0	277	874	8	0	4	431	0	16	20
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100		20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6		20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA	Perm		NA	pm+ov	Split	NA	Perm
Protected Phases	1	6		5	2		4	4	5	3	3	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases						2			4			3
Detector Phase	1	6		5	2	2	4	4	5	3	3	3
Switch Phase												
Minimum Initial (s)	10.0	15.0		10.0	15.0	15.0	10.0	10.0	10.0	5.0	5.0	5.0
Minimum Split (s)	19.0	24.5		19.5	24.5	24.5	26.0	26.0	19.5	26.0	26.0	26.0
Total Split (s)	34.0	41.5		39.5	47.0	47.0	26.0	26.0	39.5	33.0	33.0	33.0
Total Split (%)	24.3%	29.6%		28.2%	33.6%	33.6%	18.6%	18.6%	28.2%	23.6%	23.6%	23.6%
Maximum Green (s)	25.0	35.0		30.0	40.5	40.5	18.0	18.0	30.0	25.0	25.0	25.0
Yellow Time (s)	5.0	5.5		5.0	5.5	5.5	4.0	4.0	5.0	3.5	3.5	3.5
All-Red Time (s)	4.0	1.0		4.5	1.0	1.0	4.0	4.0	4.5	4.5	4.5	4.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Lost Time (s)	9.0	6.5		9.5	6.5	6.5		8.0	9.5		8.0	8.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	5.0		3.0	5.0	5.0	3.5	3.5	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None	None	None	None	None	None	None	None
Act Effct Green (s)	10.5	36.7		19.1	66.4	66.4		10.5	21.7		6.5	6.5
Actuated g/C Ratio	0.13	0.44		0.23	0.80	0.80		0.13	0.26		0.08	0.08
v/c Ratio	0.05	0.70		0.70	0.31	0.01		0.03	0.42		0.11	0.08
Control Delay	42.2	26.1		41.6	7.4	0.0		43.0	3.6		45.8	0.6
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Delay	42.2	26.1		41.6	7.4	0.0		43.0	3.6		45.8	0.6
LOS	D	C		D	A	A		D	A		D	A
Approach Delay		26.3			15.6			4.0			20.7	
Approach LOS		C			B			A			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 83.1			
Natural Cycle: 130			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.70			
Intersection Signal Delay: 18.1		Intersection LOS: B	
Intersection Capacity Utilization 64.6%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 6: Queen Annes Court & 258/Rt 32 (Brewers Neck Boulevard)





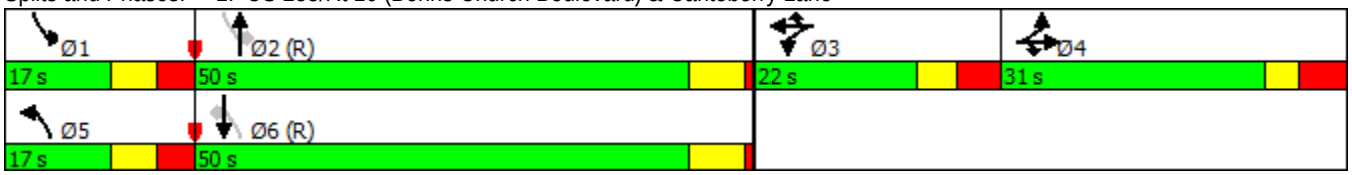
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	127	5	40	57	8	71	46	1109	95	118	931	88
Future Volume (vph)	127	5	40	57	8	71	46	1109	95	118	931	88
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	200		350	275		325
Storage Lanes	0		1	0		1	1		1	1		1
Taper Length (ft)	25			25			125			225		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected		0.956			0.959		0.950			0.950		
Satd. Flow (prot)	0	1816	1615	0	1791	1553	1805	3539	1583	1687	3505	1615
Flt Permitted		0.956			0.959		0.198			0.121		
Satd. Flow (perm)	0	1816	1615	0	1791	1553	376	3539	1583	215	3505	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			164			164			177			177
Link Speed (mph)		25			25			45			45	
Link Distance (ft)		335			1232			773			1937	
Travel Time (s)		9.1			33.6			11.7			29.3	
Peak Hour Factor	0.91	0.42	0.56	0.75	0.67	0.93	0.60	0.94	0.64	0.76	0.94	0.71
Heavy Vehicles (%)	0%	0%	0%	2%	0%	4%	0%	2%	2%	7%	3%	0%
Adj. Flow (vph)	140	12	71	76	12	76	77	1180	148	155	990	124
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	152	71	0	88	76	77	1180	148	155	990	124
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Split	NA	Prot	Split	NA	Prot	D.P+P	NA	Perm	D.P+P	NA	Perm
Protected Phases	4	4	4	3	3	3	5	2		1	6	

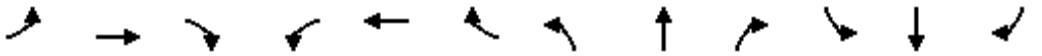
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases							6		2	2		6
Detector Phase	4	4	4	3	3	3	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	5.0	15.0	15.0	5.0	15.0	15.0
Minimum Split (s)	14.5	14.5	14.5	14.5	14.5	14.5	12.5	21.0	21.0	12.5	21.0	21.0
Total Split (s)	31.0	31.0	31.0	22.0	22.0	22.0	17.0	50.0	50.0	17.0	50.0	50.0
Total Split (%)	25.8%	25.8%	25.8%	18.3%	18.3%	18.3%	14.2%	41.7%	41.7%	14.2%	41.7%	41.7%
Maximum Green (s)	23.5	23.5	23.5	14.5	14.5	14.5	9.5	44.0	44.0	9.5	44.0	44.0
Yellow Time (s)	3.0	3.0	3.0	3.5	3.5	3.5	4.0	5.0	5.0	4.0	5.0	5.0
All-Red Time (s)	4.5	4.5	4.5	4.0	4.0	4.0	3.5	1.0	1.0	3.5	1.0	1.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		7.5	7.5		7.5	7.5	7.5	6.0	6.0	7.5	6.0	6.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	2.0	6.0	6.0	2.0	6.0	6.0
Minimum Gap (s)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	3.5	3.5	0.2	3.5	3.5
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.0	20.0	0.0	20.0	20.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0	15.0	0.0	15.0	15.0
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)		15.3	15.3		11.0	11.0	65.2	56.1	56.1	63.7	60.8	60.8
Actuated g/C Ratio		0.13	0.13		0.09	0.09	0.54	0.47	0.47	0.53	0.51	0.51
v/c Ratio		0.66	0.20		0.54	0.26	0.27	0.71	0.18	0.69	0.56	0.14
Control Delay		62.9	1.3		63.4	2.2	11.6	26.8	2.6	32.8	24.3	1.2
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		62.9	1.3		63.4	2.2	11.6	26.8	2.6	32.8	24.3	1.2
LOS		E	A		E	A	B	C	A	C	C	A
Approach Delay		43.3			35.0			23.4			23.1	
Approach LOS		D			D			C			C	

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBSB and 6:NBSB, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.71
Intersection Signal Delay: 25.4 Intersection LOS: C
Intersection Capacity Utilization 68.7% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 1: US 258/Rt 10 (Benns Church Boulevard) & Canteberry Lane





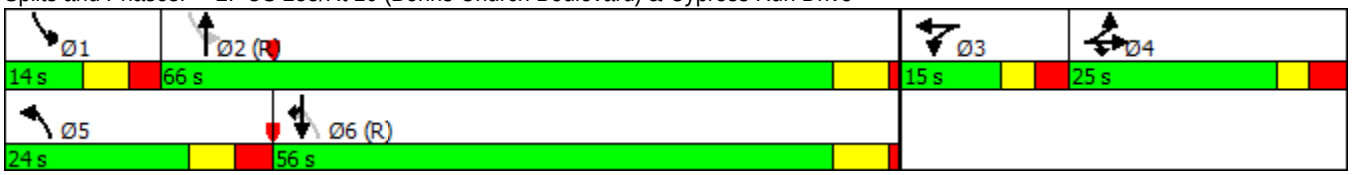
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	103	0	74	0	0	1	139	1146	0	0	907	119
Future Volume (vph)	103	0	74	0	0	1	139	1146	0	0	907	119
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	250		0	150		235
Storage Lanes	0		1	0		0	1		0	1		1
Taper Length (ft)	25			25			150			125		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt			0.850		0.865							0.850
Flt Protected		0.950					0.950					
Satd. Flow (prot)	0	1787	1599	0	1644	0	1805	3539	0	1900	3505	1615
Flt Permitted		0.950					0.232					
Satd. Flow (perm)	0	1787	1599	0	1644	0	441	3539	0	1900	3505	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			214		218							218
Link Speed (mph)		15			25			45			45	
Link Distance (ft)		1905			1451			1986			773	
Travel Time (s)		86.6			39.6			30.1			11.7	
Peak Hour Factor	0.81	0.25	0.62	0.25	0.25	0.25	0.67	0.93	0.25	0.25	0.95	0.80
Heavy Vehicles (%)	1%	0%	1%	0%	0%	0%	0%	2%	0%	0%	3%	0%
Adj. Flow (vph)	127	0	119	0	0	4	207	1232	0	0	955	149
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	127	119	0	4	0	207	1232	0	0	955	149
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100		20	100		20	100	20
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0	0	0	0		0	0		0	0	0
Detector 1 Size(ft)	20	6	20	20	6		20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Split	NA	Prot		NA		D.P+P	NA		D.P+P	NA	Prot
Protected Phases	4	4	4	3	3		5	2		1	6	6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases							6			2		
Detector Phase	4	4	4	3	3		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		5.0	14.0		5.0	14.0	14.0
Minimum Split (s)	13.5	13.5	13.5	13.0	13.0		12.5	20.0		12.0	20.0	20.0
Total Split (s)	25.0	25.0	25.0	15.0	15.0		24.0	66.0		14.0	56.0	56.0
Total Split (%)	20.8%	20.8%	20.8%	12.5%	12.5%		20.0%	55.0%		11.7%	46.7%	46.7%
Maximum Green (s)	18.5	18.5	18.5	9.0	9.0		16.5	60.0		7.0	50.0	50.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.0	5.0		4.0	5.0	5.0
All-Red Time (s)	3.5	3.5	3.5	3.0	3.0		3.5	1.0		3.0	1.0	1.0
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)		6.5	6.5		6.0		7.5	6.0		7.0	6.0	6.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		2.0	5.0		2.0	5.0	5.0
Minimum Gap (s)	0.2	0.2	0.2	0.2	0.2		0.2	3.5		0.2	3.5	3.5
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	18.0		0.0	18.0	18.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	15.0		0.0	15.0	15.0
Recall Mode	None	None	None	None	None		None	C-Min		None	C-Min	C-Min
Act Effct Green (s)		13.7	13.7		7.0		82.2	91.2			70.9	70.9
Actuated g/C Ratio		0.11	0.11		0.06		0.68	0.76			0.59	0.59
v/c Ratio		0.62	0.32		0.01		0.46	0.46			0.46	0.14
Control Delay		63.6	2.3		0.0		9.5	7.0			7.1	0.3
Queue Delay		0.0	0.0		0.0		0.0	0.0			0.0	0.0
Total Delay		63.6	2.3		0.0		9.5	7.0			7.1	0.3
LOS		E	A		A		A	A			A	A
Approach Delay		33.9						7.4			6.1	
Approach LOS		C						A			A	

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 12 (10%), Referenced to phase 2:NBSB and 6:NBSB, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.62
Intersection Signal Delay: 9.2 Intersection LOS: A
Intersection Capacity Utilization 64.5% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 2: US 258/Rt 10 (Benns Church Boulevard) & Cypress Run Drive



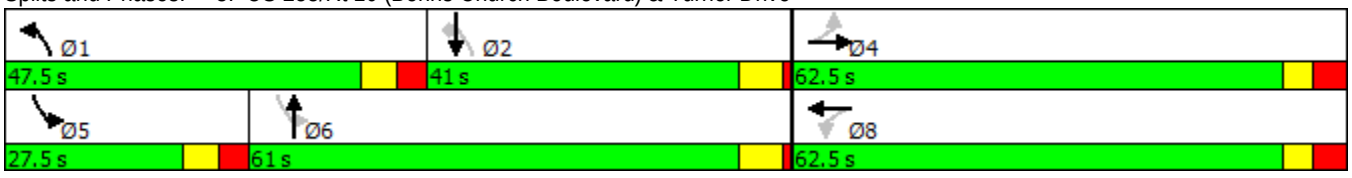
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	76	0	86	0	1	2	153	1196	1	29	877	112
Future Volume (vph)	76	0	86	0	1	2	153	1196	1	29	877	112
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	125		0	125		275
Storage Lanes	0		0	0		0	1		0	1		1
Taper Length (ft)	25			25			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt		0.936			0.932							0.850
Flt Protected		0.974					0.950			0.950		
Satd. Flow (prot)	0	1715	0	0	1771	0	1687	3539	0	1805	3505	1482
Flt Permitted		0.830					0.243			0.141		
Satd. Flow (perm)	0	1461	0	0	1771	0	431	3539	0	268	3505	1482
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		130			4							141
Link Speed (mph)		40			25			45			45	
Link Distance (ft)		1501			695			1153			1986	
Travel Time (s)		25.6			19.0			17.5			30.1	
Peak Hour Factor	0.63	0.25	0.80	0.25	0.25	0.50	0.90	0.94	0.25	0.50	0.98	0.85
Heavy Vehicles (%)	1%	0%	1%	0%	0%	0%	7%	2%	0%	0%	3%	9%
Adj. Flow (vph)	121	0	108	0	4	4	170	1272	4	58	895	132
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	229	0	0	8	0	170	1276	0	58	895	132
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100		20	100	20
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA			NA		D.P+P	NA		D.P+P	NA	Perm
Protected Phases		4			8		1	6		5	2	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2			6		2
Detector Phase	4	4		8	8		1	6		5	2	2
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		5.0	15.0		5.0	15.0	15.0
Minimum Split (s)	14.5	14.5		14.5	14.5		12.5	21.0		12.5	21.0	21.0
Total Split (s)	62.5	62.5		62.5	62.5		47.5	61.0		27.5	41.0	41.0
Total Split (%)	41.4%	41.4%		41.4%	41.4%		31.5%	40.4%		18.2%	27.2%	27.2%
Maximum Green (s)	55.0	55.0		55.0	55.0		40.0	55.0		20.0	35.0	35.0
Yellow Time (s)	3.5	3.5		3.5	3.5		4.0	5.0		4.0	5.0	5.0
All-Red Time (s)	4.0	4.0		4.0	4.0		3.5	1.0		3.5	1.0	1.0
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)		7.5			7.5		7.5	6.0		7.5	6.0	6.0
Lead/Lag							Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0		3.0	3.0		4.0	6.0		2.0	6.0	6.0
Minimum Gap (s)	3.5	3.5		0.2	0.2		0.2	3.5		0.2	3.5	3.5
Time Before Reduce (s)	20.0	20.0		0.0	0.0		0.0	20.0		0.0	20.0	20.0
Time To Reduce (s)	10.0	10.0		0.0	0.0		0.0	15.0		0.0	15.0	15.0
Recall Mode	None	None		None	None		None	Min		None	Min	Min
Act Effct Green (s)		14.2			9.7		51.4	50.3		53.3	42.0	42.0
Actuated g/C Ratio		0.16			0.11		0.58	0.57		0.60	0.47	0.47
v/c Ratio		0.67			0.04		0.42	0.63		0.22	0.54	0.17
Control Delay		26.3			28.3		10.0	16.4		8.4	18.9	3.2
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Delay		26.3			28.3		10.0	16.4		8.4	18.9	3.2
LOS		C			C		A	B		A	B	A
Approach Delay		26.3			28.3			15.6			16.5	
Approach LOS		C			C			B			B	

Intersection Summary

Area Type: Other
Cycle Length: 151
Actuated Cycle Length: 88.5
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.67
Intersection Signal Delay: 16.9 Intersection LOS: B
Intersection Capacity Utilization 70.9% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 3: US 258/Rt 10 (Benns Church Boulevard) & Turner Drive



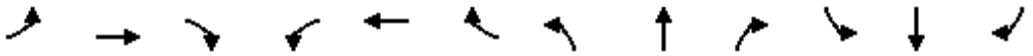
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	0	0	4	0	1341	0	0	0
Future Volume (vph)	0	0	0	0	0	0	4	0	1341	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0		125		0		140
Storage Lanes	0		0	0		0		1		0		1
Taper Length (ft)	25			25				25				75
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00
Frt												
Flt Protected							0.950					
Satd. Flow (prot)	0	0	0	0	0	0	1805	0	3505	0	1900	0
Flt Permitted							0.950					
Satd. Flow (perm)	0	0	0	0	0	0	1805	0	3505	0	1900	0
Link Speed (mph)		30			30				45			
Link Distance (ft)		810			872				3921			
Travel Time (s)		18.4			19.8				59.4			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.25	0.25	0.97	0.25	0.50	0.25
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	3%	0%	0%	0%
Adj. Flow (vph)	0	0	0	0	0	0	16	0	1382	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	0	16	0	1382	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	R NA	Left	Left	Right	R NA	Left
Median Width(ft)		0			0				12			
Link Offset(ft)		0			0				0			
Crosswalk Width(ft)		16			16				16			
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	9	15		9	9	15
Sign Control		Stop			Stop				Free			

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 40.4%		ICU Level of Service A	
Analysis Period (min) 15			



Lane Group	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	952	0
Future Volume (vph)	952	0
Ideal Flow (vphpl)	1900	1900
Storage Length (ft)		0
Storage Lanes		0
Taper Length (ft)		
Lane Util. Factor	0.95	1.00
Frt		
Flt Protected		
Satd. Flow (prot)	3539	0
Flt Permitted		
Satd. Flow (perm)	3539	0
Link Speed (mph)	45	
Link Distance (ft)	1153	
Travel Time (s)	17.5	
Peak Hour Factor	0.95	0.25
Heavy Vehicles (%)	2%	0%
Adj. Flow (vph)	1002	0
Shared Lane Traffic (%)		
Lane Group Flow (vph)	1002	0
Enter Blocked Intersection	No	No
Lane Alignment	Left	Right
Median Width(ft)	12	
Link Offset(ft)	0	
Crosswalk Width(ft)	16	
Two way Left Turn Lane		
Headway Factor	1.00	1.00
Turning Speed (mph)		9
Sign Control	Free	

Intersection Summary

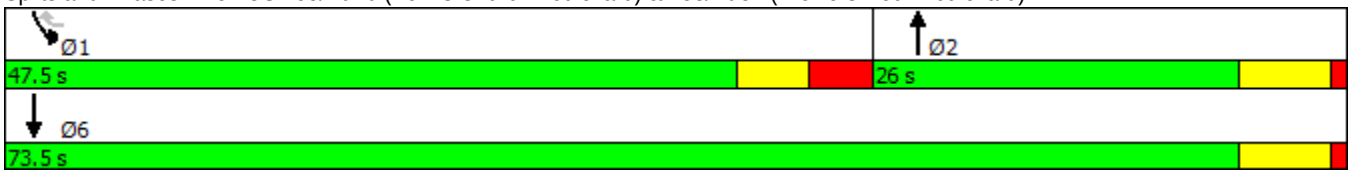


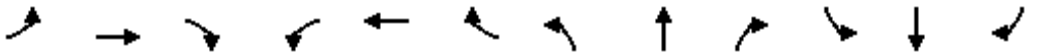
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	0	1154	0	200	0	647	276	0
Future Volume (vph)	0	0	0	0	0	1154	0	200	0	647	276	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		0	300		0
Storage Lanes	0		0	0		2	0		0	1		0
Taper Length (ft)	25			25			100			75		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.88	1.00	0.95	1.00	0.97	0.95	1.00
Frt						0.850						
Flt Protected										0.950		
Satd. Flow (prot)	0	0	0	0	0	2760	0	3471	0	3400	3471	0
Flt Permitted										0.950		
Satd. Flow (perm)	0	0	0	0	0	2760	0	3471	0	3400	3471	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						659						
Link Speed (mph)		30			45			45			45	
Link Distance (ft)		963			1126			2837			3921	
Travel Time (s)		21.9			17.1			43.0			59.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.93	0.25	0.89	0.25	0.99	0.85	0.25
Heavy Vehicles (%)	0%	0%	0%	0%	0%	3%	0%	4%	0%	3%	4%	0%
Adj. Flow (vph)	0	0	0	0	0	1241	0	225	0	654	325	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	1241	0	225	0	654	325	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors						1		2		1	2	
Detector Template						Right		Thru		Left	Thru	
Leading Detector (ft)						20		100		20	100	
Trailing Detector (ft)						0		0		0	0	
Detector 1 Position(ft)						0		0		0	0	
Detector 1 Size(ft)						20		6		20	6	
Detector 1 Type						Cl+Ex		Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)						0.0		0.0		0.0	0.0	
Detector 1 Queue (s)						0.0		0.0		0.0	0.0	
Detector 1 Delay (s)						0.0		0.0		0.0	0.0	
Detector 2 Position(ft)								94			94	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type						Perm		NA		Prot	NA	
Protected Phases								2		1	6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases						1						
Detector Phase						1		2		1	6	
Switch Phase												
Minimum Initial (s)						15.0		10.0		15.0	15.0	
Minimum Split (s)						22.5		16.0		22.5	21.0	
Total Split (s)						47.5		26.0		47.5	73.5	
Total Split (%)						64.6%		35.4%		64.6%	100.0%	
Maximum Green (s)						40.0		20.0		40.0	67.5	
Yellow Time (s)						4.0		5.0		4.0	5.0	
All-Red Time (s)						3.5		1.0		3.5	1.0	
Lost Time Adjust (s)						0.0		0.0		0.0	0.0	
Total Lost Time (s)						7.5		6.0		7.5	6.0	
Lead/Lag						Lead		Lag		Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)						3.5		2.5		3.5	5.0	
Recall Mode						Min		None		Min	Min	
Act Effct Green (s)						26.5		10.5		26.5	50.8	
Actuated g/C Ratio						0.52		0.21		0.52	1.00	
v/c Ratio						0.71		0.32		0.37	0.09	
Control Delay						6.1		20.6		7.5	0.1	
Queue Delay						0.0		0.0		0.0	0.0	
Total Delay						6.1		20.6		7.5	0.1	
LOS						A		C		A	A	
Approach Delay					6.1			20.6			5.0	
Approach LOS					A			C			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 73.5			
Actuated Cycle Length: 50.8			
Natural Cycle: 50			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.71			
Intersection Signal Delay: 7.0		Intersection LOS: A	
Intersection Capacity Utilization 60.0%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 5: US 258/Rt 10 (Benns Church Boulevard) & 258/Rt 32 (Brewers Neck Boulevard)





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	685	3	418	1126	12	1	3	222	2	4	6
Future Volume (vph)	8	685	3	418	1126	12	1	3	222	2	4	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	225		0	600		325	0		350	0		0
Storage Lanes	1		0	1		1	0		2	0		1
Taper Length (ft)	200			200			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	0.88	1.00	1.00	1.00
Frt		0.999				0.850			0.850			0.850
Flt Protected	0.950			0.950				0.984			0.976	
Satd. Flow (prot)	1805	3536	0	1787	3539	1380	0	1870	2787	0	1648	1380
Flt Permitted	0.950			0.950				0.984			0.976	
Satd. Flow (perm)	1805	3536	0	1787	3539	1380	0	1870	2787	0	1648	1380
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						171			285			160
Link Speed (mph)		45			45			45			25	
Link Distance (ft)		1126			846			914			623	
Travel Time (s)		17.1			12.8			13.8			17.0	
Peak Hour Factor	0.35	0.98	1.00	0.86	0.96	0.60	0.25	0.38	0.78	0.50	1.00	0.75
Heavy Vehicles (%)	0%	2%	0%	1%	2%	17%	0%	0%	2%	0%	25%	17%
Adj. Flow (vph)	23	699	3	486	1173	20	4	8	285	4	4	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	23	702	0	486	1173	20	0	12	285	0	8	8
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100		20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6		20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA	pm+ov	Split	NA	Perm
Protected Phases	1	6		5	2		4	4	5	3	3	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases						2			4			3
Detector Phase	1	6		5	2	2	4	4	5	3	3	3
Switch Phase												
Minimum Initial (s)	10.0	15.0		10.0	15.0	15.0	10.0	10.0	10.0	5.0	5.0	5.0
Minimum Split (s)	19.0	24.5		19.5	24.5	24.5	26.0	26.0	19.5	26.0	26.0	26.0
Total Split (s)	34.0	41.5		39.5	47.0	47.0	26.0	26.0	39.5	33.0	33.0	33.0
Total Split (%)	24.3%	29.6%		28.2%	33.6%	33.6%	18.6%	18.6%	28.2%	23.6%	23.6%	23.6%
Maximum Green (s)	25.0	35.0		30.0	40.5	40.5	18.0	18.0	30.0	25.0	25.0	25.0
Yellow Time (s)	5.0	5.5		5.0	5.5	5.5	4.0	4.0	5.0	3.5	3.5	3.5
All-Red Time (s)	4.0	1.0		4.5	1.0	1.0	4.0	4.0	4.5	4.5	4.5	4.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Lost Time (s)	9.0	6.5		9.5	6.5	6.5		8.0	9.5		8.0	8.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	5.0		3.0	5.0	5.0	3.5	3.5	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None	None	None	None	None	None	None	None
Act Effct Green (s)	10.5	26.0		31.6	66.4	66.4		10.5	34.2		6.3	6.3
Actuated g/C Ratio	0.13	0.32		0.39	0.81	0.81		0.13	0.42		0.08	0.08
v/c Ratio	0.10	0.62		0.70	0.41	0.02		0.05	0.21		0.06	0.03
Control Delay	41.2	27.6		32.8	9.6	0.0		41.8	3.1		45.5	0.2
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Delay	41.2	27.6		32.8	9.6	0.0		41.8	3.1		45.5	0.2
LOS	D	C		C	A	A		D	A		D	A
Approach Delay		28.1			16.2			4.6			22.8	
Approach LOS		C			B			A			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 81.7			
Natural Cycle: 130			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.70			
Intersection Signal Delay: 18.1		Intersection LOS: B	
Intersection Capacity Utilization 70.5%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 6: Queen Annes Court & 258/Rt 32 (Brewers Neck Boulevard)



APPENDIX D

2026 No Build Synchro Reports

1: US 258/Rt 10 (Benns Church Boulevard) & Canteberry Lane

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	1	19	99	5	43	15	801	51	55	1160	36
Future Volume (vph)	26	1	19	99	5	43	15	801	51	55	1160	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	200		350	275		325
Storage Lanes	0		1	0		1	1		1	1		1
Taper Length (ft)	25			25			125			225		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected		0.957			0.956		0.950			0.950		
Satd. Flow (prot)	0	1756	1615	0	1737	1615	1805	3374	1509	1752	3505	1615
Flt Permitted		0.957			0.956		0.062			0.263		
Satd. Flow (perm)	0	1756	1615	0	1737	1615	118	3374	1509	485	3505	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			171			171			185			185
Link Speed (mph)		25			25			45			45	
Link Distance (ft)		335			1232			773			1937	
Travel Time (s)		9.1			33.6			11.7			29.3	
Peak Hour Factor	0.82	0.25	0.53	0.76	0.50	0.79	0.46	0.92	0.75	0.73	0.63	0.80
Heavy Vehicles (%)	4%	0%	0%	3%	25%	0%	0%	7%	7%	3%	3%	0%
Adj. Flow (vph)	32	4	36	130	10	54	33	871	68	75	1841	45
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	36	36	0	140	54	33	871	68	75	1841	45
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Split	NA	Prot	Split	NA	Prot	D.P+P	NA	Perm	D.P+P	NA	Perm
Protected Phases	4	4	4	3	3	3	5	2		1	6	

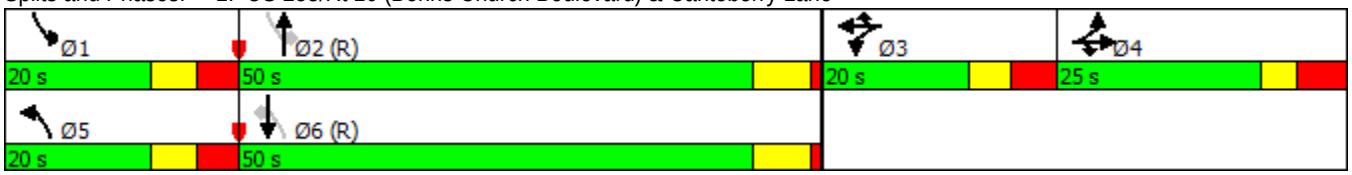
1: US 258/Rt 10 (Benns Church Boulevard) & Canteberry Lane

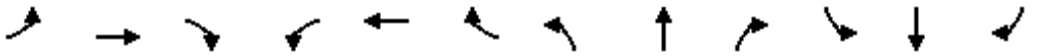
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases							6		2	2		6
Detector Phase	4	4	4	3	3	3	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	5.0	15.0	15.0	5.0	15.0	15.0
Minimum Split (s)	14.5	14.5	14.5	14.5	14.5	14.5	12.5	21.0	21.0	12.5	21.0	21.0
Total Split (s)	25.0	25.0	25.0	20.0	20.0	20.0	20.0	50.0	50.0	20.0	50.0	50.0
Total Split (%)	21.7%	21.7%	21.7%	17.4%	17.4%	17.4%	17.4%	43.5%	43.5%	17.4%	43.5%	43.5%
Maximum Green (s)	17.5	17.5	17.5	12.5	12.5	12.5	12.5	44.0	44.0	12.5	44.0	44.0
Yellow Time (s)	3.0	3.0	3.0	3.5	3.5	3.5	4.0	5.0	5.0	4.0	5.0	5.0
All-Red Time (s)	4.5	4.5	4.5	4.0	4.0	4.0	3.5	1.0	1.0	3.5	1.0	1.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		7.5	7.5		7.5	7.5	7.5	6.0	6.0	7.5	6.0	6.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	2.0	6.0	6.0	2.0	6.0	6.0
Minimum Gap (s)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	3.5	3.5	0.2	3.5	3.5
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.0	20.0	0.0	20.0	20.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0	15.0	0.0	15.0	15.0
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)		8.2	8.2		11.9	11.9	70.7	65.2	65.2	69.2	68.8	68.8
Actuated g/C Ratio		0.07	0.07		0.10	0.10	0.61	0.57	0.57	0.60	0.60	0.60
v/c Ratio		0.29	0.13		0.78	0.17	0.22	0.46	0.07	0.21	0.88	0.04
Control Delay		56.0	1.0		78.6	1.1	13.8	15.3	0.4	10.3	28.9	0.1
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		56.0	1.0		78.6	1.1	13.8	15.3	0.4	10.3	28.9	0.1
LOS		E	A		E	A	B	B	A	B	C	A
Approach Delay		28.5			57.0			14.2			27.5	
Approach LOS		C			E			B			C	

Intersection Summary

Area Type: Other
Cycle Length: 115
Actuated Cycle Length: 115
Offset: 0 (0%), Referenced to phase 2:NBSB and 6:NBSB, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.88
Intersection Signal Delay: 25.3 Intersection LOS: C
Intersection Capacity Utilization 66.1% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 1: US 258/Rt 10 (Benns Church Boulevard) & Canteberry Lane





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	0	20	0	0	0	24	715	0	2	1410	32
Future Volume (vph)	5	0	20	0	0	0	24	715	0	2	1410	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	250		0	150		235
Storage Lanes	0		1	0		0	1		0	1		1
Taper Length (ft)	25			25			150			125		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt			0.850									0.850
Flt Protected		0.950					0.950			0.950		
Satd. Flow (prot)	0	1805	1524	0	1900	0	1805	3505	0	1805	3471	1553
Flt Permitted		0.950					0.067			0.288		
Satd. Flow (perm)	0	1805	1524	0	1900	0	127	3505	0	547	3471	1553
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			152									157
Link Speed (mph)		15			25			45			45	
Link Distance (ft)		1905			1451			1986			773	
Travel Time (s)		86.6			39.6			30.1			11.7	
Peak Hour Factor	0.50	0.25	0.56	0.25	0.25	0.25	0.44	0.75	0.44	0.50	0.72	0.78
Heavy Vehicles (%)	0%	0%	6%	0%	0%	0%	0%	3%	14%	0%	4%	4%
Adj. Flow (vph)	10	0	36	0	0	0	55	953	0	4	1958	41
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	10	36	0	0	0	55	953	0	4	1958	41
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100		20	100		20	100	20
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0	0	0	0		0	0		0	0	0
Detector 1 Size(ft)	20	6	20	20	6		20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Split	NA	Prot				D.P+P	NA		D.P+P	NA	Prot
Protected Phases	4	4	4	3	3		5	2		1	6	6

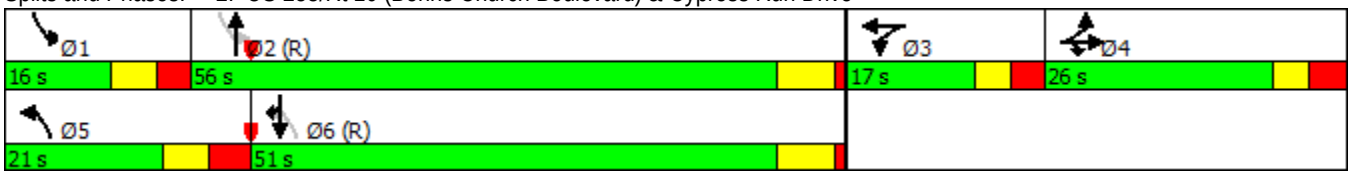
2: US 258/Rt 10 (Benns Church Boulevard) & Cypress Run Drive

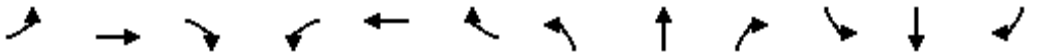
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases							6			2		
Detector Phase	4	4	4	3	3		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		5.0	14.0		5.0	14.0	14.0
Minimum Split (s)	13.5	13.5	13.5	13.0	13.0		12.5	20.0		12.0	20.0	20.0
Total Split (s)	26.0	26.0	26.0	17.0	17.0		21.0	56.0		16.0	51.0	51.0
Total Split (%)	22.6%	22.6%	22.6%	14.8%	14.8%		18.3%	48.7%		13.9%	44.3%	44.3%
Maximum Green (s)	19.5	19.5	19.5	11.0	11.0		13.5	50.0		9.0	45.0	45.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.0	5.0		4.0	5.0	5.0
All-Red Time (s)	3.5	3.5	3.5	3.0	3.0		3.5	1.0		3.0	1.0	1.0
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)		6.5	6.5		6.0		7.5	6.0		7.0	6.0	6.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		2.0	5.0		2.0	5.0	5.0
Minimum Gap (s)	0.2	0.2	0.2	0.2	0.2		0.2	3.5		0.2	3.5	3.5
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	18.0		0.0	18.0	18.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	15.0		0.0	15.0	15.0
Recall Mode	None	None	None	None	None		None	C-Min		None	C-Min	C-Min
Act Effct Green (s)		7.1	7.1				93.3	100.8		98.4	91.5	91.5
Actuated g/C Ratio		0.06	0.06				0.81	0.88		0.86	0.80	0.80
v/c Ratio		0.09	0.15				0.30	0.31		0.01	0.71	0.03
Control Delay		52.8	1.4				6.9	2.9		1.0	5.5	0.0
Queue Delay		0.0	0.0				0.0	0.0		0.0	0.0	0.0
Total Delay		52.8	1.4				6.9	2.9		1.0	5.5	0.0
LOS		D	A				A	A		A	A	A
Approach Delay		12.5						3.1			5.4	
Approach LOS		B						A			A	

Intersection Summary

Area Type: Other
Cycle Length: 115
Actuated Cycle Length: 115
Offset: 13 (11%), Referenced to phase 2:NBSB and 6:NBSB, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.71
Intersection Signal Delay: 4.8 Intersection LOS: A
Intersection Capacity Utilization 55.2% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 2: US 258/Rt 10 (Benns Church Boulevard) & Cypress Run Drive





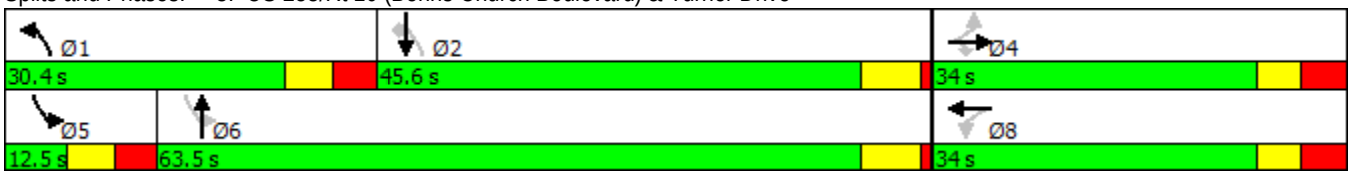
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	193	1	285	1	72	1	243	631	70	7	944	324
Future Volume (vph)	193	1	285	1	72	1	243	631	70	7	944	324
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		300	0		0	125		0	125		275
Storage Lanes	0		1	0		0	1		0	1		1
Taper Length (ft)	200			25			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt			0.850		0.997			0.973				0.850
Flt Protected		0.953			0.999		0.950			0.950		
Satd. Flow (prot)	0	1811	1615	0	1892	0	1752	3401	0	1805	3505	1553
Flt Permitted		0.513			0.991		0.094			0.274		
Satd. Flow (perm)	0	975	1615	0	1877	0	173	3401	0	521	3505	1553
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			311		1			35				287
Link Speed (mph)		40			25			45			45	
Link Distance (ft)		1497			695			1153			1986	
Travel Time (s)		25.5			19.0			17.5			30.1	
Peak Hour Factor	0.64	0.25	0.73	0.25	0.39	0.25	0.52	0.90	0.46	0.25	0.73	0.51
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	3%	4%	0%	0%	3%	4%
Adj. Flow (vph)	302	4	390	4	185	4	467	701	152	28	1293	635
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	306	390	0	193	0	467	853	0	28	1293	635
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100		20	100		20	100	20
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0	0	0	0		0	0		0	0	0
Detector 1 Size(ft)	20	6	20	20	6		20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Perm	NA		D.P+P	NA		D.P+P	NA	Perm
Protected Phases		4			8		1	6		5	2	

3: US 258/Rt 10 (Benns Church Boulevard) & Turner Drive

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4		4	8			2			6		2
Detector Phase	4	4	4	8	8		1	6		5	2	2
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		5.0	15.0		5.0	15.0	15.0
Minimum Split (s)	15.0	15.0	15.0	14.5	14.5		12.5	21.0		12.5	21.0	21.0
Total Split (s)	34.0	34.0	34.0	34.0	34.0		30.4	63.5		12.5	45.6	45.6
Total Split (%)	30.9%	30.9%	30.9%	30.9%	30.9%		27.6%	57.7%		11.4%	41.5%	41.5%
Maximum Green (s)	26.5	26.5	26.5	26.5	26.5		22.9	57.5		5.0	39.6	39.6
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		4.0	5.0		4.0	5.0	5.0
All-Red Time (s)	4.0	4.0	4.0	4.0	4.0		3.5	1.0		3.5	1.0	1.0
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)		7.5	7.5		7.5		7.5	6.0		7.5	6.0	6.0
Lead/Lag							Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0	5.0	3.0	3.0		4.0	6.0		2.0	6.0	6.0
Minimum Gap (s)	3.5	3.5	3.5	0.2	0.2		0.2	3.5		0.2	3.5	3.5
Time Before Reduce (s)	20.0	20.0	20.0	0.0	0.0		0.0	20.0		0.0	20.0	20.0
Time To Reduce (s)	10.0	10.0	10.0	0.0	0.0		0.0	15.0		0.0	15.0	15.0
Recall Mode	None	None	None	None	None		None	Min		None	Min	Min
Act Effct Green (s)		26.5	26.5		26.5		61.0	62.5		64.0	39.6	39.6
Actuated g/C Ratio		0.24	0.24		0.24		0.55	0.57		0.58	0.36	0.36
v/c Ratio		1.31	0.62		0.43		1.10	0.44		0.08	1.03	0.86
Control Delay		201.2	13.2		38.6		107.0	14.7		8.7	67.3	30.3
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Delay		201.2	13.2		38.6		107.0	14.7		8.7	67.3	30.3
LOS		F	B		D		F	B		A	E	C
Approach Delay		95.9			38.6			47.4			54.5	
Approach LOS		F			D			D			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Natural Cycle: 100			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.31			
Intersection Signal Delay: 58.4		Intersection LOS: E	
Intersection Capacity Utilization 74.5%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 3: US 258/Rt 10 (Benns Church Boulevard) & Turner Drive



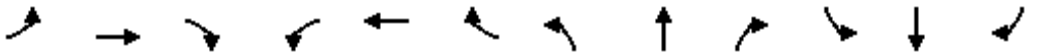
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	0	0	5	0	1032	0	1	0
Future Volume (vph)	0	0	0	0	0	0	5	0	1032	0	1	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0		125		0		140
Storage Lanes	0		0	0		0		1		0		1
Taper Length (ft)	25			25				25				75
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00
Frt												
Flt Protected							0.950				0.950	
Satd. Flow (prot)	0	0	0	0	0	0	1805	0	3438	0	1805	0
Flt Permitted							0.950				0.950	
Satd. Flow (perm)	0	0	0	0	0	0	1805	0	3438	0	1805	0
Link Speed (mph)		30			30				45			
Link Distance (ft)		810			872				3921			
Travel Time (s)		18.4			19.8				59.4			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.33	0.25	0.85	0.25	0.25	0.25
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	5%	0%	0%	0%
Adj. Flow (vph)	0	0	0	0	0	0	15	0	1214	0	4	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	0	15	0	1214	0	4	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	R NA	Left	Left	Right	R NA	Left
Median Width(ft)		0			0				12			
Link Offset(ft)		0			0				0			
Crosswalk Width(ft)		16			16				16			
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	9	15		9	9	15
Sign Control		Stop			Stop				Free			

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 38.5%		ICU Level of Service A	
Analysis Period (min) 15			

Lane Group	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	1273	0
Future Volume (vph)	1273	0
Ideal Flow (vphpl)	1900	1900
Storage Length (ft)		0
Storage Lanes		0
Taper Length (ft)		
Lane Util. Factor	0.95	1.00
Frt		
Flt Protected		
Satd. Flow (prot)	3406	0
Flt Permitted		
Satd. Flow (perm)	3406	0
Link Speed (mph)	45	
Link Distance (ft)	1153	
Travel Time (s)	17.5	
Peak Hour Factor	0.88	0.25
Heavy Vehicles (%)	6%	0%
Adj. Flow (vph)	1447	0
Shared Lane Traffic (%)		
Lane Group Flow (vph)	1447	0
Enter Blocked Intersection	No	No
Lane Alignment	Left	Right
Median Width(ft)	12	
Link Offset(ft)	0	
Crosswalk Width(ft)	16	
Two way Left Turn Lane		
Headway Factor	1.00	1.00
Turning Speed (mph)		9
Sign Control	Free	

Intersection Summary

5: US 258/Rt 10 (Benns Church Boulevard) & 258/Rt 32 (Brewers Neck Boulevard)



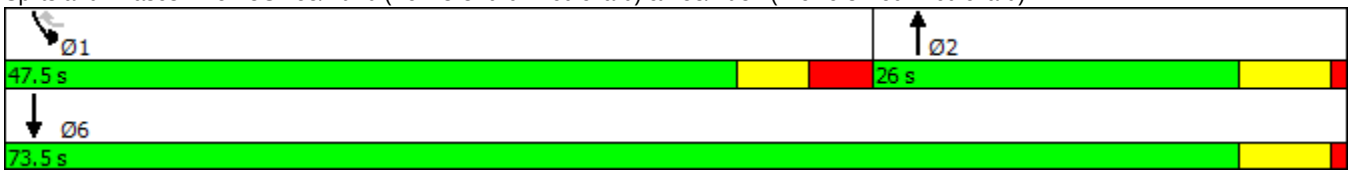
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	0	736	0	188	0	1010	244	0
Future Volume (vph)	0	0	0	0	0	736	0	188	0	1010	244	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		0	300		0
Storage Lanes	0		0	0		2	0		0	1		0
Taper Length (ft)	25			25			100			75		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.88	1.00	0.95	1.00	0.97	0.95	1.00
Frt						0.850						
Flt Protected										0.950		
Satd. Flow (prot)	0	0	0	0	0	2707	0	3471	0	3367	3438	0
Flt Permitted										0.950		
Satd. Flow (perm)	0	0	0	0	0	2707	0	3471	0	3367	3438	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						662						
Link Speed (mph)		30			45			45			45	
Link Distance (ft)		963			1126			2837			3921	
Travel Time (s)		21.9			17.1			43.0			59.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.72	0.92	0.84	0.25	0.83	0.63	0.25
Heavy Vehicles (%)	0%	0%	0%	0%	0%	5%	0%	4%	0%	4%	5%	0%
Adj. Flow (vph)	0	0	0	0	0	1022	0	224	0	1217	387	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	1022	0	224	0	1217	387	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors						1		2		1	2	
Detector Template						Right		Thru		Left	Thru	
Leading Detector (ft)						20		100		20	100	
Trailing Detector (ft)						0		0		0	0	
Detector 1 Position(ft)						0		0		0	0	
Detector 1 Size(ft)						20		6		20	6	
Detector 1 Type						Cl+Ex		Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)						0.0		0.0		0.0	0.0	
Detector 1 Queue (s)						0.0		0.0		0.0	0.0	
Detector 1 Delay (s)						0.0		0.0		0.0	0.0	
Detector 2 Position(ft)								94			94	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type						Perm		NA		Prot	NA	
Protected Phases								2		1	6	

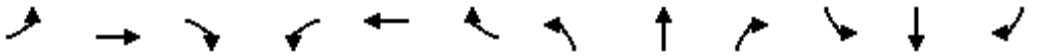
5: US 258/Rt 10 (Benns Church Boulevard) & 258/Rt 32 (Brewers Neck Boulevard)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases						1						
Detector Phase						1		2		1	6	
Switch Phase												
Minimum Initial (s)						15.0		10.0		15.0	15.0	
Minimum Split (s)						22.5		16.0		22.5	21.0	
Total Split (s)						47.5		26.0		47.5	73.5	
Total Split (%)						64.6%		35.4%		64.6%	100.0%	
Maximum Green (s)						40.0		20.0		40.0	67.5	
Yellow Time (s)						4.0		5.0		4.0	5.0	
All-Red Time (s)						3.5		1.0		3.5	1.0	
Lost Time Adjust (s)						0.0		0.0		0.0	0.0	
Total Lost Time (s)						7.5		6.0		7.5	6.0	
Lead/Lag						Lead		Lag		Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)						3.5		2.5		3.5	5.0	
Recall Mode						Min		None		Min	Min	
Act Effct Green (s)						33.5		10.4		33.5	57.5	
Actuated g/C Ratio						0.58		0.18		0.58	1.00	
v/c Ratio						0.55		0.36		0.62	0.11	
Control Delay						3.4		24.0		9.3	0.1	
Queue Delay						0.0		0.0		0.0	0.0	
Total Delay						3.4		24.0		9.3	0.1	
LOS						A		C		A	A	
Approach Delay					3.4			24.0			7.1	
Approach LOS					A			C			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 73.5			
Actuated Cycle Length: 57.5			
Natural Cycle: 45			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.62			
Intersection Signal Delay: 7.1		Intersection LOS: A	
Intersection Capacity Utilization 47.1%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 5: US 258/Rt 10 (Benns Church Boulevard) & 258/Rt 32 (Brewers Neck Boulevard)





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	989	0	243	709	3	0	1	433	7	3	12
Future Volume (vph)	7	989	0	243	709	3	0	1	433	7	3	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	225		0	600		325	0		350	0		0
Storage Lanes	1		0	1		1	0		2	0		1
Taper Length (ft)	200			200			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	0.88	1.00	1.00	1.00
Frt						0.850			0.850			0.850
Flt Protected	0.950			0.950							0.974	
Satd. Flow (prot)	1805	3471	0	1719	3505	1615	0	950	2682	0	1851	1369
Flt Permitted	0.950			0.950							0.974	
Satd. Flow (perm)	1805	3471	0	1719	3505	1615	0	950	2682	0	1851	1369
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						171			487			160
Link Speed (mph)		45			45			45			25	
Link Distance (ft)		1126			846			914			623	
Travel Time (s)		17.1			12.8			13.8			17.0	
Peak Hour Factor	0.50	0.82	0.25	0.78	0.72	0.38	0.25	0.25	0.89	0.75	0.38	0.55
Heavy Vehicles (%)	0%	4%	0%	5%	3%	0%	0%	100%	6%	0%	0%	18%
Adj. Flow (vph)	14	1206	0	312	985	8	0	4	487	9	8	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	14	1206	0	312	985	8	0	4	487	0	17	22
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100		20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6		20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA	Perm		NA	pm+ov	Split	NA	Perm
Protected Phases	1	6		5	2		4	4	5	3	3	

6: Queen Annes Court & 258/Rt 32 (Brewers Neck Boulevard)

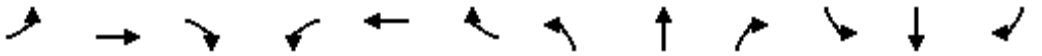
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases						2			4			3
Detector Phase	1	6		5	2	2	4	4	5	3	3	3
Switch Phase												
Minimum Initial (s)	10.0	15.0		10.0	15.0	15.0	10.0	10.0	10.0	5.0	5.0	5.0
Minimum Split (s)	19.0	24.5		19.5	24.5	24.5	26.0	26.0	19.5	26.0	26.0	26.0
Total Split (s)	34.0	41.5		39.5	47.0	47.0	26.0	26.0	39.5	33.0	33.0	33.0
Total Split (%)	24.3%	29.6%		28.2%	33.6%	33.6%	18.6%	18.6%	28.2%	23.6%	23.6%	23.6%
Maximum Green (s)	25.0	35.0		30.0	40.5	40.5	18.0	18.0	30.0	25.0	25.0	25.0
Yellow Time (s)	5.0	5.5		5.0	5.5	5.5	4.0	4.0	5.0	3.5	3.5	3.5
All-Red Time (s)	4.0	1.0		4.5	1.0	1.0	4.0	4.0	4.5	4.5	4.5	4.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Lost Time (s)	9.0	6.5		9.5	6.5	6.5		8.0	9.5		8.0	8.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	5.0		3.0	5.0	5.0	3.5	3.5	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None	None	None	None	None	None	None	None
Act Effct Green (s)	10.5	36.6		21.7	68.8	68.8		10.5	24.4		6.6	6.6
Actuated g/C Ratio	0.12	0.43		0.25	0.80	0.80		0.12	0.28		0.08	0.08
v/c Ratio	0.06	0.81		0.72	0.35	0.01		0.03	0.44		0.12	0.09
Control Delay	43.3	31.0		41.1	7.7	0.0		44.0	3.4		46.7	0.7
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Delay	43.3	31.0		41.1	7.7	0.0		44.0	3.4		46.7	0.7
LOS	D	C		D	A	A		D	A		D	A
Approach Delay		31.1			15.7			3.7			20.7	
Approach LOS		C			B			A			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 85.7			
Natural Cycle: 140			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.81			
Intersection Signal Delay: 20.0		Intersection LOS: B	
Intersection Capacity Utilization 69.1%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 6: Queen Annes Court & 258/Rt 32 (Brewers Neck Boulevard)



1: US 258/Rt 10 (Benns Church Boulevard) & Canteberry Lane



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	143	6	45	64	9	80	52	1249	107	133	1049	99
Future Volume (vph)	143	6	45	64	9	80	52	1249	107	133	1049	99
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	200		350	275		325
Storage Lanes	0		1	0		1	1		1	1		1
Taper Length (ft)	25			25			125			225		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected		0.956			0.958		0.950			0.950		
Satd. Flow (prot)	0	1816	1615	0	1789	1553	1805	3539	1583	1687	3505	1615
Flt Permitted		0.956			0.958		0.143			0.074		
Satd. Flow (perm)	0	1816	1615	0	1789	1553	272	3539	1583	131	3505	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			164			164			177			177
Link Speed (mph)		25			25			45			45	
Link Distance (ft)		335			1232			773			1937	
Travel Time (s)		9.1			33.6			11.7			29.3	
Peak Hour Factor	0.91	0.42	0.56	0.75	0.67	0.93	0.60	0.94	0.64	0.76	0.94	0.71
Heavy Vehicles (%)	0%	0%	0%	2%	0%	4%	0%	2%	2%	7%	3%	0%
Adj. Flow (vph)	157	14	80	85	13	86	87	1329	167	175	1116	139
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	171	80	0	98	86	87	1329	167	175	1116	139
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Split	NA	Prot	Split	NA	Prot	D.P+P	NA	Perm	D.P+P	NA	Perm
Protected Phases	4	4	4	3	3	3	5	2		1	6	

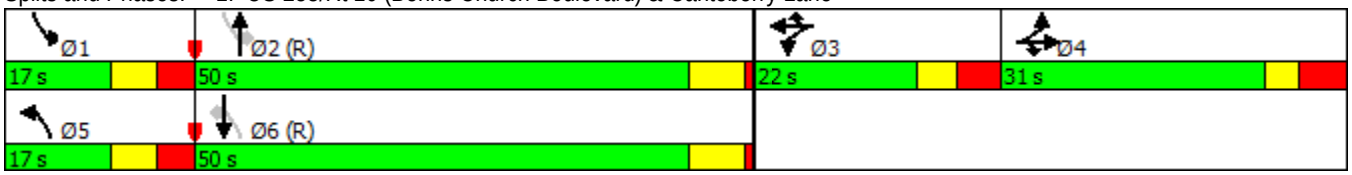
1: US 258/Rt 10 (Benns Church Boulevard) & Canteberry Lane

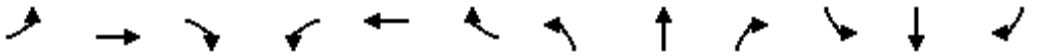
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases							6		2	2		6
Detector Phase	4	4	4	3	3	3	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	5.0	15.0	15.0	5.0	15.0	15.0
Minimum Split (s)	14.5	14.5	14.5	14.5	14.5	14.5	12.5	21.0	21.0	12.5	21.0	21.0
Total Split (s)	31.0	31.0	31.0	22.0	22.0	22.0	17.0	50.0	50.0	17.0	50.0	50.0
Total Split (%)	25.8%	25.8%	25.8%	18.3%	18.3%	18.3%	14.2%	41.7%	41.7%	14.2%	41.7%	41.7%
Maximum Green (s)	23.5	23.5	23.5	14.5	14.5	14.5	9.5	44.0	44.0	9.5	44.0	44.0
Yellow Time (s)	3.0	3.0	3.0	3.5	3.5	3.5	4.0	5.0	5.0	4.0	5.0	5.0
All-Red Time (s)	4.5	4.5	4.5	4.0	4.0	4.0	3.5	1.0	1.0	3.5	1.0	1.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		7.5	7.5		7.5	7.5	7.5	6.0	6.0	7.5	6.0	6.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	2.0	6.0	6.0	2.0	6.0	6.0
Minimum Gap (s)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	3.5	3.5	0.2	3.5	3.5
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.0	20.0	0.0	20.0	20.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0	15.0	0.0	15.0	15.0
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)		16.5	16.5		11.5	11.5	62.0	54.0	54.0	62.0	56.3	56.3
Actuated g/C Ratio		0.14	0.14		0.10	0.10	0.52	0.45	0.45	0.52	0.47	0.47
v/c Ratio		0.68	0.22		0.57	0.29	0.38	0.84	0.21	0.92	0.68	0.16
Control Delay		62.7	1.4		64.7	2.5	15.3	32.0	2.3	77.5	29.2	2.0
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		62.7	1.4		64.7	2.5	15.3	32.0	2.3	77.5	29.2	2.0
LOS		E	A		E	A	B	C	A	E	C	A
Approach Delay		43.2			35.6			28.0			32.4	
Approach LOS		D			D			C			C	

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBSB and 6:NBSB, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.92
Intersection Signal Delay: 31.3 Intersection LOS: C
Intersection Capacity Utilization 74.3% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 1: US 258/Rt 10 (Benns Church Boulevard) & Canteberry Lane





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	116	0	83	0	0	1	157	1291	0	0	1022	134
Future Volume (vph)	116	0	83	0	0	1	157	1291	0	0	1022	134
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	250		0	150		235
Storage Lanes	0		1	0		0	1		0	1		1
Taper Length (ft)	25			25			150			125		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt			0.850		0.865							0.850
Flt Protected		0.950					0.950					
Satd. Flow (prot)	0	1787	1599	0	1644	0	1805	3539	0	1900	3505	1615
Flt Permitted		0.950					0.183					
Satd. Flow (perm)	0	1787	1599	0	1644	0	348	3539	0	1900	3505	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			214		218							218
Link Speed (mph)		15			25			45			45	
Link Distance (ft)		1905			1451			1986			773	
Travel Time (s)		86.6			39.6			30.1			11.7	
Peak Hour Factor	0.81	0.25	0.62	0.25	0.25	0.25	0.67	0.93	0.25	0.25	0.95	0.80
Heavy Vehicles (%)	1%	0%	1%	0%	0%	0%	0%	2%	0%	0%	3%	0%
Adj. Flow (vph)	143	0	134	0	0	4	234	1388	0	0	1076	168
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	143	134	0	4	0	234	1388	0	0	1076	168
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100		20	100		20	100	20
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0	0	0	0		0	0		0	0	0
Detector 1 Size(ft)	20	6	20	20	6		20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Split	NA	Prot		NA		D.P+P	NA		D.P+P	NA	Prot
Protected Phases	4	4	4	3	3		5	2		1	6	6

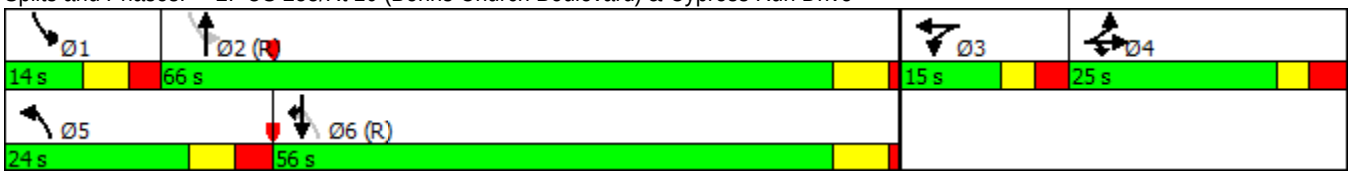
2: US 258/Rt 10 (Benns Church Boulevard) & Cypress Run Drive

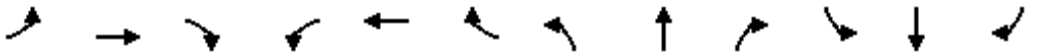
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases							6			2		
Detector Phase	4	4	4	3	3		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		5.0	14.0		5.0	14.0	14.0
Minimum Split (s)	13.5	13.5	13.5	13.0	13.0		12.5	20.0		12.0	20.0	20.0
Total Split (s)	25.0	25.0	25.0	15.0	15.0		24.0	66.0		14.0	56.0	56.0
Total Split (%)	20.8%	20.8%	20.8%	12.5%	12.5%		20.0%	55.0%		11.7%	46.7%	46.7%
Maximum Green (s)	18.5	18.5	18.5	9.0	9.0		16.5	60.0		7.0	50.0	50.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.0	5.0		4.0	5.0	5.0
All-Red Time (s)	3.5	3.5	3.5	3.0	3.0		3.5	1.0		3.0	1.0	1.0
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)		6.5	6.5		6.0		7.5	6.0		7.0	6.0	6.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		2.0	5.0		2.0	5.0	5.0
Minimum Gap (s)	0.2	0.2	0.2	0.2	0.2		0.2	3.5		0.2	3.5	3.5
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	18.0		0.0	18.0	18.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	15.0		0.0	15.0	15.0
Recall Mode	None	None	None	None	None		None	C-Min		None	C-Min	C-Min
Act Effct Green (s)		14.6	14.6		7.0		81.3	90.3			68.4	68.4
Actuated g/C Ratio		0.12	0.12		0.06		0.68	0.75			0.57	0.57
v/c Ratio		0.66	0.35		0.01		0.57	0.52			0.54	0.17
Control Delay		64.3	2.6		0.0		13.9	8.0			6.7	0.3
Queue Delay		0.0	0.0		0.0		0.0	0.0			0.0	0.0
Total Delay		64.3	2.6		0.0		13.9	8.0			6.7	0.3
LOS		E	A		A		B	A			A	A
Approach Delay		34.4						8.9			5.8	
Approach LOS		C						A			A	

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 12 (10%), Referenced to phase 2:NBSB and 6:NBSB, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.66
Intersection Signal Delay: 9.9 Intersection LOS: A
Intersection Capacity Utilization 69.2% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 2: US 258/Rt 10 (Benns Church Boulevard) & Cypress Run Drive





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	86	0	97	0	1	2	172	1347	1	33	988	126
Future Volume (vph)	86	0	97	0	1	2	172	1347	1	33	988	126
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		300	100		0	125		0	125		275
Storage Lanes	0		1	1		0	1		0	1		1
Taper Length (ft)	200			25			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt			0.850		0.925							0.850
Flt Protected		0.950					0.950			0.950		
Satd. Flow (prot)	0	1787	1599	1900	1758	0	1687	3539	0	1805	3505	1482
Flt Permitted		0.752					0.191			0.094		
Satd. Flow (perm)	0	1415	1599	1900	1758	0	339	3539	0	179	3505	1482
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			127		4							148
Link Speed (mph)		40			25			45			45	
Link Distance (ft)		1500			695			1153			1986	
Travel Time (s)		25.6			19.0			17.5			30.1	
Peak Hour Factor	0.63	0.25	0.80	0.25	0.25	0.50	0.90	0.94	0.25	0.50	0.98	0.85
Heavy Vehicles (%)	1%	0%	1%	0%	0%	0%	7%	2%	0%	0%	3%	9%
Adj. Flow (vph)	137	0	121	0	4	4	191	1433	4	66	1008	148
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	137	121	0	8	0	191	1437	0	66	1008	148
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100		20	100		20	100	20
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0	0	0	0		0	0		0	0	0
Detector 1 Size(ft)	20	6	20	20	6		20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Perm	NA		D.P+P	NA		D.P+P	NA	Perm
Protected Phases		4			8		1	6		5	2	

3: US 258/Rt 10 (Benns Church Boulevard) & Turner Drive

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4		4	8			2			6		2
Detector Phase	4	4	4	8	8		1	6		5	2	2
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		5.0	15.0		5.0	15.0	15.0
Minimum Split (s)	14.5	14.5	14.5	14.5	14.5		12.5	21.0		12.5	21.0	21.0
Total Split (s)	24.0	24.0	24.0	14.5	14.5		19.0	53.5		12.5	47.0	47.0
Total Split (%)	26.7%	26.7%	26.7%	16.1%	16.1%		21.1%	59.4%		13.9%	52.2%	52.2%
Maximum Green (s)	16.5	16.5	16.5	7.0	7.0		11.5	47.5		5.0	41.0	41.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		4.0	5.0		4.0	5.0	5.0
All-Red Time (s)	4.0	4.0	4.0	4.0	4.0		3.5	1.0		3.5	1.0	1.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)		7.5	7.5	7.5	7.5		7.5	6.0		7.5	6.0	6.0
Lead/Lag							Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0	5.0	3.0	3.0		4.0	6.0		2.0	6.0	6.0
Minimum Gap (s)	3.5	3.5	3.5	0.2	0.2		0.2	3.5		0.2	3.5	3.5
Time Before Reduce (s)	20.0	20.0	20.0	0.0	0.0		0.0	20.0		0.0	20.0	20.0
Time To Reduce (s)	10.0	10.0	10.0	0.0	0.0		0.0	15.0		0.0	15.0	15.0
Recall Mode	None	None	None	None	None		None	Min		None	Min	Min
Act Effct Green (s)		14.0	14.0		8.9		45.4	45.1		47.3	36.9	36.9
Actuated g/C Ratio		0.17	0.17		0.11		0.55	0.55		0.57	0.45	0.45
v/c Ratio		0.57	0.32		0.04		0.54	0.74		0.33	0.64	0.20
Control Delay		43.2	8.4		26.7		13.9	18.3		10.7	20.0	3.3
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Delay		43.2	8.4		26.7		13.9	18.3		10.7	20.0	3.3
LOS		D	A		C		B	B		B	B	A
Approach Delay		26.8			26.7			17.8			17.5	
Approach LOS		C			C			B			B	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 82.3
Natural Cycle: 65
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.74
Intersection Signal Delay: 18.4 Intersection LOS: B
Intersection Capacity Utilization 70.4% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 3: US 258/Rt 10 (Benns Church Boulevard) & Turner Drive

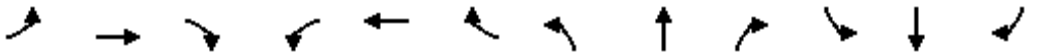


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	0	0	5	0	1511	0	0	0
Future Volume (vph)	0	0	0	0	0	0	5	0	1511	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0		125		0		140
Storage Lanes	0		0	0		0		1		0		1
Taper Length (ft)	25			25				25				75
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00
Frt												
Flt Protected							0.950					
Satd. Flow (prot)	0	0	0	0	0	0	1805	0	3505	0	1900	0
Flt Permitted							0.950					
Satd. Flow (perm)	0	0	0	0	0	0	1805	0	3505	0	1900	0
Link Speed (mph)		30			30				45			
Link Distance (ft)		810			872				3921			
Travel Time (s)		18.4			19.8				59.4			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.25	0.25	0.97	0.25	0.50	0.25
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	3%	0%	0%	0%
Adj. Flow (vph)	0	0	0	0	0	0	20	0	1558	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	0	20	0	1558	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	R NA	Left	Left	Right	R NA	Left
Median Width(ft)		0			0				12			
Link Offset(ft)		0			0				0			
Crosswalk Width(ft)		16			16				16			
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	9	15		9	9	15
Sign Control		Stop			Stop				Free			

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 45.1%		ICU Level of Service A	
Analysis Period (min) 15			

Lane Group	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	1072	0
Future Volume (vph)	1072	0
Ideal Flow (vphpl)	1900	1900
Storage Length (ft)		0
Storage Lanes		0
Taper Length (ft)		
Lane Util. Factor	0.95	1.00
Frt		
Flt Protected		
Satd. Flow (prot)	3539	0
Flt Permitted		
Satd. Flow (perm)	3539	0
Link Speed (mph)	45	
Link Distance (ft)	1153	
Travel Time (s)	17.5	
Peak Hour Factor	0.95	0.25
Heavy Vehicles (%)	2%	0%
Adj. Flow (vph)	1128	0
Shared Lane Traffic (%)		
Lane Group Flow (vph)	1128	0
Enter Blocked Intersection	No	No
Lane Alignment	Left	Right
Median Width(ft)	12	
Link Offset(ft)	0	
Crosswalk Width(ft)	16	
Two way Left Turn Lane		
Headway Factor	1.00	1.00
Turning Speed (mph)		9
Sign Control	Free	

Intersection Summary



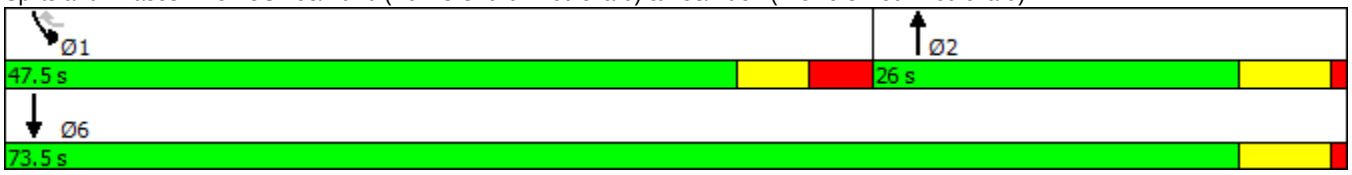
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	0	1300	0	225	0	729	311	0
Future Volume (vph)	0	0	0	0	0	1300	0	225	0	729	311	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		0	300		0
Storage Lanes	0		0	0		2	0		0	1		0
Taper Length (ft)	25			25			100			75		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.88	1.00	0.95	1.00	0.97	0.95	1.00
Frt						0.850						
Flt Protected										0.950		
Satd. Flow (prot)	0	0	0	0	0	2760	0	3471	0	3400	3471	0
Flt Permitted										0.950		
Satd. Flow (perm)	0	0	0	0	0	2760	0	3471	0	3400	3471	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						575						
Link Speed (mph)		30			45			45			45	
Link Distance (ft)		963			1126			2837			3921	
Travel Time (s)		21.9			17.1			43.0			59.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.93	0.25	0.89	0.25	0.99	0.85	0.25
Heavy Vehicles (%)	0%	0%	0%	0%	0%	3%	0%	4%	0%	3%	4%	0%
Adj. Flow (vph)	0	0	0	0	0	1398	0	253	0	736	366	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	1398	0	253	0	736	366	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors						1		2		1	2	
Detector Template						Right		Thru		Left	Thru	
Leading Detector (ft)						20		100		20	100	
Trailing Detector (ft)						0		0		0	0	
Detector 1 Position(ft)						0		0		0	0	
Detector 1 Size(ft)						20		6		20	6	
Detector 1 Type						Cl+Ex		Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)						0.0		0.0		0.0	0.0	
Detector 1 Queue (s)						0.0		0.0		0.0	0.0	
Detector 1 Delay (s)						0.0		0.0		0.0	0.0	
Detector 2 Position(ft)								94			94	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type						Perm		NA		Prot	NA	
Protected Phases								2		1	6	

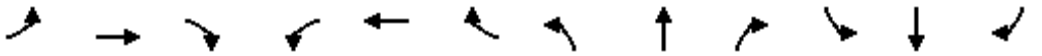
5: US 258/Rt 10 (Benns Church Boulevard) & 258/Rt 32 (Brewers Neck Boulevard)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases						1						
Detector Phase						1		2		1	6	
Switch Phase												
Minimum Initial (s)						15.0		10.0		15.0	15.0	
Minimum Split (s)						22.5		16.0		22.5	21.0	
Total Split (s)						47.5		26.0		47.5	73.5	
Total Split (%)						64.6%		35.4%		64.6%	100.0%	
Maximum Green (s)						40.0		20.0		40.0	67.5	
Yellow Time (s)						4.0		5.0		4.0	5.0	
All-Red Time (s)						3.5		1.0		3.5	1.0	
Lost Time Adjust (s)						0.0		0.0		0.0	0.0	
Total Lost Time (s)						7.5		6.0		7.5	6.0	
Lead/Lag						Lead		Lag		Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)						3.5		2.5		3.5	5.0	
Recall Mode						Min		None		Min	Min	
Act Effct Green (s)						31.2		10.7		31.2	55.8	
Actuated g/C Ratio						0.56		0.19		0.56	1.00	
v/c Ratio						0.78		0.38		0.39	0.11	
Control Delay						8.5		23.7		7.2	0.1	
Queue Delay						0.0		0.0		0.0	0.0	
Total Delay						8.5		23.7		7.2	0.1	
LOS						A		C		A	A	
Approach Delay					8.5			23.7			4.8	
Approach LOS					A			C			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 73.5			
Actuated Cycle Length: 55.8			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.78			
Intersection Signal Delay: 8.4		Intersection LOS: A	
Intersection Capacity Utilization 65.1%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 5: US 258/Rt 10 (Benns Church Boulevard) & 258/Rt 32 (Brewers Neck Boulevard)





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	772	3	471	1268	14	1	3	250	2	5	7
Future Volume (vph)	9	772	3	471	1268	14	1	3	250	2	5	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	225		0	600		325	0		350	0		0
Storage Lanes	1		0	1		1	0		2	0		1
Taper Length (ft)	200			200			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	0.88	1.00	1.00	1.00
Frt		0.999				0.850			0.850			0.850
Flt Protected	0.950			0.950				0.984			0.978	
Satd. Flow (prot)	1805	3536	0	1787	3539	1380	0	1870	2787	0	1632	1380
Flt Permitted	0.950			0.950				0.984			0.978	
Satd. Flow (perm)	1805	3536	0	1787	3539	1380	0	1870	2787	0	1632	1380
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						171			321			160
Link Speed (mph)		45			45			45			25	
Link Distance (ft)		1126			846			914			623	
Travel Time (s)		17.1			12.8			13.8			17.0	
Peak Hour Factor	0.35	0.98	1.00	0.86	0.96	0.60	0.25	0.38	0.78	0.50	1.00	0.75
Heavy Vehicles (%)	0%	2%	0%	1%	2%	17%	0%	0%	2%	0%	25%	17%
Adj. Flow (vph)	26	788	3	548	1321	23	4	8	321	4	5	9
Shared Lane Traffic (%)												
Lane Group Flow (vph)	26	791	0	548	1321	23	0	12	321	0	9	9
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100		20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6		20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA	pm+ov	Split	NA	Perm
Protected Phases	1	6		5	2		4	4	5	3	3	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases						2			4			3
Detector Phase	1	6		5	2	2	4	4	5	3	3	3
Switch Phase												
Minimum Initial (s)	10.0	15.0		10.0	15.0	15.0	10.0	10.0	10.0	5.0	5.0	5.0
Minimum Split (s)	19.0	24.5		19.5	24.5	24.5	26.0	26.0	19.5	26.0	26.0	26.0
Total Split (s)	34.0	41.5		39.5	47.0	47.0	26.0	26.0	39.5	33.0	33.0	33.0
Total Split (%)	24.3%	29.6%		28.2%	33.6%	33.6%	18.6%	18.6%	28.2%	23.6%	23.6%	23.6%
Maximum Green (s)	25.0	35.0		30.0	40.5	40.5	18.0	18.0	30.0	25.0	25.0	25.0
Yellow Time (s)	5.0	5.5		5.0	5.5	5.5	4.0	4.0	5.0	3.5	3.5	3.5
All-Red Time (s)	4.0	1.0		4.5	1.0	1.0	4.0	4.0	4.5	4.5	4.5	4.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Lost Time (s)	9.0	6.5		9.5	6.5	6.5		8.0	9.5		8.0	8.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	5.0		3.0	5.0	5.0	3.5	3.5	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None	None	None	None	None	None	None	None
Act Effct Green (s)	10.4	28.4		31.3	68.2	68.2		10.4	34.0		6.3	6.3
Actuated g/C Ratio	0.12	0.34		0.37	0.81	0.81		0.12	0.41		0.08	0.08
v/c Ratio	0.12	0.66		0.82	0.46	0.02		0.05	0.24		0.07	0.04
Control Delay	42.0	28.2		40.0	10.3	0.0		42.2	3.0		46.1	0.3
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Delay	42.0	28.2		40.0	10.3	0.0		42.2	3.0		46.1	0.3
LOS	D	C		D	B	A		D	A		D	A
Approach Delay		28.6			18.8			4.4			23.2	
Approach LOS		C			B			A			C	

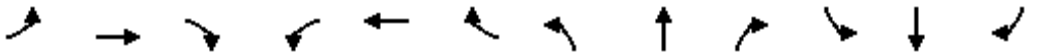
Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 83.9			
Natural Cycle: 140			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.82			
Intersection Signal Delay: 19.9		Intersection LOS: B	
Intersection Capacity Utilization 75.9%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 6: Queen Annes Court & 258/Rt 32 (Brewers Neck Boulevard)



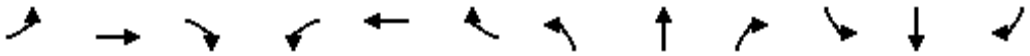
APPENDIX E

2032 No Build Synchro Reports



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	1	21	108	5	47	16	876	55	60	1269	39
Future Volume (vph)	28	1	21	108	5	47	16	876	55	60	1269	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	200		350	275		325
Storage Lanes	0		1	0		1	1		1	1		1
Taper Length (ft)	25			25			125			225		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected		0.957			0.955		0.950			0.950		
Satd. Flow (prot)	0	1755	1615	0	1737	1615	1805	3374	1509	1752	3505	1615
Flt Permitted		0.957			0.955		0.042			0.251		
Satd. Flow (perm)	0	1755	1615	0	1737	1615	80	3374	1509	463	3505	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			131			131			142			142
Link Speed (mph)		25			25			45			45	
Link Distance (ft)		335			1232			773			1937	
Travel Time (s)		9.1			33.6			11.7			29.3	
Peak Hour Factor	0.82	0.25	0.53	0.76	0.50	0.79	0.46	0.92	0.75	0.73	0.63	0.80
Heavy Vehicles (%)	4%	0%	0%	3%	25%	0%	0%	7%	7%	3%	3%	0%
Adj. Flow (vph)	34	4	40	142	10	59	35	952	73	82	2014	49
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	38	40	0	152	59	35	952	73	82	2014	49
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Split	NA	Prot	Split	NA	Prot	D.P+P	NA	Perm	D.P+P	NA	Perm
Protected Phases	4	4	4	3	3	3	5	2		1	6	

1: US 258/Rt 10 (Benns Church Boulevard) & Canteberry Lane

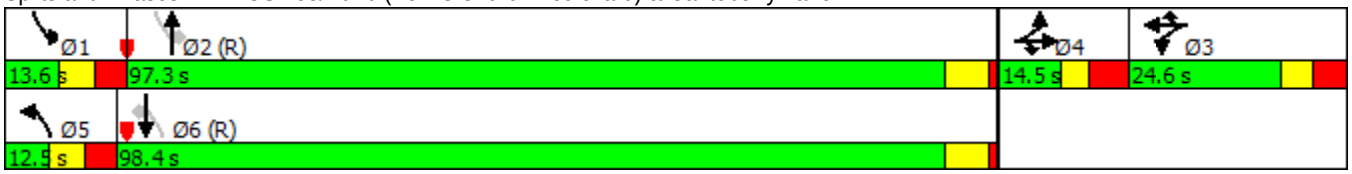


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases							6		2	2		6
Detector Phase	4	4	4	3	3	3	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	5.0	15.0	15.0	5.0	15.0	15.0
Minimum Split (s)	14.5	14.5	14.5	14.5	14.5	14.5	12.5	21.0	21.0	12.5	21.0	21.0
Total Split (s)	14.5	14.5	14.5	24.6	24.6	24.6	12.5	97.3	97.3	13.6	98.4	98.4
Total Split (%)	9.7%	9.7%	9.7%	16.4%	16.4%	16.4%	8.3%	64.9%	64.9%	9.1%	65.6%	65.6%
Maximum Green (s)	7.0	7.0	7.0	17.1	17.1	17.1	5.0	91.3	91.3	6.1	92.4	92.4
Yellow Time (s)	3.0	3.0	3.0	3.5	3.5	3.5	4.0	5.0	5.0	4.0	5.0	5.0
All-Red Time (s)	4.5	4.5	4.5	4.0	4.0	4.0	3.5	1.0	1.0	3.5	1.0	1.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		7.5	7.5		7.5	7.5	7.5	6.0	6.0	7.5	6.0	6.0
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	2.0	6.0	6.0	2.0	6.0	6.0
Minimum Gap (s)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	3.5	3.5	0.2	3.5	3.5
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.0	20.0	0.0	20.0	20.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0	15.0	0.0	15.0	15.0
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)		7.0	7.0		16.0	16.0	101.4	95.5	95.5	99.9	98.9	98.9
Actuated g/C Ratio		0.05	0.05		0.11	0.11	0.68	0.64	0.64	0.67	0.66	0.66
v/c Ratio		0.47	0.20		0.82	0.20	0.32	0.44	0.07	0.23	0.87	0.04
Control Delay		88.7	2.2		97.1	1.6	23.3	16.1	1.5	9.1	28.2	0.1
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		88.7	2.2		97.1	1.6	23.3	16.1	1.5	9.1	28.2	0.1
LOS		F	A		F	A	C	B	A	A	C	A
Approach Delay		44.3			70.4			15.3			26.8	
Approach LOS		D			E			B			C	
Queue Length 50th (ft)		37	0		147	0	10	219	1	24	894	0
Queue Length 95th (ft)		21	0		120	0	14	306	7	34	493	0
Internal Link Dist (ft)		255			1152			693			1857	
Turn Bay Length (ft)							200		350	275		325
Base Capacity (vph)		81	200		198	300	111	2148	1012	361	2310	1113
Starvation Cap Reductn		0	0		0	0	0	0	0	0	0	0
Spillback Cap Reductn		0	0		0	0	0	0	0	0	0	0
Storage Cap Reductn		0	0		0	0	0	0	0	0	0	0
Reduced v/c Ratio		0.47	0.20		0.77	0.20	0.32	0.44	0.07	0.23	0.87	0.04

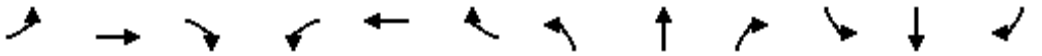
Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 120 (80%), Referenced to phase 2:NBSB and 6:NBSB, Start of Green			
Natural Cycle: 120			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.87			
Intersection Signal Delay: 26.4		Intersection LOS: C	
Intersection Capacity Utilization 69.7%		ICU Level of Service C	
Analysis Period (min) 15			

1: US 258/Rt 10 (Benns Church Boulevard) & Canteberry Lane

Splits and Phases: 1: US 258/Rt 10 (Benns Church Boulevard) & Canteberry Lane

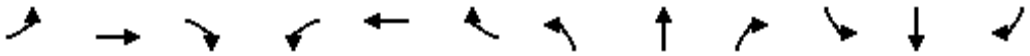


HCM 2010 analysis expects strict NEMA phasing.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	0	22	0	0	0	26	782	0	2	1542	34
Future Volume (vph)	5	0	22	0	0	0	26	782	0	2	1542	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	250		0	150		235
Storage Lanes	0		1	0		0	1		0	1		1
Taper Length (ft)	25			25			150			125		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt			0.850									0.850
Flt Protected		0.950					0.950			0.950		
Satd. Flow (prot)	0	1805	1524	0	1900	0	1805	3505	0	1805	3471	1553
Flt Permitted		0.950					0.057			0.263		
Satd. Flow (perm)	0	1805	1524	0	1900	0	108	3505	0	500	3471	1553
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			116									120
Link Speed (mph)		15			25			45			45	
Link Distance (ft)		1905			1451			1986			773	
Travel Time (s)		86.6			39.6			30.1			11.7	
Peak Hour Factor	0.50	0.25	0.56	0.25	0.25	0.25	0.44	0.75	0.44	0.50	0.72	0.78
Heavy Vehicles (%)	0%	0%	6%	0%	0%	0%	0%	3%	14%	0%	4%	4%
Adj. Flow (vph)	10	0	39	0	0	0	59	1043	0	4	2142	44
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	10	39	0	0	0	59	1043	0	4	2142	44
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100		20	100		20	100	20
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0	0	0	0		0	0		0	0	0
Detector 1 Size(ft)	20	6	20	20	6		20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Split	NA	Prot				D.P+P	NA		D.P+P	NA	Prot
Protected Phases	4	4	4	3	3		5	2		1	6	6

2: US 258/Rt 10 (Benns Church Boulevard) & Cypress Run Drive

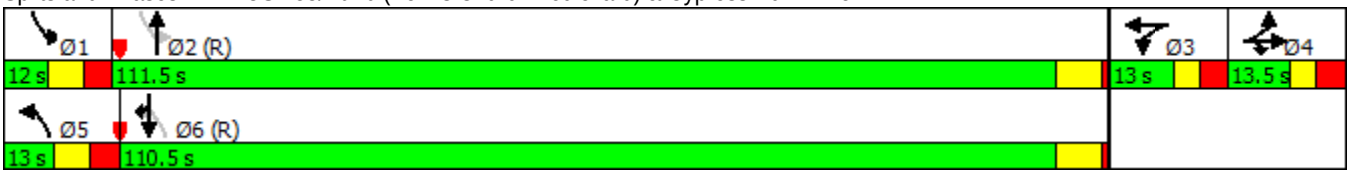


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases							6			2		
Detector Phase	4	4	4	3	3		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		5.0	14.0		5.0	14.0	14.0
Minimum Split (s)	13.5	13.5	13.5	13.0	13.0		12.5	20.0		12.0	20.0	20.0
Total Split (s)	13.5	13.5	13.5	13.0	13.0		13.0	111.5		12.0	110.5	110.5
Total Split (%)	9.0%	9.0%	9.0%	8.7%	8.7%		8.7%	74.3%		8.0%	73.7%	73.7%
Maximum Green (s)	7.0	7.0	7.0	7.0	7.0		5.5	105.5		5.0	104.5	104.5
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.0	5.0		4.0	5.0	5.0
All-Red Time (s)	3.5	3.5	3.5	3.0	3.0		3.5	1.0		3.0	1.0	1.0
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)		6.5	6.5		6.0		7.5	6.0		7.0	6.0	6.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		2.0	5.0		2.0	5.0	5.0
Minimum Gap (s)	0.2	0.2	0.2	0.2	0.2		0.2	3.5		0.2	3.5	3.5
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	18.0		0.0	18.0	18.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	15.0		0.0	15.0	15.0
Recall Mode	None	None	None	None	None		None	C-Min		None	C-Min	C-Min
Act Effct Green (s)		7.0	7.0				125.7	132.0		130.8	124.1	124.1
Actuated g/C Ratio		0.05	0.05				0.84	0.88		0.87	0.83	0.83
v/c Ratio		0.12	0.22				0.39	0.34		0.01	0.75	0.03
Control Delay		71.8	2.7				13.9	1.6		0.0	2.7	0.0
Queue Delay		0.0	0.0				0.0	0.0		0.0	0.1	0.0
Total Delay		71.8	2.7				13.9	1.6		0.0	2.8	0.0
LOS		E	A				B	A		A	A	A
Approach Delay		16.8						2.2			2.7	
Approach LOS		B						A			A	
Queue Length 50th (ft)		10	0				6	45		0	76	0
Queue Length 95th (ft)		9	0				m4	m75		m0	68	m0
Internal Link Dist (ft)		1825			1371			1906			693	
Turn Bay Length (ft)							250			150		235
Base Capacity (vph)		84	181				152	3084		479	2871	1305
Starvation Cap Reductn		0	0				0	0		0	75	0
Spillback Cap Reductn		0	0				0	0		0	0	0
Storage Cap Reductn		0	0				0	0		0	0	0
Reduced v/c Ratio		0.12	0.22				0.39	0.34		0.01	0.77	0.03

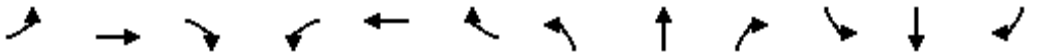
Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 128 (85%), Referenced to phase 2:NBSB and 6:NBSB, Start of Green			
Natural Cycle: 110			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.75			
Intersection Signal Delay: 2.8		Intersection LOS: A	
Intersection Capacity Utilization 58.9%		ICU Level of Service B	
Analysis Period (min) 15			

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: US 258/Rt 10 (Benns Church Boulevard) & Cypress Run Drive

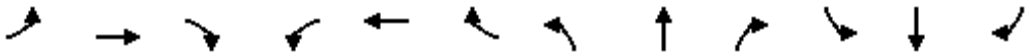


HCM 2010 analysis expects strict NEMA phasing.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	211	1	312	1	79	1	266	690	76	7	1032	355
Future Volume (vph)	211	1	312	1	79	1	266	690	76	7	1032	355
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		300	100		0	125		0	125		275
Storage Lanes	0		1	1		0	1		0	1		1
Taper Length (ft)	200			25			100			100		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt			0.850		0.997			0.973				0.850
Flt Protected		0.953		0.950			0.950			0.950		
Satd. Flow (prot)	0	1811	1615	1715	1800	0	1752	3401	0	1805	3505	1553
Flt Permitted		0.485		0.344			0.074			0.235		
Satd. Flow (perm)	0	922	1615	621	1800	0	137	3401	0	446	3505	1553
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			339		1			26				307
Link Speed (mph)		40			25			45			45	
Link Distance (ft)		1496			695			1155			1986	
Travel Time (s)		25.5			19.0			17.5			30.1	
Peak Hour Factor	0.64	0.25	0.73	0.25	0.39	0.25	0.52	0.90	0.46	0.25	0.73	0.51
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	3%	4%	0%	0%	3%	4%
Adj. Flow (vph)	330	4	427	4	203	4	512	767	165	28	1414	696
Shared Lane Traffic (%)				10%								
Lane Group Flow (vph)	0	334	427	4	207	0	512	932	0	28	1414	696
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100		20	100		20	100	20
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0	0	0	0		0	0		0	0	0
Detector 1 Size(ft)	20	6	20	20	6		20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Perm	NA		D.P+P	NA		D.P+P	NA	Perm
Protected Phases		4			8		1	6		5	2	

3: US 258/Rt 10 (Benns Church Boulevard) & Turner Drive

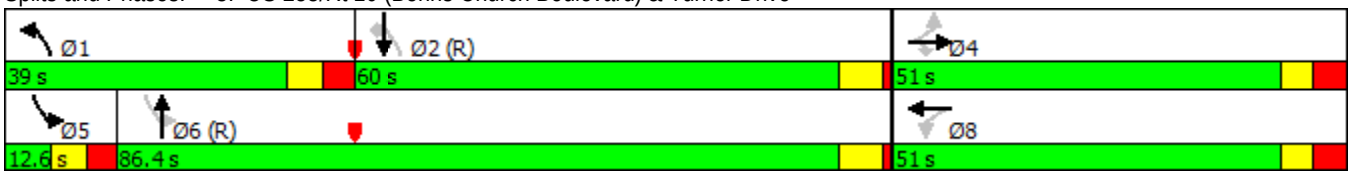


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4		4	8			2			6		2
Detector Phase	4	4	4	8	8		1	6		5	2	2
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		5.0	15.0		5.0	15.0	15.0
Minimum Split (s)	15.0	15.0	15.0	14.5	14.5		12.5	21.0		12.5	21.0	21.0
Total Split (s)	51.0	51.0	51.0	51.0	51.0		39.0	86.4		12.6	60.0	60.0
Total Split (%)	34.0%	34.0%	34.0%	34.0%	34.0%		26.0%	57.6%		8.4%	40.0%	40.0%
Maximum Green (s)	43.5	43.5	43.5	43.5	43.5		31.5	80.4		5.1	54.0	54.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		4.0	5.0		4.0	5.0	5.0
All-Red Time (s)	4.0	4.0	4.0	4.0	4.0		3.5	1.0		3.5	1.0	1.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)		7.5	7.5	7.5	7.5		7.5	6.0		7.5	6.0	6.0
Lead/Lag							Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0	5.0	3.0	3.0		4.0	6.0		2.0	6.0	6.0
Minimum Gap (s)	3.5	3.5	3.5	0.2	0.2		0.2	3.5		0.2	3.5	3.5
Time Before Reduce (s)	20.0	20.0	20.0	0.0	0.0		0.0	20.0		0.0	20.0	20.0
Time To Reduce (s)	10.0	10.0	10.0	0.0	0.0		0.0	15.0		0.0	15.0	15.0
Recall Mode	None	None	None	None	None		None	C-Min		None	C-Min	C-Min
Act Effct Green (s)		43.5	43.5	43.5	43.5		84.0	85.4		87.0	54.0	54.0
Actuated g/C Ratio		0.29	0.29	0.29	0.29		0.56	0.57		0.58	0.36	0.36
v/c Ratio		1.25	0.60	0.02	0.40		1.23	0.48		0.09	1.12	0.92
Control Delay		183.4	13.5	39.0	45.3		164.8	20.2		10.3	96.5	29.0
Queue Delay		0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay		183.4	13.5	39.0	45.3		164.8	20.2		10.3	96.5	29.0
LOS		F	B	D	D		F	C		B	F	C
Approach Delay		88.1			45.2			71.5			73.4	
Approach LOS		F			D			E			E	
Queue Length 50th (ft)		~406	65	3	170		~569	289		5	~826	230
Queue Length 95th (ft)		96	71	4	98		292	348		4	602	58
Internal Link Dist (ft)		1416			615			1075			1906	
Turn Bay Length (ft)			300	100			125			125		275
Base Capacity (vph)		267	709	180	522		415	1948		304	1261	755
Starvation Cap Reductn		0	0	0	0		0	0		0	0	0
Spillback Cap Reductn		0	0	0	0		0	0		0	0	0
Storage Cap Reductn		0	0	0	0		0	0		0	0	0
Reduced v/c Ratio		1.25	0.60	0.02	0.40		1.23	0.48		0.09	1.12	0.92

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 30 (20%), Referenced to phase 2:NBSB and 6:NBSB, Start of Green			
Natural Cycle: 110			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.25			
Intersection Signal Delay: 73.9		Intersection LOS: E	
Intersection Capacity Utilization 79.2%		ICU Level of Service D	
Analysis Period (min) 15			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

Splits and Phases: 3: US 258/Rt 10 (Benns Church Boulevard) & Turner Drive



HCM 2010 Computation does not support turning movement with Shared and Exclusive lanes.

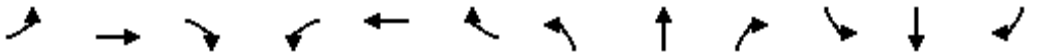
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	0	0	5	0	1128	0	1	0
Future Volume (vph)	0	0	0	0	0	0	5	0	1128	0	1	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0		125		0		140
Storage Lanes	0		0	0		0		1		0		1
Taper Length (ft)	25			25				25				75
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00
Frt												
Flt Protected							0.950				0.950	
Satd. Flow (prot)	0	0	0	0	0	0	1805	0	3438	0	1805	0
Flt Permitted							0.950				0.950	
Satd. Flow (perm)	0	0	0	0	0	0	1805	0	3438	0	1805	0
Link Speed (mph)		30			30				45			
Link Distance (ft)		810			872				3921			
Travel Time (s)		18.4			19.8				59.4			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.33	0.25	0.85	0.25	0.25	0.25
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	5%	0%	0%	0%
Adj. Flow (vph)	0	0	0	0	0	0	15	0	1327	0	4	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	0	15	0	1327	0	4	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	R NA	Left	Left	Right	R NA	Left
Median Width(ft)		0			0				12			
Link Offset(ft)		0			0				0			
Crosswalk Width(ft)		16			16				16			
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	9	15		9	9	15
Sign Control		Stop			Stop				Free			

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 41.8%		ICU Level of Service A	
Analysis Period (min) 15			

Lane Group	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	1392	0
Future Volume (vph)	1392	0
Ideal Flow (vphpl)	1900	1900
Storage Length (ft)		0
Storage Lanes		0
Taper Length (ft)		
Lane Util. Factor	0.95	1.00
Frt		
Flt Protected		
Satd. Flow (prot)	3406	0
Flt Permitted		
Satd. Flow (perm)	3406	0
Link Speed (mph)	45	
Link Distance (ft)	1155	
Travel Time (s)	17.5	
Peak Hour Factor	0.88	0.25
Heavy Vehicles (%)	6%	0%
Adj. Flow (vph)	1582	0
Shared Lane Traffic (%)		
Lane Group Flow (vph)	1582	0
Enter Blocked Intersection	No	No
Lane Alignment	Left	Right
Median Width(ft)	12	
Link Offset(ft)	0	
Crosswalk Width(ft)	16	
Two way Left Turn Lane		
Headway Factor	1.00	1.00
Turning Speed (mph)		9
Sign Control	Free	

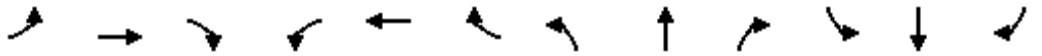
Intersection Summary

5: US 258/Rt 10 (Benns Church Boulevard) & 258/Rt 32 (Brewers Neck Boulevard)



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	0	804	0	206	0	1105	267	0
Future Volume (vph)	0	0	0	0	0	804	0	206	0	1105	267	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		0	300		0
Storage Lanes	0		0	0		2	0		0	1		0
Taper Length (ft)	25			25			100			75		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.88	1.00	0.95	1.00	0.97	0.95	1.00
Frt						0.850						
Flt Protected										0.950		
Satd. Flow (prot)	0	0	0	0	0	2707	0	3471	0	3367	3438	0
Flt Permitted										0.950		
Satd. Flow (perm)	0	0	0	0	0	2707	0	3471	0	3367	3438	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						388						
Link Speed (mph)		30			45			45			45	
Link Distance (ft)		963			1126			2837			3921	
Travel Time (s)		21.9			17.1			43.0			59.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.72	0.92	0.84	0.25	0.83	0.63	0.25
Heavy Vehicles (%)	0%	0%	0%	0%	0%	5%	0%	4%	0%	4%	5%	0%
Adj. Flow (vph)	0	0	0	0	0	1117	0	245	0	1331	424	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	1117	0	245	0	1331	424	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors						1		2		1	2	
Detector Template						Right		Thru		Left	Thru	
Leading Detector (ft)						20		100		20	100	
Trailing Detector (ft)						0		0		0	0	
Detector 1 Position(ft)						0		0		0	0	
Detector 1 Size(ft)						20		6		20	6	
Detector 1 Type						Cl+Ex		Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)						0.0		0.0		0.0	0.0	
Detector 1 Queue (s)						0.0		0.0		0.0	0.0	
Detector 1 Delay (s)						0.0		0.0		0.0	0.0	
Detector 2 Position(ft)								94			94	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type						Perm		NA		Prot	NA	
Protected Phases								2		1	6	

5: US 258/Rt 10 (Benns Church Boulevard) & 258/Rt 32 (Brewers Neck Boulevard)

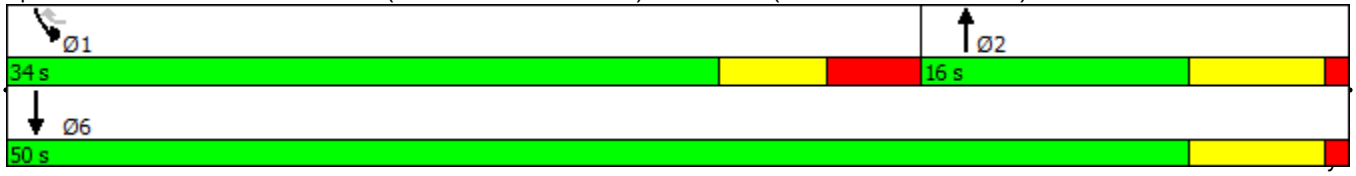


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases						1						
Detector Phase						1		2		1	6	
Switch Phase												
Minimum Initial (s)						15.0		10.0		15.0	15.0	
Minimum Split (s)						22.5		16.0		22.5	21.0	
Total Split (s)						34.0		16.0		34.0	50.0	
Total Split (%)						68.0%		32.0%		68.0%	100.0%	
Maximum Green (s)						26.5		10.0		26.5	44.0	
Yellow Time (s)						4.0		5.0		4.0	5.0	
All-Red Time (s)						3.5		1.0		3.5	1.0	
Lost Time Adjust (s)						0.0		0.0		0.0	0.0	
Total Lost Time (s)						7.5		6.0		7.5	6.0	
Lead/Lag						Lead		Lag		Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)						3.5		2.5		3.5	5.0	
Recall Mode						Min		None		Min	Min	
Act Effct Green (s)						27.8		10.0		27.8	51.4	
Actuated g/C Ratio						0.54		0.19		0.54	1.00	
v/c Ratio						0.68		0.36		0.73	0.12	
Control Delay						7.9		19.2		12.0	0.1	
Queue Delay						0.0		0.0		0.0	0.0	
Total Delay						7.9		19.2		12.0	0.1	
LOS						A		B		B	A	
Approach Delay					7.9			19.2			9.1	
Approach LOS					A			B			A	
Queue Length 50th (ft)						70		32		138	0	
Queue Length 95th (ft)						73		54		175	0	
Internal Link Dist (ft)		883			1046			2757			3841	
Turn Bay Length (ft)										300		
Base Capacity (vph)						1644		677		1823	3438	
Starvation Cap Reductn						0		0		0	0	
Spillback Cap Reductn						0		0		0	0	
Storage Cap Reductn						0		0		0	0	
Reduced v/c Ratio						0.68		0.36		0.73	0.12	

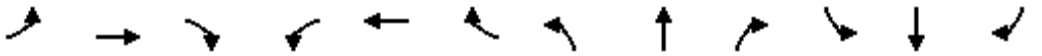
Intersection Summary

Area Type:	Other		
Cycle Length: 50			
Actuated Cycle Length: 51.4			
Natural Cycle: 50			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.73			
Intersection Signal Delay: 9.5		Intersection LOS: A	
Intersection Capacity Utilization 49.9%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 5: US 258/Rt 10 (Benns Church Boulevard) & 258/Rt 32 (Brewers Neck Boulevard)

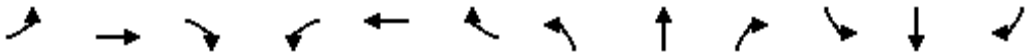


HCM 2010 Research does not support Non-NEMA phasing.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	1081	0	266	775	4	0	1	473	7	4	14
Future Volume (vph)	7	1081	0	266	775	4	0	1	473	7	4	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	225		0	600		325	0		350	0		0
Storage Lanes	1		0	1		1	0		2	0		1
Taper Length (ft)	200			200			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	0.88	1.00	1.00	1.00
Frt						0.850			0.850			0.850
Flt Protected	0.950			0.950							0.978	
Satd. Flow (prot)	1805	3471	0	1719	3505	1615	0	950	2682	0	1858	1369
Flt Permitted	0.950			0.950							0.978	
Satd. Flow (perm)	1805	3471	0	1719	3505	1615	0	950	2682	0	1858	1369
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						160			445			218
Link Speed (mph)		45			45			45			25	
Link Distance (ft)		1126			846			914			623	
Travel Time (s)		17.1			12.8			13.8			17.0	
Peak Hour Factor	0.50	0.82	0.25	0.78	0.72	0.38	0.25	0.25	0.89	0.75	0.38	0.55
Heavy Vehicles (%)	0%	4%	0%	5%	3%	0%	0%	100%	6%	0%	0%	18%
Adj. Flow (vph)	14	1318	0	341	1076	11	0	4	531	9	11	25
Shared Lane Traffic (%)												
Lane Group Flow (vph)	14	1318	0	341	1076	11	0	4	531	0	20	25
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100		20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6		20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA	Perm		NA	pm+ov	Split	NA	Perm
Protected Phases	1	6		5	2		4	4	5	3	3	

6: Queen Annes Court & 258/Rt 32 (Brewers Neck Boulevard)

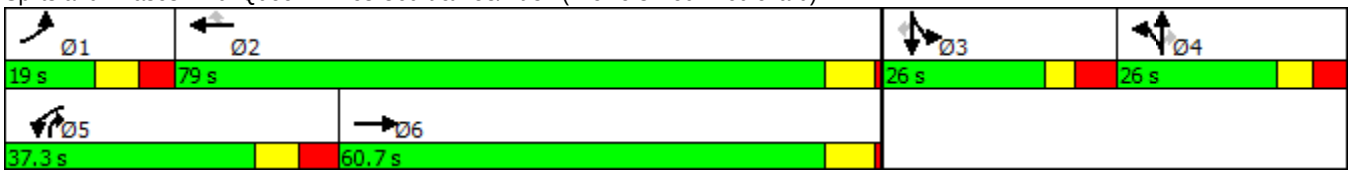


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases						2			4			3
Detector Phase	1	6		5	2	2	4	4	5	3	3	3
Switch Phase												
Minimum Initial (s)	10.0	15.0		10.0	15.0	15.0	10.0	10.0	10.0	5.0	5.0	5.0
Minimum Split (s)	19.0	24.5		19.5	24.5	24.5	26.0	26.0	19.5	26.0	26.0	26.0
Total Split (s)	19.0	60.7		37.3	79.0	79.0	26.0	26.0	37.3	26.0	26.0	26.0
Total Split (%)	12.7%	40.5%		24.9%	52.7%	52.7%	17.3%	17.3%	24.9%	17.3%	17.3%	17.3%
Maximum Green (s)	10.0	54.2		27.8	72.5	72.5	18.0	18.0	27.8	18.0	18.0	18.0
Yellow Time (s)	5.0	5.5		5.0	5.5	5.5	4.0	4.0	5.0	3.5	3.5	3.5
All-Red Time (s)	4.0	1.0		4.5	1.0	1.0	4.0	4.0	4.5	4.5	4.5	4.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Lost Time (s)	9.0	6.5		9.5	6.5	6.5		8.0	9.5		8.0	8.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	5.0		3.0	5.0	5.0	3.5	3.5	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None	None	None	None	None	None	None	None
Act Effct Green (s)	10.1	54.9		28.2	88.8	88.8		10.1	31.2		6.8	6.8
Actuated g/C Ratio	0.09	0.49		0.25	0.80	0.80		0.09	0.28		0.06	0.06
v/c Ratio	0.09	0.77		0.78	0.38	0.01		0.05	0.49		0.18	0.09
Control Delay	53.4	28.8		54.4	8.7	0.0		54.0	7.8		57.5	0.6
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Delay	53.4	28.8		54.4	8.7	0.0		54.0	7.8		57.5	0.6
LOS	D	C		D	A	A		D	A		E	A
Approach Delay		29.0			19.5			8.1			25.9	
Approach LOS		C			B			A			C	
Queue Length 50th (ft)	9	407		233	85	0		3	27		14	0
Queue Length 95th (ft)	19	576		#374	268	0		4	71		18	0
Internal Link Dist (ft)		1046			766			834			543	
Turn Bay Length (ft)	225			600		325			350			
Base Capacity (vph)	164	1716		436	2802	1323		155	1073		305	407
Starvation Cap Reductn	0	0		0	0	0		0	0		0	0
Spillback Cap Reductn	0	0		0	0	0		0	0		0	0
Storage Cap Reductn	0	0		0	0	0		0	0		0	0
Reduced v/c Ratio	0.09	0.77		0.78	0.38	0.01		0.03	0.49		0.07	0.06

Intersection Summary

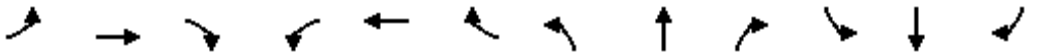
Area Type: Other
Cycle Length: 150
Actuated Cycle Length: 111
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.78
Intersection Signal Delay: 21.6 Intersection LOS: C
Intersection Capacity Utilization 73.0% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 6: Queen Annes Court & 258/Rt 32 (Brewers Neck Boulevard)



HCM 2010 analysis expects strict NEMA phasing.

1: US 258/Rt 10 (Benns Church Boulevard) & Canteberry Lane



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	156	6	49	70	10	87	57	1366	117	145	1147	108
Future Volume (vph)	156	6	49	70	10	87	57	1366	117	145	1147	108
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	200		350	275		325
Storage Lanes	0		1	0		1	1		1	1		1
Taper Length (ft)	25			25			125			225		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected		0.956			0.959		0.950			0.950		
Satd. Flow (prot)	0	1816	1615	0	1791	1553	1805	3539	1583	1687	3505	1615
Flt Permitted		0.956			0.959		0.103			0.076		
Satd. Flow (perm)	0	1816	1615	0	1791	1553	196	3539	1583	135	3505	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			164			164			177			177
Link Speed (mph)		25			25			45			45	
Link Distance (ft)		335			1232			773			1937	
Travel Time (s)		9.1			33.6			11.7			29.3	
Peak Hour Factor	0.91	0.42	0.56	0.75	0.67	0.93	0.60	0.94	0.64	0.76	0.94	0.71
Heavy Vehicles (%)	0%	0%	0%	2%	0%	4%	0%	2%	2%	7%	3%	0%
Adj. Flow (vph)	171	14	88	93	15	94	95	1453	183	191	1220	152
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	185	88	0	108	94	95	1453	183	191	1220	152
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Split	NA	Prot	Split	NA	Prot	D.P+P	NA	Perm	D.P+P	NA	Perm
Protected Phases	4	4	4	3	3	3	5	2		1	6	

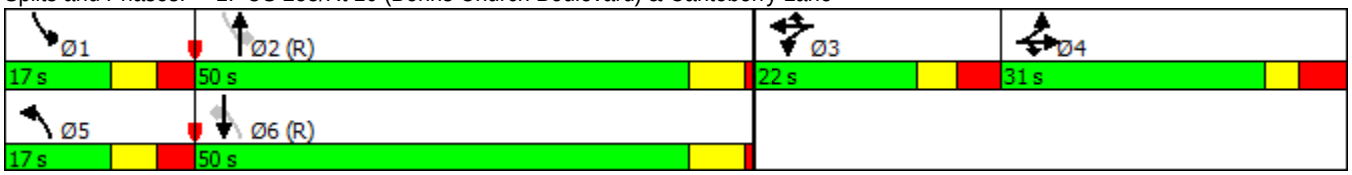
1: US 258/Rt 10 (Benns Church Boulevard) & Canteberry Lane

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases							6		2	2		6
Detector Phase	4	4	4	3	3	3	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	5.0	15.0	15.0	5.0	15.0	15.0
Minimum Split (s)	14.5	14.5	14.5	14.5	14.5	14.5	12.5	21.0	21.0	12.5	21.0	21.0
Total Split (s)	31.0	31.0	31.0	22.0	22.0	22.0	17.0	50.0	50.0	17.0	50.0	50.0
Total Split (%)	25.8%	25.8%	25.8%	18.3%	18.3%	18.3%	14.2%	41.7%	41.7%	14.2%	41.7%	41.7%
Maximum Green (s)	23.5	23.5	23.5	14.5	14.5	14.5	9.5	44.0	44.0	9.5	44.0	44.0
Yellow Time (s)	3.0	3.0	3.0	3.5	3.5	3.5	4.0	5.0	5.0	4.0	5.0	5.0
All-Red Time (s)	4.5	4.5	4.5	4.0	4.0	4.0	3.5	1.0	1.0	3.5	1.0	1.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		7.5	7.5		7.5	7.5	7.5	6.0	6.0	7.5	6.0	6.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	2.0	6.0	6.0	2.0	6.0	6.0
Minimum Gap (s)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	3.5	3.5	0.2	3.5	3.5
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.0	20.0	0.0	20.0	20.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0	15.0	0.0	15.0	15.0
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)		17.4	17.4		12.0	12.0	60.6	52.6	52.6	60.6	54.7	54.7
Actuated g/C Ratio		0.14	0.14		0.10	0.10	0.50	0.44	0.44	0.50	0.46	0.46
v/c Ratio		0.70	0.24		0.61	0.31	0.48	0.94	0.23	1.00	0.76	0.18
Control Delay		62.7	1.5		65.8	2.7	26.4	39.9	2.1	97.9	32.9	2.8
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		62.7	1.5		65.8	2.7	26.4	39.9	2.1	97.9	32.9	2.8
LOS		E	A		E	A	C	D	A	F	C	A
Approach Delay		43.0			36.4			35.2			37.9	
Approach LOS		D			D			D			D	

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBSB and 6:NBSB, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.00
Intersection Signal Delay: 36.9 Intersection LOS: D
Intersection Capacity Utilization 78.9% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 1: US 258/Rt 10 (Benns Church Boulevard) & Canteberry Lane



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	127	0	91	0	0	1	171	1412	0	0	1117	147
Future Volume (vph)	127	0	91	0	0	1	171	1412	0	0	1117	147
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	250		0	150		235
Storage Lanes	0		1	0		0	1		0	1		1
Taper Length (ft)	25			25			150			125		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt			0.850		0.865							0.850
Flt Protected		0.950					0.950					
Satd. Flow (prot)	0	1787	1599	0	1644	0	1805	3539	0	1900	3505	1615
Flt Permitted		0.950					0.145					
Satd. Flow (perm)	0	1787	1599	0	1644	0	276	3539	0	1900	3505	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			214		218							218
Link Speed (mph)		15			25			45			45	
Link Distance (ft)		1905			1451			1986			773	
Travel Time (s)		86.6			39.6			30.1			11.7	
Peak Hour Factor	0.81	0.25	0.62	0.25	0.25	0.25	0.67	0.93	0.25	0.25	0.95	0.80
Heavy Vehicles (%)	1%	0%	1%	0%	0%	0%	0%	2%	0%	0%	3%	0%
Adj. Flow (vph)	157	0	147	0	0	4	255	1518	0	0	1176	184
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	157	147	0	4	0	255	1518	0	0	1176	184
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100		20	100		20	100	20
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0	0	0	0		0	0		0	0	0
Detector 1 Size(ft)	20	6	20	20	6		20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Split	NA	Prot		NA		D.P+P	NA		D.P+P	NA	Prot
Protected Phases	4	4	4	3	3		5	2		1	6	6

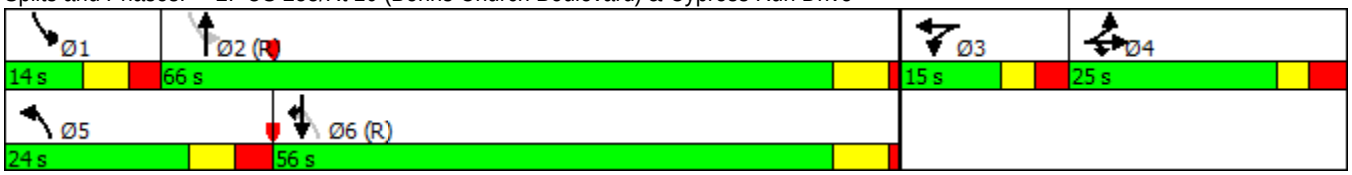
2: US 258/Rt 10 (Benns Church Boulevard) & Cypress Run Drive

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases							6			2		
Detector Phase	4	4	4	3	3		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		5.0	14.0		5.0	14.0	14.0
Minimum Split (s)	13.5	13.5	13.5	13.0	13.0		12.5	20.0		12.0	20.0	20.0
Total Split (s)	25.0	25.0	25.0	15.0	15.0		24.0	66.0		14.0	56.0	56.0
Total Split (%)	20.8%	20.8%	20.8%	12.5%	12.5%		20.0%	55.0%		11.7%	46.7%	46.7%
Maximum Green (s)	18.5	18.5	18.5	9.0	9.0		16.5	60.0		7.0	50.0	50.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.0	5.0		4.0	5.0	5.0
All-Red Time (s)	3.5	3.5	3.5	3.0	3.0		3.5	1.0		3.0	1.0	1.0
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)		6.5	6.5		6.0		7.5	6.0		7.0	6.0	6.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		2.0	5.0		2.0	5.0	5.0
Minimum Gap (s)	0.2	0.2	0.2	0.2	0.2		0.2	3.5		0.2	3.5	3.5
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	18.0		0.0	18.0	18.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	15.0		0.0	15.0	15.0
Recall Mode	None	None	None	None	None		None	C-Min		None	C-Min	C-Min
Act Effct Green (s)		15.2	15.2		7.0		80.7	89.7			66.7	66.7
Actuated g/C Ratio		0.13	0.13		0.06		0.67	0.75			0.56	0.56
v/c Ratio		0.69	0.38		0.01		0.67	0.57			0.60	0.19
Control Delay		65.8	3.8		0.0		22.8	8.9			6.7	0.3
Queue Delay		0.0	0.0		0.0		0.0	0.0			0.0	0.0
Total Delay		65.8	3.8		0.0		22.8	8.9			6.7	0.3
LOS		E	A		A		C	A			A	A
Approach Delay		35.8						10.9			5.8	
Approach LOS		D						B			A	

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 12 (10%), Referenced to phase 2:NBSB and 6:NBSB, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.69
Intersection Signal Delay: 11.1 Intersection LOS: B
Intersection Capacity Utilization 73.2% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 2: US 258/Rt 10 (Benns Church Boulevard) & Cypress Run Drive



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	94	0	106	0	1	2	188	1473	1	36	1080	138
Future Volume (vph)	94	0	106	0	1	2	188	1473	1	36	1080	138
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		300	100		0	125		0	125		275
Storage Lanes	0		1	1		0	1		0	1		1
Taper Length (ft)	200			25			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt			0.850		0.925							0.850
Flt Protected		0.950					0.950			0.950		
Satd. Flow (prot)	0	1787	1599	1900	1758	0	1687	3539	0	1805	3505	1482
Flt Permitted		0.752					0.156			0.072		
Satd. Flow (perm)	0	1415	1599	1900	1758	0	277	3539	0	137	3505	1482
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			133		4							141
Link Speed (mph)		40			25			45			45	
Link Distance (ft)		1493			695			1153			1986	
Travel Time (s)		25.4			19.0			17.5			30.1	
Peak Hour Factor	0.63	0.25	0.80	0.25	0.25	0.50	0.90	0.94	0.25	0.50	0.98	0.85
Heavy Vehicles (%)	1%	0%	1%	0%	0%	0%	7%	2%	0%	0%	3%	9%
Adj. Flow (vph)	149	0	133	0	4	4	209	1567	4	72	1102	162
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	149	133	0	8	0	209	1571	0	72	1102	162
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100		20	100		20	100	20
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0	0	0	0		0	0		0	0	0
Detector 1 Size(ft)	20	6	20	20	6		20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Perm	NA		D.P+P	NA		D.P+P	NA	Perm
Protected Phases		4			8		1	6		5	2	

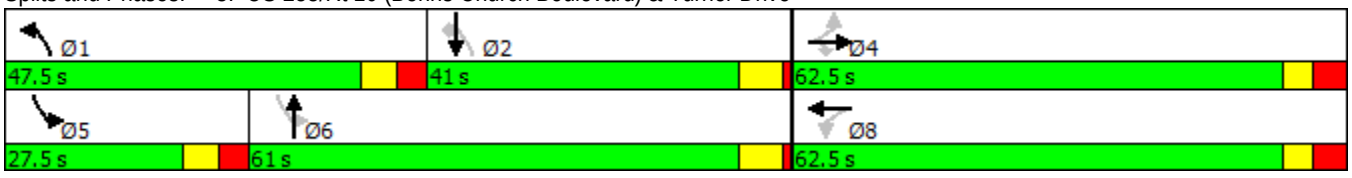
3: US 258/Rt 10 (Benns Church Boulevard) & Turner Drive

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4		4	8			2			6		2
Detector Phase	4	4	4	8	8		1	6		5	2	2
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		5.0	15.0		5.0	15.0	15.0
Minimum Split (s)	14.5	14.5	14.5	14.5	14.5		12.5	21.0		12.5	21.0	21.0
Total Split (s)	62.5	62.5	62.5	62.5	62.5		47.5	61.0		27.5	41.0	41.0
Total Split (%)	41.4%	41.4%	41.4%	41.4%	41.4%		31.5%	40.4%		18.2%	27.2%	27.2%
Maximum Green (s)	55.0	55.0	55.0	55.0	55.0		40.0	55.0		20.0	35.0	35.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		4.0	5.0		4.0	5.0	5.0
All-Red Time (s)	4.0	4.0	4.0	4.0	4.0		3.5	1.0		3.5	1.0	1.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)		7.5	7.5	7.5	7.5		7.5	6.0		7.5	6.0	6.0
Lead/Lag							Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0	5.0	3.0	3.0		4.0	6.0		2.0	6.0	6.0
Minimum Gap (s)	3.5	3.5	3.5	0.2	0.2		0.2	3.5		0.2	3.5	3.5
Time Before Reduce (s)	20.0	20.0	20.0	0.0	0.0		0.0	20.0		0.0	20.0	20.0
Time To Reduce (s)	10.0	10.0	10.0	0.0	0.0		0.0	15.0		0.0	15.0	15.0
Recall Mode	None	None	None	None	None		None	Min		None	Min	Min
Act Effct Green (s)		17.8	17.8		10.3		57.1	55.6		58.9	45.3	45.3
Actuated g/C Ratio		0.18	0.18		0.11		0.59	0.57		0.60	0.46	0.46
v/c Ratio		0.58	0.33		0.04		0.59	0.78		0.39	0.68	0.21
Control Delay		46.8	8.6		29.7		18.6	21.8		15.5	24.5	5.4
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Delay		46.8	8.6		29.7		18.6	21.8		15.5	24.5	5.4
LOS		D	A		C		B	C		B	C	A
Approach Delay		28.8			29.7			21.4			21.7	
Approach LOS		C			C			C			C	

Intersection Summary

Area Type: Other
Cycle Length: 151
Actuated Cycle Length: 97.6
Natural Cycle: 70
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.78
Intersection Signal Delay: 22.2 Intersection LOS: C
Intersection Capacity Utilization 74.3% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 3: US 258/Rt 10 (Benns Church Boulevard) & Turner Drive



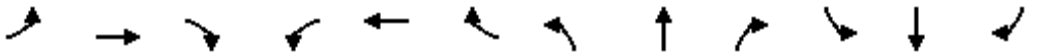
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	0	0	5	0	1652	0	0	0
Future Volume (vph)	0	0	0	0	0	0	5	0	1652	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0		125		0		140
Storage Lanes	0		0	0		0		1		0		1
Taper Length (ft)	25			25				25				75
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00
Frt												
Flt Protected							0.950					
Satd. Flow (prot)	0	0	0	0	0	0	1805	0	3505	0	1900	0
Flt Permitted							0.950					
Satd. Flow (perm)	0	0	0	0	0	0	1805	0	3505	0	1900	0
Link Speed (mph)		30			30				45			
Link Distance (ft)		810			872				3921			
Travel Time (s)		18.4			19.8				59.4			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.25	0.25	0.97	0.25	0.50	0.25
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	3%	0%	0%	0%
Adj. Flow (vph)	0	0	0	0	0	0	20	0	1703	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	0	20	0	1703	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	R NA	Left	Left	Right	R NA	Left
Median Width(ft)		0			0				12			
Link Offset(ft)		0			0				0			
Crosswalk Width(ft)		16			16				16			
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	9	15		9	9	15
Sign Control		Stop			Stop				Free			

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 49.0%		ICU Level of Service A	
Analysis Period (min) 15			

Lane Group	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	1173	0
Future Volume (vph)	1173	0
Ideal Flow (vphpl)	1900	1900
Storage Length (ft)		0
Storage Lanes		0
Taper Length (ft)		
Lane Util. Factor	0.95	1.00
Frt		
Flt Protected		
Satd. Flow (prot)	3539	0
Flt Permitted		
Satd. Flow (perm)	3539	0
Link Speed (mph)	45	
Link Distance (ft)	1153	
Travel Time (s)	17.5	
Peak Hour Factor	0.95	0.25
Heavy Vehicles (%)	2%	0%
Adj. Flow (vph)	1235	0
Shared Lane Traffic (%)		
Lane Group Flow (vph)	1235	0
Enter Blocked Intersection	No	No
Lane Alignment	Left	Right
Median Width(ft)	12	
Link Offset(ft)	0	
Crosswalk Width(ft)	16	
Two way Left Turn Lane		
Headway Factor	1.00	1.00
Turning Speed (mph)		9
Sign Control	Free	

Intersection Summary

5: US 258/Rt 10 (Benns Church Boulevard) & 258/Rt 32 (Brewers Neck Boulevard)



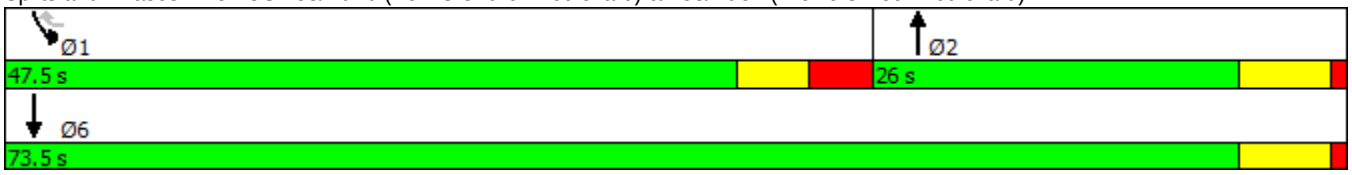
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	0	1421	0	246	0	797	340	0
Future Volume (vph)	0	0	0	0	0	1421	0	246	0	797	340	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		0	300		0
Storage Lanes	0		0	0		2	0		0	1		0
Taper Length (ft)	25			25			100			75		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.88	1.00	0.95	1.00	0.97	0.95	1.00
Frt						0.850						
Flt Protected										0.950		
Satd. Flow (prot)	0	0	0	0	0	2760	0	3471	0	3400	3471	0
Flt Permitted										0.950		
Satd. Flow (perm)	0	0	0	0	0	2760	0	3471	0	3400	3471	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						514						
Link Speed (mph)		30			45			45			45	
Link Distance (ft)		963			1126			2837			3921	
Travel Time (s)		21.9			17.1			43.0			59.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.93	0.25	0.89	0.25	0.99	0.85	0.25
Heavy Vehicles (%)	0%	0%	0%	0%	0%	3%	0%	4%	0%	3%	4%	0%
Adj. Flow (vph)	0	0	0	0	0	1528	0	276	0	805	400	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	1528	0	276	0	805	400	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors						1		2		1	2	
Detector Template						Right		Thru		Left	Thru	
Leading Detector (ft)						20		100		20	100	
Trailing Detector (ft)						0		0		0	0	
Detector 1 Position(ft)						0		0		0	0	
Detector 1 Size(ft)						20		6		20	6	
Detector 1 Type						Cl+Ex		Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)						0.0		0.0		0.0	0.0	
Detector 1 Queue (s)						0.0		0.0		0.0	0.0	
Detector 1 Delay (s)						0.0		0.0		0.0	0.0	
Detector 2 Position(ft)								94			94	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type						Perm		NA		Prot	NA	
Protected Phases								2		1	6	

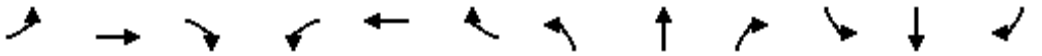
5: US 258/Rt 10 (Benns Church Boulevard) & 258/Rt 32 (Brewers Neck Boulevard)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases						1						
Detector Phase						1		2		1	6	
Switch Phase												
Minimum Initial (s)						15.0		10.0		15.0	15.0	
Minimum Split (s)						22.5		16.0		22.5	21.0	
Total Split (s)						47.5		26.0		47.5	73.5	
Total Split (%)						64.6%		35.4%		64.6%	100.0%	
Maximum Green (s)						40.0		20.0		40.0	67.5	
Yellow Time (s)						4.0		5.0		4.0	5.0	
All-Red Time (s)						3.5		1.0		3.5	1.0	
Lost Time Adjust (s)						0.0		0.0		0.0	0.0	
Total Lost Time (s)						7.5		6.0		7.5	6.0	
Lead/Lag						Lead		Lag		Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)						3.5		2.5		3.5	5.0	
Recall Mode						Min		None		Min	Min	
Act Effct Green (s)						35.9		10.8		35.9	60.4	
Actuated g/C Ratio						0.59		0.18		0.59	1.00	
v/c Ratio						0.83		0.44		0.40	0.12	
Control Delay						10.9		25.8		7.1	0.1	
Queue Delay						0.0		0.0		0.0	0.0	
Total Delay						10.9		25.8		7.1	0.1	
LOS						B		C		A	A	
Approach Delay					10.9			25.8			4.7	
Approach LOS					B			C			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 73.5			
Actuated Cycle Length: 60.4			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.83			
Intersection Signal Delay: 9.8		Intersection LOS: A	
Intersection Capacity Utilization 69.3%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 5: US 258/Rt 10 (Benns Church Boulevard) & 258/Rt 32 (Brewers Neck Boulevard)





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	844	4	515	1387	15	1	4	273	2	5	7
Future Volume (vph)	10	844	4	515	1387	15	1	4	273	2	5	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	225		0	600		325	0		350	0		0
Storage Lanes	1		0	1		1	0		2	0		1
Taper Length (ft)	200			200			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	0.88	1.00	1.00	1.00
Frt		0.999				0.850			0.850			0.850
Flt Protected	0.950			0.950				0.987			0.978	
Satd. Flow (prot)	1805	3536	0	1787	3539	1380	0	1875	2787	0	1632	1380
Flt Permitted	0.950			0.950				0.987			0.978	
Satd. Flow (perm)	1805	3536	0	1787	3539	1380	0	1875	2787	0	1632	1380
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						171			350			160
Link Speed (mph)		45			45			45			25	
Link Distance (ft)		1126			846			914			623	
Travel Time (s)		17.1			12.8			13.8			17.0	
Peak Hour Factor	0.35	0.98	1.00	0.86	0.96	0.60	0.25	0.38	0.78	0.50	1.00	0.75
Heavy Vehicles (%)	0%	2%	0%	1%	2%	17%	0%	0%	2%	0%	25%	17%
Adj. Flow (vph)	29	861	4	599	1445	25	4	11	350	4	5	9
Shared Lane Traffic (%)												
Lane Group Flow (vph)	29	865	0	599	1445	25	0	15	350	0	9	9
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100		20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6		20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA	pm+ov	Split	NA	Perm
Protected Phases	1	6		5	2		4	4	5	3	3	

6: Queen Annes Court & 258/Rt 32 (Brewers Neck Boulevard)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases						2			4			3
Detector Phase	1	6		5	2	2	4	4	5	3	3	3
Switch Phase												
Minimum Initial (s)	10.0	15.0		10.0	15.0	15.0	10.0	10.0	10.0	5.0	5.0	5.0
Minimum Split (s)	19.0	24.5		19.5	24.5	24.5	26.0	26.0	19.5	26.0	26.0	26.0
Total Split (s)	34.0	41.5		39.5	47.0	47.0	26.0	26.0	39.5	33.0	33.0	33.0
Total Split (%)	24.3%	29.6%		28.2%	33.6%	33.6%	18.6%	18.6%	28.2%	23.6%	23.6%	23.6%
Maximum Green (s)	25.0	35.0		30.0	40.5	40.5	18.0	18.0	30.0	25.0	25.0	25.0
Yellow Time (s)	5.0	5.5		5.0	5.5	5.5	4.0	4.0	5.0	3.5	3.5	3.5
All-Red Time (s)	4.0	1.0		4.5	1.0	1.0	4.0	4.0	4.5	4.5	4.5	4.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Lost Time (s)	9.0	6.5		9.5	6.5	6.5		8.0	9.5		8.0	8.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	5.0		3.0	5.0	5.0	3.5	3.5	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None	None	None	None	None	None	None	None
Act Effct Green (s)	10.4	32.9		31.2	72.6	72.6		10.4	37.0		6.3	6.3
Actuated g/C Ratio	0.11	0.36		0.34	0.80	0.80		0.11	0.41		0.07	0.07
v/c Ratio	0.14	0.68		0.98	0.51	0.02		0.07	0.26		0.08	0.04
Control Delay	45.6	30.5		66.1	13.6	0.1		45.6	2.7		49.6	0.3
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Delay	45.6	30.5		66.1	13.6	0.1		45.6	2.7		49.6	0.3
LOS	D	C		E	B	A		D	A		D	A
Approach Delay		31.0			28.6			4.5			24.9	
Approach LOS		C			C			A			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 91.3			
Natural Cycle: 150			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.98			
Intersection Signal Delay: 26.6		Intersection LOS: C	
Intersection Capacity Utilization 80.3%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 6: Queen Annes Court & 258/Rt 32 (Brewers Neck Boulevard)



APPENDIX F

Trip Distribution Percentages and Volumes

Land Use	ITE Code	Size	Units	Daily	AM Peak Hour			PM Peak Hour		
					Enter	Exit	Total	Enter	Exit	Total
Conceptual Site Plan										
Single-Family Detached Housing	210	400	Dwelling Units	3,776	74	222	296	249	147	396
Multifamily Housing (Low-Rise)	220	285	Dwelling Units	2,144	30	101	131	101	59	160
Public Park	411	4	Acres	91	0	0	0	13	10	23
Shopping Center	820	30	1000 Sq. Ft. GLA	2,651	17	11	28	107	116	223
Fast Food with Drive-Thru	934	5	1000 Sq. Ft. GLA	2,355	102	99	201	85	78	163
Subtotal				**11,017**	**223**	**433**	**656**	**555**	**410**	**965**
Pass-by Trips (Fast Food only)	49%		% Pass-by	1,154	50	49	98	42	38	80
Pass-by Trips (Shopping Center)	34%		% Pass-by	901	6	4	10	36	39	76
Total New Trips				**8,962**	**167**	**380**	**548**	**477**	**333**	**809**

Reference: Trip Generation, 10th Edition, Institute of Transportation Engineers, Washington, DC. 2017.
Note: Used highest total between average rate and fitted curve unless R2<0.75

Fast Food with Drive-Thru	934	5	1000 Sq. Ft. GLA	2,355	103	98	201	85	78	163
Pass-by Trips (Fast Food only)	49%		% Pass-by	1,154	50	48	98	42	38	80
				1,201	53	50	103	43	40	83

Shopping Center	820	30	1000 Sq. Ft. GLA	2,651	17	11	28	107	116	223
Pass-by Trips (Shopping Center Only))	34%		% Pass-by	901	6	4	10	36	39	76
				1,750	11	7	18	71	77	147

LEGEND	
—	Existing Roadway
- -	Future Roadway
STOP	Existing Stop Controlled Approach
	Existing Signalized Intersection
→	Turning Movement
XX%(XX%)	AM (PM) Entering Percentage of Site Trips
XX%(XX%)	AM (PM) Exiting Percentage of Site Trips
STOP	Future Stop Controlled Approach

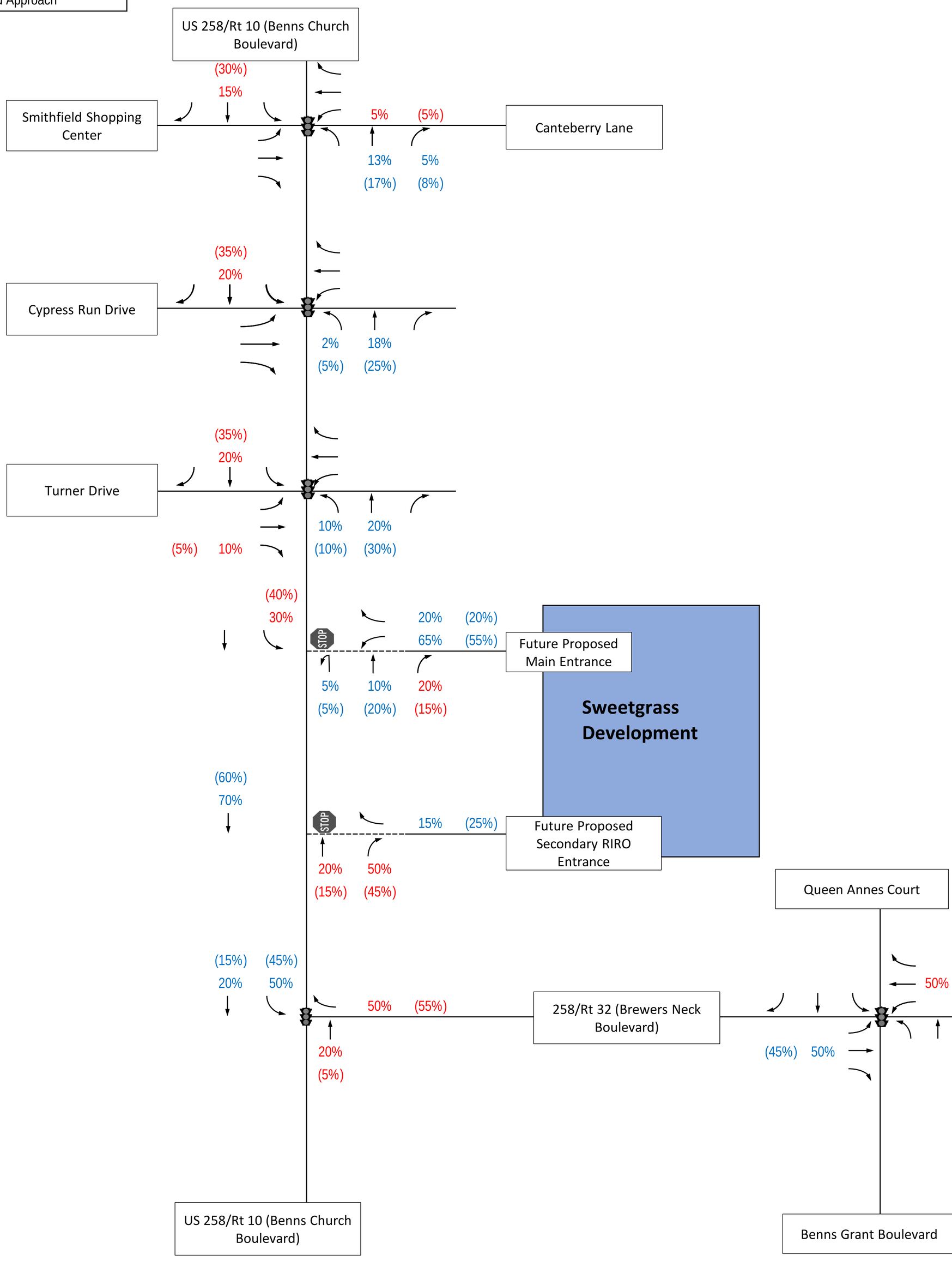


Figure F-1
Single-Family Detached Housing AM and PM Peak Hour Directional Distribution Percentages

Sweetgrass
Isle of Wight County, VA

LEGEND	
——	Existing Roadway
- - -	Future Roadway
STOP	Existing Stop Controlled Approach
	Existing Signalized Intersection
⟶	Turning Movement
XX(XX)	Weekday AM (PM) Entering Site Trips
XX(XX)	Weekday AM (PM) Exiting Site Trips
STOP	Future Stop Controlled Approach

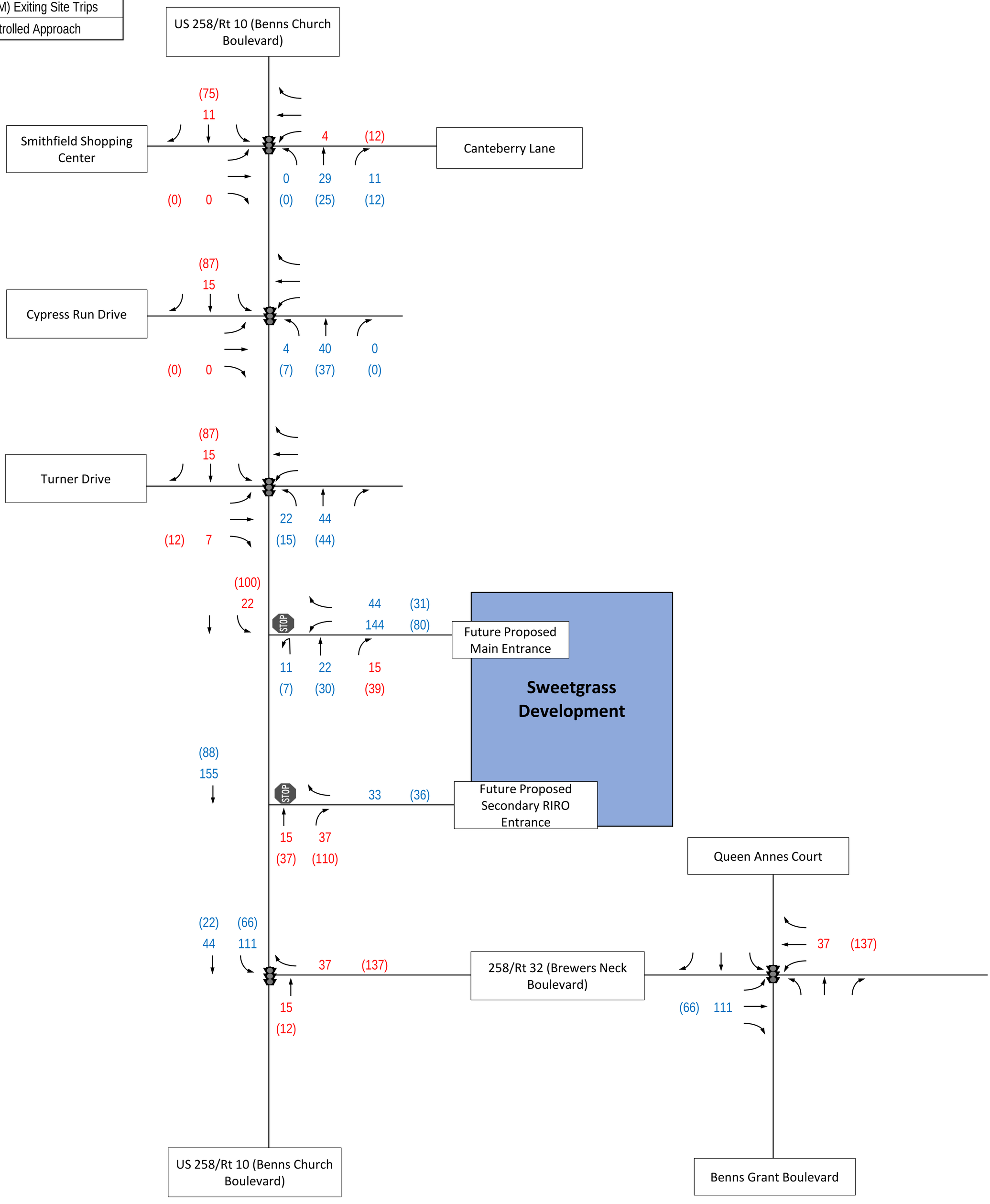


Figure F-2
Single-Family Detached Housing AM and PM Peak Hour Site Trips

Sweetgrass
Isle of Wight County, VA

LEGEND	
——	Existing Roadway
- -	Future Roadway
STOP	Existing Stop Controlled Approach
	Existing Signalized Intersection
⟶	Turning Movement
XX%(XX%)	AM (PM) Entering Percentage of Site Trips
XX%(XX%)	AM (PM) Exiting Percentage of Site Trips
STOP	Future Stop Controlled Approach

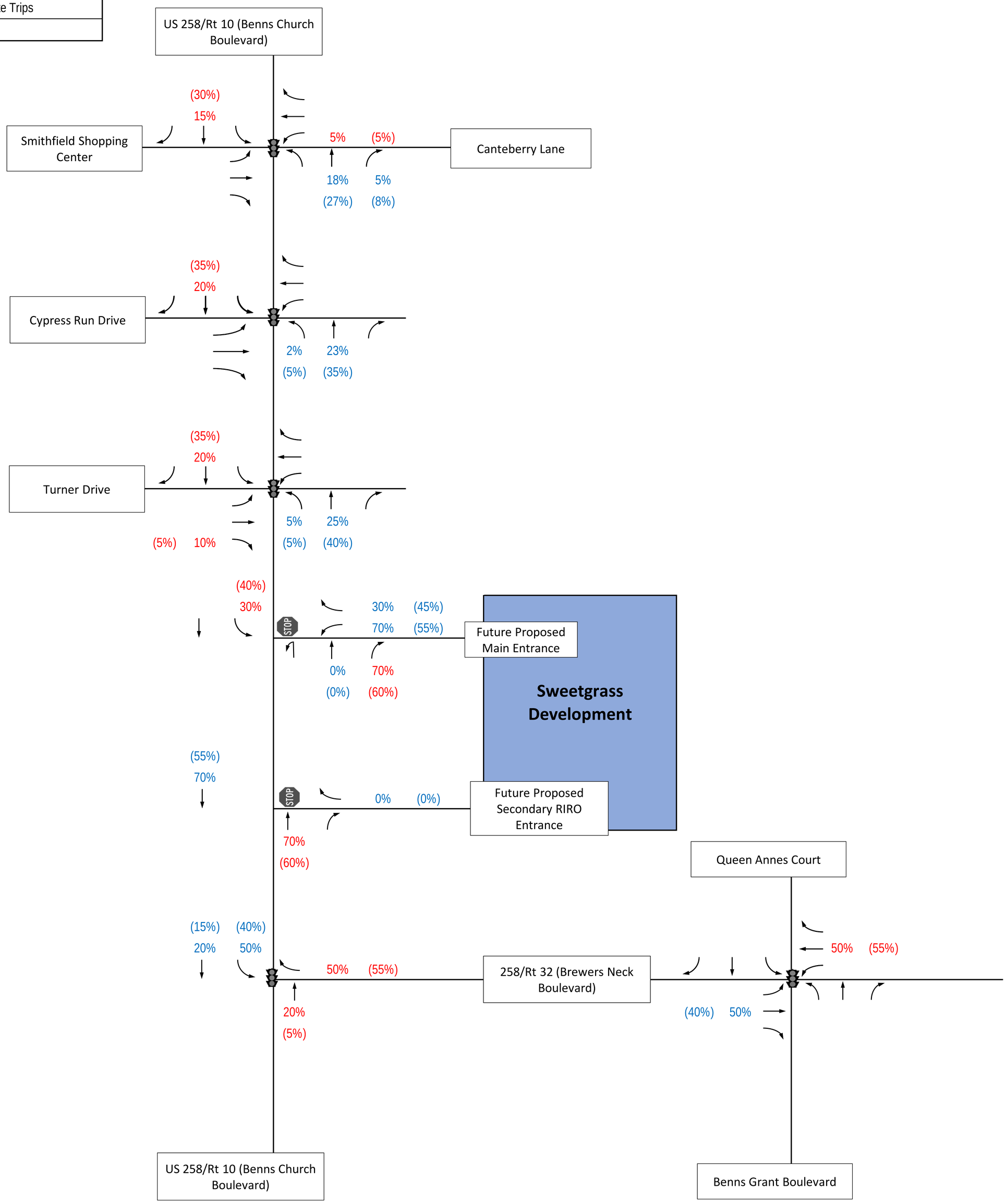


Figure F-3
Multifamily Housing (Low-Rise) AM and PM Peak Hour Directional Distribution Percentages

Sweetgrass
Isle of Wight County, VA

LEGEND	
——	Existing Roadway
- - -	Future Roadway
STOP	Existing Stop Controlled Approach
	Existing Signalized Intersection
——►	Turning Movement
XX(XX)	Weekday AM (PM) Entering Site Trips
XX(XX)	Weekday AM (PM) Exiting Site Trips
STOP	Future Stop Controlled Approach

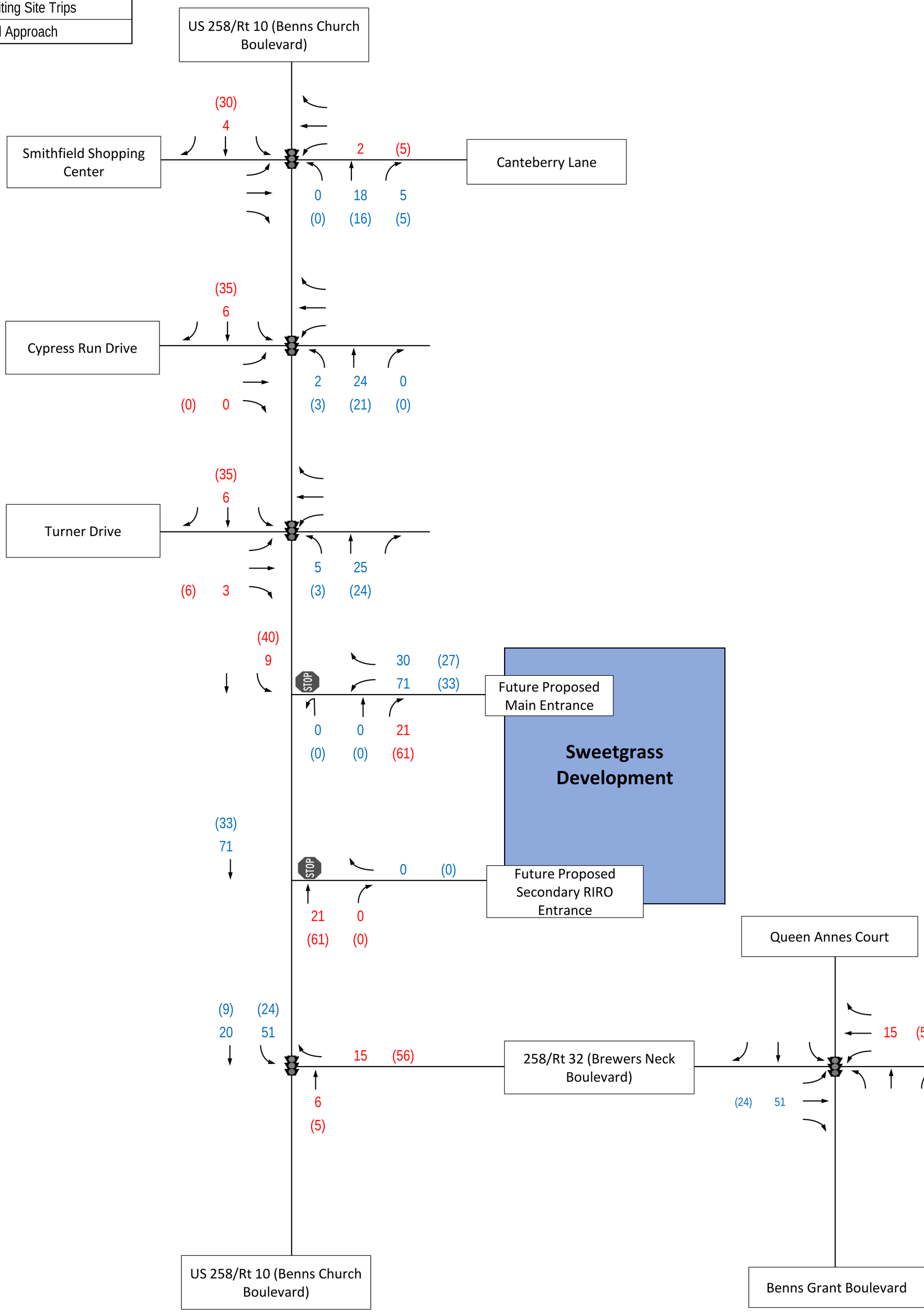


Figure F-4
Multifamily Housing (Low-Rise) AM and PM Peak Hour Site Trips

Sweetgrass
Isle of Wight County, VA

LEGEND	
——	Existing Roadway
- -	Future Roadway
STOP	Existing Stop Controlled Approach
	Existing Signalized Intersection
⟶	Turning Movement
XX%(XX%)	AM (PM) Entering Percentage of Site Trips
XX%(XX%)	AM (PM) Exiting Percentage of Site Trips
STOP	Future Stop Controlled Approach

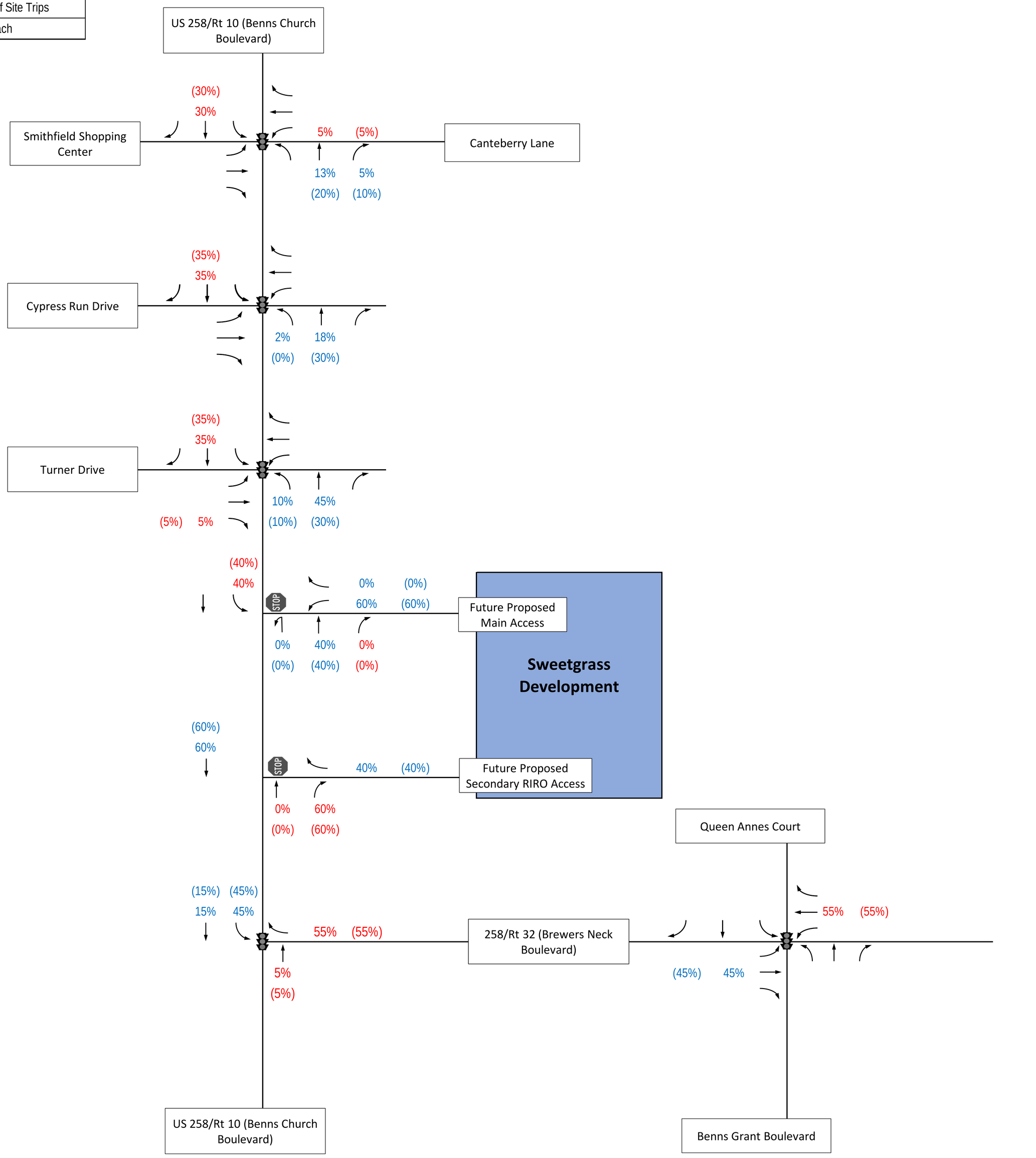


Figure F-5
Public Park AM and PM Peak Hour Directional Distribution Percentages

Sweetgrass,
Isle of Wight County, VA

LEGEND	
——	Existing Roadway
- - -	Future Roadway
STOP	Existing Stop Controlled Approach
	Existing Signalized Intersection
——►	Turning Movement
XX(XX)	Weekday AM (PM) Entering Site Trips
XX(XX)	Weekday AM (PM) Exiting Site Trips
STOP	Future Stop Controlled Approach

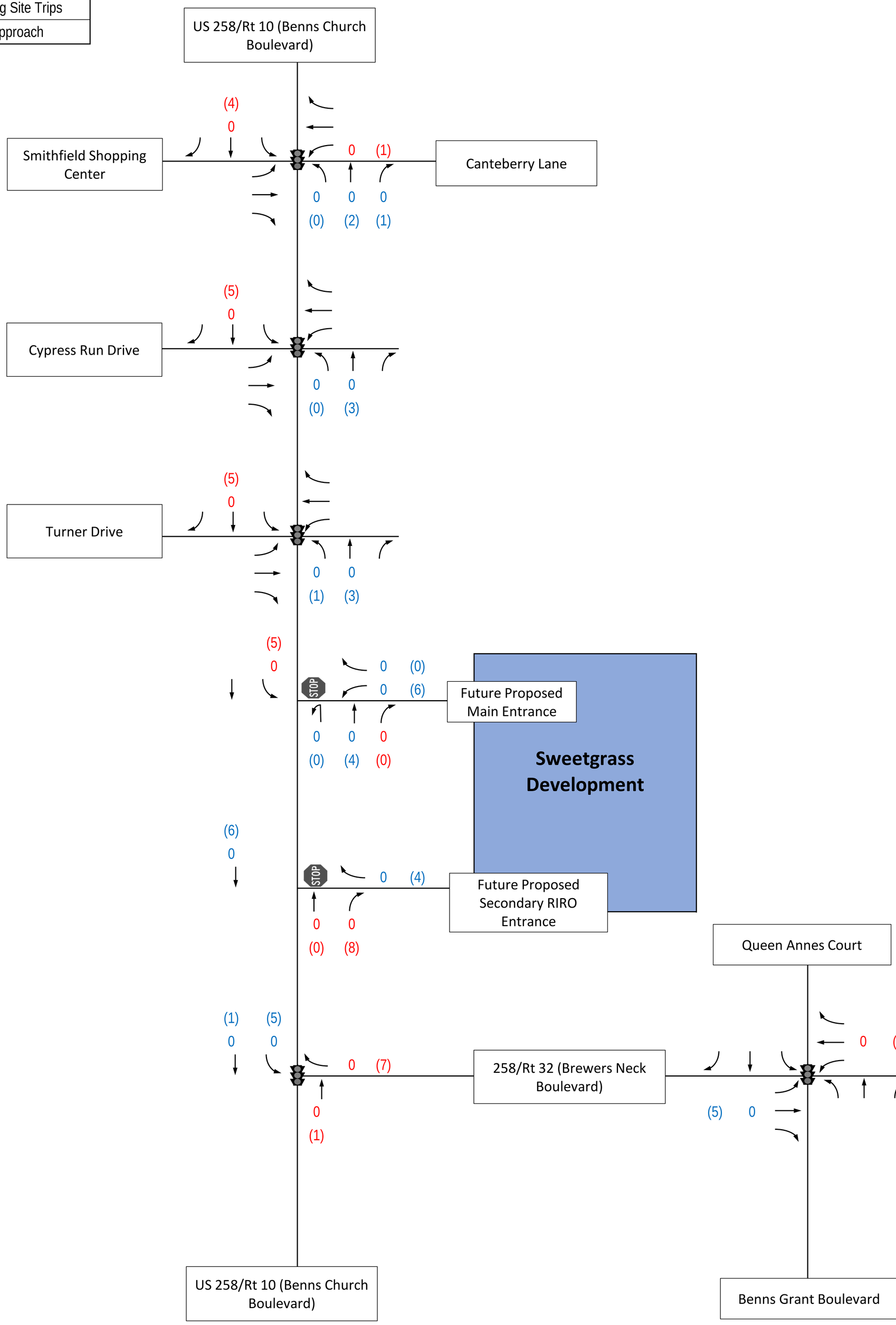


Figure F-6
Public Park AM and PM Peak Hour Site Trips

Sweetgrass
Isle of Wight County, VA

LEGEND	
——	Existing Roadway
- -	Future Roadway
STOP	Existing Stop Controlled Approach
	Existing Signalized Intersection
⟶	Turning Movement
XX%(XX%)	AM (PM) Entering Percentage of Site Trips
XX%(XX%)	AM (PM) Exiting Percentage of Site Trips
STOP	Future Stop Controlled Approach

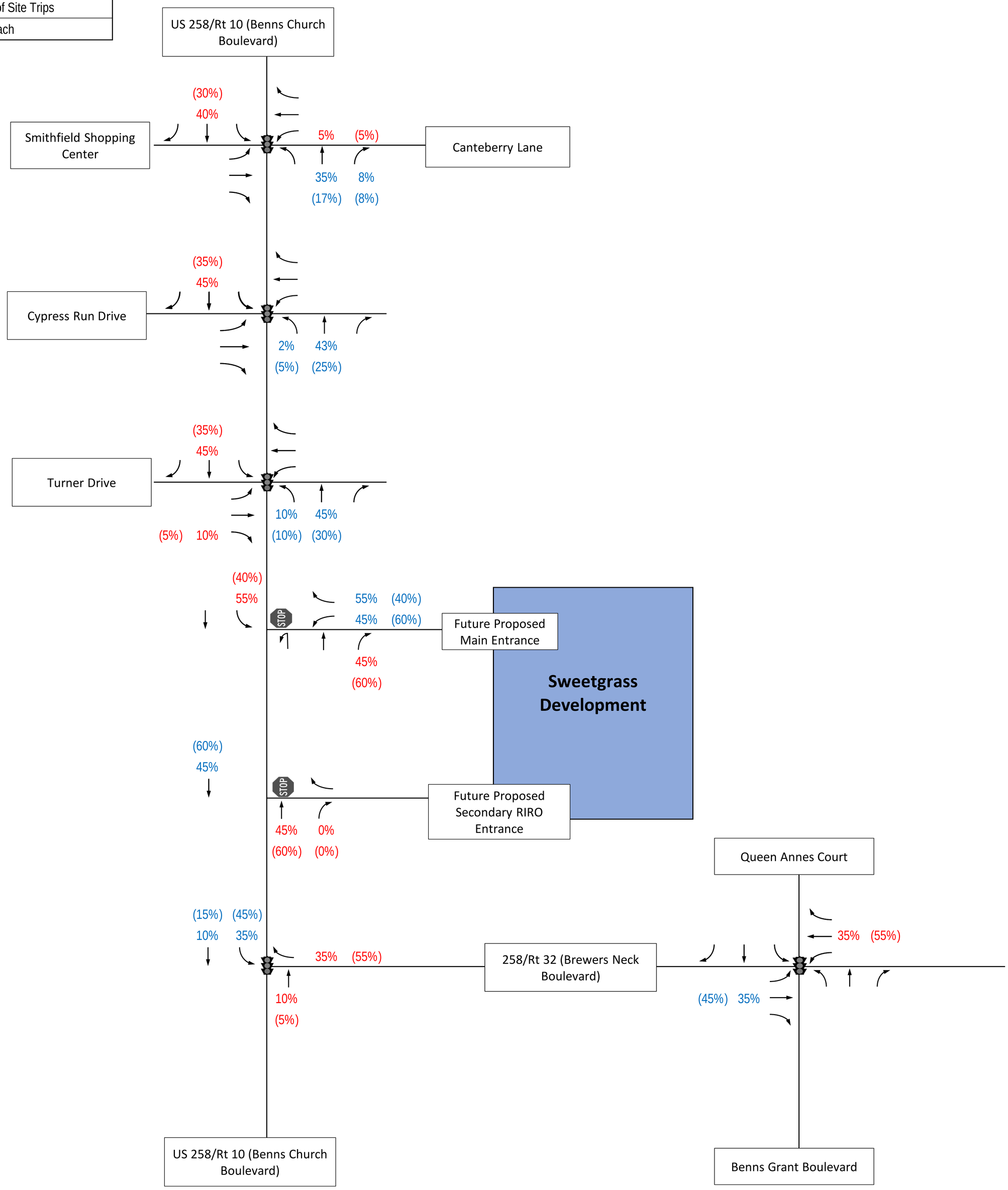


Figure F-7
Shopping Center AM and PM Peak Hour Directional Distribution Percentages

Sweetgrass
Isle of Wight County, VA

LEGEND	
——	Existing Roadway
- -	Future Roadway
STOP	Existing Stop Controlled Approach
	Existing Signalized Intersection
⟶	Turning Movement
XX(XX)	Weekday AM (PM) Entering Site Trips
XX(XX)	Weekday AM (PM) Exiting Site Trips
STOP	Future Stop Controlled Approach

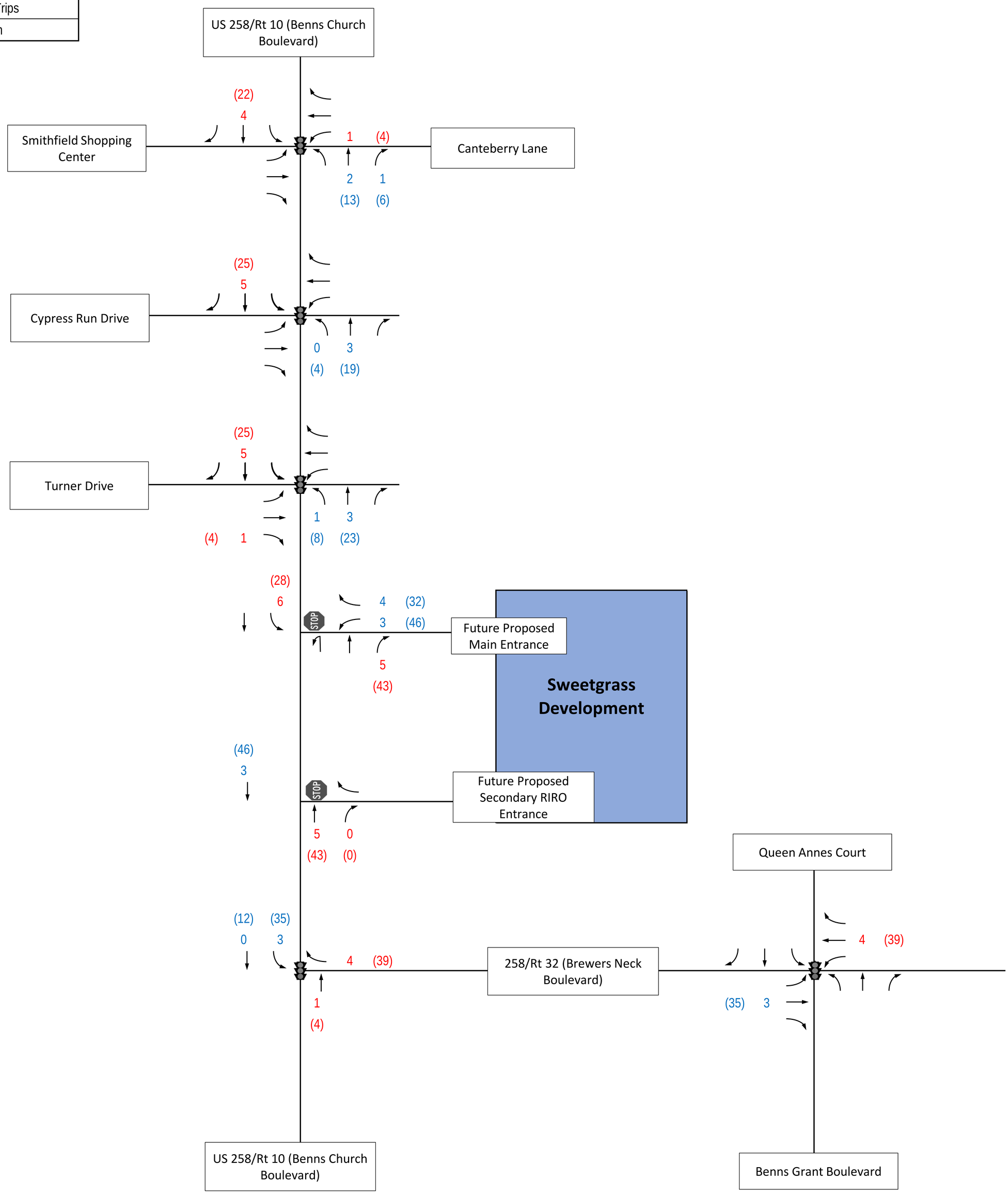


Figure F-8
Shopping Center AM and PM Peak Hour Site Trips

Sweetgrass,
Isle of Wight County, VA

LEGEND	
——	Existing Roadway
– –	Future Roadway
STOP	Existing Stop Controlled Approach
	Existing Signalized Intersection
⟶	Turning Movement
XX%(XX%)	AM (PM) Entering Percentage of Site Trips
XX%(XX%)	AM (PM) Exiting Percentage of Site Trips
STOP	Future Stop Controlled Approach

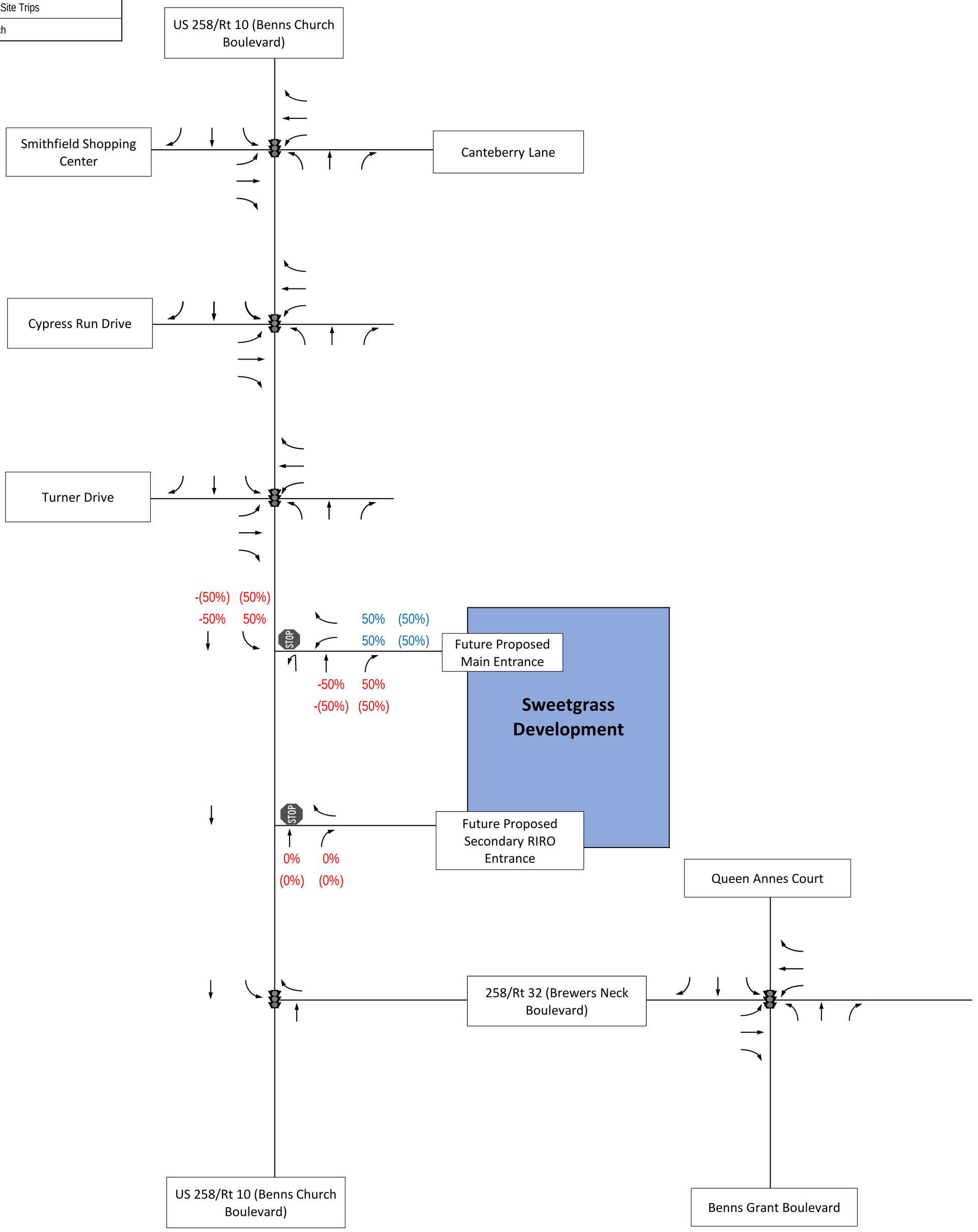


Figure F-9
Shopping Center Pass-by AM and PM Peak Hour Directional Distribution Percentages

Sweetgrass
Isle of Wight County, VA

LEGEND	
——	Existing Roadway
- - -	Future Roadway
STOP	Existing Stop Controlled Approach
	Existing Signalized Intersection
⟶	Turning Movement
XX(XX)	Weekday AM (PM) Entering Site Trips
XX(XX)	Weekday AM (PM) Exiting Site Trips
STOP	Future Stop Controlled Approach

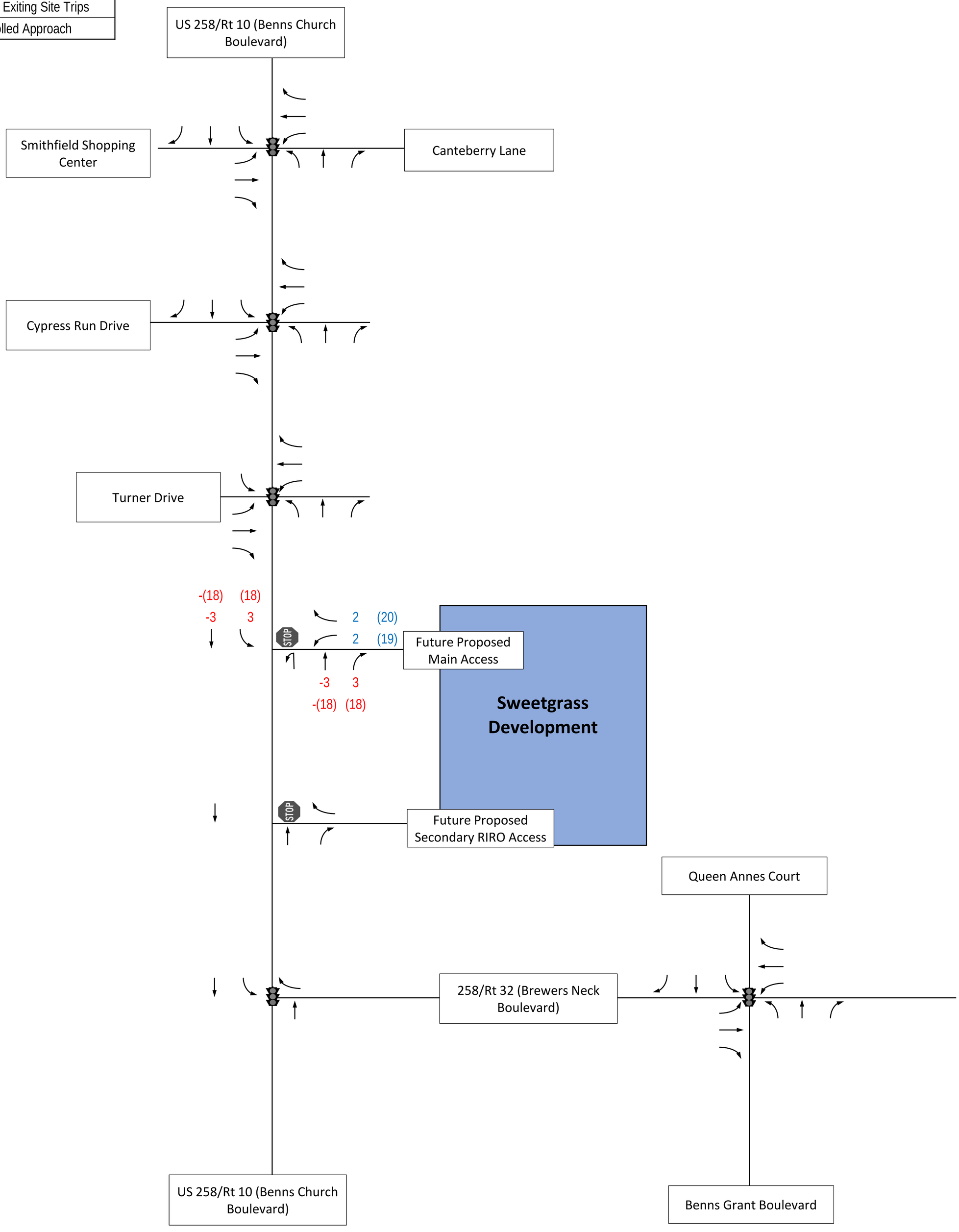


Figure F-10
Shopping Center AM and PM Peak Hour Pass-by Trips

Sweetgrass
Isle of Wight County, VA

LEGEND	
——	Existing Roadway
- -	Future Roadway
STOP	Existing Stop Controlled Approach
	Existing Signalized Intersection
⟶	Turning Movement
XX%(XX%)	AM (PM) Entering Percentage of Site Trips
XX%(XX%)	AM (PM) Exiting Percentage of Site Trips
STOP	Future Stop Controlled Approach

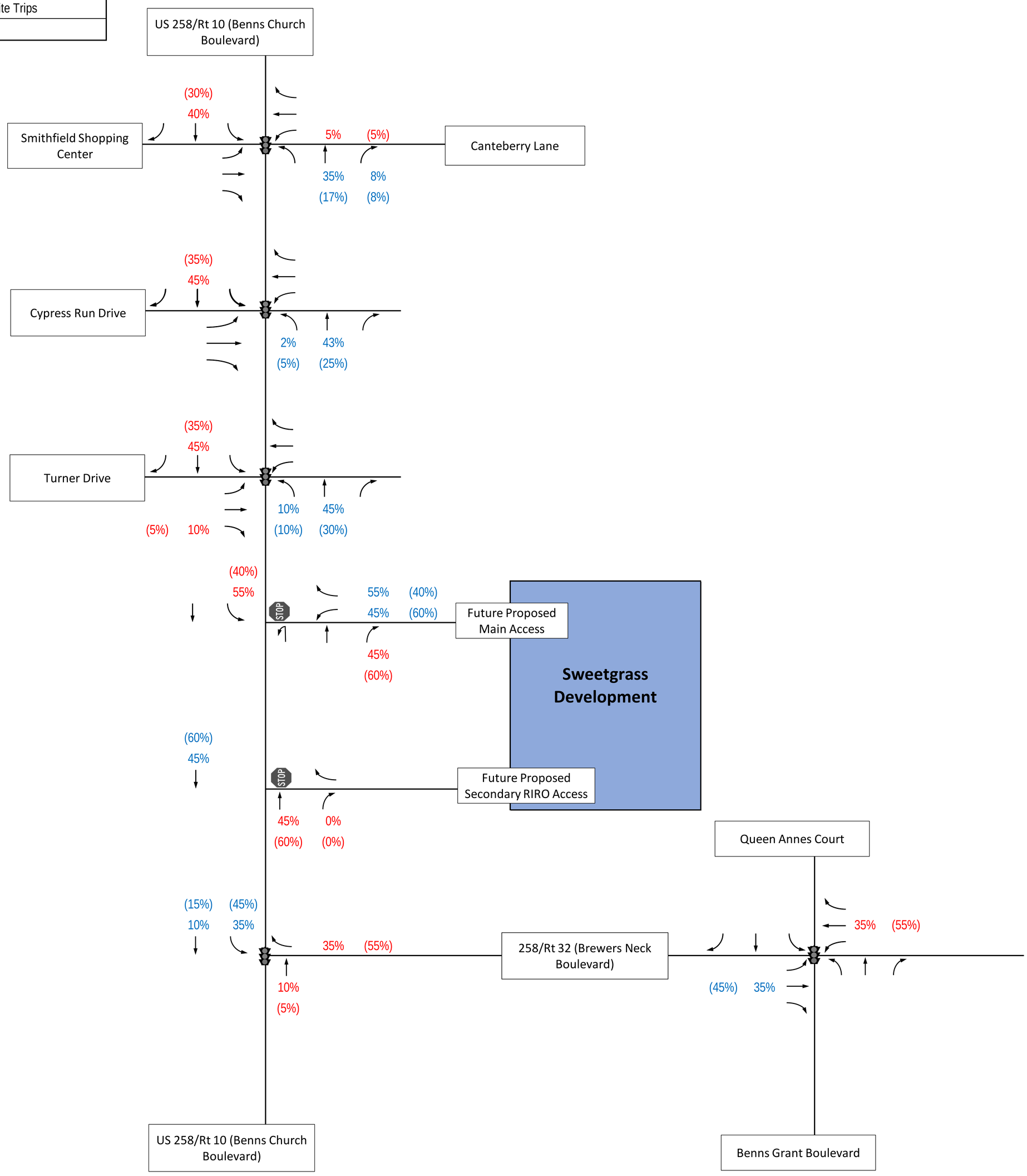


Figure F-11
Fast Food AM and PM Peak Hour Directional Distribution Percentages

Sweetgrass
Isle of Wight County, VA

LEGEND	
——	Existing Roadway
- -	Future Roadway
STOP	Existing Stop Controlled Approach
	Existing Signalized Intersection
⟶	Turning Movement
XX(XX)	Weekday AM (PM) Entering Site Trips
XX(XX)	Weekday AM (PM) Exiting Site Trips
STOP	Future Stop Controlled Approach

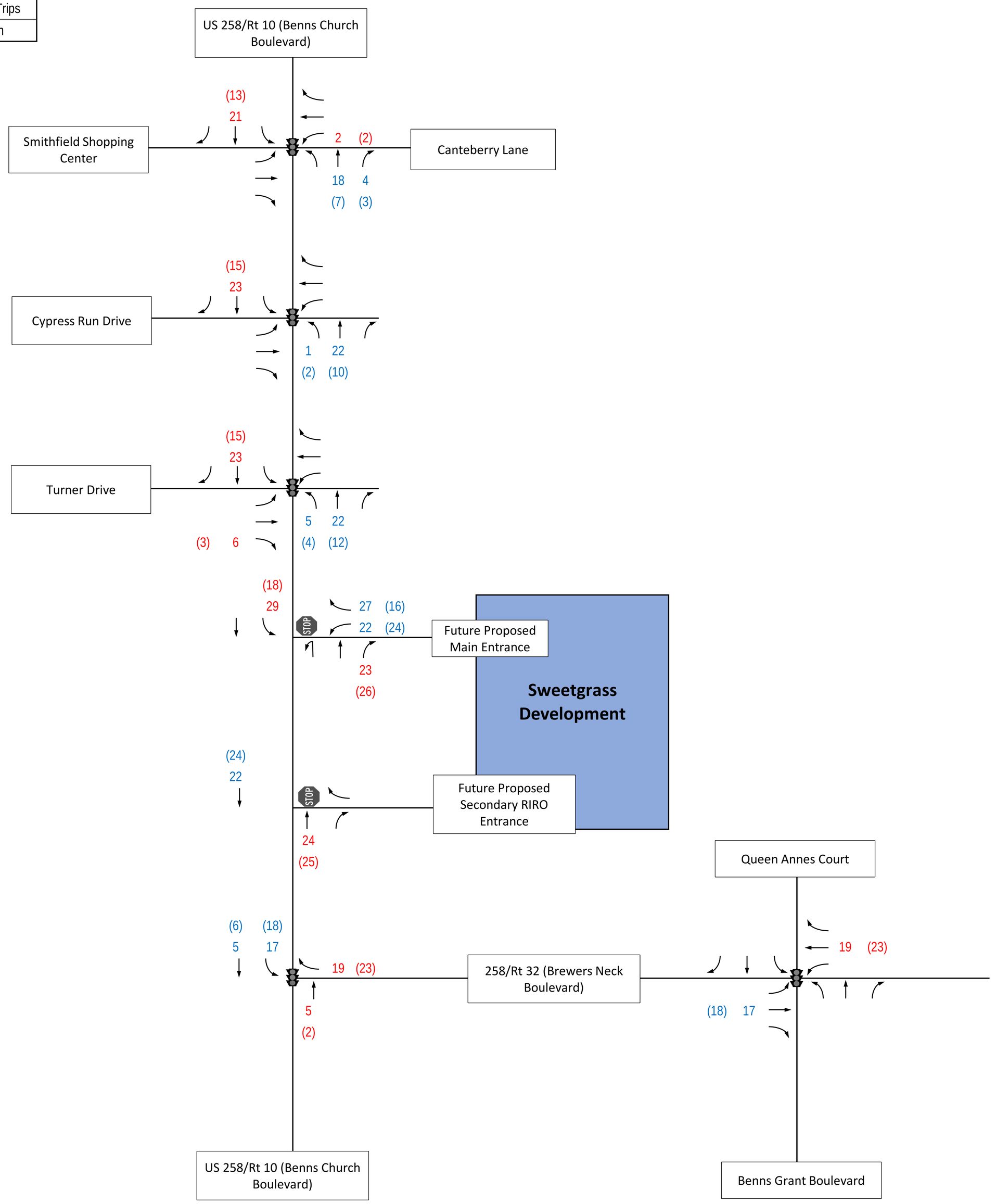


Figure F-12
Fast Food AM and PM Peak Hour New Site Trips

Sweetgrass
Isle of Wight County, VA

LEGEND	
——	Existing Roadway
– –	Future Roadway
STOP	Existing Stop Controlled Approach
	Existing Signalized Intersection
⟶	Turning Movement
XX%(XX%)	AM (PM) Entering Percentage of Site Trips
XX%(XX%)	AM (PM) Exiting Percentage of Site Trips
STOP	Future Stop Controlled Approach

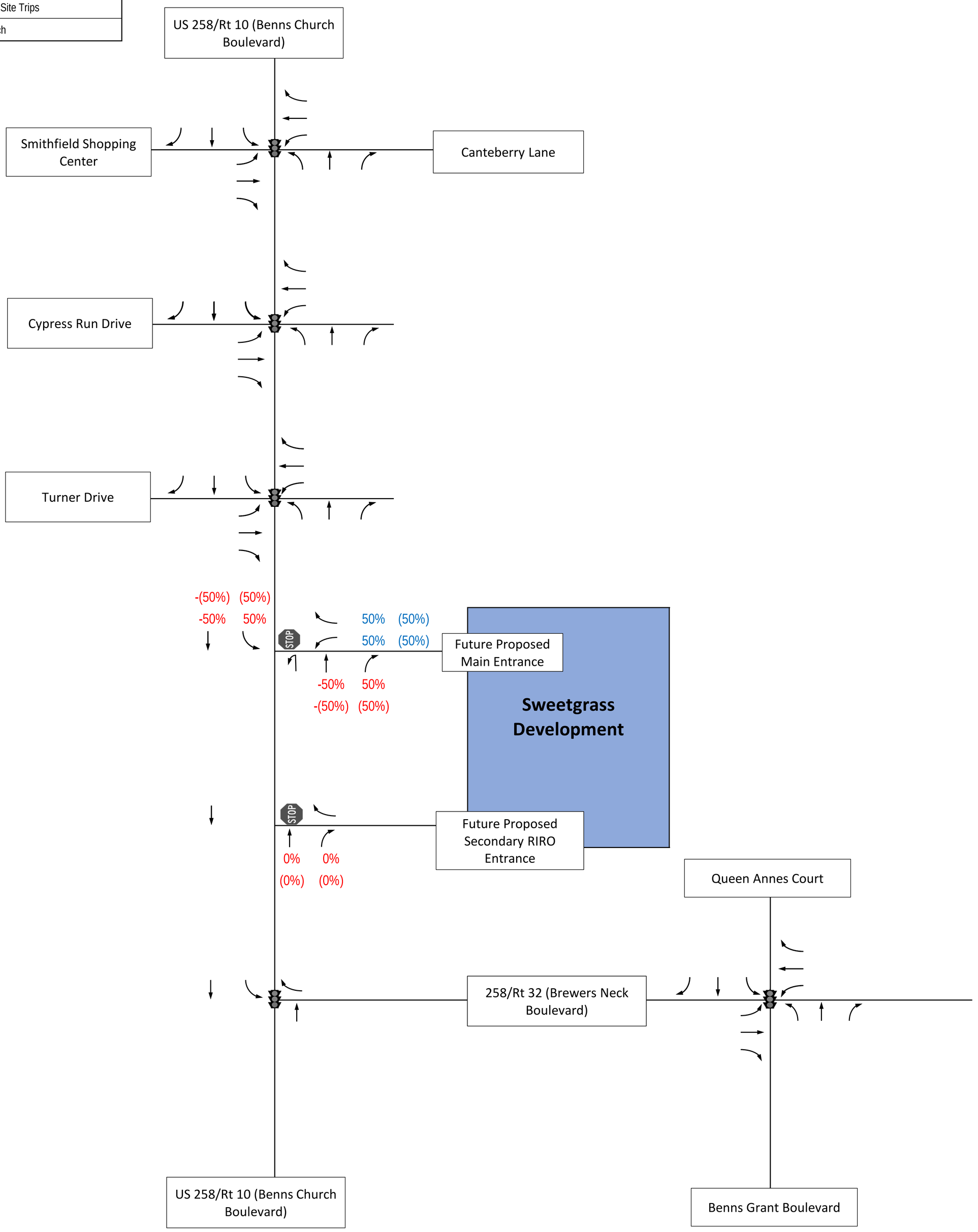


Figure F-15
Fast Food AM and PM Peak Hour Pass-by Directional Distribution Percentages

Sweetgrass
Isle of Wight County, VA

LEGEND	
——	Existing Roadway
- - -	Future Roadway
STOP	Existing Stop Controlled Approach
	Existing Signalized Intersection
⟶	Turning Movement
XX(XX)	Weekday AM (PM) Entering Site Trips
XX(XX)	Weekday AM (PM) Exiting Site Trips
STOP	Future Stop Controlled Approach

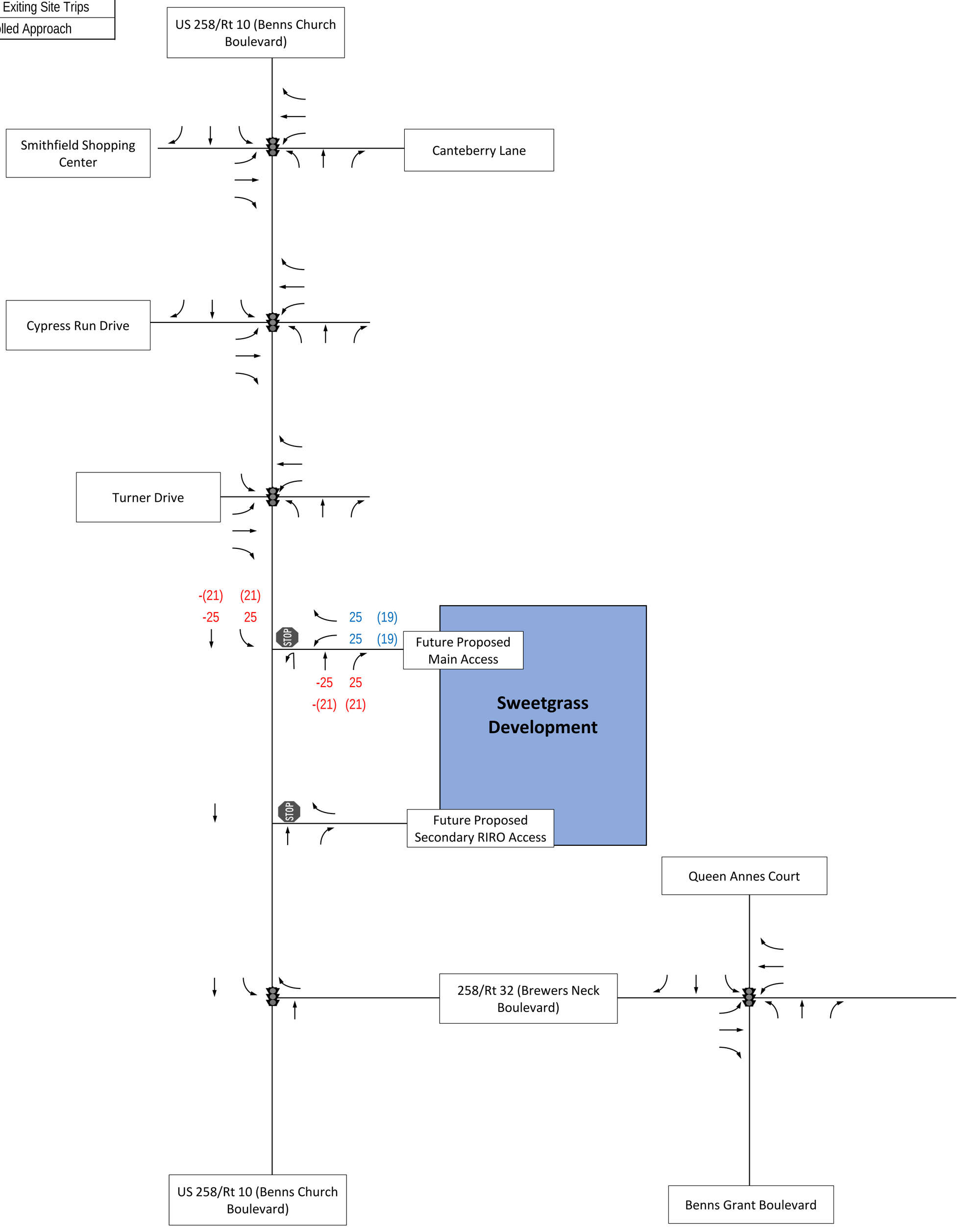


Figure F-16
Fast Food AM and PM Peak Hour Pass-by Trips

Sweetgrass
Isle of Wight County, VA

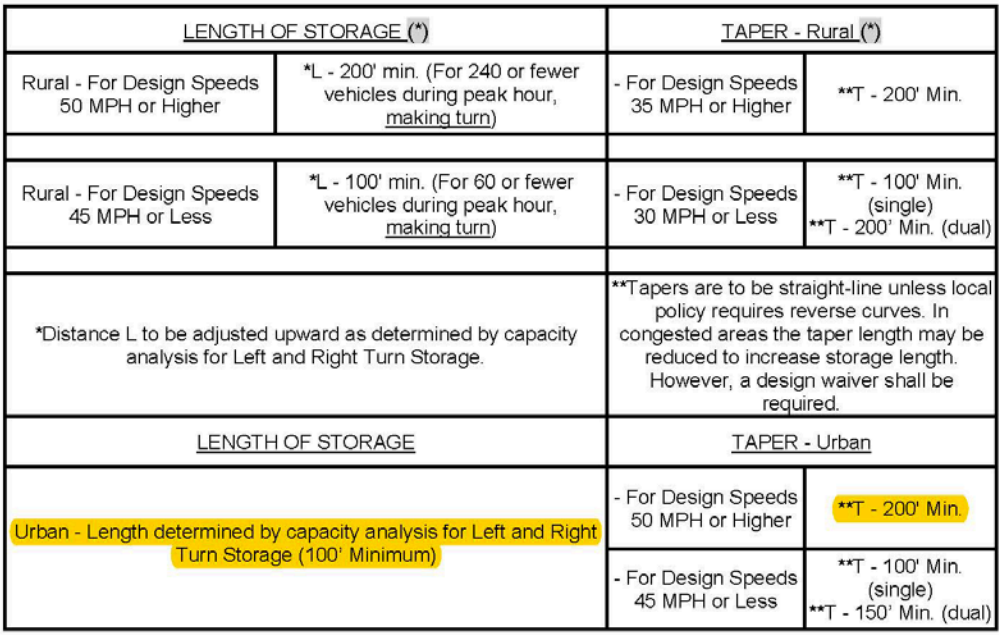
APPENDIX G

Turn Lane Warrant Analysis

Turn Lanes Warrant Analysis

Based on Figure 3-1 from Appendix F of VDOT Road Design Manual, provided below on Figure 1, both proposed entrances into development require right turn lanes. Based on the requirements shown in figure one, along with a capacity analysis, a 200-foot right turn lane with 200-foot storage is recommended at the Proposed Main Entrance and a right turn lane with 200-foot foot storage with a 200-foot taper is recommended at the Proposed Secondary Entrance.

Figure 1. Turn Lane Criteria for Single and Dual Lanes.



LENGTH OF STORAGE (*)		TAPER - Rural (*)	
Rural - For Design Speeds 50 MPH or Higher	*L - 200' min. (For 240 or fewer vehicles during peak hour, making turn)	- For Design Speeds 35 MPH or Higher	**T - 200' Min.
Rural - For Design Speeds 45 MPH or Less	*L - 100' min. (For 60 or fewer vehicles during peak hour, making turn)	- For Design Speeds 30 MPH or Less	**T - 100' Min. (single) **T - 200' Min. (dual)
*Distance L to be adjusted upward as determined by capacity analysis for Left and Right Turn Storage.		**Tapers are to be straight-line unless local policy requires reverse curves. In congested areas the taper length may be reduced to increase storage length. However, a design waiver shall be required.	
LENGTH OF STORAGE		TAPER - Urban	
Urban - Length determined by capacity analysis for Left and Right Turn Storage (100' Minimum)		- For Design Speeds 50 MPH or Higher	**T - 200' Min.
		- For Design Speeds 45 MPH or Less	**T - 100' Min. (single) **T - 150' Min. (dual)

(*) For instructions on selection of design speed, see Appendix A, Section A-1*

FIGURE 3-1 RIGHT AND LEFT TURN LANE CRITERIA FOR SINGLE AND DUAL LANES

Based on the projected volumes in year 2026 at full build-out, the projected peak hour volume right turns and approach totals at both entrances are presented below:

Entrance	Peak Hour Volume Right Turns, Vehicles per Hour	Peak Hour Volume Approach Total, Vehicles per Hour
Proposed Main Entrance	208	1724
Proposed Secondary Entrance	116	1797

Blue dots on Figure 2 below reflect where the points fall on the graph based on volumes calculations. Full-width right turn lane and a taper is required at both proposed entrances.

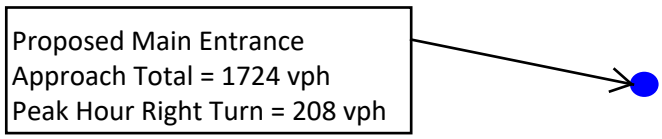
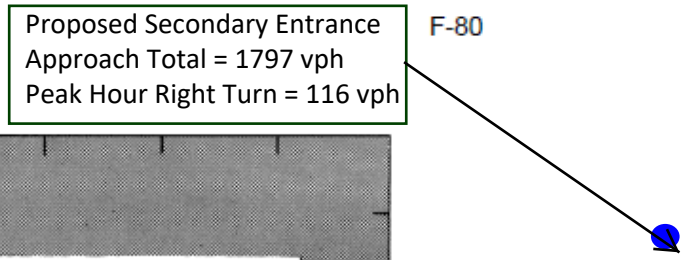
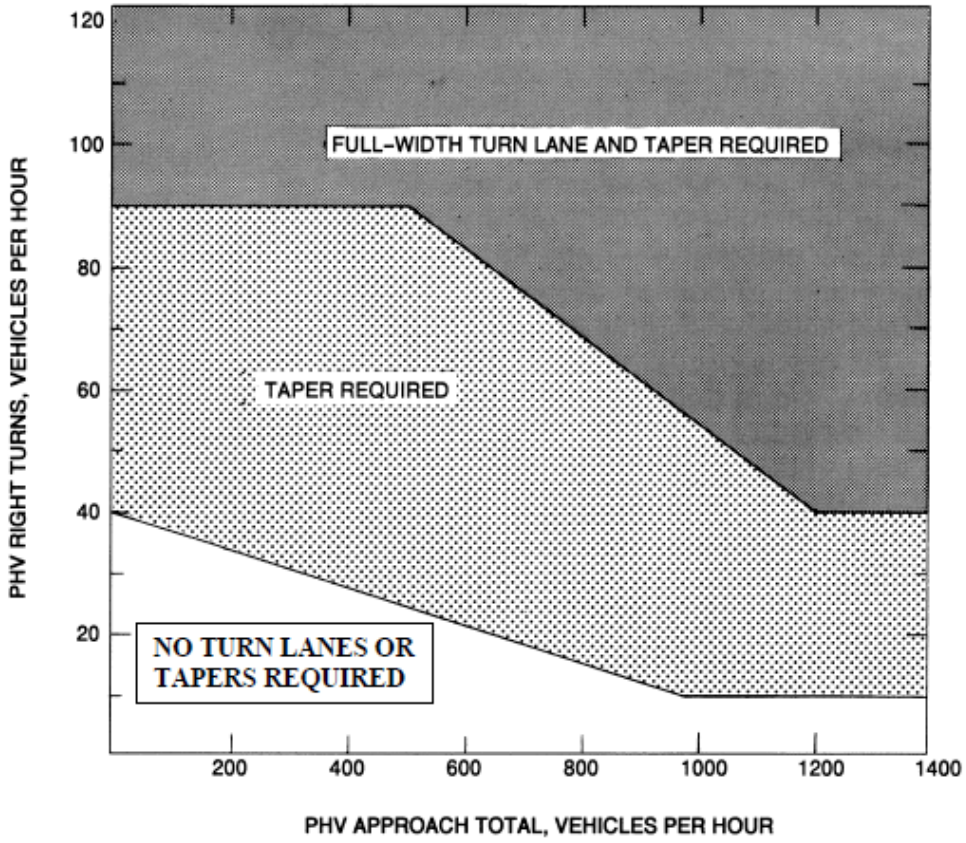


Figure 2. Warrants for Right Turn Treatment (4-Lane Highway)



F-80



Appropriate Radius required at all Intersections and Entrances (Commercial or Private).

LEGEND

PHV- - Peak Hour Volume (also Design Hourly Volume equivalent)

Adjustment for Right Turns

If PHV is not known use formula: PHV = ADT x K x D

K = the percent of AADT occurring in the peak hour
D = the percent of traffic in the peak direction of flow

Note: An average of 11% for K x D will suffice.

When right turn facilities are warranted, see Figure 3-1 for design criteria.*

FIGURE 3-27 WARRANTS FOR RIGHT TURN TREATMENT (4-LANE HIGHWAY)

* Rev. 1/15

Based on the provided guidance on Figure 2 from Appendix F of VDOT Road Design Manual on the previous page, along with a capacity analysis, a 200-foot right turn lane with 200-foot storage is recommended at the Proposed Main Entrance and a 200-foot foot storage with a 200-foot taper is recommended at the Proposed Secondary Entrance. These right turn lane recommendations were used in the 2026 and 2032 Build analyses.

Furthermore, left turn volumes were evaluated at the proposed future main entrance based on the left turn lane storage warrant from VDOT Road Design Manual presented on Figure 1. Based on the projected queues for 2026 and 2032 Build scenarios, the existing left turn lane at the intersection of US 258/Rt 10 (Benns Church Boulevard) & Future Proposed Main Entrance will need to be lengthened in order to facilitate the projected peak hour queues. A 200-foot left turn storage lane with 200-foot taper is recommended at this location and was assumed for AM and PM 2026 and 2032 Build scenarios in this analysis.

APPENDIX H

Signal Warrant Analysis

Traffic Signal Warrant Analysis

This report details the findings of a traffic signal warrant analysis on the US 258/Rt 10 (Benns Church Boulevard) & Proposed Main Entrance intersection, to determine whether a signal would be warranted for the opening day build year, 2026, of the Sweetgrass Development.

Evaluation of the need for a traffic signal at an intersection requires the examination of various factors such as traffic volumes, traffic flow and progression, and overall safety of the intersection to determine if a traffic signal would be warranted. Each of these elements is described below.

Methodology

Signal warrant analyses were performed following the procedures outlined in the 2009 edition of the Manual of Uniform Traffic Control Devices (MUTCD). Existing peak hour turning movement counts were collected at the study intersection and were used for this warrant analysis.

The traffic conditions of the intersection in the build year, 2026, were derived from a composition of existing turning movement volumes and a distribution of site trips from the Sweetgrass Development. The extent of signal warrant of the future conditions is limited by the data derived from the traffic forecast which includes only morning and evening peak hours and two additional hours, that were selected based on land uses that generate the highest traffic volumes: single-family detached housing, multifamily housing (low-rise) and fast-food restaurant.

Warrant Analysis Results

Warrant 1 – Eight Hour Vehicular Volume

Warrant 1, Eight-Hour Vehicular Volume, consists of two separate warrants; Warrant 1A-Minimum Vehicular Volume and Warrant 1B-Interruption of Continuous Traffic. The Minimum Vehicular Volume warrant is intended for use at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic signal. The Interruption of Continuous Traffic warrant is intended for use at locations where Warrant A is not satisfied and where the volume of traffic on a major street is so heavy that traffic on a minor intersecting street suffers excessive delay when attempting to cross or enter the major street. Warrant 1 is intended to be used as a single warrant; if Warrant A is met and Warrant B is not met, a traffic signal is warranted. Conversely, if Warrant A is not met and Warrant B is met, a traffic signal is still warranted.

Since this is a proposed entrance, VDOT's Traffic Signal Warrant Using Average Daily Traffic Estimate for the Virginia Supplement to the MUTCD was used. The future traffic projections at the US 258/Rt 10 (Benns Church Boulevard) & Proposed Main Entrance intersection were developed using the daily trip generation and distribution patterns shown in the TIA. The daily trip projections and associated site traffic are shown in the following table and figure respectively. For the signal warrant, the projected site trips on US 258/Rt 10 (Benns Church Boulevard) were added to the 2017 VDOT AADT of 25,000 vpd projected to Opening Day 2026 AADT of 28,585 vpd.

Land Use	ITE Code	Size	Units	Daily		
				Enter	Exit	Total
Conceptual Site Plan						
Single-Family Detached Housing	210	400	Dwelling Units	1888	1,888	3,776
Multifamily Housing (Low-Rise)	220	220	Dwelling Units	1072	1,072	2,144
Public Park	411	4	Acres	46	45	91
Shopping Center	820	30	1000 Sq. Ft. GLA	1326	1,325	2,651
Fast Food with Drive-Thru	934	5	1000 Sq. Ft. GLA	1177	1,178	2,355
Subtotal				**5,509**	**5,508**	**11,017**
Pass-by Trips (Fast Food only)	49%		% Pass-by	577	577	1,154
Pass-by Trips (Shopping Center)	34%		% Pass-by	451	450	901
Total New Trips				**4,481**	**4,481**	**8,962**

Reference: Trip Generation, 10th Edition, Institute of Transportation Engineers, Washington, DC. 2017.
Note: Used highest total between average rate and fitted curve unless R2<0.75

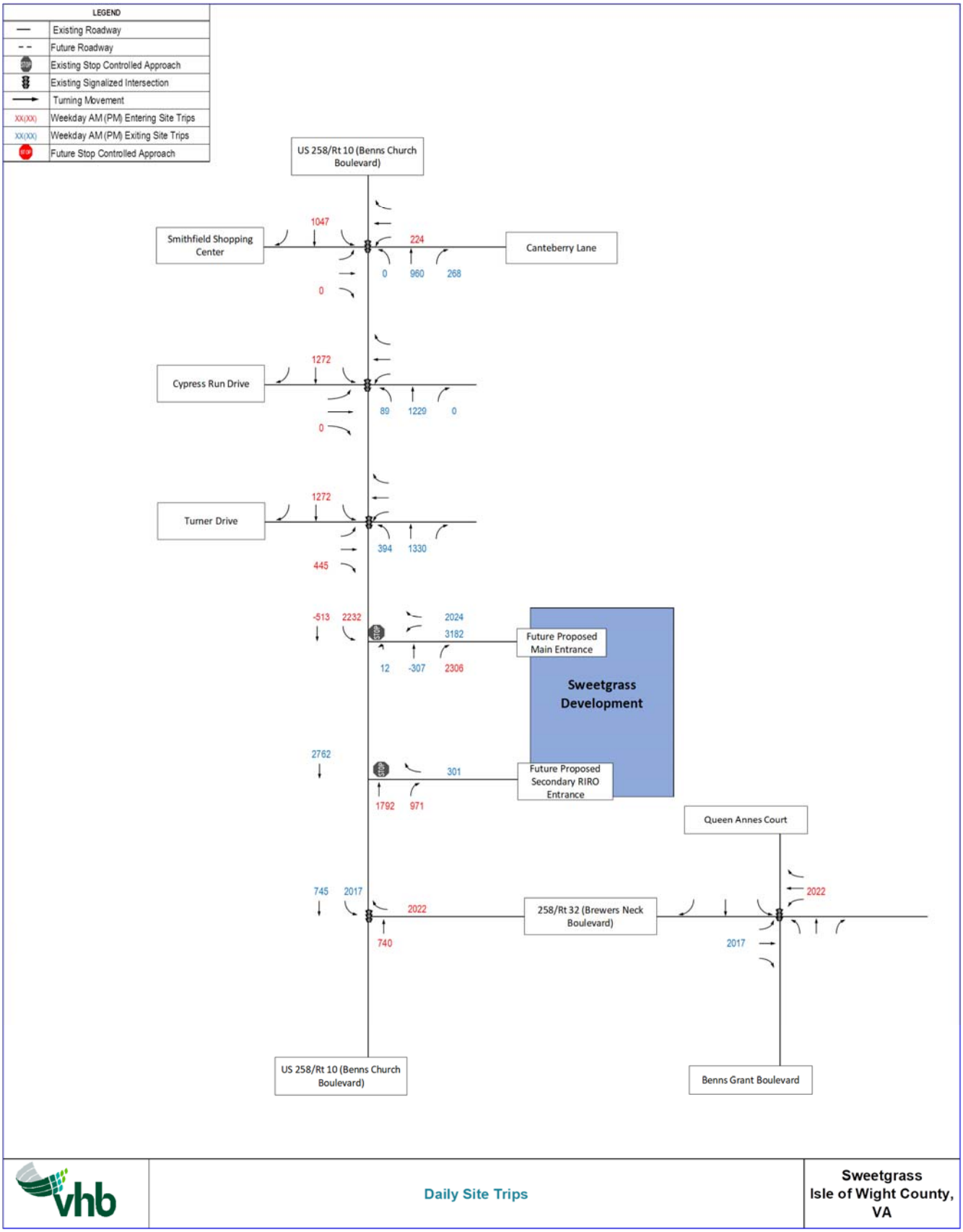

LEGEND
Existing Roadway
Future Roadway
Existing Stop Controlled Approach
Existing Signalized Intersection
Turning Movement
XX(XX) Weekday AM (PM) Entering Site Trips
XX(XX) Weekday AM (PM) Exiting Site Trips
Future Stop Controlled Approach
US 258/Rt 10 (Benns Church Boulevard)
Smithfield Shopping Center
Canteberry Lane
1047
224
0
960
268
0
Cypress Run Drive
1272
89
1229
0
0
Turner Drive
1272
394
1330
445
-513
2232
2024
3182
12
-307
2306
Future Proposed Main Entrance
Sweetgrass Development
2762
301
1792
971
Future Proposed Secondary RIRO Entrance
Queen Annes Court
745
2017
2022
2022
740
258/Rt 32 (Brewers Neck Boulevard)
2022
2017
US 258/Rt 10 (Benns Church Boulevard)
Benns Grant Boulevard
Daily Site Trips
Sweetgrass
Isle of Wight County, VA

Table 1: Future Conditions – Warrant 1 Condition A Summary

Number of Lanes		Vehicles per day on major street (total of both approaches)					Vehicles per day on minor street (total of both approaches)				
Major	Minor	100%	80%	70%	56%	Projected	100%	80%	70%	56%	Projected
2 or more	2 or more	9600	7680	6720	5376	32315	3200	2560	2240	1792	5206

Proposed signal warranted when development is: 43%

Warrant 1 is satisfied. The signal is projected to be warranted when the development is 43% built out with the 70% reduction due to the speed limit along the corridor.

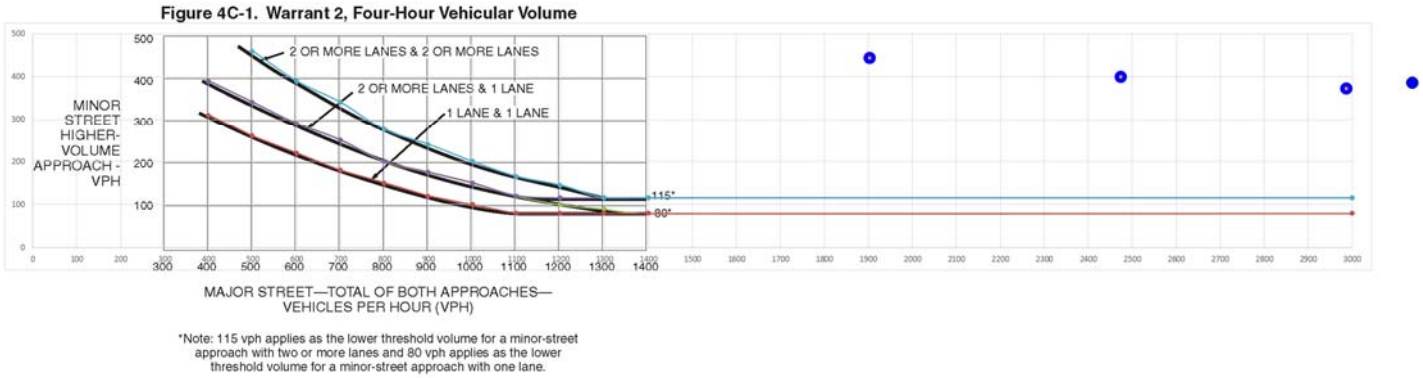
Warrant 2 – Four Hour Vehicular Volume

Warrant 2, Four-Hour Vehicular Volume, is intended for use at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic signal. A traffic signal is warranted based on Warrant 2 if "the plotted points representing the vehicles per hour on the major street and the minor street fall above the applicable curve."

Considering the two highest peak hours in terms of traffic volume at the study intersection the following figure shows that both, AM and PM peak hours, as well as additional two hours, would exceed the threshold of the Warrant. Based on the future land uses, it is expected that four hours would meet the minimum threshold volumes of the warrant.

Figure 1: 2026 Build Conditions Warrant 2

Time	Major Street (vph)	Minor Street (vph)
7:00 AM to 8:00 AM	2474	399
12:00 PM to 1:00 PM	1903	444
4:00 PM to 5:00 PM	3271	388
4:30 PM to 5:30 PM	2988	372



Warrant 2 is satisfied.

Warrant 3 – Peak Hour

Warrant 3, Peak Hour, "is intended for use at a location where traffic conditions are such that for a minimum of 1 hour of an average day, the minor-street traffic suffers undue delay when entering or crossing the major street." The Peak Hour warrant is met when "the plotted point representing the vehicles per hour on the major street and the minor street for one hour fall above the applicable curve" or based on the following conditions:

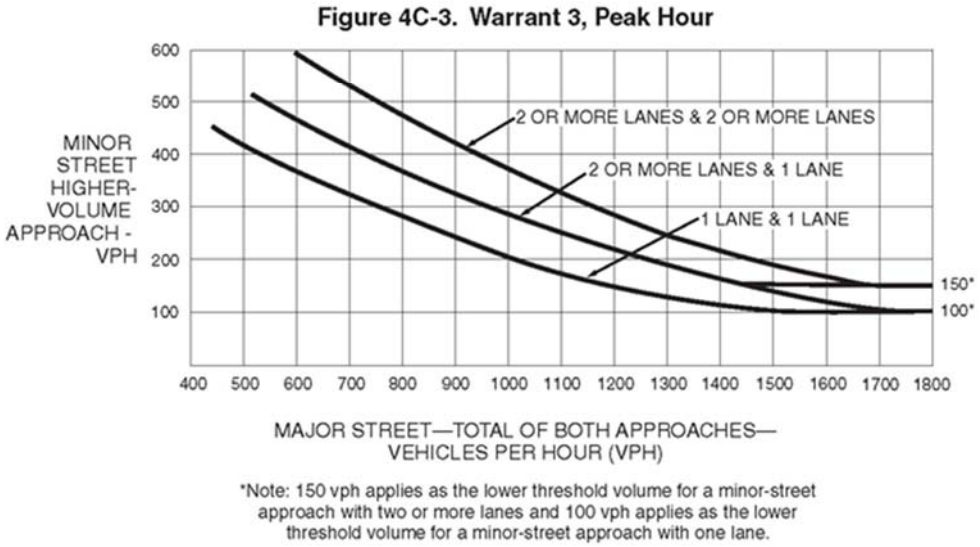
a) The total stopped time delay experienced by the traffic on one minor-street approach controlled by a stop sign equals or exceeds: 4 vehicle-hours for a one-lane approach; or 5 vehicle-hours for a two-lane approach, and

b) The volume on the same minor-street approach equals or exceeds 100 vehicles per hour for one lane or 150 vehicles per hour for two lanes, and

c) The total entering volume during the hour meets or exceeds 650 vehicles per hour for intersections with three approaches or 800 vehicles per hour for intersections with four or more approaches.

Figure 2: 2026 Build Conditions Warrant 3

Time	Major Street (vph)	Minor Street+ (vph)
7:00 AM to 8:00 AM	2474	336
4:30 PM to 8:00 AM	2988	352



As shown in Figure 2, both AM and PM peak hours fall above the curve for the geometric combination of 2 or more lanes on both the major and minor roadways.

Warrant 3 is satisfied.

Warrant 4 – Pedestrian Volume

Warrant 4, Pedestrian Volume, is intended for use at locations where the volume of traffic on the major street is so heavy that pedestrians experience significant delay or conflict when attempting to cross the major street. Warrant 4 is satisfied when "the pedestrian volume crossing the major street at an intersection during an average day is: 100 or more for each of any four hours; or 190 or more during any one hour."

Currently, there are no existing pedestrian sidewalks in the area of the study. It is not expected that the development will generate the pedestrian volumes levels required to satisfy the warrant due to the rural nature of the surrounding area.

Warrant 4 is not satisfied.

Warrant 5 – School Crossing

Warrant 5, School Crossing, is intended for use at locations “where the fact that school children cross the major street is the principal reason to consider installing a traffic control signal.” For the purposes of this warrant, the word "schoolchildren" includes elementary through high school students.

Warrant 5 is not applicable because there are no school crossings near the subject intersection.

Warrant 5 is not satisfied.

Warrant 6 – Coordinated Signal System

Warrant 6, Coordinated Signal System, is satisfied when “on a two-way street, adjacent signals do not provide the necessary degree of platooning and speed control and the proposed and adjacent signals could constitute a progressive signal system.”

A signal at Proposed Main Entrance would not help traffic platooning since the signal located at Turner Road is not coordinated.

Warrant 6 is not satisfied.

Warrant 7 – Crash Experience

Warrant 7, Crash Experience, is intended for use at locations where “the severity and frequency of crashes are the principal reasons to consider installing a traffic control signal.” A traffic signal is warranted based on Warrant 7 if the following criteria are met:

a) Adequate trial of alternatives with satisfactory observance and enforcement has failed to reduce the crash frequency; and
b) Five or more reported crashes, of types susceptible to correction by a traffic signal, have occurred within a 12-month period, each crash involving personal injury or property damage exceeding the applicable requirements for a reportable crash.

Due to the lack of crash data, we were unable to evaluate the severity and frequency of crashes at the intersection.

Warrant 7 is not satisfied.

Warrant 8 – Roadway Network

Warrant 8, Roadway Network, is intended when the proposed traffic signal will encourage concentration and traffic flow organization on a given roadway network. This Warrant is intended for location where two major routes meet or where traffic volumes exceed 1000 vehicles per hour.

Warrant 8 is not applicable because the minor street is an entrance into the development and is not a major roadway.

Warrant 8 is not satisfied.

Warrant 9 – Intersection Near a Grade Crossing

Warrant 9, Intersection Near a Grade Crossing, is intended for "use at a location where none of the conditions described in the other eight traffic signal warrants are met, but the proximity to the intersection of a grade crossing on an intersection approach controlled by a STOP or YIELD sign is the principal reason to consider installing a traffic control signal."

Warrant 9 is not applicable.

Warrant 9 is not satisfied.

Conclusions

Warrant Analysis Conclusions

This engineering study examined traffic signal warrants at the intersection of US 257/Rt 10 (Benns Church Boulevard) and the Proposed Main entrance. The analysis showed that the traffic volume warrants (Warrants 1, 2 and 3) are met at the 70% and 100% thresholds defined by the MUTCD. The warrant is based on projected traffic volumes as well as volumes generated by the development, calculated based on available traffic data from 10th edition of ITE Trip Generation Manual.

APPENDIX I

2026 Build Synchro Reports

1: US 258/Rt 10 (Benns Church Boulevard) & Canteberry Lane

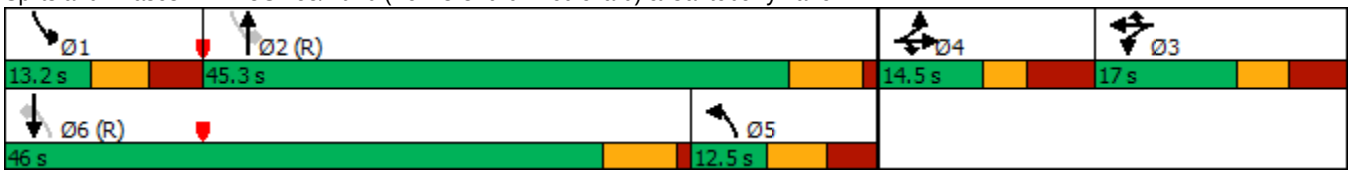
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	1	19	108	5	43	15	868	71	55	1201	36
Future Volume (vph)	26	1	19	108	5	43	15	868	71	55	1201	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	200		350	275		325
Storage Lanes	0		1	0		1	1		1	1		1
Taper Length (ft)	25			25			125			225		
Satd. Flow (prot)	0	1813	1615	0	1778	1553	1805	3539	1583	1687	3505	1615
Flt Permitted		0.954			0.954		0.120			0.223		
Satd. Flow (perm)	0	1813	1615	0	1778	1553	228	3539	1583	396	3505	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			309			309			236			236
Link Speed (mph)		25			25			45			45	
Link Distance (ft)		335			1232			773			1937	
Travel Time (s)		9.1			33.6			11.7			29.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	2%	0%	4%	0%	2%	2%	7%	3%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	29	21	0	122	47	16	943	77	60	1305	39
Turn Type	Split	NA	Prot	Split	NA	Prot	D.P+P	NA	Perm	D.P+P	NA	Perm
Protected Phases	4	4	4	3	3	3	5	2		1	6	
Permitted Phases							6		2	2		6
Detector Phase	4	4	4	3	3	3	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	5.0	15.0	15.0	5.0	15.0	15.0
Minimum Split (s)	14.5	14.5	14.5	14.5	14.5	14.5	12.5	21.0	21.0	12.5	21.0	21.0
Total Split (s)	14.5	14.5	14.5	17.0	17.0	17.0	12.5	45.3	45.3	13.2	46.0	46.0
Total Split (%)	16.1%	16.1%	16.1%	18.9%	18.9%	18.9%	13.9%	50.3%	50.3%	14.7%	51.1%	51.1%
Maximum Green (s)	7.0	7.0	7.0	9.5	9.5	9.5	5.0	39.3	39.3	5.7	40.0	40.0
Yellow Time (s)	3.0	3.0	3.0	3.5	3.5	3.5	4.0	5.0	5.0	4.0	5.0	5.0
All-Red Time (s)	4.5	4.5	4.5	4.0	4.0	4.0	3.5	1.0	1.0	3.5	1.0	1.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		7.5	7.5		7.5	7.5	7.5	6.0	6.0	7.5	6.0	6.0
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lag	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	2.0	6.0	6.0	2.0	6.0	6.0
Minimum Gap (s)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	3.5	3.5	0.2	3.5	3.5
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.0	20.0	0.0	20.0	20.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0	15.0	0.0	15.0	15.0
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)		7.0	7.0		9.1	9.1	59.5	48.3	48.3	51.2	56.2	56.2
Actuated g/C Ratio		0.08	0.08		0.10	0.10	0.66	0.54	0.54	0.57	0.62	0.62
v/c Ratio		0.21	0.05		0.69	0.11	0.07	0.50	0.08	0.20	0.60	0.04
Control Delay		42.7	0.3		59.3	0.5	6.7	11.3	0.2	10.2	14.2	0.1
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		42.7	0.3		59.3	0.5	6.7	11.3	0.2	10.2	14.2	0.1
LOS		D	A		E	A	A	B	A	B	B	A
Approach Delay		24.9			43.0			10.4			13.7	
Approach LOS		C			D			B			B	

1: US 258/Rt 10 (Benns Church Boulevard) & Canteberry Lane

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)		16	0		68	0	3	232	0	14	239	0
Queue Length 95th (ft)		43	0		#142	0	8	88	0	32	428	0
Internal Link Dist (ft)		255			1152			693			1857	
Turn Bay Length (ft)							200		350	275		325
Base Capacity (vph)		141	410		187	440	238	1900	959	308	2190	1097
Starvation Cap Reductn		0	0		0	0	0	0	0	0	0	0
Spillback Cap Reductn		0	0		0	0	0	0	0	0	0	0
Storage Cap Reductn		0	0		0	0	0	0	0	0	0	0
Reduced v/c Ratio		0.21	0.05		0.65	0.11	0.07	0.50	0.08	0.19	0.60	0.04

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 50 (56%), Referenced to phase 2:NBSB and 6:NBSB, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.69			
Intersection Signal Delay: 14.5		Intersection LOS: B	
Intersection Capacity Utilization 67.8%		ICU Level of Service C	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 1: US 258/Rt 10 (Benns Church Boulevard) & Canteberry Lane

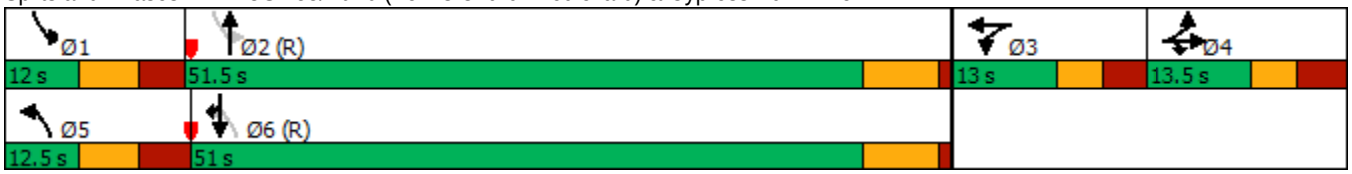


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	0	20	0	0	0	31	804	0	2	1459	32
Future Volume (vph)	5	0	20	0	0	0	31	804	0	2	1459	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	250		0	150		235
Storage Lanes	0		1	0		0	1		0	1		1
Taper Length (ft)	25			25			150			125		
Satd. Flow (prot)	0	1787	1599	0	1900	0	1805	3539	0	1805	3505	1615
Flt Permitted		0.950					0.118			0.315		
Satd. Flow (perm)	0	1787	1599	0	1900	0	224	3539	0	598	3505	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			194									200
Link Speed (mph)		15			25			45			45	
Link Distance (ft)		1905			1451			1986			773	
Travel Time (s)		86.6			39.6			30.1			11.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	0%	1%	0%	0%	0%	0%	2%	0%	0%	3%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	5	22	0	0	0	34	874	0	2	1586	35
Turn Type	Split	NA	Prot				D.P+P	NA		D.P+P	NA	Prot
Protected Phases	4	4	4	3	3		5	2		1	6	6
Permitted Phases							6			2		
Detector Phase	4	4	4	3	3		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		5.0	14.0		5.0	14.0	14.0
Minimum Split (s)	13.5	13.5	13.5	13.0	13.0		12.5	20.0		12.0	20.0	20.0
Total Split (s)	13.5	13.5	13.5	13.0	13.0		12.5	51.5		12.0	51.0	51.0
Total Split (%)	15.0%	15.0%	15.0%	14.4%	14.4%		13.9%	57.2%		13.3%	56.7%	56.7%
Maximum Green (s)	7.0	7.0	7.0	7.0	7.0		5.0	45.5		5.0	45.0	45.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.0	5.0		4.0	5.0	5.0
All-Red Time (s)	3.5	3.5	3.5	3.0	3.0		3.5	1.0		3.0	1.0	1.0
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)		6.5	6.5		6.0		7.5	6.0		7.0	6.0	6.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		2.0	5.0		2.0	5.0	5.0
Minimum Gap (s)	0.2	0.2	0.2	0.2	0.2		0.2	3.5		0.2	3.5	3.5
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	18.0		0.0	18.0	18.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	15.0		0.0	15.0	15.0
Recall Mode	None	None	None	None	None		None	C-Min		None	C-Min	C-Min
Act Effct Green (s)		7.0	7.0				72.6	79.8		76.2	73.5	73.5
Actuated g/C Ratio		0.08	0.08				0.81	0.89		0.85	0.82	0.82
v/c Ratio		0.04	0.07				0.13	0.28		0.00	0.55	0.03
Control Delay		39.2	0.5				2.8	1.9		0.5	2.0	0.0
Queue Delay		0.0	0.0				0.0	0.0		0.0	0.0	0.0
Total Delay		39.2	0.5				2.8	1.9		0.5	2.0	0.0
LOS		D	A				A	A		A	A	A
Approach Delay		7.6						1.9			1.9	
Approach LOS		A						A			A	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)		3	0				1	0		0	9	0
Queue Length 95th (ft)		14	0				m7	m47		m0	63	m0
Internal Link Dist (ft)		1825			1371			1906			693	
Turn Bay Length (ft)							250			150		235
Base Capacity (vph)		138	303				268	3138		573	2862	1355
Starvation Cap Reductn		0	0				0	0		0	0	0
Spillback Cap Reductn		0	0				0	0		0	0	0
Storage Cap Reductn		0	0				0	0		0	0	0
Reduced v/c Ratio		0.04	0.07				0.13	0.28		0.00	0.55	0.03

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 54 (60%), Referenced to phase 2:NBSB and 6:NBSB, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.55			
Intersection Signal Delay: 2.0		Intersection LOS: A	
Intersection Capacity Utilization 56.6%		ICU Level of Service B	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 2: US 258/Rt 10 (Benns Church Boulevard) & Cypress Run Drive



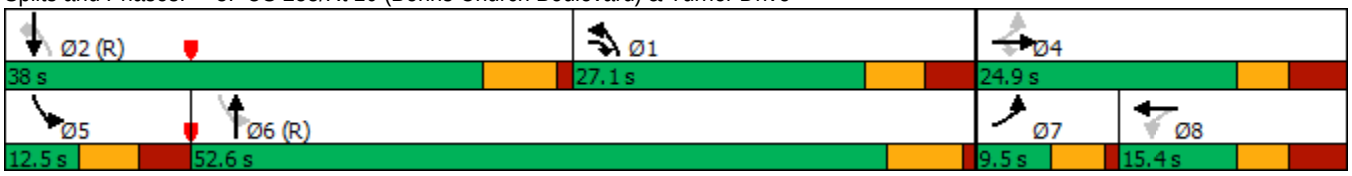
3: US 258/Rt 10 (Benns Church Boulevard) & Turner Drive

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	193	1	302	1	72	1	276	725	70	7	993	324
Future Volume (vph)	193	1	302	1	72	1	276	725	70	7	993	324
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		300	0		0	125		0	125		275
Storage Lanes	0		1	0		0	1		0	1		1
Taper Length (ft)	200			25			100			100		
Satd. Flow (prot)	0	1793	1599	0	1894	0	1687	3499	0	1805	3505	1482
Flt Permitted		0.669			0.995		0.138			0.281		
Satd. Flow (perm)	0	1259	1599	0	1887	0	245	3499	0	534	3505	1482
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			127		1			17				352
Link Speed (mph)		40			25			45			45	
Link Distance (ft)		1499			695			1153			1986	
Travel Time (s)		25.6			19.0			17.5			30.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	0%	1%	0%	0%	0%	7%	2%	0%	0%	3%	9%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	211	328	0	80	0	300	864	0	8	1079	352
Turn Type	pm+pt	NA	pm+ov	Perm	NA		D.P+P	NA		D.P+P	NA	Perm
Protected Phases	7	4	1		8		1	6		5	2	
Permitted Phases	4		4	8			2			6		2
Detector Phase	7	4	1	8	8		1	6		5	2	2
Switch Phase												
Minimum Initial (s)	5.0	7.0	5.0	7.0	7.0		5.0	15.0		5.0	15.0	15.0
Minimum Split (s)	9.5	15.0	12.5	14.5	14.5		12.5	21.0		12.5	21.0	21.0
Total Split (s)	9.5	24.9	27.1	15.4	15.4		27.1	52.6		12.5	38.0	38.0
Total Split (%)	10.6%	27.7%	30.1%	17.1%	17.1%		30.1%	58.4%		13.9%	42.2%	42.2%
Maximum Green (s)	5.0	17.4	19.6	7.9	7.9		19.6	46.6		5.0	32.0	32.0
Yellow Time (s)	3.5	3.5	4.0	3.5	3.5		4.0	5.0		4.0	5.0	5.0
All-Red Time (s)	1.0	4.0	3.5	4.0	4.0		3.5	1.0		3.5	1.0	1.0
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)		7.5	7.5		7.5		7.5	6.0		7.5	6.0	6.0
Lead/Lag	Lead		Lag	Lag	Lag		Lag	Lag		Lead	Lead	Lead
Lead-Lag Optimize?	Yes		Yes	Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	5.0	4.0	3.0	3.0		4.0	6.0		2.0	6.0	6.0
Minimum Gap (s)	3.0	3.5	0.2	0.2	0.2		0.2	3.5		0.2	3.5	3.5
Time Before Reduce (s)	0.0	20.0	0.0	0.0	0.0		0.0	20.0		0.0	20.0	20.0
Time To Reduce (s)	0.0	10.0	0.0	0.0	0.0		0.0	15.0		0.0	15.0	15.0
Recall Mode	None	None	None	None	None		None	C-Min		None	C-Min	C-Min
Act Effct Green (s)		17.4	41.6		15.3		50.1	56.6		56.1	34.9	34.9
Actuated g/C Ratio		0.19	0.46		0.17		0.56	0.63		0.62	0.39	0.39
v/c Ratio		0.87	0.41		0.25		0.74	0.39		0.02	0.79	0.45
Control Delay		69.3	10.5		32.7		26.8	3.7		3.7	21.0	4.3
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Delay		69.3	10.5		32.7		26.8	3.7		3.7	21.0	4.3
LOS		E	B		C		C	A		A	C	A
Approach Delay		33.5			32.7			9.7			16.8	
Approach LOS		C			C			A			B	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)		117	65		38		101	7		2	297	39
Queue Length 95th (ft)		#244	123		78		160	80		m2	#324	44
Internal Link Dist (ft)		1419			615			1073			1906	
Turn Bay Length (ft)			300				125			125		275
Base Capacity (vph)		243	776		325		458	2206		403	1360	790
Starvation Cap Reductn		0	0		0		0	0		0	0	0
Spillback Cap Reductn		0	0		0		0	0		0	0	0
Storage Cap Reductn		0	0		0		0	0		0	0	0
Reduced v/c Ratio		0.87	0.42		0.25		0.66	0.39		0.02	0.79	0.45

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 10 (11%), Referenced to phase 2:NBSB and 6:NBSB, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.87			
Intersection Signal Delay: 17.4		Intersection LOS: B	
Intersection Capacity Utilization 77.7%		ICU Level of Service D	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 3: US 258/Rt 10 (Benns Church Boulevard) & Turner Drive



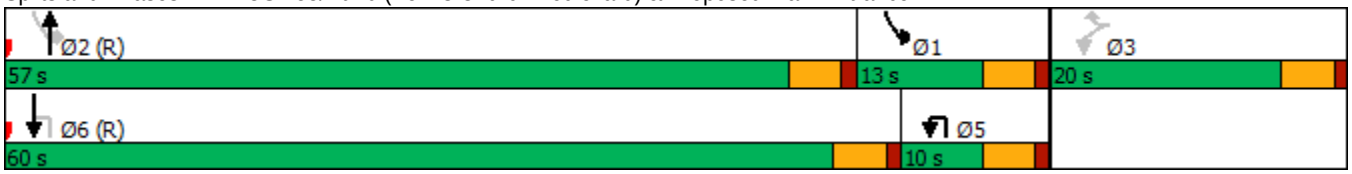


Lane Group	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Volume (vph)	267	132	16	1026	92	95	1245
Future Volume (vph)	267	132	16	1026	92	95	1245
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	125		300	300	
Storage Lanes	2	1	1		1	1	
Taper Length (ft)	25		25			200	
Satd. Flow (prot)	3502	1615	1805	3505	1615	1805	3539
Flt Permitted	0.950		0.155			0.200	
Satd. Flow (perm)	3502	1615	294	3505	1615	380	3539
Right Turn on Red		Yes			Yes		
Satd. Flow (RTOR)		143			100		
Link Speed (mph)	25			45			45
Link Distance (ft)	872			696			1153
Travel Time (s)	23.8			10.5			17.5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	3%	0%	0%	2%
Shared Lane Traffic (%)							
Lane Group Flow (vph)	290	143	17	1115	100	103	1353
Turn Type	Perm	Perm	D.P+P	NA	Perm	D.P+P	NA
Protected Phases			5	2		1	6
Permitted Phases	3	3	6		2	2	
Detector Phase	3	3	5	2	2	1	6
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	9.5	9.5	22.5	22.5	9.5	22.5
Total Split (s)	20.0	20.0	10.0	57.0	57.0	13.0	60.0
Total Split (%)	22.2%	22.2%	11.1%	63.3%	63.3%	14.4%	66.7%
Maximum Green (s)	15.5	15.5	5.5	52.5	52.5	8.5	55.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag			Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?			Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	C-Min	C-Min	None	C-Min
Walk Time (s)				7.0	7.0		7.0
Flash Dont Walk (s)				11.0	11.0		11.0
Pedestrian Calls (#/hr)				0	0		0
Act Effct Green (s)	12.7	12.7	67.6	58.5	58.5	65.8	64.3
Actuated g/C Ratio	0.14	0.14	0.75	0.65	0.65	0.73	0.71
v/c Ratio	0.59	0.41	0.05	0.49	0.09	0.26	0.54
Control Delay	40.9	9.8	4.1	10.3	2.2	2.9	3.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.9	9.8	4.1	10.3	2.2	2.9	3.3
LOS	D	A	A	B	A	A	A
Approach Delay	30.6			9.5			3.3
Approach LOS	C			A			A

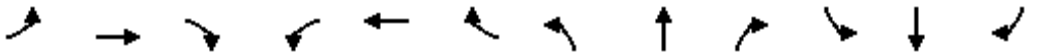
Lane Group	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Queue Length 50th (ft)	80	0	2	155	0	7	54
Queue Length 95th (ft)	115	49	7	261	21	m5	71
Internal Link Dist (ft)	792			616			1073
Turn Bay Length (ft)			125		300	300	
Base Capacity (vph)	608	398	313	2297	1092	428	2533
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.36	0.05	0.49	0.09	0.24	0.53

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 12 (13%), Referenced to phase 2:NBSB and 6:NBSB, Start of Green			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.59			
Intersection Signal Delay: 9.5		Intersection LOS: A	
Intersection Capacity Utilization 57.4%		ICU Level of Service B	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 4: US 258/Rt 10 (Benns Church Boulevard) & Proposed Main Entrance



5: US 258/Rt 10 (Benns Church Boulevard) & 258/Rt 32 (Brewers Neck Boulevard)



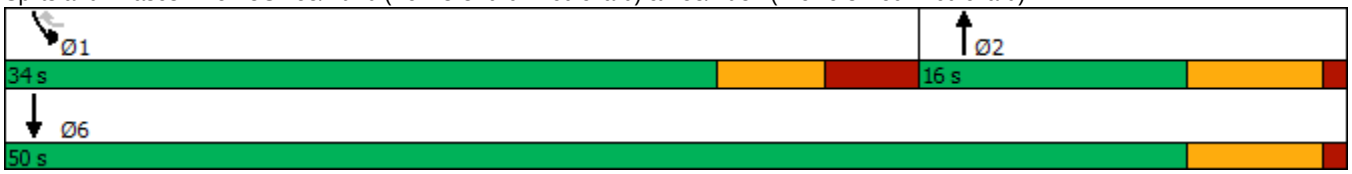
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	0	810	0	215	0	1192	313	0
Future Volume (vph)	0	0	0	0	0	810	0	215	0	1192	313	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		0	300		0
Storage Lanes	0		0	0		2	0		0	1		0
Taper Length (ft)	25			25			100			75		
Satd. Flow (prot)	0	0	0	0	0	2760	0	3471	0	3400	3471	0
Flt Permitted										0.950		
Satd. Flow (perm)	0	0	0	0	0	2760	0	3471	0	3400	3471	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						417						
Link Speed (mph)		30			45			45			45	
Link Distance (ft)		963			1126			2837			3270	
Travel Time (s)		21.9			17.1			43.0			49.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	0%	3%	0%	4%	0%	3%	4%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	880	0	234	0	1296	340	0
Turn Type						Perm		NA		Prot	NA	
Protected Phases								2		1	6	
Permitted Phases						1						
Detector Phase						1		2		1	6	
Switch Phase												
Minimum Initial (s)						15.0		10.0		15.0	15.0	
Minimum Split (s)						22.5		16.0		22.5	21.0	
Total Split (s)						34.0		16.0		34.0	50.0	
Total Split (%)						68.0%		32.0%		68.0%	100.0%	
Maximum Green (s)						26.5		10.0		26.5	44.0	
Yellow Time (s)						4.0		5.0		4.0	5.0	
All-Red Time (s)						3.5		1.0		3.5	1.0	
Lost Time Adjust (s)						0.0		0.0		0.0	0.0	
Total Lost Time (s)						7.5		6.0		7.5	6.0	
Lead/Lag						Lead		Lag		Lead		
Lead-Lag Optimize?						Yes		Yes		Yes		
Vehicle Extension (s)						3.5		2.5		3.5	5.0	
Recall Mode						Min		Max		Min	Min	
Act Effct Green (s)						25.2		10.0		25.2	48.8	
Actuated g/C Ratio						0.52		0.20		0.52	1.00	
v/c Ratio						0.54		0.33		0.74	0.10	
Control Delay						5.2		18.6		12.2	0.1	
Queue Delay						0.0		0.0		0.0	0.0	
Total Delay						5.2		18.6		12.2	0.1	
LOS						A		B		B	A	
Approach Delay					5.2			18.6			9.7	
Approach LOS					A			B			A	
Queue Length 50th (ft)						38		31		131	0	
Queue Length 95th (ft)						72		56		193	0	
Internal Link Dist (ft)		883			1046			2757			3190	

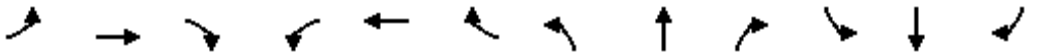
5: US 258/Rt 10 (Benns Church Boulevard) & 258/Rt 32 (Brewers Neck Boulevard)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)										300		
Base Capacity (vph)						1693		713		1852	3471	
Starvation Cap Reductn						0		0		0	0	
Spillback Cap Reductn						0		0		0	0	
Storage Cap Reductn						0		0		0	0	
Reduced v/c Ratio						0.52		0.33		0.70	0.10	

Intersection Summary			
Area Type:	Other		
Cycle Length: 50			
Actuated Cycle Length: 48.8			
Natural Cycle: 50			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.74			
Intersection Signal Delay: 9.0		Intersection LOS: A	
Intersection Capacity Utilization 52.3%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 5: US 258/Rt 10 (Benns Church Boulevard) & 258/Rt 32 (Brewers Neck Boulevard)





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	1171	0	243	783	3	0	1	433	7	3	12
Future Volume (vph)	7	1171	0	243	783	3	0	1	433	7	3	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	225		0	600		325	0		350	0		0
Storage Lanes	1		0	1		1	0		2	0		1
Taper Length (ft)	200			200			25			25		
Satd. Flow (prot)	1805	3539	0	1787	3539	1380	0	1900	2787	0	1716	1380
Flt Permitted	0.950			0.950							0.965	
Satd. Flow (perm)	1805	3539	0	1787	3539	1380	0	1900	2787	0	1716	1380
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						175			471			214
Link Speed (mph)		45			45			45			25	
Link Distance (ft)		1126			846			914			623	
Travel Time (s)		17.1			12.8			13.8			17.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	2%	0%	1%	2%	17%	0%	0%	2%	0%	25%	17%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	8	1273	0	264	851	3	0	1	471	0	11	13
Turn Type	Prot	NA		Prot	NA	Perm		NA	pm+ov	Split	NA	Perm
Protected Phases	1	6		5	2		4	4	5	3	3	
Permitted Phases						2			4			3
Detector Phase	1	6		5	2	2	4	4	5	3	3	3
Switch Phase												
Minimum Initial (s)	10.0	15.0		10.0	15.0	15.0	10.0	10.0	10.0	5.0	5.0	5.0
Minimum Split (s)	19.0	24.5		19.5	24.5	24.5	26.0	26.0	19.5	26.0	26.0	26.0
Total Split (s)	19.0	57.9		30.1	69.0	69.0	26.0	26.0	30.1	26.0	26.0	26.0
Total Split (%)	13.6%	41.4%		21.5%	49.3%	49.3%	18.6%	18.6%	21.5%	18.6%	18.6%	18.6%
Maximum Green (s)	10.0	51.4		20.6	62.5	62.5	18.0	18.0	20.6	18.0	18.0	18.0
Yellow Time (s)	5.0	5.5		5.0	5.5	5.5	4.0	4.0	5.0	3.5	3.5	3.5
All-Red Time (s)	4.0	1.0		4.5	1.0	1.0	4.0	4.0	4.5	4.5	4.5	4.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Lost Time (s)	9.0	6.5		9.5	6.5	6.5		8.0	9.5		8.0	8.0
Lead/Lag	Lag	Lead		Lag	Lead	Lead	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	5.0		3.0	5.0	5.0	3.5	3.5	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	Max	Max	None	None	None	None	None	None
Act Effct Green (s)	10.3	48.4		21.2	80.9	80.9		10.3	22.5		6.3	6.3
Actuated g/C Ratio	0.11	0.52		0.23	0.86	0.86		0.11	0.24		0.07	0.07
v/c Ratio	0.04	0.70		0.66	0.28	0.00		0.00	0.46		0.10	0.04
Control Delay	46.7	21.9		45.6	6.1	0.0		47.0	4.0		50.6	0.2
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Delay	46.7	21.9		45.6	6.1	0.0		47.0	4.0		50.6	0.2
LOS	D	C		D	A	A		D	A		D	A
Approach Delay		22.1			15.4			4.0			23.3	
Approach LOS		C			B			A			C	
Queue Length 50th (ft)	4	222		132	0	0		1	0		6	0
Queue Length 95th (ft)	22	565		#354	271	0		7	32		28	0
Internal Link Dist (ft)		1046			766			834			543	

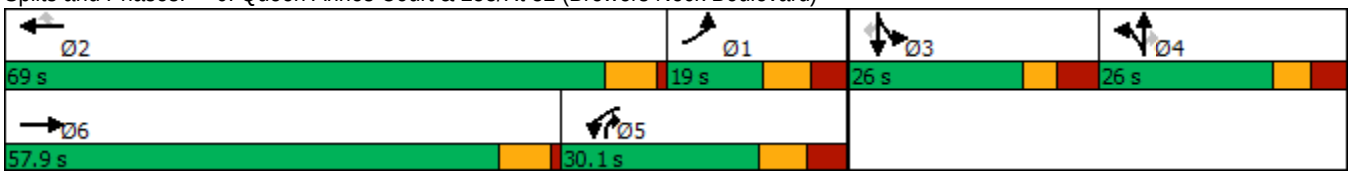
6: Queen Annes Court & 258/Rt 32 (Brewers Neck Boulevard)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	225			600		325			350			
Base Capacity (vph)	197	1993		403	3049	1213		374	1026		338	443
Starvation Cap Reductn	0	0		0	0	0		0	0		0	0
Spillback Cap Reductn	0	0		0	0	0		0	0		0	0
Storage Cap Reductn	0	0		0	0	0		0	0		0	0
Reduced v/c Ratio	0.04	0.64		0.66	0.28	0.00		0.00	0.46		0.03	0.03

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 93.9			
Natural Cycle: 140			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.70			
Intersection Signal Delay: 16.6		Intersection LOS: B	
Intersection Capacity Utilization 74.2%		ICU Level of Service D	
Analysis Period (min) 15			

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 6: Queen Annes Court & 258/Rt 32 (Brewers Neck Boulevard)



Intersection	
Int Delay, s/veh	0.2

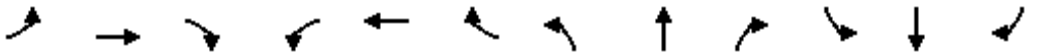
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	0	0	33	0	1101	37	0	1528	0
Future Vol, veh/h	0	0	0	0	0	33	0	1101	37	0	1528	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	0	-	-	300	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	0	0	36	0	1197	40	0	1661	0

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	-	-	599	-	0	0	-	-	0
Stage 1	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.94	-	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.32	-	-	-	-	-	-
Pot Cap-1 Maneuver	0	0	445	0	-	-	0	-	0
Stage 1	0	0	-	0	-	-	0	-	0
Stage 2	0	0	-	0	-	-	0	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	-	0	445	-	-	-	-	-	-
Mov Cap-2 Maneuver	-	0	-	-	-	-	-	-	-
Stage 1	-	0	-	-	-	-	-	-	-
Stage 2	-	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.8	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	445	-
HCM Lane V/C Ratio	-	-	0.081	-
HCM Control Delay (s)	-	-	13.8	-
HCM Lane LOS	-	-	B	-
HCM 95th %tile Q(veh)	-	-	0.3	-

1: US 258/Rt 10 (Benns Church Boulevard) & Canteberry Lane



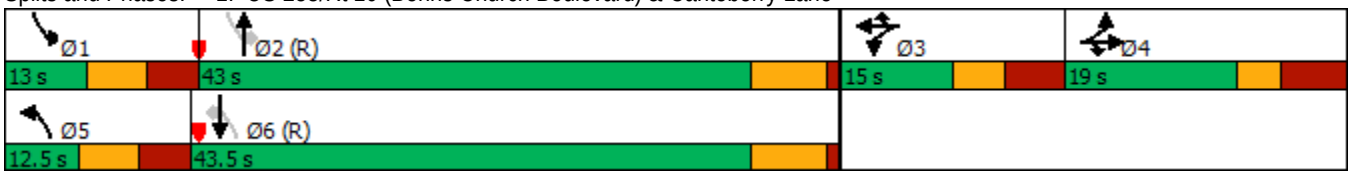
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	143	6	45	87	9	80	52	1312	134	133	1193	99
Future Volume (vph)	143	6	45	87	9	80	52	1312	134	133	1193	99
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	200		350	275		325
Storage Lanes	0		1	0		1	1		1	1		1
Taper Length (ft)	25			25			125			225		
Satd. Flow (prot)	0	1813	1615	0	1786	1553	1805	3539	1583	1687	3505	1615
Flt Permitted		0.954			0.957		0.102			0.106		
Satd. Flow (perm)	0	1813	1615	0	1786	1553	194	3539	1583	188	3505	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			218			218			236			236
Link Speed (mph)		25			25			45			45	
Link Distance (ft)		335			1232			773			1937	
Travel Time (s)		9.1			33.6			11.7			29.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	2%	0%	4%	0%	2%	2%	7%	3%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	162	49	0	105	87	57	1426	146	145	1297	108
Turn Type	Split	NA	Prot	Split	NA	Prot	D.P+P	NA	Perm	D.P+P	NA	Perm
Protected Phases	4	4	4	3	3	3	5	2		1	6	
Permitted Phases							6		2	2		6
Detector Phase	4	4	4	3	3	3	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	5.0	15.0	15.0	5.0	15.0	15.0
Minimum Split (s)	14.5	14.5	14.5	14.5	14.5	14.5	12.5	21.0	21.0	12.5	21.0	21.0
Total Split (s)	19.0	19.0	19.0	15.0	15.0	15.0	12.5	43.0	43.0	13.0	43.5	43.5
Total Split (%)	21.1%	21.1%	21.1%	16.7%	16.7%	16.7%	13.9%	47.8%	47.8%	14.4%	48.3%	48.3%
Yellow Time (s)	3.0	3.0	3.0	3.5	3.5	3.5	4.0	5.0	5.0	4.0	5.0	5.0
All-Red Time (s)	4.5	4.5	4.5	4.0	4.0	4.0	3.5	1.0	1.0	3.5	1.0	1.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		7.5	7.5		7.5	7.5	7.5	6.0	6.0	7.5	6.0	6.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)		10.9	10.9		7.4	7.4	43.2	37.7	37.7	41.7	40.7	40.7
Actuated g/C Ratio		0.12	0.12		0.08	0.08	0.48	0.42	0.42	0.46	0.45	0.45
v/c Ratio		0.74	0.13		0.72	0.27	0.31	0.96	0.18	0.81	0.82	0.13
Control Delay		58.8	0.7		68.2	2.0	15.2	37.3	1.0	50.4	28.2	0.3
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		58.8	0.7		68.2	2.0	15.2	37.3	1.0	50.4	28.2	0.3
LOS		E	A		E	A	B	D	A	D	C	A
Approach Delay		45.3			38.2			33.3			28.4	
Approach LOS		D			D			C			C	
Queue Length 50th (ft)		90	0		59	0	11	418	0	39	350	0
Queue Length 95th (ft)		#178	0		#139	0	m23	#556	m3	#140	#487	0
Internal Link Dist (ft)		255			1152			693			1857	
Turn Bay Length (ft)							200		350	275		325
Base Capacity (vph)		231	396		148	329	182	1480	799	178	1583	858

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn		0	0		0	0	0	0	0	0	0	0
Spillback Cap Reductn		0	0		0	0	0	0	0	0	0	0
Storage Cap Reductn		0	0		0	0	0	0	0	0	0	0
Reduced v/c Ratio		0.70	0.12		0.71	0.26	0.31	0.96	0.18	0.81	0.82	0.13

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 55 (61%), Referenced to phase 2:NBSB and 6:NBSB, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.96			
Intersection Signal Delay: 32.1		Intersection LOS: C	
Intersection Capacity Utilization 76.0%		ICU Level of Service D	
Analysis Period (min) 15			

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: US 258/Rt 10 (Benns Church Boulevard) & Canteberry Lane



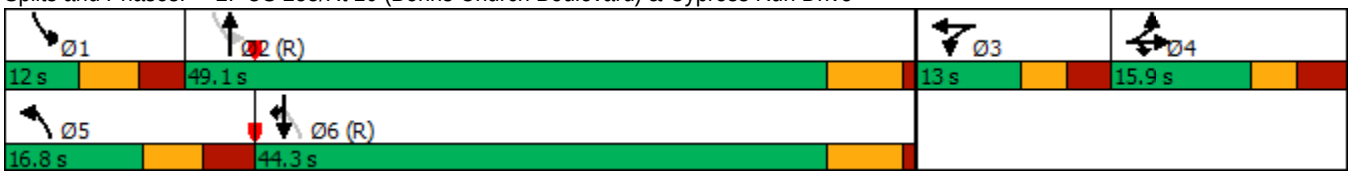
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	116	0	83	0	0	1	172	1381	0	0	1188	134
Future Volume (vph)	116	0	83	0	0	1	172	1381	0	0	1188	134
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	250		0	150		235
Storage Lanes	0		1	0		0	1		0	1		1
Taper Length (ft)	25			25			150			125		
Satd. Flow (prot)	0	1787	1599	0	1644	0	1805	3539	0	1900	3505	1615
Flt Permitted		0.950					0.114					
Satd. Flow (perm)	0	1787	1599	0	1644	0	217	3539	0	1900	3505	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			194		200							200
Link Speed (mph)		15			25			45			45	
Link Distance (ft)		1905			1451			1986			773	
Travel Time (s)		86.6			39.6			30.1			11.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	0%	1%	0%	0%	0%	0%	2%	0%	0%	3%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	126	90	0	1	0	187	1501	0	0	1291	146
Turn Type	Split	NA	Prot		NA		D.P+P	NA		D.P+P	NA	Prot
Protected Phases	4	4	4	3	3		5	2		1	6	6
Permitted Phases							6			2		
Detector Phase	4	4	4	3	3		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		5.0	14.0		5.0	14.0	14.0
Minimum Split (s)	13.5	13.5	13.5	13.0	13.0		12.5	20.0		12.0	20.0	20.0
Total Split (s)	15.9	15.9	15.9	13.0	13.0		16.8	49.1		12.0	44.3	44.3
Total Split (%)	17.7%	17.7%	17.7%	14.4%	14.4%		18.7%	54.6%		13.3%	49.2%	49.2%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.0	5.0		4.0	5.0	5.0
All-Red Time (s)	3.5	3.5	3.5	3.0	3.0		3.5	1.0		3.0	1.0	1.0
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)		6.5	6.5		6.0		7.5	6.0		7.0	6.0	6.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		None	C-Min		None	C-Min	C-Min
Act Effct Green (s)		9.0	9.0		7.0		56.9	65.9			50.0	50.0
Actuated g/C Ratio		0.10	0.10		0.08		0.63	0.73			0.56	0.56
v/c Ratio		0.71	0.27		0.00		0.66	0.58			0.66	0.15
Control Delay		61.3	2.0		0.0		24.1	7.6			5.6	0.2
Queue Delay		0.0	0.0		0.0		0.0	0.0			0.0	0.0
Total Delay		61.3	2.0		0.0		24.1	7.6			5.6	0.2
LOS		E	A		A		C	A			A	A
Approach Delay		36.6						9.4			5.1	
Approach LOS		D						A			A	
Queue Length 50th (ft)		70	0		0		25	152			33	0
Queue Length 95th (ft)		#150	0		0		#134	351			#44	m0
Internal Link Dist (ft)		1825			1371			1906			693	
Turn Bay Length (ft)							250					235
Base Capacity (vph)		186	340		312		303	2590			1947	986

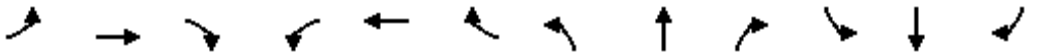
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn		0	0		0		0	0			0	0
Spillback Cap Reductn		0	0		0		0	0			0	0
Storage Cap Reductn		0	0		0		0	0			0	0
Reduced v/c Ratio		0.68	0.26		0.00		0.62	0.58			0.66	0.15

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 68 (76%), Referenced to phase 2:NBSB and 6:NBSB, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.71			
Intersection Signal Delay: 9.3		Intersection LOS: A	
Intersection Capacity Utilization 72.1%		ICU Level of Service C	
Analysis Period (min) 15			

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: US 258/Rt 10 (Benns Church Boulevard) & Cypress Run Drive



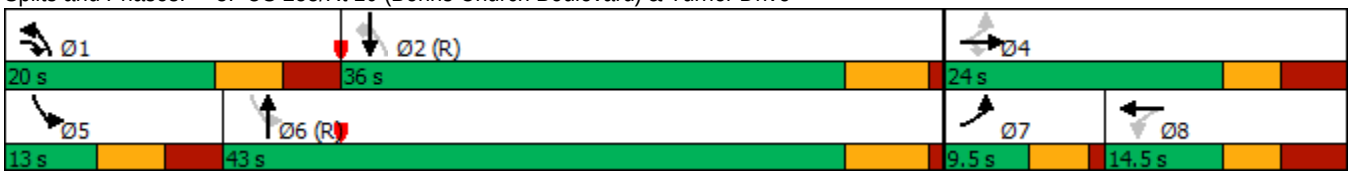


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	86	0	122	0	1	2	203	1453	1	33	1154	126
Future Volume (vph)	86	0	122	0	1	2	203	1453	1	33	1154	126
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		300	0		0	125		0	125		275
Storage Lanes	0		1	0		0	1		0	1		1
Taper Length (ft)	200			25			100			100		
Satd. Flow (prot)	0	1787	1599	0	1729	0	1687	3539	0	1805	3505	1482
Flt Permitted		0.756					0.111			0.092		
Satd. Flow (perm)	0	1422	1599	0	1729	0	197	3539	0	175	3505	1482
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			41		2							225
Link Speed (mph)		40			25			45			45	
Link Distance (ft)		1499			695			1153			1986	
Travel Time (s)		25.6			19.0			17.5			30.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	0%	1%	0%	0%	0%	7%	2%	0%	0%	3%	9%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	93	133	0	3	0	221	1580	0	36	1254	137
Turn Type	pm+pt	NA	pm+ov		NA		D.P+P	NA		D.P+P	NA	Perm
Protected Phases	7	4	1		8		1	6		5	2	
Permitted Phases	4		4	8			2			6		2
Detector Phase	7	4	1	8	8		1	6		5	2	2
Switch Phase												
Minimum Initial (s)	5.0	7.0	5.0	7.0	7.0		5.0	15.0		5.0	15.0	15.0
Minimum Split (s)	9.5	14.5	12.5	14.5	14.5		12.5	21.0		12.5	21.0	21.0
Total Split (s)	9.5	24.0	20.0	14.5	14.5		20.0	43.0		13.0	36.0	36.0
Total Split (%)	11.9%	30.0%	25.0%	18.1%	18.1%		25.0%	53.8%		16.3%	45.0%	45.0%
Yellow Time (s)	3.5	3.5	4.0	3.5	3.5		4.0	5.0		4.0	5.0	5.0
All-Red Time (s)	1.0	4.0	3.5	4.0	4.0		3.5	1.0		3.5	1.0	1.0
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)		7.5	7.5		7.5		7.5	6.0		7.5	6.0	6.0
Lead/Lag	Lead		Lead	Lag	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes			Yes	Yes							
Recall Mode	None	None	None	None	None		None	C-Min		None	C-Min	C-Min
Act Effct Green (s)		13.9	29.1		8.9		46.8	49.3		49.8	37.4	37.4
Actuated g/C Ratio		0.17	0.36		0.11		0.58	0.62		0.62	0.47	0.47
v/c Ratio		0.38	0.22		0.02		0.69	0.73		0.17	0.77	0.17
Control Delay		32.8	10.3		22.7		28.8	19.1		8.5	25.3	0.7
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Delay		32.8	10.3		22.7		28.8	19.1		8.5	25.3	0.7
LOS		C	B		C		C	B		A	C	A
Approach Delay		19.6			22.7			20.3			22.5	
Approach LOS		B			C			C			C	
Queue Length 50th (ft)		40	26		1		62	371		6	306	0
Queue Length 95th (ft)		82	57		7		#152	#555		17	#457	4
Internal Link Dist (ft)		1419			615			1073			1906	
Turn Bay Length (ft)			300				125			125		275
Base Capacity (vph)		293	639		194		351	2179		220	1637	812

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn		0	0		0		0	0		0	0	0
Spillback Cap Reductn		0	0		0		0	0		0	0	0
Storage Cap Reductn		0	0		0		0	0		0	0	0
Reduced v/c Ratio		0.32	0.21		0.02		0.63	0.73		0.16	0.77	0.17

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 0 (0%), Referenced to phase 2:NBSB and 6:NBSB, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.77			
Intersection Signal Delay: 21.1		Intersection LOS: C	
Intersection Capacity Utilization 73.3%		ICU Level of Service D	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 3: US 258/Rt 10 (Benns Church Boulevard) & Turner Drive



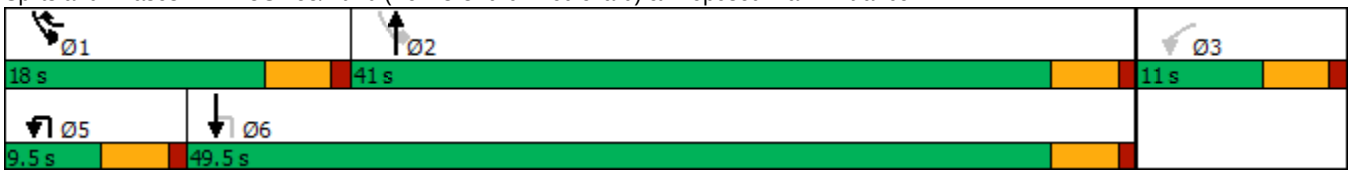
Lane Group	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Volume (vph)	227	145	13	1503	208	231	1033
Future Volume (vph)	227	145	13	1503	208	231	1033
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	125		300	300	
Storage Lanes	2	1	1		1	1	
Taper Length (ft)	25		25			200	
Satd. Flow (prot)	3502	1615	1805	3505	1615	1805	3539
Flt Permitted	0.950		0.223			0.103	
Satd. Flow (perm)	3502	1615	424	3505	1615	196	3539
Right Turn on Red		Yes			Yes		
Satd. Flow (RTOR)		158			226		
Link Speed (mph)	25			45			45
Link Distance (ft)	872			696			1153
Travel Time (s)	23.8			10.5			17.5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	3%	0%	0%	2%
Shared Lane Traffic (%)							
Lane Group Flow (vph)	247	158	14	1634	226	251	1123
Turn Type	Perm	Over	D.P+P	NA	Perm	D.P+P	NA
Protected Phases		1	5	2		1	6
Permitted Phases	3		6		2	2	
Detector Phase	3	1	5	2	2	1	6
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	9.5	9.5	22.5	22.5	9.5	22.5
Total Split (s)	11.0	18.0	9.5	41.0	41.0	18.0	49.5
Total Split (%)	15.7%	25.7%	13.6%	58.6%	58.6%	25.7%	70.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag		Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?			Yes				Yes
Recall Mode	None	None	None	Min	Min	None	Min
Act Effct Green (s)	6.5	9.9	48.6	35.0	35.0	45.0	47.7
Actuated g/C Ratio	0.10	0.15	0.75	0.54	0.54	0.69	0.73
v/c Ratio	0.70	0.42	0.03	0.87	0.23	0.66	0.43
Control Delay	42.4	8.5	2.0	20.1	2.1	20.7	4.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.4	8.5	2.0	20.1	2.1	20.7	4.4
LOS	D	A	A	C	A	C	A
Approach Delay	29.2			17.8			7.4
Approach LOS	C			B			A
Queue Length 50th (ft)	51	0	1	269	0	45	57
Queue Length 95th (ft)	#107	44	4	#476	29	113	155
Internal Link Dist (ft)	792			616			1073
Turn Bay Length (ft)			125		300	300	
Base Capacity (vph)	352	462	423	1979	1010	480	2658

Lane Group	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.70	0.34	0.03	0.83	0.22	0.52	0.42

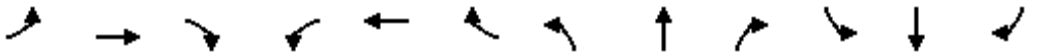
Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 65.1			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.87			
Intersection Signal Delay: 15.1		Intersection LOS: B	
Intersection Capacity Utilization 72.1%		ICU Level of Service C	
Analysis Period (min) 15			

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: US 258/Rt 10 (Benns Church Boulevard) & Proposed Main Entrance



5: US 258/Rt 10 (Benns Church Boulevard) & 258/Rt 32 (Brewers Neck Boulevard)

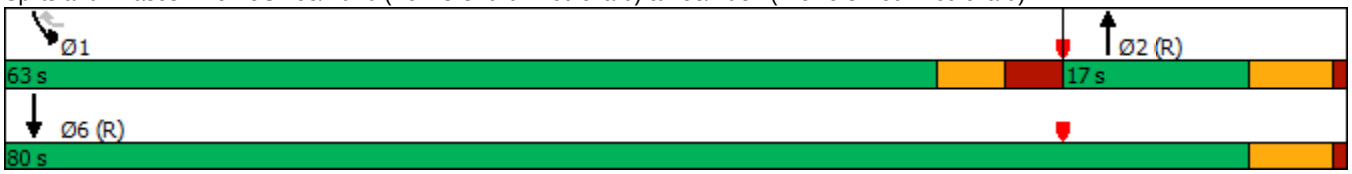


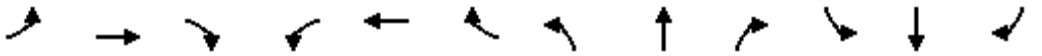
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	0	1562	0	249	0	876	360	0
Future Volume (vph)	0	0	0	0	0	1562	0	249	0	876	360	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		0	300		0
Storage Lanes	0		0	0		2	0		0	1		0
Taper Length (ft)	25			25			100			75		
Satd. Flow (prot)	0	0	0	0	0	2760	0	3471	0	3400	3471	0
Flt Permitted										0.950		
Satd. Flow (perm)	0	0	0	0	0	2760	0	3471	0	3400	3471	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						139						
Link Speed (mph)		30			45			45			45	
Link Distance (ft)		963			1126			2837			3270	
Travel Time (s)		21.9			17.1			43.0			49.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	0%	3%	0%	4%	0%	3%	4%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	1698	0	271	0	952	391	0
Turn Type						Perm		NA		Prot	NA	
Protected Phases								2		1	6	
Permitted Phases						1						
Detector Phase						1		2		1	6	
Switch Phase												
Minimum Initial (s)						15.0		10.0		15.0	15.0	
Minimum Split (s)						22.5		16.0		22.5	21.0	
Total Split (s)						63.0		17.0		63.0	80.0	
Total Split (%)						78.8%		21.3%		78.8%	100.0%	
Yellow Time (s)						4.0		5.0		4.0	5.0	
All-Red Time (s)						3.5		1.0		3.5	1.0	
Lost Time Adjust (s)						0.0		0.0		0.0	0.0	
Total Lost Time (s)						7.5		6.0		7.5	6.0	
Lead/Lag						Lead		Lag		Lead		
Lead-Lag Optimize?												
Recall Mode						Min		C-Max		Min	C-Min	
Act Effct Green (s)						55.0		11.5		55.0	80.0	
Actuated g/C Ratio						0.69		0.14		0.69	1.00	
v/c Ratio						0.87		0.55		0.41	0.11	
Control Delay						15.5		36.7		6.0	0.1	
Queue Delay						0.0		0.0		0.0	0.0	
Total Delay						15.5		36.7		6.0	0.1	
LOS						B		D		A	A	
Approach Delay					15.5			36.7			4.2	
Approach LOS					B			D			A	
Queue Length 50th (ft)						286		67		87	0	
Queue Length 95th (ft)						430		106		117	0	
Internal Link Dist (ft)		883			1046			2757			3190	
Turn Bay Length (ft)										300		
Base Capacity (vph)						1957		497		2358	3471	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn						0		0		0	0	
Spillback Cap Reductn						0		0		0	0	
Storage Cap Reductn						0		0		0	0	
Reduced v/c Ratio						0.87		0.55		0.40	0.11	

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.87			
Intersection Signal Delay: 12.7		Intersection LOS: B	
Intersection Capacity Utilization 74.2%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 5: US 258/Rt 10 (Benns Church Boulevard) & 258/Rt 32 (Brewers Neck Boulevard)





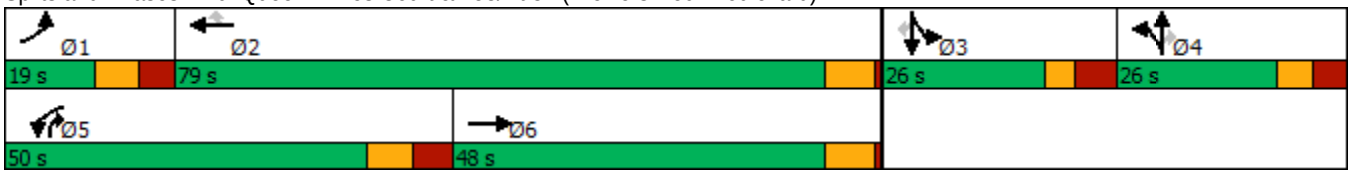
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	919	3	471	1530	14	1	3	250	2	5	7
Future Volume (vph)	9	919	3	471	1530	14	1	3	250	2	5	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	225		0	600		325	0		350	0		0
Storage Lanes	1		0	1		1	0		2	0		1
Taper Length (ft)	200			200			25			25		
Satd. Flow (prot)	1805	3539	0	1787	3539	1380	0	1877	2787	0	1590	1380
Flt Permitted	0.950			0.950				0.988			0.986	
Satd. Flow (perm)	1805	3539	0	1787	3539	1380	0	1877	2787	0	1590	1380
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						160			272			218
Link Speed (mph)		45			45			45			25	
Link Distance (ft)		1126			846			914			623	
Travel Time (s)		17.1			12.8			13.8			17.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	2%	0%	1%	2%	17%	0%	0%	2%	0%	25%	17%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	10	1002	0	512	1663	15	0	4	272	0	7	8
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA	pm+ov	Split	NA	Perm
Protected Phases	1	6		5	2		4	4	5	3	3	
Permitted Phases						2			4			3
Detector Phase	1	6		5	2	2	4	4	5	3	3	3
Switch Phase												
Minimum Initial (s)	10.0	15.0		10.0	15.0	15.0	10.0	10.0	10.0	5.0	5.0	5.0
Minimum Split (s)	19.0	24.5		19.5	24.5	24.5	26.0	26.0	19.5	26.0	26.0	26.0
Total Split (s)	19.0	48.0		50.0	79.0	79.0	26.0	26.0	50.0	26.0	26.0	26.0
Total Split (%)	12.7%	32.0%		33.3%	52.7%	52.7%	17.3%	17.3%	33.3%	17.3%	17.3%	17.3%
Yellow Time (s)	5.0	5.5		5.0	5.5	5.5	4.0	4.0	5.0	3.5	3.5	3.5
All-Red Time (s)	4.0	1.0		4.5	1.0	1.0	4.0	4.0	4.5	4.5	4.5	4.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Lost Time (s)	9.0	6.5		9.5	6.5	6.5		8.0	9.5		8.0	8.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead
Lead-Lag Optimize?												
Recall Mode	None	None		None	None	None	None	None	None	None	None	None
Act Effct Green (s)	10.1	42.1		41.1	94.0	94.0		10.1	44.0		6.1	6.1
Actuated g/C Ratio	0.09	0.39		0.38	0.87	0.87		0.09	0.41		0.06	0.06
v/c Ratio	0.06	0.72		0.75	0.54	0.01		0.02	0.21		0.08	0.03
Control Delay	51.7	33.4		39.3	8.4	0.0		51.5	3.0		55.8	0.1
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Delay	51.7	33.4		39.3	8.4	0.0		51.5	3.0		55.8	0.1
LOS	D	C		D	A	A		D	A		E	A
Approach Delay		33.6			15.5			3.7			26.1	
Approach LOS		C			B			A			C	
Queue Length 50th (ft)	6	258		257	0	0		2	0		4	0
Queue Length 95th (ft)	27	#548		#638	718	0		15	27		23	0
Internal Link Dist (ft)		1046			766			834			543	
Turn Bay Length (ft)	225			600		325			350			
Base Capacity (vph)	170	1383		681	3090	1225		318	1300		269	415

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	0		0	0	0		0	0		0	0
Spillback Cap Reductn	0	0		0	0	0		0	0		0	0
Storage Cap Reductn	0	0		0	0	0		0	0		0	0
Reduced v/c Ratio	0.06	0.72		0.75	0.54	0.01		0.01	0.21		0.03	0.02

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 107.6			
Natural Cycle: 150			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.75			
Intersection Signal Delay: 19.9		Intersection LOS: B	
Intersection Capacity Utilization 79.9%		ICU Level of Service D	
Analysis Period (min) 15			

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 6: Queen Annes Court & 258/Rt 32 (Brewers Neck Boulevard)



Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	0	0	38	0	1681	116	0	1272	0
Future Vol, veh/h	0	0	0	0	0	38	0	1681	116	0	1272	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	0	-	-	300	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	0	0	41	0	1838	126	0	1383	0

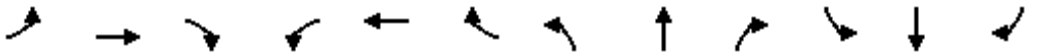
Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	-	-	919	-	0	0	-	-	0
Stage 1	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.94	-	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.32	-	-	-	-	-	-
Pot Cap-1 Maneuver	0	0	273	0	-	-	0	-	0
Stage 1	0	0	-	0	-	-	0	-	0
Stage 2	0	0	-	0	-	-	0	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	-	0	273	-	-	-	-	-	-
Mov Cap-2 Maneuver	-	0	-	-	-	-	-	-	-
Stage 1	-	0	-	-	-	-	-	-	-
Stage 2	-	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	20.5	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	273	-
HCM Lane V/C Ratio	-	-	0.151	-
HCM Control Delay (s)	-	-	20.5	-
HCM Lane LOS	-	-	C	-
HCM 95th %tile Q(veh)	-	-	0.5	-

APPENDIX J

2032 Build Synchro Reports

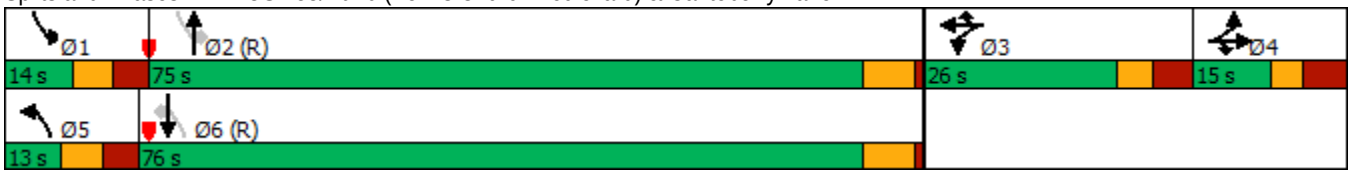


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	1	21	117	5	47	16	943	76	60	1309	39
Future Volume (vph)	28	1	21	117	5	47	16	943	76	60	1309	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	200		350	275		325
Storage Lanes	0		1	0		1	1		1	1		1
Taper Length (ft)	0			0			0			0		
Satd. Flow (prot)	0	1813	1615	0	1778	1553	1805	3539	1583	1687	3505	1615
Flt Permitted		0.954			0.954		0.115			0.217		
Satd. Flow (perm)	0	1813	1615	0	1778	1553	218	3539	1583	385	3505	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			151			151			164			164
Link Speed (mph)		25			25			45			45	
Link Distance (ft)		335			1232			773			1937	
Travel Time (s)		9.1			33.6			11.7			29.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	2%	0%	4%	0%	2%	2%	7%	3%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	31	23	0	132	51	17	1025	83	65	1423	42
Turn Type	Split	NA	Prot	Split	NA	Prot	D.P+P	NA	Perm	D.P+P	NA	Perm
Protected Phases	4	4	4	3	3	3	5	2		1	6	
Permitted Phases							6		2	2		6
Detector Phase	4	4	4	3	3	3	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	5.0	15.0	15.0	5.0	15.0	15.0
Minimum Split (s)	14.5	14.5	14.5	14.5	14.5	14.5	12.5	21.0	21.0	12.5	21.0	21.0
Total Split (s)	15.0	15.0	15.0	26.0	26.0	26.0	13.0	75.0	75.0	14.0	76.0	76.0
Total Split (%)	11.5%	11.5%	11.5%	20.0%	20.0%	20.0%	10.0%	57.7%	57.7%	10.8%	58.5%	58.5%
Yellow Time (s)	3.0	3.0	3.0	3.5	3.5	3.5	4.0	5.0	5.0	4.0	5.0	5.0
All-Red Time (s)	4.5	4.5	4.5	4.0	4.0	4.0	3.5	1.0	1.0	3.5	1.0	1.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		7.5	7.5		7.5	7.5	7.5	6.0	6.0	7.5	6.0	6.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)		7.3	7.3		14.5	14.5	85.6	79.1	79.1	82.6	85.0	85.0
Actuated g/C Ratio		0.06	0.06		0.11	0.11	0.66	0.61	0.61	0.64	0.65	0.65
v/c Ratio		0.31	0.10		0.67	0.17	0.08	0.48	0.08	0.21	0.62	0.04
Control Delay		67.0	0.9		71.3	1.2	10.4	15.9	1.0	10.5	17.3	0.1
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		67.0	0.9		71.3	1.2	10.4	15.9	1.0	10.5	17.3	0.1
LOS		E	A		E	A	B	B	A	B	B	A
Approach Delay		38.8			51.7			14.7			16.6	
Approach LOS		D			D			B			B	
Queue Length 50th (ft)		26	0		108	0	5	257	2	18	327	0
Queue Length 95th (ft)		60	0		173	0	14	340	11	39	565	0
Internal Link Dist (ft)		255			1152			693			1857	
Turn Bay Length (ft)							200		350	275		325
Base Capacity (vph)		104	235		253	350	210	2154	1027	310	2290	1112

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn		0	0		0	0	0	0	0	0	0	0
Spillback Cap Reductn		0	0		0	0	0	0	0	0	0	0
Storage Cap Reductn		0	0		0	0	0	0	0	0	0	0
Reduced v/c Ratio		0.30	0.10		0.52	0.15	0.08	0.48	0.08	0.21	0.62	0.04

Intersection Summary			
Area Type:	Other		
Cycle Length: 130			
Actuated Cycle Length: 130			
Offset: 112 (86%), Referenced to phase 2:NBSB and 6:NBSB, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.67			
Intersection Signal Delay: 18.5		Intersection LOS: B	
Intersection Capacity Utilization 71.3%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 1: US 258/Rt 10 (Benns Church Boulevard) & Canteberry Lane



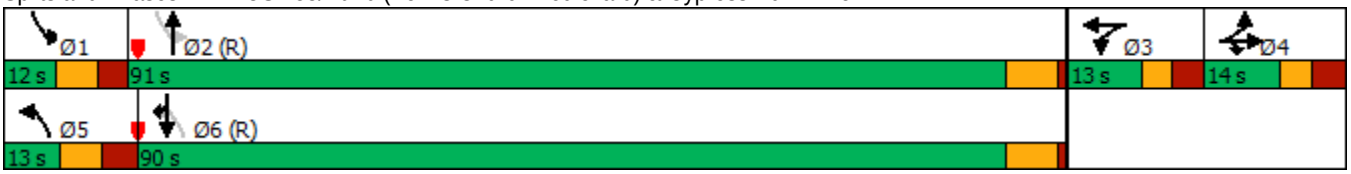
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	0	22	0	0	0	33	871	0	2	1591	34
Future Volume (vph)	5	0	22	0	0	0	33	871	0	2	1591	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	250		0	150		235
Storage Lanes	0		1	0		0	1		0	1		1
Taper Length (ft)	0			0			0			0		
Satd. Flow (prot)	0	1787	1599	0	1900	0	1805	3539	0	1805	3505	1615
Flt Permitted		0.950					0.108			0.292		
Satd. Flow (perm)	0	1787	1599	0	1900	0	205	3539	0	555	3505	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			134									138
Link Speed (mph)		15			25			45			45	
Link Distance (ft)		1905			1451			1986			773	
Travel Time (s)		86.6			39.6			30.1			11.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	0%	1%	0%	0%	0%	0%	2%	0%	0%	3%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	5	24	0	0	0	36	947	0	2	1729	37
Turn Type	Split	NA	Prot				D.P+P	NA		D.P+P	NA	Prot
Protected Phases	4	4	4	3	3		5	2		1	6	6
Permitted Phases							6			2		
Detector Phase	4	4	4	3	3		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		5.0	14.0		5.0	14.0	14.0
Minimum Split (s)	13.5	13.5	13.5	13.0	13.0		12.5	20.0		12.0	20.0	20.0
Total Split (s)	14.0	14.0	14.0	13.0	13.0		13.0	91.0		12.0	90.0	90.0
Total Split (%)	10.8%	10.8%	10.8%	10.0%	10.0%		10.0%	70.0%		9.2%	69.2%	69.2%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.0	5.0		4.0	5.0	5.0
All-Red Time (s)	3.5	3.5	3.5	3.0	3.0		3.5	1.0		3.0	1.0	1.0
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)		6.5	6.5		6.0		7.5	6.0		7.0	6.0	6.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None	None	None	None		None	C-Min		None	C-Min	C-Min
Act Effct Green (s)		7.0	7.0				109.9	115.9		113.5	110.7	110.7
Actuated g/C Ratio		0.05	0.05				0.85	0.89		0.87	0.85	0.85
v/c Ratio		0.05	0.11				0.15	0.30		0.00	0.58	0.03
Control Delay		59.6	1.1				2.2	1.2		1.0	3.0	0.0
Queue Delay		0.0	0.0				0.0	0.0		0.0	0.0	0.0
Total Delay		59.6	1.1				2.2	1.2		1.0	3.0	0.0
LOS		E	A				A	A		A	A	A
Approach Delay		11.2						1.2			2.9	
Approach LOS		B						A			A	
Queue Length 50th (ft)		4	0				0	4		0	84	0
Queue Length 95th (ft)		18	0				m6	102		m0	92	m0
Internal Link Dist (ft)		1825			1371			1906			693	
Turn Bay Length (ft)							250			150		235
Base Capacity (vph)		103	218				241	3155		532	2984	1395

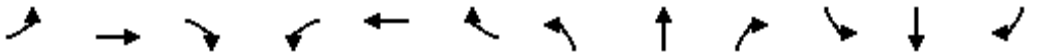
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn		0	0				0	0		0	42	0
Spillback Cap Reductn		0	0				0	0		0	0	0
Storage Cap Reductn		0	0				0	0		0	0	0
Reduced v/c Ratio		0.05	0.11				0.15	0.30		0.00	0.59	0.03

Intersection Summary			
Area Type:	Other		
Cycle Length: 130			
Actuated Cycle Length: 130			
Offset: 116 (89%), Referenced to phase 2:NBSB and 6:NBSB, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.58			
Intersection Signal Delay: 2.4		Intersection LOS: A	
Intersection Capacity Utilization 60.2%		ICU Level of Service B	
Analysis Period (min) 15			

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: US 258/Rt 10 (Benns Church Boulevard) & Cypress Run Drive





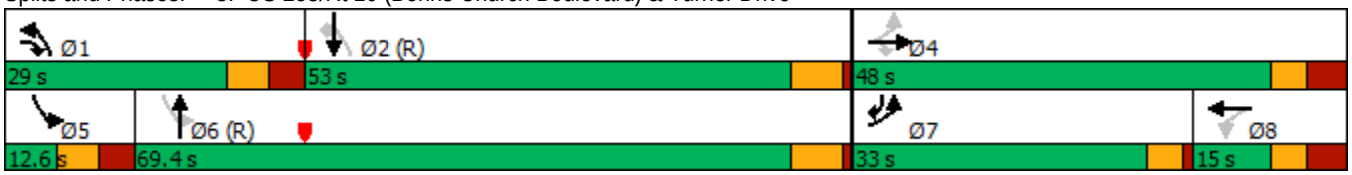
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	211	1	329	1	79	1	299	784	76	7	1081	355
Future Volume (vph)	211	1	329	1	79	1	299	784	76	7	1081	355
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		300	0		0	125		0	125		275
Storage Lanes	0		1	0		0	1		0	1		1
Taper Length (ft)	0			0			0			0		
Satd. Flow (prot)	0	1793	1599	0	1894	0	1687	3499	0	1805	3505	1482
Flt Permitted		0.597			0.997		0.081			0.232		
Satd. Flow (perm)	0	1123	1599	0	1891	0	144	3499	0	441	3505	1482
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			25					11				164
Link Speed (mph)		40			25			45			45	
Link Distance (ft)		1499			695			1153			1986	
Travel Time (s)		25.6			19.0			17.5			30.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	0%	1%	0%	0%	0%	7%	2%	0%	0%	3%	9%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	230	358	0	88	0	325	935	0	8	1175	386
Turn Type	pm+pt	NA	pm+ov	Perm	NA		D.P+P	NA		D.P+P	NA	pm+ov
Protected Phases	7	4	1		8		1	6		5	2	7
Permitted Phases	4		4	8			2			6		2
Detector Phase	7	4	1	8	8		1	6		5	2	7
Switch Phase												
Minimum Initial (s)	5.0	7.0	5.0	7.0	7.0		5.0	15.0		5.0	15.0	5.0
Minimum Split (s)	9.5	14.5	12.5	14.5	14.5		12.5	21.0		12.5	21.0	9.5
Total Split (s)	33.0	48.0	29.0	15.0	15.0		29.0	69.4		12.6	53.0	33.0
Total Split (%)	25.4%	36.9%	22.3%	11.5%	11.5%		22.3%	53.4%		9.7%	40.8%	25.4%
Yellow Time (s)	3.5	3.5	4.0	3.5	3.5		4.0	5.0		4.0	5.0	3.5
All-Red Time (s)	1.0	4.0	3.5	4.0	4.0		3.5	1.0		3.5	1.0	1.0
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)		7.5	7.5		7.5		7.5	6.0		7.5	6.0	4.5
Lead/Lag	Lead		Lead	Lag	Lag		Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?	Yes		Yes	Yes	Yes		Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None	None	None	None		None	C-Min		None	C-Min	None
Act Effct Green (s)		38.4	67.4		27.5		69.1	75.6		75.1	49.1	61.5
Actuated g/C Ratio		0.30	0.52		0.21		0.53	0.58		0.58	0.38	0.47
v/c Ratio		0.66	0.43		0.22		0.98	0.46		0.03	0.89	0.49
Control Delay		48.6	19.3		43.1		74.5	14.3		15.9	41.8	10.2
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Delay		48.6	19.3		43.1		74.5	14.3		15.9	41.8	10.2
LOS		D	B		D		E	B		B	D	B
Approach Delay		30.7			43.1			29.8			33.9	
Approach LOS		C			D			C			C	
Queue Length 50th (ft)		153	161		61		207	125		1	503	169
Queue Length 95th (ft)		230	237		109		#414	414		m6	#623	105
Internal Link Dist (ft)		1419			615			1073			1906	
Turn Bay Length (ft)			300				125			125		275
Base Capacity (vph)		367	841		400		331	2038		308	1323	1011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn		0	0		0		0	0		0	0	0
Spillback Cap Reductn		0	0		0		0	0		0	0	0
Storage Cap Reductn		0	0		0		0	0		0	0	0
Reduced v/c Ratio		0.63	0.43		0.22		0.98	0.46		0.03	0.89	0.38

Intersection Summary			
Area Type:	Other		
Cycle Length: 130			
Actuated Cycle Length: 130			
Offset: 6 (5%), Referenced to phase 2:NBSB and 6:NBSB, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.98			
Intersection Signal Delay: 32.1		Intersection LOS: C	
Intersection Capacity Utilization 82.4%		ICU Level of Service E	
Analysis Period (min) 15			

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: US 258/Rt 10 (Benns Church Boulevard) & Turner Drive



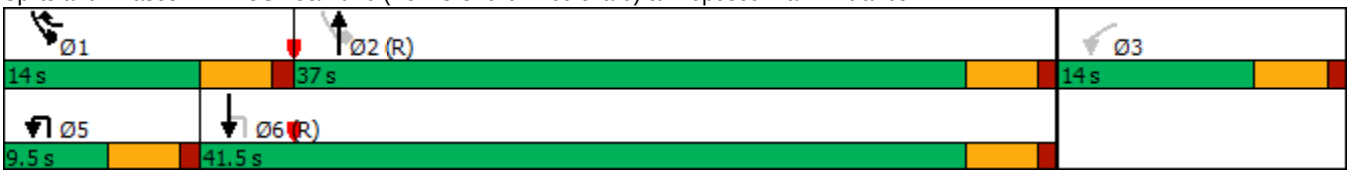
Lane Group	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Volume (vph)	267	132	16	1122	92	95	1364
Future Volume (vph)	267	132	16	1122	92	95	1364
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	125		300	300	
Storage Lanes	2	1	1		1	1	
Taper Length (ft)	0		0			0	
Satd. Flow (prot)	3502	1615	1805	3505	1615	1805	3539
Flt Permitted	0.950		0.118			0.158	
Satd. Flow (perm)	3502	1615	224	3505	1615	300	3539
Right Turn on Red		Yes			Yes		
Satd. Flow (RTOR)		143			100		
Link Speed (mph)	25			45			45
Link Distance (ft)	872			696			1153
Travel Time (s)	23.8			10.5			17.5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	3%	0%	0%	2%
Shared Lane Traffic (%)							
Lane Group Flow (vph)	290	143	17	1220	100	103	1483
Turn Type	Perm	Over	D.P+P	NA	Perm	D.P+P	NA
Protected Phases		1	5	2		1	6
Permitted Phases	3		6		2	2	
Detector Phase	3	1	5	2	2	1	6
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	9.5	9.5	22.5	22.5	9.5	22.5
Total Split (s)	14.0	14.0	9.5	37.0	37.0	14.0	41.5
Total Split (%)	21.5%	21.5%	14.6%	56.9%	56.9%	21.5%	63.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag		Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?		Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	9.3	7.0	45.8	37.1	37.1	43.1	44.8
Actuated g/C Ratio	0.14	0.11	0.70	0.57	0.57	0.66	0.69
v/c Ratio	0.58	0.47	0.06	0.61	0.10	0.29	0.61
Control Delay	30.9	11.1	3.9	14.5	3.1	6.2	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.9	11.1	3.9	14.5	3.1	6.2	6.6
LOS	C	B	A	B	A	A	A
Approach Delay	24.4			13.5			6.6
Approach LOS	C			B			A
Queue Length 50th (ft)	54	0	2	269	3	19	186
Queue Length 95th (ft)	91	43	m4	347	17	m23	265
Internal Link Dist (ft)	792			616			1073
Turn Bay Length (ft)			125		300	300	
Base Capacity (vph)	523	358	287	2002	965	426	2436

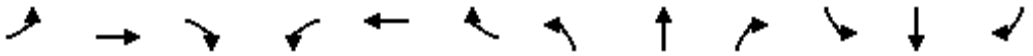
Lane Group	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.55	0.40	0.06	0.61	0.10	0.24	0.61

Intersection Summary			
Area Type:	Other		
Cycle Length: 65			
Actuated Cycle Length: 65			
Offset: 26 (40%), Referenced to phase 2:NBSB and 6:NBSB, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.61			
Intersection Signal Delay: 11.6		Intersection LOS: B	
Intersection Capacity Utilization 60.7%		ICU Level of Service B	
Analysis Period (min) 15			

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: US 258/Rt 10 (Benns Church Boulevard) & Proposed Main Entrance



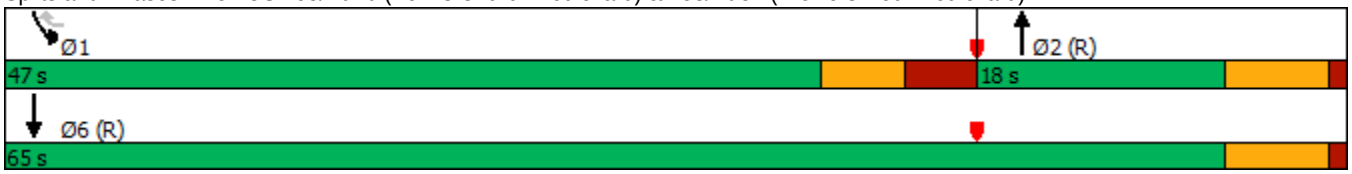


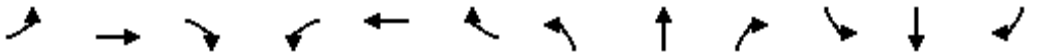
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	0	879	0	233	0	1287	336	0
Future Volume (vph)	0	0	0	0	0	879	0	233	0	1287	336	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		0	300		0
Storage Lanes	0		0	0		2	0		0	1		0
Taper Length (ft)	0			0			0			0		
Satd. Flow (prot)	0	0	0	0	0	2760	0	3471	0	3400	3471	0
Flt Permitted										0.950		
Satd. Flow (perm)	0	0	0	0	0	2760	0	3471	0	3400	3471	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						318						
Link Speed (mph)		30			45			45			45	
Link Distance (ft)		963			1126			2837			3270	
Travel Time (s)		21.9			17.1			43.0			49.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	0%	3%	0%	4%	0%	3%	4%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	955	0	253	0	1399	365	0
Turn Type						Perm		NA		Prot	NA	
Protected Phases								2		1	6	
Permitted Phases						1						
Detector Phase						1		2		1	6	
Switch Phase												
Minimum Initial (s)						15.0		10.0		15.0	15.0	
Minimum Split (s)						22.5		16.0		22.5	21.0	
Total Split (s)						47.0		18.0		47.0	65.0	
Total Split (%)						72.3%		27.7%		72.3%	100.0%	
Yellow Time (s)						4.0		5.0		4.0	5.0	
All-Red Time (s)						3.5		1.0		3.5	1.0	
Lost Time Adjust (s)						0.0		0.0		0.0	0.0	
Total Lost Time (s)						7.5		6.0		7.5	6.0	
Lead/Lag						Lead		Lag		Lead		
Lead-Lag Optimize?						Yes		Yes		Yes		
Recall Mode						Min		C-Max		Min	C-Min	
Act Effct Green (s)						37.4		14.1		37.4	65.0	
Actuated g/C Ratio						0.58		0.22		0.58	1.00	
v/c Ratio						0.55		0.34		0.72	0.11	
Control Delay						8.1		24.0		10.3	0.1	
Queue Delay						0.0		0.0		0.0	0.0	
Total Delay						8.1		24.0		10.3	0.1	
LOS						A		C		B	A	
Approach Delay					8.1			24.0			8.2	
Approach LOS					A			C			A	
Queue Length 50th (ft)						148		46		228	0	
Queue Length 95th (ft)						97		78		59	0	
Internal Link Dist (ft)		883			1046			2757			3190	
Turn Bay Length (ft)										300		
Base Capacity (vph)						1801		752		2066	3471	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn						0		0		0	0	
Spillback Cap Reductn						0		0		0	0	
Storage Cap Reductn						0		0		0	0	
Reduced v/c Ratio						0.53		0.34		0.68	0.11	

Intersection Summary			
Area Type:	Other		
Cycle Length: 65			
Actuated Cycle Length: 65			
Offset: 64 (98%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 50			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.72			
Intersection Signal Delay: 9.5		Intersection LOS: A	
Intersection Capacity Utilization 55.0%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 5: US 258/Rt 10 (Benns Church Boulevard) & 258/Rt 32 (Brewers Neck Boulevard)





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	1263	0	266	850	4	0	1	473	7	4	14
Future Volume (vph)	7	1263	0	266	850	4	0	1	473	7	4	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	225		0	600		325	0		350	0		0
Storage Lanes	1		0	1		1	0		2	0		1
Taper Length (ft)	0			0			0			0		
Satd. Flow (prot)	1805	3539	0	1787	3539	1380	0	1900	2787	0	1698	1380
Flt Permitted	0.950			0.950							0.968	
Satd. Flow (perm)	1805	3539	0	1787	3539	1380	0	1900	2787	0	1698	1380
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						189			514			231
Link Speed (mph)		45			45			45			25	
Link Distance (ft)		1126			846			914			623	
Travel Time (s)		17.1			12.8			13.8			17.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	2%	0%	1%	2%	17%	0%	0%	2%	0%	25%	17%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	8	1373	0	289	924	4	0	1	514	0	12	15
Turn Type	Prot	NA		Prot	NA	Perm		NA	pm+ov	Split	NA	Perm
Protected Phases	1	6		5	2		4	4	5	3	3	
Permitted Phases						2			4			3
Detector Phase	1	6		5	2	2	4	4	5	3	3	3
Switch Phase												
Minimum Initial (s)	10.0	15.0		10.0	15.0	15.0	10.0	10.0	10.0	5.0	5.0	5.0
Minimum Split (s)	19.0	24.5		19.5	24.5	24.5	26.0	26.0	19.5	26.0	26.0	26.0
Total Split (s)	19.0	50.0		28.0	59.0	59.0	26.0	26.0	28.0	26.0	26.0	26.0
Total Split (%)	14.6%	38.5%		21.5%	45.4%	45.4%	20.0%	20.0%	21.5%	20.0%	20.0%	20.0%
Yellow Time (s)	5.0	5.5		5.0	5.5	5.5	4.0	4.0	5.0	3.5	3.5	3.5
All-Red Time (s)	4.0	1.0		4.5	1.0	1.0	4.0	4.0	4.5	4.5	4.5	4.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Lost Time (s)	9.0	6.5		9.5	6.5	6.5		8.0	9.5		8.0	8.0
Lead/Lag	Lag	Lead		Lag	Lead	Lead	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	C-Max	C-Max	None	None	None	None	None	None
Act Effct Green (s)	10.0	82.8		18.5	109.6	109.6		10.0	20.2		6.5	6.5
Actuated g/C Ratio	0.08	0.64		0.14	0.84	0.84		0.08	0.16		0.05	0.05
v/c Ratio	0.06	0.61		1.14	0.31	0.00		0.01	0.59		0.14	0.05
Control Delay	70.3	9.7		148.1	6.2	0.0		56.0	5.8		62.2	0.4
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Delay	70.3	9.7		148.1	6.2	0.0		56.0	5.8		62.2	0.4
LOS	E	A		F	A	A		E	A		E	A
Approach Delay		10.1			39.8			5.9			27.8	
Approach LOS		B			D			A			C	
Queue Length 50th (ft)	7	387		~283	67	0		1	0		10	0
Queue Length 95th (ft)	m11	407		#464	299	0		7	36		31	0
Internal Link Dist (ft)		1046			766			834			543	
Turn Bay Length (ft)	225			600		325			350			
Base Capacity (vph)	138	2253		254	2983	1193		263	867		235	390

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	0		0	0	0		0	0		0	0
Spillback Cap Reductn	0	0		0	0	0		0	0		0	0
Storage Cap Reductn	0	0		0	0	0		0	0		0	0
Reduced v/c Ratio	0.06	0.61		1.14	0.31	0.00		0.00	0.59		0.05	0.04

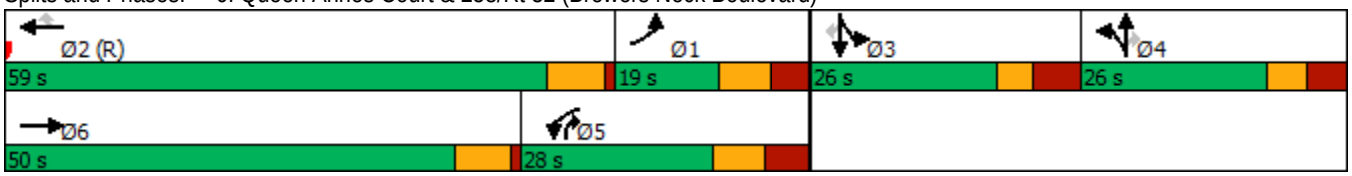
Intersection Summary			
Area Type:	Other		
Cycle Length: 130			
Actuated Cycle Length: 130			
Offset: 20 (15%), Referenced to phase 2:WBT, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.14			
Intersection Signal Delay: 21.1		Intersection LOS: C	
Intersection Capacity Utilization 78.0%		ICU Level of Service D	
Analysis Period (min) 15			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

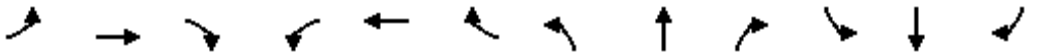
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: Queen Annes Court & 258/Rt 32 (Brewers Neck Boulevard)



1: US 258/Rt 10 (Benns Church Boulevard) & Canteberry Lane



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	156	6	49	70	10	87	57	1366	117	145	1147	108
Future Volume (vph)	156	6	49	70	10	87	57	1366	117	145	1147	108
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	200		350	275		325
Storage Lanes	0		1	0		1	1		1	1		1
Taper Length (ft)	25			25			125			225		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected		0.956			0.959		0.950			0.950		
Satd. Flow (prot)	0	1816	1615	0	1791	1553	1805	3539	1583	1687	3505	1615
Flt Permitted		0.956			0.959		0.103			0.076		
Satd. Flow (perm)	0	1816	1615	0	1791	1553	196	3539	1583	135	3505	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			164			164			177			177
Link Speed (mph)		25			25			45			45	
Link Distance (ft)		335			1232			773			1937	
Travel Time (s)		9.1			33.6			11.7			29.3	
Peak Hour Factor	0.91	0.42	0.56	0.75	0.67	0.93	0.60	0.94	0.64	0.76	0.94	0.71
Heavy Vehicles (%)	0%	0%	0%	2%	0%	4%	0%	2%	2%	7%	3%	0%
Adj. Flow (vph)	171	14	88	93	15	94	95	1453	183	191	1220	152
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	185	88	0	108	94	95	1453	183	191	1220	152
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Split	NA	Prot	Split	NA	Prot	D.P+P	NA	Perm	D.P+P	NA	Perm
Protected Phases	4	4	4	3	3	3	5	2		1	6	

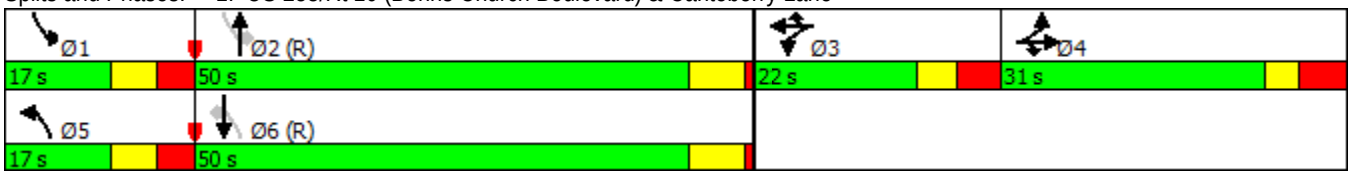
1: US 258/Rt 10 (Benns Church Boulevard) & Canteberry Lane

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases							6		2	2		6
Detector Phase	4	4	4	3	3	3	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	5.0	15.0	15.0	5.0	15.0	15.0
Minimum Split (s)	14.5	14.5	14.5	14.5	14.5	14.5	12.5	21.0	21.0	12.5	21.0	21.0
Total Split (s)	31.0	31.0	31.0	22.0	22.0	22.0	17.0	50.0	50.0	17.0	50.0	50.0
Total Split (%)	25.8%	25.8%	25.8%	18.3%	18.3%	18.3%	14.2%	41.7%	41.7%	14.2%	41.7%	41.7%
Maximum Green (s)	23.5	23.5	23.5	14.5	14.5	14.5	9.5	44.0	44.0	9.5	44.0	44.0
Yellow Time (s)	3.0	3.0	3.0	3.5	3.5	3.5	4.0	5.0	5.0	4.0	5.0	5.0
All-Red Time (s)	4.5	4.5	4.5	4.0	4.0	4.0	3.5	1.0	1.0	3.5	1.0	1.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		7.5	7.5		7.5	7.5	7.5	6.0	6.0	7.5	6.0	6.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	2.0	6.0	6.0	2.0	6.0	6.0
Minimum Gap (s)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	3.5	3.5	0.2	3.5	3.5
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.0	20.0	0.0	20.0	20.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0	15.0	0.0	15.0	15.0
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)		17.4	17.4		12.0	12.0	60.6	52.6	52.6	60.6	54.7	54.7
Actuated g/C Ratio		0.14	0.14		0.10	0.10	0.50	0.44	0.44	0.50	0.46	0.46
v/c Ratio		0.70	0.24		0.61	0.31	0.48	0.94	0.23	1.00	0.76	0.18
Control Delay		62.7	1.5		65.8	2.7	26.4	39.9	2.1	97.9	32.9	2.8
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		62.7	1.5		65.8	2.7	26.4	39.9	2.1	97.9	32.9	2.8
LOS		E	A		E	A	C	D	A	F	C	A
Approach Delay		43.0			36.4			35.2			37.9	
Approach LOS		D			D			D			D	

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBSB and 6:NBSB, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.00
Intersection Signal Delay: 36.9 Intersection LOS: D
Intersection Capacity Utilization 78.9% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 1: US 258/Rt 10 (Benns Church Boulevard) & Canteberry Lane



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	127	0	91	0	0	1	171	1412	0	0	1117	147
Future Volume (vph)	127	0	91	0	0	1	171	1412	0	0	1117	147
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	250		0	150		235
Storage Lanes	0		1	0		0	1		0	1		1
Taper Length (ft)	25			25			150			125		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt			0.850		0.865							0.850
Flt Protected		0.950					0.950					
Satd. Flow (prot)	0	1787	1599	0	1644	0	1805	3539	0	1900	3505	1615
Flt Permitted		0.950					0.145					
Satd. Flow (perm)	0	1787	1599	0	1644	0	276	3539	0	1900	3505	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			214		218							218
Link Speed (mph)		15			25			45			45	
Link Distance (ft)		1905			1451			1986			773	
Travel Time (s)		86.6			39.6			30.1			11.7	
Peak Hour Factor	0.81	0.25	0.62	0.25	0.25	0.25	0.67	0.93	0.25	0.25	0.95	0.80
Heavy Vehicles (%)	1%	0%	1%	0%	0%	0%	0%	2%	0%	0%	3%	0%
Adj. Flow (vph)	157	0	147	0	0	4	255	1518	0	0	1176	184
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	157	147	0	4	0	255	1518	0	0	1176	184
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100		20	100		20	100	20
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0	0	0	0		0	0		0	0	0
Detector 1 Size(ft)	20	6	20	20	6		20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Split	NA	Prot		NA		D.P+P	NA		D.P+P	NA	Prot
Protected Phases	4	4	4	3	3		5	2		1	6	6

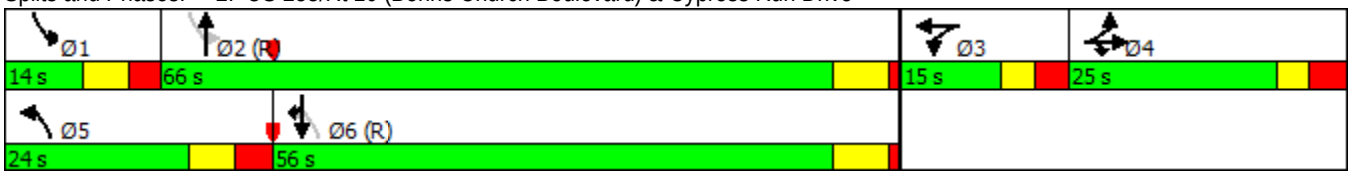
2: US 258/Rt 10 (Benns Church Boulevard) & Cypress Run Drive

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases							6			2		
Detector Phase	4	4	4	3	3		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		5.0	14.0		5.0	14.0	14.0
Minimum Split (s)	13.5	13.5	13.5	13.0	13.0		12.5	20.0		12.0	20.0	20.0
Total Split (s)	25.0	25.0	25.0	15.0	15.0		24.0	66.0		14.0	56.0	56.0
Total Split (%)	20.8%	20.8%	20.8%	12.5%	12.5%		20.0%	55.0%		11.7%	46.7%	46.7%
Maximum Green (s)	18.5	18.5	18.5	9.0	9.0		16.5	60.0		7.0	50.0	50.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.0	5.0		4.0	5.0	5.0
All-Red Time (s)	3.5	3.5	3.5	3.0	3.0		3.5	1.0		3.0	1.0	1.0
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)		6.5	6.5		6.0		7.5	6.0		7.0	6.0	6.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		2.0	5.0		2.0	5.0	5.0
Minimum Gap (s)	0.2	0.2	0.2	0.2	0.2		0.2	3.5		0.2	3.5	3.5
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	18.0		0.0	18.0	18.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	15.0		0.0	15.0	15.0
Recall Mode	None	None	None	None	None		None	C-Min		None	C-Min	C-Min
Act Effct Green (s)		15.2	15.2		7.0		80.7	89.7			66.7	66.7
Actuated g/C Ratio		0.13	0.13		0.06		0.67	0.75			0.56	0.56
v/c Ratio		0.69	0.38		0.01		0.67	0.57			0.60	0.19
Control Delay		65.8	3.8		0.0		22.8	8.9			6.7	0.3
Queue Delay		0.0	0.0		0.0		0.0	0.0			0.0	0.0
Total Delay		65.8	3.8		0.0		22.8	8.9			6.7	0.3
LOS		E	A		A		C	A			A	A
Approach Delay		35.8						10.9			5.8	
Approach LOS		D						B			A	

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 12 (10%), Referenced to phase 2:NBSB and 6:NBSB, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.69
Intersection Signal Delay: 11.1 Intersection LOS: B
Intersection Capacity Utilization 73.2% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 2: US 258/Rt 10 (Benns Church Boulevard) & Cypress Run Drive



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	94	0	106	0	1	2	188	1473	1	36	1080	138
Future Volume (vph)	94	0	106	0	1	2	188	1473	1	36	1080	138
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		300	100		0	125		0	125		275
Storage Lanes	0		1	1		0	1		0	1		1
Taper Length (ft)	200			25			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt			0.850		0.925							0.850
Flt Protected		0.950					0.950			0.950		
Satd. Flow (prot)	0	1787	1599	1900	1758	0	1687	3539	0	1805	3505	1482
Flt Permitted		0.752					0.156			0.072		
Satd. Flow (perm)	0	1415	1599	1900	1758	0	277	3539	0	137	3505	1482
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			133		4							141
Link Speed (mph)		40			25			45			45	
Link Distance (ft)		1493			695			1153			1986	
Travel Time (s)		25.4			19.0			17.5			30.1	
Peak Hour Factor	0.63	0.25	0.80	0.25	0.25	0.50	0.90	0.94	0.25	0.50	0.98	0.85
Heavy Vehicles (%)	1%	0%	1%	0%	0%	0%	7%	2%	0%	0%	3%	9%
Adj. Flow (vph)	149	0	133	0	4	4	209	1567	4	72	1102	162
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	149	133	0	8	0	209	1571	0	72	1102	162
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100		20	100		20	100	20
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	0
Detector 1 Position(ft)	0	0	0	0	0		0	0		0	0	0
Detector 1 Size(ft)	20	6	20	20	6		20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Perm	NA		D.P+P	NA		D.P+P	NA	Perm
Protected Phases		4			8		1	6		5	2	

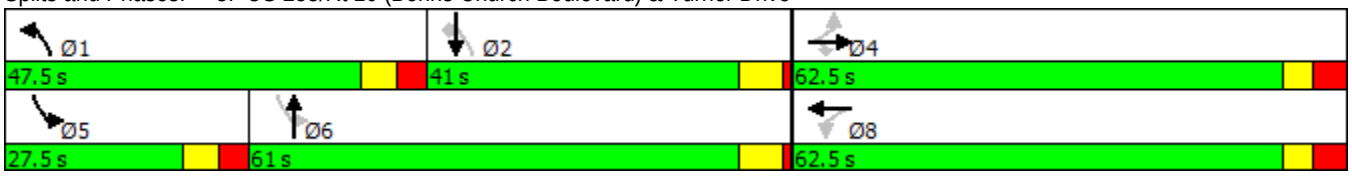
3: US 258/Rt 10 (Benns Church Boulevard) & Turner Drive

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4		4	8			2			6		2
Detector Phase	4	4	4	8	8		1	6		5	2	2
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		5.0	15.0		5.0	15.0	15.0
Minimum Split (s)	14.5	14.5	14.5	14.5	14.5		12.5	21.0		12.5	21.0	21.0
Total Split (s)	62.5	62.5	62.5	62.5	62.5		47.5	61.0		27.5	41.0	41.0
Total Split (%)	41.4%	41.4%	41.4%	41.4%	41.4%		31.5%	40.4%		18.2%	27.2%	27.2%
Maximum Green (s)	55.0	55.0	55.0	55.0	55.0		40.0	55.0		20.0	35.0	35.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		4.0	5.0		4.0	5.0	5.0
All-Red Time (s)	4.0	4.0	4.0	4.0	4.0		3.5	1.0		3.5	1.0	1.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)		7.5	7.5	7.5	7.5		7.5	6.0		7.5	6.0	6.0
Lead/Lag							Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0	5.0	3.0	3.0		4.0	6.0		2.0	6.0	6.0
Minimum Gap (s)	3.5	3.5	3.5	0.2	0.2		0.2	3.5		0.2	3.5	3.5
Time Before Reduce (s)	20.0	20.0	20.0	0.0	0.0		0.0	20.0		0.0	20.0	20.0
Time To Reduce (s)	10.0	10.0	10.0	0.0	0.0		0.0	15.0		0.0	15.0	15.0
Recall Mode	None	None	None	None	None		None	Min		None	Min	Min
Act Effct Green (s)		17.8	17.8		10.3		57.1	55.6		58.9	45.3	45.3
Actuated g/C Ratio		0.18	0.18		0.11		0.59	0.57		0.60	0.46	0.46
v/c Ratio		0.58	0.33		0.04		0.59	0.78		0.39	0.68	0.21
Control Delay		46.8	8.6		29.7		18.6	21.8		15.5	24.5	5.4
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Delay		46.8	8.6		29.7		18.6	21.8		15.5	24.5	5.4
LOS		D	A		C		B	C		B	C	A
Approach Delay		28.8			29.7			21.4			21.7	
Approach LOS		C			C			C			C	

Intersection Summary

Area Type: Other
Cycle Length: 151
Actuated Cycle Length: 97.6
Natural Cycle: 70
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.78
Intersection Signal Delay: 22.2 Intersection LOS: C
Intersection Capacity Utilization 74.3% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 3: US 258/Rt 10 (Benns Church Boulevard) & Turner Drive



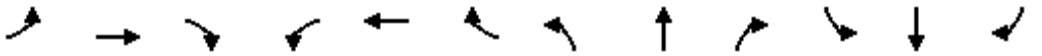
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	0	0	5	0	1652	0	0	0
Future Volume (vph)	0	0	0	0	0	0	5	0	1652	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0		125		0		140
Storage Lanes	0		0	0		0		1		0		1
Taper Length (ft)	25			25				25				75
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00
Frt												
Flt Protected							0.950					
Satd. Flow (prot)	0	0	0	0	0	0	1805	0	3505	0	1900	0
Flt Permitted							0.950					
Satd. Flow (perm)	0	0	0	0	0	0	1805	0	3505	0	1900	0
Link Speed (mph)		30			30				45			
Link Distance (ft)		810			872				3921			
Travel Time (s)		18.4			19.8				59.4			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.25	0.25	0.97	0.25	0.50	0.25
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	3%	0%	0%	0%
Adj. Flow (vph)	0	0	0	0	0	0	20	0	1703	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	0	20	0	1703	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	R NA	Left	Left	Right	R NA	Left
Median Width(ft)		0			0				12			
Link Offset(ft)		0			0				0			
Crosswalk Width(ft)		16			16				16			
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	9	15		9	9	15
Sign Control		Stop			Stop				Free			

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 49.0%		ICU Level of Service A	
Analysis Period (min) 15			

Lane Group	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	1173	0
Future Volume (vph)	1173	0
Ideal Flow (vphpl)	1900	1900
Storage Length (ft)		0
Storage Lanes		0
Taper Length (ft)		
Lane Util. Factor	0.95	1.00
Frt		
Flt Protected		
Satd. Flow (prot)	3539	0
Flt Permitted		
Satd. Flow (perm)	3539	0
Link Speed (mph)	45	
Link Distance (ft)	1153	
Travel Time (s)	17.5	
Peak Hour Factor	0.95	0.25
Heavy Vehicles (%)	2%	0%
Adj. Flow (vph)	1235	0
Shared Lane Traffic (%)		
Lane Group Flow (vph)	1235	0
Enter Blocked Intersection	No	No
Lane Alignment	Left	Right
Median Width(ft)	12	
Link Offset(ft)	0	
Crosswalk Width(ft)	16	
Two way Left Turn Lane		
Headway Factor	1.00	1.00
Turning Speed (mph)		9
Sign Control	Free	

Intersection Summary

5: US 258/Rt 10 (Benns Church Boulevard) & 258/Rt 32 (Brewers Neck Boulevard)



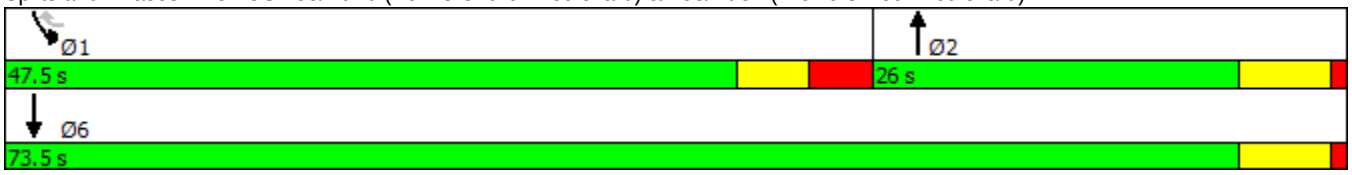
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	0	1421	0	246	0	797	340	0
Future Volume (vph)	0	0	0	0	0	1421	0	246	0	797	340	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		0	300		0
Storage Lanes	0		0	0		2	0		0	1		0
Taper Length (ft)	25			25			100			75		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.88	1.00	0.95	1.00	0.97	0.95	1.00
Frt						0.850						
Flt Protected										0.950		
Satd. Flow (prot)	0	0	0	0	0	2760	0	3471	0	3400	3471	0
Flt Permitted										0.950		
Satd. Flow (perm)	0	0	0	0	0	2760	0	3471	0	3400	3471	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						514						
Link Speed (mph)		30			45			45			45	
Link Distance (ft)		963			1126			2837			3921	
Travel Time (s)		21.9			17.1			43.0			59.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.93	0.25	0.89	0.25	0.99	0.85	0.25
Heavy Vehicles (%)	0%	0%	0%	0%	0%	3%	0%	4%	0%	3%	4%	0%
Adj. Flow (vph)	0	0	0	0	0	1528	0	276	0	805	400	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	1528	0	276	0	805	400	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors						1		2		1	2	
Detector Template						Right		Thru		Left	Thru	
Leading Detector (ft)						20		100		20	100	
Trailing Detector (ft)						0		0		0	0	
Detector 1 Position(ft)						0		0		0	0	
Detector 1 Size(ft)						20		6		20	6	
Detector 1 Type						Cl+Ex		Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)						0.0		0.0		0.0	0.0	
Detector 1 Queue (s)						0.0		0.0		0.0	0.0	
Detector 1 Delay (s)						0.0		0.0		0.0	0.0	
Detector 2 Position(ft)								94			94	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type						Perm		NA		Prot	NA	
Protected Phases								2		1	6	

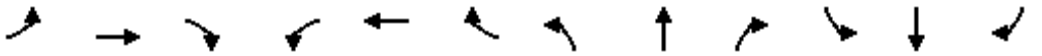
5: US 258/Rt 10 (Benns Church Boulevard) & 258/Rt 32 (Brewers Neck Boulevard)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases						1						
Detector Phase						1		2		1	6	
Switch Phase												
Minimum Initial (s)						15.0		10.0		15.0	15.0	
Minimum Split (s)						22.5		16.0		22.5	21.0	
Total Split (s)						47.5		26.0		47.5	73.5	
Total Split (%)						64.6%		35.4%		64.6%	100.0%	
Maximum Green (s)						40.0		20.0		40.0	67.5	
Yellow Time (s)						4.0		5.0		4.0	5.0	
All-Red Time (s)						3.5		1.0		3.5	1.0	
Lost Time Adjust (s)						0.0		0.0		0.0	0.0	
Total Lost Time (s)						7.5		6.0		7.5	6.0	
Lead/Lag						Lead		Lag		Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)						3.5		2.5		3.5	5.0	
Recall Mode						Min		None		Min	Min	
Act Effct Green (s)						35.9		10.8		35.9	60.4	
Actuated g/C Ratio						0.59		0.18		0.59	1.00	
v/c Ratio						0.83		0.44		0.40	0.12	
Control Delay						10.9		25.8		7.1	0.1	
Queue Delay						0.0		0.0		0.0	0.0	
Total Delay						10.9		25.8		7.1	0.1	
LOS						B		C		A	A	
Approach Delay					10.9			25.8			4.7	
Approach LOS					B			C			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 73.5			
Actuated Cycle Length: 60.4			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.83			
Intersection Signal Delay: 9.8		Intersection LOS: A	
Intersection Capacity Utilization 69.3%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 5: US 258/Rt 10 (Benns Church Boulevard) & 258/Rt 32 (Brewers Neck Boulevard)





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	844	4	515	1387	15	1	4	273	2	5	7
Future Volume (vph)	10	844	4	515	1387	15	1	4	273	2	5	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	225		0	600		325	0		350	0		0
Storage Lanes	1		0	1		1	0		2	0		1
Taper Length (ft)	200			200			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	0.88	1.00	1.00	1.00
Frt		0.999				0.850			0.850			0.850
Flt Protected	0.950			0.950				0.987			0.978	
Satd. Flow (prot)	1805	3536	0	1787	3539	1380	0	1875	2787	0	1632	1380
Flt Permitted	0.950			0.950				0.987			0.978	
Satd. Flow (perm)	1805	3536	0	1787	3539	1380	0	1875	2787	0	1632	1380
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						171			350			160
Link Speed (mph)		45			45			45			25	
Link Distance (ft)		1126			846			914			623	
Travel Time (s)		17.1			12.8			13.8			17.0	
Peak Hour Factor	0.35	0.98	1.00	0.86	0.96	0.60	0.25	0.38	0.78	0.50	1.00	0.75
Heavy Vehicles (%)	0%	2%	0%	1%	2%	17%	0%	0%	2%	0%	25%	17%
Adj. Flow (vph)	29	861	4	599	1445	25	4	11	350	4	5	9
Shared Lane Traffic (%)												
Lane Group Flow (vph)	29	865	0	599	1445	25	0	15	350	0	9	9
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100		20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6		20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA	pm+ov	Split	NA	Perm
Protected Phases	1	6		5	2		4	4	5	3	3	

6: Queen Annes Court & 258/Rt 32 (Brewers Neck Boulevard)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases						2			4			3
Detector Phase	1	6		5	2	2	4	4	5	3	3	3
Switch Phase												
Minimum Initial (s)	10.0	15.0		10.0	15.0	15.0	10.0	10.0	10.0	5.0	5.0	5.0
Minimum Split (s)	19.0	24.5		19.5	24.5	24.5	26.0	26.0	19.5	26.0	26.0	26.0
Total Split (s)	34.0	41.5		39.5	47.0	47.0	26.0	26.0	39.5	33.0	33.0	33.0
Total Split (%)	24.3%	29.6%		28.2%	33.6%	33.6%	18.6%	18.6%	28.2%	23.6%	23.6%	23.6%
Maximum Green (s)	25.0	35.0		30.0	40.5	40.5	18.0	18.0	30.0	25.0	25.0	25.0
Yellow Time (s)	5.0	5.5		5.0	5.5	5.5	4.0	4.0	5.0	3.5	3.5	3.5
All-Red Time (s)	4.0	1.0		4.5	1.0	1.0	4.0	4.0	4.5	4.5	4.5	4.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Lost Time (s)	9.0	6.5		9.5	6.5	6.5		8.0	9.5		8.0	8.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	5.0		3.0	5.0	5.0	3.5	3.5	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None	None	None	None	None	None	None	None
Act Effct Green (s)	10.4	32.9		31.2	72.6	72.6		10.4	37.0		6.3	6.3
Actuated g/C Ratio	0.11	0.36		0.34	0.80	0.80		0.11	0.41		0.07	0.07
v/c Ratio	0.14	0.68		0.98	0.51	0.02		0.07	0.26		0.08	0.04
Control Delay	45.6	30.5		66.1	13.6	0.1		45.6	2.7		49.6	0.3
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Delay	45.6	30.5		66.1	13.6	0.1		45.6	2.7		49.6	0.3
LOS	D	C		E	B	A		D	A		D	A
Approach Delay		31.0			28.6			4.5			24.9	
Approach LOS		C			C			A			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 91.3			
Natural Cycle: 150			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.98			
Intersection Signal Delay: 26.6		Intersection LOS: C	
Intersection Capacity Utilization 80.3%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 6: Queen Annes Court & 258/Rt 32 (Brewers Neck Boulevard)



APPENDIX K

Queue Reports

Intersection: 1: US 258/Rt 10 (Benns Church Boulevard) & Canteberry Lane

Movement	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LT	R	LT	R	L	T	T	R	L	T	T	R
Maximum Queue (ft)	64	51	144	70	42	217	230	54	74	222	221	25
Average Queue (ft)	18	14	68	25	9	76	75	10	22	105	105	6
95th Queue (ft)	49	39	125	59	31	160	168	36	52	187	190	22
Link Distance (ft)	277	277	1172	1172		663	663			1895	1895	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)					200			350	275			325
Storage Blk Time (%)						0	0					
Queuing Penalty (veh)						0	0					

Intersection: 2: US 258/Rt 10 (Benns Church Boulevard) & Cypress Run Drive

Movement	EB	EB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LT	R	L	T	TR	L	T	T	R
Maximum Queue (ft)	18	47	48	86	104	1	79	86	19
Average Queue (ft)	2	7	11	11	14	0	13	18	1
95th Queue (ft)	10	29	35	49	59	1	47	62	10
Link Distance (ft)	1824	1824		1925	1925		663	663	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)			250			150			235
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 3: US 258/Rt 10 (Benns Church Boulevard) & Turner Drive

Movement	EB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LTR	LTR	L	T	TR	L	T	T	R
Maximum Queue (ft)	374	108	222	304	278	112	392	409	190
Average Queue (ft)	195	44	120	120	131	9	239	249	68
95th Queue (ft)	326	88	207	238	233	59	366	383	140
Link Distance (ft)	1442	648		1098	1098		1925	1925	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)			125			125			275
Storage Blk Time (%)			9	5			34	8	
Queuing Penalty (veh)			24	12			2	24	

Intersection: 4: US 258/Rt 10 (Benns Church Boulevard) & Proposed Main Entrance

Movement	NB	SB
Directions Served	U	U
Maximum Queue (ft)	21	2
Average Queue (ft)	2	0
95th Queue (ft)	12	2
Link Distance (ft)		
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	125	140
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: US 258/Rt 10 (Benns Church Boulevard) & 258/Rt 32 (Brewers Neck Boulevard)

Movement	WB	WB	NB	NB	SB	SB	SB
Directions Served	R	R	T	T	L	L	T
Maximum Queue (ft)	135	140	78	78	160	182	4
Average Queue (ft)	46	43	35	34	89	111	0
95th Queue (ft)	109	109	67	70	149	175	4
Link Distance (ft)	1008	1008	2766	2766		3866	3866
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)					300		
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 6: Queen Annes Court & 258/Rt 32 (Brewers Neck Boulevard)

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	LT	R	R	LT	R
Maximum Queue (ft)	34	274	298	181	264	237	10	14	192	140	33	39
Average Queue (ft)	5	135	159	82	123	96	0	0	96	34	7	9
95th Queue (ft)	21	246	261	145	236	205	4	9	162	99	26	30
Link Distance (ft)		1008	1008		785	785		858			565	565
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	225			600			325		350	350		
Storage Blk Time (%)		1				0						
Queuing Penalty (veh)		0				0						

Zone Summary

Zone wide Queuing Penalty: 62

Intersection: 1: US 258/Rt 10 (Benns Church Boulevard) & Canteberry Lane

Movement	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LT	R	LT	R	L	T	T	R	L	T	T	R
Maximum Queue (ft)	186	74	122	146	175	361	368	60	146	256	264	48
Average Queue (ft)	89	24	48	55	33	185	203	20	65	141	145	17
95th Queue (ft)	158	59	98	112	108	349	364	46	119	235	242	40
Link Distance (ft)	277	277	1172	1172		663	663			1895	1895	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)					200			350	275			325
Storage Blk Time (%)						7	1			0		
Queuing Penalty (veh)						3	1			0		

Intersection: 2: US 258/Rt 10 (Benns Church Boulevard) & Cypress Run Drive

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	LTR	L	T	TR	T	T	R
Maximum Queue (ft)	171	126	12	139	189	200	132	150	67
Average Queue (ft)	68	41	1	56	54	64	35	44	13
95th Queue (ft)	131	93	8	111	143	159	90	108	44
Link Distance (ft)	1824	1824	1402		1925	1925	663	663	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)				250					235
Storage Blk Time (%)					0		0	0	
Queuing Penalty (veh)					0		0	0	

Intersection: 3: US 258/Rt 10 (Benns Church Boulevard) & Turner Drive

Movement	EB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LTR	LTR	L	T	TR	L	T	T	R
Maximum Queue (ft)	144	33	194	330	314	108	304	315	82
Average Queue (ft)	68	5	72	128	140	20	126	135	30
95th Queue (ft)	121	22	148	258	264	69	243	253	64
Link Distance (ft)	1442	648		1106	1106		1925	1925	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)			125			125			275
Storage Blk Time (%)			1	6			8	1	
Queuing Penalty (veh)			5	9			2	1	

Intersection: 4: US 258/Rt 10 (Benns Church Boulevard) & Proposed Main Entrance

Movement	NB
Directions Served	U
Maximum Queue (ft)	24
Average Queue (ft)	2
95th Queue (ft)	11
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	125
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: US 258/Rt 10 (Benns Church Boulevard) & 258/Rt 32 (Brewers Neck Boulevard)

Movement	WB	WB	NB	NB	SB	SB	SB
Directions Served	R	R	T	T	L	L	T
Maximum Queue (ft)	305	291	86	101	137	154	2
Average Queue (ft)	103	101	41	42	57	78	0
95th Queue (ft)	222	225	73	80	116	135	2
Link Distance (ft)	1008	1008	2766	2766		3866	3866
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)					300		
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 6: Queen Annes Court & 258/Rt 32 (Brewers Neck Boulevard)

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	LT	R	R	LT	R
Maximum Queue (ft)	34	220	240	282	406	386	21	25	110	53	35	43
Average Queue (ft)	7	107	124	149	169	158	2	3	50	11	4	6
95th Queue (ft)	25	192	208	244	344	334	12	14	91	38	21	26
Link Distance (ft)		1008	1008		785	785		858			565	565
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	225			600			325		350	350		
Storage Blk Time (%)		0				1						
Queuing Penalty (veh)		0				0						

Zone Summary

Zone wide Queuing Penalty: 21

Intersection: 1: US 258/Rt 10 (Benns Church Boulevard) & Canteberry Lane

Movement	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LT	R	LT	R	L	T	T	R	L	T	T	R
Maximum Queue (ft)	70	54	168	87	46	229	241	47	72	227	239	28
Average Queue (ft)	21	15	79	28	11	89	87	11	25	120	126	6
95th Queue (ft)	51	42	145	67	35	181	186	35	59	209	220	22
Link Distance (ft)	277	277	1172	1172		663	663			1895	1895	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)					200			350	275			325
Storage Blk Time (%)						0	0			0		
Queuing Penalty (veh)						0	0			0		

Intersection: 2: US 258/Rt 10 (Benns Church Boulevard) & Cypress Run Drive

Movement	EB	EB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LT	R	L	T	TR	L	T	T	R
Maximum Queue (ft)	18	55	48	92	114	7	87	100	26
Average Queue (ft)	2	10	14	15	22	0	19	21	2
95th Queue (ft)	11	34	37	56	75	4	62	69	12
Link Distance (ft)	1824	1824		1925	1925		663	663	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)			250			150			235
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 3: US 258/Rt 10 (Benns Church Boulevard) & Turner Drive

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LT	R	LTR	L	T	TR	L	T	T	R
Maximum Queue (ft)	228	179	110	216	263	201	67	333	344	174
Average Queue (ft)	113	82	53	120	91	94	6	186	194	73
95th Queue (ft)	195	149	97	205	199	178	39	302	311	137
Link Distance (ft)	1440		648		1093	1093		1925	1925	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)		300		125			125			275
Storage Blk Time (%)	0			10	2			19	2	0
Queuing Penalty (veh)	0			32	5			1	7	0

Intersection: 4: US 258/Rt 10 (Benns Church Boulevard) & Proposed Main Entrance

Movement	NB	SB
Directions Served	U	U
Maximum Queue (ft)	23	8
Average Queue (ft)	2	0
95th Queue (ft)	13	6
Link Distance (ft)		
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	125	140
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: US 258/Rt 10 (Benns Church Boulevard) & 258/Rt 32 (Brewers Neck Boulevard)

Movement	WB	WB	NB	NB	SB	SB	SB
Directions Served	R	R	T	T	L	L	T
Maximum Queue (ft)	184	180	79	92	174	195	11
Average Queue (ft)	56	54	40	36	94	119	0
95th Queue (ft)	140	141	71	74	152	177	8
Link Distance (ft)	1008	1008	2766	2766		3866	3866
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)					300		
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 6: Queen Annes Court & 258/Rt 32 (Brewers Neck Boulevard)

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	LT	R	R	LT	R
Maximum Queue (ft)	41	296	301	210	314	275	11	12	217	182	45	43
Average Queue (ft)	7	150	169	95	146	119	1	1	116	51	9	9
95th Queue (ft)	27	259	272	169	283	246	5	8	185	137	32	32
Link Distance (ft)		1008	1008		785	785		858			565	565
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	225			600			325		350	350		
Storage Blk Time (%)		2				0						
Queuing Penalty (veh)		0				0						

Zone Summary

Zone wide Queuing Penalty: 45

Intersection: 1: US 258/Rt 10 (Benns Church Boulevard) & Canteberry Lane

Movement	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LT	R	LT	R	L	T	T	R	L	T	T	R
Maximum Queue (ft)	211	74	118	141	278	457	464	59	176	318	328	44
Average Queue (ft)	101	28	53	58	47	265	277	24	77	171	177	19
95th Queue (ft)	179	63	104	113	167	439	445	51	144	275	288	39
Link Distance (ft)	277	277	1172	1172		663	663			1895	1895	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)					200			350	275			325
Storage Blk Time (%)						12	3			1	0	
Queuing Penalty (veh)						6	3			1	0	

Intersection: 2: US 258/Rt 10 (Benns Church Boulevard) & Cypress Run Drive

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	LTR	L	T	TR	T	T	R
Maximum Queue (ft)	188	124	15	175	205	232	123	144	58
Average Queue (ft)	77	46	1	61	72	85	38	47	13
95th Queue (ft)	146	99	8	125	171	185	91	109	44
Link Distance (ft)	1824	1824	1402		1919	1919	663	663	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)				250				235	
Storage Blk Time (%)				0	0		0		
Queuing Penalty (veh)				2	0		0		

Intersection: 3: US 258/Rt 10 (Benns Church Boulevard) & Turner Drive

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LT	R	TR	L	T	TR	L	T	T	R
Maximum Queue (ft)	103	91	30	200	285	284	143	272	288	73
Average Queue (ft)	46	34	3	68	106	114	25	115	125	26
95th Queue (ft)	89	68	18	139	212	220	80	226	241	58
Link Distance (ft)	1444		648		1085	1085		1919	1919	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)		300		125			125			275
Storage Blk Time (%)				2	3			6	0	
Queuing Penalty (veh)				11	6			2	0	

Intersection: 4: US 258/Rt 10 (Benns Church Boulevard) & Proposed Main Entrance

Movement	NB
Directions Served	U
Maximum Queue (ft)	27
Average Queue (ft)	3
95th Queue (ft)	15
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	125
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: US 258/Rt 10 (Benns Church Boulevard) & 258/Rt 32 (Brewers Neck Boulevard)

Movement	WB	WB	NB	NB	SB	SB	SB
Directions Served	R	R	T	T	L	L	T
Maximum Queue (ft)	354	348	93	105	159	165	1
Average Queue (ft)	136	138	45	47	67	89	0
95th Queue (ft)	286	291	81	86	128	150	1
Link Distance (ft)	1008	1008	2766	2766		3866	3866
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)					300		
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 6: Queen Annes Court & 258/Rt 32 (Brewers Neck Boulevard)

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	LT	R	R	LT	R
Maximum Queue (ft)	47	291	305	331	469	460	33	23	128	64	44	57
Average Queue (ft)	8	132	144	182	182	177	3	3	60	12	6	8
95th Queue (ft)	29	240	249	296	406	408	16	15	108	43	26	34
Link Distance (ft)		1008	1008		785	785		858			565	565
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	225			600			325		350	350		
Storage Blk Time (%)		1				3						
Queuing Penalty (veh)		0				0						

Zone Summary

Zone wide Queuing Penalty: 31

Intersection: 1: US 258/Rt 10 (Benns Church Boulevard) & Canteberry Lane

Movement	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LT	R	LT	R	L	T	T	R	L	T	T	R
Maximum Queue (ft)	77	61	230	109	77	278	287	48	73	270	290	26
Average Queue (ft)	28	17	109	38	12	123	125	12	28	138	147	7
95th Queue (ft)	66	46	194	86	51	244	249	38	60	248	265	24
Link Distance (ft)	277	277	1172	1172		663	663			1895	1895	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)					200			350	275			325
Storage Blk Time (%)						2				0	0	
Queuing Penalty (veh)						0				0	0	

Intersection: 2: US 258/Rt 10 (Benns Church Boulevard) & Cypress Run Drive

Movement	EB	EB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LT	R	L	T	TR	L	T	T	R
Maximum Queue (ft)	15	57	54	94	115	4	158	175	28
Average Queue (ft)	2	10	15	18	29	0	31	40	2
95th Queue (ft)	9	35	43	63	86	2	103	123	13
Link Distance (ft)	1824	1824		1919	1919		663	663	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)			250			150			235
Storage Blk Time (%)							0	0	
Queuing Penalty (veh)							0	0	

Intersection: 3: US 258/Rt 10 (Benns Church Boulevard) & Turner Drive

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LT	R	LTR	L	T	TR	L	T	T	R
Maximum Queue (ft)	293	253	145	224	387	329	106	430	433	251
Average Queue (ft)	167	123	64	160	147	124	8	254	266	81
95th Queue (ft)	269	219	119	251	329	266	57	414	423	178
Link Distance (ft)	1440		648		1080	1080		1919	1919	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)		300		125			125			275
Storage Blk Time (%)	1	0	4	26	5			23	9	
Queuing Penalty (veh)	2	0	0	89	14			2	31	

Intersection: 4: US 258/Rt 10 (Benns Church Boulevard) & Proposed Main Entrance

Movement	NB	SB
Directions Served	U	U
Maximum Queue (ft)	25	13
Average Queue (ft)	3	1
95th Queue (ft)	14	6
Link Distance (ft)		
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	125	140
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: US 258/Rt 10 (Benns Church Boulevard) & 258/Rt 32 (Brewers Neck Boulevard)

Movement	WB	WB	NB	NB	SB	SB
Directions Served	R	R	T	T	L	L
Maximum Queue (ft)	220	240	87	86	196	208
Average Queue (ft)	76	69	33	36	115	140
95th Queue (ft)	172	172	64	72	169	193
Link Distance (ft)	1008	1008	2766	2766		3866
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)					300	
Storage Blk Time (%)					0	
Queuing Penalty (veh)					0	

Intersection: 6: Queen Annes Court & 258/Rt 32 (Brewers Neck Boulevard)

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	LT	R	R	LT	R
Maximum Queue (ft)	34	328	326	254	359	351	8	16	265	222	43	59
Average Queue (ft)	6	175	194	126	158	134	0	1	144	85	9	11
95th Queue (ft)	23	294	302	215	318	297	4	12	224	191	31	39
Link Distance (ft)		1008	1008		785	785		858			565	565
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	225			600			325		350	350		
Storage Blk Time (%)		3				0			0			
Queuing Penalty (veh)		0				0			0			

Zone Summary

Zone wide Queuing Penalty: 139

Intersection: 1: US 258/Rt 10 (Benns Church Boulevard) & Canteberry Lane

Movement	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LT	R	LT	R	L	T	T	R	L	T	T	R
Maximum Queue (ft)	209	92	130	143	301	563	581	278	206	346	367	50
Average Queue (ft)	105	33	60	59	67	345	359	38	93	211	220	21
95th Queue (ft)	181	74	107	116	222	555	563	173	176	330	347	43
Link Distance (ft)	277	277	1172	1172		663	663			1895	1895	
Upstream Blk Time (%)						0	0					
Queuing Penalty (veh)						0	0					
Storage Bay Dist (ft)					200			350	275			325
Storage Blk Time (%)						23	9		0	2	1	
Queuing Penalty (veh)						13	11		1	3	1	

Intersection: 2: US 258/Rt 10 (Benns Church Boulevard) & Cypress Run Drive

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	LTR	L	T	TR	T	T	R
Maximum Queue (ft)	169	151	18	159	250	263	131	146	70
Average Queue (ft)	77	52	1	71	97	110	39	50	15
95th Queue (ft)	141	116	9	130	214	231	92	112	46
Link Distance (ft)	1824	1824	1402		1919	1919	663	663	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)				250				235	
Storage Blk Time (%)					0		0	0	
Queuing Penalty (veh)					0		0	0	

Intersection: 3: US 258/Rt 10 (Benns Church Boulevard) & Turner Drive

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LT	R	TR	L	T	TR	L	T	T	R
Maximum Queue (ft)	129	80	34	216	348	369	144	376	383	129
Average Queue (ft)	53	38	4	92	146	161	25	167	180	33
95th Queue (ft)	100	71	20	180	280	295	81	319	328	91
Link Distance (ft)	1437		648		1084	1084		1919	1919	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)		300		125			125			275
Storage Blk Time (%)				3	7			13	3	
Queuing Penalty (veh)				22	13			5	4	

Intersection: 4: US 258/Rt 10 (Benns Church Boulevard) & Proposed Main Entrance

Movement	NB
Directions Served	U
Maximum Queue (ft)	20
Average Queue (ft)	2
95th Queue (ft)	12
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	125
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: US 258/Rt 10 (Benns Church Boulevard) & 258/Rt 32 (Brewers Neck Boulevard)

Movement	WB	WB	NB	NB	SB	SB	SB
Directions Served	R	R	T	T	L	L	T
Maximum Queue (ft)	461	463	106	118	157	181	12
Average Queue (ft)	188	188	50	55	76	97	0
95th Queue (ft)	372	373	88	99	138	160	7
Link Distance (ft)	1008	1008	2766	2766		3866	3866
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)					300		
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 6: Queen Annes Court & 258/Rt 32 (Brewers Neck Boulevard)

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	LT	R	R	LT	R
Maximum Queue (ft)	32	271	281	390	544	546	153	28	135	62	38	49
Average Queue (ft)	7	143	159	212	208	207	6	3	66	14	5	8
95th Queue (ft)	25	251	263	347	471	481	81	17	116	45	22	31
Link Distance (ft)		1008	1008		785	785		858			565	565
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	225			600			325		350	350		
Storage Blk Time (%)		1			0	5						
Queuing Penalty (veh)		0			0	1						

Zone Summary

Zone wide Queuing Penalty: 75

Intersection: 1: US 258/Rt 10 (Benns Church Boulevard) & Canteberry Lane

Movement	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LT	R	LT	R	L	T	T	R	L	T	T	R
Maximum Queue (ft)	58	48	164	85	50	163	165	42	72	262	283	31
Average Queue (ft)	19	13	72	29	12	71	75	12	29	115	123	8
95th Queue (ft)	49	37	134	68	38	136	145	36	62	210	230	26
Link Distance (ft)	277	277	1172	1172		663	663			1895	1895	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)					200			350	275			325
Storage Blk Time (%)						0				0	0	
Queuing Penalty (veh)						0				0	0	

Intersection: 2: US 258/Rt 10 (Benns Church Boulevard) & Cypress Run Drive

Movement	EB	EB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LT	R	L	T	TR	L	T	T	R
Maximum Queue (ft)	15	47	61	53	71	5	95	127	23
Average Queue (ft)	2	8	20	8	15	0	16	21	2
95th Queue (ft)	11	28	48	35	51	3	58	78	12
Link Distance (ft)	1824	1824		1925	1925		663	663	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)			250			150			235
Storage Blk Time (%)							0	0	
Queuing Penalty (veh)							0	0	

Intersection: 3: US 258/Rt 10 (Benns Church Boulevard) & Turner Drive

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LT	R	LTR	L	T	TR	L	T	T	R
Maximum Queue (ft)	275	195	125	223	268	202	28	282	291	178
Average Queue (ft)	139	89	56	135	80	73	4	156	161	66
95th Queue (ft)	242	158	102	222	200	157	19	252	257	131
Link Distance (ft)	1442		648		1065	1065		1925	1925	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)		300		125			125			275
Storage Blk Time (%)	1			13	1			11	0	
Queuing Penalty (veh)	2			49	2			1	1	

Intersection: 4: US 258/Rt 10 (Benns Church Boulevard) & Proposed Main Entrance

Movement	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	R	U	T	T	R	L	T	T
Maximum Queue (ft)	185	158	98	89	260	257	46	131	257	251
Average Queue (ft)	107	59	42	13	105	101	18	50	79	100
95th Queue (ft)	167	132	78	50	206	202	42	98	181	204
Link Distance (ft)	816	816	816		636	636			1065	1065
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)				125			300	300		
Storage Blk Time (%)					4	0			0	
Queuing Penalty (veh)					1	0			0	

Intersection: 5: US 258/Rt 10 (Benns Church Boulevard) & 258/Rt 32 (Brewers Neck Boulevard)

Movement	WB	WB	NB	NB	SB	SB	SB
Directions Served	R	R	T	T	L	L	T
Maximum Queue (ft)	148	147	77	93	170	184	5
Average Queue (ft)	51	44	35	41	106	129	0
95th Queue (ft)	104	101	66	77	150	173	5
Link Distance (ft)	1008	1008	2766	2766		3192	3192
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)					300		
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 6: Queen Annes Court & 258/Rt 32 (Brewers Neck Boulevard)

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	LT	R	R	LT	R
Maximum Queue (ft)	38	298	319	212	235	208	9	19	223	190	45	61
Average Queue (ft)	6	173	192	110	36	30	0	1	129	64	8	11
95th Queue (ft)	24	267	277	188	135	121	4	9	204	163	31	40
Link Distance (ft)		1008	1008		785	785		858			565	565
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	225			600			325		350	350		
Storage Blk Time (%)		2				0						
Queuing Penalty (veh)		0				0						

Intersection: 7: US 258/Rt 10 (Benns Church Boulevard) & Proposed Secondary Entrance

Movement	WB
Directions Served	R
Maximum Queue (ft)	63
Average Queue (ft)	18
95th Queue (ft)	43
Link Distance (ft)	1244
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Zone Summary

Zone wide Queuing Penalty: 56

Intersection: 1: US 258/Rt 10 (Benns Church Boulevard) & Canteberry Lane

Movement	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LT	R	LT	R	L	T	T	R	L	T	T	R
Maximum Queue (ft)	176	73	175	140	175	366	366	78	162	284	286	43
Average Queue (ft)	86	26	78	55	38	186	198	27	76	171	177	20
95th Queue (ft)	152	60	158	114	108	325	335	58	141	262	268	41
Link Distance (ft)	277	277	1172	1172		663	663			1895	1895	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)					200			350	275			325
Storage Blk Time (%)						8	1		0	0	0	
Queuing Penalty (veh)						4	1		0	1	0	

Intersection: 2: US 258/Rt 10 (Benns Church Boulevard) & Cypress Run Drive

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	LTR	L	T	TR	T	T	R
Maximum Queue (ft)	142	116	21	147	160	180	121	138	52
Average Queue (ft)	66	40	1	71	65	84	40	45	15
95th Queue (ft)	126	91	9	122	142	163	90	100	42
Link Distance (ft)	1824	1824	1402		1925	1925	663	663	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)				250					235
Storage Blk Time (%)							0	0	
Queuing Penalty (veh)							0	0	

Intersection: 3: US 258/Rt 10 (Benns Church Boulevard) & Turner Drive

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LT	R	LTR	L	T	TR	L	T	T	R
Maximum Queue (ft)	126	106	32	206	293	292	139	325	328	77
Average Queue (ft)	57	42	4	86	105	116	24	134	140	25
95th Queue (ft)	105	84	20	161	239	251	88	274	283	60
Link Distance (ft)	1442		648		1065	1065		1925	1925	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)		300		125			125			275
Storage Blk Time (%)				2	5			9	1	
Queuing Penalty (veh)				17	10			3	1	

Intersection: 4: US 258/Rt 10 (Benns Church Boulevard) & Proposed Main Entrance

Movement	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	R	U	T	T	R	L	T	T
Maximum Queue (ft)	184	150	148	103	375	370	110	202	140	142
Average Queue (ft)	111	62	68	14	209	207	44	96	38	57
95th Queue (ft)	170	138	121	61	340	336	83	167	99	120
Link Distance (ft)	816	816	816		636	636			1065	1065
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)				125			300	300		
Storage Blk Time (%)					18	2				
Queuing Penalty (veh)					2	4				

Intersection: 5: US 258/Rt 10 (Benns Church Boulevard) & 258/Rt 32 (Brewers Neck Boulevard)

Movement	WB	WB	NB	NB	SB	SB
Directions Served	R	R	T	T	L	L
Maximum Queue (ft)	577	532	131	124	222	243
Average Queue (ft)	204	210	62	67	75	98
95th Queue (ft)	451	451	109	111	155	177
Link Distance (ft)	1008	1008	2766	2766		3192
Upstream Blk Time (%)	0					
Queuing Penalty (veh)	0					
Storage Bay Dist (ft)					300	
Storage Blk Time (%)					0	0
Queuing Penalty (veh)					0	0

Intersection: 6: Queen Annes Court & 258/Rt 32 (Brewers Neck Boulevard)

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	LT	R	R	LT	R
Maximum Queue (ft)	35	338	349	628	717	736	236	25	148	106	35	41
Average Queue (ft)	7	174	188	219	219	230	10	2	66	15	6	5
95th Queue (ft)	27	304	314	407	568	588	115	11	120	56	25	24
Link Distance (ft)		1008	1008		785	785		858			565	565
Upstream Blk Time (%)				0	0	0						
Queuing Penalty (veh)				0	0	0						
Storage Bay Dist (ft)	225			600			325		350	350		
Storage Blk Time (%)		4			1	9						
Queuing Penalty (veh)		0			5	1						

Intersection: 7: US 258/Rt 10 (Benns Church Boulevard) & Proposed Secondary Entrance

Movement	WB	NB
Directions Served	R	T
Maximum Queue (ft)	92	1
Average Queue (ft)	27	0
95th Queue (ft)	71	1
Link Distance (ft)	1244	3192
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Zone Summary

Zone wide Queuing Penalty: 50

Intersection: 1: US 258/Rt 10 (Benns Church Boulevard) & Canteberry Lane

Movement	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LT	R	LT	R	L	T	T	R	L	T	T	R
Maximum Queue (ft)	73	68	201	106	71	292	313	86	105	271	296	64
Average Queue (ft)	25	19	97	33	11	133	141	18	35	143	155	8
95th Queue (ft)	60	50	173	77	53	243	258	62	75	247	267	45
Link Distance (ft)	277	277	1172	1172		663	663			1895	1895	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)					200			350	275			325
Storage Blk Time (%)					0	2	0	0		0	0	0
Queuing Penalty (veh)					0	0	0	0		0	0	0

Intersection: 2: US 258/Rt 10 (Benns Church Boulevard) & Cypress Run Drive

Movement	EB	EB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LT	R	L	T	TR	L	T	T	R
Maximum Queue (ft)	28	48	63	99	114	5	148	184	24
Average Queue (ft)	3	8	21	16	29	0	31	40	2
95th Queue (ft)	15	28	50	62	89	2	95	119	12
Link Distance (ft)	1824	1824		1925	1925		663	663	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)			250			150			235
Storage Blk Time (%)							0	0	
Queuing Penalty (veh)							0	0	

Intersection: 3: US 258/Rt 10 (Benns Church Boulevard) & Turner Drive

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LT	R	LTR	L	T	TR	L	T	T	R
Maximum Queue (ft)	334	271	160	125	449	404	86	387	408	275
Average Queue (ft)	158	123	66	121	253	194	7	218	221	119
95th Queue (ft)	277	231	130	135	427	351	41	344	361	269
Link Distance (ft)	1442		648		1065	1065		1925	1925	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)		300		125			125			275
Storage Blk Time (%)	0	0		39	25		0	24	3	0
Queuing Penalty (veh)	2	1		155	75		0	2	9	2

Intersection: 4: US 258/Rt 10 (Benns Church Boulevard) & Proposed Main Entrance

Movement	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	R	U	T	T	R	L	T	T
Maximum Queue (ft)	176	142	144	98	224	217	54	104	185	207
Average Queue (ft)	101	50	67	16	130	119	22	45	78	99
95th Queue (ft)	154	114	120	63	197	184	49	87	155	177
Link Distance (ft)	816	816	816		636	636			1065	1065
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)				125			300	300		
Storage Blk Time (%)				0	5	0				
Queuing Penalty (veh)				0	1	0				

Intersection: 5: US 258/Rt 10 (Benns Church Boulevard) & 258/Rt 32 (Brewers Neck Boulevard)

Movement	WB	WB	NB	NB	SB	SB
Directions Served	R	R	T	T	L	L
Maximum Queue (ft)	170	163	97	101	239	279
Average Queue (ft)	56	47	46	50	125	156
95th Queue (ft)	118	109	84	87	196	233
Link Distance (ft)	1008	1008	2766	2766		3192
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)					300	
Storage Blk Time (%)					0	0
Queuing Penalty (veh)					0	0

Intersection: 6: Queen Annes Court & 258/Rt 32 (Brewers Neck Boulevard)

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	LT	R	R	LT	R
Maximum Queue (ft)	76	346	351	238	237	217	4	14	230	197	47	48
Average Queue (ft)	8	172	193	116	38	31	0	1	139	77	10	12
95th Queue (ft)	44	308	318	191	147	129	4	7	208	174	34	37
Link Distance (ft)		1008	1008		785	785		858			565	565
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	225			600			325		350	350		
Storage Blk Time (%)	0	4				0						
Queuing Penalty (veh)	0	0				0						

Intersection: 7: US 258/Rt 10 (Benns Church Boulevard) & Proposed Secondary Entrance

Movement	WB	SB
Directions Served	R	T
Maximum Queue (ft)	50	3
Average Queue (ft)	16	0
95th Queue (ft)	39	3
Link Distance (ft)	1244	636
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 247

Intersection: 1: US 258/Rt 10 (Benns Church Boulevard) & Canteberry Lane

Movement	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LT	R	LT	R	L	T	T	R	L	T	T	R
Maximum Queue (ft)	226	85	156	139	277	532	552	294	201	525	364	52
Average Queue (ft)	108	29	70	57	62	292	304	41	88	219	218	22
95th Queue (ft)	200	64	131	110	190	500	509	176	164	425	341	42
Link Distance (ft)	277	277	1172	1172		663	663			1895	1895	
Upstream Blk Time (%)	0					0	0			0		
Queuing Penalty (veh)	0					0	1			0		
Storage Bay Dist (ft)					200			350	275			325
Storage Blk Time (%)						22	8		0	3	1	
Queuing Penalty (veh)						13	11		0	4	1	

Intersection: 2: US 258/Rt 10 (Benns Church Boulevard) & Cypress Run Drive

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	LTR	L	T	TR	T	T	R
Maximum Queue (ft)	211	134	24	187	142	152	153	170	86
Average Queue (ft)	104	47	2	89	38	53	51	57	22
95th Queue (ft)	212	101	13	156	97	110	128	134	61
Link Distance (ft)	1824	1824	1402		1925	1925	663	663	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)				250				235	
Storage Blk Time (%)				0			0		
Queuing Penalty (veh)				0			0		

Intersection: 3: US 258/Rt 10 (Benns Church Boulevard) & Turner Drive

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LT	R	LTR	L	T	TR	L	T	T	R
Maximum Queue (ft)	132	107	35	217	242	239	84	210	213	78
Average Queue (ft)	60	49	4	109	123	121	25	80	81	21
95th Queue (ft)	111	93	22	192	234	230	62	159	162	57
Link Distance (ft)	1442		648		1065	1065		1925	1925	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)		300		125			125			275
Storage Blk Time (%)				8	6		0	2	0	
Queuing Penalty (veh)				61	14		0	1	0	

Intersection: 4: US 258/Rt 10 (Benns Church Boulevard) & Proposed Main Entrance

Movement	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	R	U	T	T	R	L	T	T
Maximum Queue (ft)	214	187	183	92	448	445	210	198	192	204
Average Queue (ft)	127	86	85	11	264	258	47	112	76	92
95th Queue (ft)	193	175	151	54	412	405	129	181	151	165
Link Distance (ft)	816	816	816		636	636			1065	1065
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)				125			300	300		
Storage Blk Time (%)					23	5			0	
Queuing Penalty (veh)					3	10			0	

Intersection: 5: US 258/Rt 10 (Benns Church Boulevard) & 258/Rt 32 (Brewers Neck Boulevard)

Movement	WB	WB	NB	NB	SB	SB	SB
Directions Served	R	R	T	T	L	L	T
Maximum Queue (ft)	575	610	122	142	142	159	8
Average Queue (ft)	265	272	59	71	74	96	0
95th Queue (ft)	531	551	104	119	124	146	6
Link Distance (ft)	1008	1008	2766	2766		3192	3192
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)					300		
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 6: Queen Annes Court & 258/Rt 32 (Brewers Neck Boulevard)

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	LT	R	R	LT	R
Maximum Queue (ft)	43	352	356	516	722	768	242	34	164	105	46	50
Average Queue (ft)	9	189	201	247	245	262	17	5	75	18	8	7
95th Queue (ft)	31	315	319	406	630	673	152	21	134	64	30	30
Link Distance (ft)		1008	1008		785	785		858			565	565
Upstream Blk Time (%)				0	0	1						
Queuing Penalty (veh)				0	0	0						
Storage Bay Dist (ft)	225			600			325		350	350		
Storage Blk Time (%)		5			2	10						
Queuing Penalty (veh)		1			11	2						

Intersection: 7: US 258/Rt 10 (Benns Church Boulevard) & Proposed Secondary Entrance

Movement	WB
Directions Served	R
Maximum Queue (ft)	101
Average Queue (ft)	29
95th Queue (ft)	72
Link Distance (ft)	1244
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 132

APPENDIX L

Signal Justification Reports



VHB
Virginia Beach, VA
TRAFFIC ENGINEER

VDOT Signal Justification Report (SJR)
Hampton Roads District

Date: 12/16/2019

I. Study Intersection

Major Street Route # and Name: US 258/Rt 10 (Benns Church Boulevard) **Direction:** North/South
Minor Street Route # and Name: Sweet Grass Main Entrance **Direction:** East/West
County or Locality: Isle of Wight County
Intersection on Arterial Preservation Network (APN)? No
If on APN, type of APN Corridor? N/A
Sketch/Diagram/Aerial of the Intersection Geometry: See Attached.

Describe the Origin and Nature of Request. If this SJR is based on a recommendation from another study (e.g. Traffic Impact Analysis or Safety Study), then note the name/date of the study and attach the study to this SJR.
Sweetgrass is an undeveloped parcel located at 14096 Benns Church Boulevard in Isle of Wight County. The parcel is on the northeast side of Route 10 (Benns Church Boulevard) between Route 32 (Brewers Neck Boulevard) and Canteberry Lane. Ryan Homes is planning a development of single family and multi-family residential units as well as a public park, and shopping center, with a fast food restaurant, on this parcel.
Traffic Impact Analysis has been prepared by VHB, and a traffic signal is recommended at the proposed main entrance into the development. The SJR is required for the proposed signal. The Sweetgrass TIA is attached to this report.

If the origin of this SJR comes from another study, what were the key conclusions from that study that are related to this intersection?
The origin of this SJR came from the attached Sweetgrass TIA. The following conclusions came from the TIA:

- Construct northbound right turn lane (200’ storage plus 200’ taper) into right in/right out Proposed Secondary Entrance off of US 258/Rt 10 (Benns Church Boulevard).
- Construct northbound right turn lane (200’ storage plus 200’ taper) into Proposed Main Entrance off of US 258/Rt 10 (Benns Church Boulevard).
- Lengthen southbound left turn lane to provide 200’ storage plus 200’ taper into Proposed Main Entrance off of US 258/Rt 10 (Benns Church Boulevard).
- Install traffic signal at intersection of US 258/Rt 10 (Benns Church Boulevard) and Proposed Main Entrance.

II. Signal Warrant Analysis Summary

Intersection Approach Information:

Approach Direction	Road Name/Route Number	Approach Speed	Approach Speed Type	Approach Speed Notes[1]	Number of Through Lanes	Annual Average Daily Traffic (AADT)
Northbound	US 258/Rt 10 (Benns Church Boulveard)	45 MPH	Posted Speed Limit	none	2	25,000 vpd[2]
Southbound	US 258/Rt 10 (Benns Church Boulveard)	45 MPH	Posted Speed Limit	none	2	
Eastbound	N/A	N/A	N/A	N/A	N/A	N/A
Westbound	Proposed Main Entrance	25 mph	Proposed Posted Speed Limit	none	0	5,206 vpd[3]

[1] If approach speed type is not the posted/statutory speed limit, explain the reason why the posted/statutory speed limit was not used.
[2] Source: VDOT 2017 Daily Traffic Volume Estimates (AADT) Jurisdiction Report.
[3] Source: Sweetgrass t TIA trip generation.

Summary of Traffic Count Source:
Thirteen-hour turning movement counts (TMC), were collected from 6 AM to 7 PM using Miovision video on a typical, non-holiday weekday (Thursday, April 26th, 2018). These counts consisted of vehicular turning movements and pedestrian crossings at each approach. The 13-hour TMC is summarized in 15-minute intervals and is included in the attached signal warrant analysis.

Summary of MUTCD Signal Warrant Analysis:

MUTCD Signal Warrants	Warrant Satisfied?	Notes / Summary
Warrant 1: Eight-Hour Vehicular Volume	☐ Yes ☐ No ☐ N/A	
Warrant 1: VDOT ADT Option[1]	☒ Yes ☐ No ☐ N/A	Projected volumes: Mainline -32,315 vpd Minor Street (1-direction) – 5,206 vpd (see graphic on page 4 for site generated traffic that was added to existing mainline ADT). See information on following pages.
Warrant 2: Four-Hour Vehicular Volume	☒ Yes ☐ No ☐ N/A	Numerical requirements for Warrant 2 are met. See attached signal warrant analysis for details.
Warrant 3: Peak Hour[2]	☒ Yes ☐ No ☐ N/A	Numerical requirements for Warrant 3 are met. See attached signal warrant analysis for details.
Warrant 4: Pedestrian Volume	☐ Yes ☒ No ☐ N/A	Pedestrian activity is minimal at this study intersection.
Warrant 5: School Crossing	☐ Yes ☐ No ☒ N/A	Click or tap here to enter text.
Warrant 6: Coordinated Signal System	☐ Yes ☒ No ☐ N/A	Upstream signal has no coordination.
Warrant 7: Crash Experience	☐ Yes ☐ No ☒ N/A	Click or tap here to enter text.
Warrant 8: Roadway Network	☐ Yes ☐ No ☒ N/A	Click or tap here to enter text.
Warrant 9: Intersection Near a Grade Crossing	☐ Yes ☐ No ☒ N/A	Click or tap here to enter text.

Are the signal warrant analyses based on current volumes or anticipated future volumes?
☐ Current volumes ☒ Anticipated future volumes/conditions

If the signal warrant is only met under future conditions, provide a summary of trip generation assumptions and anticipated development thresholds that will trigger the signal being justified:
Signal warrants were met based on the forecasted volumes with the development being at full buildout in 2026. Traffic that may be generated by the proposed development was established using equations and rates available through the Institute of Transportation Engineer's (ITE) Trip Generation, 10th Edition.

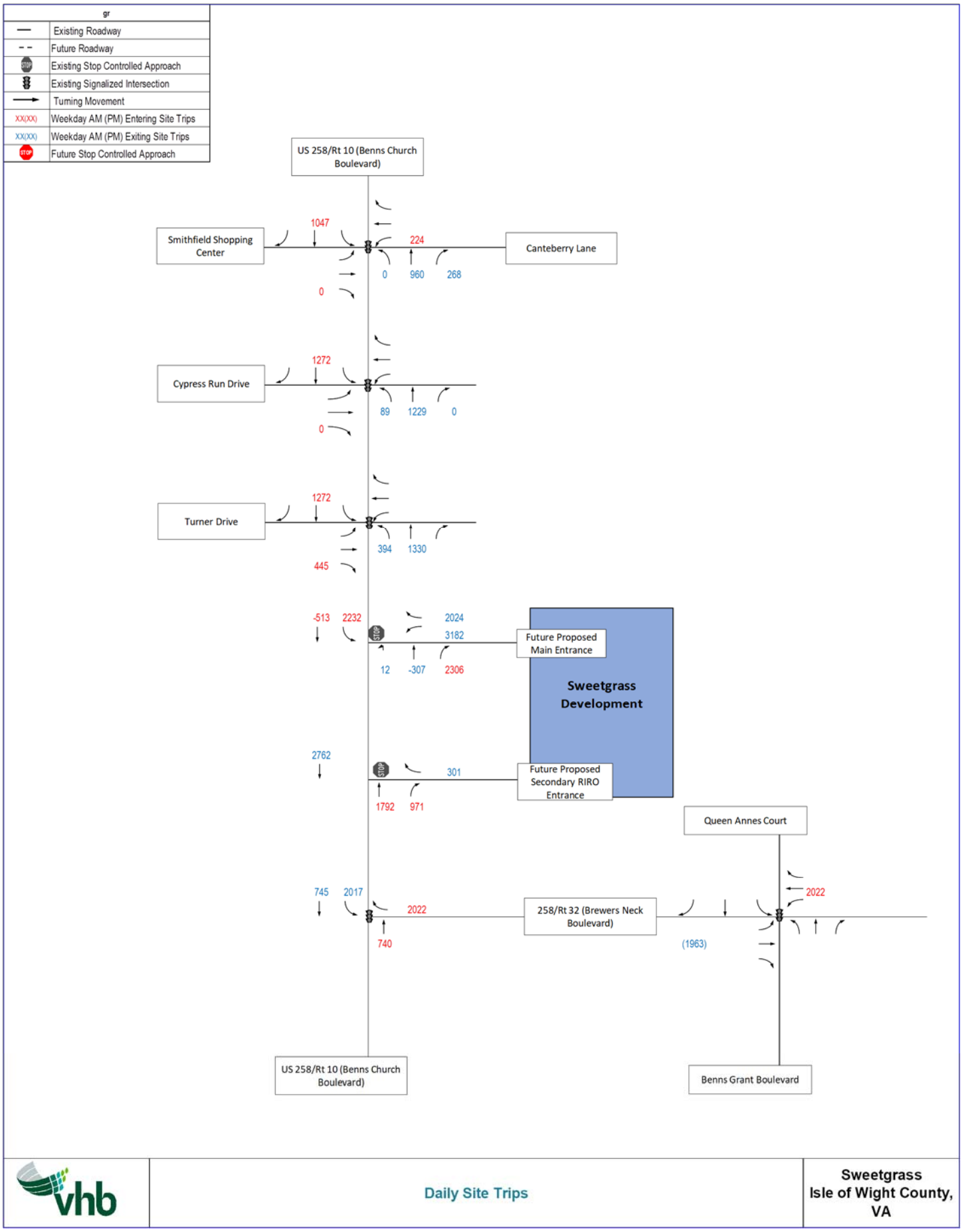
Trip generation for the site was prepared for each individual land use. ITE provides information for single-family detached housing (Land Use 210), low-rise multi-family housing (Land Use 220), public park (Land Use 411), shopping center (Land Use Code 820) and fast food with drive-through (Land Use 934).
The types of commercial development are unknown at this time, so shopping center was used. Pass-by trips to/from fast food restaurant were considered at 49% rate and pass-by trips to/from the shopping center were considered at 34% rate.
Summary of all future site trips are presented in the following tables and graphic.
Based on 70% reduction for speeds over 40 mph, a signal is warranted when the development is 43% complete.

Land Use	ITE Code	Size	Units	Daily	AM Peak Hour			PM Peak Hour		
					Enter	Exit	Total	Enter	Exit	Total
Conceptual Site Plan										
Single-Family Detached Housing	210	400	Dwelling Units	3,776	74	222	296	249	147	396
Multifamily Housing (Low-Rise)	220	285	Dwelling Units	2,144	30	101	131	101	59	160
Public Park	411	4	Acres	91	0	0	0	13	10	23
Shopping Center	820	30	1000 Sq. Ft. GLA	2,651	17	11	28	107	116	223
Fast Food with Drive-Thru	934	5	1000 Sq. Ft. GLA	2,355	102	99	201	85	78	163
Subtotal				**11,017**	**223**	**433**	**656**	**555**	**410**	**965**
Pass-by Trips (Fast Food only)	49%		% Pass-by	1,154	50	49	98	42	38	80
Pass-by Trips (Shopping Center)	34%		% Pass-by	901	6	4	10	36	39	76
Total New Trips				**8,962**	**167**	**380**	**548**	**477**	**333**	**809**

Reference: Trip Generation, 10th Edition, Institute of Transportation Engineers, Washington, DC. 2017.
Note: Used highest total between average rate and fitted curve unless R2<0.75

Land Use	ITE Code	Size	Units	Daily		
				Enter	Exit	Total
Conceptual Site Plan						
Single-Family Detached Housing	210	400	Dwelling Units	1888	1,888	3,776
Multifamily Housing (Low-Rise)	220	220	Dwelling Units	1072	1,072	2,144
Public Park	411	4	Acres	46	45	91
Shopping Center	820	30	1000 Sq. Ft. GLA	1326	1,325	2,651
Fast Food with Drive-Thru	934	5	1000 Sq. Ft. GLA	1177	1,178	2,355
Subtotal				**5,509**	**5,508**	**11,017**
Pass-by Trips (Fast Food only)	49%		% Pass-by	577	577	1,154
Pass-by Trips (Shopping Center)	34%		% Pass-by	451	450	901
Total New Trips				**4,481**	**4,481**	**8,962**

Reference: Trip Generation, 10th Edition, Institute of Transportation Engineers, Washington, DC. 2017.
Note: Used highest total between average rate and fitted curve unless R2<0.75



Daily Site Trips

Sweetgrass
Isle of Wight County, VA

III. VJuST Innovative Intersection Consideration

Summary of Potentially Feasible Innovative Intersections according to VJuST results:

Innovative Intersection Type	Feasibility Decision and Reason
Roundabout	Is a roundabout feasible? ☐ Yes ☒ No Explanation: The roundabout design was found to exceed capacity in both the AM and PM 2026 Build Condition. Additionally, the subject intersection is located on the major roadway (US 258/Rt 10 (Benns Church Boulevard) were the posted speed limit is 45 MPH. The mainline approach speeds would need to be slowed to 25-30mph to facilitate the roundabout. Slowing traffic down on northbound and southbound approaches, roundabout installation would be impractical and can potentially create a bottleneck on US 258/Rt 10.
All Innovative Intersection Designs Example: Median U-Turn	Is this Innovative Intersection type feasible? ☐ Yes ☒ No Explanation: The space needed for a continuous green tee is anticipated to exceed the available median storage width and would require the removal of the northbound U-turn. Additionally it is anticipated the west parcel will be developed soon and a green-t would restrict access to the parcel as well as pedestrian activity between Sweetgrass and the future development. The spacing between Turner Drive and the proposed signal is just over 1,000 feet. The signalized locations of the displaced lefts or median U-turn would be placed with the influence of the intersection at Turner Drive. In the case of the median u-turn the median opening for the displaced southbound lefts would fall within the vicinity of the secondary right in/right out access which would create undesirable weaving movement conflicts.

IV. Intersection Configuration and Control Recommendations and Signal Justification

Intersection Configuration and Control Recommendations:

This engineering study examined traffic signal warrants using existing volumes and Sweetgrass development trip generation at the intersection of US 258/Rt 10 (Benns Church Boulevard) & Proposed Main Entrance into the development in Isle of Wight County, VA. It is important to note that the satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal. Engineering judgement should also be used in the evaluation of the warrants to ensure that a traffic control signal will improve the overall safety and/or operation of the intersection. The analysis showed that the traffic volume warrants (Warrants 1, 2 and 3) are met at the 70% and 100% thresholds defined by the MUTCD.

Left turn lanes (200’ storage with 200’ taper) and right turn lanes (200’ storage with 200’ taper) are required on US 258/Rt 10 (Benns Church Boulevard). The Proposed Main Entrance should have a single-entry lane and three exit lanes (dual lefts and an exclusive right).

Signal Justification:

The signal is recommended in this location based on the projected volumes. US 258/Rt 10 (Benns Church Boulevard) has heavy through volumes with posted speed limit of 45 mph. Left-turns onto the roadway out of the proposed development will be almost impossible without the proposed signal. The capacity analysis has shown that the intersection will operate acceptably with a minimum impact on the adjacent transportation network with signal installation in this location.

V. Approvals

Signal Justification Report Approvals:

District Traffic Engineer (DTE): Required for all SJRs

☐ Concur ☐ Do Not Concur

_____	_____	_____
Name	Signature	Date

Comments:

_____

_____

_____

_____

District Engineer/Administrator (DE/DA): Only required if SJR recommends a proposed signal on the APN

☐ Concur ☐ Do Not Concur

_____	_____	_____
Name	Signature	Date

Comments:

_____

_____

_____

_____

State Traffic Engineer (STE): Only required if SJR recommends a proposed signal on the APN

☐ Approved ☐ Denied

_____	_____	_____
Name	Signature	Date

Comments:

_____

_____

_____

_____

If additional comments are necessary, please attach the comments on another sheet.

Appendix A:
Signal Warrant Analysis

Traffic Signal Warrant Analysis

This report details the findings of a traffic signal warrant analysis on the US 258/Rt 10 (Benns Church Boulevard) & Proposed Main Entrance intersection, to determine whether a signal would be warranted for the opening day build year, 2026, of the Sweetgrass Development.

Evaluation of the need for a traffic signal at an intersection requires the examination of various factors such as traffic volumes, traffic flow and progression, and overall safety of the intersection to determine if a traffic signal would be warranted. Each of these elements is described below.

Methodology

Signal warrant analyses were performed following the procedures outlined in the 2009 edition of the Manual of Uniform Traffic Control Devices (MUTCD). Existing peak hour turning movement counts were collected at the study intersection and were used for this warrant analysis.

The traffic conditions of the intersection in the build year, 2026, were derived from a composition of existing turning movement volumes and a distribution of site trips from the Sweetgrass Development. The extent of signal warrant of the future conditions is limited by the data derived from the traffic forecast which includes only morning and evening peak hours and two additional hours, that were selected based on land uses that generate the highest traffic volumes: single-family detached housing, multifamily housing (low-rise) and fast-food restaurant.

Warrant Analysis Results

Warrant 1 – Eight Hour Vehicular Volume

Warrant 1, Eight-Hour Vehicular Volume, consists of two separate warrants; Warrant 1A-Minimum Vehicular Volume and Warrant 1B-Interruption of Continuous Traffic. The Minimum Vehicular Volume warrant is intended for use at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic signal. The Interruption of Continuous Traffic warrant is intended for use at locations where Warrant A is not satisfied and where the volume of traffic on a major street is so heavy that traffic on a minor intersecting street suffers excessive delay when attempting to cross or enter the major street. Warrant 1 is intended to be used as a single warrant; if Warrant A is met and Warrant B is not met, a traffic signal is warranted. Conversely, if Warrant A is not met and Warrant B is met, a traffic signal is still warranted.

Since this is a proposed entrance, VDOT's Traffic Signal Warrant Using Average Daily Traffic Estimate for the Virginia Supplement to the MUTCD was used. The future traffic projections at the US 258/Rt 10 (Benns Church Boulevard) & Proposed Main Entrance intersection were developed using the daily trip generation and distribution patterns shown in the TIA. The daily trip projections and associated site traffic are shown in the following table and figure respectively. For the signal warrant, the projected site trips on US 258/Rt 10 (Benns Church Boulevard) were added to the 2017 VDOT AADT of 25,000 vpd projected to Opening Day 2026 AADT of 28,585 vpd.

Land Use	ITE Code	Size	Units	Daily		
				Enter	Exit	Total
Conceptual Site Plan						
Single-Family Detached Housing	210	400	Dwelling Units	1888	1,888	3,776
Multifamily Housing (Low-Rise)	220	220	Dwelling Units	1072	1,072	2,144
Public Park	411	4	Acres	46	45	91
Shopping Center	820	30	1000 Sq. Ft. GLA	1326	1,325	2,651
Fast Food with Drive-Thru	934	5	1000 Sq. Ft. GLA	1177	1,178	2,355
Subtotal				**5,509**	**5,508**	**11,017**
Pass-by Trips (Fast Food only)	49%		% Pass-by	577	577	1,154
Pass-by Trips (Shopping Center)	34%		% Pass-by	451	450	901
Total New Trips				**4,481**	**4,481**	**8,962**

Reference: Trip Generation, 10th Edition, Institute of Transportation Engineers, Washington, DC. 2017.
Note: Used highest total between average rate and fitted curve unless R2<0.75

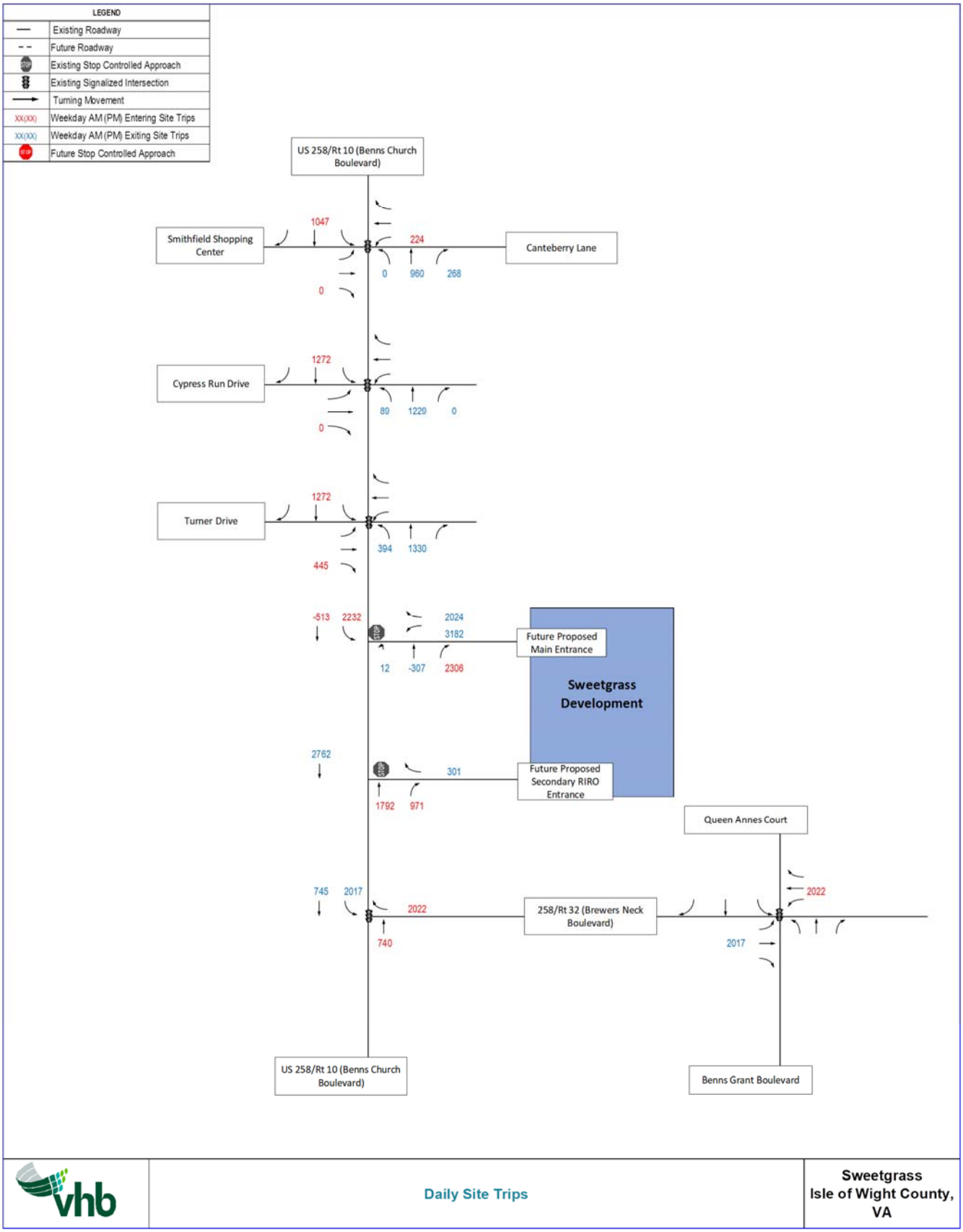

LEGEND
Existing Roadway
Future Roadway
Existing Stop Controlled Approach
Existing Signalized Intersection
Turning Movement
XX(XX) Weekday AM (PM) Entering Site Trips
XX(XX) Weekday AM (PM) Exiting Site Trips
Future Stop Controlled Approach
US 258/Rt 10 (Benns Church Boulevard)
Smithfield Shopping Center
Canteberry Lane
1047
224
0
960
268
0
Cypress Run Drive
1272
89
1229
0
0
Turner Drive
1272
394
1330
445
-513
2232
2024
3182
12
-307
2306
Future Proposed Main Entrance
Sweetgrass Development
2762
301
1792
971
Future Proposed Secondary RIRO Entrance
Queen Annes Court
745
2017
2022
2022
740
258/Rt 32 (Brewers Neck Boulevard)
2022
2017
US 258/Rt 10 (Benns Church Boulevard)
Benns Grant Boulevard
Daily Site Trips
Sweetgrass
Isle of Wight County, VA

Table 1: Future Conditions – Warrant 1 Condition A Summary

Number of Lanes		Vehicles per day on major street (total of both approaches)					Vehicles per day on minor street (total of both approaches)				
Major	Minor	100%	80%	70%	56%	Projected	100%	80%	70%	56%	Projected
2 or more	2 or more	9600	7680	6720	5376	32315	3200	2560	2240	1792	5206

Proposed signal warranted when development is: 43%

Warrant 1 is satisfied. The signal is projected to be warranted when the development is 43% built out with the 70% reduction due to the speed limit along the corridor.

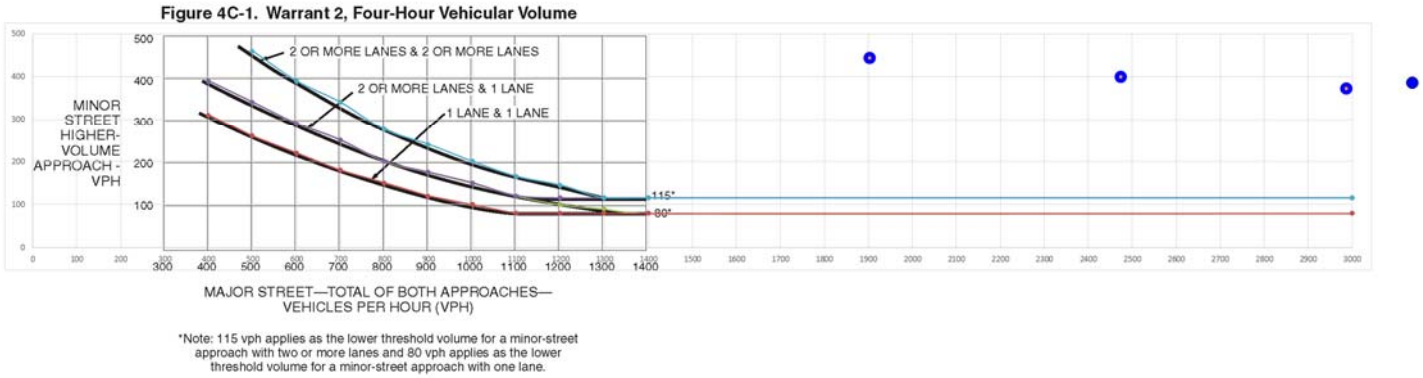
Warrant 2 – Four Hour Vehicular Volume

Warrant 2, Four-Hour Vehicular Volume, is intended for use at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic signal. A traffic signal is warranted based on Warrant 2 if "the plotted points representing the vehicles per hour on the major street and the minor street fall above the applicable curve."

Considering the two highest peak hours in terms of traffic volume at the study intersection the following figure shows that both, AM and PM peak hours, as well as additional two hours, would exceed the threshold of the Warrant. Based on the future land uses, it is expected that four hours would meet the minimum threshold volumes of the warrant.

Figure 1: 2026 Build Conditions Warrant 2

Time	Major Street (vph)	Minor Street (vph)
7:00 AM to 8:00 AM	2474	399
12:00 PM to 1:00 PM	1903	444
4:00 PM to 5:00 PM	3271	388
4:30 PM to 5:30 PM	2988	372



Warrant 2 is satisfied.

Warrant 3 – Peak Hour

Warrant 3, Peak Hour, "is intended for use at a location where traffic conditions are such that for a minimum of 1 hour of an average day, the minor-street traffic suffers undue delay when entering or crossing the major street." The Peak Hour warrant is met when "the plotted point representing the vehicles per hour on the major street and the minor street for one hour fall above the applicable curve" or based on the following conditions:

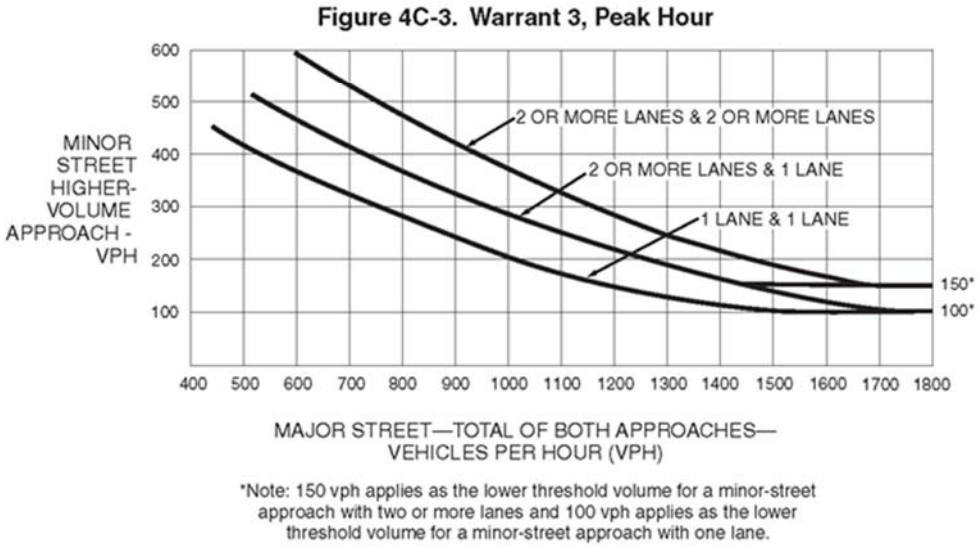
a) The total stopped time delay experienced by the traffic on one minor-street approach controlled by a stop sign equals or exceeds: 4 vehicle-hours for a one-lane approach; or 5 vehicle-hours for a two-lane approach, and

b) The volume on the same minor-street approach equals or exceeds 100 vehicles per hour for one lane or 150 vehicles per hour for two lanes, and

c) The total entering volume during the hour meets or exceeds 650 vehicles per hour for intersections with three approaches or 800 vehicles per hour for intersections with four or more approaches.

Figure 2: 2026 Build Conditions Warrant 3

Time	Major Street (vph)	Minor Street+ (vph)
7:00 AM to 8:00 AM	2474	336
4:30 PM to 8:00 AM	2988	352



As shown in Figure 2, both AM and PM peak hours fall above the curve for the geometric combination of 2 or more lanes on both the major and minor roadways.

Warrant 3 is satisfied.

Warrant 4 – Pedestrian Volume

Warrant 4, Pedestrian Volume, is intended for use at locations where the volume of traffic on the major street is so heavy that pedestrians experience significant delay or conflict when attempting to cross the major street. Warrant 4 is satisfied when "the pedestrian volume crossing the major street at an intersection during an average day is: 100 or more for each of any four hours; or 190 or more during any one hour."

Currently, there are no existing pedestrian sidewalks in the area of the study. It is not expected that the development will generate the pedestrian volumes levels required to satisfy the warrant due to the rural nature of the surrounding area.

Warrant 4 is not satisfied.

Warrant 5 – School Crossing

Warrant 5, School Crossing, is intended for use at locations “where the fact that school children cross the major street is the principal reason to consider installing a traffic control signal.” For the purposes of this warrant, the word "schoolchildren" includes elementary through high school students.

Warrant 5 is not applicable because there are no school crossings near the subject intersection.

Warrant 5 is not satisfied.

Warrant 6 – Coordinated Signal System

Warrant 6, Coordinated Signal System, is satisfied when “on a two-way street, adjacent signals do not provide the necessary degree of platooning and speed control and the proposed and adjacent signals could constitute a progressive signal system.”

A signal at Proposed Main Entrance would not help traffic platooning since the signal located at Turner Road is not coordinated.

Warrant 6 is not satisfied.

Warrant 7 – Crash Experience

Warrant 7, Crash Experience, is intended for use at locations where “the severity and frequency of crashes are the principal reasons to consider installing a traffic control signal.” A traffic signal is warranted based on Warrant 7 if the following criteria are met:

a) Adequate trial of alternatives with satisfactory observance and enforcement has failed to reduce the crash frequency; and
b) Five or more reported crashes, of types susceptible to correction by a traffic signal, have occurred within a 12-month period, each crash involving personal injury or property damage exceeding the applicable requirements for a reportable crash.

Due to the lack of crash data, we were unable to evaluate the severity and frequency of crashes at the intersection.

Warrant 7 is not satisfied.

Warrant 8 – Roadway Network

Warrant 8, Roadway Network, is intended when the proposed traffic signal will encourage concentration and traffic flow organization on a given roadway network. This Warrant is intended for location where two major routes meet or where traffic volumes exceed 1000 vehicles per hour.

Warrant 8 is not applicable because the minor street is an entrance into the development and is not a major roadway.

Warrant 8 is not satisfied.

Warrant 9 – Intersection Near a Grade Crossing

Warrant 9, Intersection Near a Grade Crossing, is intended for "use at a location where none of the conditions described in the other eight traffic signal warrants are met, but the proximity to the intersection of a grade crossing on an intersection approach controlled by a STOP or YIELD sign is the principal reason to consider installing a traffic control signal."

Warrant 9 is not applicable.

Warrant 9 is not satisfied.

Conclusions

Warrant Analysis Conclusions

This engineering study examined traffic signal warrants at the intersection of US 257/Rt 10 (Benns Church Boulevard) and the Proposed Main entrance. The analysis showed that the traffic volume warrants (Warrants 1, 2 and 3) are met at the 70% and 100% thresholds defined by the MUTCD. The warrant is based on projected traffic volumes as well as volumes generated by the development, calculated based on available traffic data from 10th edition of ITE Trip Generation Manual.

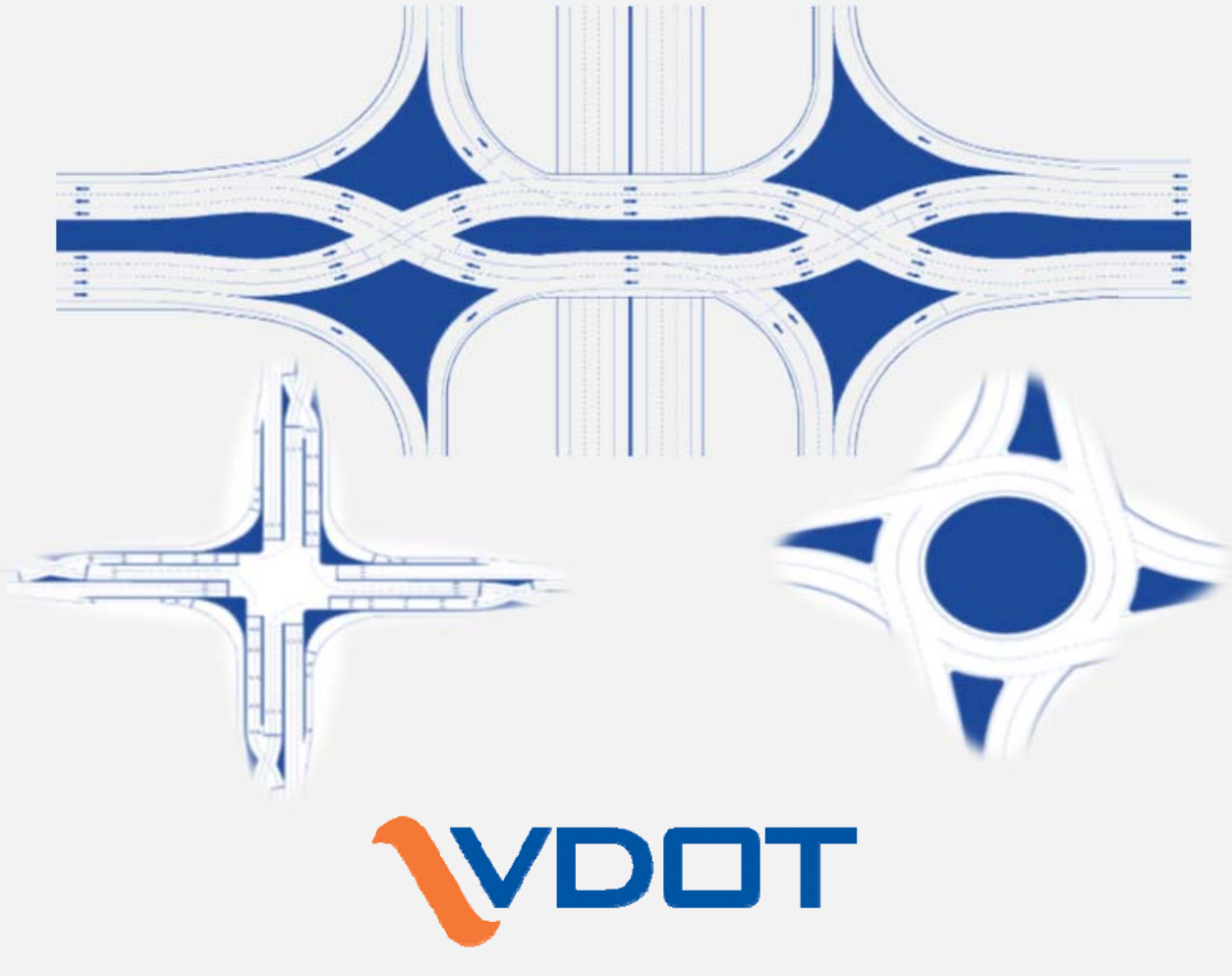
Appendix B:
VJuST Input and Results Worksheets

VJuST

VDOT Junction Screening Tool

Version 1.02
June 2018

View Disclaimer



VDOT

Modified from FHWA's Capacity Analysis for Junctions (CAP-X)

To Download the latest version of VJuST please go to: http://www.virginiadot.org/innovativeintersections
For Technical Support or Help please email: vjustsupport@vdot.virginia.gov

DISCLAIMER & ACKNOWLEDGMENTS

DISCLAIMER ACKNOWLEDGMENT

By indicating below, I acknowledge that I have obtained the most up-to-date version of this tool and that I have reviewed the Disclaimer.

Yes

DISCLAIMER FOR USERS OF THE VDOT JUNCTION SCREENING TOOL

The VDOT Junction Screening Tool ("VJuST") is offered to Users strictly for informational and educational purposes. VJuST is provided as-is, without warranty of any kind, express or implied. VDOT and the Commonwealth assume no liability or responsibility for VJuST's content or any Users' use of VJuST's content. VDOT and the Commonwealth do not endorse any course of action or recommendations adopted by Users as a result of using VJuST. By using VJuST, Users covenant not to sue VDOT or the Commonwealth for any effects arising out of or related to Users' use of VJuST. Users agree to hold VDOT and the Commonwealth harmless from any resulting liability from Users' use of VJuST. Users are strictly prohibited from altering, distributing, selling, or marketing VJuST.

The VDOT Junction Screening Tool is a modified or altered version of the CAP-X Software developed by the Federal Highway Administration (FHWA). VDOT's alterations to the CAP-X Software include:

- Seven new intersection and four new interchange configurations
- Two additional metrics (other than congestion):
    1. safety - based on weighted vehicle conflict points and
    2. pedestrians - based on the potential to accommodate pedestrians in terms of safety, wayfinding, and delay
- Enhanced congestion metric that includes consideration of shared lanes and/or channelized right-turn lanes

The following Disclaimer, Limited Warranty and Limitations of Remedies, and Notice apply to CAP-X Software elements within the VDOT Junction Screening Tool:

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The United States Government does not endorse products or manufacturers. Trade and manufacturers' names may appear in this software product only because they are considered essential to the objective of the software product.

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The use and testing of the CAP-X software is being done strictly on a voluntary basis. In exchange for the provision of CAP-X software, the user agrees that the Federal Highway Administration, U.S. Department of Transportation, any other agency of the Federal Government or distributor shall not be responsible for any errors, damage or other liability that may result from any and all use of the software, including installation and testing of the software. The user further agrees to hold the FHWA, the Federal Government, and distributor harmless from any resulting liability. The user agrees that this hold harmless provision shall flow to any person to whom or any entity to which the user provides the CAP-X software. It is the user's full responsibility to inform any person to whom or any entity to which it provides the CAP-X software of this hold harmless provision.

DISCLAIMER & ACKNOWLEDGMENTS

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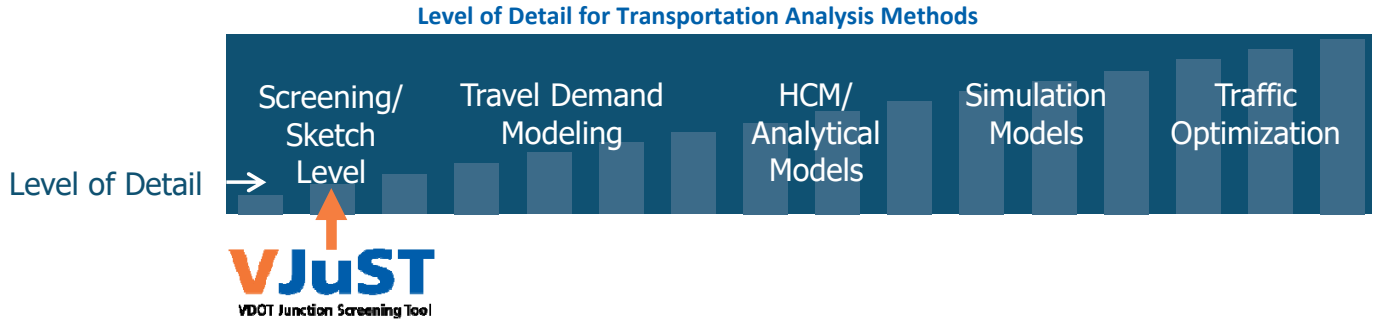
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VJuST
VDOT Junction Screening Tool

OVERVIEW OF THE TOOL

BACKGROUND

The Federal Highway Administration (FHWA) Office of Operations Research and Development developed the Capacity Analysis for Planning of Junctions (CAP-X) software to screen innovative intersection and interchange configurations. CAP-X is a sketch-level tool that was created to help users focus on more effective intersection and interchange configurations prior to conducting more demanding traffic simulations. The figure below illustrates the level of detail associated with sketch-level tools in relation to more robust methods.



CAP-X uses the Critical Lane Volume (CLV) method to provide sketch-level capacity assessments for innovative intersection and interchange configurations using peak hour volumes. The CLV method estimates an overall intersection volume-to-capacity ratio assuming the maximum capacity of the intersection is fixed (i.e., no variance in traffic signal timings).

In 2016, the Virginia Department of Transportation (VDOT) altered the CAP-X software for use in determining the congestion component in the SMART SCALE application scoring process. More information about the SMART SCALE process may be found at http://vasmartscale.org/. The VDOT innovative Intersection Committee requested that the CAP-X software tool be modified further for use in screening innovative intersection and interchange configurations in terms of congestion, pedestrians, and safety. Ultimately, the VDOT Innovative Intersection Committee envisions the tool to be useable by local jurisdictions as well as VDOT engineers and planners during the SMART SCALE application process. The tool was renamed to the VDOT Junction Screening Tool and now includes 26 unique intersection and interchange configurations, 15 of which were originally in CAP-X.

PURPOSE

The VDOT Junction Screening Tool is intended to aid transportation engineers and planners in Virginia with considering and screening innovative intersection and interchange configurations that address mobility and safety issues. This sketch-level tool can help identify and screen innovative intersection and interchange configurations to be evaluated for further study, analysis and design. Results are based on user inputs for turning movement volumes and lane configurations. This tool is only applicable to isolated intersections or interchanges; however, the results may be indicative of how an intersection or interchange within a corridor will operate.

The results provided in the VDOT Junction Screening Tool are not meant to replicate the results that would be obtained from more detailed traffic operations, safety, and design analyses. As such, the VDOT Junction Screening Tool is intended to provide information to users that will aid them in the planning, screening, and decision-making processes used to determine which innovative intersection and interchange configurations should move forward to a more detailed analysis.

SCORING SYSTEM

The VDOT Junction Screening Tool provides information to users in three categories: congestion, pedestrians, and safety. Further information on the development of each category is outlined below. This tool does not prioritize any category over another and congestion is the only category dependent on user inputs. It is the user's responsibility to decide how to apply and prioritize the results from this tool.

OVERVIEW OF THE TOOL

Congestion

Volume-to-capacity (V/C) ratio is the primary metric used to reflect congestion when comparing configurations. V/C ratio is calculated using the CLV method with the assumption that the maximum capacity of the intersection is fixed. This calculation is dynamic and is dependent on the volume and lane configuration inputs entered into the VDOT Junction Screening Tool. This calculation does not consider signal timing, geometric, or driver behavior parameters and is not intended to replicate the calculations produced by traffic analysis tools.

The user must verify the number of left-turn, through, and right-turn lanes entered for each innovative intersection or interchange configuration that is considered. Misleading results are possible if lane configurations are inconsistent across similar intersection or interchange configurations. This tool generally does not limit the number of lanes that are assigned to a particular movement. The user should also consider right-of-way (ROW) impacts and/or design requirements for an individual project when assigning lane configurations.

Some of the innovative intersection or interchange configurations are divided into multiple zones, with each zone representing a location with conflicting volumes, such as a signalized intersection or crossover. The CLV method is applied individually for each zone to calculate a V/C ratio. This method determines the maximum volume per lane that must be accommodated during each signal phase and sums the critical phase volumes to determine the overall critical volume that must be accommodated by the zone. A value of 1,600 passenger cars per lane is assumed for the maximum intersection CLV. The calculated CLV for a zone is then divided by the maximum intersection CLV to determine the V/C ratio for that zone. The maximum V/C ratio of all zones that make up an innovative intersection or interchange configuration is summarized in the Results Worksheet. This V/C ratio represents the worst bottleneck in the configuration. The following table from the Highway Capacity Manual (HCM) 2000 may be used to relate the maximum V/C ratio to a description of capacity.

Capacity Description Based on V/C Ratio

V/C Ratio	Description of Capacity
< 0.85	Under capacity
0.85 - 0.95	Near capacity
0.95 - 1.0	At capacity
> 1.0	Over capacity

Source: *Highway Capacity Manual 2010*

Pedestrian

Innovative intersection and interchange configurations were evaluated based on its potential to accommodate pedestrians considering relative impact on pedestrian safety, wayfinding, and delay. The metric developed is a static metric that is not dependent on vehicular volumes, pedestrian volumes, or the number of lanes. The potential to accommodate pedestrians is qualitatively defined as better (+), similar (blank cell), or worse (-) when compared to a conventional intersection or a traditional diamond interchange. The following components were considered in determining this rating:

Safety

- Direction of traffic flow
- Number of vehicle/pedestrian conflicts
- Relative crosswalk lengths

Wayfinding

- Crosswalk alignment

Delay

- Number of crossings for a single movement
- Traffic signal cycle length

OVERVIEW OF THE TOOL

Safety

The relative safety of each innovative intersection or interchange configuration was estimated using a risk analysis based on vehicle conflict points. The three types of conflict points (crossing, merging, and diverging) were weighted based on the calculated average crash cost associated with each conflict point type. The methodology for determining the weighting system is outlined in the Safety Information worksheet. The conflict point diagram, number of conflict points, and the weighted total conflict point metric can be found in the Safety - Conflict Point Diagram section of each lane configuration worksheet.

ASSUMPTIONS

The following assumptions apply to the entire tool. Assumptions for a specific innovative intersection or interchange configuration are listed on the lane configuration worksheet.

- This tool defines an intersection configuration as a junction of two interrupted roadways, regardless of grade separation. This tool defines an interchange configuration as a junction of two roadways where one roadway remains uninterrupted.
- This tool is to be used to screen configurations for isolated intersections only. This tool does not consider adjacent intersections or a series of intersections in a corridor.
- This tool does not assume a base or existing condition. It assumes innovative configurations to be proposed conditions and compares them against each other.

- With the exception of the unsignalized configurations (50 Mini Roundabout, 75 Mini Roundabout, Roundabout, TWSC, Single Roundabout, Double Roundabout), each zone in a configuration is assumed to be signalized.
- Signal timing is not considered as part of CLV methodology.

- The TWSC and roundabout lane configuration worksheets do not use the CLV methodology. These worksheets use the *Highway Capacity Manual* (*HCM*), 6th Edition methodology or methodology established in the article *Determination of Mini-Roundabout Capacity in the United States* to compute the congestion metrics.

- Vehicule volumes, pedestrian volumes, and number of lanes were not considered as part of the pedestrian metric.
- Pedestrian and bicycle conflicts were not considered in the development of the conflict point diagrams.
- The number of lanes was not considered in the development of the conflict point diagrams.
- A default value of 1,600 passenger cars per lane is assumed for the maximum intersection CLV.
- U-turn volumes from the TMCs are treated as left-turns. This tool only analyzes U-turns that are built into an innovative intersection or interchange configuration to remove left-turning traffic from an intersection (e.g., Restricted Crossing U-Turn).
- If a turning movement shares a lane with the through movement, the turning volume is factored by an adjustment factor to convert it to an equivalent through movement. For right turns or left turns with no opposing right-turn and through movements, the turning volume is divided by the left- or right-turn adjustment factor. For left turns with opposing right-turn and through movements, the left-turn volume is instead multiplied by a custom left-turn factor based on the opposing volume.

Custom Left-Turn Factors

Opposing Volume	Custom Factor
< 200	1.1
200 - 599	2
600 - 799	3
800 - 999	4
≥ 1,000	5

Sources: *Guidelines for the Analysis of the Traffic Impact of Development Proposals; City of Frederick - Traffic Impact Study Guidelines*

● If an approach has both a shared through-left lane and an exclusive left-turn lane, this approach and its opposing approach are assumed to operate with split phasing.

● If a movement has both a shared and an exclusive lane, the volume is distributed between the two lanes based on the number of lanes indicated. The proportion of the turning volume that is assigned to the shared lane is divided by the left- or right-turn adjustment factor to convert it to an equivalent through movement. For example, if the northbound movement has a left-turn lane and a shared left-through lane, 50% of the left-turn volume is assigned to each lane.
● If a right-turn movement is channelized with a receiving lane, the right-turn volume is not considered in the CLV calculations for that zone.

● Unless specified with the lane configuration worksheet, right-turn movements are not assumed to be channelized.
● For interchange configurations, it is assumed that no vehicles on the off-ramp make through movements.

LIST OF ABBREVIATIONS

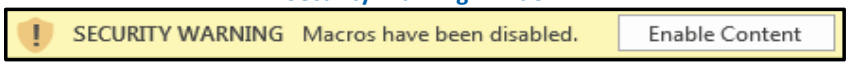
CAP-X	Capacity Analysis of Junctions
CLV	Critical Lane Volume
CGT	Continuous Green-T
DDI	Diverging Diamond Interchange
DLT	Displaced Left Turn
EB	Eastbound
E-W	East-West
FHWA	Federal Highway Administration
HCM	Highway Capacity Manual
Hr	Hour
ICD	Inscribed Circle Diameter
LTAF	Left-Turn Adjustment Factor
MUT	Median U-Turn
MUD	Michigan Urban Diamond
NB	Northbound
N-E	North-East
N-S	North-South
N-W	North-West
Parclo	Partial Cloverleaf
PC/Hr	Passenger Cars Per Hour
PCE	Passenger Car Equivalent
PCPH	Passenger Cars Per Hour
PCL	Partial Cloverleaf
PMUT	Partial Median U-Turn
QR	Quadrant Roadway
RCUT	Restricted Crossing U-Turn
ROW	Right-of-way
RTAF	Right-Turn Adjustment Factor
SB	Southbound
S-E	South-East
S-W	South-West
SPUI	Single Point Urban Interchange
TD	Traditional Diamond
TMC	Turning Movement Count
UTAF	U-Turn Adjustment Factor
V/C	Volume/Capacity
VDOT	Virginia Department of Transportation
Veh/Hr	Vehicles per hour
WB	Westbound

VJuST
VDOT Junction Screening Tool

INSTRUCTIONS

Upon opening the tool, click the Enable Content button as shown in the security warning window.

Security Warning Window



This tool contains the following worksheets to screen innovative intersection and interchange configurations and report results:

- **Input Worksheet** - the user inputs general project information, traffic volumes, and adjustment factors and to select which innovative intersection and interchange configurations should be considered
- **Lane Configuration Worksheets (29)** - the user inputs lane configurations and calculates the congestion metrics using the Critical Lane Volume (CLV) methodology
- **Results Worksheet** - summarizes the congestion, pedestrian, and safety metrics for the innovative intersection and interchange configurations selected for comparison

The following worksheets are also included for reference and guidance in screening innovative intersection and interchange configurations:

- **Overview** - describes the methodologies used to calculate the congestion, pedestrian, and safety metrics
- **Safety Information** - summarized the process used to develop the conflict point weighting factors used to develop the safety metric
- **Design Considerations** - provides a description of the innovative intersection and interchange configurations and provides guidance on when a configuration should be considered

This tool can be used to screen innovative intersection and interchange configurations following the four steps provided below.

Step 1: Enter Volume Inputs
Step 2: Review and Select Intersection and Interchange Configurations for Comparison
Step 3: Enter Lane Configurations (for each selected worksheet)
Step 4: View and Interpret Results

STEP 1: ENTER VOLUME INPUTS

Input the project title and the names of the east-west roadway facility and the north-south roadway facility. This information will be automatically populated on each subsequent worksheet.

This tool requires the user to input turning movement counts (TMCs) into the yellow cells on the **Input Worksheet** to compare innovative intersection and interchange configurations. The traffic counts may be for the current year or may be projected to a future year. If the TMC includes U-turn volumes separately, then add the U-turn volume to the left-turn volume. This tool does not analyze U-turns unless U-turns are built into an innovative intersection configuration to remove left-turning traffic from an intersection (e.g., Restricted Crossing U-Turn).

Traffic Volume Demand Inputs

Traffic Volume Demand				
Direction	Volume (veh/hr)			Truck Percent (%)
	U-Turn / Left	Thru	Right	
Eastbound	251	276	376	2.00%
Westbound	238	377	111	2.00%
Southbound	644	0	196	2.00%
Northbound	202	0	427	2.00%
Adjustment Factor	0.80 / 0.95		0.85	
Suggested	U - 0.8 / L - 0.95		0.85	
Truck to PCE Factor		Suggested = 2.00		2.00
Critical Lane Volume		1600		

VJuST
VDOT Junction Screening Tool

INSTRUCTIONS

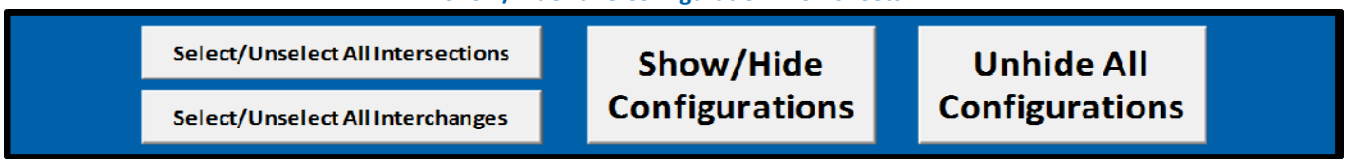
This tool uses adjustment factors to convert turning vehicles to equivalent through vehicles before calculating the CLV. Suggested values for these factors are provided in the tool; however, these values may be changed based on the typical traffic mix, driver behavior, and project location. Input the following factors into the yellow cells:

- Left-turn adjustment factor (LTAF): conversion of protected left- and U-turning vehicles to equivalent through vehicles
- Right-turn adjustment factor (RTAF): conversion of right-turning vehicles to equivalent through vehicles
- U-turn adjustment factor (UTAF): conversion of U-turning vehicles (rerouted through or left-turn movements) to equivalent through vehicles (this factor is only used if U-turns are built into an alternative configuration to remove left-turning traffic from an intersection)
- Truck to passenger car equivalent (PCE) factor: conversion of truck volume to an equivalent passenger car volume. This may be based on the *HCM, 6th Edition* .

STEP 2. REVIEW AND SELECT INTERSECTION AND INTERCHANGE CONFIGURATIONS FOR COMPARISON

Review the list of alternative intersection and interchange configurations included in this tool. Each configuration contains a link to an informational worksheet that provides guidance on when each configuration type should be considered. Indicate with a "Y" any configurations that should be considered. Indicate with an "N" any configurations that should be excluded. Use the **Show/Hide Configurations** button to hide the worksheets for all "N" configurations. The configurations selected for exclusion will also be hidden from the Results Worksheet. The **Unhide All Configurations** button may be used to unhide all worksheets. Additionally, three toggle buttons allow the user to select or unselect all intersections or interchanges. However, these toggle buttons will not hide the respective lane configuration worksheets; the user must still use the **Show/Hide Configurations** button.

Show/Hide Lane Configuration Worksheets



Provide justification by selecting an option in the drop down in the **Input Worksheet** for all alternative intersection and interchange configurations excluded for the screening comparison.

Justification Options

#	Intersections	Information	Consider?	Justification
	Signalized Intersections			
1	Conventional	-	Y	
2	Bowtie	Link	Y	
3	Center Turn Overpass	Link	N	
4	Continuous Green-T	Link	N	
5	Echelon	Link	Y	
6	Full Displaced Left Turn	Link	Y	
7	Median U-Turn	Link	Y	

Not feasible for roadway facility type
Insufficient intersection spacing
Financial constraints identified
Right-of-way restrictions identified
Unable to accommodate traffic patterns
Unable to accommodate magnitude of traffic volumes
Unable to accommodate heavy vehicles
Unable to accommodate alternative transportation modes

STEP 3: ENTER LANE CONFIGURATIONS

Complete the following steps for the intersection and interchange configurations selected for screening in the **Input Worksheet**.

Step 3.1: Answer the directional question (if applicable) **[Input Worksheet]**
Step 3.2: Enter the lane configurations **[Input Worksheet and Lane Configuration Worksheets]**

Step 3.1: Answer the Directional Questions

All asymmetrical configurations contain a question that will associate a direction with a geometric feature in the configuration to correctly reference the TMCs from the **Input Worksheet** to the lane configuration worksheets. These questions are located on the **Input Worksheet** as pictured below.

Example Directional Questions

VDOT Junction Screening Tool

Base Lane Configurations

Before entering a base number of through lanes for each direction, answer the directional question for each intersection or interchange configuration selected for consideration. Navigate to the lane configuration worksheet for example diagrams, if provided.

Intersections	Question	Selection
Bowtie	Select the roadway with the roundabouts from the drop-down list.	EB-WB / NB-SB
Continuous Green-T	Select the direction associated with the "stem" of the T-intersection from the drop-down list. See example diagrams.	
Echelon	Select the approach that shares a zone with the NB approach from the drop-down list. See example diagrams.	

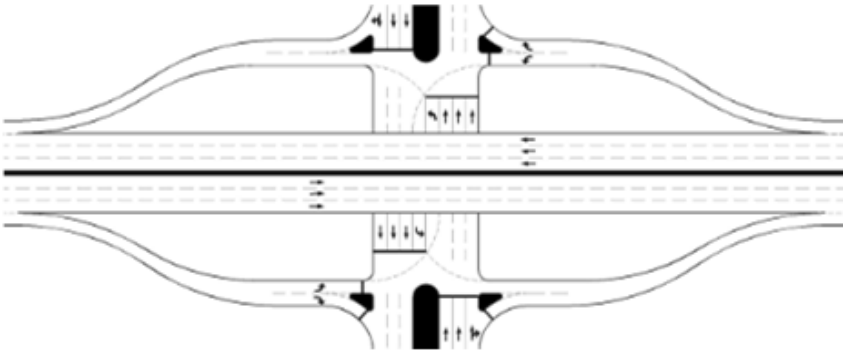
Directional Questions and Options:

- [All interchanges] Select the freeway direction from the drop-down list. EB-WB, NB-SB
- [Continuous Green-T] Select the direction associated with the "stem" of the T-intersection from the drop-down list. NB, SB, EB, WB
- [Partial Displaced Left Turn] Select the roadway with the displaced left turns. EB-WB, NB-SB
- [Multiple] Select the roadway with the U-turns from the drop-down list. EB-WB, NB-SB
- [Bowtie] Select the roadway with the roundabouts from the drop-down list. EB-WB, NB-SB
- [Split Intersection] Select the direction of the "split" roadway from the drop-down list. EB-WB, NB-SB
- [Echelon] Select the approach that shares a zone with the NB approach from the drop-down list. EB, WB
- [Single Loop] Select the quadrant that contains the loop from the drop-down list. N-E, N-W, S-E, S-W

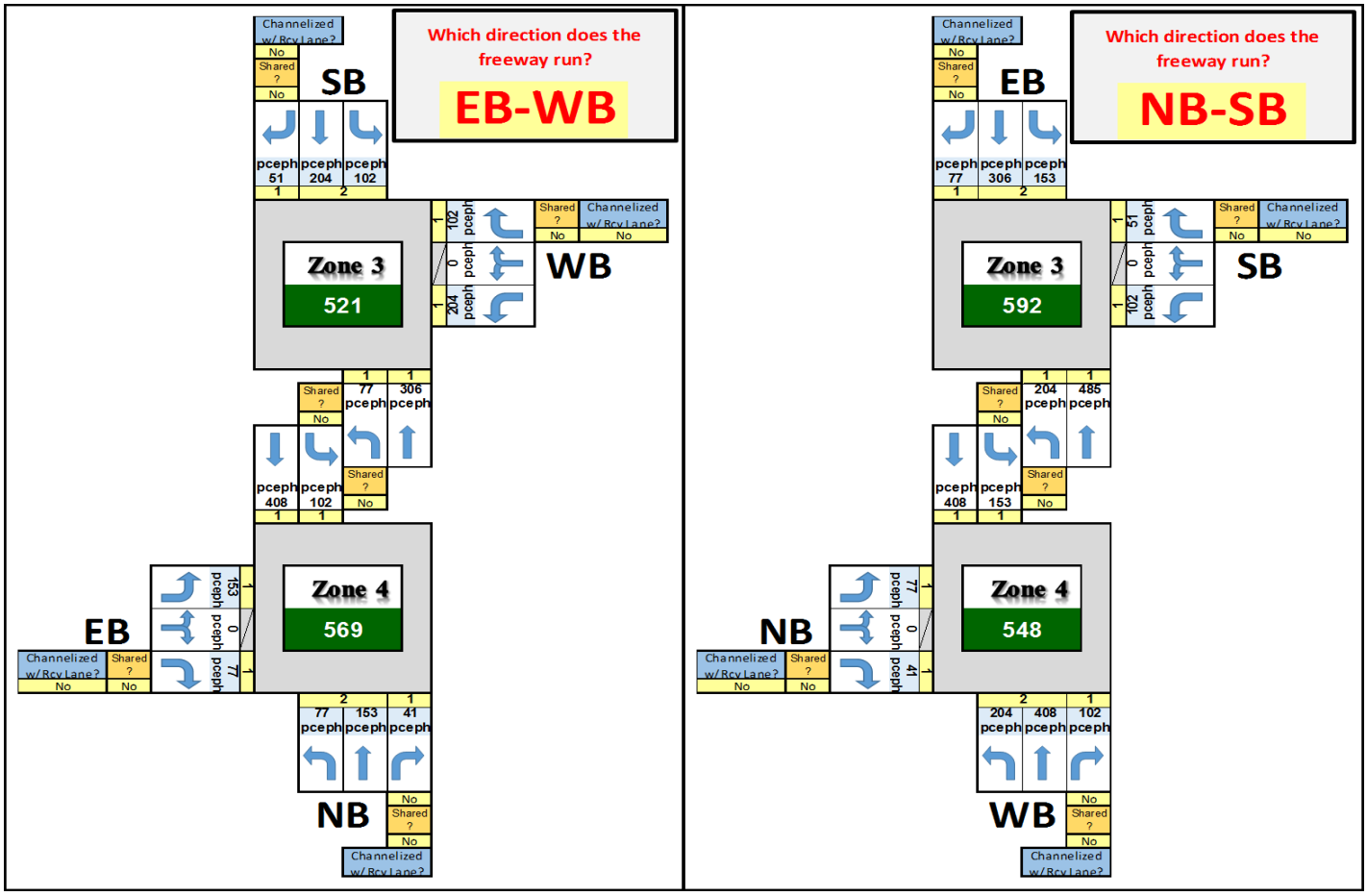
INSTRUCTIONS

Based on the answer provided in the directional question, the directional labels and volumes will update similar to the example figures shown below for a Traditional Diamond Interchange. The example figure and the layout of cells in the **Data Input and Configuration** section will not change.

Example Figure



Example Data Input and Configuration Layout



Step 3.2: Enter the Lane Configurations

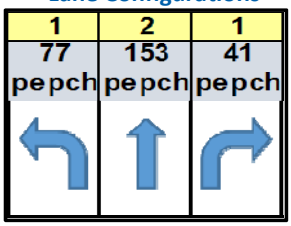
After answering the directional question for all applicable intersection and interchange configurations, enter a base number of through lanes for each travel direction on the **Input Worksheet** as pictured below. The number of through lanes entered here will be applied to each lane configuration worksheet. This base number may be overwritten on individual lane configuration worksheets. Turn lanes, shared lanes, and channelized lanes must still be entered in each lane configuration worksheet.

Base Number of Through Lanes

Base Number of Through Lanes	
If desired, enter a base number of through lanes for each direction. This number of through lanes will populate on each non-roundabout lane configuration worksheet. Although this tool allows the user to enter the number of through lanes for each lane configuration worksheet being compared on this worksheet, the user should still verify the lane configurations for each intersection or interchange configuration being compared.	
Eastbound	1
Westbound	1
Northbound	1
Southbound	1

Then, navigate to each lane configuration worksheet to verify the overall lane configuration for each approach direction. The lane configuration refers to the number of lanes for each left-turn, through, or right-turn movement. Inputs for lane configurations should be made into all yellow cells as shown in the figure below. This step should be followed on each worksheet selected for screening.

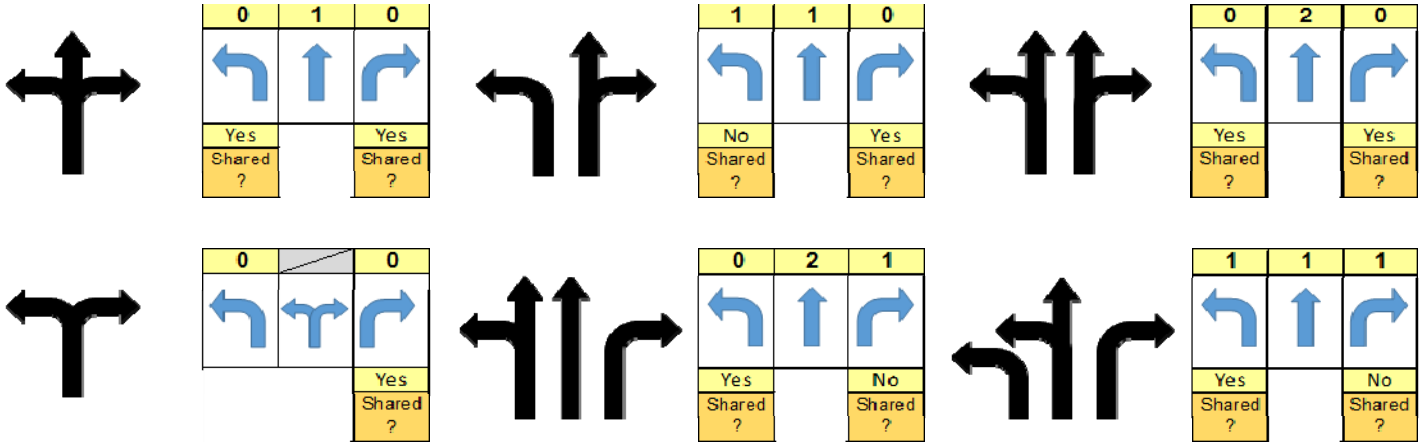
Lane Configurations



Note: This tool does not consider the geometric footprint, available right-of-way (ROW), or design requirements for an individual project. The tool generally does not limit the number of lanes that may be assigned to a particular movement. However, a pop-up box will appear asking the user to confirm the number of lanes if five or more through lanes or three or more turn lanes were entered.

Additionally, indicate if any shared lanes or channelized right-turn lanes are present. A right-turn lane should be identified as channelized only if a receiving lane is present and is at least 500 feet long. If a shared lane is present, count the lane only as a through lane and select "Yes" in the "Shared?" cell next to the appropriate turning movement. If an approach has one lane with a left-through-right movement, select one lane for the through movement and indicate that both the left- and right-turn movements are shared. If an exclusive turn lane is present in addition to the shared lane, enter one lane for the appropriate turning movement. Example shared-lane configurations and their respective inputs are shown below.

Example Shared-Lane Configurations



STEP 4: VIEW AND INTERPRET RESULTS

After completing Step 2, navigate to the **Results Worksheet**. This sheet compares the effectiveness of each alternative intersection and interchange configuration's potential to mitigate congestion, pedestrian, and safety concerns. Only the congestion metric is dependent on the inputs in Steps 1 and 2. The results shall not be interpreted until the user has performed Steps 1 and 2 on each lane configuration worksheet. The other metrics represent static values. Further descriptions of the congestion, pedestrian, and safety metrics are provided in the **Overview** and **Safety Information** tabs. These metrics do not consider signal timing parameters, geometric parameters, driver behavior parameters, available ROW, or design requirements for an individual project. It is the user's responsibility to determine how these factors may affect the results provided and decide how to apply and prioritize the results from this tool.

Descriptions of each alternative intersection and interchange configuration and guidance on when each configuration type should be considered are provided in the **Design Considerations** worksheet. Based on the results provided in the **Results Worksheet** and the information provided in the **Design Considerations** worksheet, the user may select which configurations should be selected for further study and evaluation.

SAFETY INFORMATION

The relative safety of an innovative intersection or interchange configuration was estimated by correlating crash data to assign a relative risk level associated with vehicle conflict points. The conflict points were weighted based on the calculated average crash cost associated with each conflict point type in Virginia. The methodology for determining the weighting system is outlined below. The conflict point diagram, number of conflict points, and the weighted total conflict point metric are included in the **Safety - Conflict Point Diagram** section of each lane configuration worksheet.

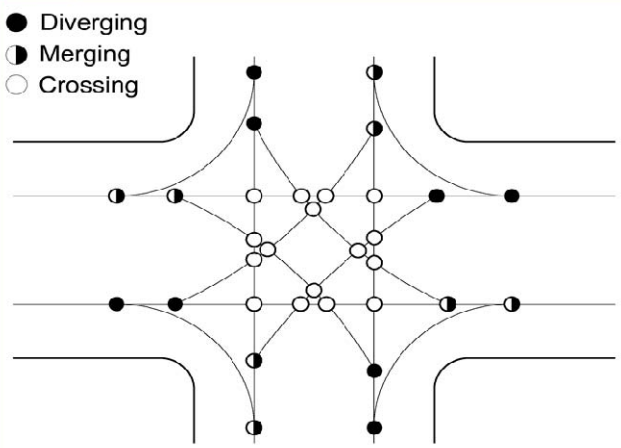
PART 1: CONFLICT POINT DIAGRAM METHODOLOGY

Conflict diagrams were developed for the innovative intersection and interchange configurations. Lines represent possible movements within the configuration. U-turns were only considered for innovative configurations that use U-turns to remove or relocate left-turning traffic from an intersection. Conflict points were defined as crossing, merging, or diverging conflicts at points of intersecting movements. A conflict point diagram is included in each lane configuration worksheet. An example diagram is shown below for a conventional intersection.

The conflict point diagrams and total number of conflict points are independent of the number of lanes, shared lanes, or channelization of movements. Additionally, the conflict point diagrams do not consider traffic signal phasing. Merge and diverge conflicts on the freeway are included for interchange configurations.

Example Conflict Diagram (Conventional Intersection)

Safety - Conflict Point Diagram



Conflict Type	Count
Crossing	16
Merging	8
Diverging	8
Total	**32**

Conflict Type	Weight
Crossing	2
Merging	1
Diverging	1

Weighted Total Conflict Points

48

PART 2: CONFLICT POINT WEIGHTING METHODOLOGY

The type, severities, and quantity of crashes that are likely to occur at each type of conflict point vary. Assumptions related to type and severity for the conflict point types were determined to allow for the comparison of configurations. A weighting system was then developed to produce a single safety metric. Four crash types were assigned to one or more conflict point types based on the likelihood of that crash type occurring. The crash types assigned to each conflict point type were as follows:

Crossing Conflict

- Head on
- Angle
- Sideswipe - opposite direction

Merging Conflict

- Sideswipe - same direction

Diverging Conflict

- Sideswipe - same direction

An average crash cost for an angle, head on, sideswipe - same direction, and sideswipe - opposite direction crash that occurred in Virginia between 2011 and 2015 was computed using the average crash cost by severity values from the Highway Safety Manual, 1st Edition.

Average Crash Cost By Severity

Severity	Crash Cost
Fatal (K)	$4,008,885
Disabling Injury (A)	$216,059
Evident Injury (B)	$79,777
Possible Injury (C)	$44,868
Property Damage (O)	$7,428

Source: *Highway Safety Manual, 1st Edition*

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SAFETY INFORMATION

Average Crash Cost in Virginia By Crash Type

Crash Type	Severity	Full Access Control		Partial Access		No Access Control		All Crashes	
		#	Avg Cost	#	Avg Cost	#	Avg Cost	#	Avg Cost
Angle	K	57	$72,195	28	$61,648	501	$55,276	618	$53,406
	A	542		240		6966		8689	
	B	1253		917		20917		26838	
	C	638		858		18433		23381	
	O	4546		2763		71505		94955	
	Total	7036		4806		118322		154481	
Head On	K	25	$242,784	5	$131,358	281	$162,816	331	$146,785
	A	84		33		1729		2075	
	B	91		54		2611		3286	
	C	41		38		1551		2037	
	O	293		130		4975		7135	
	Total	534		260		11147		14864	
Sideswipe - Same Direction	K	26	$34,673	3	$28,098	21	$24,967	51	$26,667
	A	390		23		556		1052	
	B	1320		75		1888		3632	
	C	635		124		2330		3562	
	O	8812		1075		19372		34309	
	Total	11183		1300		24167		42606	
Sideswipe - Opposite Direction	K	2	$108,807	0	$28,527	30	$55,669	32	$49,679
	A	11		1		413		483	
	B	32		11		1241		1450	
	C	7		16		798		1015	
	O	75		48		4273		5818	
	Total	127		76		6755		8798	

The average crash cost per conflict point type was calculated based on the average crash cost per crash type and the frequency of each crash type. These average crash costs per conflict point type were used to derive the weighting system used to assign relative risk to the conflict point types. It was determined that crashes occurring at crossing conflicts were roughly two times more costly, and therefore carry two times the risk, than crashes occurring at merging or diverging conflict points.

Average Crash Cost Per Conflict Point Type Per Facility Type

Conflict Point Type	Full Access Control		Partial Access		No Access Control		All Crashes	
	Avg Cost	Weight	Avg Cost	Weight	Avg Cost	Weight	Avg Cost	Weight
Crossing	$84,634	2.4	$64,683	2.3	$64,096	2.6	$61,014	2.3
Merging/Diverging	$34,673	1.0	$28,098	1.0	$24,967	1.0	$26,667	1.0

Weighting System Based on Risk Factor

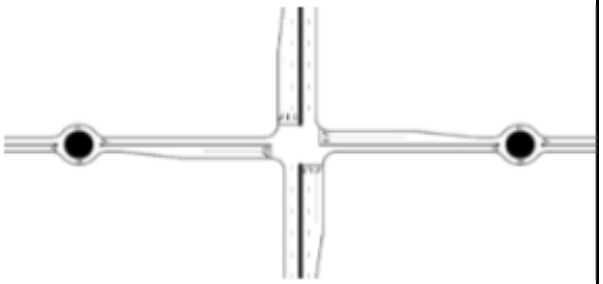
Conflict Point Type	Assigned Weight
Crossing	2
Merging	1
Diverging	1

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DESIGN CONSIDERATIONS

Intersection Designs

Bowtie



Back to Inputs

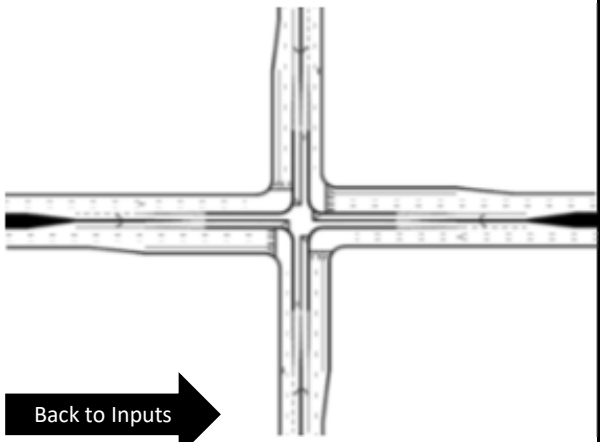
Description

The bowtie intersection is an alternative to the MUT intersection. Left-turn movements from both roadways are removed from the main intersection and are executed via a U-turn at a roundabout on the minor roadway downstream of the main intersection. Removing the left-turn movements allows for two-phase signal control.

When Should This Design Be Considered?

The bowtie intersection should be considered on roadways with high through volumes on the major roadway and low through and left-turn volumes on the minor roadway. Arterials with narrow medians and limited ROW should be considered.

Center Turn Overpass



Back to Inputs

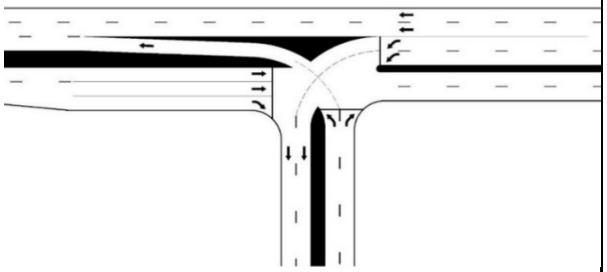
Description

All four left-turn movements are relocated to a grade-separated intersection using narrow ramps within the median. The left-turn traffic then descends back to ground level and merges into through traffic. Both intersections operate under two-phase signal control.

When Should This Design Be Considered?

The center turn overpass intersection should be considered at high-volume urban or suburban intersections where the major and minor roadways have similar left-turn volumes.

Continuous Green-T (CGT)



Back to Inputs

Description

Through traffic on the top side of a T-intersection is allowed to pass through the intersection without stopping. Left-turn volumes from the minor roadway must merge into the continuous lane of through traffic after completing the left turn. This design allows for three-phase signal control. The tool assumes the intersection is signalized. The intersection may be designed as unsignalized.

When Should This Design Be Considered?

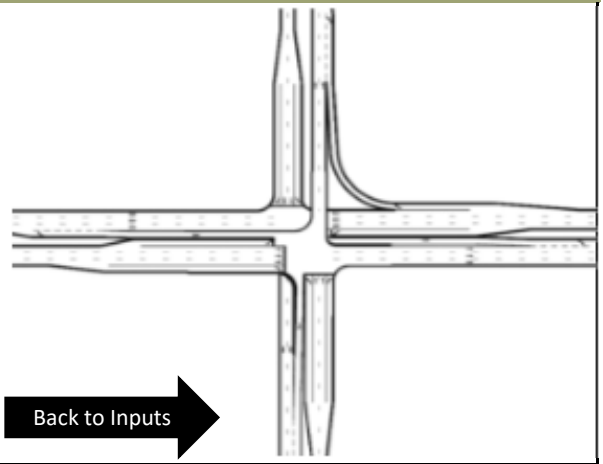
The continuous green-T intersection should be considered at three-leg intersections with moderate to low left-turn volumes on the minor roadway, high through volumes on the major roadway, and few pedestrian crossings.

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DESIGN CONSIDERATIONS

Intersection Designs

Echelon



Back to Inputs

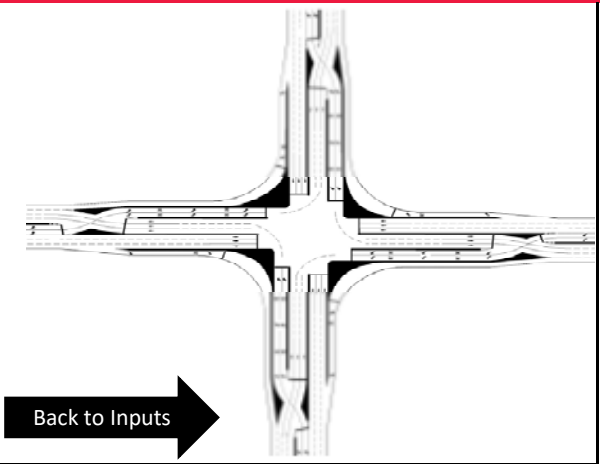
Description

One approach on both the major and minor roadways is elevated to create two grade-separated intersections of two one-way roads. Each intersection operates under two-phase signal control.

When Should This Design Be Considered?

The echelon intersection should be considered at high-volume urban or suburban intersections where the major and minor roadways have similar volumes.

Full/Partial Displaced Left Turn (DLT)



Back to Inputs

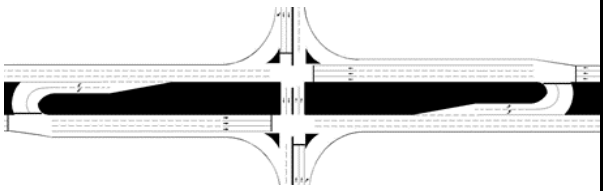
Description

Left-turning vehicles cross over to the other side of the roadway at a signalized intersection several hundred feet in advance of the main intersection. The protected left turns occur simultaneously with the opposing through movements at the main intersection, allowing for two- (full) or three-phase (partial) signal control. This design is also referred to as a Continuous Flow Intersection or Crossover Displaced Left Intersection.

When Should This Design Be Considered?

The displaced left turn intersection should be considered if opposing approaches have high and balanced through and left-turn volumes.

Full/Partial Median U-Turn (MUT)



Back to Inputs

Description

Left-turn movements from the major roadway (partial) or both roadways (full) are removed from the main intersection. These vehicles instead execute a U-turn at a median opening on the major roadway downstream of the main intersection. Removing the left-turn movements allows for two- (full) or three-phase (partial) signal control. This tool assumes all intersections are signalized. However, this intersection can be designed as partially unsignalized.

When Should This Design Be Considered?

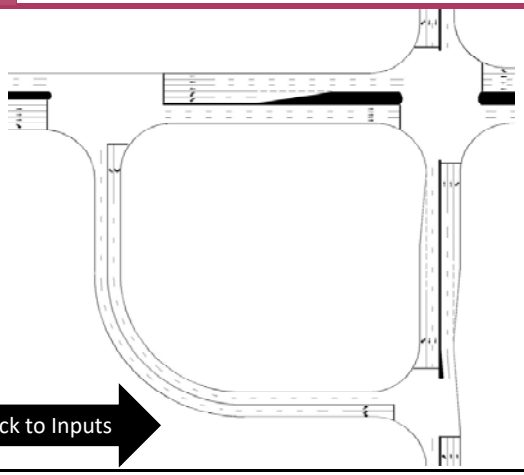
The median U-turn intersection should be considered on high-speed, median-divided highways with moderate left-turn volumes on the major roadway and minor left-turn volumes on the minor roadway.

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DESIGN CONSIDERATIONS

Intersection Designs

Quadrant Roadway (QR)



Back to Inputs

Description

All four left-turn movements are rerouted onto a connector road in one quadrant, allowing for two-phase signal control at the main intersection and three-phase signal control at the intersections with the connector road. This tool assumes all intersections are signalized. However, this intersection can be designed as partially unsignalized.

When Should This Design Be Considered?

The quadrant roadway intersection should be considered if an existing roadway can be used as a connection roadway or there are heavy left-turn and through volumes on the major and minor roadways. The ratio of minor road volume to total intersection volume is typically less than or equal to 0.35.

Restricted Crossing U-Turn (RCUT)



Back to Inputs

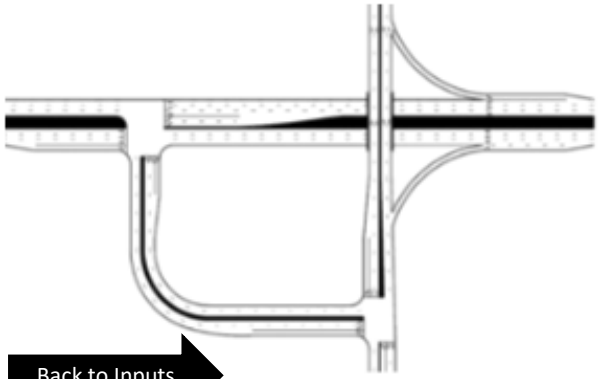
Description

Minor roadway left-turn and through movements are removed from the main intersection. These vehicles turn right onto the major roadway before making a U-turn at a downstream median opening. Removing these movements allows for two-phase signal control at the main intersection. This design is also referred to as a super street intersection. This tool assumes all intersections are signalized. However, this intersection can be designed as partially or fully unsignalized.

When Should This Design Be Considered?

The restricted crossing U-turn intersection should be considered on high-speed, median-divided highways with high through and left-turn volumes on the major roadway and low through volumes on the minor roadway.

Single Loop



Back to Inputs

Description

All four left-turn movements and some right-turn movements are rerouted onto a connector road in one quadrant, while the major and minor roadways are grade-separated. This design allows for three-phase signal control at the intersections with the connector road.This tool assumes all intersections are signalized. However, this intersection can be designed as fully unsignalized.

When Should This Design Be Considered?

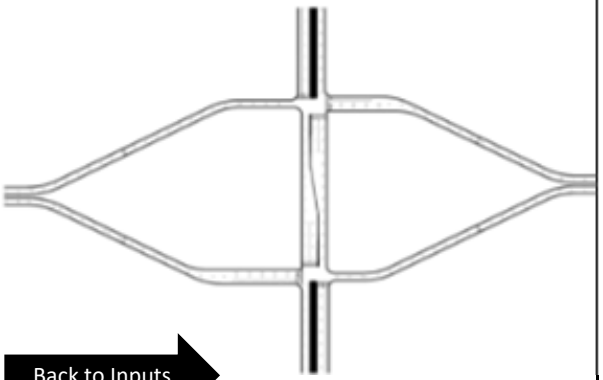
The single loop intersection should be considered for roadways with low to medium left-turn volumes.

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DESIGN CONSIDERATIONS

Intersection Designs

Split Intersection



Back to Inputs

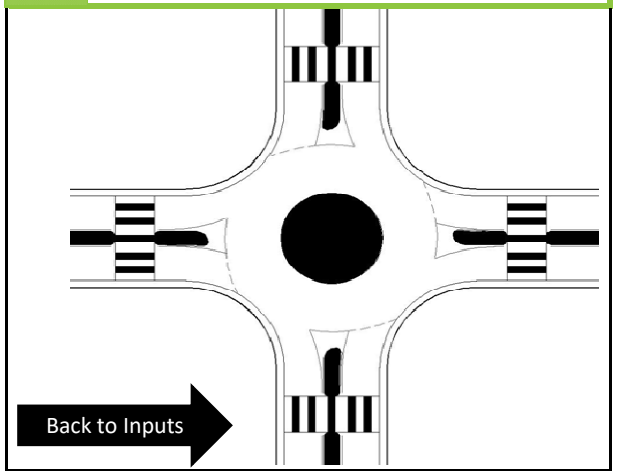
Description

The split intersection separates traffic flow on the major roadway into two one-way roads with separate intersections with the minor roadway. Each intersection may operate using three-phase signal control. This configuration is similar to a traditional diamond interchange without grade separation.

When Should This Design Be Considered?

The split intersection should be considered for isolated, suburban intersections with high left-turn volumes or in urban areas where two-way streets can be converted to one-way streets. The split intersection may also be considered if grade separation may be needed in the future.

Mini Roundabout



Back to Inputs

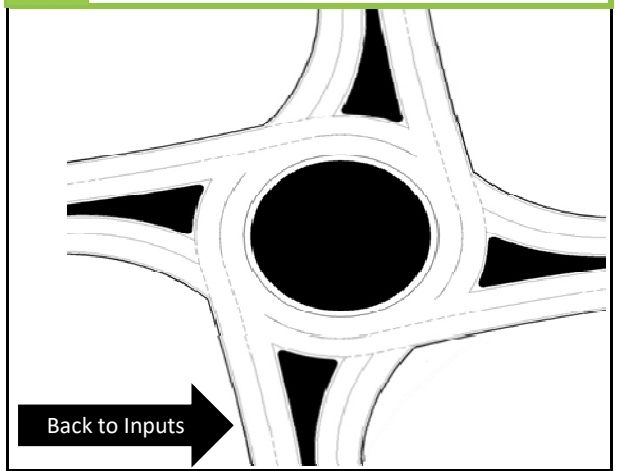
Description

A roundabout is a circular unsignalized intersection in which traffic flows in one direction around a central island. Traffic entering the roundabout must yield to traffic already inside the roundabout. This tool includes mini roundabouts with a 50 foot or 75 foot inscribed diameter.

When Should This Design Be Considered?

The mini roundabout should be considered if the posted speed limit on all four approaches is 30 mph or slower and the 85th percentile speed is 35 mph or slower.

Roundabout



Back to Inputs

Description

A roundabout is a circular unsignalized intersection in which traffic flows in one direction around a central island. Traffic entering the roundabout must yield to traffic already inside the roundabout. This tool can accommodate roundabouts with up to two lanes in each quadrant.

When Should This Design Be Considered?

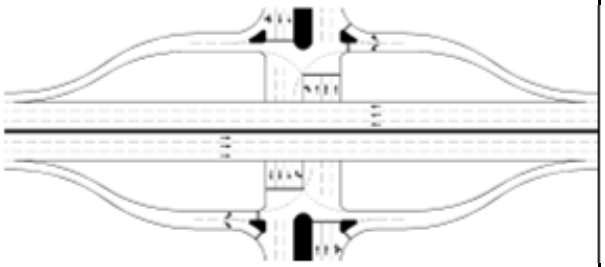
The roundabout should be considered on roadways with a high percentage of turning traffic. Additional information about when roundabouts should be considered may be found on VDOT's website.

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DESIGN CONSIDERATIONS

Interchange Designs

Traditional Diamond (TD)



Back to Inputs

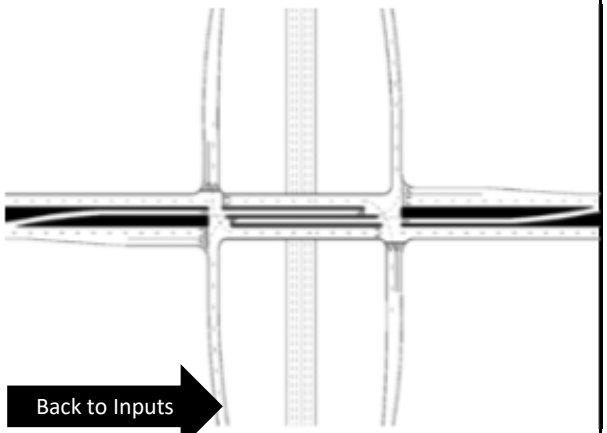
Description

The traditional diamond interchange is a grade-separated interchange with two intersections on the arterial. The intersections may be signalized or unsignalized. Each direction of travel on the freeway has one on-ramp and one off-ramp.

When Should This Design Be Considered?

The traditional diamond interchange should be considered in rural and suburban areas with moderate to low ramp volumes.

Contraflow Left



Back to Inputs

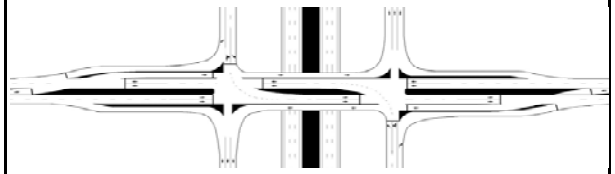
Description

The contraflow left interchange is an alternative to the traditional diamond interchange in which arterial left-turn movements cross over opposing left-turn movements into storage bays prior to the first ramp intersection. These storage bays run in the opposite direction from the adjacent through lanes. This design allows for three-phase signal control.

When Should This Design Be Considered?

The contraflow left interchange should be considered on arterials with high left-turn volumes onto the freeway ramps, especially if the left-turn demand exceeds the storage capacity between the ramps.

Displaced Left Turn (DLT)



Back to Inputs

Description

The arterial left-turning vehicles cross over to the other side of the roadway at a signalized intersection several hundred feet in advance of the first ramp intersection. At both of the ramp intersections, the protected left turns occur simultaneously with the opposing through movements, allowing for two-phase signal control. This design is also referred to as a Continuous Flow Interchange.

When Should This Design Be Considered?

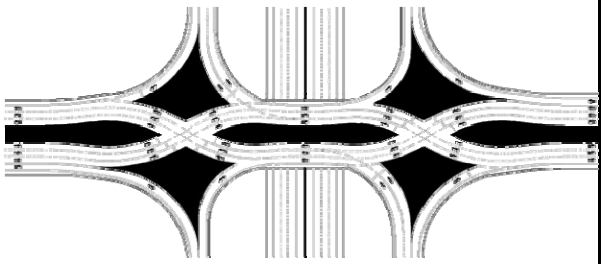
The displaced left turn intersection should be considered if there are high and balanced through volumes on the arterial, moderate to high left-turn volumes to the on-ramps, and low to moderate left-turn volumes from the off-ramps.

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DESIGN CONSIDERATIONS

Interchange Designs

Diverging Diamond (DDI)



Back to Inputs

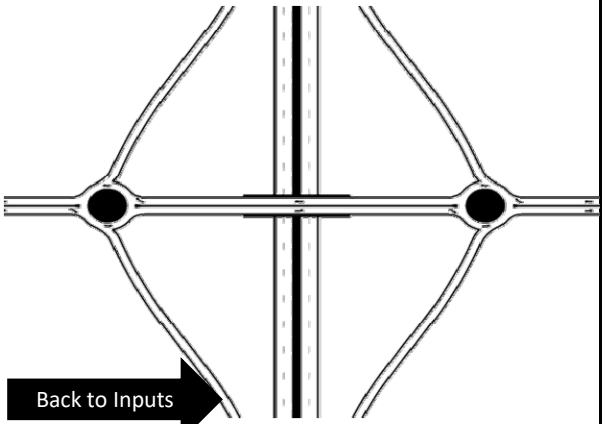
Description

The diverging diamond interchange is an alternative to the traditional diamond interchange where arterial traffic crosses over to the other side of the roadway in between the two ramps. This allows vehicles to turn left onto the on-ramps without crossing over opposing lanes of traffic. This design is also referred to as the double crossover diamond interchange.

When Should This Design Be Considered?

The diverging diamond interchange should be considered if there are high left-turn volumes onto and off of the freeway ramps and moderate but unbalanced arterial volumes.

Double Roundabout



Back to Inputs

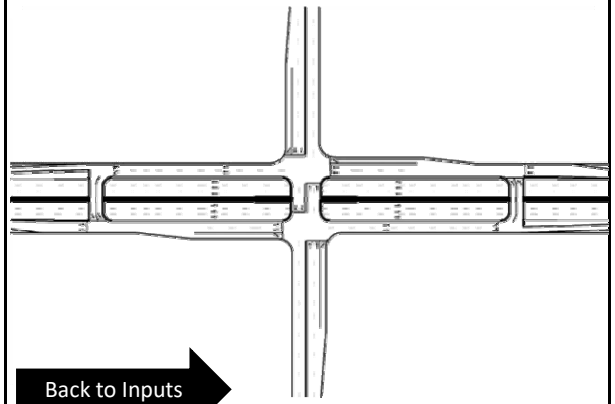
Description

The double roundabout interchange is a grade-separated interchange in which all ramps begin or end at one of two roundabouts on the arterial. This design typically allows for a narrower bridge width than the single roundabout interchange.

When Should This Design Be Considered?

The double roundabout interchange should be considered if there is a high proportion of left-turns onto the freeway ramps or where there is limited queue storage between the ramp intersections.

Michigan Urban Diamond (MUD)



Back to Inputs

Description

The Michigan urban diamond interchange is a variation of the traditional diamond interchange that removes left-turn movements from the arterial intersections. These vehicles instead make U-turns at directional crossovers on frontage roads. The intersections on the arterial operate under two-phase signal control. This design is also referred to as a Median U-Turn (MUT) Interchange. This tool assumes all intersections are signalized. However, this intersection can be designed as partially unsignalized.

When Should This Design Be Considered?

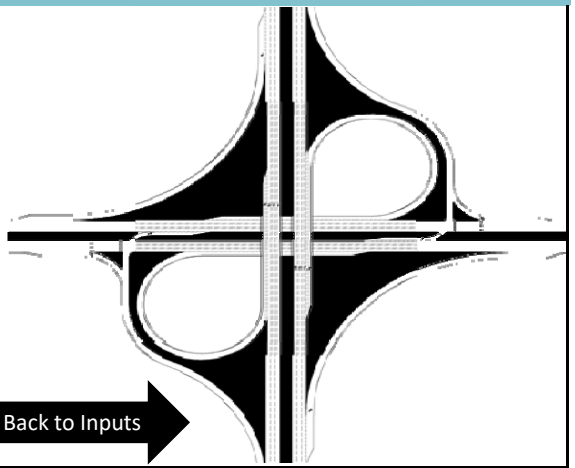
The Michigan urban diamond interchange should be considered for arterials with high through volumes and moderate to low left-turn volumes.

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DESIGN CONSIDERATIONS

Interchange Designs

Partial Cloverleaf (PCL or Parclo)



Back to Inputs

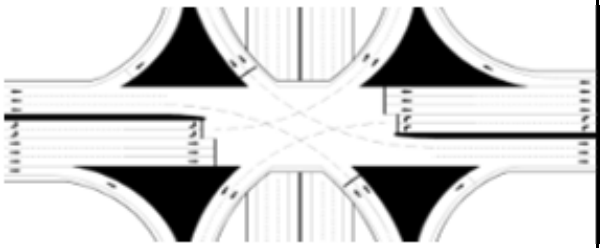
Description

The partial cloverleaf interchange is a grade-separated interchange with a combination of directional ramps and loop ramps. This configuration may include up to two intersections on the arterial. The intersections may be signalized or unsignalized.

When Should This Design Be Considered?

The partial cloverleaf interchange should be considered if a traditional diamond interchange would result in moderate to high left-turn volumes onto or off the ramps.

Single Point Urban (SPUI)



Back to Inputs

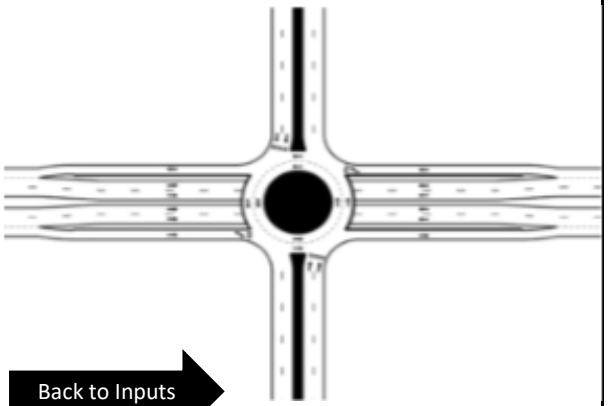
Description

The single point urban interchange is an alternative to the traditional diamond interchange in which all ramps begin or end at a single intersection on the arterial. This configuration allows for three-phase signal control.

When Should This Design Be Considered?

The single point urban interchange should be considered in urban areas with high left-turn volumes onto and off the freeway ramps or when right-of-way limitations are present.

Single Roundabout



Back to Inputs

Description

The single roundabout interchange is a grade-separated interchange in which all ramps begin or end at a single roundabout on the arterial.

When Should This Design Be Considered?

The roundabout interchange should be considered in urban areas with moderate capacity requirements or with right-of-way restrictions.

VDOT Junction Screening Tool

Input Worksheet

Project Title:	*Sweetgrasss*
E-W Facility:	*Primary Entrancd*
N-S Facility:	*Benn's Church Boulevard*
Date:	*December 17, 2019*

Traffic Volume Demand

Direction	Volume (veh/hr)				Truck Percent (%)
	U-Turn / Left		Through	Right	
Eastbound	0		0		0.00%
Westbound	227			145	0.00%
Northbound	13		1503	208	0.00%
Southbound	231		1033	0	0.00%
Adjustment Factor	0.80	0.95		0.85	
Suggested	**U - 0.8**	**L - 0.95**		**0.85**	
Truck to PCE Factor			**Suggested = 2.00**		2.00
Critical Lane Volume			1600		

Equivalent Passenger Car Volume

	Volume (pc/hr)			
	U-Turn / Left	Through	Right	Approach
Eastbound	0	0	0	0
Westbound	227	0	145	372
Northbound	13	1503	208	1724
Southbound	231	1033	0	1264

Notes:	
Left-turn Adjustment Factor	*Conversion of left-turning vehicles to equivalent through vehicles*
Right-turn Adjustment Factor	*Conversion of right-turning vehicles to equivalent through vehicles*
U-turn Adjustment Factor	*Conversion of U-turning vehicles to equivalent through vehicles*
Truck to PCE Factor	*1 truck = X Passenger Car Equivalents*
Critical Lane Volume Sum Limit	*Saturation value for critical lane volume sum at an intersection*

VDOT Junction Screening Tool

Possible Configurations

Indicate with a "Y" or "N" if each intersection or interchange configuration should or should not be considered. Use the information links for guidance. Then, click the "Show/Hide Configurations button" to hide the worksheets for the configurations that will not be considered.

#	Intersections	Information	Consider?	Justification
	Signalized Intersections			
1	Conventional	-	Y	
2	Bowtie	Link	Y	
3	Center Turn Overpass	Link	N	Not feasible for roadway facility type
4	Continuous Green-T	Link	Y	
5	Echelon	Link	N	Not feasible for roadway facility type
6	Full Displaced Left Turn	Link	N	Insufficient intersection spacing
7	Median U-Turn	Link	N	Insufficient intersection spacing
8	Partial Displaced Left Turn	Link	Y	
9	Partial Median U-Turn	Link	Y	
10	Quadrant Roadway N-E	Link	N	Not feasible for roadway facility type
11	Quadrant Roadway N-W	Link	N	Not feasible for roadway facility type
12	Quadrant Roadway S-E	Link	N	Not feasible for roadway facility type
13	Quadrant Roadway S-W	Link	N	Not feasible for roadway facility type
14	Restricted Crossing U-Turn	Link	N	Not feasible for roadway facility type
15	Single Loop	Link	N	Not feasible for roadway facility type
16	Split Intersection	Link	N	Not feasible for roadway facility type
	Unsignalized Intersections			
17	50 Mini Roundabout	Link	N	Not feasible for roadway facility type
18	75 Mini Roundabout	Link	N	Not feasible for roadway facility type
19	Roundabout	Link	Y	
20	Two-Way Stop Control	-	N	Not feasible for roadway facility type
#	**Interchanges**	**Information**	**Consider?**	**Justification**
21	Traditional Diamond	Link	N	Not feasible for roadway facility type
22	Contraflow Left	Link	N	Not feasible for roadway facility type
23	Displaced Left Turn	Link	N	Not feasible for roadway facility type
24	Diverging Diamond	Link	N	Not feasible for roadway facility type
25	Double Roundabout	Link	N	Not feasible for roadway facility type
26	Michigan Urban Diamond	Link	N	Not feasible for roadway facility type
27	Partial Cloverleaf	Link	N	Not feasible for roadway facility type
28	Single Point	Link	N	Not feasible for roadway facility type
29	Single Roundabout	Link	N	Not feasible for roadway facility type

VDOT Junction Screening Tool

Directional Questions and Base Lane Configurations

Before entering a base number of through lanes for each direction, answer all applicable directional question for each intersection or interchange configuration selected for consideration. Navigate to the lane configuration worksheet for example diagrams, if provided.

Intersections	Question	Direction
Bowtie	Select the roadway with the roundabouts from the drop-down list.	
Continuous Green-T	Select the direction associated with the "stem" of the T-intersection from the drop-down list. See example diagrams.	WB
Echelon	N/A	
Median U-Turn	N/A	
Partial Displaced Left Turn	Select the roadway with the displaced left turns from the drop-down list.	NB-SB
Partial Median U-Turn	Select the roadway with the U-turns from the drop-down list.	NB-SB
Restricted Crossing U-Turn	N/A	
Single Loop	N/A	
Split Intersection	N/A	
Interchanges	**Question**	**Direction**
All	N/A	

Base Number of Through Lanes

Enter a base number of through lanes for each direction. The number of through lanes entered will populate on each non-roundabout lane configuration worksheet. This tool also allows the user to enter the number of through lanes on the lane configuration worksheets directly. This base number may be overwritten on individual lane configuration worksheets. Turn lanes, shared lanes, and channelized lanes must still be entered in each lane configuration worksheet.

Eastbound	
Westbound	
Northbound	2
Southbound	2

VDOT Junction Screening Tool

Results Worksheet

VJuST
VDOT Junction Screening Tool

General Information	
Project Title:	Sweetgrasss
EW Facility:	Primary Entrancd
NS Facility:	Benn's Church Boulevard
Date:	December 17, 2019

Volumes (veh/hr)	U-Turn / Left	Through	Right
Eastbound	0	0	0
Westbound	227	0	145
Northbound	13	1503	208
Southbound	231	1033	0

General Instructions: All intersection and interchange configurations have a default assumption of one exclusive lane per movement. No results shall be interpreted until the user has verified the lane configurations on each worksheet.

Intersection Results

Type	Dir	Maximum V/C (Congestion)	Accommodation Compared to Conventional (Pedestrian)	Weighted Total Conflict Points (Safety)	Notes
Conventional	-	0.70		48	
Bowtie	-	1.92	+	24	
Center Turn Overpass	-	1.05	+	32	
Continuous Green-T	-	0.70	-	12*	
Echelon	-	1.09	+	28	
Full Displaced Left Turn	-	0.80	-	40	
Median U-Turn	-	1.11	+	20	
Partial Displaced Left Turn	-	0.62	-	44	
Partial Median U-Turn	-	0.72	+	28	
Quadrant Roadway	N-W	1.19		40	
	N-E	1.27		40	
	S-E	1.24		40	
	S-W	1.23		40	
Restricted Crossing U-Turn	-	2.14		20	
Single Loop	-	1.10	-	28	
Split Intersection	-	1.08		36	
50 Mini Roundabout	-	372.00		8	
75 Mini Roundabout	-	372.00		8	
Roundabout	-	1.32		8	
Two-Way Stop Control	-	N/A*		48	

*The continuous green-T is the only three-legged innovative intersection in this tool. To compare the continuous green-T to other innovative intersections, conflicts corresponding with the fourth leg must be removed. This has been done for the conventional intersection. Conflict point diagrams for three-legged and four-legged conventional intersections have been provided on the conventional intersection worksheet for reference.

Interchange Results					
		Congestion	Pedestrian	Safety	Notes
Type	Dir	Maximum V/C	Accommodation Compared to Traditional Diamond	Weighted Total Conflict Points	
Traditional Diamond	-	0.30		28	
Contraflow Left	-	1.09		32	
Displaced Left Turn	-	0.30	-	28	
Diverging Diamond	-	0.30	-	20	
Double Roundabout	-	0.27	+	16	
Michigan Urban Diamond	-	0.60	+	24	
Partial Cloverleaf	-	0.15		20	
Single Point	-	0.30	-	32	
Single Roundabout	-	0.27	+	12	

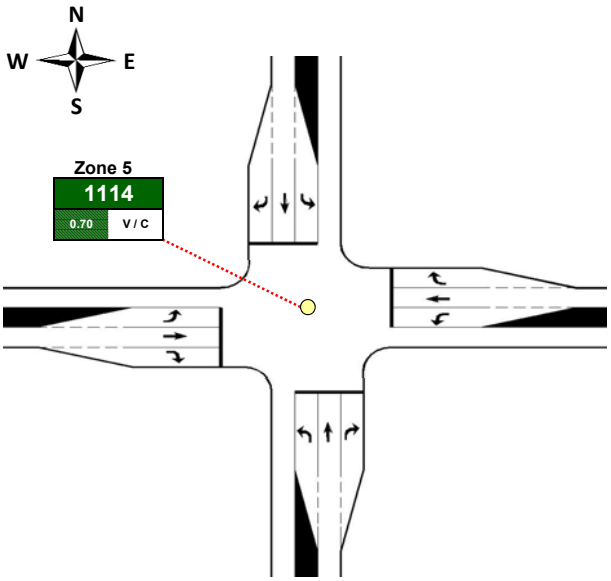
Information	
Congestion	The maximum v/c ratio represents the worst v/c of all zones that make up an intersection.
Pedestrian	Compares the potential of each design to accommodate pedestrians based on safety, wayfinding, and delay. Potential is qualitatively defined as better (+), similar (blank cell), or worse (-) than a conventional intersection or traditional diamond interchange.
Safety	Weighted Total = (2 x Crossing Conflicts) + Merging Conflicts + Diverging Conflicts

Conventional

DESIGN AND RESULTS

Project Name:	Sweetgrasss
EW Facility:	Primary Entrancd
NS Facility:	Benn's Church Boulevard
Date:	December 17, 2019

Critical Lane Volume Sum			
< 1200	1200 - 1399	1400 - 1599	≥ 1600
VOLUME / CAPACITY RATIO:			0.70

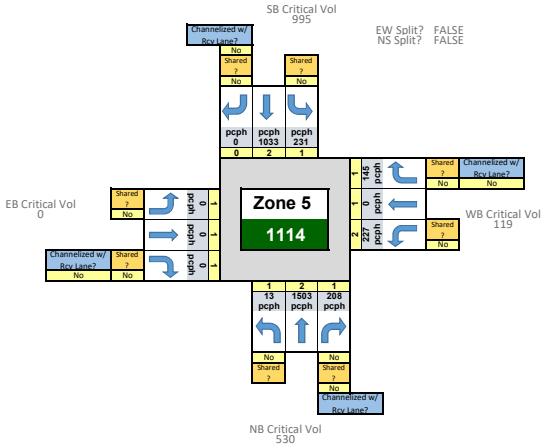


Note: This diagram does not reflect the actual lane configuration of the intersection

Conventional

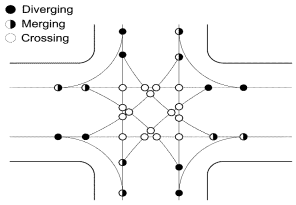
DATA INPUT AND CONFIGURATION

Enter the lane configurations in the yellow cells.



Back to Results

Safety - Conflict Point Diagram



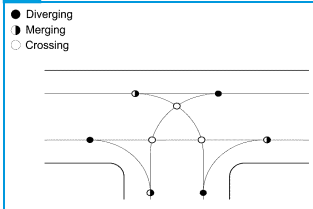
Conflict Type	Count
Crossing	16
Merging	8
Diverging	8
Total	**32**

Conflict Type	Weight
Crossing	2
Merging	1
Diverging	1

Weighted Total Conflict Points

48

Safety - Conflict Point Diagram (Three Legs)



Conflict Type	Count
Crossing	3
Merging	3
Diverging	3
Total	**9**

Conflict Type	Weight
Crossing	2
Merging	1
Diverging	1

Weighted Total Conflict Points

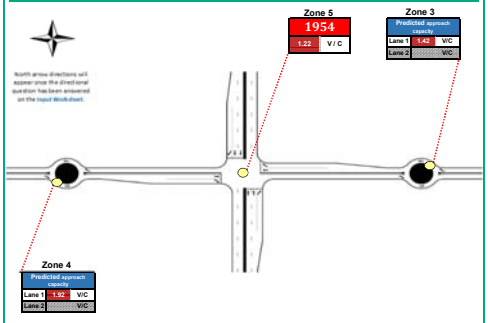
12

Bowtie Intersection

DESIGN AND RESULTS

Project Name:	Sweetgrasss
EW Facility:	Primary Entrancd
NS Facility:	Benn's Church Boulevard
Date:	December 17, 2019

Critical Lane Volume Sum			
< 1200	1200 - 1399	1400 - 1599	≥ 1600
MAXIMUM VOLUME / CAPACITY RATIO:			1.92

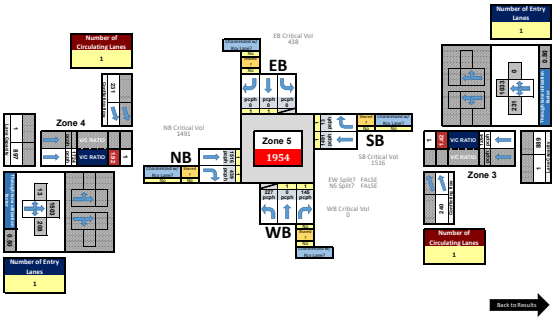


Note: This diagram does not reflect the actual lane configuration of the intersection

Bowtie Intersection

DATA INPUT AND CONFIGURATION

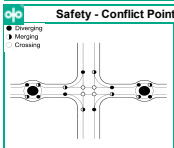
Enter the lane configurations in the yellow cells.



EQUATION: A x exp(-B x Q)

Number of Entry Lanes	Number of Circulating Lanes	Lane	A	B
1	1	--	1130	0.001
1	2	--	1130	0.0007
2	1	Left	1130	0.001
2	1	Right	1130	0.001
2	2	Left	1130	0.00075
2	2	Right	1130	0.0007

Safety - Conflict Point Diagram



Conflict Type	Count
Crossing	4
Merging	8
Diverging	8
Total	20

Conflict Type	Weight
Crossing	2
Merging	1
Diverging	1

Weighted Total Conflict Points

24

Assumptions

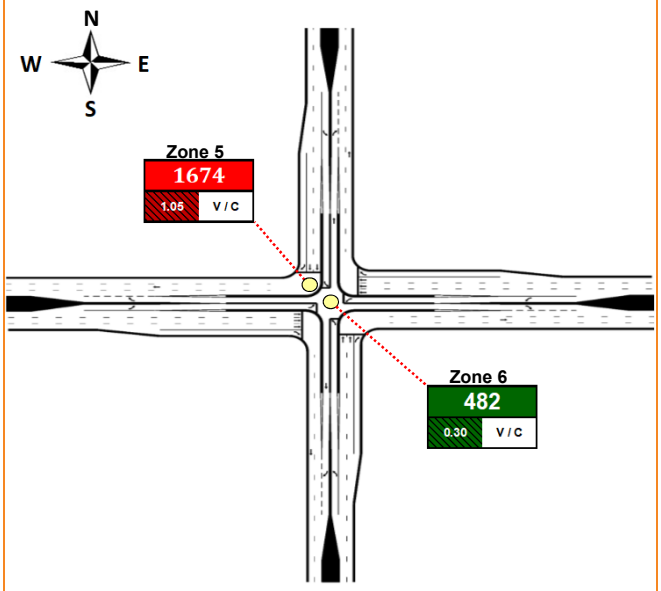
- The roundabouts have only two approaches and exits.
- Since U-turns are not considered, the CUV analysis considers only one location with conflicting volumes for each roundabout.
- The conflict point diagrams include conflict points created by U-turn movements.

Center Turn Overpass Intersection

DESIGN AND RESULTS

Project Name:	Sweetgrasss
EW Facility:	Primary Entrancd
NS Facility:	Benn's Church Boulevard
Date:	December 17, 2019

Critical Lane Volume Sum			
< 1200	1200 - 1399	1400 - 1599	≥ 1600
VOLUME / CAPACITY RATIO:			1.05

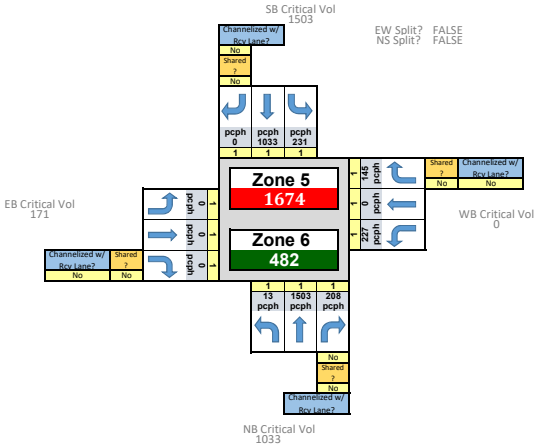


Note: This diagram does not reflect the actual lane configuration of the intersection

Center Turn Overpass Intersection

DATA INPUT AND CONFIGURATION

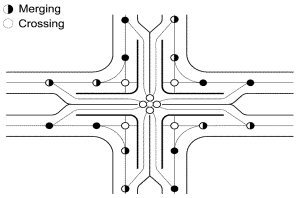
Step 1: Enter the lane configurations in the yellow cells.



Back to Results

Safety - Conflict Point Diagram

Diverging
Merging
Crossing



Conflict Type	Count
Crossing	8
Merging	8
Diverging	8
Total	24

Conflict Type	Weight
Crossing	2
Merging	1
Diverging	1

Weighted Total Conflict Points

32

Continuous Green-T Intersection

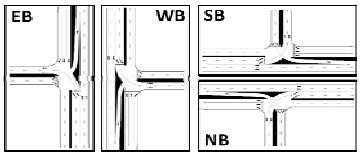
DESIGN AND RESULTS

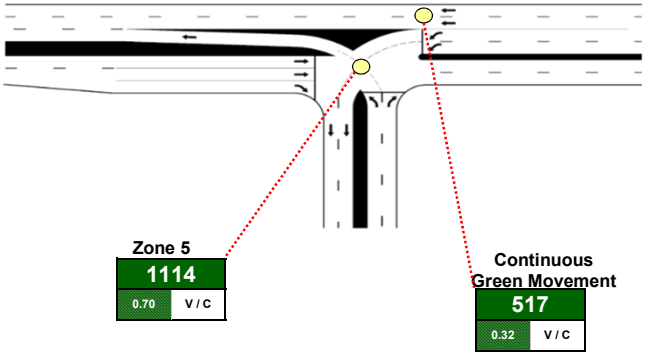
Project Name:	Sweetgrasss
EW Facility:	Primary Entrancd
NS Facility:	Benn's Church Boulevard
Date:	December 17, 2019

Critical Lane Volume Sum			
< 1200	1200 - 1399	1400 - 1599	≥ 1600
VOLUME / CAPACITY RATIO:			0.70

W S N E

North arrow directions will appear once the directional question has been answered on the **Input Worksheet**.



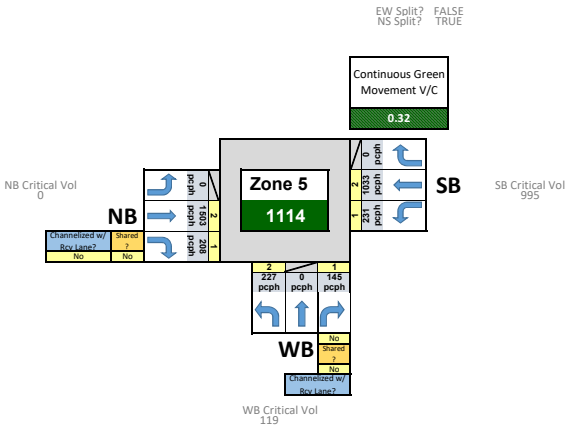


Note: This diagram does not reflect the actual lane configuration of the intersection

Continuous Green-T Intersection

DATA INPUT AND CONFIGURATION

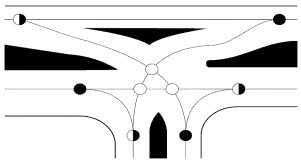
Step 1: Enter the lane configurations in the yellow cells.



Back to Results

Safety - Conflict Point Diagram

Diverging
Merging
Crossing



Conflict Type	Count
Crossing	3
Merging	3
Diverging	3
Total	9

Conflict Type	Weight
Crossing	2
Merging	1
Diverging	1

Weighted Total Conflict Points

12

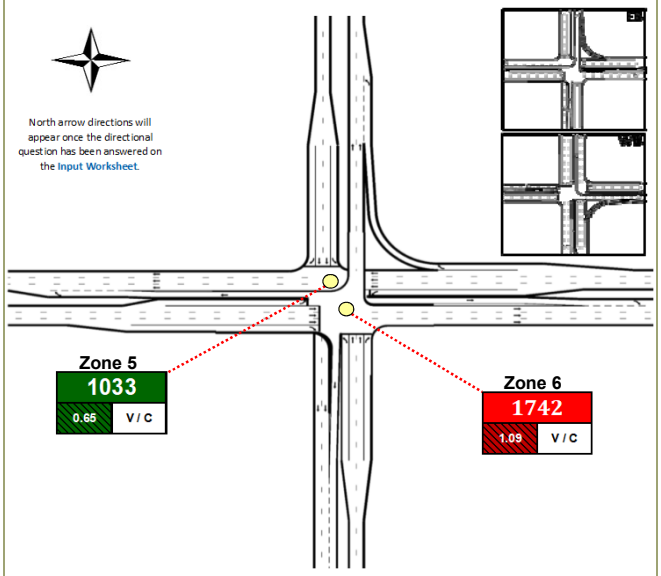
Echelon Intersection

DESIGN AND RESULTS

Project Name:	Sweetgrasss
EW Facility:	Primary Entrancd
NS Facility:	Benn's Church Boulevard
Date:	December 17, 2019

Critical Lane Volume Sum			
< 1200	1200 - 1399	1400 - 1599	≥ 1600
VOLUME / CAPACITY RATIO:			1.09

North arrow directions will appear once the directional question has been answered on the Input Worksheet.

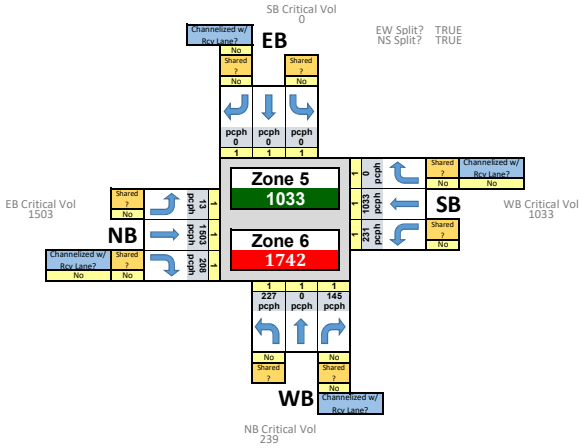


Note: This diagram does not reflect the actual lane configuration of the intersection

Echelon Intersection

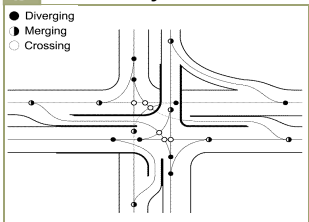
DATA INPUT AND CONFIGURATION

Enter the lane configurations in the yellow cells.



Back to Results

Safety - Conflict Point Diagram



Conflict Type	Count
Crossing	6
Merging	8
Diverging	8
Total	22

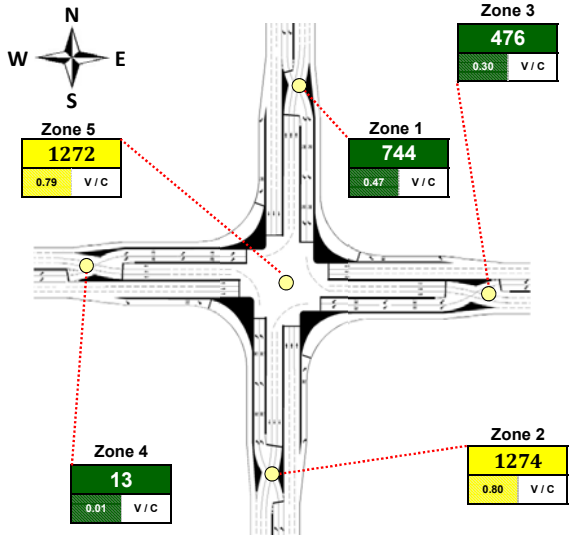
Conflict Type	Weight
Crossing	2
Merging	1
Diverging	1

Weighted Total Conflict Points
28

Full Displaced Left Turn Intersection

DESIGN AND RESULTS

		Critical Lane Volume Sum			
Project Name:	Sweetgrasss	< 1200	1200 - 1399	1400 - 1599	≥ 1600
EW Facility:	Primary Entrancd				
NS Facility:	Benn's Church Boulevard	VOLUME / CAPACITY RATIO:		0.80	
Date:	December 17, 2019				

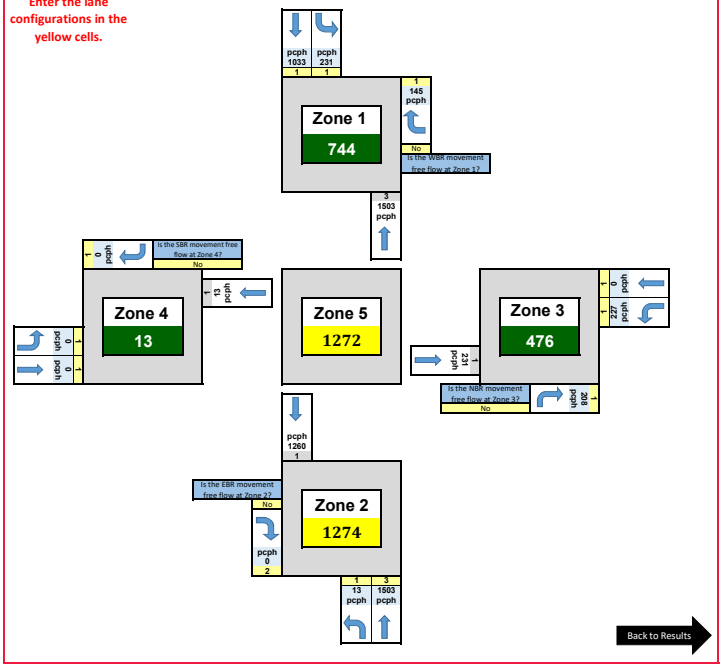


Note: This diagram does not reflect the actual lane configuration of the intersection

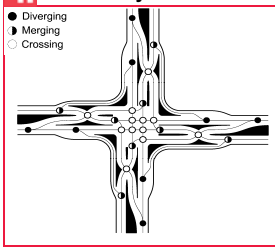
Full Displaced Left Turn Intersection

DATA INPUT AND CONFIGURATION

Enter the lane configurations in the yellow cells.



Safety - Conflict Point Diagram



Conflict Type	Count
Crossing	12
Merging	8
Diverging	8
Total	28

Conflict Type	Weight
Crossing	2
Merging	1
Diverging	1

Weighted Total Conflict Points

40

Assumptions

- CLV calculations at Zone 5 do not include right-turn movements.
- The number of through lanes entered in one zone is assumed to be equal to the number of through lanes in all zones that the movement passes through.

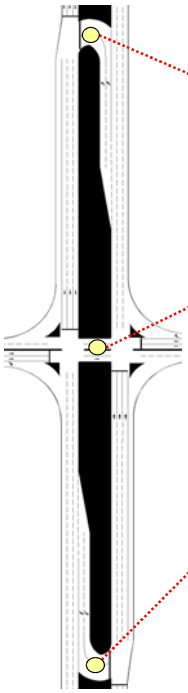
Median U-Turn Intersection

DESIGN AND RESULTS

Project Name:	Sweetgrasss
EW Facility:	Primary Entrancd
NS Facility:	Benn's Church Boulevard
Date:	December 17, 2019

Critical Lane Volume Sum			
< 1200	1200 - 1399	1400 - 1599	≥ 1600
VOLUME / CAPACITY RATIO:			1.11

North arrow directions will appear once the directional question has been answered on the **Input Worksheet**.



Zone 1: 573 — 0.36 V / C

Zone 5: 1770 — 1.11 V / C

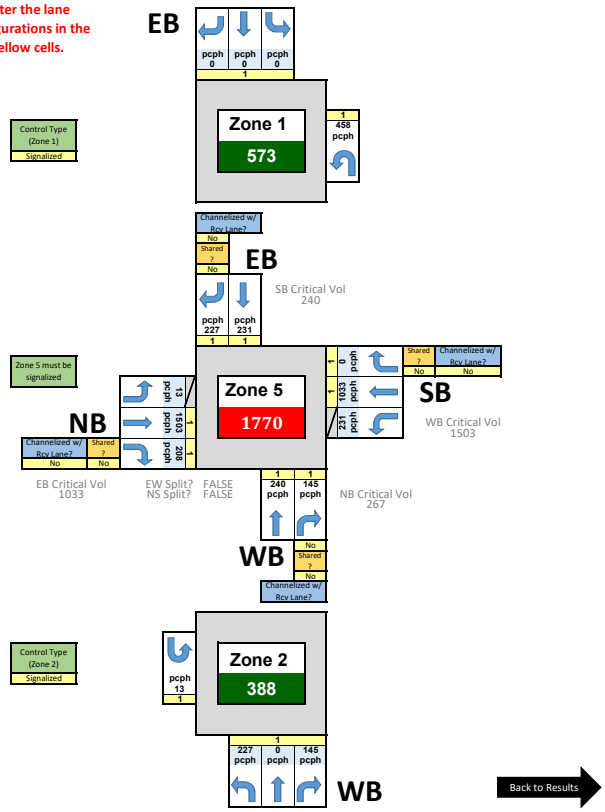
Zone 2: 388 — 0.24 V / C

Note: This diagram does not reflect the actual lane configuration of the intersection

Median U-Turn Intersection

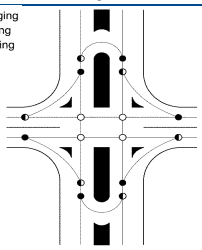
DATA INPUT AND CONFIGURATION

Enter the lane configurations in the yellow cells.



Safety - Conflict Point Diagram

● Diverging
◑ Merging
○ Crossing



Conflict Type	Count
Crossing	4
Merging	6
Diverging	6
Total	**16**

Conflict Type	Weight
Crossing	2
Merging	1
Diverging	1

Weighted Total Conflict Points

20

Assumptions

- This worksheet uses the CLV methodology for calculations at signalized zones. These calculations are based on passenger cars per hour.
- This worksheet uses the *HCM, 6th Edition* methodology for calculations at unsignalized zones. These calculations are based on vehicles per hour.

Partial Displaced Left Turn Intersection

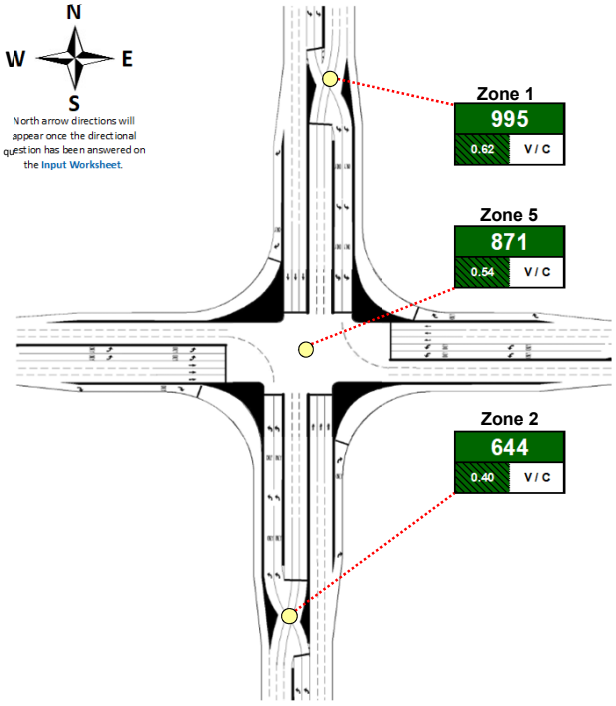
DESIGN AND RESULTS

Project Name:	Sweetgrasss
EW Facility:	Primary Entrancd
NS Facility:	Benn's Church Boulevard
Date:	December 17, 2019

Critical Lane Volume Sum			
< 1200	1200 - 1399	1400 - 1599	≥ 1600
VOLUME / CAPACITY RATIO:			0.62

N W E S

North arrow directions will appear once the directional question has been answered on the Input Worksheet.

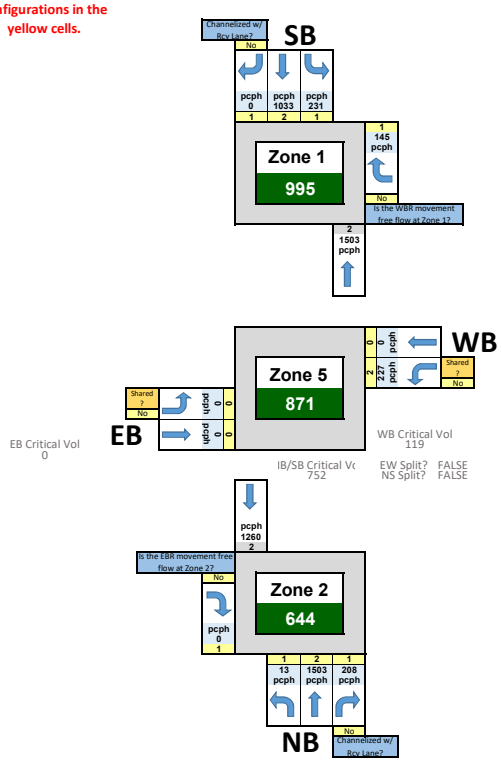


Note: This diagram does not reflect the actual lane configuration of the intersection

Partial Displaced Left Turn Intersection

DATA INPUT AND CONFIGURATION

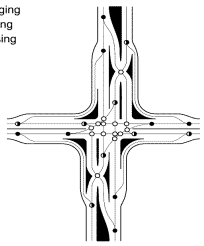
Enter the lane configurations in the yellow cells.



Back to Results

Safety - Conflict Point Diagram

● Diverging
◑ Merging
○ Crossing



Conflict Type	Count
Crossing	14
Merging	8
Diverging	8
Total	**30**

Conflict Type	Weight
Crossing	2
Merging	1
Diverging	1

Weighted Total Conflict Points

44

Assumptions

- CLV calculations at Zone 5 do not include the right-turn movements from the non-displaced-left approaches.
- The number of through lanes entered in one zone is assumed to be equal to the number of through lanes in all zones that the movement passes through.

Partial Median U-Turn Intersection

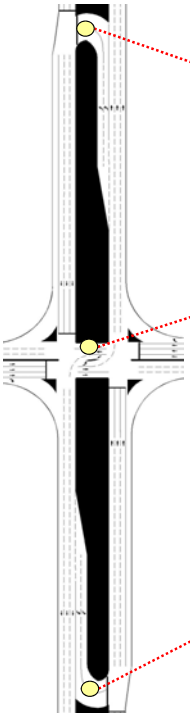
DESIGN AND RESULTS

Project Name:	Sweetgrasss
EW Facility:	Primary Entrancd
NS Facility:	Benn's Church Boulevard
Date:	December 17, 2019

Critical Lane Volume Sum			
< 1200	1200 - 1399	1400 - 1599	≥ 1600
VOLUME / CAPACITY RATIO:			0.72

N W E S

North arrow directions will appear once the directional question has been answered on the **Input Worksheet**.



Zone 1: 648 — 0.41 V / C

Zone 5: 929 — 0.58 V / C

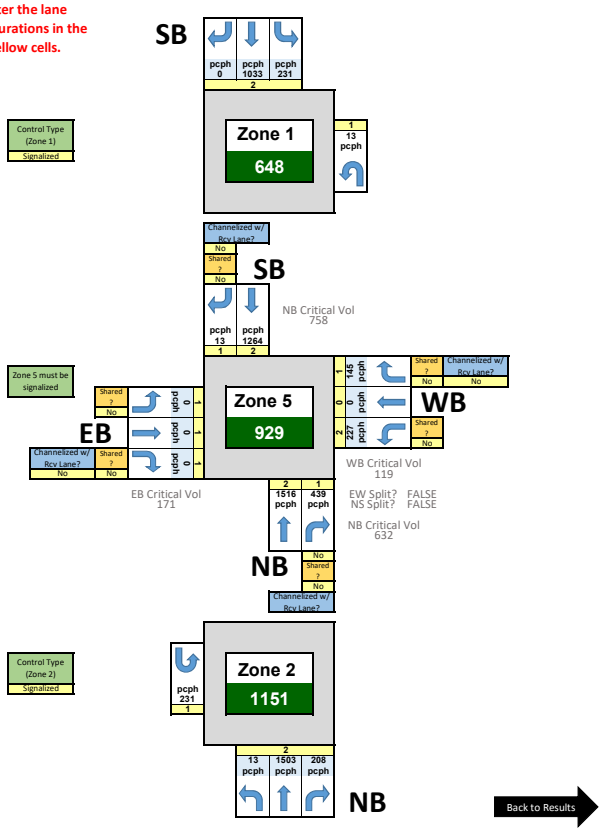
Zone 2: 1151 — 0.72 V / C

Note: This diagram does not reflect the actual lane configuration of the intersection

Patrial Median U-Turn Intersection

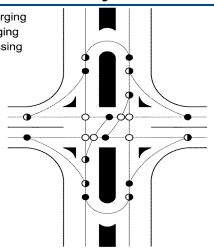
DATA INPUT AND CONFIGURATION

Enter the lane configurations in the yellow cells.



Safety - Conflict Point Diagram

● Diverging
◑ Merging
○ Crossing



Conflict Type	Count
Crossing	6
Merging	8
Diverging	8
Total	**22**

Conflict Type	Weight
Crossing	2
Merging	1
Diverging	1

Weighted Total Conflict Points

28

Assumptions

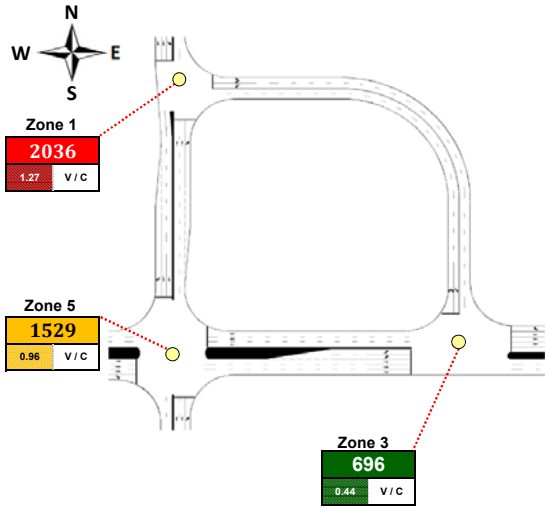
- This worksheet uses the CLV methodology for calculations at signalized zones. These calculations are based on passenger cars per hour.
- This worksheet uses the *HCM, 6th Edition* methodology for calculations at unsignalized zones. These calculations are based on vehicles per hour.

Quadrant Roadway Intersection (N-E)

DESIGN AND RESULTS

Project Name:	Sweetgrasss
EW Facility:	Primary Entrancd
NS Facility:	Benn's Church Boulevard
Date:	December 17, 2019

Critical Lane Volume Sum			
< 1200	1200 - 1399	1400 - 1599	≥ 1600
VOLUME / CAPACITY RATIO:			1.27

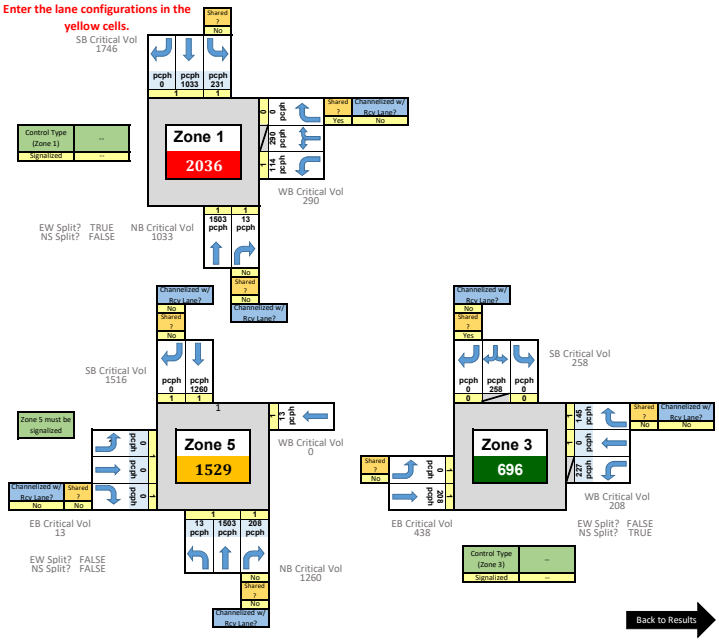


Note: This diagram does not reflect the actual lane configuration of the intersection

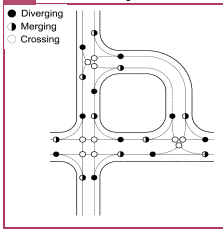
Quadrant Roadway Intersection (N-E)

DATA INPUT AND CONFIGURATION

Enter the lane configurations in the yellow cells.



Safety - Conflict Point Diagram



Conflict Type	Count
Crossing	10
Merging	10
Diverging	10
Total	30

Conflict Type	Weight
Crossing	2
Merging	1
Diverging	1

Weighted Total Conflict Points

40

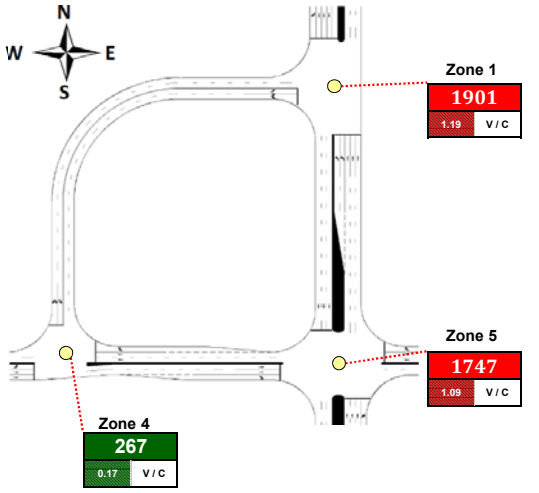
Assumptions

- All right-turning vehicles are assumed to turn right at the first opportunity.
- The northbound left-turning vehicles are assumed to go through Zone 5 and make two right turns before going through Zone 5 again to complete the left-turn movement.
- This worksheet uses the CLV methodology for calculations at signalized zones. These calculations are based on passenger cars per hour.
- This worksheet uses the *HCM, 6th Edition* methodology for calculations at unsignalized zones. These calculations are based on vehicles per hour.

Quadrant Roadway Intersection (N-W)

DESIGN AND RESULTS

		Critical Lane Volume Sum			
Project Name:	Sweetgrasss	< 1200	1200 - 1399	1400 - 1599	≥ 1600
EW Facility:	Primary Entrancd				
NS Facility:	Benn's Church Boulevard	VOLUME / CAPACITY RATIO:			1.19
Date:	December 17, 2019				

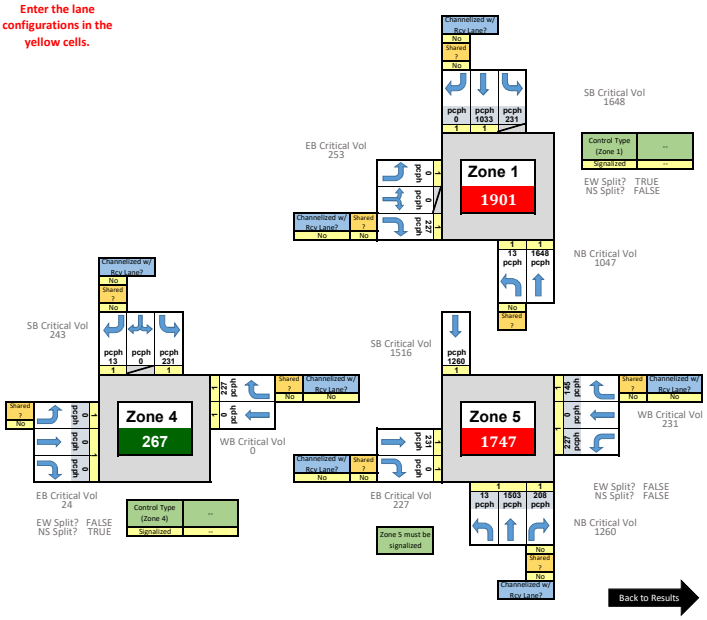


Note: This diagram does not reflect the actual lane configuration of the intersection

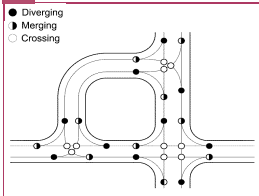
Quadrant Roadway Intersection (N-W)

DATA INPUT AND CONFIGURATION

Enter the lane configurations in the yellow cells.



Safety - Conflict Point Diagram



Conflict Type	Count
Crossing	10
Merging	10
Diverging	10
Total	30

Conflict Type	Weight
Crossing	2
Merging	1
Diverging	1

Weighted Total Conflict Points

40

Assumptions

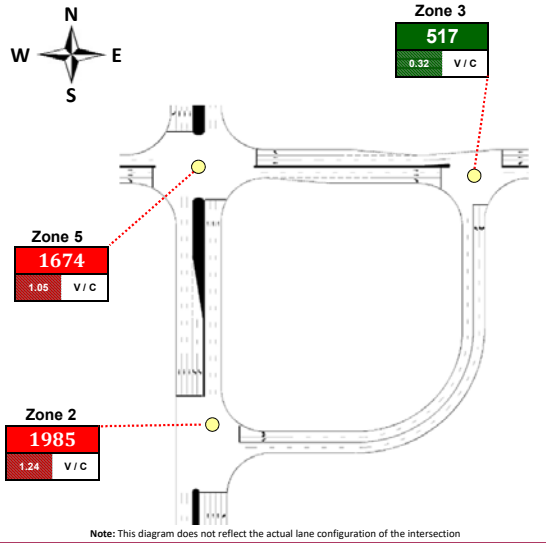
- All right-turning vehicles are assumed to turn right at the first opportunity.
- The westbound left-turning vehicles are assumed to go through Zone 5 and make two right turns before going through Zone 5 again to complete the left-turn movement.
- This worksheet uses the CLV methodology for calculations at signalized zones. These calculations are based on passenger cars per hour.
- This worksheet uses the *HCM, 6th Edition* methodology for calculations at unsignalized zones. These calculations are based on vehicles per hour.

Quadrant Roadway Intersection (S-E)

DESIGN AND RESULTS

Project Name:	Sweetgrasss
EW Facility:	Primary Entrancd
NS Facility:	Benn's Church Boulevard
Date:	December 17, 2019

Critical Lane Volume Sum			
< 1200	1200 - 1399	1400 - 1599	≥ 1600
VOLUME / CAPACITY RATIO:			1.24

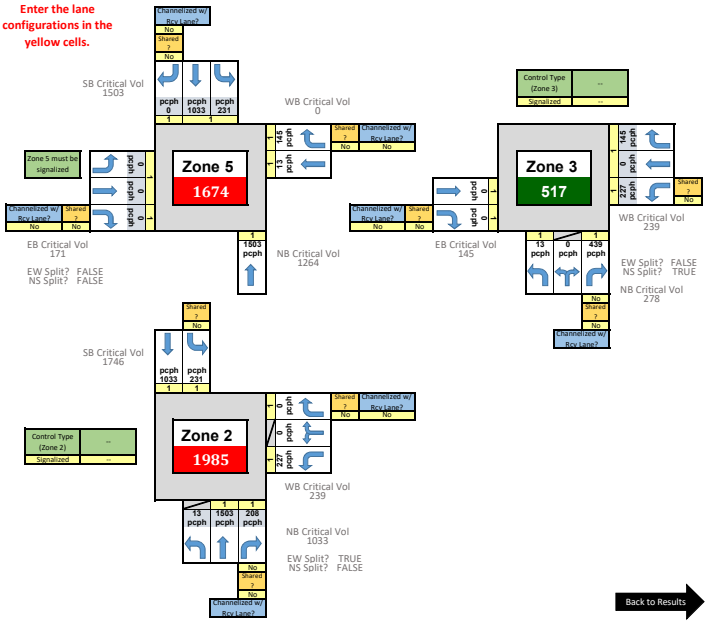


Note: This diagram does not reflect the actual lane configuration of the intersection

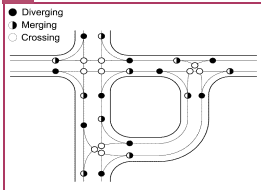
Quadrant Roadway Intersection (S-E)

DATA INPUT AND CONFIGURATION

Enter the lane configurations in the yellow cells.



Safety - Conflict Point Diagram



Conflict Type	Count
Crossing	10
Merging	10
Diverging	10
Total	30

Conflict Type	Weight
Crossing	2
Merging	1
Diverging	1

Weighted Total Conflict Points

40

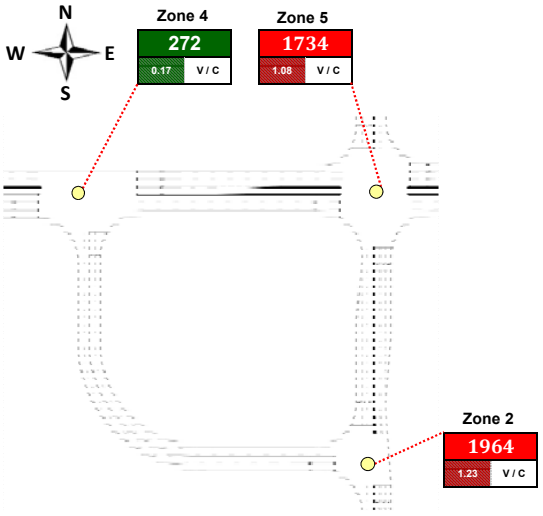
Assumptions

- All right-turning vehicles are assumed to turn right at the first opportunity.
- The eastbound left-turning vehicles are assumed to go through Zone 5 and make two right turns before going through Zone 5 again to complete the left-turn movement.
- This worksheet uses the CLV methodology for calculations at signalized zones. These calculations are based on passenger cars per hour.
- This worksheet uses the *HCM, 6th Edition* methodology for calculations at unsignalized zones. These calculations are based on vehicles per hour.

Quadrant Roadway Intersection (S-W)

DESIGN AND RESULTS

		Critical Lane Volume Sum			
Project Name:	Sweetgrasss	< 1200	1200 - 1399	1400 - 1599	≥ 1600
EW Facility:	Primary Entrancd				
NS Facility:	Benn's Church Boulevard	VOLUME / CAPACITY RATIO:			1.23
Date:	December 17, 2019				

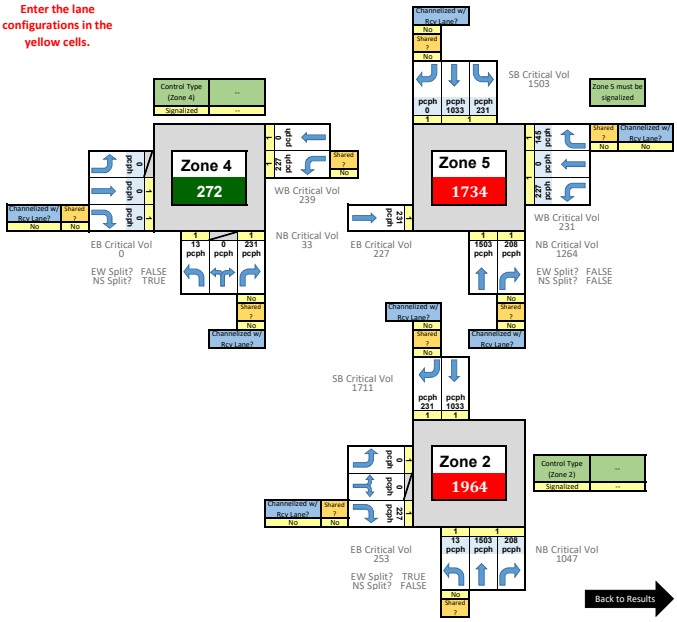


Note: This diagram does not reflect the actual lane configuration of the intersection

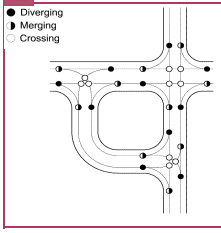
Quadrant Roadway Intersection (S-W)

DATA INPUT AND CONFIGURATION

Enter the lane configurations in the yellow cells.



Safety - Conflict Point Diagram



Conflict Type	Count
Crossing	10
Merging	10
Diverging	10
Total	30

Conflict Type	Weight
Crossing	2
Merging	1
Diverging	1

Weighted Total Conflict Points

40

Assumptions

- All right-turning vehicles are assumed to turn right at the first opportunity.
- The southbound left-turning vehicles are assumed to go through Zone 5 and make two right turns before going through Zone 5 again to complete the left-turn movement.
- This worksheet uses the CLV methodology for calculations at signalized zones. These calculations are based on passenger cars per hour.
- This worksheet uses the *HCM, 6th Edition* methodology for calculations at unsignalized zones. These calculations are based on vehicles per hour.

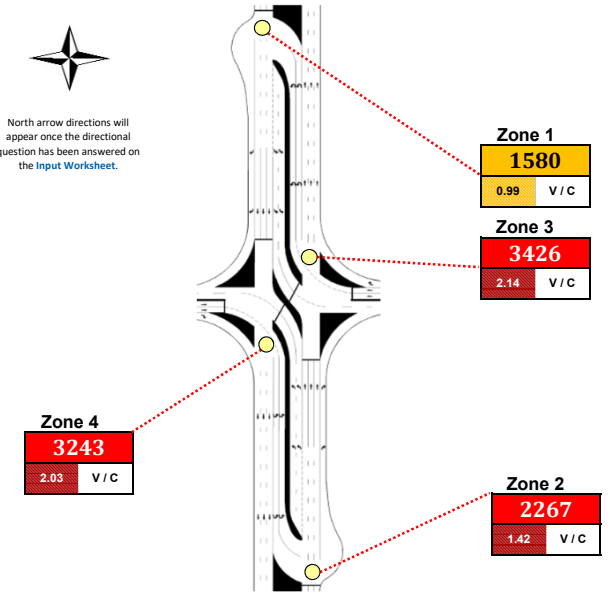
Restricted Crossing U-Turn (RCUT) Intersection

DESIGN AND RESULTS

Project Name:	*Sweetgrasss*
EW Facility:	*Primary Entrancd*
NS Facility:	*Benn's Church Boulevard*
Date:	*December 17, 2019*

Critical Lane Volume Sum			
< 1200	1200 - 1399	1400 - 1599	≥ 1600
VOLUME / CAPACITY RATIO:			**2.14**

North arrow directions will appear once the directional question has been answered on the **Input Worksheet**.

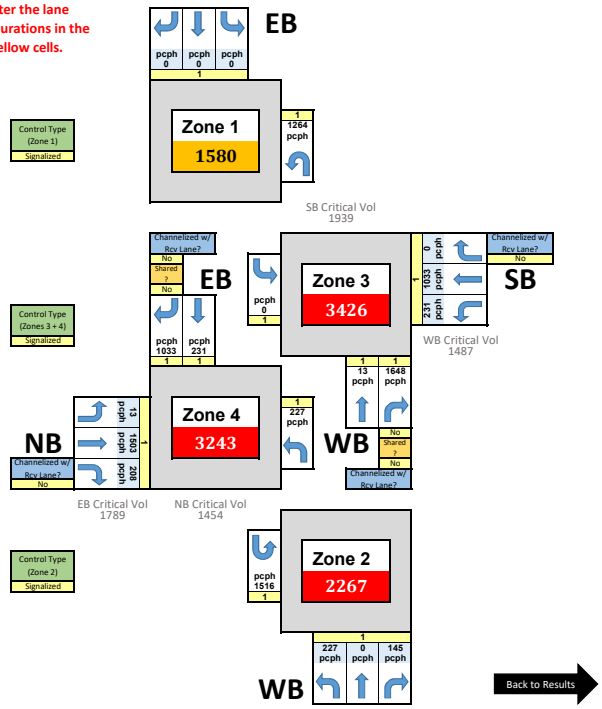


Note: This diagram does not reflect the actual lane configuration of the intersection

Restricted Crossing U-Turn (RCUT) Intersection

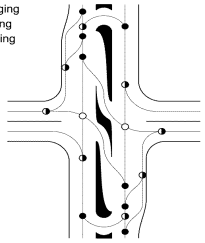
DATA INPUT AND CONFIGURATION

Enter the lane configurations in the yellow cells.



Safety - Conflict Point Diagram

- Diverging
- Merging
- Crossing



Conflict Type	Count
Crossing	2
Merging	8
Diverging	8
Total	**18**

Conflict Type	Weight
Crossing	2
Merging	1
Diverging	1

Weighted Total Conflict Points

20

Assumptions

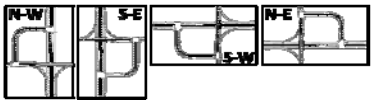
- This worksheet uses the CLV methodology for calculations at signalized zones. These calculations are based on passenger cars per hour.
- This worksheet uses the *HCM, 6th Edition* methodology for calculations at unsignalized zones. These calculations are based on vehicles per hour.

Single Loop Interchange

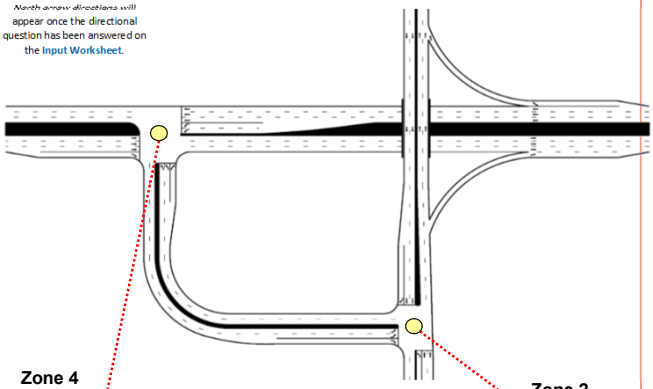
DESIGN AND RESULTS

Project Name:	Sweetgrasss
EW Facility:	Primary Entrancd
NS Facility:	Benn's Church Boulevard
Date:	December 17, 2019

Critical Lane Volume Sum			
< 1200	1200 - 1399	1400 - 1599	≥ 1600
VOLUME / CAPACITY RATIO:			1.10



North arrow directions will appear once the directional question has been answered on the **Input Worksheet**.



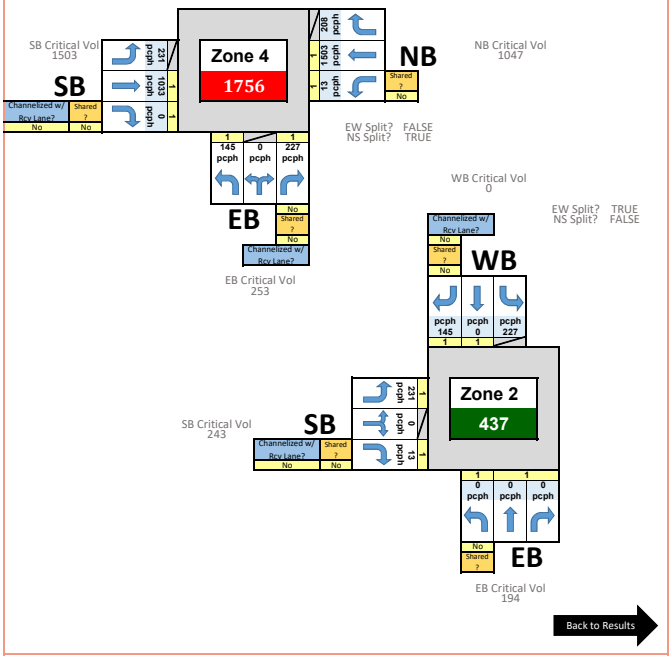
Zone 4
1756
1.10 V / C

Zone 2
437
0.27 V / C

Single Loop Interchange

DATA INPUT AND CONFIGURATION

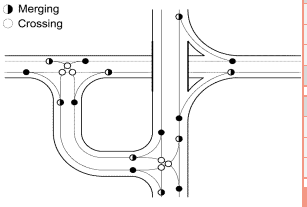
Enter the lane configurations in the yellow cells.



Back to Results

Safety - Conflict Point Diagram

● Diverging
◑ Merging
○ Crossing



Conflict Type	Count
Crossing	6
Merging	8
Diverging	8
Total	22

Conflict Type	Weight
Crossing	2
Merging	1
Diverging	1

Weighted Total Conflict Points

28

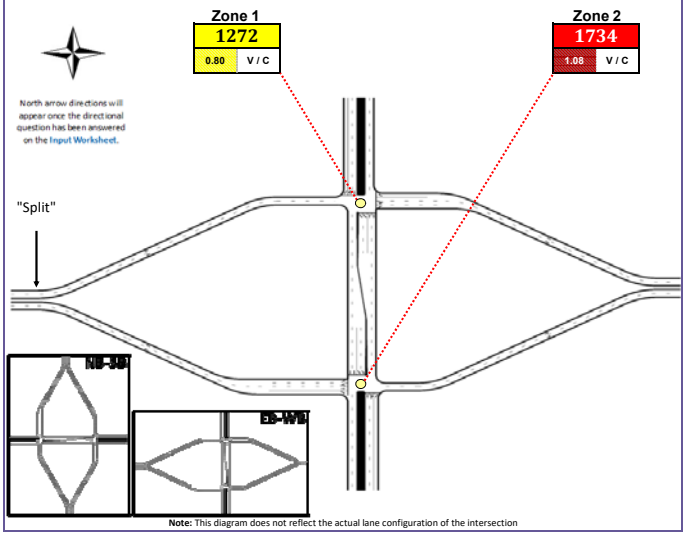
Assumptions

- The NBR movement is assumed to be free flow and is not included in any CLV calculations.

Split Intersection

DESIGN AND RESULTS

		Critical Lane Volume Sum			
Project Name:	Sweetgrasss	< 1200	1200 - 1399	1400 - 1599	≥ 1600
EW Facility:	Primary Entrancd				
NS Facility:	Benn's Church Boulevard	MAXIMUM VOLUME / CAPACITY RATIO:			1.08
Date:	December 17, 2019				

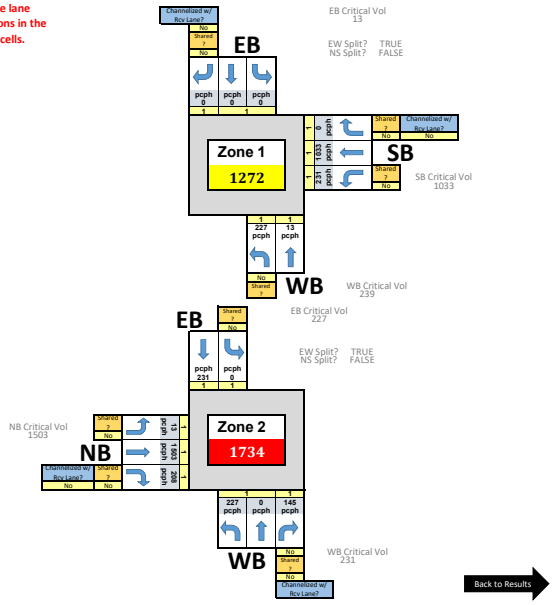


Note: This diagram does not reflect the actual lane configuration of the intersection

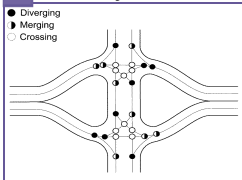
Split Intersection

DATA INPUT AND CONFIGURATION

Enter the lane configurations in the yellow cells.



Safety - Conflict Point Diagram



Conflict Type	Count
Crossing	10
Merging	8
Diverging	8
Total	26

Conflict Type	Weight
Crossing	2
Merging	1
Diverging	1

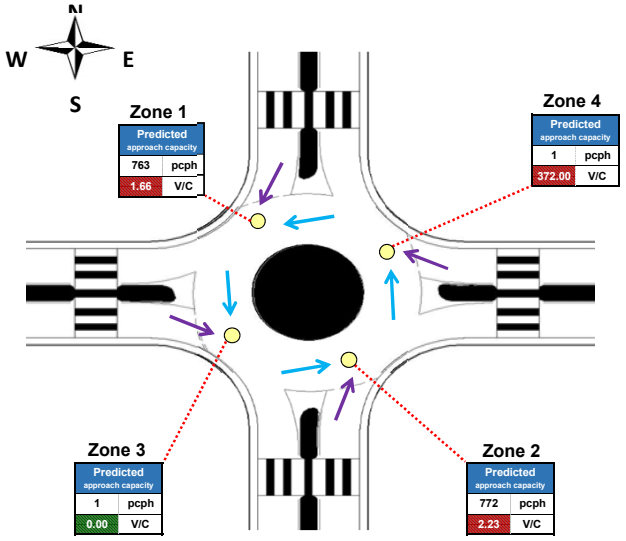
Weighted Total Conflict Points

36

50' ICD Mini-Roundabout

DESIGN AND RESULTS

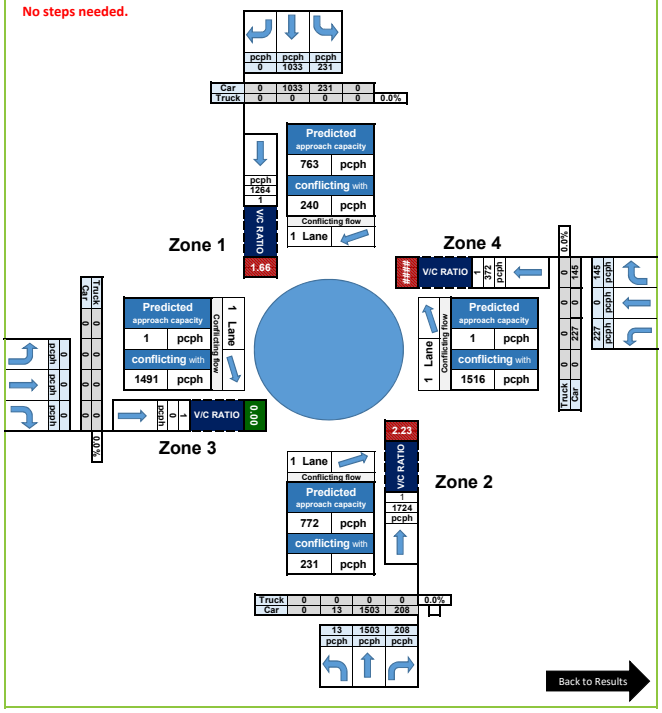
Project Name:	Sweetgrasss	Critical Lane Volume Sum			
EW Facility:	Primary Entrancd	< 1200	1200 - 1399	1400 - 1599	≥ 1600
NS Facility:	Benn's Church Boulevard	VOLUME / CAPACITY RATIO:	372.00		
Date:	December 17, 2019				



50' ICD Mini-Roundabout

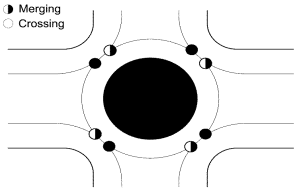
DATA INPUT AND CONFIGURATION

No steps needed.



Safety - Conflict Point Diagram

● Diverging
◑ Merging
○ Crossing



Conflict Type	Count
Crossing	0
Merging	4
Diverging	4
Total	8

Conflict Type	Weight
Crossing	2
Merging	1
Diverging	1

Weighted Total Conflict Points

8

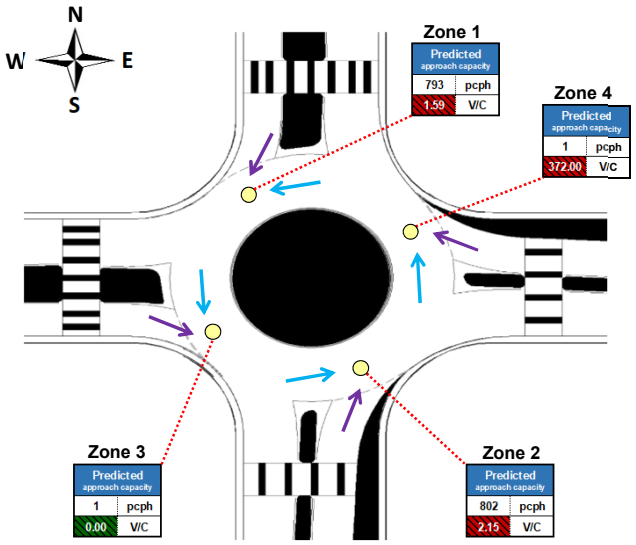
Assumptions

- This worksheet does not use the CLV methodology. The calculations are based on the article *Determination of Mini-Roundabout Capacity in the United States* , published in the *Journal of Transportation Engineering* .

75' ICD Mini-Roundabout

DESIGN AND RESULTS

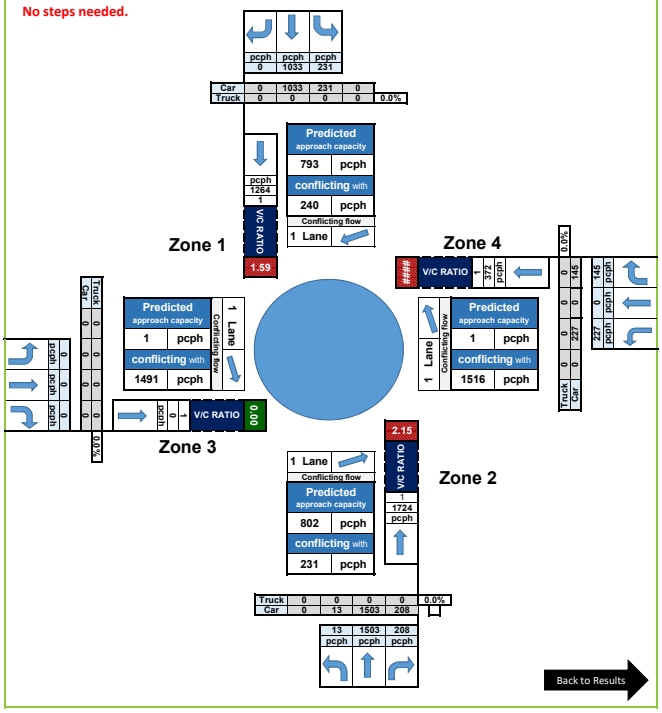
Project Name:	Sweetgrasss	Critical Lane Volume Sum			
EW Facility:	Primary Entrancd	< 1200	1200 - 1399	1400 - 1599	≥ 1600
NS Facility:	Benn's Church Boulevard	VOLUME / CAPACITY RATIO:	372.00		
Date:	December 17, 2019				



75' ICD Mini-Roundabout

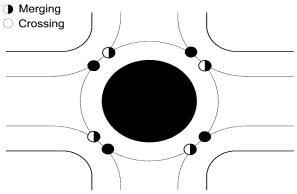
DATA INPUT AND CONFIGURATION

No steps needed.



Safety - Conflict Point Diagram

● Diverging
◑ Merging
○ Crossing



Conflict Type	Count
Crossing	0
Merging	4
Diverging	4
Total	8

Conflict Type	Weight
Crossing	2
Merging	1
Diverging	1

Weighted Total Conflict Points

8

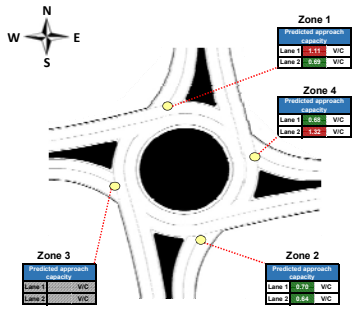
Assumptions

- This worksheet does not use the CLV methodology. The calculations are based on the article *Determination of Mini-Roundabout Capacity in the United States* , published in the *Journal of Transportation Engineering* .

Roundabout

DESIGN AND RESULTS

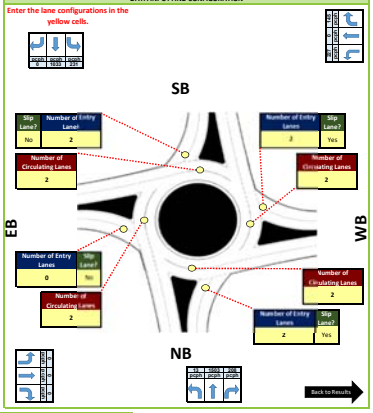
		Critical Lane Volume Sum			
Project Name:	Sweetgrasss	≤ 1200	1200 - 1399	1400 - 1599	≥ 1600
EW Facility:	Primary Entrancd	VOLUME / CAPACITY RATIO:			1.32
NS Facility:	Benn's Church Boulevard				
Date:	December 17, 2019				



Roundabout

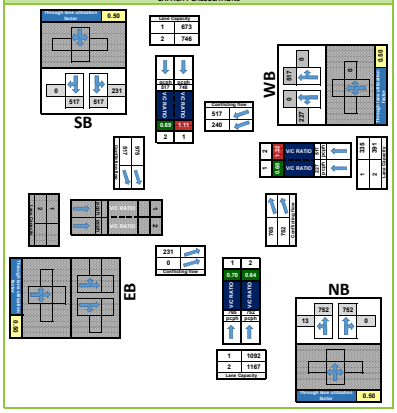
DATA INPUT AND CONFIGURATION

Enter the lane configurations in the yellow cells.



Roundabout

CAPACITY CALCULATIONS



EQUATION: A x exp(-B x Q)

Number of Entry Lanes	Number of Circulating Lanes	Lane	A	B
1	1	-	1380	0.00102
1	2	-	1420	0.00085
2	1	Left	1420	0.00091
2	1	Right	1420	0.00091
2	2	Left	1350	0.00092
2	2	Right	1420	0.00085

Safety - Conflict Point Diagram

Conflict Type	Count
Crossing	0
Merging	4
Diverging	4
Total	8

Conflict Type	Weight
Crossing	2
Merging	1
Diverging	1

Weighted Total Conflict Points

8

Assumptions

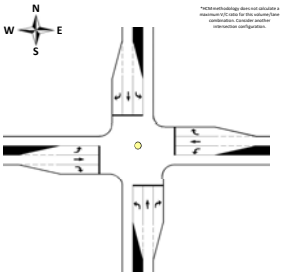
- The number of circulating lanes in one quadrant is assumed to be equal to the number of exiting lanes in the next quadrant.
- The roundabout is limited to a maximum of two entry lanes and two circulating lanes.
- All left-turning vehicles are assumed to stay in the innermost lane until exiting the roundabout.
- This worksheet does not use the CLV methodology. The calculations are based on the *HCM 6th Edition* .

Two-Way Stop Control (TWSC)

DESIGN AND RESULTS

Project Name	Sweetgrasss	Critical Lane Volume Sum
NW Facility	Primary Entrance	< 500 | 500 - 599 | 600 - 699 | ≥ 700
NE Facility	Beirn's Church Boulevard	VOLUME / CAPACITY RATIO: N/A*
Date	December 17, 2019	

*HCM methodology does not calculate a maximum V/C ratio for this volume/lane combination. Consider another intersection configuration.

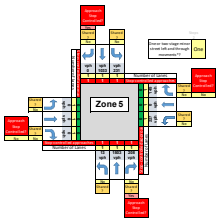


Note: This diagram does not reflect the actual lane configuration of the intersection

Two-Way Stop Control (TWSC)

DATA INPUT AND CONFIGURATION

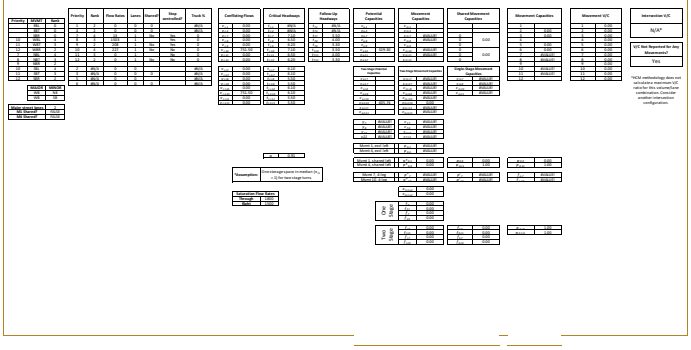
Step 1: Identify which approaches are stop-controlled by selecting "Yes" from the drop-down
Step 2: Enter the lane configurations in the yellow cells.



Back to Results

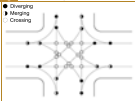
Two-Way Stop Control (TWSC)

HCM 6 CALCULATIONS



Safety - Conflict Point Diagram

- Diverging
- Merging
- Crossing



Conflict Type	Count
Crossing	16
Merging	8
Diverging	8
Total	32

Conflict Type	Weight
Crossing	2
Merging	1
Diverging	1

Weighted Total Conflict Points: 48

Assumptions

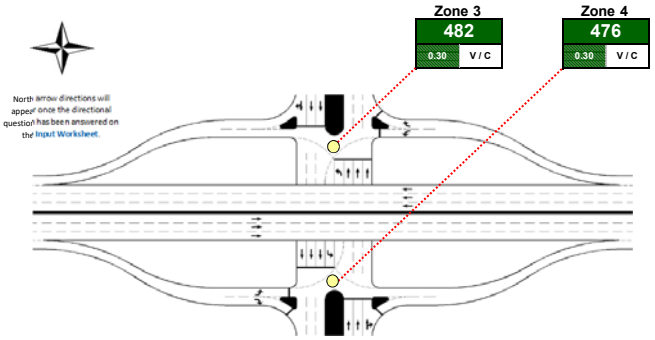
- This worksheet does not use the CLV methodology. The calculations are based on the *HCM, 6th Edition*. The calculations are based on vehicles per hour.

Traditional Diamond Interchange

DESIGN AND RESULTS

Project Name:	Sweetgrasss
EW Facility:	Primary Entrancd
NS Facility:	Benn's Church Boulevard
Date:	December 17, 2019

Critical Lane Volume Sum			
< 1200	1200 - 1399	1400 - 1599	≥ 1600
VOLUME / CAPACITY RATIO:			0.30

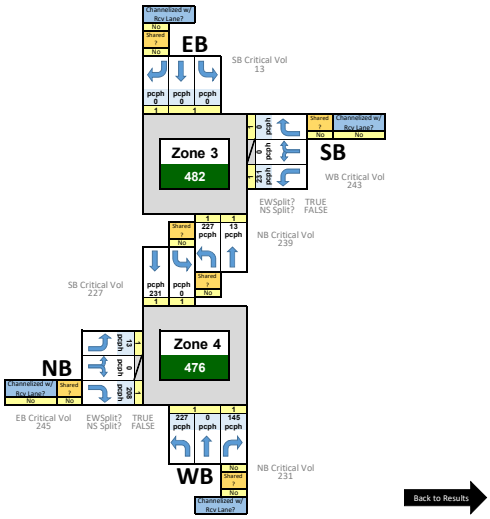


Note: This diagram does not reflect the actual lane configuration of the intersection

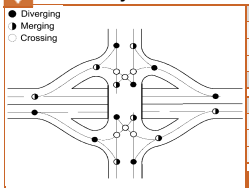
Traditional Diamond Interchange

DATA INPUT AND CONFIGURATION

Enter the lane configurations in the yellow cells.



Safety - Conflict Point Diagram



Conflict Type	Count
Crossing	6
Merging	8
Diverging	8
Total	22

Conflict Type	Weight
Crossing	2
Merging	1
Diverging	1

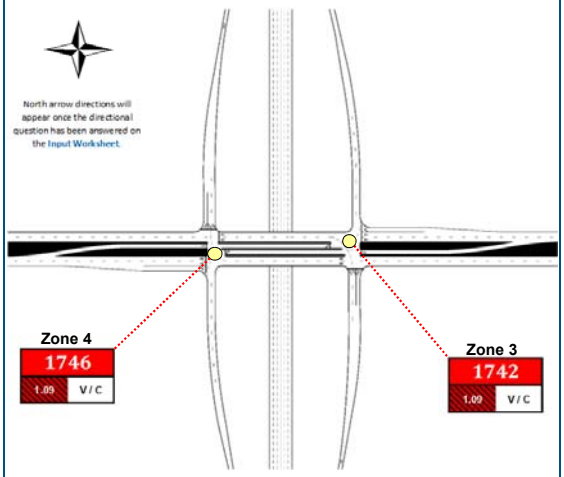
Weighted Total Conflict Points

28

Contraflow Left Interchange

DESIGN AND RESULTS

		Critical Lane Volume Sum			
Project Name:	Sweetgrasss	< 1200	1200 - 1399	1400 - 1599	≥ 1600
EW Facility:	Primary Entrancd				
NS Facility:	Benn's Church Boulevard	VOLUME / CAPACITY RATIO:			1.09
Date:	December 17, 2019				

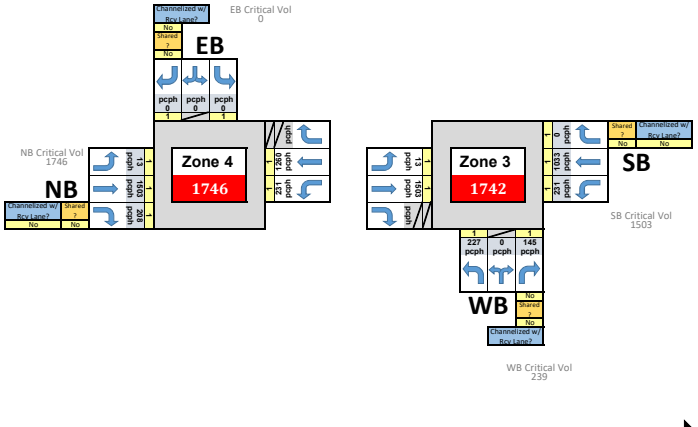


Note: This diagram does not reflect the actual lane configuration of the intersection

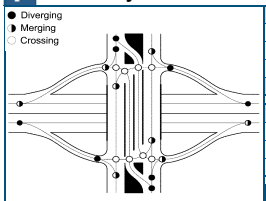
Contraflow Left Interchange

DATA INPUT AND CONFIGURATION

Enter the lane configurations in the yellow cells.



Safety - Conflict Point Diagram



Conflict Type	Count
Crossing	8
Merging	8
Diverging	8
Total	**24**

Conflict Type	Weight
Crossing	2
Merging	1
Diverging	1

Weighted Total Conflict Points

32

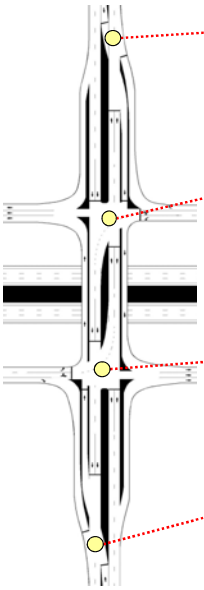
Displaced Left Turn Interchange

DESIGN AND RESULTS

Project Name:	Sweetgrasss
EW Facility:	Primary Entrancd
NS Facility:	Benn's Church Boulevard
Date:	December 17, 2019

Critical Lane Volume Sum			
< 1200	1200 - 1399	1400 - 1599	≥ 1600
VOLUME / CAPACITY RATIO:		0.30	

North arrow directions will appear once the directional question has been answered on the Input Worksheet.



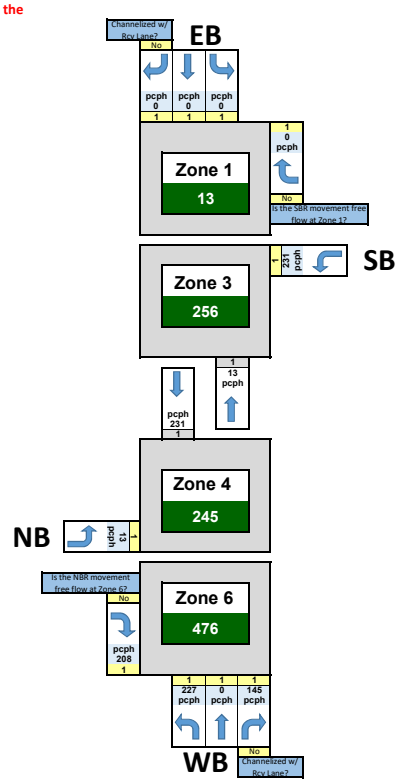
Zone 1	13	0.01 V / C
Zone 3	256	0.16 V / C
Zone 4	245	0.15 V / C
Zone 6	476	0.30 V / C

Note: This diagram does not reflect the actual lane configuration of the intersection

Displaced Left Turn Interchange

DATA INPUT AND CONFIGURATION

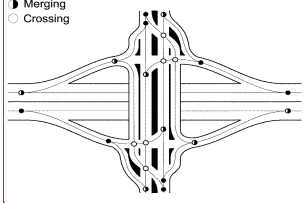
Enter the lane configurations in the yellow cells.



Back to Results

Safety - Conflict Point Diagram

Diverging
Merging
Crossing



Conflict Type	Count
Crossing	6
Merging	8
Diverging	8
Total	**22**

Conflict Type	Weight
Crossing	2
Merging	1
Diverging	1

Weighted Total Conflict Points

28

Assumptions

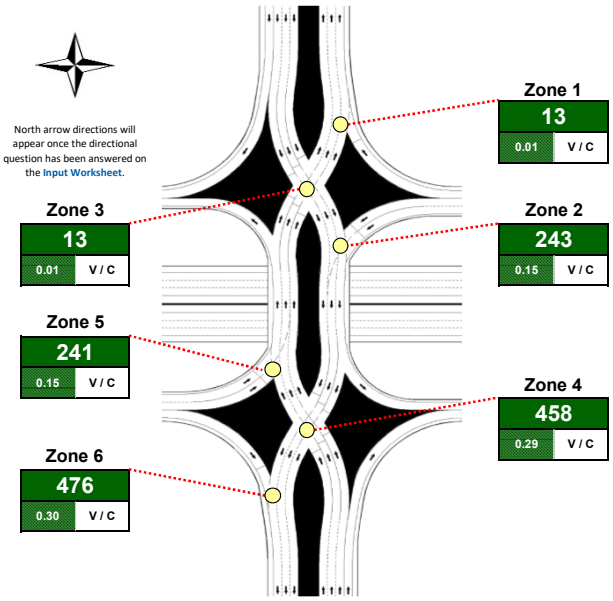
- The number of through lanes entered in one zone is assumed to be equal to the number of through lanes in all zones that the movement passes through.

Diverging Diamond Interchange (DDI)

DESIGN AND RESULTS

		Critical Lane Volume Sum			
Project Name:	Sweetgrasss	< 1200	1200 - 1399	1400 - 1599	≥ 1600
EW Facility:	Primary Entrancd				
NS Facility:	Benn's Church Boulevard	VOLUME / CAPACITY RATIO:			0.30
Date:	December 17, 2019				

North arrow directions will appear once the directional question has been answered on the Input Worksheet.

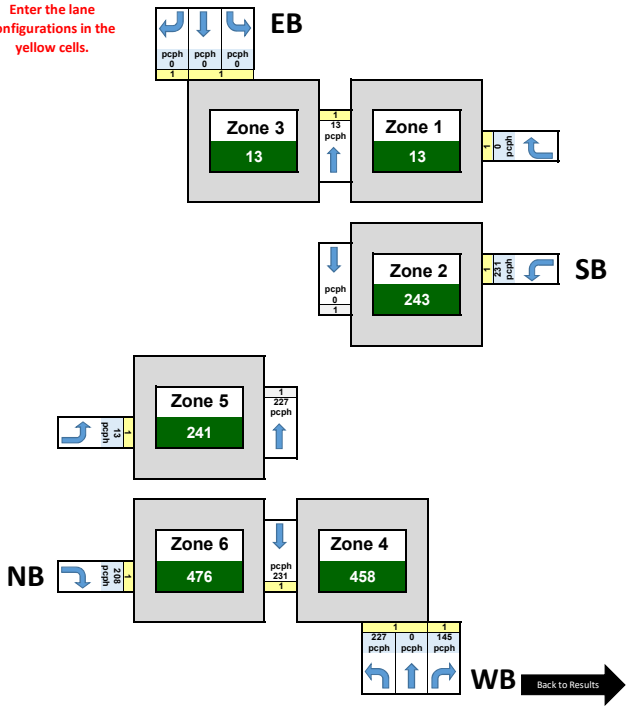


Note: This diagram does not reflect the actual lane configuration of the intersection

Diverging Diamond Interchange (DDI)

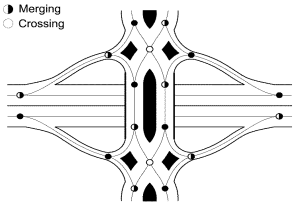
DATA INPUT AND CONFIGURATION

Enter the lane configurations in the yellow cells.



Safety - Conflict Point Diagram

● Diverging
◑ Merging
○ Crossing



Conflict Type	Count
Crossing	2
Merging	8
Diverging	8
Total	18

Conflict Type	Weight
Crossing	2
Merging	1
Diverging	1

Weighted Total Conflict Points

20

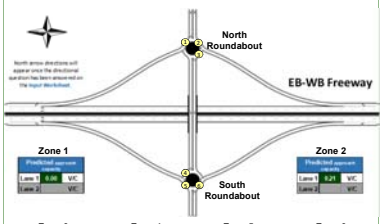
Assumptions

- The number of WB through lanes entered in Zone 4 is assumed to be equal to the number of through lanes in Zone 5. The number of EB through lanes entered in Zone 3 is assumed to be equal to the number of through lanes in Zone 2.

Double Roundabout Interchange

DESIGN AND RESULTS

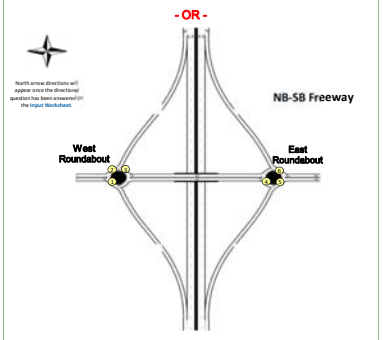
		Critical Lane Volume Sum			
Project Name:	Sweetgrasss	≤ 1200	1200 - 1399	1400 - 1599	≥ 1600
EW Facility:	Primary Entrancd				
NS Facility:	Benn's Church Boulevard	VOLUME / CAPACITY RATIO:			0.27
Date:	December 17, 2019				



Zone 1			Zone 2		
Predicted approach capacity			Predicted approach capacity		
Lane 1	0.00	V/C	Lane 1	0.21	V/C
Lane 2		V/C	Lane 2		V/C

Zone 3			Zone 4			Zone 5			Zone 6		
Predicted approach capacity			Predicted approach capacity			Predicted approach capacity			Predicted approach capacity		
Lane 1	0.17	V/C	Lane 1	0.17	V/C	Lane 1	0.29	V/C	Lane 1	0.27	V/C
Lane 2		V/C	Lane 2		V/C	Lane 2		V/C	Lane 2		V/C

- OR -

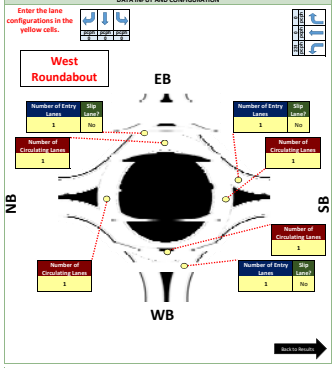


Note: This diagram does not reflect the actual lane configuration of the intersection

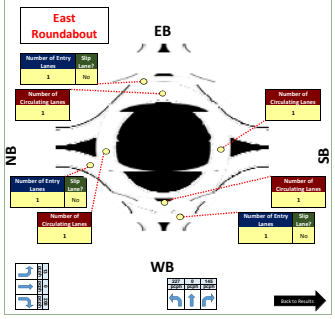
Double Roundabout Interchange

DATA INPUT AND CONFIGURATION

Enter the lane configurations in the yellow cells.

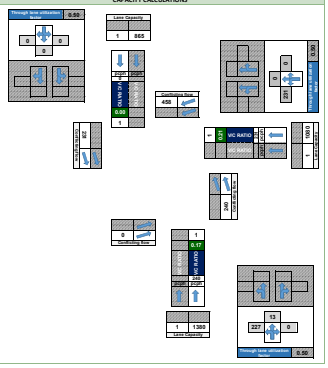


DATA INPUT AND CONFIGURATION

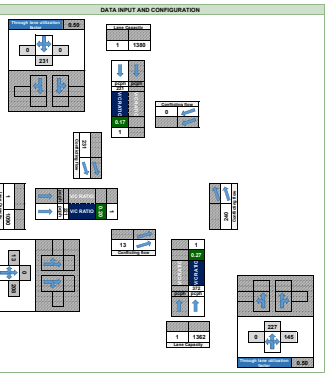


Double Roundabout Interchange

CAPACITY CALCULATIONS



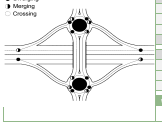
DATA INPUT AND CONFIGURATION



EQUATION: A x exp(-B x Q)

Number of Entry Lanes	Number of Circulating Lanes	Lane	A	B
1	1	-	1380	0.00102
1	2	-	1420	0.00085
2	1	Left	1420	0.00091
2	1	Right	1420	0.00091
2	2	Left	1350	0.00092
2	2	Right	1420	0.00085

Safety - Conflict Point Diagram



Conflict Type	Count
Crossing	0
Merging	8
Diverging	8
Total	16

Conflict Type	Weight
Crossing	2
Merging	1
Diverging	1

Weighted Total Conflict Points: **16**

Assumptions

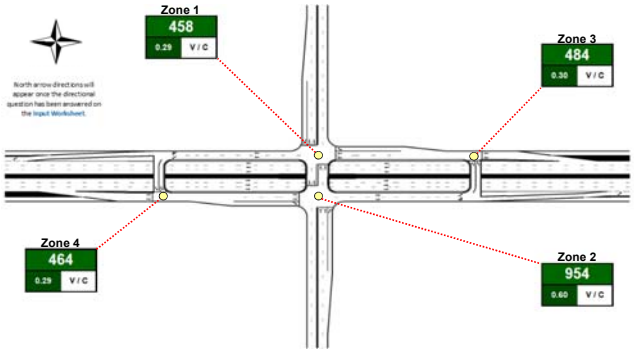
- The number of circulating lanes in one quadrant is assumed to be equal to the number of exiting lanes in the next quadrant.
- The roundabout is limited to a maximum of two entry lanes and two circulating lanes.
- All left-turning vehicles are assumed to stay in the innermost lane until exiting the roundabout.
- This worksheet does not use the CLV methodology. The calculations are based on the *HCM 6th Edition*.

Michigan Urban Diamond Intersection

DESIGN AND RESULTS

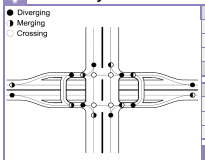
Project Name:	Sweetgrasss
EW Facility:	Primary Entrancd
NS Facility:	Benn's Church Boulevard
Date:	December 17, 2019

Critical Lane Volume Sum			
< 1200	1200 - 1399	1400 - 1599	≥ 1600
VOLUME / CAPACITY RATIO:	0.60		



Note: This diagram does not reflect the actual lane configuration of the intersection

Safety - Conflict Point Diagram



Conflict Type	Count
Crossing	4
Merging	8
Diverging	8
Total	20

Conflict Type	Weight
Crossing	2
Merging	1
Diverging	1

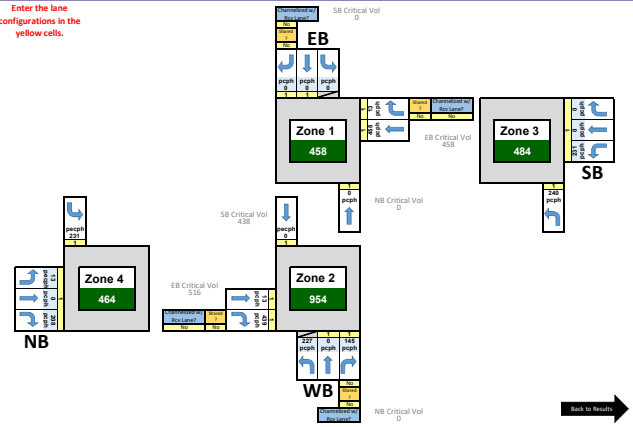
Weighted Total Conflict Points

24

Michigan Urban Diamond Intersection

DATA INPUT AND CONFIGURATION

Enter the lane configurations in the yellow cells.

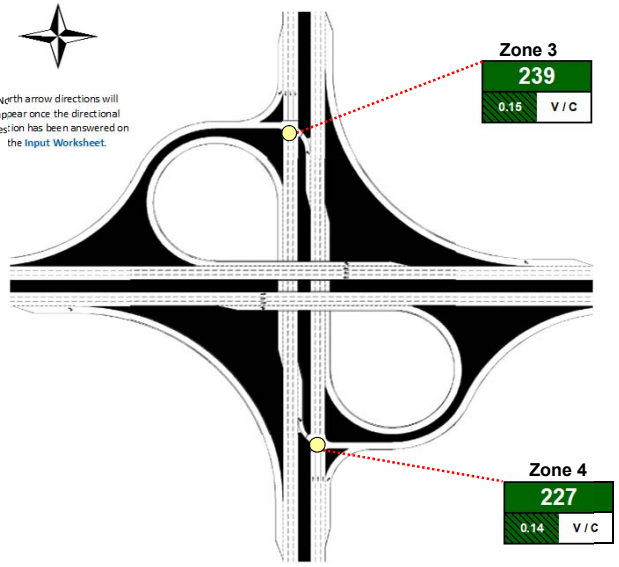


Partial Cloverleaf Interchange

DESIGN AND RESULTS

		Critical Lane Volume Sum			
Project Name:	Sweetgrasss	< 1200	1200 - 1399	1400 - 1599	≥ 1600
EW Facility:	Primary Entrancd				
NS Facility:	Benn's Church Boulevard	VOLUME / CAPACITY RATIO:			0.15
Date:	December 17, 2019				

North arrow directions will appear once the directional question has been answered on the Input Worksheet.

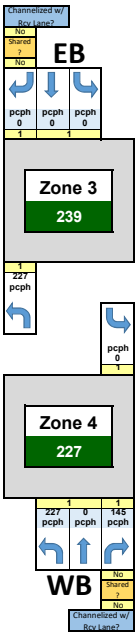


Note: This diagram does not reflect the actual lane configuration of the intersection

Partial Cloverleaf Interchange

DATA INPUT AND CONFIGURATION

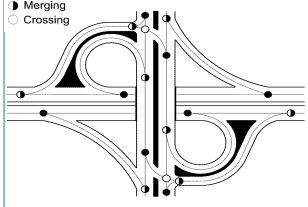
Enter the lane configurations in the yellow cells.



Back to Results

Safety - Conflict Point Diagram

● Diverging
◑ Merging
○ Crossing



Conflict Type	Count
Crossing	2
Merging	8
Diverging	8
Total	18

Conflict Type	Weight
Crossing	2
Merging	1
Diverging	1

Weighted Total Conflict Points

20

Assumptions

- This configuration assumes the Partial cloverleaf has two loop ramps, both of which will be used by vehicles exiting the freeway.

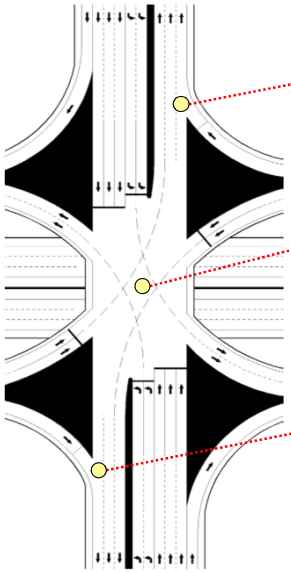
Single Point Urban Interchange (SPUI)

DESIGN AND RESULTS

Project Name:	Sweetgrasss
EW Facility:	Primary Entrancd
NS Facility:	Benn's Church Boulevard
Date:	December 17, 2019

Critical Lane Volume Sum			
< 1200	1200 - 1399	1400 - 1599	≥ 1600
VOLUME / CAPACITY RATIO:		0.30	

North arrow directions will appear once the directional question has been answered on the **Input Worksheet**.



Zone 1
13
0.01 V / C

Zone 3
482
0.30 V / C

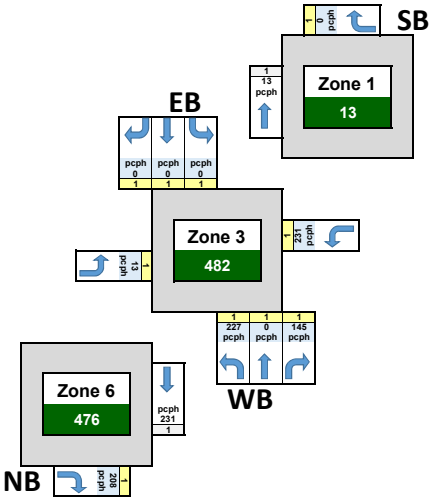
Zone 6
476
0.30 V / C

Note: This diagram does not reflect the actual lane configuration of the intersection

Single Point Urban Interchange (SPUI)

DATA INPUT AND CONFIGURATION

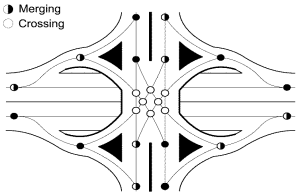
Enter the lane configurations in the yellow cells.



Back to Results

Safety - Conflict Point Diagram

● Diverging
◑ Merging
○ Crossing



Conflict Type	Count
Crossing	8
Merging	8
Diverging	8
Total	**24**

Conflict Type	Weight
Crossing	2
Merging	1
Diverging	1

Weighted Total Conflict Points

32

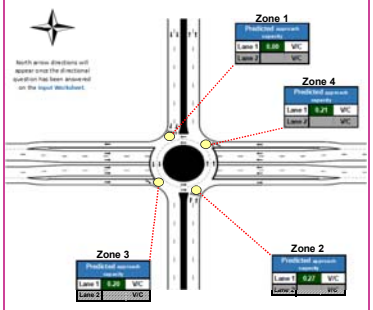
Assumptions

- The number of through lanes entered in one zone is assumed to be equal to the number of through lanes in all zones that the movement passes through.

Single Roundabout Interchange

DESIGN AND RESULTS

		Critical Lane Volume Sum			
Project Name:	Sweetgrasss	< 1200	1200 - 1399	1400 - 1599	≥ 1600
EW Facility:	Primary Entrancd	VOLUME / CAPACITY RATIO:			
NS Facility:	Benn's Church Boulevard				0.27
Date:	December 17, 2019				

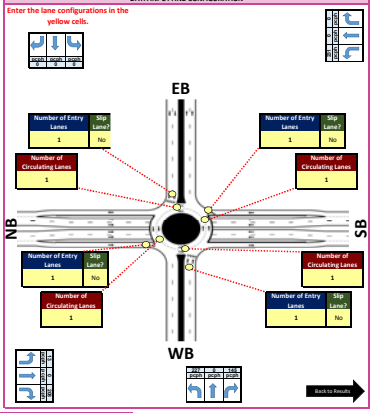


Note: This diagram does not reflect the actual lane configuration of the intersection

Single Roundabout Interchange

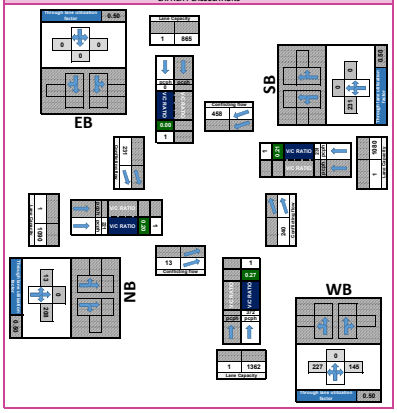
DATA INPUT AND CONFIGURATION

Enter the lane configurations in the yellow cells.



Single Roundabout Interchange

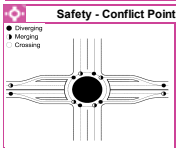
CAPACITY CALCULATIONS



EQUATION: A x exp(-B x Q)

Number of Entry Lanes	Number of Circulating Lanes	Lane	A	B
1	1	-	1380	0.00102
1	2	-	1420	0.00085
2	1	Left	1420	0.00091
2	1	Right	1420	0.00091
2	2	Left	1350	0.00092
2	2	Right	1420	0.00085

Safety - Conflict Point Diagram



Conflict Type	Count
Crossing	0
Merging	6
Diverging	6
Total	12

Conflict Type	Weight
Crossing	2
Merging	1
Diverging	1

Weighted Total Conflict Points

12

Assumptions

- The number of circulating lanes in one quadrant is assumed to be equal to the number of exiting lanes in the next quadrant.
- The roundabout is limited to a maximum of two entry lanes and two circulating lanes.
- All left-turning vehicles are assumed to stay in the innermost lane until exiting the roundabout.
- This worksheet does not use the CLV methodology. The calculations are based on the *HCM 6th Edition* .

Appendix C (optional):
TIA, Safety Study, and/or other Studies (if available)



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DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NORFOLK DISTRICT
FORT NORFOLK
803 FRONT STREET
NORFOLK VA 23510-1011

November 10, 2021

PRELIMINARY JURISDICTIONAL DETERMINATION

Eastern Virginia Regulatory Section
NAO-2021-1053 (Jones Creek)

Jamie Armentrout
Wetland Studies and Solutions, Inc.
1008 Old Virginia Beach Road, Suite 200
Virginia Beach, Virginia 23451

Dear Mr. Armentrout:

This letter is regarding your request for a preliminary jurisdictional determination of the aquatic resources (e.g., wetlands, streams, and ponds), on an approximately 249-acre parcel located at 14096 Benns Church Road, known as Sweetgrass, in Isle of Wight County, Virginia (tax map parcel #32-01-009) hereinafter referred to as project area.

The map entitled “Wetland Delineation Sweetgrass”, by WSSI dated March 8, 2021, received by the U.S. Army Corps of Engineers (Corps) on April 15, 2021 (copy enclosed) provides the locations of the aquatic resources within the project area referenced above. This letter is not confirming the Cowardin classifications of these aquatic resources.

These aquatic resources exhibit wetland criteria as defined in the 1987 Corps of Engineers Wetland Delineation Manual, and the Atlantic and Gulf Coastal Plain Regional Supplement. This site also contains aquatic resources with an ordinary high-water mark and a high tide line.

Please be aware that you may be required to obtain a Corps permit for any discharge of dredged and/or fill material, either temporary or permanent, into a water of the U.S. In addition, you may be required to obtain a Corps permit for certain activities occurring within, under, or over a navigable water of the U.S. subject to the Section 10 of the Rivers and Harbors Act. Furthermore, you may be required to obtain state and local authorizations, including a Virginia Water Protection Permit from the Virginia Department of Environmental Quality (DEQ), a permit from the Virginia Marine Resources Commission (VMRC), and/or a permit from your local wetlands board.

This is a preliminary jurisdictional determination and is not a legally binding determination regarding whether Corps jurisdiction applies to the aquatic resources in

question. To determine Corps' jurisdiction, you may request and obtain an approved jurisdictional determination.

This delineation of aquatic resources can be relied upon for no more than five years from the date of this letter. New information may warrant revision. Enclosed is a copy of the "Preliminary Jurisdictional Determination Form". Please review the document, sign, and return one copy to the Corps, either by email george.a.janek@usace.army.mil or by standard mail to U.S. Army Corps of Engineers, Norfolk District, CENAO-WR-R, Attn: George Janek, 803 Front Street, Norfolk, VA 23510-1011.

If you have any questions, please contact me by telephone at (757) 201-7135 or by email at george.a.janek@usace.army.mil.

Sincerely,



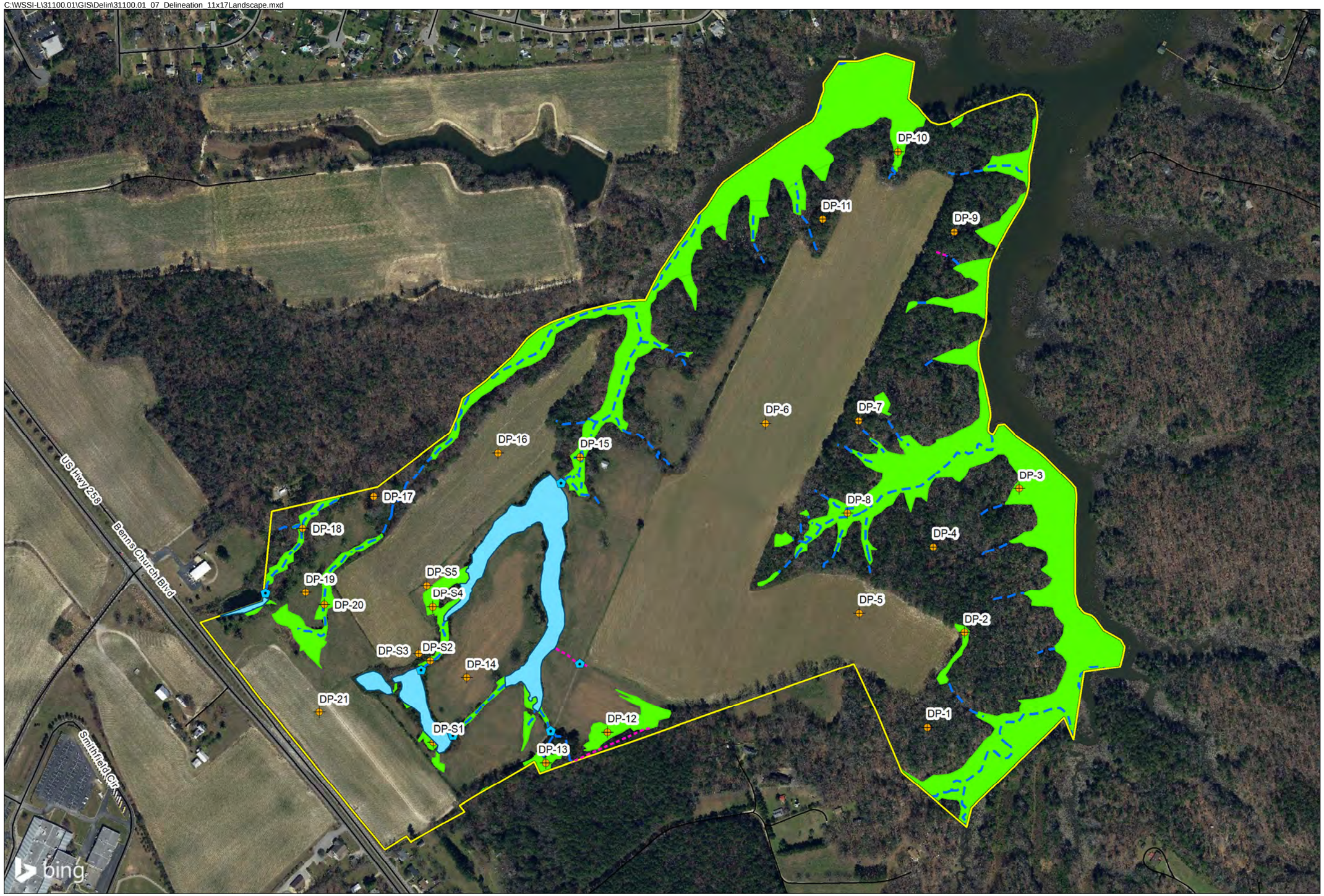
George Janek
Eastern Virginia
Regulatory Section

Enclosure(s):

cc: Henry Layden, Trustee
DEQ
Shaunee A. Beussink, Isle of Wight County

Received by USACE NAO by DGM April 15, 2021

C:\WSSI-L\31100.01\GIS\Delin\31100.01_07_Delineation_11x17Landscape.mxd



Wetland Delineation
Sweetgrass
WSSI #31100.01

NORTH

0 500

Feet

Original Scale:
1 " = 500 '

- Project Area (249.4 ac)
- Wetland Data Points
- Culvert or Outfall
- Wetland (38.75 ac)
- Farm Pond (6.05 ac)
- Stream (15,645 lf)
- Ditch (685 lf)

Delineation Notes:
In-field wetland delineation performed on December 15, 2020 through February 10, 2020 by Jamie Armentrout, PWD.

*Subject to confirmation by the USACE

Aerial Source: Bing

Figure Date: March 8, 2021

Wetland Studies and Solutions, Inc.
a DAVEY company

Figure 7

Appendix 2 - PRELIMINARY JURISDICTIONAL DETERMINATION (PJD) FORM

BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR PJD:

B. NAME AND ADDRESS OF PERSON REQUESTING PJD:

C. DISTRICT OFFICE, FILE NAME, AND NUMBER:

D. PROJECT LOCATION(S) AND BACKGROUND INFORMATION:
(USE THE TABLE BELOW TO DOCUMENT MULTIPLE AQUATIC RESOURCES AND/OR AQUATIC RESOURCES AT DIFFERENT SITES)

State: County/parish/borough: City:

Center coordinates of site (lat/long in degree decimal format):

Lat.: xx.xxx° Long.: yy.yyy°

Universal Transverse Mercator:

Name of nearest waterbody:

E. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

☐ Office (Desk) Determination. Date:

☐ Field Determination. Date(s):

TABLE OF AQUATIC RESOURCES IN REVIEW AREA WHICH "MAY BE" SUBJECT TO REGULATORY JURISDICTION.

Site number	Latitude (decimal degrees)	Longitude (decimal degrees)	Estimated amount of aquatic resource in review area (acreage and linear feet, if applicable)	Type of aquatic resource (i.e., wetland vs. non-wetland waters)	Geographic authority to which the aquatic resource "may be" subject (i.e., Section 404 or Section 10/404)

1) The Corps of Engineers believes that there may be jurisdictional aquatic resources in the review area, and the requestor of this PJD is hereby advised of his or her option to request and obtain an approved JD (AJD) for that review area based on an informed decision after having discussed the various types of JDs and their characteristics and circumstances when they may be appropriate.

2) In any circumstance where a permit applicant obtains an individual permit, or a Nationwide General Permit (NWP) or other general permit verification requiring "pre-construction notification" (PCN), or requests verification for a non-reporting NWP or other general permit, and the permit applicant has not requested an AJD for the activity, the permit applicant is hereby made aware that: (1) the permit applicant has elected to seek a permit authorization based on a PJD, which does not make an official determination of jurisdictional aquatic resources; (2) the applicant has the option to request an AJD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an AJD could possibly result in less compensatory mitigation being required or different special conditions; (3) the applicant has the right to request an individual permit rather than accepting the terms and conditions of the NWP or other general permit authorization; (4) the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the Corps has determined to be necessary; (5) undertaking any activity in reliance upon the subject permit authorization without requesting an AJD constitutes the applicant's acceptance of the use of the PJD; (6) accepting a permit authorization (e.g., signing a proffered individual permit) or undertaking any activity in reliance on any form of Corps permit authorization based on a PJD constitutes agreement that all aquatic resources in the review area affected in any way by that activity will be treated as jurisdictional, and waives any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, or in any administrative appeal or in any Federal court; and (7) whether the applicant elects to use either an AJD or a PJD, the JD will be processed as soon as practicable. Further, an AJD, a proffered individual permit (and all terms and conditions contained therein), or individual permit denial can be administratively appealed pursuant to 33 C.F.R. Part 331. If, during an administrative appeal, it becomes appropriate to make an official determination whether geographic jurisdiction exists over aquatic resources in the review area, or to provide an official delineation of jurisdictional aquatic resources in the review area, the Corps will provide an AJD to accomplish that result, as soon as is practicable. This PJD finds that there *"may be"* waters of the U.S. and/or that there *"may be"* navigable waters of the U.S. on the subject review area, and identifies all aquatic features in the review area that could be affected by the proposed activity, based on the following information:

SUPPORTING DATA. Data reviewed for PJD (check all that apply)

Checked items should be included in subject file. Appropriately reference sources below where indicated for all checked items:

☐ Maps, plans, plots or plat submitted by or on behalf of the PJD requestor:
Map: _____.

☐ Data sheets prepared/submitted by or on behalf of the PJD requestor.
☐ Office concurs with data sheets/delineation report.
☐ Office does not concur with data sheets/delineation report. Rationale: _____.

☐ Data sheets prepared by the Corps: _____.

☐ Corps navigable waters' study: _____.

☐ U.S. Geological Survey Hydrologic Atlas: _____.
☐ USGS NHD data.
☐ USGS 8 and 12 digit HUC maps.

☐ U.S. Geological Survey map(s). Cite scale & quad name: _____.

☐ Natural Resources Conservation Service Soil Survey. Citation: _____.

☐ National wetlands inventory map(s). Cite name: _____.

☐ State/local wetland inventory map(s): _____.

☐ FEMA/FIRM maps: _____.

☐ 100-year Floodplain Elevation is: ____. (National Geodetic Vertical Datum of 1929)

☐ Photographs: ☐ Aerial (Name & Date): _____.
or ☐ Other (Name & Date): _____.

☐ Previous determination(s). File no. and date of response letter: _____.

☐ Other information (please specify): _____.

IMPORTANT NOTE: The information recorded on this form has not necessarily been verified by the Corps and should not be relied upon for later jurisdictional determinations.

_____
Signature and date of
Regulatory staff member
completing PJD

_____
Signature and date of
person requesting PJD
(REQUIRED, unless obtaining
the signature is impracticable)[1]

[1] Districts may establish timeframes for requestor to return signed PJD forms. If the requestor does not respond within the established time frame, the district may presume concurrence and no additional follow up is necessary prior to finalizing an action.

AES
CONSULTING ENGINEERS

5248 Olde Towne Road, Suite 1
Williamsburg, Virginia 23188
Phone (757) 253-0040
Fax (757) 220-8994
aesva.com

Water Quality Impact Assessment

Rezoning

For

Sweetgrass Development

Prepared For

NVR, INC
860 Greenbrier Circle, Suite 100
Chesapeake, Virginia 23320

April 29, 2019
Revised November 2021

AES
CONSULTING ENGINEERS

5248 Olde Towne Road Suite 1
Williamsburg, Virginia 23188
Phone: 757-253-0040
www.aesva.com

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B. Identification of Impacts and Required Information for Review 3
C. Hydrologic Impacts 4
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V. CONCLUSION 6
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APPENDIX

Exhibit A – Impact Map
Exhibit B – Clearing Exhibit

I. INTRODUCTION

On behalf of NVR, Inc. proposes to request Rezoning for a parcel within the Windsor District is to rezone a parcel containing 249.47 acres that is currently zoned (RAC Rural Conservation District) to PD/MX (Planned Development Mixed Use) at 14096 Benns Church Boulevard, Smithfield Virginia.

The site is currently mainly farmed land, with the perimeter and portions for the site furthest from Benns Church Blvd being forested. The site lies completely within the County of Isle of Wight boarding the Smithfield City limits to the North, Jones Creek to the East, Single family subdivision to the South and Benns Church Blvd. (Rt. 10) to the West. The site contains an existing lake and slopes to existing creek known as Jones Creek. The average soils slope 2% to 6%. The site is within the Peanut soils and Water district and has a hydrologic unit code of JL41 and reaches the Pagan River-Jones Creek drainage areas.

The purpose of this assessment is to summarize and organize information about the proposed impacts to the Chesapeake Bay Preservation Area(s) (CBPAs) which are reasonably necessary for the development of this property and to identify proposed mitigation that addresses such impacts. The anticipated duration of the project is five to eight years, with impacts to the RPA occurring during the first year. While the site isn't fully designed, we anticipate ten (10) specific areas of CBPA impacts in the project area. Section 4003 of the Isle of Wight County Chesapeake Bay Ordinance generally categorizes these impacts. Exhibit A, submitted with this report, identifies the relative location of the impacts. Upon approval of the formal exception, the proposed mitigation described in this assessment will be incorporated into the submitted subdivision plans, which are required as part of the development review process.

The total area impacted approximately amounts to 102,483 square feet, in which case this assessment shall be considered a Major Water Quality Impact.

II. EXISTING CONDITIONS

The site is currently mainly farmed land, with the perimeter and portions for the site furthest from Benns Church Blvd being forested. Forested area makes up ± 47% of the site, while cropland makes up ± 36%. The remaining ± 17% of the site is water (i.e. pond and wetlands). Stormwater runoff currently sheet flows to the existing ponds located in the middle of the site and perimeter wetlands. A majority of the site is currently crop land and is moderately sloped, averaging 0-3%, with smaller areas exceeding 10%. A majority of lands sloped greater than 3% are located in RPA buffers and with the exceptions of the impacts listed below shall not be disturbed. The hydrologic soil groups found to be in the areas of proposed development are primarily hydrologic group C that generally indicates a low infiltration rate. The remaining site is predominately hydrologic group D with these soils being located in areas of the RPA buffers and wetlands. Exhibit A and Master Plan sheet 4 more clearly delineates the various soils and their relative hydrological classification, erosive characteristics and typical slopes.

III. WATER QUALITY IMPACT ASSESSMENT

A. Proposed Conditions

This project proposes 400 single family detached lots, 285 townhomes and ±5 acres of commercial area. This development will have two connections to Benns Church Boulevard. This project proposes to clear 20.28 acres of forested area and proposes ±50.40 acres of impervious (21%). The existing pond located on site will be upgrade to meet current DEQ specifications to act as a BMP. This shall include modifications to the embankment, outfall structure, and providing adequate benches.

B. Identification of Impacts and Required Information for Review

RPA Buffer Impact No. 1 (Roadway)
Impact No. 1 is for the construction associated with the road accessing the rear of the property. This impact is required to access the largest developable portion of the property. The area of this impact associated with the roadway is 9,783 square feet or 0.22 acres. ***All impacts are outside the wooded portion of the site.***

RPA Buffer Impact No. 2/8 (BMP and Outfall)
Impact No. 2 is for the construction of the stormwater pond outfall into the existing BMP. Impact No. 8 is for the regrading of the small upstream pond to incorporate it into the larger facility. This upstream pond is not considered perennial and does not have an RPA buffer associated with it. However, it falls within the buffer of the adjacent facility. These impacts are necessary to safely discharge runoff from the development into the stormwater management facilities. The combined area of these impacts is 15,660 square feet or 0.36 acres; 8,699 sf of these impacts will require clearing in the RPA buffer. 1,242 square feet of the required area of clearing within the RPA buffer overlaps the clearing area for RPA Buffer Impact No. 9.

RPA Buffer Impact No. 3/4 (Roadway)
Impact Nos. 3 and 4 are for the construction associated with the road accessing the south side of the property. This road location was aligned to minimize impacts to the RPA and wetlands on the property by crossing the buffers perpendicularly. This impact is necessary in order to access the largest portion of the property; there is a wetland channel that drains across the property from the neighboring site, which feeds into the large existing stormwater lake on the property. The combined area of these impacts is 38,172 square feet or 0.88 acres. ***This impact does not propose clearing in the RPA buffer.***

RPA Buffer Impact No. 5 (BMP Outfall)
Impact No. 5 is for the construction of a BMP outfall across existing farmed areas into the large existing lake. This impact is necessary in order to safely discharge from the BMP into the adjacent lake. The area of this impact is 5,330 square feet or 0.12 acres. ***This impact does not propose clearing in the RPA buffer.***

RPA Buffer Impact No. 6 (BMP Outfall)
Impact No. 6 is for the construction of a BMP outfall across steeply sloped areas into the adjacent wetlands area. This impact is necessary to safely discharge from the BMP and avoid future erosion of the steeper slops adjacent to the pond and existing wetlands. The area of this impact is 4,870 square feet or 0.11 acres; this impact requires clearing in the RPA buffer.

RPA Buffer Impact No. 7 (BMP Outfall)
Impact No. 7 is for the construction of a BMP outfall across steeply sloped areas into the adjacent wetlands area. This impact is necessary to safely discharge from the BMP and avoid future erosion of the steeper slops adjacent to the pond and existing wetlands. The area of this impact is 6,734 square feet or 0.15 acres; this impact requires clearing in the RPA buffer.

RPA Buffer Impact No. 9/10 (Utility Crossing)
Impact Nos. 9 and 10 are for the construction of a sanitary sewer main running between the existing ponds on the property. These impacts are necessary to provide gravity sewer to both halves of the property and eliminate the need for two separate County sanitary sewer lift stations to service the property. Portions of the impacts coincide with impacts associated with stormwater grading, and the remaining portions are designed to avoid wetland impacts. The combined area of these impacts is 8,415 square feet or 0.20 acres; 2,639 sf of these impacts will require clearing in the RPA buffer. 1,242 square feet of the required area of clearing within the RPA buffer overlaps the clearing area for RPA Buffer Impact No. 2.

Careful consideration has been taken to minimize the impacts for the proposed development. Exhibit A, submitted with this report, identifies the location of these impacts. The proposed mitigation described in this assessment will be incorporated into the construction plans for the subdivision, which are required as part of the development review process.

Although not dependent on the review and approval of this assessment, required permits necessary to develop this project include: General Virginia Stormwater Management Program (VSMP) Permit, Corps of Engineers Wetland Disturbance Permit, Virginia Department of Environmental Quality's Virginia Water Protection General Permit, Land-Disturbing Permit and Siltation Agreement. These and any other permits that may be required shall be (if not already) applied for at the appropriate time.

C. Hydrologic Impacts

It should be noted that most of the RPA impacts are currently located within farmed land and do not propose significantly changing the grading of the land or adding impervious cover to the land creating additional runoff. We have looked at each specific impact area and noted any changes to existing land cover and how those changes may impact the hydrology of the system. Any areas of steep slope will be put back with flatter site grades and matting used to stabilize the slopes.

RPA Buffer Impact No. 1 (Roadway)
Impact No. 1 is for the construction associated with the road accessing the south side of the property. This portion of the site is currently farm land, which is a B soil with less than 5% slopes. The existing soil condition likely produces little surface runoff to the adjacent wetlands. The proposed improvements for the roadway would capture the associated runoff and direct it to a stormwater BMP facility to treat and control the runoff before releasing it into the downstream existing lake. This change in the hydrology should have minimal impact on the downstream wetlands in this area and is designed to protect the natural drainage way.

RPA Buffer Impact No. 2/8 (BMP and Outfall)
Impact Nos. 2 and 8 are adjacent to the three existing ponds/lakes on the property. These areas are located along the banks of those facilities, and runoff from the impact areas currently drain directly into those facilities. Portions of the impact areas will be used to create a larger stormwater facility while maintaining existing drainage patterns to the greatest extend possible. This will improve the quality and quantity of the stormwater entering the downstream lake and will protect the natural drainage way.

RPA Buffer Impact No. 3/4 (Roadway)
Impact Nos. 3 and 4 are for the construction associated with the road accessing the south side of the property. This portion of the site is currently farm land, which is a D soil with less than 5% slopes. These soils exist in a natural low area of the site and feed into the downstream pond/lake. The drainage improvements associated with the roadway would redirect the water through a proposed BMP and treat and control the runoff before releasing it into the downstream existing lake. This change in the hydrology should present an improved situation, adding additional treatment and flood controls over the existing drainage patterns.

RPA Buffer Impact No. 5 (BMP Outfall)
Impact No. 5 is for the construction of a BMP outfall. This area is within a flat portion of the site that is currently farmed. These improvements would not significantly impact the natural hydrology, as the area of impact will match the existing drainage patterns and discharge into the downstream existing lake.

RPA Buffer Impact No. 6 (BMP Outfall)
Impact No. 6 is for the construction of a BMP outfall. This area is within a steeply sloped portion of the site. These improvements would not significantly impact the natural hydrology, as the area of impact will match the existing drainage patterns to the greatest extent possible and the slopes will be stabilized to prevent erosion and protect the natural drainage way.

RPA Buffer Impact No. 7 (BMP Outfall)
Impact No. 7 is for the construction of a BMP outfall. This area is within a steeply sloped portion of the site. These improvements should not significantly impact the natural hydrology, as the area of impact will match the existing drainage patterns to the greatest extent possible and the slopes will be stabilized to prevent erosion and protect the natural drainage way.

RPA Buffer Impact No. 9/10 (Utility Crossing)

Impact Nos. 9 and 10 are for the construction of a sanitary sewer main running between the existing ponds on the property. These impacts will not present any permanent change to the existing drainage patterns. Portions of the impacts coincide with impacts associated with stormwater grading, and the remaining portions are designed to avoid wetland impacts. These improvements should not significantly impact the natural hydrology, as the area of impact will match the existing drainage patterns to the greatest extent possible and the slopes will be stabilized to prevent erosion and protect the natural drainage way.

IV. PROPOSED MITIGATION

Mitigation to the grading and impacts noted above shall include setting aside developable open space and revegetation of current crop land within the RPA buffer. Initial mitigation efforts for these impacts shall include E&S measures as described in the Virginia Erosion & Sediment Control Handbook, such as permanent seeding that will incorporate a conservation seed mix applicable to the special requirements of the RPA, super silt fencing, and ECSC-3 straw/coconut turf reinforcement matting (manufactured by East Coast Erosion Control or equal). Final mitigation will involve a detailed landscape restoration plan. Every 400 s.f. of restoration area shall, at a minimum, include 1 canopy tree, 2 understory trees and 3 shrubs; based upon our current anticipated impacts and required buffer restoration the site will require ± 2,137 canopy trees, ± 4,274 understory trees, and ± 6,411 shrubs. Areas between the rear of the lots and the RPA buffers will be set aside in open space equaling no less than 4 acres or two time the RPA impacts, whichever is greater.

V. CONCLUSION

In summary, the findings of this Water Quality Impact Analysis indicate that:

- All measures or methods have been explored to limit any impact to the CBPA. When unavoidable, the impacted area has been minimized to the greatest extent possible.

- Extensive E&SC measures will be employed to minimize the effects of the subsequent discharge of stormwater to the receiving channel and wetlands.

- A Landscape Restoration Plan, conservation seeding and additional natural open space will be provided in order to mitigate for the impacts noted.

- Additional open space of developable land will be set aside to offset impacted areas at a ratio of 2:1.

APPENDIX

EXHIBIT A – IMPACT MAP
EXHIBIT B – CLEARING EXHIBIT

SOIL CHARACTERISTICS - ISLE OF WIGHT COUNTY, VA

SOILS NO.	SOIL NAME	HYDROLOGIC SOIL GROUP	TYPICAL SLOPES	EROSION FACTOR (K_w) WHOLE SOIL	EROSION FACTOR (T)	WATER TABLE UPPER LIMIT (FT)
2	BOHICKET SILTY CLAY LOAM	D	0–1%	0.24–0.28	5	0.0
3	CHICHAHOMINY SILT LOAM	D	0–2%	0.24–0.37	4	0.0–0.5
7	KINSTON LOAM	B/D	0–4%	0.32–0.37	5	0.0–1.0
11E	NEVARC SOILS	C	15–35%	0.20–0.37	3	1.5–3.0
11E	REMLIK SOILS	A	15–35%	0.10–0.20	5	4.0–>6.0
12A	PEAWICK SILT LOAM	D	0–2%	0.24–0.37	4	1.5–3.0
12B	PEAWICK SILT LOAM	D	2–6%	0.24–0.37	4	1.5–3.0
16	RUMFORD LOAMY SAND	B	0–4%	0.17	4	–
18B	SLAGLE FINE SANDY LOAM	C	2–6%	0.24–0.28	3	1.5–3.0
W	WATER	–	–	–	–	–

INFORMATION TAKEN FROM USDA NATURAL RESOURCES CONSERVATION SERVICE, SURVEY AREA VERSION: 10, SURVEY AREA VERSION DATED: 01/25/2010.

SOIL SUSCEPTIBILITY TO EROSION CLASSIFICATION (K)
0.23 AND LOWER – LOW ERODIBILITY
0.23 TO 0.36 – MODERATE ERODIBILITY
0.36 AND UP – HIGH ERODIBILITY

THE MAP SHOWN IS A "BEST FIT MODEL" OF THE SCS MAPS WITH EXISTING BASE INFORMATION.

RPA BUFFER IMPACT TABULATIONS

ROAD IMPACTS:
47,955 S.F.± ; 1.10 AC.±

SANITARY SEWER IMPACTS:
6,876 S.F.± ; 0.16 AC.±

BMP OUTFALL & EMBANKMENT IMPACTS:
32,594 S.F.± ; 0.75 AC.±

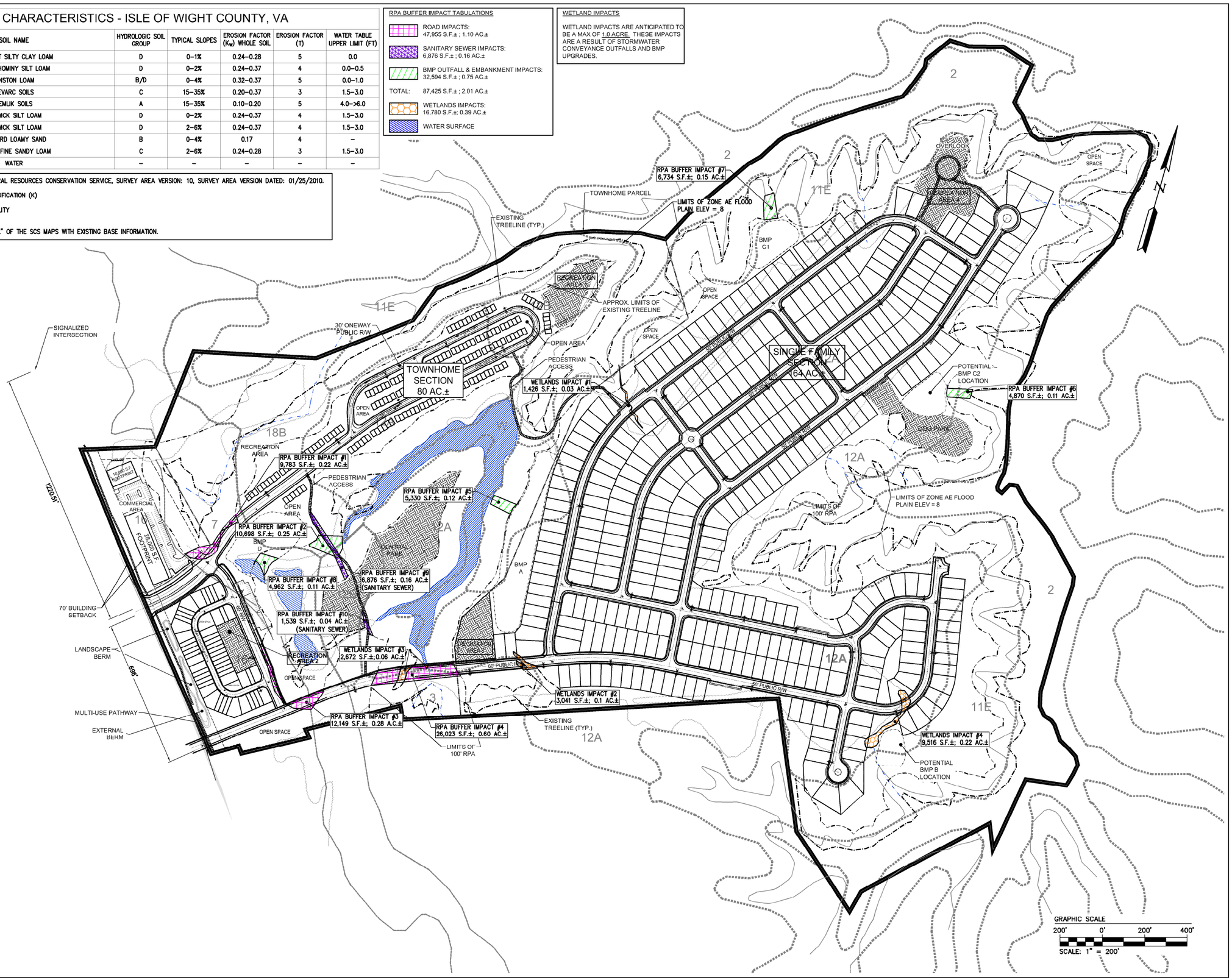
TOTAL: 87,425 S.F.± ; 2.01 AC.±

WETLANDS IMPACTS:
16,780 S.F.±; 0.39 AC.±

WATER SURFACE

WETLAND IMPACTS

WETLAND IMPACTS ARE ANTICIPATED TO BE A MAX OF 1.0 ACRE. THESE IMPACTS ARE A RESULT OF STORMWATER CONVEYANCE OUTFALLS AND BMP UPGRADES.



Remarks By	Description	Date	Rev.

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WATER QUALITY IMPACT ASSESSMENT
SWEETGRASS
REZONING
VIRGINIA
ISLE OF WIGHT COUNTY

Project Contacts:	JAC
Project Number:	W10516-00
Scale: 1"=200'	Date: 04/29/2019
Sheet Title:	WQIA EXHIBIT A

Sheet Number
1 OF 2

EXISTING	
WATER	44.65 AC.
FORESTED	115.88 AC.
CROPLAND	88.94 AC.
TOTAL	249.47 AC.
PROPOSED	
WATER	50.77 AC.
FORESTED	97.85 AC.
IMPERVIOUS	50.40 AC.
MANAGED TURF	50.45 AC.
TOTAL	249.47 AC.

HATCH LEGEND

- LIMITS OF CLEARING = 18.03 ACRES
- IMPACTS TO WOODED RPA BUFFER = 0.22 ACRES
- RPA/WETLAND AREA = 106.05 ACRES

N/F
THOMAS DARDARA T
910 CANTEBERRY LN
PARCEL ID: 22J-02-150
ZONING: SMITHFIELD: N-R

N/F
HENDRIX THOMAS
912 CANTEBERRY LN
PARCEL ID: 22J-02-149
ZONING: SMITHFIELD: N-R

N/F
EVANS ANTHONY
906 CANTEBERRY LN
PARCEL ID: 22J-02-152
ZONING: SMITHFIELD: N-R

N/F
BERLAND EDNA R
916 CANTEBERRY LN
PARCEL ID: 22J-02-147
ZONING: SMITHFIELD: N-R

N/F
DIPPO LAWRENCE A & ELIZABETH A
TRS L A & E A DIPPO LIVING TRUST
908 CANTEBERRY LN
PARCEL ID: 22J-02-151
ZONING: SMITHFIELD: N-R

N/F
FORSYTHE TIMOTHY A & DEBRA K
TRS T A & D K FORSYTHE FAMILY REV TRUST
914 CANTEBERRY LN
PARCEL ID: 22J-02-148
ZONING: SMITHFIELD: N-R

OVERLOOK

LIMITS OF ZONE AE FLOOD PLAIN ELEV = 8

APPROX. LIMITS OF EXISTING TREELINE

TOWNHOME PARCEL

N/F
EDWARDS PHILLIP F JR & CONNIE A
BENNS CHURCH BLVD
PARCEL ID: 32-01-096
ZONING: SMITHFIELD: C-C

N/F
CROWN CASTLE GI COMPANY LLC
14005 BENNS CHURCH BLVD
PARCEL ID: 32-01-096B
ZONING: RAC

N/F
ISLE OF WIGHT COUNTY SCHOOL BOARD
14171 SMITHFIELD CIR, SMITHFIELD
PARCEL ID: 32-01-010A
ZONING: RAC

N/F
WILSON ANGELA B & WILSON JAMES G JR
TRS A B WILCON REVOC LIVING TRUST
14041 BENNS CHURCH BLVD
PARCEL ID: 32-01-095
ZONING: LI

N/F
YEOMAN WILLIAM G
WILLIAM G YEOMAN III TRUST
BENNS CHURCH BLVD
PARCEL ID: 32-01-007
ZONING: RAC

N/F
CORNETT GEORGE C
14106 BENNS CHURCH BLVD
PARCEL ID: 32-01-008
ZONING: RAC

N/F
WILLIAM G. YEOMAN, TRUSTEE
14096 BENNS CURCH BOULEVARD
PARCEL ID: 32-01-009
ZONING: RAC

N/F
EDWARDS RYLAND B JR &
MARY ANN D &
EDWARDS RYLAND B & ETALS
14202 BENNS CHURCH BLVD
PARCEL ID: 32-01-067
ZONING: RAC

N/F
GIRARD PATRICIA A
14225 BENNS CHURCH BOULEVARD
PARCEL ID: 32A-02-012
ZONING: RAC

SIGNALIZED INTERSECTION

BENNS CHURCH BLVD

1236.30'

528.74'

70.00' BUILDING SETBACK

LANDSCAPE BERM

LANDSCAPE BERM

LANDSCAPE BERM

MULTI-USE PATHWAY

COMMERCIAL AREA

RECREATION AREA 1

RECREATION AREA

RECREATION AREA 2

RECREATION AREA 3

RECREATION AREA 4

PEDESTRIAN ACCESS

PEDESTRIAN ACCESS

PUBLIC PARK

DOG PARK

BMP A

BMP D

POTENTIAL BMP C1 LOCATION

POTENTIAL BMP C2 LOCATION

POTENTIAL BMP B2 LOCATION

LIMITS OF 100' RPA

LIMITS OF ZONE AE FLOOD PLAIN ELEV = 8

100'RPA

BEECHWOOD LANE

N/F
TOTTEN CHARLES D
BEECHWOOD LN
PARCEL ID: 32-01-094,094C,094D
ZONING: RAC

N/F
BELL LINWOOD E & BARBARA G
19341 BEECHWOOD LN
PARCEL ID: 31-01-094B
ZONING: RAC

N/F
WALLACE JIMMY J & MYRTLE T
14108 HAYLOFT LN
PARCEL ID: 32-01-094A
ZONING: RAC

N/F
WALLACE JIMMY J & MYRTLE T
14111 HAYLOFT LN
PARCEL ID: 32B-01-005
ZONING: RAC

N/F
CARNEY PAMELA D
14125 HAYLOFT LN
PARCEL ID: 32B-01-006
ZONING: RAC

N/F
CARNEY PAMELA D
14125 HAYLOFT LN
PARCEL ID: 32B-01-006
ZONING: RAC

N/F
ST LUKES VILLAGES LLC
C/O MCCALE DEV COR
20081 BREWERS NECK BLVD
PARCEL ID: 33-01-012B
ZONING: PD-MX

N/F
BOWDEN RONALD
BREWERS NECK BLVD
PARCEL ID: 33-01-005
ZONING: RAC

N/F
GRAY ROBERTA
C/O GARY LAWRENCE N
CHAPMANS LN
PARCEL ID: 33-03-006
ZONING: RAC

N

GRAPHIC SCALE
200' 0' 200' 400'
SCALE: 1" = 200'

Rev.	Date	Description	Revised By
1	9/23/19	REVISED PER COUNTY COMMENTS	JAG

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HamptonRoads | Centrl Virginia | Middle Peninsula

REZONING MASTER PLAN
FOR
SWEETGRASS

ISLE OF WIGHT COUNTY | WINDSOR DISTRICT | VIRGINIA

Project Contacts:	JAG
Project Number:	W10516-00
Scale: 1"=200'	Date: 06/14/2019

Sheet Title:
CLEARING LIMITS
EXHIBIT B

Sheet Number
2 OF 2

Fiscal Impact Analysis of Sweetgrass

Located in Isle of Wight County, Virginia

Prepared for:

Ryan Homes/NVR

June 21, 2021

TischlerBise
FISCAL | ECONOMIC | PLANNING

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June 2021

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MEMORANDUM

To: Eric Shirey, General Manager, Land, NVR Inc.

From: Julie Herlands, AICP, Vice President, TischlerBise

Date: June 18, 2021

RE: Fiscal Impact Analysis for Sweetgrass in Isle of Wight County, Virginia

TischlerBise is under contract with NVR Inc/Ryan Homes, to conduct a Fiscal Impact Analysis of the proposed Sweetgrass development in Isle of Wight County, Virginia, for submission to Isle of Wight County as part of the applicant's rezoning request. This report provides findings and detail on the Fiscal Impact Analysis.

The overall finding is that the proposed development is fiscally positive to the County in total. The analysis factors in all variable revenues generated by the proposed development. All operating and capital costs attributable to the development are included in the analysis. Comparing available resources to projected costs reveals sufficient revenues to cover the projected expenditures. Operating and capital costs are projected separately to identify specific capital costs attributed to the development.

The twenty-year cumulative net fiscal impact is a surplus of approximately $20.9 million and an annual net surplus of approximately $1.2 million at the project's buildout.

BACKGROUND

TischlerBise is under contract with NVR, Inc. to conduct a fiscal impact analysis of the Sweetgrass development in Isle of Wight County, VA. This report reflects TischlerBise's fiscal impact analysis of the impact of the proposed development.

A fiscal impact evaluation analyzes revenue generation and operating and capital costs to a jurisdiction associated with the provision of public services and facilities to serve new development—residential, commercial, office, or industrial. It includes all direct revenues and costs associated with a specific development proposal. Unlike an economic impact analysis, it does not include spin-off, or indirect, impacts from development but rather identifies whether sufficient revenues will be generated from the new development to cover all related direct costs. For the Sweetgrass Development fiscal impact analysis, all General Fund services and facilities are included in the analysis.

This report intends to provide information to NVR, Inc. related to the fiscal impact of development of the project to identify appropriate values of potential proffers to Isle of Wight County. Any potential proffer would offset a negative fiscal impact on the County—specifically on capital facilities—thereby allowing the County to maintain current levels of service.

PROPOSED DEVELOPMENT PROGRAM

The fiscal impact analysis uses 2021 as the base year with projections over a 20-year period, with years shown throughout the study as "Years 1-20." The development assumptions and absorption were provided by NVR, Inc.

The development is anticipated to include 615 residential units with 390 age-restricted, single family detached units and 225 townhouses. An annual absorption of 65 age-restricted single family units per year and 38 townhouses is assumed in the analysis. This results in completion of the project in Year 6.

Figure 1. Sweetgrass Development Program

Land Use	Housing Units	Market Value	Annual Absorption (Housing Units per Year)
Age-Restricted Single Family Detached	390	$305,200	65
Townhome	225	$258,875	38
Total	**615**	**N/A**	**103**

Source: NVR/Ryan Homes

The above development program projects a growth of 1,458 persons and 52 public school students. A summary of the growth projections is provided below in Figure 2. Demand factors are detailed in the Appendix.

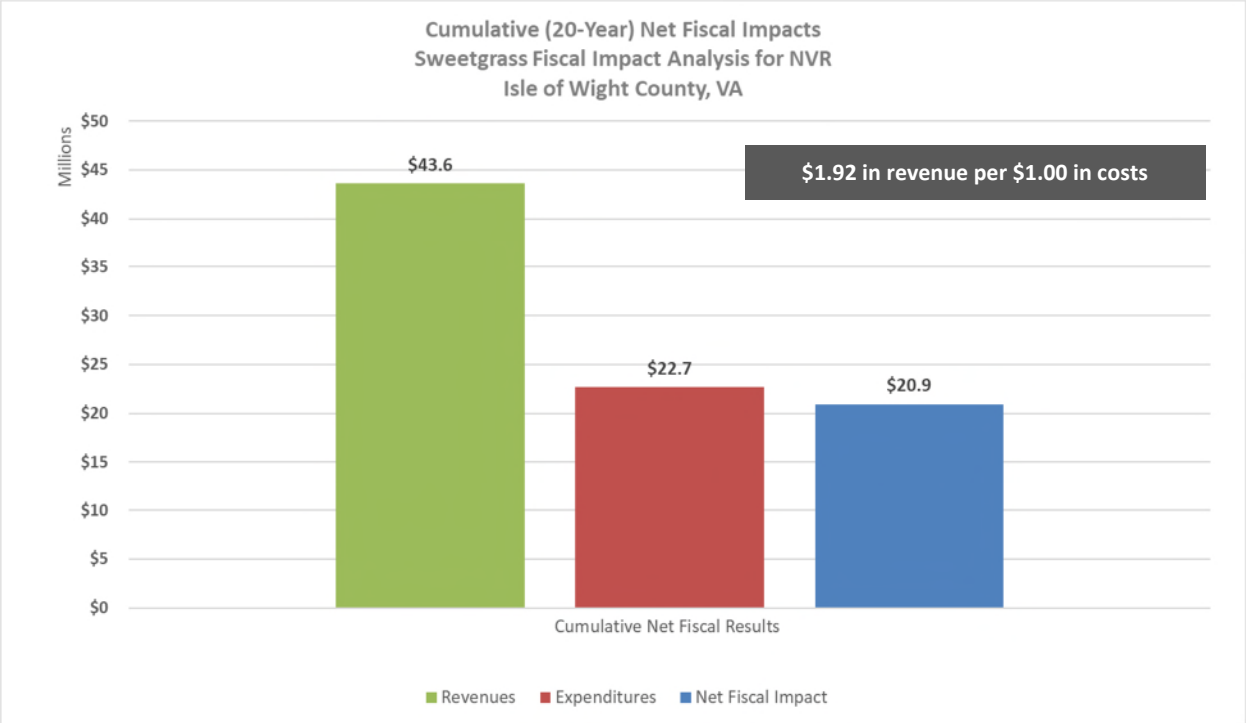
Figure 2. Sweetgrass Development Growth Projection

	Yeoman Tract (NVR)
Residential Units	
AGE-RESTRICTED, SINGLE-FAMILY DETACHED	390
TOWNHOUSE	225
TOTAL UNITS	**615**
POPULATION	**1,458**
TOTAL ENROLLMENT	**52**

SUMMARY OF FISCAL IMPACT ANALYSIS FINDINGS

The fiscal impact analysis determines that the Sweetgrass development generates sufficient revenues to offset projected costs—$1.92 in revenue for every $1.00 of costs. General Fund revenues are projected along with operating and capital impacts from the proposed development program.

Figure 3. Cumulative Net Fiscal Impact Results –Sweetgrass Development: All Revenues and Costs



In early years, lower net surpluses are generated by the Sweetgrass development due to higher ongoing capital expenditures (including debt service) and ongoing operating costs relative to revenues. However, cumulatively development results in fiscally sustainable conditions.

Capital improvements to serve new development are funded from the General Fund. The County has no dedicated capital revenues for non-utility capital improvements. Capital improvements are modeled primarily on an incremental basis and triggered when capacity is needed. A few capital facility categories are based on current or short-term planned improvements from which the proposed development will benefit. All combined, projected revenues are sufficient to cover operating and capital impacts from the development project.

SUMMARY OF APPROACH AND MAJOR ASSUMPTIONS

A fiscal impact analysis determines whether revenues generated by new growth are sufficient to cover the resulting costs for service and facility demands placed on the County. It is based on cost and revenue assumptions that reflect a community's current level of service. TischlerBise analyzed the fiscal impacts of the Sweetgrass Development scenario based on current countywide levels of service and any known infrastructure or service needs. A projection timeline of 20 years is used to show long-term trends.

The fiscal impact analysis conducted by TischlerBise incorporates a hybrid average/marginal cost approach wherever possible. The case study-marginal methodology is used in some instances; however, for smaller areas with discrete land use changes, impacts are often better analyzed using an average cost approach. This is different from a countywide fiscal analysis where facilities and other infrastructure needs are triggered and "built" once a threshold is reached, resulting in "lumpier" fiscal impact results. There are a few exceptions in this analysis, namely for current or planned improvements that are known to be needed due to capacity needs and will serve the growth from the Sweetgrass Development.

The assumptions outlined below are utilized along with the development projections to determine the potential fiscal impact to the County over the 20-year projection period. Calculations are performed using a customized fiscal impact model designed specifically for this assignment.

For this analysis, only costs to serve new growth are included. Both operating and capital costs are modeled. Some costs are not expected to be impacted by demographic changes, and may be fixed in this analysis. For example, this is true for some functions included under the Board of Supervisors budget. Other general items to note in the analysis:

- Operating costs are generally projected on an average basis with demand factors specific to the service being modeled. Personnel costs are modeled to reflect the fact that some types of positions (e.g., directors) are fixed and would not increase regardless of growth.
- Capital costs are projected on an incremental basis for most categories where capacity is needed with the exception of facilities currently being constructed or planned in the short-term. TischlerBise's experience conducting previous cash proffer studies for Isle of Wight County was helpful in this effort.
- Debt financing is assumed for capital improvements that are projected to serve growth.

LEVELS OF SERVICE

Cost projections are based on the "snapshot approach" in which it is assumed the current level of service, as funded in the County's FY2021-2022 budget, will continue through the projection period. Current

demand base data was used to calculate unit costs and service level thresholds. Examples of demand base data include population, dwelling units, employment by industry type, and jobs. In summary, the "snapshot" approach does not attempt to speculate about how levels of service, costs, revenues, and other factors will change over 20 years. Instead, it evaluates the fiscal impact to the County as it currently conducts business under the present budget.

Revenues are projected assuming that the current revenue structure and tax rates, as defined by the FY21-22 budget, will not change during the analysis period. Of particular note are the following:

- County property tax is modeled based on the cumulative assessed value of the planned residential development. The County's FY21-22 adopted tax rate of $.85 per $100 in property value.
- Personal property taxes are projected on a per capita and per job basis (and adjusted for Isle of Wight collections).

Enterprise operations such as the County's water and wastewater utilities are included in this analysis reflecting the portion of utility operating costs that are funded through the General Fund. The fiscal impact analysis assumes the level of operating subsidy continues into the future. Utility capital expenditures are assumed to be covered by private developers and therefore not included as a cost to the County.

Specific assumptions pertaining to any unique treatment of revenue and cost factors are discussed wherever relevant throughout the body of this report.

INFLATION RATE

The rate of inflation is assumed to be zero throughout the projection period, and cost and revenue projections are in constant 2021 dollars. This assumption is in accord with current budget data and avoids the difficulty of forecasting as well as interpreting results expressed in inflated dollars. In general, including inflation is complicated and unpredictable. This is particularly the case given that some costs, such as salaries, increase at different rates than other operating and capital costs such as contractual and building construction costs. And these costs, in turn, almost always increase in variation to the appreciation of real estate. Using constant 2021 dollars reinforces the snapshot approach and avoids these problems.

NON-FISCAL EVALUATIONS

It should be noted that while a fiscal impact analysis is an important consideration in planning decisions, it is only one of several issues that should be considered. Environmental and social issues, for example, should also be considered when making planning and policy decisions. In addition, economic development goals such as the ability to provide suitable locations for future employment growth should be taken into consideration when making land use decisions. The above notwithstanding, this analysis will enable interested parties to understand the fiscal implications of future development and particularly the proposed Sweetgrass development.

PROJECTION FACTORS

Projection methodologies and factors are based on our previous fiscal studies for the County and discussed where applicable in the body of this report. All variable operating costs and revenues are projected. Detail is provided in the Appendix.

FISCAL IMPACT RESULTS

Results of the fiscal impact analysis are provided in this chapter. It should be reiterated that the fiscal results include revenues and costs to serve the proposed development only.

Our results are summarized in several ways:

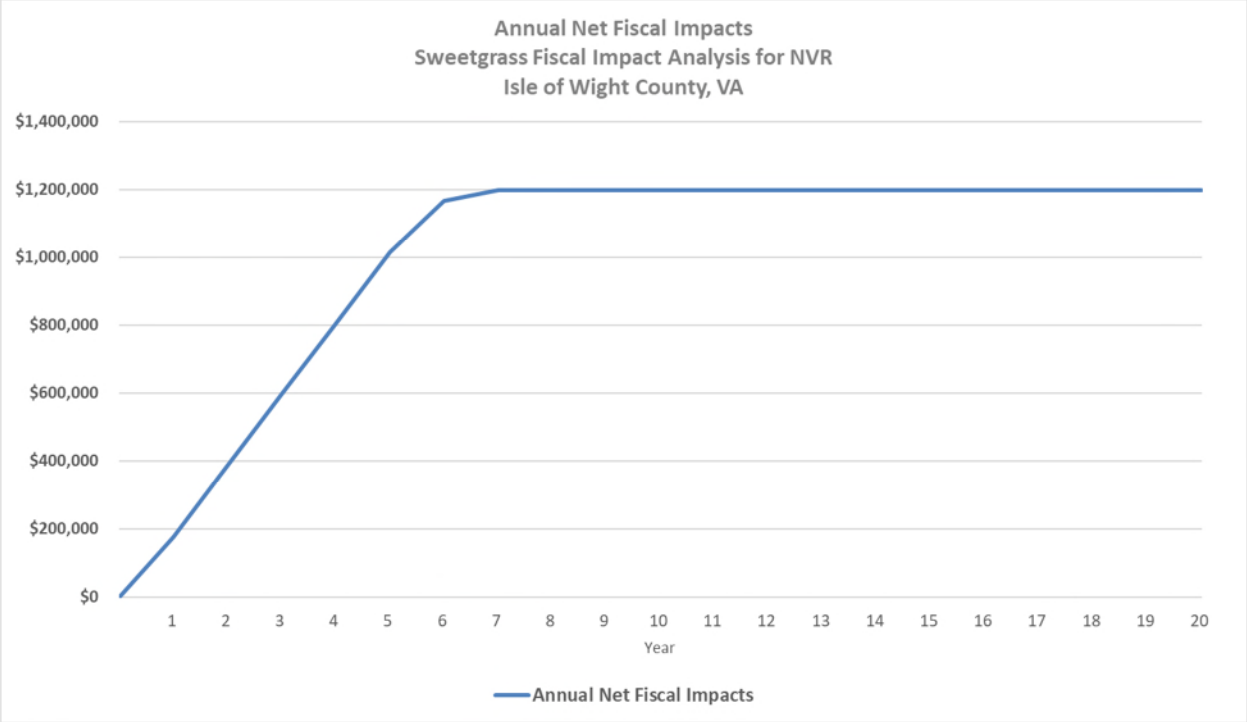
- **Annual** net fiscal results are shown first that include all revenues and costs in the funds included in the analysis in each year. Two charts are provided:
  - Combined operating and capital from the proposed development
  - Revenue compared to operating and capital impacts
- Results are then shown in a series of bar charts depicting **cumulative** net fiscal impact results
  - Cumulative net fiscal impact results convey the projected grand total revenues minus grand total expenditures over the 20-year period from the proposed development.
- The third section provides **average annual** fiscal impact results.
  - The average annual net result conveys an average impact over three time periods (Years 1-10, Years 11-20, and over the entire 20-year period).

ANNUAL NET FISCAL IMPACTS

The charts below show the annual net fiscal results to the County for the two scenarios over the 20-year development period. By showing the annual results, the magnitude, rate of change, and timeline of deficits and revenues can be observed over time. The "bumpy" nature of the annual results during particular years represents the opening of capital facilities and/or major operating costs being incurred.

Net fiscal results are **revenues minus costs in each year**, including operating and capital costs. Data points above the $0 line represent annual surpluses; points below the $0 line represent annual deficits. Surpluses in any one year are not carried forward to the next year.

Figure 4. Annual Net Fiscal Impact Results: Combined Results

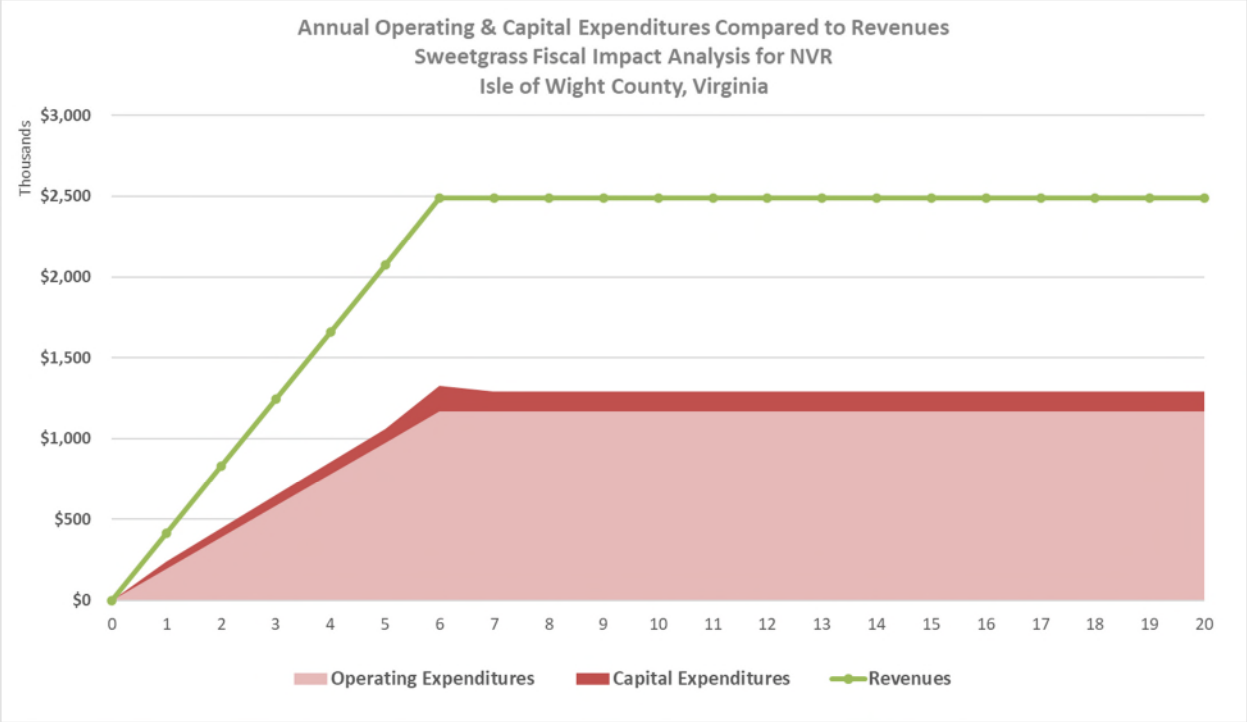


- Revenues are sufficient to cover operating and capital impacts from the proposed development.
- Each year includes the revenues generated from the proposed development minus the operating and capital costs in that same year.
- Capital improvements are assumed to be debt financed with several that are incurred in each year. Those yearly capital expenditures include:
    - Education: New Elementary School, School Administration Facility, School Fleet Bus Garage Addition
    - Sheriff Vehicles; E-911 Communication System
    - Transportation projects
- Some capital impacts are projected at the time of buildout. Year 6 reflects the projected buildout of the project. The capital expenditure triggered at that time are:
    - Parks and Recreational facilities

For further detail, the analysis segregates operating and capital impacts compared to projected revenue generation. The following figure illustrates the comparison between revenues and operating and capital expenditures.

As shown, sufficient revenues are generated in each year to cover operating and capital costs.

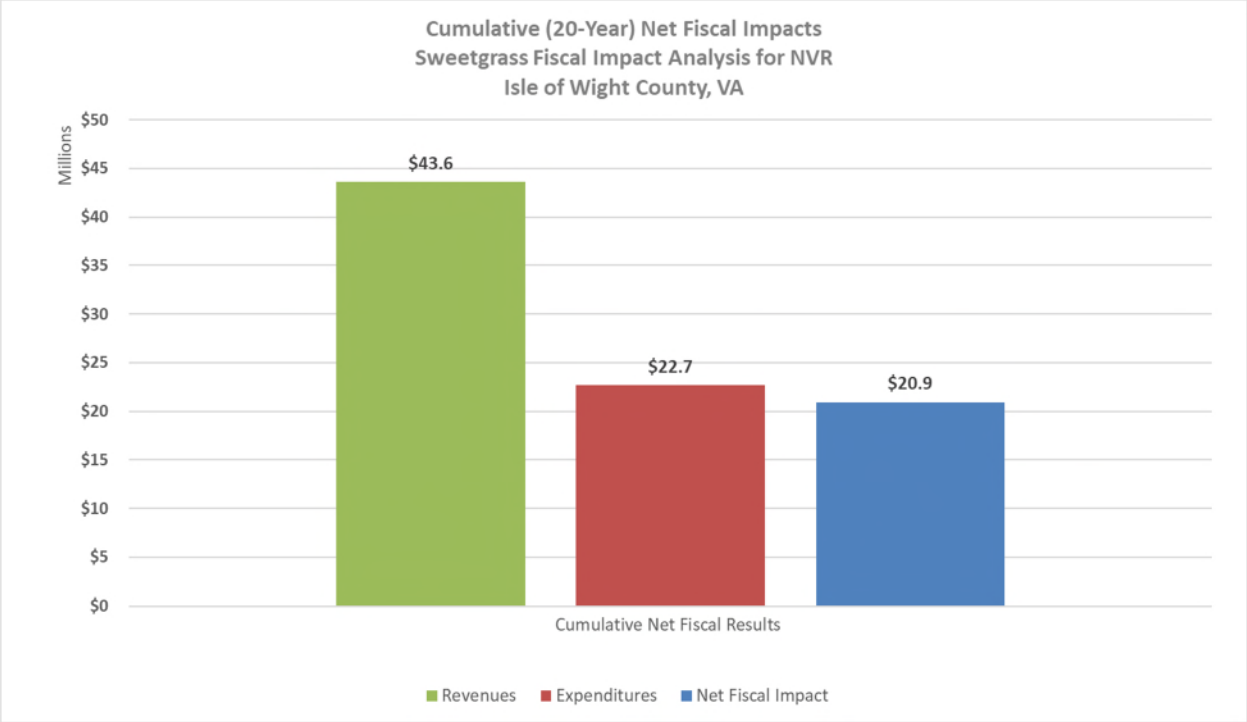
Figure 5. Annual Net Fiscal Impact Results: Revenues Compared to Operating and Capital Costs



CUMULATIVE NET FISCAL IMPACTS

Results are presented on a **cumulative** basis reflecting grand total revenues over the 20-year period minus grand total expenditures over the 20-year period.

Figure 6. Cumulative Net Fiscal Impact Results

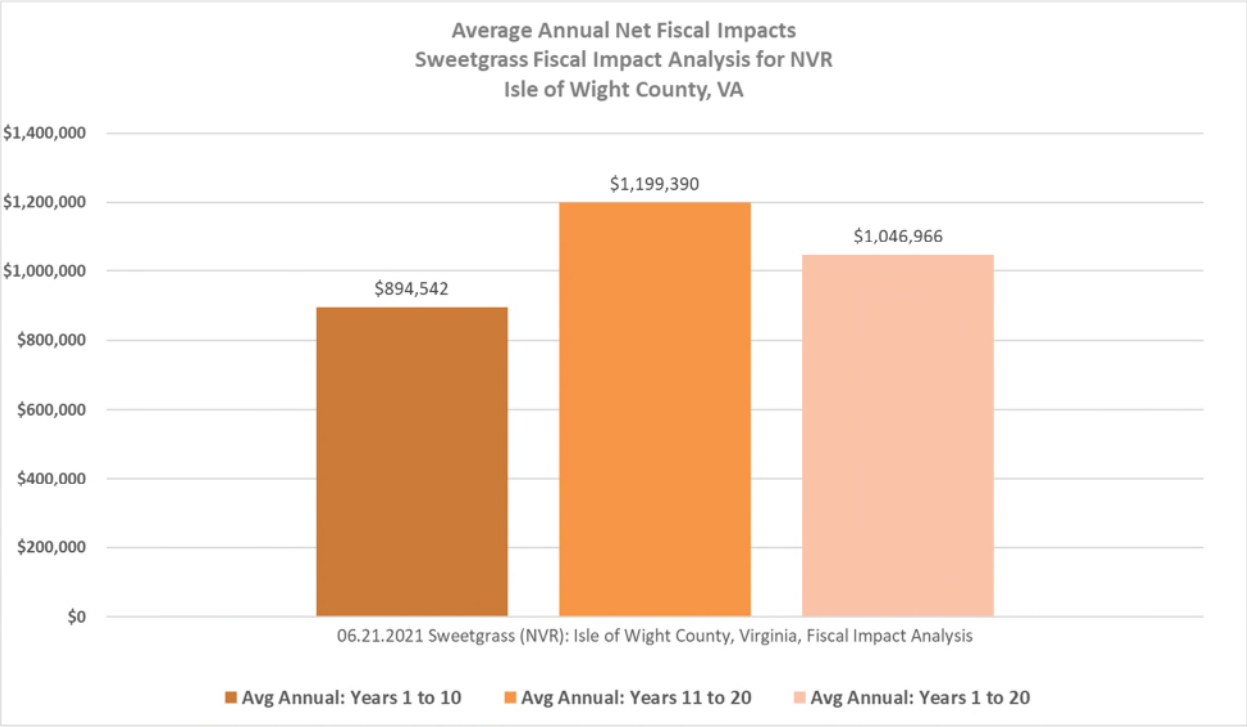


- As shown, $43.6 million in revenue is projected compared to $22.7 million in expenditures over the 20-year projection period. This generates a $20.9 million net surplus.
- Costs include ongoing annual operating expenditures and capital costs that include debt financing with payments that continue beyond the last year in the model projection period.

AVERAGE ANNUAL NET FISCAL IMPACTS

For further information, results are also presented on an **average annual** basis—in three time-period increments (First ten years, second ten years, and then over the total projection period, Years 1-20.)

Figure 7. Average Annual Net Fiscal Impact Results



- As shown in Figure 7, average annual fiscal results average approximately $1.05 million per year over the projection period with the second half of the period generating slightly better fiscal results.
- The first half of the projection period generates lower average annual fiscal results due to higher operating and capital expenditures relative to revenues during this period.

REVENUE AND EXPENDITURE PROJECTIONS

A summary of projected revenues and costs from the proposed Sweetgrass Development to the County are provided below. These figures are based on the development projections as summarized above along with the revenue and cost factors described elsewhere in this report.

Revenues

REVENUE PROJECTION METHODOLOGIES

County General Fund revenues are projected from the proposed development program. A summary of projection methodologies is shown below in Figure 8. Other items to note regarding revenue projections are:

- Property taxes are projected based on average assessed values per housing unit shown below:

Land Use	Housing Units	Market Value	Annual Absorption (Housing Units per Year)
Age-Restricted Single Family Detached	390	$305,200	65
Townhome	225	$258,875	38
Total	**615**	**N/A**	**103**

- Other revenues from the proposed residential development are projected on a per capita or per job basis.(Exceptions and/or adjustments are noted.)
- Some revenues are not affected by growth and are considered "fixed" in this analysis as shown in Figure 8.

Figure 8. Revenue Projection Methodologies

				ALLOCATION APPROACH			
Revenue Category	*Revenue Name*	*FY22 Budget $*	*% of Total*	RESIDENTIAL (Per Capita)	NONRESIDENTIAL (Per Job)	CUSTOM	FIXED
Property Taxes	Real property	$41,170,000	50%			X (Assessed Value)	
	Public service property	$1,759,000	2%				X
	Personal property - vehicles	$11,240,000	14%	X (90% from resid.)			
	Personal property - mobile homes	$167,000	0%				X
	Personal property - boats & airplanes	$108,000	0%				X
	Personal property - machinery & tools	$5,000,000	6%		X		
	Personal property - equipment	$1,905,000	2%		X		
	Penalty & interest on taxes	$570,000	1%			X (Assessed Value)	
Other Local Taxes	Local sales & use	$3,250,000	4%	X	X		
	Communications sales & use tax	$635,000	1%	X (Non-Town)	X (Non-Town)		
	Consumer utility tax	$985,000	1%	X (Non-Town)	X (Non-Town)		
	Consumption tax	$120,000	0%	X (Non-Town)	X (Non-Town)		
	Business license tax	$832,000	1%		X		
	Lodging tax	$64,000	0%				X
	Meals tax	$530,000	1%	X	X		
	Motor vehicles license tax/fee	$1,061,000	1%	X (Non-Town)			
	Cable franchise fees	$0	0%				X
	Bank stock tax	$11,000	0%				X
	Recordation & probate tax	$0	0%	X	X		
	Penalty & interest on taxes	$10,000	0%				X

Licenses, Permits & Fees	Animal license	$40,000	0%	X			
	Land use application fee	$0	0%	X	X		
	Zoning use & subdiv. Ord. fee	$75,000	0%	X	X		
	Building permits & fees	$500,000	1%	X	X		
	Concealed weapon permit fee	$40,000	0%	X			
	Land transfer fees	$1,000	0%	X	X		
	Inspections technology fee	$18,000	0%	X	X		
	Solid waste franchise fee	$30,000	0%	X	X		
Fines & Forfeitures	Court fines & forfeitures	$115,000	0%	X			
	Interest - court fine & forft.	$4,000	0%				X
	County code violations	$10,000	0%	X	X		
Use of Money & Property	Interest revenue	$300,000	0%				X
	Property rental	$185,000	0%				X
	Gain/loss on investments (PACE)	$0	0%				X
Charges for Services	Set off collection feeds	$75,000	0%	X	X		
	Finance administration fee	$1,000	0%	X	X		
	Court security fee	$65,000	0%	X	X		
	Sheriff's fee	$2,000	0%	X	X		
	Sheriff extradition revenue	$7,000	0%	X	X		
	Law library fees	$8,000	0%	X	X		
	Building const. court fees	$15,000	0%	X	X		
	Courthouse constrution fees	$20,000	0%	X	X		
	Reimb. For court appointed atty.	$2,000	0%	X	X		
	Commonwealth attorney's fees	$3,000	0%	X	X		
	Criminal check & incident report	$1,000	0%	X	X		
	Fingerprinting	$1,000	0%	X	X		
	Animal adoption fees	$30,000	0%	X			
	Miscellaneous charges for srvc.	$0	0%	X	X		
	EMS revenue recovery	$900,000	1%			X (Fire and EMS Calls)	
	Walking tours income	$0	0%				X
	Recreation and special event fees	$319,885	0%	X			
	Treasurer admin. Fees	$160,000	0%	X	X		
	Tourism	$9,080	0%	X	X		
Recovered Cost	Insurance reimbursements	$50,000	0%				X
	DSS indirect cost allocation	$387,576	0%				X
	Smithfield tourism recovered cost	$279,892	0%				X
	Smithfield debt service	$51,453	0%				X
	PU indirect cost	$230,722	0%				X
	SW indirect cost	$67,382	0%				X
	Miscellaneous	$0	0%				X
Recovered Cost	Borrow pit contribution	$50,000	0%				X
	Treasurer admin. Fees	$0	0%				X
	RAD-Emergency program	$0	0%				X
	Gifts and donations	$500	0%				X
	Animal control donations	$0	0%				X
	Sale of photocopies/maps	$10,000	0%				X
	P-card rebate	$30,000	0%				X
	Miscellaneous	$10,000	0%				X
	Sale of recyclables	$45,000	0%				X
	E-payables rebate	$11,000	0%				X
	Farmer's market fees + sponsors	$38,475	0%				X
	Vintage Market	$40,775	0%				X
	Build America Subsidy 2010C	$0	0%				X
	2011 QSCB Subsidy	$337,000	0%				X
Noncategorical Aid	Auto rental tax	$35,000	0%	X	X		
	Rolling stock tax	$42,000	0%	X	X		
	Mobile home tilting tax	$45,000	0%				X
	Grantor's tax	$135,000	0%	X	X		
	State PPTR	$5,115,890	6%	X			
Shared Expenses	Commonwealth attorney shared expenses	$421,529	1%				X
	Sheriff shared expenses	$1,332,259	2%				X
	Commissioner shared expenses	$158,295	0%				X
	Treasurer shared expenses	$140,162	0%				X
	Registrar/electoral board shared expenses	$58,290	0%				X
	Clerk of Circuit Court shared expenses	$291,573	0%				X
	Technology trust funds	$40,284	0%				X
State Aid	LOVEworks VTC grant	$0	0%				X
	Crush Friday VTC grent	$0	0%				X
	Fire Programs Fund	$93,000	0%				X
	Four for Life	$47,000	0%				X
	Local Government Challenge grant	$0	0%				X
Federal Aid	Federal grant revenue (Hurricane Matthew)	$0	0%				X
	Homeland Security grant	$0	0%				X
TOTAL		**$81,949,022**	**100%**				

REVENUE PROJECTIONS

Cumulative revenues to the County generated by the project are shown for a twenty-year cumulative period. The revenues shown in Figure 9 reflect all revenues (for operating and capital purposes) projected from the development.

Figure 9. Cumulative County Revenues (Years 1-20)

Cumulative General Fund Revenue Detail (Years 1-20) **06.21.2021 Sweetgrass (NVR): Isle of Wight County, Virginia, Fiscal Impact Analysis**		
	SCENARIO	
Category	**Sweetgrass (NVR)**	**%**
Property Taxes	$33,550,312	77%
Other Local Taxes	$5,125,424	12%
Licenses, Permits & Fees	$387,892	1%
Fines & Forfeitures	$82,659	0%
Use of Money & Property	$0	0%
Charges for Services	$900,006	2%
Recovered Cost	$0	0%
Miscellaneous Services	$0	0%
Noncategorical Aid	$3,552,482	8%
Shared Expenses	$0	0%
State Aid	$0	0%
Federal Aid	$0	0%
TOTAL	**$43,598,775**	**100%**

Expenditures

EXPENDITURE PROJECTION METHODOLOGIES

County operating and capital expenditures are projected from the proposed development program. Projection methodologies are shown below in Figure 10 . Other items to note regarding expenditure projections are:

- School operating expenditures are projected in **Transfers (Schools)** and based on an increase in enrollment from the proposed development. The Appendix includes student generation rate assumptions.

- School costs reflect the **funding provided by Isle of Wight County to the Isle of Wight Public Schools only and does not include state or federal funding** that comprises the full amount of the Public Schools' budget. Funding from the County equals approximately 42 percent of the School District's Operating expenditures.

- Public Safety expenditures are projected based on a projection of calls for service from new development. See the Appendix for further detail.

- Some expenditures are not affected by growth and are considered "fixed" in this analysis as shown in Figure 10.

Figure 10. Expenditure Projection Methodologies

				ALLOCATION APPROACH			
Expenditure Category	*Expenditure Name*	*FY22 Budget $*	*% of Total*	RESIDENTIAL (Per Capita)	NONRESIDENTIAL (Per Job)	CUSTOM	FIXED
General Administration	Board of Supervisors	$329,600	0.4%				X
	County Administrator	$483,251	0.6%	X	X		X
	County Attorney	$575,348	0.7%	X	X		X
	Human Resources	$394,837	0.5%				X
	Registrar	$391,778	0.5%	X			X
Financial Administration	Commissioner of Revenue	$765,696	0.9%	X	X		
	Real Estate Assessment	$288,900	0.3%	X	X		X
	Treasurer	$891,035	1.1%	X	X		X
	Budget and Finance	$802,014	1.0%	X	X		X
	Purchasing	$171,368	0.2%				X
Judicial	Circuit Court	$89,388	0.1%	X			X
	General District Court	$26,066	0.0%	X			
	Western Tidewater Community Corrections	$18,926	0.0%	X			
	Juvenile Accountability Program	$2,500	0.0%	X			
	Juvenile Domestic Relations Court	$12,575	0.0%	X			
	Clerk of Circuit Court	$598,133	0.7%	X			X
	Fifth District Court Services	$200,100	0.2%	X	X		
	Commonwealth Attorney	$840,042	1.0%	X	X		
Public Safety	Sheriff	$5,203,463	6.2%			X (Sheriff Calls for Service)	
	Emergency Services	$516,222	0.6%			X (Fire & EMS Calls for Service)	
	Fire & Rescue	$4,717,530	5.6%			X (Fire & EMS Calls for Service)	
	Western Tidewater Jail	$1,293,333	1.5%	X			
	Inspections	$739,804	0.9%	X	X		
	Animal Control	$594,840	0.7%	X			
Public Works	Public Works Administration	$318,110	0.4%	X	X		
	Public Works Transportation	$283,365	0.3%	X	X		
	Public Works Refuse	$2,902,214	3.5%	X	X		
	Public Works Buildings & Grounds	$1,478,908	1.8%	X	X		
	Public Works Capital Program Inspection	$76,613	0.1%				X
Parks, Recreation, Grounds	Parks & Recreation Administration	$265,736	0.3%	X			
& Cultural	Parks & Recreation Gateways & Grounds	$1,001,054	1.2%	X			
	Parks & Recreation Programs	$750,285	0.9%	X			
	Library	$891,490	1.1%	X			
Community Development	Planning & Zoning	$830,146	1.0%	X	X		
	Economic Development	$1,044,087	1.2%		X		
	Tourism	$577,222	0.7%	X	X		X
	Farmers Market	$42,220	0.1%				X
	Communications	$78,648	0.1%	X	X		
	Cooperative Extension Service	$73,823	0.1%				X
Non-Departmental	Non-Departmental	$3,667,903	4.4%				X
	Transfers (Non-Schools)	$7,056,445	8.4%	X	X		
	Transfers (Schools)	$26,422,734	31.6%	X (Enrollment)			
Debt Service	Debt Service	$13,346,056	16.0%				X^
Other Public Services	Other Public Services	$2,500,400	3.0%	X	X		X
	TOTAL	**$83,554,208**	**100.0%**				

** If "FIXED" marked along with other columns, a portion of the departmental expenditure is assumed to not be affected by the development; this is typically personnel costs.*
^ Capital expenditures projected separately.

EXPENDITURE PROJECTIONS

Cumulative County expenditures generated by the project are shown below cumulatively for Years 1-20. Operating expenditures are shown in Figure 11; capital expenditures are shown in Figure 12.

Figure 11. Cumulative County Operating Expenditures

Cumulative Operating Expenditures (Years 1-20) **06.21.2021 Sweetgrass (NVR): Isle of Wight County, Virginia, Fiscal Impact Analysis**		
	SCENARIO	
Category	**Sweetgrass (NVR)**	**%**
General Administration	$86,865	0.4%
Financial Administration	$307,015	1.5%
Judicial	$468,925	2.3%
Public Safety	$6,134,561	30.0%
Public Works	$2,781,896	13.6%
Education	$4,250,282	20.8%
Parks, Recreation, Grounds & Cultural	$1,860,367	9.1%
Community Development	$514,634	2.5%
Other Public Services	$489,840	2.4%
Debt Service*	$0	0.0%
Non-Departmental^	$3,559,651	17.4%
TOTAL	**$20,454,036**	**100%**

** Capital expenses projected separately*

^ Includes transfer to Public Utilities

Figure 12. Cumulative County Capital Expenditures

20-Year Cumulative Total Capital Expenditures **06.21.2021 Sweetgrass (NVR): Isle of Wight County, Virginia, Fiscal Impact Analysis**		
	SCENARIO	
Category	**Sweetgrass (NVR)**	**%**
Education	$1,135,478	51%
General Government	$0	0%
Parks and Recreation	$757,131	34%
Sheriff	$284,139	13%
Fire	$0	0%
Transportation	$28,675	1%
TOTAL	**$2,205,422**	**100%**

Approach to Modeling Capital Impacts

Capital expenditures are modeled using the following criteria:

- The demand from the development project create a new demand for additional capacity.
- The County does not currently have capacity to accommodate the additional demand.
- There are current/future plans by the County to build or purchase the capital need to provide additional capacity.
- The current or planned capital expenditure is anticipated to be funded by the County (as opposed to being provided by private development or funded from other sources).

A summary of the projected capital improvements and costs are shown below in Figure 13. Additional detail is provided below the figure.

Figure 13. Summary of Capital Needs and Cost

	20-Year Cumulative Total Capital Needs and Costs **06.21.2021 Sweetgrass (NVR): Isle of Wight County, Virginia, Fiscal Impact Analysis**				
	Category	**SCENARIO** **Sweetgrass (NVR)**			
		Unit of Measure	*Demand*	*Capacity Needed*	*Cost ($000s)**
EDUCATION	Elementary School	Seat	30.2	19.4	$1,119,384
	Middle School	Seat	7.0	0.0	$0
	High School	Seat	14.6	0.0	$0
	School Buses	$			$0
	School Admin Facilities	$			$0
	School Fleet Bus Garage Addition	$			$16,094
GEN GOVT	General Government	Sq. Ft.	n/a	0.0	$0
	Court Facility	Sq. Ft.	n/a	0.0	$0
	Capital Maintenance (Growth Share)	$			$0
PARKS & REC / CULTURAL	Improved Park Land	Acre	7.4	7.3	$71,552
	Improved Park Improvements	Acre	7.4	7.3	$580,838
	Recreation Facilities	Sq. Ft.	178.8	178.8	$104,740
	Trails	$			$0
	Vehicles/Equipment	Vehicle	n/a	0.0	$0
SHERIFF	Sheriff Buildings	Sq. Ft.	n/a	0.0	$0
	Animal Control	Sq. Ft.	0.0	0.0	$0
	Sheriff Vehicles/Equipment	Vehicle	1.5	1.5	$106,317
	E-911 Comm System	$			$177,821
FIRE & RESCUE	Fire Stations & Rescue Stations	Sq. Ft.	n/a	0.0	$0
	Fire Apparatus/Equipment	Vehicle	n/a	0.0	$0
	Rescue Apparatus/Equipment	Vehicle	n/a	0.0	$0
TRANSPO.	Transportation Projects	$			$28,675
				TOTAL	**$2,205,422**

** Reflects cumulative capital costs from the project over the 20-year projection period, including principal and interest.*

Education

Additional school capacity needed to serve the Sweetgrass Development is projected based on the above criteria. The schools serving the proposed development are highlighted below. (Note: Enrollment data from the 2020-21 school year is not used because of the likely effects on public school enrollment from COVID-19.)

Figure 14. Isle of Wight Public Schools

	in All Schools[1]	*County School Capacity [2]*	*School Util %*	*Seats Avail*	*PROJ. by Scen*	*$ per Seat [3]*	*Seats Needed by Scen*
ELEM (K-6)	*2,811*	*3,165*	*89%*	*354*			
Carrollton Elem (PreK-3)	710	682	104%	-28	19.4	$43,005	19.4
Carrsville Elem (PreK-5)	247	310	80%	63			
Hardy Elem (PreK-5)	517	657	79%	140			
Westside Elem (4-6)	760	849	90%	89	10.8	$43,005	0
Windsor Elem (PreK-5)	577	667	87%	90			
MS	*1,030*	*1,169*	*88%*	*139*			
Georgie Tyler Middle (6-8)	434	535	81%	101			
Smithfield Middle (7-8)	596	634	94%	38	7.0		0
HS	*1,789*	*2,463*	*73%*	*674*			
Smithfield High (9-12)	1,267	1,588	80%	321	14.6	$45,206	0
Windsor High (9-12)	522	875	60%	353			
Total	***5,630***	***6,797***	***83%***	1,167	**51.8**		**19**

[1] Virginia Dept of Education, Fall Membership Report of Isle of Wight County Schools, 2019-20 (enrollment as of Sept. 30, 2019).
[2] Isle of Wight County Schools Facility Capacity, 02/08/19
[3] Isle of Wight current cost estimates ($2021)

- Isle of Wight in FY 2025-26 plans to construct a new elementary school, valued at approximately $38.8 million
- One support facility for Isle of Wight Public Schools is included in the County FY2020-2029 CIP – Fleet/Bus Garage addition. Costs to serve the proposed Sweetgrass project are based on the cost per student for the County's contribution for the capital project.
    - Fleet Bus Garage: $2,500,000 divided by divided by planned capacity of the system over the life of the CIP 8,0476 (current capacity of 6,797 plus 1,250 additional seats) = $311 per student

General Government

No current or future capacity expansions are anticipated by the County for General Government facilities.

Parks and Recreation

Additional park and recreation improvements are projected to serve the proposed development. The projection is based on the County's current levels of service as follows:

- 5.1 acres per 1,000 persons of active parks (192 acres active parks / 37,945population x 1,000) at $77,500 per acre for land and improvements
- 123 square feet per 1,000 persons of recreation facility space (4,656 / 37,333 population x 1,000) at $508 per square foot for recreational facility expansion.

- Trails expansions are not included as a County cost as projects in the latest County Capital Improvement Program (FY2020-2029) are identified as being funded from private entities.

Sheriff

- Additional sheriff vehicles are projected based on current levels of service of 5.3 vehicles per 1,000 calls for service (48 sheriff vehicles / 9,393 Sheriff calls x 1,000). The cost per vehicle is $60,500 (inflated to 2021 dollars from Isle of Wight Cash Proffer Study, 2012).

Fire and Rescue

No current or future *capacity* expansions are anticipated by the County for Fire and/or Rescue facilities. (Other capital expenditures for replacement (non-growth related) vehicles are listed in the CIP.)

Transportation

The County FY2020-2029 CIP identifies anticipated local expenditures of $900,000 on future system level capacity transportation improvements. To determine the Sweetgrass Development's share of the costs, TischlerBise analyzed future Countywide growth (based on our 2012 Cash Proffer Study) and identified that 50 percent of the costs are due to growth, or $450,000. This cost is allocated to future increase in vehicle trips throughout the County (base year trips are 101,790; a 50 percent increase equals 50,895). The cost per trip allocated to new development is $8.00 (truncated) ($450,000 / 59,344).

The Sweetgrass Project is projected to generate 2,664 trips. Costs are projected based on $8.00 per trip. With debt financing, total 20-year costs equal $21,314.

APPENDIX: DEMOGRAPHIC & DATA ASSUMPTIONS

BASE YEAR DATA

The table below summarizes estimates of the base year population, housing units, employment, nonresidential space, and facility factors in Isle of Wight County. These estimated values serve as the basis for the fiscal impact analysis and are used to determine the cost and revenue factors used in the analysis.

Figure 15. Base Year Input Data

		Base Year->	2021
Population [1]	POPULATION		37,945
	POP AND JOBS		47,638
	NON-TOWN POPULATION		26,758
	NON-TOWN POP AND JOBS		27,926
Housing Units by Type [2]	SINGLE FAMILY		12,507
	TOWNHOUSE		730
	APARTMENTS		1,272
	MOBILE HOME		1,847
	TOTAL HOUSING		16,356
	SF UNITS		15,083
Jobs by Type [3]	OFFICE JOBS		2,577
	RETAIL JOBS		1,908
	INDUSTRIAL JOBS		3,930
	INSTITUTIONAL JOBS		1,125
	HOTEL JOBS		94
	SELF-EMPLOYED JOBS		59
	TOTAL JOBS		9,693
	RETAIL, OFFICE, IND JOBS		8,568
Nonresidential Floor Area [2]	OFFICE SF		775,666
	RETAIL SF		954,000
	INDUSTRIAL SF		1,702,812
	INSTITUTIONAL SF		1,472,197
	HOTEL SF		82,907
	TOTAL NR KSF		4,987,582
Vehicle Trips [4]	RESIDENTIAL TRIPS		73,880
	NONRES TRIPS		27,910
	VEHICLE TRIPS		101,790

Facility Factors	[5]	PARK ACRES	3,068
	[5]	FACILITY SF	321,287
Public Safety Factors	[5]	TOTAL SHERIFF CALLS	9,099
	[5]	TOTAL FIRE CALLS	5,608
		TOTAL EMS CALLS	0
	[5]	TOTAL FIRE AND EMS CALLS	5,608
School Factors [9]		ELEM ENROLLMENT	2,811
		MS ENROLLMENT	1,030
		HS ENROLLMENT	1,789
		TOTAL ENROLLMENT	5,630
Fiscal Factors	[6]	CUMUL AV	$4,646,536,085
		SMITHFIELD JOBS	6358
		WINDSOR JOBS	2,167
	[7]	COUNTY ENROLLMENT	5,630
		COUNTY EMPLOYEES	210

[1] Weldon Cooper Center, July 1, 2020 estimate.
[2] Weldon Cooper Center, July 1, 2020 estimate; percentage distribution from US Census ACS, 2015-2019
[3] QCEW - Bureau of Labor Statistics, 2020 Annual Averages, All establishment sizes.
[4] TischlerBise; ITE.
[5] Isle of Wight County
[6] Isle of Wight County, CAFR FY17
[7] Isle of Wight County Public Schools

HOUSEHOLD SIZE

Household size is used to project population over the planning horizon. Figure 16 shows household size assumptions by type of unit, categorized by type of unit included in the analysis.

Figure 16. Household Size

Household Size
Persons per Housing Unit

Type of Unit	*Persons [3]*	*Housing Units [3]*	*PPHU*	*Households [3]*	*PPHH*	
Single Family [1]	29,698	12,551	2.37	11,676	2.54	80%
Multifamily [2]	3,059	1,358	2.25	1,341	2.28	9%
Mobile Homes	3,613	1,769	2.04	1,570	2.30	11%
Total	**36,370**	**15,678**	**2.32**	**14,587**	**2.49**	100%

[1] Includes Single Family Detached, Attached, and Mobile Homes.
[2] Includes Structures with 2+ Units.
[3] U.S. Census Bureau 2015-2019 American Community Survey 5-Yr Estimates

PUBLIC SCHOOL STUDENTS PER HOUSING UNIT

Student generation rates for Isle of Wight Public Schools are from the study "Isle of Wight County Schools Student Yield & Subdivision Analysis" conducted for the school district by Cooperative Strategies in April 2018. It is assumed that age-restricted single family housing will not generate new students. Rates are shown in Figure 17.

Figure 17. Isle of Wight County Public Schools Pupil Yields per Housing Unit

Student Yields

	Elem (PK-3)	*Elem (4-6)*	*Mid (7-8)*	*High (9-12)*	***TOTAL***
Single Family	0.104	0.080	0.059	0.125	**0.368**
Age-Restricted Single Family	0.000	0.000	0.000	0.000	**0.000**
Town Home	0.086	0.048	0.031	0.065	**0.230**
Multifamily (Apartment)	0.156	0.090	0.037	0.105	**0.388**

Note: Figures may not sum to totals shown due to rounding.
Source: Cooperative Strategies, "Isle of Wight County Schools Student Yield & Subdivision Analysis," April 2018.

VEHICLE TRIPS

Vehicle trips are used to project some operating and capital expenditures in the fiscal impact analysis. Average Weekday Vehicle Trip Ends by type of development (or trip generation rates) are from the reference book, *Trip Generation, 10TH Edition*, published by the Institute of Transportation Engineers (ITE), in 2017. A "trip end" represents a vehicle either entering or exiting a development (as if a traffic counter were placed across a driveway). Trip rates have been adjusted to avoid overestimating the number of actual trips because one vehicle trip is counted in the trip rates of both the origination and destination points. A simple factor of 50 percent has been applied to Residential and the Office and Industrial categories. The Retail category has a trip factor of less than 50 percent because this type of development attracts vehicles as they pass-by on arterial and collector roads. For example, when someone stops at a convenience store on their way home from work, the convenience store is not their primary destination.

Trip rates and adjustment factors are shown in the figure. Using trips generated from single family units as an example, the formula is as follows: 12,507 units x 9.44 vehicle trips per unit x 50% adjustment = 59,032. As shown in Figure 18, residential development accounts for an estimated 73 percent of total daily trips and nonresidential development accounts for an additional 27 percent.

Figure 18. Vehicle Trips

Residential Vehicle Trips on an Average Weekday			
Residential Units	*Assumptions*		
Single Family	12,507		
Townhouse	730		
Apartments	1,272		
Mobile Home	1,847		
Average Weekday Vehicles Trip Ends Per Unit [1]			*Trip Factor*
Single Family	9.44		50%
Townhouse	7.32		50%
Apartments	5.44		50%
Mobile Home	9.44		50%
Residential Vehicle Trip Ends on an Average Weekday			
Single Family	59,032		
Townhouse	2,671		
Apartments	3,461		
Mobile Home	8,716		
TOTAL RESIDENTIAL TRIPS	***73,880***		*73%*
Nonresidential Vehicle Trips on an Average Weekday			
Nonresidential Gross Floor Area (1,000 sq. ft.) [2]	*Assumptions*		
Office	776		
Retail	954		
Industrial	1,703		
Institutional	1,472		
Hotel	83		
Average Weekday Vehicle Trip Ends per 1,000 Sq. Ft. [1]		*Trip Factors*	
Office	9.74		50%
Retail	37.75		34%
Industrial	4.96		50%
Institutional	9.74		50%
Hotel	11.94		50%
Nonresidential Vehicle Trips on an Average Weekday			
Office	3,777		
Retail	12,245		
Industrial	4,223		
Institutional	7,170		
Hotel	495		
TOTAL NONRESIDENTIAL TRIPS	***27,910***		*27%*
TOTAL TRIPS	**101,790**		*100%*

[1] Trip rates are from the Institute of Transportation Engineers (ITE) Trip Generation Manual, 2017.

PUBLIC SAFETY COST ALLOCATION APPROACH

Public safety costs are allocated to residential and nonresidential development using a proportionate share methodology.

Proportionate Share Calculation

A proportionate share calculation allocates demand from residential and nonresidential development based on characteristics of population, labor force, and jobs in the County. Based on this analysis and shown in Figure 19, 77 percent demand is from residential development and 23 percent from nonresidential development.

Figure 19. Proportionate Share Factors

Demand Units						
Residential					***Demand Hours/Day***	***Person Hours***
	Population	37,945				
	Residents Not Working		20,693		20	413,860
	Employed Residents		17,252			
	Employed in Isle of Wight County			3,243	14	45,402
	Employed outside Isle of Wight County			14,009	14	196,126
					Residential Subtotal	655,388
					Residential Share	**77%**
Nonresidential						
	Non-working Residents		20,693		4	82,772
	Jobs Located in Isle of Wight County		10,786			
	Residents Employed in Isle of Wight County			3,243	10	32,430
	Non-Resident Workers (inflow commuters)			7,543	10	75,430
					Nonresidential Subtotal	190,632
					Nonresidential Share	**23%**
					Total	846,020

Source: US Census, OnTheMap Application and LEHD Origin-Destination Employment Statistics, 2018

SHERIFF CALLS FOR SERVICE

Using the above proportionate share methodology, Sheriff calls for service per capita and per nonresidential trip are derived. For Sheriff calls for service, self-initiated calls are netted out of the total number both to derive the cost per call for service and to project future calls for service from the development program.

To project future Sheriff calls for service from new development, the data are used to determine a call per person and call per nonresidential trip. *Note: the development program only includes residential development; therefore, only the call per capita is used in the analysis.*

These factors are then applied to projected population from the development program to project demand for Sheriff services using calls for service. (E.g., for every new person in the County, it is estimated that .1906 Sheriff calls for service are generated.)

Figure 20. Isle of Wight County Sheriff Calls for Service Projection Methodology

SHERIFF DATA INPUT AREA

Sheriff Calls for Service Data [1]

		2018	*2021 (estimated)*	
TOTAL CALLS FOR SERVICE		**9,099**	**9,393**	
	% [2]		*pop/nonres trips*	*Call per capita/nonres trip*
Residential	77%	**7,232**	37,945	0.1906
Nonresidential	23%	**2,160**	27,910	0.0774

Calls per Capita	0.1906
Calls per Nonres. Trip	0.0774

[1] Based on information provided by the Isle of Wight Public Safety; Non-self initiated calls. 2021 estimate obtained by dividing 2018 calls by 2018 housing units, then multiplying by 2021 estimated housing units.
[2] Proportionate share calculation; TischlerBise

FIRE AND EMS CALLS FOR SERVICE

Using the above proportionate share methodology, Fire and EMS calls for service per capita and per nonresidential trip are derived.

To project future Fire and EMS calls for service from new development, the data are used to determine a call per person and call per nonresidential trip. *Note: the development program only includes residential development; therefore, only the call per capita is used in the analysis.*

These factors are then applied to projected population from the development program to project demand for Fire and EMS services using calls for service. (E.g., for every new person in the County, it is estimated that .1138 Fire and EMS calls for service are generated.)

Figure 21. Isle of Wight County Fire and EMS Calls for Service Projection Methodology

FIRE/RESCUE DATA INPUT AREA

Fire/Rescue Calls for Service Data [1]

		2020		
TOTAL CALLS FOR SERVICE		**5,608**		
	% [2]		*pop/nonres trips*	*Call per capita/nonres trip*
Residential	77%	**4,318**	37,945	0.1138
Nonresidential	23%	**1,290**	27,910	0.0462

Calls per Capita	0.1138
Calls per Nonres. Trip	0.0462

[1] Based on information provided by the Isle of Wight Public Safety

[2] Proportionate share calculation; TischlerBise

Figure 22. Detailed Demand Projections

Sweetgrass (NVR) SCENARIO ANNUAL DEMAND BASE

		Base Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	Fiscal Year->	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041
	POPULATION	0	243	486	729	972	1,215	1,458	1,458	1,458	1,458	1,458	1,458	1,458	1,458	1,458	1,458	1,458	1,458	1,458	1,458	1,458
	POP AND JOBS	0	243	486	729	972	1,215	1,458	1,458	1,458	1,458	1,458	1,458	1,458	1,458	1,458	1,458	1,458	1,458	1,458	1,458	1,458
	AGE-RESTRICTED, SINGLE-FAMILY DETACHED	0	65	130	195	260	325	390	390	390	390	390	390	390	390	390	390	390	390	390	390	390
	TOWNHOUSE	0	38	75	113	150	188	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225
	HOUSING UNIT TYPE 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	HOUSING UNIT TYPE 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	HOUSING UNIT TYPE 5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	HOUSING UNIT TYPE 6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	HOUSING UNIT TYPE 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	HOUSING UNIT TYPE 8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL UNITS	0	103	205	308	410	513	615	615	615	615	615	615	615	615	615	615	615	615	615	615	615
$0 Sales Per Sq. Ft.	NONRESIDENTIAL TYPE 1 SF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
$0 Sales Per Sq. Ft.	NONRESIDENTIAL TYPE 2 SF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
$0 Sales Per Sq. Ft.	NONRESIDENTIAL TYPE 3 SF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
$0 Sales Per Sq. Ft.	NONRESIDENTIAL TYPE 4 SF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
$0 Sales Per Sq. Ft.	NONRESIDENTIAL TYPE 5 SF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
$0 Sales Per Sq. Ft.	NONRESIDENTIAL TYPE 6 SF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL SF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NONRESIDENTIAL TYPE 1 JOBS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NONRESIDENTIAL TYPE 2 JOBS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NONRESIDENTIAL TYPE 3 JOBS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NONRESIDENTIAL TYPE 4 JOBS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NONRESIDENTIAL TYPE 5 JOBS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NONRESIDENTIAL TYPE 6 JOBS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL JOBS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	RESIDENTIAL TRIPS	0	444	888	1,332	1,776	2,220	2,664	2,664	2,664	2,664	2,664	2,664	2,664	2,664	2,664	2,664	2,664	2,664	2,664	2,664	2,664
	NONRES TRIPS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	VEHICLE TRIPS	0	444	888	1,332	1,776	2,220	2,664	2,664	2,664	2,664	2,664	2,664	2,664	2,664	2,664	2,664	2,664	2,664	2,664	2,664	2,664
0.191	RES SHERIFF CALLS	0	46	93	139	185	232	278	278	278	278	278	278	278	278	278	278	278	278	278	278	278
0.077	NONRES SHERIFF CALLS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL SHERIFF CALLS	0	46	93	139	185	232	278	278	278	278	278	278	278	278	278	278	278	278	278	278	278
0.114	RES FIRE AND RESCUE CALLS	0	28	55	83	111	138	166	166	166	166	166	166	166	166	166	166	166	166	166	166	166
0.046	NONRES FIRE AND RESCUE CALLS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL FIRE AND EMS CALLS	0	28	55	83	111	138	166	166	166	166	166	166	166	166	166	166	166	166	166	166	166
	ELEM ENROLLMENT	0	5	10	15	20	25	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
	MS ENROLLMENT	0	1	2	3	5	6	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	HS ENROLLMENT	0	2	5	7	10	12	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
	TOTAL ENROLLMENT	0	9	17	26	35	43	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52
	ELEM ENROLLMENT (PRE K-3)	0	3	6	10	13	16	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19
	ELEM ENROLLMENT (GR 4-6)	0	2	4	5	7	9	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
			5.03	10.05	15.08	20.10	25.13	30.15	30.15	30.15	30.15	30.15	30.15	30.15	30.15	30.15	30.15	30.15	30.15	30.15	30.15	30.15
	ANNUAL MV	$0	$29,545,813	$29,545,813	$29,545,813	$29,545,813	$29,545,813	$29,545,813	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	CUMUL RES AV	$0	$29,545,813	$59,091,625	$88,637,438	$118,183,250	$147,729,063	$177,274,875	$177,274,875	$177,274,875	$177,274,875	$177,274,875	$177,274,875	$177,274,875	$177,274,875	$177,274,875	$177,274,875	$177,274,875	$177,274,875	$177,274,875	$177,274,875	$177,274,875
	CUMUL NONRES AV	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	CUMUL AV	$0	$29,545,813	$59,091,625	$88,637,438	$118,183,250	$147,729,063	$177,274,875	$177,274,875	$177,274,875	$177,274,875	$177,274,875	$177,274,875	$177,274,875	$177,274,875	$177,274,875	$177,274,875	$177,274,875	$177,274,875	$177,274,875	$177,274,875	$177,274,875
	NET CUMUL AV	$0	$29,545,813	$29,545,813	$29,545,813	$29,545,813	$29,545,813	$29,545,813	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	NON-TOWN POPULATION		243	486	729	972	1,215	1,458	1,458	1,458	1,458	1,458	1,458	1,458	1,458	1,458	1,458	1,458	1,458	1,458	1,458	1,458
	NON-TOWN POP AND JOBS		243	486	729	972	1,215	1,458	1,458	1,458	1,458	1,458	1,458	1,458	1,458	1,458	1,458	1,458	1,458	1,458	1,458	1,458

TischlerBise
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TischlerBise
FISCAL | ECONOMIC | PLANNING

4701 Sangamore Road | Suite S240 | Bethesda, MD 20816
301.320.6900
www.tischlerbise.com

MEMORANDUM

To: Eric Shirey, General Manager, Land, NVR Inc.

From: Julie Herlands, AICP, Vice President, TischlerBise

Date: February 10, 2023

RE: Fiscal Impact Analysis for Sweetgrass in Isle of Wight County, Virginia//Response to Isle of Wight Capital Impacts Finding

TischlerBise conducted a Fiscal Impact Analysis of the proposed Sweetgrass development in Isle of Wight County, Virginia, for NVR Inc/Ryan Homes for submission to Isle of Wight County as part of the applicant's rezoning request. TischlerBise provided a report dated June 21, 2021, to NVR Inc./Ryan Homes.

The overall finding of the Fiscal Impact Analysis is that the proposed development is fiscally positive to the County in total.[1] TischlerBise's analysis factors in all variable revenues generated by the proposed development compared to all operating and capital costs attributable to the development.

Isle of Wight County has a *Capital Impacts Model* that was developed by TischlerBise.[2] The Model was developed specifically for the County to identify capital impacts eligible for mitigation by cash proffers. Isle of Wight County has recently provided NVR with a summary of the Model's capital impact findings for the Sweetgrass development,[3] which total approximately $2.3 million in capital impacts of which $785,285 is cash proffer eligible.

TischlerBise's fiscal impact analysis also identifies capital cost impacts attributed to the development totaling approximately $2.2 million. However, unlike the *Capital Impacts Model*, which does not include revenue offsets,[4] the TischlerBise **Fiscal Impact Analysis** (as requested by the County as part of the rezoning application) captures all revenues attributable to Sweetgrass and is projected to generate sufficient revenues in total to cover projected operating and capital costs.

[1] The twenty-year cumulative net fiscal impact is a surplus of approximately $20.9 million and an annual net surplus of approximately $1.2 million at the project's buildout.
[2] Model transmitted October 28, 2020.
[3] Printout dated 12/14/2022.
[4] Virginia localities fund most locally funded services (including schools) with property tax revenues, which is a general revenue source (i.e., a discretionary revenue that is appropriated by elected officials during the budget process). Property tax revenues are not typically earmarked for specific purposes (other than a locality's full faith and credit obligation to retire debt where applicable or when levied for special tax districts).

Sweetgrass
Product Selection and Market Analysis

The Sweetgrass Community is setup to serve two different buyer profiles, both of which require an active lifestyle and demand a high quality product.

The "Lifestyle" Ranch section provides first floor owner bedrooms and baths that tailor to the "55 and greater" customer. The new construction supply for this product is restrained which continues to drive up prices. Sweetgrass' customers will primarily come from Isle of Wight, however secondary buyers are expected from the Peninsula and City of Suffolk.

Census data reveals those areas having 215,412 people that is age 55 or older. Migration data tells us that 14,219 of those will desire to move this year.

Last year, there was 2,175 first floor owner bedroom homes sold within those areas. Today there is only 505 first floor owner bedroom homes for sale across the broader market and Isle of Wight County specifically has only 54 active listings today (the majority being new construction).

The Sweetgrass Community will sell over 60 ranch homes each year and that is considering the absorption levels of other communities that serve this buyer such as South Harbor in Isle of Wight County and Church Square in the Town of Smithfield.

The "Towns" section provides a tremendous value for families who have been priced out of the market due to inflation, rising interest rates and increased new home sales prices. Sweetgrass will offer townhomes that come equipped with a garage and 3-4 bedrooms. The renters of Isle of Wight will finally have an option to obtain home ownership. Isle of Wight's average price for a home built after the year 2000 and at least 1500 square feet was $465,533. Sweetgrass Towns will provide relief to such pricing pressure by offering elegant and high quality homes from the upper $200's and lower $300's.

Both products at Sweetgrass have tremendous demand in the marketplace, which will equate to a very busy jobsite and fast buildout.



Sweetgrass Elevations - June 15, 2023


Facing North
LEGACY
AT
SWEETGRASS
Sweetgrass Elevations - June 15, 2023


Facing South
TOWNHOMES
Sweetgrass Elevations - June 15, 2023


Facing South
Sweetgrass Elevations - June 15, 2023


Facing West
View over Park
Sweetgrass Elevations - June 15, 2023



Sweetgrass Elevations - June 15, 2023


Facing East
AES
CONSULTING ENGINEERS
Sweetgrass Elevations - June 15, 2023


Sweetgrass Elevations - June 15, 2023


AES
CONSULTING ENGINEERS
Sweetgrass Elevations - June 15, 2023


Facing West
View of Amenity



Sweetgrass Elevations - June 15, 2023


Sweetgrass Elevations - June 15, 2023


Sweetgrass Elevations - June 15, 2023


Sweetgrass Elevations - June 15, 2023


Sweetgrass Elevations - June 15, 2023



Sweetgrass Elevations - June 15, 2023


ES
LTING ENGINEERS
Sweetgrass Elevations - June 15, 2023



Sweetgrass Elevations - June 15, 2023


Sweetgrass Elevations - June 15, 2023



Sweetgrass Elevations - June 15, 2023

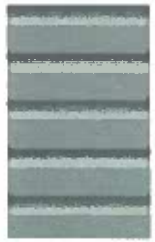

Sweetgrass Elevations - June 15, 2023

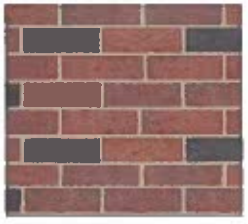


Sweetgrass Elevations - June 15, 2023

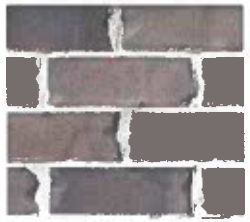
Lake Single Family Detached Color Schemes - Prime, Premium, Premium Plus

Scheme #	Primary Siding (Variform)	Accent Siding (Variform)	Shutter Color	Front Door Paint Color	Brick (GS Salisbury or Equivalent)	Stone (Environmental or Equivalent)	
Lake 1	Dover White	Dover White	Plygem	Sherwin Williams	Savannah Gray	Gray	Prime, Premium, Premium Plus
ESCLB01A - Reflect			Black 	Tricorn Black 			
ESCLB01B - Inspire			Black 	Sundried Tomato 			
Lake 2	Flint	Flint	Plygem	Sherwin Williams	Cordoba	Gray	Prime, Premium, Premium Plus
ESLB02A - Reflect			Black 	Seaworthy 			
ESLB02B - Inspire			Black 	Rain 			

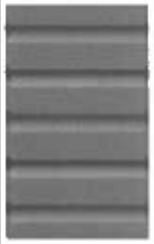
Scheme #	Primary Siding (Variform)	Accent Siding (Variform)	Shutter Color	Front Door Paint Color	Brick (GS Salisbury or Equivalent)	Stone (Environmental or Equivalent)	
Lake 3	Georgian Gray	Dover White	Plygem	Sherwin Williams	Charred Oak	PA Lime	Prime, Premium, Premium Plus
ESLB03A - Reflect			Blue 	Web Gray 			
ESLB03B - Inspire			Blue 	Sequin			
Lake 4	Silver Mist	Silver Mist	Plygem	Sherwin Williams	LaCava	PA Sierra	Prime, Premium, Premium Plus
ESLV04A - Reflect			Blue 	Grizzle Gray 			
ESLV04B - Inspire			Blue 	Salty Dog 			
Lake 5	Irish Thistle	Irish Thistle	Plygem	Sherwin Williams	Savannah Gray	PA Sierra	Prime, Premium, Premium Plus
ELSV05A - Reflect			Dark Navy 	Naval 			
ELSV05B - Inspire			Dark Navy 	Cupola Yellow			

Scheme #	Primary Siding (Variform)	Accent Siding (Variform)	Shutter Color	Front Door Paint Color	Brick (GS Salisbury or Equivalent)	Stone (Environmental or Equivalent)	
Lake 6	Spanish Olive	Silver Mist	Plygem	Sherwin Williams	LaCava	Appalachian	Prime, Premium, Premium Plus
ESLV06A - Reflect			Black 	Rock Bottom 			
ESLV06B - Inspire			Black 	Pewter Green 			
Lake 7	Stone Mountain Clay	Island Pearl	Plygem	Sherwin Williams	Berkshire	Manor	Prime, Premium, Premium Plus
ESLB07A - Reflect			Peppercorn 	Urbane Bronze 			
ESLB07B - Inspire			Peppercorn 	Still Water 			
Lake 8	Sandy Tan	Sandy Tan	Plygem	Sherwin Williams	Olde Columbia	Manor	Prime, Premium, Premium Plus
ESLB08A - Reflect			Gray 	Homburg Gray 			
ESLB08B - Inspire			Gray 	Riverway 			

Sweetgrass Elevations - June 15, 2023

Scheme #	Primary Siding (Variform)	Accent Siding (Variform)	Shutter Color	Front Door Paint Color	Brick (GS Salisbury or Equivalent)	Stone (Environmental or Equivalent)	
Lake 9	Natural Almond	Natural Almond	Plygem	Sherwin Williams	Turner Ridge	Dakota	Prime, Premium, Premium Plus
ESLB09A - Reflect			Gray 	Oyster Bay 			
ESLB09B - Inspire			Gray 	Bunglehouse Blue 			
Lake 10	Island Pearl	Island Pearl	Plygem	Sherwin Williams	Charred Oak	Appalachian	Prime, Premium, Premium Plus
ESLB10A - Reflect			Black 	Slate Tile 			
ESLB10B - Inspire			Black 	Samovar Silver 			
Lake 11	Pewter	Pewter	Plygem	Sherwin Williams	Cordoba	PA Lime	Premium, Premium Plus
ESLB11A - Reflect			Black 	Tricorn Black 			
ESLB11B - Inspire			Black 	Bravado Red 			

Scheme #	Primary Siding (Variform)	Accent Siding (Variform)	Shutter Color	Front Door Paint Color	Brick (GS Salisbury or Equivalent)	Stone (Environmental or Equivalent)	
Lake 12	Wedgewood	Wedgewood			Turner Ridge	Carolina	Premium, Premium Plus
ESLB12A - Reflect			Dark Navy 	In the Navy 			
ESLB12B - Inspire			Dark Navy 	Hubbard Squash			
Lake 13	Sagebrook	Silver Mist			Walnut Grove	Carolina	Premium, Premium Plus
ESLB13A - Reflect			Black 	Tricorn Black 			
ESLB13B - Inspire			Black 	Peppercorn 			
Lake 14	Twilight Shadow	Twilight Shadow			Walnut Grove	Carolina	Premium, Premium Plus
			Black 	Tricorn Black 			
			Black 	Rainwashed			

Scheme #	Primary Siding (Variform)	Accent Siding (Variform)	Shutter Color	Front Door Paint Color	Brick (GS Salisbury or Equivalent)	Stone (Environmental or Equivalent)	
Lake 15	Bayou	Bayou			Cordoba	PA Lime	
ESLB15A - Reflect			Black 	Tricorn Black 			Premium, Premium Plus
ESLB15B - Inspire			Black 	Mineral Deposit 			
Lake 16	Deep Brunswick	Deep Brunswick			LaCava	Appalachian	
ESLB16A - Reflect			Pebblestone Clay 	Chocolate Powder 			Premium Plus
ESLB16B - Inspire			Pebblestone Clay 	Tradewind			
Lake 17	Teak	Dover White			Savannah Gray	Dakota	
ESLB17A - Reflect			Black 	Evergreen Fog 			Premium Plus
ESLB17B - Inspire			Black 	Teal Stencil 			
Lake 18	Sedona Red	Sedona Red			Savannah Gray	Appalachian	

Scheme #	Primary Siding (Variform)	Accent Siding (Variform)	Shutter Color	Front Door Paint Color	Brick (GS Salisbury or Equivalent)	Stone (Environmental or Equivalent)
ESLB18A - Reflect			Black 	Tricorn Black 		
ESLB18B - Inspire			Black 	Anonymous 		

Premium Plus


NISSAN


356
354
SHIH TZU
WE
Welcome

June 17, 2022

Isle of Wight County Planning and Zoning
17140 Monument Circle, Suite 101
Isle of Wight VA 23397

Via e-mail:

Re: Sweetgrass Cultural Resources Assessment
Parcel Number 32-01-009 (14096 Benns Church Road) (±294.4 acres)
Isle of Wight County, VA

Dear Sir or Madam:

Thunderbird Archeology, a division of Wetland Studies and Solutions, Inc. (WSSI) has completed a desk-based Cultural Resources Assessment on behalf of NVR, Inc. for the Sweetgrass site located in Isle of Wight County, Virginia (see Attachment). The project area includes +/- 249.4 acres of, generally located northeast of Benns Church Blvd and north of Beechwood Lane.

Our research showed that the project area has not been previously subject to cultural resources investigation and no cultural resources have been previously recorded on the property. We feel that the project area has at least a moderate potential to include historic and/or prehistoric period archeological resources. Additionally, one or more standing buildings on the site may be historic (i.e., 50-years or older). Our research found no evidence or other indications that a cemetery or human burials are present on the property.

In our opinion, any prehistoric period archeological sites that may be identified on the property will not likely be significant (i.e., eligible for listing in the National Register of Historic Places) due to the property's history of agricultural use and the likelihood that such sites have been disturbed by plowing. Although significant historic period archeological sites could be identified within the project area and the historic standing buildings thereon could be deemed significant, we anticipate that any such resources could be avoided or mitigated.

If you have any questions or want to discuss the attached report, feel free to contact me at 703.307.6951 or bsipe@wetlands.com.

Sincerely,

WETLAND STUDIES AND SOLUTIONS, INC.

Boyd Sipe, MA, RPA
Manager – Archeology

Enclosures : Attachment

DRAFT

DRAFT

Cultural Resources Site Assessment
Sweetgrass (±249.4 acres)
Isle of Wight County, Virginia
WSSI #31100.01

INTRODUCTION

This transmittal presents an evaluation of the potential for locating cultural resources on the ±249.4-acre Sweetgrass project area, located at 14096 Benns Church Boulevard, Smithfield, VA (Exhibit 1). The study area is situated on a low-lying terrace bordering Jones Creek on its north-eastern side (Exhibit 2). The project area appears to be generally low in topographic relief, sloping gradually towards and draining into unnamed tributary streams of the Creek to the northwest and the southeast.

The most recent aerial photography of the project area shows most of the project area under cultivation, with forests in the north-eastern section accounting for roughly 20% of the vegetation cover (Exhibit 3). A sheet-metal-roof square structure is visible near the center of the property. Parcel records indicate two improvements on the property, both categorized "Miscellaneous," one constructed in 1960 and the other in 2010. A review of online historic aerial photography suggests that the central structure predates 1972. The historic aerials also indicate at least two other structures, about 450 ft to the north and north-east of the central building, existed on the property until about 2004. The layout and use of the fields has remained consistent since at least 1972. The 1919 United States Geological Survey (USGS) quadrangle covering the project area indicates that buildings stood in the same location as the ones visible in the 1972 photo. It also shows that another structure, demolished before 1972, was once located between 800 and 1000 ft. east of the currently standing building (Exhibit 4).

DRAFT

KNOWN CULTURAL RESOURCES IN OR NEAR THE PROJECT AREA

The following inventory of previously recorded cultural resources within and near the project area was established by using the Virginia Department of Historic Resources' (DHR) online Virginia Cultural Resource Information System (V-CRIS), as well as examining cultural resource files and reports at the Thunderbird Archeology office in Gainesville, Virginia.

No previous cultural resources investigations have been conducted of the study area, and no archeological or architectural resources have been recorded within the study area. In total, three archeological site and eight architectural resources have been recorded within an approximate one-mile radius of the study area (Tables 1 and 2). One of the archeological sites, 44IW0242, represents a Middle Woodland period campsite, and has been deemed not eligible for inclusion on the National Register of Historic Places (NRHP). The other two archeological sites have not been formally evaluated. 44IW0113 represents another Woodland period Native American artifact scatter, and 44IW0271 represents the St. Luke's Church and Grounds, where prehistoric Native American artifact scatters were found

mixed with deposits associated with the historic Euro-American and African American church and cemetery. It is cross listed as architectural resource 046-0024, which is described in further detail below.

Table 1: Previously Recorded Archeological Sites within a One-Mile Radius of the Project Area

DHR SITE NUMBER	SITE TYPE	TEMPORAL AFFILIATION	NRHP ELIGIBILITY
44IW0271	Artifact scatter, Artifact scatter, Artifact scatter, Cemetery, Church, Lithic scatter	Antebellum Period, Colony to Nation, Early National Period, Middle Archaic Period, Pre-Contact, Early Woodland, Late Woodland, Antebellum Period, Civil War, Colony to Nation, Contact Period, Early National Period, Reconstruction and Growth, The New Dominion, World War I to World War II	Not Evaluated
44IW0242	Camp	Middle Woodland	DHR Staff: Not Eligible
44IW0113	No Data	Early Woodland, Late Woodland, Middle Woodland	Not Evaluated

Table 2: Previously Recorded Architectural Resources within a One-Mile Radius of the Project Area

DHR RESOURCE NUMBER	RESOURCE NAME	TYPE	TEMPORAL AFFILIATION	NRHP ELIGIBILITY
300-0115	Angel on Gravestone Gravestone, 14477 Benns Church Boulevard	Sculpture/Statue	World War I to World War II (1917 - 1945)	Not Evaluated
046-0024	Newport Parish Church Old Brick Church Saint Luke's Church Saint Luke's Smithfield	Church/Chapel	Contact Period (1607 - 1750)	VLR Listing NRHP Listing NHL Listing This property is subject to an easement held by the Board of Historic Resources
046-5250	Farmhouse, 20041 Brewers Neck Boulevard B. J. Hogue Homeplace	Single Dwelling	Early National Period (1790 - 1829)	DHR Staff: Not Eligible
046-5246	Benns Church	Church/Chapel	World War I to World War II (1917 - 1945)	Not Evaluated

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Table 3: Previously Recorded Architectural Resources within a One-Mile Radius of the Project Area

DHR RESOURCE NUMBER	RESOURCE NAME	TYPE	TEMPORAL AFFILIATION	NRHP ELIGIBILITY
046-5276	House, 19514 Casper Circle	Single Dwelling	World War I to World War II (1917 - 1945)	DHR Staff: Not Eligible
046-5274	House, 14564 Benns Church Blvd W.P. Jordan House	Single Dwelling	Reconstruction and Growth (1866 - 1916)	DHR Staff: Eligible
046-5275	House, 14580 Benns Church Boulevard	Single Dwelling	World War I to World War II (1917 - 1945)	DHR Staff: Not Eligible
046-5054	House, 15150 Benns Church Boulevard (Route 10) Jordan Home #1 Margaret Davis House Charles Driver Jordan House	Single Dwelling	Antebellum Period (1830 - 1860)	The Primary Resource is no longer extant.

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Of the eight previously recorded architectural resources located within a mile of the center of the project area, three have been deemed not eligible for NRHP listing (046-5250, 046-5276, 046-5275) and another has already been demolished (046-054) (Table 2); all represent 20th century farms and houses. Two resources have not been evaluated: 046-5246 (Benns Church) and 300-0115 (Angel on Gravestone). The first of these has as its primary resource the building currently housing Benns United Methodist Church, a brick structure erected in 1926 and added to in 1957 and 1967. Its secondary resource is the Benns Church Cemetery. Resource 300-0115 represents a sculpture of an angel on a gravestone dated to c.1921. The text description on file with DHR gives its location as the Benns Church Cemetery, however, its mapped location in VCRIS places it within Saint Luke's Church and Cemetery (046-0024).

DHR Resource 046-0024 (Saint Luke's Church) is listed on the NRHP, Virginia Landmark Registry (VLR), and as a National Historic Landmark (NHL). It represents a colonial period church building constructed between 1632 and 1657. It has been operated as a museum and a non-profit since 1953. The description of the resource in VCRIS indicates that it has maintained its historic character and feel; this increases the chances that nearby development plans would face greater scrutiny from regulators and the public. However, while the current project area is within less than half a mile of this site, it is separated by intervening forested areas, which diminish the possibility of a detrimental visual effect on the resource. Finally, one architectural resource within a mile of the project area, DHR ID#046-5274 (W.P. Jordan House) has been deemed eligible for NRHP listing. It represents a c.1888 Italianate-style Single Family Dwelling and its outbuildings. It was the home of W.P. Jordan, a member of a prominent family who owned most of the land south

of Benns Church to Suffolk in the 19th century. However, the VCRIS file regarding the resource states that W.P. Jordan himself was not associated with any significant historical events.

ARCHEOLOGICAL SITE PROBABILITY

The following presents an assessment of the probability that archeological sites will occur within the study area; this has not been field verified.

The probability for locating prehistoric sites generally depends on the variables of topography, proximity to water, and internal drainage. Sites are more likely on well-drained landforms of low relief near water. The study area has at least a moderate probability for containing prehistoric resources due to its areas of low-relief topography near water sources. If prehistoric sites are present in plowed upland settings, they are not likely to require work beyond the recordation done at the Phase I level as plowing disturbs the context of the Native American sites and reduces the information potential of a particular site. Prehistoric sites found outside of an upland setting (e.g., floodplain) or in unplowed contexts could require additional work if preserved deposits are identified.

The probability for the occurrence of historic period sites largely depends upon the history of settlement in the area, the topography and the proximity of a particular property to historic roads. Historic maps offer insight into habitation of the vicinity; however, the absence of structures on historic maps does not eliminate the possibility of an archeological site being present within the property, as it was common for properties occupied by tenants, enslaved laborers, and freed African Americans to be excluded from these maps. As previously stated, the USGS map from 1919 shows several no-longer-extant buildings within the project area. The project area also borders US Route 258 (Benns Church Boulevard), which has served as the main road between Smithfield and Benns Church for several centuries. These factors increase the overall likelihood for the occurrence of historic period archeological resources within the study area. In our opinion, these maps, and the presence of known archeological sites near the project area indicate a moderate to high likelihood for the occurrence of historic period archeological sites within the study area.

Archeological sites dating from the 17th -19th century, if present within the study area, will likely require archeological work above the Phase I (Identification)-level; this is particularly true of dwellings that were occupied by enslaved African Americans or tenants, as these site types have been less intensively studied. As noted above, sites of these types are not typically represented on historic maps and are typically only identifiable through field investigations. Twentieth-century sites are not likely to be considered significant or require additional archeological work unless they contain unique, intact cultural materials that would contribute new research information.

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CONCLUSIONS AND RECOMMENDATIONS

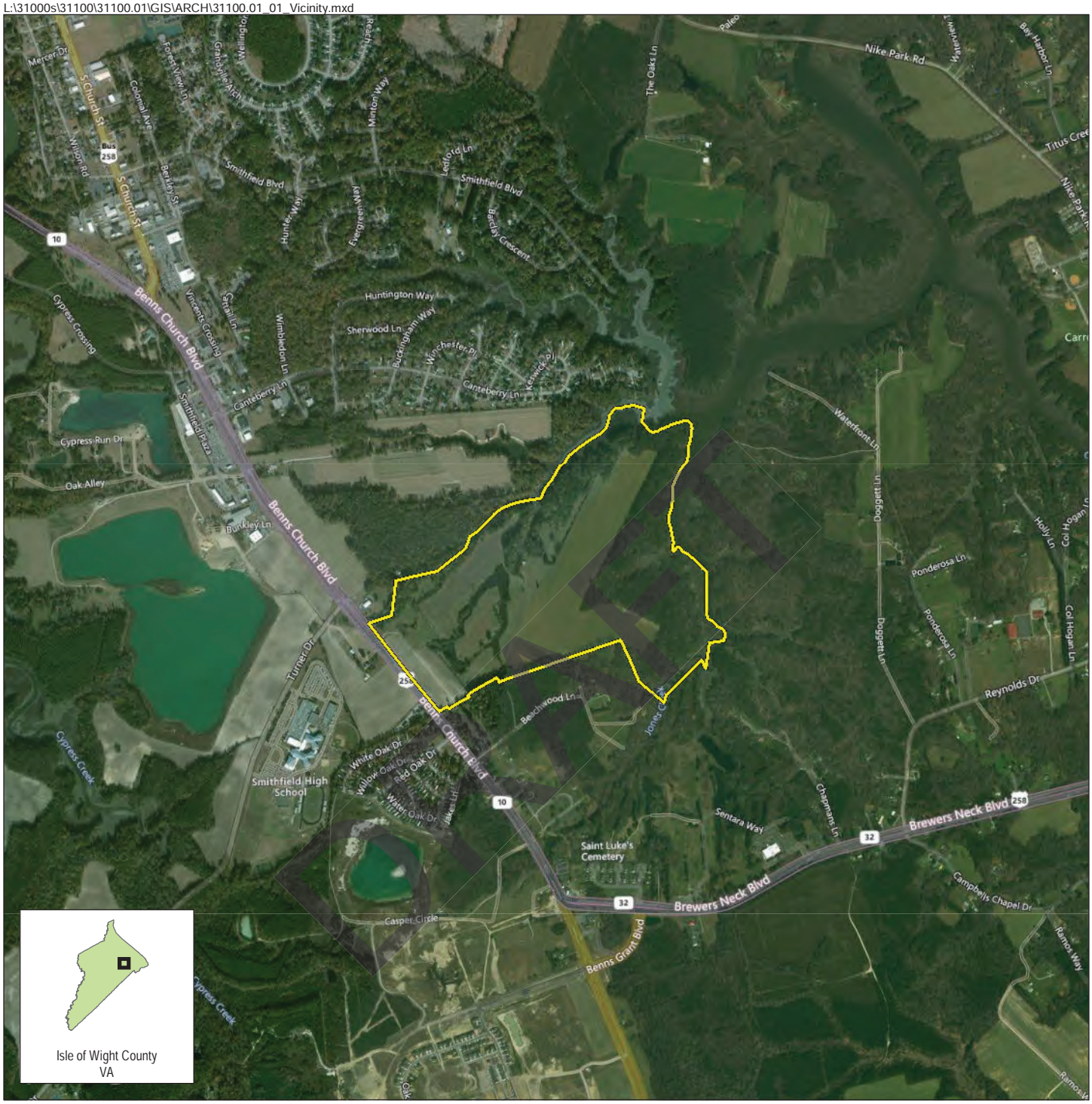
If impacts to Waters of the United States are planned in association with the development of the study area, the U.S. Army Corps of Engineers (USACE) may require that a Phase I cultural resources investigation be completed and reviewed by the DHR to comply with Section 106 of the National Historic Preservation Act (NHPA) of 1966 (as amended) in conjunction with obtaining a Clean Water Act Permit. In this scenario, the DHR would review and provide comments to assist the USACE in fulfilling its obligations under the NHPA but will typically defer to the federal agency regarding definition of APEs, eligibility determinations, and requirements for additional investigations.

Finally, as two previously recorded architectural resources are within an approximate one-mile radius of the project area are either eligible for listing, or already listed in the NRHP, an assessment of the direct adverse effects the development of the project area could have on the viewsheds on these resources (i.e., a Viewshed Study) could also be required if the project is subject to review by local, state, or federal agencies; however, if the project is not subject to review by any local, state, or federal agencies, then an assessment of adverse effects on the viewsheds of these resources would not need to be conducted. Isle of Wight County does not uniformly require cultural resources investigations as part of local land-use review. However, if development of the site requires rezoning or other local government review or approval, cultural resources investigations could be requested or potentially required as a condition of approval. Any cultural resources studies conducted for Section 106 review would almost certainly be adequate for local government review should such studies be requested by the county.

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Project Area: ± 249.5 acres

Vicinity Map
Sweetgrass
WSSI #31100.01

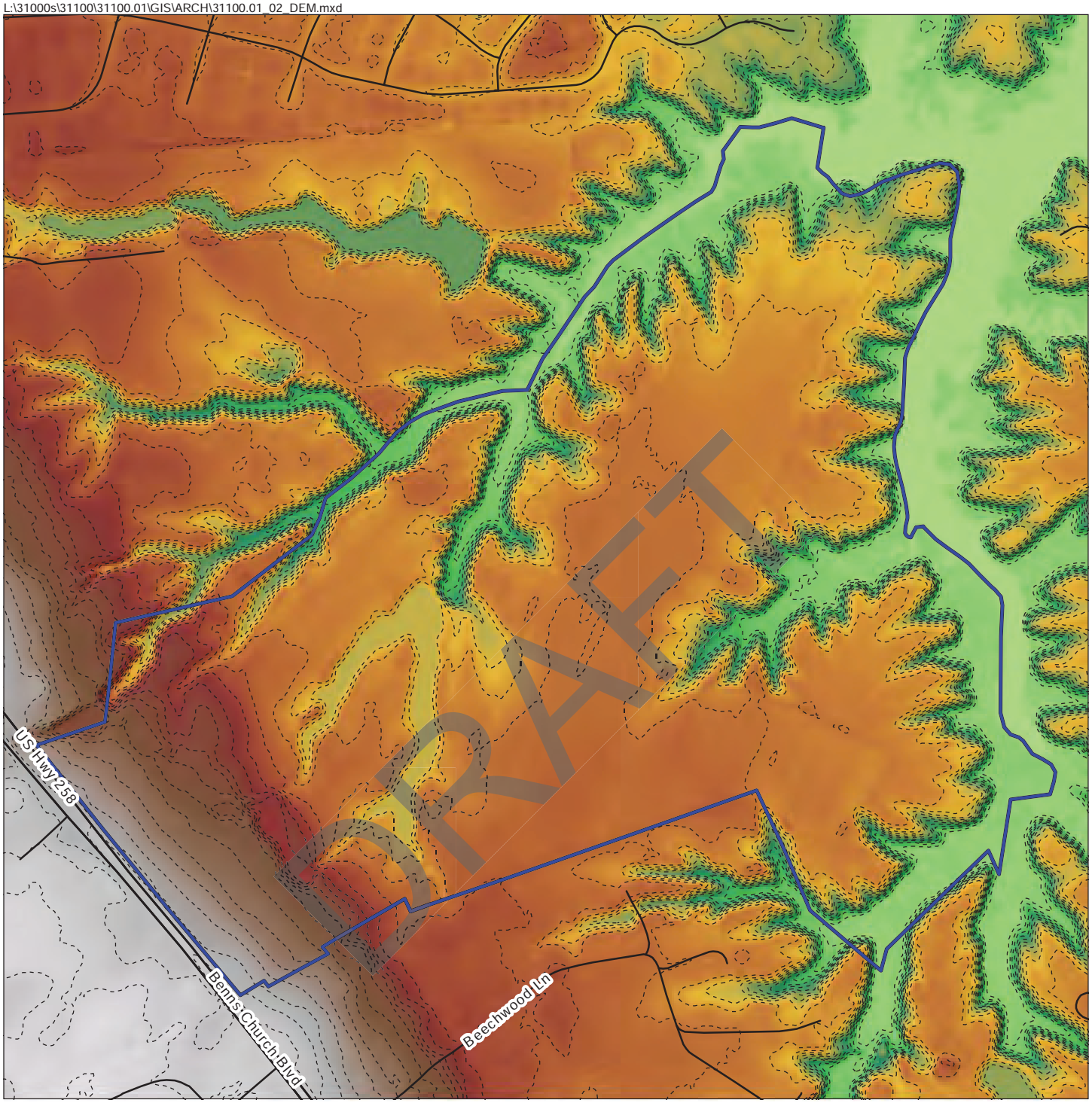
NORTH
0 2,000
Feet
Original Scale:
1 " = 2,000 '

Source: Bing Aerial Hybrid

Wetland Studies and Solutions, Inc.
a DAVEY company

Exhibit 1

L:\31000s\31100\31100.01\GIS\ARCH\31100.01_02_DEM.mxd



Project Area

2-ft Contours

Elevation (meters)

Value

High : 16.7476

Low : 1.17549e-38

Digital Elevation Model (DEM)
Sweetgrass
WSSI #31100.01

NORTH

0 700

Feet

Original Scale:
1 " = 700 '

Vertical Datum: NAVD88
Source: 2010; USGS

Wetland Studies and Solutions, Inc.
a DAVEY company

Exhibit 2

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Project Area

Spring 2021 Natural Color Imagery
Sweetgrass
WSSI #31100.01

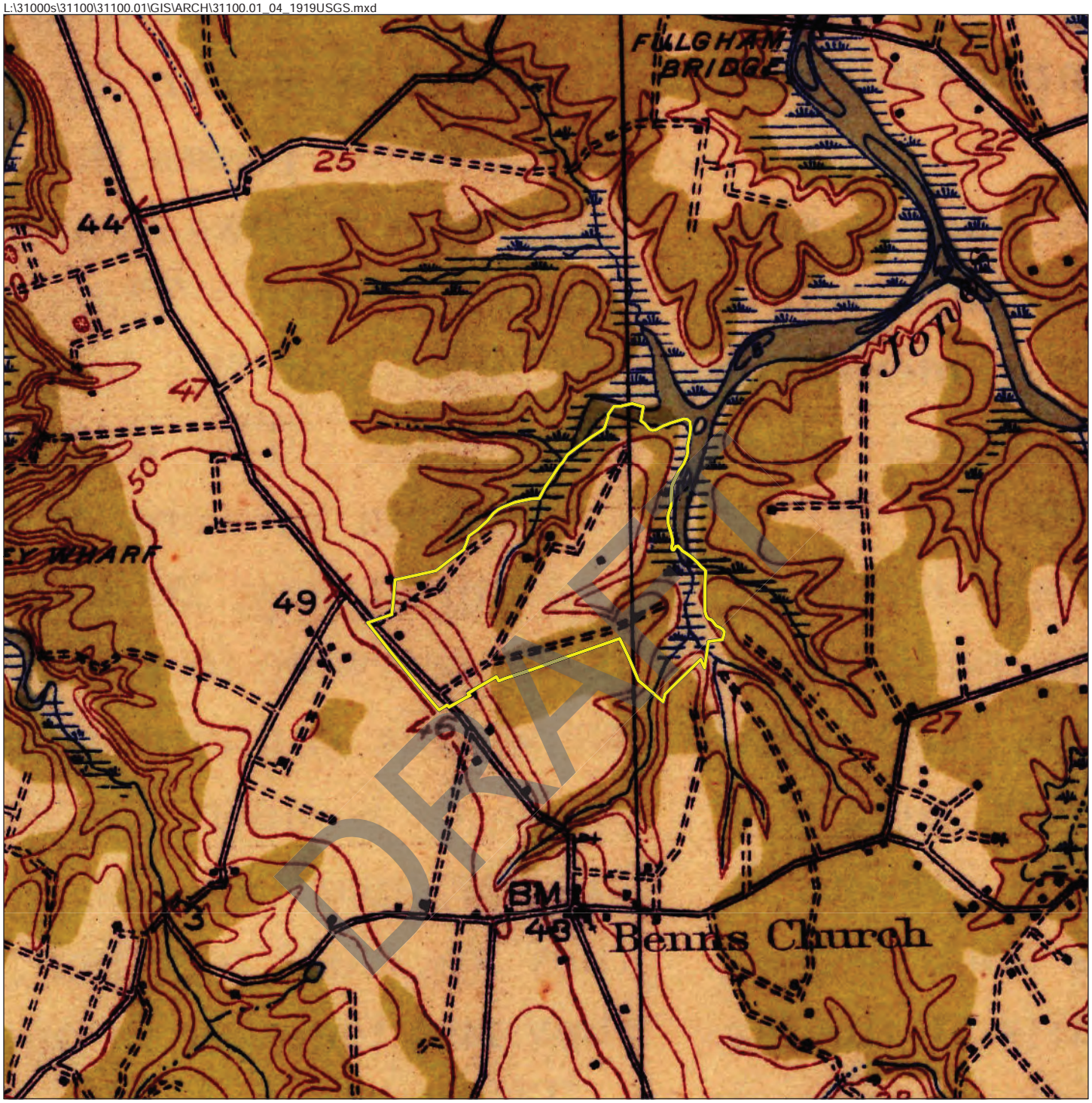
NORTH
0 700
Feet
Original Scale:
1 " = 700 '

Source: VBMP. 2021

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Exhibit 3

L:\31000s\31100\31100.01\GIS\ARCH\31100.01_04_1919USGS.mxd



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Project Area

1919 USGS Quad
Sweetgrass
WSSI #31100.01

NORTH
0 2,000
Feet
Original Scale:
1 " = 2,000 '

Benns Church, VA 1919
Latitude: 36°57'1"N
Longitude: 76°35'10"W
Hydrologic Unit Code (HUC): 020802060904
HUC12 Name: Jones Creek-Pagan River
COE Region: Atlantic and Gulf Coastal Plain

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Exhibit 4

Cultural Resource Forms

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Snapshot

Date Generated: June 02, 2022

Site Name: No Data
Site Classification: Terrestrial, open air
Year(s): 1200 B.C.E - 1606 C.E
Site Type(s): No Data
Other DHR ID: No Data
Temporary Designation: No Data

Site Evaluation Status
Not Evaluated

Locational Information

USGS Quad: BENNS CHURCH
County/Independent City: Isle of Wight (County)
Physiographic Province: No Data
Elevation: No Data
Aspect: No Data
Drainage: No Data
Slope: No Data
Acreage: No Data
Landform: Other
Ownership Status: No Data
Government Entity Name: No Data

Site Components

Component 1

Category: No Data
Site Type: No Data
Cultural Affiliation: Native American
Cultural Affiliation Details: No Data
DHR Time Period: Early Woodland, Late Woodland, Middle Woodland
Start Year: -1200
End Year: 1606
Comments: No Data

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Bibliographic Information

Bibliography:
No Data
Informant Data:
No Data

CRM Events

Event Type: Survey:Phase I/Reconnaissance

Project Staff/Notes:
No Data

Project Review File Number: No Data
Sponsoring Organization: No Data
Organization/Company: Unknown (DSS)
Investigator: MacCord, Howard A.
Survey Date: 6/21/1972
Survey Description:
No Data

Current Land Use	Date of Use	Comments
Other	*No Data*	Wide terrace adjoining spring branch. Large dug away for sand pit.

Threats to Resource: No Data
Site Conditions: Unknown Portion of Site Destroyed
Survey Strategies: Surface Testing
Specimens Collected: No
Specimens Observed, Not Collected: No
Artifacts Summary and Diagnostics:
Pottery and points (VSL #422).
Summary of Specimens Observed, Not Collected:
No Data
Current Curation Repository: No Data
Permanent Curation Repository: No Data
Field Notes: No
Field Notes Repository: No Data
Photographic Media: No Data
Survey Reports: No Data
Survey Report Information:
No Data
Survey Report Repository: No Data
DHR Library Reference Number: No Data
Significance Statement: No Data
Surveyor's Eligibility Recommendations: No Data
Surveyor's NR Criteria Recommendations, : No Data
Surveyor's NR Criteria Considerations: No Data

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Snapshot

Date Generated: June 02, 2022

Site Name: No Data
Site Classification: Terrestrial, open air
Year(s): 300 - 999 C.E
Site Type(s): Camp
Other DHR ID: No Data
Temporary Designation: 44CRI731-5

Site Evaluation Status

DHR Staff: Not Eligible

Locational Information

USGS Quad: BENNS CHURCH
County/Independent City: Isle of Wight (County)
Physiographic Province: Coastal Plain
Elevation: 40
Aspect: No Data
Drainage: James River
Slope: No Data
Acreage: 0.014
Landform: Knoll
Ownership Status: Private
Government Entity Name: No Data

Site Components

Component 1

Category: Domestic
Site Type: Camp
Cultural Affiliation: Native American
Cultural Affiliation Details: No Data
DHR Time Period: Middle Woodland
Start Year: 300
End Year: 999
Comments: No Data

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Bibliographic Information

Bibliography:

No Data

Informant Data:

No Data

CRM Events

Event Type: DHR Staff: Not Eligible

DHR ID: 44IW0242
Staff Name: Kirchen, Roger
Event Date: 10/20/2006
Staff Comment No Data

Event Type: Survey:Phase I/Reconnaissance

Project Staff/Notes:
No Data
Project Review File Number: 2006-0234
Sponsoring Organization: No Data
Organization/Company: Unknown (DSS)
Investigator: Cultural Resources, Invc., Ellen Brady
Survey Date: 9/1/2005
Survey Description:
Phase I- 50 foot interval shovel tests with radials dug at 25 feet intervals around positive shovel tests.

Current Land Use	Date of Use	Comments
Dwelling, single	9/1/2005 12:00:00 AM	*No Data*

Threats to Resource: No Data
Site Conditions: 50-74% of Site Destroyed
Survey Strategies: Subsurface Testing
Specimens Collected: Yes
Specimens Observed, Not Collected: No
Artifacts Summary and Diagnostics:
Mockley Ceramics, primary and secondary chert, quartz and quartzite flakes, quartzite FCR, and plastic
Summary of Specimens Observed, Not Collected:
No Data
Current Curation Repository: CRI-Fredericksburg
Permanent Curation Repository: No Data
Field Notes: Yes
Field Notes Repository: CRI-Fredericksburg
Photographic Media: No Data
Survey Reports: Yes
Survey Report Information:
A Phase I Cultural Resources Survey of Approximately 600 Acres at Benns Church Isle of Wight County, Virginia
Survey Report Repository: CRI-Fredericksburg
DHR Library Reference Number: No Data
Significance Statement: No Data
Surveyor's Eligibility Recommendations: No Data
Surveyor's NR Criteria Recommendations, : No Data
Surveyor's NR Criteria Considerations: No Data

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Snapshot

Date Generated: June 02, 2022

Site Name: St. Luke's Church and Grounds
Site Classification: Terrestrial, open air
Year(s): No Data
Site Type(s): Artifact scatter, Artifact scatter, Artifact scatter, Cemetery, Church, Lithic scatter
Other DHR ID: 046-0024
Temporary Designation: St. Luke's

Site Evaluation Status

Not Evaluated
This property is subject to an easement held by the Board of Historic Resources

Locational Information

USGS Quad: BENNS CHURCH
County/Independent City: Isle of Wight (County)
Physiographic Province: Coastal Plain
Elevation: 40
Aspect: Facing East
Drainage: James River
Slope: 2 - 6
Acreage: 18.500
Landform: Terrace
Ownership Status: Private
Government Entity Name: No Data

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Site Components

Component 1

Category: Funerary
Site Type: Cemetery
Cultural Affiliation: African American, Euro-American
Cultural Affiliation Details: No Data
DHR Time Period: Antebellum Period, Colony to Nation, Early National Period
Start Year: No Data
End Year: No Data
Comments: [2011 Smith]

August 2008: At least one section of the cemetery showed an individual who exhibited some African ancestry.

Component 2

Category: Indeterminate
Site Type: Artifact scatter
Cultural Affiliation: Native American
Cultural Affiliation Details: No Data
DHR Time Period: Middle Archaic Period
Start Year: No Data
End Year: No Data
Comments: August 2008: Native American finds were in disturbed contexts (grave shafts and pipe trenches). A Morrow Mountain projectile point was found.

Component 3

Category: Industry/Processing/Extraction
Site Type: Lithic scatter
Cultural Affiliation: Native American

Cultural Affiliation Details: No Data
DHR Time Period: Pre-Contact
Start Year: No Data
End Year: No Data
Comments: August 2008: Native American finds were in disturbed contexts (grave shafts and pipe trenches). Many undateable artifacts were found but they show that stone tools were being manufactured on site: chunks; initial edging, primary and secondary thinning flakes; a preform; scrapers; fire-cracked rocks.

Component 4

Category: Indeterminate
Site Type: Artifact scatter
Cultural Affiliation: Native American
Cultural Affiliation Details: No Data
DHR Time Period: Early Woodland
Start Year: No Data
End Year: No Data
Comments: August 2008: Native American finds were in disturbed contexts (grave shafts and pipe trenches). Dateable artifacts include Early Woodland pottery from the following periods: Marcey Creek (c. 1,000 B.C. to c. 750 B.C.), Accokeek (c. 900 B.C. to c. 300 B.C.), Popes Creek (c. 500 B.C. to A.D. 300)

Component 5

Category: Indeterminate
Site Type: Artifact scatter
Cultural Affiliation: Native American
Cultural Affiliation Details: No Data
DHR Time Period: Late Woodland
Start Year: No Data
End Year: No Data
Comments: August 2008: Native American finds were in disturbed contexts (grave shafts and pipe trenches). Townsend (A.D. 950 to Contact) pottery found.

Component 6

Category: Religion
Site Type: Church
Cultural Affiliation: Euro-American
Cultural Affiliation Details: No Data
DHR Time Period: Antebellum Period, Civil War, Colony to Nation, Contact Period, Early National Period, Reconstruction and Growth, The New Dominion, World War I to World War II
Start Year: No Data
End Year: No Data
Comments: [2011 Smith] St. Luke's Episcopal Church

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Bibliographic Information

Bibliography:

No Data

Informant Data:

Name: Unknown
Company 1: Historic St. Luke's Restoration, Inc.
Address 1: 14477 Benn's Church Blvd.
City: Smithfield
State: Virginia
ZIP: 23430
Phone 1: 757-357-3367
Owner Relationship: Owner of property

CRM Events

Event Type: Easement: DHR

DHR ID: 44IW0271
Staff Name: Smith, Anthony
Event Date: 3/15/2011
Staff Comment Archaeological work triggered by VDHR historic easement. Excavation of three test units in locations of soil bore tests revealed three intact archaeological features in two units. Excavation of two test units abutting the church foundations revealed disturbed fill (modern) to base of foundation in these locations.

Event Type: Archaeological Monitoring

Project Staff/Notes:

[Record enriched from CRM report "Archaeological Mitigation for a Drainage Trench at St. Luke's Church, Isle of Wight County, Virginia" on 19 June 2014]

Project Review File Number: No Data
Sponsoring Organization: No Data
Organization/Company: DHR Archives Reading Room
Investigator: Alain Outlaw
Survey Date: 7/1/2007
Survey Description:

In July 2007, archaeologists monitored the excavation of a 60' long x 5' wide trench for a new stormwater drainage system which extends from the northwest corner of St. Luke's Church to a nearby pond. The 2' deep trench revealed eleven features. Ten were unmarked graves, and one was a planting hole.

The bones, coffin remains , and personal effects were re-interred in mapped locations, in archaeologically excavated burial shafts and as near as possible to their original graves, but outside the trench corridor. Selected artifacts from the trench were retained for a study collection to be archivally stored and/or exhibited at St. Luke's Church.

Data on burial practices and human osteology were recorded. Unexpectedly, however, archaeological contexts also revealed important architectural information on the building, repair and restoration episodes of the church, as well as a glimpse at the prehistory of these environs.

Current Land Use	Date of Use	Comments
Cemetery	8/1/2008 12:00:00 AM	Church cemetery

Threats to Resource: Development, Other
Site Conditions: Unknown Portion of Site Destroyed
Survey Strategies: Observation, Subsurface Testing
Specimens Collected: Yes
Specimens Observed, Not Collected: Yes
Artifacts Summary and Diagnostics:

Selected artifacts retained for a study collection to be archivally stored and/or exhibited at St. Luke's Church.

Summary of Specimens Observed, Not Collected:

Human remains, coffin remains, and personal effects were reinterred.

Current Curation Repository: St. Luke's Church
Permanent Curation Repository: St. Luke's Church
Field Notes: No
Field Notes Repository: No Data
Photographic Media: No Data
Survey Reports: Yes
Survey Report Information:

CRM report IW-48
DHR File No. 2007-0936

Survey Report Repository: VDHR (Richmond)
DHR Library Reference Number: No Data
Significance Statement: Area immediately surrounding church building already listed on NRHP (1966), expansion of this to include all of church property seems prudent.

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Surveyor's Eligibility Recommendations: No Data
Surveyor's NR Criteria Recommendations, : No Data
Surveyor's NR Criteria Considerations: No Data

Event Type: Other

Project Staff/Notes:
No Data
Project Review File Number: No Data
Sponsoring Organization: No Data
Organization/Company: Unknown (DSS)
Investigator: No Data
Survey Date: No Data
Survey Description:

[2011 Smith] JRIA excavated 1' square test units at three potential soil test bore locations off three corners of St. Luke's Church. The test units off the northeast and northwest corners revealed the edges of apparently linear features oriented east-west and presumably are unmarked burials.

In addition, JRIA excavated a 1' x 4.75' trench against the south wall of the church and a 3.3' x 5' trench against the north wall of the church tower. The trenches were excavated to allow architects to examine the church foundations. The trench against the north church tower wall uncovered the west half of a cellar entrance to a basement under the church tower. Historical records indicate that the basement was added to the church in the late 19th century. The trench againt the south wall of the church discovered a 3'+ wide trench that paralleled the church foundation that was excavated during the 1950's restoration project that enabled brick to be extracted from the face of the below ground foundation and replaced with modern brick while the original salvaged brick was reused elsewhere in the church restoration.

The only artifact recovered during the JRIA testing were modern artifacts and there were not collected.

Current Land Use	Date of Use	Comments
Cemetery	3/15/2011 12:00:00 AM	Expansive active graveyard surrounding church building.
Church	3/15/2011 12:00:00 AM	Active place of worship.

Threats to Resource: Public Utility Expansion
Site Conditions: Intact Cultural Level, Subsurface Integrity, Unknown Portion of Site Destroyed
Survey Strategies: Informant, Subsurface Testing
Specimens Collected: No
Specimens Observed, Not Collected: No
Artifacts Summary and Diagnostics:
No Data
Summary of Specimens Observed, Not Collected:
No Data
Current Curation Repository: No Data
Permanent Curation Repository: No Data
Field Notes: Yes
Field Notes Repository: JRIA
Photographic Media: No Data
Survey Reports: Yes
Survey Report Information:

2012
Matthew Laird, Anthony Smith
Archaeological Testing Associated with a Drainage Installation Project at St. Luke's Church (046-0024/44IW0271), Isle of Wight County, Virginia
---
2011, Matthew Laird, Nicholas Luccketti, Anthony Smith
Archaeological Testing at St. Luke's Church, Isle of Wight County, Virginia

Survey Report Repository: JRIA, DHR
DHR Library Reference Number: IW-062, IW-063
Significance Statement: Area immediately surrounding church building already listed on NRHP (1966), expansion of this to include all of church property seems prudent.
Surveyor's Eligibility Recommendations: Legacy
Surveyor's NR Criteria Recommendations, : A, B, C
Surveyor's NR Criteria Considerations: Birth Place or Grave, Commemorative Property, Moved Property, Reconstructed Property, Significance of less than Fifty Years

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Property Information

Property Names

Name Explanation	Name
Historic	Newport Parish Church
Historic	Old Brick Church
NRHP Listing	Saint Luke's Church
Current	Saint Luke's Smithfield

Property Addresses

Current - 14477 Benn's Church Boulevard Route 10

County/Independent City(s): Isle Of Wight (County)
Incorporated Town(s): *No Data*
Zip Code(s): 23314, 23430
Magisterial District(s): *No Data*
Tax Parcel(s): *No Data*
USGS Quad(s): BENNS CHURCH

Property Evaluation Status

VLR Listing
NRHP Listing
NHL Listing
This property is subject to an easement held by the Board of Historic Resources

Additional Property Information

Architecture Setting: Village
Acreage: 5
Site Description:

1974 Nomination:
The Newport Parish Church is located in the township of Benn's Church, Virginia, not far from Smithfield in Isle of Wight County, and in fact, is often referred to simply as "Saint Luke's Smithfield". Surrounded by a graveyard and a golf course, only part of the former is owned by the Historic Saint Luke's Foundation, and none of the latter. A rather complicated boundary winds through the churchyard, dividing land owned by the church and land owned by the Benn's Church Cemetery, confusingly called Saint Luke's Cemetery.

Land immediately east of the church boundary is used as a golf course and the Foundation has recently purchased 2 acres of land directly behind the church and planted there a stand of pine trees which now contributes significantly to the visual integrity of the site. To the north of the church are a pair of small ponds, and a stream running east-west, a tributary of Jones Creek. A visitors-center building sits to the south and west of Saint Luke's at a distance of perhaps 75 yards. The land between the two is a tree-covered slope falling off towards the church, divided by a dirt road running north-south. Further south is private land used as pasture.

The boundary will include the visitors-center, which is not part of the Landmark of course, but no other buildings than Saint Luke's. Although this will be a site of only about 5 acres, it is laid out in such a way as to present a serene and somewhat bucolic setting for a church whose associations, after all should hearken us back to an era of quiet, rustic charm. From the church, the slope of the hill towards the west and south safeguards our view. To the north, we see the ponds in the near distance, and to the east, a stand of pine trees planted as a screen by the Foundation. All of these features contribute significantly to the integrity of Saint Luke's surroundings.

The grounds are well-maintained near the church by the Foundation, even though a number of the grave lots are in private hands and would otherwise be overgrown.

2010: The church building sits on a level lot covered by grassy lawn as well as mature trees, planting beds, and shrubs. A historic cemetery with a variety of gravestones, tablets, and markers surrounds the church. Although Historic St. Luke’s Restoration, Inc. owns additional acreage in the vicinity, the easement boundaries encompass 1.0 acre and include the historic church and surrounding cemetery. A visitor center with gift shop is situated to the southwest of the church, but outside of the easement property boundaries. Access to the property is made via a brick walkway that leads from the visitor center and parking area to the west elevation of the church building. Three light poles line the brick walkway within the easement boundaries. A formal brick entry area with brick steps, pavers, and metal handrails is located at the west tower entrance. Several garden beds are also located in this area.

Surveyor Assessment:

1936: St. Luke's, or as it was called prior to the Revolution: "The Old Brick Church", was built under the care of Joseph Bridger (died 1686) sometime between 1632 and 1682, in what was then Warrescoyack Parish, later divided in 1642 into Newport and Warrescoyack.

The church is remarkable as the only remaining example of a buttressed Gothic Church of the seventeenth century in America.

The church remained in constant use until about the first quarter of the 18th century when it fell Into disrepair. In 1887 the roof fell in carrying down part of the walls. The building remained in a state of disuse until a restoration was begun in 1890 under the direction of the Rev. David Barr, then rector of the Church. The work was completed about 1897. The present stained glass was set in at this time.

1974 nomination: The Newport Parish Church, more familiarly known as Saint Luke's, is the oldest remaining church of English foundation in the United States. Although there is still some question about the date of the building, research indicates 1632 to be the most likely date of its construction. Its interior appointments are in a later, more Jacobean spirit, now restored, but the fabric of the church places it firmly in the late-medieval English small parish church style. While Saint Luke's is not stylistically coherent, it instead provides examples of various periods of English Gothic architecture. Its entrance for instance, with heavy round arch, is practically

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Romanesque; its brick-traceried lancet window in the east wall suggests high English Gothic, while the crow-stepped gables at either end are suggestive of the Late-Gothic period. In the third storey of the tower, added several decades after the first two, we have a suggestion of the classical style of the English architecture of the late seventeenth century. Saint Luke's belongs as much to the history of Western Architecture as it does to that of early colonial America.

The dating of Saint Luke's has been a challenging task for researchers for some time. Best evidence however places the date at about 1632, with the interior completed only over the course of the next three decades. Colonel Joseph Bridger, who was definitely in the vicinity by 1657, commissioned the Driver brothers to complete the interior after that. The third storey was added to the tower at the west end of Saint Luke's in the late seventeenth century.

With the disestablishment of the Anglican Church in Virginia during the 1780's, Newport Parish Church sank into a decline from which it recovered only in the twentieth century. Its use became intermittent only, over those years.

In 1828, a young deacon renamed the "Old Brick" Saint Luke's, but as Morrison points out, the new name was never validated by consecration or action of the vestry and the most appropriate name remains The Newport Parish Church. The building was again closed four years later.

By the late nineteenth century, the Old Brick had been long-neglected, and during a violent storm in the 1880ts, the roof collapsed and bricks were dislodged from the walls. Several bricks were supposedly found then with the date 1632 incised, settling once and for all the date of the first construction. It didn't.

The roof was rebuilt, but Saint Luke's was neglected again and by 1950 ominous bulges had appeared in the basement walls and the building seemed to be in danger of collapse. A dramatic nationwide appeal was mounted, and sufficient funds were raised to research and restore Saint Luke's to a respectable condition. Headed by James Grote Vanderpool, then Avery Architectural Librarian at Columbia University, an intensive and extended (1953-1957) historical and archeological program was developed to reconstruct much of the interior which had been altered during Georgian and Victorian periods, as well as to stabilize and restore the exterior. The March 1958 issue of the Journal of the Society of Architectural Historians contains an account of the particulars of the work done.

The church and a small amount of land around it is still owned and administered by The Historic Saint Luke's Foundation, which maintains it in excellent condition. The third storey of the tower has recently been filled with de-humidification equipment for the church.

2010 dendrochronology report summary:
Given that the door head and the door lintel have dated to shortly after 1677, and these timbers have been built into the primary brick structure, these dates clearly demonstrate that the church could not have been constructed before this date. Furthermore, there are two additional pieces of supporting evidence which the tree-ring dates support. The first is a date brick of which a poor photograph was published in The American Magazine, Vol. VII, in February 1888. The date is on the side of the brick and was probably scratched in the wet clay by the brickmakers, but not positioned as a publicly visible date. The date had been traditionally interpreted as reading 1632, but a more careful study of the image shows it to be more likely 1682. The brick was removed during a restoration at this time, and was kept in the church, but is now lost.

The other piece of evidence are a number of lead window cames excavated from adjacent to the church in the 1950s restoration. These were unrolled and were found to have a date stamp of 1685, which is consistent with the architectural detailing of the brickwork.

These independent dates are entirely consistent with the dendrochronological dates, when one takes into account between 5 and 10 rings of sapwood missing to the bark edge.

The two dated balusters had no sapwood surviving, and had much earlier last measured ring dates. This does not mean that they are in fact earlier than the rest of the church, but just means that they originated further within the tree when cut out for turning blanks.

The first baluster was taken from the church in May 1845 by a New England visitor and given to the Connecticut Historical Society. The antiquarian John W Barber put a label on it which says: “The banister from the chancel of an ancient church near Smithfield Isle of Wight Co., Virginia, made in England in 1631…” The dendrochronology has here shown that the tree from which the baluster was cut was still growing in at least 1634, and most probably 50 years beyond, and dendro-provenancing has shown that the timber matches with Virginian chronologies, not with English material. The baluster is now in the Museum of Southern Decorative Arts in Winston-Salem.

The second baluster (stc4) is shorter than the first one and was originally a stair baluster. It has been reused upside down in the present communion rail. This had a last measured ring date of 1619, but again it had no sapwood, and clearly about 50 heartwood rings were also lost when converted and turned. There is no reason to think that either balusters could not date to the early 1680s.

All this fits stylistically very well with two other local Virginian churches which date to the 1680s, including the first Bruton Parish Church and the church at Jamestown.

2010 DHR BDR:
Located in Smithfield, Isle of Wight County, Historic St. Luke’s Church has been maintained and operated as a museum/non-profit organization by Historic St. Luke’s Restoration, Inc. since 1953. Historic St. Luke’s Restoration, Inc received a 2005 Save America’s Treasures grant for rehabilitation of the building and donation of an easement is a condition of the grant agreement. Planned rehabilitation work includes repointing and replacement of damaged bricks, repair of interior and exterior woodwork, roof repair, lichen removal, plaster repair, and updates to electrical and security systems.

Designated a National Historic Landmark by the Secretary of the Interior in 1960, St. Luke’s Church stills retains its integrity and form. The property was also individually listed on the Virginia Landmarks Register (1969) and the National Register of Historic Places (1966) for its architectural significance. The architectural evolution of St. Luke’s Church is a distinct and rare example of 17th Century Gothic style architecture in the United States. It is also representative of the religious and political foundations of early America. The property is regularly open to the public for lectures, weddings, tours, and other similar events.

Surveyor Recommendation: *No Data*

Ownership

Ownership Category	Ownership Entity

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Private	*No Data*

Primary Resource Information

Resource Category: Religion
Resource Type: Church/Chapel
NR Resource Type: Building
Historic District Status: *No Data*
Date of Construction: Ca 1682
Date Source: Dendrochronology
Historic Time Period: Contact Period (1607 - 1750)
Historic Context(s): Architecture/Community Planning, Religion
Other ID Number: *No Data*
Architectural Style: Colonial
Form: *No Data*
Number of Stories: 1.0
Condition: Excellent
Interior Plan: Nave
Threats to Resource: None
Cultural Affiliations: *No Data*
Cultural Affiliation Details:

No Data

Architectural Description:

Architecture Summary, 1974 nomination: The Newport Parish Church, or Saint Luke's as it is more familiarly but unofficially known, is the most convincingly Gothic church in America. Erected possibly as early as 1632, this is a small church of the English late-medieval period, with considerable Gothic detailing.

Basically, Saint Luke's is a simple nave plan (29'4 and 3/4" X 65'& 3/4") with a twenty foot square tower at the west end. Its two-foot-thick walls are laid in a rough Flemish bond, including crude tracery in brick, forming pointed lancet windows. The large lancet east wall is a striking exercise in brick tracery. Deep wall buttresses project prominently from three bays of the north and south walls. They have sloping set-offs.

At both the east and west end of the church are crow-stepped gables, while unadorned turrets, corbelled slightly at their bases, decorate the corners of the building.

The tower at the west end of Saint Luke's is one of its most interesting features, with a suggestion on first sight that there may be a suggestion of classical awareness in late 17th century America. The triangular feature over the doorway is a particularly intriguing one which one might think to be a crude example of the forever-used renaissance pediment. However, not only does its heaviness argue against the spirit of the renaissance, but the use of this feature may easily be traced to similar usage in English high-style architecture of the very late sixteenth century.

The shape and depth of the round arch below that triangle, also argues against anything but a traditional outlook by the builders. It is heavy and very three-dimensional (an effect created by cleverly turning the outside wall towards the inside of the arch with moulded bricks) giving the effect more of a Romanesque archivolt than anything classical.

The Newport Parish Church was doubtless planned with a tower but with one of only two storeys, which almost certainly terminated in Gothic crenellation. The quoining of those two storeys, which again could be interpreted as a classical reference, in fact is a feature to be found mixed together with medieval elements in English Architecture as early as the mid-sixteenth century.

Despite these few rebuttals to the arguments of a classical mixture in the tower of Saint Luke's however, it is certainly in fact that. In the third storey of that tower, added in the late seventeenth century, we have something that William Pierson calls ".....precocious.....forming a prophetic prelude of things to come . . . ." A remarkable visual change from the earlier
heavy quoining to much more delicate pilaster strips marks a new awareness of architectural trends acquired by men of increasing cultural pre-occupation. Based upon extensive research compiled by The Historic Saint Luke's Foundation in the 1950's, it seems safe to say that the building program there may be divided into work done before 1657, and work done after that. When compared with the nearby work of the 1660's at Bacon's Castle, which also shows a sense of social ambitiousness, we can see the same cultural self-consciousness in the post-1657 work at Newport Parish Church. The classical pilasters are a limited but definite piece of evidence of that striving.

The interior appointments of Saint Luke's were not added until a number of years after completion of the fabric of the building, and after 1657 Colonel Joseph Bridger commissioned Charles and Thomas Driver to complete the work and add the third storey to the tower. The roof has been rebuilt a number of times and doubtless originally had a steeper, more Gothic, pitch. The tie-beam timber-truss, closed above the collar beam, has also been rebuilt but is based upon the original scheme as verified by research.

Originally, a gallery existed at the west end of the nave, supported by a massive hewn oak beam, and this has been rebuilt, as has been the rood screen in the chancel and the square brick tiles in the floor of the church. The original stained-glass windows were replaced in the nineteenth century and those Victorian windows remain in place today.

While there has been an extensive refitting of the interior, the work has been based upon meticulous research over a period of years and must be considered as 'correct' as humanly possible. This conjectural restoration has not affected the external appearance of the church except for some

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change to the pitch of the roof.

2010 Dendrochronology report: Only two oak timbers remained within the structure at St Luke's Church: the moulded door frame head and lintel above the west door. Although neither of the timbers retained bark edge, both had some sapwood, suggesting that very few rings were lost in the conversion. As such, the dates were entirely consistent with the brick inscribed '1682' (now lost). It is also consistent with the 1685 date found inscribed in lead cames found on the site. Two ex situ balusters, one in the collection of MESDA at Winston-Salem, and the other reused in the present communion rail, were photographed and the sequences dated. Although neither retained any sapwood, the last measured ring dates of 1619 and 1633 were entirely consistent with the presumed early 1680s construction date.

2010 DHR BDR:
Situated in the community of Benn's Church near Smithfield, St. Luke's is a parish church of the late-medieval period with significant gothic detailing. Among its Gothic features are buttresses, quoins, stepped gables, brick-traceried windows, and the medieval tie-beam timber interior roof structure. The church has a simple nave plan with a twenty-foot square three-tiered tower at the west end. Its two-foot thick walls are laid in Flemish and English bond, with brick tracery forming pointed lancet windows. It is thought that a number of years lapsed between construction of the church and completion of its interior architecture. The original temporary forms were replaced with more permanent Jacobean fittings by Colonel Bridger some time in the late 17th Century. Some of these Jacobean interior finishes included Tuscan columns formed from the trunk of a tree and turned balusters of the rood screen and kneeling rail. The design and joinery of the interior architecture is precise and represents highly skilled craftsmanship. Original amber and clear glass windows were replaced in the late 1800's with nineteenth century stained glass. This glass remains today. The building was thoroughly restored in the 1950s, which incorporated replacement of a number of interior features and woodwork.

See BDR for component descriptions.

August 2010

May 2015

Exterior Components

Component	Component Type	Material	Material Treatment
Roof	Gable, Front	Slate	Shingle
Foundation	Solid/Continuous	Brick	Other
Structural System and Exterior Treatment	Masonry	Brick	Bond, Flemish
Windows	Other	Wood	Paired
Windows	Fixed	Stone	Other
Structural System and Exterior Treatment	Other	Brick	Other

Secondary Resource Information

Secondary Resource #1

Resource Category: Funerary
Resource Type: Cemetery
Date of Construction: 1680Ca
Date Source: Date Stone/Cornerstone
Historic Time Period: Contact Period (1607 - 1750)
Historic Context(s): Funerary, Religion
Architectural Style: *No Data*
Form: *No Data*
Condition: Good
Threats to Resource: None
Cultural Affiliations: *No Data*
Cultural Affiliation Details:

No Data

Architectural Description:

Architecture Summary, 1974: In yard surrounding church.

August 2010

May 2015

Current Use: Church/Religious
Historic Religious Affilitation: Other
Ethnic Affiliation: English
Has Marked Graves: True

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Has Unmarked Graves: False
Enclosure Type: None
Number Of Gravestones: 26 - 50
Earliest Marked Death Year: *No Data*
Latest Marked Death Year: *No Data*

Significant Burials

Marked Type	First Name	Last Name	Birth Year	Death Year
Other	Jospeh	Bridger	*No Data*	1686

Historic District Information

Historic District Name: *No Data*
Local Historic District Name: *No Data*
Historic District Significance: *No Data*

CRM Events

Event Type: DHR Staff Site Visit

Project Review File Number: *No Data*
Investigator: Michael J. Pulice
Organization/Company: DHR
Photographic Media: Digital
Survey Date: 11/1/2019
Dhr Library Report Number: *No Data*
Project Staff/Notes:

Exterior photographs taken during brief site visits by DHR's Western Region Preservation Office architectural historian Mike Pulice.
10/30/2019 to Virginia Beach properties
11/1/2019 to St. Luke's Church

Event Type: DHR Staff Site Visit

Project Review File Number: *No Data*
Investigator: Megan Melinat
Organization/Company: DHR
Photographic Media: Digital
Survey Date: 5/28/2015
Dhr Library Report Number: *No Data*
Project Staff/Notes:

Easement staff stewardship visit; complete report available in the easement property file.

Event Type: Easement: DHR

DHR ID: 046-0024
Staff Name: Wendy Musumeci
Event Date: 9/16/2010
Staff Comment

Historic St. Luke's Restoration, Inc. has conveyed an easement over a 1.0-acre portion of the Historic St. Luke's Church property in Isle of Wight County (DHR Easement File No. 046-0024). The easement, recorded on September 16, 2010, was conveyed as a condition of a Save America's Treasures grant.

Located in Smithfield, Isle of Wight County, Historic St. Luke's Church has been maintained and operated as a museum/non-profit organization by Historic St. Luke's Restoration, Inc. since 1953. The building sits on a level lot covered by grassy lawn as well as mature trees, planting beds, and shrubs. A historic cemetery with a variety of gravestones, tablets, and markers surrounds the church. Although the exact date of construction in unknown, Historic Saint Luke's Church, also known as the Newport Parish Church and the Old Brick Church, is one the oldest remaining churches of English foundation in the United States. Situated in the community of Benn's Church near Smithfield, St. Luke's is a parish church of the late-medieval period with significant gothic detailing. Among its Gothic features are buttresses, quoins, stepped gables,

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brick-traceried windows, and the medieval tie-beam timber interior roof structure. The church has a simple nave plan with a twenty-foot square three-tiered tower at the west end. Its two-foot thick walls are laid in Flemish and English bond, with brick tracery forming pointed lancet windows. It is thought that a number of years lapsed between construction of the church and completion of its interior architecture. The original temporary forms were replaced with more permanent Jacobean fittings by Colonel Bridger some time in the late 17th Century. Some of these Jacobean interior finishes included Tuscan columns formed from the trunk of a tree and turned balusters of the rood screen and kneeling rail. The design and joinery of the interior architecture was precise and represented highly skilled craftsmanship. Original amber and clear glass windows were replaced in the late 1800's with nineteenth century stained glass. This glass remains today.

The building was thoroughly restored in the 1950s, which incorporated replacement of a number of interior features and woodwork elements. Designated a National Historic Landmark by the Secretary of the Interior in 1960, St. Luke's Church stills retains its integrity and form. The property was also individually listed on the Virginia Landmarks Register (1969) and the National Register of Historic Places (1966) for its architectural significance. The architectural evolution of St. Luke's Church is a distinct and rare example of 17th Century Gothic style architecture in the United States. It is also representative of the religious and political foundations of early America. The property is regularly open to the public for lectures, weddings, tours, and other similar events.

Event Type: DHR Staff Site Visit

Project Review File Number: *No Data*
Investigator: Wendy Musumeci
Organization/Company: DHR
Photographic Media: Digital
Survey Date: 8/18/2010
Dhr Library Report Number: *No Data*
Project Staff/Notes:
DHR Easement Staff site visit - Baseline Documentation Report

Event Type: NRHP Nomination

DHR ID: 046-0024
Staff Name: James Dillon
Event Date: 10/23/1974
Staff Comment
No Data

Event Type: VLR Listing

DHR ID: 046-0024
Staff Name: VHLC
Event Date: 9/9/1969
Staff Comment
No Data

Event Type: Survey:Phase I/Reconnaissance

Project Review File Number: *No Data*
Investigator: Andrew D. Logan
Organization/Company: VA Dept. of Historic Resources
Photographic Media: Film
Survey Date: 7/27/1967
Dhr Library Report Number: *No Data*
Project Staff/Notes:
Update of HABSI survey

Event Type: NRHP Listing

DHR ID: 046-0024
Staff Name: NPS
Event Date: 10/15/1966
Staff Comment
No Data

Event Type: NHL Listing

DHR ID: 046-0024

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Staff Name: NPS
Event Date: 10/9/1960
Staff Comment
No Data

Event Type: Survey:HABS Inventory

Project Review File Number: *No Data*
Investigator: Robert Wiggins
Organization/Company: National Park Service
Photographic Media: Other
Survey Date: 10/1/1958
Dhr Library Report Number: *No Data*
Project Staff/Notes:
No Data

Event Type: HABS/HALS/HAER Documentation

Project Review File Number: *No Data*
Investigator: Finlay F. Ferguson, Jr.
Organization/Company: National Park Service
Photographic Media: Film
Survey Date: 4/26/1934
Dhr Library Report Number: *No Data*
Project Staff/Notes:
HABS No 11-20

Bibliographic Information

Bibliography:

Name: James River Instit for Archaeology
DHR CRM Report Number: IW-063
Record Type: Report
Bibliographic Notes: Archaeological Testing Associated with Drainage Installation Project at St. Luke's Church, Isle of Wight, VA. February 2012. DHR File No. 2007-0278

Record Type: Report
Bibliographic Notes: Oxford Dendrochronology Laboratory Report 2010/28

The Tree-Ring Dating of Timbers from Newport Parish Church (St Luke's or Old Brick Church), Smithfield, Isle of Wight County, Virginia. Dr. D.W.H. Miles, FSA, and M.J. Worthington

Property Notes:
No Data

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Virginia Dept. of Historic Resources

V-CRIS

Virginia Cultural Resource Information System

Legend

- Architecture Resources
- Architecture Labels
- Individual Historic District Properties
- Archaeological Resources
- Archaeology Labels
- DHR Easements
- USGS GIS Place names
- County Boundaries



N

Feet

0 200 400 600 800

1:9,028 / 1"=752 Feet

Title: Architecture Labels **Date: 6/2/2022**

DISCLAIMER:Records of the Virginia Department of Historic Resources (DHR) have been gathered over many years from a variety of sources and the representation depicted is a cumulative view of field observations over time and may not reflect current ground conditions.The map is for general information purposes and is not intended for engineering, legal or other site-specific uses. Map may contain errors and is provided "as-is". More information is available in the DHR Archives located at DHR's Richmond office.

Notice if AE sites:Locations of archaeological sites may be sensitive the National Historic Preservation Act (NHPA), and the Archaeological Resources Protection Act (ARPA) and Code of Virginia §2.2-3705.7 (10). Release of precise locations may threaten archaeological sites and historic resources.

Property Information

Property Names

Name Explanation	Name
Function/Location	House, 15150 Benns Church Boulevard (Route 10)
Historic	Jordan Home #1
Historic	Margaret Davis House
Historic/Current	Charles Driver Jordan House

Property Evaluation Status

The Primary Resource is no longer extant.

Property Addresses

Current - 15150 Benns Church Boulevard Route 10

County/Independent City(s): Isle Of Wight (County)
Incorporated Town(s): *No Data*
Zip Code(s): 23430
Magisterial District(s): *No Data*
Tax Parcel(s): 32-01-082
USGS Quad(s): BENNS CHURCH

Additional Property Information

Architecture Setting: Rural
Acreage: 103
Site Description:

1937 survey: This property is located 1/2 mile south of Benns Church, 150 yards west of Route 10.

2005 Intensive Survey:
This resource is located on a 103-acre site situated on the west side of Benns Church Boulevard (Route 10/32) south of the village of Benns Church. The area is characterized by farmsteads dating to the 19th century and small mid-20th century dwellings. The site is open with a treestand to the immediate south of the dwelling. A driveway extends west from Benns Church Boulevard toward the dwelling. The driveway is situated to the dwelling's north and bisects the dwelling and shed. It continues to the west beyond the house site. There is a one-and-one-half story shed located to the northwest of the dwelling.

Property Event Type:

Destroyed

Surveyor Assessment:

Start Year: 1857
End Year: 1859
Date Source: Site Visit/Written Data
Type: Original Construction
Notes: This dwelling was erected between 1857 and 1859.

1937 survey:
This tract of land consisted of about 500 acres and was inherited by Margaret Davis from her father. In 1840 she married Charles Driver Jordan. This land was all in virgin timber and they planned to clear up a place and build a nice home. A place was cleared up and two kitchens were built for the workmen and slaves. During this time Charles Jordan and his wife lived with his father near Smithfield. After four years Mrs. Charles Jordan died, leaving one daughter. Mr. Jordan lived in one of the kitchens as a widower, for sixteen years. In 1857 he started a nice home, to be built out of the best materials to be had, in a grove of oak and hickory trees.

In 1858 Charles Jordan married Sophie Ann Cate, a school teacher from New Hampshire, who came to this county as a governess. After the Ware Between the States, Mrs. Jordan had a private school in her yard in one of the old kitchens, this being the first private school in the neighrborhood. After public schools were established she taught one of the first public schools in this section. She first taught in her own yard and received a salary of $30.00 per month; later the county built her a two-room school near Benns Church. Mrs. Jordan was considered a fine teacher and boys and girls from four or five miles came to her school. She also gave lessons on the piano.

From time to time some of this land has been sold, and there is now about 180 acres of land in the present tract, which belongs to the estate of C. S. Jordan. C. S. Jordan was the son of C. D. Jordan. They also had two other children, a boy and a girl. The girl, Mrs. E. A. Morrison, in Suffolk, is the only survivor.

2005 Intensive Survey:
This dwelling is a typical center-passage, single-pile I-house will ell. The I-house has a center-passage plan that gains access to the dwelling through a central hallway flanked by rooms. This building type dates to the period between the eighteenth century and the early twentieth century. The central hallway contains the stair to the upper story or stories and for those dwellings with a basement a stair to this area would be situated under the main stair to the upper story or stories. The plan of the dwelling is one-room deep with most often a parlor and dining room flanking the hall. The upper story or stories comprise a similar configuration with bedrooms above the rooms below. In some cases the area above the main entry has been enclosed containing a small room that served as a small bedroom or was converted in the twentieth-century to an indoor lavatory. The facades of these buildings are symmetrical and are

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usually three- to five-bay, and the building is topped most often by a side gable or hipped roof. Chimneys are situated on the center of the side elevations and fireplaces would be found within each room flanking the hall. Chimneys could be interior or exterior on the side elevations and rise above the common roof. The construction materials used for these buildings range from wood frame, brick, or locally mined stone. Most often they are simple vernacular buildings constructed of wood with wood framing and clad in weatherboard siding. Articulation is minimal and most often comprises a simple boxed cornice on the façade and rear elevation, and cornice returns and a raking cornice on the gable ends. Often found on these dwelling is an ell erected to the rear of the I-house plan containing a service wing for additional space including an indoor kitchen. Most often the ell is wood frame construction topped with a perpendicular gable roof with a gable end chimney or hipped roof with a chimney at the end.

This dwelling was erected by Charles Driver Jordan who had inherited the lands from his wife, Margaret Davis Jordan after her death in 1844. Margaret Davis Jordan had inherited the land from her family in 1836. In 1840 Margaret Davis married Charles Driver Jordan and the couple lived in Smithfield with his father. The lands were comprised of 500 acres and were virgin timber forest. Noted were the erection of two kitchens built for slaves and workman on the lands prior to the construction of the dwelling. Charles Driver Jordan is noted as living in one kitchen after the death of his wife for sixteen years. He began erection of the dwelling in 1857 and used the best material he could obtain on the site of a grove of oak and hickory trees. The plan of the dwelling is similar to other houses owned by the Jordan family in the vicinity of this dwelling. A similar, if not identical dwelling, was situated to the south of this dwelling occupied by another Charles Jordan. In 1858 Charles Driver Jordan married Sophia Ann Cates, a schoolteacher from New Hampshire who had come to Isle of Wight County as a governess. The dwelling was completed in 1859, which included the ell appended to the west. Additional family history notes that Mrs. Sophia Ann Cates Jordan taught private school in one of the kitchens on the house site and after public schools were created in Isle of Wight County, operated a public school in one of the kitchens until a school was built nearby.

The kitchens have since been demolished and the only outbuilding associated with the dwelling is a shed to the northwest. The Jordan, Charles Driver House is eligible for listing in the National Register of Historic Places under Criterion C for its architectural style from the period 1857-1859.

August 2018: This house was torn down in July 2018.

Surveyor Recommendation: Recommended Eligible

Ownership

Ownership Category	Ownership Entity
Private	*No Data*

Associate

Property Associate Name	Property Associate Role
Jordan, Charles Driver	Owner

Primary Resource Information

Resource Category: Domestic
Resource Type: Single Dwelling
NR Resource Type: Building
Historic District Status: *No Data*
Date of Construction: Ca 1857
Date Source: Written Data
Historic Time Period: Antebellum Period (1830 - 1860)
Historic Context(s): Architecture/Landscape, Domestic
Other ID Number: *No Data*
Architectural Style: No Discernable Style
Form: L-Plan
Number of Stories: 2.0
Condition: Demolished
Interior Plan: Central Passage, Single Pile
Threats to Resource: Demolition, Development
Cultural Affiliations: *No Data*
Cultural Affiliation Details:

No Data

Architectural Description:

1937 survey: This two-story, L-shaped, frame single dwelling features a hipped roof constructed of shingles. There are three brick chimneys; one on each end and one in the rear. There are 30 windows; 12 panes 12 x 18" downstairs and 12 panes 12 x 18" upstairs. The shutters have slats and are constructed of wooden pegs. The one-story front porch is approximately 10' x 12' and features square columns. There are six rooms in the house and the approximate ceiling height is 9' 3". The open string stairway features round balusters, handrail, and newel. The four-panel doors are constructed of heart pine. The walls are plastered with baseboards at the bottom.

2005 Intensive Survey:
This dwelling is two-story with a five bay façade topped by a hipped roof. The foundation is a solid brick wall and the structural system is

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frame clad in weatherboard siding. The roof is clad in standing-seam metal and features wide eaves. There are exterior end chimneys on the side elevations of 5-course American bond brick and corbelled bases and shoulders. The windows are 6/6 wood double-hung sash with metal storm windows. The main centrally placed entrance on the façade is double-leaf with two panels. The door is surmounted by a nine-light transom and flanked by sidelights with four lights and a panel. Sheltering the entrance is a one-story one-bay porch with a hipped roof clad in standing-seam metal. The porch roof features a dentiled cornice and is supported by square columns. Appended to the west elevation is a service ell. The ell is two-stories with a solid brick foundation and is wood frame construction clad in weatherboard. The roof is hipped clad in standing-seam metal. There is an exterior end brick chimney on the west elevation of 5-course American bond brick. There is a four panel door on the north elevation and west elevation. Windows punctuate the north, south and west elevations on both stories. Appended to the south elevation of the ell and west elevation of the dwelling is a one-story addition circa 1960. It has a concrete block foundation and is wood frame construction clad in vinyl siding. The roof has a shed form clad in asphalt shingles. There is a metal sliding door on the south elevation off a wood ramp that ascends toward the door from the south. There are metal windows on the west elevation.

The interior of the building is a typical central passage, single pile form. It comprises 2488 square feet of living space. The hall features a half-turn stair with slender balusters and a turned newel, which is situated at the west end of the hall. The rooms flanking the hall are rectangular in shape with fireplace openings on the walls opposite access to the hall. The mantels within the dwelling have been removed and the fireplaces have been filled and converted for stove use. Doors accessing the rooms from the hall are wood with four panels, iron locksets and porcelain door handles. The door and window surrounds are fluted with roundel corner blocks. The flooring is oak covered with wall-to-wall carpeting. The baseboards within the rooms are wide with a bead and the windows in the main rooms on the first story feature wood panels below. The walls are covered with plaster on lathe. There is a double-leaf door under the stair landing accessing the addition. The doors have two panels. There is a door under the stair to a closet with two panels. The ell features a hall from the north wall to the addition. This hall accesses the kitchen situated at the west end of the dwelling. The kitchen floor is covered with early 20th century linoleum with a braided rug pattern. The plaster in this room is missing and the flooring is deteriorated.

The addition appended to the building in the mid-20th century features modern wallboard walls and wall-to-wall carpeting. The space is divided into two areas for a main room and lavatory at the west end. The lavatory fixtures have been removed as well as part of the partition wall. The windows and doors have minimal surrounds.

The second story features a similar plan. An angled stair off the main stair landing accesses the hall within the ell on the second story. Each room has similar features to the first story rooms. There is a lavatory off the ell hallway with early 20th century porcelain fixtures. The walls have been clad in modern wallboard and the flooring has been clad in modern vinyl sheeting.

August 2018: This house was torn down in July 2018.

Exterior Components

Component	Component Type	Material	Material Treatment
Windows	Sash, Double-Hung	Wood	6/6
Porch	1-story, 1-bay	Wood	Columns, Square
Roof	Hipped	Metal	Standing Seam
Chimneys	Exterior End	Brick	Bond, American, 5-course
Foundation	Solid/Continuous	Brick	Bond, Common
Structural System and Exterior Treatment	Frame	Wood	Weatherboard

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Secondary Resource Information

Secondary Resource #1

Resource Category: DSS Legacy
Resource Type: Shed
Date of Construction: 1860Ca
Date Source: Site Visit
Historic Time Period: Antebellum Period (1830 - 1860)
Historic Context(s): Domestic
Architectural Style: No discernible style
Form: Rectangular
Condition: Demolished
Threats to Resource: Demolition, Development
Cultural Affiliations: *No Data*
Cultural Affiliation Details:

No Data

Architectural Description:

2005 Intensive Survey:
This shed dates to the mid-19th century and features a brick pier foundation. The building is mortise and tenon construction with pegged joints. The wood frame building is clad in wide horizontal boards that are not lapped. The roof has a catslide from clad in standing-seam metal. There is a vertical board door on the south elevation. The interior features a divided space with a wood frame wall clad in horizontal boards. The flooring is wide plank and the interior walls are not adorned.

Interior Plan: Undivided Space (non-domestic)

Number of Stories: 1.5

Exterior Components

Component	Component Type	Material	Material Treatment
Structural System and Exterior Treatment	Wood Frame	Wood	Board-and-Batten
Foundation	Piers	Brick	*No Data*

Historic District Information

Historic District Name: *No Data*
Local Historic District Name: *No Data*
Historic District Significance: *No Data*

CRM Events

Event Type: DHR Evaluation Committee: Not Eligible

DHR ID: 046-5054
Staff Name: DHR Evaluation Committee
Event Date: 7/21/2016
Staff Comment

M. Holma presenting:
Charles Driver Jordan House, Isle of Wight County, DHR File Number 046-5054, DHR Project Review File No. 2016-3598
In 2006, the Charles Driver Jordan House was identified as a two-story, five bay I-house with a hipped roof and a rear two-story ell, ca. 1857, situated on approximately 103 acres. The structural system is frame weatherboard, with brick foundation. Windows are 6/6 double-hung sash, though several are not in the window openings, but on floors below the openings. There are two exterior end brick chimneys of five-course American bond on the main house, and one on the rear ell. A one-story, one-bay porch with a hipped roof of standing-seam metal covers the entrance, featuring a dentiled cornice and square columns. The south elevation of the ell was given a one-story addition in 1960, with a concrete block foundation and wood frame construction clad in vinyl siding. A 19th-century, one-and-a-half story shed of wood frame construction stood northwest of the house, on a brick pier foundation. Its catslide roof was covered in standing-seam metal. Two former kitchens for enslaved workers are known to have been demolished on the property; however the property was thought to retain archaeological potential as no disturbance had taken place since then. Mrs. Sophia Ann Cates Jordan, wife of Charles Driver Jordan, taught public school in one of the kitchens until a school was built nearby. The property was evaluated at the local level of significance under Criterion C (Architecture) with a period of significance of 1857-1859. The committee recommended it eligible with 30 points.

Since 2006, much of the property's 103 acres have been subject to gravel and sand mining. Although the dwelling is extant, the historic setting has been lost, as well as the property's archaeology potential. Due to the loss of integrity, the committee recommended that the property is no longer eligible for listing.

Event Type: DHR Evaluation Committee: Deferred

DHR ID: 046-5054
Staff Name: DHR Evaluation Committee
Event Date: 5/18/2006
Staff Comment

Kristin Hill presenting:
Charles Driver Jordan House, Isle of Wight County
The Charles Driver Jordan House is a two-story, five bay I-house with a hipped roof and a rear two-story ell, ca. 1857, situated on approximately 103 acres. The structural system is frame weatherboard, with brick foundation. Windows are 6/6 double-hung sash, though several are not in the window openings, but on floors below the openings. There are two exterior end brick chimneys of five course American bond on the main house, and one on the rear ell. A one-story, one bay porch with a hipped roof of standing seam metal covers the entrance, featuring a dentiled cornice and square columns. The south elevation of the ell was given a one-story addition in 1960, with a concrete block foundation and wood frame construction clad in vinyl siding. A 19th century one-and-a-half story shed of wood frame construction sits northwest of the house, on a brick pier foundation. The catslide roof is covered in standing seam metal. Two former kitchens for slaves and workmen are known to have been demolished on the property. Mrs. Sophia Ann Cates Jordan, wife of Charles Driver Jordan, taught public school in one of the kitchens until a school was built nearby. The property was considered locally significant under Criterion C with a period of significance of 1857-1859. The committee recommended it eligible with 30 points.

Event Type: Survey:Phase I/Reconnaissance

Project Review File Number: 2006-0234
Investigator: Kimble David
Organization/Company: Stantec 2034

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Photographic Media: Film
Survey Date: 10/3/2005
Dhr Library Report Number: IW-042
Project Staff/Notes:

for Cultural Resources, Inc.

Aimee Leithoff, Ellen Brady
A Phase I Cultural Resources Survey of Approximately 600 Acres at Benns Church, Isle of Wight County, Virginia
2005
CRI
IW-042

Surveyor's NR Criteria Recommendations: C - Distinctive Characteristics of Architecture/Construction

Phase II Intensive Survey Integrity Recommendations: Design, Feeling, Location, Materials, Setting, Workmanship

Event Type: HABS/HALS/HAER Documentation

Project Review File Number: *No Data*
Investigator: Florence M. Jordan
Organization/Company: National Park Service
Photographic Media: Film
Survey Date: 1/18/1937
Dhr Library Report Number: *No Data*
Project Staff/Notes:

WPA Virginia Historic Inventory Survey #141

Surveyor's NR Criteria Recommendations: C - Distinctive Characteristics of Architecture/Construction

Phase II Intensive Survey Integrity Recommendations: Design, Feeling, Location, Materials, Setting, Workmanship

Bibliographic Information

Bibliography:

Name: Jordan, Annie A.
Record Type: Oral History/Interview
Bibliographic Notes: Benns Church, Virginia.

Record Type: Personal Papers
Bibliographic Notes: Diary of Charles Driver Jordan.

Stuck, Ken, VDOT Environmental, Hampton Roads District
Wednesday 29 August 2018 email correspondence with DHR Archives
[reporting demolition of the house in July 2018]

Property Notes:

Company 1: Benns Church Properties
Address 1: P O Box 500
City: Carrollton
State: Virginia
ZIP: 23314
2005: Owner of property

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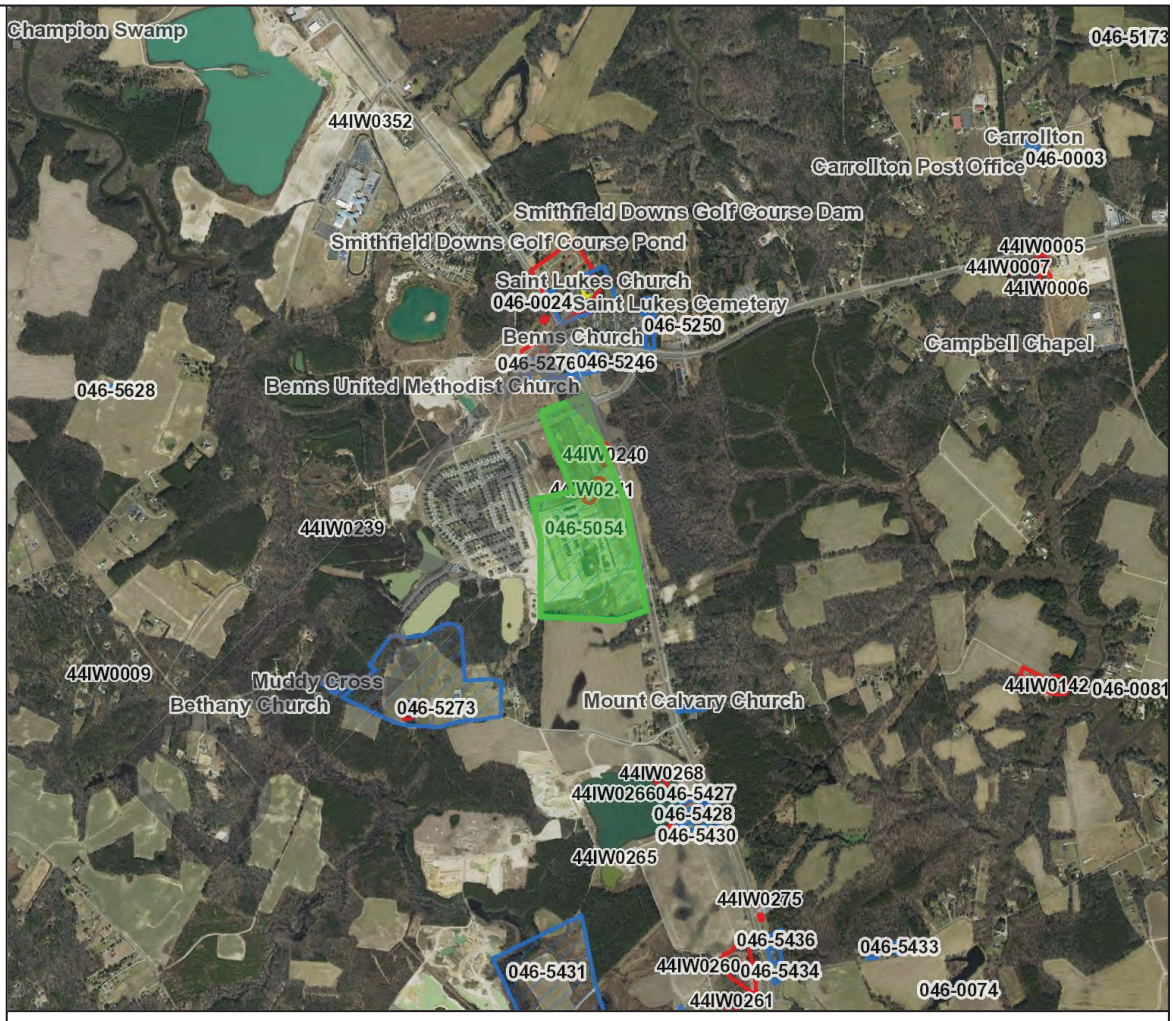
Virginia Dept. of Historic Resources

V-CRIS

Virginia Cultural Resource Information System

Legend

- Architecture Resources
- Architecture Labels
- Individual Historic District Properties
- Archaeological Resources
- Archaeology Labels
- DHR Easements
- USGS GIS Place names
- County Boundaries



N

Feet

0 600 1200 1800 2400

1:36,112 / 1"=3,009 Feet

Title: Architecture Labels **Date: 6/2/2022**

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Notice if AE sites:Locations of archaeological sites may be sensitive the National Historic Preservation Act (NHPA), and the Archaeological Resources Protection Act (ARPA) and Code of Virginia §2.2-3705.7 (10). Release of precise locations may threaten archaeological sites and historic resources.

Property Information

Property Names

Name Explanation	Name
Historic/Current	Benns Church

Property Evaluation Status

Not Evaluated

Property Addresses

Alternate - State Road 10/32
Current - 14571 Benns Church Boulevard

County/Independent City(s):	Isle of Wight (County)
Incorporated Town(s):	*No Data*
Zip Code(s):	23430
Magisterial District(s):	*No Data*
Tax Parcel(s):	32-01-084
USGS Quad(s):	BENNS CHURCH

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Additional Property Information

Architecture Setting: Village

Acreage: 1

Site Description:

2005:
This building is situated on the southeast corner of the intersection of Benns Church Boulevard (10/32) and Brewers Neck Road (32). The building faces west to Benns Church Boulevard (10/32). The area is characterized by residential properties to the west and commercial properties to the north. The lands to the south are primarily agircutlural. The area has changed over time to accommodate the widening of Benns Church Boulevard (10/32) and Brewers Neck Road (32). The site is generally flat and there are parking lots to the west, north and east.

2005:
To the west of the church is a grave marker. It is a stone slab resting on the ground.

Surveyor Assessment:

2005:
In 1813 George Benn willed the land on which the church stood to the Methodist Convention. This tomb was moved to a spot in the front of the church where the tombstone lies. The brick church was constructed in 1924 and remodeled in 1957 and 1967. This is the oldest Methodist congregation in the area, begun in 1789.

Surveyor Recommendation: *No Data*

Ownership

Ownership Category	Ownership Entity
Private	*No Data*

Primary Resource Information

Resource Category:	Religion
Resource Type:	Church/Chapel
NR Resource Type:	Building
Historic District Status:	*No Data*
Date of Construction:	1924
Date Source:	Site Visit/Written Data
Historic Time Period:	World War I to World War II (1917 - 1945)
Historic Context(s):	Architecture/Community Planning, Religion
Other ID Number:	*No Data*
Architectural Style:	Vernacular
Form:	*No Data*
Number of Stories:	1.0
Condition:	Good

Threats to Resource: None Known

Cultural Affiliations: *No Data*

Cultural Affiliation Details:

No Data

Architectural Description:

2005:
This building is a brick church laid in 6-course American bond. The roof has a gable form with gabled end walls. There is a projecting vestibule on the west elevation. It is also brick construction topped by a gable roof with a gabled brick end wall. The end wall features stretcher bond brick coping. The entrance comprises a double-leaf wood vertical board door with strap hinges. The door is enframed in a rowlock brick blank arch with a rowlock brick surround. The stairs leading to the doors and stoop are brick flanked by brick cheek walls with limestone coping. At the vestibule ends are brick buttresses with limestone caps. There is a date stone situated on the south buttress. The north and south walls have a ribbon window fenestration pattern. The windows are casement wood with stained glass. On the west façade of the main building there is an oculus with stained glass within the gable. The gable end wall is coped in brick stretcher bond. There are stepped buttresses at the building edges. The north and south elevations feature bays divided by stepped brick buttresses. An addition was made in 1957 and additional modifications were made in 1967, which obscure the original east end of the building. The addition retains the general proportion and massing of the original building. The materials are similar and the roof form is also similar. The addition is two stories with a gable roof. The windows on the addition are 6/6 wood double-hung sash.

Exterior Components

Component	Component Type	Material	Material Treatment
Roof	Gable	Slate	Shingle
Structural System and Exterior Treatment	Masonry	Brick	Bond, American, 6-course
Windows	Fixed	Wood	1-light
Foundation	Solid/Continuous	Brick	Bond, American

Secondary Resource Information

Secondary Resource #1

Resource Category: Funerary

Resource Type: Cemetery

Date of Construction: 1924

Date Source: Site Visit/Written Data

Historic Time Period: World War I to World War II (1917 - 1945)

Historic Context(s): Architecture/Community Planning, Religion

Architectural Style: Vernacular

Form: *No Data*

Condition: Good

Threats to Resource: None Known

Cultural Affiliations: *No Data*

Cultural Affiliation Details:

No Data

Architectural Description:

2005:
The grave marker is a stone slab resting on the ground. It reads, “Sacred to the memory of George Benn, Esq. who departed this life on the 9th day of November 1815, Aged 51 years.”

Current Use: *No Data*

Historic Religious Affilitation: *No Data*

Ethnic Affiliation: *No Data*

Has Marked Graves: *No Data*

Has Unmarked Graves: *No Data*

Enclosure Type: *No Data*

Number Of Gravestones: *No Data*

Earliest Marked Death Year: *No Data*

Latest Marked Death Year: *No Data*

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Historic District Information

Historic District Name: *No Data*
Local Historic District Name: *No Data*
Historic District Significance: *No Data*

CRM Events

Event Type: Survey:Phase I/Reconnaissance

Project Review File Number: *No Data*
Investigator: David, Kimble
Organization/Company: Unknown (DSS)
Photographic Media: *No Data*
Survey Date: 3/1/2005
Dhr Library Report Number: *No Data*
Project Staff/Notes:

2004-2005-0001

Project Bibliographic Information:

Name: King, Helen Haverty
Record Type: Book
Bibliographic Notes: Historical Notes on Isle of Wight County, Virginia, 1993.

Name: Virginia, Isle of Wight County
Record Type: Tax Records

Bibliographic Information

Bibliography:

No Data

Property Notes:

Name: Unknown
Company 1: Treasurers Benns Church
Address 1: 14571 Benns Church Boulevard
City: Smithfield
State: Virginia
ZIP: 23430
Owner Relationship: Owner of property

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Virginia Dept. of Historic Resources

V-CRIS

Virginia Cultural Resource Information System

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N

Feet

0 50 100 150 200

1:2,500 / 1"=208 Feet

Title: Architecture Labels **Date: 6/2/2022**

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Property Information

Property Names

Name Explanation	Name
Function/Location	Farmhouse, 20041 Brewers Neck Boulevard
Current	B. J. Hogue Homeplace

Property Evaluation Status

DHR Staff: Not Eligible

Property Addresses

Current - 20041 Brewers Neck Boulevard

County/Independent City(s): Isle of Wight (County)
Incorporated Town(s): *No Data*
Zip Code(s): 23314
Magisterial District(s): *No Data*
Tax Parcel(s): 33-01-012C
USGS Quad(s): BENNS CHURCH

Additional Property Information

Architecture Setting: Suburban
Acreage: 4.4

Site Description:

2005:
This farmstead is located on the north side of Brewers Neck Boulevard (US Route 10/32) near the intersection with Benns Church Boulevard (US Route 10). The property comprises 4.41 acres. The dwelling faces south to Brewers Neck Boulevard. The area is characterized by late 20th century suburban developments and a golf course. The property is generally flat and is bound by mature trees on the east and west sides.

October 2006:
This farmstead is located on the north side of Brewers Neck Boulevard (US Route 10/32) near the intersection with Benns Church Boulevard (US Route 10). The property comprises 4.41 acres. The dwelling faces south to Brewers Neck Boulevard. The area is characterized by late 20th century suburban developments and a golf course. The property is generally flat and is bound by mature trees on the east and west sides. There is a tidewater marsh situated at the east and north boundary of the property. The area on the east side of the property has been landscaped with low growth and bridges crossing the tidewater marshes. There is an asphalt-paved driveway leading north toward the dwelling from the main roadway, which terminates in a circle. The driveway continues along the west side of the dwelling toward the barn.

2005:
There were no visible secondary resources viewed on the site visit. It is noted that there is a swimming pool and barn on the property.

October 2006:
There is a barn situated north of the dwelling. There is a swimming pool situated immediately north of the dwelling. The barn served as a garage and now serves as a secondary dwelling.

Surveyor Assessment:

2005:
This dwelling is known as Mrs. Hoggie's Homeplace or the B. J. Houge Homeplace. Constructed circa 1800, it is one of the earlier dwellings located within the immediate area. The general surroundings have been adapted for use as a golf course and small suburban housing developments. The dwelling is an example of a center-passage plan common to Isle of Wight County and the 19th century. It was part of a larger tract of land and only the house site remains.

Center-passage plans appeared in Virginia during the first part of the 18th century. The plan comprises a central hall flanked rooms. Most often this form is one-and-one-half stories or two-stories. In some cases the area under the roof served as additional sleeping or storage space. The dwelling plan most often was one or two rooms deep. The façade of the building was symmetrical and comprised three or five bays. The interior rooms on the first story served as living space while upper stories served as bedchambers. In single-pile dwellings of one room deep the rooms flanking the hall served as the dining room and parlor. In earlier examples the interior finishes varied depending on which room served as the best room or parlor. The hall contained the stair to the upper stories and basement, if constructed with an underground space. The upper stories featured the same floor plan as the first story. In some examples a small room would have been added in the hallway on the second story above the entrance. It served as a small unheated space for storage. Chimneys were situated at the ends of the dwelling. The center-passage single-pile plan was popular during the 1800s. The center-passage double-pile plan is seen as early as the Revolutionary War period. The front rooms off the first story hall served as the parlor and dining room, while the rear rooms served as workrooms and a first story chamber. Most often the kitchen was located in the basement, in an ell off the rear or in a separate building. Most often chimneys were situated on the side elevation at the center of each equally planned room’s wall. In a few cases, the chimneys were erected on the interior of the dwelling and one chimney served two fireplaces that were back-to-back. By the mid-19th century the center-passage double-pile dwelling was erected as a symbol of prosperity among the agricultural society.

October 2006:
This dwelling is known as Mrs. Hoggie's Homeplace of the B. J. Hogue Homeplace. Constructed circa 1800 it is one of the earlier dwellings located within the immediate area. The general surroundings have been adapted for use as a golf course and small suburban

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housing developments. The dwelling is an example of a center-passage plan common to Isle of Wight County and the 19th century. It was part of a larger tract of land and only the house site remains.

The property originally comprised approximately 200 acres in the mid-19th century. The original farm parcel was situated immediately east of St. Luke's Church, the oldest continually used church in the United States. The property had a series of owners through the last half of the 19th century including, Groce, Whitehead, Bunkley, Nock, and Jordan. The Jordan and Bunkleys owned numerous acres in the surrounding area. Upon the property's acquisition by W. G. Bunkley, Jr. in 1899, the property had faced bankruptcy and court ordered sale at least twice in the last half of the 19th century. Between the years 1846 and 1899, the property had six owners. W. G. Bunkley, Jr. owned the property from 1899 to 1944. The Hogue family purchased the property in 1944 and it is often called the B. J. Hogue Homeplace for its association with the Hogue family. The Hogue family sold the property in 1966 for development. Prior to the sale of the property, they subdivided the parcel into three tracts: the farm tract, a smaller tract on the west side of the house, and the house tract (which is the current acreage associated with this submission). The largest farm tract was converted for use as a golf course and the smaller tract on the west side of the house was converted for use as a residential subdivision. The Hogue family erected the pool to the north of the dwelling and erected the barn or garage at the north end of the property. The house tract was sold in 1986 to the Smithfield Hotel Corporation and plans were made for the construction of a hotel. The hotel was never constructed and the parcel was sold in 1991 and then again in 1994 to the current owners, Carlton O'Neal. The site is proposed for development, which includes the demolition of the house and associated outbuilding and pool.

The house is an example of a center-passage house, but was most likely a smaller house at one time that was expanded to the current configuration in the mid-19th century. The difference in the appearance of the chimney on the west elevation and the slight asymmetry of the house reflect that the house may have been a smaller building that was enlarged. This is reinforced by the lack of a fireplace on the second story of the room on the west side of the building. Unfortunately, the foundation is so low that an inspection of the underside of the building was unable to be made, which would potentially yield additional information on the building's construction methods.

Throughout American architectural history the enlargement of permanent dwellings has been common practice. The addition of rooms or wings to smaller houses is a tradition that carries forward to the present day. Early sources of additive construction are mostly found adjacent to the existing building's façade or to the rear. In many cases the early additions are made to the rear maintaining the building's façade and general appearance. The addition made to the side of the building in many cases maintained the scale and massing of the earlier building, serving as an added room or rooms and maintaining a unified façade appearance. Many regions of Virginia have varying characteristics of additions that are common to the region and are not featured in other areas of the Commonwealth. For instance, additive construction common in the Eastern Shore of Virginia is unique to that area most likely due to the remote nature of its location. In the case of Isle of Wight County, there are varying types of additive construction that enlarged earlier dwellings. Most common in the 19th century is the addition of a large building adjacent to the earlier dwelling that does not maintain a consistent façade. In some cases the addition is placed so it projects from the earlier building's façade. The newer building usually has a side-passage plan and is linked to the earlier building by an added hallway with stair to the upper story or stories. The newer portion of the dwelling becomes the formal public space within the dwelling, while the older portion is used as chamber or private spaces. Another type of additive construction found in the county is the addition of a building adjacent to the early building where the newer portion could be a separate dwelling. The newer building may have a hall with adjoining rooms and will abut the earlier dwelling connected by doorways to rooms or hallways in the earlier building. In effect the dwelling becomes two joined independent yet attached dwellings in some cases with two halls, two stairs, and in some cases two separate levels, where one must step up or down into the adjacent building. Efforts to combine these types of buildings in a unified dwelling are in many cases not made, where two doors will be found on the façade.

This type of additive construction is common primarily in the 19th century. From most historical accounts of these dwellings, once a property owner achieved a certain financial status or if a property ownership changed, an addition was made. In these cases the addition becomes the primarily living space and the earlier building becomes secondary providing workspaces. In cases of the addition of rooms to the dwelling, the new portion became the formal living space with ornate mantels and wainscoting, for example. For those additions made where a dwelling with its own hall and stair were added, the newer addition became the formal reception area with ornate mantles. In many cases, the earlier building finishes were updated to the style of the later building construction. In effect the house was updated to the current fashion of the time. The interior configuration of the earlier portion was retained in almost all cases. The only changes noted are those with corner stairs adjacent to the fireplace in a one-room plan, which would have been removed in favor of a new hall and stair, added in the new portion.

Most of these modifications and additions occurred from the period of the early to late 19th century. In some cases additions were made within a twenty- to thirty-year period from the earlier building's construction. In those additions made in the post-Civil War period, more of an effort was made to create a unified façade appearance with the updating of the façade with a common roof, articulation and style. Even with the unification of the façade and style, it is still visually evident that an addition was made from asymmetrical facades and the retention of earlier chimneys. The evolution of the dwelling in the additive construction process seems to be an important element of the making of additions in Isle of Wight County. Though there is no established typology for additive construction, it may be rooted in long and important history of the county and the awareness of the age and history of its residents. Many communities share these methods of additive construction and in most cases the retention of the earlier built environment is quite common.

The house retains a general center-passage single-pile form. Center-passage plans appeared in Virginia during the first part of the 18th century. The plan comprises a central hall flanked rooms. Most often this form is one-and-one-half stories or two-stories. In some cases the area under the roof served as additional sleeping or storage space. The dwelling plan most often was one or two rooms deep. The façade of the building was symmetrical and comprised three or five bays. The interior rooms on the first story served as living space while upper stories served as bedchambers. In single-pile dwellings of one room deep the rooms flanking the hall served as the dining room and parlor. In earlier examples the interior finishes varied depending on which room served as the best room or parlor. The hall contained the stair to the upper stories and basement, if constructed with an underground space. The upper stories featured the same floor plan as the first story. In some examples a small room would have been added in the hallway on the second story above the entrance. It served as a small unheated space for storage. Chimneys were situated at the ends of the dwelling. The center-passage single-pile plan was popular during the 1800s. The center-passage double-pile plan is seen as early as the Revolutionary War period. The front rooms off the first story hall served as the parlor and dining room, while the rear rooms served as workrooms and a first story chamber. Most often the kitchen was located in the basement, in an ell off the rear or in a separate building. Most often chimneys were situated on the side elevation at the center of each equally planned room's wall. In a few cases, the chimneys were erected on the interior of the dwelling and one chimney served two fireplaces that were back-to-back. By the mid-19th century the center-passage double-pile dwelling was erected as a symbol of prosperity among the agricultural society.

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This building was evaluated for its eligibility in the National Register of Historic Places. It was considered under the National Register of Historic Places Criteria and Criteria Exceptions. The evaluation included researching the history of the property and an architectural analysis of the current building form. The property does not meet Criteria A (Event) as there is no historical evidence that there was a historic event that occurred on the property. The property does not meet Criteria B (Person) as it is not associated with a person important in history. The property does not meet Criteria C (Architecture) because it is an example of a common domestic building that has been altered over time. The property does not meet Criteria D (Information Potential) since there is no historic evidence that it would yield information that would be potentially important in history. The property also does not meet the Criteria Exceptions. Based upon the documented research and architectural analysis, the property is not recommended eligible for listing in the National Register of Historic Places.

Surveyor Recommendation: Legacy

Ownership

Ownership Category	Ownership Entity
Private	*No Data*

Primary Resource Information

Resource Category: Domestic
Resource Type: Single Dwelling
NR Resource Type: Building
Historic District Status: *No Data*
Date of Construction: Ca 1800
Date Source: Site Visit/Written Data
Historic Time Period: Early National Period (1790 - 1829)
Historic Context(s): Architecture/Community Planning, Domestic, Subsistence/Agriculture
Other ID Number: *No Data*
Architectural Style: Federal/Adamesque
Form: *No Data*
Number of Stories: 2.0
Condition: Good
Interior Plan: Central Passage, Single Pile
Threats to Resource: Demolition, Development
Cultural Affiliations: *No Data*
Cultural Affiliation Details:

No Data

Architectural Description:

2005:
This single-family dwelling was constructed circa 1800. It has a solid brick foundation and is wood frame clad in aluminum siding. The dwelling is topped by a cross-gable roof clad in asphalt shingles. The foundation is generally low and it appears that the building rests upon the ground. The general ground print is cross-shaped. The façade has five bays with a central entrance. There is a three-bay two-story porch dominating the south façade. The porch is topped by a gable roof with a raking cornice and cornice returns. The porch columns are square with minimal capitals. There is a balustrade on the second story that appears to be a replacement. The porch floor is brick on the first story. The windows on the dwelling are 6/6 double-hung sash with storm windows. Shutters flank the end bay windows. The main entrance on the first story is comprised of a wood single-leaf door with six panels. There are four-light and one-panel sidelights flanking the door. On the second story there is a fifteen-light single-leaf door accessing the second story of the porch. The doors have storm doors. The gable end elevations are marked by massive exterior side brick chimneys with single shoulders. The chimneys have corbelled caps. Additions have been made to the rear. They are two-stories and one-story with open decks.

October 2006:
This single-family dwelling was constructed circa 1800 and is an example of a dwelling that has undergone an expansion dating to the 19th century. It has a solid brick foundation that has been parged and is wood frame clad in vinyl siding. The dwelling is topped by a side-gable roof clad in asphalt shingles. The foundation is generally low and it appears that the building rests upon the ground. The general ground print is cross-shaped. The façade has five bays with a central entrance, but the façade is not symmetrical. It initially appears symmetrical, but the door placement is not central and the windows on the west end of the façade are set slightly farther apart than those on the east end of the facade. There is a three-bay two-story porch dominating the south façade, which was likely added in the 20th century. The porch is topped by a gable roof with a raking cornice and cornice returns. The porch columns are square with minimal capitals. There is a balustrade on the second story that appears to be a replacement. The porch floor is brick framed poured concrete on the first story. The windows on the dwelling are 6/6 double-hung sash with storm windows. Shutters flank the end bay windows. The main entrance on the first story is comprised of a wood single-leaf door with six panels. There are four-light and one-panel sidelights flanking the door. The door and sidelights are framed by a Classical surround comprised a cornice supported by fluted pilasters. On the second story there is a fifteen-light single-leaf door accessing the second story of the porch. The doors have storm doors. The gable end elevations are marked by massive exterior side brick chimneys with single shoulders. The chimneys have corbelled caps. The east chimney is 5-course American bond brick and the west chimney has replacement brick laid 8-course American bond consistent with brick found on the addition chimney on the north elevation. Additions have been made to the rear. There is a two story addition abutting the north elevation. There are one-story additions abutting the west elevation and north elevation of the two story addition. There is a chimney situated at west corner of the north elevation. The one story addition on the west elevation of the ell has a shed roof and the roof of the north one-story addition is gabled. The porch on the one-story addition has a shed roof and plain wood posts. The poured

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concrete porch floor continues the apron around the pool. There is a deck applied to the porch on the east end.

The interior comprises a center passage, single-pile plan. The central passage features a steep stair with a plain wood newel and plain wood balusters. The stairs have wood treads and risers and the stairs are steep. The hall features beaded-board wainscoting. There is a small closet under the stair. The living room was inaccessible and currently serves as storage space. The dining room has a wood chair rail and a mid-19th century fireplace surround. The doors within the dwelling are six panel single-leaf and wood. The flooring is pine tongue-and-groove narrow boards. There are baseboards and plain surrounds on the doors and windows. The walls in the main dwelling have been plastered. The ell contains a bedroom, lavatory, kitchen, and breakfast room. The floor is vinyl sheet in the kitchen and the cabinetry dates to the 1970s. The lavatory has porcelain fixtures and a tile floor. The fixtures and tile date to the 1960s. The bedroom has a wall-to-wall carpeted floor and built in closets at the north end. The breakfast room has similar treatment to the kitchen and there is a closet on the west side with a double-leaf wood louvered door. The den or family room is slightly lower than the ell and main dwelling. The family room features wallboard walls, acoustic tile ceiling, and wall-to-wall carpeted floor. There is a corner fireplace at the northwest corner. The second story is situated within the main dwelling and ell. The bedrooms are situated above the living room and dining room. There are closets situated at the north end rooms of the ell and a lavatory on the east side of the hallway leading to the closets. The flooring is similar to the first story flooring. The walls are plastered and features similar baseboards and window and door surrounds. The door to the west bedroom has three panels and is wood and single-leaf. This door has been pegged together unlike other doors within the dwelling. The east bedroom has wall-to-wall carpeting and a similar mantel to the one found in the dining room. The west bedroom does not have a fireplace. The hall features an open stairwell surrounded by similar newels and balusters found the main stair.

Exterior Components

Component	Component Type	Material	Material Treatment
Roof	Gable	Asphalt	Shingle
Chimneys	Exterior side	Brick	Bond, American
Porch	2-story, 3-bay	Wood	Columns, Square
Windows	Sash, Double-Hung	Wood	6/6
Chimneys	Exterior side	Brick	Bond, American, 5-course
Structural System and Exterior Treatment	Frame	Wood	Siding, Vinyl
Foundation	Solid/Continuous	Brick	Bond, American

Secondary Resource Information

Secondary Resource #1

Resource Category: Social/Recreational
Resource Type: Pool/Swimming Pool
Date of Construction: 1980Ca
Date Source: Site Visit
Historic Time Period: The New Dominion (1946 - 1991)
Historic Context(s): Architecture/Community Planning, Domestic, Subsistence/Agriculture
Architectural Style: Post Modern
Form: *No Data*
Condition: Fair
Threats to Resource: Demolition, Development
Cultural Affiliations: *No Data*
Cultural Affiliation Details:

No Data

Architectural Description:

2005:
There is a pool to the north of the dwelling.

October 2006:
The swimming pool is situated north of the dwelling. It is a concrete pit surrounded by a concrete apron.

Secondary Resource #2

Resource Category: Agriculture/Subsistence
Resource Type: Barn
Date of Construction: 1970Ca
Date Source: Site Visit
Historic Time Period: The New Dominion (1946 - 1991)
Historic Context(s): Architecture/Community Planning, Domestic, Subsistence/Agriculture
Architectural Style: Post Modern

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Form: *No Data*
Condition: Fair
Threats to Resource: Demolition, Development
Cultural Affiliations: *No Data*
Cultural Affiliation Details:

No Data

Architectural Description:

2005:
There is a barn situated at the north end of the property.

October 2006:
The barn has been converted for use a dwelling. The barn is one-and-one-half stories with wings on the east and west elevations. There is a one-story addition on the north side of the barn. The building has a concrete foundation and is wood frame clad in weatherboard. The roof is gable clad in standing-seam metal. The windows in the dwelling are comprised of 1/1 and 6/6 wood double-hung sash. Fifteen-light doors have also been placed within window openings and serve as fixed windows. The interior is comprised of numerous rooms connected by wood single-leaf doors. The main room on the south end of the main building is a kitchen and living space. The flooring is clad in vinyl sheets and the walls are modern wood paneling. The west wing has a dirt floor and is unimproved. The east wing comprises a room with a concrete floor covered in wall-to-wall carpeting. The walls are wood paneled. The windows comprise 15-light doors. The north one-story addition comprises a modern lavatory and a room with a carpeted floor. The attic story is unfinished and the roof rafters are visible. The stair to the attic is situated within the main first story and is accessed from the north end. The stairs are enclosed with wood treads and risers.

Interior Plan: Other
Number of Stories: 1.5

Historic District Information

Historic District Name: *No Data*
Local Historic District Name: *No Data*
Historic District Significance: *No Data*

CRM Events

Event Type: DHR Staff: Not Eligible

DHR ID: 046-5250
Staff Name: DHR
Event Date: 5/3/2007
Staff Comment

Project also reviewed by DHR staff archaeologist Joanna Wilson.

Kristin Kirchen presenting:
B.J. Hogue Homeplace, Isle of Wight County, DHR File Number 046-5250, Project Review Number 2002-1728
The resource is a circa 1800, 2 story, 5 bay frame dwelling covered in vinyl siding, with a central passage, single pile plan. It has a side gable roof covered in asphalt shingles. A 2-story frame addition was built on the rear, with 1-story frame additions on the rear addition's north and west elevations. The rear addition has two interior brick chimneys, and the addition on the north elevation of the rear addition has an exterior brick chimney. Secondary resources include a 1970 frame barn and a 1980 swimming pool. It was evaluated as locally significant under Criterion C (Architecture) with a period of significance of ca. 1800. The committee recommended not eligible with 20 points.

Event Type: Survey:Phase I/Reconnaissance

Project Review File Number: *No Data*
Investigator: David, Kimble
Organization/Company: Unknown (DSS)
Photographic Media: *No Data*
Survey Date: 10/29/2006
Dhr Library Report Number: *No Data*
Project Staff/Notes:

for CRI, Inc.

Project Bibliographic Information:

Record Type: Deed

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Bibliographic Notes: Isle of Wight County Deed Records

Name: King, Helen Haverty
Record Type: Book
Bibliographic Notes: Historical Notes on Isle of Wight County, Virginia, 1993.

Record Type: Tax Records
Bibliographic Notes: Isle of Wight County, Virginia

Surveyor's NR Criteria Recommendations: C - Distinctive Characteristics of Architecture/Construction

Phase II Intensive Survey Integrity Recommendations: Location, Workmanship

Event Type: Survey:Phase I/Reconnaissance

Project Review File Number: *No Data*

Investigator: David, Kimble

Organization/Company: Unknown (DSS)

Photographic Media: *No Data*

Survey Date: 3/1/2005

Dhr Library Report Number: *No Data*

Project Staff/Notes:

2004-2005-0001

Project Bibliographic Information:

Record Type: Deed
Bibliographic Notes: Isle of Wight County Deed Records

Name: King, Helen Haverty
Record Type: Book
Bibliographic Notes: Historical Notes on Isle of Wight County, Virginia, 1993.

Record Type: Tax Records
Bibliographic Notes: Isle of Wight County, Virginia

Surveyor's NR Criteria Recommendations: C - Distinctive Characteristics of Architecture/Construction

Phase II Intensive Survey Integrity Recommendations: Location, Workmanship

Bibliographic Information

Bibliography:

No Data

Property Notes:

Name: Carlton Oneal
Company 1: Bank of Southside VA
City: Smithfield
State: Virginia
ZIP: 23430
Owner Relationship: Owner of property

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Virginia Dept. of Historic Resources

V-CRIS

Virginia Cultural Resource Information System

Legend

- Architecture Resources
- Architecture Labels
- Individual Historic District Properties
- Archaeological Resources
- Archaeology Labels
- DHR Easements
- USGS GIS Place names
- County Boundaries



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Feet

0 50 100 150 200

1:2,500 / 1"=208 Feet

Title: Architecture Labels **Date: 6/2/2022**

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Property Information

Property Names

Name Explanation	Name
Function/Location	House, 14564 Benns Church Blvd
Historic	W.P. Jordan House

Property Evaluation Status

DHR Staff: Eligible

Property Addresses

Alternate - State Route 10/32
Current - 14564 Benns Church Blvd

County/Independent City(s): Isle of Wight (County)
Incorporated Town(s): *No Data*
Zip Code(s): 23314
Magisterial District(s): *No Data*
Tax Parcel(s): 32-01-075A
USGS Quad(s): BENNS CHURCH

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Additional Property Information

Architecture Setting: Rural
Acreage: 1

Site Description:

This dwelling is situated on the west side of Benns Church Blvd (SR 10/32) south of the intersection with Brewers Neck Blvd (SR 32). It is set back approximately 150-feet from the roadway. There is a grass driveway that leads to the north of the dwelling. The site is flat with deciduous trees planted around the site. The dwelling faces east.

There is a garage located northwest of the dwelling. There is a workshop located west of the dwelling. There is a well-situated southeast of the workshop. There is a collapsed shed north of the workshop.

Surveyor Assessment:

Start Year: 1880 ca
End Year: 1880 ca
Date Source: Site Visit
Type: Original Construction

This dwelling features an Italianate style common to the mid-19th century. The Italianate style became popular from 1850 to 1880 and was based upon Italian rural architecture. It was one of the romantic styles of the Picturesque movement. The hallmarks of the Italianate style are bracketed cornices, wide eaves, and a vertical emphasis. Additional articulation was added to window surrounds, the addition of entrance towers, articulated rounded-topped doors, and quoins. Like other styles of the 19th century, the Italianate was adaptable to various settings. It was well suited to narrow urban lots, and could be expanded in open rural settings. Modest Italianate houses such as this dwelling can be found among more prominent farmers of the mid- to late-19th century. The style exhibits the patron's knowledge of architectural style and fashion and is not commonly seen in the rural landscape of Isle of Wight County.

This dwelling was part of the Jordan family land holdings near the village of Benns Church. The Jordan family owned most of the lands south of Benns Church extending from Benns Church to the City of Suffolk boundary. The Jordan family owned numerous houses along Benns Church Boulevard and farmed the lands on either side of the road. The lands to the south of this property are mostly still farmed. There is a small cluster of mid-20th century dwellings in the vicinity of Benns Church.

The village of Benns Church was obliterated when Benns Church Boulevard and Brewer's Neck Boulevard were widened in the mid-20th century. There is a gas station and store located at the intersection of Benns Church Boulevard and Brewer's Neck Boulevard, though these were added in the mid- to late-20th century. The village developed at the Brewer's Neck and Benns Church Boulevards intersection around Benns Church and St. Luke's Church in the 19th century. The area is just south of the Town of Smithfield along roadways that connected Isle of Wight County with the City of Suffolk.

This house and surrounding 132 acres was owned by W. P. Jordan in the late 19th century. He mostly likely received the lands from his family in the 19th century as a part of the subdivision of the family's larger landholdings. He died intestate in 1905 and had numerous debts. To pay the debts the family sold the property to George Thomas. Thomas owned the property until his death in 1917. The property was sold through the 20th century and comprised between 125 and 132 acres at one time. The property was subdivided in the late 20th century and only a one acre site remains surrounding the house.

The property is an example of an Italianate-style house of the late 19th century. It retains architectural features of the period, but is not an exemplary example of the house type. The property does not retain its original acreage as a farmstead. Though owned by a member of the Jordan family, W. P. Jordan is not associated with a historic event in Isle of Wight County. Therefore, the house is not recommended as eligible for listing in the National Register of Historic Places.

Surveyor Recommendation: Legacy

Ownership

Ownership Category	Ownership Entity
Private	*No Data*

Associate

Property Associate Name	Property Associate Role
Jordan, W. P.	Owner

Primary Resource Information

Resource Category: Domestic
Resource Type: Single Dwelling
NR Resource Type: Building
Historic District Status: *No Data*
Date of Construction: Ca 1880
Date Source: Site Visit/Written Data
Historic Time Period: Reconstruction and Growth (1866 - 1916)
Historic Context(s): Architecture/Community Planning, Domestic
Other ID Number: *No Data*
Architectural Style: Italianate
Form: *No Data*
Number of Stories: 2.0
Condition: Good
Interior Plan: Side Passage, Double Pile
Threats to Resource: Deterioration
Cultural Affiliations: *No Data*
Cultural Affiliation Details:

No Data

Architectural Description:

This is a circa 1880 Italianate-style single-family dwelling. It rests on a brick foundation and comprises a wood frame structural system clad in weatherboard. The roof has a low-pitched hipped form clad in standing-seam metal. The roof features a wide cornice with a wide frieze and scrolled brackets. The façade of the dwelling is three-bay with a side-passage plan. The windows on the dwelling are 2/2 wood double hung sash with storm windows. Some windows feature wood louvered shutters, but most shutters are missing. The door is single-leaf wood with four panels. The door is flanked by sidelights and topped by a transom. There is a wrap-around porch on the façade that wraps the north elevation. It features chamfered posts with bracketed capitals and a hipped roof clad in standing-seam metal. There is an interior brick chimney on the south elevation near the east façade. It has a square plan and is brick. The cap features decorative brickwork and is coped in metal. Appended to the west elevation is a one-story addition. It is wood frame clad in weatherboard. A second story addition is mounted on the roof of the one-story addition.

The interior of the dwelling reflects a side-passage double-pile plan. The hall comprises one bay of the three bay façade. The hall is oriented east-west and contains the stair. The stair rises to the second story. The stair features turned newels and balusters. There is decorative scrollwork along the stair. The hallway features two entrances; the east façade and the north elevation. The entrances are the same. There is a living room on the southeast end of the building and has a wide opening and wood fireplace mantel. There is a 15-lgiht door between the living and dining room, situated west of the living room. There is a 15-light single-leaf door at the base of the stair accessing the dining room. The dining room has similar features to the living room, including a similar mantel. There is a door in the dining room on the west wall to the addition. At the west end of the hall is the kitchen. The kitchen has modern wood paneling and a vinyl floor. The cabinetry is mid-20th century. The addition has similar modern wood paneling and the flooring is wall-to-wall carpeting. The ceiling is wood boarded. The walls on the first story are plaster in most areas. Some plaster has been replaced with modern painted wall board. The ceilings have been re-clad in drywall. The baseboards and door surrounds are simple and the flooring is tongue-and-groove oak. The second story comprises bedrooms above the living and dining room, and a small room above the hall. The bedrooms above the living and dining room feature wood mantels. All rooms have simplified door and window surrounds. There is some damage to the plaster on the second story from water intrusion. The walls are plastered on the second story mostly with some replacement drywall in areas. The flooring is tongue-and-groove pine board. The lavatory is situated on the west end of the hall and is contained within the addition above the kitchen. The lavatory features mid-20th century fixtures and vinyl tile flooring.

Exterior Components

Component	Component Type	Material	Material Treatment
Windows	Sash, Double-Hung	Wood	2/2
Roof	Hipped	Metal	Standing Seam
Chimneys	Interior	Brick	Bond, American
Porch	1-story	Wood	Other
Foundation	Solid/Continuous	Brick	Bond, American
Structural System and Exterior Treatment	Frame	Wood	Weatherboard

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Secondary Resource Information

Secondary Resource #1

Resource Category: DSS Legacy
Resource Type: Shed
Date of Construction: 1900Ca
Date Source: Site Visit
Historic Time Period: Reconstruction and Growth (1866 - 1916)
Historic Context(s): Architecture/Community Planning, Domestic
Architectural Style: Vernacular
Form: *No Data*
Condition: Deteriorated
Threats to Resource: Development
Cultural Affiliations: *No Data*
Cultural Affiliation Details:

No Data

Architectural Description:

To the north of the workshop is a small shed. It is wood frame clad in vertical board. It has a shed roof clad in standing-seam metal. It is in deteriorated condition and is overgrown with foliage.

Number of Stories: 1

Secondary Resource #2

Resource Category: Domestic
Resource Type: Garage
Date of Construction: 1990Ca
Date Source: Site Visit
Historic Time Period: Reconstruction and Growth (1866 - 1916)
Historic Context(s): Architecture/Community Planning, Domestic
Architectural Style: Post Modern
Form: *No Data*
Condition: Fair
Threats to Resource: Development
Cultural Affiliations: *No Data*
Cultural Affiliation Details:

No Data

Architectural Description:

To the north of the shed is a garage. Constructed circa 1990, it has a wood frame structural system clad in plywood. It features a gable roof clad in asphalt shingles. There is a double-leaf door on the east façade.

Number of Stories: 1

Secondary Resource #3

Resource Category: Agriculture/Subsistence
Resource Type: Workshop
Date of Construction: 1900Ca
Date Source: Site Visit
Historic Time Period: Reconstruction and Growth (1866 - 1916)
Historic Context(s): Architecture/Community Planning, Domestic
Architectural Style: Vernacular
Form: *No Data*
Condition: Fair
Threats to Resource: Development
Cultural Affiliations: *No Data*
Cultural Affiliation Details:

DRAFT

No Data

Architectural Description:

There is a workshop west of the dwelling with a rectangular plan. It features a brick foundation and is wood frame construction clad in wood novelty siding. There is a single leaf door on the east elevation flanked by wood 2-light casement windows. The roof has a catslide form clad in asphalt shingles.

Number of Stories: 1

Secondary Resource #4

Resource Category: Domestic
Resource Type: Well/Well House
Date of Construction: 1890Ca
Date Source: Site Visit
Historic Time Period: Reconstruction and Growth (1866 - 1916)
Historic Context(s): Architecture/Community Planning, Domestic
Architectural Style: Vernacular
Form: *No Data*
Condition: Fair
Threats to Resource: Development
Cultural Affiliations: *No Data*
Cultural Affiliation Details:

No Data

Architectural Description:

There is a brick circular well to the southeast of the workshop. The well is laid in common bond brick and has a concrete cap.

Number of Stories: .5

Historic District Information

Historic District Name: *No Data*
Local Historic District Name: *No Data*
Historic District Significance: *No Data*

CRM Events

Event Type: DHR Staff: Eligible

DHR ID: 046-5274
Staff Name: DHR
Event Date: 10/19/2006
Staff Comment

Kristin Kirchen presenting:
W.P. Jordan House, Isle of Wight County, DHR File Number 046-5274
The house is a circa 1880 2-story, 3-bay Italianate style, side passage, double-pile dwelling. It rests on a brick foundation, and has a frame structure clad in weatherboard. The hipped roof is covered in standing seam metal, and features a wide cornice and frieze with scrolled brackets. The house has 2/2 double-hung windows, some with louvered shutters. A wrap-around 1-story porch covers the north and east sides of the house. It was built by the Jordan family near Benns Church village, part of the extensive Jordan land holdings in this part of Isle of Wight County. The property's original 132 acres were sold piecemeal throughout the 20th century, such that the house now sits on 1 acre. It was evaluated as locally significant under Criterion C with a period of significance of circa 1880, and the committee recommended eligible with 30 points.

DHR strongly encouraged the County to retain this resource in its original location and offer the resource to interested individuals or groups for preservation.

Event Type: Survey:Phase II/Intensive

Project Review File Number: 2006-0234
Investigator: David, Kimble
Organization/Company: Unknown (DSS)

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Photographic Media: *No Data*
Survey Date: 8/14/2006
Dhr Library Report Number: IW-42
Project Staff/Notes:

Intensive level survey conducted for Cultural Resources, Inc.

Project Bibliographic Information:

Name: CRI, Inc.
DHR CRM Report Number: IW-42
Record Type: Report
Bibliographic Notes: "A Phase I Cultural Resources Survey of appoximately 600 acres at Benns Church, Isle of Wight County, Virginia."

Prepared by: Aimee J. Leithoff and Ellen M. Bray (PI)

Dated: October 2005

Name: King, Helen Haverty
Record Type: Book
Bibliographic Notes: Historical Notes on Isle of Wight.

Record Type: Deed

Record Type: Tax Records

Surveyor's NR Criteria Recommendations: C - Distinctive Characteristics of Architecture/Construction

Phase II Intensive Survey Integrity Recommendations: Design, Location, Materials, Workmanship

Event Type: DHR Staff: Potentially Eligible

DHR ID: 046-5274
Staff Name: DHR
Event Date: 6/1/2006
Staff Comment

DHR believes that a Phase II evaluation of this property is warranted; the information presented in the Phase I is not sufficient to make a determination of eligibility.

Event Type: Survey:Phase I/Reconnaissance

Project Review File Number: 2006-0234
Investigator: David, Kimble
Organization/Company: Unknown (DSS)
Photographic Media: *No Data*
Survey Date: 10/3/2005
Dhr Library Report Number: IW-42
Project Staff/Notes:

Survey conducted for Cultural Resources, Inc.

Project Bibliographic Information:

Name: CRI, Inc.
DHR CRM Report Number: IW-42
Record Type: Report
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Record Type: Book
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Record Type: Deed

Record Type: Tax Records

Surveyor's NR Criteria Recommendations: C - Distinctive Characteristics of Architecture/Construction

Phase II Intensive Survey Integrity Recommendations: Design, Location, Materials, Workmanship

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Bibliographic Information

Bibliography:

No Data

Property Notes:

Name: Unknown
Company 1: Benns Church Properties
Address 1: P O Box 500
City: Carrollton
State: Virginia
ZIP: 23314
Owner Relationship: Owner of property

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Virginia Dept. of Historic Resources

V-CRIS

Virginia Cultural Resource Information System

Legend

- Architecture Resources
- Architecture Labels
- Individual Historic District Properties
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N

Feet

0 50 100 150 200

1:2,500 / 1"=208 Feet

Title: Architecture Labels **Date: 6/2/2022**

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Property Information

Property Names

Name Explanation	Name
Function/Location	House, 14580 Benns Church Boulevard

Property Evaluation Status

DHR Staff: Not Eligible

Property Addresses

Current - 14580 Benns Church Blvd
Alternate - 14580 State Road 10/32

County/Independent City(s): Isle of Wight (County)
Incorporated Town(s): *No Data*
Zip Code(s): 23314
Magisterial District(s): *No Data*
Tax Parcel(s): 32-01-075A
USGS Quad(s): BENNS CHURCH

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Additional Property Information

Architecture Setting: Rural
Acreage: 1.5

Site Description:

This dwelling is situated on the west side of Benns Church Blvd (SR 10/32) south of the intersection with Brewers Neck Blvd (SR 32). It is set back approximately 150-feet from the roadway. There is a grass driveway that leads to the north of the dwelling. The site is flat with deciduous trees planted around the site. The dwelling faces east.

A secondary dwelling was erected near the street in front of the earlier dwelling.

Surveyor Assessment:

This is an example of a modest house constructed circa 1930. Located a Benns Church a small village south of Smithfield at the intersection of two roadways, the dwelling was added to this area during a growth period. Earlier dwellings dating to the antebellum period lined the roadways. During the post Civil War period, larger farmsteads were subdivided and newly erected houses were interspersed between the earlier farmhouses. In the early 20th century, the area of Benns Church grew with the addition of schools and small businesses. The intersection had been an important location in Colonial Virginia as the St. Paul's Church and Benns Church located here date to the 17th and 18th centuries respectively.

The style is vernacular Colonial Revival, which gained popularity in the late 19th and early 20th century. It is a simple style that employs minimal articulation and can be adapted to modest houses. The style and form of the dwelling are typical of the period in Isle of Wight County. This building is not recommended as eligible for listing in the National Register of Historic Places.

Surveyor Recommendation: *No Data*

Ownership

Ownership Category	Ownership Entity
Private	*No Data*

Primary Resource Information

Resource Category: Domestic
Resource Type: Single Dwelling
NR Resource Type: Building
Historic District Status: *No Data*
Date of Construction: Ca 1930
Date Source: Site Visit/Written Data
Historic Time Period: World War I to World War II (1917 - 1945)
Historic Context(s): Domestic
Other ID Number: *No Data*
Architectural Style: Vernacular
Form: *No Data*
Number of Stories: 1.0

Condition: Fair
Threats to Resource: Development
Cultural Affiliations: *No Data*
Cultural Affiliation Details:

No Data

Architectural Description:

This dwelling is a one-story building with a concrete block foundation. It is wood frame construction clad in wood novelty siding topped with a side-gable roof clad in standing-seam metal. There is a one-bay, gabled-roof porch on the façade supported by plain wood posts. The roof is clad in standing-seam metal and the porch features cornice returns. The porch shelters the main entrance comprise of a single-leaf wood door with a panel and light. There is a wood frame screened door mounted to the main entrance doorframe. To the south of the entrance is a paired 6/6 wood double-hung sash window. To the north of the entrance is a 2/2 wood double-hung sash window. Wood shutters flank the windows. The north window has a pedimented hood. The roof cornice features cornice returns. To the west of the dwelling is an ell with a gable roof clad in standing–seam metal. The windows on the side elevations are similar to the north window on the façade. On the west elevation, there is a hipped-roof porch with wrought-iron posts. The porch shelters a single-leaf entrance. The porch floor is poured concrete and the porch roof is clad in standing-seam metal.

Exterior Components

Component	Component Type	Material	Material Treatment
Windows	Sash, Double-Hung	Wood	2/2
Foundation	Solid/Continuous	Concrete	Block
Windows	Sash, Double-Hung	Wood	6/6
Roof	Gable, Side	Metal	Standing Seam
Porch	1-story, 1-bay	Wood	Other
Structural System and Exterior Treatment	Frame	Wood	Weatherboard

Secondary Resource Information

Secondary Resource #1

Resource Category: Domestic
Resource Type: Secondary Dwelling
Date of Construction: 1978Ca
Date Source: Site Visit/Written Data
Historic Time Period: The New Dominion (1946 - 1991)
Historic Context(s): Domestic
Architectural Style: Post Modern
Form: *No Data*
Condition: Good
Threats to Resource: Development
Cultural Affiliations: *No Data*
Cultural Affiliation Details:

No Data

Architectural Description:

Constructed in 1978, this dwelling is concrete block construction clad in brick veneer. It features a side-gable roof clad in asphalt shingles. he façade is asymmetrical with a projecting shed-roofed porch supported by turned posts. The entrance on the façade is single-leaf flanked by window openings. The windows to the south are comprised of paired wood double-hung windows with 12/12 sashes. The windows to the north are also 8/8 wood sash with a panel below the lower sash. The windows feature rowlock brick sills. An overhead garage door dominates the south end of the façade.

Number of Stories: 1

Historic District Information

Historic District Name: *No Data*
Local Historic District Name: *No Data*
Historic District Significance: *No Data*

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CRM Events

Event Type: DHR Staff: Not Eligible

DHR ID: 046-5275
Staff Name: Kirchen, Roger
Event Date: 6/1/2006
Staff Comment

No Data

Event Type: Survey:Phase I/Reconnaissance

Project Review File Number: 2006-0234
Investigator: David, Kimble
Organization/Company: Unknown (DSS)
Photographic Media: *No Data*
Survey Date: 10/3/2005
Dhr Library Report Number: IW-42
Project Staff/Notes:

for Cultural Resources, Inc.

Project Bibliographic Information:

Name: CRI, Inc.
DHR CRM Report Number: IW-42
Record Type: Report
Bibliographic Notes: "A Phase I Cultural Resources Survey of appoximately 600 acres at Benns Church, Isle of Wight County, Virginia."

Prepared by: Aimee J. Leithoff and Ellen M. Bray (PI)

Dated: October 2005

Record Type: Tax Records

Bibliographic Information

Bibliography:

No Data

Property Notes:

Name: Unknown
Company 1: Benns Church Properties
Address 1: P O Box 500
City: Carrollton
State: Virginia
ZIP: 23314
Owner Relationship: Owner of property

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Virginia Dept. of Historic Resources

V-CRIS

Virginia Cultural Resource Information System

Legend

- Architecture Resources
- Architecture Labels
- Individual Historic District Properties
- Archaeological Resources
- Archaeology Labels
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N

Feet

0 50 100 150 200

1:2,500 / 1"=208 Feet

Title: Architecture Labels **Date: 6/2/2022**

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Notice if AE sites:Locations of archaeological sites may be sensitive the National Historic Preservation Act (NHPA), and the Archaeological Resources Protection Act (ARPA) and Code of Virginia §2.2-3705.7 (10). Release of precise locations may threaten archaeological sites and historic resources.

Property Information

Property Names

Name Explanation	Name
Function/Location	House, 19514 Casper Circle

Property Addresses

Current - 19514 Casper Circle

County/Independent City(s): Isle of Wight (County)
Incorporated Town(s): *No Data*
Zip Code(s): 23314
Magisterial District(s): *No Data*
Tax Parcel(s): 32-01-075B
USGS Quad(s): BENNS CHURCH

Property Evaluation Status

DHR Staff: Not Eligible

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Additional Property Information

Architecture Setting: Rural
Acreage: 2.5
Site Description:

This dwelling is situated on the west side of Benns Church Blvd (SR 10/32) south of the intersection with Brewers Neck Blvd (SR 32). It is set back approximately 300-feet from the roadway. There is a dirt driveway (named Casper Circle) that leads to the north of the dwelling. The site is flat and open with sandy soil. The dwelling faces east.

A large metal warehouse is located west of the dwelling. There are two trailers also situated west of the dwelling and east of the warehouse.

Surveyor Assessment:

This is an example of a modest house constructed circa 1930. Located a Benns Church a small village south of Smithfield at the intersection of two roadways, the dwelling was added to this area during a growth period. Earlier dwellings dating to the antebellum period lined the roadways. During the post Civil War period, larger farmsteads were subdivided and newly erected houses were interspersed between the earlier farmhouses. In the early 20th century, the area of Benns Church grew with the addition of schools and small businesses. The intersection had been an important location in Colonial Virginia as the St. Paul's Church and Benns Church located here date to the 17th and 18th centuries respectively.

The style is vernacular Colonial Revival, which gained popularity in the late 19th and early 20th century. It is a simple style that employs minimal articulation and can be adapted to modest houses. The style and form of the dwelling are typical of the period in Isle of Wight County. The dwelling has been converted to an office. This building is not recommended as eligible for listing in the National Register of Historic Places.

Surveyor Recommendation: *No Data*

Ownership

Ownership Category	Ownership Entity
Private	*No Data*

Primary Resource Information

Resource Category: Domestic
Resource Type: Single Dwelling
NR Resource Type: Building
Historic District Status: *No Data*
Date of Construction: 1931
Date Source: Site Visit/Written Data
Historic Time Period: World War I to World War II (1917 - 1945)
Historic Context(s): Domestic
Other ID Number: *No Data*
Architectural Style: Vernacular
Form: *No Data*

Number of Stories: 1.0
Condition: Good
Threats to Resource: Development
Cultural Affiliations: *No Data*
Cultural Affiliation Details:

No Data

Architectural Description:

This is a one-story wood frame dwelling clad in weatherboard siding. The foundation is brick and the roof is side-gable clad in standing-seam metal. The façade is asymmetrical with a central entrance flanked by window openings. The entrance is comprised of a single-leaf door with storm door. The window opening to the south of the entrance is comprised of paired 6/6 wood double-hung sash windows flanked by shutters. The window to the north of the entrance is comprised of a single 6/6 wood double-hung sash window flanked by shutters. A porch shelters the east façade and is comprised of a shed roof clad in standing-seam metal supported by wrought-iron posts and a concrete floor. Ells were appended to the north and south side elevations. The ell to the south is wood frame construction clad in weatherboard and has a side-gable roof at a lower height than the main dwelling roof. There is a 6/6 wood double-hung sash window on the east façade and a similar window to the south facade. There is a single-leaf entrance on the south elevation containing a three-panel, one-light door. Appended to the west elevation of this ell is a shed-roofed addition. There is a 2/2 window on the south elevation. The north ell comprises a concrete block foundation and is wood frame clad in weatherboard siding. It features 6/6 metal double-hung sash windows and a sliding window. There is a door leading from the west elevation to a wood ramp. Append to the west elevation is an addition with a shed roof extending from the eave of the main roof. It features 6/6 wood double-hung sash windows and an incorporated porch supported by a wood post.

Exterior Components

Component	Component Type	Material	Material Treatment
Windows	Sash, Double-Hung	Wood	6/6
Windows	Sash, Double-Hung	Wood	2/2
Porch	1-story, 1-bay	Wood	Other
Roof	Gable, Side	Metal	Standing Seam
Foundation	Solid/Continuous	Brick	Bond, American
Structural System and Exterior Treatment	Frame	Wood	Weatherboard

Secondary Resource Information

Secondary Resource #1

Resource Category: Industry/Processing/Extraction
Resource Type: Warehouse
Date of Construction: 1990
Date Source: Site Visit
Historic Time Period: *No Data*
Historic Context(s): Domestic
Architectural Style: Post Modern
Form: *No Data*
Condition: Good
Threats to Resource: Development
Cultural Affiliations: *No Data*
Cultural Affiliation Details:

No Data

Architectural Description:

To the west of the dwelling is a large metal warehouse with a rectangular plan. The warehouse is topped by a low-pitched metal clad gable roof. There is a single –leaf door on the north elevation and an oversized double-leaf sliding door on the south elevation. There is an overhead garage doors are located on the east elevation. Situated between the warehouse and dwelling are two mobile trailers.

Number of Stories: 1

Historic District Information

Historic District Name: *No Data*
Local Historic District Name: *No Data*
Historic District Significance: *No Data*

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CRM Events

Event Type: DHR Staff: Not Eligible

DHR ID: 046-5276
Staff Name: Kirchen, Roger
Event Date: 6/1/2006
Staff Comment

No Data

Event Type: Survey:Phase I/Reconnaissance

Project Review File Number: 2006-0234
Investigator: David, Kimble
Organization/Company: Unknown (DSS)
Photographic Media: *No Data*
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Project Bibliographic Information:

Name: CRI, Inc.
DHR CRM Report Number: IW-42
Record Type: Report
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Prepared by: Aimee J. Leithoff and Ellen M. Bray (PI)

Dated: October 2005

Record Type: Tax Records

Bibliographic Information

Bibliography:

No Data

Property Notes:

Name: Unknown
Company 1: Benns Church Properties
Address 1: P O Box 500
City: Carrollton
State: Virginia
ZIP: 23314
Owner Relationship: Owner of property

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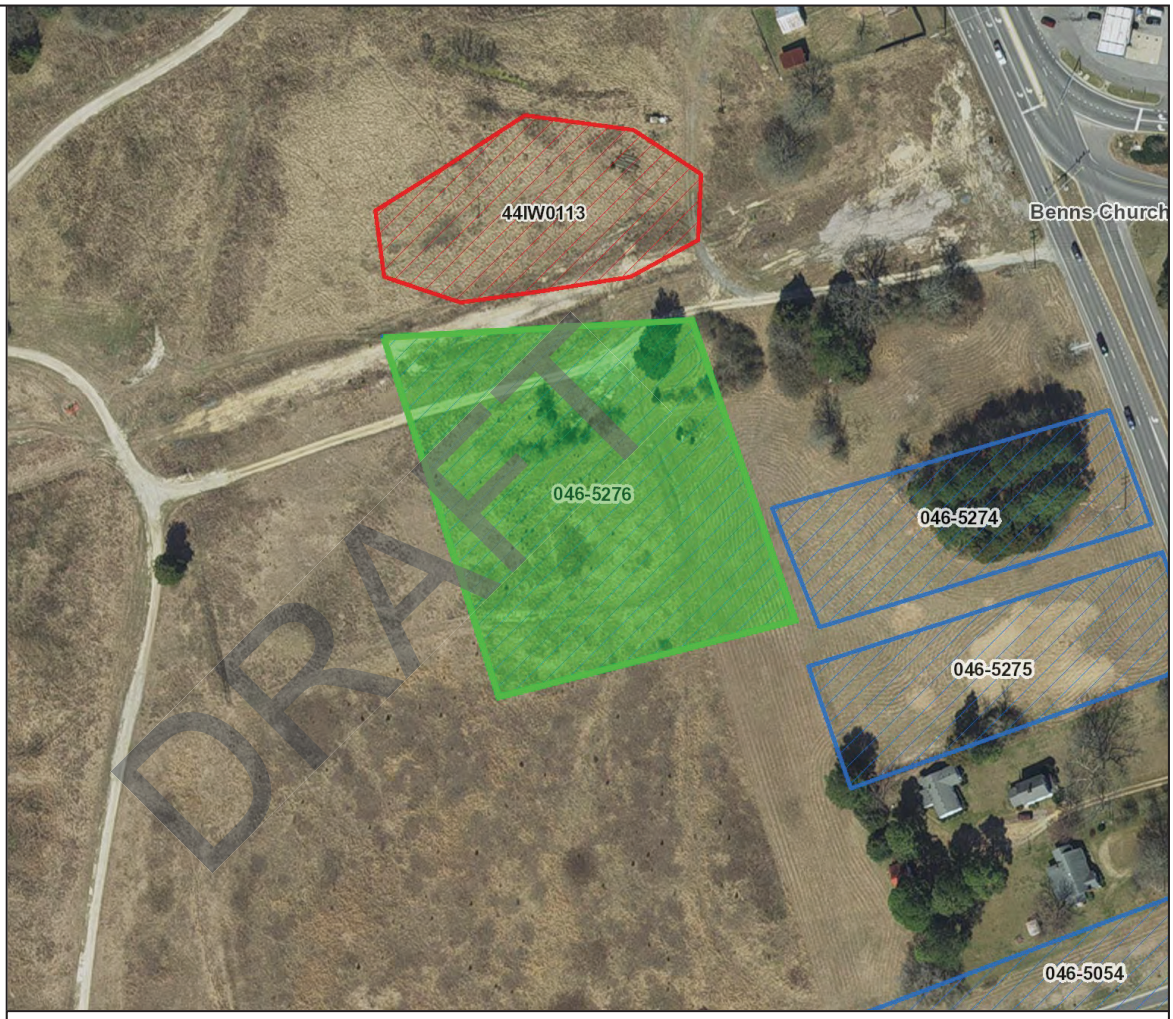
Virginia Dept. of Historic Resources

V-CRIS

Virginia Cultural Resource Information System

Legend

- Architecture Resources
- Architecture Labels
- Individual Historic District Properties
- Archaeological Resources
- Archaeology Labels
- DHR Easements
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N

Feet

0 50 100 150 200

1:2,500 / 1"=208 Feet

Title: Architecture Labels **Date: 6/2/2022**

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Property Information

Property Names

Name Explanation	Name
Descriptive	Angel on Gravestone
Function/Location	Gravestone, 14477 Benns Church Boulevard

Property Evaluation Status

Not Evaluated

Property Addresses

Current - 14477 Benns Church Boulevard Route 258

County/Independent City(s): Isle Of Wight (County)
Incorporated Town(s): *No Data*
Zip Code(s): 23314
Magisterial District(s): *No Data*
Tax Parcel(s): *No Data*
USGS Quad(s): BENNS CHURCH

Additional Property Information

Architecture Setting: Town
Acreage: *No Data*
Site Description:

Located in the Benns Church cemetery, near a golf club, with overhanging trees or branches nearby.

Surveyor Assessment:

Start Year: 1921 ca
End Year: 1921
Date Source: Site Visit
Type: Original Construction

Surveyor Recommendation: *No Data*

Primary Resource Information

Resource Category: Social/Recreational
Resource Type: Sculpture/Statue
NR Resource Type: Object
Historic District Status: *No Data*
Date of Construction: Ca 1921
Date Source: Site Visit
Historic Time Period: World War I to World War II (1917 - 1945)
Historic Context(s): Funerary
Other ID Number: *No Data*
Architectural Style: *No Data*
Form: *No Data*
Number of Stories: *No Data*
Condition: Poor
Threats to Resource: Deterioration
Cultural Affiliations: *No Data*
Cultural Affiliation Details:

No Data

Architectural Description:

Inscriptions: On Gravestone Front: "Marion E. Briggs Daughter of WlJl & Florence Briggs Sept.25, 1911 Sept.28, 1921." Back of Gravestone: "Our darling one has gone before. To greet us on the blissful shore"
Dimensions: Base: H:3' W:1.5' Depth:1.5'
Sculpture: H:1.5' W:6" Depth:8"
The sculpture depicts a small angel standing, head bowed, arms down, holding a swag below her waist. The angel stands PL leg straight, PR leg

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bent and back.

Secondary Resource Information

Historic District Information

Historic District Name: *No Data*
Local Historic District Name: *No Data*
Historic District Significance: *No Data*

CRM Events

Event Type: Other

Project Review File Number: *No Data*
Investigator: Gwaltney, Heather
Organization/Company: Unknown (DSS)
Photographic Media: *No Data*
Survey Date: 10/18/1995
Dhr Library Report Number: *No Data*
Project Staff/Notes:
SOS! Survey

Bibliographic Information

Bibliography:

No Data

Property Notes:

Name: Heather Gwaltney
Address 1: 6067 Beechland Road
City: Elberon
State: Virginia
ZIP: 23846
Phone 1: 804-294-3235
Surveyor Notes: SOS! Survey Volunteer
Owner Relationship: Informant

Name: Richard Austin
Title: Curator
Address 1: 14477 Benns Church Boulevard
City: Smithfield
State: Virginia
ZIP: 23430
Phone 1: 804-357-3367
Surveyor Notes: Richard Austin s the contact person, Benns Church is the owner/administrator.
Owner Relationship: Owner of property

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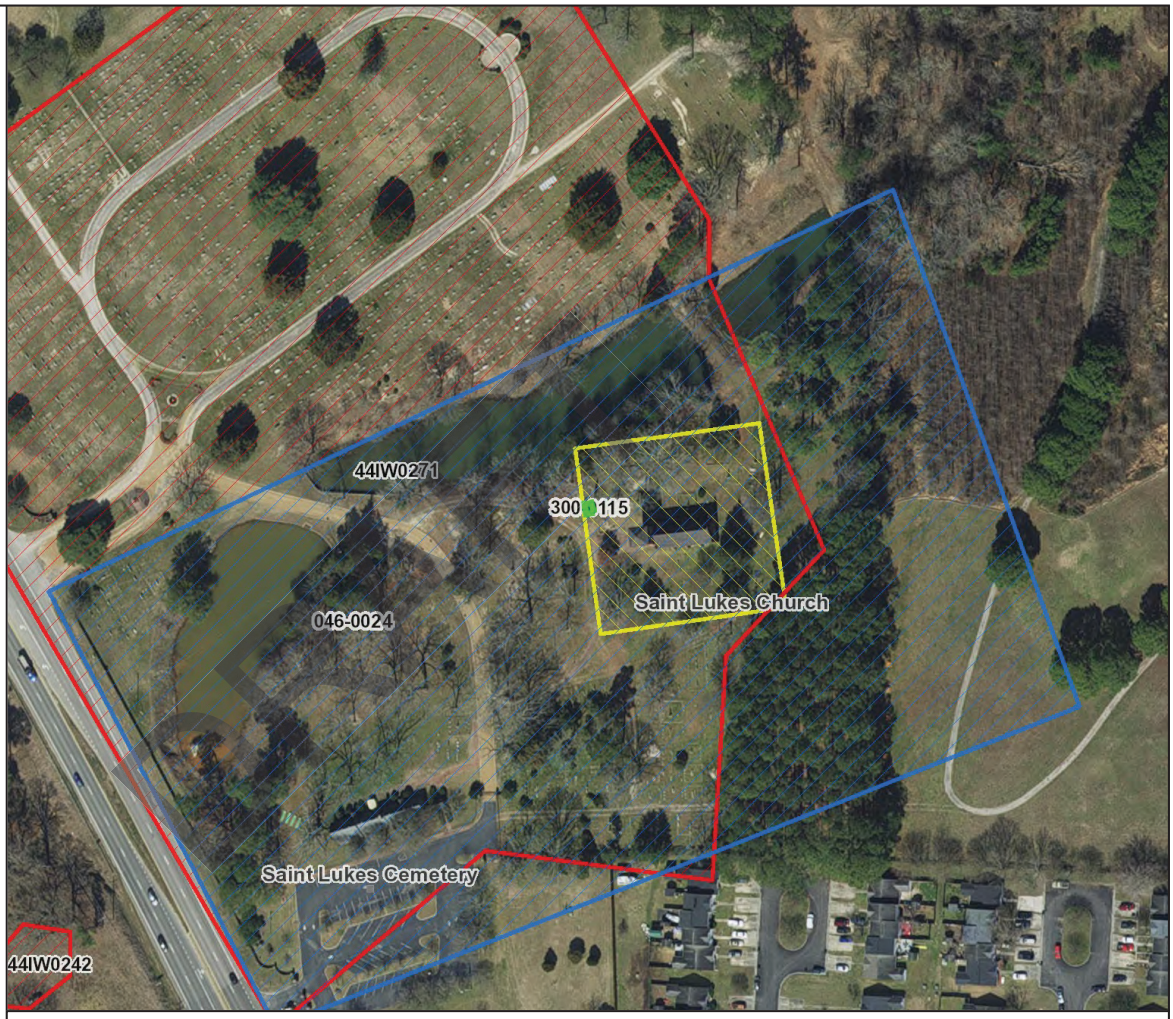
Virginia Dept. of Historic Resources

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N

Feet

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Title: Architecture Labels **Date: 6/2/2022**

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COMMONWEALTH of VIRGINIA

DEPARTMENT OF TRANSPORTATION
23116 Meherrin Road
COURTLAND, VIRGINIA 23837

July 19, 2023

Amy Ring
Planning and Zoning Department
Isle of Wight County
P. O. Box 80
Isle of Wight, VA 23397

RE: Sweetgrass (formerly Yeoman Farm) – Chapter 527
Benn's Church Boulevard (Route 10/258)
Isle of Wight County

In accordance with §15.2-2222.1 of the Code of Virginia and the Virginia Traffic Impact Analysis Regulations, 24 VAC 30-155 (also known as Chapter 527), the Traffic Impact Study prepared by Vanasse Hangen Brustlin, Inc. (VHB) dated December 17, 2019, along with a supplemental memorandum dated March 25, 2023 and other modified application materials was submitted to the Virginia Department of Transportation (VDOT) for review on June 23, 2023.

Our Evaluation Report is attached to assist the County in their decision making process regarding this rezoning application. The Evaluation Report summarizes the key findings and includes our comments on the accuracy of the methodologies, assumptions, and conclusions presented in the analysis.

It is requested that VDOT's comments be included in the official public records, and to have both this letter and the VDOT Evaluation Report placed in the official file for the subject case. VDOT will make these documents available to the public through various means, including posting them to the VDOT website.

If you have any questions, please contact me at (757) 346-3084 or Jason Fowler@vdot.virginia.gov.

Sincerely,

Jason Fowler, P.E.
Area Land Use Engineer
Virginia Department of Transportation
Franklin Residency

EVALUATION REPORT
Of
Chapter 527 Traffic Impact Analysis

1) We concur with the proposed trip generation rates as provided in the submitted study based on the following development schedule:

Phase 1 Use	No. of Units	Units
Single Family Detached Housing	390	dwelling units
Multi-Family Housing (Low-Rise)	225	dwelling units
Strip Retail Plaza < 40k	18	1000 sq. ft. GLA
General office	55	1000 sq. ft. GLA

The proposed uses have the potential to generate 7,021 daily, 535 AM peak hour, and 732 PM peak hour trips on the roadway network. As outlined in the study, these trips are reduced by allowable pass-by and internal capture rates to represent new trips on the roadway network (6,685 daily, 521 AM peak, and 692 PM peak).

2) The trip generation has been reduced from the original 2019 study. There is no proffer that restricts traffic to the numbers used in the study, or otherwise limits the higher traffic generating uses that are allowed by-right with the zoning. Therefore the potential exists for the development to generate substantially more traffic than what is used in the analysis.

3) This is the 2nd TIA memorandum submitted (June 2021), in which trip generation and models have been adjusted. The original TIA has not been amended to incorporate the changes as submitted. The models are still based upon the original 2018 traffic counts, with 2026 and 2032 still used as the Build and Build +6 scenario. Additionally, the Synchro & SimTraffic models were not submitted for review.

4) The proposed 40’ public right of way serving the front residential may be insufficient to incorporate all of the required street design elements (pedestrian facilities, drainage structures, etc.).

5) The provided stubs in the concept plan are required per the SSAR regulations to be built to the property line.

6) Final design will be in accordance with the VDOT Road Design Manual. While it is understood that the development plan sheets submitted are not for construction, the following comments have been provided as a result of a preliminary review of the conceptual plans:

    - Pavement Markings and Sign details need to be submitted on a separate sheet for review in the site plan assembly.

- Construction site plans need to be submitted and include but are not limited to; intersection geometrics, lane configurations, transitions, turn lane warrants, corner radii, intersection site distances, right of way etc.

- AutoTurn analyses of study intersections need to be submitted to this office for review. The AutoTurn analysis will need to include a design vehicle of the largest type to be utilized for this site. This will ensure vehicle clearance as well as curb/median clearances are met.

- Sight distance for entrances and intersections must be evaluated for compliance in accordance with Appendix F of the VDOT Road Design Manual. Refer to Table 2-7.

- VDOT will have final approval of the design and construction of traffic signals, timings, and all equipment used for signal modifications. Intersection modifications and traffic signal design and phasing plans will need to be submitted for review and meet or exceed Eastern Region Operations standards and specifications. All design and construction costs will be the sole responsibility of the developer. A final traffic signal inspection will be completed by Department personnel. All punch list items resulting from this inspection will need to be corrected and re-inspected before the Department will assume responsibility of the traffic signal.

- Any right-of-way acquisition, as well as signal relocation or upgrades that are required for the recommended improvements shall be obtained, designed, and paid for by the developer.

Residential Pipeline Projects as of 10/14/22*

Projects listed below are either currently under construction or have not yet started.

SUBDIVISION NAME & DWELLING TYPE	NUMBER OF UNITS	DATE APPROVED	STATUS
Red Oaks MHP Phase II	191	1978	Dormant
Timber Preserve (aka Crown Creek) SFD	340	1986	Dormant
Cypress Creek PH 6 & 7 (Smithfield) SFD	194	1988	Under Construction
Mallory Point/Scott's Farm (Smithfield) SFD/SFA	812	2021	Dormant
Benns Grant Apartments	240	2009	Under Construction
St. Luke's Village SFD/SFA	179	2005	Dormant
Bridge Point Commons Apartments & Condos	350	2008	Dormant
Brewer's Station Apartments	162	2014	Under Construction
Brewers Station SFD & SFA	88	2014	Dormant
The Crossings Condos	210	2002	Under Construction
Archer's Meade SFD	63	2014	Dormant
South Harbor (Age Restricted) SFD & SFA	340	2020	Under Construction
The Park at Battery (Smithfield) Condos	150	2020	Dormant
Cambridge Villas (Windsor) SFD	212	2010	Dormant
The Heritage Apartments	12	2019	Under Construction
Windsor Station (Windsor)	60	2022	Dormant
James River Crossing (Bartlett Estates)	52	2022	Dormant
TOTAL UNITS	**3655**		
Units Under Construction	**1158**		
Remaining Units Approved but Dormant	**2497**		
2017-21 Avg. Building Permit/Year for Houses**	**230**		

*List includes major subdivisions only & not infill

**All new dwelling units incl. infill lots & family member lots comprising approx. 25% of permits

RESOLUTION NUMBER PC-23-11

ISLE OF WIGHT COUNTY PLANNING COMMISSION
A RESOLUTION TO PRESENT A REPORT AND RECOMMENDATION TO THE BOARD OF SUPERVISORS FOR CONDITIONAL ZONING REQUEST ZA-06-19 FOR APPROXIMATELY 250 ACRES OF TAX MAP NUMBER 32-01-009 ON BENNS CHURCH BOULEVARD (RTE. 10) FROM RURAL AGRICULTURAL CONSERVATION TO CONDITIONAL -PLANNED DEVELOPMENT - MIXED USE TO ALLOW UP TO 390 AGE RESTRICTED SINGLE FAMILY DETACHED RESIDENCES, 225 UNRESTRICTED TOWNHOME RESIDENCES, AND FIVE ACRES OF COMMERCIAL USES

WHEREAS, NVR, Inc., applicant, and Henry Layden, special trustee for the William Grover Yeoman, III Trust, property owner have requested Conditional Zoning (ZA-06-19) for approximately 250 acres of tax map number 32-01-009 located on Benns Grant Boulevard (Rte. 10) from the Rural Agricultural Conservation zoning district to the Conditional - Planned Development - Mixed Use zoning district to allow up to 390 age-restricted single family detached residential units, 225 residential townhomes, and approximately five acres of commercial uses to include up to 18,000 square feet of retail and commercial uses and up to 55,000 square feet of office uses; and

WHEREAS the procedural requirements for the consideration of this request by the Planning Commission have been met.

NOW, THEREFORE, BE IT RESOLVED by the Planning Commission of Isle of Wight County, that:

Section 1. Findings.

_____ A. The Isle of Wight County Planning Commission finds that the proposed amendment to conditional zoning is reasonable and warranted due to a change in circumstances affecting the property and has considered the following factors and finds that the proposed rezoning does not conflict with:

1. the existing use and character of property within the County;

2. the Comprehensive Plan;

3. the suitability of the property for various uses;

4. the trends of growth or change;

5. the current or future requirements of the community as to land for various purposes as determined by population and economic studies and other studies;

6. the transportation requirements of the community;

7. the requirements for airports, housing, schools, parks, playgrounds, recreation areas and other public services;

8. the conservation of natural resources;

9. the preservation of floodplains;

10. the preservation of agricultural and forestal land;

11. the conservation of properties and their values; and

12. the encouragement of the most appropriate use of land throughout the County.

_____ B. The Isle of Wight County Planning Commission does not find that the proposed zoning map amendment is reasonable based on the consideration of the factors listed herein.

Section 2. Recommendation to Board of Supervisors.

The Planning Commission recommends to the Board of Supervisors that the request ZA-6-19 be:

___ a. Granted as submitted, and that the Board of Supervisors adopt the proposed Ordinance without modification.

___b. Denied, and that Board of Supervisors not adopt the proposed Ordinance.

___c. Granted with the proffered conditions set forth on the attached proffer statement, and that the Board of Supervisors adopt the proposed Ordinance with such conditions.

DATE: _____

READ AND PASSED:_____
Chairman, Isle of Wight County Planning Commission

TESTE:_____
Secretary, Isle of Wight County Planning Commission

Approved as to Form:

_____
Robert W. Jones, Jr., County Attorney

Isle of Wight County Schools
PREPARING STUDENTS FOR COLLEGE, CAREER AND LIFE

TO: Amy Ring, Director, Community Development
FROM: Dr. Theo Cramer, Superintendent
DATE: September 25, 2023
RE: Sweetgrass Project Revision: Conditional Zoning Request ZA-6-19; 14096 Benns Church Blvd., Smithfield, VA 23430, Tax Parcel # 32-01-009

Isle of Wight County Schools will see a significant impact from the proposed Sweetgrass development. Using the Tischler Bise Capital Impacts Model from the county, the residential units will generate additional students in the northern end of the county. The division recently rezoned the Sweetgrass area to Hardy Elementary School. Fortunately, Hardy Elementary, along with Westside Elementary, Smithfield Middle and Smithfield High have building space for the additional students.

However, there will be impacts on Isle of Wight County Schools from the enrollment increase. While the buildings may have space for the added students, the current staffing configuration does not. The projected elementary student increase will necessitate hiring at least 1 general education teacher for Hardy Elementary. An additional dedicated bus and driver is also required as the current transportation situation will not accommodate more elementary students.

Our current special education population is approximately 15% of our overall student population. Projecting with those figures, Smithfield High School will need an additional special education teacher and instructional assistant. We also expect to add a special needs bus, driver and assistant for the development.

Other impacts the division will realize include purchasing:

- Teaching resources needed for additional classrooms, teachers and students including but not limited to textbooks, instructional resources and technology resources.
- Furniture to accommodate increased enrollment.

There is the potential for other impacts, as well. IWCS must adhere to the Virginia Standards of Quality regarding class size:

"(i) 24 to one in kindergarten with no class being larger than 29 students; if the average daily membership in any kindergarten class exceeds 24 pupils, a full-time teacher's aide shall be assigned to the class; (ii) 24 to one in grades one, two, and three with no class being larger than 30 students; (iii) 25 to one in grades four through six with no class being larger than 35 students; and (iv) 24 to one in English classes in grades six through 12." § 22.1-253.13:2.

Depending on the grade levels of the new students and their course of study, there may be further staffing needs throughout the division.

In conclusion, Isle of Wight County Schools anticipates a significant financial impact from the proposed development.

Amy Ring

From: Tammie Clary <tclary@smithfieldva.gov>
Sent: Monday, October 16, 2023 10:51 AM
To: Amy Ring
Subject: RE: Sweetgrass PD-MX Conditional Zoning application

Caution: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Good Morning,

Below please find comments from the TOS Planning Commission on the proposed Sweetgrass project:

1. They believe it is a better plan than before; however, they would like to see more green space in the front of the development, removing the rear load dwellings near Recreational Area 2.
2. They would prefer greater side yard setbacks, and greater widths for the lots.
3. They are not in favor of the three house repeat.
4. They would like to see consideration to the roadways, accounting for on street parking on both sides of the street, while still allowing for two-way travel lanes.
5. They would like the opportunity to provide additional comments as the plan progresses.

Please let me know if you have any questions or concerns.

Thank you.

Best,

TAMMIE CLARY
Community Development & Planning Director
Town of Smithfield, Virginia
310 Institute St, Smithfield, VA 23430
1-(757)-365-4200

From: Amy Ring <aring@isleofwightus.net>
Sent: Wednesday, September 13, 2023 11:46 AM
To: Tammie Clary <tclary@smithfieldva.gov>
Subject: Sweetgrass PD-MX Conditional Zoning application

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Good Morning, Tammy,

You may have received a letter from us recently in regard to the upcoming public hearing for the proposed Sweetgrass conditional Planned Development-Mixed Use project on Route 10 adjacent to the Sherwin Williams paint store. As you recall, you all submitted comments on it previously, and it has since gone through several iterations since 2019. I'll be sending you the narrative, proffer statement, FIA, and TIA for your information via the Wetransfer site due to file size, should you choose to make comment. The staff report will be posted with the agenda next Wednesday evening. Have a good rest of the week, Amy

Amy M. Ring, AICP
Community Development Director
PO BOX 80, Isle of Wight, VA 23397
(757) 365-6210