A G E N D A
JAMES CITY COUNTY PLANNING COMMISSION
REGULAR MEETING
County Government Center Board Room
101 Mounts Bay Road, Williamsburg VA 23185
November 3, 2021
6:00 PM

A. CALL TO ORDER

B. ROLL CALL

C. PUBLIC COMMENT

D. REPORTS OF THE COMMISSION

E. CONSENT AGENDA

1. Minutes of the October 6, 2021 Regular Meeting

F. PUBLIC HEARINGS

1. ORD-20-0015. Zoning Ordinance Amendments to Address the Keeping of Bees in Non-Residential Districts
2. SUP-21-0016. Williamsburg Unitarian Church School
3. Z-21-0012 and MP-21-0003. Proffer and Master Plan Amendment for the Continuing Care Retirement Facility at Ford's Colony (Ford's Village)

G. PLANNING COMMISSION CONSIDERATIONS

H. PLANNING DIRECTOR'S REPORT

1. Updates to the Remote Participation Policy and the Bylaws of the Planning Commission of James City County, Virginia
2. Planning Director's Report - November 2021

I. PLANNING COMMISSION DISCUSSION AND REQUESTS

1. Final Planning Commission Working Group (PCWG) Meeting

J. ADJOURNMENT

AGENDA ITEM NO. E.1.

ITEM SUMMARY

DATE: 11/3/2021

TO: The Planning Commission

FROM: Paul D. Holt, III, Secretary

SUBJECT: Minutes of the October 6, 2021 Regular Meeting

ATTACHMENTS:

	Description	Type
🗋	Minutes of the October 6, 2021 Regular Meeting	Minutes

REVIEWERS:

Department	Reviewer	Action	Date
Planning Commission	Holt, Paul	Approved	10/27/2021 - 4:21 PM
Planning Commission	Holt, Paul	Approved	10/27/2021 - 4:21 PM
Publication Management	Daniel, Martha	Approved	10/27/2021 - 4:27 PM
Planning Commission	Holt, Paul	Approved	10/27/2021 - 4:27 PM

M I N U T E S
JAMES CITY COUNTY PLANNING COMMISSION
REGULAR MEETING
County Government Center Board Room
101 Mounts Bay Road, Williamsburg VA 23185
October 6, 2021
6:00 PM

A. CALL TO ORDER

Mr. Haldeman called the meeting to order at 6 p.m.

B. ROLL CALL

Planning Commissioners Present:
Jack Haldeman
Rich Krapf
Tim O'Connor
Frank Polster
Julia Leverenz
Barbara Null

Planning Commissioners Absent:
Rob Rose

Staff Present:
Paul Holt, Director of Community Development and Planning
Max Hlavin, Deputy County Attorney
Tori Haynes, Senior Planner
Tom Leininger, Senior Planner
Thomas Wysong, Senior Planner
Alister Perkinson, Parks Administrator, Parks and Recreation

Mr. Rich Krapf made a motion to amend the agenda to move the Consideration item after the Consent Agenda but before the Public Hearings due to the anticipated length of the meeting.

On a roll call vote, the Commission voted to approve amending the Agenda. (6-0)

On a roll call vote, the Commission voted to amend the Agenda as stated. (6-0)

(Secretary's note: The James City County Parks Master Plan Update was heard at this point in the Agenda. The Minutes for this item are recorded under item G below.)

C. PUBLIC COMMENT

Mr. Haldeman opened Public Comment.

As no one wished to speak, Mr. Haldeman closed Public Comment.

D. REPORTS OF THE COMMISSION

Ms. Barbara Null stated that the Development Review Committee (DRC) did not meet in September.

Mr. Frank Polster stated that the Policy Committee met on September 9, 2021, to consider ORD-20-0015. Zoning Ordinance Amendments to Address the Keeping of Bees in Non-Residential Phase III.

Mr. Polster stated that at its July 14, 2021 meeting, the Policy Committee continued to review and discuss amendments to the Zoning Ordinance to address the keeping of bees in non-residential districts. Mr. Polster stated that the Committee reviewed proposed performance standards, which were based on the current County regulations on residential beekeeping and the Committee's discussions at the October 15, 2020, Policy Committee meeting.

Mr. Polster stated that staff was directed to draft an Ordinance that permits beekeeping in Residential Planned Community (R-4, Commercial Uses), Limited Business (LB), General Business (B-1), Limited Business/Industrial (M-1), General Industrial (M-2), Planned Unit Development (PUD-R, Commercial Uses), Planned Unit Development (PUD-C), Research and Technology (RT), Mixed Use (MU), and Economic Opportunity (EO) Zoning Districts.

Mr. Polster stated that the Policy Committee approved the draft Ordinance and recommends approval to the Planning Commission by a vote of 4-0.

E. CONSENT AGENDA

1. Minutes of the August 4, 2021 Regular Meeting

Mr. Krapf made a motion to approve the Consent Agenda.

On a voice vote, the Commission voted to approve the Consent Agenda. (6-0)

F. PUBLIC HEARINGS

1. Z-20-0002. 2280 Lake Powell Road Rezoning

A motion to Approve w/ Conditions was made by Rich Krapf, the motion result was Passed.
AYES: 6 NAYS: 0 ABSTAIN: 0 ABSENT: 1
Ayes: Haldeman, Krapf, Leverenz, Null, O'Connor, Polster
Absent: Rose

Ms. Tori Haynes, Senior Planner, stated Mr. Benny Zhang of Kaufman and Canoles has applied on behalf of the Smith family to rezone 1.985 acres located at 2280 Lake Powell Road from R-8 Rural Residential to R-2 General Residential for the purpose of a single-family residential minor subdivision. Ms. Haynes stated that the property is designated Low Density Residential in both the current 2035 and draft 2045 Comprehensive Plans, and is inside the Primary Service Area (PSA) but per James City Service Authority (JCSA) must use private well and septic systems at this location.

Ms. Haynes stated that under the current R-8 zoning, the minimum lot size is three acres, so a subdivision of the parcel would not be possible. Ms. Haynes further stated that should the property be rezoned to R-2, the minimum lot size is 30,000 square feet for lots served by well and septic. Ms. Haynes stated that staff reviewed a preliminary plat and found that the proposal can meet the R-2 Zoning District Ordinance requirements.

Ms. Haynes stated that the gross density would be about one unit per acre. Ms. Haynes stated that the maximum subdivision potential would be one residential lot, and the maximum by-right unit potential would be one single-family unit. Ms. Haynes stated that duplexes or multifamily

units would require a Special Use Permit (SUP). Ms. Haynes stated that staff estimates an average of one student could be generated, and can be adequately accommodated by the school system.

Ms. Haynes further stated that staff finds that the proposed rezoning is consistent with the current 2035 and draft 2045 Comprehensive Plans. Ms. Haynes stated that the impact of one single-family unit would not adversely impact surrounding development and would be consistent with by-right minor subdivisions currently permitted in the R-2 Zoning District.

Ms. Haynes stated that staff recommends that the Planning Commission recommend approval of the application to the Board of Supervisors.

Mr. Haldeman called for disclosures from the Commission.

There were no disclosures.

Mr. Haldeman opened the Public Hearing.

As no one wished to speak, Mr. Haldeman closed the Public Hearing.

Mr. Krapf made a motion to recommend approval of the application.

On a roll call vote, the Commission voted to recommend approval of Z-20-0002. 2280 Lake Powell Road Rezoning. (6-0)

2. Z-19-0006 and SUP-19-0005. Hazelwood Farms - The Enterprise Center

A motion to Postpone was made by Julia Leverenz, the motion result was Passed.
AYES: 6 NAYS: 0 ABSTAIN: 0 ABSENT: 1
Ayes: Haldeman, Krapf, Leverenz, Null, O'Connor, Polster
Absent: Rose

Mr. Thomas Wysong, Senior Planner, stated that Mr. Tim Trant of Kaufman & Canoles has applied on behalf of the Hazelwood Farm property owners to rezone approximately 328 acres from its current zoning of B-1, General Business and A-1, General Agricultural to the EO, Economic Opportunity Zoning District to allow for up to 2,920,000 square feet of warehouse/industrial/office use, up to 75,000 square feet of commercial use, and up to 250 residential dwelling units. Mr. Wysong stated that accompanying this rezoning is a request for an SUP to allow for the following uses:

- Apartments;
- Multiple-family dwellings;
- Fast food restaurants;
- Truck terminals;
- The manufacture and processing of textiles and textile products in structures more than 10,000 square feet;
- Heavy equipment sales and service with major repair under cover or screened with landscaping and fencing from adjacent property;
- Machinery sales and service with major repair under cover;
- A convenience store pursuant to Section 24-11(a)(1);
- Any commercial building or group of buildings that exceeds 10,000 square feet of floor area pursuant to Section 24-11(a)(2) of the County Code;
- Any commercial building or group of buildings, not including office uses, which generates, or would be expected to generate, a total of 100 or more additional trips to and from the site during the peak hour of the operation pursuant to Section 24-11(a)(3)

of the County Code; and buildings, additions, and expansions requiring an SUP pursuant to Section 24-11(b) of the County Code; and

- Extension of public water and sewer facilities up Route 30 and along Route 746 to serve this property.

Mr. Wysong stated that the site is located inside the PSA and is designated for Economic Opportunity – Barhamsville Interchange Area in both the current 2035 and draft 2045 Comprehensive Plans. Mr. Wysong further stated that the recommended primary uses for this area include industrial, light industrial, office, medical/research, and/or tourist attraction uses with secondary uses such as retail commercial being limited in amount and type to support the primary uses.

Mr. Wysong noted that staff finds multiple favorable factors for this application and the proposed uses for this site align with the Comprehensive Plan. Mr. Wysong stated that the overall fiscal impact of this project is expected to be positive. The applicant is proposing proffers to mitigate the impacts associated with this rezoning, which include transportation improvements to the surrounding road network, design guidelines for development of the property, use limitation for certain commercial uses, commitments to sustainable residential construction, commitments to recreational facilities, commercial phasing, and the submittal of a water and sewer master plan prior to site development.

Mr. Wysong stated that, furthermore, the County is proposing conditions to mitigate impacts associated with the SUP. Mr. Wysong stated that these conditions include enhanced landscape buffering along the Barnes Road, Route 30, Route 746, and the Interstate 64 (I-64) right-of-way, enhanced site design and architectural design, and specific restrictions regarding location and site features for certain commercial uses.

Mr. Wysong stated that staff also finds that there are some unfavorable factors for this application including unmitigated impacts on the school system, no commitment to affordable and workforce housing as part of the application, and the project timeline not being guaranteed to align with the Economic Opportunity Construction Phasing Guidelines.

Mr. Wysong stated that, overall, staff finds that the proposed rezoning and SUP will not negatively impact surrounding development, and that the proffers and proposed conditions will help mitigate impacts generated by the proposal. Mr. Wysong further stated that staff finds that the development of the property is consistent with the recommended Land Use in the current 2035 Comprehensive Plan and the draft 2045 Comprehensive Plan.

Mr. Wysong stated that staff recommends that the Planning Commission recommend approval of this application to the Board of Supervisors, subject to the proposed proffers and SUP conditions.

Ms. Julia Leverenz requested clarification on an inconsistency on the build-out plan between residential and commercial space.

Mr. Wysong stated that there is a recommended Construction Phasing Policy for development on this property which requires building permits for 20% of the primary workplace square footage, as shown on the masterplan, to be issued prior to commencing any residential construction.

Mr. Wysong further stated that the second and third parts of the phasing plan would be more difficult to ensure:

> Any certificate of occupancy must be issued for at least 50% of the primary workplace square footage prior to building permits being issued for any residential unit above 50%

of the total proposed units as shown on the Master Plan; and

Prior to issuance of building permits for construction of the final 10% of the residential units, any Certificate of Occupancy must be issued for at least 90% of the primary workplace square footage, as shown on the Master Plan.

Mr. Haldeman inquired whether item XI in the Community Impact Statement would allow the developer to construct all the residential units once Certificates of Occupancy for at least 1,000,000 square feet of industrial, warehouse and/or office space have been issued.

Mr. Wysong confirmed.

Mr. Haldeman inquired if the fiscal impact analysis is based on the full build-out of commercial, industrial, and warehouse space along with the build-out of the 250 housing units.

Mr. Wysong confirmed that it was.

Mr. Haldeman noted that the total fiscal impact a full build-out is $643,000; however, if only 1,000,000 square feet is built, the positive impact from the commercial development no longer mitigates the negative fiscal impact of the residential development.

Mr. Wysong stated that it is not possible to predict how the property will be developed; however, conceptually this would be a possible scenario.

Mr. O'Connor requested that Mr. Wysong define "truck terminal" as opposed to "truck stop."

Mr. Wysong stated that the Zoning Ordinance defines "truck terminal" as a storage facility for the unloading, transferring, and storage of materials being transported by truck. A truck terminal may include facilities for the servicing and repair of trucks.

Mr. O'Connor noted that the SUP was for 60 months pending start of construction for the first commercial building. Mr. O'Connor requested confirmation that the SUP would become permanent once that requirement was fulfilled.

Mr. Wysong stated that the time limitation would end with the construction of the first commercial structure.

Mr. Krapf noted that the Master Plan was not very specific. Mr. Krapf inquired if staff felt this was a satisfactory Master Plan.

Mr. Wysong stated that this Master Plan was along the same lines as similarly large developments such as Stonehouse where you have the various land bays with land use designations and density caps.

Mr. Wysong stated that staff did work with the applicant to make the Master Plan as specific as possible. Mr. Wysong further stated that the application package was considered against the Zoning Ordinance and submittal requirement and the Master Plan met those requirements.

Ms. Leverenz inquired if the New Town Master Plan was equally vague.

Mr. Holt stated that New Town was unique in that the development was rezoned in multiple pieces with multiple Master Plans, multiple proffers. Mr. Holt stated that New Town is substantially different with a diverse mix of commercial uses and far more residential. Mr. Holt noted that with a property as large as the Hazelwood property and development of the site over time, it is not feasible to have the specificity at this level.

Mr. Haldeman called for disclosures from the Commission.

Mr. Krapf stated that he discussed the application with Mr. Trant.

Ms. Leverenz stated that she spoke with Mr. Trant.

Mr. Polster and Mr. Haldeman stated that they also spoke with Mr. Trant.

Mr. Haldeman opened the Public Hearing.

Mr. Trant gave a presentation highlighting the history and the main features of the application. Mr. Trant also outlined the various items the Hazelwood family had done as an investment in making the property ready for development.

Mr. Polster inquired about what the applicant needed to move to the next tier in the Virginia Business Ready Site Program.

Mr. Trant stated that the project is currently at Tier 2 and looking to move to Tier 3. Mr. Trant stated that for Tier 3, it would be necessary to have the correct Zoning in place, which is part of the application. Mr. Trant further stated that having utilities in place was the criteria to move to Tier 4.

Mr. Polster inquired if the Hazelwood family had considered how the cost of infrastructure would be handled.

Mr. Trant stated that the Applicant team reviewed many factors to determine the cost to install adequate utilities to handle this development as well as existing commercial properties. Mr. Trant further stated that the process also included discussion of how the costs would be shared with the neighboring properties.

Mr. Polster inquired if the Applicant was prepared to cover the cost of installing the utilities or would that be left to the developer.

Mr. Trant stated that the Applicant is aware that to attract the type of development they intend for the property water and sewer must be available. Mr. Trant stated that it is likely that the applicant will be responsible for the connection to public utilities.

Mr. Polster stated that he would be more comfortable with the application if there were assurances in the proffers for the water and sewer connection.

Mr. Trant stated that this would be a significant expense for the applicant in addition to the investments the applicant has already made. Mr. Trant noted that this would be a windfall for the existing businesses and future development at the applicant's expense. Mr. Trant stated that without a mechanism to recoup that cost, the applicant could not commit to a proffer to be responsible for connecting to public utilities.

Ms. Leverenz inquired about the distance from the I-64 interchange to the entrance to the Spine Road.

Mr. Trant stated that the distance is approximately 1,500 feet.

Mr. Krapf stated that he is struggling with the lack of specificity for the anticipated uses. Mr. Krapf noted that there are restrictions on certain businesses to mitigate impacts on neighboring properties. Mr. Krapf further noted that other manufacturing uses were listed for several areas

on the Master Plan. Mr. Krapf inquired if those uses would be limited to one or if they could occur in multiple land bays.

Mr. Trant stated that if several similar manufacturers were identified, they could each go in a separate land bay. Mr. Trant noted that the SUP uses were carefully selected and most had the same or less impact than the by-right uses.

Mr. O'Connor inquired if anything would prevent a convenience store or fast food restaurant to be constructed on well and septic within the 60 months, making the SUP valid.

Mr. Wysong stated that connection to public water and sewer are required for commercial uses in the Economic Opportunity District.

Mr. Krapf inquired if there has been consideration of the amount of water required for the development at build-out.

Mr. Arch Marston, AES Consulting Engineers, stated that the applicant has been in discussion with the JCSA over the last five years. Mr. Marston stated that using figures from the Health Department, they developed an analysis based on acreage. At that time the JCSA determined that the supply would be adequate.

Mr. Polster inquired if the JCSA considered the upper limit placed on the County for its water draw.

Mr. Wysong stated that the JCSA considers this limit whenever it reviews a legislative case as part of its water and sewer impact report.

Mr. O'Connor inquired about the intensity of this development compared to what might be developed with fewer restrictions.

Mr. Jason Grimes, AES Consulting Engineers, stated that the applicant team considered the existing infrastructure to determine capacity to determine what types of uses could be accommodated with only modest improvements as opposed to setting a development plan and then looking at what improvements would be needed to handle the impacts.

Ms. Darlene Previsch, 211 Old Stage Road, addressed the Commission with concerns about the impact of the development on the surrounding community.

Ms. Sharon Oakley, 18555 New Kent Highway, addressed the Commission with concerns about the traffic impacts.

Mr. Scott Maye, 2624 Meadow Lake Drive, addressed the Commission with concerns about lack of public notification, the size of the development, and the impact on the surrounding community.

Mr. Mike Ballard, 2640 Meadow Lake Drive, addressed the Commission with concerns about the impacts from the industrial park and residential development on traffic and schools.

Ms. Melanie Smith, 9347 Barnes Road, addressed the Commission with concerns about the impacts of the residential development on Stonehouse Elementary School. Ms. Smith also noted that there are existing industrial buildings that remain empty and previously approved projects that have not been built out.

Mr. Rick Newberg, 2637 Meadow Lake Drive, addressed the Commission with

concerns about quality of life decreasing as development occurs.

Mr. William Hewitt, 8641 Merry Oaks Lane, addressed the Commission with concerns about the traffic impacts on Merry Oaks Lane, Route 60, and Route 30.

Mr. Dale Ohmann, 2612 Meadow Lake Drive, addressed the Commission with concerns about the impact of development on the character of the community and the quality of life.

Ms. Sharon Seltzer, 9809 Fire Tower Road, addressed the Commission on the need for more public notification and public input. Ms. Seltzer also commented on the impact of development on the character of the community and the quality of life.

Mr. Chris Taylor, 3921 Powhatan Parkway, addressed the Commission in support of the application.

Mr. Kimber Smith 3051 Heritage Landing Road, addressed the Commission in support of the application.

Mr. Donald Prevish, 211 Old Stage Road, addressed the Commission on the impact of the development on traffic.

As no one else wished to speak, Mr. Haldeman closed the Public Hearing.

Mr. Haldeman opened the floor for discussion by the Commission.

Ms. Null stated that the citizens have presented valid concerns that need to be addressed before moving the application forward. Ms. Null stated that she is especially concerned about the impact on traffic, schools, and public services with the residential development. Ms. Null noted that residential development rarely pays for itself.

Mr. Krapf stated that application, if approved, will forever change upper James City County. Mr. Krapf stated that there are a number of positive factors associated with the project. Mr. Krapf stated that it meets the criteria for the Economic Opportunity Zoning District. Mr. Krapf stated that a particularly positive factor is that this is a cohesive development plan for the parcel rather than piecemeal development. Mr. Krapf further stated that there are also enough concerns that call for further review and analysis. Mr. Krapf stated that his main concern is the open-endedness of the proposal. Mr. Krapf stated that until the full scope of the project is known, he would not be able to support the application.

Ms. Leverenz stated that the application is consistent with the Comprehensive Plan which is something the Commission is obligated to consider heavily. Ms. Leverenz further stated that she appreciates the Hazelwood family's desire to lock in a vision for development of the property. Ms. Leverenz stated that she does not find that the application is quite ready to move forward. Ms. Leverenz stated that there are too many open-ended questions to be addressed. Ms. Leverenz further stated that she is very concerned that the proposal does not adhere to the County's Economic Opportunity Construction Phasing Guidelines. Ms. Leverenz stated that there were too many unanswered questions for her to support the application at this time.

Mr. Polster stated that he remembers the Hazelwood family's presentation to the DRC in 2018. Mr. Polster stated that Mr. Hazelwood pointed out that the property is at the northern edge of the Foreign Trade Zone. Mr. Polster stated that having parts come in, be assembled, and the product distributed is the type of light industry with tool tax that the County envisioned. Mr. Polster stated that during the recent Comprehensive Plan review, he was very protective

of the existing language that described the County's vision for this property. Mr. Polster stated that the plan presented by the Hazelwood family in 2018, was very consistent with the Comprehensive Plan language. Mr. Polster stated that what has changed his perspective is the open ended proposal currently before the Commission. Mr. Polster stated that the Design Guidelines are well thought out; however, they may not adequately mitigate the size of the development that may occur. Mr. Polster noted that he wished there could be compromise on some of the SUP elements to make the scale more modest. Mr. Polster stated that he does not believe that the Commission has enough information to make a recommendation to the Board of Supervisors at this time.

Mr. Polster inquired if the SUP and the Rezoning for the Enterprise Center would be voted on individually.

Mr. Holt stated that for the Enterprise Center, there would be one vote for the SUP and the Rezoning together. Mr. Holt noted that the two are intertwined where it would not really be possible to cleanly separate them.

Mr. Holt stated that he wanted to clarify that there is a substantial amount of information in the Traffic Impact Study that talks about trip generations. Mr. Holt further stated that all of the data had been reviewed, validated, and approved by the Virginia Department of Transportation (VDOT). Mr. Holt stated that based on the size of the proposed development, the County hired an independent third party review the data. Mr. Holt stated that with the proposed improvements, of which there are many, there is agreement between VDOT and the independent third party that the traffic impacts should be mitigated and the Level of Service would be maintained as generally acceptable.

Mr. Holt stated that, as further clarification, there is the Rezoning that will cover all of the by-right uses for the Economic Opportunity District, a handful of SUP uses associated with that Zoning District, and the Commercial SUP that covers any building over 10,000 square feet or a use that generates more than 100 peak hour trips. Mr. Holt stated that it is important to know that warehouse and office uses are exempt from the SUP provisions. Mr. Holt noted that most of the development would be warehouses, therefore, the provisions that trigger the Commercial SUP would not apply.

Mr. Polster reiterated his question about whether the votes for the SUP and the Rezoning could be separated.

Mr. Holt stated that he would find it difficult to pull them apart at this time.

Mr. Polster stated that he concurs with the concerns about the open-ended application. Mr. Polster further stated that he is disappointed that there is no Affordable Housing component to the application which needs to be included for the Workforce needed for the various industries. Mr. Polster stated that he was also concerned by the lack of a proffer to mitigate school impacts; particularly for Stonehouse Elementary School. Mr. Polster stated that he would not support the application.

Mr. O'Connor thanked the applicant for coming forward with a thoughtful application. Mr. O'Connor stated that the Economic Opportunity Zoning has existed for roughly 20 years, yet this is the first application submitted. Mr. O'Connor stated that this application has all of the features established in the Comprehensive Plan. Mr. O'Connor stated that there would be similar conversations about other properties in the future. Mr. O'Connor noted that there would be the same issues and discussion regarding traffic then. Mr. O'Connor further stated that the Stonehouse Development has reduced its size by 1,000 homes which should mitigate some of the concerns about this proposal. Mr. O'Connor stated that he is concerned about the open ended Master Plan but he also sees the need for flexibility. Mr. O'Connor further

stated that he would like to see a single-family residential component to the project. Mr. O'Connor stated that after listening to the presentation and discussion, he has become more supportive of the application than he was previously.

Mr. Haldeman stated that his reservation is with the residential component. Mr. Haldeman stated that because that reservation is particularly grave he is unable to support the entire application. Mr. Haldeman stated that for this project, the residential component is out of place, unnecessary, places a substantial fiscal risk on taxpayers, and unnecessarily increases traffic. Mr. Haldeman further stated that there is no assurance that the development will include Affordable Housing. Mr. Haldeman stated that the housing will put additional pressure on Stonehouse Elementary which is near capacity and Warhill High School which is approaching its capacity. Mr. Haldeman stated that per the Zoning Ordinance, the purpose of the Economic Opportunity District is to facilitate economic development, increase the nonresidential tax base and create jobs. Mr. Haldeman stated that also in the Zoning Ordinance language, the principal uses and development form should optimize the economic development potential of the area and encourage development types that have attributes that offer a positive fiscal contribution, provide quality jobs, enhance community values, are environmentally friendly, and support economic stability. Mr. Haldeman stated that all of this project meets the Ordinance description except the residential portion. Mr. Haldeman stated that the Comprehensive Plan description mirrors the language in the Zoning Ordinance and there is no mention of residential development. Mr. Haldeman stated that without the residential component, the project would be everything that the County is looking for.

Mr. O'Connor stated that from the Planning Commission perspective, consideration needs to be given to what the impacts to the community would be if the parcel was subdivided and developed by-right. Mr. O'Connor stated that by having a Master Plan and by having SUP conditions, it provides a controlled outcome. Without those guidelines, there would not be any congruity of design or scale. Mr. O'Connor stated that if the parcel were to be maximized, the end result might not be a good fit for the community.

Ms. Leverenz stated the plan has many favorable factors but it is not the right plan at this time. Ms. Leverenz stated that with additional work and some modifications the proposal could be what the County is looking for. Ms. Leverenz stated that locking in the development of this parcel would be very good for the County.

Ms. Null stated she is not opposed to the project other than the residential housing and the traffic impacts. Ms. Null stated that she finds the location to be appropriate for an industrial park, but has reservations about whether the demand will be enough to fill the available space given the Stonehouse Commerce Park and the Moss Creek development. Ms. Null stated that she would like for the applicant to clarify certain aspects and bring the application back for consideration.

Mr. Holt stated that the Commission has the option to make a motion and send the matter to the Board of Supervisors, defer the vote, or entertain a motion from the applicant should they wish to postpone.

Mr. Trant stated that the Hazelwood family has said from the beginning that they want to do this right and have an application that the County embraces. Mr. Trant stated that if it would please the Commission to have more time, the applicant would welcome that. Mr. Trant stated that the applicant is more than willing to work with the County and the community to address concerns.

Ms. Leverenz stated that this would address concerns from the community that they did not have enough time to consider and understand the proposal.

Mr. Polster stated that he also would welcome a deferral. Mr. Polster stated that he would like to better understand the scale of the development and how the traffic analysis triggers would modify the intensity.

Mr. O'Connor inquired about the parameters of the deferral.

Mr. Holt stated that the matter would be deferred to a date certain. Mr. Holt stated that he would lean to the applicant to determine the amount of time needed to provide the necessary responses.

Mr. Trant stated that the January meeting should give adequate time to come to some resolutions.

Mr. Holt stated that under the Planning Commissions Deferral Policy, the Commission can defer for up to 100 days which would take it to January 5, 2022. Mr. Holt further stated that there is a component of State Code that provides that if the Planning Commission does not act within 100 days, the application would automatically go to the Board of Supervisors.

Mr. Haldeman inquired about the form of the motion.

Mr. Holt stated that the motion would be to postpone the matter to January 5, 2022.

Mr. O'Connor inquired if staff had enough information from the Commission to have a dialogue with the applicant.

Mr. Holt stated that if the Commission was looking for specific items, data, or specific analysis, staff and the applicant would need to know what those were.

Mr. Polster stated that what he wanted to understand what the implications were that led the conclusion that the infrastructure would support a certain number of 10,000 square foot building or a certain number of square feet from that. Mr. Polster stated that he was trying to understand the intensity of the development for the 10,000 square foot components in the SUP. Mr. Polster further stated that he wanted to understand the modeling used to tie in the intensity of the development and the impacts of the traffic.

Mr. Grimes stated that they can provide the different scenarios considered and how they would fit within the project. Mr. Grimes stated that the flexible options are because the end users are not yet known.

Mr. Holt stated with the range of allowable uses, there is no feasible way to model all of the various scenarios and combinations. Mr. Holt stated that the Traffic Study only modeled three uses. Mr. Holt stated that ultimately the traffic cap in the proffers could not be exceeded. Mr. Holt stated that the protections in the proffers and the SUP conditions led staff to find that the impacts would be mitigated.

Ms. Leverenz stated that she would like to see a specific plan for providing water and sewer; information on the adequacy of the planned roundabouts for truck traffic; a revision to the phasing of the residential development, if not in compliance with the County's phasing policy, then skewed toward the end of the commercial development; and consider the potential of bringing forward more specific master plans for the land areas as they are developed.

Ms. Leverenz made a motion to postpone the consideration of the matter to January 5, 2022.

On a roll call vote the Commission voted to postpone consideration of Z-19-0006 and SUP-19-0005. Hazelwood Farms - The Enterprise Center to its Regular Meeting on January 5, 2022.

3. SUP-19-0006. Hazelwood Farms - The Village Center

A motion to Approve w/ Conditions was made by Frank Polster, the motion result was Passed.
AYES: 6 NAYS: 0 ABSTAIN: 0 ABSENT: 1
Ayes: Haldeman, Krapf, Leverenz, Null, O'Connor, Polster
Absent: Rose

Mr. Thomas Wysong, Senior Planner, stated that Mr. Tim Trant of Kaufman & Canoles has applied on behalf of Hazelwood Farms LLC and Hazelwood R M, III, Trustee, et al for an SUP on approximately 79 acres to permit up to approximately 510,000 square feet of commercial development to allow for the following specially permitted uses on the properties:

- A convenience store which sells and dispenses fuel;
- Extension of public water and sewer facilities;
- Commercial buildings or groups of buildings that exceed 10,000 square feet of floor area pursuant to County Code Section 24-11(a)(2) and within the square footage limits shown on the Master Plan;
- Commercial buildings or groups of buildings, not including office uses, which generate, or would be expected to generate, a total of 100 or more additional trips to and from the site during the peak hour of the operation pursuant to County Code Section 24-11(a)(3); and
- Any buildings, additions, and expansions requiring an SUP pursuant to County Code Section 24-11(b).

Mr. Wysong stated that the site is located inside the PSA and is designated for Mixed Use-Stonehouse in both the current 2035 and draft 2045 Comprehensive Plans. Mr. Wysong further stated that for the area between I-64 and Old-Stage Road, the Comprehensive Plan specifically recommends community–scale commercial uses such as shopping centers, hotels, restaurants, and office uses.

Mr. Wysong stated that staff is proposing conditions to mitigate impacts associated with the proposed uses. Mr. Wysong further stated that the conditions include construction of the transportation improvements recommended in the Traffic Impact Analysis for this project, enhanced landscape buffering along the Barnes Road, Route 30, and Interstate-64 right- of-way, enhanced site design and architectural design for each building, incorporation of sustainable design initiatives, and specific restrictions regarding location and site features for certain commercial uses to protect community character.

Mr. Wysong stated that staff finds that the SUP will not negatively impact surrounding development, and the proposed conditions will help mitigate impacts generated by the proposal. Staff also finds that the development of the property for the proposed commercial uses is consistent with recommended uses and GSAs in the current 2035 and draft 2045 Comprehensive Plans.

Mr. Wysong stated that staff recommends that the Planning Commission recommend approval of this application to the Board of Supervisors, subject to the proposed SUP conditions.

Mr. Polster inquired if condition for installation of water and sewer facilities for the commercial area was the same as for The Enterprise Center. Mr. Polster further inquired if there was a 60-

month condition for commencing construction of at least one of the specially permitted uses.

Mr. Wysong stated that the 60-month stipulation is the same as for The Enterprise Center. Mr. Wysong further stated that he would need to check the requirements of the B-1 Zoning District regarding whether public water and sewer is required.

Mr. Polster inquired about the scenarios that drove the traffic analysis for The Village Center.

Mr. Wysong stated that he would defer to the applicant on that question; however, the recommended traffic improvements were based on the analysis done by the County's consultant.

Mr. Holt stated that the traffic analysis was modeled on the amount of square footage for the shopping center. Mr. Holt further stated that he does not believe there is a requirement in the B-1 Zoning District to connect to public water and sewer.

Mr. Polster requested verification that there must be a first structure on the property within 60 months, not including the water and sewer facilities.

Mr. Holt confirmed that a first structure must be constructed within the 60-month timeframe. Mr. Holt noted that the SUP was necessary to extend water and sewer to this property so that it could also be extended for the uses on the Economic Opportunity property.

Mr. O'Connor inquired if there were plans to improve this interchange in the near future.

Mr. Holt stated that there were no plans at this time.

Mr. O'Connor inquired if it was a matter of land acquisition or simply not being designated as needing improvement.

Mr. Holt stated that the interchange was operating satisfactorily at this time and that the improvements proposed in the two applications would allow the interchange to continue to operate at acceptable levels.

Ms. Leverenz stated that there is a discrepancy where the SUP conditions state that no single building shall exceed 70,000 square feet and the Design Guidelines state that buildings over 70,000 square feet shall not be subject to the Design Guidelines.

Mr. Wysong stated that the SUP conditions would be the controlling document.

The Commission inquired if there was an update on whether the B1 Zoning District required connection to public water and sewer.

Mr. Wysong stated that the Zoning Ordinance did not require it.

Mr. Holt stated that staff would then look to the JCSA regulations which stipulate connecting to public water and sewer when within a certain distance from existing lines. Mr. Holt further stated that the SUP is required if water and sewer must be extended.

Mr. Haldeman called for disclosures from the Commission.

Mr. Krapf, Mr. O'Connor, Mr. Polster, and Mr. Haldeman stated that they had spoken with Mr. Trant.

Mr. Haldeman opened the Public Hearing

Mr. Tim Trant, Kaufman & Canoles, PC, representing the Hazelwood family, made a presentation to the Commission on the proposed project.

Mr. Krapf noted that SUP would be valid for any commercial buildings or group of buildings that exceed 10,000 square feet of floor area and commercial buildings or group of buildings, not including office uses, which generates, or would be expected to generate, a total of 100 or more additional trips. Mr. Krapf stated that he was looking for specificity on how many buildings over 10,000 square feet would be permitted.

Mr. Krapf noted that there was already an approved Master Plan for the Moss Creek parcel that included office and warehouse, convenience store with fuel sales, restaurants and retail. Mr. Krapf further noted that there was the Stonehouse Land Bay V Master Plan which is designated for up to 180 residential units. Mr. Krapf inquired if the applicant had any concern that the Moss Creek development would impact this proposal.

Mr. Trant stated that there may be some overlapping uses; however, this is not an impediment to the project. Mr. Trant stated that there would be more than sufficient demand for those services in that location. Mr. Trant noted that, in regard to the size and arrangement of buildings on the property, the Design Team positioned the development in land bays with the associated square footage to give a sense of scale and order. Mr. Trant noted that there would be commercial outparcels along Route 60 and a larger shopping center area on the interior.

Mr. John Hopke, Hopke & Associates, stated that the design goal was for the complex to look like an assembly of building rather than having the giant monolithic buildings.

Mr. Norris L. Shave, 9563 Barnes Road, addressed the Commission with concerns about the traffic impacts of the proposal.

Mr. William Hewitt, 8741 Merry Oaks Lane, addressed the Commission about the impacts of the project on Barnes Road.

Mr. Kimber Smith, 3051 Heritage Landing Road, stated that he had provided comments in support of both proposals in his comments on The Enterprise Center.

Mr. John Lockwood, 20251 Triangle Road, addressed the Commission with Concerns about traffic impacts for both applications.

Ms. Carol Coomer, 9825 Hidden Nest, addressed the Commission with concerns about the lack of notification to Stonehouse residents.

Ms. Darlene Prevish, 211 Old Stage Road, addressed the Commission with concerns about the public notification process.

As no one else wished to speak, Mr. Haldeman closed the Public Hearing.

Mr. Haldeman opened the floor for discussion by the Commission.

Mr. O'Connor stated that, for clarification, the traffic study was performed by the applicant's consultant. Mr. O'Connor further stated that staff had a third party traffic study done by the County's on-call consultant. Mr. O'Connor stated that staff reviewed and considered the findings of both studies. Mr. O'Connor stated that one of the unintended, but beneficial, consequences of the traffic study is the recommendation that the entrance to the Moss Creek Commerce Center be shifted to Barnes Road and signalized.

Mr. Polster stated that predictions for where growth would occur in the County focus on the upper part of the County. Mr. Polster further stated that the amenities proposed for The Village Center would be required to meet the demands of residents in that area. Mr. Polster stated that he appreciated the coordination between the applicant and the Stonehouse Development on the traffic study and the signalization. Mr. Polster stated that he would support the application.

Mr. Krapf stated that he finds the application to be favorable since the scale is more modest in scale, and the SUP was being requested to allow uses for the property as it is currently zoned. Mr. Krapf further stated that the development is envisioned as an entertainment, retail, office, and business support center. Mr. Krapf noted that these are services that could benefit the existing community and anticipated future growth.

Mr. Krapf stated that he has some concerns about an open-ended series of 10,000 square foot buildings; however, the applicant's explanation of trying to create the appearance of individual components was a very thoughtful solution. Mr. Krapf stated that he would support the application.

Mr. O'Connor inquired if the Director of Planning will review the building plans to ensure consistency with the Design Guidelines.

Mr. Holt stated that when building permits are pulled, they will be reviewed against the Design Guidelines. Mr. Holt stated that inconsistencies would be brought to the DRC for a determination.

Mr. Polster made a motion to recommend approval of the application with the conditions recommended by staff.

On a roll call vote, the Commission voted to recommend approval of SUP-19-0006. Hazelwood Farms - The Village Center. (6-0)

G. PLANNING COMMISSION CONSIDERATIONS

1. James City County Parks Master Plan Update

A motion to Approve was made by Frank Polster, the motion result was Passed.
AYES: 6 NAYS: 0 ABSTAIN: 0 ABSENT: 1
Ayes: Haldeman, Krapf, Leverenz, Null, O'Connor, Polster
Absent: Rose

Mr. Tom Leininger, Senior Planner, stated that over the past year and a half, a committee led by Parks and Recreation, Planning, and General Services had been working on the Master Plan updates to three parks, Upper County Park, James City County Recreation Center, and Warhill Sports Complex.

Mr. Leininger stated that on April 9, 2021, the James City County Board of Supervisors endorsed updating the Master Plans of three parks in the County. On July 21, 2021, this item was placed on the DRC agenda as a discussion item.

Mr. Leininger stated that Alister Perkinson from Parks and Recreation would provide additional details to the master plan updates and the next steps for each park.

Mr. Alister Perkinson, Parks Administrator, provided an overview of each Master Plan and the anticipated improvements and amenities. Mr. Perkinson stated that the next step after this meeting would be to present the update to the Board of Supervisors.

Ms. Null inquired about the use of synthetic turf at Warhill Sports Complex as proposed at the DRC.

Mr. Perkinson stated that the two lighted softball fields and the two lighted baseball fields would be synthetic turf.

Mr. Haldeman inquired about potential use of the small parcel on the other side of Longhill Road from the Warhill Sports Complex.

Mr. Perkinson stated that the parcel was considered; however, any development would be difficult at this time due to the infrastructure it would require.

Mr. Polster made a motion to recommend approval of the Master Plans to the Board of Supervisors.

On a roll call vote the Commission voted to recommend approval of the Master Plans for Upper County Park, JCC Recreation Center and Warhill Sports Complex. (6-0)

H. PLANNING DIRECTOR'S REPORT

1. Planning Director's Report - October 2021

Mr. Holt stated that he had nothing to add to what was provided in the Agenda packet.

I. PLANNING COMMISSION DISCUSSION AND REQUESTS

Mr. Haldeman noted that Mr. O'Connor was scheduled to represent the Commission at the October Board of Supervisors meeting; however, there were no cases going forward.

Mr. Polster inquired if the Commission would be reviewing he Comprehensive Plan process on November 6, 2021.

Mr. Holt stated that the process review would be held on November 10, 2021.

J. ADJOURNMENT

Ms. Null made a motion to adjourn.

The meeting was adjourned at approximately 9:36 pm.

_____ _____

Paul D. Holt, III, Secretary Jack Haldeman, Chair

AGENDA ITEM NO. F.1.

ITEM SUMMARY

DATE:	11/3/2021
TO:	The Planning Commission
FROM:	Terry Costello, Deputy Zoning Administrator/Senior Planner
SUBJECT:	ORD-20-0015. Zoning Ordinance Amendments to Address the Keeping of Bees in Non-Residential Districts

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ATTACHMENTS:

	Description	Type
🗋	Memorandum	Cover Memo
🗋	Draft Ordinance	Ordinance
🗋	Initiating Resolution	Backup Material

REVIEWERS:

Department	Reviewer	Action	Date
Planning Commission	Holt, Paul	Approved	10/25/2021 - 8:37 AM
Planning Commission	Holt, Paul	Approved	10/25/2021 - 8:39 AM
Publication Management	Daniel, Martha	Approved	10/25/2021 - 8:43 AM
Planning Commission	Holt, Paul	Approved	10/25/2021 - 9:21 AM

M E M O R A N D U M

DATE: November 3, 2021

TO: The Planning Commission

FROM: Terry Costello, Deputy Zoning Administrator/Senior Planner

SUBJECT: ORD-20-0015. Zoning Ordinance Amendments to Address the Keeping of Bees in Non-Residential Districts

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Introduction

At its September 8, 2020 meeting, the Board of Supervisors approved the keeping of bees in Residential Districts (R-1, Limited Residential District; R-2, General Residential District; R-3, Residential Redevelopment District; R-4, Residential Planned Community District; R-5, Multifamily Residential District; and PUD-R, Planned Unit Development Districts, Residential) with performance standards. Additionally, the Board of Supervisors adopted an Initiating Resolution to address beekeeping in non-residential districts (R-4, Residential Planned Community District, Commercial Uses; LB, Limited Business; B-1, General Business; M-1, Limited Business/Industrial; M-2, General Industrial; PUD-R, Planned Unit Development, Commercial Uses; PUD-C, Planned Unit Development; RT, Research and Technology; MU, Mixed Use; and EO, Economic Opportunity Zoning Districts).

Pollinators contribute substantially to the economy. According to the Presidential Memorandum titled, "Creating a Federal Strategy to Promote the Health of Honey Bees and other Pollinators" dated June 20, 2014, honeybee pollination adds more than $15 billion in value to agricultural crops each year in the United States. There are also a number of valuable non-food products produced by the honeybee, such as beeswax used in cleaning and beauty supplies. Over the past few decades, there has been a significant loss of pollinators, which include honeybees.

At the state level, there have been several initiatives to support beekeeping in the Commonwealth. On March 30, 2012, the Virginia General Assembly created the Beehive Grant Program to assist individuals who desire to keep bees. On August 31, 2016, the Virginia Department of Agriculture and Consumer Services adopted Best Management Practices (BMPs) for the Operation of Apiaries in Order to Limit Operator Liability. These BMPs are voluntary, except that those seeking certain liability protections provided for under State Code must comply with the BMPs.

Overview

Staff conducted research on other localities regarding the keeping of bees in non-residential districts. To provide consistency, the same localities that were surveyed as part of the Residential Beekeeping Ordinance were used for this review. Most of the localities that allow beekeeping in residential districts do not permit beekeeping in non-residential districts. Fairfax County allows this use in non-residential districts, as well as Isle of Wight County. However, the only non-residential district in Isle of Wight County where the use is permitted is the Village Center District, which is similar to James City County's Mixed Use District. Both localities use the same standards for residential and non-residential districts. Some localities such as the Cities of Hampton, Norfolk, and Williamsburg do not address beekeeping in their Ordinances; due to the nature of the Ordinances, this allows the use to occur.

Staff presented Phase I materials at the October 15, 2020 meeting of the Policy Committee. Staff presented three options should the Policy Committee wish to move forward with allowing beekeeping in non-residential zoned districts. One option was to encourage all beekeepers to voluntarily follow the Virginia Department of Agriculture and Consumer Services BMPs that were adopted by the State of Virginia; the

second was to apply the residential beekeeping standards to non-residential properties; and the third was to develop standards in the Special Regulations section of the Zoning Ordinance applicable to non-residential properties only. At this meeting, the Policy Committee directed staff to develop performance standards for non-residential properties similar to the format for residential properties.

Staff presented performance standards for ground mounted hives as well as rooftop hives at the July 15, 2021 meeting of the Policy Committee. The proposed standards included the residential ones as well as requiring notification in situations where there were multiple tenants and signage. Standards proposed for rooftop hives included distances from the edge, requirement of a strapping system, and signage. The Committee decided there should be no restrictions as far as beekeeping being an accessory use or a primary use. The Committee directed staff to prepare a draft Ordinance based on the agreed upon performance standards.

Staff presented the draft Ordinance at the September 9, 2021 meeting of the Policy Committee. After further discussion, the requirement of notifying adjacent property owners was deleted from the draft Ordinance due to the regulation being unenforceable. The Policy Committee recommended approval of the Ordinance to the Planning Commission.

Recommendation

Staff recommends that the Planning Commission recommend approval of the attached Ordinance to the Board of Supervisors.

TC/md
ZOA20-15BeekpNRD-mem

Attachments:
1. Draft Ordinance
2. Initiating Resolution

ORDINANCE NO._____

AN ORDINANCE TO AMEND AND REORDAIN CHAPTER 24, ZONING, OF THE CODE OF THE COUNTY OF JAMES CITY, VIRGINIA, BY AMENDING ARTICLE II, SPECIAL REGULATIONS, DIVISION 1, IN GENERAL, SECTION 24-47.1, STANDARDS FOR BEEKEEPING; AND BY AMENDING ARTICLE V, DISTRICTS, DIVISION 5, RESIDENTIAL PLANNED COMMUNITY DISTRICT, R-4, SECTION 24-281, USE LIST; DIVISION 9, LIMITED BUSINESS DISTRICT, LB, SECTION 24-368, USE LIST; DIVISION 10, GENERAL BUSINESS DISTRICT, B-1, SECTION 24-390, USE LIST; DIVISION 11, LIMITED BUSINESS/INDUSTRIAL DISTRICT, M-1, SECTION 24-411, USE LIST; DIVISION 12, GENERAL INDUSTRIAL DISTRICT, M-2, SECTION 24-436, USE LIST; DIVISION 13, RESEARCH AND TECHNOLOGY DISTRICT, RT, SECTION 24-461, USE LIST; DIVISION 14, PLANNED UNIT DEVELOPMENT DISTRICTS, PUD, SECTION 24-493, USE LIST; DIVISION 15, MIXED USE, MU, SECTION 24-518, USE LIST; AND DIVISION 17, ECONOMIC OPPORTUNITY, EO, SECTION 24-536.4, USE LIST.

BE IT ORDAINED by the Board of Supervisors of the County of James City, Virginia, that Chapter 24, Zoning, is hereby amended and reordained by amending Article II, Special Regulations, Division 1, In General, Section 24-47.1, Standards for beekeeping, and by amending Article V, Districts, Division 5, Residential Planned Community District, R-4, Section 24-281, Use List; Division 9, Limited Business District, LB, Section 24-368, Use List; Division 10, General Business District, B-1, Section 24-390, Use List; Division 11, Limited Business/Industrial District, M-1, Section 24-411, Use List; Division 12, General Industrial District, M-2, Section 24-436, Use List; Division 13, Research and Technology District, RT, Section 24-461, Use List; Division 14, Planned Unit Development Districts, PUD, Section 24-493, Use List; Division 15, Mixed Use, MU, Section 24-518, Use List; and Division 17, Economic Opportunity, EO, Section 24-536.4, Use List.

Chapter 24. Zoning

Article II. Special Regulations

Division I. In General

Sec. 24-47.1. Standards for beekeeping.

(a) Beekeeping on residentially zoned property shall comply with the following requirements:

(~~a~~*1*) Hives shall be at least ten feet away from public rights-of-way and the boundary lines of properties not owned or controlled by the person maintaining the hive.

(~~b~~2) Hives shall be at least 50 feet away from any dwelling or structure located on property not under the same ownership or control as that of the person maintaining the hive.

(~~c~~3) A barrier shall be required if a hive is located between ten and 30 feet from a public right-of-way or boundary line of a property not owned or controlled by the person maintaining the hive. The barrier shall consist of fencing, vegetation, or both, and must (i) be no less than six feet in height as measured from finished grade; (ii) be of sufficient density to establish bee flyways six feet or higher; (iii) be located between the hive and public right-of-way or property boundary line; and (iv) extend no less than ten feet in length on either side of the hive.

(~~d~~*4*) Hives shall be located within the rear yard of the lot and shall be orientated with the entrance facing internal to the property.

(~~e~~5) There shall be an on-site water source located within 50 feet of the hive, or less than half the distance to the nearest unnatural source of water, whichever is closest.

(~~f~~6) If the property on which the hive is located is less than one acre, the person maintaining the hive shall have no more than six colonies. If the property is one acre or more, the number of colonies shall not be limited.

(b) Beekeeping on non-residentially zoned property shall comply with the requirements of subsection (a) and the following:

(1) There shall be a permanent sign, not to exceed four square feet in size, on the property stating that bees are on the premises. The sign shall be attached to the building and shall not be illuminated.

(2) Hives located on rooftops shall:
(a) Be located only on flat roofs.
(b) Be at least six feet from the edge of the roof.
(c) Include a strapping system to ensure hives are secure.

Article V. Districts

Division 5. Residential Planned Community, R-4

Sec. 24-281. Use list.

Use Category	Use List	Permitted Uses	Specially Permitted Uses
Commercial Uses	*Beekeeping in accordance with section 24-47.1*	*P*	

Division 9. Limited Business District, LB

Sec. 24-368. Use list.

Use Category	Use List	Permitted Uses	Specially Permitted Uses
Commercial Uses	*Beekeeping in accordance with section 24-47.1*	*P*	

Division 10. General Business District, B-1

Sec. 24-390. Use list.

Use Category	Use List	Permitted Uses	Specially Permitted Uses
Commercial Uses	*Beekeeping in accordance with section 24-47.1*	*P*	

Division 11. Limited Business/Industrial District, M-1

Sec. 24-411. Use list.

Use Category	Use List	Permitted Uses	Specially Permitted Uses
Commercial Uses	*Beekeeping in accordance with section 24-47.1*	*P*	

Division 12. General Industrial District, M-2

Sec. 24-436. Use list.

Use Category	Use List	Permitted Uses	Specially Permitted Uses
Commercial Uses	*Beekeeping in accordance with section 24-47.1*	*P*	

Division 13. Research and Technology District, RT

Sec. 24-461. Use list.

Use Category	Use List	Permitted Uses	Specially Permitted Uses
Commercial Uses	*Beekeeping in accordance with section 24-47.1*	*P*	

Division 14. Planned Unit Development Districts, PUD

Sec. 24-493. Use list.

(a) In the planned unit development district, residential (PUD-R), all structures to be erected or land to be used shall be for the following uses:

Use Category	Use List	Permitted Uses	Specially Permitted Uses
Commercial Uses	*Beekeeping in accordance with section 24-47.1*	*P*	

(b) In the planned unit development district, commercial (PUD-C), all structures to be erected or land to be used shall be for one or more of the following uses:

Use Category	Use List	Permitted Uses	Specially Permitted Uses
Commercial Uses	*Beekeeping in accordance with section 24-47.1*	*P*	

Division 15. Mixed Use, MU

Sec. 24-518. Use list.

Use Category	Use List	Permitted Uses	Specially Permitted Uses
Commercial Uses	*Beekeeping in accordance with section 24-47.1*	*P*	

Division 17. Economic Opportunity, EO

Sec. 24-536.4. Use list.

Use Category	Use List	Permitted Uses	Specially Permitted Uses
Commercial Uses	*Beekeeping in accordance with section 24-47.1*	*P*	

ZOA20-15-BeekpNRD-ord

RESOLUTION

INITIATION OF AMENDMENTS TO THE ZONING ORDINANCE TO CONSIDER

THE KEEPING OF BEES IN NON-RESIDENTIAL ZONING DISTRICTS

WHEREAS, Virginia Code § 15.2-2286 and County Code § 24-13 permit the Board of Supervisors of James City County, Virginia (the "Board") to, by resolution, initiate amendments to the regulations of the Zoning Ordinance that the Board finds to be prudent; and

WHEREAS, amendments to the Zoning Ordinance may be prudent to address the keeping of bees in non-residential zoning districts; and

WHEREAS, the Board is of the opinion that the public necessity, convenience, general welfare, and good zoning practice warrant the consideration of amendments to the Zoning Ordinance.

NOW, THEREFORE, BE IT RESOLVED that the Board of Supervisors of James City County, Virginia, does hereby initiate amendment of Chapter 24, Zoning of the James City County Code in order to consider the keeping of bees in non-residential zoning districts, and directs staff to prepare such amendments for consideration by the Planning Commission and the Board of Supervisors. The Planning Commission shall hold at least one public hearing on the consideration of amendment of said Ordinance and shall forward its recommendation thereon to the Board of Supervisors in accordance with the law.

James O. Icenhour, Jr.
Chairman, Board of Supervisors

ATTEST:

Teresa Fellows
Deputy Clerk to the Board

	VOTES AYE	NAY	ABSTAIN
SADLER	✓		
MCGLENNON	✓		
LARSON	✓		
HIPPLE	✓		
ICENHOUR	✓		

Adopted by the Board of Supervisors of James City County, Virginia, this 8th day of September, 2020.

IntAmd-Bees-NonRD-res

AGENDA ITEM NO. F.2.

ITEM SUMMARY

DATE: 11/3/2021

TO: The Planning Commission

FROM: Terry Costello, Deputy Zoning Administrator/Senior Planner

SUBJECT: SUP-21-0016. Williamsburg Unitarian Universalists Church School

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ATTACHMENTS:

	Description	Type
🗋	Staff Report	Staff Report
🗋	Location Map	Exhibit
🗋	Master Plan	Exhibit
🗋	Email from adjacent property owner	Backup Material
🗋	Proposed SUP Conditions	Backup Material

REVIEWERS:

Department	Reviewer	Action	Date
Planning Commission	Holt, Paul	Approved	10/27/2021 - 10:59 AM
Planning Commission	Holt, Paul	Approved	10/27/2021 - 10:59 AM
Publication Management	Daniel, Martha	Approved	10/27/2021 - 11:11 AM
Planning Commission	Holt, Paul	Approved	10/27/2021 - 11:14 AM

SPECIAL USE PERMIT-21-0016. Williamsburg Unitarian Universalists Church School

Staff Report for the November 3, 2021, Planning Commission Public Hearing

SUMMARY FACTS

Applicant:	Mr. Joe Cross
Land Owner:	Williamsburg Universalists
Proposal:	To allow for a school within an existing place of public assembly for a maximum of 30 children with five staff members.
Location:	3051 Ironbound Road
Tax Map/Parcel No.:	4710100065A
Project Acreage:	± 7.5 acres, using approximately 2,200 square footage of 12,103 square feet total, in addition to the outside playground
Zoning:	R-8, Rural Residential
Comprehensive Plan:	Low Density Residential
Primary Service Area:	Inside
Staff Contact:	Terry Costello, Deputy Zoning Administrator/Senior Planner

PUBLIC HEARING DATES

Planning Commission: November 3, 2021, 6:00 p.m.

Board of Supervisors: December 14, 2021, 5:00 p.m. (Tentative)

FACTORS FAVORABLE

1. With the proposed conditions, staff finds the proposal to be compatible with the surrounding zoning and development.

2. With the proposed conditions, staff finds the proposal to be consistent with both the adopted 2035 Comprehensive Plan and draft 2045 Comprehensive Plan.

3. Adequate off-street parking is provided.

4. Impacts: See Impact Analysis on Pages 3-4.

FACTORS UNFAVORABLE

1. Impacts: See Impact Analysis on Pages 3-4.

SUMMARY STAFF RECOMMENDATION

Approval, subject to the proposed conditions.

PROJECT DESCRIPTION

- This proposal is to allow for a school within an existing place of public assembly. A Special Use Permit (SUP) is required for schools in R-8, Rural Residential.

- Eighty percent of the groups or programs at the church meet during the week. Of that group, the majority meet after 6 p.m. The groups that do meet during the day typically have six or less participants. Twenty percent of the groups or programs that meet at the church meet after church services on Sunday, or Sunday afternoons. All non-church groups or programs meet exclusively on Saturday and Sundays. (These numbers are pre-COVID-19).

- The school will have a maximum of 30 children. The ages range from toddler to kindergarten age. The school will have five staff members. The program will operate Monday through Friday. The program will be utilizing approximately 2,200 square feet of the total building square footage of 12,103 square feet. The outside playground will also be used. The hours of operation will be from 7:30 a.m.-6 p.m., with instructional time from 8:30 a.m. -3 p.m. There will be very limited daycare before 8:30 a.m. and after 3 p.m. It is anticipated no more than five children will be attending daycare before school begins and after school ends.

- The site currently has 57 paved parking spaces and 16 gravel parking spaces for a total of 73 spaces. There is adequate parking for the staff that will be on-site and the few parents who will utilize the daycare program. The majority of children will be dropped off in a car line and picked up in the same manner.

PLANNING AND ZONING HISTORY

- The Williamsburg Unitarian Universalists Church has occupied its current facility since January 1997. The original site plan for the sanctuary of approximately 5,000 square feet was approved by the Planning Division in September 1994 and amended in August 1999, before an SUP was required. The James City County Zoning Ordinance was amended in December 1999 to require an SUP for houses of worship (places of public assembly) on R-8 zoned property.

- An SUP (SUP-20-95) was approved in July 1995 for a school in an existing structure on the property. A daycare and its expansion were approved with special use permits SUP-33-96 (March 1997) and SUP-12-99 (July 1999).

- An SUP (SUP-0017-2014) was approved in January 2015 to expand the building and parking area and to permit the use of the "Parker House" as an accessory use to the house of worship or as a single-family dwelling for rent. This SUP replaced the previous SUPs mentioned above.

- This SUP request will not replace SUP-0017-2014 but will be in addition to the approved SUP for the place of public assembly.

SURROUNDING ZONING AND DEVELOPMENT

North: PL. Public Lands and R-8, Rural Residential.

East: R-8, Rural Residential.

South: R-8, Rural Residential.

West: PL, Public Lands and R-8, Rural Residential.

The property is located east of Clara Byrd Baker Elementary School and the James City Service Authority's Treatment Plant. Surrounding properties to the north, east, west, and south contain single-family residential dwellings.

Impacts/Potentially Unfavorable Conditions	Status *(No Mitigation Required/Mitigated/Not Fully Mitigated)*	Considerations/Proposed Mitigation of Potentially Unfavorable Conditions
Public Transportation: Vehicular	Mitigated	-The proposed use on the property is not anticipated to exceed 100 peak hour trips. According to the Institute of Transportation Engineers (ITE) Trip Generation Manual, approximately 19 morning peak hour trips would be generated and approximately 10 afternoon peak hour trips would be generated. The majority of the traffic from the school/daycare use should not coincide with traffic generated at the start and end times for Clara Byrd Baker Elementary School. (Condition No. 3). -The subject property is located on a major collector road, as recommended in the Comprehensive Plan for commercial uses in areas designated Low Density Residential. -No changes anticipated to the Level of Service on Ironbound Road. According to the 2035 Comprehensive Plan, the Level of Service for that portion of Ironbound Road is at Level A-C. The draft 2045 Comprehensive Plan confirms this status in 2017, and projects it to remain the same in 2045.
Public Transportation: Pedestrian/Bicycle	No Mitigation Required	-Pedestrian/bicycle accommodations are not triggered when there are no changes proposed to the building footprint.
Public Safety	No Mitigation Required	-Subject property is located within a six-minute radius of Fire Stations 3 and 5. -The proposal does not generate impacts that require mitigation to the County's emergency services or facilities.
Public Schools	No Mitigation Required	-The proposal will not generate schoolchildren.
Public Parks and Recreation	No Mitigation Required	-The proposal does not generate impacts that require mitigation to the County's parks and recreation services or facilities.
Public Libraries and Cultural Centers	No Mitigation Required	-The proposal does not generate impacts that require mitigation to public libraries or cultural centers.
Groundwater and Drinking Water Resources	No Mitigation Required	-The proposal does not generate impacts that require mitigation to groundwater or drinking water resources.

Impacts/Potentially Unfavorable Conditions	**Status** *(No Mitigation Required/Mitigated/Not Fully Mitigated)*	**Considerations/Proposed Mitigation of Potentially Unfavorable Conditions**
Watersheds, Streams, and Reservoirs	No Mitigation Required	-The Stormwater and Resource Protection Division has reviewed this application and had no objections. No new impervious surface is proposed as part of this SUP request. Should exterior site improvements be made in the future, such as an expansion or paved parking area, those improvements would be subject to additional environmental review at that time.
Cultural/Historic	No Mitigation Required	-The subject property has been previously disturbed and has no known cultural resources on-site.
Nearby and Surrounding Properties	No Mitigation Required	-The subject property is located near both residential and public uses. -Traffic is anticipated to be typical of a community facility, the subject property must adhere to the County's Noise Ordinance, and there is no new signage or lighting proposed.
Community Character	No Mitigation Required	-Ironbound Road is located along a Community Character Corridor (CCC). -Existing façade and landscaping maintain the property's character, and parking is not located directly on the CCC as recommended by the Comprehensive Plan.

COMPREHENSIVE PLAN

- The property is designated Low Density Residential on the 2035 Comprehensive Plan Land Use Map and on the 2045 draft Comprehensive Plan Land Use Map. Two parcels north and west are Federal, State, and County land. All remaining properties north and west, as well as south and east, are designated Low Density Residential. For Low Density Residential, appropriate primary uses recommended by the Comprehensive Plan include single-family homes, multifamily units, accessory units, and cluster housing. Other uses including schools, places of public assembly, very limited commercial, and community-oriented facilities may also be considered appropriate should the proposal meet the following standards:

- Complements the residential character of the area. Staff finds the proposal consistent with the residential character of the area, as no exterior changes to the building or property are proposed.

- Have traffic, noise, lighting, and other impacts similar to surrounding residential uses. Traffic is anticipated to be typical of a community facility, and the times traffic would be generated for the school should not coincide with start and end times for Clara Byrd Baker Elementary School (Condition No. 3). Approximately 19 morning peak hour trips are anticipated, with approximately 10 afternoon peak hour trips. (ITE Trip Generation Manual) The subject property must adhere to the County's Noise Ordinance, and there is no new signage or lighting proposed.

- Generally be located on collector or arterial roads at intersections. This property is located on, and takes access from, Ironbound Road. The Virginia Department of Transportation classifies Ironbound Road as a major collector road.

- Provide adequate screening and buffering to protect the character of nearby residential areas. Staff finds that existing vegetation provide adequate screening of the existing place of public assembly from adjacent properties. The school use will be located entirely within the existing place of public assembly structure, while also utilizing the outdoor playground.

PROPOSED SUP CONDITIONS

Proposed conditions are provided as Attachment No. 3.

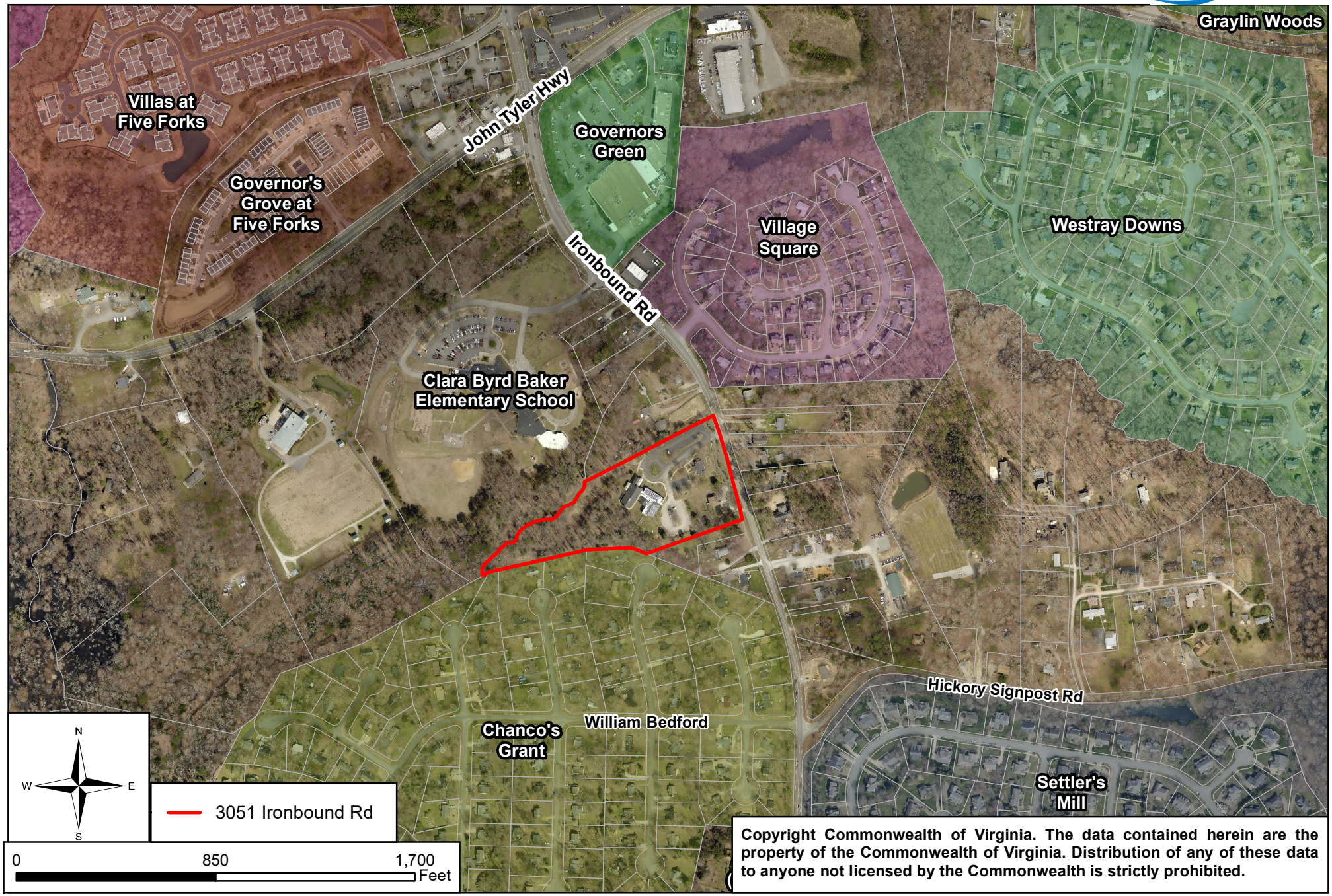
STAFF RECOMMENDATION

Staff finds the proposal to be compatible with surrounding development and consistent with the recommendations of the adopted Comprehensive Plan. Staff recommends that the Planning Commission recommend approval of this application to the Board of Supervisors, subject to the attached conditions.

TC/ap
SUP21-16UnitrnUniv

Attachments:
1. Location Map
2. Master Plan
3. Proposed SUP Conditions
4. Email from adjacent property owner

JCC SUP-21-0016
Williamsburg Unitarian Universalists Church School



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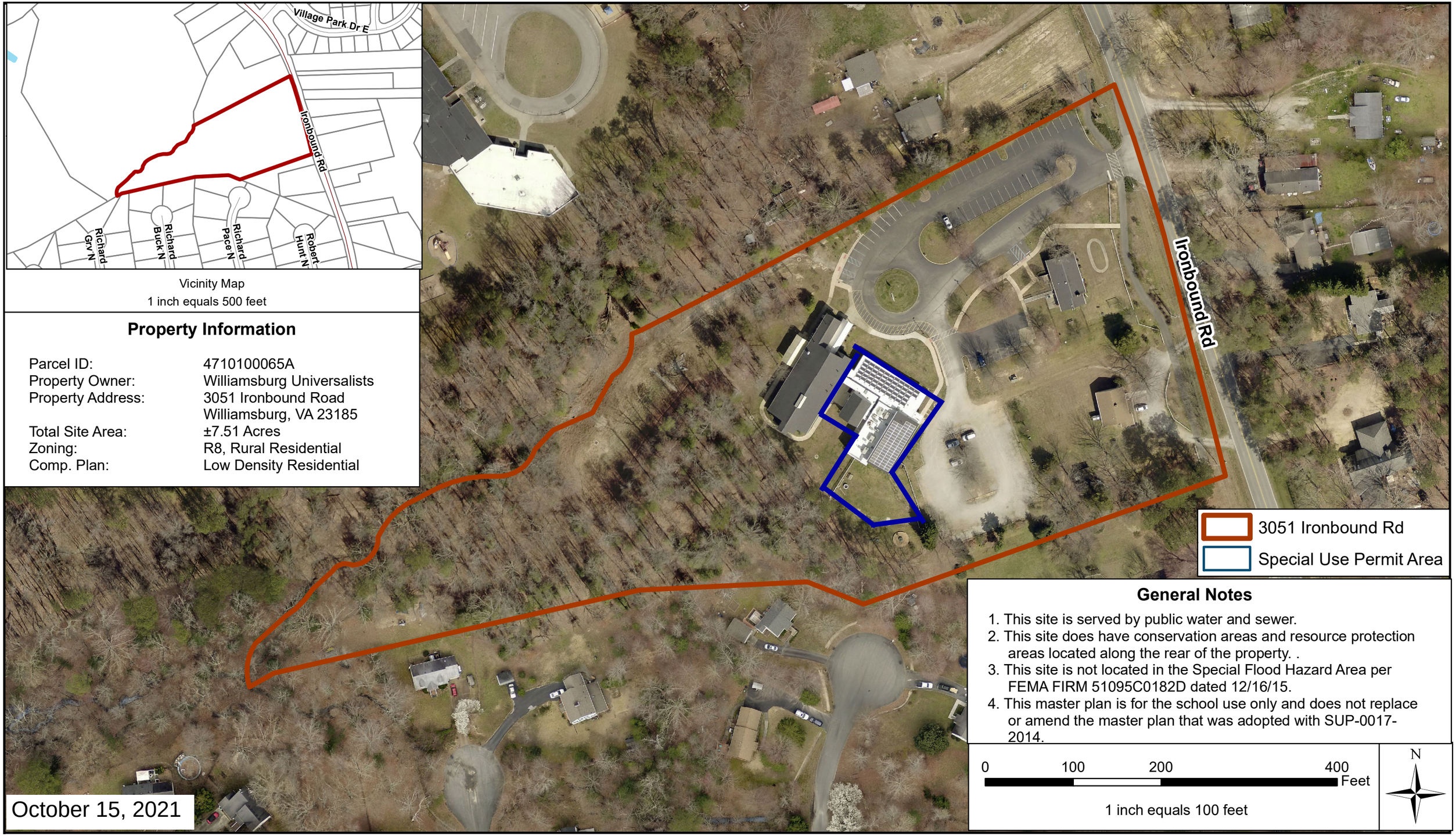
SUP-21-0016. Williamsburg Unitarian Universalists Church School

Vicinity Map
1 inch equals 500 feet

Property Information

Parcel ID:	4710100065A
Property Owner:	Williamsburg Universalists
Property Address:	3051 Ironbound Road Williamsburg, VA 23185
Total Site Area:	±7.51 Acres
Zoning:	R8, Rural Residential
Comp. Plan:	Low Density Residential



General Notes

1. This site is served by public water and sewer.
2. This site does have conservation areas and resource protection areas located along the rear of the property. .
3. This site is not located in the Special Flood Hazard Area per FEMA FIRM 51095C0182D dated 12/16/15.
4. This master plan is for the school use only and does not replace or amend the master plan that was adopted with SUP-0017-2014.

0 100 200 400 Feet

1 inch equals 100 feet

N

Terry Costello

To: Terry Costello
Subject: FW: [External] Williamsburg Unitarian Universalists Church School

---

From: Andrea Armstrong <andbubs@cox.net>
Sent: Sunday, October 24, 2021 12:00 AM
To: Community Development <community.development@jamescitycountyva.gov>
Subject: [External] Williamsburg Unitarian Universalists Church School

We are absolutely against the initiation of a "church school" in our neighborhood. There is already a public school just

a few steps down the road in close proximity to them. Another school is NOT NEEDED. We already have school bus

backups, very long lines of cars blocking the road which prevent us from getting back home after appointments, etc. Also,

as I mentioned, there is a fully functional school available in our area. Another school is definitely NOT NECESSARY at all.

We oppose all efforts to have a church school here.

Sincerely,

John and Andrea Armstrong

SUP-21-0016. Williamsburg Unitarian Universalists Church School

1. ***Master Plan*** – This SUP shall permit a school on property located at 3051 Ironbound Road and further identified as James City County Real Estate Tax Map Parcel No. 4710100065A (the "Property"). The use and layout of the Property shall be generally as shown on the document entitled "SUP-21-0016, Williamsburg Unitarian Universalists Church School" and date stamped October 15, 2021, with any deviations considered per Section 24-23(a)(2) of the Zoning Ordinance, as amended.
2. ***School Building*** – The school shall be operated within the existing specially permitted place of public assembly on the Property.
3. ***Hours of Operation*** – The school shall be limited to hours of operation, which include drop off and pick up times, from 7:30 a.m. to 6:00 p.m., Monday through Friday.
4. ***Enrollment*** – Enrollment of the school shall be limited to thirty (30) children, Pre-K through Kindergarten. On or before January 1 of each year, school enrollment data for the previous calendar year and projected enrollment for the upcoming calendar year shall be provided to the Zoning Administrator, or designee. The enrollment numbers shall include the total number of children enrolled and the number of staff employed.
5. ***Commencement of Use –*** The school shall be in operation within eighteen (18) months from the date of approval of this SUP, or this SUP shall automatically be void.
6. ***Severance Clause*** – This SUP is not severable. Invalidation of any word, phrase, clause, sentence, or paragraph shall invalidate the remainder.

AGENDA ITEM NO. F.3.

ITEM SUMMARY

DATE: 11/3/2021

TO: The Planning Commission

FROM: Thomas Wysong, Senior Planner II

SUBJECT: Z-21-0012 and MP-21-0003. Proffer and Master Plan Amendment for the Continuing Care Retirement Facility at Ford's Colony (Ford's Village)

ATTACHMENTS:

	Description	Type
🗋	Staff Report	Staff Report
🗋	1. Applicant Deferral Request Letter	Backup Material
🗋	2. Planning Commission Legislative Deferral Policy	Backup Material
🗋	3. Location Map	Backup Material
🗋	4. Community Impact Statement	Backup Material
🗋	5. Proposed Master Plan	Backup Material
🗋	6. Existing Proffers	Backup Material
🗋	7. Existing Master Plan	Backup Material
🗋	8. Fiscal Impact Analysis	Backup Material
🗋	9. Housing Types Example	Backup Material
🗋	10. DRW Memo	Backup Material

REVIEWERS:

Department	Reviewer	Action	Date
Planning Commission	Holt, Paul	Approved	10/27/2021 - 11:27 AM
Planning Commission	Holt, Paul	Approved	10/27/2021 - 11:27 AM
Publication Management	Pobiak, Amanda	Approved	10/27/2021 - 2:55 PM
Planning Commission	Holt, Paul	Approved	10/27/2021 - 3:01 PM

REZONING-21-0012 and MP-21-0003. Proffer and Master Plan Amendment for the Continuing Care Retirement Facility at Ford's Colony (Ford's Village)
Staff Report for the November 3, 2021, Planning Commission Public Hearing

SUMMARY FACTS

Applicant:	Mr. Vernon Geddy, III, on behalf of Fyre Development, LLC
Land Owners:	SWR-HOCKADAY, LLC & MCMURRAN, MARTHA
Proposal:	A request to amend the adopted proffers and master plan for the Continuing Care Retirement Facility at Ford's Colony. The proposal would permit up to 286 age-restricted residential units consisting of single-family dwellings and multifamily dwellings, as well as a facility containing a total of no more than 230 age-restricted assisted living/memory care rooms/skilled nursing beds, with no more than 75 apartments, no more than 155 assisted living rooms/memory care rooms, and no more than 40 skilled nursing beds. This development would include accessory amenities intended for the residents and employees of the development and not the general public.
Location:	3889 News Road
Tax Map/Parcel No.:	3730100004
Current Zoning:	R-4, Residential Planned Community District with proffers
Project Acreage:	+/- 179.2 acres
Comprehensive Plan:	Low Density Residential
Primary Service Area: (PSA)	Inside
Staff Contact:	Thomas Wysong, Senior Planner II

PUBLIC HEARING DATES

Planning Commission:	November 3, 2021, 6:00 p.m. December 1, 2021 6:00 p.m. (tentative)
Board of Supervisors:	TBD

FACTORS FAVORABLE

1. Staff finds the proposed use to be consistent with both the adopted 2035 Comprehensive Plan and draft 2045 Comprehensive Plan.

2. Pursuant to the Fiscal Impact Analysis (FIA) submitted for this application, the proposal is expected to have a positive fiscal impact.

FACTORS UNFAVORABLE

1. Per the deferral request letter (See Attachment 1), the proffers for this application have not been finalized by the applicant team, which is necessary for a comprehensive review and evaluation of the proposal.

SUMMARY STAFF RECOMMENDATION

After this case was advertised for a public hearing, the applicant requested a deferral of this case until the December 1 Planning Commission meeting. The applicant has requested the additional time to prepare revised Proffers. The revised Proffer document will assist staff in completing a comprehensive review and evaluation of the proposal and to determine if impacts are mitigated. Therefore, staff concurs with the request for deferral and recommends that the Planning Commission defer this application to the December 1, 2021 regular meeting.

Attachments:
1. Applicant Deferral Request Letter
2. PC Deferral Policy
3. Location Map
4. Community Impact Statement
5. Proposed Master Plan
6. Existing Proffers
7. Existing Master Plan
8. Fiscal Impact Analysis
9. Housing Examples
10. DRW Memo

GEDDY, HARRIS, FRANCK & HICKMAN, L.L.P.

ATTORNEYS AT LAW
1177 JAMESTOWN ROAD
WILLIAMSBURG, VIRGINIA 23185
TELEPHONE: (757) 220-6500
FAX: (757) 229-5342

MAILING ADDRESS:
POST OFFICE BOX 379
WILLIAMSBURG, VIRGINIA 23187-0379

VERNON M. GEDDY, JR. (1926-2005)
STEPHEN D. HARRIS
SHELDON M. FRANCK
VERNON M. GEDDY, III
SUSANNA B. HICKMAN
ANDREW M. FRANCK

SHERRI L. NELSON

October 27, 2021

Mr. Paul Holt
Director- Community Development
James City County
101-A Mounts Bay Rd.
Williamsburg, VA 23185

Re: Ford's Village – Z-21-0012/MP-21-0003
Ford's Colony Master Plan Amendment

Dear Mr. Holt:

I write on behalf of the applicants to request that the Planning Commission defer consideration of this case until its December 1, 2021 meeting. The applicants have been working closely and cooperatively with Staff on this case and crafting proffers to mitigate any potential impacts from the proposal. While we had submitted draft proffers that were deemed acceptable by Staff, an internal review by one of the applicants resulted in the unexpected need to make changes to those draft proffers and the revised version will not be ready in time for review by Staff and presentation at the November meeting. We are confident the revised version of the proffers will continue to address and mitigate any potential impacts from the proposal and look forward to presenting the complete case to the Commission in December.

As you know, these applicants have cooperated with Staff in voluntarily agreeing to delay going to the Planning Commission in order to help ease crowded agendas. We would respectfully request that the Commission defer this case until its December meeting.

Sincerely,

Vernon M. Geddy, III

cc: Mr. Rock Bell
Ms. Doris-Ellie Sullivan

RESOLUTION

PLANNING COMMISSION LEGISLATIVE APPLICATION DEFERRAL POLICY

WHEREAS, at the joint work session on May 22, 2018, the Board of Supervisors (the "Board") requested the Planning Commission (the "Commission") develop a legislative application deferral policy to address circumstances where an applicant requests deferral of an application after it has been advertised for a public hearing; and

WHEREAS, Section 15.2-2285 of the Code of Virginia states that no Zoning Ordinance shall be amended or reenacted unless the governing body has referred the proposed amendment or reenactment to the local Planning Commission for its recommendations and that failure of the Commission to report 100 days after the first meeting of the Commission shall be deemed approval, unless the proposed amendment or reenactment has been withdrawn by the applicant prior to the expiration of the time period; and

WHEREAS, the Policy Committee reviewed and discussed this policy on June 14, 2018, and recommended its approval by a vote of 5-0.

NOW, THEREFORE, BE IT RESOLVED that the Planning Commission of James City County, Virginia, hereby adopts the following policy to be used when considering requests for deferral of legislative applications:

1. Legislative applications ("applications") that have been reviewed by all applicable reviewing agencies and are deemed complete, as determined by the Director of Planning or designee (the "Director"), shall be advertised for a public hearing at the first available meeting by the Planning Commission (the "Commission"). Prior to advertising, an applicant may submit one or more written requests to the Director requesting a deferral for a period of time that does not exceed 100 days in total. Prior to advertising for any public hearing, the Director may consider a longer deferral period in consideration of the factors in No. 4, below, which shall not be exclusive. At the end of the deferral period, the application shall be placed on the Commission's agenda with an advertised public hearing. The applicant may withdraw the application under § 15.2-2285(B) at any time.

2. Once an application has been placed on the Commission's agenda with an advertised public hearing, the applicant may submit one or more written requests to the Director for postponement of consideration by the Commission. Such written requests shall include a statement explaining the reasons for the postponement request. The Commission shall not postpone consideration of an application for more than 100 days from the date of the first advertised public hearing.

3. The Commission shall determine whether to grant a postponement following a public hearing on the case. If the Commission grants a postponement, the application will be scheduled for a Commission meeting requested by the applicant and approved by the Commission and the applicant shall be required to pay a fee to reimburse the County for expenses associated with postponing consideration of the application, which may include the costs of re-advertising. The Commission shall

not postpone consideration of an application for more than 100 days from the date of the first advertised public hearing. If the Commission does not grant the postponement request, the Commission may either approve or deny the application at that meeting, or may continue the public hearing to the next regularly scheduled meeting of the Commission and either approve or deny the application at that meeting. The applicant may withdraw the application under § 15.2-2285(B) at any time.

4. In considering a postponement, the Commission may consider the following factors, which shall not be exclusive:

   - The Commission requests substantive changes to the application, supplemental materials, proffers or conditions that must be addressed prior to a vote by the Commission.
   - Substantive issues are raised by the County or a reviewing agency that must be addressed prior to a vote by the Commission.
   - Delays have occurred with County or external reviewing agency comments that affect the application.
   - Errors in legally required advertising are discovered and must be rectified.
   - Adjacent property owner concerns have been expressed that generate the need for substantive changes or additional public meetings.
   - The applicant demonstrates that there are extenuating circumstances that are unique to the application that require additional time.

Heath Richardson
Chair, Planning Commission

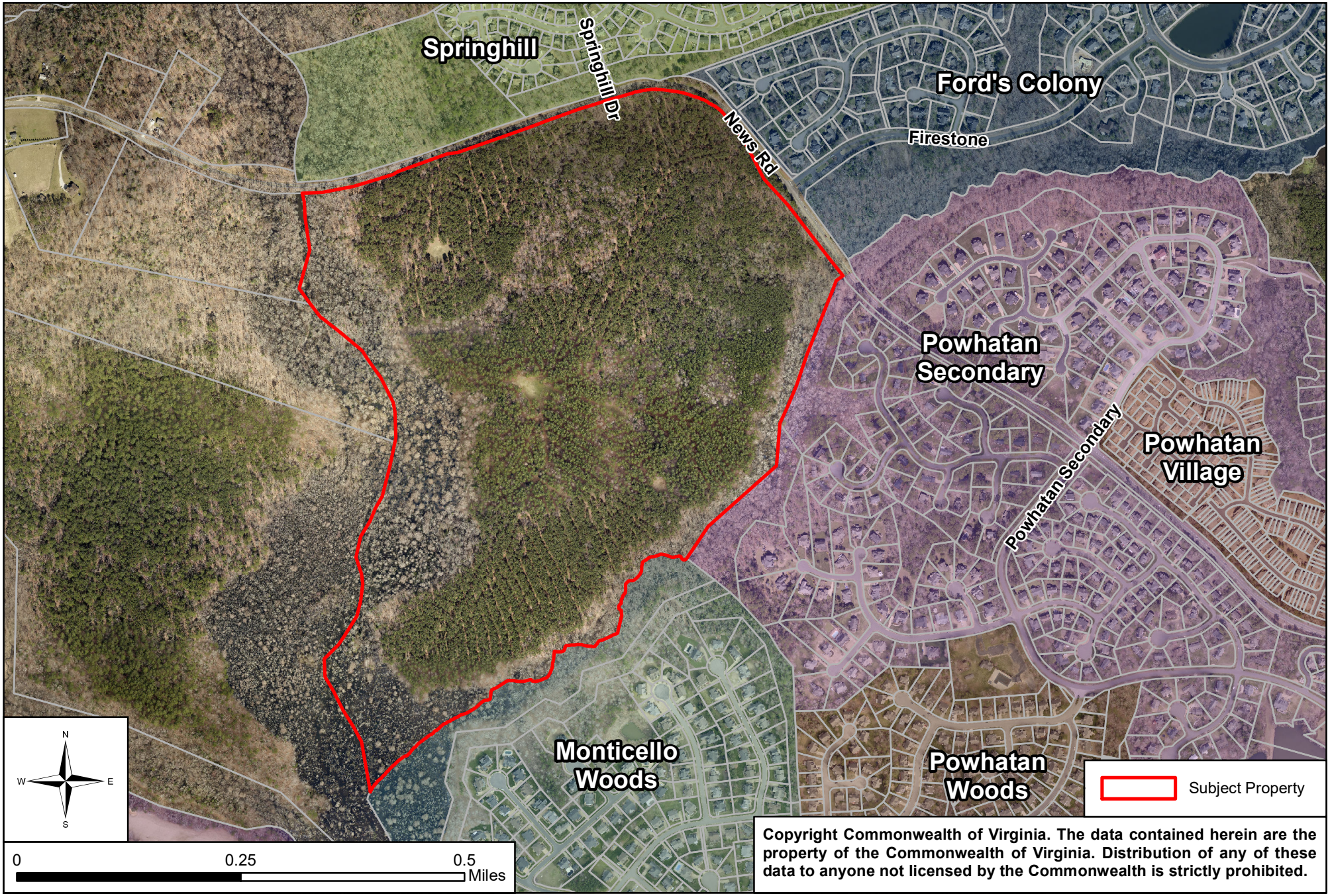
ATTEST:

Paul D. Holt, III
Secretary

Adopted by the Planning Commission of James City County, Virginia, this 3rd day of July, 2018.

LegltveADefralPol-res

Z-21-0012 & MP 21-0003. Proffer and Master Plan Amendment for Ford's Colony (Ford's Village)



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Community Impact Statement

For

Ford's Village

Prepared For

Frye Development, LLC
Norfolk, VA 23510

Revised October 2021
AES Project Number W10514

Prepared by:

AES CONSULTING ENGINEERS

5248 Olde Towne Road Suite 1
Williamsburg, Virginia 23188
Phone: 757-253-0040
Fax: 757-220-8994
www.aesva.com

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I. INTRODUCTION

Frye Development, LLC, proposes to amend the previously approved master plan for Ford's Colony at Williamsburg to create a revised mix of senior residential housing and skilled care units. The amended master plan covers 180.79 acres located along News Road located directly across from Firestone Drive.

II. THE PROJECT TEAM

The organizations that participated in the preparation of the information provided with this rezoning submission are as follows:

- Developer - Frye Development, LLC
- Senior Living Operator - Retirement Unlimited, Inc.
- Civil Engineering - AES Consulting Engineers
- Environmental/Wetlands - Wetlands Solutions, Inc./Kerr Environmental
- Traffic - DRW & Associates
- Land Planning - Michael Watkins Architect
- Attorney - Geddy, Harris, Franck & Hickman, LLP

Frye Development, LLC, a wholly owned subsidiary of Frye Properties, Inc.. Frye Properties, Inc. Headquartered in Norfolk, Virginia, Frye provides real estate development, property management, construction, and full-service real estate brokerage services. The recipient of multiple regional and national awards for its developments, Frye Properties, Inc. has earned the respect of government officials, residents and clients. Frye is a trusted and highly experienced design, development, build group that specializes in creating traditional, walkable neighborhoods that seamlessly integrate into the special communities where they build. Frye's dedicated team represents a collection of experience that ranges from master planning, land development, architecture and building, to historic rehabilitation and management of a large portfolio of residential and commercial properties. Frye's extensive experience in developing quality residential projects, including East Beach in Norfolk and The Cavalier Residences in Virginia Beach, demonstrates its long-standing commitment to the highest level of design standards within the urban context. Frye believes its philosophy of respecting the land and its natural assets, its surroundings, and community history leads to the creation of vibrant, memorable communities which will compliment James City County's development goals and standards. Frye is excited about the chance to make that vision a reality.

Frye Development has partnered with Retirement Unlimited, Incorporated (RUI) to operate the senior living building on the property. RUI is a family run business, focused on senior living throughout the state of Virginia. RUI honors the values and traditions set forth by their founders and strives to take the senior living experience to the next level by offering diverse enrichment programs, social experiences, and levels of care in a comfortable and elegant setting. RUI operates multiple properties across the state Virginia including sites in Newport News, Virginia Beach and Richmond.

III. EXISTING CONDITIONS

Site Location:

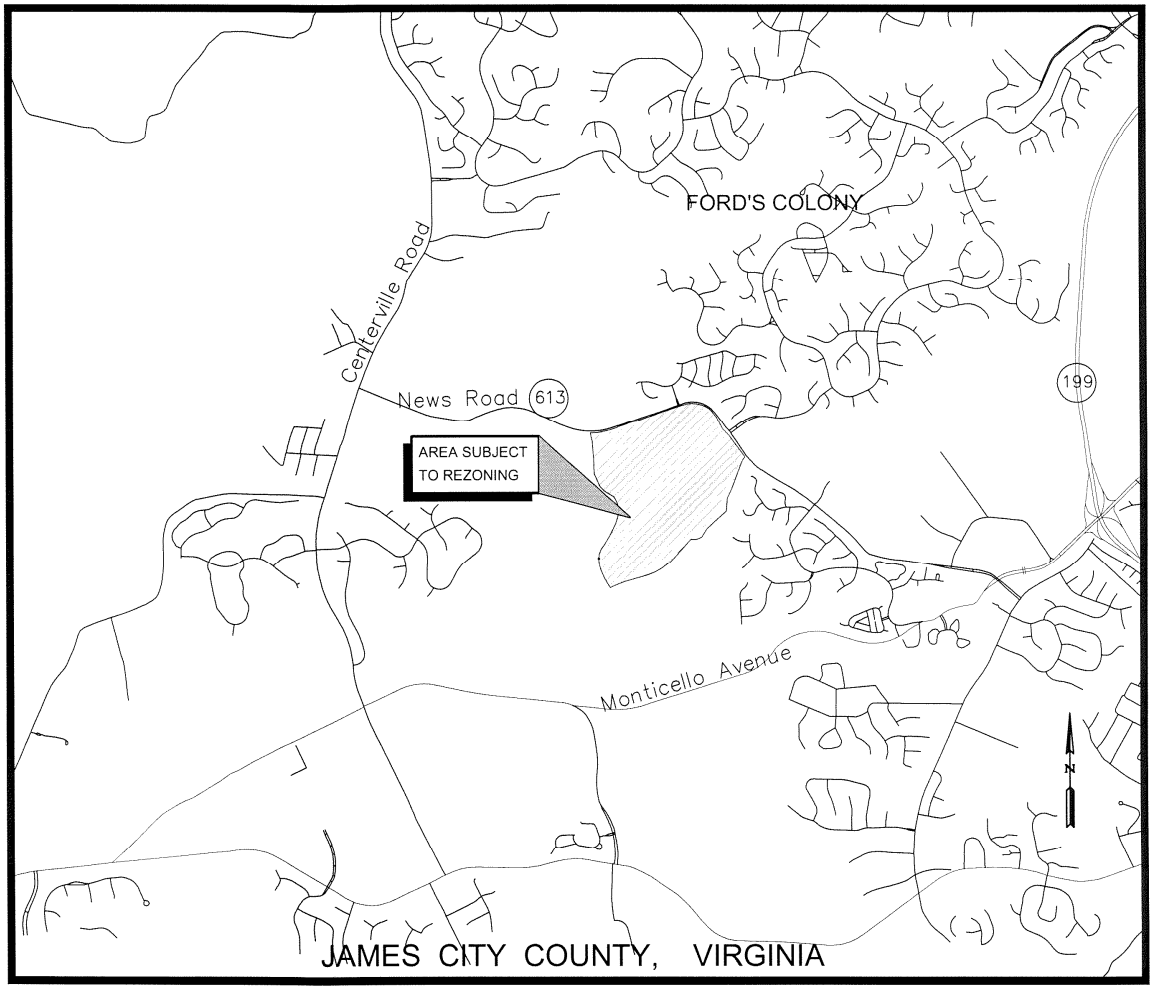

Figure 1

Master Plan Sheet 3 and 4 contain detailed information on wetlands, buffers, soils, and slopes. A pre-development site analysis revealed the following results:

Wetland areas:	*47.42 acres*
Buffers:	*58.81 acres*
Subtotal	***106.23 acres***
Uplands	*74.56 acres*
Total	***180.79 acres***

IV. PROJECT DESCRIPTION

The Village is approximately 181 acres in area and located across from the Firestone Entrance to Ford's Colony on News Road in James City County. The Village is envisioned as a full-service Continuing Care Retirement Community (CCRC) with 286 age restricted single family, townhome and condominium units; and a senior living building housing a combination of 230 independent-living apartment units, assisted-living units, and skilled/memory care beds. The CCRC development will provide on-site shared amenities available for those living in the senior living ("big house") and those living in the independent homes. The 286 age restricted units are envisioned as for sale product with a small reservation of 5 units available for short term rentals for guests of community residences. The model of this development differs from similar existing CCRC developments in James City as the senior living operator intends to offer their units on a rental model rather than the upfront buy-in model and the housing units are to be fee simple. Additionally, the property while part of the overall Ford's Colony master plan is intended to be autonomous, having its own internal homeowner's association. Approximately 70% of the total site is preserved in open space; much of that open space is to remain natural through the preservation of wetlands, streams, and associated buffers in compliance with James City County ordinances and policies. Other developable lands have been provided as common open space either in the form of buffer areas or recreation open space (as noted on Sheet 4 of the Master Plan set, *The Village Land-Use Master Plan*).

V. PLANNING CONSIDERATIONS

A. Land Use

The proposed land use for The Village is consistent with the current property zoning and designation of CCRC on the Ford's Colony at Williamsburg Master Plan and the surrounding land uses in the vicinity; Ford's Colony and Springhill to the north, Powhatan Secondary to the east, Monticello Woods to the south, and Greensprings Plantation to the west. The Village property is designated Low-Density Residential on the current James City County Comprehensive Plan, with a gross density of 1 to 4 units per acre. The revised mix of residential age restricted units reduces the previously approved density on the property (from 10 units/acre to 7 units/acre) and is shown in the residential count of the Ford's Colony Master Plan which produces an overall density of approximately 1.2 DUA. The maximum residential density in the R-4 District (which is also generally consistent with surrounding zoning districts) is 2.0 Dwelling Units per Acre.

B. Environmental

A detailed environmental site analysis was conducted on this property. The Warburton Tract was subjected to thorough soft and hardwood timbering less than twenty years ago. Thick undergrowth is prevalent on the property. Recent work performed by the Environmental Services Division of Wetlands Solutions identified 47 acres of wetlands and streams or 26% of the site. Wetland Solutions has also conducted a perennial stream analysis on the property and is in the process of coordinating a review with the James City County Environmental Department. The Warburton Tract Preliminary Layout and Grading plan sheet found in the environmental studies report at page 4 shows both the Resource Protection Area (RPA) buffers; based on changes in the perennial scoring system areas previously covered by 50' non-RPA buffers have been revised to have full 100-ft RPA buffers. Additional areas containing slopes of 25% or greater have been mapped but account for limited portions of the developable area of the site (outside

RPA buffers). Updated research and field verification also indicated that habitat for the Small Whorled Pogonia and Virginia Least Trillium are not present on this site.

C. Parks and Recreation

Frye Development, LLC, proposes to provide both active and passive recreational amenities designed to meet the needs of the anticipated residents while exceeding James City County policy standards. There are two sets of amenities for the project; those within the CCRC building and those scattered throughout the development in the form of pocket parks, soft and hard surface trails and passive open space. Frye proposes to dedicate a minimum of 4 acres of park/recreation space within Land Uses A,B&C; including a pool and community center building, walking trails a series of parks, several passive open space areas, nature trails and sidewalks. The project envisions the potential to provide existing Ford's Colony residents the ability to share in the development amenities.

VI. ANALYSIS OF IMPACTS TO PUBLIC FACILITIES AND SERVICES

The subject property is located within the Primary Service Area of James City County. Parcels and subsequent land development activities within the Primary Service Area are required to connect to public water and sanitary sewer service provided by the James City Service Authority (JCSA). Sheet 5 of the Master Plan, *The Master Utility Plan* is intended to supplement this report for information on public water and public sanitary sewer.

A. Public Water Facilities

The subject property will be served with public drinking water by the existing JCSA water distribution system in the area. JCSA currently maintains an existing 12-inch water main along News Road. This line is supported by loops through existing Ford's Colony as well as a loop from Monticello Avenue. The system facilities in this area are anticipated to be adequate for this development based upon previous flow data taken at a hydrant at the entrance to the adjacent Spring Hill subdivision. This would indicate adequate pressures and flows will be present throughout the proposed development. While our projected flows anticipate water and sewage demands based on residential housing as outlined by JCSA and the State Health Department, it is significant to note, that case studies and previous projects within JCC demonstrate reduced water consumption in age restricted communities.

A detailed water distribution system model will be completed and submitted as part of the subdivision review process. The model will examine flow rates and pressures throughout the immediate water system area to ensure adequate flow and pressure to accommodate the required fire flows.

B. Public Sewer Facilities

Sanitary sewer service is provided to the subject property via the adjacent Powhatan Secondary interceptor sewer. This pipeline is a 21-inch gravity interceptor which flows to JCSA Lift Station 1-2. Lift Station 1-2 pumps directly into a HRSD Force Main. All flows from the project are to be

collected by onsite gravity sewers and connected to the existing 21-inch interceptor line. The connection point will be in the vicinity of manhole on News Road as indicated on the Utility Master Plan. Capacity in the existing gravity sewer and receiving Lift Station was evaluated by JCSA as part of the original application. The current application represents a 42% reduction in total daily anticipated sewer flows from the project. Additionally, JCSA made improvements to the Powhattan Sewer main since the 2008 rezoning which we anticipate would have improved the current sewer capacity.

Table 1 – Projected Wastewater Flows from *The Village*

Type of Development	No. of Units	Flow (GPD/ Unit)	Average Daily Flow (GPD)	Duration (hrs)	Avg. Flow (GPM)	Peak Flow (GPM)
RESIDENTIAL						
Single-family/Multi Family	286	310	88,660	24	46.3	115.7
IL Apartments	75	310	23,250	24	25.8	64.5
Subtotal	361		111,910		77.7	194.3
NON-RESIDENTIAL						
Nursing/Skilled	155 Beds	160	24,800	24	17.2	42.5
Subtotal			24,800		17.2	42.5
Total (Amendment)			**136,710**		**94.9**	**237.3**
Total (Original)			*219,420*		*152.4*	*381.0*

C. Fire Protection and Emergency Services

There are currently five fire stations providing fire protection and Emergency Medical Services (EMS) to James City County. The closest fire station to the subject site is Station #5 located at 3201 Monticello Avenue, approximately 3.25 miles southwest of this project. According to the James City County Deputy Fire Marshal, the official response time is based on the arrival of both fire and EMS personnel. Currently, EMS services are only available from Station #4 on Olde Towne Road. From this station, an estimated response time will be less than eight minutes. However, EMS is planned for Station #5 in the near future. The CCRC will have medical first responders, as well as CPR and First Aid certified personnel, on staff. Limited medical facilities are onsite in the main CCRC and the Assisted Living buildings.

The next closest fire station to the subject site is station number 3 at 5077 John Tyler Highway. Only slightly more distant than the Monticello station (approximately 3.9 miles), response time to the site is reasonable if an emergency event occurs requiring additional fire and life safety support. These two fire stations, and the emergency medical staff available at these stations, will provide a more than adequate response to potential emergencies. In

addition, through cooperative agreements between Williamsburg, James City County, and York County, the site may also be served by the York County station at Lightfoot.

D. 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. Reputable, private contractors, hired by the Homeowners Association will handle the collection of solid waste. Both trash and recyclable material will be removed from this site to a solid waste transfer station.

E. Utility Service Providers

Virginia Natural Gas, Dominion Virginia Power, and Cox 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 development at no cost to the developer when positive revenue is identified; plus, with new land development, these utility service providers are required to place all new utility service underground.

F. Schools

The Village is located within the Matoka Elementary School, James Blair Middle School, and Lafayette High School districts. However, under the proposed Master Plan, the CCRC facility and all residential units will be age-restricted removing the residency potential for school age children. Thus, the proposed development, consistent with the previously approved zoning for the property will not generate any school children.

VII. ANALYSIS OF ENVIRONMENTAL IMPACTS

A. Preliminary Wetland Determination

Investigations were conducted by Wetland Solutions (WSSI/Kerr Environmental Services Corp in the fall of 2016 and were reinvestigated in 2020 for the property. The extent of wetland features is shown on Master Conceptual Plan Sheet 3. The U.S. Army Corps of Engineers confirmation of delineated wetlands is currently underway.

Based on the investigation by WSSI, approximately 47 acres of wetlands are present on the property. In the Master Plan for the proposed development, we have attempted to avoid all impacts to the wetlands, however it may be necessary to provide minor impacts to the wetlands for utility crossings and stormwater outfalls. In addition, there may be some temporary disturbances of some steep slopes associated with the construction of the sanitary sewer pump station and the stormwater management facilities. All of the above-described items may require proper state and federal permitting prior to the issuance of James City County Land Disturbance Permits.

B. Resource Protection Areas

The property contains Resource Protection Areas (RPA) and associated buffers which are shown on Master Plan Sheet 2- Existing Conditions. Also illustrated is an expanded Powhatan Creek buffer as previously coordinated with James City County.

C. Soils

The Soil Survey of James City and York Counties and the City of Williamsburg, Virginia (USDA 1985) shows several soil types within the property boundary. This property is predominantly situated on well-drained soils of Craven-Uchee, Emporia Complex, Emporia, and Slagle soil types. Detailed soils breakdown are noted on sheet 3 of the master plan.

VIII. ANALYSIS OF STORMWATER MANAGEMENT

As the property falls within the Powhatan Creek Watershed, additional measures of watershed management are suggested by James City County policy to protect the natural resource of the watershed, and prevent further degradation of the watershed's water quality. These measures, in the form of Special Stormwater Criteria (SSC), further enhance the quality of stormwater runoff from the development site and assist in the preservation of pre-development hydrology. In addition to the main structural BMP, seven (7) SSC measures are required to meet minimum requirements set forth by the James City County policy. Furthermore, five (5) additional measures will be provided to improve the water quality of the Powhatan Creek Watershed "over and above" the state stormwater requirements. Water quality measures to be implemented include: bioretention facilities; dry swales at locations not draining to a BMP; enhanced outlet protection at all piped outfalls of BMP; enhanced cut/fill slope stabilization measure applied site-wide. Please refer to the Stormwater Plan for the water quality calculation work sheet as well as the preliminary list of measures to be implemented.

A preliminary stormwater management analysis and design has been performed as a component of the planning for this proposed project. The purpose of the stormwater management plan is to address the Department of Environmental Quality (DEQ) requirements for water quality and quantity control of flow generated by the proposed development. AES performed initial design BMP sizing and determined that the proposed wet ponds and bioretention cells will satisfy a significant amount of the water quality and quantity requirements as outlined in the Virginia Runoff Reduction Method. Preliminary estimates suggest the development will need to remove a proposed 30 lbs. of phosphorus a year with our current envisioned design removing as much as 38 lbs. per year. In evaluating stormwater management solutions on the subject site, unique site characteristics were considered. Preliminary site investigation identified the following site characteristics to be considered in stormwater management planning:

- The entire project is situated within the Powhatan Creek Watershed of the James River. The property nearly equally drains to the Powhatan Creek mainstem and to Cold Spring Swamp (Powhatan Creek Subwatershed 209).
- The property is currently young forest and overall unimproved. Extensive landscaping will be used within the developed areas of the site and large perimeter area buffers will be left in the current natural state.

In summary, with the preliminary analysis of *The Village*, the stormwater management plan proposed will protect overall downstream water quality, help preserve the natural hydrology of the watershed, and reduce the tendency of development to cause downstream erosion to receiving channels.

IX. ANALYSIS OF IMPACTS TO TRAFFIC

A traffic study memo has been prepared by DRW & Associates to supplement previously prepared studies of the News Road Corridor and Ford's Colony Firestone entrances. In summary of that memo, the impacts associated with the amendment represent a roughly 14% reduction in the Total Daily traffic from the currently proposed development over the previously approved rezoning application (7% less traffic volume than anticipated in the recent 2020 Kimley Horn Study). The developer is still pledging to address the remaining traffic proffers as proposed under the original development.

X. FISCAL IMPACT STUDY

A fiscal impact analysis was completed utilizing the James City County provided worksheet. The worksheet demonstrates that the proposed community will generate a positive fiscal contribution of roughly $505,000 annually however it should be noted that this worksheet considers school children for all the residential units within the community. Not wanting to modify the JCC forms we have submitted them as required, however as this project is proffered to be age restricted, we feel that this fiscal analysis provides for an overly conservative evaluation of the benefit this community will provide James City County. If we were to remove the school children from the worksheets calculation this development is anticipated to positively contribute $1,887,000 annually to James City County's tax base.

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XI. CONCLUSIONS

In summary, the Community Impact Statement for the rezoning and subsequent development of *The Village* highlights the following conclusions and public benefits:

- This project will provide a significant financial benefit to James City County; with a net positive contribution of approximately $1.9 million per year.
- The rezoning is consistent with the intended land use designated on the current Comprehensive Plan for this area. Further, the proposed residential development is consistent with adjacent neighborhoods and represents reduced impacts from the current master plan.
- There is adequate capacity in the system of roads serving this project and developer is maintaining the previously proffered traffic improvements with the project.
- Adequate public services (water and sewer, fire) and utility services (gas, electricity, cable television, and telephone) are available for development.
- James City County's stormwater requirements, including the incorporation of SSC associated with the Powhatan Creek are being met. Additional use of Low-Impact Design (LID) techniques ensures those requirements are exceeded.

MASTER PLAN AMENDMENT FOR FORD'S VILLAGE

AT

FORD'S COLONY · WILLIAMSBURG ·

FOR

FRYE DEVELOPMENT, LLC

PROJECT TEAM

DEVELOPER: FRYE DEVELOPMENT, LLC

CCRC OPERATOR: RETIREMENT UNLIMITED, INC

LAND PLANNING: MICHAEL WATKINS ARCHITECT, LLC

ENVIRONMENTAL: WETLANDS SOLUTIONS, INC.

TRAFFIC: DRW & ASSOCIATES

CIVIL CONSULTING: AES CONSULTING ENGINEERS

LEGAL COUNSEL: GEDDY, HARRIS, FRANK & HICKMAN, LLP

SITE DATA:

PARCEL ID:	3730100004
PROPERTY OWNERS:	SWR-HOCKADAY, LLC & MARTHA WARBURTON McMURRAN
PROPERTY ADDRESS:	3889 NEWS ROAD
CURRENT ZONING:	R-4 W/PROFFERS
PROPERTY ACREAGE:	180.7 AC. ±

VICINITY MAP

(APROX. SCALE 1"=2000')

ORIGINALLY SUBMITTED: JUNE 2021

INDEX OF SHEETS

1	COVER SHEET
2	FORD'S COLONY LAND USE MASTER PLAN
3	ENVIRONMENTAL INVENTORY
4	BINDING MASTER PLAN
5	MASTER UTILITY PLAN
6	MASTER STORMWATER MANAGEMENT PLAN

NOTE: THIS PROJECT LIES WITHIN THE POWHATAN CREEK WATERSHED OF THE JAMES RIVER. THE EASTERN HALF OF THE PROPERTY IS PART OF POWHATAN CREEK SUBWATERSHED 209 (COLD SPRING SWAMP) AND THE WESTERN HALF IS PART OF THE NON-TIDAL POWHATAN CREEK MAINSTEM.

CONSULTING ENGINEERS

WILLIAMSBURG • RICHMOND • GLOUCESTER

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(757) 253-0040 • Fax (757) 220-8994

Master Plan Amendment - Ford's Village
JCC CASE # Z-21-0012 / MP-21-0003
AES Project # W10514-01

FORD'S COLONY
WILLIAMSBURG

NON RESIDENTIAL AMENITY AND SERVICE SITES

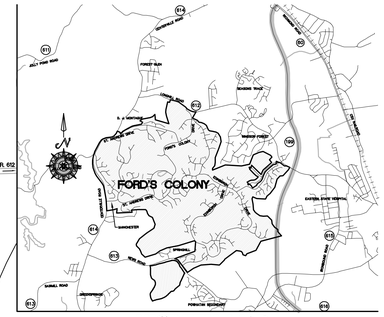
1	100 HOTEL CONDOMINIUMS, EXECUTIVE MEETING FACILITIES AND GOLF ACADEMY	4.71 AC.
2	GOLF CLUB AND PRO SHOP	5.05 AC.
3	INFORMATION AND SALES CENTER	1.81 AC.
4	ADMINISTRATIVE BUILDING	3.50 AC.
5	PUBLIC SERVICE AREA *	28.05 AC.
6	GOLF MAINTENANCE	3.90 AC.
7	COMMUNITY CLUB	7.72 AC.
8	PROJECT MAINTENANCE	10.59 AC.
9	DRIVING RANGE/CART STORAGE	10.34 AC.
10	ADDITIONAL RECREATION AREA	6.36 AC.
11	ADDITIONAL PUBLIC SERVICE AREA	6.76 AC.
12	CONTINUING CARE RETIREMENT COMMUNITY (CCRC)	180.8 AC.
	TOTAL	269.49 AC.

* NOTE: 1.21 AC. PORTION OF ORIGINAL 30.0 AC. P.S.A. SOLD TO FORD'S COLONY

LEGEND

- – RESIDENTIAL "A"
- – RESIDENTIAL "B"
- – RESIDENTIAL "D"
- – OPEN SPACE
- – WILLIAMSBURG WEST SUBDIVISION AND APARTMENTS NOT A PORTION OF MASTER PLAN

NOTE:
VARIABLE WIDTH (25' MIN) BUFFER ALONG THE FORD'S COLONY TRACT WHERE IT ADJOINS CENTERVILLE ROAD SHALL BE RESERVED FOR FUTURE WIDENING AND REALIGNMENT OF S.R. 614



VICINITY MAP
SCALE 1"= 4000'

GENERAL NOTES:

1. RECORDATION OF THIS PLAN IS SOLELY FOR THE PURPOSE OF IDENTIFYING THE LAND COVERED BY THE PROFFERS RECORDED HEREWITH AND DOES NOT CONSTITUTE A PLAT OF SUBDIVISION NOR DOES IT DEDICATE TO PUBLIC OR PRIVATE USE ANY ROADS, COMMON AREAS, GREEN AREAS, OR RECREATION AREAS.
2. THE PROPERTY SHOWN ON THIS PLAN IS COVERED BY PROTECTIVE COVENANTS OF RECORD IN THE CLERK'S OFFICE IN THE COURTHOUSE OF JAMES CITY COUNTY, VIRGINIA, WHICH PROVIDE FOR THE MAINTENANCE OF COMMON OPEN SPACE, RECREATION AREAS, SIDEWALKS, PARKING, PRIVATE STREETS AND OTHER PRIVATELY OWNED, BUT COMMON FACILITIES SERVING THIS PROJECT.
3. LOTS NUMBERED REPRESENT RECORDED SECTIONS OR SECTIONS THAT HAVE RECEIVED PRELIMINARY APPROVAL.
4. THE 2008 MASTER PLAN AMENDMENT WILL BE CONSIDERED A STAND ALONE PROJECT FOR THE PURPOSES OF STORMWATER MANAGEMENT POINTS AND CREDITS.

LAND USE TABULATION

	2021	2008
RESIDENTIAL "A"		
TOTAL NUMBER OF UNITS	2,856 UNITS	2,856 UNITS
GROSS AREA OF RESIDENTIAL "A"	1,868.77± AC.=(63.09%)	1,868.77± AC.=(63.09%)
PERMITTED DESTINY	4.00 UNITS/ ACRE	4.00 UNITS/ ACRE
UNIT DENSITY	1.53 UNITS/ ACRE	1.53 UNITS/ ACRE
RESIDENTIAL "B"		
TOTAL NUMBER OF UNITS	80 UNITS	80 UNITS
GROSS AREA OF RESIDENTIAL "B"	22.9± AC.=(0.77%)	22.9± AC.=(0.77%)
PERMITTED DENSITY	9.60 UNITS/ ACRE	9.60 UNITS/ ACRE
UNIT DENSITY	3.49 UNITS/ ACRE	3.49 UNITS/ ACRE
RESIDENTIAL "D"		
TOTAL NUMBER OF UNITS	314 UNITS	314 UNITS
GROSS AREA OF RESIDENTIAL "D"	31.82 AC.=(1.07%)	31.82 AC.=(1.07%)
PERMITTED DENSITY	18.00 UNITS/ ACRE	18.00 UNITS/ ACRE
UNIT DENSITY	9.67 UNITS/ ACRE	9.87 UNITS/ ACRE
C.C.R.C. "A","B" & "C"		
TOTAL NUMBER OF UNITS	286 UNITS	38 UNITS
C.C.R.C. "D"		
TOTAL NUMBER OF UNITS	75 UNITS	558 UNITS
TOTAL NUMBER OF BEDS	155 BEDS	145 BEDS
ACREAGE FOR DENSITY	166.22 AC.	166.22 AC.
OVERALL C.C.R.C. DENSITY (SEE NOTE)	2.17 UNITS/ AC.	3.59 UNITS/ AC.
NOTE: BEDS ARE NOT INCLUDED IN DENSITY CALCULATIONS		
OPEN SPACE		
WITHIN NON-RESIDENTIAL AMENITY AND SERVICE SITES	150.27 AC.	150.27 AC.
* GOLF COURSE, LAKES AND BUFFERS, MARSH RESERVE	844.71 AC.	844.71 AC.
OPEN SPACE WITHIN RESIDENTIAL "A"	514.12 AC.	514.12 AC.
OPEN SPACE WITHIN RESIDENTIAL "B" & "D"	38.77 AC.	38.77 AC.
TOTAL AREA OF OPEN SPACE	1,547.87 AC.	1,547.87 AC.
TOTAL AREA OF PROJECT	2,962.24 AC.	2,962.24 AC.
% OF OPEN AREA	52.3%	52.3%
OVERALL DENSITY		
TOTAL PROJECT AREA	2,962.28 AC.	2,962.28 AC.
TOTAL NUMBER OF RESIDENTIAL UNITS	3,340 UNITS	3,701 UNITS
OVERALL PROJECT DENSITY	1.13 UNITS/ AC.	1.25 UNITS/ AC.

* NOTES

MARSH RESERVES, LAKES AND BUFFERS	278.12 AC.
GOLF COURSE (INCLUDES LAKES IN PLAY)	491.09 AC.
RESERVED FOR ROUTE 199	20.0 AC.
ASSOCIATED GREENBELTS NATURAL OPEN SPACE IN 1993 ADDITION	3.30 AC.
OPEN SPACE IN 1995 ADDITION	5.00 AC.
OPEN SPACE IN 1998 ADDITION	47.20 AC.
OPEN SPACE IN 2008 ADDITION	112.49 AC.

No.	DATE	REVISION / COMMENT / NOTE	BY
2	5/20/08	REVISIONS PER RELOCATION OF BUILDINGS	AES
1	4/14/08	REVISIONS PER JCC COMMENTS DATED MARCH 25, 2008	AES
			JAG
			MEMO BY

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CONSULTING ENGINEERS
WILLIAMSBURG • RICHMOND • GLOUCESTER

LAND USE MASTER PLAN
FORD'S COLONY
AT WILLIAMSBURG
OWNER / DEVELOPER: REALTEC, INCORPORATED
VIRGINIA
JAMES CITY COUNTY
POWHATAN DISTRICT

Designed AES	Drawn AES
Scale 1"= 600'	Date 6/2021
Project No. W10514-01	
Drawing No. 2	

SOIL CHARACTERISTICS

SOIL #	SOIL NAME	TYPICAL SLOPES	EROSION FACTOR (K)	EROSION FACTOR (T)
5	BETHERA	0–2%	0.28–0.32	5
10B	CRAVEN	2–6%	0.32–0.37	3
10C	CRAVEN	6–10%	0.32–0.37	3
11C	CRAVEN–UCHEE COMPLEX	6–10%	0.32–0.37	3
14B	EMPORIA	2–6%	0.20–0.28	4
15D	EMPORIA COMPLEX	10–15%	0.20–0.28	4
15E	EMPORIA COMPLEX	15–25%	0.20–0.28	4
19B	KEMPSVILLE EMPORIA	2–6%	0.20–0.32	3
26B	PAMUNKEY	2–6%	0.28	4
27	PEAWICK	RELATIVELY FLAT	0.24–0.37	4
29A	SLAGLE	0–2%	0.24	3

INFORMATION TAKEN FROM "SOIL SURVEY OF JAMES CITY AND YORK COUNTIES AND THE CITY OF WILLIAMSBURG, VIRGINIA" ISSUED IN APRIL, 1985 BY THE UNITED STATES DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE IN COOPERATION WITH VIRGINIA POLYTECHNIC INSTITUTE AND STATE

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.

ENVIRONMENTAL IMPACTS

TIDAL WETLANDS:	NONE
TIDAL SHORES:	NONE
100 FT RPA BUFFER:	5,685 S.F.; 0.13 AC.
NON-TIDAL WETLANDS IN RMA:	17,055 S.F.; 0.39 AC.
NON-TIDAL WETLANDS IN RPA:	8,050 S.F.; 0.18 AC.
HYDRIC SOILS:	NOT MODIFIED
25% OR GREATER SLOPES:	8,000± S.F.; 0.18 AC.
NON-RPA BUFFERS:	52,383 S.F.; 1.20 AC.

SITE DATA:

TOTAL SITE AREA=
7,871,302 S.F.; 180.7 AC±
DISTURBED AREA=
2,981,056 S.F.; 68.43 AC±
(37.8% OF TOTAL SITE)
SITE IMPERVIOUS COVER=
1,178,353 S.F.; 27.05 AC±
(15.0% OF TOTAL SITE)
CCRC BUILDING IMPERVIOUS COVER=
370,200 S.F.; 8.50 AC±
SINGLE FAMILY IMPERVIOUS COVER=
808,153 S.F.; 18.55 AC±
OPEN SITE AREA =
5,480,470 S.F.; 125.8 AC±
(69.6% OF TOTAL SITE)

STEEP SLOPE IMPACT=
7,998 S.F.; 0.18 AC.

WETLAND IMPACT 2=
3,736 S.F.; 0.08 AC.
ROAD CROSSING
100 LF OF STREAM IMPACT
RPA BUFFER IMPACT=
18,336 S.F.; 0.42 AC.

PILE SEWER BRIDGE
RPA BUFFER IMPACT=
7,069 S.F.; 0.16 AC.

NOTE: SITE CONTAINS SOILS CLASSIFIED AS C AND D HYDROLOGIC GROUP. (11C SOILS HAVE BEEN CONSIDERED GROUP C FOR THE PURPOSES OF CALCULATIONS) SOILS TESTING IS BEING PERFORMED TO DETERMINE INFILTRATION RATES ON SITE.

POWHATAN SECONDARY SUBDIVISION

SPRINGHILL SUBDIVISION

APPROX. LOCATION OF 100 YR. FLOOD PLAIN VARIABLE ELEV. 23–21 FT.

LIMITS OF RPA WETLANDS

100' RPA BUFFER

COLD SPRING SWAMP

EXISTING ACCESS/LOGGING ROAD TO REMAIN WITHIN THE RPA AS PEDESTRIAN PATH

APPROX. LOCATION OF 100–YR. FLOOD PLAIN VARIABLE ELEVATION 23–21

ZONE 2 BUFFER

ZONE 3 BUFFER

LIMITS OF NON–RPA WETLANDS

GRAPHIC SCALE
100' 0' 100' 200'
SCALE: 1" = 100'

- RPA WETLAND
- NON-RPA WETLAND
- RPA BUFFER (100')
- ZONE 2 RIPARIAN BUFFER (VARIABLE WIDTH)
- ZONE 3 IMPERVIOUS COVER SETBACK (25')
- NON-RPA BUFFER (50')
- WETLAND (STORMWATER) IMPACTS
- ROAD WETLAND IMPACTS
- WETLAND IMPACTS (PILE CONSTRUCTION)
- STEEP SLOPE IMPACTS

Rev.	Date	Description	Revised By
2	5/20/08	REVISIONS PER RELOCATION OF BUILDINGS	JAG
1	4/14/08	REVISIONS PER JCC COMMENTS DATED MARCH 25, 2008	JAG

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Hampton Roads | Central Virginia | Middle Peninsula

ENVIRONMENTAL INVENTORY AT
FORDS' VILLAGE
AT
FORD'S COLONY OF WILLIAMSBURG
FOR
FRYE DEVELOPMENT, LLC
POWHATAN DISTRICT JAMES CITY COUNTY VIRGINIA

Project Contacts:	JAG
Project Number:	W10514-01
Scale: 1"=100'	Date: 6/2021
Sheet Number	3

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FORD'S COLONY SUBDIVISION

FORD'S COLONY SUBDIVISION

POWHATAN SECONDARY SUBDIVISION

POWHATAN SECONDARY SUBDIVISION

MONTICELLO WOODS SUBDIVISION

MONTICELLO WOODS SUBDIVISION

SPRINGHILL HOME OWNERS ASSOCIATION

SPRINGHILL SUBDIVISION

PRIVATE GATED ENTRANCE

GATED EMERGENCY ENTRANCE ONLY

LAND USE "D"

LIMITS OF RPA WETLANDS (TYP.)

100' RPA BUFFER

LIMITS OF NON-RPA WETLANDS (TYP.)

COLD SPRING SWAMP

CLUB HOUSE RECREATION AREA

PARK

SWM

ZONE 2

ZONE 3

GREENWAY TRAIL (TYP.)

STEEP SLOPES

150' COMMUNITY CHARACTER CORRIDOR BUFFER ALONG NEWS RD.

NEWS ROAD

PAVED MULTI-USE TRAIL

POWHATAN CREEK

GRAVES PROPERTY

NIXON PROPERTY

N/F RICHARDSON HOLDINGS

GRAPHIC SCALE

150' 0' 150' 300'

SCALE: 1" = 150'

DEVELOPMENT TABULATIONS:

EXISTING ZONING (AND LAND USE DESIGNATION)	R-4 (B & D)
PROPOSED LAND USE DESIGNATION:	R-4 (A, B, C, & D)

DENSITY TABULATIONS:

GROSS ACREAGE:	180.79 AC. +/-	
LESS RPA WETLANDS:	47.42 AC. +/-	
LESS 25% SLOPES:	1.4 AC. +/-	(OUTSIDE WETLANDS AREAS)
TOTAL NON-DEVELOPABLE AREA:	48.82 AC. +/-	(27.0% OF TOTAL PARCEL)

LAND-USE TABULATIONS:

TOTAL PARCEL:	180.79 AC. +/-
LANDUSES A, B, C, & D (1):	74.56 AC. +/-
OPEN SPACE:	
RPA WETLANDS:	47.42 AC. +/-
BUFFER AREAS (2) :	58.81 AC. +/-
TOTAL OPEN SPACE:	106.23 AC. +/-

(1) INCLUDES (±4 AC.) RECREATIONAL-AMENITY OPEN SPACE AREA.

(2) BUFFER AREAS INCLUDE RPA BUFFER (35.36 AC.), ZONE 2 RIPARIAN BUFFER (11.17 AC.), ZONE 3 RIPARIAN BUFFER (1.37 AC.), COMMUNITY CHARACTER CORRIDOR BUFFER (10.91 AC.).

LEGEND:

- RPA WETLAND (47.42 AC. ±)
- RPA BUFFER (100') (35.35 AC. ±)
- ZONE 2 RIPARIAN BUFFER (7.10 AC. ±) (VARIABLE WIDTH)
- ZONE 3 RIPARIAN BUFFER (25') (1.38 AC. ±)
- LANDUSE BOUNDARIES (61.59 AC. ± "A, B, & C"; 12.90 AC.± "D")
- APPROX. LOCATIONS OF RECREATIONAL-AMENITY OPEN SPACE (4 AC. ±)
- SLOPES 25% OR GREATER
- PEDESTRIAN CIRCULATION
- STORMWATER FEATURE

NOTE: 15 FT. BUILIDNG SETBACK TO RPA BUFFER ALONG COLD SPRING SWAMP.

Land Use Density Chart	Max. # Units	Max. Non-Residential Floor Space	Maximum Developable Acreage
Land Use A, B, & C A - Single Family B - Multifamily (2-4 unit buildings) C- Multifamily (2 over 4 unit buildings) TOTAL	286 (1) UNITS	N/A	±61 Acres
D - Independent Living Apartments	75 Units		
D - Commom Areas Dining Areas Administration Offices Other Amenities Other Limited Commercial Uses (2)		UP TO 150,000 S.F.	±13 Acres
D - Health Care Center Assisted Living/Memory Care Skilled Nursing	125 Rooms 30 Beds		
MAXIMUMS:	516 UNITS	150,000 gsf	±74 Acres

NOTES

(1) MASTERPLAN WILL CONSIST OF A MIX OF SINGLE FAMILY, TOWNHOME, AND CONDOMINIUM, STYLE UNITS . MASTER PLAN LAYOUT SHOWN FOR DENSITY PURPOSES; FINAL CONFIGURATION TO BE REVIEWED AND APPROVED AT SITE PLAN.

(2) LIMITED COMMERCIAL USES SHALL BE PERMITTED FOR USE BY RESIDENTS, GUEST OF THE COMMUNITY, & EMPLOYEES.

ADDITIONAL MASTER PLAN NOTES

- NO STRUCTURES WITHIN THE "D" PORTION OF THE SITE SHALL EXCEED 60-FT IN HEIGHT.
- ALL STREETS, ALLEYS AND DRIVEWAYS SHALL BE PRIVATELY MAINTAINED. ALL ENTRANCES TO THE VDOT RIGHT OF WAY SHALL BE DESIGNED IN ACCORDANCE WITH VDOT COMMERCIAL ENTRANCE DESIGN STANDARDS.
- A MINIMUM OF 4 ACRES OF DEDICATED RECREATION AREAS SHALL BE PROVIDED. THESE AREAS SHALL BE GENERALLY AS SHOWN ON THE MASTER PLAN AND PROVIDE BASIC AMMENITIES SUCH AS A POOL, CLUBHOUSE, PARK BENCHES AND LANDSCAPED AREAS. ADDITIONALLY PASSIVE OPEN SPACES AND WALKING TRAILS SHALL BE PROVIDED.

Rev.	Date	Description	Revised By

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Hampton Roads | Central Virginia | Middle Peninsula

AMENDED LAND-USE MASTER PLAN

FORDS' VILLAGE

AT

FORD'S COLONY OF WILLIAMSBURG

FOR

FRYE DEVELOPMENT, LLC

POWHATAN DISTRICT JAMES CITY COUNTY VIRGINIA

Project Contacts:	JAG
Project Number:	W10514-01
Scale: 1"=100'	Date: 6/2021
Sheet Number	4

NOTES:

- ALL GRAVITY SEWER SHALL BE 8" DIA
- ELEVATED OPEN PILE SEWER BRIDGE WILL BE UTILIZED TO SEWER THE PROJECT.
- ALL UNITS SHALL BE SERVED BY PUBLIC SEWER. UNITS DESIGNATED AS GP ON THE MASTER PLAN ARE ANTICIPATED TO REQUIRE A PRIVATELY MAINTAINED PUMP.
- ADDITIONAL FIRE HYDRANTS WILL BE PLACED AT THE TIME OF SITE PLAN TO ENSURE PROPER FIRE DEPARTMENT ACCESS AND COVERAGE.
- THIS UTILITY LAYOUT IS CONCEPTUAL IN NATURE AND MAY NEED TO BE MODIFIED AS PART OF THE FINAL ENGINEERING DESIGN. THE LAYOUT WILL BE CONFIRMED WITH AND APPROVED BY JCSA PRIOR TO SUBMISSION OF DEVELOPMENT PLAN DRAWINGS

SUBDIVISION
POWHATAN SECONDARY SUBDIVISION
MONTICELLO WOODS SUBDIVISION
SPRINGHILL SUBDIVISION
NEWS ROAD
POWHATAN CREEK
COLD SPRING SWAMP
CONNECT TO EXISTING WATERLINE (CONNECTION TO OCCUR IN SHOULDER IF FEASIBLE)
APPROX. LOCATION OF WATERMAN LOOP. FINAL CONNECTION TO BE DETERMINED AT SITE PLAN.
GP GRINDER PUMP LOTS
LIMITS OF RPA WETLANDS
100' RPA BUFFER
PROPOSED FIRE HYDRANT
PROPOSED FIRE HYDRANT (TYP.)
ELEVATED SEWER BRIDGE
EX. MANHOLE INV=±16.0
PROPERTY LINE
EX. CULVERT (SIZE?)
EX. BLDG

SAN MH TOP=45.0 INV=40.0 D=5.0'
SAN MH TOP=50.0 INV=37.0 D=13.0'
SAN MH TOP=60.0 INV=36.0 D=24.0'
SAN MH TOP=40.0 INV=35.0 D=5.0'
SAN MH TOP=68.0 INV=63.0 D=5.0'
SAN MH TOP=58.0 INV=33.0 D=25.0'
SAN MH TOP=57.0 INV=32.0 D=25.0'
SAN MH TOP=40.0 INV=28.5 D=11.5'
SAN MH TOP=60.0 INV=55.0 D=5.0'
SAN MH TOP=75.0 INV=70.0 D=5.0'
SAN MH TOP=75.0 INV=70.0 D=5.0'
SAN MH TOP=73.0 INV=64.0 D=9.0'
SAN MH TOP=70.0 INV=65.0 D=5.0'
SAN MH TOP=60.0 INV=55.0 D=5.0'
SAN MH TOP=50.0 INV=27.0 D=23.0'
SAN MH TOP=63.0 INV=35.0 D=22.0'
SAN MH TOP=40.0 INV=25.0 D=15.0'
SAN MH TOP=57.0 INV=41.0 D=16.0'
SAN MH TOP=59.95 INV=54.25 D=5.0'
SAN MH TOP=61.0 INV=51.0 D=10.0'
SAN MH TOP=57.5 INV=52.5 D=5.0'
SAN MH TOP=35.0 INV=21.0 D=14.0'
SAN MH TOP=24.0 INV=19.0 D=5.0'

GRAPHIC SCALE
100' 0' 100' 200'
SCALE: 1" = 100'

Rev.	Date	Description	Revised By

AES CONSULTING ENGINEERS
5248 Olde Towne Road, Suite 1
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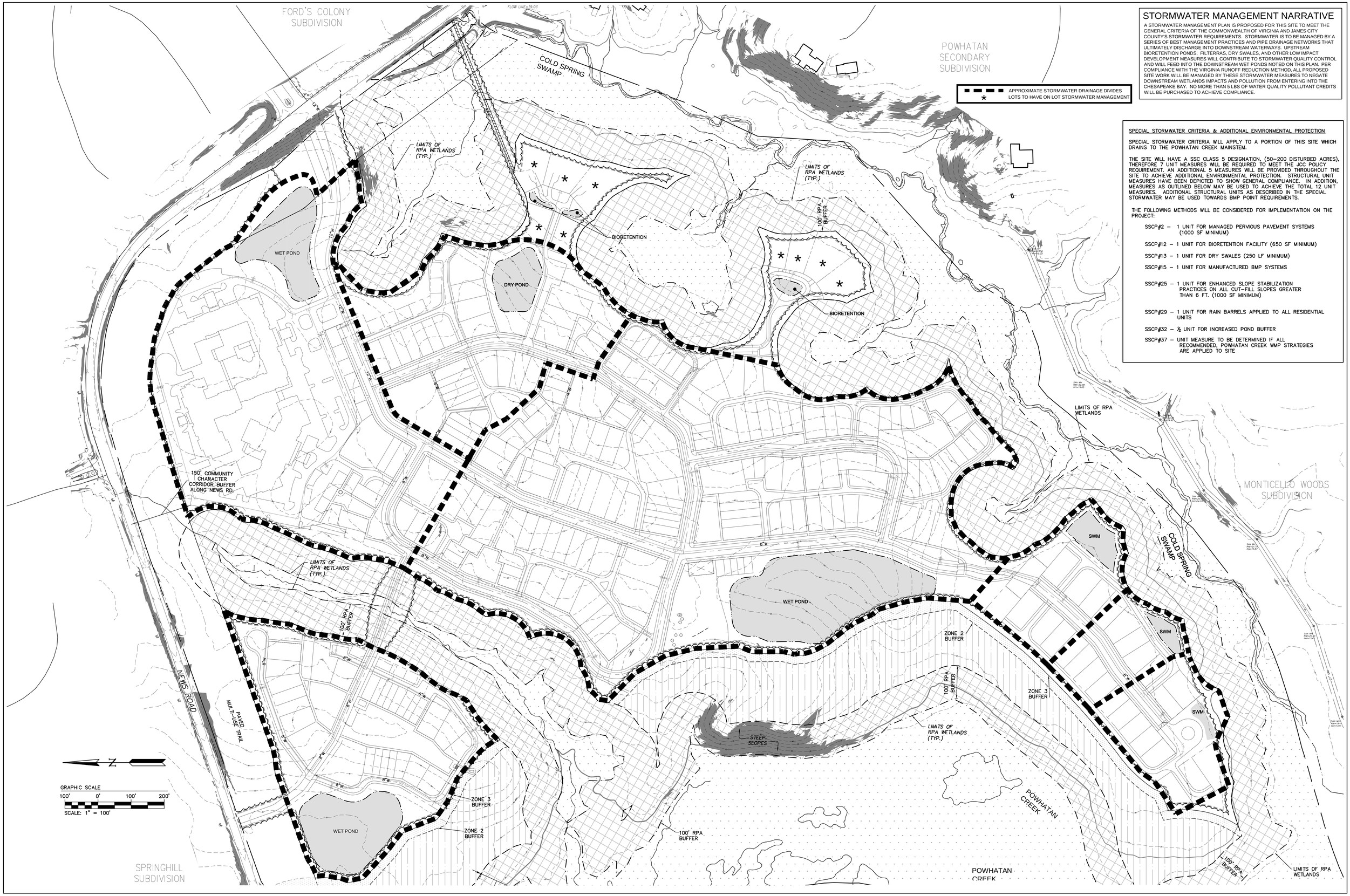
Hampton Roads | Central Virginia | Middle Peninsula

CONCEPTUAL UTILITY PLAN OF
FORDS' VILLAGE
AT
FORD'S COLONY OF WILLIAMSBURG
FOR
FRYE DEVELOPMENT, LLC
POWHATAN DISTRICT | JAMES CITY COUNTY | VIRGINIA

Project Contacts:	JAG
Project Number:	W10514-01
Scale: 1"=100'	Date: 6/2021
Sheet Number	5



STORMWATER MANAGEMENT NARRATIVE

A STORMWATER MANAGEMENT PLAN IS PROPOSED FOR THIS SITE TO MEET THE GENERAL CRITERIA OF THE COMMONWEALTH OF VIRGINIA AND JAMES CITY COUNTY'S STORMWATER REQUIREMENTS. STORMWATER IS TO BE MANAGED BY A SERIES OF BEST MANAGEMENT PRACTICES AND PIPE DRAINAGE NETWORKS THAT ULTIMATELY DISCHARGE INTO DOWNSTREAM WATERWAYS. UPSTREAM BIORETENTION PONDS, FILTERRAS, DRY SWALES, AND OTHER LOW IMPACT DEVELOPMENT MEASURES WILL CONTRIBUTE TO STORMWATER QUALITY CONTROL AND WILL FEED INTO THE DOWNSTREAM WET PONDS NOTED ON THIS PLAN. 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. NO MORE THAN 5 LBS OF WATER QUALITY POLLUTANT CREDITS WILL BE PURCHASED TO ACHIEVE COMPLIANCE.

SPECIAL STORMWATER CRITERIA & ADDITIONAL ENVIRONMENTAL PROTECTION

SPECIAL STORMWATER CRITERIA WILL APPLY TO A PORTION OF THIS SITE WHICH DRAINS TO THE POWHATAN CREEK MAINSTEM.

THE SITE WILL HAVE A SSC CLASS 5 DESIGNATION, (50–200 DISTURBED ACRES), THEREFORE 7 UNIT MEASURES WILL BE REQUIRED TO MEET THE JCC POLICY REQUIREMENT. AN ADDITIONAL 5 MEASURES WILL BE PROVIDED THROUGHOUT THE SITE TO ACHIEVE ADDITIONAL ENVIRONMENTAL PROTECTION. STRUCTURAL UNIT MEASURES HAVE BEEN DEPICTED TO SHOW GENERAL COMPLIANCE. IN ADDITION, MEASURES AS OUTLINED BELOW MAY BE USED TO ACHIEVE THE TOTAL 12 UNIT MEASURES. ADDITIONAL STRUCTURAL UNITS AS DESCRIBED IN THE SPECIAL STORMWATER MAY BE USED TOWARDS BMP POINT REQUIREMENTS.

THE FOLLOWING METHODS WILL BE CONSIDERED FOR IMPLEMENTATION ON THE PROJECT:

- SSCP#2 – 1 UNIT FOR MANAGED PERVIOUS PAVEMENT SYSTEMS (1000 SF MINIMUM)
- SSCP#12 – 1 UNIT FOR BIORETENTION FACILITY (650 SF MINIMUM)
- SSCP#13 – 1 UNIT FOR DRY SWALES (250 LF MINIMUM)
- SSCP#15 – 1 UNIT FOR MANUFACTURED BMP SYSTEMS
- SSCP#25 – 1 UNIT FOR ENHANCED SLOPE STABILIZATION PRACTICES ON ALL CUT–FILL SLOPES GREATER THAN 6 FT. (1000 SF MINIMUM)
- SSCP#29 – 1 UNIT FOR RAIN BARRELS APPLIED TO ALL RESIDENTIAL UNITS
- SSCP#32 – ½ UNIT FOR INCREASED POND BUFFER
- SSCP#37 – UNIT MEASURE TO BE DETERMINED IF ALL RECOMMENDED, POWHATAN CREEK WMP STRATEGIES ARE APPLIED TO SITE

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POWHATAN DISTRICT | JAMES CITY COUNTY | VIRGINIA

Project Contacts:	JAG
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080017656

AMENDED AND RESTATED FORD'S

COLONY PROFFERS

These AMENDED and RESTATED FORD'S COLONY PROFFERS are made this 10th day of June, 2008 by REALTEC INCORPORATED, a North Carolina corporation (together with its successors in title, the "Owner").

RECITALS

A. Owner is the developer of the Ford's Colony at Williamsburg development containing approximately 2,962 acres and which is zoned R-4, Residential Planned Community, with proffers, and subject to a Master Plan heretofore approved by James City County (the "Existing Master Plan").

B. In connection with prior Master Plan amendments, Owner has entered into and James City County has accepted Amended and Restated Ford's Colony Proffers dated as of January 6, 2005 and recorded in the Clerk's Office of the Circuit Court for the City of Williamsburg and County of James City as Instrument No. 050001465 and Richard J. Ford has entered into and James City County has accepted Richard J. Ford/Ford's Colony Proffers dated as of September 29, 1995 and recorded in the Clerk's Office of the Circuit Court for the City of Williamsburg and County of James City in James City Deed Book 757 at page 529 (together, the "Existing Proffers"). The property now subject to the Existing Proffers and Existing Master Plan is hereinafter called the "Existing Property".

C. Owner has applied to amend its Existing Master Plan to include as Section 37 of Ford's Colony a tract of land with an address of 3889 News Road, Parcel ID# 3730100004, containing approximately 180 acres, which property is more particularly described on Exhibit A (the "Additional Property") and to rezone the Additional Property from R-8 to R-4, with proffers.

Prepared by: Vernon M. Geddy, III, Esq., 1177 Jamestown Rd., Williamsburg, VA 23185 (757- 220-6500)

Return to: Adam R. Kinsman, Deputy County Attorney, 101-C Mounts Bay Rd., Williamsburg, VA 23185 (757-253-6612)

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D. Owner has submitted to the County a master plan entitled "Master Plan for Rezoning of The Village at Ford's Colony at Williamsburg for Realtec Incorporated" prepared by AES Consulting Engineers dated July 20, 2007, last revised May 20, 2008 (the "Amended Master Plan") in accordance with the County Zoning Ordinance.

E. Owner desires to offer to the County certain conditions on the development of the Property not generally applicable to land zoned R-4.

F. In consideration of the approval of the amendment of its Amended Master Plan and the rezoning, Owner desires to amend and restate the Existing Proffers as set forth below. If the requested rezoning and amendment of Owner's Existing Master Plan is not approved by James City County, these Amended and Restated Ford's Colony Proffers shall be void and the Existing Proffers shall remain unchanged, in full force and effect.

RESTATEMENT

1. **Restatement**. The Existing Proffers are hereby restated and incorporated herein by reference and shall continue to apply only to the Existing Property.

PROFFERS APPLICABLE TO THE ADDITIONAL PROPERTY

The following proffers apply only to the Additional Property:

2. **Master Plan**. The Additional Property shall be developed generally as shown and set out on sheets 4 through 8 of the Amended Master Plan. Final plans (as defined in Section 24-279 of the Zoning Ordinance) may vary from the Amended Master Plan to the extent permitted by Section 24-279 of the Zoning Ordinance.

3. **Density**. (a) There shall be no more than 596 independent living dwelling units ("dwelling units"), 83 assisted living/memory care rooms and 60 skilled nursing beds (together, the "rooms/beds") and two AG Beds (as defined in Proffer 22) on the Additional Property. The

terms "assisted living room" or "room" shall mean a non-medical residential room in the assisted living facility area of the continuing care retirement community licensed in accordance with Sections 63.2-1800 et seq. of the Virginia Code and Sections 22 VAC 40-72 et seq. of the Virginia Administrative Code where adults who are aged, infirm or disabled are provided personal and health care services and 24-hour supervision and assistance. Rooms must meet the standards set forth in 22 VAC 40-72-730 and 880. Typically rooms are occupied by one person. No more than two persons may occupy a room and only persons directly related by blood or marriage may occupy the same room.

(b) All dwelling units developed on the Additional Property shall be occupied by persons eighteen (18) years of age or older in accordance with applicable federal and state laws and regulations, including but not limited to: the Fair Housing Act, 42 U.S.C. 3601 et seq. and the exemption therefrom provided by 42 U.S.C. 3607(b)(2)(C) regarding discrimination based on familial status; the Housing for Older Persons Act of 1995, 46 U.S.C. 3601 et seq.; the Virginia Fair Housing Law Va. Code 36-96.1 et seq.; any regulations adopted pursuant to the foregoing; any judicial decisions arising thereunder; any exemptions and/or qualifications thereunder; and any amendments to the foregoing as now or may hereafter exist. Specific provisions of the age restriction described above and provisions for enforcement of same shall be set forth in a recorded document which shall be subject to the review and approval of the County Attorney prior to issuance of the first building permit for dwelling units on the Additional Property.

(c) Any accessory commercial uses located on the Additional Property, such as bank offices, beauty salons and barbershops, shall be located and designed to serve residents of the Additional Property as verified by the Director of Planning.

4. **Water Conservation.** (a) The Owner shall be responsible for developing water

conservation standards to be submitted to and approved by the James City Service Authority ("JCSA") and subsequently for enforcing these standards. The standards shall address such water conservation measures as limitations on the installation and use of irrigation systems and irrigation wells, the use of drought resistant native and other adopted low water use landscaping materials and warm season turf on common areas in areas with appropriate growing conditions for such turf and the use of water conserving fixtures and appliances to promote water conservation and minimize the use of public water resources. The standards shall be approved by the JCSA prior to final subdivision or site plan approval.

(b) If the Owner desires to have outdoor watering of the Additional Property it shall provide water for irrigation utilizing surface water collection from the surface water ponds ("Impoundments") or other collection devices such as cisterns or rain barrels ("Collection Devices"). In the design phase, the Owner and design engineer shall take into consideration the design of stormwater systems that can be used to collect stormwater for outdoor water use for the development. In no circumstance shall the JCSA public water supply be used for irrigation purposes, except as otherwise provided by this condition. If the Owner demonstrates to the satisfaction and approval of the General Manager of JCSA through drainage area studies and irrigation water budgets that the Impoundments and Collection Devices cannot provide sufficient water for all irrigation, the General Manager of the JCSA may, in writing, approve a shallow (less than 100 feet) irrigation well to supplement the water provided by the Impoundments and the Collection Devices.

5. **Contributions for Community Impacts**. (a) A contribution of $1,000 for each dwelling unit on the Additional Property shall be made to the County for fire, police or emergency services, library uses, and other public facilities, uses or infrastructure.

(b) A contribution of $250.00 for each room/bed (excluding the AG Beds) on the Additional Property shall be made to the County for fire, police or emergency services uses.

(c) A contribution of $870.00 for each dwelling unit and $435.00 for each room/bed on the Additional Property shall be made to the JCSA for water system improvements.

(d) A one-time cash contribution in the amount of $36,000.00 shall be made to the County prior to the County being obligated to issue any certificates of occupancy for dwelling units/rooms/beds on the Additional Property for off-site improvements at the News Road/Monticello Avenue intersection and in the Monticello Avenue corridor.

(e) A contribution of $750.00 for each dwelling unit on the Additional Property, subject to a credit for the costs of engineering and construction related to the improvements proffered by Owner in Section 6(b) calculated as set forth below, shall be made to the County for improvements to the News Road/Powhatan Secondary intersection, flood control measures where News Road crosses Cold Spring swamp, improvements at the News Road/Centerville Road intersection and other off-site road improvements in the News Road corridor. Owner shall receive a credit in an amount equal to its actual costs of the engineering and construction of the improvements proffered by Owner in Section 6(b) against the initial per unit contributions proffered under paragraph (d) of this Section (the "Credit Amount"). If construction of such improvements is not complete at the time the initial per unit contributions are due under paragraph (e) of this Section, the Credit Amount shall equal an engineer's estimate of such costs submitted by the Owner and approved by the Director of Planning, The Credit Amount divided by $750.00 is the number of dwelling units for which the Credit Amount offsets the cash contribution otherwise due and payable. After application of the Credit Amount, the $750.00 per dwelling unit cash contribution shall be payable on all subsequent dwelling units on the

Additional Property. Owner shall provide the County with copies of invoices and other supporting documentation of the costs of the improvements. If the Credit Amount is based on an agreed upon costs estimate, it shall be adjusted to equal the final actual costs of engineering and construction ("Actual Costs"). If the Credit Amount is more than the Actual Costs, Owner shall pay to the County an amount equal to the difference. If the Credit Amount is less than the Actual Costs, Owner shall receive an additional credit equal to the difference between the Actual Costs and the Credit Amount at the time the next cash contributions are due this paragraph.

(f) The contributions described above in paragraphs (a), (b), (c) and (e) shall be payable for each dwelling unit or room/bed, as applicable, on the Additional Property at the time of final subdivision or site plan approval for the residential unit or non-residential building unless the County adopts a policy calling for the payment of cash proffers at a later time in the development process, in which case the contributions described in paragraphs (a), (b), (c) and (e) above shall be payable at the time specified in the policy. In the event dwelling units, such as townhouse units, require both a site plan and subdivision plat, the contributions described above shall be paid at the time of final subdivision plat approval.

(g) A one-time cash contribution shall be made to JCSA in the amount of $60,000.00 prior to the County being obligated to issue any certificates of occupancy for dwelling units/rooms/beds on the Additional Property for use by JCSA for off-site sewer improvements.

(h) The per unit/room/bed contribution amounts shall consist of the amounts set forth in the above paragraphs plus any adjustments included in the Marshall and Swift Building Costs Index (the "Index") from 2008 to the year a payment is made if payments are made after on or after January 1, 2009. In no event shall the per unit/room/bed contribution be adjusted to a sum less than the amounts set forth in the preceding paragraphs of this Section. In the event that the

Index is not available, a reliable government or other independent publication evaluating information heretofore used in determining the Index (approved in advance by the County Manager of Financial Management Services) shall be relied upon in establishing an inflationary factor for purposes of increasing the per unit/room/bed contribution to approximate the rate of annual inflation in the County.

6. **Entrances; Traffic Improvements**. (a) At the main entrance into the Additional Property at the intersection of News Road and Firestone Drive, an exclusive left-turn lane from westbound News Road into the Additional Property and an exclusive right-turn lane, including a shoulder bike lane, from eastbound News Road into the Additional Property shall be constructed. A shoulder bike lane along the Additional Property's News Road frontage shall be constructed. The existing southbound left turn lane on Firestone Drive at News Road will be restriped to a shared left and through lane.

(b) Prior to the County issuing final approval on any site or subdivision plan for any dwelling units/rooms/beds on the Additional Property, Owner shall submit plans to the County and Virginia Department of Transportation ("VDOT") for the installation of an exclusive left-turn lane on westbound News Road at the intersection with Powhatan Secondary. Owner will complete construction of the left-turn lane within twelve months of County and VDOT approvals to construct this exclusive left-turn lane. Owner is not responsible for road right of way acquisition or landscape/screening other than stabilization of disturbed soils. The County may elect to accept the cash equivalent contribution outlined in Proffer 5(d), (with any adjustments as may be appropriate as provided for in Proffer 5(g)), in lieu of construction of the turn lane by the Owner, in the event that acquisition of any needed right-of-way proves to be prohibitive. In the event that VDOT constructs this turn lane as part of its Six Year Secondary Road Plan, the

County may elect to divert some or all of the cash equivalent contribution to other road projects in the News Road Corridor, at the News Road/Monticello Avenue intersection, or in the western Monticello Avenue Corridor. Owner shall install or pay for the installation of a traffic signal at the intersection of News Road with Powhatan Secondary at such time as VDOT traffic signal warrants are met and VDOT has approved the installation of such a traffic signal.

(c) The improvements proffered hereby shall be constructed in accordance with VDOT standards. The improvements listed in paragraph (a) shall be completed or all required permits and plans for such approvals shall have been approved by all necessary governmental agencies and their completion bonded in form satisfactory to the County Attorney prior to the issuance of any certificates of occupancy for any building on the Additional Property.

(d) The second entrance to the Additional Property shall be located in the general location shown on the Master Plan and shall be limited by gate to emergency access only unless and until turn lanes approved by VDOT at this entrance have been installed.

(e) Owner shall convey free of charge to VDOT any right of way from the Additional Property necessary for the widening or realignment of News Road within 60 days of a written request for such conveyance together with final plans for the widening or realignment.

(f) Owner shall conduct traffic counts at its entrances prior to the County being obligated to issue certificates of occupancy for more than 247 dwelling units/rooms/beds on the Additional Property and again prior to the County being obligated to issue certificates of occupancy for more than 494 dwelling units/rooms/beds on the Additional Property. If these counts show a trip generation from the Additional Property more than 10% higher than the trip generation projected by the News Road Corridor Traffic Forecast and Analysis dated April 4, 2008 prepared by DRW Consultants, LLC filed with the rezoning application and on file with the Planning Division,

Owner shall submit an updated traffic impact study, including a listing of any entrance or turn lane improvements necessary to accommodate the increased traffic and the appropriate trigger for their construction, for review and approval by the County and VDOT. Owner shall install the necessary improvements, including any warranted traffic signal, as approved by the County and VDOT at the time recommended in the updated approved traffic study.

7. **Archaeology.** A Phase I Archaeological Study for the entire Additional Property shall be submitted to the Director of Planning for review and approval prior to land disturbance. A treatment plan shall be submitted and approved by the Director of Planning for all sites in the Phase I study that are recommended for a Phase II evaluation and/or identified as 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 of Planning and a treatment plan for said sites shall be submitted to, and approved by, the Director of Planning 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 III 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 of Planning prior to land disturbance within the study areas. 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 *Standards 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 Additional Property and the clearing, grading or construction activities thereon.

8. Off-Site Sewer Easements. Upon the request of JCSA, Owner shall grant JCSA utility easements over, across and under the portion of the Additional Property along Powhatan Creek to permit future connections from the gravity sewer on the Additional Property to Tax Parcel 3640100007. The location of the easement shall be determined during the site plan approval process. The easements shall be recorded prior to JCSA issuing a Certificate to Construct.

9. Sustainable Building. The project shall be designed and constructed to obtain at least 200 points under the EarthCraft House Virginia, EarthCraft Multi-Family program certification process and a copy of the project worksheet shall be provided to the Director of Planning prior to the issuance of a certificate of occupancy for buildings in the phase in question.

10. Master Stormwater Management Plan. (a) Owner shall submit to the County a master stormwater management plan for the Additional Property consistent with the Master Stormwater Conceptual Plan prepared by AES Consulting Engineers dated July 20, 2007, last revised April 14, 2008 ("Stormwater Plan") and included in the Master Plan set submitted herewith and on file with the County, including facilities and measures necessary to meet the County's general stormwater management system requirements and the special stormwater criteria applicable in the Powhatan Creek watershed ("SSC") and, in addition, including features and measures over and above those necessary to meet the general requirements and SSC requirements and which will provide at least an additional five SSC credits, which shall include, without limitation, the features and measures listed on the Stormwater Plan subject to the criteria and conditions set forth on the Stormwater Plan. The master stormwater plan shall be approved

by the Environmental Director or his designee prior to the submission of any development plans for the Additional Property. The master stormwater management plan may be revised and/or updated during the development of the Additional Property based on on-site conditions discovered in the field with the prior approval of the Environmental Division. The approved master stormwater management plan, as revised and/or updated, shall be implemented in all development plans for the Additional Property.

(b) Prior to final site plan approval of the first site plan on the Additional Property, Owner shall submit a stream monitoring plan to the Environmental Division for their review and approval including a baseline assessment of the existing condition of the stream segments delineated on sheet 7 of the Master Plan and providing for annual monitoring beginning upon the date of the issuance of the first certificate of occupancy for a building on the Additional Property and continuing for a period of ten years from that date of the geomorphology of such stream segments. If such monitoring indicates the presence of new erosion not shown in the baseline assessment, Owner shall install additional upstream run-off control measures to prevent further erosion as approved by the Environmental Division.

(c) The warehouse building constructed in the area shown on the Master Plan as "Maintenance Area" shall be constructed using "green roof" technology. "Green roof" is defined as a roof which includes vegetation planted in soil or another growing medium spread over a waterproof membrane and may include drainage and/or irrigation systems.

11. **Nutrient Management Plan**. The Owner shall be responsible for contacting an agent of the Virginia Cooperative Extension Office ("VCEO") or, if a VCEO agent is unavailable, a soil scientist licensed in the Commonwealth of Virginia, an agent of the Soil and Water Conservation District or other qualified professional to conduct soil tests and to develop,

based upon the results of the soil tests, customized nutrient management plans (the "Plans") for all common areas within the Additional Property shown on site plans for the Additional Property. The Plans shall be submitted to the County's Environmental Director for his review and approval prior to the issuance of the any certificates of occupancy for units/rooms/beds shown on the site plan. Upon approval, the Owner shall be responsible for ensuring that any nutrients applied to common areas be applied in strict accordance with the Plan.

12. **Private Streets**. All streets and alleys on the Additional Property shall be private and shall be maintained by the Owner.

13. **Lighting**. All light poles on the Additional Property shall not exceed 30 feet in height. All external lights on the Additional Property shall be recessed fixtures with no globe, bulb or lens extending below the casing or otherwise unshielded by the case so that the light source is visible from the side of the fixture. No light spillage defined as 0.1 footcandle or higher shall extend outside the property lines of the Additional Property unless otherwise approved by the Director of Planning. Owner shall submit a lighting plan to the Director of Planning for review and approval for consistency with this Proffer prior to final site plan approval.

14. **Greenway Trail**. Subject to the issuance of all required permits by the County and other agencies as may be needed, Owner shall construct a trail with a minimum eight foot wide travel path with a mulch or other natural surface (which will be open to the general public during daylight hours only), including necessary bridges, if any, generally in the location shown on the Master Plan. In addition, Owner shall grant the County an easement eight feet in width from the centerline of the trail as constructed for public access as described above and the maintenance and improvement of the trail by the County. The exact location of the trail and

greenway easement may be varied with the prior written approval of the Environmental Division. The trail shall be constructed within twelve months of the issuance of necessary permits by the County and other agencies as may be needed.

15. **Natural Resources.** A natural resource inventory of suitable habitats for S1, S2, S3, G1, G2, or G3 resources as defined in the County's Natural Resources Policy on the Additional Property shall be submitted to the Director of Planning for his/her review and approval prior to the submittal of any development plans for the Additional Property. If the inventory confirms that a natural heritage resource exists, a conservation management plan shall be submitted to and approved by the Director of Planning for the affected area. All inventories and conservation management plans shall meet the Virginia Department of Conservation and Recreation's Division of Natural Resources ("DCR/DNH") standards for preparing such plans, and shall be conducted under the supervision of a qualified biologist as determined by the DCR/DNH or the United States Fish and Wildlife Service. All approved conservation management plans shall be incorporated into the plan of development for the site, and the clearing, grading or construction activities thereon, to the maximum extent possible. Upon approval by the Director of Planning, a mitigation plan may substitute for the incorporation of the conservation management plan into the plan of development for the site. This proffer shall be interpreted in accordance with the County's Natural Resources Policy adopted by the County on July 27, 1999.

16. **Public Transit.** Owner shall install a bus stop and shelter on News Road adjacent to the main entrance into the Additional Property, with the exact location being subject to the approval of Williamsburg Area Transit ("WAT"), or any successor entity to WAT as may become appropriate. The bus stop shall be installed upon the request of WAT at such time as

WAT provides bus service along News Road to the Additional Property.

17. **Ford's Colony at Williamsburg Homeowners Association.** Owner shall not subject the Additional Property to the Declaration of Protective Covenants, Section II, Ford's Colony at Williamsburg, dated April 2, 1985 ("DPC") or the Bylaws of the Ford's Colony Homeowners Association ("FCHOA"), as amended from time to time ("Bylaws") nor shall owners or residents of units, lots or parcels on the Additional Property be "Owner(s)" as such term is defined in the DPC or the Bylaws or be Members (as defined in the DPC) of the FCHOA.

18. **Recreation**. Owner will provide recreational and social facilities and programs appropriate for residents of a continuing care retirement community, which includes senior adult housing, assisted living beds, and nursing beds, as determined by Owner and generally as described below and in the general locations shown on the Master Plan. Facilities will be both indoor and outdoor and will be managed and maintained on a year round basis by Owner. Hard surface and soft surface trails and sidewalks will be installed for walking and bicycling and shown on the site plan for each phase of the development. The phase one construction shall include an outdoor pool and areas designated for lawn games, and accessible gardens. The phase one main CCRC building will contain terraces and covered porch areas that will be programmed for community social events such as cookouts and concerts and will have benches and chairs to be used during non-programmed time. The phase one main CCRC building will contain a comprehensive wellness center and pool for aerobic and strength conditioning, physical therapy, swimming and water aerobics, rooms for dining, formal lounges and bar, activities such as arts and crafts and woodworking, convenience shopping, health, beauty and other spa features, and a chapel. A multi-purpose facility will be built in conjunction with phase one for social and educational programming with a capacity of approximately 400 people. A private transportation

system will be employed to transport groups to Williamsburg area entertainment venues and shopping. All residents shall have full access to all indoor and outdoor facilities and programming. The dedicated assisted living buildings and skilled nursing care building will feature health care-related exercise areas and indoor and outdoor respite areas.

Associated Functions:

Building A: Lobby, Main Hall, Front Desk, Work Room, Mail Room, Administration, Sales, Security, Living Room, Community Center/Chapel, Library, Card Room, Terrace Room, Deli, Dining Room, Kitchen, Game Room, Crafts, Shop, Movie Auditorium, Bank, Toilets, Beauty/Barber, Business, Wellness/Spa, Pool, Staff Support, Maintenance, Housekeeping, Mechanical, Loading Dock, Receiving and Training

Building B: Lobby, Main Hall, Front Desk, Work Room, Mail Room, Administration, Sales, Security, Living Room, Community Center/Chapel, Library, Card Room, Terrace Room, Deli, Dining Room, Kitchen, Game Room, Crafts, Shop, Movie Auditorium, Bank, Toilets, Beauty/Barber, Business, Wellness/Spa, Pool, Staff Support, Maintenance, Housekeeping, Mechanical, Loading Dock, Receiving and Training, Service

Building C: main community meeting & multi-purpose, terrace, parking

Building D: spa, beauty/barber, arts/crafts, & chapel

19. **Cold Spring Swamp Drainage Analysis**. Prior to the County being obligated to grant final approval of the first site plan for development on the Additional Property, Owner shall cause a duly licensed professional engineer to prepare and submit to the County an analysis of the Cold Spring swamp drainage basin assuming full development in the drainage basin, subject to the review and approval of the County's Environmental Division Director, evaluating the adequacy of the existing culverts under News Road for use by the County in determining whether or not improvements to the culverts are necessary for flood control purposes.

20. **Height Restrictions**. No building on the Additional Property shall exceed 60 feet in height (with building height as defined in Section 24-2 of the County Zoning Ordinance) nor have more than four stories above grade. Building P as designated on the Master Plan shall not

exceed 106 feet above sea level (or 38 feet above finished grade) in height (with building height as defined in Section 24-2 of the County Zoning Ordinance). The buildings shown on the Master Plan as Duplexes shall not contain more than one and one-half stories. Building A shall not contain more than three stories or exceed 50 feet above finished grade in height (with building height as defined in Section 24-2 of the County Zoning Ordinance). Building Q shall not contain more than two stories. The buildings shown on the Master Plan as Maintenance, Transportation and Warehouse shall not contain more than two stories.

21. **Building P.** All mechanical equipment and vehicular entrances to underground parking for Building P shall be located on the sides of the building. All mechanical equipment serving Building P shall be screened for sound attenuation purposes by solid walls approved by the Director of Planning. Owner shall install evergreen trees behind Building P pursuant to a landscape plan approved by the Development Review Committee in the site plan review process in order to provide additional screening of the basement level of Building P from the Monticello Woods subdivision.

22. **Social Services.** Owner shall reserve two assisted living beds ("AG Beds") in Phase 2 of the project for individuals receiving auxiliary grants under the Auxiliary Grant Program (the "Program") administered by the Virginia Department of Social Services and shall participate in the Program with respect to the AG Beds. Such individuals must meet applicable Program eligibility criteria as determined by the County Department of Social Services and are subject to all admission and discharge criteria of the facility other than ability to pay for services and all other generally applicable rules and regulations of the facility.

WITNESS the following signatures and seals:

REALTEC INCORPORATED

By: _____

Title: VICE PRESIDENT

STATE OF VIRGINIA

~~CITY~~/COUNTY OF James City to-wit:

The foregoing instrument was acknowledged before me this 30th day of June, 2008 by Drew Mulhare, Vice President of REALTEC INCORPORATED, a North Carolina corporation, on behalf of the corporation.

_____

NOTARY PUBLIC

My commission expires: _____

Registration No.: _____

LYNN B. COMBS
Notary Public
Commonwealth of Virginia
185796
My Commission Expires May 31, 2011

Additional Property Description

EXHIBIT A

PARCEL A

All of that certain piece or parcel of land, lying and being in Jamestown District, James City County, Virginia, known as Hockaday, containing one hundred forty-seven and one-half (147-1/2) acres, more or less, bounded on the East, South and West by the land of the Shaw Land & Timber Co., known as the Pyle tract, the land of J. A. Barnes and Powhatan Swamp, and on the North by the land of Now Brothers.

PARCEL B

All of that certain piece or parcel of land situate in Jamestown District, James City County, Virginia, containing fifty five and two fifths (55-2/5) acres, more or less, and known as Cypress Swamp, and adjoining the lands of William Martin's estate on the East, Greenspring on the South and Thomas N. Ratcliffe on the West and D. S. Jones on the North.

LESS AND EXCEPT that property conveyed to the Commonwealth of Virginia by Order Confirming Commissioner's Report, entered February 20, 1974, in the Circuit Court for the City of Williamsburg and County of James City, Virginia, and recorded in the Office of the Clerk of Court of such Court in James City County Deed Book 150, at Page 420, containing 3.74 acres, more or less, confirming that certain Certificate Number C-21570, filed by State Highway Commissioner of Virginia against the Heirs at Law of John G. Warburton, dated May 24, 1972, and recorded June 12, 1972, in the aforesaid Clerk's Office in James City County Deed Book 137, at Page 213, and SUBJECT TO the easements conveyed to the Commonwealth of Virginia in such Order and such Certificate.

The property herein conveyed, commonly known as the "Hockaday-Cypress Tract," is further described in its entirety on that certain plat of survey, entitled 'BOUNDARY SURVEY OF A PORTION OF THE JOHN G. WARBURTON ESTATE, KNOWN AS THE HOCKADAY-CYPRESS TRACT," made by V. Monroe Mallory, of Dillard & Mallory, P.C., Certified Land Surveyors, Tappahannock, Virginia, dated October 25, 2001, recorded November 7, 2001, in the aforesaid Clerk's Office in James City County Plat Book 83, at Page 82, to which plat reference is made for a more complete description of such property.

Being a portion of the same property conveyed to John G. Warburton by Deed from C. H. Matthews and Mary Matthews, his wife, dated April 22, 1925, and recorded April 27, 1925, in the aforesaid Clerk's Office in James City County Deed Book 22, at Page 76, and by Deed from C. C. Hall and Beulah B. Hall, his wife, and T. C. Hall and Elsie G. Hall, his wife, dated March 18, 1952, and recorded April 3, 1952, in the aforesaid Clerk's Office in James City County Deed Book 47, at Page 183, the aforesaid John G. Warburton, having departed this life on October 15, 1966, and by his Last Will and Testament, dated February 3, 1964, and duly probated and recorded in the aforesaid Clerk's Office in City of Williamsburg Will Book 11, at Page 393, and duly recorded in the James City County probate records in Will File Number 374, devised such property to his daughters, Martha W. McMurran, and Sue Gregory Warburton Redd, subject to a life estate devised to Sarah Warburton, widow of John G. Warburton, who thereafter departed this life on September 25, 1991 (and whose Last Will and Testament, dated July 30, 1984, was duly probated and duly recorded in the aforesaid Clerk's Office in City of Williamsburg Will Book 45, at Page 18, and duly recorded in the James City County probate records in Will File Number 3234), leaving Martha W. McMurran and Sue Gregory Warburton Redd as the sole fee simple owners of such property, the said Sue Gregory Warburton Redd having conveyed her undivided one-half interest in and to such property to SWR-Hockaday, LLC, by Deed of Gift, dated February 24, 2003, and recorded March 3, 2003, in the aforesaid Clerk's Office as James City County Instrument Number 030006334, and by Deed of Correction, dated February 15, 2005, and recorded March 2, 2005, in the aforesaid Clerk's Office as James City County Instrument Number 050004430 and being the same property conveyed to Realtec, Incorporated, a North Carolina corporation, by Deed dated August 6, 2007, from Martha Warburton McMurran, widow and SWR-Hockaday, LLC, a Georgia limited liability company, and recorded in the said Clerk's Office as Instrument Number 070024542.

VIRGINIA: CITY OF WILLIAMSBURG & COUNTY OF JAMES CITY
This document was admitted to record on 16 Oct 08
at 2:47 AM/PM. The taxes imposed by Virginia Code
Section 58.1-801, 58.1-802 & 58.1-814 have been paid.

STATE TAX	LOCAL TAX	ADDITIONAL TAX
$ —	$ —	$ —

TESTE: BETSY B. WOOLRIDGE, CLERK
BY: Betsy B Woolridge Clerk

MASTER PLAN FOR REZONING OF THE VILLAGE

AT

FORD'S COLONY · WILLIAMSBURG ·

FOR

REALTEC INCORPORATED

PROJECT TEAM

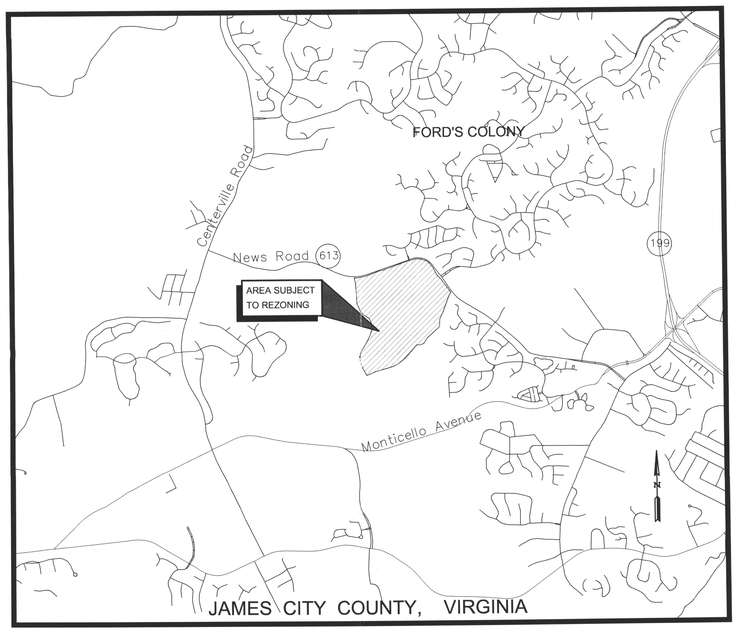
DEVELOPER: REALTEC INCORPORATED

LAND PLANNING: EDWARDS ASSOCIATES ARCHITECTS
MCBRIDE HESS DESIGN GROUP P.A.

ENVIRONMENTAL: CAHILL ASSOCIATES
KOONTZ-BRYANT, P.C.
KERR ENVIRONMENTAL SERVICES CORPORATION

TRAFFIC: DRW & ASSOCIATES

CIVIL CONSULTING: AES CONSULTING ENGINEERS



VICINITY MAP

(APROX. SCALE 1"=2000')

ORIGINALLY SUBMITTED: JULY 20, 2007
RESUBMITTED: APRIL 14, 2008
RESUBMITTED: MAY 20, 2008

JCC CASE # Z-0008-2007 / MP-0006-2007

INDEX OF SHEETS

1	COVER SHEET
2	2008 FORD'S COLONY MASTER PLAN
3	ENVIRONMENTAL INVENTORY
4	SECTION 37 LAND-USE MASTER PLAN
5	BINDING MASTER PLAN
6	MASTER UTILITY PLAN
7	MASTER STORMWATER MANAGEMENT PLAN
8	GRADING PLAN

NOTE: THIS PROJECT LIES WITHIN THE POWHATAN CREEK WATERSHED OF THE JAMES RIVER. THE EASTERN HALF OF THE PROPERTY IS PART OF POWHATAN CREEK SUBWATERSHED 209 (COLD SPRING SWAMP) AND THE WESTERN HALF IS PART OF THE NON-TIDAL POWHATAN CREEK MAINSTEM.

FINAL VERSION OF CCRC MASTER PLAN
10/9/08

RECEIVED
JUN 2008
Planning Department

MP-0006-2007 / Z-0008-2007

Edwards Associates architects

ES
CONSULTING ENGINEERS
WILLIAMSBURG • RICHMOND • GLOUCESTER
5248 Olde Towne Road, Suite 1 • Williamsburg, Virginia 23188
(757) 253-0040 • Fax (757) 220-8994

Cahill Associates
ENVIRONMENTAL CONSULTANTS

Master Plan for Rezoning -
The Village at Ford's Colony
JCC CASE # Z-0008-2007 /
MP-0006-2007
AES Project # 5652-22

FORD'S COLONY
WILLIAMSBURG

NON RESIDENTIAL AMENITY AND SERVICE SITES

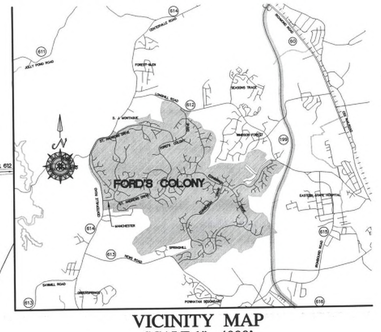
1	100 HOTEL CONDOMINIUMS, EXECUTIVE MEETING FACILITIES AND GOLF ACADEMY	4.71 AC.
2	GOLF CLUB AND PRO SHOP	5.05 AC.
3	INFORMATION AND SALES CENTER	1.81 AC.
4	ADMINISTRATIVE BUILDING	3.50 AC.
5	PUBLIC SERVICE AREA *	28.05 AC.
6	GOLF MAINTENANCE	3.90 AC.
7	COMMUNITY CLUB	7.72 AC.
8	PROJECT MAINTENANCE	10.59 AC.
9	DRIVING RANGE/CART STORAGE	10.34 AC.
10	ADDITIONAL RECREATION AREA	6.36 AC.
11	ADDITIONAL PUBLIC SERVICE AREA	6.76 AC.
12	CONTINUING CARE RETIREMENT COMMUNITY (CCRC)	180.7 AC.
	TOTAL	269.49 AC.

* NOTE: 1.21 AC. PORTION OF ORIGINAL 30.0 AC. P.S.A. SOLD TO FORD'S COLONY

LEGEND

- – RESIDENTIAL "A"
- – RESIDENTIAL "B"
- – RESIDENTIAL "D"
- – OPEN SPACE
- – WILLIAMSBURG WEST SUBDIVISION AND APARTMENTS NOT A PORTION OF MASTER PLAN

NOTE:
VARIABLE WIDTH (25' MIN) BUFFER ALONG THE FORD'S COLONY TRACT WHERE IT ADJOINS CENTERVILLE ROAD SHALL BE RESERVED FOR FUTURE WIDENING AND REALIGNMENT OF S.R. 614



VICINITY MAP
SCALE 1"= 4000'

GENERAL NOTES:

1. RECORDATION OF THIS PLAN IS SOLELY FOR THE PURPOSE OF IDENTIFYING THE LAND COVERED BY THE PROFFERS RECORDED HEREWITH AND DOES NOT CONSTITUTE A PLAT OF SUBDIVISION NOR DOES IT DEDICATE TO PUBLIC OR PRIVATE USE ANY ROADS, COMMON AREAS, GREEN AREAS, OR RECREATION AREAS.
2. THE PROPERTY SHOWN ON THIS PLAN IS COVERED BY PROTECTIVE COVENANTS OF RECORD IN THE CLERK'S OFFICE IN THE COURTHOUSE OF JAMES CITY COUNTY, VIRGINIA, WHICH PROVIDE FOR THE MAINTENANCE OF COMMON OPEN SPACE, RECREATION AREAS, SIDEWALKS, PARKING, PRIVATE STREETS AND OTHER PRIVATELY OWNED, BUT COMMON FACILITIES SERVING THIS PROJECT.
3. LOTS NUMBERED REPRESENT RECORDED SECTIONS OR SECTIONS THAT HAVE RECEIVED PRELIMINARY APPROVAL.
4. THE 2008 MASTER PLAN AMENDMENT WILL BE CONSIDERED A STAND ALONE PROJECT FOR THE PURPOSES OF STORMWATER MANAGEMENT POINTS AND CREDITS.

LAND USE TABULATION

	2008	2004
RESIDENTIAL "A"		
TOTAL NUMBER OF UNITS	2,856 UNITS	2,856 UNITS
GROSS AREA OF RESIDENTIAL "A"	1,868.77± AC.=(63.09%)	1,868.77± AC.=(67.19%)
PERMITTED DESTINY	4.00 UNITS/ ACRE	4.00 UNITS/ ACRE
UNIT DENSITY	1.53 UNITS/ ACRE	1.53 UNITS/ ACRE
RESIDENTIAL "B"		
TOTAL NUMBER OF UNITS	80 UNITS	80 UNITS
GROSS AREA OF RESIDENTIAL "B"	22.9± AC.=(0.77%)	22.9± AC.=(0.79%)
PERMITTED DENSITY	9.60 UNITS/ ACRE	9.60 UNITS/ ACRE
UNIT DENSITY	3.49 UNITS/ ACRE	3.49 UNITS/ ACRE
RESIDENTIAL "D"		
TOTAL NUMBER OF UNITS	314 UNITS	314 UNITS
GROSS AREA OF RESIDENTIAL "D"	31.82 AC.=(1.07%)	31.82 AC.=(1.14%)
PERMITTED DENSITY	18.00 UNITS/ ACRE	18.00 UNITS/ ACRE
UNIT DENSITY	9.87 UNITS/ ACRE	9.87 UNITS/ ACRE
C.C.R.C. "B"		
TOTAL NUMBER OF UNITS	38 UNITS	N/A
GROSS AREA OF C.C.R.C. "B"	10.97± AC.=(0.37%)	N/A
PERMITTED DENSITY	9.60 UNITS/ ACRE	N/A
UNIT DENSITY	3.46 UNITS/ ACRE	N/A
C.C.R.C. "D"		
TOTAL NUMBER OF UNITS	558 UNITS	N/A
GROSS AREA OF C.C.R.C. "D"	57.33 AC. =(1.94%)	N/A
PERMITTED DENSITY	18.00 UNITS/ ACRE	N/A
UNIT DENSITY	9.73 UNITS/ ACRE	N/A
OPEN SPACE		
WITHIN NON-RESIDENTIAL AMENITY AND SERVICE SITES	150.27 AC.	39.27 AC.
* GOLF COURSE, LAKES AND BUFFERS, MARSH RESERVE	844.71 AC.	844.71 AC.
OPEN SPACE WITHIN RESIDENTIAL "A"	514.12 AC.	514.12 AC.
OPEN SPACE WITHIN RESIDENTIAL "B" & "D"	38.77 AC.	38.77 AC.
TOTAL AREA OF OPEN SPACE	1,547.87 AC.	1,436.87 AC.
TOTAL AREA OF PROJECT	2,962.24 AC.	2,781.49 AC.
% OF OPEN AREA	52.3%	51.7%
OVERALL DENSITY		
TOTAL PROJECT AREA	2,962.28 AC.	2,781.49 AC.
TOTAL NUMBER OF RESIDENTIAL UNITS	3846 UNITS	3,250 UNITS
OVERALL PROJECT DENSITY	1.30 UNITS/ AC.	1.17 UNITS/ AC.

* NOTES	
MARSH RESERVES, LAKES AND BUFFERS	278.12 AC.
GOLF COURSE (INCLUDES LAKES IN PLAY)	491.09 AC
RESERVED FOR ROUTE 199	20.0 AC
ASSOCIATED GREENBELTS NATURAL OPEN SPACE IN 1993 ADDITION	3.30 AC.
OPEN SPACE IN 1995 ADDITION	5.00 AC.
OPEN SPACE IN 1998 ADDITION	47.20 AC.
OPEN SPACE IN 2008 ADDITION	111.0 AC.

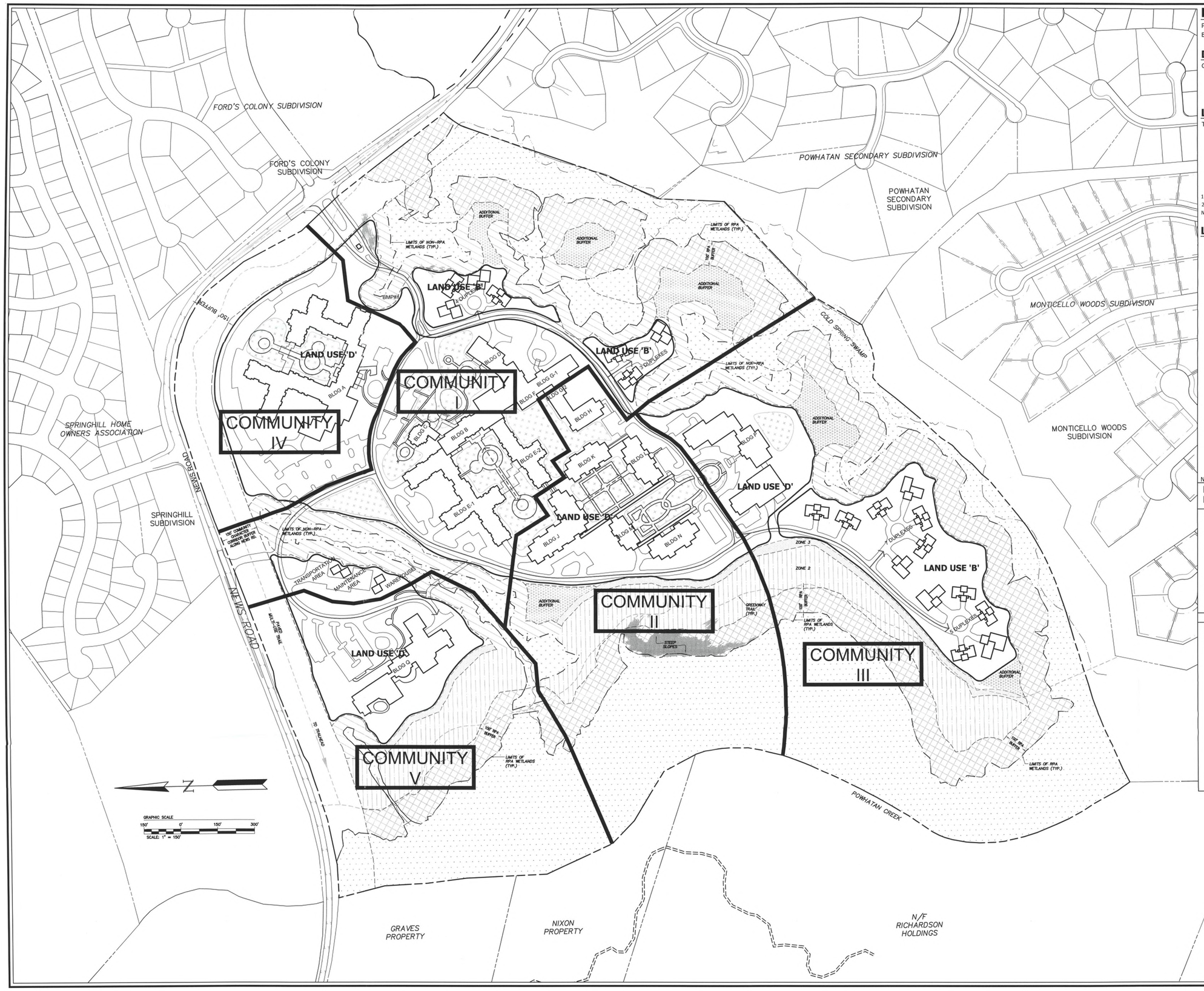
No.	DATE	REVISION / COMMENT / NOTE	BY
1	4/14/08	REVISIONS PER JCC COMMENTS DATED MARCH 25, 2008	AES
2	5/20/08	REVISIONS PER RELOCATION OF BUILDINGS	AES

5248 Olde Towne Road, Suite 1
Williamsburg, Virginia 23188
(757) 253-0040
Fax (757) 220-8994

CONSULTING ENGINEERS
WILLIAMSBURG • RICHMOND • GLOUCESTER

2008 LAND USE MASTER PLAN
FORD'S COLONY
AT WILLIAMSBURG
OWNER / DEVELOPER : REALTEC, INCORPORATED
VIRGINIA
JAMES CITY COUNTY
POWHATAN DISTRICT

Designed	Drawn
AES	AES
Scale	Date
1"= 600'	2/4/08
Project No.	
5652-70	
Drawing No.	
2	



DEVELOPMENT TABULATIONS:

PROPOSED ZONING (AND LAND USE DESIGNATION)	R-4 (B & D)
EXISTING ZONING:	R-8

DENSITY TABULATIONS:

GROSS ACREAGE:	180.79 AC. +/-
LESS RPA WETLANDS:	42.20 AC. +/-
LESS 25% SLOPES:	1.4 AC. +/-
TOTAL NON-DEVELOPABLE AREA:	43.60 AC. +/- (24.1% OF TOTAL PARCEL)

LAND-USE TABULATIONS:

TOTAL PARCEL:	**180.79 AC. +/-**
LANDUSES B & D (1):	68.30 AC. +/-
OPEN SPACE:	112.49 AC. +/-
RPA WETLANDS:	42.20 AC. +/-
NON-RPA WETLANDS	9.23 AC. +/-
BUFFER AREAS (2):	61.06 AC. +/-

1. INCLUDES (±9 AC.) RECREATIONAL-AMENITY OPEN SPACE AREA.
2. BUFFER AREAS INCLUDE RPA BUFFER (22.00 AC.), ZONE 2 RIPARIAN BUFFER (11.87 AC.), ZONE 3 RIPARIAN BUFFER (1.77 AC.), NON-RPA BUFFER (9.96 AC.), COMMUNITY CHARACTER COORIDOR BUFFER (10.91 AC.) & ADDITIONAL BUFFERS (4.55 AC.).

LEGEND:

- RPA WETLAND (42.20 AC. ±)
- NON-RPA WETLAND (9.23 AC. ±)
- RPA BUFFER (100') (22.00 AC. ±)
- ZONE 2 RIPARIAN BUFFER (11.87 AC. ±) (VARIABLE WIDTH)
- ZONE 3 RIPARIAN BUFFER (25') (1.77 AC. ±)
- NON-RPA BUFFER (50') (9.96 AC. ±)
- LAND USE "B" — LANDUSE BOUNDARIES (68.30 AC. ±)
- ADDITIONAL BUFFER (4.55 AC. ±)
- APPROX. LOCATIONS OF RECREATIONAL-AMENITY OPEN SPACE (9 AC. ±)
- SLOPES 25% OR GREATER
- VEHICULAR CIRCULATION
- PEDESTRIAN CIRCULATION

NOTE: 15 FT. BUILIDNG SETBACK TO RPA BUFFER ALONG COLD SPRING SWAMP.

Land Use Density Chart	Max. # Units	Area Density	Max. Non-Residential Floor Space	Maximum Acreage
B - Townhomes	38	0.17 Dwelling Units (du) per Acre	N/A	180.8 Acres
D - Independent Living Units	558	3.44	N/A	
D - Commom Areas (1)			297,800 gsf	
Dining Areas				
Administration				
Service/Loading Dock				
Wellness Center				
Other Amenities				
Other Limited Commercial Uses (3)				
D - Health Care Center (2)				
Assisted Living	83 Rooms	N/A	N/A	
Skilled Nursing	60 Beds			
Auxiliary Grant Program	2 Beds			
TOTALS:	596	3.30 du / ac.	297,800 gsf	180.8 Acres

Note (1): Exclusive of "Community Buildings" (identified as Building "C" on the Illustrative Masterplan).
Note (2): Health Care Center units not part of Land Use Density Tabulation.
Note (3): Limited commercial uses to include but not be limited to doctor's office, book store, pharmacy, deli, farmers market, craft store for use by residents only

COMMUNITY BREAKDOWN

COMMUNITY 1:	BUILDINGS B, C, D, E-1/E-2, F, G-1, 14 DUPLEXES, WAREHOUSE, STORAGE & EMPLOYEE PARKING TOTAL INDEPENDENT LIVING UNITS = 230; TOTAL BEDS/ROOMS = 54
COMMUNITY 2:	BUILDINGS G-2, H, J, K, L, M & N TOTAL INDEPENDENT LIVING UNITS = 168; TOTAL BEDS/ROOMS = 54
COMMUNITY 3:	BUILDING P, 24 DUPLEXES TOTAL INDEPENDENT LIVING UNITS = 60; TOTAL BEDS/ROOMS = 0
COMMUNITY 4:	BUILDING A TOTAL INDEPENDENT LIVING UNITS = 138; TOTAL BEDS/ROOMS = 0
COMMUNITY 5:	BUILDING Q TOTAL INDEPENDENT LIVING UNITS = 0; TOTAL BEDS/ROOMS = 35

No.	DATE	REVISION / COMMENT / NOTE	REVISED BY	REVIEWED BY
2	5/20/08	REVISIONS PER RELOCATION OF BUILDINGS	AES	JAG
1	4/14/08	REVISIONS PER JCC COMMENTS DATED MARCH 25, 2008	AES	JAG

Edwards Associates architects

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Engineers
Surveyors
Planners
Landscape Architects
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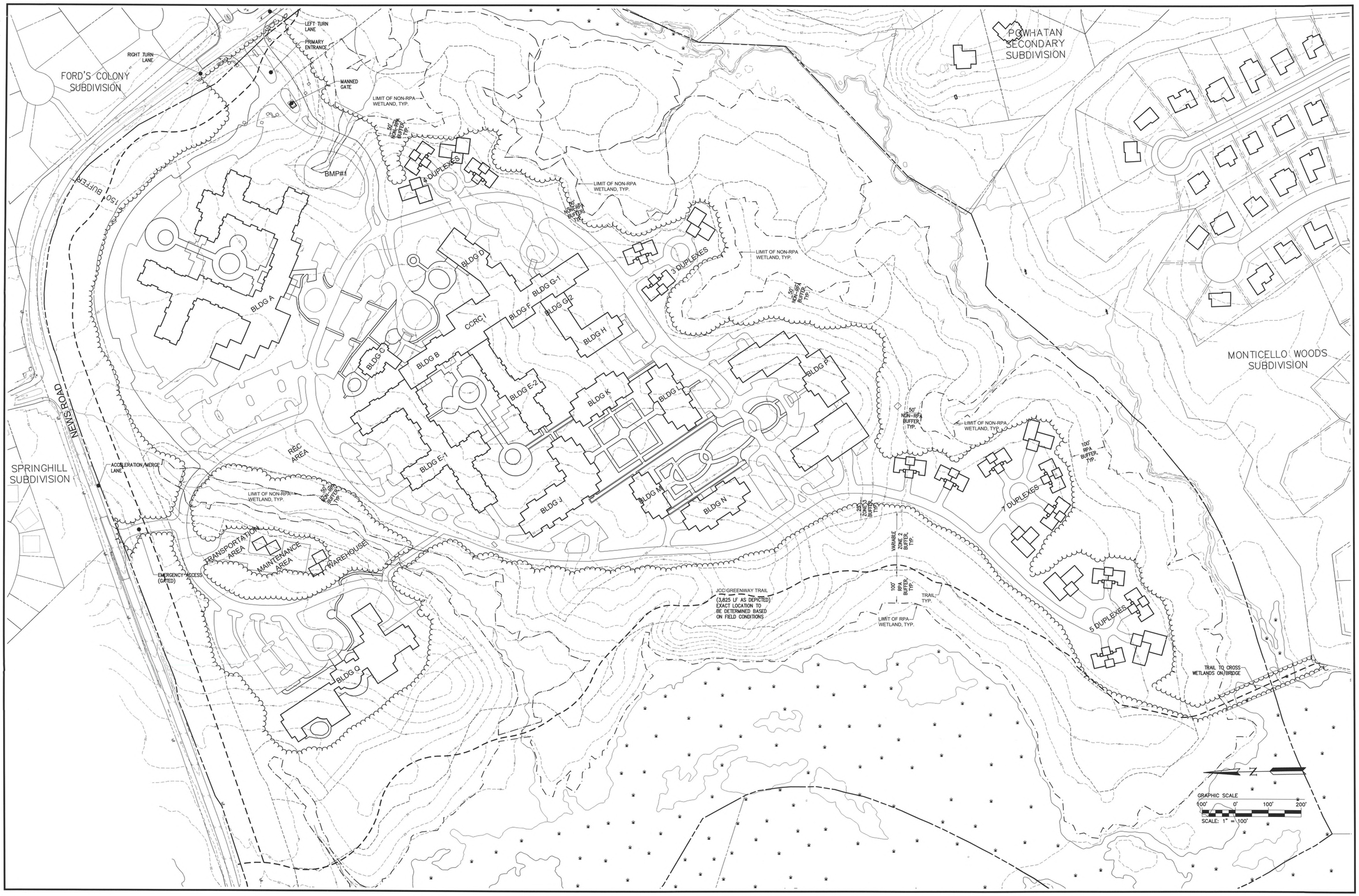
Williamsburg, Virginia 23188
Ph: (757) 253-0040
Fax: (757) 220-8994
www.aesva.com

Cahill Associates
ENVIRONMENTAL CONSULTANTS

BINDING LAND-USE MASTER PLAN FOR REZONING of
THE VILLAGE
at
FORD'S COLONY OF WILLIAMSBURG
for
REALTEC INCORPORATED
POWHATAN DISTRICT JAMES CITY COUNTY VIRGINIA

Designed	Drawn
AES	AES
Scale	Date
1"=150'	2/4/08
Project No.	
5652-22	
Drawing No.	
4	



No.	DATE	REVISION / COMMENT / NOTE	REVISED BY	REVIEWED BY
2	5/20/08	REVISIONS PER RELOCATION OF BUILDINGS	AES	JAG
1	4/14/08	REVISIONS PER JCC COMMENTS DATED MARCH 25, 2008	AES	JAG

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BINDING MASTER PLAN of
THE VILLAGE
at
FORD'S COLONY OF WILLIAMSBURG
for
REALTEC INCORPORATED

POWHATAN DISTRICT JAMES CITY COUNTY VIRGINIA

Designed	Drawn
AES	AES
Scale	Date
1"=100'	2/4/08
Project No.	
5652-22	
Drawing No.	
5	

NOTE:

- TO LIMIT WETLANDS AND RPA BUFFER IMPACTS 2 UNITS WILL BE SERVED BY A DUPLEX GRINDER PUMP. THIS UNIT WILL BE OWNED AND MAINTAINED BY THE CCRC FACILITY.
- TWO BRIDGES WILL BE UTILIZED TO SEWER THE PROJECT. THE ONE BRIDGE WHICH WILL IMPACT RPA WETLANDS, ALSO SERVES AS A PEDESTRIAN CONNECTION FOR THE COUNTY TRAIL SYSTEM.
- ALL UTILITIES ON-SITE TO REMAIN PRIVATE (UNLESS OTHERWISE NOTED).

NOTE: ALL BUILDINGS SHALL BE PROTECTED BY FIRE SUPPRESSION SYSTEMS. ADDITIONAL FIRE HYDRANTS WILL BE PLACED AT THE TIME OF SITE PLAN ONCE THE LOCATIONS OF FIRE DEPARTMENT CONNECTIONS ARE ESTABLISHED

GRAPHIC SCALE
100' 0' 100' 200'
SCALE: 1" = 100'

No.	DATE	REVISION / COMMENT / NOTE	REVISED BY	REVIEWED BY
2	5/20/08	REVISIONS PER RELOCATION OF BUILDINGS	AES	JAG
1	4/14/08	REVISIONS PER JCC COMMENTS DATED MARCH 25, 2008	AES	JAG

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MASTER UTILITY PLAN of
THE VILLAGE
at
FORD'S COLONY OF WILLIAMSBURG
for
REALTEC INCORPORATED
POWHATAN DISTRICT JAMES CITY COUNTY VIRGINIA

Designed	Drawn
AES	AES
Scale	Date
1"=100'	2/4/08
Project No.	
5652-22	
Drawing No.	
6	

FORD'S COLONY SUBDIVISION

COLD SPRING SWAMP

STREAM MONITORING #1

SSCP#29 (ALL DUPLEXES TO HAVE RAINBARRELS)

SSCP#12

SSCP#2

BMP#1

BMP1 23.4 AC. AC.

150' BUFFER

BLDG A

BLDG B

BLDG C

BLDG D

BLDG E-1

BLDG E-2

BLDG F

BLDG G-1

BLDG G-2

BLDG H

BLDG J

BLDG K

BLDG L

BLDG M

BLDG N

BLDG P

5 DUPLEXES

3 DUPLEXES

7 DUPLEXES

NEWS ROAD

SPRINGHILL SUBDIVISION

MONTICELLO SUBDIVISI

UNDISTURBED WOODS

NEW PLANTING AREA

WAREHOUSE

STREAM MONITORING #2

POWHATAN CREEK

GRAPHIC SCALE
100' 0' 100' 200'
SCALE: 1" = 100'

LEGEND

- MANAGED PERVIOUS PAVEMENT SYSTEMS - 6.43 AC.
- WET BMP - 0.42 AC.
- BIORETENTION/RAIN GARDEN - 3.22 AC.
- APROX. LIMITS OF UNDISTURBED AREA = 111.3± AC. (MIN. 96.7 ACRES TO BE SET ASIDE AS JCC CONSERVATION EASEMENT FOR BMP POINT COMPLIANCE)
- STREAM MONITORING LOCATION

BMP POINT ANALYSIS

TOTAL AREA OF SITE = 180.7± AC. (100%)

TOTAL AREA OF WETLANDS & RPA BUFFER = 73.43± AC.

TOTAL AREA OF OTHER BUFFERS = 31.6± AC.

PROPOSED NATURAL OPEN SPACE (EXTENDED RPA BUFFERS & ADDITIONAL BUFFER)
(COUNTING FOR 0.15 POINTS) = 41.6 AC.
41.6/180.7 X 100% X 0.15 = 3.45 POINTS

PROPOSED NATURAL OPEN SPACE
(COUNTING FOR 0.10 POINTS) = 55.1 AC.
55.11/180.7 X 100% X 0.10 = 3.05 POINTS
TOTAL = 6.50 POINTS

PROPOSED STRUCTURAL BMP'S
SWM/BMP WET POND #1 = 23.4 AC.
23.4/180.7 X 10 = 1.33 POINTS
INFILTRATION AREAS = 41.6 AC.
41.6/180.7 X 10 = 2.30 POINTS
TOTAL = 3.63 POINTS

TOTAL BMP POINTS = 6.50 OPEN SPACE
3.63 BMPS
10.13± POINTS

NOTES:
1) SWM FACILITIES MAY REQUIRE IMPACTS TO THE RPA TO PROVIDE ADEQUATE OUTFALLS.

2) LID MEASURES FOR BMP POINTS WOULD BE MEASURES INSTALLED IN EXCESS OF THE 12 UNIT MEASURES PROPOSED BUT MAY BE DEPICTED ON THE MASTER PLAN.

3) SANITARY SEWER AND PEDESTRIAN/VEHICULAR BRIDGES WILL REQUIRE IMPACTS TO THE RPA BUFFER.

4)INFILTRATION PRACTICES WITHIN PARKING AREAS AND AROUND BUILDINGS ARE PLANNED TO CONTRIBUTE TO THE BMP POINT REQUIREMENTS. ADDITIONAL TESTING WILL BE PERFORMED TO DETERMINE EXACT LOCATION DEPTHS AND DESIGN OF THESE FEATURES.

SPECIAL STORMWATER CRITERIA & ADDITIONAL ENVIRONMENTAL PROTECTION

SPECIAL STORMWATER CRITERIA WILL APPLY TO A PORTION OF THIS SITE WHICH DRAINS TO THE POWHATAN CREEK MAINSTEM.

THE SITE WILL HAVE A SSC CLASS 5 DESIGNATION, (50-200 DISTURBED ACRES), THEREFORE 7 UNIT MEASURES WILL BE REQUIRED TO MEET THE JCC POLICY REQUIREMENT. AN ADDITIONAL 5 MEASURES WILL BE PROVIDED THROUGHOUT THE SITE TO ACHIEVE ADDITIONAL ENVIRONMENTAL PROTECTION. STRUCTURAL UNIT MEASURES HAVE BEEN DEPICTED TO SHOW GENERAL COMPLIANCE. IN ADDITION, MEASURES AS OUTLINED BELOW MAY BE USED TO ACHIEVE THE TOTAL 12 UNIT MEASURES. ADDITIONAL STRUCTURAL UNITS AS DESCRIBED IN THE SPECIAL STORMWATER MAY BE USED TOWARDS BMP POINT REQUIREMENTS.

THE FOLLOWING METHODS WILL BE CONSIDERED FOR IMPLEMENTATION ON THE PROJECT:

(x4) SSCP#2 – 1 UNIT FOR MANAGED PERVIOUS PAVEMENT SYSTEMS (1000 SF MINIMUM)

(1) SSCP#4 – 1 UNIT FOR DISCONNECTED IMPERVIOUS AREAS (DOWN-SPOUTS DISCHARGING TO CISTERNS)

(x2) SSCP#12 – 1 UNIT FOR BIORETENTION FACILITY (650 SF MINIMUM)

(x2) SSCP#13 – 1 UNIT FOR DRY SWALES (250 LF MINIMUM)

(1/2) SSCP#14 – ½ UNIT FOR SUMPED OR BOTTOMLESS INLETS AT STRUCTURES NEAR BMP'S

SSCP#15 – 1 UNIT FOR MANUFACTURED BMP SYSTEMS

(1) SSCP#20 – 1 UNIT FOR ALL 12" OR GREATER OUTLET PIPES WITH ENHANCED OUTLET PROTECTION MEASURES

SSCP#23 – 1 UNIT FOR FILTER/BUFFER STRIPS

(1) SSCP#24 – 1 UNIT FOR AN INSPECTION/MAINTENANCE AGREEMENT FOR A BMP THAT DOES NOT HAVE ONE

(1) SSCP#25 – 1 UNIT FOR ENHANCED SLOPE STABILIZATION PRACTICES ON ALL CUT-FILL SLOPES GREATER THAN 6 FT. (1000 SF MINIMUM)

SSCP#28 – 1 UNIT FOR ENHANCED CHANNEL STABILIZATION PRACTICES

(1) SSCP#29 – 1 UNIT FOR RAIN BARRELS APPLIED TO ALL RESIDENTIAL UNITS

SSCP#31 – 2 UNITS FOR PROVIDING GREEN ROOF SYSTEM

(1/2) SSCP#32 – ½ UNIT FOR INCREASED POND BUFFER

(1) SSCP#37 – UNIT MEASURE TO BE DETERMINED IF ALL RECOMMENDED, POWHATAN CREEK WMP STRATEGIES ARE APPLIED TO SITE

(1/2) SSCP#38 – ½ UNIT PER EVERY 1 POINT OVER 10 USING JCC'S 10 POINT SYSTEM

(1/2) SSCP#39 – ½ UNIT FOR PROVIDING AS-BUILT DRAWINGS FOR ENTIRE STORM DRAIN SYSTEM

No.	DATE	REVISION / COMMENT / NOTE	REVISED BY	REVIEWED BY
2	5/20/08	REVISIONS PER RELOCATION OF BUILDINGS	AES	JAC
1	4/14/08	REVISIONS PER JCC COMMENTS DATED MARCH 25, 2008	AES	JAC

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Cahill Associates
ENVIRONMENTAL CONSULTANTS

MASTER STORMWATER MANAGEMENT PLAN of
THE VILLAGE
at
FORD'S COLONY OF WILLIAMSBURG
for
REALTEC INCORPORATED
POWHATAN DISTRICT JAMES CITY COUNTY VIRGINIA

Designed	Drawn
AES	AES
Scale	Date
1"=100'	2/4/08
Project No.	
5652-22	
Drawing No.	
7	

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FORD'S COLONY SUBDIVISION

POWHATAN SECONDARY SUBDIVISION

MONTICELLO WOODS SUBDIVISION

SPRINGHILL SUBDIVISION

NEWS ROAD

150' BUFFER

BMP#1

4 DUPLEXES

3 DUPLEXES

7 DUPLEXES

5 DUPLEXES

BLDG A

BLDG B

BLDG C

BLDG D

BLDG E-2

BLDG F

BLDG G

BLDG G-2

BLDG H

BLDG J

BLDG K

BLDG L

BLDG M

BLDG N

BLDG P

BLDG Q

RETAINING WALL

RETAINING WALL

TRANSPORTATION AREA

MAINTENANCE AREA

WAREHOUSE

N

GRAPHIC SCALE

100' 0' 100' 200'

SCALE: 1" = 100'

S:\Jobs\5652\22\Warburton Tract\dwg\Planning\Rezoning\Retirement Layout\Progress Layout 2008-01-02\08 - Grading.dwg, 5/21/2008 2:02:37 PM, leeanne griffin

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GRADING PLAN of
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POWHATAN DISTRICT JAMES CITY COUNTY VIRGINIA

Designed	Drawn
AES	AES
Scale	Date
1"=100'	2/4/08
Project No.	
5652-22	
Drawing No.	
8	

Version FY2022
(Last Updated 7/19/2021)

Please use the accompanying Excel spreadsheet to calculate the numbers below.

FISCAL IMPACT WORKSHEET AND ASSUMPTIONS

Please complete all *applicable* sections. Please use the provided spreadsheet to perform calculations. If space provided is insufficient, please feel free to include additional pages. If you have any questions please contact the Planning Office at 757-253-6685 or planning@jamescitycountyva.gov

1a) PROPOSAL NAME: Ford's Village

1b) Does this project propose residential units? Yes x☐ No☐ (if no, skip Sec. 2)

1c) Does this project include commercial or industrial uses? Yes ☒ No☐ (If no skip Sec. 3)

Fiscal Impact Worksheet Section 2: Residential Developments

2a) TOTAL NEW DWELLING UNITS. Please indicate the total number of each type of proposed dwelling unit. Then, *add* the total number of new dwelling units.

Single-Family Detached	158	Apartment	75
Townhome/Condominium/Single-Family	128	Manufactured Home	0
Total Dwelling Units	361		

Are any units affordable? Yes ☐ No ☐ (If yes, how many?)_____

Residential Expenses – School Expenses

2b) TOTAL NEW STUDENTS GENERATED. *Multiply* the number of each type of proposed unit from (2a) its corresponding Student Generation Rate below. Then, *add* the total number of students generated by the proposal.

Unit Type	Number of Proposed Units (from 2a)	Student Generation Rate	Students Generated
Single-Family Detached	184	0.4	73.6
Townhome/Condo/Attached	102	0.17	17.34
Apartment	75	0.31	23.25

Manufactured Home		0.46	
Total			114.19

2c) TOTAL SCHOOL EXPENSES. *Multiply* the total number of students generated from (2b) by the Per-Student Total Expenses below.

Total Students Generated	Per-Student Operating Expenses	Per-Student Capital Expenses	**Per-Student Total Expenses**	**Total School Expenses**
114.19	*$8,762.38*	*$1,948.32*	***$10,710.70***	$1,223,054

Residential Expenses - Non-School Expenses

2d) TOTAL POPULATION GENERATED. *Multiply* the number of proposed units from (2a) and multiply by the Average Household Size number below.

Total Units Proposed	**Average Household Size**	**Total Population Generated**
361	**2.49**	612.5

2e) TOTAL NON-SCHOOL EXPENSES. *Multiply* the population generated from (2d) by the Per Capita Non-School Expenses below.

Total Population Generated	**Per-Capita Non-School Expenses**	**Total Non-School Expenses**
612.5	***$680.24***	$ 416,647.00

2f) TOTAL RESIDENTIAL EXPENSES. *Add* school expenses from (2c) and non-school expenses (2e) to determine total residential expenses.

Total School Expenses	**Non-School Expenses**	**Total Residential Expenses**
$ 1,223,055	$ 416,647.00	$ 1,639,701.83

Residential Revenues

2g) TOTAL REAL ESTATE EXPECTED MARKET VALUE. Write the number of each type of units proposed from (2a). Then *determine the average* expected market value for each type of unit. Then, *multiply* the number of unit proposed by their average expected market value. Finally, *add* the total expected market value of the proposed units.

Unit Type:	**Number of Units:**	**Average Expected Market Value:**	**Total Expected Market Value:**
Single-Family Detached	158	$ 730,000	$ 115,340,000
Townhome/Condo/Multi-family	128	$ 568,164	$ 72,725,000

Apartments	75	$ 200,000	$ 15,000,000
Total:	0	N/A	$ 203,065,000

2h) TOTAL REAL ESTATE TAXES PAID. *Multiply* the total market value from (2g) by the real estate tax rate blow.

Total Market Value	Real Estate Tax Rate	Total Real Estate Taxes Paid
$ 203,065,000	**.0084**	$ 1,705,746

2i) TOTAL PERSONAL PROPERTY TAXES PAID. *Multiply* the total real estate taxes paid (2h) by the property tax average below.

Real Estate Tax Paid	Personal Property Tax Average	Personal Property Taxes Paid
$ 1,705,746	**0.15**	$ 255,862

2j) TOTAL SALES & MEALS TAXES PAID. *Multiply* the total real estate taxes paid (2h) by the sales and meals tax average below:

Real Estate Tax Paid	Sales and Meals Tax Average	Total Sales & Meals Taxes Paid
$ 1,705,746	**.09**	$ 153,517

2k) TOTAL CONSERVATION EASEMENT TAXES PAID. If the proposal contains a conservation easement, *multiply* the size of the proposed conservation easement by the conservation easement assessment rate.

Proposed Conservation Easement Size	Assessment Rate	Conservation Easement Taxes Paid
0	**$2000/acre** (prorated)	0

2l) TOTAL HOA TAXES PAID. If the HOA will own any property that will be rented to non- HOA members, *multiply* the expected assessed value of those rentable facilities by the real estate tax rate below.

HOA Property Type	Total Assessed Value	Real Estate Tax Rate	Total HOA Taxes Paid
0	0	**.0084**	$ 0

2m) TOTAL RESIDENTIAL REVENUES. *Add* all residential taxes paid to the County from (2h) through (2l).

Total Residential Revenues	**$2,115,125**

2n) RESIDENTIAL FISCAL IMPACT. Subtract total residential revenues (2m) from total residential expenses (2f).

Total Residential Ex	Total Residential Revenues	Total Residential Fiscal Impact
$ 1,575,652	$ 2,115,125	$ 539,473

Fiscal Impact Analysis Worksheet Section 3: Commercial and Industrial Developments

Commercial and Industrial Expenses

3a) TOTAL NEW BUSINESSES. How many new businesses are proposed? _____
(Include all businesses that will rent or lease space at the location as part of the proposal, including probable tenants of an office park or strip mall).

3b) TOTAL COMMERCIAL EXPENSES. *Multiply* the total business real estate expected assessment value from (3c) below by the Commercial Expenses Rate below.

Total Expected Assessment Value	Commercial Expense Rate	Total Commercial Expenses
$30,000,000	**0.00468**	**$** 140,400

Commercial & Industrial Revenues

3c) TOTAL REAL ESTATE EXPECTED ASSESSMENT VALUE. E*stimate* the expected real estate assessment value, at buildout, of all proposed commercial element properties below.

Proposed Business Properties (by use and location)	Expected Assessment Value
Elder Care	$ 30,000,000
Total:	$ 30,000,000

3d) TOTAL REAL ESTATE TAXES PAID. *Multiply* the total expected market property value from (3c) by the real estate tax rate below.

Expected Market Value	Real Estate Tax Rate	Real Estate Taxes Paid
30,000,000	**.0084**	$ 252,000

3e) TOTAL BUSINESS PERSONAL PROPERTY TAXES PAID. *Multiply* the total business capitalization for each proposed commercial element by the business personal property tax rate below. Then *add* the total personal property taxes paid.

Proposed Business Name	Total Business Capitalization	Personal Property Tax Rate	Total Business Property Taxes Paid
Elder Care	$2,500,000	.001	$25,000.00
Total:			$25,000

3f) TOTAL BUSINESS MACHINERY AND TOOLS TAXES PAID. If any manufacturing is proposed, *multiply* the total business capitalization for each proposed manufacturing element by the business machinery and tools tax rate below. Then, *add* the machinery and tools tax paid.

Proposed Business Name	Total Business Capitalization	Machinery and Tools Tax Rate	Total Business Property Taxes Paid
		0.01	
		0.01	
Total:		N/A	

3g) TOTAL SALES TAXES PAID. *Estimate* the applicable total gross retail sales, prepared meals sales, and hotel/motel room sales for proposal's commercial elements below. Then, *multiply* the projected commercial gross sales by the applicable sales tax rates. Then, *add* the total sales taxes paid.

Tax Type	Projected Gross Sales	Sales Tax Rates	Sales Taxes Paid
		0.015 of Gross Retail Sales	
Food Services	500,000	**0.04 of Prepared Sales**	$22,000.00
		0.02 of Gross Sales*	
Total:	**N/A**	**N/A**	$ 22,000.00

*Actual Occupancy Tax is 5% of Gross Sales; however, 60% of those funds are targeted to tourism.

3h) TOTAL BUSINESS LICENSES FEES PAID. Estimate each business element's total gross sales. Multiply each business element's projected gross sales by the Annual Business License rate to determine annual business licenses fee paid.

Proposed Business Name(s)	Business Type* (see exhibit sheet)	Projected Total Gross Sales	Business License Rate	Annual Business License Fees Paid
	Professional Services	10,500,000	**0.0058**	$ 60,900

	Retail Services	0	**0.0020**	
	Other Services	500,000.00	**0.0036**	$1,800.00
	Total	N/A	N/A	$ 62,700.00

3i) TOTAL COMMERCIAL AND INDUSTRIAL REVENUES. *Add* the total taxes and fees paid by all of the business elements from (3d) through (3h).

Total Commercial and Industrial Revenues	$ 361,700.00

3j) COMMERCIAL FISCAL IMPACT. *Subtract* total commercial and industrial revenues (3i) from total commercial and industrial expenses (3b).

Total Commercial	Total Commercial Revenues	Total Commercial Fiscal Impact
		221,300.00

3k) TOTAL PROPOSED FISCAL IMPACT. *Add* residential fiscal impacts (2n) and commercial fiscal impacts (3j).

Residential Fiscal Impact	Commercial Fiscal Impact	Total Proposed Fiscal Impact
$ 539,473	$ 221,300	$ 727,922

Fiscal Impact Analysis Worksheet Section 4: Current Land Use

Current Residential Use (If there are no existing residential units, skip to (4g)).

4a) TOTAL CURRENT DWELLING UNITS. Please indicate the total number of each type of existing dwelling unit. Then, *add* the total number of existing dwelling units.

Single-Family Detached	1	Apartment	
Townhome/Condominium/Single-Family Attached		Manufactured Home	
Total Dwelling Units	1		

Residential Expenses - School Expenses

4b) TOTAL CURRENT STUDENTS. *Multiply* the number of existing units from (4a) by its corresponding Student Generation Rate below. Then, *add* the total number of existing students.

Unit Type	Number of Existing Units	Student Generation Rate	Existing Students
Single-Family Detached	0.4	0.4	0.4
Townhome/Condo/Attached	0	0.17	
Apartment	0	0.31	
Manufactured Home	0	0.46	

Total		**N/A**	0.4

4c) TOTAL CURRENT SCHOOL EXPENSES. *Multiply* the total number of current students from (4b) by the per-student school cost below.

Number of Existing Students	Per-Student School Cost	Current School Expenses
0.4	***$11,828***	$ 4,731.20

Residential Expenses - Non-School Expenses

4d) TOTAL CURRENT POPULATION. *Multiply* the total number of existing units from (4a) by average household size below.

Total Existing Units	Average Household Size	Total Current Population
0	**2.45**	

4e) TOTAL CURRENT NON-SCHOOL EXPENSES. *Multiply* the current population from (4d) by per-capita non-school expenses below.

Total Current Population	Per-Capita Non-School Expenses	Current Non-School Expenses
	$1,284.00	

4f) TOTAL RESIDENTIAL EXPENSES. *Add* school expenses from (4c) and non-school expenses from (4e).

School Expenses	Non-School Expenses	Residential Expenses
$	$ 3145.80	

Residential Revenues

4g) TOTAL CURRENT ASSESSMENT VALUE. *Search* for each residential property included in the proposal on the Parcel Viewer at http://property.jccegov.com/parcelviewer/Search.aspx . *Indicate* each property's total assessment value below. Then, *add* total assessment values.

Property Address and Description	Assessment Value
3889 News Road	$ 3,153,900.00
Total:	$ 3,153,900.00

4h) TOTAL CURRENT REAL ESTATE TAXES PAID. *Multiply* the total assessment value from (4g) by the real estate tax rate below.

Total Assessment Value	Real Estate Tax Rate	Real Estate Taxes Paid
3,153,900.00	**.0084**	$ 26,493

4i) TOTAL CURRENT PERSONAL PROPERTY TAXES PAID. *Multiply* total real estate taxes paid from (4h) by the personal property tax average below.

Real Estate Tax Paid	Personal Property Tax Average	Personal Property Paid
$26,492	**0.15**	$3,974

4j) TOTAL CURRENT SALES AND MEALS TAXES PAID. *Multiply* the total real estate taxes paid from (4h) by the sales and meals tax average below.

Real Estate Tax Paid	Sales and Meals Tax Average	Average Excise Tax Paid
$26,492	**.09**	$ 2,384

4k) TOTAL CURRENT RESIDENTIAL REVENUES. *Add* all current residential taxes paid to the County from (4h) through (4j).

Total Current Residential Revenues	$ 32,851

4l) CURRENT RESIDENTIAL FISCAL IMPACT. *Subtract* total residential revenues (4k) from total residential expenses (4f).

Total Residential	Total Residential Revenues	Total Residential Fiscal Impact
$32,851		$32,851

4m) FINAL RESIDENTIAL FISCAL IMPACT. *Subtract* current residential fiscal impact from (4l) from proposed residential fiscal impact from (2n).

Proposed Residential Impact	Current Residential Impact	Final Residential Fiscal Impact
$539,473	$32,851	$ 506,622

Current Commercial Use

Current Commercial Expenses (if there are no current businesses or commercial properties, skip to (5k).

5a) TOTAL CURRENT BUSINESSES. How many businesses exist on the proposal properties? 0 (Include all businesses that rent or lease space at the location).

5b) TOTAL CURRENT COMMERCIAL EXPENSES. *Multiply* the current number of businesses operating on the proposal properties by the per-business expense rate below.

Total Expected Assessment Value	Commercial Expense Rate	Total Commercial Expenses
	0.00468	$

Current Commercial Revenues

5c) TOTAL CURRENT ASSESSMENT VALUE. *Search* for each commercial property included in the proposal on the Parcel Viewer at http://property.jccegov.com/parcelviewer/Search.aspx . *Indicate* each property's total assessment value below. Then, *add* total assessment values.

Addresses	Assessment Value	Real Estate Tax Rate	Real Estate Tax Paid
		.0084	
		.0084	
Total:			$

5d) TOTAL CURRENT BUSINESS PERSONAL PROPERTY TAXES PAID. *Multiply* the total business capitalization for each current commercial element by the business personal property tax rate below. Then *add* the total personal property taxes paid.

Current Business	Total Business	Personal Property Tax Rate	Business Property Taxes Paid
		0.01	
		0.01	
		0.01	
Total:		N/A	$

5e) TOTAL CURRENT MACHINERY AND TOOLS TAX PAID. If any manufacturing exists, *multiply* the total capitalization for manufacturing equipment by the business machinery and tools tax rate below.

Current Business	Total Business Capitalization	Personal Property Tax Rate	Machinery and Tools Tax Paid
0		**0.01**	$ 0

5f) TOTAL CURRENT SALES TAXES PAID. *Estimate* the applicable total gross retail sales, prepared meals sales, and hotel/motel sales for existing commercial elements below. Then, *multiply* the projected commercial gross sales by the applicable sales tax rates. Then, *add* the total sales taxes paid.

Activity	Projected Gross Sales	Tax Rate	Sales Taxes Paid
Retail Sales	0	**0.01 of Gross Retail Sales**	0
Prepared Meals	0	**0.04 of Prepared Sales**	0
Hotel, Motel	0	**0.02 of Gross Sales***	0
Total:	**N/A**	**N/A**	$ 0

*Actual Occupancy Tax is 5% of Gross Sales; however, 60% of those funds are targeted to tourism.

5g) TOTAL CURRENT BUSINESS LICENSES FEES PAID. *Estimate* each current business element's total gross sales. Then, *multiply* each business element's projected gross sales by the Annual Business License rate to determine annual business licenses fee paid. Then, *add* the total business license fees paid.

Business Type	Gross Sales	Business License Rate	Annual Business License Fees Paid
Professional Services	0	**$0.0058**	
Retail Sales	0	**$0.0020**	
Contractors	0	**$0.0016**	
Wholesalers	0	**$0.0005**	
Manufacturers	0	**No tax**	
Other Services	0	**$0.0036**	

5h) TOTAL CURRENT COMMERCIAL REVENUES. *Add* all current commercial revenues paid by existing businesses from (5c) through (5g).

Total Current Commercial Revenues	$ 0.00

5i) CURRENT COMMERCIAL FISCAL IMPACT. *Subtract* total commercial revenues (5h) from total residential expenses (5b).

Total Commercial Expenses	Total Commercial Revenues	Total Commercial Fiscal Impact
		$ 0.00

5j) FINAL COMMERCIAL FISCAL IMPACT. *Subtract* current commercial fiscal impact from (5i) from proposed commercial fiscal impact from (3j).

Proposed Commercial Impact	Current Commercial Impact	Final Commercial Fiscal Impact
$221,300	0	$221,300

5k) FINAL FISCAL IMPACT. *Subtract* the final commercial fiscal impact from (5i) from final residential fiscal impact from (4m).

Final Residential Impact	Final Commercial Impact	Final Fiscal Impact
$ 506,622	$221,300	$ 727,922

Fiscal Impact Worksheet Section 6: Phasing

Residential Phasing

6a) Copy *and paste* the residential phasing template from the accompanying Excel sheet to the page below.

Commercial Phasing

6b) *Copy* and *paste* the commercial phasing template from the accompanying Excel sheet to the page below.

Final Phasing Projections

6c) *Copy* and *paste* the final phasing projection from the accompanying Excel sheet to the page below.

Fiscal Impact Worksheet Section 7: Employment

7a) *Copy and paste* the employment projections from the accompanying Excel sheet to the page below.

DEFINITIONS AND ASSUMPTIONS

Apartment – A building used, or intended to be used as the residence of three or more families living independently of each other. Tenants have no equity in the dwelling.

Assessment Value – Assessment value is assumed to be within 1% of market value. Market value drives assessment value.

Buildout – All data and assumptions reflect the fiscal impact of the proposal at buildout.

Commercial Expense Rate – The commercial expense rate uses the proportional valuation method to determine individual business expenses. Under that method businesses are collectively responsible for impact related to the commercial property valuation.

This rate assumes that the costs of providing County services to a business are directly correlated with that business's property assessment. This assumes more valuable properties have generally more intense uses incurring greater County expenses.

Condominium – A building, or group of buildings, in which units are owned individually and the structure, common areas and common facilities are owned by all the owners on a proportional, undivided basis.

Contractor – Any person, firm or corporation accepting or offering to accept orders or contracts for doing any work on or in any building or structure, any paving, curbing or other work on sidewalks, streets, alleys or highways, any excavation of earth, rock or other materials, any construction of sewers and any installation of interior building components.

Direct Impact – The worksheet only calculates direct financial impacts on the County budget. The worksheet is only one of many development management tools and as such, does not make a determination whether any type of development "should" happen based solely on that proposal's fiscal impact. The tool is not designed to measure non-budget impacts, such as increased traffic or nonbudget benefits, such as forwarding the goals of the Comprehensive Plan. Costs incurred by other entities, such as other localities or the state, remain uncounted.

Dwelling – Any structure which is designed for use for residential purposes, except hotels, motels, boardinghouses, lodging houses and tourist cabins.

Exempt – Certain types of business activities or products are exempted from annual County business licenses. These include manufacturers, insurance agencies, apartment complexes and gasoline sales.

Fees & Licenses – All fees collected by the County, including business and professional licenses, planning fees, building permit fees, stormwater fees, environmental inspection fees, septic tank fees, dog licenses and motor vehicle licenses, are deducted from the per-capita and per-business budgetary costs of each department that collects them.

Fiscal Impact Analysis – The County has created a set of standardized data and assumptions to streamline both the creation and review of fiscal impact studies. The County had no itemized list of questions for fiscal impact study creators to answer, resulting in portions of fiscal impact studies with no bearing on the County's budgetary bottom line. The guesswork is removed from the creation of these documents. The data used by fiscal impact study authors also came from myriad sources, often within the County, which were difficult to verify. The fiscal impact worksheet allows consistency across multiple fiscal impact studies.

Fiscal Impact Worksheet – The worksheet helps the applicant present relevant data to the County, using data verified by the County. The worksheet provides consistency across all fiscal impact analyses.

Non-School Expenses – Non-school expenses include all non-school budget spending. Non-school expenses are calculated using the Proportional Variation method. Using the Proportional Variation method, residents and businesses are assumed to be responsible for differing percentages of the County's non-school spending.

Manufacturing – Assembly of components, pieces, or subassemblies, or the process of converting raw, unfinished materials into different products, substances or purposes.

Market Value – Market value is assumed to be within 1% of assessment value. Market value drives assessment value.

Manufactured Home – A manufactured home is a structure not meeting the specifications or requirements or a manufactured home, designed for transportation after fabrication. The only manufactured homes counted in the Student Generation figure are those in designated manufactured home parks. Manufactured homes on individual lots are indistinguishable from single-family detached dwellings for the purposes of the worksheet.

Phasing – All residential developments are assumed to have an absorption rate of 20% per annum. All commercial development are assumed to have an absorption rate of 20% per annum. The date stamp Year 1 in the phasing template represents 365 days after the Board of Supervisors approval.

Professional Services – Work performed by an independent contractor within the scope of the practice of accounting, actuarial services, architecture, land surveying, landscape architecture, law, dentistry, medicine, optometry, pharmacy or professional engineering. Professional services shall also include the services of an economist procured by the State Corporation Commission.

Proportional Valuation Impact – Proportional valuation impact assumes that a proposed residential or commercial project's fiscal impact is proportional to the percentage of the total tax base that is either residential or commercial. James City's proportional valuation is calculated using the County's Real Estate Mapping GIS program.

Furthermore, individual business expenses to the County are calculated using the proportional valuation impact method. (See Commercial Expense Rate)

Per-Business Expense Rate – The per-business expense rate assumes that the County incurs non-school expenses equal to 0.04% of the commercial real estate assessment of any given business.

Per Capita Evaluation Method – This worksheet uses the Per Capita Evaluation method to assign per-capita and per-business costs to non-school expenses. This method assumes that current per-capita and per-business expenditures and service levels are consistent with future per-capita and per-business expenditures and service levels.

Per Capita – Per capita calculations divide each department's spending, minus fees and state contributions, by the current County population. This number excludes institutional residents in detention at correctional facilities and mental institutions. Total population is determined from James City County Planning Division figures.

Per Student – Per student calculations divide County contributions to WJCC Schools by the total number of K-12 students living in James City and also attending WJCC Schools. Total students are determined from Williamsburg-James City County Schools enrollment reports.

Per Business – Per business calculations divide each departments spending, minus fees and state contributions, by the total number of County businesses. Total businesses are determined by the number of business licenses issued.

Total Number of JCC Businesses	**5490***
Percentage of Property Tax Assessments	**13%****

*James City County Commissioner of the Revenue

**Commercial impacts are calculated on a proportional variation process

Proffer – Proffers paid for schools can only be applied toward the capital expense portion of per-student school expenses. (See Board of Supervisors' Proffer Policy.)

Retail Services – Display and sale of merchandise at retail or the rendering of personal services, such as food, drugs, clothing, furniture, hardware, appliances, barber and beauty, antiques, and household uses and other uses.

Single-Family Detached Dwelling – A detached structure arranged or designed to be occupied by one family, the structure only having one dwelling unit.

State Contributions – The state contributes both targeted and unspecified funds to the James City County budget.

Student Generation Rate – The student generation rate the number of students produced by an individual dwelling unit per year. Different domestic units produce students are different rates. Using WJCC enrollment figures, an address was found for WJCC students residing in James City County. Using the James City County Real Estate Division's Property Information map on the James City County website, the number of students from each subdivision was determined. Using the Real Estate Division's Real Estate Parcel Count, the number of improved lots in each neighborhood was determined. Total students from each neighborhood were divided by the total number of units from that neighborhood to determine the average number of students per housing unit. The student generation numbers for 256 subdivisions were determined this way, along with the same method for counting students from apartments and manufactured home parks.

Townhome –In a structure containing three or more dwelling units, a dwelling unit for single-family occupancy, not more than three stories in height, attached by one or more vertical party walls extending to the roof sheathing without passageway openings to one or more additional such dwelling units, each of which is served by an individual exterior entrance or entrances.

Fiscal Impact Analysis Worksheet - Version 2021- Proposed Land Use Last updated on 7/19

This Excel file will assist you with most of the Fiscal Impact Worksheet's calculations. Please skip inapplicable questions.
Use the numbers in this program to fill in the identical section on the worksheet.
Please enter the information requested in the relevant yellow highlighted cells

2a) How many residential units are proposed? What types?

Single Family Detached	158
Townhome/Condominium/Multifamily	128
Apartment	75
Manufactured Home Park Unit	0
Total	361
Are any units affordable? If yes, how many?	0

Residential Expenses - School Expenses

2b) How many students are generated?

	Student Generation Rate	Students Generated
Single Family Detached	0.4	63.2
Townhome/Condominium/Multifamily	0.17	21.76
Apartment	0.31	23.25
Manufactured Home Park Unit	0.46	0
Total		108.21

2c) What is the schools expenses?

Total Students	108.21
Per Student Operating Costs	$8,762.38
Per Student Capital Costs	$1,948.32
Per Student School Costs	$10,710.70
Total School Fiscal Impact	$ 1,159,004.85

Residential Expenses - Non-School Expenses

2d) What is the total population generated?

Total Units	361
Average Household Size	2.49
Total Population Generated	612.5

2e) What are the total non-school expenses?

Total Population Generated	612.5
Per-Capita Non School Costs	$ 680.24
Total Non-School Costs	$ 416,647.00

2f) What is the total residential expenses?

Total School Expenses	$	1,159,004.85
Total Non-School Expenses	$	416,647.00
Total Residential Expenses	$	1,575,651.85

Residential Revenues

2g) What is the average expected market value for each type of unit sold?

Unit Type	Number of Type	Price for Each Unit Type
Single Family Detached	158	$ 730,000.00
Bungalows	26	$ 400,000.00
	0	$ -
Townhomes	69	$ 700,000.00
Condos	33	$ 425,000.00
	0	$ -
	0	$ -
	0	$ -
Apartment (Value of Apartment Complex (Total))		15,000,000
Manufactured Home Park Unit (Value of Park Property (Total))	0	
Total Expected Real Estate Sales Amount		$ 203,065,000.00

2h) What are the total real estate taxes paid?

Total Expected Real Estate Sales Amount		203065000
Real Estate Tax Rate		0.0084
Total Real Estate Tax Revenue	$	1,705,746.00

2i) What is are total personal property taxes paid?

Total Real Estate Tax Revenue		1705746
Personal property Tax Revenue (as % of Real Estate Taxes Paid)		0.15
Total Personal Property Tax Revenue	$	255,861.90

2j) What are the total sales and meals taxes paid?

Total Real Estate Tax Revenue		1705746
Sales and Meals Tax Revenue (as % of real estate taxes paid)		0.09
Total Personal Property Tax Revenue	$	153,517.14

2k) What are total conservation easement taxes paid? (If any)

Total Acreage in Conservation Easement		0
Conservation Easement Real Estate Tax Rate		2000
Total Conservation Easement Tax Revenue	$	-

2l) What are the total HOA taxes paid (for property rentable to non-HOA members, if any)?

Total Market Value of any HOA Property Rentable to non-HOA Members	0
Real Estate Tax Rate	0.0084
Total Rentable HOA Property Tax Revenue	$ -

2m) What is the total residential tax revenue? $ 2,115,125.04

Residential Fiscal Impact

2n) What is the residential fiscal impact? $ 539,473.19

Commercial Expenses

3a) How many new businesses are proposed? (Include all businesses that will rent or lease space)

Total Number of New Businesses	1

3b) What is the expected real estate market value for each business property (at buildout)?

	Business Property	Expected Market Value
1	Elderly Care	$ 30,000,000.00
2		
3		
4		
5		
6		
Total Commercial Real Estate Expected Market Value		$ 30,000,000.00

3c) What are the commercial expenses?

Total Commercial Real Estate Taxes Paid	252000
Per-Business Commercial Expense Rate	0.00468
Total Commercial Expenses	$ 140,400.00

Commercial Revenues

3d) What are the commercial real estate taxes paid?

Total Commercial Real Estate Assessment Value	30000000
Real Estate Tax Rate	0.0084
Total Commercial Real Estate Taxes Paid	$ 252,000.00

3e) What are the business personal property taxes paid?

	Proposed Businesses Name (s)	Initial Capital Investment		
1	Elderly Care	$ 2,500,000.00	$	25,000.00
2			$	-
3			$	-
4		$ -	$	-
5		$ -	$	-
6		$ -	$	-
	Total Business Personal Property Taxes Paid		$	25,000.00

3f) What are the business machinery and tools taxes paid (for manufacturers only)? -

	Proposed Businesses Name(s)	Initial Capital Investment		
1			$	-
2		$ -	$	-
3		$ -	$	-
4		$ -	$	-
5		$ -	$	-
6		$ -	$	-
	Total Business Personal Property Taxes Paid		$	-

3g) What are retail sales-based taxes paid? (if any)

	Proposed Business Name(s)	Estimated Retail Sales	Estimated Prepared Meals Sales	Estimated Hotel/Motel/Condo Room Sales		
1	Elderly Care	$ 200,000.00	$ 500,000.00	$ -	$	22,000.00
2			$ -	$ -	$	-
3			$ -	$ -	$	-
4			$ -	$ -	$	-
5		$ -	$ -	$ -	$	-
6		$ -	$ -	$ -	$	-
	Total Sales-Based Tax Paid	$ 200,000.00	$ 500,000.00	$ -	$	22,000.00
	Total Business Sales Tax Revenue				$	22,000.00

3h) What are the proposed annual business license fees paid?

	Proposed Business Name(s)	Business Type	Estimated Sales	License Fee Rate		
1		Contractors	$ -	0.0016	$	-
2		Manufacturers		0	$	-
3		Other Services	$ 500,000.00	0.0036	$	1,800.00
4		Professional Services	$ 10,500,000.00	0.0058	$	60,900.00
5		Retail Sales		0.002	$	-
6		Wholesalers		0.0005	$	-

Total Business License Revenue	$	62,700.00
3i) What are the total commercial revenues?	$	361,700.00

Commercial Fiscal Impact

3j) What is the net commercial fiscal impact?	$	221,300.00
3k) What is the proposed fiscal impact?	$	760,773.19

You will now estimate the current conditions of the proposal property. Please click on worksheet tab labeled "Current" below and follow the instructions.

What is the final fiscal impact?	$	727,922.17

Phasing - Residential Phasing

6a) When will proposed residential units be built?

Total Units Proposed 361

	Year 1	Year 2	Year 3	Year 4	Year 5	Buildout
Homes Built	61	75	75	75	75	361
Total Res Exp	$ 1,575,651.85	$ 1,575,651.85	$ 1,575,651.85	$ 1,575,651.85	$ 1,575,651.85	
Per Unit Exp	$ 4,364.69	$ 4,364.69	$ 4,364.69	$ 4,364.69	$ 4,364.69	$ 4,364.69
Total Res Exp	$ 266,245.88	$ 327,351.49	$ 327,351.49	$ 327,351.49	$ 327,351.49	$ 1,575,651.85
Total Res Rev	$ 2,115,125.04	$ 2,115,125.04	$ 2,115,125.04	$ 2,115,125.04	$ 2,115,125.04	
Per Unit Rev	$ 5,859.07	$ 5,859.07	$ 5,859.07	$ 5,859.07	$ 5,859.07	$ 5,859.07
Total Res Rev	$ 357,403.40	$ 357,403.40	$ 357,403.40	$ 357,403.40	$ 357,403.40	$ 1,787,017.00
Per Unit Impact	$ (1,494.39)	$ (1,494.39)	$ (1,494.39)	$ (1,494.39)	$ (1,494.39)	$ (1,494.39)
Res Impact	$ (85,606.52)	$ (190,860.43)	$ (296,114.34)	$ (401,368.26)	$ (506,622.17)	$ 506,622.17

Phasing - Commercial Phasing

6b) When will proposed commercial units be built?

Total New Businesses 1

	Year 1	Year 2	Buildout
Bus Built	0.5	0.5	1
Bus Exp	$ 140,400.00	$ 140,400.00	
Per Bus Exp	$ 140,400.00	$ 140,400.00	
Year Bus Exp	$ 70,200.00	$ 70,200.00	
Bus Rev	$ 361,700.00	$ 361,700.00	
Per Bus Rev	$ 361,700.00	$ 361,700.00	
Year Bus Rev	$ 180,850.00	$ 180,850.00	

Bus Impact	$ 110,650.00	$ 221,300.00		

6c) What is the final phasing projection?

	Year 1	Year 2	Year 3	Year 4	Year 5	Buildout
Res Impact	$ (85,606.52)	$ (190,860.43)	$ (296,114.34)	$ (401,368.26)	$ (506,622.17)	$ (506,622.17)
Bus Impact	$ 110,650.00	$ 221,300.00	$ 221,300.00	$ 221,300.00	$ 221,300.00	
Final Impact	$ 25,043.48	$ 30,439.57	$ (74,814.34)	$ (180,068.26)	$ (285,322.17)	

Employment

7a) How many fill-time equivalent jobs (FTE)will be generated from the proposal? What will be the average payroll?

	Business	FTE Jobs Generated	Average Payroll
1	Nursing	50	$ 1,650,000.00
2	Professional	11	$ 600,000.00
3	Administrative	5	$ 300,000.00
4	Support Services	22	$ 650,000.00
5			$ -
6			$ -

Proposed Home Types

Note: these are photos of our projects in Hampton Roads. The architecture of Ford's Village will be less coastal, and more in keeping with the historic vernacular of the Peninsula and Williamsburg area.

Drive Under Gateway Apartment

Manor Home
4 units per building

Single Family Homes
2200-3000+ sf

Cottage detached Garage
1800-2400 sf

Village House- 2 Story Bungalows
1400-1900 sf

Detached Townhomes
(blank wall one side)
2200-2400 sf

Images are taken from downtown Norfolk Virginia,
and Savannah, Georgia.

Townhomes
2600-2900 sf

Mews Large (Typically face a park or courtyard)
1300-1700 SF

Mews Small
1250-1350 sf Attached and Detached Examples

Bungalows
800-1000 sf

DRW Consultants, LLC
Traffic Impact Studies
Development Access
Condemnation Damages

TO: Jason Grimes, P. E.
FROM: Dexter R. Williams, P. E.
SUBJECT: Response To 22 July, 2021 VDOT Letter:
RE: Ford's Village (a.k.a Ford's Bluff, Village at Ford's Colony)
3889 News Rd. (Rt. 613)
James City County plan Z-21-0012, MP-21-003
DATE: September 7, 2021

This memo and enclosed documents are provided to inform VDOT and any other interested parties on the extensive history of traffic analysis at the Rt. 613 News Road/Firestone Drive as well as respond to points in the July 22, 2021 letter from VDOT. As reference documents, enclosed are the most recent and relevant traffic studies to date:

1. TIS Update for Ford's Colony Master Plan – Phased Development, Kimley-Horn and Assc., Inc. January 2020
2. Traffic Analysis For Ford's Colony CRC, DRW Consultants, LLC, July 12, 2007
3. News Road Corridor Traffic Forecast And Analysis, DRW Consultants, LLC, April 22, 2008

Exhibit 1b in the 2008 DRW study has a useful reference map identifying various development properties around Ford's Colony and News Road.

Following is a history of traffic analysis at Rt. 613 News Road/Firestone Drive intersection:

1. The intersection is part of the Ford's Colony development approval in 1988 with proffered road improvements and a requirement for traffic study update every five years to determine if unbuilt proffered improvements are warranted.
2. The first study update in 1993 by DRW included the intersection and the other three points of access to Ford's Colony. At that time, the Rt. 613 News Road/Firestone Drive intersection has been constructed in its current state by the Ford's Colony development company with proffered left and right turn lanes on News Road at Firestone Drive serving Ford's Colony traffic. The only remaining proffered item at that time and now is signalization when warranted.
3. DRW provided subsequent traffic study updates in 1998 and 2003.
4. In 2006, DRW provided a traffic study for what is now called Ford's Village (a.k.a Ford's Bluff, Village at Ford's Colony) for proposed single family use (then called the Warburton Tract). Sole access to this tract of land is aligned at the Rt. 613 News Road/Firestone Drive intersection.
5. In 2007, DRW provided at TIA dated 07-12-07 for The Village At Ford's Colony (CRCC

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style development) that focused only on the News Road/Firestone Drive intersection as the sole access to The Village.

6. In 2008, DRW provided a traffic study of the News Road corridor that was triggered by the Village At Ford's Colony zoning proposal for CCRC senior housing and care development.
7. Beginning in 2019, DRW provided a series of memos to JCC documenting the degree of change in trip generation between the evolving CCRC development plans (Ford's Bluff to Ford's Village) and the original The Village At Ford's Colony.
8. In early 2020, KHA included the Rt. 613 News Road/Firestone Drive intersection in a study for a Ford's Colony master plan update on behalf of Ford's Colony Home Owners Association. This work included a signal warrant analysis at Rt. 613 News Road/Firestone Drive.
9. DRW provided a memo dated January 21, 2021 that documented changes in proposed trip generation from 2008 study (updated July 9, 2021) and changes in traffic counts at the Rt. 613 News Road/Firestone Drive intersection between 2007 (2008 study) and 2017 (2020 study).
10. DRW has provided an updated memo dated Aug. 31, 2021 that addresses comments from JCC regarding the changes in proposed trip generation from 2008 and the 2020 KHA study and changes in traffic counts at the Rt. 613 News Road/Firestone Drive intersection between 2007 and 2017.

At the time of the 2008 DRW study, the Village At Ford's Colony (now Ford's Village) was under the control of the developer of Ford's Colony (Realtec, Inc). Realtec, Inc. is no longer active, and Ford's Village is proposed for development by different developers and the proffer from 2008 can no longer be guaranteed. It may be a consideration for the current rezoning proposal going forward but there may be no way to guarantee action by the developers of Ford's Village on other privately owned land in Ford's Colony. A review of Google Earth indicates that Firestone Drive has been resurfaced several times over the years and a stop bar has been replaced after each resurfacing, but it does not appear that the two lanes of pavement on the Firestone Drive exit have ever been striped.

The Aug. 31, 2021 DRW memo documented that:

1. PM peak hour counts are higher than AM counts (2007 and 2017).
2. Trip generation for Ford's Village as proposed is less than that for The Village At Ford's Colony in the 2008 study and the 2020 Kimley Horn study in the PM peak hour and for daily traffic, and not appreciably greater in the AM peak hour.
3. Traffic hasn't grown much from 2007 to 2017: 1.8% per year in the AM and 0.5% in the PM. Buildout forecast in the 2008 study is 58% and 46% greater than 2017 counts in the AM and PM peak hours, respectively. The 2027 forecast in the 2020 KHA study is 42% and 39% greater than 2017 counts in the AM and PM peak hours, respectively.
4. In summary, the August 31, 2021 memo demonstrates that there is nothing new about foreseeable traffic forecasts with Ford's Village that wasn't addressed in the 2008 study

for The Village at Ford's Colony and the 2020 KHA study and there is no justification for a new study: traffic generation for Ford's Village has been deliberately kept at or below previous levels, increases in traffic volumes over the last ten years are meager, and previous traffic forecasts are well in excess of existing conditions.

Regarding any commitment for signalization at the Rt. 613 News Road/Firestone Drive intersection, Ford's Colony proffered signalization in 1988 and the most recent 2020 KHA study addressed that issue and concluded that signalization is not warranted. If VDOT needs to see native files for the 2020 KHA study, then VDOT needs to contact KHA.

There has never been any analysis for a signal warranted by The Village At Ford's Colony/Ford's Village because traffic forecast are far below signal warrant thresholds as follows:

1. For exiting left turn traffic on site entrance at News Road/Firestone Drive to meet minor warrants, it must meet/exceed 53 vehicles per hour for eight hours for Warrant 1, 60 vehicles per hour for four hours for Warrant 2 and 75 vehicles per hour for the peak hour.
2. Exiting left turn traffic forecasts are as follows:
    a. 2008 Study: 7 vehicles per hour AM, 16 vehicles per hour PM
    b. 2020 KHA Study: 14 vehicles per hour AM, 23 vehicles per hour PM
3. For entering left turn traffic on site entrance at News Road/Firestone Drive to meet minor warrants, it must meet the thresholds cited above for exiting left turns.
4. Entering left turn traffic forecasts are as follows:
    a. 2008 Study: 44 vehicles per hour AM, 77 vehicles per hour PM
    b. 2020 KHA Study: 31 vehicles per hour AM, 59 vehicles per hour PM
5. Use of entering left turns requires the westbound approach on News Road at Firestone Drive to meet/exceed 420 vehicles per hour for eight hours and generally more for Warrants 2 and 3.
6. Westbound through traffic forecasts are as follows:
    a. 2008 Study: 300 vehicles per hour AM, 243 vehicles per hour PM
    b. 2020 KHA Study: 269 vehicles per hour AM, 218 vehicles per hour PM

There is no possibility for Ford's Village traffic to warrant a signal at News Road/Firestone Drive:

- Forecast exiting left turns, peak hour volumes are nowhere near minimum thresholds for minor streets
- For entering left turns, forecast westbound through traffic peak hour volumes are nowhere near minimum thresholds for major streets.

Regarding access to Ford's Village at News Road/Firestone Drive, the anticipated design includes previous proffers: "a left turn lane from westbound News Road into the Additional Property and a right turn radius from eastbound News Road into the Additional Property shall be constructed". Left turn lane warrants were addressed in the 2007 study, and right turn warrants were addressed in the 2007 and 2008 studies.

DRW Consultants, LLC
Traffic Impact Studies
Development Access
Condemnation Damages

TO: Jason Grimes, P. E., AES
FROM: Dexter R. Williams, P. E.
SUBJECT: Ford's Bluff Trip Generation And Traffic Forecasts: Relative Need For Peak Hour Traffic Study Update
DATE: August 31, 2021

This memo and enclosed exhibits present a summary of peak hour trip generation for proposed and prior development inventories for Ford's Bluff and a comparison of peak hour traffic counts and background traffic forecasts presented in previous studies. There are two previous studies of relevance:

1. News Road Corridor Traffic Forecast And Analysis, DRW Consultants, April 22, 2008. This study was the culmination of JCC review of the original Village At Fords' Colony traffic impact study. The original study was expanded to include the News Road corridor and ten other developments in addition to the News Road/Firestone Drive intersection which is to provide access to previous and proposed Ford's Bluff.
2. Ford's Colony Master Plan – Phased Development, Kimley-Horn & Associates, January 2020. This study primarily focused on points of access to Ford's Colony. It includes trip generation for the Village At Ford's Colony based on zoned units which differed from the units assumed in the 2008 study.

Enclosed Exhibit A shows trip generation for Ford's Bluff (formerly Village At Ford's Colony) as follows:

1. Table One shows the Trip Generation, 7th Edition (TG7) land uses, and units used for the Village At Ford's Colony traffic studies in 2008. There are five different land uses with separate trip generation by beds and units, 952 beds and units total.
2. Table Two shows the current proposal for Ford's Bluff five land uses and the translation to TGM10 trip generation uses.
3. Table Three shows the currently proposed Ford's Bluff lots translated to detached and attached single family housing units.
4. Table Four shows Trip Generation Manual, 10th Edition (TGM10) trip generation for five land uses in proposed Ford's Bluff, 516 beds and units total. The KHA 2020 trip generation used equations for congregate care AM and PM peak hour trip generation. My previous work used rates for congregate care AM and PM peak hour. I think rates are the appropriate source vs. equations, but the guidelines for choosing equations vs. rates are murky and the differences are trivial (equations are slightly higher for 75 units). Therefore, I used congregate care AM and PM equations on enclosed Exhibit A for consistency with previous KHA work.

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5. Table Five presents a comparison of proposed Ford's Bluff units and trip generation relative to previous values as follows:
    a. Row 1 is trip generation in the 2008 traffic studies for The Village At Ford's Colony using TG7.
    b. Row 2 is trip generation for the units defined in the 2008 proffers and presented in the 2020 KHA study using TGM10. 2008 proffers cited development limits of 596 independent living units, 83 assisted living/memory care rooms and 60 skilled nursing beds.
    c. The 2008 proffers allow up to 2 persons per room in the AL rooms. Row 3 assumes 2 beds in each assisted living rooms with 166 maximum beds. TGM10 is used for trip generation.
    d. In all cases, proposed development units, PM trip generation and daily trip generation are reduced from the previous prior units and trip generation values. Proposed development AM trip generation is higher than the previous benchmarks.

Regarding other traffic growth on News Road, enclosed Exhibit B shows April 2007 counts from the 2008 study and June 2017 counts from the 2020 KHA study at the News Road/Firestone Drive/future Ford's Bluff intersection. For 2007 counts shown on top row, PM peak hour counts (570 vehicles per hour [vph]) are 35% higher than AM counts (421 vph). For 2017 counts shown on middle row, PM peak hour counts (599 vehicles per hour [vph]) are 20% higher than AM counts (498 vph). In the ten years between 2007 and 2017 counts, traffic increased at an overall rate of 1.8% per year in the AM peak hour (18% over 10 years) and 0.5% per year in the PM peak hour (5% over ten years). These comparative results are summarized below:

TABLE ONE: NEWS ROAD/FIRESTONE DRIVE
2007/2017 PEAK HOUR COUNT COMPARISON (TOTAL ALL APPROACHES)

	AM PEAK HOUR	PM PEAK HOUR
2007 COUNTS	421	570
2017 COUNTS	498	599
10 YEAR % INCREASE	18%	5%
ANNUAL % INCREASE	1.8%	0.5%

Regarding forecast background traffic (i.e., without Ford's Bluff site), Exhibit C shows the 2008 traffic study build out forecast at the News Road/Firestone Drive/future Ford's Bluff intersection on the top row. The second row on Exhibit C shows the increase in the 2008 build out forecast over 2017 counts: overall increase of 23% in the AM peak hour and 38% in the PM peak hour. Even on a percentage basis, the build out forecast in the 2008 study is appreciably higher than the actual increases from 2007 to 2017. The following table illustrates the relative size of the 2008 study peak hour forecast to the 2017 counts:

TABLE TWO: NEWS ROAD/FIRESTONE DRIVE
2008 STUDY FORECAST VS. 2017 COUNTS (TOTAL ALL APPROACHES)

	AM PEAK HOUR	PM PEAK HOUR
2017 COUNTS	498	599
2008 STUDY FORECAST	614	827
INCREASE	116	228
% INCREASE	23%	38%

The buildout forecast for the 2027 KHA forecast shown on the third row of Exhibit C. The fourth row on Exhibit C shows the increase in the 2027 KHA forecast over 2017 counts: overall increase of 17% in the AM peak hour and 24% in the PM peak hour.

TABLE THREE: NEWS ROAD/FIRESTONE DRIVE
2020 STUDY FORECAST VS. 2017 COUNTS (TOTAL ALL APPROACHES)

	AM PEAK HOUR	PM PEAK HOUR
2017 COUNTS	498	599
2020 STUDY FORECAST	583	745
INCREASE	85	146
% INCREASE	17%	24%

In summary, trip generation for the proposed development plan has adequately been addressed in previous studies because the critical PM peak hour is lower than previous studies and overall daily traffic is lower. In addition, the 2008 and the 2020 study has overall background forecast that is well in excess of 2017 counts. There is nothing in terms of known traffic sources (both proposed site, other site development and general background growth) that has not been addressed in previous studies. There is no justification for additional peak hour traffic study because any reasonable order of magnitude for known traffic increase sources has been addressed.

		LAND USE	SQ.FT.,	WEEKDAY TRIP GENERATION						
				AM PEAK HOUR			PM PEAK HOUR			
VALUE	LAND USE	CODE	OTHER UNITS	Enter	Exit	Total	Enter	Exit	Total	DAILY
TABLE ONE - THE VILLAGE AT FORD'S COLONY TRIP GENERATION - 2008 TG7										
eq./adj. st.	Elderly Detached	251	32 units	4	6	10	13	9	22	206
rate/adj. st.	Elderly Attached	252	332 units	12	15	27	23	14	37	1155
rate/adj. st.	Congregate Care	253	290 units	10	7	17	27	22	49	586
rate/adj. st.	Assisted Living	254	118 occ.bed	15	5	20	18	16	34	323
rate/adj. st.	Nursing Home	620	180 beds	21	10	31	13	27	40	427
		TOTAL	952 bed/unit	62	43	105	94	88	182	2697

TABLE TWO: 2021 FORD'S BLUFF UNITS IN ITE TERMS

2020 Updated Units		TGM10
Independent Living Apts	75	Congregate Care
Assisted Living/ Memory Care Beds	125	Assisted Living
Skilled Nursing Facility Beds	30	Nursing Home
Independent Living Homes - Attached	102	Sr. Adult Attached
Independent Living Homes - Detached	184	Sr. Adult Detached
Total	516	

TABLE THREE: 2020 FORD'S BLUFF LOTS IN DETACHED AND ATTACHED UNITS

Lot Type Description	Detached	Attached
Single Family - general	67	
Village House 2-story Bungalow	46	
Cottage	27	
Bungalow	31	
Detached Townhouse	13	
Townhouse		37
Mews Large		9
Mews Small		23
Manor House Multi Family		32
Drive-Through Apartment		1
Total	184	102

TABLE FOUR: FORD'S BLUFF FIVE LAND USES - 2020 TGM10

eq.-adj. st.	Sr. Adult Detached	251	184 units	21	44	65	47	30	77	962
eq.-adj. st.	Sr. Adult Attached	252	102 units	7	13	20	15	12	27	385
eq/rate-adj. st.	Congregate Care	253	75 units	4	2	6	8	8	16	152
rate-adj. st.	Assisted Living	254	125 beds	15	9	24	13	20	33	325
rate/adj. st.	Nursing Home	620	30 beds	4	1	5	2	5	7	92
			516 bed/unit	51	69	120	85	75	160	1916

TABLE FIVE: PROPOSED DEVELOPMENT CHANGE FROM PRIOR VALUES

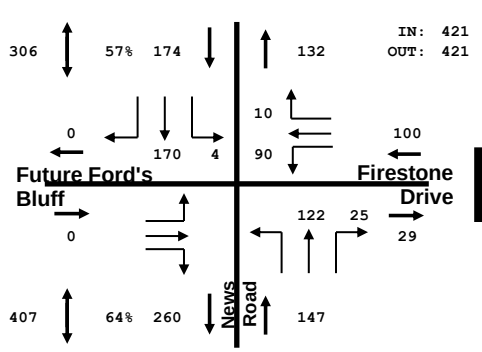
PRIOR TRIP GENERATION VALUES		UNITS	AM PEAK	PM PEAK	TOTAL
1	April 2008 Study (TG7)	952	105	182	2697
	Change With Proposed Plan	-436	15	-22	-781
2	KHA 2020 (TGM10) 83 AL Beds	739	101	161	2078
	Change With Proposed Plan	-223	19	-1	-162
3	2008 Proffer Limits (TGM10) 166 AL Beds	822	117	182	2294
	Change With Proposed Plan	-306	3	-22	-378

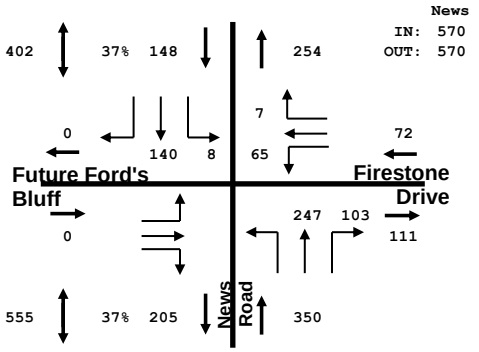
FORD'S BLUFF
TRIP GENERATION AUG. 31, 2021

DRW Consultants, LLC
804-794-7312

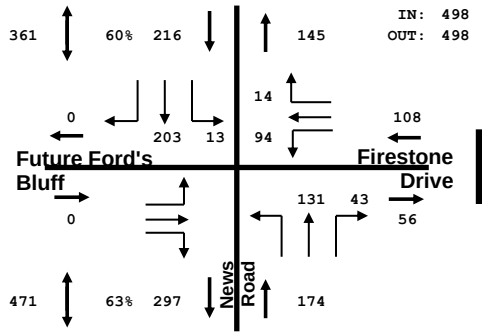
Trip generation rates from Trip Generation, 7th Edition (TG7) and Trip Generation Manual, 10th Edition (TGM10) by the Institute of Transportation Engineers (ITE) Unless Otherwise Noted

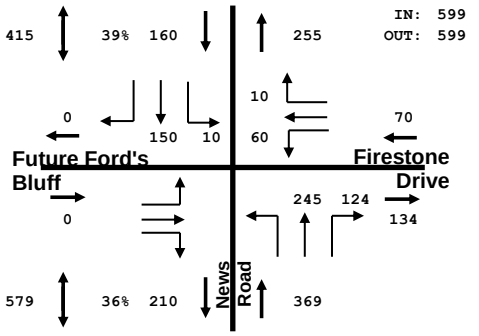
Exhibit A



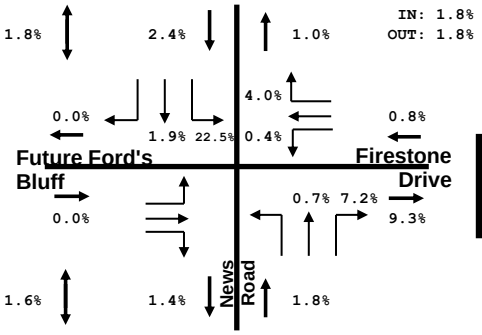


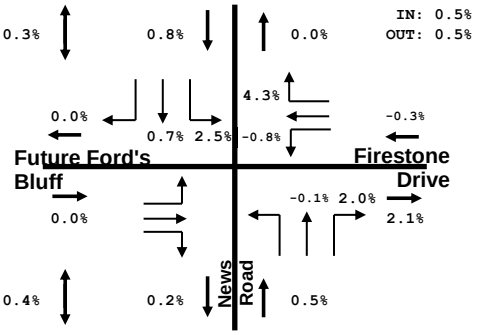
April 2007 Counts





June 2017 Counts





% Increase/Year 2007 To 2017

AM PEAK HOUR

Exhibit Reference

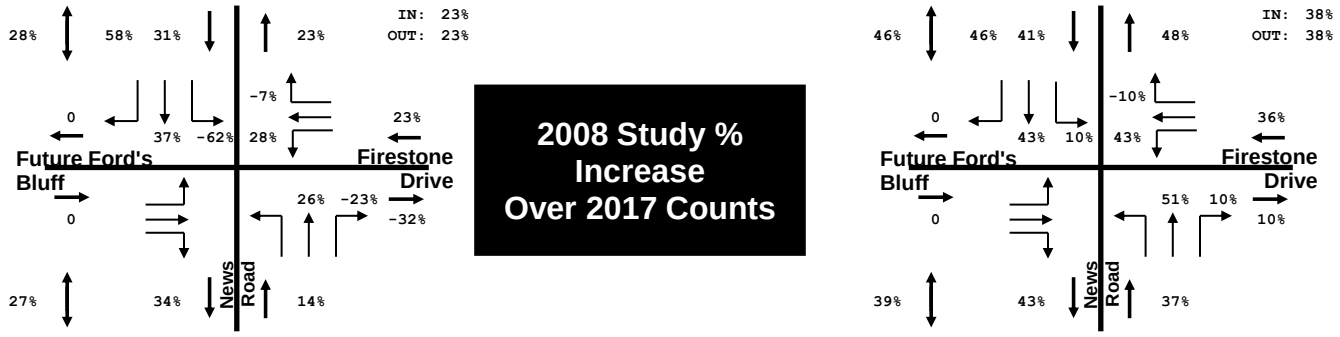
PM PEAK HOUR

NEWS ROAD 2007/2017 PEAK HOUR COUNT COMPARISON

DRW Consultants, LLC
804-794-7312

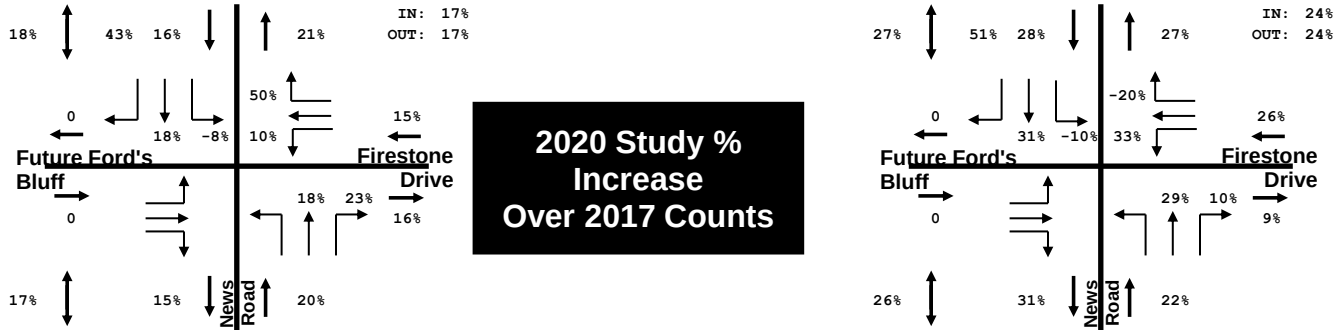
Exhibit B

2008 Study Build Out Forecast



2008 Study % Increase Over 2017 Counts

2020 Study Forecast To 2027



2020 Study % Increase Over 2017 Counts

AM PEAK HOUR

Exhibit Reference

PM PEAK HOUR

NEWS ROAD TRAFFIC FORECASTS WITHOUT FORD'S BLUFF AND PERCENT INCREASE OVER 2017 COUNTS

DRW Consultants, LLC
804-794-7312

Exhibit C

TRAFFIC IMPACT STUDY (TIS) UPDATE

Ford's Colony Master Plan – Phased Development

James City County, Virginia

Prepared for:

Ford's Colony Home Owners Association (FCHOA)

Prepared by:

Kimley»Horn

January 2020

Traffic Impact Study (TIS) Update
for
Ford's Colony Master Plan – Phased Development
James City County, Virginia

Prepared for:
Ford's Colony Home Owners Association (FCHOA)

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January 2020

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1 EXECUTIVE SUMMARY

Ford's Colony Homeowners Association (FCHOA), with support of REDUS VA Housing, LLC (REDUS) is pursuing a Master Plan and Proffer Amendment which includes proposing the construction of 60 residential condominium/townhouse units (Eaglescliff) within the Ford's Colony development (i.e., Ford's Colony) in James City County, Virginia. Ford's Colony is a master planned community bounded by Longhill Road (State Route 612) to the north, Centerville Road (State Route 614) to the west, News Road (State Route 613) to the south, and a combination of retail/commercial land uses, residential areas, and Humelsine Parkway (State Route 199) to the east.

Through conversations with FCHOA, REDUS, and James City County staff as well as our review of the Ford's Colony Proffers (MP-2-87) dated June 20, 1988 and the Amended and Restated Ford's Colony Proffers (Z-04-98/MP-3-98) dated January 24, 1999, it was determined that a traffic impact study (TIS) must be prepared every five (5) years and/or prior to any proposed expansion or development within the Ford's Colony Master Planned residential development. The previous update was the *Ford's Colony Traffic Impact Study 2003-2004 Update*, completed in February 2004.

The purpose of this report is to satisfy the TIS requirement of the aforementioned proffers by summarizing existing and projected future traffic volumes as well as the associated operational conditions to determine if any of the identified off-site roadway, intersection, or traffic control (i.e., intersection signalization) improvements have been triggered for construction and/or may require accelerated implementation. In addition to the 60 residential condominium/townhouse units, the following units were included in this TIS as part of the background traffic to represent the totality of the Ford's Colony Master Plan.

- 295 platted, unbuilt lots
- 30 un-platted Windsor development lots
- 14 un-platted Brian Ford's property lots

This study will identify the potential impacts to the intersections and roadway network as a result of the proposed development.

Based on the analysis of the existing traffic volumes and operation findings provided in this traffic study, the following recommendations were identified and are summarized below for the Existing conditions:

- **Longhill Road at Williamsburg W. Drive/Lane Place Drive**
  - Maintain the existing geometric configuration and traffic control measures
  - Continue to monitor and implement new timing and coordination plans as part of regular VDOT operations and maintenance
  - It is noted that the Longhill Road Phase 1 Widening Project (VDOT UPC – 100921) includes improvements that will enhance the capacity at this intersection, is fully funded, and currently under construction
- **Longhill Road at Fords Colony Drive**
  - Relocate and restripe the northbound approach STOP bar so driver sight distance is not impeded by the Ford's Colony monument sign and/or vegetation located in the median
  - Restripe the 24-foot wide northbound approach to consist of a 12-foot shared through/left-turn lane and a 12-foot exclusive right-turn lane with 150 feet of storage

- Continue to monitor traffic volumes to identify when/if the full turn-lane warrant for the eastbound right-turn movement is satisfied
- Existing traffic volumes and the associated operational conditions (i.e., level of service (LOS)/side street delay) do not warrant or justify the installation of the traffic signal at this time.
- Although the installation of a traffic signal is specifically referenced in the Ford's Colony proffers, per VDOT policy and roadway design manual guidelines, should volumes warrant the consideration of a traffic signal the intersection will also need to be analyzed for the consideration of a roundabout.

- **Centerville Road at Manchester Drive**
  - Maintain the existing geometric configuration and traffic control measures
- **News Road at Firestone Drive**
  - Maintain the existing geometric configuration and traffic control measures

From the analysis of the Build conditions which included the background traffic growth and approved developments, the following recommendations were identified and are summarized below for the Build conditions:

- **Longhill Road at Williamsburg W. Drive/Lane Place Drive**
  - Continue to monitor and implement new timing and coordination plans as part of regular VDOT operations and maintenance
  - The Longhill Road Phase 1 Widening Project (UPC – 100921) is currently under construction. The widening project includes the following improvements to this intersection:
    - Widen Longhill Road to a four-lane divided typical section
    - Upgrade the traffic signal equipment to accommodate the additional through lanes
    - Pedestrian accommodations such as crosswalks, ADA ramps, and pedestrian signal displays for the crossing of select legs of the intersection

      <u>Eastbound Longhill Road</u>
      - Widen and construct an additional approach and receiving through lane

      <u>Westbound Longhill Road</u>
      - Widen and construct an additional approach and receiving through lane
  - Improvements associated with Longhill Road Phase 1 Widening Project (UPC – 100921) address several of the proffered improvements associated with the Ford's Colony Master Plan. Proffers should be updated/modified to account for/recognize these changes in responsibility.

- **Longhill Road at Fords Colony Drive**
  - Based on future traffic volume projections, construct a full width right-turn lane consisting of 200-feet of storage and a 200-foot taper for the eastbound approach.

- Future traffic volumes and the associated future operational conditions (i.e., level of service (LOS)/side street delay) continue to reflect that a traffic signal is not warranted and do not justify the installation of a traffic signal at this intersection.
- It is noted that the installation of a traffic signal is specifically referenced in the Ford's Colony proffers. However, per VDOT policy and roadway design manual guidelines, if volumes warrant the consideration of a traffic signal then the intersection will also need to be analyzed for the consideration of a roundabout.
- Additionally, it is noted that the Longhill Road Corridor Study, completed in October 2014, did not recommended the installation of a traffic signal at this intersection as part of the long term (horizon year 2034) improvements. Therefore, it is recommended that a traffic signal should no longer be proffered as a means of traffic control for this intersection.

- **Centerville Road at Manchester Drive**
  - Maintain the existing geometric configuration and traffic control measures.
- **News Road at Firestone Drive**
  - Maintain the existing geometric configuration and traffic control measures.

Given the minimal residual development potential in Ford's Colony, no additional or proffered improvements are triggered beyond those that were identified under the Existing or Build operational conditions.

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2 INTRODUCTION

Ford's Colony Homeowners Association (FCHOA), with support of REDUS VA Housing, LLC (REDUS) is pursuing a Master Plan and Proffer Amendment which includes proposing the construction of 60 residential condominium/townhouse units within the Ford's Colony development (i.e., Ford's Colony) in James City County, Virginia. Ford's Colony is a master planned community bounded by Longhill Road (State Route 612) to the north, Centerville Road (State Route 614) to the west, News Road (State Route 613) to the south, and a combination of retail/commercial land uses, residential areas, and Humelsine Parkway (State Route 199) to the east.

Through conversations with FCHOA, REDUS, and James City County staff as well as our review of the Ford's Colony Proffers (MP-2-87) dated June 20, 1988 and the Amended and Restated Ford's Colony Proffers (Z-04-98/MP-3-98) dated January 24, 1999, it was determined that a traffic impact study (TIS) must be prepared every five (5) years and/or prior to any proposed expansion or development within the Ford's Colony Master Planned residential development. The previous update was the *Ford's Colony Traffic Impact Study 2003-2004 Update*, completed in February 2004.

The purpose of this report is to satisfy the TIS requirement of the aforementioned proffers by summarizing existing and projected future traffic volumes as well as the associated operational conditions to determine if any of the identified off-site roadway, intersection, or traffic control (i.e., intersection signalization) improvements have been triggered for construction and/or may require acceleration. In addition, this study will identify the impacts to the intersections and roadway network due to the proposed development.

The proposed development will be located south of the roundabout intersection of Fords Colony Drive at St. Andrews Drive and is bounded by Eaglescliffe Condominiums to the west, single family units to the south, and the Marriott Manor Club at Ford's Colony to the east. **Figure 1** illustrates the proposed development's location. It is anticipated that the construction of the 60 residential condominium/townhouse units will be completed and operational for business by 2021. In addition to the 60 residential condominium/townhouse units, the following units were included in this TIS as part of the background traffic to represent the totality of the Ford's Colony Master Plan.

- 295 platted, unbuilt lots
- 30 un-platted Windsor development lots
- 14 un-platted Ford's property lots

Kimley-Horn has been retained to prepare a report that meets the requirements of updating the Ford's Colony TIS per the proffers as well as provides an assessment of the traffic impacts associated with the proposed development of the site. This report has been prepared for submittal to James City County and the Virginia Department of Transportation (VDOT) to evaluate existing conditions as well as future traffic conditions that include development related traffic volumes. Assumptions regarding the study area, access, and trip distribution were discussed with and approved by James City County staff prior to the completion of this analysis. The assumptions document is provided in **Appendix A**.

3 PROJECT BACKGROUND

3.1 STUDY AREA

Consistent with the previously completed TIS, the study area for this analysis, as illustrated in **Figure 1**, includes the following intersections:

Intersections

- Longhill Road at Williamsburg W. Drive/Lane Place Drive (signalized)
- Longhill Road at Fords Colony Drive (unsignalized)
- Centerville Road at Manchester Drive (unsignalized)
- News Road at Firestone Drive (unsignalized)

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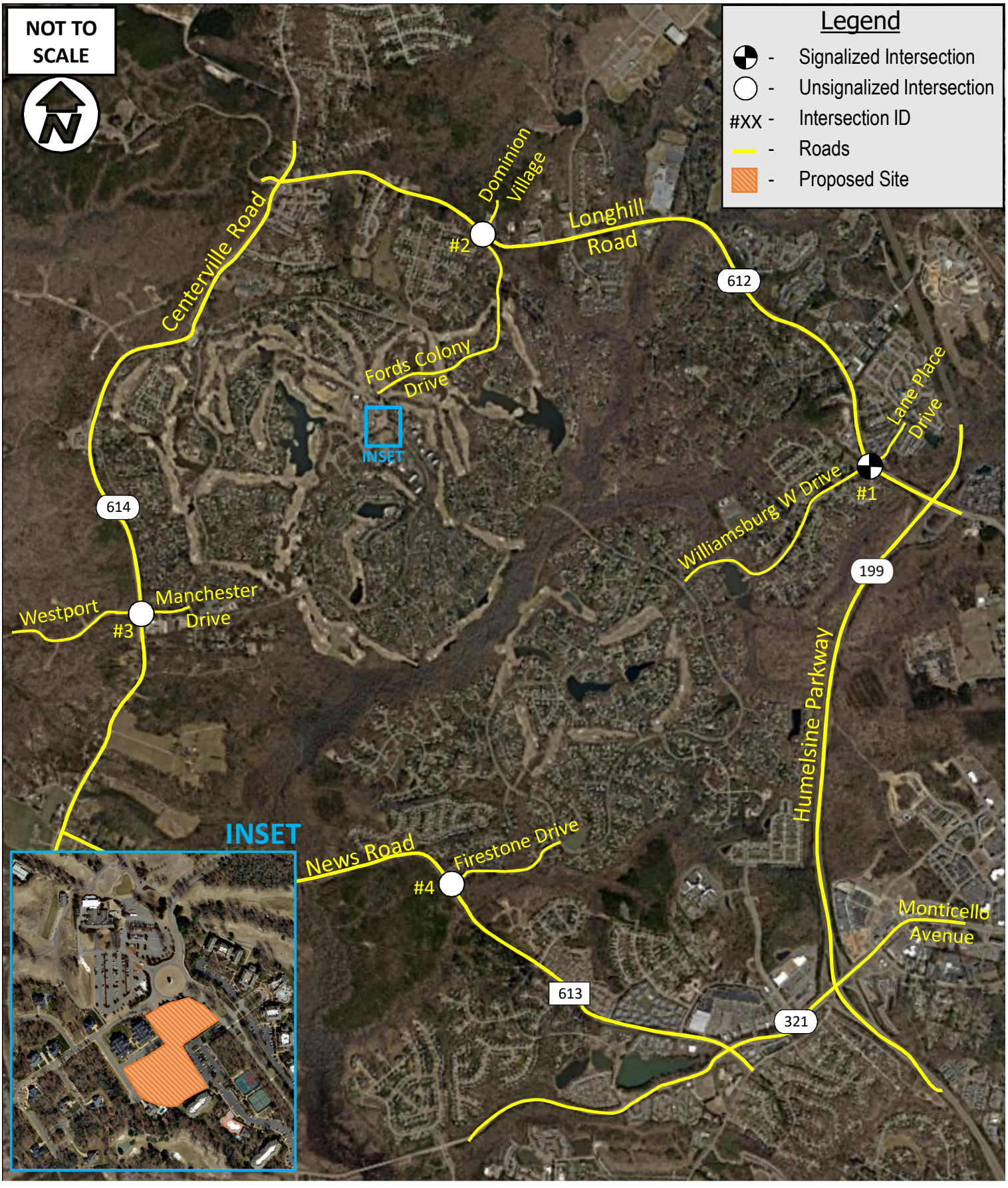

Kimley»Horn	Ford's Colony TIS Update James City County, VA	Study Area	FIGURE 1

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3.2 PREVIOUS STUDIES

As mentioned in **Chapter 2**, the previous *Ford's Colony Traffic Impact Study 2003-2004 Update*, was completed in February 2004. This study was conducted pursuant to the proffer requirements and included a schedule of roadway improvements at the four (4) intersections that provide access to/from the Ford's Colony development, as shown in **Table 1**.

Table 1: Ford's Colony Traffic Impact Study 2003-2004 Update Recommendations

Proffered Improvement Description		Recommended Action
(a)	**Installation of Traffic Signals**	
(i)	Longhill Road at Williamsburg W. Drive	Monitor traffic volumes in future to determine signal warrant justification
(ii)	News Road at Firestone Drive	Not warranted
(iii)	Longhill Road at Fords Colony Drive	Not warranted
(d)	**Construction of Longhill Road at Williamsburg W. Drive Intersection**	
(ii)	Add two through lanes on Longhill Road	Operational analysis determined improvement was not required
(iii)	Add second westbound left-turn lane on Longhill Road	Operational analysis determined improvement was not required
(iv)	Add second northbound right-turn lane on Williamsburg W. Drive	Operational analysis determined improvement was not required
(e)	**Construct eastbound right-turn lane on Longhill road at Fords Colony Drive**	**Continue to monitor traffic volumes in future to determine turn lane warrant justification.**
(f)	**Dedication of a 15-foot strip of land and construction of four lanes on Longhill Road from Williamsburg W. to Route 199**	**Operational analysis determined improvement was not required**

3.3 EXISTING ZONING

The project site for the proposed development is located within the Ford's Colony Master Planned development. This parcel is currently unoccupied and is zoned as Residential Planned Community (R4). **Figure 2** illustrates the existing zoning adjacent to the site.

Zoning in this area primarily consists of the following districts: General Residential (R2), Residential Planned Community (R4), Rural Residential (R8), and General Agriculture (A1). The Marriott's Manor Club at Ford's Colony is located to the east of the proposed site and the Ford's Colony Country Club is located to the north of the proposed site, which contains hotel accommodations, restaurants, services, and various recreational golf uses. To the south and west of the proposed residential condominium/townhouse site are additional residential areas.

3.4 EXISTING CONDITIONS

Longhill Road, Centerville Road, and News Road are the primary thoroughfares within the study area that provide connections to Williamsburg W. Drive, Ford's Colony Drive, Manchester Drive, and Firestone Drive, which provide access to/from the Ford's Colony community. **Figure 3** depicts existing roadway geometry, lane assignments, and conditions for study area roadways and intersections. The following provides a brief description of existing roadway characteristics for each facility:

Longhill Road (State Route 612) is a two-lane, undivided minor arterial that runs in an approximate east/west direction between Centerville Road to the west and the Humelsine Parkway (Route 199) interchange to the east. Traffic counts collected by VDOT in 2018 indicate that Longhill Road carried approximately 7,600 vehicles per day (vpd) between Centerville Road and Season's Trace and approximately 16,000 vpd between Season's Trace and Humelsine Parkway. The posted speed limit along this segment of roadway within the study area is 45 miles per hour (mph).

Centerville Road (State Route 614) is a two-lane, undivided minor arterial in James City County. Centerville Road runs in an approximate north/south direction in the study area between Longhill Road to the north and News Road to the south. Traffic counts collected by VDOT in 2018 indicate that Centerville Road carried approximately 4,900 vpd between News Road and Jolly Pond Road. The posted speed limit along this segment of Centerville Road is 45 mph.

News Road (State Route 613) is a two-lane, undivided major collector road that runs in an approximate east/west direction that extends from Centerville Road in the west to Ironbound Road in the east. Traffic counts collected by VDOT in 2018 indicate that News Road carried approximately 3,900 vpd within the study area. The posted speed limit is 45 mph.

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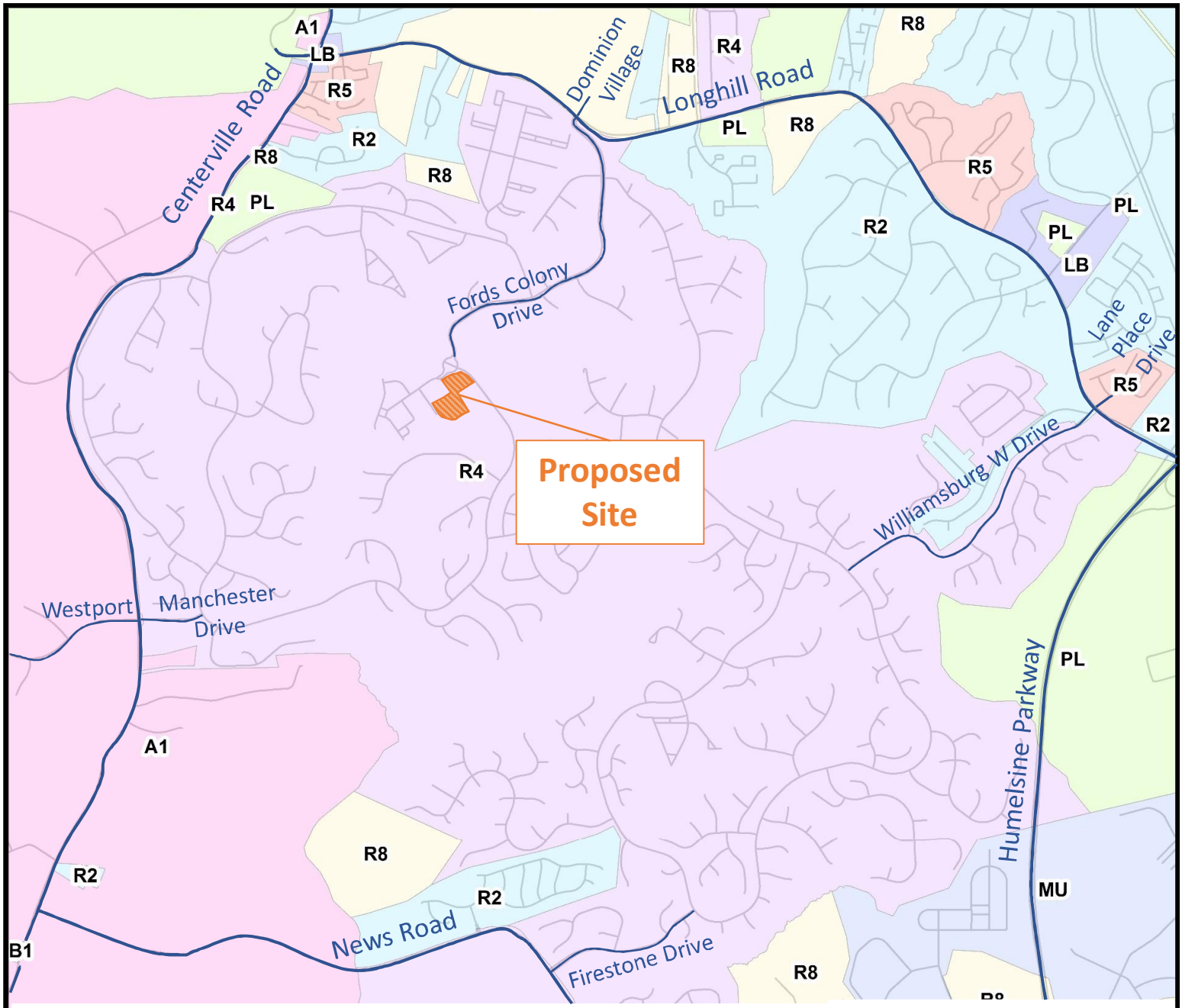

Legend

- General Agriculture (A1)
- General Business (B1)
- General Industrial (M2)
- General Residential (R2)
- Limited Business (LB)
- Limited Business/Industrial (M1)
- Limited Residential (R1)
- Low-Density Residential (R6)
- Mixed Use (MU)
- Multi-Family Residential (R5)
- Planned Unit Development Commercial (PUD-C)
- Planned Unit Development Residential (PUD-R)
- Public Lands (PL)
- Residential Planned Community (R4)
- Rural Residential (R8)

Source: James City County GIS Zoning Layer

Kimley»Horn	Ford's Colony TIS Update James City County, VA	Existing Zoning	FIGURE 2

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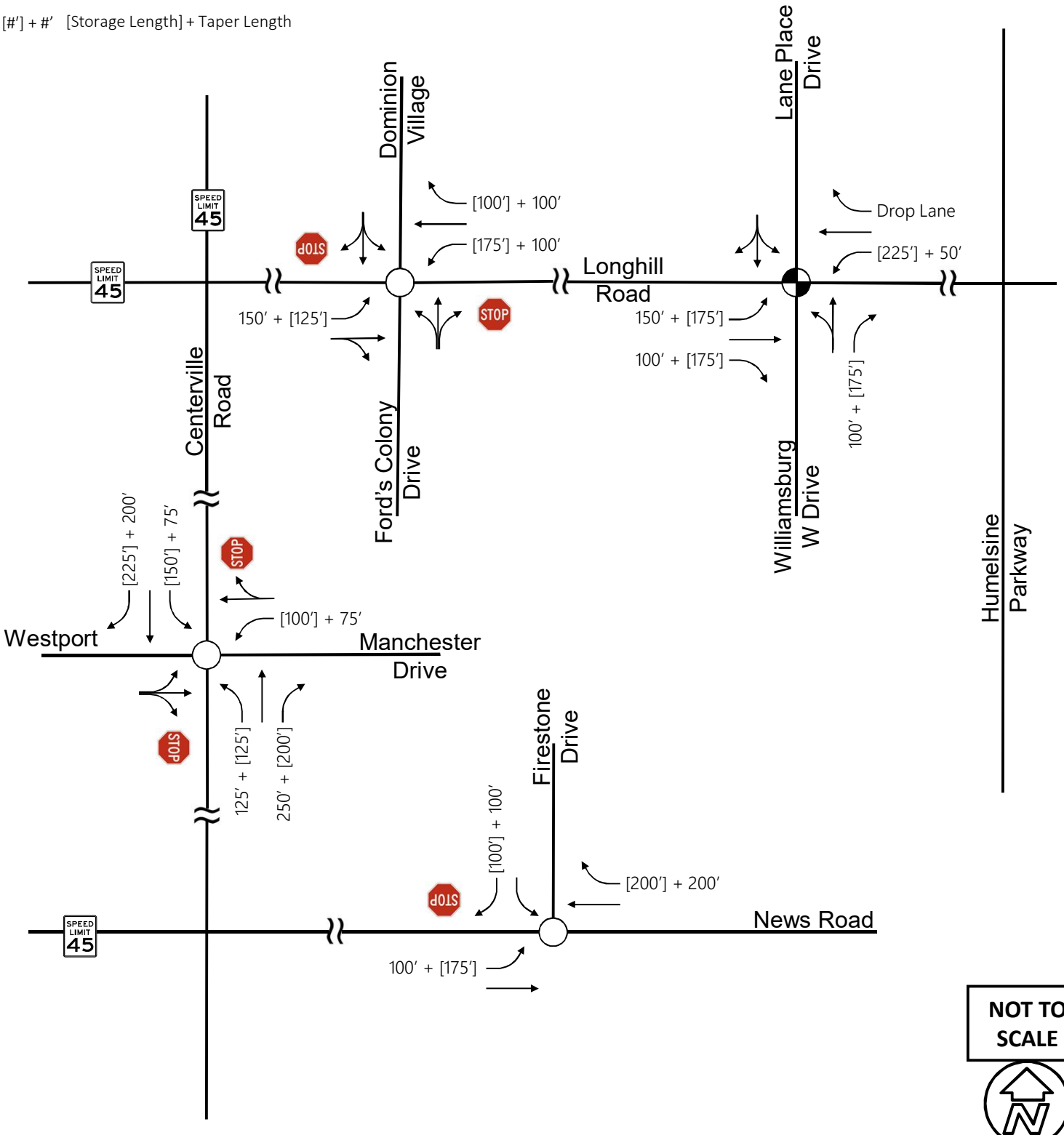
Legend

- Signalized Intersection
- Unsignalized Intersection
- Existing Lane Assignment
- [#'] + #' [Storage Length] + Taper Length



Kimley»Horn	Ford's Colony TIS Update James City County, VA	Existing Roadway Conditions	FIGURE 3

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3.5 EXISTING PEDESTRIAN AND BICYCLE ACCOMMODATIONS

Pedestrian accommodations (i.e., crosswalks, pedestrian signal heads) are not provided at any of the study intersections. However, sidewalk is provided on the north side of Longhill Road from Williamsburg W. Drive/Lane Place Drive to Warhill Trail. Portions of sidewalk are located along Centerville Road but lack connectivity throughout the study area.

In addition, paved shoulders allow for bicycle traffic on Longhill Road from Williamsburg W. Drive to Old Towne Road. Dedicated bike lane pavement markings traversing through the intersections are provided at major intersections along Longhill Road to enhance the visibility and safety of the bicyclists. A dedicated bike lane is provided along southbound Centerville Road from Longhill Road to just north of Mallory Place. Paved shoulders allow for bicyclist traffic on Centerville Road, south of Mallory Place. Pedestrian and bicycle accommodations are not provided along either side of News Road.

3.6 EXISTING TRAFFIC

Consistent with the previously completed TIS, AM and PM peak conditions were analyzed to evaluate potential impacts of the proposed development. To coincide with these times, turning movement counts (TMC) which included vehicular, truck, and pedestrian traffic were collected at the following study area intersections on June 8, 2017:

- Longhill Road at Williamsburg W. Drive/Lane Place Drive
- Longhill Road at Fords Colony Drive
- Centerville Road at Manchester Drive
- News Road at Firestone Drive

The uniform peak hours for these intersections were found to be 7:30 AM to 8:30 AM and 4:45 PM to 5:45 PM for the AM and PM peak hours, respectively. It should be noted that peak hour volumes were not adjusted and/or balanced, due to the location and number of access driveways between study area intersections.

Each movement of the 2017 TMCs were grown using annualized growth rates detailed in **Section 6.1** to calculate the 2019 volumes for each intersection. The AM and PM peak hour turning movement volumes from the abovementioned data sources are shown in **Figure 4**. Detailed count data is also provided in **Appendix B**.

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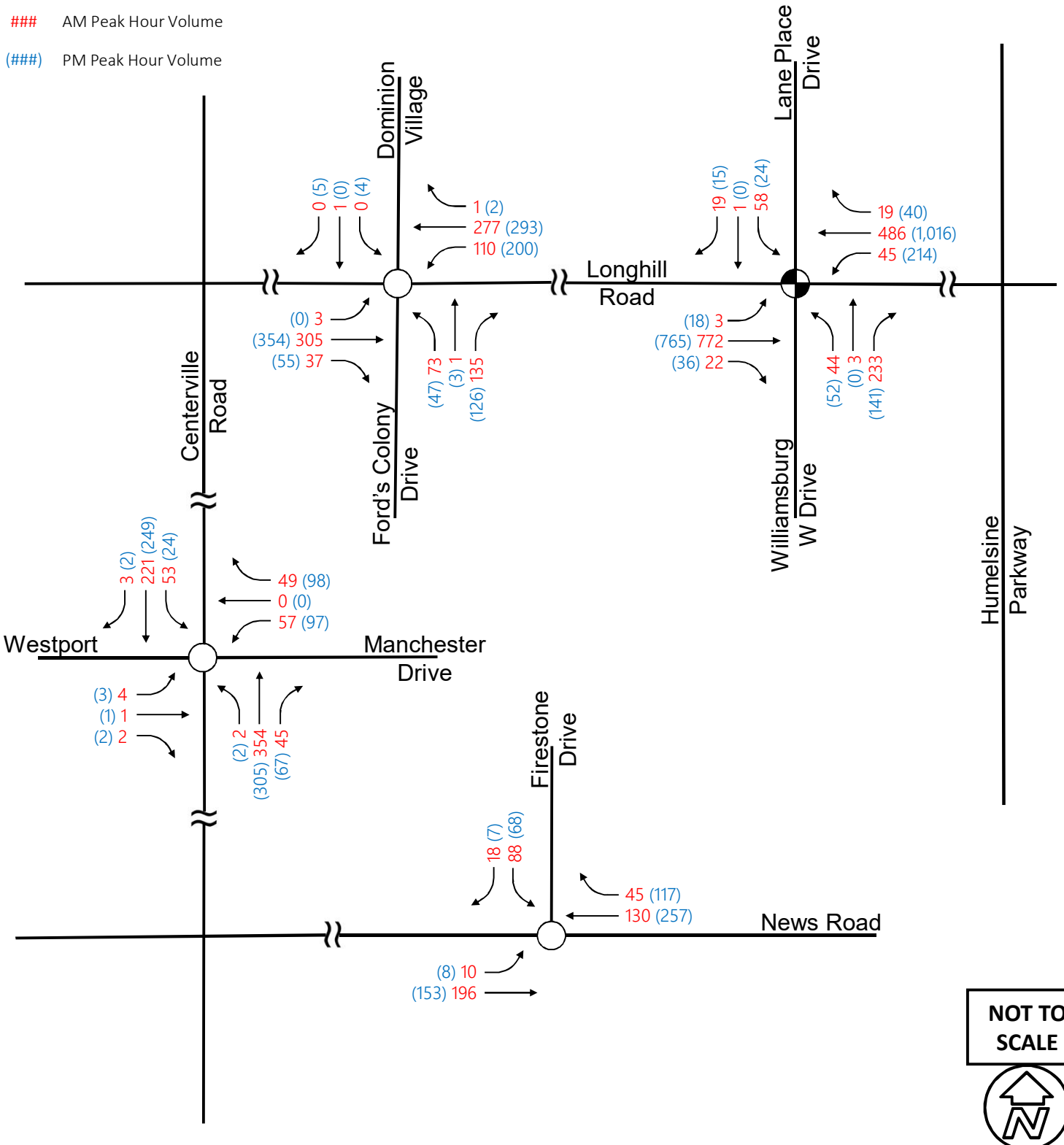

Kimley»Horn	Ford's Colony TIS Update James City County, VA	2019 Existing AM and PM Peak Hour Traffic Volumes	FIGURE 4

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4 TRIP GENERATION

To determine the anticipated number of trips generated by the proposed residential condominium/townhouse development, the *Trip Generation Manual*, published by the Institute of Transportation Engineers [ITE], 10th Edition, 2017 was used to estimate the new traffic on the adjacent roadway network.

The proposed development will consist of 60 residential condominium/townhouse units. Based on this land use type and intensity, trip generation estimates were calculated as shown in **Table 2**.

Table 2: ITE Trip Generation Summary (10th Edition)

ITE Code	ITE Description	Density	Daily	AM Peak Hour			PM Peak Hour		
				Enter (23%)	Exit (77%)	Total	Enter (63%)	Exit (37%)	Total
220	Multifamily Housing (Low-Rise)	60 Dwelling Units	413	7	22	29	23	14	37

Source: ITE Trip Generation Manual, 10th Edition

The total amount of traffic generated by the proposed development is anticipated to consisted of 413 daily trips, of which 29 trips will occur during the AM peak and 37 trips will occur during the PM peak hour, respectively. No pass-by or internal capture rate reductions were included as part of this analysis.

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5 TRAFFIC DISTRIBUTION AND ASSIGNMENT

The directional distribution and assignment of trips generated by the proposed redevelopment was based on a review of existing traffic volumes, site access, the *Ford's Colony Traffic Impact Study 2003-2004 Update*, and an understanding of travel patterns within the study area. From this review and conversations with VDOT, the following traffic distributions were derived for the analysis of the study area:

- AM Peak Hour
  - 80% of the trips generated will travel to/from the north on Ford's Colony Drive
    - 60% to/from the east on Longhill Road
    - 20% to/from the west on Longhill Road
  - 20% of the trips generated will travel to/from the west on Manchester Drive
- PM Peak Hour
  - 70% of the trips generated will travel to/from the north on Ford's Colony Drive
    - 55% to/from the east on Longhill Road
    - 15% to/from the west on Longhill Road
  - 30% of the trips generated will travel to/from the west on Manchester Drive

Based on conversations with VDOT, this TIS assumes site trips will not utilize the Williamsburg W. Drive or Firestone Drive access points due to the distance to/from the proposed development site.

As shown previously in and consistent with the previous TIS, the proposed development site will not introduce any new access points to existing/adjacent study area roadways.

Detailed AM and PM peak hour trip distribution and trip assignment is shown in **Figure 5** and **Figure 6**, respectively.

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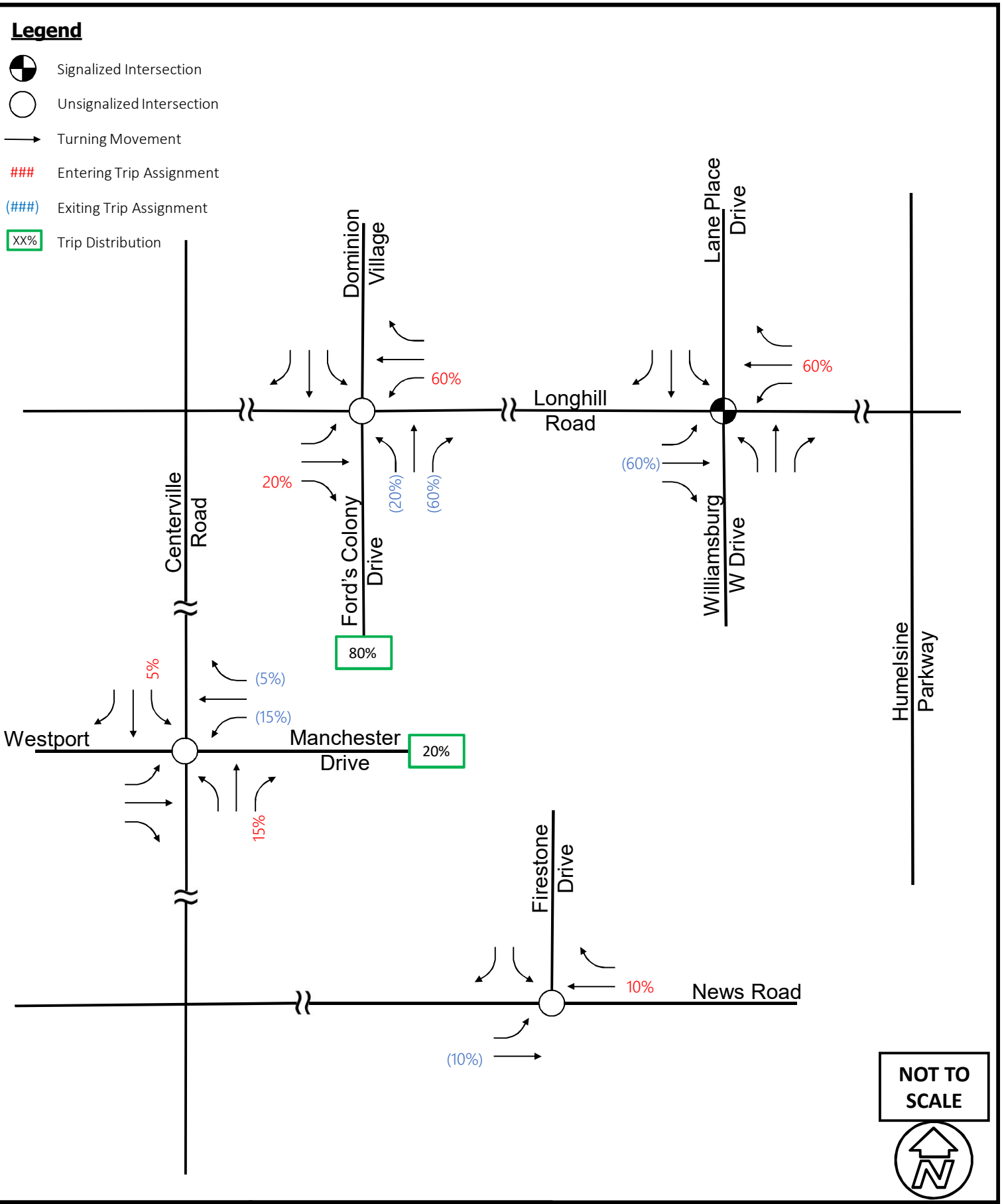

Kimley»Horn	Ford's Colony TIS Update James City County, VA	AM Condominium Site Distribution and Assignment	FIGURE 5

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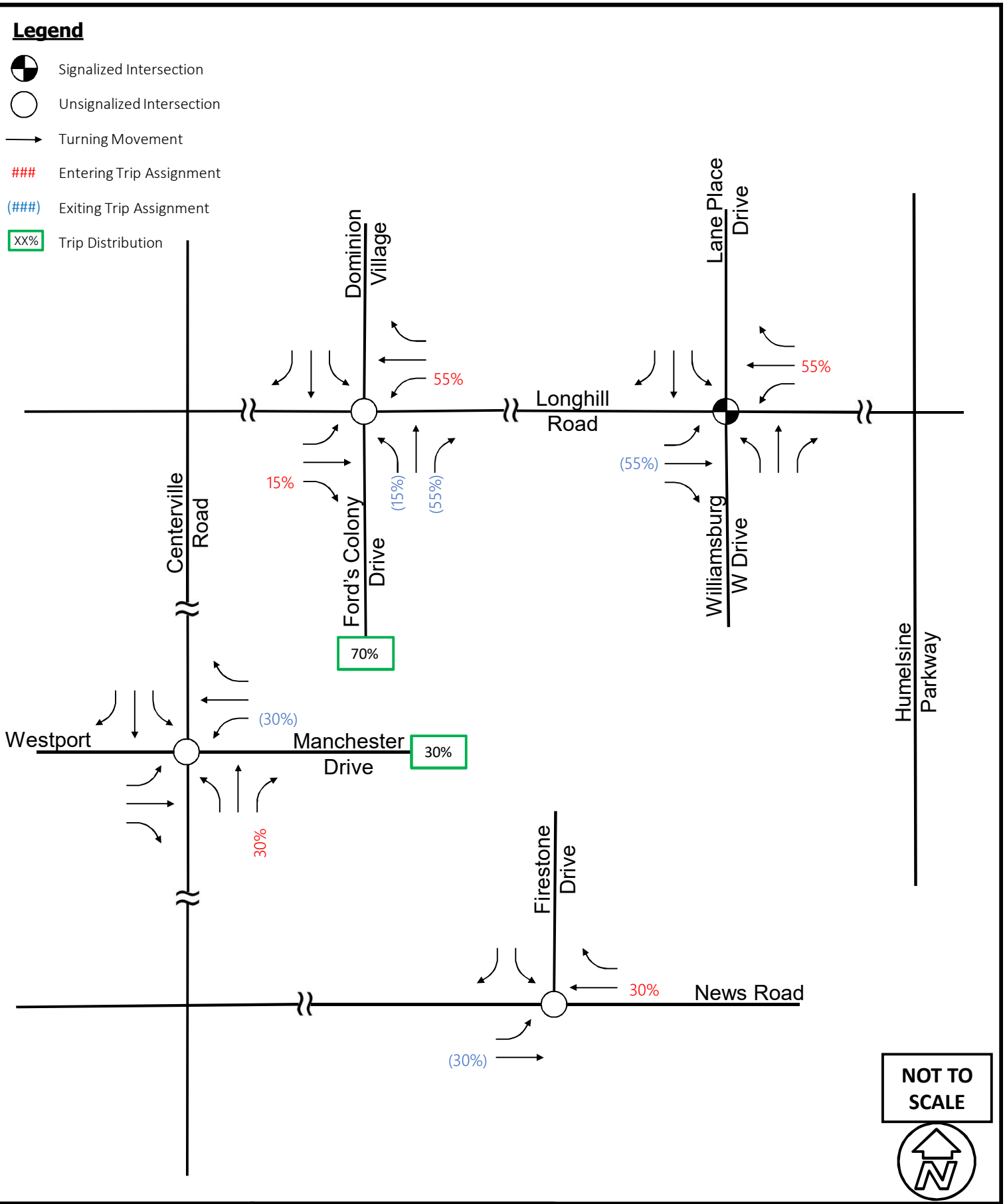

Kimley»Horn	Ford's Colony TIS Update James City County, VA	PM Condominium Site Distribution and Assignment	FIGURE 6

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6 PROJECTED TRAFFIC VOLUMES

Based on discussions with James City County, the following existing and horizon year scenarios were agreed to and analyzed to determine future impacts of the proposed development based on the anticipated schedule for construction and opening:

- Scenario 1 – 2019 Existing traffic conditions
- Scenario 2 – 2021 Opening Year No-Build conditions – Build-out year traffic conditions ***with*** only background development trips applied (i.e., approved adjacent development traffic)
- Scenario 3 – 2021 Opening Year Build conditions – Build-out year traffic conditions ***with*** background development trips applied ***plus*** traffic volumes generated by the proposed development
- Scenario 4 – 2027 Opening Year +6 years No-Build conditions – Build-out year traffic conditions ***with*** only background development trips applied (i.e., approved adjacent development traffic)
- Scenario 5 – 2027 Opening Year +6 years Build conditions – Build-out year traffic conditions ***with*** background development trips applied ***plus*** traffic volumes generated by the proposed development

6.1 BACKGROUND TRAFFIC GROWTH

Background traffic growth rates were determined by using rates developed as part of the *Longhill Road Corridor Study*, completed and adopted in October 2014, and historical traffic volume trends over the previous six (6) years (i.e., 2011 to 2016) from VDOT data.

- Longhill Road – 2.0% per year (consistent with *Longhill Road Corridor Study*)
- Centerville Road – 2.5% per year
- News Road – 2.0% per year

Since November 2019, approximately 2,851 of 3,250 total units have been built within Ford's Colony with a remainder of 399 unbuilt units, as shown in **Figure 7**. The 399 unbuilt units are as follows:

- 295 platted, unbuilt lots
- 60 un-platted Eaglescliff development lots
- 30 un-platted Windsor development lots
- 14 un-platted Ford's property lots

With the addition of 90 units, Ford's Colony has a remainder of 309 units available. The additional 90 units consist of 60 units in the Eaglescliff development (described in Chapter 4) and 30 units in the Windsor development (described in Section 6.1.1.). The aforementioned traffic growth rates were applied to all intersection movements to account for the trip generation potential of the remaining 309 units; thus, accounting for the full build-out of Ford's Colony.

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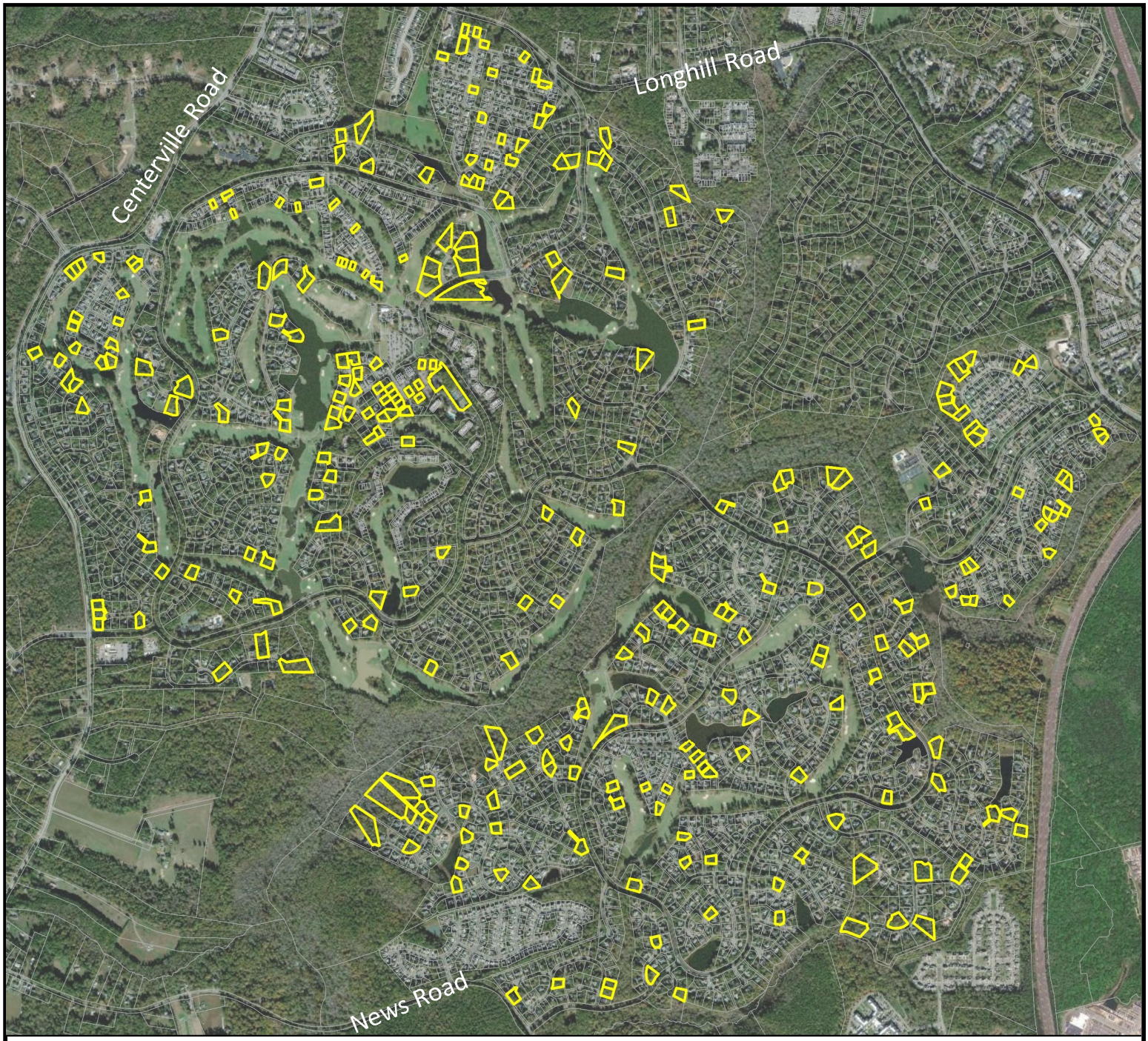

Kimley»Horn	Ford's Colony TIS Update James City County, VA	Ford's Colony Unbuilt Lots	FIGURE 7

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6.1.1 OTHER DEVELOPMENT TRAFFIC

Since the 2004 study was completed, there has been minimal to no residential development/expansion occurring within the Ford's Colony Master Plan development. However, three additional developments adjacent to Ford's Colony were provided by James City County for inclusion in the analysis of future traffic operational conditions: The Villages at Ford's Colony (The Villages), Westport Subdivision at Ford's Colony (Westport), and Windsor Property (Windsor).

Per the *News Road Corridor Traffic Forecast and Analysis*, completed in April 2008, the Villages at Ford's Colony has a proposed entrance on the northbound approach of the News Road at Firestone Drive intersection. The Westport development's entrance is currently located on the eastbound approach (west leg) of the Manchester Drive at Centerville Road intersection.

In addition, the Windsor development is anticipated to be located along Ford's Colony Drive across from N. Knob Hill. Future traffic volumes associated with these other approved developments were accounted for and calculated using the most recent version of the *ITE Trip Generation Manual.*

Trip generation densities as well as the trip distribution and assignment percentages for The Villages and Westport developments will remain consistent with the *News Road Corridor Traffic Forecast and Analysis.* The trip distribution and assignment for the Windsor property will be consistent with the proposed redevelopment as detailed in **Chapter 5**.

The Villages development will consist of attached and detached senior adult housing, congregate care housing, assisted living, and a nursing home, for a total of 739 units. The trip generation was calculated, and the results are shown in **Table 3.** The total amount of traffic generated by The Villages development consisted of 2,078 daily trips, of which 101 and 161 trips will occur during the AM and PM peak hours, respectively.

Table 3: ITE Trip Generation Summary for The Villages at Ford's Colony Development

ITE Code	ITE Description	Density	Unit	Daily	AM Peak Hour			PM Peak Hour		
					Enter	Exit	Total	Enter	Exit	Total
251	Senior Adult Housing - Detached	38	Dwelling Units	240	7	13	20	14	9	23
252	Senior Adult Housing - Attached	168	Dwelling Units	650	12	21	33	24	19	43
253	Congregate Care Housing	390	Dwelling Units	788	13	9	22	32	28	60
254	Assisted Living	83	Beds/Rooms	216	10	6	16	8	14	22
620	Nursing Home	60	Beds/Rooms	184	7	3	10	4	9	13
Total		**739**		**2,078**	**49**	**52**	**101**	**82**	**79**	**161**

Note: It is assumed that there is one bed per room, and therefore each bed is considered one dwelling unit.

The Westport development will consist of 43 units of single-family detached housing. The trip generation estimates for the proposed Westport development are shown in **Table 4**. The total amount of traffic generated by the Westport development consisted of 478 daily trips, of which 35 will occur during the AM peak hour and 45 will occur during the PM peak hour, respectively.

Table 4: ITE Trip Generation Summary for Westport Subdivision at Ford's Colony Development

ITE Code	ITE Description	Density	Unit	Daily	AM Peak Hour			PM Peak Hour		
					Enter	Exit	Total	Enter	Exit	Total
210	Single-Family Detached Housing	43	Dwelling Units	478	9	26	35	28	17	45

The Windsor development will consist of 30 units of multifamily attached housing. The trip generation estimates for the proposed Windsor development are shown in **Table 5.** The total amount of traffic generated by the Windsor development consisted of 186 daily trips, of which 15 will occur during the AM peak hour and 20 will occur during the PM peak hour, respectively. **Figure 8** through **Figure 13** illustrate the approved development site trip distributions and assignments.

Table 5: ITE Trip Generation Summary for Windsor Development

ITE Code	ITE Description	Density	Unit	Daily	AM Peak Hour			PM Peak Hour		
					Enter	Exit	Total	Enter	Exit	Total
220	Multifamily Housing (Low-Rise)	30	Dwelling Units	186	3	12	15	13	7	20

6.2 TOTAL TRAFFIC

Traffic associated with the proposed residential condominium/townhouse development was added to the future background traffic volumes as well as the approved development traffic volumes to develop the total traffic volumes for 2021 and 2027 future Build conditions. **Figure 14** through **Figure 17** illustrate the peak hour traffic volumes used in the analysis of future conditions (i.e., No-Build and Build). Worksheets detailing the volumes for the study area intersections are provided in **Appendix C**.

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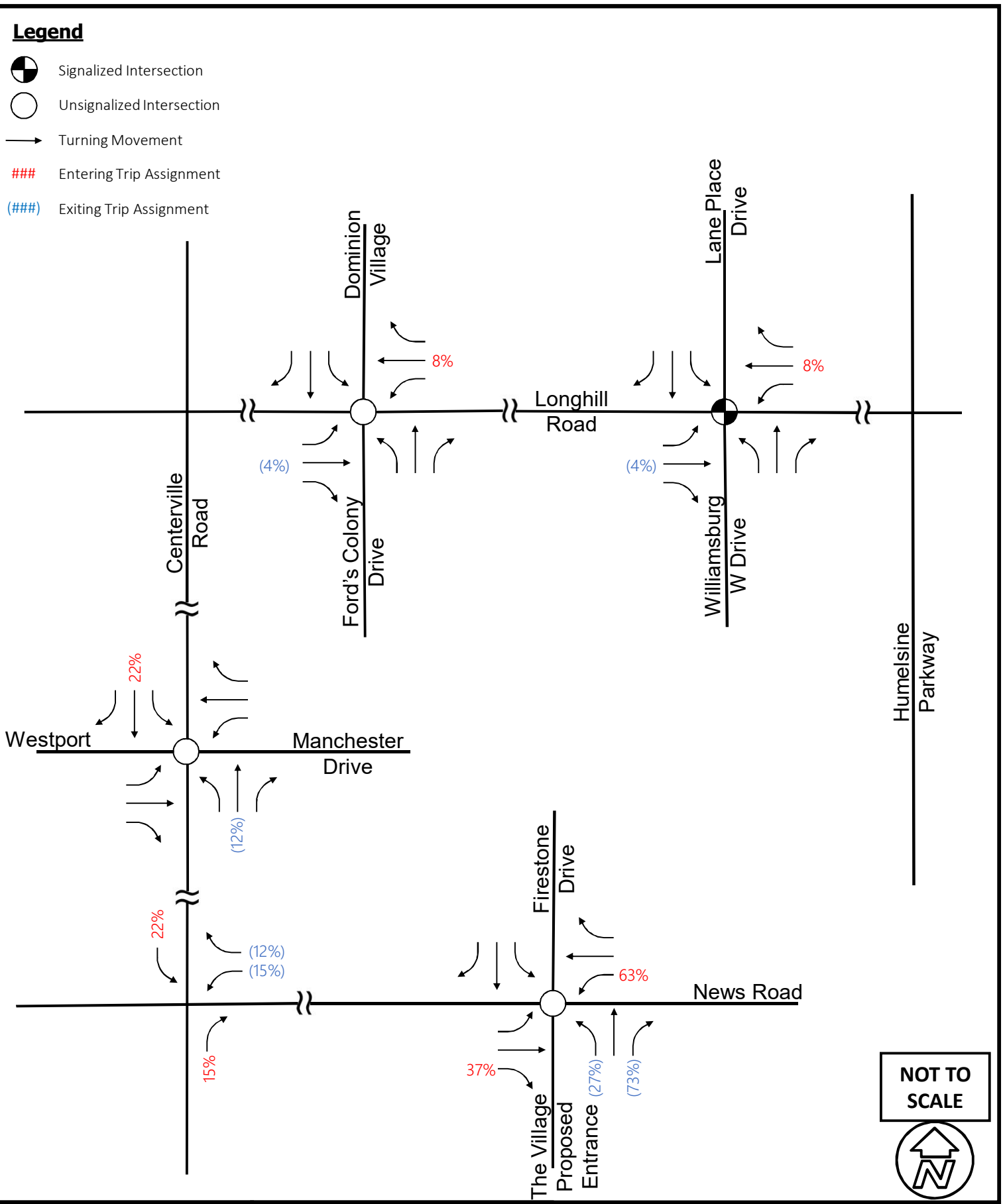

Kimley»Horn	Ford's Colony TIS Update James City County, VA	The Villages AM Background Site Distribution	FIGURE 8

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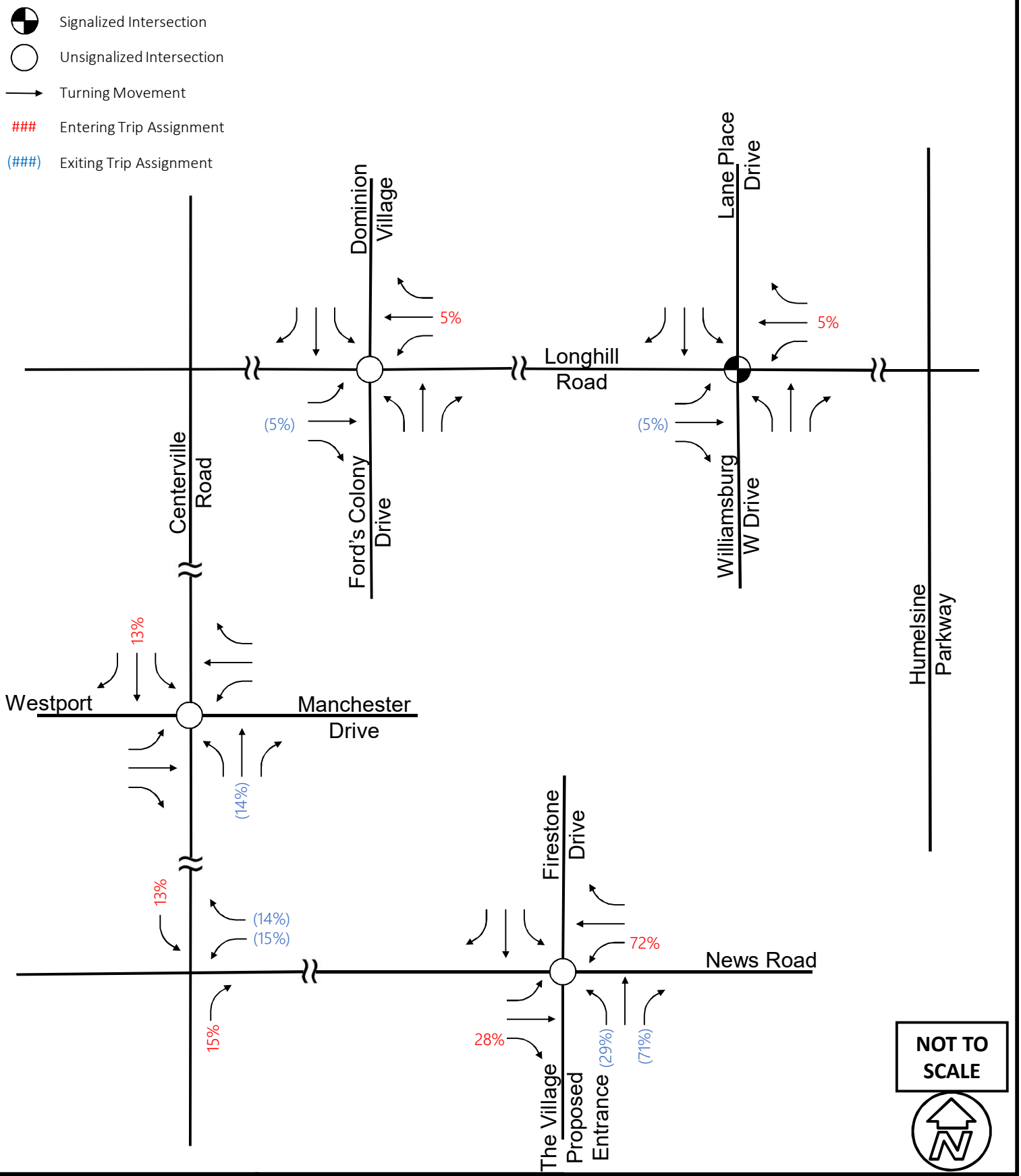

Kimley»Horn	Ford's Colony TIS Update James City County, VA	The Villages PM Background Site Distribution	FIGURE 9

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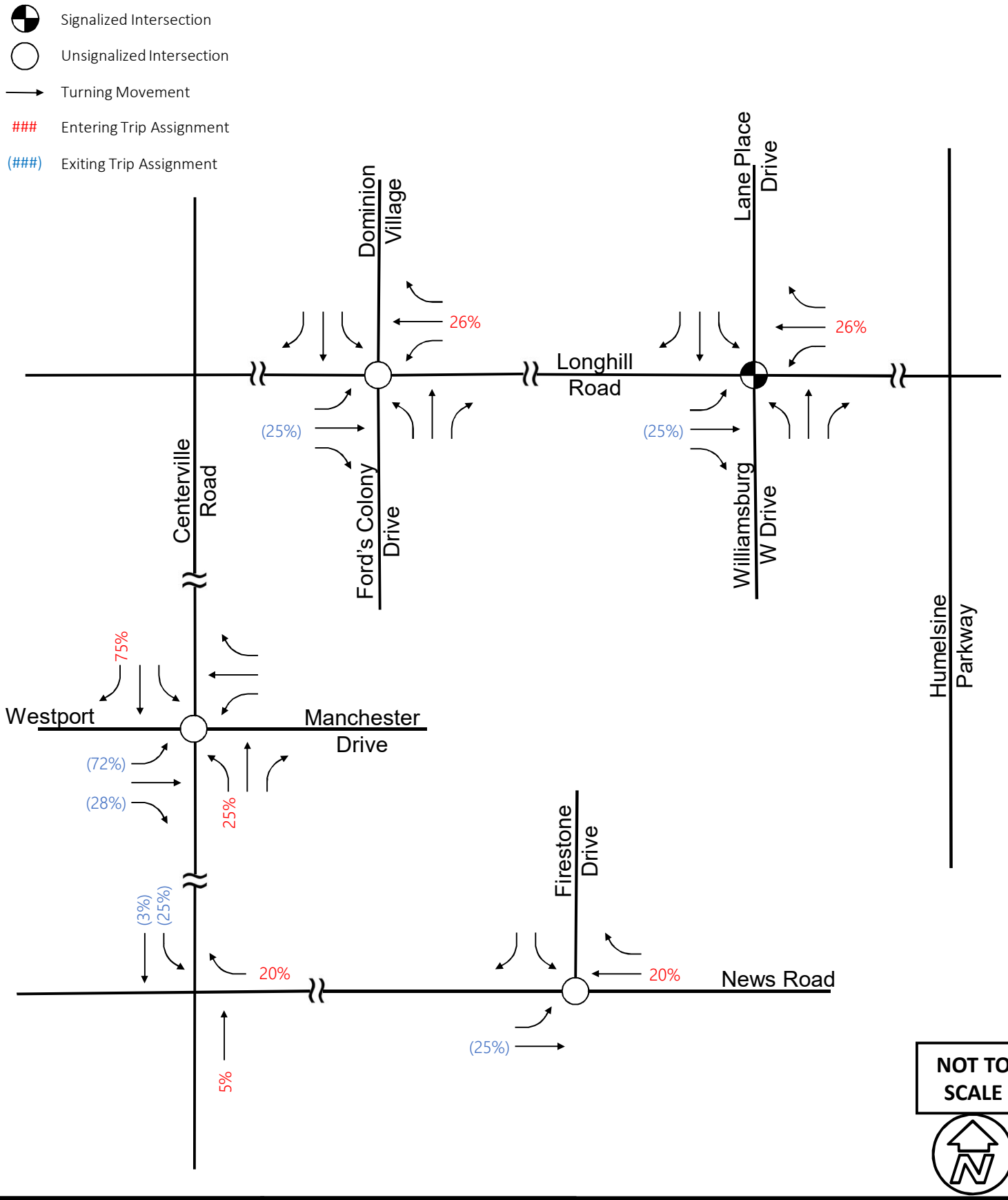

Kimley»Horn	Ford's Colony TIS Update James City County, VA	Westport AM Background Site Distribution	FIGURE 10

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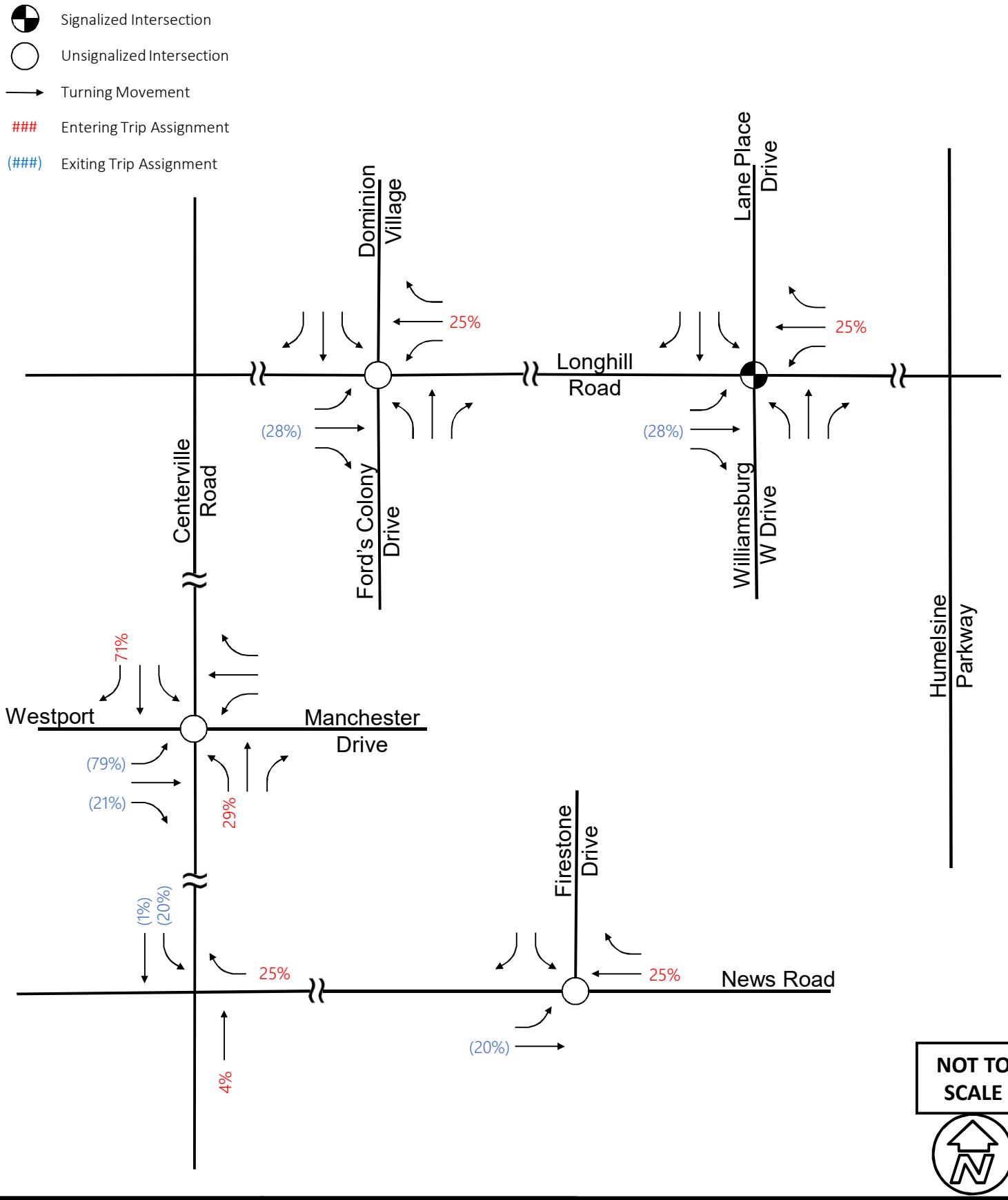

Kimley»Horn	Ford's Colony TIS Update James City County, VA	Westport PM Background Site Distribution	FIGURE 11

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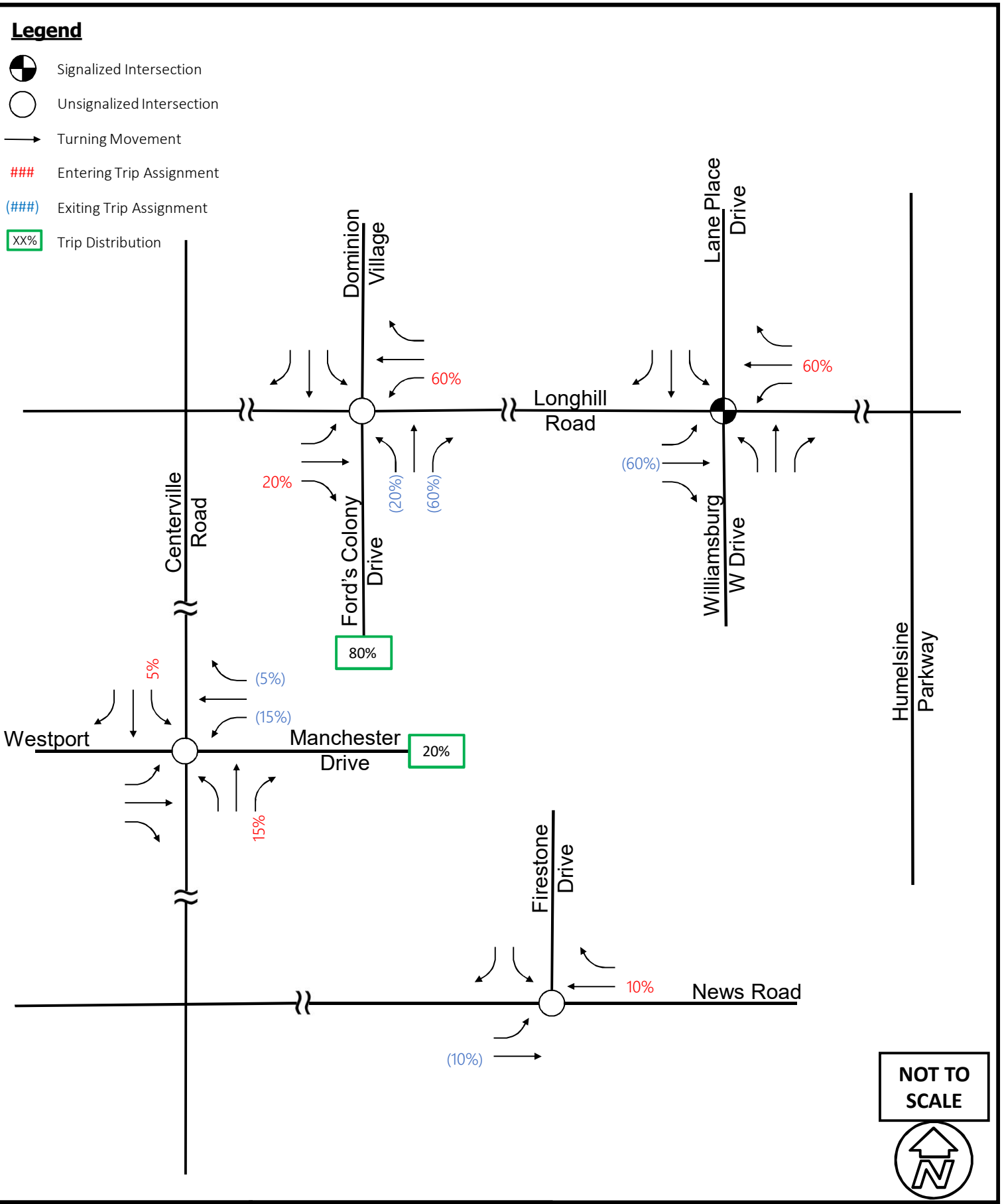

Kimley»Horn	Ford's Colony TIS Update James City County, VA	Windsor AM Background Site Distribution	FIGURE 12

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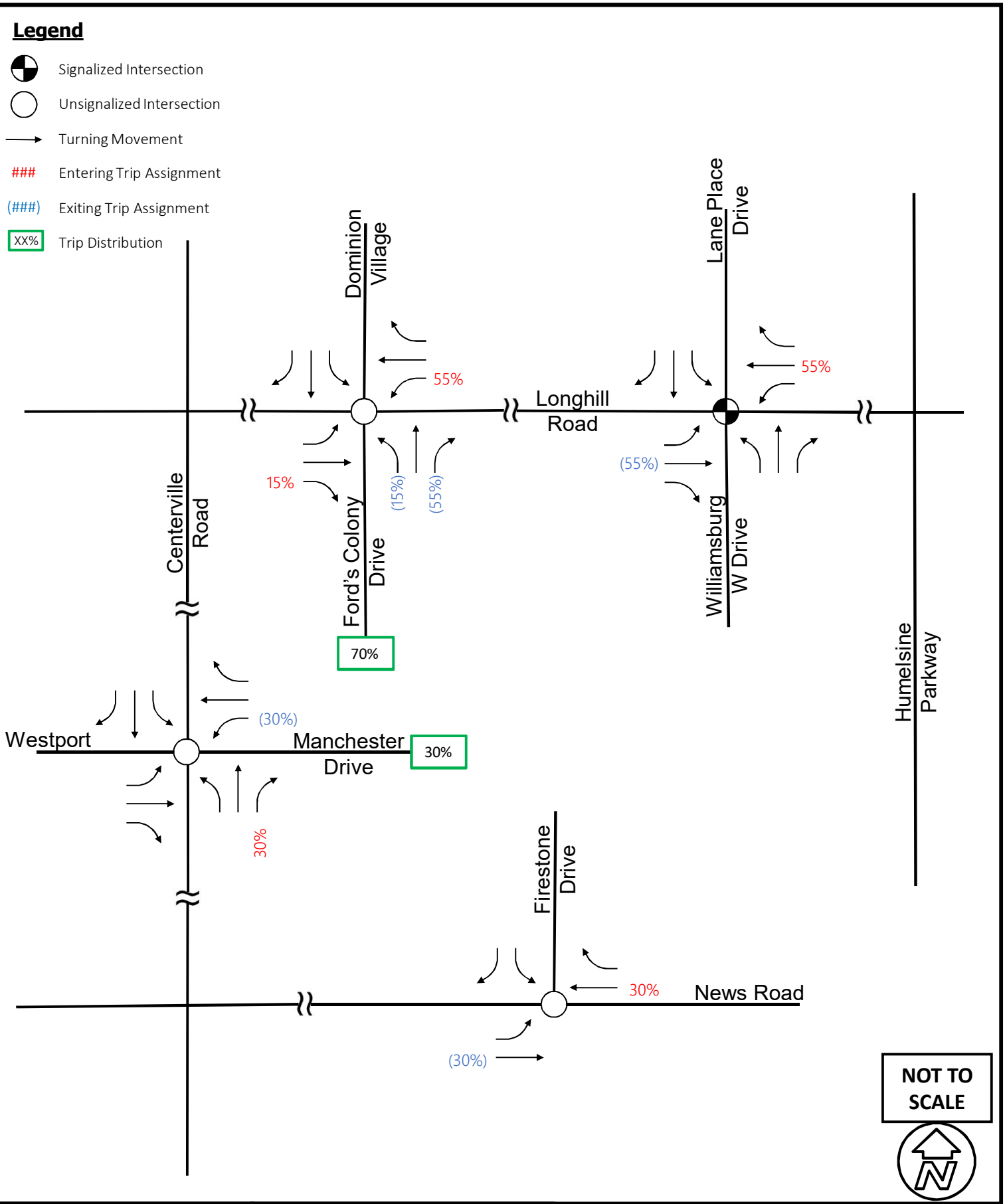

Kimley»Horn	Ford's Colony TIS Update James City County, VA	Windsor PM Background Site Distribution	FIGURE 13

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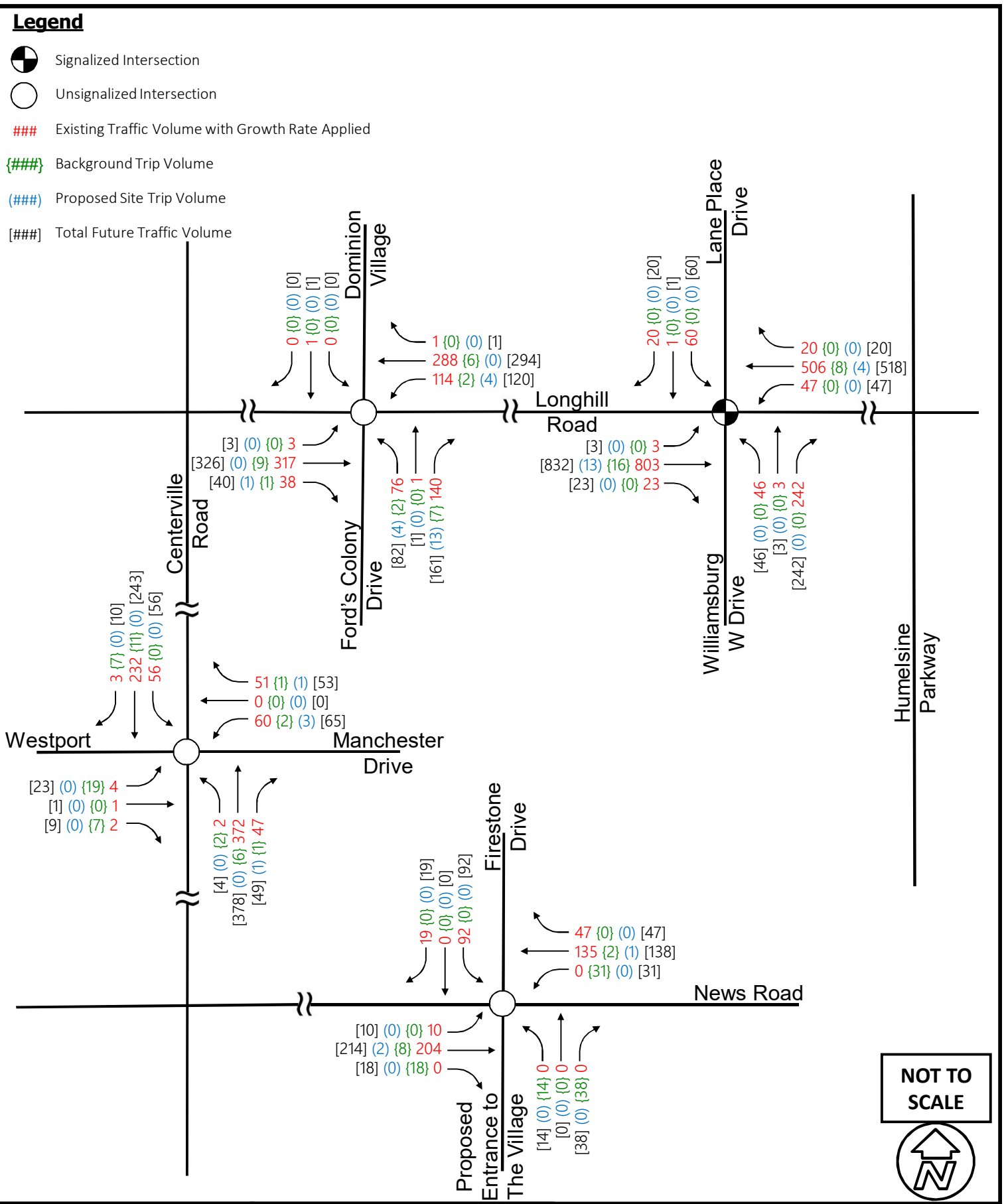

Kimley»Horn	Ford's Colony TIS Update James City County, VA	2021 Build AM Peak Hour Volumes	FIGURE 14

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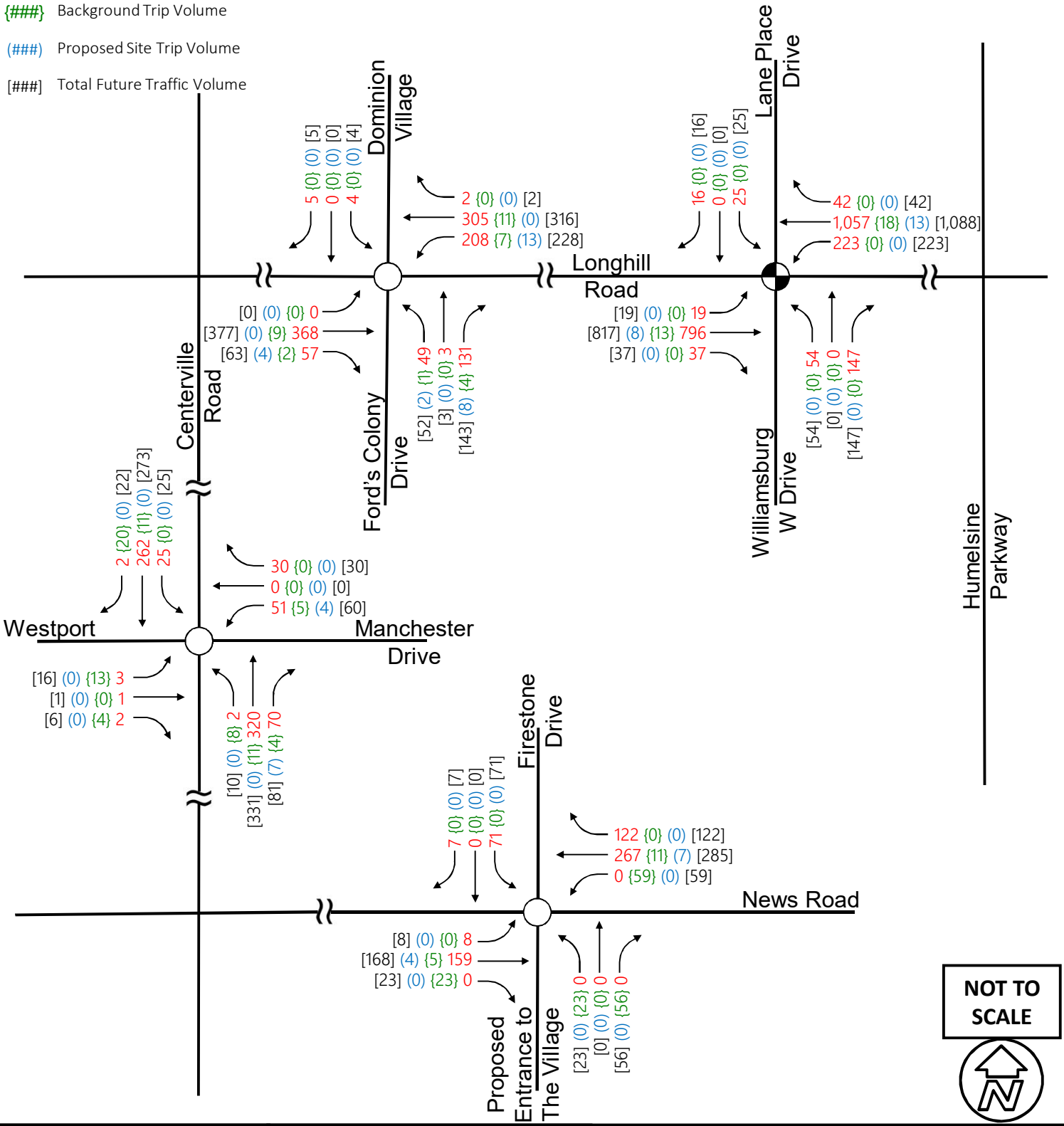

Kimley»Horn	Ford's Colony TIS Update James City County, VA	2021 Build PM Peak Hour Volumes	FIGURE 15

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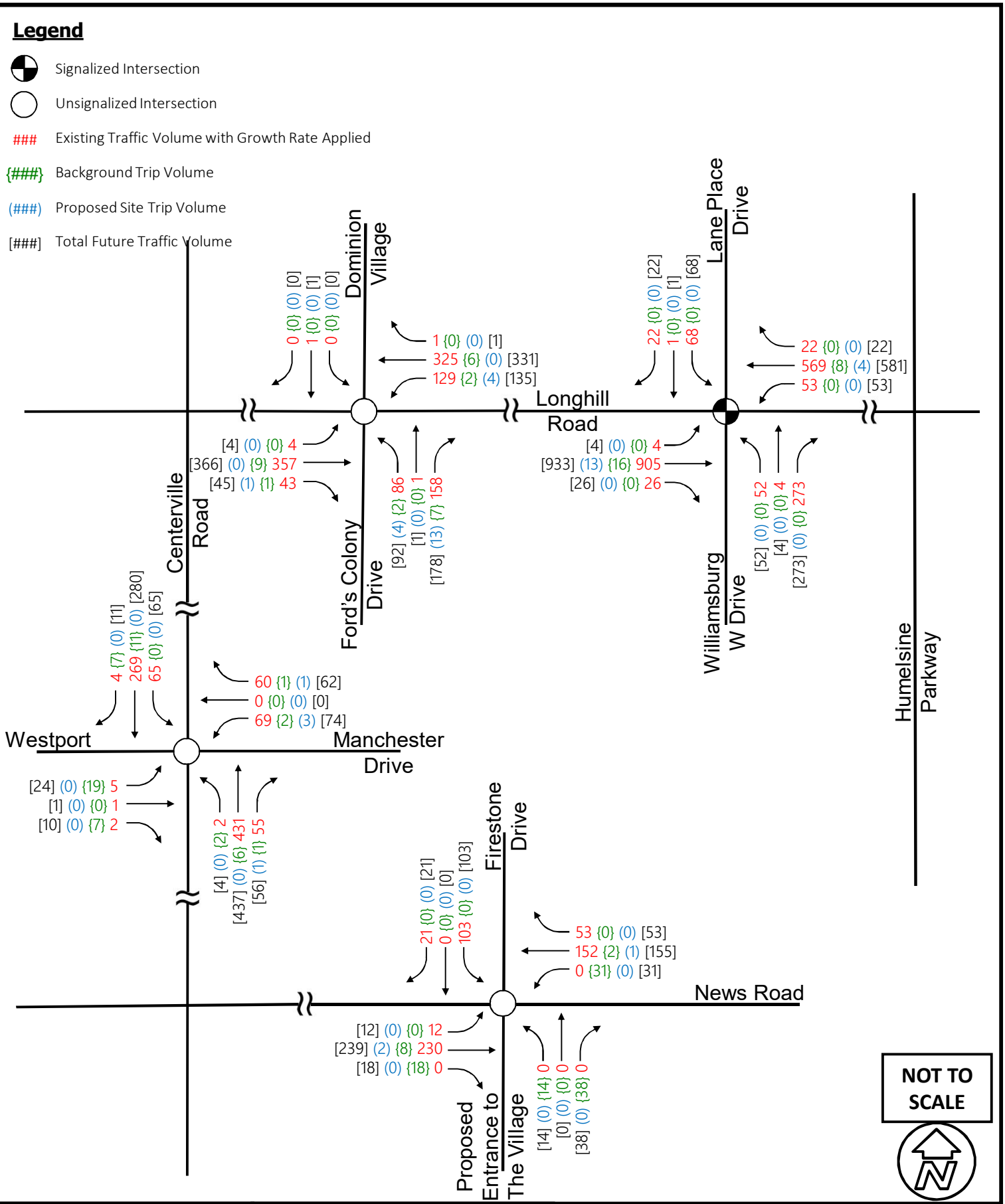

Kimley»Horn	Ford's Colony TIS Update James City County, VA	2027 Build AM Peak Hour Volumes	FIGURE 16

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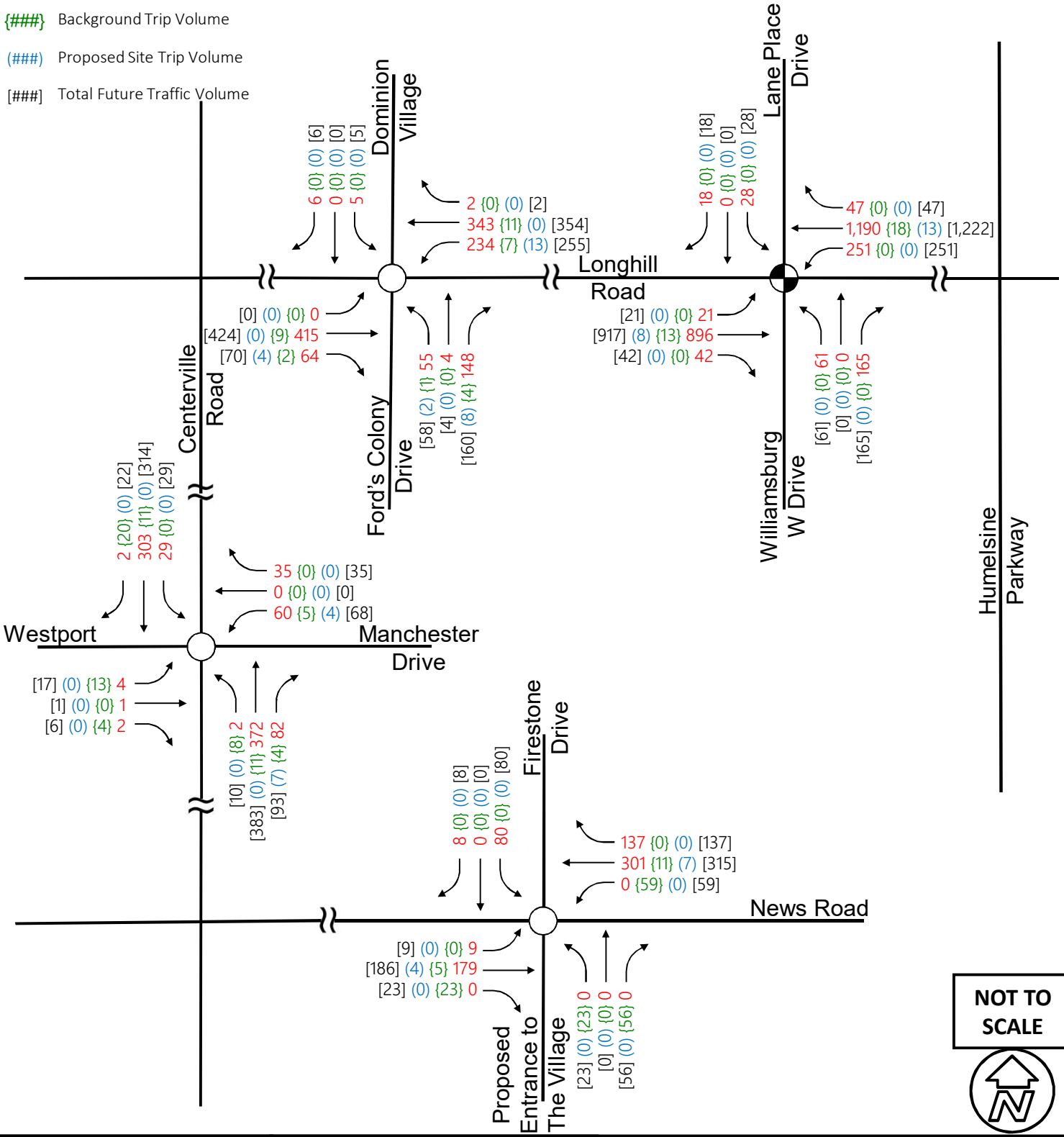

Kimley»Horn	Ford's Colony TIS Update James City County, VA	2027 Build PM Peak Hour Volumes	FIGURE 17

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7 TRAFFIC ANALYSIS

The traffic analysis for the proposed condominium/townhouse development as well as the improvements outlined in the proffers consisted of right-turn lane warrants, traffic signal warrants, and intersection operations. Analyses of study area intersections for AM and PM peak hours were performed for the following scenarios:

- 2019 Existing
- 2021 No-Build (background traffic only)
- 2021 Build (background traffic with proposed development trips)
- 2027 No-Build (background traffic only) – *Includes planned Longhill Road widening and intersection improvements currently under construction*
- 2027 Build (background traffic with proposed development trips) – *Includes planned Longhill Road widening and intersection improvements currently under construction*

The planned Longhill Road widening and intersection improvements currently under construction included in the study area are shown in **Figure 18**.

Figure 18: Longhill Road Widening and Intersection Improvements

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7.1 RIGHT-TURN LANE WARRANT

A right-turn lane warrant analysis was performed for the eastbound approach of Longhill Road at the Fords Colony Drive intersection to assess the need for a full-width exclusive right-turn treatment, as outlined by the proffers. This was conducted in accordance with VDOT right turn-lane warrant analysis guidelines per *Appendix F Access Management Design Standards for Entrances and Intersections*. Detailed data sheets for the turn lane warrant under each scenario are provided in **Appendix D.** Based on these guidelines, **Table 6** illustrates that a full-width, right-turn lane and taper is warranted for the PM peak hour under 2021 Build, 2027 No Build, and 2027 Build scenarios.. Based on these turn-lane warrant analysis findings, it is recommended that a full width right-turn lane be constructed for the eastbound approach Longhill Road at Fords Colony Drive.

Table 6: Summary of Right-Turn Lane Warrant Analysis for Fords Colony Drive at Longhill Road

Scenario	Warrants Analysis	
	Right-Turn Lane Warrant	
	AM	PM
Existing (2019)	✓ (taper required)	✓ (taper required)
No Build (2021)	✓ (taper required)	✓ (taper required)
Build (2021)	✓ (taper required)	✓ (full-width turn lane and taper required)
No Build (2027)	✓ (taper required)	✓ (full-width turn lane and taper required)
Build (2027)	✓ (taper required)	✓ (full-width turn lane and taper required)

Notes: × *- Warrant not met*
✓ *- Warrant met*

7.2 TRAFFIC SIGNAL WARRANT ANALYSIS

Traffic signal warrant analyses were performed for the unsignalized intersection of Longhill Road at Fords Colony Drive and the unsignalized intersection of News Road at Firestone Drive, consistent with the methodologies provided in the *Manual on Uniform Traffic Control Devices* (MUTCD), to evaluate the need for traffic signalization under existing and future traffic conditions. These warrants are based on mainline and minor street traffic volumes, the number of travel lanes, approach turn-lanes, and mainline posted speed limit. According to the MUTCD, a traffic control signal should not be installed unless one or more of the signal warrants are met. The warrants used in this analysis are as follows:

- **Warrant 1 (Eight-Hour Vehicular Volume)** - is satisfied if ONE of the following conditions exists for any eight hours of an average day:
  - Condition A (Minimum Vehicular Volume) - volumes meet or exceed the necessary hourly thresholds for any eight hours of an average day. Thresholds may be modified based on vehicle speeds and population of the local community.

- Condition B (Interruption of Continuous Traffic) - volumes meet or exceed the necessary hourly thresholds for any eight hours of an average day. Thresholds may be modified based on vehicle speeds and population of the local community.
- Combination of Condition A and B - intended to be used where Conditions A and B are not individually met and where volume thresholds may be reduced based on anticipated traffic delay at the intersection.

- **Warrant 2 (Four-Hour Vehicular Volume)** - volumes meet or exceed the necessary hourly thresholds for any four hours of an average day. Thresholds are typically higher than those for Warrant 1 and may be applicable when high traffic volumes are concentrated over a shorter time period (less than eight hours). The thresholds may also be modified based on vehicle speeds and population of the local community

- **Warrant 3 (Peak Hour Volume)** - volumes meet or exceed the necessary hourly thresholds for any one hour of an average day. This warrant should only be applied in unusual cases where an area is expected to discharge a large volume of traffic over a short period of time. Thresholds may be modified based on vehicle speeds and population of the local community.

Under each warrant analysis, existing turning movement volumes were used to determine if the volume thresholds provided in the MUTCD were met. This provides a baseline to establish the potential for needing a signal under current traffic loads. For future No-Build and Build conditions, the signal warrant analysis was performed accounting for future growth in traffic associated with and without the proposed development traffic. For the Longhill Road at Fords Colony Drive intersection, the westbound right-turn volumes were not accounted for as part of this analysis under the existing and future conditions since an exclusive right-turn lane is provided to accommodate this movement. In addition, the northbound right-turn lane volumes on Fords Colony Drive were not included in the signal warrant analysis as drivers are utilizing the 24-foot pavement width to turn right as other vehicles are stopped for the through or left-turn movements. For the News Road at Firestone Drive intersection, the southbound and westbound right-turn vehicles were not accounted for as part of this analysis under the existing conditions. In addition, the northbound right-turn vehicles were not included as part of this analysis for the Villages driveway under the future conditions.

To assign the hourly site traffic for the future warrant analysis, all assumptions and methods (i.e., trip generation, pass-by reduction, distribution, background traffic growth, other development traffic) were followed, with an additional step of applying hourly variations to the daily trip generation total. The hourly variation breakdown for Multifamily Housing (Low-Rise) (220), as provided in the ITE Trip Generation Manual, were used for this purpose, as shown in **Table 7.**

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Table 7: Hourly Variations in Residential Traffic

Time	Average Weekday	
	Percent of 24-Hour Entering Traffic	Percent of 24-Hour Exiting Traffic
6 am – 7 am	1.6%	5.7%
7 am – 8 am	2.5%	9.0%
8 am – 9 am	3.7%	9.1%
9 am – 10 am	3.7%	6.5%
10 am – 11 am	4.1%	5.5%
11 am – 12 pm	4.5%	5.7%
12 pm – 1 pm	5.3%	5.3%
1 pm – 2 pm	5.4%	5.7%
2 pm – 3 pm	6.5%	5.9%
3 pm – 4 pm	8.1%	6.3%
4 pm – 5 pm	9.8%	6.3%
5 pm – 6 pm	10.8%	6.5%

Source: ITE Trip Generation Manual, 10th Edition

The results of the signal warrant analyses are provided in **Table 8** and **Table 9**, with complete tables outlining the traffic volumes used, in **Appendix D**.

Table 8: Summary of Warrant Analysis for Longhill Road at Fords Colony Drive

Scenario	Warrants Analysis				
	Warrant 1 (8 Hour)			Warrant 2 (4 Hour)	Warrant 3 (1 Hour)
	Condition A	Condition B	Combination (A & B)		
Existing (2019)	✗ (0 out of 8)	✗ (4 out of 8)	✗ (0 out of 8)	✗	✗
No Build (2021)	✗ (0 out of 8)	✗ (6 out of 8)	✗ (0 out of 8)	✗	✗
Build (2021)	✗ (0 out of 8)	✓	✗ (1 out of 8)	✗	✗
No Build (2027)	✗ (0 out of 8)	✓	✗ (1 out of 8)	✓	✗
Build (2027)	✗ (0 out of 8)	✓	✗ (3 out of 8)	✓	✗

Notes: ✗ *- Warrant not met*
✓ *- Warrant met*
(# out of 8) – Number of hours that could meet the 8-hour warrant requirement

The warrant analysis for the Longhill Road at Fords Colony Drive intersection indicate that under the Existing and No Build future scenarios, Condition A, Condition B, and the Combination (A & B) Condition were not met except for the 2021 Build, 2027 No Build, and Build models, where Condition B was met.

Warrant 2 (4-hour volume) was not met under Existing and 2021 future scenarios for the Longhill Road at Fords Colony Drive intersection but was met for 2027 No Build and Build scenarios. From the warrant analysis, the traffic volumes on Longhill Road did not meet the minimum thresholds under Condition A and a maximum of 3 out of 8 volumes were met for the Combination Warrant. Since the intersection does not meet both Warrant 1 Condition A and Condition B or the Combination as well as low demand on Longhill Road, the traffic signal is not warranted and not recommended for further consideration as a part of the Fords Colony Master Plan.

Table 9: Summary of Warrant Analysis for News Road at Firestone Drive

Scenario	Warrants Analysis				
	Warrant 1 (8 Hour)			Warrant 2 (4 Hour)	Warrant 3 (1 Hour)
	Condition A	Condition B	Combination (A & B)*		
Existing (2019)	✗ (0 out of 8)	✗ (0 out of 8)	✗ (0 out of 8)	✗	✗
No Build (2021)	✗ (1 out of 8)	✗ (0 out of 8)	✗ (3 out of 8)	✗	✗
Build (2021)	✗ (1 out of 8)	✗ (0 out of 8)	✗ (3 out of 8)	✗	✗
No Build (2027)	✗ (6 out of 8)	✗ (3 out of 8)	✗ (6 out of 8)	✗	✗
Build (2027)	✗ (6 out of 8)	✗ (3 out of 8)	✗ (7 out of 8)	✗	✗

Notes: ✗ *- Warrant not met*
✓ *- Warrant met*
(# out of 8) – Number of hours that could meet the 8-hour warrant requirements

The warrant analysis for the News Road at Firestone Drive indicated that under existing, No Build future, and Build future scenarios, conditions for Warrant 1 were not met. Under these scenarios, traffic generated by the current developments in Ford's Colony and approved developments were not high enough to meet the volume thresholds. Additionally, the 4-hour volume warrant was not met under existing conditions the News Road at Firestone Drive intersection. When taking into consideration the future site traffic generated by the background development and proposed residential condominium/townhouse development, a traffic signal is not warranted at the intersection for News Road at Firestone Drive.

7.3 PROFFER SCHEDULE OF IMPROVEMENTS

In addition to the turn lane and signal warrant analyses, the proffers identified the schedule of improvements based on the number of residential building permits when the hotel was or was not built. Since the hotel has not been constructed, the number of remaining undeveloped parcels was identified as 399 undeveloped within Ford's Colony out of the total 3,250 parcels identified from the previously completed TIS. The 399 undeveloped units consist of the following:

- 295 platted, unbuilt lots
- 60 un-platted Eaglescliff development lots
- 30 un-platted Windsor development lots

- 14 un-platted Brian Ford's property lots

Therefore, 2,841 parcels have been developed to date. **Table 10** illustrates the schedule of improvements, satisfaction of schedule, and construction of improvements.

Under Proffer Item A, the Longhill Road at Fords Colony Drive intersection satisfies the number of units, but the intersection of News Road at Firestone Drive does not satisfy the number of units. The Proffer Item E improvement is satisfied by the number of units constructed. Although several of the schedule of improvements are satisfied by the number of units, traffic operations and warrant analyses results proceed this schedule of improvements as the traffic operations are acceptable and warrants are not met for signalization.

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Table 10: Proffered Improvements Triggered by Ford's Colony Permits

Proffer Item	Proffer Improvement	Residential Building Permits if Hotel Not Built	Number of Units Constructed	Number of Units Satisfied	Improvement Constructed	Improvement for Full Build Out (3,250 Units)
A. Installation of Traffic Signals						
i	Longhill Road at Williamsburg W. Drive	2,236	2,851	✓	✓	-
ii	News Road at Firestone Drive	3,250	2,851	X	X	X
iii	Longhill Road at Fords Colony Drive	947	2,851	✓	X	X
B. Installation of Left and Right-Turn Lanes						
i	News Road at Firestone Drive (Left-Turn)	2,603	2,851	✓	✓	-
	News Road at Firestone Drive (Right-Turn)		2,851	✓	✓	-
ii	Centerville Road at Manchester Drive (Left-Turn)	947	2,851	✓	✓	-
	Centerville Road at Manchester Drive (Right-Turn)		2,851	✓	✓	-
C. Construct Williamsburg W. Drive						
i.	Establish right-of-way for four-lane road to Longhill Road	1,545	2,851	✓	✓	-
ii.	Construct two-lane private road Williamsburg W. Drive to Longhill Road	1,545	2,851	✓	✓	-
iii.	If VDOT does not permit construction of an intersection with Route 199 as set forth in paragraph below, widen the initial two-lane road to a four-lane road	2,928	2,851	X	X	X
D. Longhill Road at Williamsburg W. Drive Intersection Improvements						
i.	Construct intersection of Williamsburg W. Drive and Longhill Road with: Right-turn lane on Williamsburg W. Drive onto Longhill Road; Right turn-lane on Longhill Road onto Williamsburg W. Drive; and left-turn lane on Longhill Road onto Williamsburg W. Drive	1,545	2,851	✓	✓	-
ii.	Add two through lanes on Longhill Road	2,603	2,851	✓	Under construction	-
iii.	Add lane for dual left-turn lanes on westbound Longhill Road onto Williamsburg W. Drive	2,928	2,851	✓	X	X
iv.	Add lane for dual right-turn on Williamsburg W. Drive onto Longhill Road	3,250	2,851	X	X	X
E. Installation of right-turn lane on Longhill Road onto Ford's Colony Drive		947	2,851	✓	X	✓

7.4 INTERSECTION OPERATIONAL ANALYSIS

Operational analyses were conducted for the study area intersections for the AM and PM peak hours under the existing and future scenarios. The existing signal timings, including cycle lengths, clearance intervals, and splits, were provided by VDOT. Under 2019 No Build and Build conditions, all signal timings, coordination offsets, and phasing were optimized. Additionally, splits were generally kept similar between scenario as well, with only minor changes made to compensate for additional site traffic.

In addition, the peak hour factor (PHF) used for the existing (2019) conditions represents the actual PHF based on recent traffic count data. Per VDOT's Traffic Operations and Safety Analysis Manual (TOSAM) guidance, PHFs less than 0.92 should be adjusted up to 0.92 for all future analyses. Therefore, under future conditions, the intersections with PHFs less than 0.92 were adjusted up to 0.92 for this purpose of this study.

Analyses were completed to determine the operating characteristics of the study area intersections using *Synchro Professional 10.0* modeling software, which uses methodologies contained in the 2010 Highway Capacity Manual (HCM) [TRB Special Report 209, 2000]. The intersection operational analysis inputs and analysis methodologies were consistent with VDOT's TOSAM. Intersection turning movement counts were used with information about the number of lanes, current traffic control, and signal timings to determine the operational conditions of each study area intersection. Level of service (LOS) is reported for each of the study area intersections.

LOS describes the amount of traffic congestion at an intersection or on a roadway and ranges from A to F (A indicating a condition of little to no congestion and F a condition with severe congestion, unstable traffic flow, and stop-and-go conditions). LOS is based on the average delay experienced by all traffic using the intersection during the busiest (peak) 15-minute period. Generally, LOS A through LOS D are considered acceptable. Delay and associated LOS for both signalized and unsignalized intersections are reported from the Synchro analysis. In the LOS/delay tables for each of the study area intersections, values highlighted in "bold" represent movements operating at LOS E or worse. **Table 11** shows the corresponding thresholds in delay for unsignalized and signalized intersections.

The queuing results represent the maximum simulated queues for each movement as they compare to the effective storage lengths. Effective storage lengths represent the amount of distance available to vehicles to queue without generally impacting the adjacent lanes and consist of the full width storage, plus half of the taper distance. By using the effective storage, vehicles that can use a portion of the taper length as additional room for storage can be accounted for. All traffic models were developed and analyzed with the effective storage lengths coded into the network. Values highlighted as "bold" represent queue lengths that exceed the available storage lengths/spill back to an upstream intersection. As part of the queuing analysis, "percent blocking" was noted in instances where queues impact adjacent turn- and/or through-lanes. This percentage represents the approximate amount of time during the peak hour when a lane was observed to be blocked (e.g., "10% blocking" indicates that during the peak hour, the turn-lane storage was exceeded and impacted 10 percent of the adjacent lane volume). The results are presented in the following summaries and supporting calculations are presented in **Appendix E**.

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Table 11: LOS Control Delay Thresholds

LOS	Signalized Intersections Control Delay Per Vehicle [sec/veh]	Unsignalized Intersections Average Control Delay [sec/veh]	Relative Delay
A	≤ 10	≤ 10	Short Delays
	Free-flow traffic operations at average travel speeds. Vehicles completely unimpeded in ability to maneuver. Minimal delay at signalized intersections.		
B	> 10 – 20	> 10 – 15	
	Reasonably unimpeded traffic operations at average travel speeds. Vehicle maneuverability slightly restricted. Low traffic delays.		
C	> 20 – 35	> 15 – 25	
	Stable traffic operations. Lane changes becoming more restricted. Travel speeds reduced to half of average free flow travel speeds. Longer intersection delays.		
D	>35 – 55	> 25 – 35	Moderate Delays
	Small increases in traffic flow can cause increased delays. Delays likely attributable to increase traffic, reduced signal progression and adverse timing.		
E	>55 – 80	> 35 – 50	
	Significant delays. Travel speeds reduced to one third of average free flow travel speed.		
F	> 80	> 50	Long Delays
	Extremely low speeds. Intersection congestion. Long delays. Extensive traffic queues at intersections.		

Source: Highway Capacity Manual, Transportation Research Board, Washington, D.C., 2010

The following sections summarizes each study area intersection's operations as it relates to vehicle traffic demand for the analysis scenarios. Results are presented in **Table 12** through **Table 19** and **Figure 19** through **Figure 28**.

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7.4.1 LONGHILL ROAD AT WILLIAMSBURG W. DRIVE/LANE PLACE DRIVE

Results of the capacity and queuing analysis for this signalized intersection are shown in **Table 12** and **Table 13**. Under existing and future conditions, the AM and PM peak hours are anticipated to experience an overall intersection LOS D or better with individual movements also expected to operate at LOS D or better. The overall intersection LOS improves to LOS C or better under 2027 No-Build and Build conditions due to the Longhill Road widening improvements.

Queuing results indicate that the intersection does not currently, nor is it projected to experience significant queuing or blocking. **Table 13** does show that the westbound left-turn and right-turn lanes have the potential to periodically meet or exceed its available storage length during the PM peak hour under 2019 Existing, 2021 No Build, and 2021 Build conditions. However, this is attributed to the adjacent through-lane stacking up and blocking access to this turn lane, and not due to the capacity of the turn lane. It has been observed with the SimTraffic software, that maximum queues can be recorded when vehicles are blocked from being able to enter a turn lane, because as soon as a vehicle is able to enter the turn lane, it meets the speed thresholds that the software uses to record maximum queue, which always happens at the back of the turn lane (i.e., 250 feet in this case).

Table 12: Longhill Road at Williamsburg W. Drive/Lane Place Drive Intersection Level of Service

Scenario	Overall LOS	Level of Service per Movement by Approach (Delay in sec/veh)											
		Eastbound			Westbound			Northbound			Southbound		
		LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
AM Peak Hour													
2019 Existing	C (28.5)	A (9.8)	C (33.7)	B (10.9)	B (17.9)	B (14.5)	A (9.4)	D (39.7)		D (38.5)	D (44.0)		
		C (33.0)			B (14.6)			D (38.7)			D (44.0)		
2021 No Build	C (27.8)	A (9.3)	C (33.0)	B (10.1)	B (17.2)	B (14.1)	A (9.0)	D (38.0)		D (37.5)	D (44.8)		
		C (32.3)			B (14.1)			D (37.6)			D (44.8)		
2021 Build	C (28.9)	A (9.4)	D (35.2)	B (10.1)	B (17.7)	B (14.1)	A (9.0)	D (38.0)		D (37.6)	D (44.8)		
		C (34.5)			B (14.2)			D (37.7)			D (44.8)		
2027 No Build	C (21.0)	B (10.8)	B (19.1)	B (13.0)	B (12.7)	B (13.8)	B (11.2)	C (32.5)		D (35.2)	D (47.2)		
		B (18.9)			B (13.6)			D (34.7)			D (47.2)		
2027 Build	C (21.1)	B (10.8)	B (19.2)	B (12.9)	B (12.8)	B (13.8)	B (11.2)	C (32.6)		D (35.5)	D (47.5)		
		B (19.0)			B (13.6)			D (35.0)			D (47.5)		
PM Peak Hour													
2019 Existing	C (31.2)	C (20.46)	C (26.0)	B (10.8)	C (25.7)	D (36.1)	A (7.9)	D (40.9)		D (39.0)	D (42.9)		
		C (25.2)			C (33.5)			D (39.5)			D (42.9)		
2021 No Build	D (41.2)	C (22.3)	C (29.2)	B (10.9)	D (48.6)	D (51.4)	A (7.6)	D (42.4)		D (40.1)	D (44.4)		
		C (28.3)			D (49.5)			D (40.7)			D (44.4)		
2021 Build	D (43.0)	C (22.4)	C (29.6)	B (10.9)	D (52.4)	D (54.2)	A (7.5)	D (42.6)		D (40.2)	D (44.6)		
		C (28.7)			D (52.4)			D (40.9)			D (44.6)		
2027 No Build	B (17.3)	A (9.0)	B (17.7)	B (12.6)	B (14.4)	B (13.3)	A (8.1)	D (39.3)		D (37.3)	D (42.7)		
		B (17.3)			B (13.4)			D (37.8)			D (42.7)		
2027 Build	B (17.3)	A (9.1)	B (17.7)	B (12.6)	B (14.6)	B (13.4)	A (8.1)	D (39.4)		D (37.4)	D (42.8)		
		B (17.3)			B (13.5)			D (38.0)			D (42.8)		

Table 13: Longhill Road at Williamsburg W. Drive/Lane Place Drive Maximum Queuing

Scenario	Maximum Queue Length by Movement (feet)											
	Eastbound			Westbound			Northbound			Southbound		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Effective Storage Length	250	Cont.	225	250	Cont.	250*	Cont.		225	Cont.		
AM Peak Hour												
2019 Existing	69	479	164	81	230	41	92		120	112		
2021 No Build	46	563	205	67	206	51	93		133	115		
2021 Build	66	561	187	65	217	49	92		141	124		
2027 No Build	27	233	67	78	157	55	94		168	132		
2027 Build	49	264	29	67	166	44	98		167	124		
PM Peak Hour												
2019 Existing	148	519	206	**250**	763	**690**	97		109	81		
2021 No Build	167	562	224	**250**	772	**777**	115		83	88		
2021 Build	209	553	204	**250**	784	**777**	140		87	83		
2027 No Build	59	238	33	211	251	73	109		110	90		
2027 Build	69	262	53	215	244	115	128		103	88		

Notes: Results displayed are the average results across 10 microsimulation runs
**denotes the No Build and Build effective storage length associated with the Longhill Road widening*

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7.4.2 LONGHILL ROAD AT FORDS COLONY DRIVE

Results of the capacity and queuing analysis for this unsignalized intersection are shown in **Table 14** and **Table 15**. Under existing and future conditions, the AM and PM peak hours are anticipated to experience an overall intersection LOS B or better with all movements at LOS D or better with the exception of the following movements/approaches:

- AM Peak Hour
  - 2019 Existing – Northbound Approach (LOS E)
  - 2027 No Build - Northbound Approach (LOS F)
- PM Peak Hour
  - 2021 No Build – Northbound Approach (LOS E)
  - 2027 No Build – Northbound Approach (LOS F)/Southbound Approach (LOS E)
  - 2027 Build – Northbound Approach (LOS E)/Southbound Approach (LOS E)

Restriping the northbound approach noticeably improves operations under the future 2027 No Build conditions from LOS F during the AM and PM peak hours to LOS D and LOS E respectively, under the 2027 Build conditions. Queuing results also indicate that the intersection is not projected to experience significant queuing or blocking issues. Based on these operational conditions (i.e., existing and future) the existing two-way STOP configuration provides sufficient traffic control for this intersection.

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Table 14: Longhill Road at Fords Colony Drive Intersection Level of Service

Scenario	Overall LOS	Level of Service per Movement by Approach (Delay in sec/veh)											
		Eastbound			Westbound			Northbound			Southbound		
		LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
AM Peak Hour													
2019 Existing	A (8.9)	A (7.9)	A (0.0)		A (8.6)	A (0.0)	A (0.0)	**E (35.5)**			C (22.2)		
		A (0.1)			A (2.4)			**E (35.5)**			C (22.2)		
2021 No Build	A (7.8)	A (7.9)	A (0.0)		A (8.5)	A (0.0)	A (0.0)	D (30.1)			C (21.0)		
		A (0.1)			A (2.4)			D (30.1)			C (21.0)		
2021 Build	A (5.6)	A (7.9)	A (0.0)	A (0.0)	A (8.5)	A (0.0)	A (0.0)	C (19.2)		A (0.0)	C (21.3)		
		A (0.1)			A (2.5)			C (19.2)			C (21.3)		
2027 No Build	B (13.5)	A (8.0)	A (0.0)		A (8.7)	A (0.0)	A (0.0)	**F (55.5)**			C (24.4)		
		A (0.1)			A (2.5)			**F (55.5)**			C (24.4)		
2027 Build	A (7.1)	A (8.0)	A (0.0)	A (0.0)	A (8.7)	A (0.0)	A (0.0)	D (25.9)		A (0.0)	C (24.8)		
		A (0.1)			A (2.5)			D (25.9)			C (24.8)		
PM Peak Hour													
2019 Existing	A (6.5)	A (0.0)	A (0.0)		A (8.9)	A (0.0)	A (0.0)	D (28.8)			C (24.5)		
		A (0.0)			A (3.6)			D (28.8)			C (24.5)		
2021 No Build	B (8.3)	A (0.0)	A (0.0)		A (9.2)	A (0.0)	A (0.0)	**E (39.7)**			D (28.3)		
		A (0.0)			A (3.7)			**E (39.7)**			D (28.3)		
2021 Build	A (6.1)	A (0.0)	A (0.0)	A (0.0)	A (9.3)	A (0.0)	A (0.0)	C (24.7)		A (0.0)	D (27.3)		
		A (0.0)			A (3.9)			C (24.7)			D (27.3)		
2027 No Build	B (17.0)	A (0.0)	A (0.0)		A (9.6)	A (0.0)	A (0.0)	**F (92.0)**			**E (39.8)**		
		A (0.0)			A (3.9)			**F (92.0)**			**E (39.8)**		
2027 Build	A (8.6)	A (0.0)	A (0.0)	A (0.0)	A (9.7)	A (0.0)	A (0.0)	**E (38.8)**		A (0.0)	**E (37.7)**		
		A (0.0)			A (4.0)			**E (38.8)**			**E (37.7)**		

Table 15: Longhill Road at Fords Colony Drive Maximum Queuing

Scenario	Maximum Queue Length by Movement (feet)											
	Eastbound			Westbound			Northbound			Southbound		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Effective Storage Length	200	Cont.		225	Cont.	150	Cont.		175*	Cont.		
AM Peak Hour												
2019 Existing	14	10		70	0	0	192			6		
2021 No Build	5	22		77	0	0	209			14		
2021 Build	9	8	0	103	0	0	115		93	14		
2027 No Build	7	19		84	0	0	291			5		
2027 Build	16	4	8	87	0	0	196		132	9		
PM Peak Hour												
2019 Existing	0	21		88	4	0	156			17		
2021 No Build	0	33		105	0	0	246			22		
2021 Build	0	2	17	125	0	0	155		106	26		
2027 No Build	0	32		138	0	0	500			26		
2027 Build	0	5	19	134	0	0	357		156	24		

Notes: Results displayed are the average results across 10 microsimulation runs
**denotes the Build effective storage length associated with the Fords Colony Drive widening*

7.4.3 CENTERVILLE ROAD AT MANCHESTER DRIVE

Results of the capacity and queuing analysis for this unsignalized intersection are shown in **Table 16** and **Table 17**. Under existing and future conditions, the AM and PM peak hours are anticipated to experience movements with LOS C or better. Queuing results also indicate that the intersection is not projected to experience significant queuing or blocking issues.

Table 16: Centerville Road at Manchester Drive Intersection Level of Service

Scenario	Overall LOS	Level of Service per Movement by Approach (Delay in sec/veh)											
		Eastbound			Westbound			Northbound			Southbound		
		LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
AM Peak Hour													
2019 Existing	A (2.8)	C (16.0)			C (19.7)	B (11.0)		A (7.7)	A (0.0)	A (0.0)	A (8.6)	A (0.0)	A (0.0)
		C (16.0)			C (15.7)			A (0.0)			A (1.6)		
2021 No Build	A (3.5)	C (18.7)			C (22.2)	B (11.2)		A (7.8)	A (0.0)	A (0.0)	A (8.7)	A (0.0)	A (0.0)
		C (18.7)			C (17.2)			A (0.1)			A (1.6)		
2021 Build	A (3.6)	C (18.7)			C (22.6)	B (11.2)		A (7.8)	A (0.0)	A (0.0)	A (8.7)	A (0.0)	A (0.0)
		C (18.7)			C (17.5)			A (0.1)			A (1.6)		
2027 No Build	A (4.1)	C (22.6)			D (29.4)	B (11.9)		A (7.9)	A (0.0)	A (0.0)	A (9.0)	A (0.0)	A (0.0)
		C (22.6)			C (21.3)			A (0.1)			A (1.7)		
2027 Build	A (4.2)	C (22.7)			D (29.9)	B (11.9)		A (7.9)	A (0.0)	A (0.0)	A (9.0)	A (0.0)	A (0.0)
		C (22.7)			C (21.7)			A (0.1)			A (1.7)		
PM Peak Hour													
2019 Existing	A (1.9)	B (13.5)			C (15.9)	B (10.3)		A (7.7)	A (0.0)	A (0.0)	A (8.1)	A (0.0)	A (0.0)
		B (13.5)			B (13.8)			A (0.0)			A (0.7)		
2021 No Build	A (2.4)	C (15.6)			C (18.2)	B (10.5)		A (7.9)	A (0.0)	A (0.0)	A (8.5)	A (0.0)	A (0.0)
		C (15.6)			C (15.5)			A (0.2)			A (0.7)		
2021 Build	A (2.4)	C (15.6)			C (18.4)	B (10.5)		A (7.9)	A (0.0)	A (0.0)	A (8.5)	A (0.0)	A (0.0)
		C (15.6)			C (15.7)			A (0.2)			A (0.7)		
2027 No Build	A (2.6)	C (17.9)			C (22.0)	B (10.9)		A (8.0)	A (0.0)	A (0.0)	A (8.7)	A (0.0)	A (0.0)
		C (17.9)			C (18.1)			A (0.2)			A (0.7)		
2027 Build	A (2.7)	C (17.9)			C (22.5)	B (10.9)		A (8.0)	A (0.0)	A (0.0)	A (8.7)	A (0.0)	A (0.0)
		C (17.9)			C (18.5)			A (0.2)			A (0.7)		

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Table 17: Centerville Road at Manchester Drive Maximum Queuing

Scenario	Maximum Queue Length by Movement (feet)											
	Eastbound			Westbound			Northbound			Southbound		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Effective Storage Length	Cont.			Cont.	140		190	Cont.	325	190	Cont.	325
AM Peak Hour												
2019 Existing	30			60	54		8	0	0	64	0	0
2021 No Build	45			72	52		9	0	0	60	0	0
2021 Build	47			68	55		7	2	0	64	0	0
2027 No Build	47			69	58		10	2	5	72	0	0
2027 Build	51			77	56		8	2	4	69	0	0
PM Peak Hour												
2019 Existing	28			42	46		4	0	0	30	0	0
2021 No Build	40			56	46		16	0	0	50	0	0
2021 Build	39			58	47		16	0	0	53	0	0
2027 No Build	38			70	46		14	0	0	54	0	0
2027 Build	42			63	49		19	0	0	49	0	2

Notes: Results displayed are the average results across 10 microsimulation runs

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7.4.4 NEWS ROAD AT FIRESTONE DRIVE

Results of the capacity and queuing analysis for this unsignalized intersection are shown in **Table 18** and **Table 19**. Under existing and future conditions, the AM and PM peak hours are anticipated to experience movements with LOS C or better. Queuing results also indicate that the intersection is not projected to experience significant queuing or blocking issues.

Table 18: News Road at Firestone Drive Intersection Level of Service

Scenario	Overall LOS	Level of Service per Movement by Approach (Delay in sec/veh) AM Peak Hour											
		Eastbound			Westbound			Northbound			Southbound		
		LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
AM Peak Hour													
2019 Existing	A (2.6)	A (7.8)	A (0.0)	-	-	A (0.0)	A (0.0)	-	-	-	B (11.2)	-	A (0.0)
		A (0.4)			A (0.0)			-			B (11.2)		
2021 No Build	A (4.0)	A (7.8)	A (0.0)		A (7.8)	A (0.0)		B (10.5)		A (0.0)	B (14.2)		A (0.0)
		A (0.3)			A (1.1)			B (10.5)			B (14.2)		
2021 Build	A (4.0)	A (7.8)	A (0.0)		A (7.8)	A (0.0)		B (10.6)		A (0.0)	B (14.2)		A (0.0)
		A (0.3)			A (1.1)			B (10.6)			B (14.2)		
2027 No Build	A (4.1)	A (7.9)	A (0.0)		A (7.9)	A (0.0)		B (10.8)		A (0.0)	C (15.5)		A (0.0)
		A (0.4)			A (1.0)			B (10.8)			C (15.5)		
2027 Build	A (4.1)	A (7.9)	A (0.0)		A (7.9)	A (0.0)		B (10.9)		A (0.0)	C (15.6)		A (0.0)
		A (0.4)			A (1.0)			B (10.9)			C (15.6)		
PM Peak Hour													
2019 Existing	A (1.6)	A (8.1)	A (0.0)	-	-	A (0.0)	A (0.0)	-	-	-	B (12.0)	-	A (0.0)
		A (0.4)			A (0.0)			-			B (12.0)		
2021 No Build	A (3.5)	A (8.4)	A (0.0)		A (7.7)	A (0.0)		B (11.1)		A (0.0)	C (18.6)		A (0.0)
		A (0.3)			A (1.0)			B (11.1)			C (18.6)		
2021 Build	A (3.5)	A (8.5)	A (0.0)		A (7.7)	A (0.0)		B (11.2)		A (0.0)	C (18.9)		A (0.0)
		A (0.3)			A (1.0)			B (11.2)			C (18.9)		
2027 No Build	A (3.7)	A (8.6)	A (0.0)		A (7.8)	A (0.0)		B (11.5)		A (0.0)	C (21.0)		A (0.0)
		A (0.3)			A (0.9)			B (11.5)			C (21.0)		
2027 Build	A (3.7)	A (8.6)	A (0.0)		A (7.8)	A (0.0)		B (11.5)		A (0.0)	C (21.4)		A (0.0)
		A (0.3)			A (0.9)			B (11.5)			C (21.4)		

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Table 19: News Road at Firestone Drive Maximum Queuing

Scenario	Maximum Queue Length by Movement (feet)											
	Eastbound			Westbound			Northbound			Southbound		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Effective Storage Length	225	Cont.		225	Cont.	300	Cont.		150	Cont.		150
AM Peak Hour												
2019 Existing	40	0	-	-	4	0	-		-	69	-	31
2021 No Build	28	0		31	0		40		54	82		33
2021 Build	30	0		28	0		40		54	71		33
2027 No Build	28	0		26	0		38		54	79		33
2027 Build	37	0		26	0		36		52	82		37
PM Peak Hour												
2019 Existing	27	0	-	-	0	5	-		-	71	-	31
2021 No Build	35	1		34	4		57		68	76		33
2021 Build	33	1		34	0		49		59	87		32
2027 No Build	37	0		32	0		52		67	99		33
2027 Build	44	0		37	6		54		54	94		33

Notes: Results displayed are the average results across 10 microsimulation runs

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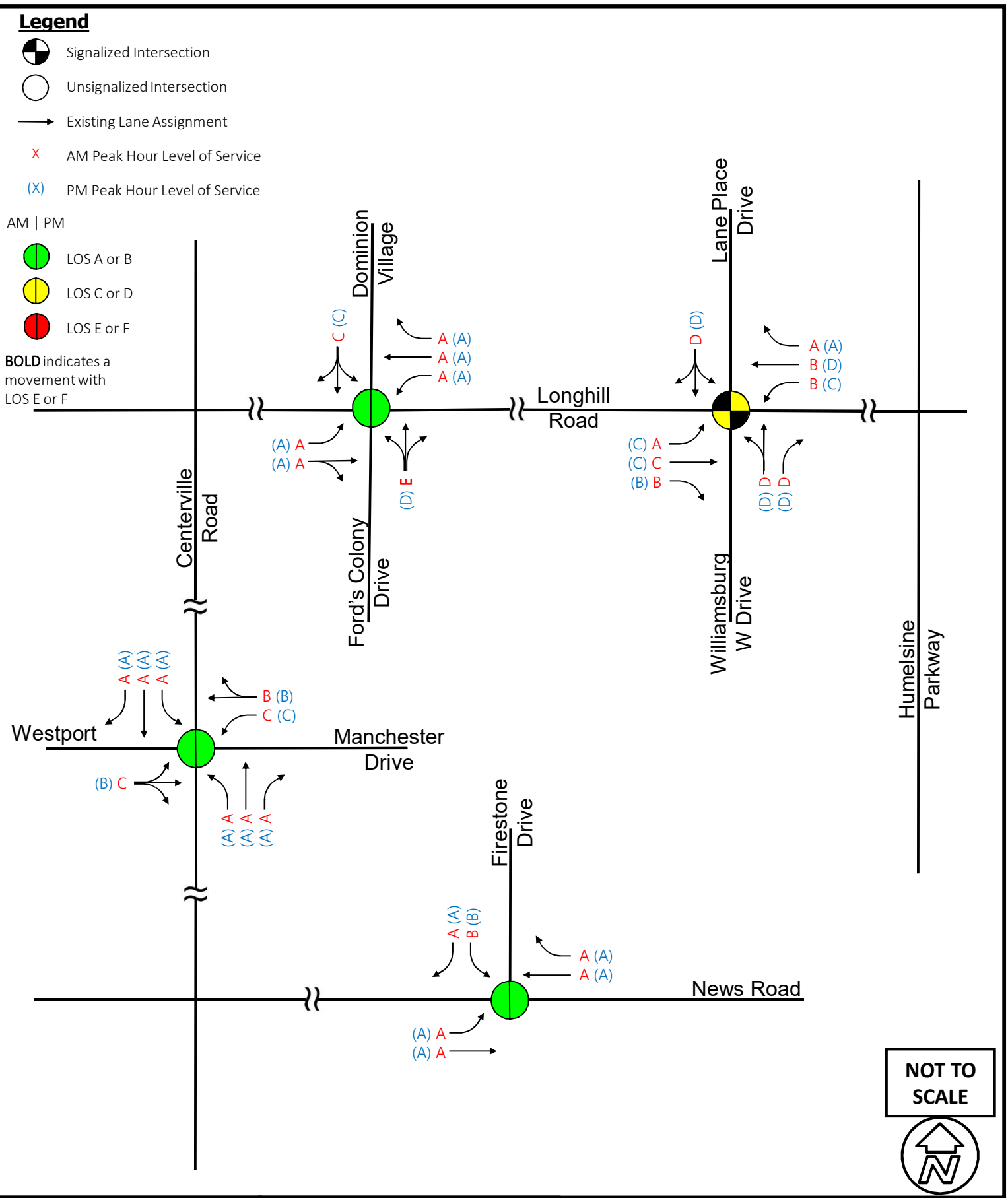

Kimley»Horn	Ford's Colony TIS Update James City County, VA	2019 Existing Conditions Level of Service	FIGURE 19

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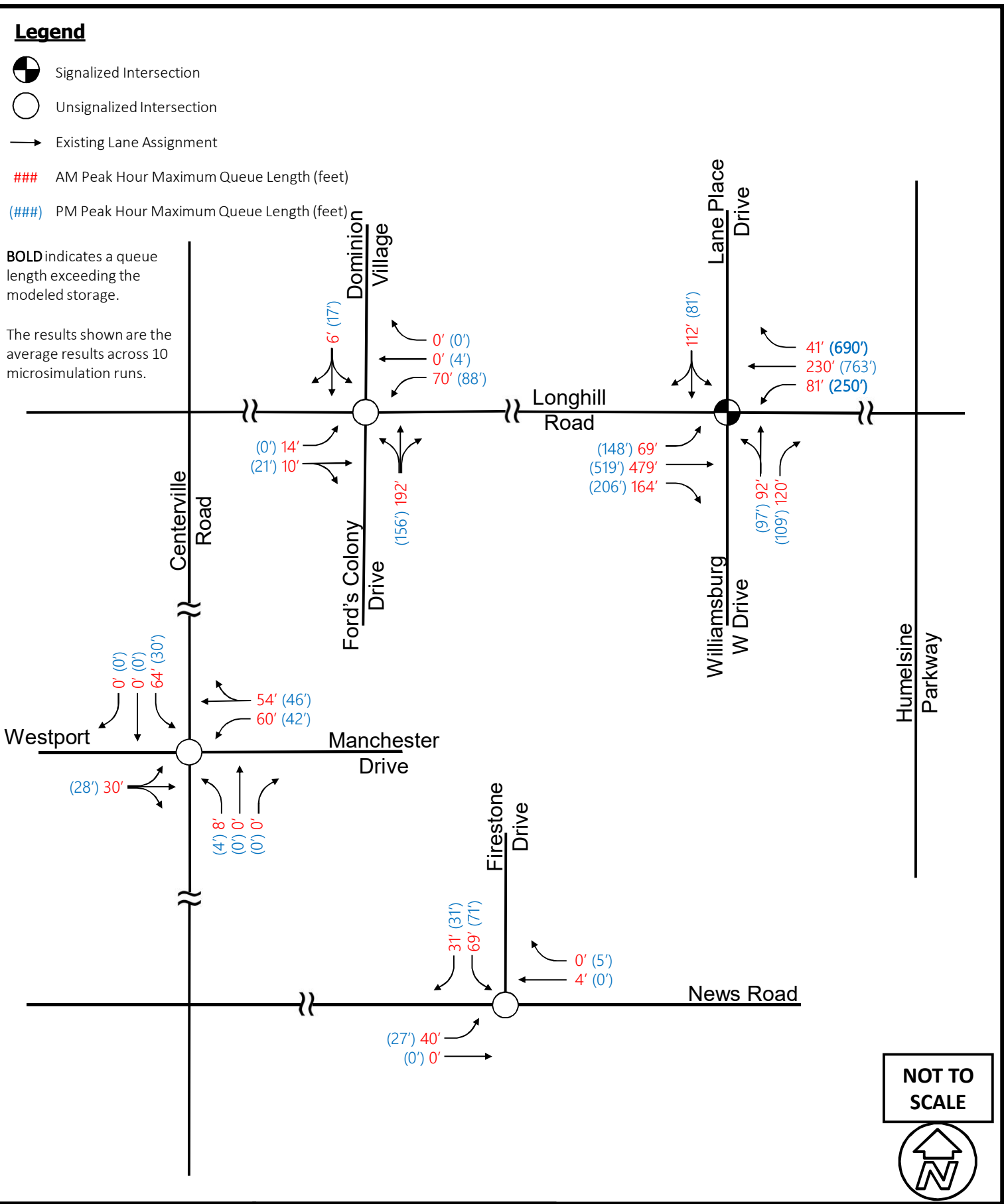

Kimley»Horn	Ford's Colony TIS Update James City County, VA	2019 Existing Conditions Maximum Queue Length	FIGURE 20

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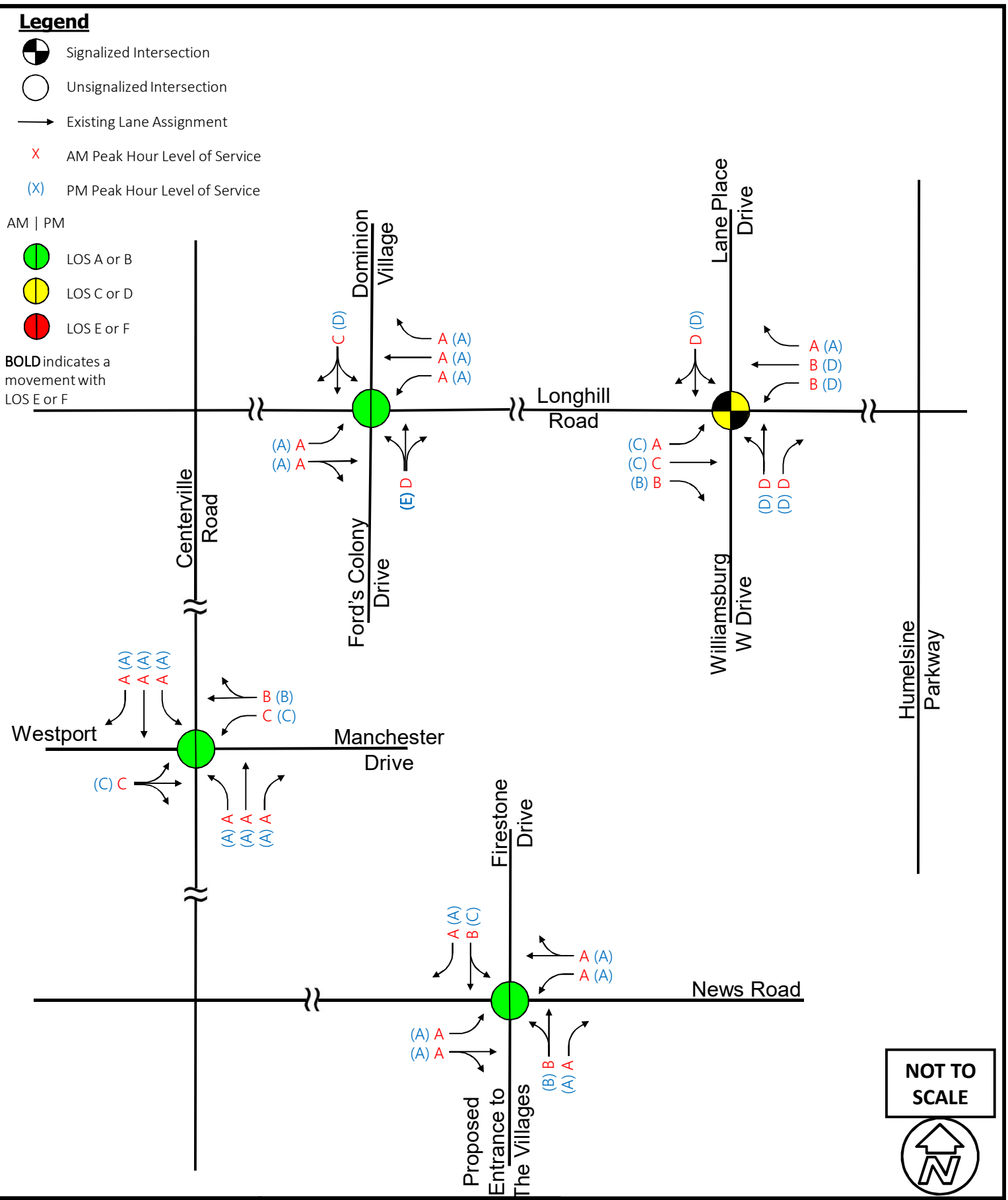

Kimley»Horn	Ford's Colony TIS Update James City County, VA	2021 No Build Conditions Level of Service	FIGURE 21

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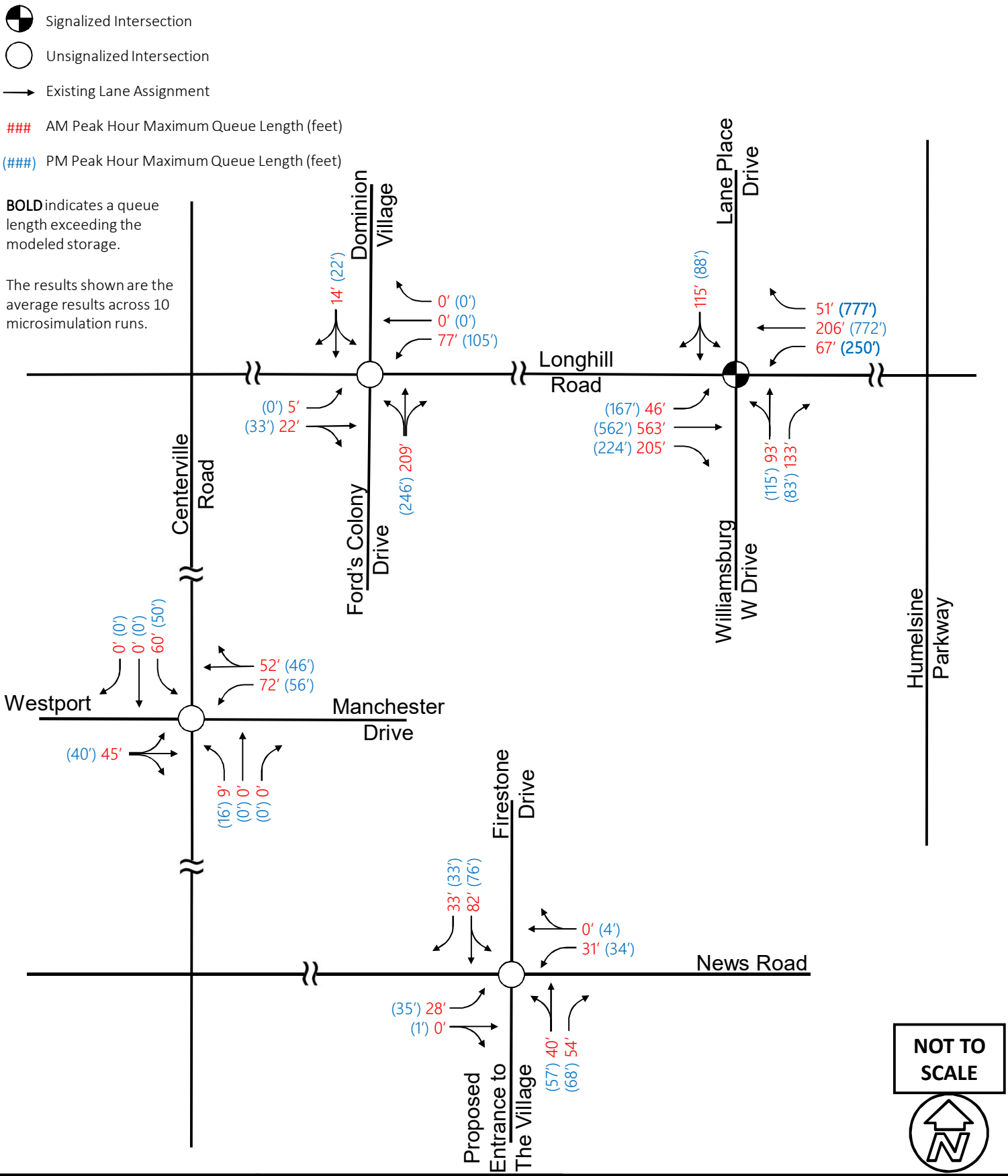

Kimley»Horn	Ford's Colony TIS Update James City County, VA	2021 No Build Conditions Maximum Queue	FIGURE 22

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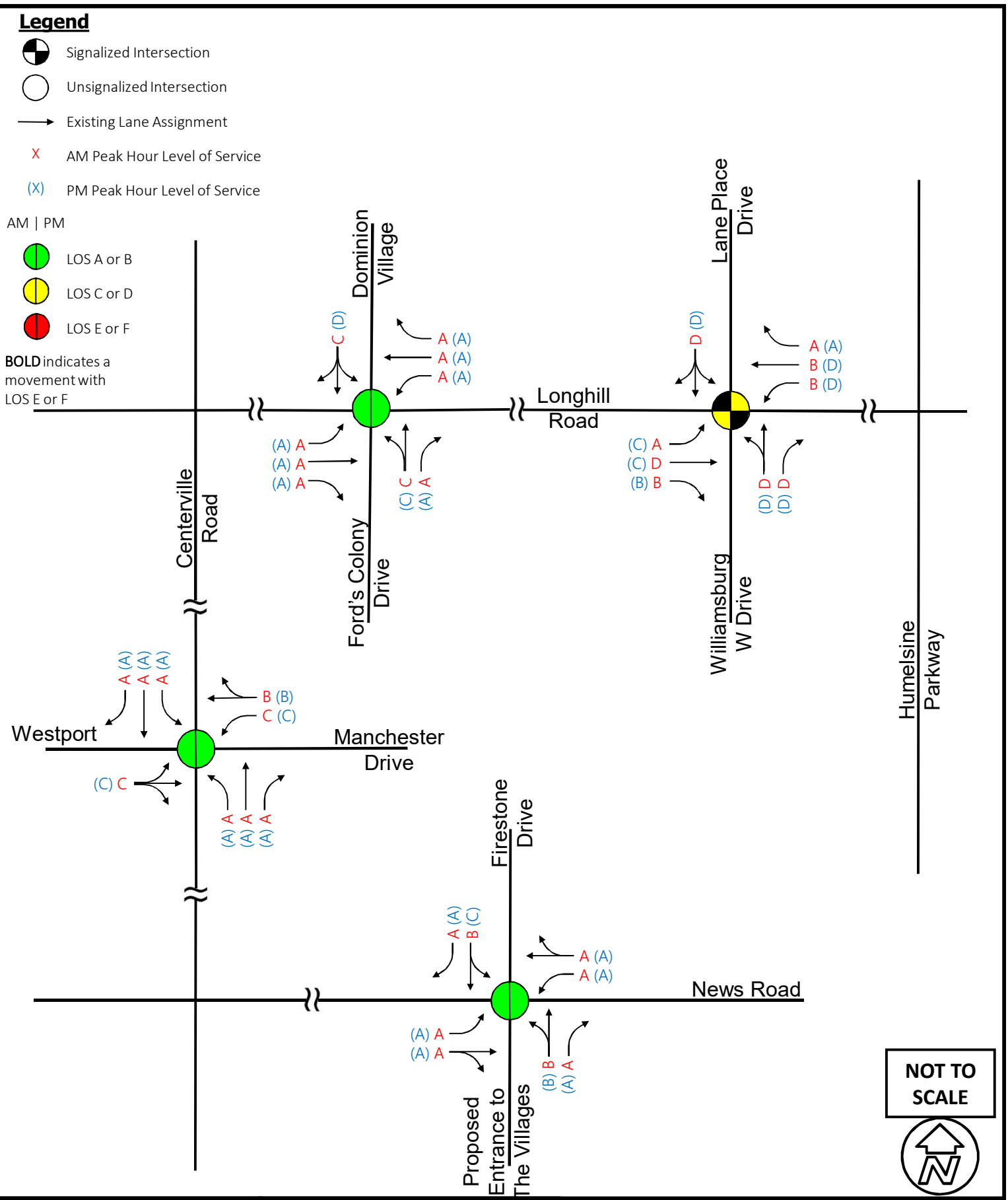

Kimley»Horn	Ford's Colony TIS Update James City County, VA	2021 Build Conditions Level of Service	FIGURE 23

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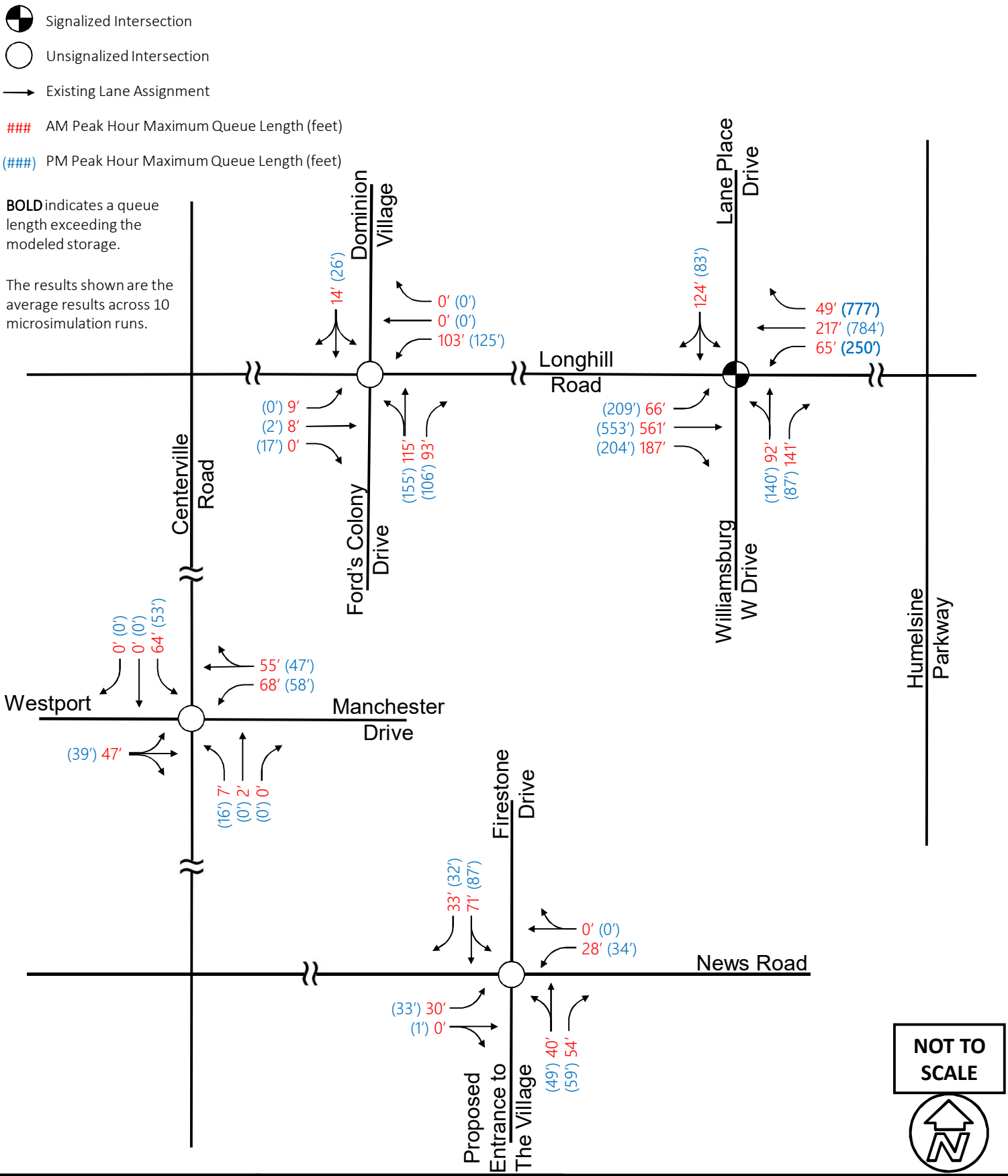

Kimley»Horn	Ford's Colony TIS Update James City County, VA	2021 Build Conditions Maximum Queue	FIGURE 24

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Legend

X AM Peak Hour Level of Service

(X) PM Peak Hour Level of Service

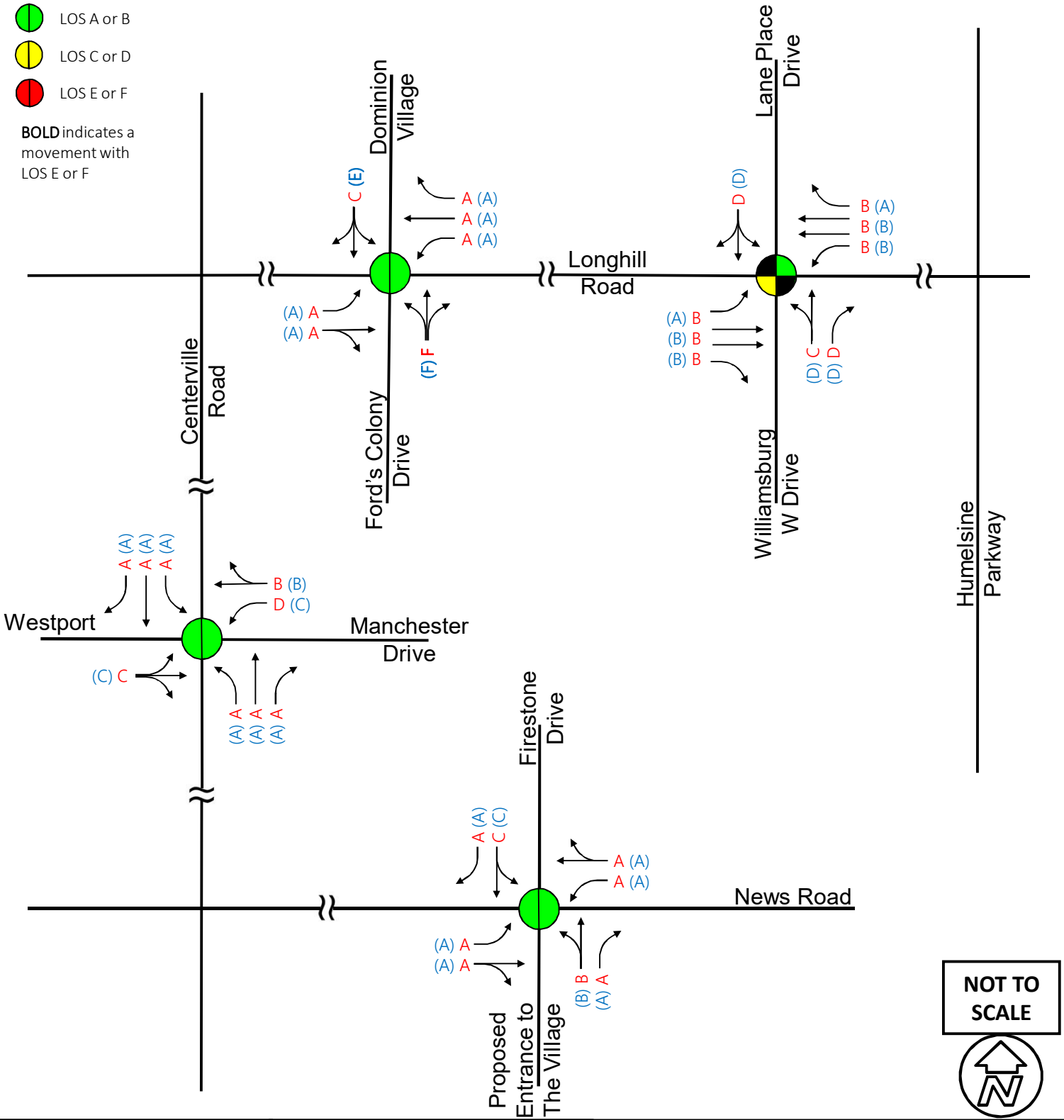
AM | PM

LOS A or B

LOS C or D

LOS E or F

BOLD indicates a movement with LOS E or F



NOT TO SCALE

N

Kimley»Horn	Ford's Colony TIS Update James City County, VA	2027 No Build Conditions Level of Service	FIGURE 25

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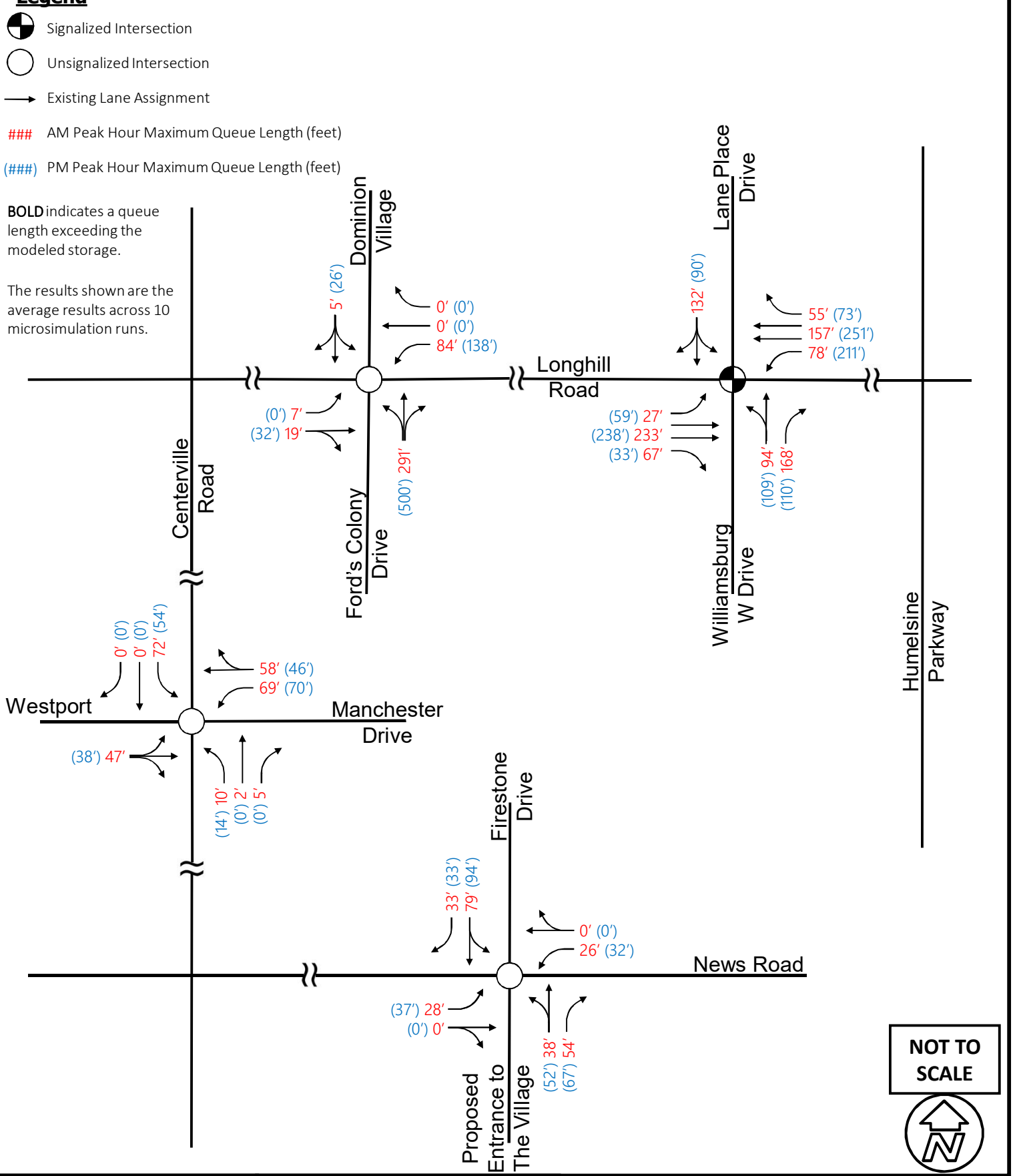

Kimley»Horn	Ford's Colony TIS Update James City County, VA	2027 No Build Conditions Maximum Queue Length	FIGURE 26

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Legend

X AM Peak Hour Level of Service

(X) PM Peak Hour Level of Service

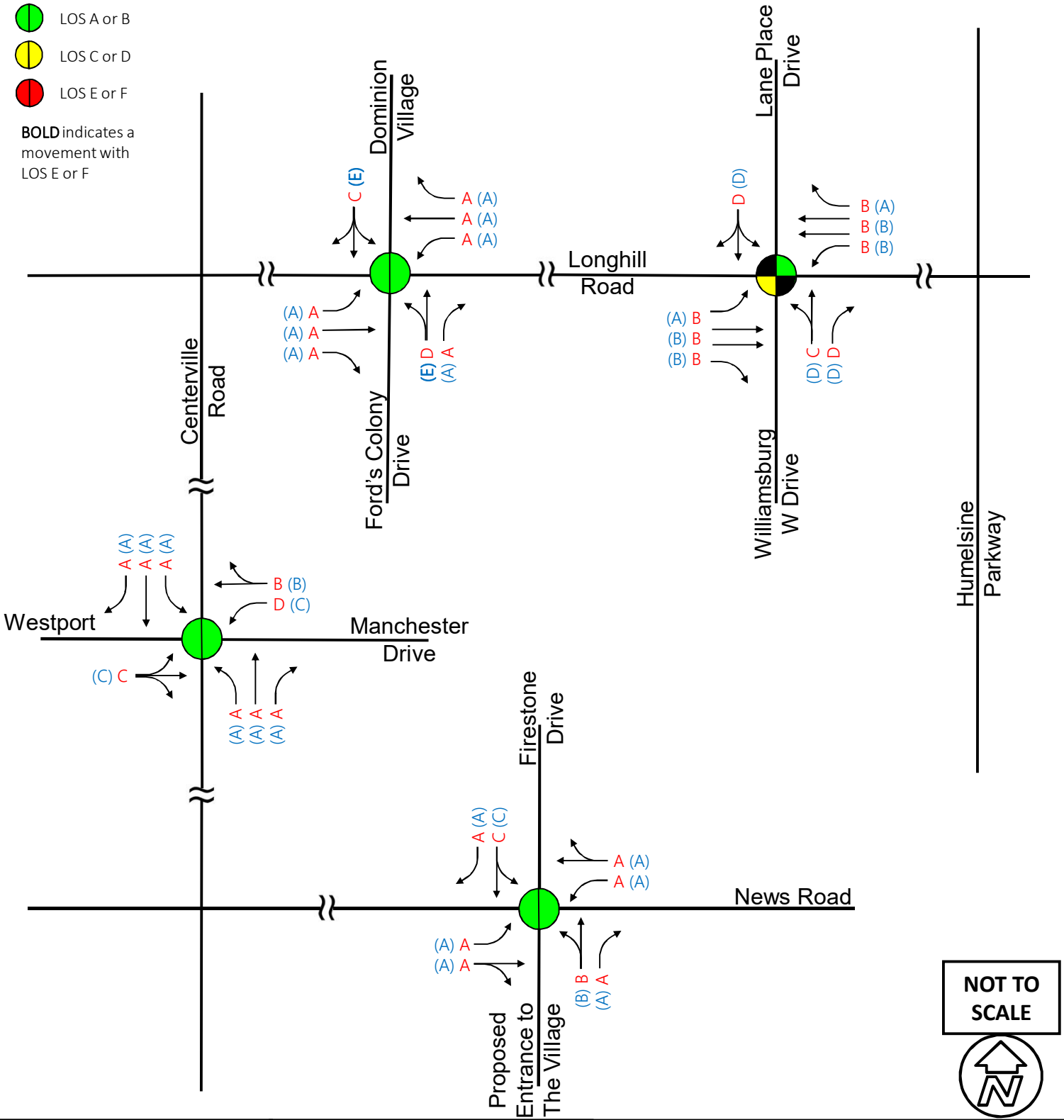
AM | PM

LOS A or B

LOS C or D

LOS E or F

BOLD indicates a movement with LOS E or F



Kimley»Horn	Ford's Colony TIS Update James City County, VA	2027 Build Conditions Level of Service	FIGURE 27

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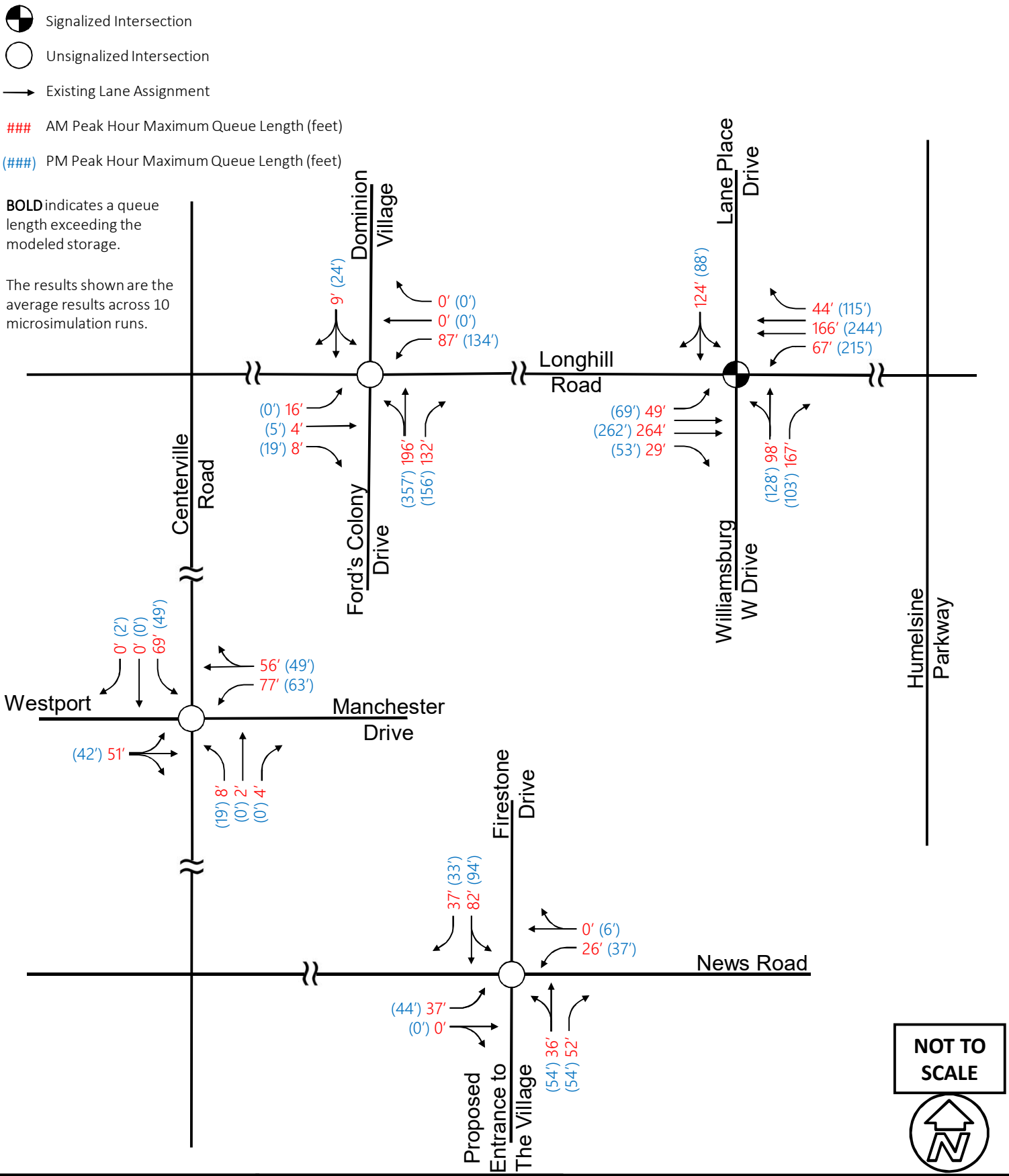

Kimley»Horn	Ford's Colony TIS Update James City County, VA	2027 Build Conditions Maximum Queue Length	FIGURE 28

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8 CONCLUSIONS AND RECOMMENDATIONS

This traffic study examined the existing operational characteristics of the Ford's Colony study area intersections as well as the anticipated impacts associated with the proposed residential condominium/townhouse development located in Ford's Colony in James City County, Virginia. Additionally, this study was completed to meet the requirements of the original proffers (i.e., FCHOA to prepare and submit an updated Traffic Impact Study every five (5)), as well as determine if any of the identified proffered off-site roadway, intersection, or traffic control improvements have been triggered for construction and/or may require accelerated implementation. Based on the results of the No Build and Build traffic analysis, the future impacts of vehicular traffic associated with the background traffic and the proposed development are anticipated to be minimal, with conditions at the study area intersections expected to be maintained at levels comparable to that under existing conditions. Based on the analysis of the existing traffic volumes and operation findings provided in this traffic study, the following recommendations were identified and are summarized below for the Existing conditions:

- **Longhill Road at Williamsburg W. Drive/Lane Place Drive**
  - Maintain the existing geometric configuration and traffic control measures
  - Continue to monitor and implement new timing and coordination plans as part of regular VDOT operations and maintenance
  - It is noted that the Longhill Road Phase 1 Widening Project (VDOT UPC – 100921) includes improvements that will enhance the capacity at this intersection, is fully funded, and currently under construction
- **Longhill Road at Fords Colony Drive**
  - Relocate and restripe the northbound approach STOP bar so driver sight distance is not impeded by the Ford's Colony monument sign and/or vegetation located in the median
  - Restripe the 24-foot wide northbound approach to consist of a 12-foot shared through/left-turn lane and a 12-foot exclusive right-turn lane with 150 feet of storage
  - Continue to monitor traffic volumes to identify when/if the full turn-lane warrant for the eastbound right-turn movement is satisfied
  - Existing traffic volumes and the associated operational conditions (i.e., level of service (LOS)/side street delay) do not warrant or justify the installation of the traffic signal at this time.
  - Although the installation of a traffic signal is specifically referenced in the Ford's Colony proffers, per VDOT policy and roadway design manual guidelines, should volumes warrant the consideration of a traffic signal the intersection will also need to be analyzed for the consideration of a roundabout.
- **Centerville Road at Manchester Drive**
  - Maintain the existing geometric configuration and traffic control measures
- **News Road at Firestone Drive**
  - Maintain the existing geometric configuration and traffic control measures

From the analysis of the Build conditions which included the background traffic growth and approved developments, the following recommendations were identified and are summarized below for the Build conditions:

- **Longhill Road at Williamsburg W. Drive/Lane Place Drive**
  - Continue to monitor and implement new timing and coordination plans as part of regular VDOT operations and maintenance
  - The Longhill Road Phase 1 Widening Project (UPC – 100921) is currently construction. The widening project includes the following improvements to this intersection:
    - Widen Longhill Road to a four-lane divided typical section
    - Upgrade the traffic signal equipment to accommodate the additional through lanes
    - Pedestrian accommodations such as crosswalks, ADA ramps, and pedestrian signal displays for the crossing of select legs of the intersection

    <u>Eastbound Longhill Road</u>
    - Widen and construct an additional approach and receiving through lane

    <u>Westbound Longhill Road</u>
    - Widen and construct an additional approach and receiving through lane
  - Improvements associated with Longhill Road Phase 1 Widening Project (UPC – 100921) address several of the proffered improvements associated with the Ford's Colony Master Plan. Proffers should be updated/modified to account for/recognize these changes in responsibility.
- **Longhill Road at Fords Colony Drive**
  - Based on future traffic volume projections, construct a full width right-turn lane consisting of 200-feet of storage and 200-foot taper for the eastbound approach.
  - Future traffic volumes and the associated future operational conditions (i.e., level of service (LOS)/side street delay) continue to reflect that a traffic signal is not warranted and do not justify the installation of a traffic signal at this intersection.
  - It is noted that the installation of a traffic signal is specifically referenced in the Ford's Colony proffers. However, per VDOT policy and roadway design manual guidelines, if volumes warrant the consideration of a traffic signal then the intersection will also need to be analyzed for the consideration of a roundabout.
  - Additionally, it is noted that the Longhill Road Corridor Study, completed in October 2014, did not recommended the installation of a traffic signal at this intersection as part of the long term (horizon year 2034) improvements. Therefore, it is recommended that a traffic signal should no longer be proffered as a means of traffic control for this intersection.
- **Centerville Road at Manchester Drive**
  - Maintain the existing geometric configuration and traffic control measures
- **News Road at Firestone Drive**
  - Maintain the existing geometric configuration and traffic control measures

Given the minimal residual development potential in Ford's Colony, no additional or proffered improvements are triggered beyond those that were identified under the Existing or Build operational conditions.

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TRAFFIC IMPACT STUDY (TIS) UPDATE

Ford’s Colony Master Plan – Phased Development

James City County, Virginia

Technical Appendices

Prepared for:

Ford's Colony Home Owners Association (FCHOA)

Prepared by:

Kimley»Horn

January 2020

Appendix A: Assumptions Document

The following documentation outlines our proposed traffic impact study (TIS) assumptions for the Ford's Colony Master Plan development, located in James City County and bounded by Longhill Road (State Route 612) to the north, Centerville Road (State Route 614) to the west, News Road (State Route 613) to the south, and a combination of retail/commercial land uses, residential land uses, and Route 199 to the east. As part of this analysis, existing traffic data will be collected and future traffic volumes developed to identify if any of the proffered but unbuilt roadway, intersection, or traffic control improvements at the four (4) access points/study area intersections are experiencing or will experience traffic conditions that are or will trigger the need for construction. Proffered improvements are those described in the Ford's Colony original proffers dated March 11, 1987 and the associated Ford's Colony Phasing Plan for Roadway Improvements agreement approved by the County on June 20, 1988. This includes traffic signal and turn-lane warrant analyses that will be conducted at the defined study area intersections. Recommendations and opinions of probable cost for relevant improvements associated with the potential development will be described in the DRAFT and FINAL report.

Study Area

The study area for the TIS update and the associated proposed development site includes the following signalized and unsignalized intersections:

- County Club Drive/Williamsburg W. Drive at Longhill Road *(signalized)*
- Ford's Colony Drive at Longhill Road *(unsignalized)*
- Manchester Drive at Centerville Road *(unsignalized)*
- Firestone Drive at News Road *(unsignalized)*

Data Collection

Turning movement counts (TMC) were collected at the study area intersections on Thursday, June 8, 2017 which included vehicular, truck, and pedestrian volumes. Four-hour TMCs were conducted during the AM and PM peak periods (6:30 AM to 8:30 AM and 4:00 PM to 6:00 PM) at the following intersections:

- Manchester Drive at Centerville Road
- Country Club Drive/Williamsburg W. Drive at Longhill Road

In preparation for potential signal warrant analysis, 12-hour TMCs (i.e., 6:00 AM to 6:00 PM) were performed at the following intersections:

- Ford's Colony Drive at Longhill Road
- Firestone Drive at News Road

Future Traffic

The proposed development will have an opening year of 2019. Future analyses will coincide with this year. Growth rates will be determined by using rates developed as part of the *Longhill Road Corridor Study*, completed and adopted in October 2014, and historical traffic volume trends over the previous six (6) years (i.e., 2011 to 2016) from the Virginia Department of Transportation (VDOT) data.

- Longhill Road – 2.0% per year (consistent with Longhill Road Corridor Study)
- Centerville Road – 2.5% per year
- News Road – 2.0% per year

Two additional developments adjacent to Ford's Colony have been approved for development and were provided by James City County: The Village's at Ford's Colony and Westport Subdivision at Ford's Colony. These two developments will be included in the background traffic projections in addition to the general traffic growth. For the Villages at Ford's Colony, Kimley-Horn will use *ITE Trip Generation 9th Edition* (2012) Trip Generation Rates and Land Use Code 251: Senior Adult Housing-Detached, Code 252: Senior Adult Housing-Attached, Code 253: Congregate Care Housing, Code 254: Assisted Living, and Code 620: Nursing Home. For the Westport Subdivision at Ford's Colony, Kimley-Horn will use Code 210: Single-Family Detached-Housing. This is consistent with the land use provided in the *Ford's Colony Traffic Impact Study 2003-2004 Update.* The trip distribution and assignment for these approved developments will be based on the previous study's trip distribution percentages. Trip generation calculations for the approved developments are shown in **Table 1 and Table 2**.

Table 1: Trip Generation for The Villages at Ford's Colony Development

ITE Code	ITE Description	Density	Unit	Daily	AM Peak Hour			PM Peak Hour		
					In	Out	Total	In	Out	Total
251	Senior Adult Housing - Detached	38	Dwelling Units	200	13	23	36	13	9	22
252	Senior Adult Housing - Attached	168	Dwelling Units	522	11	22	33	23	19	42
253	Congregate Care Housing	390	Dwelling Units	788	14	9	23	36	30	66
254	Assisted Living	83	Beds/Rooms	256	8	4	12	8	10	18
620	Nursing Home	60	Beds/Rooms	120	7	3	10	4	9	13
Total		**739**		**1,886**	**53**	**61**	**114**	**84**	**77**	**161**

Note: It is assumed that there is one bed per room, and therefore each bed is considered one dwelling unit.

Table 2: Trip Generation for Westport Subdivision at Ford's Colony Development

ITE Code	ITE Description	Density	Unit	Daily	AM Peak Hour			PM Peak Hour		
					In	Out	Total	In	Out	Total
210	Single-Family Detached Housing	43	Dwelling Units	483	10	30	40	31	18	49

Proposed Land Use

Kimley-Horn will use *ITE Trip Generation 9th Edition* (2012) Trip Generation Rates and Land Use Code 230: Residential Condominium/Townhouse. This is consistent with the land use provided in the *Ford's Colony Traffic Impact Study 2003-2004 Update*. Trip generation calculations for the proposed development are shown in **Table 3**. No pass-by or internal capture rate reductions will be included as part of this analysis.

Table 3: Trip Generation for Residential Development

Land Use (ITE Code)	Dwelling Units	Weekday Total	AM			PM		
			Total	Enter (17%)	Exit (83%)	Total	Enter (67%)	Exit (33%)
Residential Condominium/Townhouse (230)	60 units	412	34	6	28	40	27	13

To assign the hourly site traffic for the future traffic signal warrant analysis, hourly variations will be used for Residential Uses Combined – Excluding Senior-Oriented Facilities as provided in the *Hourly Variation in Trip Generation for Office and Residential Land Uses* article published in the ITE Journal January 2015, as shown in **Table 4** below. It is noted that the hourly trip generation variation for residential land uses is proposed since it is a similar land use and ITE does not provide an applicable hourly variation breakdown for Residential Condominium/Townhouse (230).

Table 4: Hourly Trip Generation Variations for Residential Land Uses

Time	Average Weekday	
	Percent of 24-Hour Entering Traffic	Percent of 24-Hour Exiting Traffic
6 AM – 7 AM	1.6	5.7
7 AM – 8 AM	2.5	9.0
8 AM – 9 AM	3.7	9.1
9 AM – 10 AM	3.7	6.5
10 AM – 11 AM	4.1	5.5
11 AM – 12 PM	4.5	5.7
12 PM – 1 PM	5.3	5.3
1 PM – 2 PM	5.4	5.7
2 PM – 3 PM	6.5	5.9
3 PM – 4 PM	8.1	6.3
4 PM – 5 PM	9.8	6.3
5 PM – 6 PM	10.8	6.5

Site traffic distributions will be determined from existing travel patterns, site location within Ford's Colony, access to/from the external adjacent street network, and employment/activity center destinations in the surrounding area. Based on this, we are assuming that the following distributions will be used for the proposed development:

- 65% of the trips generated will travel to/from the north on Ford's Colony Drive
- 20% of the trips generated will travel to/from the west on Manchester Drive
- 10% of the trips generated will travel to/from the east on Williamsburg W. Drive
- 5% of the trips generated will travel to/from the south on Firestone Drive

Analysis Years

The proposed development is anticipated to be completed in 2019. Therefore, the following analysis scenarios for the AM and PM peak hours will be studied as part of this TIS update.

- Scenario 1 – Existing (2017) traffic conditions
- Scenario 2 – Opening Year (2019) No-Build conditions – Build-out year traffic conditions *with* only background development trips applied (i.e., approved adjacent development traffic)
- Scenario 3 – Opening Year (2019) Build-out conditions – Build-out year traffic conditions *with* background development trips applied *plus* traffic volumes generated by the proposed development
- Scenario 4 – Opening Year +6 years (2025) No-Build conditions – Build-out year traffic conditions *with* only background development trips applied (i.e., approved adjacent development traffic)
- Scenario 5 – Opening Year +6 years (2025) Build-out conditions – Build-out year traffic conditions *with* background development trips applied *plus* traffic volumes generated by the proposed development

Traffic Operations Analysis

Proposed inputs and analysis methodologies will be consistent with VDOT's Traffic Operations and Safety Analysis Manual (TOSAM). Operational analyses for the study area intersections will be conducted using traffic analysis tools (e.g., Synchro 9.1 Professional, SimTraffic 9.1) and Highway Capacity Manual (HCM) methodologies.

The following warrants will be analyzed for the study area intersections for future no-build and build conditions: *Warrant 1 – Eight Hour* and *Warrant 2 – Four Hour*. Kimley-Horn will conduct a traffic signal warrant analysis using the standards provided in the *Manual of Uniform Traffic Control Devices (MUTCD)*. The traffic signal warrant analysis will be performed for the following intersections:

- Ford's Colony Drive at Longhill Road
- Firestone Drive at News Road

Turn-lane warrant analyses will be prepared and evaluated for the intersection of Ford's Colony Drive at Longhill Road. The turn-lane warrant analysis will be consistent with methodologies shown in Appendix C of the VDOT Road Design Manual as well as guidelines provided in Appendix F of the VDOT Access Management Design Standards for Entrances and Intersections. Should a turn-lane be warranted, recommendations for storage length and taper length will be provided.

The future conditions analyses will confirm the need and define the geometric configurations necessary for the proposed roadway and intersection capacity improvements. Measures of effectiveness that will be reported for each scenario will consist of delay per vehicle, level of service (LOS), and maximum queue lengths. These measures of effectiveness will be presented in tabular format. Vehicle delay and LOS will be summarized by movement, approach, and overall intersection, while maximum queue lengths will be summarized for each movement.

Reporting

A TIS report with an accompanying appendix (including all analysis files) will be prepared that summarizes the analysis methodology and results. The report and associated analysis files will be provided in electronic format as a part of the FINAL traffic analysis submittal.

Appendix B: Traffic Count Data

Data Collection Group
LSmith@DataCollectionGroup.net

File Name : Longhill and Country Club
Site Code :
Start Date : 6/8/2017
Page No : 1

Groups Printed- Passenger Veh - Trucks

	Lane Place From North					Longhill From East					Country Club From South					Longhill From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
06:30 AM	4	0	4	0	8	2	71	1	0	74	26	0	5	0	31	1	84	0	0	85	198
06:45 AM	3	0	9	0	12	3	123	4	0	130	35	1	11	0	47	1	107	0	0	108	297
Total	7	0	13	0	20	5	194	5	0	204	61	1	16	0	78	2	191	0	0	193	495
07:00 AM	1	1	12	0	14	2	147	6	0	155	57	0	15	0	72	4	164	0	0	168	409
07:15 AM	3	0	8	0	11	4	100	7	0	111	52	0	6	0	58	4	158	1	0	163	343
07:30 AM	4	0	17	0	21	5	92	10	0	107	53	1	15	0	69	3	168	1	0	172	369
07:45 AM	9	0	19	0	28	7	121	9	0	137	77	2	10	0	89	9	200	1	0	210	464
Total	17	1	56	0	74	18	460	32	0	510	239	3	46	0	288	20	690	3	0	713	1585
08:00 AM	5	1	11	0	17	4	125	10	0	139	50	0	11	0	61	4	182	1	0	187	404
08:15 AM	0	0	9	0	9	2	129	14	0	145	44	0	6	0	50	5	192	0	0	197	401
Total	5	1	20	0	26	6	254	24	0	284	94	0	17	0	111	9	374	1	0	384	805
04:00 PM	2	0	6	0	8	11	192	45	0	248	33	0	7	0	40	10	155	6	0	171	467
04:15 PM	2	0	4	0	6	7	227	61	0	295	33	0	9	0	42	13	174	4	0	191	534
04:30 PM	8	0	6	0	14	11	211	50	0	272	27	1	5	0	33	11	180	3	0	194	513
04:45 PM	4	0	7	0	11	6	239	61	0	306	33	0	12	0	45	10	181	3	0	194	556
Total	16	0	23	0	39	35	869	217	0	1121	126	1	33	0	160	44	690	16	0	750	2070
05:00 PM	2	0	4	0	6	10	237	49	0	296	34	0	10	0	44	8	198	9	0	215	561
05:15 PM	4	0	6	0	10	16	266	60	0	342	29	0	14	0	43	8	182	2	0	192	587
05:30 PM	4	0	6	0	10	6	235	36	0	277	40	0	14	0	54	9	174	3	0	186	527
05:45 PM	5	0	1	0	6	11	244	44	0	299	32	0	10	0	42	8	172	5	0	185	532
Total	15	0	17	0	32	43	982	189	0	1214	135	0	48	0	183	33	726	19	0	778	2207
Grand Total	60	2	129	0	191	107	2759	467	0	3333	655	5	160	0	820	108	2671	39	0	2818	7162
Apprch %	31.4	1	67.5	0		3.2	82.8	14	0		79.9	0.6	19.5	0		3.8	94.8	1.4	0		
Total %	0.8	0	1.8	0	2.7	1.5	38.5	6.5	0	46.5	9.1	0.1	2.2	0	11.4	1.5	37.3	0.5	0	39.3	
Passenger Veh	55	2	126	0	183	103	2688	464	0	3255	650	2	154	0	806	107	2602	37	0	2746	6990
% Passenger Veh	91.7	100	97.7	0	95.8	96.3	97.4	99.4	0	97.7	99.2	40	96.2	0	98.3	99.1	97.4	94.9	0	97.4	97.6
Trucks	5	0	3	0	8	4	71	3	0	78	5	3	6	0	14	1	69	2	0	72	172
% Trucks	8.3	0	2.3	0	4.2	3.7	2.6	0.6	0	2.3	0.8	60	3.8	0	1.7	0.9	2.6	5.1	0	2.6	2.4

Data Collection Group
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File Name : Longhill and Country Club
Site Code :
Start Date : 6/8/2017
Page No : 2

	Lane Place From North					Longhill From East					Country Club From South					Longhill From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:30 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	4	0	17	0	21	5	92	10	0	107	53	1	**15**	0	69	3	168	**1**	0	172	369
07:45 AM	**9**	0	**19**	0	**28**	**7**	121	9	0	137	**77**	**2**	10	0	**89**	**9**	**200**	1	0	**210**	**464**
08:00 AM	5	**1**	11	0	17	4	125	10	0	139	50	0	11	0	61	4	182	1	0	187	404
08:15 AM	0	0	9	0	9	2	**129**	**14**	0	**145**	44	0	6	0	50	5	192	0	0	197	401
Total Volume	18	1	56	0	75	18	467	43	0	528	224	3	42	0	269	21	742	3	0	766	1638
% App. Total	24	1.3	74.7	0		3.4	88.4	8.1	0		83.3	1.1	15.6	0		2.7	96.9	0.4	0		
PHF	.500	.250	.737	.000	.670	.643	.905	.768	.000	.910	.727	.375	.700	.000	.756	.583	.928	.750	.000	.912	.883
Passenger Veh	16	1	54	0	71	15	449	41	0	505	223	2	39	0	264	21	727	3	0	751	1591
% Passenger Veh	88.9	100	96.4	0	94.7	83.3	96.1	95.3	0	95.6	99.6	66.7	92.9	0	98.1	100	98.0	100	0	98.0	97.1
Trucks	2	0	2	0	4	3	18	2	0	23	1	1	3	0	5	0	15	0	0	15	47
% Trucks	11.1	0	3.6	0	5.3	16.7	3.9	4.7	0	4.4	0.4	33.3	7.1	0	1.9	0	2.0	0	0	2.0	2.9

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File Name : Longhill and Country Club
Site Code :
Start Date : 6/8/2017
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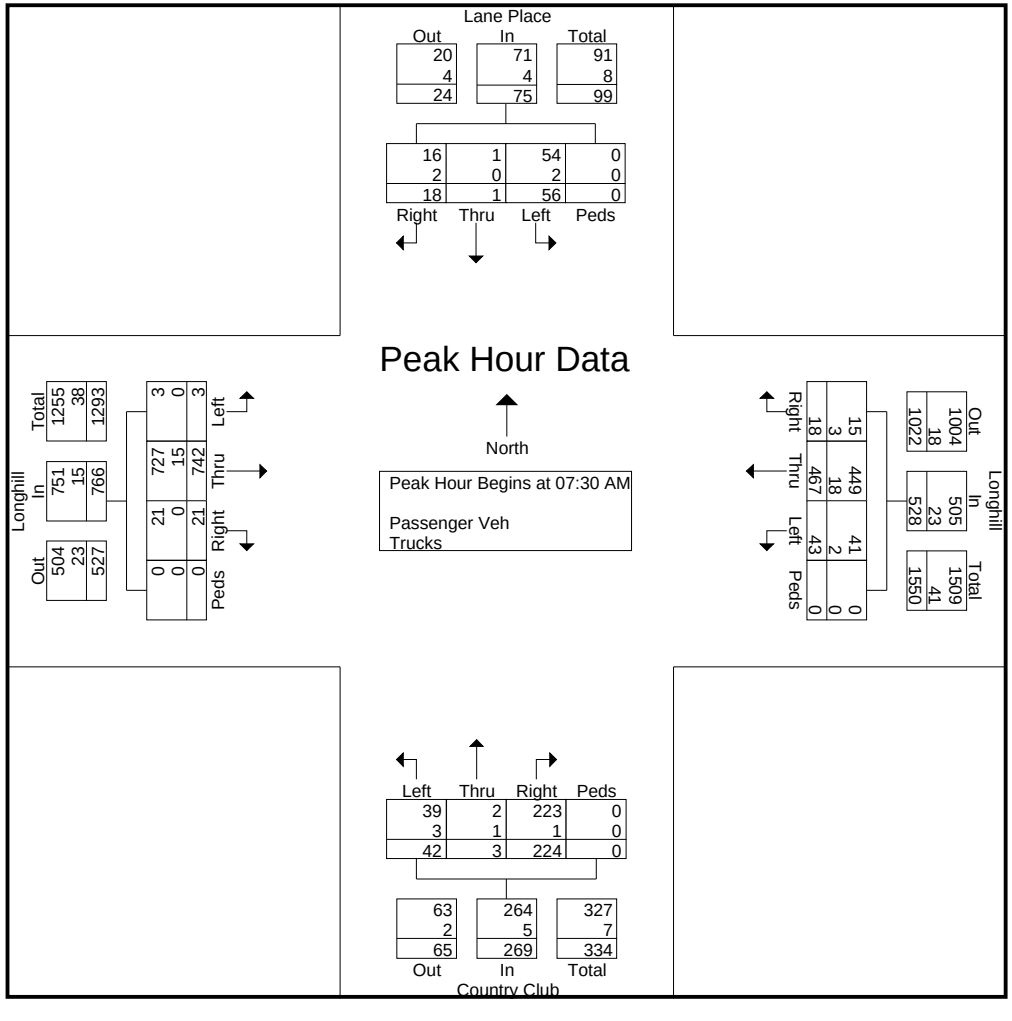

Data Collection Group
LSmith@DataCollectionGroup.net

File Name : Longhill and Country Club
Site Code :
Start Date : 6/8/2017
Page No : 4

	Lane Place From North					Longhill From East					Country Club From South					Longhill From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	**4**	0	**7**	0	**11**	6	239	**61**	0	306	33	0	12	0	45	**10**	181	3	0	194	556
05:00 PM	2	0	4	0	6	10	237	49	0	296	34	0	10	0	44	8	**198**	**9**	0	**215**	561
05:15 PM	4	0	6	0	10	**16**	**266**	60	0	**342**	29	0	**14**	0	43	8	182	2	0	192	**587**
05:30 PM	4	0	6	0	10	6	235	36	0	277	**40**	0	14	0	**54**	9	174	3	0	186	527
Total Volume	14	0	23	0	37	38	977	206	0	1221	136	0	50	0	186	35	735	17	0	787	2231
% App. Total	37.8	0	62.2	0		3.1	80	16.9	0		73.1	0	26.9	0		4.4	93.4	2.2	0		
PHF	.875	.000	.821	.000	.841	.594	.918	.844	.000	.893	.850	.000	.893	.000	.861	.875	.928	.472	.000	.915	.950
Passenger Veh	13	0	23	0	36	38	967	206	0	1211	132	0	49	0	181	35	716	17	0	768	2196
% Passenger Veh	92.9	0	100	0	97.3	100	99.0	100	0	99.2	97.1	0	98.0	0	97.3	100	97.4	100	0	97.6	98.4
Trucks	1	0	0	0	1	0	10	0	0	10	4	0	1	0	5	0	19	0	0	19	35
% Trucks	7.1	0	0	0	2.7	0	1.0	0	0	0.8	2.9	0	2.0	0	2.7	0	2.6	0	0	2.4	1.6

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File Name : Longhill and Country Club
Site Code :
Start Date : 6/8/2017
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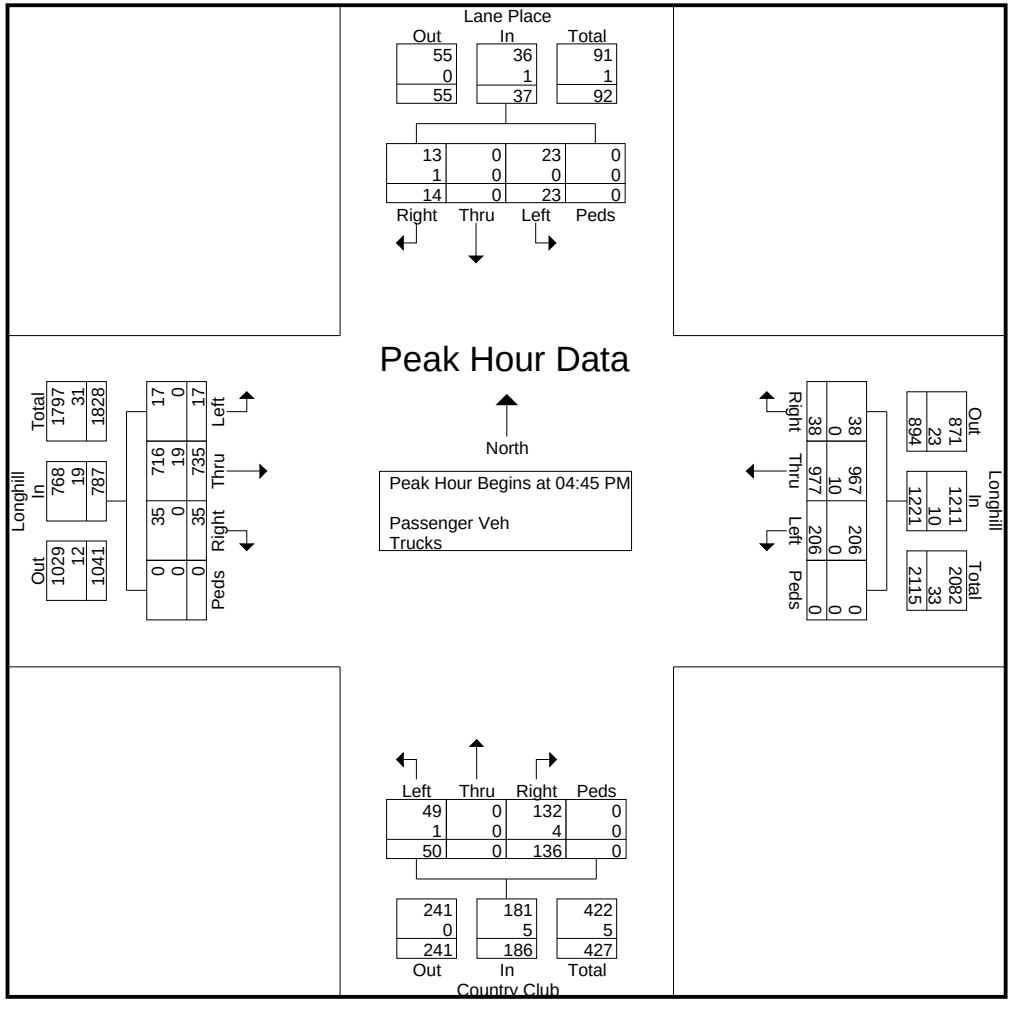

Data Collection Group
LSmith@DataCollectionGroup.net

File Name : Longhill and Fords Colony
Site Code : 13333333
Start Date : 6/8/2017

Groups Printed- Passenger Veh - Trucks

	Entrance From North					Longhill From East					Fords Colony From South					Longhill From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
06:00 AM	0	0	0	0	0	1	10	3	0	14	8	0	4	0	12	3	16	0	0	19	45
06:15 AM	1	0	1	0	2	1	13	1	0	15	6	0	2	0	8	2	21	1	0	24	49
06:30 AM	0	0	0	0	0	1	19	7	0	27	7	0	2	0	9	0	26	0	0	26	62
06:45 AM	0	0	0	0	0	1	36	9	0	46	25	0	6	0	31	2	55	1	0	58	135
Total	1	0	1	0	2	4	78	20	0	102	46	0	14	0	60	7	118	2	0	127	291
07:00 AM	0	0	1	0	1	1	46	11	0	58	39	1	3	0	43	2	51	0	0	53	155
07:15 AM	1	0	0	0	1	0	55	20	0	75	26	0	16	0	42	8	64	0	0	72	190
07:30 AM	0	0	0	0	0	0	68	19	0	87	28	0	15	0	43	4	56	0	0	60	190
07:45 AM	0	0	0	0	0	0	55	30	0	85	37	0	15	0	52	7	84	1	0	92	229
Total	1	0	1	0	2	1	224	80	0	305	130	1	49	0	180	21	255	1	0	277	764
08:00 AM	0	0	0	0	0	1	53	28	0	82	36	0	15	0	51	10	69	2	0	81	214
08:15 AM	0	1	0	0	1	0	90	29	0	119	29	1	25	0	55	15	84	0	0	99	274
08:30 AM	0	0	0	0	0	0	63	39	0	102	42	0	10	0	52	14	80	0	0	94	248
08:45 AM	0	0	1	0	1	1	52	45	0	98	32	0	10	0	42	12	56	0	0	68	209
Total	0	1	1	0	2	2	258	141	0	401	139	1	60	0	200	51	289	2	0	342	945
09:00 AM	0	0	0	0	0	1	56	27	0	84	22	0	11	0	33	12	58	1	0	71	188
09:15 AM	0	0	0	0	0	0	48	25	0	73	25	0	9	0	34	10	66	0	0	76	183
09:30 AM	0	0	1	0	1	1	36	20	0	57	37	0	12	0	49	11	61	1	0	73	180
09:45 AM	0	0	0	0	0	0	38	48	0	86	43	0	10	0	53	12	63	0	0	75	214
Total	0	0	1	0	1	2	178	120	0	300	127	0	42	0	169	45	248	2	0	295	765
10:00 AM	1	0	0	0	1	0	53	30	0	83	44	0	17	0	61	9	36	0	0	45	190
10:15 AM	0	0	1	0	1	0	41	28	0	69	41	0	16	0	57	14	49	0	0	63	190
10:30 AM	1	0	0	0	1	1	41	20	0	62	34	0	14	0	48	5	39	1	0	45	156
10:45 AM	1	0	1	0	2	0	40	28	0	68	29	3	14	0	46	10	42	1	0	53	169
Total	3	0	2	0	5	1	175	106	0	282	148	3	61	0	212	38	166	2	0	206	705
11:00 AM	1	0	1	0	2	1	37	32	0	70	35	0	6	0	41	15	39	1	0	55	168
11:15 AM	0	0	0	0	0	2	38	30	0	70	24	0	9	0	33	11	48	0	0	59	162
11:30 AM	0	0	1	0	1	0	45	33	0	78	25	2	14	0	41	12	53	1	0	66	186
11:45 AM	0	0	3	0	3	0	49	41	0	90	33	0	12	0	45	17	49	0	0	66	204
Total	1	0	5	0	6	3	169	136	0	308	117	2	41	0	160	55	189	2	0	246	720
12:00 PM	1	1	0	0	2	2	56	51	0	109	29	1	13	0	43	9	44	0	0	53	207
12:15 PM	2	0	0	0	2	3	48	33	0	84	30	0	5	0	35	18	34	2	0	54	175
12:30 PM	0	1	0	0	1	0	46	33	0	79	29	1	9	0	39	11	37	0	0	48	167
12:45 PM	0	0	0	0	0	0	46	34	0	80	36	0	19	0	55	21	52	0	0	73	208
Total	3	2	0	0	5	5	196	151	0	352	124	2	46	0	172	59	167	2	0	228	757

Data Collection Group
LSmith@DataCollectionGroup.net

File Name : Longhill and Fords Colony
Site Code : 13333333
Start Date : 6/8/2017

Groups Printed- Passenger Veh - Trucks

	Entrance From North					Longhill From East					Fords Colony From South					Longhill From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
01:00 PM	2	0	0	0	2	1	35	31	0	67	38	0	15	0	53	12	38	0	0	50	172
01:15 PM	0	0	1	0	1	4	62	40	0	106	28	0	10	0	38	11	59	0	0	70	215
01:30 PM	0	1	3	0	4	2	45	27	0	74	20	0	8	0	28	11	38	0	0	49	155
01:45 PM	2	0	3	0	5	2	32	20	0	54	28	0	9	0	37	8	59	1	0	68	164
Total	4	1	7	0	12	9	174	118	0	301	114	0	42	0	156	42	194	1	0	237	706
02:00 PM	0	0	0	0	0	1	64	42	0	107	42	1	18	0	61	12	51	3	0	66	234
02:15 PM	1	0	1	0	2	1	60	51	0	112	29	0	5	0	34	15	43	0	0	58	206
02:30 PM	2	0	2	0	4	1	83	37	0	121	29	0	10	0	39	16	55	1	0	72	236
02:45 PM	2	0	0	0	2	0	86	51	0	137	34	0	19	0	53	8	55	1	0	64	256
Total	5	0	3	0	8	3	293	181	0	477	134	1	52	0	187	51	204	5	0	260	932
03:00 PM	1	0	2	0	3	0	58	41	0	99	31	0	15	0	46	16	45	0	0	61	209
03:15 PM	1	0	4	0	5	1	73	32	0	106	29	0	14	0	43	30	105	0	0	135	289
03:30 PM	3	0	1	0	4	1	77	45	0	123	30	0	14	0	44	20	75	1	0	96	267
03:45 PM	0	0	1	0	1	0	60	43	0	103	36	2	27	0	65	15	63	1	0	79	248
Total	5	0	8	0	13	2	268	161	0	431	126	2	70	0	198	81	288	2	0	371	1013
04:00 PM	0	1	0	0	1	0	68	31	0	99	32	0	16	0	48	12	77	0	0	89	237
04:15 PM	0	0	1	0	1	1	61	37	0	99	27	0	9	0	36	16	84	6	0	106	242
04:30 PM	1	0	0	0	1	0	74	38	0	112	27	1	13	0	41	9	77	1	0	87	241
04:45 PM	1	0	0	0	1	0	65	50	0	115	30	1	14	0	45	19	93	0	0	112	273
Total	2	1	1	0	4	1	268	156	0	425	116	2	52	0	170	56	331	7	0	394	993
05:00 PM	3	0	0	0	3	1	63	39	0	103	31	2	4	0	37	11	78	0	0	89	232
05:15 PM	0	0	1	0	1	1	79	47	0	127	25	0	14	0	39	9	86	0	0	95	262
05:30 PM	1	0	3	0	4	0	75	56	0	131	35	0	13	0	48	14	83	0	0	97	280
05:45 PM	0	0	0	0	0	0	53	44	0	97	39	0	5	0	44	13	81	0	0	94	235
Total	4	0	4	0	8	2	270	186	0	458	130	2	36	0	168	47	328	0	0	375	1009
Grand Total	29	5	34	0	68	35	2551	1556	0	4142	1451	16	565	0	2032	553	2777	28	0	3358	9600
Apprch %	42.6	7.4	50	0		0.8	61.6	37.6	0		71.4	0.8	27.8	0		16.5	82.7	0.8	0		
Total %	0.3	0.1	0.4	0	0.7	0.4	26.6	16.2	0	43.1	15.1	0.2	5.9	0	21.2	5.8	28.9	0.3	0	35	
Passenger Veh	29	4	34	0	67	35	2433	1538	0	4006	1443	15	551	0	2009	537	2645	27	0	3209	9291
% Passenger Veh	100	80	100	0	98.5	100	95.4	98.8	0	96.7	99.4	93.8	97.5	0	98.9	97.1	95.2	96.4	0	95.6	96.8
Trucks	0	1	0	0	1	0	118	18	0	136	8	1	14	0	23	16	132	1	0	149	309
% Trucks	0	20	0	0	1.5	0	4.6	1.2	0	3.3	0.6	6.2	2.5	0	1.1	2.9	4.8	3.6	0	4.4	3.2

Data Collection Group
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File Name : Longhill and Fords Colony
Site Code : 13333333
Start Date : 6/8/2017
Page No : 3

	Entrance From North					Longhill From East					Fords Colony From South					Longhill From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	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 07:45 AM																					
07:45 AM	0	0	0	0	0	0	55	30	0	85	37	0	15	0	52	7	**84**	1	0	92	229
08:00 AM	0	0	0	0	0	**1**	53	28	0	82	36	0	15	0	51	10	69	**2**	0	81	214
08:15 AM	0	**1**	0	0	**1**	0	**90**	29	0	**119**	29	**1**	**25**	0	**55**	**15**	84	0	0	**99**	**274**
08:30 AM	0	0	0	0	0	0	63	**39**	0	102	**42**	0	10	0	52	14	80	0	0	94	248
Total Volume	0	1	0	0	1	1	261	126	0	388	144	1	65	0	210	46	317	3	0	366	965
% App. Total	0	100	0	0		0.3	67.3	32.5	0		68.6	0.5	31	0		12.6	86.6	0.8	0		
PHF	.000	.250	.000	.000	.250	.250	.725	.808	.000	.815	.857	.250	.650	.000	.955	.767	.943	.375	.000	.924	.880
Passenger Veh	0	1	0	0	1	1	244	123	0	368	143	1	59	0	203	44	296	3	0	343	915
% Passenger Veh	0	100	0	0	100	100	93.5	97.6	0	94.8	99.3	100	90.8	0	96.7	95.7	93.4	100	0	93.7	94.8
Trucks	0	0	0	0	0	0	17	3	0	20	1	0	6	0	7	2	21	0	0	23	50
% Trucks	0	0	0	0	0	0	6.5	2.4	0	5.2	0.7	0	9.2	0	3.3	4.3	6.6	0	0	6.3	5.2

Data Collection Group
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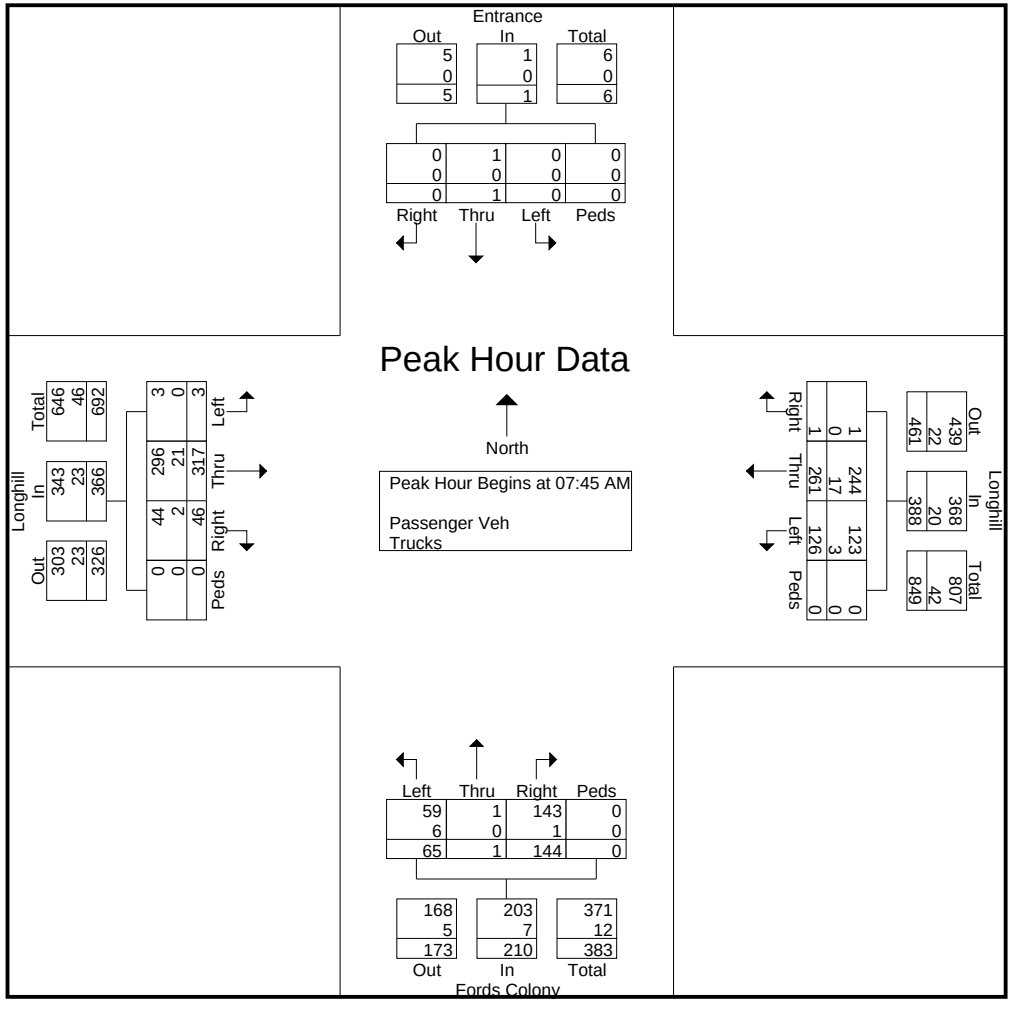
File Name : Longhill and Fords Colony
Site Code : 13333333
Start Date : 6/8/2017
Page No : 4



Data Collection Group
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File Name : Longhill and Fords Colony
Site Code : 13333333
Start Date : 6/8/2017
Page No : 5

	Entrance From North					Longhill From East					Fords Colony From South					Longhill From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	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 11:30 AM																					
11:30 AM	0	0	1	0	1	0	45	33	0	78	25	**2**	**14**	0	41	12	**53**	1	0	**66**	186
11:45 AM	0	0	**3**	0	**3**	0	49	41	0	90	**33**	0	12	0	**45**	17	49	0	0	66	204
12:00 PM	1	**1**	0	0	2	2	**56**	**51**	0	**109**	29	1	13	0	43	9	44	0	0	53	**207**
12:15 PM	**2**	0	0	0	2	**3**	48	33	0	84	30	0	5	0	35	**18**	34	**2**	0	54	175
Total Volume	3	1	4	0	8	5	198	158	0	361	117	3	44	0	164	56	180	3	0	239	772
% App. Total	37.5	12.5	50	0		1.4	54.8	43.8	0		71.3	1.8	26.8	0		23.4	75.3	1.3	0		
PHF	.375	.250	.333	.000	.667	.417	.884	.775	.000	.828	.886	.375	.786	.000	.911	.778	.849	.375	.000	.905	.932
Passenger Veh	3	1	4	0	8	5	193	154	0	352	117	3	44	0	164	56	177	2	0	235	759
% Passenger Veh	100	100	100	0	100	100	97.5	97.5	0	97.5	100	100	100	0	100	100	98.3	66.7	0	98.3	98.3
Trucks	0	0	0	0	0	0	5	4	0	9	0	0	0	0	0	0	3	1	0	4	13
% Trucks	0	0	0	0	0	0	2.5	2.5	0	2.5	0	0	0	0	0	0	1.7	33.3	0	1.7	1.7

Data Collection Group
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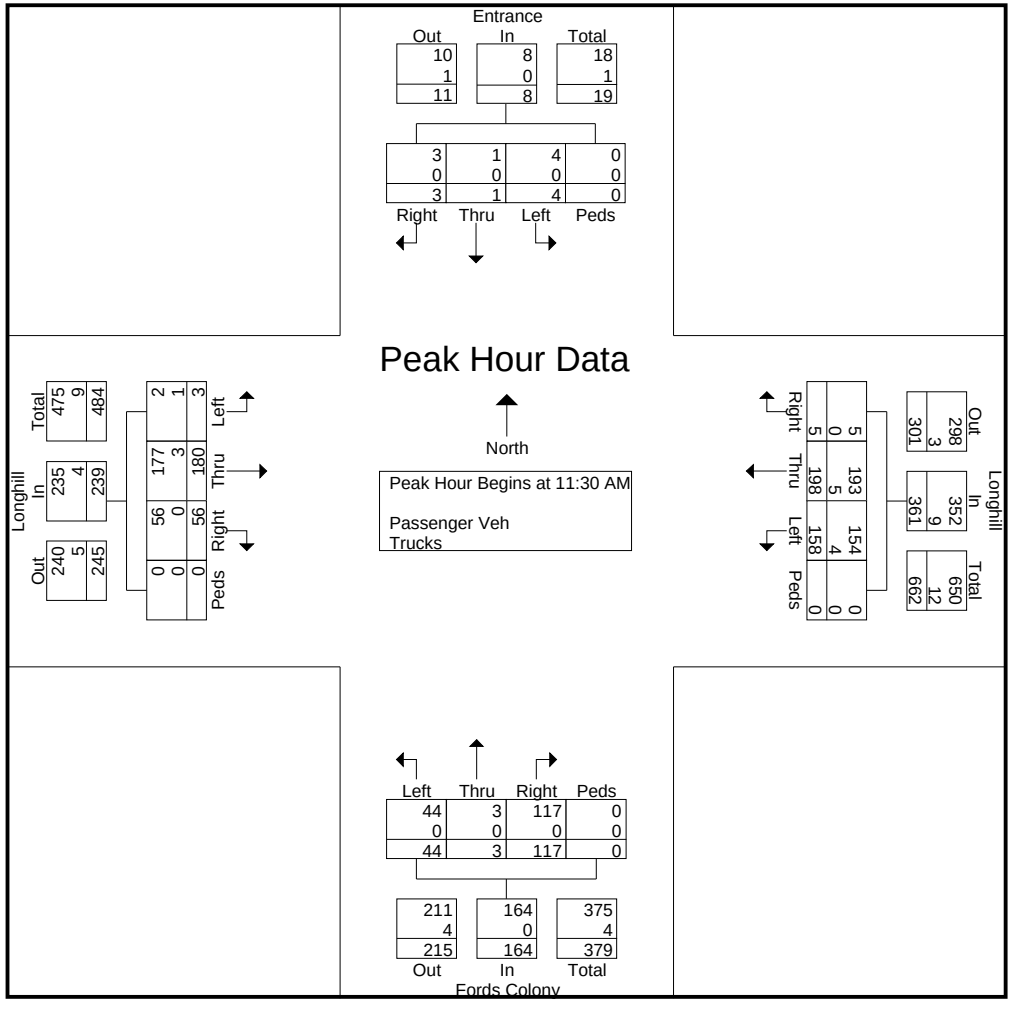
File Name : Longhill and Fords Colony
Site Code : 13333333
Start Date : 6/8/2017
Page No : 6



Data Collection Group
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File Name : Longhill and Fords Colony
Site Code : 13333333
Start Date : 6/8/2017
Page No : 7

	Entrance From North					Longhill From East					Fords Colony From South					Longhill From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	1	0	0	0	1	0	65	50	0	115	30	1	**14**	0	45	**19**	**93**	0	0	**112**	273
05:00 PM	**3**	0	0	0	3	**1**	63	39	0	103	31	**2**	4	0	37	11	78	0	0	89	232
05:15 PM	0	0	1	0	1	1	**79**	47	0	127	25	0	14	0	39	9	86	0	0	95	262
05:30 PM	1	0	**3**	0	**4**	0	75	**56**	0	**131**	**35**	0	13	0	**48**	14	83	0	0	97	**280**
Total Volume	5	0	4	0	9	2	282	192	0	476	121	3	45	0	169	53	340	0	0	393	1047
% App. Total	55.6	0	44.4	0		0.4	59.2	40.3	0		71.6	1.8	26.6	0		13.5	86.5	0	0		
PHF	.417	.000	.333	.000	.563	.500	.892	.857	.000	.908	.864	.375	.804	.000	.880	.697	.914	.000	.000	.877	.935
Passenger Veh	5	0	4	0	9	2	277	192	0	471	119	2	45	0	166	53	337	0	0	390	1036
% Passenger Veh	100	0	100	0	100	100	98.2	100	0	98.9	98.3	66.7	100	0	98.2	100	99.1	0	0	99.2	98.9
Trucks	0	0	0	0	0	0	5	0	0	5	2	1	0	0	3	0	3	0	0	3	11
% Trucks	0	0	0	0	0	0	1.8	0	0	1.1	1.7	33.3	0	0	1.8	0	0.9	0	0	0.8	1.1

Data Collection Group
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File Name : Longhill and Fords Colony
Site Code : 13333333
Start Date : 6/8/2017
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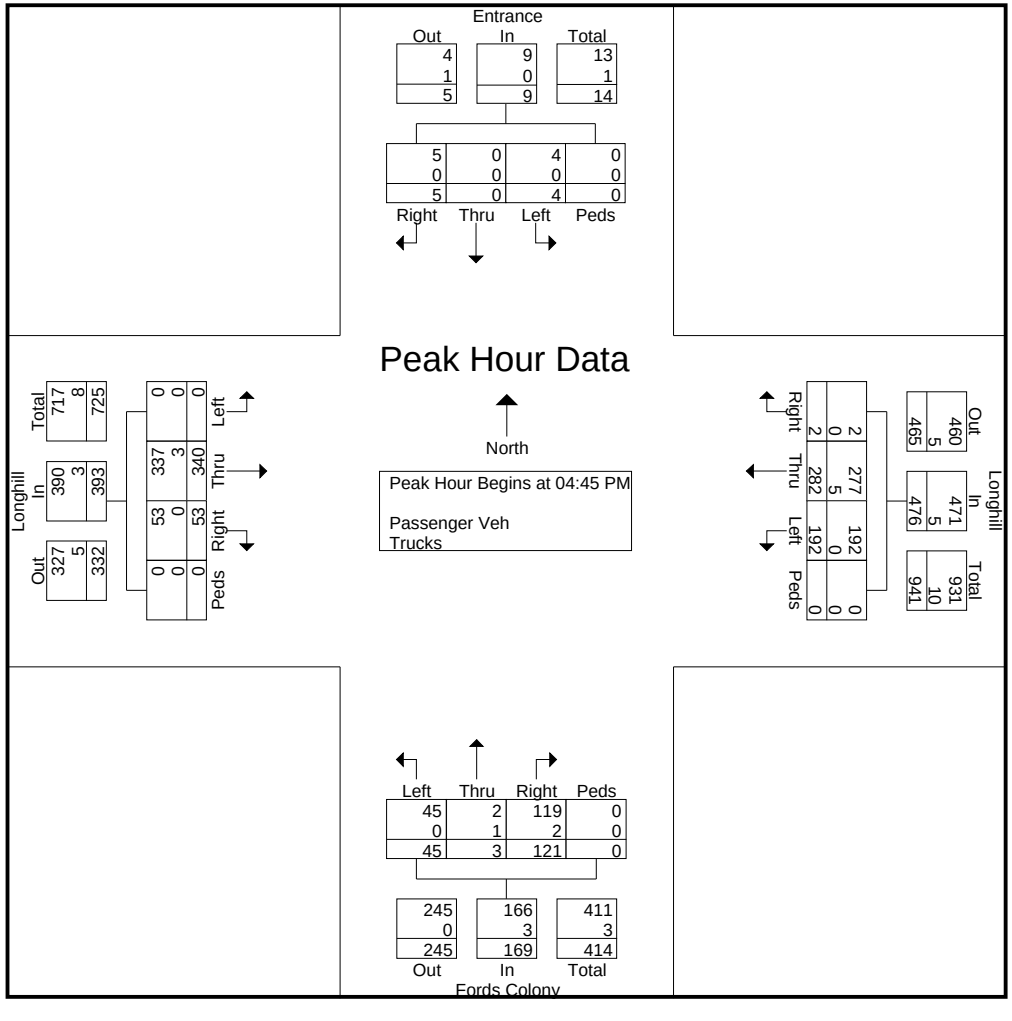

Data Collection Group
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File Name : Centerville and Manchester
Site Code :
Start Date : 6/8/2017
Page No : 1

Groups Printed- Passenger Veh - Trucks

	Centerville From North					Manchester From East					Centerville From South					Westport From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
06:30 AM	0	19	6	0	25	3	0	4	0	7	2	31	1	0	34	1	0	0	0	1	67
06:45 AM	0	28	10	0	38	7	0	7	0	14	4	54	0	0	58	0	0	0	0	0	110
Total	0	47	16	0	63	10	0	11	0	21	6	85	1	0	92	1	0	0	0	1	177
07:00 AM	1	29	1	0	31	7	0	9	0	16	5	57	0	0	62	1	0	0	0	1	110
07:15 AM	0	52	7	0	59	10	0	13	0	23	6	77	2	0	85	0	0	0	0	0	167
07:30 AM	2	36	9	0	47	11	0	12	0	23	11	123	1	0	135	0	1	2	0	3	208
07:45 AM	0	58	10	0	68	10	0	15	0	25	10	85	1	0	96	0	0	1	0	1	190
Total	3	175	27	0	205	38	0	49	0	87	32	342	4	0	378	1	1	3	0	5	675
08:00 AM	0	55	14	0	69	8	0	16	0	24	10	61	0	0	71	0	0	1	0	1	165
08:15 AM	1	61	17	0	79	18	0	11	0	29	12	68	0	0	80	2	0	0	0	2	190
Total	1	116	31	0	148	26	0	27	0	53	22	129	0	0	151	2	0	1	0	3	355
04:00 PM	0	59	11	0	70	5	2	11	0	18	17	74	0	0	91	1	0	1	0	2	181
04:15 PM	0	58	4	0	62	1	0	9	0	10	16	65	0	0	81	0	0	1	0	1	154
04:30 PM	1	45	5	0	51	6	0	7	0	13	13	85	0	0	98	2	1	0	0	3	165
04:45 PM	0	61	5	0	66	7	0	15	0	22	21	71	0	0	92	1	1	2	0	4	184
Total	1	223	25	0	249	19	2	42	0	63	67	295	0	0	362	4	2	4	0	10	684
05:00 PM	0	60	6	0	66	9	0	12	0	21	16	66	0	0	82	0	0	0	0	0	169
05:15 PM	2	59	7	0	68	5	0	8	0	13	14	74	2	0	90	1	0	0	0	1	172
05:30 PM	0	57	5	0	62	7	0	12	0	19	13	79	0	0	92	0	0	1	0	1	174
05:45 PM	1	58	9	0	68	5	0	13	0	18	13	46	2	0	61	1	0	2	0	3	150
Total	3	234	27	0	264	26	0	45	0	71	56	265	4	0	325	2	0	3	0	5	665
Grand Total	8	795	126	0	929	119	2	174	0	295	183	1116	9	0	1308	10	3	11	0	24	2556
Apprch %	0.9	85.6	13.6	0		40.3	0.7	59	0		14	85.3	0.7	0		41.7	12.5	45.8	0		
Total %	0.3	31.1	4.9	0	36.3	4.7	0.1	6.8	0	11.5	7.2	43.7	0.4	0	51.2	0.4	0.1	0.4	0	0.9	
Passenger Veh	6	752	117	0	875	114	2	170	0	286	165	1050	8	0	1223	9	3	10	0	22	2406
% Passenger Veh	75	94.6	92.9	0	94.2	95.8	100	97.7	0	96.9	90.2	94.1	88.9	0	93.5	90	100	90.9	0	91.7	94.1
Trucks	2	43	9	0	54	5	0	4	0	9	18	66	1	0	85	1	0	1	0	2	150
% Trucks	25	5.4	7.1	0	5.8	4.2	0	2.3	0	3.1	9.8	5.9	11.1	0	6.5	10	0	9.1	0	8.3	5.9

Data Collection Group
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File Name : Centerville and Manchester
Site Code :
Start Date : 6/8/2017
Page No : 2

	Centerville From North					Manchester From East					Centerville From South					Westport From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:30 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	**2**	36	9	0	47	11	0	12	0	23	11	**123**	**1**	0	**135**	0	**1**	**2**	0	**3**	**208**
07:45 AM	0	58	10	0	68	10	0	15	0	25	10	85	1	0	96	0	0	1	0	1	190
08:00 AM	0	55	14	0	69	8	0	**16**	0	24	10	61	0	0	71	0	0	1	0	1	165
08:15 AM	1	**61**	**17**	0	**79**	**18**	0	11	0	**29**	**12**	68	0	0	80	**2**	0	0	0	2	190
Total Volume	3	210	50	0	263	47	0	54	0	101	43	337	2	0	382	2	1	4	0	7	753
% App. Total	1.1	79.8	19	0		46.5	0	53.5	0		11.3	88.2	0.5	0		28.6	14.3	57.1	0		
PHF	.375	.861	.735	.000	.832	.653	.000	.844	.000	.871	.896	.685	.500	.000	.707	.250	.250	.500	.000	.583	.905
Passenger Veh	1	193	42	0	236	45	0	52	0	97	32	310	2	0	344	2	1	4	0	7	684
% Passenger Veh	33.3	91.9	84.0	0	89.7	95.7	0	96.3	0	96.0	74.4	92.0	100	0	90.1	100	100	100	0	100	90.8
Trucks	2	17	8	0	27	2	0	2	0	4	11	27	0	0	38	0	0	0	0	0	69
% Trucks	66.7	8.1	16.0	0	10.3	4.3	0	3.7	0	4.0	25.6	8.0	0	0	9.9	0	0	0	0	0	9.2

Data Collection Group
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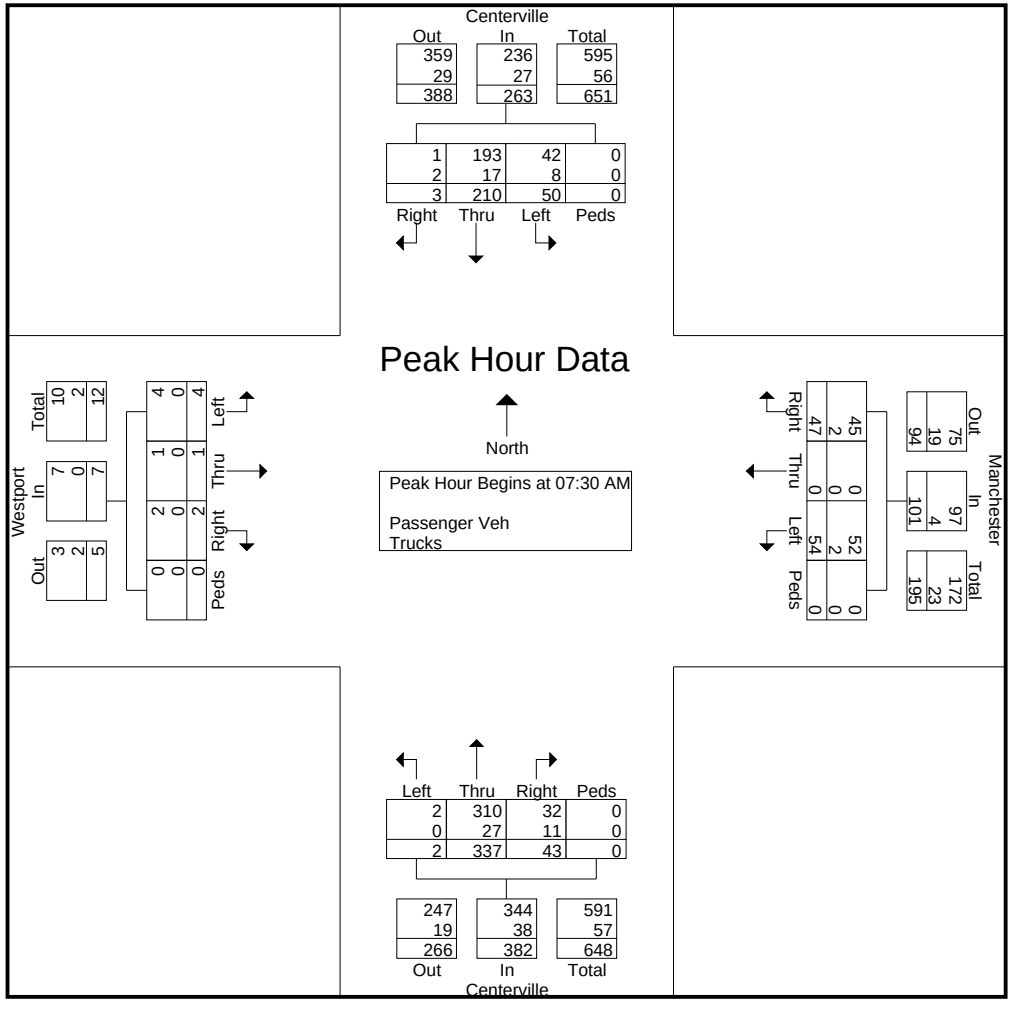
File Name : Centerville and Manchester
Site Code :
Start Date : 6/8/2017
Page No : 3



Data Collection Group
LSmith@DataCollectionGroup.net

File Name : Centerville and Manchester
Site Code :
Start Date : 6/8/2017
Page No : 4

	Centerville From North					Manchester From East					Centerville From South					Westport From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	0	**61**	5	0	66	7	0	**15**	0	**22**	**21**	71	0	0	**92**	**1**	**1**	**2**	0	**4**	**184**
05:00 PM	0	60	6	0	66	**9**	0	12	0	21	16	66	0	0	82	0	0	0	0	0	169
05:15 PM	**2**	59	**7**	0	**68**	5	0	8	0	13	14	74	**2**	0	90	1	0	0	0	1	172
05:30 PM	0	57	5	0	62	7	0	12	0	19	13	**79**	0	0	92	0	0	1	0	1	174
Total Volume	2	237	23	0	262	28	0	47	0	75	64	290	2	0	356	2	1	3	0	6	699
% App. Total	0.8	90.5	8.8	0		37.3	0	62.7	0		18	81.5	0.6	0		33.3	16.7	50	0		
PHF	.250	.971	.821	.000	.963	.778	.000	.783	.000	.852	.762	.918	.250	.000	.967	.500	.250	.375	.000	.375	.950
Passenger Veh	2	233	23	0	258	27	0	47	0	74	62	281	2	0	345	2	1	3	0	6	683
% Passenger Veh	100	98.3	100	0	98.5	96.4	0	100	0	98.7	96.9	96.9	100	0	96.9	100	100	100	0	100	97.7
Trucks	0	4	0	0	4	1	0	0	0	1	2	9	0	0	11	0	0	0	0	0	16
% Trucks	0	1.7	0	0	1.5	3.6	0	0	0	1.3	3.1	3.1	0	0	3.1	0	0	0	0	0	2.3

Data Collection Group
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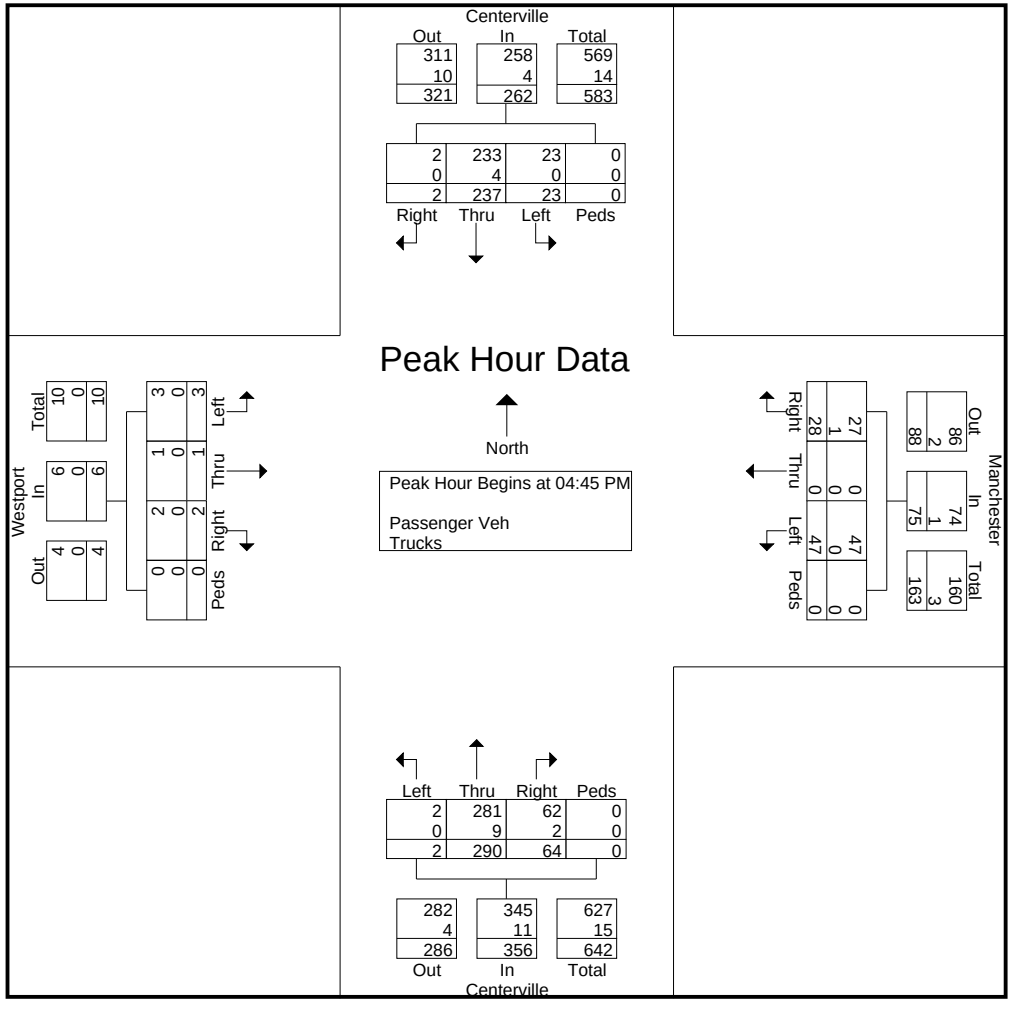
File Name : Centerville and Manchester
Site Code :
Start Date : 6/8/2017
Page No : 5



Data Collection Group
LSmith@DataCollectionGroup.net

File Name : News and Firestone
Site Code : 00681114
Start Date : 6/8/2017
Page No : 1

Groups Printed- Passenger Veh - Trucks

	Firestone From North					News From East					From South					News From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
06:00 AM	0	0	7	0	7	0	3	0	0	3	0	0	0	0	0	0	17	0	0	17	27
06:15 AM	0	0	5	0	5	1	6	0	0	7	0	0	0	0	0	0	21	0	0	21	33
06:30 AM	1	0	16	0	17	3	6	0	0	9	0	0	0	0	0	0	26	0	0	26	52
06:45 AM	1	0	14	0	15	1	14	0	0	15	0	0	0	0	0	0	27	0	0	27	57
Total	2	0	42	0	44	5	29	0	0	34	0	0	0	0	0	0	91	0	0	91	169
07:00 AM	2	0	18	0	20	2	23	0	0	25	0	0	0	0	0	0	36	0	0	36	81
07:15 AM	2	0	15	0	17	2	21	0	0	23	0	0	0	0	0	0	47	0	0	47	87
07:30 AM	1	0	24	0	25	9	30	0	0	39	0	0	0	0	0	0	49	0	0	49	113
07:45 AM	5	0	15	0	20	11	29	0	0	40	0	0	0	0	0	0	55	2	0	57	117
Total	10	0	72	0	82	24	103	0	0	127	0	0	0	0	0	0	187	2	0	189	398
08:00 AM	4	0	27	0	31	11	31	0	0	42	0	0	0	0	0	0	39	3	0	42	115
08:15 AM	7	0	19	0	26	12	35	0	0	47	0	0	0	0	0	0	45	5	0	50	123
08:30 AM	1	0	30	0	31	9	25	0	0	34	0	0	0	0	0	0	58	4	0	62	127
08:45 AM	2	0	18	0	20	11	40	0	0	51	0	0	0	0	0	0	61	1	0	62	133
Total	14	0	94	0	108	43	131	0	0	174	0	0	0	0	0	0	203	13	0	216	498
09:00 AM	3	0	25	0	28	13	46	0	0	59	0	0	0	0	0	0	66	0	0	66	153
09:15 AM	5	0	22	0	27	16	25	0	0	41	0	0	0	0	0	0	38	1	0	39	107
09:30 AM	4	0	18	0	22	13	29	0	0	42	0	0	0	0	0	0	36	1	0	37	101
09:45 AM	4	0	22	0	26	19	22	0	0	41	0	0	0	0	0	0	35	0	0	35	102
Total	16	0	87	0	103	61	122	0	0	183	0	0	0	0	0	0	175	2	0	177	463
10:00 AM	1	0	19	0	20	22	28	0	0	50	0	0	0	0	0	0	34	2	0	36	106
10:15 AM	4	0	29	0	33	10	32	0	0	42	0	0	0	0	0	0	37	0	0	37	112
10:30 AM	3	0	27	0	30	13	22	0	0	35	0	0	0	0	0	0	39	1	0	40	105
10:45 AM	3	0	35	0	38	33	35	0	0	68	0	0	0	0	0	0	43	1	0	44	150
Total	11	0	110	0	121	78	117	0	0	195	0	0	0	0	0	0	153	4	0	157	473
11:00 AM	3	0	22	0	25	31	30	0	0	61	0	0	0	0	0	0	31	2	0	33	119
11:15 AM	6	0	22	0	28	20	35	0	0	55	0	0	0	0	0	0	41	1	0	42	125
11:30 AM	0	0	31	0	31	21	52	0	0	73	0	0	0	0	0	0	43	0	0	43	147
11:45 AM	2	0	29	0	31	33	35	0	0	68	0	0	0	0	0	0	31	3	0	34	133
Total	11	0	104	0	115	105	152	0	0	257	0	0	0	0	0	0	146	6	0	152	524
12:00 PM	3	0	19	0	22	29	23	0	0	52	0	0	0	0	0	0	32	3	0	35	109
12:15 PM	3	0	26	0	29	33	40	0	0	73	0	0	0	0	0	0	36	2	0	38	140
12:30 PM	0	0	21	0	21	29	44	0	0	73	0	0	0	0	0	0	33	2	0	35	129
12:45 PM	6	0	17	0	23	35	65	0	0	100	0	0	0	0	0	0	41	4	0	45	168
Total	12	0	83	0	95	126	172	0	0	298	0	0	0	0	0	0	142	11	0	153	546

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Groups Printed- Passenger Veh - Trucks

	Firestone From North					News From East					From South					News From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
01:00 PM	6	0	32	0	38	28	39	0	0	67	0	0	0	0	0	0	47	0	0	47	152
01:15 PM	0	0	30	0	30	25	44	0	0	69	0	0	0	0	0	0	31	4	0	35	134
01:30 PM	1	0	27	0	28	21	34	0	0	55	0	0	0	0	0	0	40	0	0	40	123
01:45 PM	3	0	25	0	28	32	41	0	0	73	0	0	0	0	0	0	28	1	0	29	130
Total	10	0	114	0	124	106	158	0	0	264	0	0	0	0	0	0	146	5	0	151	539
02:00 PM	4	0	28	0	32	22	40	0	1	63	0	0	0	0	0	0	49	6	0	55	150
02:15 PM	2	0	32	0	34	29	46	0	0	75	0	0	0	0	0	0	29	0	0	29	138
02:30 PM	3	0	26	0	29	37	66	0	0	103	0	0	0	0	0	0	43	2	0	45	177
02:45 PM	8	0	26	0	34	30	59	0	0	89	0	0	0	0	0	0	37	2	0	39	162
Total	17	0	112	0	129	118	211	0	1	330	0	0	0	0	0	0	158	10	0	168	627
03:00 PM	2	0	18	0	20	27	48	0	0	75	0	0	0	0	0	0	30	5	0	35	130
03:15 PM	1	0	24	0	25	38	56	0	0	94	0	0	0	0	0	0	35	0	0	35	154
03:30 PM	2	0	19	0	21	34	60	0	0	94	0	0	0	0	0	0	64	8	0	72	187
03:45 PM	3	0	20	0	23	24	56	0	0	80	0	0	0	0	0	0	44	3	0	47	150
Total	8	0	81	0	89	123	220	0	0	343	0	0	0	0	0	0	173	16	0	189	621
04:00 PM	4	0	14	0	18	39	51	0	0	90	0	0	0	0	0	0	52	5	0	57	165
04:15 PM	1	0	20	0	21	36	52	0	0	88	0	0	0	0	0	0	37	4	0	41	150
04:30 PM	6	0	16	0	22	33	61	0	0	94	0	0	0	0	0	0	38	5	0	43	159
04:45 PM	3	0	15	0	18	27	67	0	0	94	0	0	0	0	0	0	37	3	0	40	152
Total	14	0	65	0	79	135	231	0	0	366	0	0	0	0	0	0	164	17	0	181	626
05:00 PM	0	0	17	0	17	39	60	0	0	99	0	0	0	0	0	0	34	2	0	36	152
05:15 PM	1	0	12	0	13	25	57	0	0	82	0	0	0	0	0	0	41	0	0	41	136
05:30 PM	3	0	21	0	24	21	63	0	0	84	0	0	0	0	0	0	35	3	0	38	146
05:45 PM	2	0	24	0	26	35	70	0	0	105	0	0	0	0	0	0	34	4	0	38	169
Total	6	0	74	0	80	120	250	0	0	370	0	0	0	0	0	0	144	9	0	153	603
Grand Total	131	0	1038	0	1169	1044	1896	0	1	2941	0	0	0	0	0	0	1882	95	0	1977	6087
Apprch %	11.2	0	88.8	0		35.5	64.5	0	0		0	0	0	0		0	95.2	4.8	0		
Total %	2.2	0	17.1	0	19.2	17.2	31.1	0	0	48.3	0	0	0	0	0	0	30.9	1.6	0	32.5	
Passenger Veh	122	0	1024	0	1146	1034	1819	0	1	2854	0	0	0	0	0	0	1827	90	0	1917	5917
% Passenger Veh	93.1	0	98.7	0	98	99	95.9	0	100	97	0	0	0	0	0	0	97.1	94.7	0	97	97.2
Trucks	9	0	14	0	23	10	77	0	0	87	0	0	0	0	0	0	55	5	0	60	170
% Trucks	6.9	0	1.3	0	2	1	4.1	0	0	3	0	0	0	0	0	0	2.9	5.3	0	3	2.8

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	Firestone From North					News From East					From South					News From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	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 08:15 AM																					
08:15 AM	**7**	0	19	0	26	12	35	0	0	47	0	0	0	0	0	0	45	**5**	0	50	123
08:30 AM	1	0	**30**	0	**31**	9	25	0	0	34	0	0	0	0	0	0	58	4	0	62	127
08:45 AM	2	0	18	0	20	11	40	0	0	51	0	0	0	0	0	0	61	1	0	62	133
09:00 AM	3	0	25	0	28	**13**	**46**	0	0	**59**	0	0	0	0	0	0	**66**	0	0	**66**	**153**
Total Volume	13	0	92	0	105	45	146	0	0	191	0	0	0	0	0	0	230	10	0	240	536
% App. Total	12.4	0	87.6	0		23.6	76.4	0	0		0	0	0	0		0	95.8	4.2	0		
PHF	.464	.000	.767	.000	.847	.865	.793	.000	.000	.809	.000	.000	.000	.000	.000	.000	.871	.500	.000	.909	.876
Passenger Veh	12	0	91	0	103	44	131	0	0	175	0	0	0	0	0	0	221	10	0	231	509
% Passenger Veh	92.3	0	98.9	0	98.1	97.8	89.7	0	0	91.6	0	0	0	0	0	0	96.1	100	0	96.3	95.0
Trucks	1	0	1	0	2	1	15	0	0	16	0	0	0	0	0	0	9	0	0	9	27
% Trucks	7.7	0	1.1	0	1.9	2.2	10.3	0	0	8.4	0	0	0	0	0	0	3.9	0	0	3.8	5.0

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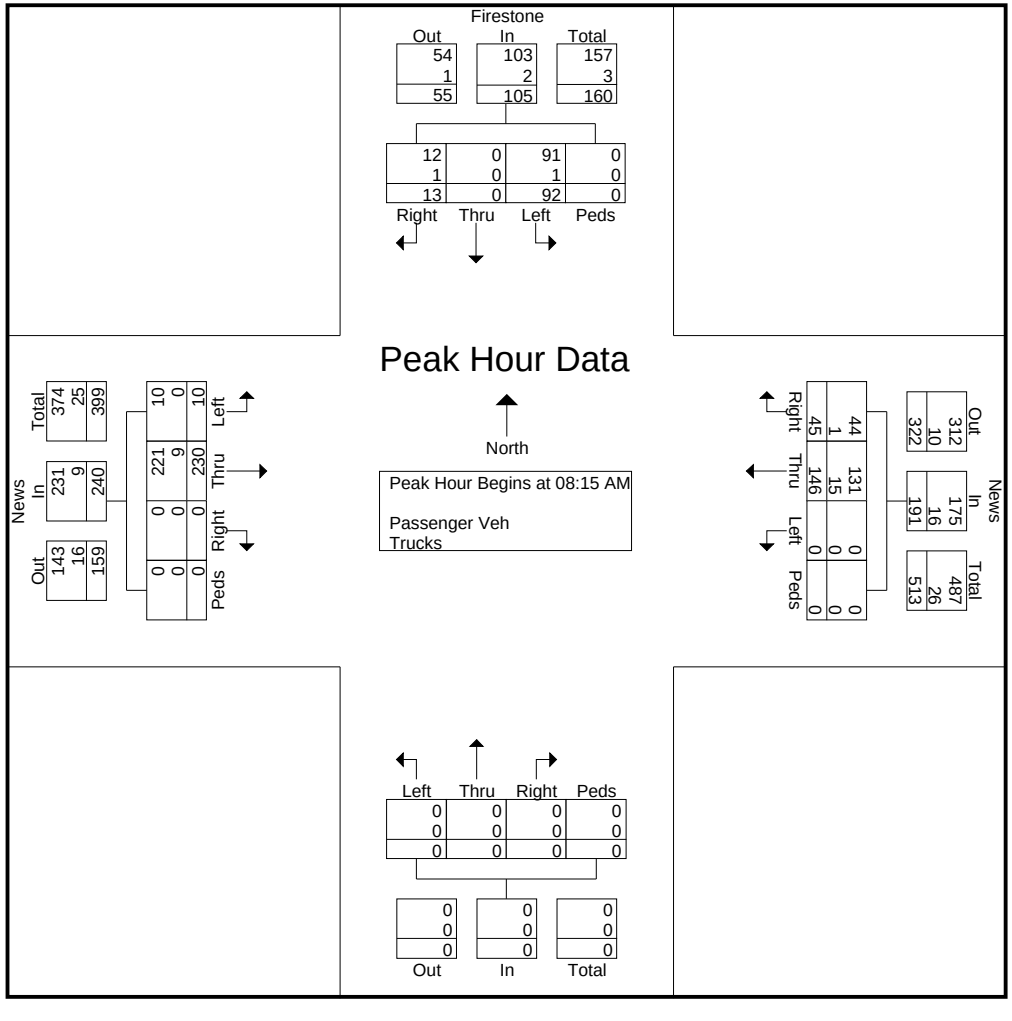

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	Firestone From North					News From East					From South					News From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 12:15 PM																					
12:15 PM	3	0	26	0	29	33	40	0	0	73	0	0	0	0	0	0	36	2	0	38	140
12:30 PM	0	0	21	0	21	29	44	0	0	73	0	0	0	0	0	0	33	2	0	35	129
12:45 PM	**6**	0	17	0	23	**35**	**65**	0	0	**100**	0	0	0	0	0	0	41	**4**	0	45	**168**
01:00 PM	6	0	**32**	0	**38**	28	39	0	0	67	0	0	0	0	0	0	**47**	0	0	**47**	152
Total Volume	15	0	96	0	111	125	188	0	0	313	0	0	0	0	0	0	157	8	0	165	589
% App. Total	13.5	0	86.5	0		39.9	60.1	0	0		0	0	0	0		0	95.2	4.8	0		
PHF	.625	.000	.750	.000	.730	.893	.723	.000	.000	.783	.000	.000	.000	.000	.000	.000	.835	.500	.000	.878	.876
Passenger Veh	12	0	92	0	104	121	181	0	0	302	0	0	0	0	0	0	153	8	0	161	567
% Passenger Veh	80.0	0	95.8	0	93.7	96.8	96.3	0	0	96.5	0	0	0	0	0	0	97.5	100	0	97.6	96.3
Trucks	3	0	4	0	7	4	7	0	0	11	0	0	0	0	0	0	4	0	0	4	22
% Trucks	20.0	0	4.2	0	6.3	3.2	3.7	0	0	3.5	0	0	0	0	0	0	2.5	0	0	2.4	3.7

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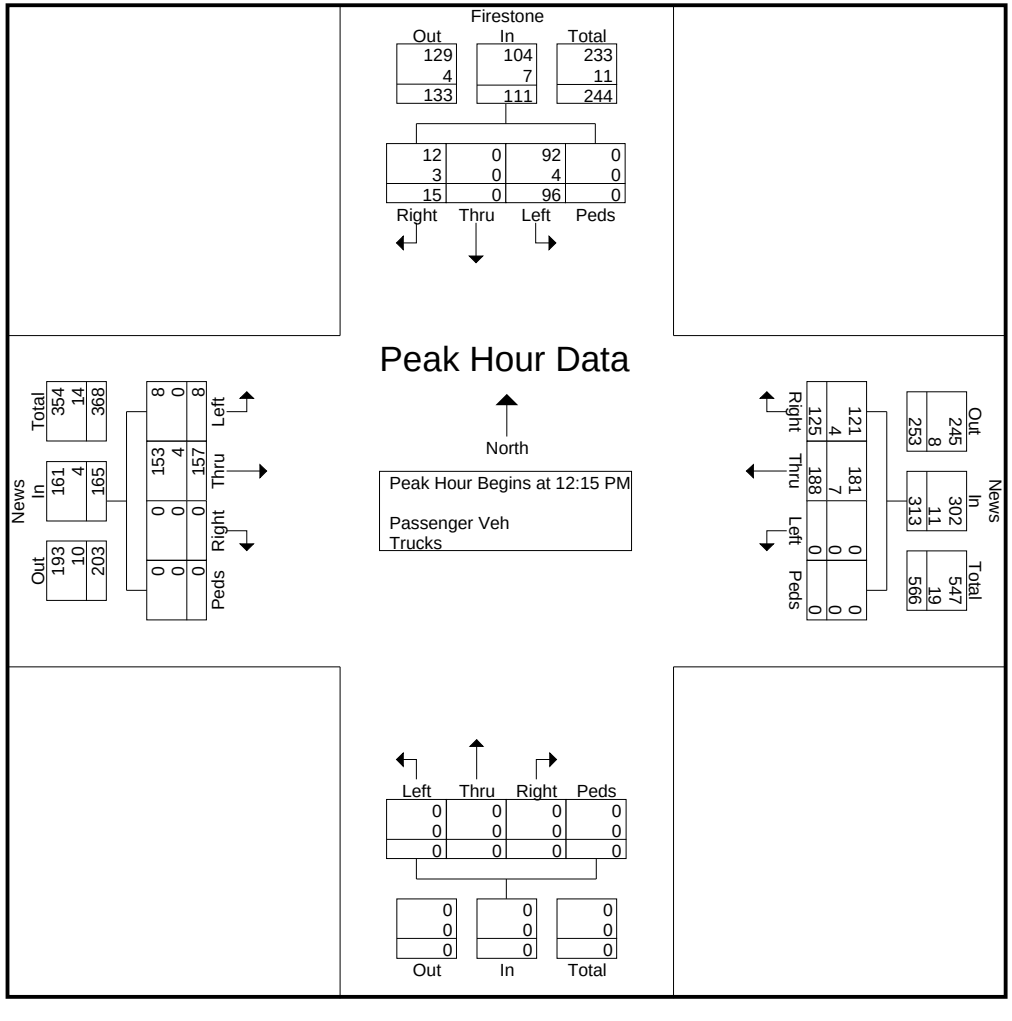

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	Firestone From North					News From East					From South					News From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 03:15 PM																					
03:15 PM	1	0	**24**	0	**25**	38	56	0	0	**94**	0	0	0	0	0	0	35	0	0	35	154
03:30 PM	2	0	19	0	21	34	**60**	0	0	94	0	0	0	0	0	0	**64**	**8**	0	**72**	**187**
03:45 PM	3	0	20	0	23	24	56	0	0	80	0	0	0	0	0	0	44	3	0	47	150
04:00 PM	**4**	0	14	0	18	**39**	51	0	0	90	0	0	0	0	0	0	52	5	0	57	165
Total Volume	10	0	77	0	87	135	223	0	0	358	0	0	0	0	0	0	195	16	0	211	656
% App. Total	11.5	0	88.5	0		37.7	62.3	0	0		0	0	0	0		0	92.4	7.6	0		
PHF	.625	.000	.802	.000	.870	.865	.929	.000	.000	.952	.000	.000	.000	.000	.000	.000	.762	.500	.000	.733	.877
Passenger Veh	10	0	76	0	86	135	218	0	0	353	0	0	0	0	0	0	184	14	0	198	637
% Passenger Veh	100	0	98.7	0	98.9	100	97.8	0	0	98.6	0	0	0	0	0	0	94.4	87.5	0	93.8	97.1
Trucks	0	0	1	0	1	0	5	0	0	5	0	0	0	0	0	0	11	2	0	13	19
% Trucks	0	0	1.3	0	1.1	0	2.2	0	0	1.4	0	0	0	0	0	0	5.6	12.5	0	6.2	2.9

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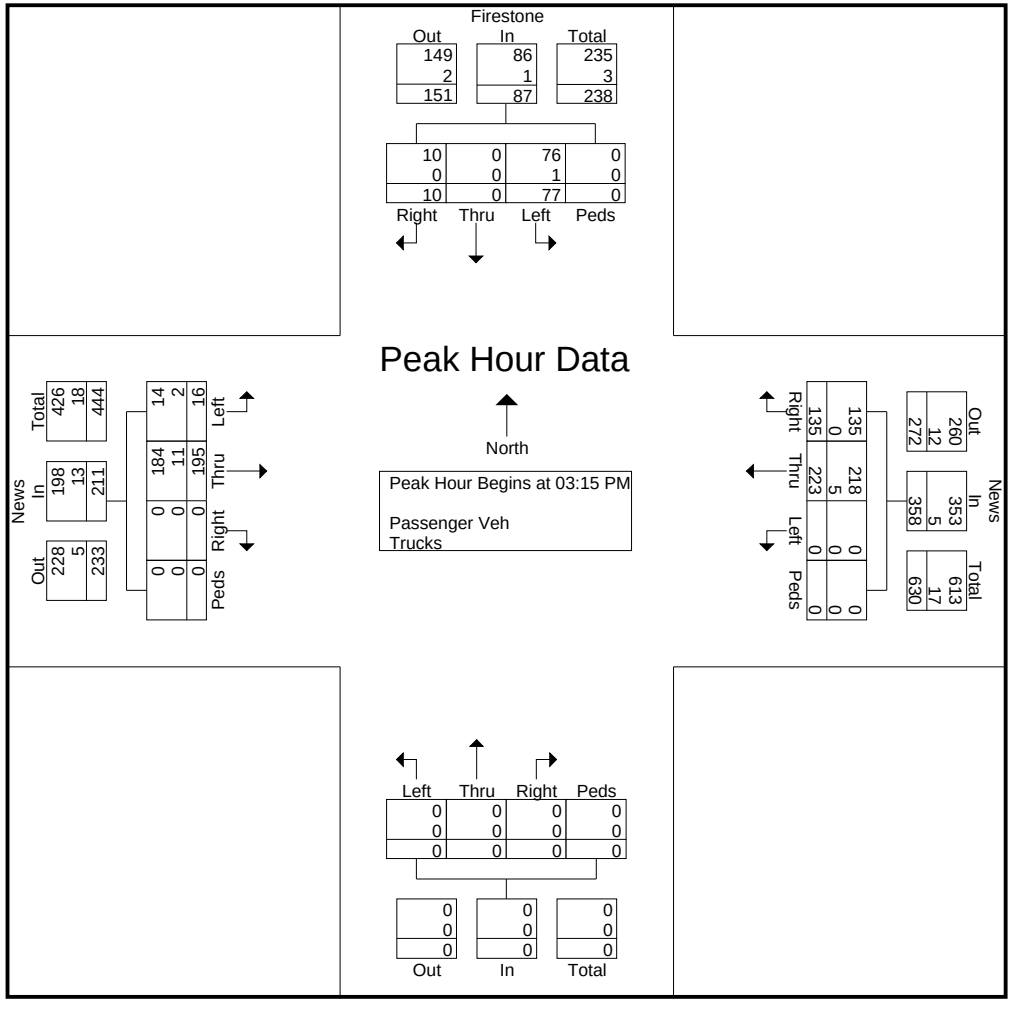


Appendix C: Volume Worksheets

VOLUME DEVELOPMENT SHEET

Longhill Road at Williamsburg W. Drive/Lane Place Drive
AM Peak Hour
(7:30 AM to 8:30 AM)

Description		Longhill Road Eastbound			Longhill Road Westbound			Williamsburg W. Drive Northbound			Lane Place Drive Southbound		
		Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
2017	**Counts**												
	Cars	3	727	21	41	449	15	39	2	223	54	1	16
	Trucks	0	15	0	2	18	3	3	1	1	2	0	2
Total Existing 2017 Traffic		3	742	21	43	467	18	42	3	224	56	1	18
	Truck %	0%	2%	0%	5%	4%	17%	7%	33%	0%	4%	0%	11%
	PHF	0.88											
	Growth Rate	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Existing													
2019	**Existing**	3	772	22	45	486	19	44	3	233	58	1	19
	Growth Rate	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Background Traffic													
	Westport												
	Entering Distribution					26%							
	Exiting Distribution		25%										
	Entering Assignment					2							
	Exiting Assignment		7										
	Windsor												
	Entering Distribution					60%							
	Exiting Distribution		60%										
	Entering Assignment					2							
	Exiting Assignment		7										
	The Village												
	Entering Distribution					8%							
	Exiting Distribution		4%										
	Entering Assignment					4							
	Exiting Assignment		2										
2021	**No Build**	3	819	23	47	514	20	46	3	242	60	1	20
2027	**No Build**	4	920	26	53	577	22	52	4	273	68	1	22
	Proposed Trips												
	Entering Distribution					60%							
	Exiting Distribution		60%										
	Entering Assignment					4							
	Exiting Assignment		13										
	Proposed + Background												
2021 Total Traffic		3	832	23	47	518	20	46	3	242	60	1	20
2027 Total Traffic		4	933	26	53	581	22	52	4	273	68	1	22

PM Peak Hour
(4:45 PM to 5:45 PM)

Description		Longhill Road Eastbound			Longhill Road Westbound			Williamsburg W. Drive Northbound			Lane Place Drive Southbound		
		Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
2017	**Counts**												
	Cars	17	716	35	206	967	38	49	0	132	23	0	13
	Trucks	0	19	0	0	10	0	1	0	4	0	0	1
Total Existing 2017 Traffic		17	735	35	206	977	38	50	0	136	23	0	14
	Truck %	0%	3%	0%	0%	1%	0%	2%	-	3%	0%	-	7%
	PHF	0.95											
	Growth Rate	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Existing													
2019	**Existing**	18	765	36	214	1,016	40	52	0	141	24	0	15
	Growth Rate	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Background Traffic													
	Westport												
	Entering Distribution					25%							
	Exiting Distribution		28%										
	Entering Assignment					7							
	Exiting Assignment		5										
	Windsor												
	Entering Distribution					55%							
	Exiting Distribution		55%										
	Entering Assignment					7							
	Exiting Assignment		4										
	The Village												
	Entering Distribution					5%							
	Exiting Distribution		5%										
	Entering Assignment					4							
	Exiting Assignment		4										
2021	**No Build**	19	809	37	223	1,075	42	54	0	147	25	0	16
2027	**No Build**	21	909	42	251	1,209	47	61	0	165	28	0	18
	Proposed Trips												
	Entering Distribution					55%							
	Exiting Distribution		55%										
	Entering Assignment					13							
	Exiting Assignment		8										
	Proposed + Background												
2021 Total Traffic		19	817	37	223	1,088	42	54	0	147	25	0	16
2027 Total Traffic		21	917	42	251	1,222	47	61	0	165	28	0	18

VOLUME DEVELOPMENT SHEET

Longhill Road at Ford's Colony Drive
AM Peak Hour
(7:30 AM to 8:30 AM)

Description	Longhill Road Eastbound			Longhill Road Westbound			Fords Colony Drive Northbound			Dominion Village Entrance Southbound		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
2017 Counts												
Cars	3	277	34	103	247	1	63	1	130	0	1	0
Trucks	0	16	2	3	19	0	7	0	0	0	0	0
Total Existing 2017 Traffic	3	293	36	106	266	1	70	1	130	0	1	0
Truck %	0%	5%	6%	3%	7%	0%	10%	0%	0%	-	0%	-
PHF	0.83											
Growth Rate	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Existing												
2019 Existing	3	305	37	110	277	1	73	1	135	0	1	0
Growth Rate	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Background Traffic												
Westport												
Entering Distribution					26%							
Exiting Distribution		25%										
Entering Assignment					2							
Exiting Assignment		7										
Windsor												
Entering Distribution			20%	60%								
Exiting Distribution							20%		60%			
Entering Assignment			1	2								
Exiting Assignment							2		7			
The Village												
Entering Distribution					8%							
Exiting Distribution		4%										
Entering Assignment					4							
Exiting Assignment		2										
2021 No Build	3	326	39	116	294	1	78	1	148	0	1	0
2027 No Build	4	366	44	131	331	1	88	1	165	0	1	0
Proposed Trips												
Entering Distribution			20%	60%								
Exiting Distribution							20%		60%			
Entering Assignment			1	4								
Exiting Assignment							4		13			
Proposed + Background												
2021 Total Traffic	3	326	40	120	294	1	82	1	161	0	1	0
2027 Total Traffic	4	366	45	135	331	1	92	1	178	0	1	0

PM Peak Hour
(4:45 PM to 5:45 PM)

Description	Longhill Road Eastbound			Longhill Road Westbound			Fords Colony Drive Northbound			Dominion Village Entrance Southbound		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
2017 Counts												
Cars	0	337	53	192	277	2	45	2	119	4	0	5
Trucks	0	3	0	0	5	0	0	1	2	0	0	0
Total Existing 2017 Traffic	0	340	53	192	282	2	45	3	121	4	0	5
Truck %	-	1%	0%	0%	2%	0%	0%	33%	2%	0%	-	0%
PHF	0.94											
Growth Rate	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Existing												
2019 Existing	0	354	55	200	293	2	47	3	126	4	0	5
Growth Rate	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Background Traffic												
Westport												
Entering Distribution					25%							
Exiting Distribution		28%										
Entering Assignment					7							
Exiting Assignment		5										
Windsor												
Entering Distribution			15%	55%								
Exiting Distribution							15%		55%			
Entering Assignment			2	7								
Exiting Assignment							1		4			
The Village												
Entering Distribution					5%							
Exiting Distribution		5%										
Entering Assignment					4							
Exiting Assignment		4										
2021 No Build	0	377	59	215	316	2	50	3	135	4	0	5
2027 No Build	0	424	66	242	354	2	56	4	152	5	0	6
Proposed Trips												
Entering Distribution			15%	55%								
Exiting Distribution							15%		55%			
Entering Assignment			4	13								
Exiting Assignment							2		8			
Proposed + Background												
2021 Total Traffic	0	377	63	228	316	2	52	3	143	4	0	5
2027 Total Traffic	0	424	70	255	354	2	58	4	160	5	0	6

VOLUME DEVELOPMENT SHEET

Centerville Road at Manchester Drive
AM Peak Hour
(7:30 AM to 8:30 AM)

Description	Westport Eastbound			Manchester Drive Westbound			Centerville Road Northbound			Centerville Road Southbound		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
2017 Counts												
Cars	4	1	2	52	0	45	2	310	32	42	193	1
Trucks	0	0	0	2	0	2	0	27	11	8	17	2
Total Existing 2017 Traffic	4	1	2	54	0	47	2	337	43	50	210	3
Truck %	0%	0%	0%	4%	-	4%	0%	8%	26%	16%	8%	67%
PHF	0.91											
Growth Rate	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%
Existing												
2019 Existing	4	1	2	57	0	49	2	354	45	53	221	3
Growth Rate	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%
Background Traffic												
Westport												
Entering Distribution							*25%*					*75%*
Exiting Distribution	72%		28%									
Entering Assignment							*2*					*7*
Exiting Assignment	19		7									
Windsor												
Entering Distribution									*15%*	*5%*		
Exiting Distribution				15%		5%						
Entering Assignment									*1*	*0*		
Exiting Assignment				2		1						
The Village												
Entering Distribution											*22%*	
Exiting Distribution								12%				
Entering Assignment											*11*	
Exiting Assignment								6				
2021 No Build	23	1	9	62	0	52	4	378	48	56	243	10
2027 No Build	24	1	10	71	0	61	4	437	55	65	280	11
Proposed Trips												
Entering Distribution									*15%*	*5%*		
Exiting Distribution				15%		5%						
Entering Assignment									*1*	*0*		
Exiting Assignment				3		1						
Proposed + Background												
2021 Total Traffic	23	1	9	65	0	53	4	378	49	56	243	10
2027 Total Traffic	24	1	10	74	0	62	4	437	56	65	280	11

PM Peak Hour
(4:45 PM to 5:45 PM)

Description	Westport Eastbound			Manchester Drive Westbound			Centerville Road Northbound			Centerville Road Southbound		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
2017 Counts												
Cars	3	1	2	47	0	27	2	281	62	23	233	2
Trucks	0	0	0	0	0	1	0	9	2	0	4	0
Total Existing 2017 Traffic	3	1	2	47	0	28	2	290	64	23	237	2
Truck %	0%	0%	0%	0%	-	4%	0%	3%	3%	0%	2%	0%
PHF	0.95											
Growth Rate	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%
Existing												
2019 Existing	3	1	2	49	0	29	2	305	67	24	249	2
Growth Rate	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%
Background Traffic												
Westport												
Entering Distribution							*29%*					*71%*
Exiting Distribution	79%		21%									
Entering Assignment							*8*					*20*
Exiting Assignment	13		4									
Windsor												
Entering Distribution									*30%*			
Exiting Distribution				30%								
Entering Assignment									*4*			
Exiting Assignment				5								
The Village												
Entering Distribution											*13%*	
Exiting Distribution								14%				
Entering Assignment											*11*	
Exiting Assignment								11				
2021 No Build	16	1	6	56	0	30	10	331	74	25	273	22
2027 No Build	17	1	6	64	0	35	10	383	86	29	314	22
Proposed Trips												
Entering Distribution									*30%*			
Exiting Distribution				30%								
Entering Assignment									*7*			
Exiting Assignment				4								
Proposed + Background												
2021 Total Traffic	16	1	6	60	0	30	10	331	81	25	273	22
2027 Total Traffic	17	1	6	68	0	35	10	383	93	29	314	22

VOLUME DEVELOPMENT SHEET

Firestone Drive at News Road
AM Peak Hour
(7:30 AM to 8:30 AM)

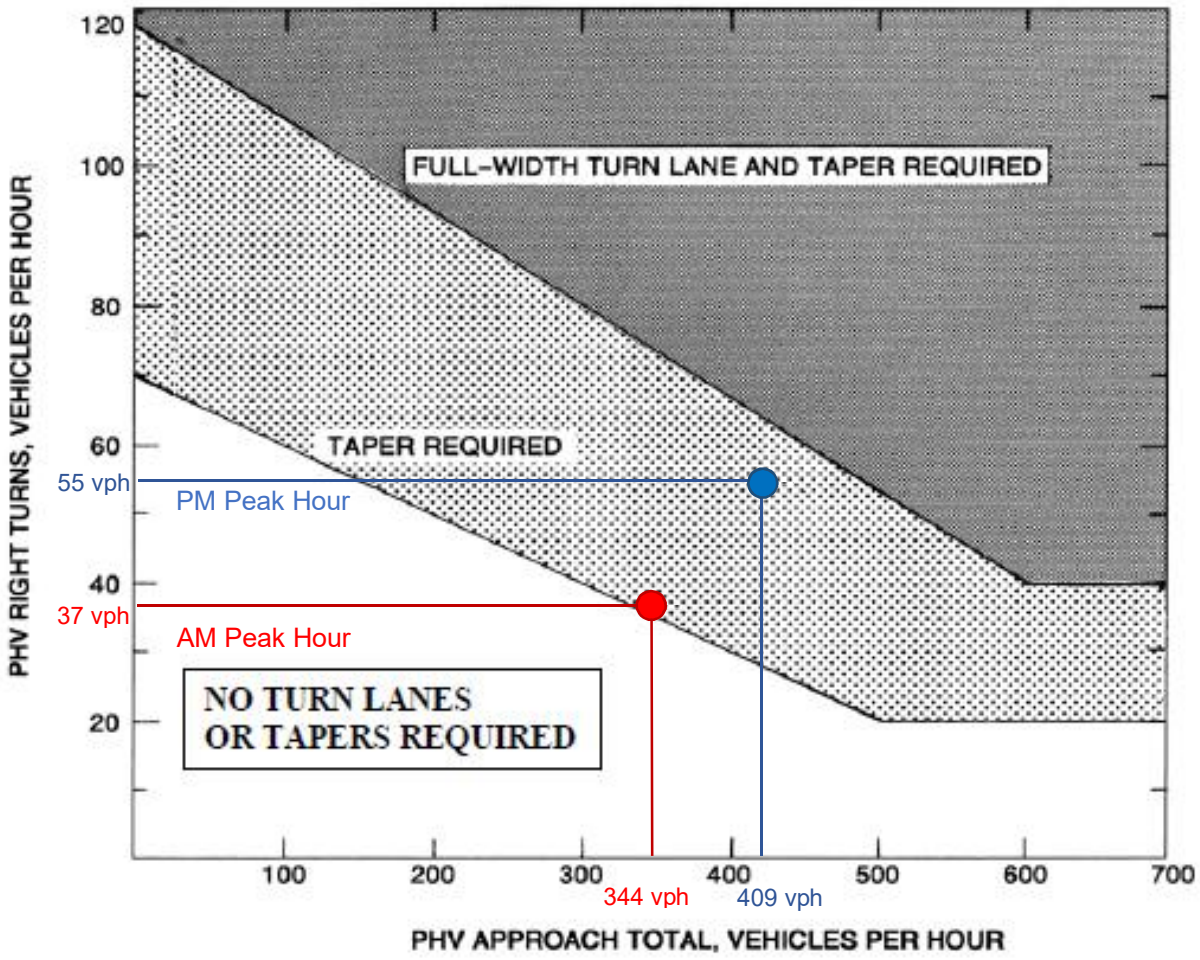
Description	News Road Eastbound			News Road Westbound			Proposed Entrance Northbound			Firestone Drive Southbound		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
2017 Counts												
Cars	8	182	0	0	109	42	-	-	-	85	0	17
Trucks	2	6	0	0	16	1	-	-	-	0	0	0
Total Existing 2017 Traffic	10	188	0	0	125	43	0	0	0	85	0	17
Truck %	20%	3%	-	-	13%	2%	-	-	-	0%	-	0%
PHF	0.95											
Growth Rate	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Existing												
2019 Existing	10	196	0	0	130	45	0	0	0	88	0	18
Growth Rate	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Background Traffic												
Westport												
Entering Distribution					*20%*							
Exiting Distribution		25%										
Entering Assignment					*2*							
Exiting Assignment		7										
Windsor												
Entering Distribution					*10%*							
Exiting Distribution		10%										
Entering Assignment					*0*							
Exiting Assignment		1										
The Village												
Entering Distribution			*37%*	*63%*								
Exiting Distribution							27%		73%			
Entering Assignment			*18*	*31*								
Exiting Assignment							14		38			
2021 No Build	10	212	18	31	137	47	14	0	38	92	0	19
2027 No Build	12	237	18	31	154	53	14	0	38	103	0	21
Proposed Trips												
Entering Distribution					*10%*							
Exiting Distribution		10%										
Entering Assignment					*1*							
Exiting Assignment		2										
Proposed + Background												
2021 Total Traffic	10	214	18	31	138	47	14	0	38	92	0	19
2027 Total Traffic	12	239	18	31	155	53	14	0	38	103	0	21

PM Peak Hour
(4:45 PM to 5:45 PM)

Description	News Road Eastbound			News Road Westbound			Proposed Entrance Northbound			Firestone Drive Southbound		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
2017 Counts												
Cars	8	144	0	0	243	112	-	-	-	64	0	7
Trucks	0	3	0	0	4	0	-	-	-	1	0	0
Total Existing 2017 Traffic	8	147	0	0	247	112	0	0	0	65	0	7
Truck %	0%	2%	-	-	2%	0%	-	-	-	2%	-	0%
PHF	0.96											
Growth Rate	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Existing												
2019 Existing	8	153	0	0	257	117	0	0	0	68	0	7
Growth Rate	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Background Traffic												
Westport												
Entering Distribution					*25%*							
Exiting Distribution		20%										
Entering Assignment					*7*							
Exiting Assignment		3										
Windsor												
Entering Distribution					*30%*							
Exiting Distribution		30%										
Entering Assignment					*4*							
Exiting Assignment		2										
The Village												
Entering Distribution			*28%*	*72%*								
Exiting Distribution							29%		71%			
Entering Assignment			*23*	*59*								
Exiting Assignment							23		56			
2021 No Build	8	164	23	59	278	122	23	0	56	71	0	7
2027 No Build	9	182	23	59	308	137	23	0	56	80	0	8
Proposed Trips												
Entering Distribution					*30%*							
Exiting Distribution		30%										
Entering Assignment					*7*							
Exiting Assignment		4										
Proposed + Background												
2021 Total Traffic	8	168	23	59	285	122	23	0	56	71	0	7
2027 Total Traffic	9	186	23	59	315	137	23	0	56	80	0	8

Appendix D: Turn Lane and Signal Warrant Worksheets

2019 Existing Conditions – Longhill Road EBRT



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

For posted speeds at or under 45 mph, PHV right turns > 40, and PHV total < 300.
Adjusted right turns = PHV Right Turns - 20
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

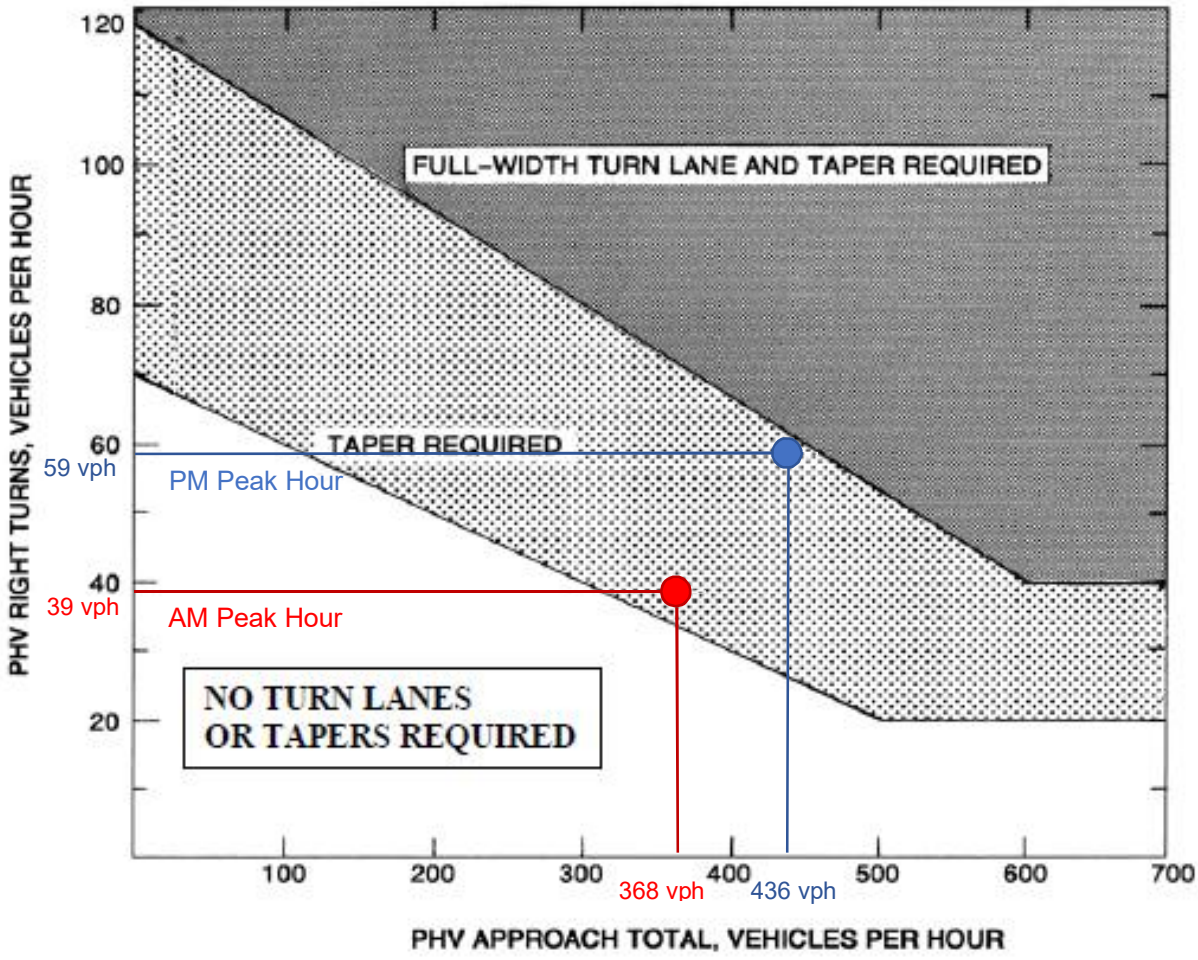
Note: An average of 11% for K x D will suffice.

When right turn facilities are warranted, see Figure 3-1 for design criteria.*

FIGURE 3-26 WARRANTS FOR RIGHT TURN TREATMENT (2-LANE HIGHWAY)

* Rev. 1/15

2021 No Build Conditions – Longhill Road EBRT



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

For posted speeds at or under 45 mph, PHV right turns > 40, and PHV total < 300.
Adjusted right turns = PHV Right Turns - 20
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

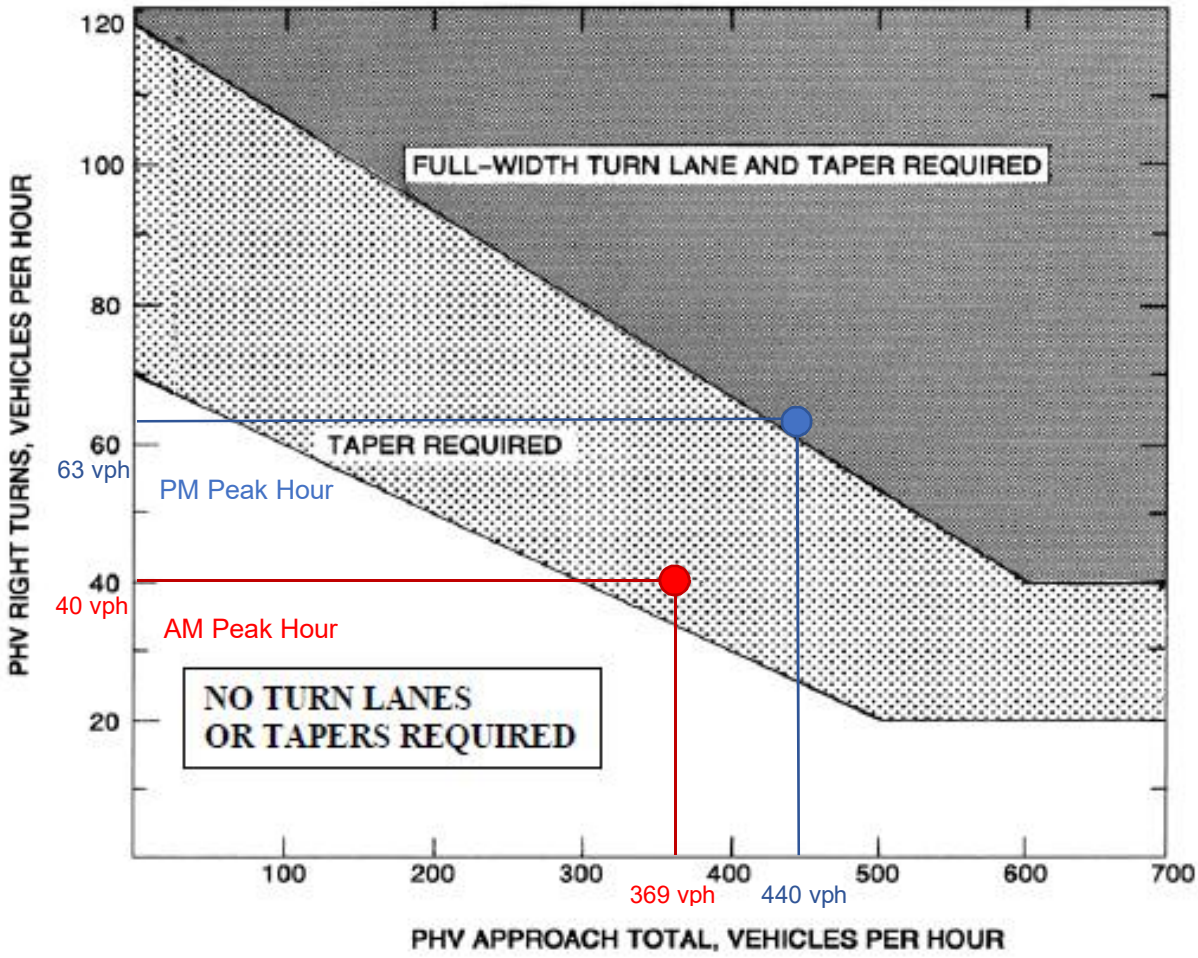
Note: An average of 11% for K x D will suffice.

When right turn facilities are warranted, see Figure 3-1 for design criteria.*

FIGURE 3-26 WARRANTS FOR RIGHT TURN TREATMENT (2-LANE HIGHWAY)

* Rev. 1/15

2021 Build Conditions – Longhill Road EBRT



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

For posted speeds at or under 45 mph, PHV right turns > 40, and PHV total < 300.
Adjusted right turns = PHV Right Turns - 20
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

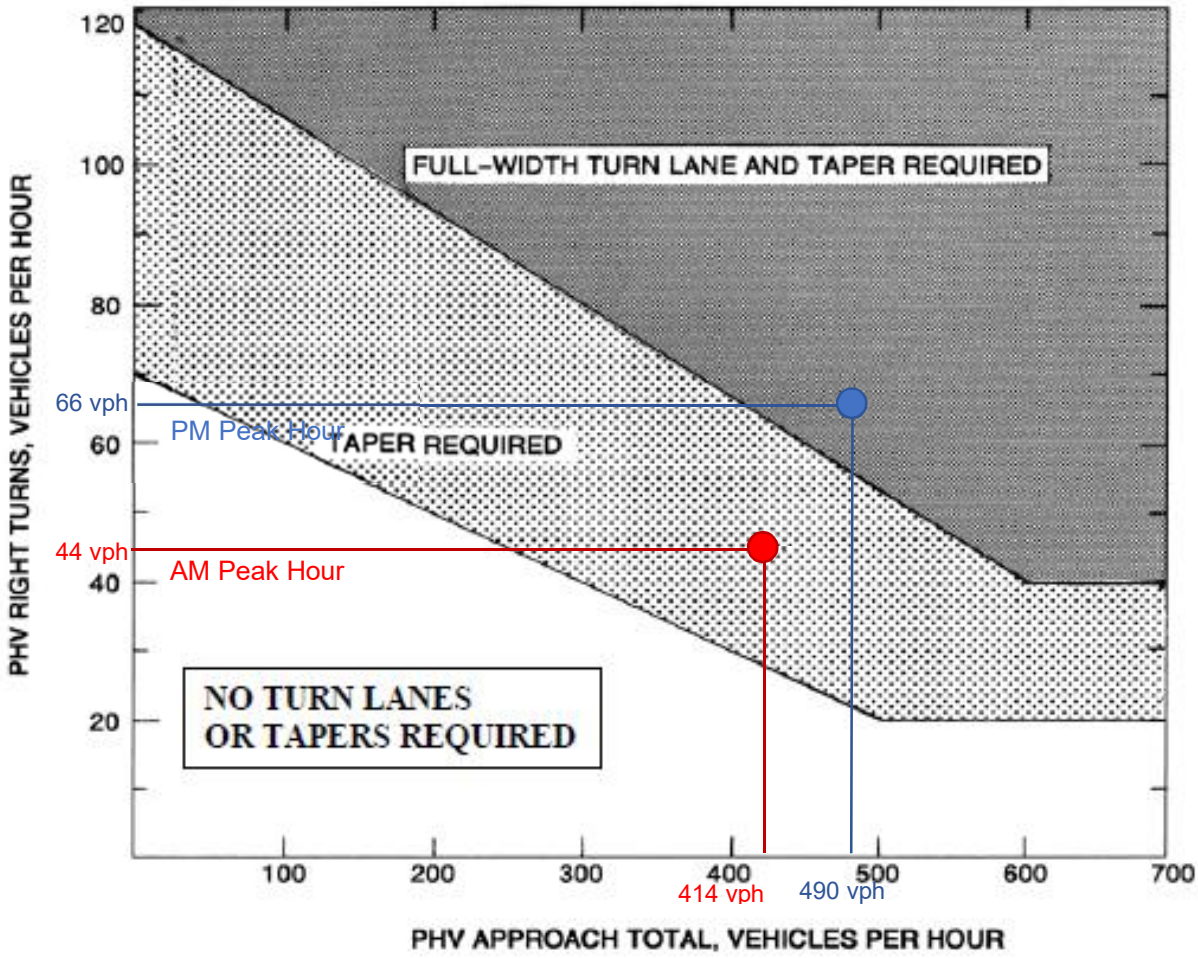
Note: An average of 11% for K x D will suffice.

When right turn facilities are warranted, see Figure 3-1 for design criteria.*

FIGURE 3-26 WARRANTS FOR RIGHT TURN TREATMENT (2-LANE HIGHWAY)

* Rev. 1/15

2027 No Build Conditions – Longhill Road EBRT



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

For posted speeds at or under 45 mph, PHV right turns > 40, and PHV total < 300.
Adjusted right turns = PHV Right Turns - 20
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

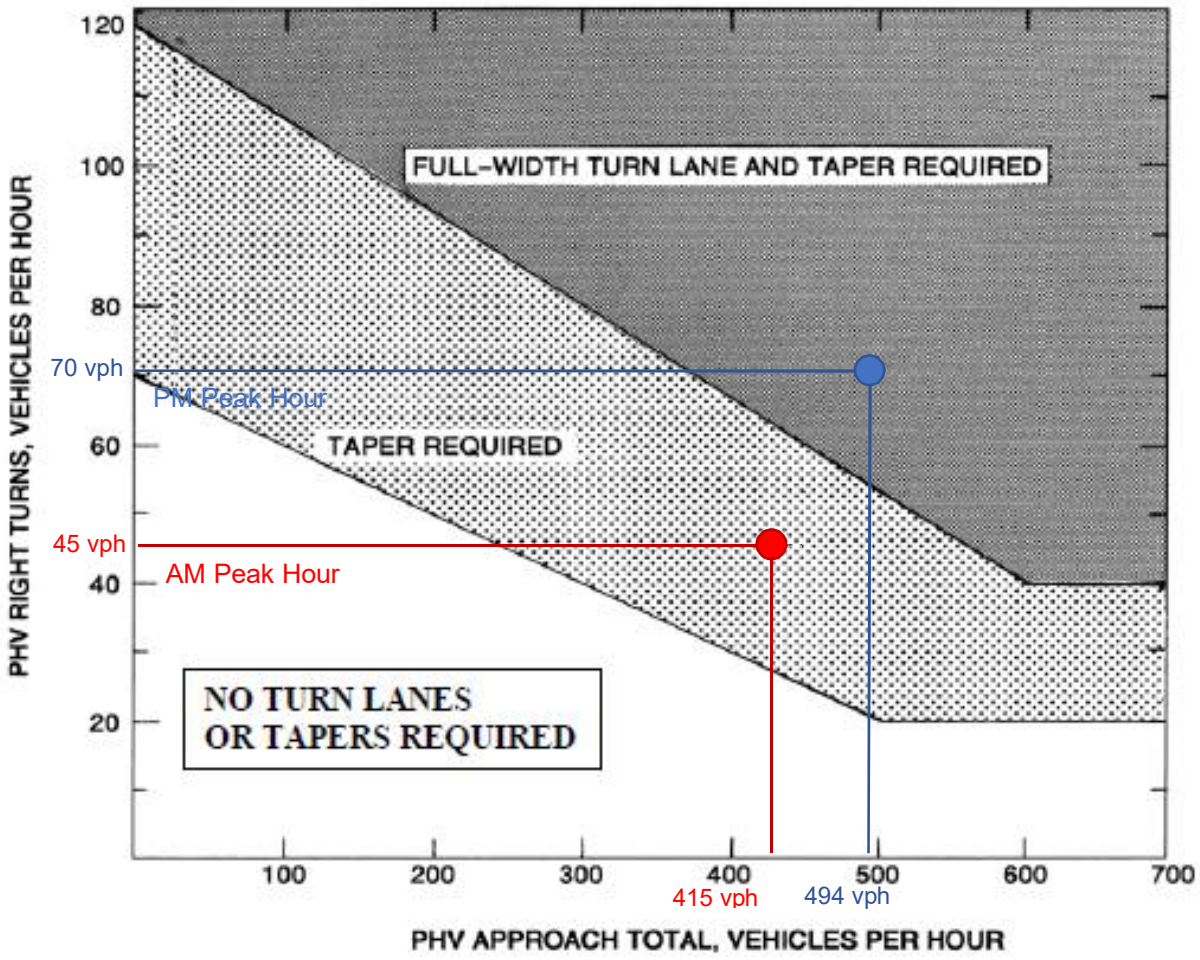
Note: An average of 11% for K x D will suffice.

When right turn facilities are warranted, see Figure 3-1 for design criteria.*

FIGURE 3-26 WARRANTS FOR RIGHT TURN TREATMENT (2-LANE HIGHWAY)

* Rev. 1/15

2027 Build Conditions – Longhill Road EBRT



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

For posted speeds at or under 45 mph, PHV right turns > 40, and PHV total < 300.
Adjusted right turns = PHV Right Turns - 20
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 3-26 WARRANTS FOR RIGHT TURN TREATMENT (2-LANE HIGHWAY)

* Rev. 1/15

Firestone Drive at News Road

Firestone Drive Traffic Signal Warrant Analysis

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: Firestone Drive at News Road

COUNT DATE: 6/8/2017

INTERSECTION CONDITION: 2019 Existing (No SBR or WBR)

MAJOR STREET: News Road — # OF APPROACH LANES: 2

MINOR STREET: Firestone Drive — # OF APPROACH LANES: 1

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): N

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): Y

	MAJOR ST	MINOR ST		WARRANT 1, Condition A			WARRANT 1, Condition B			WARRANT 1, Combination Warrant						WARRANT 2	WARRANT 3
										CONDITION A			CONDITION B				
	BOTH APPROACHES	HIGHEST APPROACH		MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES	EB/WB	SB	NB	420	105		630	53		336	84		504	42			
06:00 AM TO 07:00 AM	125	**42**	0											Y			
07:00 AM TO 08:00 AM	304	**72**	0					Y						Y			
08:00 AM TO 09:00 AM	360	**94**	0					Y		Y	Y	**Y**		Y			
09:00 AM TO 10:00 AM	311	**87**	0					Y			Y			Y			
10:00 AM TO 11:00 AM	285	**110**	0		Y			Y			Y			Y			
11:00 AM TO 12:00 AM	316	**104**	0					Y			Y			Y			
12:00 PM TO 01:00 PM	338	**83**	0					Y		Y				Y			
01:00 PM TO 02:00 PM	321	**114**	0		Y			Y			Y			Y			
02:00 PM TO 03:00 PM	394	**112**	0		Y			Y		Y	Y	**Y**		Y			
03:00 PM TO 04:00 PM	425	**81**	0	Y				Y		Y				Y			
04:00 PM TO 05:00 PM	428	**65**	0	Y				Y		Y				Y			
05:00 PM TO 06:00 PM	419	**74**	0					Y		Y				Y			
	0	**0**	**0**														
	0	0	0														
	0	0	0														
	0	0	0														
	4,026	1,038	0			**0**			**0**			**2**			**0**	**0**	**0**
				8 HOURS NEEDED			8 HOURS NEEDED			8 HOURS OF BOTH COND. A AND COND. B NEEDED						4 HRS NEEDED	1 HR NEEDED
				NOT SATISFIED			**NOT SATISFIED**			**NOT SATISFIED**						**NOT SATISFIED**	**NOT SATISFIED**

WARRANT 1 -- Eight-Hour Vehicular Volume Warrant
- Condition A : Minimum Vehicular Volume
- Condition B : Interruption of Continuous Traffic
- Combination : Combination of Condition A and Condition B

WARRANT 2 -- Four-Hour Vehicular Volume Warrant

WARRANT 3 -- Peak Hour Warrant

Firestone Drive Traffic Signal Warrant Analysis

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: Firestone Drive at News Road

COUNT DATE: 6/8/2017

INTERSECTION CONDITION: 2021 No Build (No SBR, WBR, or NBR)

MAJOR STREET: News Road — # OF APPROACH LANES: 2

MINOR STREET: Firestone Drive/The Villages Driveway — # OF APPROACH LANES: 1

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): N

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): Y

	MAJOR ST	MINOR ST		WARRANT 1, Condition A			WARRANT 1, Condition B			WARRANT 1, Combination Warrant						WARRANT 2	WARRANT 3
										CONDITION A			CONDITION B				
	BOTH APPROACHES	HIGHEST APPROACH		MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES	EB/WB	SB	NB	420	105		630	53		336	84		504	42			
06:00 AM TO 07:00 AM	151	**42**	32											Y			
07:00 AM TO 08:00 AM	348	**72**	50					Y		Y				Y			
08:00 AM TO 09:00 AM	417	**94**	51					Y		Y	Y	**Y**		Y			
09:00 AM TO 10:00 AM	363	**87**	36					Y		Y	Y	**Y**		Y			
10:00 AM TO 11:00 AM	338	**110**	31		Y			Y		Y	Y	**Y**		Y			
11:00 AM TO 12:00 AM	374	**104**	32					Y		Y	Y	**Y**		Y			
12:00 PM TO 01:00 PM	393	**83**	32					Y		Y				Y			
01:00 PM TO 02:00 PM	377	**114**	34		Y			Y		Y	Y	**Y**		Y			
02:00 PM TO 03:00 PM	462	**112**	36	Y	Y	**Y**		Y		Y	Y	**Y**		Y			
03:00 PM TO 04:00 PM	504	**81**	38	Y				Y		Y			Y	Y	**Y**		
04:00 PM TO 05:00 PM	520	**65**	38	Y				Y		Y			Y	Y	**Y**		
05:00 PM TO 06:00 PM	518	**74**	39	Y				Y		Y			Y	Y	**Y**		
	0	**0**	**0**														
	0	0	0														
	0	0	0														
	0	0	0														
	4,765	1,038	449			**1**			**0**			**6**			**3**	**0**	**0**
				8 HOURS NEEDED			8 HOURS NEEDED			8 HOURS OF BOTH COND. A AND COND. B NEEDED						4 HRS NEEDED	1 HR NEEDED
				NOT SATISFIED			**NOT SATISFIED**			**NOT SATISFIED**						**NOT SATISFIED**	**NOT SATISFIED**

WARRANT 1 -- Eight-Hour Vehicular Volume Warrant
- Condition A : Minimum Vehicular Volume
- Condition B : Interruption of Continuous Traffic
- Combination : Combination of Condition A and Condition B

WARRANT 2 -- Four-Hour Vehicular Volume Warrant

WARRANT 3 -- Peak Hour Warrant

Firestone Drive Traffic Signal Warrant Analysis

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: Firestone Drive at News Road

COUNT DATE: 6/8/2017

INTERSECTION CONDITION: 2021 Build (No SBR, WBR,or NBR)

MAJOR STREET: News Road — # OF APPROACH LANES: 2

MINOR STREET: Firestone Drive/The Villages Driveway — # OF APPROACH LANES: 1

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): N

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): Y

	MAJOR ST	MINOR ST		WARRANT 1, Condition A			WARRANT 1, Condition B			WARRANT 1, Combination Warrant						WARRANT 2	WARRANT 3
										CONDITION A			CONDITION B				
	BOTH APPROACHES	HIGHEST APPROACH		MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES	EB/WB	SB	NB	420	105		630	53		336	84		504	42			
06:00 AM TO 07:00 AM	151	**43**	32											Y			
07:00 AM TO 08:00 AM	348	**74**	50					Y		Y				Y			
08:00 AM TO 09:00 AM	417	**96**	51					Y		Y	Y	**Y**		Y			
09:00 AM TO 10:00 AM	363	**88**	36					Y		Y	Y	**Y**		Y			
10:00 AM TO 11:00 AM	338	**111**	31		Y			Y		Y	Y	**Y**		Y			
11:00 AM TO 12:00 AM	374	**105**	32		Y			Y		Y	Y	**Y**		Y			
12:00 PM TO 01:00 PM	393	**84**	32					Y		Y	Y	**Y**		Y			
01:00 PM TO 02:00 PM	377	**115**	34		Y			Y		Y	Y	**Y**		Y			
02:00 PM TO 03:00 PM	462	**113**	36	Y	Y	**Y**		Y		Y	Y	**Y**		Y			
03:00 PM TO 04:00 PM	504	**82**	38	Y				Y		Y			Y	Y	**Y**		
04:00 PM TO 05:00 PM	520	**66**	38	Y				Y		Y			Y	Y	**Y**		
05:00 PM TO 06:00 PM	518	**75**	39	Y				Y		Y			Y	Y	**Y**		
	0	**0**	**0**														
	0	0	0														
	0	0	0														
	0	0	0														
	4,765	1,052	449			**1**			**0**			**7**			**3**	**0**	**0**
				8 HOURS NEEDED			8 HOURS NEEDED			8 HOURS OF BOTH COND. A AND COND. B NEEDED						4 HRS NEEDED	1 HR NEEDED
				NOT SATISFIED			**NOT SATISFIED**			**NOT SATISFIED**						**NOT SATISFIED**	**NOT SATISFIED**

WARRANT 1 -- Eight-Hour Vehicular Volume Warrant
- Condition A : Minimum Vehicular Volume
- Condition B : Interruption of Continuous Traffic
- Combination : Combination of Condition A and Condition B

WARRANT 2 -- Four-Hour Vehicular Volume Warrant

WARRANT 3 -- Peak Hour Warrant

Firestone Drive Traffic Signal Warrant Analysis

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: Firestone Drive at News Road

COUNT DATE: 6/8/2017

INTERSECTION CONDITION: 2027 No Build (No SBR, WBR, or NBR)

MAJOR STREET: News Road — # OF APPROACH LANES: 2

MINOR STREET: Firestone Drive/The Villages Driveway — # OF APPROACH LANES: 1

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): N

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): Y

	MAJOR ST	MINOR ST		WARRANT 1, Condition A			WARRANT 1, Condition B			WARRANT 1, Combination Warrant						WARRANT 2	WARRANT 3
										CONDITION A			CONDITION B				
	BOTH APPROACHES	HIGHEST APPROACH		MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES	EB/WB	SB	NB	420	105		630	53		336	84		504	42			
06:00 AM TO 07:00 AM	188	**42**	32											Y			
07:00 AM TO 08:00 AM	420	**72**	50	Y				Y		Y				Y			
08:00 AM TO 09:00 AM	511	**94**	51	Y				Y		Y	Y	**Y**	Y	Y	**Y**		
09:00 AM TO 10:00 AM	453	**87**	36	Y				Y		Y	Y	**Y**		Y			
10:00 AM TO 11:00 AM	429	**110**	31	Y	Y	**Y**		Y		Y	Y	**Y**		Y			
11:00 AM TO 12:00 AM	474	**104**	32	Y				Y		Y	Y	**Y**		Y			
12:00 PM TO 01:00 PM	515	**83**	32	Y				Y		Y			Y	Y	**Y**		
01:00 PM TO 02:00 PM	499	**114**	34	Y	Y	**Y**		Y		Y	Y	**Y**		Y			
02:00 PM TO 03:00 PM	609	**112**	36	Y	Y	**Y**		Y		Y	Y	**Y**	Y	Y	**Y**		
03:00 PM TO 04:00 PM	679	**81**	38	Y			Y	Y	**Y**	Y			Y	Y	**Y**		
04:00 PM TO 05:00 PM	720	**65**	38	Y			Y	Y	**Y**	Y			Y	Y	**Y**		
05:00 PM TO 06:00 PM	733	**74**	39	Y			Y	Y	**Y**	Y			Y	Y	**Y**		
	0	**0**	**0**														
	0	0	0														
	0	0	0														
	0	0	0														
	6,230	1,038	449			**3**			**3**			**6**			**6**	**0**	**0**
				8 HOURS NEEDED			8 HOURS NEEDED			8 HOURS OF BOTH COND. A AND COND. B NEEDED						4 HRS NEEDED	1 HR NEEDED
				NOT SATISFIED			**NOT SATISFIED**			**NOT SATISFIED**						**NOT SATISFIED**	**NOT SATISFIED**

WARRANT 1 -- Eight-Hour Vehicular Volume Warrant
- Condition A : Minimum Vehicular Volume
- Condition B : Interruption of Continuous Traffic
- Combination : Combination of Condition A and Condition B

WARRANT 2 -- Four-Hour Vehicular Volume Warrant

WARRANT 3 -- Peak Hour Warrant

Firestone Drive Traffic Signal Warrant Analysis

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: Firestone Drive at News Road

COUNT DATE: 6/8/2017

INTERSECTION CONDITION: 2027 Build (No SBR, WBR, or NBR)

MAJOR STREET: News Road — # OF APPROACH LANES: 2

MINOR STREET: Firestone Drive/The Villages Driveway — # OF APPROACH LANES: 1

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): N

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): Y

	MAJOR ST	MINOR ST		WARRANT 1, Condition A			WARRANT 1, Condition B			WARRANT 1, Combination Warrant						WARRANT 2	WARRANT 3
										CONDITION A			CONDITION B				
	BOTH APPROACHES	HIGHEST APPROACH		MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES	EB/WB	SB	NB	420	105		630	53		336	84		504	42			
06:00 AM TO 07:00 AM	188	**43**	32											Y			
07:00 AM TO 08:00 AM	420	**74**	50	Y				Y		Y				Y			
08:00 AM TO 09:00 AM	511	**96**	51	Y				Y		Y	Y	**Y**	Y	Y	**Y**		
09:00 AM TO 10:00 AM	453	**88**	36	Y				Y		Y	Y	**Y**		Y			
10:00 AM TO 11:00 AM	429	**111**	31	Y	Y	**Y**		Y		Y	Y	**Y**		Y			
11:00 AM TO 12:00 AM	474	**105**	32	Y	Y	**Y**		Y		Y	Y	**Y**		Y			
12:00 PM TO 01:00 PM	515	**84**	32	Y				Y		Y	Y	**Y**	Y	Y	**Y**		
01:00 PM TO 02:00 PM	499	**115**	34	Y	Y	**Y**		Y		Y	Y	**Y**		Y			
02:00 PM TO 03:00 PM	609	**113**	36	Y	Y	**Y**		Y		Y	Y	**Y**	Y	Y	**Y**		
03:00 PM TO 04:00 PM	679	**82**	38	Y			Y	Y	**Y**	Y			Y	Y	**Y**		
04:00 PM TO 05:00 PM	720	**66**	38	Y			Y	Y	**Y**	Y			Y	Y	**Y**		
05:00 PM TO 06:00 PM	733	**75**	39	Y			Y	Y	**Y**	Y			Y	Y	**Y**		
	0	**0**	**0**														
	0	0	0														
	0	0	0														
	0	0	0														
	6,230	1,052	449			**4**			**3**			**7**			**6**	**0**	**0**
				8 HOURS NEEDED			8 HOURS NEEDED			8 HOURS OF BOTH COND. A AND COND. B NEEDED						4 HRS NEEDED	1 HR NEEDED
				NOT SATISFIED			**NOT SATISFIED**			**NOT SATISFIED**						**NOT SATISFIED**	**NOT SATISFIED**

WARRANT 1 -- Eight-Hour Vehicular Volume Warrant
- Condition A : Minimum Vehicular Volume
- Condition B : Interruption of Continuous Traffic
- Combination : Combination of Condition A and Condition B

WARRANT 2 -- Four-Hour Vehicular Volume Warrant

WARRANT 3 -- Peak Hour Warrant

Fords Colony Drive at Longhill Road

Fords Colony Drive Traffic Signal Warrant Analysis

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: Fords Colony Drive at Longhill Road

COUNT DATE: 6/8/2017

INTERSECTION CONDITION: 2019 Existing (No WBR or NBR)

MAJOR STREET: Longhill Road — # OF APPROACH LANES: 2

MINOR STREET: Fords Colony Drive — # OF APPROACH LANES: 1

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): N

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): Y

	MAJOR ST	MINOR ST		WARRANT 1, Condition A			WARRANT 1, Condition B			WARRANT 1, Combination Warrant						WARRANT 2	WARRANT 3
										CONDITION A			CONDITION B				
	BOTH APPROACHES	HIGHEST APPROACH		MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES	EB/WB	NB	SB	420	105		630	53		336	84		504	42			
06:00 AM TO 07:00 AM	234	**15**	2														
07:00 AM TO 08:00 AM	604	**52**	2	Y						Y			Y	Y	**Y**		
08:00 AM TO 09:00 AM	771	**63**	2	Y			Y	Y	**Y**	Y			Y	Y	**Y**		
09:00 AM TO 10:00 AM	617	**44**	1	Y						Y			Y	Y	**Y**		
10:00 AM TO 11:00 AM	507	**66**	5	Y				Y		Y			Y	Y	**Y**		
11:00 AM TO 12:00 AM	573	**45**	6	Y						Y			Y	Y	**Y**		
12:00 PM TO 01:00 PM	598	**50**	5	Y						Y			Y	Y	**Y**		
01:00 PM TO 02:00 PM	551	**44**	12	Y						Y			Y	Y	**Y**		
02:00 PM TO 03:00 PM	763	**55**	8	Y			Y	Y	**Y**	Y			Y	Y	**Y**		
03:00 PM TO 04:00 PM	833	**75**	13	Y			Y	Y	**Y**	Y			Y	Y	**Y**	**Y**	
04:00 PM TO 05:00 PM	850	**56**	4	Y			Y	Y	**Y**	Y			Y	Y	**Y**		
05:00 PM TO 06:00 PM	865	**39**	8	Y			Y			Y			Y				
	0	**0**	**0**														
	0	0	0														
	0	0	0														
	0	0	0														
	7,766	604	68			**0**			**4**			**0**			**10**	**1**	**0**
				8 HOURS NEEDED			8 HOURS NEEDED			8 HOURS OF BOTH COND. A AND COND. B NEEDED						4 HRS NEEDED	1 HR NEEDED
				NOT SATISFIED			**NOT SATISFIED**			**NOT SATISFIED**						**NOT SATISFIED**	**NOT SATISFIED**

WARRANT 1 -- Eight-Hour Vehicular Volume Warrant
- Condition A : Minimum Vehicular Volume
- Condition B : Interruption of Continuous Traffic
- Combination : Combination of Condition A and Condition B

WARRANT 2 -- Four-Hour Vehicular Volume Warrant

WARRANT 3 -- Peak Hour Warrant

Fords Colony Drive Traffic Signal Warrant Analysis

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: Fords Colony Drive at Longhill Road

COUNT DATE: 6/8/2017

INTERSECTION CONDITION: 2021 No Build (No WBR or NBR)

MAJOR STREET: Longhill Road — # OF APPROACH LANES: 2

MINOR STREET: Fords Colony Drive — # OF APPROACH LANES: 1

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): N

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): Y

	MAJOR ST	MINOR ST		WARRANT 1, Condition A			WARRANT 1, Condition B			WARRANT 1, Combination Warrant						WARRANT 2	WARRANT 3
										CONDITION A			CONDITION B				
	BOTH APPROACHES	HIGHEST APPROACH		MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES	EB/WB	NB	SB	420	105		630	53		336	84		504	42			
06:00 AM TO 07:00 AM	268	18	2														
07:00 AM TO 08:00 AM	665	57	2	Y			Y	Y	Y	Y			Y	Y	Y		
08:00 AM TO 09:00 AM	843	69	2	Y			Y	Y	Y	Y			Y	Y	Y		
09:00 AM TO 10:00 AM	674	48	1	Y			Y			Y			Y	Y	Y		
10:00 AM TO 11:00 AM	560	71	5	Y				Y		Y			Y	Y	Y		
11:00 AM TO 12:00 AM	631	49	6	Y			Y			Y			Y	Y	Y		
12:00 PM TO 01:00 PM	656	54	5	Y			Y	Y	Y	Y			Y	Y	Y		
01:00 PM TO 02:00 PM	608	48	12	Y						Y			Y	Y	Y		
02:00 PM TO 03:00 PM	831	59	8	Y			Y	Y	Y	Y			Y	Y	Y		
03:00 PM TO 04:00 PM	909	80	14	Y			Y	Y	Y	Y			Y	Y	Y	Y	
04:00 PM TO 05:00 PM	932	60	4	Y			Y	Y	Y	Y			Y	Y	Y	Y	
05:00 PM TO 06:00 PM	950	43	8	Y			Y			Y			Y	Y	Y		
	0	0	0														
	0	0	0														
	0	0	0														
	0	0	0														
	8,527	656	69			0			6			0			11	2	0
				8 HOURS NEEDED			8 HOURS NEEDED			8 HOURS OF BOTH COND. A AND COND. B NEEDED						4 HRS NEEDED	1 HR NEEDED
				NOT SATISFIED			**NOT SATISFIED**			**NOT SATISFIED**						**NOT SATISFIED**	**NOT SATISFIED**

WARRANT 1 -- Eight-Hour Vehicular Volume Warrant
- Condition A : Minimum Vehicular Volume
- Condition B : Interruption of Continuous Traffic
- Combination : Combination of Condition A and Condition B

WARRANT 2 -- Four-Hour Vehicular Volume Warrant

WARRANT 3 -- Peak Hour Warrant

Fords Colony Drive Traffic Signal Warrant Analysis

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: Fords Colony Drive at Longhill Road

COUNT DATE: 6/8/2017

INTERSECTION CONDITION: 2021 Build (No WBR or NBR)

MAJOR STREET: Longhill Road — # OF APPROACH LANES: 2

MINOR STREET: Fords Colony Drive — # OF APPROACH LANES: 1

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): N

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): Y

	MAJOR ST	MINOR ST		WARRANT 1, Condition A			WARRANT 1, Condition B			WARRANT 1, Combination Warrant						WARRANT 2	WARRANT 3
										CONDITION A			CONDITION B				
	BOTH APPROACHES	HIGHEST APPROACH		MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES	EB/WB	NB	SB	420	105		630	53		336	84		504	42			
06:00 AM TO 07:00 AM	273	**23**	2														
07:00 AM TO 08:00 AM	673	**64**	2	Y			Y	Y	**Y**	Y			Y	Y	**Y**		
08:00 AM TO 09:00 AM	855	**77**	2	Y			Y	Y	**Y**	Y			Y	Y	**Y**	**Y**	
09:00 AM TO 10:00 AM	686	**53**	1	Y			Y	Y	**Y**	Y			Y	Y	**Y**		
10:00 AM TO 11:00 AM	573	**76**	5	Y				Y		Y			Y	Y	**Y**		
11:00 AM TO 12:00 AM	646	**54**	6	Y			Y	Y	**Y**	Y			Y	Y	**Y**		
12:00 PM TO 01:00 PM	671	**57**	5	Y			Y	Y	**Y**	Y			Y	Y	**Y**		
01:00 PM TO 02:00 PM	623	**52**	12	Y						Y			Y	Y	**Y**		
02:00 PM TO 03:00 PM	850	**63**	8	Y			Y	Y	**Y**	Y			Y	Y	**Y**		
03:00 PM TO 04:00 PM	932	**84**	14	Y			Y	Y	**Y**	Y	Y	**Y**	Y	Y	**Y**	**Y**	
04:00 PM TO 05:00 PM	960	**64**	4	Y			Y	Y	**Y**	Y			Y	Y	**Y**	**Y**	
05:00 PM TO 06:00 PM	982	**47**	8	Y			Y			Y			Y	Y	**Y**		
	0	**0**	**0**														
	0	0	0														
	0	0	0														
	0	0	0														
	8,724	714	69			**0**			**8**			**1**			**11**	**3**	**0**
				8 HOURS NEEDED			8 HOURS NEEDED			8 HOURS OF BOTH COND. A AND COND. B NEEDED						4 HRS NEEDED	1 HR NEEDED
				NOT SATISFIED			**SATISFIED**			**NOT SATISFIED**						**NOT SATISFIED**	**NOT SATISFIED**

WARRANT 1 -- Eight-Hour Vehicular Volume Warrant
- Condition A : Minimum Vehicular Volume
- Condition B : Interruption of Continuous Traffic
- Combination : Combination of Condition A and Condition B

WARRANT 2 -- Four-Hour Vehicular Volume Warrant

WARRANT 3 -- Peak Hour Warrant

Fords Colony Drive Traffic Signal Warrant Analysis

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: Fords Colony Drive at Longhill Road

COUNT DATE: 6/8/2017

INTERSECTION CONDITION: 2027 No Build (No WBR or NBR)

MAJOR STREET: Longhill Road — # OF APPROACH LANES: 2

MINOR STREET: Fords Colony Drive — # OF APPROACH LANES: 1

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): N

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): Y

	MAJOR ST	MINOR ST		WARRANT 1, Condition A			WARRANT 1, Condition B			WARRANT 1, Combination Warrant						WARRANT 2	WARRANT 3
										CONDITION A			CONDITION B				
	BOTH APPROACHES	HIGHEST APPROACH		MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES	EB/WB	NB	SB	420	105		630	53		336	84		504	42			
06:00 AM TO 07:00 AM	300	**20**	2														
07:00 AM TO 08:00 AM	743	**64**	2	Y			Y	Y	**Y**	Y			Y	Y	**Y**		
08:00 AM TO 09:00 AM	944	**77**	2	Y			Y	Y	**Y**	Y			Y	Y	**Y**	**Y**	
09:00 AM TO 10:00 AM	755	**54**	1	Y			Y	Y	**Y**	Y			Y	Y	**Y**		
10:00 AM TO 11:00 AM	626	**79**	6	Y				Y		Y			Y	Y	**Y**		
11:00 AM TO 12:00 AM	706	**55**	7	Y			Y	Y	**Y**	Y			Y	Y	**Y**		
12:00 PM TO 01:00 PM	734	**61**	6	Y			Y	Y	**Y**	Y			Y	Y	**Y**		
01:00 PM TO 02:00 PM	680	**54**	14	Y			Y	Y	**Y**	Y			Y	Y	**Y**		
02:00 PM TO 03:00 PM	931	**66**	9	Y			Y	Y	**Y**	Y			Y	Y	**Y**	**Y**	
03:00 PM TO 04:00 PM	1,018	**90**	15	Y			Y	Y	**Y**	Y	Y	**Y**	Y	Y	**Y**	**Y**	
04:00 PM TO 05:00 PM	1,043	**68**	5	Y			Y	Y	**Y**	Y			Y	Y	**Y**	**Y**	
05:00 PM TO 06:00 PM	1,064	**48**	9	Y			Y			Y			Y	Y	**Y**		
	0																
	0	0	0														
	0	0	0														
	0	0	0														
	9,544	736	78			**0**			**9**			**1**			**11**	**4**	**0**
				8 HOURS NEEDED			8 HOURS NEEDED			8 HOURS OF BOTH COND. A AND COND. B NEEDED						4 HRS NEEDED	1 HR NEEDED
				NOT SATISFIED			**SATISFIED**			**NOT SATISFIED**						**SATISFIED**	**NOT SATISFIED**

WARRANT 1 -- Eight-Hour Vehicular Volume Warrant
- Condition A : Minimum Vehicular Volume
- Condition B : Interruption of Continuous Traffic
- Combination : Combination of Condition A and Condition B

WARRANT 2 -- Four-Hour Vehicular Volume Warrant

WARRANT 3 -- Peak Hour Warrant

Fords Colony Drive Traffic Signal Warrant Analysis

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: Fords Colony Drive at Longhill Road

COUNT DATE: 6/8/2017

INTERSECTION CONDITION: 2027 Build (No WBR or NBR)

MAJOR STREET: Longhill Road — # OF APPROACH LANES: 2

MINOR STREET: Fords Colony Drive — # OF APPROACH LANES: 1

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): N

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): Y

	MAJOR ST	MINOR ST		WARRANT 1, Condition A			WARRANT 1, Condition B			WARRANT 1, Combination Warrant						WARRANT 2	WARRANT 3
										CONDITION A			CONDITION B				
	BOTH APPROACHES	HIGHEST APPROACH		MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES	EB/WB	NB	SB	420	105		630	53		336	84		504	42			
06:00 AM TO 07:00 AM	305	**25**	2														
07:00 AM TO 08:00 AM	751	**71**	2	Y			Y	Y	**Y**	Y			Y	Y	**Y**		
08:00 AM TO 09:00 AM	956	**85**	2	Y			Y	Y	**Y**	Y	Y	**Y**	Y	Y	**Y**	**Y**	
09:00 AM TO 10:00 AM	767	**59**	1	Y			Y	Y	**Y**	Y			Y	Y	**Y**		
10:00 AM TO 11:00 AM	639	**84**	6	Y			Y	Y	**Y**	Y	Y	**Y**	Y	Y	**Y**		
11:00 AM TO 12:00 AM	721	**60**	7	Y			Y	Y	**Y**	Y			Y	Y	**Y**		
12:00 PM TO 01:00 PM	749	**64**	6	Y			Y	Y	**Y**	Y			Y	Y	**Y**		
01:00 PM TO 02:00 PM	695	**58**	14	Y			Y	Y	**Y**	Y			Y	Y	**Y**		
02:00 PM TO 03:00 PM	950	**70**	9	Y			Y	Y	**Y**	Y			Y	Y	**Y**	**Y**	
03:00 PM TO 04:00 PM	1,041	**94**	15	Y			Y	Y	**Y**	Y	Y	**Y**	Y	Y	**Y**	**Y**	
04:00 PM TO 05:00 PM	1,071	**72**	5	Y			Y	Y	**Y**	Y			Y	Y	**Y**	**Y**	
05:00 PM TO 06:00 PM	1,096	**52**	9	Y			Y			Y			Y	Y	**Y**		
	0	**0**	**0**														
	0	0	0														
	0	0	0														
	0	0	0														
	9,741	794	78			**0**			**10**			**3**			**11**	**4**	**0**
				8 HOURS NEEDED			8 HOURS NEEDED			8 HOURS OF BOTH COND. A AND COND. B NEEDED						4 HRS NEEDED	1 HR NEEDED
				NOT SATISFIED			**SATISFIED**			**NOT SATISFIED**						**SATISFIED**	**NOT SATISFIED**

WARRANT 1 -- Eight-Hour Vehicular Volume Warrant
- Condition A : Minimum Vehicular Volume
- Condition B : Interruption of Continuous Traffic
- Combination : Combination of Condition A and Condition B

WARRANT 2 -- Four-Hour Vehicular Volume Warrant

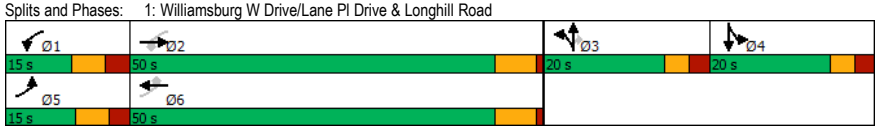
WARRANT 3 -- Peak Hour Warrant

Appendix E: Synchro and SimTraffic Reports

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	772	22	45	486	19	44	3	233	58	1	19
Future Volume (vph)	3	772	22	45	486	19	44	3	233	58	1	19
Lane Util. 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
Frt			0.850			0.850			0.850		0.967	
Flt Protected	0.950			0.950				0.955			0.964	
Satd. Flow (prot)	1805	1863	1615	1719	1827	1380	0	1673	1615	0	1676	0
Flt Permitted	0.346			0.084				0.955			0.964	
Satd. Flow (perm)	657	1863	1615	152	1827	1380	0	1673	1615	0	1676	0
Satd. Flow (RTOR)			156			156			265		13	
Adj. Flow (vph)	3	877	25	51	552	22	50	3	265	66	1	22
Lane Group Flow (vph)	3	877	25	51	552	22	0	53	265	0	89	0
Turn Type	D.P+P	NA	Perm	D.P+P	NA	Perm	Split	NA	Perm	Split	NA	
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases	6		2	2		6			3			
Total Split (s)	15.0	50.0	50.0	15.0	50.0	50.0	20.0	20.0	20.0	20.0	20.0	
Total Lost Time (s)	6.5	6.0	6.0	7.0	6.0	6.0		5.5	5.5		5.5	
Act Effct Green (s)	51.1	45.5	45.5	47.9	50.8	50.8		9.2	9.2		9.9	
Actuated g/C Ratio	0.59	0.53	0.53	0.56	0.59	0.59		0.11	0.11		0.12	
v/c Ratio	0.01	0.89	0.03	0.27	0.51	0.03		0.30	0.65		0.44	
Control Delay	9.3	35.7	0.0	13.1	15.4	0.1		43.8	13.5		41.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	
Total Delay	9.3	35.7	0.0	13.1	15.4	0.1		43.8	13.5		41.3	
LOS	A	D	A	B	B	A		D	B		D	
Approach Delay		34.6			14.7			18.5			41.3	
Approach LOS		C			B			B			D	

Intersection Summary			
Cycle Length: 105			
Actuated Cycle Length: 85.9			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.89			
Intersection Signal Delay: 25.8		Intersection LOS: C	
Intersection Capacity Utilization 75.1%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 1: Williamsburg W Drive/Lane Pl Drive & Longhill Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	772	22	45	486	19	44	3	233	58	1	19
Future Volume (vph)	3	772	22	45	486	19	44	3	233	58	1	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.0	6.0	7.0	6.0	6.0		5.5	5.5		5.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85		0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00		0.96	
Satd. Flow (prot)	1805	1863	1615	1719	1827	1380		1673	1615		1676	
Flt Permitted	0.35	1.00	1.00	0.08	1.00	1.00		0.95	1.00		0.96	
Satd. Flow (perm)	658	1863	1615	152	1827	1380		1673	1615		1676	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	3	877	25	51	552	22	50	3	265	66	1	22
RTOR Reduction (vph)	0	0	12	0	0	10	0	0	239	0	12	0
Lane Group Flow (vph)	3	877	13	51	552	12	0	53	26	0	77	0
Heavy Vehicles (%)	0%	2%	0%	5%	4%	17%	7%	33%	0%	4%	0%	11%
Turn Type	D.P+P	NA	Perm	D.P+P	NA	Perm	Split	NA	Perm	Split	NA	
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases	6		2	2		6			3			
Actuated Green, G (s)	51.5	47.6	47.6	51.0	50.7	50.7		9.2	9.2		8.0	
Effective Green, g (s)	51.5	47.6	47.6	51.0	50.7	50.7		9.2	9.2		8.0	
Actuated g/C Ratio	0.56	0.52	0.52	0.55	0.55	0.55		0.10	0.10		0.09	
Clearance Time (s)	6.5	6.0	6.0	7.0	6.0	6.0		5.5	5.5		5.5	
Vehicle Extension (s)	2.0	5.0	5.0	2.0	5.0	5.0		3.0	3.0		3.0	
Lane Grp Cap (vph)	377	961	833	141	1004	758		166	161		145	
v/s Ratio Prot	0.00	c0.47		c0.01	c0.30			c0.03			c0.05	
v/s Ratio Perm	0.00		0.01	0.19		0.01			0.02			
v/c Ratio	0.01	0.91	0.02	0.36	0.55	0.02		0.32	0.16		0.53	
Uniform Delay, d1	9.8	20.4	10.9	17.3	13.4	9.4		38.6	38.0		40.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2	0.0	13.3	0.0	0.6	1.1	0.0		1.1	0.5		3.7	
Delay (s)	9.8	33.7	10.9	17.9	14.5	9.4		39.7	38.5		44.0	
Level of Service	A	C	B	B	B	A		D	D		D	
Approach Delay (s)		33.0			14.6			38.7			44.0	
Approach LOS		C			B			D			D	

Intersection Summary				
HCM 2000 Control Delay	28.5	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.76			
Actuated Cycle Length (s)	92.2	Sum of lost time (s)	24.0	
Intersection Capacity Utilization	75.1%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	305	37	110	277	1	73	1	135	0	1	0
Future Volume (vph)	3	305	37	110	277	1	73	1	135	0	1	0
Lane Util. 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
Frt		0.984				0.850		0.913				
Flt Protected	0.950			0.950				0.983				
Satd. Flow (prot)	1805	1779	0	1752	1776	1615	0	1648	0	0	1900	0
Flt Permitted	0.950			0.950				0.983				
Satd. Flow (perm)	1805	1779	0	1752	1776	1615	0	1648	0	0	1900	0
Adj. Flow (vph)	4	367	45	133	334	1	88	1	163	0	1	0
Lane Group Flow (vph)	4	412	0	133	334	1	0	252	0	0	1	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary												
Control Type: Unsignalized												
Intersection Capacity Utilization 53.5%				ICU Level of Service A								
Analysis Period (min) 15												

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	305	37	110	277	1	73	1	135	0	1	0
Future Volume (Veh/h)	3	305	37	110	277	1	73	1	135	0	1	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Hourly flow rate (vph)	4	367	45	133	334	1	88	1	163	0	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	335			412			998	998	390	1138	1020	334
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	335			412			998	998	390	1138	1020	334
tC, single (s)	4.1			4.1			7.2	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			88			55	100	75	100	100	100
cM capacity (veh/h)	1236			1142			195	216	663	123	210	712

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	4	412	133	334	1	252	1
Volume Left	4	0	133	0	0	88	0
Volume Right	0	45	0	0	1	163	0
cSH	1236	1700	1142	1700	1700	359	210
Volume to Capacity	0.00	0.24	0.12	0.20	0.00	0.70	0.00
Queue Length 95th (ft)	0	0	10	0	0	128	0
Control Delay (s)	7.9	0.0	8.6	0.0	0.0	35.5	22.2
Lane LOS	A		A			E	C
Approach Delay (s)	0.1		2.4			35.5	22.2
Approach LOS						E	C

Intersection Summary												
Average Delay			8.9									
Intersection Capacity Utilization			53.5%		ICU Level of Service				A			
Analysis Period (min)			15									

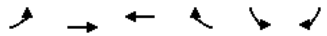
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	1	2	57	0	49	2	354	45	53	221	3
Future Volume (vph)	4	1	2	57	0	49	2	354	45	53	221	3
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.961			0.850				0.850			0.850
Flt Protected		0.972		0.950			0.950			0.950		
Satd. Flow (prot)	0	1775	0	1736	1553	0	1805	1759	1282	1556	1759	967
Flt Permitted		0.972		0.950			0.950			0.950		
Satd. Flow (perm)	0	1775	0	1736	1553	0	1805	1759	1282	1556	1759	967
Adj. Flow (vph)	4	1	2	63	0	54	2	389	49	58	243	3
Lane Group Flow (vph)	0	7	0	63	54	0	2	389	49	58	243	3
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 36.9%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	1	2	57	0	49	2	354	45	53	221	3
Future Volume (Veh/h)	4	1	2	57	0	49	2	354	45	53	221	3
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	4	1	2	63	0	54	2	389	49	58	243	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	806	801	243	754	755	389	246			438		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	806	801	243	754	755	389	246			438		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.3		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.3		
p0 queue free %	98	100	100	79	100	92	100			94		
cM capacity (veh/h)	266	302	801	307	321	655	1332			1051		

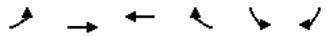
Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	7	63	54	2	389	49	58	243	3
Volume Left	4	63	0	2	0	0	58	0	0
Volume Right	2	0	54	0	0	49	0	0	3
cSH	336	307	655	1332	1700	1700	1051	1700	1700
Volume to Capacity	0.02	0.21	0.08	0.00	0.23	0.03	0.06	0.14	0.00
Queue Length 95th (ft)	2	19	7	0	0	0	4	0	0
Control Delay (s)	16.0	19.7	11.0	7.7	0.0	0.0	8.6	0.0	0.0
Lane LOS	C	C	B	A			A		
Approach Delay (s)	16.0	15.7		0.0			1.6		
Approach LOS	C	C							

Intersection Summary					
Average Delay	2.8				
Intersection Capacity Utilization	36.9%	ICU Level of Service		A	
Analysis Period (min)	15				



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	10	196	130	45	88	18
Future Volume (vph)	10	196	130	45	88	18
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1504	1845	1681	1583	1805	1615
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1504	1845	1681	1583	1805	1615
Adj. Flow (vph)	11	206	137	47	93	19
Lane Group Flow (vph)	11	206	137	47	93	19
Sign Control		Free	Free		Stop	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 21.9%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	10	196	130	45	88	18
Future Volume (Veh/h)	10	196	130	45	88	18
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	206	137	47	93	19
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						6
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	184				365	137
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	184				365	137
tC, single (s)	4.3				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.4				3.5	3.3
p0 queue free %	99				85	98
cM capacity (veh/h)	1290				633	917

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	11	206	137	47	112
Volume Left	11	0	0	0	93
Volume Right	0	0	0	47	19
cSH	1290	1700	1700	1700	762
Volume to Capacity	0.01	0.12	0.08	0.03	0.15
Queue Length 95th (ft)	1	0	0	0	13
Control Delay (s)	7.8	0.0	0.0	0.0	11.2
Lane LOS	A				B
Approach Delay (s)	0.4		0.0		11.2
Approach LOS					B

Intersection Summary				
Average Delay		2.6		
Intersection Capacity Utilization		21.9%	ICU Level of Service	A
Analysis Period (min)		15		

Intersection: 1: Williamsburg W Drive/Lane Pl Drive & Longhill Road

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB
Directions Served	L	T	R	L	T	R	LT	R	LTR
Maximum Queue (ft)	69	479	164	81	230	41	92	120	112
Average Queue (ft)	3	197	13	24	93	6	35	61	43
95th Queue (ft)	39	398	82	62	182	26	76	101	88
Link Distance (ft)		1007			741	741	405		475
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	250		225	250				225	
Storage Blk Time (%)	0	6	0	0	0				
Queuing Penalty (veh)	0	1	0	0	0				

Intersection: 2: Fords Colony Drive/Dominon Village & Longhill Road

Movement	EB	EB	WB	NB	SB
Directions Served	L	TR	L	LTR	LTR
Maximum Queue (ft)	14	10	70	192	6
Average Queue (ft)	1	0	21	69	0
95th Queue (ft)	7	6	51	148	4
Link Distance (ft)		2032		736	278
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	200		225		
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 3: Centerville Road & Westport/Manchester Drive

Movement	EB	WB	WB	NB	SB
Directions Served	LTR	L	TR	L	L
Maximum Queue (ft)	30	60	54	8	64
Average Queue (ft)	5	23	19	0	14
95th Queue (ft)	22	48	41	5	45
Link Distance (ft)	247	762			
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			140	190	190
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 4: News Road & Firestone Drive

Movement	EB	WB	SB	SB
Directions Served	L	T	L	R
Maximum Queue (ft)	40	4	69	31
Average Queue (ft)	2	0	34	14
95th Queue (ft)	18	4	57	39
Link Distance (ft)		493	375	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	225			150
Storage Blk Time (%)				
Queuing Penalty (veh)				

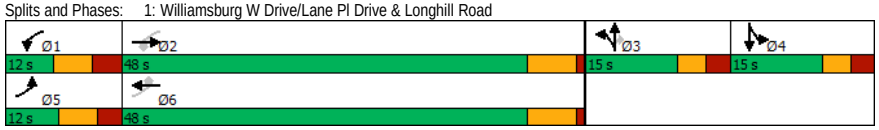
Network Summary

Network wide Queuing Penalty: 2

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	819	23	47	514	20	46	3	242	60	1	20
Future Volume (vph)	3	819	23	47	514	20	46	3	242	60	1	20
Lane Util. 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
Frt			0.850			0.850			0.850		0.966	
Flt Protected	0.950			0.950				0.955			0.964	
Satd. Flow (prot)	1805	1863	1615	1719	1827	1380	0	1673	1615	0	1674	0
Flt Permitted	0.342			0.088				0.955			0.964	
Satd. Flow (perm)	650	1863	1615	159	1827	1380	0	1673	1615	0	1674	0
Satd. Flow (RTOR)			182			182			244		15	
Adj. Flow (vph)	3	890	25	51	559	22	50	3	263	65	1	22
Lane Group Flow (vph)	3	890	25	51	559	22	0	53	263	0	88	0
Turn Type	D.P+P	NA	Perm	D.P+P	NA	Perm	Split	NA	Perm	Split	NA	
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases	6		2	2		6			3			
Total Split (s)	12.0	48.0	48.0	12.0	48.0	48.0	15.0	15.0	15.0	15.0	15.0	
Total Lost Time (s)	6.5	6.0	6.0	7.0	6.0	6.0		5.5	5.5		5.5	
Act Effct Green (s)	47.8	43.0	43.0	44.7	47.5	47.5		8.3	8.3		8.5	
Actuated g/C Ratio	0.59	0.53	0.53	0.56	0.59	0.59		0.10	0.10		0.11	
v/c Ratio	0.01	0.89	0.03	0.27	0.52	0.02		0.31	0.68		0.46	
Control Delay	7.7	34.1	0.0	12.0	14.1	0.1		41.9	17.0		40.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	
Total Delay	7.7	34.1	0.0	12.0	14.1	0.1		41.9	17.0		40.3	
LOS	A	C	A	B	B	A		D	B		D	
Approach Delay		33.1			13.4			21.2			40.3	
Approach LOS		C			B			C			D	

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 80.4			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.89			
Intersection Signal Delay: 25.1		Intersection LOS: C	
Intersection Capacity Utilization 78.1%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 1: Williamsburg W Drive/Lane Pl Drive & Longhill Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	819	23	47	514	20	46	3	242	60	1	20
Future Volume (vph)	3	819	23	47	514	20	46	3	242	60	1	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.0	6.0	7.0	6.0	6.0		5.5	5.5		5.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85		0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00		0.96	
Satd. Flow (prot)	1805	1863	1615	1719	1827	1380		1673	1615		1675	
Flt Permitted	0.34	1.00	1.00	0.09	1.00	1.00		0.95	1.00		0.96	
Satd. Flow (perm)	650	1863	1615	160	1827	1380		1673	1615		1675	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	3	890	25	51	559	22	50	3	263	65	1	22
RTOR Reduction (vph)	0	0	12	0	0	10	0	0	221	0	14	0
Lane Group Flow (vph)	3	890	13	51	559	12	0	53	42	0	74	0
Heavy Vehicles (%)	0%	2%	0%	5%	4%	17%	7%	33%	0%	4%	0%	11%
Turn Type	D.P+P	NA	Perm	D.P+P	NA	Perm	Split	NA	Perm	Split	NA	
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases	6		2	2		6			3			
Actuated Green, G (s)	48.4	45.2	45.2	47.9	47.5	47.5		8.3	8.3		6.7	
Effective Green, g (s)	48.4	45.2	45.2	47.9	47.5	47.5		8.3	8.3		6.7	
Actuated g/C Ratio	0.56	0.52	0.52	0.55	0.55	0.55		0.10	0.10		0.08	
Clearance Time (s)	6.5	6.0	6.0	7.0	6.0	6.0		5.5	5.5		5.5	
Vehicle Extension (s)	2.0	5.0	5.0	2.0	5.0	5.0		3.0	3.0		3.0	
Lane Grp Cap (vph)	373	969	840	136	998	754		159	154		129	
v/s Ratio Prot	0.00	c0.48		c0.01	0.31			c0.03			c0.04	
v/s Ratio Perm	0.00		0.01	0.19		0.01			0.03			
v/c Ratio	0.01	0.92	0.02	0.38	0.56	0.02		0.33	0.27		0.57	
Uniform Delay, d1	9.3	19.2	10.1	16.5	12.9	9.0		36.7	36.5		38.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2	0.0	13.8	0.0	0.6	1.2	0.0		1.2	1.0		6.1	
Delay (s)	9.3	33.0	10.1	17.2	14.1	9.0		38.0	37.5		44.8	
Level of Service	A	C	B	B	B	A		D	D		D	
Approach Delay (s)		32.3			14.1			37.6			44.8	
Approach LOS		C			B			D			D	

Intersection Summary					
HCM 2000 Control Delay		27.8	HCM 2000 Level of Service		C
HCM 2000 Volume to Capacity ratio		0.78			
Actuated Cycle Length (s)		86.9	Sum of lost time (s)		24.0
Intersection Capacity Utilization		78.1%	ICU Level of Service		D
Analysis Period (min)		15			
c Critical Lane Group					

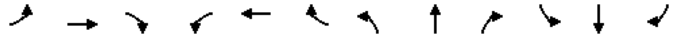
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	326	39	116	294	1	78	1	148	0	1	0
Future Volume (vph)	3	326	39	116	294	1	78	1	148	0	1	0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.984				0.850		0.912				
Flt Protected	0.950			0.950				0.983				
Satd. Flow (prot)	1805	1779	0	1752	1776	1615	0	1647	0	0	1900	0
Flt Permitted	0.950			0.950				0.983				
Satd. Flow (perm)	1805	1779	0	1752	1776	1615	0	1647	0	0	1900	0
Adj. Flow (vph)	3	354	42	126	320	1	85	1	161	0	1	0
Lane Group Flow (vph)	3	396	0	126	320	1	0	247	0	0	1	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 56.1%		ICU Level of Service B	
Analysis Period (min) 15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	326	39	116	294	1	78	1	148	0	1	0
Future Volume (Veh/h)	3	326	39	116	294	1	78	1	148	0	1	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	3	354	42	126	320	1	85	1	161	0	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	321			396			954	954	375	1094	974	320
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	321			396			954	954	375	1094	974	320
tC, single (s)	4.1			4.1			7.2	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			89			60	100	76	100	100	100
cM capacity (veh/h)	1250			1157			210	232	676	134	226	725

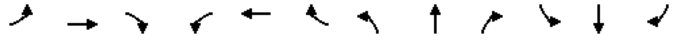
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	3	396	126	320	1	247	1
Volume Left	3	0	126	0	0	85	0
Volume Right	0	42	0	0	1	161	0
cSH	1250	1700	1157	1700	1700	382	226
Volume to Capacity	0.00	0.23	0.11	0.19	0.00	0.65	0.00
Queue Length 95th (ft)	0	0	9	0	0	109	0
Control Delay (s)	7.9	0.0	8.5	0.0	0.0	30.1	21.0
Lane LOS	A		A			D	C
Approach Delay (s)	0.1		2.4			30.1	21.0
Approach LOS						D	C

Intersection Summary					
Average Delay	7.8				
Intersection Capacity Utilization	56.1%	ICU Level of Service		B	
Analysis Period (min)	15				



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	1	9	62	0	52	4	378	48	56	243	10
Future Volume (vph)	23	1	9	62	0	52	4	378	48	56	243	10
Lane Util. 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
Frt		0.962			0.850				0.850			0.850
Flt Protected		0.966		0.950			0.950			0.950		
Satd. Flow (prot)	0	1766	0	1736	1553	0	1805	1759	1282	1556	1759	967
Flt Permitted		0.966		0.950			0.950			0.950		
Satd. Flow (perm)	0	1766	0	1736	1553	0	1805	1759	1282	1556	1759	967
Adj. Flow (vph)	25	1	10	67	0	57	4	411	52	61	264	11
Lane Group Flow (vph)	0	36	0	67	57	0	4	411	52	61	264	11
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 41.8%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	1	9	62	0	52	4	378	48	56	243	10
Future Volume (Veh/h)	23	1	9	62	0	52	4	378	48	56	243	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	25	1	10	67	0	57	4	411	52	61	264	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	862	857	264	816	816	411	275			463		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	862	857	264	816	816	411	275			463		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.3		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.3		
p0 queue free %	90	100	99	76	100	91	100			94		
cM capacity (veh/h)	241	279	780	275	294	636	1300			1029		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	36	67	57	4	411	52	61	264	11
Volume Left	25	67	0	4	0	0	61	0	0
Volume Right	10	0	57	0	0	52	0	0	11
cSH	299	275	636	1300	1700	1700	1029	1700	1700
Volume to Capacity	0.12	0.24	0.09	0.00	0.24	0.03	0.06	0.16	0.01
Queue Length 95th (ft)	10	23	7	0	0	0	5	0	0
Control Delay (s)	18.7	22.2	11.2	7.8	0.0	0.0	8.7	0.0	0.0
Lane LOS	C	C	B	A			A		
Approach Delay (s)	18.7	17.2		0.1			1.6		
Approach LOS	C	C							

Intersection Summary					
Average Delay		3.5			
Intersection Capacity Utilization		41.8%	ICU Level of Service		A
Analysis Period (min)		15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	212	18	31	137	47	14	0	38	92	0	19
Future Volume (vph)	10	212	18	31	137	47	14	0	38	92	0	19
Lane Util. 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
Frt		0.988			0.962				0.850			0.850
Flt Protected	0.950			0.950				0.950			0.950	
Satd. Flow (prot)	1504	1824	0	1770	1659	0	0	1770	1583	0	1805	1615
Flt Permitted	0.950			0.950				0.950			0.950	
Satd. Flow (perm)	1504	1824	0	1770	1659	0	0	1770	1583	0	1805	1615
Adj. Flow (vph)	11	223	19	33	144	49	15	0	40	97	0	20
Lane Group Flow (vph)	11	242	0	33	193	0	0	15	40	0	97	20
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 37.3%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	212	18	31	137	47	14	0	38	92	0	19
Future Volume (Veh/h)	10	212	18	31	137	47	14	0	38	92	0	19
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	223	19	33	144	49	15	0	40	97	0	20
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									6			6
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	193			242			474	514	232	500	498	168
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	193			242			474	514	232	500	498	168
tC, single (s)	4.3			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.4			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			98			97	100	95	78	100	98
cM capacity (veh/h)	1279			1324			477	449	807	449	458	881

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	11	242	33	193	55	117
Volume Left	11	0	33	0	15	97
Volume Right	0	19	0	49	40	20
cSH	1279	1700	1324	1700	1109	542
Volume to Capacity	0.01	0.14	0.02	0.11	0.05	0.22
Queue Length 95th (ft)	1	0	2	0	4	20
Control Delay (s)	7.8	0.0	7.8	0.0	10.5	14.2
Lane LOS	A		A		B	B
Approach Delay (s)	0.3		1.1		10.5	14.2
Approach LOS					B	B

Intersection Summary				
Average Delay		4.0		
Intersection Capacity Utilization		37.3%	ICU Level of Service	A
Analysis Period (min)		15		

Intersection: 1: Williamsburg W Drive/Lane Pl Drive & Longhill Road

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB
Directions Served	L	T	R	L	T	R	LT	R	LTR
Maximum Queue (ft)	46	563	205	67	206	51	93	133	115
Average Queue (ft)	2	241	18	30	94	7	38	63	46
95th Queue (ft)	28	465	106	58	179	30	80	105	94
Link Distance (ft)		1007			741	741	405		475
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	250		225	250				225	
Storage Blk Time (%)		10	0		0				
Queuing Penalty (veh)		3	0		0				

Intersection: 2: Fords Colony Drive/Dominon Village & Longhill Road

Movement	EB	EB	WB	NB	SB
Directions Served	L	TR	L	LTR	LTR
Maximum Queue (ft)	5	22	77	209	14
Average Queue (ft)	0	1	23	72	1
95th Queue (ft)	4	9	56	151	6
Link Distance (ft)		2032		736	278
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	200		225		
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 3: Centerville Road & Westport/Manchester Drive

Movement	EB	WB	WB	NB	SB
Directions Served	LTR	L	TR	L	L
Maximum Queue (ft)	45	72	52	9	60
Average Queue (ft)	19	25	19	0	15
95th Queue (ft)	41	50	40	4	45
Link Distance (ft)	247	762			
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			140	190	190
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 4: News Road & Firestone Drive

Movement	EB	WB	NB	NB	SB	SB
Directions Served	L	L	LT	R	LT	R
Maximum Queue (ft)	28	31	40	54	82	33
Average Queue (ft)	2	6	12	24	35	14
95th Queue (ft)	15	23	37	49	63	39
Link Distance (ft)			372		374	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	225	225		150		150
Storage Blk Time (%)					0	
Queuing Penalty (veh)					0	

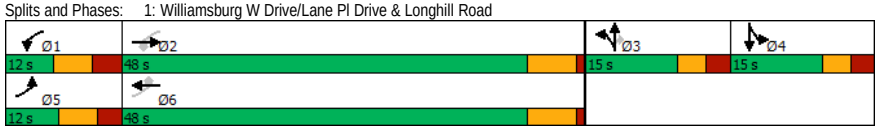
Network Summary

Network wide Queuing Penalty: 3

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	832	23	47	518	20	46	3	242	60	1	20
Future Volume (vph)	3	832	23	47	518	20	46	3	242	60	1	20
Lane Util. 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
Frt			0.850			0.850			0.850		0.966	
Flt Protected	0.950			0.950				0.955			0.964	
Satd. Flow (prot)	1805	1863	1615	1719	1827	1380	0	1673	1615	0	1674	0
Flt Permitted	0.339			0.088				0.955			0.964	
Satd. Flow (perm)	644	1863	1615	159	1827	1380	0	1673	1615	0	1674	0
Satd. Flow (RTOR)			182			182			241		15	
Adj. Flow (vph)	3	904	25	51	563	22	50	3	263	65	1	22
Lane Group Flow (vph)	3	904	25	51	563	22	0	53	263	0	88	0
Turn Type	D.P+P	NA	Perm	D.P+P	NA	Perm	Split	NA	Perm	Split	NA	
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases	6		2	2		6			3			
Total Split (s)	12.0	48.0	48.0	12.0	48.0	48.0	15.0	15.0	15.0	15.0	15.0	
Total Lost Time (s)	6.5	6.0	6.0	7.0	6.0	6.0		5.5	5.5		5.5	
Act Effct Green (s)	47.8	43.0	43.0	44.7	47.5	47.5		8.3	8.3		8.5	
Actuated g/C Ratio	0.59	0.53	0.53	0.56	0.59	0.59		0.10	0.10		0.11	
v/c Ratio	0.01	0.91	0.03	0.27	0.52	0.02		0.31	0.69		0.46	
Control Delay	7.7	35.8	0.0	12.0	14.1	0.1		41.9	17.5		40.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	
Total Delay	7.7	35.8	0.0	12.0	14.1	0.1		41.9	17.5		40.3	
LOS	A	D	A	B	B	A		D	B		D	
Approach Delay		34.7			13.5			21.6			40.3	
Approach LOS		C			B			C			D	

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 80.4			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.91			
Intersection Signal Delay: 26.0		Intersection LOS: C	
Intersection Capacity Utilization 78.8%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 1: Williamsburg W Drive/Lane Pl Drive & Longhill Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	832	23	47	518	20	46	3	242	60	1	20
Future Volume (vph)	3	832	23	47	518	20	46	3	242	60	1	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.0	6.0	7.0	6.0	6.0		5.5	5.5		5.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85		0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00		0.96	
Satd. Flow (prot)	1805	1863	1615	1719	1827	1380		1673	1615		1675	
Flt Permitted	0.34	1.00	1.00	0.09	1.00	1.00		0.95	1.00		0.96	
Satd. Flow (perm)	645	1863	1615	160	1827	1380		1673	1615		1675	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	3	904	25	51	563	22	50	3	263	65	1	22
RTOR Reduction (vph)	0	0	12	0	0	10	0	0	218	0	14	0
Lane Group Flow (vph)	3	904	13	51	563	12	0	53	45	0	74	0
Heavy Vehicles (%)	0%	2%	0%	5%	4%	17%	7%	33%	0%	4%	0%	11%
Turn Type	D.P+P	NA	Perm	D.P+P	NA	Perm	Split	NA	Perm	Split	NA	
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases	6		2	2		6			3			
Actuated Green, G (s)	48.4	45.2	45.2	47.9	47.5	47.5		8.3	8.3		6.7	
Effective Green, g (s)	48.4	45.2	45.2	47.9	47.5	47.5		8.3	8.3		6.7	
Actuated g/C Ratio	0.56	0.52	0.52	0.55	0.55	0.55		0.10	0.10		0.08	
Clearance Time (s)	6.5	6.0	6.0	7.0	6.0	6.0		5.5	5.5		5.5	
Vehicle Extension (s)	2.0	5.0	5.0	2.0	5.0	5.0		3.0	3.0		3.0	
Lane Grp Cap (vph)	371	969	840	136	998	754		159	154		129	
v/s Ratio Prot	0.00	c0.49		c0.01	0.31			c0.03			c0.04	
v/s Ratio Perm	0.00		0.01	0.19		0.01			0.03			
v/c Ratio	0.01	0.93	0.02	0.38	0.56	0.02		0.33	0.29		0.57	
Uniform Delay, d1	9.4	19.4	10.1	17.0	12.9	9.0		36.7	36.6		38.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2	0.0	15.8	0.0	0.6	1.2	0.0		1.2	1.1		6.1	
Delay (s)	9.4	35.2	10.1	17.7	14.1	9.0		38.0	37.6		44.8	
Level of Service	A	D	B	B	B	A		D	D		D	
Approach Delay (s)		34.5			14.2			37.7			44.8	
Approach LOS		C			B			D			D	

Intersection Summary					
HCM 2000 Control Delay		28.9	HCM 2000 Level of Service		C
HCM 2000 Volume to Capacity ratio		0.79			
Actuated Cycle Length (s)		86.9	Sum of lost time (s)		24.0
Intersection Capacity Utilization		78.8%	ICU Level of Service		D
Analysis Period (min)		15			
c Critical Lane Group					

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	326	40	120	294	1	82	1	161	0	1	0
Future Volume (vph)	3	326	40	120	294	1	82	1	161	0	1	0
Lane Util. 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
Frt			0.850			0.850			0.850			
Flt Protected	0.950			0.950				0.953				
Satd. Flow (prot)	1805	1810	1524	1752	1776	1615	0	1648	1615	0	1900	0
Flt Permitted	0.950			0.950				0.953				
Satd. Flow (perm)	1805	1810	1524	1752	1776	1615	0	1648	1615	0	1900	0
Adj. Flow (vph)	3	354	43	130	320	1	89	1	175	0	1	0
Lane Group Flow (vph)	3	354	43	130	320	1	0	90	175	0	1	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 45.1%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	326	40	120	294	1	82	1	161	0	1	0
Future Volume (Veh/h)	3	326	40	120	294	1	82	1	161	0	1	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	3	354	43	130	320	1	89	1	175	0	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									7			
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	321			397			940	941	354	1028	983	320
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	321			397			940	941	354	1028	983	320
tC, single (s)	4.1			4.1			7.2	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			89			58	100	75	100	100	100
cM capacity (veh/h)	1250			1156			214	235	694	146	222	725

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	3	354	43	130	320	1	265	1
Volume Left	3	0	0	130	0	0	89	0
Volume Right	0	0	43	0	0	1	175	0
cSH	1250	1700	1700	1156	1700	1700	631	222
Volume to Capacity	0.00	0.21	0.03	0.11	0.19	0.00	0.42	0.00
Queue Length 95th (ft)	0	0	0	9	0	0	52	0
Control Delay (s)	7.9	0.0	0.0	8.5	0.0	0.0	19.2	21.3
Lane LOS	A			A			C	C
Approach Delay (s)	0.1			2.5			19.2	21.3
Approach LOS							C	C

Intersection Summary					
Average Delay	5.6				
Intersection Capacity Utilization	45.1%	ICU Level of Service		A	
Analysis Period (min)	15				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	1	9	65	0	53	4	378	49	56	243	10
Future Volume (vph)	23	1	9	65	0	53	4	378	49	56	243	10
Lane Util. 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
Frt		0.962			0.850				0.850			0.850
Flt Protected		0.966		0.950			0.950			0.950		
Satd. Flow (prot)	0	1766	0	1736	1553	0	1805	1759	1282	1556	1759	967
Flt Permitted		0.966		0.950			0.950			0.950		
Satd. Flow (perm)	0	1766	0	1736	1553	0	1805	1759	1282	1556	1759	967
Adj. Flow (vph)	25	1	10	71	0	58	4	411	53	61	264	11
Lane Group Flow (vph)	0	36	0	71	58	0	4	411	53	61	264	11
Sign Control		Stop			Stop			Free			Free	

Intersection Summary												
Control Type: Unsignalized												
Intersection Capacity Utilization 41.8%				ICU Level of Service A								
Analysis Period (min) 15												

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	1	9	65	0	53	4	378	49	56	243	10
Future Volume (Veh/h)	23	1	9	65	0	53	4	378	49	56	243	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	25	1	10	71	0	58	4	411	53	61	264	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	863	858	264	816	816	411	275			464		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	863	858	264	816	816	411	275			464		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.3		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.3		
p0 queue free %	90	100	99	74	100	91	100			94		
cM capacity (veh/h)	240	278	780	275	294	636	1300			1028		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	36	71	58	4	411	53	61	264	11
Volume Left	25	71	0	4	0	0	61	0	0
Volume Right	10	0	58	0	0	53	0	0	11
cSH	298	275	636	1300	1700	1700	1028	1700	1700
Volume to Capacity	0.12	0.26	0.09	0.00	0.24	0.03	0.06	0.16	0.01
Queue Length 95th (ft)	10	25	7	0	0	0	5	0	0
Control Delay (s)	18.7	22.6	11.2	7.8	0.0	0.0	8.7	0.0	0.0
Lane LOS	C	C	B	A			A		
Approach Delay (s)	18.7	17.5		0.1			1.6		
Approach LOS	C	C							

Intersection Summary									
Average Delay			3.6						
Intersection Capacity Utilization			41.8%	ICU Level of Service				A	
Analysis Period (min)			15						

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	214	18	31	138	47	14	0	38	92	0	19
Future Volume (vph)	10	214	18	31	138	47	14	0	38	92	0	19
Lane Util. 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
Frt		0.988			0.962				0.850			0.850
Flt Protected	0.950			0.950				0.950			0.950	
Satd. Flow (prot)	1504	1824	0	1770	1658	0	0	1770	1583	0	1805	1615
Flt Permitted	0.950			0.950				0.950			0.950	
Satd. Flow (perm)	1504	1824	0	1770	1658	0	0	1770	1583	0	1805	1615
Adj. Flow (vph)	11	225	19	33	145	49	15	0	40	97	0	20
Lane Group Flow (vph)	11	244	0	33	194	0	0	15	40	0	97	20
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 37.5%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	214	18	31	138	47	14	0	38	92	0	19
Future Volume (Veh/h)	10	214	18	31	138	47	14	0	38	92	0	19
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	225	19	33	145	49	15	0	40	97	0	20
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									6			6
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	194			244			478	516	234	502	502	170
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	194			244			478	516	234	502	502	170
tC, single (s)	4.3			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.4			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			98			97	100	95	78	100	98
cM capacity (veh/h)	1278			1322			474	447	805	447	456	880

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	11	244	33	194	55	117
Volume Left	11	0	33	0	15	97
Volume Right	0	19	0	49	40	20
cSH	1278	1700	1322	1700	1106	539
Volume to Capacity	0.01	0.14	0.02	0.11	0.05	0.22
Queue Length 95th (ft)	1	0	2	0	4	20
Control Delay (s)	7.8	0.0	7.8	0.0	10.6	14.2
Lane LOS	A		A		B	B
Approach Delay (s)	0.3		1.1		10.6	14.2
Approach LOS					B	B

Intersection Summary				
Average Delay		4.0		
Intersection Capacity Utilization		37.5%	ICU Level of Service	A
Analysis Period (min)		15		

Intersection: 1: Williamsburg W Drive/Lane Pl Drive & Longhill Road

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB
Directions Served	L	T	R	L	T	R	LT	R	LTR
Maximum Queue (ft)	66	561	187	65	217	49	92	141	124
Average Queue (ft)	3	255	19	28	93	7	36	65	46
95th Queue (ft)	38	499	106	57	181	31	75	108	96
Link Distance (ft)		1007			741	741	405		475
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	250		225	250				225	
Storage Blk Time (%)		11	0		0				
Queuing Penalty (veh)		3	1		0				

Intersection: 2: Fords Colony Drive/Dominon Village & Longhill Road

Movement	EB	EB	WB	NB	NB	SB
Directions Served	L	R	L	LT	R	LTR
Maximum Queue (ft)	9	8	103	115	93	14
Average Queue (ft)	1	0	32	42	35	1
95th Queue (ft)	6	5	72	90	67	6
Link Distance (ft)				723		278
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	200	300	225		175	
Storage Blk Time (%)				0	0	
Queuing Penalty (veh)				0	0	

Intersection: 3: Centerville Road & Westport/Manchester Drive

Movement	EB	WB	WB	NB	NB	SB
Directions Served	LTR	L	TR	L	T	L
Maximum Queue (ft)	47	68	55	7	2	64
Average Queue (ft)	18	27	19	0	0	15
95th Queue (ft)	41	54	40	4	2	47
Link Distance (ft)	247	762			622	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			140	190		190
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 4: News Road & Firestone Drive

Movement	EB	WB	NB	NB	SB	SB
Directions Served	L	L	LT	R	LT	R
Maximum Queue (ft)	30	28	40	54	71	33
Average Queue (ft)	3	5	12	24	35	14
95th Queue (ft)	17	21	37	49	59	39
Link Distance (ft)			372		374	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	225	225		150		150
Storage Blk Time (%)						
Queuing Penalty (veh)						

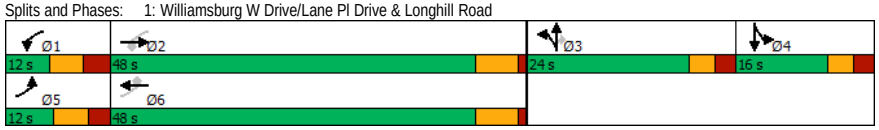
Network Summary

Network wide Queuing Penalty: 4

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	920	26	53	577	22	52	4	273	68	1	22
Future Volume (vph)	4	920	26	53	577	22	52	4	273	68	1	22
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850		0.967	
Flt Protected	0.950			0.950				0.955			0.964	
Satd. Flow (prot)	1805	3539	1615	1719	3471	1380	0	1669	1615	0	1676	0
Flt Permitted	0.377			0.186				0.955			0.964	
Satd. Flow (perm)	716	3539	1615	337	3471	1380	0	1669	1615	0	1676	0
Satd. Flow (RTOR)			164			164			207		13	
Adj. Flow (vph)	4	1000	28	58	627	24	57	4	297	74	1	24
Lane Group Flow (vph)	4	1000	28	58	627	24	0	61	297	0	99	0
Turn Type	D.P+P	NA	Perm	D.P+P	NA	Perm	Split	NA	Perm	Split	NA	
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases	6		2	2		6			3			
Total Split (s)	12.0	48.0	48.0	12.0	48.0	48.0	24.0	24.0	24.0	16.0	16.0	
Total Lost Time (s)	6.5	6.0	6.0	7.0	6.0	6.0		5.5	5.5		5.5	
Act Effct Green (s)	40.9	34.0	34.0	36.4	40.7	40.7		12.0	12.0		9.8	
Actuated g/C Ratio	0.52	0.43	0.43	0.46	0.52	0.52		0.15	0.15		0.12	
v/c Ratio	0.01	0.65	0.04	0.23	0.35	0.03		0.24	0.71		0.45	
Control Delay	10.5	22.1	0.1	12.9	13.4	0.1		37.2	22.6		42.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	
Total Delay	10.5	22.1	0.1	12.9	13.4	0.1		37.2	22.6		42.3	
LOS	B	C	A	B	B	A		D	C		D	
Approach Delay		21.5			12.9			25.1			42.3	
Approach LOS		C			B			C			D	

Intersection Summary			
Cycle Length: 100			
Actuated Cycle Length: 78.6			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.71			
Intersection Signal Delay: 20.3		Intersection LOS: C	
Intersection Capacity Utilization 61.9%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 1: Williamsburg W Drive/Lane Pl Drive & Longhill Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	920	26	53	577	22	52	4	273	68	1	22
Future Volume (vph)	4	920	26	53	577	22	52	4	273	68	1	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.0	6.0	7.0	6.0	6.0		5.5	5.5		5.5	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85		0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.96	
Satd. Flow (prot)	1805	3539	1615	1719	3471	1380		1670	1615		1677	
Flt Permitted	0.38	1.00	1.00	0.19	1.00	1.00		0.96	1.00		0.96	
Satd. Flow (perm)	716	3539	1615	336	3471	1380		1670	1615		1677	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	4	1000	28	58	627	24	57	4	297	74	1	24
RTOR Reduction (vph)	0	0	16	0	0	12	0	0	177	0	12	0
Lane Group Flow (vph)	4	1000	12	58	627	12	0	61	120	0	87	0
Heavy Vehicles (%)	0%	2%	0%	5%	4%	17%	7%	33%	0%	4%	0%	11%
Turn Type	D.P+P	NA	Perm	D.P+P	NA	Perm	Split	NA	Perm	Split	NA	
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases	6		2	2		6			3			
Actuated Green, G (s)	41.5	37.4	37.4	41.0	40.7	40.7		12.0	12.0		6.8	
Effective Green, g (s)	41.5	37.4	37.4	41.0	40.7	40.7		12.0	12.0		6.8	
Actuated g/C Ratio	0.50	0.45	0.45	0.49	0.49	0.49		0.14	0.14		0.08	
Clearance Time (s)	6.5	6.0	6.0	7.0	6.0	6.0		5.5	5.5		5.5	
Vehicle Extension (s)	2.0	5.0	5.0	2.0	5.0	5.0		3.0	3.0		3.0	
Lane Grp Cap (vph)	364	1579	720	223	1685	670		239	231		136	
v/s Ratio Prot	0.00	c0.28		c0.01	c0.18			0.04			c0.05	
v/s Ratio Perm	0.01		0.01	0.12		0.01			c0.07			
v/c Ratio	0.01	0.63	0.02	0.26	0.37	0.02		0.26	0.52		0.64	
Uniform Delay, d1	10.8	17.9	12.9	12.5	13.5	11.2		31.9	33.2		37.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2	0.0	1.2	0.0	0.2	0.3	0.0		0.6	2.0		9.9	
Delay (s)	10.8	19.1	13.0	12.7	13.8	11.2		32.5	35.2		47.2	
Level of Service	B	B	B	B	B	B		C	D		D	
Approach Delay (s)		18.9			13.6			34.7			47.2	
Approach LOS		B			B			C			D	

Intersection Summary					
HCM 2000 Control Delay	21.0	HCM 2000 Level of Service	C		
HCM 2000 Volume to Capacity ratio	0.59				
Actuated Cycle Length (s)	83.8	Sum of lost time (s)	24.0		
Intersection Capacity Utilization	61.9%	ICU Level of Service	B		
Analysis Period (min)	15				
c Critical Lane Group					

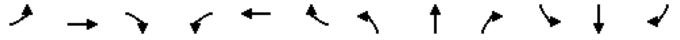
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	366	44	131	331	1	88	1	165	0	1	0
Future Volume (vph)	4	366	44	131	331	1	88	1	165	0	1	0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.984				0.850		0.912				
Flt Protected	0.950			0.950				0.983				
Satd. Flow (prot)	1805	1779	0	1752	1776	1615	0	1646	0	0	1900	0
Flt Permitted	0.950			0.950				0.983				
Satd. Flow (perm)	1805	1779	0	1752	1776	1615	0	1646	0	0	1900	0
Adj. Flow (vph)	4	398	48	142	360	1	96	1	179	0	1	0
Lane Group Flow (vph)	4	446	0	142	360	1	0	276	0	0	1	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 60.9%		ICU Level of Service B	
Analysis Period (min) 15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	366	44	131	331	1	88	1	165	0	1	0
Future Volume (Veh/h)	4	366	44	131	331	1	88	1	165	0	1	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	4	398	48	142	360	1	96	1	179	0	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	361			446			1074	1075	422	1230	1098	360
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	361			446			1074	1075	422	1230	1098	360
tC, single (s)	4.1			4.1			7.2	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			87			44	99	72	100	99	100
cM capacity (veh/h)	1209			1109			171	192	636	100	186	689

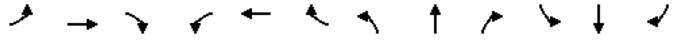
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	4	446	142	360	1	276	1
Volume Left	4	0	142	0	0	96	0
Volume Right	0	48	0	0	1	179	0
cSH	1209	1700	1109	1700	1700	325	186
Volume to Capacity	0.00	0.26	0.13	0.21	0.00	0.85	0.01
Queue Length 95th (ft)	0	0	11	0	0	189	0
Control Delay (s)	8.0	0.0	8.7	0.0	0.0	55.5	24.4
Lane LOS	A		A			F	C
Approach Delay (s)	0.1		2.5			55.5	24.4
Approach LOS						F	C

Intersection Summary				
Average Delay	13.5			
Intersection Capacity Utilization	60.9%	ICU Level of Service		B
Analysis Period (min)	15			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	1	10	71	0	61	4	437	55	65	280	11
Future Volume (vph)	24	1	10	71	0	61	4	437	55	65	280	11
Lane Util. 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
Frt		0.961			0.850				0.850			0.850
Flt Protected		0.967		0.950			0.950			0.950		
Satd. Flow (prot)	0	1766	0	1736	1553	0	1805	1759	1282	1556	1759	967
Flt Permitted		0.967		0.950			0.950			0.950		
Satd. Flow (perm)	0	1766	0	1736	1553	0	1805	1759	1282	1556	1759	967
Adj. Flow (vph)	26	1	11	77	0	66	4	475	60	71	304	12
Lane Group Flow (vph)	0	38	0	77	66	0	4	475	60	71	304	12
Sign Control		Stop			Stop			Free			Free	

Intersection Summary												
Control Type: Unsignalized												
Intersection Capacity Utilization 45.3%				ICU Level of Service A								
Analysis Period (min) 15												



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	1	10	71	0	61	4	437	55	65	280	11
Future Volume (Veh/h)	24	1	10	71	0	61	4	437	55	65	280	11
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	26	1	11	77	0	66	4	475	60	71	304	12
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	995	989	304	940	941	475	316			535		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	995	989	304	940	941	475	316			535		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.3		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.3		
p0 queue free %	86	100	99	66	100	89	100			93		
cM capacity (veh/h)	188	230	740	223	245	586	1256			966		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	38	77	66	4	475	60	71	304	12
Volume Left	26	77	0	4	0	0	71	0	0
Volume Right	11	0	66	0	0	60	0	0	12
cSH	242	223	586	1256	1700	1700	966	1700	1700
Volume to Capacity	0.16	0.34	0.11	0.00	0.28	0.04	0.07	0.18	0.01
Queue Length 95th (ft)	14	37	9	0	0	0	6	0	0
Control Delay (s)	22.6	29.4	11.9	7.9	0.0	0.0	9.0	0.0	0.0
Lane LOS	C	D	B	A			A		
Approach Delay (s)	22.6	21.3		0.1			1.7		
Approach LOS	C	C							

Intersection Summary									
Average Delay			4.1						
Intersection Capacity Utilization			45.3%	ICU Level of Service				A	
Analysis Period (min)			15						

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	237	18	31	154	53	14	0	38	103	0	21
Future Volume (vph)	12	237	18	31	154	53	14	0	38	103	0	21
Lane Util. 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
Frt		0.989			0.961				0.850			0.850
Flt Protected	0.950			0.950				0.950			0.950	
Satd. Flow (prot)	1504	1826	0	1770	1657	0	0	1770	1583	0	1805	1615
Flt Permitted	0.950			0.950				0.950			0.950	
Satd. Flow (perm)	1504	1826	0	1770	1657	0	0	1770	1583	0	1805	1615
Adj. Flow (vph)	13	249	19	33	162	56	15	0	40	108	0	22
Lane Group Flow (vph)	13	268	0	33	218	0	0	15	40	0	108	22
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 39.3%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	237	18	31	154	53	14	0	38	103	0	21
Future Volume (Veh/h)	12	237	18	31	154	53	14	0	38	103	0	21
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	13	249	19	33	162	56	15	0	40	108	0	22
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									6			6
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	218			268			524	568	258	551	550	190
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	218			268			524	568	258	551	550	190
tC, single (s)	4.3			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.4			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			97			97	100	95	74	100	97
cM capacity (veh/h)	1252			1296			440	417	780	414	427	857

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	13	268	33	218	55	130
Volume Left	13	0	33	0	15	108
Volume Right	0	19	0	56	40	22
cSH	1252	1700	1296	1700	1073	498
Volume to Capacity	0.01	0.16	0.03	0.13	0.05	0.26
Queue Length 95th (ft)	1	0	2	0	4	26
Control Delay (s)	7.9	0.0	7.9	0.0	10.8	15.5
Lane LOS	A		A		B	C
Approach Delay (s)	0.4		1.0		10.8	15.5
Approach LOS					B	C

Intersection Summary					
Average Delay	4.1				
Intersection Capacity Utilization	39.3%	ICU Level of Service		A	
Analysis Period (min)	15				

Intersection: 1: Williamsburg W Drive/Lane Pl Drive & Longhill Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB
Directions Served	L	T	T	R	L	T	T	R	LT	R	LTR
Maximum Queue (ft)	27	233	229	67	78	157	132	55	94	168	132
Average Queue (ft)	2	114	107	8	28	84	39	10	37	73	49
95th Queue (ft)	14	197	189	43	61	143	92	38	79	133	101
Link Distance (ft)		1006	1006			738	738		392		461
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	250			225	250			250		225	
Storage Blk Time (%)		0	0	0						0	
Queuing Penalty (veh)		0	0	0						0	

Intersection: 2: Fords Colony Drive/Dominon Village & Longhill Road

Movement	EB	EB	WB	NB	SB
Directions Served	L	TR	L	LTR	LTR
Maximum Queue (ft)	7	19	84	291	5
Average Queue (ft)	1	1	26	106	0
95th Queue (ft)	6	11	60	233	3
Link Distance (ft)		2032		736	278
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	200		225		
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 3: Centerville Road & Westport/Manchester Drive

Movement	EB	WB	WB	NB	NB	NB	SB
Directions Served	LTR	L	TR	L	T	R	L
Maximum Queue (ft)	47	69	58	10	2	5	72
Average Queue (ft)	20	28	20	1	0	0	19
95th Queue (ft)	42	56	41	6	2	5	52
Link Distance (ft)	247	762			622		
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			140	190		325	190
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 4: News Road & Firestone Drive

Movement	EB	WB	NB	NB	SB	SB
Directions Served	L	L	LT	R	LT	R
Maximum Queue (ft)	28	26	38	54	79	33
Average Queue (ft)	3	5	12	24	40	16
95th Queue (ft)	16	20	37	51	67	40
Link Distance (ft)			372		374	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	225	225		150		150
Storage Blk Time (%)						
Queuing Penalty (veh)						

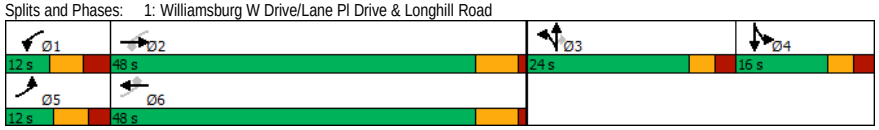
Network Summary

Network wide Queuing Penalty: 0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	933	26	53	581	22	52	4	273	68	1	22
Future Volume (vph)	4	933	26	53	581	22	52	4	273	68	1	22
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850		0.967	
Flt Protected	0.950			0.950				0.955			0.964	
Satd. Flow (prot)	1805	3539	1615	1719	3471	1380	0	1669	1615	0	1676	0
Flt Permitted	0.374			0.181				0.955			0.964	
Satd. Flow (perm)	711	3539	1615	328	3471	1380	0	1669	1615	0	1676	0
Satd. Flow (RTOR)			164			164			206		13	
Adj. Flow (vph)	4	1014	28	58	632	24	57	4	297	74	1	24
Lane Group Flow (vph)	4	1014	28	58	632	24	0	61	297	0	99	0
Turn Type	D.P+P	NA	Perm	D.P+P	NA	Perm	Split	NA	Perm	Split	NA	
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases	6		2	2		6			3			
Total Split (s)	12.0	48.0	48.0	12.0	48.0	48.0	24.0	24.0	24.0	16.0	16.0	
Total Lost Time (s)	6.5	6.0	6.0	7.0	6.0	6.0		5.5	5.5		5.5	
Act Effct Green (s)	41.1	34.1	34.1	36.5	40.9	40.9		12.0	12.0		9.8	
Actuated g/C Ratio	0.52	0.43	0.43	0.46	0.52	0.52		0.15	0.15		0.12	
v/c Ratio	0.01	0.66	0.04	0.23	0.35	0.03		0.24	0.71		0.45	
Control Delay	10.5	22.3	0.1	12.9	13.5	0.1		37.2	22.8		42.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	
Total Delay	10.5	22.3	0.1	12.9	13.5	0.1		37.2	22.8		42.5	
LOS	B	C	A	B	B	A		D	C		D	
Approach Delay		21.7			13.0			25.2			42.5	
Approach LOS		C			B			C			D	

Intersection Summary			
Cycle Length: 100			
Actuated Cycle Length: 78.8			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.71			
Intersection Signal Delay: 20.4		Intersection LOS: C	
Intersection Capacity Utilization 62.3%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 1: Williamsburg W Drive/Lane Pl Drive & Longhill Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	933	26	53	581	22	52	4	273	68	1	22
Future Volume (vph)	4	933	26	53	581	22	52	4	273	68	1	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.0	6.0	7.0	6.0	6.0		5.5	5.5		5.5	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85		0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.96	
Satd. Flow (prot)	1805	3539	1615	1719	3471	1380		1670	1615		1677	
Flt Permitted	0.37	1.00	1.00	0.18	1.00	1.00		0.96	1.00		0.96	
Satd. Flow (perm)	711	3539	1615	327	3471	1380		1670	1615		1677	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	4	1014	28	58	632	24	57	4	297	74	1	24
RTOR Reduction (vph)	0	0	15	0	0	12	0	0	177	0	12	0
Lane Group Flow (vph)	4	1014	13	58	632	12	0	61	120	0	87	0
Heavy Vehicles (%)	0%	2%	0%	5%	4%	17%	7%	33%	0%	4%	0%	11%
Turn Type	D.P+P	NA	Perm	D.P+P	NA	Perm	Split	NA	Perm	Split	NA	
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases	6		2	2		6			3			
Actuated Green, G (s)	41.7	37.6	37.6	41.2	40.9	40.9		12.0	12.0		6.8	
Effective Green, g (s)	41.7	37.6	37.6	41.2	40.9	40.9		12.0	12.0		6.8	
Actuated g/C Ratio	0.50	0.45	0.45	0.49	0.49	0.49		0.14	0.14		0.08	
Clearance Time (s)	6.5	6.0	6.0	7.0	6.0	6.0		5.5	5.5		5.5	
Vehicle Extension (s)	2.0	5.0	5.0	2.0	5.0	5.0		3.0	3.0		3.0	
Lane Grp Cap (vph)	363	1584	722	220	1690	671		238	230		135	
v/s Ratio Prot	0.00	c0.29		c0.01	c0.18			0.04			c0.05	
v/s Ratio Perm	0.01		0.01	0.12		0.01			c0.07			
v/c Ratio	0.01	0.64	0.02	0.26	0.37	0.02		0.26	0.52		0.64	
Uniform Delay, d1	10.8	18.0	12.9	12.5	13.5	11.2		32.0	33.4		37.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2	0.0	1.2	0.0	0.2	0.3	0.0		0.6	2.1		10.1	
Delay (s)	10.8	19.2	12.9	12.8	13.8	11.2		32.6	35.5		47.5	
Level of Service	B	B	B	B	B	B		C	D		D	
Approach Delay (s)		19.0			13.6			35.0			47.5	
Approach LOS		B			B			D			D	

Intersection Summary					
HCM 2000 Control Delay		21.1	HCM 2000 Level of Service		C
HCM 2000 Volume to Capacity ratio		0.60			
Actuated Cycle Length (s)		84.0	Sum of lost time (s)		24.0
Intersection Capacity Utilization		62.3%	ICU Level of Service		B
Analysis Period (min)		15			
c Critical Lane Group					

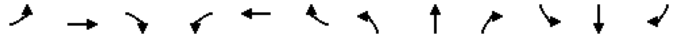
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	366	45	135	331	1	92	1	178	0	1	0
Future Volume (vph)	4	366	45	135	331	1	92	1	178	0	1	0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850			
Flt Protected	0.950			0.950				0.953				
Satd. Flow (prot)	1805	1810	1524	1752	1776	1615	0	1648	1615	0	1900	0
Flt Permitted	0.950			0.950				0.953				
Satd. Flow (perm)	1805	1810	1524	1752	1776	1615	0	1648	1615	0	1900	0
Adj. Flow (vph)	4	398	49	147	360	1	100	1	193	0	1	0
Lane Group Flow (vph)	4	398	49	147	360	1	0	101	193	0	1	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 48.6%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	366	45	135	331	1	92	1	178	0	1	0
Future Volume (Veh/h)	4	366	45	135	331	1	92	1	178	0	1	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	4	398	49	147	360	1	100	1	193	0	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									7			
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	361			447			1060	1061	398	1157	1109	360
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	361			447			1060	1061	398	1157	1109	360
tC, single (s)	4.1			4.1			7.2	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			87			42	99	71	100	99	100
cM capacity (veh/h)	1209			1108			174	195	656	110	183	689

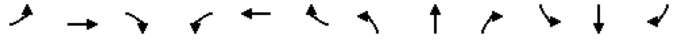
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	4	398	49	147	360	1	294	1
Volume Left	4	0	0	147	0	0	100	0
Volume Right	0	0	49	0	0	1	193	0
cSH	1209	1700	1700	1108	1700	1700	507	183
Volume to Capacity	0.00	0.23	0.03	0.13	0.21	0.00	0.58	0.01
Queue Length 95th (ft)	0	0	0	11	0	0	91	0
Control Delay (s)	8.0	0.0	0.0	8.7	0.0	0.0	25.9	24.8
Lane LOS	A			A			D	C
Approach Delay (s)	0.1			2.5			25.9	24.8
Approach LOS							D	C

Intersection Summary					
Average Delay	7.1				
Intersection Capacity Utilization	48.6%	ICU Level of Service		A	
Analysis Period (min)	15				



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	1	10	74	0	62	4	437	56	65	280	11
Future Volume (vph)	24	1	10	74	0	62	4	437	56	65	280	11
Lane Util. 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
Frt		0.961			0.850				0.850			0.850
Flt Protected		0.967		0.950			0.950			0.950		
Satd. Flow (prot)	0	1766	0	1736	1553	0	1805	1759	1282	1556	1759	967
Flt Permitted		0.967		0.950			0.950			0.950		
Satd. Flow (perm)	0	1766	0	1736	1553	0	1805	1759	1282	1556	1759	967
Adj. Flow (vph)	26	1	11	80	0	67	4	475	61	71	304	12
Lane Group Flow (vph)	0	38	0	80	67	0	4	475	61	71	304	12
Sign Control		Stop			Stop			Free			Free	

Intersection Summary												
Control Type: Unsignalized												
Intersection Capacity Utilization 45.3%				ICU Level of Service A								
Analysis Period (min) 15												



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	1	10	74	0	62	4	437	56	65	280	11
Future Volume (Veh/h)	24	1	10	74	0	62	4	437	56	65	280	11
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	26	1	11	80	0	67	4	475	61	71	304	12
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	996	990	304	940	941	475	316			536		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	996	990	304	940	941	475	316			536		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.3		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.3		
p0 queue free %	86	100	99	64	100	89	100			93		
cM capacity (veh/h)	188	229	740	223	245	586	1256			965		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	38	80	67	4	475	61	71	304	12
Volume Left	26	80	0	4	0	0	71	0	0
Volume Right	11	0	67	0	0	61	0	0	12
cSH	241	223	586	1256	1700	1700	965	1700	1700
Volume to Capacity	0.16	0.36	0.11	0.00	0.28	0.04	0.07	0.18	0.01
Queue Length 95th (ft)	14	39	10	0	0	0	6	0	0
Control Delay (s)	22.7	29.9	11.9	7.9	0.0	0.0	9.0	0.0	0.0
Lane LOS	C	D	B	A			A		
Approach Delay (s)	22.7	21.7		0.1			1.7		
Approach LOS	C	C							

Intersection Summary									
Average Delay			4.2						
Intersection Capacity Utilization			45.3%	ICU Level of Service				A	
Analysis Period (min)			15						

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	239	18	31	155	53	14	0	38	103	0	21
Future Volume (vph)	12	239	18	31	155	53	14	0	38	103	0	21
Lane Util. 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
Frt		0.989			0.962				0.850			0.850
Flt Protected	0.950			0.950				0.950			0.950	
Satd. Flow (prot)	1504	1826	0	1770	1659	0	0	1770	1583	0	1805	1615
Flt Permitted	0.950			0.950				0.950			0.950	
Satd. Flow (perm)	1504	1826	0	1770	1659	0	0	1770	1583	0	1805	1615
Adj. Flow (vph)	13	252	19	33	163	56	15	0	40	108	0	22
Lane Group Flow (vph)	13	271	0	33	219	0	0	15	40	0	108	22
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 39.4%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	239	18	31	155	53	14	0	38	103	0	21
Future Volume (Veh/h)	12	239	18	31	155	53	14	0	38	103	0	21
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	13	252	19	33	163	56	15	0	40	108	0	22
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									6			6
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	219			271			528	572	262	555	554	191
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	219			271			528	572	262	555	554	191
tC, single (s)	4.3			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.4			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			97			97	100	95	74	100	97
cM capacity (veh/h)	1251			1292			437	415	777	411	425	856

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	13	271	33	219	55	130
Volume Left	13	0	33	0	15	108
Volume Right	0	19	0	56	40	22
cSH	1251	1700	1292	1700	1069	495
Volume to Capacity	0.01	0.16	0.03	0.13	0.05	0.26
Queue Length 95th (ft)	1	0	2	0	4	26
Control Delay (s)	7.9	0.0	7.9	0.0	10.9	15.6
Lane LOS	A		A		B	C
Approach Delay (s)	0.4		1.0		10.9	15.6
Approach LOS					B	C

Intersection Summary					
Average Delay	4.1				
Intersection Capacity Utilization	39.4%	ICU Level of Service		A	
Analysis Period (min)	15				

Intersection: 1: Williamsburg W Drive/Lane Pl Drive & Longhill Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB
Directions Served	L	T	T	R	L	T	T	R	LT	R	LTR
Maximum Queue (ft)	49	250	264	29	67	166	140	44	98	167	124
Average Queue (ft)	4	122	118	7	26	80	44	8	35	77	52
95th Queue (ft)	32	211	211	24	55	141	101	32	76	138	99
Link Distance (ft)		1006	1006			738	738		392		461
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	250			225	250			250		225	
Storage Blk Time (%)	0	0	0							0	
Queuing Penalty (veh)	0	0	0							0	

Intersection: 2: Fords Colony Drive/Dominon Village & Longhill Road

Movement	EB	EB	EB	WB	NB	NB	SB
Directions Served	L	T	R	L	LT	R	LTR
Maximum Queue (ft)	16	4	8	87	196	132	9
Average Queue (ft)	1	0	0	34	58	44	0
95th Queue (ft)	9	4	6	69	146	102	5
Link Distance (ft)		2030			723		278
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	200		300	225		175	
Storage Blk Time (%)					1	0	
Queuing Penalty (veh)					3	0	

Intersection: 3: Centerville Road & Westport/Manchester Drive

Movement	EB	WB	WB	NB	NB	NB	SB
Directions Served	LTR	L	TR	L	T	R	L
Maximum Queue (ft)	51	77	56	8	2	4	69
Average Queue (ft)	19	30	20	1	0	0	20
95th Queue (ft)	44	61	42	7	2	5	53
Link Distance (ft)	247	762			622		
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			140	190		325	190
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 4: News Road & Firestone Drive

Movement	EB	WB	NB	NB	SB	SB
Directions Served	L	L	LT	R	LT	R
Maximum Queue (ft)	37	26	36	52	82	37
Average Queue (ft)	3	4	13	24	40	17
95th Queue (ft)	17	18	38	48	68	42
Link Distance (ft)			372		374	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	225	225		150		150
Storage Blk Time (%)						
Queuing Penalty (veh)						

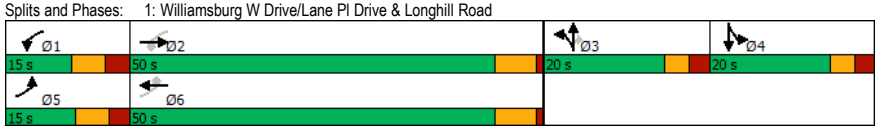
Network Summary

Network wide Queuing Penalty: 3

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	765	36	214	1016	40	52	0	141	24	0	15
Future Volume (vph)	18	765	36	214	1016	40	52	0	141	24	0	15
Lane Util. 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
Frt			0.850			0.850			0.850		0.947	
Flt Protected	0.950			0.950				0.950			0.970	
Satd. Flow (prot)	1805	1845	1615	1805	1881	1615	0	1770	1568	0	1699	0
Flt Permitted	0.073			0.138				0.950			0.970	
Satd. Flow (perm)	139	1845	1615	262	1881	1615	0	1770	1568	0	1699	0
Satd. Flow (RTOR)			156			156			161		161	
Adj. Flow (vph)	19	805	38	225	1069	42	55	0	148	25	0	16
Lane Group Flow (vph)	19	805	38	225	1069	42	0	55	148	0	41	0
Turn Type	D.P+P	NA	Perm	D.P+P	NA	Perm	Split	NA	Perm	Split	NA	
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases	6		2	2		6			3			
Total Split (s)	15.0	50.0	50.0	15.0	50.0	50.0	20.0	20.0	20.0	20.0	20.0	
Total Lost Time (s)	6.5	6.0	6.0	7.0	6.0	6.0		5.5	5.5		5.5	
Act Effct Green (s)	56.6	44.4	44.4	51.4	55.1	55.1		8.5	8.5		7.1	
Actuated g/C Ratio	0.65	0.51	0.51	0.59	0.64	0.64		0.10	0.10		0.08	
v/c Ratio	0.10	0.85	0.04	0.75	0.89	0.04		0.32	0.49		0.14	
Control Delay	7.8	31.0	0.1	30.3	29.5	0.1		43.1	11.6		1.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	
Total Delay	7.8	31.0	0.1	30.3	29.5	0.1		43.1	11.6		1.1	
LOS	A	C	A	C	C	A		D	B		A	
Approach Delay		29.2			28.7			20.1			1.1	
Approach LOS		C			C			C			A	

Intersection Summary			
Cycle Length: 105			
Actuated Cycle Length: 86.6			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.89			
Intersection Signal Delay: 27.7		Intersection LOS: C	
Intersection Capacity Utilization 81.6%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 1: Williamsburg W Drive/Lane Pl Drive & Longhill Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	765	36	214	1016	40	52	0	141	24	0	15
Future Volume (vph)	18	765	36	214	1016	40	52	0	141	24	0	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.0	6.0	7.0	6.0	6.0		5.5	5.5		5.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85		0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00		0.97	
Satd. Flow (prot)	1805	1845	1615	1805	1881	1615		1770	1568		1700	
Flt Permitted	0.07	1.00	1.00	0.14	1.00	1.00		0.95	1.00		0.97	
Satd. Flow (perm)	138	1845	1615	262	1881	1615		1770	1568		1700	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	19	805	38	225	1069	42	55	0	148	25	0	16
RTOR Reduction (vph)	0	0	18	0	0	17	0	0	134	0	39	0
Lane Group Flow (vph)	19	805	20	225	1069	25	0	55	14	0	2	0
Heavy Vehicles (%)	0%	3%	0%	0%	1%	0%	2%	0%	3%	0%	0%	7%
Turn Type	D.P+P	NA	Perm	D.P+P	NA	Perm	Split	NA	Perm	Split	NA	
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases	6		2	2		6			3			
Actuated Green, G (s)	57.1	48.5	48.5	56.6	55.1	55.1		8.5	8.5		3.9	
Effective Green, g (s)	57.1	48.5	48.5	56.6	55.1	55.1		8.5	8.5		3.9	
Actuated g/C Ratio	0.61	0.52	0.52	0.61	0.59	0.59		0.09	0.09		0.04	
Clearance Time (s)	6.5	6.0	6.0	7.0	6.0	6.0		5.5	5.5		5.5	
Vehicle Extension (s)	2.0	5.0	5.0	2.0	5.0	5.0		3.0	3.0		3.0	
Lane Grp Cap (vph)	120	962	842	293	1114	956		161	143		71	
v/s Ratio Prot	0.00	0.44		c0.07	c0.57			c0.03			c0.00	
v/s Ratio Perm	0.09		0.01	0.40		0.02			0.01			
v/c Ratio	0.16	0.84	0.02	0.77	0.96	0.03		0.34	0.09		0.02	
Uniform Delay, d1	20.3	18.9	10.8	15.3	17.9	7.8		39.6	38.7		42.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2	0.2	7.1	0.0	10.4	18.2	0.0		1.3	0.3		0.1	
Delay (s)	20.6	26.0	10.8	25.7	36.1	7.9		40.9	39.0		42.9	
Level of Service	C	C	B	C	D	A		D	D		D	
Approach Delay (s)		25.2			33.5			39.5			42.9	
Approach LOS		C			C			D			D	

Intersection Summary					
HCM 2000 Control Delay		31.2	HCM 2000 Level of Service		C
HCM 2000 Volume to Capacity ratio		0.88			
Actuated Cycle Length (s)		93.0	Sum of lost time (s)		24.0
Intersection Capacity Utilization		81.6%	ICU Level of Service		D
Analysis Period (min)		15			
c Critical Lane Group					

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	354	55	200	293	2	47	3	126	4	0	5
Future Volume (vph)	0	354	55	200	293	2	47	3	126	4	0	5
Lane Util. 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
Frt		0.980				0.850		0.903			0.925	
Flt Protected				0.950				0.987			0.978	
Satd. Flow (prot)	1900	1846	0	1805	1863	1615	0	1661	0	0	1719	0
Flt Permitted				0.950				0.987			0.978	
Satd. Flow (perm)	1900	1846	0	1805	1863	1615	0	1661	0	0	1719	0
Adj. Flow (vph)	0	377	59	213	312	2	50	3	134	4	0	5
Lane Group Flow (vph)	0	436	0	213	312	2	0	187	0	0	9	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 54.8%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	354	55	200	293	2	47	3	126	4	0	5
Future Volume (Veh/h)	0	354	55	200	293	2	47	3	126	4	0	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	0	377	59	213	312	2	50	3	134	4	0	5
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	314			436			1150	1146	406	1250	1174	312
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	314			436			1150	1146	406	1250	1174	312
tC, single (s)	4.1			4.1			7.1	6.8	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.3	3.3	3.5	4.0	3.3
p0 queue free %	100			81			67	98	79	96	100	99
cM capacity (veh/h)	1258			1134			150	142	644	101	157	733

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	0	436	213	312	2	187	9
Volume Left	0	0	213	0	0	50	4
Volume Right	0	59	0	0	2	134	5
cSH	1700	1700	1134	1700	1700	333	193
Volume to Capacity	0.00	0.26	0.19	0.18	0.00	0.56	0.05
Queue Length 95th (ft)	0	0	17	0	0	81	4
Control Delay (s)	0.0	0.0	8.9	0.0	0.0	28.8	24.5
Lane LOS			A			D	C
Approach Delay (s)	0.0		3.6			28.8	24.5
Approach LOS						D	C

Intersection Summary				
Average Delay	6.5			
Intersection Capacity Utilization	54.8%	ICU Level of Service		A
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	1	2	49	0	29	2	305	67	24	249	2
Future Volume (vph)	3	1	2	49	0	29	2	305	67	24	249	2
Lane Util. 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
Frt		0.955			0.850				0.850			0.850
Flt Protected		0.976		0.950			0.950			0.950		
Satd. Flow (prot)	0	1771	0	1805	1553	0	1805	1845	1568	1805	1863	1615
Flt Permitted		0.976		0.950			0.950			0.950		
Satd. Flow (perm)	0	1771	0	1805	1553	0	1805	1845	1568	1805	1863	1615
Adj. Flow (vph)	3	1	2	52	0	31	2	321	71	25	262	2
Lane Group Flow (vph)	0	6	0	52	31	0	2	321	71	25	262	2
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 31.4%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	1	2	49	0	29	2	305	67	24	249	2
Future Volume (Veh/h)	3	1	2	49	0	29	2	305	67	24	249	2
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	3	1	2	52	0	31	2	321	71	25	262	2
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	668	708	262	640	639	321	264			392		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	668	708	262	640	639	321	264			392		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	100	86	100	96	100			98		
cM capacity (veh/h)	352	354	782	383	388	715	1312			1178		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	6	52	31	2	321	71	25	262	2
Volume Left	3	52	0	2	0	0	25	0	0
Volume Right	2	0	31	0	0	71	0	0	2
cSH	431	383	715	1312	1700	1700	1178	1700	1700
Volume to Capacity	0.01	0.14	0.04	0.00	0.19	0.04	0.02	0.15	0.00
Queue Length 95th (ft)	1	12	3	0	0	0	2	0	0
Control Delay (s)	13.5	15.9	10.3	7.7	0.0	0.0	8.1	0.0	0.0
Lane LOS	B	C	B	A			A		
Approach Delay (s)	13.5	13.8		0.0			0.7		
Approach LOS	B	B							

Intersection Summary					
Average Delay		1.9			
Intersection Capacity Utilization		31.4%	ICU Level of Service		A
Analysis Period (min)		15			

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	8	153	257	117	68	7
Future Volume (vph)	8	153	257	117	68	7
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1805	1863	1863	1615	1770	1615
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1805	1863	1863	1615	1770	1615
Adj. Flow (vph)	8	159	268	122	71	7
Lane Group Flow (vph)	8	159	268	122	71	7
Sign Control		Free	Free		Stop	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization	24.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	8	153	257	117	68	7
Future Volume (Veh/h)	8	153	257	117	68	7
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	8	159	268	122	71	7
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						6
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	390				443	268
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	390				443	268
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				88	99
cM capacity (veh/h)	1180				568	776

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	8	159	268	122	78
Volume Left	8	0	0	0	71
Volume Right	0	0	0	122	7
cSH	1180	1700	1700	1700	624
Volume to Capacity	0.01	0.09	0.16	0.07	0.12
Queue Length 95th (ft)	1	0	0	0	11
Control Delay (s)	8.1	0.0	0.0	0.0	12.0
Lane LOS	A				B
Approach Delay (s)	0.4		0.0		12.0
Approach LOS					B

Intersection Summary				
Average Delay	1.6			
Intersection Capacity Utilization	24.0%	ICU Level of Service		A
Analysis Period (min)	15			

Intersection: 1: Williamsburg W Drive/Lane Pl Drive & Longhill Road

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB
Directions Served	L	T	R	L	T	R	LT	R	LTR
Maximum Queue (ft)	148	519	206	250	763	690	97	109	81
Average Queue (ft)	16	228	25	124	330	110	39	47	26
95th Queue (ft)	74	445	120	248	758	532	78	81	61
Link Distance (ft)		1007			741	741	405		475
Upstream Blk Time (%)					7	3			
Queuing Penalty (veh)					0	0			
Storage Bay Dist (ft)	250		225	250				225	
Storage Blk Time (%)	0	9	0	1	7				
Queuing Penalty (veh)	0	5	1	7	15				

Intersection: 2: Fords Colony Drive/Dominon Village & Longhill Road

Movement	EB	WB	WB	NB	SB
Directions Served	TR	L	T	LTR	LTR
Maximum Queue (ft)	21	88	4	156	17
Average Queue (ft)	2	34	0	58	4
95th Queue (ft)	11	71	4	118	14
Link Distance (ft)	2032		1469	736	278
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)		225			
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 3: Centerville Road & Westport/Manchester Drive

Movement	EB	WB	WB	NB	SB
Directions Served	LTR	L	TR	L	L
Maximum Queue (ft)	28	42	46	4	30
Average Queue (ft)	6	20	13	0	6
95th Queue (ft)	23	37	34	3	23
Link Distance (ft)	247	762			
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			140	190	190
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 4: News Road & Firestone Drive

Movement	EB	WB	SB	SB
Directions Served	L	R	L	R
Maximum Queue (ft)	27	5	71	31
Average Queue (ft)	3	0	34	6
95th Queue (ft)	16	5	60	26
Link Distance (ft)			375	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	225	300		150
Storage Blk Time (%)				
Queuing Penalty (veh)				

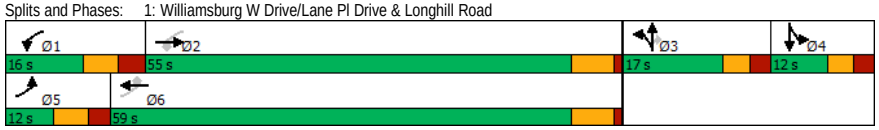
Network Summary

Network wide Queuing Penalty: 28

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	809	37	223	1075	42	54	0	147	25	0	16
Future Volume (vph)	19	809	37	223	1075	42	54	0	147	25	0	16
Lane Util. 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
Frt			0.850			0.850			0.850		0.947	
Flt Protected	0.950			0.950				0.950			0.971	
Satd. Flow (prot)	1805	1863	1615	1719	1827	1380	0	1687	1615	0	1636	0
Flt Permitted	0.069			0.106				0.950			0.971	
Satd. Flow (perm)	131	1863	1615	192	1827	1380	0	1687	1615	0	1636	0
Satd. Flow (RTOR)			158			158			164		164	
Adj. Flow (vph)	20	852	39	235	1132	44	57	0	155	26	0	17
Lane Group Flow (vph)	20	852	39	235	1132	44	0	57	155	0	43	0
Turn Type	D.P+P	NA	Perm	D.P+P	NA	Perm	Split	NA	Perm	Split	NA	
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases	6		2	2		6			3			
Total Split (s)	12.0	55.0	55.0	16.0	59.0	59.0	17.0	17.0	17.0	12.0	12.0	
Total Lost Time (s)	6.5	6.0	6.0	7.0	6.0	6.0		5.5	5.5		5.5	
Act Effct Green (s)	59.2	45.7	45.7	53.9	57.8	57.8		8.6	8.6		6.6	
Actuated g/C Ratio	0.67	0.51	0.51	0.61	0.65	0.65		0.10	0.10		0.07	
v/c Ratio	0.11	0.89	0.04	0.86	0.95	0.05		0.35	0.51		0.16	
Control Delay	7.4	34.2	0.1	49.7	36.6	0.1		46.6	12.4		1.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	
Total Delay	7.4	34.2	0.1	49.7	36.6	0.1		46.6	12.4		1.2	
LOS	A	C	A	D	D	A		D	B		A	
Approach Delay		32.1			37.7			21.6			1.2	
Approach LOS		C			D			C			A	

Intersection Summary			
Cycle Length: 100			
Actuated Cycle Length: 88.9			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.95			
Intersection Signal Delay: 33.8		Intersection LOS: C	
Intersection Capacity Utilization 84.8%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 1: Williamsburg W Drive/Lane Pl Drive & Longhill Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	809	37	223	1075	42	54	0	147	25	0	16
Future Volume (vph)	19	809	37	223	1075	42	54	0	147	25	0	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.0	6.0	7.0	6.0	6.0		5.5	5.5		5.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85		0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00		0.97	
Satd. Flow (prot)	1805	1863	1615	1719	1827	1380		1687	1615		1635	
Flt Permitted	0.07	1.00	1.00	0.11	1.00	1.00		0.95	1.00		0.97	
Satd. Flow (perm)	131	1863	1615	192	1827	1380		1687	1615		1635	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	20	852	39	235	1132	44	57	0	155	26	0	17
RTOR Reduction (vph)	0	0	19	0	0	17	0	0	141	0	41	0
Lane Group Flow (vph)	20	852	20	235	1132	27	0	57	14	0	2	0
Heavy Vehicles (%)	0%	2%	0%	5%	4%	17%	7%	33%	0%	4%	0%	11%
Turn Type	D.P+P	NA	Perm	D.P+P	NA	Perm	Split	NA	Perm	Split	NA	
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases	6		2	2		6			3			
Actuated Green, G (s)	59.7	50.0	50.0	59.2	57.8	57.8		8.6	8.6		3.5	
Effective Green, g (s)	59.7	50.0	50.0	59.2	57.8	57.8		8.6	8.6		3.5	
Actuated g/C Ratio	0.63	0.52	0.52	0.62	0.61	0.61		0.09	0.09		0.04	
Clearance Time (s)	6.5	6.0	6.0	7.0	6.0	6.0		5.5	5.5		5.5	
Vehicle Extension (s)	2.0	5.0	5.0	2.0	5.0	5.0		3.0	3.0		3.0	
Lane Grp Cap (vph)	115	977	847	266	1108	836		152	145		60	
v/s Ratio Prot	0.00	0.46		c0.09	c0.62			c0.03			c0.00	
v/s Ratio Perm	0.10		0.01	0.46		0.02			0.01			
v/c Ratio	0.17	0.87	0.02	0.88	1.02	0.03		0.38	0.10		0.03	
Uniform Delay, d1	22.1	19.8	10.9	21.9	18.8	7.5		40.8	39.8		44.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2	0.3	9.3	0.0	26.7	32.6	0.0		1.6	0.3		0.2	
Delay (s)	22.3	29.2	10.9	48.6	51.4	7.6		42.4	40.1		44.4	
Level of Service	C	C	B	D	D	A		D	D		D	
Approach Delay (s)		28.3			49.5			40.7			44.4	
Approach LOS		C			D			D			D	

Intersection Summary					
HCM 2000 Control Delay		41.2	HCM 2000 Level of Service		D
HCM 2000 Volume to Capacity ratio		0.95			
Actuated Cycle Length (s)		95.3	Sum of lost time (s)		24.0
Intersection Capacity Utilization		84.8%	ICU Level of Service		E
Analysis Period (min)		15			
c Critical Lane Group					

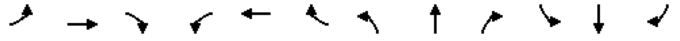
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	377	59	215	316	2	50	3	135	4	0	5
Future Volume (vph)	0	377	59	215	316	2	50	3	135	4	0	5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.980				0.850		0.903			0.925	
Flt Protected				0.950				0.987			0.978	
Satd. Flow (prot)	1900	1771	0	1752	1776	1615	0	1650	0	0	1719	0
Flt Permitted				0.950				0.987			0.978	
Satd. Flow (perm)	1900	1771	0	1752	1776	1615	0	1650	0	0	1719	0
Adj. Flow (vph)	0	401	63	229	336	2	53	3	144	4	0	5
Lane Group Flow (vph)	0	464	0	229	336	2	0	200	0	0	9	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 57.8%		ICU Level of Service B	
Analysis Period (min) 15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	377	59	215	316	2	50	3	135	4	0	5
Future Volume (Veh/h)	0	377	59	215	316	2	50	3	135	4	0	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	0	401	63	229	336	2	53	3	144	4	0	5
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	338			464			1232	1228	432	1340	1258	336
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	338			464			1232	1228	432	1340	1258	336
tC, single (s)	4.1			4.1			7.2	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			79			57	98	77	95	100	99
cM capacity (veh/h)	1232			1092			124	142	627	83	136	711

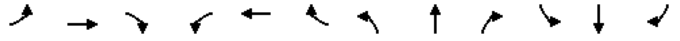
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	0	464	229	336	2	200	9
Volume Left	0	0	229	0	0	53	4
Volume Right	0	63	0	0	2	144	5
cSH	1700	1700	1092	1700	1700	294	163
Volume to Capacity	0.00	0.27	0.21	0.20	0.00	0.68	0.06
Queue Length 95th (ft)	0	0	20	0	0	115	4
Control Delay (s)	0.0	0.0	9.2	0.0	0.0	39.7	28.3
Lane LOS			A			E	D
Approach Delay (s)	0.0		3.7			39.7	28.3
Approach LOS						E	D

Intersection Summary					
Average Delay	8.3				
Intersection Capacity Utilization	57.8%	ICU Level of Service		B	
Analysis Period (min)	15				



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	1	6	56	0	30	10	331	74	25	273	22
Future Volume (vph)	16	1	6	56	0	30	10	331	74	25	273	22
Lane Util. 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
Frt		0.966			0.850				0.850			0.850
Flt Protected		0.966		0.950			0.950			0.950		
Satd. Flow (prot)	0	1773	0	1736	1553	0	1805	1759	1282	1556	1759	967
Flt Permitted		0.966		0.950			0.950			0.950		
Satd. Flow (perm)	0	1773	0	1736	1553	0	1805	1759	1282	1556	1759	967
Adj. Flow (vph)	17	1	6	59	0	32	11	348	78	26	287	23
Lane Group Flow (vph)	0	24	0	59	32	0	11	348	78	26	287	23
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 35.4%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	1	6	56	0	30	10	331	74	25	273	22
Future Volume (Veh/h)	16	1	6	56	0	30	10	331	74	25	273	22
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	17	1	6	59	0	32	11	348	78	26	287	23
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	741	787	287	716	732	348	310			426		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	741	787	287	716	732	348	310			426		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.3		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.3		
p0 queue free %	95	100	99	82	100	95	99			98		
cM capacity (veh/h)	311	315	757	331	339	691	1262			1062		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	24	59	32	11	348	78	26	287	23
Volume Left	17	59	0	11	0	0	26	0	0
Volume Right	6	0	32	0	0	78	0	0	23
cSH	365	331	691	1262	1700	1700	1062	1700	1700
Volume to Capacity	0.07	0.18	0.05	0.01	0.20	0.05	0.02	0.17	0.01
Queue Length 95th (ft)	5	16	4	1	0	0	2	0	0
Control Delay (s)	15.6	18.2	10.5	7.9	0.0	0.0	8.5	0.0	0.0
Lane LOS	C	C	B	A			A		
Approach Delay (s)	15.6	15.5		0.2			0.7		
Approach LOS	C	C							

Intersection Summary					
Average Delay		2.4			
Intersection Capacity Utilization		35.4%	ICU Level of Service		A
Analysis Period (min)		15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	164	23	59	278	122	23	0	56	71	0	7
Future Volume (vph)	8	164	23	59	278	122	23	0	56	71	0	7
Lane Util. 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
Frt		0.982			0.954				0.850			0.850
Flt Protected	0.950			0.950				0.950			0.950	
Satd. Flow (prot)	1504	1814	0	1770	1653	0	0	1770	1583	0	1805	1615
Flt Permitted	0.950			0.950				0.950			0.950	
Satd. Flow (perm)	1504	1814	0	1770	1653	0	0	1770	1583	0	1805	1615
Adj. Flow (vph)	8	171	24	61	290	127	24	0	58	74	0	7
Lane Group Flow (vph)	8	195	0	61	417	0	0	24	58	0	74	7
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 46.0%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	164	23	59	278	122	23	0	56	71	0	7
Future Volume (Veh/h)	8	164	23	59	278	122	23	0	56	71	0	7
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	8	171	24	61	290	127	24	0	58	74	0	7
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									6			6
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	417			195			614	738	183	692	686	354
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	417			195			614	738	183	692	686	354
tC, single (s)	4.3			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.4			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			96			94	100	93	77	100	99
cM capacity (veh/h)	1052			1378			384	328	859	324	351	695

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	8	195	61	417	82	81
Volume Left	8	0	61	0	24	74
Volume Right	0	24	0	127	58	7
cSH	1052	1700	1378	1700	1215	354
Volume to Capacity	0.01	0.11	0.04	0.25	0.07	0.23
Queue Length 95th (ft)	1	0	3	0	5	22
Control Delay (s)	8.4	0.0	7.7	0.0	11.1	18.6
Lane LOS	A		A		B	C
Approach Delay (s)	0.3		1.0		11.1	18.6
Approach LOS					B	C

Intersection Summary					
Average Delay	3.5				
Intersection Capacity Utilization	46.0%	ICU Level of Service		A	
Analysis Period (min)	15				

Intersection: 1: Williamsburg W Drive/Lane Pl Drive & Longhill Road

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB
Directions Served	L	T	R	L	T	R	LT	R	LTR
Maximum Queue (ft)	167	562	224	250	772	777	115	83	88
Average Queue (ft)	19	251	25	145	397	204	45	45	30
95th Queue (ft)	85	474	120	271	843	748	93	74	68
Link Distance (ft)		1007			741	741	405		475
Upstream Blk Time (%)					13	7			
Queuing Penalty (veh)					0	0			
Storage Bay Dist (ft)	250		225	250				225	
Storage Blk Time (%)	0	10	0	1	9				
Queuing Penalty (veh)	0	6	1	6	19				

Intersection: 2: Fords Colony Drive/Dominon Village & Longhill Road

Movement	EB	WB	NB	SB
Directions Served	TR	L	LTR	LTR
Maximum Queue (ft)	33	105	246	22
Average Queue (ft)	3	39	84	4
95th Queue (ft)	18	79	193	16
Link Distance (ft)	2032		736	278
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		225		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: Centerville Road & Westport/Manchester Drive

Movement	EB	WB	WB	NB	SB
Directions Served	LTR	L	TR	L	L
Maximum Queue (ft)	40	56	46	16	50
Average Queue (ft)	14	24	13	1	6
95th Queue (ft)	37	47	32	8	30
Link Distance (ft)	247	762			
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			140	190	190
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 4: News Road & Firestone Drive

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	LT	R	LT	R
Maximum Queue (ft)	35	1	34	4	57	68	76	33
Average Queue (ft)	2	0	7	0	18	31	34	6
95th Queue (ft)	16	0	26	3	47	55	61	25
Link Distance (ft)		1230		492	372		374	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	225		225			150		150
Storage Blk Time (%)								
Queuing Penalty (veh)								

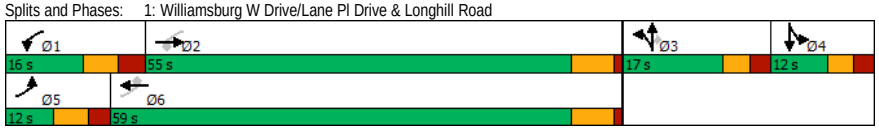
Network Summary

Network wide Queuing Penalty: 32

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	817	37	223	1088	42	54	0	147	25	0	16
Future Volume (vph)	19	817	37	223	1088	42	54	0	147	25	0	16
Lane Util. 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
Frt			0.850			0.850			0.850		0.947	
Flt Protected	0.950			0.950				0.950			0.971	
Satd. Flow (prot)	1805	1863	1615	1719	1827	1380	0	1687	1615	0	1636	0
Flt Permitted	0.069			0.101				0.950			0.971	
Satd. Flow (perm)	131	1863	1615	183	1827	1380	0	1687	1615	0	1636	0
Satd. Flow (RTOR)			158			158			164		164	
Adj. Flow (vph)	20	860	39	235	1145	44	57	0	155	26	0	17
Lane Group Flow (vph)	20	860	39	235	1145	44	0	57	155	0	43	0
Turn Type	D.P+P	NA	Perm	D.P+P	NA	Perm	Split	NA	Perm	Split	NA	
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases	6		2	2		6			3			
Total Split (s)	12.0	55.0	55.0	16.0	59.0	59.0	17.0	17.0	17.0	12.0	12.0	
Total Lost Time (s)	6.5	6.0	6.0	7.0	6.0	6.0		5.5	5.5		5.5	
Act Effct Green (s)	59.5	46.0	46.0	54.2	58.1	58.1		8.6	8.6		6.6	
Actuated g/C Ratio	0.67	0.52	0.52	0.61	0.65	0.65		0.10	0.10		0.07	
v/c Ratio	0.11	0.90	0.04	0.88	0.96	0.05		0.35	0.51		0.16	
Control Delay	7.4	34.7	0.1	53.4	38.3	0.1		46.8	12.5		1.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	
Total Delay	7.4	34.7	0.1	53.4	38.3	0.1		46.8	12.5		1.2	
LOS	A	C	A	D	D	A		D	B		A	
Approach Delay		32.7			39.6			21.7			1.2	
Approach LOS		C			D			C			A	

Intersection Summary			
Cycle Length: 100			
Actuated Cycle Length: 89.2			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.96			
Intersection Signal Delay: 35.1		Intersection LOS: D	
Intersection Capacity Utilization 85.5%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 1: Williamsburg W Drive/Lane Pl Drive & Longhill Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	817	37	223	1088	42	54	0	147	25	0	16
Future Volume (vph)	19	817	37	223	1088	42	54	0	147	25	0	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.0	6.0	7.0	6.0	6.0		5.5	5.5		5.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85		0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00		0.97	
Satd. Flow (prot)	1805	1863	1615	1719	1827	1380		1687	1615		1635	
Flt Permitted	0.07	1.00	1.00	0.10	1.00	1.00		0.95	1.00		0.97	
Satd. Flow (perm)	131	1863	1615	184	1827	1380		1687	1615		1635	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	20	860	39	235	1145	44	57	0	155	26	0	17
RTOR Reduction (vph)	0	0	18	0	0	17	0	0	141	0	41	0
Lane Group Flow (vph)	20	860	21	235	1145	27	0	57	14	0	2	0
Heavy Vehicles (%)	0%	2%	0%	5%	4%	17%	7%	33%	0%	4%	0%	11%
Turn Type	D.P+P	NA	Perm	D.P+P	NA	Perm	Split	NA	Perm	Split	NA	
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases	6		2	2		6			3			
Actuated Green, G (s)	60.0	50.3	50.3	59.5	58.1	58.1		8.6	8.6		3.5	
Effective Green, g (s)	60.0	50.3	50.3	59.5	58.1	58.1		8.6	8.6		3.5	
Actuated g/C Ratio	0.63	0.53	0.53	0.62	0.61	0.61		0.09	0.09		0.04	
Clearance Time (s)	6.5	6.0	6.0	7.0	6.0	6.0		5.5	5.5		5.5	
Vehicle Extension (s)	2.0	5.0	5.0	2.0	5.0	5.0		3.0	3.0		3.0	
Lane Grp Cap (vph)	115	980	849	262	1110	838		151	145		59	
v/s Ratio Prot	0.00	0.46		c0.09	c0.63			c0.03			c0.00	
v/s Ratio Perm	0.11		0.01	0.47		0.02			0.01			
v/c Ratio	0.17	0.88	0.02	0.90	1.03	0.03		0.38	0.10		0.03	
Uniform Delay, d1	22.2	19.9	10.9	23.0	18.7	7.5		41.0	39.9		44.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2	0.3	9.7	0.0	29.4	35.4	0.0		1.6	0.3		0.2	
Delay (s)	22.4	29.6	10.9	52.4	54.2	7.5		42.6	40.2		44.6	
Level of Service	C	C	B	D	D	A		D	D		D	
Approach Delay (s)		28.7			52.4			40.9			44.6	
Approach LOS		C			D			D			D	

Intersection Summary					
HCM 2000 Control Delay		43.0	HCM 2000 Level of Service		D
HCM 2000 Volume to Capacity ratio		0.96			
Actuated Cycle Length (s)		95.6	Sum of lost time (s)		24.0
Intersection Capacity Utilization		85.5%	ICU Level of Service		E
Analysis Period (min)		15			
c Critical Lane Group					

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	377	63	228	316	2	52	3	143	4	0	5
Future Volume (vph)	0	377	63	228	316	2	52	3	143	4	0	5
Lane Util. 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
Frt			0.850			0.850			0.850		0.925	
Flt Protected				0.950				0.955			0.978	
Satd. Flow (prot)	1900	1810	1524	1752	1776	1615	0	1657	1615	0	1719	0
Flt Permitted				0.950				0.955			0.978	
Satd. Flow (perm)	1900	1810	1524	1752	1776	1615	0	1657	1615	0	1719	0
Adj. Flow (vph)	0	401	67	243	336	2	55	3	152	4	0	5
Lane Group Flow (vph)	0	401	67	243	336	2	0	58	152	0	9	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 48.2%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	377	63	228	316	2	52	3	143	4	0	5
Future Volume (Veh/h)	0	377	63	228	316	2	52	3	143	4	0	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	0	401	67	243	336	2	55	3	152	4	0	5
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									7			
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	338			468			1228	1225	401	1300	1290	336
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	338			468			1228	1225	401	1300	1290	336
tC, single (s)	4.1			4.1			7.2	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			78			55	98	77	95	100	99
cM capacity (veh/h)	1232			1088			123	140	653	87	128	711

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	0	401	67	243	336	2	210	9
Volume Left	0	0	0	243	0	0	55	4
Volume Right	0	0	67	0	0	2	152	5
cSH	1700	1700	1700	1088	1700	1700	447	170
Volume to Capacity	0.00	0.24	0.04	0.22	0.20	0.00	0.47	0.05
Queue Length 95th (ft)	0	0	0	21	0	0	61	4
Control Delay (s)	0.0	0.0	0.0	9.3	0.0	0.0	24.7	27.3
Lane LOS				A			C	D
Approach Delay (s)	0.0			3.9			24.7	27.3
Approach LOS							C	D

Intersection Summary					
Average Delay	6.1				
Intersection Capacity Utilization	48.2%	ICU Level of Service		A	
Analysis Period (min)	15				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	1	6	60	0	30	10	331	81	25	273	22
Future Volume (vph)	16	1	6	60	0	30	10	331	81	25	273	22
Lane Util. 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
Frt		0.966			0.850				0.850			0.850
Flt Protected		0.966		0.950			0.950			0.950		
Satd. Flow (prot)	0	1773	0	1736	1553	0	1805	1759	1282	1556	1759	967
Flt Permitted		0.966		0.950			0.950			0.950		
Satd. Flow (perm)	0	1773	0	1736	1553	0	1805	1759	1282	1556	1759	967
Adj. Flow (vph)	17	1	6	63	0	32	11	348	85	26	287	23
Lane Group Flow (vph)	0	24	0	63	32	0	11	348	85	26	287	23
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 35.4%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	1	6	60	0	30	10	331	81	25	273	22
Future Volume (Veh/h)	16	1	6	60	0	30	10	331	81	25	273	22
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	17	1	6	63	0	32	11	348	85	26	287	23
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	741	794	287	716	732	348	310			433		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	741	794	287	716	732	348	310			433		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.3		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.3		
p0 queue free %	95	100	99	81	100	95	99			98		
cM capacity (veh/h)	311	312	757	331	339	691	1262			1056		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	24	63	32	11	348	85	26	287	23
Volume Left	17	63	0	11	0	0	26	0	0
Volume Right	6	0	32	0	0	85	0	0	23
cSH	365	331	691	1262	1700	1700	1056	1700	1700
Volume to Capacity	0.07	0.19	0.05	0.01	0.20	0.05	0.02	0.17	0.01
Queue Length 95th (ft)	5	17	4	1	0	0	2	0	0
Control Delay (s)	15.6	18.4	10.5	7.9	0.0	0.0	8.5	0.0	0.0
Lane LOS	C	C	B	A			A		
Approach Delay (s)	15.6	15.7		0.2			0.7		
Approach LOS	C	C							

Intersection Summary					
Average Delay		2.4			
Intersection Capacity Utilization		35.4%	ICU Level of Service		A
Analysis Period (min)		15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	168	23	59	285	122	23	0	56	71	0	7
Future Volume (vph)	8	168	23	59	285	122	23	0	56	71	0	7
Lane Util. 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
Frt		0.982			0.955				0.850			0.850
Flt Protected	0.950			0.950				0.950			0.950	
Satd. Flow (prot)	1504	1814	0	1770	1654	0	0	1770	1583	0	1805	1615
Flt Permitted	0.950			0.950				0.950			0.950	
Satd. Flow (perm)	1504	1814	0	1770	1654	0	0	1770	1583	0	1805	1615
Adj. Flow (vph)	8	175	24	61	297	127	24	0	58	74	0	7
Lane Group Flow (vph)	8	199	0	61	424	0	0	24	58	0	74	7
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 46.4%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	168	23	59	285	122	23	0	56	71	0	7
Future Volume (Veh/h)	8	168	23	59	285	122	23	0	56	71	0	7
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	8	175	24	61	297	127	24	0	58	74	0	7
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									6			6
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	424			199			626	749	187	702	698	360
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	424			199			626	749	187	702	698	360
tC, single (s)	4.3			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.4			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			96			94	100	93	77	100	99
cM capacity (veh/h)	1045			1373			377	323	855	318	346	689

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	8	199	61	424	82	81
Volume Left	8	0	61	0	24	74
Volume Right	0	24	0	127	58	7
cSH	1045	1700	1373	1700	1209	348
Volume to Capacity	0.01	0.12	0.04	0.25	0.07	0.23
Queue Length 95th (ft)	1	0	3	0	5	22
Control Delay (s)	8.5	0.0	7.7	0.0	11.2	18.9
Lane LOS	A		A		B	C
Approach Delay (s)	0.3		1.0		11.2	18.9
Approach LOS					B	C

Intersection Summary				
Average Delay	3.5			
Intersection Capacity Utilization	46.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection: 1: Williamsburg W Drive/Lane Pl Drive & Longhill Road

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB
Directions Served	L	T	R	L	T	R	LT	R	LTR
Maximum Queue (ft)	209	553	204	250	784	777	140	87	83
Average Queue (ft)	23	266	23	144	454	253	45	47	28
95th Queue (ft)	105	491	111	270	929	835	98	74	63
Link Distance (ft)		1007			741	741	405		475
Upstream Blk Time (%)					18	10			
Queuing Penalty (veh)					0	0			
Storage Bay Dist (ft)	250		225	250				225	
Storage Blk Time (%)	0	12	0	1	10				
Queuing Penalty (veh)	0	7	0	8	22				

Intersection: 2: Fords Colony Drive/Dominon Village & Longhill Road

Movement	EB	EB	WB	NB	NB	SB
Directions Served	T	R	L	LT	R	LTR
Maximum Queue (ft)	2	17	125	155	106	26
Average Queue (ft)	0	1	53	45	34	5
95th Queue (ft)	2	9	98	110	74	18
Link Distance (ft)	2030			723		278
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)		300	225		175	
Storage Blk Time (%)				0	0	
Queuing Penalty (veh)				0	0	

Intersection: 3: Centerville Road & Westport/Manchester Drive

Movement	EB	WB	WB	NB	SB
Directions Served	LTR	L	TR	L	L
Maximum Queue (ft)	39	58	47	16	53
Average Queue (ft)	15	24	14	1	6
95th Queue (ft)	37	49	33	9	29
Link Distance (ft)	247	762			
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			140	190	190
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 4: News Road & Firestone Drive

Movement	EB	EB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	LT	R	LT	R
Maximum Queue (ft)	33	1	34	49	59	87	32
Average Queue (ft)	3	0	8	18	30	35	6
95th Queue (ft)	17	0	28	46	52	67	26
Link Distance (ft)		1230		372		374	
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	225		225		150		150
Storage Blk Time (%)							
Queuing Penalty (veh)							

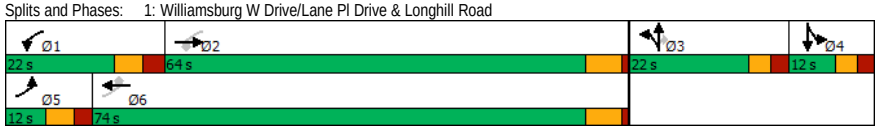
Network Summary

Network wide Queuing Penalty: 37

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	909	42	251	1209	47	61	0	165	28	0	18
Future Volume (vph)	21	909	42	251	1209	47	61	0	165	28	0	18
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850		0.947	
Flt Protected	0.950			0.950				0.950			0.971	
Satd. Flow (prot)	1805	3539	1615	1719	3471	1380	0	1687	1615	0	1636	0
Flt Permitted	0.151			0.214				0.950			0.971	
Satd. Flow (perm)	287	3539	1615	387	3471	1380	0	1687	1615	0	1636	0
Satd. Flow (RTOR)			195			132			200		200	
Adj. Flow (vph)	22	957	44	264	1273	49	64	0	174	29	0	19
Lane Group Flow (vph)	22	957	44	264	1273	49	0	64	174	0	48	0
Turn Type	D.P+P	NA	Perm	D.P+P	NA	Perm	Split	NA	Perm	Split	NA	
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases	6		2	2		6			3			
Total Split (s)	12.0	64.0	64.0	22.0	74.0	74.0	22.0	22.0	22.0	12.0	12.0	
Total Lost Time (s)	6.5	6.0	6.0	7.0	6.0	6.0		5.5	5.5		5.5	
Act Effct Green (s)	54.4	38.6	38.6	48.2	53.4	53.4		9.6	9.6		7.1	
Actuated g/C Ratio	0.64	0.45	0.45	0.57	0.63	0.63		0.11	0.11		0.08	
v/c Ratio	0.08	0.60	0.05	0.68	0.59	0.05		0.34	0.48		0.15	
Control Delay	6.8	19.6	0.1	18.5	12.7	0.1		47.4	9.4		1.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	
Total Delay	6.8	19.6	0.1	18.5	12.7	0.1		47.4	9.4		1.0	
LOS	A	B	A	B	B	A		D	A		A	
Approach Delay		18.5			13.3			19.6			1.0	
Approach LOS		B			B			B			A	

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 85.2			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.68			
Intersection Signal Delay: 15.4		Intersection LOS: B	
Intersection Capacity Utilization 63.8%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 1: Williamsburg W Drive/Lane Pl Drive & Longhill Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	909	42	251	1209	47	61	0	165	28	0	18
Future Volume (vph)	21	909	42	251	1209	47	61	0	165	28	0	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.0	6.0	7.0	6.0	6.0		5.5	5.5		5.5	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85		0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00		0.97	
Satd. Flow (prot)	1805	3539	1615	1719	3471	1380		1687	1615		1635	
Flt Permitted	0.15	1.00	1.00	0.21	1.00	1.00		0.95	1.00		0.97	
Satd. Flow (perm)	286	3539	1615	387	3471	1380		1687	1615		1635	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	22	957	44	264	1273	49	64	0	174	29	0	19
RTOR Reduction (vph)	0	0	23	0	0	20	0	0	156	0	46	0
Lane Group Flow (vph)	22	957	21	264	1273	29	0	64	18	0	2	0
Heavy Vehicles (%)	0%	2%	0%	5%	4%	17%	7%	33%	0%	4%	0%	11%
Turn Type	D.P+P	NA	Perm	D.P+P	NA	Perm	Split	NA	Perm	Split	NA	
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases	6		2	2		6			3			
Actuated Green, G (s)	55.0	43.8	43.8	54.5	53.4	53.4		9.6	9.6		3.3	
Effective Green, g (s)	55.0	43.8	43.8	54.5	53.4	53.4		9.6	9.6		3.3	
Actuated g/C Ratio	0.60	0.48	0.48	0.60	0.58	0.58		0.11	0.11		0.04	
Clearance Time (s)	6.5	6.0	6.0	7.0	6.0	6.0		5.5	5.5		5.5	
Vehicle Extension (s)	2.0	5.0	5.0	2.0	5.0	5.0		3.0	3.0		3.0	
Lane Grp Cap (vph)	198	1695	773	386	2027	806		177	169		59	
v/s Ratio Prot	0.00	0.27		c0.08	c0.37			c0.04			c0.00	
v/s Ratio Perm	0.06		0.01	c0.33		0.02			0.01			
v/c Ratio	0.11	0.56	0.03	0.68	0.63	0.04		0.36	0.11		0.03	
Uniform Delay, d1	8.9	17.0	12.6	10.5	12.5	8.1		38.0	37.0		42.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2	0.1	0.7	0.0	4.0	0.9	0.0		1.3	0.3		0.2	
Delay (s)	9.0	17.7	12.6	14.4	13.3	8.1		39.3	37.3		42.7	
Level of Service	A	B	B	B	B	A		D	D		D	
Approach Delay (s)		17.3			13.4			37.8			42.7	
Approach LOS		B			B			D			D	

Intersection Summary					
HCM 2000 Control Delay	17.3	HCM 2000 Level of Service	B		
HCM 2000 Volume to Capacity ratio	0.62				
Actuated Cycle Length (s)	91.4	Sum of lost time (s)	24.0		
Intersection Capacity Utilization	63.8%	ICU Level of Service	B		
Analysis Period (min)	15				
c Critical Lane Group					

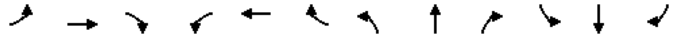
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	424	66	242	354	2	56	4	152	5	0	6
Future Volume (vph)	0	424	66	242	354	2	56	4	152	5	0	6
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.980				0.850		0.903			0.926	
Flt Protected				0.950				0.987			0.978	
Satd. Flow (prot)	1900	1771	0	1752	1776	1615	0	1650	0	0	1721	0
Flt Permitted				0.950				0.987			0.978	
Satd. Flow (perm)	1900	1771	0	1752	1776	1615	0	1650	0	0	1721	0
Adj. Flow (vph)	0	451	70	257	377	2	60	4	162	5	0	6
Lane Group Flow (vph)	0	521	0	257	377	2	0	226	0	0	11	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 63.7%		ICU Level of Service B	
Analysis Period (min) 15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	424	66	242	354	2	56	4	152	5	0	6
Future Volume (Veh/h)	0	424	66	242	354	2	56	4	152	5	0	6
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	0	451	70	257	377	2	60	4	162	5	0	6
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	379			521			1383	1379	486	1506	1412	377
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	379			521			1383	1379	486	1506	1412	377
tC, single (s)	4.1			4.1			7.2	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			75			36	96	72	91	100	99
cM capacity (veh/h)	1191			1040			93	110	585	57	105	674

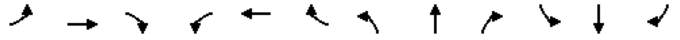
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	0	521	257	377	2	226	11
Volume Left	0	0	257	0	0	60	5
Volume Right	0	70	0	0	2	162	6
cSH	1700	1700	1040	1700	1700	236	114
Volume to Capacity	0.00	0.31	0.25	0.22	0.00	0.96	0.10
Queue Length 95th (ft)	0	0	24	0	0	215	8
Control Delay (s)	0.0	0.0	9.6	0.0	0.0	92.0	39.8
Lane LOS			A			F	E
Approach Delay (s)	0.0		3.9			92.0	39.8
Approach LOS						F	E

Intersection Summary				
Average Delay		17.0		
Intersection Capacity Utilization		63.7%	ICU Level of Service	B
Analysis Period (min)		15		



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	1	6	64	0	35	10	383	86	29	314	22
Future Volume (vph)	17	1	6	64	0	35	10	383	86	29	314	22
Lane Util. 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
Frt		0.968			0.850				0.850			0.850
Flt Protected		0.965		0.950			0.950			0.950		
Satd. Flow (prot)	0	1775	0	1736	1553	0	1805	1759	1282	1556	1759	967
Flt Permitted		0.965		0.950			0.950			0.950		
Satd. Flow (perm)	0	1775	0	1736	1553	0	1805	1759	1282	1556	1759	967
Adj. Flow (vph)	18	1	6	67	0	37	11	403	91	31	331	23
Lane Group Flow (vph)	0	25	0	67	37	0	11	403	91	31	331	23
Sign Control		Stop			Stop			Free			Free	

Intersection Summary					
Control Type: Unsignalized					
Intersection Capacity Utilization 38.8%			ICU Level of Service A		
Analysis Period (min) 15					



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	17	1	6	64	0	35	10	383	86	29	314	22
Future Volume (Veh/h)	17	1	6	64	0	35	10	383	86	29	314	22
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	18	1	6	67	0	37	11	403	91	31	331	23
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	855	909	331	824	841	403	354			494		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	855	909	331	824	841	403	354			494		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.3		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.3		
p0 queue free %	93	100	99	76	100	94	99			97		
cM capacity (veh/h)	256	266	715	278	291	643	1216			1001		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	25	67	37	11	403	91	31	331	23
Volume Left	18	67	0	11	0	0	31	0	0
Volume Right	6	0	37	0	0	91	0	0	23
cSH	304	278	643	1216	1700	1700	1001	1700	1700
Volume to Capacity	0.08	0.24	0.06	0.01	0.24	0.05	0.03	0.19	0.01
Queue Length 95th (ft)	7	23	5	1	0	0	2	0	0
Control Delay (s)	17.9	22.0	10.9	8.0	0.0	0.0	8.7	0.0	0.0
Lane LOS	C	C	B	A			A		
Approach Delay (s)	17.9	18.1		0.2			0.7		
Approach LOS	C	C							

Intersection Summary					
Average Delay		2.6			
Intersection Capacity Utilization		38.8%	ICU Level of Service		A
Analysis Period (min)		15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	182	23	59	308	137	23	0	56	80	0	8
Future Volume (vph)	9	182	23	59	308	137	23	0	56	80	0	8
Lane Util. 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
Frt		0.983			0.954				0.850			0.850
Flt Protected	0.950			0.950				0.950			0.950	
Satd. Flow (prot)	1504	1815	0	1770	1654	0	0	1770	1583	0	1805	1615
Flt Permitted	0.950			0.950				0.950			0.950	
Satd. Flow (perm)	1504	1815	0	1770	1654	0	0	1770	1583	0	1805	1615
Adj. Flow (vph)	9	190	24	61	321	143	24	0	58	83	0	8
Lane Group Flow (vph)	9	214	0	61	464	0	0	24	58	0	83	8
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 49.0%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	182	23	59	308	137	23	0	56	80	0	8
Future Volume (Veh/h)	9	182	23	59	308	137	23	0	56	80	0	8
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	9	190	24	61	321	143	24	0	58	83	0	8
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									6			6
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	464			214			667	806	202	752	746	392
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	464			214			667	806	202	752	746	392
tC, single (s)	4.3			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.4			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			96			93	100	93	72	100	99
cM capacity (veh/h)	1009			1356			353	299	839	294	323	661

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	9	214	61	464	82	91
Volume Left	9	0	61	0	24	83
Volume Right	0	24	0	143	58	8
cSH	1009	1700	1356	1700	1186	322
Volume to Capacity	0.01	0.13	0.04	0.27	0.07	0.28
Queue Length 95th (ft)	1	0	4	0	6	28
Control Delay (s)	8.6	0.0	7.8	0.0	11.5	21.0
Lane LOS	A		A		B	C
Approach Delay (s)	0.3		0.9		11.5	21.0
Approach LOS					B	C

Intersection Summary				
Average Delay	3.7			
Intersection Capacity Utilization	49.0%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection: 1: Williamsburg W Drive/Lane Pl Drive & Longhill Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB
Directions Served	L	T	T	R	L	T	T	R	LT	R	LTR
Maximum Queue (ft)	59	238	228	33	211	251	230	73	109	110	90
Average Queue (ft)	15	123	113	9	93	110	93	12	45	47	31
95th Queue (ft)	48	203	204	29	170	212	185	49	91	87	66
Link Distance (ft)		1006	1006			738	738		390		461
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	250			225	250			250		225	
Storage Blk Time (%)		0	0		0	0	0	0			
Queuing Penalty (veh)		0	0		1	1	0	0			

Intersection: 2: Fords Colony Drive/Dominon Village & Longhill Road

Movement	EB	WB	NB	SB
Directions Served	TR	L	LTR	LTR
Maximum Queue (ft)	32	138	500	26
Average Queue (ft)	4	52	216	5
95th Queue (ft)	19	102	508	18
Link Distance (ft)	2032		736	278
Upstream Blk Time (%)			0	
Queuing Penalty (veh)			0	
Storage Bay Dist (ft)		225		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: Centerville Road & Westport/Manchester Drive

Movement	EB	WB	WB	NB	SB
Directions Served	LTR	L	TR	L	L
Maximum Queue (ft)	38	70	46	14	54
Average Queue (ft)	15	27	15	1	8
95th Queue (ft)	38	57	35	10	33
Link Distance (ft)	247	762			
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			140	190	190
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 4: News Road & Firestone Drive

Movement	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	L	TR	LT	R	LT	R
Maximum Queue (ft)	37	32	2	52	67	99	33
Average Queue (ft)	4	8	0	18	30	40	7
95th Queue (ft)	20	27	2	46	56	76	29
Link Distance (ft)			492	372		374	
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	225	225			150		150
Storage Blk Time (%)						0	
Queuing Penalty (veh)						0	

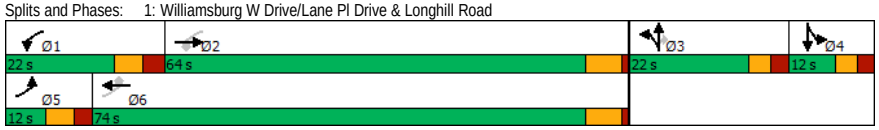
Network Summary

Network wide Queuing Penalty: 1

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	917	42	251	1222	47	61	0	165	28	0	18
Future Volume (vph)	21	917	42	251	1222	47	61	0	165	28	0	18
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850		0.947	
Flt Protected	0.950			0.950				0.950			0.971	
Satd. Flow (prot)	1805	3539	1615	1719	3471	1380	0	1687	1615	0	1636	0
Flt Permitted	0.147			0.211				0.950			0.971	
Satd. Flow (perm)	279	3539	1615	382	3471	1380	0	1687	1615	0	1636	0
Satd. Flow (RTOR)			195			132			200		200	
Adj. Flow (vph)	22	965	44	264	1286	49	64	0	174	29	0	19
Lane Group Flow (vph)	22	965	44	264	1286	49	0	64	174	0	48	0
Turn Type	D.P+P	NA	Perm	D.P+P	NA	Perm	Split	NA	Perm	Split	NA	
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases	6		2	2		6			3			
Total Split (s)	12.0	64.0	64.0	22.0	74.0	74.0	22.0	22.0	22.0	12.0	12.0	
Total Lost Time (s)	6.5	6.0	6.0	7.0	6.0	6.0		5.5	5.5		5.5	
Act Effct Green (s)	54.7	38.9	38.9	48.5	53.6	53.6		9.6	9.6		7.1	
Actuated g/C Ratio	0.64	0.45	0.45	0.57	0.63	0.63		0.11	0.11		0.08	
v/c Ratio	0.08	0.60	0.05	0.69	0.59	0.05		0.34	0.48		0.15	
Control Delay	6.8	19.6	0.1	18.9	12.8	0.1		47.5	9.4		1.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	
Total Delay	6.8	19.6	0.1	18.9	12.8	0.1		47.5	9.4		1.0	
LOS	A	B	A	B	B	A		D	A		A	
Approach Delay		18.5			13.4			19.6			1.0	
Approach LOS		B			B			B			A	

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 85.5			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.69			
Intersection Signal Delay: 15.5		Intersection LOS: B	
Intersection Capacity Utilization 64.0%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 1: Williamsburg W Drive/Lane Pl Drive & Longhill Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	917	42	251	1222	47	61	0	165	28	0	18
Future Volume (vph)	21	917	42	251	1222	47	61	0	165	28	0	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.0	6.0	7.0	6.0	6.0		5.5	5.5		5.5	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85		0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00		0.97	
Satd. Flow (prot)	1805	3539	1615	1719	3471	1380		1687	1615		1635	
Flt Permitted	0.15	1.00	1.00	0.21	1.00	1.00		0.95	1.00		0.97	
Satd. Flow (perm)	280	3539	1615	382	3471	1380		1687	1615		1635	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	22	965	44	264	1286	49	64	0	174	29	0	19
RTOR Reduction (vph)	0	0	23	0	0	20	0	0	156	0	46	0
Lane Group Flow (vph)	22	965	21	264	1286	29	0	64	18	0	2	0
Heavy Vehicles (%)	0%	2%	0%	5%	4%	17%	7%	33%	0%	4%	0%	11%
Turn Type	D.P+P	NA	Perm	D.P+P	NA	Perm	Split	NA	Perm	Split	NA	
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases	6		2	2		6			3			
Actuated Green, G (s)	55.2	44.0	44.0	54.7	53.6	53.6		9.6	9.6		3.3	
Effective Green, g (s)	55.2	44.0	44.0	54.7	53.6	53.6		9.6	9.6		3.3	
Actuated g/C Ratio	0.60	0.48	0.48	0.60	0.59	0.59		0.10	0.10		0.04	
Clearance Time (s)	6.5	6.0	6.0	7.0	6.0	6.0		5.5	5.5		5.5	
Vehicle Extension (s)	2.0	5.0	5.0	2.0	5.0	5.0		3.0	3.0		3.0	
Lane Grp Cap (vph)	195	1699	775	384	2031	807		176	169		58	
v/s Ratio Prot	0.00	0.27		c0.08	c0.37			c0.04			c0.00	
v/s Ratio Perm	0.07		0.01	c0.33		0.02			0.01			
v/c Ratio	0.11	0.57	0.03	0.69	0.63	0.04		0.36	0.11		0.03	
Uniform Delay, d1	9.0	17.0	12.5	10.5	12.5	8.0		38.2	37.1		42.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2	0.1	0.7	0.0	4.0	0.9	0.0		1.3	0.3		0.2	
Delay (s)	9.1	17.7	12.6	14.6	13.4	8.1		39.4	37.4		42.8	
Level of Service	A	B	B	B	B	A		D	D		D	
Approach Delay (s)		17.3			13.5			38.0			42.8	
Approach LOS		B			B			D			D	

Intersection Summary					
HCM 2000 Control Delay	17.3	HCM 2000 Level of Service	B		
HCM 2000 Volume to Capacity ratio	0.62				
Actuated Cycle Length (s)	91.6	Sum of lost time (s)	24.0		
Intersection Capacity Utilization	64.0%	ICU Level of Service	B		
Analysis Period (min)	15				
c Critical Lane Group					

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	424	70	255	354	2	58	4	160	5	0	6
Future Volume (vph)	0	424	70	255	354	2	58	4	160	5	0	6
Lane Util. 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
Frt			0.850			0.850			0.850		0.926	
Flt Protected				0.950				0.955			0.978	
Satd. Flow (prot)	1900	1810	1524	1752	1776	1615	0	1659	1615	0	1721	0
Flt Permitted				0.950				0.955			0.978	
Satd. Flow (perm)	1900	1810	1524	1752	1776	1615	0	1659	1615	0	1721	0
Adj. Flow (vph)	0	451	74	271	377	2	62	4	170	5	0	6
Lane Group Flow (vph)	0	451	74	271	377	2	0	66	170	0	11	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 52.7%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	424	70	255	354	2	58	4	160	5	0	6
Future Volume (Veh/h)	0	424	70	255	354	2	58	4	160	5	0	6
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	0	451	74	271	377	2	62	4	170	5	0	6
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									7			
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	379			525			1376	1372	451	1457	1444	377
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	379			525			1376	1372	451	1457	1444	377
tC, single (s)	4.1			4.1			7.2	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			74			33	96	72	92	100	99
cM capacity (veh/h)	1191			1037			93	109	613	61	98	674

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	0	451	74	271	377	2	236	11
Volume Left	0	0	0	271	0	0	62	5
Volume Right	0	0	74	0	0	2	170	6
cSH	1700	1700	1700	1037	1700	1700	336	121
Volume to Capacity	0.00	0.27	0.04	0.26	0.22	0.00	0.70	0.09
Queue Length 95th (ft)	0	0	0	26	0	0	126	7
Control Delay (s)	0.0	0.0	0.0	9.7	0.0	0.0	38.8	37.7
Lane LOS				A			E	E
Approach Delay (s)	0.0			4.0			38.8	37.7
Approach LOS							E	E

Intersection Summary					
Average Delay		8.6			
Intersection Capacity Utilization		52.7%	ICU Level of Service		A
Analysis Period (min)		15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	1	6	68	0	35	10	383	93	29	314	22
Future Volume (vph)	17	1	6	68	0	35	10	383	93	29	314	22
Lane Util. 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
Frt		0.968			0.850				0.850			0.850
Flt Protected		0.965		0.950			0.950			0.950		
Satd. Flow (prot)	0	1775	0	1736	1553	0	1805	1759	1282	1556	1759	967
Flt Permitted		0.965		0.950			0.950			0.950		
Satd. Flow (perm)	0	1775	0	1736	1553	0	1805	1759	1282	1556	1759	967
Adj. Flow (vph)	18	1	6	72	0	37	11	403	98	31	331	23
Lane Group Flow (vph)	0	25	0	72	37	0	11	403	98	31	331	23
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 38.8%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	17	1	6	68	0	35	10	383	93	29	314	22
Future Volume (Veh/h)	17	1	6	68	0	35	10	383	93	29	314	22
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	18	1	6	72	0	37	11	403	98	31	331	23
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	855	916	331	824	841	403	354			501		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	855	916	331	824	841	403	354			501		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.3		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.3		
p0 queue free %	93	100	99	74	100	94	99			97		
cM capacity (veh/h)	256	263	715	278	291	643	1216			995		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	25	72	37	11	403	98	31	331	23
Volume Left	18	72	0	11	0	0	31	0	0
Volume Right	6	0	37	0	0	98	0	0	23
cSH	303	278	643	1216	1700	1700	995	1700	1700
Volume to Capacity	0.08	0.26	0.06	0.01	0.24	0.06	0.03	0.19	0.01
Queue Length 95th (ft)	7	25	5	1	0	0	2	0	0
Control Delay (s)	17.9	22.5	10.9	8.0	0.0	0.0	8.7	0.0	0.0
Lane LOS	C	C	B	A			A		
Approach Delay (s)	17.9	18.5		0.2			0.7		
Approach LOS	C	C							

Intersection Summary					
Average Delay		2.7			
Intersection Capacity Utilization		38.8%	ICU Level of Service		A
Analysis Period (min)		15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	186	23	59	315	137	23	0	56	80	0	8
Future Volume (vph)	9	186	23	59	315	137	23	0	56	80	0	8
Lane Util. 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
Frt		0.983			0.954				0.850			0.850
Flt Protected	0.950			0.950				0.950			0.950	
Satd. Flow (prot)	1504	1815	0	1770	1653	0	0	1770	1583	0	1805	1615
Flt Permitted	0.950			0.950				0.950			0.950	
Satd. Flow (perm)	1504	1815	0	1770	1653	0	0	1770	1583	0	1805	1615
Adj. Flow (vph)	9	194	24	61	328	143	24	0	58	83	0	8
Lane Group Flow (vph)	9	218	0	61	471	0	0	24	58	0	83	8
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 49.4%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	186	23	59	315	137	23	0	56	80	0	8
Future Volume (Veh/h)	9	186	23	59	315	137	23	0	56	80	0	8
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	9	194	24	61	328	143	24	0	58	83	0	8
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									6			6
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	471			218			678	817	206	762	758	400
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	471			218			678	817	206	762	758	400
tC, single (s)	4.3			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.4			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			95			93	100	93	71	100	99
cM capacity (veh/h)	1003			1352			347	294	835	289	319	655

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	9	218	61	471	82	91
Volume Left	9	0	61	0	24	83
Volume Right	0	24	0	143	58	8
cSH	1003	1700	1352	1700	1180	317
Volume to Capacity	0.01	0.13	0.05	0.28	0.07	0.29
Queue Length 95th (ft)	1	0	4	0	6	29
Control Delay (s)	8.6	0.0	7.8	0.0	11.5	21.4
Lane LOS	A		A		B	C
Approach Delay (s)	0.3		0.9		11.5	21.4
Approach LOS					B	C

Intersection Summary				
Average Delay	3.7			
Intersection Capacity Utilization	49.4%	ICU Level of Service		A
Analysis Period (min)	15			

Intersection: 1: Williamsburg W Drive/Lane Pl Drive & Longhill Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB
Directions Served	L	T	T	R	L	T	T	R	LT	R	LTR
Maximum Queue (ft)	69	262	253	53	215	242	244	115	128	103	88
Average Queue (ft)	15	129	120	11	94	108	96	12	45	42	32
95th Queue (ft)	50	229	219	40	166	203	189	59	97	80	69
Link Distance (ft)		1006	1006			738	738		390		461
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	250			225	250			250		225	
Storage Blk Time (%)	0	0	1	0	0	0	0	0			
Queuing Penalty (veh)	0	0	0	0	0	0	0	0			

Intersection: 2: Fords Colony Drive/Dominon Village & Longhill Road

Movement	EB	EB	WB	B11	NB	NB	SB
Directions Served	T	R	L	T	LT	R	LTR
Maximum Queue (ft)	5	19	134	54	357	156	24
Average Queue (ft)	0	1	62	2	107	56	5
95th Queue (ft)	5	8	112	55	362	145	18
Link Distance (ft)	2030			2988	723		278
Upstream Blk Time (%)					1		
Queuing Penalty (veh)					0		
Storage Bay Dist (ft)		300	225			175	
Storage Blk Time (%)					10	1	
Queuing Penalty (veh)					16	0	

Intersection: 3: Centerville Road & Westport/Manchester Drive

Movement	EB	WB	WB	NB	SB	SB
Directions Served	LTR	L	TR	L	L	R
Maximum Queue (ft)	42	63	49	19	49	2
Average Queue (ft)	15	27	16	2	9	0
95th Queue (ft)	39	52	36	11	33	0
Link Distance (ft)	247	762				
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			140	190	190	325
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 4: News Road & Firestone Drive

Movement	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	L	TR	LT	R	LT	R
Maximum Queue (ft)	44	37	6	54	54	94	33
Average Queue (ft)	4	10	0	18	28	40	7
95th Queue (ft)	23	31	3	46	50	76	29
Link Distance (ft)			492	372		374	
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	225	225			150		150
Storage Blk Time (%)						0	
Queuing Penalty (veh)						0	

Network Summary

Network wide Queuing Penalty: 18

News Road Corridor Traffic Forecast And Analysis

JAMES CITY COUNTY, VIRGINIA

For:
REALTEC, INC.

By:
DRW Consultants, LLC
Midlothian, VA

April 22, 2008

News Road Corridor Traffic Forecast And Analysis

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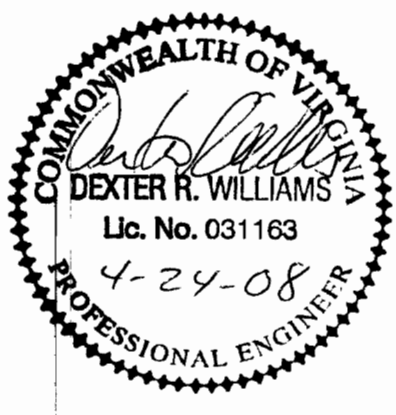

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REPORT
TEXT

EXECUTIVE SUMMARY

This traffic study was prepared in response to comments received at the February 27, 2008 meeting of the James City County Planning Commission regarding the proposed rezoning of The Village At Ford's Colony (The Village). The primary principle discussed at the meeting was that a traffic study for the News Road corridor should be prepared based on an accounting of traffic from approved development to date as well as the proposed development of The Village At Ford's Colony and other likely proposals for development. This approach to accounting for other anticipated development traffic in the area is a corridor build out approach to traffic forecasting as opposed to the previous July 12, 2007 "Traffic Analysis For Ford's Colony CRCC". The July 12, 2007 used a forecast year with growth factor approach to traffic forecasting, which does not account for other development directly.

The July 12, 2007 report focused only on the The Village (CCRC) connection to the News Road/Firestone Drive intersection. As discussed at the Planning Commission meeting, counts were available for the News Road intersections at Centerville Road, Old News Road and Monticello Avenue and thus were available to be included in a News Road corridor study. This corridor study includes traffic forecasts for the News Road intersections at Centerville Road, Firestone Drive, Old News Road and Monticello Avenue.

The Village is a retirement community with various types of housing for seniors. These include:

1. Townhomes. 32 units are included in this report. (Note: the number of planned townhome units has been reduced to 24 since the completion of traffic analysis in this report).
2. Independent Living Units. 332 units included in this report.
3. Congregate Case Apartments. 290 units included in this report.
4. Assisted Living/Skill Care. 118 beds included in this report.
5. Nursing Home. 180 beds included in this report.

The existing two lane sections of News Road have adequate capacity for traffic to be generated by all approved and proposed development (including The Village) in the News Road corridor. Ford's Colony, the developer The Village will include turn lanes on News Road at Firestone Drive for access to The Village as well as cash contributions and/or construction for turn lanes on News Road at Powhatan Village, general improvements to News Road, and to the West Monticello Avenue plan which includes improvements at the Monticello Avenue/News Road intersection.

INTRODUCTION

Exhibit 1a shows the News Road corridor from Centerville Road on the west to Monticello Avenue on the east. Centerville Road is the periphery of the Primary Service Area and primarily serves a radial route connection between residential uses in the adjacent area and the Williamsburg region. As such, a forecast for residential development in the adjacent area can be an effective tool for forecasting future traffic on News Road.

Exhibit 1b shows the development area and inventory used in this traffic study (the Exhibit 1b development area map frame is shown on Exhibit 1a). There are 10 identified developments in the area.

There are four AM and PM peak hour traffic analysis scenarios presented in this study:

1. 2007/2008 counts.
2. All Approved Development: Addition of Ford's Colony, Powhatan Secondary north of News Road, Springhill, Westport and Liberty Ridge traffic to counts.
3. The Village: Addition of The Village traffic to all approved development traffic.
4. Proposed Development: Addition of Nixon/Graves, Richardson and Beamer traffic to The Village traffic.

Exhibit 1c shows intersections on the News Road corridor from Centerville Road to Monticello Avenue. Traffic forecasts and analysis for these intersections are addressed as follows:

1. Traffic counts and forecasts are included for the Centerville Road, Firestone Drive, Old News Road and Monticello Avenue intersections. These were the counts that were available for creation of forecasts and inclusion in this study.
2. Traffic analysis is included for the Centerville Road, Firestone Drive, Old News Road and Monticello Avenue intersections. A more thorough traffic analysis for the Monticello Avenue corridor, including the News Road intersection, is included in the March 1, 2008 traffic study for Section 12 of New Town for the 2015 PM peak hour. The March 1, 2008 traffic study includes traffic growth from sources other than News Road area development, and includes recommendations for improvements for West Monticello Avenue (including the News Road intersection) that were originally developed in conjunction with the 2006 rezoning of Section 9 of New Town.
3. Recommendations for turn lane additions at intersections are included for all unsignalized intersections. (See March 1, 2008 report for signalized intersection at Monticello Avenue).

2007/2008 AM AND PM PEAK HOUR TRAFFIC COUNTS

Exhibit 3 shows AM and PM peak hour counts for the News Road corridor. The Centerville Road intersection turning movement counts are tabulated on Appendix Exhibit A series and shown graphically on the upper row of Exhibit 3. These counts were conducted in April 2007, but have not been published before.

The Firestone Drive intersection turning movement counts are tabulated on Appendix Exhibit B series and shown graphically on the second row of Exhibit 3. These counts were conducted in April 2007 and were used in the July 12, 2007 traffic study for The Village.

The Old News Road intersection turning movement counts are tabulated on Appendix Exhibit C series and shown graphically on the third row of Exhibit 3. These counts were conducted in January 2008 by LandMark Design Group and haven not been published before.

The Old News Road intersection turning movement counts are tabulated on Appendix Exhibit D series and shown graphically on the bottom row of Exhibit 3. The PM counts were conducted in April 2007 and were used in the March 1, 2008 traffic study for Section 12 of New Town. The AM counts were conducted on March 11, 2008 and have not been published before. (Note: the Appendix Exhibit D exhibit uses a north/south orientation for News Road; all other areas of this report use an east/west orientation for News Road).

Peak hour intersection levels of service are calculated using Synchro. Synchro reports are presented in the technical appendix. Following are peak hour LOS for 2007/2008 counts on the News Road corridor:

1. Centerville Road (Appendix Exhibits G1 and G2). There are no auxiliary lanes at this three-way, unsignalized intersection, with single lane approaches in all three directions and a stop sign for the westbound approach on News Road. News Road westbound approach: LOS B for AM and PM, Centerville Road southbound approach: LOS A for AM and PM. Right turn and left turn lane warrants are included in the technical appendix for existing counts (Appendix Exhibits J1 and J2 for AM and PM peak hour right turn lane warrants on northbound Centerville Road, and Appendix Exhibit K for left turn lanes warrants on southbound Centerville Road). A right turn taper is warranted for existing counts, and a left turn lane is warranted on southbound Centerville Road for 2007 PM peak hour counts.
2. Firestone Drive (Appendix Exhibits H1 and H2). There are auxiliary lanes on all approaches at this three-way, unsignalized intersection, with an eastbound left turn lane and a westbound right turn lane on News Road, and separate right and left turn lanes and a stop sign for the southbound approach on Firestone Drive. Firestone Drive southbound approach: LOS B AM and PM, News Road eastbound left turn: LOS A AM and PM.
3. Old News Road (Appendix Exhibits I1 and I2). This is a four-way, unsignalized intersection with stop signs on the northbound and southbound approaches. Southbound Old News Road and northbound Lake Powhatan have single approach lanes to the stop signs. Westbound News Road has two through lanes with a left turn

lane and a right turn lane. Eastbound News Road has two through lanes with a separate left turn lane. Old News Road southbound approach: LOS B AM and PM, Lake Powhatan northbound approach: LOS B AM and LOS C PM, News Road eastbound left turn: LOS A AM and PM, News Road westbound left turn: LOS A AM and PM.

4. Monticello Avenue (Appendix Exhibit P1 and P2). This is a signalized intersection with overall LOS C and LOS D or better for all turning movements for AM and PM peak hours.

Traffic on News Road progressively increases from west to east. The lowest traffic volumes are on News Road east of Centerville Road. The peak hour two-way two lane highway segment LOS is B in the AM and PM peak hours. The highest traffic on the two lane sections of News Road is from Powhatan Secondary to Old News Road. The peak hour two-way two lane highway segment LOS is C in the AM peak hour and LOS D in the PM peak hour.

FORD'S COLONY TRIP DISTRIBUTION

Peak hour traffic counts were conducted at all access points to Ford's Colony in 2003 with results reported in a traffic study dated February 28, 2004 by DRW Consultants, Inc. The 2004 report was an update of previous reports in 1993 and 1998. The report documented that Ford's Colony peak hour trip generation in 1998 and 2003 varied from 54% to 64% of values in Trip Generation, 6th Edition by the Institute of Transportation Engineers (ITE). The traffic forecast for Ford's Colony in the 2004 study used a percentage of ITE values for trip generation. The percentage of ITE values was the average of 1998 and 2003 peak hour entering and exiting traffic.

The 2003 counts also provide a basis for determining trip distribution for Ford's Colony for use as a basis for other development trip distribution. The upper sections of Exhibits 2a and 2b respectively show the 2003 AM and PM peak hour counts for traffic entering and existing Ford's Colony four points of access. The lower sections of Exhibits 2a and 2b respectively

show the percentages of total entering and exiting traffic for the AM and PM peak hours at the four points of access.

There are four points of access to Ford's Colony:

1. Williamsburg West Drive on Longhill Road: This access also provides access to Williamsburg West subdivision. Ford's Colony access is via a card-operated gate.
2. Ford's Colony Drive on Longhill Road: This access is open in Ford's Colony for about 1,000 feet, with manned and card-operated gates thereafter for access to Ford's Colony.
3. Firestone Drive on News Road: This access is a card-operated gate.
4. Manchester Drive on Centerville Road: This is a manned gate access, and is the designated access for construction and outside service traffic.

To determine east-west trip distribution splits for new development traffic with access on News Road, Ford's Colony traffic on Longhill Road and News Road (direct east-west access roads) is aggregated. These access points include Ford's Colony Drive and Williamsburg West Drive on Longhill Road and Firestone Drive on News Road. The east-west split delineation of traffic at these three points of access is shown on Exhibit 2c (east in blue arrows, west in red arrows).

East-west splits using these three points of access are calculated for the AM and PM peak hours on Exhibits 2a and 2b. The following table summarizes the results for the east-west directional split of Ford's Colony traffic:

TABLE ONE: FORD'S COLONY EAST-WEST DIRECTIONAL SPLIT

	EAST	WEST
AM ENTERING	73%	27%
AM EXITING	83%	17%
PM ENTERING	82%	18%
PM EXITING	81%	19%

To determine north-south trip distribution splits for new development traffic with access on Centerville Road, all Ford's Colony traffic is aggregated. The north-south split delineation of traffic at these three points of access is shown on Exhibit 2d (north in blue arrows, south in red arrows).

North-south splits using these three points of access are calculated for the AM and PM peak hours using the three access points. The following table summarizes the results for the north-south directional split of Ford's Colony traffic:

TABLE TWO: FORD'S COLONY NORTH-SOUTH DIRECTIONAL SPLIT

	NORTH	SOUTH
AM ENTERING	75%	25%
AM EXITING	72%	28%
PM ENTERING	71%	29%
PM EXITING	79%	21%

The Table One results for the east-west split are remarkably consistent for the AM exiting, PM entering and PM exiting traffic, with 2% or less difference between any of the three conditions. The AM entering traffic has a higher west split which may be related to relatively higher trip generation for Ford's Colony service-oriented, AM entering traffic.

The Table Two results for the north-south split are also relatively consistent, with 8% or less difference between any of the four conditions. These results are applied to new developments in this study.

APPROVED DEVELOPMENT TRAFFIC FORECAST

Ford's Colony has access to News Road directly at Firestone Drive only. Traffic studies in 1993, 1998 and 2003 have shown Ford's Colony trip generation to vary substantially from conventional trip generate equations and average rates in Trip Generation, 5th, 6th and 7th Editions (TG5 through TG7), published by the Institute of Transportation Engineers (ITE).

The approach to forecasting build out traffic from Ford's Colony on News Road is to calculate the percentage increase in TG7 traffic values between April 2007 development and build out, and apply the percentage increase to Ford's Colony traffic counts at Firestone Drive.

Table One on Exhibit 4 shows Ford's Colony trip generation for 2007 and build out using TG7. Percentage increases for build out over 2007 development are in the 32% range. These percentages have been applied to Ford's Colony traffic on Firestone Drive. The increase in Firestone Drive traffic is assigned to the four News Road intersections on Appendix Exhibit E1.

For the 30 unbuilt single family housing units in Powhatan Secondary north of News Road, 100% of TG7 values are assigned as new traffic onto News Road at Powhatan Secondary. Trip generation and distribution for these units are shown on Table 2 on Exhibit 4. Trip assignments to the four News Road intersections are shown on Appendix Exhibit E2.

For the 74 unbuilt units in Greensprings, these are assumed to be the Exhibit 2 Greensprings area with access to Centerville Road south of News Road as shown on Exhibit 2. Table 3 on Exhibit 4 shows trip generation for these 74 units, and trip distribution from these units north on Centerville Road. 60% of traffic is assigned to the north, with 40% assigned to News Road. Trip assignments to the four News Road intersections are shown on Appendix Exhibit E3. The Ford's Colony trip distribution was not applied completely to Greensprings because of the relative ease of access to Monticello Avenue at Centerville Road.

For the 108 unbuilt units in Westport, Ford's Colony trip generation factors are used and results are assigned as new traffic. Westport has access to Centerville Road north of News Road. Table 1 on Exhibit 5 shows trip generation using the Ford's Colony north-south trip distribution split. Trip assignments to the four News Road intersections are shown on Appendix Exhibit E4.

For the 138 unbuilt units in Liberty Ridge, 100% of TG7 values are assigned as new traffic. Liberty Ridge has access to Centerville Road north of Westport. Table 2 on Exhibit 5 shows trip generation using the Ford's Colony north-south trip distribution split. Trip assignments to the four News Road intersections are shown on Appendix Exhibit E5.

Exhibit 8 shows the traffic forecast on News Road for all approved development. Traffic assignment for unbuilt units in Ford's Colony, Powhatan Secondary, Greensprings, Westport and Liberty Ridge have been added to the 2007/2008 counts.

Following are peak hour LOS for traffic forecast with all approved development on the News Road corridor:

1. Centerville Road (Appendix Exhibits G3 and G4). With existing lane configuration, News Road westbound approach: LOS B for AM and LOS C PM, Centerville Road southbound approach: LOS A for AM and PM. Right turn warrants are included in the technical appendix for the approved development forecast (Appendix Exhibits J1 and J2 for AM and PM peak hour right turn lane warrants on northbound Centerville Road). A right turn taper is warranted for the approved development forecast, and a left turn lane was warranted on southbound Centerville Road for 2007 PM peak hour counts.
2. Firestone Drive (Appendix Exhibits H3 and H4). With existing lane configuration, Firestone Drive southbound approach: LOS B AM and LOS B PM, News Road eastbound left turn: LOS A AM and PM.
3. Old News Road (Appendix Exhibits I3 and I4). With existing lane configuration, Old News Road southbound approach: LOS B AM and LOS C PM, Lake Powhatan northbound approach: LOS B AM and LOS C PM, News Road eastbound left turn: LOS A AM and PM, News Road westbound left turn: LOS A AM and PM.
4. Monticello Avenue (Appendix Exhibit P3 and P4). This is a signalized intersection with overall LOS D for the AM peak hour and LOS C for the PM peak hour and LOS D or better for all turning movements for AM and PM peak hours.

On News Road east of Centerville Road, the peak hour two-way two lane highway segment LOS is C in the AM and PM peak hours. On News Road from Powhatan Secondary to Old News Road, the peak hour two-way two lane highway segment LOS is C in the AM peak hour and LOS D in the PM peak hour.

THE VILLAGE AT FORD'S COLONY TRAFFIC FORECAST

Trip generation for The Village is shown in Table 1 on Exhibit 6 using Trip Generation, 7th Edition (TG7), by the Institute of Transportation Engineers (ITE). Trip generation has increased from the July 12, 2007 report by the addition of 180 nursing home beds which were not included in the development inventory provided for that report.

Trip distribution for The Village is also shown on Exhibit 6. The Ford's Colony east-west trip distribution split is used. Trip assignments to the four News Road intersections are shown on Appendix Exhibit E6.

Exhibit 9 shows the traffic forecast on News Road for The Village. Traffic assignment for The Village has been added to the approved development forecast.

Following are peak hour LOS for traffic forecast with all approved development on the News Road corridor:

1. Centerville Road (Appendix Exhibits G5 and G6). With existing lane configuration, News Road westbound approach: LOS B for AM and LOS C PM, Centerville Road southbound approach: LOS A for AM and PM.
2. Firestone Drive (Appendix Exhibits H5 and H6). Firestone Drive southbound approach: LOS C AM and LOS B PM, The Village northbound approach: LOS B AM and LOS C PM, News Road eastbound left turn: LOS A AM and PM, News Road westbound left turn: LOS A AM and PM.
3. Old News Road (Appendix Exhibits I5 and I6). With existing lane configuration, Old News Road southbound approach: LOS B AM and LOS C PM, Lake Powhatan

northbound approach: LOS B AM and LOS C PM, News Road eastbound left turn: LOS A AM and PM, News Road westbound left turn: LOS A AM and PM.

4. Monticello Avenue (Appendix Exhibit P5 and P6). This is a signalized intersection with overall LOS D for the AM peak hour and LOS C for the PM peak hour and LOS D or better for all turning movements for AM and PM peak hours.

On News Road east of Centerville Road, the peak hour two-way two lane highway segment LOS is C in the AM and PM peak hours. On News Road from Powhatan Secondary to Old News Road, the peak hour two-way two lane highway segment LOS is C in the AM peak hour and LOS D in the PM peak hour.

PROPOSED DEVELOPMENT TRAFFIC FORECAST

The Nixon/Graves property lies west of The Village with access via News Road. There is no specific development plan for this property. Development density at one single family unit per acre is used, yielding 60 units. Trip generation for the 60 units is shown on Table 1 on Exhibit 7. The Ford's Colony east-west trip distribution split is used. Trip assignments to the four News Road intersections are shown on Appendix Exhibit E7.

The Richardson property lies west of the Nixon/Graves property. There is no specific development plan for this property. Development density at one single family unit per three acres is used, yielding 39 units. Trip generation for the 39 units is shown on Table 2 on Exhibit 7. The Ford's Colony east-west trip distribution split is used. Trip assignments to the four News Road intersections are shown on Appendix Exhibit E8.

The Beamer property is adjacent to Powhatan Secondary north of News Road. 70 townhouses are proposed for this property. Trip generation for the 39 units is shown on Table 3 on Exhibit 7. All access is via Jester Lane to Old News Road, traffic to Centerville Road, News Road east and Monticello Avenue south is assigned to News Road at Old News Road. Trip assignments to the four News Road intersections are shown on Appendix Exhibit E8.

Exhibit 10 shows the traffic forecast on News Road for proposed development. Traffic assignment for the three proposed developments has been added to The Village forecast.

Following are peak hour LOS for traffic forecast with all approved development on the News Road corridor:

1. Centerville Road (Appendix Exhibits G7 and G8). With existing lane configuration, News Road westbound approach: LOS B for AM and LOS C PM, Centerville Road southbound approach: LOS A for AM and PM. Right turn warrants are included in the technical appendix for the proposed development forecast (Appendix Exhibits J1 and J2 for AM and PM peak hour right turn lane warrants on northbound Centerville Road). A right turn taper is warranted for the proposed development forecast, and a left turn lane was warranted on southbound Centerville Road for 2007 PM peak hour counts.
2. Firestone Drive (Appendix Exhibits H7 and H8). With westbound left turn lane, Firestone Drive southbound approach: LOS C AM and LOS D PM , The Village northbound approach: LOS B AM and PM, News Road eastbound left turn: LOS A AM and PM, News Road westbound left turn: LOS A AM and PM.
3. Old News Road (Appendix Exhibits I7 and I8). With existing lane configuration, Old News Road southbound approach: LOS B AM and LOS D PM, Lake Powhatan northbound approach: LOS B AM and LOS D PM, News Road eastbound left turn: LOS A AM and PM, News Road westbound left turn: LOS A AM and PM.
4. Monticello Avenue (Appendix Exhibit P7 and P8). This is a signalized intersection with overall LOS D for the AM and PM peak hours and LOS D or better for all turning movements for AM peak hour and LOS E or better for PM peak hour.

On News Road east of Centerville Road, the peak hour two-way two lane highway segment LOS is C in the AM and PM peak hours. On News Road from Powhatan Secondary to Old News Road, the peak hour two-way two lane highway segment LOS is D in the AM and PM peak hours.

SUMMARY AND CONCLUSIONS

At the News Road/Centerville Road intersection, existing counts warrant a southbound left turn lane on Centerville Road. For all scenarios, a right turn lane taper is warranted on northbound Centerville Road at the intersection. The proposed development forecast shows traffic very nearly warranting a full right turn lane. The westbound single lane on News Road at the stop sign show LOS C or better for all scenarios, but the volumes are such that widening to provide two lanes on the stop approach is desirable. The following table shows the intersection LOS for all scenarios:

TABLE THREE
UNSIGNALIZED INTERSECTION LOS AT
CENTERVILLE ROAD/NEWS ROAD

	AM PEAK HOUR LOS		PM PEAK HOUR LOS	
CONDITION	Westbound Left/Right	Southbound Left/Thru	Westbound Left/Right	Southbound Left/Thru
2007/2008	B – 12.1	A – 2.5	B – 13.6	A – 2.5
Approved	B – 13.5	A – 3.4	C – 16.7	A – 3.1
The Village	B – 14.1	A – 3.7	C – 17.9	A – 3.4
Proposed	B – 14.6	A – 3.9	C – 19.2	A – 3.7

Notes: Numeric values in seconds delay, with increasing value for decreasing LOS.

At the News Road/Springhill Drive intersection, counts were not available. There is a right turn lane on westbound News Road and there is no eastbound left turn lane on News Road. The proposed development forecast is a 58% increase over existing counts on News Road west of Firestone and the potential for a left turn lane warrant increases with increasing traffic.

At the News Road/Firestone Drive, the progressive increase in traffic from existing counts to the proposed development forecast shows a corresponding increase in delay for the southbound Firestone Drive approach. There is an existing left turn lane on westbound News Road to serve the access connection of The Village at this intersection. An eastbound right turn lane on News Road is not warranted (Appendix Exhibit J3). The following table shows the intersection LOS for all scenarios:

TABLE FOUR
UNSIGNALIZED INTERSECTION LOS AT
FIRESTONE DRIVE/NEWS ROAD

CONDITION	AM PEAK HOUR LOS				PM PEAK HOUR LOS			
	SB Left	NB Left	EB Left	WB Left	SB Left	NB Left	EB Left	WB Left
2007/2008	B – 11.3	n/a	A – 7.5	n/a	B – 12.2	n/a	A – 8.1	n/a
Approved	B – 12.7	n/a	A – 7.5	n/a	B – 14.0	n/a	A – 8.4	n/a
The Village	C – 17.9	B – 13.5	A – 7.6	A – 7.9	D – 26.1	C – 17.2	A – 8.4	A – 7.8
Proposed	C – 20.3	B – 14.5	A – 7.7	A – 8.0	D – 33.0	C – 19.7	A – 8.6	A – 7.9

Notes: Numeric values in seconds delay, with increasing value for decreasing LOS.

At the News Road/Powhatan Parkway intersection, there is a westbound right turn lane. There is no eastbound right turn lane or left turn lanes in either direction. While counts were not available for this intersection, the 2008 counts on News Road west of Old News Road probably warrant a westbound left turn lane, and the proposed development forecast almost certainly will warrant a left turn lane. A full eastbound right turn lane may not be warranted under any condition due to the trend towards most trip distribution to and from the east on News Road.

At the News Road/Old News Road, the progressive increase in traffic from existing counts to the proposed development forecast shows a corresponding decline in LOS for the southbound Old News Road approach. There are existing eastbound and westbound left turn lanes on News Road, and a westbound right turn lane. An eastbound right turn lane on News Road is not warranted (right turn volume of 2 vph less than 10 vph minimum to warrant a right turn taper on a four lane road). The addition of a second southbound lane on Old News Road may not show a LOS improvement, but the volumes are such that improvements to provide two lanes on the stop approach are desirable. The following table shows the intersection LOS for all scenarios:

TABLE FIVE
UNSIGNALIZED INTERSECTION LOS AT
OLD NEWS ROAD/NEWS ROAD

CONDITION	AM PEAK HOUR LOS				PM PEAK HOUR LOS			
	SB App.	NB App.	EB Left	WB Left	SB App.	NB App.	EB Left	WB Left
2007/2008	B – 10.3	B – 10.8	A – 7.7	A – 8.1	B – 15.0	C – 15.2	A – 8.5	A – 0.0
Approved	B – 10.7	B – 11.8	A – 7.8	A – 8.4	C – 18.3	C – 18.7	A – 8.8	A – 0.0
The Village	B – 11.0	B – 12.4	A – 7.9	A – 8.5	C – 22.6	C – 23.1	A – 9.1	A – 0.0
Proposed	B – 11.7	B – 13.1	A – 7.9	A – 8.7	D – 28.6	D – 27.5	A – 9.4	A – 0.0

Notes: Numeric values in seconds delay, with increasing value for decreasing LOS.

The following table shows the two-way two lane highway segment traffic LOS and volume/capacity (v/c) ratios for New Road east of Centerville Road (lowest volumes) and from Powhatan Secondary to Old News Road (highest volumes):

TABLE SIX
TWO-WAY TWO LANE HIGHWAY SEGMENT LOS ON NEWS ROAD

CONDITION	EAST OF CENTERVILLE		POW. SEC. TO OLD NEWS	
	AM PEAK HOUR	PM PEAK HOUR	AM PEAK HOUR	PM PEAK HOUR
2007/2008	B – 0.12	B – 0.15	C – 0.23	D – 0.32
Approved	C – 0.16	C – 0.15	C – 0.28	D – 0.35
The Village	C – 0.18	C – 0.17	C – 0.31	D – 0.40
Proposed	C – 0.19	C – 0.18	D – 0.34	D – 0.44

Notes: Numeric values in volume capacity ratios (v/c), with increasing value for decreasing LOS.

Needed improvements for News Road at Monticello Avenue were addressed with the West Monticello Plan prepared in 2006 and included in the March 1, 2008 traffic study for Section 12 of New Town. The March 1, 2008 traffic study includes a traffic forecast beyond the News Road corridor with resulting large volumes. Any changes needed for the Monticello Marketplace driveway on News Road should be addressed with the design for the West Monticello Plan. For the purposes of comparison, the following table presents signalized intersection LOS results for the traffic counts and forecasts presented in this report:

TABLE SEVEN
SIGNALIZED INTERSECTION LOS AT
NEWS ROAD/MONTICELLO AVENUE

CONDITION	AM PEAK HOUR LOS									
	Overall	EB Left	EB Thru	WB Left	WB Thru	NB Left	NB Thru	NB Right	SB Left	SB L/T/R
2007/2008	C – 34.0	D – 45.4	D – 36.9	C – 25.0	B – 12.3	D– 41.2	D – 42.2	D – 42.2	D – 45.3	D – 39.8
Approved	D – 35.2	D – 45.4	D – 38.9	C – 25.0	B – 13.1	D– 41.2	D – 42.5	D – 42.2	D – 47.4	D – 39.5
The Village	D – 35.9	D – 45.4	D – 39.9	C – 24.9	B – 13.5	D– 40.9	D – 42.6	D – 41.8	D – 49.3	D – 40.1
Proposed	D – 36.8	D – 45.4	D – 41.3	C – 24.9	B – 14.0	D– 40.7	D – 42.7	D – 41.7	D – 51.3	D – 41.0
CONDITION	PM PEAK HOUR LOS									
	Overall	EB Left	EB Thru	WB Left	WB Thru	NB Left	NB Thru	NB Right	SB Left	SB L/T/R
2007/2008	C – 32.1	D – 44.5	D – 38.0	C – 28.0	B – 17.3	D– 40.1	D – 45.9	D – 39.7	D – 46.4	D – 43.2
Approved	C – 33.1	D – 44.8	D – 39.1	C – 27.9	B – 18.0	D– 39.7	D – 50.0	D – 39.3	D – 48.6	D – 44.7
The Village	C – 34.7	D – 43.3	D – 38.0	C – 29.5	B – 19.4	D– 39.4	D – 54.5	D – 39.1	D – 53.9	D – 47.4
Proposed	D – 35.9	D – 43.7	D – 38.5	C – 29.5	B – 19.8	D– 39.2	E – 60.0	D – 38.9	E – 57.1	D – 49.1

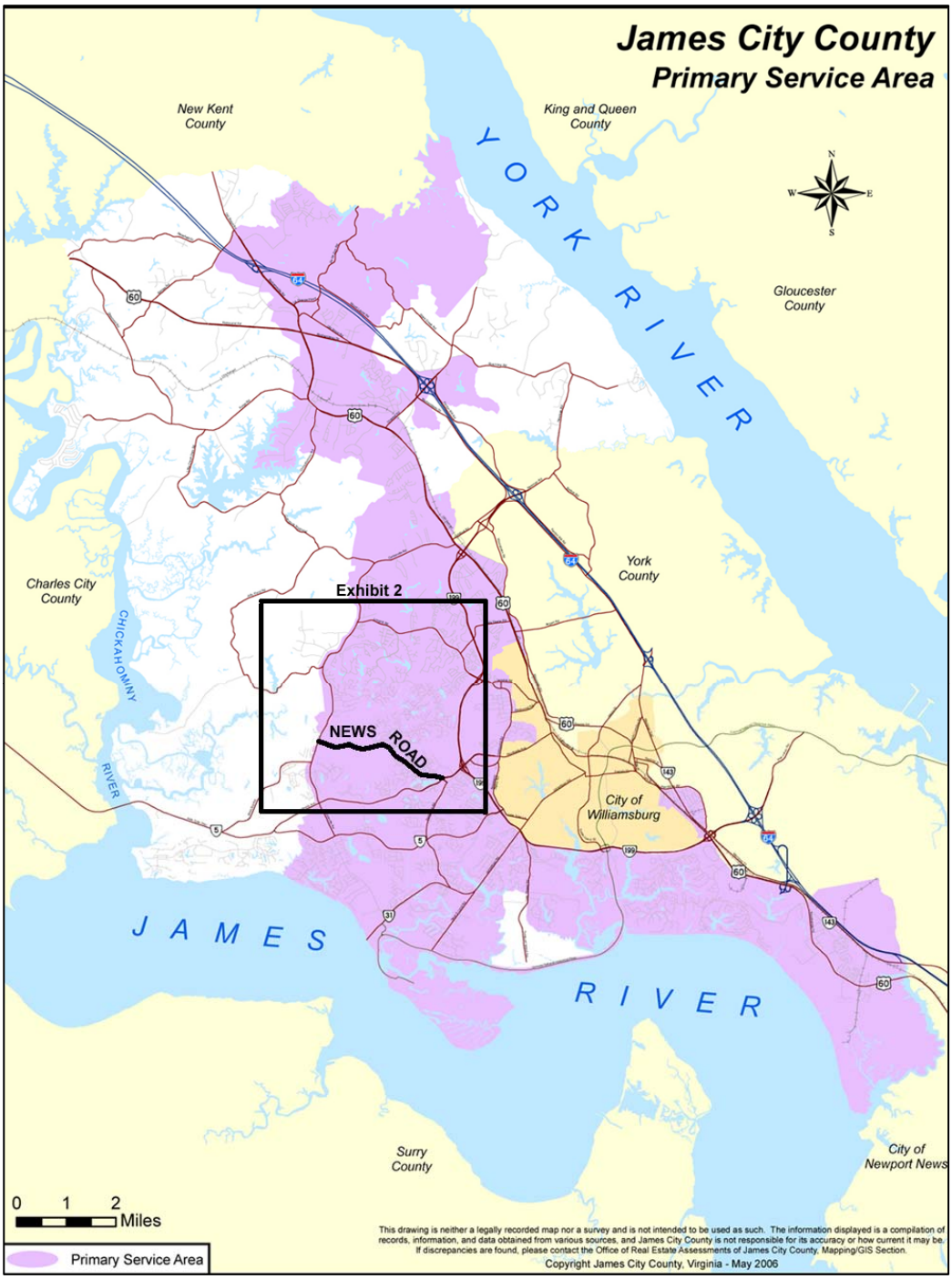
Notes: Numeric values in seconds delay, with increasing value for decreasing LOS.

Overall, the total traffic forecast on News Road will be within the capacity of two lane News Road. Stop-sign controlled traffic will experience LOS B through D, with LOS D occurring only in the PM peak hour.

At Firestone Drive, Ford's Colony will include an eastbound right turn lane for The Village development as well as a westbound left turn lane. Ford's Colony previously proffered the installation of a traffic signal at News Road/Firestone Drive at such time that traffic at the intersection warrants the traffic signal.

Ford's Colony also intends to provide a westbound left turn lane on News Road at Powhatan Secondary. This westbound left turn lane will provide improved convenience to the residents of Powhatan Secondary and reduced delay for all westbound traffic on News Road.

REPORT EXHIBITS



NEWS ROAD CORRIDOR
REGIONAL LOCATION

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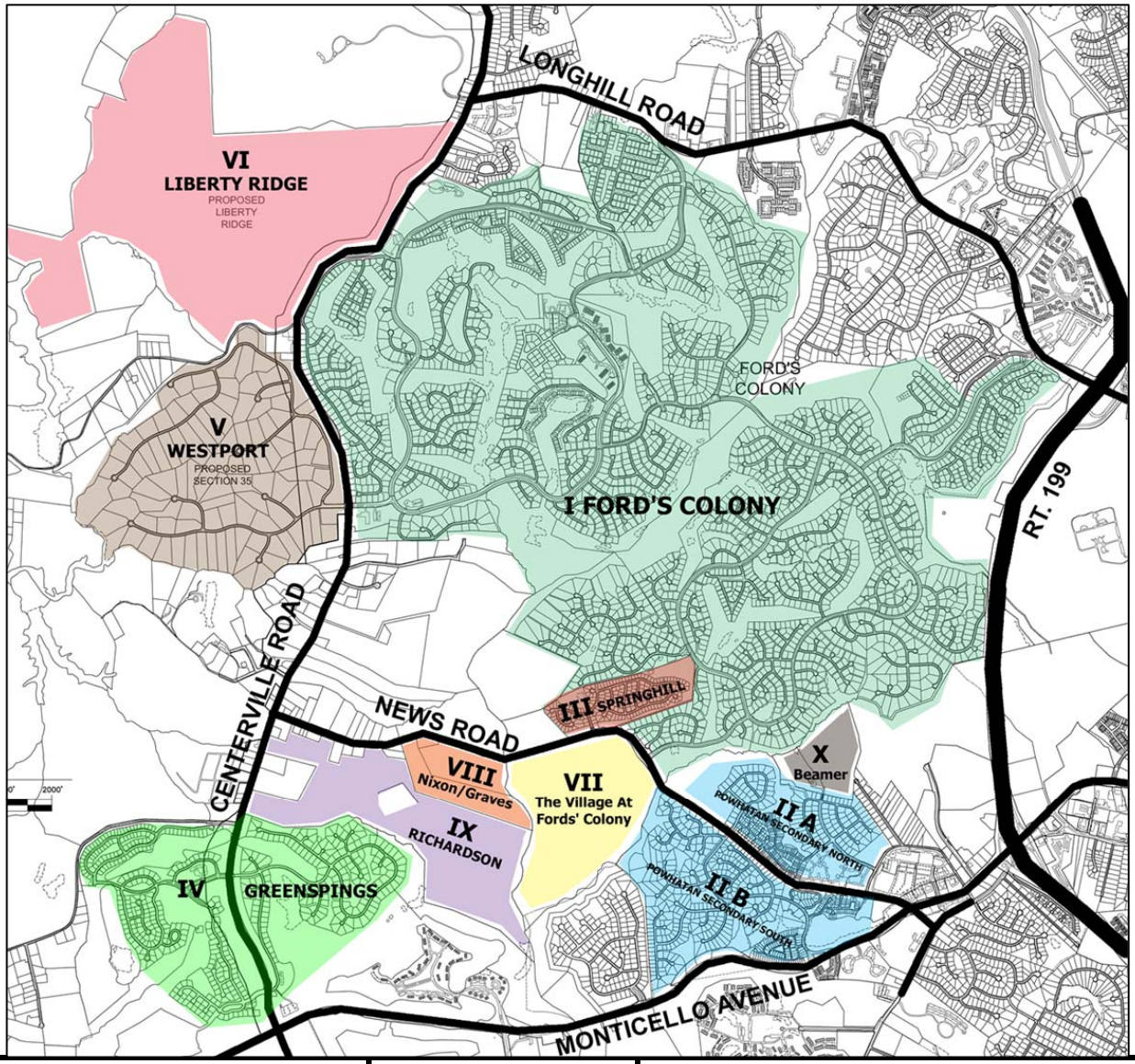
804-794-7312

Exhibit 1a



Development		Inventory Source	Forecast Technique
Map #	Name		
I	Ford's Colony	Ford's Colony	Increase News Road/Firestone counts by buildout (3050 units)/April 07 (2272 units) ratio
IIA	Powhatan Secondary North of News Road	Ford's Colony	Assign trips for 30 unbuilt units
IIB	Powhatan Secondary South of News Road	Ford's Colony	Built out; no assignment
III	Springhill	Ford's Colony	Built out; no assignment
IV	Greensprings	AES	Assign trips for 74 unbuilt units
V	Westport	Ford's Colony	Assign trips for 108 unbuilt units
VI	Liberty Ridge	Ford's Colony	Assign trips for 139 unbuilt units
VII	The Village At Ford's Colony	Ford's Colony	Assign proposed development trips
VIII	Nixon/Graves (Realtec)	Ford's Colony	Assign trips for one SF unit per 3 ac. (60 units)
IX	Richardson	Ford's Colony	Assign trips for one SF unit per 1 ac. (20 units)
X	Beamer	Ford's Colony	Assign trips for 70 new units

NEWS ROAD CORRIDOR
DEVELOPMENT INVENTORY

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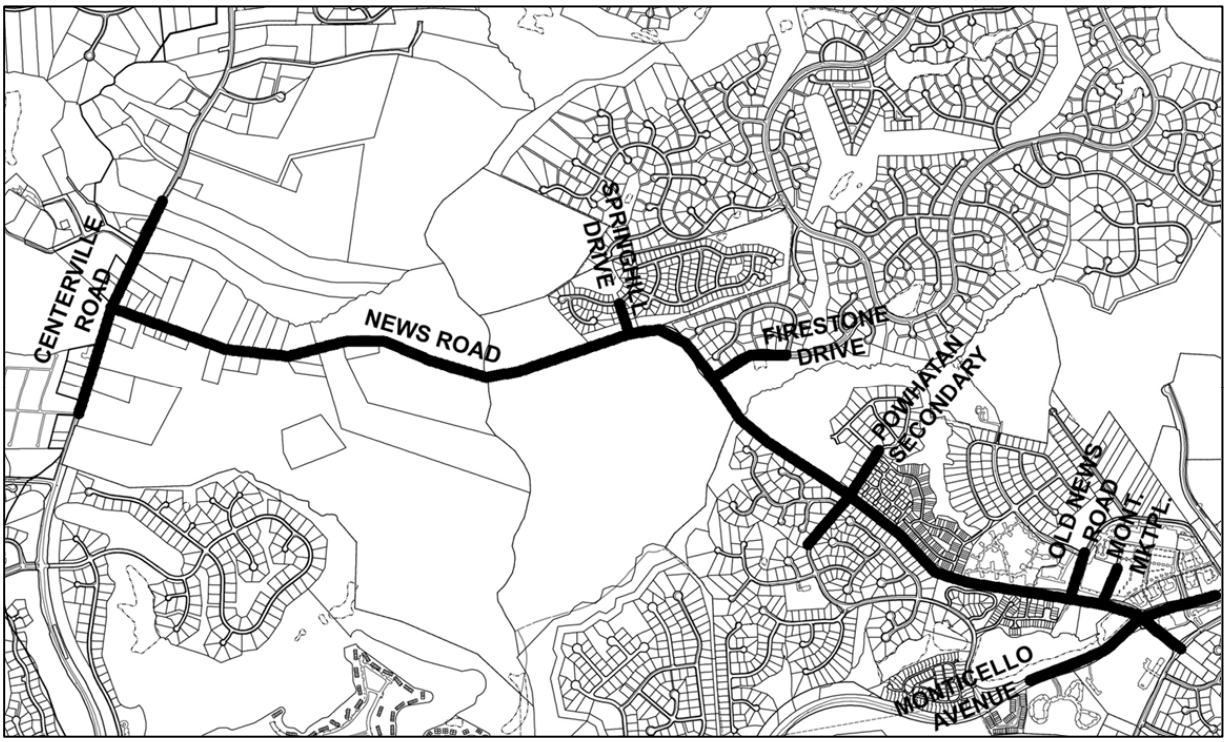
Exhibit 1b



NEWS ROAD CORRIDOR
INTERSECTIONS

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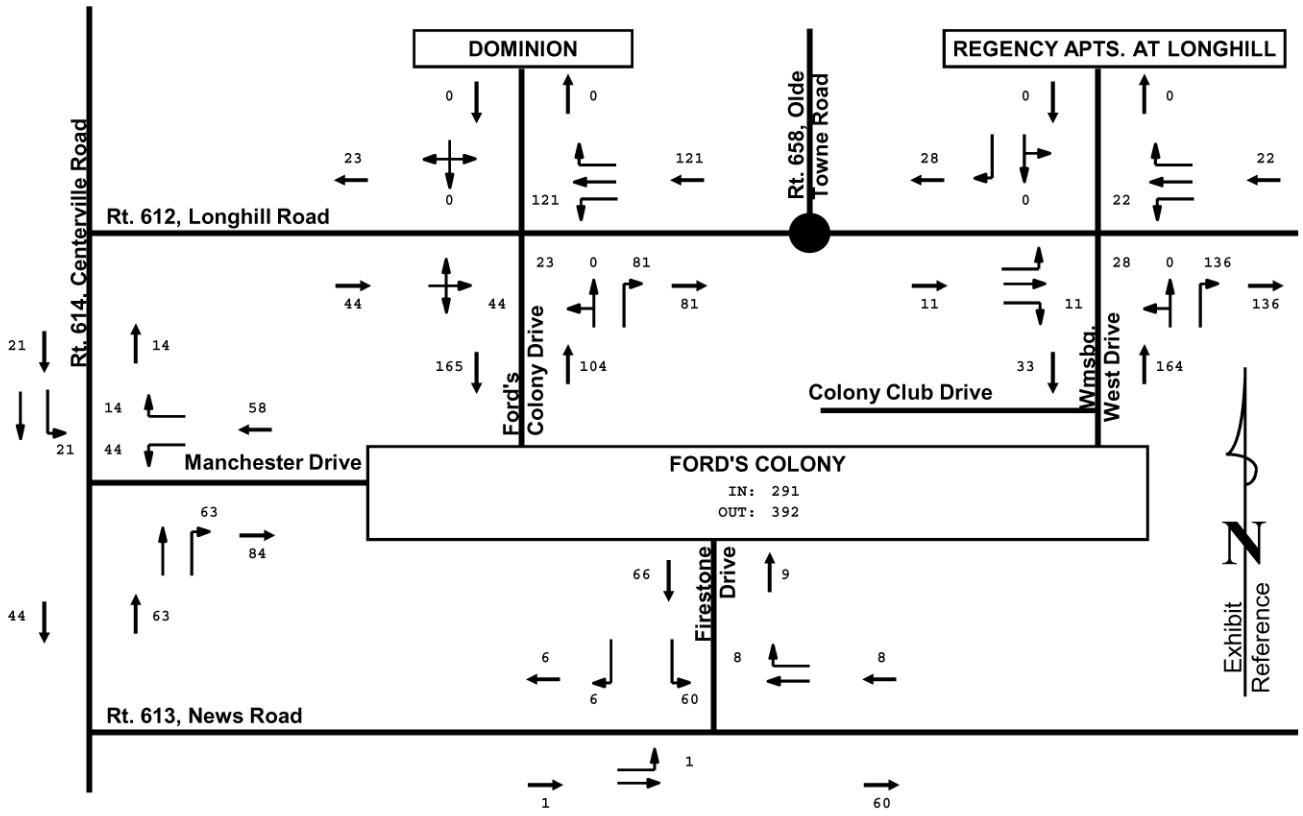
Exhibit 1c

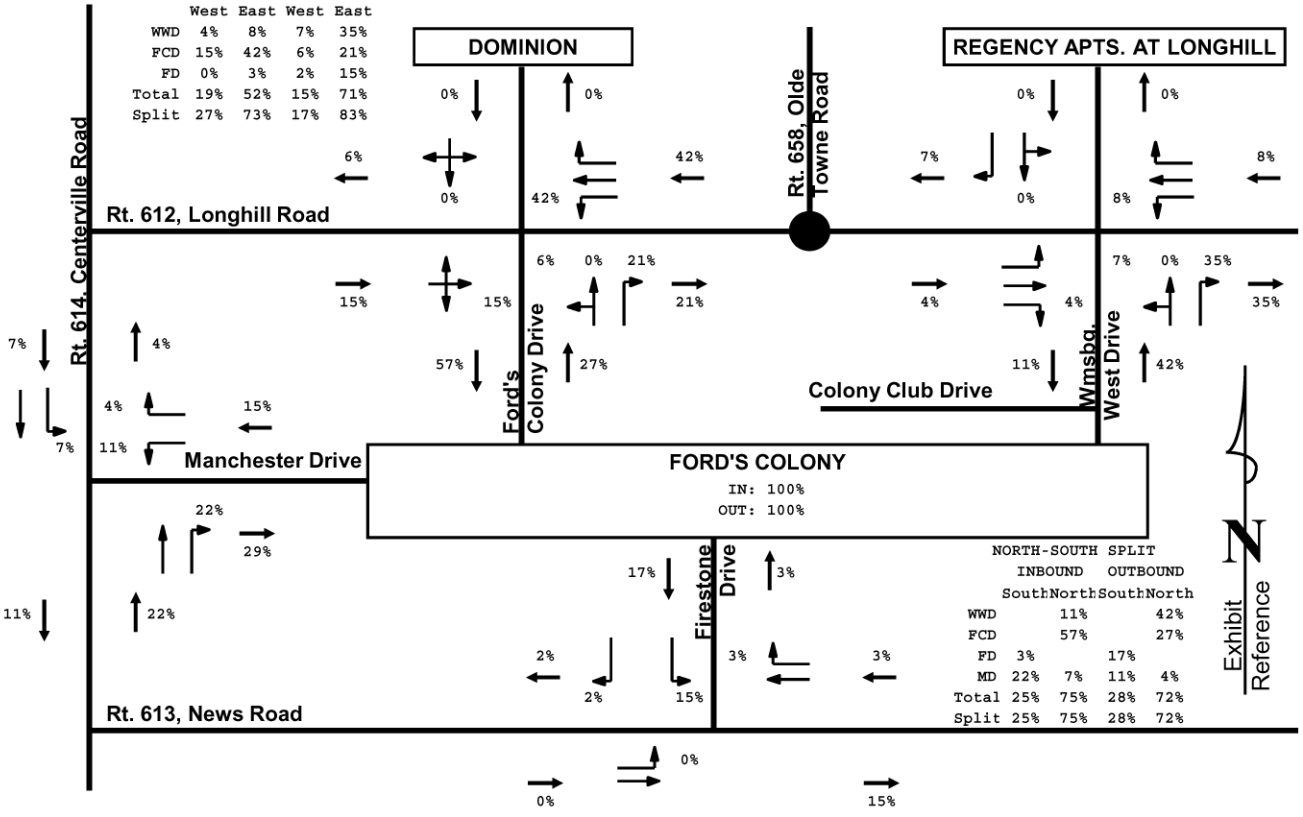
2003 AM Peak Hour Counts



2003 AM PEAK HOUR DISTRIBUTION

EAST-WEST SPLIT

	INBOUND		OUTBOUND	
	West	East	West	East
WWD	4%	8%	7%	35%
FCD	15%	42%	6%	21%
FD	0%	3%	2%	15%
Total	19%	52%	15%	71%
Split	27%	73%	17%	83%



NORTH-SOUTH SPLIT

	INBOUND		OUTBOUND	
	South	North	South	North
WWD		11%		42%
FCD		57%		27%
FD	3%		17%	
MD	22%	7%	11%	4%
Total	25%	75%	28%	72%
Split	25%	75%	28%	72%

FORD'S COLONY 2003 AM PEAK HOUR DISTRIBUTION

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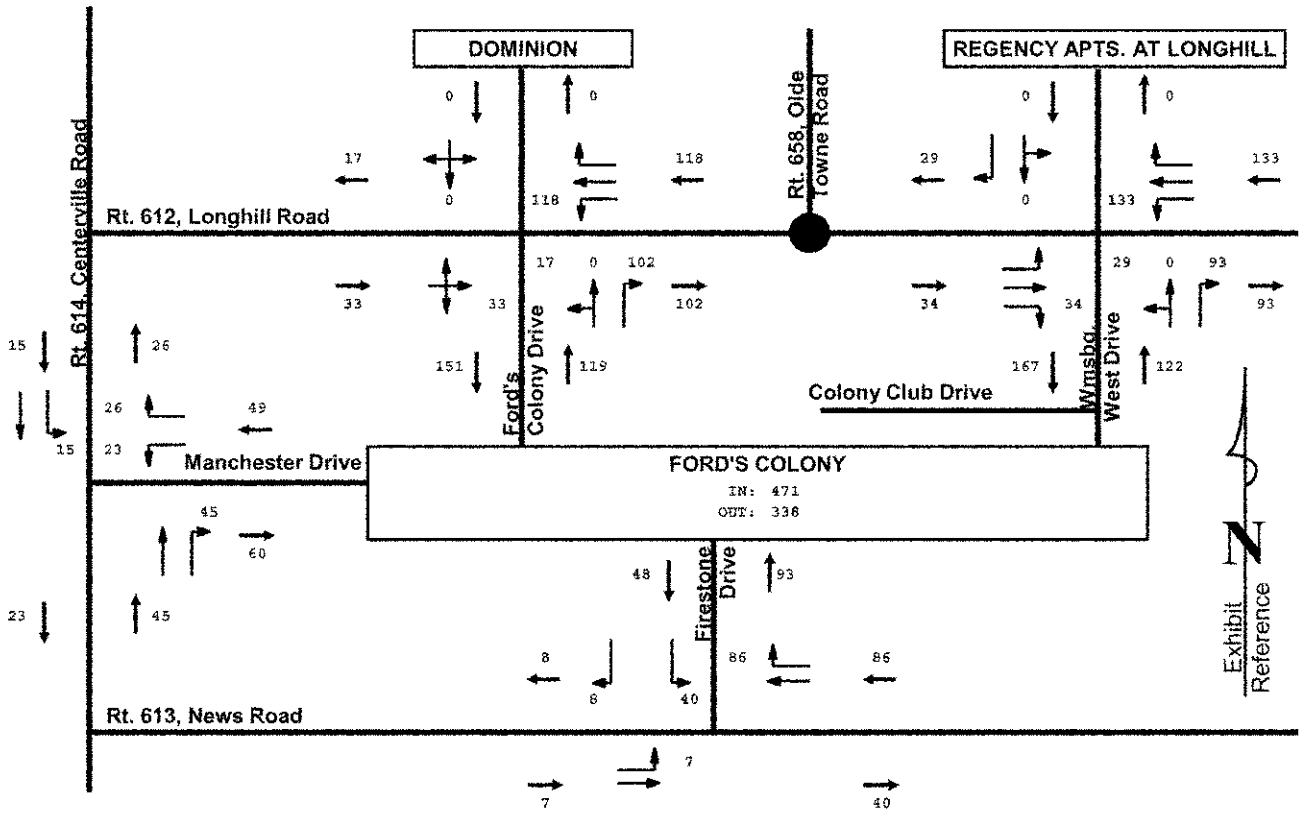
Exhibit 2a

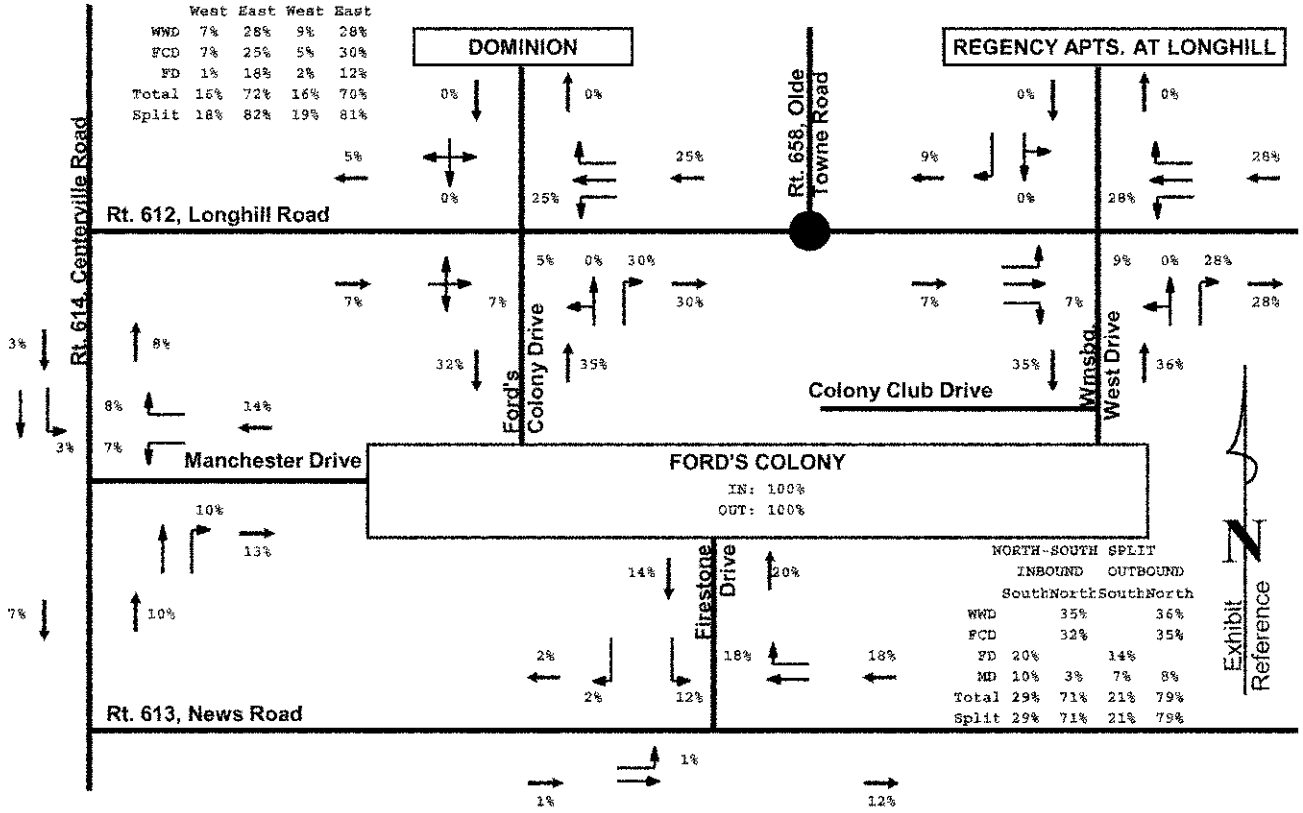
2003 PM Peak Hour Counts



2003 PM PEAK HOUR DISTRIBUTION

EAST-WEST SPLIT

	INBOUND		OUTBOUND	
	West	East	West	East
WWD	7%	28%	9%	28%
FCD	7%	25%	5%	30%
FD	1%	18%	2%	12%
Total	15%	72%	16%	70%
Split	18%	82%	19%	81%



NORTH-SOUTH SPLIT

	INBOUND		OUTBOUND	
	South	North	South	North
WWD	35%		36%	
FCD	32%		35%	
FD	20%		14%	
MD	10%	3%	7%	8%
Total	29%	71%	21%	79%
Split	29%	71%	21%	79%

FORD'S COLONY 2003 PM PEAK HOUR DISTRIBUTION

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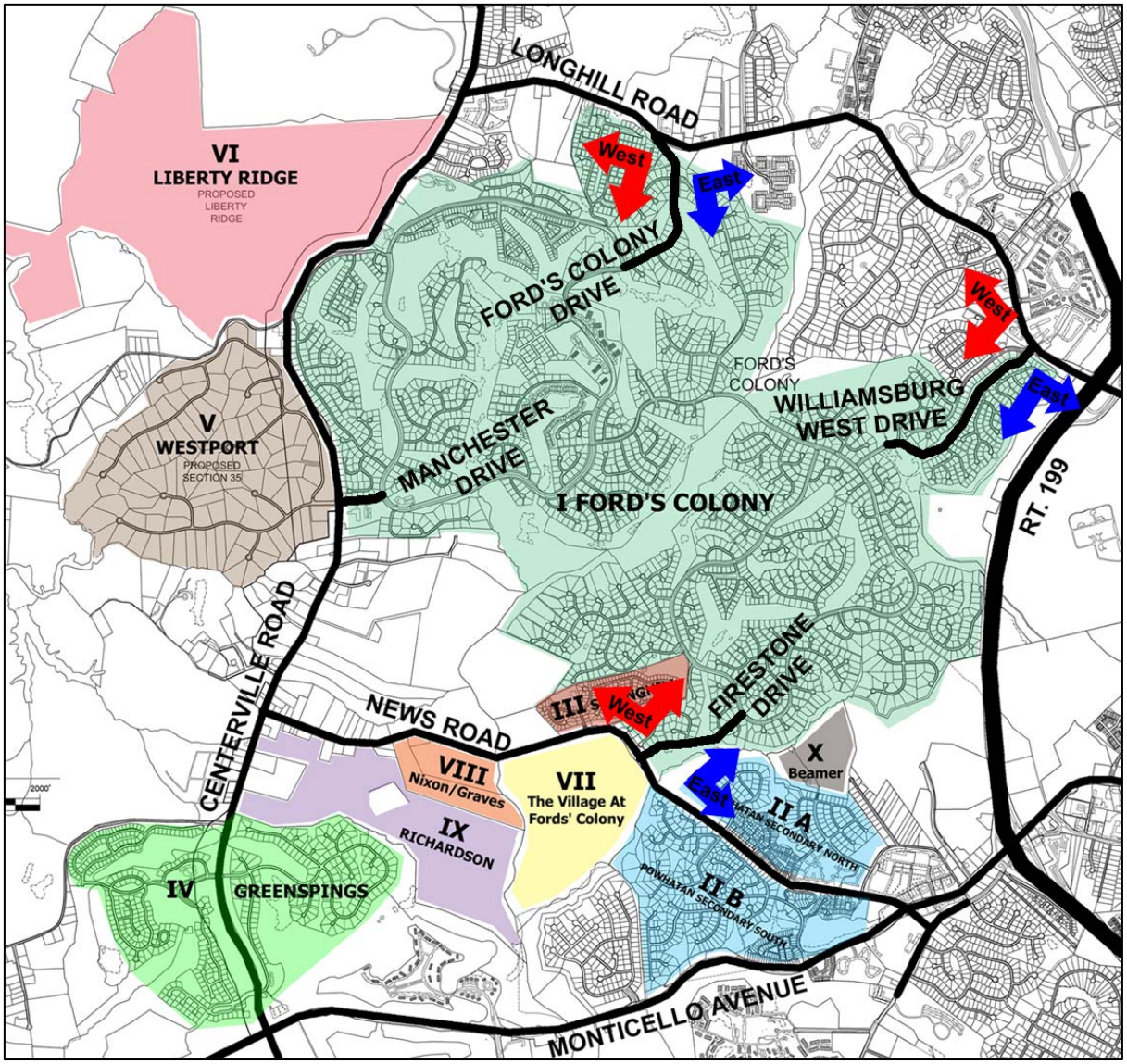
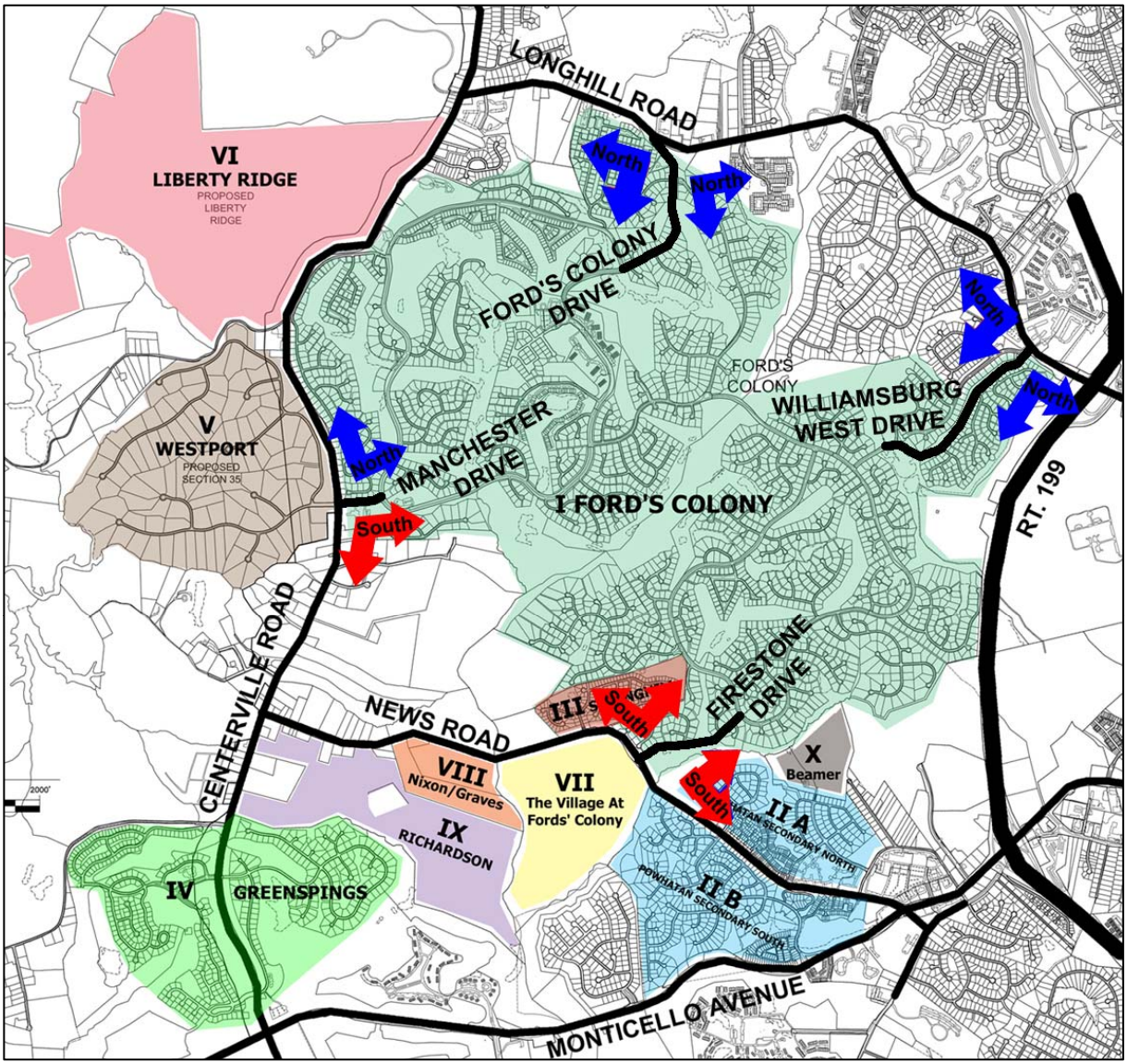
Exhibit 2b



FORD'S COLONY EAST- WEST DISTRIBUTION SPLIT
TRAFFIC LOCATIONS

DRW Consultants, LLC
804-794-7312

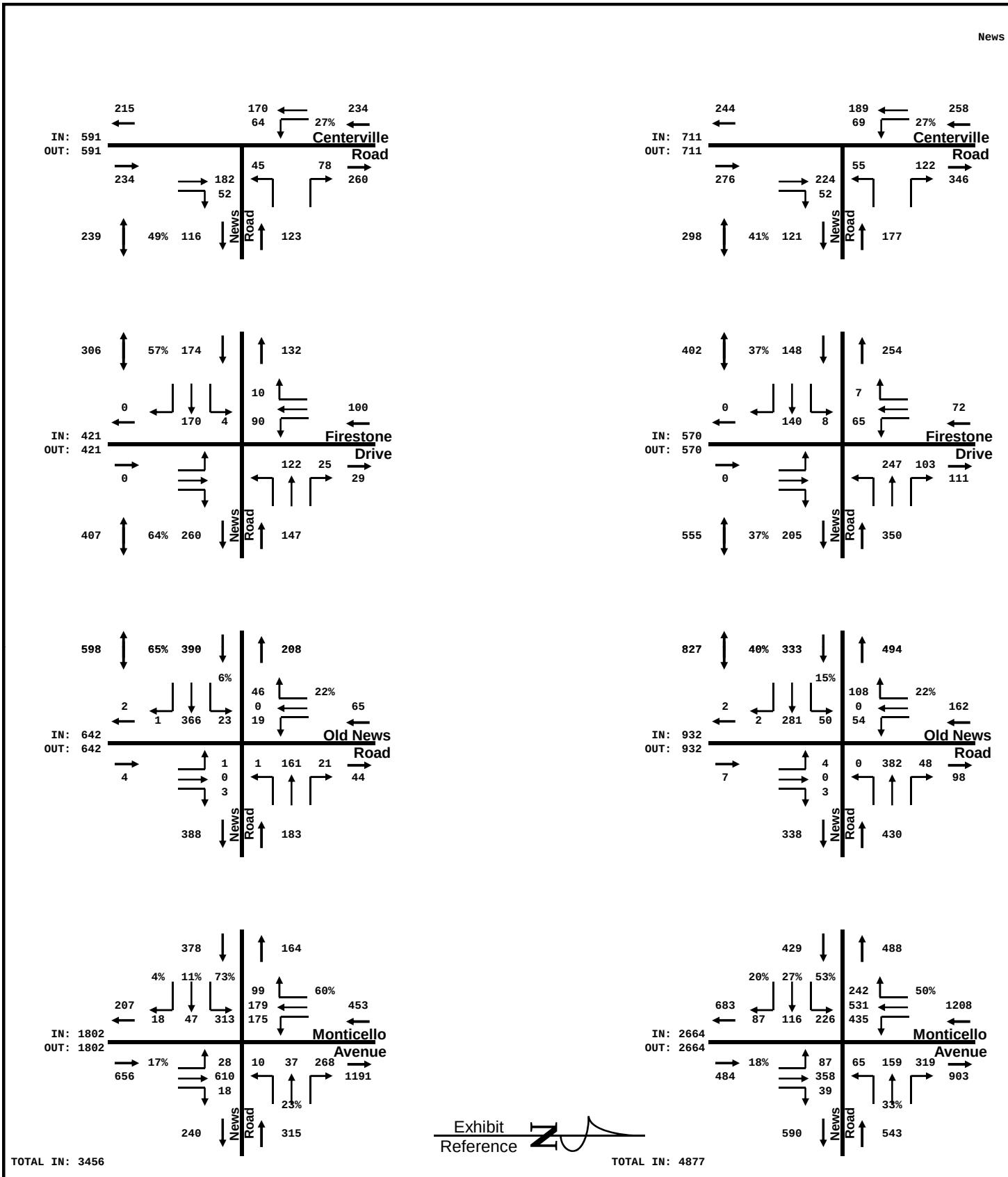
Exhibit 2c



FORD'S COLONY NORTH-SOUTH DISTRIBUTION SPLIT
TRAFFIC LOCATIONS

DRW Consultants, LLC
804-794-7312

Exhibit 2d



2007/2008 PEAK HOUR COUNTS

DRW Consultants, LLC
804-794-7312

Exhibit 3

TRACT	LAND USE	LAND USE CODE	SQ.FT., OTHER UNITS	WEEKDAY TRIP GENERATION						
				AM PEAK HOUR			PM PEAK HOUR			
				Enter	Exit	Total	Enter	Exit	Total	DAILY
TABLE 1 - FORD'S COLONY TRIP GENERATION (I)										
2007										
avg. rate-adj. st.	Single-Family	210	2,180 units	409	1226	1635	1387	815	2202	20863
eq.-adj. st.	Condo/Townhouse	230	92 units	8	40	48	38	18	56	598
	2007 TOTAL		2272 units	417	1266	1683	1425	833	2258	21461
BUILD OUT										
avg. rate-adj. st.	Single-Family	210	2,862 units	537	1610	2147	1821	1070	2891	27389
eq.-adj. st.	Condo/Townhouse	230	188 units	15	71	86	68	33	101	1098
	BUILDOUT TOTAL		3050 units	552	1681	2233	1889	1103	2992	28487
			% INCREASE	32.4%	32.8%	32.7%	32.6%	32.4%	32.5%	32.7%

TABLE 2 - POWHATAN SECONDARY NORTH (IIA) - East West Split

eq.-adj. st.	Single-Family	210	30 units	8	22	30	23	13	36	343
		AM Peak Hour					PM Peak Hour			
		Entering Traffic		Exiting Traffic			Entering Traffic		Exiting Traffic	
	Direction	% Dist.	Trips	% Dist.	Trips		% Dist.	Trips	% Dist.	Trips
	Centerville North	22%	2	12%	3		13%	3	14%	2
	Centerville South	5%	0	5%	1		5%	1	5%	1
	Old News North	20%	2	5%	1		20%	5	15%	2
	Monticello North	20%	2	45%	10		30%	7	35%	5
	News East	23%	2	23%	5		22%	5	21%	3
	Monticello South	10%	1	10%	2		10%	2	10%	1
		100%	9	100%	22		100%	23	100%	14
NOTE: ALL TRAFFIC ASSIGNED TO NEWS ROAD VIA POWHATAN SECONDARY										

TABLE 3 - GREENSPRINGS (IV) - 40% To News Road

eq.-adj. st.	Single-Family	210	74 units	15	46	61	52	30	82	788
		AM Peak Hour					PM Peak Hour			
		Entering Traffic		Exiting Traffic			Entering Traffic		Exiting Traffic	
	Direction	% Dist.	Trips	% Dist.	Trips		% Dist.	Trips	% Dist.	Trips
	Centerville South	40%	6	40%	18		40%	21	40%	12
	Centerville North	20%	3	20%	9		20%	10	20%	6
	Old News North	10%	2	10%	5		10%	5	10%	3
	Monticello North	20%	3	20%	9		20%	10	20%	6
	News East	10%	2	10%	5		10%	5	10%	3
		100%	16	100%	46		100%	51	100%	30
NOTE: TRAFFIC ASSIGNED TO NEWS ROAD VIA CENTERVILLE ROAD										

Trip generation rates from Trip Generation, 7th Edition (TG7) by the Institute of Transportation Engineers (ITE)

FORD'S COLONY, POWHATAN SECONDARY, GREENSPRINGS
TRIP GENERATION AND DISTRIBUTION

DRW Consultants, LLC
804-794-7312

Exhibit 4

TRACT	LAND USE	LAND USE CODE	SQ.FT., OTHER UNITS	WEEKDAY TRIP GENERATION						
				AM PEAK HOUR			PM PEAK HOUR			
				Enter	Exit	Total	Enter	Exit	Total	DAILY

TABLE 1 - WESTPORT (V) - North-South Split

eq.-adj. st.	Single-Family	210	108 units	21	64	85	72	43	115	1116
Average of % ITE avg. trip rate for 1998 and 2003 - Ford's Colony				95%	46%	58%	49%	74%	58%	
Ford's Colony Trip Generation Rates			108 units	20	30	49	35	32	67	

	AM Peak Hour				PM Peak Hour			
	Entering Traffic		Exiting Traffic		Entering Traffic		Exiting Traffic	
Direction	% Dist.	Trips	% Dist.	Trips	% Dist.	Trips	% Dist.	Trips
Centerville North	75%	15	72%	22	71%	25	79%	25
Centerville South	0%	0	0%	0	0%	0	0%	0
Old News North	5%	1	5%	2	5%	2	5%	2
Monticello North	10%	2	15%	5	15%	5	10%	3
News East	5%	1	5%	2	5%	2	5%	2
Monticello South	5%	1	3%	1	4%	1	1%	0
	100%	20	100%	32	100%	35	100%	32

NOTE: TRAFFIC ASSIGNED TO NEWS ROAD VIA CENTERVILLE ROAD

TABLE 2 - LIBERTY RIDGE (VI) - North-South Split

eq.-adj. st.	Single-Family	210	138 units	27	79	106	90	53	143	1398

	AM Peak Hour				PM Peak Hour			
	Entering Traffic		Exiting Traffic		Entering Traffic		Exiting Traffic	
Direction	% Dist.	Trips	% Dist.	Trips	% Dist.	Trips	% Dist.	Trips
Centerville North	75%	20	72%	57	71%	64	79%	42
Centerville South	0%	0	0%	0	0%	0	0%	0
Old News North	5%	1	5%	4	5%	5	5%	3
Monticello North	10%	3	15%	12	15%	14	10%	5
News East	5%	1	5%	4	5%	5	5%	3
Monticello South	5%	1	3%	2	4%	4	1%	1
	100%	26	100%	79	100%	92	100%	54

NOTE: TRAFFIC ASSIGNED TO NEWS ROAD VIA CENTERVILLE ROAD

Trip generation rates from Trip Generation, 7th Edition (TG7) by the Institute of Transportation Engineers (ITE)

WESTPORT, LIBERTY RIDGE
TRIP GENERATION AND DISTRIBUTION

DRW Consultants, LLC
804-794-7312

Exhibit 5

TRACT	LAND USE	LAND USE CODE	SQ.FT., OTHER UNITS	WEEKDAY TRIP GENERATION AM PEAK HOUR Enter	Exit	Total	PM PEAK HOUR Enter	Exit	Total	DAILY
TABLE 1 - THE VILLAGE TRIP GENERATION										
	Elderly Detached	251	32 units	4	6	10	13	9	22	206
	Elderly Attached	252	332 units	12	15	27	23	14	37	1155
	Congregate Care	253	290 units	10	7	17	27	22	49	586
	Assisted Living	254	118 occ.bed	15	5	20	18	16	34	323
rate/adj. st.	Nursing Home	620	180 beds	21	10	31	13	27	40	427
		TOTAL	952 units	62	43	105	94	88	182	2697
TG 7 Definitions	Elderly Detached	251	may have recreation, but not central dining or health care							
	Elderly Attached	252	apartment-like residential units							
	Congregate Care	253	centralized amenities: dining, house keeping, trans., social/rec							
	Assisted Living	254	protective oversight, ALS and Alzheimers may be included							

ITE USE CODE	253	254			251	252		
FORD'S COLONY CCRC DEFINITIONS	CCRC Apt	Asst. Liv. Skill Care	CCRC Total		Town Homes	Ind. L.U.	Non CCRC	
Community 1	154	18	172		6			
Community 2		100	100		26	214		
Community 3	136		136			118		
	290	118	408		32	332	364	

TABLE 2 - THE VILLAGE SITE TRIP DISTRIBUTION - East West Split

					62	43	105	94	88	182	
	AM Peak Hour							PM Peak Hour			
	Entering Traffic		Exiting Traffic					Entering Traffic		Exiting Traffic	
Direction	% Dist.	Trips	% Dist.	Trips				% Dist.	Trips	% Dist.	Trips
Centerville North	22%	14	12%	5				13%	12	14%	12
Centerville South	5%	3	5%	2				5%	5	5%	4
Old News North	20%	12	5%	2				20%	19	15%	13
Monticello North	20%	12	45%	19				30%	28	35%	31
News East	23%	14	23%	10				22%	21	21%	18
Monticello South	10%	6	10%	4				10%	9	10%	9
	100%	61	100%	42				100%	94	100%	87

Trip generation rates from Trip Generation, 7th Edition (TG7) by the Institute of Transportation Engineers (ITE)

THE VILLAGE AT FORD'S COLONY (VII)
TRIP GENERATION AND DISTRIBUTION

DRW Consultants, LLC
804-794-7312

Exhibit 6

TRACT	LAND USE	LAND USE CODE	SQ.FT., OTHER UNITS	WEEKDAY TRIP GENERATION						
				AM PEAK HOUR			PM PEAK HOUR			
				Enter	Exit	Total	Enter	Exit	Total	DAILY

TABLE 1 - NIXON-GRAVES (VIII) - East-West Split

eq.-adj. st.	Single-Family	210	60 units	13	38	51	43	25	68	650

	AM Peak Hour				PM Peak Hour			
	Entering Traffic		Exiting Traffic		Entering Traffic		Exiting Traffic	
Direction	% Dist.	Trips	% Dist.	Trips	% Dist.	Trips	% Dist.	Trips
Centerville North	22%	3	12%	5	13%	6	14%	4
Centerville South	5%	1	5%	2	5%	2	5%	1
Old News North	20%	3	5%	2	20%	9	15%	4
Monticello North	20%	3	45%	17	30%	13	35%	9
News East	23%	3	23%	9	22%	9	21%	5
Monticello South	10%	1	10%	4	10%	4	10%	3
	100%	14	100%	39	100%	43	100%	26

NOTE: ALL TRAFFIC ASSIGNED TO NEWS ROAD

TABLE 2 - RICHARDSON (IX) - East-West Split

eq.-adj. st.	Single-Family	210	39 units	9	28	37	29	17	46	437

	AM Peak Hour				PM Peak Hour			
	Entering Traffic		Exiting Traffic		Entering Traffic		Exiting Traffic	
Direction	% Dist.	Trips	% Dist.	Trips	% Dist.	Trips	% Dist.	Trips
Centerville North	22%	2	12%	3	13%	4	14%	2
Centerville South	5%	0	5%	1	5%	1	5%	1
Old News North	20%	2	5%	1	20%	6	15%	3
Monticello North	20%	2	45%	13	30%	9	35%	6
News East	23%	2	23%	6	22%	6	21%	4
Monticello South	10%	1	10%	3	10%	3	10%	2
	100%	9	100%	27	100%	29	100%	18

NOTE: ALL TRAFFIC ASSIGNED TO NEWS ROAD

TABLE 3 - BEAMER (X) - North-South Split

eq.-adj. st.	Condo/Townhouse	230	70 units	7	32	39	30	15	45	474

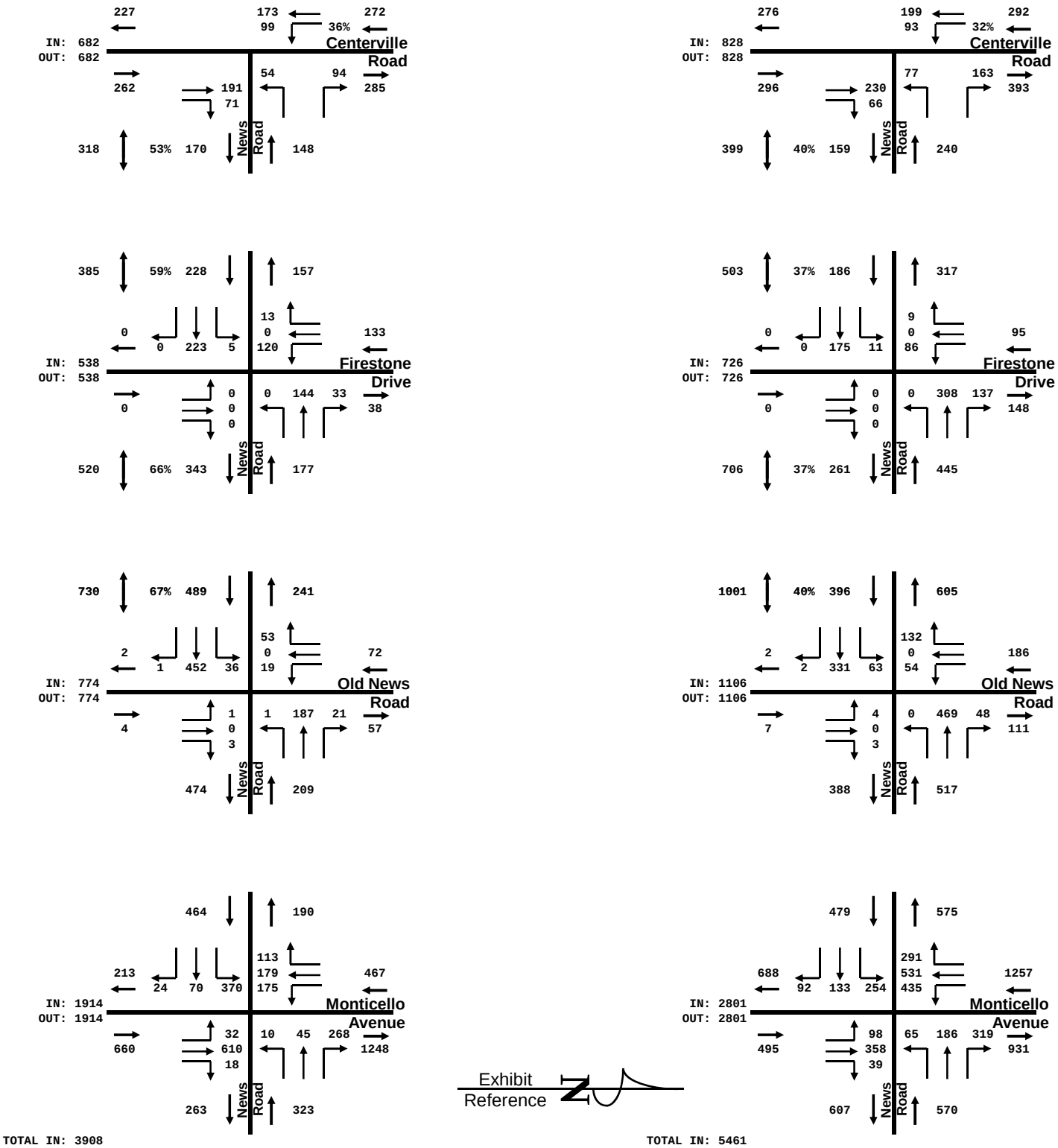
	AM Peak Hour				PM Peak Hour			
	Entering Traffic		Exiting Traffic		Entering Traffic		Exiting Traffic	
Direction	% Dist.	Trips	% Dist.	Trips	% Dist.	Trips	% Dist.	Trips
Centerville North	5%	0	5%	2	5%	2	5%	1
Centerville South	5%	0	5%	2	5%	2	5%	1
Old News North	75%	5	72%	23	71%	21	79%	12
Monticello North	0%	0	0%	0	0%	0	0%	0
News East	10%	1	13%	4	10%	3	10%	2
Monticello South	5%	0	5%	2	9%	3	1%	0
	100%	6	100%	33	100%	31	100%	16

Trip generation rates from Trip Generation, 7th Edition (TG7) by the Institute of Transportation Engineers (ITE)

NIXON-GRAVES, RICHARDSON, BEAMER
TRIP GENERATION AND DISTRIBUTION

DRW Consultants, LLC
804-794-7312

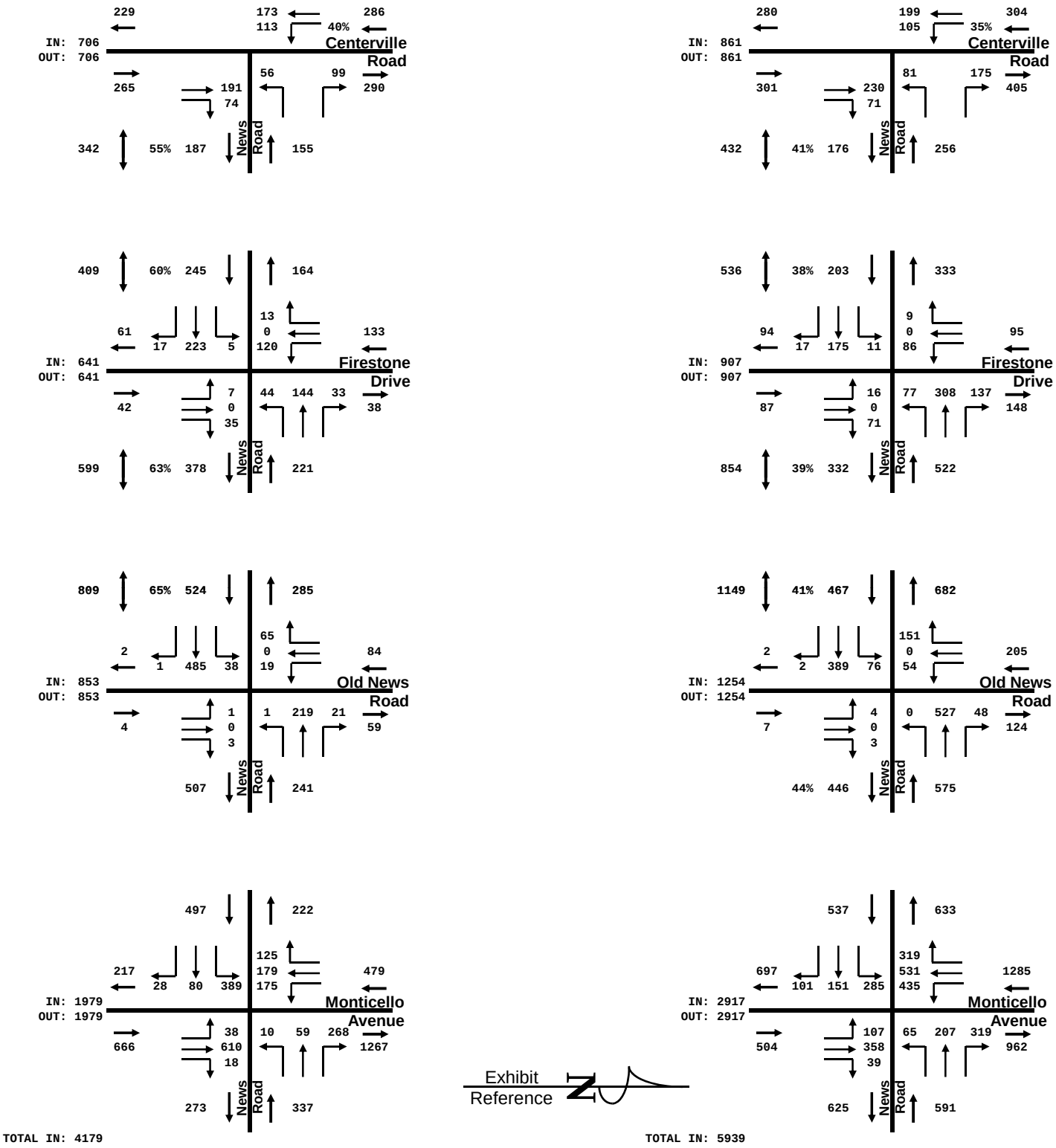
Exhibit 7



APPROVED DEVELOPMENT TRAFFIC FORECAST (I THRU VI)
(2007/2008 Counts And All Approved Development Traffic)

DRW Consultants, LLC
804-794-7312

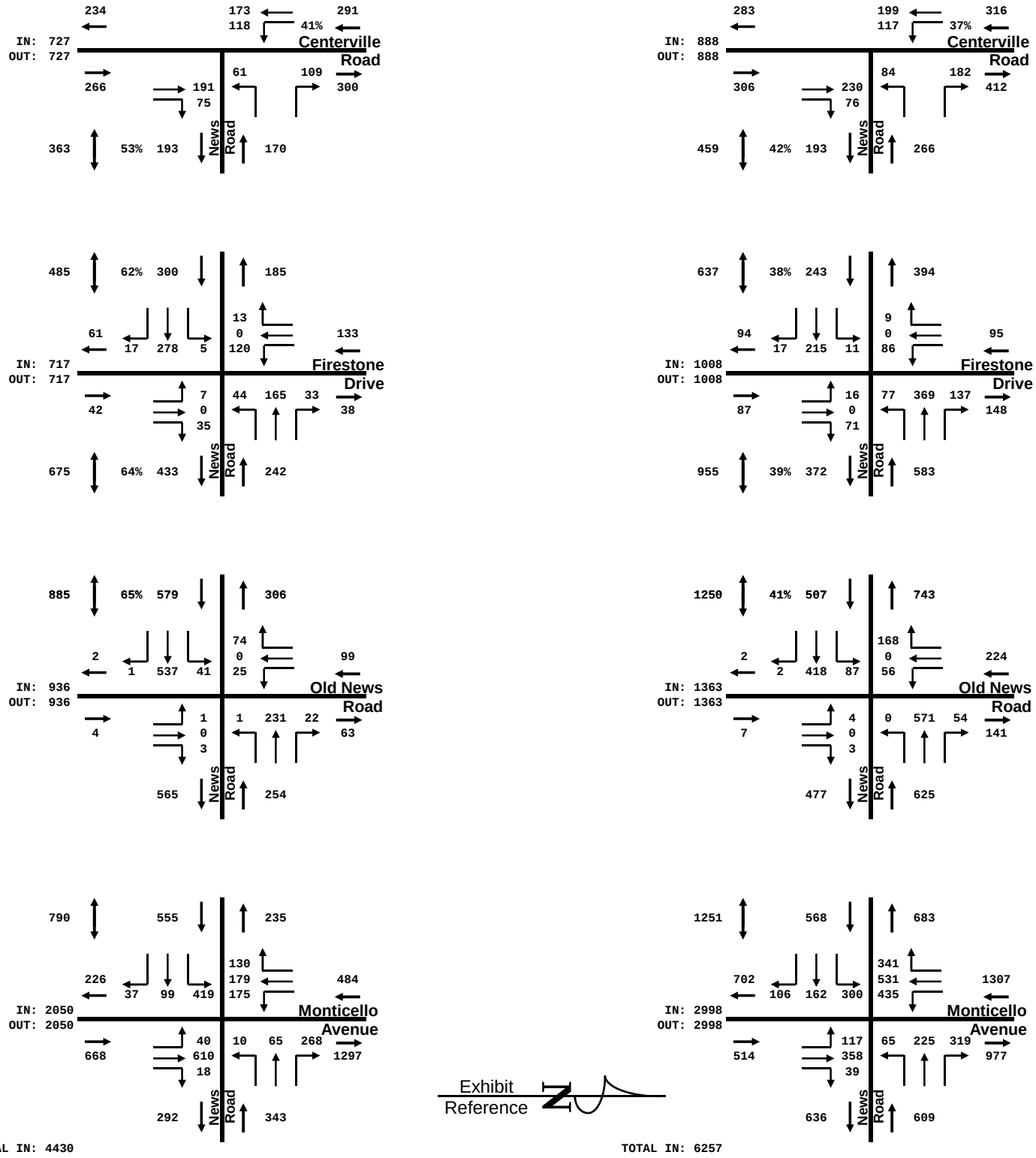
Exhibit 8



THE VILLAGE AT FORD'S COLONY TRAFFIC FORECAST (I THRU VII)
(Approved Development Forecast And The Village Traffic)

DRW Consultants, LLC
804-794-7312

Exhibit 9



PROPOSED DEVELOPMENT TRAFFIC FORECAST (I THRU X)
(The Village Forecast With Proposed Development Traffic)

DRW Consultants, LLC
804-794-7312

Exhibit 10

APPENDIX
EXHIBITS

APPENDIX
TABLE OF CONTENTS

APPENDIX EXHIBITS	Number
Peak Hour Traffic Count	**AM PM**
News Road/Centerville Road	A1 A2
News Road/Firestone Drive	B1 B2
News Road/Old News Road	C1 C2
News Road/Monticello Avenue	D1 D2
Development Trip Assignments	
Ford's Colony Build Out Trips	E1
Powhatan Secondary North Trip Assignments	E2
Greensprings Trip Assignments	E3
Westport Trip Assignments	E4
Liberty Ridge Trip Assignments	E5
The Village At Ford's Colony Trip Assignments	E6
Nixon-Graves Trip Assignments	E7
Richardson Trip Assignments	E8
Beamer Trip Assignments	E9
Synchro Unsignalized Intersection LOS (HCM)	**AM PM**
News Road/Centerville Road	
2007/2008 Counts	G1 G2
Approved Development Forecast	G3 G4
The Village Forecast	G5 G6
Proposed Development Forecast	G7 G8
News Road/Firestone Drive	
2007/2008 Counts	H1 H2
Approved Development Forecast	H3 H4
The Village Forecast	H5 H6
Proposed Development Forecast	H7 H8
News Road/Old News Road	
2007/2008 Counts	I1 I2
Approved Development Forecast	I3 I4
The Village Forecast	I5 I6
Proposed Development Forecast	I7 I8
Right Turn Lane Warrants	**AM PM**
News Road/Centerville Road (Counts And All Forecasts)	J1 J2
News Road/Firestone Drive (Counts And All Forecasts)	J3 J3
Left Turn Lane Warrants	
News Road/Centerville Road (2007)	K
News Road Two Lane Highway LOS	**AM PM**
East Of Centerville Road	
2007/2008 Counts	L1 L2
Approved Development Forecast	L3 L4
The Village Forecast	L5 L6
Proposed Development Forecast	L7 L8
Powhatan Secondary to Old News Road	
2007/2008 Counts	O1 O2
Approved Development Forecast	O3 O4
The Village Forecast	O5 O6
Proposed Development Forecast	O7 O8
Synchro Signalized Intersection LOS (HCM)	**AM PM**
News Road/Monticello Avenue	
2007/2008 Counts	P1 P2
Approved Development Forecast	P3 P4
The Village Forecast	P5 P6
Proposed Development Forecast	P7 P8

AM PEAK HOUR Date: Thu, 4/26/07

LOCATION: Centerville Road/News Road

CUMULATIVE 15 MINUTE COUNTS

TIME	NB Left	NB Thru	NB Right	SB Left	SB Thru	SB Right	EB Left	EB Thru	EB Right	WB Left	WB Thru	WB Right	Total
7:00 to 7:15		34	10	19	44					14		20	141
7:15 to 7:30		91	19	35	83					26		33	287
7:30 to 7:45		133	36	46	128					38		60	441
7:45 to 8:00		182	52	64	170					45		78	591
8:00 to 8:15		216	66	79	195					54		87	697
8:15 to 8:30		267	70	103	228					61		117	846
8:30 to 8:45		308	80	120	262					66		139	975
8:45 to 9:00		357	90	134	296					73		157	1107
Count Sheet		F	E	B	A					D		C	

15 MINUTE INTERVAL COUNTS

TIME	NB Left	NB Thru	NB Right	SB Left	SB Thru	SB Right	EB Left	EB Thru	EB Right	WB Left	WB Thru	WB Right	Total
7:00 to 7:15	0	34	10	19	44	0	0	0	0	14	0	20	141
7:15 to 7:30	0	57	9	16	39	0	0	0	0	12	0	13	146
7:30 to 7:45	0	42	17	11	45	0	0	0	0	12	0	27	154
7:45 to 8:00	0	49	16	18	42	0	0	0	0	7	0	18	150
8:00 to 8:15	0	34	14	15	25	0	0	0	0	9	0	9	106
8:15 to 8:30	0	51	4	24	33	0	0	0	0	7	0	30	149
8:30 to 8:45	0	41	10	17	34	0	0	0	0	5	0	22	129
8:45 to 9:00	0	49	10	14	34	0	0	0	0	7	0	18	132

HOUR INTERVAL

TIME	NB Left	NB Thru	NB Right	SB Left	SB Thru	SB Right	EB Left	EB Thru	EB Right	WB Left	WB Thru	WB Right	Total
7:00 to 8:00	0	182	52	64	170	0	0	0	0	45	0	78	591
7:15 to 8:15	0	182	56	60	151	0	0	0	0	40	0	67	556
7:30 to 8:30	0	176	51	68	145	0	0	0	0	35	0	84	559
7:45 to 8:45	0	175	44	74	134	0	0	0	0	28	0	79	534
8:00 to 9:00	0	175	38	70	126	0	0	0	0	28	0	79	516

PEAK HOUR TURNING MOVEMENT VOLUMES

TIME	NB Left	NB Thru	NB Right	SB Left	SB Thru	SB Right	EB Left	EB Thru	EB Right	WB Left	WB Thru	WB Right	Total
7:00 to 8:00	0	182	52	64	170	0	0	0	0	45	0	78	591
8:00 to 9:00	0	175	38	70	126	0	0	0	0	28	0	79	516

Exhibit A1

PM PEAK HOUR Date: Wed, 4/25/07

LOCATION: Centerville Road/News Road

CUMULATIVE 15 MINUTE COUNTS

TIME	NB Left	NB Thru	NB Right	SB Left	SB Thru	SB Right	EB Left	EB Thru	EB Right	WB Left	WB Thru	WB Right	Total
3:45 to 4:00													
4:00 to 4:15		46	15	12	44					18		22	157
4:15 to 4:30		112	28	28	97					30		50	345
4:30 to 4:45		160	35	45	133					48		78	499
4:45 to 5:00		212	44	67	174					64		106	667
5:00 to 5:15		274	62	84	227					79		140	866
5:15 to 5:30		337	75	96	277					90		172	1047
5:30 to 5:45		384	87	114	322					103		200	1210
5:45 to 6:00		425	96	121	371					112		221	1346
Count Sheet		F	E	B	A					D		C	

15 MINUTE INTERVAL COUNTS

TIME	NB Left	NB Thru	NB Right	SB Left	SB Thru	SB Right	EB Left	EB Thru	EB Right	WB Left	WB Thru	WB Right	Total
4:00 to 4:15	0	46	15	12	44	0	0	0	0	18	0	22	157
4:15 to 4:30	0	66	13	16	53	0	0	0	0	12	0	28	188
4:30 to 4:45	0	48	7	17	36	0	0	0	0	18	0	28	154
4:45 to 5:00	0	52	9	22	41	0	0	0	0	16	0	28	168
5:00 to 5:15	0	62	18	17	53	0	0	0	0	15	0	34	199
5:15 to 5:30	0	63	13	12	50	0	0	0	0	11	0	32	181
5:30 to 5:45	0	47	12	18	45	0	0	0	0	13	0	28	163
5:45 to 6:00	0	41	9	7	49	0	0	0	0	9	0	21	136

HOUR INTERVAL

TIME	NB Left	NB Thru	NB Right	SB Left	SB Thru	SB Right	EB Left	EB Thru	EB Right	WB Left	WB Thru	WB Right	Total
4:00 to 5:00	0	212	44	67	174	0	0	0	0	64	0	106	667
4:15 to 5:15	0	228	47	72	183	0	0	0	0	61	0	118	709
4:30 to 5:30	0	225	47	68	180	0	0	0	0	60	0	122	702
4:45 to 5:45	0	224	52	69	189	0	0	0	0	55	0	122	711
5:00 to 6:00	0	213	52	54	197	0	0	0	0	48	0	115	679

PEAK HOUR TURNING MOVEMENT VOLUMES

TIME	NB Left	NB Thru	NB Right	SB Left	SB Thru	SB Right	EB Left	EB Thru	EB Right	WB Left	WB Thru	WB Right	Total
4:45 to 5:45	0	224	52	69	189	0	0	0	0	55	0	122	711

Exhibit A2

AM PEAK HOUR

LOCATION: News Road/Firestone Drive

DATE: Thu, 4/26/07

CUMULATIVE 15 MINUTE COUNTS

TIME	NB Left	NB Thru	NB Right	SB Left	SB Thru	SB Right	EB Left	EB Thru	EB Right	WB Left	WB Thru	WB Right	Total
7:00 to 7:15				10		1	0	54			29	3	97
7:15 to 7:30				23		2	1	109			53	6	194
7:30 to 7:45				37		6	1	142			89	10	285
7:45 to 8:00				55		6	2	197			113	17	390
8:00 to 8:15				72		9	3	244			140	26	494
8:15 to 8:30				88		12	4	252			180	30	566
8:30 to 8:45				119		14	4	320			209	36	702
8:45 to 9:00				145		16	6	367			235	42	811
Count Sheet				C		D	E	F			A	B	

15 MINUTE INCREMENT COUNTS

TIME	NB Left	NB Thru	NB Right	SB Left	SB Thru	SB Right	EB Left	EB Thru	EB Right	WB Left	WB Thru	WB Right	Total
7:00 to 7:15	0	0	0	10	0	1	0	54	0	0	29	3	97
7:15 to 7:30	0	0	0	13	0	1	1	55	0	0	24	3	97
7:30 to 7:45	0	0	0	14	0	4	0	33	0	0	36	4	91
7:45 to 8:00	0	0	0	18	0	0	1	55	0	0	24	7	105
8:00 to 8:15	0	0	0	17	0	3	1	47	0	0	27	9	104
8:15 to 8:30	0	0	0	16	0	3	1	8	0	0	40	4	72
8:30 to 8:45	0	0	0	31	0	2	0	68	0	0	29	6	136
8:45 to 9:00	0	0	0	26	0	2	2	47	0	0	26	6	109

HOUR INCREMENT

TIME	NB Left	NB Thru	NB Right	SB Left	SB Thru	SB Right	EB Left	EB Thru	EB Right	WB Left	WB Thru	WB Right	Total
7:00 to 8:00	0	0	0	55	0	6	2	197	0	0	113	17	390
7:15 to 8:15	0	0	0	62	0	8	3	190	0	0	111	23	397
7:30 to 8:30	0	0	0	65	0	10	3	143	0	0	127	24	372
7:45 to 8:45	0	0	0	82	0	8	3	178	0	0	120	26	417
8:00 to 9:00	0	0	0	90	0	10	4	170	0	0	122	25	421

PEAK HOUR TURNING MOVEMENT VOLUMES

TIME	NB Left	NB Thru	NB Right	SB Left	SB Thru	SB Right	EB Left	EB Thru	EB Right	WB Left	WB Thru	WB Right	Total
8:00 to 9:00	0	0	0	90	0	10	4	170	0	0	122	25	421

Exhibit B1

PM PEAK HOUR

LOCATION: News Road/Firestone Drive

DATE:
Wed, 4/25/07

CUMULATIVE 15 MINUTE COUNTS

TIME	NB Left	NB Thru	NB Right	SB Left	SB Thru	SB Right	EB Left	EB Thru	EB Right	WB Left	WB Thru	WB Right	Total
4:00 to 4:15				19		4	3	27			53	24	130
4:15 to 4:30				36		7	3	58			91	49	244
4:30 to 4:45				47		7	5	91			148	80	378
4:45 to 5:00				69		13	7	127			202	101	519
5:00 to 5:15				84		14	8	166			274	130	676
5:15 to 5:30				101		14	11	198			338	152	814
5:30 to 5:45				111		18	14	230			393	173	939
5:45 to 6:00				122		20	16	259			438	191	1046
Count Sheet				C		D	E	F			A	B	

15 MINUTE INCREMENT COUNTS

TIME	NB Left	NB Thru	NB Right	SB Left	SB Thru	SB Right	EB Left	EB Thru	EB Right	WB Left	WB Thru	WB Right	Total
4:00 to 4:15	0	0	0	19	0	4	3	27	0	0	53	24	130
4:15 to 4:30	0	0	0	17	0	3	0	31	0	0	38	25	114
4:30 to 4:45	0	0	0	11	0	0	2	33	0	0	57	31	134
4:45 to 5:00	0	0	0	22	0	6	2	36	0	0	54	21	141
5:00 to 5:15	0	0	0	15	0	1	1	39	0	0	72	29	157
5:15 to 5:30	0	0	0	17	0	0	3	32	0	0	64	22	138
5:30 to 5:45	0	0	0	10	0	4	3	32	0	0	55	21	125
5:45 to 6:00	0	0	0	11	0	2	2	29	0	0	45	18	107

HOUR INCREMENT

TIME	NB Left	NB Thru	NB Right	SB Left	SB Thru	SB Right	EB Left	EB Thru	EB Right	WB Left	WB Thru	WB Right	Total
4:00 to 5:00	0	0	0	69	0	13	7	127	0	0	202	101	519
4:15 to 5:15	0	0	0	65	0	10	5	139	0	0	221	106	546
4:30 to 5:30	0	0	0	65	0	7	8	140	0	0	247	103	570
4:45 to 5:45	0	0	0	64	0	11	9	139	0	0	245	93	561
5:00 to 6:00	0	0	0	53	0	7	9	132	0	0	236	90	527

PEAK HOUR TURNING MOVEMENT VOLUMES

TIME	NB Left	NB Thru	NB Right	SB Left	SB Thru	SB Right	EB Left	EB Thru	EB Right	WB Left	WB Thru	WB Right	Total
4:30 to 5:30	0	0	0	65	0	7	8	140	0	0	247	103	570

Exhibit B2

AM PEAK HOUR Date: Tue, 1/29/08

LOCATION: News Road/Old News Road

CUMULATIVE 15 MINUTE COUNTS

TIME	NB Left	NB Thru	NB Right	SB Left	SB Thru	SB Right	EB Left	EB Thru	EB Right	WB Left	WB Thru	WB Right	Total
7:00 to 7:15													0
7:15 to 7:30													0
7:30 to 7:45													0
7:45 to 8:00													0
8:00 to 8:15													0
8:15 to 8:30													0
8:30 to 8:45													0
8:45 to 9:00													0

Count Sheet

15 MINUTE INTERVAL COUNTS

TIME	NB Left	NB Thru	NB Right	SB Left	SB Thru	SB Right	EB Left	EB Thru	EB Right	WB Left	WB Thru	WB Right	Total
7:00 to 7:15	0	0	0	0	0	4	2	46	0	0	12	7	71
7:15 to 7:30	0	0	0	2	0	5	4	91	0	0	37	2	141
7:30 to 7:45	0	0	0	14	0	13	4	84	0	0	18	1	134
7:45 to 8:00	0	0	0	2	0	8	7	108	0	0	34	2	161
8:00 to 8:15	0	0	0	5	0	16	9	104	0	0	65	7	206
8:15 to 8:30	1	0	0	2	0	8	2	54	0	0	34	6	107
8:30 to 8:45	0	0	0	4	0	14	3	87	0	0	32	3	143
8:45 to 9:00	0	0	3	8	0	8	9	121	1	1	30	5	186

HOUR INTERVAL

TIME	NB Left	NB Thru	NB Right	SB Left	SB Thru	SB Right	EB Left	EB Thru	EB Right	WB Left	WB Thru	WB Right	Total
7:00 to 8:00	0	0	0	18	0	30	17	329	0	0	101	12	507
7:15 to 8:15	0	0	0	23	0	42	24	387	0	0	154	12	642
7:30 to 8:30	1	0	0	23	0	45	22	350	0	0	151	16	608
7:45 to 8:45	1	0	0	13	0	46	21	353	0	0	165	18	617
8:00 to 9:00	1	0	3	19	0	46	23	366	1	1	161	21	642

PEAK HOUR TURNING MOVEMENT VOLUMES

TIME	NB Left	NB Thru	NB Right	SB Left	SB Thru	SB Right	EB Left	EB Thru	EB Right	WB Left	WB Thru	WB Right	Total
7:15 to 8:15	0	0	0	23	0	42	24	387	0	0	154	12	642
8:00 to 9:00	1	0	3	19	0	46	23	366	1	1	161	21	642

Exhibit C1

PM PEAK HOUR Date: Tue, 1/29/08

LOCATION: News Road/Old News Road

CUMULATIVE 15 MINUTE COUNTS

TIME	NB Left	NB Thru	NB Right	SB Left	SB Thru	SB Right	EB Left	EB Thru	EB Right	WB Left	WB Thru	WB Right	Total
3:45 to 4:00													
4:00 to 4:15													0
4:15 to 4:30													0
4:30 to 4:45													0
4:45 to 5:00													0
5:00 to 5:15													0
5:15 to 5:30													0
5:30 to 5:45													0
5:45 to 6:00													0

Count Sheet

15 MINUTE INTERVAL COUNTS

TIME	NB Left	NB Thru	NB Right	SB Left	SB Thru	SB Right	EB Left	EB Thru	EB Right	WB Left	WB Thru	WB Right	Total
4:00 to 4:15	0	0	0	5	0	19	11	47	1	0	53	8	144
4:15 to 4:30	1	0	0	8	0	26	9	56	0	1	99	11	211
4:30 to 4:45	0	0	0	25	0	29	14	81	2	0	112	19	282
4:45 to 5:00	0	0	0	8	0	13	11	66	0	0	77	2	177
5:00 to 5:15	0	0	2	7	0	31	12	71	0	0	86	11	220
5:15 to 5:30	4	0	1	14	0	35	13	63	0	0	107	16	253
5:30 to 5:45	1	0	0	6	0	26	8	82	0	0	106	16	245
5:45 to 6:00	0	0	1	9	0	29	8	66	4	0	80	10	207

HOUR INTERVAL

TIME	NB Left	NB Thru	NB Right	SB Left	SB Thru	SB Right	EB Left	EB Thru	EB Right	WB Left	WB Thru	WB Right	Total
4:00 to 5:00	1	0	0	46	0	87	45	250	3	1	341	40	814
4:15 to 5:15	1	0	2	48	0	99	46	274	2	1	374	43	890
4:30 to 5:30	4	0	3	54	0	108	50	281	2	0	382	48	932
4:45 to 5:45	5	0	3	35	0	105	44	282	0	0	376	45	895
5:00 to 6:00	5	0	4	36	0	121	41	282	4	0	379	53	925

PEAK HOUR TURNING MOVEMENT VOLUMES

TIME	NB Left	NB Thru	NB Right	SB Left	SB Thru	SB Right	EB Left	EB Thru	EB Right	WB Left	WB Thru	WB Right	Total
4:30 to 5:30	4	0	3	54	0	108	50	281	2	0	382	48	932

Exhibit C2

AM PEAK HOUR Date: Tue, 3/11/08

LOCATION: MONTICELLO AVENUE/NEWS ROAD

CUMULATIVE 15 MINUTE COUNTS

TIME	NB Left	NB Thru	NB Right	SB Left	SB Thru	SB Right	EB Left	EB Thru	EB Right	WB Left	WB Thru	WB Right	Total
7:00 to 7:15	5	12	44	59	14	9	9	112	5	37	49	14	369
7:15 to 7:30	8	24	112	143	24	11	21	237	6	72	89	29	776
7:30 to 7:45	11	35	175	217	32	17	23	398	13	111	134	44	1210
7:45 to 8:00	11	41	251	316	45	20	29	586	19	160	176	74	1728
8:00 to 8:15	15	49	312	372	61	27	37	722	23	212	228	113	2171
8:15 to 8:30	19	60	375	428	75	32	41	838	26	258	281	143	2576
8:30 to 8:45	27	75	428	489	95	37	48	921	31	309	324	172	2956
8:45 to 9:00	33	86	486	569	126	46	55	1039	42	373	380	193	3428
Count Sheet	J	K	L	G	H	I	A	B	C	D	E	F	

15 MINUTE INTERVAL COUNTS

TIME	NB Left	NB Thru	NB Right	SB Left	SB Thru	SB Right	EB Left	EB Thru	EB Right	WB Left	WB Thru	WB Right	Total
7:00 to 7:15	5	12	44	59	14	9	9	112	5	37	49	14	369
7:15 to 7:30	3	12	68	84	10	2	12	125	1	35	40	15	407
7:30 to 7:45	3	11	63	74	8	6	2	161	7	39	45	15	434
7:45 to 8:00	0	6	76	99	13	3	6	188	6	49	42	30	518
8:00 to 8:15	4	8	61	56	16	7	8	136	4	52	52	39	443
8:15 to 8:30	4	11	63	56	14	5	4	116	3	46	53	30	405
8:30 to 8:45	8	15	53	61	20	5	7	83	5	51	43	29	380
8:45 to 9:00	6	11	58	80	31	9	7	118	11	64	56	21	472

HOUR INTERVAL

TIME	NB Left	NB Thru	NB Right	SB Left	SB Thru	SB Right	EB Left	EB Thru	EB Right	WB Left	WB Thru	WB Right	Total
7:00 to 8:00	11	41	251	316	45	20	29	586	19	160	176	74	1728
7:15 to 8:15	10	37	268	313	47	18	28	610	18	175	179	99	1802
7:30 to 8:30	11	36	263	285	51	21	20	601	20	186	192	114	1800
7:45 to 8:45	16	40	253	272	63	20	25	523	18	198	190	128	1746
8:00 to 9:00	22	45	235	253	81	26	26	453	23	213	204	119	1700

PEAK HOUR TURNING MOVEMENT VOLUMES

TIME	NB Left	NB Thru	NB Right	SB Left	SB Thru	SB Right	EB Left	EB Thru	EB Right	WB Left	WB Thru	WB Right	Total
7:15 to 8:15	10	37	268	313	47	18	28	610	18	175	179	99	1802

Exhibit D1

PM PEAK HOUR Date: Thu, 4/19/07

LOCATION: MONTICELLO AVENUE/NEWS ROAD

CUMULATIVE 15 MINUTE COUNTS

TIME	NB Left	NB Thru	NB Right	SB Left	SB Thru	SB Right	EB Left	EB Thru	EB Right	WB Left	WB Thru	WB Right	Total
3:45 to 4:00													
4:00 to 4:15	8	40	57	34	20	15	8	60	7	107	101	39	496
4:15 to 4:30	16	88	141	72	49	29	25	148	17	221	206	93	1105
4:30 to 4:45	24	122	211	115	81	42	37	218	27	304	318	133	1632
4:45 to 5:00	35	162	291	165	116	56	52	319	32	406	437	190	2261
5:00 to 5:15	47	208	384	233	152	71	73	393	45	520	564	251	2941
5:15 to 5:30	69	259	448	291	183	84	93	505	55	646	702	321	3656
5:30 to 5:45	83	287	528	339	205	107	120	584	61	738	819	372	4243
5:45 to 6:00	100	321	607	388	232	133	139	675	71	823	952	423	4864
Count Sheet	D	E	F	A	B	C	J	K	L	G	H	I	

15 MINUTE INTERVAL COUNTS

TIME	NB Left	NB Thru	NB Right	SB Left	SB Thru	SB Right	EB Left	EB Thru	EB Right	WB Left	WB Thru	WB Right	Total
4:00 to 4:15	8	40	57	34	20	15	8	60	7	107	101	39	496
4:15 to 4:30	8	48	84	38	29	14	17	88	10	114	105	54	609
4:30 to 4:45	8	34	70	43	32	13	12	70	10	83	112	40	527
4:45 to 5:00	11	40	80	50	35	14	15	101	5	102	119	57	629
5:00 to 5:15	12	46	93	68	36	15	21	74	13	114	127	61	680
5:15 to 5:30	22	51	64	58	31	13	20	112	10	126	138	70	715
5:30 to 5:45	14	28	80	48	22	23	27	79	6	92	117	51	587
5:45 to 6:00	17	34	79	49	27	26	19	91	10	85	133	51	621

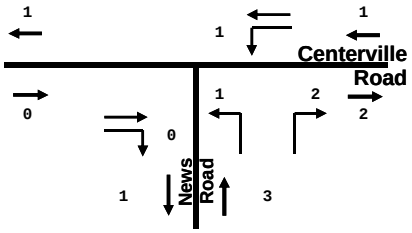
HOUR INTERVAL

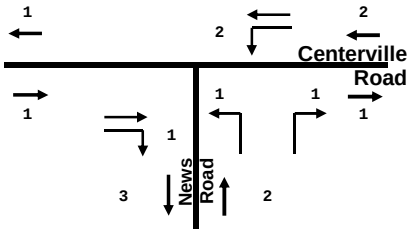
TIME	NB Left	NB Thru	NB Right	SB Left	SB Thru	SB Right	EB Left	EB Thru	EB Right	WB Left	WB Thru	WB Right	Total
4:00 to 5:00	35	162	291	165	116	56	52	319	32	406	437	190	2261
4:15 to 5:15	39	168	327	199	132	56	65	333	38	413	463	212	2445
4:30 to 5:30	53	171	307	219	134	55	68	357	38	425	496	228	2551
4:45 to 5:45	59	165	317	224	124	65	83	366	34	434	501	239	2611
5:00 to 6:00	65	159	316	223	116	77	87	356	39	417	515	233	2603

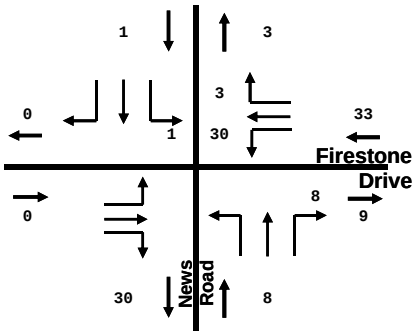
PEAK HOUR TURNING MOVEMENT VOLUMES

TIME	NB Left	NB Thru	NB Right	SB Left	SB Thru	SB Right	EB Left	EB Thru	EB Right	WB Left	WB Thru	WB Right	Total
4:45 to 5:45	59	165	317	224	124	65	83	366	34	434	501	239	2611

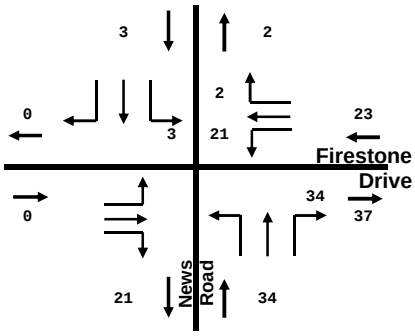
Exhibit D2

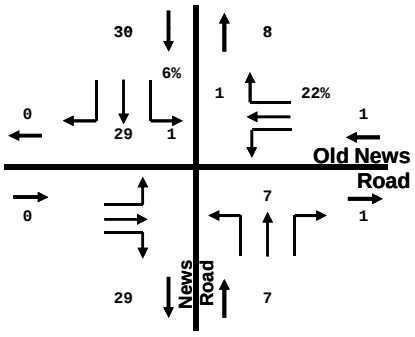


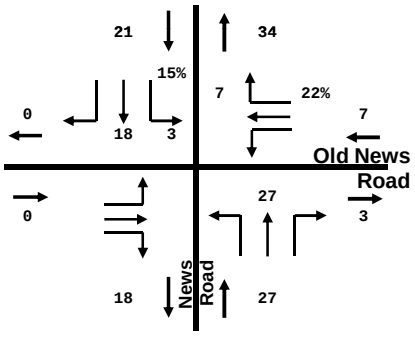


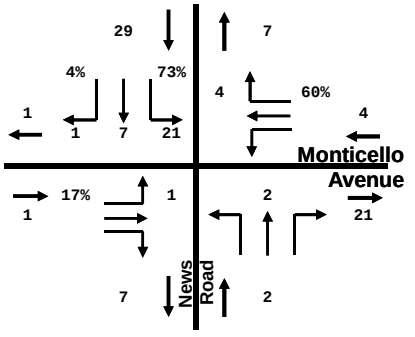


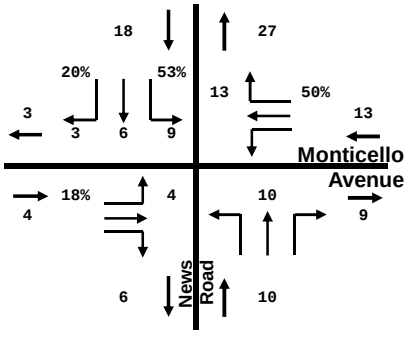
GROWTH FACTOR
AM IN 32.4%
AM OUT 32.8%
PM IN 32.6%
PM OUT 32.4%











N

Exhibit Reference

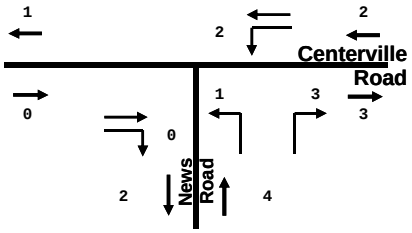
AM PEAK HOUR

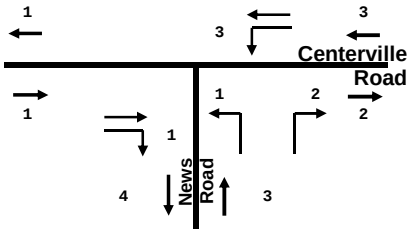
PM PEAK HOUR

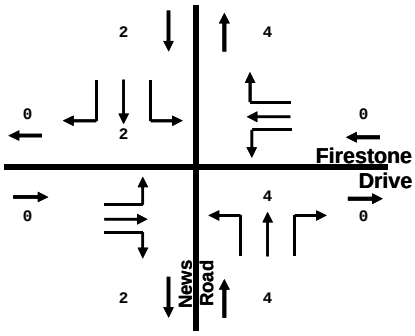
FORD'S COLONY BUILD OUT TRIP ASSIGNMENTS

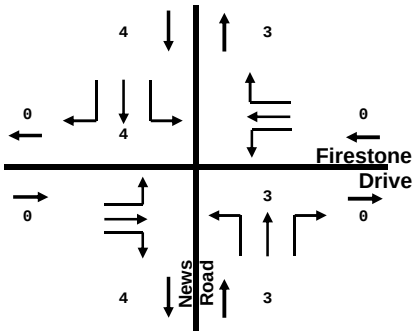
DRW Consultants, LLC
804-794-7312

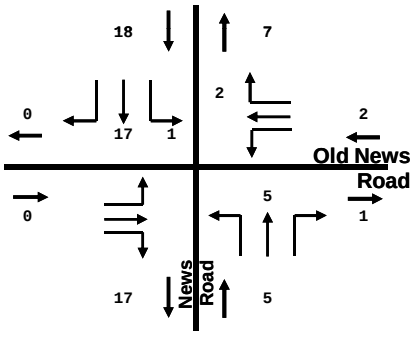
Exhibit E1

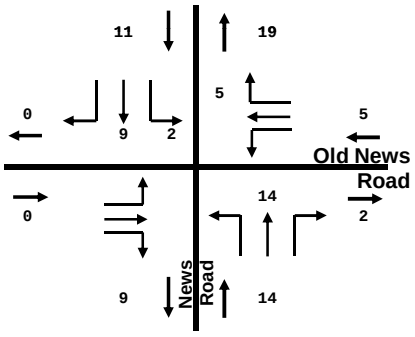


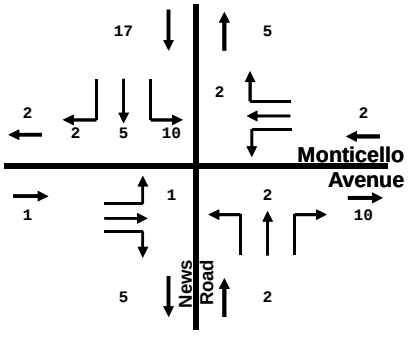


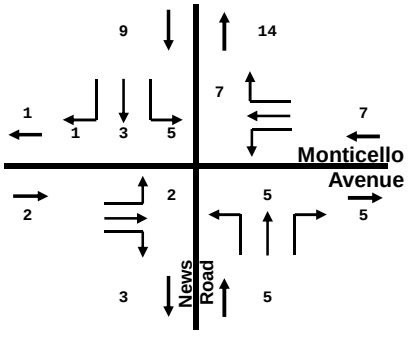












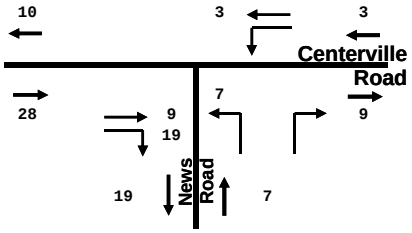
AM PEAK HOUR

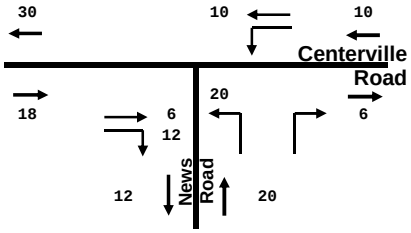
PM PEAK HOUR

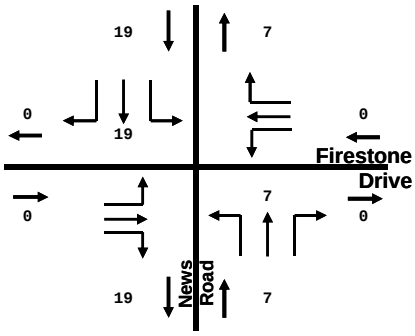
POWHATAN SECONDARY NORTH TRIP ASSIGNMENTS

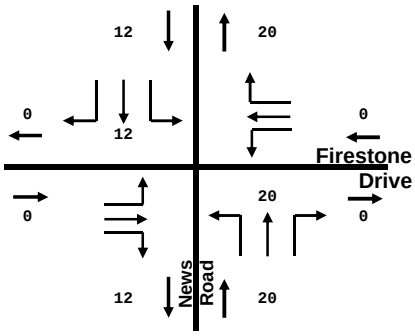
DRW Consultants, LLC
804-794-7312

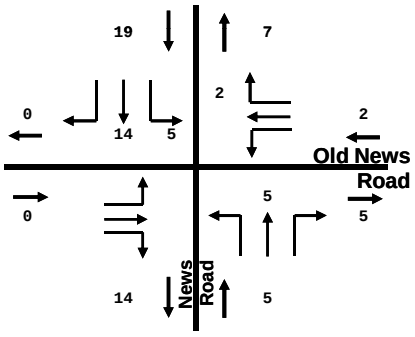
Exhibit E2

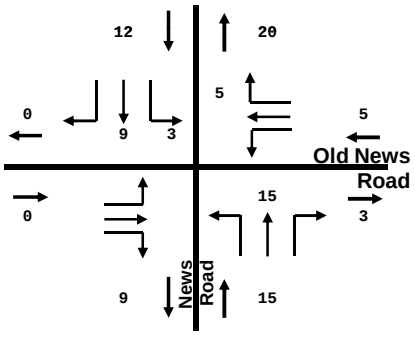


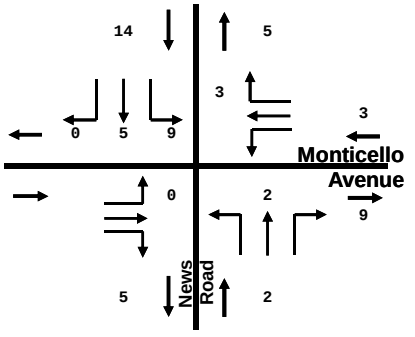


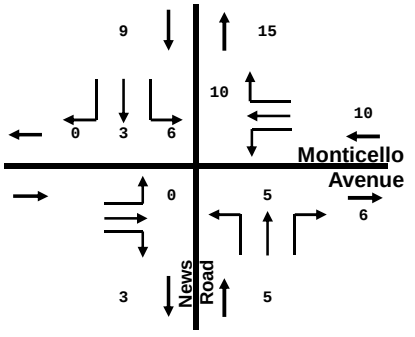












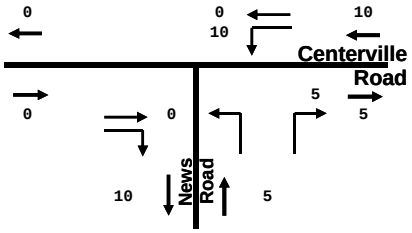
AM PEAK HOUR

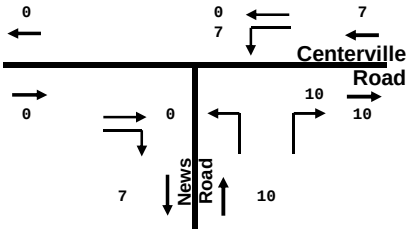
PM PEAK HOUR

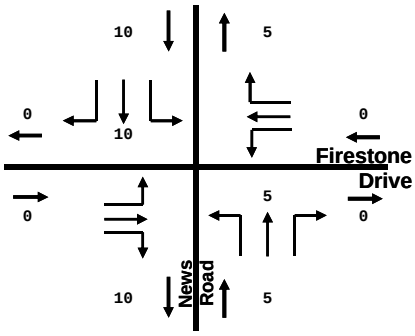
GREENSPRINGS TRIP ASSIGNMENTS

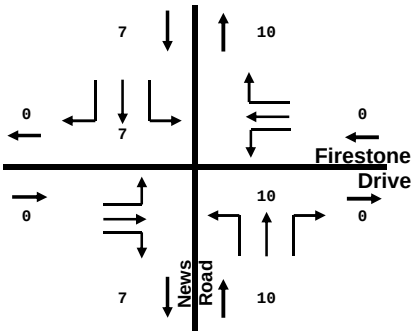
DRW Consultants, LLC
804-794-7312

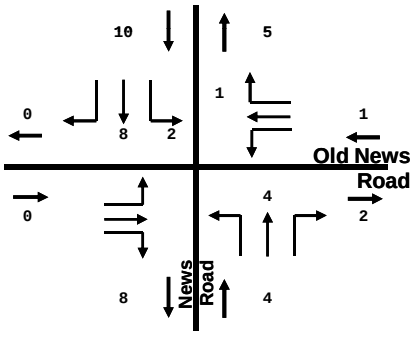
Exhibit E3

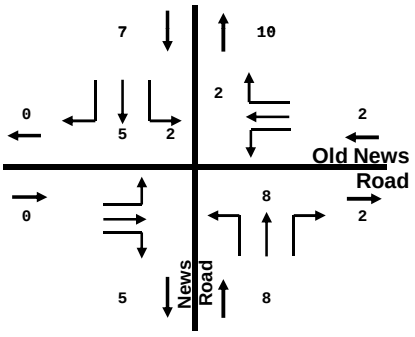


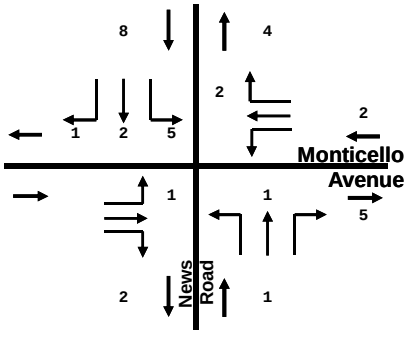


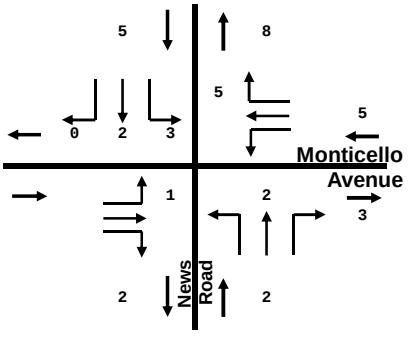












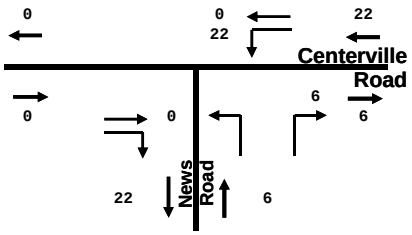
AM PEAK HOUR

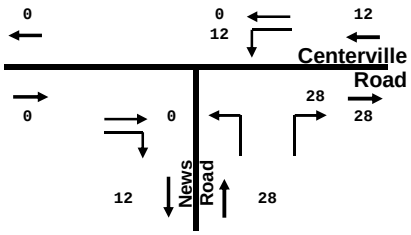
PM PEAK HOUR

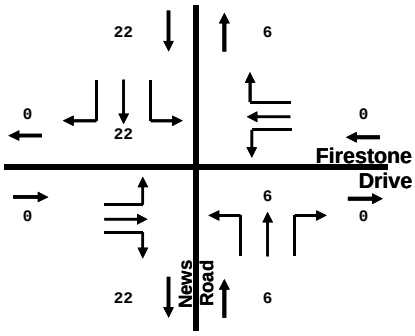
WESTPORT TRIP ASSIGNMENTS

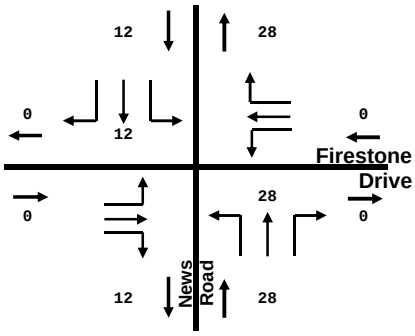
DRW Consultants, LLC
804-794-7312

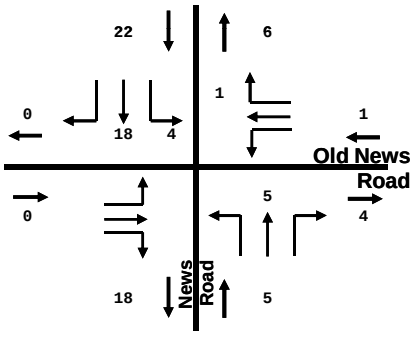
Exhibit E4

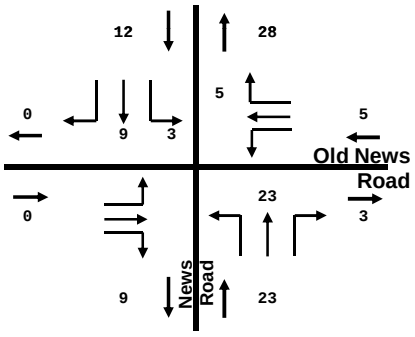


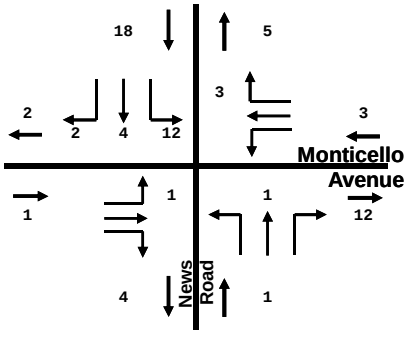


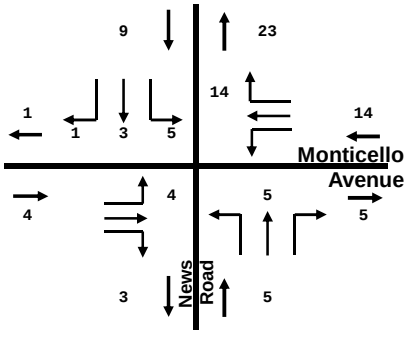












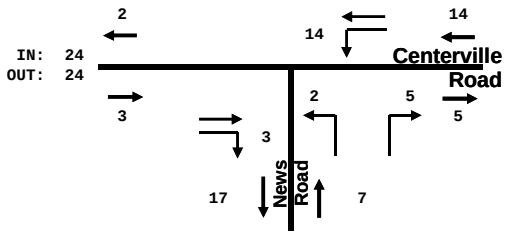
AM PEAK HOUR

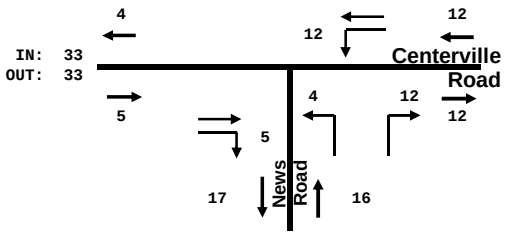
PM PEAK HOUR

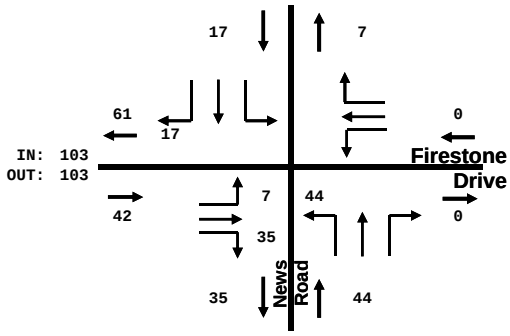
LIBERTY RIDGE TRIP ASSIGNMENTS

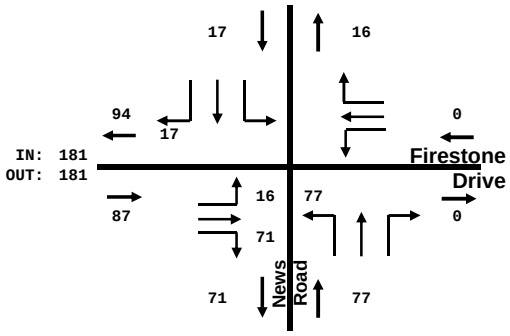
DRW Consultants, LLC
804-794-7312

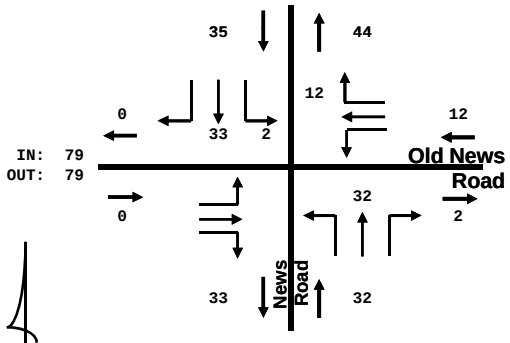
Exhibit E5

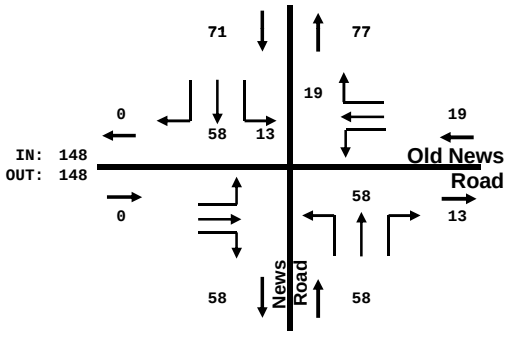


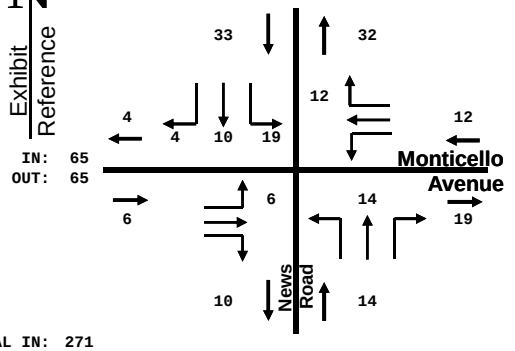


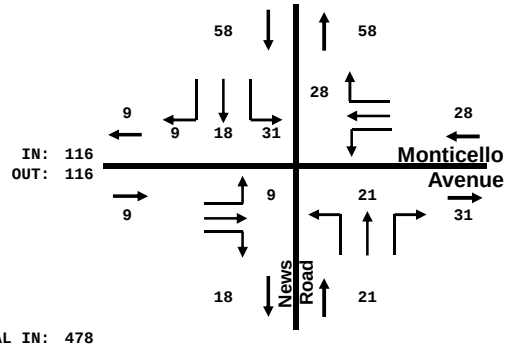












TOTAL IN: 271

TOTAL IN: 478

AM PEAK HOUR

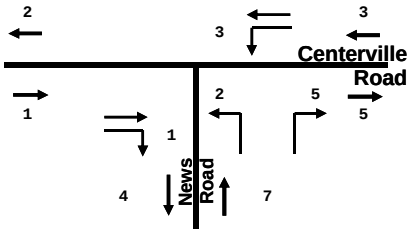
PM PEAK HOUR

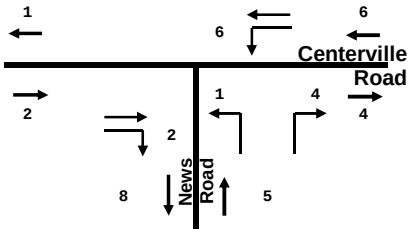
THE VILLAGE AT FORD'S COLONY TRIP ASSIGNMENTS

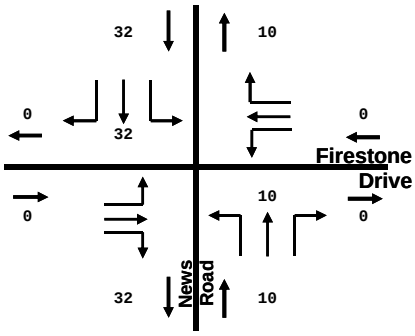
DRW Consultants, LLC
804-794-7312

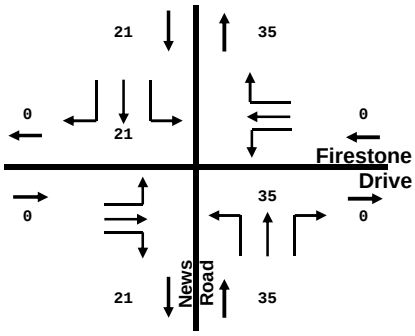
Exhibit E6

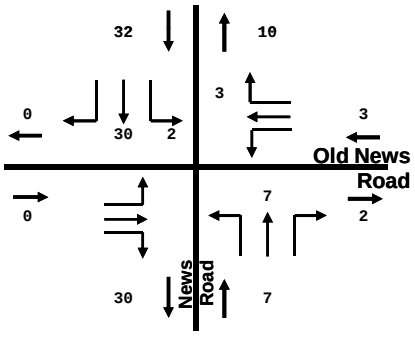
News

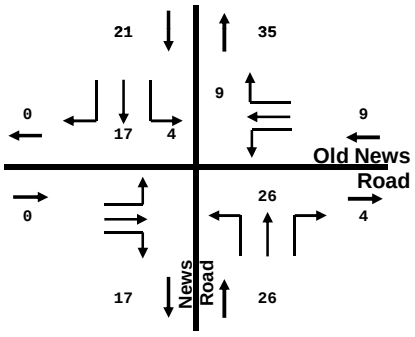


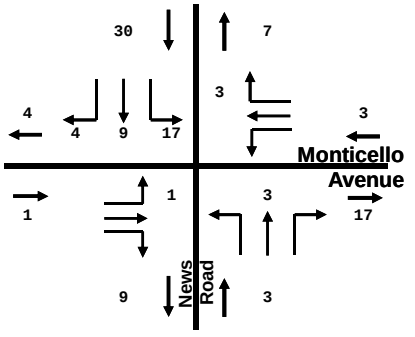


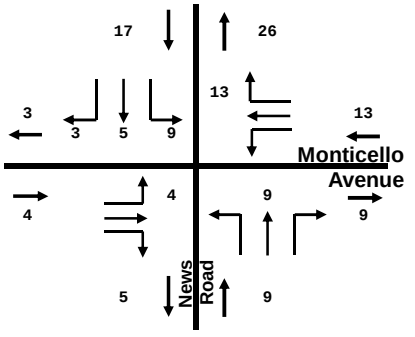












AM PEAK HOUR

PM PEAK HOUR

NIXON-GRAVES TRIP ASSIGNMENTS

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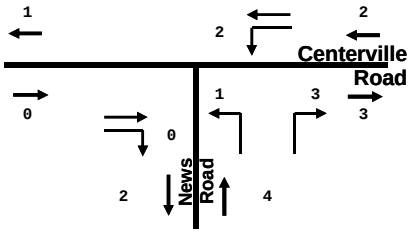
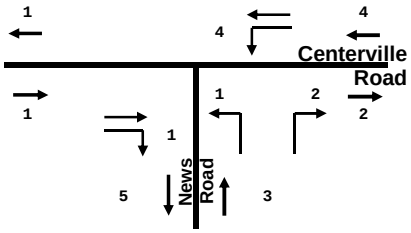
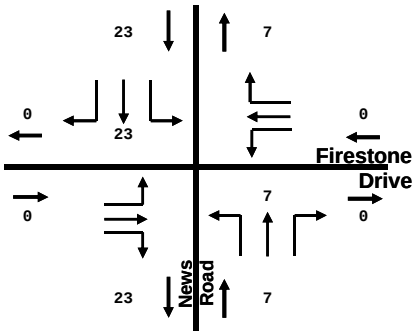
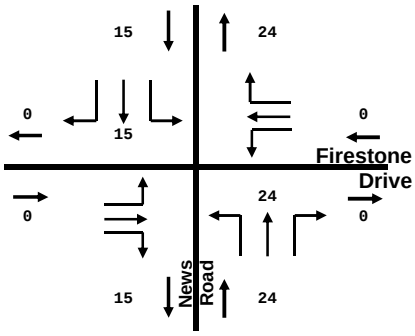
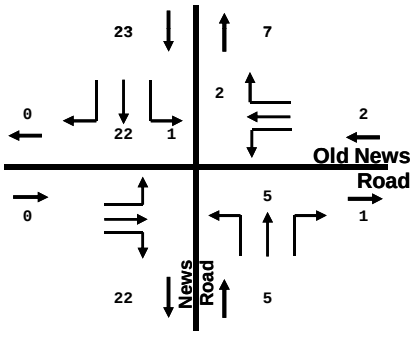
Exhibit E7

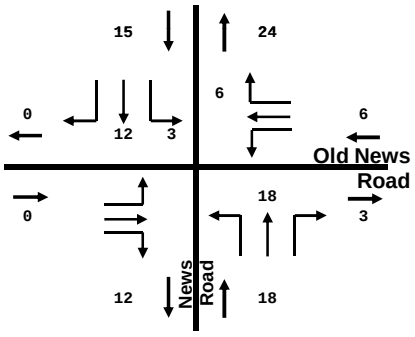


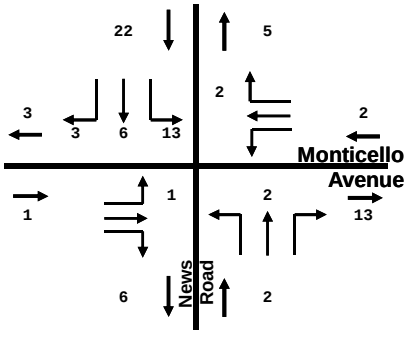


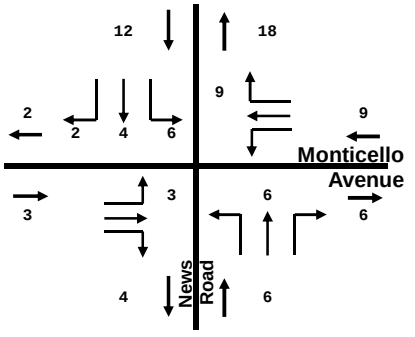












AM PEAK HOUR

PM PEAK HOUR

RICHARDSON TRIP ASSIGNMENTS

DRW Consultants, LLC
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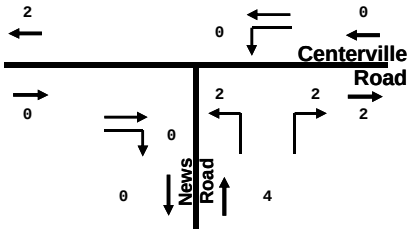
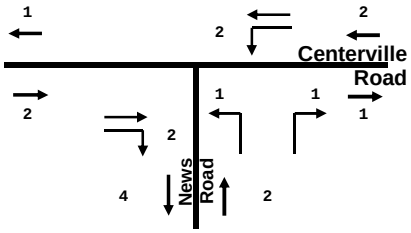
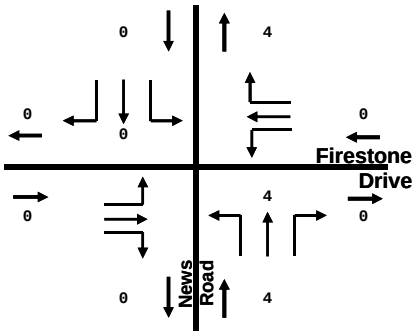
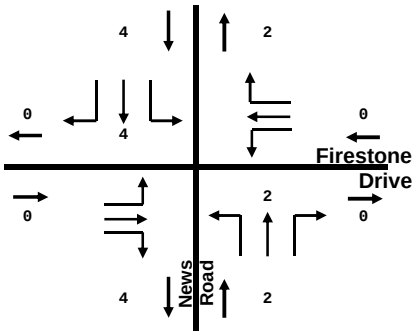
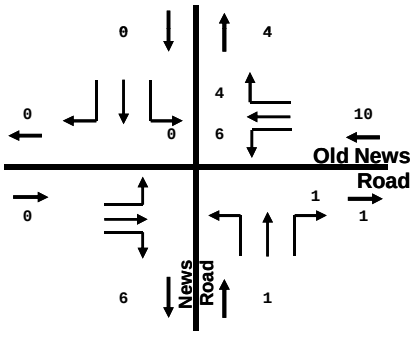
Exhibit E8

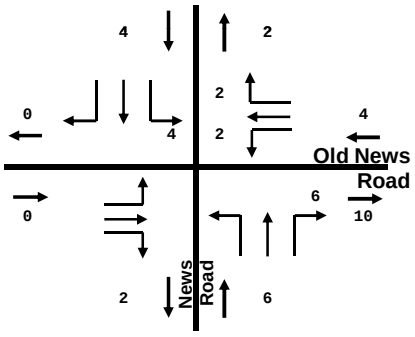


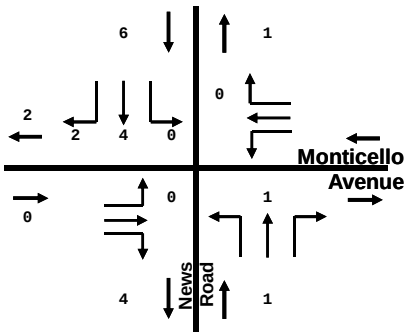


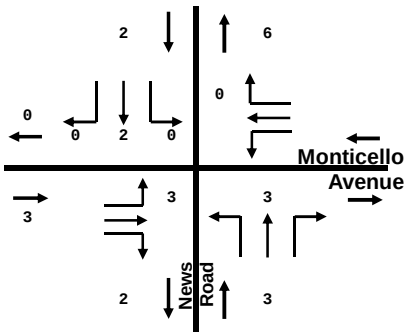












N

Exhibit Reference

AM PEAK HOUR

PM PEAK HOUR

BEAMER TRIP ASSIGNMENTS

DRW Consultants, LLC
804-794-7312

Exhibit E9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	45	78	182	52	64	170
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	49	85	198	57	70	185
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	550	226			254	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	550	226			254	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	90	90			95	
cM capacity (veh/h)	470	813			1311	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	134	254	254
Volume Left	49	0	70
Volume Right	85	57	0
cSH	642	1700	1311
Volume to Capacity	0.21	0.15	0.05
Queue Length (ft)	20	0	4
Control Delay (s)	12.1	0.0	2.5
Lane LOS	B		A
Approach Delay (s)	12.1	0.0	2.5
Approach LOS	B		

Intersection Summary			
Average Delay		3.5	
Intersection Capacity Utilization		42.5%	ICU Level of Service
Analysis Period (min)		15	

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	55	122	224	52	69	189
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	60	133	243	57	75	205
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	627	272			300	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	627	272			300	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	86	83			94	
cM capacity (veh/h)	421	767			1261	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	192	300	280
Volume Left	60	0	75
Volume Right	133	57	0
cSH	611	1700	1261
Volume to Capacity	0.32	0.18	0.06
Queue Length (ft)	34	0	5
Control Delay (s)	13.6	0.0	2.5
Lane LOS	B		A
Approach Delay (s)	13.6	0.0	2.5
Approach LOS	B		

Intersection Summary			
Average Delay	4.3		
Intersection Capacity Utilization	49.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	54	94	191	71	99	173
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	59	102	208	77	108	188
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	649	246			285	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	649	246			285	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	85	87			92	
cM capacity (veh/h)	398	793			1277	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	161	285	296
Volume Left	59	0	108
Volume Right	102	77	0
cSH	582	1700	1277
Volume to Capacity	0.28	0.17	0.08
Queue Length (ft)	28	0	7
Control Delay (s)	13.5	0.0	3.4
Lane LOS	B		A
Approach Delay (s)	13.5	0.0	3.4
Approach LOS	B		

Intersection Summary			
Average Delay	4.3		
Intersection Capacity Utilization	47.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	77	163	230	66	93	199
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	84	177	250	72	101	216
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	704	286			322	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	704	286			322	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	77	76			92	
cM capacity (veh/h)	370	753			1238	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	261	322	317
Volume Left	84	0	101
Volume Right	177	72	0
cSH	565	1700	1238
Volume to Capacity	0.46	0.19	0.08
Queue Length (ft)	60	0	7
Control Delay (s)	16.7	0.0	3.1
Lane LOS	C		A
Approach Delay (s)	16.7	0.0	3.1
Approach LOS	C		

Intersection Summary			
Average Delay	5.9		
Intersection Capacity Utilization	56.0%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	56	99	191	74	113	173
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	61	108	208	80	123	188
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	682	248			288	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	682	248			288	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	84	86			90	
cM capacity (veh/h)	376	791			1274	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	168	288	311
Volume Left	61	0	123
Volume Right	108	80	0
cSH	565	1700	1274
Volume to Capacity	0.30	0.17	0.10
Queue Length (ft)	31	0	8
Control Delay (s)	14.1	0.0	3.7
Lane LOS	B		A
Approach Delay (s)	14.1	0.0	3.7
Approach LOS	B		

Intersection Summary			
Average Delay	4.6		
Intersection Capacity Utilization	49.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	81	175	230	71	105	199
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	88	190	250	77	114	216
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	733	289			327	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	733	289			327	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	75	75			91	
cM capacity (veh/h)	352	751			1232	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	278	327	330
Volume Left	88	0	114
Volume Right	190	77	0
cSH	552	1700	1232
Volume to Capacity	0.50	0.19	0.09
Queue Length (ft)	70	0	8
Control Delay (s)	17.9	0.0	3.4
Lane LOS	C		A
Approach Delay (s)	17.9	0.0	3.4
Approach LOS	C		

Intersection Summary			
Average Delay	6.5		
Intersection Capacity Utilization	58.0%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	61	109	191	75	118	173
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	66	118	208	82	128	188
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	693	248			289	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	693	248			289	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	82	85			90	
cM capacity (veh/h)	368	790			1273	

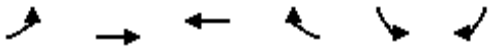
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	185	289	316
Volume Left	66	0	128
Volume Right	118	82	0
cSH	560	1700	1273
Volume to Capacity	0.33	0.17	0.10
Queue Length (ft)	36	0	8
Control Delay (s)	14.6	0.0	3.9
Lane LOS	B		A
Approach Delay (s)	14.6	0.0	3.9
Approach LOS	B		

Intersection Summary			
Average Delay	4.9		
Intersection Capacity Utilization	50.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	84	182	230	76	117	199
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	91	198	250	83	127	216
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	762	291			333	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	762	291			333	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	73	74			90	
cM capacity (veh/h)	334	748			1227	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	289	333	343
Volume Left	91	0	127
Volume Right	198	83	0
cSH	538	1700	1227
Volume to Capacity	0.54	0.20	0.10
Queue Length (ft)	79	0	9
Control Delay (s)	19.2	0.0	3.7
Lane LOS	C		A
Approach Delay (s)	19.2	0.0	3.7
Approach LOS	C		

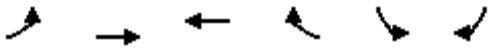
Intersection Summary			
Average Delay	7.1		
Intersection Capacity Utilization	59.5%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	4	170	122	25	90	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	185	133	27	98	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	160				326	133
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	160				326	133
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				85	99
cM capacity (veh/h)	1419				666	917

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	4	185	133	27	98	11
Volume Left	4	0	0	0	98	0
Volume Right	0	0	0	27	0	11
cSH	1419	1700	1700	1700	666	917
Volume to Capacity	0.00	0.11	0.08	0.02	0.15	0.01
Queue Length (ft)	0	0	0	0	13	1
Control Delay (s)	7.5	0.0	0.0	0.0	11.3	9.0
Lane LOS	A				B	A
Approach Delay (s)	0.2		0.0		11.1	
Approach LOS					B	

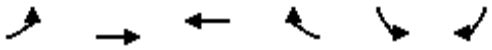
Intersection Summary			
Average Delay	2.7		
Intersection Capacity Utilization	20.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	8	140	247	103	65	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	152	268	112	71	8
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	380				438	268
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	380				438	268
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				88	99
cM capacity (veh/h)	1178				572	770

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	9	152	268	112	71	8
Volume Left	9	0	0	0	71	0
Volume Right	0	0	0	112	0	8
cSH	1178	1700	1700	1700	572	770
Volume to Capacity	0.01	0.09	0.16	0.07	0.12	0.01
Queue Length (ft)	1	0	0	0	11	1
Control Delay (s)	8.1	0.0	0.0	0.0	12.2	9.7
Lane LOS	A				B	A
Approach Delay (s)	0.4		0.0		11.9	
Approach LOS					B	

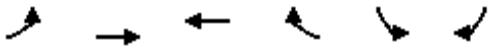
Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	23.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	5	223	144	33	120	13
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	242	157	36	130	14
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	192				410	157
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	192				410	157
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				78	98
cM capacity (veh/h)	1381				596	889

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	5	242	157	36	130	14
Volume Left	5	0	0	0	130	0
Volume Right	0	0	0	36	0	14
cSH	1381	1700	1700	1700	596	889
Volume to Capacity	0.00	0.14	0.09	0.02	0.22	0.02
Queue Length (ft)	0	0	0	0	21	1
Control Delay (s)	7.6	0.0	0.0	0.0	12.7	9.1
Lane LOS	A				B	A
Approach Delay (s)	0.2		0.0		12.4	
Approach LOS					B	

Intersection Summary			
Average Delay	3.1		
Intersection Capacity Utilization	25.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	11	175	308	137	86	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	190	335	149	93	10
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	484				549	335
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	484				549	335
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				81	99
cM capacity (veh/h)	1079				491	707

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	12	190	335	149	93	10
Volume Left	12	0	0	0	93	0
Volume Right	0	0	0	149	0	10
cSH	1079	1700	1700	1700	491	707
Volume to Capacity	0.01	0.11	0.20	0.09	0.19	0.01
Queue Length (ft)	1	0	0	0	17	1
Control Delay (s)	8.4	0.0	0.0	0.0	14.0	10.2
Lane LOS	A				B	B
Approach Delay (s)	0.5		0.0		13.7	
Approach LOS					B	

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	27.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	5	223	17	44	155	33	7	0	35	120	0	13
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
Hourly flow rate (vph)	5	242	18	48	168	36	8	0	38	130	0	14
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	204			261			541	562	252	555	536	168
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	204			261			541	562	252	555	536	168
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			96			98	100	95	68	100	98
cM capacity (veh/h)	1367			1304			431	418	787	408	433	876

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1	SB 2
Volume Total	5	261	48	168	36	8	38	130	14
Volume Left	5	0	48	0	0	8	0	130	0
Volume Right	0	18	0	0	36	0	38	0	14
cSH	1367	1700	1304	1700	1700	431	787	408	876
Volume to Capacity	0.00	0.15	0.04	0.10	0.02	0.02	0.05	0.32	0.02
Queue Length (ft)	0	0	3	0	0	1	4	34	1
Control Delay (s)	7.6	0.0	7.9	0.0	0.0	13.5	9.8	17.9	9.2
Lane LOS	A		A			B	A	C	A
Approach Delay (s)	0.2		1.5			10.4		17.1	
Approach LOS						B		C	

Intersection Summary				
Average Delay	4.7			
Intersection Capacity Utilization	39.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	11	175	17	77	308	137	16	0	71	86	0	9
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
Hourly flow rate (vph)	12	190	18	84	335	149	17	0	77	93	0	10
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	484			209			735	874	199	793	735	335
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	484			209			735	874	199	793	735	335
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			94			94	100	91	64	100	99
cM capacity (veh/h)	1079			1362			312	267	842	263	322	707

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1	SB 2
Volume Total	12	209	84	335	149	17	77	93	10
Volume Left	12	0	84	0	0	17	0	93	0
Volume Right	0	18	0	0	149	0	77	0	10
cSH	1079	1700	1362	1700	1700	312	842	263	707
Volume to Capacity	0.01	0.12	0.06	0.20	0.09	0.06	0.09	0.36	0.01
Queue Length (ft)	1	0	5	0	0	4	8	39	1
Control Delay (s)	8.4	0.0	7.8	0.0	0.0	17.2	9.7	26.1	10.2
Lane LOS	A		A			C	A	D	B
Approach Delay (s)	0.5		1.2			11.1		24.6	
Approach LOS						B		C	

Intersection Summary				
Average Delay	4.4			
Intersection Capacity Utilization	41.0%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	5	278	17	44	165	33	7	0	35	120	0	13
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
Hourly flow rate (vph)	5	302	18	48	179	36	8	0	38	130	0	14
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	215			321			611	633	311	626	607	179
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	215			321			611	633	311	626	607	179
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			96			98	100	95	64	100	98
cM capacity (veh/h)	1355			1239			386	380	729	364	394	863

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1	SB 2
Volume Total	5	321	48	179	36	8	38	130	14
Volume Left	5	0	48	0	0	8	0	130	0
Volume Right	0	18	0	0	36	0	38	0	14
cSH	1355	1700	1239	1700	1700	386	729	364	863
Volume to Capacity	0.00	0.19	0.04	0.11	0.02	0.02	0.05	0.36	0.02
Queue Length (ft)	0	0	3	0	0	2	4	40	1
Control Delay (s)	7.7	0.0	8.0	0.0	0.0	14.5	10.2	20.3	9.2
Lane LOS	A		A			B	B	C	A
Approach Delay (s)	0.1		1.5			10.9		19.2	
Approach LOS						B		C	

Intersection Summary				
Average Delay	4.8			
Intersection Capacity Utilization	42.3%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	11	215	17	77	369	137	16	0	71	86	0	9
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
Hourly flow rate (vph)	12	234	18	84	401	149	17	0	77	93	0	10
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	550			252			845	984	243	903	845	401
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	550			252			845	984	243	903	845	401
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			94			93	100	90	57	100	98
cM capacity (veh/h)	1020			1313			262	230	796	220	277	649

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1	SB 2
Volume Total	12	252	84	401	149	17	77	93	10
Volume Left	12	0	84	0	0	17	0	93	0
Volume Right	0	18	0	0	149	0	77	0	10
cSH	1020	1700	1313	1700	1700	262	796	220	649
Volume to Capacity	0.01	0.15	0.06	0.24	0.09	0.07	0.10	0.43	0.02
Queue Length (ft)	1	0	5	0	0	5	8	49	1
Control Delay (s)	8.6	0.0	7.9	0.0	0.0	19.7	10.0	33.0	10.6
Lane LOS	A		A			C	B	D	B
Approach Delay (s)	0.4		1.0			11.8		30.9	
Approach LOS						B		D	

Intersection Summary				
Average Delay	4.6			
Intersection Capacity Utilization	44.2%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	23	366	1	1	161	21	1	0	3	19	0	46
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
Hourly flow rate (vph)	25	398	1	1	175	23	1	0	3	21	0	50
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	198			399			588	648	199	429	626	88
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	198			399			588	648	199	429	626	88
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			100	100	100	96	100	95
cM capacity (veh/h)	1372			1156			366	380	808	500	391	953

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	WB 4	NB 1	SB 1
Volume Total	25	265	134	1	88	88	23	4	71
Volume Left	25	0	0	1	0	0	0	1	21
Volume Right	0	0	1	0	0	0	23	3	50
cSH	1372	1700	1700	1156	1700	1700	1700	621	754
Volume to Capacity	0.02	0.16	0.08	0.00	0.05	0.05	0.01	0.01	0.09
Queue Length (ft)	1	0	0	0	0	0	0	1	8
Control Delay (s)	7.7	0.0	0.0	8.1	0.0	0.0	0.0	10.8	10.3
Lane LOS	A			A				B	B
Approach Delay (s)	0.5			0.0				10.8	10.3
Approach LOS								B	B

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	29.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	50	281	2	0	382	48	4	0	3	54	0	108
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
Hourly flow rate (vph)	54	305	2	0	415	52	4	0	3	59	0	117
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	467			308			740	883	154	680	832	208
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	467			308			740	883	154	680	832	208
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	95			100			98	100	100	82	100	85
cM capacity (veh/h)	1090			1250			250	269	865	323	288	798

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	WB 4	NB 1	SB 1
Volume Total	54	204	104	0	208	208	52	8	176
Volume Left	54	0	0	0	0	0	0	4	59
Volume Right	0	0	2	0	0	0	52	3	117
cSH	1090	1700	1700	1700	1700	1700	1700	360	536
Volume to Capacity	0.05	0.12	0.06	0.00	0.12	0.12	0.03	0.02	0.33
Queue Length (ft)	4	0	0	0	0	0	0	2	36
Control Delay (s)	8.5	0.0	0.0	0.0	0.0	0.0	0.0	15.2	15.0
Lane LOS	A							C	B
Approach Delay (s)	1.3			0.0				15.2	15.0
Approach LOS								C	B

Intersection Summary			
Average Delay	3.2		
Intersection Capacity Utilization	34.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	36	452	1	1	187	21	1	0	3	19	0	53
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
Hourly flow rate (vph)	39	491	1	1	203	23	1	0	3	21	0	58
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	226			492			732	798	246	533	776	102
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	226			492			732	798	246	533	776	102
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			100			100	100	100	95	100	94
cM capacity (veh/h)	1340			1067			284	308	754	418	317	934

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	WB 4	NB 1	SB 1
Volume Total	39	328	165	1	102	102	23	4	78
Volume Left	39	0	0	1	0	0	0	1	21
Volume Right	0	0	1	0	0	0	23	3	58
cSH	1340	1700	1700	1067	1700	1700	1700	533	705
Volume to Capacity	0.03	0.19	0.10	0.00	0.06	0.06	0.01	0.01	0.11
Queue Length (ft)	2	0	0	0	0	0	0	1	9
Control Delay (s)	7.8	0.0	0.0	8.4	0.0	0.0	0.0	11.8	10.7
Lane LOS	A			A				B	B
Approach Delay (s)	0.6			0.0				11.8	10.7
Approach LOS								B	B

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	31.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	63	331	2	0	469	48	4	0	3	54	0	132
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
Hourly flow rate (vph)	68	360	2	0	510	52	4	0	3	59	0	143
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	562			362			896	1060	181	830	1009	255
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	562			362			896	1060	181	830	1009	255
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	93			100			98	100	100	76	100	81
cM capacity (veh/h)	1005			1193			180	208	831	248	223	744

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	WB 4	NB 1	SB 1
Volume Total	68	240	122	0	255	255	52	8	202
Volume Left	68	0	0	0	0	0	0	4	59
Volume Right	0	0	2	0	0	0	52	3	143
cSH	1005	1700	1700	1700	1700	1700	1700	271	471
Volume to Capacity	0.07	0.14	0.07	0.00	0.15	0.15	0.03	0.03	0.43
Queue Length (ft)	5	0	0	0	0	0	0	2	53
Control Delay (s)	8.8	0.0	0.0	0.0	0.0	0.0	0.0	18.7	18.3
Lane LOS	A							C	C
Approach Delay (s)	1.4			0.0				18.7	18.3
Approach LOS								C	C

Intersection Summary			
Average Delay	3.7		
Intersection Capacity Utilization	38.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	38	485	1	1	219	21	1	0	3	19	0	65
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
Hourly flow rate (vph)	41	527	1	1	238	23	1	0	3	21	0	71
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	261			528			802	873	264	590	851	119
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	261			528			802	873	264	590	851	119
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			100			100	100	100	95	100	92
cM capacity (veh/h)	1301			1035			247	277	734	380	286	910

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	WB 4	NB 1	SB 1
Volume Total	41	351	177	1	119	119	23	4	91
Volume Left	41	0	0	1	0	0	0	1	21
Volume Right	0	0	1	0	0	0	23	3	71
cSH	1301	1700	1700	1035	1700	1700	1700	492	692
Volume to Capacity	0.03	0.21	0.10	0.00	0.07	0.07	0.01	0.01	0.13
Queue Length (ft)	2	0	0	0	0	0	0	1	11
Control Delay (s)	7.9	0.0	0.0	8.5	0.0	0.0	0.0	12.4	11.0
Lane LOS	A			A				B	B
Approach Delay (s)	0.6			0.0				12.4	11.0
Approach LOS								B	B

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	33.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	76	389	2	0	527	48	4	0	3	54	0	151
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
Hourly flow rate (vph)	83	423	2	0	573	52	4	0	3	59	0	164
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	625			425			1040	1214	212	953	1163	286
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	625			425			1040	1214	212	953	1163	286
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	91			100			97	100	100	70	100	77
cM capacity (veh/h)	952			1131			133	165	793	199	177	710

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	WB 4	NB 1	SB 1
Volume Total	83	282	143	0	286	286	52	8	223
Volume Left	83	0	0	0	0	0	0	4	59
Volume Right	0	0	2	0	0	0	52	3	164
cSH	952	1700	1700	1700	1700	1700	1700	206	423
Volume to Capacity	0.09	0.17	0.08	0.00	0.17	0.17	0.03	0.04	0.53
Queue Length (ft)	7	0	0	0	0	0	0	3	75
Control Delay (s)	9.1	0.0	0.0	0.0	0.0	0.0	0.0	23.1	22.6
Lane LOS	A							C	C
Approach Delay (s)	1.5			0.0				23.1	22.6
Approach LOS								C	C

Intersection Summary			
Average Delay	4.4		
Intersection Capacity Utilization	41.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	41	537	1	1	231	22	1	0	3	25	0	74
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
Hourly flow rate (vph)	45	584	1	1	251	24	1	0	3	27	0	80
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	275			585			882	951	292	638	927	126
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	275			585			882	951	292	638	927	126
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			100			99	100	100	92	100	91
cM capacity (veh/h)	1285			986			213	249	704	350	257	901

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	WB 4	NB 1	SB 1
Volume Total	45	389	196	1	126	126	24	4	108
Volume Left	45	0	0	1	0	0	0	1	27
Volume Right	0	0	1	0	0	0	24	3	80
cSH	1285	1700	1700	986	1700	1700	1700	447	645
Volume to Capacity	0.03	0.23	0.12	0.00	0.07	0.07	0.01	0.01	0.17
Queue Length (ft)	3	0	0	0	0	0	0	1	15
Control Delay (s)	7.9	0.0	0.0	8.7	0.0	0.0	0.0	13.1	11.7
Lane LOS	A			A				B	B
Approach Delay (s)	0.6			0.0				13.1	11.7
Approach LOS								B	B

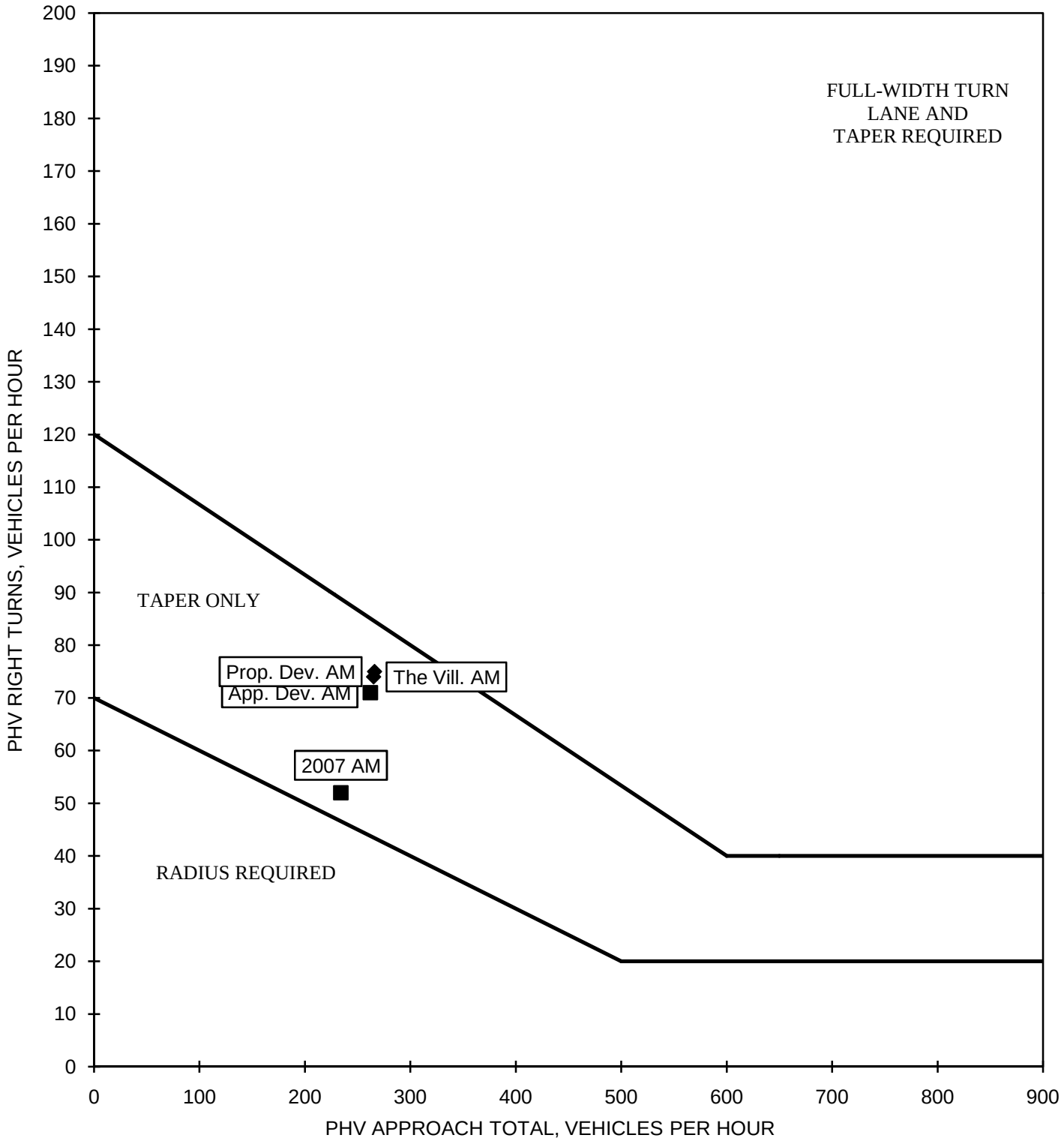
Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	36.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	87	418	2	0	571	54	4	0	3	56	0	168
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
Hourly flow rate (vph)	95	454	2	0	621	59	4	0	3	61	0	183
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	679			457			1138	1324	228	1040	1266	310
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	679			457			1138	1324	228	1040	1266	310
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	90			100			96	100	100	64	100	73
cM capacity (veh/h)	909			1101			106	139	774	169	150	686

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	WB 4	NB 1	SB 1
Volume Total	95	303	154	0	310	310	59	8	243
Volume Left	95	0	0	0	0	0	0	4	61
Volume Right	0	0	2	0	0	0	59	3	183
cSH	909	1700	1700	1700	1700	1700	1700	168	389
Volume to Capacity	0.10	0.18	0.09	0.00	0.18	0.18	0.03	0.05	0.63
Queue Length (ft)	9	0	0	0	0	0	0	4	103
Control Delay (s)	9.4	0.0	0.0	0.0	0.0	0.0	0.0	27.5	28.6
Lane LOS	A							D	D
Approach Delay (s)	1.6			0.0				27.5	28.6
Approach LOS								D	D

Intersection Summary				
Average Delay	5.4			
Intersection Capacity Utilization	44.4%	ICU Level of Service		A
Analysis Period (min)	15			

Guidelines for Right Turn Treatments 2 - Lane Highway



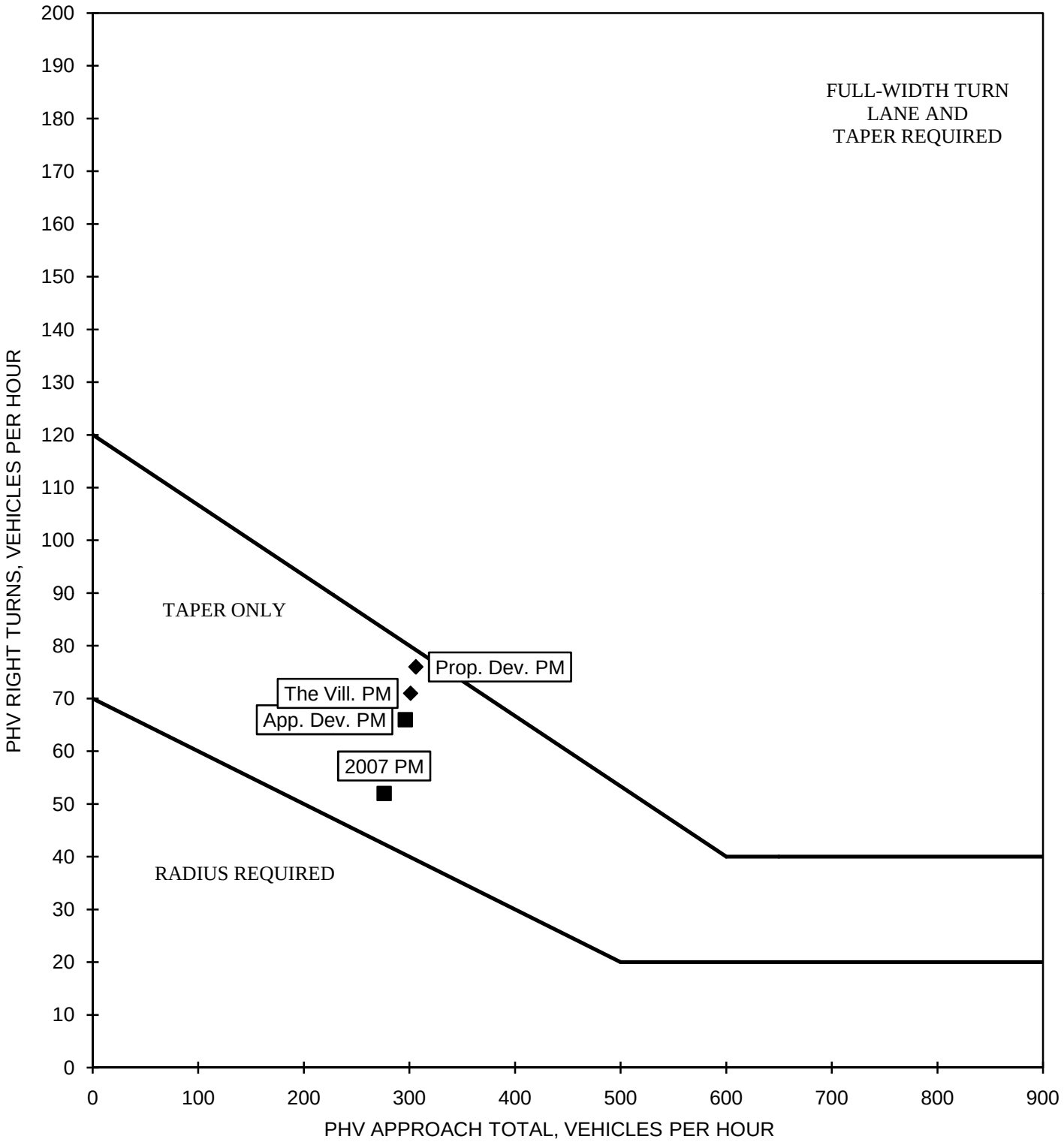
Source: VDOT Road Design Manual, Vol. 1, Page C-15, Figure C-1-8

VDOT RIGHT TURN LANE WARRANT
NORTHBOUND CENTERVILLE ROAD AT NEWS ROAD
AM PEAK HOUR COUNTS AND FORECAST

DRW Consultants, LLC
804-794-7312

Exhibit J1

Guidelines for Right Turn Treatments 2 - Lane Highway



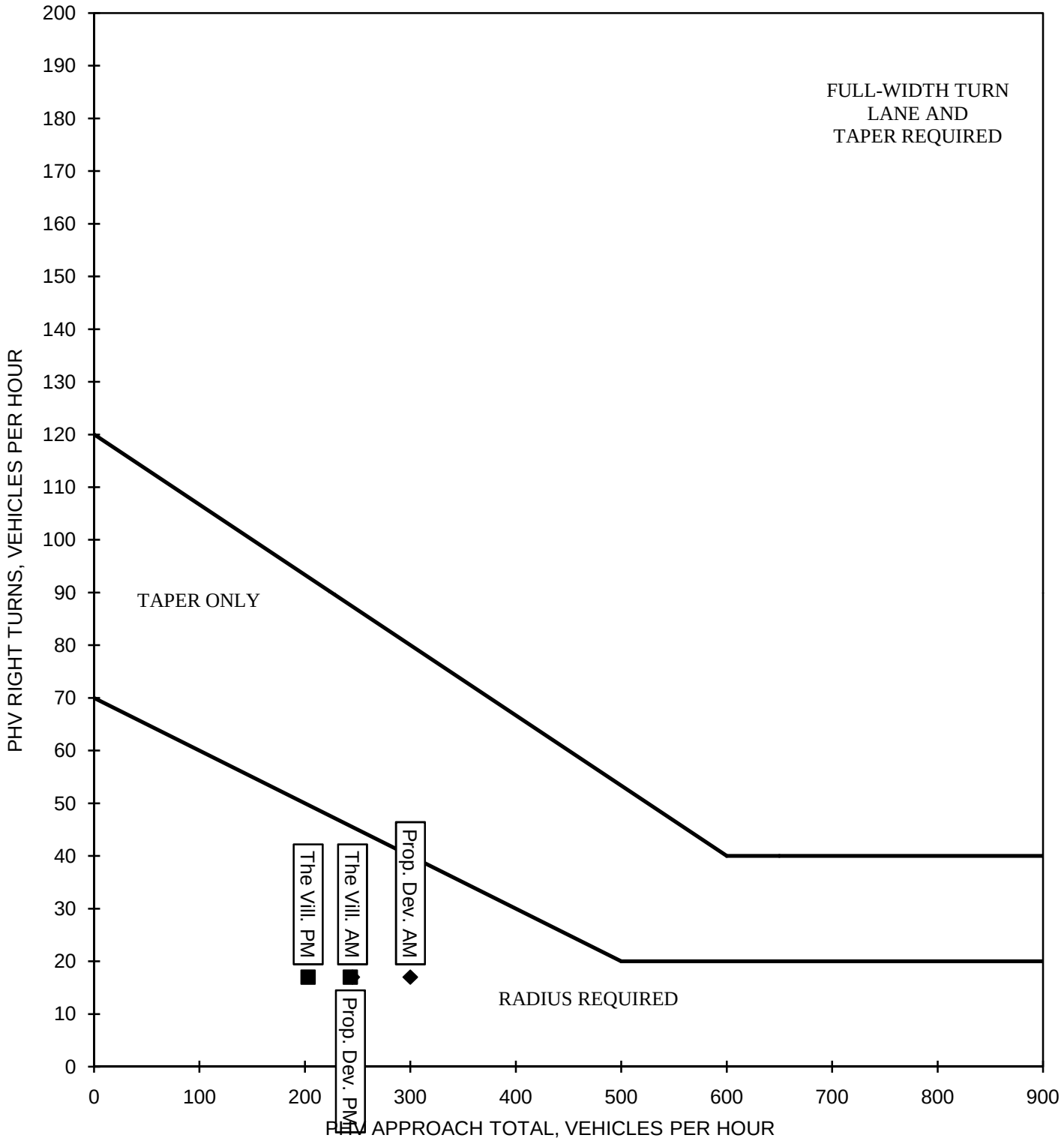
Source: VDOT Road Design Manual, Vol. 1, Page C-15, Figure C-1-8

VDOT RIGHT TURN LANE WARRANT
NORTHBOUND CENTERVILLE ROAD AT NEWS ROAD
PM PEAK HOUR COUNTS AND FORECAST

DRW Consultants, LLC
804-794-7312

Exhibit J2

Guidelines for Right Turn Treatments 2 - Lane Highway



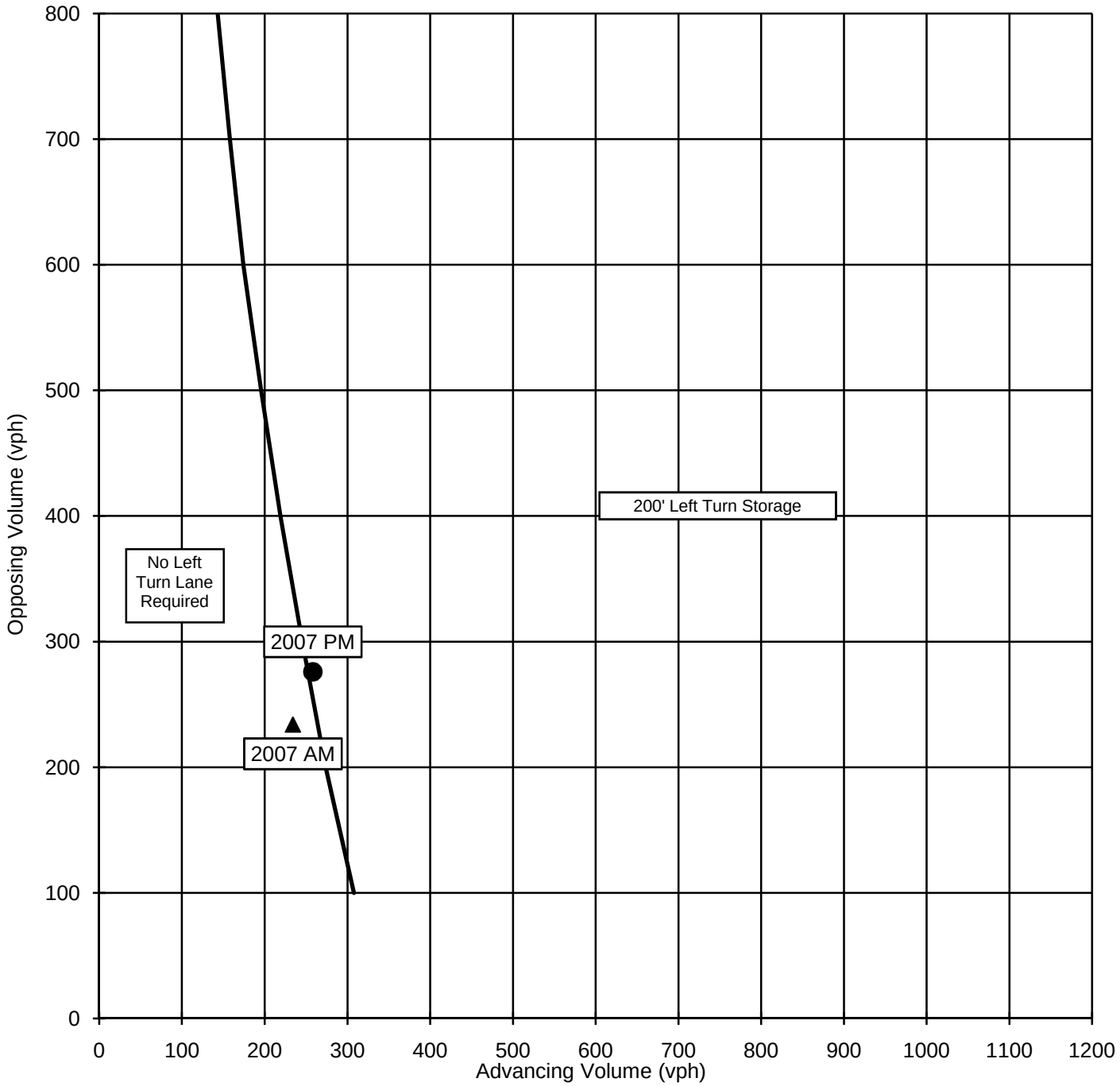
Source: VDOT Road Design Manual, Vol. 1, Page C-15, Figure C-1-8

VDOT RIGHT TURN LANE WARRANT
EASTBOUND NEWS ROAD AT FIRESTONE DRIVE

DRW Consultants, LLC
804-794-7312

Exhibit J3

LEFT TURN LANE WARRANT
50 mph Design Speed
% Left Turns = 27%



Source: Interpolated from VDOT Road Design Manual, Appendix C, derived from Highway Research Record Number 211

VDOT LEFT TURN LANE WARRANTS
NORTHBOUND CENTERVILLE ROAD AT NEWS ROAD
AM AND PM PEAK HOUR COUNTS

DRW Consultants, LLC
804-794-7312

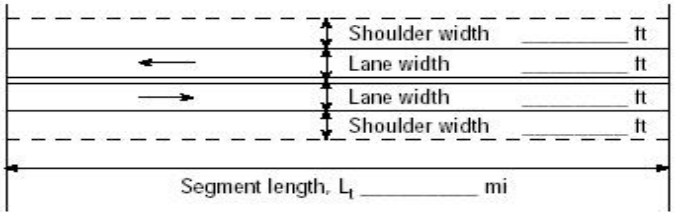
Exhibit K

TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst	*DRW*	Highway	*News Road*
Agency or Company	*DRW Consultants, LLC*	From/To	*East of Centerville*
Date Performed	*4/3/2008*	Jurisdiction	*JCC*
Analysis Time Period	*2007/2008 COUNTS AM*	Analysis Year	*Exhibit L1*

Project Description: *News Road Corridor Study - Exhibit L1*

Input Data



☐ Class I highway ☑ Class II highway

Terrain ☐ Level ☑ Rolling

Two-way hourly volume	*239* veh/h
Directional split	*51 / 49*
Peak-hour factor, PHF	*0.92*
No-passing zone	*100*
% Trucks and Buses , P_T	*5* %
% Recreational vehicles, P_R	*0%*
Access points/ *mi*	*10*

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	*0.71*
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	*2.5*
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	*1.1*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	*0.930*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*393*
v_p * highest directional split proportion[2] (pc/h)	*200*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Field Measured speed, S_{FM}	*mi/h*	Base free-flow speed, $BFFS_{FM}$	*50.0 mi/h*
Observed volume, V_f	*veh/h*	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	*3.0 mi/h*
Free-flow speed, FFS FFS=S_{FM}+0.00776(V_f/ f_{HV})	*mi/h*	Adj. for access points, f_A (Exhibit 20-6)	*2.5 mi/h*
		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*44.5 mi/h*

Adj. for no-passing zones, f_{np} (*mi/h*) (Exhibit 20-11)	*4.5*
Average travel speed, ATS (*mi/h*) ATS=FFS-0.00776v_p-f_{np}	*37.0*

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	*0.77*
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	*1.8*
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	*0.962*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*351*
v_p * highest directional split proportion[2] (pc/h)	*179*
Base percent time-spent-following, BPTSF(%)=100(1-$e^{-0.000879v_p}$)	*26.5*
Adj. for directional distribution and no-passing zone, $f_{d/hp}$(%)(Exh. 20-12)	*23.9*
Percent time-spent-following, PTSF(%)=BPTSF+$f_{d/np}$	*50.5*

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	*B*
Volume to capacity ratio, v/c=V_p/ 3,200	*0.12*
Peak 15-min veh-miles of travel, VMT_{15} (veh- *mi*)= 0.25L_t(V/PHF)	*91*
Peak-hour vehicle-miles of travel, VMT_{60}(veh- *mi*)=V*L_t	*335*
Peak 15-min total travel time, TT_{15}(veh-h)= VMT_{15}/ATS	*2.5*

Notes

1. If Vp >= 3,200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split Vp>= 1,700 pc/h, terminated anlysis-the LOS is F.

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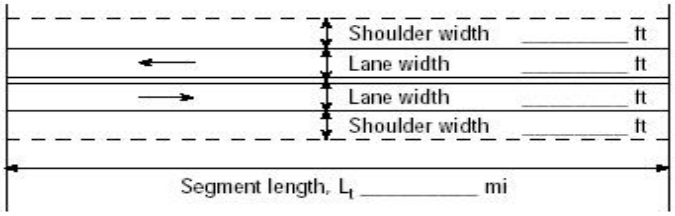
TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst	*DRW*	Highway	*News Road*
Agency or Company	*DRW Consultants, LLC*	From/To	*East of Centerville*
Date Performed	*4/3/2008*	Jurisdiction	*JCC*
Analysis Time Period	*2007/2008 COUNTS PM*	Analysis Year	*Exhibit L2*

Project Description: *News Road Corridor Study - Exhibit L2*

Input Data



☐ Class I highway ☑ Class II highway

Terrain ☐ Level ☑ Rolling

Two-way hourly volume	*298* veh/h
Directional split	*59 / 41*
Peak-hour factor, PHF	*0.92*
No-passing zone	*100*
% Trucks and Buses , P_T	*5* %
% Recreational vehicles, P_R	*0%*
Access points/ *mi*	*10*

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	*0.71*
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	*2.5*
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	*1.1*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	*0.930*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*490*
v_p * highest directional split proportion[2] (pc/h)	*289*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Field Measured speed, S_{FM}	*mi/h*	Base free-flow speed, $BFFS_{FM}$	*50.0 mi/h*
Observed volume, V_f	*veh/h*	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	*3.0 mi/h*
Free-flow speed, FFS FFS=S_{FM}+0.00776(V_f/ f_{HV})	*mi/h*	Adj. for access points, f_A (Exhibit 20-6)	*2.5 mi/h*
		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*44.5 mi/h*

Adj. for no-passing zones, f_{np} (*mi/h*) (Exhibit 20-11)	*4.2*
Average travel speed, ATS (*mi/h*) ATS=FFS-0.00776v_p-f_{np}	*36.5*

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	*0.77*
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	*1.8*
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	*0.962*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*437*
v_p * highest directional split proportion[2] (pc/h)	*258*
Base percent time-spent-following, BPTSF(%)=100(1-$e^{-0.000879v_p}$)	*31.9*
Adj. for directional distribution and no-passing zone, $f_{d/np}$(%)(Exh. 20-12)	*22.1*
Percent time-spent-following, PTSF(%)=BPTSF+$f_{d/np}$	*54.0*

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	*B*
Volume to capacity ratio, v/c=V_p/ 3,200	*0.15*
Peak 15-min veh-miles of travel, VMT_{15} (veh- *mi*)= 0.25L_t(V/PHF)	*113*
Peak-hour vehicle-miles of travel, VMT_{60}(veh- *mi*)=V*L_t	*417*
Peak 15-min total travel time, TT_{15}(veh-h)= VMT_{15}/ATS	*3.1*

Notes

1. If Vp >= 3,200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split Vp>= 1,700 pc/h, terminated anlysis-the LOS is F.

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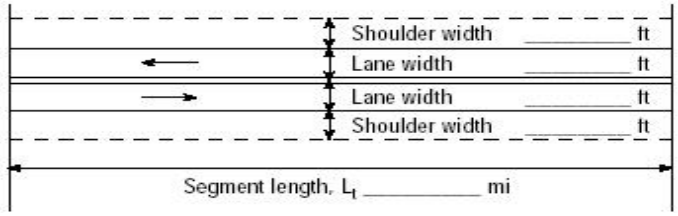
TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst	*DRW*	Highway	*News Road*
Agency or Company	*DRW Consultants, LLC*	From/To	*East of Centerville*
Date Performed	*4/3/2008*	Jurisdiction	*JCC*
Analysis Time Period	*APPROVED DEVELOPMENT AM*	Analysis Year	*Exhibit L3*

Project Description: *News Road Corridor Study - Exhibit L3*

Input Data



☐ Class I highway ☑ Class II highway

Terrain ☐ Level ☑ Rolling

Two-way hourly volume	*318* veh/h
Directional split	*53 / 47*
Peak-hour factor, PHF	*0.92*
No-passing zone	*100*
% Trucks and Buses , P_T	*5* %
% Recreational vehicles, P_R	*0%*
Access points/ *mi*	*10*

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	*0.71*
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	*2.5*
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	*1.1*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	*0.930*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*523*
v_p * highest directional split proportion[2] (pc/h)	*277*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Field Measured speed, S_{FM}	*mi/h*	Base free-flow speed, $BFFS_{FM}$	*50.0 mi/h*
Observed volume, V_f	*veh/h*	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	*3.0 mi/h*
Free-flow speed, FFS FFS=S_{FM}+0.00776(V_f/ f_{HV})	*mi/h*	Adj. for access points, f_A (Exhibit 20-6)	*2.5 mi/h*
		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*44.5 mi/h*

Adj. for no-passing zones, f_{np} (*mi/h*) (Exhibit 20-11)	*4.1*
Average travel speed, ATS (*mi/h*) ATS=FFS-0.00776v_p-f_{np}	*36.3*

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	*0.77*
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	*1.8*
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	*0.962*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*467*
v_p * highest directional split proportion[2] (pc/h)	*248*
Base percent time-spent-following, BPTSF(%)=100(1-$e^{-0.000879v_p}$)	*33.7*
Adj. for directional distribution and no-passing zone, $f_{d/np}$(%)(Exh. 20-12)	*22.9*
Percent time-spent-following, PTSF(%)=BPTSF+$f_{d/np}$	*56.5*

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	*C*
Volume to capacity ratio, v/c=V_p/ 3,200	*0.16*
Peak 15-min veh-miles of travel, VMT_{15} (veh- *mi*)= 0.25L_t(V/PHF)	*121*
Peak-hour vehicle-miles of travel, VMT_{60}(veh- *mi*)=V*L_t	*445*
Peak 15-min total travel time, TT_{15}(veh-h)= VMT_{15}/ATS	*3.3*

Notes

1. If Vp >= 3,200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split Vp>= 1,700 pc/h, terminated anlysis-the LOS is F.

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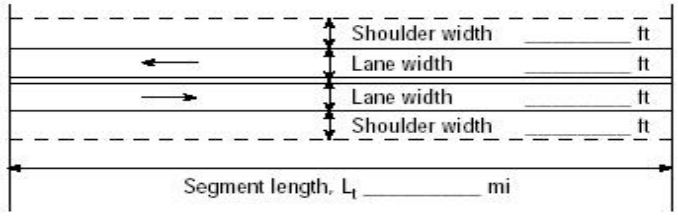
TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst	*DRW*	Highway	*News Road*
Agency or Company	*DRW Consultants, LLC*	From/To	*East of Centerville*
Date Performed	*4/3/2008*	Jurisdiction	*JCC*
Analysis Time Period	*Approved Development PM*	Analysis Year	*Exhibit L4*

Project Description: *News Road Corridor Study - Exhibit L4*

Input Data



☐ Class I highway ☑ Class II highway

Terrain ☐ Level ☑ Rolling

Two-way hourly volume	*399* veh/h
Directional split	*60 / 40*
Peak-hour factor, PHF	*0.92*
No-passing zone	*100*
% Trucks and Buses , P_T	*5* %
% Recreational vehicles, P_R	*0%*
Access points/ *mi*	*10*

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	*0.93*
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	*1.9*
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	*1.1*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	*0.957*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*487*
v_p * highest directional split proportion[2] (pc/h)	*292*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Field Measured speed, S_{FM}	*mi/h*	Base free-flow speed, $BFFS_{FM}$	*50.0 mi/h*
Observed volume, V_f	*veh/h*	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	*3.0 mi/h*
Free-flow speed, FFS FFS=S_{FM}+0.00776(V_f/ f_{HV})	*mi/h*	Adj. for access points, f_A (Exhibit 20-6)	*2.5 mi/h*
		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*44.5 mi/h*

Adj. for no-passing zones, f_{np} (*mi/h*) (Exhibit 20-11)	*4.2*
Average travel speed, ATS (*mi/h*) ATS=FFS-0.00776v_p-f_{np}	*36.5*

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	*0.77*
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	*1.8*
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	*0.962*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*586*
v_p * highest directional split proportion[2] (pc/h)	*352*
Base percent time-spent-following, BPTSF(%)=100(1-$e^{-0.000879v_p}$)	*40.3*
Adj. for directional distribution and no-passing zone, $f_{d/hp}$(%)(Exh. 20-12)	*20.8*
Percent time-spent-following, PTSF(%)=BPTSF+$f_{d/np}$	*61.1*

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	*C*
Volume to capacity ratio, v/c=V_p/ 3,200	*0.15*
Peak 15-min veh-miles of travel, VMT_{15} (veh- *mi*)= 0.25L_t(V/PHF)	*152*
Peak-hour vehicle-miles of travel, VMT_{60}(veh- *mi*)=V*L_t	*559*
Peak 15-min total travel time, TT_{15}(veh-h)= VMT_{15}/ATS	*4.2*

Notes

1. If Vp >= 3,200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split Vp>= 1,700 pc/h, terminated anlysis-the LOS is F.

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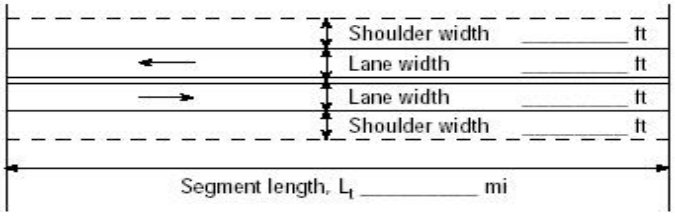
TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst	*DRW*	Highway	*News Road*
Agency or Company	*DRW Consultants, LLC*	From/To	*East of Centerville*
Date Performed	*4/3/2008*	Jurisdiction	*JCC*
Analysis Time Period	*The Village DEVELOPMENT AM*	Analysis Year	*Exhibit L5*

Project Description: *News Road Corridor Study - Exhibit L5*

Input Data



☐ Class I highway ☑ Class II highway

Terrain ☐ Level ☑ Rolling

Two-way hourly volume	*342* veh/h
Directional split	*55 / 45*
Peak-hour factor, PHF	*0.92*
No-passing zone	*100*
% Trucks and Buses , P_T	*5* %
% Recreational vehicles, P_R	*0%*
Access points/ *mi*	*10*

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	*0.71*
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	*2.5*
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	*1.1*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.930*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*563*
v_p * highest directional split proportion[2] (pc/h)	*310*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Field Measured speed, S_{FM}	*mi/h*	Base free-flow speed, $BFFS_{FM}$	*50.0 mi/h*
Observed volume, V_f	*veh/h*	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	*3.0 mi/h*
Free-flow speed, FFS FFS=S_{FM}+0.00776(V_f/ f_{HV})	*mi/h*	Adj. for access points, f_A (Exhibit 20-6)	*2.5 mi/h*
		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*44.5 mi/h*

Adj. for no-passing zones, f_{np} (*mi/h*) (Exhibit 20-11)	*4.0*
Average travel speed, ATS (*mi/h*) ATS=FFS-0.00776v_p-f_{np}	*36.1*

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	*0.77*
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	*1.8*
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.962*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*502*
v_p * highest directional split proportion[2] (pc/h)	*276*
Base percent time-spent-following, BPTSF(%)=100(1-$e^{-0.000879v_p}$)	*35.7*
Adj. for directional distribution and no-passing zone, $f_{d/hp}$(%)(Exh. 20-12)	*22.0*
Percent time-spent-following, PTSF(%)=BPTSF+$f_{d/np}$	*57.7*

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	*C*
Volume to capacity ratio, v/c=V_p/ 3,200	*0.18*
Peak 15-min veh-miles of travel, VMT_{15} (veh- *mi*)= 0.25L_t(V/PHF)	*130*
Peak-hour vehicle-miles of travel, VMT_{60}(veh- *mi*)=V*L_t	*479*
Peak 15-min total travel time, TT_{15}(veh-h)= VMT_{15}/ATS	*3.6*

Notes

1. If Vp >= 3,200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split Vp>= 1,700 pc/h, terminated anlysis-the LOS is F.

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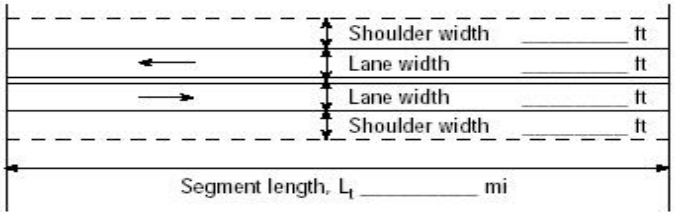
TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst	*DRW*	Highway	*News Road*
Agency or Company	*DRW Consultants, LLC*	From/To	*East of Centerville*
Date Performed	*4/3/2008*	Jurisdiction	*JCC*
Analysis Time Period	*The Village DEVELOPMENT PM*	Analysis Year	*Exhibit L6*

Project Description: *News Road Corridor Study - Exhibit L6*

Input Data



☐ Class I highway ☑ Class II highway

Terrain ☐ Level ☑ Rolling

Two-way hourly volume	*432* veh/h
Directional split	*59 / 41*
Peak-hour factor, PHF	*0.92*
No-passing zone	*100*
% Trucks and Buses , P_T	*5* %
% Recreational vehicles, P_R	*0%*
Access points/ *mi*	*10*

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	*0.93*
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	*1.9*
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	*1.1*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	*0.957*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*528*
v_p * highest directional split proportion[2] (pc/h)	*312*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Field Measured speed, S_{FM}	*mi/h*	Base free-flow speed, $BFFS_{FM}$	*50.0 mi/h*
Observed volume, V_f	*veh/h*	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	*3.0 mi/h*
Free-flow speed, FFS FFS=S_{FM}+0.00776(V_f/ f_{HV})	*mi/h*	Adj. for access points, f_A (Exhibit 20-6)	*2.5 mi/h*
		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*44.5 mi/h*

Adj. for no-passing zones, f_{np} (*mi/h*) (Exhibit 20-11)	*4.1*
Average travel speed, ATS (*mi/h*) ATS=FFS-0.00776v_p-f_{np}	*36.3*

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	*0.94*
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	*1.5*
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	*0.976*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*512*
v_p * highest directional split proportion[2] (pc/h)	*302*
Base percent time-spent-following, BPTSF(%)=100(1-$e^{-0.000879v_p}$)	*36.2*
Adj. for directional distribution and no-passing zone, $f_{d/np}$(%)(Exh. 20-12)	*21.5*
Percent time-spent-following, PTSF(%)=BPTSF+$f_{d/np}$	*57.7*

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	*C*
Volume to capacity ratio, v/c=V_p/ 3,200	*0.17*
Peak 15-min veh-miles of travel, VMT_{15} (veh- *mi*)= 0.25L_t(V/PHF)	*164*
Peak-hour vehicle-miles of travel, VMT_{60}(veh- *mi*)=V*L_t	*605*
Peak 15-min total travel time, TT_{15}(veh-h)= VMT_{15}/ATS	*4.5*

Notes

1. If Vp >= 3,200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split Vp>= 1,700 pc/h, terminated anlysis-the LOS is F.

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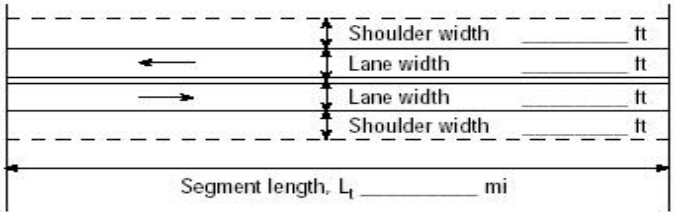
TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst	*DRW*	Highway	*News Road*
Agency or Company	*DRW Consultants, LLC*	From/To	*East of Centerville*
Date Performed	*4/3/2008*	Jurisdiction	*JCC*
Analysis Time Period	*PROPOSED DEVELOPMENT AM*	Analysis Year	*Exhibit L7*

Project Description: *News Road Corridor Study - Exhibit L7*

Input Data



☐ Class I highway ☑ Class II highway

Terrain ☐ Level ☑ Rolling

Two-way hourly volume	*363* veh/h
Directional split	*53 / 47*
Peak-hour factor, PHF	*0.92*
No-passing zone	*100*
% Trucks and Buses , P_T	*5* %
% Recreational vehicles, P_R	*0%*
Access points/ *mi*	*10*

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	*0.71*
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	*2.5*
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	*1.1*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	*0.930*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*597*
v_p * highest directional split proportion[2] (pc/h)	*316*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Field Measured speed, S_{FM}	*mi/h*	Base free-flow speed, $BFFS_{FM}$	*50.0 mi/h*
Observed volume, V_f	*veh/h*	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	*3.0 mi/h*
Free-flow speed, FFS FFS=S_{FM}+0.00776(V_f/ f_{HV})	*mi/h*	Adj. for access points, f_A (Exhibit 20-6)	*2.5 mi/h*
		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*44.5 mi/h*

Adj. for no-passing zones, f_{np} (*mi/h*) (Exhibit 20-11)	*3.9*
Average travel speed, ATS (*mi/h*) ATS=FFS-0.00776v_p-f_{np}	*36.0*

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	*0.77*
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	*1.8*
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	*0.962*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*533*
v_p * highest directional split proportion[2] (pc/h)	*282*
Base percent time-spent-following, BPTSF(%)=100(1-$e^{-0.000879v_p}$)	*37.4*
Adj. for directional distribution and no-passing zone, $f_{d/hp}$(%)(Exh. 20-12)	*21.7*
Percent time-spent-following, PTSF(%)=BPTSF+$f_{d/np}$	*59.1*

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	*C*
Volume to capacity ratio, v/c=V_p/ 3,200	*0.19*
Peak 15-min veh-miles of travel, VMT_{15} (veh- *mi*)= 0.25L_t(V/PHF)	*138*
Peak-hour vehicle-miles of travel, VMT_{60}(veh- *mi*)=V*L_t	*508*
Peak 15-min total travel time, TT_{15}(veh-h)= VMT_{15}/ATS	*3.8*

Notes

1. If Vp >= 3,200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split Vp>= 1,700 pc/h, terminated anlysis-the LOS is F.

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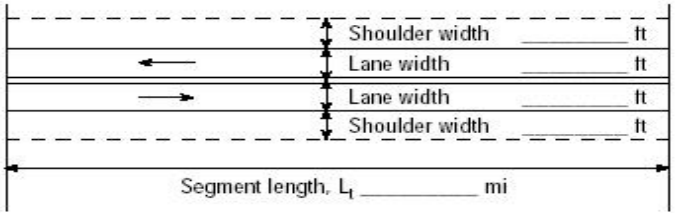
TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst	*DRW*	Highway	*News Road*
Agency or Company	*DRW Consultants, LLC*	From/To	*East of Centerville*
Date Performed	*4/3/2008*	Jurisdiction	*JCC*
Analysis Time Period	*PROPOSED DEVELOPMENT PM*	Analysis Year	*Exhibit L8*

Project Description: *News Road Corridor Study - Exhibit L8*

Input Data



☐ Class I highway ☑ Class II highway

Terrain ☐ Level ☑ Rolling

Two-way hourly volume	*459* veh/h
Directional split	*58 / 42*
Peak-hour factor, PHF	*0.92*
No-passing zone	*100*
% Trucks and Buses , P_T	*5* %
% Recreational vehicles, P_R	*0%*
Access points/ *mi*	*10*

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	*0.93*
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	*1.9*
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	*1.1*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	*0.957*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*561*
v_p * highest directional split proportion[2] (pc/h)	*325*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Field Measured speed, S_{FM}	*mi/h*	Base free-flow speed, $BFFS_{FM}$	*50.0 mi/h*
Observed volume, V_f	*veh/h*	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	*3.0 mi/h*
Free-flow speed, FFS FFS=S_{FM}+0.00776(V_f/ f_{HV})	*mi/h*	Adj. for access points, f_A (Exhibit 20-6)	*2.5 mi/h*
		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*44.5 mi/h*

Adj. for no-passing zones, f_{np} (*mi/h*) (Exhibit 20-11)	*4.0*
Average travel speed, ATS (*mi/h*) ATS=FFS-0.00776v_p-f_{np}	*36.1*

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	*0.94*
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	*1.5*
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	*0.976*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*544*
v_p * highest directional split proportion[2] (pc/h)	*316*
Base percent time-spent-following, BPTSF(%)=100(1-$e^{-0.000879v_p}$)	*38.0*
Adj. for directional distribution and no-passing zone, $f_{d/hp}$(%)(Exh. 20-12)	*21.2*
Percent time-spent-following, PTSF(%)=BPTSF+$f_{d/np}$	*59.2*

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	*C*
Volume to capacity ratio, v/c=V_p/ 3,200	*0.18*
Peak 15-min veh-miles of travel, VMT_{15} (veh- *mi*)= 0.25L_t(V/PHF)	*175*
Peak-hour vehicle-miles of travel, VMT_{60}(veh- *mi*)=V*L_t	*643*
Peak 15-min total travel time, TT_{15}(veh-h)= VMT_{15}/ATS	*4.8*

Notes

1. If Vp >= 3,200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split Vp>= 1,700 pc/h, terminated anlysis-the LOS is F.

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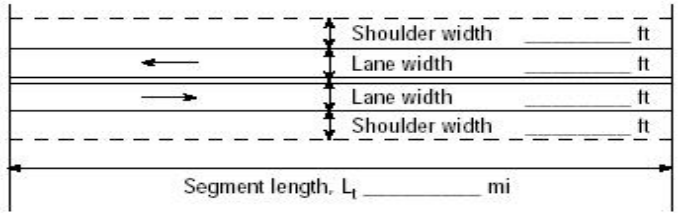
TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst	*DRW*	Highway	*News Road*
Agency or Company	*DRW Consultants, LLC*	From/To	*Old News Road/Powhatan Seconda*
Date Performed	*3/12/2008*	Jurisdiction	*JCC*
Analysis Time Period	*2007/2008 COUNTS AM*	Analysis Year	*Exhibit O1*

Project Description: *News Road Corridor Study - Exhibit O1*

Input Data



☐ Class I highway ☑ Class II highway

Terrain ☐ Level ☑ Rolling

Two-way hourly volume	*598* veh/h
Directional split	*65 / 35*
Peak-hour factor, PHF	*0.92*
No-passing zone	*100*
% Trucks and Buses , P_T	*5* %
% Recreational vehicles, P_R	*0%*
Access points/ *mi*	*1*

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	*0.93*
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	*1.9*
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	*1.1*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	*0.957*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*730*
v_p * highest directional split proportion[2] (pc/h)	*475*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Field Measured speed, S_{FM}	*mi/h*	Base free-flow speed, $BFFS_{FM}$	*50.0 mi/h*
Observed volume, V_f	*veh/h*	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	*3.0 mi/h*
Free-flow speed, FFS FFS=S_{FM}+0.00776(V_f/ f_{HV})	*mi/h*	Adj. for access points, f_A (Exhibit 20-6)	*0.3 mi/h*
		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*46.8 mi/h*

Adj. for no-passing zones, f_{np} (*mi/h*) (Exhibit 20-11)	*3.3*
Average travel speed, ATS (*mi/h*) ATS=FFS-0.00776v_p-f_{np}	*37.8*

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	*0.94*
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	*1.5*
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	*0.976*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*709*
v_p * highest directional split proportion[2] (pc/h)	*461*
Base percent time-spent-following, BPTSF(%)=100(1-$e^{-0.000879v_p}$)	*46.4*
Adj. for directional distribution and no-passing zone, $f_{d/hp}$(%)(Exh. 20-12)	*17.4*
Percent time-spent-following, PTSF(%)=BPTSF+$f_{d/np}$	*63.7*

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	*C*
Volume to capacity ratio, v/c=V_p/ 3,200	*0.23*
Peak 15-min veh-miles of travel, VMT_{15} (veh- *mi*)= 0.25L_t(V/PHF)	*98*
Peak-hour vehicle-miles of travel, VMT_{60}(veh- *mi*)=V*L_t	*359*
Peak 15-min total travel time, TT_{15}(veh-h)= VMT_{15}/ATS	*2.6*

Notes

1. If Vp >= 3,200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split Vp>= 1,700 pc/h, terminated anlysis-the LOS is F.

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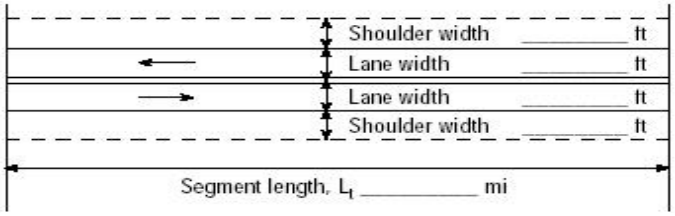
TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst	*DRW*	Highway	*News Road*
Agency or Company	*DRW Consultants, LLC*	From/To	*Old News Road/Powhatan Seconda*
Date Performed	*3/12/2008*	Jurisdiction	*JCC*
Analysis Time Period	*2007/2008 COUNTS PM*	Analysis Year	*Exhibit O2*

Project Description: *News Road Corridor Study - Exhibit O2*

Input Data



☐ Class I highway ☑ Class II highway

Terrain ☐ Level ☑ Rolling

Two-way hourly volume	*827* veh/h
Directional split	*60 / 40*
Peak-hour factor, PHF	*0.92*
No-passing zone	*100*
% Trucks and Buses , P_T	*5* %
% Recreational vehicles, P_R	*0%*
Access points/ *mi*	*1*

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	*0.93*
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	*1.9*
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	*1.1*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	*0.957*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*1010*
v_p * highest directional split proportion[2] (pc/h)	*606*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Field Measured speed, S_{FM}	*mi/h*	Base free-flow speed, $BFFS_{FM}$	*50.0 mi/h*
Observed volume, V_f	*veh/h*	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	*4.8 mi/h*
Free-flow speed, FFS FFS=S_{FM}+0.00776(V_f/ f_{HV})	*mi/h*	Adj. for access points, f_A (Exhibit 20-6)	*0.3 mi/h*
		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*45.0 mi/h*

Adj. for no-passing zones, f_{np} (*mi/h*) (Exhibit 20-11)	*2.6*
Average travel speed, ATS (*mi/h*) ATS=FFS-0.00776v_p-f_{np}	*34.5*

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	*0.94*
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	*1.5*
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	*0.976*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*980*
v_p * highest directional split proportion[2] (pc/h)	*588*
Base percent time-spent-following, BPTSF(%)=100(1-$e^{-0.000879v_p}$)	*57.7*
Adj. for directional distribution and no-passing zone, $f_{d/hp}$(%)(Exh. 20-12)	*12.5*
Percent time-spent-following, PTSF(%)=BPTSF+$f_{d/np}$	*70.3*

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	*D*
Volume to capacity ratio, v/c=V_p/ 3,200	*0.32*
Peak 15-min veh-miles of travel, VMT_{15} (veh- *mi*)= 0.25L_t(V/PHF)	*135*
Peak-hour vehicle-miles of travel, VMT_{60}(veh- *mi*)=V*L_t	*496*
Peak 15-min total travel time, TT_{15}(veh-h)= VMT_{15}/ATS	*3.9*

Notes

1. If Vp >= 3,200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split Vp>= 1,700 pc/h, terminated anlysis-the LOS is F.

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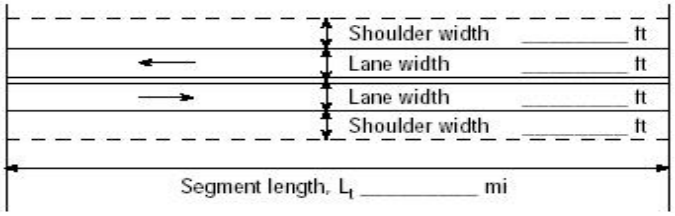
TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst	*DRW*	Highway	*News Road*
Agency or Company	*DRW Consultants, LLC*	From/To	*Old News Road/Powhatan Seconda*
Date Performed	*3/12/2008*	Jurisdiction	*JCC*
Analysis Time Period	*Approved Development AM*	Analysis Year	*Exhibit O3*

Project Description: *News Road Corridor Study - Exhibit O3*

Input Data



☐ Class I highway ☑ Class II highway

Terrain ☐ Level ☑ Rolling

Two-way hourly volume	*730* veh/h
Directional split	*67 / 33*
Peak-hour factor, PHF	*0.92*
No-passing zone	*100*
% Trucks and Buses , P_T	*5* %
% Recreational vehicles, P_R	*0*%
Access points/ *mi*	*1*

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	*0.93*
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	*1.9*
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	*1.1*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	*0.957*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*892*
v_p * highest directional split proportion[2] (pc/h)	*598*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Field Measured speed, S_{FM}	*mi/h*	Base free-flow speed, $BFFS_{FM}$	*50.0 mi/h*
Observed volume, V_f	*veh/h*	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	*3.0 mi/h*
Free-flow speed, FFS FFS=S_{FM}+0.00776(V_f/ f_{HV})	*mi/h*	Adj. for access points, f_A (Exhibit 20-6)	*0.3 mi/h*
		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*46.8 mi/h*

Adj. for no-passing zones, f_{np} (*mi/h*) (Exhibit 20-11)	*2.8*
Average travel speed, ATS (*mi/h*) ATS=FFS-0.00776v_p-f_{np}	*37.0*

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	*0.94*
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	*1.5*
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	*0.976*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*865*
v_p * highest directional split proportion[2] (pc/h)	*580*
Base percent time-spent-following, BPTSF(%)=100(1-$e^{-0.000879v_p}$)	*53.2*
Adj. for directional distribution and no-passing zone, $f_{d/hp}$(%)(Exh. 20-12)	*13.9*
Percent time-spent-following, PTSF(%)=BPTSF+$f_{d/np}$	*67.1*

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	*C*
Volume to capacity ratio, v/c=V_p/ 3,200	*0.28*
Peak 15-min veh-miles of travel, VMT_{15} (veh- *mi*)= 0.25L_t(V/PHF)	*119*
Peak-hour vehicle-miles of travel, VMT_{60}(veh- *mi*)=V*L_t	*438*
Peak 15-min total travel time, TT_{15}(veh-h)= VMT_{15}/ATS	*3.2*

Notes

1. If Vp >= 3,200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split Vp>= 1,700 pc/h, terminated anlysis-the LOS is F.

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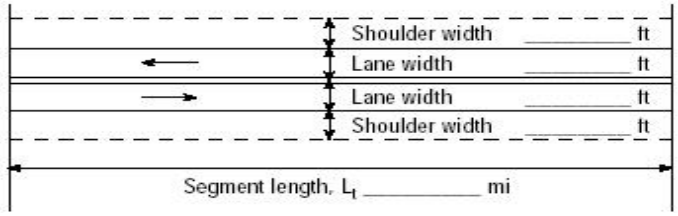
TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst	*DRW*	Highway	*News Road*
Agency or Company	*DRW Consultants, LLC*	From/To	*Old News Road/Powhatan Seconda*
Date Performed	*3/12/2008*	Jurisdiction	*JCC*
Analysis Time Period	*Approved Development PM*	Analysis Year	*Exhibit O4*

Project Description: *News Road Corridor Study - Exhibit O4*

Input Data



☐ Class I highway ☑ Class II highway

Terrain ☐ Level ☑ Rolling

Two-way hourly volume	*1001* veh/h
Directional split	*60 / 40*
Peak-hour factor, PHF	*0.92*
No-passing zone	*100*
% Trucks and Buses , P_T	*5* %
% Recreational vehicles, P_R	*0%*
Access points/ *mi*	*1*

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	*0.99*
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	*1.5*
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	*1.1*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	*0.976*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*1127*
v_p * highest directional split proportion[2] (pc/h)	*676*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Field Measured speed, S_{FM}	*mi/h*	Base free-flow speed, $BFFS_{FM}$	*50.0 mi/h*
Observed volume, V_f	*veh/h*	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	*3.0 mi/h*
Free-flow speed, FFS FFS=S_{FM}+0.00776(V_f/ f_{HV})	*mi/h*	Adj. for access points, f_A (Exhibit 20-6)	*0.3 mi/h*
		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*46.8 mi/h*

Adj. for no-passing zones, f_{np} (*mi/h*) (Exhibit 20-11)	*2.3*
Average travel speed, ATS (*mi/h*) ATS=FFS-0.00776v_p-f_{np}	*35.7*

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	*0.94*
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	*1.5*
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	*0.976*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*1186*
v_p * highest directional split proportion[2] (pc/h)	*712*
Base percent time-spent-following, BPTSF(%)=100(1-$e^{-0.000879v_p}$)	*64.7*
Adj. for directional distribution and no-passing zone, $f_{d/hp}$(%)(Exh. 20-12)	*10.3*
Percent time-spent-following, PTSF(%)=BPTSF+$f_{d/np}$	*75.1*

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	*D*
Volume to capacity ratio, v/c=V_p/ 3,200	*0.35*
Peak 15-min veh-miles of travel, VMT_{15} (veh- *mi*)= 0.25L_t(V/PHF)	*163*
Peak-hour vehicle-miles of travel, VMT_{60}(veh- *mi*)=V*L_t	*601*
Peak 15-min total travel time, TT_{15}(veh-h)= VMT_{15}/ATS	*4.6*

Notes

1. If Vp >= 3,200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split Vp>= 1,700 pc/h, terminated anlysis-the LOS is F.

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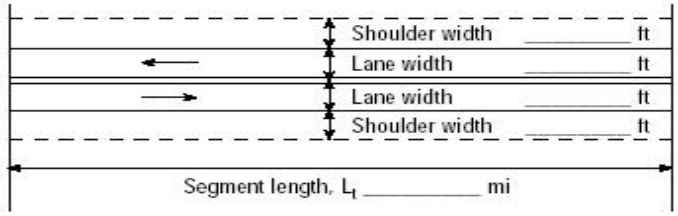
TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst	*DRW*	Highway	*News Road*
Agency or Company	*DRW Consultants, LLC*	From/To	*Old News Road/Powhatan Seconda*
Date Performed	*3/12/2008*	Jurisdiction	*JCC*
Analysis Time Period	*The Village Development AM*	Analysis Year	*Exhibit O5*

Project Description: *News Road Corridor Study - Exhibit O5*

Input Data



☐ Class I highway ☑ Class II highway

Terrain ☐ Level ☑ Rolling

Two-way hourly volume	*809* veh/h
Directional split	*65 / 35*
Peak-hour factor, PHF	*0.92*
No-passing zone	*100*
% Trucks and Buses , P_T	*5* %
% Recreational vehicles, P_R	*0%*
Access points/ *mi*	*1*

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	*0.93*
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	*1.9*
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	*1.1*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	*0.957*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*988*
v_p * highest directional split proportion[2] (pc/h)	*642*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Field Measured speed, S_{FM}	*mi/h*	Base free-flow speed, $BFFS_{FM}$	*50.0 mi/h*
Observed volume, V_f	*veh/h*	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	*3.0 mi/h*
Free-flow speed, FFS FFS=S_{FM}+0.00776(V_f/ f_{HV})	*mi/h*	Adj. for access points, f_A (Exhibit 20-6)	*0.3 mi/h*
		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*46.8 mi/h*

Adj. for no-passing zones, f_{np} (*mi/h*) (Exhibit 20-11)	*2.6*
Average travel speed, ATS (*mi/h*) ATS=FFS-0.00776v_p-f_{np}	*36.5*

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	*0.94*
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	*1.5*
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	*0.976*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*959*
v_p * highest directional split proportion[2] (pc/h)	*623*
Base percent time-spent-following, BPTSF(%)=100(1-$e^{-0.000879v_p}$)	*57.0*
Adj. for directional distribution and no-passing zone, $f_{d/hp}$(%)(Exh. 20-12)	*12.8*
Percent time-spent-following, PTSF(%)=BPTSF+$f_{d/np}$	*69.8*

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	*C*
Volume to capacity ratio, v/c=V_p/ 3,200	*0.31*
Peak 15-min veh-miles of travel, VMT_{15} (veh- *mi*)= 0.25L_t(V/PHF)	*132*
Peak-hour vehicle-miles of travel, VMT_{60}(veh- *mi*)=V*L_t	*485*
Peak 15-min total travel time, TT_{15}(veh-h)= VMT_{15}/ATS	*3.6*

Notes

1. If Vp >= 3,200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split Vp>= 1,700 pc/h, terminated anlysis-the LOS is F.

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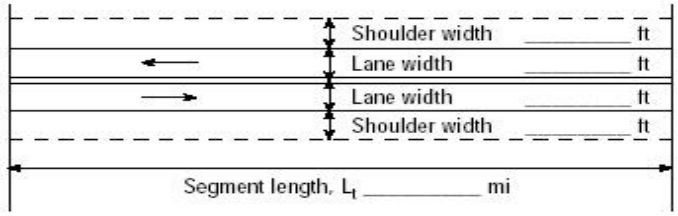
TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst	*DRW*	Highway	*News Road*
Agency or Company	*DRW Consultants, LLC*	From/To	*Old News Road/Powhatan Seconda*
Date Performed	*3/12/2008*	Jurisdiction	*JCC*
Analysis Time Period	*The Village Development PM*	Analysis Year	*Exhibit O6*

Project Description: *News Road Corridor Study - Exhibit O6*

Input Data



☐ Class I highway ☑ Class II highway

Terrain ☐ Level ☑ Rolling

Two-way hourly volume	*1149* veh/h
Directional split	*59 / 41*
Peak-hour factor, PHF	*0.92*
No-passing zone	*100*
% Trucks and Buses , P_T	*5* %
% Recreational vehicles, P_R	*0*%
Access points/ *mi*	*1*

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	*0.99*
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	*1.5*
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	*1.1*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	*0.976*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*1293*
v_p * highest directional split proportion[2] (pc/h)	*763*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Field Measured speed, S_{FM}	*mi/h*	Base free-flow speed, $BFFS_{FM}$	*50.0 mi/h*
Observed volume, V_f	*veh/h*	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	*3.0 mi/h*
Free-flow speed, FFS FFS=S_{FM}+0.00776(V_f/ f_{HV})	*mi/h*	Adj. for access points, f_A (Exhibit 20-6)	*0.3 mi/h*
		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*46.8 mi/h*

Adj. for no-passing zones, f_{np} (*mi/h*) (Exhibit 20-11)	*1.9*
Average travel speed, ATS (*mi/h*) ATS=FFS-0.00776v_p-f_{np}	*34.8*

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	*1.0*
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	*1.000*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*1249*
v_p * highest directional split proportion[2] (pc/h)	*737*
Base percent time-spent-following, BPTSF(%)=100(1-$e^{-0.000879v_p}$)	*66.6*
Adj. for directional distribution and no-passing zone, $f_{d/np}$(%)(Exh. 20-12)	*9.7*
Percent time-spent-following, PTSF(%)=BPTSF+$f_{d/np}$	*76.3*

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	*D*
Volume to capacity ratio, v/c=V_p/ 3,200	*0.40*
Peak 15-min veh-miles of travel, VMT_{15} (veh- *mi*)= 0.25L_t(V/PHF)	*187*
Peak-hour vehicle-miles of travel, VMT_{60}(veh- *mi*)=V*L_t	*689*
Peak 15-min total travel time, TT_{15}(veh-h)= VMT_{15}/ATS	*5.4*

Notes

1. If Vp >= 3,200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split Vp>= 1,700 pc/h, terminated anlysis-the LOS is F.

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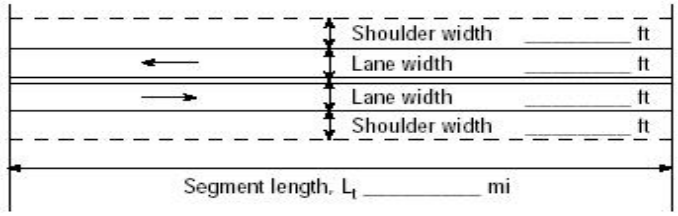
TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst	*DRW*	Highway	*News Road*
Agency or Company	*DRW Consultants, LLC*	From/To	*Old News Road/Powhatan Seconda*
Date Performed	*3/12/2008*	Jurisdiction	*JCC*
Analysis Time Period	*Proposed Development AM*	Analysis Year	*Exhibit O7*

Project Description: *News Road Corridor Study - Exhibit O7*

Input Data



☐ Class I highway ☑ Class II highway

Terrain ☐ Level ☑ Rolling

Two-way hourly volume	*885* veh/h
Directional split	*65 / 35*
Peak-hour factor, PHF	*0.92*
No-passing zone	*100*
% Trucks and Buses , P_T	*5* %
% Recreational vehicles, P_R	*0*%
Access points/ *mi*	*1*

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	*0.93*
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	*1.9*
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	*1.1*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	*0.957*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*1081*
v_p * highest directional split proportion[2] (pc/h)	*703*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Field Measured speed, S_{FM}	*mi/h*	Base free-flow speed, $BFFS_{FM}$	*50.0 mi/h*
Observed volume, V_f	*veh/h*	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	*3.0 mi/h*
Free-flow speed, FFS FFS=S_{FM}+0.00776(V_f/ f_{HV})	*mi/h*	Adj. for access points, f_A (Exhibit 20-6)	*0.3 mi/h*
		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*46.8 mi/h*

Adj. for no-passing zones, f_{np} (*mi/h*) (Exhibit 20-11)	*2.4*
Average travel speed, ATS (*mi/h*) ATS=FFS-0.00776v_p-f_{np}	*36.0*

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	*0.94*
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	*1.5*
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	*0.976*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*1049*
v_p * highest directional split proportion[2] (pc/h)	*682*
Base percent time-spent-following, BPTSF(%)=100(1-$e^{-0.000879v_p}$)	*60.2*
Adj. for directional distribution and no-passing zone, $f_{d/hp}$(%)(Exh. 20-12)	*11.9*
Percent time-spent-following, PTSF(%)=BPTSF+$f_{d/np}$	*72.1*

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	*D*
Volume to capacity ratio, v/c=V_p/ 3,200	*0.34*
Peak 15-min veh-miles of travel, VMT_{15} (veh- *mi*)= 0.25L_t(V/PHF)	*144*
Peak-hour vehicle-miles of travel, VMT_{60}(veh- *mi*)=V*L_t	*531*
Peak 15-min total travel time, TT_{15}(veh-h)= VMT_{15}/ATS	*4.0*

Notes

1. If Vp >= 3,200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split Vp>= 1,700 pc/h, terminated anlysis-the LOS is F.

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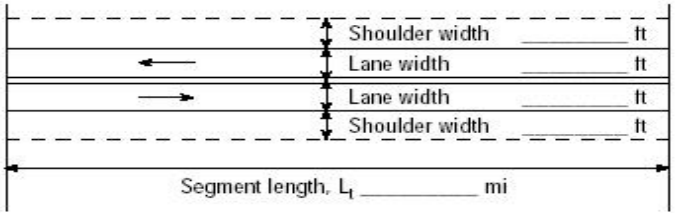
TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst	*DRW*	Highway	*News Road*
Agency or Company	*DRW Consultants, LLC*	From/To	*Old News Road/Powhatan Seconda*
Date Performed	*3/12/2008*	Jurisdiction	*JCC*
Analysis Time Period	*Proposed Development PM*	Analysis Year	*Exhibit O8*

Project Description: *News Road Corridor Study - Exhibit O8*

Input Data



☐ Class I highway ☑ Class II highway

Terrain ☐ Level ☑ Rolling

Two-way hourly volume	*1250* veh/h
Directional split	*59 / 41*
Peak-hour factor, PHF	*0.92*
No-passing zone	*100*
% Trucks and Buses , P_T	*5* %
% Recreational vehicles, P_R	*0*%
Access points/ *mi*	*1*

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	*0.99*
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	*1.5*
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	*1.1*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	*0.976*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*1407*
v_p * highest directional split proportion[2] (pc/h)	*830*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Field Measured speed, S_{FM}	*mi/h*	Base free-flow speed, $BFFS_{FM}$	*50.0 mi/h*
Observed volume, V_f	*veh/h*	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	*3.0 mi/h*
Free-flow speed, FFS FFS=S_{FM}+0.00776(V_f/ f_{HV})	*mi/h*	Adj. for access points, f_A (Exhibit 20-6)	*0.3 mi/h*
		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*46.8 mi/h*

Adj. for no-passing zones, f_{np} (*mi/h*) (Exhibit 20-11)	*1.7*
Average travel speed, ATS (*mi/h*) ATS=FFS-0.00776v_p-f_{np}	*34.1*

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	*1.0*
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	*1.000*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*1359*
v_p * highest directional split proportion[2] (pc/h)	*802*
Base percent time-spent-following, BPTSF(%)=100(1-$e^{-0.000879v_p}$)	*69.7*
Adj. for directional distribution and no-passing zone, $f_{d/hp}$(%)(Exh. 20-12)	*8.5*
Percent time-spent-following, PTSF(%)=BPTSF+$f_{d/np}$	*78.2*

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	*D*
Volume to capacity ratio, v/c=V_p/ 3,200	*0.44*
Peak 15-min veh-miles of travel, VMT_{15} (veh- *mi*)= 0.25L_t(V/PHF)	*204*
Peak-hour vehicle-miles of travel, VMT_{60}(veh- *mi*)=V*L_t	*750*
Peak 15-min total travel time, TT_{15}(veh-h)= VMT_{15}/ATS	*6.0*

Notes

1. If Vp >= 3,200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split Vp>= 1,700 pc/h, terminated anlysis-the LOS is F.

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.91	0.91	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1863	1583	1610	3234	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1770	1863	1583	1610	3234	
Volume (vph)	28	610	18	175	179	99	10	37	268	313	47	18
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	29	642	19	184	188	104	11	39	282	329	49	19
RTOR Reduction (vph)	0	0	14	0	0	49	0	0	250	0	6	0
Lane Group Flow (vph)	29	642	5	184	188	55	11	39	32	165	226	0
Turn Type	Prot		Perm	Prot		Perm	Split		Perm	Split		
Protected Phases	5	2		1	6		4	4		3	3	
Permitted Phases			2			6			4			
Actuated Green, G (s)	4.9	23.7	23.7	32.6	51.4	51.4	8.8	8.8	8.8	13.9	13.9	
Effective Green, g (s)	8.4	27.2	27.2	36.1	54.9	54.9	11.8	11.8	11.8	16.9	16.9	
Actuated g/C Ratio	0.08	0.26	0.26	0.35	0.53	0.53	0.11	0.11	0.11	0.16	0.16	
Clearance Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	143	926	414	614	1868	836	201	211	180	262	526	
v/s Ratio Prot	0.02	c0.18		c0.10	0.05		0.01	0.02		c0.10	0.07	
v/s Ratio Perm			0.01			0.07			0.18			
v/c Ratio	0.20	0.69	0.01	0.30	0.10	0.07	0.05	0.18	0.18	0.63	0.43	
Uniform Delay, d1	44.7	34.6	28.4	24.7	12.2	12.0	41.1	41.7	41.7	40.6	39.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.7	2.3	0.0	0.3	0.1	0.2	0.1	0.4	0.5	4.7	0.6	
Delay (s)	45.4	36.9	28.5	25.0	12.3	12.2	41.2	42.2	42.2	45.3	39.8	
Level of Service	D	D	C	C	B	B	D	D	D	D	D	
Approach Delay (s)		37.0			17.2			42.2			42.1	
Approach LOS		D			B			D			D	

Intersection Summary			
HCM Average Control Delay	34.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	104.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	52.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.91	0.91	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.98	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1863	1583	1610	3190	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.98	
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1770	1863	1583	1610	3190	
Volume (vph)	87	358	39	435	531	242	65	159	319	226	116	87
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	92	377	41	458	559	255	68	167	336	238	122	92
RTOR Reduction (vph)	0	0	33	0	0	133	0	0	287	0	41	0
Lane Group Flow (vph)	92	377	8	458	559	122	68	167	49	143	268	0
Turn Type	Prot		Perm	Prot		Perm	Split		Perm	Split		
Protected Phases	5	2		1	6		4	4		3	3	
Permitted Phases			2			6			4			
Actuated Green, G (s)	8.5	17.3	17.3	37.5	46.3	46.3	12.1	12.1	12.1	12.1	12.1	
Effective Green, g (s)	12.0	20.8	20.8	41.0	49.8	49.8	15.1	15.1	15.1	15.1	15.1	
Actuated g/C Ratio	0.12	0.20	0.20	0.39	0.48	0.48	0.15	0.15	0.15	0.15	0.15	
Clearance Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	204	708	317	698	1695	758	257	270	230	234	463	
v/s Ratio Prot	0.05	c0.11		c0.26	0.16		0.04	0.09		0.09	c0.10	
v/s Ratio Perm			0.03			0.16			0.21			
v/c Ratio	0.45	0.53	0.03	0.66	0.33	0.16	0.26	0.62	0.21	0.61	0.58	
Uniform Delay, d1	42.9	37.2	33.5	25.7	16.8	15.3	39.5	41.7	39.2	41.7	41.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.6	0.8	0.0	2.2	0.5	0.5	0.6	4.2	0.5	4.7	1.8	
Delay (s)	44.5	38.0	33.5	28.0	17.3	15.8	40.1	45.9	39.7	46.4	43.2	
Level of Service	D	D	C	C	B	B	D	D	D	D	D	
Approach Delay (s)		38.8			20.8			41.5			44.2	
Approach LOS		D			C			D			D	

Intersection Summary			
HCM Average Control Delay	32.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	104.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	66.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.91	0.91	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1863	1583	1610	3240	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1770	1863	1583	1610	3240	
Volume (vph)	32	610	18	175	179	113	10	45	268	370	70	24
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	34	642	19	184	188	119	11	47	282	389	74	25
RTOR Reduction (vph)	0	0	14	0	0	58	0	0	250	0	7	0
Lane Group Flow (vph)	34	642	5	184	188	61	11	47	32	195	286	0
Turn Type	Prot		Perm	Prot		Perm	Split		Perm	Split		
Protected Phases	5	2		1	6		4	4		3	3	
Permitted Phases			2			6			4			
Actuated Green, G (s)	5.1	22.4	22.4	32.6	49.9	49.9	8.8	8.8	8.8	15.2	15.2	
Effective Green, g (s)	8.6	25.9	25.9	36.1	53.4	53.4	11.8	11.8	11.8	18.2	18.2	
Actuated g/C Ratio	0.08	0.25	0.25	0.35	0.51	0.51	0.11	0.11	0.11	0.17	0.17	
Clearance Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	146	881	394	614	1817	813	201	211	180	282	567	
v/s Ratio Prot	0.02	c0.18		c0.10	0.05		0.01	0.03		c0.12	0.09	
v/s Ratio Perm			0.01			0.08			0.18			
v/c Ratio	0.23	0.73	0.01	0.30	0.10	0.08	0.05	0.22	0.18	0.69	0.51	
Uniform Delay, d1	44.6	35.8	29.4	24.7	13.0	12.8	41.1	41.9	41.7	40.3	38.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.8	3.0	0.0	0.3	0.1	0.2	0.1	0.5	0.5	7.1	0.7	
Delay (s)	45.4	38.9	29.4	25.0	13.1	13.0	41.2	42.5	42.2	47.4	39.5	
Level of Service	D	D	C	C	B	B	D	D	D	D	D	
Approach Delay (s)		38.9			17.5			42.2			42.7	
Approach LOS		D			B			D			D	

Intersection Summary			
HCM Average Control Delay	35.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	104.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	53.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.91	0.91	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.98	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1863	1583	1610	3197	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.98	
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1770	1863	1583	1610	3197	
Volume (vph)	98	358	39	435	531	291	65	186	319	254	133	92
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	103	377	41	458	559	306	68	196	336	267	140	97
RTOR Reduction (vph)	0	0	33	0	0	163	0	0	286	0	37	0
Lane Group Flow (vph)	103	377	8	458	559	143	68	196	50	160	307	0
Turn Type	Prot		Perm	Prot		Perm	Split		Perm	Split		
Protected Phases	5	2		1	6		4	4		3	3	
Permitted Phases			2			6			4			
Actuated Green, G (s)	8.8	16.4	16.4	37.6	45.2	45.2	12.5	12.5	12.5	12.5	12.5	
Effective Green, g (s)	12.3	19.9	19.9	41.1	48.7	48.7	15.5	15.5	15.5	15.5	15.5	
Actuated g/C Ratio	0.12	0.19	0.19	0.40	0.47	0.47	0.15	0.15	0.15	0.15	0.15	
Clearance Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	209	677	303	699	1657	741	264	278	236	240	476	
v/s Ratio Prot	0.06	c0.11		c0.26	0.16		0.04	0.11		0.10	c0.11	
v/s Ratio Perm			0.03			0.19			0.21			
v/c Ratio	0.49	0.56	0.03	0.66	0.34	0.19	0.26	0.71	0.21	0.67	0.65	
Uniform Delay, d1	42.9	38.1	34.2	25.7	17.5	16.2	39.2	42.1	38.9	41.8	41.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.8	1.0	0.0	2.2	0.6	0.6	0.5	7.9	0.5	6.8	3.0	
Delay (s)	44.8	39.1	34.2	27.9	18.0	16.7	39.7	50.0	39.3	48.6	44.7	
Level of Service	D	D	C	C	B	B	D	D	D	D	D	
Approach Delay (s)		39.8			21.1			42.8			45.9	
Approach LOS		D			C			D			D	

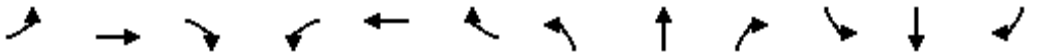
Intersection Summary			
HCM Average Control Delay	33.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	104.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	69.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.91	0.91	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1863	1583	1610	3239	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1770	1863	1583	1610	3239	
Volume (vph)	38	610	18	175	179	125	10	59	268	389	80	28
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	40	642	19	184	188	132	11	62	282	409	84	29
RTOR Reduction (vph)	0	0	14	0	0	65	0	0	249	0	7	0
Lane Group Flow (vph)	40	642	5	184	188	67	11	62	33	205	310	0
Turn Type	Prot		Perm	Prot		Perm	Split		Perm	Split		
Protected Phases	5	2		1	6		4	4		3	3	
Permitted Phases			2			6			4			
Actuated Green, G (s)	5.4	21.8	21.8	32.7	49.1	49.1	9.2	9.2	9.2	15.3	15.3	
Effective Green, g (s)	8.9	25.3	25.3	36.2	52.6	52.6	12.2	12.2	12.2	18.3	18.3	
Actuated g/C Ratio	0.09	0.24	0.24	0.35	0.51	0.51	0.12	0.12	0.12	0.18	0.18	
Clearance Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	151	861	385	616	1790	801	208	219	186	283	570	
v/s Ratio Prot	0.02	c0.18		c0.10	0.05		0.01	0.03		c0.13	0.10	
v/s Ratio Perm			0.01			0.08			0.18			
v/c Ratio	0.26	0.75	0.01	0.30	0.11	0.08	0.05	0.28	0.18	0.72	0.54	
Uniform Delay, d1	44.5	36.4	29.9	24.7	13.4	13.3	40.8	41.9	41.4	40.5	39.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.9	3.5	0.0	0.3	0.1	0.2	0.1	0.7	0.5	8.9	1.1	
Delay (s)	45.4	39.9	29.9	24.9	13.5	13.5	40.9	42.6	41.8	49.3	40.1	
Level of Service	D	D	C	C	B	B	D	D	D	D	D	
Approach Delay (s)		40.0			17.7			41.9			43.7	
Approach LOS		D			B			D			D	

Intersection Summary			
HCM Average Control Delay	35.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	104.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	54.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

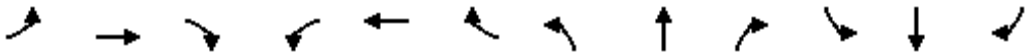
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.91	0.91	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.98	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1863	1583	1610	3200	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.98	
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1770	1863	1583	1610	3200	
Volume (vph)	107	358	39	435	531	319	65	207	319	285	151	101
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	113	377	41	458	559	336	68	218	336	300	159	106
RTOR Reduction (vph)	0	0	33	0	0	185	0	0	285	0	35	0
Lane Group Flow (vph)	113	377	8	458	559	151	68	218	51	181	349	0
Turn Type	Prot		Perm	Prot		Perm	Split		Perm	Split		
Protected Phases	5	2		1	6		4	4		3	3	
Permitted Phases			2			6			4			
Actuated Green, G (s)	10.3	17.3	17.3	36.2	43.2	43.2	12.8	12.8	12.8	12.7	12.7	
Effective Green, g (s)	13.8	20.8	20.8	39.7	46.7	46.7	15.8	15.8	15.8	15.7	15.7	
Actuated g/C Ratio	0.13	0.20	0.20	0.38	0.45	0.45	0.15	0.15	0.15	0.15	0.15	
Clearance Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	235	708	317	676	1589	711	269	283	240	243	483	
v/s Ratio Prot	0.06	c0.11		c0.26	0.16		0.04	0.12		0.11	c0.12	
v/s Ratio Perm			0.03			0.21			0.21			
v/c Ratio	0.48	0.53	0.03	0.68	0.35	0.21	0.25	0.77	0.21	0.74	0.72	
Uniform Delay, d1	41.8	37.2	33.5	26.8	18.7	17.4	38.9	42.4	38.6	42.2	42.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.6	0.8	0.0	2.7	0.6	0.7	0.5	12.2	0.4	11.7	5.3	
Delay (s)	43.3	38.0	33.5	29.5	19.4	18.1	39.4	54.5	39.1	53.9	47.4	
Level of Service	D	D	C	C	B	B	D	D	D	D	D	
Approach Delay (s)		38.8			22.5			44.5			49.5	
Approach LOS		D			C			D			D	

Intersection Summary			
HCM Average Control Delay	34.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	104.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	71.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.91	0.91	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1863	1583	1610	3237	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1770	1863	1583	1610	3237	
Volume (vph)	40	610	18	175	179	130	10	65	268	419	99	37
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	42	642	19	184	188	137	11	68	282	441	104	39
RTOR Reduction (vph)	0	0	15	0	0	69	0	0	248	0	8	0
Lane Group Flow (vph)	42	642	4	184	188	68	11	68	34	221	355	0
Turn Type	Prot		Perm	Prot		Perm	Split		Perm	Split		
Protected Phases	5	2		1	6		4	4		3	3	
Permitted Phases			2			6			4			
Actuated Green, G (s)	5.5	21.1	21.1	32.7	48.3	48.3	9.4	9.4	9.4	15.8	15.8	
Effective Green, g (s)	9.0	24.6	24.6	36.2	51.8	51.8	12.4	12.4	12.4	18.8	18.8	
Actuated g/C Ratio	0.09	0.24	0.24	0.35	0.50	0.50	0.12	0.12	0.12	0.18	0.18	
Clearance Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	153	837	374	616	1763	788	211	222	189	291	585	
v/s Ratio Prot	0.02	c0.18		c0.10	0.05		0.01	0.04		c0.14	0.11	
v/s Ratio Perm			0.01			0.09			0.18			
v/c Ratio	0.27	0.77	0.01	0.30	0.11	0.09	0.05	0.31	0.18	0.76	0.61	
Uniform Delay, d1	44.4	37.0	30.4	24.7	13.8	13.7	40.6	41.9	41.2	40.5	39.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.0	4.2	0.0	0.3	0.1	0.2	0.1	0.8	0.5	10.8	1.8	
Delay (s)	45.4	41.3	30.4	24.9	14.0	13.9	40.7	42.7	41.7	51.3	41.0	
Level of Service	D	D	C	C	B	B	D	D	D	D	D	
Approach Delay (s)		41.2			17.9			41.8			44.9	
Approach LOS		D			B			D			D	

Intersection Summary			
HCM Average Control Delay	36.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	104.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	55.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.91	0.91	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.98	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1863	1583	1610	3201	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.98	
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1770	1863	1583	1610	3201	
Volume (vph)	117	358	39	435	531	341	65	225	319	300	162	106
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	123	377	41	458	559	359	68	237	336	316	171	112
RTOR Reduction (vph)	0	0	33	0	0	200	0	0	284	0	35	0
Lane Group Flow (vph)	123	377	8	458	559	159	68	237	52	192	372	0
Turn Type	Prot		Perm	Prot		Perm	Split		Perm	Split		
Protected Phases	5	2		1	6		4	4		3	3	
Permitted Phases			2			6			4			
Actuated Green, G (s)	10.5	16.9	16.9	36.2	42.6	42.6	13.0	13.0	13.0	12.9	12.9	
Effective Green, g (s)	14.0	20.4	20.4	39.7	46.1	46.1	16.0	16.0	16.0	15.9	15.9	
Actuated g/C Ratio	0.13	0.20	0.20	0.38	0.44	0.44	0.15	0.15	0.15	0.15	0.15	
Clearance Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	238	694	311	676	1569	702	272	287	244	246	489	
v/s Ratio Prot	0.07	c0.11		c0.26	0.16		0.04	0.13		0.12	c0.13	
v/s Ratio Perm			0.03			0.23			0.21			
v/c Ratio	0.52	0.54	0.03	0.68	0.36	0.23	0.25	0.83	0.21	0.78	0.76	
Uniform Delay, d1	41.9	37.6	33.8	26.8	19.1	17.9	38.7	42.6	38.5	42.4	42.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.9	0.9	0.0	2.7	0.6	0.8	0.5	17.3	0.4	14.8	6.9	
Delay (s)	43.7	38.5	33.8	29.5	19.8	18.7	39.2	60.0	38.9	57.1	49.1	
Level of Service	D	D	C	C	B	B	D	E	D	E	D	
Approach Delay (s)		39.3			22.7			46.7			51.7	
Approach LOS		D			C			D			D	

Intersection Summary			
HCM Average Control Delay	35.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	104.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	72.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Traffic Analysis For Ford's Colony CCRC

JAMES CITY COUNTY, VIRGINIA

For:
Realtec, Inc.

By:
DRW Consultants, LLC
Midlothian, VA

July 12, 2007

Traffic Analysis For Ford's Colony CCRC

JAMES CITY COUNTY, VIRGINIA

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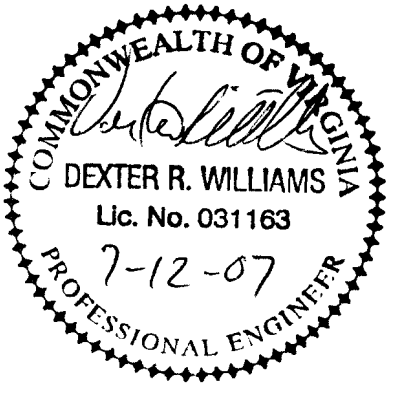
July 12, 2007



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News Road Daily Traffic Counts And Trends	3
Ford's Colony CCRC Trip Generation And Distribution	4
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REPORT
TEXT

INTRODUCTION

Realtec, Inc. (Fords' Colony) proposes to build a Continuing Care Retirement Community (CCRC) on News Road across from the existing Firestone Drive access to Ford's Colony. This report has been prepared for review by James City County (JCC) and VDOT concurrent with the proposed rezoning of the development.

The Ford's Colony CCRC development location in the Williamsburg region is shown on Exhibit 1. The Ford's Colony CCRC development location in the local area is shown on Exhibit 2. The property is located on the south side of News Road.

Access to the Ford's Colony CCRC will be on News Road across from Firestone Drive. This traffic study addresses existing and future traffic conditions at the News Road/Firestone Drive intersection.

EXISTING PEAK HOUR TRAFFIC

Peak hour turning movement counts were conducted at the News Road/Firestone Drive intersection. The counts were conducted from 7 to 9 AM on Thursday, April 26, 2007 and from 4 to 6 PM on Wednesday, April 25, 2007. The peak hour counts are tabulated on Appendix Exhibit A series.

The April 2007 peak hour turning movement volumes are shown on the intersection diagram on the top row of Exhibit 5. There is an existing eastbound left turn and westbound right turn on News Road serving Firestone Drive. There is also an existing westbound left turn that will serve the Ford's Colony CCRC.

2007 peak hour level of service (LOS) calculations are shown on Appendix Exhibits D1 and D2 for the AM and PM peak hours, respectively. Synchro is used for LOS calculations in this study, and Exhibits D1 and D2 are SYNCHRO HCM (Highway Capacity Manual) unsignalized intersection reports. There is LOS A overall (ICU LOS basis) and LOS B or better for all turning movements in both peak hours for 2007 conditions.

2012 PEAK HOUR BACKGROUND TRAFFIC

Exhibit 3 shows JCC daily traffic counts and the resulting trends on two sections of News Road. The section of News Road from Centerville Road to Springhill Subdivision has a 1.00 growth factor from 2007 to 2012, or 0% per year average increase. The section of News Road from Springhill Subdivision to Powhatan Secondary has a 1.13 growth factor from 2007 to 2012, or 2.6% per year average increase.

A 3% annual traffic growth rate is used in this study. The second row on Exhibit 5 shows 2012 peak hour background traffic at the News Road/Firestone Drive intersection with a 1.15 growth factor applied to existing peak hour counts.

2012 peak hour background traffic level of service (LOS) calculations are shown on Appendix Exhibits D3 and D4 for the AM and PM peak hours, respectively. There is LOS A overall (ICU LOS basis) and LOS B or better for all turning movements in both peak hours for 2012 background traffic.

FORD'S COLONY CCRC TRIP GENERATION, DISTRIBUTION AND ASSIGNMENT

The Ford's Colony CCRC development includes a range of senior living accommodations. Trip generation for the Ford's Colony CCRC has been calculated using Trip Generation, 7th Edition (TG7), published by the Institute of Transportation Engineers (ITE). The terminology used in the project description of the Ford's Colony CCRC has been translated to TG7 categories as follows:

1. 32 Townhomes. For trip generation purposes, TG7 Elderly Detached, Land Use Code (LUC) 251 is used in this study. These units are not attached but LUC 251 distinguishes these units from the independent living units (apartments).
2. 332 Independent Living Units. These are described as apartments, and TG7 Elderly Attached, Land Use Code 252 is characterized as apartment-like units.

3. 290 CCRC Apartments. These units translate directly to TG7 Congregate Care, Land Use Code 253.
4. 118 Assisted Living/Skill Care. These units translate directly to TG7 Assisted Living, Land Use Code 254.

Trip generation and distribution for the Ford's Colony CCRC is shown on Exhibit 4, Table 1. Site trip distribution is shown in Table 2 on Exhibit 4. The third row on Exhibit 5 shows the assignment of Ford's Colony CCRC traffic to the News Road/Firestone Drive intersection.

2012 TOTAL TRAFFIC FORECAST

The bottom row on Exhibit 5 shows total 2012 peak hour traffic at the News Road/Firestone Drive intersection.

Exhibits 6a and 6b respectively show the peak hour left turn lane warrants for the westbound left turn at News Road/Firestone Drive intersection. A left turn lane is warranted in the PM peak hour.

Exhibit 7 shows the peak hour right turn lane turn lane warrants for the eastbound right turn at News Road/Firestone Drive intersection. Only a right turn radius is warranted for AM or PM peak hour traffic.

2012 peak hour total traffic level of service (LOS) calculations are shown on Appendix Exhibits D5 and D6 for the AM and PM peak hours, respectively. There is LOS A overall (ICU LOS basis) and LOS C or better for all turning movements in both peak hours.

SUMMARY AND CONCLUSIONS

The collective effect of background traffic growth and the Ford's Colony CCRC in 2012 produces LOS C or better for all turning movements. The following table compares LOS results:

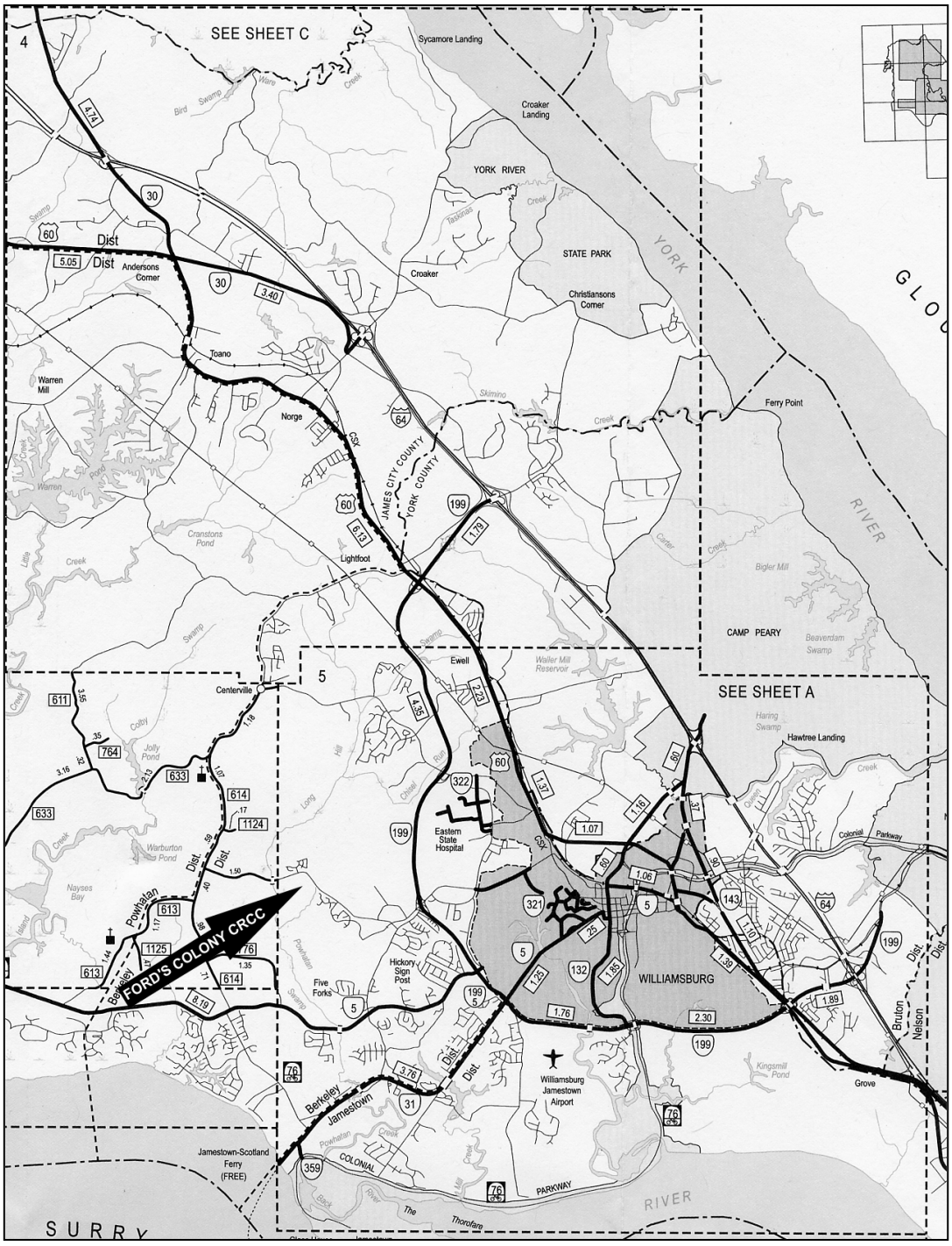
TABLE 1: NEWS ROAD/FIRESTONE DRIVE
UNSIGNALIZED INTERSECTION LOS RESULTS

	AM PEAK HOUR						PM PEAK HOUR					
	2007		2012 Bkgd		2012 Total		2007		2012 Bkgd		2012 Total	
Overall	A	21%	A	23%	A	36%	A	23%	A	26%	A	39%
EBL	A	8	A	8	A	8	A	8	A	8	A	8
EBT	n/a		n/a		n/a		n/a		n/a		n/a	
EBR	n/a		n/a		n/a		n/a		n/a		n/a	
WBL	n/a		n/a		A	8	n/a		n/a		A	8
WBT	n/a		n/a		n/a		n/a		n/a		n/a	
WBR	n/a		n/a		n/a		n/a		n/a		n/a	
NBL	n/a		n/a		n/a		n/a		n/a		n/a	
NBT	n/a		n/a		B	13	n/a		n/a		C	16
NBR	n/a		n/a		A	10	n/a		n/a		A	10
SBL	B	11	B	12	n/a		B	12	B	13	n/a	
SBT	n/a		n/a		C	15	n/a		n/a		C	21
SBR	A	9	A	9	A	9	A	10	A	10	A	9

Notes: For overall intersection, numeric values in % Intersection Capacity Utilization, with increasing value for decreasing LOS. For individual movements, numeric values in seconds delay, with increasing value for decreasing LOS.

The addition of the Ford's Colony CCRC access to align on News Road at Firestone Drive produces LOS C or better for all turning movements and does not require any additional turn lanes. The existing southbound left turn lane on Firestone Drive at News Road will be restriped to a shared left and through lane. The only other improvement at the intersection will be the connection of Ford's Colony CCRC access.

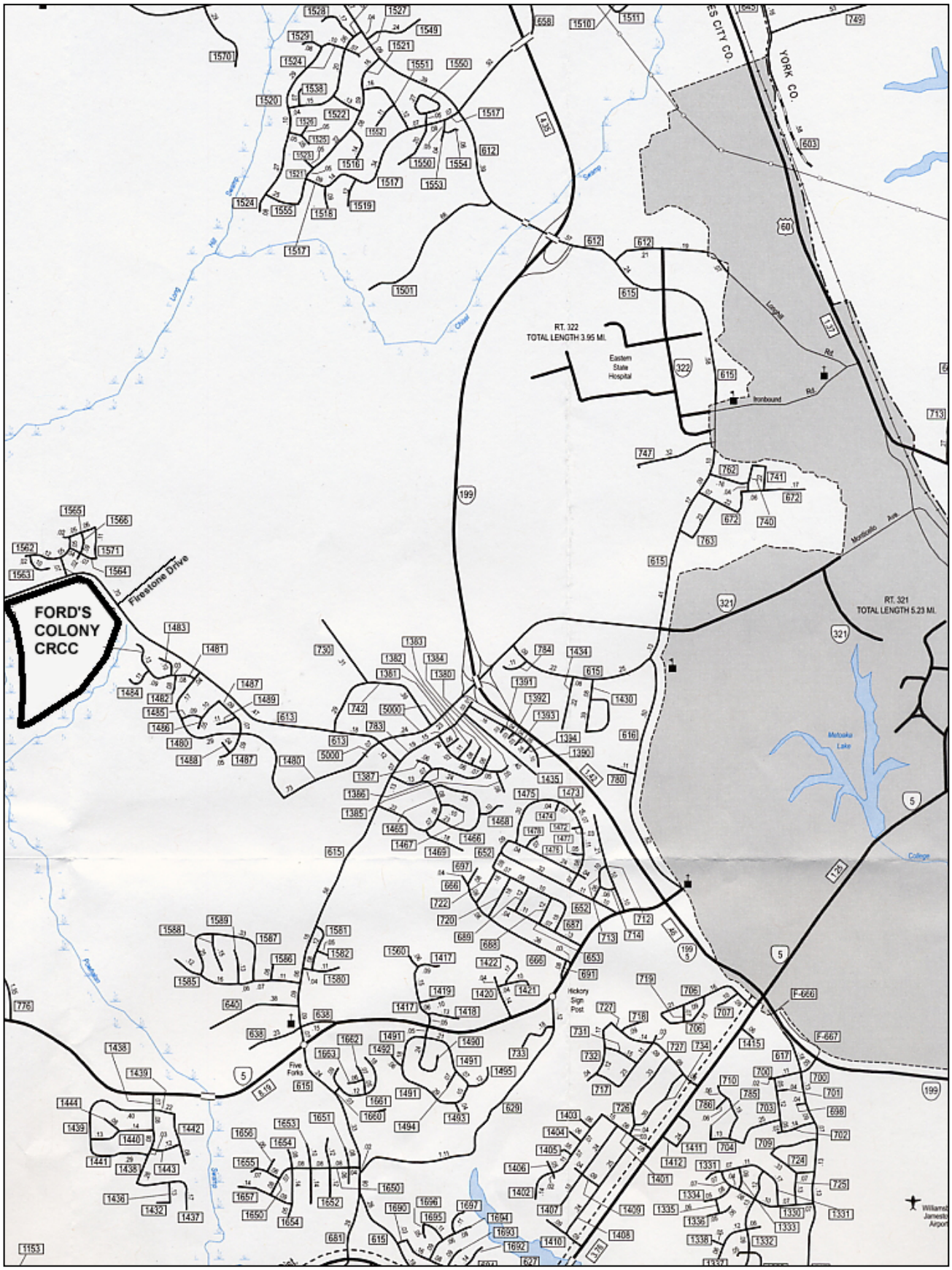
REPORT EXHIBITS



REGIONAL LOCATION MAP
FORD'S COLONY CCRC

DRW Consultants, LLC
804-794-7312

Exhibit 1



AREA LOCATION MAP
FORD'S COLONY CRCC

DRW Consultants, LLC
804-794-7312

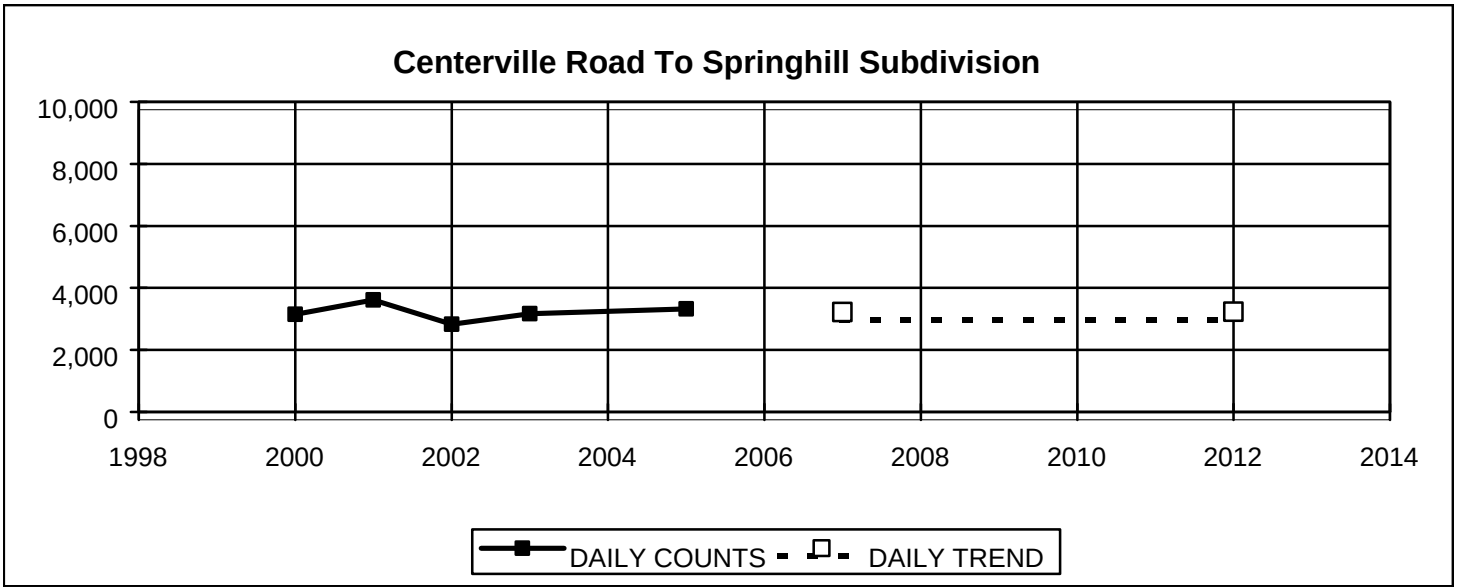
Exhibit 2

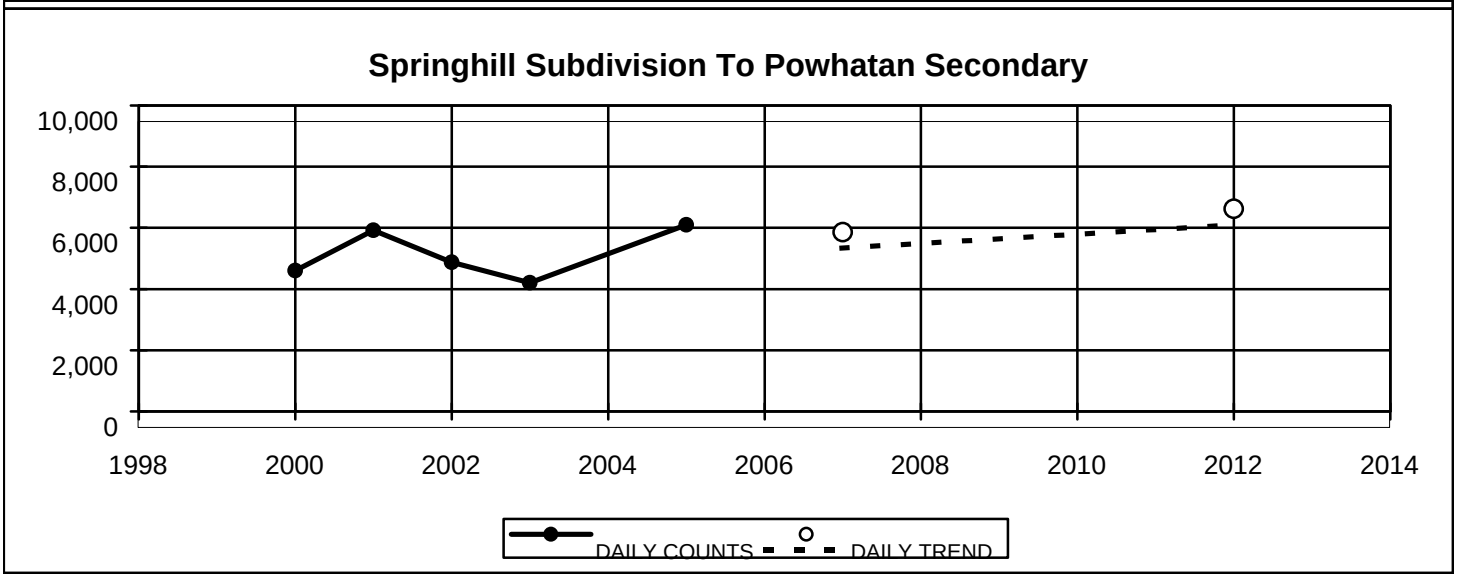
Street: News Road, Rt. 613
From: Centerville Road
To: Springhill Subdivision
Station: 36

Year	DAILY COUNTS	
2000	3,147	
2001	3,611	
2002	2,830	
2003	3,168	
2005	3,323	
Year	DAILY TREND	
2007	3,221	Δ07
2012	3,227	1.00

Street: News Road, Rt. 613
From: Springhill Subdivision
To: Powhatan Secondary
Station: 37

Year	DAILY COUNTS	
2000	4,603	
2001	5,918	
2002	4,871	
2003	4,207	
2005	6,096	
Year	DAILY TREND	
2007	5,863	Δ07
2012	6,617	1.13





Traffic counts published by James City County Planning Division.

NEWS ROAD DAILY TRAFFIC COUNTS AND TRENDS

DRW Consultants, LLC
804-794-7312

Exhibit 3

TRACT	LAND USE	LAND USE CODE	SQ.FT., OTHER UNITS	WEEKDAY TRIP GENERATION AM PEAK HOUR Enter	Exit	Total	PM PEAK HOUR Enter	Exit	Total	DAILY
TABLE 1 - Total Units Trip Generation										
	Elderly Detached	251	32 units	4	6	10	13	9	22	206
	Elderly Attached	252	332 units	12	15	27	23	14	37	1155
	Congregate Care	253	290 units	10	7	17	27	22	49	586
	Assisted Living	254	118 occ.bed	15	5	20	18	16	34	323
	TOTAL		772 units	41	33	74	81	61	142	2270
TG 7 Definitions	Elderly Detached	251	may have recreation, but not central dining or health care							
	Elderly Attached	252	apartment-like residential units							
	Congregate Care	253	centralized amenities: dining, house keeping, trans., social/rec							
	Assisted Living	254	protective oversight, ALS and Alzheimers may be included							

ITE USE CODE	253	254			251	252		
FORD'S COLONY CCRC DEFINITIONS	CCRC Apt	Asst. Liv. Skill Care	CCRC Total		Town Homes	Ind. L.U.	Non CCRC	
Community 1	154	18	172		6			
Community 2		100	100		26	214		
Community 3	136		136			118		
	290	118	408		32	332	364	

TABLE 2 - SITE TRIP DISTRIBUTION

					41	33	74	81	61	142	
	AM Peak Hour							PM Peak Hour			
	Entering Traffic		Exiting Traffic					Entering Traffic		Exiting Traffic	
Direction	% Dist.	Trips	% Dist.	Trips				% Dist.	Trips	% Dist.	Trips
East	85%	35	85%	28				85%	69	85%	52
North	5%	2	5%	2				5%	4	5%	3
West	10%	4	10%	3				10%	8	10%	6
	100%	41	100%	33				100%	81	100%	61

Trip generation rates from Trip Generation, 7th Edition (TG7) by the Institute of Transportation Engineers (ITE)

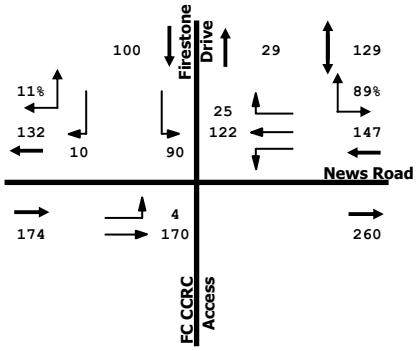
FORD'S COLONY CCRC
TRIP GENERATION AND DISTRIBUTION

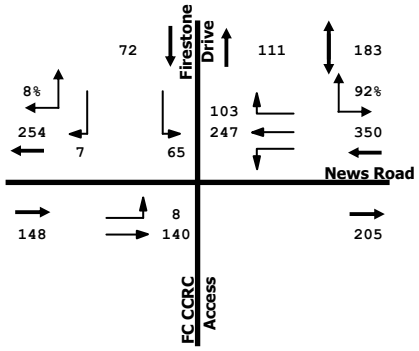
DRW Consultants, LLC
804-794-7312

Exhibit 4

Firestone Drive
FC CCRC Access
News Road

2007 Counts

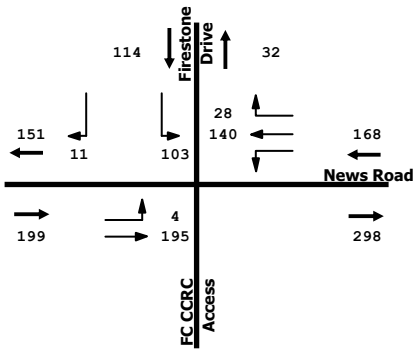


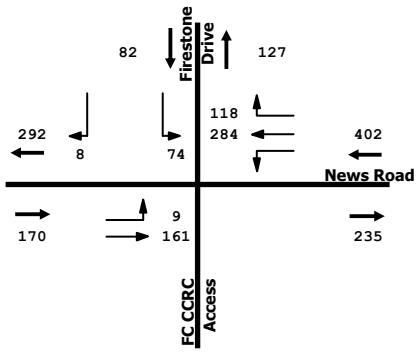


TO RT. 199

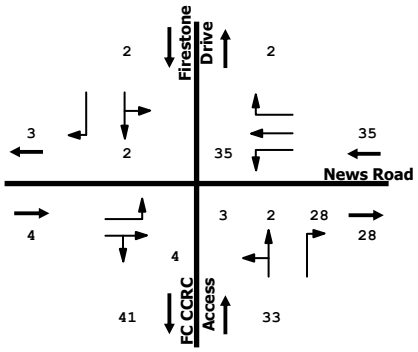
TRAFFIC GROWTH FACTOR: 1.15

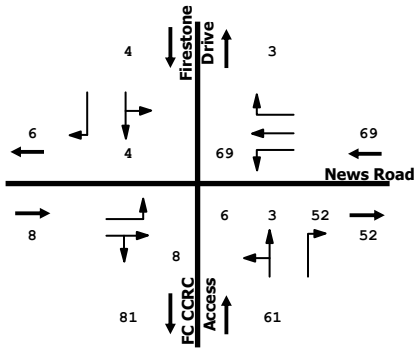
2012 Background Forecast



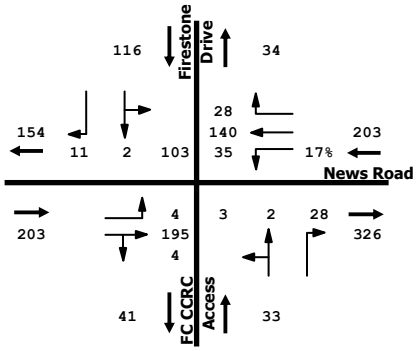


CCRC Site Traffic Assignment





2012 Total Traffic



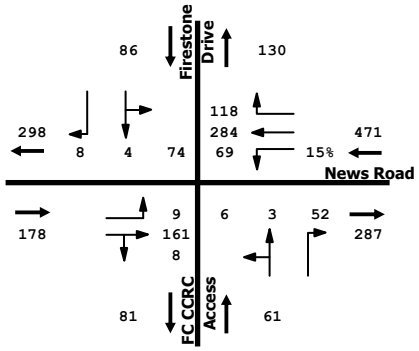


Exhibit Reference

AM Peak Hour

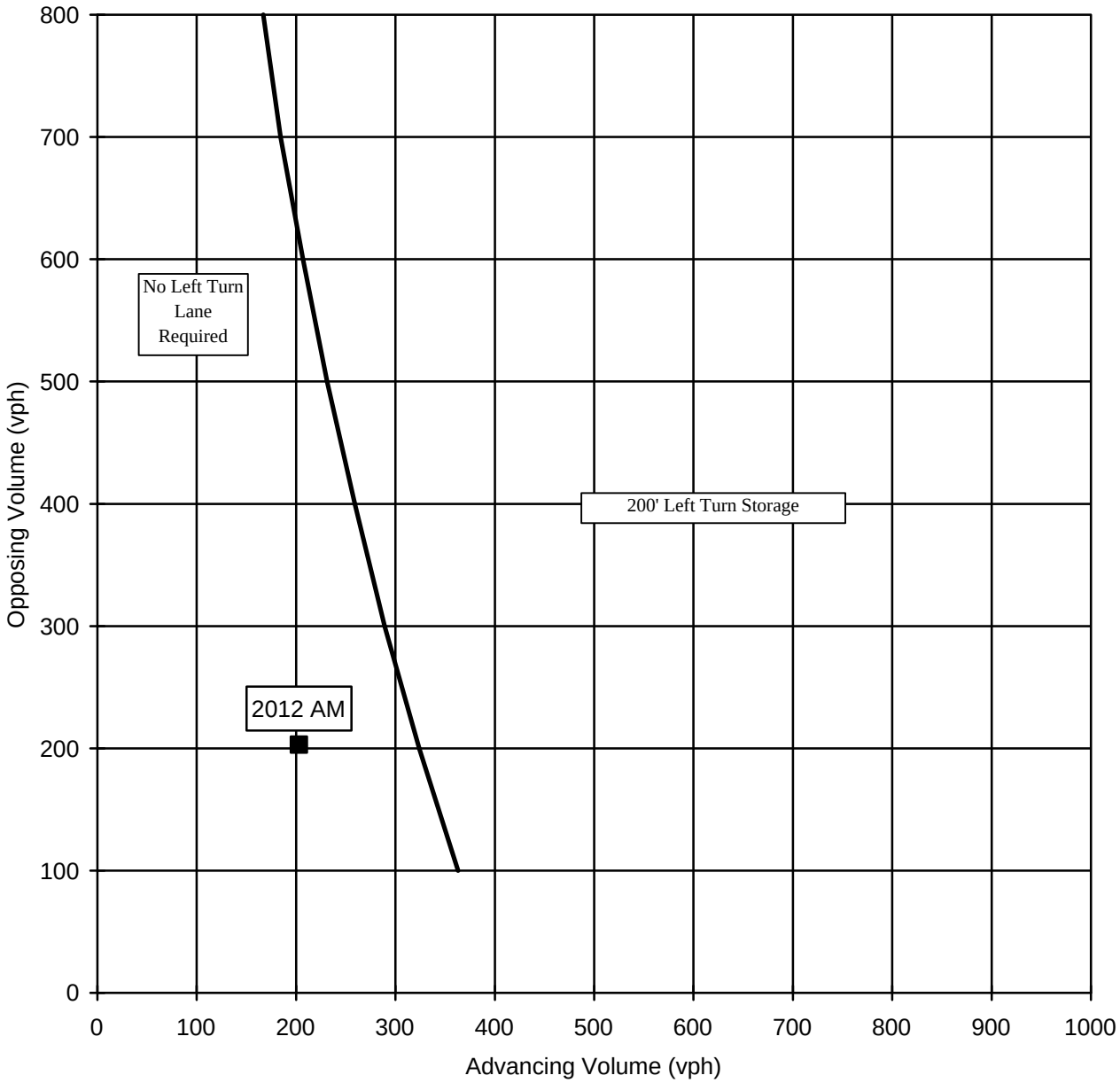
PM Peak Hour

EXISTING PEAK HOUR TRAFFIC COUNTS AND 2012 FORECAST

DRW Consultants, LLC
804-794-7312

Exhibit 5

LEFT TURN LANE WARRANT
50 mph Design Speed
% Left Turns = 17%



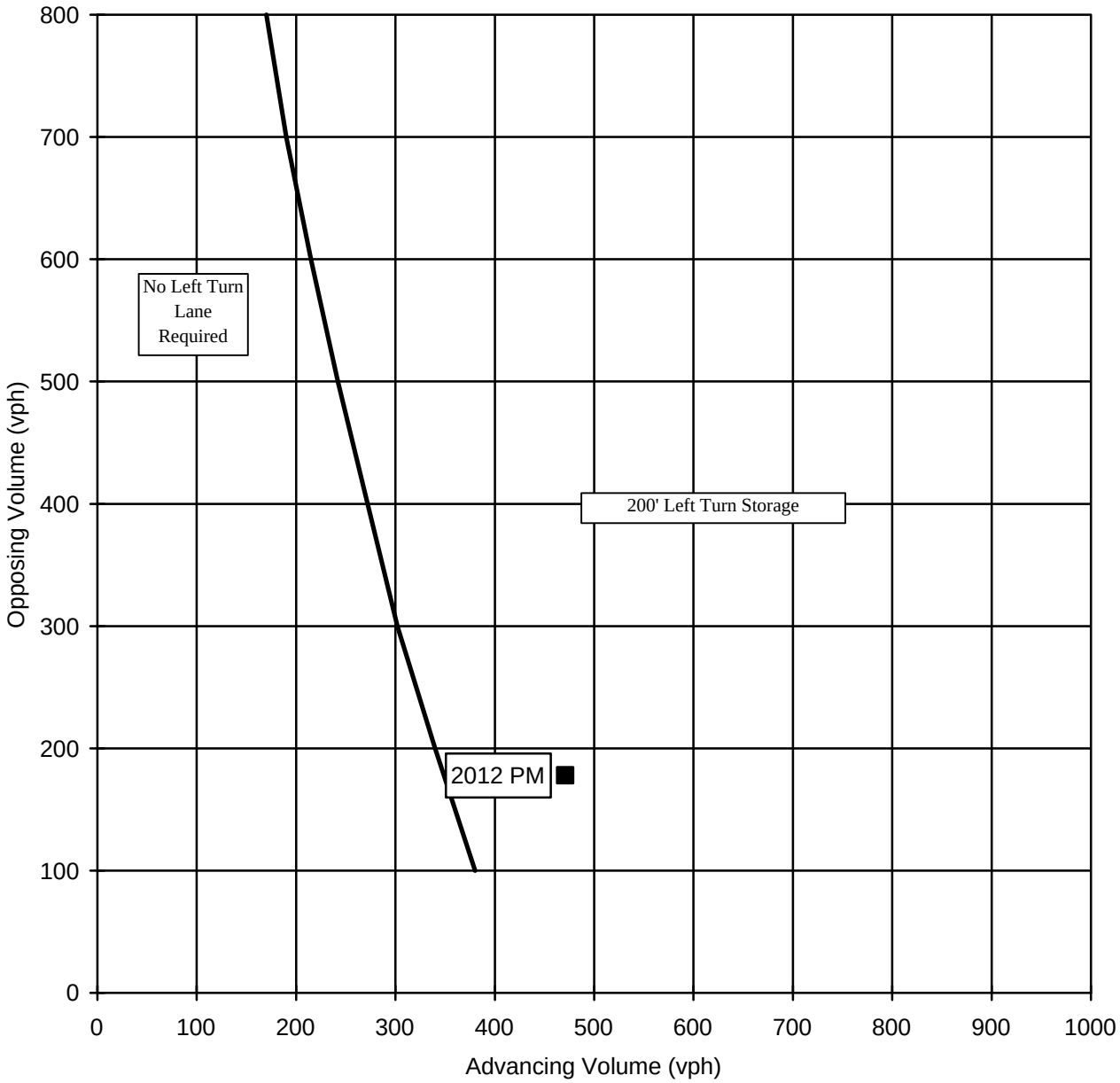
Source: Interpolated from VDOT Road Design Manual, Appendix C, derived from Highway Research Record Number 211

2012 AM PEAK HOUR
LEFT TURN LANE WARRANT
WESTBOUND NEWS ROAD AT FORDS'S COLONY CCRC

DRW Consultants, LLC
804-794-7312

Exhibit 6a

LEFT TURN LANE WARRANT
50 mph Design Speed
% Left Turns = 15%



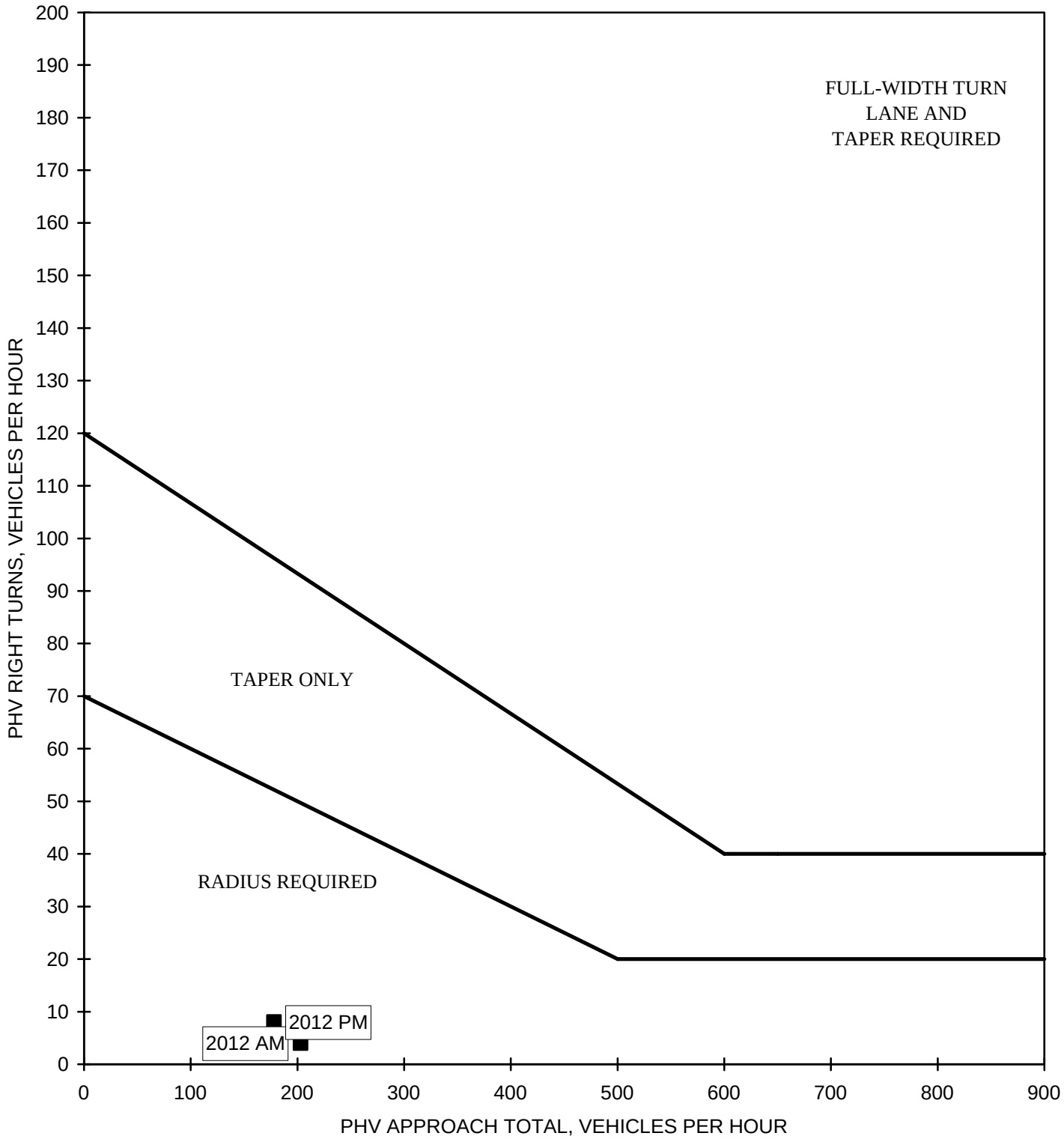
Source: Interpolated from VDOT Road Design Manual, Appendix C, derived from Highway Research Record Number 211

2012 PM PEAK HOUR
LEFT TURN LANE WARRANT
WESTBOUND NEWS ROAD AT FORDS'S COLONY CCRC

DRW Consultants, LLC
804-794-7312

Exhibit 6b

Guidelines for Right Turn Treatments 2 - Lane Highway



Source: VDOT Road Design Manual, Vol. 1, Page C-15, Figure C-1-8

2012 PEAK HOUR
RIGHT TURN LANE WARRANT
EASTBOUND NEWS ROAD AT FORD'S COLONY CCRC

DRW Consultants, LLC
804-794-7312

Exhibit 7

APPENDIX
EXHIBITS

APPENDIX
TABLE OF CONTENTS

APPENDIX EXHIBITS	Number
Peak Hour Traffic Count	**AM PM**
News Road/Firestone Drive	A1..... A2
News Road/Firestone Drive Unsignalized Intersection LOS	**AM PM**
2007 Peak Hour Traffic Counts	D1..... D2
2012 Background Traffic	D3..... D4
2012 Total Traffic (With Ford's Colony CCRC)	D5..... D6

AM PEAK HOUR

LOCATION: News Road/Firestone Drive

DATE:
Thu, 4/26/07

CUMULATIVE 15 MINUTE COUNTS

TIME	NB Left	NB Thru	NB Right	SB Left	SB Thru	SB Right	EB Left	EB Thru	EB Right	WB Left	WB Thru	WB Right	Total
7:00 to 7:15				10		1	0	54			29	3	97
7:15 to 7:30				23		2	1	109			53	6	194
7:30 to 7:45				37		6	1	142			89	10	285
7:45 to 8:00				55		6	2	197			113	17	390
8:00 to 8:15				72		9	3	244			140	26	494
8:15 to 8:30				88		12	4	252			180	30	566
8:30 to 8:45				119		14	4	320			209	36	702
8:45 to 9:00				145		16	6	367			235	42	811
Count Sheet				C		D	E	F			A	B	

15 MINUTE INCREMENT COUNTS

TIME	NB Left	NB Thru	NB Right	SB Left	SB Thru	SB Right	EB Left	EB Thru	EB Right	WB Left	WB Thru	WB Right	Total
7:00 to 7:15	0	0	0	10	0	1	0	54	0	0	29	3	97
7:15 to 7:30	0	0	0	13	0	1	1	55	0	0	24	3	97
7:30 to 7:45	0	0	0	14	0	4	0	33	0	0	36	4	91
7:45 to 8:00	0	0	0	18	0	0	1	55	0	0	24	7	105
8:00 to 8:15	0	0	0	17	0	3	1	47	0	0	27	9	104
8:15 to 8:30	0	0	0	16	0	3	1	8	0	0	40	4	72
8:30 to 8:45	0	0	0	31	0	2	0	68	0	0	29	6	136
8:45 to 9:00	0	0	0	26	0	2	2	47	0	0	26	6	109

HOUR INCREMENT

TIME	NB Left	NB Thru	NB Right	SB Left	SB Thru	SB Right	EB Left	EB Thru	EB Right	WB Left	WB Thru	WB Right	Total
7:00 to 8:00	0	0	0	55	0	6	2	197	0	0	113	17	390
7:15 to 8:15	0	0	0	62	0	8	3	190	0	0	111	23	397
7:30 to 8:30	0	0	0	65	0	10	3	143	0	0	127	24	372
7:45 to 8:45	0	0	0	82	0	8	3	178	0	0	120	26	417
8:00 to 9:00	0	0	0	90	0	10	4	170	0	0	122	25	421

PEAK HOUR TURNING MOVEMENT VOLUMES

TIME	NB Left	NB Thru	NB Right	SB Left	SB Thru	SB Right	EB Left	EB Thru	EB Right	WB Left	WB Thru	WB Right	Total
8:00 to 9:00	0	0	0	90	0	10	4	170	0	0	122	25	421

Exhibit A1

PM PEAK HOUR

LOCATION: News Road/Firestone Drive

DATE:
Wed, 4/25/07

CUMULATIVE 15 MINUTE COUNTS

TIME	NB Left	NB Thru	NB Right	SB Left	SB Thru	SB Right	EB Left	EB Thru	EB Right	WB Left	WB Thru	WB Right	Total
4:00 to 4:15				19		4	3	27			53	24	130
4:15 to 4:30				36		7	3	58			91	49	244
4:30 to 4:45				47		7	5	91			148	80	378
4:45 to 5:00				69		13	7	127			202	101	519
5:00 to 5:15				84		14	8	166			274	130	676
5:15 to 5:30				101		14	11	198			338	152	814
5:30 to 5:45				111		18	14	230			393	173	939
5:45 to 6:00				122		20	16	259			438	191	1046
Count Sheet				C		D	E	F			A	B	

15 MINUTE INCREMENT COUNTS

TIME	NB Left	NB Thru	NB Right	SB Left	SB Thru	SB Right	EB Left	EB Thru	EB Right	WB Left	WB Thru	WB Right	Total
4:00 to 4:15	0	0	0	19	0	4	3	27	0	0	53	24	130
4:15 to 4:30	0	0	0	17	0	3	0	31	0	0	38	25	114
4:30 to 4:45	0	0	0	11	0	0	2	33	0	0	57	31	134
4:45 to 5:00	0	0	0	22	0	6	2	36	0	0	54	21	141
5:00 to 5:15	0	0	0	15	0	1	1	39	0	0	72	29	157
5:15 to 5:30	0	0	0	17	0	0	3	32	0	0	64	22	138
5:30 to 5:45	0	0	0	10	0	4	3	32	0	0	55	21	125
5:45 to 6:00	0	0	0	11	0	2	2	29	0	0	45	18	107

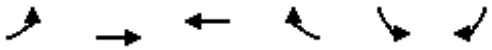
HOUR INCREMENT

TIME	NB Left	NB Thru	NB Right	SB Left	SB Thru	SB Right	EB Left	EB Thru	EB Right	WB Left	WB Thru	WB Right	Total
4:00 to 5:00	0	0	0	69	0	13	7	127	0	0	202	101	519
4:15 to 5:15	0	0	0	65	0	10	5	139	0	0	221	106	546
4:30 to 5:30	0	0	0	65	0	7	8	140	0	0	247	103	570
4:45 to 5:45	0	0	0	64	0	11	9	139	0	0	245	93	561
5:00 to 6:00	0	0	0	53	0	7	9	132	0	0	236	90	527

PEAK HOUR TURNING MOVEMENT VOLUMES

TIME	NB Left	NB Thru	NB Right	SB Left	SB Thru	SB Right	EB Left	EB Thru	EB Right	WB Left	WB Thru	WB Right	Total
4:30 to 5:30	0	0	0	65	0	7	8	140	0	0	247	103	570

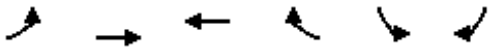
Exhibit A2



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	4	170	122	25	90	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	185	133	27	98	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	160				326	133
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	160				326	133
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				85	99
cM capacity (veh/h)	1419				666	917

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	4	185	133	27	98	11
Volume Left	4	0	0	0	98	0
Volume Right	0	0	0	27	0	11
cSH	1419	1700	1700	1700	666	917
Volume to Capacity	0.00	0.11	0.08	0.02	0.15	0.01
Queue Length 95th (ft)	0	0	0	0	13	1
Control Delay (s)	7.5	0.0	0.0	0.0	11.3	9.0
Lane LOS	A				B	A
Approach Delay (s)	0.2		0.0		11.1	
Approach LOS					B	

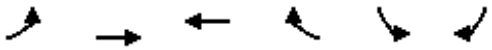
Intersection Summary			
Average Delay	2.7		
Intersection Capacity Utilization	20.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	8	140	247	103	65	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	152	268	112	71	8
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	380				438	268
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	380				438	268
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				88	99
cM capacity (veh/h)	1178				572	770

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	9	152	268	112	71	8
Volume Left	9	0	0	0	71	0
Volume Right	0	0	0	112	0	8
cSH	1178	1700	1700	1700	572	770
Volume to Capacity	0.01	0.09	0.16	0.07	0.12	0.01
Queue Length 95th (ft)	1	0	0	0	11	1
Control Delay (s)	8.1	0.0	0.0	0.0	12.2	9.7
Lane LOS	A				B	A
Approach Delay (s)	0.4		0.0		11.9	
Approach LOS					B	

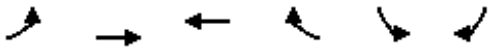
Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	23.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	4	195	140	28	103	11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	212	152	30	112	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	183				373	152
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	183				373	152
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				82	99
cM capacity (veh/h)	1392				626	894

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	4	212	152	30	112	12
Volume Left	4	0	0	0	112	0
Volume Right	0	0	0	30	0	12
cSH	1392	1700	1700	1700	626	894
Volume to Capacity	0.00	0.12	0.09	0.02	0.18	0.01
Queue Length 95th (ft)	0	0	0	0	16	1
Control Delay (s)	7.6	0.0	0.0	0.0	12.0	9.1
Lane LOS	A				B	A
Approach Delay (s)	0.2		0.0		11.7	
Approach LOS					B	

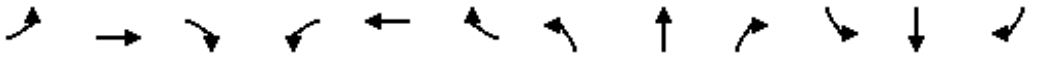
Intersection Summary			
Average Delay	2.8		
Intersection Capacity Utilization	22.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	9	161	284	118	74	8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	175	309	128	80	9
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	437				503	309
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	437				503	309
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				85	99
cM capacity (veh/h)	1123				523	731

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	10	175	309	128	80	9
Volume Left	10	0	0	0	80	0
Volume Right	0	0	0	128	0	9
cSH	1123	1700	1700	1700	523	731
Volume to Capacity	0.01	0.10	0.18	0.08	0.15	0.01
Queue Length 95th (ft)	1	0	0	0	13	1
Control Delay (s)	8.2	0.0	0.0	0.0	13.1	10.0
Lane LOS	A				B	A
Approach Delay (s)	0.4		0.0		12.8	
Approach LOS					B	

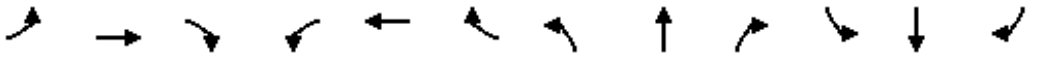
Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	25.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	4	195	4	35	140	28	3	2	28	103	2	11
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
Hourly flow rate (vph)	4	212	4	38	152	30	3	2	30	112	2	12
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	183			216			464	482	214	480	453	152
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	183			216			464	482	214	480	453	152
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			97			99	100	96	76	100	99
cM capacity (veh/h)	1392			1353			488	469	826	465	487	894

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1	SB 2
Volume Total	4	216	38	152	30	5	30	114	12
Volume Left	4	0	38	0	0	3	0	112	0
Volume Right	0	4	0	0	30	0	30	0	12
cSH	1392	1700	1353	1700	1700	480	826	465	894
Volume to Capacity	0.00	0.13	0.03	0.09	0.02	0.01	0.04	0.25	0.01
Queue Length 95th (ft)	0	0	2	0	0	1	3	24	1
Control Delay (s)	7.6	0.0	7.7	0.0	0.0	12.6	9.5	15.2	9.1
Lane LOS	A		A			B	A	C	A
Approach Delay (s)	0.1		1.3			10.0		14.7	
Approach LOS						A		B	

Intersection Summary				
Average Delay	4.2			
Intersection Capacity Utilization	36.3%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	9	161	8	69	284	118	6	3	52	74	4	8
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
Hourly flow rate (vph)	10	175	9	75	309	128	7	3	57	80	4	9
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	437			184			668	786	179	711	662	309
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	437			184			668	786	179	711	662	309
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			95			98	99	93	74	99	99
cM capacity (veh/h)	1123			1391			346	304	863	307	358	731

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1	SB 2
Volume Total	10	184	75	309	128	10	57	85	9
Volume Left	10	0	75	0	0	7	0	80	0
Volume Right	0	9	0	0	128	0	57	0	9
cSH	1123	1700	1391	1700	1700	331	863	309	731
Volume to Capacity	0.01	0.11	0.05	0.18	0.08	0.03	0.07	0.27	0.01
Queue Length 95th (ft)	1	0	4	0	0	2	5	27	1
Control Delay (s)	8.2	0.0	7.7	0.0	0.0	16.2	9.5	21.0	10.0
Lane LOS	A		A			C	A	C	A
Approach Delay (s)	0.4		1.1			10.5		20.0	
Approach LOS						B		C	

Intersection Summary				
Average Delay	3.7			
Intersection Capacity Utilization	39.3%	ICU Level of Service		A
Analysis Period (min)	15			

AGENDA ITEM NO. H.1.

ITEM SUMMARY

DATE: 11/3/2021

TO: The Planning Commission

FROM: Paul D. Holt, III, Secretary

SUBJECT: Updates to the Remote Participation Policy and the Bylaws of the Planning Commission of James City County, Virginia

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The currently adopted Bylaws of the James City County Planning Commission provide that a quorum of the Commission shall consist of a majority of the members of the Commission and a physical quorum is required. Notwithstanding, Planning Commissioners may participate in any meeting wherein the public business is discussed or transacted through electronic communication in accordance with §2.2-3708.1 of the Code of Virginia.

Pursuant to those provisions, the Planning Commission adopted a policy governing remote participation in meetings by Commission members due to personal matters or a disability or medical condition (the "Policy").

Virginia Code Section 2.2-3708.2 was recently amended during the 2021 General Assembly Special Session I such that the Policy needs to be amended and readopted to reflect changes made by the new legislation.

Namely, the General Assembly added language allowing for remote participation when a family member's medical condition requires the participant to provide care for such family member, thereby preventing the participant's physical attendance. The legislation also amended the limitation for personal matters to two or 25 percent of the meetings held per calendar year rounded up to the next whole number, whichever is greater.

The proposed revised Policy, copy attached, is in conformance with the new legislation. There are also minor revisions to clarify certain portions of the Policy.

Given the updated code reference, the PC Bylaws must be amended too. Procedurally, the Bylaws require a minimum 30 days' notice and that action be taken at a regularly scheduled meeting.

This discussion item is to begin that notification period and no vote is requested at the November meeting. Staff will return to the regularly scheduled meeting of the Planning Commission in December for action on these items.

ATTACHMENTS:

	Description	Type
🗋	Draft PC Bylaws	Exhibit
🗋	Updated Remote Participation Policy	Exhibit

REVIEWERS:

Department	Reviewer	Action	Date
Planning Commission	Holt, Paul	Approved	10/25/2021 - 2:23 PM
Planning Commission	Holt, Paul	Approved	10/25/2021 - 2:23 PM
Publication Management	Daniel, Martha	Approved	10/25/2021 - 2:25 PM
Planning Commission	Holt, Paul	Approved	10/25/2021 - 4:00 PM

B Y L A W S

PLANNING COMMISSION

COUNTY OF JAMES CITY, VIRGINIA

ARTICLE I. OBJECTIVES

This Planning Commission (the "Commission") was established by the Board of Supervisors of James City County (the "Board") on April 13, 1953, to direct the development of James City County (the "County") and ensure its prosperity, health, safety, and general welfare, in accordance with Chapter 22, Title 15.2, Article 2, *Code of Virginia*, 1950, as amended (the "Virginia Code").

The Commission shall be responsible for making recommendations to the board of supervisors on all phases of county planning, including a comprehensive plan, long-range planning, zoning, and subdivision regulations. The Commission shall also be responsible for preparing and submitting annual capital improvement programs to the governing body, in accordance with applicable state code. It shall also have the powers and duties provided by general law and such other powers and duties as may be assigned by the board of supervisors.

ARTICLE II. MEMBERSHIP

The Commission shall consist of 7 or 9 residents of the county, each appointed by the Board for a term of four years.

ARTICLE III. MEETINGS

1. All meetings of the Commission shall be open to the public.

2. Special meetings of the Commission may be called by the Chair or by two members upon written request to the Secretary. The Secretary shall deliver (via hand delivery, U.S. Mail, or electronic mail, return receipt requested) to all members, at least five days in advance of a special meeting, a written notice fixing the time, place and the purpose of the meeting.

3. Written notice of a special meeting is not required if the time of the special meeting has been fixed at a regular meeting, or at a previous special meeting at which all members were present.

4. A quorum of the Commission shall consist of a majority of the members of the Commission and a physical quorum is required *unless otherwise permitted by state law for the continuity of government operations or consistent with the Virginia Freedom of Information Act (Virginia Code § 2.2-3700 et seq.), as amended ("FOIA")*. ~~Notwithstanding,~~ Planning Commissioners may participate in any meeting wherein the public business is discussed or transacted through electronic communication in accordance with ~~§2.2-3708.1 of the Code of Virginia~~ *FOIA and policies adopted by the Commission*.

5. No action of the Commission shall be valid unless approved by a majority vote of those present and voting.

6. The annual meeting for the election of officers (Chair and Vice Chair) shall be held as the first order of business at a regular meeting to occur the third week of March of each year and thereafter the newly elected officers shall preside at the regular meeting in April. When a vacancy occurs for the Chair or Vice Chair, an election shall be held on the next regular meeting date.

7. All minutes and records of the Commission of its meetings, resolutions, transactions and votes, shall be kept by the Secretary.

8. The commission, by resolution adopted at a regular meeting, may fix the day or days to which any meeting shall be continued if the chair, or vice-chair if the chair is unable to act, finds and declares that weather or other conditions are such that it is hazardous for members to attend the meeting. Such finding shall be communicated to the members and press as promptly as possible. All hearings and other matters previously advertised for such meeting shall be conducted at the continued meeting and no further advertisement is required. The commission shall cause a copy of such resolution to be inserted in a newspaper having general circulation in the locality at least seven days prior to the first meeting held pursuant to the adopted schedule.

ARTICLE IV. OUTSIDE MEETINGS WITH APPLICANTS

1. Planning Commissioners are permitted to meet with applicants outside of a Planning Commission meeting or public hearing pursuant to the following:

    a. Commissioners shall publicly disclose all meetings by reporting them verbally at the Planning Commission meeting where the case is scheduled for public hearing.
    b. Commissioners may find it helpful to contact Planning Division staff prior to such meetings to gather facts about the application; the staff may attend such meetings if requested by the Commission and approved by the Planning Director or designee.
    c. The purpose of such meetings is limited to fact finding and clarification for all parties.
    d. Commissioners should endeavor to include one other Commissioner, when possible, in the meeting.
    e. Following such meeting, a summary of the discussion shall be provided to all Commission members.
    f. Commissioners shall not make a commitment of their voting intent.

ARTICLE V. MATTERS PENDING BEFORE THE COMMISSION

1. All matters which require an advertised public hearing in accordance with Section 15.2-2204 of the Virginia Code and which meet submittal requirements filed with the Planning Division at least six weeks before the regular meeting are to be placed on the agenda for the advertised public hearing. All other matters filed at least 15 days before the regular meeting in the

Planning Division are to be placed on the agenda. Any matter not placed on the agenda in advance of the meeting can be considered at the meeting by a majority vote of the Commission.

2. For each public hearing, notices shall be forwarded to the Commission members no less than 7 days prior to the public hearing.

ARTICLE VI. HEARINGS

1. Advertised public hearings shall be scheduled during a regular meeting, except in the event of a joint public hearing between the Commission and the Board.

2. For each public hearing item, presentations by staff, applicants, individuals or groups shall be limited as follows:

   a. Presentations by staff, applicants and groups are limited to 15 minutes each;

   b. Comments by individuals are limited to 5 minutes each.

   c. At a meeting, the time limits set forth in a, b, and/or c above may be extended at the discretion of the Chair.

ARTICLE VII. VOTING

1. No member present shall abstain from voting on a roll call vote unless a member has a conflict of interest in the matter being voted upon. For the purposes of this paragraph, a "conflict of interest" shall exist when there is an actual conflict: (1) pursuant to the Virginia State and Local Government Conflict of Interests Act, Section 2.2-3100 et seq. of the Virginia Code; or (2) pursuant to any applicable policy adopted by the Board of Supervisors; or (3) as stated by the Commission member unless objected to by a majority vote of the members of the Commission.

2. In reporting a vote to the Board, the Secretary shall indicate (in writing) the recorded roll call vote, including any abstentions.

ARTICLE VIII. DUTIES

A. CHAIR

The Chair shall have the following duties:

1. Preside at meetings and hearings of the Commission;

2. When authorized by the Commission, the Chair shall affix to any documents its signature on the Commission's behalf;

3. The Chair or the Chair's designee shall represent the Commission and keep it informed when not in session;

4. The Chair shall appoint all members and Chairs of committees and subcommittees; and
5. The Chair or the Chair's appointee shall act as a liaison to the Williamsburg and York County Planning Commissions.

B. VICE CHAIR

The Vice Chair shall perform the duties of the Chair during the absence or disability of the Chair.

C. SECRETARY

The Secretary of the Commission shall be the Director of Planning and shall have the following duties:

1. Keep a record of all regular, adjourned regular, special, and adjourned special meetings and public hearings and transcribe in a minute book of the Commission;

2. Prepare and cause to be delivered all notices of all meetings required to be sent under these Bylaws to Commission members;

3. Have charge of all official books, papers, maps, and records of the Commission and conduct all official correspondence relative to hearings, meetings, resolutions, decisions, and other business of the Commission as directed by the Chair or reflected by valid actions of the Commission;

4. Receive minutes of all committee meetings and preserve these as official records of the Commission; and

5. Notify the Vice Chair, by telephone or in person, on the day the Chair informs the Secretary that they will not be present at a scheduled meeting. It is the duty of the Secretary to brief the Vice Chair on items to come before the Commission when the Vice Chair presides.

D. MEMBER DUTIES

Members of the Commission shall have the duties assigned to it by the Virginia Code, the County Charter, and as assigned by the Board. With respect to attendance at meetings, the Commission shall have the following specific duties:

1. Attend regular, adjourned regular, special and adjourned special meetings and public hearings;

2. Attend regular, adjourned regular, special, and adjourned special committee meetings to which the member is appointed;

3. Represent the Commission at Board meetings in rotation; and

4. Attend ad-hoc committee meetings as agreed to by the Commission.

ARTICLE IX. COMMITTEES

1. The Director of Planning or the Director's designee shall serve as a non-voting, ex officio member of all standing and special committees.

2. All committee reports written or oral shall be an official record of the Commission.

3. The following committees and their Chair shall be appointed by the Commission Chair within thirty days after the Chair takes office:

   a. Development Review Committee. This Committee shall be composed of at least four members and have the following responsibilities:

      1. Review those applications for subdivisions which are required by law to be submitted to the Commission for approval, receive and review staff reports on them, and make recommendations to the Commission;

      2. Review those site plan applications that are required by law to be submitted to the Commission for approval, receive and review staff reports on them, and make recommendations to the Commission.

      3. Review those applications, where provided by law and as more specifically provided therein, that serve as an appeal of a decision by the planning director or his designee.

      4. Unless otherwise provided for by law, such decisions of the DRC shall be recommendations which are then forwarded to the full Commission for action.

   b. Policy Committee. This Committee shall be composed of at least four members and shall have the following responsibilities:

      1. Address long-range planning goals of the Commission and explore strategies for achieving them; and

      2. Address ways to maintain and improve working relationships between the Commission, other County organizations, as well as with surrounding jurisdictions and organizations involved in planning initiatives.

      3. Conduct the Commission's initial review of the Capital Improvement Plan.

      4. Recommend and prepare new and revised policies for the Commission.

      5. Conduct the Commission's initial review of ordinance amendments, as directed by the Chair of the Commission.

c. Leadership Committee. This committee shall be composed of three members; the Chair and Vice Chair of the Commission and the Chair of the Policy Committee. The Leadership Committee shall review concerns raised regarding the conduct of the Commission or any one of its members acting in his or her official capacity. The Leadership Committee shall, if deemed necessary by the Leadership Committee, recommend appropriate remedial measures to the Commission.

ARTICLE X. PARLIAMENTARY AUTHORITY AND ORGANIZATIONAL PROCEDURE

The Commission shall follow the most recent edition of Robert's Rules of Order, and more specifically, the provisions which pertain to the "conduct of business in boards" and in particular, the "Procedure in Small Boards."

ARTICLE XI. AMENDMENT

Amendments may be made to these Bylaws by a two-thirds (2/3) vote of the Commission voting members only after a minimum 30 days' prior notice is given and only at a regular scheduled meeting.

ARTICLE XII. MISCELLANEOUS

The Commission may suspend any of these rules by not less than a two-thirds (2/3) vote of those Commission members present and voting at the meeting.

Adopted November 28, 1978
Amended July 10, 1990
Amended May 12, 1992
Amended March 8, 1994
Amended May 4, 1998
Amended June 1, 1998
Amended June 3, 2002
Amended August 5, 2002
Amended January 12, 2004
Amended January 6, 2010
Amended April 7, 2010
Amended March 5, 2014
Amended March 4, 2015

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Richard Krapf, Chairman

PLANNING COMMISSION OF JAMES CITY COUNTY, VIRGINIA

POLICY FOR REMOTE PARTICIPATION

In accordance with § 2.2-3708.2 of the Code of Virginia, the following policy is established for members' remote participation in meetings of the Planning Commission (the "Commission") due to a personal matter or a disability or other medical condition. A member may participate in a meeting through electronic communication means from a remote location only as follows:

1. A quorum of the Commission must be physically assembled at one central location.

2. If a member's remote participation is due to a personal matter:
    a. On or before the day of a meeting, the member shall notify the chair of the Commission that the member is unable to attend the meeting due to a personal matter. The member must identify with specificity the nature of the personal matter. The member should also notify the Commission's Secretary (*i.e.* the Director of Planning or a designee) if the member desires to participate in a meeting remotely due to personal matter that prevents the member's physical attendance.
    b. The Commission members physically present must approve the remote participation by a majority vote, which shall be recorded in the Commission's minutes. The decision shall be based solely on the criteria in this policy, without regard to the identity of the member or matters that will be considered or voted on during the meeting. If the member's remote participation is disapproved because such participation would violate this policy, such disapproval shall be recorded in the Commission's minutes with specificity as to the conflict with this policy.
    c. The Secretary shall record in the Commission's minutes: (i) the specific nature of the personal matter cited by the member, and (ii) the remote location from which the member participated.
    d. Remote participation by any member due to a personal matter shall be limited in each calendar year to two meetings or 25 percent of the meetings held per calendar year rounded up to the next whole number, whichever is greater.

3. If a member's remote participation is due to a disability or medical condition:
    a. On or before the day of a meeting, the member shall notify the chair of the Commission that the member is unable to attend the meeting due to (i) a temporary or permanent disability or medical condition that prevents the member's physical attendance, or (ii) a family member's medical condition that required the member to provide care for such family member, thereby preventing the member's physical attendance. The member should also notify the Commission's Secretary (*i.e.* the Director of Planning or a designee) if the member desires to participate in a meeting remotely but a disability or other medical condition prevents the member's physical attendance.
    b. The Secretary shall record in the Commission's minutes: (i) the fact that the member participated through electronic communication means due to a disability or other medical condition consistent with the categories in 3(a), and (ii) the remote location from which the member participated.

4. The location of the member's remote participation need not be open to the public.

5. For any remote participation by electronic communication means, the Secretary of the Commission shall make arrangements for the voice of the member or members to be heard by all persons in attendance at the meeting location.

This policy shall also be applicable to committee meetings of the Commission, to include the Development Review Committee and the Policy Committee.

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Chair

Adopted by the Planning Commission of James City County, Virginia, this __ day of ___, 2021.

AGENDA ITEM NO. H.2.

ITEM SUMMARY

DATE: 11/3/2021

TO: The Planning Commission

FROM: Paul D. Holt, III, Director of Community Development and Planning

SUBJECT: Planning Director's Report - November 2021

ATTACHMENTS:

	Description	Type
🗋	Memorandum	Cover Memo
🗋	Spreadsheet Listing New Cases Received	Cover Memo

REVIEWERS:

Department	Reviewer	Action	Date
Planning Commission	Holt, Paul	Approved	10/26/2021 - 8:26 AM
Planning Commission	Holt, Paul	Approved	10/26/2021 - 8:29 AM
Publication Management	Daniel, Martha	Approved	10/26/2021 - 8:31 AM
Planning Commission	Holt, Paul	Approved	10/26/2021 - 8:32 AM

PLANNING DIRECTOR'S REPORT
November 2021

This report summarizes the status of selected Department of Community Development activities during the past month.

- **Planning**
  - **Monthly Case Report:** For a list of all cases received in the last two months, please see the attached documents.

  - **Board Action Results:**
    - **October 14, 2021**
      - There were no Public Hearings on the Agenda.

Plan Type	Plan Number	Case Title	Address	Plan Description	Plan Assigned To	Plan District
Conceptual Plan	C-21-0087	Pocahontas Trail Multimodal Draft Plans	8421 POCAHONTAS TRL	Pocahontas Trail Multimodal 30% Plans	Thomas Leininger	Roberts
	C-21-0088	Stonehouse Water Master Plan	9150 SIX MOUNT ZION RD	Stonehouse Water Master Plan Phase 1A	Thomas Wysong	Stonehouse
	C-21-0089	4396 Landfall Dr. Pier	4396 LANDFALL DR	4396 Landfall Dr. Pier	Terry Costello	Berkeley
	C-21-0096	1303 Jamestown Rd Broadwater Cannabis	1303 JAMESTOWN RD	1303 Jamestown Rd Broadwater Cannabis	Jose Ribeiro	Berkeley
	C-21-0097	Stonehouse Tract S Development & Stormwater Plan	9250 SIX MOUNT ZION RD	Stonehouse Tract S Development & Stormwater Plan	Thomas Wysong	Stonehouse
	C-21-0098	Stonehouse Tract 11A Development & Stormwater Plan	9100 SIX MOUNT ZION RD	Stonehouse Tract 11A Development & Stormwater Plan	Thomas Wysong	Stonehouse
	C-21-0099	Stonehouse Tract 10A Development & Stormwater Plan	9101 SIX MOUNT ZION RD	Stonehouse Tract 10A Development & Stormwater Plan	Thomas Wysong	Stonehouse
	C-21-0100	6945 Pocahontas Trail Work Force Housing	6945 POCAHONTAS TRL	Proposed conversion of existing conference hotel to multi-family residential for market rate "work force" housing	Tori Haynes	Roberts
Subdivision Plat	S-21-0069	2188 Lake Powell Road, Perkinson Family Subdivision	2188 LAKE POWELL RD	2188 Lake Powell Road, Perkinson Family Subdivision	Tori Haynes	Roberts
	S-21-0074	113 William Richmond Lots 187 & 188 BLA	113 WILLIAM RICHMOND	113 William Richmond Lots 187 & 188 BLA	Thomas Leininger	Roberts
	S-21-0075	Stonehouse Tract 3, Parcel A, Section 3	9495 ASTILBE LN	Stonehouse Tract 3, Parcel A, Section 3, Lot 34 & Lot 35	Thomas Wysong	Stonehouse
	S-21-0076	Stonehouse Tract 3, Parcel B, Section 4	9535 GODDIN CT	Stonehouse Tract 3, Parcel B, Section 4, Lot 1	John Risinger	Stonehouse
	S-21-0077	Stonehouse Tract 3, Parcel C, Section 4	9820 CORAL BELLS CT	Stonehouse Tract 3, Parcel C, Section 4, Lots 5-9	Thomas Wysong	Stonehouse
Site Plan	SP-21-0095	James City County Marina Improvement Project	2054 JAMESTOWN RD	James City County Marina Improvement Project Amendment #4 (lighting)	Tori Haynes	Berkeley
	SP-21-0096	7754 Richmond Road. Bryant Contracting SP Amendment	7754 RICHMOND RD	7754 Richmond Road ? Bryant Contracting SP Amendment Fencing Revision	Terry Costello	Stonehouse
	SP-21-0097	4091 Ironbound Rd. Self Storage Facility SP Amendment	4091 IRONBOUND RD	4091 Ironbound Rd. Self Storage Facility Emergency Lighting SP Amendment	Tori Haynes	Jamestown
	SP-21-0098	4881 Centerville Rd. Verizon Tower SP Amendment	4881 CENTERVILLE RD	4881 Centerville Rd. Verizon Tower SP Amendment	John Risinger	Powhatan
	SP-21-0099	Billsburg Brewery Picnic Pavilion SP Amendment	2054-B JAMESTOWN RD	Replaces previously approved 20' x 60' (1,200 SF) permanent event tent with a 30' X 40' (1,200 SF) picnic pavilion	Tori Haynes	Berkeley
	SP-21-0100	3900 John Tyler Hwy Cell Tower Antenna SP Amendment	3900 JOHN TYLER HWY	Proposal to remove 6 antennas and 6 RRH(s) and install 9 antennas and 9 RRH(s) to pre-existing cell tower	Terry Costello	Berkeley
	SP-21-0101	10039 Old Stage Rd Cell Tower Antenna Amendment	10039 OLD STAGE RD	Proposal to remove 9 RRU(s) and install 3 antennas and 6 new RRU(s) to pre-existing cell tower	John Risinger	Stonehouse
	SP-21-0102	4039 Ironbound Rd Cell Tower Antenna Amendment	4039 IRONBOUND RD	Proposal to remove 6 antennas and 9 RRH(s) and install 9 antennas and 9 new RRH(s) to pre-existing cell tower	Tom Leininger	Jamestown
	SP-21-0103	127 Carriage Rd Cell Tower Amendment	127 CARRIAGE RD	Proposal to install 3 antennas & 3 sector frame mounts, 6 proposed RRU's & ancillary equipment on an existing communications tower. Install metal platform in leased area for ground equipment cabinets.	Terry Costello	Jamestown
	SP-21-0104	10039 Old Stage Rd. Dish Tower SP Amendment	10039 OLD STAGE RD	Proposal to install 3 antennas & 3 sector frame mounts, 6 proposed RRU's & ancillary equipment on an existing communications tower. Install metal platform in leased area for ground equipment cabinets.	John Risinger	Stonehouse
	SP-21-0105	5701 Centerville Rd. Dish Tower SP Amendment	5701 CENTERVILLE RD	Proposal to install 3 antennas & 3 sector frame mounts, 6 proposed RRU's & ancillary equipment on an existing communications tower. Install metal platform in leased area for ground equipment cabinets.	John Risinger	Powhatan
	SP-21-0106	44660 Longhill Rd Cell tower Amendment	4460 LONGHILL RD	Proposal to nstall 3 antennas & 3 sector frame mounts, 6 proposed RRU's & ancillary equipment on an existing communications tower. Install metal platform in leased area for ground equipment cabinets	Tom Leininger	Powhatan
	SP-21-0107	4881 Centerville Rd. Verizon Tower SP Amendment	4881 CENTERVILLE RD	Proposal to Install 3 new antennas, 6 RRH's on new platform antenna mount with ancillary equipment on existing tower. Install metal platform for placement of ground equipment cabinets within leased area	John Risinger	Powhatan
	SP-21-0108	Warhill High School Auxiliary Gym	4615 OPPORTUNITY WAY	Small Site Plan for Warhill High School Auxiliary Gym & Shelter	Tori Haynes	Powhatan
	SP-21-0109	6487 Richmond Rd Cell Tower	6487 RICHMOND RD	Proposal to collocate new antenna and equipment to existing tower for Dish Wireless at 185'. Add 5'x7' steel equipment platform within existing fenced compound. Tower height will not increase and no additional ground disturbance required	Thomas Leininger	Stonehouse
	SP-21-0110	7581 Richmond Rd. Blaine Landing Apartments	7581 RICHMOND RD	Site plan for 119 residential apartment units with clubhouse and pool	John Risinger	Stonehouse
	SP-21-0111	Busch Gardens Rhine River BMP SP Amendment	7851 POCAHONTAS TRL	Rhine River Dam Outfall Structure Repair	Jose Ribeiro	Roberts
	SP-21-0113	Vacation Village Entrance Improvements	5000 COACH HOUSE LN	Vacation Village Entrance Improvements	Thomas Wysong	Jamestown
Rezoning	Z-21-0014	Governor's Land Proffer Amendment	2700 TWO RIVERS RD	Amendment to current proffers associated with JCC Case No. Z-0007-1996 and Z-0007-1989 to eliminate the playground	John Risinger	Berkeley

AGENDA ITEM NO. I.1.

ITEM SUMMARY

DATE: 10/6/2021

TO: The Planning Commission

FROM: Paul D. Holt, III, Director of Community Development and Planning

SUBJECT: Final Planning Commission Working Group (PCWG) Meeting

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At the request of the Planning Commission Chair, this item is on the agenda to allow Commissioners to provide guidance to staff on the structure of November 10 PCWG Agenda. Staff will be prepared to provide a brief update (Board discussion outcomes) but otherwise currently does not have any presentations or substantive updates to provide. Rather, staff envisions the November 10th meeting to simply be a time for the PCWG to reflect on the 2045 update process and to solicit general feedback on what went well and what might be helpful to change or fine-tune in future comprehensive plan update processes.

Staff would therefore recommend the following Agenda for the November 10 PCWG meeting:

A.) A short update by staff

B.) Discussion by PCWG members:

i. what went well (and to incorporate into the next Comp. Plan update process); and,

ii. what iterative process improvements the PCWG would like to see as part of the next Comp. Plan update process?

REVIEWERS:

Department	Reviewer	Action	Date
Planning Commission	Holt, Paul	Approved	10/27/2021 - 1:14 PM
Planning Commission	Holt, Paul	Approved	10/27/2021 - 1:14 PM
Publication Management	Pobiak, Amanda	Approved	10/27/2021 - 3:23 PM
Planning Commission	Holt, Paul	Approved	10/27/2021 - 3:24 PM