

A G E N D A
JAMES CITY COUNTY BOARD OF SUPERVISORS
REGULAR MEETING
County Government Center Board Room
101 Mounts Bay Road, Williamsburg, VA 23185
June 14, 2022
5:00 PM

A. CALL TO ORDER

B. ROLL CALL

C. MOMENT OF SILENCE

D. PLEDGE OF ALLEGIANCE

1. Pledge Leader - Ki'Shaun Sterling, a rising 4th grade student at James River Elementary and a resident of the Roberts District

E. PUBLIC COMMENT

F. CONSENT CALENDAR

G. PUBLIC HEARING(S)

1. 5427 Olde Towne Road Easement Exchange
2. Amendment to the Adopted Budget for Federal Coronavirus Relief Funding
3. Sale of County Property Located at 1637 Green Mount Parkway
4. 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)

H. BOARD CONSIDERATION(S)

I. BOARD REQUESTS AND DIRECTIVES

J. REPORTS OF THE COUNTY ADMINISTRATOR

K. CLOSED SESSION

1. Consideration of a personnel matter, the appointment of individuals to County Boards and/or Commissions, pursuant to Section 2.2-3711 (A)(1) of the Code of Virginia
2. Appointments - Williamsburg Regional Library Board of Trustees
3. Appointments - Economic Development Authority

L. ADJOURNMENT

1. Adjourn until 1 pm on June 28, 2022 for the Business Meeting

ITEM SUMMARY

DATE: 6/14/2022

TO: The Board of Supervisors

FROM: Teresa J. Saeed, Deputy Clerk

SUBJECT: Pledge Leader - Ki'Shaun Sterling, a rising 4th grade student at James River Elementary and a resident of the Roberts District

REVIEWERS:

Department	Reviewer	Action	Date
Board Secretary	Saeed, Teresa	Approved	6/7/2022 - 8:10 AM

ITEM SUMMARY

DATE: 6/14/2022
TO: The Board of Supervisors
FROM: Adam R. Kinsman, County Attorney
SUBJECT: 5427 Olde Towne Road Easement Exchange

ATTACHMENTS:

	Description	Type
☐	memo	Cover Memo

REVIEWERS:

Department	Reviewer	Action	Date
Attorney	Kinsman, Adam	Approved	6/3/2022 - 1:45 PM
Publication Management	Daniel, Martha	Approved	6/3/2022 - 1:54 PM
Legal Review	Kinsman, Adam	Approved	6/3/2022 - 3:56 PM
Board Secretary	Saeed, Teresa	Approved	6/3/2022 - 3:58 PM
Board Secretary	Purse, Jason	Approved	6/7/2022 - 2:37 PM
Board Secretary	Saeed, Teresa	Approved	6/7/2022 - 2:38 PM

MEMORANDUM

DATE: June 14, 2022
TO: The Board of Supervisors
FROM: Adam R. Kinsman, County Attorney
SUBJECT: 5427 Olde Towne Road Easement Exchange

The County holds a landscape and scenic easement on the parcel located at 5427 Olde Towne Road and further identified as James City County Real Estate Tax Map No. 3240100002A (the "Property"). The owner of the Property has requested that the County exchange a portion of the easement for another location on the Property. Subsequent to advertisement of this application, the Owner discovered that the easement is also held by the Historic Virginia Land Conservancy (the "HVLC"). The HVLC has yet to consider the owner's request; accordingly, I recommend that the Board open the advertised public hearing and postpone consideration of this application to its July 12, 2022, meeting.

ARK/md
5427OTEasmtExch-mem

ITEM SUMMARY

DATE: 6/14/2022

TO: The Board of Supervisors

FROM: Sharon B. Day, Director of Financial and Management Services

SUBJECT: Amendment to the Adopted Budget for Federal Coronavirus Relief Funding

ATTACHMENTS:

	Description	Type
☐	Memorandum	Cover Memo
☐	Resolution	Resolution

REVIEWERS:

Department	Reviewer	Action	Date
Financial Management	Cochet, Cheryl	Approved	5/20/2022 - 2:37 PM
Publication Management	Pobiak, Amanda	Approved	5/20/2022 - 2:54 PM
Legal Review	Kinsman, Adam	Approved	5/24/2022 - 9:40 AM
Board Secretary	Saeed, Teresa	Approved	5/31/2022 - 8:53 AM
Board Secretary	Rinehimer, Bradley	Approved	5/31/2022 - 9:00 AM
Board Secretary	Saeed, Teresa	Approved	6/3/2022 - 10:50 AM

MEMORANDUM

DATE: June 14, 2022

TO: The Board of Supervisors

FROM: Sharon B. Day, Director of Financial and Management Services

SUBJECT: Amendment to the Adopted Budget for Federal Coronavirus Relief Funding

The *Code of Virginia*, § 15.2-2507, requires a public hearing when amendments to the budget to adjust the aggregate amount to be appropriated exceed 1% of total expenditures, which for Fiscal Year (FY) 2022 totals \$2,345,267. The public hearing is to consider an amendment to the Adopted Budget for federal funding received by the County through the American Rescue Plan Act (ARPA) of 2021.

ARPA provides funding for programs to address the public health and economic impacts of the COVID-19 pandemic. A primary component of ARPA establishes the Coronavirus Local Fiscal Recovery Fund (CLFRF) to help local governments take action to decrease the spread of the virus, address the economic fallout of the pandemic, and lay the foundation for recovery.

James City County's total allocation under ARPA is \$14,863,696, of which 50% was received as a first tranche in May 2021, and the remaining 50%, or \$7,431,848, will be delivered as a second tranche, estimated to be received in early June 2022. The attached resolution provides for the appropriation of this second tranche of ARPA funds.

Per guidance from the U.S. Department of Treasury, the CLFRF funds may be used:

- To respond to the public health emergency or its negative economic impacts, including assistance to households, small businesses, and nonprofits, or aid to impacted industries such as tourism, travel, and hospitality;
- To respond to workers performing essential work during the COVID-19 public health emergency by providing premium pay to eligible workers;
- For the provision of government services to the extent of the reduction in revenue due to the COVID-19 public health emergency relative to revenues collected in the most recent full fiscal year prior to the emergency; and
- To make necessary investments in water, sewer, or broadband infrastructure.

The CLFRF funds may be used to cover eligible costs incurred by a local government during the period beginning March 3, 2021 and ending December 31, 2024. As provided by the U.S. Department of Treasury, any funds not obligated by December 31, 2024 and any funds not expended to cover such obligations by December 31, 2026 must be returned.

It is stated the funding may not be used for a deposit into a pension fund or to offset, directly or indirectly, a reduction in net tax revenue resulting from a change in law, regulation, or administrative interpretation during the covered period that reduces any tax or delays the imposition of any tax or tax increase.

Amendment to the Adopted Budget for Federal Coronavirus Relief Funding

May 24, 2022

Page 2

In November 2021, the Board of Supervisors approved a plan to utilize the ARPA funding to provide government services. Planned expenditures include capital projects to support Parks & Recreation operations; housing programs and initiatives; assistance to nonprofits; fiber optic cabling and telephone replacement projects; and limited-term positions to assist with these ARPA projects. To enhance the financial reporting for these projects, a new fund was established specifically for ARPA. The budgets for the first tranche payment and related project expenditures were moved from the Special Projects/Grants Fund to the new ARPA Fund during FY 2022.

It is recommended that the Board of Supervisors adopt the attached resolution to authorize acceptance of the second ARPA tranche and appropriate these funds in the ARPA Fund.

SBD/md

AdptBdgtAmdARPA-mem

Attachment

RESOLUTION

AMENDMENT TO THE ADOPTED BUDGET

FOR FEDERAL CORONAVIRUS RELIEF FUNDING

WHEREAS, James City County is a local government eligible for direct funding through the federal Coronavirus Local Fiscal Recovery Fund established by the American Rescue Plan Act (ARPA) of 2021; and

WHEREAS, the County has been allocated an estimated \$14,863,696 from the Coronavirus Local Fiscal Recovery Fund, of which the first tranche was received in May 2021 and the second tranche in the amount of \$7,431,848 is to be received by June 2022; and

WHEREAS, the County agrees to abide by the stipulations as presented by the U.S. Department of Treasury regarding the eligible use of these ARPA funds; and

WHEREAS, no local match is required.

NOW, THEREFORE, BE IT RESOLVED that the Board of Supervisors of James City County, Virginia, hereby authorizes acceptance of the Coronavirus Local Fiscal Recovery Fund funding and appropriates to the ARPA Fund as shown below and further authorizes the County Administrator to execute the documents necessary to accept and implement the grant.

Revenue:

Federal - ARPA Coronavirus Recovery Funds \$7,431,848

Expenditure:

ARPA Coronavirus Recovery Funds \$7,431,848

John J. McGlennon
Chairman, Board of Supervisors

ATTEST:

Teresa J. Saeed
Deputy Clerk to the Board

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SADLER
MCGLENNON

VOTES			
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Adopted by the Board of Supervisors of James City County, Virginia, this 14th day of June, 2022.

ITEM SUMMARY

DATE: 6/14/2022

TO: The Board of Supervisors

FROM: Bradley J. Rinehimer, Assistant County Administrator

SUBJECT: Sale of County Property Located at 1637 Green Mount Parkway

ATTACHMENTS:

	Description	Type
☐	Memorandum	Cover Memo
☐	Resolution	Resolution

REVIEWERS:

Department	Reviewer	Action	Date
Admin	Rinehimer, Bradley	Approved	5/31/2022 - 8:47 AM
Publication Management	Pobiak, Amanda	Approved	5/31/2022 - 10:05 AM
Legal Review	Kinsman, Adam	Approved	5/31/2022 - 12:59 PM
Board Secretary	Saeed, Teresa	Approved	6/3/2022 - 10:50 AM
Board Secretary	Purse, Jason	Approved	6/7/2022 - 2:37 PM
Board Secretary	Saeed, Teresa	Approved	6/7/2022 - 2:38 PM

MEMORANDUM

DATE: June 14, 2022

TO: The Board of Supervisors

FROM: Bradley J. Rinehimer, Assistant County Administrator

SUBJECT: Sale of County Property Located at 1637 Green Mount Parkway

In 2019, James City County (the "County") purchased the property at 1637 Green Mount Parkway for public use purposes. Subsequent to the County's acquisition, InLight Real Estate Partners ("InLight") indicated its desire to purchase the property for warehousing purposes. Staff is of the opinion that a different public use site can be acquired and that InLight's proposal represents a desirable use of the property. Staff therefore recommends that the Board authorize the sale of the property at 1637 Green Mount Parkway to Greenmount Parkway Williamsburg Propco, LLC, a subsidiary of InLight Real Estate Partners. The price per developable acre was agreed upon at \$90,000 per acre with 14.37 buildable acres, resulting in a sales price of \$1,293,300.

The attached resolution authorizes the County Administrator to execute those documents necessary to sell the Property to Greenmount Parkway Williamsburg Propco, LLC.

BJR/md
1637GrnMtPkwySale-mem

Attachment

RESOLUTION

SALE OF COUNTY PROPERTY LOCATED AT 1637 GREEN MOUNT PARKWAY

WHEREAS, James City County (the “County”) currently owns a certain parcel of land located in the County of James City, containing approximately 21.2 acres located at 1637 Green Mount Parkway and further identified as L-1 P-2 Green Mount Industrial Park and James City County Real Estate Tax Parcel No. 6010200001 (the “Property”); and

WHEREAS, the Property is currently an undeveloped piece of property in the Green Mount Industrial Area; and

WHEREAS, Greenmount Parkway Williamsburg Propco, LLC, has offered to purchase the Property for \$90,000 per buildable acre which was determined to be 14.37 acres; and

WHEREAS, the County has not identified any current or future need for the Property; and

WHEREAS, the Board of Supervisors, following a public hearing, is of the opinion that the County should sell the Property to Greenmount Parkway Williamsburg Propco, LLC, for \$1,293,300.

NOW, THEREFORE, BE IT RESOLVED that the Board of Supervisors of James City County, Virginia, does hereby authorize and direct the County Administrator to execute those documents necessary for the sale and transfer of the Property to Greenmount Parkway Williamsburg Propco, LLC.

John J. McGlennon
Chairman, Board of Supervisors

ATTEST:

Teresa J. Saeed
Deputy Clerk to the Board

	VOTES			
	<u>AYE</u>	<u>NAY</u>	<u>ABSTAIN</u>	<u>ABSENT</u>
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LARSON	___	___	___	___
SADLER	___	___	___	___
MCGLENNON	___	___	___	___

Adopted by the Board of Supervisors of James City County, Virginia, this 14th day of June, 2022.

ITEM SUMMARY

DATE: 6/14/2022

TO: The Board of Supervisors

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. Ordinance	Ordinance
☐	2. Location Map	Exhibit
☐	3. CIS	Backup Material
☐	4. Proposed Proffers	Backup Material
☐	5. Proposed Master Plan	Backup Material
☐	6. Existing Proffers	Backup Material
☐	7. Existing Master Plan	Exhibit
☐	8. Fiscal Impact Analysis	Backup Material
☐	9. Housing Types Example	Backup Material
☐	10. DRW Memo	Backup Material
☐	11. Parks and Recreation Exception Request	Backup Material
☐	12. Public Input	Backup Material
☐	13. PC Minutes	Backup Material
☐	14. Deferral Request	Backup Material

REVIEWERS:

Department	Reviewer	Action	Date
Planning	Holt, Paul	Approved	6/2/2022 - 8:31 AM
Development Management	Holt, Paul	Approved	6/2/2022 - 8:32 AM
Publication Management	Daniel, Martha	Approved	6/2/2022 - 3:58 PM
Legal Review	Kinsman, Adam	Approved	6/3/2022 - 1:14 PM
Board Secretary	Saeed, Teresa	Approved	6/3/2022 - 3:59 PM
Board Secretary	Purse, Jason	Approved	6/7/2022 - 2:37 PM
Board Secretary	Saeed, Teresa	Approved	6/7/2022 - 2:39 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 June 14, 2022, Board of Supervisors Public Hearing

SUMMARY FACTS

Applicant: Mr. Vernon Geddy, III, on behalf of Frye 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: Inside (PSA)

Staff Contact: Thomas Wysong, Senior Planner II

PUBLIC HEARING DATES

Planning Commission: November 3, 2021, 6:00 p.m. (Postponed)
 December 1, 2021, 6:00 p.m.

Board of Supervisors: January 11, 2022 (Postponed)
 March 8, 2022 (Postponed)
 April 12, 2022 (Postponed)
 June 14, 2022

FACTORS FAVORABLE

1. Staff finds the proposal to be consistent with the adopted 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.
3. Due to the proffered age restriction, the proposal is not anticipated to generate any schoolchildren.
4. The applicant has proffered cash contributions that are intended to mitigate the impacts of this proposal.
5. The applicant has proffered transportation improvements that adequately mitigate impacts to News Road and the surrounding transportation network.

This staff report is prepared by the James City County Planning Division to provide information to the Planning Commission and Board of Supervisors to assist them in making a recommendation on this application. It may be useful to members of the general public interested in this application.

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 June 14, 2022, Board of Supervisors Public Hearing

6. The applicant has proffered for the 286 single-family and multifamily units to be constructed to Energy Star (or equivalent independent) residential certification.
7. The applicant has proffered for the submittal of a Nutrient Management Plan for all landscaped areas within the development.
8. The applicant has proffered the installation of a bus stop and shelter on News Road adjacent to the main entrance into the Property, upon request of Williamsburg Area Transit Authority (WATA) or any successor agencies.
9. The applicant has proffered to reserve two assisted living beds for Medicaid-qualified individuals under the Auxiliary Grant Program administered by the Virginia Department of Social Services.
10. The applicant has proffered the submittal of a Traffic Management Plan (TMP) for construction of the project in order to mitigate the traffic impacts on News Road related to construction.
11. Impacts: See Impact Analysis on Pages 10-12.

FACTORS UNFAVORABLE

1. Impacts: See Impact Analysis on Pages 10-12.
2. See Affordable/Workforce Analysis on Page 8.

SUMMARY STAFF RECOMMENDATION

Staff recommends that the Board of Supervisors postpone this application to the September 13, 2022, Regular Meeting pursuant to the applicant's request (see Attachment No. 14).

PLANNING COMMISSION RECOMMENDATION

At its December 1, 2021, Regular Meeting, the Planning Commission recommended approval of the application with the proposed conditions by a vote of 5-1.

CHANGES SINCE THE PLANNING COMMISSION MEETING

In response to public input, the applicant has included an additional proffer requiring the submittal of a TMP for construction of the project prior to site development. The applicant has also revised the proffer and master plan for the emergency access to ensure an updated traffic study will be provided and improvements installed in the event this entrance is proposed for conversion to a full entrance.

CHANGES SINCE THE JANUARY 11, 2022, BOARD OF SUPERVISORS MEETING

The applicant has provided a proffer for project phasing, as well as a proffer detailing the establishment of a homeowners association for the single-family and multifamily units (see Page 4 of the staff report and updated Attachment No. 4).

PROJECT DESCRIPTION

This application proposes to amend the currently adopted Ford's Colony Master Plan and related proffers for the Continuing Care Retirement Community (CCRC) proposed on the property. This previously approved CCRC, which has not commenced development, is known as Ford's Village and is identified as Section 37 on the approved Ford's Colony Master Plan. The use of the property for continuing care is not proposed to change, though this amendment does significantly change the proposed unit mixture and internal site layout for Ford's Village.

This staff report is prepared by the James City County Planning Division to provide information to the Planning Commission and Board of Supervisors to assist them in making a recommendation on this application. It may be useful to members of the general public interested in this application.

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 June 14, 2022, Board of Supervisors Public Hearing

Master Plan Amendment

Under the currently approved Master Plan (MP-0008-2007), the access to Ford’s Village is proposed to be provided via an entrance on News Road, located across from the Firestone residential entrance to Ford’s Colony. The streets internal to Ford’s Village are proposed to be privately maintained and the project is shown connecting to public water and sewer provided by James City Service Authority (JCSA).

In terms of internal layout, the currently approved 2007 Plan shows a total of 36 principal buildings, along with several smaller accessory structures. Nineteen of the buildings are two-unit townhouses (duplexes), which account for 38 units. The remaining 17 buildings and accessory structures are intended to house the various independent living units, assisted living rooms, and skilled nursing beds planned for the CCRC, which account for a total of 703 units/rooms/beds. There are also a wide variety of support uses including a health center, community meeting facility, parking and storage functions, maintenance and support functions, dining halls and kitchens, and on-site services (such as a barbershop, beauty parlor, post office, etc.).

The proposed Master Plan amendment would change the proposed unit mixture by significantly increasing the amount of single-family and multifamily units and significantly decreasing the amount of proposed apartments, resulting in a more balanced mix within the development. In this proposal, the land use would be divided into two categories: the single-family and multifamily units would account for 286 units and be dispersed along the private road network proposed in Land Areas designated A, B, or C. The proposed apartments, memory care/assisted living, and skilled nursing beds would account for a maximum of 230 units and be located within Land Area D, which is the hub of apartments, medical, and institutional uses.

Both categories of development would be part of the same continuing care facility, with residents and employees able to access the shared

amenities within the parcel. These amenities include recreational amenities and limited commercial uses intended for the residents and employees of the development (not the general public) and including a café/coffee shop; education room; spa and wellness center; physical therapy and/or physician’s office(s), and pharmacy.

As detailed in the following table, the unit mixture within the proposed Master Plan amendment would significantly increase the amount of single-family and multifamily units on-site, while also significantly reducing the amount of apartments. In terms of medical and institutional uses, the potential development for assisted living/memory care is increased, while the potential development of skilled nursing beds decreases.

Table 1: Master Plan Unit Mix Comparison

Unit/Bed Type	Adopted 2007 Master Plan	Proposed 2021 Amendment	Difference
Single-Family and Multifamily Units	38	286	+248
Apartments	558	75	-483
Assisted Living/Memory Care	85	155	+72
Skilled Nursing	60	40	-20
Total Max	741	516*	-225

**Per the amended proffers, the total amount of apartments, assisted living/memory care rooms/skilled nursing beds within the institutional facility (Land Use “D” on the Master Plan) shall not exceed 230 (see rows shaded blue in the Table), which is why this number is capped at 516.*

This staff report is prepared by the James City County Planning Division to provide information to the Planning Commission and Board of Supervisors to assist them in making a recommendation on this application. It may be useful to members of the general public interested in this application.

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 June 14, 2022, Board of Supervisors Public Hearing

Proffer Amendment

In conjunction with the proposed Master Plan amendment, the applicant is proposing to amend and restate the proffers for the parcel. This proposal includes revisions to the existing proffer language as well as the proposed removal of certain proffers as follows:

- Revision to the proffered unit max and type to match what is proposed on the amended Master Plan (see Table 1 on Page 3 for details).
- Revisions to the details of the proffered Stormwater Plan to reflect the amended approach to stormwater management on the Master Plan.
- Revisions to the recreational amenities proffers to clarify that the proposed amenities are not open to the general public and are intended for residents of Ford's Village.
- Inclusion of a proffer requiring the submittal and approval of an updated traffic signal warrant analysis for the News Road/Firestone Drive/project entrance intersection prior to site plan or subdivision plan approval.
- Inclusion of a proffer requiring the submittal of a TMP for construction of the project in order to mitigate the traffic impacts on News Road related to construction.
- Inclusion of a proffer requiring an updated traffic study and installation of required road improvements to the emergency entrance, in the event it is proposed to be converted to a full entrance.
- Inclusion of a phasing proffer stipulating that the County will not issue building permits for more than 50 dwelling units in the single-family and multifamily unit neighborhoods until construction on the institutional uses has commenced.
- Inclusion of a proffer detailing the establishment of a homeowners association for the single-family and multifamily component of the residential development.
- Revisions to the build-out trigger point for when traffic counts need to be submitted to the County (current approved number is at 247 units, then at 494 units; the proposed trigger point is at 400 units, roughly halfway between the two). The purpose of the trigger points is to determine the traffic impacts at certain points during project build-out such that any additional needed transportation improvements (such as entrance or turn lane improvements) can be installed prior to continued build-out.
- Removal of the Greenway Trail proffer, which proposes the construction and dedication to the public of this trail portion, on account of the lack of an interconnecting easement being made available from the Monticello Woods property (See Impact Analysis Table on Page 10 for further analysis).
- Removal of redundant proffers that establish standards already required by the Zoning Ordinance, including the proffer regulating lighting, archaeology study, natural resource study, etc.
- Removal of proffers limiting heights for buildings no longer shown on the Master Plan.
- Removal of the proffer requiring the submittal of the Cold Spring Swamp Drainage Analysis, on account of an analysis being completed for the swamp since the original rezoning and master plan approval for this property.

This staff report is prepared by the James City County Planning Division to provide information to the Planning Commission and Board of Supervisors to assist them in making a recommendation on this application. It may be useful to members of the general public interested in this application.

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 June 14, 2022, Board of Supervisors Public Hearing

Per the Planning Commission's recommendation, Planning staff held a follow-up meeting with Stormwater and Resource Protection (SRP) to discuss the potential for upstream flooding on the property and the impact of removing Proffer No. 19 and Proffer No. 10(b) on flooding and erosion control. SRP confirmed that the Powhatan Creek Floodplain Study (which analyzes the full build-out of the Powhatan Creek watershed) eliminates the need for Proffer No. 19, which would require a drainage analysis of Cold Spring Swamp (part of the Powhatan Creek Study) at full build-out.

SRP also confirmed that the removal of Proffer No. 10(b), which requires the submittal of a stream monitoring plan on the subject property and annual monitoring of erosion for a period of 10 years, would not prevent the Stormwater Division from adequately addressing erosion concerns on the parcel during the development plan process.

The stream monitoring plan required by this proffer requires a baseline assessment and monitoring of stream segments delineated on Sheet No. 7 of the Master Plan. Furthermore, this proffer requires the property owner to install additional upstream run-off control measures, as approved by SRP, to prevent further erosion if the stream monitoring indicates the presence of new erosion not shown in the baseline assessment. These additional upstream runoff control measures would include measures on the other side of News Road on parcels not included with this application, which would make enforcement of this proffer impractical for the County. Finally, mitigating any potential impacts of this development on the Powhatan Creek watershed and the Cold Spring Swamp would be accomplished at the site plan stage, should this project be approved, and the development would be held to the current standards and requirements of the Erosion and Sediment Control, Stormwater Management, and Chesapeake Bay Preservation Ordinances.

As detailed within Table 2, the proposed proffers also include revisions and updates to the cash commitments associated with this project. Specifically, the applicant is proposing to update and increase the per unit/room/bed commitment for the 2021 amendment to account for the Marshall & Swift Building Cost Index. The proposed proffers also remove the cash commitments to specific improvements from the 2007 rezoning related to infrastructure development, namely sewer and road improvements. The \$60,000 cash commitment to sewer infrastructure has been proposed for removal, as has the \$36,000 cash commitment to road improvements for the Monticello Avenue/News Road Intersection and Monticello Avenue Corridor. The \$60,000 proffered for off-site sewer improvements is proposed for removal by the applicant. JCSA has raised no concerns with this proposed removal.

The \$36,000 proffered for off-site transportation improvements to the News Road/Monticello Avenue intersection and the Monticello Avenue Corridor is proposed for removal by the applicant due to the completion of these improvements since the original rezoning.

Overall, the total development amount of cash contribution for the project is expected to decrease by approximately 25% from \$1,757,475 to \$1,326,095.15, depending on final unit mix. This is largely attributed to the overall proposed reduction in dwelling units resulting from the amended Master Plan and proffers, in which the current proffered amount of 596 residential units is being decreased by 40% to 361 dwelling units.

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 June 14, 2022, Board of Supervisors Public Hearing

Table 2: The Village at Ford’s Colony: Cash Contribution Proffer Comparison

Cash Contribution Proffer Summary	Approved 2007 Proffers (in 2008 dollars)	2021 Proffer Amendment
Proffer Use:	Amount:	Amount:
Fire, Police, Emergency Services, Library, Public Facilities:	\$1,000 per Dwelling Unit (x 596 Dwelling Units = \$596,000)	\$1,277.61 per Dwelling Unit (x 361 Dwelling Units) = \$461,217.21
<i>Fire, Police, Emergency Services, Library, Public Facilities:</i>	\$250 per Room/Bed (x 83 Rooms) + (x 60 Beds) = \$35,750	\$319.40 per Room/Skilled Nursing Unit* (x 115 Rooms) + (20 Skilled Nursing Units) = \$43,119
Water Infrastructure Development:	\$870 per Dwelling Unit (x 596 Dwelling Units) = \$518,520	\$1,111.52 per Dwelling Unit (x 361 Dwelling Units) = \$401,258.72
<i>Water Infrastructure Development:</i>	\$435 per Room/Bed (x 83 Rooms) + (x 60 Beds) = \$62,205	\$555.76 per Room/Skilled Nursing Unit x (115 Rooms +20 Skilled Nursing Units) = \$75,027.60
Sewer Infrastructure Development:	\$60,000 (one-time payment)	\$0
Monticello Avenue/News Road Intersection and Monticello Avenue Corridor Improvements:	\$36,000 (one-time payment)	\$0
Road Improvements:	\$750 per Dwelling Unit (x 596 Dwelling Units = \$447,000)	\$958.20 per Dwelling Unit (x 361) = \$345,910.20
Total Cash Contribution Per Dwelling Unit:	Up to: \$2,620 per Dwelling Unit (x 596 Dwelling Units = \$1,561,520)	Up to \$3,347.33 per Dwelling Unit (x 361 Dwelling Units) = \$1,208,386.13
<i>Total Cash Contribution Per Room/Bed:</i>	\$685 per Room/Bed (x 143 Rooms/Beds) = \$97,955	\$875.16 per Room/Skilled Nursing Unit (x 135 Rooms/Unit) = \$118,146.60
Total Development Cash Contribution:**	Up to: \$1,757,475	Up to \$1,326,095.15***

*Per the proffers, one skilled nursing unit is equal to two beds.

**Cash amount is stated as “up to” on account of the different unit mix possibilities, per the proffers in both proposals.

***Per the proffers, two of the four beds within one of the assisted living rooms will be reserved for Medicaid qualified individuals and are exempt from the proffered cash contribution, which is why half a unit’s worth of cash contributions (2 beds = \$437.58) has been subtracted from the estimated total.

This staff report is prepared by the James City County Planning Division to provide information to the Planning Commission and Board of Supervisors to assist them in making a recommendation on this application. It may be useful to members of the general public interested in this application.

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 June 14, 2022, Board of Supervisors Public Hearing

Transportation Analysis

Separate from the cash contributions, the applicant has proffered the same on-site transportation improvements included within the 2007 rezoning, with the exception of the shoulder bike lane on News Road, which is not recommended by the County's bicycle/pedestrian maps and has been removed from the proffers. These on-site improvements include the following:

- A signal at the intersection of News Road, Firestone Drive, and the project entrance (if warranted by updated traffic signal warrant analysis that is proffered to be completed prior to development plan approval).
- An exclusive left-turn lane from westbound News Road into the Property.
- An exclusive right-turn lane from eastbound News Road into the Property at the main entrance into the Property at the intersection of News Road and Firestone Drive.
- The restriping of the existing southbound left-turn lane on Firestone Drive at News Road to be a shared left and through lane.
- The installation of an exclusive left-turn on westbound News Road at the intersection with Powhatan Secondary.
- The installation or payment for a traffic signal at the intersection of News Road and Powhatan Secondary at the time such signal is warranted.

The applicant has submitted a trip generation calculation memorandum (see Attachment No. 10) for this proposal that compares the proposed unit mix to information within the previously approved traffic studies for Ford's Colony, including the study performed for the

rezoning of this parcel in 2007 and the 2020 Kimley-Horn and Associates Inc. traffic study. The traffic study from the 2007 rezoning showed a daily trip generation of 2,697, while the proposed generation for this amendment shows a total of 1,916 trips, a reduction of 781 daily trips.

The County adopted the Adequate Transportation Facilities Test by resolution on August 14, 2018. This policy requires for a proposed Special Use Permit (SUP) or rezoning to be tested during the application process to ensure that transportation facilities are adequate to mitigate traffic impacts. Per the adopted policy, a proposed rezoning or SUP application will pass the test if:

- i. No off-site improvements are required by the Traffic Impact Analysis (TIA) that is approved by both the Planning Director and the Virginia Department of Transportation (VDOT); or
- ii. All off-site improvements recommended by a TIA that are approved by both the Planning Director and the VDOT are guaranteed in a form approved by the Planning Director and County Attorney.

The transportation improvements proffered with this application ensure that this proposal passes the Adequate Transportation Facilities Test.

Parks and Recreation Analysis

This project is required to meet the R-4 Zoning Ordinance requirements, which requires 40% of the overall planned development of Ford's Colony to be open space. If approved, this proposal would result in no change in the overall open space for Ford's Colony, which is 52.3%. The R-4 District also requires one acre of recreational open space per 350 dwelling units. This proposal exceeds this requirement by proposing a minimum of four acres of dedicated recreation area.

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)
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The R-4 requirements do not encompass all aspects of the Parks and Recreation Development Guidelines, which include trails, courts/pools, and fields. Please see below for the proposal analysis.

- Requirement: Park land (0.83 acres minimum).
- Applicant Proposal: The Master Plan guarantees a minimum of four acres of recreational land and facility, which substantially exceeds the recommended amount.

- Requirement: Playground (minimum of five activities) or other age-appropriate alternative facility.
- Applicant Proposal: The Master Plan shows eight pocket parks, in which playgrounds can be located; however, the Master Plan and proffers do not commit to facilities in the pocket parks.

- Requirement: Hard surface sport court or pool.
- Applicant Proposal: The applicant has proffered pickleball courts, to be located within the Land Use areas designated for single-family and multifamily development.

- Requirement: Graded athletic field.
- Applicant Proposal: The applicant is not proposing a graded athletic field as part of this proposal.

- Requirement: Paved multiuse trail.
- Applicant Proposal: The applicant is proposing the Greenway Trail to serve the site, as well as a multiuse path along News Road.

The Parks and Recreation Development Guidelines state that the Board of Supervisors may approve alternatives to the recommended facility categories listed above. The applicant has submitted an exception request (see Attachment No. 11). While playgrounds/age-appropriate alternative facilities and a graded athletic field are not included in this proposal, other recreational amenities proposed for the site include a spa and wellness center, an outdoor pool, and walking/biking paths.

The County’s *2002 Greenway Master Plan* proposed a Greenway Trail traversing this property from News Road to Monticello Avenue. The currently adopted Master Plan shows the proposed Greenway Trail connecting from News Road to the southern portion of the property. The proposed Master Plan shows the Greenway Trail traversing the southern portion of the property and connecting to the “Park” and “Clubhouse/Recreation” area, but offering no connection to the southern property line.

Housing Affordability Analysis

The Comprehensive Plan encourages inclusion of affordable and workforce units within new residential development. The 361 proposed units are planned to be a mix of single-family, multifamily, or apartments, all to be offered at market rate within the context of the Continuing Care development. At this time, it is undetermined what the exact unit mix will be. The tables below and on the next page provide the sales and rental prices affordable at distinct percentages of Area Median Income (AMI) level, which is \$84,500 for 2021.

Affordable Sales Price by AMI %

% AMI	Upper limit of the sales price affordable to this AMI level (2021 prices)
30%	\$129,750
60%	\$257,250
80%	\$341,950
100%	\$427,125
120%	\$512,000

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Affordable Rental Price by AMI %

% AMI	Upper limit of the rental price affordable to this AMI level (2021 prices)
30%	\$ 634
60%	\$1,268
80%	\$1,689
100%	\$2,113
120%	\$2,535

PLANNING AND ZONING HISTORY

The subject property is currently an undeveloped parcel of land (formerly known as the “Warburton Tract”) which is largely in a natural, undisturbed state. The land has previously been timbered, and remnants of several logging roads cross it in various locations. The parcel is heavily vegetated with a mixture of pines, hardwoods, and dense underbrush. The ground is higher in the center of the property, and slopes away steeply toward the eastern, southern, and western edges. Cold Spring Swamp runs along the eastern boundary of the property, and the main stem of Powhatan Creek runs along the western property boundary. The property is approximately 179.20 acres in size.

This parcel was rezoned in 2008 from the R-8, Rural Residential Zoning District to the R-4, Residential Planned Community with proffers and incorporated into the Ford’s Colony Master Plan. The proposed use for the property on the approved Master Plan is a CCRC consisting of 38 townhomes, 558 independent living units, 83 assisted living rooms, and 60 skilled nursing beds. In conjunction with this rezoning and master plan, the parcel was removed from the Gordon Creek Agricultural and Forestal District. No development has commenced within the property and no cash proffers have been collected.

SURROUNDING ZONING AND DEVELOPMENT

North: R-2, General Residential (Springhill Subdivision); R-4, Residential Planned Community District (Ford’s Colony).

West: A-1, General Agricultural.

South: PUD-R, Planned Unit Development Residential Community District (Monticello Woods).

East: R-4, Residential Planned Community District (Powhatan Secondary).

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Staff Report for the June 14, 2022, Board of Supervisors Public Hearing

IMPACT ANALYSIS

Impacts/Potentially Unfavorable Conditions	Status <i>(No Mitigation Required/Mitigated/Not Fully Mitigated)</i>	Considerations/Proposed Mitigation of Potentially Unfavorable Conditions
Please note the information in the Status column indicated below does not include information from the Financial Impacts of Residential Units section of this staff report.		
<u>Public Transportation: Vehicular</u>	<u>Mitigated</u>	<ul style="list-style-type: none"> - Please see the Transportation Analysis on Page 7. - Per the proffers, upon the request of the Williamsburg Area Transit Authority (WATA), the Owner shall install a bus stop, and shelter on News Road adjacent to the main entrance into the Property, with the exact location being subject to the approval of WATA.
<u>Public Transportation: Pedestrian/Bicycle</u>	<u>Not Fully Mitigated</u>	<ul style="list-style-type: none"> - The County’s <i>Pedestrian Accommodation Master Plan</i> and <i>Regional Bikeways Map</i> shows the need for a multiuse path along the property frontage on News Road. - The proposed Master Plan shows a multiuse path abutting the News Road frontage in between the primary entrance and emergency access entrance for the property, but not the entirety of the property as recommended on the maps. - Pursuant to Section 24-35 of the Zoning Ordinance, the proposed improvements shown on these maps are required to be shown on the site plan and installed at development. - The County’s <i>2002 Greenway Master Plan</i> proposed a Greenway Trail traversing this property from News Road to Monticello Avenue. - The currently adopted Master Plan shows the proposed Greenway Trail connecting from News Road to the southern portion of the property. The proposed Master Plan shows the Greenway Trail traversing the southern portion of the property and connecting to the “Park” and “Clubhouse/Recreation” areas, but offering no connection to the southern property line.
<u>Public Safety</u>	<u>Mitigated</u>	<ul style="list-style-type: none"> - Located within a six-minute radius of Fire Station 5. - The proposal is expected to generate impacts that are mitigated by the proffered cash contributions (see Table 2 on Page 6 for details).

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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 June 14, 2022, Board of Supervisors Public Hearing

Impacts/Potentially Unfavorable Conditions	Status <i>(No Mitigation Required/Mitigated/Not Fully Mitigated)</i>	Considerations/Proposed Mitigation of Potentially Unfavorable Conditions
Please note the information in the Status column indicated below does not include information from the Financial Impacts of Residential Units section of this staff report.		
<u>Public Schools</u>	<u>No Mitigation Required</u>	- Ford’s Village is proposed as a CCRC. Per the proffers, all proposed units are age-restricted and are not expected to generate schoolchildren.
<u>Public Parks and Recreation</u>	<u>No Mitigation Required</u>	- See Analysis on Pages 7 and 8.
<u>Public Libraries and Cultural Centers</u>	<u>Mitigated</u>	- Per the proposed proffers, the applicant is contributing a portion of the \$1,277.61 to mitigate impacts to the library.
<u>Groundwater and Drinking Water Resources</u>	<u>Mitigated</u>	<ul style="list-style-type: none"> - The Master Plan proposes to connect to the existing water and sewer facilities currently located within News Road. JCSA has reviewed and approved the water and sewer flows within the CIS, as well as the proposed utility layout within the Master Plan. - Per the proposed proffers, the property will be developed with water conservation standards approved by JCSA.
<u>Watersheds, Streams, and Reservoirs</u> The property is located within the Powhatan Creek Watershed.	<u>Mitigated</u>	<ul style="list-style-type: none"> - The Master Plan shows a conceptual layout for stormwater management facilities. - The proposed proffers require the Master Stormwater Management Plan (MSWMP) for the Property be approved prior to the first site plan submittal and comply with the standards within the adopted Watershed Management Plan in place at time of submittal.
<u>Cultural/Historic</u>	<u>No Mitigation Required</u>	<ul style="list-style-type: none"> - This property is identified as a Moderate sensitive area on the James City County Archaeological Assessment, meaning no archaeological study is required for this application as part of the legislative submittal. - Per Section 24-145 of the Zoning Ordinance, a Phase 1 Archaeological Study will be required for submittal and review as part of the initial site plan submittal.

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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)
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Impacts/Potentially Unfavorable Conditions	Status <i>(No Mitigation Required/Mitigated/Not Fully Mitigated)</i>	Considerations/Proposed Mitigation of Potentially Unfavorable Conditions
Please note the information in the Status column indicated below does not include information from the Financial Impacts of Residential Units section of this staff report.		
<u>Nearby and Surrounding Properties</u>	<u>No Mitigation Required</u>	<ul style="list-style-type: none"> - The proposed area to be developed as Ford’s Village will be residential in nature and age-restricted throughout, per the proposed proffers. The impacts related to nuisances such as noise and light are not anticipated to impact neighboring and surrounding proffers due to adequate buffering and Ordinance requirements regarding lighting.
<u>Community Character</u>	<u>Mitigated</u>	<ul style="list-style-type: none"> - News Road is identified as a Wooded Community Character Corridor (CCC). - The Master Plan shows a 150-foot wide CCC buffer along the entire frontage of News Road on the property. This property is heavily wooded and consists of mature trees that provide substantial screening from the News Road right-of-way.

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**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 June 14, 2022, Board of Supervisors Public Hearing**

FINANCIAL IMPACTS OF RESIDENTIAL UNITS

On September 10, 2019, the Board of Supervisors adopted a resolution directing staff to produce a fact sheet that outlines general financial impacts of residential dwellings based on the Adopted Budget, the Capital Improvements Program, the Comprehensive Plan, the Strategic Plan, and any other relevant data. The resolution further directs that the fact sheet should address the immediate and long-range fiscal impacts related to increased use and demand on the following public facilities and resources. The per unit Residential Impacts are based on the Fiscal Year (FY) 2022 data provided by the Department of Financial and Management Services (FMS) and JCSA, as well as the projected number of annual residential unit data through 2034 (the Comprehensive Plan horizon year). The per unit impacts are detailed in Table 1 below.

Table 1-Per Unit Fiscal Residential Impacts Information

Category	Residential Impact	Proffered with current application*
Public Transportation	\$ 299.21	\$958.20
Public Safety	-	\$1,277.61
Public Schools	\$1,417.63	\$0**
Public Parks & Recreation	\$4,156.19	\$0
Public Libraries and Cultural Centers	\$ 170.88	\$1,277.61 (portion of Public Safety)
Groundwater and Drinking Water Resources	\$3,542.69	\$1,111.52
Watersheds, Streams & Reservoirs	\$1,954.03	\$0

**The rooms/beds are excluded from this analysis, per the CCRC analysis guidance in the Comprehensive Plan.*

***All units are age-restricted and not expected to generate school children.*

The general financial impacts of dwelling units described above are for the County and residential development as a whole. Submission of a development-specific FIA is required for all rezonings that include a residential component. The FIA takes into account all development components, including both residential and non-residential uses and the results are also affected by types of residential units and projected assessed values.

- The County’s FIA worksheet was submitted per the FY 2021 calculations provided by the Department of FMS (see Attachment No. 8).
- Per that analysis, the development would result in a \$727,922 annual positive fiscal impact to the County. When not accounting for schoolchildren generation (which is not anticipated as a result of this age-restricted development), the impact is \$1,887,000.

Comprehensive Plan

The 2045 Comprehensive Plan states that the use of land should be consistent with the capacity of existing and planned public facilities and services and the County’s ability to provide such facilities and services. The Plan also states “expect developments subject to zoning or SUP review to mitigate their impacts.” Information on impacts and the mitigation provided by this application are included in this staff report.

The property is designated Low Density Residential (LDR) on the adopted 2045 Comprehensive Plan Land Use Map and is located inside the PSA. The following general guidance is stated for the LDR designation in the Comprehensive Plan:

Single-family homes, multifamily units, and retirement and care facilities/communities are all recommended uses in LDR areas provided that development:

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Staff Report for the June 14, 2022, Board of Supervisors Public Hearing

- Complements the residential character of the surrounding area;
- Has traffic, noise, and lighting impacts similar to surrounding uses;
- Is generally located on collector or arterial roads at intersections;
- Provides adequate screening and buffering to protect the character of nearby residential areas; and
- Act as a transitional use between residential and commercial areas or, if located within a residential community, be integrated with the residential character of the area rather than altering its nature.

Staff finds this proposal meets all of these criteria. Additionally, the Comprehensive Plan recommends a gross density of one to four units per acre in LDR areas. When describing the review process for a CCRC, the Comprehensive Plan recommends the density be based on the number of independent living units (361 units), with the assisted living rooms and/or skilled nursing beds excluded from this calculation as these are considered institutional uses.

As such, this application would result in a significant decrease in the density on the subject parcel from the 4.77 units per acre to 2.89 dwelling units per acre. This proposal would also result in a marginal decrease within the overall density of Ford's Colony from 1.36 unit per acre to 1.28 units per acre.

STAFF RECOMMENDATION

Staff recommends that the Board of Supervisors postpone this application to the September 13, 2022, meeting pursuant to the applicant's request (see Attachment No. 14).

TW/md
RZ21-12MP21-3PMPAFdsColVill

Attachments:

1. Ordinance
2. Location Map
3. Community Impact Statement
4. Proposed Proffers
5. Proposed Master Plan
6. Existing Proffers
7. Existing Master Plan
8. Fiscal Impact Analysis
9. Housing Examples
10. DRW Memorandum
11. Parks and Recreation Exception Request
12. Public Input
13. Approved Minutes from the December 1, 2021, Planning Commission Meeting
14. Applicant's Deferral Request

ORDINANCE NO. _____

AN ORDINANCE TO AMEND EXISTING PROFFERS RECORDED AS INSTRUMENT NUMBER 080017656, APPROVED AS PART OF Z-08-07 TO PERMIT A DIFFERENT MIX OF UNIT TYPES AND REVISED DEVELOPMENT STANDARDS AND AS DESCRIBED IN CASE NOS. Z-21-0012 AND MP 21-0003

WHEREAS, on July 8, 2008, the Board of Supervisors approved Case No. Z-08-07 which included proffers regulating the development of a proposed Community Care Retirement Facility, including but not limited to the number of units, unit type, cash contributions for impact mitigation, and stormwater management, on the parcel located at 3889 News Road, James City County, Virginia, further identified as James City Tax ID Parcel No. 3730100004 (the "Property"); and

WHEREAS, Mr. Vernon Geddy has applied for an amendment to the existing proffers on behalf of the owners, SWR-Hockaday LLC & Martha McMurrin, to permit a different unit mixture, site design, and development approach; and

WHEREAS, the Planning Commission, following its public hearing on December 1, 2021, recommended approval of Case Nos. Z-21-0012 and MP 21-0003 by a vote of 5-1; and

WHEREAS, the Board of Supervisors of James City County, Virginia, finds Case Nos. Z-21-0012 and MP 21-0003 to be required by public necessity, convenience, general welfare, and good zoning practice.

NOW, THEREFORE, BE IT ORDAINED by the Board of Supervisors of James City County, Virginia, that Case Nos. Z-21-0012 and MP 21-0003 is hereby approved as described therein and the amended voluntary proffers are accepted.

John J. McGlennon
Chairman, Board of Supervisors

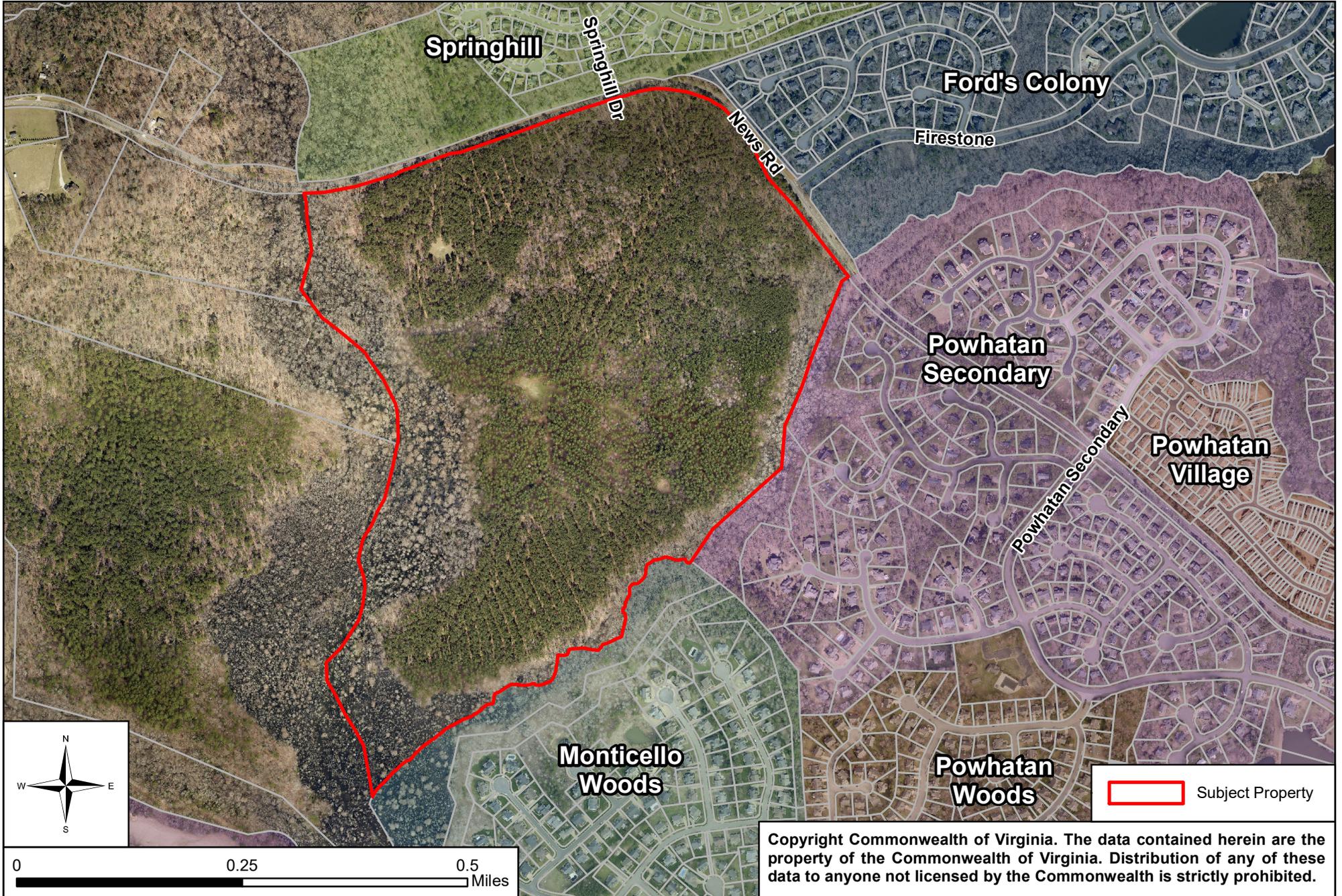
ATTEST:

Teresa J. Saeed
Deputy Clerk to the Board

	VOTES			
	<u>AYE</u>	<u>NAY</u>	<u>ABSTAIN</u>	<u>ABSENT</u>
ICENHOUR	_____	_____	_____	_____
HIPPLE	_____	_____	_____	_____
LARSON	_____	_____	_____	_____
SADLER	_____	_____	_____	_____
MCGLENNON	_____	_____	_____	_____

Adopted by the Board of Supervisors of James City County, Virginia, this 14th day of June, 2022.

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



Community Impact Statement

For

Ford's Village



Prepared For

**Frye Development, LLC
Norfolk, VA 23510**

*Revised October 2021
AES Project Number W10514*

Prepared by:



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Williamsburg, Virginia 23188
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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:

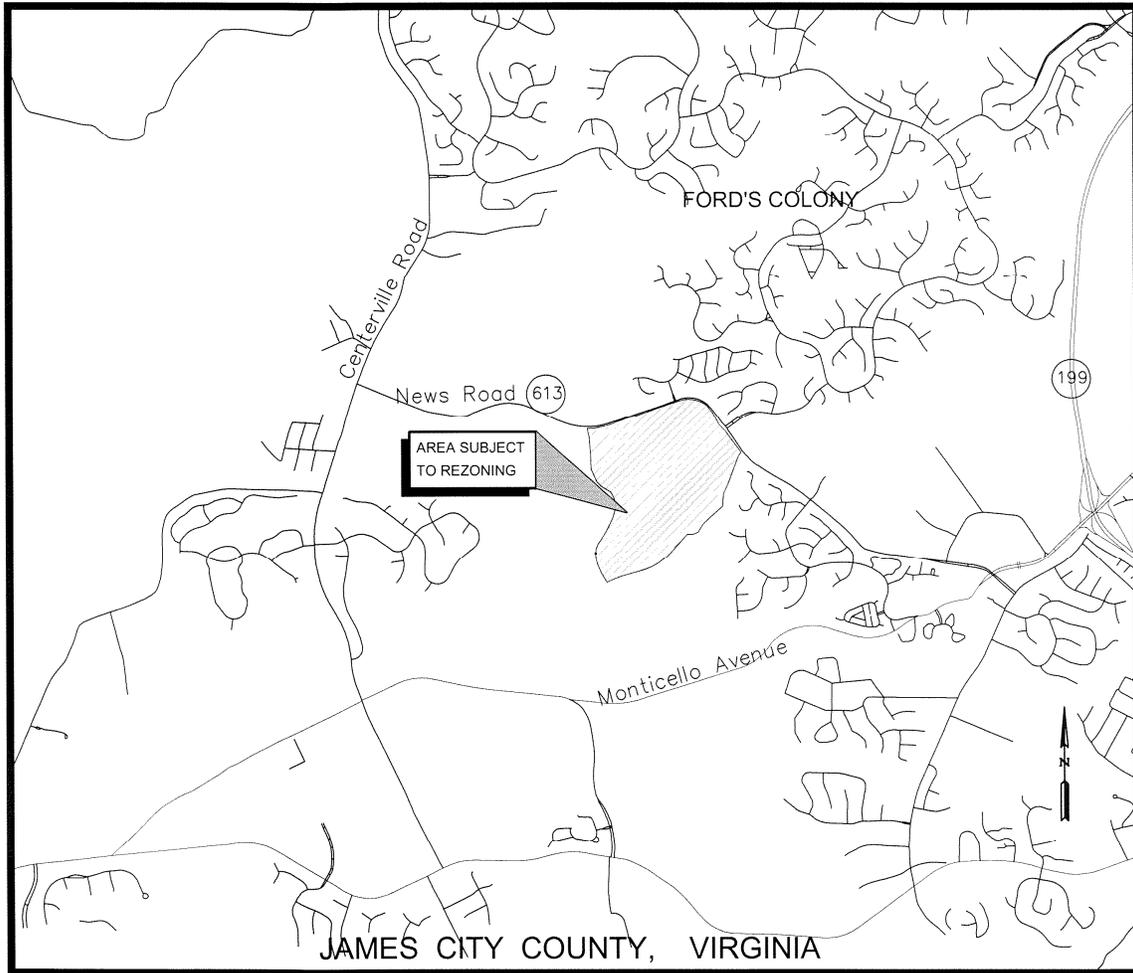


Figure 1

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

<i>Wetland areas:</i>	<i>47.42 acres</i>
<i>Buffers:</i>	<i>58.81 acres</i>
Subtotal	106.23 acres
<i>Uplands</i>	<i>74.56 acres</i>
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 JCSEA as part of the original application. The current application represents a 42% reduction in total daily anticipated sewer flows from the project. Additionally, JCSEA 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
<i>Total (Original)</i>			<i>219,420</i>		<i>152.4</i>	<i>381.0</i>

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.

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.

Tax Parcel: 3730100004
Prepared by: Vernon M. Geddy, III (VSB#21902)
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AMENDMENT TO AMENDED AND RESTATED FORD'S
COLONY PROFFERS

This AMENDMENT TO AMENDED AND RESTATED FORD'S COLONY PROFFERS are made this 17th day of February, 2022 by **SWR-HOCKADAY, LLC**, a Georgia limited liability company, and **MARTHA WARBURTON MCMURRAN** (collectively, together with their successors in title to the Property, the "Owner") and **FRYE DEVELOPMENT, LLC**, a Virginia limited liability company ("Developer"), each to be indexed as Grantor, and **JAMES CITY COUNTY, VIRGINIA**, a political subdivision of the Commonwealth of Virginia (the "County), to be indexed as Grantee.

RECITALS

A. Owner is the owner of the real property with an address of 3889 News Road, Parcel ID# 3730100004, containing approximately 180 acres, which property is more particularly described on Exhibit A (the "Property"). Developer is the contract purchaser of the Property.

B. Upon application in 2008 by Realtec, Incorporated, the then owner of the Property and developer of the Ford's Colony at Williamsburg development, the County approved an amendment of the Ford's Colony Master Plan to include the Property as Section 37 of Ford's Colony (the "Approved Master Plan") and the rezoning of the Property from R-8 to R-4, subject to Amended and Restated Ford's Colony Proffers made by Realtec, Incorporated dated June 10, 2008 and recorded in the Clerk's Office of the Circuit Court for the City of Williamsburg and County of James City as Instrument

No. 080017656 (the "2008 Proffers"). The 2008 Proffers restated the prior proffers applicable to the Ford's Colony development not including the Property (defined as the "Existing Property" in the 2008 Proffers) and added new proffers applicable only to the Property. Realtec no longer owns the Property and is no longer involved in the development of Ford's Colony. The proffers applicable to the Existing Property were amended by Amendment to Ford's Colony Proffers dated March 11, 2020 and recorded in the aforesaid Clerk's Office as Instrument No. 200008078 (the "2020 Amendment"). The 2008 Proffers, as amended by the 2020 Amendment, are hereinafter called the "Existing Proffers."

C. Owner and Developer have submitted to the County an application to (i) amend the Approved Master Plan and in connection therewith have submitted a master plan entitled "Master Plan Amendment for Ford's Village" prepared by AES Consulting Engineers dated June 2021 (the "Amended Master Plan") in accordance with the County Zoning Ordinance and (ii) amend the Existing Proffers applicable to the Property to offer to the County certain revised conditions on the development of the Property not generally applicable to land zoned R-4.

D. In consideration of the approval of the amendment of the Approved Master Plan, Owner desires to amend the Existing Proffers as set forth below. If the requested rezoning and amendment of the Approved Master Plan is not approved by James City County, this Amendment to Amended and Restated Ford's Colony Proffers shall be void and the Existing Proffers applicable to the Property shall remain unchanged, in full force and effect. Owner shall have no obligation under this Amendment to Amended and Restated Ford's Colony Proffers unless and until the Property is developed pursuant to

the Amended Master Plan.

AMENDMENT OF PROFFERS APPLICABLE TO THE PROPERTY

Sections 2 through 22 of the Existing Proffers are hereby deleted and replaced by the following:

2. **Master Plan**. The Property shall be developed generally as shown and set out on sheets 4 through 6 of the Amended Master Plan. Final plans (as defined in Section 24-276(b)(1) of the Zoning Ordinance) may vary from the Amended Master Plan to the extent permitted by Section 24-276(b)(1) of the Zoning Ordinance.

3. **Density**. (a) There shall be no more than 230 dwelling units comprised of independent living units, assisted living/memory care units consisting of up to four beds, and skilled nursing units consisting of up to two beds (each a "dwelling unit") on the portion of the Property designated on the Master Plan as CCRC-D, of which no more than 75 shall be independent dwelling units, no more than 155 shall be AL units (defined below) and no more than 40 shall be skilled nursing beds. The term "assisted living/memory care unit" (an "AL Unit") shall mean a non-medical residential dwelling unit in the assisted living facility area or memory care area of the independent and assisted living community licensed in accordance with Sections 63.2-1800 et seq. of the Virginia Code and Sections 22 VAC 40-73 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. An AL Unit must meet the standards set forth in 22 VAC 40-73-750 and 900.

(b) There shall be no more than a total of 286 independent living dwelling units on the portion of the Property designated on the Master Plan as CCRC-A, CCRC-B or

CCRC-C.

(c) All dwelling units developed on the 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 Property.

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

4. Water Conservation. 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.

5. Contributions for Community Impacts. (a) A contribution of \$1,277.61 for each independent living dwelling unit ("IL Dwelling Unit") on the 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 \$319.40 for each AL Unit and skilled nursing dwelling unit (each an "AL/MC/SN Dwelling Unit") on the Property shall be made to the County for fire, police or emergency services uses.

(c) A contribution of \$1,111.52 for each IL Dwelling Unit and \$555.76 for each AL/MC/SN Dwelling Unit on the Property shall be made to the JCSA for water system improvements.

(d) A contribution of \$958.20 for each IL Dwelling Unit on the 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 \$958.20 is the number of IL Dwelling Units for which the Credit Amount offsets the cash contribution otherwise due and payable. After application of the Credit Amount, the \$958.20 per IL Dwelling Unit cash contribution shall be payable on all subsequent IL Dwelling Units on the 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 a credit equal to the difference between the Actual Costs and the Credit Amount at the time the next cash contributions are due this paragraph.

(e) The contributions described above in paragraphs (a), (b), (c) and (d) shall be paid to the County for each dwelling unit on the Property after completion of the final inspection and prior to the time of the issuance of any certificate of occupancy for the dwelling unit in question.

(f) The per dwelling unit 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 2021 to the year a payment is made if payments are made after on or after January 1, 2022. In no event shall the per dwelling unit

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 dwelling unit contribution to approximate the rate of annual inflation in the County.

(g) The Subsidized Beds defined in Paragraph 15 shall not be included in the number of dwelling units contemplated in this Paragraph 5 and therefore shall not be subject to the contribution amounts described in subparagraphs (a), (b), (c) and (d).

6. Entrances; Traffic Improvements. (a) Prior to approval of any site or subdivision plans for development on the Property there shall be an updated traffic signal warrant analysis for the News Road/Firestone Drive/project entrance intersection submitted to and approved by VDOT and the County. If the updated analysis shows a signal is warranted and the installation of the signal is approved by VDOT, Owner shall install or pay for the installation of the traffic signal as a part of the construction of the project entrance. At the main entrance into the Property at the intersection of News Road and Firestone Drive, an exclusive left-turn lane from westbound News Road into the Property and an exclusive right-turn lane from eastbound News Road into the Property 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 on the 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. If VDOT traffic signal warrants are met and VDOT has approved the installation of a traffic signal at the intersection of News Road with Powhatan Secondary on or before the date that control of the homeowners' association created for the areas designated in the Master Plan as CCRC-A, CCRC-B or CCRC-C has transitioned from developer to homeowner control, Owner shall install or pay for the installation of the 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 guaranteed in form satisfactory to the County Attorney prior to the issuance of any certificates of occupancy for any

building on the Property.

(d) The second entrance to the 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 an updated traffic study identifying the impacts of a full entrance is submitted to and reviewed and approved by VDOT and the County. This updated study shall be approved prior to the submission of any site plan for the full entrance and shall document required turn lane and other roadway improvements for the full entrance which improvements shall be shown on the submitted site plan. The entrance shall be limited to emergency access only until such improvements have been constructed and, to the extent necessary, accepted by VDOT.

(e) Owner shall convey free of charge to VDOT or the County any right of way from the Property necessary for the widening or realignment of News Road or the improvements proffered herein 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 entrance prior to the County being obligated to issue certificates of occupancy for more than 400 dwelling units 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 TIS Update for Ford's Colony Master Plan – Phased Development, Kimley-Horn and Associates., Inc. January 2020 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. **Sustainable Building.** (a) Independent living dwelling units in the areas designated in the Master Plan as CCRC-A, CCRC-B or CCRC-C shall be built to an Energy Star (or equivalent independent) residential certification.

(b) The development in the area designated on the Master Plan as CCRC-D shall contain the following elements: (i) Carpool or Vanpool parking; (ii) Hybrid or Low-Emissions Vehicle Parking; (iii) Low Flow Plumbing Fixtures; (iv) Green Label Carpet and Carpet Padding; and (v) Energy Star Appliances.

8. **Master Stormwater Management Plan.** The Master Stormwater Management Plan (MSWMP) for the Property shall be approved prior to the first site plan submittal. The MSWMP shall comply with the standards within the adopted watershed management plan in place at time of submittal and all outside agency permits shall be issued prior to the third submittal of the MSWMP. The approved master stormwater management plan, as revised and/or updated, shall be implemented in all development plans for the Property.

9. **Nutrient Management Plan.** The Owner shall be responsible for contacting an agent of the Colonial Soil and Water Conservation District ("CSWCD") or, if a CSWCD agent is unavailable, a soil scientist licensed in the Commonwealth of Virginia, 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 landscaped common areas within the Property shown on site plans for the Property. The Plans shall be submitted to the County's Director of Stormwater and Resource

Protection for his review and approval prior to the issuance of building permits for more than 50% of the dwelling units shown on the Master Plan. Upon approval, the Owner, until such time as the homeowners association is established and thereafter the association, shall be responsible for ensuring that any nutrients applied to common areas be applied in strict accordance with the Plan.

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

11. **Ford's Colony at Williamsburg Homeowners Association.** The Additional Property shall not be subjected to the Declaration of Protective Covenants, Section II, Ford's Colony at Williamsburg, dated April 2, 1985, as the same may have been amended and/or restated ("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.

12. **Public Transit.** Upon the request of the Williamsburg Area Transit Authority ("WATA") or any successor entity to WATA as may become appropriate on or before the date that control of the homeowners' association created for the areas designated in the Master Plan as CCRC-A, CCRC-B or CCRC-C has transitioned from developer to homeowner control and after such time as WATA provides bus service along News Road to the Property, Owner shall install a bus stop and shelter on News Road adjacent to the main entrance into the Property, with the exact location being subject to the approval of WATA.

13. Recreation. The portion of the Property designated as CCRC-D on the Master Plan shall include, but shall not be limited to, the following amenities: main lobby and living room; dining room; activities/card room; fitness center; beauty/barber salon; library; multipurpose room and landscaped grounds and courtyards generally as shown on the Master Plan. CCRC-D may also include, but shall not be limited to, the following additional amenities: a bar/lounge; café/coffee shop; education room, spa and wellness center; physical therapy and/or physician's office(s), home health, and pharmacy. The amenities listed above are intended for residents and employees of Ford's Village and their guests and not the general public. The portions of the Property designated as CCRC-A, CCRC-B and CCRC-C on the Master Plan shall include the following amenities: a clubhouse with studio room for classes, and a recreation room; an outdoor pool; pocket parks; pickleball courts and walking and biking paths all generally as shown on the Master Plan. The exact recreational facilities provided in portions of the Property designated as CCRC-A, CCRC-B and CCRC-C on the Master Plan and their location may be changed with the prior approval of the Development Review Committee.

14. Off-Site Sewer Easements. Upon the request of JCSA and at no costs to 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.

15. Social Services. Owner shall reserve two assisted living beds ("Subsidized

Beds") for Medicaid qualified individuals at a rate that is no greater than what such individuals' out-of-pocket expense would be under the Auxiliary Grant Program administered by the Virginia Department of Social Services. Such individuals shall be subject to all admission and discharge criteria of the facility and all other generally applicable rules and regulations of the facility.

16. Construction Traffic Management Plan. Owner shall prepare and submit to the County a construction traffic management plan which seeks to minimize impacts from construction traffic entering and exiting the Property to the extent reasonably practical. The plan will be submitted with the initial site plan for development on the Property and shall be subject to review and approval by the Planning Director. A copy of the approved plan shall be provided to all contractors working on the Property and all construction contracts entered into by Owner shall require compliance with the plan by the contractor.

17. Project Phasing. The County shall not be obligated to issue building permits for more than a total of 50 dwelling units in the portions of the Property designated on the Master Plan as CCRC-A, CCRC-B or CCRC-C until the County has issued a building permit for construction of the facility on the portion of the Property designated on the Master Plan as CCRC-D and construction has commenced. Construction having commenced shall mean foundations have been poured.

18. Homeowners Association. There shall be organized an owner's association or associations (the "Association") in accordance with Virginia law in which all property owners in the portion of the Property designated on the Master Plan as CCRC-A, CCRC-B or CCRC-C, by virtue of their property ownership, shall be members.

The articles of incorporation, bylaws and restrictive covenants (together, the "Governing Documents") creating and governing each Association shall be submitted to and reviewed by the County Attorney for consistency with this Proffer. The Governing Documents shall require that the Association adopt an annual maintenance budget, which shall include a reserve for capital components, and all other common areas (including open spaces) under the jurisdiction of the Association, shall require each purchaser of a lot to make a capital contribution to the Association for reserves and shall require that the Association (i) assess all members for the maintenance of all properties owned or maintained by the Association and (ii) file liens on members' properties for non-payment of such assessments. The Governing Documents shall provide that at such time as 75% of the Lots permitted on the portion of the Property designated on the Master Plan as CCRC-A, CCRC-B or CCRC-C have been conveyed to purchasers other than builders, the declarant's right to unilaterally appoint and remove members of the Board of Directors of the Association shall terminate and the Board shall thereafter be elected by the lot owners (including the declarant). The Governing Documents shall not include a provision granting the declarant any veto rights over actions of the Board of the Association once the Board is elected by the lot owners.

[signatures appear on following pages]

WITNESS the following signatures and seals:

OWNER:

SWR-HOCKADAY, LLC, a Georgia Limited liability company

A.M. REDD, JR., INC., a Georgia corporation, Its Manager

By: Margaret P. Staats
Title: President

STATE OF Georgia
CITY/COUNTY OF Fulton, to-wit:

The foregoing instrument was acknowledged before me this 17th day of February, 2022 by Margaret P. Staats, President of A.M. REDD, JR., INC., a Georgia corporation, as Manager of SWR-HOCKADAY, LLC, a Georgia Limited liability company on behalf of the company.

Sarah Ann Staats
NOTARY PUBLIC

My commission expires: 1/14/2023
Registration No.: N/A



OWNER:

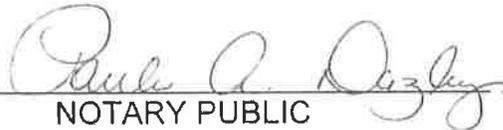
MARTHA WARBURTON MCMURRAN

By: 
Channing M. Hall, III, Her Attorney-in-Fact
Under Limited Power of Attorney recorded
as James City County Instrument No.
180010230

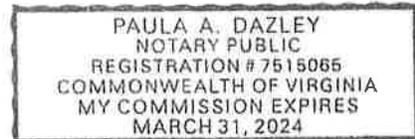
COMMONWEALTH OF VIRGINIA

COUNTY OF JAMES CITY, to-wit:

The foregoing instrument was acknowledged before me this 17th day of February,
2022, by CHANNING M. HALL, III, Attorney-in-Fact for MARTHA WARBURTON
MCMURRAN.

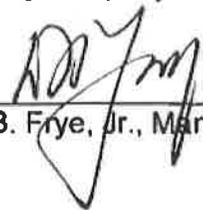

NOTARY PUBLIC

My commission expires: 03/31/2024
Registration No.: 7515065



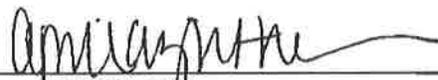
DEVELOPER:

FRYE DEVELOPMENT, LLC, a Virginia limited liability company

By: 
D. B. Frye, Jr., Manager

STATE OF Virginia
CITY/COUNTY OF Norfolk, to-wit:

The foregoing instrument was acknowledged before me this 17th day of February, 2022 by D. B. Frye, Jr., Manager of FRYE DEVELOPMENT, LLC, a Virginia limited liability company, on behalf of the company.


NOTARY PUBLIC

My commission expires: 7/31/2025
Registration No.: 7315880

APRIL ALBRIGHT NOLAN
NOTARY PUBLIC
REGISTRATION # 7315880
COMMONWEALTH OF VIRGINIA
MY COMMISSION EXPIRES
7-31-2025

Exhibit A

Property Description

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 flirty-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 New Brothers.

PARCEL B

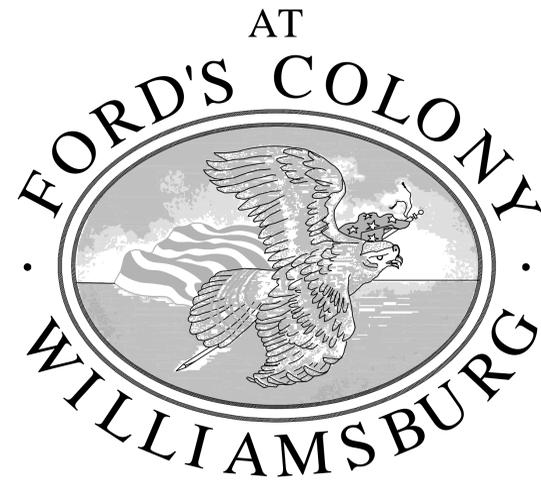
All of that certain piece or parcel of land situate in Jamestown District, James City County, Virginia, containing fifty-five and two fifths (55-2/5) acres, more or less, and known as Cypress Swamp, and adjoining the lands of William Martin's estate on the East, Greenspring on the South and Thomas N. 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, Tappahanock, 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 the same property conveyed to Martha Warburton McMurrin, and SWR-Hockaday, LLC, a Georgia limited liability company, by Deed from Peter G. Zemanian, Substitute Trustee, dated February 12, 2010, and recorded February 22, 2010, in the aforesaid Clerk's Office, as James County Instrument No. 100003372.

MASTER PLAN AMENDMENT FOR FORD'S VILLAGE



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

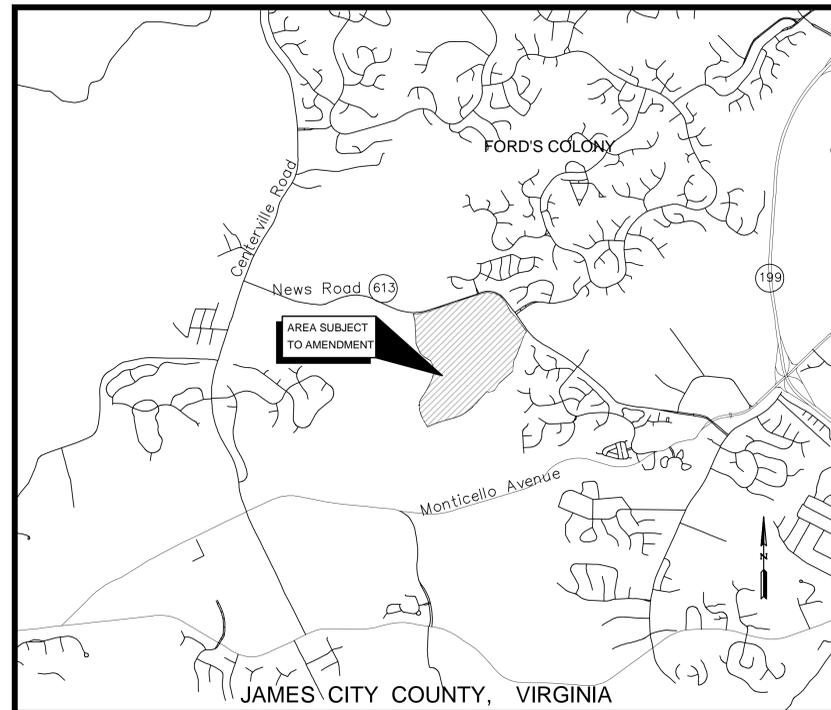
SITE DATA:

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. ±

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.



VICINITY MAP

(APROX. SCALE 1"=2000')

ORIGINALLY SUBMITTED: JUNE 2021

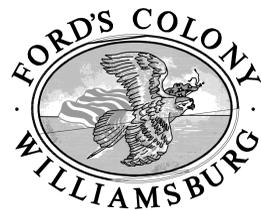


CONSULTING ENGINEERS

WILLIAMSBURG • RICHMOND • GLOUCESTER

5248 Olde Towne Road, Suite 1 • Williamsburg, Virginia 23188
 (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



NON RESIDENTIAL AMENITY AND SERVICE SITES

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

GENERAL NOTES:

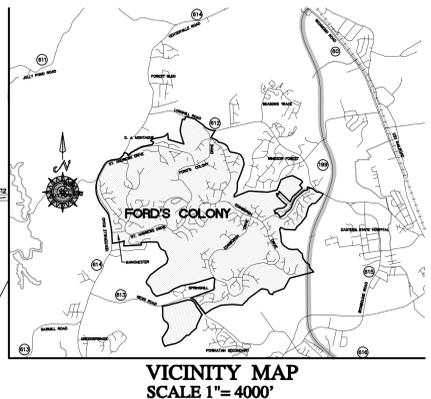
- RECORDATION OF THIS PLAN IS SOLELY FOR THE PURPOSE OF IDENTIFYING THE LAND COVERED BY THE PROFFERS RECORDED HERewith AND DOES NOT CONSTITUTE A PLAT OF SUBDIVISION NOR DOES IT DEDICATE TO PUBLIC OR PRIVATE USE ANY ROADS, COMMON AREAS, GREEN AREAS, OR RECREATION AREAS.
- THE PROPERTY SHOWN ON THIS PLAN 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.
- LOTS NUMBERED REPRESENT RECORDED SECTIONS OR SECTIONS THAT HAVE RECEIVED PRELIMINARY APPROVAL.
- 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 DENSITY	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	9.87 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**SEE SHT 4	125.03 AC.	125.03 AC.
OVERALL C.C.R.C. DENSITY (SEE SHT 4)	2.89 UNITS/AC.	4.77 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"	914.12 AC.	914.12 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.
GROSS AREA (FOR DENSITY CALCULATION ONLY)	2,830.6 AC.	2,830.6 AC.
TOTAL NUMBER OF RESIDENTIAL UNITS	3,340 UNITS	3,701 UNITS
OVERALL PROJECT DENSITY	1.28 UNITS/AC.	1.36 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 GREENBELT'S 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	DESIGNED	DRAWN
1	4/7/08	REVISIONS PER JCC COMMENTS DATED MARCH 25, 2008	AES	JAG
2	5/7/08	REVISIONS PER RELOCATION OF BUILDINGS	AES	JAG

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

CONSULTING ENGINEERS

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

Designed: 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 (I)
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	KEMPUNKEY EMPORIA	2-6%	0.20-0.32	3
26B	PAMUNKEY	2-6%	0.28	4
27	PEAMCK	RELATIVELY FLAT	0.24-0.37	4
29A	SLAGLE	0-2%	0.24	3

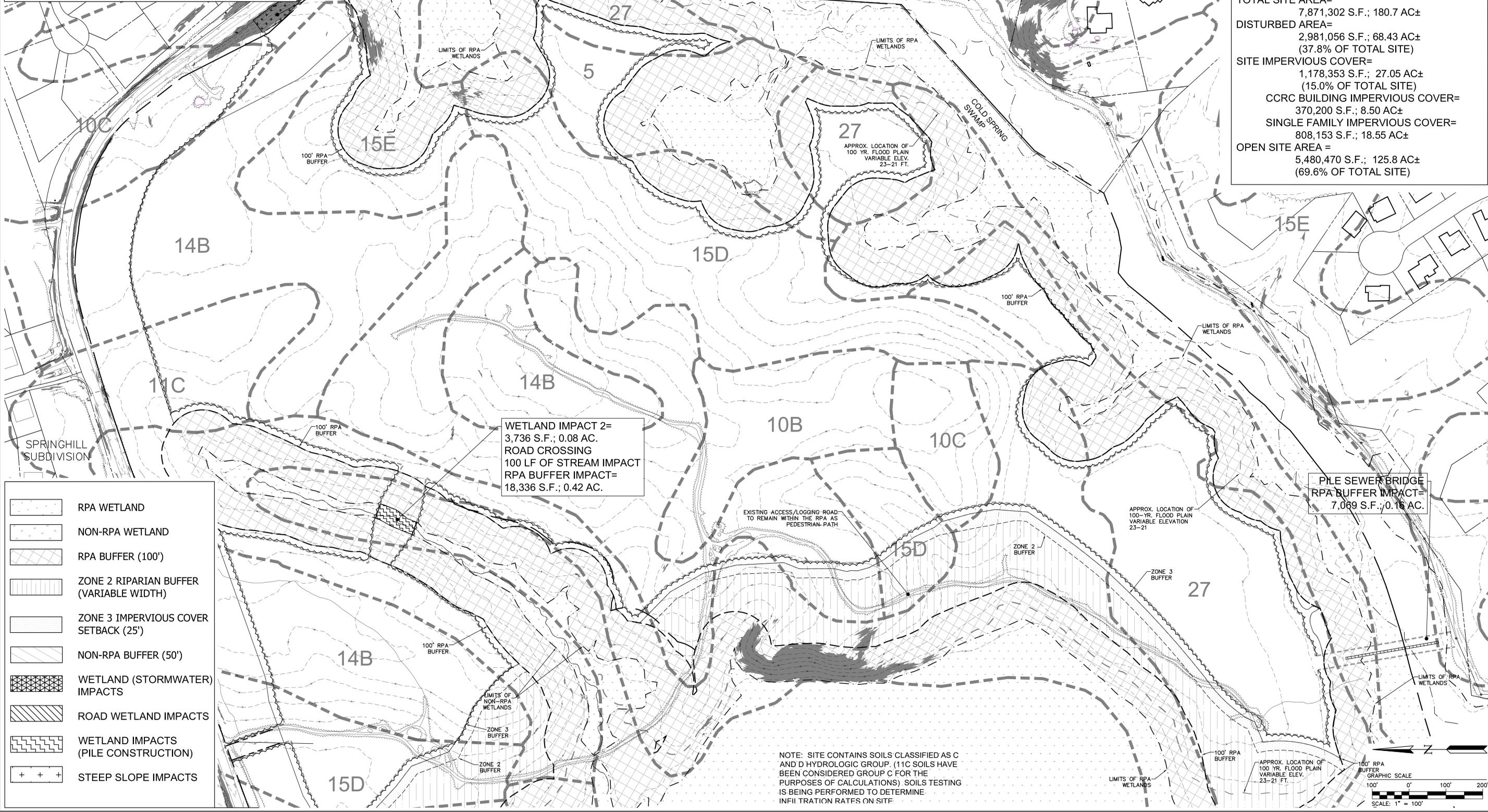
INFORMATION TAKEN FROM "SOIL SURVEY OF JAMES CITY AND YORK COUNTIES AND THE CITY OF WILLIAMSBURG, VIRGINIA" ISSUED IN APRIL 1985 BY THE UNITED STATES DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE IN COOPERATION WITH VIRGINIA POLYTECHNIC INSTITUTE AND STATE.

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.

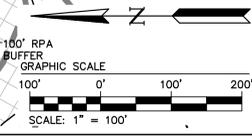
ENVIRONMENTAL IMPACTS	
TIDAL WETLANDS:	NONE
TIDAL SHORES:	NONE
100 FT RPA BUFFER:	5,685 S.F.; 0.13 AC.
NON-TIDAL WETLANDS IN RMA:	17,055 S.F.; 0.39 AC.
NON-TIDAL WETLANDS IN RPA:	8,050 S.F.; 0.18 AC.
HYDRIC SOILS:	NOT MODIFIED
25% OR GREATER SLOPES:	8,000± S.F.; 0.18 AC.
NON-RPA BUFFERS:	52,383 S.F.;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



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

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.



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

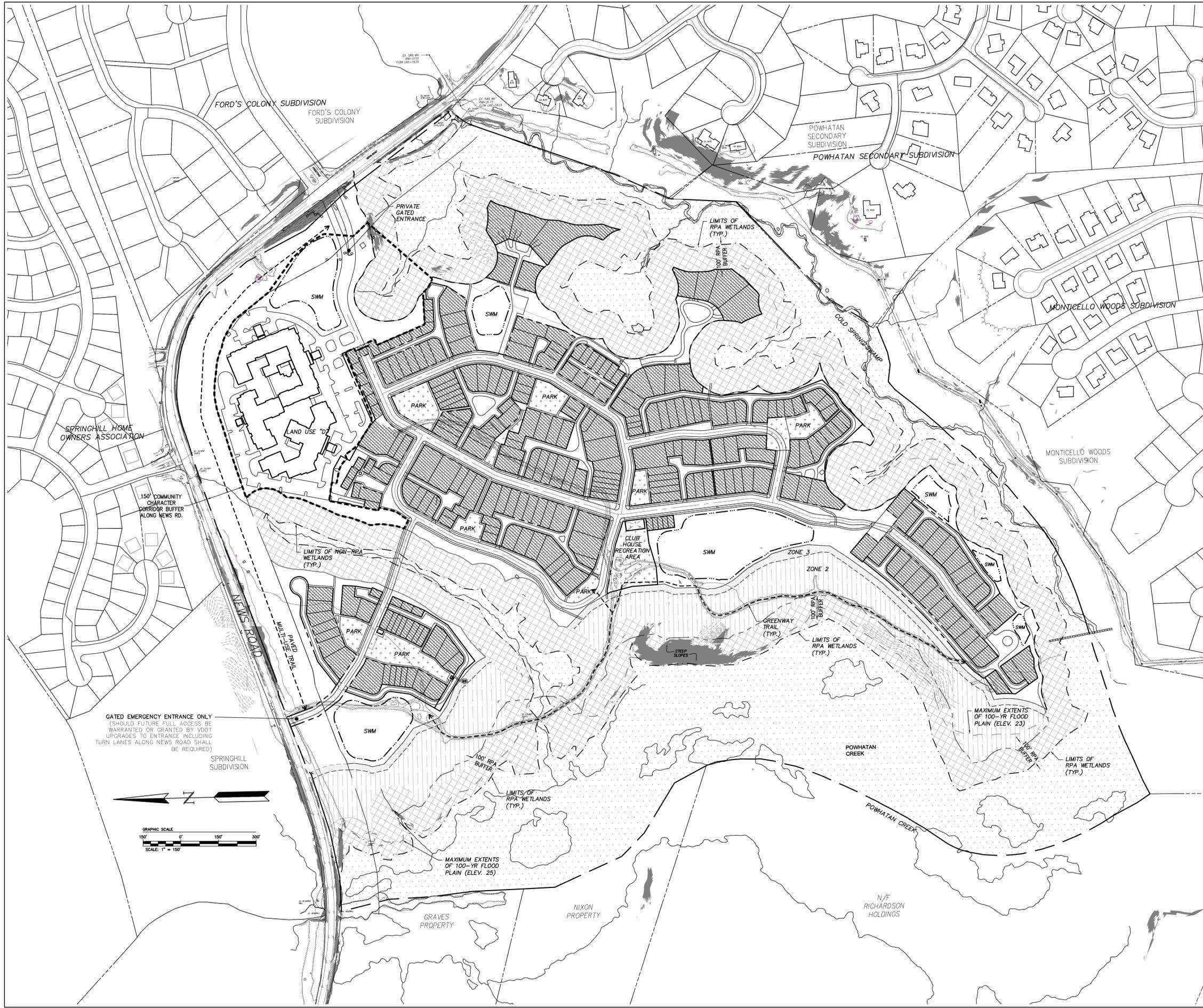
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 www.aesva.com

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



DEVELOPMENT TABULATIONS:

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

DENSITY TABULATIONS:

TOTAL ACREAGE:	180.79 AC. +/-
LESS RPA WETLANDS:	47.42 AC. +/-
LESS RPA BUFFERS:	35.35 AC. +/-
LESS 25% SLOPES:	0.0 AC. +/- (OUTSIDE WETLANDS/BUFFER AREAS)
LESS FLOOD PLAIN (1):	0.01 AC. +/- (OUTSIDE WETLANDS/BUFFER AREAS)
TOTAL NON-DEVELOPABLE AREA:	82.78 AC. +/- (45% OF TOTAL PARCEL)
GROSS ACREAGE FOR PARCEL DENSITY:	125.03 AC. +/-

LAND-USE TABULATIONS:

TOTAL PARCEL:	180.79 AC. +/-
LANDUSES A, B, C, & D (2):	74.56 AC. +/-
OPEN SPACE:	
RPA WETLANDS:	47.42 AC. +/-
BUFFER AREAS (3):	58.81 AC. +/-
TOTAL OPEN SPACE:	106.23 AC. +/-

(1) FLOOD PLAIN IS DELINEATED ON THE PLANS AND GENERALLY LOCATES THE LIMITS OF THE FLOOD PLAIN BASED UPON FIELD SURVEYED ELEVATIONS.
 (2) INCLUDES (±4 AC.) RECREATIONAL-AMENITY OPEN SPACE AREA.
 (3) 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. ±)
- LAND USE "B"
- APPROX. LOCATIONS OF RECREATIONAL-AMENITY OPEN SPACE (4 AC. ±)
- SLOPES 25% OR GREATER
- PEDESTRIAN CIRCULATION
- STORMWATER FEATURE

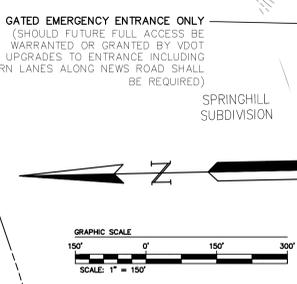
NOTE: 15 FT. BUILDING SETBACK TO RPA BUFFER ALONG COLD SPRING SWAMP.

Land Use Density Chart	Max. # Units	Max. Non-Residential Floor Space	Land Use Pod Size
Land Use A, B, & C			
A - Single Family			
B - Multifamily (2-4 unit buildings)	286 (1) UNITS	N/A	±61 Acres
C - Multifamily (2 over 4 unit buildings)			
TOTAL			
D - Independent Living Apartments	75 Units		
D - Common Areas			
Dining Areas			
Administration Offices			
Other Amenities			
Other Limited Commercial Uses (2)		UP TO 150,000 S.F.	±13 Acres
E - Health Care Center			
Assisted Living/Memory Care	155 Rooms		
Skilled Nursing	40 Beds		
MAXIMUMS:	361 UNITS(3)	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.
 (3) TOTAL NUMBER OF UNITS, ROOMS & BEDS SHALL NOT EXCEED 516 AS DESCRIBED IN PROFFERS.

ADDITIONAL MASTER PLAN NOTES

- NO STRUCTURES WITHIN THE "D" PORTION OF THE SITE SHALL EXCEED 60-FT IN HEIGHT AS DEFINED BY JCC ORDINANCE.
- 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 AMENITIES 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

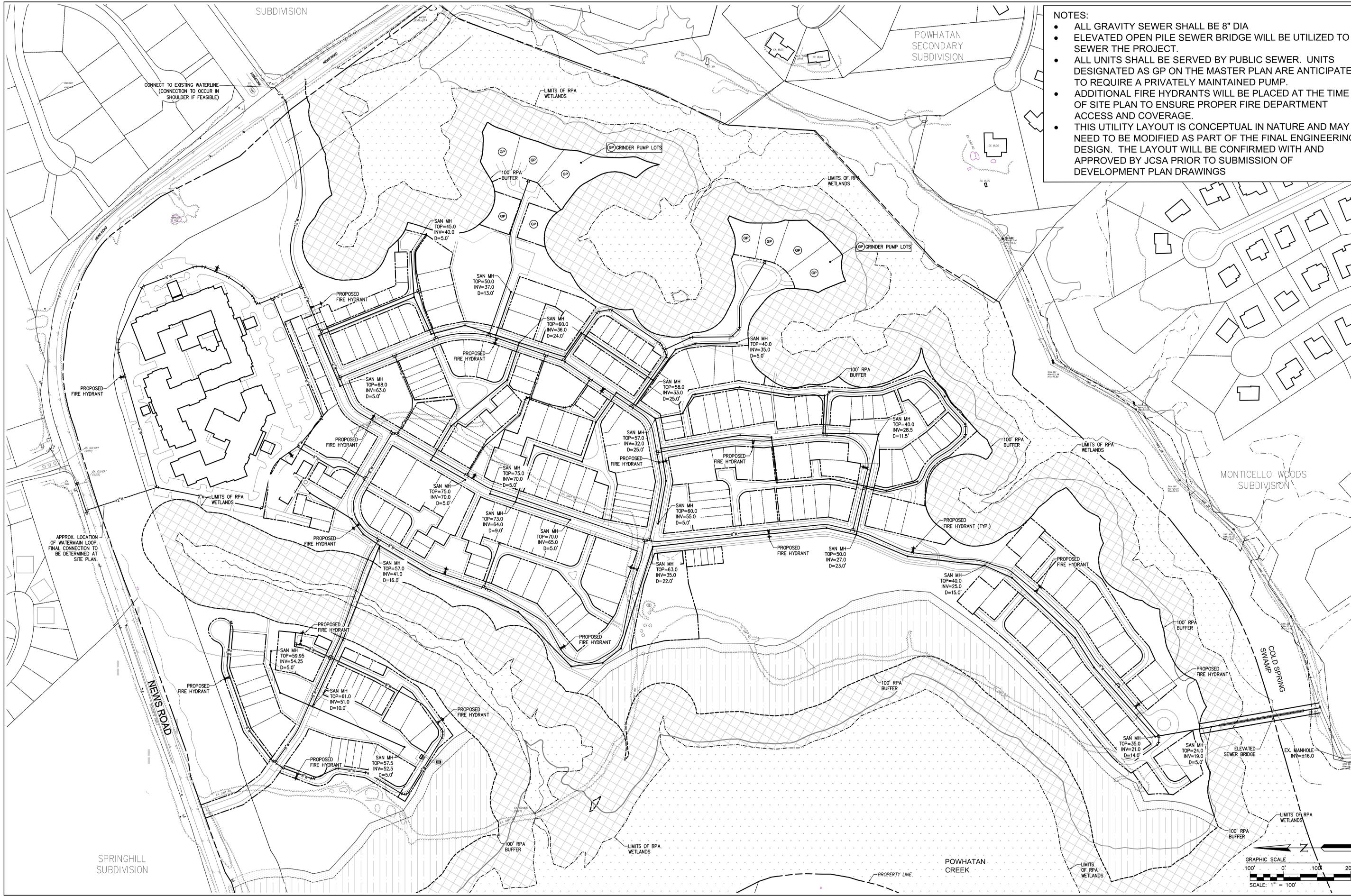
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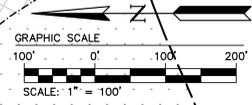
AMENDED LAND-USE MASTER PLAN
FORDS' VILLAGE
 AT
 FORD'S COLONY OF WILLIAMSBURG
 FOR
 FRYE DEVELOPMENT, LLC

POWHATAN DISTRICT | JAMES CITY COUNTY | VIRGINIA

Project Contact: 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



Rev.	Date	Description	Revised By

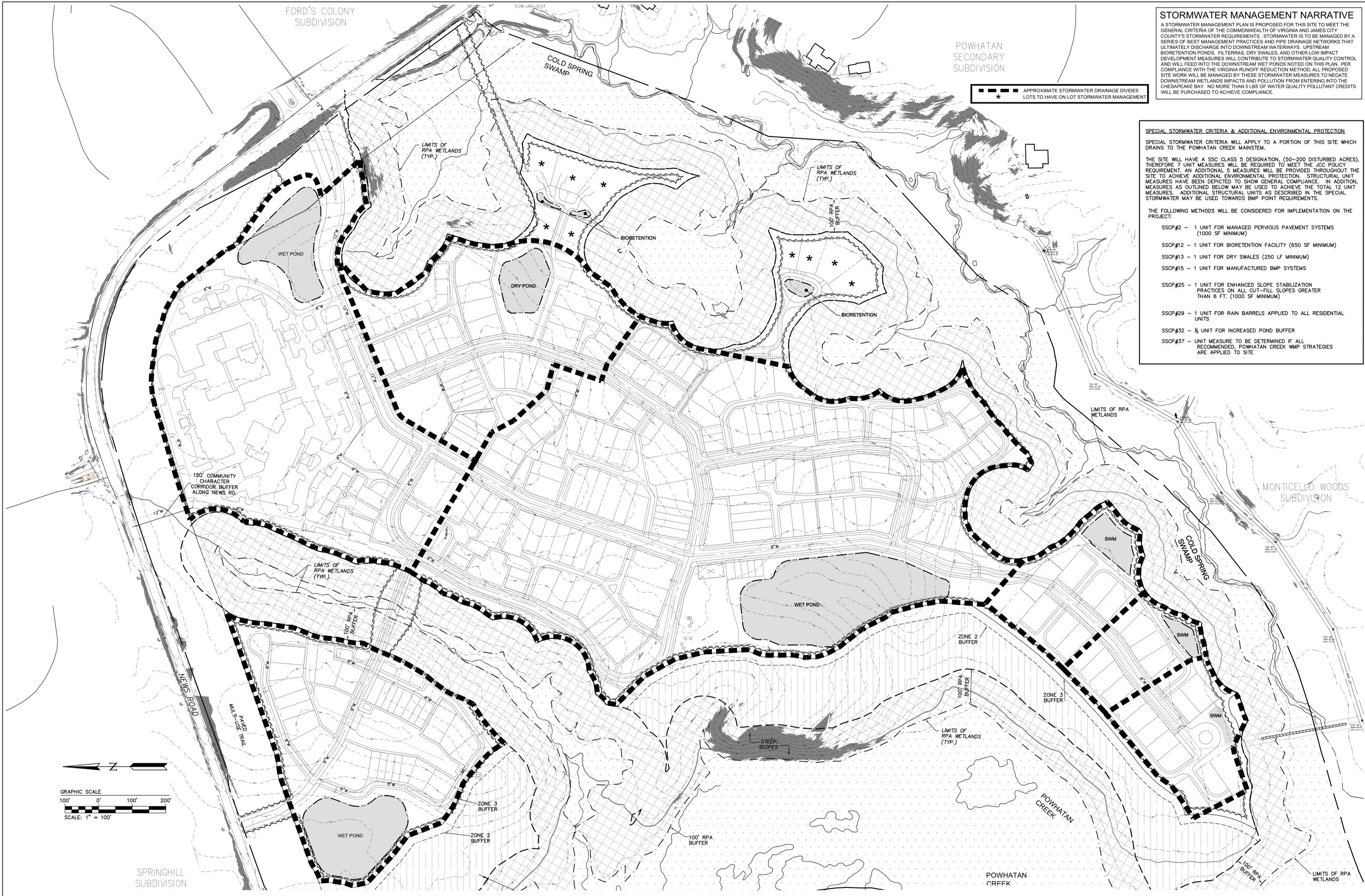
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CONCEPTUAL UTILITY PLAN OF
FORDS' VILLAGE
 AT
 FORD'S COLONY OF WILLIAMSBURG
 FOR
 FRYE DEVELOPMENT, LLC

POWHATAN DISTRICT JAMES CITY COUNTY VIRGINIA

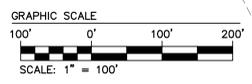
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STORMWATER MANAGEMENT NARRATIVE
 A STORMWATER MANAGEMENT PLAN IS PROPOSED FOR THIS SITE TO MEET THE GENERAL CRITERIA OF THE COMMONWEALTH OF VIRGINIA AND JAMES CITY COUNTY'S STORMWATER REQUIREMENTS. STORMWATER IS TO BE MANAGED BY A SERIES OF BEST MANAGEMENT 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 - 1/2 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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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)

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: [Signature]

Title: VICE PRESIDENT

STATE OF VIRGINIA
CITY/COUNTY OF James City to-wit:

The foregoing instrument was acknowledged before me this 30th day of

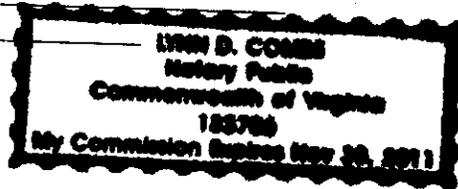
June, 2008 by Drew Mulhare, Vice President of REALTEC

INCORPORATED, a North Carolina corporation, on behalf of the corporation.

[Signature]
NOTARY PUBLIC

My commission expires: _____

Registration No.: _____



Additional Property Description

PARCEL 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 Marlin'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 130, 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, 1986, 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. McMurrin, 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, 1964, was duly probated and duly recorded in the aforesaid Clerk's Office in City of Williamsburg Will Book 45, at Page 16, and duly recorded in the James City County probate records in Will File Number 3234), leaving Martha W. McMurrin 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 D30006334, 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 McMurrin, 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

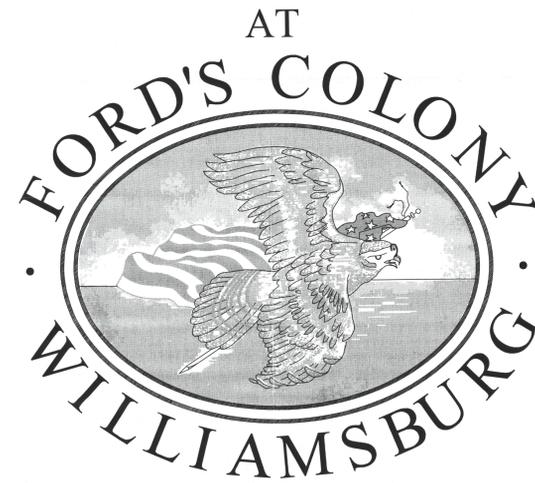
This document was admitted to record on 16 July 08
at 2:47 AM/PM. The taxes imposed by Virginia Code
Section 58.1-801, 58.1-802 & 58.1-814 have been paid.

STATE TAX LOCAL TAX ADDITIONAL TAX

\$ _____ \$ _____ \$ _____
TESTE: BETSY B. WOOLRIDGE, CLERK

BY: Betsy B. Woolridge Clerk

MASTER PLAN FOR REZONING OF THE VILLAGE



AT FOR REALTEC INCORPORATED

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.

PROJECT TEAM

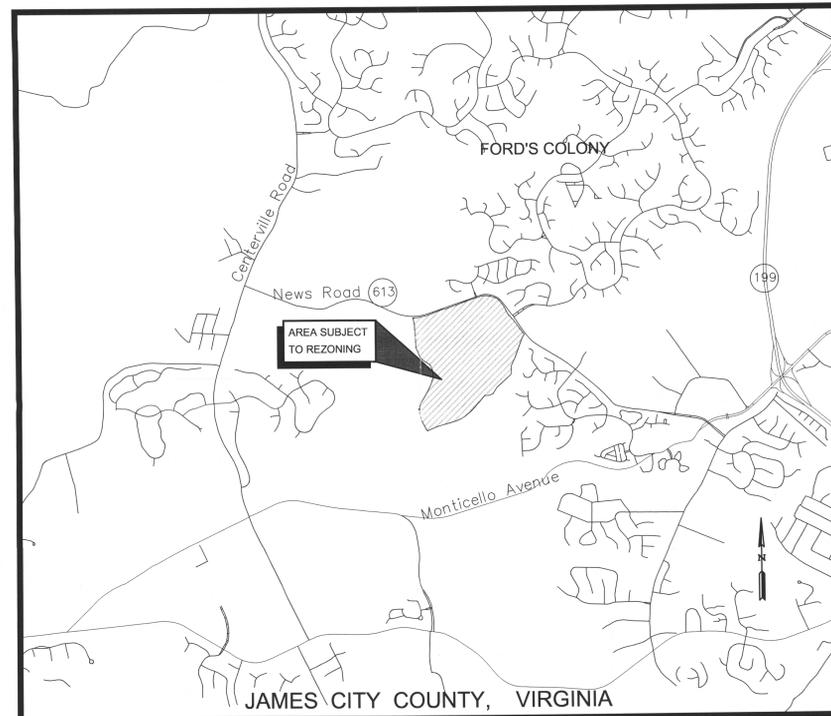
DEVELOPER: REALTEC INCORPORATED

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

(APPROX. SCALE 1"=2000')

ORIGINALLY SUBMITTED: JULY 20, 2007

RESUBMITTED: APRIL 14, 2008

RESUBMITTED: MAY 20, 2008

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



CONSULTING ENGINEERS

WILLIAMSBURG • RICHMOND • GLOUCESTER

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

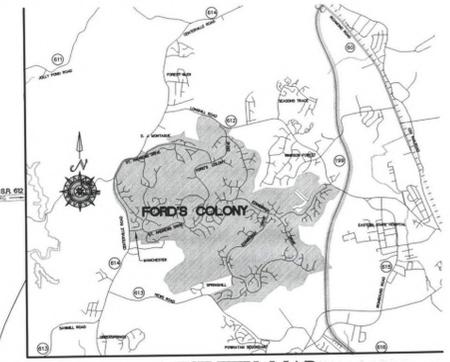
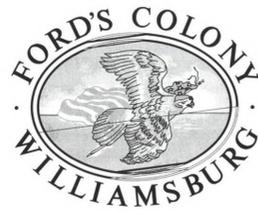


MP-0006-2007 / Z-0008-2007

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

FINAL VERSION
OF CCRC MASTER
PLAN





VICINITY MAP
SCALE 1" = 4000'

NON RESIDENTIAL AMENITY AND SERVICE SITES

100 HOTEL CONDOMINIUMS, EXECUTIVE MEETING FACILITIES AND GOLF ACADEMY	4.71 AC.
GOLF CLUB AND PRO SHOP	5.05 AC.
INFORMATION AND SALES CENTER	1.81 AC.
ADMINISTRATIVE BUILDING	3.50 AC.
PUBLIC SERVICE AREA *	28.05 AC.
GOLF MAINTENANCE	3.90 AC.
COMMUNITY CLUB	7.72 AC.
PROJECT MAINTENANCE	10.59 AC.
DRIVING RANGE/CART STORAGE	10.34 AC.
ADDITIONAL RECREATION AREA	6.36 AC.
ADDITIONAL PUBLIC SERVICE AREA	6.76 AC.
CONTINUING CARE RETIREMENT COMMUNITY (CCRC)	180.7 AC.
TOTAL	289.49 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

GENERAL NOTES:

- 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.
- 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.
- LOTS NUMBERED REPRESENT RECORDED SECTIONS OR SECTIONS THAT HAVE RECEIVED PRELIMINARY APPROVAL.
- 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 DENSITY	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	9.80 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	2,962.24 AC.	2,781.49 AC.
TOTAL NUMBER OF RESIDENTIAL UNITS	3,846 UNITS	3,250 UNITS
OVERALL PROJECT DENSITY	1.30 UNITS/ACRE	1.17 UNITS/ACRE

* 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 GREENBELT'S NATURAL OPEN SPACE IN 1993 ADDITION	3.30 AC.
OPEN SPACE IN 1995 ADDITION	5.00 AC.
OPEN SPACE IN 1998 ADDITION	47.50 AC.
OPEN SPACE IN 2008 ADDITION	111.0 AC.

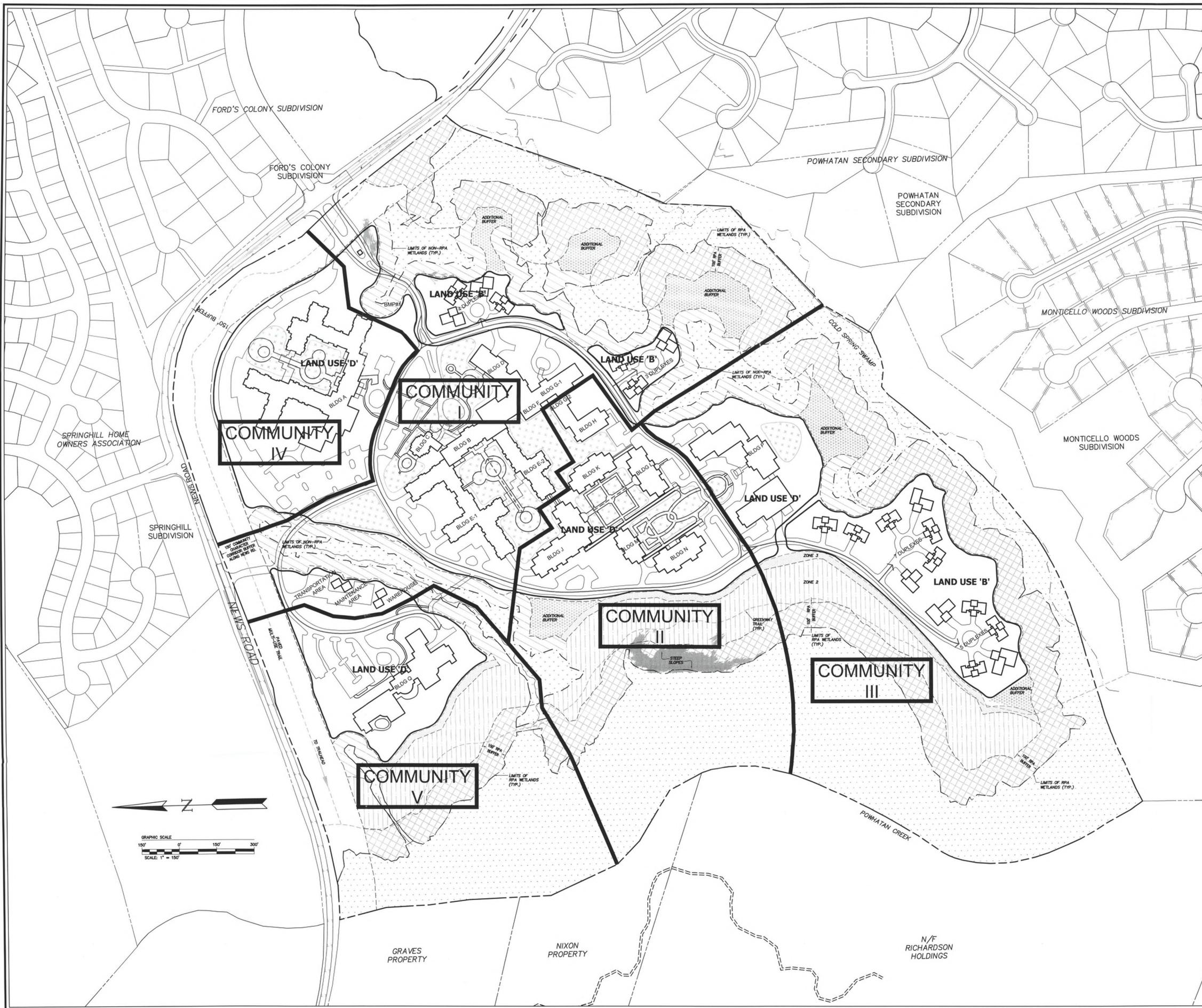
NO.	DATE	REVISION / COMMENT / NOTE
2	5/29/08	REVISIONS PER RELOCATION OF BUILDINGS
1	4/14/08	REVISIONS PER JCC COMMENTS DATED MARCH 20, 2008
		DESIGNED BY
		DRAWN BY

5248 Olde Towne Road, Suite 1
Williamsburg, Virginia 23108
(757) 253-0089
Fax (757) 220-8994



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

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



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 CORRIDOR 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. ±)
- LANDUSE "B" 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. BUILDING 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 - Common 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)	83 Rooms 60 Beds 2 Beds	N/A	N/A	
TOTALS:	596	3.30 du / ac.	297,800 gsf	180.8 Acres

Note (1) Excludes "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

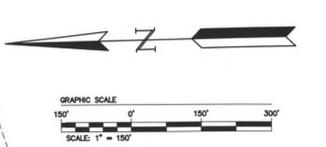
COMMUNITY 1: BUILDINGS B, C, D, E-1/E-2, F, G-1, 14 DUPLEXES, WAREHOUSE, STORAGE & EMPLOYEE PARKING
 TOTAL INDEPENDENT LIVING UNITS = 230; TOTAL BEDS/ROOMS = 54

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



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



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



No.	DATE	REVISION / COMMENT / NOTE	DESIGNED BY	DRAWN 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


ES
 CONSULTING ENGINEERS
 WILLIAMSBURG • RICHMOND

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


Cahill Associates
 ENVIRONMENTAL CONSULTANTS

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

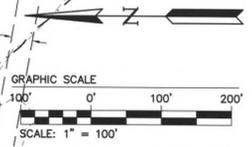
Designed	Drawn
AES	AES
Scale	Date
1"=100'	2/4/08
Project No.	Drawing No.
5652-22	5



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



No.	DATE	REVISION / COMMENT / NOTE	DESIGNED BY	CHECKED 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

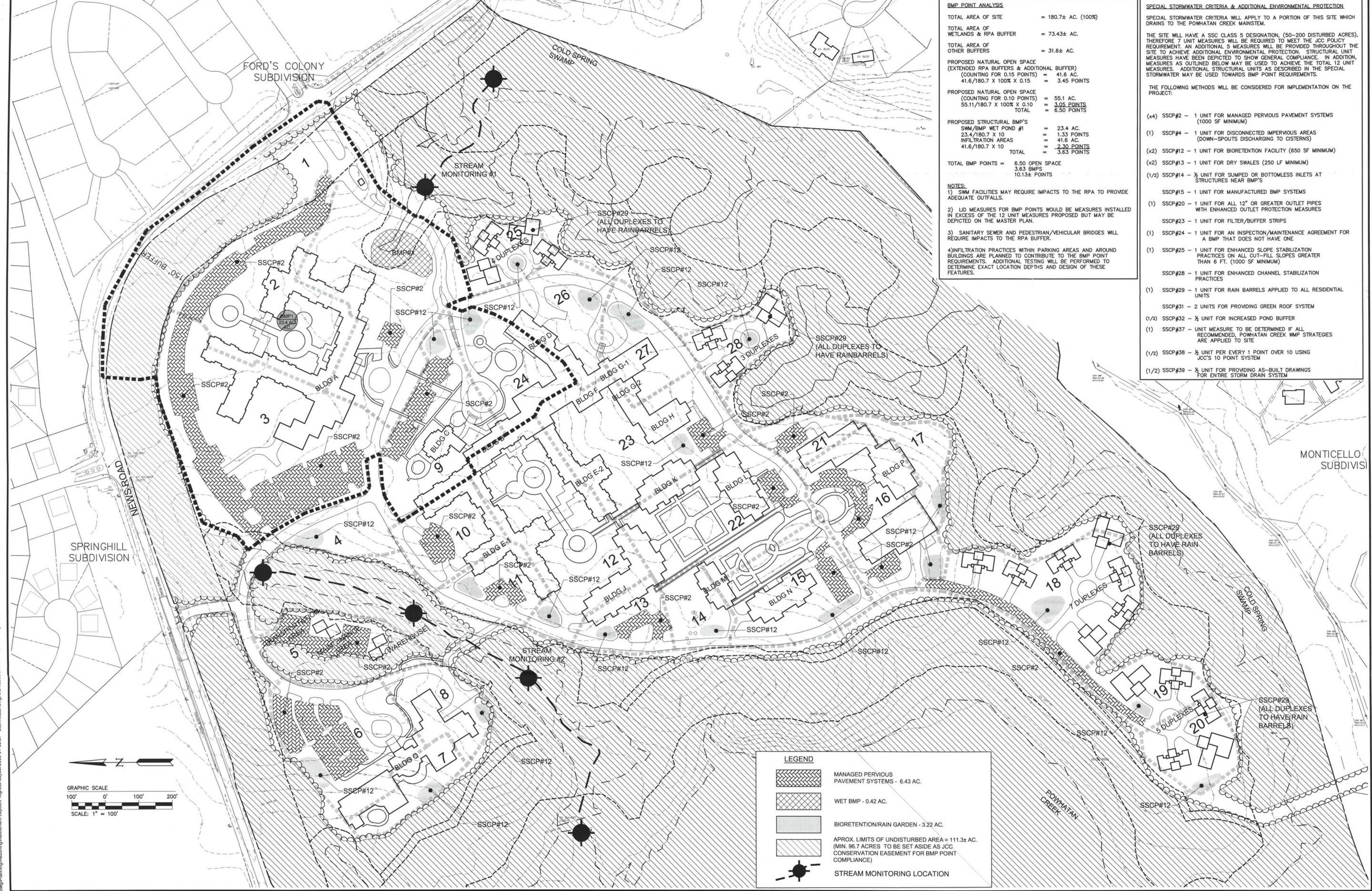
ES CONSULTING ENGINEERS
Engineers
Surveyors
Planners
Landscape Architects
WILLIAMSBURG • RICHMOND

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Williamsburg, Virginia 23188
Ph: (757) 253-0040
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Cahill Associates
ENVIRONMENTAL CONSULTANTS

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

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



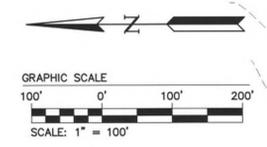
BMP POINT ANALYSIS

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. 55.1/180.7 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 BMP'S 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 - 1/2 UNIT FOR SLUMPED 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 - 1/2 UNIT FOR INCREASED POND BUFFER
 - (1) SSCP#37 - 1 UNIT MEASURE TO BE DETERMINED IF ALL RECOMMENDED, POWHATAN CREEK WMP STRATEGIES ARE APPLIED TO SITE
 - (1/2) SSCP#38 - 1/2 UNIT PER EVERY 1 POINT OVER 10 USING JCC'S 10 POINT SYSTEM
 - (1/2) SSCP#39 - 1/2 UNIT FOR PROVIDING AS-BUILT DRAWINGS FOR ENTIRE STORM DRAIN SYSTEM



LEGEND

	MANAGED PERVIOUS PAVEMENT SYSTEMS - 6.43 AC.
	WET BMP - 0.42 AC.
	BIORETENTION/RAIN GARDEN - 3.22 AC.
	APPROX. 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

S:\Jobs\56522-Wetburton - Treating\Planning\Reasoning\Layout\Progress Layout\2008-01-02\07 - Stormwater.dwg, 5/21/2008, 2:02:46 PM, leanna.griffin

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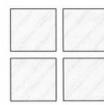
MASTER STORMWATER MANAGEMENT PLAN of
THE VILLAGE
 FORD'S COLONY OF WILLIAMSBURG
 for
 REALTEC INCORPORATED
 POWHATAN DISTRICT JAMES CITY COUNTY VIRGINIA

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



Sub: 56522-Warhouson Tracking\Planning\Grading\Retirement Layout\Progress Layout 2008-01-02-08 - Grading.dwg, 5/21/2008 2:02:37 PM, leanne.griffin

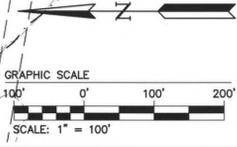
No.	DATE	REVISION / COMMENT / NOTE	DESIGNED BY	DRAWN BY
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GRADING PLAN of THE VILLAGE at FORD'S COLONY OF WILLIAMSBURG for REALTEC INCORPORATED		Designed AES Scale 1"=100' Project No. 5652-22 Drawing No. 8
POWHATAN DISTRICT JAMES CITY COUNTY VIRGINIA		



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 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 below.

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. *Estimate* 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
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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
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- 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.jccgov.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
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- 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
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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 at 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
Real Estate Tax Rate
Total Rentable HOA Property Tax Revenue

0
0.0084
\$ -

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
1	Elderly Care
2	
3	
4	
5	
6	

Expected Market Value

\$ 30,000,000.00

Total Commercial Real Estate Expected Market Value

\$ 30,000,000.00

3c) What are the commercial expenses?

Total Commercial Real Estate Taxes Paid
Per-Business Commercial Expense Rate
Total Commercial Expenses

252000
0.00468
\$ 140,400.00

Commercial Revenues

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

Total Commercial Real Estate Assessment Value
Real Estate Tax Rate
Total Commercial Real Estate Taxes Paid

30000000
0.0084
\$ 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 full-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



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 Assoc., 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

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.



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.

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.

VALUE	LAND USE	LAND USE CODE	SQ.FT., OTHER UNITS	WEEKDAY TRIP GENERATION						DAILY
				AM PEAK HOUR			PM PEAK HOUR			
				Enter	Exit	Total	Enter	Exit	Total	

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
	TOTAL		516 bed/unit	51	69	120	85	75	160	1916

TABLE FIVE: PROPOSED DEVELOPMENT CHANGE FROM PRIOR VALUES

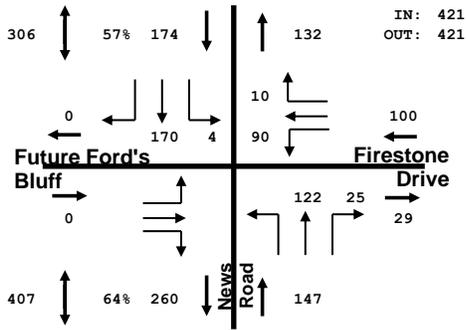
PRIOR TRIP GENERATION VALUES		UNITS	AM PEAK	PM PEAK	TOTAL
1	April 2008 Study (TG7)	952	105	182	2697
	Change With Proposed Plan	-436	15	-22	-781
2	KHA 2020 (TGM10) 83 AL Beds	739	101	161	2078
	Change With Proposed Plan	-223	19	-1	-162
3	2008 Proffer Limits (TGM10) 166 AL Beds	822	117	182	2294
	Change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

**FORD'S BLUFF
TRIP GENERATION AUG. 31, 2021**

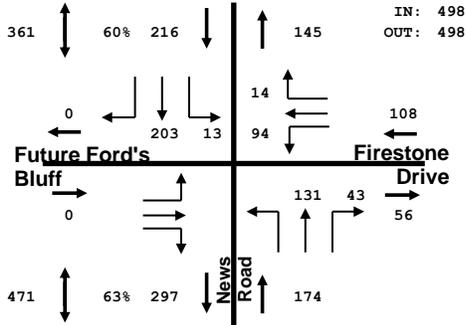
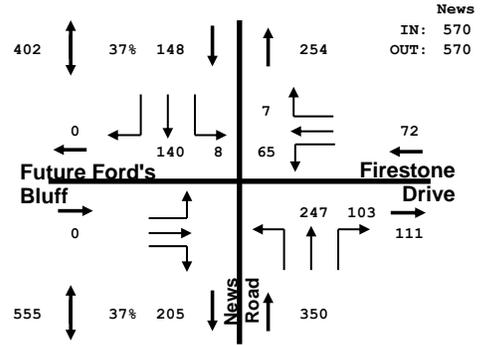
**DRW Consultants, LLC
804-794-7312**

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

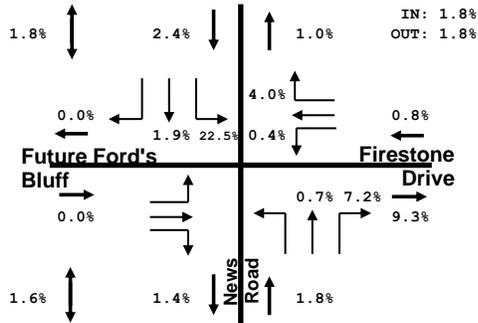
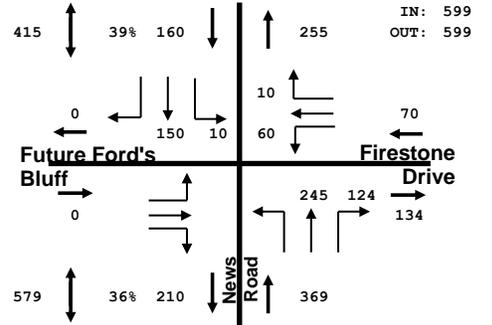
Exhibit A



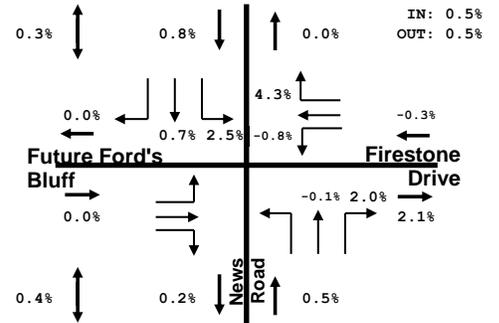
April 2007 Counts



June 2017 Counts



**% Increase/Year
2007 To 2017**



AM PEAK HOUR

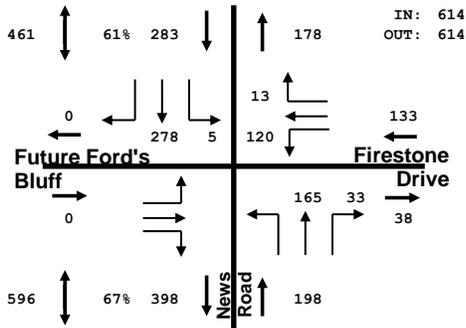
Exhibit Reference

PM PEAK HOUR

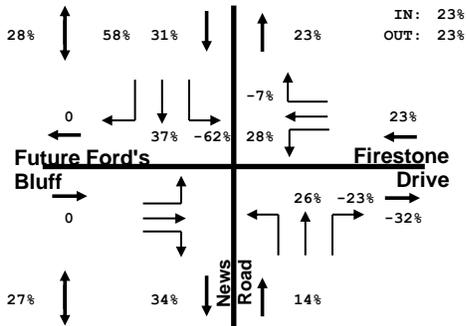
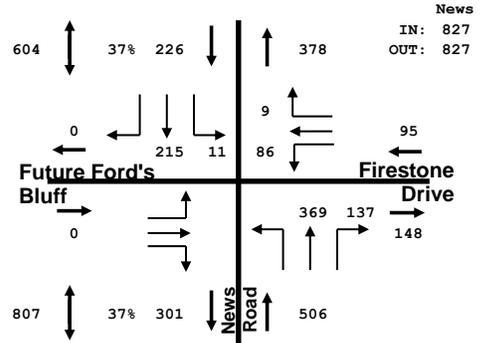
NEWS ROAD 2007/2017 PEAK HOUR COUNT COMPARISON

DRW Consultants, LLC
804-794-7312

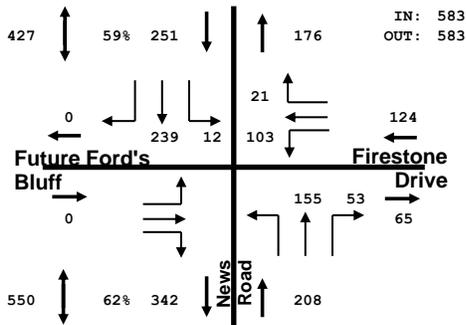
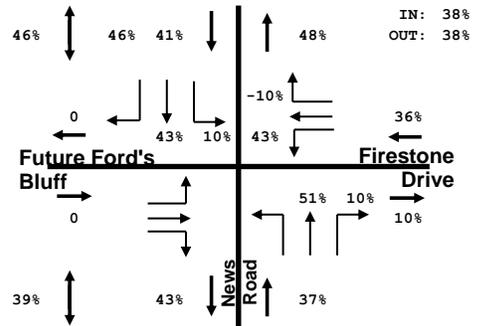
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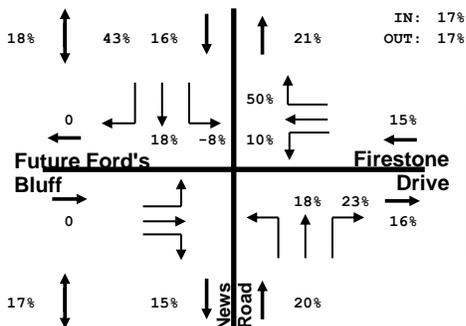
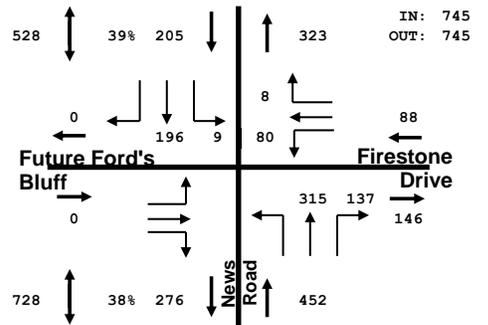
2008 Study Build Out Forecast



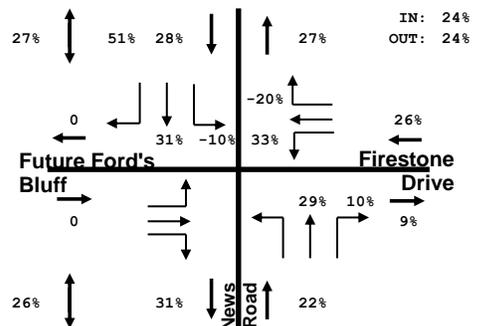
2008 Study % Increase Over 2017 Counts



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)

Prepared by:
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**117079000
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
 - Eastbound Longhill Road
 - Widen and construct an additional approach and receiving through lane
 - Westbound Longhill Road
 - 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)

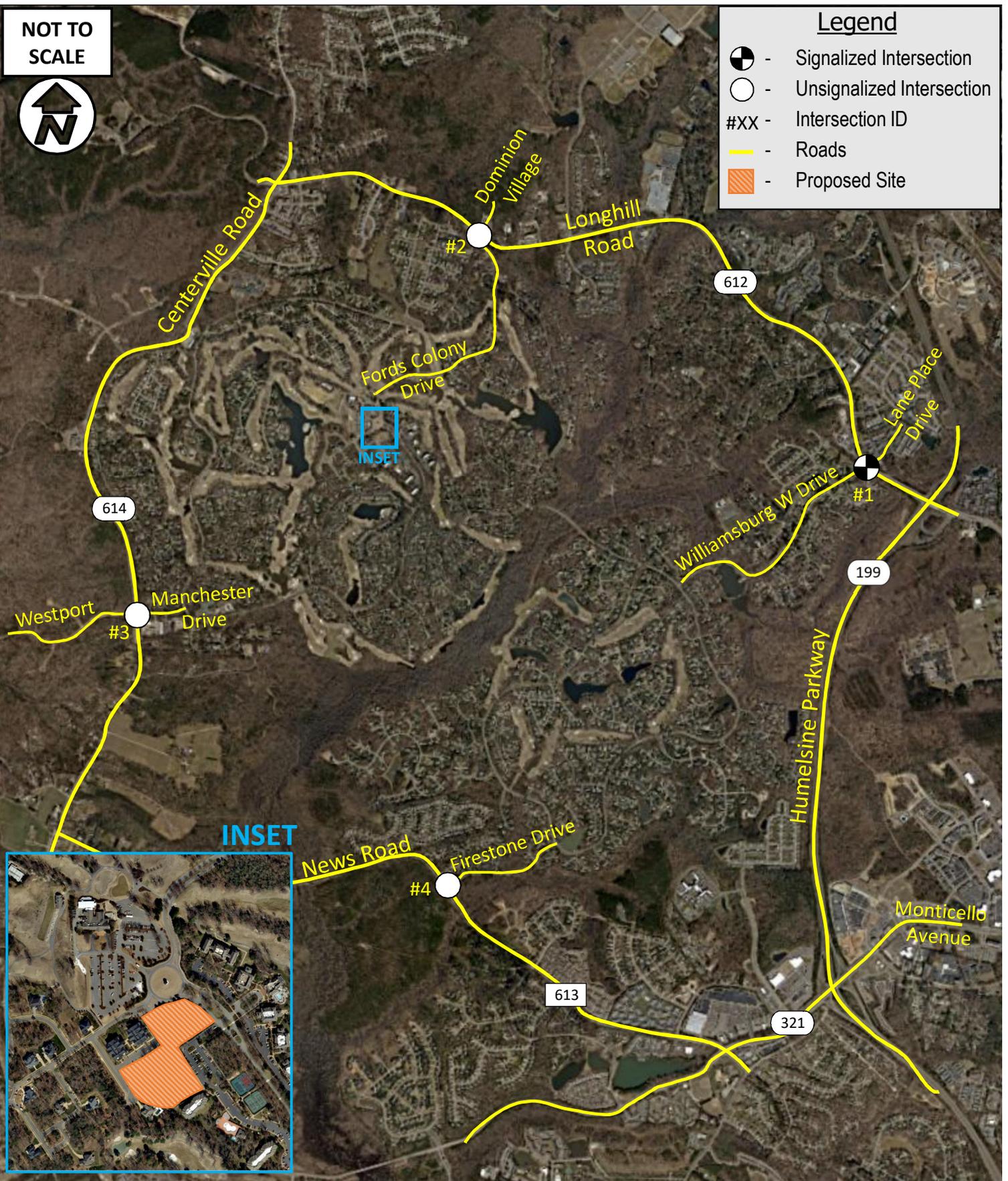
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NOT TO SCALE



Legend

- Signalized Intersection
- Unsignalized Intersection
- Intersection ID
- Roads
- Proposed Site



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

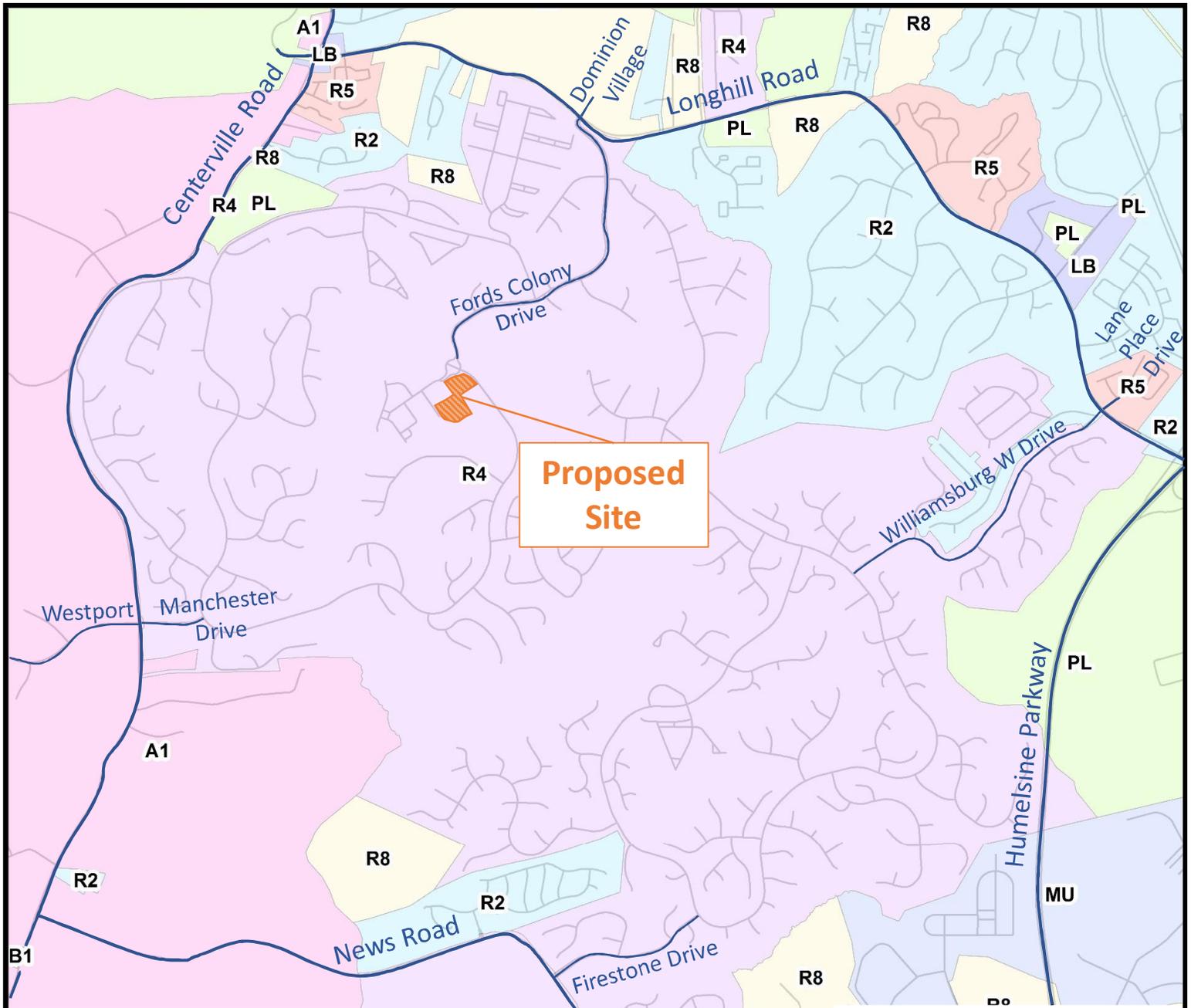
Longhill Road, Centerville Road, and News Road are the primary thoroughfares within the study area that provide connections to Williamsburg W. Drive, Ford's Colony Drive, Manchester Drive, and Firestone Drive, which provide access to/from the Ford's Colony community. **Figure 3** depicts existing roadway 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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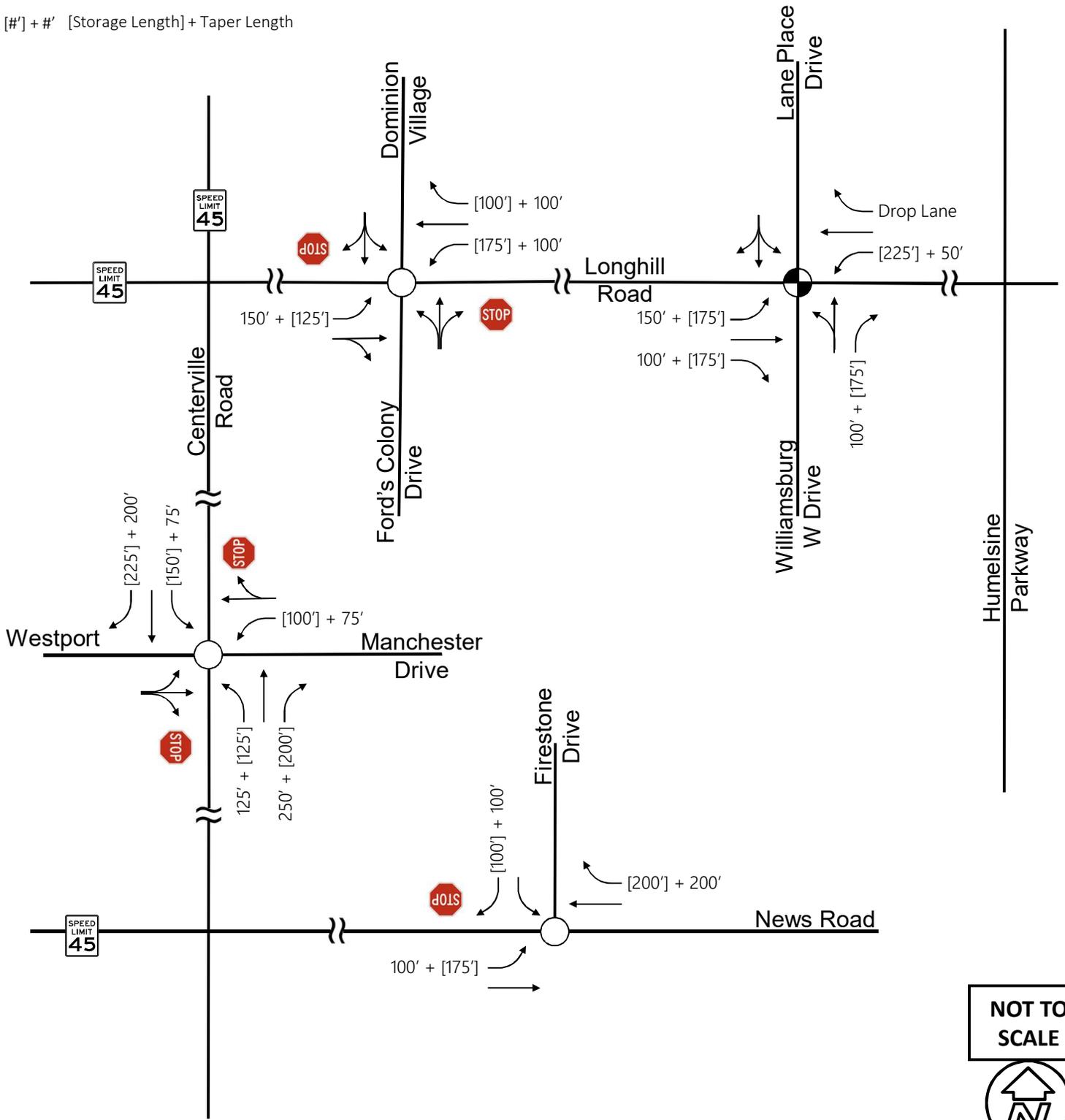
- | | |
|----------------------------------|--|
| General Agriculture (A1) | Mixed Use (MU) |
| General Business (B1) | Multi-Family Residential (R5) |
| General Industrial (M2) | Planned Unit Development Commercial (PUD-C) |
| General Residential (R2) | Planned Unit Development Residential (PUD-R) |
| Limited Business (LB) | Public Lands (PL) |
| Limited Business/Industrial (M1) | Residential Planned Community (R4) |
| Limited Residential (R1) | Rural Residential (R8) |
| Low-Density Residential (R6) | |

Source: James City County GIS Zoning Layer

Legend

-  Signalized Intersection
-  Unsignalized Intersection
-  Existing Lane Assignment

[#] + #' [Storage Length] + Taper Length



NOT TO SCALE



	<p>Ford's Colony TIS Update James City County, VA</p>	<p>Existing Roadway Conditions</p>	<p>FIGURE 3</p>
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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

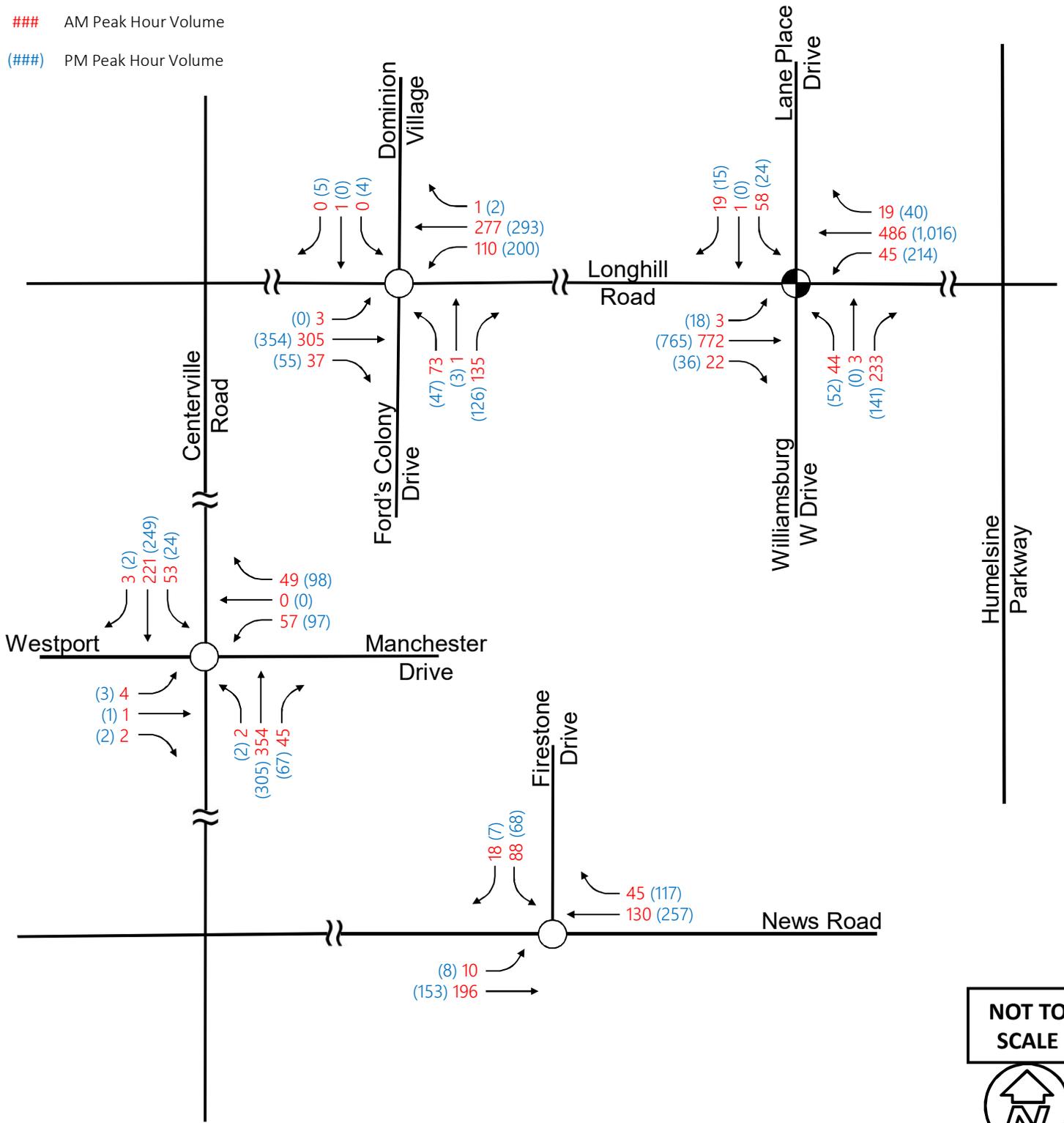
The uniform peak hours for these intersections were found to be 7:30 AM to 8:30 AM and 4:45 PM to 5:45 PM for the AM and PM peak hours, respectively. It should be noted that peak hour volumes were not adjusted and/or balanced, due to the location and number of access driveways between study area intersections.

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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Legend

-  Signalized Intersection
-  Unsignalized Intersection
-  Turning Movement
- ###** AM Peak Hour Volume
- (###)** PM Peak Hour Volume



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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 consist 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.

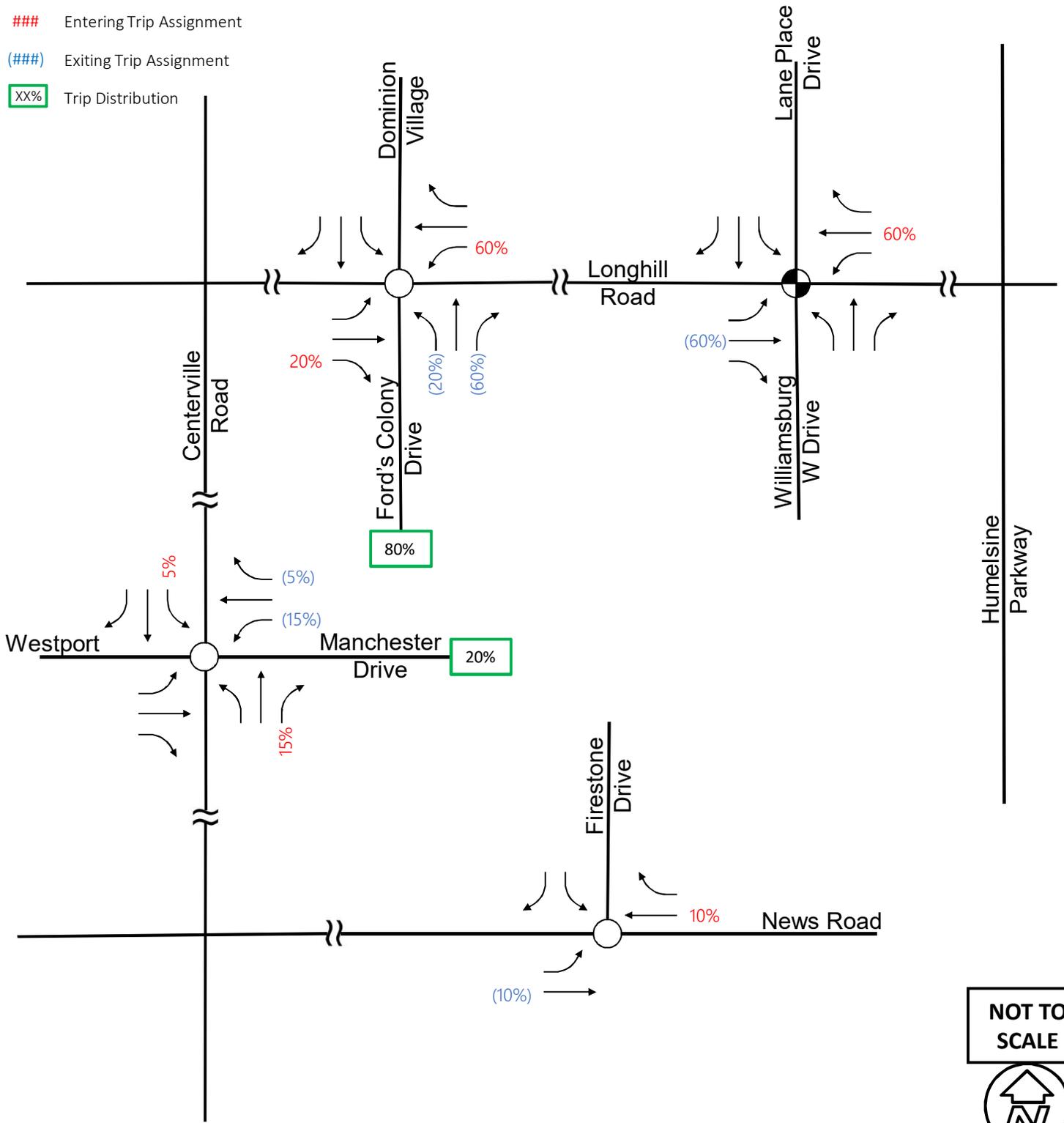
As shown previously in and consistent with the previous TIS, the proposed development site will not introduce any new access points to existing/adjacent study area roadways.

Detailed AM and PM peak hour trip distribution and trip assignment is shown in **Figure 5** and **Figure 6**, respectively.

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Legend

-  Signalized Intersection
-  Unsignalized Intersection
-  Turning Movement
-  Entering Trip Assignment
-  Exiting Trip Assignment
-  Trip Distribution



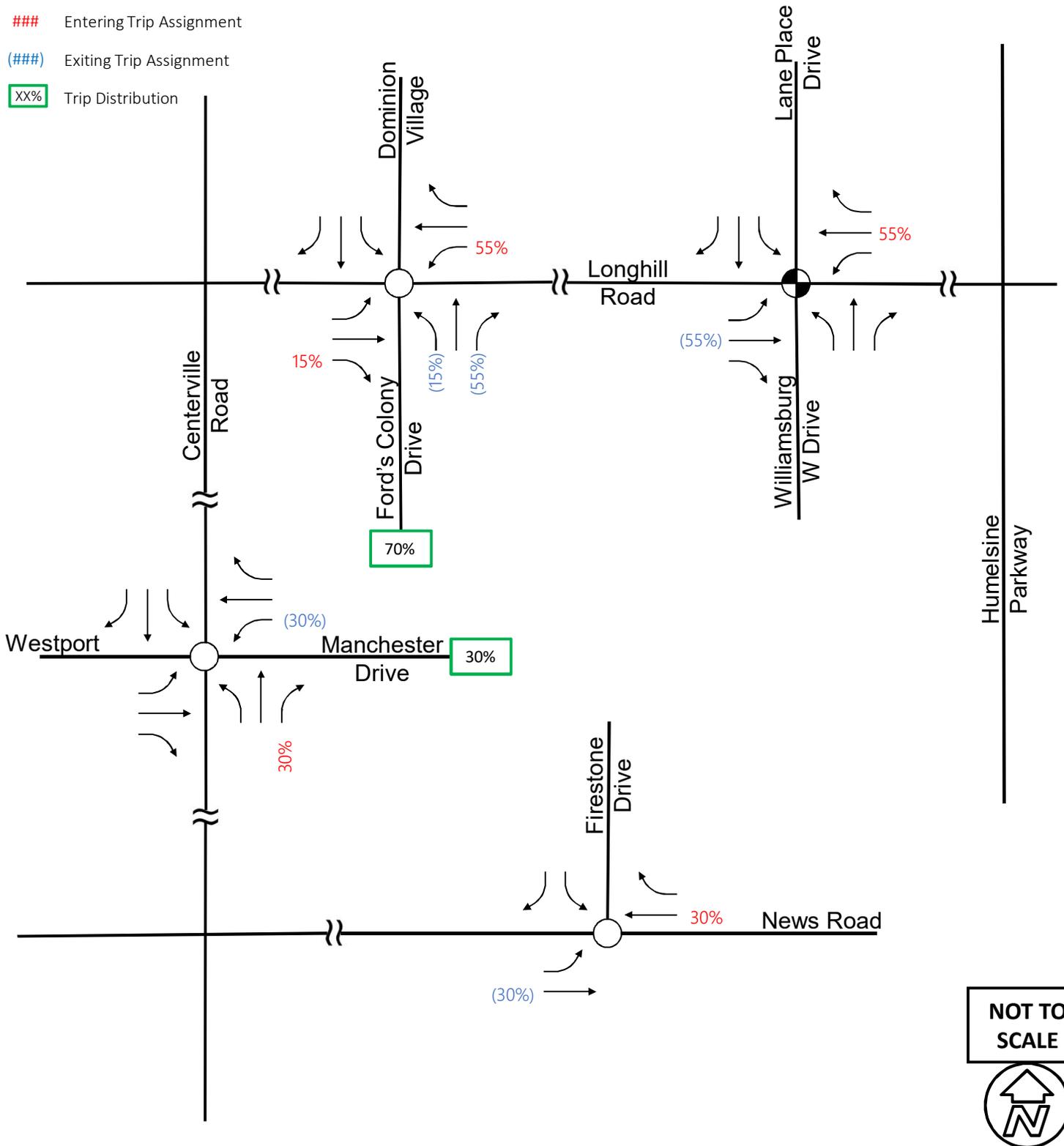
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Legend

-  Signalized Intersection
-  Unsignalized Intersection
-  Turning Movement
-  Entering Trip Assignment
-  Exiting Trip Assignment
-  Trip Distribution



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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.

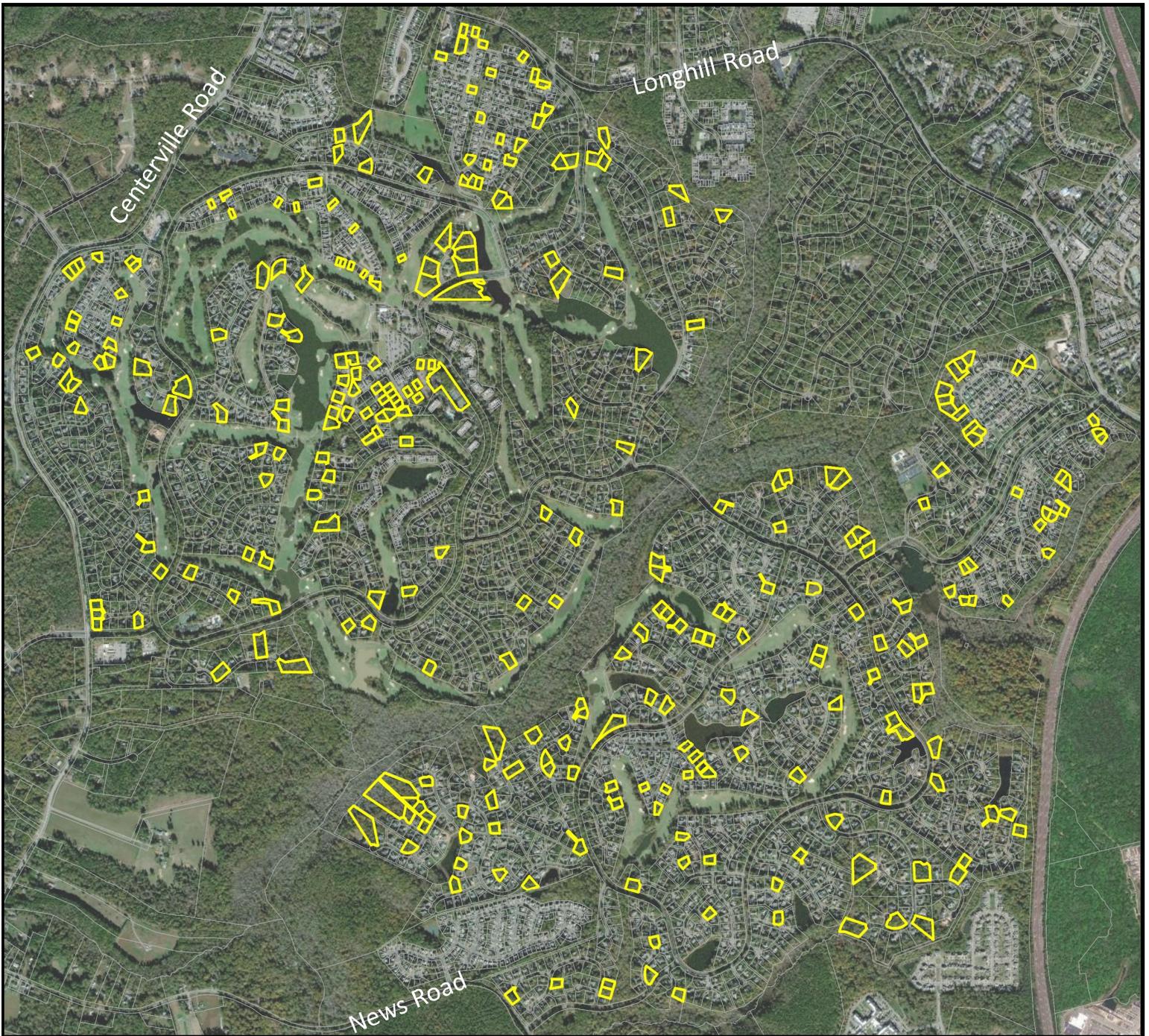
- Longhill Road – 2.0% per year (consistent with *Longhill Road Corridor Study*)
- Centerville Road – 2.5% per year
- News Road – 2.0% per year

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

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

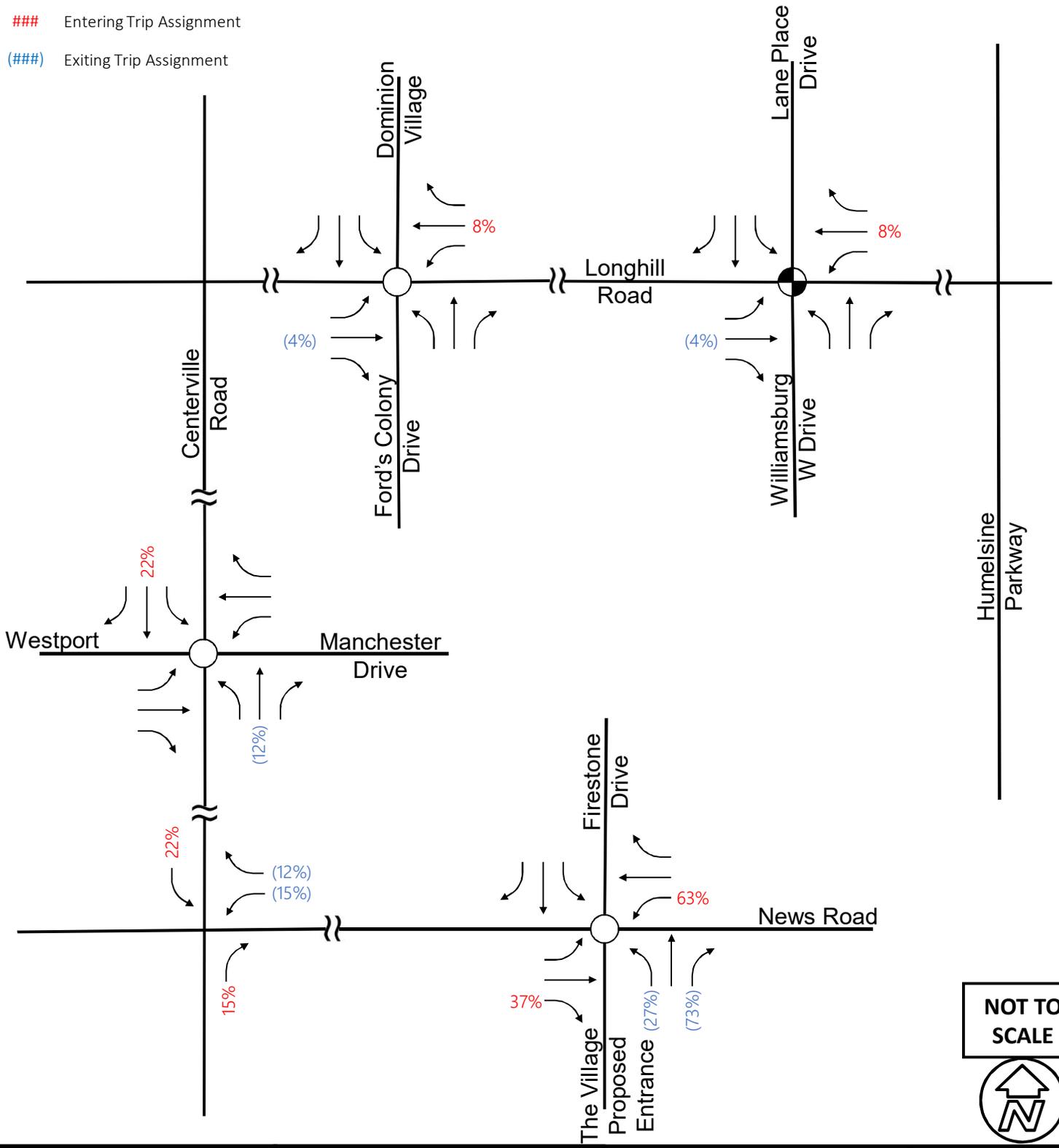
6.2 TOTAL TRAFFIC

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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Legend

-  Signalized Intersection
-  Unsignalized Intersection
-  Turning Movement
- ### Entering Trip Assignment
- (###) Exiting Trip Assignment



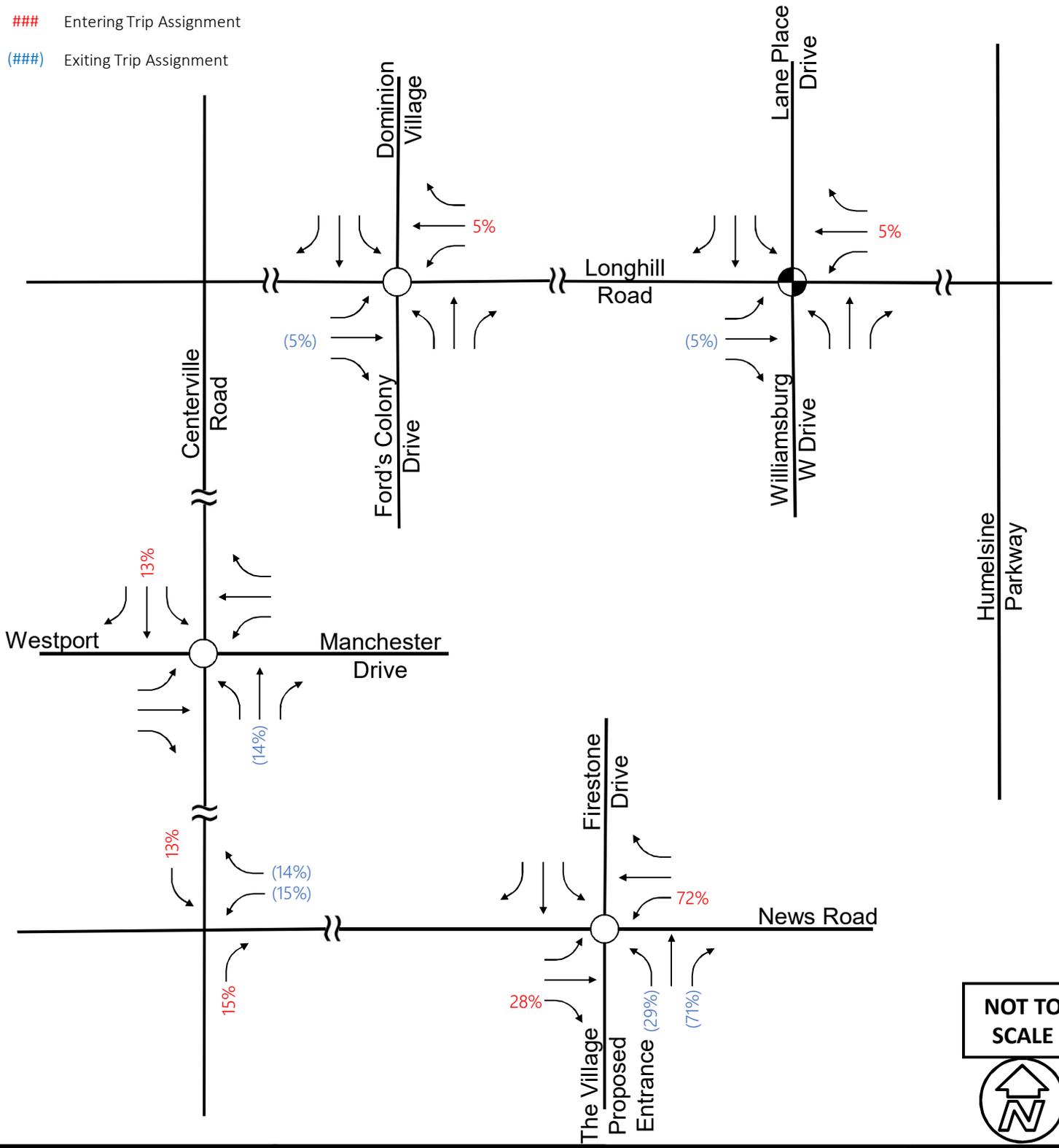
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Legend

-  Signalized Intersection
-  Unsignalized Intersection
-  Turning Movement
- ### Entering Trip Assignment
- (###) Exiting Trip Assignment



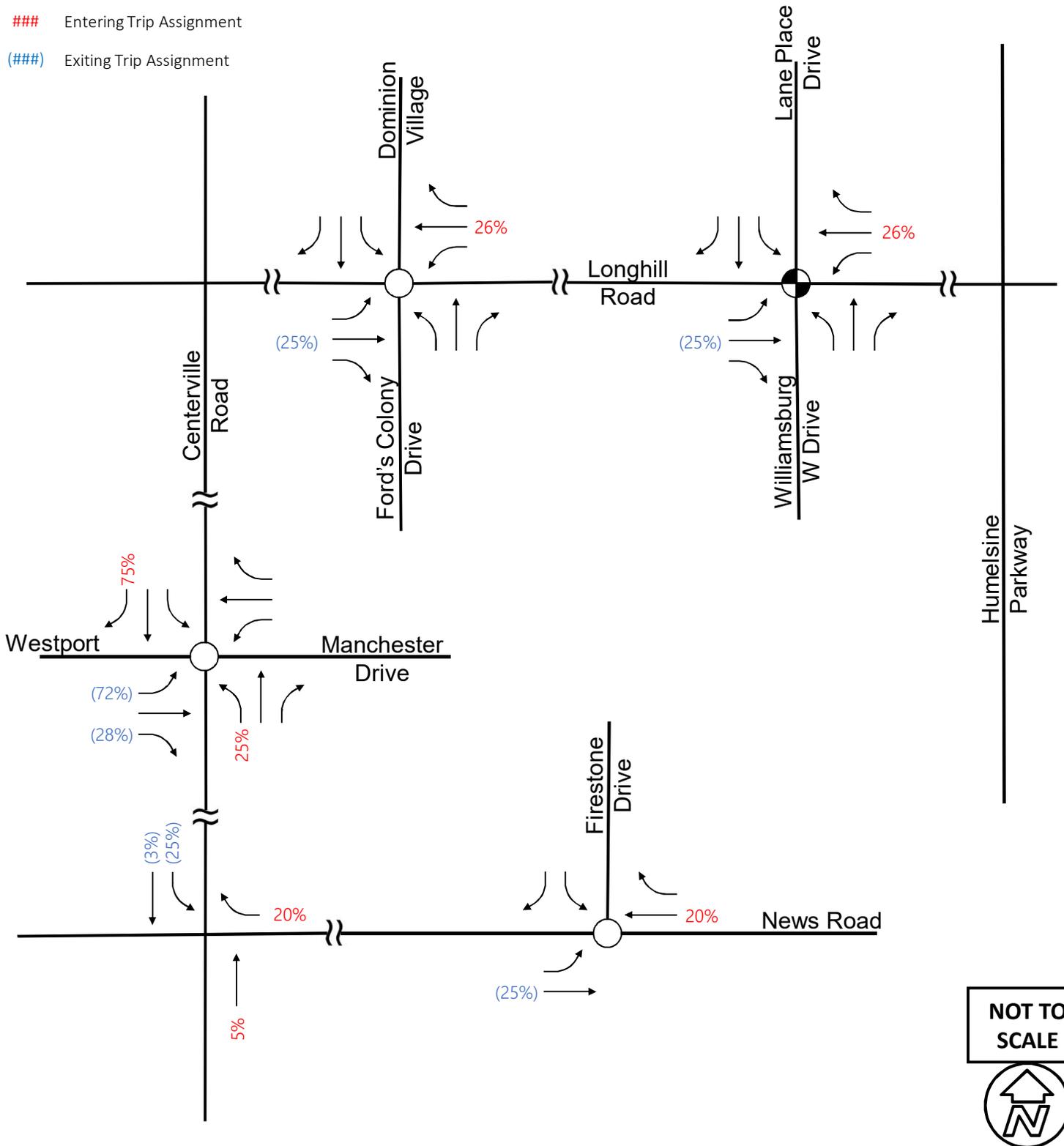
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Legend

-  Signalized Intersection
-  Unsignalized Intersection
-  Turning Movement
- ### Entering Trip Assignment
- (###) Exiting Trip Assignment

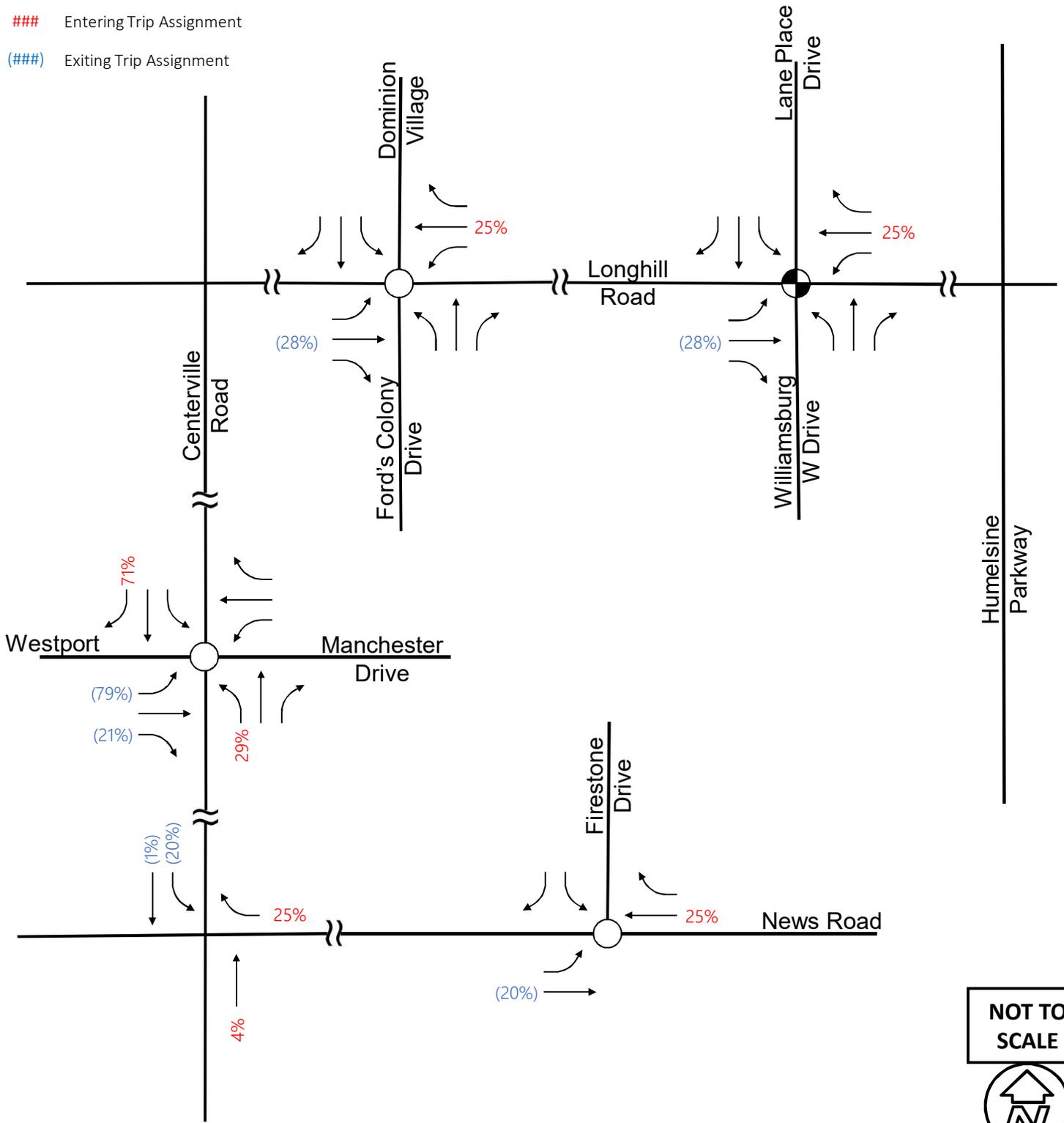


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Legend

-  Signalized Intersection
-  Unsignalized Intersection
-  Turning Movement
- ### Entering Trip Assignment
- (###) Exiting Trip Assignment

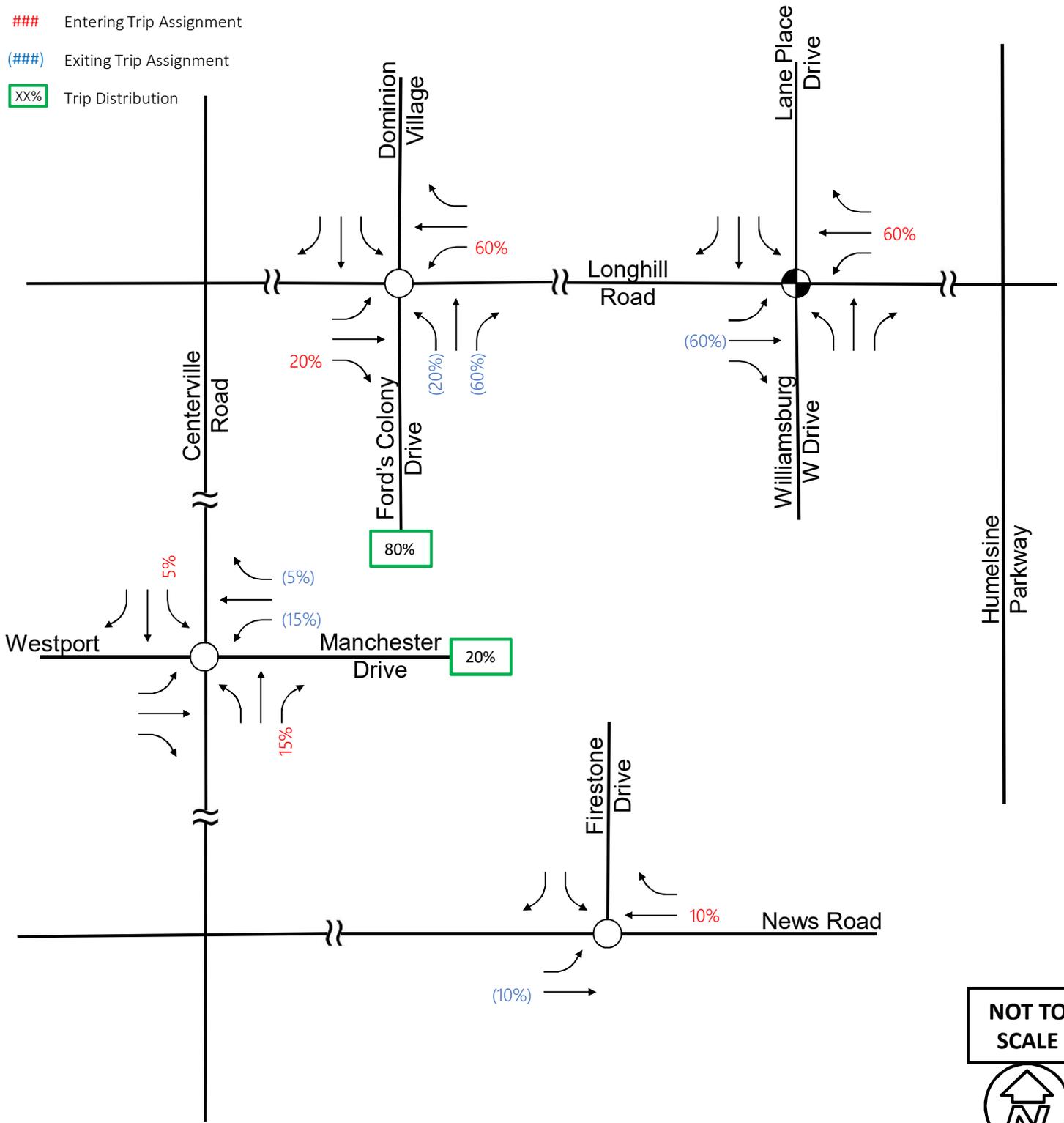


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Legend

-  Signalized Intersection
-  Unsignalized Intersection
-  Turning Movement
-  Entering Trip Assignment
-  Exiting Trip Assignment
-  Trip Distribution

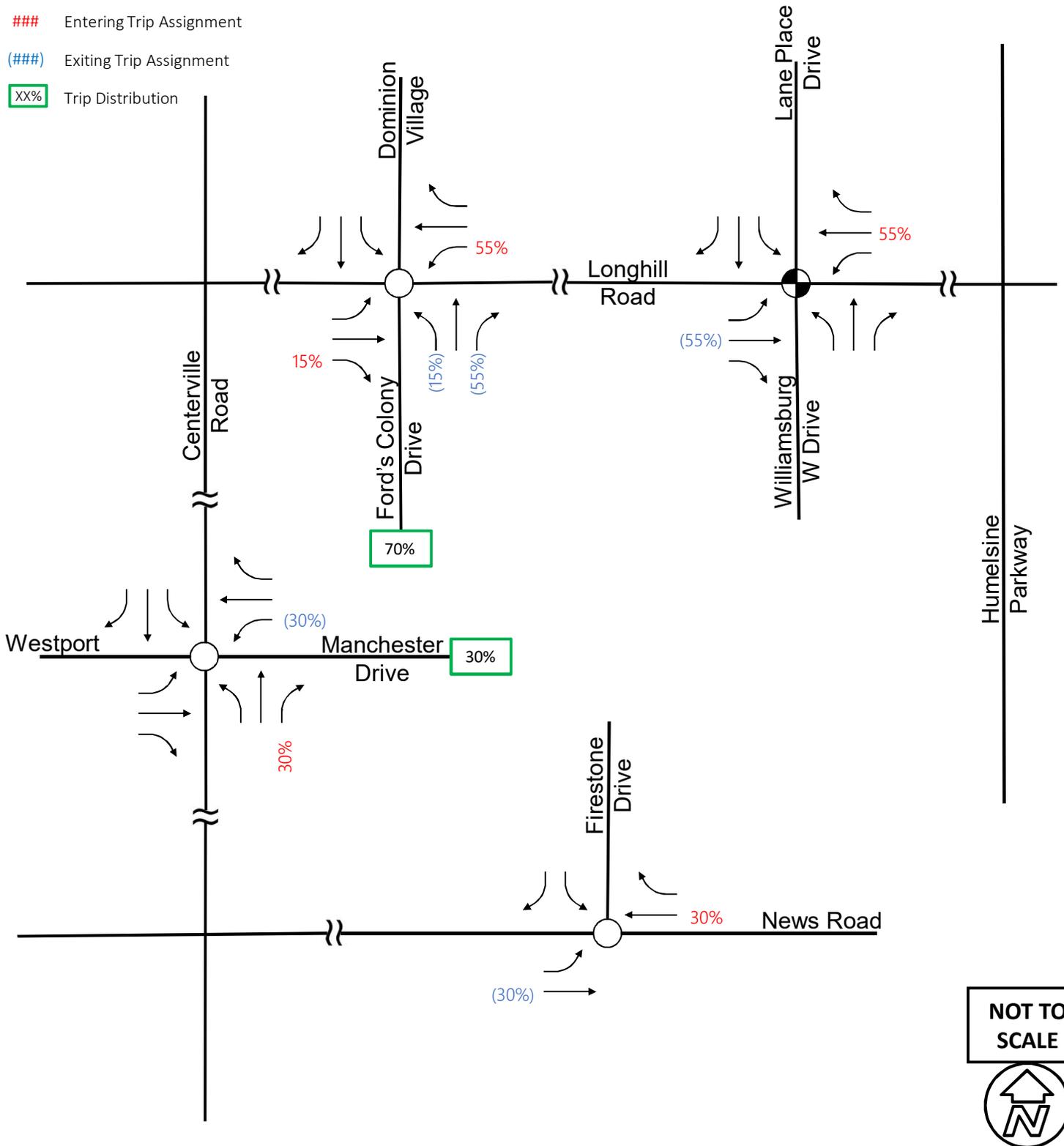


NOT TO SCALE



Legend

-  Signalized Intersection
-  Unsignalized Intersection
-  Turning Movement
-  Entering Trip Assignment
-  Exiting Trip Assignment
-  Trip Distribution



NOT TO SCALE



Legend

Signalized Intersection

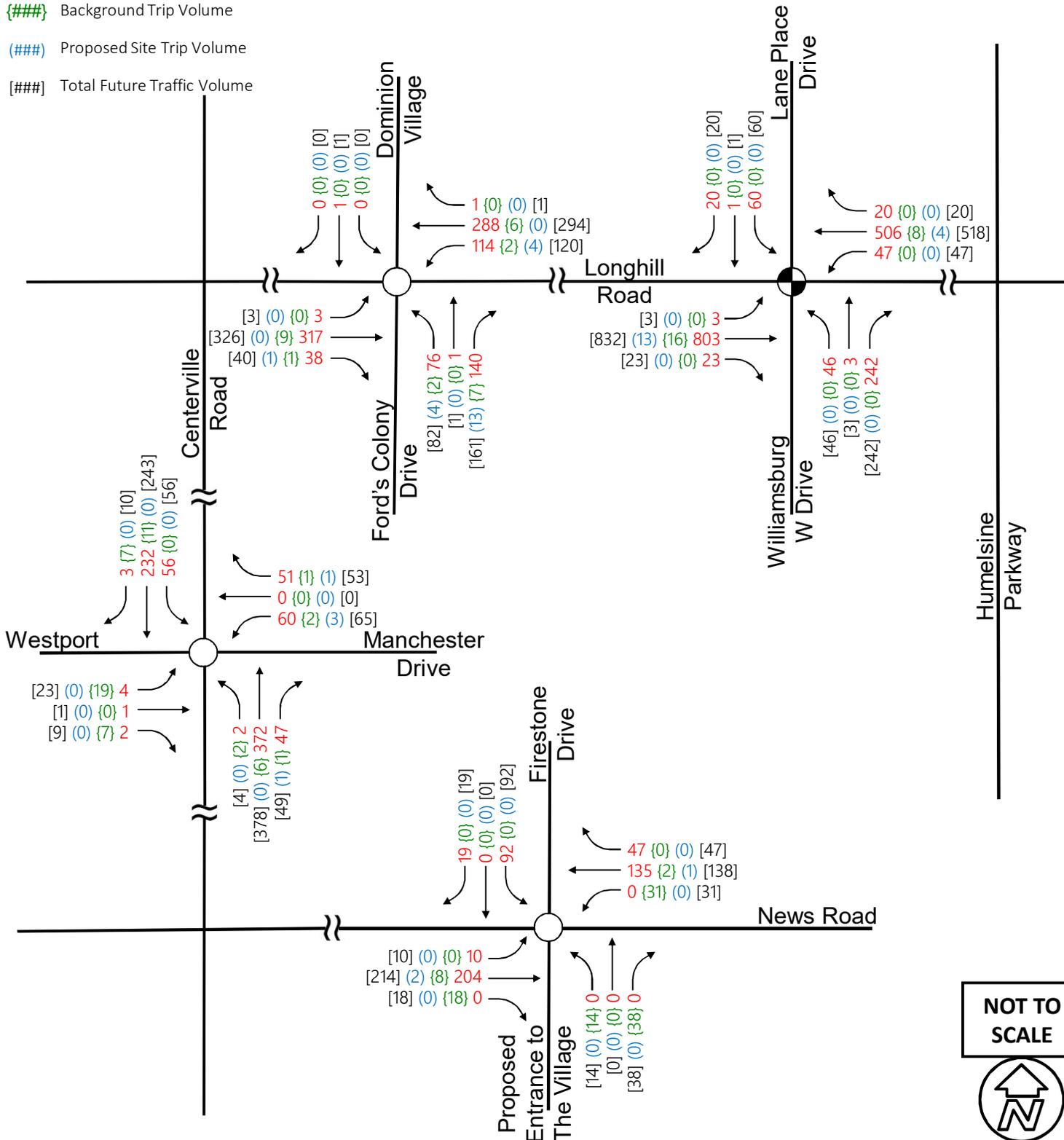
Unsignalized Intersection

Existing Traffic Volume with Growth Rate Applied

{###} Background Trip Volume

{###} Proposed Site Trip Volume

[###] Total Future Traffic Volume



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Signalized Intersection

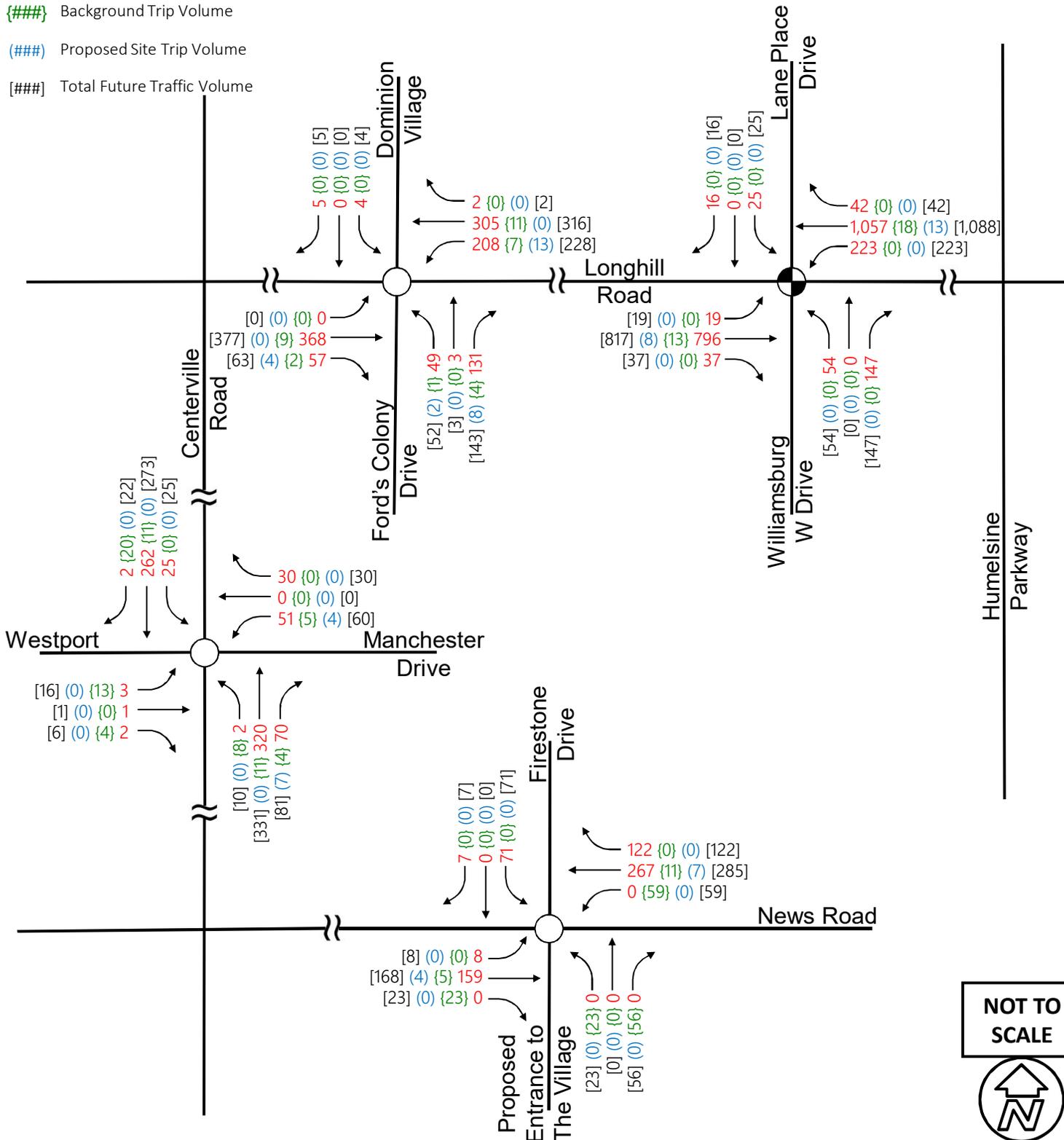
Unsignalized Intersection

Existing Traffic Volume with Growth Rate Applied

{###} Background Trip Volume

(###) Proposed Site Trip Volume

[###] Total Future Traffic Volume



NOT TO SCALE

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	✗	✗	✗
iii	Longhill Road at Fords Colony Drive	947	2,851	✓	✗	✗
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	✗	✗	✗
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	✓	✗	✗
iv.	Add lane for dual right-turn on Williamsburg W. Drive onto Longhill Road	3,250	2,851	✗	✗	✗
E. Installation of right-turn lane on Longhill Road onto Ford's Colony Drive						
		947	2,851	✓	✗	✓

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)	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)	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)	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)	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)	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)	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)	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)	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.	
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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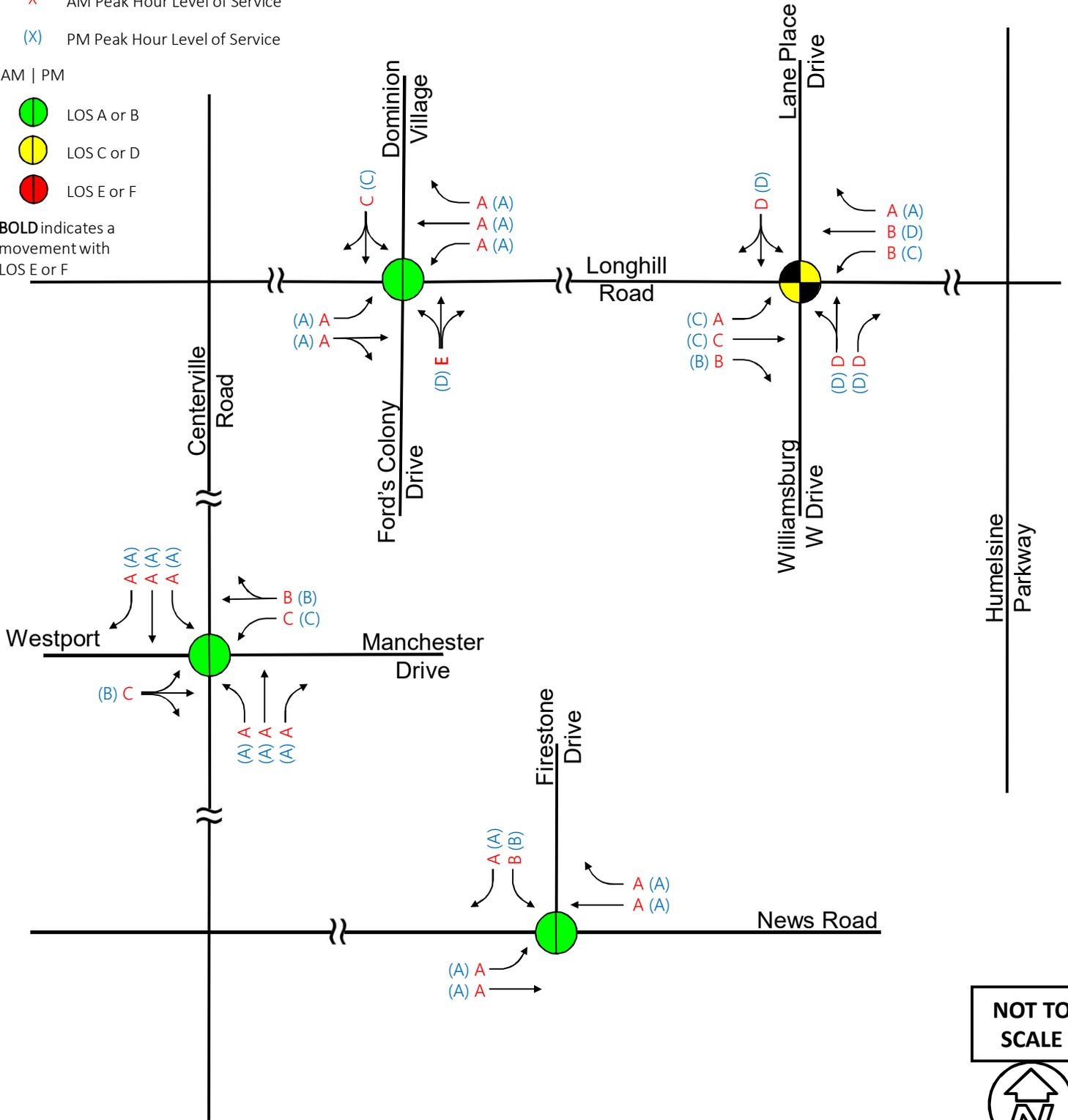
Legend

-  Signalized Intersection
-  Unsignalized Intersection
-  Existing Lane Assignment
-  AM Peak Hour Level of Service
-  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

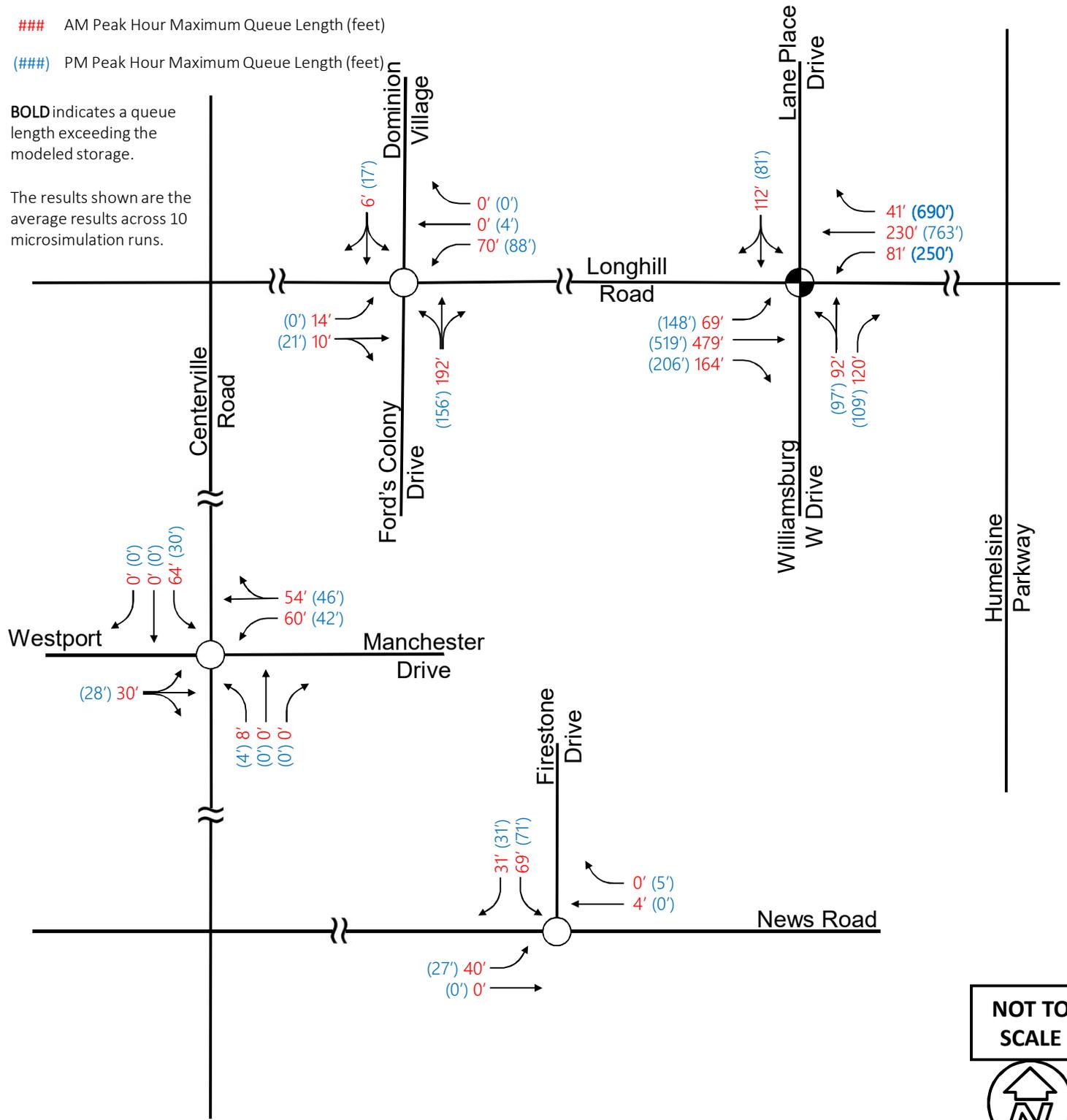


Legend

-  Signalized Intersection
-  Unsignalized Intersection
-  Existing Lane Assignment
- ###** AM Peak Hour Maximum Queue Length (feet)
- (###)** PM Peak Hour Maximum Queue Length (feet)

BOLD indicates a queue length exceeding the modeled storage.

The results shown are the average results across 10 microsimulation runs.



NOT TO SCALE



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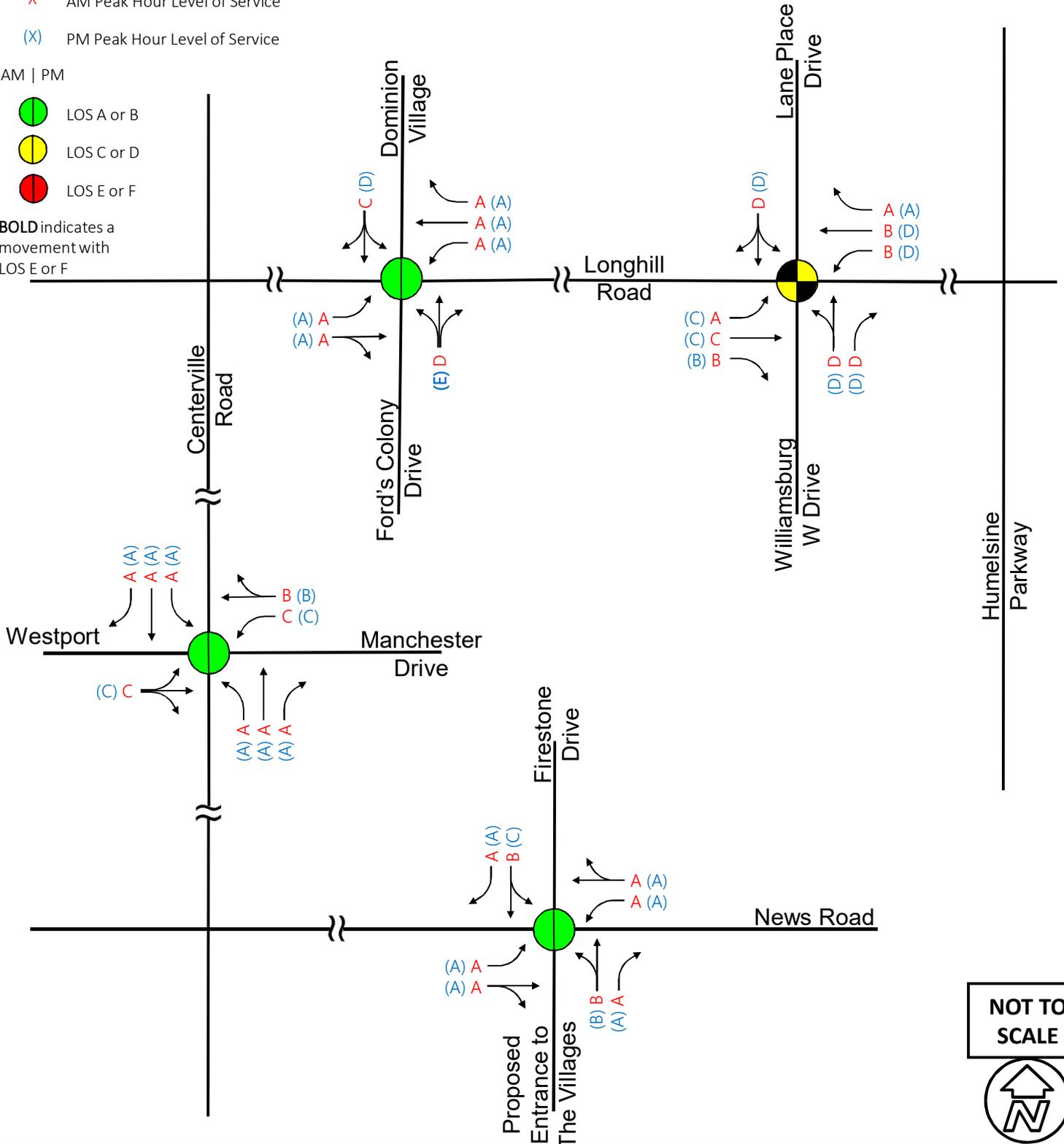
Legend

-  Signalized Intersection
-  Unsignalized Intersection
-  Existing Lane Assignment
-  AM Peak Hour Level of Service
-  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



Legend

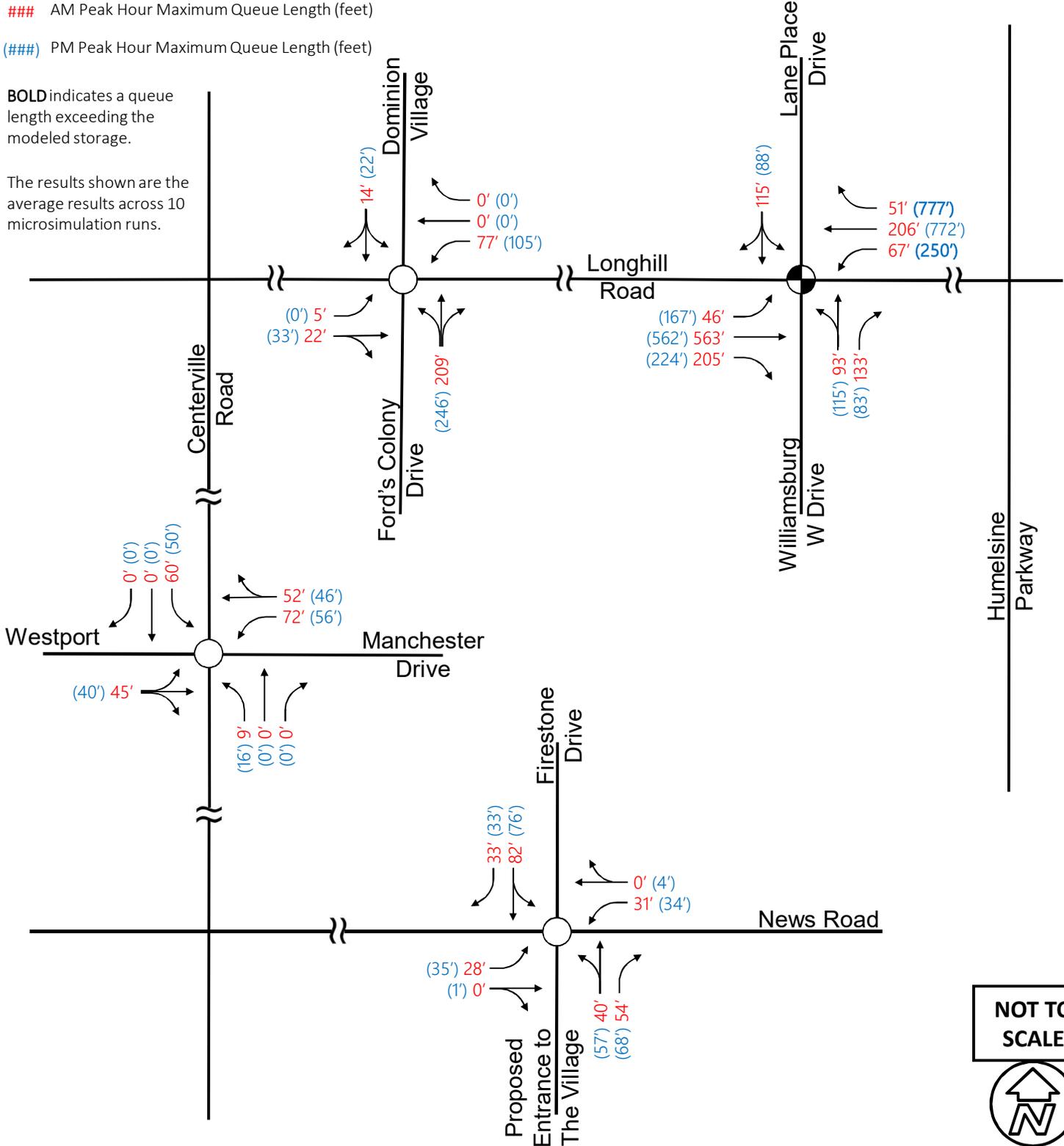
-  Signalized Intersection
-  Unsignalized Intersection
-  Existing Lane Assignment

AM Peak Hour Maximum Queue Length (feet)

(###) PM Peak Hour Maximum Queue Length (feet)

BOLD indicates a queue length exceeding the modeled storage.

The results shown are the average results across 10 microsimulation runs.



NOT TO SCALE



Legend

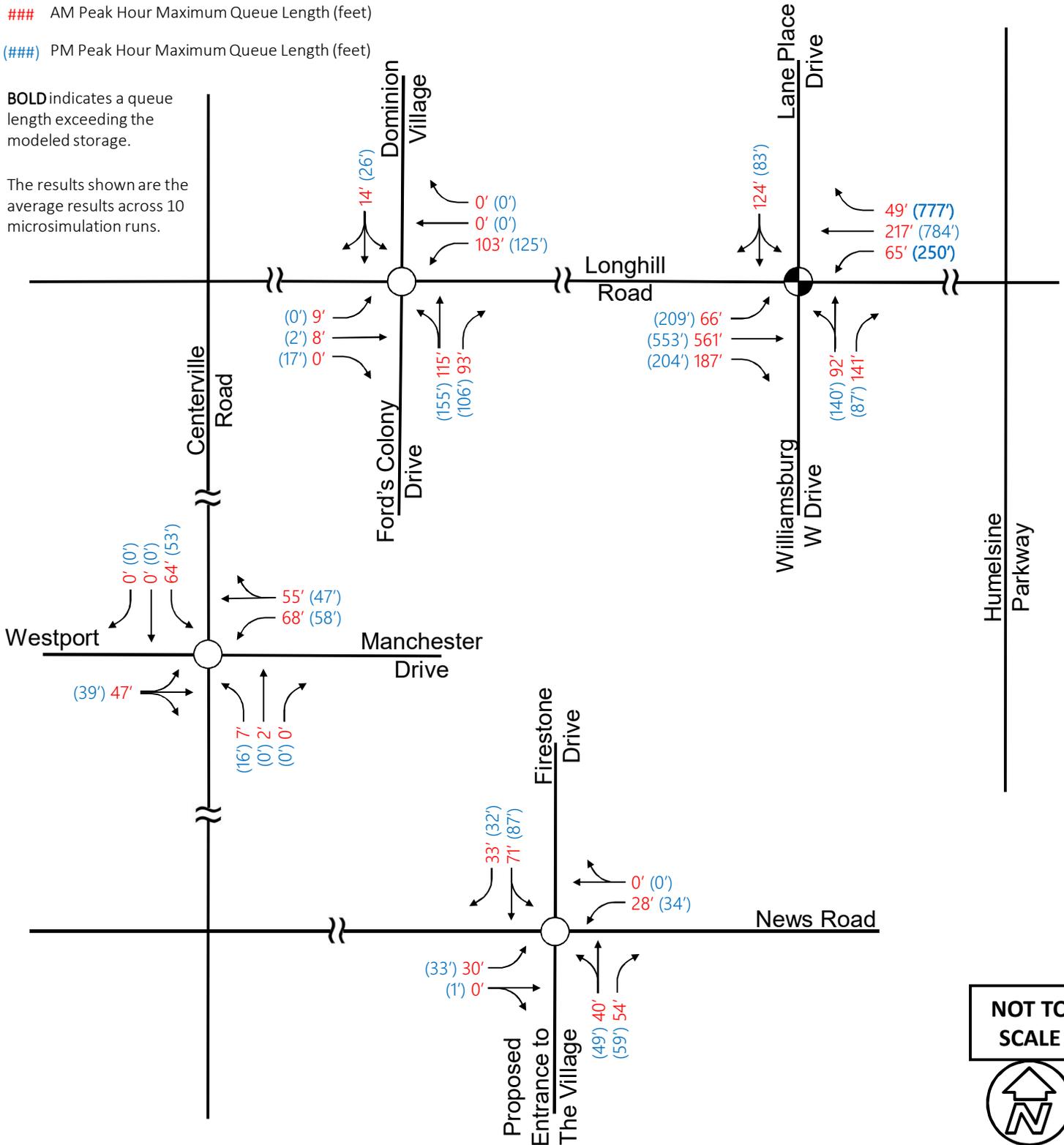
-  Signalized Intersection
-  Unsignalized Intersection
-  Existing Lane Assignment

AM Peak Hour Maximum Queue Length (feet)

(###) PM Peak Hour Maximum Queue Length (feet)

BOLD indicates a queue length exceeding the modeled storage.

The results shown are the average results across 10 microsimulation runs.



NOT TO SCALE



Legend

X AM Peak Hour Level of Service

(X) PM Peak Hour Level of Service

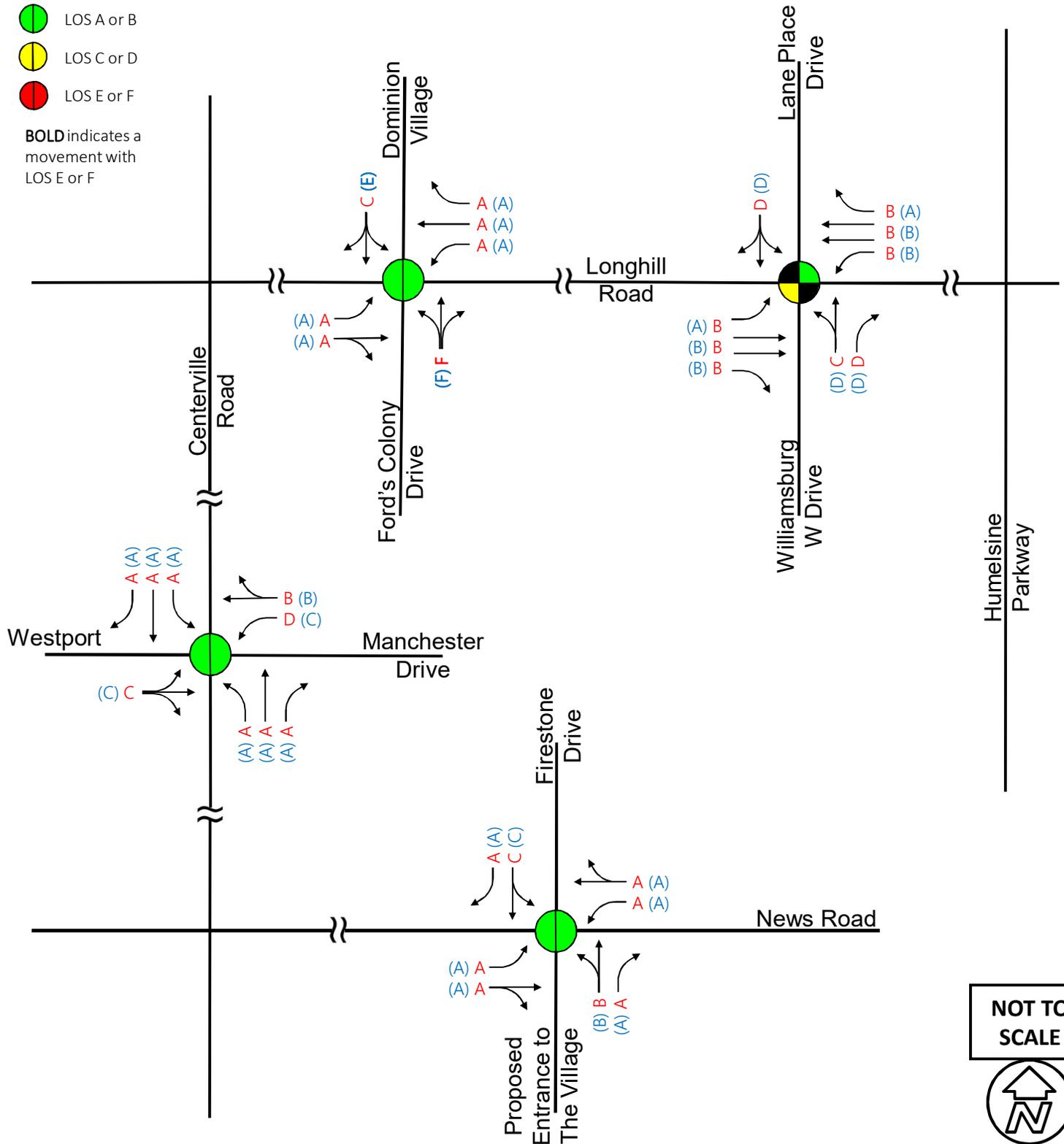
AM | PM

LOS A or B

LOS C or D

LOS E or F

BOLD indicates a movement with LOS E or F



NOT TO SCALE



Legend

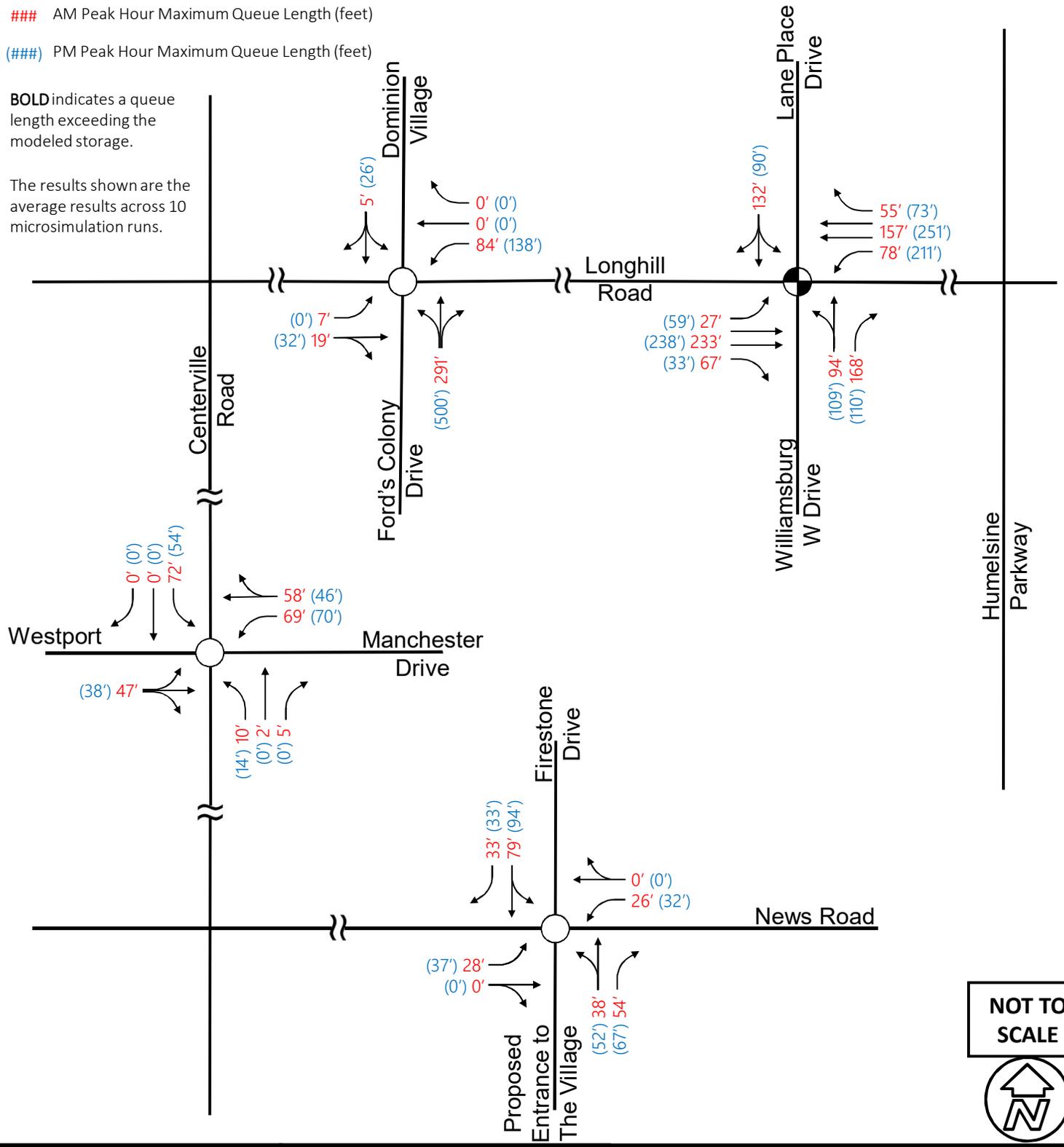
-  Signalized Intersection
-  Unsignalized Intersection
-  Existing Lane Assignment

AM Peak Hour Maximum Queue Length (feet)

(###) PM Peak Hour Maximum Queue Length (feet)

BOLD indicates a queue length exceeding the modeled storage.

The results shown are the average results across 10 microsimulation runs.



NOT TO SCALE



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Legend

X AM Peak Hour Level of Service

(X) PM Peak Hour Level of Service

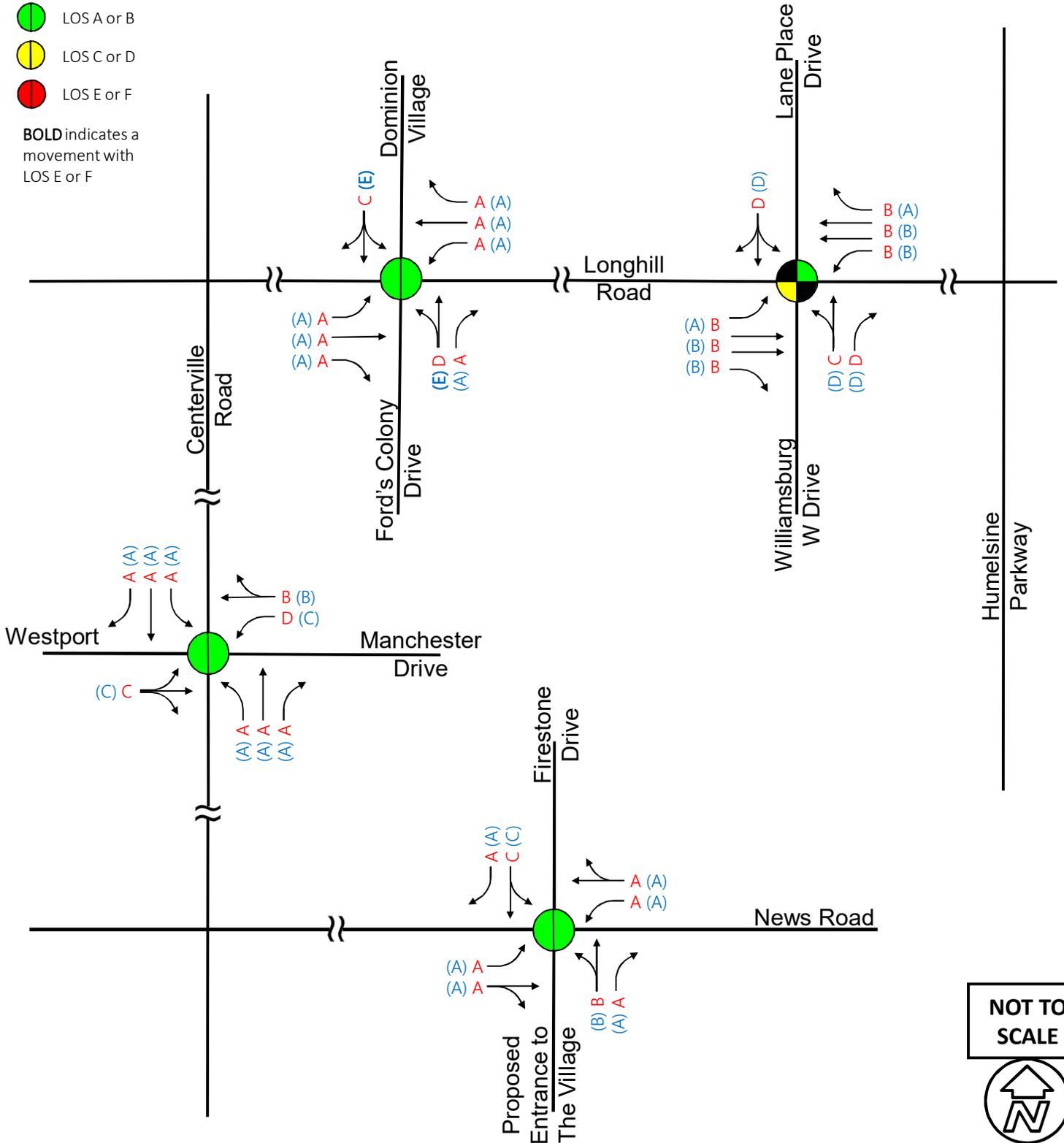
AM | PM

LOS A or B

LOS C or D

LOS E or F

BOLD indicates a movement with LOS E or F



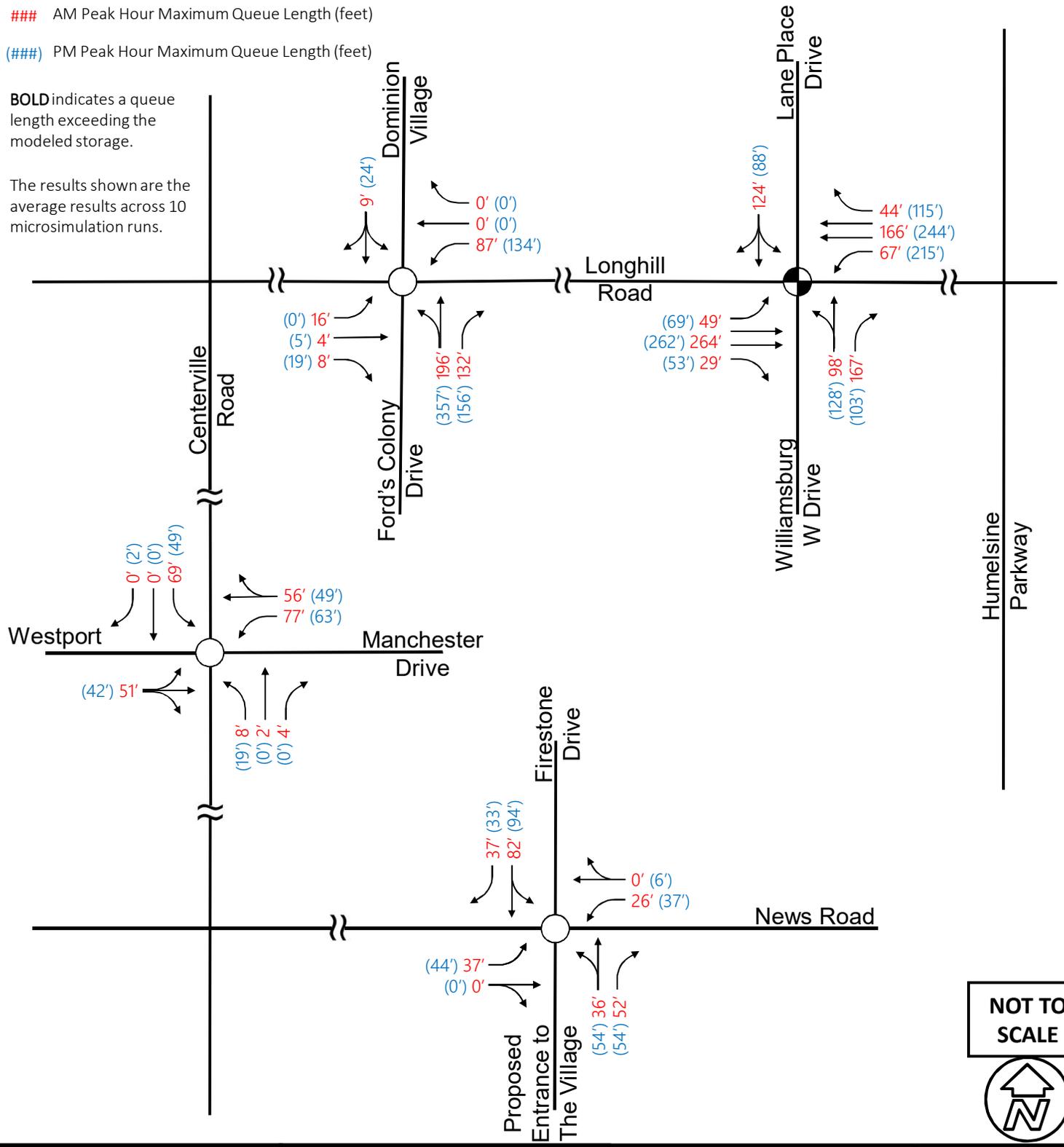
Legend

-  Signalized Intersection
-  Unsignalized Intersection
-  Existing Lane Assignment

AM Peak Hour Maximum Queue Length (feet)
 (###) PM Peak Hour Maximum Queue Length (feet)

BOLD indicates a queue length exceeding the modeled storage.

The results shown are the average results across 10 microsimulation runs.



NOT TO SCALE



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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

Eastbound Longhill Road

- Widen and construct an additional approach and receiving through lane

Westbound Longhill Road

- 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

Start Time	Lane Place From North					Longhill From East					Country Club From South					Longhill From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. 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

LSmith@DataCollectionGroup.net

File Name : Longhill and Country Club

Site Code :

Start Date : 6/8/2017

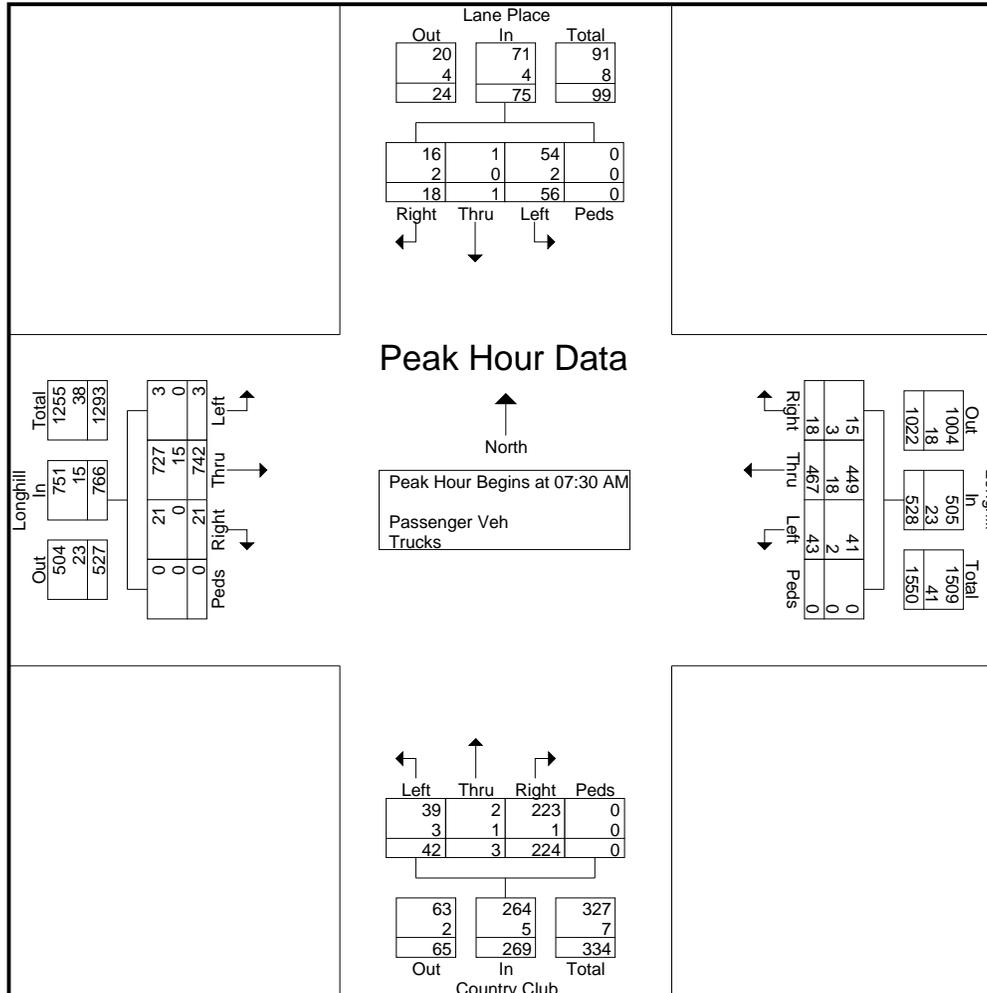
Page No : 2

Start Time	Lane Place From North					Longhill From East					Country Club From South					Longhill From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. 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

Data Collection Group

LSmith@DataCollectionGroup.net

File Name : Longhill and Country Club
 Site Code :
 Start Date : 6/8/2017
 Page No : 3



Data Collection Group

LSmith@DataCollectionGroup.net

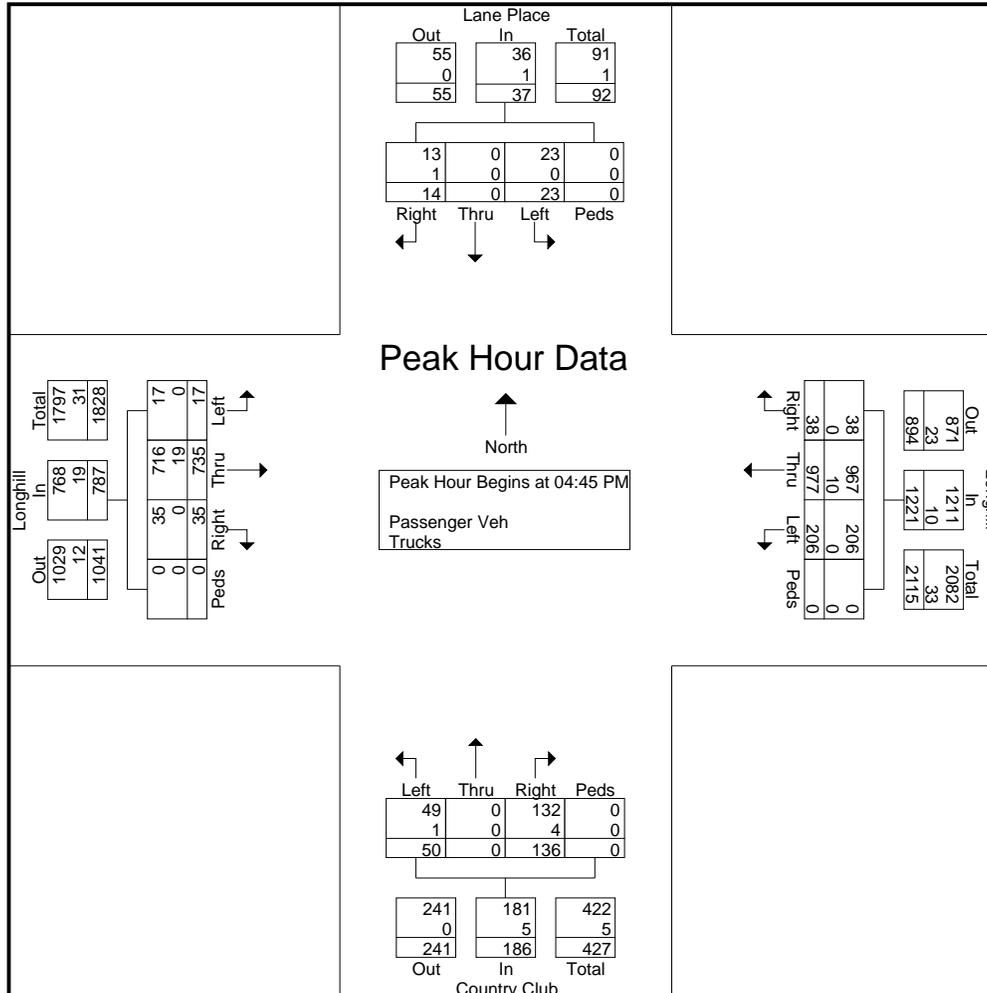
File Name : Longhill and Country Club
 Site Code :
 Start Date : 6/8/2017
 Page No : 4

Start Time	Lane Place From North					Longhill From East					Country Club From South					Longhill From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. 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

Data Collection Group

LSmith@DataCollectionGroup.net

File Name : Longhill and Country Club
 Site Code :
 Start Date : 6/8/2017
 Page No : 5



Data Collection Group

LSmith@DataCollectionGroup.net

File Name : Longhill and Fords Colony
 Site Code : 13333333
 Start Date : 6/8/2017
 Page No : 1

Groups Printed- Passenger Veh - Trucks

Start Time	Entrance From North					Longhill From East					Fords Colony From South					Longhill From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. 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
 Page No : 2

Groups Printed- Passenger Veh - Trucks

Start Time	Entrance From North					Longhill From East					Fords Colony From South					Longhill From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. 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

LSmith@DataCollectionGroup.net

File Name : Longhill and Fords Colony
 Site Code : 13333333
 Start Date : 6/8/2017
 Page No : 3

Start Time	Entrance From North					Longhill From East					Fords Colony From South					Longhill From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. 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

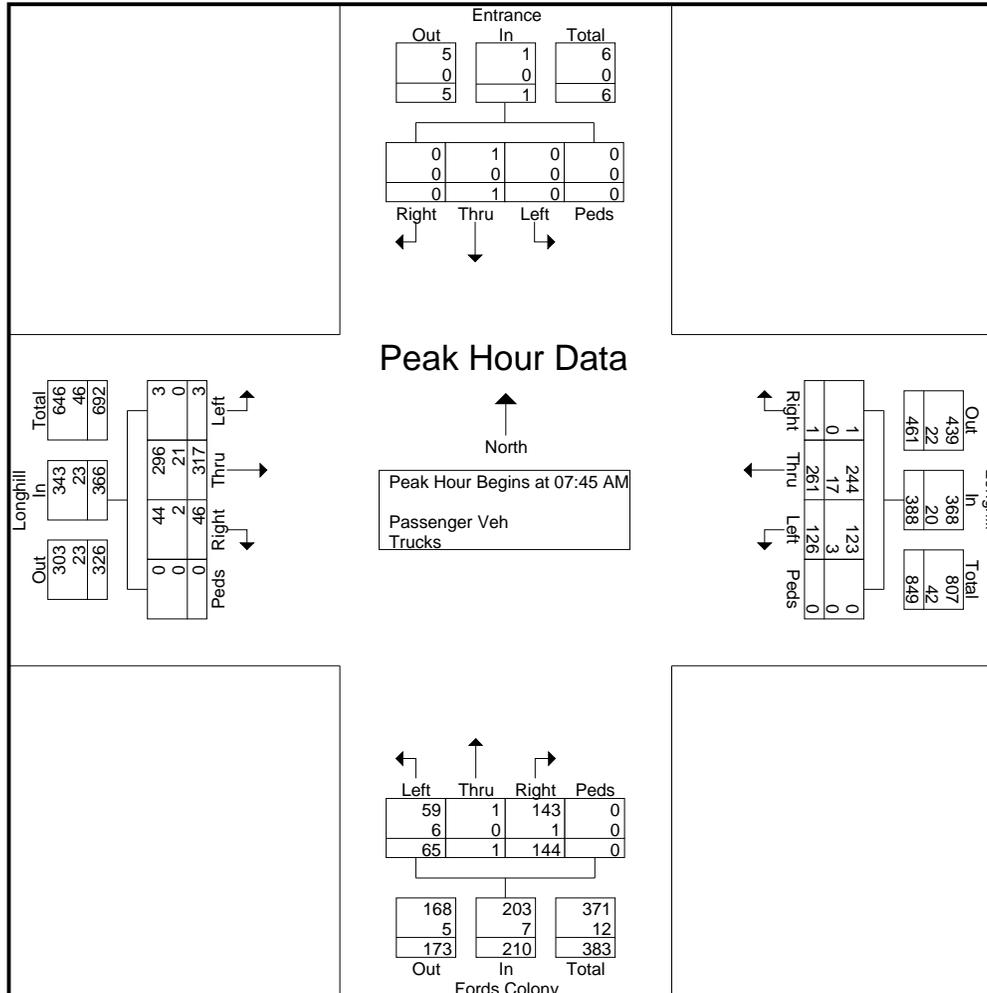
LSmith@DataCollectionGroup.net

File Name : Longhill and Fords Colony

Site Code : 13333333

Start Date : 6/8/2017

Page No : 4



Data Collection Group

LSmith@DataCollectionGroup.net

File Name : Longhill and Fords Colony
 Site Code : 13333333
 Start Date : 6/8/2017
 Page No : 5

Start Time	Entrance From North					Longhill From East					Fords Colony From South					Longhill From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. 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

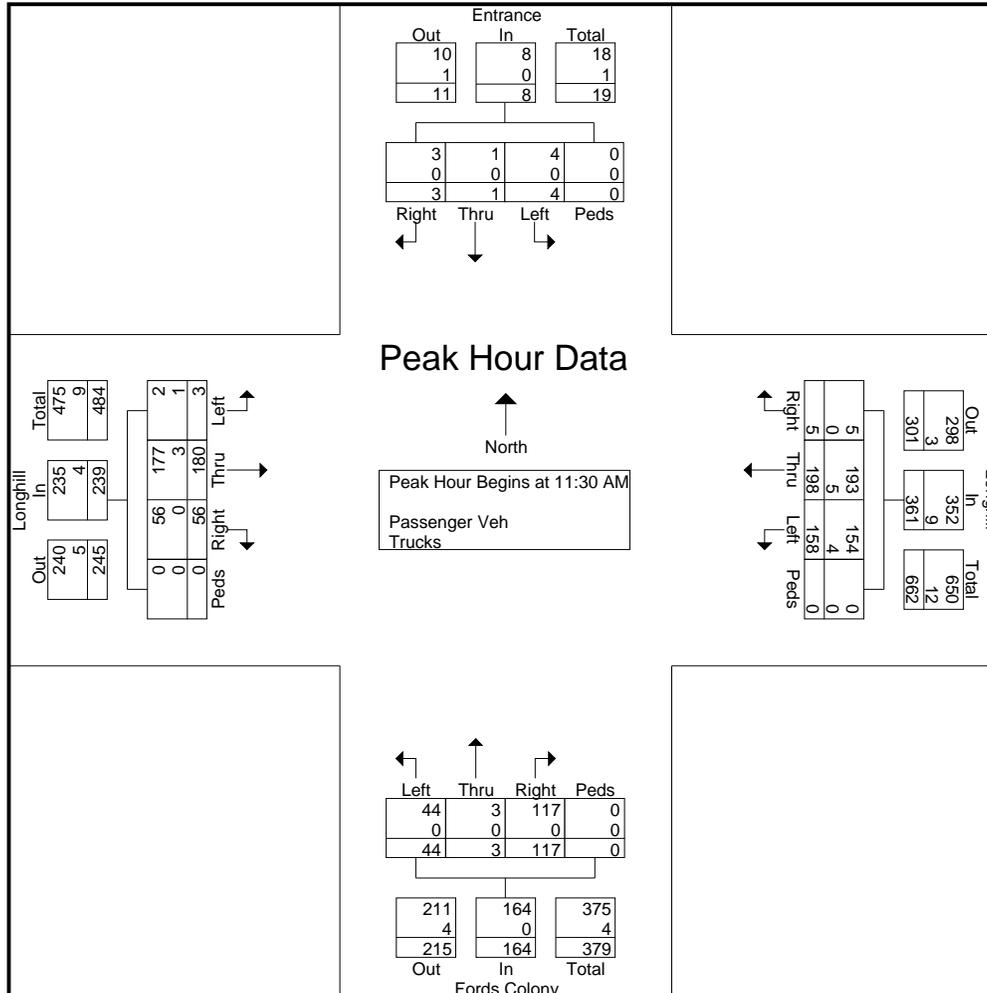
LSmith@DataCollectionGroup.net

File Name : Longhill and Fords Colony

Site Code : 13333333

Start Date : 6/8/2017

Page No : 6



Data Collection Group

LSmith@DataCollectionGroup.net

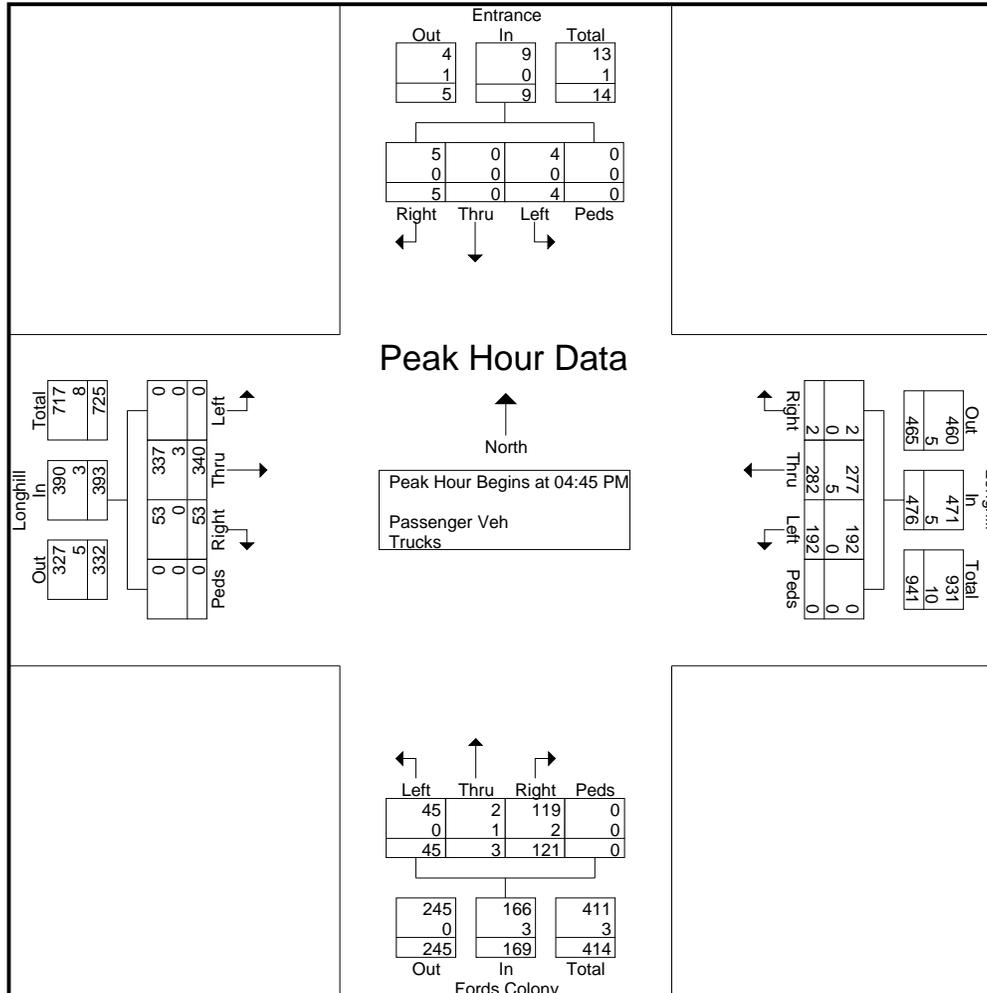
File Name : Longhill and Fords Colony
 Site Code : 13333333
 Start Date : 6/8/2017
 Page No : 7

Start Time	Entrance From North					Longhill From East					Fords Colony From South					Longhill From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. 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

LSmith@DataCollectionGroup.net

File Name : Longhill and Fords Colony
 Site Code : 13333333
 Start Date : 6/8/2017
 Page No : 8



Data Collection Group

LSmith@DataCollectionGroup.net

File Name : Centerville and Manchester
 Site Code :
 Start Date : 6/8/2017
 Page No : 1

Groups Printed- Passenger Veh - Trucks

Start Time	Centerville From North					Manchester From East					Centerville From South					Westport From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. 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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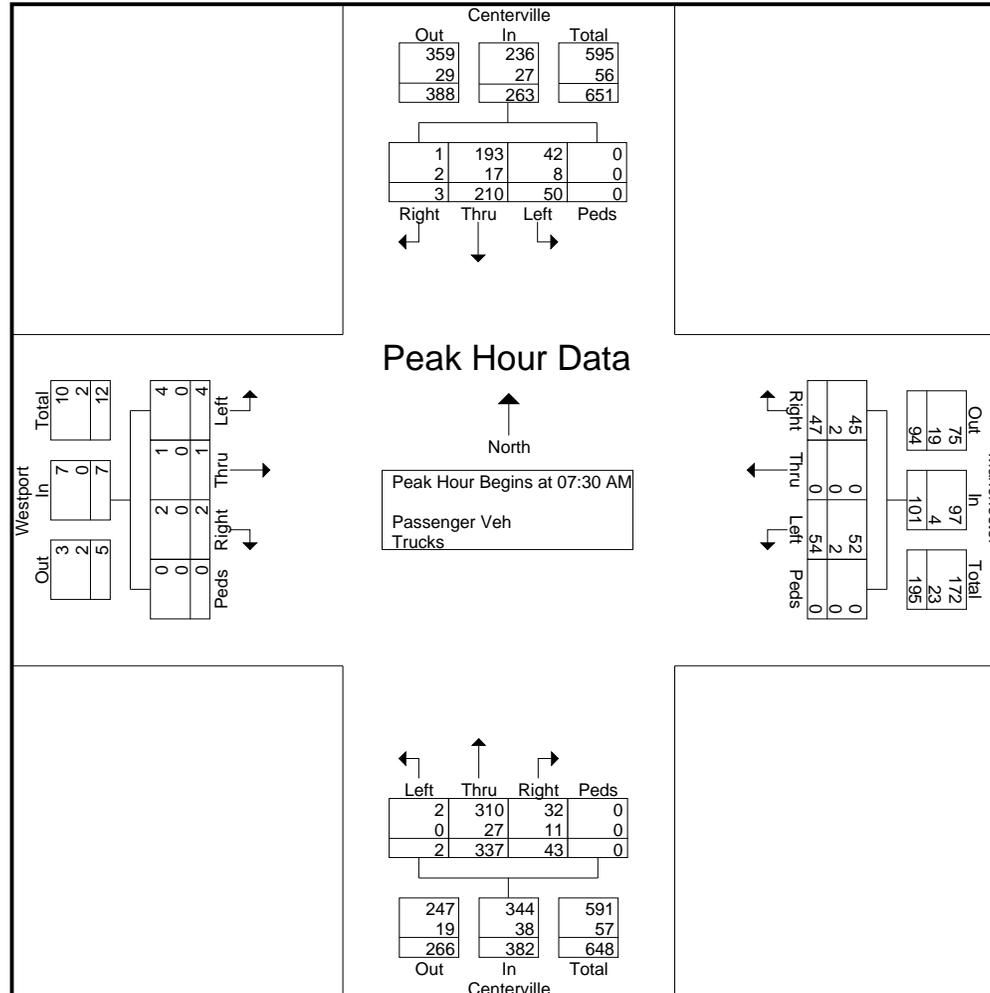
File Name : Centerville and Manchester
 Site Code :
 Start Date : 6/8/2017
 Page No : 2

Start Time	Centerville From North					Manchester From East					Centerville From South					Westport From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. 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

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File Name : Centerville and Manchester
 Site Code :
 Start Date : 6/8/2017
 Page No : 3



Data Collection Group

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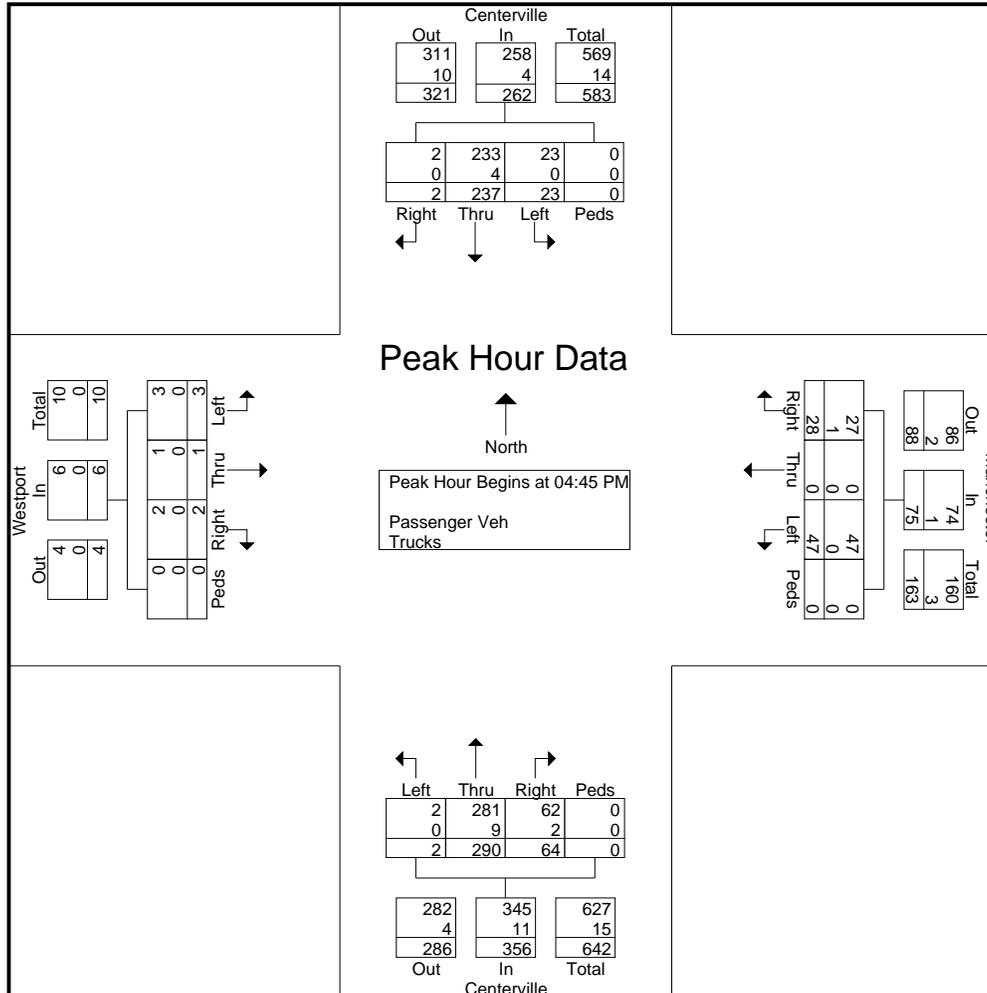
File Name : Centerville and Manchester
 Site Code :
 Start Date : 6/8/2017
 Page No : 4

Start Time	Centerville From North					Manchester From East					Centerville From South					Westport From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. 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

Start Time	Firestone From North					News From East					From South					News From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. 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

Data Collection Group

LSmith@DataCollectionGroup.net

File Name : News and Firestone
 Site Code : 00681114
 Start Date : 6/8/2017
 Page No : 2

Groups Printed- Passenger Veh - Trucks

Start Time	Firestone From North					News From East					From South					News From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. 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

Data Collection Group

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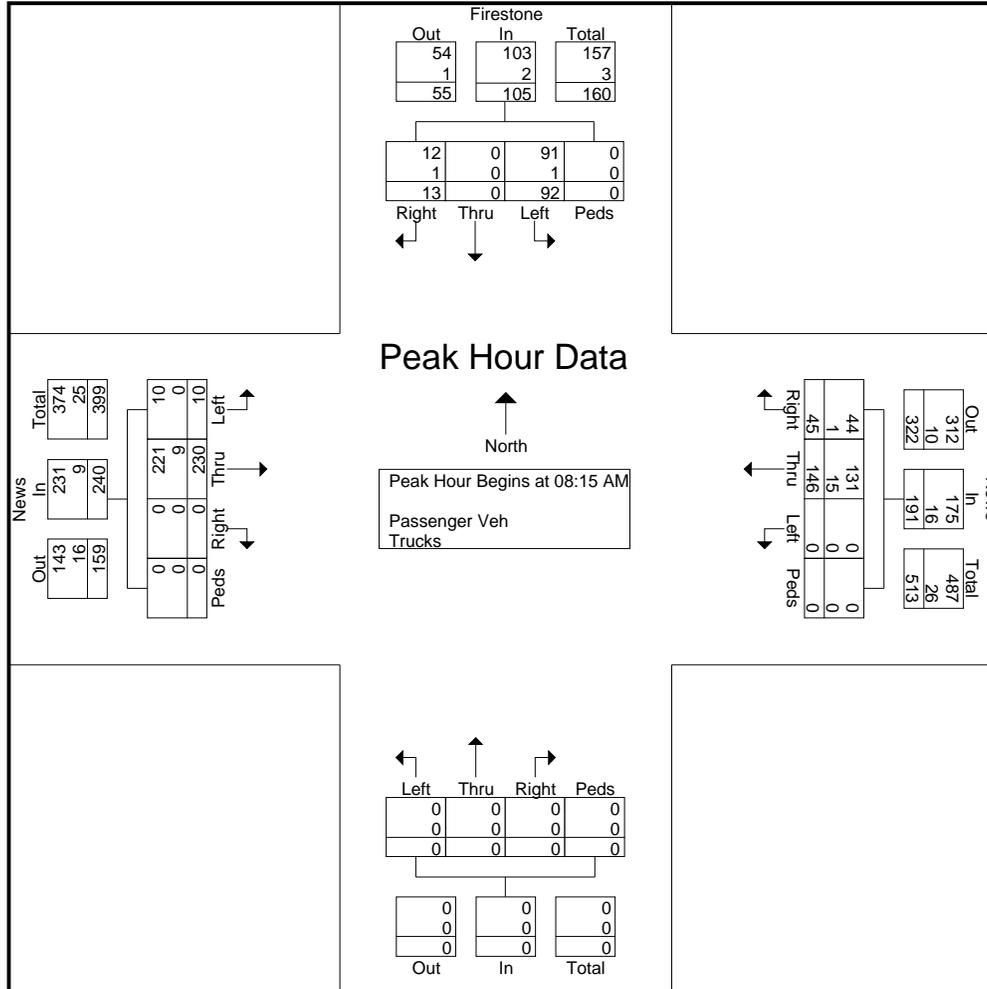
File Name : News and Firestone
 Site Code : 00681114
 Start Date : 6/8/2017
 Page No : 3

Start Time	Firestone From North					News From East					From South					News From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. 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	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

Data Collection Group

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File Name : News and Firestone
 Site Code : 00681114
 Start Date : 6/8/2017
 Page No : 4



Data Collection Group

LSmith@DataCollectionGroup.net

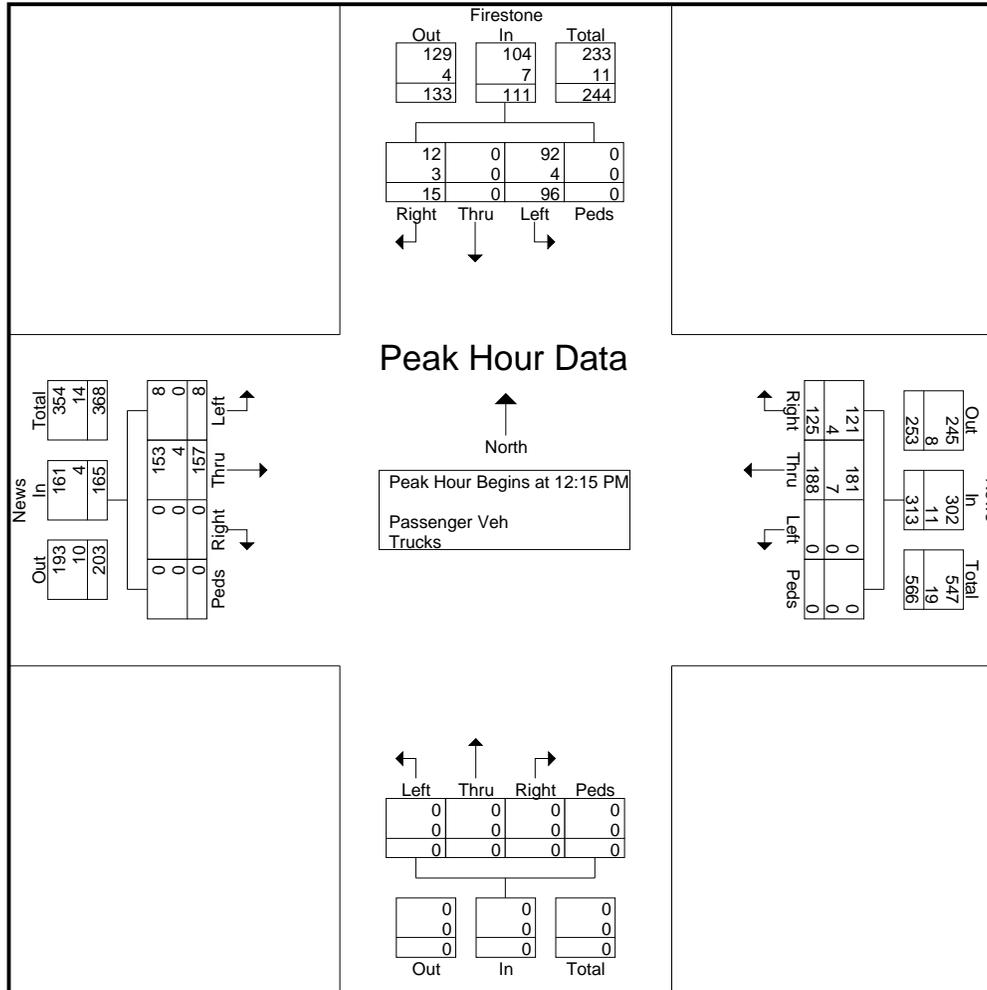
File Name : News and Firestone
 Site Code : 00681114
 Start Date : 6/8/2017
 Page No : 5

Start Time	Firestone From North					News From East					From South					News From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. 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	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

Data Collection Group

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File Name : News and Firestone
 Site Code : 00681114
 Start Date : 6/8/2017
 Page No : 6



Data Collection Group

LSmith@DataCollectionGroup.net

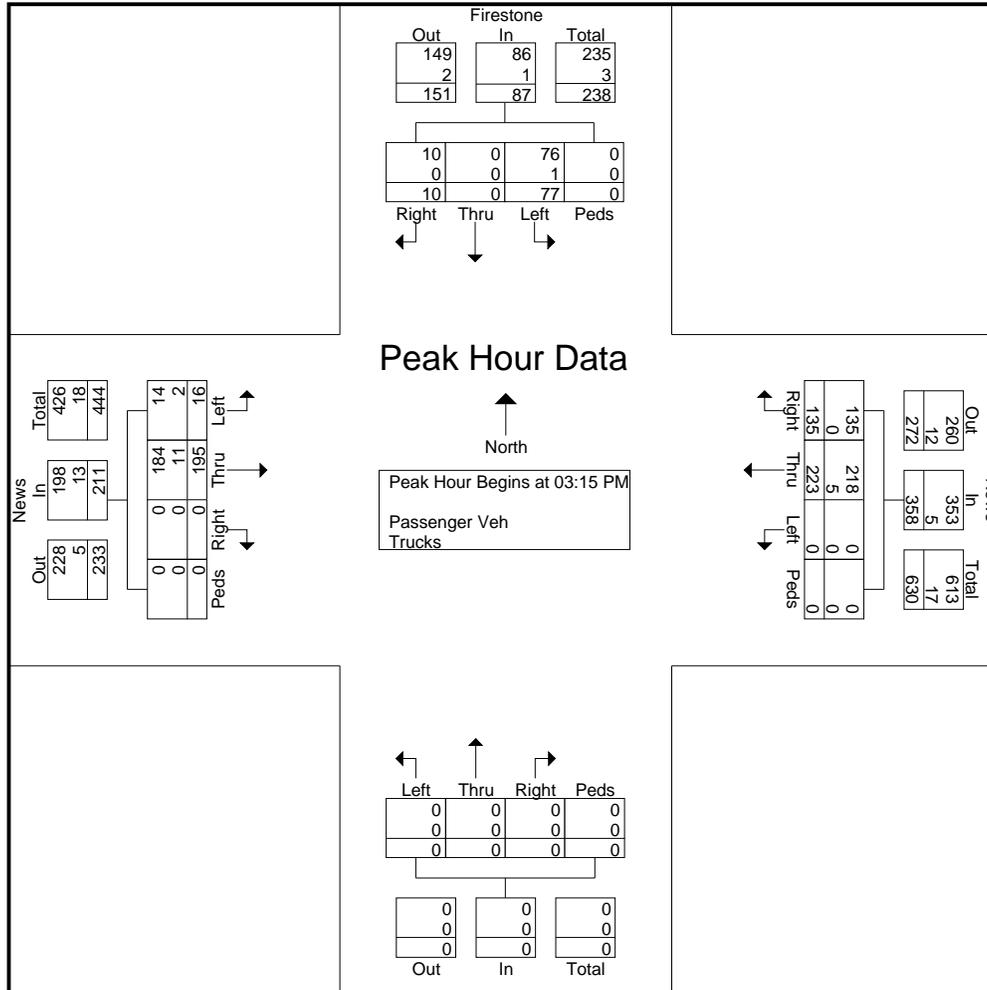
File Name : News and Firestone
 Site Code : 00681114
 Start Date : 6/8/2017
 Page No : 7

Start Time	Firestone From North					News From East					From South					News From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. 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

Data Collection Group

LSmith@DataCollectionGroup.net

File Name : News and Firestone
 Site Code : 00681114
 Start Date : 6/8/2017
 Page No : 8



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 <u>Eastbound</u>			Longhill Road <u>Westbound</u>			Fords Colony Drive <u>Northbound</u>			Dominion Village Entrance <u>Southbound</u>		
	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 <u>Eastbound</u>			Longhill Road <u>Westbound</u>			Fords Colony Drive <u>Northbound</u>			Dominion Village Entrance <u>Southbound</u>		
	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)**

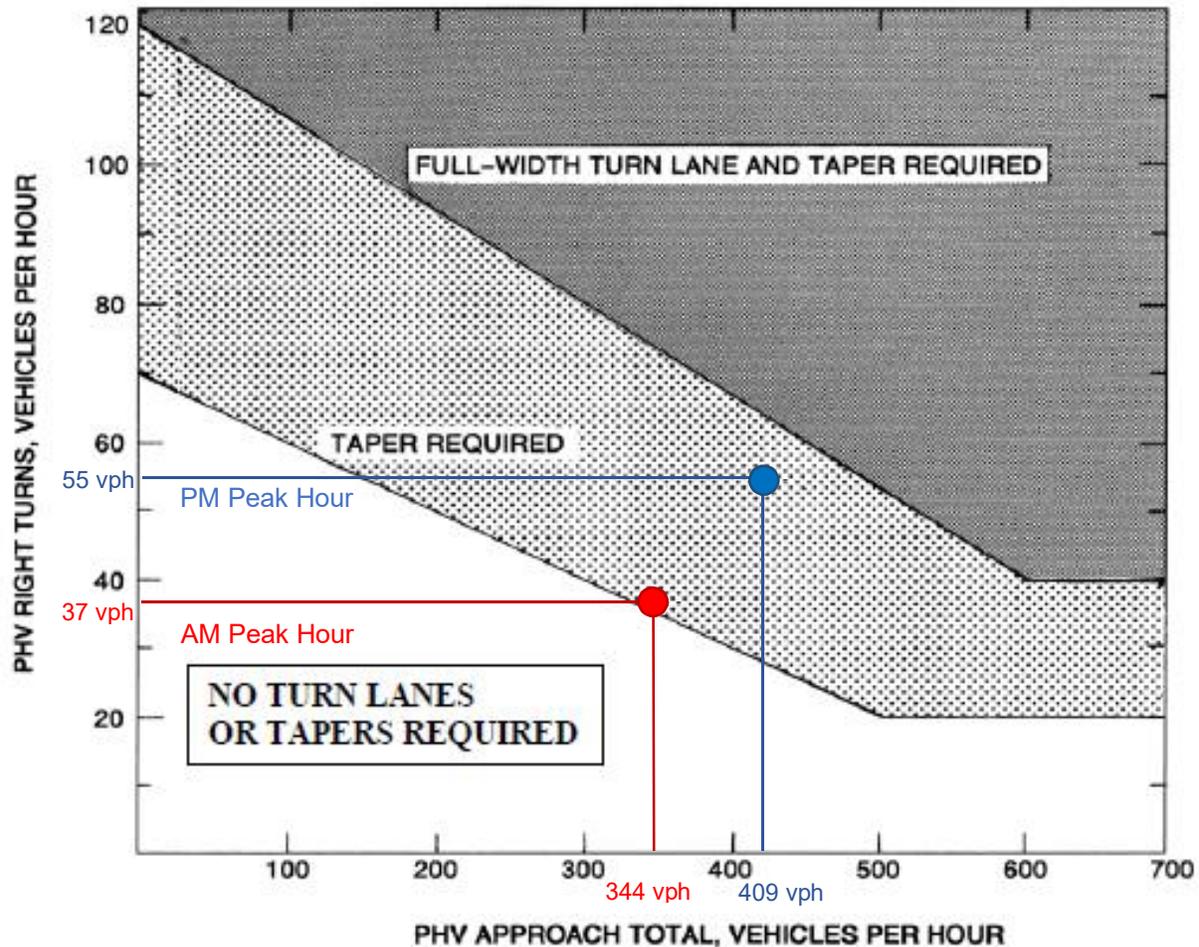
Description	News Road Eastbound			News Road Westbound			Proposed Entrance Northbound			Firestone Drive Southbound		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
2017 Counts												
Cars	8	182	0	0	109	42	-	-	-	85	0	17
Trucks	2	6	0	0	16	1	-	-	-	0	0	0
Total Existing 2017 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: $PHV = ADT \times K \times D$

K = the percent of AADT occurring in the peak hour

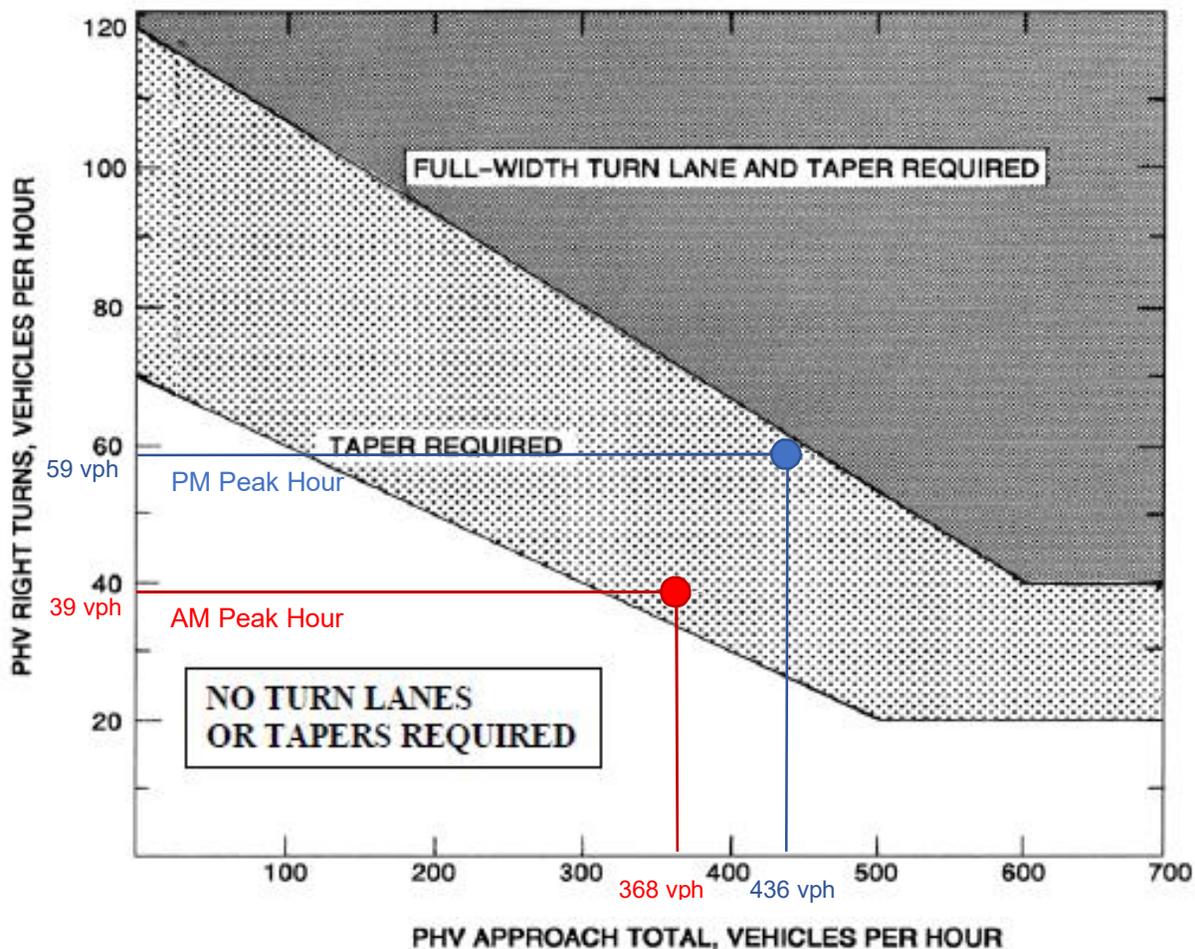
D = the percent of traffic in the peak direction of flow

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)

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: $PHV = ADT \times K \times D$

K = the percent of AADT occurring in the peak hour

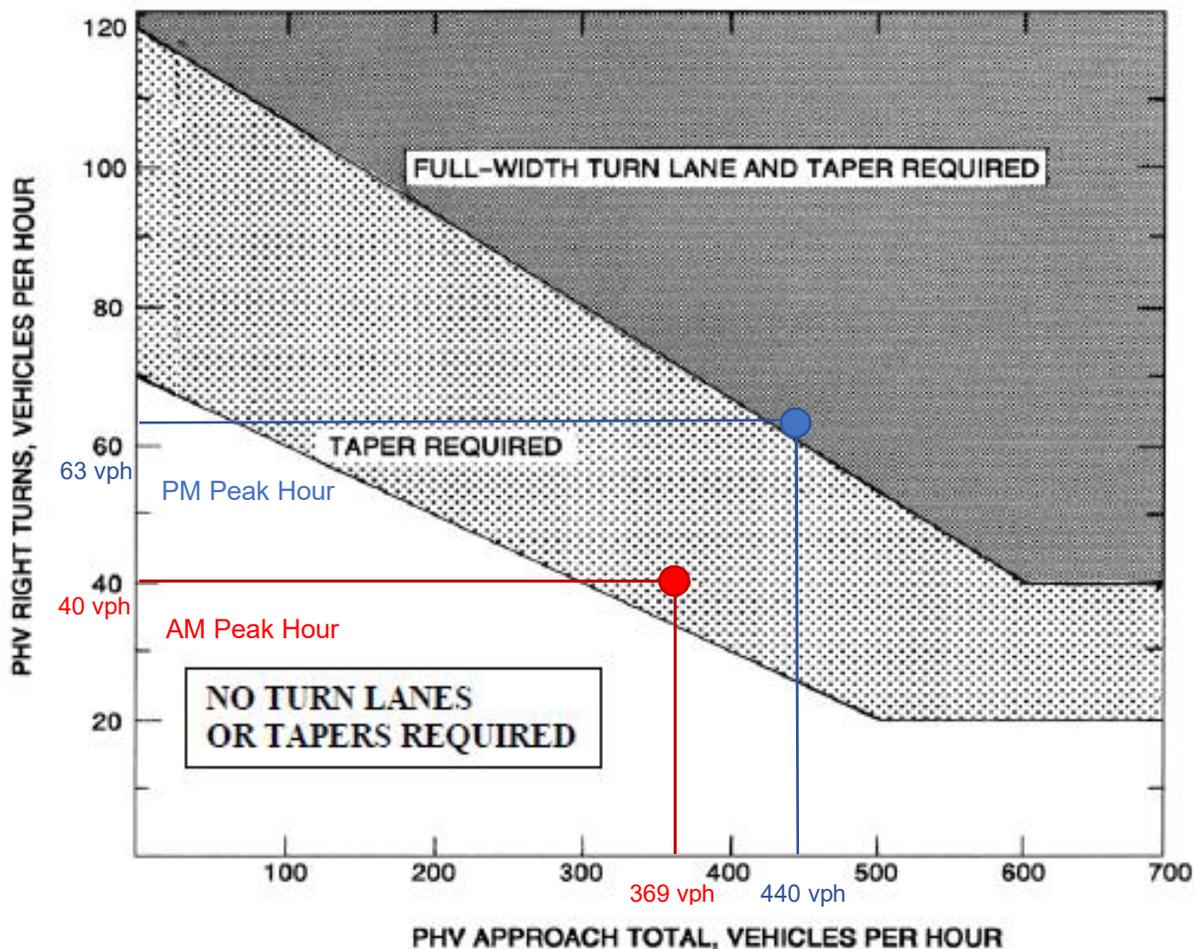
D = the percent of traffic in the peak direction of flow

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)

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: $PHV = ADT \times K \times D$

K = the percent of AADT occurring in the peak hour

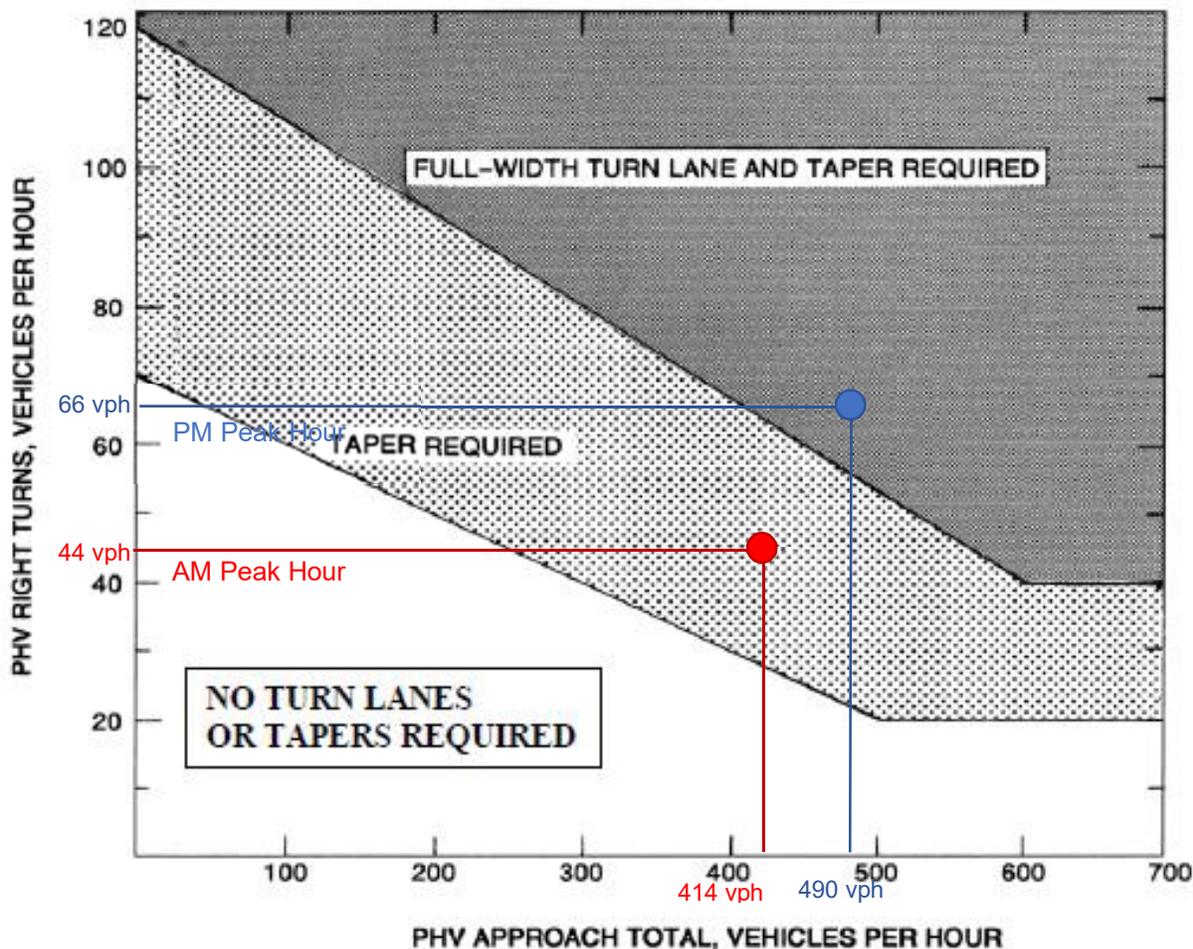
D = the percent of traffic in the peak direction of flow

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)

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: $PHV = ADT \times K \times D$

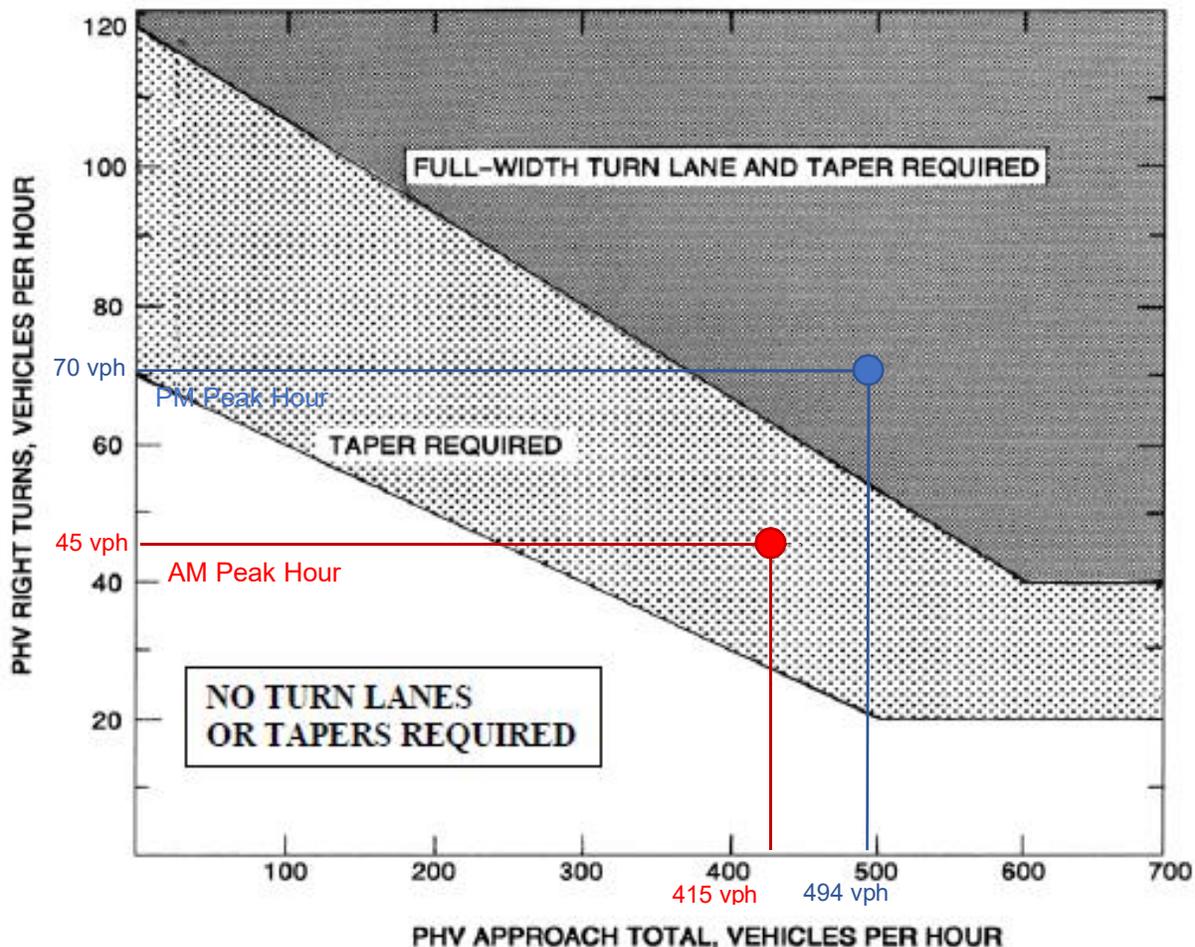
K = the percent of AADT occurring in the peak hour
 D = the percent of traffic in the peak direction of flow

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)

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: $PHV = ADT \times K \times D$

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)

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: 2027 Build (No SBR, WBR, or NBR)

MAJOR STREET: News Road
 MINOR STREET: Firestone Drive/The Villages Driveway

OF APPROACH LANES: 2
 # 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 BOTH APPROACHES	MINOR ST HIGHEST APPROACH		WARRANT 1, Condition A			WARRANT 1, Condition B			WARRANT 1, Combination Warrant						WARRANT 2	WARRANT 3		
				MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET	CONDITION A			CONDITION B						
										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 NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			8 HOURS OF BOTH COND. A AND COND. B NEEDED NOT SATISFIED						4 HRS NEEDED NOT SATISFIED		1 HR NEEDED 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
 MINOR STREET: Fords Colony Drive

OF APPROACH LANES: 2
 # 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 BOTH APPROACHES	MINOR ST HIGHEST APPROACH		WARRANT 1, Condition A			WARRANT 1, Condition B			WARRANT 1, Combination Warrant						WARRANT 2	WARRANT 3
				MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET	CONDITION A			CONDITION B				
										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 NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			8 HOURS OF BOTH COND. A AND COND. B NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED			1 HR NEEDED 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
 MINOR STREET: Fords Colony Drive

OF APPROACH LANES: 2
 # 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 BOTH APPROACHES	MINOR ST HIGHEST APPROACH		WARRANT 1, Condition A			WARRANT 1, Condition B			WARRANT 1, Combination Warrant						WARRANT 2	WARRANT 3
				MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET	CONDITION A			CONDITION B				
										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 NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			8 HOURS OF BOTH COND. A AND COND. B NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED			1 HR NEEDED 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
 MINOR STREET: Fords Colony Drive

OF APPROACH LANES: 2
 # 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 BOTH APPROACHES	MINOR ST HIGHEST APPROACH		WARRANT 1, Condition A			WARRANT 1, Condition B			WARRANT 1, Combination Warrant						WARRANT 2	WARRANT 3
				MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET	CONDITION A			CONDITION B				
										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 NOT SATISFIED			8 HOURS NEEDED SATISFIED			8 HOURS OF BOTH COND. A AND COND. B NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED			1 HR NEEDED 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
 MINOR STREET: Fords Colony Drive

OF APPROACH LANES: 2
 # 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 BOTH APPROACHES	MINOR ST HIGHEST APPROACH			WARRANT 1, Condition A			WARRANT 1, Condition B			WARRANT 1, Combination Warrant						WARRANT 2	WARRANT 3	
					MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET	CONDITION A			CONDITION B					
											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				
				8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED SATISFIED			8 HOURS OF BOTH COND. A AND COND. B NEEDED NOT SATISFIED						4 HRS NEEDED SATISFIED		1 HR NEEDED 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
 MINOR STREET: Fords Colony Drive

OF APPROACH LANES: 2
 # 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 BOTH APPROACHES	MINOR ST HIGHEST APPROACH		WARRANT 1, Condition A			WARRANT 1, Condition B			WARRANT 1, Combination Warrant						WARRANT 2	WARRANT 3		
				MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET	CONDITION A			CONDITION B						
										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 NOT SATISFIED			8 HOURS NEEDED SATISFIED			8 HOURS OF BOTH COND. A AND COND. B NEEDED NOT SATISFIED						4 HRS NEEDED SATISFIED		1 HR NEEDED 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

Lanes, Volumes, Timings

Fords Colony TIS Update

1: Williamsburg W Drive/Lane PI Drive & Longhill Road

2019 Existing

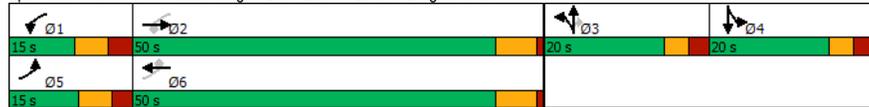


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↗	↘	↔	↗	↘	↔	↗	↘	↔	↗	↘
Traffic Volume (vph)	3	772	22	45	486	19	44	3	233	58	1	19
Future Volume (vph)	3	772	22	45	486	19	44	3	233	58	1	19
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr't		0.850			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 PI Drive & Longhill Road



HCM Signalized Intersection Capacity Analysis

Fords Colony TIS Update

1: Williamsburg W Drive/Lane PI Drive & Longhill Road

2019 Existing



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	
Fr't	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	
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			

Lanes, Volumes, Timings

Fords Colony TIS Update

2: Fords Colony Drive/Dominon Village & Longhill Road

2019 Existing

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		Stop		

Intersection Summary

Control Type: Unsignalized

Intersection Capacity Utilization 53.5%

ICU Level of Service A

Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis

Fords Colony TIS Update

2: Fords Colony Drive/Dominon Village & Longhill Road

2019 Existing

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		Stop		
Grade	0%		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

Lanes, Volumes, Timings

Fords Colony TIS Update

3: Centerville Road & Westport/Manchester Drive

2019 Existing

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			0.950		0.850			0.850	
Flt Protected	0.972		0.950			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			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			Free	

Intersection Summary

Control Type: Unsignalized

Intersection Capacity Utilization 36.9%

ICU Level of Service A

Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis

Fords Colony TIS Update

3: Centerville Road & Westport/Manchester Drive

2019 Existing

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			Free	
Grade	0%		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

Lanes, Volumes, Timings
4: News Road & Firestone Drive

Fords Colony TIS Update
2019 Existing

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
Fr't				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%						
Analysis Period (min) 15						
ICU Level of Service A						

HCM Unsignalized Intersection Capacity Analysis
4: News Road & Firestone Drive

Fords Colony TIS Update
2019 Existing

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 #						
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			

Queuing and Blocking Report

Fords Colony TIS Update
2019 Existing

Intersection: 1: Williamsburg W Drive/Lane PI 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)					

Queuing and Blocking Report

Fords Colony TIS Update
2019 Existing

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

Lanes, Volumes, Timings

Fords Colony TIS Update

1: Williamsburg W Drive/Lane PI Drive & Longhill Road

2021 No Build

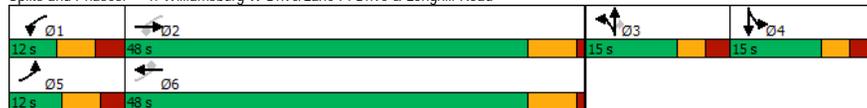


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	3	819	23	47	514	20	46	3	242	60	1	20
Future Volume (vph)	3	819	23	47	514	20	46	3	242	60	1	20
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850			0.850			0.850		0.850		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 PI Drive & Longhill Road



HCM Signalized Intersection Capacity Analysis

Fords Colony TIS Update

1: Williamsburg W Drive/Lane PI Drive & Longhill Road

2021 No Build



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	263	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			

Lanes, Volumes, Timings

Fords Colony TIS Update

2: Fords Colony Drive/Dominon Village & Longhill Road

2021 No Build



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

HCM Unsignalized Intersection Capacity Analysis

Fords Colony TIS Update

2: Fords Colony Drive/Dominon Village & Longhill Road

2021 No Build



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				D	C

Intersection Summary

Average Delay 7.8

Intersection Capacity Utilization 56.1%

ICU Level of Service

B

Analysis Period (min) 15

Lanes, Volumes, Timings

Fords Colony TIS Update

3: Centerville Road & Westport/Manchester Drive

2021 No Build

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
Flt	0.962		0.850			0.950			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

HCM Unsignalized Intersection Capacity Analysis

Fords Colony TIS Update

3: Centerville Road & Westport/Manchester Drive

2021 No Build

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

Lanes, Volumes, Timings
4: News Road & Firestone Drive

Fords Colony TIS Update
2021 No Build

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group												
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
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%												
Analysis Period (min) 15												
ICU Level of Service A												

HCM Unsignalized Intersection Capacity Analysis
4: News Road & Firestone Drive

Fords Colony TIS Update
2021 No Build

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
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 PI 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

Lanes, Volumes, Timings

Fords Colony TIS Update

1: Williamsburg W Drive/Lane PI Drive & Longhill Road

2021 Build

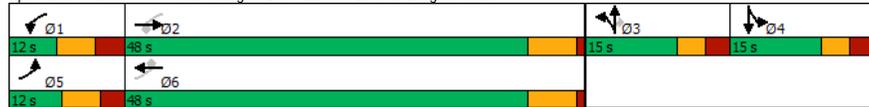


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	3	832	23	47	518	20	46	3	242	60	1	20
Future Volume (vph)	3	832	23	47	518	20	46	3	242	60	1	20
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850			0.850			0.850		0.850		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 PI Drive & Longhill Road



HCM Signalized Intersection Capacity Analysis

Fords Colony TIS Update

1: Williamsburg W Drive/Lane PI Drive & Longhill Road

2021 Build



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			

Lanes, Volumes, Timings

Fords Colony TIS Update

2: Fords Colony Drive/Dominon Village & Longhill Road

2021 Build

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
Frnt		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

HCM Unsignalized Intersection Capacity Analysis

Fords Colony TIS Update

2: Fords Colony Drive/Dominon Village & Longhill Road

2021 Build

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

Lanes, Volumes, Timings

Fords Colony TIS Update

3: Centerville Road & Westport/Manchester Drive

2021 Build



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
Flt Protected		0.962		0.850				0.850		0.950		0.850
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

HCM Unsignalized Intersection Capacity Analysis

Fords Colony TIS Update

3: Centerville Road & Westport/Manchester Drive

2021 Build



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

Lanes, Volumes, Timings
4: News Road & Firestone Drive

Fords Colony TIS Update
2021 Build



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
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	

HCM Unsignalized Intersection Capacity Analysis
4: News Road & Firestone Drive

Fords Colony TIS Update
2021 Build



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 PI 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

Lanes, Volumes, Timings

Fords Colony TIS Update

1: Williamsburg W Drive/Lane PI Drive & Longhill Road

2027 No Build



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		0.950		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		42.3		
Approach LOS		C		B		C		D		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 PI Drive & Longhill Road



HCM Signalized Intersection Capacity Analysis

Fords Colony TIS Update

1: Williamsburg W Drive/Lane PI Drive & Longhill Road

2027 No Build



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		47.2		
Approach LOS		B		B		C		D		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			

Lanes, Volumes, Timings

Fords Colony TIS Update

2: Fords Colony Drive/Dominon Village & Longhill Road

2027 No Build



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
Frnt	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

HCM Unsignalized Intersection Capacity Analysis

Fords Colony TIS Update

2: Fords Colony Drive/Dominon Village & Longhill Road

2027 No Build



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	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	361				446				1074		1075	
tC, single (s)	4.1				4.1				7.2		6.5	
tC, 2 stage (s)												
tF (s)	2.2				2.2				3.6		4.0	
p0 queue free %	100				87				44		99	
cM capacity (veh/h)	1209				1109				171		192	

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

Lanes, Volumes, Timings

Fords Colony TIS Update

3: Centerville Road & Westport/Manchester Drive

2027 No Build



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
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

HCM Unsignalized Intersection Capacity Analysis

Fords Colony TIS Update

3: Centerville Road & Westport/Manchester Drive

2027 No Build



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

Lanes, Volumes, Timings
4: News Road & Firestone Drive

Fords Colony TIS Update
2027 No Build

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group												
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
Flt	0.989		0.961			0.850			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												

HCM Unsignalized Intersection Capacity Analysis
4: News Road & Firestone Drive

Fords Colony TIS Update
2027 No Build

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Movement														
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					
Grade	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 PI 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

Lanes, Volumes, Timings

Fords Colony TIS Update

1: Williamsburg W Drive/Lane PI Drive & Longhill Road

2027 Build

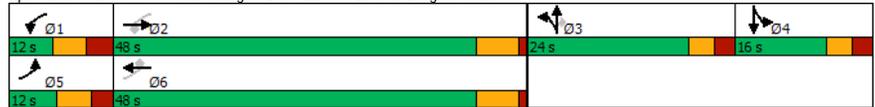


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	4	933	26	53	581	22	52	4	273	68	1	22
Future Volume (vph)	4	933	26	53	581	22	52	4	273	68	1	22
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850		0.950		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 PI Drive & Longhill Road



HCM Signalized Intersection Capacity Analysis

Fords Colony TIS Update

1: Williamsburg W Drive/Lane PI Drive & Longhill Road

2027 Build



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			

Lanes, Volumes, Timings

Fords Colony TIS Update

2: Fords Colony Drive/Dominon Village & Longhill Road

2027 Build

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group												
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
Frnt			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

HCM Unsignalized Intersection Capacity Analysis

Fords Colony TIS Update

2: Fords Colony Drive/Dominon Village & Longhill Road

2027 Build

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
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

Lanes, Volumes, Timings

Fords Colony TIS Update

3: Centerville Road & Westport/Manchester Drive

2027 Build



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
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

HCM Unsignalized Intersection Capacity Analysis

Fords Colony TIS Update

3: Centerville Road & Westport/Manchester Drive

2027 Build



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

Lanes, Volumes, Timings
4: News Road & Firestone Drive

Fords Colony TIS Update
2027 Build

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group												
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
Frnt	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												

HCM Unsignalized Intersection Capacity Analysis
4: News Road & Firestone Drive

Fords Colony TIS Update
2027 Build

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
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	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	219				271				528		572	
tC, single (s)	4.3				4.1				7.1		6.5	
tC, 2 stage (s)												
tF (s)	2.4				2.2				3.5		4.0	
p0 queue free %	99				97				97		100	
cM capacity (veh/h)	1251				1292				437		415	

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 PI 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

Lanes, Volumes, Timings

Fords Colony TIS Update

1: Williamsburg W Drive/Lane PI Drive & Longhill Road

2019 Existing

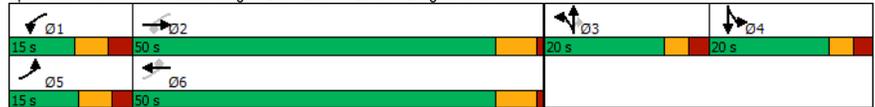


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	18	765	36	214	1016	40	52	0	141	24	0	15
Future Volume (vph)	18	765	36	214	1016	40	52	0	141	24	0	15
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt		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 PI Drive & Longhill Road



HCM Signalized Intersection Capacity Analysis

Fords Colony TIS Update

1: Williamsburg W Drive/Lane PI Drive & Longhill Road

2019 Existing



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	
Flt	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	
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

Lanes, Volumes, Timings

Fords Colony TIS Update

2: Fords Colony Drive/Dominon Village & Longhill Road

2019 Existing



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		Stop		

Intersection Summary

Control Type: Unsignalized

Intersection Capacity Utilization 54.8%

ICU Level of Service A

Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis

Fords Colony TIS Update

2: Fords Colony Drive/Dominon Village & Longhill Road

2019 Existing



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		Stop		
Grade	0%		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

Lanes, Volumes, Timings

Fords Colony TIS Update

3: Centerville Road & Westport/Manchester Drive

2019 Existing

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		0.950		0.850		0.950		0.850	
Flt Protected	0.976		0.950		0.950		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		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		Free		Free	

Intersection Summary

Control Type: Unsignalized

Intersection Capacity Utilization 31.4%

ICU Level of Service A

Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis

Fords Colony TIS Update

3: Centerville Road & Westport/Manchester Drive

2019 Existing

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		Free		Free	
Grade	0%		0%		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

Lanes, Volumes, Timings
4: News Road & Firestone Drive

Fords Colony TIS Update
2019 Existing

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
Fr't				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%						
Analysis Period (min) 15						
ICU Level of Service A						

HCM Unsignalized Intersection Capacity Analysis
4: News Road & Firestone Drive

Fords Colony TIS Update
2019 Existing

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 PI 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

Lanes, Volumes, Timings

Fords Colony TIS Update

1: Williamsburg W Drive/Lane PI Drive & Longhill Road

2021 No Build

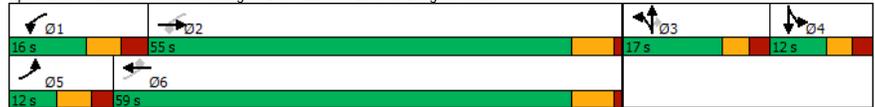


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	19	809	37	223	1075	42	54	0	147	25	0	16
Future Volume (vph)	19	809	37	223	1075	42	54	0	147	25	0	16
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850			0.850			0.850		0.850		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	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	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 PI Drive & Longhill Road



HCM Signalized Intersection Capacity Analysis

Fords Colony TIS Update

1: Williamsburg W Drive/Lane PI Drive & Longhill Road

2021 No Build



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	5.5		
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	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85	0.95	0.85	0.95	0.95
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00	0.97	0.97
Satd. Flow (prot)	1805	1863	1615	1719	1827	1380	1687	1615	1635	1687	1615	1635
Flt Permitted	0.07	1.00	1.00	0.11	1.00	1.00	0.95	1.00	0.97	1.00	0.97	0.97
Satd. Flow (perm)	131	1863	1615	192	1827	1380	1687	1615	1635	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			

Lanes, Volumes, Timings

Fords Colony TIS Update

2: Fords Colony Drive/Dominon Village & Longhill Road

2021 No Build



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
Flt Protected				0.950		0.850		0.903			0.925	
Satd. Flow (prot)	1900	1771	0	1752	1776	1615	0	1650	0	0	1719	0
Flt Permitted				0.950		0.987		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

HCM Unsignalized Intersection Capacity Analysis

Fords Colony TIS Update

2: Fords Colony Drive/Dominon Village & Longhill Road

2021 No Build



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

Lanes, Volumes, Timings

Fords Colony TIS Update

3: Centerville Road & Westport/Manchester Drive

2021 No Build



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
Flt	0.966		0.850		0.950		0.850		0.950		0.850	
Flt Protected	0.966		0.950		0.950		0.950		0.950		0.850	
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		0.950		0.850	
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		Free		Free	

Intersection Summary

Control Type: Unsignalized

Intersection Capacity Utilization 35.4%

ICU Level of Service A

Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis

Fords Colony TIS Update

3: Centerville Road & Westport/Manchester Drive

2021 No Build



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		Free		Free	
Grade	0%		0%		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

Lanes, Volumes, Timings
4: News Road & Firestone Drive

Fords Colony TIS Update
2021 No Build

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
Frnt	0.982		0.954		0.950		0.850		0.950		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		Stop		Stop	

Intersection Summary												
Control Type: Unsignalized												
Intersection Capacity Utilization 46.0%						ICU Level of Service A						
Analysis Period (min) 15												

HCM Unsignalized Intersection Capacity Analysis
4: News Road & Firestone Drive

Fords Colony TIS Update
2021 No Build

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 PI 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

Lanes, Volumes, Timings

Fords Colony TIS Update

1: Williamsburg W Drive/Lane PI Drive & Longhill Road

2021 Build

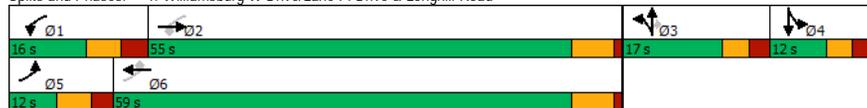


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	19	817	37	223	1088	42	54	0	147	25	0	16
Future Volume (vph)	19	817	37	223	1088	42	54	0	147	25	0	16
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850			0.850			0.850		0.850		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	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	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 PI Drive & Longhill Road



HCM Signalized Intersection Capacity Analysis

Fords Colony TIS Update

1: Williamsburg W Drive/Lane PI Drive & Longhill Road

2021 Build



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	5.5		
Lane Util. Factor	1.00	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	0.85	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.97	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			

Lanes, Volumes, Timings

Fords Colony TIS Update

2: Fords Colony Drive/Dominon Village & Longhill Road

2021 Build

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group												
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
Frnt			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

HCM Unsignalized Intersection Capacity Analysis

Fords Colony TIS Update

2: Fords Colony Drive/Dominon Village & Longhill Road

2021 Build

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
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

Lanes, Volumes, Timings

Fords Colony TIS Update

3: Centerville Road & Westport/Manchester Drive

2021 Build

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
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	

HCM Unsignalized Intersection Capacity Analysis

Fords Colony TIS Update

3: Centerville Road & Westport/Manchester Drive

2021 Build

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		

Lanes, Volumes, Timings
4: News Road & Firestone Drive

Fords Colony TIS Update
2021 Build



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
Frnt	0.982		0.955		0.950		0.850		0.950		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		Stop		Stop	

Intersection Summary

Control Type: Unsignalized	
Intersection Capacity Utilization 46.4%	ICU Level of Service A
Analysis Period (min) 15	

HCM Unsignalized Intersection Capacity Analysis
4: News Road & Firestone Drive

Fords Colony TIS Update
2021 Build



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		Stop		Stop			
Grade	0%		0%		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 PI 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

Lanes, Volumes, Timings

Fords Colony TIS Update

1: Williamsburg W Drive/Lane PI Drive & Longhill Road

2027 No Build

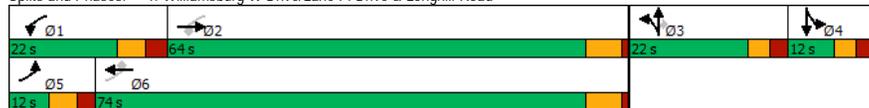


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	21	909	42	251	1209	47	61	0	165	28	0	18
Future Volume (vph)	21	909	42	251	1209	47	61	0	165	28	0	18
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		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	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 Effcl 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 PI Drive & Longhill Road



HCM Signalized Intersection Capacity Analysis

Fords Colony TIS Update

1: Williamsburg W Drive/Lane PI Drive & Longhill Road

2027 No Build



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	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	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	1.00	0.97	0.97
Satd. Flow (prot)	1805	3539	1615	1719	3471	1380	1687	1615	1635			1635
Flt Permitted	0.15	1.00	1.00	0.21	1.00	1.00	0.95	1.00	0.97			0.97
Satd. Flow (perm)	286	3539	1615	387	3471	1380	1687	1615	1635			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			

Lanes, Volumes, Timings

Fords Colony TIS Update

2: Fords Colony Drive/Dominon Village & Longhill Road

2027 No Build



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

HCM Unsignalized Intersection Capacity Analysis

Fords Colony TIS Update

2: Fords Colony Drive/Dominon Village & Longhill Road

2027 No Build



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		F		E

Intersection Summary

Average Delay 17.0

Intersection Capacity Utilization 63.7%

ICU Level of Service

B

Analysis Period (min) 15

Lanes, Volumes, Timings

Fords Colony TIS Update

3: Centerville Road & Westport/Manchester Drive

2027 No Build



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
Fr't	0.968		0.850			0.950		0.850			0.850	
Flt Protected	0.965		0.950			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			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			Free	

Intersection Summary

Control Type: Unsignalized

Intersection Capacity Utilization 38.8%

ICU Level of Service A

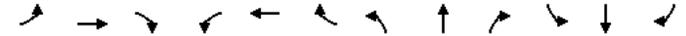
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis

Fords Colony TIS Update

3: Centerville Road & Westport/Manchester Drive

2027 No Build



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			Free	
Grade	0%		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

Lanes, Volumes, Timings
4: News Road & Firestone Drive

Fords Colony TIS Update
2027 No Build

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group												
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
Frnt	0.983		0.954				0.950		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												

HCM Unsignalized Intersection Capacity Analysis
4: News Road & Firestone Drive

Fords Colony TIS Update
2027 No Build

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR												
Movement																								
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															
Grade	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 PI 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

Lanes, Volumes, Timings

Fords Colony TIS Update

1: Williamsburg W Drive/Lane PI Drive & Longhill Road

2027 Build

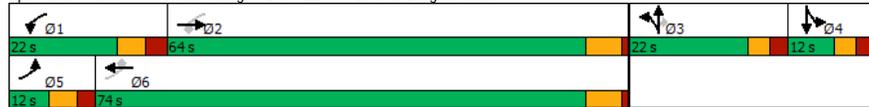


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	21	917	42	251	1222	47	61	0	165	28	0	18
Future Volume (vph)	21	917	42	251	1222	47	61	0	165	28	0	18
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		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	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 PI Drive & Longhill Road



HCM Signalized Intersection Capacity Analysis

Fords Colony TIS Update

1: Williamsburg W Drive/Lane PI Drive & Longhill Road

2027 Build



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	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	0.85	0.95	0.95
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00	0.97	0.97
Satd. Flow (prot)	1805	3539	1615	1719	3471	1380	1687	1615	1635			1635
Flt Permitted	0.15	1.00	1.00	0.21	1.00	1.00	0.95	1.00	0.97			0.97
Satd. Flow (perm)	280	3539	1615	382	3471	1380	1687	1615	1635			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			

Lanes, Volumes, Timings

Fords Colony TIS Update

2: Fords Colony Drive/Dominon Village & Longhill Road

2027 Build

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group												
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
Flt Protected			0.850			0.850			0.850			0.926
Satd. Flow (prot)	1900	1810	1524	1752	1776	1615	0	1659	1615	0	1721	0
Flt Permitted			0.950			0.955			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

HCM Unsignalized Intersection Capacity Analysis

Fords Colony TIS Update

2: Fords Colony Drive/Dominon Village & Longhill Road

2027 Build

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
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

Lanes, Volumes, Timings

Fords Colony TIS Update

3: Centerville Road & Westport/Manchester Drive

2027 Build



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
Flt Protected		0.968			0.850				0.850			0.850
Flt Permitted		0.965		0.950			0.950			0.950		
Satd. Flow (prot)	0	1775	0	1736	1553	0	1805	1759	1282	1556	1759	967
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

HCM Unsignalized Intersection Capacity Analysis

Fords Colony TIS Update

3: Centerville Road & Westport/Manchester Drive

2027 Build



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

Lanes, Volumes, Timings
4: News Road & Firestone Drive

Fords Colony TIS Update
2027 Build

	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
Frnt	0.983		0.954		0.950		0.850		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		Stop		Stop	

Intersection Summary												
Control Type: Unsignalized												
Intersection Capacity Utilization 49.4%				ICU Level of Service A								
Analysis Period (min) 15												

HCM Unsignalized Intersection Capacity Analysis
4: News Road & Firestone Drive

Fords Colony TIS Update
2027 Build

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Movement	↔	↔		↔	↔		↔	↔	↔	↔	↔	↔	
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		Stop		Stop		
Grade	0%		0%		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 PI 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

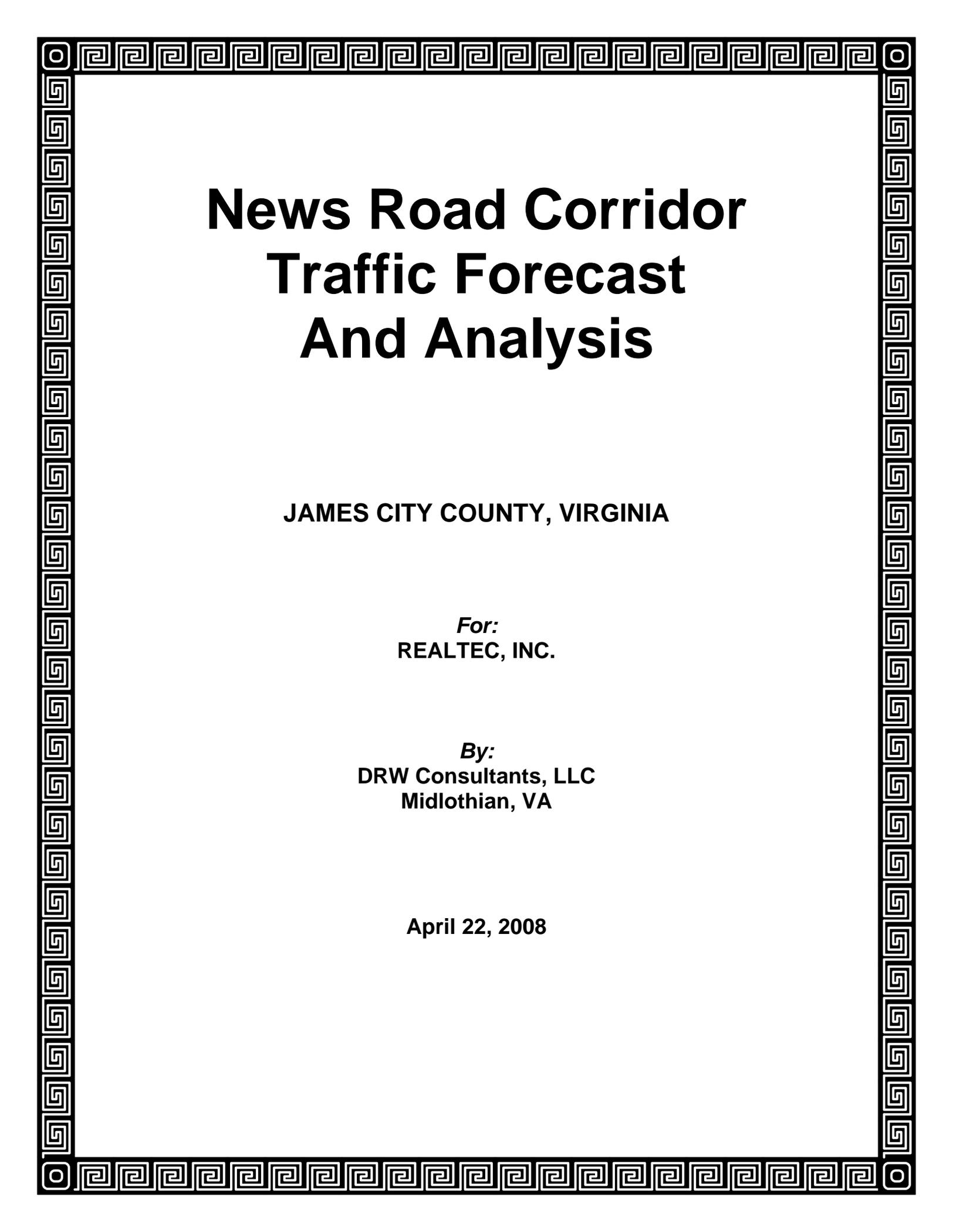
Movement	EB	WB	WB	NB	SB	SB
Directions Served	LTR	L	TR	L	L	R
Maximum Queue (ft)	42	63	49	19	49	2
Average Queue (ft)	15	27	16	2	9	0
95th Queue (ft)	39	52	36	11	33	0
Link Distance (ft)	247	762				
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			140	190	190	325
Storage Blk 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

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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

JAMES CITY COUNTY, VIRGINIA

For:
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April 22, 2008

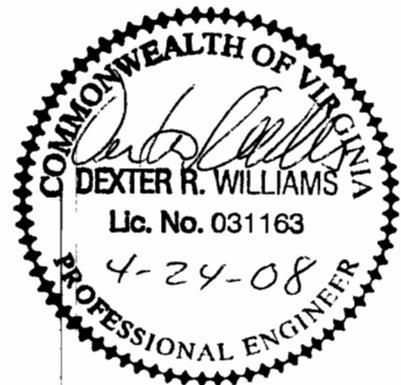
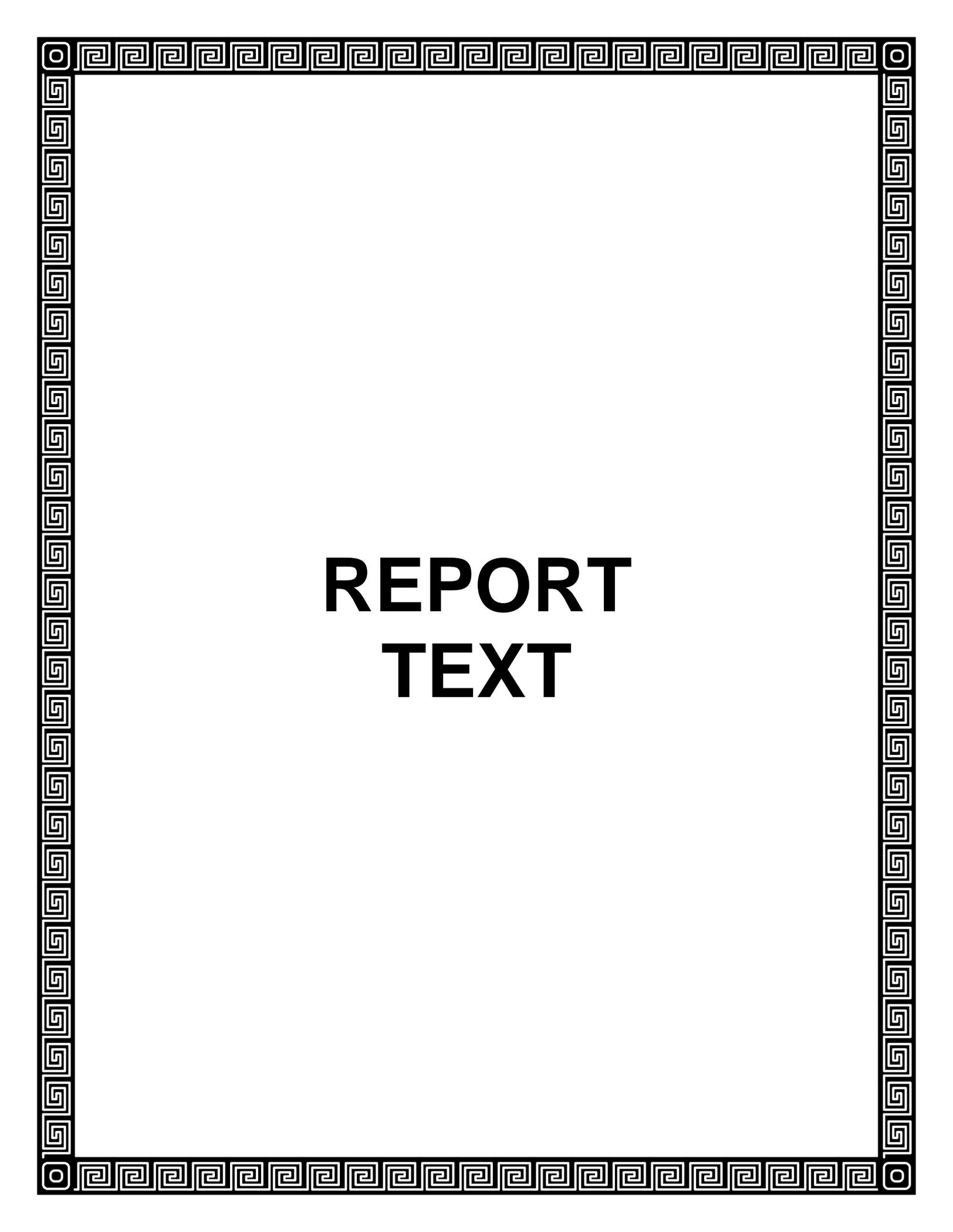


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**REPORT
TEXT**

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**

CONDITION	AM PEAK HOUR LOS		PM PEAK HOUR LOS	
	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**

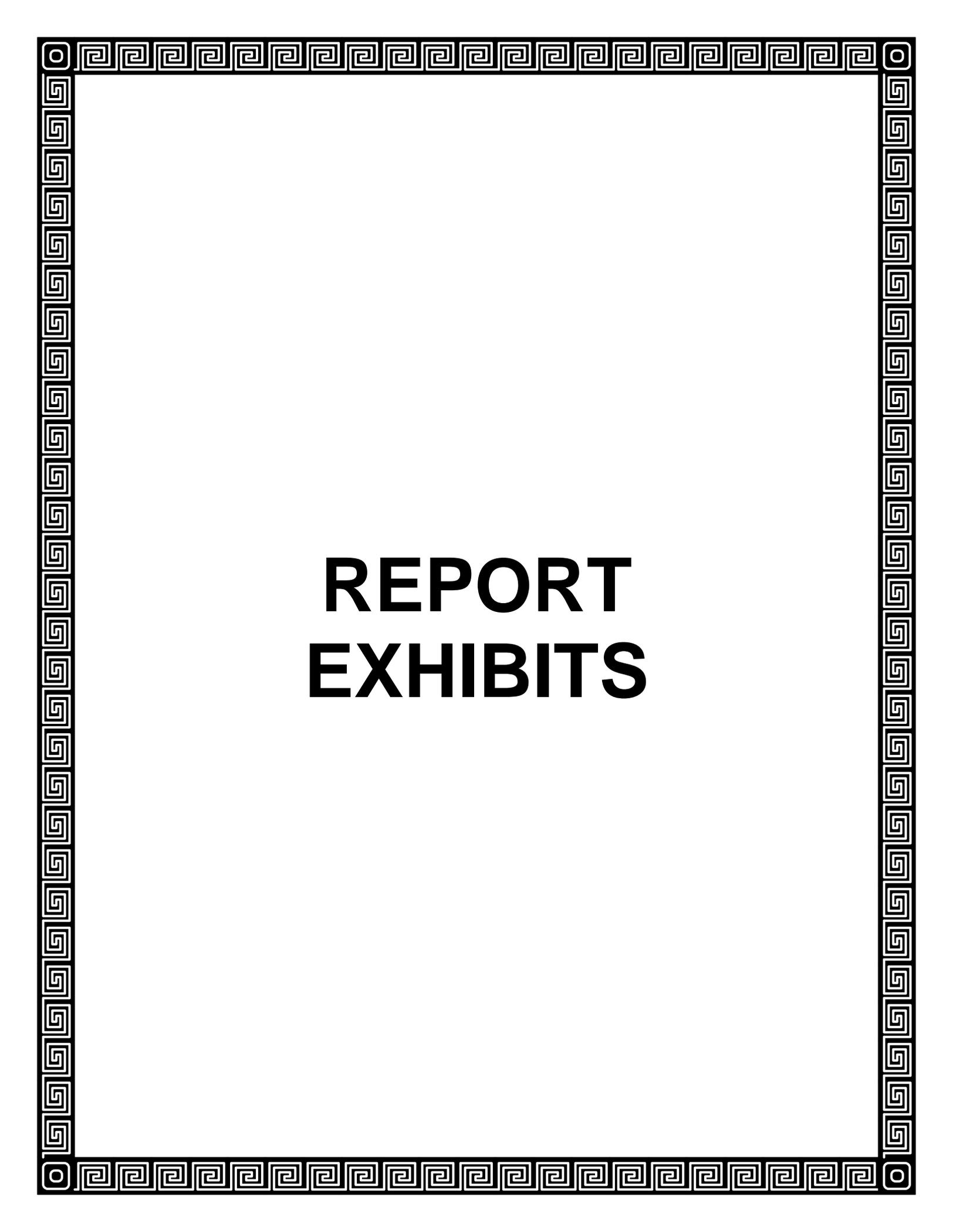
CONDITIO N	AM PEAK HOUR LOS									
	Overall	EB Left	EB Thru	WB Left	WB Thru	NB Left	NB Thru	NB Right	SB Left	SB L/T/R
2007/2008	C – 34.0	D – 45.4	D – 36.9	C – 25.0	B – 12.3	D– 41.2	D – 42.2	D – 42.2	D – 45.3	D – 39.8
Approved	D – 35.2	D – 45.4	D – 38.9	C – 25.0	B – 13.1	D– 41.2	D – 42.5	D – 42.2	D – 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
CONDITIO N	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.

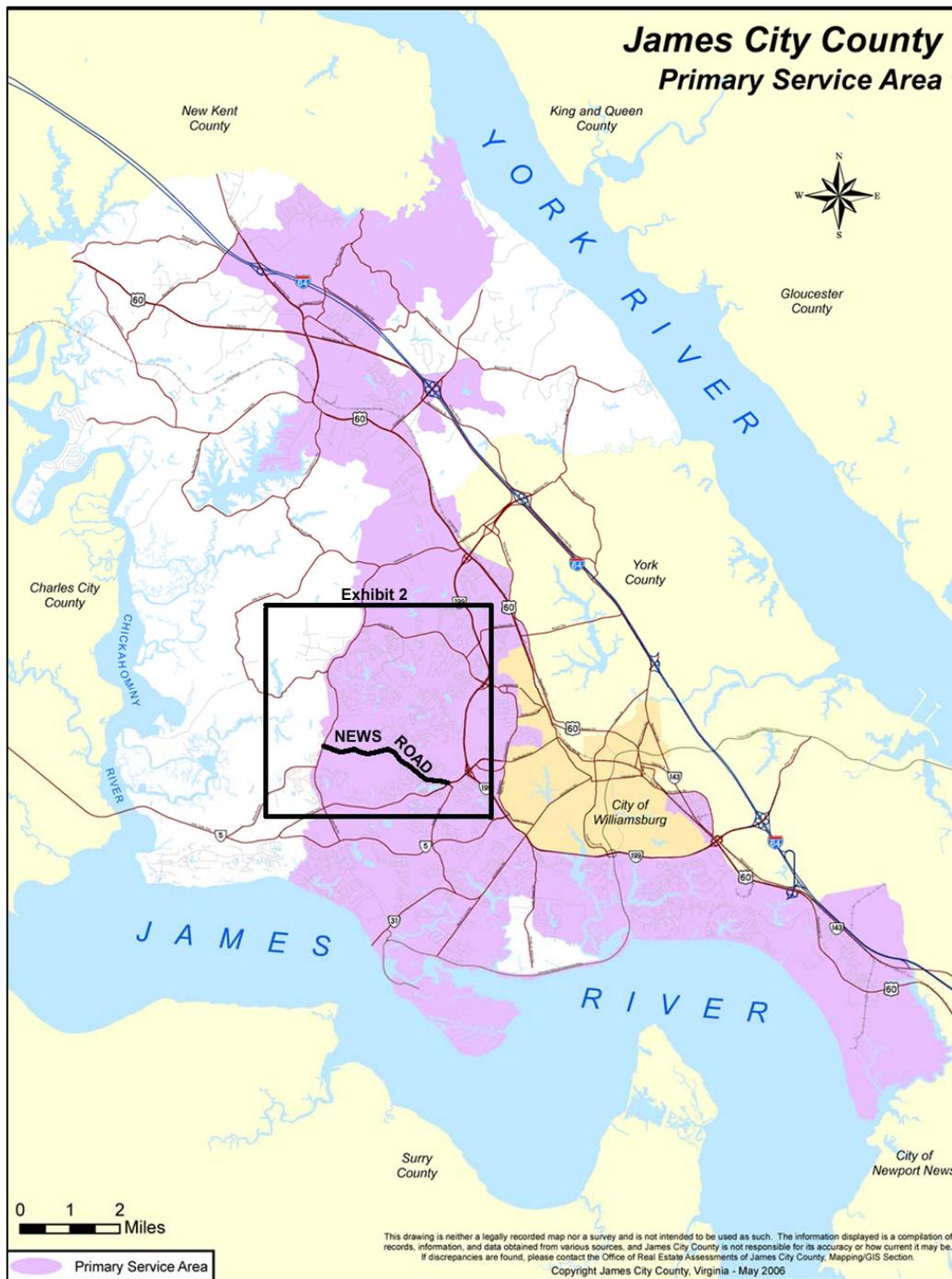
Overall, the total traffic forecast on News Road will be within the capacity of two lane News Road. Stop-sign controlled traffic will experience LOS B through D, with LOS D occurring only in the PM peak hour.

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.

A decorative border surrounds the page, featuring a Greek key pattern. The top and bottom borders are composed of a continuous row of squares, each containing a smaller square rotated 45 degrees. The left and right borders are composed of a continuous column of squares, each containing a smaller square rotated 90 degrees. The corners are marked with a small circle.

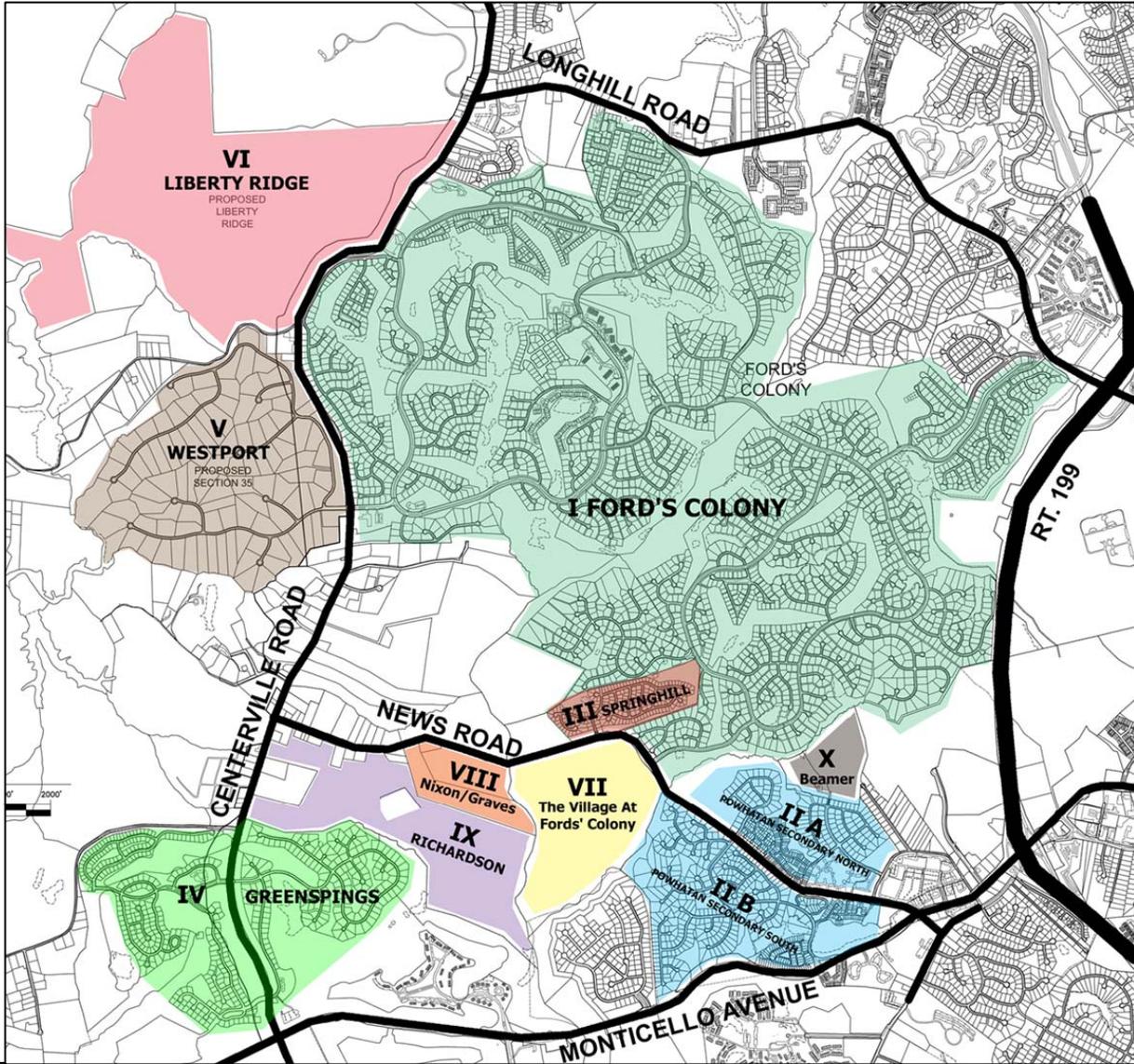
REPORT EXHIBITS



**NEWS ROAD CORRIDOR
REGIONAL LOCATION**

**DRW Consultants, LLC
804-794-7312**

Exhibit 1a

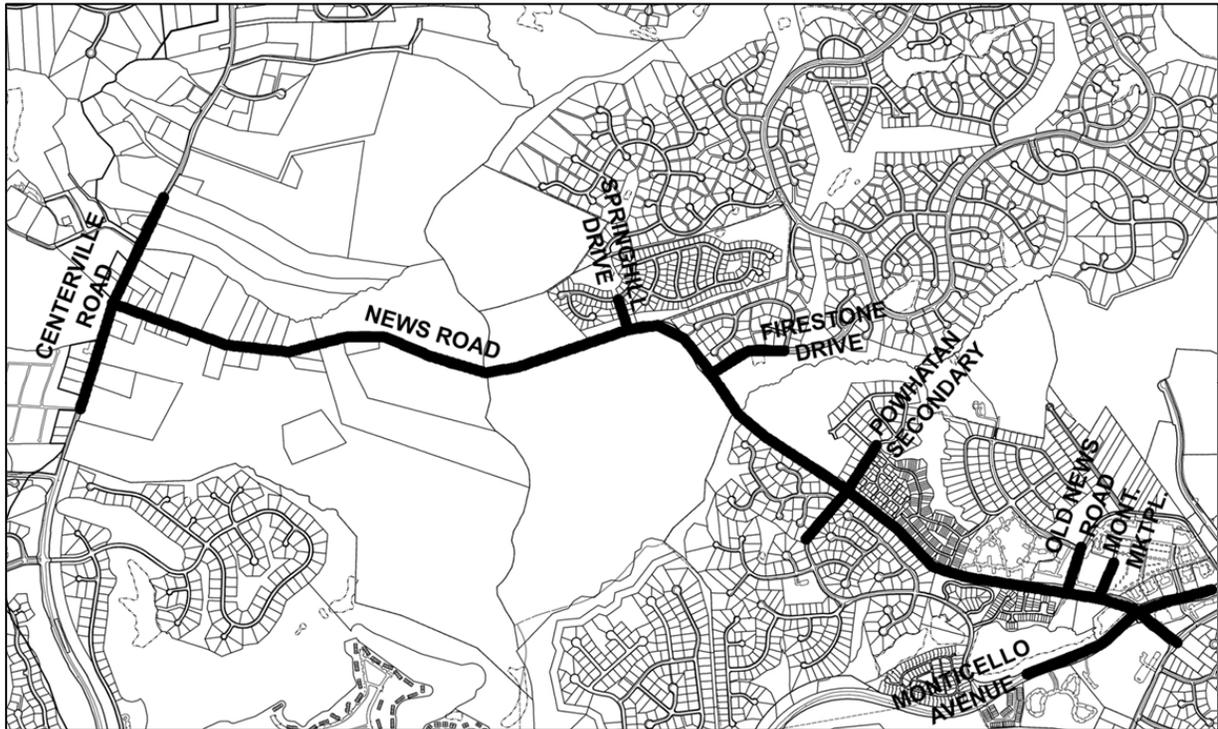


Development		Inventory Source	Forecast Technique
Map #	Name		
I	Ford's Colony	Ford's Colony	Increase News Road/Firestone counts by buildout (3050 units)/April 07 (2272 units) ratio
IIA	Powhatan Secondary North of News Road	Ford's Colony	Assign trips for 30 unbuilt units
IIB	Powhatan Secondary South of 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

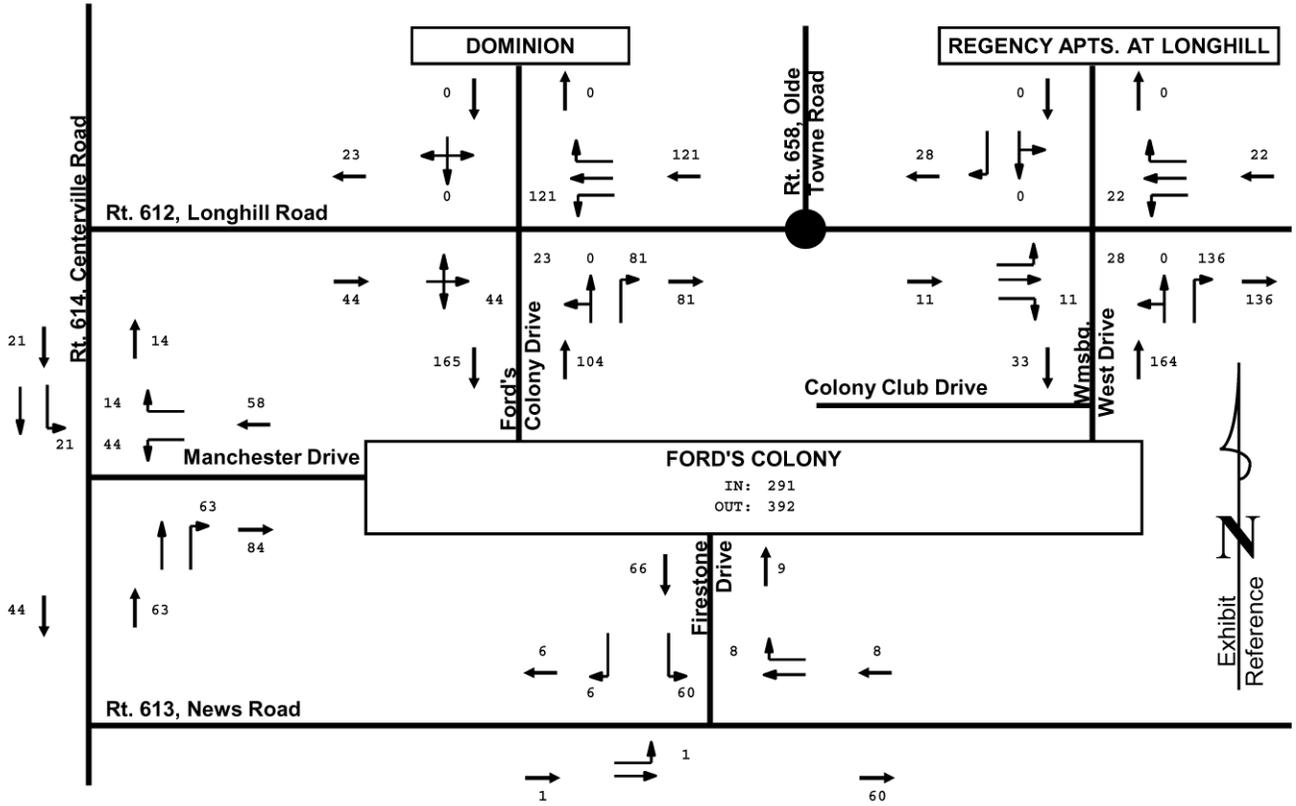


NEWS ROAD CORRIDOR
INTERSECTIONS

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804-794-7312

Exhibit 1c

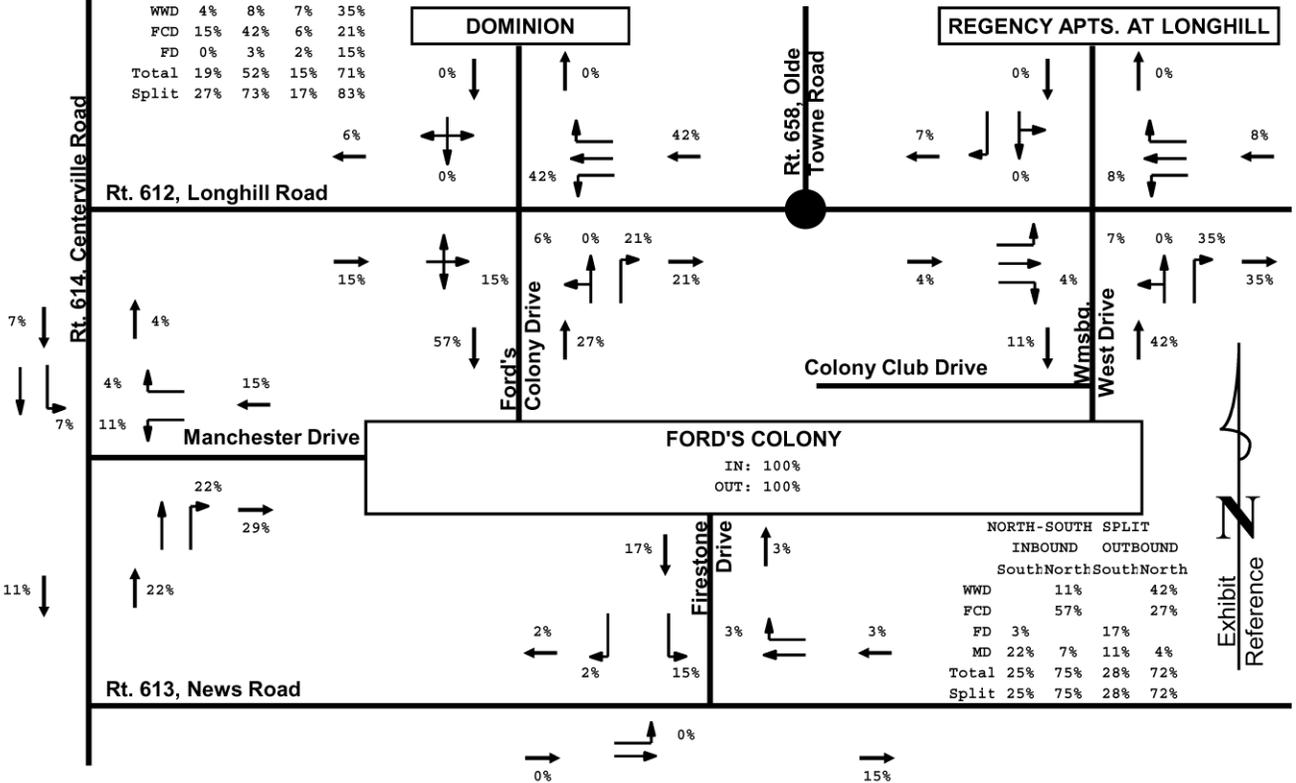
2003 AM Peak Hour Counts



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%

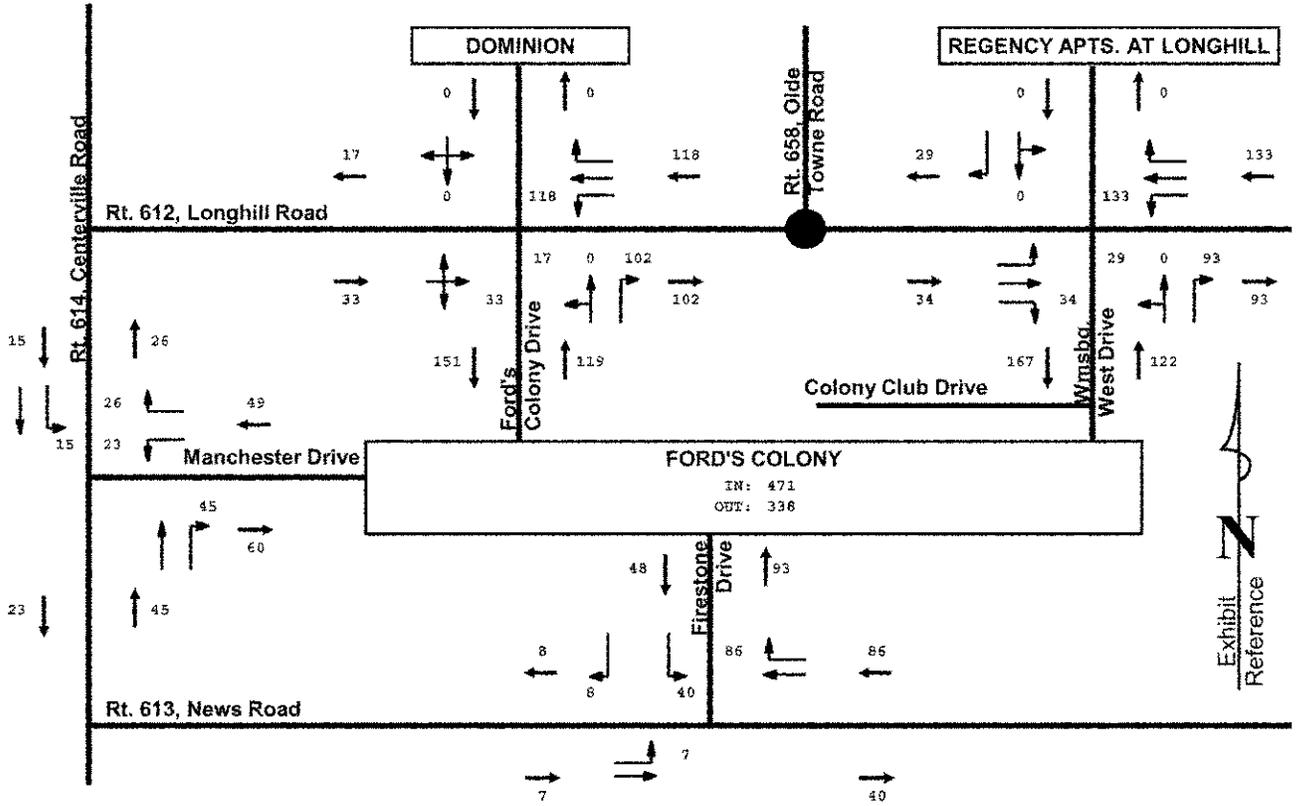
2003 AM PEAK HOUR DISTRIBUTION



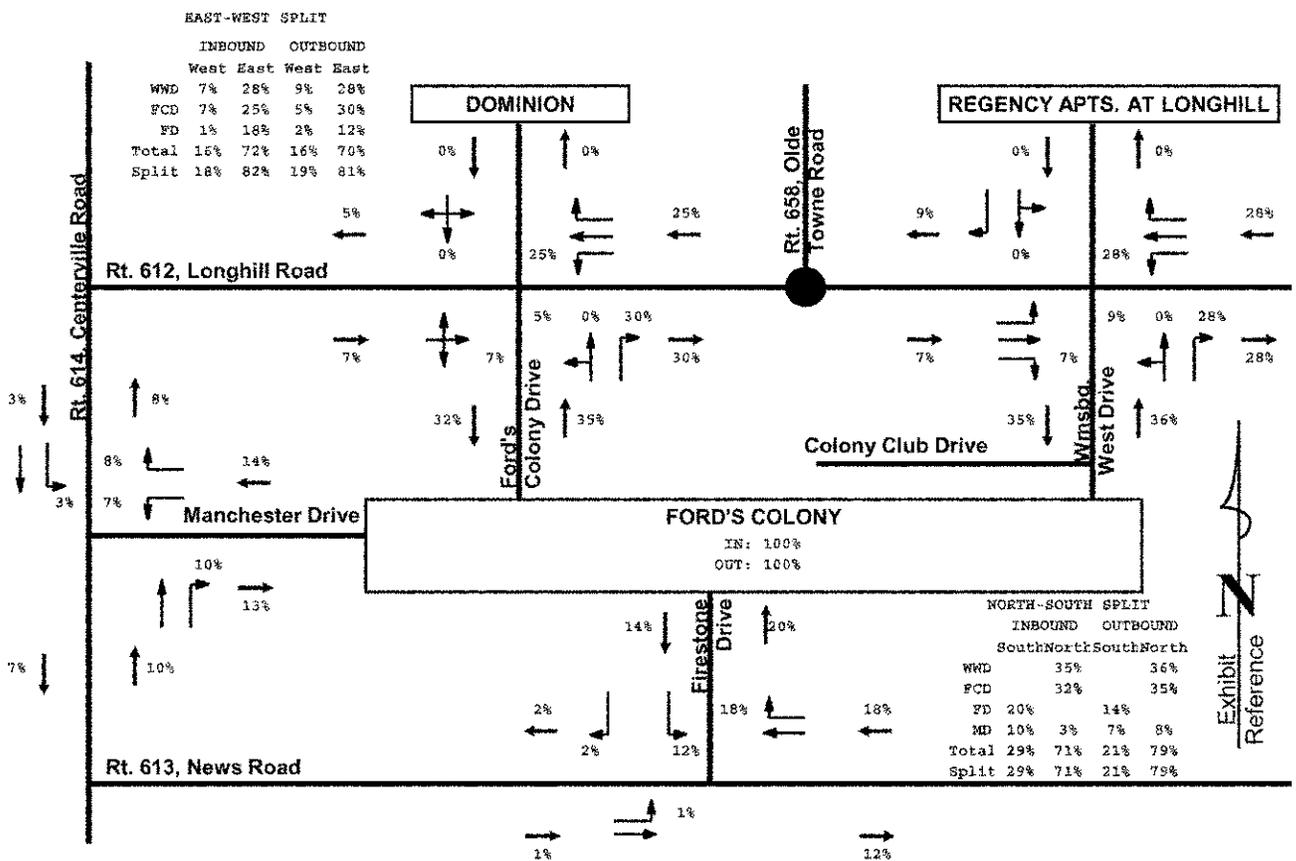
NORTH-SOUTH SPLIT

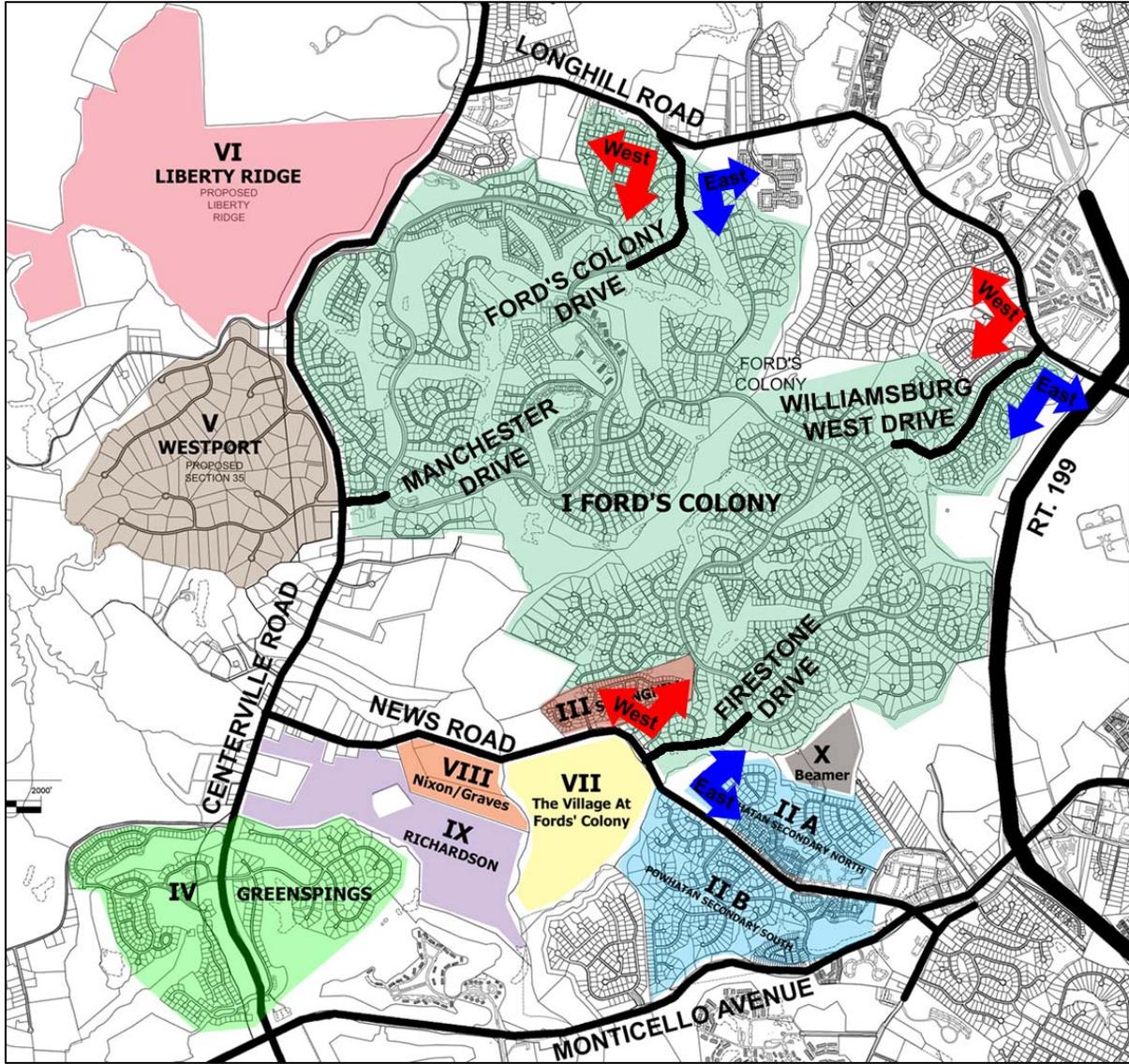
	INBOUND		OUTBOUND	
	South	North	South	North
WWD	11%	42%		
FCD	57%	27%		
FD	3%	17%		
MD	22%	7%	11%	4%
Total	25%	75%	28%	72%
Split	25%	75%	28%	72%

2003 PM Peak Hour Counts



2003 PM PEAK HOUR DISTRIBUTION

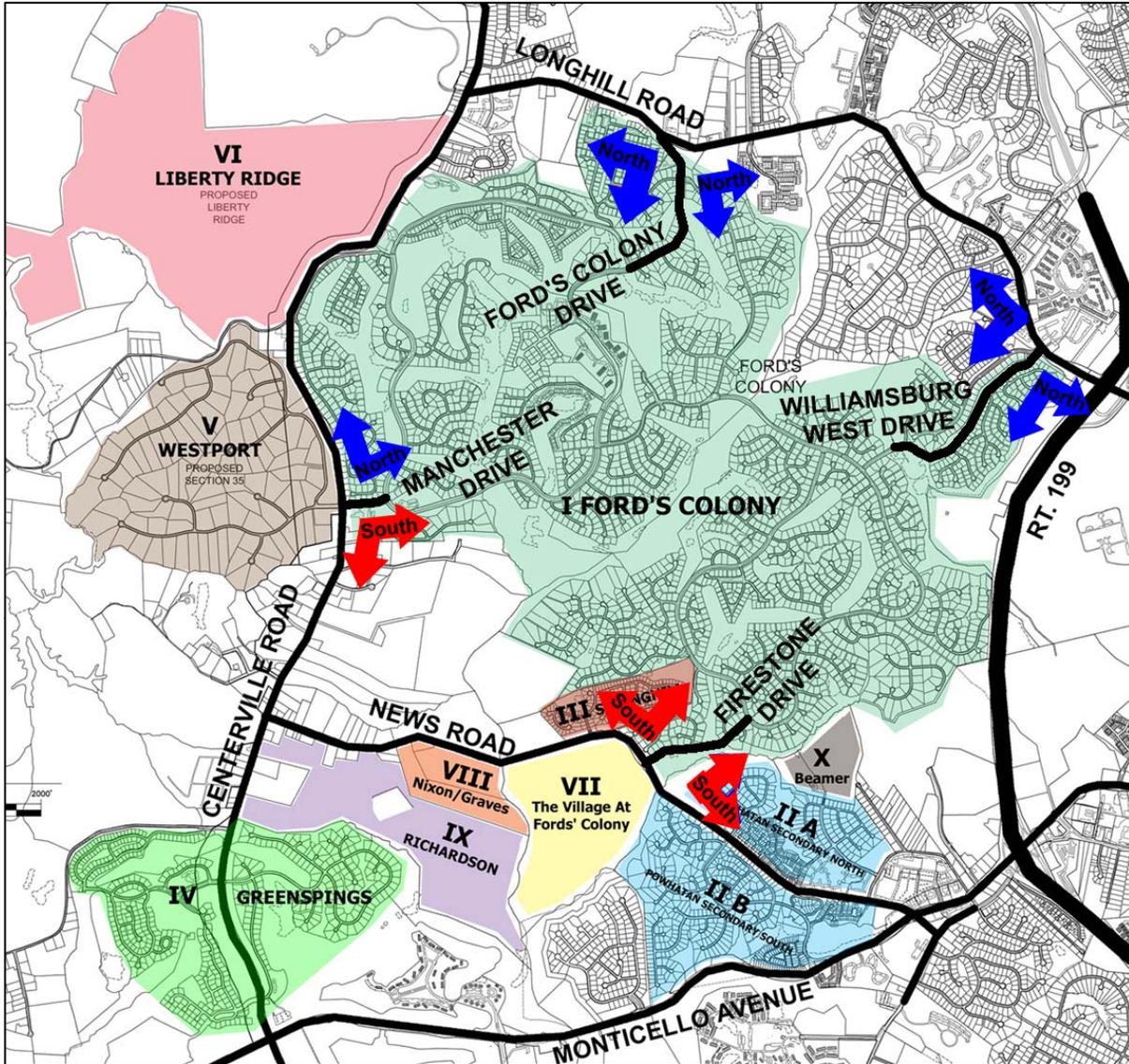




FORD'S COLONY EAST- WEST DISTRIBUTION SPLIT
TRAFFIC LOCATIONS

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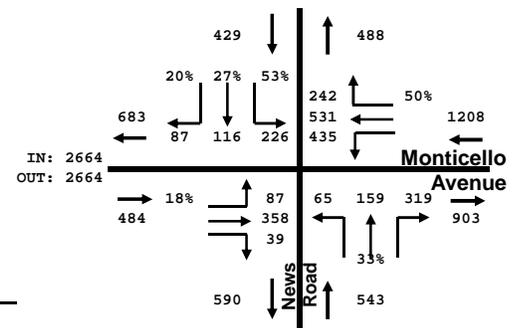
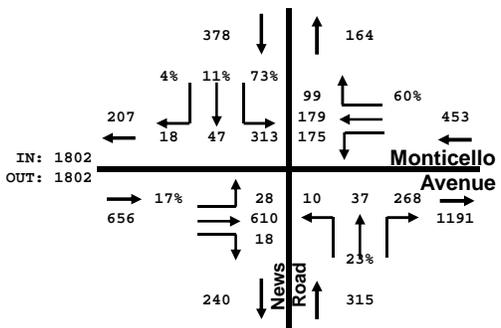
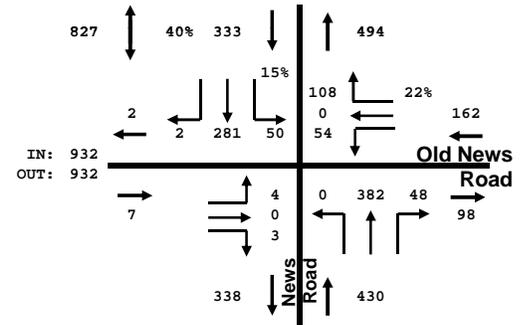
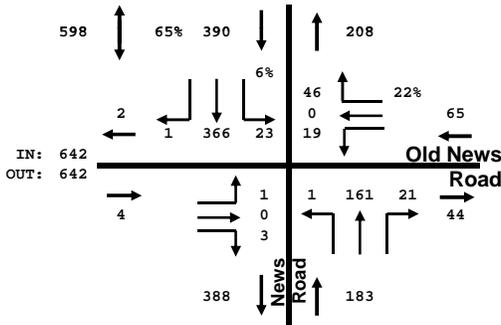
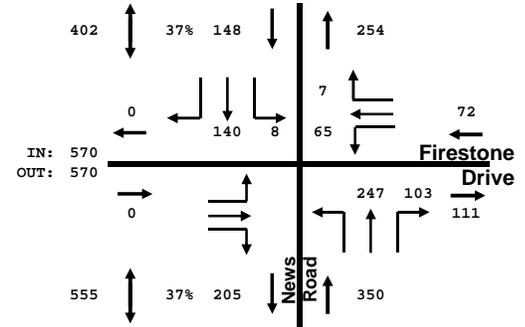
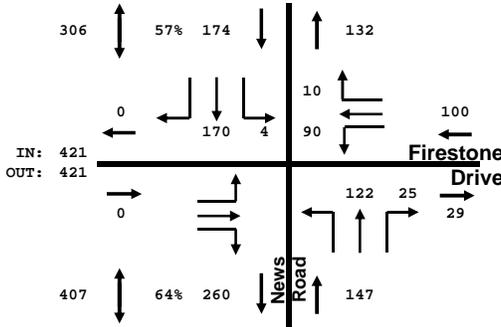
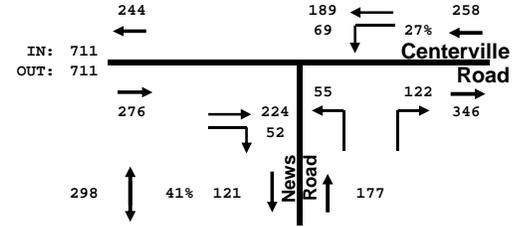
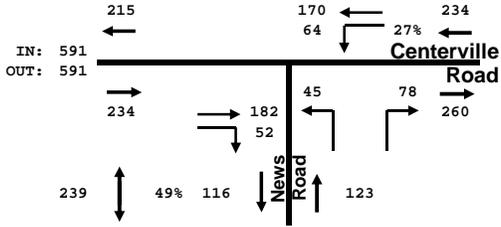
Exhibit 2c



FORD'S COLONY NORTH-SOUTH DISTRIBUTION SPLIT
TRAFFIC LOCATIONS

DRW Consultants, LLC
804-794-7312

Exhibit 2d



TOTAL IN: 3456

TOTAL IN: 4877



AM PEAK HOUR

PM PEAK HOUR

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						DAILY
				AM PEAK HOUR			PM PEAK HOUR			
				Enter	Exit	Total	Enter	Exit	Total	

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						DAILY
				AM PEAK HOUR			PM PEAK HOUR			
				Enter	Exit	Total	Enter	Exit	Total	

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						DAILY
				AM PEAK HOUR			PM PEAK HOUR			
				Enter	Exit	Total	Enter	Exit	Total	

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

Direction	62				43		105		94		88		182	
	AM Peak Hour								PM Peak Hour					
	Entering Traffic				Exiting Traffic				Entering Traffic			Exiting Traffic		
	% Dist.	Trips	% Dist.	Trips	% Dist.	Trips	% 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						DAILY
				AM PEAK HOUR			PM PEAK HOUR			
				Enter	Exit	Total	Enter	Exit	Total	

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	% 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	% 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

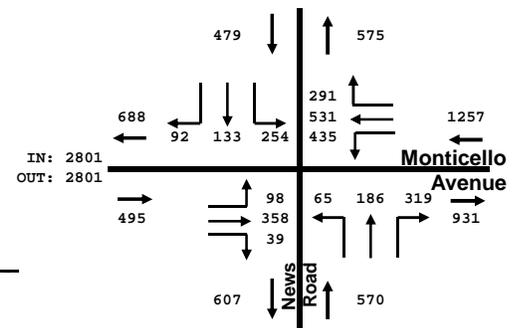
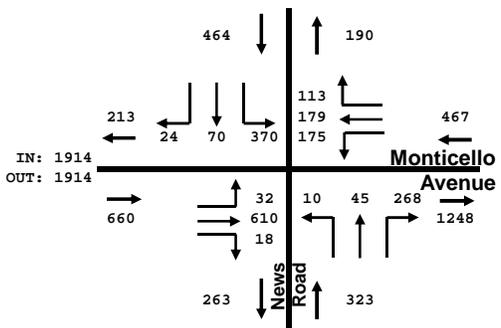
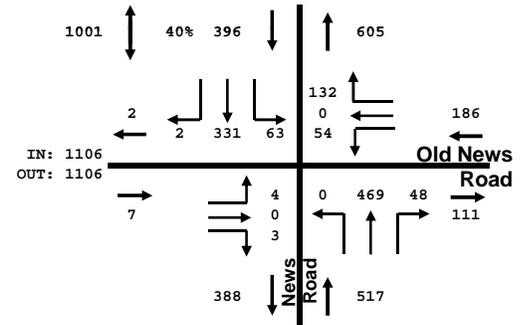
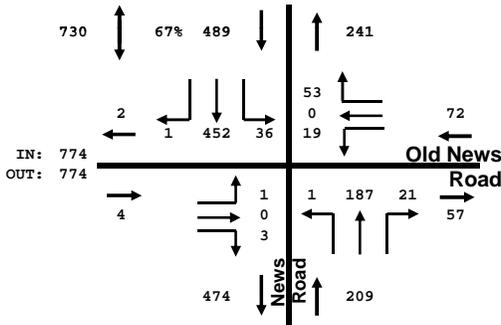
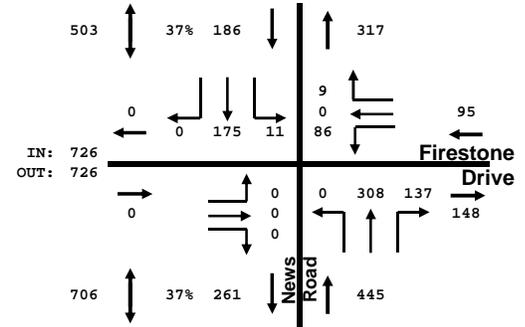
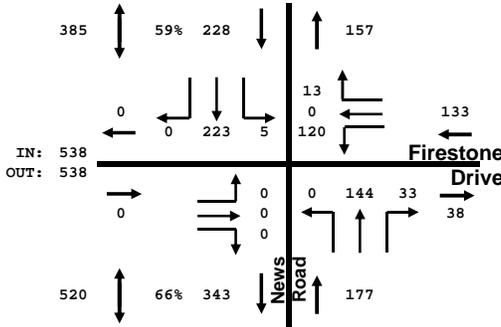
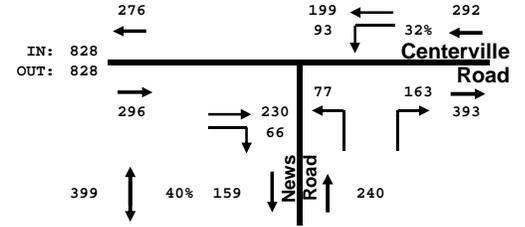
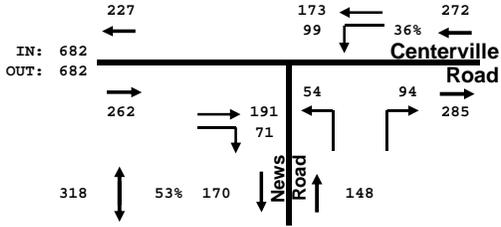
eq.-adj. st.	Condo/Townhouse	230	70 units	7	32	39	30	15	45	474
		AM Peak Hour				PM Peak Hour				
		Entering Traffic		Exiting Traffic		Entering Traffic		Exiting Traffic		
Direction	% Dist.	Trips	% Dist.	Trips	% Dist.	Trips	% Dist.	Trips	% Dist.	Trips
Centerville North	5%	0	5%	2	5%	2	5%	1		
Centerville 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



TOTAL IN: 3908

TOTAL IN: 5461

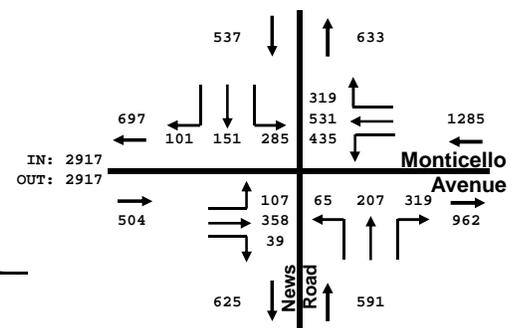
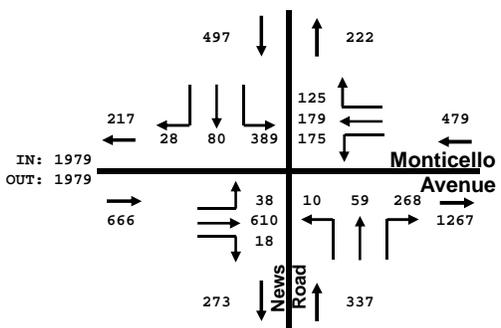
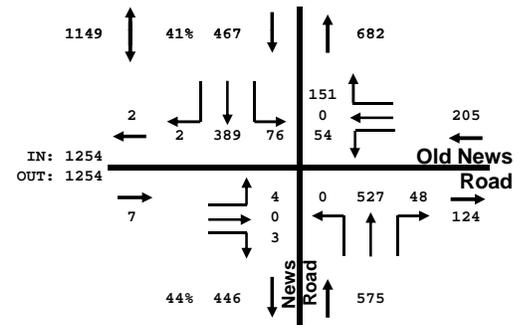
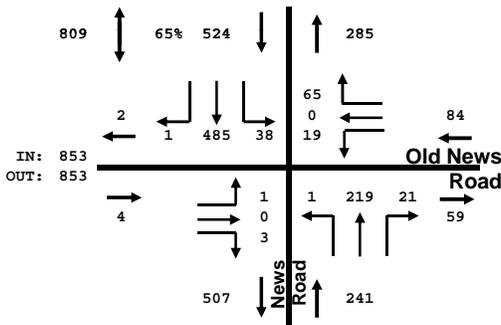
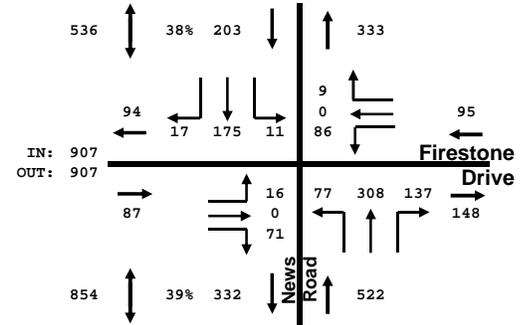
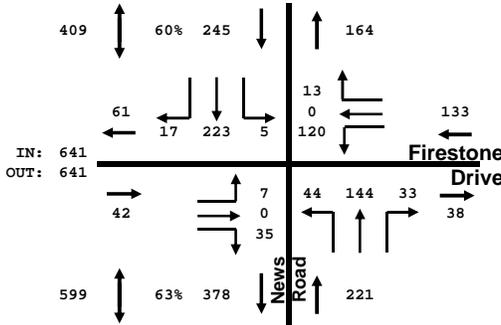
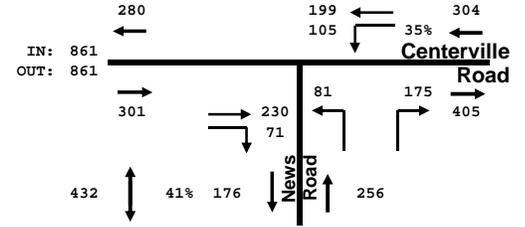
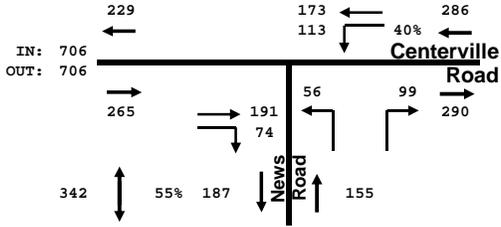
AM PEAK HOUR

PM PEAK HOUR

APPROVED DEVELOPMENT TRAFFIC FORECAST (I THRU VI)
(2007/2008 Counts And All Approved Development Traffic)

DRW Consultants, LLC
804-794-7312

Exhibit 8



TOTAL IN: 4179

TOTAL IN: 5939

Exhibit Reference

AM PEAK HOUR

PM PEAK HOUR

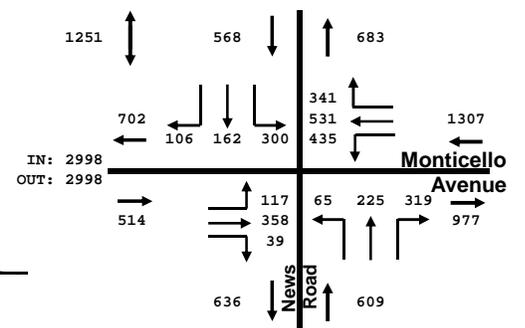
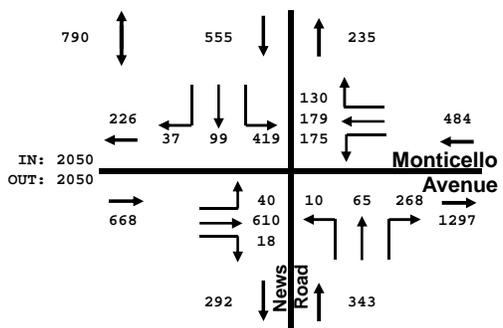
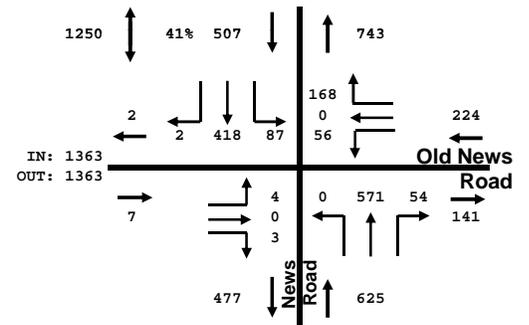
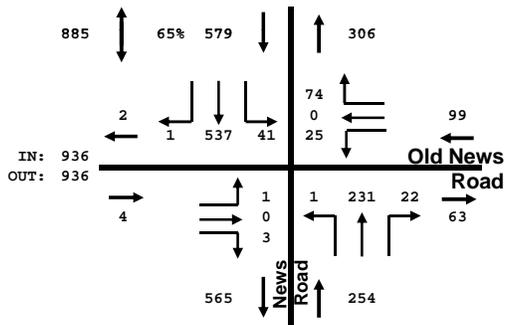
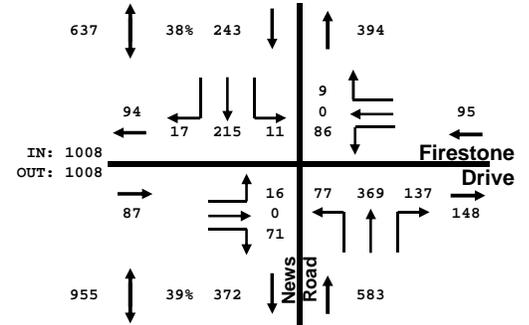
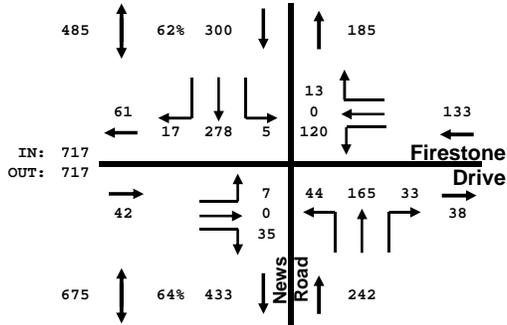
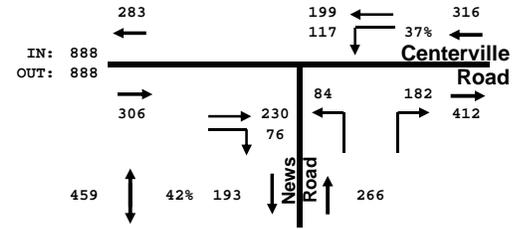
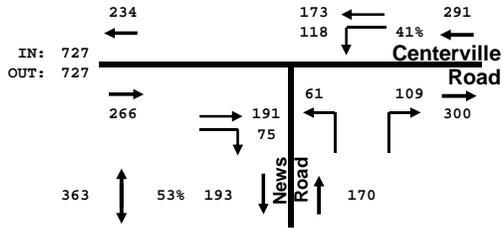


Exhibit Reference

TOTAL IN: 4430

TOTAL IN: 6257

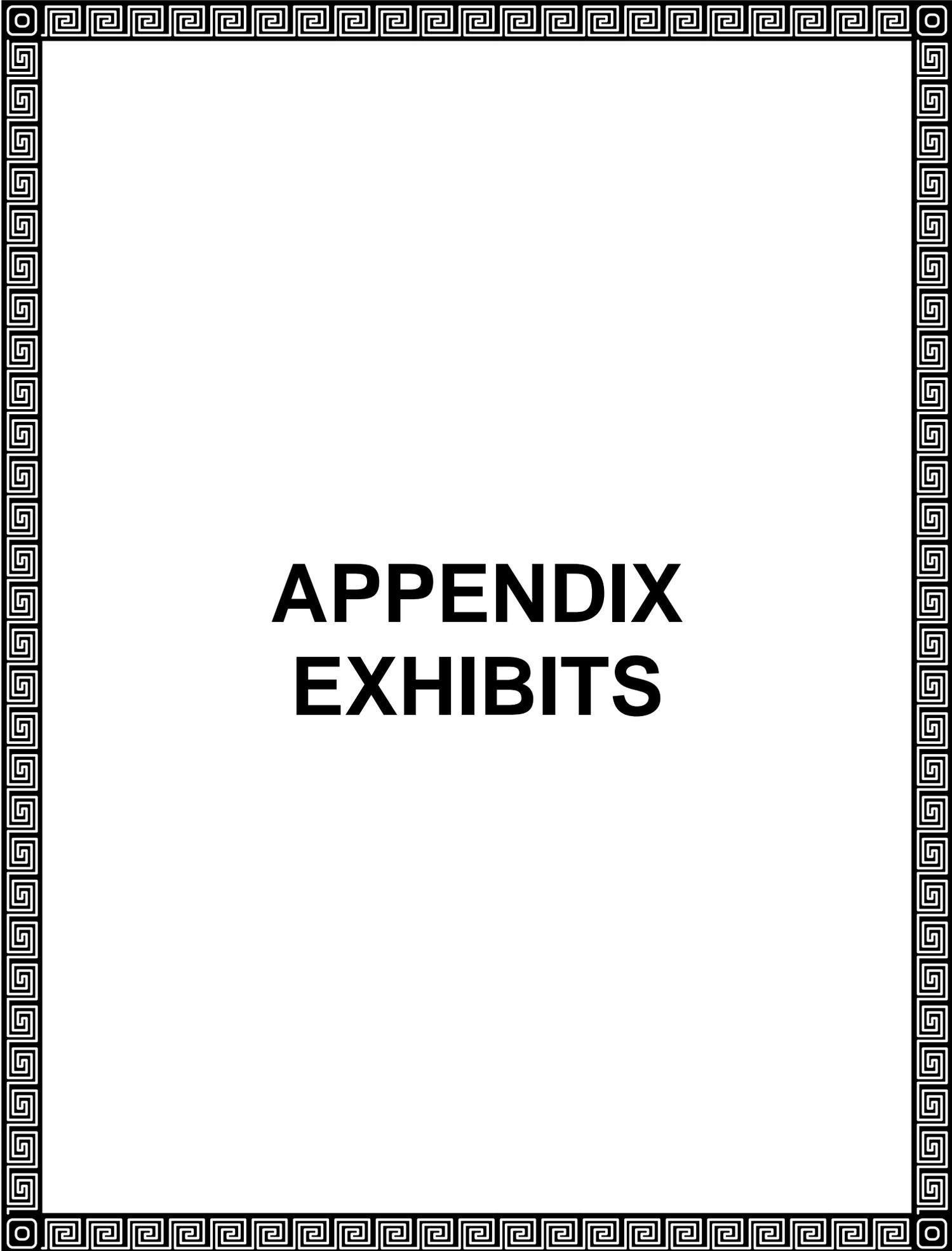
AM PEAK HOUR

PM PEAK HOUR

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

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

PM PEAK HOUR

LOCATION: News Road/Firestone Drive

DATE:
Wed, 4/25/07

CUMULATIVE 15 MINUTE COUNTS

TIME	NB	NB	NB	SB	SB	SB	EB	EB	EB	WB	WB	WB	Total
	Left	Thru	Right										
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	NB	NB	SB	SB	SB	EB	EB	EB	WB	WB	WB	Total
	Left	Thru	Right										
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	NB	NB	SB	SB	SB	EB	EB	EB	WB	WB	WB	Total
	Left	Thru	Right										
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	NB	NB	SB	SB	SB	EB	EB	EB	WB	WB	WB	Total
	Left	Thru	Right										
4:30 to 5:30	0	0	0	65	0	7	8	140	0	0	247	103	570

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

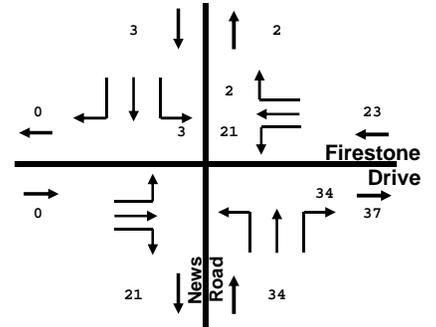
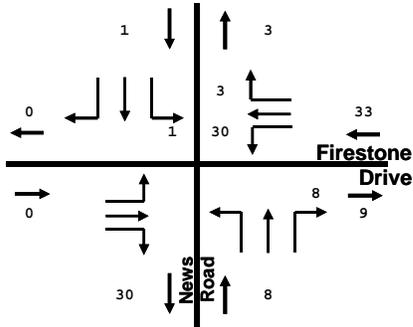
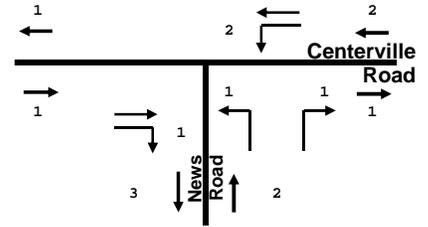
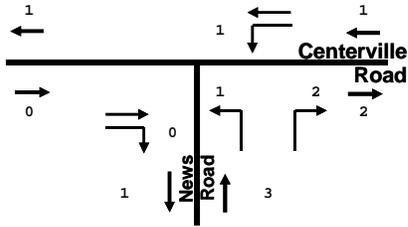
HOUR INTERVAL

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

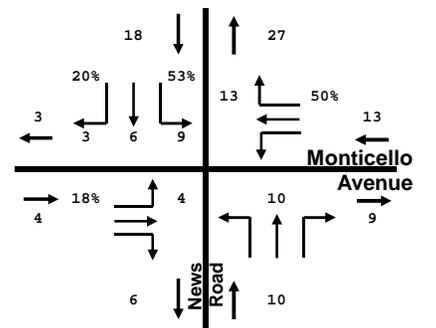
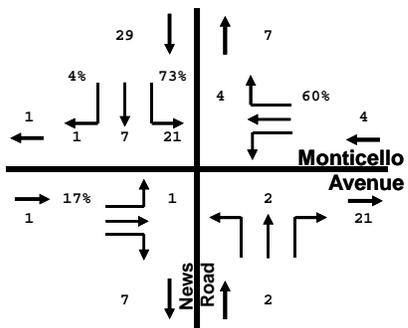
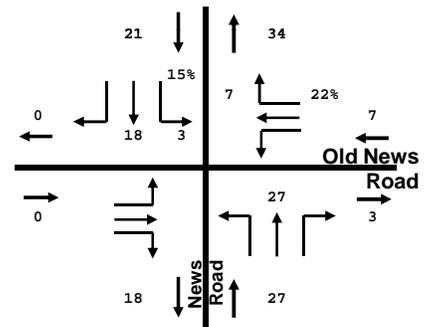
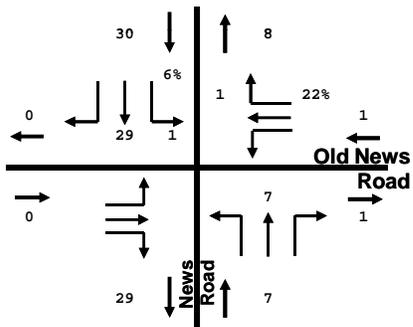
PEAK HOUR TURNING MOVEMENT VOLUMES

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

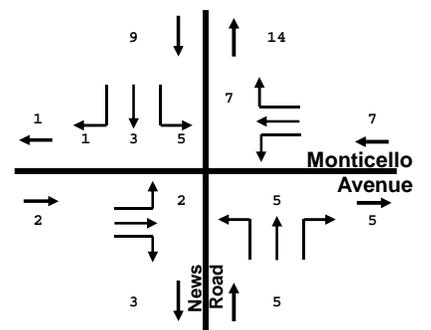
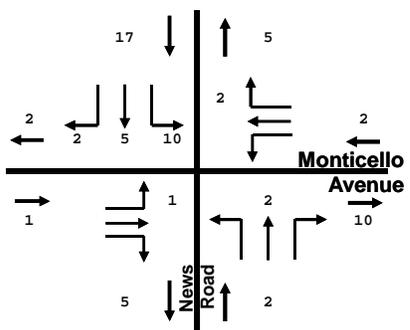
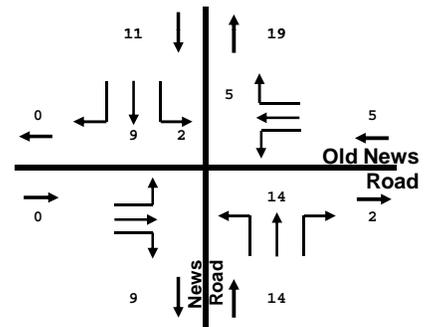
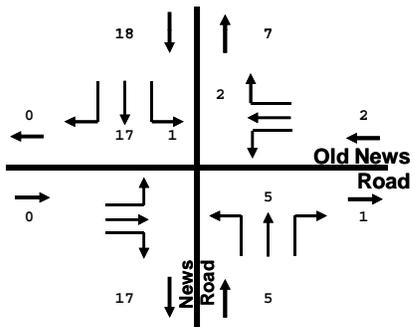
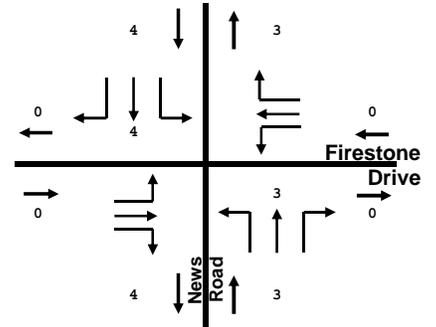
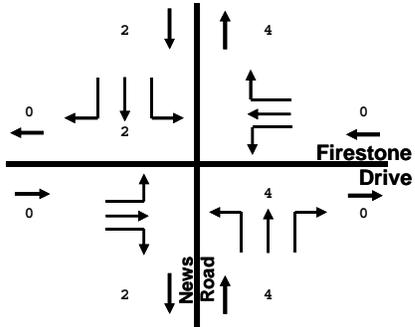
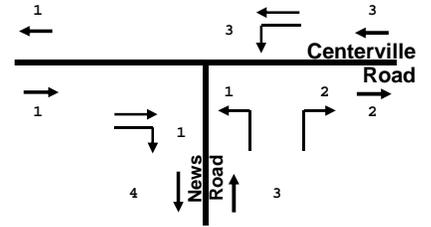
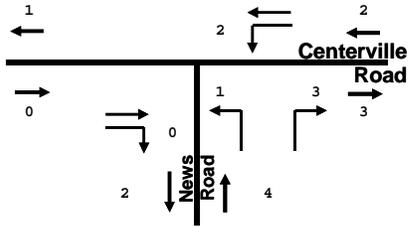


GROWTH FACTOR
 AM IN 32.4%
 AM OUT 32.8%
 PM IN 32.6%
 PM OUT 32.4%



AM PEAK HOUR

PM PEAK HOUR



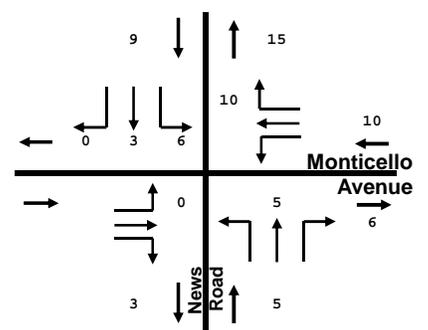
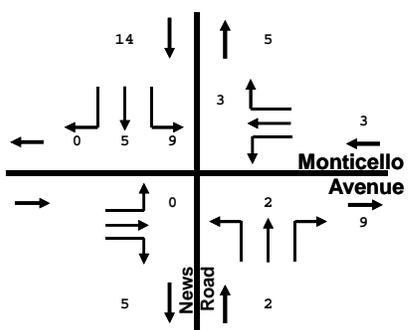
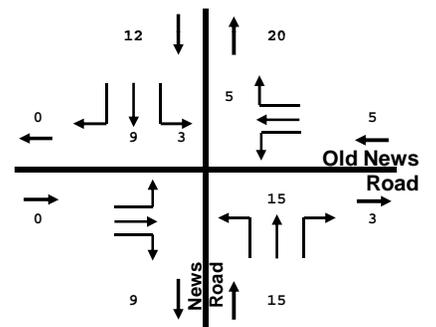
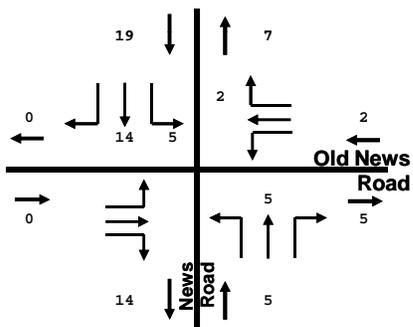
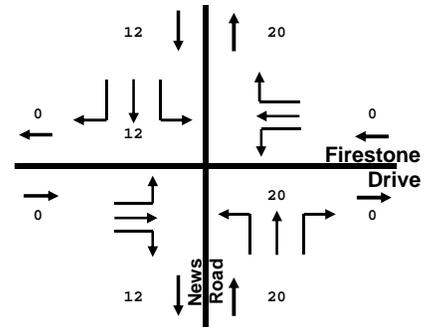
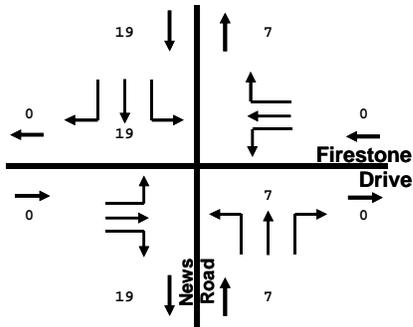
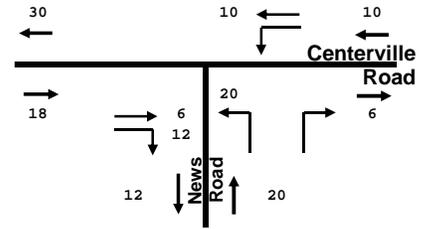
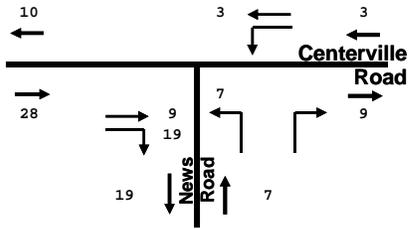
AM PEAK HOUR

PM PEAK HOUR

POWHATAN SECONDARY NORTH TRIP ASSIGNMENTS

DRW Consultants, LLC
804-794-7312

Exhibit E2



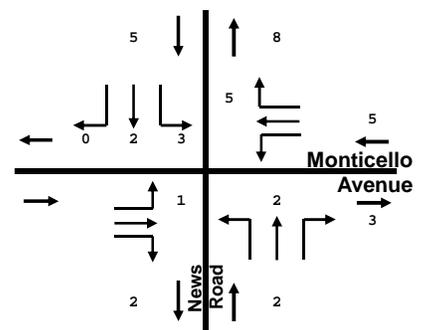
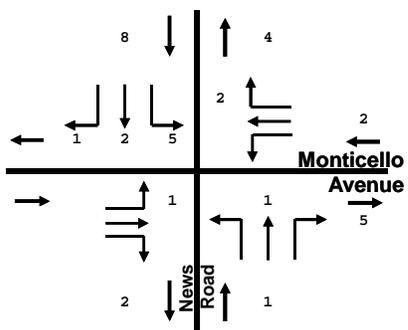
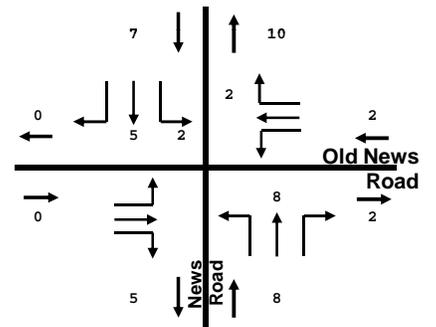
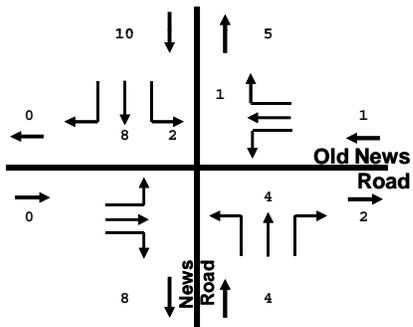
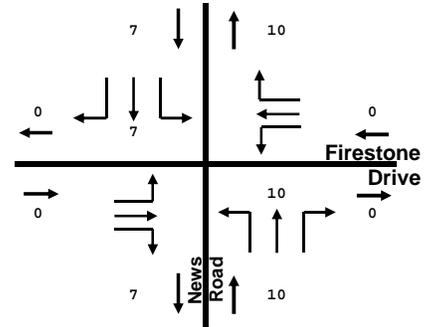
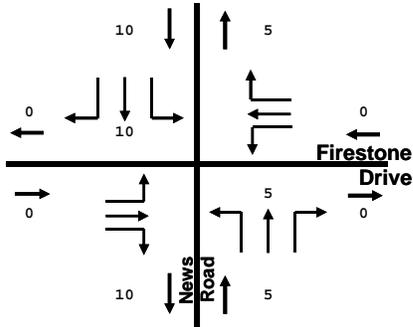
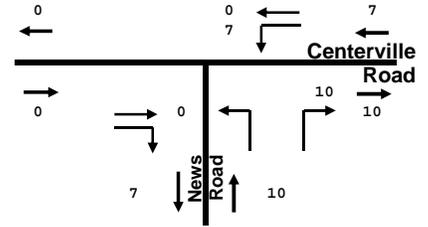
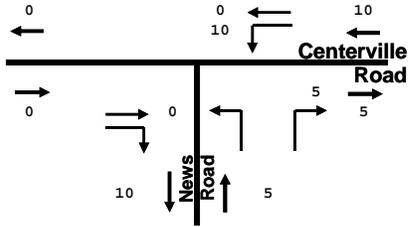
AM PEAK HOUR

PM PEAK HOUR

GREENSPRINGS TRIP ASSIGNMENTS

DRW Consultants, LLC
804-794-7312

Exhibit E3



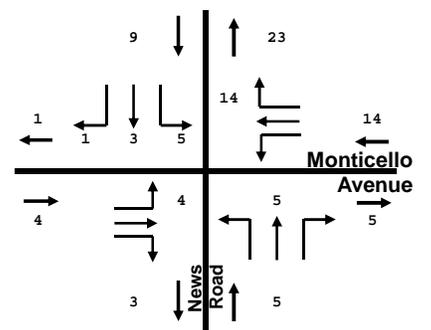
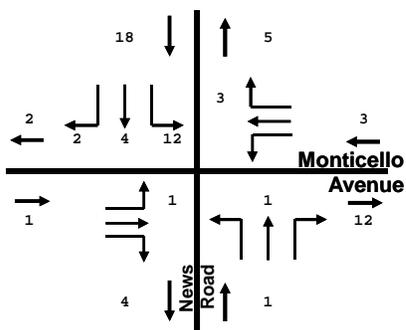
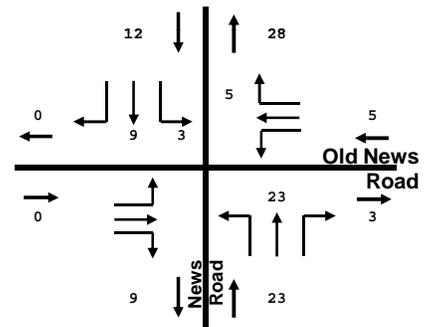
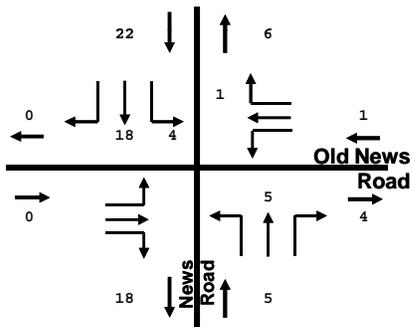
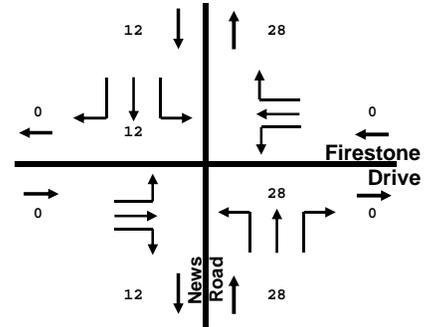
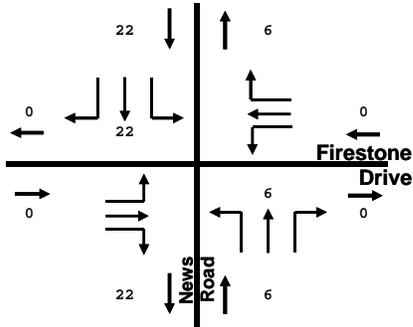
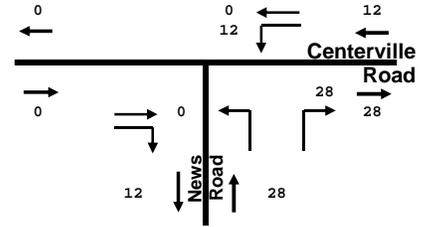
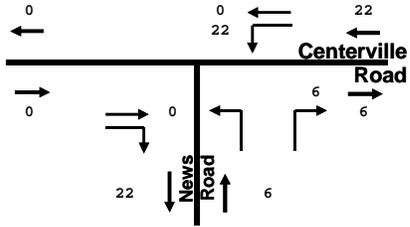
AM PEAK HOUR

PM PEAK HOUR

WESTPORT TRIP ASSIGNMENTS

DRW Consultants, LLC
804-794-7312

Exhibit E4



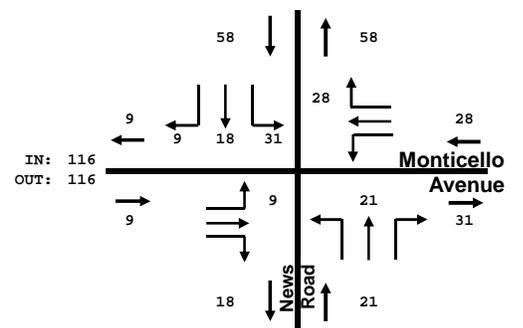
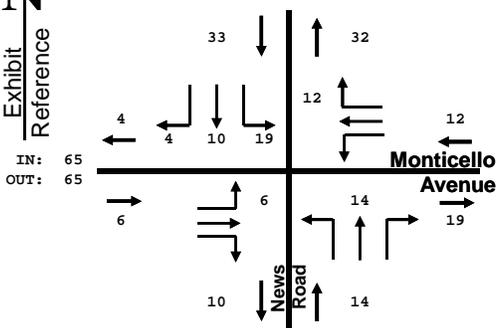
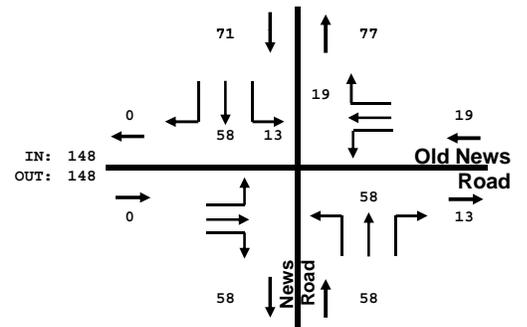
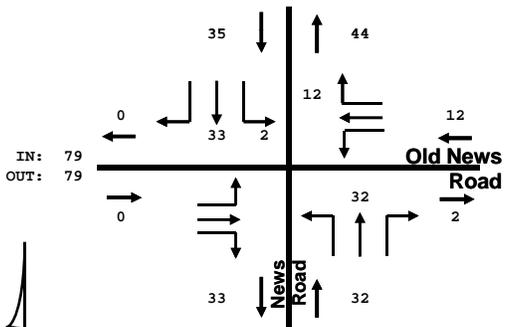
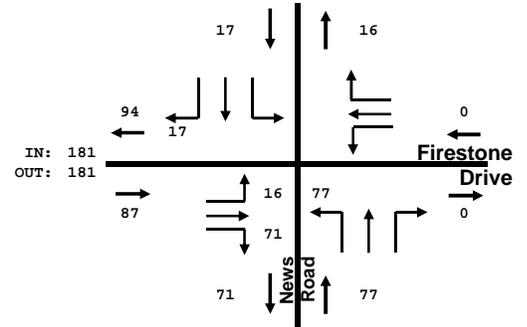
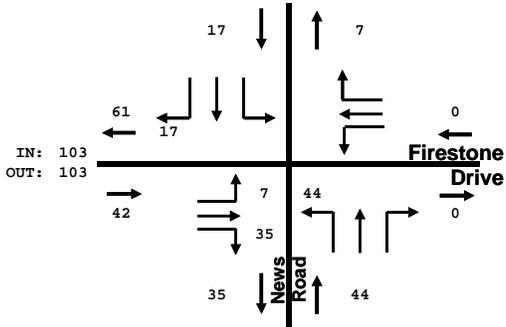
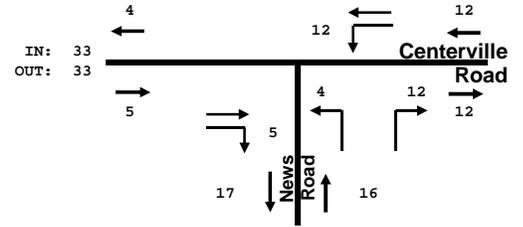
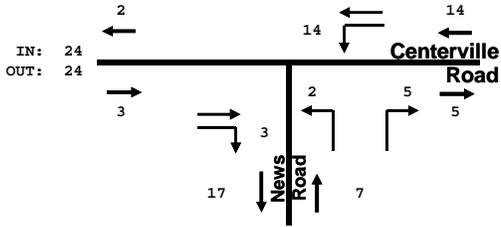
AM PEAK HOUR

PM PEAK HOUR

LIBERTY RIDGE TRIP ASSIGNMENTS

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Exhibit E5



TOTAL IN: 271

TOTAL IN: 478

AM PEAK HOUR

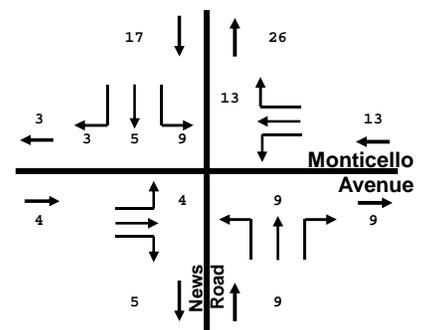
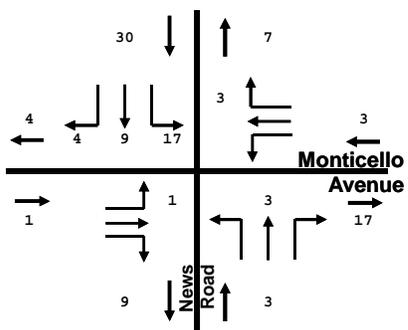
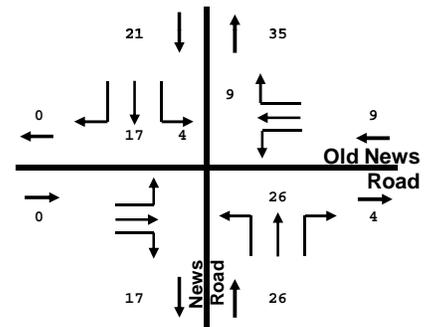
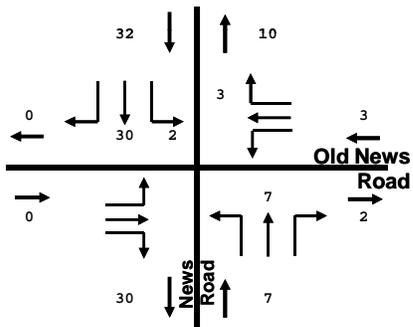
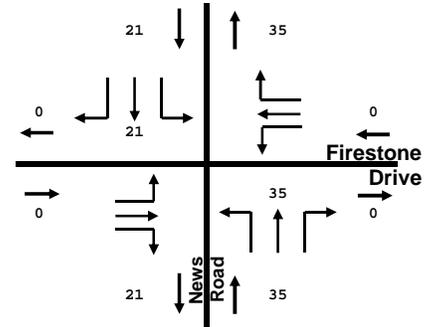
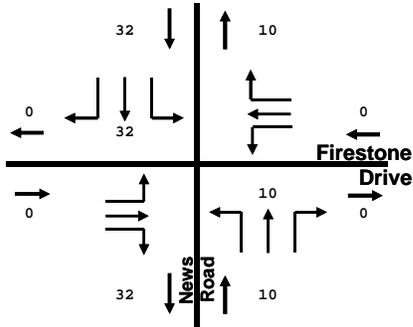
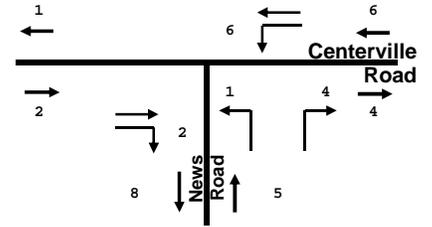
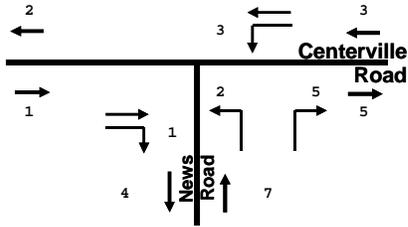
PM PEAK HOUR

Exhibit Reference

THE VILLAGE AT FORD'S COLONY TRIP ASSIGNMENTS

DRW Consultants, LLC
804-794-7312

Exhibit E6



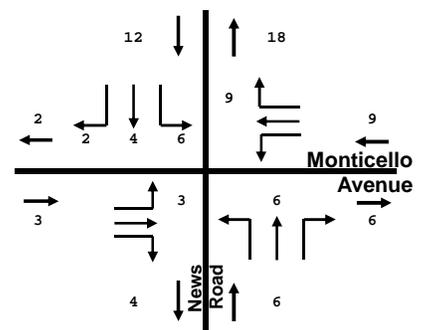
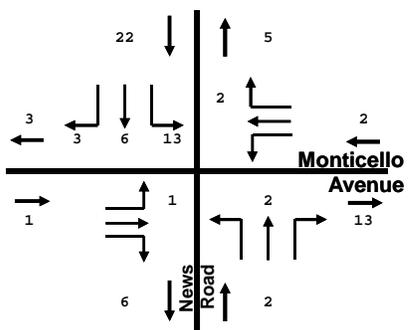
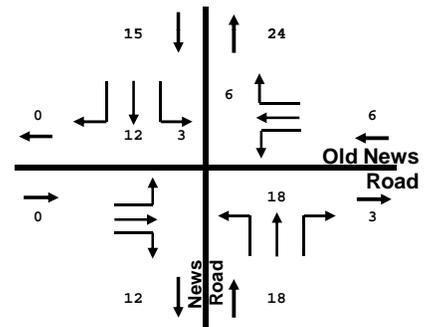
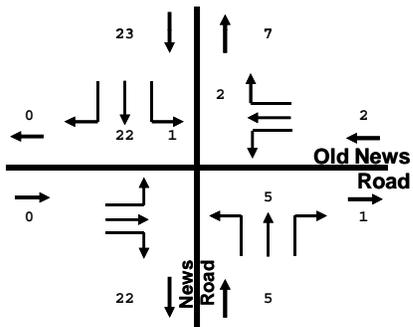
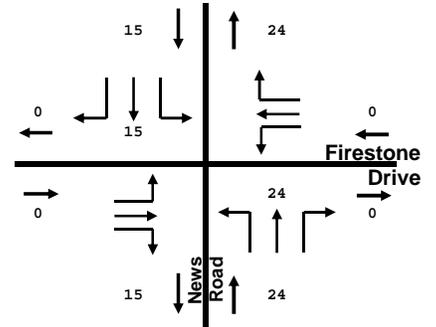
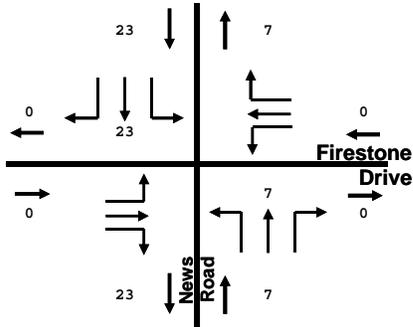
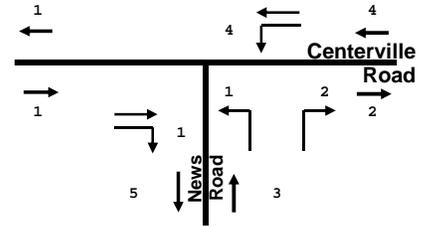
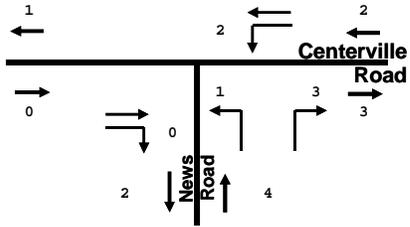
AM PEAK HOUR

PM PEAK HOUR

NIXON-GRAVES TRIP ASSIGNMENTS

DRW Consultants, LLC
804-794-7312

Exhibit E7



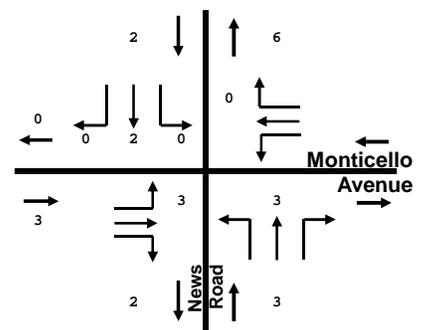
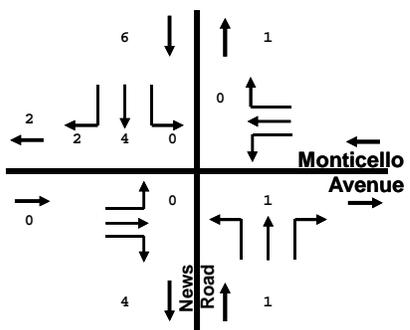
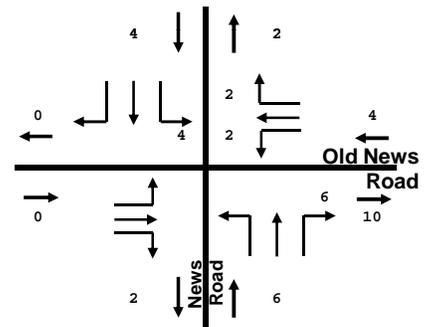
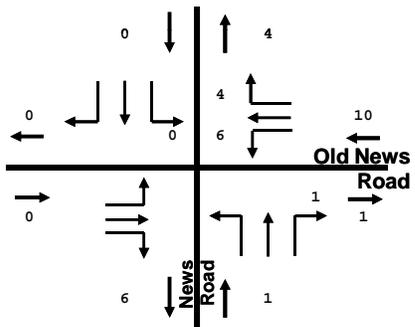
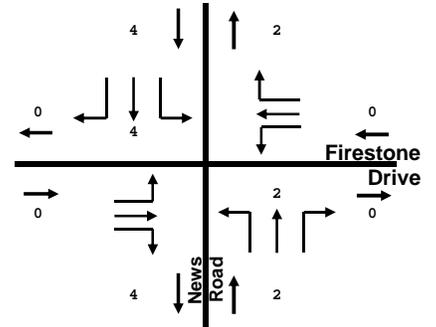
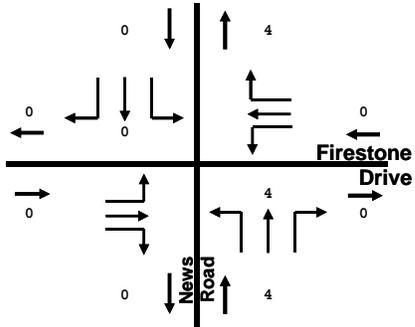
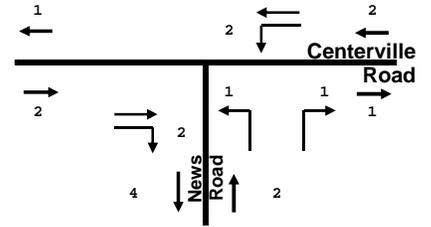
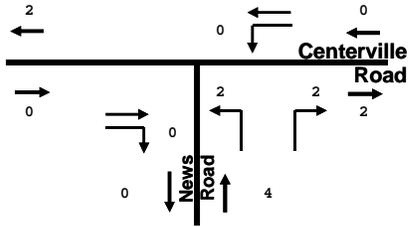
AM PEAK HOUR

PM PEAK HOUR

RICHARDSON TRIP ASSIGNMENTS

DRW Consultants, LLC
804-794-7312

Exhibit E8



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	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)	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			



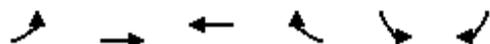
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Volume (veh/h)	84	182	230	76	117	199
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	91	198	250	83	127	216
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
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		

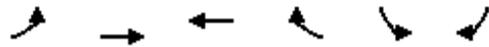
Intersection Summary			
Average Delay			7.1
Intersection Capacity Utilization	59.5%	ICU Level of Service	B
Analysis Period (min)			15



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			



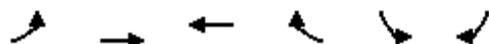
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	8	140	247	103	65	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	152	268	112	71	8
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent 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				Stop	
Grade	0%		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	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	204		261		541		562		252		555	
tC, single (s)	4.1		4.1		7.1		6.5		6.2		7.1	
tC, 2 stage (s)												
tF (s)	2.2		2.2		3.5		4.0		3.3		3.5	
p0 queue free %	100		96		98		100		95		68	
cM capacity (veh/h)	1367		1304		431		418		787		408	

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					

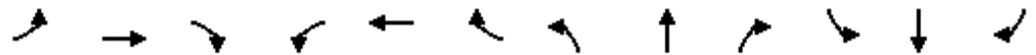
Intersection Summary		
Average Delay	4.7	
Intersection Capacity Utilization	39.4%	ICU Level of Service A
Analysis Period (min)	15	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control	Free		Free		Stop		Stop				Stop	
Grade	0%		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	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	484		209		735		874		199		793	
tC, single (s)	4.1		4.1		7.1		6.5		6.2		7.1	
tC, 2 stage (s)												
tF (s)	2.2		2.2		3.5		4.0		3.3		3.5	
p0 queue free %	99		94		94		100		91		64	
cM capacity (veh/h)	1079		1362		312		267		842		263	

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			

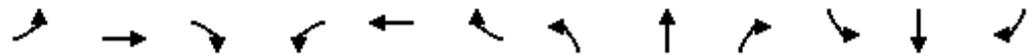
Intersection Summary		
Average Delay		4.4
Intersection Capacity Utilization	41.0%	ICU Level of Service
Analysis Period (min)		15
		A



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control	Free		Free		Stop		Stop				Stop	
Grade	0%		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	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	215		321		611		633		311		626	
tC, single (s)	4.1		4.1		7.1		6.5		6.2		7.1	
tC, 2 stage (s)												
tF (s)	2.2		2.2		3.5		4.0		3.3		3.5	
p0 queue free %	100		96		98		100		95		64	
cM capacity (veh/h)	1355		1239		386		380		729		364	

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
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				Stop	
Grade	0%		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	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	550		252		845		984		243		903	
tC, single (s)	4.1		4.1		7.1		6.5		6.2		7.1	
tC, 2 stage (s)												
tF (s)	2.2		2.2		3.5		4.0		3.3		3.5	
p0 queue free %	99		94		93		100		90		57	
cM capacity (veh/h)	1020		1313		262		230		796		220	

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	



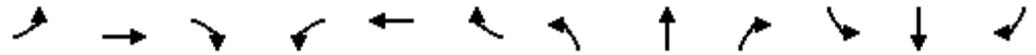
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↶	↶↷		↶	↶↷	↶		↷↶			↷↶		
Sign Control	Free		Free		Stop		Stop						
Grade	0%		0%		0%		0%						
Volume (veh/h)	23	366	1	1	161	21	1	0	3	19	0	46	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly 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										



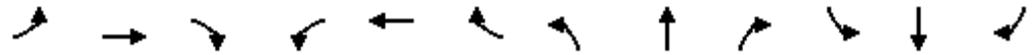
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↶	↶↷		↶	↶↷	↶		↷			↷	
Sign Control	Free		Free		Free		Stop		Stop		Stop	
Grade	0%		0%		0%		0%		0%		0%	
Volume (veh/h)	50	281	2	0	382	48	4	0	3	54	0	108
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
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	



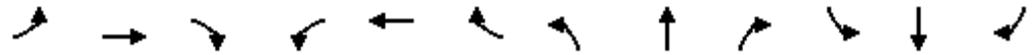
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↶	↶↷		↶	↶↷	↶		↷			↷	
Sign Control	Free		Free				Stop				Stop	
Grade	0%		0%				0%				0%	
Volume (veh/h)	36	452	1	1	187	21	1	0	3	19	0	53
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow 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									



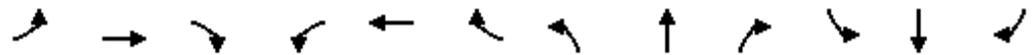
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↶	↶↷		↶	↶↷	↶		↷			↷	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	63	331	2	0	469	48	4	0	3	54	0	132
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow 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
Analysis Period (min)		15
		A



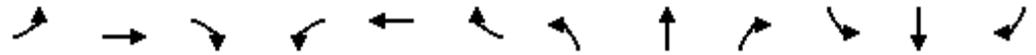
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↶	↶↷		↶	↶↷	↶		↷			↷	
Sign Control	Free		Free		Free		Stop		Stop		Stop	
Grade	0%		0%		0%		0%		0%		0%	
Volume (veh/h)	38	485	1	1	219	21	1	0	3	19	0	65
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
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		286	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	625		425				1040		1214		286	
tC, single (s)	4.1		4.1				7.5		6.5		6.9	
tC, 2 stage (s)												
tF (s)	2.2		2.2				3.5		4.0		3.3	
p0 queue free %	91		100				97		100		77	
cM capacity (veh/h)	952		1131				133		165		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
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										

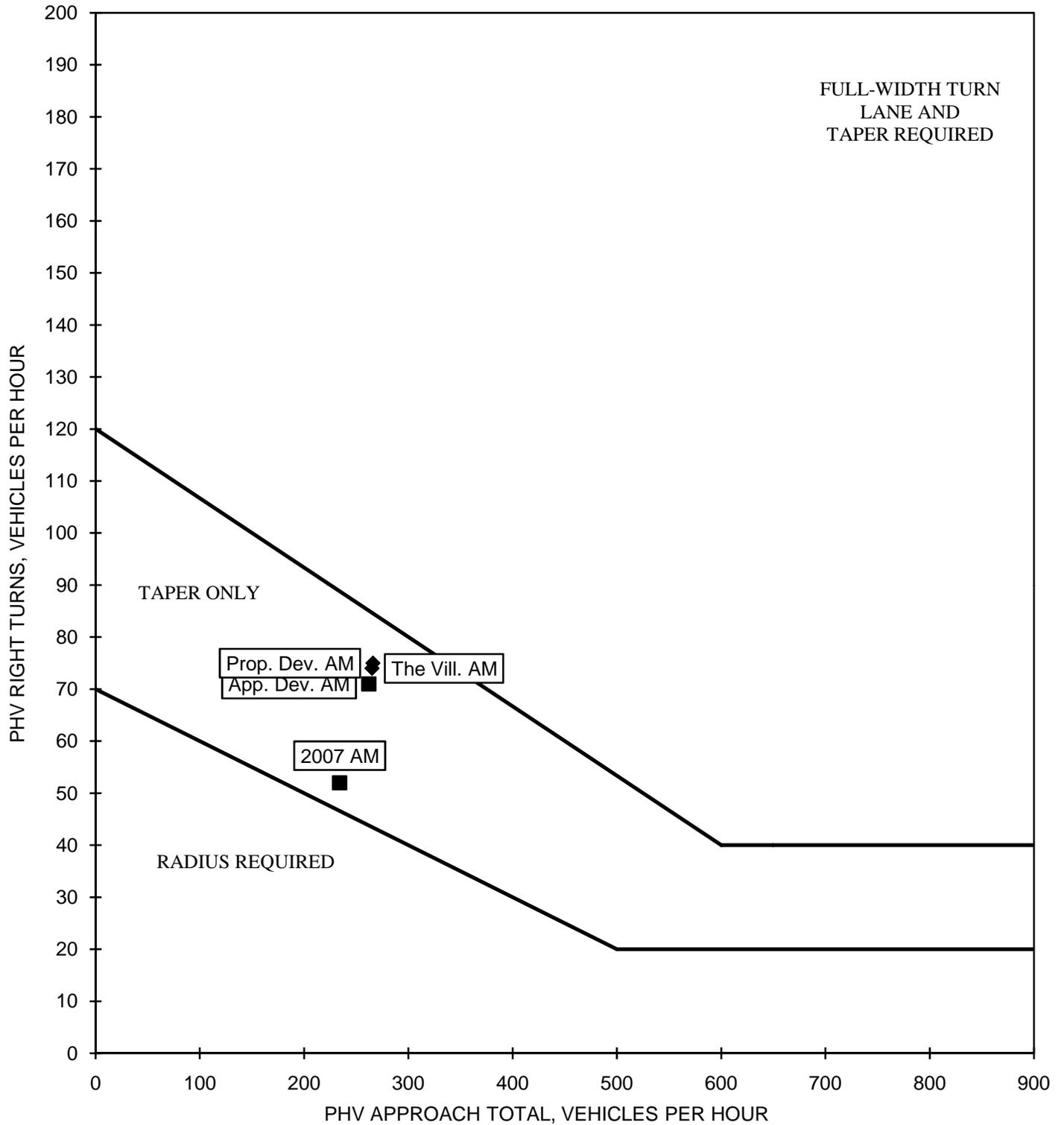


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗	↖		↕			↕	
Sign Control	Free		Free				Stop				Stop	
Grade	0%		0%				0%				0%	
Volume (veh/h)	87	418	2	0	571	54	4	0	3	56	0	168
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (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



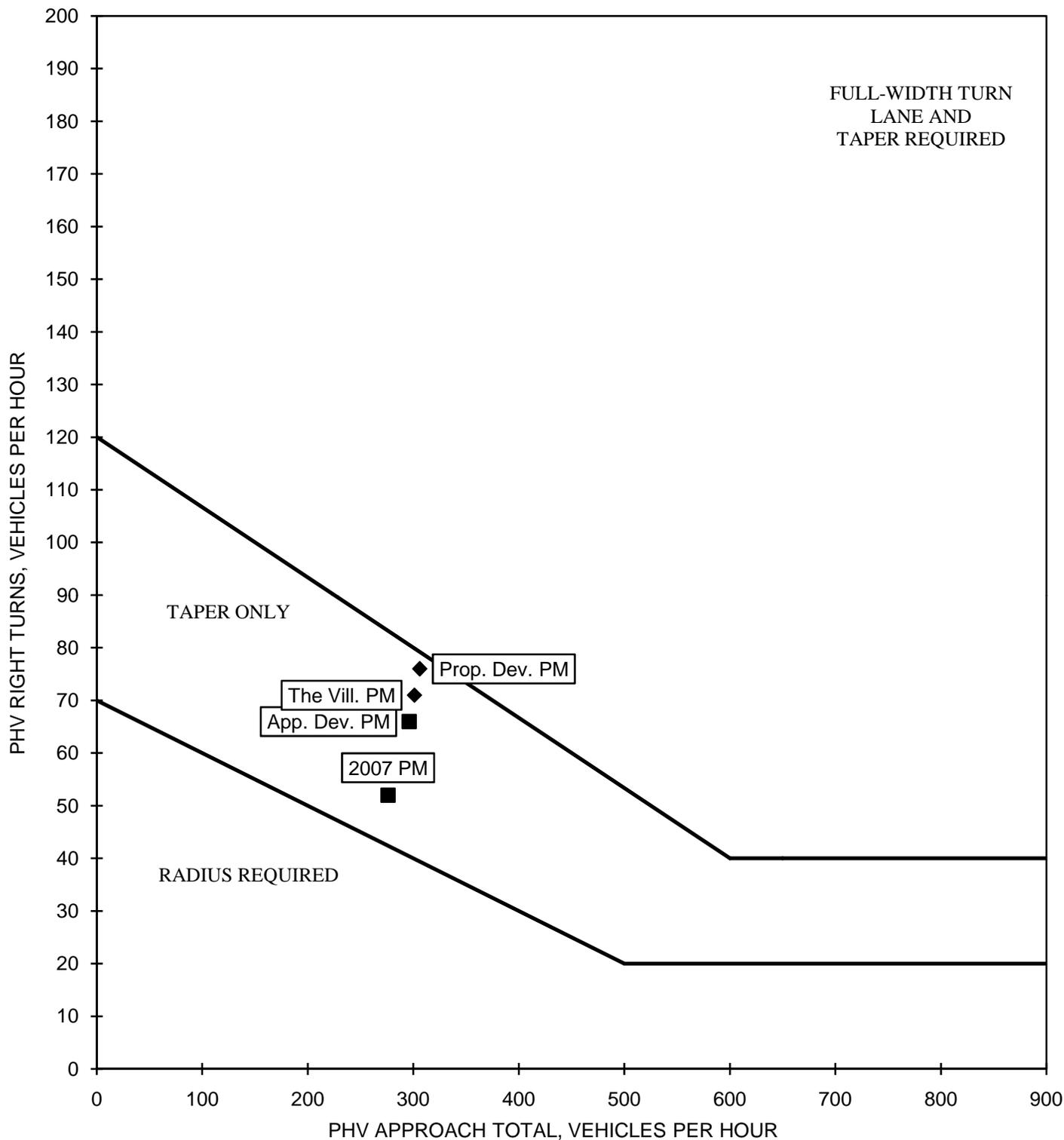
Source: VDOT Road Design Manual, Vol. 1, Page C-15, Figure C-1-8

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



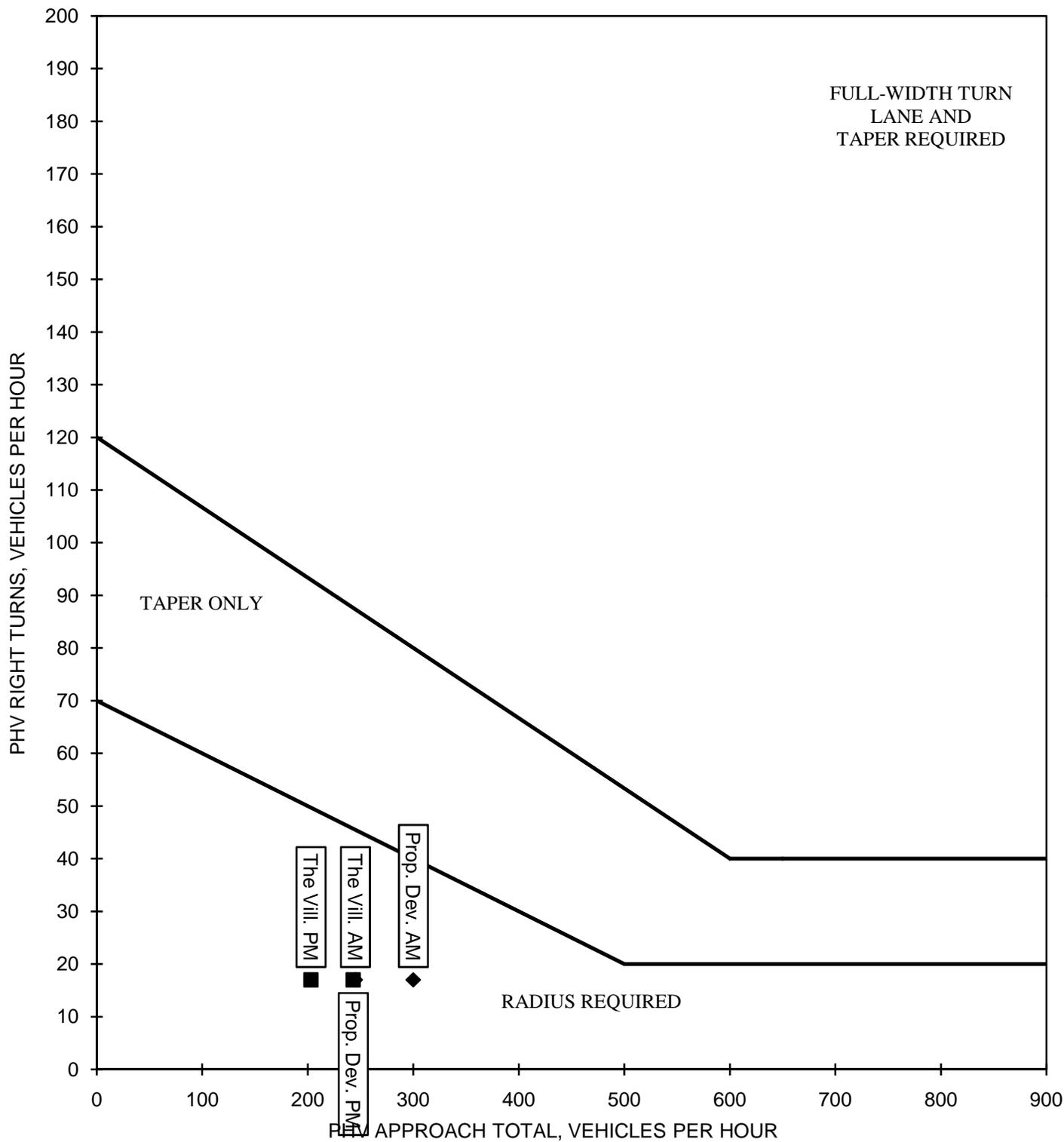
Source: VDOT Road Design Manual, Vol. 1, Page C-15, Figure C-1-8

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



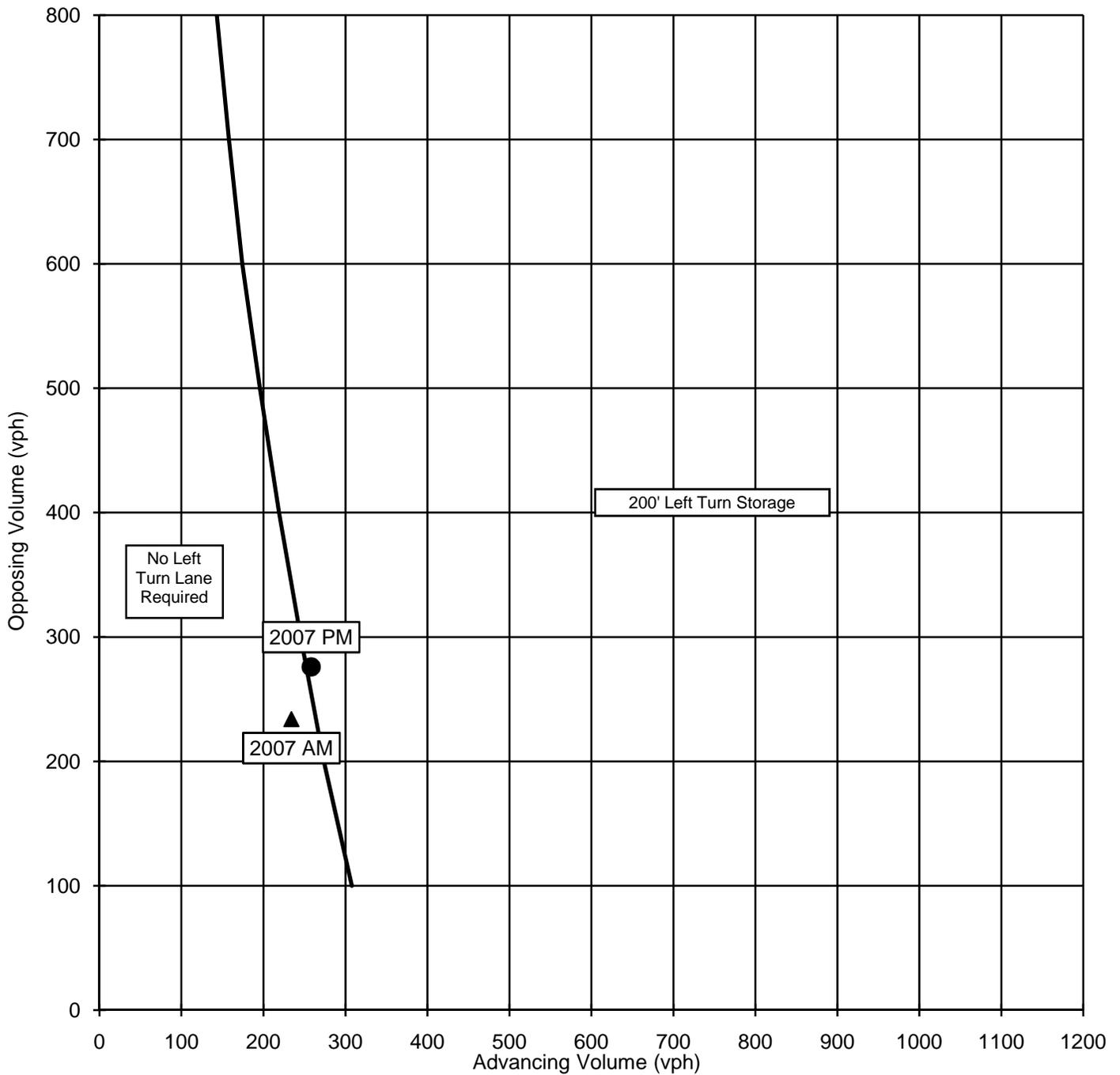
Source: VDOT Road Design Manual, Vol. 1, Page C-15, Figure C-1-8

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

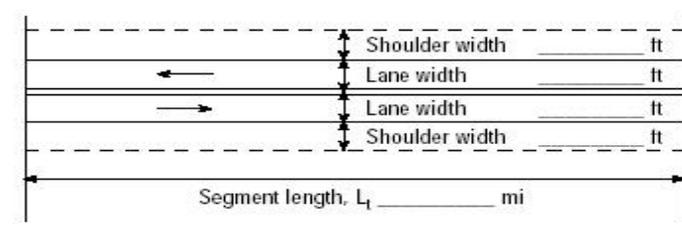
Exhibit K

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

 <p style="text-align: center;">Segment length, L_1 _____ mi</p>	<table style="width: 100%; border: none;"> <tr> <td style="width: 15%;"></td> <td style="width: 15%;"><input type="checkbox"/> Class I highway</td> <td style="width: 15%;"><input checked="" type="checkbox"/> Class II highway</td> <td style="width: 55%;"></td> </tr> <tr> <td>Terrain</td> <td><input type="checkbox"/> Level</td> <td><input checked="" type="checkbox"/> Rolling</td> <td></td> </tr> <tr> <td>Two-way hourly volume</td> <td colspan="3" style="text-align: right;">239 veh/h</td> </tr> <tr> <td>Directional split</td> <td colspan="3" style="text-align: right;">51 / 49</td> </tr> <tr> <td>Peak-hour factor, PHF</td> <td colspan="3" style="text-align: right;">0.92</td> </tr> <tr> <td>No-passing zone</td> <td colspan="3" style="text-align: right;">100</td> </tr> <tr> <td>% Trucks and Buses, P_T</td> <td colspan="3" style="text-align: right;">5%</td> </tr> <tr> <td>% Recreational vehicles, P_R</td> <td colspan="3" style="text-align: right;">0%</td> </tr> <tr> <td>Access points/ mi</td> <td colspan="3" style="text-align: right;">10</td> </tr> </table>		<input type="checkbox"/> Class I highway	<input checked="" type="checkbox"/> Class II highway		Terrain	<input type="checkbox"/> Level	<input checked="" type="checkbox"/> 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		
	<input type="checkbox"/> Class I highway	<input checked="" type="checkbox"/> Class II highway																																			
Terrain	<input type="checkbox"/> Level	<input checked="" type="checkbox"/> 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) $ATS=FFS-0.00776v_p \cdot f_{np}$	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, $f_{dnp}(\%)(Exh. 20-12)$	23.9
Percent time-spent-following, $PTSF(\%)=BPTSF+f_{dnp}$	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, $VMT_{15}(\text{veh} \cdot \text{mi})=0.25L_1(V/PHF)$	91
Peak-hour vehicle-miles of travel, $VMT_{60}(\text{veh} \cdot \text{mi})=V \cdot L_1$	335
Peak 15-min total travel time, $TT_{15}(\text{veh} \cdot \text{h})=VMT_{15}/ATS$	2.5

Notes

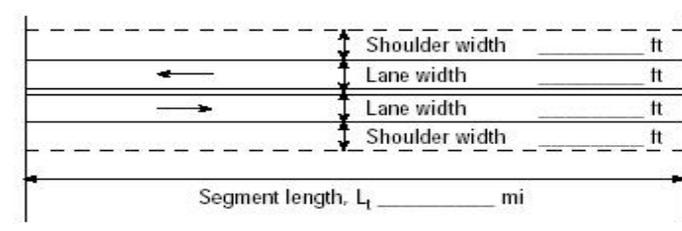
1. If $V_p \geq 3,200$ pc/h, terminate analysis-the LOS is F.
2. If highest directional split $V_p \geq 1,700$ pc/h, terminated analysis-the LOS is F.

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

 <p style="text-align: center;">Segment length, L_1 _____ mi</p>	<table style="width: 100%; border: none;"> <tr> <td style="width: 20px;"><input type="checkbox"/></td> <td>Class I highway</td> <td style="width: 20px;"><input checked="" type="checkbox"/></td> <td>Class II highway</td> </tr> <tr> <td colspan="2">Terrain <input type="checkbox"/> Level</td> <td colspan="2"><input checked="" type="checkbox"/> Rolling</td> </tr> <tr> <td colspan="2">Two-way hourly volume</td> <td colspan="2">298 veh/h</td> </tr> <tr> <td colspan="2">Directional split</td> <td colspan="2">59 / 41</td> </tr> <tr> <td colspan="2">Peak-hour factor, PHF</td> <td colspan="2">0.92</td> </tr> <tr> <td colspan="2">No-passing zone</td> <td colspan="2">100</td> </tr> <tr> <td colspan="2">% Trucks and Buses, P_T</td> <td colspan="2">5%</td> </tr> <tr> <td colspan="2">% Recreational vehicles, P_R</td> <td colspan="2">0%</td> </tr> <tr> <td colspan="2">Access points/ mi</td> <td colspan="2">10</td> </tr> </table>	<input type="checkbox"/>	Class I highway	<input checked="" type="checkbox"/>	Class II highway	Terrain <input type="checkbox"/> Level		<input checked="" type="checkbox"/> 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	
<input type="checkbox"/>	Class I highway	<input checked="" type="checkbox"/>	Class II highway																																		
Terrain <input type="checkbox"/> Level		<input checked="" type="checkbox"/> 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) $ATS=FFS-0.00776v_p \cdot f_{np}$	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, $f_{dnp}(\%)(Exh. 20-12)$	22.1
Percent time-spent-following, $PTSF(\%)=BPTSF+f_{dnp}$	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, $VMT_{15}(\text{veh} \cdot \text{mi})=0.25L_1(V/PHF)$	113
Peak-hour vehicle-miles of travel, $VMT_{60}(\text{veh} \cdot \text{mi})=V \cdot L_1$	417
Peak 15-min total travel time, $TT_{15}(\text{veh} \cdot \text{h})=VMT_{15}/ATS$	3.1

Notes

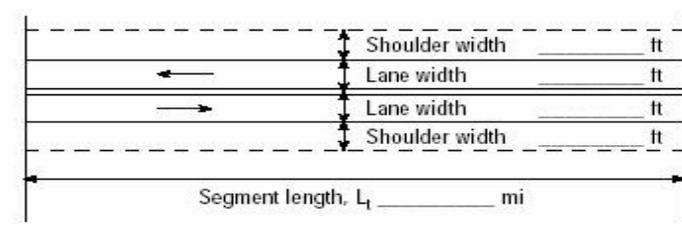
1. If $V_p \geq 3,200$ pc/h, terminate analysis-the LOS is F.
2. If highest directional split $V_p \geq 1,700$ pc/h, terminated analysis-the LOS is F.

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

 <p style="text-align: center;">Segment length, L_1 _____ mi</p>	<table style="width: 100%; border: none;"> <tr> <td style="width: 15%;"><input type="checkbox"/> Class I highway</td> <td style="width: 15%;"><input checked="" type="checkbox"/> Class II highway</td> </tr> <tr> <td>Terrain <input type="checkbox"/> Level</td> <td><input checked="" type="checkbox"/> Rolling</td> </tr> <tr> <td>Two-way hourly volume</td> <td style="text-align: right;">318 veh/h</td> </tr> <tr> <td>Directional split</td> <td style="text-align: right;">53 / 47</td> </tr> <tr> <td>Peak-hour factor, PHF</td> <td style="text-align: right;">0.92</td> </tr> <tr> <td>No-passing zone</td> <td style="text-align: right;">100</td> </tr> <tr> <td>% Trucks and Buses, P_T</td> <td style="text-align: right;">5%</td> </tr> <tr> <td>% Recreational vehicles, P_R</td> <td style="text-align: right;">0%</td> </tr> <tr> <td>Access points/ mi</td> <td style="text-align: right;">10</td> </tr> </table>	<input type="checkbox"/> Class I highway	<input checked="" type="checkbox"/> Class II highway	Terrain <input type="checkbox"/> Level	<input checked="" type="checkbox"/> 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
<input type="checkbox"/> Class I highway	<input checked="" type="checkbox"/> Class II highway																		
Terrain <input type="checkbox"/> Level	<input checked="" type="checkbox"/> 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) $ATS=FFS-0.00776v_p \cdot f_{np}$	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, $f_{dnp}(\%)(Exh. 20-12)$	22.9
Percent time-spent-following, $PTSF(\%)=BPTSF+f_{dnp}$	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, $VMT_{15}(\text{veh} \cdot \text{mi})=0.25L_1(V/PHF)$	121
Peak-hour vehicle-miles of travel, $VMT_{60}(\text{veh} \cdot \text{mi})=V \cdot L_1$	445
Peak 15-min total travel time, $TT_{15}(\text{veh} \cdot \text{h})=VMT_{15}/ATS$	3.3

Notes

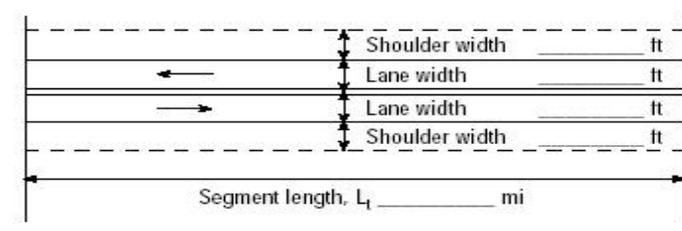
1. If $V_p \geq 3,200$ pc/h, terminate analysis-the LOS is F.
2. If highest directional split $V_p \geq 1,700$ pc/h, terminated analysis-the LOS is F.

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

 <p style="text-align: center;">Segment length, L_1 _____ mi</p>	<table style="width: 100%;"> <tr> <td><input type="checkbox"/> Class I highway</td> <td><input checked="" type="checkbox"/> Class II highway</td> </tr> <tr> <td>Terrain <input type="checkbox"/> Level</td> <td><input checked="" type="checkbox"/> Rolling</td> </tr> <tr> <td>Two-way hourly volume</td> <td>399 veh/h</td> </tr> <tr> <td>Directional split</td> <td>60 / 40</td> </tr> <tr> <td>Peak-hour factor, PHF</td> <td>0.92</td> </tr> <tr> <td>No-passing zone</td> <td>100</td> </tr> <tr> <td>% Trucks and Buses, P_T</td> <td>5%</td> </tr> <tr> <td>% Recreational vehicles, P_R</td> <td>0%</td> </tr> <tr> <td>Access points/ mi</td> <td>10</td> </tr> </table>	<input type="checkbox"/> Class I highway	<input checked="" type="checkbox"/> Class II highway	Terrain <input type="checkbox"/> Level	<input checked="" type="checkbox"/> 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
<input type="checkbox"/> Class I highway	<input checked="" type="checkbox"/> Class II highway																		
Terrain <input type="checkbox"/> Level	<input checked="" type="checkbox"/> 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, $FFS = S_{FM} + 0.00776(V_f / f_{HV})$ _____ mi/h	Adj. for access points, f_A (Exhibit 20-6) _____ 2.5 mi/h
	Free-flow speed, $FSS = BFFS - f_{LS} - f_A$ _____ 44.5 mi/h
Adj. for no-passing zones, f_{np} (mi/h) (Exhibit 20-11)	4.2
Average travel speed, ATS (mi/h) $ATS = FFS - 0.00776 v_p f_{np}$	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, $f_{dnp}(\%)$ (Exh. 20-12)	20.8
Percent time-spent-following, $PTSF(\%) = BPTSF + f_{dnp}$	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, $VMT_{15}(\text{veh} \cdot \text{mi}) = 0.25L_1(V/PHF)$	152
Peak-hour vehicle-miles of travel, $VMT_{60}(\text{veh} \cdot \text{mi}) = V * L_1$	559
Peak 15-min total travel time, $TT_{15}(\text{veh} \cdot \text{h}) = VMT_{15}/ATS$	4.2

Notes

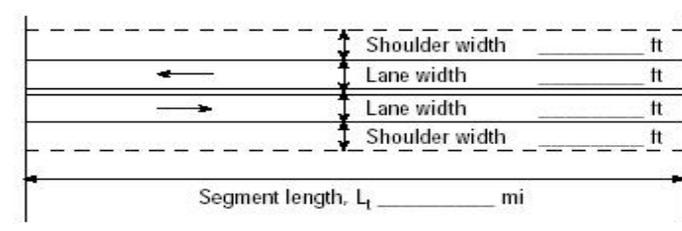
1. If $V_p \geq 3,200$ pc/h, terminate analysis-the LOS is F.
2. If highest directional split $V_p \geq 1,700$ pc/h, terminated analysis-the LOS is F.

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

 <p style="text-align: center;">Segment length, L_1 _____ mi</p>	<table style="width: 100%;"> <tr> <td><input type="checkbox"/> Class I highway</td> <td><input checked="" type="checkbox"/> Class II highway</td> </tr> <tr> <td>Terrain <input type="checkbox"/> Level</td> <td><input checked="" type="checkbox"/> Rolling</td> </tr> <tr> <td>Two-way hourly volume</td> <td>342 veh/h</td> </tr> <tr> <td>Directional split</td> <td>55 / 45</td> </tr> <tr> <td>Peak-hour factor, PHF</td> <td>0.92</td> </tr> <tr> <td>No-passing zone</td> <td>100</td> </tr> <tr> <td>% Trucks and Buses, P_T</td> <td>5%</td> </tr> <tr> <td>% Recreational vehicles, P_R</td> <td>0%</td> </tr> <tr> <td>Access points/ mi</td> <td>10</td> </tr> </table>	<input type="checkbox"/> Class I highway	<input checked="" type="checkbox"/> Class II highway	Terrain <input type="checkbox"/> Level	<input checked="" type="checkbox"/> 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
<input type="checkbox"/> Class I highway	<input checked="" type="checkbox"/> Class II highway																		
Terrain <input type="checkbox"/> Level	<input checked="" type="checkbox"/> 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) $ATS=FFS-0.00776v_p \cdot f_{np}$	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, $f_{dnp}(\%)(Exh. 20-12)$	22.0
Percent time-spent-following, $PTSF(\%)=BPTSF+f_{dnp}$	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)= $0.25L_1(V/PHF)$	130
Peak-hour vehicle-miles of travel, VMT_{60} (veh- mi)= $V \cdot L_1$	479
Peak 15-min total travel time, TT_{15} (veh-h)= VMT_{15}/ATS	3.6

Notes

1. If $V_p \geq 3,200$ pc/h, terminate analysis-the LOS is F.
2. If highest directional split $V_p \geq 1,700$ pc/h, terminated analysis-the LOS is F.

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

<input type="checkbox"/> Class I highway	<input checked="" type="checkbox"/> Class II highway
Terrain <input type="checkbox"/> Level	<input checked="" type="checkbox"/> 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) $ATS=FFS-0.00776v_p \cdot f_{np}$	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, $f_{dhp}(\%)(Exh. 20-12)$	21.5
Percent time-spent-following, $PTSF(\%)=BPTSF+f_{dhp}$	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, $VMT_{15}(\text{veh} \cdot \text{mi})=0.25L_1(V/PHF)$	164
Peak-hour vehicle-miles of travel, $VMT_{60}(\text{veh} \cdot \text{mi})=V \cdot L_1$	605
Peak 15-min total travel time, $TT_{15}(\text{veh} \cdot \text{h})=VMT_{15}/ATS$	4.5

Notes

1. If $V_p \geq 3,200$ pc/h, terminate analysis-the LOS is F.
2. If highest directional split $V_p \geq 1,700$ pc/h, terminated analysis-the LOS is F.

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

<input type="checkbox"/> Class I highway	<input checked="" type="checkbox"/> Class II highway
Terrain <input type="checkbox"/> Level	<input checked="" type="checkbox"/> 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) $ATS=FFS-0.00776v_p \cdot f_{np}$	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, $f_{dnp}(\%)(Exh. 20-12)$	21.7
Percent time-spent-following, $PTSF(\%)=BPTSF+f_{dnp}$	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, $VMT_{15}(\text{veh} \cdot \text{mi})=0.25L_1(V/PHF)$	138
Peak-hour vehicle-miles of travel, $VMT_{60}(\text{veh} \cdot \text{mi})=V \cdot L_1$	508
Peak 15-min total travel time, $TT_{15}(\text{veh} \cdot \text{h})=VMT_{15}/ATS$	3.8

Notes

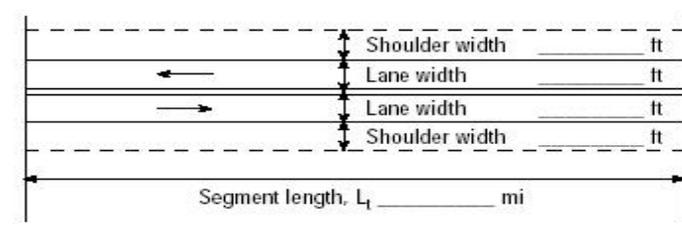
1. If $V_p \geq 3,200$ pc/h, terminate analysis-the LOS is F.
2. If highest directional split $V_p \geq 1,700$ pc/h, terminated analysis-the LOS is F.

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

 <p style="text-align: center;">Segment length, L_1 _____ mi</p>	<table style="width: 100%; border: none;"> <tr> <td style="width: 20px;"><input type="checkbox"/></td> <td>Class I highway</td> <td style="width: 20px;"><input checked="" type="checkbox"/></td> <td>Class II highway</td> </tr> <tr> <td colspan="2">Terrain <input type="checkbox"/> Level</td> <td colspan="2"><input checked="" type="checkbox"/> Rolling</td> </tr> <tr> <td colspan="2">Two-way hourly volume</td> <td colspan="2">459 veh/h</td> </tr> <tr> <td colspan="2">Directional split</td> <td colspan="2">58 / 42</td> </tr> <tr> <td colspan="2">Peak-hour factor, PHF</td> <td colspan="2">0.92</td> </tr> <tr> <td colspan="2">No-passing zone</td> <td colspan="2">100</td> </tr> <tr> <td colspan="2">% Trucks and Buses, P_T</td> <td colspan="2">5%</td> </tr> <tr> <td colspan="2">% Recreational vehicles, P_R</td> <td colspan="2">0%</td> </tr> <tr> <td colspan="2">Access points/ mi</td> <td colspan="2">10</td> </tr> </table>	<input type="checkbox"/>	Class I highway	<input checked="" type="checkbox"/>	Class II highway	Terrain <input type="checkbox"/> Level		<input checked="" type="checkbox"/> 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	
<input type="checkbox"/>	Class I highway	<input checked="" type="checkbox"/>	Class II highway																																		
Terrain <input type="checkbox"/> Level		<input checked="" type="checkbox"/> Rolling																																			
Two-way hourly volume		459 veh/h																																			
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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) $ATS=FFS-0.00776v_p \cdot f_{np}$	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, $f_{dnp}(\%)(Exh. 20-12)$	21.2
Percent time-spent-following, $PTSF(\%)=BPTSF+f_{dnp}$	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, $VMT_{15}(\text{veh} \cdot \text{mi})=0.25L_t(V/PHF)$	175
Peak-hour vehicle-miles of travel, $VMT_{60}(\text{veh} \cdot \text{mi})=V \cdot L_t$	643
Peak 15-min total travel time, $TT_{15}(\text{veh} \cdot \text{h})=VMT_{15}/ATS$	4.8

Notes

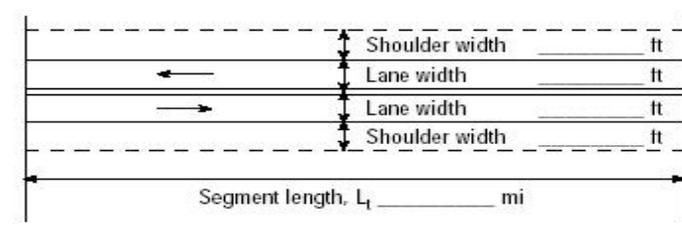
1. If $V_p \geq 3,200$ pc/h, terminate analysis-the LOS is F.
2. If highest directional split $V_p \geq 1,700$ pc/h, terminated analysis-the LOS is F.

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

 <p style="text-align: center;">Segment length, L_1 _____ mi</p>	<table style="width: 100%;"> <tr> <td><input type="checkbox"/> Class I highway</td> <td><input checked="" type="checkbox"/> Class II highway</td> </tr> <tr> <td>Terrain <input type="checkbox"/> Level</td> <td><input checked="" type="checkbox"/> Rolling</td> </tr> <tr> <td>Two-way hourly volume</td> <td>598 veh/h</td> </tr> <tr> <td>Directional split</td> <td>65 / 35</td> </tr> <tr> <td>Peak-hour factor, PHF</td> <td>0.92</td> </tr> <tr> <td>No-passing zone</td> <td>100</td> </tr> <tr> <td>% Trucks and Buses, P_T</td> <td>5%</td> </tr> <tr> <td>% Recreational vehicles, P_R</td> <td>0%</td> </tr> <tr> <td>Access points/ mi</td> <td>1</td> </tr> </table>	<input type="checkbox"/> Class I highway	<input checked="" type="checkbox"/> Class II highway	Terrain <input type="checkbox"/> Level	<input checked="" type="checkbox"/> 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
<input type="checkbox"/> Class I highway	<input checked="" type="checkbox"/> Class II highway																		
Terrain <input type="checkbox"/> Level	<input checked="" type="checkbox"/> 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) $ATS=FFS-0.00776v_p \cdot f_{np}$	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, $f_{dnp}(\%)(Exh. 20-12)$	17.4
Percent time-spent-following, $PTSF(\%)=BPTSF+f_{dnp}$	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)= $0.25L_1(V/PHF)$	98
Peak-hour vehicle-miles of travel, VMT_{60} (veh- mi)= $V \cdot L_1$	359
Peak 15-min total travel time, TT_{15} (veh-h)= VMT_{15}/ATS	2.6

Notes

1. If $V_p \geq 3,200$ pc/h, terminate analysis-the LOS is F.
2. If highest directional split $V_p \geq 1,700$ pc/h, terminated analysis-the LOS is F.

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

<input type="checkbox"/> Class I highway	<input checked="" type="checkbox"/> Class II highway
Terrain <input type="checkbox"/> Level	<input checked="" type="checkbox"/> 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) $ATS=FFS-0.00776v_p \cdot f_{np}$	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, $f_{dnp}(\%)(Exh. 20-12)$	12.5
Percent time-spent-following, $PTSF(\%)=BPTSF+f_{dnp}$	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, $VMT_{15}(\text{veh} \cdot \text{mi})=0.25L_t(V/PHF)$	135
Peak-hour vehicle-miles of travel, $VMT_{60}(\text{veh} \cdot \text{mi})=V \cdot L_t$	496
Peak 15-min total travel time, $TT_{15}(\text{veh} \cdot \text{h})=VMT_{15}/ATS$	3.9

Notes

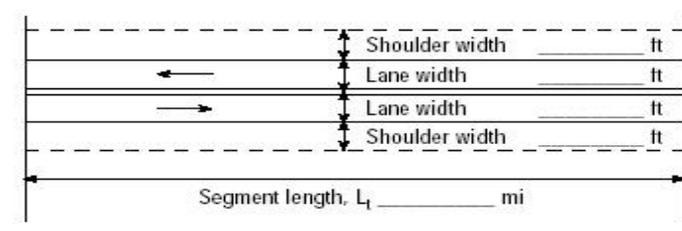
1. If $V_p \geq 3,200$ pc/h, terminate analysis-the LOS is F.
2. If highest directional split $V_p \geq 1,700$ pc/h, terminated analysis-the LOS is F.

TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information	Site Information
Analyst <i>DRW</i>	Highway <i>News Road</i>
Agency or Company <i>DRW Consultants, LLC</i>	From/To <i>Old News Road/Powhatan Seconda</i>
Date Performed <i>3/12/2008</i>	Jurisdiction <i>JCC</i>
Analysis Time Period <i>Approved Development AM</i>	Analysis Year <i>Exhibit O3</i>

Project Description: *News Road Corridor Study - Exhibit O3*

Input Data

 <p style="text-align: center;">Segment length, L_1 _____ mi</p>	<table style="width: 100%; border: none;"> <tr> <td style="width: 20px;"><input type="checkbox"/></td> <td>Class I highway</td> <td style="width: 20px;"><input checked="" type="checkbox"/></td> <td>Class II highway</td> </tr> <tr> <td colspan="2">Terrain <input type="checkbox"/> Level</td> <td colspan="2"><input checked="" type="checkbox"/> Rolling</td> </tr> <tr> <td colspan="2">Two-way hourly volume</td> <td colspan="2">730 veh/h</td> </tr> <tr> <td colspan="2">Directional split</td> <td colspan="2">67 / 33</td> </tr> <tr> <td colspan="2">Peak-hour factor, PHF</td> <td colspan="2">0.92</td> </tr> <tr> <td colspan="2">No-passing zone</td> <td colspan="2">100</td> </tr> <tr> <td colspan="2">% Trucks and Buses, P_T</td> <td colspan="2">5%</td> </tr> <tr> <td colspan="2">% Recreational vehicles, P_R</td> <td colspan="2">0%</td> </tr> <tr> <td colspan="2">Access points/ mi</td> <td colspan="2">1</td> </tr> </table>	<input type="checkbox"/>	Class I highway	<input checked="" type="checkbox"/>	Class II highway	Terrain <input type="checkbox"/> Level		<input checked="" type="checkbox"/> 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	
<input type="checkbox"/>	Class I highway	<input checked="" type="checkbox"/>	Class II highway																																		
Terrain <input type="checkbox"/> Level		<input checked="" type="checkbox"/> 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) $ATS=FFS-0.00776v_p \cdot f_{np}$	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, $f_{dnp}(\%)(Exh. 20-12)$	13.9
Percent time-spent-following, $PTSF(\%)=BPTSF+f_{dnp}$	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)= $0.25L_1(V/PHF)$	119
Peak-hour vehicle-miles of travel, VMT_{60} (veh- mi)= $V \cdot L_1$	438
Peak 15-min total travel time, TT_{15} (veh-h)= VMT_{15}/ATS	3.2

Notes

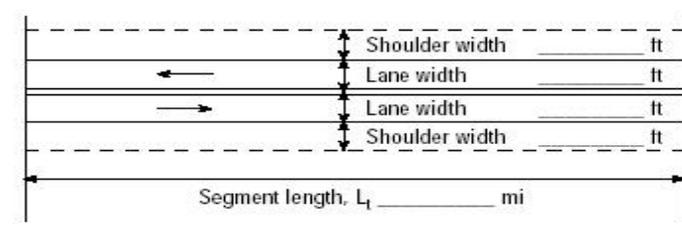
1. If $V_p \geq 3,200$ pc/h, terminate analysis-the LOS is F.
2. If highest directional split $V_p \geq 1,700$ pc/h, terminated analysis-the LOS is F.

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

 <p style="text-align: center;">Segment length, L_1 _____ mi</p>	<table style="width: 100%;"> <tr> <td><input type="checkbox"/> Class I highway</td> <td><input checked="" type="checkbox"/> Class II highway</td> </tr> <tr> <td>Terrain <input type="checkbox"/> Level</td> <td><input checked="" type="checkbox"/> Rolling</td> </tr> <tr> <td>Two-way hourly volume</td> <td>1001 veh/h</td> </tr> <tr> <td>Directional split</td> <td>60 / 40</td> </tr> <tr> <td>Peak-hour factor, PHF</td> <td>0.92</td> </tr> <tr> <td>No-passing zone</td> <td>100</td> </tr> <tr> <td>% Trucks and Buses, P_T</td> <td>5%</td> </tr> <tr> <td>% Recreational vehicles, P_R</td> <td>0%</td> </tr> <tr> <td>Access points/ mi</td> <td>1</td> </tr> </table>	<input type="checkbox"/> Class I highway	<input checked="" type="checkbox"/> Class II highway	Terrain <input type="checkbox"/> Level	<input checked="" type="checkbox"/> 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
<input type="checkbox"/> Class I highway	<input checked="" type="checkbox"/> Class II highway																		
Terrain <input type="checkbox"/> Level	<input checked="" type="checkbox"/> 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) $ATS=FFS-0.00776v_p \cdot f_{np}$	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, $f_{dnp}(\%)(Exh. 20-12)$	10.3
Percent time-spent-following, $PTSF(\%)=BPTSF+f_{dnp}$	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)= $0.25L_1(V/PHF)$	163
Peak-hour vehicle-miles of travel, VMT_{60} (veh- mi)= $V \cdot L_1$	601
Peak 15-min total travel time, TT_{15} (veh-h)= VMT_{15}/ATS	4.6

Notes

1. If $V_p \geq 3,200$ pc/h, terminate analysis-the LOS is F.
2. If highest directional split $V_p \geq 1,700$ pc/h, terminated analysis-the LOS is F.

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

<input type="checkbox"/> Class I highway	<input checked="" type="checkbox"/> Class II highway
Terrain <input type="checkbox"/> Level	<input checked="" type="checkbox"/> 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, FSS ($FSS=BFFS-f_{LS}-f_A$) 46.8 mi/h
Adj. for no-passing zones, f_{np} (mi/h) (Exhibit 20-11)	2.6
Average travel speed, ATS (mi/h) $ATS=FSS-0.00776v_p \cdot f_{np}$	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, $f_{dhp}(\%)(Exh. 20-12)$	12.8
Percent time-spent-following, $PTSF(\%)=BPTSF+f_{dhp}$	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, $VMT_{15}(\text{veh} \cdot \text{mi})=0.25L_1(V/PHF)$	132
Peak-hour vehicle-miles of travel, $VMT_{60}(\text{veh} \cdot \text{mi})=V \cdot L_1$	485
Peak 15-min total travel time, $TT_{15}(\text{veh} \cdot \text{h})=VMT_{15}/ATS$	3.6

Notes

1. If $V_p \geq 3,200$ pc/h, terminate analysis-the LOS is F.
2. If highest directional split $V_p \geq 1,700$ pc/h, terminated analysis-the LOS is F.

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

<input type="checkbox"/> Class I highway	<input checked="" type="checkbox"/> Class II highway
Terrain <input type="checkbox"/> Level	<input checked="" type="checkbox"/> 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) $ATS=FFS-0.00776v_p \cdot f_{np}$	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, $f_{dnp}(\%)(Exh. 20-12)$	9.7
Percent time-spent-following, $PTSF(\%)=BPTSF+f_{dnp}$	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)= $0.25L_1(V/PHF)$	187
Peak-hour vehicle-miles of travel, VMT_{60} (veh- mi)= $V \cdot L_1$	689
Peak 15-min total travel time, TT_{15} (veh-h)= VMT_{15}/ATS	5.4

Notes

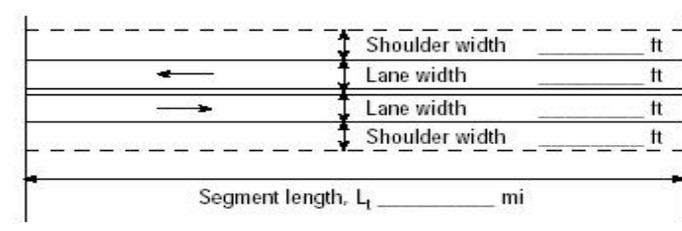
1. If $V_p \geq 3,200$ pc/h, terminate analysis-the LOS is F.
2. If highest directional split $V_p \geq 1,700$ pc/h, terminated analysis-the LOS is F.

TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information	Site Information
Analyst <i>DRW</i>	Highway <i>News Road</i>
Agency or Company <i>DRW Consultants, LLC</i>	From/To <i>Old News Road/Powhatan Seconda</i>
Date Performed <i>3/12/2008</i>	Jurisdiction <i>JCC</i>
Analysis Time Period <i>Proposed Development AM</i>	Analysis Year <i>Exhibit 07</i>

Project Description: *News Road Corridor Study - Exhibit 07*

Input Data

 <p style="text-align: center;">Segment length, L_1 _____ mi</p>	<table style="width: 100%; border: none;"> <tr> <td style="width: 20px;"><input type="checkbox"/></td> <td>Class I highway</td> <td style="width: 20px;"><input checked="" type="checkbox"/></td> <td>Class II highway</td> </tr> <tr> <td colspan="4">Terrain <input type="checkbox"/> Level <input checked="" type="checkbox"/> Rolling</td> </tr> <tr> <td colspan="2">Two-way hourly volume</td> <td colspan="2">885 veh/h</td> </tr> <tr> <td colspan="2">Directional split</td> <td colspan="2">65 / 35</td> </tr> <tr> <td colspan="2">Peak-hour factor, PHF</td> <td colspan="2">0.92</td> </tr> <tr> <td colspan="2">No-passing zone</td> <td colspan="2">100</td> </tr> <tr> <td colspan="2">% Trucks and Buses, P_T</td> <td colspan="2">5%</td> </tr> <tr> <td colspan="2">% Recreational vehicles, P_R</td> <td colspan="2">0%</td> </tr> <tr> <td colspan="2">Access points/ mi</td> <td colspan="2">1</td> </tr> </table>	<input type="checkbox"/>	Class I highway	<input checked="" type="checkbox"/>	Class II highway	Terrain <input type="checkbox"/> Level <input checked="" type="checkbox"/> 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	
<input type="checkbox"/>	Class I highway	<input checked="" type="checkbox"/>	Class II highway																																		
Terrain <input type="checkbox"/> Level <input checked="" type="checkbox"/> Rolling																																					
Two-way hourly volume		885 veh/h																																			
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% 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) $ATS=FFS-0.00776v_p \cdot f_{np}$	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, $f_{dnp}(\%)(Exh. 20-12)$	11.9
Percent time-spent-following, $PTSF(\%)=BPTSF+f_{dnp}$	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, $VMT_{15}(\text{veh} \cdot \text{mi})=0.25L_1(V/PHF)$	144
Peak-hour vehicle-miles of travel, $VMT_{60}(\text{veh} \cdot \text{mi})=V \cdot L_1$	531
Peak 15-min total travel time, $TT_{15}(\text{veh} \cdot \text{h})=VMT_{15}/ATS$	4.0

Notes

1. If $V_p \geq 3,200$ pc/h, terminate analysis-the LOS is F.
2. If highest directional split $V_p \geq 1,700$ pc/h, terminated analysis-the LOS is F.

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

<input type="checkbox"/> Class I highway	<input checked="" type="checkbox"/> Class II highway
Terrain <input type="checkbox"/> Level	<input checked="" type="checkbox"/> 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) $ATS=FFS-0.00776v_p \cdot f_{np}$	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, $f_{dnp}(\%)(Exh. 20-12)$	8.5
Percent time-spent-following, $PTSF(\%)=BPTSF+f_{dnp}$	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)= $0.25L_1(V/PHF)$	204
Peak-hour vehicle-miles of travel, VMT_{60} (veh- mi)= $V \cdot L_1$	750
Peak 15-min total travel time, TT_{15} (veh-h)= VMT_{15}/ATS	6.0

Notes

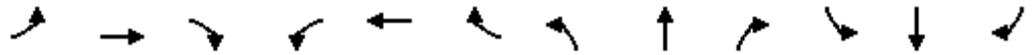
1. If $V_p \geq 3,200$ pc/h, terminate analysis-the LOS is F.
2. If highest directional split $V_p \geq 1,700$ pc/h, terminated analysis-the LOS is F.



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	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

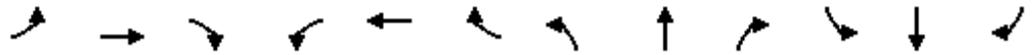
HCM Average Control Delay	34.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	104.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	52.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



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	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	
Protected Phases	5	2		1	6		4	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	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	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	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	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	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	

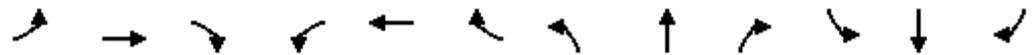
Intersection Summary

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	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	
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	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

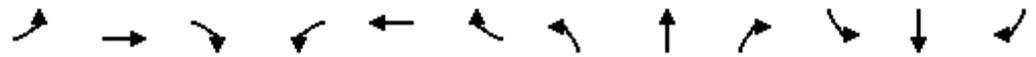
HCM Average Control Delay	34.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	104.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	71.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



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	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

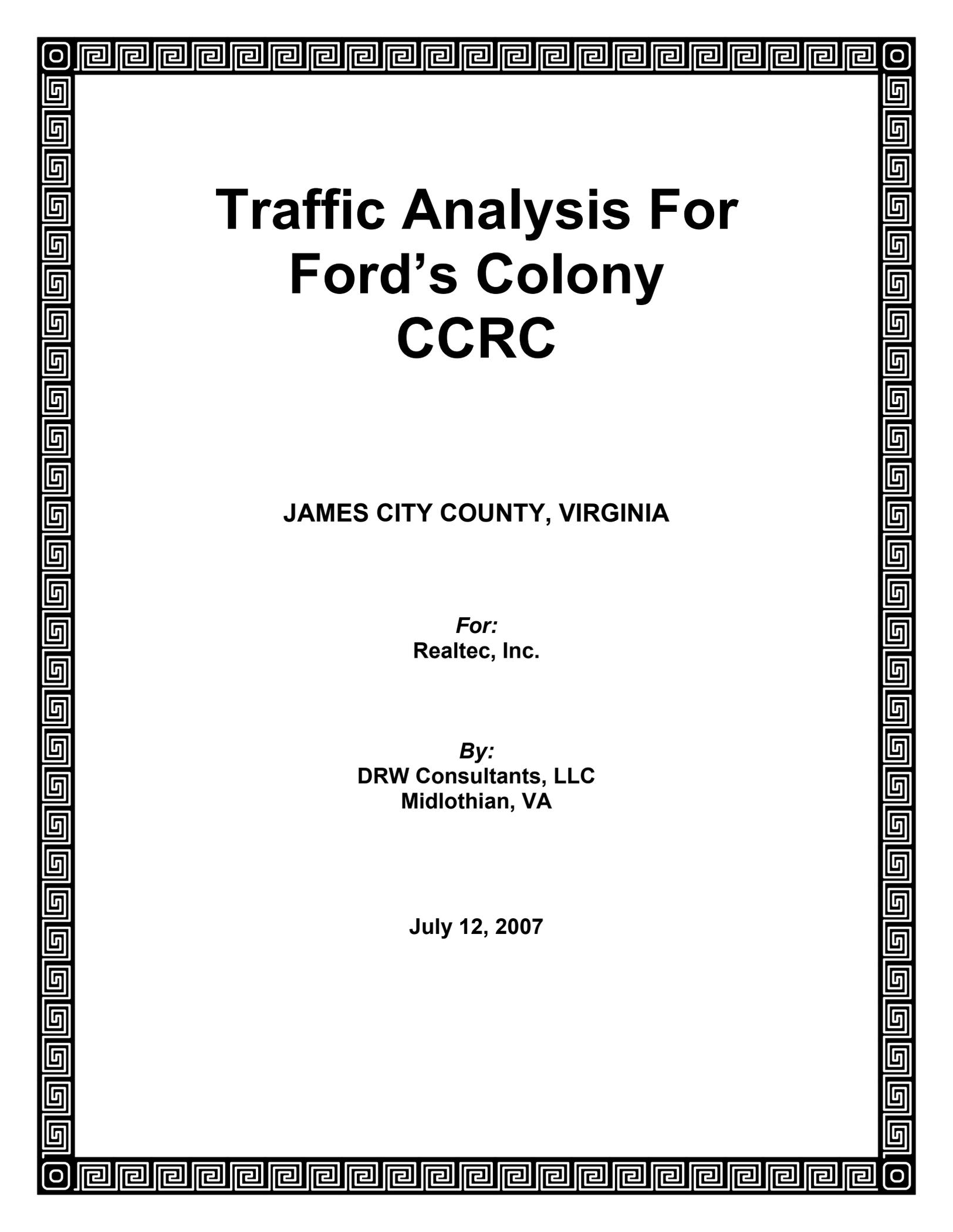
HCM Average Control Delay	36.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	104.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	55.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



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	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

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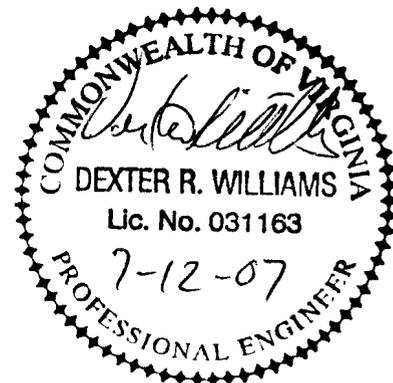
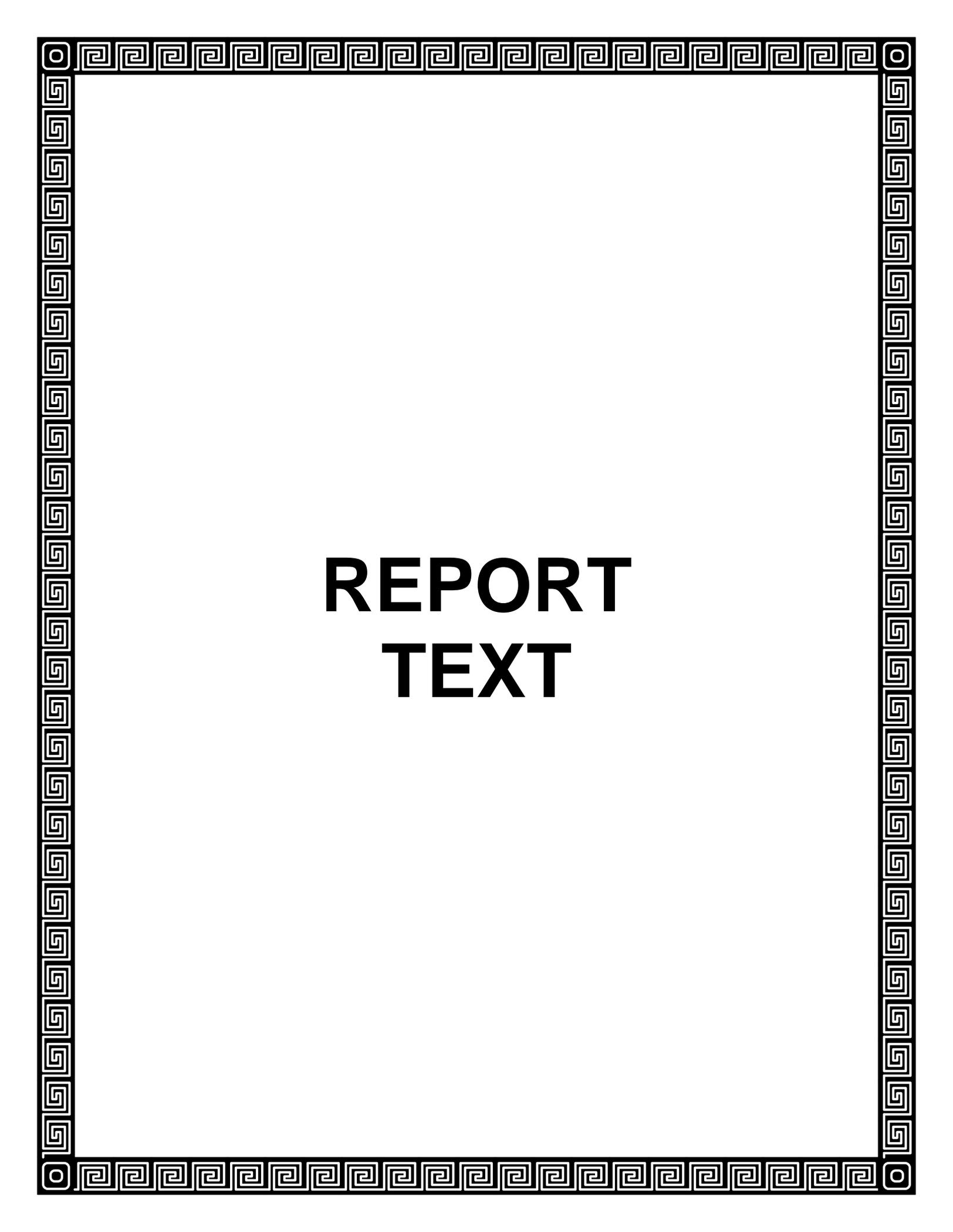


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2012 Total Traffic Forecast	3
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Ford's Colony CCRC Trip Generation And Distribution	4
Existing Peak Hour Counts And 2012 Forecast.....	5
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**REPORT
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 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

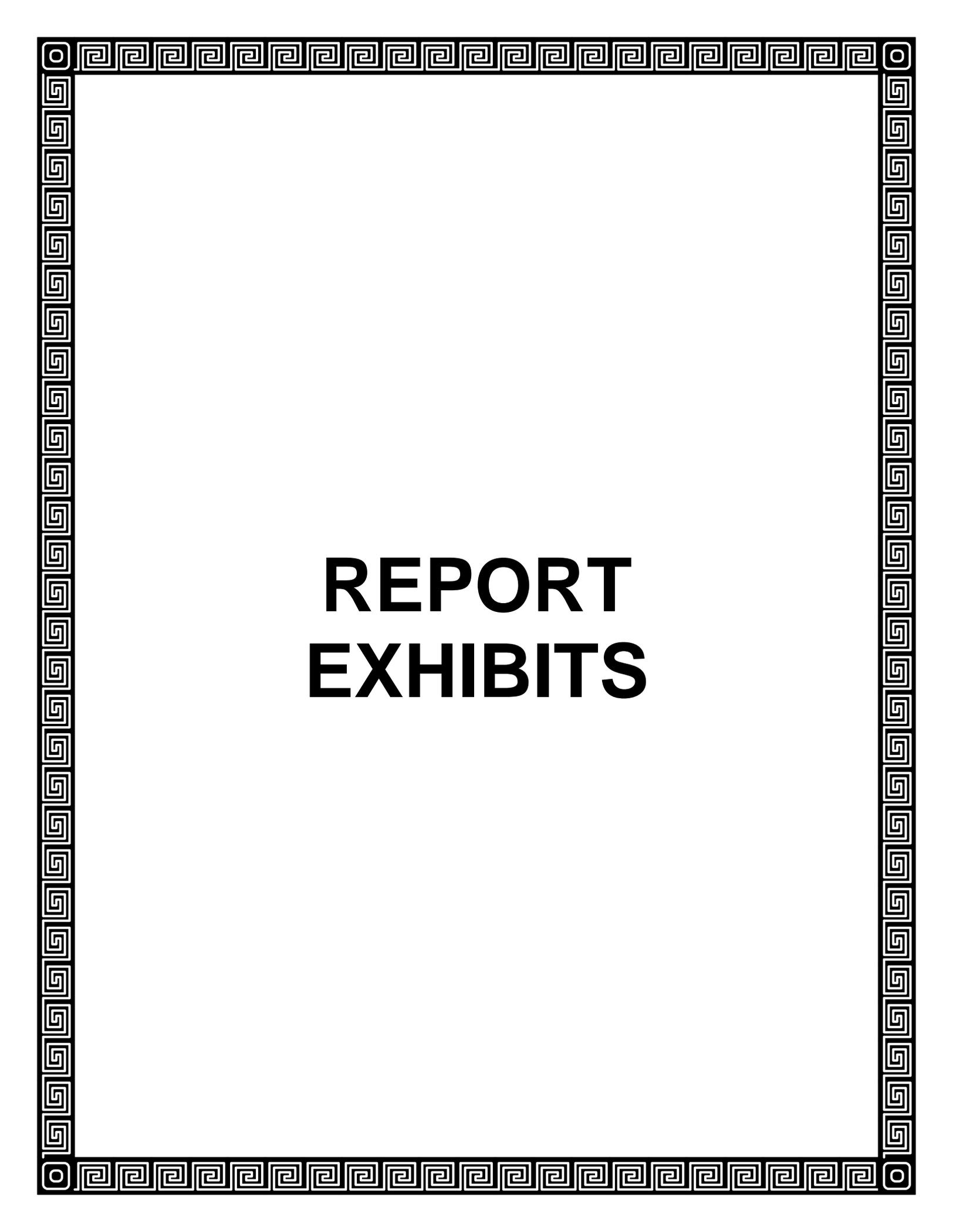
The collective effect of background traffic growth and the Ford's Colony CCRC in 2012 produces LOS C or better for all turning movements. The following table compares LOS results:

**TABLE 1: NEWS ROAD/FIRESTONE DRIVE
UNSIGNALIZED INTERSECTION LOS RESULTS**

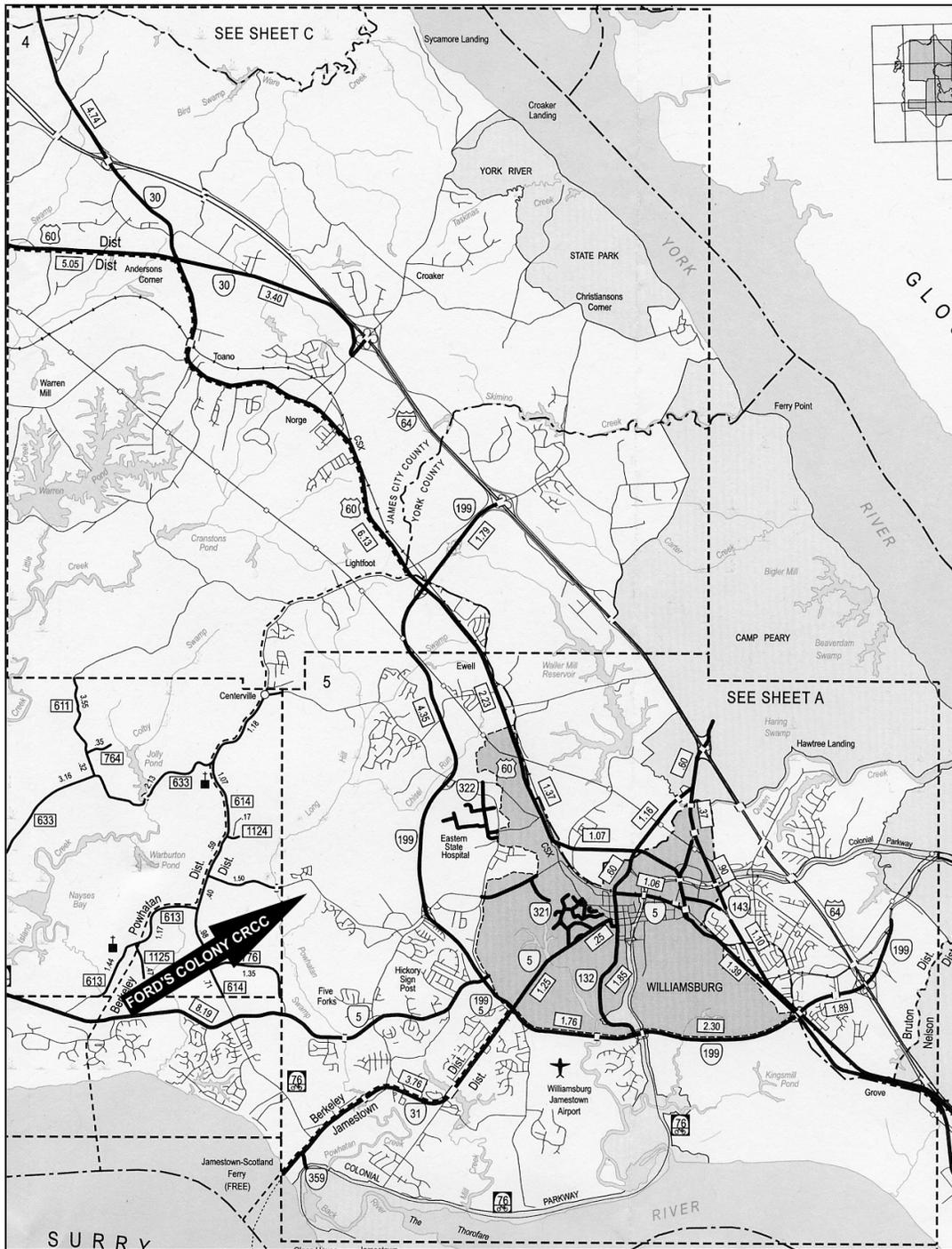
	AM PEAK HOUR						PM PEAK HOUR					
	2007		2012 Bkgd		2012 Total		2007		2012 Bkgd		2012 Total	
Overall	A	21%	A	23%	A	36%	A	23%	A	26%	A	39%
EBL	A	8	A	8	A	8	A	8	A	8	A	8
EBT	n/a		n/a		n/a		n/a		n/a		n/a	
EBR	n/a		n/a		n/a		n/a		n/a		n/a	
WBL	n/a		n/a		A	8	n/a		n/a		A	8
WBT	n/a		n/a		n/a		n/a		n/a		n/a	
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.

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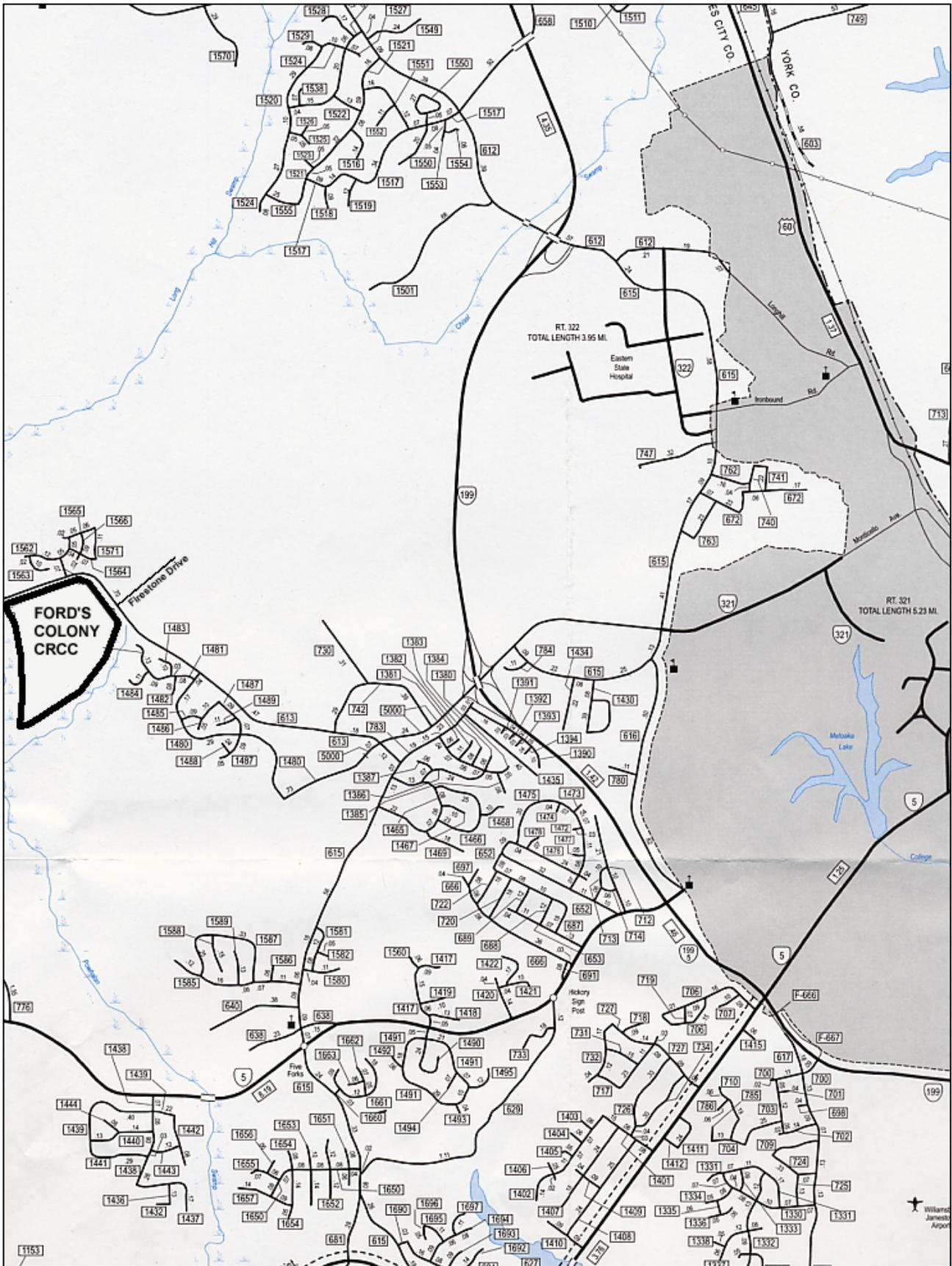
REPORT EXHIBITS



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

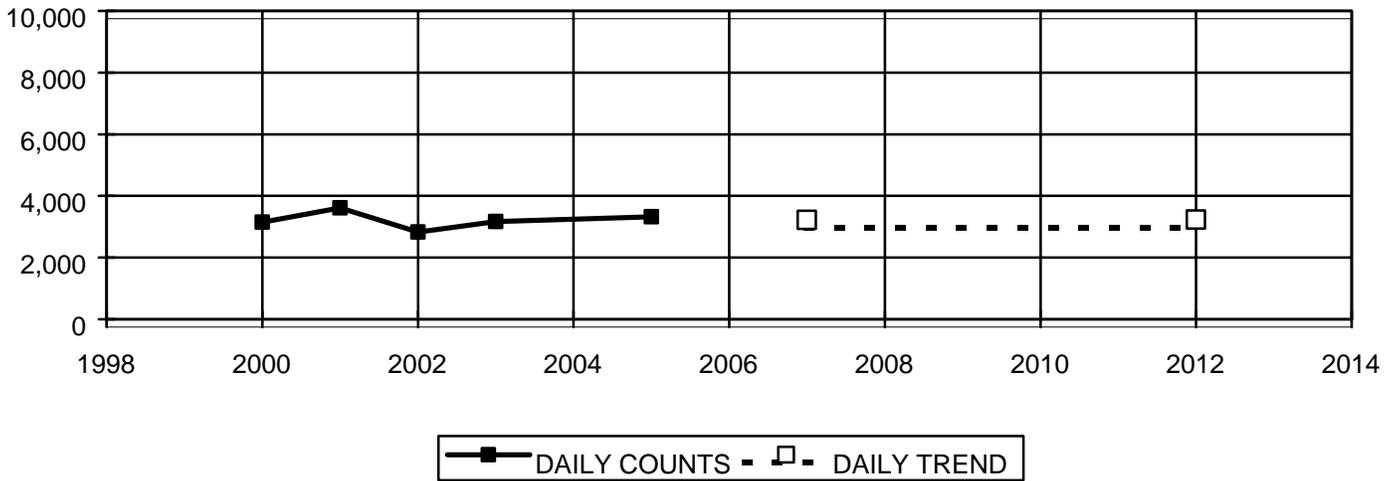
Street: News Road, Rt. 613
 From: Centerville Road
 To: Springhill Subdivision
 Station: 36

Street: News Road, Rt. 613
 From: Springhill Subdivision
 To: Powhatan Secondary
 Station: 37

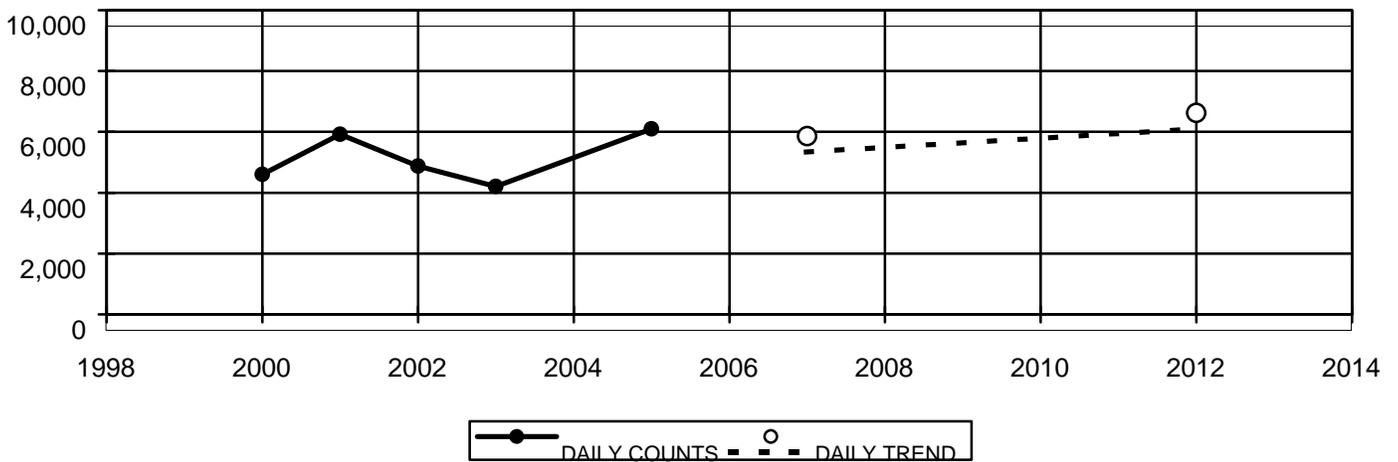
Year	DAILY COUNTS	
2000	3,147	
2001	3,611	
2002	2,830	
2003	3,168	
2005	3,323	
Year	DAILY TREND	
2007	3,221	Δ07
2012	3,227	1.00

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

Centerville Road To Springhill Subdivision



Springhill Subdivision To Powhatan Secondary



Traffic counts published by James City County Planning Division.

TRACT	LAND USE	LAND USE CODE	SQ.FT., OTHER UNITS	WEEKDAY TRIP GENERATION						DAILY
				AM PEAK HOUR			PM PEAK HOUR			
				Enter	Exit	Total	Enter	Exit	Total	

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

Direction	41		33		74		81		61		142	
	AM Peak Hour				PM Peak Hour							
	Entering Traffic		Exiting Traffic		Entering Traffic		Exiting Traffic					
	% 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				

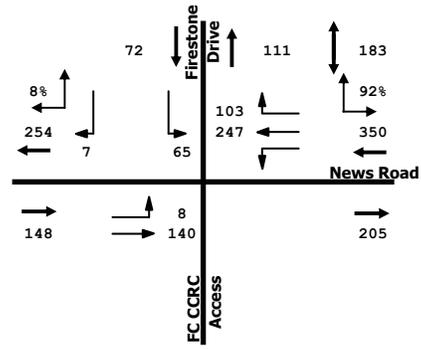
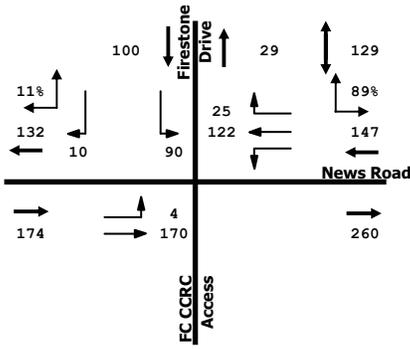
Trip generation rates from Trip Generation, 7th Edition (TG7) by the Institute of Transportation Engineers (ITE)

FORD'S COLONY CCRC
TRIP GENERATION AND DISTRIBUTION

DRW Consultants, LLC
804-794-7312

Exhibit 4

2007 Counts

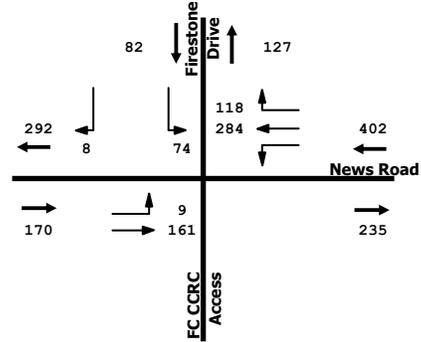
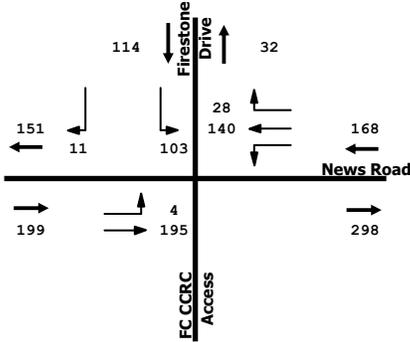


Firestone Drive
FC CCRC Access
News Road

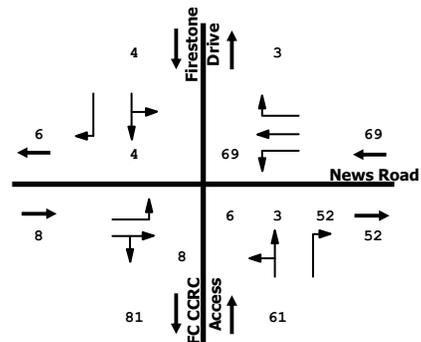
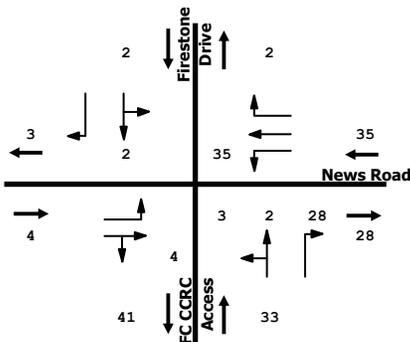
TO RT. 199

TRAFFIC GROWTH FACTOR: 1.15

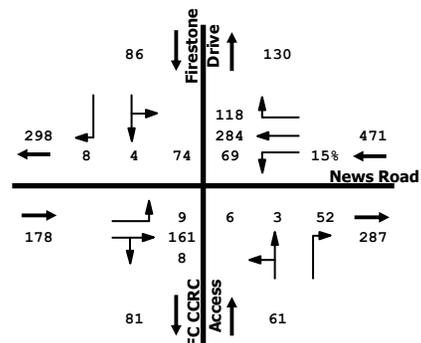
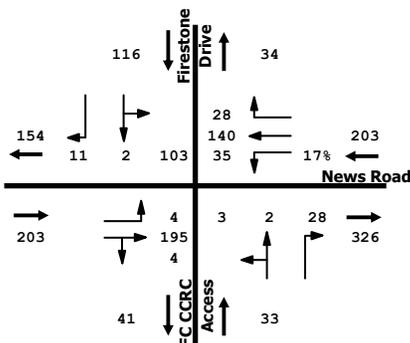
2012 Background Forecast



CCRC Site Traffic Assignment



2012 Total Traffic



AM Peak Hour

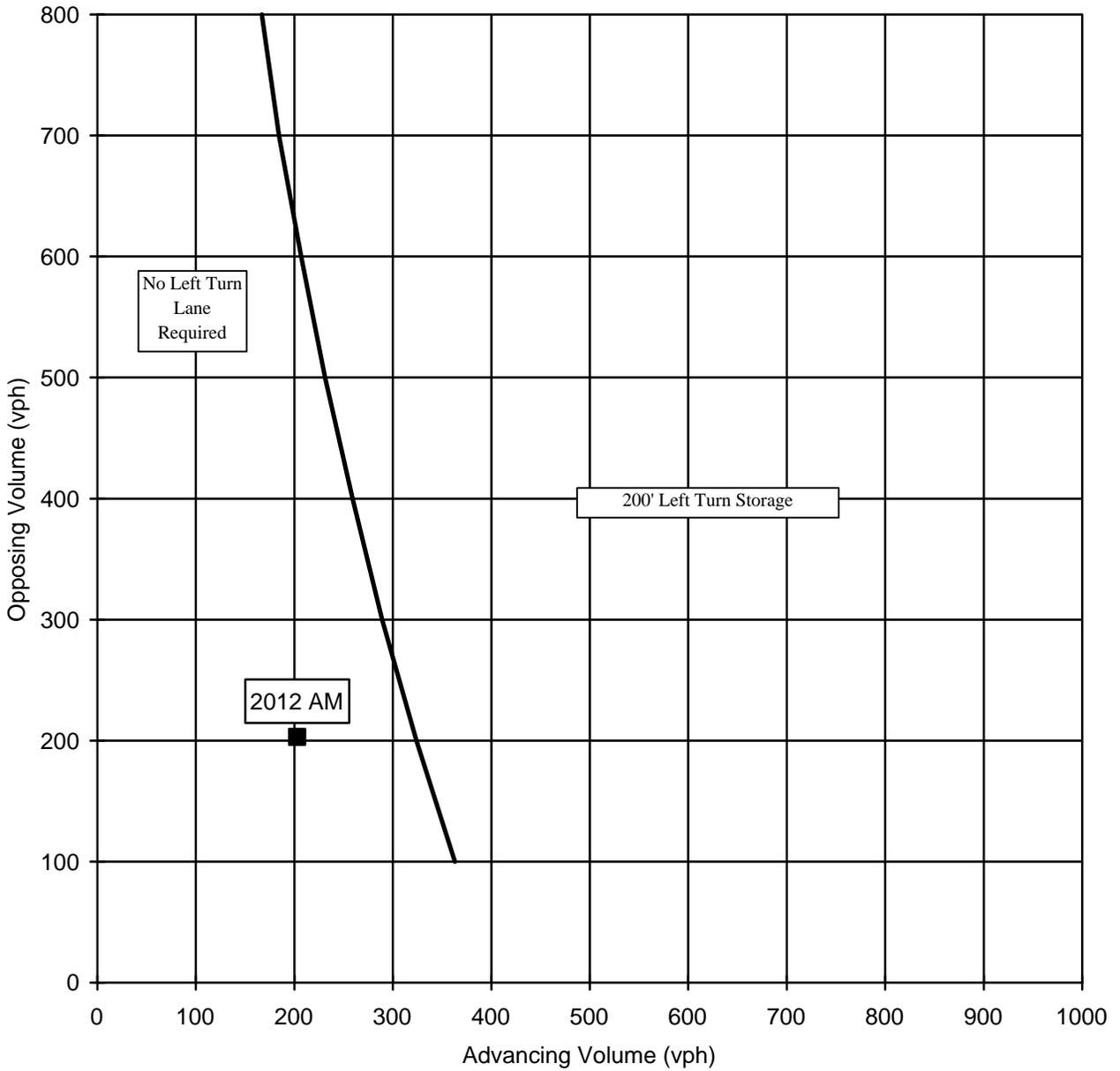
PM Peak Hour

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%



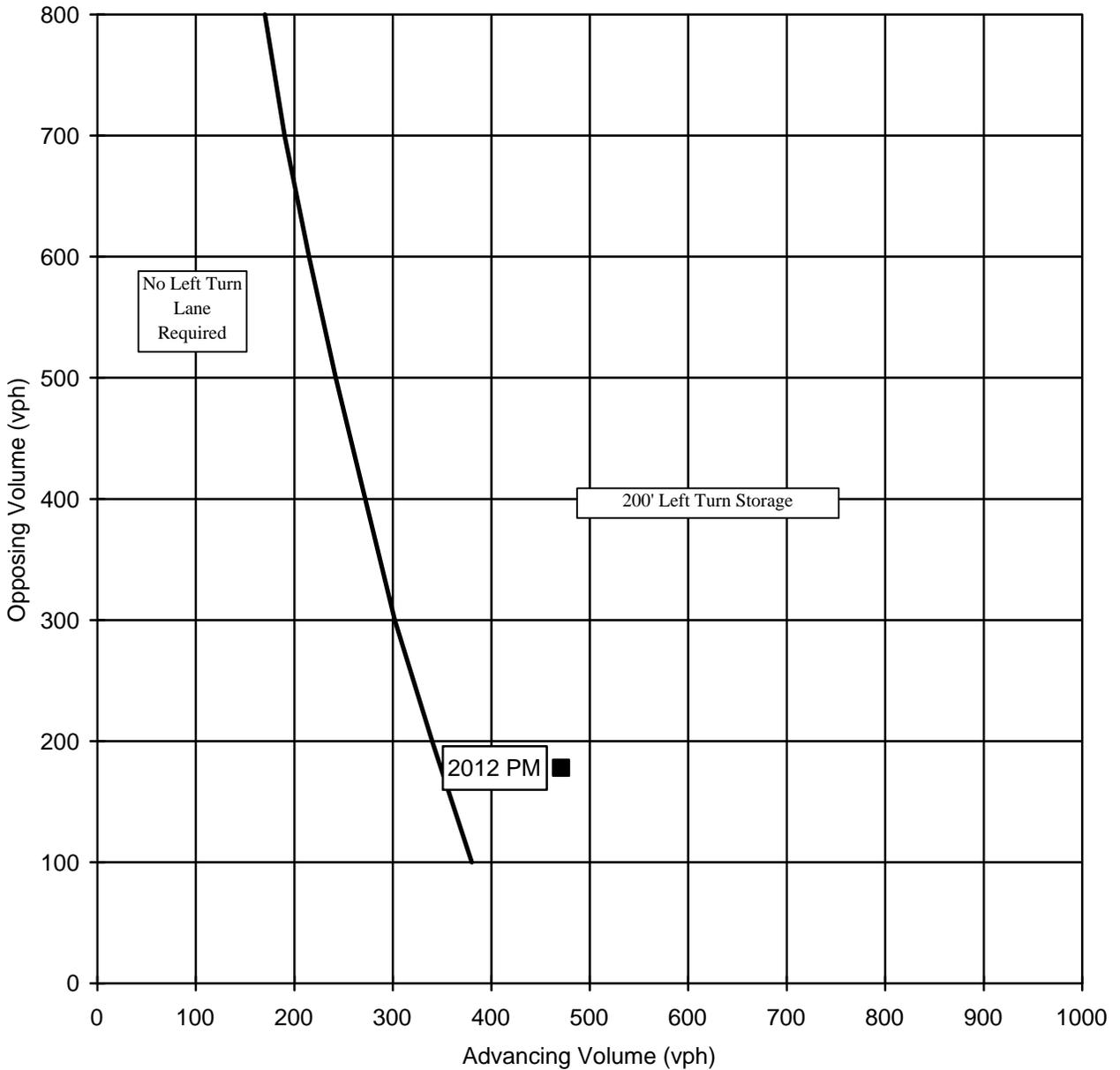
Source: Interpolated from VDOT Road Design Manual, Appendix C, derived from Highway Research Record Number 211

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%



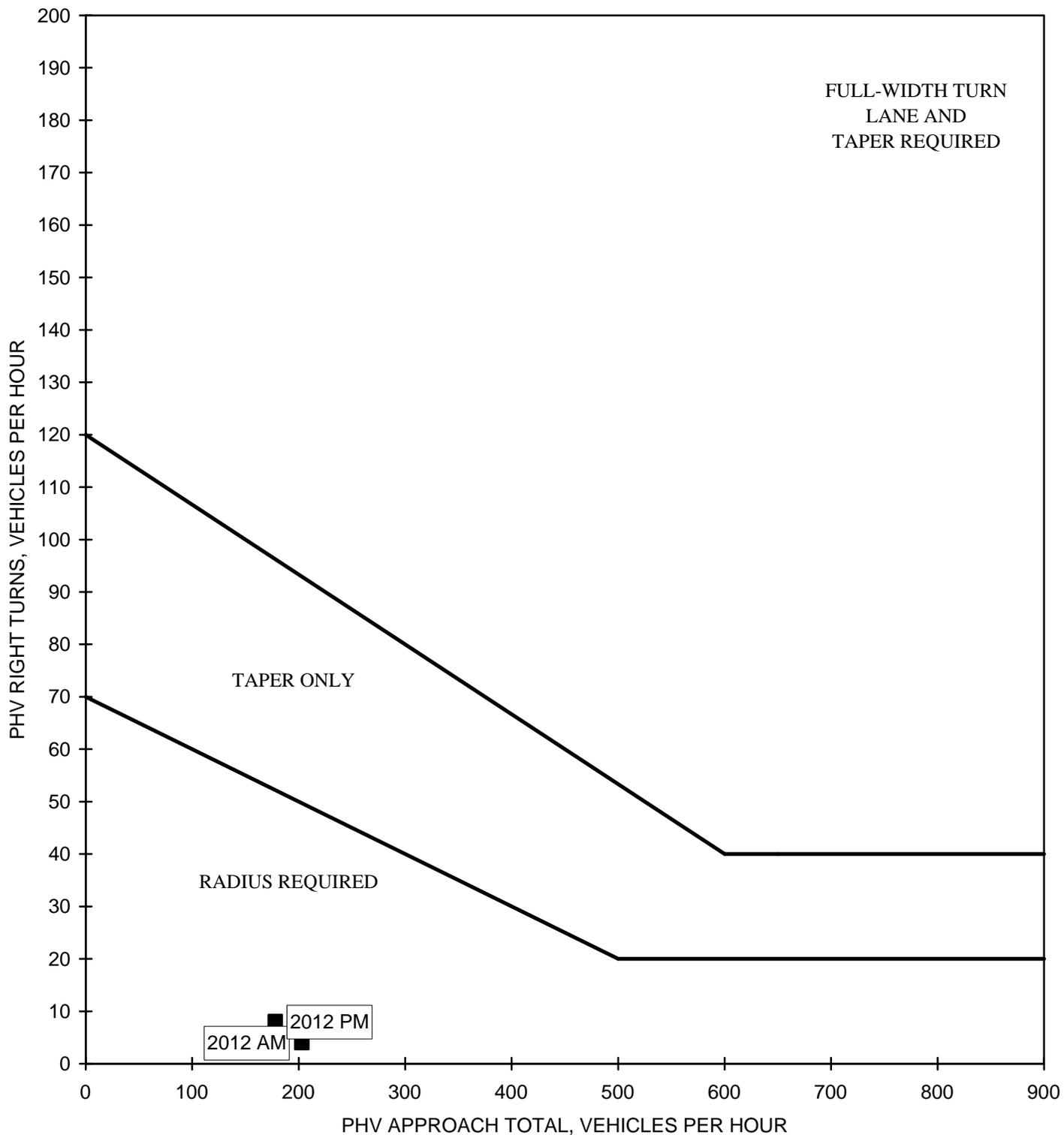
Source: Interpolated from VDOT Road Design Manual, Appendix C, derived from Highway Research Record Number 211

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

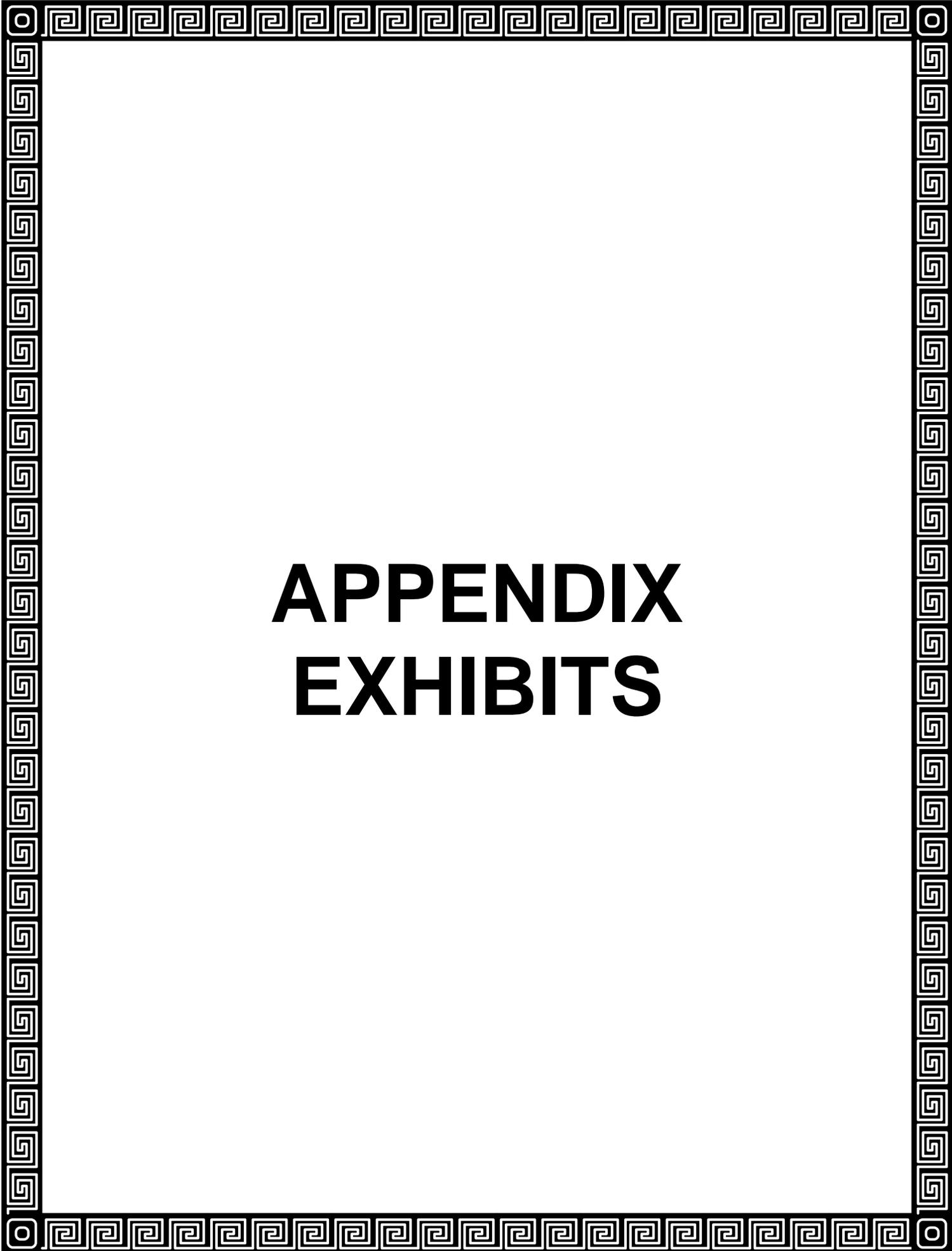


Source: VDOT Road Design Manual, Vol. 1, Page C-15, Figure C-1-8

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			SB			EB			WB			Total
	Left	Thru	Right										
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			SB			EB			WB			Total
	Left	Thru	Right										
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			SB			EB			WB			Total
	Left	Thru	Right										
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			SB			EB			WB			Total
	Left	Thru	Right										
8:00 to 9:00	0	0	0	90	0	10	4	170	0	0	122	25	421

PM PEAK HOUR

LOCATION: News Road/Firestone Drive

DATE: Wed, 4/25/07

CUMULATIVE 15 MINUTE COUNTS

TIME	NB			SB			EB			WB			Total	
	Left	Thru	Right											
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			SB			EB			WB			Total
	Left	Thru	Right										
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			SB			EB			WB			Total
	Left	Thru	Right										
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			SB			EB			WB			Total
	Left	Thru	Right										
4:30 to 5:30	0	0	0	65	0	7	8	140	0	0	247	103	570



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			



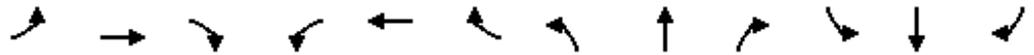
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗	↗	↖	↖	↖
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	9	161	284	118	74	8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	175	309	128	80	9
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
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	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	437		184		668		786		179		711	
tC, single (s)	4.1		4.1		7.1		6.5		6.2		7.1	
tC, 2 stage (s)												
tF (s)	2.2		2.2		3.5		4.0		3.3		3.5	
p0 queue free %	99		95		98		99		93		74	
cM capacity (veh/h)	1123		1391		346		304		863		307	

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		

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

November 22, 2021

Mr. Paul Holt
Director of Community Development
James City County
101-A Mounts Bay Road
Williamsburg, Virginia 23185

Re: Ford's Village – Z-21-0012 and MP-21-0003

Dear Mr. Holt:

I write on behalf of the applicant to request an exception to the James City County Recreational Facility Development Guidelines for the referenced applications. Such an exception may be granted by the Board of Supervisors with recommendations from the Planning Director and Director of Parks and Recreation.

Ford's Village is a large-campus, continuing care retirement community. The applicants have proffered extensive age-appropriate recreation facilities designed for older adults pursuant to Proffer 13 of the Amendment to Amended and Restated Ford's Colony Proffers submitted with the applications, a copy of which is pasted below:

13. Recreation. The portion of the Property designated as CCRC-D on the Master Plan shall include, but shall not be limited to, the following amenities: main lobby and living room; dining room; activities/card room; fitness center; beauty/barber salon; library; multipurpose room and landscaped grounds and courtyards generally as shown on the Master Plan. CCRC-D may also include, but shall not be limited to, the following additional amenities: a bar/lounge; café/coffee shop; education room, spa and wellness center; physical therapy and/or physician's office(s), home health, and pharmacy. The amenities listed above are intended for residents and employees of Ford's Village and their guests and not the general public. The portions of the Property designated as CCRC-A, CCRC-B and CCRC-C on the Master Plan shall include the following amenities: a clubhouse with studio room for classes, and a recreation room; an outdoor pool; pocket parks; pickleball courts and walking and biking paths all generally as shown on the Master Plan. The exact recreational facilities provided in portions of the Property designated as CCRC-A, CCRC-B and CCRC-C on the Master

Plan and their location may be changed with the prior approval of the Development Review Committee.

All residents of Ford's Village will have access to all amenities within the development. As discussed with staff, there are ample recreational facilities proffered but the proffered facilities do not meet the letter of the Guidelines due to the lack of an athletic field and playground. We submit the proffered facilities more than meet the goals of the Guidelines and that strict application of the Guidelines is not appropriate in this case.

Thank you for your consideration of this request and please let me know if you need anything further from us.

Sincerely,

A handwritten signature in cursive script, appearing to read "Vernon M. Geddy, III".

Vernon M. Geddy, III

Mr. Rock Bell
Mr. Jason Grimes
Ms. Doris-Ellie Sullivan

Thomas Wysong

From: Thomas Wysong
Sent: Wednesday, November 3, 2021 3:23 PM
To: Paul Holt
Subject: RE: [External] [External]New Development on News Rd

Got it, thanks.

From: Paul Holt <Paul.Holt@jamescitycountyva.gov>
Sent: Wednesday, November 3, 2021 3:09 PM
To: Thomas Wysong <Thomas.Wysong@jamescitycountyva.gov>
Subject: FW: [External] [External]New Development on News Rd

For Dec. packet

From: Richard Krapf <Richard.Krapf@jamescitycountyva.gov>
Sent: Wednesday, November 3, 2021 3:07 PM
To: Jamie Shannon <jamieshannonrealty@gmail.com>
Cc: PlanComm <PlanComm@jamescitycountyva.gov>
Subject: Re: [External] [External]New Development on News Rd

Dear Ms. Shannon -

Thank you for taking the time to write, outlining your views on this land use case. Citizen feedback is an important part of our review process and will be considered along with other elements such as the Comprehensive Plan and staff report. Please note that the applicant has requested a deferral until our December 1st planning commission meeting.

Sincerely,

Rich Krapf

From: Jamie Shannon <jamieshannonrealty@gmail.com>
Sent: Wednesday, November 3, 2021 1:19 PM
To: Richard Krapf
Subject: [External] [External]New Development on News Rd

Mr. Krapf,

I'm a local business owner and resident. I work, live and worship here locally in Williamsburg, Virginia.

I'm opposed to the new mega-development being considered on News Road. That being said I understand that those services may be necessary for our area but feel like the area being considered isn't a good location due to the impact it will have on both the local residents, traffic patterns and lack of space to accommodate that with a major infrastructure change to the local roadways and utilities. Not to mention as a local real

estate agent I'm privy to the understanding that this could greatly affect local neighborhood values now as well as future values.

I personally live and have clients that live in neighborhoods to include Ford's Colony, Powhatan Secondary and Powhatan Woods.

I urge you to vote NO against this new development!

Jamie Shannon
Keller Williams Realty Williamsburg
4084 Courthouse St #3B
Williamsburg, VA 23188
Licensed agent in Virginia

Thomas Wysong

From: Sharon Paulson <spaul7137@gmail.com>
Sent: Wednesday, November 10, 2021 9:08 AM
To: Thomas Wysong
Subject: [External]Input regarding proposed Ford's Village on News Road

To all members of James City County Planning Commission:

It was with great consternation that my husband and I found out this morning for the first time that there is a huge plan afoot to build a high density housing/retirement/assisted living facility off of News Road in the middle of the Powhatan Creek watershed.

While we have confidence in the wisdom of our planning council and Board of Supervisors to make the correct decision, we would have felt remiss if we did not go on record as opposing this proposed project. The list of reasons for this stance is large, but we will just highlight a few in this email as follows:

1. News Road is already a safety hazard for many drivers who venture there. It is almost unthinkable to imagine hundreds (or thousands) if you count staff, more drivers navigating that dangerous 2-lane, curvy road. This is perhaps the single most salient point against building any new construction that has an outlet to News Road.
2. The potential damage to the watershed here is immense. This location is special and we have a huge custodial responsibility for this treasure.
3. Traffic on Centerville Road, already high, would also increase due to its intersection with News Road.
4. Construction noise and traffic would impact surrounding communities directly.
5. A sudden addition of so many residents demands that an assessment of availability of both medical staff and facilities be carried out. It is already difficult to secure necessary medical appointments, and this is an extremely important, often overlooked aspect of new development, particularly of the high-density kind.
6. A study of the impact on local law enforcement would also need to be undertaken.

We would like to be informed of any information with regard to forthcoming decisions and would definitely want time to gather community support against this.

There is a feeling in the community that nobody can fight big money projects when they get set in motion. We don't believe that. We trust that the decision to accept or reject this project will be done in a thoughtful, patient way, allowing for all voices to be heard.

Thanks so much for your service.

Sincerely,
Sharon & John Paulson

Carol A Burtis
4509 Basswood Way
Williamsburg VA 23188
Burtisca@gmail.com

November 30, 2021

Re: Fords Colony Fords Village

Michael Woolson
James City County, Virginia

Via e-mail: Michael.Woolson @jamescitycountyva.gov

Dear Mr. Woolson:

I have been a homeowner in the Powhatan Villages in Williamsburg VA for the past two years. I chose to move from the Midwest to Williamsburg, VA and selected my home based on affordability with my budget. My home backs up to News Road.

Any impact to News Road will affect my home and the homes of my neighbors. I noted the last traffic study to support the Fords Colony Fords Village project was done five years ago. In the past two years I have noted not only an increase in traffic on News Road, but a significant increase in traffic noise, to the point it can awaken me from sleep despite double honeycomb blinds AND sound blocking thermal drapes on my bedroom windows. At times, drivers hit the accelerator forcefully and do not have adequate mufflers on their vehicles, creating a noise nuisance. A current traffic study needs to be done to adequately forecast future traffic, and consideration as to reducing the speed limit and increasing police presence along News Road would be appropriate with yet another destination added to the street. It is not logical to project decreased traffic at the same time as adding yet another destination adjacent to News Road. Increasing buffers to offset additional noise along the North Side of News Road behind the Powhatan Villages homes would also be appropriate, and assurances that News Road will not be widened in the proximity of Powhatan Villages need to be addressed.

I also noted that the flood-plane measure is based on the current one-hundred year flood-plane criteria. Please be advised that this measure is being revised as one-hundred year flood-plane criteria are no longer dependable due to climate change. Until the method of measure's revision is complete, using a higher number year flood-plane criteria would be a more adequate measure. JCSA Engineer Dion Walsh's comments regarding the water main, revision of sewer manholes & uphill flow, minimizing grinder pump lots, & connection to sewer along the creek by Monticello Woods did not appear to be addressed in your project, and corrections need to be made to insure the best and safest alternatives for the area. It would also be beneficial to list prohibited chemicals that homeowners should not allow to seep into storm sewers.

Via e-mail: Michael.Woolson@jamescitycountyva.gov

Page 2

My final area of concern is a possible increased real estate tax base due to this project, which will affect my Powhatan Villages community and anyone on a fixed income budget, including myself. Many of my neighbors are also retired and on fixed incomes. With inflation, any real estate property tax increase caused by the development of Ford Villages will negatively impact many Powhatan Village residents.

Mr. Woolson, if writing and presenting this letter of concern is adequate to have the issues I mentioned addressed, please so advise. If it does not, please inform me of the time and address of the meeting tonight so I may bring my concerns publicly. With the continued covid threat and an inability to see well to drive at night, I would prefer this letter meet the criteria to address the concerns. In any case, please respond via return e-mail: Burtisca@gmail.com

Thank you for your attention to these matters.

Sincerely,
Carol A. Burtis

**SWR-HOCKADAY LLC
MARTHA WARBURTON MCMURRAN
WARBURTON FAMILY MEMBERS
C/O CHANNING M. HALL, III
CHANNING M. HALL, III, PLLC
P.O. BOX 339
WILLIAMSBURG, VA 23187**

March 17, 2022

BY EMAIL ONLY

Board of Supervisors
County of James City
ATTN: Mr. Paul Holt
Director of Community Development/Planning Director
101 Mounts Bay Road
Building D
Williamsburg, VA 23185

**CASE # Z-21-0012 & MP-21-003
PROFFERS AND MASTER PLAN
AMENDMENT (FORD'S VILLAGE) - ("THE FRYE PROPOSAL")
FRYE DEVELOPMENT, LLC ("FRYE")
PROPERTY: 179.2 ACRES/HOCKADAY-CYPRESS TRACT/
3889 NEWS ROAD/TAX MAP #373010004 ("HOCKADAY PARCEL")
OWNERS: SWR-HOCKADAY LLC & MARTHA WARBURTON MCMURRAN**

Honorable Ladies and Gentlemen of the Board:

SWR-Hockaday LLC (a Warburton family entity) and Martha Warburton McMurrin ("Martha") each own 50% of the Hockaday Parcel. Our Warburton family roots run deep in this community.

Susan Warburton Redd ("Susan") and Martha are the daughters of John G. Warburton and Sarah R. Warburton. Sarah Redd McCain ("Sarah") and A. Miles Redd, III ("Miles"), are the children of Susan, who formerly owned 50% of the Hockaday Parcel, before conveying it, for family planning purposes, to SWR-Hockaday LLC, of which she owned 100%. Sarah and Miles now own SWR-Hockaday, LLC. Robert S. McCain is the husband of Sarah Redd McCain. R. Epes McMurrin, Jr., is the son of Martha.

Our family has been in James City County for at least 360 years. We love the scenic and historic environs that have nurtured many generations of Warburtons.

Board of Supervisors/County of James County
Re: Case # Z-21-0012 & MP-21-003
Hockaday Parcel/3889 News Road
March 17, 2022

Our forebearer, Thomas Warburton, first patented 200 acres of land in James City County on February 1, 1664. The Warburton family has continuously owned this land ever since, and intends to keep it in the family.

This family homeplace is located on the Pinewood-Varnese Parcel, now comprised of 659 wooded acres off of Brickbat Road, containing "Pinewoods," sometimes called "Warburton House." Built in the late 1600's, "Pinewoods," an early small brick "planter's house," is one of the oldest extant structures in James City County, and contains several unusual architectural details. We recently completed some conservation work on the structure to ensure its survival for future generations.

We seek to be wise, good, and careful stewards of all of our property, to the common good of our community.

In keeping with this goal of good stewardship, and endeavoring to be good citizens, over the years, we have given land outright, and easements over land, for purposes of the public interest and public utilities and improvements. For example, in 2016, we donated 31.47 acres of land, known as the Indigo Pond Tract, located at 4900 John Tyler Highway, to James City County, because of its environmentally sensitive nature, draining into the Mill Creek watershed. By way of further example, in 2006, we gave an easement on the Pinewoods property, along Brickbat Road, to the James City County Service Authority, for public utilities.

About 16 years ago, we sold the Hockaday Parcel to another developer, who used partial owner financing from us to fund its purchase. They rezoned it and subjected it to the current proffers of higher density than the Frye Proposal. When that developer defaulted on the owner financing we provided, we were forced to foreclose and take the property back.

Having been "burned" by this previous transaction, we were especially careful this time in evaluating the developer with whom we eventually contracted to sell. We wanted a Virginia firm of high repute, which was comprised of "good people," which subscribed to high standards of ethics, vision, and design, which was well-capitalized, which did not produce cookie-cutter tract housing, and which crafted communities of outstanding character, quality, architecture, and aesthetic sensibilities. After many meetings and much due diligence, we vetted Frye from stem to stern, and found Frye to exceed our expectations. One need look no further than Frye's acclaimed East Beach development to envision the aesthetics and the lifestyle that could be here on the Hockaday Parcel.

We are not speculators or investors out to make a quick buck. We have owned the Hockaday Parcel for a long time, and we want the Frye proposal to work for James City County and its citizens. John G. Warburton was in the lumber/timber business, and he used the Hockaday Parcel as a rough "timber tract," for the continuous harvesting, planting, and re-

Board of Supervisors/County of James County
Re: Case # Z-21-0012 & MP-21-003
Hockaday Parcel/3889 News Road
March 17, 2022

harvesting of trees. It is time to move on from its past use as a timber parcel, especially because it is within the PSA, placed there by the County as an appropriate spot for responsible growth. We think that both John and his wife, Sarah, would be pleased to see this land turned into a high-quality, age-restricted residential and continuing care retirement community, that is an enduring asset and amenity for all of the County.

After Ford's Village is built, we will be proud to be its long-term neighbor, for we are here in James City County for the long haul. One day, some of our family may well reside in Ford's Village. We also suggest that Frye will not be here today and gone tomorrow, but will rather be a long-term contributor to our beloved, evolving community, which has come a long way since Thomas Warburton acquired the 17th century heart of Pinewoods which we still hold today.

We therefore urge you to act affirmatively on the Frye Proposal.

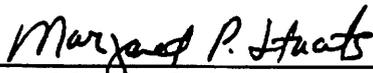
Very truly yours,

MARTHA WARBURTON MCMURRAN

By: 
Channing M. Hall, III,
Her Attorney-in-Fact

SWR-HOCKADAY LLC

By: A.M. REDD, JR., INC., Its Manager

By: 
Margaret P. Staats

A. Miles Redd, III

Sarah Redd McCain

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Re: Case # Z-21-0012 & MP-21-003
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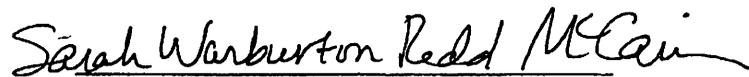
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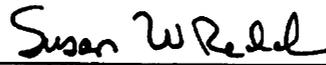
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Board of Supervisors/County of James County
Re: Case # Z-21-0012 & MP-21-003
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Susan Warburton Redd

R. Epes McMurrin, Jr.

Robert S. McCain

cc: Channing M. Hall, III, Esquire
Vernon M. Geddy, III, Esquire

Board of Supervisors/County of James County
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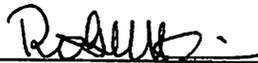
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R. Epes McMurren, Jr.



Robert S. McCain

cc: Channing M. Hall, III, Esquire
Vernon M. Geddy, III, Esquire

Thomas K. Norment Jr.
(757) 259.3835
tknorment@kaufcan.com

April 8, 2022

Re: Frye Development LLC
Z-21-0012 and MP21-003
Ford's Village

Dear Honorable John J. McGlennon

I am pleased to advise you my friend and bank board colleague Bret Frye has asked me to join with Vernon M. Geddy, III in advocating the Board of Supervisors' approval on Tuesday, April 12, 2022, of the continuing care retirement facility at Ford's Village.

As you are aware, it is a rarity I become engaged in local land use issues due to my professional focus in other areas of the law. However, after reflection and some due diligence I agreed to assist Mr. Frye.

Mr. Frye is collaborating with W. Haywood Fralin of Roanoke on the "assisted living/memory care and skilled nursing beds" component of the proposed development. I have known Mr. Fralin for over thirty years. He is a health care provider who is nationally recognized for developing projects characterized by "excellence". He currently serves as Chairman of Medical Facilities of America, Inc. and Retirement Unlimited, Inc. which are multistate providers.

I have taken the opportunity to review the files on this application and note the following:

1. Mr. Wysong and planning staff notes:
 - a. The application is compatible with the Comprehensive Plan and zoning ordinance.
 - b. Mr. Geddy and the applicant have attempted to address both citizen, staff and supervisor's concerns by
 - i. Reducing allowable density, and the number of residential units by 40% below by-right levels: "Mr. Wysong stated the developer could build out the existing plan without legislative action". (Unapproved Minutes of December 1, 2021).
 - ii. Proffering traffic impact mitigation by providing a "secondary construction entrance" and Mr. Holt noted the improvements in the proffers and would rely on private verse public funding".
2. Your staff recommended Planning Commission approve the application.

3. On December 1, 2021, after planning staff's presentation and public Comment, the Planning Commission voted 5-1 to approve recommended approval of the application.

Since the Planning Commission met I understand the Ford's Colony HOA has forward a letter supporting the project.

In addition to the applicant having addressed planning staff's technical concerns, it occurs to me this development could enhance the "quality of life" in all of James City County.

James City County continues to be a "greying community". Approximately 25% of the County's population is 65 years or older "The Weldon Cooper Center project this segment of our population may increase to 35% by 2030". Having an extraordinary residential housing community with step down healthcare has been previously recognized as an "asset" to the community. A visual survey reminds us Patriot's Colony is in Berkeley District and in proximity to First Colony, Heritage Landing, Berkeley's Green, etc. residential areas. WindsorMeade is in Jamestown District and proximity to New Town, and other residential communities. Williamsburg Landing is in the Roberts District in proximity to multiple residential communities including Kingsmill, Kingswood and Birchwood. It does occur to me that Ford's Village in proximity to Ford's Colony would be a significant asset to the Powhatan, Jamestown and Berkeley Districts as the project is at the intersection of all three Districts. Also, it would be the closest such community to the Stonehouse District containing 2,000 homes in Colonial Heritage. I believe the Stonehouse District does not have a similar community. Being a "senior citizen" myself I find comfort being in proximity to that which we know, friendships we have developed and nearby family.

Positive technical land use considerations and societal considerations aside, I am not naïve. Having had the privilege of previously serving on the James City County Board of Supervisors and in another legislative role, I know "politics" can creep into legislative issues. I understand the Powhatan Supervisor is critical of this project. I respect his prerogative within the bounds of civil, fact based legislative dialogue. However, I have learned through representing 13 different localities that I cannot always myopically focus on my beloved James City County. I feel I have a greater stewardship responsibility to advocate and promote the corporate goal of each community I represent. Sometimes my corporate approach annoys one part of the district I represent. But, without being disrespectful or insensitive, I do what is right and beneficial to that one community that may have an opportunity to enhance the quality of life for its citizens.

I am optimistic Supervisor Icenhour on reflection will embrace a county wide perspective on this positive application, recognizing the collective benefit to James City County residents outweighs his individual concerns.

I would remind the Supervisors of the 2035 Comprehensive Plan which provides several salient considerations which I quote:

1. "The Goal now States: Provide the means for all citizens, especially youth and seniors, to achieve a high quality of life through safe, affordable, and convenient access to programs, services, and activities."
2. Health Care: "The growing number of aging citizens requires different health care services and increases the need for additional health care service providers in the coming years."
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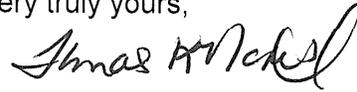
April 8, 2022
Page 3

permitting process for group homes, independent living facilities, assisted living facilities, skilled nursing facilities (nursing homes), and continuing care retirement facilities.”

I appreciate your courtesies and fervently hope a majority of your Board will support the Frye Development, LLC application as it will be an enhancement to our entire county and is consistent planning staff expectations.

I will attempt to chat with each of you before Tuesday.

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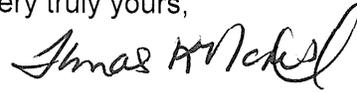
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Thomas K. Norment Jr.

**Approved Minutes of the December 1, 2021
Planning Commission Regular Meeting**

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)

Mr. Thomas Wysong, Senior Planner, stated that Mr. Vernon Geddy has applied on behalf of Frye Development to amend the adopted Master Plan and Proffers for the Continuing Care Retirement Community (CCRC) at Ford's Colony. Mr. Wysong stated that the subject parcel is zoned R-4, Residential Planned Community, is inside the Primary Service Area (PSA), and designated Low Density Residential in the Comprehensive Plan, which recommends this use.

Mr. Wysong stated that in 2008, this parcel was rezoned from R-8, Rural Residential to R-4, Residential Planned Community with Proffers to permit a CCRC known as the Village at Ford's Colony. Mr. Wysong further stated that this currently approved Master Plan for this property permits up to 741 units, rooms and beds and is accompanied by Proffers intended to mitigate community impacts.

Mr. Wysong stated that this proposal would amend the approved Master Plan and Proffers by reducing the total number of units, rooms, and beds from 741 to 516 and changing the layout of the site. Mr. Wysong stated that the applicant is proposing up to 286 residential units comprised of single-family dwellings and multifamily dwellings with an additional 230 assisted living/memory care rooms/skilled nursing beds to be located in the facility portion of the property. Mr. Wysong further stated that this development would include accessory amenities intended for the residents and employees of the development.

Mr. Wysong stated that the Proffers have been updated to include a unit mixture cap on the facility portion of the property of up to 75 apartments in this facility portion, no more than 155 assisted living rooms/memory care rooms, and no more than 40 skilled nursing beds. Mr. Wysong stated that the major changes to the proffers include the updating of the current contribution amount for community impacts, the addition of a proffer requiring a traffic signal warrant analysis for the proposed main entrance to the development, and the revision of stormwater commitments. Mr. Wysong further stated that the applicant is also proposing to remove certain proffers, including the completion of the Cold Spring Swamp Drainage Analysis and the Greenway Trail Proffer. Mr. Wysong stated that if approved, this amendment would reduce the density on the subject parcel from 3.59 units per acre to 2.17 dwelling units per acre and would also result in a marginal decrease within the overall density of Ford's Colony from 1.25 unit per acre to 1.13 units per acre.

Mr. Wysong stated that staff finds the proposal to be compatible with the Comprehensive Plan, Zoning Ordinance, and surrounding development, and recommends that the Planning Commission recommend approval of this application, subject to the amended proffers.

Mr. Polster inquired if the Stormwater Division took into account the removal of two proffers related to Stormwater mitigation when they reviewed the proposal.

Mr. Wysong stated that Stormwater staff did review the proposal and did not raise any concerns over the removal of the two proffers; however, they may not have fully considered the upstream issues, the culvert, and the flooding issues.

Mr. Krapf inquired whether the height limitation from previously approved proffers would remain in effect for new buildings.

Mr. Wysong stated that a new building not shown on the Master Plan would require a Master Plan Amendment.

Mr. Haldeman stated that there is an approved Master Plan for a CCRC on the property. Mr. Haldeman inquired if the developer could build out the CCRC according to the existing plan should this amended plan not be approved.

Mr. Wysong stated that the developer could build out the existing plan without any legislative action.

Mr. Haldeman noted that the Public Hearing remains open from the November 3, 2021 meeting.

Mr. Vernon Geddy, Geddy, Harris, Franck, & Hickman, LLP, 1177 Jamestown Road, representing the applicant, made a presentation to the Commission on the project.

Mr. Krapf inquired if there are any measures under consideration to mitigate the prolonged impact of construction vehicles on News Road.

Mr. Jason Grimes, AES Consulting Engineers, stated that nothing has been put in place; however, the most intense development will occur at the outset with the RUI building.

Mr. Krapf noted that his concern lies with the heavy equipment that brings in bulldozers, etc. and the impact on traffic flow. Mr. Krapf stated that since the bulk of the citizen concerns relate to traffic issues, this might be something that the applicant should consider.

Ms. Leverenz inquired if Frye Development has developed any other CCRC properties.

Mr. Geddy stated that this would be the first.

Ms. Leverenz further inquired if the owners of independent living units would also own the lot.

Mr. Geddy stated they would own the lot.

Ms. Leverenz inquired if the homeowners association (HOA) would provide property management services.

Mr. Geddy stated that there would be an HOA which would provide property maintenance services.

Ms. Leverenz inquired if the residents in the independent living section would have priority consideration for the assisted living option.

Mr. Geddy stated that at this time it would be based on availability.

Ms. Null inquired about the price range on the homes.

Mr. Rock Bell, Vice President for Development, Frye Properties, stated that they would be moderately high-end homes; however, it would not be feasible to give a price point at this time.

Ms. Null stated that her question stemmed from wanting to understand who might be living in that community; would it be sufficiently affordable.

Mr. Geddy stated that there would be a mix of housing types from small bungalow to larger single-family residences.

Mr. Rose inquired why there was no planning for construction traffic, given the applicant's experience in developing properties.

Mr. Geddy stated that traffic impacts had been addressed through the secondary construction entrance. Mr. Geddy further stated that the applicant would also look at options for timing of arrivals and departures, as well as what equipment could remain on the property for the duration of construction.

Mr. O'Connor inquired about the difference in intensity between the approved plan and this proposal and the resulting impact on the watershed.

Mr. Grimes stated that the original plan called for large apartment style buildings with large parking fields. Mr. Grimes stated that this proposal was developed to provide one large scale institutional style structure with single-family style development surrounding it. Mr. Grimes further stated that the resulting decrease in impervious covers allows for different stormwater mitigation options. Mr. Grimes noted that the existing proffers were no longer applicable to the proposal.

Mr. O'Connor inquired if the stormwater management would be the traditional curb and gutter with pipe and drop inlets.

Mr. Grimes stated that the current stormwater regulations would require treatment trains that take it through a series of infiltration measures, bioretention measures, and Low Impact Development (LID) swales. Mr. Grimes noted that many of the properties would have rain barrels or rain gardens as part of the stormwater management plan.

Ms. Leverenz inquired if the positive fiscal impact would come from the assisted living facility.

Mr. Geddy stated that the larger impact would come from the RUI facility; however, since there are no school children associated with the single-family dwellings, the independent living units should also have a positive impact.

* Mr. Rose left the meeting at approximately 6:50 p.m.

Mr. Haldeman called for disclosures from the Commission.

Mr. Polster stated that he spoke with Mr. Grimes and Mr. Geddy.

Mr. Krapf, Mr. O'Connor, Mr. Haldeman, and Ms. Null each stated that they spoke with Mr. Geddy.

Ms. Susan Tisdale, 209 Governor Edward Nott Court, addressed the Commission in opposition to the application.

Ms. Leanne Sutton, 201 Old Carriage Way, addressed the Commission in opposition to the application.

Ms. Kay Krapfl, 3833 Cluster Way, addressed the Commission in opposition to the application.

Mr. David Banks, 215 Charter House Lane, addressed the Commission in opposition to the application.

Mr. Kevin Fleming, 228 Old Carriage Way, addressed the Commission in opposition to the application.

Ms. Lisa Schmidt, 108 Powhatan Overlook, addressed the Commission in opposition to the application.

Ms. Regina Walsh, 4599 Beacon Hill Drive, addressed the Commission in opposition to the application.

Mr. Jason Smith, 124 Old Carriage Way, addressed the Commission in opposition to the application.

Mr. Bob Meyers, 143 Waters Edge Drive, addressed the Commission in opposition to the application.

Mr. Eric Ganzer, 4280 Beamer's Ridge, addressed the Commission in opposition to the application.

Ms. Debbie Wright, 450 Thompson Lane, addressed the Commission in opposition to the application.

Ms. Beth Emerson, 4052 Powhatan Secondary, addressed the Commission in opposition to the application.

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

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

Mr. Polster stated that he was trying to understand whether the Stormwater Division concurs with the ramifications of removing these proffers for the upstream portion of the property and what, if any, consequences might occur. Mr. Polster stated that he would like to see the Stormwater Division come to the Board of Supervisors meeting prepared to discuss any potential consequences.

Mr. Krapf stated that the initial approved plan for this property included a CCRC that could still be built out by-right if this application is not approved. Mr. Krapf stated that he considered this application with an eye toward whether it was a better design or would mitigate any impacts of the development. Mr. Krapf noted that this plan reduces the number of residential units by 40% over the adopted Master Plan. Mr. Krapf further noted that the fiscal impact of this proposal is positive. Mr. Krapf stated that the proposed design is more appealing and leaves more open space giving it the appearance of a neighborhood.

Mr. Krapf stated that he does have significant concerns about the ability of News Road to accommodate the additional traffic.

Mr. Krapf requested that Mr. Holt clarify the Virginia Department of Transportation's (VDOT) role in the construction of the proffered traffic improvements.

Mr. Holt noted that the improvements and associated warrants are in the proffers and would rely on private versus public funding. Mr. Holt stated that the developer would be responsible for constructing the improvements. Mr. Holt further stated that VDOT's approval would be for the geometric design of the improvements in an engineering level document at the site plan stage.

Ms. Leverenz stated that she is pleased with the proposed design; however, it appears that this project is something slightly different from the traditional CCRC. Ms. Leverenz stated that this proposal has two distinct components with the Assisted Living facility being one and the Independent Living Units, essentially a 55 + retirement community, the second. Ms. Leverenz stated that contrary to the most CCRCs, there is no guarantee that residents in the Independent Living Units would be given priority for space in the Assisted Living, when the need arises. Ms. Leverenz noted that if this were just an age-restricted retirement community, the Commission would not be inclined to support it.

The Commission discussed several CCRC facilities that are adjacent to, but separate from a neighboring retirement community that do not guarantee access to the Assisted Living Units.

Mr. O'Connor stated that the decision point is whether to allow the possibility that the more intense development would be built out by-right or accept a proposal that would reduce the number of units, reduce the traffic and improve stormwater mitigation.

Mr. Haldeman stated that he plans to support the application. Mr. Haldeman stated that he shares the public's concerns and those of his fellow Commissioners. Mr. Haldeman stated that the location is not well suited to this type of development; however, there is an existing plan in place and this amendment is a substantial improvement.

Ms. Null noted that she would like to see a second gate or access point to ensure that residents can leave in the event of an emergency.

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

On a roll call vote, the Commission voted to recommend approval of 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) (5-1)

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

ATTORNEYS AT LAW

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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

June 1, 2022

Mr. Jason Purse
Assistant County Administrator
101-D Mounts Bay Road
Williamsburg, VA 23185

Mr. Paul Holt
Director, Community Development
101-A Mounts Bay Road
Williamsburg, VA 23185

Re: Rezoning-21-0012 and MP-21-0003 Ford's Village

Dear Jason and Paul:

I am writing on behalf of our client, Frye Development, LLC, to request that the Board of Supervisors defer consideration of the application until its September 13, 2022 meeting to allow the applicant time to consider and make revisions to the application in response to issues raised. Please let me know if you need anything further.

Very truly yours,



Vernon M. Geddy, III

VMGIII

Cc: Mr. Bart Frye

ITEM SUMMARY

DATE: 6/14/2022

TO: The Board of Supervisors

FROM: Teresa J. Saeed, Deputy Clerk

SUBJECT: Consideration of a personnel matter, the appointment of individuals to County Boards and/or Commissions, pursuant to Section 2.2-3711 (A)(1) of the Code of Virginia

REVIEWERS:

Department	Reviewer	Action	Date
Board Secretary	Saeed, Teresa	Approved	6/3/2022 - 11:55 AM

ITEM SUMMARY

DATE: 6/14/2022
TO: The Board of Supervisors
FROM: Teresa J. Saeed, Deputy Clerk
SUBJECT: Appointments - Williamsburg Regional Library Board of Trustees

ATTACHMENTS:

Description	Type
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REVIEWERS:

Department	Reviewer	Action	Date
Board Secretary	Saeed, Teresa	Approved	6/3/2022 - 11:58 AM

ITEM SUMMARY

DATE: 6/14/2022
TO: The Board of Supervisors
FROM: Teresa J. Saeed, Deputy Clerk
SUBJECT: Appointments - Economic Development Authority

ATTACHMENTS:

Description	Type
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REVIEWERS:

Department	Reviewer	Action	Date
Board Secretary	Saeed, Teresa	Approved	6/3/2022 - 11:58 AM

ITEM SUMMARY

DATE: 6/14/2022
TO: The Board of Supervisors
FROM: Teresa J. Saeed, Deputy Clerk
SUBJECT: Adjourn until 1 pm on June 28, 2022 for the Business Meeting

REVIEWERS:

Department	Reviewer	Action	Date
Board Secretary	Saeed, Teresa	Approved	6/3/2022 - 11:56 AM