



Application for
Rezoning

OFFICE USE ONLY
Date Received:

April 29, 2026

RZ 26-0219

Case Number:

Complete this application in its entirety and submit pages 4 and 5 along with the required materials (including any required supplements) as listed on page 2 to the address below:

City of Hampton
Community Development Department, Planning Division
22 Lincoln Street, 5th Floor
Hampton, Virginia 23669

1. PROPERTY INFORMATION

Address or Location 1534, 1538, 1540 West Queen Street, Hampton, VA 23669

LRSN 2000008,2000007,2000006 Current Zoning District R-13 & MD-4 Proposed Zoning District MD-4

Current Land Use Residential Single Family and Multi-Family Apartments

Proposed Land Use Multi-Family Apartments

The proposed use will be in: ☐ an existing building ☐ a new addition ☒ new building

2. PROPERTY OWNER INFORMATION (an individual or a legal entity may be listed as owner)

Owner's Name Old Town Development LLC

Address PO Box 250 City Toano State VA Zip 23168

Phone 757-532-6562 Email roblangbuilder@yahoo.com

3. APPLICANT INFORMATION (if different from owner)

Applicant's Name _____

Address _____ City _____ State _____ Zip _____

Phone _____ Email _____

4. APPLICANT AGENT INFORMATION (if different from applicant)

Agent's Name _____

Address _____ City _____ State _____ Zip _____

Phone _____ Email _____

5. CERTIFICATION FOR LEGAL ENTITY PROPERTY OWNERS

Complete this section only if the property owner is **not** an individual but rather a legal entity such as a corporation, trust, LLC, partnership, diocese, etc. as specified in Step 2 above.

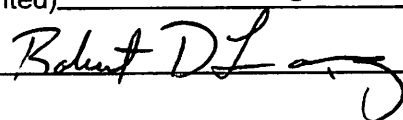
"I hereby submit that I am legally authorized to execute this application on behalf of the fee-simple owner of this property. I have read this application and it is submitted with my full knowledge and consent. I authorize city staff and representatives to have access to this property for inspection. The information contained in this application is accurate and correct to the best of my knowledge."

Name(s), title(s), signature(s), and date(s) of authorized representative(s) of the legal entity (attach additional page if necessary):

Name of Legal Entity Old Town Development LLC

Signed by:

Name (printed) Robert D. Lang, Its (title) Managing Partner, Old Town Development LLC

Signature  Date 4-20-2026

Name (printed) _____, Its (title) _____

Signature _____ Date _____

Name (printed) _____, Its (title) _____

Signature _____ Date _____

6. CERTIFICATION FOR INDIVIDUAL PROPERTY OWNERS

Complete this section only if the property owner is an individual or individuals.

"I hereby submit that I am the fee-simple owner of this property. I have read this application and it is submitted with my full knowledge and consent. I authorize city staff and representatives to have access to this property for inspection. The information contained in this application is accurate and correct to the best of my knowledge."

Name(s), signature(s), and date(s) of owner(s) (attach additional page if necessary):

Name (printed) _____

Signature _____ Date _____

Name (printed) _____

Signature _____ Date _____

OFFICE USE ONLY

- | | |
|-------------------|--------------------------------------|
| • Application Fee | • Narrative Statement |
| • Application Fee | • Survey Plat |
| | • Additional materials (if required) |

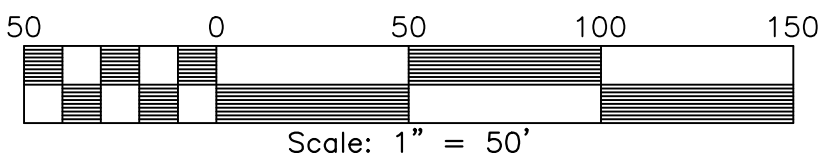
VA STATE PLANE SOUTH ZONE
(GPS DERIVED)

EXHIBIT SHOWING
WEST QUEEN STREET PARCELS
FOR DEVELOPMENT

CITY OF HAMPTON VIRGINIA
DATE: 10/22/2025 SCALE: 1"=40" JOB # 20-496

LandTech
Resources, Inc.
Surveying • Engineering • GPS
205 Bulifants Boulevard, Suite E, Williamsburg, Virginia 23188
Phone: (757) 565-1677 Fax: (757) 565-0782
web: landtechresources.com

SHEET 1 OF 1



PROPERTY INFORMATION:

1540 W. QUEEN STREET; 1538 W. QUEEN STREET; 1534 W. QUEEN STREET

GENERAL NOTES

- 1) THIS FIRM MADE NO ATTEMPT TO LOCATE UNDERGROUND UTILITIES EXCEPT THOSE SHOWN.
- 2) VERTICAL DATUM BASED ON CITY OF HAMPTON BM #537 (NAVD 88)
- 3) THIS FIRM IS NOT RESPONSIBLE FOR THE LOCATION OF ANY STRUCTURE, MANHOLE, VALVE, ETC., HIDDEN OR OBSTRUCTED AT THE TIME THE FIELD SURVEY WAS PERFORMED.
- 4) PROPERTY LIES IN F.I.R.M. ZONES "X" & "AE" (EL 8') ACCORDING TO FLOOD INSURANCE RATE MAP #5155270024H DATED MAY 16, 2016.
- 5) WETLANDS SHOWN PER DELINEATION BY ENVIRONMENTAL SERVICES GROUP. RESOURCE PROTECTION AREA AND RESOURCE MANAGEMENT AREA NOT SHOWN.
- 6) THIS SURVEY WAS COMPLETED BY LANDTECH RESOURCES, INC., UNDER THE DIRECT AND RESPONSIBLE CHARGE OF PETER FARRELL, L.S., LICENSE NO. 2036, FROM AN ACTUAL GROUND SURVEY MADE UNDER HIS SUPERVISION; THE INFORMATION SHOWN HEREON WAS OBTAINED ON 12/28/2020 & 08-03-2021 AND MEETS MINIMUM ACCURACY STANDARDS UNLESS OTHERWISE NOTED.

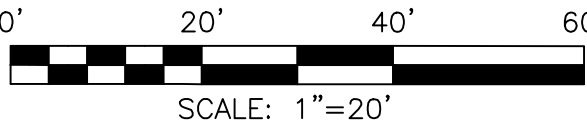
LEGEND

UTILITY POLE
GUY ANCHOR
OH—OVERHEAD UTILITIES

CONCRETE
GRAVEL

GREEN PAINT MARKS (SANITARY SEWER)
BLUE PAINT MARKS (WATER)
YELLOW PAINT MARKS (GAS)

ABOVE UNDERGROUND UTILITIES SHOWN
HEREON ARE BASED ON FIELD LOCATION OF
PAINT MARKINGS PER MISS UTILITY
TICKET #-----



Legal Description

1534 West Queen Street

PARCEL 1:

THAT certain lot, piece or parcel of land, with the buildings and improvements thereon, situate, lying and being in the City of Hampton, Virginia and located on the northerly side of Queen Street and being more particularly described as follows: Beginning at a point which is 78.9 feet from the point on the northerly side of Queen Street, which point is formed by the intersection of the easterly boundary of the Mitchell land and the westerly boundary of the J.W. Davis land and being on a course North 71 degrees 25 minutes West from said intersection; thence from the point or place of beginning North 8 degrees 45 minutes East along the northerly side of Queen Street to a point 147.62 feet; thence North 81 degrees 15 minutes East a distance of 82.3 feet; thence south 8 degrees 45 minutes West 162 feet to the point or place of beginning.

PARCEL 2:

ALL THAT certain tract or parcel of land, situate, in Wythe District, Elizabeth City County, Virginia, a part of the property assigned to the said Elizabeth R. Wainwright in the division of the Estate of the late Mrs. Lucetta Williams located on the Southerly side of the Sawyer's Swamp Road between Hampton and New Market, fronting thereon a distance of seventy-eight and one half (78.5) feet; and running back to the line dividing the woodland from the open land; as shown on Plat of the Estate of Mrs. Lucetta Williams, recorded in the Clerk's Office of Hampton, (formerly Elizabeth City County, Virginia), in Deed Book 62, Page 164; said parcel measuring sixty-three and three tenths (63.3) feet on the rear; but the said Elizabeth R. Wainwright expressly reserves for herself, her heirs and assign, a convenient right-of-way from the said Main County Road over the land hereby conveyed to the woodland belonging to her as shown on said Plat. PROPERTY KNOWN AS: 1534 West Queen St., Hampton, VA 23669

RPC: 2000008

Legal Description: 1540 West Queen Street

ALL THAT certain lot, piece or parcel of land, situate, lying and being in the City of Hampton, Virginia, fronting on the North side of West Queen Street (formerly known as New Market Road) a distance of 84.5 feet, being all of parcel number four (4) as shown on that certain plat entitled, "PLAT OF LUCETTA WILLIAMS ESTATE, SITUATE AT NEW MARKET WYTHE DISTRICT, ELIZABETH CITY COUNTY, VIRGINIA,"

dated October 21, 1917, and made by Girard Chambers, C.E., which said plat is recorded in the Clerk's Office of the Circuit Court for the City of Hampton, Virginia, in Deed Book 62, at Page 164, which reference is here made.

LESS AND EXCEPT that certain piece of parcel of land conveyed to the City of Hampton, Virginia, for the purpose of widening West Queen Street said instrument dated April 5, 1957 and recorded in the aforesaid Clerk's Office in Deed Book 259, Page 52, on April 9, 1957 and LESS AND EXCEPT property given to the City of Hampton recorded in the aforesaid Clerk's Office in Deed Book 597, Page 541, recorded May 27, 1981.

It being the same property conveyed unto Rob the Builder, Inc. by deed from Douglas L. Morrison, et us, dated September 22, 2014, and recorded in the aforesaid Clerk's Office at Instrument No. 140011216.

RPC: 2000006

Legal Description: 1538 West Queen Street

ALL THAT certain lot, piece or parcel of land lying, situate and being in the City of Hampton, Virginia, fronting on the Northerly side of West Queen Street a distance approximately 67.14 feet and running back therefrom in parallel, or nearly paralleled, lines to the creek; being bounded on the North by the creek; on the East by the property now or formerly of S. Hotie Mitchell, III; on the South by West Queen Street; and on the West by the property now or formerly belonging to Mewborn. Being the remainder of parcel No. 3 – Elizabeth R. Wainwright lying on the North side of the County Road (West Queen Street) as shown on a certain plat entitled "Plat of Lucetta Williams' Estate Situated at New Market, Wythe Dist. Eliz. City Co, VA." Made by Girard Chambers, Co. Surveyor, dated October 31, 1917, and recorded in the Clerk's Office of the Circuit Court of the City of Hampton, Virginia, in Deed Book 62, page 164. Being the undivided one-third interest in the aforesaid real estate devised unto Steven M. James under item Fourth in the Last Will and Testament of Virginia D. Mitchell dated December 11, 1975 and recorded in the aforesaid Clerk's Office in Will Book 40, page 270.

Subject to all easements and restriction of record affecting the property.

Together with all and singular the buildings and improvement thereon, rights and privileges, tenements, hereditaments, easements and appurtenances thereunto belonging or in anywise appertaining.

It being the same property conveyed unto Old Town Development, LLC, by deed from R. Wayne Johnson, et al, dated January 20, 2015, and recorded in the aforesaid Clerk's Office at Instrument No. 150001533.

RPC: 2000007

Narrative Statement
January 22, 2026

Currently Old Town Development LLC owns three parcels of land located at 1534 W Queen Street, 1538 W Queen Street and 1540 W Queen Street. LRSN for the respective properties is 1534 W. Queen Street – 2000008, 1538 W. Queen Street - 2000007 and 1540 W. Queen Street is 2000006.

Two tracts of land have existing homes which are currently uninhabitable. One tract of land is a vacant lot. The lots that are located at 1538 W Queen Street and 1540 W Queen Street are zoned MD-4. The lot located at 1534 W Queen Street is zoned R-13.

Old Town Development, LLC proposes to combine all three properties into one tract of land and rezone the combined property to MD-4 to allow construction of one apartment building with a total of 68 units.

The approximate total size of the project site is 6.19 acres. The proposed development would only utilize 1.75 acres of the total site. This would allow for 4.44 acres for undeveloped green space and water.

The requested rezoning conforms to the Hampton Community Plan which designates this area as high-density residential.

Anticipated impact on adjacent properties: none

Anticipated impact on city services: none

Proposed use of site: Apartment complex consisting of one 4-story, 68-unit building with parking.

The building will have the following exterior architectural features:

- Brick
- Fiber-cement siding
- Maintenance-free vinyl windows
- 30-Year architectural asphalt shingles
- Standing seam metal accent roofing
- Composite decking
- Vinyl railing
- Maintenance-free exterior cornice
- Entry pergola with bench seating
- HVAC systems will be located in balcony mechanical closets with wall venting.

The buildings will have the following interior features:

- Entry lobby
- Mail Center
- Fitness facility
- Conference Room
- Activity Room
- Elevator
- Eight and nine-foot ceilings
- Solid surface countertops
- LED lighting

Site improvement will include the following:

- Site would include a Mulch walking path to Newmarket Creek where tenants could utilize as a sitting area and/or kayak launch.
- Site will be professionally landscaped.
- Site will have LED parking lot lighting and LED building lighting per City of Hampton ordinance.
- Site will have Two EV charging stations.
- Dumpster will be screened by a brick dumpster enclosure matched to the building with composite gates. Landscaping will also be used to screen dumpster enclosure.
- The site will incorporate pavers in some select areas of the parking lot.
- The site stormwater runoff will be controlled by underground detention.

PROPERTY INFORMATION

PIN: 2000006
ADDRESS:
1540 W QUEEN STREET
HAMPTON, VIRGINIA 23669
ZONING MD-4 (Multifamily Residential)
PIN: 2000007
ADDRESS:
1538 W QUEEN STREET
HAMPTON, VIRGINIA 23669
ZONING MD-4 (Multifamily Residential)
PIN: 2000008
ADDRESS:
1534 W QUEEN STREET
HAMPTON, VIRGINIA 23669
ZONING R-13 (One Family Residential)



LANDSCAPE LEGEND

- CANOPY TREE (2.5" MIN. CALIPER)
- ORNAMENTAL TREE (2.5" MIN. CALIPER)
- SHRUB (24" MIN. HEIGHT)

LEGEND
IPF=IRON PIPE FOUND
IRF=IRON ROD FOUND

COMMERCIAL ENTRANCE SKETCH
WEST QUEEN STREET
DEVELOPMENT

Scale: 1"=30'
Date: 10/22/2025
Job Number: 20-496
Drawn By: WSF
Sheet Title:

CONCEPTUAL

Sheet Number:
C001

CONCEPTUAL

CONCEPTUAL



REVISION / COMMENT / NOTE

ELEVATIONS
Scale 1/8" =1'-0"

LPS
LAND PLANNING SOLUTIONS
JON BENGTON
5857 HARBOUR VIEW BLVD.
SUITE 202
SUFFOLK, VA 23435
757-935-9014

**WEST QUEEN
STREET**

PROPOSED 4 STORY BRICK AND FRAME
APARTMENT BUILDING PREPARED FOR:
ROB LANG DEVELOPMENT
THESE PLANS ARE THE PROPERTY OF LAND
PLANNING SOLUTIONS, INC. THE DUPLICATION,
REPRODUCTION, COPYING, SALE, RENTAL,
LICENSING OR ANY OTHER DISTRIBUTION OR USE
OF THESE DRAWINGS WITHOUT THE WRITTEN
CONSENT OF LAND PLANNING SOLUTIONS, INC.
IS PROHIBITED UNLESS EXPRESSLY AUTHORIZED IN
WRITING BY JONATHAN W. BENGTSON.

A1

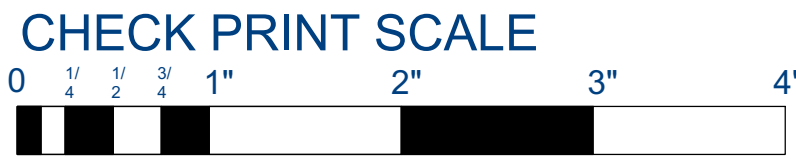
5/26/2025



Front Elevation



Rear Elevation



ELEVATIONS
Scale 1/8" =1'-0"



Left Elevation



Right Elevation



JON BENGTON
5857 HARBOUR VIEW BLVD.
SUITE 202
SUFFOLK, VA 23435
757-935-9014

WEST QUEEN
STREET

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A2

5/26/2025





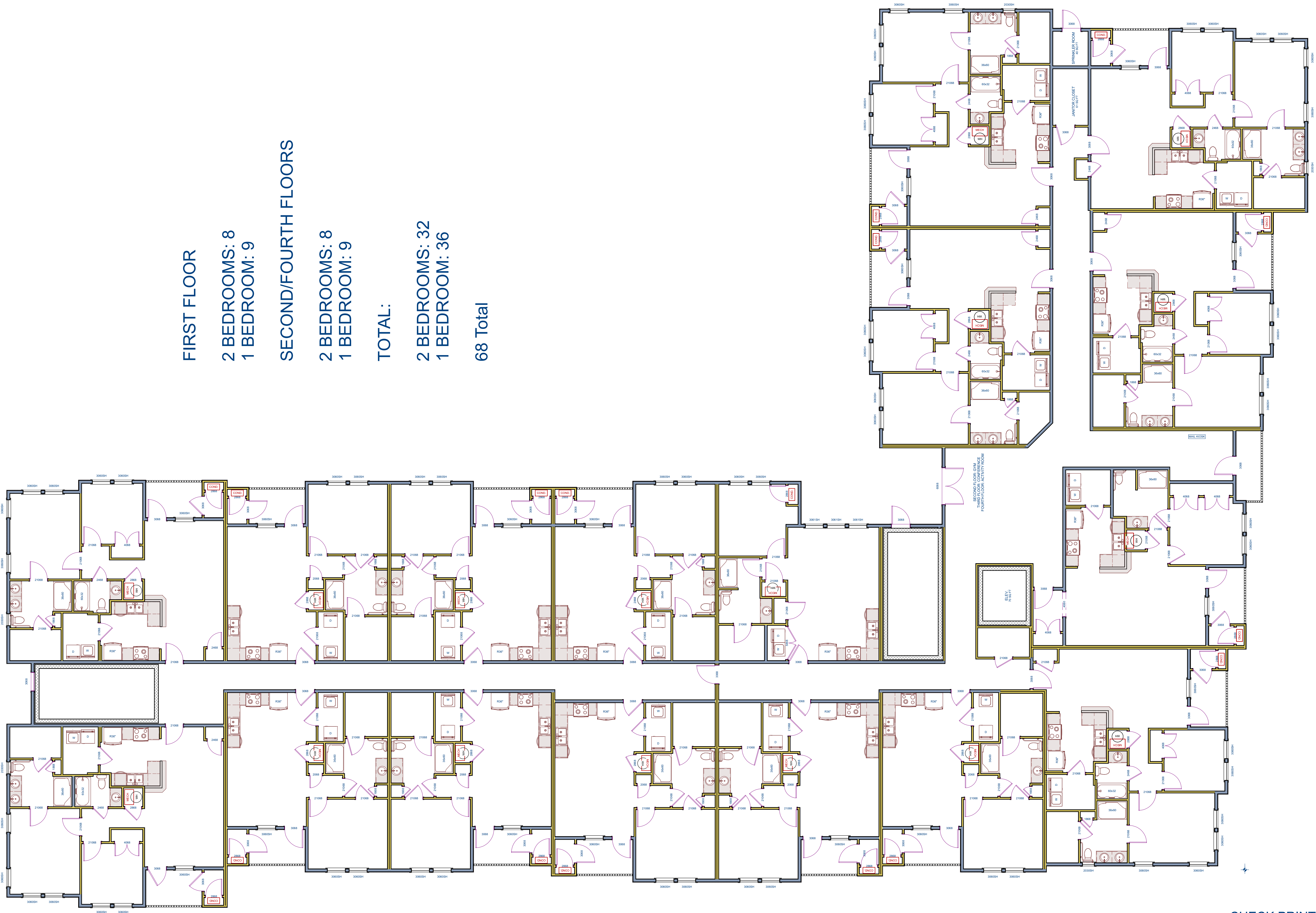
JON BENGTON
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757-935-9014

WEST QUEEN
STREET

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SOLUTIONS, INC. IS PROHIBITED UNLESS EXPRESSLY AUTHORIZED IN
WRITING BY JONATHAN W. BENGTON.

A3

5/26/2025



FIRST FLOOR
2 BEDROOMS: 8
1 BEDROOM: 9
SECOND/FOURTH FLOORS
2 BEDROOMS: 8
1 BEDROOM: 9
TOTAL:
2 BEDROOMS: 32
1 BEDROOM: 36
68 Total





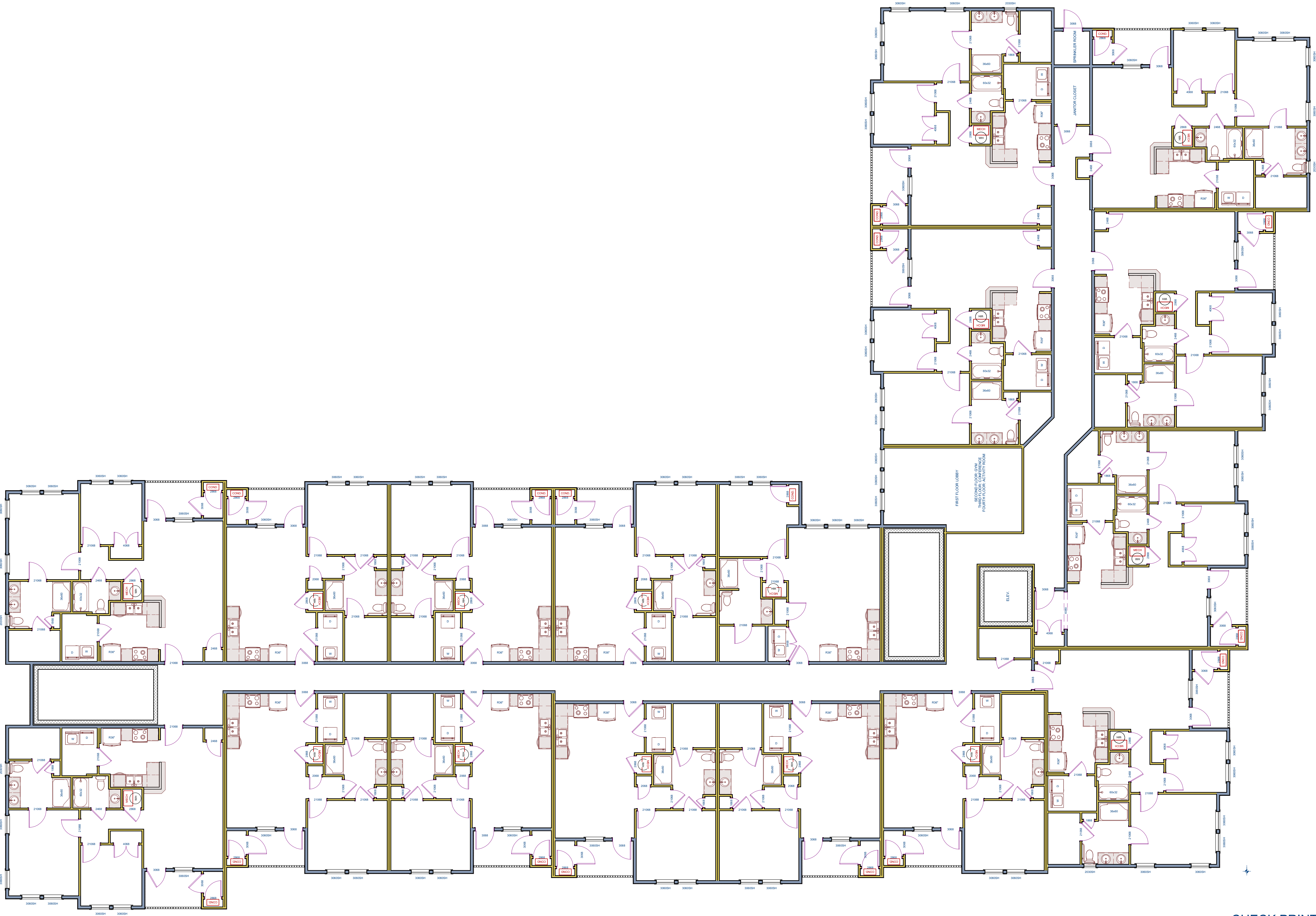
JON BENGTSON
5857 HARBOUR VIEW BLVD.
SUITE 202
SUFFOLK, VA 23435
757-935-9014

WEST QUEEN
STREET

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THE WRITTEN CONSENT OF LAND PLANNING
SOLUTIONS, INC. IS HEREBY EXPRESSLY
PROHIBITED UNLESS EXPRESSLY AUTHORIZED IN
WRITING BY JONATHAN W. BENGTSON.

A4

5/26/2025



1/8" = 1'-0"



NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: Rob Lang Builder		File Number: NAO-2016-0064	Date: 18NOV2024
Attached is:			See Section below
	INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)	A	
	PROFFERED PERMIT (Standard Permit or Letter of permission)	B	
	PERMIT DENIAL	C	
	APPROVED JURISDICTIONAL DETERMINATION	D	
X	PRELIMINARY JURISDICTIONAL DETERMINATION	E	

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at <http://www.usace.army.mil/Missions/CivilWorks/RegulatoryProgramandPermits/appeals.aspx> or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- **ACCEPT:** If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- **OBJECT:** If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- **ACCEPT:** If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- **APPEAL:** If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- **ACCEPT:** You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- **APPEAL:** If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

If you have questions regarding this decision and/or the appeal process you may contact:

Ms. Sayward McLaughlin
U.S. Army Corps of Engineers – Norfolk District
803 Front Street
Norfolk, VA 23510
(757) 799-9748
sayward.a.mclaughlin@usace.army.mil

If you only have questions regarding the appeal process you may also contact:

Mr. Andrew Dangler
Regulatory Appeals Review Officer
U.S. Army Corps of Engineers
North Atlantic Division – Fort Hamilton
301 John Warren Avenue – First Floor
Brooklyn, New York 11252-6700
Telephone number: (518)487-0215

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.

Signature of appellant or agent.

Date:

Telephone number:



DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NORFOLK DISTRICT
FORT NORFOLK
803 FRONT STREET
NORFOLK VA 23510-1011

November 20, 2024

PRELIMINARY JURISDICTIONAL DETERMINATION

Southern Virginia Regulatory Section
NAO-2016-1318 (Newmarket Creek)

Mr. Robert Lang
c/o Julie Steele, Environmental Specialties Group, Inc.
5007-C #211 Victory Boulevard
Yorktown, VA 23693

Dear Robert Lang:

This letter is in regard to your request for a preliminary jurisdictional determination for waters of the U.S. (including wetlands) on two parcels totaling approximately 5.445 acres located at 1534, 1538, and 1540 W. Queen Street in Hampton, Virginia (PIN #'s: 2000006 and 2000007 and 2000008) hereinafter referred to as project area.

The map entitled "Wetland Delineation 1540, 1538, 1534 West Queen Street, Virginia", by Environmental Specialties Group Inc. dated January 26, 2023, and received by the U.S. Army Corps of Engineers (Corps) on October 1, 2024 (copy enclosed) provides the approximate location of the aquatic resources within the project area referenced above. This letter is not confirming the Cowardin classifications of these aquatic resources. These aquatic resources exhibit wetland criteria as defined in the 1987 Corps of Engineers Wetland Delineation Manual and the Atlantic and Gulf Coastal Plain Regional Supplement. This site also contains aquatic resources with an ordinary high-water mark (or high tide line).

This preliminary jurisdictional determination and associated aquatic resource delineation map may be submitted with a permit application.

Please note we are providing information under 1 and 2 below based on the preliminary data you submitted to the us relative to project boundaries and plans. Consequently, these findings and recommendations are subject to change if the project scope changes, new information becomes available, or new species are added.

1. A search of the Virginia Department of Historic Resources data revealed that:

☐ No known historic properties are located on the property.

☒ Tribal consultation may be required.

☒ The following known architectural resources are located on the property: 114-5297

- ☐ The following known archaeological resources are located on the property:
- ☐ The following known historic resources are located in the vicinity of the property (potential for effects to these resources from future development):
- 2. A search of the data supplied by the U.S. Fish & Wildlife Service, the Virginia Department of Conservation and Recreation and the Virginia Department of Wildlife Resources revealed that:
 - ☐ No known populations of threatened or endangered species are located on or within the vicinity of the subject property.
 - ☒ The following federally listed species may occur within the vicinity of the subject property: **Northern Long-eared bat** and **Tricolored bat** (proposed endangered)
 - ☐ The following state-listed (or other) species may occur within the vicinity of the subject property:

Please be aware that you may be required to obtain a Corps permit for any discharge of dredged and/or fill material, either temporary or permanent, into a water of the U.S. In addition, you may be required to obtain a Corps permit for certain activities occurring within, under, or over a navigable water of the U.S. subject to the Section 10 of the Rivers and Harbors Act. Furthermore, you may be required to obtain state and local authorizations, including a Virginia Water Protection Permit from the Virginia Department of Environmental Quality (DEQ), a permit from the Virginia Marine Resources Commission (VMRC), and/or a permit from your local wetlands board.

This delineation and preliminary jurisdictional determination may not be valid for the Wetland Conservation Provisions of the Food Security Act of 1985, as amended. Therefore, if you or your tenant are US Department of Agriculture (USDA) program participants, or anticipate participation in USDA programs, you should discuss the applicability of a certified wetland determination with the local USDA service center, prior to starting work.

The Norfolk District has relied on the information and data provided by Environmental Specialties Group, Inc. to make this preliminary determination. If it is determined such information and data are materially false or materially incomplete, a new preliminary determination would be necessary.

This is a preliminary jurisdictional determination and is not a legally binding determination regarding whether Corps jurisdiction applies to the aquatic resources in question. To determine Corps' jurisdiction, you may request and obtain an approved jurisdictional determination.

This delineation of aquatic resources can be relied upon for no more than five years from the date of this letter. New information may warrant revision. Enclosed is a copy of the "Preliminary Jurisdictional Determination Form". Please review the document, sign, and return one copy to the Corps, either by email sayward.a.mclaughlin@usace.army.mil or by standard mail to Attn: Sayward McLaughlin, U.S. Army Corps of Engineers, Norfolk District, CENAO-WR-R, 803 Front Street, Norfolk, VA 23510-1011.

If you have any questions, please contact the office either by telephone at (757) 799-9748 or by email at sayward.a.mclaughlin@usace.army.mil.

Sincerely,

Sayward McLaughlin
Southern Virginia
Regulatory Section

Enclosure(s)

Hampton, Virginia

Legend

- Parcels
- Parking on the Lawn Allowed

Wetland Delineation
1540, 1538 and 1534 West
Queen Street, Hampton, Virginia
Date: 1-23-2023
Prepared by: Environmental
Specialties Group, Inc.
ESG Project Number: 8539
Source: City of Hampton GIS

x = Data Station
U = Upland
W = Wetland

Feet
0 50 100 150 200
1:2,257 / 1"=188 Feet



Title: 8539 - 1540, 1538 and 1534 West Queen Street, Hampton

Date: 1-26-2023

DISCLAIMER: This drawing is neither a legally recorded map nor a survey and is not intended to be used as such. The information displayed is a compilation of records, information, and data obtained from various sources, and City of Hampton is not responsible for its accuracy or how current it may be.



From: [Dexter Williams](#)
To: [Bowen, Carol](#)
Cc: [Mitchell, Jason L.](#); [Newsome, McCord](#); [Whipple, Donald](#); roblangbuilder@yahoo.com; william@landtechresources.com
Subject: [EXTERNAL] Villas At West Queen: TIA & Entrance Design
Date: Thursday, July 7, 2022 10:21:09 AM
Attachments: [0 06-29-22 DRW TIA Villas At West Queen.pdf](#)
[20-496-Concept-REV-Proposed.pdf](#)

Enclosed is TIA for the Villas At West Queen pursuant to our previous discussion on scope of work.

You had asked the following questions regarding the location of the project entrance:

Would the proposed right turn only entrance/exit from the complex be a perpendicular T-intersection with the main roadway to minimize site distance and turning movement issues coming in and out of the complex?

Have you evaluated if the existing right turn lanes on West Queen should be extended past your entrance to minimize the impact of turning vehicles coming in and out of the complex while vehicles on West Queen are shifting over to enter the right turn lanes in the same area? We would like to see your evaluation of this scenario.

The enclosed 20-496-Concept by LRI shows the alignment of the entrance at or nearly at 90 degrees perpendicular to West Queen Street.

The existing double right turn lanes on westbound West Queen Street at Power Plant Parkway are 525 feet of full width double right turn lanes with a 120 foot reverse curve taper. The property frontage lies within the taper length. There is no right of way available to the east of the property to extend these double right turn lanes further to the east.

There is no need for further length on these double right turn lanes to accommodate vehicle queues. There are less than 300 vehicles per hour (vph) on these double right turn lanes in the AM and PM peak hours (300 vph is the general minimum threshold to consider double turn lanes). Queuing results in the TIA for the double right turn lanes are under 100 feet. The existing 525 feet full width length of the turn lanes provides far more storage than needed.

It is possible that the entrance for Villas At West Queen can be separated from the double right turn lanes and taper. Enclosed 20-496-Concept shows a modification of the curb line on West Queen Street to shift the double right turn taper to the west. This shortens the double right turn lane full width from 525 feet to 485 feet. This shortening has no consequence for double right turn lane storage and provides separation between the turning movement for Villas At West Queen and the double right turn lanes.

I would appreciate a phone call to review the entrance geometry with you in particular.

Thanks.

Dexter R. Williams, P. E.
DRW Consultants, LLC
2319 Latham Place

Midlothian, Virginia 23113

O 804-794-7312

C 804-399-1173

Traffic Impact Analysis For Villas At West Queen

CITY OF HAMPTON, VIRGINIA

For:
ROB THE BUILDER, INC.

By:
**DRW Consultants, LLC
Midlothian, VA**

June 29, 2022

Traffic Impact Analysis For Villas At West Queen

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For:
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Midlothian, VA**

June 29, 2022

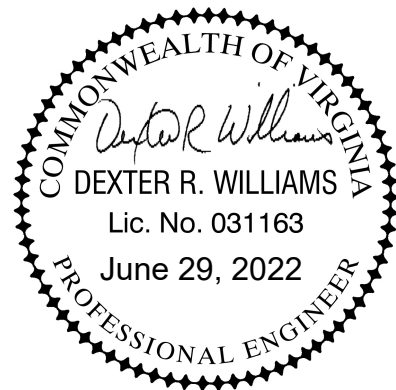
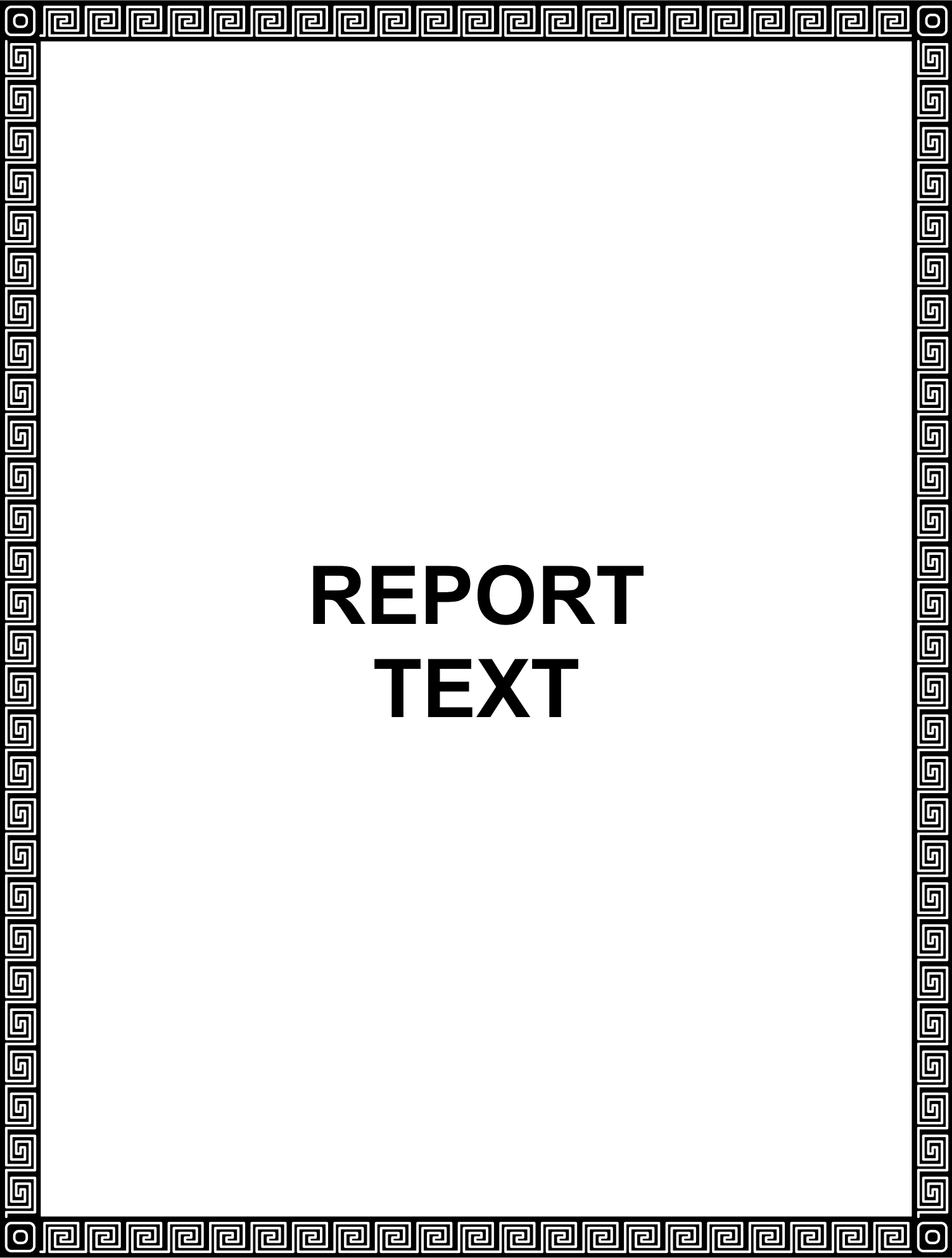


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REPORT TEXT

INTRODUCTION

This traffic impact analysis (TIA) has been prepared to address the effects of rezoning and SUP for Villas At West Queen, a proposed apartment development on West Queen Street. The upper section of Exhibit 1 shows the location of the proposed development in the City of Hampton.

The lower section on Exhibit 1 shows development property on the City parcel map. Two parcels of the property were previously rezoned to permit 38 units with a single right turn in/out entrance on West Queen Street. Those two parcels are shown in blue on lower section of Exhibit 1.

A third parcel shown in yellow on the lower section of Exhibit 1 is now proposed for rezoning to be incorporated in the development. Exhibit 2 shows the proposed development plan by LRI for all three parcels. The LRI plan shows 68 units in a single four-story building proposed for the combined parcels with a right turn in/out entrance on West Queen Street.

TRAFFIC STUDY SCOPE AND TRAFFIC DATA

A traffic study scope of work memo was reviewed by City staff prior to initiating this traffic study. That scope of work is shown on the Appendix Exhibit N series. Following are study scope turning movement count locations (unless otherwise noted) from 7 to 9 AM and 4 to 6 PM on a weekday at the following locations shown on the lower section of Exhibit 1:

1. West Queen Street/Power Plant Parkway/Briarfield Road. This is a signalized intersection and an analysis location. (See Appendix Exhibit B series for tabulated counts).
2. West Queen Street/Buckingham Drive/Hampton Commons Apartments. This is a signalized intersection and an analysis location. (See Appendix Exhibit A series for tabulated counts).
3. West Queen Street/Entrance For Villas At West Queen. This is the future access for the site.

2022 TRAFFIC COUNTS AND ANALYSIS

Appendix Exhibit C shows the 2022 AM and PM peak hour counts on the analysis road network without balance. Exhibit 3 shows the 2022 AM and PM peak hour counts on the analysis road network with balance on West Queen Street.

Traffic analysis in this TIA is structured as follows:

1. The West Queen Street/Power Plant Parkway/Briarfield Road intersection and the West Queen Street/Buckingham Drive/Hampton Commons Apartments intersection are included in a Synchro model for traffic level of service and in SimTraffic for queuing analysis.
2. The entrance to The Villas At West Queen is coded as a right turn in/out unsignalized intersection and site trips are assigned as U-turns at The West Queen Street/Power Plant Parkway/Briarfield Road intersection and the West Queen Street/Buckingham Drive/Hampton Commons Apartments intersection.

Following are software analysis protocols used in this report:

- Traffic signal timing (cycle length, clearance intervals and green time splits) at the two signalized intersections is from signal data provided by the City (see Appendix Exhibit O and P).
- Peak hour factor for overall intersection applied to all movements.
- Truck percentages from traffic counts.
- Maximum queues for SimTraffic results.
- Storage lengths for turning lanes are length of full width storage plus one-half taper lengths in SimTraffic per VDOT TOSAM2 recommendations. (Note: full width turn lane length and taper length are shown on Exhibit 3 and subsequent exhibits).

Following are traffic level of service (LOS) and queuing results for West Queen Street/Power Plant Parkway/Briarfield Road 2022 traffic counts (see Appendix Exhibits J1 and J2 for Synchro report and Appendix Exhibit L1 and L2 for SimTraffic reports):

TABLE 1-1 WEST QUEEN ST/POWERPLANT PKWY/ BRIARFIELD RD - 2022 COUNTS								
SIGNALIZED LOS And Seconds Delay					Maximum Queues			
	AM		PM		Storage	SimTraffic Q&B		
Overall	C	26.7	C	33.2		AM	PM	
EBL/U	C	26.8	C	33.8	220	208	213	
EBT	C	21.7	C	25.8		162	185	
EBR	C	20.6	C	24.2	210	55	59	
WBL/U	C	32.3	D	43.0	220	64	60	
WBT	C	30.7	D	40.6		104	102	
WBR	C	21.2	C	25.8	585	81	95	
NBL	D	41.5	D	47.8	330	138	149	
NBT/R	C	29.5	D	37.4		155	216	
SBL	C	31.2	D	39.6	345	221	296	
SBT	C	24.0	C	28.6		116	176	
SBR	C	23.0	C	25.9	280	78	103	

SimTraffic queue shown is maximum report value for multi-lane groups

The West Queen Street/Power Plant Parkway/Briarfield Road intersection has overall LOS C in the AM and PM peak hours with LOS C and D for all lane groups. All turn lane queues are within storage distance.

Following are traffic level of service (LOS) and queuing results for the West Queen Street/Buckingham Drive/Hampton Commons Apartments intersection 2022 traffic counts (see Appendix Exhibits J1 and J2 for Synchro report and Appendix Exhibit K1 and K2 for SimTraffic reports):

TABLE 1-2 WEST QUEEN ST/BUCKINGHAM DR/NEW HAMPTON COMMONS APTS - 2022 COUNTS							
SIGNALIZED LOS And Seconds Delay					Maximum Queues		
	AM		PM		Storage Length	SimTraffic Q&B	
Overall	A	4.6	A	3.7		AM	PM
EBL/U	A	2.6	A	2.2	140	30	43
EBT	A	3.1	A	2.6		97	105
EBR	A	2.6	A	2.2	125	18	68
WBL/U	A	2.6	A	2.2	205	39	38
WBT/R	A	3.0	A	2.5		82	95
NBL/T	C	23.0	C	24.7		63	55
NBR	C	22.1	C	23.2	230	51	20
SBL/T	C	22.1	C	23.3		43	38
SBR	C	22.1	C	23.3	40	36	35

SimTraffic queue shown is maximum report value for multi-lane groups

The West Queen Street/Buckingham Drive/Hampton Commons Apartments intersection has overall LOS A in the AM and PM peak hours with LOS A and C for all lane groups. All turn lane queues are within storage distance.

2024 BACKGROUND TRAFFIC

The 68-unit project is anticipated to be complete by 2024. Exhibit 4 shows VDOT daily traffic counts and a declining trend from 2015 to 2019 on West Queen Street (2020 counts not used in linear regression analysis due to COVID). Per previous scope of work, a 2% per year growth of traffic counts to 2024 forecast year with 1.04 growth factor is applied to counts for 2024 background traffic forecast as shown on Exhibit 5.

For comparison of 2022 peak hour counts with daily traffic trends, Exhibit 3 shows daily traffic estimates using VDOT k-factors (ratio of peak hour traffic to daily traffic) and PM peak hour counts. The k-factors varied over the 2015 to 2019 period so high and low values are shown on Exhibit 3.

On Power Plant Parkway north of West Queen Street/Briarfield Road, the low-side k-factor 0.93 produces a high-side daily traffic estimate of 20,097 vehicles per day (vpd) and the high-side k-factor 0.105 produces a low-side daily traffic estimate of 17,800 vpd. The high-side daily estimate is consistent the 2019 VDOT count of 20,000 AADT.

On West Queen Street east of Power Plant Parkway, the low-side k-factor 0.91 produces a high-side daily traffic estimate of 12,098 (vpd) and the high-side k-factor 0.104 produces a low-side daily traffic estimate of 10,673 vpd. The low-side daily estimate is consistent the 2019 VDOT count of 10,000 AADT.

Following are traffic level of service (LOS) and queuing results for West Queen Street/Power Plant Parkway/Briarfield Road for 2024 background traffic forecast (see Appendix Exhibits J3 and J4 for

Synchro report and Appendix Exhibit K3 and K4 for SimTraffic reports):

TABLE 2-1 WEST QUEEN ST/POWERPLANT PKWY/ BRIARFIELD RD - 2024 BACKGROUND							
SIGNALIZED LOS And Seconds Delay					Maximum Queues		
	AM		PM		Storage	SimTraffic Q&B	
Overall	C	27.2	C	33.4		AM	PM
EBL/U	C	26.1	D	36.4	220	198	214
EBT	C	21.6	C	29.5		167	229
EBR	C	20.4	C	27.3	210	65	55
WBL/U	C	31.6	D	39.5	220	89	55
WBT	C	31.1	D	44.1		89	109
WBR	C	21.3	C	25.8	585	78	85
NBL	D	43.7	D	48.6	330	133	164
NBT/R	C	31.3	D	36.5		149	209
SBL	C	31.7	D	38.3	345	229	268
SBT	C	24.9	C	27.2		119	174
SBR	C	23.7	C	24.7	280	83	99

SimTraffic queue shown is maximum report value for multi-lane groups

The West Queen Street/Power Plant Parkway/Briarfield Road intersection has overall LOS C in the AM and PM peak hours with LOS C and D for all lane groups. All turn lane queues are within storage distance.

Following are traffic level of service (LOS) and queuing results for the West Queen Street/Buckingham Drive/Hampton Commons Apartments intersection 2024 background traffic forecast (see Appendix Exhibits J3 and J4 for Synchro report and Appendix Exhibit K3 and K4 for SimTraffic reports):

TABLE 2-2 WEST QUEEN ST/BUCKINGHAM DR/NEW HAMPTON COMMONS APTS - 2024 BACKGROUND							
SIGNALIZED LOS And Seconds Delay					Maximum Queues		
	AM		PM		Storage Length	SimTraffic Q&B	
Overall	A	4.6	A	3.7		AM	PM
EBL/U	A	2.6	A	2.2	140	30	54
EBT	A	3.1	A	2.7		100	100
EBR	A	2.6	A	2.2	125	27	42
WBL/U	A	2.6	A	2.2	205	42	44
WBT/R	A	3.0	A	2.5		98	78
NBL/T	C	23.0	C	24.6		75	60
NBR	C	22.1	C	23.1	230	39	20
SBL/T	C	22.1	C	23.2		38	37
SBR	C	22.1	C	23.2	40	35	35

SimTraffic queue shown is maximum report value for multi-lane groups

The West Queen Street/Buckingham Drive/Hampton Commons Apartments intersection has overall LOS A in the AM and PM peak hours with LOS A and C for all lane groups. All turn lane queues are within storage distance.

2024 FORECAST AND ANALYSIS FOR VILLAS AT WEST QUEEN

Trip distribution for Villas At West Queen has been derived from turning movement counts to and from Buckingham Drive. Buckingham Drive provides access to a residential area that does not have any other outlet and provides the best means for determining east/west traffic splits on West Queen Street.

Exhibit 6 shows the trip distributions percentages for Buckingham Drive at West Queen Street. Traffic is generally oriented to the west with the eastern percentage of traffic varying from 17% (PM entering traffic) to 35% (AM exiting traffic).

Because of Villas At West Queen traffic must make U-turns at adjacent intersections, entering and exiting trip percentages overlap. Trip distribution for Villas at West Queen has been separated in the entering and exiting distribution percentages.

Table 1 on Exhibit 8 shows trip generation for the proposed 68 units in Villas At West Queen using Trip Generation Manual, 10th Edition (TGM10) and Table 2 shows trip generation for 68 units Villas At West Queen using Trip Generation Manual, 11th Edition (TGM11). Table 3 on Exhibit 8 shows trip generation for currently approved 38 units in Villas At West Queen using TGM10 and Table 4 shows trip generation for currently approved 38 units in Villas At West Queen using TGM11. The TGM10 values are higher and are used in this study.

PROPOSED 68 UNITS IN VILLAS AT WEST QUEEN

Trip assignments for 68 units in Villas At West Queen are shown for entering traffic on Exhibit 9a, exiting traffic on Exhibit 9b with 2024 total traffic with 68 units on Exhibit 10.

Following are traffic level of service (LOS) and queuing results for West Queen Street/Power Plant Parkway/Briarfield Road for 2024 total traffic with 68 units in Villas At West Queen (see Appendix Exhibits J5 and J6 for Synchro report and Appendix Exhibit K5 and K6 for SimTraffic reports):

TABLE 3-1 WEST QUEEN ST/POWERPLANT PKWY/ BRIARFIELD RD - 2024 68 UNITS							
SIGNALIZED LOS And Seconds Delay					Maximum Queues		
	AM		PM		Storage	SimTraffic Q&B	
Overall	C	27.3	C	33.7		AM	PM
EBL/U	C	26.1	D	36.4	220	192	210
EBT	C	21.6	C	29.2		158	212
EBR	C	20.3	C	27.0	210	61	64
WBL/U	C	32.2	D	39.2	220	74	58
WBT	C	31.2	D	41.6		95	109
WBR	C	21.3	C	25.3	585	99	85
NBL	D	43.7	D	48.6	330	131	166
NBT/R	C	31.3	D	38.0		157	233
SBL	C	31.7	D	39.0	345	255	290
SBT	C	24.9	C	27.9		120	195
SBR	C	23.7	C	25.3	280	78	102

SimTraffic queue shown is maximum report value for multi-lane groups

The West Queen Street/Power Plant Parkway/Briarfield Road intersection has overall LOS C in the AM and PM peak hours with LOS C and D for all lane groups. All turn lane queues are within storage distance.

Following are traffic level of service (LOS) and queuing results for the West Queen Street/Buckingham Drive/Hampton Commons Apartments intersection for 2024 total traffic with 68 units in Villas At West Queen (see Appendix Exhibits J5 and J6 for Synchro report and Appendix Exhibit K5 and K6 for SimTraffic reports):

TABLE 3-2 WEST QUEEN ST/BUCKINGHAM DR/NEW HAMPTON COMMONS APTS - 2024 68 UNITS							
SIGNALIZED LOS And Seconds Delay					Maximum Queues		
	AM		PM		Storage Length	SimTraffic Q&B	
Overall	A	4.6	A	3.7		AM	PM
EBL/U	A	2.7	A	2.3	140	40	46
EBT	A	3.2	A	2.7		93	102
EBR	A	2.6	A	2.2	125	18	40
WBL/U	A	2.6	A	2.2	205	42	51
WBT/R	A	3.1	A	2.6		96	83
NBL/T	C	23.1	C	24.6		68	64
NBR	C	22.1	C	23.1	230	42	25
SBL/T	C	22.1	C	23.2		39	37
SBR	C	22.1	C	23.2	40	36	35

SimTraffic queue shown is maximum report value for multi-lane groups

The West Queen Street/Buckingham Drive/Hampton Commons Apartments intersection has overall LOS A in the AM and PM peak hours with LOS A and C for all lane groups. All turn lane queues are within

storage distance.

At the Villas At West Queen entrance on West Queen Street, there is LOS B for the southbound exiting right turn in the AM and PM peak hours with 36 feet queue in the AM peak hour and 31 feet queue in the PM peak hour.

CURRENTLY APPROVED 38 UNITS IN VILLAS AT WEST QUEEN

Trip assignments for 38 units in Villas At West Queen are shown for entering traffic on Exhibit 11a, exiting traffic on Exhibit 11b with 2024 total traffic with 38 units on Exhibit 12.

Following are traffic level of service (LOS) and queuing results for West Queen Street/Power Plant Parkway/Briarfield Road for 2024 total traffic with 38 units in Villas At West Queen (see Appendix Exhibits J7 and J8 for Synchro report and Appendix Exhibit K7 and K8 for SimTraffic reports):

TABLE 4-1 WEST QUEEN ST/POWERPLANT PKWY/ BRIARFIELD RD - 2024 38 UNITS							
SIGNALIZED LOS And Seconds Delay					Maximum Queues		
	AM		PM		Storage	SimTraffic Q&B	
Overall	C	27.3	C	33.5		AM	PM
EBL/U	C	26.1	D	36.4	220	197	215
EBT	C	21.6	C	29.4		170	238
EBR	C	20.4	C	27.3	210	64	60
WBL/U	C	32.0	D	39.7	220	75	54
WBT	C	31.1	D	44.2		89	108
WBR	C	21.3	C	25.9	585	98	82
NBL	D	43.7	D	48.6	330	128	176
NBT/R	C	31.3	D	36.3		162	223
SBL	C	31.7	D	38.7	345	236	302
SBT	C	24.9	C	27.2		122	180
SBR	C	23.7	C	24.7	280	92	102

SimTraffic queue shown is maximum report value for multi-lane groups

The West Queen Street/Power Plant Parkway/Briarfield Road intersection has overall LOS C in the AM and PM peak hours with LOS C and D for all lane groups. All turn lane queues are within storage distance.

Following are traffic level of service (LOS) and queuing results for the West Queen Street/Buckingham Drive/Hampton Commons Apartments intersection for 2024 total traffic with 38 units in Villas At West Queen (see Appendix Exhibits J7 and J8 for Synchro report and Appendix Exhibit K7 and K8 for SimTraffic reports):

TABLE 4-2 WEST QUEEN ST/BUCKINGHAM DR/NEW HAMPTON COMMONS APTS - 2024 38 UNITS							
SIGNALIZED LOS And Seconds Delay					Maximum Queues		
	AM		PM		Storage Length	SimTraffic Q&B	
Overall	A	4.6	A	3.7		AM	PM
EBL/U	A	2.7	A	2.3	140	34	44
EBT	A	3.2	A	2.7		104	107
EBR	A	2.6	A	2.2	125	15	43
WBL/U	A	2.6	A	2.2	205	44	40
WBT/R	A	3.1	A	2.6		88	87
NBL/T	C	23.1	C	24.6		80	56
NBR	C	22.1	C	23.1	230	47	22
SBL/T	C	22.1	C	23.2		45	34
SBR	C	22.1	C	23.2	40	36	35

SimTraffic queue shown is maximum report value for multi-lane groups

The West Queen Street/Buckingham Drive/Hampton Commons Apartments intersection has overall LOS A in the AM and PM peak hours with LOS A and C for all lane groups. All turn lane queues are within storage distance.

At the Villas At West Queen entrance on West Queen Street, there is LOS B for the southbound exiting right turn in the AM and PM peak hours with 31 feet queue in the AM peak hour and 33 feet queue in the PM peak hour.

SUMMARY AND CONCLUSIONS

Traffic LOS and queuing at the West Queen Street/Power Plant Parkway/Briarfield Road intersection is shown on Exhibit 13 for all scenarios: 2022 counts, 2024 background traffic, 2024 total traffic with 68 proposed units and 2024 total traffic with 38 currently approved units. All scenarios are overall LOS C and there is very little change in queuing between scenarios. There is very little change in seconds delay at the intersection between any scenarios:

- 2022 to 2024 background: AM increase 0.5 seconds, PM increase 0.2 seconds
- 2024 background to 2024 total with 68 units: AM increase 0.1 seconds, PM increase 0.3 seconds
- 2024 total 68 units to 38 units: AM no change, PM decrease 0.2 seconds

Traffic LOS and queuing at the West Queen Street/Buckingham Drive/Hampton Commons Apartments intersection are shown on Exhibit 14 for all scenarios: 2022 counts, 2024 background traffic, 2024 total traffic with 68 proposed units and 2024 total traffic with 38 currently approved units. All scenarios are overall LOS A, there is no change in overall second delay between any scenarios and there is very little change in queuing between scenarios.

In conclusion, there is no change in traffic analysis results between 38 units and 68 units at the West Queen Street/Buckingham Drive/Hampton Commons Apartments intersection and only slight variations at the West Queen Street/Power Plant Parkway/Briarfield Road intersection.



REPORT EXHIBITS

Hampton, Virginia

Legend

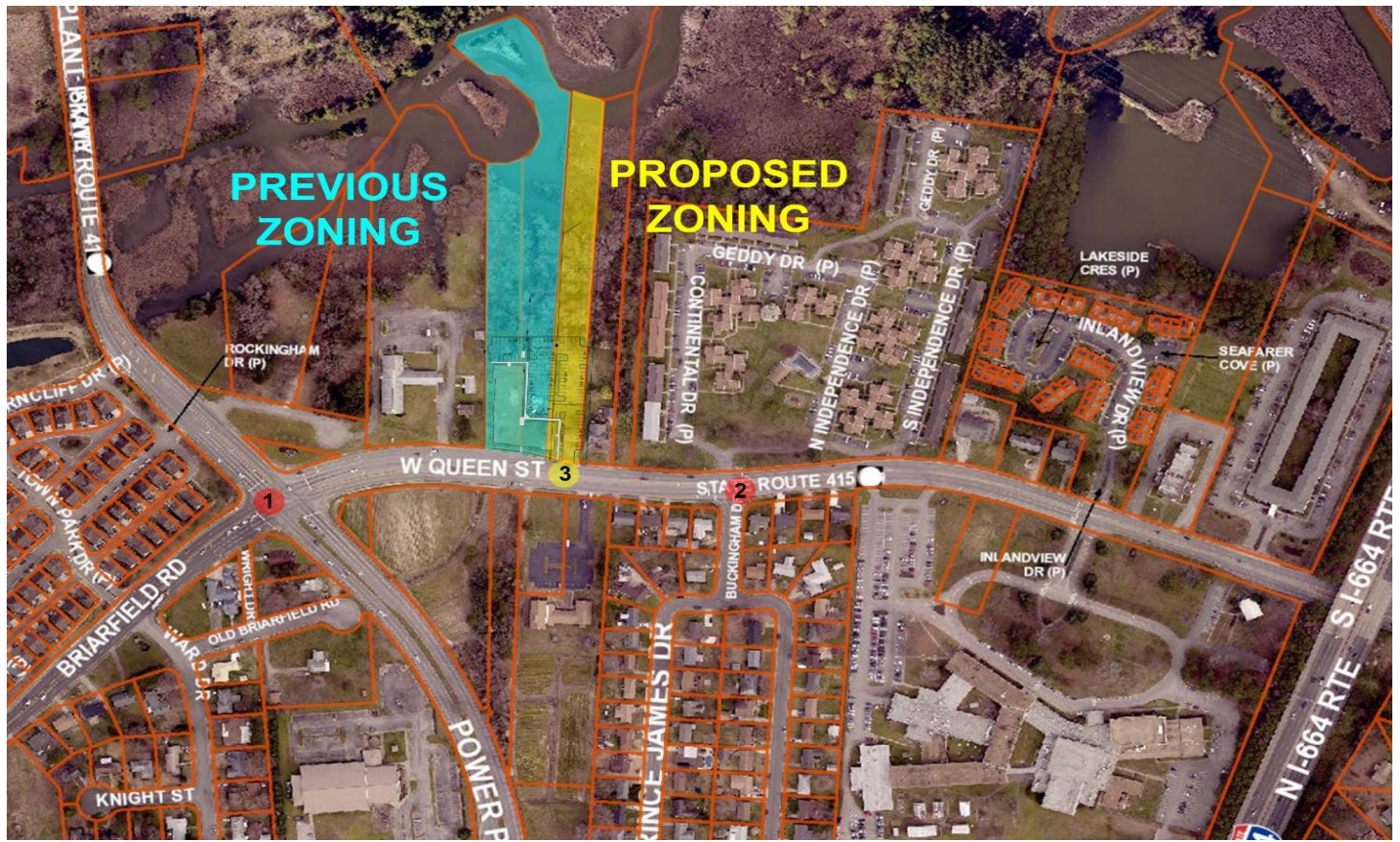
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- No Parking on Lawn
- Parking on Lawn Allowed
- Under Review



Title:

Date: 6/29/2022

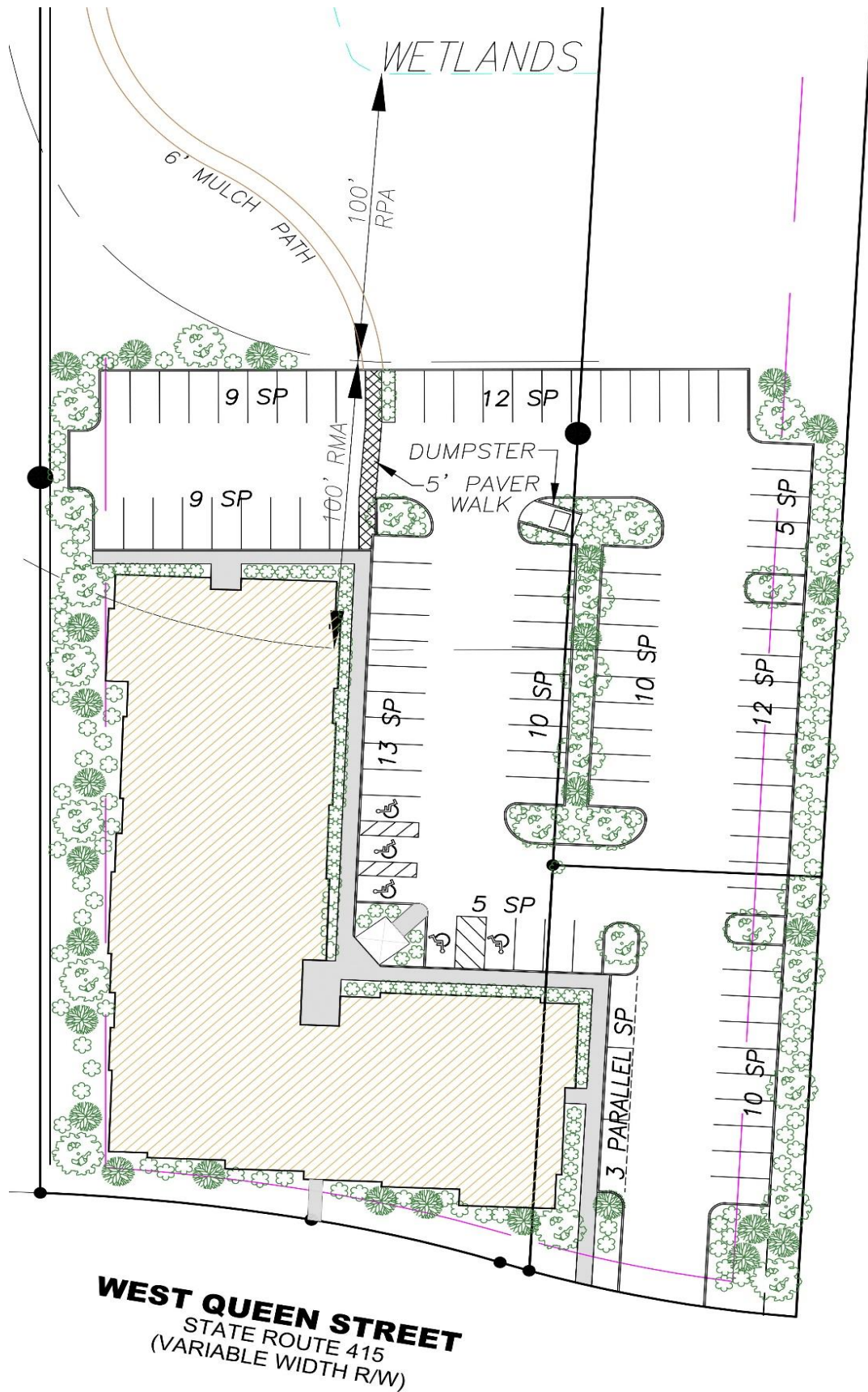
DISCLAIMER: This drawing is neither a legally recorded map nor a survey and is not intended to be used as such. The information displayed is a compilation of records, information, and data obtained from various sources, and City of Hampton is not responsible for its accuracy or how current it may be.



VILLAS AT WEST QUEEN
PROPERTY LOCATION MAPS

DRW Consultants, LLC
804-794-7312

Exhibit 1

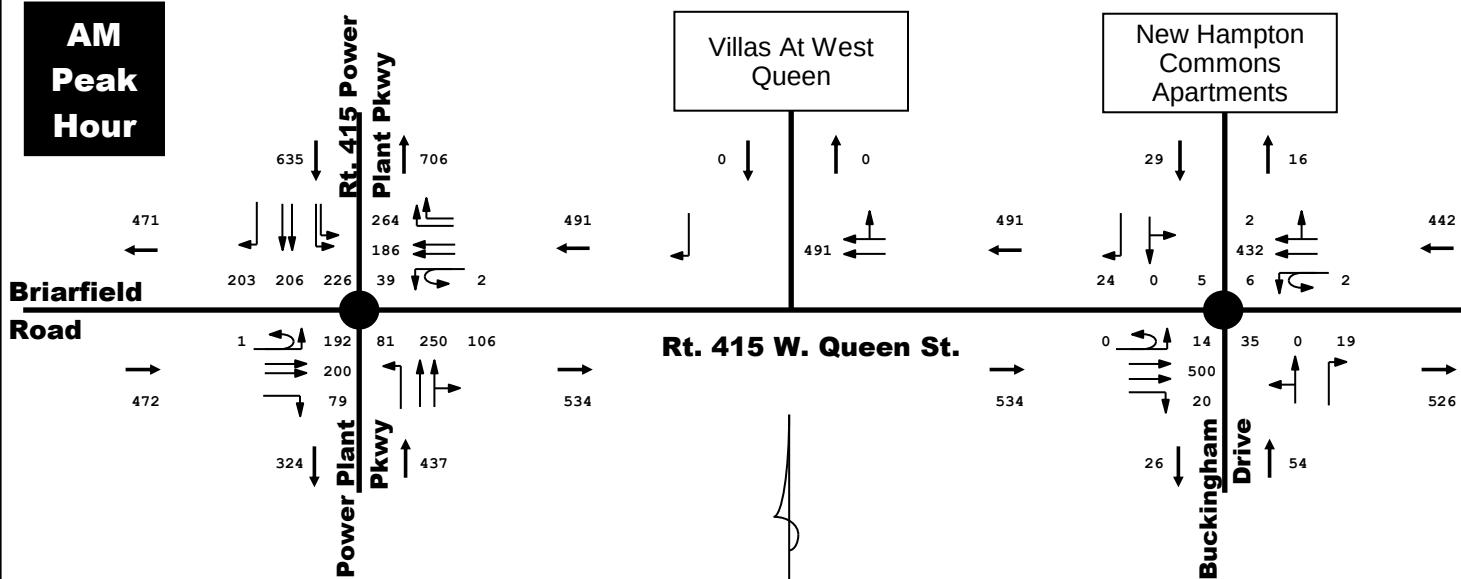


PROPOSED DEVELOPMENT PLAN BY
LANDTECH RESOURCES, INC.

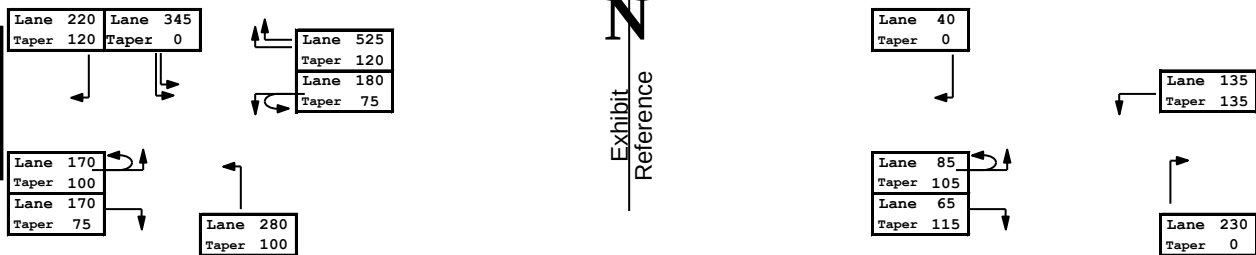
DRW Consultants, LLC
804-794-7312

Exhibit 2

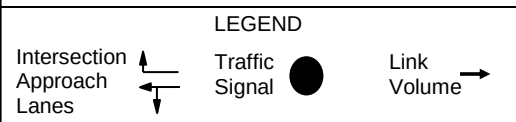
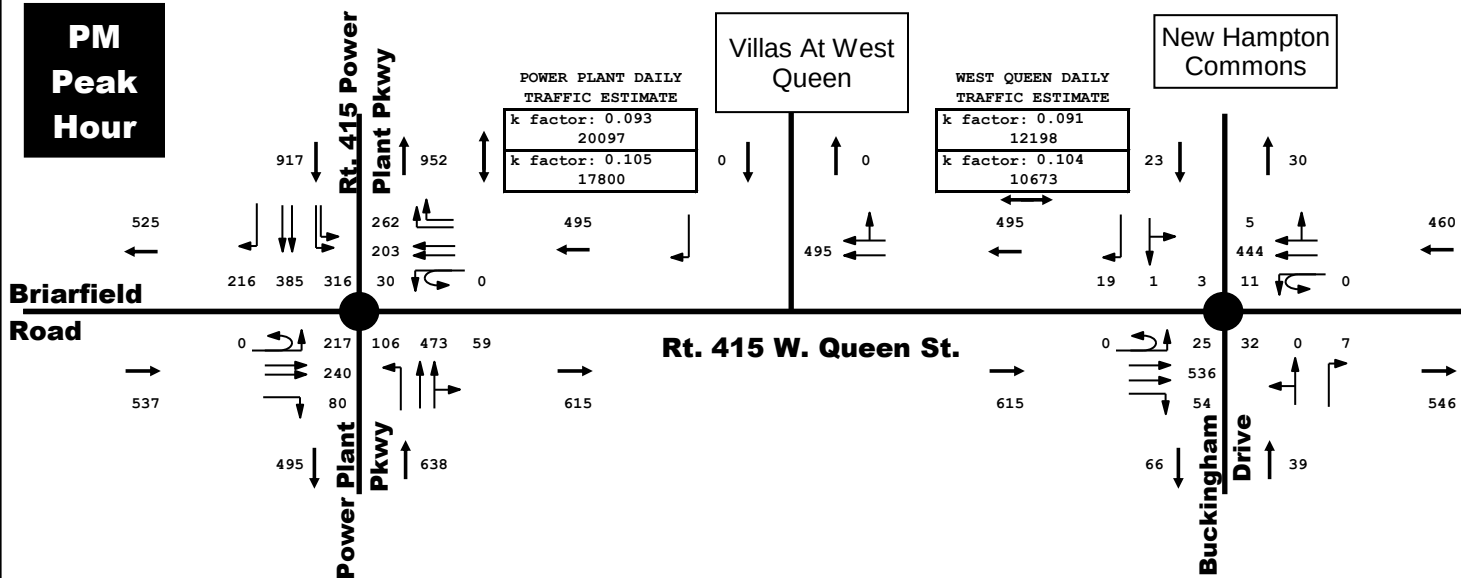
**AM
Peak
Hour**



**Turn
Lanes**



**PM
Peak
Hour**



THURSDAY, MAY 19, 2022
EXISTING PEAK HOUR COUNTS
WITH BALANCE

DRW Consultants, LLC
804-794-7312

Exhibit 3

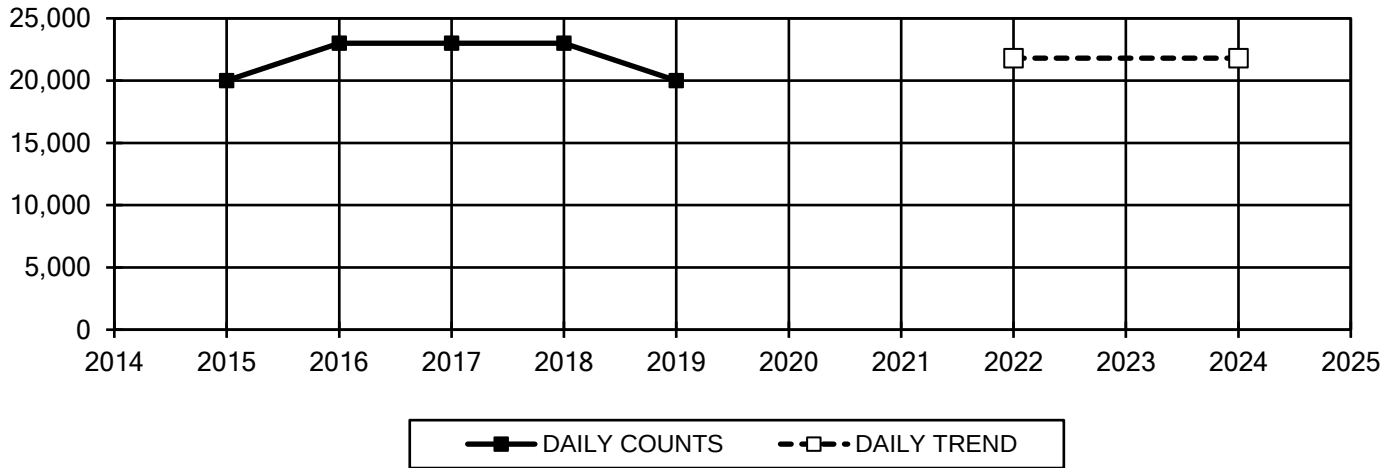
Street: Rt. 415 Power Plant Road
From: Pine Chapel Road
To: Briarfield Road

Street: Rt. 415 West Queen Stret
From: Briarfield Road
To: Michigan Drive

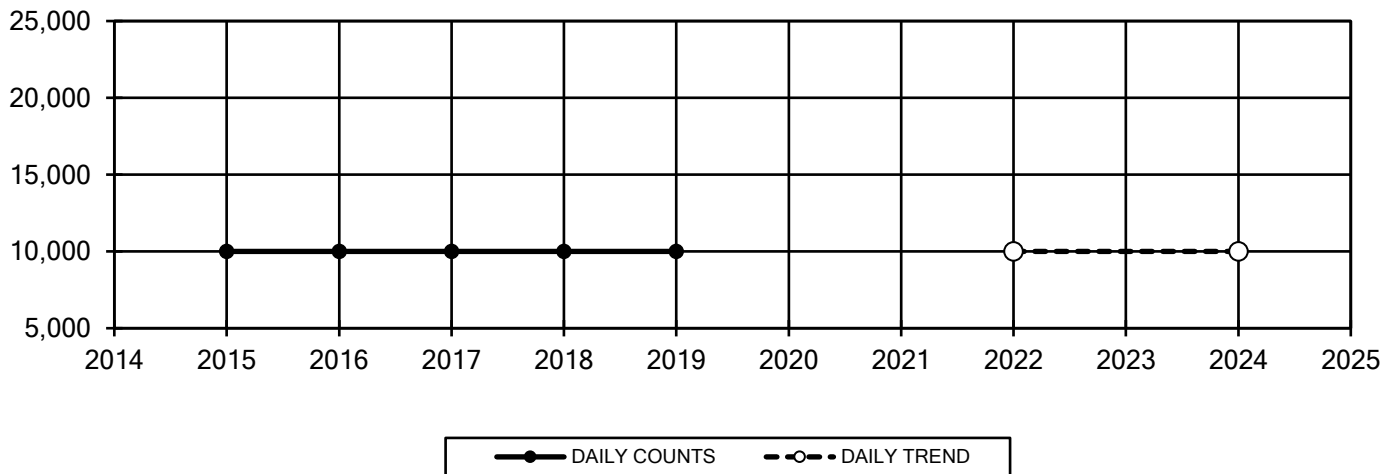
Year	DAILY COUNTS	
2015	20,000	
2016	23,000	
2017	23,000	
2018	23,000	
2019	20,000	
Year	DAILY TREND	
2022	21,800	Δ22
2024	21,800	1.00

Year	DAILY COUNTS	
2015	10,000	
2016	10,000	
2017	10,000	
2018	10,000	
2019	10,000	
Year	DAILY TREND	
2022	10,000	Δ22
2024	10,000	1.00

Power Plant Road From Pine Chapel To Briarfield



W. Queen Street From Briarfield To Michigan Dr



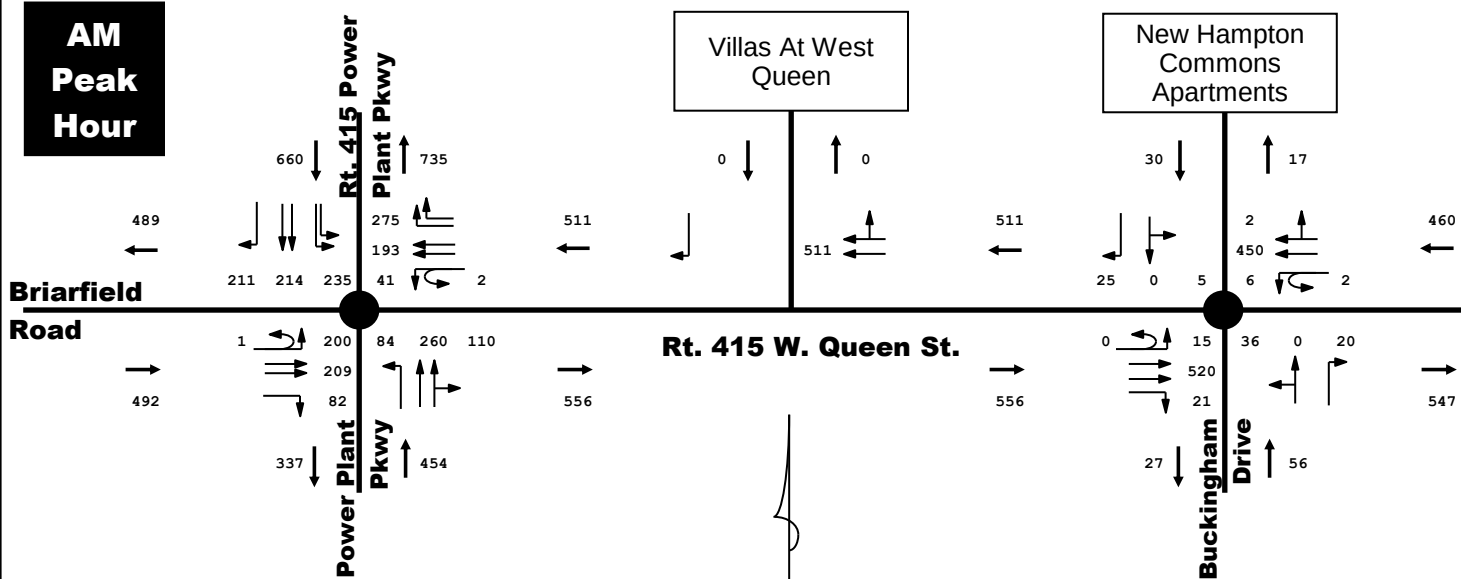
VDOT Average Annual Daily Traffic (AADT) Volume Estimates

RT. 415 POWER PLANT PARKWAY AND WEST QUEEN STREET
DAILY TRAFFIC COUNTS AND TRENDS

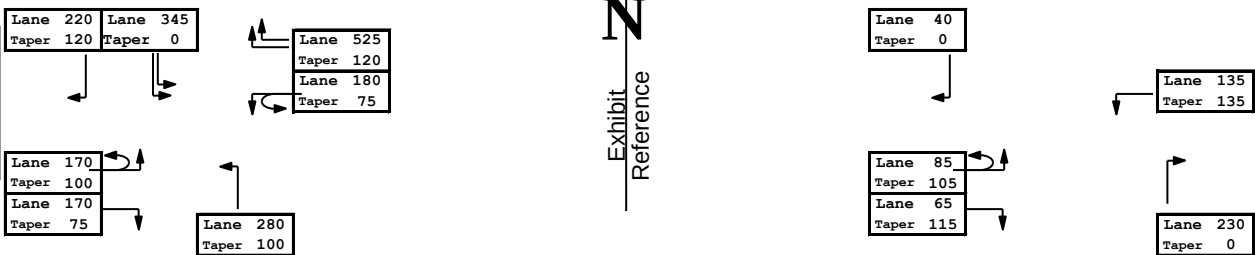
DRW Consultants, LLC
804-794-7312

Exhibit 4

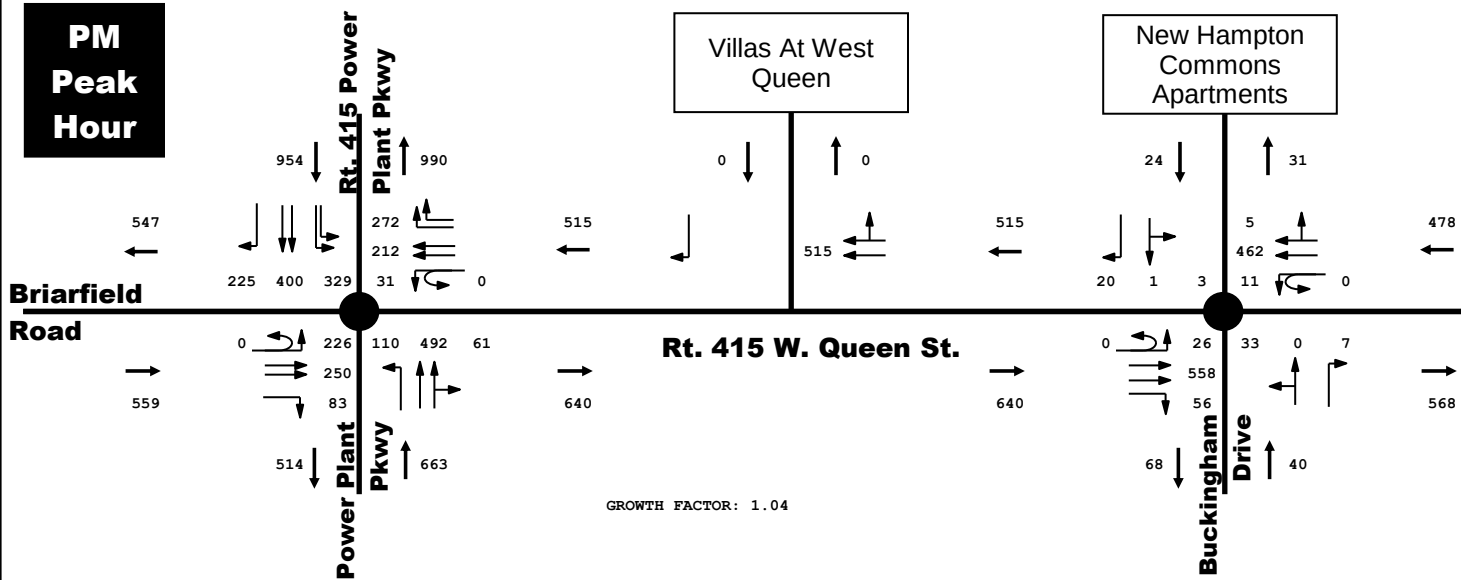
**AM
Peak
Hour**



**Turn
Lanes**



**PM
Peak
Hour**



GROWTH FACTOR: 1.04

LEGEND

Intersection Approach Lanes

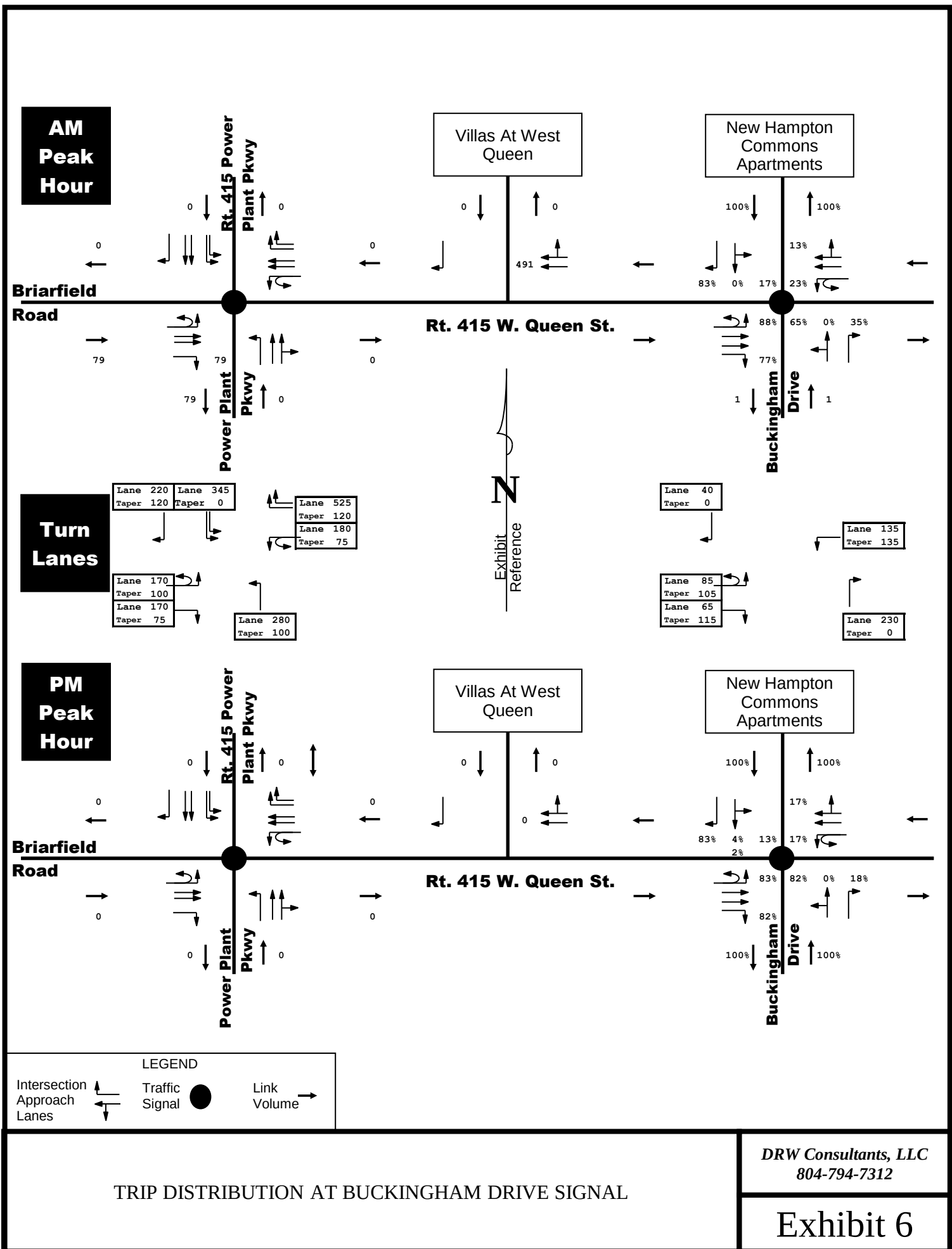
Traffic Signal

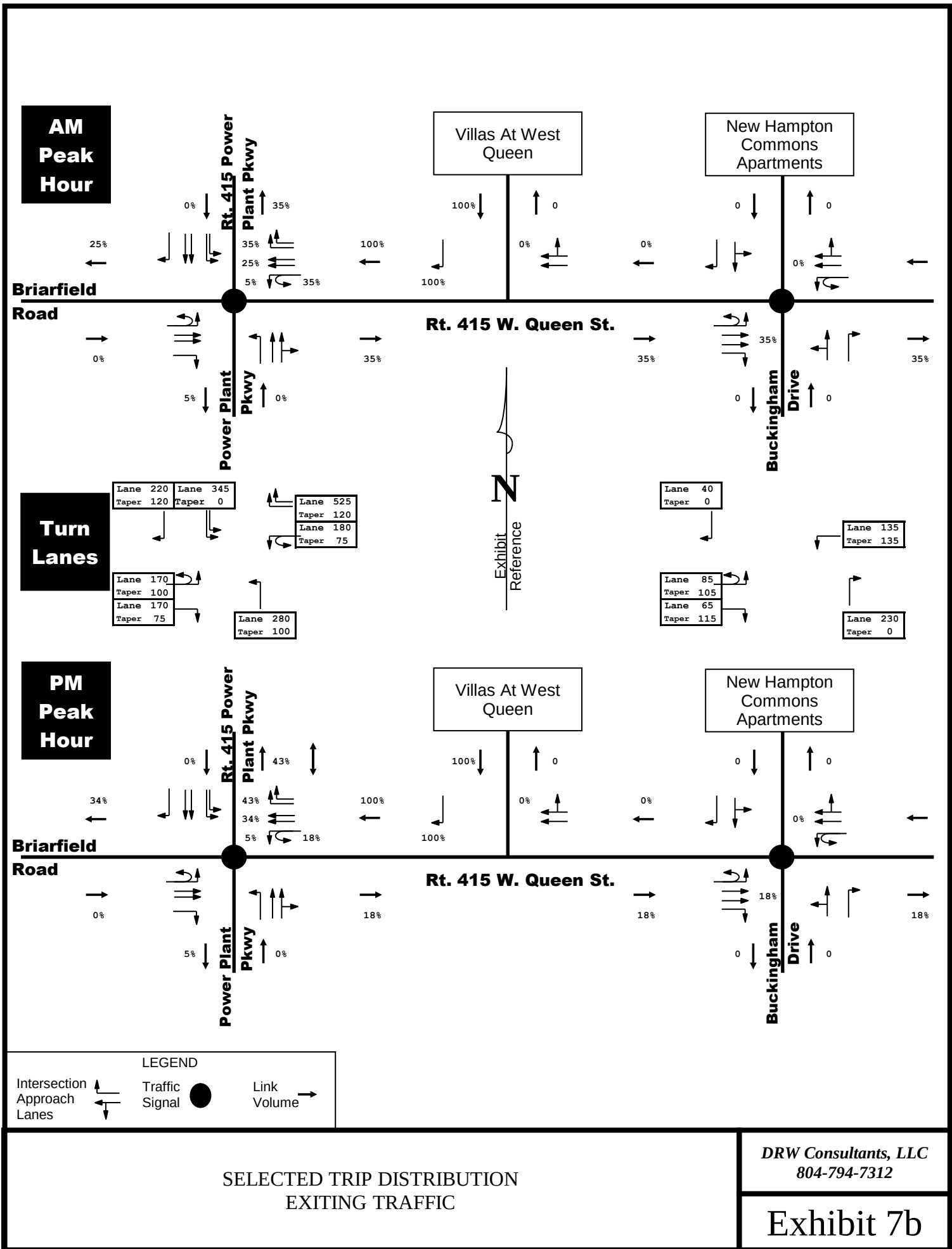
Link Volume

2024 PEAK HOUR BACKGROUND TRAFFIC

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Exhibit 5



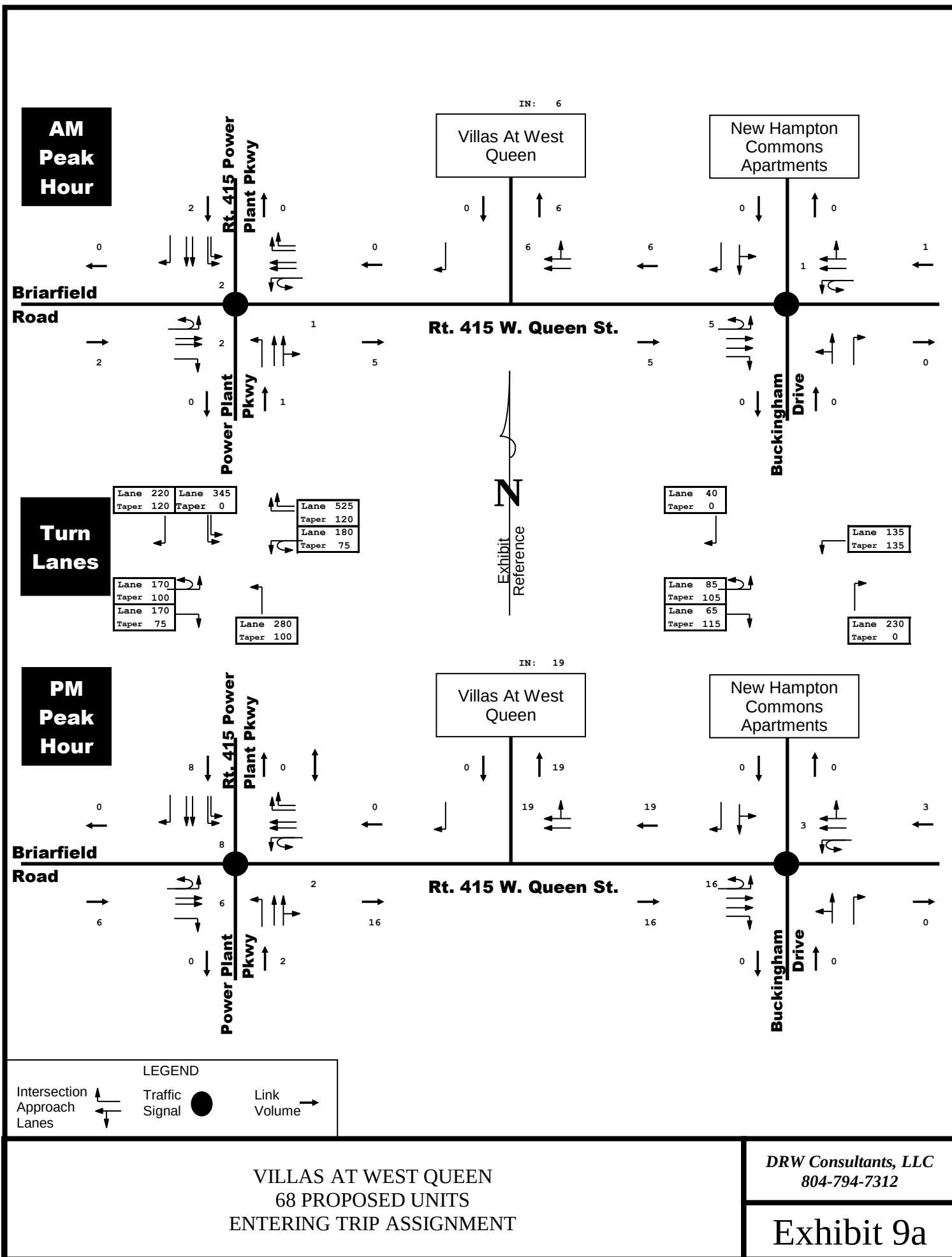


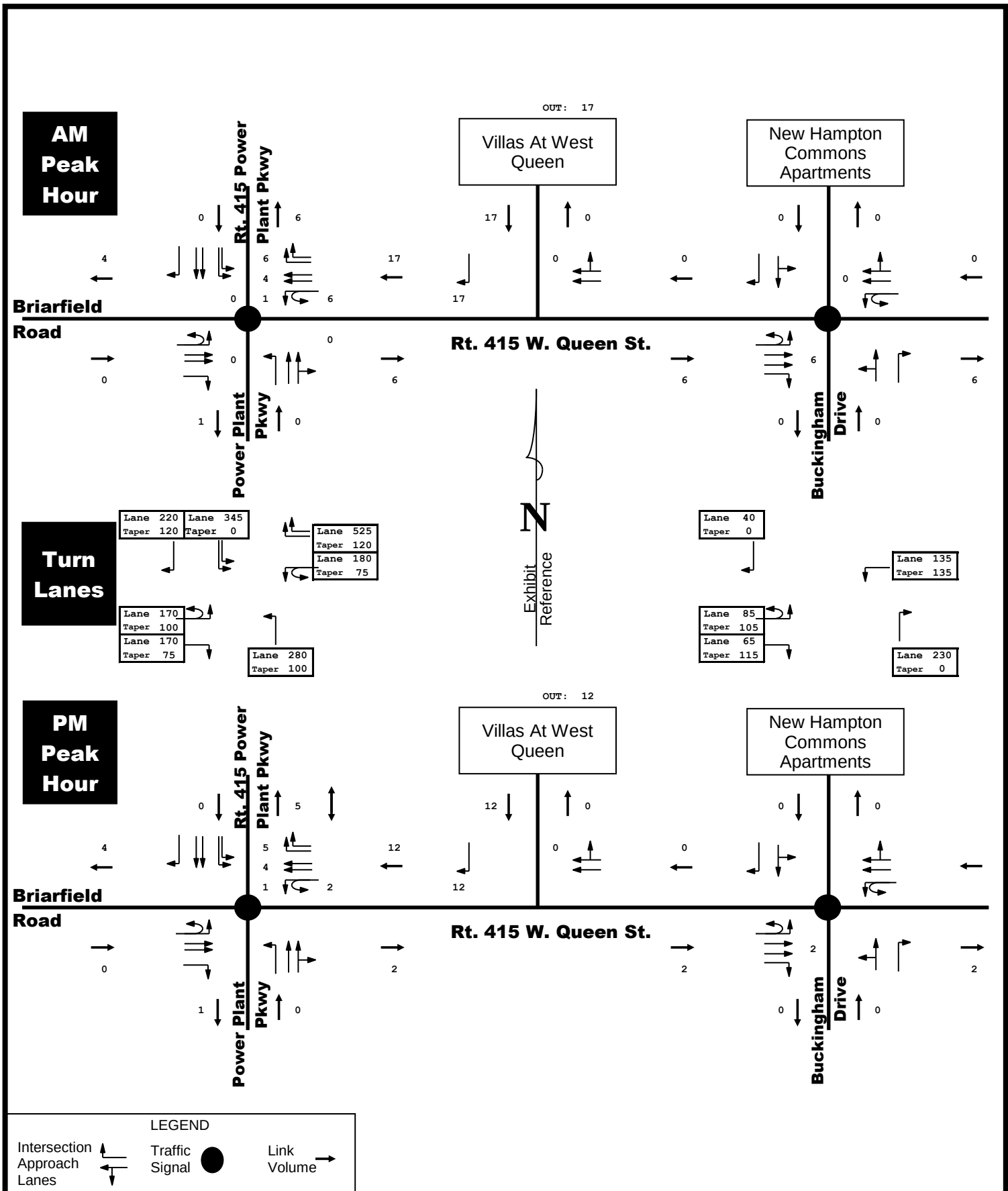
		LAND USE CODE		WEEKDAY TRIP GENERATION						
			SQ.FT., OTHER UNITS	AM PEAK HOUR			PM PEAK HOUR			
VALUE	LAND USE			Enter	Exit	Total	Enter	Exit	Total	DAILY
TABLE 1: TRIP GENERATION MANUAL 10TH EDITION PROPOSED UNITS										
eq.-adj. st.	Multifamily Mid Rise	221	68 units	6	17	23	19	12	31	369
rate-adj. st.	Multifamily Mid Rise	221	68 units	6	18	24	18	12	30	370
TABLE 2: TRIP GENERATION MANUAL 11TH EDITION PROPOSED UNITS										
eq.-adj. st.	Multifamily Mid Rise	221	68 units	4	14	18	16	11	27	278
rate-adj. st.	Multifamily Mid Rise	221	68 units	6	19	25	16	11	27	309
TABLE 3: TRIP GENERATION MANUAL 10TH EDITION CURRENT UNITS										
eq.-adj. st.	Multifamily Mid Rise	221	38 units	3	10	13	10	7	17	205
rate-adj. st.	Multifamily Mid Rise	221	38 units	4	10	14	10	7	17	207
TABLE 4: TRIP GENERATION MANUAL 11TH EDITION CURRENT UNITS										
eq.-adj. st.	Multifamily Mid Rise	221	38 units	1	4	5	9	6	15	135
rate-adj. st.	Multifamily Mid Rise	221	38 units	3	11	14	9	6	15	173

THE VILLAS AT WEST QUEEN
TRIP GENERATION

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Exhibit 8



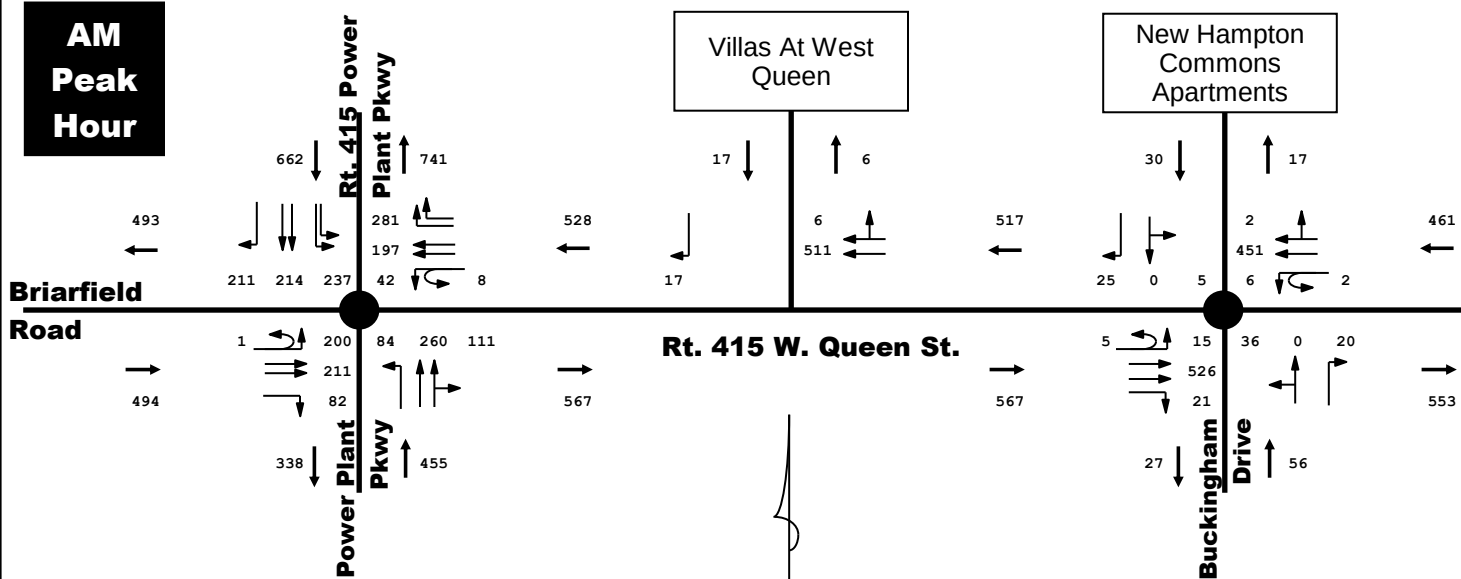


VILLAS AT WEST QUEEN
 68 PROPOSED UNITS
 EXITING TRIP ASSIGNMENT

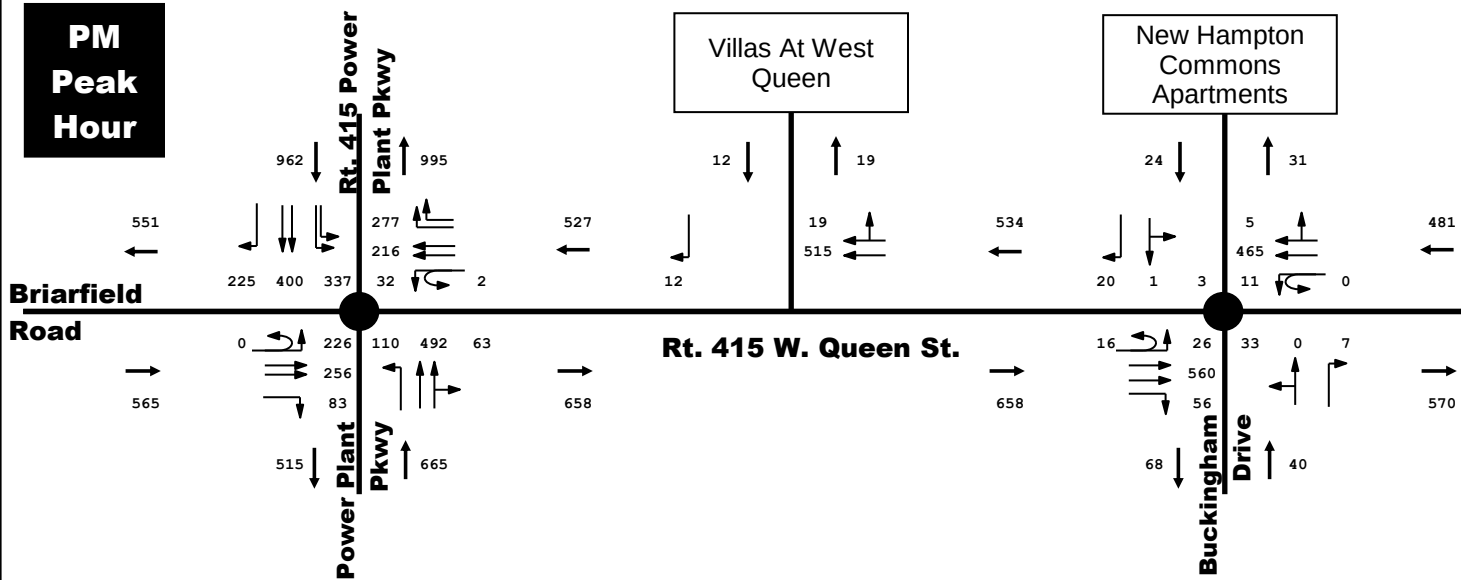
DRW Consultants, LLC
 804-794-7312

Exhibit 9b

**AM
Peak
Hour**



**PM
Peak
Hour**



LEGEND

Intersection Approach Lanes

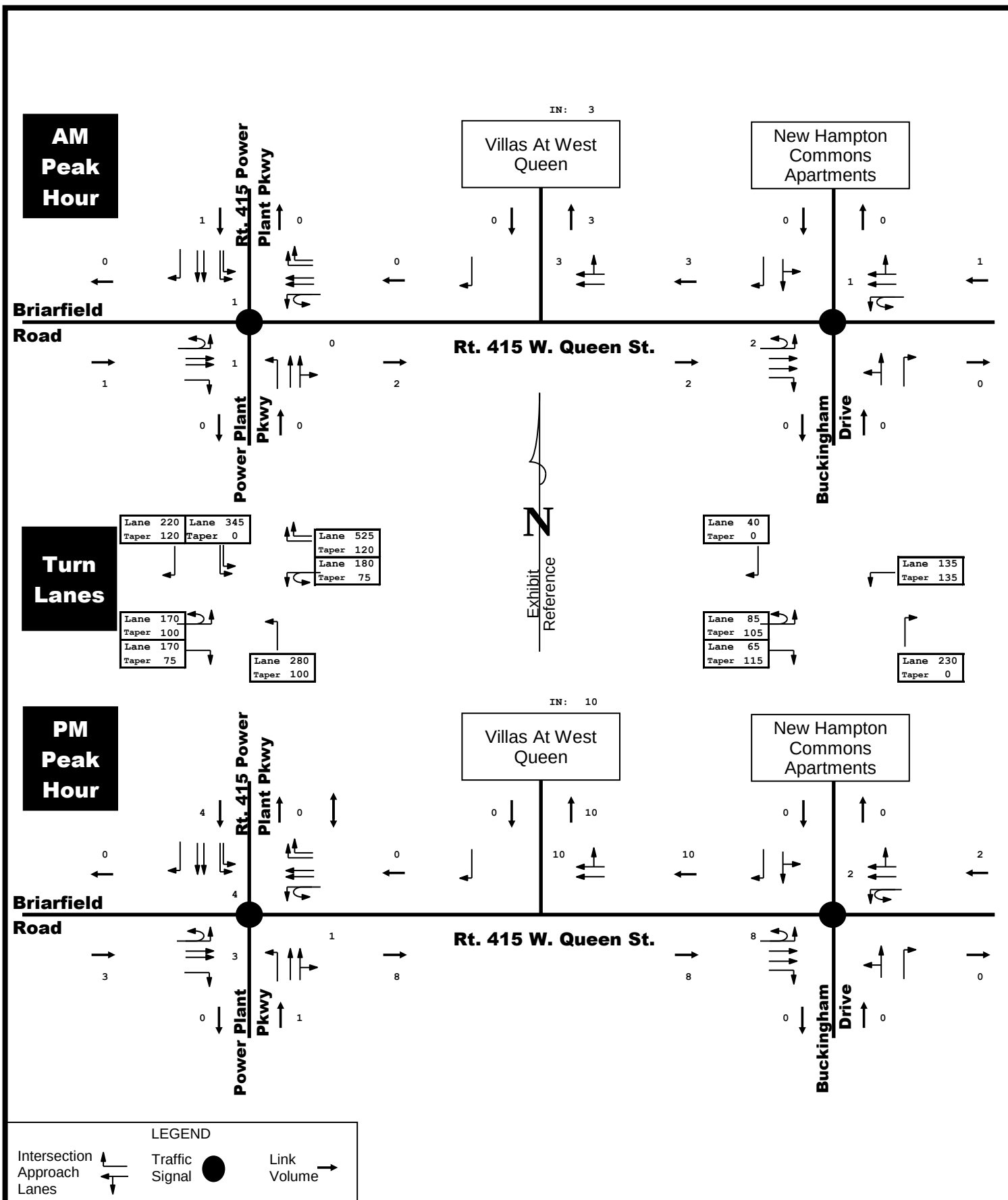
Traffic Signal

Link Volume

2024 TOTAL TRAFFIC
WITH 68 PROPOSED UNITS

DRW Consultants, LLC
804-794-7312

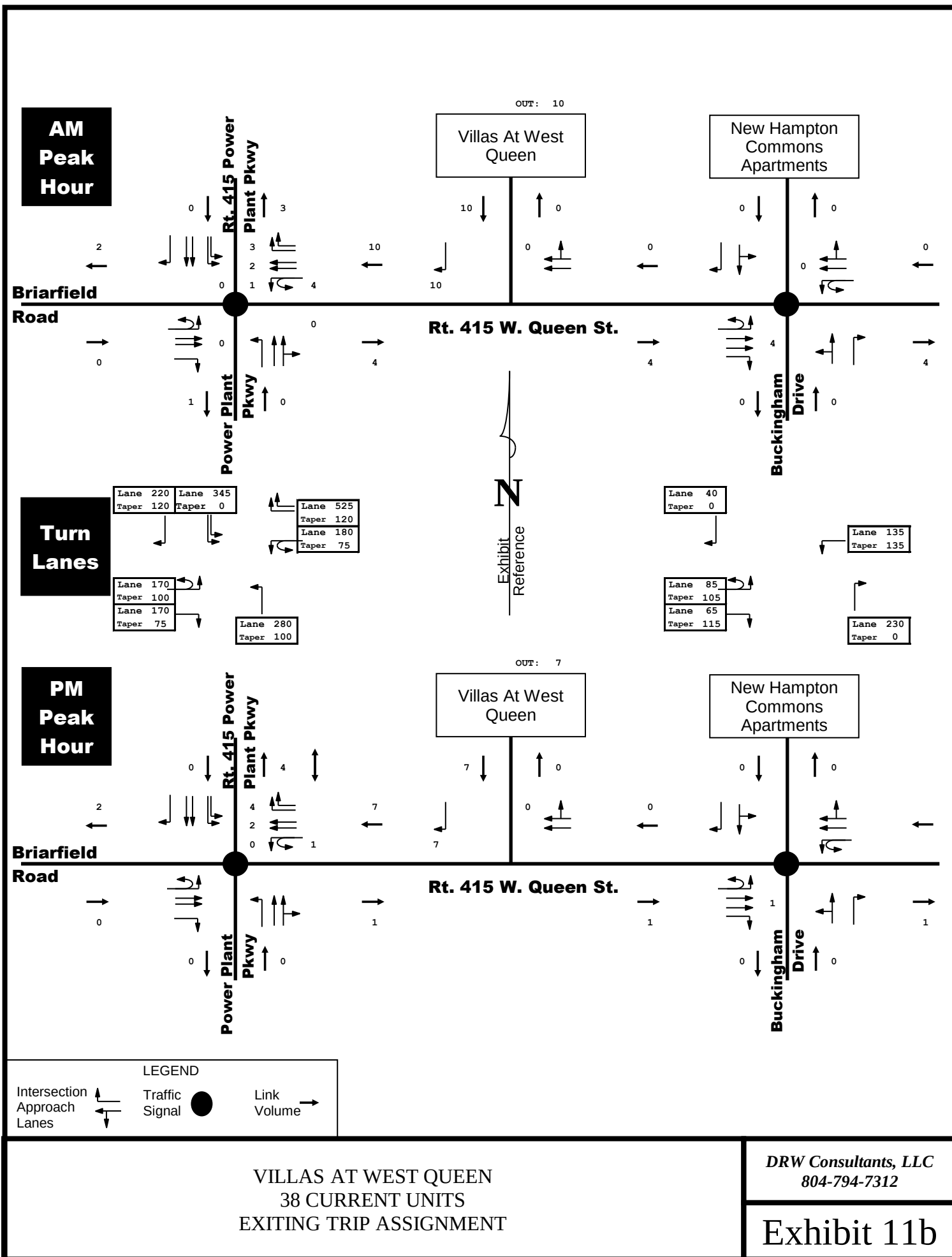
Exhibit 10



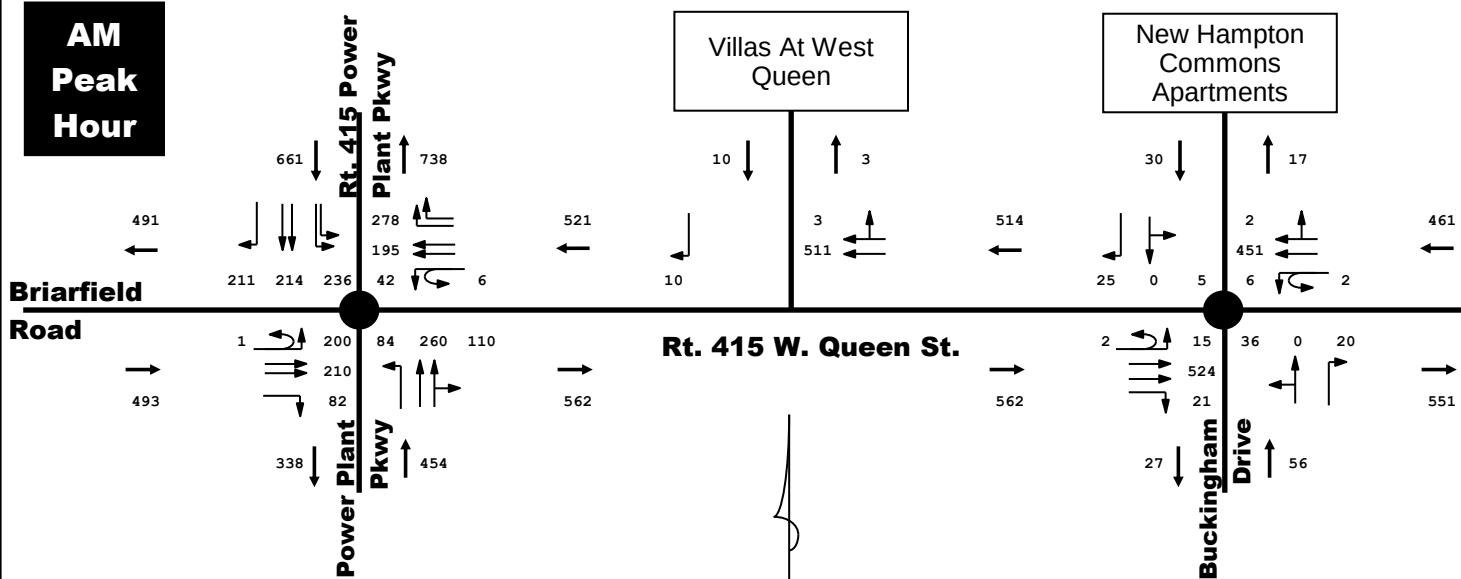
VILLAS AT WEST QUEEN
38 CURRENT UNITS
ENTERING TRIP ASSIGNMENT

DRW Consultants, LLC
804-794-7312

Exhibit 11a

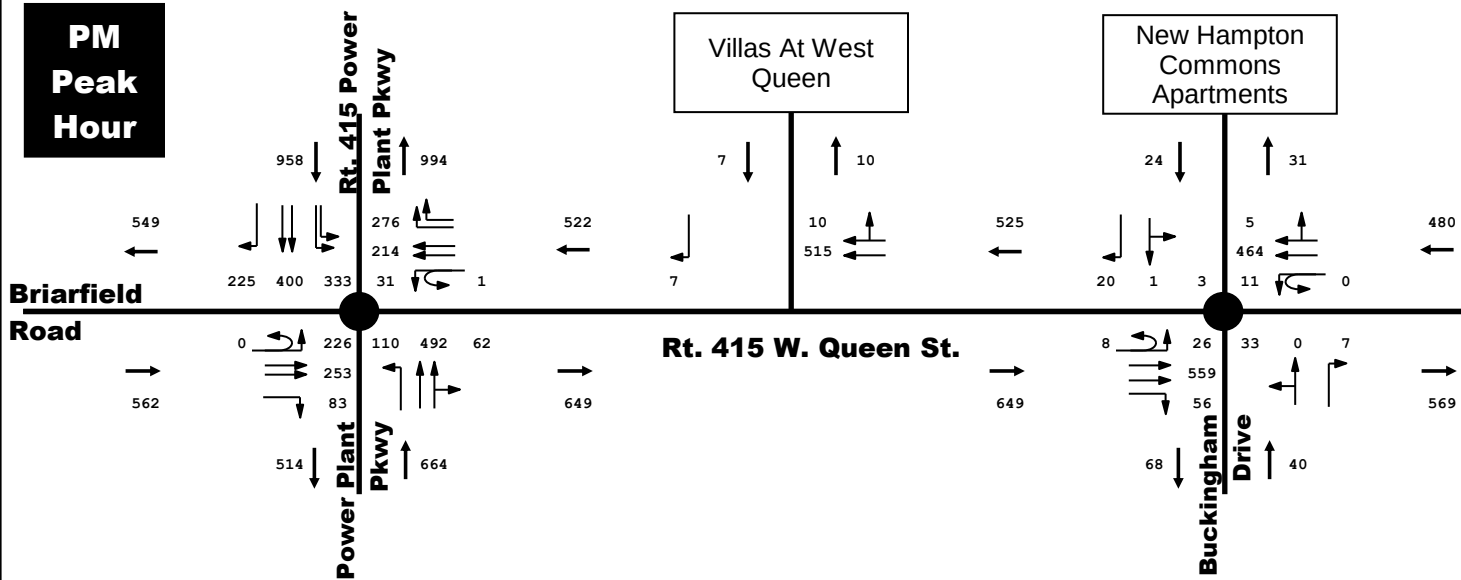


**AM
Peak
Hour**



**Turn
Lanes**

**PM
Peak
Hour**



LEGEND

Intersection Approach Lanes

Traffic Signal

Link Volume

DRW Consultants, LLC
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Exhibit 12

**TABLE ONE: WEST QUEEN ST/POWER PLANT PKWY/BRIARFIELD RD
LEVEL OF SERVICE AND QUEUING**

	LANE GROUP	Storage (feet)	AM PEAK HOUR				PM PEAK HOUR			
			Lane LOS	Lane Delay (sec)	Max. Queue (ft.)	Overall LOS & Delay	Lane LOS	Lane Delay (sec)	Max. Queue (ft.)	Overall LOS
2022 TRAFFIC COUNTS	EBL/U	220	C	26.8	208	C 26.7 Sec.	C	33.8	213	C 33.2 Sec.
	EBT		C	21.7	162		C	25.8	185	
	EBR	210	C	20.6	55		C	24.2	59	
	WBL/U	220	C	32.3	64		D	43.0	60	
	WBT		C	30.7	104		D	40.6	102	
	WBR	585	C	21.2	81		C	25.8	95	
	NBL	330	D	41.5	138		D	47.8	149	
	NBT/R		C	29.5	155		D	37.4	216	
	SBL	345	C	31.2	221		D	39.6	296	
	SBT		C	24.0	116		C	28.6	176	
	SBR	280	C	23.0	78		C	25.9	103	
2024 BACKGROUND TRAFFIC	EBL/U	220	C	26.1	198	C 27.2 Sec.	D	36.4	214	C 33.4 Sec.
	EBT		C	21.6	167		C	29.5	229	
	EBR	210	C	20.4	65		C	27.3	55	
	WBL/U	220	C	31.6	89		D	39.5	55	
	WBT		C	31.1	89		D	44.1	109	
	WBR	585	C	21.3	78		C	25.8	85	
	NBL	330	D	43.7	133		D	48.6	164	
	NBT/R		C	31.3	149		D	36.5	209	
	SBL	345	C	31.7	229		D	38.3	268	
	SBT		C	24.9	119		C	27.2	174	
	SBR	280	C	23.7	83		C	24.7	99	
2024 TOTAL WITH 68 UNITS	EBL/U	220	C	26.1	192	C 27.3 Sec.	D	36.4	210	C 33.7 Sec.
	EBT		C	21.6	158		C	29.2	212	
	EBR	210	C	20.3	61		C	27.0	64	
	WBL/U	220	C	32.2	74		D	39.2	58	
	WBT		C	31.2	95		D	41.6	109	
	WBR	585	C	21.3	99		C	25.3	85	
	NBL	330	D	43.7	131		D	48.6	166	
	NBT/R		C	31.3	157		D	38.0	233	
	SBL	345	C	31.7	255		D	39.0	290	
	SBT		C	24.9	120		C	27.9	195	
	SBR	280	C	23.7	78		C	25.3	102	
2024 TOTAL WITH 38 UNITS	EBL/U	220	C	26.1	197	C 27.3 Sec.	D	36.4	215	C 33.5 Sec.
	EBT		C	21.6	170		C	29.4	238	
	EBR	210	C	20.4	64		C	27.3	60	
	WBL/U	220	C	32.0	75		D	39.7	54	
	WBT		C	31.1	89		D	44.2	108	
	WBR	585	C	21.3	98		C	25.9	82	
	NBL	330	D	43.7	128		D	48.6	176	
	NBT/R		C	31.3	162		D	36.3	223	
	SBL	345	C	31.7	236		D	38.7	302	
	SBT		C	24.9	122		C	27.2	180	
	SBR	280	C	23.7	92		C	24.7	102	

WEST QUEEN ST/POWER PLANT PKWY/BRIARFIELD RD
LEVEL OF SERVICE AND QUEUING

DRW Consultants, LLC
804-794-7312

Exhibit 13

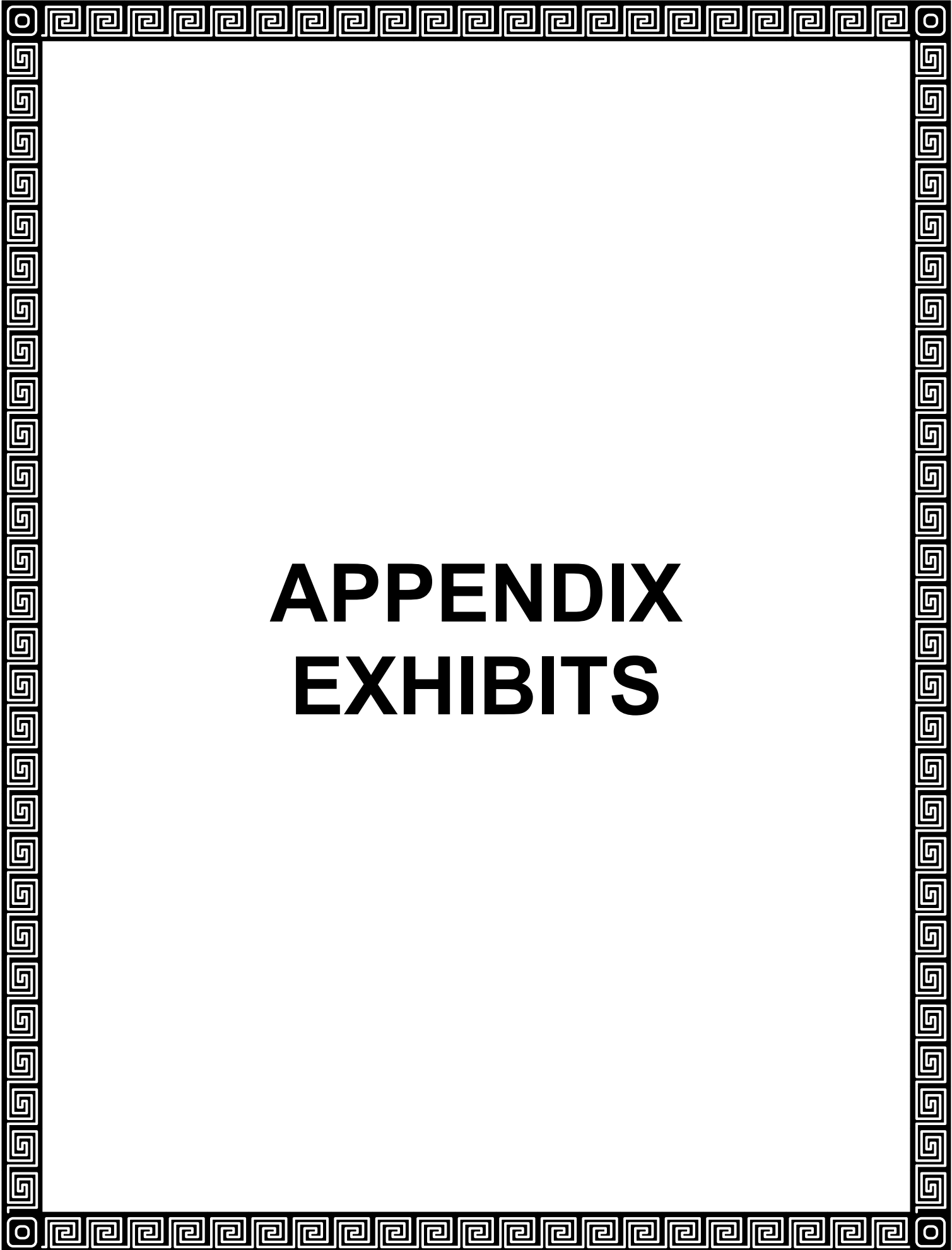
**TABLE TWO: WEST QUEEN ST/BUCKINGHAM DR/NEW HAMPTON COMMONS APTS:
LEVEL OF SERVICE AND QUEUING**

	LANE GROUP	Storage (feet)	AM PEAK HOUR				PM PEAK HOUR			
			Lane LOS	Lane Delay (sec)	Max. Queue (ft.)	Overall LOS & Delay	Lane LOS	Lane Delay (sec)	Max. Queue (ft.)	Overall LOS
2022 TRAFFIC COUNTS	EBL/U	140	A	2.6	30	A	A	2.2	43	A
	EBT		A	3.1	97		A	2.6	105	
	EBR	125	A	2.6	18		A	2.2	68	
	WBL/U	205	A	2.6	39		A	2.2	38	
	WBT/R		A	3.0	82	4.6 Sec.	A	2.5	95	3.7 Sec.
	NBL/T		C	23.0	63		C	24.7	55	
	NBR	230	C	22.1	51		C	23.2	20	
	SBL/T		C	22.1	43		C	23.3	38	
	SBR	40	C	22.1	36		C	23.3	35	
2024 BACKGROUND TRAFFIC	EBL/U	140	A	2.6	30	A	A	2.2	54	A
	EBT		A	3.2	100		A	2.7	100	
	EBR	125	A	2.6	27		A	2.2	42	
	WBL/U	205	A	2.6	42		A	2.2	44	
	WBT/R		A	3.1	98	4.6 Sec.	A	2.5	78	3.7 Sec.
	NBL/T		C	23.1	75		C	24.6	60	
	NBR	230	C	22.1	39		C	23.1	20	
	SBL/T		C	22.1	38		C	23.2	37	
	SBR	40	C	22.1	35		C	23.2	35	
2024 TOTAL WITH 68 UNITS	EBL/U	140	A	2.7	40	A	A	2.3	46	A
	EBT		A	3.2	93		A	2.7	102	
	EBR	125	A	2.6	18		A	2.2	40	
	WBL/U	205	A	2.6	42		A	2.2	51	
	WBT/R		A	3.1	96	4.6 Sec.	A	2.6	83	3.7 Sec.
	NBL/T		C	23.1	68		C	24.6	64	
	NBR	230	C	22.1	42		C	23.1	25	
	SBL/T		C	22.1	39		C	23.2	37	
	SBR	40	C	22.1	36		C	23.2	35	
2024 TOTAL WITH 38 UNITS	EBL/U	140	A	2.7	34	A	A	2.3	44	A
	EBT		A	3.2	104		A	2.7	107	
	EBR	125	A	2.6	15		A	2.2	43	
	WBL/U	205	A	2.6	44		A	2.2	40	
	WBT/R		A	3.1	88	4.6 Sec.	A	2.6	87	3.7 Sec.
	NBL/T		C	23.1	80		C	24.6	56	
	NBR	230	C	22.1	47		C	23.1	22	
	SBL/T		C	22.1	45		C	23.2	34	
	SBR	40	C	22.1	36		C	23.2	35	

WEST QUEEN ST/BUCKINGHAM DR/NEW HAMPTON COMMONS APTS:
LEVEL OF SERVICE AND QUEUING

*DRW Consultants, LLC
804-794-7312*

Exhibit 14



APPENDIX EXHIBITS

APPENDIX TABLE OF CONTENTS

APPENDIX EXHIBITS	Number
Tabulated Traffic Counts.....	
West Queen Street/Buckingham Drive/Hampton Commons Apartments	A1 to A3
West Queen Street/Power Plant Parkway/Briarfield Road	B1 to B3
Traffic Counts Without Balance.....	C
 Synchro HCM 2000 Signalized Intersection LOS	 AM PM
2022	J1 J2
2024 Background Traffic.....	J3 J4
2024 Total Traffic 68 Proposed Units	J5 J6
2024 Total Traffic 38 Currently Approved Units	J7 J8
 SIMTRAFFIC Queuing And Blocking Report LOS	 AM PM
2022	K1 K2
2024 Background Traffic.....	K3 K4
2024 Total Traffic 68 Proposed Units	K5 K6
2024 Total Traffic 38 Currently Approved Units	K7 K8
 Villas At West Queen Synchro HCM6 Unsignalized Intersection LOS	 AM PM
2024 Total Traffic 68 Proposed Units	L1 L2
2024 Total Traffic 38 Currently Approved Units	L3 L4
 Reference Documents	
March 25, 2022 Workslope.....	N1 to N3
West Queen Street/Power Plant Parkway/Briarfield Road	O1 to O3
West Queen Street/Buckingham Drive/Hampton Commons Apartments	P1 to P3

CARS TURNING MOVEMENT COUNT - SUMMARY

Intersection of: W. Queen Street
 and: Buckingham Drive
 Location: Hampton, Virginia

Counted by: VCU
 Date: May 19, 2022
 Weather: Sunny, Warm
 Entered by: ARG

Thursday

Star Rating: 5



TIME	EASTBOUND on: W. Queen Street					WESTBOUND on: W. Queen Street					NORTHBOUND on: Buckingham Drive					SOUTHBOUND on: Continental Drive					TOTAL N + S + E + W
	U-TN	LEFT	THRU	RIGHT	TOTAL	U-TN	LEFT	THRU	RIGHT	TOTAL	U-TN	LEFT	THRU	RIGHT	TOTAL	U-TN	LEFT	THRU	RIGHT	TOTAL	
AM																					
7:00-7:15	0	0	52	2	54	0	1	39	0	40	0	9	0	5	14	0	1	0	5	6	114
7:15-7:30	0	4	68	1	73	0	3	45	1	49	0	7	0	4	11	0	2	0	6	8	141
7:30-7:45	0	3	88	6	97	0	1	67	1	69	0	11	0	2	13	0	0	0	10	10	189
7:45-8:00	0	6	114	2	122	1	1	100	0	102	0	10	0	4	14	0	1	0	6	7	245
8:00-8:15	0	4	148	7	159	0	1	86	1	88	0	7	0	3	10	0	2	0	5	7	264
8:15-8:30	0	1	129	3	133	1	1	109	1	112	0	4	0	5	9	0	1	0	2	3	257
8:30-8:45	0	3	78	4	85	0	1	104	0	105	0	10	0	6	16	0	0	0	11	11	217
8:45-9:00	0	1	92	4	97	0	2	90	0	92	0	5	0	2	7	0	1	0	3	4	200
2 Hr Totals	0	22	769	29	820	2	11	640	4	657	0	63	0	31	94	0	8	0	48	56	1627
1 Hr Totals																					
7:00-8:00	0	22	322	11	355	1	6	251	2	260	0	37	0	15	52	0	4	0	27	31	698
7:15-8:15	0	17	418	16	451	1	6	298	3	308	0	35	0	13	48	0	5	0	27	32	839
7:30-8:30	0	14	479	18	511	2	4	362	3	371	0	32	0	14	46	0	4	0	23	27	955
7:45-8:45	0	14	469	16	499	2	4	399	2	407	0	31	0	18	49	0	4	0	24	28	983
8:00-9:00	0	9	447	18	474	1	5	389	2	397	0	26	0	16	42	0	4	0	21	25	938
PEAK HOUR																					
7:45-8:45	0	14	469	16	499	2	4	399	2	407	0	31	0	18	49	0	4	0	24	28	983
PM																					
4:00-4:15	0	10	134	13	157	0	2	91	0	93	0	9	0	1	10	0	1	0	4	5	265
4:15-4:30	0	7	138	19	164	0	2	118	1	121	0	10	0	2	12	0	0	0	6	6	303
4:30-4:45	0	3	118	13	134	0	1	111	3	115	0	7	0	2	9	0	0	0	6	6	264
4:45-5:00	0	5	124	9	138	0	4	108	1	113	0	4	0	2	6	0	2	1	3	6	263
5:00-5:15	0	7	114	9	130	0	6	115	0	121	0	8	0	1	9	0	2	1	2	5	265
5:15-5:30	0	8	128	11	147	0	5	99	1	105	0	7	0	3	10	0	0	0	6	6	268
5:30-5:45	0	9	109	9	127	0	3	104	0	107	0	5	0	1	6	0	0	1	3	4	244
5:45-6:00	1	9	107	12	129	0	4	112	2	118	0	9	0	1	10	0	2	0	7	9	266
2 Hr Totals	1	58	972	95	1126	0	27	858	8	893	0	59	0	13	72	0	7	3	37	47	2138
1 Hr Totals																					
4:00-5:00	0	25	514	54	593	0	9	428	5	442	0	30	0	7	37	0	3	1	19	23	1095
4:15-5:15	0	22	494	50	566	0	13	452	5	470	0	29	0	7	36	0	4	2	17	23	1095
4:30-5:30	0	23	484	42	549	0	16	433	5	454	0	26	0	8	34	0	4	2	17	23	1060
4:45-5:45	0	29	475	38	542	0	18	426	2	446	0	24	0	7	31	0	4	3	14	21	1040
5:00-6:00	1	33	458	41	533	0	18	430	3	451	0	29	0	6	35	0	4	2	18	24	1043
PEAK HOUR																					
4:00-5:00	0	25	514	54	593	0	9	428	5	442	0	30	0	7	37	0	3	1	19	23	1095

HEAVY TRUCKS TURNING MOVEMENT COUNT - SUMMARY

Intersection of: W. Queen Street
and: Buckingham Drive
Location: Hampton, Virginia

Counted by: VCU
Date: May 19, 2022
Weather: Sunny, Warm
Entered by: ARG

Thursday

Star Rating: 5



TIME	EASTBOUND on: W. Queen Street					WESTBOUND on: W. Queen Street					NORTHBOUND on: Buckingham Drive					SOUTHBOUND on: Continental Drive					TOTAL N + S + E + W
	U-TN	LEFT	THRU	RIGHT	TOTAL	U-TN	LEFT	THRU	RIGHT	TOTAL	U-TN	LEFT	THRU	RIGHT	TOTAL	U-TN	LEFT	THRU	RIGHT	TOTAL	
AM																					
7:00-7:15	0	0	4	0	4	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	7
7:15-7:30	0	0	4	0	4	0	1	5	0	6	0	1	0	0	1	0	0	0	0	0	11
7:30-7:45	0	0	11	0	11	0	1	2	0	3	0	1	0	0	1	0	0	0	0	0	15
7:45-8:00	0	0	10	0	10	0	1	5	0	6	0	0	0	0	0	0	0	0	0	0	16
8:00-8:15	0	0	9	1	10	0	1	10	0	11	0	1	0	0	1	1	0	0	0	1	23
8:15-8:30	0	0	4	2	6	0	0	6	0	6	0	3	0	1	4	0	0	0	0	0	16
8:30-8:45	0	0	7	1	8	0	0	6	0	6	0	0	0	0	0	0	0	0	0	0	14
8:45-9:00	0	0	1	1	2	0	0	4	0	4	0	1	0	0	1	0	0	0	0	0	7
2 Hr Totals	0	0	50	5	55	0	4	41	0	45	0	7	0	1	8	1	0	0	0	1	109
1 Hr Totals																					
7:00-8:00	0	0	29	0	29	0	3	15	0	18	0	2	0	0	2	0	0	0	0	0	49
7:15-8:15	0	0	34	1	35	0	4	22	0	26	0	3	0	0	3	1	0	0	0	1	65
7:30-8:30	0	0	34	3	37	0	3	23	0	26	0	5	0	1	6	1	0	0	0	1	70
7:45-8:45	0	0	30	4	34	0	2	27	0	29	0	4	0	1	5	1	0	0	0	1	69
8:00-9:00	0	0	21	5	26	0	1	26	0	27	0	5	0	1	6	1	0	0	0	1	60
PEAK HOUR																					
7:45-8:45	0	0	30	4	34	0	2	27	0	29	0	4	0	1	5	1	0	0	0	1	69
PM																					
4:00-4:15	0	0	7	0	7	0	1	5	0	6	0	0	0	0	0	0	0	0	0	0	13
4:15-4:30	0	0	4	0	4	0	1	2	0	3	0	2	0	0	2	0	0	0	0	0	9
4:30-4:45	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	2
4:45-5:00	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
5:00-5:15	0	0	4	0	4	0	0	5	0	5	0	0	0	0	0	0	0	0	0	0	9
5:15-5:30	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	3
5:30-5:45	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:45-6:00	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1
2 Hr Totals	0	0	20	0	20	0	2	17	0	19	0	2	0	0	2	0	0	0	0	0	41
1 Hr Totals																					
4:00-5:00	0	0	15	0	15	0	2	8	0	10	0	2	0	0	2	0	0	0	0	0	27
4:15-5:15	0	0	12	0	12	0	1	8	0	9	0	2	0	0	2	0	0	0	0	0	23
4:30-5:30	0	0	8	0	8	0	0	9	0	9	0	0	0	0	0	0	0	0	0	0	17
4:45-5:45	0	0	8	0	8	0	0	8	0	8	0	0	0	0	0	0	0	0	0	0	16
5:00-6:00	0	0	5	0	5	0	0	9	0	9	0	0	0	0	0	0	0	0	0	0	14
PEAK HOUR																					
4:00-5:00	0	0	15	0	15	0	2	8	0	10	0	2	0	0	2	0	0	0	0	0	27

TOTALS TURNING MOVEMENT COUNT - SUMMARY

Intersection of: W. Queen Street
and: Buckingham Drive
Location: Hampton, Virginia

Counted by: VCU
Date: May 19, 2022
Weather: Sunny, Warm
Entered by: ARG

Thursday
Star Rating: 5



TIME	EASTBOUND on: W. Queen Street					WESTBOUND on: W. Queen Street					NORTHBOUND on: Buckingham Drive					SOUTHBOUND on: Continental Drive					TOTAL N + S + E + W
	U-TN	LEFT	THRU	RIGHT	TOTAL	U-TN	LEFT	THRU	RIGHT	TOTAL	U-TN	LEFT	THRU	RIGHT	TOTAL	U-TN	LEFT	THRU	RIGHT	TOTAL	
AM																					
7:00-7:15	0	0	56	2	58	0	1	42	0	43	0	9	0	5	14	0	1	0	5	6	121
7:15-7:30	0	4	72	1	77	0	4	50	1	55	0	8	0	4	12	0	2	0	6	8	152
7:30-7:45	0	3	99	6	108	0	2	69	1	72	0	12	0	2	14	0	0	0	10	10	204
7:45-8:00	0	6	124	2	132	1	2	105	0	108	0	10	0	4	14	0	1	0	6	7	261
8:00-8:15	0	4	157	8	169	0	2	96	1	99	0	8	0	3	11	1	2	0	5	8	287
8:15-8:30	0	1	133	5	139	1	1	115	1	118	0	7	0	6	13	0	1	0	2	3	273
8:30-8:45	0	3	85	5	93	0	1	110	0	111	0	10	0	6	16	0	0	0	11	11	231
8:45-9:00	0	1	93	5	99	0	2	94	0	96	0	6	0	2	8	0	1	0	3	4	207
2 Hr Totals	0	22	819	34	875	2	15	681	4	702	0	70	0	32	102	1	8	0	48	57	1736
1 Hr Totals																					
7:00-8:00	0	13	351	11	375	1	9	266	2	278	0	39	0	15	54	0	4	0	27	31	738
7:15-8:15	0	17	452	17	486	1	10	320	3	334	0	38	0	13	51	1	5	0	27	33	904
7:30-8:30	0	14	513	21	548	2	7	385	3	397	0	37	0	15	52	1	4	0	23	28	1025
7:45-8:45	0	14	499	20	533	2	6	426	2	436	0	35	0	19	54	1	4	0	24	29	1052
8:00-9:00	0	9	468	23	500	1	6	415	2	424	0	31	0	17	48	1	4	0	21	26	998
PEAK HOUR																					
7:45-8:45	0	14	499	20	533	2	6	426	2	436	0	35	0	19	54	1	4	0	24	29	1052
PHF																					0.916
%T	#####	0%	6%	20%	6%	0%	33%	6%	0%	7%	#####	11%	#####	5%	9%	100%	0%	#####	0%	3%	7%
PM																					
4:00-4:15	0	10	141	13	164	0	3	96	0	99	0	9	0	1	10	0	1	0	4	5	278
4:15-4:30	0	7	142	19	168	0	3	120	1	124	0	12	0	2	14	0	0	0	6	6	312
4:30-4:45	0	3	119	13	135	0	1	112	3	116	0	7	0	2	9	0	0	0	6	6	266
4:45-5:00	0	5	127	9	141	0	4	108	1	113	0	4	0	2	6	0	2	1	3	6	266
5:00-5:15	0	7	118	9	134	0	6	120	0	126	0	8	0	1	9	0	2	1	2	5	274
5:15-5:30	0	8	128	11	147	0	5	102	1	108	0	7	0	3	10	0	0	0	6	6	271
5:30-5:45	0	9	110	9	128	0	3	104	0	107	0	5	0	1	6	0	0	1	3	4	245
5:45-6:00	1	9	107	12	129	0	4	113	2	119	0	9	0	1	10	0	2	0	7	9	267
2 Hr Totals	1	58	992	95	1146	0	29	875	8	912	0	61	0	13	74	0	7	3	37	47	2179
1 Hr Totals																					
4:00-5:00	0	25	529	54	608	0	11	436	5	452	0	32	0	7	39	0	3	1	19	23	1122
4:15-5:15	0	22	506	50	578	0	14	460	5	479	0	31	0	7	38	0	4	2	17	23	1118
4:30-5:30	0	23	492	42	557	0	16	442	5	463	0	26	0	8	34	0	4	2	17	23	1077
4:45-5:45	0	29	483	38	550	0	18	434	2	454	0	24	0	7	31	0	4	3	14	21	1056
5:00-6:00	1	33	463	41	538	0	18	439	3	460	0	29	0	6	35	0	4	2	18	24	1057
PEAK HOUR																					
4:00-5:00	0	25	529	54	608	0	11	436	5	452	0	32	0	7	39	0	3	1	19	23	1122
PHF																					0.899
%T	#####	0%	3%	0%	2%	#####	18%	2%	0%	2%	#####	6%	#####	0%	5%	#####	0%	0%	0%	0%	2%

CARS TURNING MOVEMENT COUNT - SUMMARY

Intersection of: W. Queen Street
and: Powerplant Parkway
Location: Hampton, Virginia

Counted by: VCU
Date: May 19, 2022
Weather: Sunny, Warm
Entered by: ARG

Thursday

Star Rating: 5



TIME	EASTBOUND on: W. Queen Street					WESTBOUND on: W. Queen Street					NORTHBOUND on: Powerplant Pkwy					SOUTHBOUND on: Powerplant Pkwy					TOTAL N + S + E + W
	U-TN	LEFT	THRU	RIGHT	TOTAL	U-TN	LEFT	THRU	RIGHT	TOTAL	U-TN	LEFT	THRU	RIGHT	TOTAL	U-TN	LEFT	THRU	RIGHT	TOTAL	
AM																					
7:00-7:15	0	35	33	21	89	0	8	13	35	56	0	9	45	6	60	0	15	34	19	68	273
7:15-7:30	0	28	35	19	82	0	6	17	37	60	1	14	46	8	69	0	36	41	37	114	325
7:30-7:45	0	35	40	15	90	0	12	28	44	84	1	21	46	15	83	1	37	45	40	123	380
7:45-8:00	0	49	52	23	124	0	7	48	65	120	0	17	55	20	92	0	57	46	48	151	487
8:00-8:15	0	48	40	18	106	2	10	37	48	97	0	20	53	47	120	0	76	45	45	166	489
8:15-8:30	1	38	56	12	107	0	8	39	73	120	0	10	62	21	93	0	49	41	45	135	455
8:30-8:45	0	48	37	20	105	0	8	46	68	122	0	25	70	10	105	0	34	62	61	157	489
8:45-9:00	0	60	54	13	127	0	5	49	49	103	0	29	69	9	107	0	37	65	48	150	487
2 Hr Totals	1	341	347	141	830	2	64	277	419	762	2	145	446	136	729	1	341	379	343	1064	3385
1 Hr Totals																					
7:00-8:00	0	341	160	78	579	0	33	106	181	320	2	61	192	49	304	1	145	166	144	456	1659
7:15-8:15	0	160	167	75	402	2	35	130	194	361	2	72	200	90	364	1	206	177	170	554	1681
7:30-8:30	1	170	188	68	427	2	37	152	230	421	1	68	216	103	388	1	219	177	178	575	1811
7:45-8:45	1	183	185	73	442	2	33	170	254	459	0	72	240	98	410	0	216	194	199	609	1920
8:00-9:00	1	194	187	63	445	2	31	171	238	442	0	84	254	87	425	0	196	213	199	608	1920
PEAK HOUR																					
7:45-8:45	1	183	185	73	442	2	33	170	254	459	0	72	240	98	410	0	216	194	199	609	1920
PM																					
4:00-4:15	0	56	68	23	147	0	6	42	64	112	0	29	135	12	176	1	80	93	58	232	667
4:15-4:30	0	50	58	16	124	0	6	58	71	135	0	27	109	20	156	1	87	110	46	244	659
4:30-4:45	0	63	55	16	134	0	7	52	63	122	0	29	120	10	159	0	71	84	48	203	618
4:45-5:00	0	41	49	24	114	0	10	44	62	116	0	16	107	15	138	2	71	95	52	220	588
5:00-5:15	0	48	55	15	118	1	5	51	68	125	0	23	88	7	118	0	68	107	45	220	581
5:15-5:30	0	51	57	15	123	0	9	43	63	115	0	28	110	11	149	0	79	106	41	226	613
5:30-5:45	0	44	44	14	102	0	6	48	48	102	0	18	99	17	134	0	66	91	44	201	539
5:45-6:00	0	36	34	15	85	1	8	56	70	135	0	23	82	18	123	0	77	87	36	200	543
2 Hr Totals	0	389	420	138	947	2	57	394	509	962	0	193	850	110	1153	4	599	773	370	1746	4808
1 Hr Totals																					
4:00-5:00	0	210	230	79	519	0	29	196	260	485	0	101	471	57	629	4	309	382	204	899	2532
4:15-5:15	0	202	217	71	490	1	28	205	264	498	0	95	424	52	571	3	297	396	191	887	2446
4:30-5:30	0	203	216	70	489	1	31	190	256	478	0	96	425	43	564	2	289	392	186	869	2400
4:45-5:45	0	184	205	68	457	1	30	186	241	458	0	85	404	50	539	2	284	399	182	867	2321
5:00-6:00	0	179	190	59	428	2	28	198	249	477	0	92	379	53	524	0	290	391	166	847	2276
PEAK HOUR																					
4:00-5:00	0	210	230	79	519	0	29	196	260	485	0	101	471	57	629	4	309	382	204	899	2532

HEAVY TRUCKS TURNING MOVEMENT COUNT - SUMMARY

Intersection of: W. Queen Street
and: Powerplant Parkway
Location: Hampton, Virginia

Counted by: VCU
Date: May 19, 2022
Weather: Sunny, Warm
Entered by: ARG

Thursday

Star Rating: 5



TIME	EASTBOUND on: W. Queen Street					WESTBOUND on: W. Queen Street					NORTHBOUND on: Powerplant Pkwy					SOUTHBOUND on: Powerplant Pkwy					TOTAL N + S + E + W
	U-TN	LEFT	THRU	RIGHT	TOTAL	U-TN	LEFT	THRU	RIGHT	TOTAL	U-TN	LEFT	THRU	RIGHT	TOTAL	U-TN	LEFT	THRU	RIGHT	TOTAL	
AM																					
7:00-7:15	0	1	4	0	5	0	0	2	1	3	0	2	0	0	2	0	0	0	1	1	11
7:15-7:30	0	4	5	1	10	0	1	3	2	6	0	0	5	0	5	0	0	7	2	9	30
7:30-7:45	0	1	4	0	5	0	0	3	0	3	0	0	2	1	3	0	4	2	3	9	20
7:45-8:00	0	1	3	1	5	0	1	1	2	4	0	2	3	3	8	0	5	3	0	8	25
8:00-8:15	0	3	3	0	6	0	4	3	6	13	0	0	1	5	6	0	1	3	1	5	30
8:15-8:30	0	2	2	1	5	0	1	6	2	9	0	3	4	0	7	0	3	4	3	10	31
8:30-8:45	0	3	7	4	14	0	0	6	0	6	0	4	2	0	6	0	1	2	0	3	29
8:45-9:00	0	2	1	1	4	0	0	3	2	5	0	3	1	0	4	0	1	3	2	6	19
2 Hr Totals	0	0	29	8	54	0	7	27	15	49	0	14	18	9	41	0	15	24	12	51	195
1 Hr Totals																					
7:00-8:00	0	7	16	2	25	0	2	9	5	16	0	4	10	4	18	0	9	12	6	27	86
7:15-8:15	0	9	15	2	26	0	6	10	10	26	0	2	11	9	22	0	10	15	6	31	105
7:30-8:30	0	7	12	2	21	0	6	13	10	29	0	5	10	9	24	0	13	12	7	32	106
7:45-8:45	0	9	15	6	30	0	6	16	10	32	0	9	10	8	27	0	10	12	4	26	115
8:00-9:00	0	10	13	6	29	0	5	18	10	33	0	10	8	5	23	0	6	12	6	24	109
PEAK HOUR																					
7:45-8:45	0	9	15	6	30	0	6	16	10	32	0	9	10	8	27	0	10	12	4	26	115
PM																					
4:00-4:15	0	4	6	0	10	0	0	4	0	4	0	2	0	0	2	0	1	1	3	5	21
4:15-4:30	0	1	2	1	4	0	1	2	1	4	0	3	0	0	3	0	2	1	7	10	21
4:30-4:45	0	2	0	0	2	0	0	1	1	2	0	0	1	1	2	0	0	0	0	0	6
4:45-5:00	0	0	2	0	2	0	0	0	0	0	0	0	1	1	2	0	0	1	2	3	7
5:00-5:15	0	0	3	0	3	0	1	0	3	4	0	0	1	0	1	0	1	0	0	1	9
5:15-5:30	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	2
5:30-5:45	0	0	1	0	1	0	0	0	2	2	0	1	1	0	2	0	0	1	1	2	7
5:45-6:00	0	0	0	0	0	0	0	0	1	1	0	0	1	0	1	0	0	0	0	0	2
2 Hr Totals	0	7	14	1	22	0	2	9	8	19	0	6	5	2	13	0	4	4	13	21	75
1 Hr Totals																					
4:00-5:00	0	7	10	1	18	0	1	7	2	10	0	5	2	2	9	0	3	3	12	18	55
4:15-5:15	0	3	7	1	11	0	2	3	5	10	0	3	3	2	8	0	3	2	9	14	43
4:30-5:30	0	2	5	0	7	0	1	3	4	8	0	0	3	2	5	0	1	1	2	4	24
4:45-5:45	0	0	6	0	6	0	1	2	5	8	0	1	3	1	5	0	1	2	3	6	25
5:00-6:00	0	0	4	0	4	0	1	2	6	9	0	1	3	0	4	0	1	1	1	3	20
PEAK HOUR																					
4:00-5:00	0	7	10	1	18	0	1	7	2	10	0	5	2	2	9	0	3	3	12	18	55

TOTALS TURNING MOVEMENT COUNT - SUMMARY

Intersection of: W. Queen Street
and: Powerplant Parkway
Location: Hampton, Virginia

Counted by: VCU
Date: May 19, 2022
Weather: Sunny, Warm
Entered by: ARG

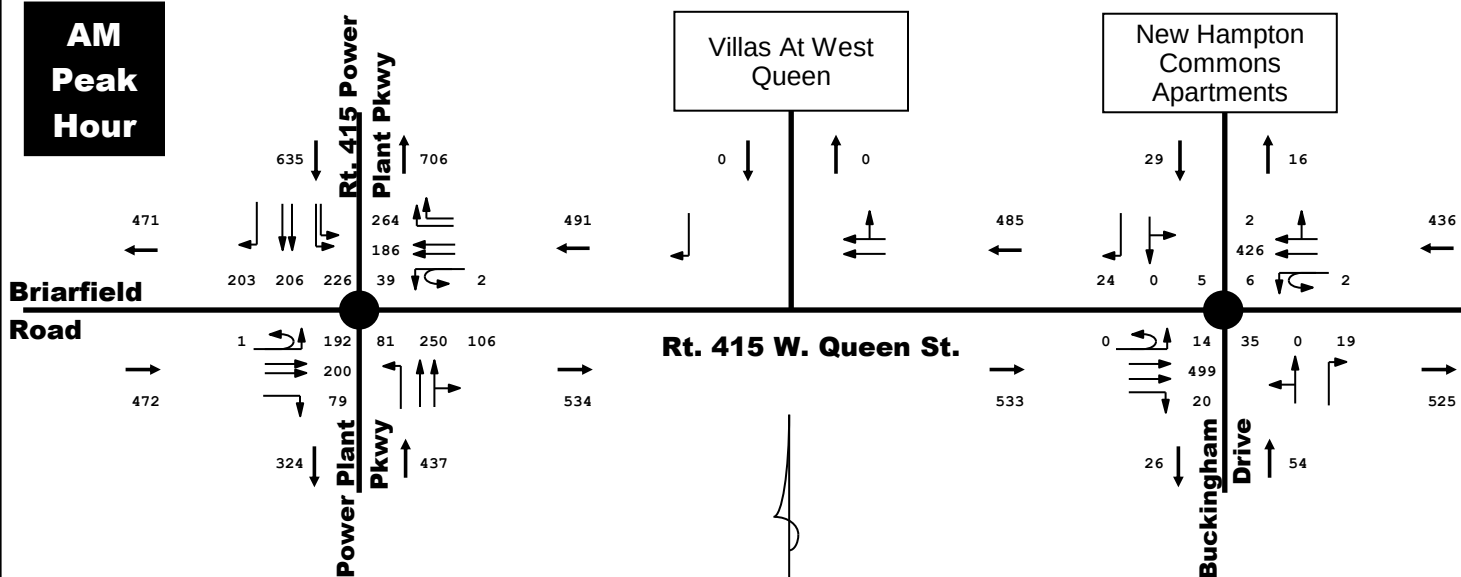
Thursday

Star Rating: 5

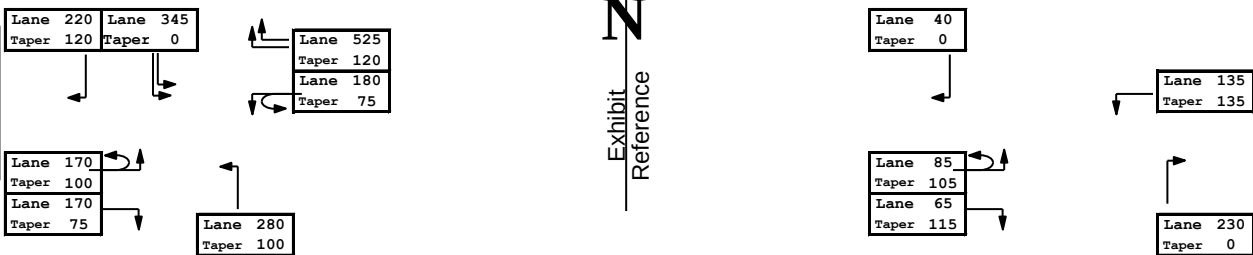


TIME	EASTBOUND on: W. Queen Street					WESTBOUND on: W. Queen Street					NORTHBOUND on: Powerplant Pkwy					SOUTHBOUND on: Powerplant Pkwy					TOTAL N + S + E + W
	U-TN	LEFT	THRU	RIGHT	TOTAL	U-TN	LEFT	THRU	RIGHT	TOTAL	U-TN	LEFT	THRU	RIGHT	TOTAL	U-TN	LEFT	THRU	RIGHT	TOTAL	
AM																					
7:00-7:15	0	36	37	21	94	0	8	15	36	59	0	11	45	6	62	0	15	34	20	69	284
7:15-7:30	0	32	40	20	92	0	7	20	39	66	1	14	51	8	74	0	36	48	39	123	355
7:30-7:45	0	36	44	15	95	0	12	31	44	87	1	21	48	16	86	1	41	47	43	132	400
7:45-8:00	0	50	55	24	129	0	8	49	67	124	0	19	58	23	100	0	62	49	48	159	512
8:00-8:15	0	51	43	18	112	2	14	40	54	110	0	20	54	52	126	0	77	48	46	171	519
8:15-8:30	1	40	58	13	112	0	9	45	75	129	0	13	66	21	100	0	52	45	48	145	486
8:30-8:45	0	51	44	24	119	0	8	52	68	128	0	29	72	10	111	0	35	64	61	160	518
8:45-9:00	0	62	55	14	131	0	5	52	51	108	0	32	70	9	111	0	38	68	50	156	506
2 Hr Totals	1	358	376	149	884	2	71	304	434	811	2	159	464	145	770	1	356	403	355	1115	3580
1 Hr Totals																					
7:00-8:00	0	154	176	80	410	0	35	115	186	336	2	65	202	53	322	1	154	178	150	483	1551
7:15-8:15	0	169	182	77	428	2	41	140	204	387	2	74	211	99	386	1	216	192	176	585	1786
7:30-8:30	1	177	200	70	448	2	43	165	240	450	1	73	226	112	412	1	232	189	185	607	1917
7:45-8:45	1	192	200	79	472	2	39	186	264	491	0	81	250	106	437	0	226	206	203	635	2035
8:00-9:00	1	204	200	69	474	2	36	189	248	475	0	94	262	92	448	0	202	225	205	632	2029
PEAK HOUR																					
7:45-8:45	1	192	200	79	472	2	39	186	264	491	0	81	250	106	437	0	226	206	203	635	2035
PHF																					0.98
%T	0%	5%	8%	8%	6%	0%	15%	9%	4%	7%	#####	11%	4%	8%	6%	#####	4%	6%	2%	4%	6%
PM																					
4:00-4:15	0	60	74	23	157	0	6	46	64	116	0	31	135	12	178	1	81	94	61	237	688
4:15-4:30	0	51	60	17	128	0	7	60	72	139	0	30	109	20	159	1	89	111	53	254	680
4:30-4:45	0	65	55	16	136	0	7	53	64	124	0	29	121	11	161	0	71	84	48	203	624
4:45-5:00	0	41	51	24	116	0	10	44	62	116	0	16	108	16	140	2	71	96	54	223	595
5:00-5:15	0	48	58	15	121	1	6	51	71	129	0	23	89	7	119	0	69	107	45	221	590
5:15-5:30	0	51	57	15	123	0	9	45	63	117	0	28	110	11	149	0	79	106	41	226	615
5:30-5:45	0	44	45	14	103	0	6	48	50	104	0	19	100	17	136	0	66	92	45	203	546
5:45-6:00	0	36	34	15	85	1	8	56	71	136	0	23	83	18	124	0	77	87	36	200	545
2 Hr Totals	0	396	434	139	969	2	59	403	517	981	0	199	855	112	1166	4	603	777	383	1767	4883
1 Hr Totals																					
4:00-5:00	0	217	240	80	537	0	30	203	262	495	0	106	473	59	638	4	312	385	216	917	2587
4:15-5:15	0	205	224	72	501	1	30	208	269	508	0	98	427	54	579	3	300	398	200	901	2489
4:30-5:30	0	205	221	70	496	1	32	193	260	486	0	96	428	45	569	2	290	393	188	873	2424
4:45-5:45	0	184	211	68	463	1	31	188	246	466	0	86	407	51	544	2	285	401	185	873	2346
5:00-6:00	0	179	194	59	432	2	29	200	255	486	0	93	382	53	528	0	291	392	167	850	2296
PEAK HOUR																					
4:00-5:00	0	217	240	80	537	0	30	203	262	495	0	106	473	59	638	4	312	385	216	917	2587
PHF																					0.94
%T	#####	3%	4%	1%	3%	#####	3%	3%	1%	2%	#####	5%	0%	3%	1%	0%	1%	1%	6%	2%	2%

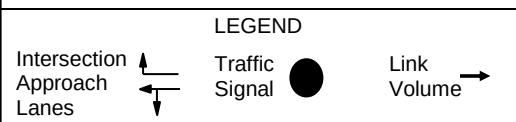
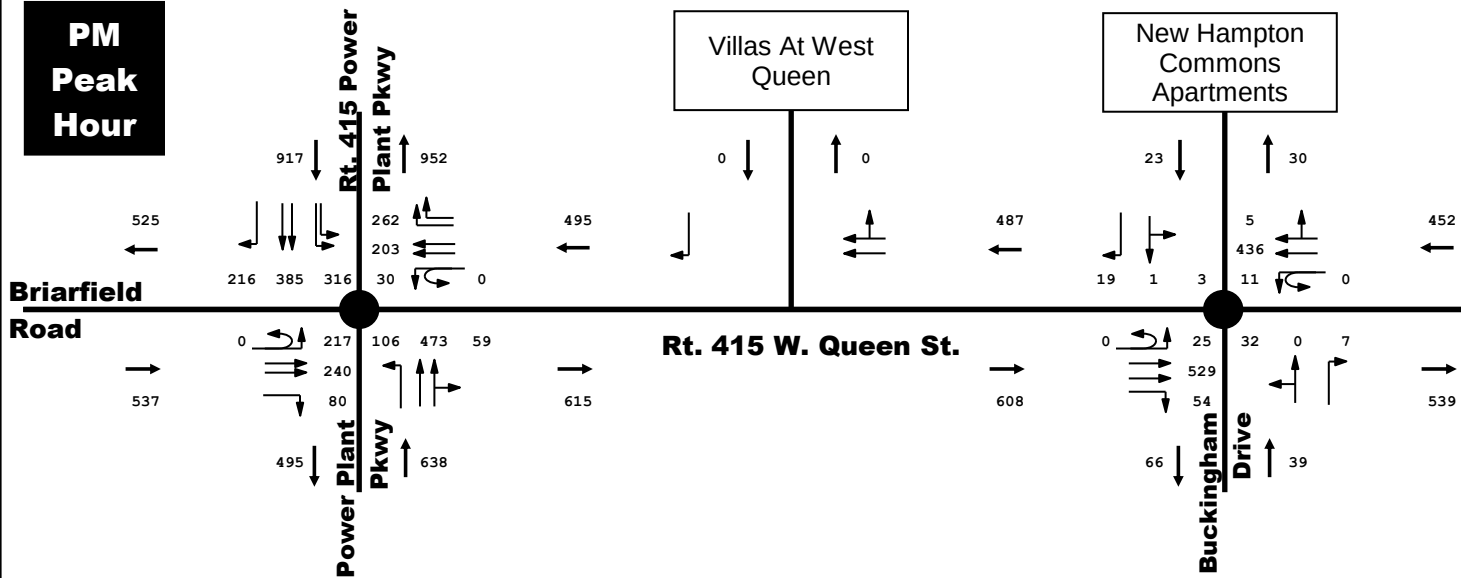
**AM
Peak
Hour**



**Turn
Lanes**



**PM
Peak
Hour**



THURSDAY, MAY 19, 2022
EXISTING PEAK HOUR COUNTS
WITHOUT BALANCE

DRW Consultants, LLC
804-794-7312

Exhibit C

												
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	1	192	200	79	2	39	186	264	81	250	106	226
Future Volume (vph)	1	192	200	79	2	39	186	264	81	250	106	226
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0	6.1	6.1		7.0	6.1	6.1	7.0	6.9		7.0
Lane Util. Factor		1.00	0.95	1.00		1.00	0.95	0.88	1.00	0.95		0.97
Frt		1.00	1.00	0.85		1.00	1.00	0.85	1.00	0.96		1.00
Flt Protected		0.95	1.00	1.00		0.95	1.00	1.00	0.95	1.00		0.95
Satd. Flow (prot)		1719	3343	1495		1579	3312	2733	1626	3279		3367
Flt Permitted		0.95	1.00	1.00		0.95	1.00	1.00	0.95	1.00		0.95
Satd. Flow (perm)		1719	3343	1495		1579	3312	2733	1626	3279		3367
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	1	196	204	81	2	40	190	269	83	255	108	231
RTOR Reduction (vph)	0	0	0	62	0	0	0	207	0	70	0	0
Lane Group Flow (vph)	0	197	204	19	0	42	190	62	83	293	0	231
Heavy Vehicles (%)	0%	5%	8%	8%	0%	15%	9%	4%	11%	4%	8%	4%
Turn Type	Prot	Prot	NA	Perm	Prot	Prot	NA	pt+ov	Prot	NA		Prot
Protected Phases	7	7	4		3	3	8	8 1	5	2		1
Permitted Phases				4								
Actuated Green, G (s)		14.6	16.8	16.8		5.6	7.8	23.2	5.6	12.2		8.4
Effective Green, g (s)		14.6	16.8	16.8		5.6	7.8	16.2	5.6	12.2		8.4
Actuated g/C Ratio		0.21	0.24	0.24		0.08	0.11	0.23	0.08	0.17		0.12
Clearance Time (s)		7.0	6.1	6.1		7.0	6.1		7.0	6.9		7.0
Vehicle Extension (s)		3.5	3.5	3.5		3.5	3.5		3.5	3.5		3.5
Lane Grp Cap (vph)		358	802	358		126	369	632	130	571		404
v/s Ratio Prot		c0.11	0.06			0.03	c0.06	0.02	0.05	c0.09		c0.07
v/s Ratio Perm				0.01								
v/c Ratio		0.55	0.25	0.05		0.33	0.51	0.10	0.64	0.51		0.57
Uniform Delay, d1		24.8	21.5	20.5		30.4	29.3	21.2	31.2	26.2		29.1
Progression Factor		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2		2.0	0.2	0.1		1.8	1.4	0.1	10.3	3.3		2.1
Delay (s)		26.8	21.7	20.6		32.3	30.7	21.2	41.5	29.5		31.2
Level of Service		C	C	C		C	C	C	D	C		C
Approach Delay (s)			23.6				25.8			31.7		
Approach LOS			C				C			C		
Intersection Summary												
HCM 2000 Control Delay			26.7				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.54									
Actuated Cycle Length (s)			70.0				Sum of lost time (s)			27.0		
Intersection Capacity Utilization			54.6%				ICU Level of Service			A		
Analysis Period (min)			15									
c Critical Lane Group												

	↓	↙
Movement	SBT	SBR
Lane Configurations	↑↑	↑
Traffic Volume (vph)	206	203
Future Volume (vph)	206	203
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	6.9	6.9
Lane Util. Factor	0.95	1.00
Frt	1.00	0.85
Flt Protected	1.00	1.00
Satd. Flow (prot)	3406	1583
Flt Permitted	1.00	1.00
Satd. Flow (perm)	3406	1583
Peak-hour factor, PHF	0.98	0.98
Adj. Flow (vph)	210	207
RTOR Reduction (vph)	0	163
Lane Group Flow (vph)	210	44
Heavy Vehicles (%)	6%	2%
Turn Type	NA	Perm
Protected Phases	6	
Permitted Phases		6
Actuated Green, G (s)	15.0	15.0
Effective Green, g (s)	15.0	15.0
Actuated g/C Ratio	0.21	0.21
Clearance Time (s)	6.9	6.9
Vehicle Extension (s)	3.5	3.5
Lane Grp Cap (vph)	729	339
v/s Ratio Prot	c0.06	
v/s Ratio Perm		0.03
v/c Ratio	0.29	0.13
Uniform Delay, d1	23.0	22.2
Progression Factor	1.00	1.00
Incremental Delay, d2	1.0	0.8
Delay (s)	24.0	23.0
Level of Service	C	C
Approach Delay (s)	26.3	
Approach LOS	C	
Intersection Summary		

												
Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	14	500	20	2	6	432	2	35	0	19	4	0
Future Volume (vph)	14	500	20	2	6	432	2	35	0	19	4	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.1	6.1	6.1		6.1	6.1			6.0	6.0		6.0
Lane Util. Factor	1.00	0.95	1.00		1.00	0.95			1.00	1.00		1.00
Frt	1.00	1.00	0.85		1.00	1.00			1.00	0.85		1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00			0.95	1.00		0.95
Satd. Flow (prot)	1805	3406	1583		1436	3404			1626	1538		1805
Flt Permitted	0.48	1.00	1.00		0.45	1.00			0.93	1.00		0.93
Satd. Flow (perm)	915	3406	1583		680	3404			1592	1538		1767
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)	15	543	22	2	7	470	2	38	0	21	4	0
RTOR Reduction (vph)	0	0	7	0	0	0	0	0	0	19	0	0
Lane Group Flow (vph)	15	543	15	0	9	472	0	0	38	2	0	4
Heavy Vehicles (%)	0%	6%	2%	0%	33%	6%	0%	11%	0%	5%	0%	0%
Turn Type	Perm	NA	Perm	Perm	Perm	NA		Perm	NA	Perm	Perm	NA
Protected Phases		2				6			8			4
Permitted Phases	2		2	6	6			8		8	4	
Actuated Green, G (s)	35.9	35.9	35.9		35.9	35.9			4.3	4.3		4.3
Effective Green, g (s)	35.9	35.9	35.9		35.9	35.9			4.3	4.3		4.3
Actuated g/C Ratio	0.69	0.69	0.69		0.69	0.69			0.08	0.08		0.08
Clearance Time (s)	6.1	6.1	6.1		6.1	6.1			6.0	6.0		6.0
Vehicle Extension (s)	4.0	4.0	4.0		4.0	4.0			0.2	0.2		0.2
Lane Grp Cap (vph)	628	2337	1086		466	2336			130	126		145
v/s Ratio Prot		c0.16				0.14						
v/s Ratio Perm	0.02		0.01		0.01				c0.02	0.00		0.00
v/c Ratio	0.02	0.23	0.01		0.02	0.20			0.29	0.01		0.03
Uniform Delay, d1	2.6	3.1	2.6		2.6	3.0			22.6	22.1		22.1
Progression Factor	1.00	1.00	1.00		1.00	1.00			1.00	1.00		1.00
Incremental Delay, d2	0.0	0.1	0.0		0.0	0.1			0.5	0.0		0.0
Delay (s)	2.6	3.1	2.6		2.6	3.0			23.0	22.1		22.1
Level of Service	A	A	A		A	A			C	C		C
Approach Delay (s)		3.1				3.0			22.7			22.1
Approach LOS		A				A			C			C
Intersection Summary												
HCM 2000 Control Delay			4.6			HCM 2000 Level of Service			A			
HCM 2000 Volume to Capacity ratio			0.24									
Actuated Cycle Length (s)			52.3			Sum of lost time (s)			12.1			
Intersection Capacity Utilization			71.0%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	24
Future Volume (vph)	24
Ideal Flow (vphpl)	1900
Total Lost time (s)	6.0
Lane Util. Factor	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1615
Flt Permitted	1.00
Satd. Flow (perm)	1615
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	26
RTOR Reduction (vph)	24
Lane Group Flow (vph)	2
Heavy Vehicles (%)	0%
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	4.3
Effective Green, g (s)	4.3
Actuated g/C Ratio	0.08
Clearance Time (s)	6.0
Vehicle Extension (s)	0.2
Lane Grp Cap (vph)	132
v/s Ratio Prot	
v/s Ratio Perm	0.00
v/c Ratio	0.02
Uniform Delay, d1	22.1
Progression Factor	1.00
Incremental Delay, d2	0.0
Delay (s)	22.1
Level of Service	C
Approach Delay (s)	
Approach LOS	
Intersection Summary	

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	217	240	80	30	203	262	106	473	59	316	385	216
Future Volume (vph)	217	240	80	30	203	262	106	473	59	316	385	216
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	6.1	6.1	7.0	6.1	6.1	7.0	6.9		7.0	6.9	6.9
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.88	1.00	0.95		0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1752	3471	1599	1752	3505	2814	1719	3538		3467	3574	1524
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1752	3471	1599	1752	3505	2814	1719	3538		3467	3574	1524
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	231	255	85	32	216	279	113	503	63	336	410	230
RTOR Reduction (vph)	0	0	62	0	0	208	0	11	0	0	0	168
Lane Group Flow (vph)	231	255	23	32	216	71	113	555	0	336	410	62
Heavy Vehicles (%)	3%	4%	1%	3%	3%	1%	5%	0%	3%	1%	1%	6%
Turn Type	Prot	NA	Perm	Prot	NA	pt+ov	Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8	8 1	5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)	20.1	24.6	24.6	5.1	9.6	29.8	9.1	20.1		13.2	24.2	24.2
Effective Green, g (s)	20.1	24.6	24.6	5.1	9.6	22.8	9.1	20.1		13.2	24.2	24.2
Actuated g/C Ratio	0.22	0.27	0.27	0.06	0.11	0.25	0.10	0.22		0.15	0.27	0.27
Clearance Time (s)	7.0	6.1	6.1	7.0	6.1		7.0	6.9		7.0	6.9	6.9
Vehicle Extension (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	3.5
Lane Grp Cap (vph)	391	948	437	99	373	712	173	790		508	961	409
v/s Ratio Prot	c0.13	0.07		0.02	c0.06	0.03	0.07	c0.16		c0.10	0.11	
v/s Ratio Perm			0.01									0.04
v/c Ratio	0.59	0.27	0.05	0.32	0.58	0.10	0.65	0.70		0.66	0.43	0.15
Uniform Delay, d1	31.3	25.6	24.1	40.8	38.3	25.7	38.9	32.2		36.3	27.2	25.1
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	2.5	0.2	0.1	2.2	2.3	0.1	8.9	5.2		3.4	1.4	0.8
Delay (s)	33.8	25.8	24.2	43.0	40.6	25.8	47.8	37.4		39.6	28.6	25.9
Level of Service	C	C	C	D	D	C	D	D		D	C	C
Approach Delay (s)		28.8			32.9			39.1			31.7	
Approach LOS		C			C			D			C	
Intersection Summary												
HCM 2000 Control Delay			33.2			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.64									
Actuated Cycle Length (s)			90.0			Sum of lost time (s)				27.0		
Intersection Capacity Utilization			63.4%			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												
Traffic Volume (vph)	25	536	54	11	444	5	32	0	7	3	1	19
Future Volume (vph)	25	536	54	11	444	5	32	0	7	3	1	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.1	6.1	6.1	6.1	6.1			6.0	6.0		6.0	6.0
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			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.95	1.00		0.96	1.00
Satd. Flow (prot)	1805	3505	1615	1530	3534			1703	1615		1831	1615
Flt Permitted	0.47	1.00	1.00	0.43	1.00			1.00	1.00		1.00	1.00
Satd. Flow (perm)	891	3505	1615	687	3534			1792	1615		1900	1615
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	28	596	60	12	493	6	36	0	8	3	1	21
RTOR Reduction (vph)	0	0	17	0	1	0	0	0	8	0	0	20
Lane Group Flow (vph)	28	596	43	12	498	0	0	36	0	0	4	1
Heavy Vehicles (%)	0%	3%	0%	18%	2%	0%	6%	0%	0%	0%	0%	0%
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6			8		8	4		4
Actuated Green, G (s)	36.9	36.9	36.9	36.9	36.9			2.7	2.7		2.7	2.7
Effective Green, g (s)	36.9	36.9	36.9	36.9	36.9			2.7	2.7		2.7	2.7
Actuated g/C Ratio	0.71	0.71	0.71	0.71	0.71			0.05	0.05		0.05	0.05
Clearance Time (s)	6.1	6.1	6.1	6.1	6.1			6.0	6.0		6.0	6.0
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0			0.2	0.2		0.2	0.2
Lane Grp Cap (vph)	635	2501	1152	490	2522			93	84		99	84
v/s Ratio Prot		c0.17			0.14							
v/s Ratio Perm	0.03		0.03	0.02				c0.02	0.00		0.00	0.00
v/c Ratio	0.04	0.24	0.04	0.02	0.20			0.39	0.00		0.04	0.01
Uniform Delay, d1	2.2	2.6	2.2	2.2	2.5			23.7	23.2		23.3	23.2
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	0.1	0.0	0.0	0.1			1.0	0.0		0.1	0.0
Delay (s)	2.2	2.6	2.2	2.2	2.5			24.7	23.2		23.3	23.3
Level of Service	A	A	A	A	A			C	C		C	C
Approach Delay (s)		2.6			2.5			24.4			23.3	
Approach LOS		A			A			C			C	
Intersection Summary												
HCM 2000 Control Delay			3.7			HCM 2000 Level of Service				A		
HCM 2000 Volume to Capacity ratio			0.25									
Actuated Cycle Length (s)			51.7			Sum of lost time (s)			12.1			
Intersection Capacity Utilization			71.0%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

1: Power Plant & Briarfield Road/W Queen

06/17/2022

												
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	1	200	209	82	2	41	193	275	84	260	110	235
Future Volume (vph)	1	200	209	82	2	41	193	275	84	260	110	235
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0	6.1	6.1		7.0	6.1	6.1	7.0	6.9		7.0
Lane Util. Factor		1.00	0.95	1.00		1.00	0.95	0.88	1.00	0.95		0.97
Frt		1.00	1.00	0.85		1.00	1.00	0.85	1.00	0.96		1.00
Flt Protected		0.95	1.00	1.00		0.95	1.00	1.00	0.95	1.00		0.95
Satd. Flow (prot)		1719	3343	1495		1579	3312	2733	1626	3279		3367
Flt Permitted		0.95	1.00	1.00		0.95	1.00	1.00	0.95	1.00		0.95
Satd. Flow (perm)		1719	3343	1495		1579	3312	2733	1626	3279		3367
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	1	204	213	84	2	42	197	281	86	265	112	240
RTOR Reduction (vph)	0	0	0	64	0	0	0	216	0	70	0	0
Lane Group Flow (vph)	0	205	213	20	0	44	197	65	86	307	0	240
Heavy Vehicles (%)	0%	5%	8%	8%	0%	15%	9%	4%	11%	4%	8%	4%
Turn Type	Prot	Prot	NA	Perm	Prot	Prot	NA	pt+ov	Prot	NA		Prot
Protected Phases	7	7	4		3	3	8	8 1	5	2		1
Permitted Phases				4								
Actuated Green, G (s)		15.3	17.0	17.0		6.1	7.8	23.2	5.6	11.5		8.4
Effective Green, g (s)		15.3	17.0	17.0		6.1	7.8	16.2	5.6	11.5		8.4
Actuated g/C Ratio		0.22	0.24	0.24		0.09	0.11	0.23	0.08	0.16		0.12
Clearance Time (s)		7.0	6.1	6.1		7.0	6.1		7.0	6.9		7.0
Vehicle Extension (s)		3.5	3.5	3.5		3.5	3.5		3.5	3.5		3.5
Lane Grp Cap (vph)		375	811	363		137	369	632	130	538		404
v/s Ratio Prot		c0.12	0.06			0.03	c0.06	0.02	0.05	c0.09		c0.07
v/s Ratio Perm				0.01								
v/c Ratio		0.55	0.26	0.06		0.32	0.53	0.10	0.66	0.57		0.59
Uniform Delay, d1		24.3	21.4	20.3		30.0	29.4	21.2	31.3	27.0		29.2
Progression Factor		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2		1.8	0.2	0.1		1.6	1.7	0.1	12.4	4.3		2.5
Delay (s)		26.1	21.6	20.4		31.6	31.1	21.3	43.7	31.3		31.7
Level of Service		C		C		C	C	C	D	C		C
Approach Delay (s)			23.2				25.8			33.6		
Approach LOS			C				C			C		
Intersection Summary												
HCM 2000 Control Delay			27.2				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.56									
Actuated Cycle Length (s)			70.0				Sum of lost time (s)			27.0		
Intersection Capacity Utilization			55.9%				ICU Level of Service			B		
Analysis Period (min)			15									
c Critical Lane Group												

	↓	↙
Movement	SBT	SBR
Lane Configurations	↑↑	↑
Traffic Volume (vph)	214	211
Future Volume (vph)	214	211
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	6.9	6.9
Lane Util. Factor	0.95	1.00
Frt	1.00	0.85
Flt Protected	1.00	1.00
Satd. Flow (prot)	3406	1583
Flt Permitted	1.00	1.00
Satd. Flow (perm)	3406	1583
Peak-hour factor, PHF	0.98	0.98
Adj. Flow (vph)	218	215
RTOR Reduction (vph)	0	171
Lane Group Flow (vph)	218	44
Heavy Vehicles (%)	6%	2%
Turn Type	NA	Perm
Protected Phases	6	
Permitted Phases		6
Actuated Green, G (s)	14.3	14.3
Effective Green, g (s)	14.3	14.3
Actuated g/C Ratio	0.20	0.20
Clearance Time (s)	6.9	6.9
Vehicle Extension (s)	3.5	3.5
Lane Grp Cap (vph)	695	323
v/s Ratio Prot	c0.06	
v/s Ratio Perm		0.03
v/c Ratio	0.31	0.14
Uniform Delay, d1	23.7	22.8
Progression Factor	1.00	1.00
Incremental Delay, d2	1.2	0.9
Delay (s)	24.9	23.7
Level of Service	C	C
Approach Delay (s)	26.9	
Approach LOS	C	
Intersection Summary		

												
Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	15	520	21	2	6	450	2	36	0	20	4	0
Future Volume (vph)	15	520	21	2	6	450	2	36	0	20	4	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.1	6.1	6.1		6.1	6.1			6.0	6.0		6.0
Lane Util. Factor	1.00	0.95	1.00		1.00	0.95			1.00	1.00		1.00
Frt	1.00	1.00	0.85		1.00	1.00			1.00	0.85		1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00			0.95	1.00		0.95
Satd. Flow (prot)	1805	3406	1583		1436	3404			1626	1538		1805
Flt Permitted	0.47	1.00	1.00		0.44	1.00			0.93	1.00		0.93
Satd. Flow (perm)	898	3406	1583		665	3404			1592	1538		1767
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)	16	565	23	2	7	489	2	39	0	22	4	0
RTOR Reduction (vph)	0	0	7	0	0	0	0	0	0	20	0	0
Lane Group Flow (vph)	16	565	16	0	9	491	0	0	39	2	0	4
Heavy Vehicles (%)	0%	6%	2%	0%	33%	6%	0%	11%	0%	5%	0%	0%
Turn Type	Perm	NA	Perm	Perm	Perm	NA		Perm	NA	Perm	Perm	NA
Protected Phases		2				6			8			4
Permitted Phases	2		2	6	6			8		8	4	
Actuated Green, G (s)	35.9	35.9	35.9		35.9	35.9			4.3	4.3		4.3
Effective Green, g (s)	35.9	35.9	35.9		35.9	35.9			4.3	4.3		4.3
Actuated g/C Ratio	0.69	0.69	0.69		0.69	0.69			0.08	0.08		0.08
Clearance Time (s)	6.1	6.1	6.1		6.1	6.1			6.0	6.0		6.0
Vehicle Extension (s)	4.0	4.0	4.0		4.0	4.0			0.2	0.2		0.2
Lane Grp Cap (vph)	616	2337	1086		456	2336			130	126		145
v/s Ratio Prot		c0.17				0.14						
v/s Ratio Perm	0.02		0.01		0.01				c0.02	0.00		0.00
v/c Ratio	0.03	0.24	0.01		0.02	0.21			0.30	0.01		0.03
Uniform Delay, d1	2.6	3.1	2.6		2.6	3.0			22.6	22.1		22.1
Progression Factor	1.00	1.00	1.00		1.00	1.00			1.00	1.00		1.00
Incremental Delay, d2	0.0	0.1	0.0		0.0	0.1			0.5	0.0		0.0
Delay (s)	2.6	3.2	2.6		2.6	3.1			23.1	22.1		22.1
Level of Service	A	A	A		A	A			C	C		C
Approach Delay (s)		3.1				3.1			22.7			22.1
Approach LOS		A				A			C			C
Intersection Summary												
HCM 2000 Control Delay			4.6			HCM 2000 Level of Service			A			
HCM 2000 Volume to Capacity ratio			0.25									
Actuated Cycle Length (s)			52.3			Sum of lost time (s)			12.1			
Intersection Capacity Utilization			71.0%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	25
Future Volume (vph)	25
Ideal Flow (vphpl)	1900
Total Lost time (s)	6.0
Lane Util. Factor	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1615
Flt Permitted	1.00
Satd. Flow (perm)	1615
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	27
RTOR Reduction (vph)	25
Lane Group Flow (vph)	2
Heavy Vehicles (%)	0%
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	4.3
Effective Green, g (s)	4.3
Actuated g/C Ratio	0.08
Clearance Time (s)	6.0
Vehicle Extension (s)	0.2
Lane Grp Cap (vph)	132
v/s Ratio Prot	
v/s Ratio Perm	0.00
v/c Ratio	0.02
Uniform Delay, d1	22.1
Progression Factor	1.00
Incremental Delay, d2	0.0
Delay (s)	22.1
Level of Service	C
Approach Delay (s)	
Approach LOS	
Intersection Summary	

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	226	250	83	31	212	272	110	492	61	329	400	225
Future Volume (vph)	226	250	83	31	212	272	110	492	61	329	400	225
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	6.1	6.1	7.0	6.1	6.1	7.0	6.9		7.0	6.9	6.9
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.88	1.00	0.95		0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1752	3471	1599	1752	3505	2814	1719	3538		3467	3574	1524
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1752	3471	1599	1752	3505	2814	1719	3538		3467	3574	1524
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	240	266	88	33	226	289	117	523	65	350	426	239
RTOR Reduction (vph)	0	0	68	0	0	215	0	11	0	0	0	170
Lane Group Flow (vph)	240	266	20	33	226	74	117	577	0	350	426	69
Heavy Vehicles (%)	3%	4%	1%	3%	3%	1%	5%	0%	3%	1%	1%	6%
Turn Type	Prot	NA	Perm	Prot	NA	pt+ov	Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8	8 1	5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)	19.1	20.4	20.4	7.5	8.8	29.9	9.2	21.0		14.1	25.9	25.9
Effective Green, g (s)	19.1	20.4	20.4	7.5	8.8	22.9	9.2	21.0		14.1	25.9	25.9
Actuated g/C Ratio	0.21	0.23	0.23	0.08	0.10	0.25	0.10	0.23		0.16	0.29	0.29
Clearance Time (s)	7.0	6.1	6.1	7.0	6.1		7.0	6.9		7.0	6.9	6.9
Vehicle Extension (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	3.5
Lane Grp Cap (vph)	371	786	362	146	342	716	175	825		543	1028	438
v/s Ratio Prot	c0.14	0.08		0.02	c0.06	0.03	0.07	c0.16		c0.10	0.12	
v/s Ratio Perm			0.01									0.05
v/c Ratio	0.65	0.34	0.06	0.23	0.66	0.10	0.67	0.70		0.64	0.41	0.16
Uniform Delay, d1	32.4	29.1	27.3	38.5	39.2	25.7	38.9	31.6		35.6	25.9	23.9
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	4.0	0.3	0.1	0.9	4.9	0.1	9.7	4.9		2.7	1.2	0.8
Delay (s)	36.4	29.5	27.3	39.5	44.1	25.8	48.6	36.5		38.3	27.2	24.7
Level of Service	D	C	C	D	D	C	D	D		D	C	C
Approach Delay (s)		31.9			34.1			38.5			30.4	
Approach LOS		C			C			D			C	
Intersection Summary												
HCM 2000 Control Delay			33.4			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.67									
Actuated Cycle Length (s)			90.0			Sum of lost time (s)				27.0		
Intersection Capacity Utilization			65.1%			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												
Traffic Volume (vph)	26	558	56	11	462	5	33	0	7	3	1	20
Future Volume (vph)	26	558	56	11	462	5	33	0	7	3	1	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.1	6.1	6.1	6.1	6.1			6.0	6.0		6.0	6.0
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			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.95	1.00		0.96	1.00
Satd. Flow (prot)	1805	3505	1615	1530	3534			1703	1615		1831	1615
Flt Permitted	0.46	1.00	1.00	0.42	1.00			1.00	1.00		1.00	1.00
Satd. Flow (perm)	874	3505	1615	671	3534			1792	1615		1900	1615
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	29	620	62	12	513	6	37	0	8	3	1	22
RTOR Reduction (vph)	0	0	18	0	1	0	0	0	8	0	0	21
Lane Group Flow (vph)	29	620	44	12	518	0	0	37	0	0	4	1
Heavy Vehicles (%)	0%	3%	0%	18%	2%	0%	6%	0%	0%	0%	0%	0%
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6			8		8	4		4
Actuated Green, G (s)	36.7	36.7	36.7	36.7	36.7			2.7	2.7		2.7	2.7
Effective Green, g (s)	36.7	36.7	36.7	36.7	36.7			2.7	2.7		2.7	2.7
Actuated g/C Ratio	0.71	0.71	0.71	0.71	0.71			0.05	0.05		0.05	0.05
Clearance Time (s)	6.1	6.1	6.1	6.1	6.1			6.0	6.0		6.0	6.0
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0			0.2	0.2		0.2	0.2
Lane Grp Cap (vph)	622	2497	1150	478	2518			93	84		99	84
v/s Ratio Prot		c0.18			0.15							
v/s Ratio Perm	0.03		0.03	0.02				c0.02	0.00		0.00	0.00
v/c Ratio	0.05	0.25	0.04	0.03	0.21			0.40	0.00		0.04	0.01
Uniform Delay, d1	2.2	2.6	2.2	2.2	2.5			23.6	23.1		23.2	23.1
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	0.1	0.0	0.0	0.1			1.0	0.0		0.1	0.0
Delay (s)	2.2	2.7	2.2	2.2	2.5			24.6	23.1		23.2	23.2
Level of Service	A		A	A	A			C	C		C	C
Approach Delay (s)		2.6			2.5			24.4			23.2	
Approach LOS		A			A			C			C	
Intersection Summary												
HCM 2000 Control Delay			3.7			HCM 2000 Level of Service				A		
HCM 2000 Volume to Capacity ratio			0.26									
Actuated Cycle Length (s)			51.5			Sum of lost time (s)			12.1			
Intersection Capacity Utilization			71.0%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

												
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	1	200	211	82	8	42	197	281	84	260	111	237
Future Volume (vph)	1	200	211	82	8	42	197	281	84	260	111	237
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0	6.1	6.1		7.0	6.1	6.1	7.0	6.9		7.0
Lane Util. Factor		1.00	0.95	1.00		1.00	0.95	0.88	1.00	0.95		0.97
Frt		1.00	1.00	0.85		1.00	1.00	0.85	1.00	0.96		1.00
Flt Protected		0.95	1.00	1.00		0.95	1.00	1.00	0.95	1.00		0.95
Satd. Flow (prot)		1719	3343	1495		1602	3312	2733	1626	3278		3367
Flt Permitted		0.95	1.00	1.00		0.95	1.00	1.00	0.95	1.00		0.95
Satd. Flow (perm)		1719	3343	1495		1602	3312	2733	1626	3278		3367
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	1	204	215	84	8	43	201	287	86	265	113	242
RTOR Reduction (vph)	0	0	0	63	0	0	0	221	0	71	0	0
Lane Group Flow (vph)	0	205	215	21	0	51	201	66	86	307	0	242
Heavy Vehicles (%)	0%	5%	8%	8%	0%	15%	9%	4%	11%	4%	8%	4%
Turn Type	Prot	Prot	NA	Perm	Prot	Prot	NA	pt+ov	Prot	NA		Prot
Protected Phases	7	7	4		3	3	8	8 1	5	2		1
Permitted Phases				4								
Actuated Green, G (s)		15.3	17.1	17.1		6.0	7.8	23.2	5.6	11.5		8.4
Effective Green, g (s)		15.3	17.1	17.1		6.0	7.8	16.2	5.6	11.5		8.4
Actuated g/C Ratio		0.22	0.24	0.24		0.09	0.11	0.23	0.08	0.16		0.12
Clearance Time (s)		7.0	6.1	6.1		7.0	6.1		7.0	6.9		7.0
Vehicle Extension (s)		3.5	3.5	3.5		3.5	3.5		3.5	3.5		3.5
Lane Grp Cap (vph)		375	816	365		137	369	632	130	538		404
v/s Ratio Prot		c0.12	0.06			0.03	c0.06	0.02	0.05	c0.09		c0.07
v/s Ratio Perm				0.01								
v/c Ratio		0.55	0.26	0.06		0.37	0.54	0.11	0.66	0.57		0.60
Uniform Delay, d1		24.3	21.4	20.3		30.2	29.4	21.2	31.3	27.0		29.2
Progression Factor		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2		1.8	0.2	0.1		2.0	1.8	0.1	12.4	4.3		2.5
Delay (s)		26.1	21.6	20.3		32.2	31.2	21.3	43.7	31.3		31.7
Level of Service		C		C		C	C	C	D	C		C
Approach Delay (s)			23.2				26.0			33.6		
Approach LOS			C				C			C		
Intersection Summary												
HCM 2000 Control Delay			27.3				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.57									
Actuated Cycle Length (s)			70.0				Sum of lost time (s)			27.0		
Intersection Capacity Utilization			56.1%				ICU Level of Service			B		
Analysis Period (min)			15									
c Critical Lane Group												

	↓	↙
Movement	SBT	SBR
Lane Configurations	↑↑	↑
Traffic Volume (vph)	214	211
Future Volume (vph)	214	211
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	6.9	6.9
Lane Util. Factor	0.95	1.00
Frt	1.00	0.85
Flt Protected	1.00	1.00
Satd. Flow (prot)	3406	1583
Flt Permitted	1.00	1.00
Satd. Flow (perm)	3406	1583
Peak-hour factor, PHF	0.98	0.98
Adj. Flow (vph)	218	215
RTOR Reduction (vph)	0	171
Lane Group Flow (vph)	218	44
Heavy Vehicles (%)	6%	2%
Turn Type	NA	Perm
Protected Phases	6	
Permitted Phases		6
Actuated Green, G (s)	14.3	14.3
Effective Green, g (s)	14.3	14.3
Actuated g/C Ratio	0.20	0.20
Clearance Time (s)	6.9	6.9
Vehicle Extension (s)	3.5	3.5
Lane Grp Cap (vph)	695	323
v/s Ratio Prot	c0.06	
v/s Ratio Perm		0.03
v/c Ratio	0.31	0.14
Uniform Delay, d1	23.7	22.8
Progression Factor	1.00	1.00
Incremental Delay, d2	1.2	0.9
Delay (s)	24.9	23.7
Level of Service	C	C
Approach Delay (s)	26.9	
Approach LOS	C	
Intersection Summary		

												
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	5	15	526	21	2	6	451	2	36	0	20	5
Future Volume (vph)	5	15	526	21	2	6	451	2	36	0	20	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.1	6.1	6.1		6.1	6.1			6.0	6.0	
Lane Util. Factor		1.00	0.95	1.00		1.00	0.95			1.00	1.00	
Frt		1.00	1.00	0.85		1.00	1.00			1.00	0.85	
Flt Protected		0.95	1.00	1.00		0.95	1.00			0.95	1.00	
Satd. Flow (prot)		1805	3406	1583		1436	3404			1626	1538	
Flt Permitted		0.47	1.00	1.00		0.44	1.00			0.93	1.00	
Satd. Flow (perm)		897	3406	1583		661	3404			1592	1538	
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)	5	16	572	23	2	7	490	2	39	0	22	5
RTOR Reduction (vph)	0	0	0	7	0	0	0	0	0	0	20	0
Lane Group Flow (vph)	0	21	572	16	0	9	492	0	0	39	2	0
Heavy Vehicles (%)	0%	0%	6%	2%	0%	33%	6%	0%	11%	0%	5%	0%
Turn Type	Perm	Perm	NA	Perm	Perm	Perm	NA		Perm	NA	Perm	Perm
Protected Phases			2				6			8		
Permitted Phases	2	2		2	6	6			8		8	4
Actuated Green, G (s)		35.9	35.9	35.9		35.9	35.9			4.3	4.3	
Effective Green, g (s)		35.9	35.9	35.9		35.9	35.9			4.3	4.3	
Actuated g/C Ratio		0.69	0.69	0.69		0.69	0.69			0.08	0.08	
Clearance Time (s)		6.1	6.1	6.1		6.1	6.1			6.0	6.0	
Vehicle Extension (s)		4.0	4.0	4.0		4.0	4.0			0.2	0.2	
Lane Grp Cap (vph)		615	2337	1086		453	2336			130	126	
v/s Ratio Prot			c0.17				0.14					
v/s Ratio Perm		0.02		0.01		0.01				c0.02	0.00	
v/c Ratio		0.03	0.24	0.01		0.02	0.21			0.30	0.01	
Uniform Delay, d1		2.6	3.1	2.6		2.6	3.0			22.6	22.1	
Progression Factor		1.00	1.00	1.00		1.00	1.00			1.00	1.00	
Incremental Delay, d2		0.0	0.1	0.0		0.0	0.1			0.5	0.0	
Delay (s)		2.7	3.2	2.6		2.6	3.1			23.1	22.1	
Level of Service		A	A	A		A	A			C	C	
Approach Delay (s)			3.1				3.1			22.7		
Approach LOS			A				A			C		
Intersection Summary												
HCM 2000 Control Delay			4.6				HCM 2000 Level of Service			A		
HCM 2000 Volume to Capacity ratio			0.25									
Actuated Cycle Length (s)			52.3				Sum of lost time (s)			12.1		
Intersection Capacity Utilization			71.0%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												



Movement	SBT	SBR
Lane Configurations	↔ ↗	↗
Traffic Volume (vph)	0	25
Future Volume (vph)	0	25
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	6.0	6.0
Lane Util. Factor	1.00	1.00
Frt	1.00	0.85
Flt Protected	0.95	1.00
Satd. Flow (prot)	1805	1615
Flt Permitted	0.93	1.00
Satd. Flow (perm)	1767	1615
Peak-hour factor, PHF	0.92	0.92
Adj. Flow (vph)	0	27
RTOR Reduction (vph)	0	25
Lane Group Flow (vph)	5	2
Heavy Vehicles (%)	0%	0%
Turn Type	NA	Perm
Protected Phases	4	
Permitted Phases		4
Actuated Green, G (s)	4.3	4.3
Effective Green, g (s)	4.3	4.3
Actuated g/C Ratio	0.08	0.08
Clearance Time (s)	6.0	6.0
Vehicle Extension (s)	0.2	0.2
Lane Grp Cap (vph)	145	132
v/s Ratio Prot		
v/s Ratio Perm	0.00	0.00
v/c Ratio	0.03	0.02
Uniform Delay, d1	22.1	22.1
Progression Factor	1.00	1.00
Incremental Delay, d2	0.0	0.0
Delay (s)	22.1	22.1
Level of Service	C	C
Approach Delay (s)	22.1	
Approach LOS	C	
Intersection Summary		

HCM Signalized Intersection Capacity Analysis

1: Power Plant & Briarfield Road/W Queen

06/17/2022

												
Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	226	256	83	2	32	216	277	110	492	63	337	400
Future Volume (vph)	226	256	83	2	32	216	277	110	492	63	337	400
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	6.1	6.1		7.0	6.1	6.1	7.0	6.9		7.0	6.9
Lane Util. Factor	1.00	0.95	1.00		1.00	0.95	0.88	1.00	0.95		0.97	0.95
Frt	1.00	1.00	0.85		1.00	1.00	0.85	1.00	0.98		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00
Satd. Flow (prot)	1752	3471	1599		1755	3505	2814	1719	3536		3467	3574
Flt Permitted	0.95	1.00	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00
Satd. Flow (perm)	1752	3471	1599		1755	3505	2814	1719	3536		3467	3574
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	240	272	88	2	34	230	295	117	523	67	359	426
RTOR Reduction (vph)	0	0	68	0	0	0	215	0	12	0	0	0
Lane Group Flow (vph)	240	272	20	0	36	230	80	117	578	0	359	426
Heavy Vehicles (%)	3%	4%	1%	0%	3%	3%	1%	5%	0%	3%	1%	1%
Turn Type	Prot	NA	Perm	Prot	Prot	NA	pt+ov	Prot	NA		Prot	NA
Protected Phases	7	4		3	3	8	8 1	5	2		1	6
Permitted Phases			4									
Actuated Green, G (s)	19.1	20.8	20.8		7.9	9.6	30.6	9.2	20.3		14.0	25.1
Effective Green, g (s)	19.1	20.8	20.8		7.9	9.6	23.6	9.2	20.3		14.0	25.1
Actuated g/C Ratio	0.21	0.23	0.23		0.09	0.11	0.26	0.10	0.23		0.16	0.28
Clearance Time (s)	7.0	6.1	6.1		7.0	6.1		7.0	6.9		7.0	6.9
Vehicle Extension (s)	3.5	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5
Lane Grp Cap (vph)	371	802	369		154	373	737	175	797		539	996
v/s Ratio Prot	c0.14	0.08			0.02	c0.07	0.03	0.07	c0.16		c0.10	0.12
v/s Ratio Perm			0.01									
v/c Ratio	0.65	0.34	0.06		0.23	0.62	0.11	0.67	0.73		0.67	0.43
Uniform Delay, d1	32.4	28.9	26.9		38.2	38.4	25.2	38.9	32.3		35.8	26.6
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	4.0	0.3	0.1		0.9	3.2	0.1	9.7	5.7		3.2	1.3
Delay (s)	36.4	29.2	27.0		39.2	41.6	25.3	48.6	38.0		39.0	27.9
Level of Service	D	C	C		D	D	C	D	D		D	C
Approach Delay (s)		31.7				32.9			39.7			31.2
Approach LOS		C				C			D			C
Intersection Summary												
HCM 2000 Control Delay			33.7			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.67									
Actuated Cycle Length (s)			90.0			Sum of lost time (s)			27.0			
Intersection Capacity Utilization			65.5%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	225
Future Volume (vph)	225
Ideal Flow (vphpl)	1900
Total Lost time (s)	6.9
Lane Util. Factor	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1524
Flt Permitted	1.00
Satd. Flow (perm)	1524
Peak-hour factor, PHF	0.94
Adj. Flow (vph)	239
RTOR Reduction (vph)	172
Lane Group Flow (vph)	67
Heavy Vehicles (%)	6%
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	25.1
Effective Green, g (s)	25.1
Actuated g/C Ratio	0.28
Clearance Time (s)	6.9
Vehicle Extension (s)	3.5
Lane Grp Cap (vph)	425
v/s Ratio Prot	
v/s Ratio Perm	0.04
v/c Ratio	0.16
Uniform Delay, d1	24.5
Progression Factor	1.00
Incremental Delay, d2	0.8
Delay (s)	25.3
Level of Service	C
Approach Delay (s)	
Approach LOS	
Intersection Summary	

												
Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	16	26	560	56	11	465	5	33	0	7	3	1
Future Volume (vph)	16	26	560	56	11	465	5	33	0	7	3	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.1	6.1	6.1	6.1	6.1			6.0	6.0		6.0
Lane Util. Factor		1.00	0.95	1.00	1.00	0.95			1.00	1.00		1.00
Frt		1.00	1.00	0.85	1.00	1.00			1.00	0.85		1.00
Flt Protected		0.95	1.00	1.00	0.95	1.00			0.95	1.00		0.96
Satd. Flow (prot)		1805	3505	1615	1530	3534			1703	1615		1831
Flt Permitted		0.46	1.00	1.00	0.42	1.00			1.00	1.00		1.00
Satd. Flow (perm)		871	3505	1615	670	3534			1792	1615		1900
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	18	29	622	62	12	517	6	37	0	8	3	1
RTOR Reduction (vph)	0	0	0	18	0	1	0	0	0	8	0	0
Lane Group Flow (vph)	0	47	622	44	12	522	0	0	37	0	0	4
Heavy Vehicles (%)	0%	0%	3%	0%	18%	2%	0%	6%	0%	0%	0%	0%
Turn Type	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	Perm	Perm	NA
Protected Phases			2			6			8			4
Permitted Phases	2	2		2	6			8		8	4	
Actuated Green, G (s)		36.7	36.7	36.7	36.7	36.7			2.7	2.7		2.7
Effective Green, g (s)		36.7	36.7	36.7	36.7	36.7			2.7	2.7		2.7
Actuated g/C Ratio		0.71	0.71	0.71	0.71	0.71			0.05	0.05		0.05
Clearance Time (s)		6.1	6.1	6.1	6.1	6.1			6.0	6.0		6.0
Vehicle Extension (s)		4.0	4.0	4.0	4.0	4.0			0.2	0.2		0.2
Lane Grp Cap (vph)		620	2497	1150	477	2518			93	84		99
v/s Ratio Prot			c0.18			0.15						
v/s Ratio Perm		0.05		0.03	0.02				c0.02	0.00		0.00
v/c Ratio		0.08	0.25	0.04	0.03	0.21			0.40	0.00		0.04
Uniform Delay, d1		2.2	2.6	2.2	2.2	2.5			23.6	23.1		23.2
Progression Factor		1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00
Incremental Delay, d2		0.1	0.1	0.0	0.0	0.1			1.0	0.0		0.1
Delay (s)		2.3	2.7	2.2	2.2	2.6			24.6	23.1		23.2
Level of Service		A	A	A	A	A			C	C		C
Approach Delay (s)			2.6			2.5			24.4			23.2
Approach LOS			A			A			C			C
Intersection Summary												
HCM 2000 Control Delay			3.7			HCM 2000 Level of Service			A			
HCM 2000 Volume to Capacity ratio			0.26									
Actuated Cycle Length (s)			51.5			Sum of lost time (s)			12.1			
Intersection Capacity Utilization			71.0%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	20
Future Volume (vph)	20
Ideal Flow (vphpl)	1900
Total Lost time (s)	6.0
Lane Util. Factor	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1615
Flt Permitted	1.00
Satd. Flow (perm)	1615
Peak-hour factor, PHF	0.90
Adj. Flow (vph)	22
RTOR Reduction (vph)	21
Lane Group Flow (vph)	1
Heavy Vehicles (%)	0%
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	2.7
Effective Green, g (s)	2.7
Actuated g/C Ratio	0.05
Clearance Time (s)	6.0
Vehicle Extension (s)	0.2
Lane Grp Cap (vph)	84
v/s Ratio Prot	
v/s Ratio Perm	0.00
v/c Ratio	0.01
Uniform Delay, d1	23.1
Progression Factor	1.00
Incremental Delay, d2	0.0
Delay (s)	23.2
Level of Service	C
Approach Delay (s)	
Approach LOS	
Intersection Summary	

												
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	1	200	210	82	6	42	195	278	84	260	110	236
Future Volume (vph)	1	200	210	82	6	42	195	278	84	260	110	236
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0	6.1	6.1		7.0	6.1	6.1	7.0	6.9		7.0
Lane Util. Factor		1.00	0.95	1.00		1.00	0.95	0.88	1.00	0.95		0.97
Frt		1.00	1.00	0.85		1.00	1.00	0.85	1.00	0.96		1.00
Flt Protected		0.95	1.00	1.00		0.95	1.00	1.00	0.95	1.00		0.95
Satd. Flow (prot)		1719	3343	1495		1595	3312	2733	1626	3279		3367
Flt Permitted		0.95	1.00	1.00		0.95	1.00	1.00	0.95	1.00		0.95
Satd. Flow (perm)		1719	3343	1495		1595	3312	2733	1626	3279		3367
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	1	204	214	84	6	43	199	284	86	265	112	241
RTOR Reduction (vph)	0	0	0	64	0	0	0	218	0	70	0	0
Lane Group Flow (vph)	0	205	214	20	0	49	199	66	86	307	0	241
Heavy Vehicles (%)	0%	5%	8%	8%	0%	15%	9%	4%	11%	4%	8%	4%
Turn Type	Prot	Prot	NA	Perm	Prot	Prot	NA	pt+ov	Prot	NA		Prot
Protected Phases	7	7	4		3	3	8	8 1	5	2		1
Permitted Phases				4								
Actuated Green, G (s)		15.3	17.0	17.0		6.1	7.8	23.2	5.6	11.5		8.4
Effective Green, g (s)		15.3	17.0	17.0		6.1	7.8	16.2	5.6	11.5		8.4
Actuated g/C Ratio		0.22	0.24	0.24		0.09	0.11	0.23	0.08	0.16		0.12
Clearance Time (s)		7.0	6.1	6.1		7.0	6.1		7.0	6.9		7.0
Vehicle Extension (s)		3.5	3.5	3.5		3.5	3.5		3.5	3.5		3.5
Lane Grp Cap (vph)		375	811	363		138	369	632	130	538		404
v/s Ratio Prot		c0.12	0.06			0.03	c0.06	0.02	0.05	c0.09		c0.07
v/s Ratio Perm				0.01								
v/c Ratio		0.55	0.26	0.06		0.36	0.54	0.10	0.66	0.57		0.60
Uniform Delay, d1		24.3	21.4	20.3		30.1	29.4	21.2	31.3	27.0		29.2
Progression Factor		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2		1.8	0.2	0.1		1.9	1.7	0.1	12.4	4.3		2.5
Delay (s)		26.1	21.6	20.4		32.0	31.1	21.3	43.7	31.3		31.7
Level of Service		C		C		C	C	C	D	C		C
Approach Delay (s)			23.2				25.9			33.6		
Approach LOS			C				C			C		
Intersection Summary												
HCM 2000 Control Delay			27.3				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.57									
Actuated Cycle Length (s)			70.0				Sum of lost time (s)			27.0		
Intersection Capacity Utilization			56.0%				ICU Level of Service			B		
Analysis Period (min)			15									
c Critical Lane Group												

	↓	↙
Movement	SBT	SBR
Lane Configurations	↑↑	↑
Traffic Volume (vph)	214	211
Future Volume (vph)	214	211
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	6.9	6.9
Lane Util. Factor	0.95	1.00
Frt	1.00	0.85
Flt Protected	1.00	1.00
Satd. Flow (prot)	3406	1583
Flt Permitted	1.00	1.00
Satd. Flow (perm)	3406	1583
Peak-hour factor, PHF	0.98	0.98
Adj. Flow (vph)	218	215
RTOR Reduction (vph)	0	171
Lane Group Flow (vph)	218	44
Heavy Vehicles (%)	6%	2%
Turn Type	NA	Perm
Protected Phases	6	
Permitted Phases		6
Actuated Green, G (s)	14.3	14.3
Effective Green, g (s)	14.3	14.3
Actuated g/C Ratio	0.20	0.20
Clearance Time (s)	6.9	6.9
Vehicle Extension (s)	3.5	3.5
Lane Grp Cap (vph)	695	323
v/s Ratio Prot	c0.06	
v/s Ratio Perm		0.03
v/c Ratio	0.31	0.14
Uniform Delay, d1	23.7	22.8
Progression Factor	1.00	1.00
Incremental Delay, d2	1.2	0.9
Delay (s)	24.9	23.7
Level of Service	C	C
Approach Delay (s)	26.9	
Approach LOS	C	
Intersection Summary		

												
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	2	15	524	21	2	6	451	2	36	0	20	5
Future Volume (vph)	2	15	524	21	2	6	451	2	36	0	20	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.1	6.1	6.1		6.1	6.1			6.0	6.0	
Lane Util. Factor		1.00	0.95	1.00		1.00	0.95			1.00	1.00	
Frt		1.00	1.00	0.85		1.00	1.00			1.00	0.85	
Flt Protected		0.95	1.00	1.00		0.95	1.00			0.95	1.00	
Satd. Flow (prot)		1805	3406	1583		1436	3404			1626	1538	
Flt Permitted		0.47	1.00	1.00		0.44	1.00			0.93	1.00	
Satd. Flow (perm)		897	3406	1583		662	3404			1592	1538	
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)	2	16	570	23	2	7	490	2	39	0	22	5
RTOR Reduction (vph)	0	0	0	7	0	0	0	0	0	0	20	0
Lane Group Flow (vph)	0	18	570	16	0	9	492	0	0	39	2	0
Heavy Vehicles (%)	0%	0%	6%	2%	0%	33%	6%	0%	11%	0%	5%	0%
Turn Type	Perm	Perm	NA	Perm	Perm	Perm	NA		Perm	NA	Perm	Perm
Protected Phases			2				6			8		
Permitted Phases	2	2		2	6	6		8			8	4
Actuated Green, G (s)		35.9	35.9	35.9		35.9	35.9			4.3	4.3	
Effective Green, g (s)		35.9	35.9	35.9		35.9	35.9			4.3	4.3	
Actuated g/C Ratio		0.69	0.69	0.69		0.69	0.69			0.08	0.08	
Clearance Time (s)		6.1	6.1	6.1		6.1	6.1			6.0	6.0	
Vehicle Extension (s)		4.0	4.0	4.0		4.0	4.0			0.2	0.2	
Lane Grp Cap (vph)		615	2337	1086		454	2336			130	126	
v/s Ratio Prot			c0.17				0.14					
v/s Ratio Perm		0.02		0.01		0.01				c0.02	0.00	
v/c Ratio		0.03	0.24	0.01		0.02	0.21			0.30	0.01	
Uniform Delay, d1		2.6	3.1	2.6		2.6	3.0			22.6	22.1	
Progression Factor		1.00	1.00	1.00		1.00	1.00			1.00	1.00	
Incremental Delay, d2		0.0	0.1	0.0		0.0	0.1			0.5	0.0	
Delay (s)		2.7	3.2	2.6		2.6	3.1			23.1	22.1	
Level of Service		A	A	A		A	A			C	C	
Approach Delay (s)			3.1				3.1			22.7		
Approach LOS			A				A			C		
Intersection Summary												
HCM 2000 Control Delay			4.6				HCM 2000 Level of Service			A		
HCM 2000 Volume to Capacity ratio			0.25									
Actuated Cycle Length (s)			52.3				Sum of lost time (s)			12.1		
Intersection Capacity Utilization			71.0%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												



Movement	SBT	SBR
Lane Configurations	↔	↗
Traffic Volume (vph)	0	25
Future Volume (vph)	0	25
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	6.0	6.0
Lane Util. Factor	1.00	1.00
Frt	1.00	0.85
Flt Protected	0.95	1.00
Satd. Flow (prot)	1805	1615
Flt Permitted	0.93	1.00
Satd. Flow (perm)	1767	1615
Peak-hour factor, PHF	0.92	0.92
Adj. Flow (vph)	0	27
RTOR Reduction (vph)	0	25
Lane Group Flow (vph)	5	2
Heavy Vehicles (%)	0%	0%
Turn Type	NA	Perm
Protected Phases	4	
Permitted Phases		4
Actuated Green, G (s)	4.3	4.3
Effective Green, g (s)	4.3	4.3
Actuated g/C Ratio	0.08	0.08
Clearance Time (s)	6.0	6.0
Vehicle Extension (s)	0.2	0.2
Lane Grp Cap (vph)	145	132
v/s Ratio Prot		
v/s Ratio Perm	0.00	0.00
v/c Ratio	0.03	0.02
Uniform Delay, d1	22.1	22.1
Progression Factor	1.00	1.00
Incremental Delay, d2	0.0	0.0
Delay (s)	22.1	22.1
Level of Service	C	C
Approach Delay (s)	22.1	
Approach LOS	C	
Intersection Summary		

HCM Signalized Intersection Capacity Analysis

1: Power Plant & Briarfield Road/W Queen

06/17/2022

												
Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	226	253	83	1	31	214	276	110	492	62	333	400
Future Volume (vph)	226	253	83	1	31	214	276	110	492	62	333	400
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	6.1	6.1		7.0	6.1	6.1	7.0	6.9		7.0	6.9
Lane Util. Factor	1.00	0.95	1.00		1.00	0.95	0.88	1.00	0.95		0.97	0.95
Frt	1.00	1.00	0.85		1.00	1.00	0.85	1.00	0.98		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00
Satd. Flow (prot)	1752	3471	1599		1754	3505	2814	1719	3537		3467	3574
Flt Permitted	0.95	1.00	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00
Satd. Flow (perm)	1752	3471	1599		1754	3505	2814	1719	3537		3467	3574
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	240	269	88	1	33	228	294	117	523	66	354	426
RTOR Reduction (vph)	0	0	68	0	0	0	217	0	11	0	0	0
Lane Group Flow (vph)	240	269	20	0	34	228	77	117	578	0	354	426
Heavy Vehicles (%)	3%	4%	1%	0%	3%	3%	1%	5%	0%	3%	1%	1%
Turn Type	Prot	NA	Perm	Prot	Prot	NA	pt+ov	Prot	NA		Prot	NA
Protected Phases	7	4		3	3	8	8 1	5	2		1	6
Permitted Phases			4									
Actuated Green, G (s)	19.1	20.5	20.5		7.4	8.8	29.8	9.2	21.1		14.0	25.9
Effective Green, g (s)	19.1	20.5	20.5		7.4	8.8	22.8	9.2	21.1		14.0	25.9
Actuated g/C Ratio	0.21	0.23	0.23		0.08	0.10	0.25	0.10	0.23		0.16	0.29
Clearance Time (s)	7.0	6.1	6.1		7.0	6.1		7.0	6.9		7.0	6.9
Vehicle Extension (s)	3.5	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5
Lane Grp Cap (vph)	371	790	364		144	342	712	175	829		539	1028
v/s Ratio Prot	c0.14	0.08			0.02	c0.07	0.03	0.07	c0.16		c0.10	0.12
v/s Ratio Perm			0.01									
v/c Ratio	0.65	0.34	0.06		0.24	0.67	0.11	0.67	0.70		0.66	0.41
Uniform Delay, d1	32.4	29.1	27.2		38.7	39.2	25.8	38.9	31.5		35.7	25.9
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	4.0	0.3	0.1		1.0	5.1	0.1	9.7	4.8		3.0	1.2
Delay (s)	36.4	29.4	27.3		39.7	44.2	25.9	48.6	36.3		38.7	27.2
Level of Service	D	C	C		D	D	C	D	D		D	C
Approach Delay (s)		31.9				34.2			38.4			30.6
Approach LOS		C				C			D			C
Intersection Summary												
HCM 2000 Control Delay			33.5			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.67									
Actuated Cycle Length (s)			90.0			Sum of lost time (s)			27.0			
Intersection Capacity Utilization			65.3%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	225
Future Volume (vph)	225
Ideal Flow (vphpl)	1900
Total Lost time (s)	6.9
Lane Util. Factor	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1524
Flt Permitted	1.00
Satd. Flow (perm)	1524
Peak-hour factor, PHF	0.94
Adj. Flow (vph)	239
RTOR Reduction (vph)	170
Lane Group Flow (vph)	69
Heavy Vehicles (%)	6%
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	25.9
Effective Green, g (s)	25.9
Actuated g/C Ratio	0.29
Clearance Time (s)	6.9
Vehicle Extension (s)	3.5
Lane Grp Cap (vph)	438
v/s Ratio Prot	
v/s Ratio Perm	0.05
v/c Ratio	0.16
Uniform Delay, d1	23.9
Progression Factor	1.00
Incremental Delay, d2	0.8
Delay (s)	24.7
Level of Service	C
Approach Delay (s)	
Approach LOS	
Intersection Summary	

												
Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	8	26	559	56	11	464	5	33	0	7	3	1
Future Volume (vph)	8	26	559	56	11	464	5	33	0	7	3	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.1	6.1	6.1	6.1	6.1			6.0	6.0		6.0
Lane Util. Factor		1.00	0.95	1.00	1.00	0.95			1.00	1.00		1.00
Frt		1.00	1.00	0.85	1.00	1.00			1.00	0.85		1.00
Flt Protected		0.95	1.00	1.00	0.95	1.00			0.95	1.00		0.96
Satd. Flow (prot)		1805	3505	1615	1530	3534			1703	1615		1831
Flt Permitted		0.46	1.00	1.00	0.42	1.00			1.00	1.00		1.00
Satd. Flow (perm)		872	3505	1615	671	3534			1792	1615		1900
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	9	29	621	62	12	516	6	37	0	8	3	1
RTOR Reduction (vph)	0	0	0	18	0	1	0	0	0	8	0	0
Lane Group Flow (vph)	0	38	621	44	12	521	0	0	37	0	0	4
Heavy Vehicles (%)	0%	0%	3%	0%	18%	2%	0%	6%	0%	0%	0%	0%
Turn Type	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	Perm	Perm	NA
Protected Phases			2			6			8			4
Permitted Phases	2	2		2	6			8		8	4	
Actuated Green, G (s)		36.7	36.7	36.7	36.7	36.7			2.7	2.7		2.7
Effective Green, g (s)		36.7	36.7	36.7	36.7	36.7			2.7	2.7		2.7
Actuated g/C Ratio		0.71	0.71	0.71	0.71	0.71			0.05	0.05		0.05
Clearance Time (s)		6.1	6.1	6.1	6.1	6.1			6.0	6.0		6.0
Vehicle Extension (s)		4.0	4.0	4.0	4.0	4.0			0.2	0.2		0.2
Lane Grp Cap (vph)		621	2497	1150	478	2518			93	84		99
v/s Ratio Prot			c0.18			0.15						
v/s Ratio Perm		0.04		0.03	0.02				c0.02	0.00		0.00
v/c Ratio		0.06	0.25	0.04	0.03	0.21			0.40	0.00		0.04
Uniform Delay, d1		2.2	2.6	2.2	2.2	2.5			23.6	23.1		23.2
Progression Factor		1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00
Incremental Delay, d2		0.1	0.1	0.0	0.0	0.1			1.0	0.0		0.1
Delay (s)		2.3	2.7	2.2	2.2	2.6			24.6	23.1		23.2
Level of Service		A	A	A	A	A			C	C		C
Approach Delay (s)			2.6			2.5			24.4			23.2
Approach LOS			A			A			C			C
Intersection Summary												
HCM 2000 Control Delay			3.7			HCM 2000 Level of Service			A			
HCM 2000 Volume to Capacity ratio			0.26									
Actuated Cycle Length (s)			51.5			Sum of lost time (s)			12.1			
Intersection Capacity Utilization			71.0%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	20
Future Volume (vph)	20
Ideal Flow (vphpl)	1900
Total Lost time (s)	6.0
Lane Util. Factor	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1615
Flt Permitted	1.00
Satd. Flow (perm)	1615
Peak-hour factor, PHF	0.90
Adj. Flow (vph)	22
RTOR Reduction (vph)	21
Lane Group Flow (vph)	1
Heavy Vehicles (%)	0%
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	2.7
Effective Green, g (s)	2.7
Actuated g/C Ratio	0.05
Clearance Time (s)	6.0
Vehicle Extension (s)	0.2
Lane Grp Cap (vph)	84
v/s Ratio Prot	
v/s Ratio Perm	0.00
v/c Ratio	0.01
Uniform Delay, d1	23.1
Progression Factor	1.00
Incremental Delay, d2	0.0
Delay (s)	23.2
Level of Service	C
Approach Delay (s)	
Approach LOS	
Intersection Summary	

Intersection: 1: Power Plant & Briarfield Road/W Queen

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	UL	T	T	R	UL	T	T	R	R	L	T	TR
Maximum Queue (ft)	208	162	106	55	64	104	94	81	64	138	141	155
Average Queue (ft)	106	64	31	21	18	37	22	23	14	52	77	63
95th Queue (ft)	180	136	75	44	48	79	65	60	46	107	127	123
Link Distance (ft)		709	709			567	567				754	754
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	220			210	220			585	585	330		
Storage Blk Time (%)	0	0										
Queuing Penalty (veh)	0	0										

Intersection: 1: Power Plant & Briarfield Road/W Queen

Movement	SB	SB	SB	SB	SB
Directions Served	L	L	T	T	R
Maximum Queue (ft)	188	221	116	82	78
Average Queue (ft)	55	126	54	25	36
95th Queue (ft)	164	202	100	61	64
Link Distance (ft)			396	396	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	345	345		280	
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 2: Buckingham/New Hampton & W Queen

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	UL	T	T	R	UL	T	TR	LT	R	LT	R
Maximum Queue (ft)	30	83	97	18	39	68	82	63	51	43	36
Average Queue (ft)	5	20	31	2	4	24	30	20	11	3	17
95th Queue (ft)	22	61	78	9	23	59	69	49	35	20	44
Link Distance (ft)		358	358			538	538	255		442	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	140			125	205			230			40
Storage Blk Time (%)		0	0							0	1
Queuing Penalty (veh)		0	0							0	0

Intersection: 3: W Queen & Villas

Movement

Directions Served

Maximum Queue (ft)

Average Queue (ft)

95th Queue (ft)

Link Distance (ft)

Upstream Blk Time (%)

Queuing Penalty (veh)

Storage Bay Dist (ft)

Storage Blk Time (%)

Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 0

Intersection: 1: Power Plant & Briarfield Road/W Queen

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	UL	T	T	R	UL	T	T	R	R	L	T	TR
Maximum Queue (ft)	213	185	125	59	60	102	89	95	78	148	216	200
Average Queue (ft)	121	69	43	20	11	44	25	28	21	68	130	104
95th Queue (ft)	193	137	95	44	38	86	68	68	59	124	197	177
Link Distance (ft)		709	709			567	567				754	754
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	220			210	220			585	585	330		
Storage Blk Time (%)	0	0										
Queuing Penalty (veh)	1	0										

Intersection: 1: Power Plant & Briarfield Road/W Queen

Movement	SB	SB	SB	SB	SB
Directions Served	L	L	T	T	R
Maximum Queue (ft)	250	296	176	157	103
Average Queue (ft)	133	188	88	69	44
95th Queue (ft)	246	272	154	132	83
Link Distance (ft)			396	396	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	345	345		280	
Storage Blk Time (%)		0			
Queuing Penalty (veh)		0			

Intersection: 2: Buckingham/New Hampton & W Queen

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	UL	T	T	R	UL	T	TR	LT	R	LT	R
Maximum Queue (ft)	43	89	105	68	38	65	95	55	20	38	35
Average Queue (ft)	9	23	28	6	5	20	27	17	4	4	16
95th Queue (ft)	31	68	81	33	25	54	68	42	18	21	43
Link Distance (ft)		358	358			538	538	255		442	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	140			125	205			230			40
Storage Blk Time (%)		0	0	0						0	1
Queuing Penalty (veh)		0	0	0						0	0

Intersection: 3: W Queen & Villas

Movement

Directions Served

Maximum Queue (ft)

Average Queue (ft)

95th Queue (ft)

Link Distance (ft)

Upstream Blk Time (%)

Queuing Penalty (veh)

Storage Bay Dist (ft)

Storage Blk Time (%)

Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 1

Intersection: 1: Power Plant & Briarfield Road/W Queen

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	UL	T	T	R	UL	T	T	R	R	L	T	TR
Maximum Queue (ft)	198	167	131	65	89	89	75	78	63	133	149	132
Average Queue (ft)	103	63	32	23	22	34	18	24	17	55	77	64
95th Queue (ft)	170	124	82	48	60	74	55	61	52	106	128	115
Link Distance (ft)		709	709			567	567				754	754
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	220			210	220			585	585	330		
Storage Blk Time (%)	0	0	0									
Queuing Penalty (veh)	0	0	0									

Intersection: 1: Power Plant & Briarfield Road/W Queen

Movement	SB	SB	SB	SB	SB
Directions Served	L	L	T	T	R
Maximum Queue (ft)	190	229	119	101	83
Average Queue (ft)	69	138	55	31	37
95th Queue (ft)	184	217	102	72	67
Link Distance (ft)			396	396	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	345	345		280	
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 2: Buckingham/New Hampton & W Queen

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	UL	T	T	R	UL	T	TR	LT	R	LT	R
Maximum Queue (ft)	30	78	100	27	42	81	98	75	39	38	35
Average Queue (ft)	6	24	36	2	5	27	34	21	10	4	17
95th Queue (ft)	23	64	83	16	26	64	78	53	31	22	45
Link Distance (ft)		358	358			538	538	255		442	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	140			125	205			230			40
Storage Blk Time (%)			0							0	1
Queuing Penalty (veh)			0							0	0

Intersection: 3: W Queen & Villas

Movement

Directions Served

Maximum Queue (ft)

Average Queue (ft)

95th Queue (ft)

Link Distance (ft)

Upstream Blk Time (%)

Queuing Penalty (veh)

Storage Bay Dist (ft)

Storage Blk Time (%)

Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 0

Queuing and Blocking Report

06/17/2022

Intersection: 1: Power Plant & Briarfield Road/W Queen

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	UL	T	T	R	UL	T	T	R	R	L	T	TR
Maximum Queue (ft)	214	229	138	55	55	109	96	85	78	164	219	208
Average Queue (ft)	126	81	50	22	13	50	33	29	22	72	136	111
95th Queue (ft)	203	163	107	45	41	98	82	69	61	132	201	189
Link Distance (ft)		709	709			567	567				754	754
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	220			210	220			585	585	330		
Storage Blk Time (%)	1	0										
Queuing Penalty (veh)	1	0										

Intersection: 1: Power Plant & Briarfield Road/W Queen

Movement	SB	SB	SB	SB	SB
Directions Served	L	L	T	T	R
Maximum Queue (ft)	226	268	174	161	99
Average Queue (ft)	128	184	91	68	47
95th Queue (ft)	240	261	157	131	83
Link Distance (ft)			396	396	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	345	345		280	
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 2: Buckingham/New Hampton & W Queen

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	UL	T	T	R	UL	T	TR	LT	R	LT	R
Maximum Queue (ft)	54	90	100	42	44	77	78	60	20	37	35
Average Queue (ft)	12	25	33	5	5	22	27	19	4	4	17
95th Queue (ft)	37	70	84	23	27	58	66	45	18	22	44
Link Distance (ft)		358	358			538	538	255		442	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	140			125	205			230			40
Storage Blk Time (%)			0	0						0	1
Queuing Penalty (veh)			0	0						0	0

Intersection: 3: W Queen & Villas

Movement

Directions Served

Maximum Queue (ft)

Average Queue (ft)

95th Queue (ft)

Link Distance (ft)

Upstream Blk Time (%)

Queuing Penalty (veh)

Storage Bay Dist (ft)

Storage Blk Time (%)

Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 2

Queuing and Blocking Report

06/17/2022

Intersection: 1: Power Plant & Briarfield Road/W Queen

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	UL	T	T	R	UL	T	T	R	R	L	T	TR
Maximum Queue (ft)	192	158	112	61	74	95	82	99	83	131	157	148
Average Queue (ft)	104	60	33	24	20	38	23	24	17	57	79	65
95th Queue (ft)	172	118	76	50	55	82	65	67	56	109	130	119
Link Distance (ft)		709	709			567	567				754	754
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	220			210	220			585	585	330		
Storage Blk Time (%)	0	0										
Queuing Penalty (veh)	0	0										

Intersection: 1: Power Plant & Briarfield Road/W Queen

Movement	SB	SB	SB	SB	SB
Directions Served	L	L	T	T	R
Maximum Queue (ft)	215	255	120	100	78
Average Queue (ft)	68	139	56	33	37
95th Queue (ft)	186	221	106	80	63
Link Distance (ft)			396	396	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	345	345		280	
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 2: Buckingham/New Hampton & W Queen

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	UL	T	T	R	UL	T	TR	LT	R	LT	R
Maximum Queue (ft)	40	85	93	18	42	96	95	68	42	39	36
Average Queue (ft)	8	23	31	2	3	26	30	20	10	4	20
95th Queue (ft)	29	63	75	10	21	67	73	50	30	23	47
Link Distance (ft)		358	358			538	538	255		442	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	140			125	205			230			40
Storage Blk Time (%)			0						0		1
Queuing Penalty (veh)			0						0		0

Queuing and Blocking Report

06/17/2022

Intersection: 3: W Queen & Villas

Movement	SB
Directions Served	R
Maximum Queue (ft)	35
Average Queue (ft)	11
95th Queue (ft)	36
Link Distance (ft)	411
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 0

Intersection: 1: Power Plant & Briarfield Road/W Queen

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	UL	T	T	R	UL	T	T	R	R	L	T	TR
Maximum Queue (ft)	210	212	139	64	58	109	98	85	80	166	233	198
Average Queue (ft)	124	82	51	23	15	48	30	29	20	74	137	111
95th Queue (ft)	203	165	105	47	44	93	76	69	59	138	205	181
Link Distance (ft)		709	709			567	567				754	754
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	220			210	220			585	585	330		
Storage Blk Time (%)	1	0										
Queuing Penalty (veh)	1	0										

Intersection: 1: Power Plant & Briarfield Road/W Queen

Movement	SB	SB	SB	SB	SB
Directions Served	L	L	T	T	R
Maximum Queue (ft)	236	290	195	162	102
Average Queue (ft)	127	184	94	68	47
95th Queue (ft)	238	268	165	131	84
Link Distance (ft)			396	396	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	345	345		280	
Storage Blk Time (%)		0	0		
Queuing Penalty (veh)		0	0		

Intersection: 2: Buckingham/New Hampton & W Queen

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	UL	T	T	R	UL	T	TR	LT	R	LT	R
Maximum Queue (ft)	46	95	102	40	51	81	83	64	25	37	35
Average Queue (ft)	15	26	32	4	7	23	27	18	4	3	15
95th Queue (ft)	39	74	85	22	32	61	66	45	18	19	43
Link Distance (ft)		358	358			538	538	255		442	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	140			125	205			230			40
Storage Blk Time (%)		0	0	0						0	1
Queuing Penalty (veh)		0	0	0						0	0

Intersection: 3: W Queen & Villas

Movement	SB
Directions Served	R
Maximum Queue (ft)	31
Average Queue (ft)	11
95th Queue (ft)	35
Link Distance (ft)	411
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 2

Intersection: 1: Power Plant & Briarfield Road/W Queen

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	UL	T	T	R	UL	T	T	R	R	L	T	TR
Maximum Queue (ft)	197	170	107	64	75	89	78	97	98	128	152	162
Average Queue (ft)	104	60	35	23	21	40	21	24	19	56	78	65
95th Queue (ft)	171	123	78	48	55	81	59	70	66	108	132	122
Link Distance (ft)		709	709			567	567				754	754
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	220			210	220			585	585	330		
Storage Blk Time (%)	0	0										
Queuing Penalty (veh)	0	0										

Intersection: 1: Power Plant & Briarfield Road/W Queen

Movement	SB	SB	SB	SB	SB
Directions Served	L	L	T	T	R
Maximum Queue (ft)	196	236	122	103	92
Average Queue (ft)	68	137	53	31	37
95th Queue (ft)	184	212	100	73	68
Link Distance (ft)			396	396	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	345	345		280	
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 2: Buckingham/New Hampton & W Queen

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	UL	T	T	R	UL	T	TR	LT	R	LT	R
Maximum Queue (ft)	34	77	104	15	44	79	88	80	47	45	36
Average Queue (ft)	6	19	32	2	5	24	31	21	11	5	18
95th Queue (ft)	23	57	78	10	27	60	71	55	34	26	45
Link Distance (ft)		358	358			538	538	255		442	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	140			125	205			230			40
Storage Blk Time (%)			0							0	1
Queuing Penalty (veh)			0							0	0

Intersection: 3: W Queen & Villas

Movement	SB
Directions Served	R
Maximum Queue (ft)	31
Average Queue (ft)	9
95th Queue (ft)	31
Link Distance (ft)	411
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 0

Intersection: 1: Power Plant & Briarfield Road/W Queen

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	UL	T	T	R	UL	T	T	R	R	L	T	TR
Maximum Queue (ft)	215	238	128	60	64	108	89	82	73	176	223	206
Average Queue (ft)	128	79	48	22	15	47	28	27	20	77	138	111
95th Queue (ft)	202	155	101	46	45	91	71	65	57	141	199	182
Link Distance (ft)		709	709			567	567				754	754
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	220			210	220			585	585	330		
Storage Blk Time (%)	1	0										
Queuing Penalty (veh)	1	0										

Intersection: 1: Power Plant & Briarfield Road/W Queen

Movement	SB	SB	SB	SB	SB
Directions Served	L	L	T	T	R
Maximum Queue (ft)	250	302	180	162	102
Average Queue (ft)	136	187	88	68	46
95th Queue (ft)	238	269	153	130	84
Link Distance (ft)			396	396	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	345	345		280	
Storage Blk Time (%)		0	0		
Queuing Penalty (veh)		0	0		

Intersection: 2: Buckingham/New Hampton & W Queen

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	UL	T	T	R	UL	T	TR	LT	R	LT	R
Maximum Queue (ft)	44	107	104	43	40	87	84	56	22	34	35
Average Queue (ft)	12	27	30	5	6	22	26	19	4	3	15
95th Queue (ft)	34	77	84	26	27	59	64	46	17	20	42
Link Distance (ft)		358	358			538	538	255		442	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	140			125	205			230			40
Storage Blk Time (%)		0	0	0						0	1
Queuing Penalty (veh)		0	0	0						0	0

Intersection: 3: W Queen & Villas

Movement	SB
Directions Served	R
Maximum Queue (ft)	33
Average Queue (ft)	7
95th Queue (ft)	28
Link Distance (ft)	411
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 1

Intersection

Int Delay, s/veh 0.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑			↑
Traffic Vol, veh/h	0	567	511	6	0	17
Future Vol, veh/h	0	567	511	6	0	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	6	7	0	0	0
Mvmt Flow	0	616	555	7	0	18

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	-	0	- 0 - 281
Stage 1	-	-	- - -
Stage 2	-	-	- - -
Critical Hdwy	-	-	- - 6.9
Critical Hdwy Stg 1	-	-	- - -
Critical Hdwy Stg 2	-	-	- - -
Follow-up Hdwy	-	-	- - 3.3
Pot Cap-1 Maneuver	0	-	- - 0 722
Stage 1	0	-	- - 0 -
Stage 2	0	-	- - 0 -
Platoon blocked, %	-	-	- - -
Mov Cap-1 Maneuver	-	-	- - 722
Mov Cap-2 Maneuver	-	-	- - -
Stage 1	-	-	- - -
Stage 2	-	-	- - -

Approach	EB	WB	SB
HCM Control Delay, s	0	0	10.1
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	722
HCM Lane V/C Ratio	-	-	-	0.026
HCM Control Delay (s)	-	-	-	10.1
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.1

Intersection

Int Delay, s/veh 0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑			↑
Traffic Vol, veh/h	0	658	515	19	0	12
Future Vol, veh/h	0	658	515	19	0	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	6	7	0	0	0
Mvmt Flow	0	715	560	21	0	13

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	-	0	-
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	-
Pot Cap-1 Maneuver	0	-	-
Stage 1	0	-	-
Stage 2	0	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	10.2
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	712
HCM Lane V/C Ratio	-	-	-	0.018
HCM Control Delay (s)	-	-	-	10.2
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.1

Intersection

Int Delay, s/veh 0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑			↑
Traffic Vol, veh/h	0	562	511	3	0	10
Future Vol, veh/h	0	562	511	3	0	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	6	7	0	0	0
Mvmt Flow	0	611	555	3	0	11

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	-	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	6.9
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	3.3
Pot Cap-1 Maneuver	0	-	0
Stage 1	0	-	0
Stage 2	0	-	0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	724
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	10
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	724
HCM Lane V/C Ratio	-	-	-	0.015
HCM Control Delay (s)	-	-	-	10
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0

Intersection

Int Delay, s/veh 0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑			↑
Traffic Vol, veh/h	0	649	515	10	0	7
Future Vol, veh/h	0	649	515	10	0	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	6	7	0	0	0
Mvmt Flow	0	705	560	11	0	8

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	-	0	-
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	-
Pot Cap-1 Maneuver	0	-	-
Stage 1	0	-	-
Stage 2	0	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	10.1
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	717
HCM Lane V/C Ratio	-	-	-	0.011
HCM Control Delay (s)	-	-	-	10.1
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0

TO: Carol Bowen, Traffic Engineer, City of Hampton
FROM: Dexter R. Williams, P. E.
SUBJECT: Traffic Study Scope For Villas At West Queen
DATE: March 25, 2022

DEVELOPMENT PLAN

The Villas At West Queen is a proposed apartment development on West Queen Street. Two parcels of the property were previously rezoned to permit 38 units with a single right turn in/out entrance on West Queen Street. Those two parcels are shown in blue on Figure 1:

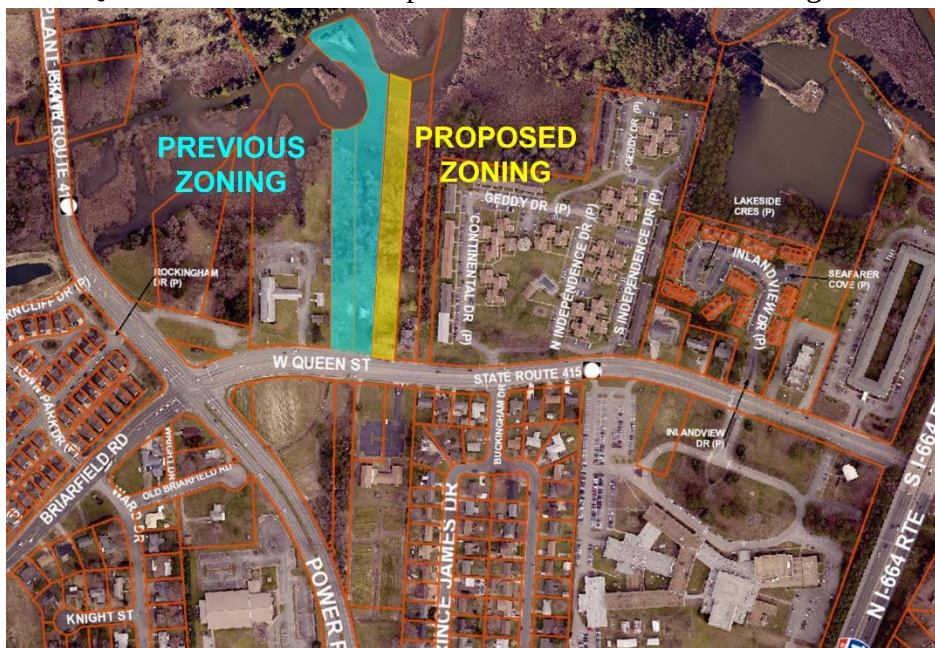


Figure 1: Villas At West Queen Property Location

The enclosed conceptual plan by LRI shows an expansion onto an adjacent parcel shown in yellow on Figure 1. The LRI plan shows 68 units in a single four-story building proposed for the combined parcels with a right turn in/out entrance on West Queen Street.

TRAFFIC COUNTS

Turning movement counts from 7 to 9 AM and 4 to 6 PM on a weekday at the following anticipated locations and shown in red on Figure 2:

1. Power Plant Parkway/Briarfield Road/West Queen Street.
2. West Queen Street/Buckingham Drive.



Figure 2: Traffic Count And Analysis Locations

TRAFFIC ANALYSIS LOCATIONS

Figure 2 also shows the proposed Villas At West Queen construction area shaded in blue. There are three intersections proposed for traffic analysis in the AM and PM peak hours to measure the impact of the proposed apartments:

1. Power Plant Parkway/Briarfield Road/West Queen Street.
2. West Queen Street/Buckingham Drive.
3. New Villas At West Queen entrance on West Queen Street (shown in yellow).

Analysis and reports will include:

- Analysis with Synchro
- HCM LOS reports
- SimTraffic queuing and blocking reports
- Three scenarios:
 - Existing
 - 2024 Background
 - 2024 Site Build Out

BACKGROUND TRAFFIC FORECAST WITHOUT PROPOSED SITE

The project is anticipated to be complete by 2024. Enclosed VDOT daily traffic counts and trends show level trends from 2015 to 2019 on Power Plant Road and West Queen Street (2020 counts not used in linear regression analysis due to COVID). For background traffic, 2% per year growth of peak hour traffic counts to 2024 background forecast year with 1.04 growth factor applied to counts.

SITE BUILD OUT FORECAST

Trip generation will be calculated using Trip Generation Manual, 10th Edition (TGM10) as follows:

TABLE ONE: SITE TRIP GENERATION

		LAND			WEEKDAY TRIP GENERATION						
		USE	SQ.FT.,		AM PEAK HOUR			PM PEAK HOUR			
VALUE	LAND USE	CODE	OTHER UNITS		Enter	Exit	Total	Enter	Exit	Total	DAILY
TRIP GENERATION MANUAL 10TH EDITION											
eq.-adj. st.	Multifamily Mid Rise	221	68 units		6	17	23	19	12	31	369
rate-adj. st.	Multifamily Mid Rise	221	68 units		6	18	24	18	12	30	370
TRIP GENERATION MANUAL 11TH EDITION											
eq.-adj. st.	Multifamily Mid Rise	221	68 units		4	14	18	16	11	27	278
rate-adj. st.	Multifamily Mid Rise	221	68 units		6	19	25	16	11	27	309

As shown, TGM11 has somewhat lower values and VDOT is balking on using TGM11. TGM 10 will be used.

Trip distribution east and west will be based on the directional splits for Intersection 2. Site traffic assignment will include U-turns from eastbound to westbound West Queen Street at Intersection 2 and from westbound to eastbound West Queen Street at Intersection 1.

Site traffic will be added to background traffic to produce 2024 site build out forecast.

Hampton

Timing Sheet

5/26/2022 9:12:50 AM

Station : 115 - Queen St. @ Briarfield Rd. (Upload File)

Phase	1 (SL)	2 (NT)	3 (WL)	4 (ET)	5 (NL)	6 (ST)	7 (EL)	8 (WT)	9	10	11	12	13	14	15	16
Walk																
Ped Clearance																
Min Green	5	10	5	6	5	10	7	6								
Passage	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5								
Max1	25	30	25	25	25	25	25	25								
Max2	15	30	20	20	15	30	20	17								
Yellow	4	4.9	4	4.1	4	4.9	4	4.1	6	6	6	6	6	6	6	6
Red	3	2	3	2	3	2	3	2								
Red Revert																
Added Initial																
Max Initial																
Time Before Reduce																
Cars Before Reduce																
Time To Reduce																
Reduce By																
Min Gap																
Dynamic Max Limit																
Dynamic Max Step																
Enable	ON	ON	ON	ON	ON	ON	ON	ON								
Auto Entry				ON				ON								
Auto Exit		ON				ON										
Non Act1																
Non Act2																
Lock Call		ON				ON										
Min Recall		ON				ON										
Max Recall																
Ped Recall																
Soft Recall																
Dual Entry		ON		ON		ON		ON								
Sim Gap Enable		ON		ON		ON		ON								
Guar Passage																
Rest In Walk																
Cond Service																
Add Init Calc																
Bike Clear																

Preemption

Channel	1	2	3	4	5	6
Lock Input	ON	ON	ON	ON	ON	ON
Override Flash						
Override Higher						
Flash Dwell						
Link						
Delay						
Min Duration						
Min Green	5	5	5	5	5	5
Min Walk						
Ped Clear						
Track Green						
Min Dwell	10	10	10	10	5	5
Max Presence					240	240
Track R1						
Track R2						
Track R3						
Track R4						
Dwell Ped1						
Exit R1	2	4	2	3		
Exit R2	6	8	6	8		
Exit R3						
Exit R4						

Preempt LP

Channel	1	2	3	4
Min				
Max				
Type				
Platoon Rx				
Cond Lockout				
Coord in Preempt				
Platoon Tx				
Lock				
Begin Mode	SKIP	SKIP	SKIP	SKIP
Priority P1				
Priority P2				
Priority P3				
Priority P4				
Max Lockout				
Ext Dwell				
Ant Arrival				
Max Grn 1				
Max Grn 2				
Max Grn 3				
Max Grn 4				
Max Grn 5				
Max Grn 6				
Max Grn 7				
Max Grn 8				
Max Grn 9				
Max Grn 10				
Max Grn 11				
Max Grn 12				
Max Grn 13				
Max Grn 14				
Max Grn 15				
Max Grn 16				
Headway Group				
Queue Jump				
Headway Time				
TX Time				
PP Hold Time				
PP Tx Phase 1				

Prepared By

Date Implemented

Reviewed By

Traffic Engineer

EXHIBIT 01

PP Tx Phase 2				
PP Tx Phase 3				
PP Tx Phase 4				

Hampton

Timing Sheet

5/26/2022 9:12:50 AM

Station : 115 - Queen St. @ Briarfield Rd. (Upload File)

Coordination

[illegible]

Hampton

Timing Sheet

5/26/2022 9:12:50 AM

Station : 115 - Queen St. @ Briarfield Rd. (Upload File)

[illegible]

EXHIBIT 02

[illegible]

Scheduler

[illegible]

User Comments:

Hampton

Timing Sheet

5/26/2022 9:06:33 AM

Station : 116 - Queen St. @ Buckingham Dr. (Upload File)

Phase	1	2 (ET)	3	4 (ST)	5	6 (WT)	7	8 (NT)	9	10	11	12	13	14	15	16
Walk																
Ped Clearance																
Min Green		30		7		30		7								
Passage		4				4										
Max1		35		15		35		15								
Max2		35		15		35		15								
Yellow	6	4.1	6	3.5	6	4.1	6	3.5	6	6	6	6	6	6	6	6
Red		2		2.5		2		2.5								
Red Revert																
Added Initial																
Max Initial																
Time Before Reduce																
Cars Before Reduce																
Time To Reduce																
Reduce By																
Min Gap																
Dynamic Max Limit																
Dynamic Max Step																
Enable		ON		ON		ON		ON								
Auto Entry				ON				ON								
Auto Exit		ON				ON										
Non Act1																
Non Act2																
Lock Call		ON				ON										
Min Recall		ON				ON										
Max Recall																
Ped Recall																
Soft Recall																
Dual Entry		ON		ON		ON		ON								
Sim Gap Enable		ON		ON		ON		ON								
Guar Passage																
Rest In Walk																
Cond Service																
Add Init Calc																
Bike Clear																

Preemption

Channel	1	2	3	4	5	6
Lock Input	ON	ON	ON	ON	ON	ON
Override Flash						
Override Higher						
Flash Dwell						
Link						
Delay						
Min Duration						
Min Green	5	5	5	5	5	5
Min Walk						
Ped Clear						
Track Green						
Min Dwell	5	5	5	5	5	5
Max Presence			240	240	240	240
Track R1						
Track R2						
Track R3						
Track R4						
Dwell Ped1						
Exit R1						
Exit R2						
Exit R3						
Exit R4						

Preempt LP

Channel	1	2	3	4
Min				
Max				
Type				
Platoon Rx				
Cond Lockout				
Coord in Preempt				
Platoon Tx				
Lock				
Begin Mode	SKIP	SKIP	SKIP	SKIP
Priority P1				
Priority P2				
Priority P3				
Priority P4				
Max Lockout				
Ext Dwell				
Ant Arrival				
Max Grn 1				
Max Grn 2				
Max Grn 3				
Max Grn 4				
Max Grn 5				
Max Grn 6				
Max Grn 7				
Max Grn 8				
Max Grn 9				
Max Grn 10				
Max Grn 11				
Max Grn 12				
Max Grn 13				
Max Grn 14				
Max Grn 15				
Max Grn 16				
Headway Group				
Queue Jump				
Headway Time				
TX Time				
PP Hold Time				
PP Tx Phase 1				

Prepared By

Date Implemented

Reviewed By

Traffic Engineer

EXHIBIT P1

Hampton Timing Sheet 5/26/2022 9:06:33 AM

Coordination

Hampton Timing Sheet 5/26/2022 9:06:33 AM

EXHIBIT P2

[illegible]

Scheduler

[illegible]

User Comments:

Law Offices of
Bennett L. Stein, P.C.
A Professional Corporation
632 Hampton Highway
Yorktown, Virginia 23693
Phone (757) 873-1221 / Fax (757) 873-4449

TITLE CERTIFICATION AND LIEN DISCLOSURE

The undersigned, attorney for the owners of the property (the "Property") to be under the name of "PROPOSED COMMERCIAL ENTRANCE SKETCH FOR WEST QUEEN STREET DEVELOPMENT FOR THE CITY OF HAMPTON, VIRGINIA," as shown on a proposed plat, dated October 22, 2025 prepared by LRI LANDTECH RESOURCES, INC. ENGINEERING and SURVEYING, (the "Plat"), hereby certifies, as required by Sections 14.24(5), Code of the City of Hampton, Virginia, that title to the two of the Properties are in the name of: Old Town Development, LLC, a Virginia registered limited liability company, and the third property is in the name of: Rob the Builder, Inc., a Virginia Corporation, all of which is owned by Robert D. Lang as either Manager or President of said companies.

The Lots have the following Parcel ID (1534 W Queen Street) 02A005A00 00000 containing 2.24 acres +/-, (1538 W Queen Street) 02A005 00 00000 containing 1.4657 acres +/-, (1540 W Queen Street) 02A004 00 00004 containing 1.74 acres +/- in the City of Hampton, Virginia.

Property known as 1534 W. Queen Street was acquired by the owner by instrument of record in the Clerk's Office of the Circuit Court of the City of Hampton, Virginia, in Instrument No. 210021078 on October 25, 2021. Property known as 1538 W. Queen Street was acquired by the owner by instrument of record in the Clerk's Office of the Circuit Court of the City of Hampton, Virginia, in No. 150001533 on February 11, 2015. Property known as 1540 W. Queen Street was

acquired by the owner by instrument of record in the Clerk's Office of the Circuit Court of the City of Hampton, Virginia, in No.140011216 on September 23, 2014.

I further certify that there are as of the date of this certification no deed restrictions or covenants of record, title defects, or encumbrances affecting, or potentially affecting, any portion of the Property proposed to be dedicated to public use on the Plat, other than the following:

1. A Proffer Agreement with the City of Hampton exist on the property known as 1538 W. Queen Street and 1540 W. Queen Street duly recording in the Clerk's Office of the Circuit Court of the City of Hampton on December 10, 2020 by Instrument No. 200018243.

I further certify that there are no deeds of trust encumbering the Properties.

LAW OFFICE OF BENNETT L. STEIN, P.C.

OCT 27 2025

Date

By: 

Bennett L. Stein, Esquire
VSB# 06902
632 Hampton Highway
Yorktown, VA 23693