PLANNING COMMISSION
WORK SESSION AGENDA

Town Council Chambers
765 Lynn Street, Herndon, VA 20170

Monday, January 8, 2024 | 7:00 PM

---

1. **Call to Order**

2. **Public Hearings**

   a. ZONING MAP AMENDMENT - ZMA #22-02, 13100 and 13150 Worldgate Drive, in the PD-W, Planned Development-Worldgate zoning district with proffered conditions to allow the redevelopment of the site with single-family attached and multi-family residential uses. (Continued from the December 18, 2023 regular meeting.)

   b. APPLICATION FOR A SPECIAL EXCEPTION – SE #23-03, 299 Herndon Parkway, Suite 106, to allow personal service use consisting of cosmetics and aesthetic services

   c. COMPREHENSIVE PLAN AMENDMENT - CPA #23-01, Resolution to consider Comprehensive Plan Amendment, CPA #23-01, pursuant to Section 15.2-2229 of the Code of Virginia, an amendment to the Town of Herndon 2030 Comprehensive Plan, adopted August 12, 2008, as amended through May 24, 2022

3. **New Business**

   a. Resolution to amend and restate the Bylaws of the Town of Herndon Planning Commission

   b. Discussion - Election of Officers

4. **Comments**

   a. Comments from the Staff Members

   b. Comments from the Commissioners

5. **Adjournment**

Planning Commission Work Session
Agenda Item 2.a.

Agenda Item: **ZONING MAP AMENDMENT - ZMA #22-02, 13100 and 13150 Worldgate Drive, in the PD-W, Planned Development-Worldgate zoning district with proffered conditions to allow the redevelopment of the site with single-family attached and multi-family residential uses. (Continued from the December 18, 2023 regular meeting.)**

Meeting Date: January 8, 2024

Category: Public Hearings

Prepared by: Bryce Perry, Deputy Director of Community Development

Description:
This is a Zoning Map Amendment application that proposes to rezone two parcels in the Worldgate development to allow the demolition of existing office building and construction of approximately 450 residential units.

Background:
The properties were annexed by the town in the 1980s. However, the existing office buildings and a structured parking garage were approved and constructed using Fairfax County land controls and zoning regulations. The properties are zoned PD-W, Planned-Development Worldgate, which allows for a mix of commercial and residential uses up to certain densities. The application includes a generalized development plan, a proffer statement, and requests for nine zoning modifications. The application was reviewed preliminarily at the December 4, 2023, Planning Commission work session and continued from the December 18, 2023, public hearing. A further update is provided in the attached memo.

Fiscal Impact:
None

Recommendation:
Staff is withholding a recommendation at this time pending further coordination with the applicant on outstanding staff comments.

Attachments:
1. Staff Memo
2. Staff Presentation

TOWN OF Herndon VIRGINIA

MEMORANDUM

To: **Chair Romeo & Planning Commission Members**

From: **Bryce A. Perry, Deputy Director, Community Development**

Date: **January 8, 2024**

Subject: **ZMA#22-02, 13100 & 13150 Worldgate Drive**

This memo serves as an addendum to the staff report dated December 4, 2023, and provides an update on the above-referenced land use case.

Staff comments for the application, as currently presented to the Planning Commission, have been provided to the applicant. There remain outstanding items that staff will need to work with the applicant on before staff can provide a recommendation to the Planning Commission. The remaining comments include the following among other more minor items:

1. ADA compliance and missing pedestrian connections
2. Design and security of the trail north of the parking garage
3. Options for tree preservation
4. Uncertainty on how off-site work would be permissible.
5. Conflicts between existing utilities and landscaping
6. Location of the Worldgate Drive bus stop
7. Construction timing of the Elden Street bus stop
8. Emergency access easements within Wiltshire Lane
9. Maintaining private improvements within public right-of-way
10. Extension of the right-turn lane at westbound approach to Elden Street
11. Design vehicle turning movements
12. Clarification on whether green space requirements are being met
13. Need for a written explanation regarding visitor parking
14. Omission of any shade structures on the garage or other measures to reduce heat island
15. Concerns with phasing and how to address a situation in which the office buildings are demolished but the multi-family building is not built to screen the garage.
16. Enforceability of the green building certification.
17. Commitments to green infrastructure for Low Impact Development.

While staff believes many of the remaining comments are straightforward, there are a few items staff understands the applicant will want to further discuss. It is possible that the applicant and staff will meet before the work session. Staff will be prepared to provide the Planning Commission with any updates in its presentation at the work session.

TOWN OF Herndon VIRGINIA

Zoning Map Amendment ZMA#22-02
13100 & 13150 Worldgate Drive

Planning Commission Work Session
January 8, 2024

Bryce A. Perry, Deputy Director
Department of Community Development

Context



Case Summary

- Demolition of existing office buildings
- Redevelopment with multi-family, stacked, and townhouse residential uses
- 1.34 FAR
- 460 dwelling units
- Modifications requested



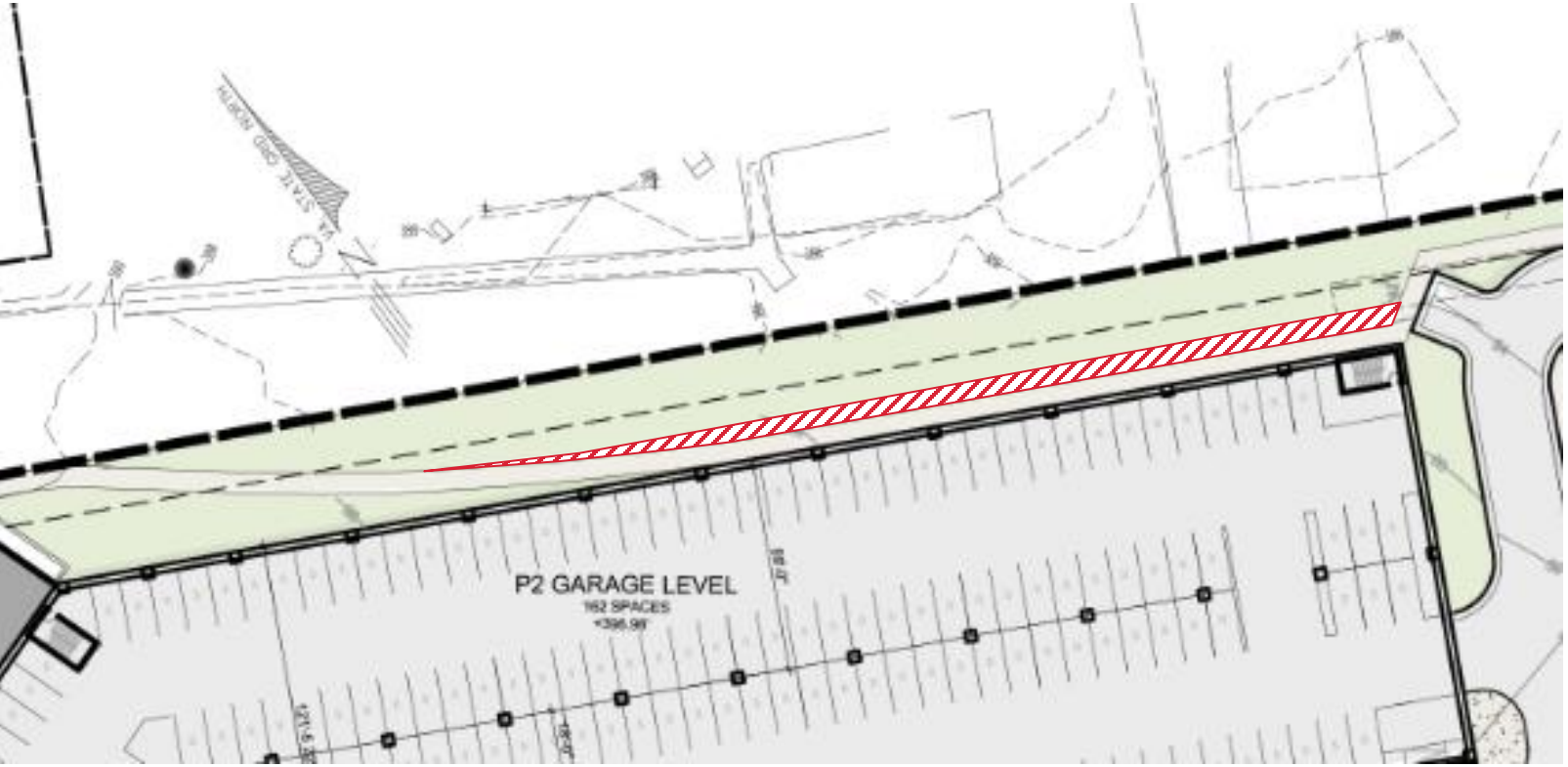


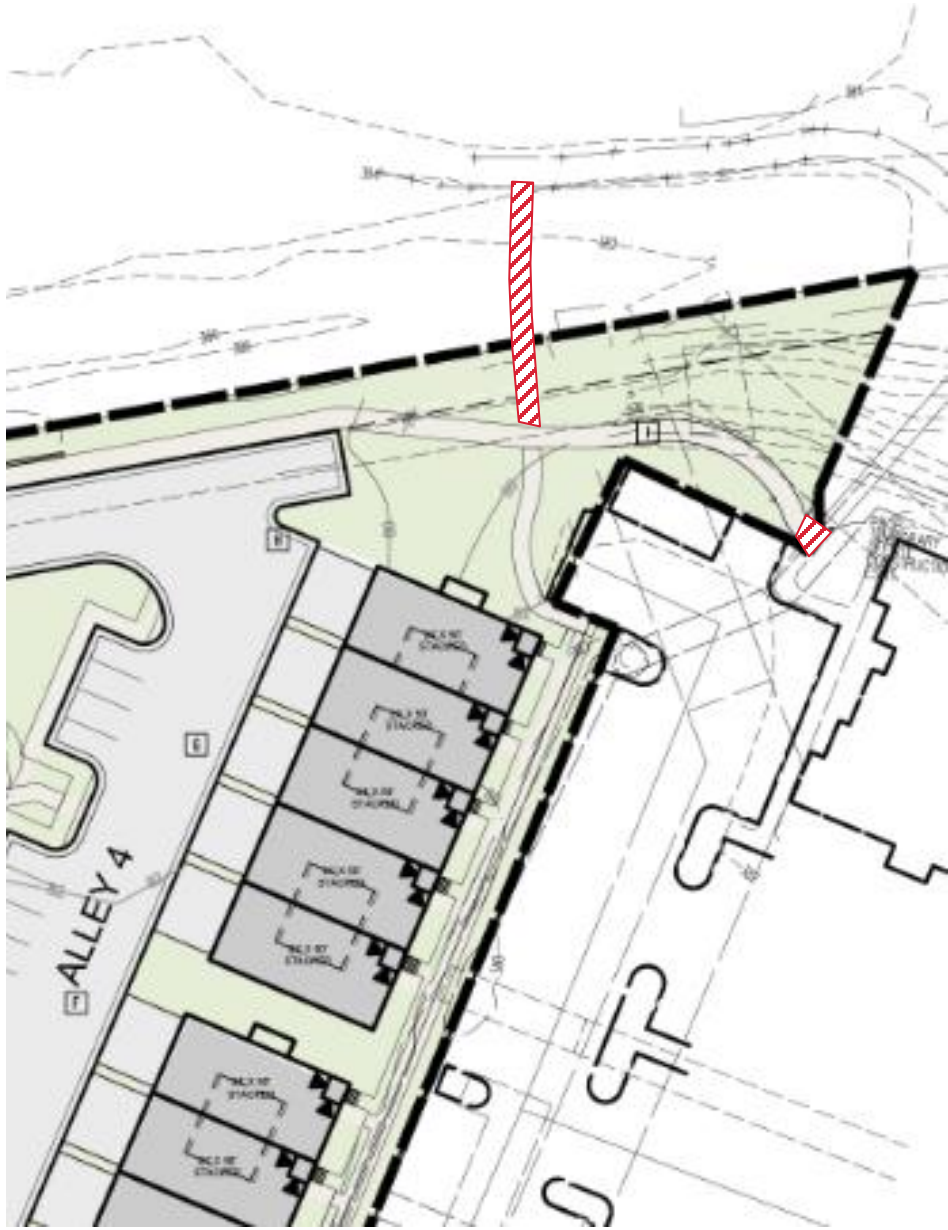
Case Updates

- Formal staff comments issued
- Areas identified as requiring further coordination and resolution:
  - Design of Worldgate Drive westbound and Road A entrance
  - Trail design and connection into Chandon Park
  - Reliance on off-site work
  - Pedestrian circulation throughout development
  - Location and design of Worldgate Drive bus stop, timing of Elden Street bus stop
  - Clarity on emergency and public access easements
  - Improvements within public right-of-way
  - Visitor parking
  - Interim conditions following demolition
  - On-site sustainability measures

- Staff hopes to meet this week with applicant to discuss
- Staff is withholding a recommendation at this time.

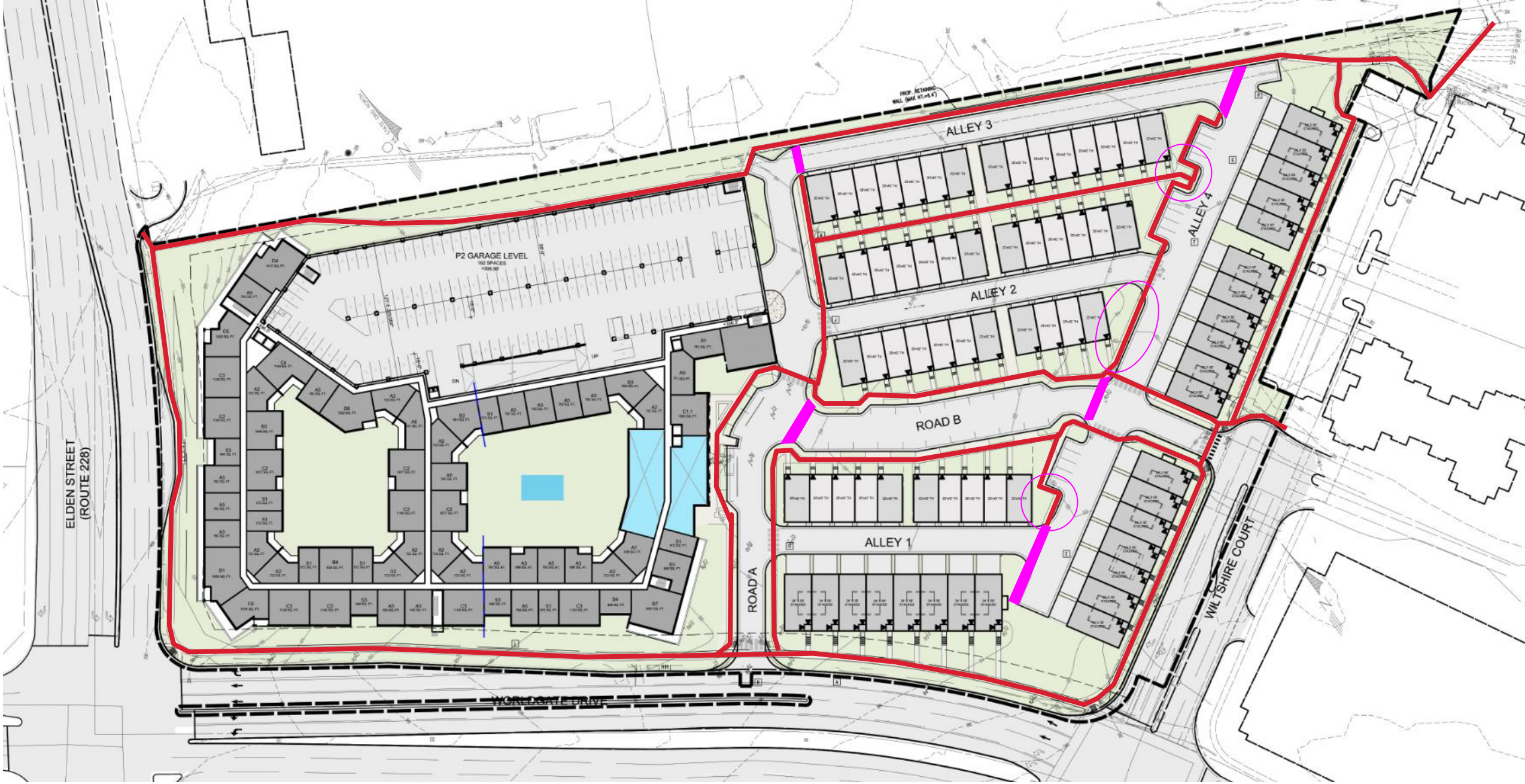

(ROUTE 228
ROAD A
WORLDGATE DRIVE

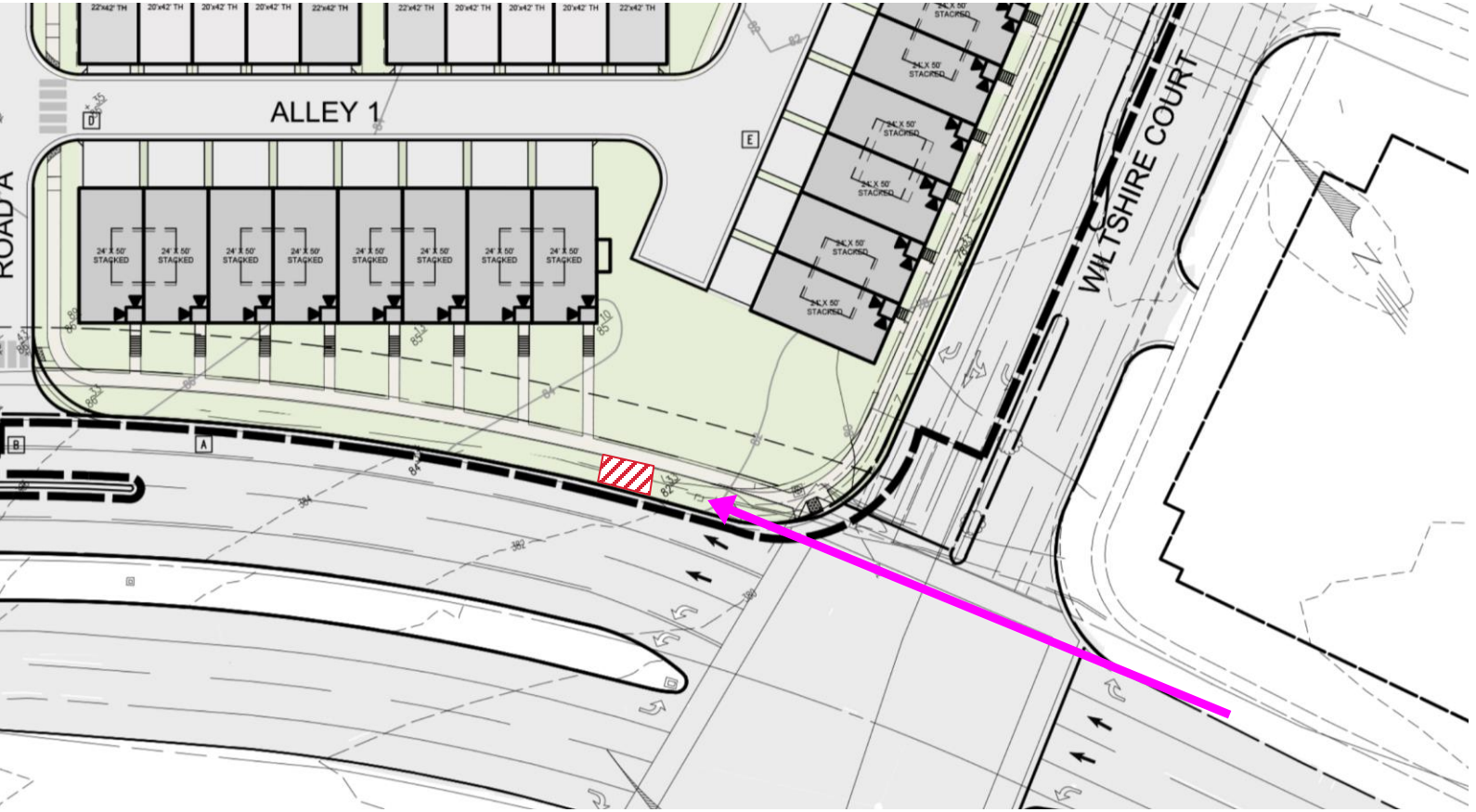

P2 GARAGE LEVEL
162 SPACES


ALLEY 4

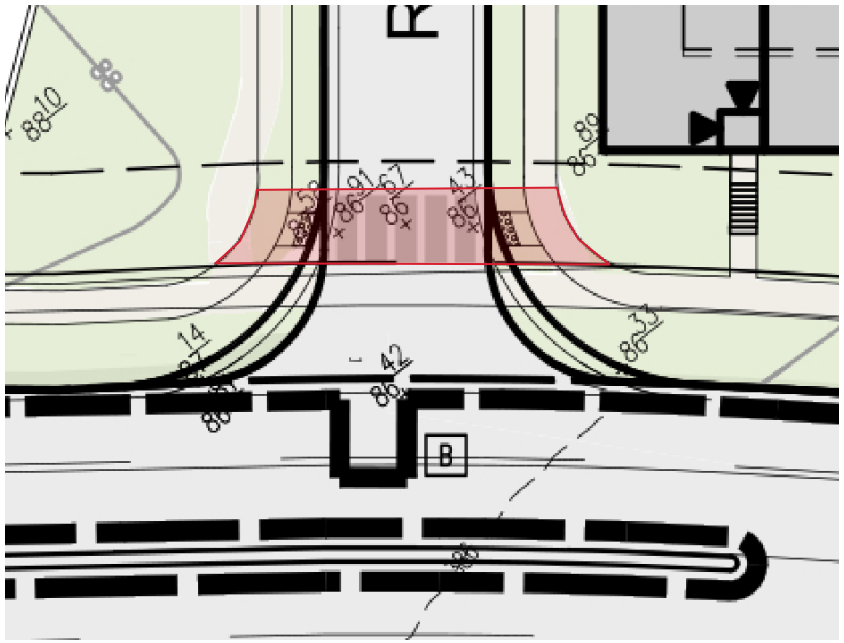

STACKED
24' X 50'
STACKED
85
10
82
33
180


ALLEY 4

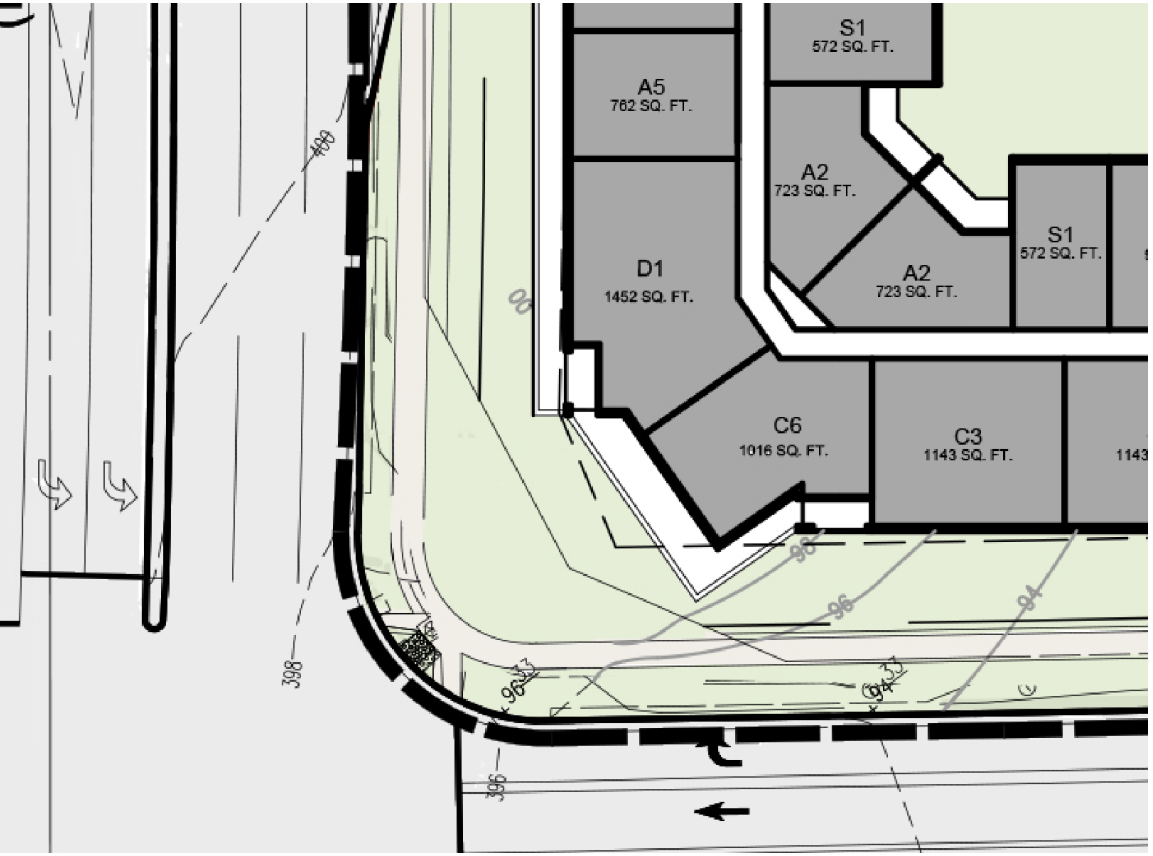

ELDEN STREET
(ROUTE 228)
P2 GARAGE LEVEL
152 SPACES
ALLEY 3
ALLEY 4
ALLEY 2
ROAD B
ALLEY 1
ROAD A
WILTSHIRE COURT
WORLDGATE DRIVE

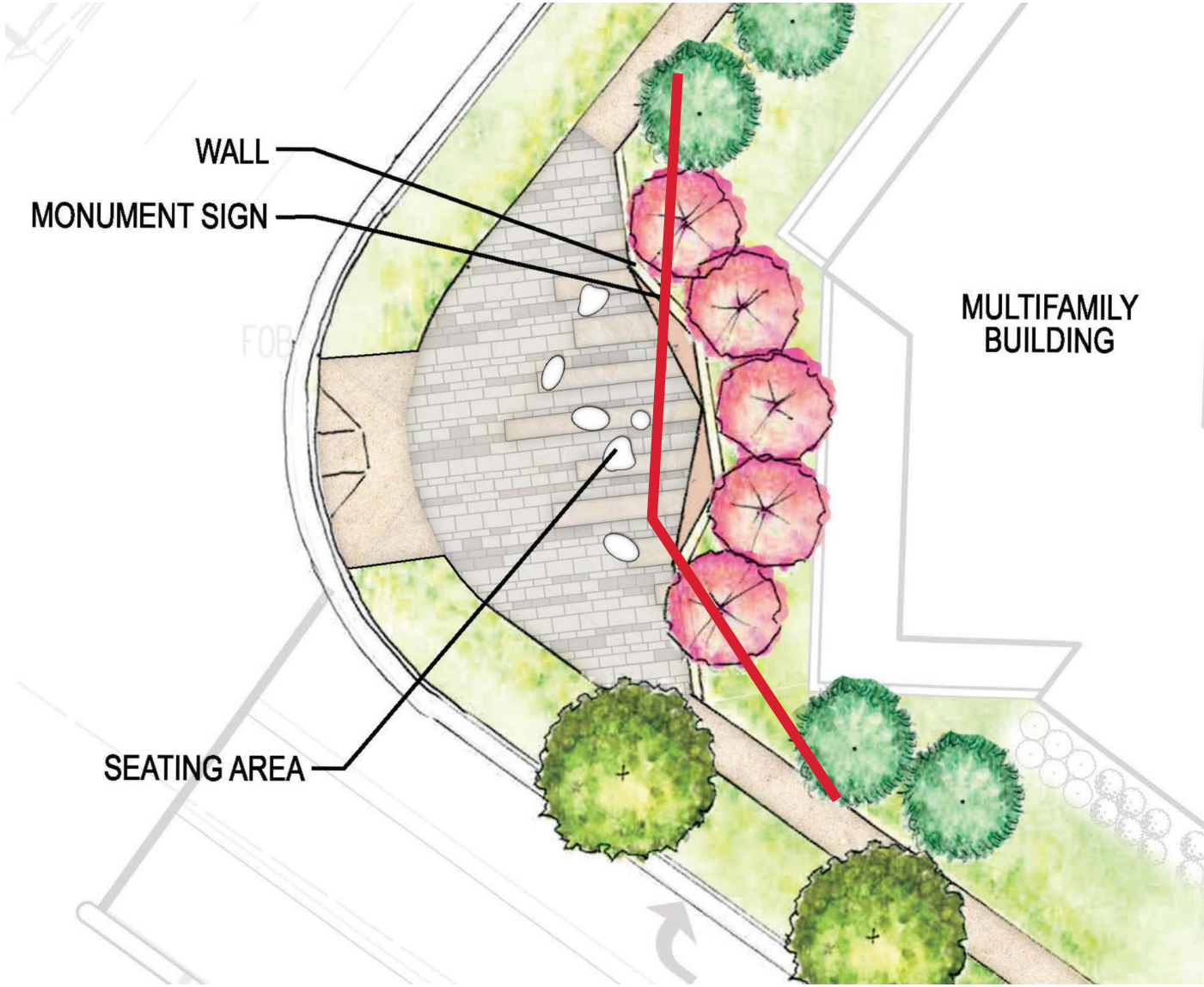

ALLEY 1
WILTSHIRE COURT
ROAD A


STACKED TOWNHOUSE
SHRUB PLANTINGS & DECORATIVE SCREEN
SPECIAL PAVING
MOVABLE SEATING
BENCH
STACKED TOWNHOUSE
ENTRY SIGN


B

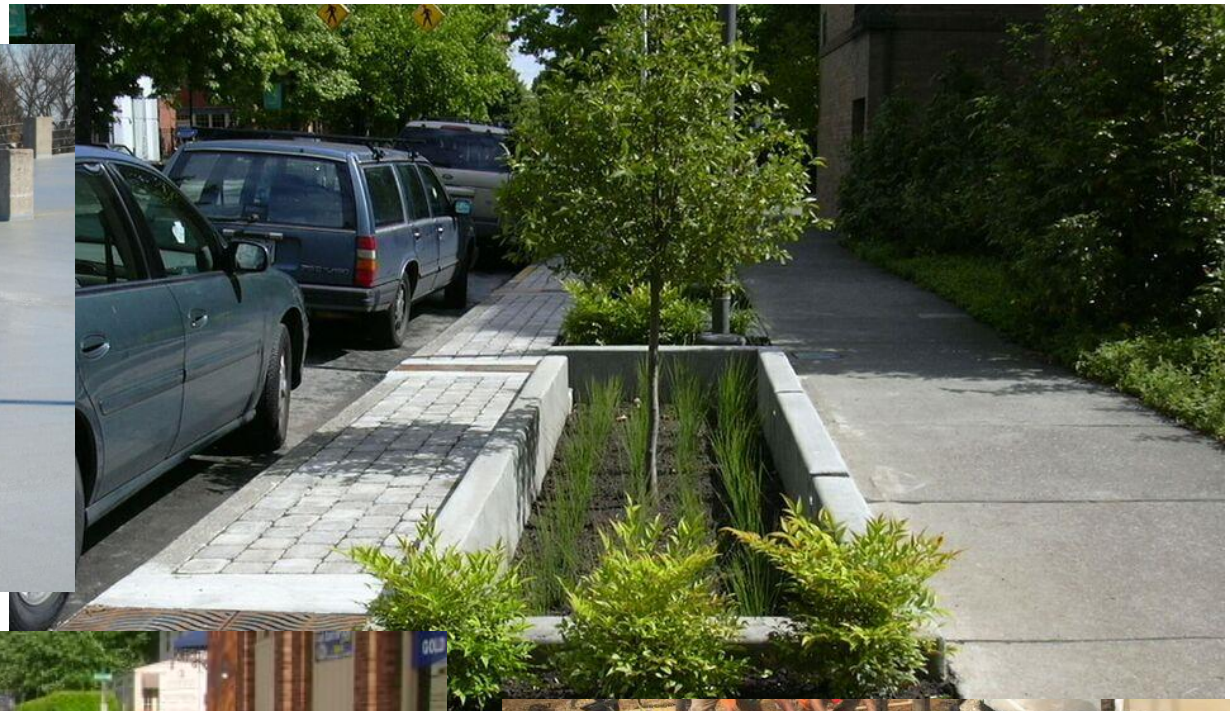

24' X 50' STACKED
WILTSHIRE COURT
E


S1
572 SQ. FT.
A5
762 SQ. FT.
A2
723 SQ. FT.
D1
1452 SQ. FT.
S1
572 SQ. FT.
A2
723 SQ. FT.
C6
1016 SQ. FT.
C3
1143 SQ. FT.
400
398
396
98
96
94


WALL
MONUMENT SIGN
SEATING AREA
MULTIFAMILY
BUILDING


ALLEY 3
ALLEY 4
ALLEY 2
ROAD B
ALLEY 1
ROAD A
WILTSHIRE COURT








CONTECH
ENGINEERED SOLUTIONS
Jellyfish® Filter

Zoning Map Amendment ZMA#22-02
13100 & 13150 Worldgate Drive

Planning Commission Work Session
January 8, 2024

Bryce A. Perry, Deputy Director
Department of Community Development

Planning Commission Work Session
Agenda Item 2.b.

Agenda Item: **APPLICATION FOR A SPECIAL EXCEPTION – SE #23-03, 299 Herndon Parkway, Suite 106, to allow personal service use consisting of cosmetics and aesthetic services**

Meeting Date: January 8, 2024

Category: Public Hearings

Prepared by: Fadrique Iglesias, Community Planner, David Stromberg, Zoning Administrator

Description:
This application seeks to allow personal service use consisting of cosmetics and aesthetic services. The property owner (and applicant) proposes to reconfigure the existing space to sign a new tenant. The site, located at the northeast corner of Herndon Parkway and Elden Street, encompasses a 916-square-foot tenant space within the Herndon Park Condominium Center, a complex comprised of two interconnected commercial office buildings constructed around 1987. Vehicular access is facilitated by two-way, double-loaded drive aisles on the east and west sides, with entrances at the northwest corner of Herndon Parkway and the southeast corner of Elden Street. The Herndon 2030 Comprehensive Plan designated the property as "Business Corridor Use." Zoned as CO, Commercial Office, the area is a transitional zone between high-intensity commercial activities and residential neighborhoods.

Background:
Previous approvals (SE #21-5 and an associated amendment) were granted for personal service use, specifically cosmetics and aesthetic services, on adjacent properties within the same office condominium. The Planning Commission's consistent recommendation for approval, coupled with the Town Council's subsequent endorsement, underscores the continuity of support for such applications within the broader context of the site's zoning and historical development.

Fiscal Impact:
None

Recommendation:
Staff is recommending approval of Special Exception, SE #23-03, in accordance with Alternative #2 and with the following conditions:

1. The personal services business space shall be constructed and utilized in substantial conformance with the original application received on June 27, 2023,

and the updated first-floor plan received on September 25, 2023, or similar types of cosmetics and personal services uses.
2. The business operations shall be conducted by appointment only and limited to six total people, including employees, occupying the space at any given time; and
3. The retail sales floor space allocation shall be limited to not more than 50 square feet within the tenant space.

Attachments:

1. Staff Report
2. Resolution (Proposed)
3. Applicant Narrative
4. Proposed Special Exception Floor Plan, dated September 25, 2023
5. TP #86-08 As-Built
6. Staff Presentation

STAFF REPORT

Agenda Item: APPLICATION FOR A SPECIAL EXCEPTION– SE #23-03, 299 - Herndon Parkway, Suite 106.

Meeting Date: January 8, 2024

Staff Contact: Fadrique Iglesias, Community Planner; David Stromberg, AICP, Zoning Administrator

Summary Information:

Proposed Modification	This application seeks to allow personal service use consisting of cosmetics and aesthetic services. The property owner (and applicant) proposes reconfiguring the existing 916 square feet of tenant space to sign a new tenant. The property is zoned CO, Commercial Office. The Herndon 2030 Comprehensive Plan designated the property as "Business Corridor Use." The property is located within the Herndon Park Condominium office building and is located at the northeast corner of the intersection of Herndon Parkway and Elden Street.		
Address	299 Herndon Pkwy Ste 106 Herndon VA 20170 4467		
Fairfax County Tax Map Number	0171 13 0106		
Owners	Nghiem Minh Huynh Yen		
Applicant	Nghiem Minh		
Business/Organization	Rosslyn Cosmetology, LLC.		
Property Use	Multi-story, multi-tenant commercial office		
Zoning District	CO, Commercial Office		
HDO Designation	N/A		
Adjacent Zoning	**North:** RM, Residential, Multi-family. **South:** O&LI, Office & Light Industrial	**East:** R-15, Residential, Single-family **West:** CS, Commercial Services	
Building Type(s)	Three-story, approximately 30,000 square feet (gross floor area). Unit 106 consists of approximately 916 square feet and is in a multi-unit building (Building 2).	**Date of Construction:**	1987
Comprehensive Plan Land Use Designation	Business Corridor		

Location Map:



Background & Site Description:

The existing 916-square-foot tenant space is contained within a three-story, multi-tenant, commercial office building which is connected to a second similar building (297 Herndon Parkway). The site is at the northeast corner of the intersection of Herndon Parkway and Elden Street. The two attached buildings, parking and surrounding site features comprise what is also known as Herndon Park Condominium Center and was constructed circa 1987. Two-way vehicular circulation is achieved through two-way, double-loaded drive aisles on the east and west sides of the site and wrapping around the northern part of the site. The site is accessed from Herndon Parkway at the northwest corner of the site and at the southeast corner of the site along Elden Street.

The CO zoning district is intended to function as a transitional area between higher-intensity commercial uses and neighborhood residential uses. A previous Special Exception (SE#21-05) was granted to allow personal service use consisting of cosmetics and aesthetic services within the adjacent unit and an expansion into an additional unit was subsequently granted. The cases are shown below.

- SE #21-05, 299 Herndon Parkway, Suite 108 for personal service use consisting of cosmetics and aesthetic services for a maximum of six people was granted on November 16, 2021.
- SE #21-05 amendment, 299 Herndon Parkway, Suite 107 for an expansion of personal service use consisting of cosmetics and aesthetic services was granted on June 13, 2023, and increased the number of people to 12 in total (including employees and clients).

In both cases, the Planning Commission recommended approval with the same conditions, and the Town Council approved the application.

Case Details & Proposal:

The applicant proposes to reconfigure the existing 916 square feet of tenant space into a cosmetics and personal services business to sign a new tenant. These personal services may include a spa salon and cosmetic services.

Staff Analysis:

Zoning Ordinance Compliance

The proposed personal services use, and retail sales use is only allowed by special exception in accordance with the Town's Zoning Ordinance 78-40.3 - *CO - Commercial office district*, Table 78-40.3(c)(3).

The zoning ordinance allows for flexibility for instances like this, when businesses traditionally located with other commercial service and retail sales uses have operational characteristics that make them appropriate to operate in traditional office park developments, provided adequate development and land use controls exist. In this case, the proposed personal services and retail sales uses are consistent with the purpose and intent of the Commercial Office Zoning District and the additional controls that can be implemented through the special exception process.

Based upon the application submitted and reviewed for compliance with the above town code sections, staff believes this proposal complies with the referenced Town of Herndon Zoning Ordinance section. It will be compatible with the existing uses on site and not negatively impact adjacent residential uses to the north and east of the site. Staff also evaluated the criteria for review of special exceptions found in Zoning Ordinance Section 78-153.3(e):

Comprehensive Plan Adherence

Corridor Land Use Policies. Most particularly, the proposal aligns with Land Use Policies for Business Corridor #1 and #3 (Herndon 2030 Comprehensive Plan, pages III-11 and III-12).

Criteria from Section 78-153.3(e)	**Meets/ Does Not Meet**	**Why the application meets or does not meet the criteria of Section 78-153.3(e)**
a. Is consistent with the Comprehensive Plan.	Meets	The Comprehensive Plan Land Use Section provides polices for provision of goods and services to the local community and positive economic benefits of new businesses. The proposed uses will be in conformance with the comprehensive plan polices.
b. Is free of conflict with any provision of this chapter and related regulations or any other applicable local, state, or federal laws and regulations.	Meets	The proposed special exception uses are provisioned with the base zoning district and do not create any substantial conflicts with other regulatory requirements. The use and business operations will be conditioned to ensure the use continually meets the purpose and intent of the Commercial Office Zoning District.
c. Does not adversely affect the health or safety of persons residing or working in the neighborhood of the proposed use.	Meets	The proposed uses are generally compatible to the site / neighborhood. This proposed project does not alter the intensity of use of the site and does not disproportionately increase the number of users or vehicular traffic on the site during limited business hours. Thus, health and safety of the occupants and the neighborhood is not impacted negatively.
d. Consistent with the purpose and intent of the zoning district in which it is located or will improve compatibility among uses and will ensure efficient development within the town.	Meets	The proposed use, personal services, is compatible with the intent of the CO district “to provide development opportunities for office uses that are principally used during daylight hours and that may serve as a transition between residential and retail commercial and service commercial uses.”

e. Minimizes adverse visual impact of the proposed use on adjacent lands.	Meets	The proposed uses are exclusively indoors and will not alter or increase impacts on any adjacent lands.
f. Contributes to a logical and orderly development pattern consistent with accepted or emerging planning practices.	Not Applicable	The only physical alterations are internal to the existing structure and thus not subject to this criterion.
g. Minimizes adverse impact on surrounding lands regarding service delivery, parking and loading, odors, noise, glare, and vibration, and should not create a nuisance.	Meets with conditions	Staff recommended conditions limit the overall capacity and distribution of customers in order to prevent negative impacts to parking, loading, and noise.
h. Avoids significant adverse impacts on the property values of surrounding lands or substantially and permanently injures the use of neighboring property for those uses that are permitted in the zoning district.	Meets	The proposed use has virtually no external impacts and provides needed space utilization for the new business owners
i. Does not significantly and adversely impact the natural environment, including but not limited to, air, noise, stormwater management, wildlife, vegetation, wetlands, and the natural functioning of the environment.	Meets	The proposed use is exclusively indoors and will not alter and not impact any adjacent lands.
j. Results in development that is adequately served by transportation facilities, including whether or not a substantial deterioration of the level of service on the town's transportation network would occur and whether or not the proposed use is designed to ensure safe ingress and egress onto the site and safe road conditions on and around the site.	Not Applicable	The only physical alterations are internal to the existing structure and thus not subject to this criterion.
k. Results in development that is adequately served by public facilities (roads, potable water and sewage, schools, parks, police, and fire and emergency medical facilities).	Not Applicable	The only physical alterations are internal to the existing structure and thus not subject to this criterion.
l. If infill and redevelopment is consistent with the redevelopment criteria and other applicable guidelines as stated in the Herndon 2030 Comprehensive Plan (adopted August 12, 2008), as amended.	Not Applicable	The only physical alterations are internal to the existing structure and thus not subject to this criterion.

m. If located in the floodplain overlay district, meets floodplain overlay standards.	Meets	There are no physical changes in the building footprints or grading within the FPO and this site will be removed from the FPO.

Fiscal Impact:

The proposal encourages uses that provide a variety of personal services as well as promotes economic development that increases employment and adds to the community tax base.

Transportation

The property contains a parking lot with 108 spaces. Additionally, the business is located approximately 100 feet from the nearest Fairfax Connector bus stop along Route 926 on Elden Street and 200 feet from the nearest Fairfax Connector bus stop along Route 924 on Herndon Parkway.

Analysis of Conditions

Staff is recommending three conditions for this special exception, listed in the following conditions analysis table. Staff believes these conditions provide reasonable ways in which the proposed use can be permitted while properly mitigating potential impacts, as well as achieving the purpose and intent of the applicable zoning district.

#	Condition	Covered by language in the Zoning Code	Reason for Condition
1	Substantial conformance with the submitted application	No	This condition is what gives the town the authority to ensure the proposed use is developed in the way that is presented to the Planning Commission and the Town Council.
2	Business operations shall be conducted by appointment only and limited to six (6) total people, inclusive of employees, occupying the space at any given time.	No	Personal service and retail uses typically generate more vehicle trips and parking demand than office uses. Conditions to limit occupancy and requiring appointments will maintain a similar intensity as uses that are allowed by right in this zoning district. This capacity ratio is consistent with the already approved special exception for personal service uses in the office park.

3	Allocation of retail sales to not more than 50 square feet within the tenant space.	No	Limiting retail space will allow the owner to have accessory retail associated with their provided services without the impacts generated by a full retail outlet.

Any future tenants proposing a personal service use will be required to comply with these three conditions. Any changes to these conditions can only be approved through an amendment of this special exception at a public hearing of the Planning Commission and Town Council. Any violation of the aforementioned conditions or other sections of the Herndon Town Code shall be grounds for revoking the special exception pursuant to the manner described in Section 78-155.3(h).

Planning Commission Alternatives:

The following alternatives are available to the Planning Commission for its decision on SE #23-003.

1. Recommendation for approval.
2. Recommendation for approval with conditions.
3. Recommendation for denial.
4. Continuance of the application to the February 26, 2024, Planning Commission meeting or later specified meeting date.

Staff Recommendation:

Staff is recommending approval of Special Exception, SE #23-03, in accordance with Alternative #2 and with the following conditions:

1. The personal services business space shall be constructed and utilized in substantial conformance with the original application received on June 27, 2023, and the updated first-floor plan received on September 25, 2023, or similar types of cosmetics and personal services uses.
2. The business operations shall be conducted by appointment only and limited to six total people, including employees, occupying the space at any given time; and
3. The retail sales floor space allocation shall be limited to not more than 50 square feet within the tenant space.

TOWN OF HERNDON, VIRGINIA
PLANNING COMMISSION

RESOLUTION

JANUARY 22, 2024

Resolution - to consider Special Exception Application SE #23-03, to permit a personal service use consisting of cosmetics and aesthetic services within the multi-tenant commercial office building in a Commercial Office, CO, zoning district.

The applicant, Nghiem Minh, has submitted a request for a special exception to permit a personal service use consisting of cosmetics and aesthetic services within the multi-tenant commercial office building at 299 Herndon Parkway, Suite 106, further identified as Fairfax County Tax Map # 0171 13 0106.

The Planning Commission has reviewed this application and has held a public hearing in accordance with the provisions of §15.2-2204 of the State Code and recommended that the application be approved with amended conditions based upon the finding that the amended conditions still meet the purpose and intent of the Zoning Ordinance, in particular Section 78-155.3(e).

BE IT RESOLVED by the Planning Commission of the Town of Herndon, Virginia, that:

The Planning Commission recommends approval of amending Special Exception Application SE #23-03 that shall run with the land and not be voided or extinguished from a change in ownership of the property in accordance with the conditions set forth below to achieve compliance with the standards found in Section 78-155.3;

1. The personal services business space shall be constructed and utilized in substantial conformance with the original application received on June 27, 2023, and updated first-floor plan received on September 25, 2023, or similar types of cosmetics and personal services uses.

2. The business operations shall be conducted by appointment only and limited to six total people, including employees, occupying the space at any given time; and

3. The retail sales floor space allocation shall be limited to not more than 50 square feet within the tenant space.

Lux Nail & Spa
299 Herndon Pkwy, suite 106
Herndon, VA 20170

Town of Herndon
Community Development
777 Lynn St. 2nd Floor
Herndon, VA 20170

Application For An Exception

Dear Planning Commission,
Please reconsider this letter as an application to the 'Special Exception' to permit a personal service use as Nail and Spa Salon. Our condo unit is within the first floor of the multi-tenant commercial building. The site is located at Herndon Park Condominium Center, 299 Herndon Parkway, Suite 106. From what I have learned the site is classified as a commercial office, and our business is classified as personal use. Our Condo unit is currently for rent, for more than two years, there are still no tenants. So we are having a hard time financially.

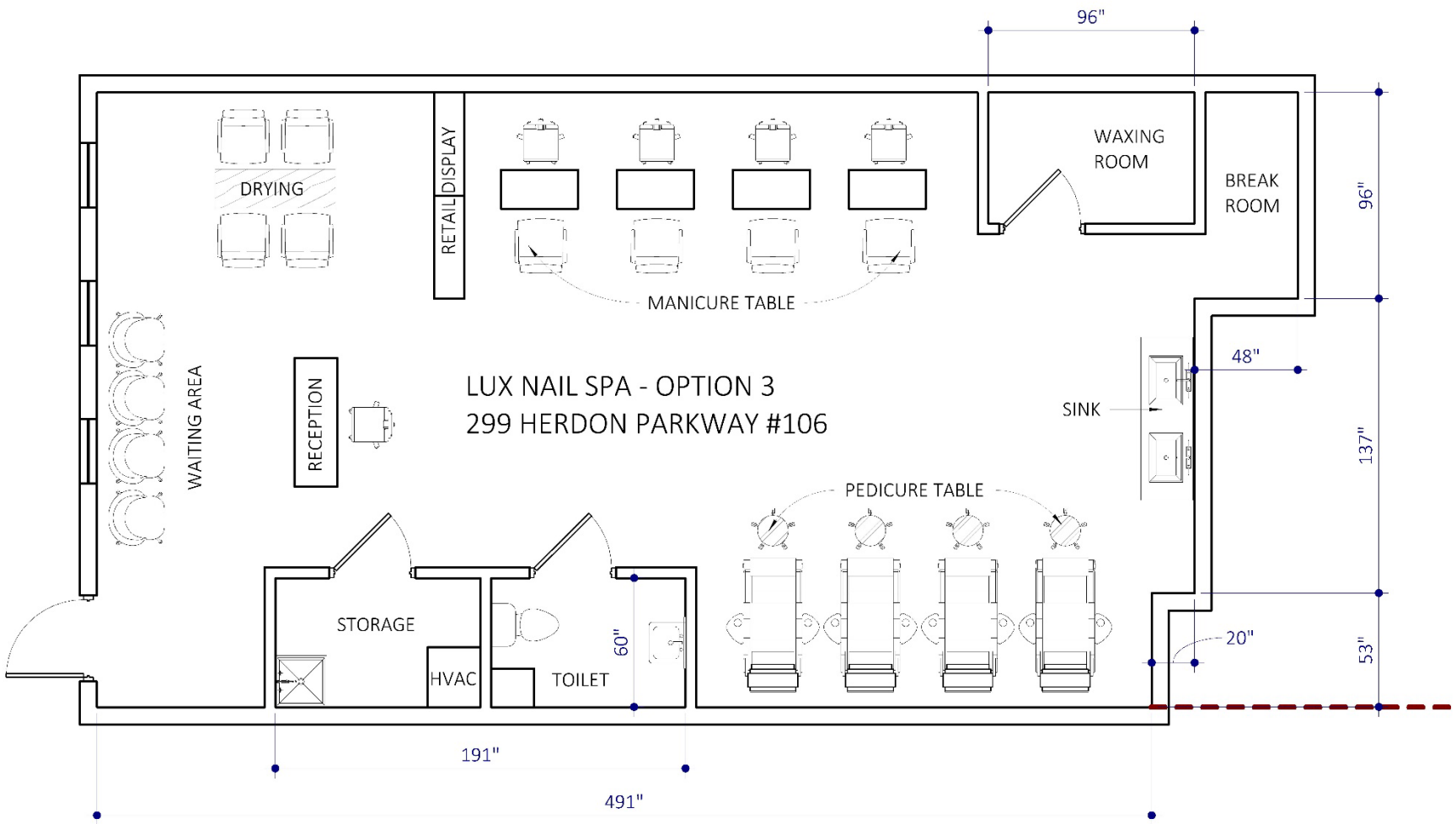
I would like to request from the Planning Committee to change the status from purpose of use, to personal service retails business. This would help us make use of the vacant office and allow us to bring back revenue, create jobs, and become a part of the town's future business development.

Lux Nail & Spa will be conducting service at approximately 966 square feet. This includes, four pedicure chairs, four manicure tables, one waxing room, and a display shelf to accommodate retail sales. The maximum number of employees will be four at the time shell be able to serve a maximum of up to four customers. Hours of operation will be from Monday through Saturday 9:00 am - 6:00 pm by appointment only. Lux Nail and Spa will also provide product sales in relation to the services provided. The services and products provided to the clients are nail polishing, nail coloring, and skin care products approved by the FDA.

Lux Nails & Spa would like to have the Town of Herndon Community Development Committee to review our 'Special exception' application. We are looking forward to starting our business and to grow alongside the Town of Herndon economic future.

Sincerely

Minh Nghiem
Owner


96"
DRYING
RETAIL DISPLAY
MANICURE TABLE
WAXING ROOM
BREAK ROOM
96"
WAITING AREA
RECEPTION
LUX NAIL SPA - OPTION 3
299 HERDON PARKWAY #106
SINK
48"
137"
PEDICURE TABLE
STORAGE
HVAC
TOILET
60"
20"
53"
191"
491"

PERFORMANCE BOND ESTIMATE

ITEM NO.		ITEM	QUANTITY	UNIT	UNIT PRICE	COST
		CLEARING & GRUBBING	1.3	ACRES	2060	2678
		EXCAVATION		CU. YDS.		
		EMBANKMENT		CU.YDS.		
		OVERLOT GRADING	1	LOTS	150	150
	STRUCTURES	D1-3D	1	Ea.	2060	2060
	DRAINAGE	CONCRETE PIPE 15" CL. III	19	LIN.FT.	51	969
		CONCRETE PIPE		LIN.FT.		
		CONCRETE PIPE		LIN.FT.		
		CONCRETE PIPE		LIN.FT.		
		CONCRETE PIPE		LIN. FT.		
		CONCRETE PIPE		LIN. FT.		
		PAVED DITCH		LIN.FT.		
		RIP RAP	180	SQ.FT.	4.5	810
		SODDED SWALE				
		CONCRETE ENDWALL		EACH		
		CONCRETE ENDWALL		EACH		
		CONCRETE ENDWALL		EACH		
		CONCRETE ENDSECTION		EACH		
		RELOCATION OF TRAFFIC LIGHT	1	L.S	35,000	35,000
		DRIVEWAY ENTRANCE, TYPE CG-10A	2	EACH	2500	5000
		SIDEWALK	200	LIN.FT.	90	1800
		HEADER CURB	170	LIN.FT.	10	1700
		CURB & GUTTER	200	LIN.FT.	11	2200
		VALLEY GUTTER		EACH		
		GRAVEL BASE		SQ.YDS.		
		GRAVEL BASE		LIN.FT. ℄		
		GRAVEL SHOULDERS		SQ. YDS.		
		SURFACE TREATMENT		SQ. YDS.		
		BITUMINOUS CONCRETE SURFACE 2" S-5	660	SQ. YDS.	4.6	303.6
		BASE COURSE 6" B-3	660	SQ.YDS.	13.8	9108
		SUBBASE MATERIALS 10" 21-A	182	CU. YDS.	20.5	3731
		STREET SIGNS		EACH		
		STREET LIGHTS		EACH		
		ROADSIDE DELINEATORS		EACH		
		TRAFFIC BARRICADE		EACH		
		SCREENING & REFORESTATION				
		PIPES AS SHOWN ON PLAT	8	EACH	6300	50400
		MONUMENTS AS SHOWN ON PLAT		EACH		
		WATER LINE	110	LIN.FT.	29	3190
		FIRE HYDRANTS 1	1	EACH	1490	1490
		SANITARY SEWER	260	LIN. FT.	34	8840
		'AS BUILT' PLAN	1.75 AC.	LUMP SUM	570/AC	997.50
		PLUS 10% ENGRG. FEE & MISC.				$ 8326.35
		TOTAL				$ 91589.85

I HEREBY CERTIFY THAT THE FOREGOING IS MY BEST ESTIMATE OF THE QUANTITIES OF IMPROVEMENTS IN THIS SUBDIVISION OR SITE PLAN.

SIGNATURE: _____ DATE: 9-8-86

CASH ESCROW BOND ESTIMATE

ITEM NO.	ITEM	QUANTITY	UNIT	UNIT PRICE	COST
1.	EROSION/SEDIMENTATION CONTROL (SEE ZONING ORD. FOR APPROPRIATE FEE)	1.75		300	1000 MIN.
2.	ARBORIST FEE (PER L.F. OF TREED CLEARING LINE)		L.F.	1.00	
3.	DAMAGE TO EXISTING PUB. UTILITIES (TO BE COMPUTED BY TOWN OF HERNDON.)	———	L.S.	———	10,000
4.	LANDSCAPING	———	L.S.	———	14,950.00
				TOTAL:	25,950.00

FEE SCHEDULE

ITEM	QUANTITY	UNIT	FEE PER UNIT FOR SUBDS.	FEE PER UNIT FOR SITE PLANS	FEE
BITUMINOUS SURFACE	3780	SQ. YD.		.35	1323
CURB & GUTTER	1600	LIN. FT.	.60	.60	960
HEADER CURB	150	LIN. FT.		.60	90
SANITARY SEWER	260	LIN. FT.	1.60	1.60	416
SIDEWALK	630	LIN. FT.	.60	.60	378
STORM DRAINAGE	—	LIN. FT.	2.90	2.90	—
T.V. INSPECTION	260	LIN. FT.	1.35	1.35	351
WATERLINE	68	LIN. FT.	1.35	1.35	91.8
OVERLOT GRADING AND SURFACE DRAINAGE PLAN (per division of land or per disturbed acre, whichever is greater)	1.3	LOT/ACRE	100.00	100.00	130
MISCELLANY		ACRE		$20.00(min)	
SCREENING		LIN. FT.	1.60	1.60	
℄ LINEAR FEET OF STREET		LIN. FT.	1.20		
ESTIMATED FEE - TOTAL					$ 4090.8
INITIAL FEE PAYMENT (50% OF ESTIMATED FEE)	(RECEIPT #		DATE	)	$ 2045.4
BALANCE OF FEE (COMPUTED BY TOWN)	(RECEIPT #		DATE	)	

NOTES

1. The methods and materials used in the construction of the improvements herein shall conform to the current Town of Herndon Standard Specifications, current Fairfax County Design and Construction Standards, and the current VDH&T Road and Bridge Specifications. In the event of conflict between the standards and specifications, prevailing guidelines shall be selected by the Town of Herndon.
2. A permit must be obtained from the Town of Herndon before any construction is started in conformity with these plans.
3. A permit must be obtained from the office of the Resident Engineer, VDH&T, Fairfax, Virginia, before any construction is started on any existing state highway.
4. The Developer is required to notify the Town of Herndon, in writing, three (3) days prior to the beginning of construction. The Developer shall require that all of his contractors specifically request inspection at least twenty four (24) hours before beginning:
   (A) Clearing and grubbing
   (B) Installation of siltation and erosion control measures
   (C) Earth work
   (D) Installation of any underground utility
   (E) Installation of any forms
   (F) Placing any concrete
   (G) Before placing subbase, base, or paving surface
   Failure to do so for any reason shall constitute rejection of said work.
5. All existing underground utilities shall be physically located by the Developer or his engineer prior to the beginning of any construction in the vicinity of these utilities.
6. All utilities installed as a part of this development shall be placed underground.
7. All underground utilities within the street right-of-way and all service connections shall be installed to the required distance beyond the right-of-way line prior to the installation of any subbase material, curb and gutter, or sidewalk.
8. All utilities to be taken over by the Town for maintenance purposes must be inspected, tested and approved by the Town before being accepted into the Town's system.
9. Cut sheets shall be submitted and approved by the Town of Herndon prior to the start of construction of any underground utilities, streets, or curbs and gutters.
10. Sanitary Sewers: All sanitary sewer materials and methods of construction shall comply with the current Town of Herndon Standards and Specifications.
11. Storm Sewers: (A) Storm sewer and culvert pipe shall be reinforced concrete pipe to conform to the current A.A.S.H.T.O. designation M 170, unless otherwise designated on the plans. Class II pipe will be permitted beyond the limits of the street right-of-way. Class III pipe will be required within the limits of the right-of-way.
    (B) Underdrains and/or crossdrains shall be installed by the Developer where deemed necessary by the Town of Herndon.
12. Streets: (A) All base and subbase material shall be compacted to 95% of theoretical maximum density as determined by A.A.S.H.T.O. T-99 method A, within plus or minus 2% of optimum moisture for the full width of any dedicated right-of-way and all townhouse streets, commercial and industrial parking lots, private streets, parking bays, curb and gutter, and sidewalks adjacent to streets and parking lots (not intended to include lead sidewalks).
    (B) Soil reports and subgrade specifications shall be submitted to the Town of Herndon for approval prior to the start of construction of any sidewalks, curb and gutter, streets or parking areas.
    (C) Subbase depth is based on a CBR of 10. Where CBR is less than 10, one inch of subbase or base material shall be added for each point below CBR 10. Where CBR is greater than 10, subbase may be reduced one inch for each five points above CBR 10. All special designs are subject to approval by the Town of Herndon.
    (D) Standard street name signs shall be installed at each intersection by the Developer, as well as required traffic control signs in the development.
    (E) A minimum of one driveway entrance shall be provided per lot. Driveway entrances, CG-10A, shall be installed in conformity with the standards. Pipestem lot driveways are subject to approval by the Town of Herndon.
    (F) Surfaced streets shall be maintained in a clean condition, mud and dust free at all times, and adequate means shall be provided to clean trucks and other equipment using the completed streets.
    (G) Street names shall be approved by Fairfax County.
    (H) Street lights shall be installed according to Town of Herndon standards.
13. Water Distribution: (A) All water main materials and construction shall comply with the regulations of the standard specifications and plans of the Town of Herndon and the current Waterworks Regulations of the Virginia State Board of Health.
    (B) All water mains shall have a minimum cover of 4.0 feet. Water mains shall be installed eight (8) feet north or east of the centerline of the street unless otherwise designated on the plans.
    (C) Working pressure shall be >20 psi.
14. Land Conservation Notes: (A) Measures to control erosion and siltation shall be provided pursuant to and in compliance with current state and local regulations. However, the approval of these plans shall in no way relieve the Developer or his agent of any legal responsibility which may be required by the Code of Virginia or any ordinance enacted by the Town of Herndon.
    (B) No disturbed area will be denuded for more than 60 calendar days.
    (C) All erosion and siltation control measures are to be placed prior to or as the first step in clearing.
    (D) All storm and sanitary sewer lines not in streets are to be mulched and seeded within 15 days after backfill. No more than 500 feet are to be open at any one time.
    (E) Electric power, telephone and gas supply trenches are to be compacted, seeded and mulched, within 15 days after backfill.
    (F) All temporary earth berm diversions and silt dams are to be mulched and seeded for temporary vegetative cover within 10 days after grading. Straw or hay mulch is required. The same applies for all stock piles.
    (G) During construction, all storm sewer inlets will be protected by silt traps, maintained and modified as required by construction progress.
    (H) All disturbed area not paved, sodded, or built upon by November 1, or disturbed after that date, is to be seeded within 15 days with oats, abruzzi rye, or equivalent and mulched with hay or straw at the rate of 2 tons per acre.
    (I) Prior to beginning any work on this site, the Contractor must read and adhere to the "Protection of Trees" Guidelines, Volume III, Fairfax County Public Facilities Manual, and Section 28-22A of the Town of Herndon Zoning Ordinance.
15. These plans and specifications are based on the minimum requirements for CO zoning. This plan contains NO dwelling units.
16. All elevations must be based on the U.S.G.S. or the U.S.C. & G.S. mean sea level datum.
17. Prior to any approved clearing and grading on a site, a tree protection fence shall be erected in accordance with the fence detail on the approved landscape plan.

FIRE FLOW INFORMATION

FH # 1528 (APPROX. 750' FROM ELDEN STREET INTERSECTION)
STATIC 75 PSI. RESIDUAL 65 PSI.
FLOW = 1250 GPM.
Q20 = 3138 GPM.

Construction Type - 3B
Gross floor area of each building 15,000 Sq. Ft.
Maximum Height of building - 35'
Number of stories - 3 1/2
Building shall not be sprinklered.

INDEX

	PAGE
COVER SHEET	1
SITE PLAN	2

I HEREBY CERTIFY THAT THIS AS-BUILT CONFORMS WITH THE APPROVED SITE PLAN EXCEPT AS SHOWN AND REPRESENTS ACTUAL FIELD CONDITIONS ON THE SITE.

COMMONWEALTH OF VIRGINIA — HAROLD A. LOGAN — CERTIFICATES 1111 & 191 — CERTIFIED LAND SURVEYOR

21/Oct 86
DATE / HAROLD A. LOGAN

INDICATES "AS-BUILT"

STORM DRAINAGE PRO-RATA SHARE TABULATION

Project: HERNDON PARK
Watershed: SUGARLAND RUN
Pro-Rata Share 2000.00 per impervious acre
Area 1.75 acre
% Impervious 90 %
2000.00 x 1.75 x 0.90 = 3150.00

DATE COMPUTED 2-24-86

EMERGENCY

POLICE — FIRE — RESCUE

911

HERNDON POLICE 437-1118

THE DESIGNING FIRM HAS CONTACTED ALL UTILITY OPERATORS FOR THE HORIZONTAL LOCATION OF THEIR UNDERGROUND UTILITIES, IF ANY, AND THIS PLAN SHOWS THEIR LOCATION IS MARKED BY THE OPERATIONS.

NOTICE REQUIRED

Contractors shall notify operators who maintain underground utility lines in the area of proposed excavation or blasting at least two working days, but not more than ten working days prior to commencement of excavation or demolition in accordance with Section 10(a) of Chapter 6B of the Fairfax County Code. Names and telephone numbers of the operators of the underground utility lines in Fairfax County appear below. These numbers shall also be used to serve in an emergency condition, as required by Section 15(b) of Chapter 6B of the Code.

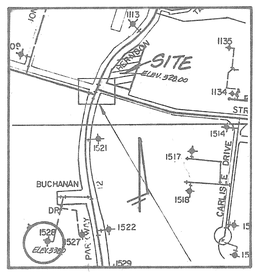
COLUMBIA GAS PIPELINE CO	759-2115
FAIRFAX CITY WATER SERVICE	385-7915
TOWN OF HERNDON DPW	435-6856
A.T. & T. CO.	Miss Utility (301) 559-0100
CHESAPEAKE & POTOMAC TELE. CO.	
COLONIAL PIPELINE CO.	
COLUMBIA GAS OF VA.	
CONTINENTAL TELEPHONE OF VA.	
PLANTATION PIPELINE CO.	
TRANSCO GAS PIPELINE CO.	
VEPCO	

LEGEND

- CENTERLINE (℄)
- LEFT BLDG RESTRICTION LINE
- RIGHT BLDG RESTRICTION LINE
- EXISTING STORM SEWER
- PROPOSED STORM SEWER
- EXISTING SANITARY SEWER
- PROPOSED SANITARY SEWER
- PROPOSED DRAINAGE DIVIDES
- EXISTING WATER MAINS AND APPURTENANCES (VALVES, TEE, HYDRANT, VALVE, REDUCER)
- PROPOSED WATER MAINS AND APPURTENANCES (VALVES, TEE, HYDRANT, VALVE, REDUCER)

PLAN APPROVAL SHALL NOT BE GIVEN UNTIL ALL DEDICATIONS AND EASEMENTS HAVE BEEN RECORDED AND DEED BOOK AND PAGE NUMBER PROVIDED TO THE PLANNING DEPARTMENT OF THE TOWN OF HERNDON.

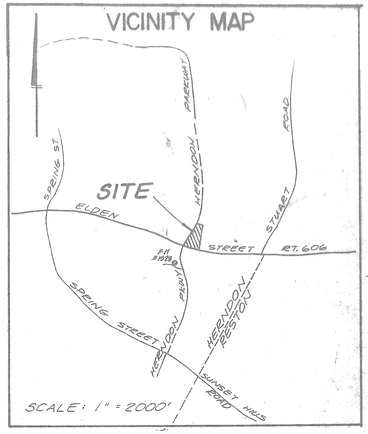
THIS APPROVAL IS NOT A COMMITMENT TO PROVIDE PUBLIC SANITARY SEWER



WATER LINE VICINITY MAP

SCALE: 1" = 500'

VICINITY MAP



LOCATION OF BENCHMARKS:
EXISTING SANITARY MANHOLE AT ELDEN STREET. TOP OF MANHOLE ELEVATION 318.75 U.S.G.S. DATUM.

RECOMMENDED FOR APPROVAL

DATE — FAIRFAX COUNTY FIRE MARSHAL

DATE — DIRECTOR OF PUBLIC WORKS

DATE — DIRECTOR OF PLANNING

PUBLIC HEARINGS

DATE	BODY	ACTION TAKEN

APPROVED

FOR CONSTRUCTION AND ISSUANCE OF BUILDING PERMITS
TOWN OF HERNDON, VIRGINIA

DATE — TOWN PLANNER

SITE PLAN APPROVAL VOID IF FINAL BUILDING PERMITS HAVE NOT BEEN OBTAINED WITHIN ONE YEAR.
SUBDIVISION APPROVAL VOID IF FINAL SUBDIVISION PLAT IS NOT RECORDED WITHIN ONE YEAR AFTER APPROVAL OF PRELIMINARY PLAN.

SITE PLAN #86-6 — SUBDIVISION

TOWN OF HERNDON, VIRGINIA

COVER SHEET

SUBDIVISION NAME OR SITE PLAN AND NUMBER.	HERNDON PARK
OWNER, ADDRESS, INCLUDE ZIP CODE AND TELEPHONE NUMBER.	RESTON/HERNDON LIMITED PARTNERSHIP 8150 LEESBURG PIKE SUITE 1200 VIENNA, VIRGINIA 22180 TELEPHONE: [illegible]
DEVELOPER, ADDRESS, INCLUDE ZIP CODE AND TELEPHONE NUMBER.	SAME AS ABOVE
CERTIFIED ENGINEER, ARCHITECT OR SURVEYOR SUBMITTING PLAN, ADDRESS, INCLUDE ZIP CODE AND TELEPHONE NUMBER.	HAROLD A. LOGAN ASSOCIATES - P.C. 4200 DANIELS AVE. ANNANDALE, VIRGINIA 22003 PHONE: (703) 941-3531
TAX MAP SECTION NUMBER 17-1 (17-1), DOUBLE CIRCLE NUMBER 4 (5), PARCEL NUMBER 32A (1)	
TOTAL AREA 1.75 AC.	PRESENT ZONING CO

DRAWN JUNE, 1977 (DSP), REVISED DEC., 1977(DSP), REVISED JAN., 1979(DSP), REV. NOV. 81 | PAGE 1 OF 5 PAGES
REV. AUG., 1982, REV. DEC. 1982, REV. NOV. 1984

AS BUILT
APPROVED 3-21-88 Charles T. Kenny Engr. Tech. II
HERNDON PARK

SANITARY SEWER PROFILE

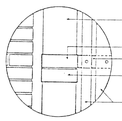
SCALE: VERT. 1"= 5'
HORIZ. 1" = 30'

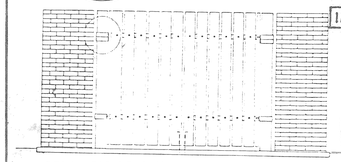
I HEREBY CERTIFY THAT THIS AS-BUILT CONFORMS WITH THE APPROVED SITE PLAN EXCEPT AS SHOWN AND REPRESENTS ACTUAL FIELD CONDITIONS ON THE SITE.

2/10/87
DATE: HAROLD A. LOGAN C.L.S.

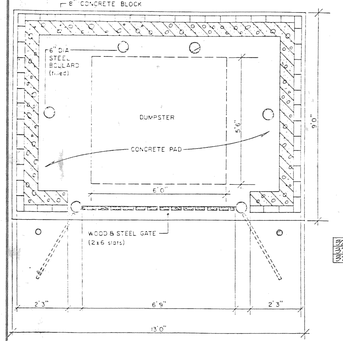
INDICATES "AS-BUILT"

HINGE DETAIL (no scale)

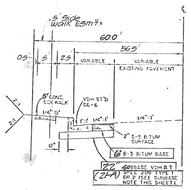




COMMONWEALTH OF VIRGINIA
HAROLD A. LOGAN
CERTIFICATES
1111 & 191
CERTIFIED LAND SURVEYOR



DESIGN FOR TRASH RECEPTACLE ENCLOSURE
NO SCALE



TYPICAL SECTION
ELDEN STREET WIDENING
NO SCALE

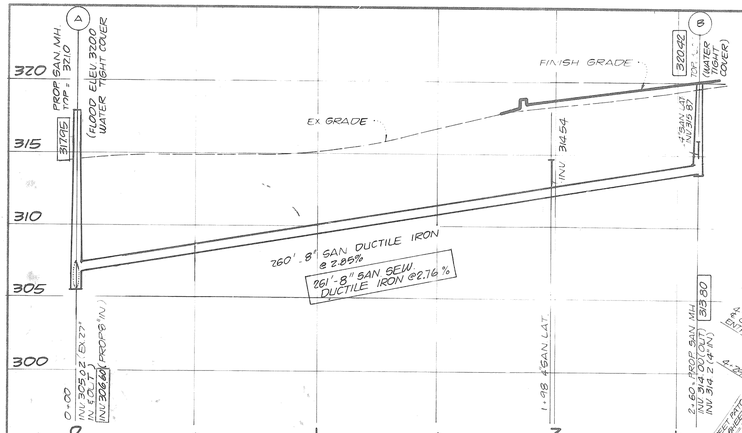
ELDEN STREET – ROUTE 606

(VARIABLE R/W)

Approx location of ex 12" water line

* NOTES

1) ALL TRAFFIC CONTROL DEVISES AND POLES BE RELOCATED OR REPLACED PER VDH ET STANDARDS AND SPECIFICATIONS
2) THE EXISTING POLE WILL BE SALVAGED BY THE TOWN OF HERNDON AT THE TIME OF RELOCATION.
3) TRAFFIC CONTROL WILL BE COORDINATED WITH HERNDON POLICE AT NO TIME WILL TRAFFIC LIGHT BE TURNED OFF.
4) 24 HOURS NOTICE WILL BE GIVEN BEFORE RELOCATION TAKES PLACE, RELOCATION HOURS ARE FROM 9.00 A.M. TO 3.00 PM MONDAY THRU FRIDAY
5) AS-BUILT GRADING IN THE FLOOD PLAIN AREA IS IN COMPLIANCE WITH THE APPROVED SITE PLAN.



<image

TOWN OF HERNDON, VIRGINIA

ORDINANCE

JUNE 14, 1983

REZONING APPLICATION #Z-83-101, WITH PROFFERS - AN ORDINANCE TO CHANGE THE ZONING CLASSIFICATION OF PARCELS 3 AND 25, FAIRFAX COUNTY TAX MAP REFERENCE 17-1-004, FROM RE-0.5, RESIDENTIAL DISTRICT, TO C-O, COMMERCIAL OFFICE, WITH PROFFERS AND TO AMEND THE OFFICIAL ZONING MAP SO AS TO SHOW THEREON THIS CHANGE OF ZONING CLASSIFICATION

BE IT ORDAINED by the Town Council of the Town of Herndon as follows:

1. That the zoning classification of the property identified as Fairfax County Tax Map Reference 17-1-004, Parcels 3 and 25, as hereby changed from RE-0.5, Residential District, to C-O, Commercial Office, with the following proffers.

The undersigned hereby proffer that in the event the subject property is rezoned to C-O zoning category by the Town of Herndon Town Council, development of the property shall be in accordance with the following conditions pursuant to Virginia Code Section 15.1-491(a) and the Zoning Ordinance of the Town of Herndon:

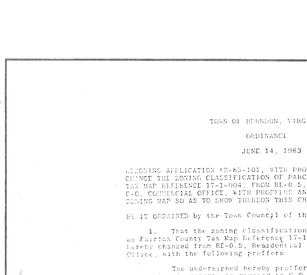
1. Clinics (without overnight care of patients) and telephone exchanges and dial centers shall be deleted from uses of right on the subject property.
2. The height of the buildings on the property shall not exceed forty feet.
3. The applicant shall construct a one-way exit only (egress) to Elden Street.
4. Parking of vehicles shall be for passenger vehicles only on property as shown in the flood plain.
5. Prior to the approval of final site plan on the subject property a new hydraulic study shall be submitted regarding the flood plain as shown.
6. The total square footage of office space for the site, including parcels, Tax Map 17-1-004-3 and 25, and Tax Map 17-1-005-A5 shall not exceed 20,000 square feet. The development of the site shall conform to all applicable ordinances and development standards of the Town of Herndon.

2. That the official zoning map is hereby amended to show thereon this change of zoning classification with proffers, and

3. That this ordinance shall become effective on June 15, 1983.

RZ-83-C-101

This is certified to be a true and accurate copy of Ordinance adopted at a regular open meeting of the Town Council of the Town of Herndon on June 14, 1983.



BLOCK AND GRAVEL CURB INLET SEDIMENT FILTER

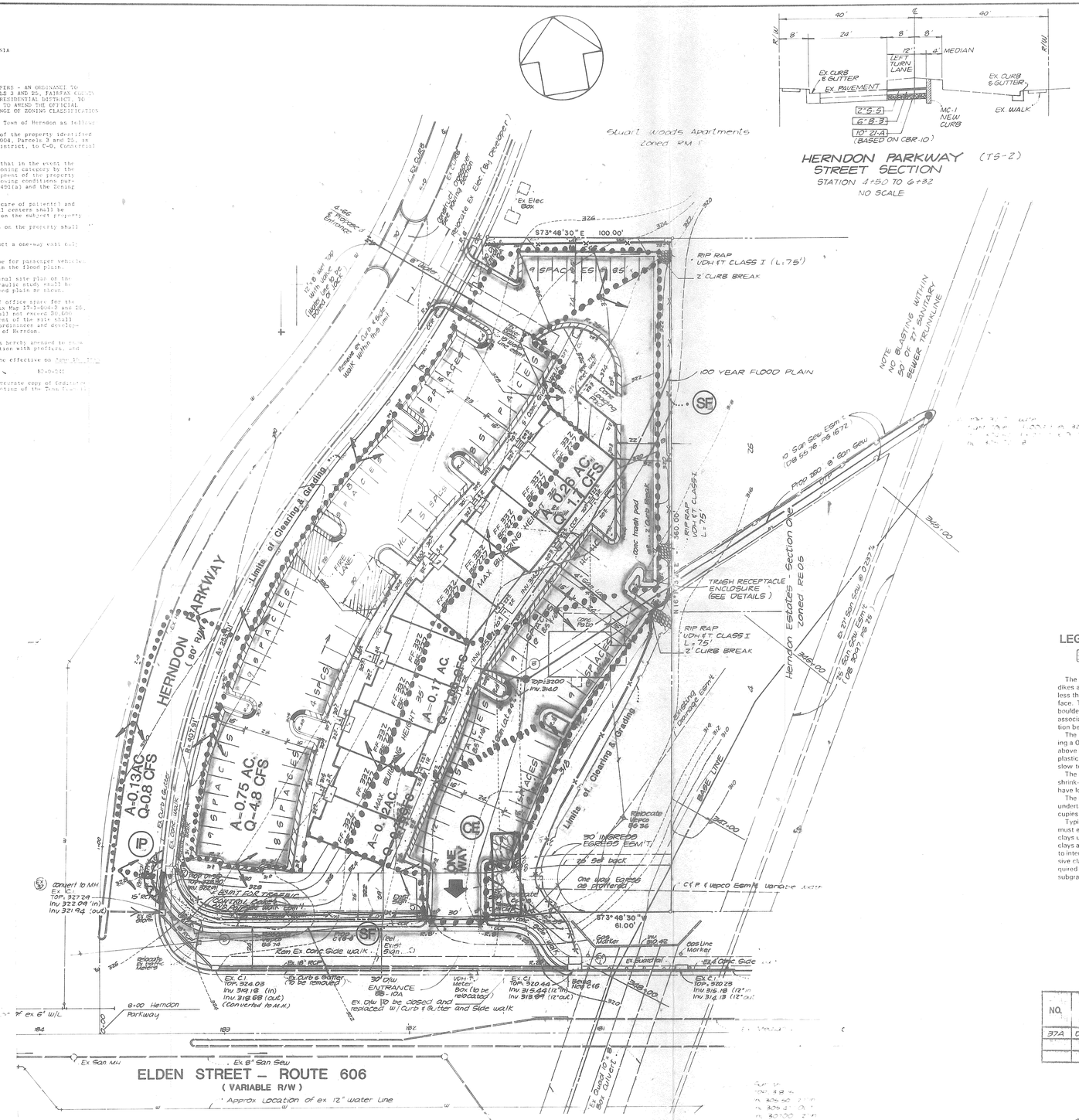
Source: Va SWCC Plate 1.08b

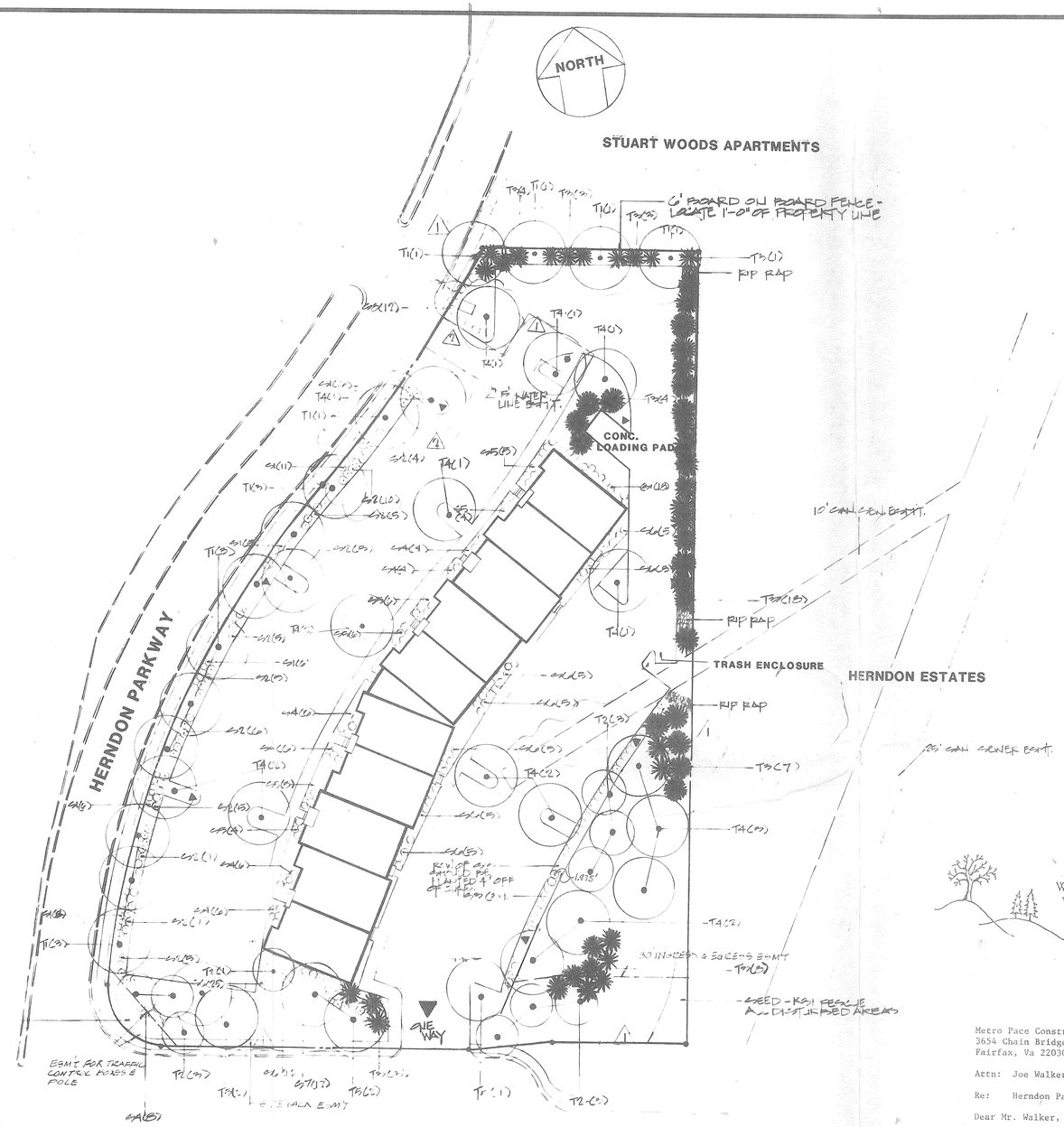
Specific Application

This method of inlet protection is applicable at curb inlets where an overflow capability is necessary to prevent excessive ponding in front of the structure.

Maintenance

1. The structure shall be inspected after each rain and repairs made as needed.
2. Sediment shall be removed and the trap restored to its original dimensions when the sediment has accumulated to 1/2 the design depth of the trap. Removed sediment shall be deposited in a suitable area and in such a manner that it will not erode.
3. Structures shall be removed and the area stabilized when the remaining drainage area has been properly stabilized.


Stuart Woods Apartments
Zoned RM-1
S73°48'30"E 100.00'
9 SPACES @ 9.5'
RIP RAP VDH #T CLASS I (L=75')
2' CURB BREAK
100 YEAR FLOOD PLAIN
SF
CE
IP
HERNDON PARKWAY (TS-2)
Limits of Clearing & Grading
A=0.13AC. Q=0.8 CFS
A=0.75 AC. Q=4.8 CFS
A=0.12AC. Q=0.8CFS
A=0.17 AC. Q=1.1 CFS
ONE WAY
30' INGRESS EGRESS EASMT.
25' B/L
One Way Egress (3 Entrance)
Relocate Mbox #36
BASE LINE
Convert to MH Ex. CI Top 327.29 Inv 322.09 (in) Inv 321.94 (out)
EASMT FOR TRAFFIC CONTROL DEVICE
Ex. Curb & Gutter (To be removed)
30' D/W ENTRANCE RB-10A
Ex. D/W to be closed and replaced w/ curb & gutter and side walk
Ex. CI Top 320.44 Inv 315.44 (12"in) Inv 315.24 (12"out)
Ex. CI Top 320.23 Inv 315.18 (12"in) Inv 314.18 (12"out)
Relocate Mbox #16
Ex. Guardrail
Ex. Sign
Ex. Side Walk
Ex. Curb & Gutter
Ex. Pavement
Ex. Curb & Gutter
Ex. Walk
MC-1 NEW CURB
Ex. Elec Box
Ex. Trans Pad
Ex. Trash Pad
Ex. Bldg
Ex. Bldg Entrance
Ex. Bldg Overhang
Ex. Bldg Steps
Ex. Bldg Ramp
Ex. Bldg Walk
Ex. Bldg Wall
Ex. Bldg Window
Ex. Bldg Door
Ex. Bldg Roof Overhang
Ex. Bldg Basement Entrance
Ex. Bldg Basement Window
Ex. Bldg Basement Door
Ex. Bldg Basement Steps
Ex. Bldg Basement Ramp
Ex. Bldg Basement Wall
Ex. Bldg Basement Roof Overhang
Ex. Bldg Basement Roof
Ex. Bldg Basement Roof Ridge
Ex. Bldg Basement Roof Valley
Ex. Bldg Basement Roof Hip
Ex. Bldg Basement Roof Gable
Ex. Bldg Basement Roof Dormer
Ex. Bldg Basement Roof Skylight
Ex. Bldg Basement Roof Vent
Ex. Bldg Basement Roof Chimney
Ex. Bldg Basement Roof Antenna
Ex. Bldg Basement Roof Satellite Dish
Ex. Bldg Basement Roof Solar Panel
Ex. Bldg Basement Roof Flagpole
Ex. Bldg Basement Roof Weather Vane
Ex. Bldg Basement Roof Lightning Rod
Ex. Bldg Basement Roof Guy Wire
Ex. Bldg Basement Roof Guy Anchor
Ex. Bldg Basement Roof Guy Wire Insulator
Ex. Bldg Basement Roof Guy Wire Tightener
Ex. Bldg Basement Roof Guy Wire Clamp
Ex. Bldg Basement Roof Guy Wire Thimble
Ex. Bldg Basement Roof Guy Wire Shackle
Ex. Bldg Basement Roof Guy Wire Turnbuckle
Ex. Bldg Basement Roof Guy Wire Eye Bolt
Ex. Bldg Basement Roof Guy Wire Eye Nut
Ex. Bldg Basement Roof Guy Wire Eye Plate
Ex. Bldg Basement Roof Guy Wire Eye Hook
Ex. Bldg Basement Roof Guy Wire Eye Ring
Ex. Bldg Basement Roof Guy Wire Eye Thimble
Ex. Bldg Basement Roof Guy Wire Eye Shackle
Ex. Bldg Basement Roof Guy Wire Eye Turnbuckle
Ex. Bldg Basement Roof Guy Wire Eye Bolt
Ex. Bldg Basement Roof Guy Wire Eye Nut
Ex. Bldg Basement Roof Guy Wire Eye Plate
Ex. Bldg Basement Roof Guy Wire Eye Hook
Ex. Bldg Basement Roof Guy Wire Eye Ring
Ex. Bldg Basement Roof Guy Wire Eye Thimble
Ex. Bldg Basement Roof Guy Wire Eye Shackle
Ex. Bldg Basement Roof Guy Wire Eye Turnbuckle
TRASH RECEPTACLE ENCLOSURE (SEE DETAILS)
RIP RAP VDH #T CLASS I L=75' 2' CURB BREAK
Herndon Estates Section One Zoned RE 0.5
NOTE BLASTING WITHIN 50 OF 27" SANITARY SEWER TRUNKLINE
Ex. 10" San Sew (DB 5516 PG 1672)
Prop 360 8" San Sew
Ex. 8" San Sew @ 0.37%
75' San Sew Esmt (DB 8097 PG 25)
Ex. 8" San Sew
ELDEN STREET - ROUTE 606
(VARIABLE R/W)
Approx. location of ex. 12" water line
Ex. 6" W/L
8.00 Herndon Parkway
Velocity traffic meters
Ex. San MH
Ex. 8" San Sew
Ex. Ditch to be filled in & Box Culvert removed
Ex. Drop Inlet
Ex. Sign
Ex. Bldg Side
Ex. Bldg Corner
Ex. Bldg Front
Ex. Bldg Rear



PLANTING SCHEDULE						
KEY	COMMON NAME	BOTANIC NAME	QTY.	SIZE	ROOT	COMMENTS
T1	RED MAPLE	ACER RUBRUM	15	2-2½"	B&B	'RED SUNSET'
T2	KWANZAN CHERRY	PRUNUS SERRULATA	10	2-2½"	B&B	'KWANZAN'
T3	AUSTRIAN PINE	PINUS NIGRA	51	5-8'	B&B	'NIGRA'
T4	PIN OAK	QUERCUS PALUSTRIS	17	2-2½"	B&B	
T5	KALLERY PEAR	PYRUS CALLERYANA	5	2-2½"	B&B	'BRADFORD'
S1	SEA GREEN JUNIPER	JUNIPERUS CHINENSIS	60	18-24"	CONT.	'SEA GREEN'
S2	DOUBLEFILE VIBURNUM	VIBURNUM PLICATUM TOMENTOSUM	64	24-30"	CONT	
S3	DWARF EUONYMUS	EUONYMUS ALATUS	39	18-24"	CONT	'COMPACTA'
S4	AZALEA	AZALEA OBTUSUM	34	18-24"	CONT.	'ROSEBUD'
S5	AZALEA	AZALEA OBTUSUM	29	18-24"	CONT.	'DELAWARE VALLEY WHITE'
S6	SARGENTI JUNIPER	JUNIPERUS CHINENSIS	7½	18-24"	CONT.	'SARGENTII'
S7	ABELIA	ABELIA GRANDIFLORA	17	24-30"	CONT.	
S8	HICKS YEW	TAXUS X MEDIA	12	30-36"	CONT.	'HICKSII'

ALL TREES TO BE WELL-BRANCHED AND FULL CROWN.

▲ - POLE LIGHT - 20' HIGH POLE FERM 10, SHOE BOX ; 175 W METAL HALIDE.

NOTE:

1. NO LANDSCAPING IS TO BE PLANTED WITHIN 4' OF FIRE HYDRANT OR SIAMESE CONNECTION
2. NO SIGNIFICANT LANDSCAPING IS TO BE PLANTED IN EASEMENTS

WEST WINDS NURSERY

RECEIVED
MAR 1 1 1988
METRO PACE CONSTRUCTION

12105 Bennett Road
Herndon, Va. 22071
703/620-8899

March 11,1988

Metro Pace Construction, Inc.
3654 Chain Bridge Road, Suite 103
Fairfax, Va 22030

Attn: Joe Walker

Re: Herndon Park

Dear Mr. Walker,

This is to certify the trees and shrubs installed at Herndon Park; 299 Herndon Parkway; Herndon, Virginia are according to the Landscape plans prepared by Harold A. Logan Associates dated March 16,1988 and numbered SP 330-4. There were no substitutions, additions or deletions made.

If further information is needed, please let us know.

Sincerely,

Cecilia A. Welch

CAW/mag

LANDSCAPING REQUIREMENTS

Interior Requirements	Required	Provided
16 Deciduous trees per acre	27	47
10 Evergreen Trees per acre	17	51
1 Shrub at the rate of 1 for every 5 feet of building perimeter	118	150
Landscape Buffer Requirements		
1 Evergreen tree at the rate of 1 for ever, 15 feet along the entire distance of the buffer strip	74	ELDEN ST & HERNDON PKW. DECIDUOUS TREES 27 EVERGREEN TREES 3 DECIDUOUS SHRUBS 94 EVERGREEN SHRUBS 82 STUARTWOODS APTS & HERNDON ESTATES EVERGREEN TREES 44 DECIDUOUS TREES 11 DECIDUOUS SHRUBS 39
Screening Requirements		
1 Deciduous tree at the rate of 1 tree per 30 linear feet of property adjoining the residential district	3	3
1 Evergreen tree at the rate of 1 tree per 10 linear feet of property adjoining the residential district	10	11
Parking Lot Requirements		
1 Deciduous tree for every eight parking spaces	14	13

I HEREBY CERTIFY THAT THIS AS-BUILT CONFORMS WITH THE APPROVED SITE PLAN EXCEPT AS SHOWN AND REPRESENTS ACTUAL FIELD CONDITIONS ON THE SITE.

3/6/88
DATE HAROLD A. LOGAN

INDICATES "AS-BUILT"

COMMONWEALTH OF VIRGINIA
HAROLD A. LOGAN
CERTIFICATES
1111 & 191
CERTIFIED LAND SURVEYOR

THIS SHEET TO BE USED FOR LANDSCAPING PURPOSES ONLY!

HERNDON PARK

HERNDON, VIRGINIA

PACE DESIGN

6820 ELM STREET
McLEAN, VIRGINIA 22101
703/442-7373

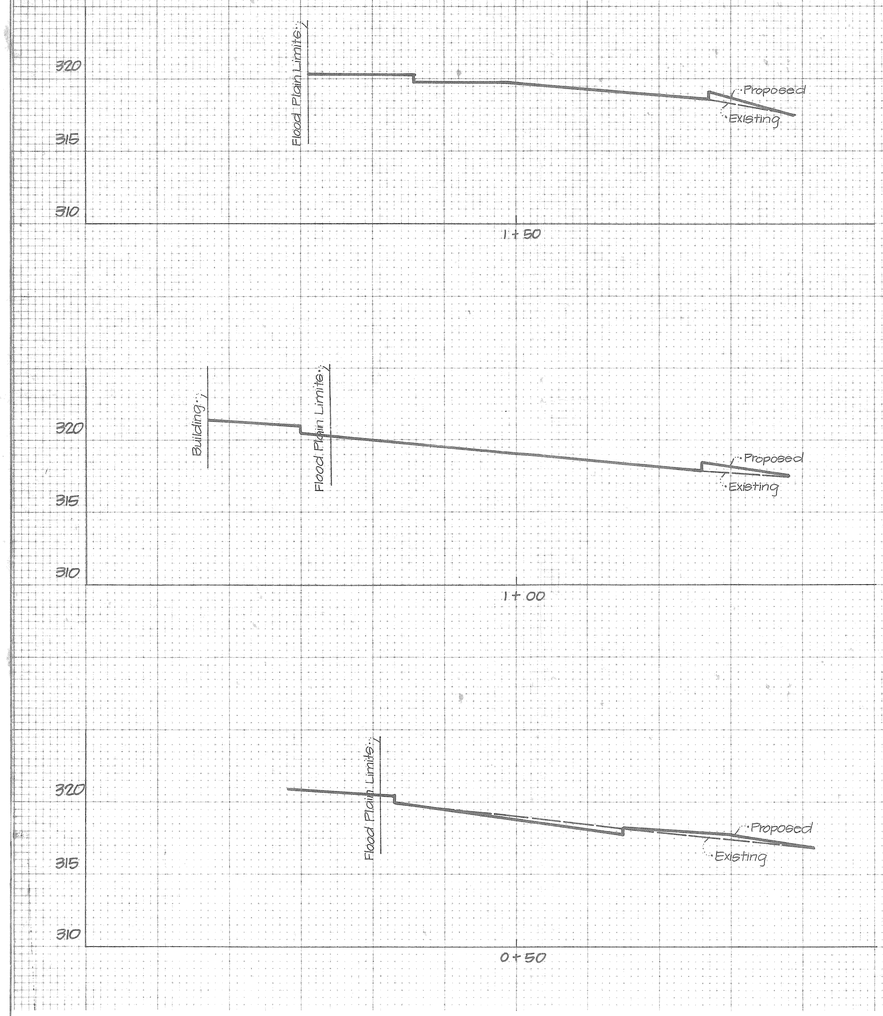
NO.	DATE	REVISIONS
	5-22-86	
	7-31-86	PERMIT SET
	8-20-86	PERMIT SET REVISION - BLANK RE-ENTERED
1	9-6-86	PER TWP. OF HERNDON REQ.
	1-8-87	REV LIGHTING PER ENGINEER
2	1-15-86	REV TO ENTRANCE

COMMONWEALTH OF VIRGINIA
HAROLD A. LOGAN
CERTIFICATES
1111 & 191
CERTIFIED LAND SURVEYOR

TITLE
LANDSCAPE PLAN

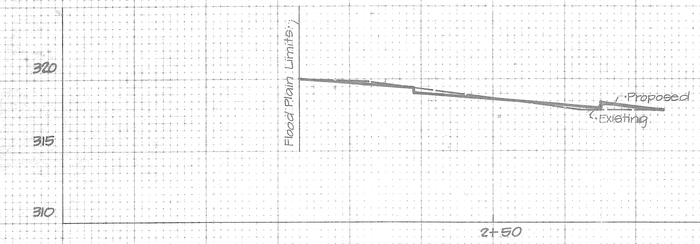
SCALE 1":30'-0"
APPROVED BY
DRAWN BY DED

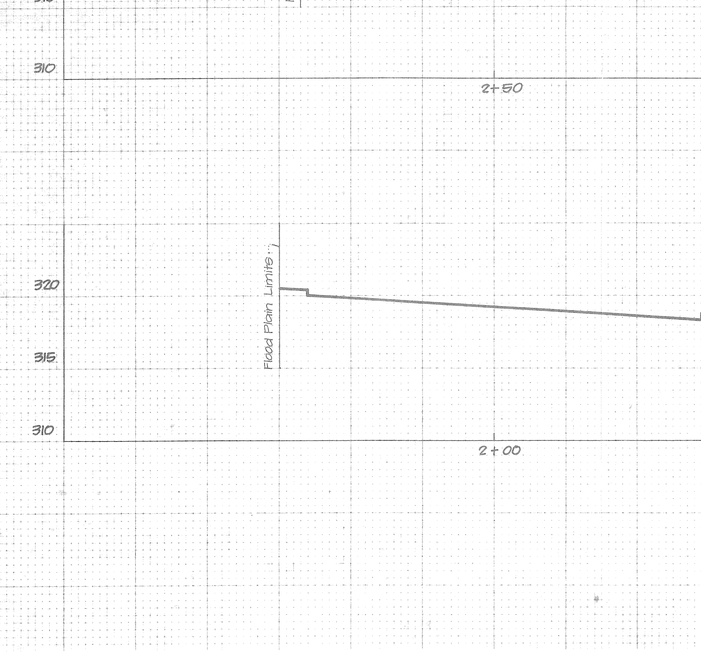
JOB NUMBER 51410
SHEET NUMBER 4 OF 5



STATION	AREA	E AREA	LENGTH	VOL (CU. FT.)
0 + 00	0	3.5	50	175
0 + 50	7.00	6.3		318
1 + 00	5.75	5.8		290
1 + 50	6.00	5.9		295
2 + 00	5.90	4.0		200
2 + 50	2.00	1.0		50
3 + 00	0			

TOTAL = 1,328 CU. FT
= 49.18 CU YD





I HEREBY CERTIFY THAT THIS AS-BUILT CONFORMS WITH THE APPROVED SITE PLAN EXCEPT AS SHOWN AND REPRESENTS ACTUAL FIELD CONDITIONS ON THE SITE.

3/16/54
DATE HAROLD A. LOGAN

INDICATES "AS-BUILT"

COMMONWEALTH OF VIRGINIA
HAROLD A. LOGAN
CERTIFICATES
1111 & 191
CERTIFIED LAND SURVEYOR

SCALE: 1"= 10' HOR.
1"= 5' VERT.
BY: JLW
DATE: 3-15-88
REVISIONS:

HERNDON PARK
TOWN OF HERNDON, VIRGINIA

FLOOD PLAIN CROSS SECTIONS

HAROLD A. LOGAN – ASSOCIATES P.C.
LAND SURVEYING – SITE PLANNING – SUBDIVISION DESIGN
4200 DANIELS AVENUE
ANNANDALE, VIRGINIA 22003 941-3531

SHEET 5 OF 5
AB 330

Special Exception (SE) #23-03
299 Herndon Parkway, Suite 106
Personal Services Use

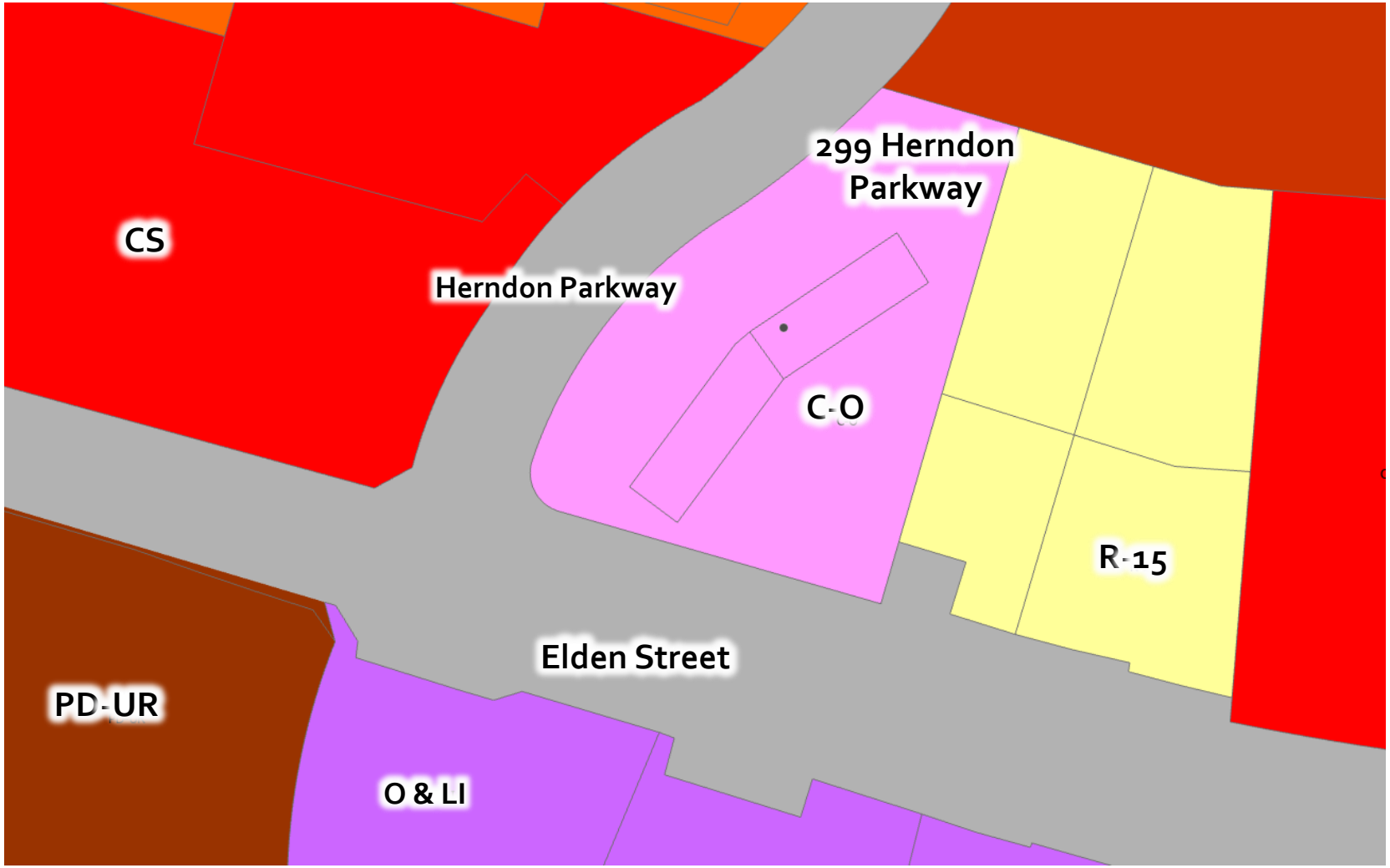
Planning Commission Working Session
January 8, 2024

Fadrique Iglesias
Community Planner

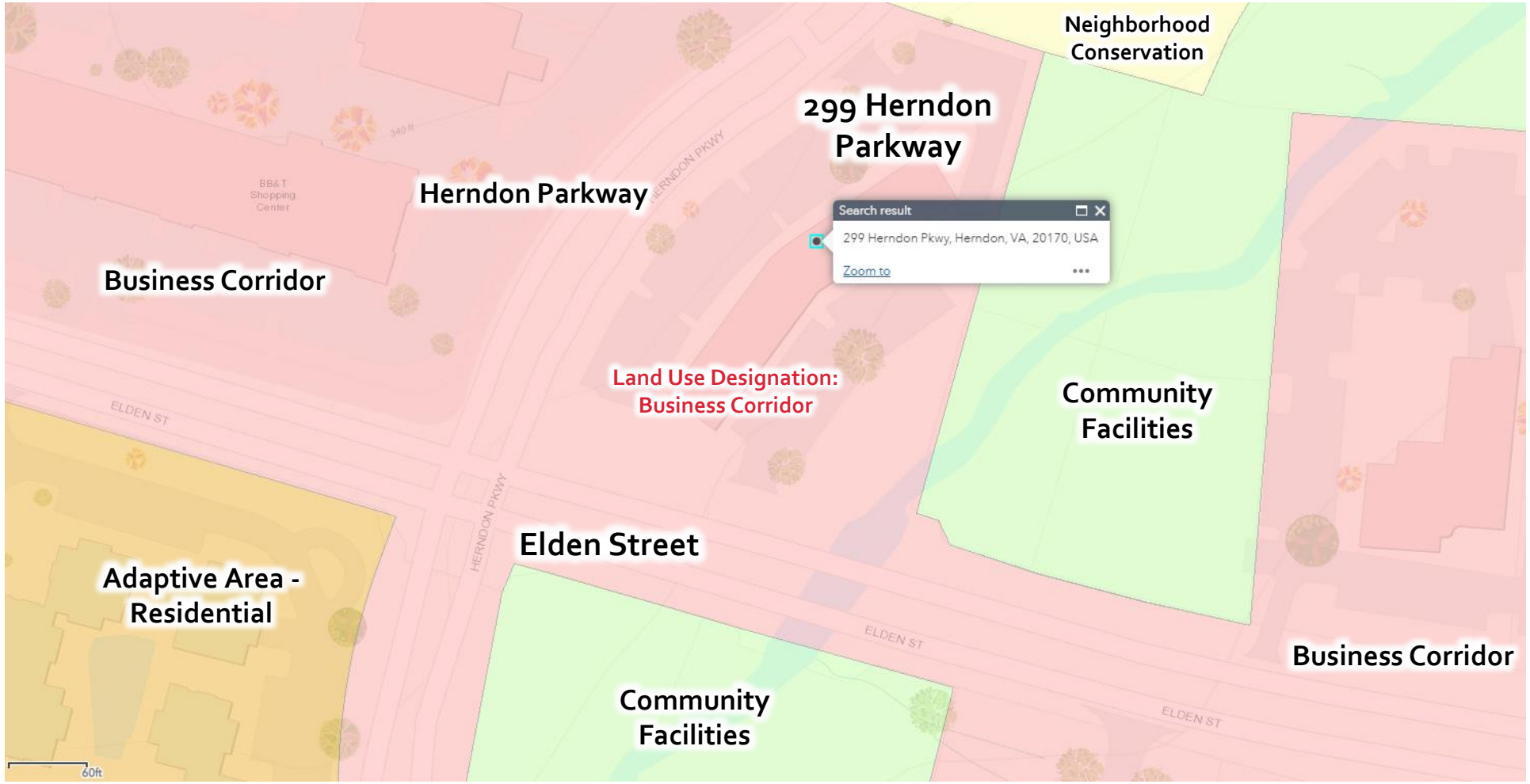
Aerial Photograph



Zoning Map


299 Herndon Parkway
CS
Herndon Parkway
C-O
R-15
Elden Street
PD-UR
O & LI

2030 Comprehensive Plan Land Use Map



Personal Services Use in CO Zoning District

- Not permitted by-right in CO Zoning District
- Permitted by Special Exception only
- Zoning Ordinance: flexibility for businesses traditionally located with other commercial service and retail sales uses but have operational characteristics that make them appropriate to operate in traditional office parks
  - Adequate development and land use controls are necessary
  - Provide for compatible special exception uses
  - Minimize impacts to adjacent, less intense uses (i.e. adjacent residential uses)

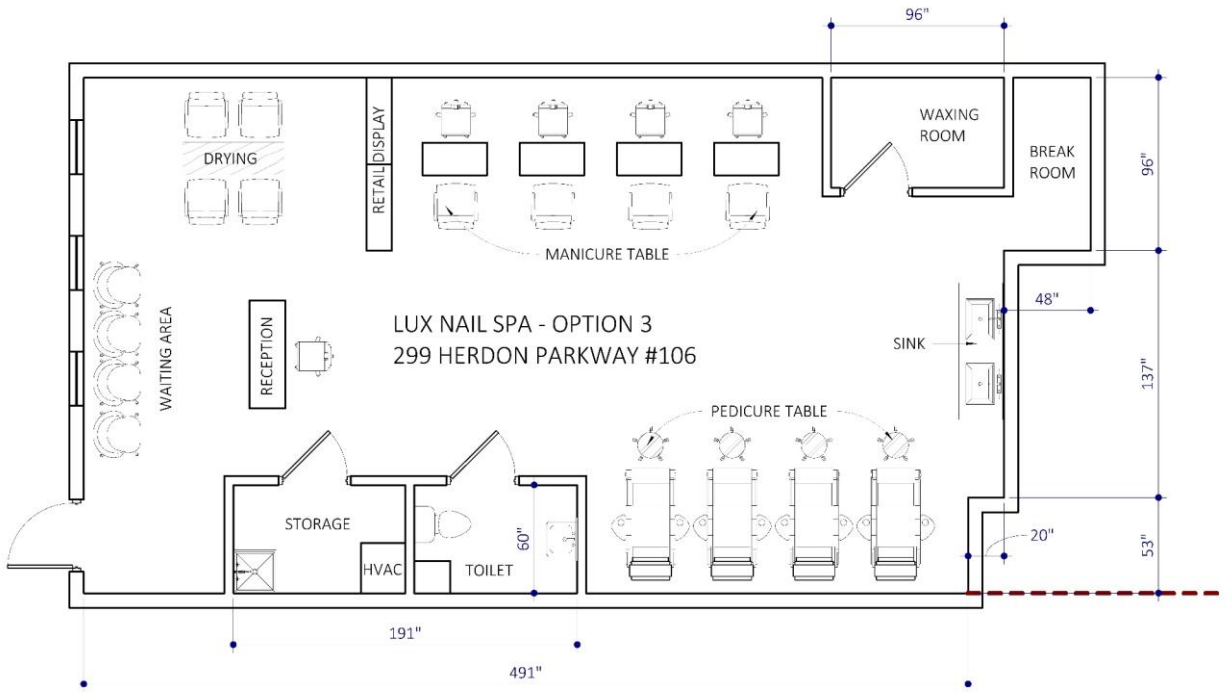
Background

A previous Special Exception (SE#21-05) was granted to allow a personal service use consisting of cosmetics and aesthetic services within the adjacent unit and an expansion into an additional unit was subsequently granted. The cases are shown below.

- SE #21-05, 299 Herndon Parkway, Suite 108 for personal service use consisting of cosmetics and aesthetic services for a maximum of six people was granted on November 16, 2021.
- SE #21-05 amendment, 299 Herndon Parkway, Suite 107 for an expansion of personal service use consisting of cosmetics and aesthetic services was granted on June 13, 2023, and increase the number of clients to 12 people in total (including employees).

In both cases the Planning Commission recommended approval with the same conditions, and the Town Council approved the application.

Proposed Special Exception



Applicant proposes to reconfigure the existing 916 sq. ft. of tenant space into a cosmetics and personal services business to sign a new tenant. These personal services may include a spa salon and cosmetic services.

Three-story multi-unit building (Building 2), approx. 30,000 sq. ft. (gross floor area).

Business operations proposed: maximum customer count of five (5) at any given time.

Parking & Transportation

- Property contains a parking lot with 116 spaces.
- Business is located approximately:
  - 100 feet from a Fairfax Connector bus stop along Route 926 on Elden Street;
  - 200 feet from a Fairfax Connector bus stop along Route 924 on Herndon Pkwy;
  - 1.5 miles from Herndon Metrorail Station



Staff Analysis

- Zoning Ordinance compliance & Comprehensive Plan adherence
  - Purpose and intent of the CO Zoning District
- By-right uses versus special exception uses
- Use compatibility
- Parking analysis
- Potential impacts
- What conditions may mitigate and/or manage impacts

Impacts

- Denial of the Special Exception:
  - By-right uses (commercial office) remains
  - Proposed business (personal services) would not be permitted at the subject property/location
  - Space would remain vacant
- Approval of the Special Exception:
  - By-right uses and land use compatibility remain
  - No anticipated negative impacts with attached conditions
  - Current local business will be ready to expand operations or lease, adding economic development and tax base

Special Exception Conditions

1. The personal services business space shall be constructed and utilized in substantial conformance with the original application and updated first-floor plan received on June 27, 2023, and September 25, 2023, subsequently or similar types of cosmetics and personal services uses.

2. The business operations shall be conducted by appointment only and limited to six total people, including employees, occupying the space at any given time; and

3. The retail sales floor space allocation shall be limited to not more than 50 square feet within the tenant space.

Recommendations

- Staff recommends ***approval*** of SE #23-03 with conditions in accordance with the draft resolution

Planning Commission Work Session
Agenda Item 2.c.

Agenda Item: **COMPREHENSIVE PLAN AMENDMENT - CPA #23-01, Resolution to consider Comprehensive Plan Amendment, CPA #23-01, pursuant to Section 15.2-2229 of the Code of Virginia, an amendment to the Town of Herndon 2030 Comprehensive Plan, adopted August 12, 2008, as amended through May 24, 2022**

Meeting Date: January 8, 2024

Category: Public Hearings

Prepared by: Ahmad Zaki, Lead Planner/Long Range

Description:
CPA #23-01 proposes the adoption of the Transit Related Growth (TRG) Small Area Plan and amendments to Chapter III of the Town of Herndon 2030 Comprehensive Plan, as adopted on August 12, 2008, and amended through May 24, 2022. Once approved, the small area plan will serve as the primary source for guidance on the development of 94 acres of 25 privately owned properties within the Town of Herndon Transit-Related Growth area, located at the southeastern corner of the town, proximate to but not directly adjacent to the Herndon Metrorail Station.

Background:
Pursuant to Section 15.2-2223 of the Code of Virginia, local planning commissions prepare and recommend by resolution comprehensive plan amendments for adoption by the local governing body. The governing body shall act within 90 days of the planning commission's recommended resolution on a plan amendment, as stipulated in Section 15.2-2229 of the Code of Virginia.

This Comprehensive Plan Amendment, CPA # 23-01, was initiated by the Town Council on December 12, 2023, through Resolution (23-G-77). With that initiation, the amendment was referred to the Planning Commission for review and recommendation.

Fiscal Impact:
None

Recommendation:
Staff is withholding a recommendation at this time.

Attachments:
1. Staff Report

2. Amendment Text (Proposed)
3. CPA #23-01, Resolution 23-G-77
4. TRG Draft Report
5. TRG Traffic Study Draft Report
6. TRG Fiscal Impact Analysis
7. Staff Presentation

STAFF REPORT

Agenda Item:
Comprehensive Plan Amendment, CPA #23-01, to consider Comprehensive Plan Amendment, CPA #23-01, pursuant to Section 15.2-2229 of the Code of Virginia, an amendment to the Town of Herndon 2030 Comprehensive Pla, adopted August 12, 2008, as amended through May 24, 2022.

Meeting Date:
January 8, 2024

Staff Contact:
Ahmad Zaki, Lead Planner, Long-Range Planning

Background:

Pursuant to Section 15.2-2223 of the Code of Virginia, local planning commissions prepare and recommend by resolution comprehensive plan amendments for adoption by the local governing body. The governing body shall act within 90 days of the planning commission's recommended resolution on a plan amendment, as stipulated in Section 15.2-2229 of the Code of Virginia.

The Town of Herndon initiated the Transit Related Growth Area (TRG) Small Area Plan project in early 2022, involving comprehensive data collection, analysis, constraint and opportunity assessment, market study, infrastructure analysis, and traffic study and modeling. Three alternative concepts emerged from these studies, shared with the public, stakeholders, and governing bodies for feedback. Following robust public engagement and guidance from the Town Council, Planning Commission, and TRG Advisory Committee, a preferred alternative was selected and refined into the draft plan. The draft plan underwent discussion and feedback at a joint Planning Commission and TRG Advisory Committee session on December 11, 2023.

Public engagement has been central to the planning process, facilitated through collaboration with project consultants SOM (Skidmore, Owings, and Merrill), an advisory committee, and a technical staff committee. This inclusive approach continues, with ongoing and future public hearings scheduled with the Planning Commission and Town Council.

The TRG Small Area Plan is currently in its culminating phase. SOM has completed a draft final plan for the TRG Small Area Plan and presented it to the TRG Advisory Committee and Planning Commission joint session on December 11, 2023. The session was open to the public and allowed the commissioners and committee members to review the plan elements, ask questions, and provide feedback. The draft TRG Small Area Plan

covers key aspects such as land use, road network, design objectives, density and FAR, parking measures, open space network, and five TRG districts.

A second draft of the TRG Small Area Plan was submitted and is currently in review by town staff. That draft will be the version reviewed by the Planning Commission at this time and is attached to this report. Also attached is the draft language for the Comprehensive Plan Amendment.

As outlined in Section 15.2-2223 of the Code of Virginia, the Planning Commission is responsible for conducting a thorough review of the TRG Small Area Plan and its associated amendment and recommending it by resolution for adoption by the Town Council. The Planning Commission and Town Council sessions will provide valuable opportunities for detailed review and discussion of the draft TRG Small Area Plan, guiding the refinement and finalization of the plan.

Item Details:

A comprehensive plan is a strategic, long-term policy document that encompasses critical aspects and delineates the general or approximate location, character, and extent of various features such as future land use, density, road network, and transportation elements, providing a comprehensive framework for guiding the town's growth and development over an extended period.

The Comprehensive Plan Amendment (CPA # 23-01) was initiated by the Town Council on December 12, 2023, through Resolution (23-G-77). With that initiation, the amendment was referred to the Planning Commission for review and recommendation. CPA #23-01 proposes the adoption of the Transit Related Growth (TRG) Small Area Plan and amendments to Chapter III of the Town of Herndon 2030 Comprehensive Plan, as adopted on August 12, 2008, and amended through May 24, 2022, to incorporate the TRG Small Area Plan by reference.

This amendment aims to adopt the TRG Small Area Plan and incorporate it by reference into the town’s 2030 Comprehensive Plan. Once approved, the TRG Small Area will serve as the primary source for guidance on the development of 94 acres of 25 privately owned properties within the Town of Herndon Transit-Related Growth area, located at the southeastern corner of the town, proximate to but not directly adjacent to the Herndon Metrorail Station.

Unlike previous CPAs adopting small area plans, this amendment would incorporate the TRG by reference into the town’s 2030 Comprehensive Plan in general terms without specificity of plan content. This approach allows the small area plan document to stand independently as an extension of the comprehensive plan. This approach reduces the potential for redundancies and conflicts between the comprehensive plan and small area plans and helps streamline implementation. Several northern Virginia jurisdictions use this method and staff will be recommending this approach for the previously approved small area plans in town with the Herndon 2050 Comprehensive Plan project set to begin in 2024.

The TRG Small Area Plan aims to embody the collective vision and aspiration of the community, serving as a long-term plan for the future redevelopment of 94 privately owned acres into a well-designed, viable mixed-use district. The plan seeks to encourage redevelopment, account for diverse development timelines, establish buffers to abutting neighborhoods, create a distinctive sense of place integral to Herndon's identity, contribute to a multi-modal transportation network, and set expectations for innovative, sustainable, and excellent architectural and urban design.

Staff Analysis:

While substantial progress has been made, certain plan elements, notably transportation mitigation, remain in progress. Also, critical aspects like building character, massing and design guidelines, parking measures, traffic Level of Services (LOS) policy framework, sustainability measures, and the implementation phases of the TRG Small Area Plan necessitate further refinement. Staff have begun a detailed errata sheet listing and clarifying staff comments to date. Staff will provide a summary of the significant outstanding items with the work session presentation. At the work session, staff will also be prepared to address the questions raised by the Planning Commission at the December 11, 2023, joint meeting with the TRG Advisory Committee.

Fiscal Impact:

The TRG Small Area Plan anticipates a 25-year horizon for the development of the concepts it envisions. A Fiscal Impact Analysis conducted by the project sub-consultant (RCLCO), estimates the plan will generate roughly $221,608,000 (in nominal dollars) in revenues to the Town of Herndon by 2045. Property taxes represent the largest portion of this total (32%), followed by business license revenues (30%), transient occupancy taxes (13%), and meals taxes (11%).

Meanwhile, RCLCO estimates the Town of Herndon will incur roughly $53,067,000 (in nominal dollars) in expenditures to serve users in the future TRG during the same forecast period from 2023 to 2045. This does not include the capital cost for the implementation of facilities and open spaces the Town might incur. The Proposed Use Scenario is projected to generate a positive net fiscal impact and revenues which can be used to help offset any necessary infrastructural investments.

Planning Commission Decision Alternatives:

The following alternatives are available to the Planning Commission for its decision on CPA#23-01:

1. Recommendation for approval,
2. Recommendation for approval with conditions,
3. Recommendation for denial, or
4. Continuance of the application to the February 26, 2024, public hearing.

Staff Recommendation:

Staff is withholding a recommendation at this time given the ongoing staff review and the need for further coordination with the consultant to address the TRG Small Area Plan's outstanding elements and required refinement.

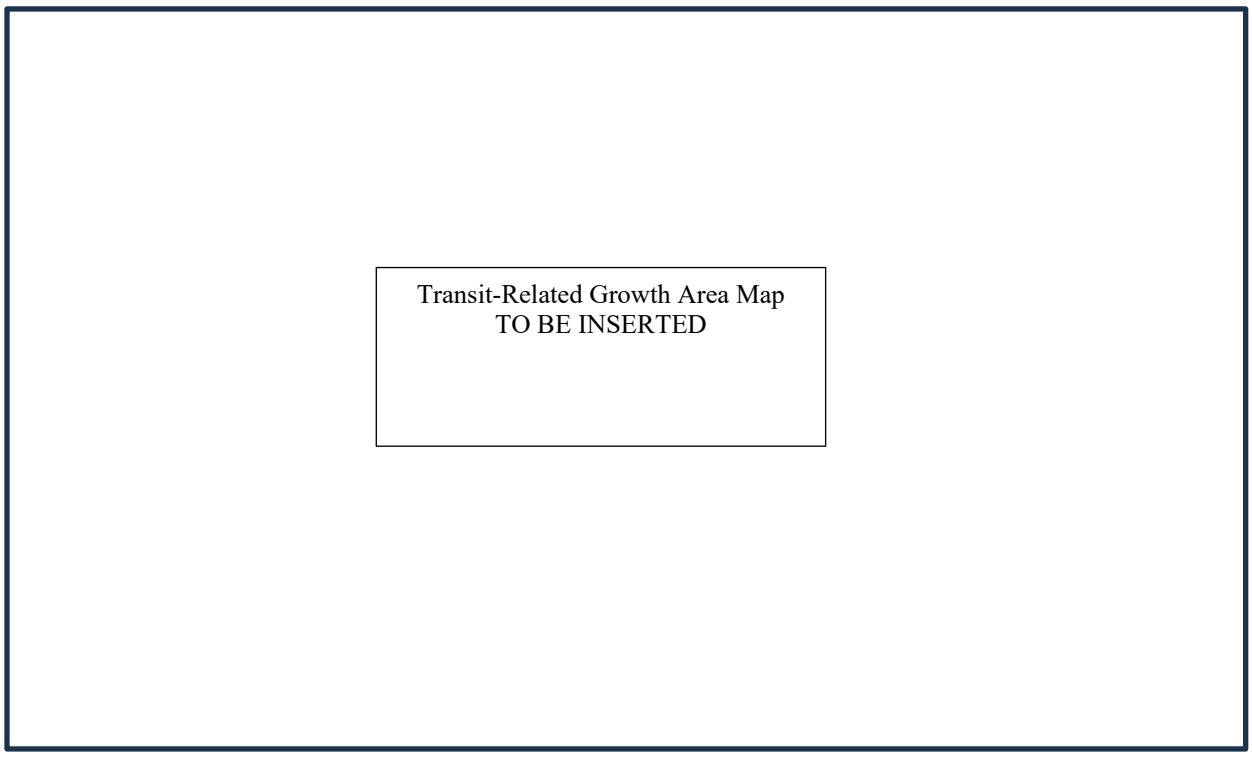
Transit-Related Growth (TRG) Small Area Plan

The Transit Related Growth Area (TRG) is comprised of approximately 94 acres of land within the southeast quadrant of the town with proximity to the Herndon Metrorail Station. Its boundaries are shown in the Transit-Related Growth Area Map shown below.

The TRG Small Area Plan was prepared based on detailed analysis of the area and extensive public engagement. The small area plan serves as the primary source of direction on issues such as land use, transportation, urban design, and sustainability, that are specific to the unique character and environment sought for the TRG area. The small area plan provides a level of specificity that supplements and expands the other applicable guidance included in the town's Comprehensive Plan.

The small area plan functions, along with the zoning ordinance, as an important tool for the town and TRG stakeholders by establishing the framework for future growth and land use changes in the TRG. Adherence with small area plan will be necessary for cohesive and vibrant, sustainable, and equitable development occurring in the TRG.

Should any potential TRG-related conflicts between the TRG Small Area Plan and previously adopted comprehensive plan amendments or small area plans emerge, the language from the TRG Small Area Plan takes precedent



TOWN OF HERNDON, VIRGINIA

RESOLUTION

DECEMBER 12, 2023

Resolution- to initiate consideration of a Comprehensive Plan Amendment, CPA #23-01, to amend Chapter 3, Land Use Plan, of the 2030 Comprehensive Plan adopted August 12, 2008, as amended through May 24, 2022, to adopt the Transit Related Growth (TRG) Small Area Plan and incorporate it by reference into the Town's 2030 Comprehensive Plan.

THEREFORE, BE IT RESOLVED by the Town Council of the Town of Herndon, Virginia that:

1. The Town Council of the Town of Herndon initiates consideration of the requested comprehensive plan amendment in accordance with Section 15.2-2223 and 15.2-2232 of the Code of Virginia.

2. The proposed amendment is referred to the Planning Commission for review and recommendation in accordance with Code of Virginia § 15.2-2229. Amendments.

3. Public necessity, convenience, general welfare, or good zoning practice requires the Town Council's consideration of this proposed measure.

This is certified to be a true and accurate copy of Resolution 23-G-77 adopted at a legally convened meeting of the Town Council of the Town of Herndon on December 12, 2023.

Margie C. Tacci, Deputy Town Clerk

TOWN OF HERNDON, VIRGINIA 1879

23-G-77

TRG
TRANSIT - RELATED GROWTH AR

TOWN OF Herndon
SOM

DRAFT

Town of Herndon

Transit-Related Small Area Plan

Final Report

December 06, 2023

Table of Contents

I	**Introduction** Acknowledgments Executive Summary Plan Purpose Plan Aspiration Plan Assumptions Plan Development Process & Methodology Equity Framework	Pg. 00-09
II	**Site Exploration & Analysis** Existing Conditions Summary of Existing Market Analysis Summary of Existing Transportation Analysis Summary of Utilities Analysis Constraints and Opportunities	Pg. 10-23
III	**Public Engagement** Opportunities for Input Summary of Findings	Pg. 23-27
IV	**Plan Vision** Summary of Concept Scenarios Preferred Vision Principles, Goals & Objectives	Pg. 28-66
V	**Urban Design Framework** Land Use & Density Urban Design and Architectural Character Recreation & Open Space Design Neighborhood Design Transportation Network Parking Strategies	Pg. 36-67
VI	**Traffic Impact** Summary of Model Findings Explanation of Mitigation Measures Level of Service Policy	Pg. 68-72
VII	**Public Infrastructure Impacts** Summary of Model Findings Explanation of Mitigation Measures	Pg. 73-74
VIII	**Fiscal Impacts & Market Strategies** Summary of Findings Explanation of Mitigation Measures	Pg. 74-75
IX	**Community Service Impacts** Summary of Findings Explanation of Mitigation Measures	Pg. 76-77
X	**Plan Implementation** Small Area Plan Execution Strategies	Pg. 78-83
XI	**Appendix** A - Site Conditions Report B - Traffic Analysis C - Fiscal Impact	

Acknowledgements

The TRG SAP is the result of a highly collaborative effort lasting nearly two years. Led by Town of Herndon staff and officials, this report was produced by a consultant team and informed by extensive input from the public.

Each of these groups -- the public, Town staff and officials, and the subject matter experts & designers -- are recognized for their invaluable contributions to this ambitious plan.

Special recognition is due to the TRG Advisory Committee, comprised of Town staff and officials, whose technical expertise and feedback were critical to development of the Plan throughout the entire process. Likewise, the Architectural Review Board's deep familiarity with the Town of Herndon provided the team with critical design guidance. The Town Council, which represents the myriad voices within the Town of Herndon community, supplied guidance and oversight of this TRG SAP.

Mayor
Sheila A. Olem

Vice Mayor
Clark Hendric

Town Council
Naila Alam
Cesar del Aguila
Pradip Dhakal
Keven LeBlanc
Donielle M. Scherff

Town Staff
Elizabeth M. Gilleran, AICP
Director of Community Development

Bryce A. Perry
Deputy Director of Community Development

Ahmad Zaki
Lead Long-Range Planner

Consultant Team
Skidmore, Owings & Merrill (SOM)
Lead Consultant and Urban Design

VHB
Transportation Engineering

RCLCO
Economic Development

Dharam
Cost Estimating

Urban, LTD
Civil Engineering

Architectural Review Board
Leslie Baker-Glass, Chair
Eric Boll
Melody Fetske
Amy Oleinick
William Savage

TRG Advisory Committee
George Burke, Chair
Vice Chair Planning Commission

Meron Yohannes
Planning Commission Member

Andrew Snowhite
Community Member

Rajesh Ramasubramanian
Community Member

Greg Riegle
Representative for the Property Owners

Ken Wire
Representative for the Property Owners

Bryce Perry
Voting Staff Member

Michael Romeo (Alternate)
Planning Commission Member

Emlyn Marsteller (Alternate)
Community Member

Fadrique Iglesias (Alternate)
Community Development Staff

Executive Summary

EXEC SUMMARY

Plan Purpose

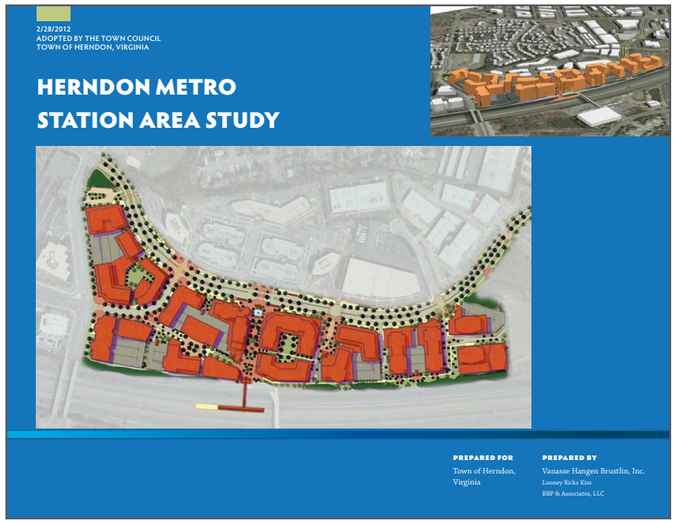
In Fall 2021, the Town of Herndon issued a request for proposals for a small area plan, to be referred to as the Transit-Related Growth Area (TRG). A consultant team was selected shortly thereafter, and work on the project began in April, 2022.

The TRG plan was originally envisioned in the Herndon Metro Station Area Study (HMSAS) of 2012, which was subsequently incorporated by reference into the Town of Herndon Comprehensive Plan 2030. The HMSAS is a small area plan that encompasses a large part of the territory within approximately 3/4 mile from the then-anticipated Herndon Metrorail Station (the Herndon station has since been completed; it opened in Summer, 2023).

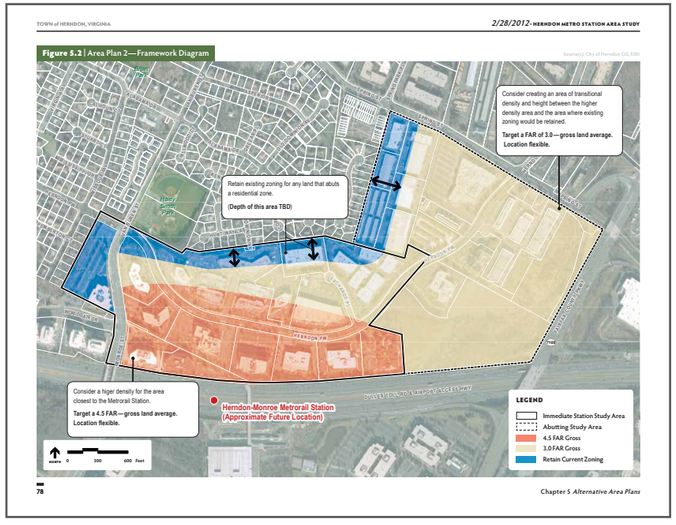
At the outset of the study, the boundary of the Herndon Metro Station Area Study originally included the TRG's study area. During the planning process it was determined that the HMSAS would focus on a smaller area within the original boundary immediately adjacent to the new Metro Station. That area would become designated as the Herndon Transit-Oriented Core (HTOC). The HMSAS recommended that a subsequent study explore the area within the original study that was not included in the HTOC: the TRG represents the fulfillment of that vision.

The plan for the HTOC calls for significant new density of a mix of uses, and building heights of up to 275 feet, considerably higher than is found anywhere else in Herndon. The TRG plan represents a transitional zone between the planned highrise HTOC and the rest of the Town of Herndon, which is typically low rise and predominately zoned for Single-Family Residential.

While this plan serves to negotiate the transition between the HTOC and the adjacent areas, it also presents an opportunity to create a vibrant, walkable, and mixed-use area that provides amenities to residents and economic development benefits to the Town. Ultimately, the TRG SAP is an effort to encourage smart growth in a critical 94 acre area within a 5-15 minute walking radius of the new Herndon Metro.



Cover page of the Herndon Metro Station Area Study



Excerpt of HMSAS, Showing htoc & trg

Plan Aspiration

With the opening of Herndon Station in November 2022, the Town of Herndon is now linked by the Silver Line all the way between Washington, DC and Dulles Airport. With its opening, a new paradigm has emerged for the section of the Town known as the Transit-Related Growth Area (TRG), previously a relatively low density area of office buildings, light industrial areas, and modest hotels, subdivided by the Herndon Parkway, and now an area envisioned for a new model of development transformation that leverages its proximity to Metro.

Over the coming decades, a combination of public realm redevelopment, and the integration of development and redevelopment of new and existing buildings will usher in a 21st-century model of transit-related urbanism that will elevate the value of this area of the town of Herndon. Through this transformation, the area will offer new kinds of lifestyles for residents and business, all shaped around unprecedented connectivity to northern Virginia and the rest of the DC region. This transformation will elevate the experience of this area for both those who will live and work here, those who live in adjacent areas of the Town of Herndon, visitors from around the region, and Town stakeholders.

The opportunity to realize this transformation leverages approximately 94 acres of land spread across 25 different parcels located within the Town of Herndon, all located approximately five to 15 minutes from the new Silver Line Metro Station. Located immediately adjacent to the area of the Town known as the Herndon Transit-Oriented Core (HTOC), the TRG is one of the largest areas of generally under-developed land proximate to the Metro in all of Fairfax County.

In addition to promoting the mutually reinforcing value between the future of transit and new development within the TRG, the transformation of this area will upgrade both the function and experience of area roadways and infrastructure through the development of a more integrated grid of streets. Further, the transformation will realize millions of square feet of future residential, commercial and retail development, as well as new open spaces, while enhancing many of the area's existing assets. Together, the potential for these transformations make the TRG an area of uniquely large and impactful opportunity for both placemaking and value creation on behalf of the Town of Herndon.

The realization of transformation within the TRG will be realized through a combination of public investment in infrastructure and the public realm as well as through the piecemeal redevelopment of private parcels located within the area over time. As a tool to guide both public policy and investment decisions within the area, and also to help inform developers about the Town's future vision for cohesive transformation of the area, this Transit-Related Small Area Plan describes the mission and opportunity for transit-related transformation of the area, elaborates on the Town's preliminary vision for redevelopment, and establishes critical bounds and elements essential to realizing its cohesive success. In doing so, the Small Area Plan addresses the following questions:

- What is the value that direct connectivity to the Silver Line brings to the Town of Herndon?
- How can that value be leveraged through transit-related development transformation within the TRG?
- What is the Town's vision for that redevelopment future - and what does that vision look like?
- What are the context, constraints, and opportunities afforded by existing area conditions?
- What amounts and kinds of redevelopment are viable within the area?
- What kinds of place making opportunities are possible?
- How can existing roadways, parcels, and site parameters be part of the realization of the vision?
- What are the essential elements to making a vision that will be realized piecemeal cohesively successful as it is realized?



Project Assumptions

The task of urban planning is inherently uncertain, as the future conditions within a project's time horizon can never be assured with certainty. As part of the TRG SAP process, the team made several assumptions of future conditions based on the best,most current data available to serve as a basis of design. For the purposes of this project, it is assumed that the following projects will be implemented as currently planned.

Herndon Transit-Oriented Core

As a rule, it is assumed that development will proceed in the HTOC as described in the HMSAS document, except where subsequent development plans have been built or approved. In the computer model and drawings included in this document the building masses and street scapes were devised by combining the HMSAS illustrations with the known ongoing or complete developments as appropriate.

Fairbrook

Shortly before the TRG SAP process began, a significant parcel within the TRG study area, known as Fairbrook, was approved for redevelopment. Because of this, the Fairbrook site is assumed to be developed as conceived in their current documents. This is the only TRG parcel with imminent significant redevelopment plans. As such, the Fairbrook parcel has been excluded from design consideration within this plan.

While Fairbrook was considered as part of the site conditions analysis, the design drawings in the TRG SAP show the Fairbrook property as excluded from the TRG boundary.

Fairbrook Drive

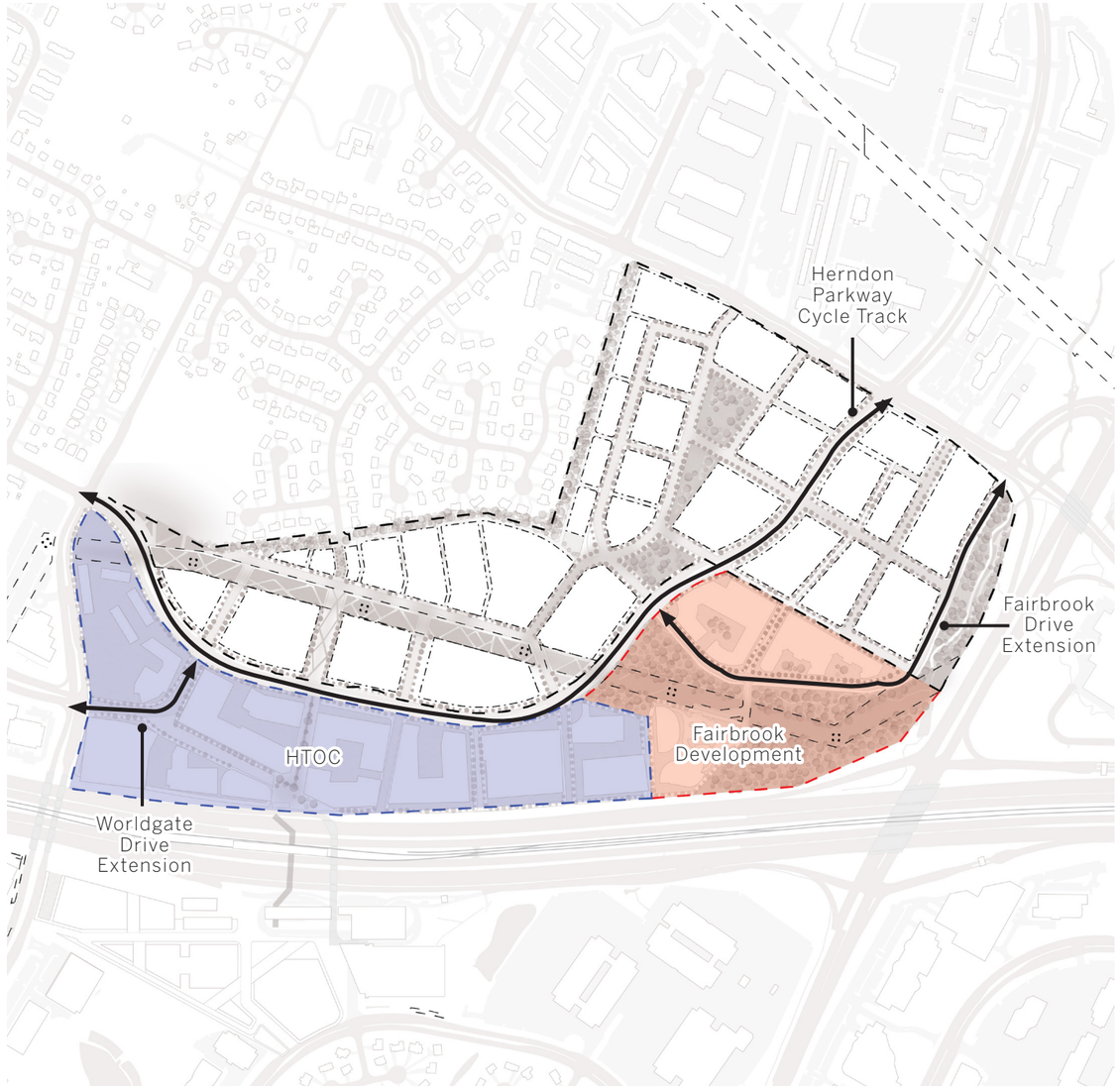
Fairbrook Drive is a proposed road that would branch off Herndon Parkway, pass through the Fairbrook development, and turn north along Sugar Land Run before intersecting with Spring Street. At present, the status of the Fairbrook Drive extension is not clear, but for the purposes of the TRG SAP, it is assumed to be completed.

Worldgate Extension

The Worldgate Drive extension is a planned road segment that would directly connect Worldgate Drive with the Herndon Parkway, passing through the HTOC.

Herndon Parkway Cycle Track

A two-way cycle track is planned to run along the southern edge of Herndon Parkway between Spring St. and Van Buren St.



Plan Process and Methodology

Work on the Town of Herndon TRG Small Area Plan has been divided into five Phases over the course of nearly two years, from Information Gathering to Finalization. Broadly, this project started by exploring existing site conditions; identifying key constraints and opportunities; developing design options; refining and elaborating the selected design.

The TRG SAP planning process was multidisciplinary by nature, and thus multiple methodologies were used depending on the task.

These methodologies included, among others:

- Public surveys
  - Qualitative and quantitative
- Public communication
  - Public meetings
  - Project website
  - Podcast
- Data analysis
  - Existing conditions
  - Computer modeling of proposed conditions
- Urban design
  - Existing conditions analysis
  - Design iterations
  - Design refinement

PROJECT TIMELINE

PHASE 1: **Information Gathering**	• Participated in introductory meetings and site visit • Collected internal and external stakeholder input including engagement with the Advisory Committee, subject matter experts, and Town of Herndon staff and to align expectations for engagement with the Town Council, and community neighborhood groups • Prepared stakeholder and public engagement plan • Researched critical site and context issues • Developed the project website • Conducting three stakeholder engagement workshops • Prepared Inception Report, including the summary of engagement activities
PHASE 2: **Exploration & Analysis**	• Prepared existing conditions reports for the local economy & market conditions; transportation; and, infrastructure & utilities • Prepared an urban design Site Analysis Report • Prepared and delivered the Constraints and Opportunities memo
PHASE 3: **Visioning**	• Prepared a fiscal impact analysis • Developed three draft urban design frameworks with narratives for Staff review. • Evaluated and iterated the urban design frameworks, both qualitatively and quantitatively. • Presented urban design concept options to the Town of Herndon Staff, Advisory Committee and Town Council members • Selected a preferred concept option in coordination with project stakeholders
PHASE 4: **Development of the Preferred Plan**	• Prepared a Master Plan Report outline and reviewed with staff • Prepared the draft Master Plan including sketches, drawings, 2D and 3D concept imagery, vignettes, and study models • Prepared appendices and revise financial analysis • Presented the draft Master Plan to the Town of Herndon Staff, Advisory Committee and Town Council members
PHASE 5: **Finalization** TO BE COMPLETED	• Integrating feedback from project stakeholders • Reviewing the draft Master Plan, appendices with fiscal analysis with Town of Herndon staff • Finalizing and delivering the Master Plan

Equity Framework

The TRG Small Area Plan Vision reflects the insights of diverse stakeholders including the property owners, businesses, residents, community organizers, elected leaders, town staff and the general public. As a guiding document looking to the future, this plan has identified a vision for the area – from transportation to landscape to housing and more. The vision was developed using a equity lens from the beginning by reflecting on the past and present. As the Town of Herndon moves towards implementing this vision and making it a reality for a more equitable and resilient TRG, it will require assessment of metrics at regular intervals to advance the Plan's objectives every day through stakeholder collaboration. As a part of this process, we have developed eight building blocks to guide growth and development in the study area. These are:

Cultural Sensitivity
Future development should prioritize cultural sensitivity by recognizing and honoring the distinct cultural backgrounds of the impacted communities. All future growth and progress should be influenced by a wide range of voices, including individuals from diverse backgrounds, cultures, and expertise. Extensive community involvement in project assessments and appraisals is of utmost importance. Establishing an open channel of communication with the community and stakeholders is crucial, integrating equity strategies into every phase of the planning and development.

Inclusion
To ensure progressive change in the TRG, it's essential that the project team collaborates closely with the stakeholder community to establish project equity strategies. Based on stakeholder and public engagement, future development in the TRG should prioritize creating a sense of belonging by accommodating a wide range of human conditions, considering factors like age, mobility, visual capability, neuro-divergence, language, culture, environmental sensitivity, socio-economic status, and religious affiliation. Every new development should embrace universal design principles to ensure accessibility and inclusivity for all members of the community, fostering a more welcoming urban environment. Incorporating feedback from public engagement sessions into equitable strategies will remain crucial throughout this process.

Advocacy
Advocacy is an important pillar of evaluating equity by placing a special emphasis on marginalized and low-income communities. Future development should prioritize inclusive design by adopting practical approaches that consider the unique needs of these communities, ensuring that public spaces and infrastructure are accessible and functional for all future residents of the TRG. Development strategies should be carefully crafted to ensure that underserved communities, including low-income residents, communities of color, immigrants, and others at risk of being left behind, benefit from the transformation. This can be achieved by incorporating affordable housing options, job opportunities, and educational resources within development of properties. Evaluating equity also requires assessing how responsible and impactful investments should be made to guarantee that lower-wealth residents can reside in culturally rich, healthy, safe, and opportunity-filled neighborhoods, ultimately fostering greater social and economic equity within the urban environment. Region-wide best practices should be looked into to integrate proven approaches that promote equitable urban development. Any future initiative should aim to rectify specific gaps in urban performance, such as food deserts, park deserts, and amenity deserts, and make its data and research transparent and accessible to the community and stakeholders, actively advocating for the community's interests.

Access
Equity through access can be ensured if spaces are welcoming to everyone, incorporating areas designed for diverse income levels, and accommodating both housed and unhoused individuals, with public spaces that encourage gatherings and inclusivity. Accessibility, comfort, and usability should be paramount for any new development in the TRG, reflecting the principles of universal design and sensory impairment-sensitive design to cater to people of all backgrounds and abilities. Any future development must prioritize interconnectivity and non-segregation principles by providing public and open spaces within a short walking distance, easy access to transit, and proximity to community amenities.

Safety
Future development should prioritize both physical and neurological safety, fostering a sense of security through transparent facades and the "eyes on the street" concept. It should also promote a vibrant public realm with safe programming and enhance interconnectivity and permeability through varied density and open space planning. Furthermore, changes in the future should align with this vision to support land use changes that prioritize safety, and incorporate design features that cater to neurodiverse inhabitants. Functional security features should be seamlessly integrated into the community-focused design, facilitating meaningful interactions while ensuring safety. Resiliency measures against climate change and natural disasters should be integrated in any future development, protecting the community and exceeding local safety standards to ensure long-term sustainability and equitable safety.

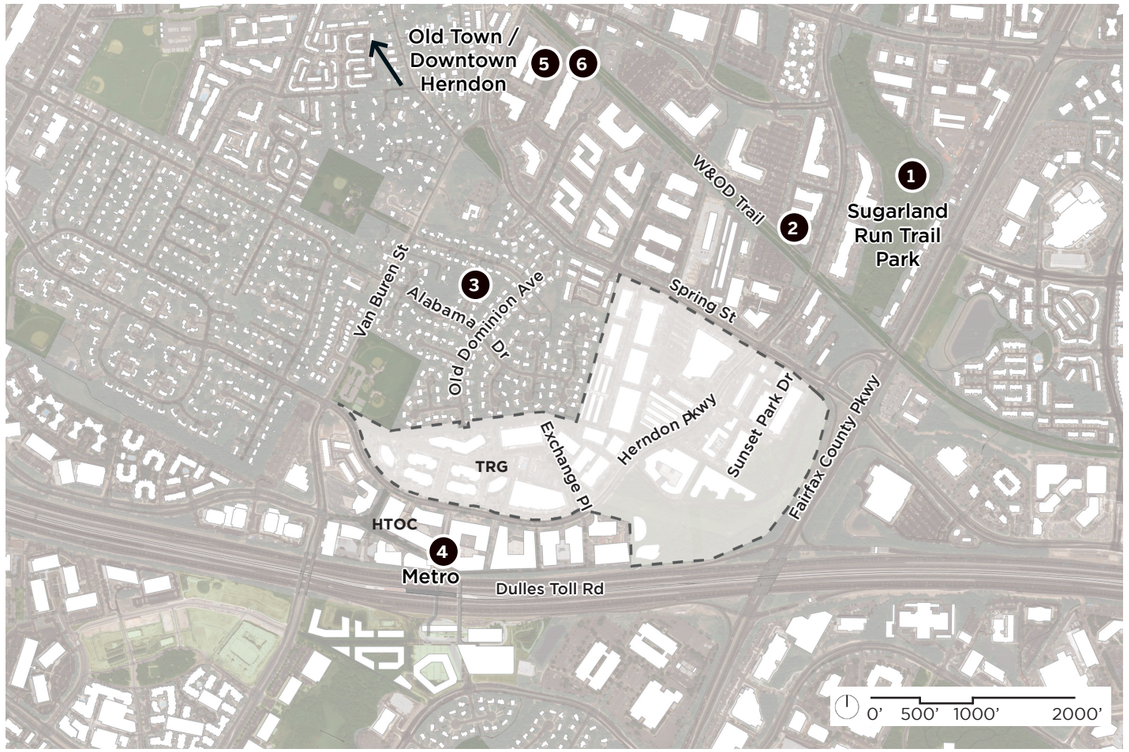
Health & Well-being
Physical health and mental well-being is crucial when implementing the Plan for the TRG. This can be done by ensuring residents, workers, students and all users of the spaces here have access to quality outdoor views, minimizing noise pollution for a comfortable environment. Active programming in commercial areas should be designed to contribute to the neighboring community, fostering inclusivity and shared benefits. Any new development should enhance the environment and improve the quality of living by creating a microclimate managed through shading and tree coverage, thereby providing a comfortable and green outdoor environment for all residents. An active lifestyle can be encouraged through improved walk and bike scores by offering high-quality open spaces, playgrounds, and robust pedestrian and biking infrastructure within easy reach.

Community Prosperity
Prosperity is at the core of any successful community. This can be achieved by providing spaces for local businesses, minority-owned, women-owned, and small businesses, and by incorporating retail spaces and community facilities that cater to the neighborhood's needs. Providing economic opportunities for the local population is also essential. As envisioned for Sunset business park - diverse economically-focused initiatives should continue to be prioritized, such as introducing new incubators, co-working spaces, a variety of retail spaces, and local community anchor spaces. It should also involve the utilization of local artists and locally-sourced labor promoting economic empowerment and inclusivity. The inclusion of community facilities like community kitchens, daycare centers, and other resources can enhance the quality of life for residents, particularly those from racially marginalized backgrounds.

Advancing equity is inextricably linked with prioritizing diverse housing access by including a range of housing types, including social, affordable, and inclusionary housing, to cater to the needs of different income groups and promote economic diversity. Strategies for the inclusion of unhoused individuals and people from all socio-economic levels should also be integrated in planning any new development to ensure that the benefits of the urban design project are accessible to a broad and inclusive community.

Site Exploration & Analysis

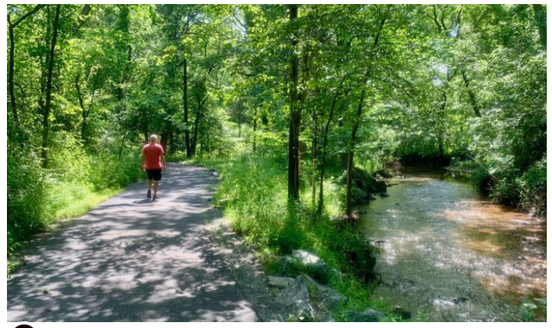
Existing Conditions - Views Around the Site



The TRG site lies at the southern boundary of the Town of Herndon, across the street from the Metro Station and the ongoing HTOC development area, bounded in large part by major roadways: Dulles Toll Road, Fairfax County Parkway, Spring Street and the Herndon Parkway.

The Downs of Herndon, a single-use, single-family home neighborhood, borders the rest of the site, at the northern perimeter. The W&OD Trail, a popular, regional biking enthusiast destination lies just one block from the TRG Spring St. boundary, at a 7-minute bike ride to the Old Town of Herndon and to the Reston Town Center.

Another park amenity lying just a block from the TRG is the Sugarland Run Stream Valley Park, whose waterway seemingly originates within the TRG.



1 SUGARLAND RUN STREAM VALLEY PARK



2 W & OD TRAIL



3 THE DOWNS OF HERNDON



4 HERNDON METRO STATION

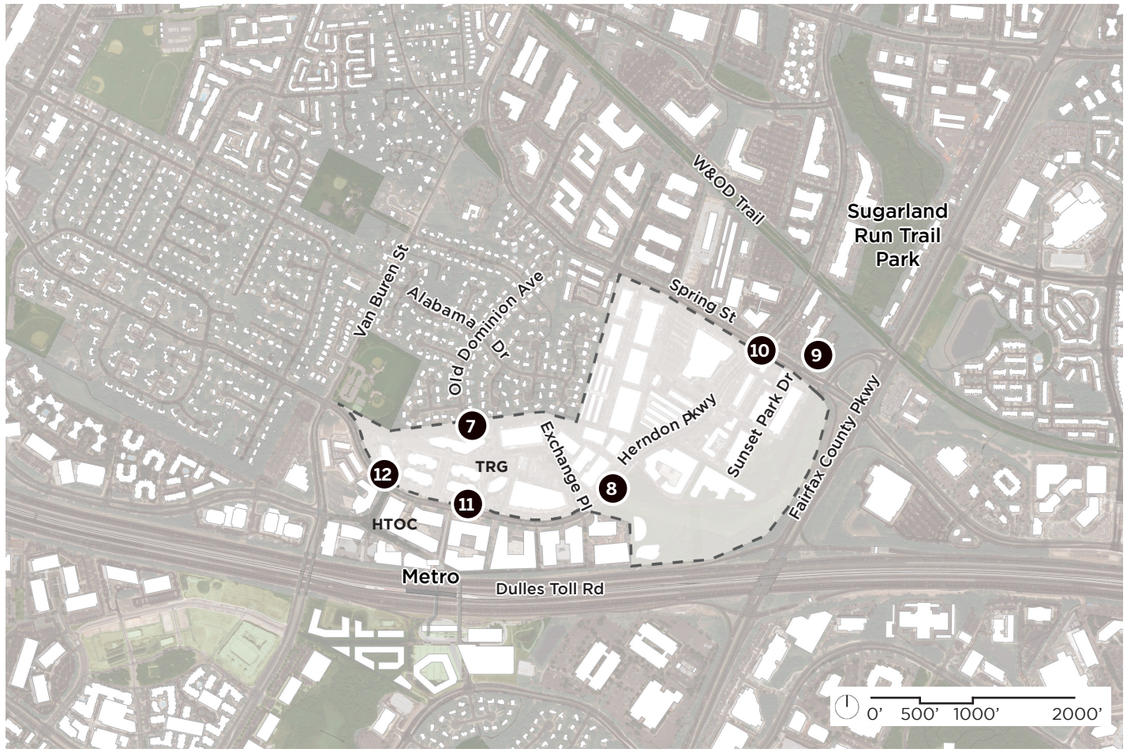


5 DOWNTOWN HERNDON



6 DOWNTOWN HERNDON, NEW JUNCTION SQUARE MIXED USE DEVELOPMENT

Existing Conditions - Views Around the Site



The western part of the TRG, between Exchange Place and Van Buren St, is the area within a 5-minute walk from the Metro, with newly built pedestrian crossing (photo 11) connecting the Metro Station path to the TRG across the Herndon Parkway. Further north lies a pedestrian opening through the vegetated buffer (photo 7) connecting to the Downs neighborhood. It is known for residents to walk to Sunset Business Park (photo 9) via this connector, presently a circuitous 15-minute walk through multiple office building parking lots and along the winding Herndon Parkway.

The largely vegetated area abutting Fairfax County Parkway with a small frontage to Herndon Parkway (photo 8) is the apparent origin of the Sugarland Run, a stream that runs northward through a forested trail park outflowing to the Potomac River.

The intersection of Spring St and Herndon Parkway (photo 10), is the major auto-oriented access to the TRG site, juxtaposing with the proximate Sugarland Run greenery, and the existing (photo 12) and planned neighborhoods planned towards the west.



7 PATH TO DOWNS NEIGHBORHOOD



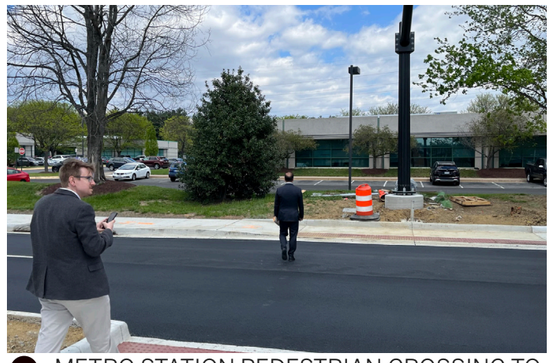
8 HERNDON PARKWAY



9 SUNSET BUSINESS PARK



10 SPRING STREET

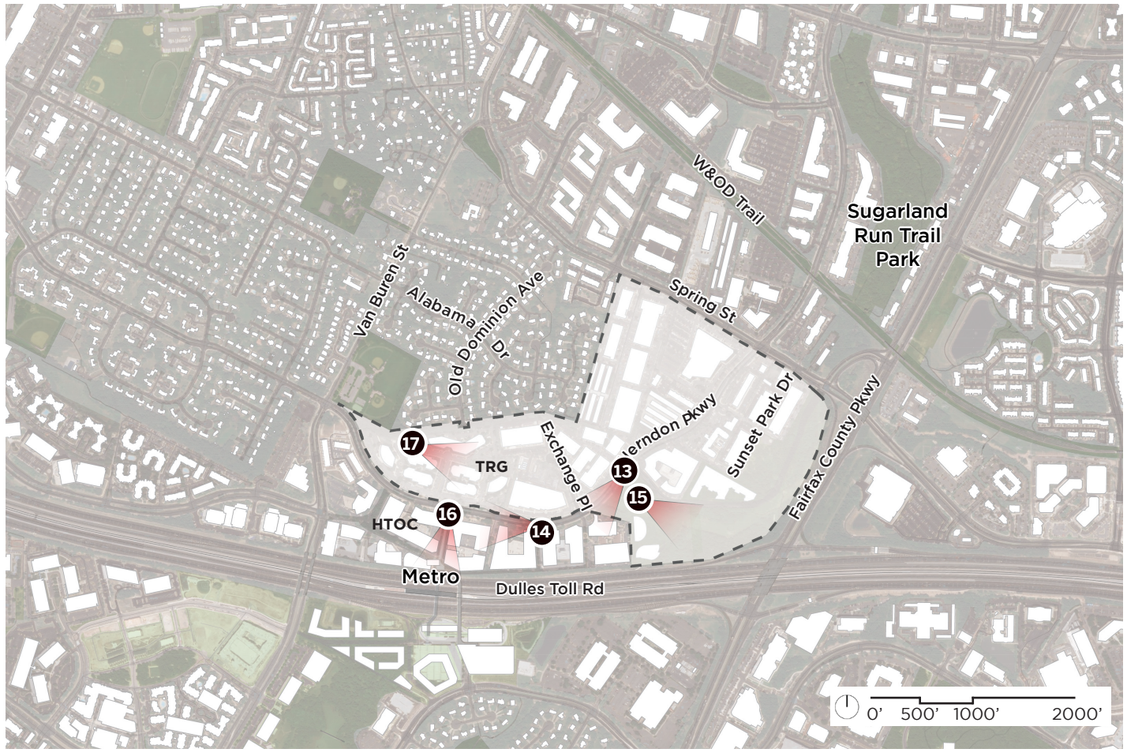


11 METRO STATION PEDESTRIAN CROSSING TO TRG AT HERNDON PKWY



12 METRO SQUARE CONDO COMPLEX

Existing Conditions - Views Around the Site





13 HERNDON PARKWAY, NEAR FAIRBROOK



14 TYP. VIEW ALONG THE HERNDON PARKWAY



15 SUGARLAND RUN STREAM



16 VIEW TOWARDS THE METRO



17 VIEW OF THE NEW RESTON GATEWAY SKYLINE FROM THE TRG

The TRG features several scenic vistas and view corridors. The most significant view corridor follows the Dominion easement in the east-west direction. The easement is free of obstructions and extends in straight-line segments, creating continuous unimpeded views. This corridor frames two views, one of the undeveloped space, and the second of the Reston skyline.

While the Dominion easement has the benefit of framing view corridors, the pylons and wires themselves could be considered eyesores. In the Visioning stage, design strategies can be employed to highlight the view corridor, and simultaneously obscure the electricity pylons. Careful placement and orientation of building masses, location and species of trees, and streetscape design can all help to highlight existing views.

Existing Conditions - Property Ownership Patterns

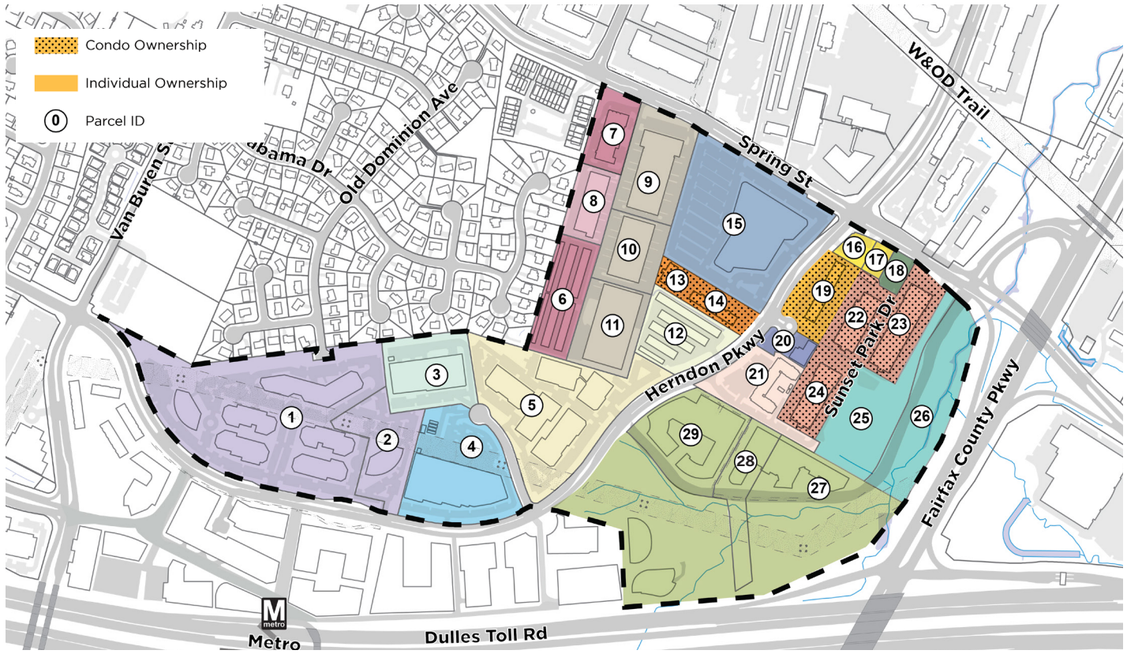
PROPERTY OWNERSHIP

The map below illustrates property ownership, where each property owner is denoted by a unique color. Note how some colors span across multiple parcels, revealing the opportunity of single ownership (e.g., parcels 1-2 and 9-10-11), whether contiguous or not (parcels 6 and 7). Condo ownership (like parcels 22-23-24) may bring either a challenge or an opportunity, depending on how condo owners work together.

The TRG has 26 parcels and 94 owners. A majority of the land (88%) is owned by individual property owners and the remaining land area (22%) is owned by condo ownership. Condo ownership properties include the Springwood Professional Center, Parkway Crossing and Sunset Business Park.

One prevalent opportunity throughout the TRG is building age: most of the buildings date back to the 1980's and 1990's, which puts them at the end of their useful lifespan or are likely in need of will need major renovation in the near future.

48% of the buildings in the TRG are single-story followed by 20% 2-story buildings and only two 3-story buildings, yielding a low median FAR is 0.46., which may fit existing zoning in a pre-transit era, but the TRG Small Area Plan is looking increase FAR to be attune with transit oriented developments.



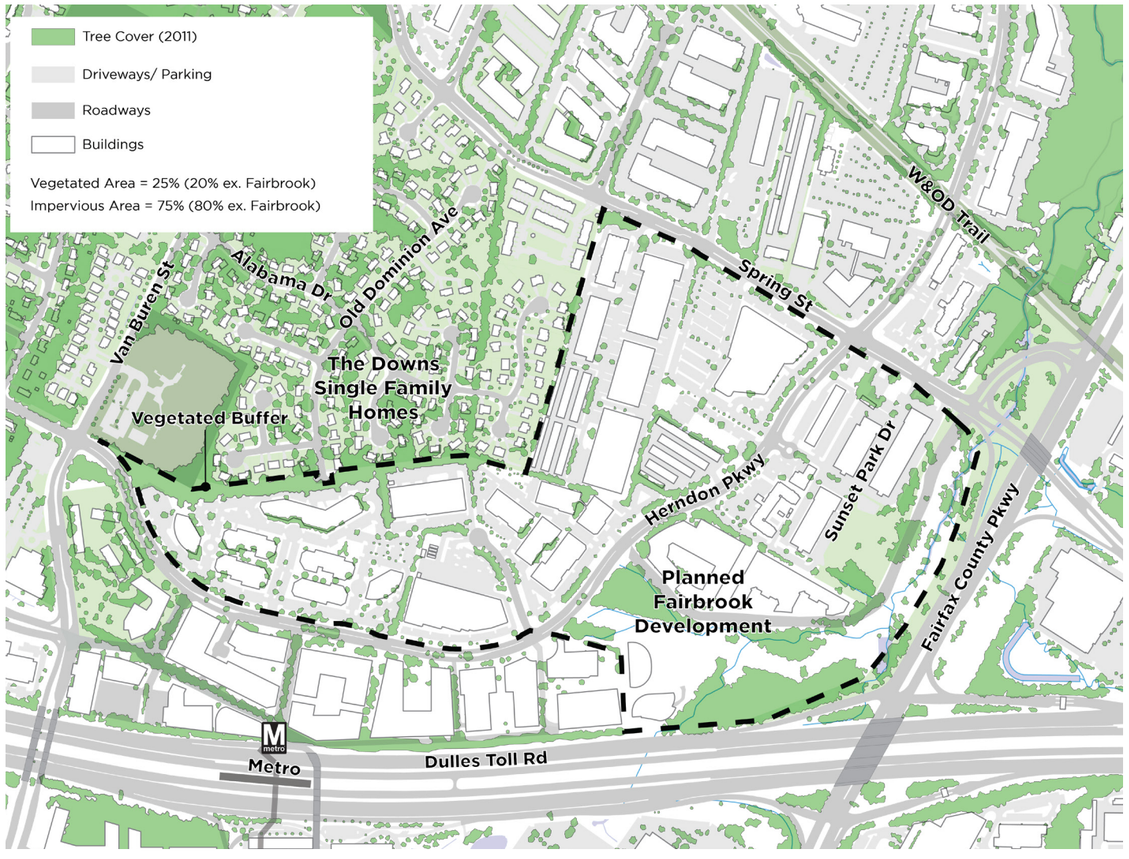
Parcel ID	Property / Main User	Number of Owners	Year Built / Added	Building Age (Years)	Property Land Area (SF)	Property Land Area (Acres)	Property GFA (SF)	FAR	Height (Stories)
1	Monroe Business Center	1	1986	37					1, 1, 3
2			1988	35	822,649		253,263	0.31	3
3	Beanstalk	1	1985	38	158,158		73,094	0.46	1
4	Freddie Mac / Data Center	1	1985	38	272,598		136,603	0.50	2
5	Van Buren Office Park	1	1985	38	410,222		108,402	0.26	1
6	Security Public Storage	1	1985	38					1
7			2004	19	207,645		102,663	0.49	1
8	331-351 Victory Dr	1	1982	41	77,390		36,921	0.48	1
9	301-315 Spring St, 340-366 Victory Dr	1	1980	43					1
10	308-330 Victory Dr		1975	48					1
11	300-302 Victory Dr		1977	46	422,766		204,635	0.48	1
12	Public Storage	1	1985	38	131,586		45,520	0.35	1
13	Springwood Professional Center	5	1988	35					2
14		14	1988	35	76,200		31,400		2
15	Boeing	1	1985	38	432,166		208,265	0.48	2
16	Office Center	1	1987	36					3
17	(vacant)		n/a	n/a	38,016		10,760	0.28	1
18	Dunkin Donuts	1	1969	54	22,223		4,469	0.20	1
19	Parkway Crossing	18	2005	18	97,200		36,000	0.37	2
20	465 Herndon Parkway	1	1995	28	33,621		16,678	0.50	2
21	Hyatt House	1	1999	24	127,894		87,100	0.68	4
22	Sunset Business Park	12	1984	39					1
23		14	1984	39					1
24		17	1984	39	309,100		125,300	0.41	1
25	(vacant, green area)	1	n/a	n/a					n/a
26	(vacant, green area, Sugarland Run)		n/a	n/a	415,580			-	n/a
	TRG (without Fairbrook) Totals:	**94**			4,055,014	**93.1**	**1,481,073**	**0.37**	
27	Fairbrook	1	n/a	n/a					n/a
28			n/a	n/a					n/a
29			1985	38	1,200,741		89,000	0.07	2
	TRG, Including Fairbrook Property, Totals:	**95**			5,255,755	**120.7**	**1,570,073**	**0.30**	

Property Data Summary	SF	Acres	GFA (SF)	FAR
TRG Parcels	4,055,014	**93.1**	**1,481,073**	**0.37**
Fairbrook Parcels	1,200,741	**27.6**	**89,000**	**0.07**
TRG Parcels Total:	5,255,755	**120.7**	**1,570,073**	**0.30**

Existing Conditions

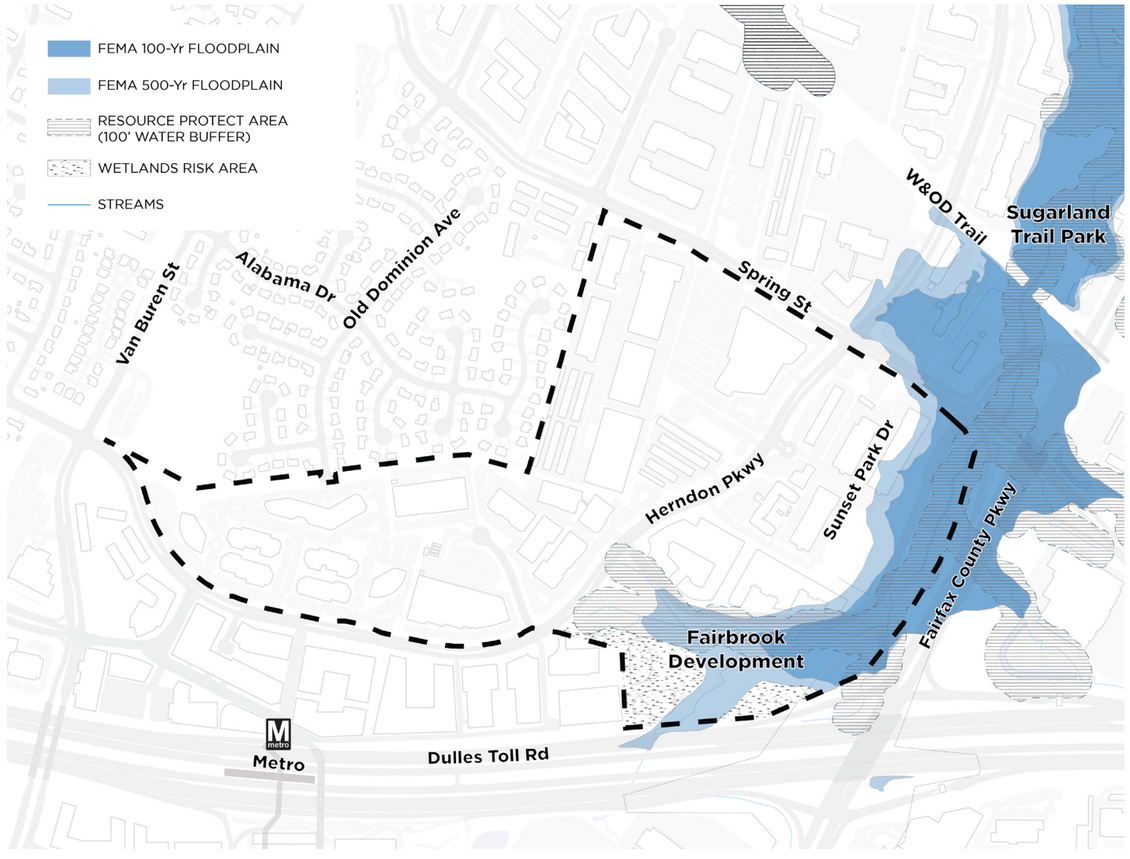
TREE CANOPY

A significant majority of the TRG land is currently man-made — buildings, parking lots, or roadways — meaning that within the body of the TRG there is very little tree canopy. There are, however, two significant exceptions to this: a forested buffer separating the Downs of Herndon neighborhood from the TRG, and the greenspace around Sugarland Run, which



NATURAL RESOURCES & FLOOD RISK

Because so much of the TRG is already developed, there are few natural resources on site. The only areas in the TRG that are within a flood plain are along Sugarland Run, at the eastern edge of study area near Fairfax County Parkway. These areas are unlikely to be redeveloped, in any event, due to their relatively inaccessible location and steep topography.



Existing Conditions - Dominion Easement

OVERHEAD POWER LINE EASEMENT

The Dominion Easement bisects the western portion of the TRG site, the area within a 5-minute walk from the Metro and across the Herndon Parkway from the planned HTOC development.

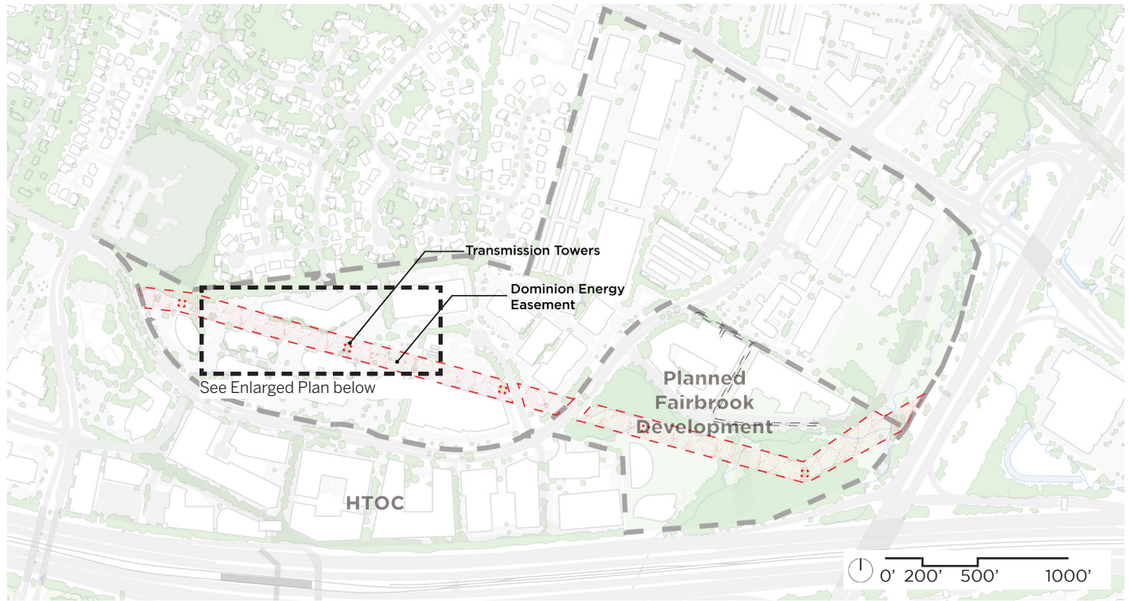
Buildings presently flank the easement on both sides, making its 100-foot clear zone readily apparent in maps and aerial photos, such as the bird's eye view on opposite page. Most of the clear zone is being used for driveways, parking lots, and low landscaping.

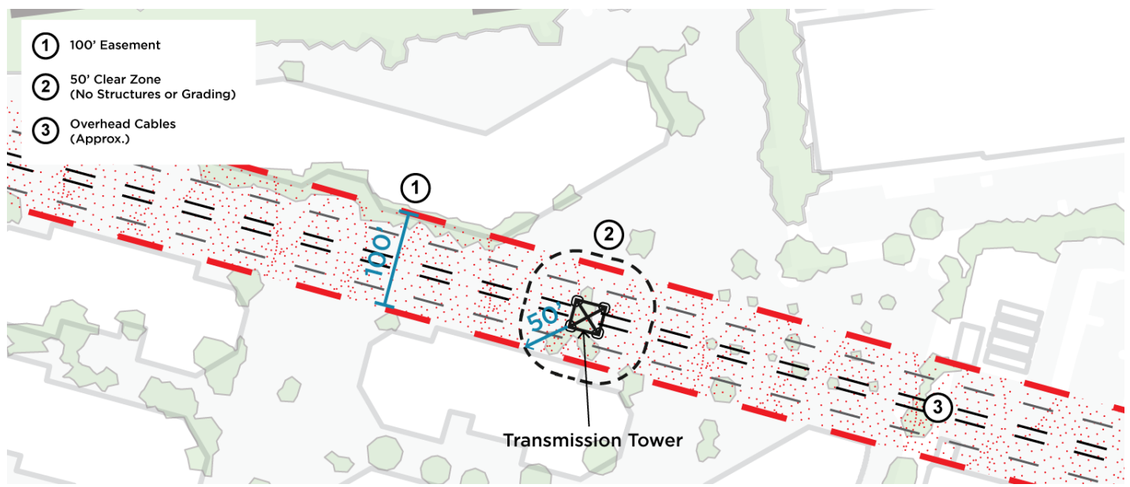
Although the easement poses a major constraint on the TRG, it could also be viewed as an opportunity: is it a divider or a connector; a parking or a park?



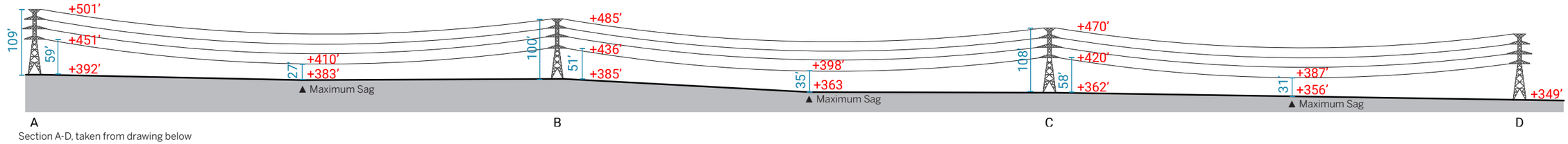
The general restrictions from the easement are listed below. Note that final requirements are determined by an official agreement between property owners and Dominion.

- No buildings or structures, including dumpsters and playhouses, are allowed within the easement
- Road finished grade min 25' clearance under maximum sag of power line
- No grading within 50' of transmission tower
- Minimum 36" cover for any storm, water, or sewer within the easement. Wet utilities to be designed for heavy vehicle loading.
- No blasting within easement
- Signs shall be no more than 10' in height, and minimum 50' from any structure
- Light poles shall be maximum 14' in height above grade and no closer than 50' from any structure
- Contractor to restore any disturbed area within the easement
- Any encroachments into the easement shall be coordinated with Dominion and subject to an "Encroachment Agreement"

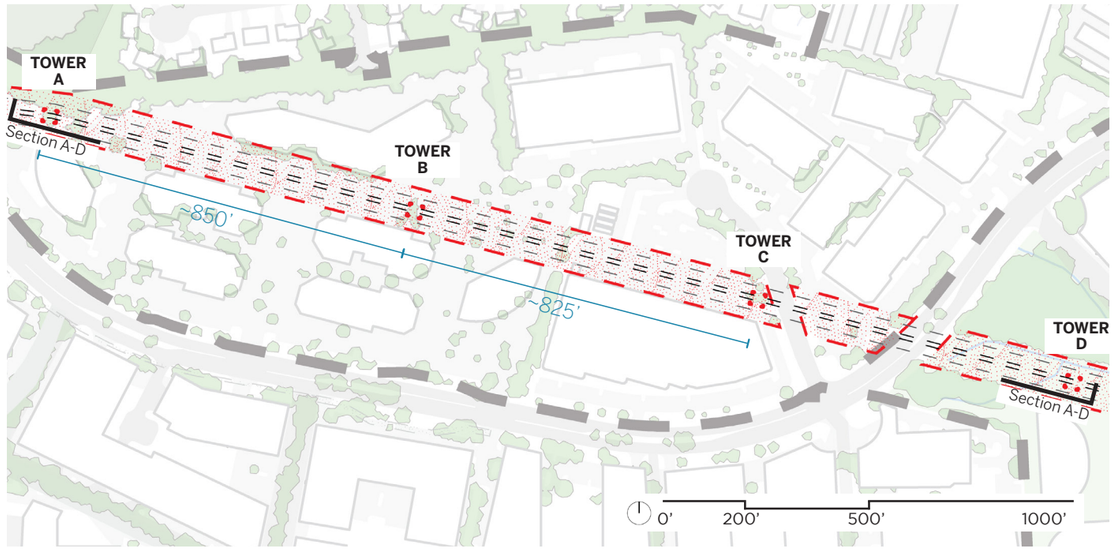


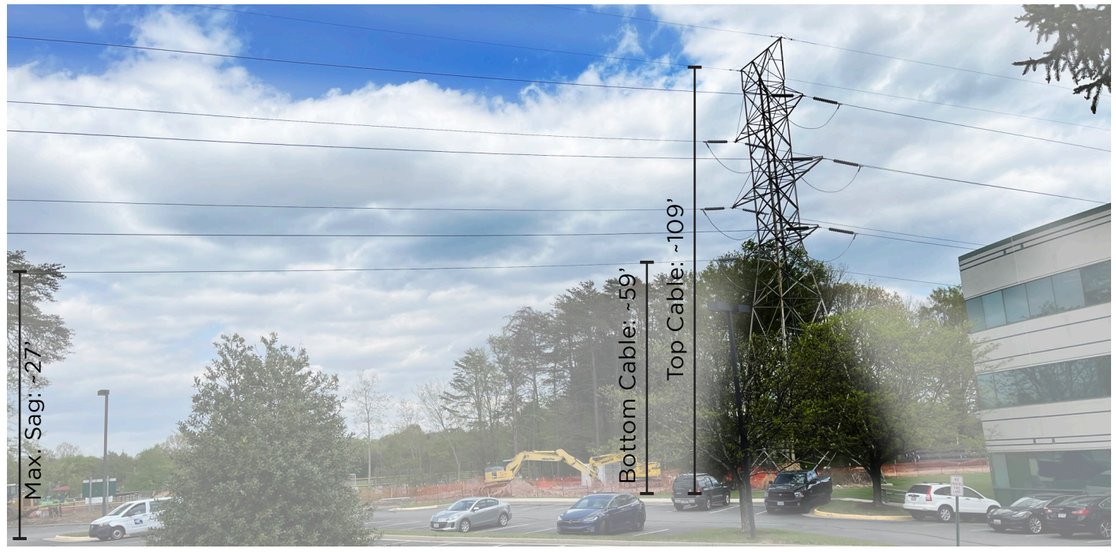


Existing Conditions - Dominion Easement



Section A-D, taken from drawing below





There are three transmission towers on the contiguous western portion of the TRG bounded by Herndon Parkway. Those towers are approximately 825 to 850 feet apart, roughly the distance of two large city blocks.
The towers are at least twice as tall as the buildings around them, as seen in the photo on opposite page. A 109' height is nearly as tall as a 10-story residential building, or an 8-story office building.

The buildings are presently oriented parallel to the easement, which would maximize views to the cables from the third story upward. This is not an issue, however, as the buildings are less than three stories tall. Building orientation should be considered to minimize views to towers and cables. A 10-story building could potentially have cable-free views on the top five stories, depending on the location, as the cables drops as much as 32' from tower to maximum sag.

Attention must also be paid to maximum sags, as some are as low as 27' above grade, just two feet higher than a street light pole.
Although the Dominion Easement is perceivably flat as it crosses the TRG, the site in fact drops 43' from Tower A to Tower D, over the course of approximately 2,440.' Much of this grade change can occurs at property divisions, such as between the Shorenstein and Freddie Mac parcels, as seen in photo to the right.

Existing Conditions - Heights

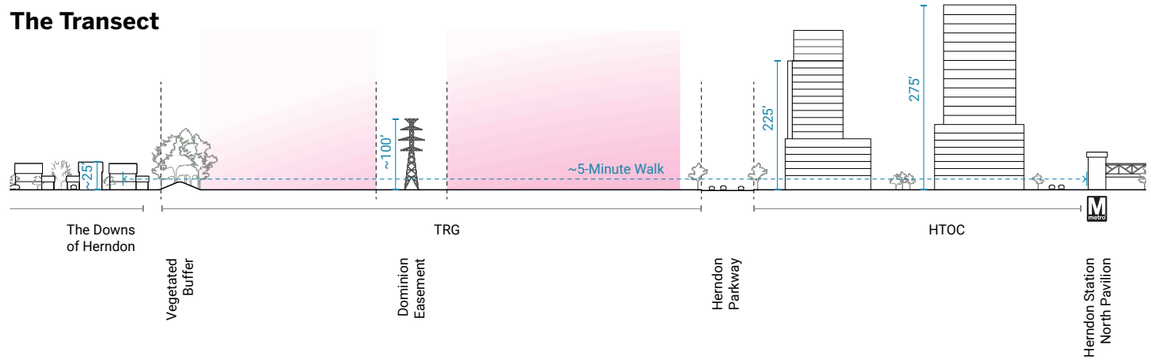


The TRG Small Area Plan will replace current zoning height limitations in favor of new ones, to be more attuned with standard transit-oriented densities.

The Opportunity for the TRG lies in higher building heights and development densities within the Metro Station 5-minute walk radius, that could gradually decrease towards the Downs neighborhood and the 10-minute walk zone going eastward towards Spring Street.

The Transect study section reveals a TRG flanked by 25' and 225' heights from Downs to HTOC, with the opportunity to potentially infill development to gradually match those heights, in order to fit with the surrounding context from a scale perspective. The Dominion towers and 100'-max cable heights may present a visual challenge for surrounding buildings, however also lends itself as the threshold between higher and lower heights at the TRG.

The Transect



Ongoing Developments Across the Herndon Parkway



ONE OF THE FAIRBROOK DEVELOPMENT OPTIONS



PARKVIEW



555 HERNDON PARKWAY

Summary of Market Analysis

As is detailed more fully in the Market Analysis included in Appendix C, there is expected to be strong market demand within the TRG and region.

Regional Overview

Washington, D.C., is a strong market that continues to experience significant growth. Given the presence of the federal government, the regional economy of Washington, D.C., is generally more resistant to economic downturns than the regional economies of other major metropolitan areas. However, most recent job growth is occurring in the private sector, in industries like Professional & Business Services and Education & Health Services. More recently, technology has emerged as a major driver in the local market, in part due to the presence of the Central Intelligence Agency, the Defense Department, and other federal agencies that award contracts for cybersecurity and cloud computing. Fifty-five of the world's 500 fastest-growing cybersecurity companies are based in the region. An economic recovery is well underway in the Washington D.C. area. The region added 59,000 jobs during 2021, and Moody's Analytics expects it to surpass pre-pandemic levels of employment during 2023.

The economist Base Case (60% probability) assumes that increases in Federal Reserve's Funds Rate—coupled with elevated energy prices, lingering supply chain disruptions, and weaker global growth—will negatively impact the U.S. economy. U.S. GDP growth is likely to slow (0% to 2%) during 2022 and 2023 with a high likelihood of a shallow recession during that time frame. However, it is important to note that redevelopment in the TRG is likely to occur over the long term, and not just the near term. Even in the case of immediate opportunities in the TRG, the markets for several favored asset classes (e.g., rental apartments, self- storage) are expected to remain relatively stable, and supportive of new development.

Submarket Context

Historically, many of the new technology and cybersecurity jobs in the region have concentrated along the Dulles Toll Road, resulting in rapid residential and commercial growth. Today, Fairfax County and adjacent Loudoun County are among the five wealthiest counties in the nation, highlighting their appeal to residents and employers. Along with the introduction of rapid transit via the Silver Line, growth along the Dulles Toll Road has spurred a significant amount of real estate development in this part of the region, which has transitioned from largely suburban in character to increasingly dynamic and mixed-use.

Demand is moderating, as the Washington market continues to mature, and as its office spaces grow more efficient. There is also a robust pipeline, and the TRG is not as well-located as other site to compete for corporate users, though there may be opportunities for smaller and/or creative ones.

Hotel

The Dulles Corridor is a large, but slow-growing hotel market. Although the COVID-19 pandemic hit the submarket hard, the TRG is likely to present attractive opportunities for additional hotel development when redevelopment begins to take place, and as the amenity base continues to grow.

Retail

The Dulles Corridor is home to a large and competitive retail market, and careful planning is necessary to ensure that development takes place in a way that is complementary of – rather than competitive with – Reston Town Center, Downtown Herndon, and other existing and future retail destinations.

		CUMULATIVE DEMAND IN TRG			LEVEL OF OPPORTUNITY IN TRG				
DESCRIPTION		BY 2025	BY 2035	BY 2045	LOCATION APPEAL	CONCEPT FIT	LIKELY LAND ECONOMICS	SUPPLY / DEMAND BALANCE	MARKET OPPORTUNITY
RENTAL HOUSING		**610 Units**	**2,500 Units**	**4,540 Units**					
Mid-Rise Apartments	Five to seven story community, with structured parking in a podium or wrap configuration	570 Units	2,280 Units	4,100 Units	STRONG	STRONG	STRONG	MODERATE	STRONG
High-Rise Apartments	10 or more story community, with underground and/or structured parking				MODERATE	STRONG	WEAK	MODERATE	MODERATE
Rental Townhomes	Three-story rental townhomes, with one- or two-car attached garages	40 Units	220 Units	440 Units	STRONG	STRONG	MODERATE	STRONG	STRONG
FOR-SALE HOUSING		**260 Units**	**1,010 Units**	**1,640 Units**					
Townhomes	Three-story for-sale townhomes, with two-car attached garages	70 Units	290 Units	480 Units	STRONG	STRONG	STRONG	STRONG	STRONG
Two-Over-Twos	Two-story condos in four-story townhome structures, with one attached garage parking space	100 Units	370 Units	590 Units	STRONG	STRONG	STRONG	MODERATE	STRONG
Flats	Four- or five-story community, with attached parking on the ground level	90 Units	350 Units	570 Units	MODERATE	STRONG	MODERATE	STRONG	MODERATE / STRONG
HOSPITALITY		**310 Keys**	**320 Keys**	**340 Keys**					
Limited-Service Hotel	Four- to five-story hotel; likely upper midscale or upscale flag	310 Keys	320 Keys	340 Keys	STRONG	STRONG	MODERATE	MODERATE	MODERATE / STRONG
Full-Service Hotel	Five to 10 story hotel, with hotel restaurant, conferencing facilities, etc.; upper upscale or luxury flag				WEAK	STRONG	WEAK	MODERATE	MODERATE / WEAK
OFFICE		**120,000 SF**	**811,000 SF**	**1,326,000 SF**					
Corporate Office	Office space suitable for a wide variety of financial, technology, or government users.	91,000 SF	613,000 SF	1,002,000 SF	MODERATE	STRONG	MODERATE	WEAK	MODERATE
Creative Office	Space designed for smaller service-offering firms in industries such as architecture, design, etc.	29,000 SF	198,000 SF	324,000 SF	STRONG	STRONG	MODERATE	MODERATE	MODERATE / STRONG
RETAIL		**208,000 SF**	**267,000 SF**	**293,000 SF**					
Grocery & Drug	Boutique grocer, or a traditional one if a tenant can be attracted; potential for pharmacy as well	29,000 SF	51,000 SF	60,000 SF	STRONG	STRONG	MODERATE	MODERATE	MODERATE / STRONG
Restaurant	Mix of fast casual and sit-down restaurant concepts	83,000 SF	97,000 SF	105,000 SF	STRONG	STRONG	STRONG	STRONG	STRONG
Entertainment & Fitness	Mix of fitness concepts, as well as small-scale entertainment (e.g., breweries)	43,000 SF	51,000 SF	56,000 SF	MODERATE	STRONG	STRONG	STRONG	STRONG
Services	Basic household services, such as nail salons, barbershops, banks, etc.	31,000 SF	43,000 SF	47,000 SF	STRONG	STRONG	STRONG	STRONG	STRONG
Hard & Soft Goods	Primarily local boutique tenants, with a focus on locally crafted goods	22,000 SF	25,000 SF	25,000 SF	MODERATE	STRONG	STRONG	WEAK	MODERATE
OTHER		**N/A**	**29,000 SF**	**52,000 SF**					
Self-Storage	Facility offering a variety of storage unit sizes in a climate controlled environment	N/A	29,000 SF	52,000 SF	STRONG	WEAK	MODERATE	MODERATE	MODERATE

Self Storage

The Dulles Corridor is an attractive location for self-storage, which is likely to see continued demand. However, the use should be limited to select sites that will not interfere with the creation of a streetscape, so as not to adversely impact opportunities for other uses.

Market Constraints and Opportunities

Overall, market demand within the TRG is expected to be strong. This is particularly true for residential and retail uses. While there is projected demand for office and full service hotel uses, that demand is likely to be less strong.

Summary of Transportation Analysis

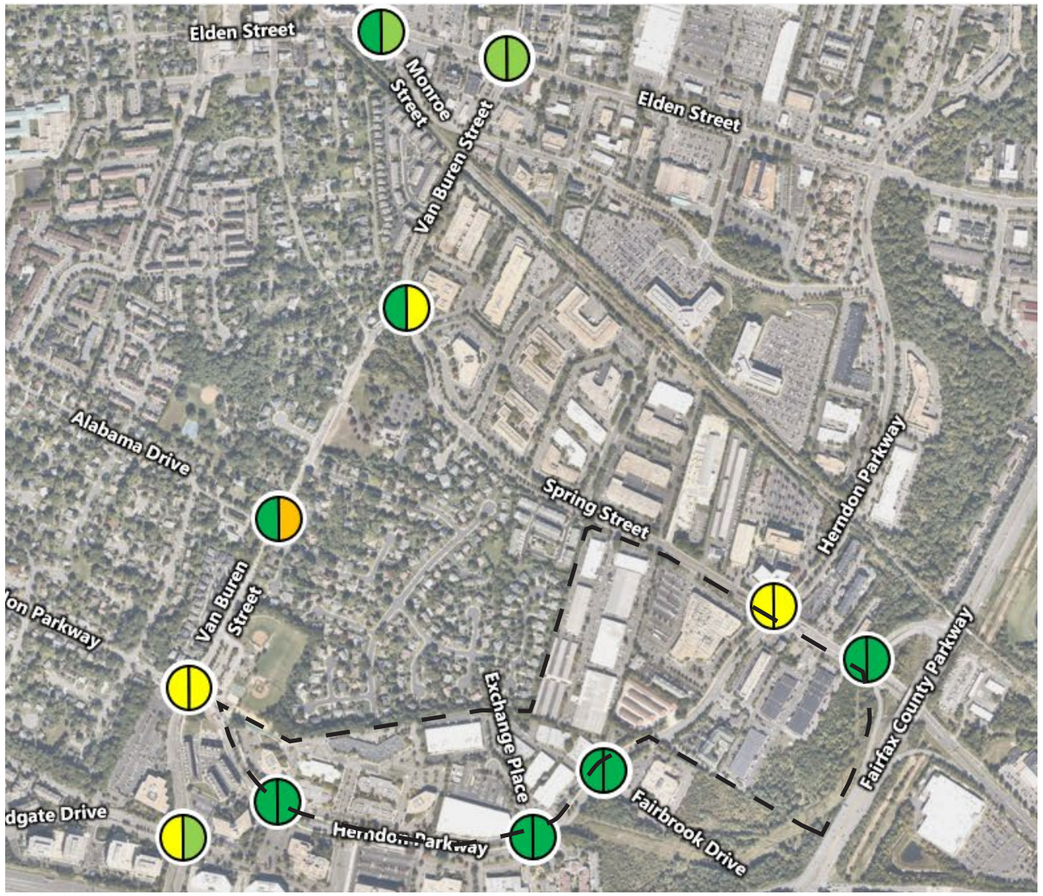
As is detailed further in the Transportation Analysis in Appendix B, a study of existing traffic conditions in and around the TRG was conducted.

Baseline Traffic Data
Eleven intersections in and around the TRG were studied to form the basis for existing and future modeling. These intersections were studied at both morning and evening traffic peaks. Rather than using the most current 2022 traffic count data, data from an earlier 2017 TRG traffic study were used. This was done to avoid data aberrations caused by the COVID-19 pandemic. Signal timing and phasing from 2022, however, were assumed in order to more accurately model future conditions. For the "no-build" scenario, the full redevelopment of the HTOC is assumed as well as a 1% annual background growth rate.

Existing Traffic Conditions
A microsimulation traffic model was utilized to estimate the operating conditions of the existing transportation system. Existing conditions traffic were found to operate acceptably. Traffic performance was measured using Level of Service (LOS) metrics, which measure the adequacy of intersection performance given traffic volumes. Levels of service range from A (free-flow) to F (forced traffic flow). In Herndon and the greater Northern Virginia area, LOS D is common and generally considered acceptable during the peak hours. Fairfax County's adopted LOS standard for some roadway classifications in the Tyson Corner Urban Center Plan is LOS E. This standard has been adopted to balance walkability, cycling, transit and other alternative modes of transportation with motor vehicles.

At the studied intersections, the traffic model estimates that all signalized intersections operate at LOS D or better. While the Van Buren Street / Alabama Drive all-way stop-control intersection operates at LOS E during the PM peak, a traffic signal is under construction at this intersection and is expected to facilitate flow.

As seen in the traffic model results, the transportation system is able to accommodate the current traffic demand and facilitate vehicular movement throughout the Town. Additionally, roadway improvement projects are under construction or planned in the near future at Van Buren Street / Alabama Drive, Van Buren Street / Herndon Parkway, and Spring Street / Herndon Parkway. These projects will help improve conditions at the areas with the highest levels of congestion in existing conditions.



Summary of Utilities Analysis

As detailed more fully in the Appendix, to establish a baseline understanding of existing utilities and stormwater infrastructure, GIS data was used to map and study current conditions. When future development scenarios are proposed, computer modeling was conducted by the Town of Herndon to evaluate any necessary infrastructure changes or upgrades.

Water Distribution
The current water distribution system within the TRG consists of a watermains along Herndon Parkway tying into other mains along Spring St. and Van Buren St., which branches off of Herndon Pkwy to serve each individual parcel within the TRG.
The water mains along Herndon Pkwy, Spring St, and Van Buren St. shall remain as such, as long as future demands lie within existing service capacity. If future demands prove to be above capacity, then these water mains may need to be upsized. During the Visioning Stages, the various design scenarios will be evaluated to determine potential impacts to the water distribution system.

Water distribution networks within each parcel will likely need to be removed entirely and re-laid, depending on future layouts. For example, if a current industrial site with a large parking lot is redeveloped into a multifamily building with a garage, then a new waterline network will need to be designed to avoid conflicts with structures and other constraints. Current per parcel density in the TRG is quite low. Redevelopment to higher densities, such as multifamily, will cause a significant increase in demands.

Ultimate development will also depend on the capacity of the existing system, which will need to be coordinated with the Town of Herndon. There may be a need for system capacity increases to handle future development. These will be determined as individual parcels develop over time.

Once the preferred scenario was developed by the consultant team Visioning phase, accurate water demands will be input into the Town's water model. These analyses will determine which watermains will require upsizing. They will also determine sizing of branches lines serving each parcel.

Sanitary Sewer System
The existing sewer system consists of a collection mains that cross Herndon Pkwy. and Spring St. These sewers drain off-site residential areas as well as parcels within the TRG.
Due to currently proposed redevelopment in the HTOC and on the Fairbrook site, the sanitary sewer trunk line in the Herndon Parkway needs to be upgraded. The final TRG SAP will provide additional density calculations that will indicate what the ultimate size of the trunk line should be.

As current uses within the TRG have low densities overall, redevelopment to higher density uses, such as multifamily, would cause a significant increase in sewage flows. On-site local collector sewers on each parcel will need to be realigned to work with the future development layout.

Storm Sewer
The existing storm sewer system consists of each parcel within the TRG collecting stormwater and discharging directly into the floodplain or larger storm sewers within the TRG and ultimately discharging into the floodplain around Sugarland run. There may be a few small runs of storm sewer that also drain offsite parcels, but on a much smaller scale compared to how current water and sewer systems are serving offsite parcels.

Since the parcels within the TRG are mainly nonresidential, they are already mostly impervious. This means that future development will not have to worry as much about impacts on downstream capacity. Redevelopment from industrial or commercial sites to multifamily or mixed-use development does not usually result in an increase in impervious area and thus stormwater runoff. Any redevelopment should strive to provide an increase in pervious areas or small LID measures to avoid an increase in runoff.

As with the water distribution and sanitary sewer systems, onsite storm sewer systems will likely have to be removed and redesigned to align with the future development. Some of the larger collection storm drains can potentially remain as is.

Due to proximity to the major floodplain around Sugarland run, there will likely not be a need to detain stormwater. Adequate outfall may be achievable without any new stormwater management facilities.

Stormwater quality improvements however will be required as a best management practice, even if the overall impervious area does not increase. This shall be coordinated with the Town of Herndon. Any stormwater quality measures shall be included within each parcel, (green infrastructure incorporated into buildings, storm filters, tree box filters, hydrodynamic separators, urban bioretention basins, etc...). Water quality credit purchase, which is discouraged by the Town, is also an option, and shall be coordinated with the Town.

Constraints & Opportunities

Based on the extensive analysis conducted in the Site Exploration phase, the following critical Constraints and Opportunities were identified.

	Constraints	Opportunities
Urban Design	• Multiple property ownership across the site, particularly at the lots controlled by condos, will likely require complex stakeholder consensus building. • The lack of a circulation network or mobility grid connecting the parcels, as well as the existing grade changes and other man-made features which prevent cross-parcel connectivity • The Dominion power easement bisects the 5-minute Metro walk zone, which constrains urban block design as well as building placement and orientation. • The low density, low height residential neighborhood to one side of the TRG, and the high-rise, high density development planned on the other characterize the clearly defined, and contrasting boundaries of the site. The TRG development should strive to reconcile both conditions	• Many buildings are dated and due for refurbishment or redevelopment • There is the opportunity to enhance Sunset Business Park: while the myriad of businesses, shops and restaurants in this area are an asset to the TRG and a local destination, the complex currently lacks a holistic sense of place • Approximately half of the TRG (excluding the Fairbrook parcels) is a 5 to 10-min walk from Metro and has only four owners, as compared to 90 owners throughout the rest of the site. • The SAP controls both sides of the Herndon Parkway from the edge of the Fairbrook site to Spring Street, bringing the opportunity of designing the street character at that segment of the Parkway.
Market Conditions	• Long-term demand for corporate office space, which currently occupies a significant portion of the TRG, is likely to be moderate. • Demand for full service hotels is likely to be moderate / weak.	• Overall, there is strong market opportunity for the following uses: rental residential; for-sale residential; creative / smaller office; and retail, particularly services
Utilities & Storm Water	• Likely all onsite utilities (excluding those on the main trunk) will need to be replaced to accommodate future development. Offsite upgrades may be needed depending on the changes in densities.	• The main “trunk” utility lines are well located and can likely remain in place, although the sanitary trunk line is slated to be unsized. (Future study and evaluation of proposed scenarios will need to be conducted to verify whether or not additional service upgrades will be required.)
Traffic Conditions	• The two “bookend” intersections in the TRG (Herndon Pkwy. / Spring St. & Herndon Pkwy. / Van Buren St.) likely pose the biggest constraints in addition to excessive queuing conditions along Van Buren Street. • While the existing road network is predicted to have surplus capacity under the “no build” scenario, modeling of TRG design proposals will be required to confirm acceptable performance.	• Because the existing roadway network is likely sufficient to accommodate future development, there is the opportunity to add density within the TRG. (Further study is required to confirm this) • Additional roads and improved route options could improve traffic conditions for all users.

Public Engagement

Opportunities for Input

At the core of the engagement process was the belief to bring people together to build consensus and achieve transformational objectives. The process began by engaging with stakeholders to uncover their full range of aspirations. Everyone's input is valuable, and by bringing these aspirations to the surface, we create a shared vision that resonates with all involved parties.

The goal was to ensure meaningful, inclusive and open dialogue. The process aimed to:

- *Inform and engage the community in a transparent and meaningful process*
- *Develop a common understanding of the TRG's challenges and opportunities*
- *Clarify, confirm, and incorporate community priorities and local knowledge*
- *Generate ideas for the future of a TRG that reflect the values and priorities of the Town of Herndon*

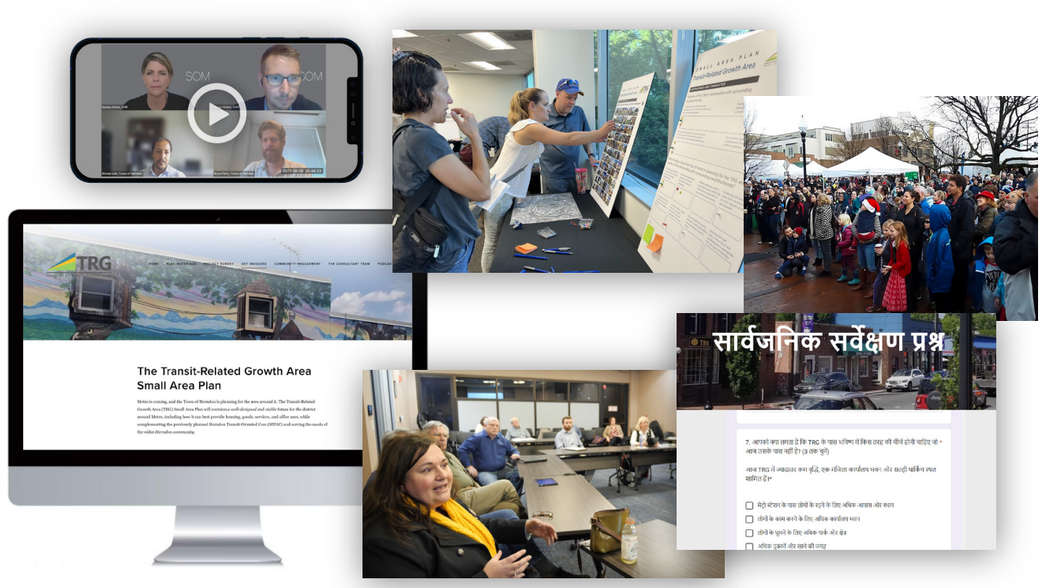
Following the site tour, in partnership with the consultant team, the Town of Herndon Planning Staff launched an intensive community engagement process to inform a Small Area Plan for the TRG. Outreach initiatives included public workshops, meetings with property owners, meetings with the advisory committee and work sessions with the Planning Commission and Town Council. Meetings also included one-on-one meetings with council members, and sessions with important stakeholders such as the Architectural Review Board and other departments within the Town of Herndon. Along with extensive dialogue with local residents and businesses, and elected and government officials, in-person and online surveys were conducted through the TRG website to elicit diverse points of view and ensure openness and transparency. All engagement encouraged open and creative thinking, exploring a wide range of possibilities. The process was not constrained by existing norms but aimed to break new ground and consider innovative solutions that were grounded in reality.

As we gathered information and worked to determine opportunities and constraints for the site, we focused on the following questions:

- *What mix of uses can establish the TRG as a place to live, work, shop and recreate in conjunction with the HTOC and Fairbrook?*
- *What is an appropriate mix of uses for the TRG that makes sense now and, in the future,*
- *Based upon market expectations and the town's vision for the area?*
- *How should density be addressed across the TRG?*
- *What is the best way to create an appropriate transition to the abutting single family*
- *Detached and attached neighborhoods?*
- *What is the best way to handle the transition between the HTOC and the TRG?*
- *How can roadway capacity constraints be addressed?*
- *How can the TRG have a unique sense of place while ensuring its identification with the Town of Herndon?*
- *What are the appropriate layout and size of pedestrian and cycling facilities for traversing the TRG and connecting to other areas of the town?*
- *What is the appropriate placement and size of passive and active recreational open space for the TRG?*
- *How can social, economic, and environmentally sustainable practices be infused into the future development and lifestyle of the TRG?*
- *How can the plan ensure economically feasible building footprints and ample space to provide for an enhanced outdoor and pedestrian-oriented lifestyle?*

MODES OF ENGAGEMENT

Project Website | Podcast | Public Meetings | Multiple Trilingual Surveys | Meetings with Public Officials | Flyer Distribution | Tabling



Opportunities for Input

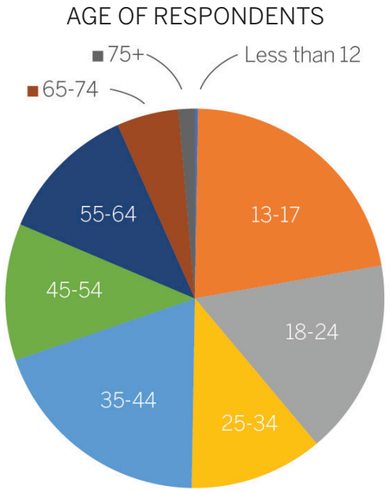


PUBLIC MEETINGS

May 25, 2022	**Advisory Committee Meeting**	Introductory meeting between project team and Advisory Committee
June 10, 2022	**Town Council Meeting**	
June 21, 2022	**TRG Property Owners Meeting**	Opportunity for Project Team to hear from the TRG Property Ownership Community
June 22, 2022	**TRG Neighbors Meeting**	Opportunity for Project Team to hear from the nearby neighbors to the TRG
June 23, 2022	**Public Meeting**	Opportunity for Project Team to hear from the general public
July 19, 2022	**Property Owners Workshop**	
August 3. 2022	**Property Owners Meeting**	
October 3, 2022	**Architectural Review Board Meeting**	Discussion of appropriate aesthetic architectural and urban design features for the Town of Herndon
December 8, 2022	**Advisory Committee Workshop**	Discussion of Site Analysis and Constraints & Opportunities Memos
February 16, 2023	**Town Council and Planning Commission Presentation**	Update on Site Analysis and Constraints & Opportunities and preliminary Visioning Workshop
March 29, 2023	**Advisory Committee Meeting**	Discussion of Concept Scenarios
May 24, 2023	**Public Meeting**	Presentation of Concept Scenarios
June 20, 2022	**Town Council and Planning Commission Presentation**	Discussion of Concept Scenarios; introduction to Preferred Scenario

Opportunities of Input

A comprehensive survey was conducted in Herndon as part of the TRG Small Area Plan visioning process and it yielded valuable insights from approximately 550+ respondents. 77.1% of the respondents were residents of Herndon. The survey was thoughtfully designed to be trilingual, offering respondents the option to provide feedback in English, Spanish, or Hindi. Age-wise, the survey achieved a balanced distribution of respondents. This inclusive approach aimed to capture the diverse perspectives and aspirations of the community.



The survey comprised a series of questions intended to gauge the community's sentiments and desires regarding the future of the TRG (Transit-Related Growth) area, particularly in light of the new Metro stop in Herndon. Here are some key findings from the survey:

Excitement about the New Metro Stop
A significant number of respondents expressed enthusiasm about the newly opened Metro stop in Herndon and indicated that they would use it frequently.

Desire for Change around the Metro Station
Respondents were asked about their views on the potential for change in the land surrounding the Metro station. A majority of 70% believed that this area should change and favored more shops and restaurants, demonstrating a strong desire for commercial development.

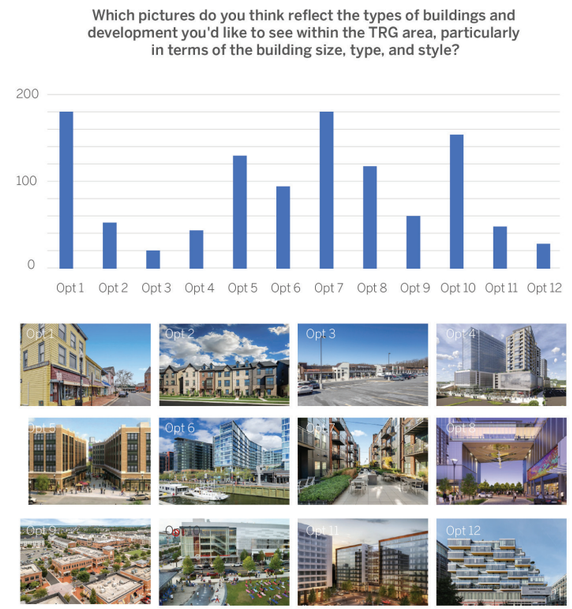
Future TRG Amenities
When asked about what they would like to see in the TRG area in the future that it currently lacks, the following priorities emerged:

- 36% desired more housing near the Metro station, suggesting a need for increased residential options.
- 70% expressed a desire for more shops and restaurants, indicating a clear demand for additional retail and dining opportunities.
- 62.7% wanted more parks and open spaces, emphasizing the importance of green spaces for community well-being.
- 48% wished for improved infrastructure for walking and biking, highlighting the importance of pedestrian-friendly design.
- 20% expressed interest in art and gateway features, emphasizing the value of aesthetics and cultural elements.
- 15% respondents also indicated a need for more office space and hotel space, suggesting potential for commercial expansion.

Preferred Building Development Types, Open Spaces and Streets
Respondents were shown precedent examples of building sizes, types, styles and open spaces, parks, and streets. Their insights helped design the urban design framework of the TRG.

Regional Inspirations
The survey also prompted respondents to identify their favorite parts of the region that could serve as good examples for the redesign of the TRG area. This information informed the visioning process about the types of improvements that resonate with the community.

The TRG Small Area Plan future vision Survey in Herndon revealed a community eager for positive change, driven by the opening of the Metro station. The survey results provide valuable guidance for design efforts, with an emphasis on enhancing housing, commercial options, green spaces, pedestrian infrastructure, and cultural elements in the TRG area. These insights will be crucial in shaping a vibrant and sustainable future for Herndon's transit-related growth.



Summary of Findings

The Public Engagement process ultimately led the design of the TRG. Insights gained through this exercise were brought directly into the project design. Below are highlights from the public engagement process; they represent ideas that were re-iterated throughout the engagement process by multiple individuals and through multiple media.

Unique Herndon Character
- Herndon is a unique town, and is different from the rest of its Northern Virginia context.
- Residents are deeply proud of this character and feel strongly that any new development incorporates that original character

Mixed Use Future
- Multiple, mixed use hubs
- Sunset Business Park received near-unanimous support from the public
- Mixed use development provides the opportunity to include affordable housing as part of the mix
- Both destination and neighborhood-serving retail would prove valuable in the TRG

Multi-modal Transportation Environment
- Herndon Parkway could become a multi-modal Parkway which establishes an appropriate relationship with surrounding residential neighborhoods.
- Existing investments in trails, cycle tracks, and the vehicular network should be augmented.
- Opportunity to integrate connections to Metro and to the W&OD trail for future redevelopment.
- Porous development that encourages walking and next-gen personalized mobility.
- All development should be sensitive to traffic implications



Landscape as a Driver of Design
- Landscape should be a driver of the future vision.
- Redevelopment that is green and environmentally performative.
- Network of naturally connected open spaces for future residents and workers.
- Sugar Land Run could be a placemaking asset and affirming a commitment to sustainability as an expectation for all property owners and future developers.

Flexibility in Land Use
- Property owners stressed the importance of flexibility of land uses, in order to maintain market feasibility

Plan Vision

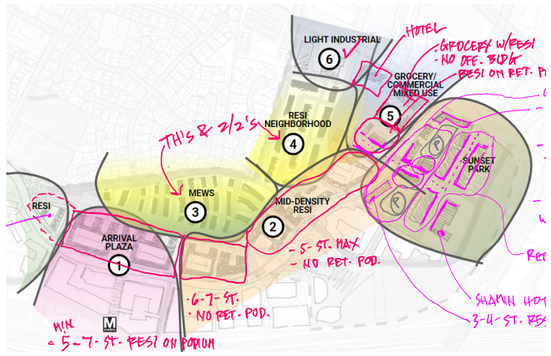
Summary of Concept Scenarios

The team generated three concept scenarios to be shared with the Town and the public for input. The object of the exercise was not to select one "winner" scheme that would represent the ultimate design for the plan, but rather to present three visions that contrast from one another in important ways, and thereby spark a conversation about what elements are successful or problematic in each approach. Ultimately, the final design would be a kind of collage of the three concept scenarios, borrowing the most successful elements from each.

For each of the three proposals, sketches were prepared, computer models were updated and real estate data were calculated. This analysis-heavy approach allowed the project team and general public to readily compare between the three options.

In May 2022, the three options were presented to the public in-person and online and written and oral feedback were collected

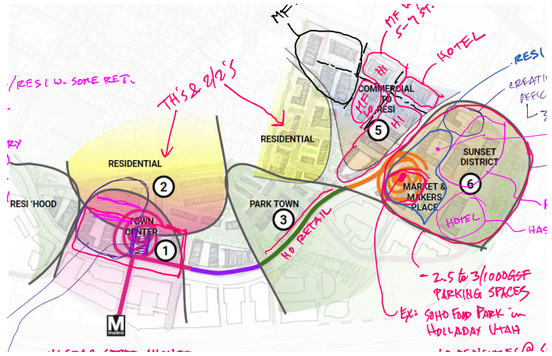
Scenario 1

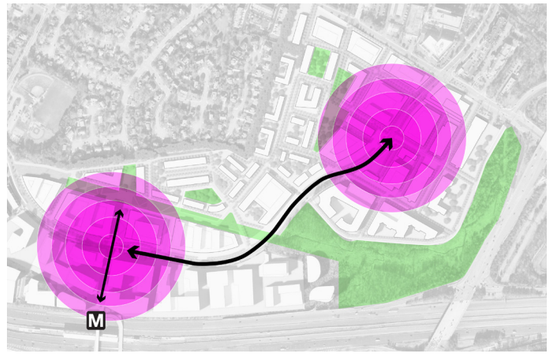






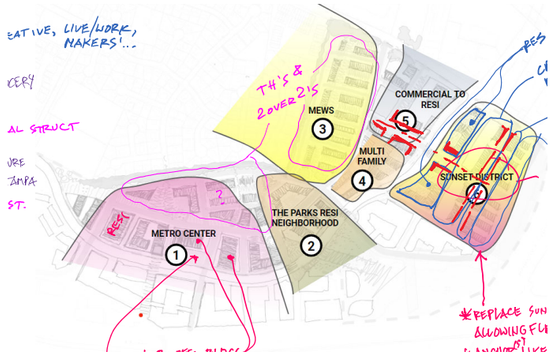
Scenario 2







Scenario 3







Concept Scenarios — Scenario 1: Neighborhood Clusters

Scenario 1: Neighborhood Clusters

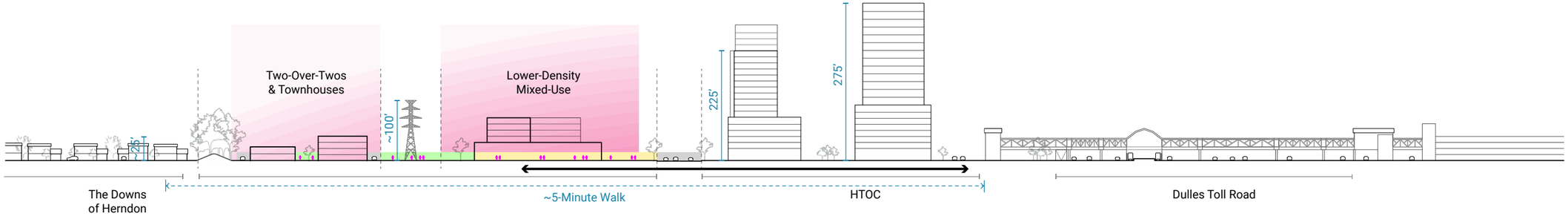
This scheme would generally disperse urban intensity across the site, creating multiple neighborhood clusters rather that a single TRG urban core.

- Multiple clusters of retail, residential, and commercial activity, both near and away from Metro
- An internal network of linear parks creates pedestrian connections between the clusters
- Main civic plaza creates a gateway to Metro
- Metro neighborhood is heavily residential, 5 to 7-story towers on retail podium
- Retail is mostly neighborhood serving, and clustered on Metro and Sunset Districts
- Grocery store on Spring St
- No commercial office close to Metro







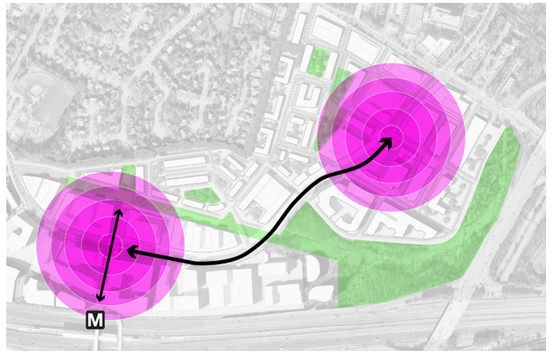


Concept Scenarios — Scenario 2: Two Centers

Scenario 2: Two Centers

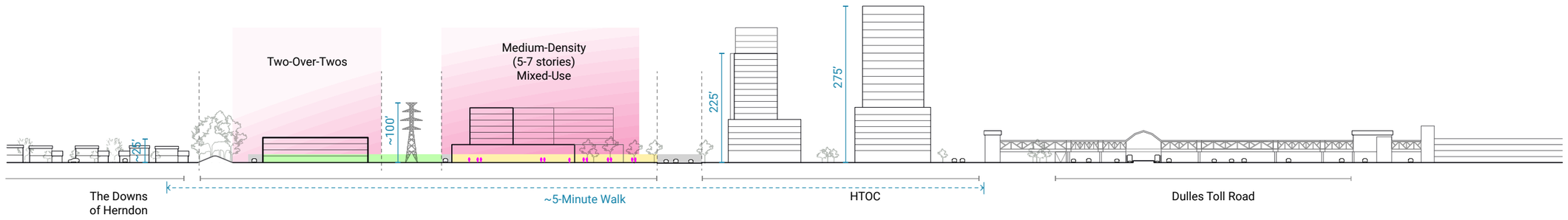
This scheme would concentrate development along two centers, one at the point in the TRG nearest the metro, and one at the Sunset Business Park. The two would be connected by an activated promenade.

- There are 2 centers of commercial activity: by the Metro and at Sunset District, each with their own distinct identity
- The edges of Herndon Parkway are transformed into a 10-min. walkable pedestrian parklike promenade connecting the 2 centers
- Grocery store as Metro neighborhood anchor
- Metro neighborhood is about 75% residential, with a corporate office component and greater retail and entertainment









Concept Scenarios — Scenario 3: Metro Center

Scenario 3: Metro Center

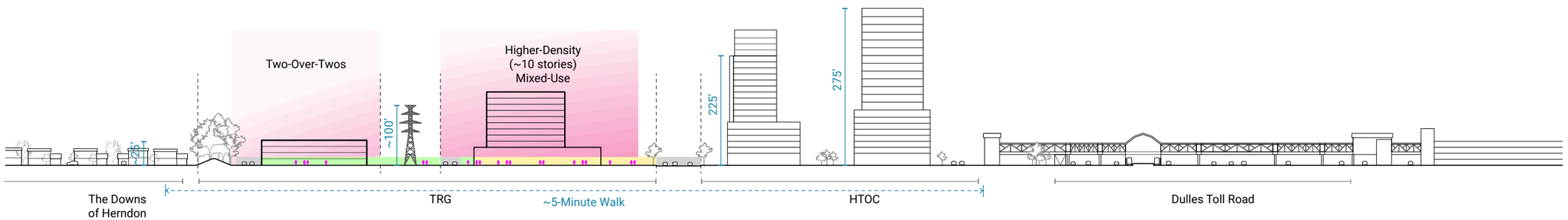
This scheme would concentrate high intensity development within a five-minute walking radius of the Metro. The rest of the TRG would be more neighborhood-focused.

- The Metro Station area is a significant center of activity and feels like a natural extension of the HTOC with ~10-story buildings
- Multimodal street grid throughout
- One signature, large plaza at Metro arrival
- Grocery store as Metro neighborhood anchor
- Metro neighborhood is about half residential, half commercial, with a corporate office anchor
- Sunset District building replacement adds flexibility for new entertainment and retail anchor uses
- Development anticipated to happen more rapidly than in other schemes.





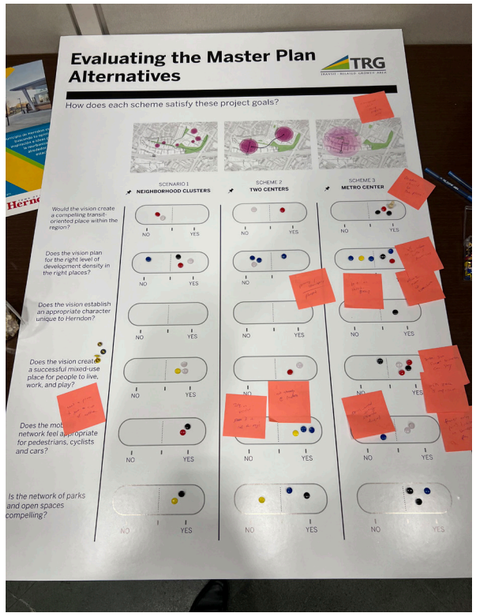




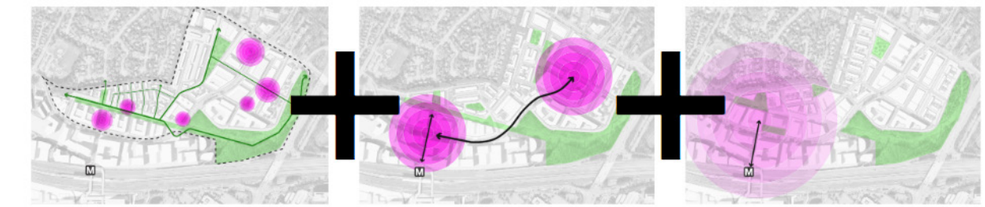
Preferred Vision

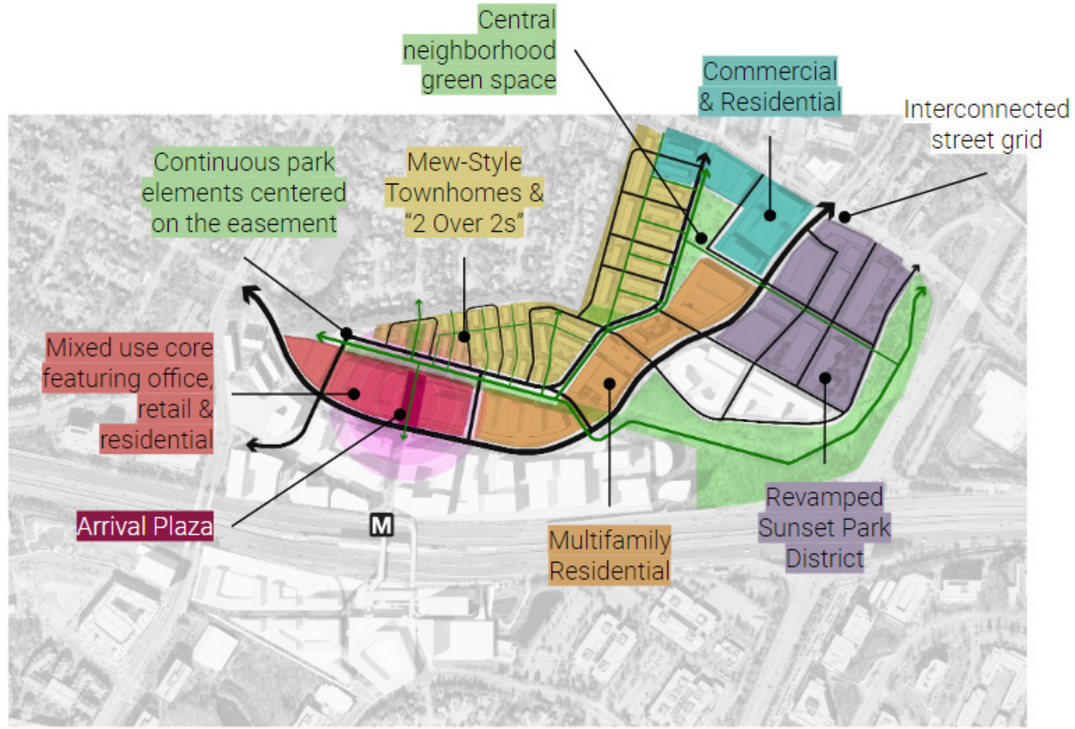
The three concept scenarios were publicly presented twice: once in May, 2023 to the general public, and once in June, 2023 to the Town Council and Planning Commission. At the public presentation, the community was encouraged to provide input in dynamic ways: verbally, in one-on-one chats with the Project Team; through written post-it notes; or by answering multiple-choice questions. At the Town Council and Planning Commission meeting, a lively discussion was held discussion the three concepts.

No individual concept stood out as a clear winner, but the discussion elicited the following priorities from the community:



- A strong metro center that is less dense than the HTOC, but more dense than the rest of the TRG.
- A central plaza across from the metro promenade that is retail dense and grand, while maintaining an appropriately human scale.
- A transect that gradually transitions from highly dense at the metro, to moderately dense across Herndon Parkway, to townhomes, to the Downs neighborhood.
- The character will be both unique & appropriate.
- Sustainable design elements can help identify Herndon as a forward-looking Town.
- A rich mix of uses, including retail, office and residential, should be highly integrated and featured prominently.
- This mixed-use core should be concentrated near the metro in the short term.
- This mix of uses can promote sustainability by limiting vehicular trips.
- All mobility options (including the interests of drivers, pedestrians & cyclists) should be supported by the plan.
- A secondary route to Herndon Parkway should be added
- Non-vehicular modes of transit should be promoted
- A landscape scheme centered around the power easement & the Fairbrook development will likely be successful.
- A strategy where continuous landscape elements connect across the site and unite the various zones is preferred.
- Landscape design is an opportunity to achieve sustainability goals.





Project Principles



REGIONALLY COMPLEMENTARY AND DIFFERENTIATED

Herndon lies next to Reston, but it is not Reston. Residents are proud of their small town feel, and although they would like to see a mix of uses and amenities, they would rather not see Herndon become another Reston. The TRG has the potential to grow in a more of a neighborhood-serving way, complimentary to its surrounding assets.



THE RIGHT DENSITY, IN THE RIGHT PLACES

The TRG has the opportunity for a varied range of uses, density and character throughout the site. The 5-10-min. Metro walk zone frontage is right across the street from the planned HTOC high-rise developments, whereas the site's northern edge borders a low density single family home neighborhood. About a third of the TRG site lies beyond the 10-min. Metro walk zone.

The only natural resource and potential park-like amenity follows the Sugarland Run and borders Sunset Business Park. All these diverse features call for different types of density, in the right places, and are reflected in the vision for transformation.



A CHARACTER THAT IS UNIQUELY "HERNDON"

The TRG will embrace a character that embraces both the Town's uniquely identifiable look and feel, while also embracing new kinds and scales of development, organized around active open space. The character for the Town must be reflected in the right scale of future development, and a complementary series of architectural and urban design relationships with both Old Town and adjacent neighborhoods, including the HTOC.

Project Principles



A LIVE-WORK-RIDE-PLAY COMMUNITY

The TRG will realize different sub-areas with differentiated predominant uses and densities, like neighborhoods within the larger area, resulting in a self-sustaining community where residents meet all, or most of their needs, within a short distance. This future will incorporate abundant mixed-use development and affordable multi-family housing, configurations of uses that support transit-related lifestyles, memorable destination uses, and central public neighborhood assets like parks and retail.



CONNECTED REDEVELOPMENT

The future TRG will realize cross-parcel connectivity that fosters more vehicular routes and pedestrian and bicycle connectivity, more like a truly integrated part of the town of Herndon, rather than concentrating all circulation and access on the Herndon Parkway. This new network will augment trails, cycle tracks, and the vehicular network, integrate connections to Metro, Sugarland Run Trail Park and the W&OD trail, rethink the Herndon Parkway as a multi-modal Parkway, and generate a porous landscape of development that encourages walking and next-gen personalized mobility, as well as greater connectivity with surrounding residential neighborhoods.



LANDSCAPE AS A DRIVER

Greenery, open space and parkland is a major characteristic of the Town of Herndon. The TRG site area is largely impervious surface today, but in the future will become much greener by integrating and elevating Sugarland Run as a placemaking asset, growing a network of naturally-connected open spaces, imagining redevelopment that is green and environmentally performative, and affirming a commitment to sustainability across all development.

Urban Design Framework

Introduction

The urban design framework set forth in this Small Area Plan lays out redevelopment recommendations as a guide for future build-out occurring over a planning horizon of 20 years.

The recommended framework aims to create a new vibrant place in the Town of Herndon, attracting people, businesses, and activity, boosting economic development by instituting a balance of land uses, densities and urban form framing the Plan.

The rendered aerial view shown in this page represents the preferred scenario, a conceptual development plan based on market feasibility and recommended program, public and stakeholder feedback, and direction from the Town of Herndon. The rendering illustrates the resulting development test-fit, reconciling months of analysis and input gathering with site and infrastructure capacity.



Aerial view of the preferred potential development scenario

Land Use & Density

Land Use Plan

The land use plan demonstrates the mixed-use future of the TRG. A broad and balanced mix variety of land uses ensures the level of activity and economic stability that the Town requires. The future TRG, with its infusion of residential, still retains a broad spectrum of employment opportunities including retail, restaurant, and hotel services, and transitions from class B office to mid-size class A office and creative spaces.

Notes on Flexibility
A variety of housing options is important to meet the needs of a growing and diverse community. Multi-family buildings should be located along Herndon Parkway and attached and stacked single-family units should be located in the transitional blocks closest to the existing single family detached house neighborhoods abutting the TRG.

The plan demonstrates general locations for future office uses. It is important to secure certain strategic areas for office including blocks closest to the Herndon Metrorail Station, blocks with appropriate visibility and access, and on larger parcels or multiple parcels with shared ownership. Larger parcels or parcels with shared ownership provide the opportunity to blend office and residential in carefully planned and cohesive designs, and may afford the possibility of shared residential and office mixed-use parking arrangements.

Retail, restaurant, and similar uses should be consolidated within the Metro Arrival Area and the new and expanded Sunset District, but may also be appropriate in other strategic areas with high visibility from the street or with park frontage.

Office, retail and restaurant uses, maker spaces, and hotels may be appropriate in lieu of multifamily if the traffic generated can be accommodated, a context-sensitive design can be achieved, and a balance of uses can be retained across the TRG.

Low Density Residential: Attached or stacked single-family units, commonly known as "townhomes" and "two-over-twos." Units have front and backyards, with sideyards at the ends of the unit rows.

Medium Density Residential: Mid-rise apartment buildings with parking garage.

Office: "Class A" multi-story commercial office on parking garage podiums in the Metro Arrival area and Spring Street; and "creative office," or a type other than"class A", such as but not limited to, ground floor long-span makers space with access to outdoor working areas, as well as low rise buildings with atypical office floor plates in the Sunset District.

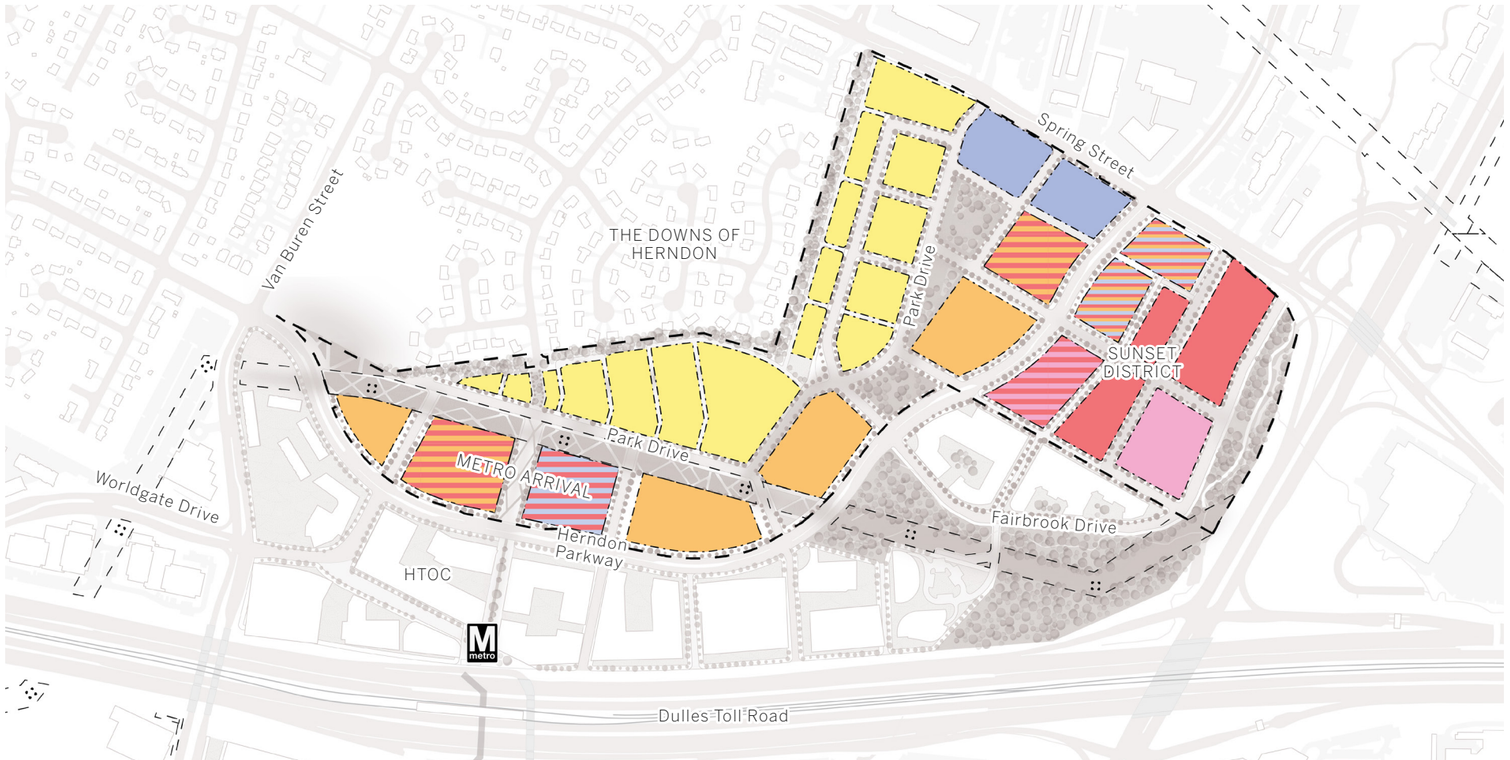
Retail: Neighborhood serving shops and restaurants, grocery, entertainment, fitness and services

Hospitality: Mid-rise hotel use with related amenities.

Mixed-Use: In addition to the mix of uses planned throughout the TRG, the depicted hatched areas denote development blocks with a stacked mix of uses.

Dominion Easement

Existing Parcels



Land Use Plan

Land Use & Density

Potential Development Densities

The land use strategy follows the design objectives of providing a low density residential area adjacent to The Downs neighborhood, transitioning to higher densities and mixed uses approaching the Metro Arrival area, and along the Herndon Parkway and part of Spring Street.

The new and expanded "Sunset District" retains it existing, eclectic retail core, hence the large amount of concentrated retail use, while providing flexibility for a higher density mix fronting Herndon Parkway and Spring Street.

The Spring Street and Herndon Parkway intersection frames a gateway for a commercially focused flexible mixed use area.

The planning team developed a concept development plan, presented publicly as the "preferred scenario," in order to arrive at potential development data tabulations and floor area ratios (FAR's) used as a "test-fit" basis for transportation, cost modeling, and fiscal impact analysis. The development tabulations presented herein, are merely a test-fit informed by a combination mainly of market feasibility, public feedback, and Town of Herndon direction.

The Land Use Plan aims to provide ample flexibility to give developers options, and to adapt to changes in market conditions over time.

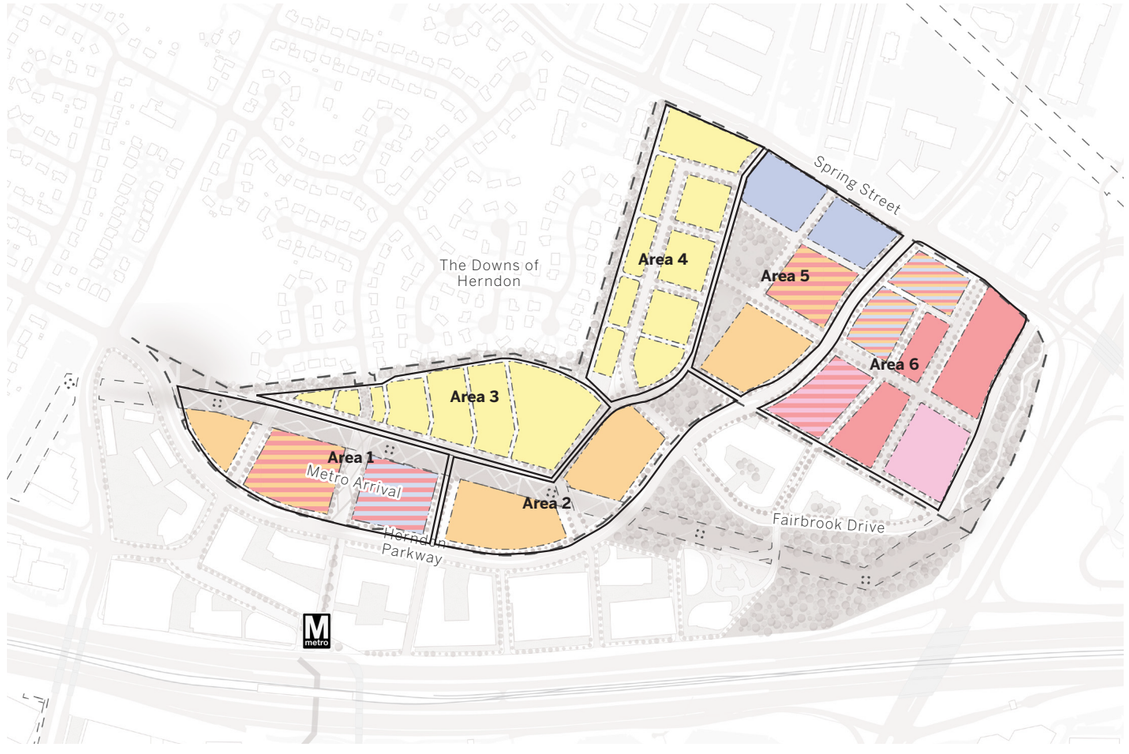
DEVELOPMENT DATA SUMMARY

Program	Type	GFA (sf)	Units (RES/H)
Residential	R-Multifamily	2,843,200	2,369
	R-TH & 202's	836,300	420
Hotel	Hotel	277,500	463
Retail	Grocery	63,600	
	Restaurant Services	155,300	
	Entertainment Fitness	74,400	
Office	Corporate	1,122,600	
	Creative	66,800	
Grand Total		5,439,700 sf	

DEVELOPMENT DATA BY AREA

Area	Use	Building (sf)	Units (RES/H)	FAR
Area 1	R-Multifamily	638,700	532	2.40
	Corporate	641,700		
	Restaurant Services	43,100		
Area 2	R-Multifamily	937,500	781	1.80
Area 3	R-TH	355,700	178	0.70
Area 4	R-TH	480,600	240	0.75
Area 5	R-Multifamily	673,500	561	2.00
	Corporate	480,900		
	Grocery	50,900		
	Restaurant Services	35,900		
Area 6	R-Multifamily	593,500	495	1.20
	Hotel	277,500	463	
	Creative	66,800		
	Entertainment Fitness	74,400		
	Grocery	12,700		
	Restaurant Services	76,300		
Grand Total		5,439,700 sf		

DEVELOPMENT DATA AREAS



Urban Design and Architectural Character

Redevelopment Framework

The Redevelopment Framework Plan is based on the following design objective:

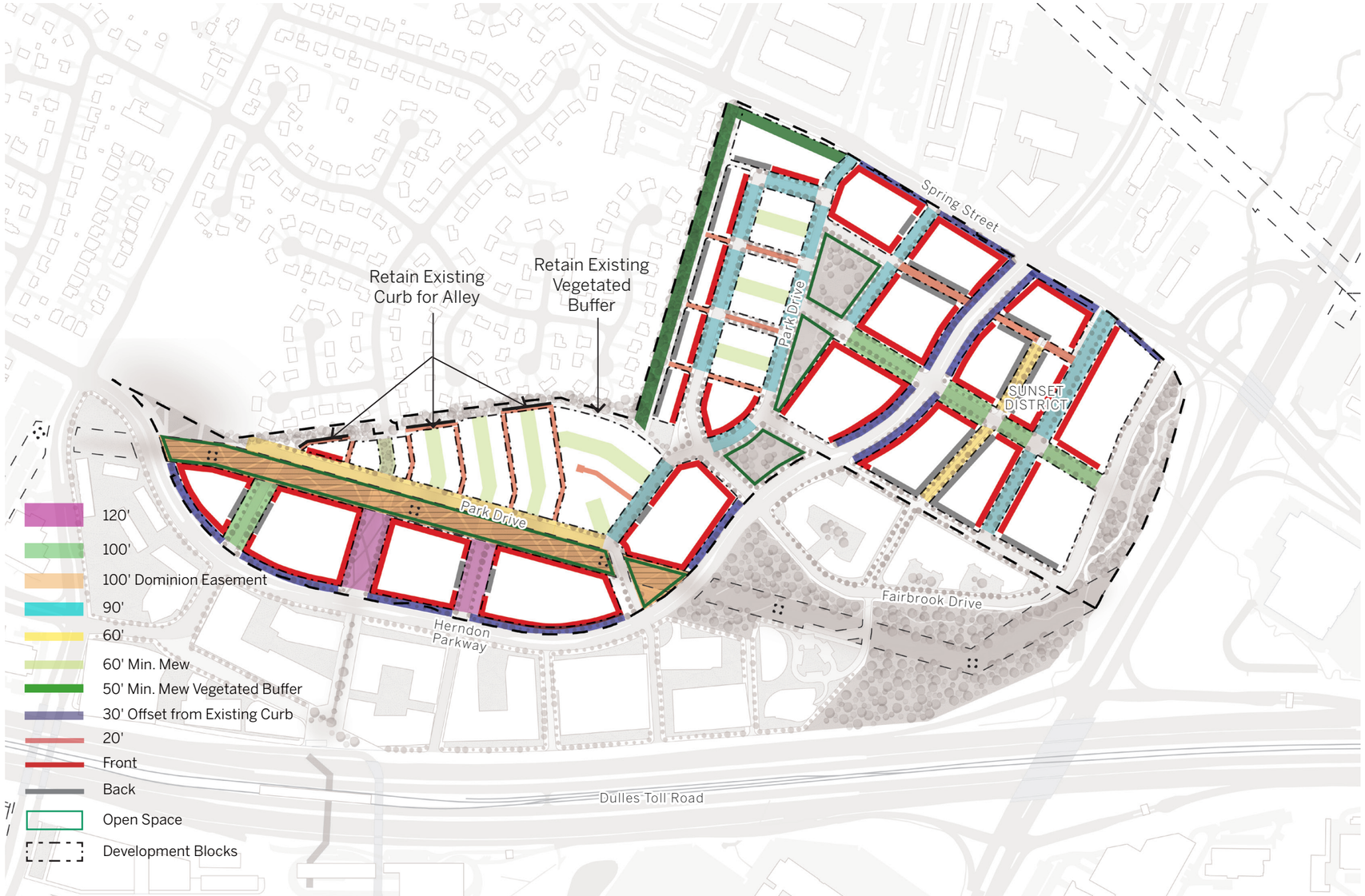
"A MULTIMODAL STREET GRID
AS THE FRAMEWORK FOR DEVELOPMENT"

Lay down an walkable, multimodal, urban street grid as the basic framework for redevelopment, integrating development blocks with a network of open spaces. The space between the blocks is the public realm, consisting of streets and open space.

This plan recommends certain distances between the blocks, or rights-of-way (ROW's), and designated open spaces towards shaping future building massing and frontages that would result in great urbanist places.

The ROW's are wider at denser areas and narrower at residential, lower density areas. ROW's are planned to accommodate multi-modal streets, complete with wide sidewalks accommodating building frontage zones (i.e. seating, front yards/gardens), pedestrian circulation, and site furnishing zones with bioretention opportunities.

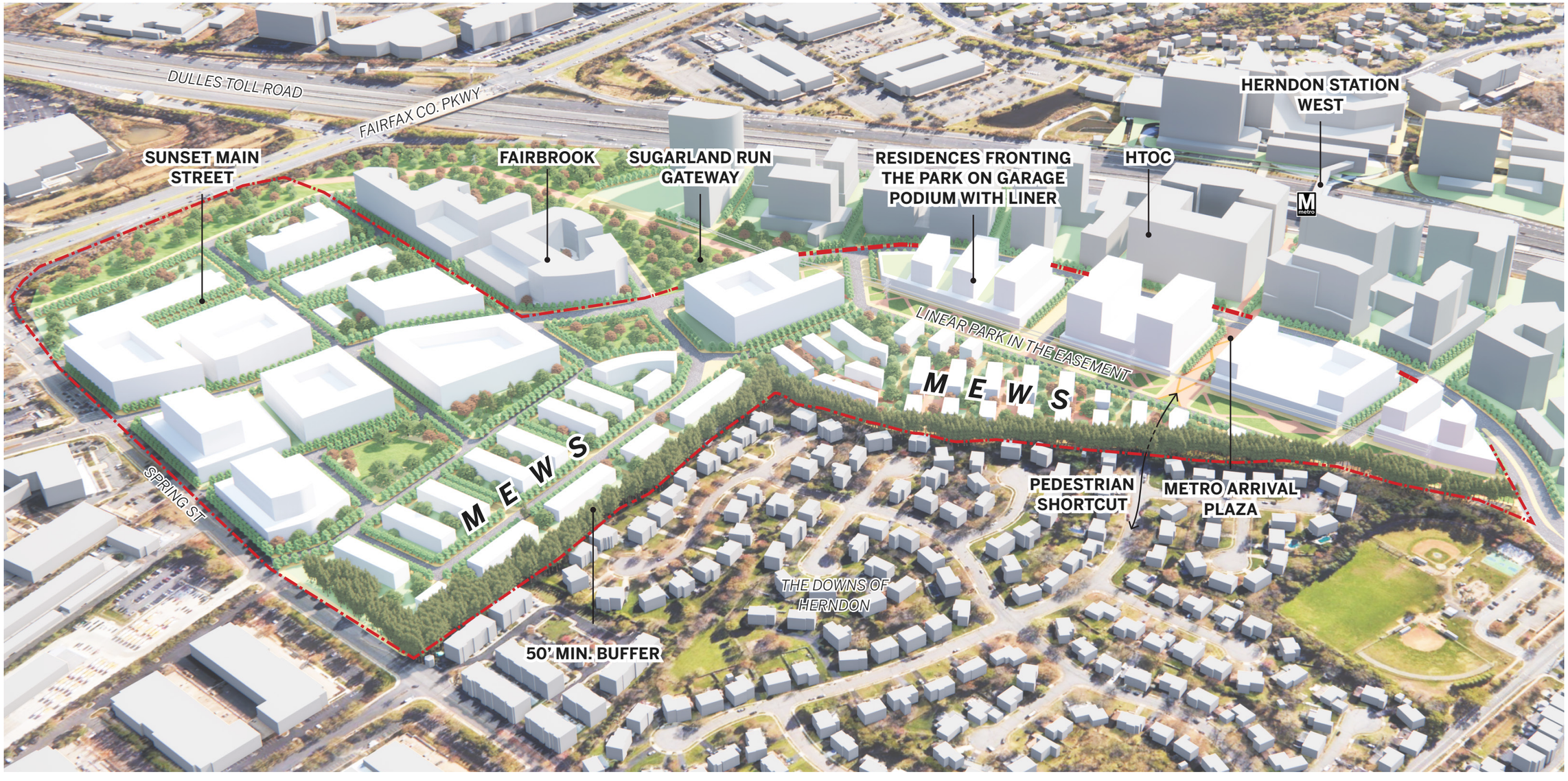
The Plan denotes fronts and backs of buildings, where "Front" refers to public facades with presentable materiality, fenestration and primary access, and "Back" refers to facades reserved for parking and service access.



Redevelopment Framework Plan

Urban Design and Architectural Character

Redevelopment Framework



Urban Design and Architectural Character

Heights and Massing

Building heights are informed by site capacity, transportation analysis, market feasibility, public feedback and Town of Herndon direction. The heights shown in this Plan are notional, approximate numbers based on the preferred scenario.

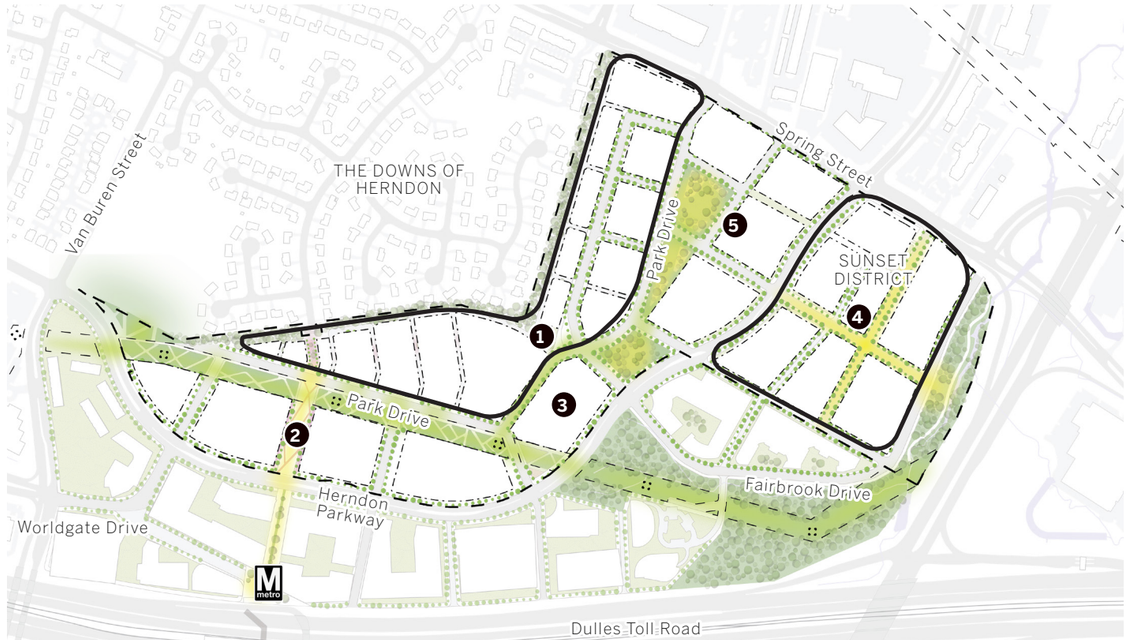
The approach is to:

- Respect the Down's low density neighborhood context
- Accommodate the heighest density and taller buildings within the "Metro Arrival" 5-minute walk zone
- frame both sides of the Herndon Parkway with multi-story building frontages, transforming the feel of the Parkway from freeway to urban street.
- Provide transitioning heights from HTOC to TRG the Downs

Residential Mews area should range from 3 to 4 stories in height, being townhomes and two-over-two's typologies. Townhomes should be contiguous to the northern TRG boundary along the Downs, and the 4-story homes should be contiguous to the planned "alternate route" to Herndon Parkway.

Metro Arrival area should rank tallest in the TRG, approximately up to 10 stories high. These are the four blocks fronting Herndon Parkway and closest to Metro, within the 5-minute walk from the station, directly across the HTOC highrises.
Sunset District is envisioned to have a unique mix of creative uses and could have buildings ranging from 1-story and up to 7 stories. The idea is to allow for long-span "makers" space or entertainment and fitness destinations, as well as multi-story buildings with podiums having concentrated parking serving the district.
The rest of the multifamily and mixed use buildings framing the Herndon Parkway and fronting Spring St. between the proposed "alternate route" and Herndon Parkway could also go up to 5 or 7 stories.

BUILDING HEIGHTS AREAS



1. Residential Mews: 3 to 4-story
2. Metro Arrival: 5 to 10-Story
3. Herndon Parkway Multifamily: 5 to 7-Story
4. Sunset District: up to 5-story
5. Spring St & Herndon Pkwy Mixed Use: up to 7-Story

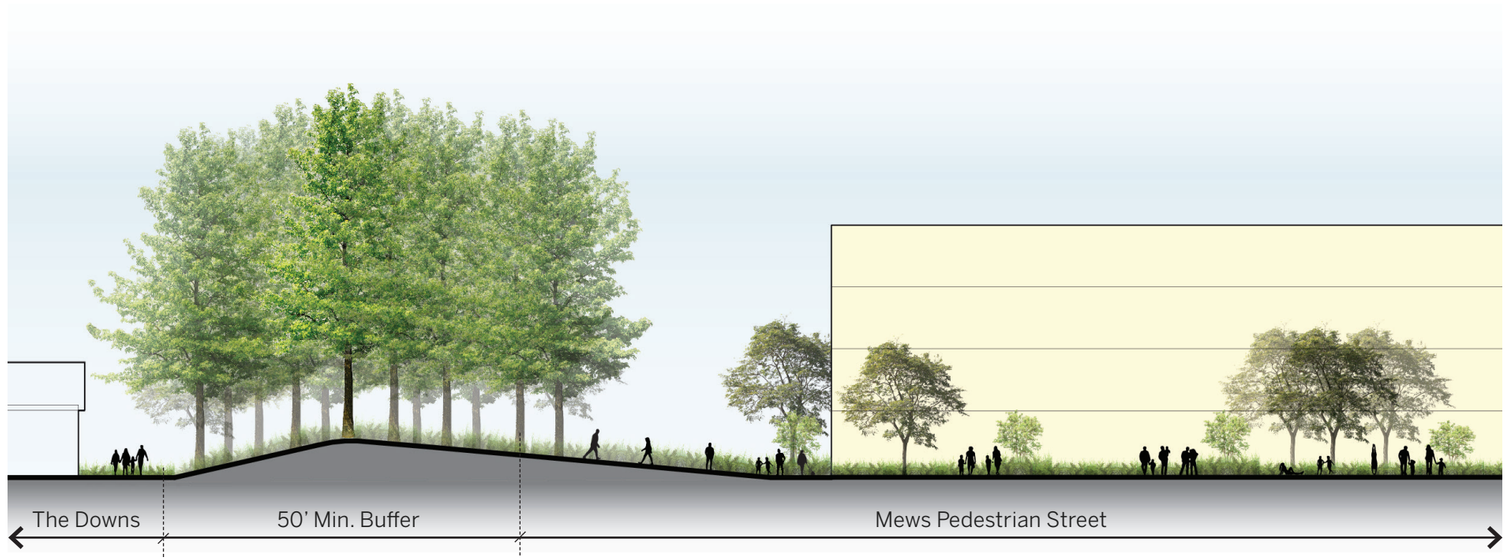
Urban Design and Architectural Character

Heights and Massing

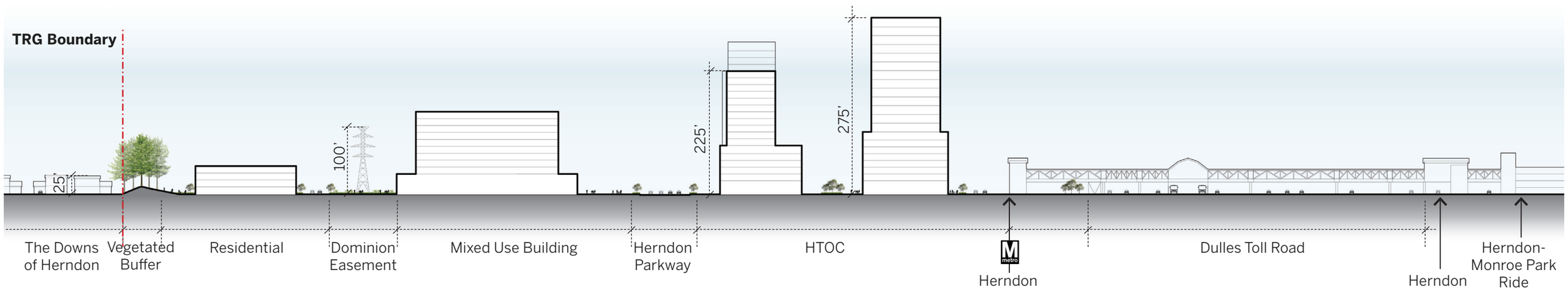


Key Plan

Section through the Buffer



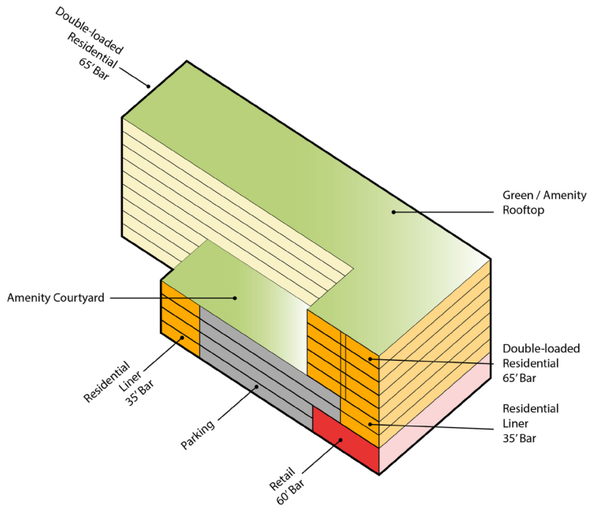
TRANSECT | THE DOWNS - TRG - HTOC - HERNDON STATION



Section through the Site

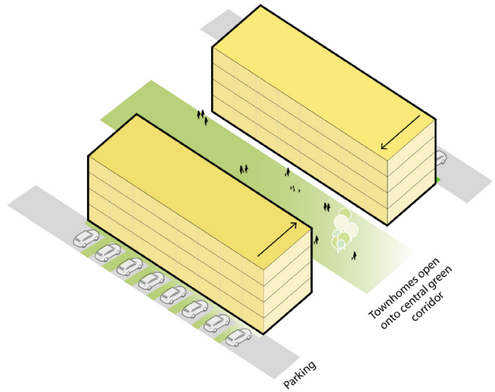
Urban Design and Architectural Character

Building Typologies



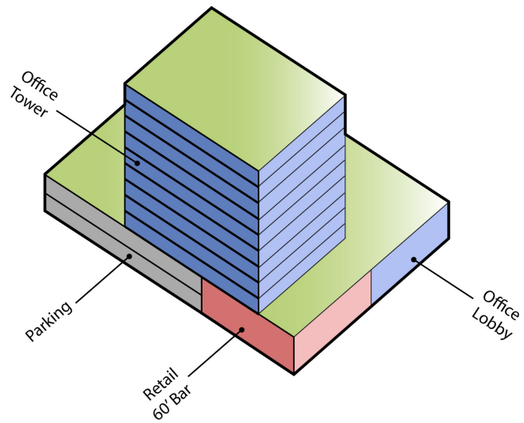
Mixed Use / Multifamily

- Parking structure screened with residential "liner" buildings, green roof, and towers above



Townhomes / 2-Over-2's / Mews

- Homes fronting a pedestrian street, with vehicular access from back alleys



Corporate Office

- Tower(s) on parking podium
- 25,000 approx. typical floorplate

Parking Garage Screening



Murals

- Wrap parking garages with active uses facing main streets, such as residential liners or retail frontage
- Where garage facades must be exposed, screen them creatively, such as, engaging the community with art and murals, or using vegetated screens



Vegetated Screen

- Landscape garage rooftops to provide amenity spaces and reduce stormwater runoff, especially on residential uses
- Avoid parking levels at grade – place them on upper floors to maximize ground floor activity



Architectural Screen

- Parking may occur at grade when screened by building program such as commercial or residential activity, or amenities.

Urban Design and Architectural Character

Architectural Character

Based on the prior TRG visioning report survey and ARB presentation, there is a collective voice of preserving a unique architectural character of the town of Herndon, where overall design and material durability and quality is ensured, in which the characteristic needs to be well articulated throughout the whole district.

Along with its architectural uniqueness, the district would be recommended to have active edge and streetscapes along Herndon Parkway, and avoid any open space that is residual and pedestrian-unfriendly streets.



















Type of Buildings and Development Preferred within the TRG area

Type of Open Spaces, Parks, and Streets Preferred within the TRG area

Recreation and Open Space Design

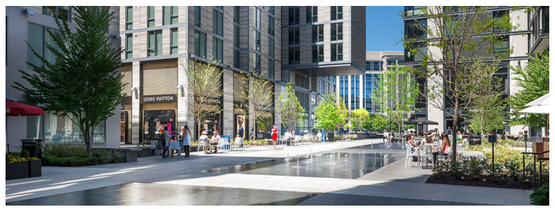
A Network of Open Spaces

The Vision for redevelopment in the TRG is anchored on open space: pedestrian mobility through a network of parks and greenery that extends beyond the TRG, with the potential to connect to a future Sugarland Trail Park extension, and potential connection to the W&OD Trail.

All open spaces should consider integrating bioretention for stormwater management.

❶ Arrival Plaza

The Arrival Plaza will serve as an extension of the HTOC Promenade into the TRG. It will be the main point of arrival for commuters arriving from the Metro. *(More information and imagery for the Arrival Plaza is included in the "Neighborhoods" section below)*



ARRIVAL PLAZA PRECEDENT IMAGE

❷ Linear Park

The planned "linear park" is a central feature overlapping the Dominion easement, converting a utility space into a public amenity. This park connects to the triangular park on the eastern area of the TRG, forming an corridor of green interstitial mobility through the site. In between the two larger parks, lies a feature wide right-of-way with ample sidewalks for rain gardens. *(More information and imagery for the Linear Park is included later in this chapter)*



PRECEDENT IMAGE, SHOWING LINEAR PARK UNDER POWER EASEMENT

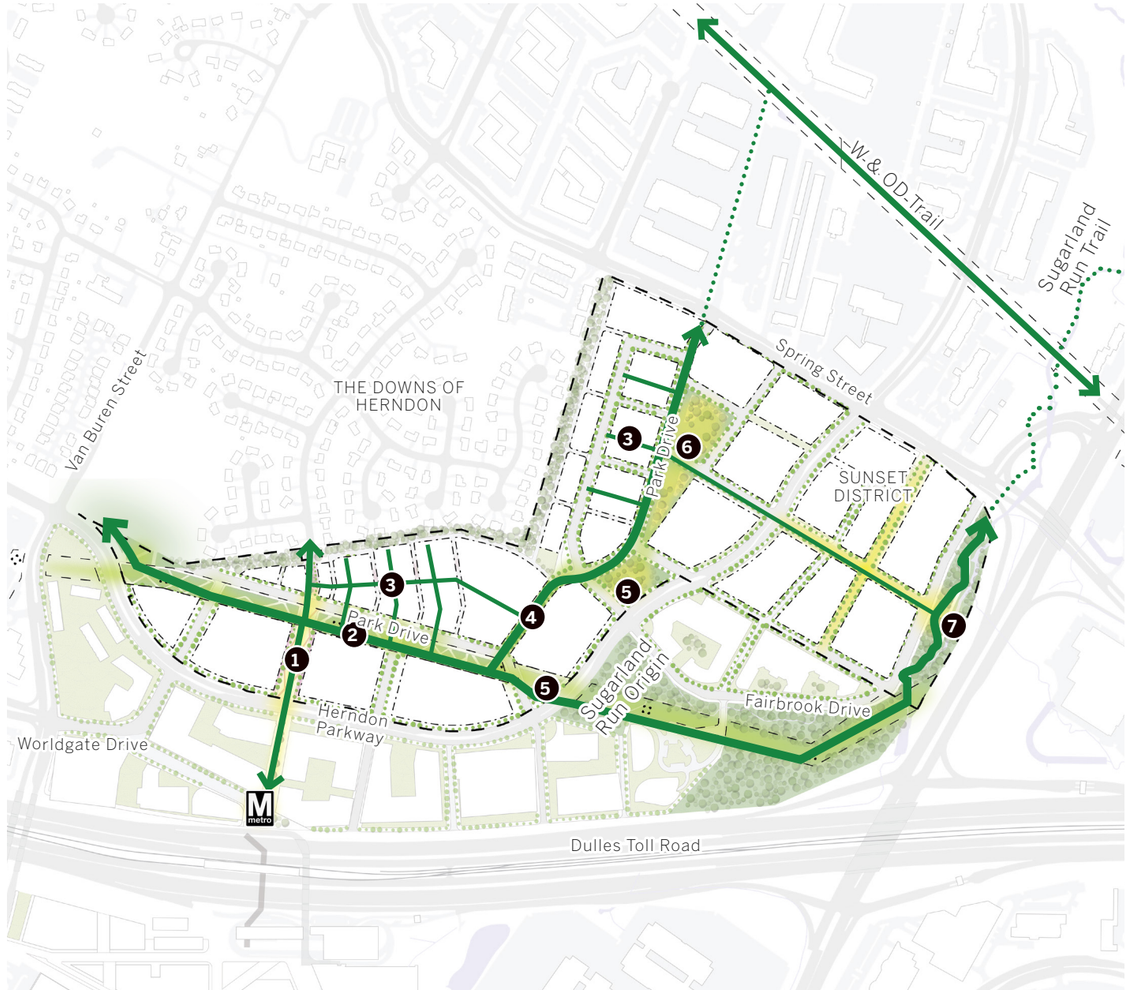
❸ The Mews

Mews are townhome communities that are laid out such that each home opens to a park-like pedestrian-only street. Alleys are provided behind the homes for vehicular access and parking. These types of communities are ideal for creating walk-able neighborhoods, and for making safe space for children to play.



PRECEDENT IMAGE, SHOWING CHILDREN SAFELY PLAYING IN THE STREET

OPEN SPACE NETWORK PLAN



Recreation and Open Space Design

A Network of Open Spaces

❹ Rain Gardens

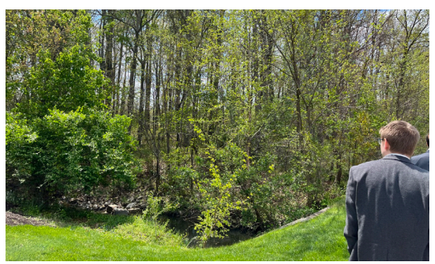
Rain gardens are considered "performative" greenspaces, meaning that, in addition to the aesthetic streetscape value they provide, they also perform important ecological functions, such as absorbing storm water and supporting biodiversity. For the TRG, there are ample opportunities to include this important green infrastructure.



PRECEDENT IMAGE SHOWING SIDEWALK RAINGARDEN

❺ Gateway to Sugarland Run

Sugarland Run is an important natural feature in the TRG. Its origin on Spring Street at the Fairbrook property is an opportunity to create an important connection between the TRG and its nearby natural environment.



OBSERVED ORIGIN OF SUGARLAND RUN

❻ Triangular Green

A generous park space in this location could serve the diverse users that surround it, office workers, retail customers and residents, creating a vibrant space throughout the day.



PRECEDENT IMAGE FOR TRIANGULAR GREEN

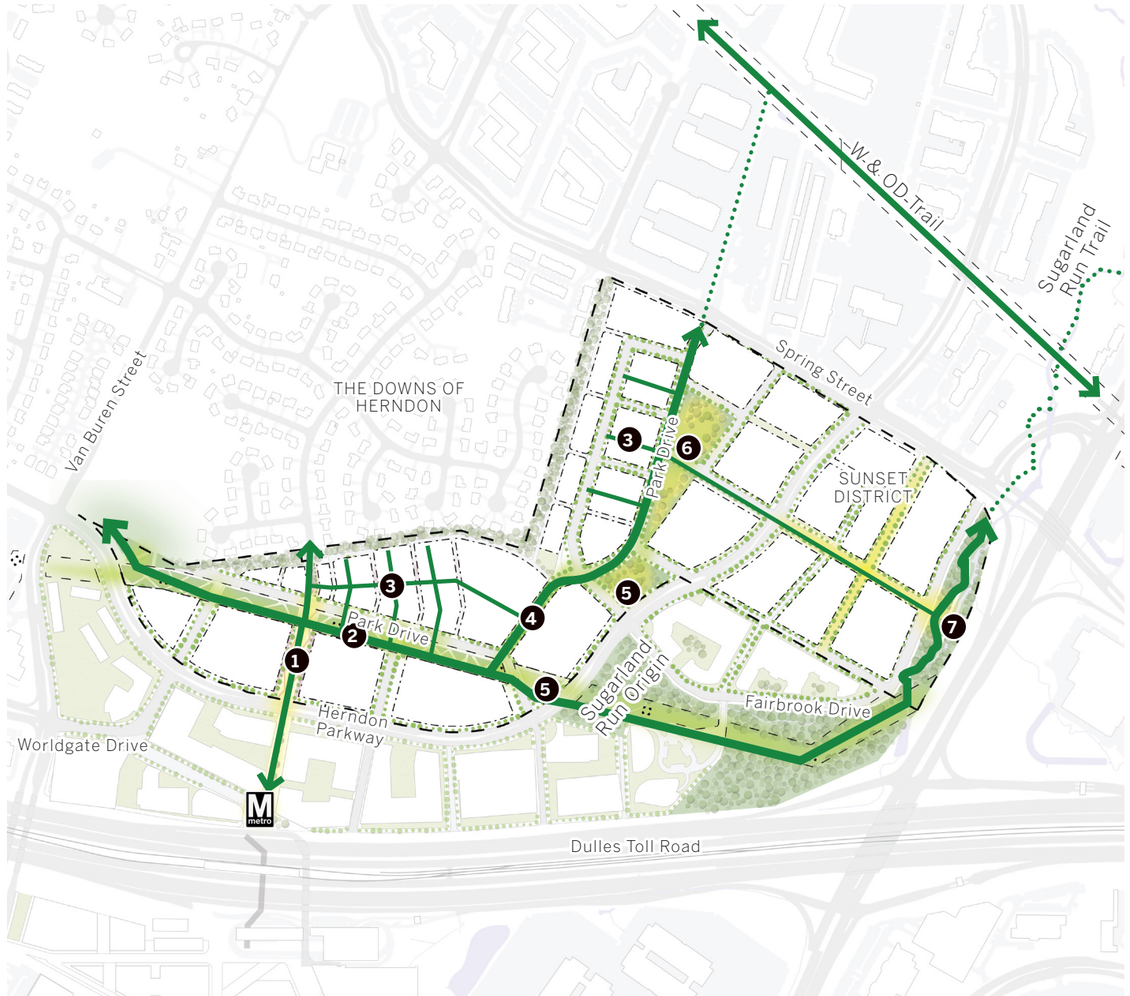
❼ Potential Sugarland Run Trail Extension

There is opportunity to create a connection between Sugarland run in the TRG, and the Sugarland Run trail across Spring Street to the north.



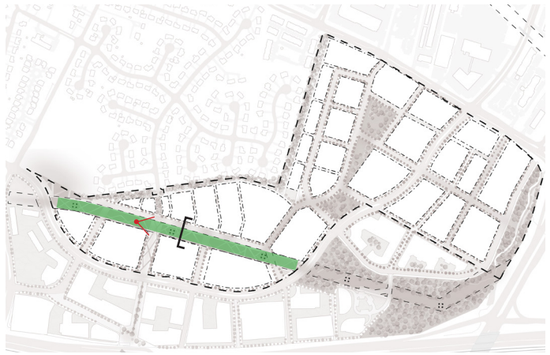
PRECEDENT IMAGE OF DEVELOPMENT & CREEK

OPEN SPACE NETWORK PLAN



Recreation and Open Space Design

Linear Park

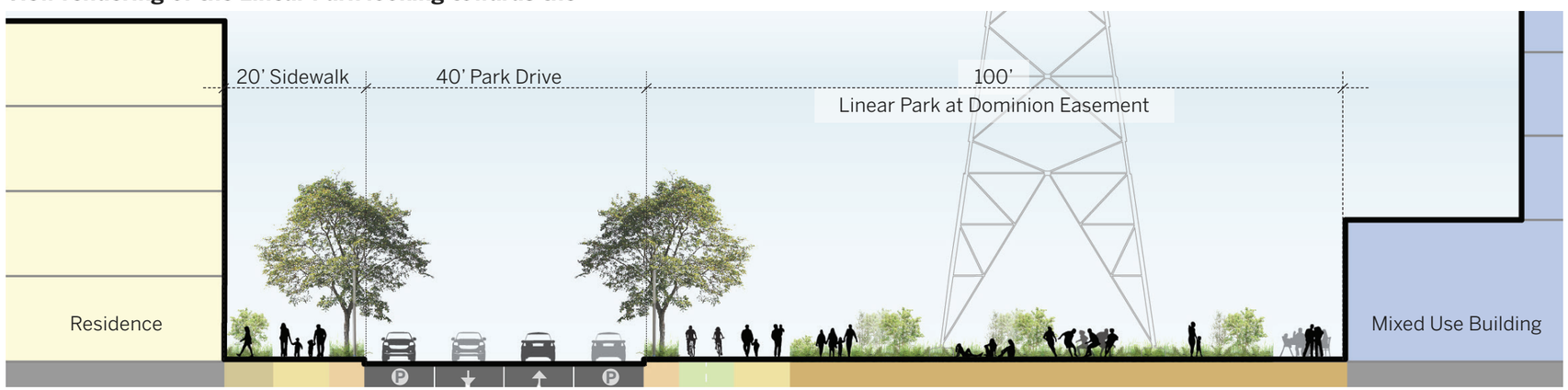


Key Plan



View rendering of the Linear Park looking towards the

- Seating/Front or Side Yard
- Pedestrian Path or Shared Street
- Landscape and Site Furnishings
- Cycle Track



Section though Linear Park

Recreation and Open Space Design

Bioretention and Stormwater Management

Stormwater management features such as bioswales and green roofs are landscaping elements to capture and filter stormwater runoff. Seasonality plays an essential role in bioswale function whether they receive more runoff and may hold standing water for longer periods, promoting active filtration. These features offer a dynamic and adaptable solution for stormwater management, adapting their function to the changing seasons.

As part of the streetscape and public realm design, features can include such as the following.

- Bioretention (including Urban Bioretention)
- Infiltration (if soils allow)
- Stormwater planters
- Vegetated roofs



BIOSWALES, SUNBURY, PA



BIORETENTION, BALTIMORE, MD



RAIN GARDEN AT TROOST AVE, KANSAS CITY, MO



PARKING GARAGE GREEN ROOF, FAIRFAX, VA

Recreation and Open Space Design

Bioretention and Stormwater Management

Effective stormwater management is essential for protecting our environment and building sustainable communities. Investing in green infrastructure for most-efficient performance, exploring reuse of water opportunities, and limiting impact of heavy rainfall and flooding can turn stormwater from an issue into a sustainable and valuable infrastructure.

Various BMP measures should be evaluated for suitability based on each property's development program. The list below is indicative of possible types of facilities that would be expected throughout the redevelopment district and should be considered for each site on a case-by-case basis depending on the site's specific parameters.

- Underground SWM vaults
- Cistern/rainwater harvesting
- Manufactured filtering devices
- Pervious Pavement/Pavers
- Off-site nutrient credits



UNDERGROUND SWM VAULT WITH INFILTRATION



UNDERGROUND SWM VAULT



MANUFACTURED FILTERING DEVICE



RAINWATER HARVESTING

Recreation and Open Space Design

Sustainability Principles

The Town of Herndon should promote the use of sustainable urban design, landscape engineering, construction, and building maintenance practices that will protect the global climate, improve livability in the Town, and promote the well being of residents. These practices, which should be implemented throughout the TRG, are illustrated on the drawing of the Triangle Park, below.

Working together with the development and property ownership communities, the Town should encourage the deployment of the following practices in private development to the extent possible.

Ecology & Environment
- Easement serves as green space
- Native trees and plants
- Pollinator gardens
- Carbon sequestration
- Urban agriculture

Economy & Equity
- Mixed income housing
- Incubator for local startups at Sunset

Energy and Carbon
- Passive building energy reduction
- On-site PV energy generation
- Off-site renewable energy

Water
- Reuse for irrigation
- Low flow fixtures
- Native planting, low irrigation

Resiliency
- Stormwater retention gardens
- Vegetated rooftops
- Sidewalk rain gardens

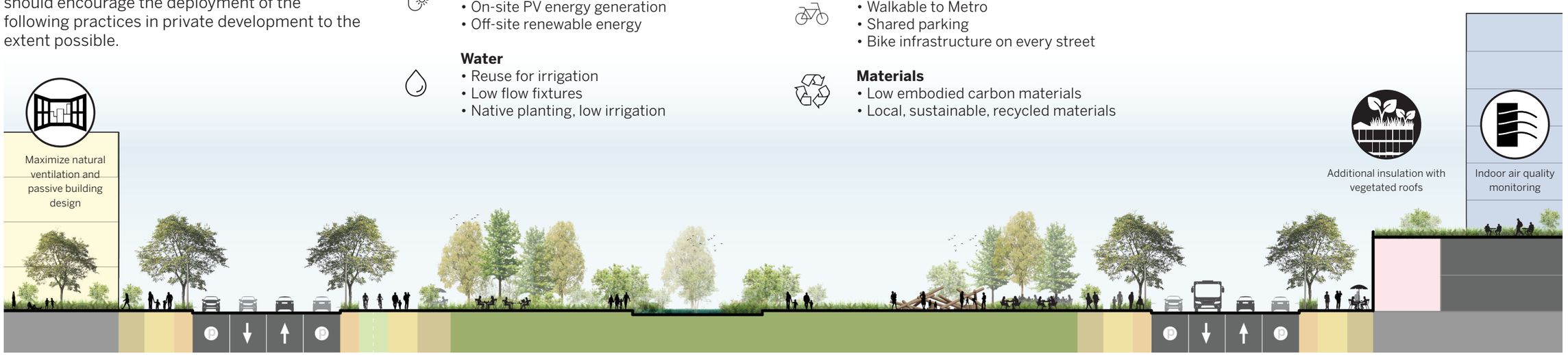
Livability and Wellness
- Bicycle Trails
- Interconnected network of parks and open spaces
- Permeable and walkable blocks
- Connection to trails and Parks

Mobility
- Walkable to Metro
- Shared parking
- Bike infrastructure on every street

Materials
- Low embodied carbon materials
- Local, sustainable, recycled materials

Waste
- Reduction of construction waste to landfill

Heritage and Identity
- Celebrate the unique identity of Herndon
- Support local businesses at Sunset
- Promote the TRG through pop up programming



The Neighborhoods

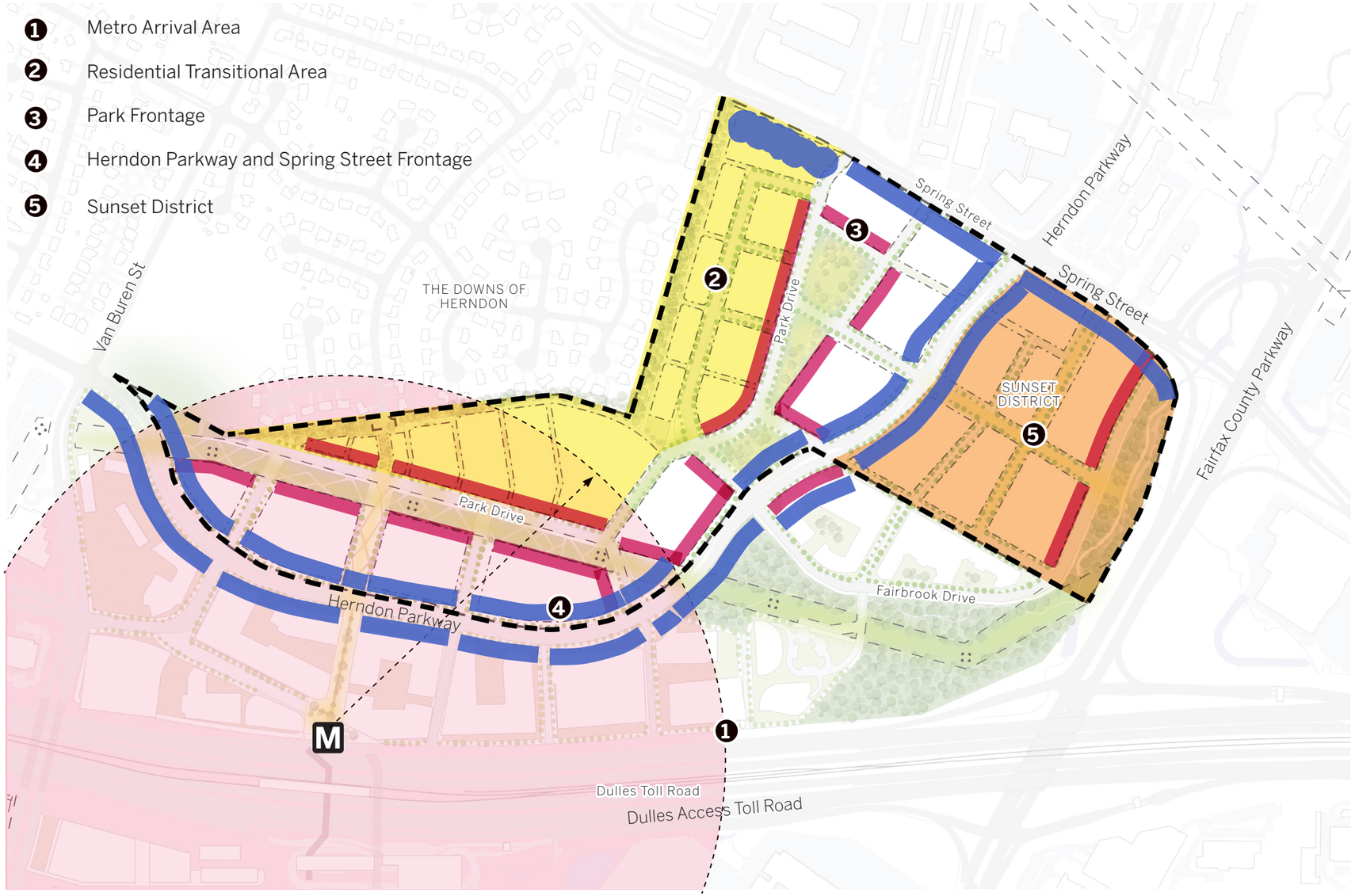
At 93 acres, future development at the TRG will likely take the shape of various neighborhoods, some having an individual unique character, while

having guidelines generic for the whole TRG and then

While the preceding sections in this chapter dealt with design recommendations encompassing the entire 93-acre site, this section addresses the future "neighborhoods likely to form with future redevelopment at the TRG.

The Neighborhoods (right-hand exhibit) lists and depicts specific context-based areas with objectives for design and character and thus should have specific guidance. Also, they can overlap each other and not be limited in the same way the current arrangement of sub areas are.

The Neighborhoods (right-hand exhibit) lists and depicts the context-based areas at the TRG meriting a further set of design guidelines and recommendations.



The Neighborhoods

The Neighborhoods

Metro Arrival

The Metro Arrival area is within a 5-minute walk from the Metro and the most transit oriented area in the TRG. This neighborhood is set to be a vibrant place with a mix of uses including residential, office and retail. This is one of the three areas in the TRG with a planned concentration of retail.

The Metro Arrival Plaza is the terminus from the HTOC promenade, and creates an intersection with the planned linear park. As the plaza intersects the linear park, it discreetly connects through the residential mews to the existing pedestrian connector to the Downs neighborhood.



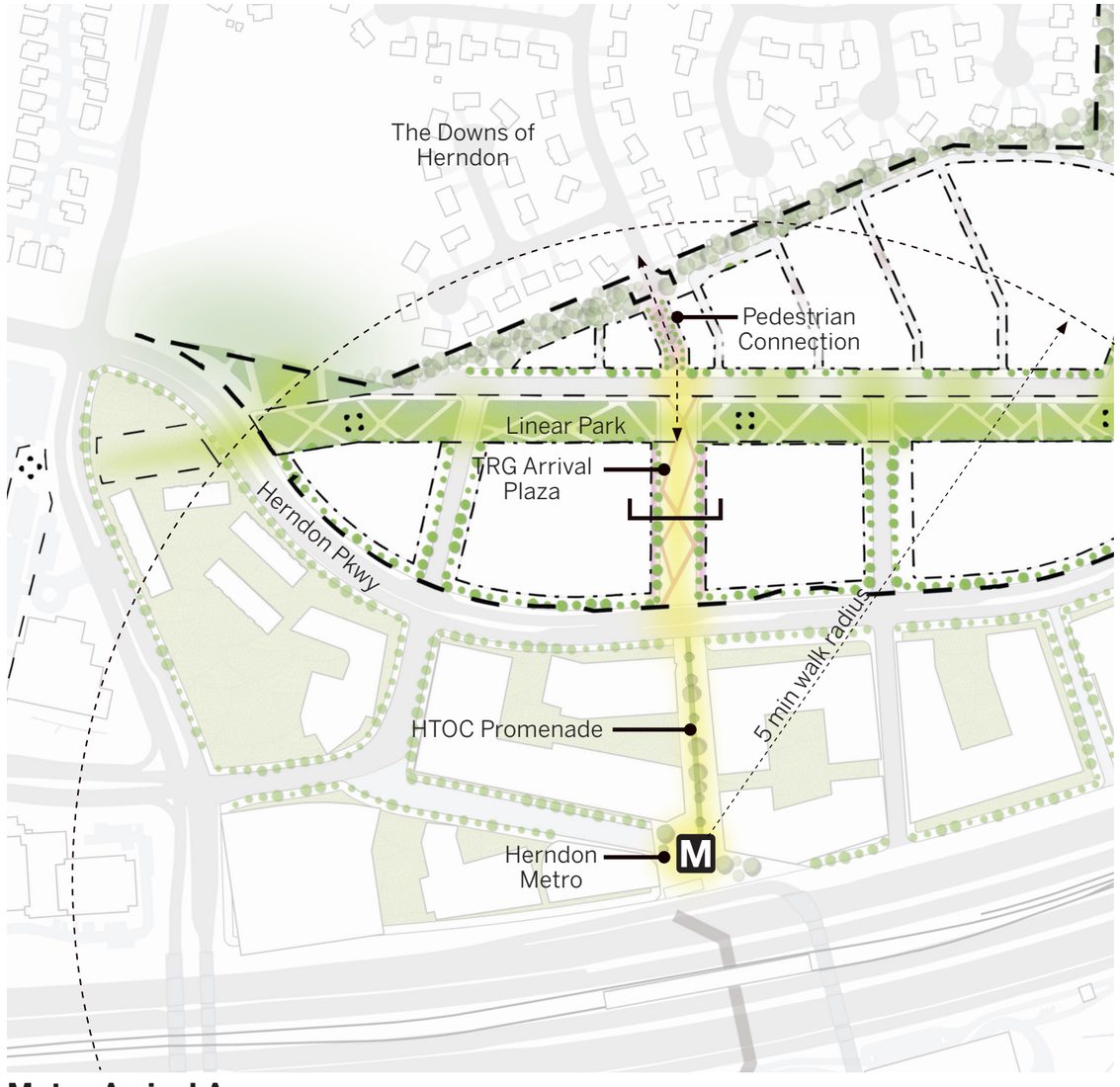
Union Station, Denver



Mosaic District, VA



City Center, DC



Metro Arrival Area

The Neighborhoods

Metro Arrival

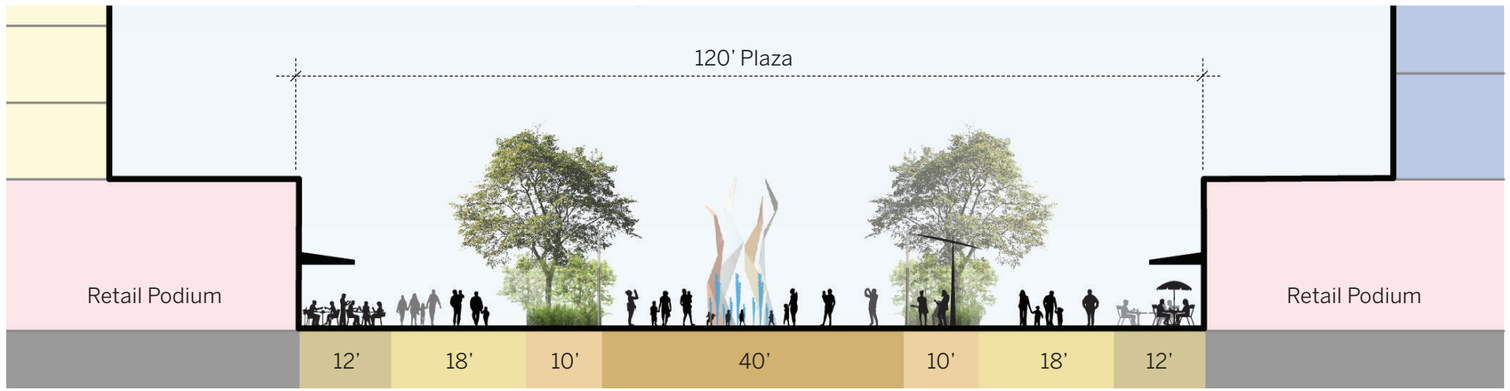


Key Plan



View rendering of the Linear Park looking towards the Plaza

- Seating/Front or Side Yard
- Pedestrian Path or Shared Street
- Landscape and Site Furnishings
- Seasonal Program/Activities Feature Zone



Section through Metro Arrival Plaza

Residential Transitional Area

This is a low density residential area consisting of a combination of townhomes and two-over-two's serving as a density and heights transition between the single-family homes neighborhood, The Downs of Herndon, and the planned higher density area fronting Herndon Parkway, separated by a 50'-minimum vegetated buffer.

Pedestrians out front, cars in the back.

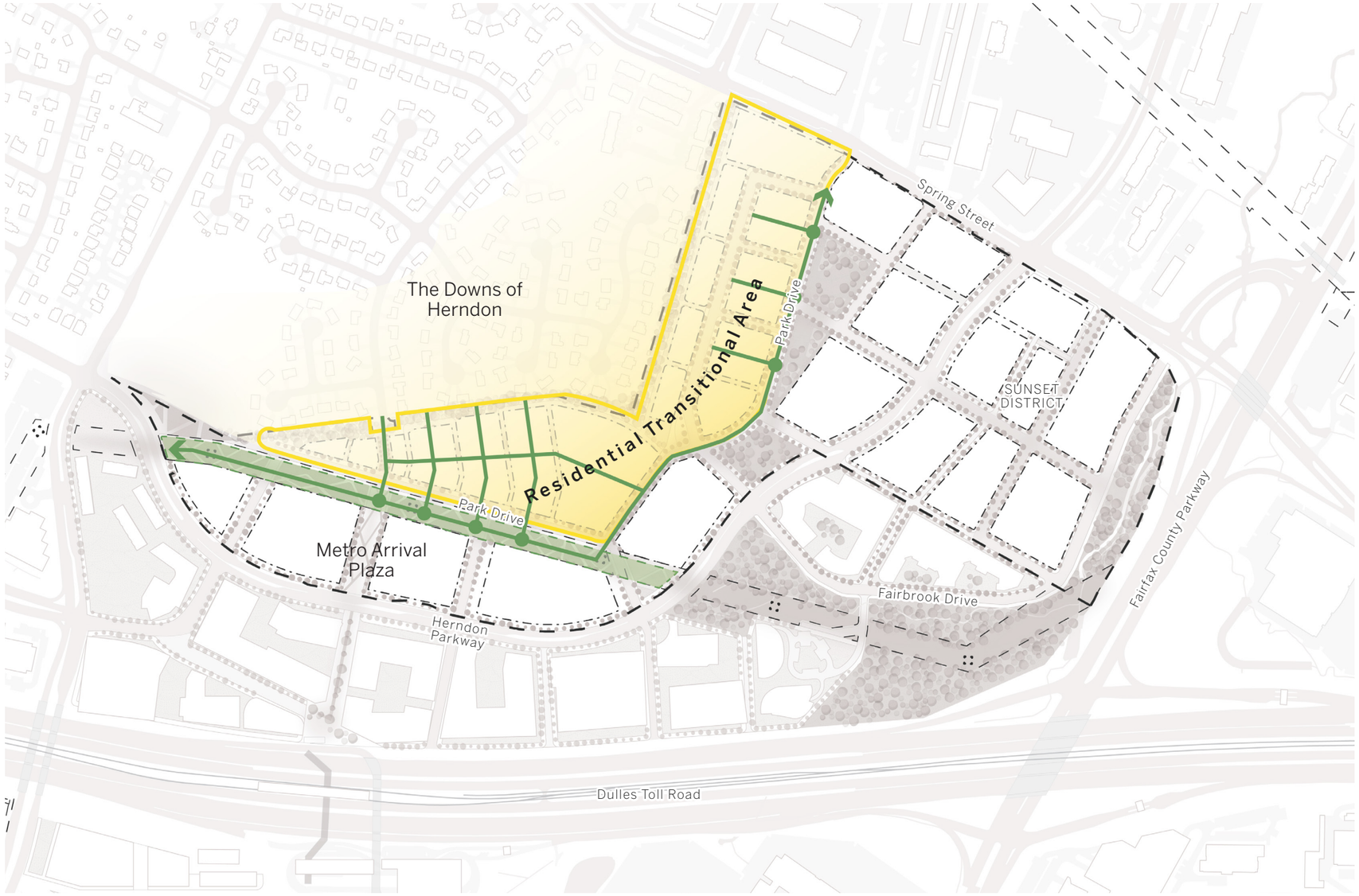
Most of this residential area is envisioned as "mews," anchored on open space, with pedestrian streets emanating from the planned linear park. This Vision aspires to the highest standard of pedestrianized amenities, however the Plan allows the flexibility to provide a "shared street" or local/ private street. The streets could be paved with impervious pavers instead of asphalt, as a traffic calming measure (if vehicles were allowed), and as a signal that the street is pedestrian oriented.

With pedestrian streets out front, alleys are planned at 20' to allow for fire truck access.



Sample rendering of a pedestrian street

Residential Transitional Area



Park Frontages Diagram

The Neighborhoods

Residential Transitional Area

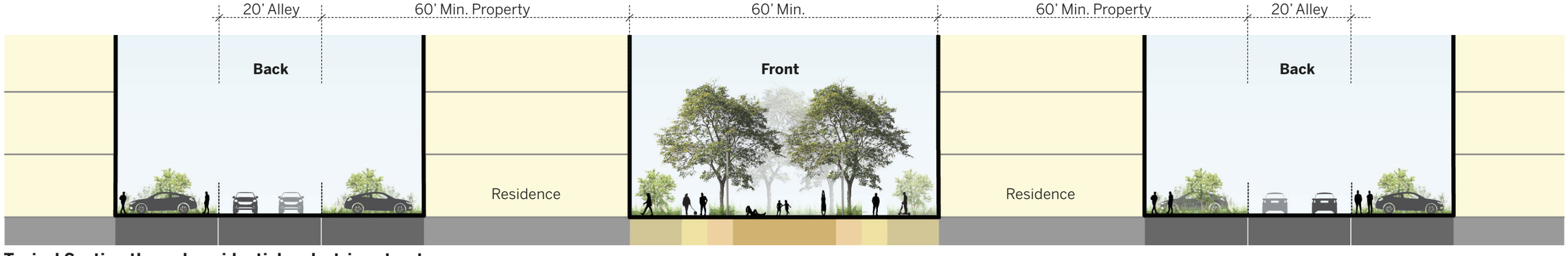


Key Plan

- Seating/Front or Side Yard
- Pedestrian Path or Shared Street
- Landscape and Site Furnishings



View rendering of a mew-style pedestrian street

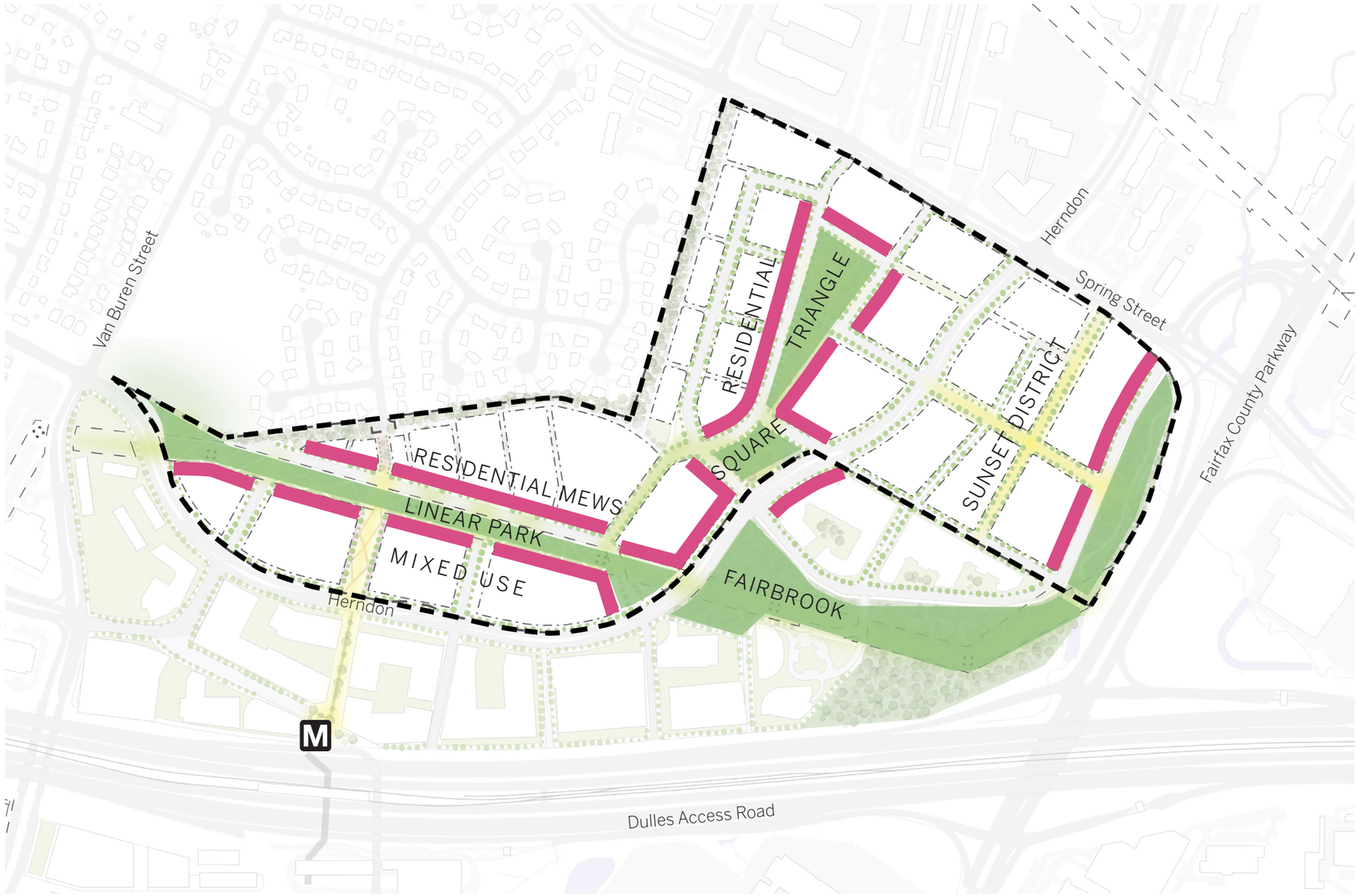


Typical Section through residential pedestrian street, or mew

The Neighborhoods

Park Frontage

The redevelopment framework plan strategically places development blocks shaping the network of open spaces, and fronting parks within and outside the TRG. The planned linear, square and triangle parks on the TRG provide the competitive advantage of having a substantial amount of linear feet of development facades fronting open space. This advantage also occurs with parks outside the TRG, like in the case of the development block fronting the Fairbrook greenery, promising a development with great views in the future.



Park Frontage

The Neighborhoods

Park Frontage

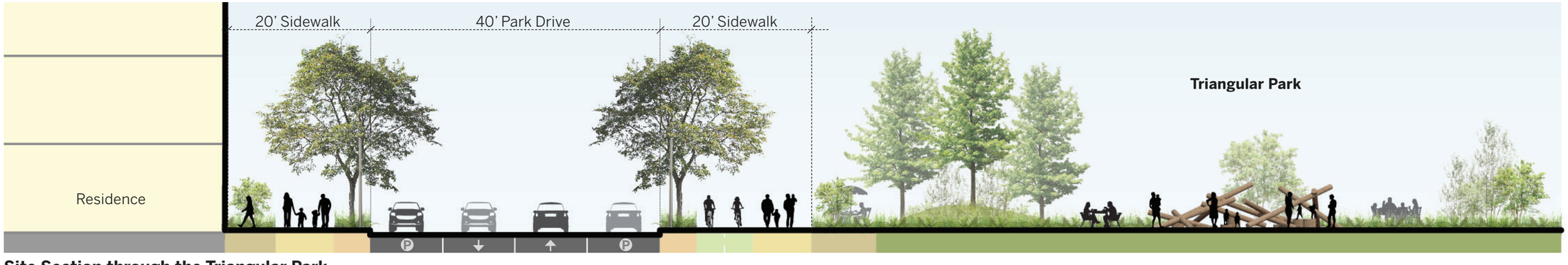


Key Plan

- Seating/Front or Side Yard
- Pedestrian Path or Shared Street
- Landscape and Site Furnishings
- Cycle Track



View rendering of the Triangular Park

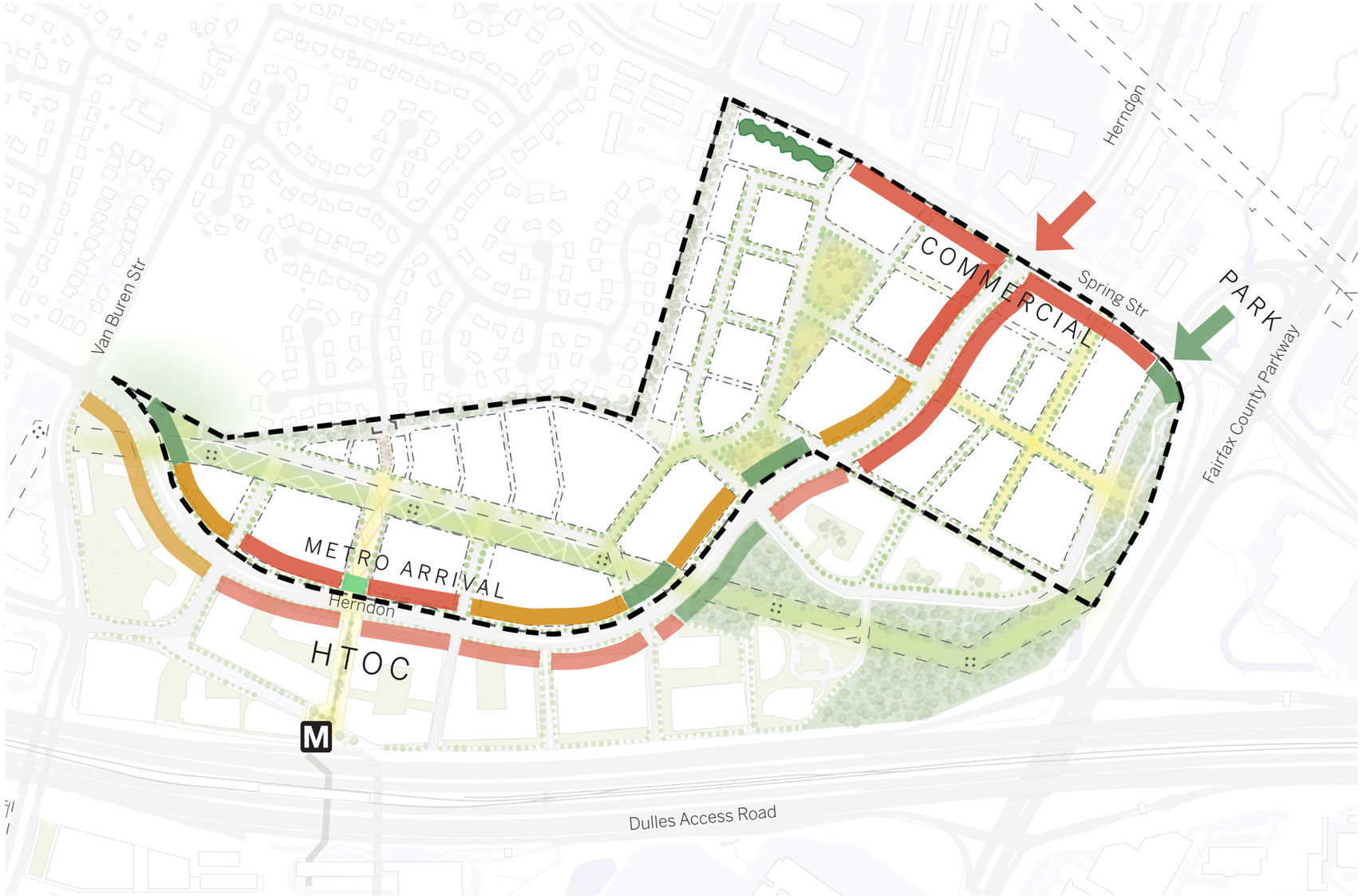


Site Section through the Triangular Park

The Neighborhoods

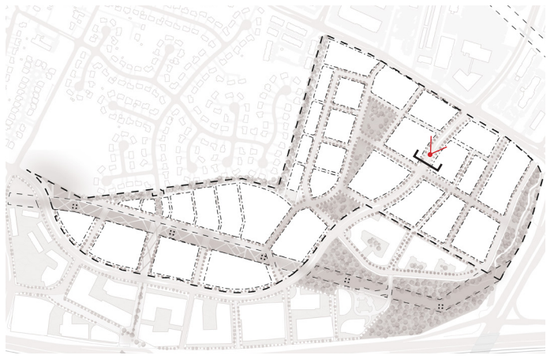
Herndon Parkway and Spring Street Frontage

The Plan envisions the look and feel of Herndon Parkway to be fully transformed with a new urban "street wall" of building mass intertwined with pockets of open space. Herndon Parkway will change from "throughput" to "place", establishing an area with a new sense of identity for the Town of Herndon.



Street Frontage Diagram

Herndon Pkwy and Spring Street Frontage

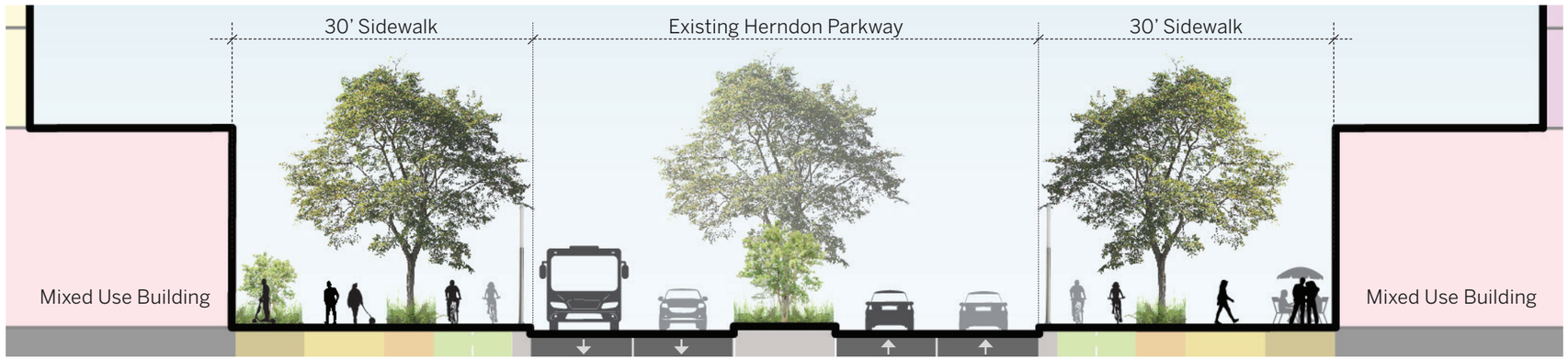


Key Plan



View rendering of the Herndon and Spring Street gateway to the TRG

- Seating/Front or Side Yard
- Pedestrian Path or Shared Street
- Landscape and Site Furnishings
- Cycle Track



Section through Herndon Parkway

The Neighborhoods

Sunset District

A vibrant new business park destination, elevating and celebrating the Sunset Business Park, and augmenting connections around it to Sugarland Run and integrating creative office spaces around it, the plan seeks to celebrate this unique local asset and elevate its presence and role within the community.

The Plan seeks to transform this area from a parking lot driven business park to a great urban public realm. The first step to archive this is to relocate some of the front door parking to concentrated parking areas located in the center of the District, on parking garages along the Herndon Parkway.

The existing Sunset Park Drive would be transformed into a "main street," hence the new name "Sunset Main Street." A reduced roadbed and widened sidewalks with street trees and outdoor seating would bring to this area the "small town feel" that Herndon residents are so enamored with, but with the industrial (and funky) vibe that brings about the unique identity of the Sunset District. A feel similar to that of Union Market in DC, but with the local Town flavor.



Sunset District Plan

The Neighborhoods

Sunset District

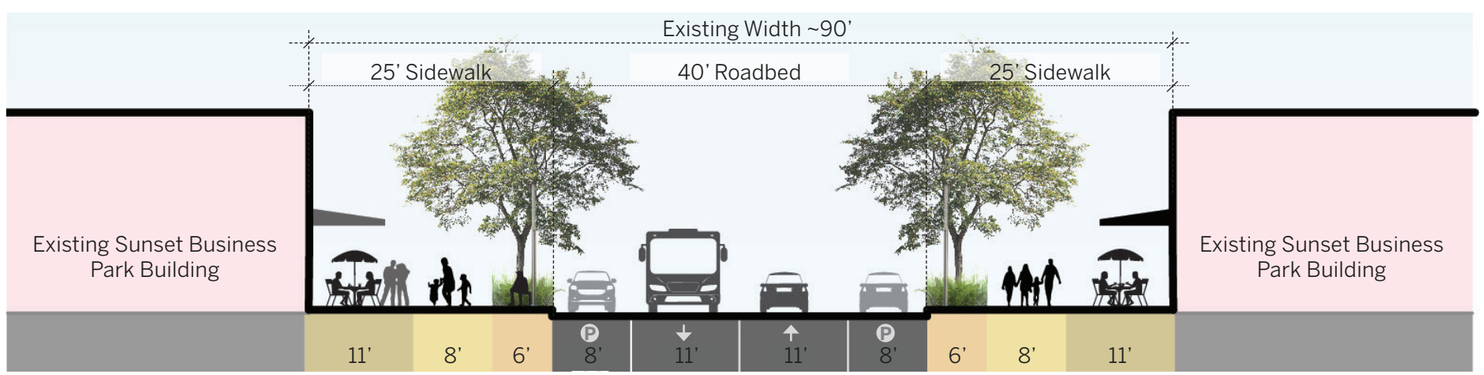


Key Plan



View rendering of Sunset Main Street

- Seating/Front or Side Yard
- Pedestrian Path or Shared Street
- Landscape and Site Furnishings



Transportation Network

Mobility Grid

To best function as a transit growth area, a successful mobility grid is critical to promote the smooth flow of all forms of transportation. The proposed network is designed to create a friendly and attractive pedestrian experience, while simultaneously allowing for vehicular traffic to flow. In order to achieve this, an alternate route to Herndon Parkway was added to the plan to provide traffic relief, especially given the higher densities anticipated by the plan. In addition to this, pedestrian scale and permeable blocks were designed to promote walkability and neighborhood character. All rights of way were designed to be generous, incorporating landscape elements with stormwater management capacity.

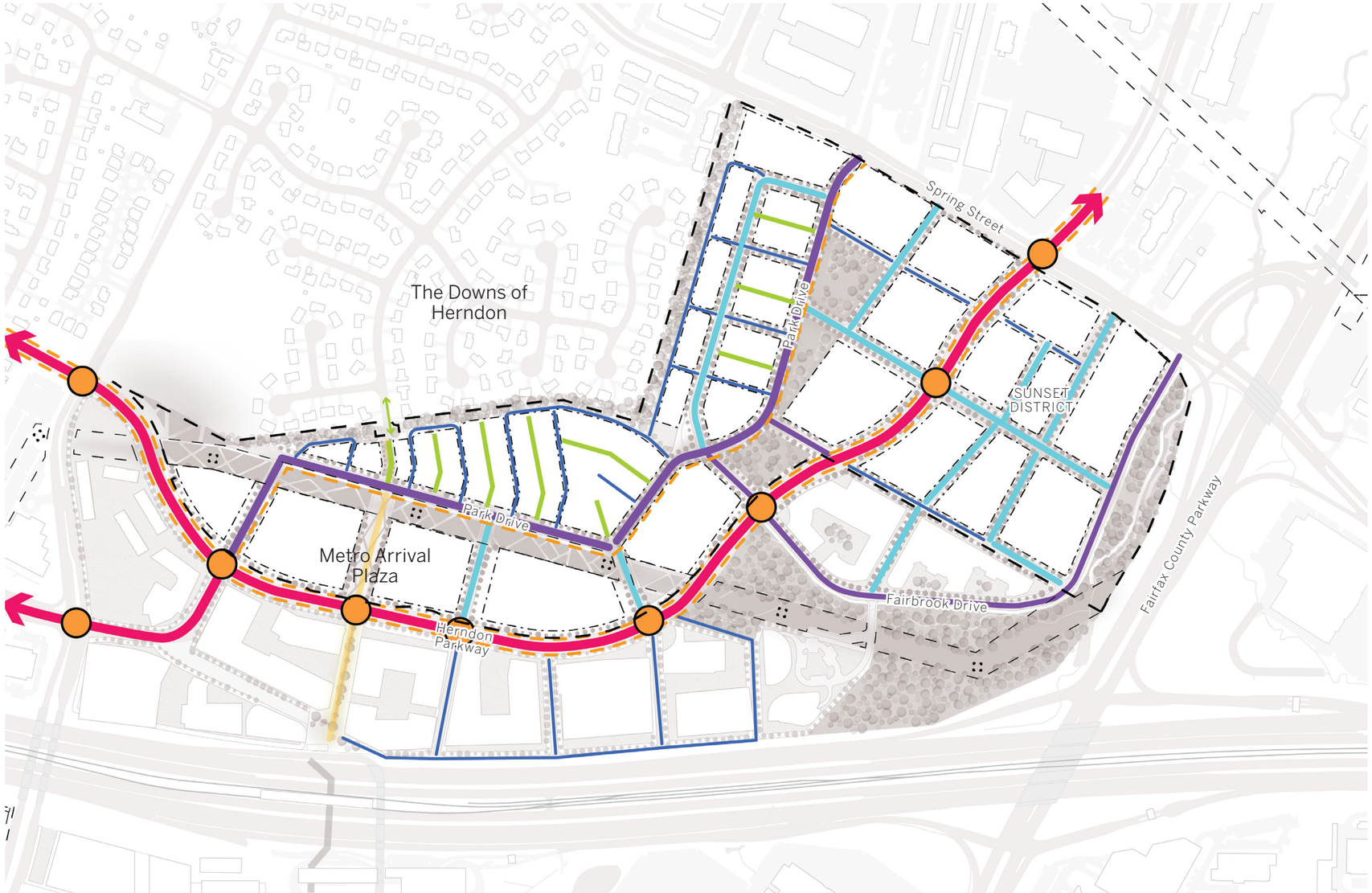
Street sections corresponding to each street type are listed below and depicted in the following pages:

ROAD TYPES
See Street Sections on following pages:

- Primary Streets:
- Secondary Streets: Park Dr & Fairbrook Dr
- Tertiary Streets: Town Streets
- Alleys
- Pedestrian Streets
- Promenade / Plaza

Supporting Facilities

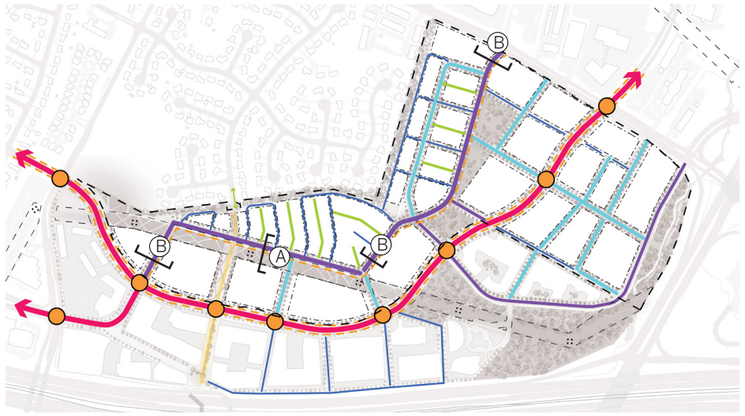
- Cycle Track
- Signalized Intersection



Road Types Plan

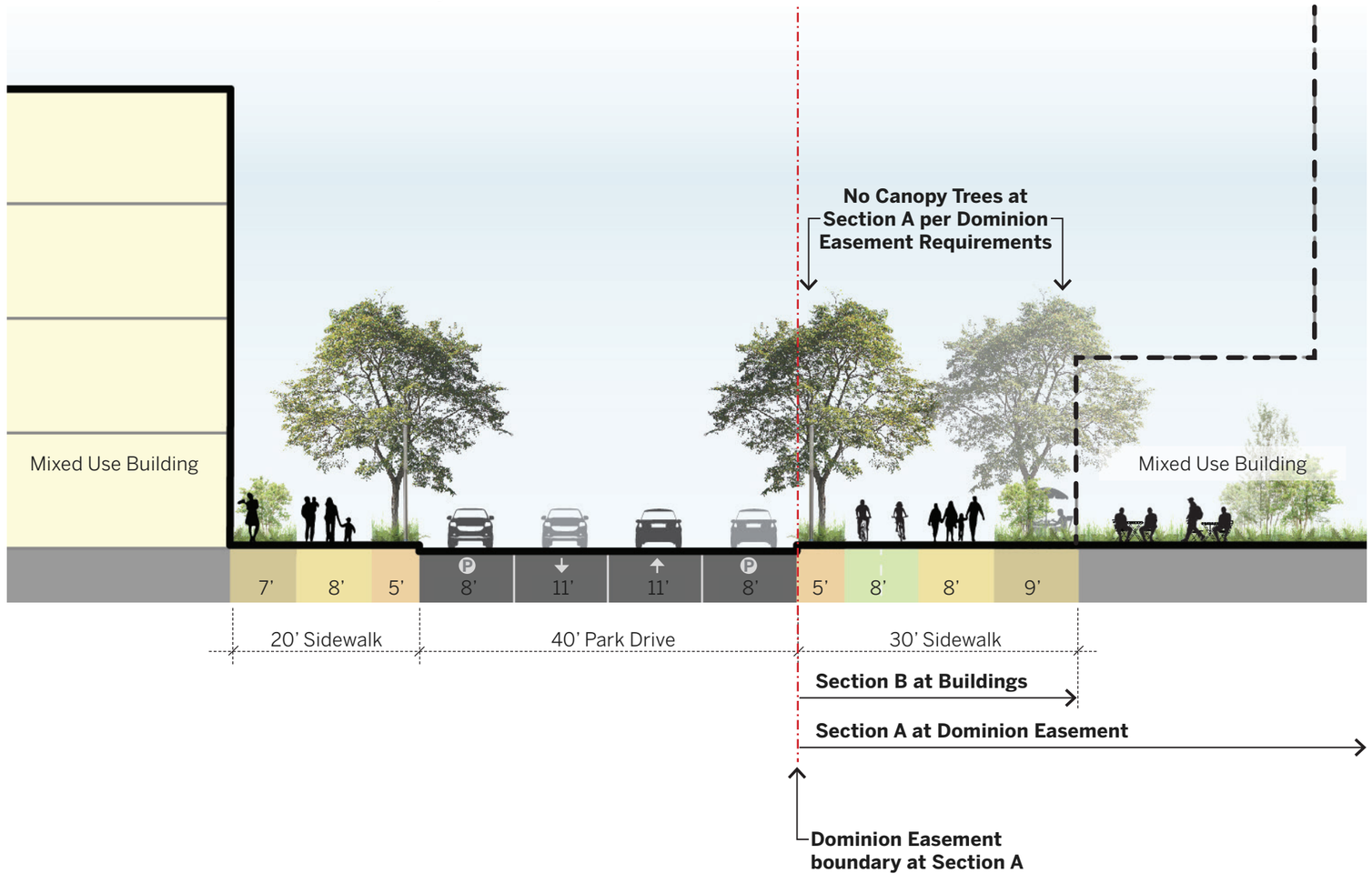
Transportation Network

Road Types – Street Sections



Key Plan

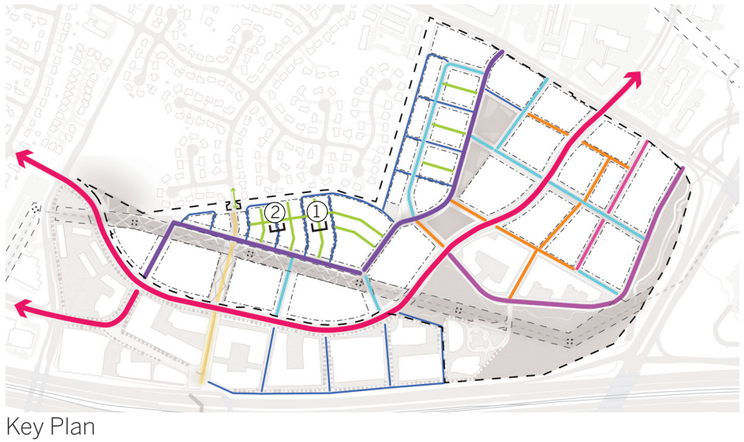
Street Section at Park Drive, a Secondary Street



- Seating/Front or Side Yard
- Pedestrian Path or Shared Street
- Landscape and Site Furnishings
- Cycle Track

Transportation Network

Road Types – Street Sections



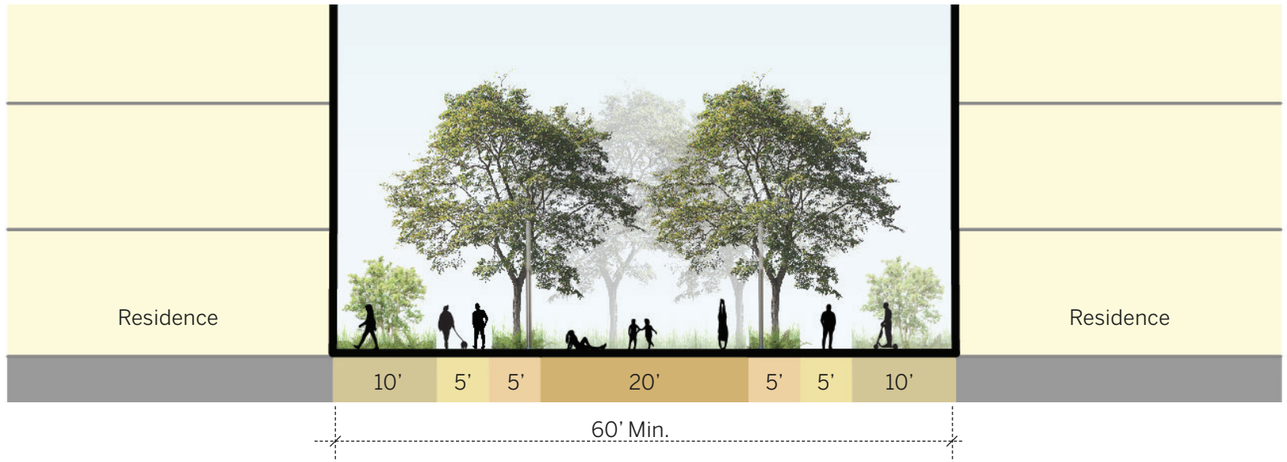
Key Plan

Front Yard

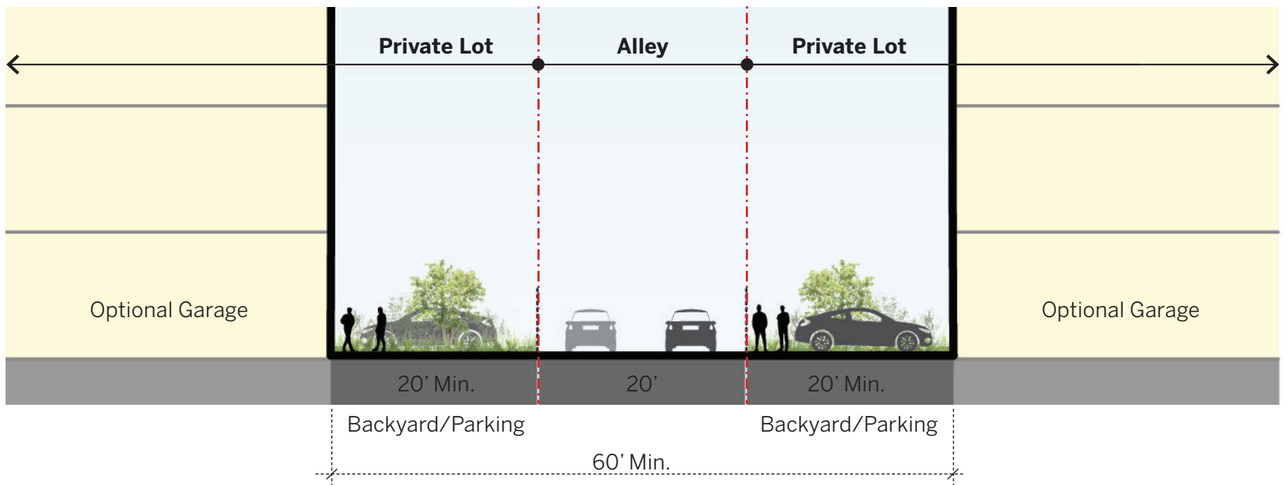
Pedestrian Street

Landscape and Site Furnishings

1. Mews Pedestrian Street

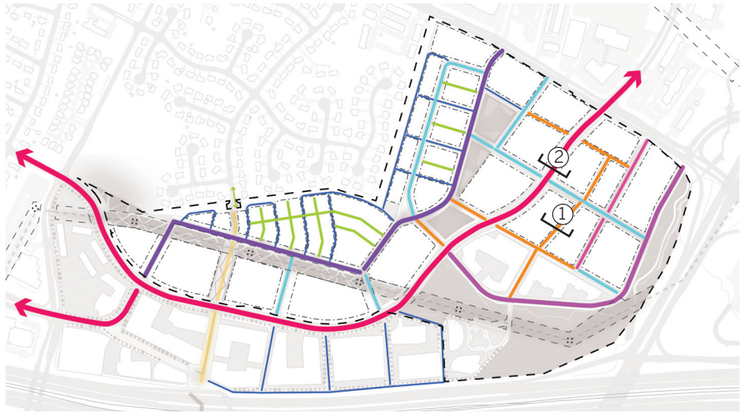


2. Mews Alley



Transportation Network

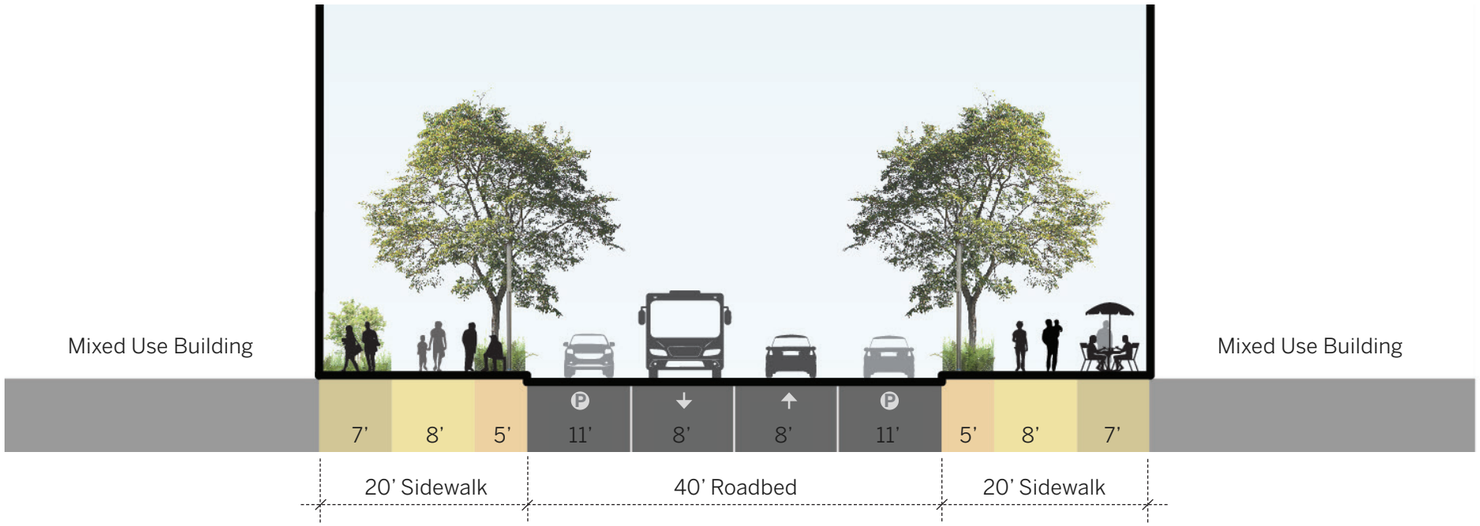
Road Types – Street Sections



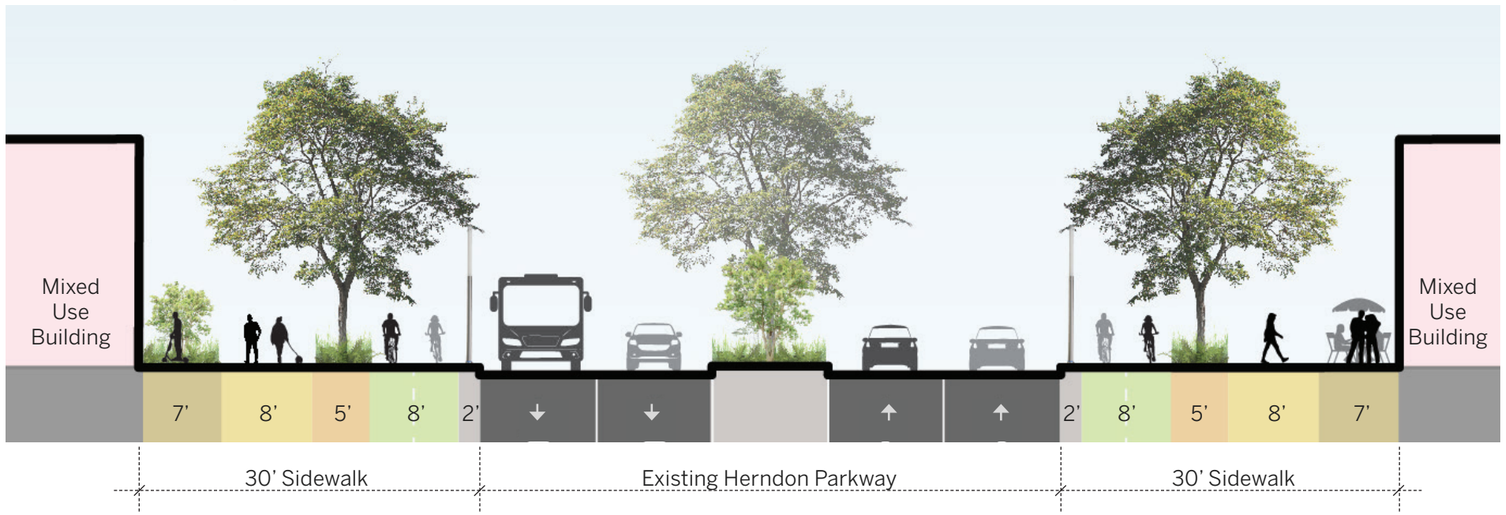
Key Plan

- Seating/Front or Side Yard
- Pedestrian Street
- Landscape and Site Furnishings
- Cycle Track
- Buffer

1. Typical Town Street



2. Herndon Parkway



Parking Strategies

Overarching recommendations

- Maximizing on-street parking
- avoid exposed garage facades fronting Herndon Parkway and parks
- All garages adjacent to parks must use wrapping, such as residential liners

Shared Parking Garages

Garages serving commercial uses on mixed use blocks should allow shared parking among different programs within a block or more. These garages should cater to any retail, shopping and entertainment users, in addition to serving office users.

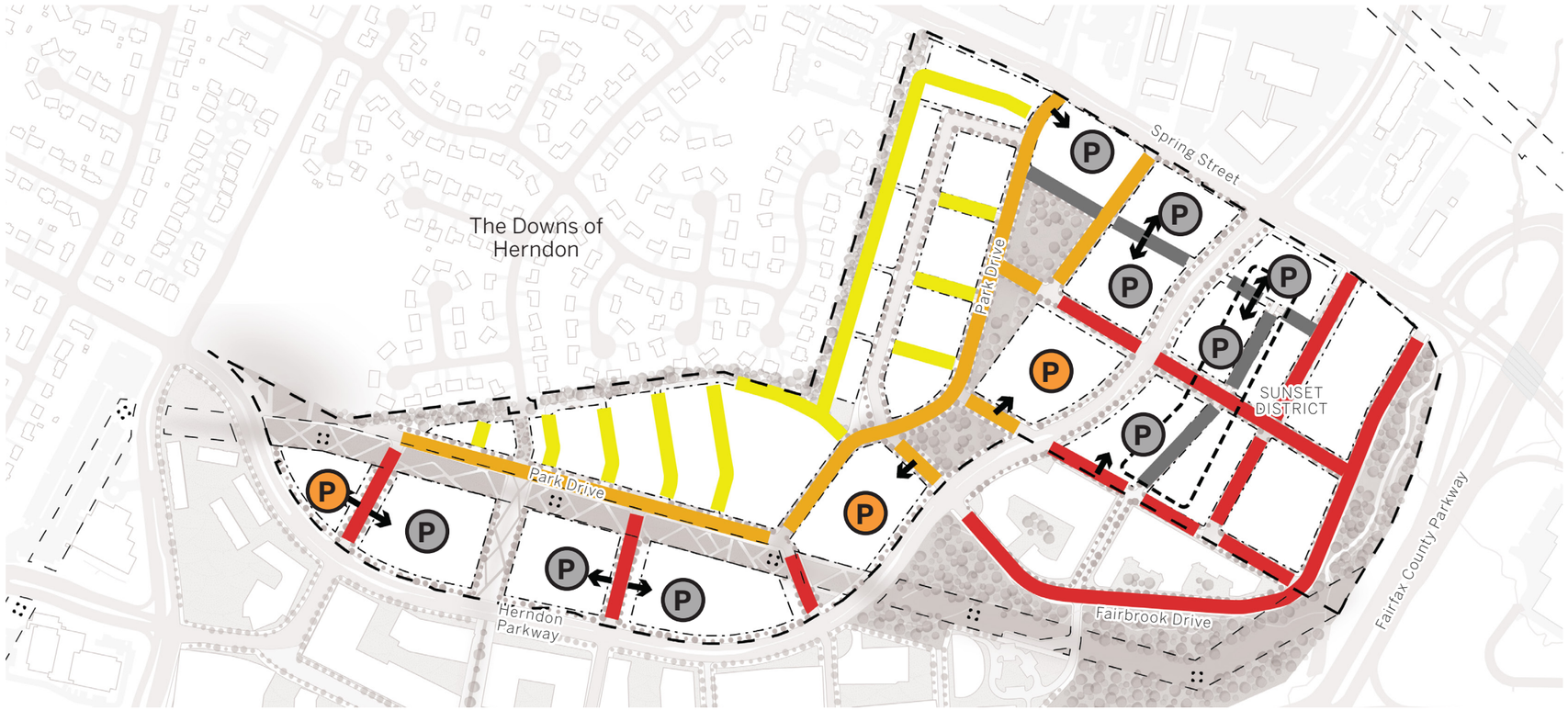
The new and expanded Sunset District employs a concentrated parking strategy, where most commercial users are expected to park one or two blocks away, moving away from the present "park at the front door" condition. All streets in the District will have on-street parking, with a service area (as shown in the Parking Strategy recommendations diagram) or "back of house" at the interior of the district, with flexibility for "makers spaces" and other creative uses to have the ability for outdoor work areas or additional paved area beyond the street for parking and service spaces.

- Garage - shared parking
- Garage - residents only
- On-street parking - all uses
- On-street parking - primarily residential
- On-Street Parking - service street
- Low-density residential private
- Service area at Sunset District
- Access

On-Street Parking

The mobility street grid maximizes on-street parking. This type of parking can be regulated to best fit the uses and demands of future redevelopment, for example: parking could be regulated so that most retail users are directed to the parking garages, leaving on-street parking for residents. As shown in the Parking Strategy Recommendations diagram on this page, on-street parking could be designated as follows:

- **Primarily residential:** parking on the streets adjacent to low-density residential development, such as the proposed Park Drive, could be regulated to only allow residential living and visiting uses according to future densities and needs.
- **All uses:** streets adjacent to commercial mixed use blocks could be open to all users
- **Low density residential private parking:** townhomes and two-over-twos in the residential transitional area would park behind their buildings. There is flexibility for this to occur in several ways, such as: on backyard that doubles as parking space, on backyard, under an upper floor deck, next to a backyard, in the case of a wider unit, or on individual garage inside the unit. Note that a substantial amount of this area lies within the Metro 5-minute walk zone, and the parking ratio is anticipated to be up to 1.3 spaces per unit.



Parking Strategy Recommendations

Traffic Impact

Background

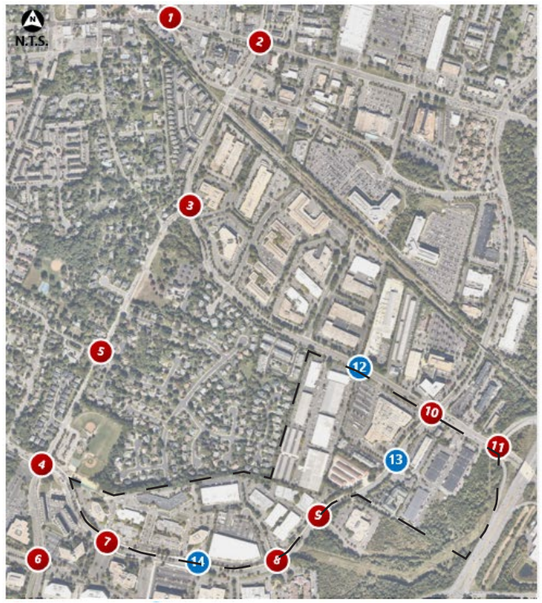
In support of the Transit-Related Growth (TRG) Small Area Plan, a transportation analysis was conducted to evaluate the projected transportation impacts of multiple development scenarios, compare those impacts to a baseline no-development scenario, and identify the need for transportation improvements. The analysis shows that, even in the absence of additional traffic volumes associated with proposed TRG development, the "bookends" of the Herndon Parkway corridor – Van Buren Street and Spring Street – are projected to experience operational challenges. Given this finding, the study team determined that the planned extension of Fairbrook Drive to Spring Street is needed to alleviate traffic pressure on these "bookend" locations even in a no-development scenario. **With the Fairbrook Drive extension, as well as a robust internal street grid with the proposed TRG, the transportation system is able to absorb the incremental traffic generated by the TRG development without the need for substantial supplementary transportation improvement projects.** This street grid, in conjunction with the urban mixed-use development pattern planned for the greater Herndon Metro Station vicinity, will mitigate the quantity of vehicle trips on the external roadway network.

It should be noted that the findings reported in this draft plan do not reflect incorporation of additional mitigation measures to offset transportation impact. Potential mitigation measures are described at the end of this chapter, but their impacts are not included in the following calculations. A revised model which takes into consideration the mitigation measures is currently being produced.

Study Methodology

The current TRG study is not the first planning effort completed by the Town of Herndon in the vicinity of the Metro Station. The Herndon Metro Station Area Study, completed in 2012, outlined expected development within the Herndon Transit-Oriented Core (HTOC) area. In 2017, a transportation planning study was completed to identify a potential density and land use mix for the TRG area. These prior studies informed this new TRG study via the adoption of consistent methodology and assumptions, as well as the incorporation of findings and recommendations made in these previous studies. The following intersections (shown in Figure 1) comprise the TRG transportation study area in support of the Small Area Plan.

1. Elden Street / Monroe Street
2. Elden Street / Van Buren Street
3. Van Buren Street / Spring Street
4. Van Buren Street / Herndon Parkway
5. Van Buren Street / Alabama Drive
6. Van Buren Street / World gate Drive
7. Herndon Parkway / Future World gate Drive Extension
8. Herndon Parkway / Exchange Place
9. Herndon Parkway / Fair brook Drive
10. Spring Street / Herndon Parkway
11. Spring Street / Fairfax County Parkway / Future Fair brook Drive Extension



Consistent with prior studies, VISSIM microsimulation was utilized to model the transportation system, including vehicular and pedestrian traffic at the study intersections. The TRG is a 20-year plan that will require time and market conditions to achieve full buildout; as such, a 2045 design year was selected to analyze the projected traffic conditions associated with TRG buildout. There are a substantial number of roadway and development projects planned within the study area that were accounted for within all 2045 traffic modeling, including:

- Funded roadway improvement projects at Herndon Parkway / Van Buren Street and Herndon Parkway / Spring Street.
- Unfunded, but planned, roadway extension of Worldgate Drive.

In addition to accounting for the traffic growth associated with HTOC and Fairbrook developments, the TRG study also conservatively assumed a 1% annual growth of traffic volumes, consistent with prior studies. The study developed a 2045 traffic volume forecast that included no new TRG development traffic and then modeled the transportation system under that traffic demand to project a 2045 baseline operating condition for the roadway network. The TRG study team subsequently developed three different TRG development scenarios that included varying density and development patterns. The transportation impacts of these scenarios were evaluated, which identified that a new road parallel to Herndon Parkway was critical to alleviate pressure from Herndon Parkway. With input from the Town of Herndon, a Preferred Development Scenario was then identified, and the transportation impacts were evaluated.

The most commonly utilized transportation metric is Level of Service (LOS), which measures the adequacy of intersection geometrics and the traffic control for the given turning volumes. Levels of service range from A through F, based on the average control delay experienced by vehicles traveling through the intersection during the peak hour. Table 2 provides a description of various levels of service categories and delay ranges. In the Herndon and greater Northern Virginia area, it is common and acceptable to have LOS D during the peak hours.

Level of Service Description for Intersections

Level of Service	Description	Signalized Intersection / Roundabout	Unsignalized Intersection
A	Little or no delay	<= 10 sec.	<= 10 sec.
B	Short traffic delay	10-20 sec.	10-15 sec.
C	Average traffic delay	20-35 sec.	15-25 sec.
D	Long traffic delay	35-55 sec.	25-35 sec.
E	Very long traffic delay	55-80 sec.	35-50 sec.
F	Unacceptable delay	> 80 sec.	> 50 sec.

No Build 2045

No Build 2045 Transportation Findings

The Herndon Parkway corridor is anticipated to accommodate projected 2045 volume demand (without TRG redevelopment); based on the acceptable values of projected delay, Level of Service (LOS), and queuing at the intersections along this corridor, it appears to have surplus capacity to handle additional demand, whether from TRG redevelopment or elsewhere. The exact quantity of this surplus capacity is difficult to estimate as the operations of this corridor are driven by closely spaced signalized intersections; the capacity of such a segment is based on a variety of factors including traffic signal parameters and local driver behavior – hence the need for VISSIM microsimulation traffic modeling to estimate traffic conditions.

The most constrained locations within the study area system are at the two ends of Herndon Parkway – Van Buren Street and Spring Street. While there are no intersections in the study area that operate at LOS F at an overall intersection level, there are multiple individual movements on that are projected to operate at LOS F, below the Town's acceptable threshold (see Table 1). In the modeled No Build 2045 condition, the Worldgate Drive extension offers the only additional access to the corridor beyond these two "bookend" intersections. Previous studies have identified a Fairbrook Drive extension as an improvement that would create an additional access route on the corridor's eastern end and relieve pressure on the Herndon Parkway / Spring Street intersection. The operating performance of the Herndon Parkway / Van Buren Street intersection is limited by its geometry and lane configuration – both the northbound left turn and the southbound through movement on Van Buren Street. The northbound left turn is limited by the single left turn lane while the southbound through movement is limited by the dual through lanes only extending a short distance – this essentially limits the signal capacity to a single lane. This intersection would likely need to be expanded to provide more capacity on the west end of the Herndon Parkway study corridor.

In projected No Build 2045 conditions AM peak hour, average queue lengths throughout the study network are accommodated with no concerns. AM peak hour maximum queue lengths are accommodated with a few exceptions – specifically eastbound Herndon Parkway (west of Fairbrook Drive) and the Spring Street segment at Herndon Parkway and the Fairfax County Parkway.

The maximum queue is projected to extend onto Fairfax County Parkway; albeit the exact extents are unknown as the traffic signal on Fairfax County Parkway was not modeled as part of this study. In the projected No Build 2045 conditions PM peak hour, the roadway network experiences increased queuing compared to the AM peak hour. Average queue lengths are still mostly accommodated, although the southbound Van Buren Street queue at Herndon Parkway and the northbound Herndon Parkway queue at Spring Street are significant. Maximum queue lengths fill most of the Herndon Parkway corridor and Spring Street near the interchange. These maximum queue lengths are most likely not all occurring simultaneously, so these queue findings do not equate to gridlock conditions. Queuing also does not directly correlate to delay; for instance, many of the intersections along Herndon Parkway are projected to operate at LOS B and C despite this level of queuing.

No Build 2045 "LOS F" Turning Movements

Turning Movement	Peak	Source of Congestion
Southbound Left Turn from Herndon Pkwy to Spring St	PM	*Heavy Demand, Lack of Alternate Access*
Eastbound Alabama Drive at Van Buren Street	PM	*Intersection capacity limitations at Van Buren Street / Herndon Parkway*
Northbound Left Turn from Van Buren St to Herndon Pkwy	PM	

Transportation Impacts

Preferred TRG Development Scenario Transportation Findings

At full buildout, the Preferred TRG Development Scenario incorporates nearly 2,800 residential units, 450 hotel rooms, approximately 1.2 million square feet of office space, and nearly 300,000 square feet of retail. The TRG's proximity to the Silver Line and the urban mixed-use development form will induce a substantial quantity of transit, pedestrian, and bicycle trips, but there will still be a significant reliance on personal vehicles to complete trips. Approximately 3,100 vehicle trips are projected for both the AM and PM weekday peak hour. These trips will distribute throughout the roadway network to both local and regional destinations. Two new major road connections – the Fairbrook Drive extension to Spring Street and a new roadway parallel to Herndon Parkway – will form the foundation of the TRG's street grid. These two connections, as well as the proposed location of TRG land use typology, are shown in Figure 2. The future of the Spring Street / Fairfax County Parkway interchange is currently in flux as Fairfax County and the Virginia Department of Transportation are presently planning its future configuration. For the purposes of this study, the interchange configuration was largely unchanged in future traffic models, with only turn lane modifications made at the existing Spring Street / Fairfax County Parkway intersection to accommodate the Fairbrook Drive extension.

In Preferred Build 2045 Scenario conditions, traffic levels are anticipated to be stressed at a few locations; however, the general traffic conditions are manageable in a peak hour urban condition. All study intersections are projected to operate at LOS D or better in both peak hours, except for the Spring Street / Herndon Parkway intersection, which is anticipated to operate at LOS E in both peak hours. While LOS E does represent increased delay, many intersections in the Northern Virginia area operate at this condition during a peak hour and Fairfax County has adopted an LOS E intersection standard in several of its urban development areas. In comparison to projected No Build 2045 traffic conditions, this is an increase from one intersection peak hour operating at LOS E to two intersection peak hours operating at LOS E; however, an examination of the delay values at the Herndon Parkway / Spring Street intersection reveals that the AM LOS change resulted from only four seconds of increased delay and the PM delay only increased by six seconds (remained LOS E).

The other significant increases in anticipated intersection delay in the Preferred Build Scenario are the Herndon Parkway / Fairbrook Drive intersection, the Herndon Parkway / Worldgate Drive intersection, the Van Buren Street / Herndon Parkway intersection (AM peak only), and the Van Buren Street / Alabama Drive intersection (PM peak only). The three Herndon Parkway intersections are still projected to operate at acceptable levels – LOS C and LOS D, respectively. The PM peak delay increase at Van Buren Street / Alabama Drive intersection is caused by increased traffic pressure on the constrained Van Buren Street / Herndon Parkway intersection.

Compared to No Build 2045 conditions, several "new" movements are projected to operate at LOS F in the Preferred Build Scenario. As seen below, these movements are located at the Herndon Parkway / Spring Street intersection and the Spring Street / Fairfax County Parkway Ramps / Fairbrook Drive intersection. These two Spring Street intersections should be studied further in the future as Parkway interchange planning progresses. While there was LOS F on the Van Buren Street corridor in No Build 2045 conditions, delay does increase in the Build scenario due to the increased demand on the capacity-constrained Van Buren Street / Herndon Parkway intersection.

In projected Preferred Build conditions, the average and maximum queue findings are similar to No Build 2045 conditions in both peak hours; the additional TRG traffic volume impacts are largely offset by the Fairbrook Drive extension and new traffic signal at Sunset Business Park. In the AM peak hour, average queue lengths are accommodated throughout the study network, including the Fairfax County Parkway off-ramp queue that is contained within the off-ramp. Maximum AM peak hour queue lengths are accommodated with a few exceptions (the same ones as No Build 2045) – specifically eastbound Herndon Parkway (west of Fairbrook Drive) and the Spring Street segment at Herndon Parkway and Fairfax County Parkway. The maximum queue is projected to extend onto Fairfax County Parkway; albeit the exact extents are unknown as the traffic signal on Fairfax County Parkway was not modeled as part of this study.

Average PM peak hour queue lengths are mostly accommodated, although the southbound Van Buren Street queue at Herndon Parkway and the westbound Spring Street queue at Fairfax County Parkway are significant. Maximum PM peak hour queue lengths fill most of the Herndon Parkway corridor and Spring Street at Herndon Parkway and the Fairfax County Parkway. These maximum queue lengths are most likely not all occurring simultaneously, so these queue findings do not equate to gridlock conditions. Queuing also does not directly correlate to delay; for instance, many of the intersections along Herndon Parkway are projected to operate at LOS C despite this level of queuing.

Preferred Build "LOS F" Turning Movements

Turning Movement	Peak	LOS F in No Build?	Source of Congestion
Herndon Pkwy / Spring Street			
Eastbound Left	AM/PM	No	*Heavy Demand*
Eastbound Thru/Right	PM	No	
Southbound Left	PM	No	
Spring St / Fairfax County Parkway Ramps / Fairbrook Dr			
Westbound Left	AM	No	*"Interim" Intersection Modifications*
Northbound Left/Thru	AM/PM	No	
Van Buren Street / Worldgate Drive			*Heavy Demand*
Eastbound Left	PM	No	
Van Buren St / Herndon Pkwy			*Capacity limitations at Van Buren St / Herndon Pkwy*
Northbound Left	PM	Yes	
Van Buren St / Alabama Drive			
All Alabama Drive	PM	Yes	
Herndon Parkway / Fairbrook Drive			*Demand*
Westbound Left	PM	No	

Source: Average of 7 AM and 20 PM Peak Hour VISSIM simulation runs.

Transportation Impacts - Mitigation Strategies

Given that multiple intersections demonstrate operational deficiencies in the Preferred Build traffic analysis – as defined by the Town of Herndon's LOS standard – the Project Team explored a variety of potential mitigation measures with Town of Herndon staff.

The Build traffic analysis did not substantially alter the No Build roadway network, except where previously mentioned such as at Spring Street / Fairfax County Parkway / Fairbrook Drive. The primary candidate mitigations focus on measures to increase the capacity of the roadway network in a manner that would be compatible with the mixed-used, human-scale development envisioned for the TRG. These candidate mitigations seek to improve traffic operations to an acceptable level at the three intersections that fall short of the Town's LOS standard:

- Spring Street / Herndon Parkway (overall intersection LOS E in both peaks)
- Van Buren Street / Herndon Parkway (turning movement LOS F in PM peak)
- Van Buren Street / Alabama Drive (turning movement LOS F in PM peak)

The Project Team used microsimulation tools to conduct initial screenings of a wide range of infrastructure improvements, an exercise that helped identify a set of candidate mitigations to be further modeled in VISSIM. Table 21 lists the mitigations to be modeled in VISSIM; this traffic modeling is ongoing and the results of the analysis will be summarized in the next iteration of this technical memo.

The Preferred Build traffic analysis included baseline assumptions on vehicle trips. The Town of Herndon may consider additional potential mitigation measures to reduce the amount of volume on the roadway network. Those measures could include the following:

- New or optimized active transportation facilities to encourage non-vehicle trips.
- Transportation Demand Management (TDM) strategies (e.g., transit incentives, "park once" strategies, etc.).

CANDIDATE MITIGATIONS TO BE CONSIDERED

Intersection	Issue	Potential Solution	Notes
Herndon Parkway / Van Buren St	SB Van Buren St dual thru lanes only 150 ft in length, leading to delay	Widen SB Van Buren St to extend dual thru lanes	Roadway widening with right of way impacts
	Single NBL turn lane to serve 300+ peak-hr vehicles; competing with SB Van Buren for signal capacity	Dual NBL turn lanes	Roadway widening with right of way impacts; screened out options to get dual NBL turn lanes without widening
Spring Street / Herndon Parkway	Viability of new TRG road to relieve pressure on Herndon Parkway is limited by lack of signal at Spring Street	New traffic signal at Spring Street / new TRG road with rerouted traffic from Herndon Parkway	-
	Intersection Capacity Constraints	Dual left turn lanes from EB Spring St onto NB Herndon Pkwy	Possible roadway widening – may be accommodated within median
Spring Street / Fairbrook Dr / Fairfax County Pkwy	Queue spillback on Fairfax County Pkwy off-ramp	Dual left turn lane from off-ramp	Roadway widening with right of way impacts
	Congestion on WB Spring St	Dual left turn from WB Spring St onto Fairbrook Dr	Widening likely able to be accommodated within median
	Fairbrook Drive congestion in PM Peak	Separate left turn lane from thru lane	Requires wider cross-section for new road (Fairbrook Drive extension)
Herndon Parkway / Fairbrook Dr	Fairbrook Drive congestion	Signal optimization	-

Public Infrastructure Impacts

Water Distribution & Sewer Collection Impacts

Background

The TRG, Fairbrook District and the HTOC share water distribution and wastewater collection infrastructure with the TRG. To understand this better, a hydraulic assessment was conducted for the Preferred Use Scenario of the TRG. For this hydraulic analysis, water demand and wastewater loadings were calculated for the redeveloped TRG Area using development data. Water demand and wastewater loadings were added to demands and loadings for the Fairbrook and HTOC areas. The results of the hydraulic analysis are used to determine the necessary upgrades needed to the infrastructure.

Since the TRG Area redevelopment is intended to be a mix of uses. The gallon per day water demand projections were developed using the demand factors in Section 2.01 of the Herndon Water Main Design and Construction Standards. Water demands within the TRG Area and the contiguous HTOC and Fairbrook Districts were included in the 2016 Water Utility Master Plan and the 2019 Water Utility Master Plan Update for the Town of Herndon. It is important to note that the model update will increase the demand of both water and sewer by approximately 65%.

Water Distribution System

Water demand was calculated through the Town of Herndon water model (InfoWater) to determine whether further improvements are needed to be made to accommodate projected TRG growth. The model was run in a year 2045 maximum day demand scenario with all water infrastructure improvements recommended in the UMP and subsequent updates included in the model. The model runs indicate that water system pressure is impacted to the west of the TRG area and fire flow requirements are met with marginal lost of hydrant capacity at a few nodes in the TRG.

Modeling results demonstrated that adequate water pressure will be available and the increased water demand from the TRG will only have a marginal impact on fire flow demand Town-wide. With new TRG demand added to the model, fire flow will be minimally impacted in some nodes in the TRG Area and adjacent Districts compared to previous model runs without the TRG demands. It should be noted that full development of the TRG Area and adjacent Districts will require relocation and addition of water distribution system infrastructure to suit the new development. This will provide an opportunity to mitigate the water pressure impacts to the west of the TRG Area. New piping proposed by developers for the TRG area will need to be properly sized and looped into the existing system to minimize pressure and fire flow issues.

Sewer Collection System Evaluation

The current wastewater infrastructure in and nearby the TRG Area consists of three branches that merge and discharge to the Sugarland Run Interceptor. TRG wastewater loadings were added into the Herndon InfoSewer hydraulic model along with the most recent wastewater flow estimates (2019) for the Fairbrook District and the HTOC were included in the model runs. To consider impact on infrastructure a multiplier of 1.94 was applied to average daily wastewater loadings to simulate a peak loading. Modeling results indicated that the existing wastewater pipe system along Herndon Parkway and adjacent to the Fairbrook District will become surcharged when loadings from the TRG are added to existing loadings. Gravity sewers are considered to be surcharged when water levels in the pipe exceed 80% or more of the pipe diameter.

Further, impact from proposed development to wastewater infrastructure in the TRG Area, HTOC and Fairbrook Districts was evaluated and improvements to the wastewater infrastructure were designed by WRA in 2020. Those improvements are still to be constructed. Once this construction is complete, only marginal changes to the plans will be required to accommodate the TRG Area development.

Fiscal Impacts & Market Strategies

Overview

The fiscal impact of the preferred use scenario was analyzed outlining the revenues that new development in the TRG is likely to generate for the Town of Herndon, as well as the operating expenditures the Town of Herndon is likely to incur while serving the users of that new development.

For the analysis, the assumptions for the quantities of development in the TRG included the data described in the table below.

DEVELOPMENT DATA SUMMARY

Program	Type	GFA (sf)	Units (RES/H)
Residential	R-Multifamily	2,843,200	2,369
	R-TH & 202's	836,300	420
Hotel	Hotel	277,500	463
Retail	Grocery	63,600	
	Restaurant Services	155,300	
	Entertainment Fitness	74,400	
Office	Corporate	1,122,600	
	Creative	66,800	
Grand Total		5,439,700 sf	

This development data was supplemented by a market analysis that incorporated data from third party sources, including public assessor's databases. To project the net fiscal impact revenues were estimated based on the taxes and fees that residents, businesses, and property owners are likely to pay. Then, operating expenditures were subtracted from town revenues, based on the town services the Proposed Use Scenario is likely to require. Revenues less expenditures each year are the General Fund net fiscal impact.

Findings

From 2023 to 2045, it can be estimated that new development will generate roughly $221,608,000 (in nominal dollars) in revenues to the Town of Herndon. Property taxes represent the largest portion of this total (32%), followed by business license revenues (30%), transient occupancy taxes (13%), and meals taxes (11%). Meanwhile, Town of Herndon will incur roughly $53,067,000 (in nominal dollars) in operating expenditures to serve users of the Proposed Use Scenario during the same forecast period.
As a result, the Proposed Use Scenario is projected to generate a positive net fiscal impact of $168,541,000 to the General Fund of the Town of Herndon during this time.

When considering the annual net fiscal impact at buildout, the redevelopment will produce an estimated $15,803,000 to the Town of Herndon each year, in 2023 dollars. This revenue compares with $3,433,000 in annual town expenditures, for an annual net fiscal impact of $12,370,000 in 2023 dollars.

At full buildout, Proposed Use Scenario will support approximately 5,648 residents, including approximately 942 schoolchildren. In addition, it will support approximately 6,765 employees—including 5,462 office employees and 1,302 retail, hospitality, and apartment employees—at an average salary of $102,000, in 2023 dollars.

As of FY 2023, the total assessed value of properties in the TRG is approximately $214,899,000, and these properties generate an estimated $559,000 in real property taxes to the Town of Herndon annually. In comparison, the TRG—following redevelopment—is expected to feature a total assessed value of $1,765,929,000, and to generate approximately $4,591,000 in real property taxes to the Town of Herndon annually, both in FY 2023 dollars. This assessed value base is approximately eight times higher than the assessed value base that exists in the TRG today, highlighting the long-term benefits of redevelopment.

Balancing near-term market realities with long-term planning aspirations is a key strategic consideration for the TRG. While the TRG offers potential to support a diverse mix of uses, market conditions are more favorable for certain uses (e.g., housing and hospitality) than others at this time. Furthermore, certain properties are ripe for redevelopment today, while others may not become available for many more years. Together, these dynamics highlight the importance of having a long-term vision for the TRG, along with laying the groundwork that can bring that vision to fruition.

Zoning and Entitlements

First and foremost, Town of Herndon should ensure all sites within the TRG are zoned and entitled for their envisioned uses, to minimize any regulatory barriers that could deter property owners from considering redevelopment. As part of these efforts, the Town of Herndon should be prepared to request property owners set aside easements for portions of their properties on which necessary infrastructural improvements are planned, and to provide the necessary incentives to ensure development is still feasible on the remaining portions of those properties.

Funding Mechanism

At the same time, the Town of Herndon should also establish a funding mechanism for investments that it wishes to see built, but that developers may not wish to include in their plans. Establishing this funding mechanism in advance of reviewing development proposals is likely key, in order to ensure the mechanism is ready when needed.
Temporary Activations: Particularly in portions of the TRG that are not yet ready for redevelopment, temporary activations can plan a key role in bringing users to the area in the meantime. Examples of such activations include beer gardens, farmers markets, holiday markets, and other seasonal attractions. In general, temporary activations are likely to be most impactful in portions of the TRG near existing development and ongoing redevelopment, and the Town of Herndon should try to focus efforts to drive energy near locations in which it is already happening, in order to avoid dispersing this energy to other locations where it may not be as impactful.

Community Service Impacts

Summary of Community Service Impacts

As with expanded transportation and utility infrastructure needs, density and population growth generates demand for additional public services provided by the town, the county, and other public authorities.

More housing in particular means more town residents that rely on and use town and county facilities and participate in their programs.

Redevelopment proposals occurring under the TRG SAP will need to identify, evaluate, and understand these impacts and provide a measured path for mitigation and management.

Public services that should be assessed for impact management include but is not limited to those service related to town administration, public schools, public safety and security, public emergency services, public parks, and public recreational programs.

The Town of Herndon strives to provide high levels of service and programming to those that live, work, and play in Herndon. The challenge considering notable growth within its boundaries stems from finite resources and jurisdictional limitations operating as a four-square mile town. Those factors are important variables in the evaluation of impacts to the local services.

TRG SAP implementation presents an opportunity to expand and improve these services in an appropriate, creative, and equitable manner with an understanding that demand for specific services will evolve over the life of the plan implementation and the demand for new services may emerge.

Plan Implementation

Implementation Matrix

In order to translate the vision for the Transit-Related Growth Area Small Area Plan into reality, a coordinated series of public and private actions will be necessary. Accordingly, implementation will not be executed by any single individual, property owner, or public entity. Rather, it will require the willing collaboration of several diverse public, private, and institutional stakeholders working together with common purpose. As noted, there are several key public policy and regulatory actions to be taken by the Town to incorporate this plan into Herndon's broader land use policy. In addition the Town should incentivize certain actions, promote noted uses and activities, and work to implement infrastructure and open space improvements. Private property owners should be regularly engaged to support activation, improve connections, and encourage appropriate and timely redevelopment adhering to the principles and urban design framework for transit-related growth. Because implementation of the SAP requires a series of public and private actions, there is no simple timeline of sequential actions prescribed herein. Rather, the Implementation Matrix offers a menu of action items that taken together will help advance the principles of the SAP and help Herndon advance its broader objectives for this important growth area.

i	**Incorporate SAP into Herndon Comprehensive Plan**	• Incorporate the TRG SAP into the upcoming Comp Plan by reference • Use this plan to inform the new land use map in the Comp Plan
ii	**Update the Zoning Code**	• Update the Zoning Code to reflect the concepts described in this plan, especially as they relate to: use, density and building heights
iii	**Incentivize park space along Dominion Power easement**	• Use zoning benefits to adequately incentivize the creation of a privately-owned public park. • The Town should support developers in any negotiations with Dominion in order to achieve this park space on an as-needed basis.
iv	**Improve the pedestrian connection between the Downs of Herndon neighborhood with the TRG**	• Make the connection attractive, well-lit, and accessible to all users. The connection should continue to be closed to vehicular traffic
v	**Reduce parking minimums within the TRG**	• Parking minimums should be minimized in transit-adjacent developments.
vi	**Incentivize the provision of shared parking in the Sunset District neighborhood**	• The amount of surface parking currently provided at the Sunset Business Park should be reduced, and consolidated into nearby structured lots. • Create zoning incentives for the developers of adjacent lots to provide shared structured parking
vii	**Support Sunset Business Park complex**	• Consider sponsoring community events at the Sunset Business Park
viii	**Support the TRG by promoting use of the Metro**	• Encourage employers and employees to take advantage of Commuter Benefit Options • Use TOH messaging platforms to promote and provide visibility to the new Metro

Implementation Matrix

ix	**Complete the planned cycle tracks planned for the TRG**	
x	**Guide the alignment of private streets to create a cohesive grid**	• As parcels develop separately, and at different times, the Town cannot dictate a specific grid of private streets. Rather the Town should promote the creation of a mutually-beneficial street grid, through incentives, mediation between adjacent property owners, and other means
xi	**Monitor traffic impacts and implement mitigation strategies from Transportation chapter, as warranted**	
xii	**Create excitement about the TRG**	• Particularly in portions of the TRG that are not yet ready for redevelopment, temporary activations can plan a key role in bringing users to the area in the meantime. Examples of such activations include beer gardens, farmers markets, holiday markets, and other seasonal attractions

Project Phasing - Developable Lots

The graphics below highlight the relationship between present ownership patterns, existing public and utility rights-of-way, and the development framework proposed for the SAP. Although the entire TRG is in private control with only the Herndon Parkway as a public right-of-way, the framework allows for the development of individual parcels, small clusters of parcels, large aggregations of parcels, or the entire SAP as a cohesive unit. The plan was devised to respond to existing roadway access and frontage and to facilitate redevelopment while maximizing flexibility.
As shown, despite the complex relationship between the underlying ownership patterns and the proposed framework, many of the lots can be developed independently -- i.e. without any other owner or ownership group developing their properties -- thus ensuring flexibility and encouraging action. In addition, three (3) existing lots remain as currently configured, four (4) large lots have frontage and are fully accessible along Herndon Parkway.

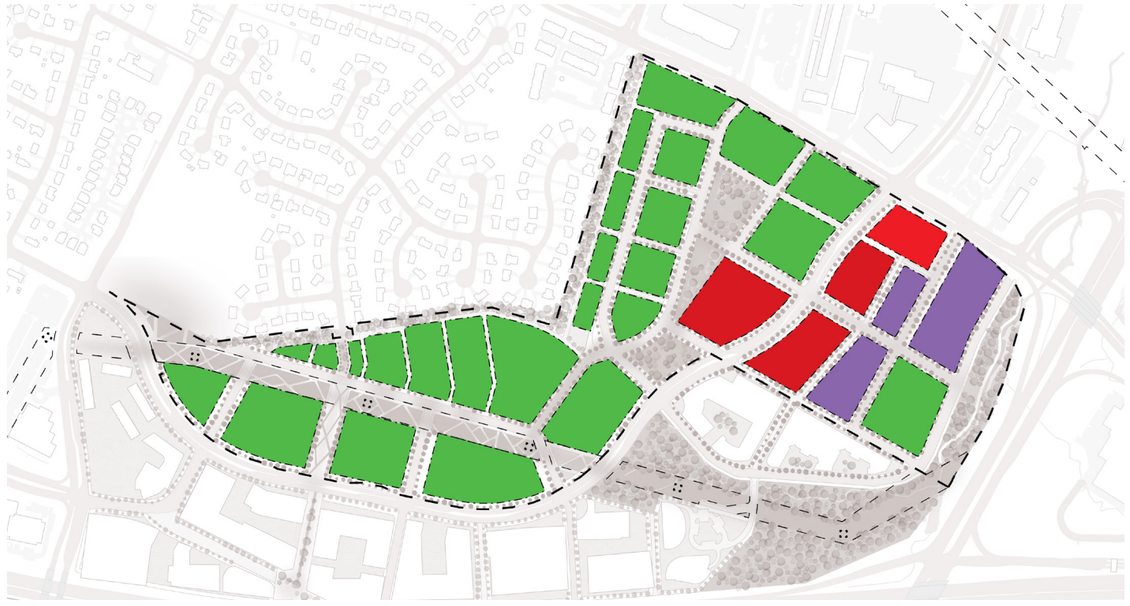
	Lot can be developed without any other owner / ownership group developing their properties.
	Lots are proposed to remain as is.
	Lots are under multiple ownerships, complicating phasing.*

*Nevertheless, the proposed block forms could be achieved without the need for cooperation of neighboring lot owners, due to site accessibility, in both existing and proposed configurations.

PHASING - CURRENT PROPERTY OWNERSHIP OVERLAYED ON PROPOSED LOTS



PHASING - REQUIRED COORDINATION BETWEEN MULTIPLE OWNER GROUPS



Project Phasing - Infrastructure

In the TRG, roadways and open spaces will be privately owned and operated, but will serve a critical public purpose. Accordingly, it is imperative to plan the configuration and coordinate the implementation of the shared infrastructure carefully. Taken together the proposed roadways and open spaces will provide access, facilitate circulation, and offer an attractive public realm to support and enliven the development. They have been configured to service each of the 26 parcels, which might be redeveloped at any given time in response to market conditions and private investment objectives. Accordingly, the framework includes a highly functional road network that respects existing property lines and ownership patterns, connects to existing and adjacent public roadways, and offers a fine-grained and interconnected grid. Secondary and tertiary roads and alleys connect directly to existing roads or serve single properties in order to reduce complexity, enhance flexibility, and ensure access.

Park Drive

Park Drive provides an important route through the SAP, running roughly parallel to and connecting at key points to the Herndon Parkway. While its operation is critical to the functionality of the TRG, the proposed roadway does span multiple parcel boundaries and property ownerships. Accordingly, it is important that the Town work closely with property owners and private developers to ensure coordination, facilitate the timely development of a continuous Park Road, and provide for sequential implementation to provide necessary access, facilitate circulation, and support traffic flow.

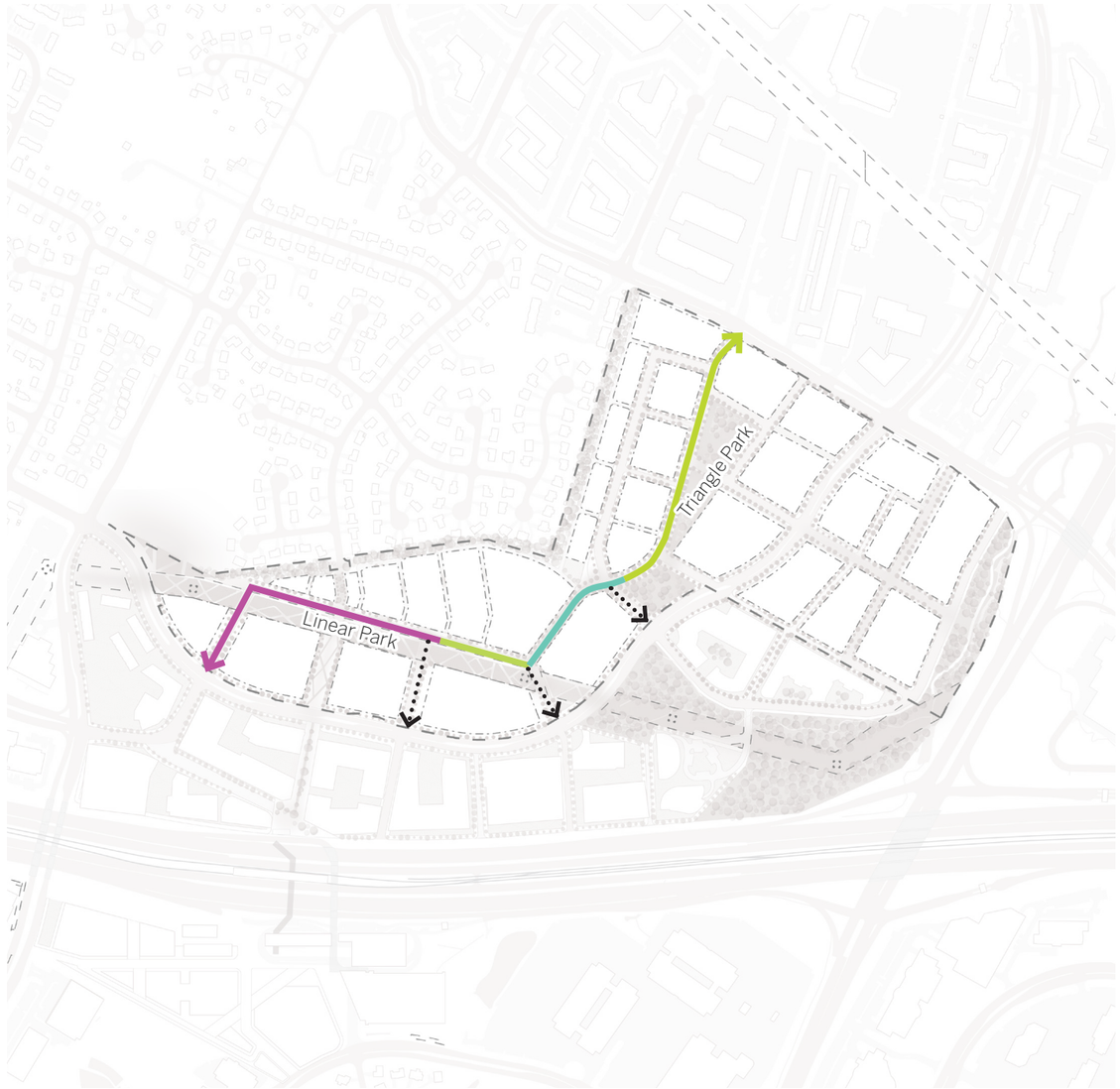
In the graphic to the right, Park Drive is highlighted. The different colors highlight the different property ownerships. Irrespective of whether on not the other adjacent properties redevelop, it would be sensible for any of the four owners of the proposed Park Drive to build their own segment of the road as it would allow them to create logical linkages with the Herndon Parkway.

Linear Park and Triangle Park

Linear Park (described above in the Recreation and Open Space segment of the Urban Design Frameworks chapter) spans the land of three owners. Triangle Park also spans three property lines. Each of these six segments of land could be severed from the others and still create a valuable privately-owned, publicly accessible park space. The Town should incentivize owners to develop these areas as parks irrespective of the development intentions of their neighbors.

When it comes to properly aligning the parks, though, as multiple owners develop their segment, the Town should support the ownership community in creating strategies for a cohesive public space. It may make sense for a single landscape architect to design the land across parcels to create cohesion. If that is not a possibility, park paths and other features should at least align. The Town should offer to coordinate or mediate to encourage effective communication and responsibility sharing across ownerships.

These critical elements, the parks and Park Drive, form the backbone of the TRG in creating a truly networked neighborhood. They also are the most complicated in terms of phasing because of how many property lines they span. The Town's leadership and attentiveness to this issue going forward will be essential to the success of the TRG.



Appendix

Page 140 of 483

TRG
TRANSIT - RELATED GROWTH AREA

TOWN OF Herndon
SOM

SITE CONDITIONS ANALYSIS

TOWN OF HERNDON TRANSIT-RELATED SMALL AREA PLAN
NOVEMBER 2022

DRAFT

DRAFT

SITE CONDITIONS ANALYSIS

1. Introduction
2. Site Context
   2.1 Views of the Vicinity
   2.2 Views Around the Site
   2.3 View Corridors
3. Site Features
   3.1 Natural Resources
   3.2 Topography
   3.3 Climate and Wind Patterns
   3.4 Sun Orientation and Shading
   3.5 Building Orientation
   3.6 Site Circulation
4. Constraints and Opportunities
   4.1 Property Ownership Patterns
   4.2 Dominion Easement
   4.3 Heights
   4.4 Transitional Space, Frontages and Buffers

DRAFT

DRAFT

INTRODUCTION

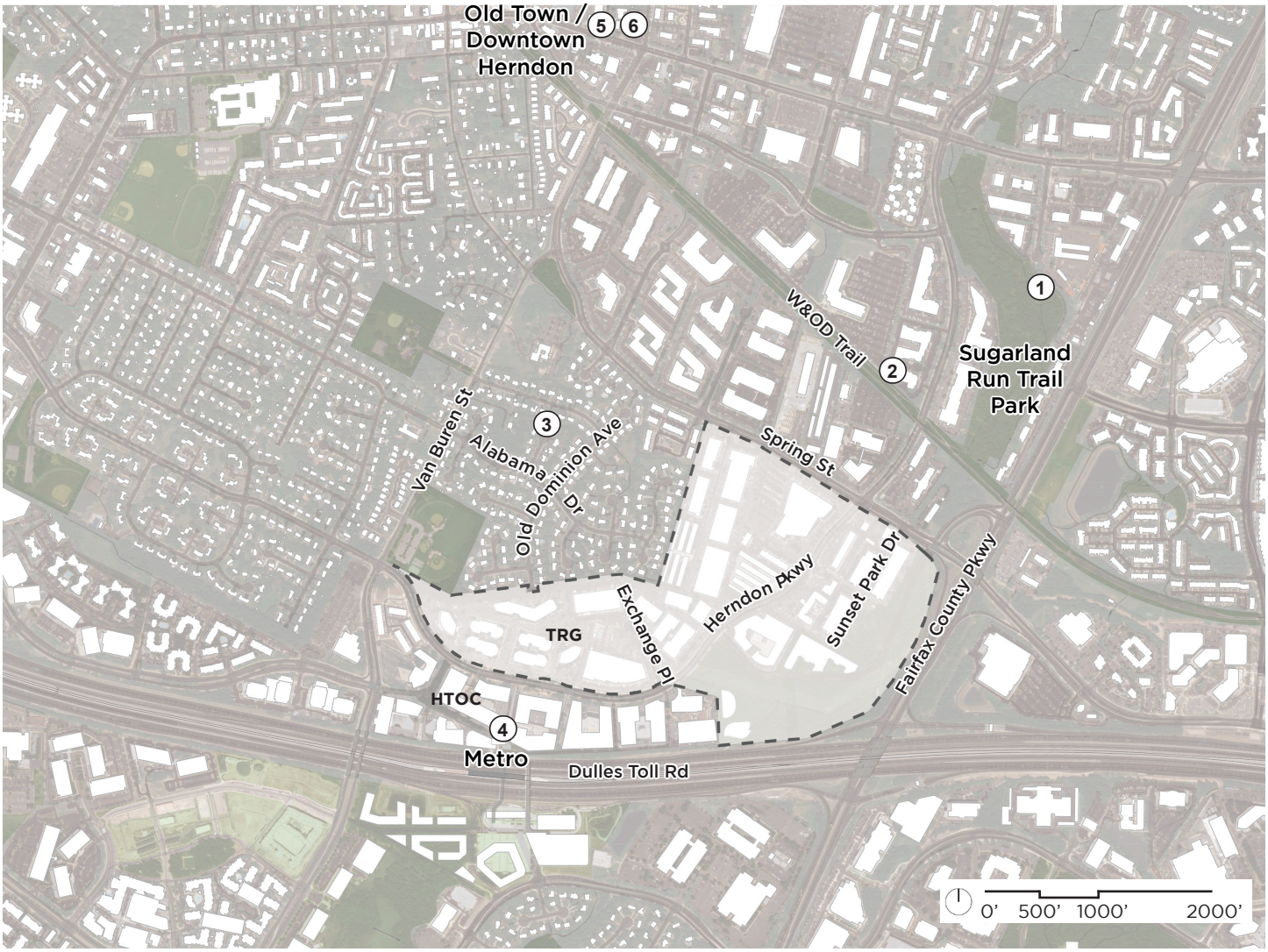
The purpose of this study is to analyze site conditions and highlight key features on the TRG that will help inform the Constraints and Opportunities Report, with the ultimate goal of shaping the design vision for the TRG.

This Site Condition Analysis memorandum reviews and analyzes environmental constraints of the study area including identification and study natural resource areas, view corridors, wetlands and potential remediation issues and needs. Grade and other features of the transitional space, frontages and buffers between existing residential neighborhoods and existing properties in the TRG have been studied and mapped.

Our analysis highlights property ownership patterns within the TRG. We present findings about physical impacts of the Dominion Energy easement and overhead lines. Our analysis comments on the impact on future development and density as it relates to building heights and locations, as well as activities and site features.

DRAFT

Site Context | **Views of the Vicinity**



The TRG site lies at the southern boundary of the Town of Herndon, across the street from the Metro Station and the ongoing HTOC development area, bounded in large part by major roadways: Dulles Toll Road, Fairfax County Parkway, Spring Street and the Herndon Parkway.

The Downs of Herndon, a single-use, single-family home neighborhood, borders the rest of the site, at the northern perimeter.

The W&OD Trail, a popular, regional biking enthusiast destination lies just one block from the TRG Spring St. boundary, at a 7-minute bike ride to the Old Town of Herndon and to the Reston Town Center.

Another park amenity lying just a block from the TRG is the Sugarland Run Stream Valley Park, whose waterway seemingly originates within the TRG.

DRAFT



1 Sugarland Run Stream Valley Park



2 W & OD Trail



3 The Downs of Herndon



4 Herndon Metro Station, pavilion and path to Herndon Parkway



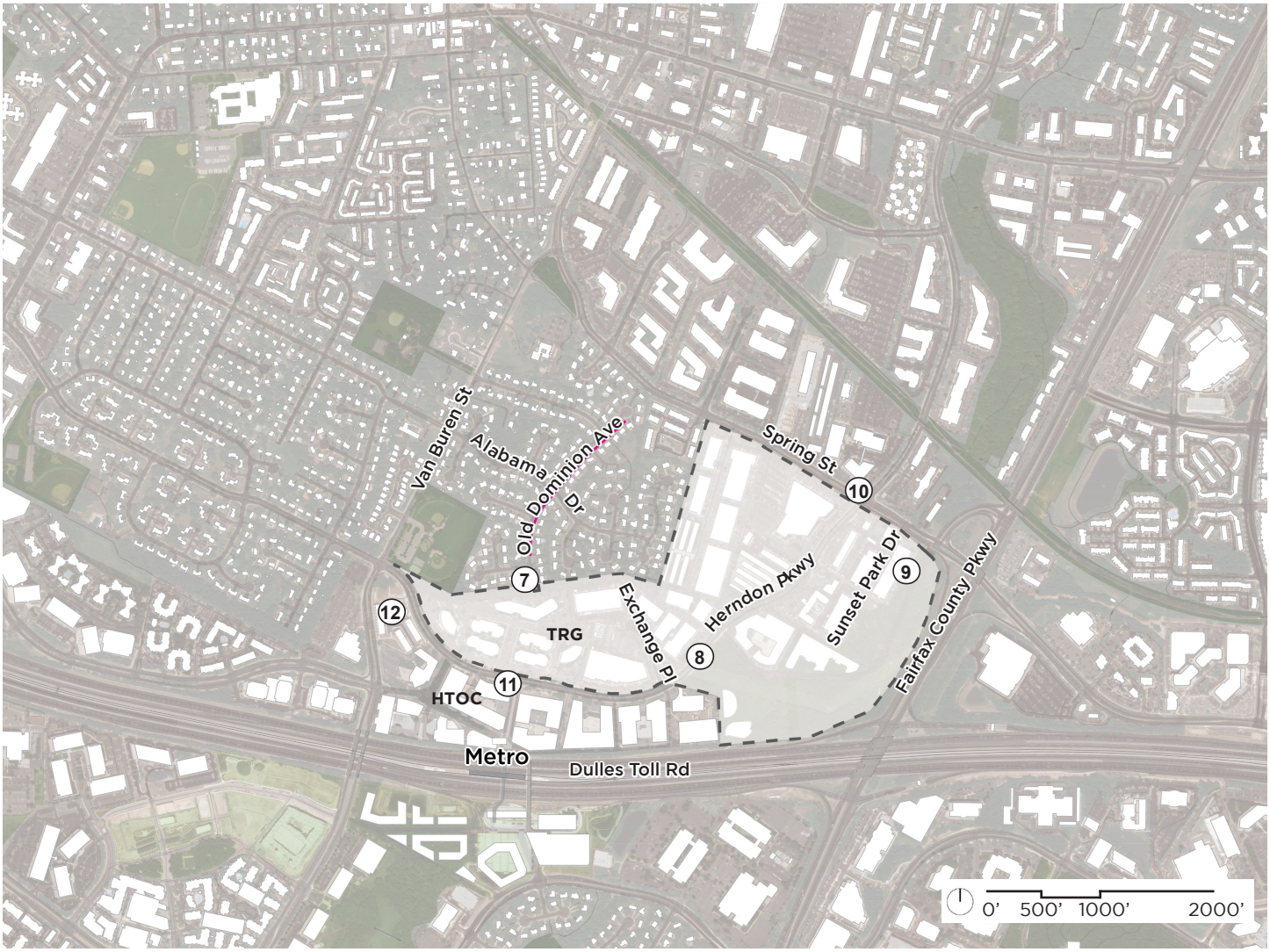
5 Downtown Herndon, landmark shop by the W&OD Trail



6 Downtown Herndon, new Junction Square mixed use development

DRAFT

Site Context | **Views Around the Site**



The western part of the TRG, between Exchange Place and Van Buren St, is the area within a 5-minute walk from the Metro, with newly built pedestrian crossing (photo 11) connecting the Metro Station path to the TRG across the Herndon Parkway. Further north lies a pedestrian opening through the vegetated buffer (photo 7) connecting to the Downs neighborhood. It is known for residents to walk to Sunset Business Park (photo 9) via this connector, presently a circuitous 15-minute walk through multiple office building parking lots and along the winding Herndon Parkway.

The largely vegetated area abutting Fairfax County Parkway with a small frontage to Herndon Parkway (photo 8) is the apparent origin of the Sugarland Run, a stream that runs northward through a forested trail park outflowing to the Potomac River.

The intersection of Spring St and Herndon Parkway (photo 10), is the major auto-oriented access to the TRG site, juxtaposing with the proximate Sugarland Run greenery, and the existing (photo 12) and planned neighborhoods planned towards the west.

DRAFT



⑦ Pedestrian dirt path through vegetated to Old Dominion Avenue



⑧ Herndon Parkway



⑨ Sunset Business Park



⑩ Spring Street

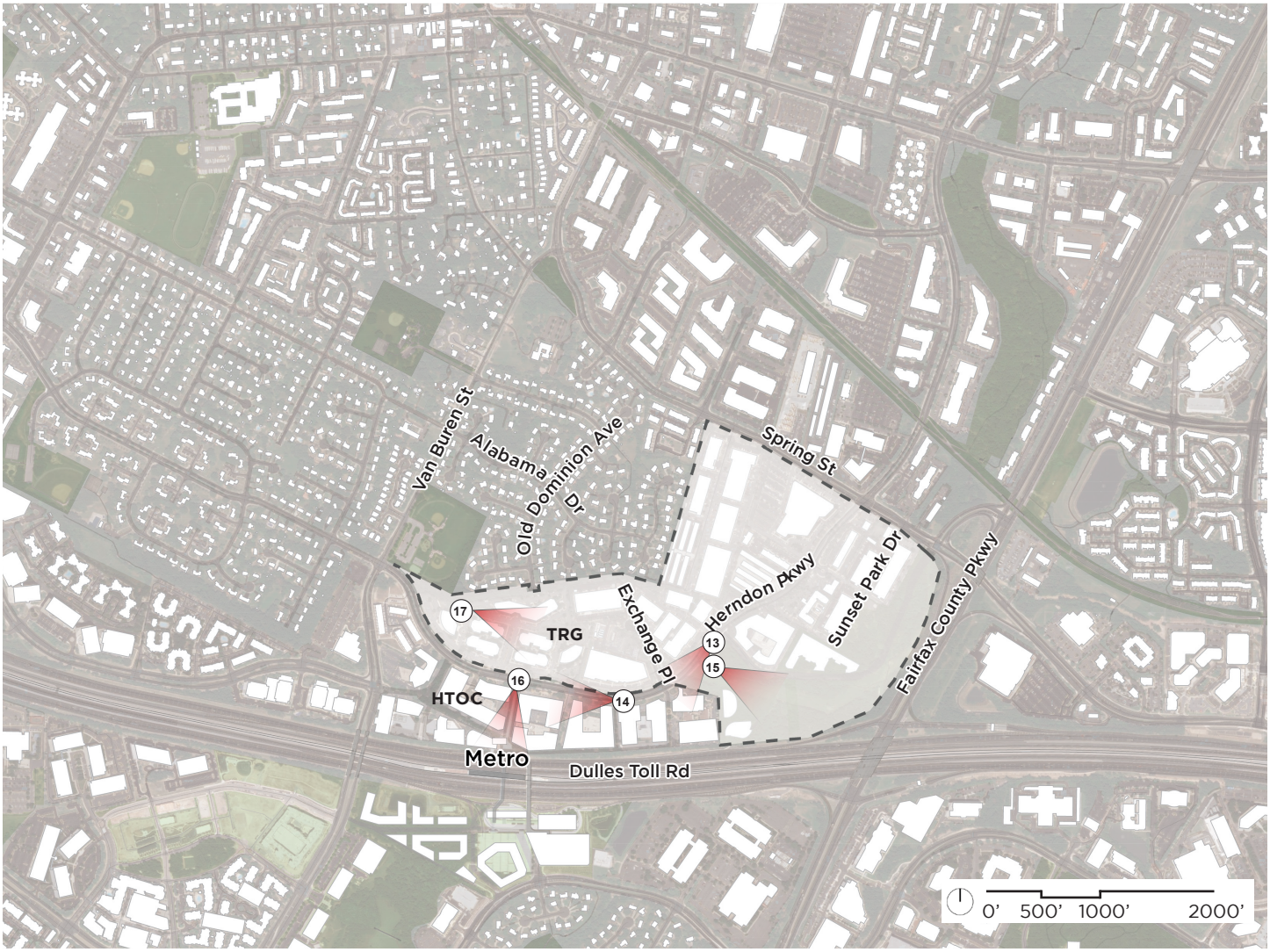


⑪ Metro Station pedestrian crossing to TRG at Herndon Pkwy



⑫ Metro Square Condo Complex

Site Context | **View Corridors**



The TRG features several scenic vistas and view corridors. The most significant view corridor follows the Dominion easement in the east-west direction. The easement is free of obstructions and extends in straight-line segments, creating continuous unimpeded views. This corridor frames two views, one of the undeveloped space, and the second of the Reston skyline.

While the Dominion easement has the benefit of framing view corridors, the pylons and wires themselves could be considered eyesores. In the Visioning stage, design strategies can be employed to highlight the view corridor, and simultaneously obscure the electricity pylons. Careful placement and orientation of building masses, location and species of trees, and streetscape design can all help to highlight existing views.

DRAFT



⑬ View along the greener segment of Herndon Parkway, near Fairbrook



⑭ Typical view along the Herndon Parkway



⑮ Potential Sugarland Run stream and trail gateway



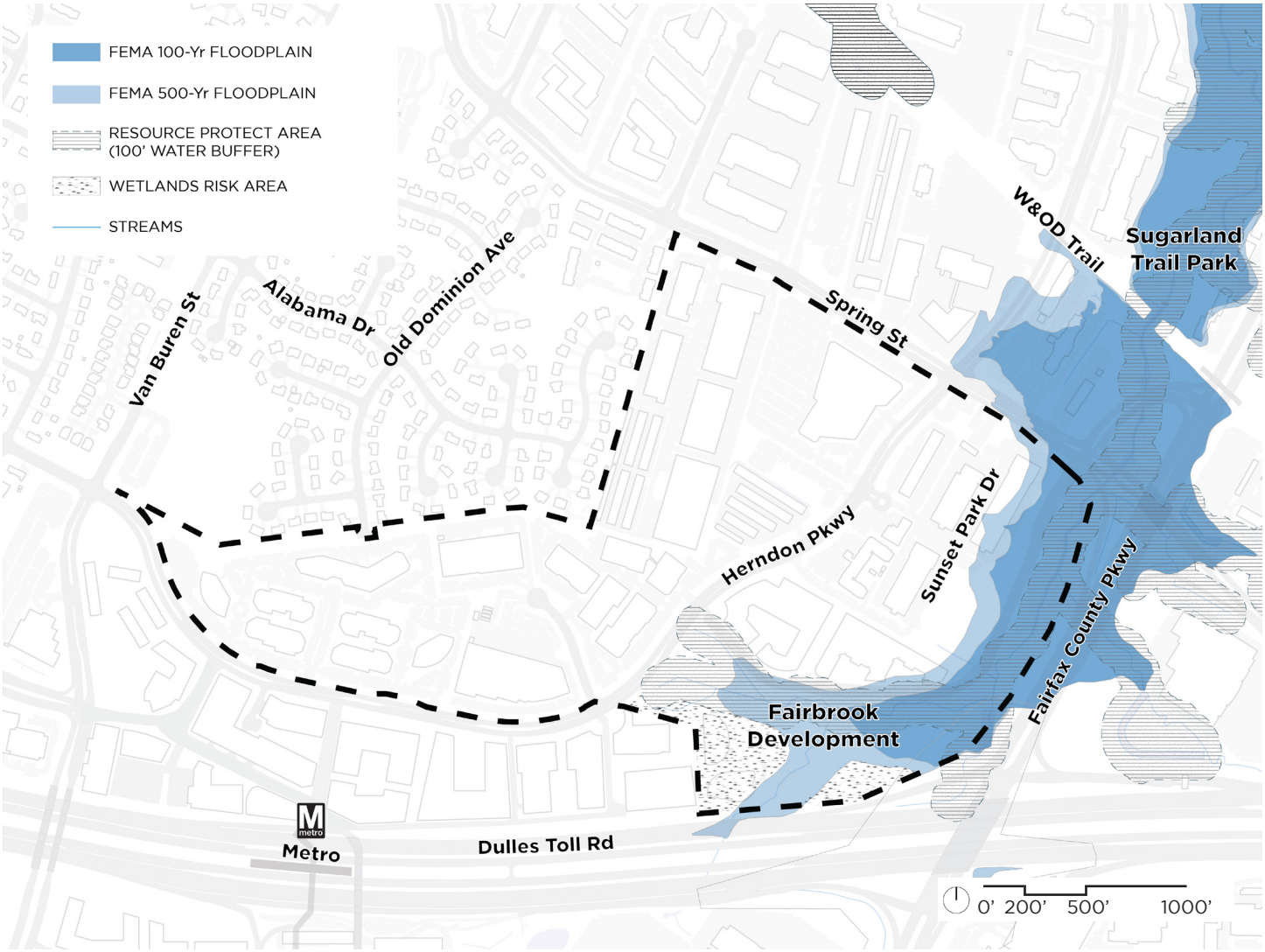
⑯ View towards the Metro pavilion, to be flanked by HTOC development



⑰ View of the new Reston Gateway skyline from the TRG

DRAFT

Site Features | **Natural Resources**

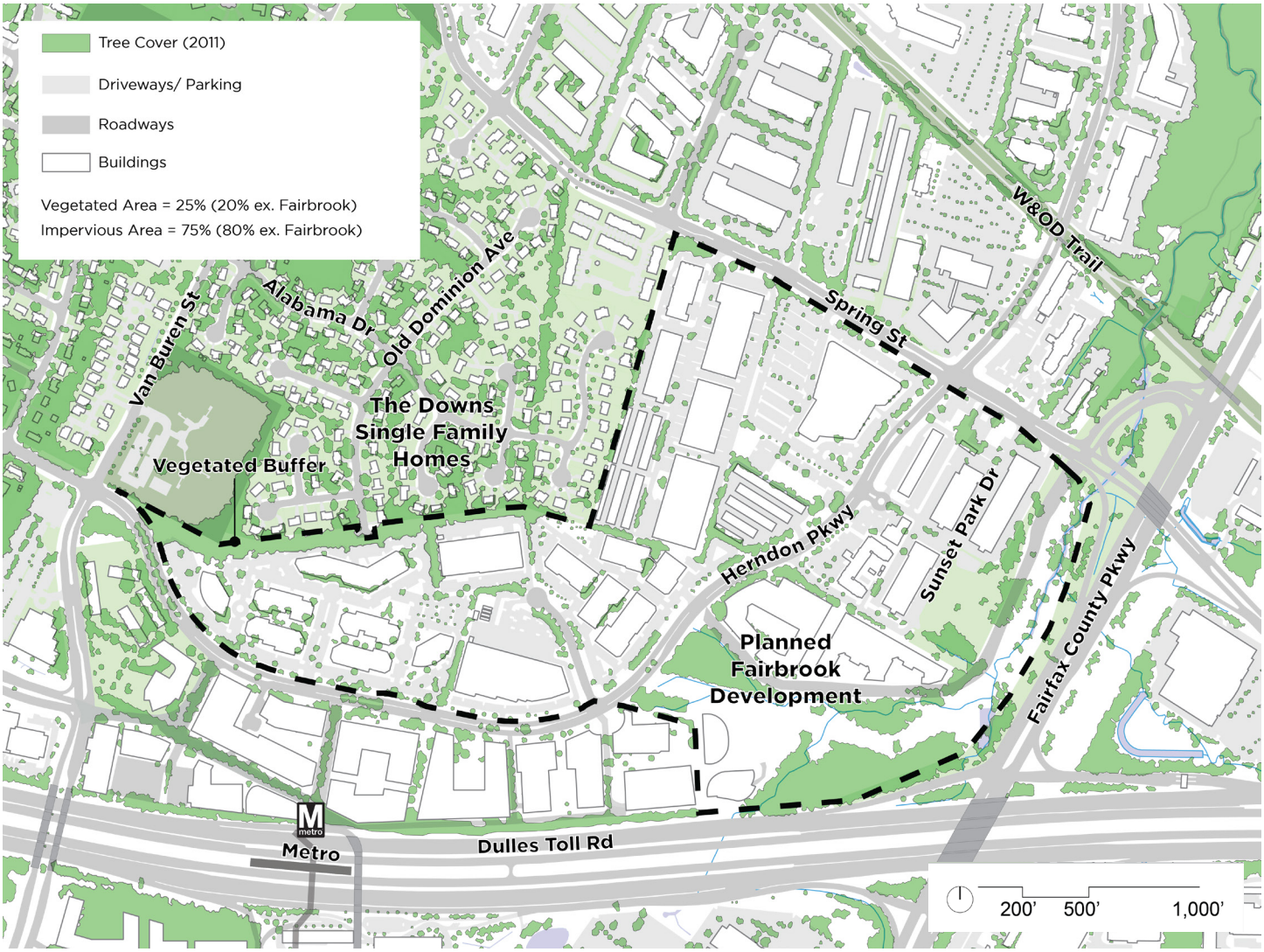


Wetlands and RPA's shall be field verified by a wetlands expert prior to any design or site plan submission. Impacts are subject to Army Corps of Engineers approval, and shall be analyzed at the site plan level. Field surveys and assessments have already been done as part of the Fairbrook Development and lie with the Town's records for reference. The planning-level observations herein are based on an inspection of the overall site, utilizing imagery and GIS data.

The vast majority of the TRG, 77%, is already developed as office/industrial and is impervious and void of natural resources. Wetlands and RPA areas, lie on 23% of the TRG, consisting of most of the Fairbrook property and bordering the Fairfax County Parkway. The area on the Fairbrook property contains three tributary streams to Sugarland Run which lie outside of the major floodplain. There are other natural resource areas, but they lie within the floodplain, which is already a protected area, and therefore, not an area of concern for future development. Development within the floodplain is heavily restricted and

DRAFT

Site Features | **Tree Cover**

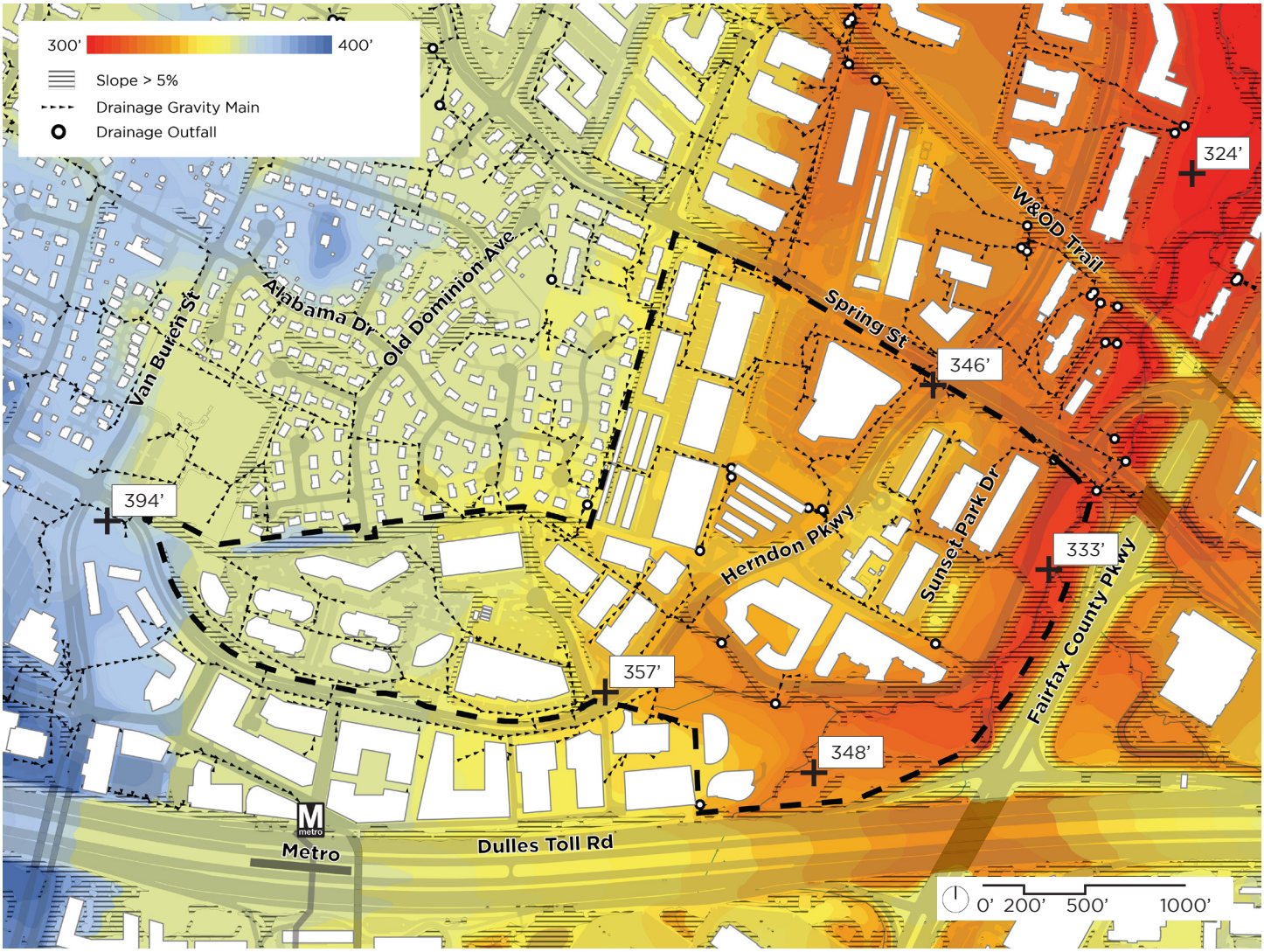


is subject to FEMA approval. Any development within the "wetlands risk area" will be difficult due to the presence of natural resources. Since the potential development areas containing natural resources are low in quantity, the potential for wetland remediation, mitigation, credits, stream restoration, etc., are of low concern. As long as stormwater quality and quantity regulations are met, there should not be significant impacts to current natural resources.

Aside from the floodplain and the Fairbrook property, the permeable areas within the TRG are minimal, those being the green area between the floodplain and Sunset Park Drive, and scattered peripheral landscaped buffers. These areas may be vegetated, but most likely do not contain any natural resources, as these are man-made features. Areas within the Dominion easements most likely do not contain natural resources since they have been previously graded, and more importantly are also heavily regulated and subject to restrictions and encroachment agreements with Dominion.

DRAFT

Site Features | **Topography**



Overall, the site slopes gently from east to west at approximately 2-3%. Along the north to south axis, the TRG is nearly flat.

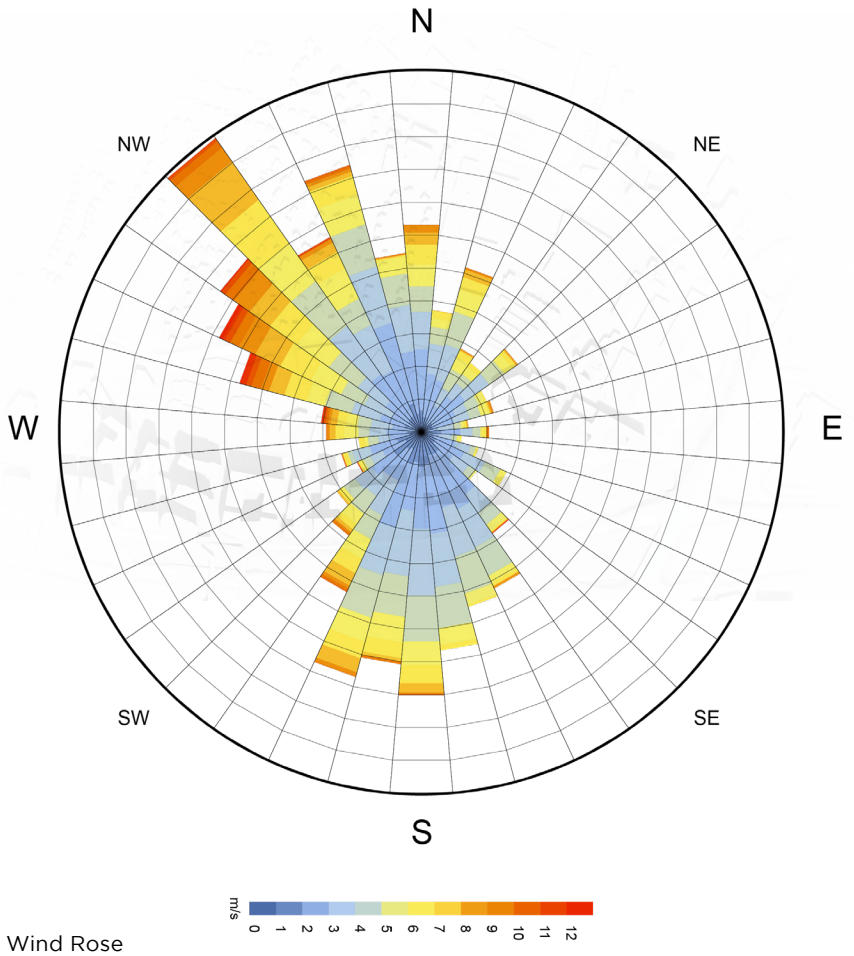
Within the TRG, there are steeply sloped areas: the banks of Sugarland Run; the embankments of the Fairfax County Parkway and the Dulles Toll Road; and the vegetated buffer separating the TRG from the Downs. These areas more or less fixed, but should have minimal impact on any redevelopment within the study area. There are also steep slopes centrally located within the TRG which separate building edges, parking pads, and roadways. These steeply graded areas would likely need to shift with any redevelopment.

The existing drainage and sewer gravity mains follow the east to west slope and outfall primarily into Sugarland Run, at the east of the site.

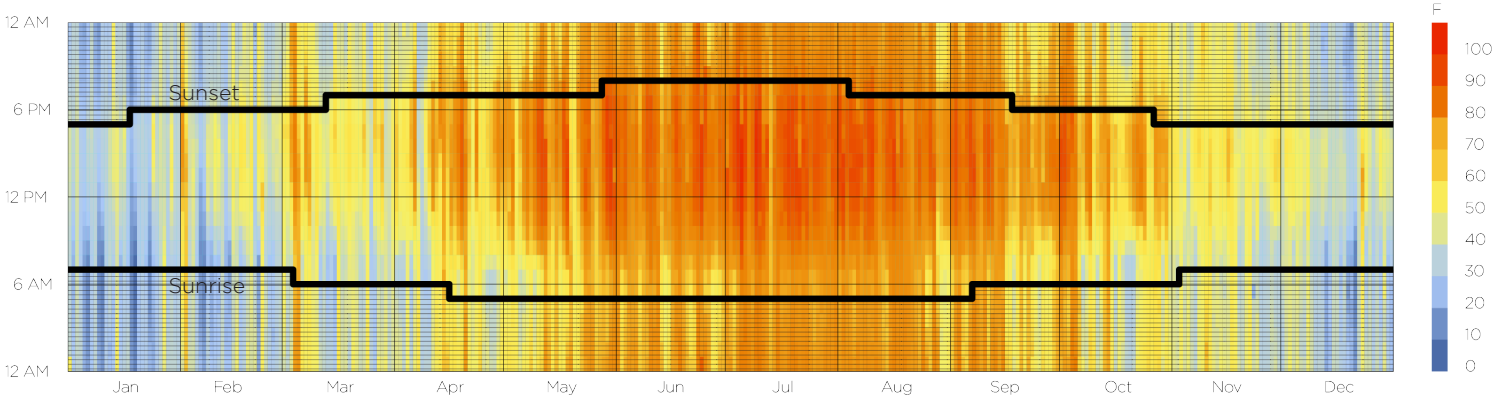
DRAFT

Overall, Herndon's climate is characterized by hot, humid summers and mild winters. Design strategies should seek to mitigate high temperatures in the summertime. Open, public space should have areas which are shaded in the summer. Paving and landscape materials should be carefully chosen to avoid excessive heat build up. Additionally building orientations should be carefully chosen to avoid excessive solar radiation.

Generally, the major winds are along the north-south rather than east-west axis, with the predominant wind coming from the NW. In this case, the NW wind approaches the TRG from the Downs of Herndon. Wind speeds are generally moderate, with upper bounds of approximately 26 mph, which the National Weather Service characterizes as a "Strong Breeze." Future development in the HTOC may affect the experience of southerly winds within the TRG.



Wind Rose
Segment length indicates relative wind frequency.
Segment direction indicates the direction that the wind is coming *from*
Segment color indicates wind speed.



Hourly Dry Bulb Temperature (30-yr average)

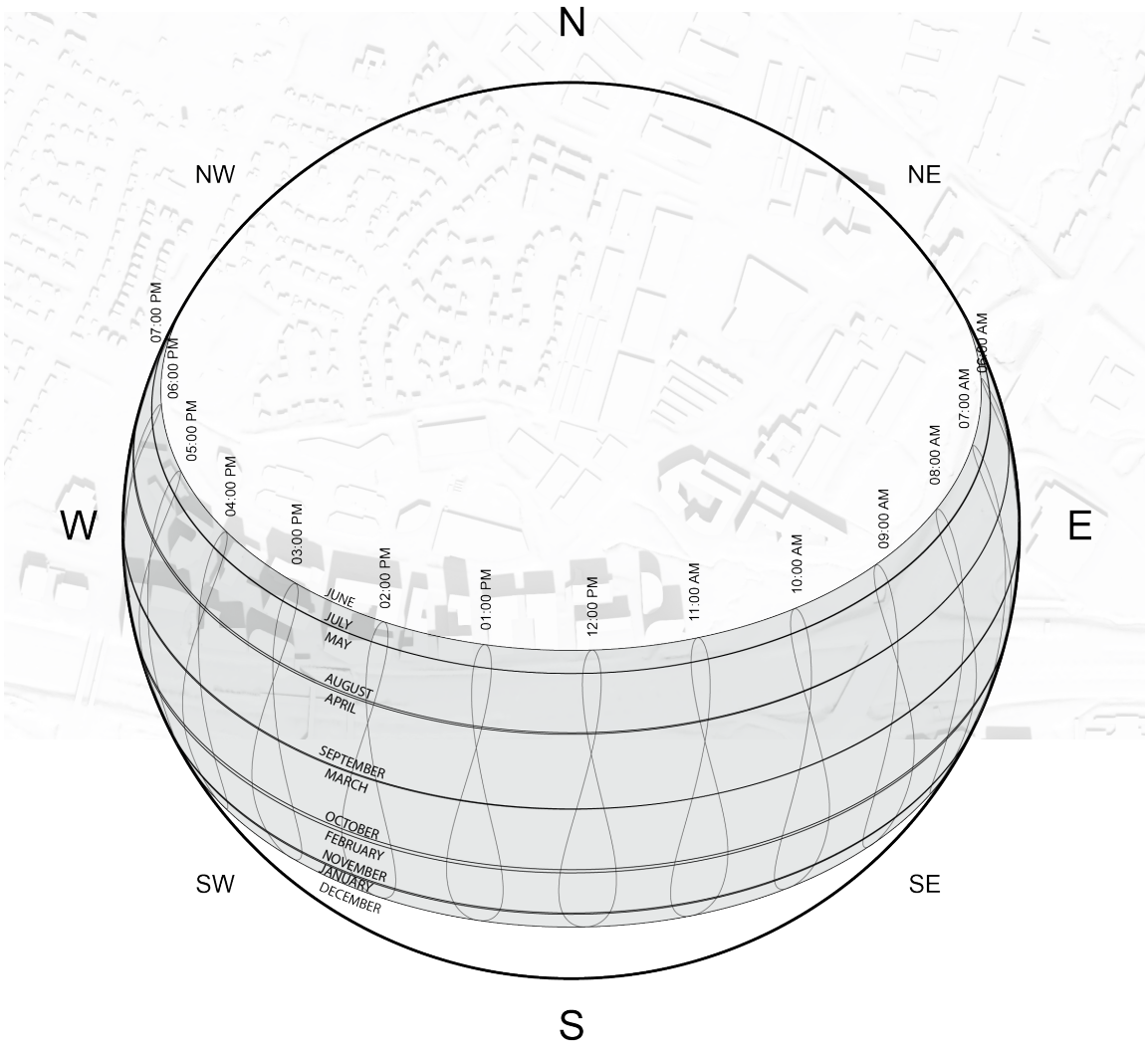
DRAFT

Site Features | **Sun Orientation & Shading**

With the anticipated development of the HTOC a study was conducted to evaluate what, if any, shading impacts should be expected within the TRG boundaries. In order to approximate future HTOC development, the general building masses illustrated in the original HTOC report were used. Where available, approximate building masses from approved HTOC developments were used. For the solstices and equinoxes, hourly shadow patterns were modeled and overlayed for the hours of 8:00 AM - 4:00PM.
Even at full HTOC build out, the vast majority of the TRG will not be significantly impacted.

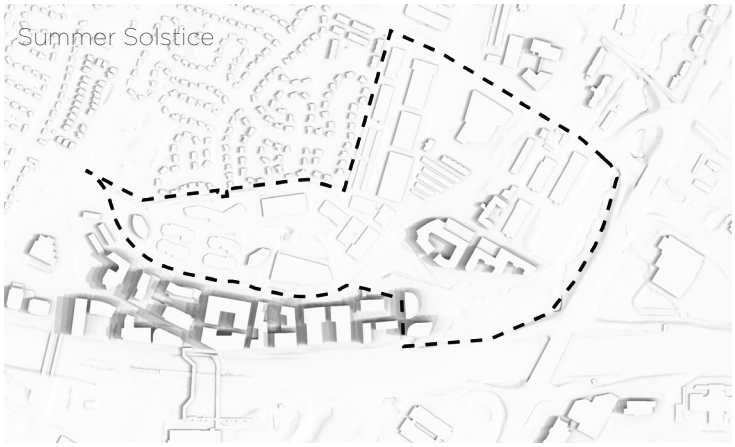
However, the stretch of the Herndon Parkway immediately adjacent to the HTOC would be shaded at least some part of the day throughout the year. In the weeks surrounding the winter solstice, some shading should be expected to cross the Parkway and impact the TRG for ~200 feet at the ground plane.

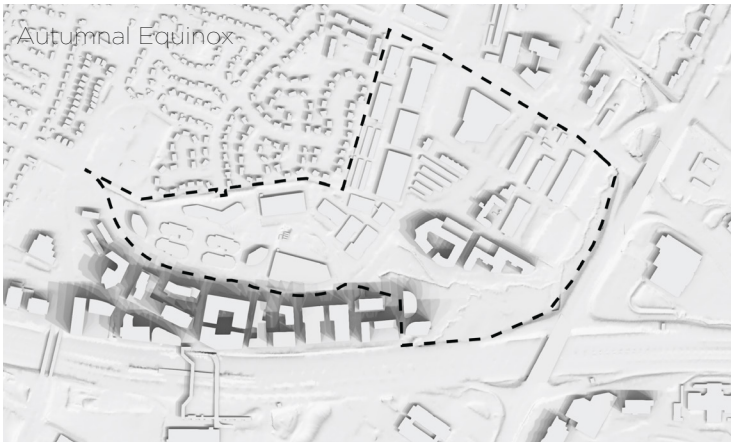
In the Visioning Phase, consideration to sun orientation and shading should be prioritized, especially when it comes to building mass orientation.

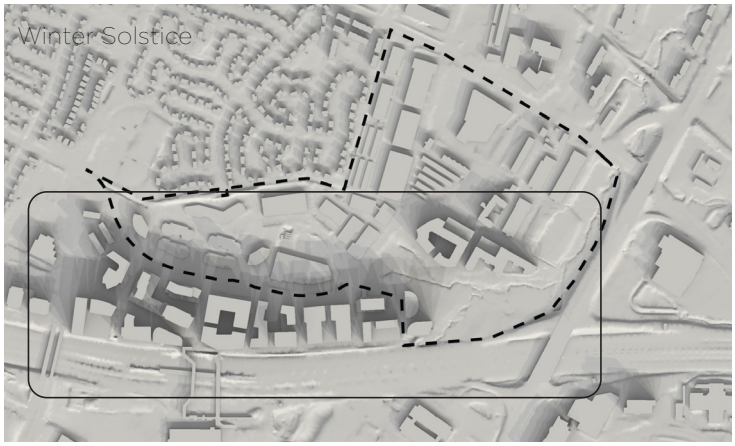


DRAFT


Vernal Equinox


Summer Solstice

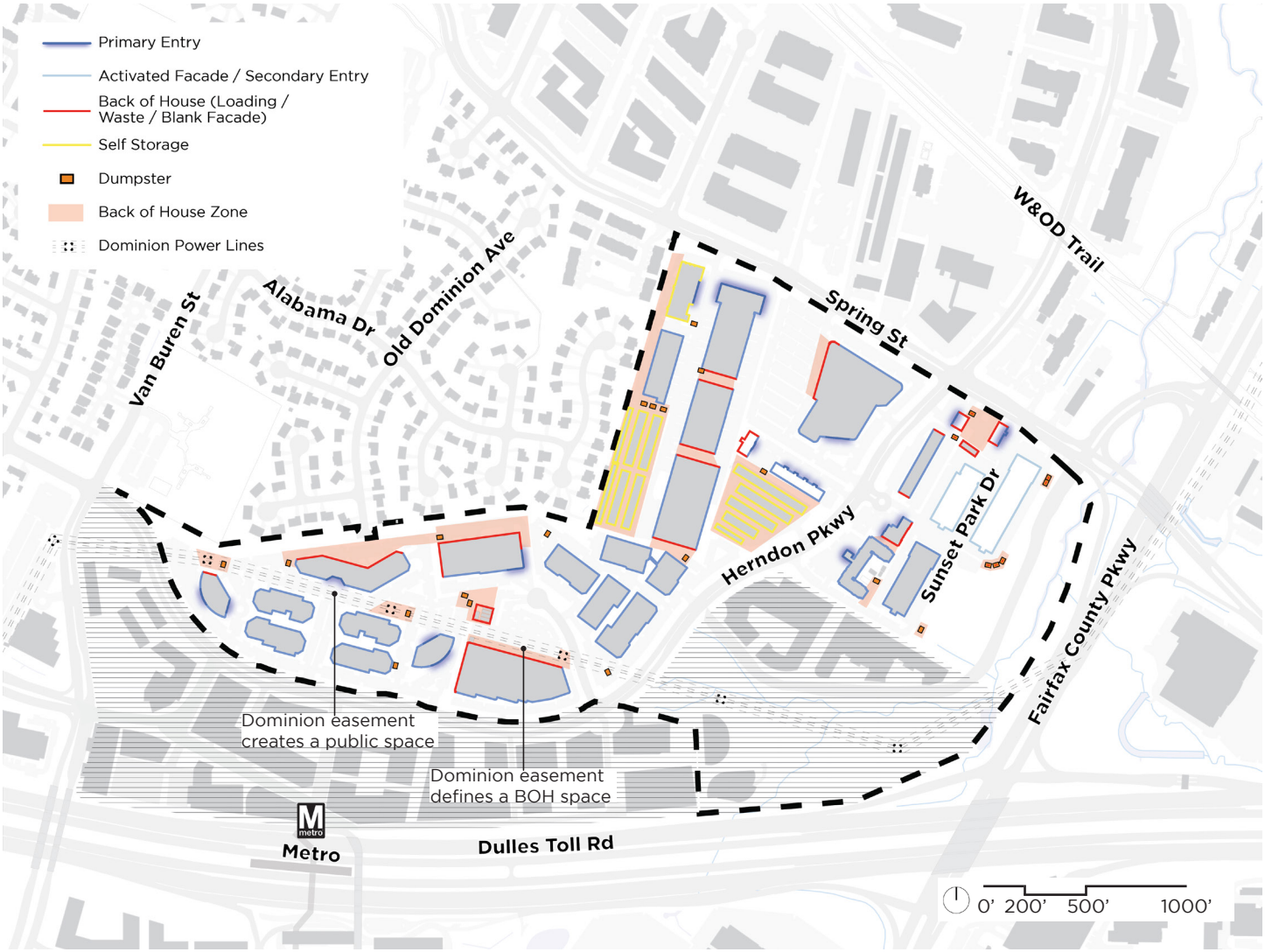

Autumnal Equinox


Winter Solstice


Winter Solstice (Zoom In)

DRAFT

Site Features | **Building Orientation**

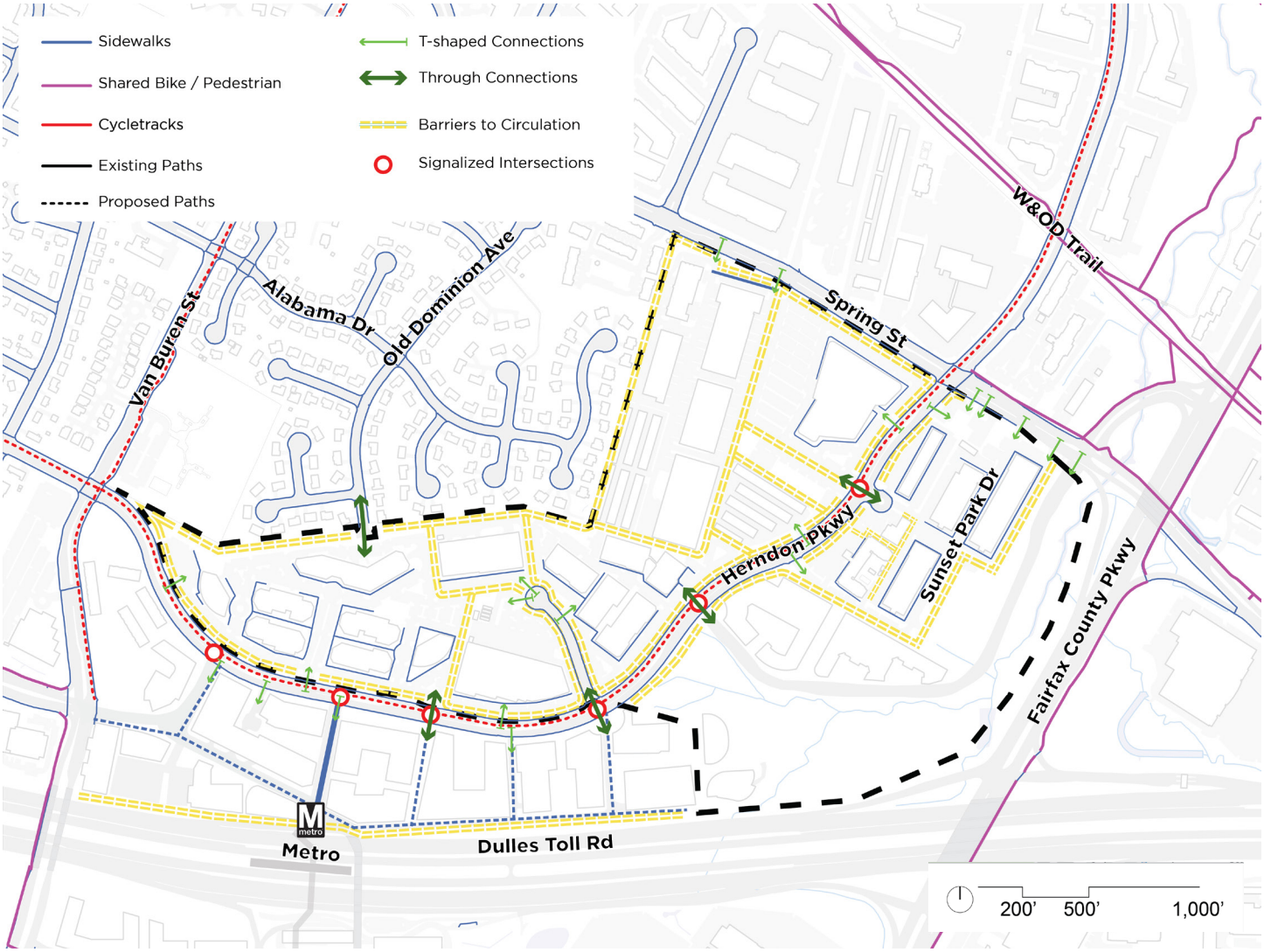


The map above illustrates the existing building orientations within the TRG, and the way in which front of house (FOH) vs back of house (BOH) spaces are organized. In its current configuration, there is little differentiation in the way in which FOH and BOH zones are distributed throughout site. In some areas, BOH zones abut natural barriers, which create clearly defined and obscured areas for these service functions. In other parts of the study area, however, BOH zones are located prominently within the site. In some cases, the BOH of one building faces the main entry of another. This lack of hierarchy is problematic because it creates amorphous, ill-defined public spaces.

This challenge should be addressed during Visioning by creating clearly differentiated areas for gathering (building approaches, entries and public space) and service (waste collection and removal, loading, etc.)

This lack of spatial organization can also be seen in the existing circulation patterns. Generally, buildings within the TRG are laid

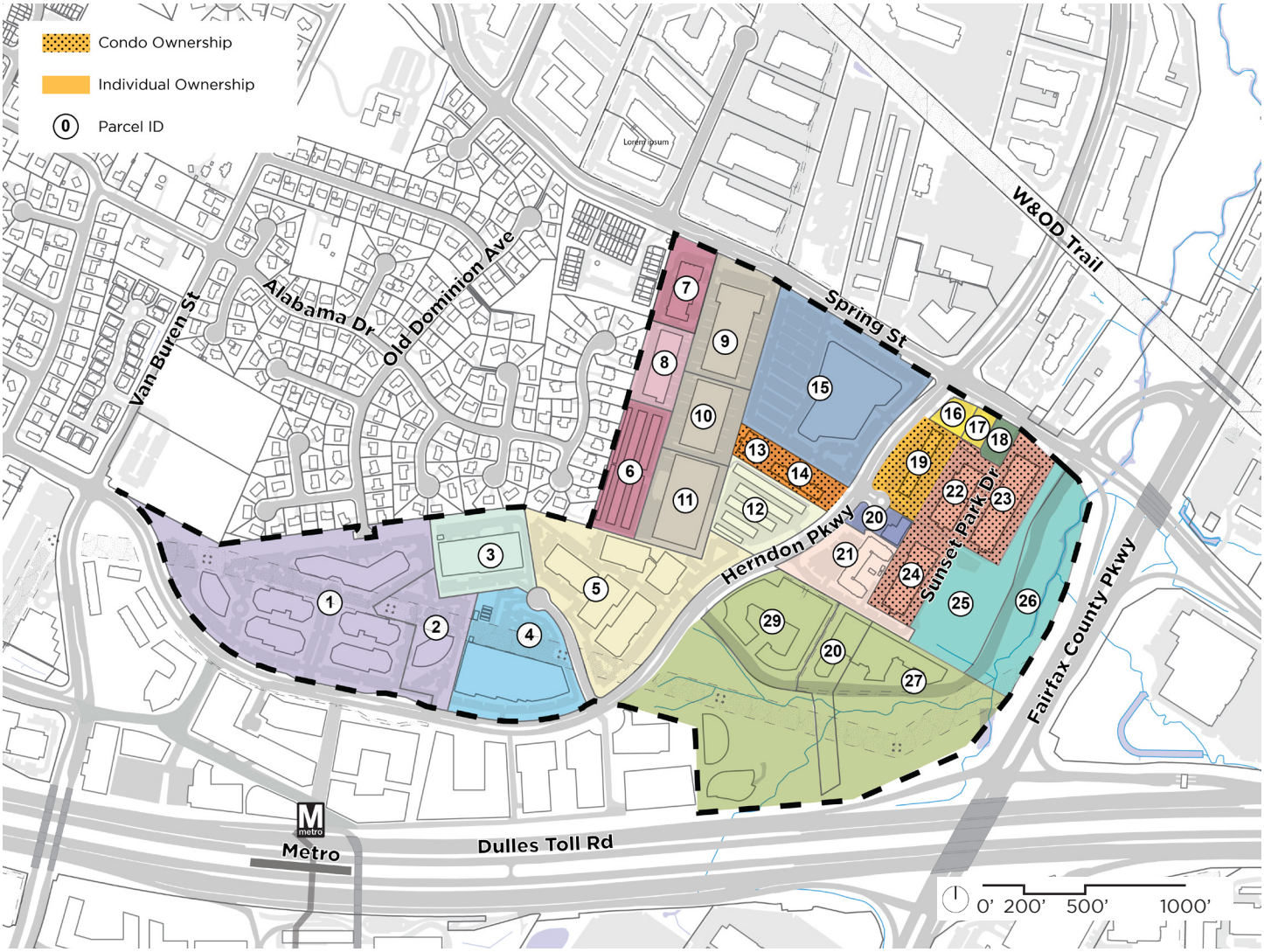
DRAFT



out in a “sea of parking,” without a continuous street network. This configuration works well for passenger vehicles, which use Herndon Parkway to reach their parking lot, and leave the same way. For pedestrians or cyclists, however, who might need to transverse the study area, this lack of a street network presents a challenge. In the design process, particular attention should be paid to creating a network of shared, legible, continuous paths, that integrate seamlessly with the HTOC, Spring Street and Van Buren Street.

DRAFT

Constraints & Opportunities | **Property Ownership Patterns**



The map above illustrates property ownership, where each property owner is denoted by a unique color. Note how some colors span across multiple parcels, revealing the opportunity of single ownership (e.g., parcels 1-2 and 9-10-11), whether contiguous or not (parcels 6 and 7). Condo ownership (like parcels 22-23-24) may bring either a challenge or an opportunity, depending on how condo owners work together.

The TRG has 26 parcels and 94 owners. A majority of the land (88%) is owned by individual property owners and the remaining land area (22%) is owned by condo ownership. Condo ownership properties include the Springwood Professional Center, Parkway Crossing and Sunset Business Park.

One prevalent opportunity throughout the TRG is building age: most of the buildings date back to the 1980's and 1990's, which puts them at the end of their useful lifespan or are likely in need of will need major renovation in the near future.

DRAFT

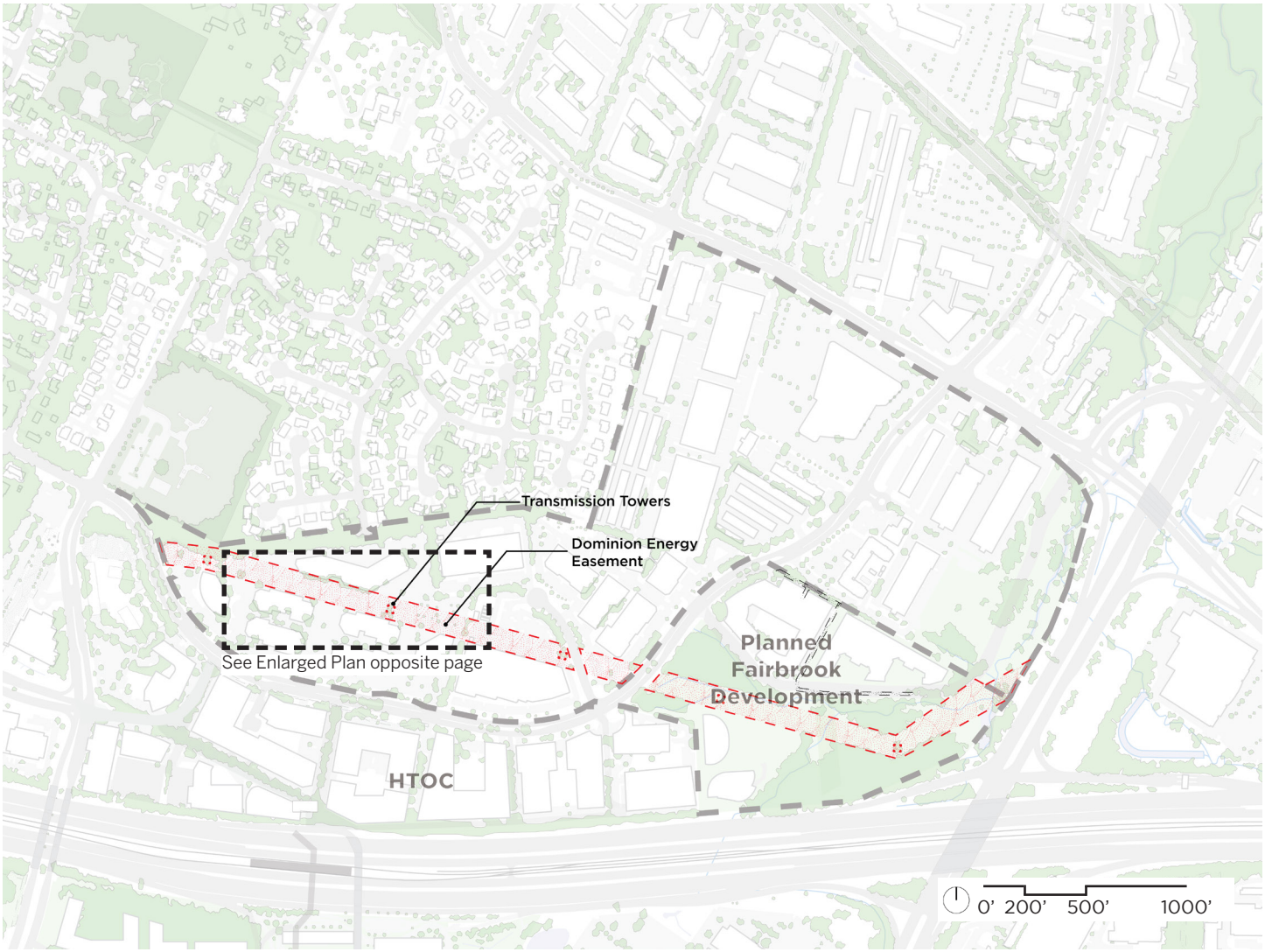
Parcel ID	Property / Main User	Number of Owners	Year Built / Added	Building Age (Years)	Property Land Area (SF)	Property Land Area (Acres)	Property GFA (SF)	FAR	Height (Stories)
1	Shorenstein, Monroe Business Center	1	1986	37					1, 1, 3
2			1988	35	822,649		253,263	0.31	3
3	Beanstalk	1	1985	38	158,158		73,094	0.46	1
4	Freddie Mac / Data Center	1	1985	38	272,598		136,603	0.50	2
5	Rooney, Exchange Pl	1	1985	38	410,222		108,402	0.26	1
6	Security Public Storage	1	1985	38					1
7			2004	19	207,645		102,663	0.49	1
8	331-351 Victory Dr	1	1982	41	77,390		36,921	0.48	1
9	301-315 Spring St, 340-366 Victory Dr	1	1980	43					1
10	308-330 Victory Dr		1975	48					1
11	300-302 Victory Dr		1977	46	422,766		204,635	0.48	1
12	Public Storage	1	1985	38	131,586		45,520	0.35	1
13	Springwood Professional Center	5	1988	35					2
14		14	1988	35	76,200		31,400		2
15	Boeing	1	1985	38	432,166		208,265	0.48	2
16	Office Center	1	1987	36					3
17	(vacant)		n/a	n/a	38,016		10,760	0.28	1
18	Dunkin Donuts	1	1969	54	22,223		4,469	0.20	1
19	Parkway Crossing	18	2005	18	97,200		36,000	0.37	2
20	465 Herndon Parkway	1	1995	28	33,621		16,678	0.50	2
21	Hyatt House	1	1999	24	127,894		87,100	0.68	4
22	Sunset Business Park	12	1984	39					1
23		14	1984	39					1
24		17	1984	39	309,100		125,300	0.41	1
25	(vacant, green area)	1	n/a	n/a					n/a
26	(vacant, green area, Sugarland Run)		n/a	n/a	415,580			-	n/a
	TRG (without Fairbrook) Totals:	**94**			4,055,014	**93.1**	**1,481,073**	**0.37**	
27	Fairbrook	1	n/a	n/a					n/a
28			n/a	n/a					n/a
29			1985	38	1,200,741		89,000	0.07	2
	TRG, Including Fairbrook Property, Totals:	**95**			5,255,755	**120.7**	**1,570,073**	**0.30**	

Property Data Summary	SF	Acres	GFA (SF)	FAR
TRG Parcels	4,055,014	**93.1**	**1,481,073**	**0.37**
Fairbrook Parcels	1,200,741	**27.6**	**89,000**	**0.07**
TRG Parcels Total:	5,255,755	**120.7**	**1,570,073**	**0.30**

48% of the buildings in the TRG are single-story followed by 20% 2-story buildings and only two 3-story buildings, yielding a low median FAR is 0.46., which may fit existing zoning in a pre-transit era, but the TRG Small Area Plan is looking increase FAR to be attune with transit oriented developments.

DRAFT

Location



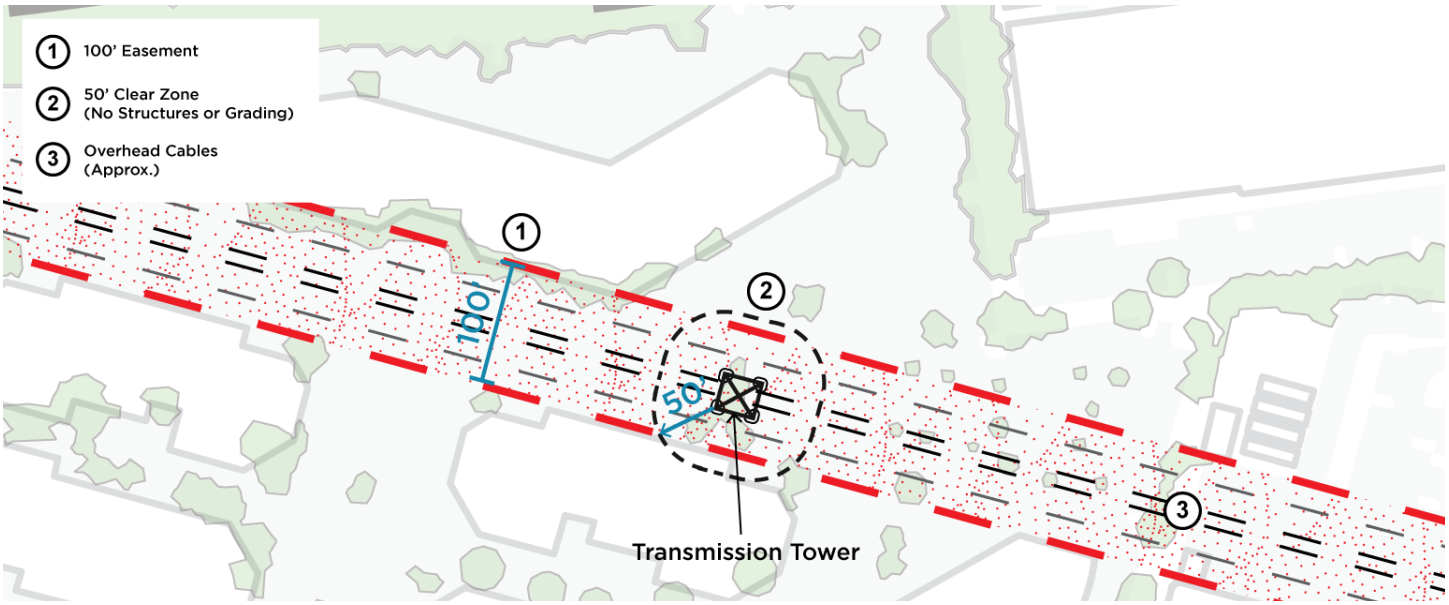
The Dominion Easement bisects the western portion of the TRG site, the area within a 5-minute walk from the Metro and across the Herndon Parkway from the planned HTOC development.

Buildings presently flank the easement on both sides, making its 100-foot clear zone readily apparent in maps and aerial photos, such as the bird's eye view on opposite page. Most of the clear zone is being used for driveways, parking lots, and low landscaping. Dumpster enclosures also exist on the easement, even though requirements (listed and illustrated on opposite page) rule out structures on the easement.

Although the easement poses a major constraint on the TRG, it could also be viewed as an opportunity: is it a divider or a connector; a parking or a park? These opportunities will be explored in the next stages of the project.

DRAFT

Requirements



Enlarged Plan showing clearance requirements

General Requirements:

1. No buildings or structures, including dumpsters and playhouses, are allowed within the easement
2. Road finished grade min 25' clearance under maximum sag of power line
3. No grading within 50' of transmission tower
4. Minimum 36" cover for any storm, water, or sewer within the easement. Wet utilities to be designed for heavy vehicle loading.
5. No blasting within easement
6. Signs shall be no more than 10' in height, and minimum 50' from any structure
7. Light poles shall be maximum 14' in height above grade and no closer than 50' from any structure
8. Contractor to restore any disturbed area within the easement
9. Any encroachments into the easement shall be coordinated with Dominion and subject to an "Encroachment Agreement"

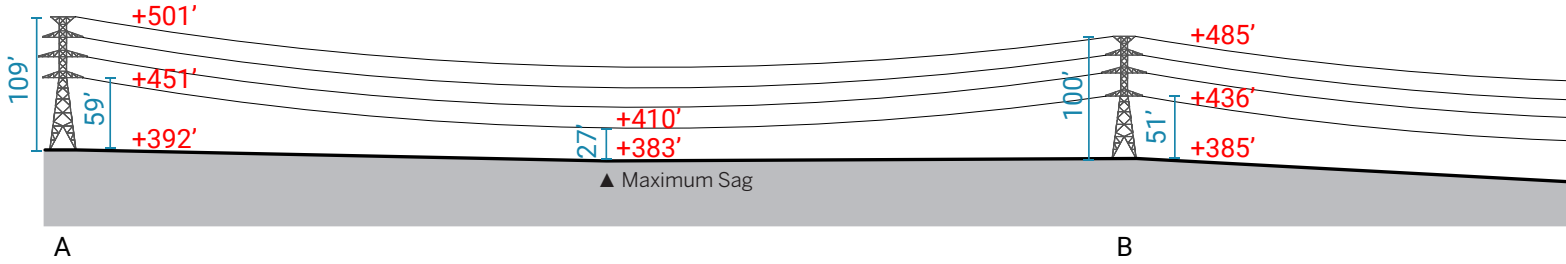
Note that final requirements are determined by an agreement with Dominion.



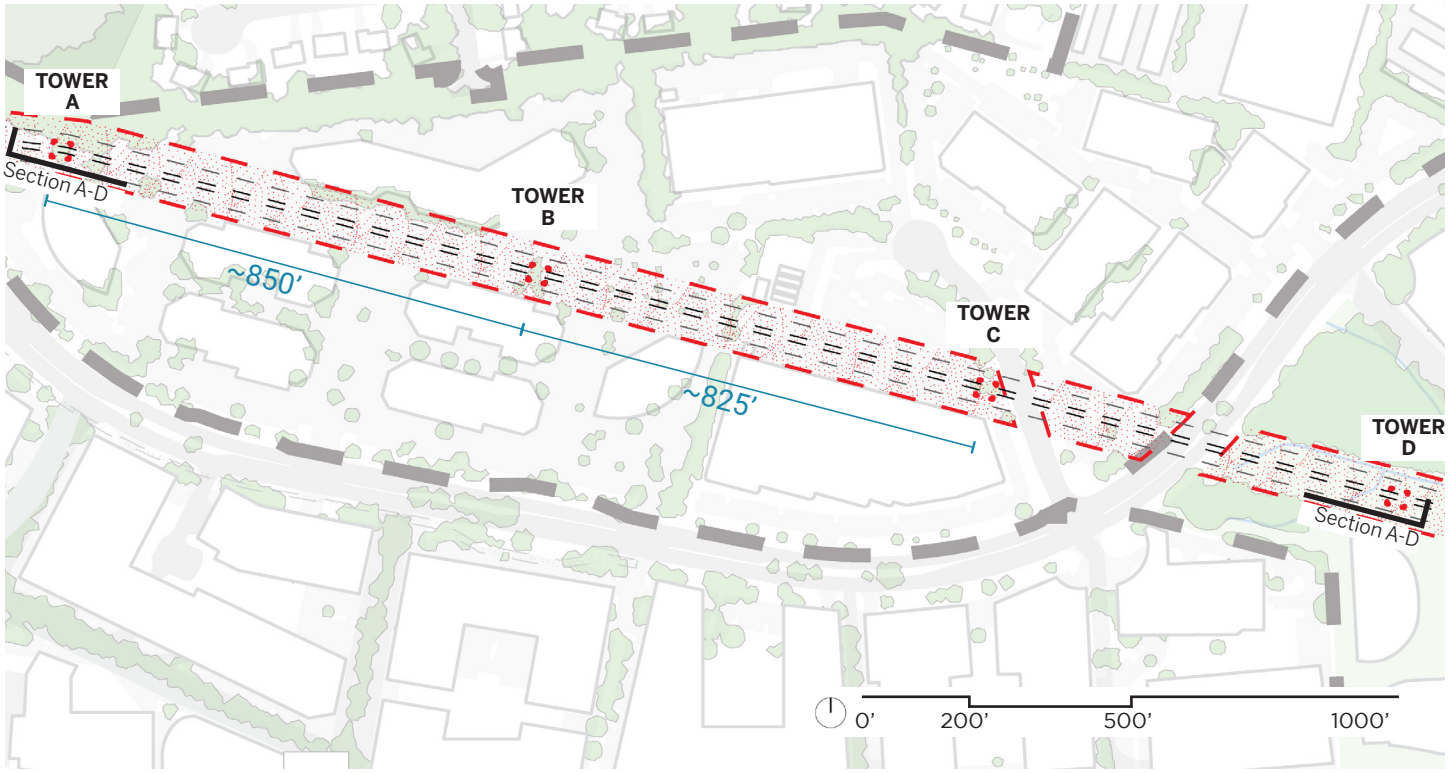
Bird's eye view of the Dominion Easement from the Sugarland Run stream

DRAFT

Constraints & Opportunities | **Dominion Easement**



Section A-D, taken from drawing below

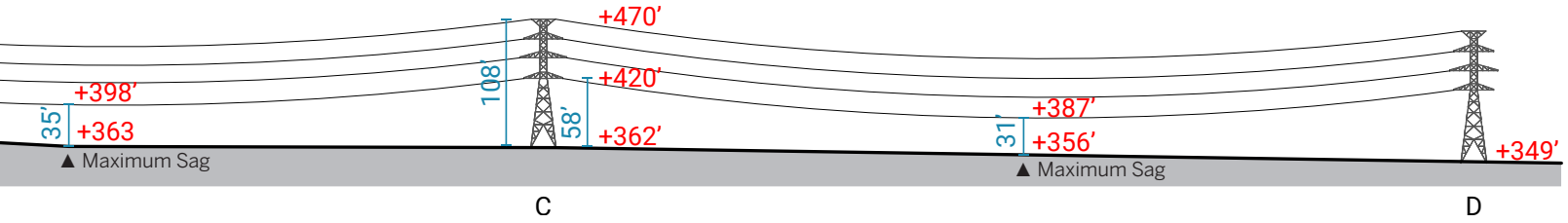


There are three transmission towers on the contiguous western portion of the TRG bounded by Herndon Parkway. Those towers are approximately 825 to 850 feet apart, roughly the distance of two large city blocks. The towers are at least twice as tall as the buildings around them, as seen in the photo on opposite page. A 109’ height is nearly as tall as a 10-story residential building, or an 8-story office building.

The buildings are presently oriented parallel to the easement, which would maximize views to the cables from the third story upward. This is not an issue, however, as the buildings are less than three stories tall. Building orientation should be considered to minimize views to towers and cables. A 10-story building could potentially have cable-free views on the top five stories, depending on the location, as the cables drops as much as 32’ from tower to maximum sag.

Attention must also be paid to maximum sags, as some are as low as 27’ above grade, just two feet higher than a street light pole.

DRAFT





View of transmission Tower A (see exhibit on opposite page)

Although the Dominion Easement is perceivably flat as it crosses the TRG, the site in fact drops 43' from Tower A to Tower D, over the course of approximately 2,440.' Much of this grade change can occurs at property divisions, such as between the Shorenstein and Freddie Mac parcels, as seen in photo to the right.



DRAFT

The Opportunity



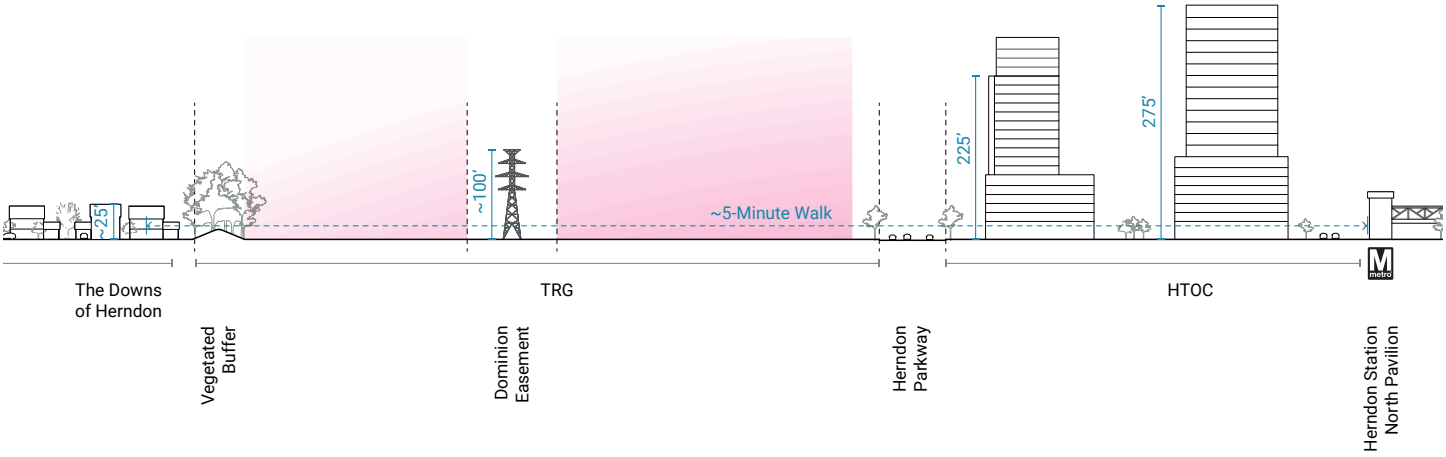
The TRG Small Area Plan will null current zoning height limitations in favor of new ones, to be attune with transit-oriented densities given the opening of the Herndon Metro Station.

The Opportunity for the TRG lies in higher building heights and development densities within the Metro Station 5-minute walk radius, that could gradually decrease towards the Downs neighborhood and the 10-minute walk zone going eastward towards Spring Street.

The Transect study section reveals a TRG flanked by 25' and 225' heights from Downs to HTOC, with the opportunity to potentially infill development to gradually match those heights, in order to fit with the surrounding context from a scale perspective. The Dominion towers and 100'-max cable heights may present a visual challenge for surrounding buildings, however also lends itself as the threshold between higher and lower heights at the TRG.

DRAFT

The Transect



Ongoing Developments Across the Herndon Parkway



View 1 one of the Fairbrook development options: 8-story residential, new Fairbrook Dr, Sugarland Bridge Park, and 11- & 19-story office buildings



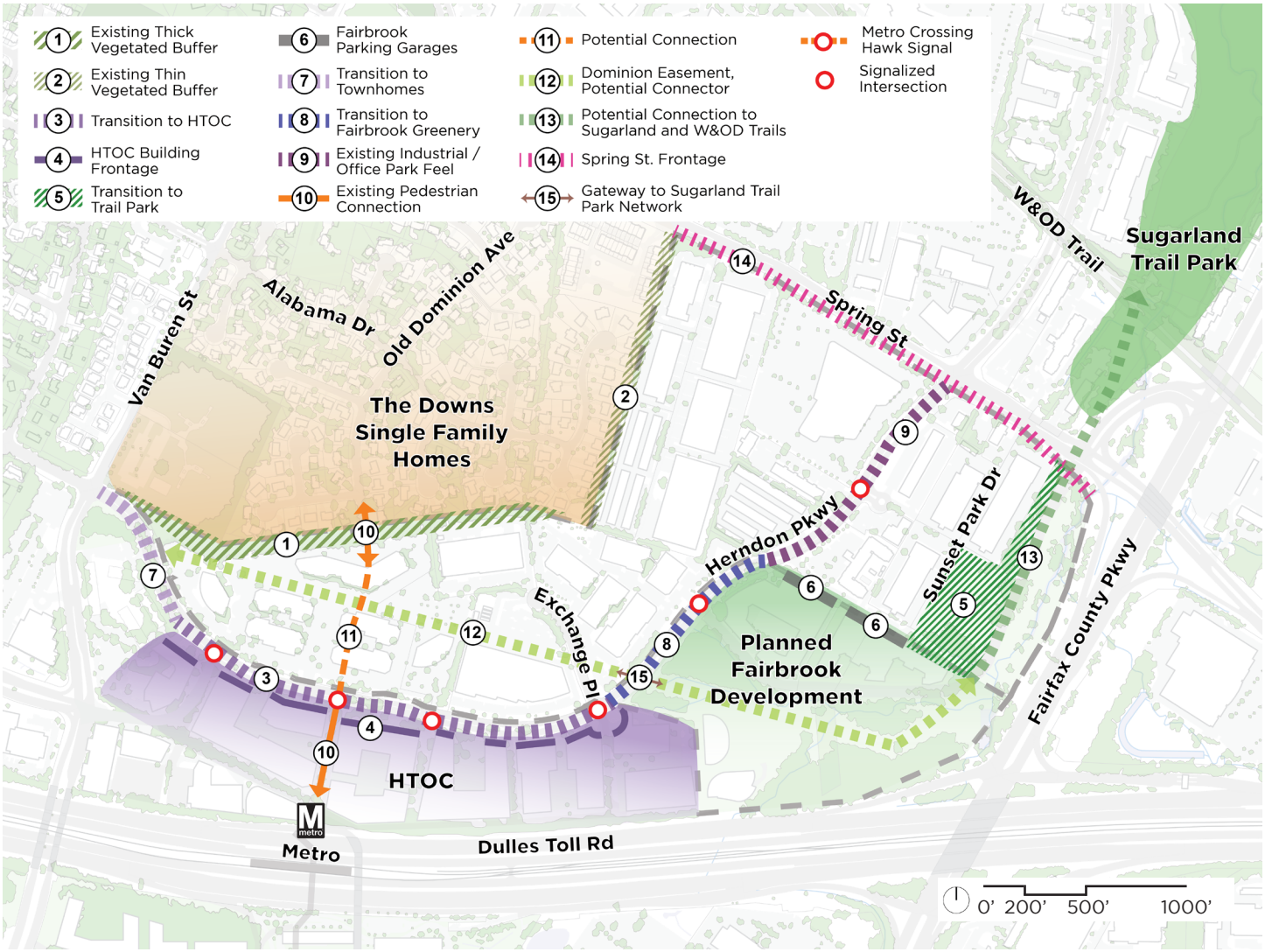
View 2 Parkview



View 3 555 Herndon Parkway

DRAFT

Transitional Spaces, Frontages & Buffers



The substantial **buffer** (1) between the Downs neighborhood and the TRG should be maintained and enhanced if necessary. The existing buffer by the self storage properties (2) is presently thin and improvements in the vegetative screening should be considered.

Within the TRG, Herndon Parkway can be divided into four segments, each with a distinct character. Starting from the west, the first segment features a quiet transition to the mid-density residential use at Metro Square townhomes (7); followed by nearly a half-mile of HTOC mixed use high-rises (3, 4); then the high-density hustle and bustle reaches a green break at the Fairbrook property (8); and the final segment has an industrial feel approaching Spring St.

Of these four transitions along the Parkway,

DRAFT

the SAP can only effect both sides of the street at (9), which presently industrial. Special consideration needs to be paid to this transect in particular. The other three segments are outside the TRG scope, so opportunities can be explored on how to face, meet or complement the other side of the Parkway.

The transition between the Sunset Business Park (5) and the tributary streams of Sugarland Run presents a significant opportunity for improvement. This buffer area could become a great amenity to Sunset Park, with the potential of joining the larger trail park network (13).

Transitions bring **connections.** The potential connection (13) to the Sugarland and W&OD Trail networks already connects to the entire TRG via the Dominion easement (12). This can be viewed either major constraint or great opportunity.

From trails to rails, the easement connects to Metro (11), and to the Downs residential neighborhood (10-north).

All of this multi-modal and amenity connectivity brings the opportunity of walkability, which is good for business, promotes social interaction and is compatible with the Town's values.

Frontages and gateways: As the Market report notes, Spring Street presently has the highest visibility in numbers. It is an auto-centric 1/3 mile long stretch of industrial frontage, which lacks curb appeal, but it features a unique mix of business and local destinations. This frontage poses aesthetic and placemaking challenges to be explored.

Other gateways are filled with opportunity as well: the Metro connection (11) must be explored for opportunities to create a sense of arrival and connectivity throughout the TRG. And Fairbrook's gateway to the Sugarland Run Trail Park Network must be explored from across the Parkway on the TRG side. The easement forces an open space on the TRG across from that gateway, perhaps lending itself to a more green gateway.

These three aforementioned gateways potentially vary in character from transit hub, to greenway, to industrial...or whichever unique character is yet to be found for the Spring Street and Herndon Parkway area.

Another opportunity lies in the parking garages in the planned Fairbrook development, which include exposed facades (6) that face the hotel and Sunset Park area. This zone could be viewed as a **transition space, a buffer or back of house,** depending on how its designed.

Conclusions

Context

The TRG site lies at the periphery of the Town of Herndon along the Dulles Toll Road, a short drive or ride to the Old Town of Herndon and the Reston Town Center, with nearby recreational destinations like the W&OD Trail and the Sugarland Run Trail Park. It is largely surrounded by residential low-density neighborhoods.

Property Ownership Patterns:

Note:

The Fairbrook property is well under development, and therefore the SAP should plan to integrate and complement their current plan, rather than proposing a plan for the parcel.

Multiple-owner challenges:

Seventeen property owners control the 26 parcels of the TRG (excluding the Fairbrook property). Three of those parcels are condominiums, which which could complicate any design proposals. Areas with multiple parcels under single ownership reduce the challenges of planning for multiple owners.

5-Minute Walk from Metro Area:

Three property owners control the properties within the 5-minute walk radius from the Metro. The largest and closest of these is the Shorenstein property, which covers approximately two thirds of the 5-minute walk area.

Natural Resources

Excluding the Fairbrook property, the TRG is 80% impervious surface with minimal natural resources and vegetated areas.

The natural, green and forested areas are adjacent to Sunset Business Park, perhaps bringing an opportunity to that presently industrial area.

Topography

Except at edges, the TRG is gently sloped (~2-3%) from east to west. The grade changes within the central area of the TRG are mostly man-made and would likely change with any redevelopment.

Climate, Sun Orientation & Shading

Overall, the TRG should not be significantly impacted by shadows from HTOC development. Careful design strategies should be employed to create naturally cooling spaces for the summer months.

Circulation

Currently, the TRG lacks a cohesive network of streets within it. Except for Herndon Parkway, which bisects the TRG, there are no defined streets. Creating legible, accessible pathways will be a necessary component to creating a walkable zone.

Dominion Easement

The Dominion Easement presents both challenges and opportunities. An agreement should be reached with Dominion regarding the potential uses and allowances on the easement, as these vary on a case-by-case basis. Potential for cross-site connectivity and integration within a neighborhood setting should be explored, and precedents for open

DRAFT

spaces should be researched.

Building orientation, heights, and views should be studied relative to the electricty pylons and cables, taking into account the variable cable heights across the site.

Heights

The SAP aims to increase density and building heights within the TRG. The Visioning stage will evaluate what the transect should look like, as potential development transitions from single family homes to high-rise HTOC, bisected by power transmission lines.

Transitional Space, Frontages and Buffers

The TRG site is rich in opportunities for character diversity.

The SAP could propose a distinct character for the Herndon Parkway between the Fairbrook property and Spring Street, as the TRG controls both sides of the Parkway at this segment. Moving west on the Parkway presents the TRG with the challenge of how to transition or with the opportunity of how to complement the other side of the Parkway, as development varies between green Fairbrook, bustling HTOC, and quiet mid-rise homes.

Finding curb-appeal on Spring Street will be a challenge. Buffers along the Downs neighborhood should be maintained and enhanced where necessary.

DRAFT

Herndon Transit-Related Growth Area

Existing, No Build, 3 Build, and Preferred Build Scenario Traffic Conditions

PREPARED FOR

Town of Herndon
Department of Community Development
777 Lynn Street
Herndon, Virginia, 20170
703.787.7380

PREPARED BY

1001 G St NW
Ste 1125
Washington, DC 20001
202.739.9555

Existing and No Build Final Submittal: January 13, 2022
3 Build Scenarios Draft Submittal: June 12, 2023
Original Preferred Build Scenario Draft Submittal: August 8, 2023
Revised Preferred Build Scenario Draft Submittal: October 16, 2023
Revised Preferred Build Scenario Draft Submittal (updated with candidate mitigations): December 4, 2023

Table of Contents

Introduction 1

1.1 Location and Context 1
1.2 Transportation Scope of Work 1
1.2.1 Baseline Traffic Data 2
1.3 Transportation Analysis Scenarios 2

Existing Traffic Conditions 3

2.1 Traffic Model 3
2.2 Traffic Volumes 3
2.3 Existing Conditions Traffic Analysis 4
2.3.1 Performance Metrics 4
2.3.2 Existing Conditions Findings 4

No Build 2045 Traffic Conditions 9

3.1 No Build 2045 Model Assumptions 9
3.1.1 Traffic Volumes 9
3.1.2 Roadway Network 10
3.2 No Build 2045 Traffic Volumes 10
3.3 No Build 2045 Traffic Analysis 10
3.3.1 No Build 2045 Findings 12
3.4 No Build Traffic Conclusions – Constraints and Opportunities 18

Three Build 2045 Scenarios with Fairbrook Drive Extension: Traffic Conditions 19

4.1 Build 2045 Scenario Model Assumptions 19
4.1.1 Development Scenarios 19
4.1.2 Roadway Network 19
4.1.3 Traffic Volumes 20
4.2 Build 2045 Scenario One: Neighborhood Clusters 21
4.2.1 Trip Generation 21
4.2.2 Transportation Connectivity 21
4.2.3 Traffic Analysis 24
4.3 Build 2045 Scenario Two: Two Centers 30
4.3.1 Trip Generation 30
4.3.2 Transportation Connectivity 30
4.3.3 Traffic Analysis 35
4.4 Build 2045 Scenario Three: Metro Center 39
4.4.1 Trip Generation 39
4.4.2 Transportation Connectivity 39
4.4.3 Traffic Analysis 42
4.5 Comparison of Three Build Scenarios 48
4.5.1 Development Characteristics and Connectivity 48
4.5.2 Traffic Volumes 48
4.5.3 Traffic Impacts 48

Preferred Build 2045 Scenario with Fairbrook Drive Extension: Traffic Conditions 49

5.1 Preferred Build 2045 Scenario Model Assumptions 49
5.2 Preferred Build 2045 Scenario 49
5.2.1 Trip Generation 49
5.2.2 Transportation Connectivity 51
5.2.3 Traffic Analysis 53
5.2.4 Potential Transportation Mitigation 59

Appendices

A Traffic Volume Datasets – All Intersections in Model 1

B VISSIM Model Complete Intersection Metrics 1

List of Tables

Table No.	Description	Page
Table 1	Metro Square Trip Generation	3
Table 2	Level of Service Description for Intersections	4
Table 3	Existing Condition Intersection Delay and LOS	4
Table 4	No Build 2045 Intersection Delay and LOS	12
Table 5	No Build 2045 "LOS F" Turning Movements	12
Table 6	TRG Build Scenario 1 (Neighborhood Clusters), Full Buildout, Site Trip Generation	22
Table 7	Comparison of Intersection Delay and LOS: No Build 2045 to Build Scenario 1 (Neighborhood Clusters)	26
Table 8	Build Scenario 1 "LOS F" Turning Movements	26
Table 9	TRG Build Scenario 2 (Two Centers), Full Buildout, Site Trip Generation	31
Table 10	Comparison of Intersection Delay and LOS: No Build 2045 to Build Scenario 2 (Two Centers)	35
Table 11	Build Scenario 2 "LOS F" Turning Movements	35
Table 12	TRG Build Scenario 3 (Metro Center), Full Buildout, Site Trip Generation	40
Table 13	Comparison of Intersection Delay and LOS: No Build 2045 to Build Scenario 3 (Metro Center)	44
Table 14	Build Scenario 3 "LOS F" Turning Movements	44
Table 15	Comparison of Build Scenarios	48
Table 16	Comparison of Build Scenario Trip Generation	48
Table 17	Comparison of Intersection Delay and LOS: No Build 2045 to All Three Build 2045 Scenarios	48
Table 18	TRG Preferred Build Scenario, Full Buildout, Site Trip Generation	50
Table 19	Comparison of Intersection Delay and LOS: No Build 2045 to Preferred Build Scenario	55
Table 20	Preferred Build "LOS F" Turning Movements	55
Table 21	Candidate Mitigations to be Tested in VISSIM	59

List of Figures

Figure No.	Description	Page
Figure 1	Transit-Related Growth Area Map	2
Figure 2	Existing Conditions Traffic Volumes	5
Figure 3	Existing Conditions Intersection Level of Service	6
Figure 4	Existing Conditions Congestion Heat Map – AM Peak Hour	7
Figure 5	Existing Conditions Congestion Heat Map – PM Peak Hour	8
Figure 6	No Build 2045 Traffic Volumes	11
Figure 7	No Build 2045 Intersection Level of Service	13
Figure 8	No Build 2045 Congestion Heat Map – AM Peak Hour	14
Figure 9	No Build 2045 Congestion Heat Map – PM Peak Hour	15
Figure 10	No Build 2045 Queue Map – AM Peak Hour	16
Figure 11	No Build 2045 Queue Map – PM Peak Hour	17
Figure 12	Modeled Configuration of Spring Street / Fairfax County Parkway Ramps / Fairbrook Drive Extension	20
Figure 13	Neighborhood Clusters Scenario Street Plan	21
Figure 14	Build Scenario 1 (Neighborhood Clusters) 2045 Traffic Volumes	23
Figure 15	Build Scenario 1 (Neighborhood Clusters) New Site Trips	24
Figure 16	Build Scenario 1 (Neighborhood Clusters) Site Pass-By Trips	25
Figure 17	Build Scenario 1 (Neighborhood Clusters) 2045 Intersection Level of Service	27
Figure 18	Build Scenario 1 (Neighborhood Clusters) 2045 Congestion Heat Map – AM Peak Hour	28
Figure 19	Build Scenario 1 (Neighborhood Clusters) 2045 Congestion Heat Map – PM Peak Hour	29
Figure 20	Two Centers Scenario Street Plan	30
Figure 21	Build Scenario 2 (Two Centers) 2045 Traffic Volumes	32
Figure 22	Build Scenario 2 (Two Centers) New Site Trips	33
Figure 23	Build Scenario 2 (Two Centers) Site Pass-By Trips	34
Figure 24	Build Scenario 2 (Two Centers) 2045 Intersection Level of Service	36
Figure 25	Build Scenario 2 (Two Centers) 2045 Congestion Heat Map – AM Peak Hour	37
Figure 26	Build Scenario 2 (Two Centers) 2045 Congestion Heat Map – PM Peak Hour	38
Figure 27	Metro Center Scenario Street Plan	39
Figure 28	Build Scenario 3 (Metro Center) 2045 Traffic Volumes	41
Figure 29	Build Scenario 3 (Metro Center) New Site Trips	42
Figure 30	Build Scenario 3 (Metro Center) Site Pass-By Trips	43
Figure 31	Build Scenario 3 (Metro Center) 2045 Intersection Level of Service	45
Figure 32	Build Scenario 3 (Metro Center) 2045 Congestion Heat Map – AM Peak Hour	46
Figure 33	Build Scenario 3 (Metro Center) 2045 Congestion Heat Map – PM Peak Hour	47
Figure 34	Preferred Scenario Development Plan	51
Figure 35	Preferred Build Scenario 2045 Traffic Volumes	52
Figure 36	Preferred Build Scenario New Site Trips	53
Figure 37	Preferred Build Scenario Site Pass-By Trips	54
Figure 38	Preferred Build Scenario 2045 Intersection Level of Service	56
Figure 39	Preferred Build Scenario 2045 Congestion Heat Map – AM Peak Hour	57
Figure 40	Preferred Build Scenario 2045 Congestion Heat Map – PM Peak Hour	58
Figure 41	Preferred Build Scenario 2045 Queue Map – AM Peak Hour	60
Figure 42	Preferred Build Scenario 2045 Queue Map – PM Peak Hour	61

1

Introduction

The Town of Herndon is preparing a Small Area Plan for the Transit-Related Growth (TRG) Area proximate to the Silver Line Metro Station. VHB is providing transportation services on the SOM-led Project Team. This report covers VHB's transportation analysis of Existing, No Build 2045, an initial three Build 2045 development scenarios, and the preferred Build 2045 development scenario. This analysis informed the selection of the preferred development scenario.

1.1 Location and Context

The TRG Area is located in the Town of Herndon, within Fairfax County, Virginia. The TRG, in conjunction with the Herndon Transit-Oriented Core (HTOC), comprises the land area that the Town has designated for mixed-use, transit-supported development. The HTOC is the area immediately adjacent to the Metro Station, located north of the Dulles Toll Road, east of Van Buren Street, south of Herndon Parkway, and west of the Fairbrook site. The TRG represents the next layer of development, and is located adjacent to the HTOC but farther away from the Metro Station in comparison to the HTOC. **Figure 1** outlines the boundaries of both the HTOC and the TRG. The TRG consists of the office and light industrial land areas both north and west of Herndon Parkway, as well as east of Herndon Parkway between the Fairbrook site, Fairfax County Parkway, and Spring Street.

The TRG Small Area Plan is not the first planning effort completed by the Town of Herndon in the vicinity of the Metro Station. The Herndon Metro Station Area Study, completed in 2012, outlined expected development within the HTOC area. In 2017, a transportation planning study (the "2017 TRG study") was completed to identify a potential density and land use mix for the TRG area that could be supported by the transportation system. This TRG Small Area Plan currently underway is a broader planning study that will encompass land use planning, placemaking, transportation, and other infrastructure.

1.2 Transportation Scope of Work

The Town of Herndon outlined specific requirements for the TRG transportation study in its Request for Proposals (RFP). These requirements include the analysis of key intersections and roadway segments along Herndon Parkway, Spring Street, and Van Buren Street. The list of study intersections is as follows:

1. Elden Street / Monroe Street
2. Elden Street / Van Buren Street
3. Van Buren Street / Spring Street
4. Van Buren Street / Herndon Parkway with scheduled roadway improvements
5. Van Buren Street / Alabama Drive with scheduled roadway improvements
6. Van Buren Street / Worldgate Drive

Figure 1 Transit-Related Growth Area Map



Source: SOM Transit-Related Growth Area Phase 1 Inception and Engagement Summary Report, Page 8, August 2022.

7. Herndon Parkway / Exchange Place
8. Herndon Parkway / Fairbrook Drive
9. Herndon Parkway / Driveway (Potential Future Worldgate Drive Extension)
10. Spring Street / Herndon Parkway with scheduled roadway improvements
11. Spring Street / Fairfax County Parkway ramps / Potential Future Fairbrook Drive Extension

1.2.1 Baseline Traffic Data

The Town's RFP also specified the utilization of the peak hour traffic counts collected in May 2017 as part of the prior TRG planning study; the use of this count data is to avoid COVID-19 pandemic-related reductions in peak hour traffic that would be present in newly collected 2022 data. This is a typical approach employed in transportation studies in the years following the start of the pandemic to account for the unknowns regarding the return to pre-COVID traffic patterns.

1.3 Transportation Analysis Scenarios

This report submittal documents Existing conditions, No Build 2045 conditions, three (3) Build 2045 Scenarios with the Fairbrook Drive extension, and a preferred Build 2045 Scenario with the Fairbrook Drive extension. The Existing and No Build analysis established the background transportation conditions with no additional development within the TRG Area. The three (3) Build Scenarios evaluated the capacity of the roadway network to handle increased demand from potential TRG development scenarios. The Town requested that these three scenarios include Fairbrook Drive extension as this new roadway is viewed as a critical TRG infrastructure connection. The Preferred Build Scenario evaluates the anticipated operating conditions of the TRG development scenario that encompasses the feedback of study stakeholders. Following are the specific transportation scenarios that have been evaluated to date and are documented in this report:

- Existing Conditions
  - 2017 Volume Data + Metro Square Development
  - 2022 Signal Timing and Phasing
- No Build 2045
  - 1% Annual Background Growth for Volumes
  - HTOC (Excluding Metro Square Acreage) + Fairbrook Development Volumes
  - Funded Roadway Improvement Projects + Worldgate Drive extension
  - HTOC + Fairbrook Roadway and Traffic Signal Improvements
- Three (3) Build 2045 Scenarios without Mitigation
  - TRG Development Scenarios, including the addition of the Fairbrook Drive extension to Spring Street
    - VHB worked with SOM and the Town to identify development density and distribution, land use composition, and internal roadway network.
    - Fairbrook Drive extension was modeled as a two-lane cross-section with a tie-in to the existing traffic signal at Spring Street / Fairfax County Parkway Ramps.
- One (1) Preferred Build 2045 Scenario without Mitigation
  - TRG Development Preferred Scenario, including the same Fairbrook Drive extension to Spring Street modeled in the three Build Scenarios

Following is the additional transportation scenario that will be evaluated in a subsequent phase of the TRG Small Area Plan effort:

- One (1) Preferred Build 2045 Scenario with Transportation Mitigation (could include infrastructure and/or policy).

2

Existing Traffic Conditions

This chapter discusses the assumptions, methodology, and findings of the Existing conditions traffic analysis. A microsimulation traffic model was utilized to estimate the operating conditions of the existing transportation system. Existing conditions traffic operates acceptably.

2.1 Traffic Model

In the 2017 TRG transportation study, a VISSIM microscopic simulation model was developed to analyze traffic conditions at the study intersections and along the study roadway segments. A microsimulation model is the most accurate transportation modeling tool for complex traffic conditions. An example of a complex traffic condition is when the vehicular queue from one traffic signal extends into a separate, upstream signalized intersection, thereby impacting its operations; a macroscopic traffic model (e.g., Synchro) is not the appropriate tool to accurately analyze this condition.

A microscopic simulation model must also be calibrated to establish that it is an accurate representation of the modeled traffic conditions. Calibration involves modifying model behavior such that model outputs (e.g., processed volume, vehicle speeds, vehicular travel time, etc.) are consistent with field observations on the actual roadway network. This calibration data must be collected concurrently to the traffic volume dataset so that the model can replicate the calibration conditions.

The previously developed and calibrated 2017 VISSIM model was utilized as the foundation for modeling efforts in the 2022 study. The model was first reviewed, ported into the most recent software version (VISSIM 11) approved for use by the Virginia Department of Transportation (VDOT), and verified that it could be repurposed for this study. The model was then updated to more accurately represent 2022 conditions via the inclusion of the most recent traffic signal timings (provided by the Town) as well as the addition of traffic volumes associated with the Metro Square two-over-two townhome development (see **Table 1**). These updates were minor enough that the model was assumed to still be calibrated; additionally, the model could not be recalibrated as newly collected calibration data (e.g., travel times, vehicle speeds) would be five years newer than the utilized 2017 traffic volume data.

Table 1 Metro Square Trip Generation

AM Peak Hour			PM Peak Hour		
Total	Entry	Exit	Total	Entry	Exit
17	4	13	25	15	10

Source: Institute of Transportation Engineer's *Trip Generation Manual, 11th Edition*, Land Use Code 221. 64 condo units in two-over-two (four-story) buildings.

2.2 Traffic Volumes

As mentioned, the 2017 traffic volume dataset was utilized for the analysis of 2022 Existing conditions due to the impact of the COVID-19 pandemic on traffic patterns. One of the more notable impacts has been the rise of remote work, which

anecdotally appears to still be occurring at significantly higher levels than pre-pandemic conditions. More working from home activity results in lower peak hour traffic levels due to the reduction in commuting. As it remains unclear what the long-term stabilization of traffic patterns will look like, agencies such as VDOT have utilized traffic data collected prior to the COVID-19 pandemic to conservatively plan for the future (VDOT's IIM-TMPD-7.0 allows for traffic counts as old as 2015 to be utilized to establish base traffic). The balanced, Existing conditions volume dataset at the study intersections is shown in **Figure 2**. **Appendix A** shows traffic volumes for all study and non-study intersections in the traffic model.

2.3 Existing Conditions Traffic Analysis

Consistent with the 2017 TRG Study, the AM and PM peak hour traffic models were run for 90 minutes per simulation run – the first 30 minutes is a loading ("seeding") period for the traffic while the final 60 minutes represent the peak hour condition. This latter period is when the traffic performance metrics are collected from the model. It is standard policy to average the results of multiple simulation runs. VDOT's microsimulation sample size tool was utilized to determine the number of model runs that result in averaged results that have a statistical 95% confidence level. Consequently, the AM model and PM model were simulated seven and twenty times, respectively, in accordance with the output from the sample size tool.

2.3.1 Performance Metrics

In this study, vehicle delay (seconds per vehicle) and queue (feet) at intersections are the primary performance metrics, as determined by the Town. The most commonly utilized transportation metric is Level of Service (LOS), which measures the adequacy of intersection geometrics and the traffic control for the given turning volumes. Levels of service range from A through F, based on the average control delay experienced by vehicles traveling through the intersection during the peak hour. Control delay represents the portion of total delay attributed to traffic control devices (e.g., signals or stop signs). **Table 2** provides a description of various levels of service categories and delay ranges. In the Herndon and greater Northern Virginia area, it is common and acceptable to have LOS D during the peak hours.

As noted, Level of Service is defined by the *Highway Capacity Manual* as a scale based on control delay. The delay reported by VISSIM is microsimulation delay, which is actual minus expected travel time. This delay includes both control delay (e.g., due to intersection control) and roadway friction (e.g., drivers interacting with traffic). For this reason, VDOT's policy in its *Traffic Operations and Safety Analysis Manual* (TOSAM) is to not report LOS from VISSIM. Given that it is the most widely recognized traffic metric, LOS is reported in this study; however, this difference in LOS definition should be noted.

Table 2 Level of Service Description for Intersections

Level of Service	Description	Signalized Intersection / Roundabout	Unsignalized Intersection
A	Little or no delay	<= 10 sec.	<= 10 sec.
B	Short traffic delay	10-20 sec.	10-15 sec.
C	Average traffic delay	20-35 sec.	15-25 sec.
D	Long traffic delay	35-55 sec.	25-35 sec.
E	Very long traffic delay	55-80 sec.	35-50 sec.
F	Unacceptable delay	> 80 sec.	> 50 sec.

2.3.2 Existing Conditions Findings

The Existing Conditions traffic model results indicate that one of the key model calibration metrics is satisfied – the model is able to process existing traffic volume demand on each movement, approach, and intersection within an appropriate calibration threshold. While the model was not recalibrated as discussed previously, this result conveys confidence that the model is still representative of existing conditions.

In Existing conditions, the traffic models estimate that all of the signalized intersections operate at a LOS of D or better during the two peak hours, which is an acceptable condition. During the PM peak hour, the Van Buren Street / Alabama Drive all-way stop-control intersection operates at LOS E, which is primarily due to delay on the southbound Van Buren Street approach that also experiences vehicle queues extending upstream to Spring Street. A traffic signal is under construction at this intersection in Fall 2022 and will help facilitate flow at this location. **Table 3** lists the intersection delay and LOS at each of the eleven study intersections. Intersection LOS is also shown in **Figure 3**.

Table 3 Existing Condition Intersection Delay and LOS

Intersection	AM Peak Hour		PM Peak Hour	
	Delay	LOS	Delay	LOS
Elden St / Monroe St	18.0	B	22.5	C
Elden St / Van Buren St	24.3	C	22.4	C
Van Buren St / Spring St	11.7	B	44.8	D
Van Buren St / Herndon Pkwy	35.9	D	39.2	D
Van Buren St / Alabama Dr [1]	10.6	B	46.1	E
Van Buren St / Worldgate Dr	39.1	D	24.9	C
Herndon Pkwy / Driveway [1]	0.5	A	0.8	A
Herndon Pkwy / Exchange Pl [1]	0.5	A	0.6	A
Herndon Pkwy / Fairbrook Dr [1]	0.4	A	0.6	A
Spring St / Herndon Pkwy	47.4	D	46.8	D
Spring St / FCP Ramps	18.8	B	17.4	B

Source: Average of 7 AM and 20 PM Peak Hour VISSIM simulation runs.
1 Unsignalized intersections in Existing conditions scenario.

Congestion "heat" maps for each of the peak hours are shown in **Figures 4 and 5**. These represent the average vehicle speeds present in different lanes and segments of the model. Slower vehicle speeds (shown in shades of red) represent areas of higher congestion and vehicle queuing, whereas higher vehicle speeds (shown in shades of green) represent areas of lower congestion and vehicle queueing. In the AM peak hour, the greatest areas of congestion are northbound Van Buren Street south of Herndon Parkway and the Spring Street / Herndon Parkway intersection vicinity. In the PM peak hour, the heaviest congestion areas are the Van Buren Street corridor (notably southbound north of Alabama Drive and northbound south of Herndon Parkway) as well as the Spring Street / Herndon Parkway intersection vicinity.

As seen in the traffic model results, in Existing conditions the transportation system is able to accommodate the traffic demand and facilitate vehicular movement throughout the Town. Additionally, roadway improvement projects are under-construction or planned in the near future at Van Buren Street / Alabama Drive, Van Buren Street / Herndon Parkway, and Spring Street / Herndon Parkway; these projects will help improve conditions at the areas of with the highest levels of congestion in Existing conditions.

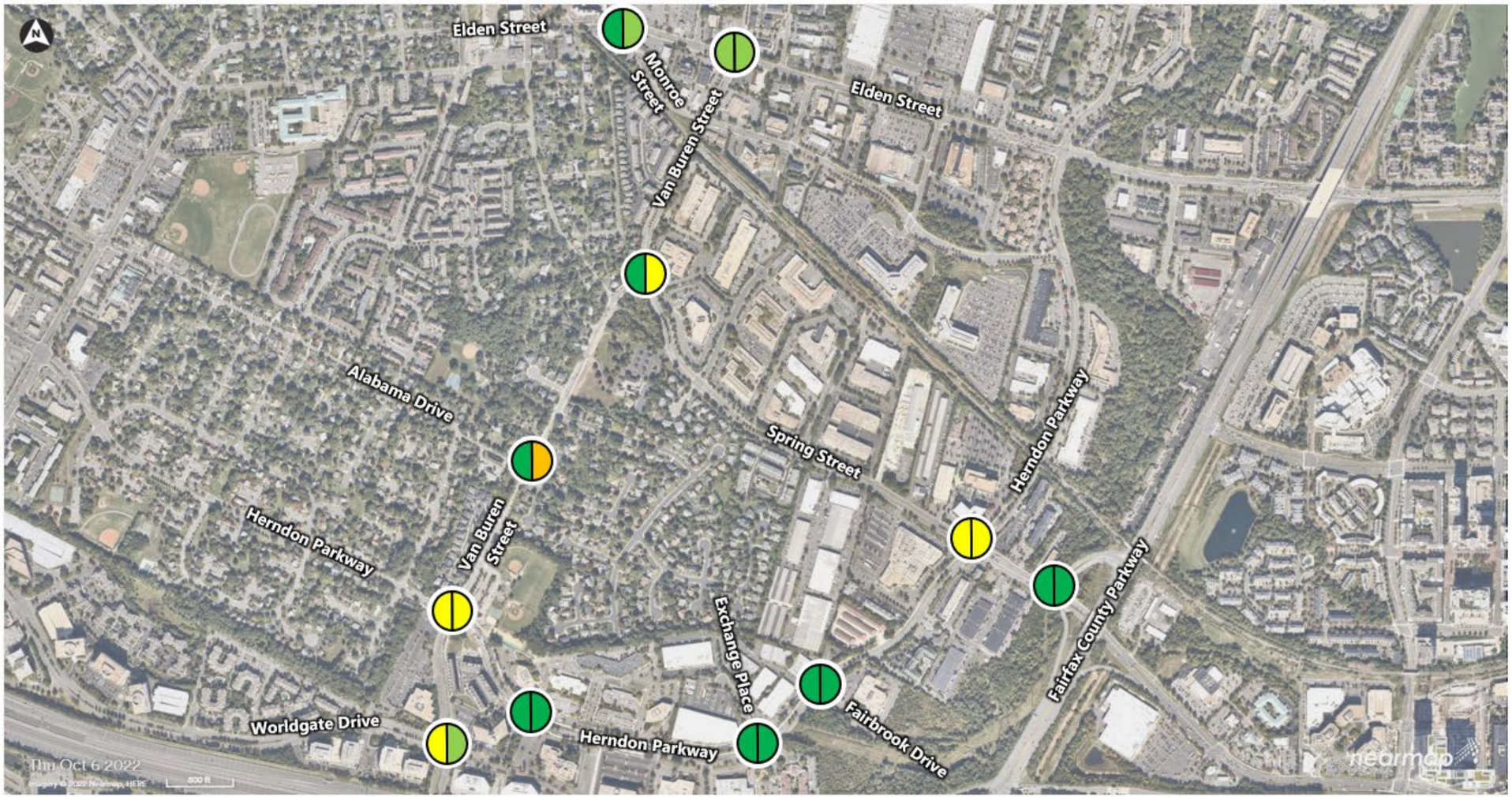
Appendix B documents the delay, LOS, and vehicle queuing for all of the movements at each of the eleven study intersections.

Figure 2 Existing Conditions Traffic Volumes



Existing traffic volumes are from May 2017 and include the addition of Metro Square townhome traffic. Basemap Source: Nearmap.

Figure 3 Existing Conditions Intersection Level of Service

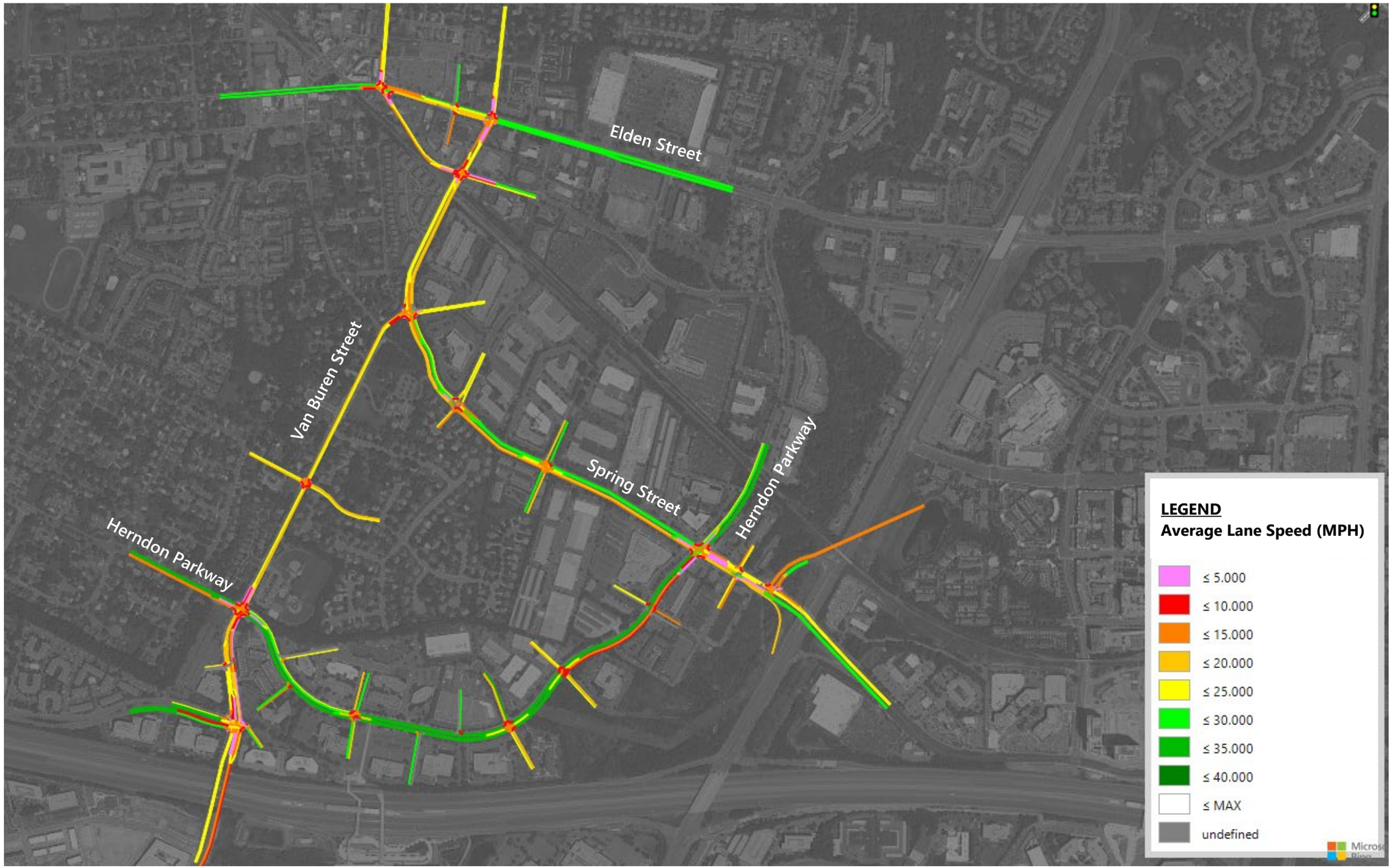


Intersection Level of Service (LOS)

- AM Peak Hour / PM Peak Hour
- LOS A / LOS B
- LOS C
- LOS D
- LOS E
- LOS F

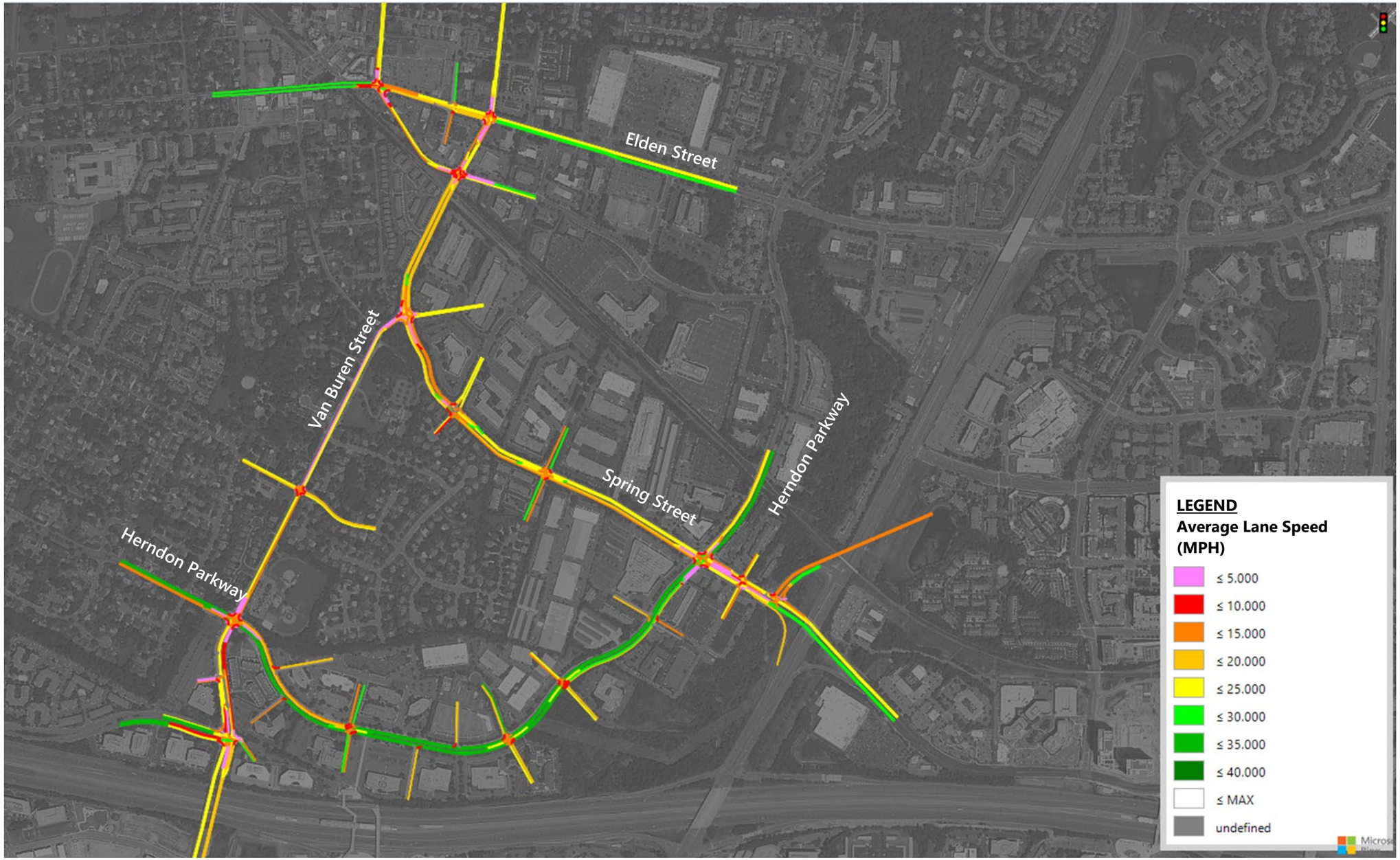
Source: Average of 7 AM Peak Hour and 20 PM Peak Hour VISSIM simulation runs. Aerial imagery from NearMap.

Figure 4 Existing Conditions Congestion Heat Map – AM Peak Hour



Source: Average of 7 AM Peak Hour VISSIM simulation runs.

Figure 5 Existing Conditions Congestion Heat Map – PM Peak Hour



Source: Average of 20 PM Peak Hour VISSIM simulation runs.

3

No Build 2045 Traffic Conditions

This section of the report documents the assumptions and findings of the No Build traffic analysis, which establishes a baseline condition for the design year to which the TRG development scenarios can be compared. While congestion is higher than Existing conditions, the network has capacity to accommodate the demand.

3.1 No Build 2045 Model Assumptions

In coordination with Town of Herndon staff, VHB set the horizon year for future-year traffic analysis as 2045. Using 2045 as the horizon year was deemed appropriate because it allows sufficient time for full buildout of the development associated with the TRG Small Area Plan.

A VISSIM microscopic simulation model was developed for No Build 2045 conditions to analyze projected traffic conditions for the 2045 horizon year. The No Build model considers growth in traffic volumes associated with organic growth as well as known development projects outside of the TRG area. This No Build 2045 model provides a future-year baseline against which to evaluate traffic impacts associated with the TRG Small Area Plan.

3.1.1 Traffic Volumes

In estimating background traffic growth for the No Build 2045 model, a 1% annual growth rate was applied to existing traffic volumes to project traffic volumes to the horizon year 2045. As mentioned in the approach to the Existing conditions traffic modeling in Chapter 2, VHB assumed zero traffic growth through 2022 as a result of sustained impacts to traffic volumes due to the COVID-19 pandemic. The 1% annual growth rate was then applied from 2022 to 2045. This rate was utilized in both the 2012 HMSAS and 2017 TRG studies, and was agreed upon by Town staff for this study.

In addition to the 1% annual growth rate, VHB layered in estimated trips related to known development projects:

- Development volume growth included the HTOC-related volumes as identified in the 2012 Herndon Metro Station Area Study. To account for the Metro Square development – which was built by-right as 2-over-2 townhomes on a parcel that the HTOC assumed would develop at a substantially greater density – VHB applied a 20% trip reduction to the HTOC-related volumes. The 20% reduction is based on the Metro Square parcel's acreage relative to the total HTOC site.
- Development volume growth also included volumes associated with the Fairbrook development, as identified in the 2020 Fairbrook Business Park Traffic Impact Study (TIS).

This approach to background growth estimation is consistent with the methodologies used in both the 2012 Herndon Metrorail Station Area Study and the 2017 TRG study. It should be noted that, based on a comparison to growth projections derived from the MWCOG Regional Travel Demand Model (TDM), this approach may overstate traffic demand in the No Build 2045 scenario; however, a conservative traffic forecasting

approach ensures that the infrastructure can more than accommodate the future demand.

3.1.2 Roadway Network

VHB included the following transportation network improvements in the No Build 2045 traffic model:

- Van Buren Street / Herndon Parkway intersection improvements.
- Herndon Parkway / Spring Street roadway project.
- Worldgate Drive extension to Herndon Parkway.
- Van Buren Street / Alabama Drive traffic signal. Note: the remainder of the Van Buren Street streetscape project did not necessitate modifications to the traffic model.
- Traffic signals along Herndon Parkway at Worldgate Drive extension, the Metro Promenade, 555 Herndon Parkway, Exchange Place, and Fairbrook Drive. These signals are planned to accommodate the Worldgate Drive extension, HTOC and Fairbrook developments, and the Herndon Metro Station; therefore, they are anticipated to be in operation by the 2045 analysis year.
- Fairbrook Drive approach to Herndon Parkway as shown in Fairbrook TIS.

Based on information provided by Fairfax County Department of Transportation (DOT) to the Town of Herndon, the proposed improvements to the Spring Street / Fairfax County Parkway (FCP) interchange were not included in the Future Year VISSIM models. The County's correspondence indicated that the Spring Street / FCP interchange improvements project is unfunded, is not a priority for the County, and has no associated timeline.

Furthermore, the County's correspondence implies that the Spring Street / FCP interchange conceptual design is inextricably linked with a proposed "Echelon" interchange between Fairbrook Drive extension and the Dulles Toll Road. To that point, the County's concept for the Spring Street / FCP interchange does not accommodate movements from northbound Fairfax County Parkway onto westbound Spring Street (i.e., into Herndon), as it appears that the County assumes those movements will be accommodated by a future Fairbrook Drive extension / Dulles Toll Road interchange.

Given the linking of the two interchanges, the County's concept for the Spring Street / FCP interchange improvements cannot be incorporated into a Future Year model on its own. Incorporating both interchanges is infeasible as the Project Team has already determined that the Fairbrook Drive extension / Dulles Toll Road interchange will not be included in the Future Year VISSIM models. Furthermore, one or both concepts seem likely to change if and when they advance past the conceptual stage.

The uncertainty around the timing and configuration of the Spring Street / FCP interchange improvements project led to a decision to exclude it in the Future Year models for the Herndon TRG traffic analysis. If the study were to include the current concept design and subsequently that design were to change, it could raise questions/doubts regarding the study conclusions and recommendations.

The proposed extension of Fairbrook Drive between Herndon Parkway and Spring Street was also excluded from the roadway network for the No Build 2045 model. The decision to exclude the Fairbrook Drive extension was based on input from Town of Herndon staff regarding challenges in right-of-way acquisition and VDOT concurrence on connecting Fairbrook Drive to the existing Spring Street / FCP ramp signal. These challenges cast doubt on the feasibility of constructing the Fairbrook Drive extension by 2045; therefore it was determined to include the extension not as a baseline No Build condition, but rather a potential Build condition.

The proposed Herndon Parkway / Sunset Business Park traffic signal exclusively services turning movements associated with potential TRG development; as such, this signal was not modeled in No Build conditions.

Signal phasing and timing was optimized at all traffic signals within the No Build model. It is appropriate to include optimized signals because transportation agencies typically optimize their traffic signals every few years. It is safe to assume that in 2045, the Town of Herndon will operate the signals to most efficiently serve all road users (vehicular and pedestrian). At all new or modified signals (i.e., from roadway projects), signal timings include multimodal consideration of pedestrian crossing intervals.

Through iterative testing to identify the optimal signal phasing and timing at the Spring Street / Herndon Parkway intersection, the Project Team identified a phasing strategy that is an established strategy but one that is not frequently utilized. Specifically, the westbound Spring Street left turn signal phase was modeled to reservice during the signal cycle (i.e., occur twice at separate time points within the cycle). This reservicing is needed to clear the vehicle queue in the left turn lanes to allow traffic on both westbound Spring Street and the Fairfax County Parkway offramps to consecutively enter the left turn lanes. It was otherwise found that one of these traffic streams would experience lengthy queues without this reservicing.

3.2 No Build 2045 Traffic Volumes

As mentioned in Section 3.1.1, No Build 2045 traffic volumes were derived from a 1% annual background growth rate and known development projects. The process utilized to develop the volume dataset is listed below:

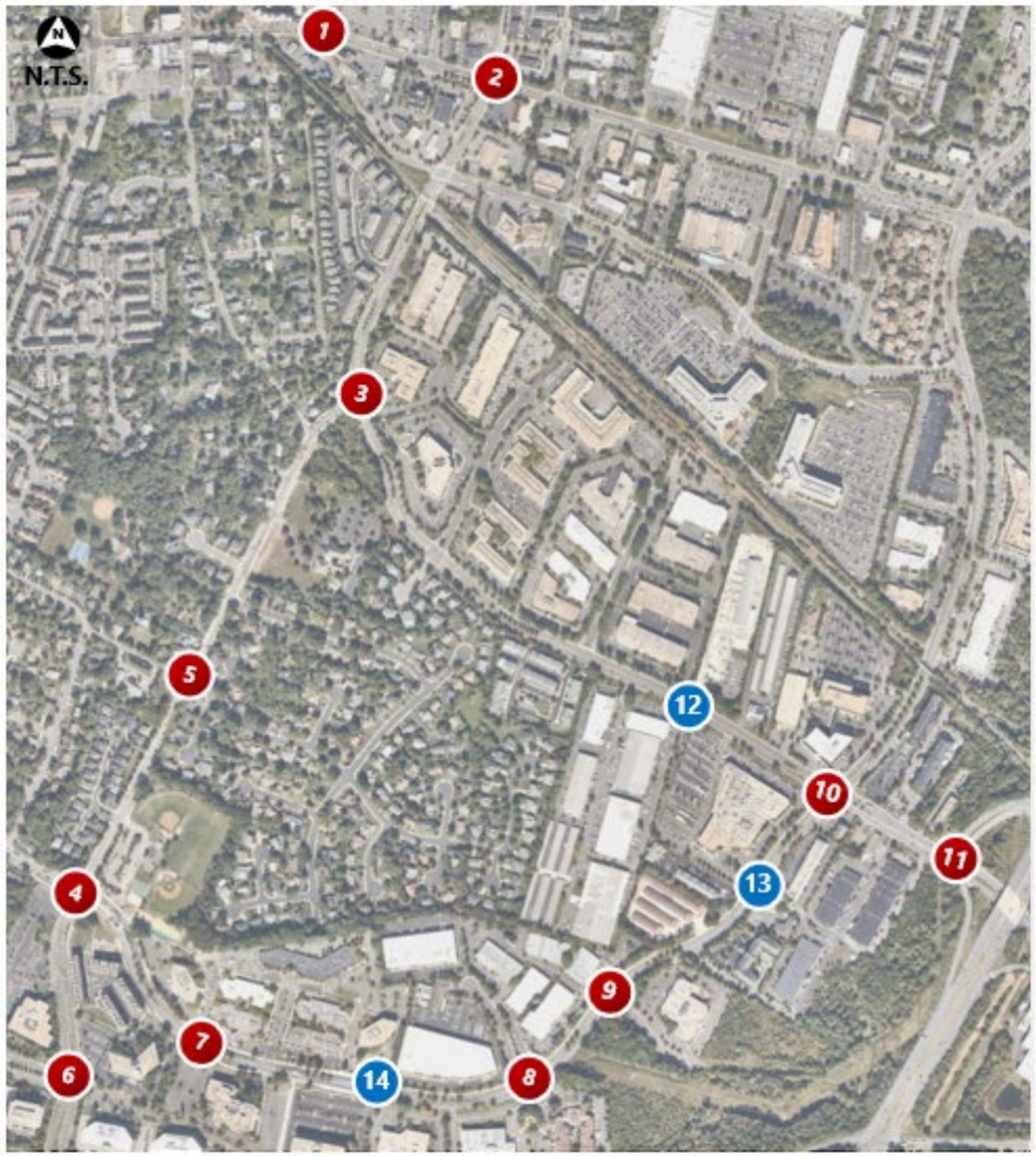
1. Remove volumes associated with the existing land uses on the HTOC site and the Fairbrook site, with the exception of the Metro Square development volumes that were maintained.
2. Apply a 1% annual growth rate from 2022 to 2045.
3. Shift traffic volume to account for the Worldgate Drive extension to Herndon Parkway. Shift consistent with previous HMSAS.
4. Add the traffic volumes associated with the Fairbrook development, per the previously completed Fairbrook TIS.
5. Add the traffic volumes associated with 80% of the HTOC development, per the previously completed HMSAS. The 20% reduction accounts for the Metro Square property that will not developed at the anticipated HTOC density.
6. Shift a percentage of northbound Van Buren Street left turns from Herndon Parkway to Worldgate Drive in the PM peak hour only. This shift is a result of iterative traffic modeling and is discussed more in the subsequent analysis section.

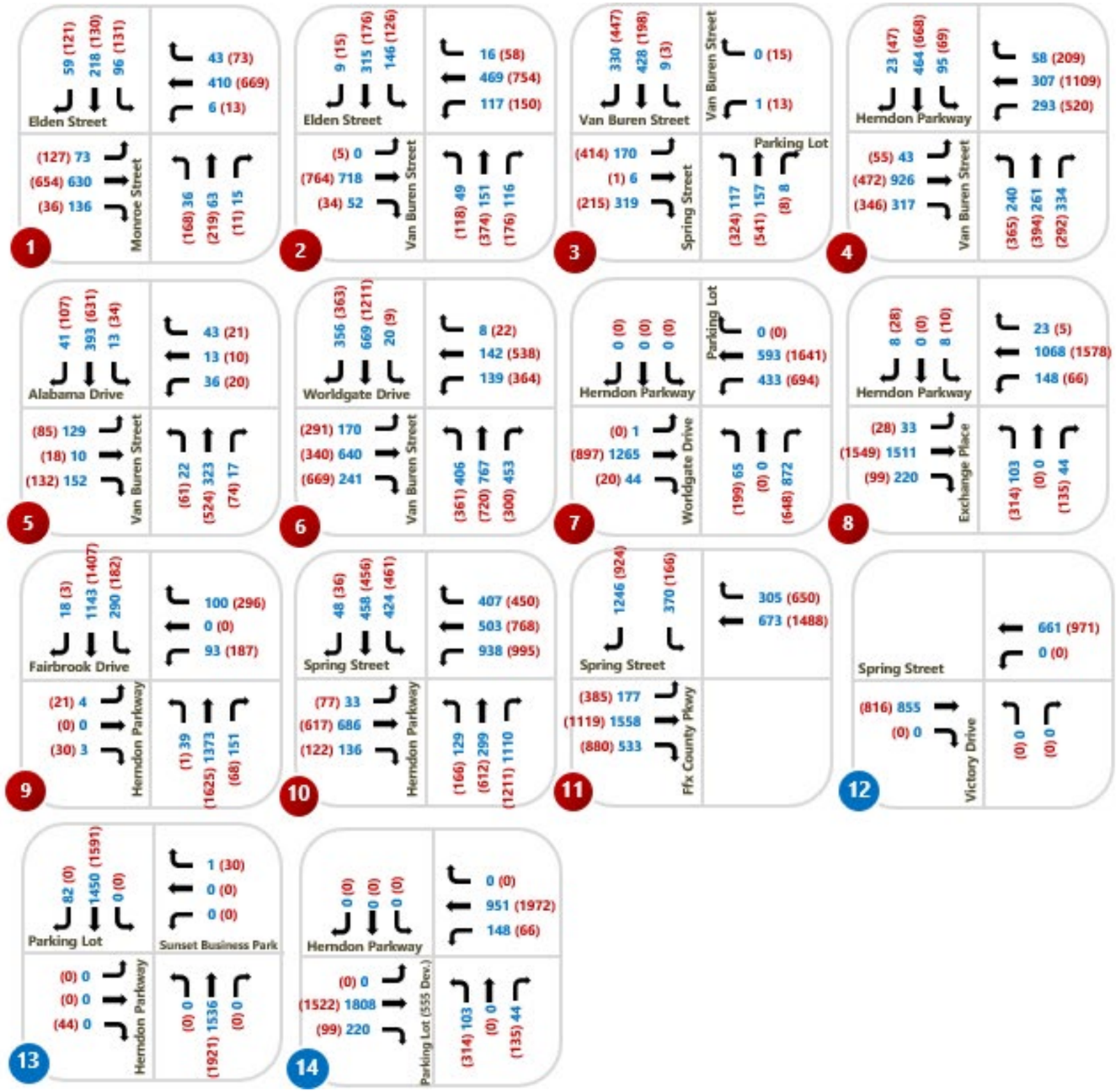
Figure 6 displays the traffic volume dataset that was analyzed at the study intersections in the No Build 2045 traffic model. These traffic volumes are substantially higher than Existing conditions traffic volumes. **Appendix A** shows traffic volumes for all study and non-study intersections in the traffic model.

3.3 No Build 2045 Traffic Analysis

Consistent with the Existing conditions traffic analysis, the No Build models were run under the same conditions (i.e., length of individual simulation run and number of averaged simulation runs). The same traffic operations metrics were also collected to evaluate the change in system performance between Existing and No Build 2045 conditions.

Figure 6 No Build 2045 Traffic Volumes





No Build 2045 traffic volumes include annual background growth, specific development projects, and volume shift to account for the Worldgate Drive extension. Basemap Source: Nearmap

3.3.1 No Build 2045 Findings

In No Build 2045 conditions, with significantly higher traffic volumes but also improved roadway configurations, the transportation network within the study area is able to accommodate the increased demand; albeit the network does have more congestion than Existing conditions. **Table 4** lists the intersection delay and LOS at each of the eleven study intersections. Intersection LOS is also shown in **Figure 7**.

All study intersections are projected to operate at LOS D or better in both peak hours, except for the Spring Street / Herndon Parkway intersection, which is anticipated to operate at LOS E in the PM peak hour. While LOS E does represent increased delay, many intersections in the Northern Virginia area operate at this condition during a peak hour.

Table 4 No Build 2045 Intersection Delay and LOS

Intersection [1]	AM Peak Hour		PM Peak Hour	
	Delay	LOS	Delay	LOS
Elden St / Monroe St	27.2	C	34.1	C
Elden St / Van Buren St	31.2	C	36.7	D
Van Buren St / Spring St	16.8	B	40.8	D
Van Buren St / Herndon Pkwy	30.5	C	44.4	D
Van Buren St / Alabama Dr	16.1	B	33.4	C
Van Buren St / Worldgate Dr	23.8	C	27.7	C
Herndon Pkwy / Worldgate	25.2	C	22.0	C
Herndon Pkwy / Exchange Pl	11.0	B	15.8	B
Herndon Pkwy / Fairbrook Dr	14.2	B	19.9	B
Spring St / Herndon Pkwy	51.5	D	59.1	E
Spring St / FCP Ramps	22.1	C	25.8	C

Source: Average of 7 AM and 20 PM Peak Hour VISSIM simulation runs.
1 All study intersections are signalized in the No Build scenario.

The heaviest volume movements at the Spring Street / Herndon Parkway intersection (in both peak hours) are the westbound Spring Street left turn and the northbound Herndon Parkway right turn. Even with the roadway improvements and signal phasing strategy that optimize the capacity of these signal movements, the heavy demand on these movements limits the overall efficiency of the intersection. Previous studies, including the 2017 TRG Study and the Fairbrook TIS, identified the need to extend Fairbrook Drive to the Spring Street / Fairfax County Parkway Ramps signal. This roadway extension would help alleviate the predicted congestion at Spring Street / Herndon Parkway by providing a second connection between the Metro Station area and Fairfax County Parkway / Reston, which would likely better distribute traffic demand across the network rather than concentrating it at a single location (i.e., Spring Street / Herndon Parkway).

As mentioned in Section 3.2, initial traffic modeling of the PM peak indicated significant and severe congestion at the Van Buren Street / Herndon Parkway intersection. Several intersection constraints such as a single northbound left turn lane and only 150 feet of dual southbound thru lanes limit the capacity of the intersection. Even with optimized signal timings, the model indicates that the northbound Van Buren Street queue will extend south of the Dulles Toll Road and that the southbound Van Buren Street queue will extend to Spring Street.

As a general rule, drivers will typically take the fastest path to their destinations, especially with GPS navigation so widely utilized. The northbound Van Buren Street left turn at Worldgate Drive has approximately twice the capacity of the left turn at Herndon Parkway due to the presence of dual left turn lanes. An approximate 20% shift of drivers from the left turn at Van Buren Street to the left turn at Worldgate Drive allows the system to reach an equilibrium where queue gridlock does not occur south of Herndon Parkway.

The intersection turning movements in **Table 5** operate at LOS F in No Build 2045 conditions; the existing Town of Herndon Ordinance states "no individual turning movement level of service at an intersection falls below "LOS E"".

Table 5 No Build 2045 "LOS F" Turning Movements

Turning Movement	Peak	Source of Congestion
Southbound Left Turn from Herndon Pkwy to Spring St	PM	*Heavy Demand, Lack of Alternate Access*
Eastbound Alabama Drive at Van Buren Street	PM	*Intersection capacity limitations at Van Buren Street / Herndon Parkway*
Northbound Left Turn from Van Buren St to Herndon Pkwy	PM	

Source: Average of 7 AM and 20 PM Peak Hour VISSIM simulation runs.

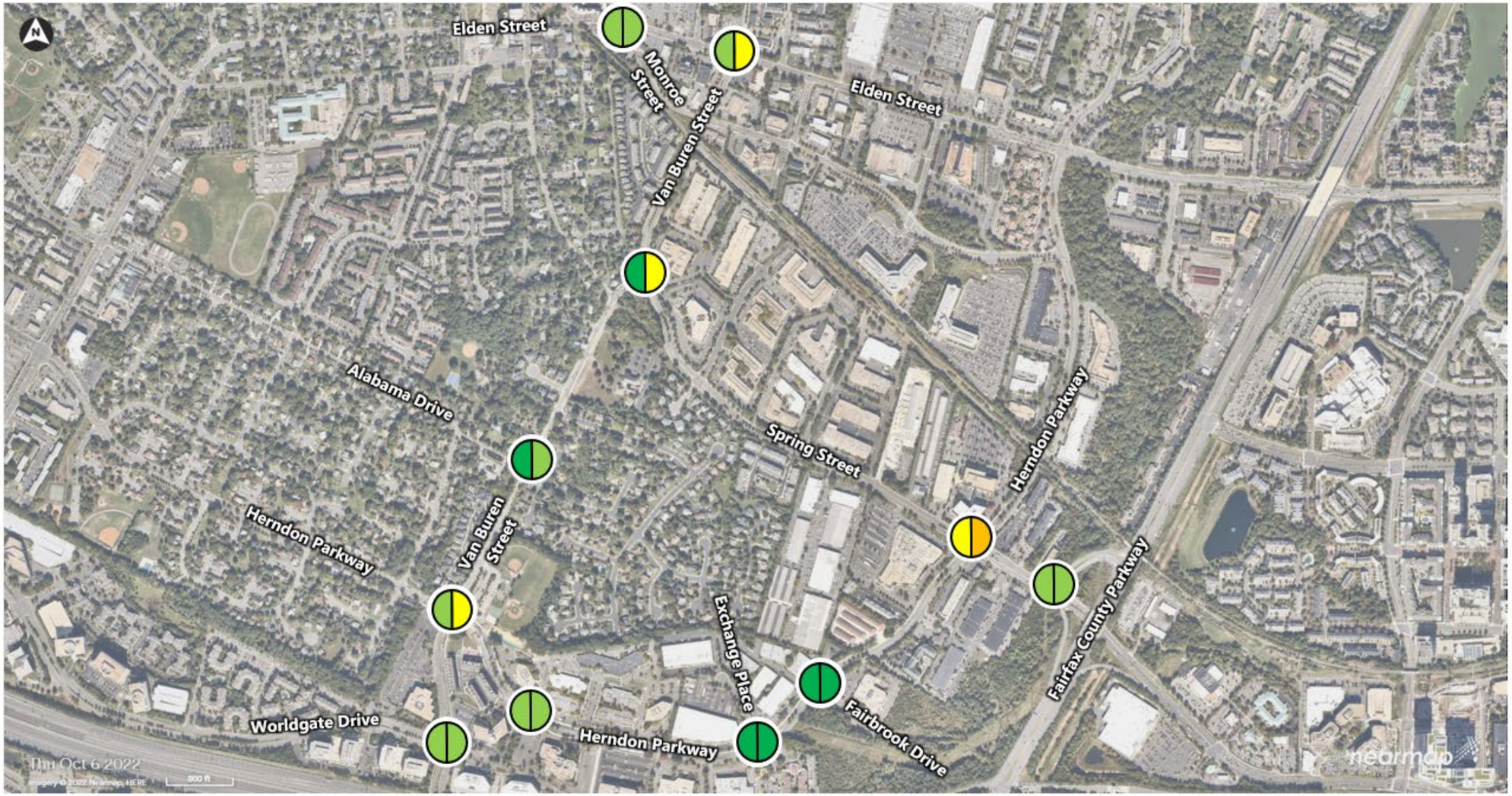
Congestion "heat" maps for each of the peak hours are shown in **Figures 8 and 9**. These represent the average vehicle speeds present in different lanes and segments of the model. Slower vehicle speeds (shown in shades of red) represent areas of higher congestion and vehicle queuing, whereas higher vehicle speeds (shown in shades of green) represent areas of lower congestion and vehicle queueing. In both peak hours, the heaviest areas of congestion are the Spring Street / Herndon Parkway intersection and the three intersections at the junctions of Van Buren Street, Worldgate Drive, and Herndon Parkway. Additionally, in the PM peak hour, southbound Van Buren Street experiences a significant amount of congestion.

Projected average and maximum queue lengths for No Build 2045 conditions are displayed in **Figures 10 and 11**. An important note regarding the maximum queue lengths is that each roadway segment's maximum queue length most likely does not temporarily align (i.e., occur at the same time). Rather, this figure shows the maximum queue length on each segment of roadway during the peak hour.

In the AM peak hour, average queue lengths throughout the study network are accommodated with no concerns. The maximum AM peak hour queue lengths, which typically exceed what is designed for, are accommodated with a few exceptions – specifically eastbound Herndon Parkway (west of Fairbrook Drive) and the Spring Street segment at Herndon Parkway and the Fairfax County Parkway. The maximum queue is projected to extend onto the Parkway; albeit the exact extents are unknown due to this study not including the traffic signal on the Parkway.

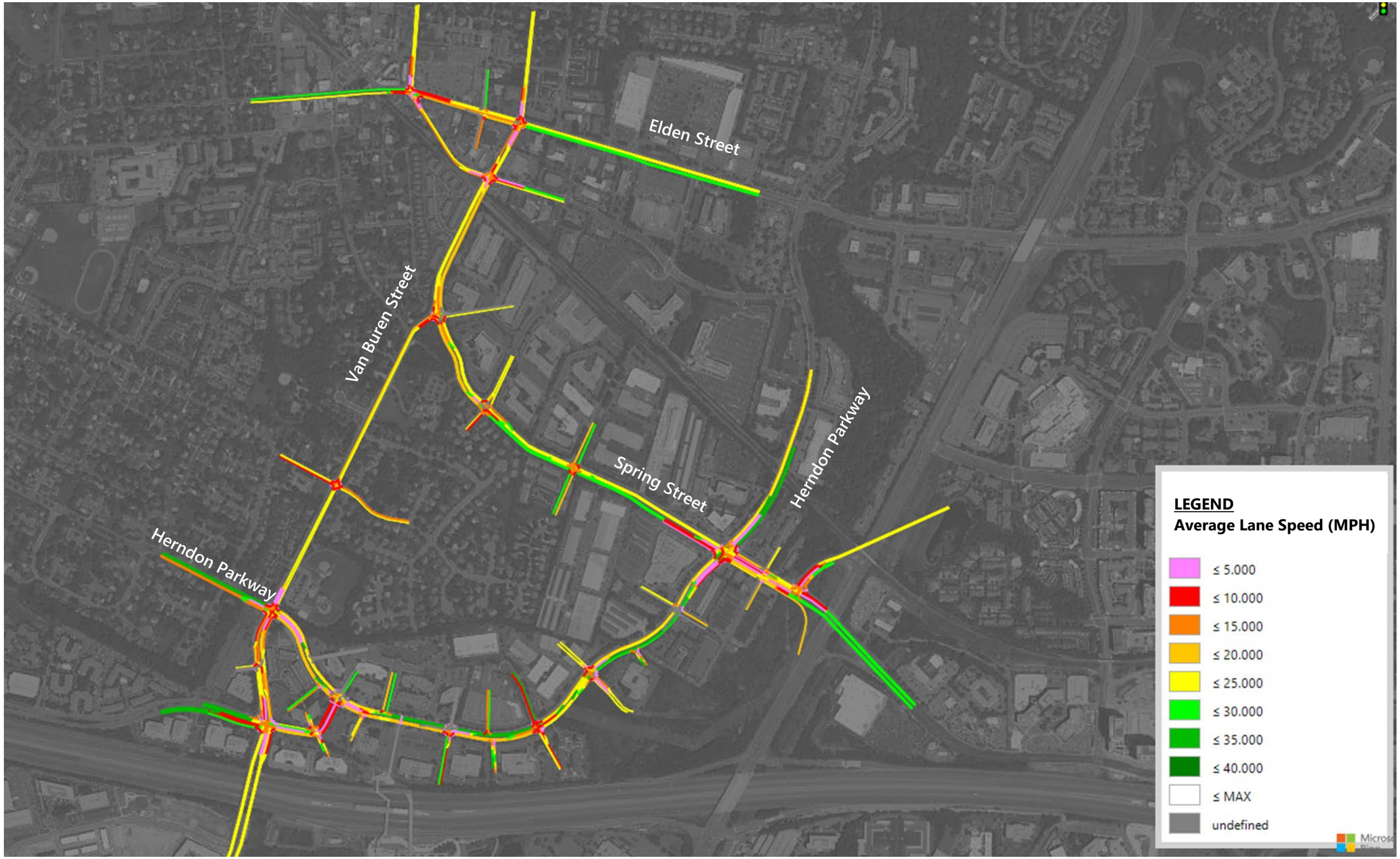
In the PM peak hour, the roadway network experiences increased queueing compared to the AM peak hour. Average queue lengths are still mostly accommodated, although the southbound Van Buren Street queue at Herndon Parkway and the northbound Herndon Parkway queue at Spring Street are significant. Maximum queue lengths fill most of the Herndon Parkway corridor and Spring Street at Herndon Parkway and the Fairfax County Parkway. As previously mentioned, these maximum queue lengths are most likely not all occurring simultaneously, so these queue findings do not equate to gridlock conditions. Queuing also does not directly correlate to delay; for instance, many of the intersections along Herndon Parkway are projected to operate at LOS B and C despite this level of queuing.

Figure 7 No Build 2045 Intersection Level of Service



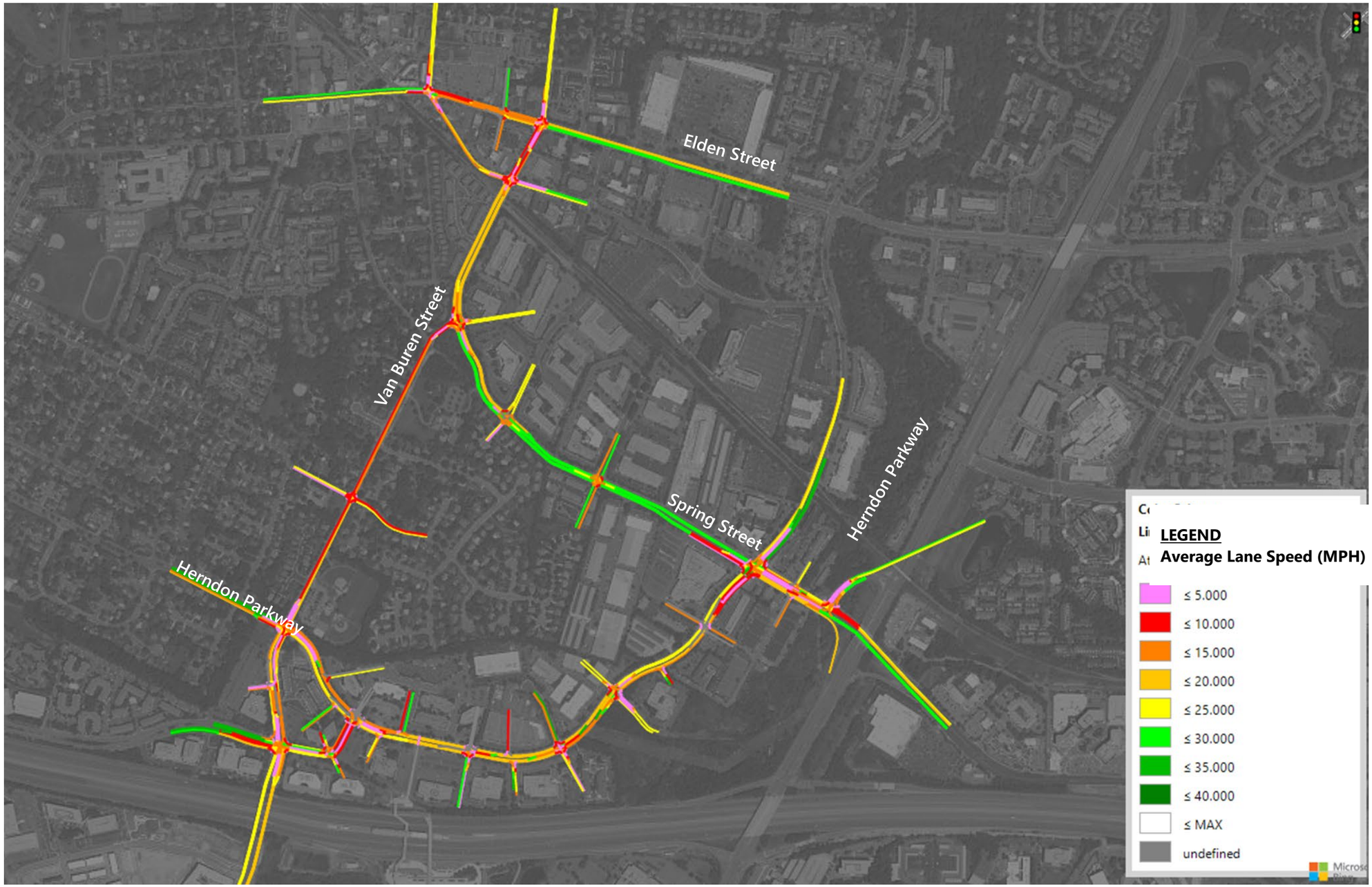
Source: Average of 7 AM Peak Hour and 20 PM Peak Hour VISSIM simulation runs. Aerial imagery from NearMap.

Figure 8 No Build 2045 Congestion Heat Map – AM Peak Hour



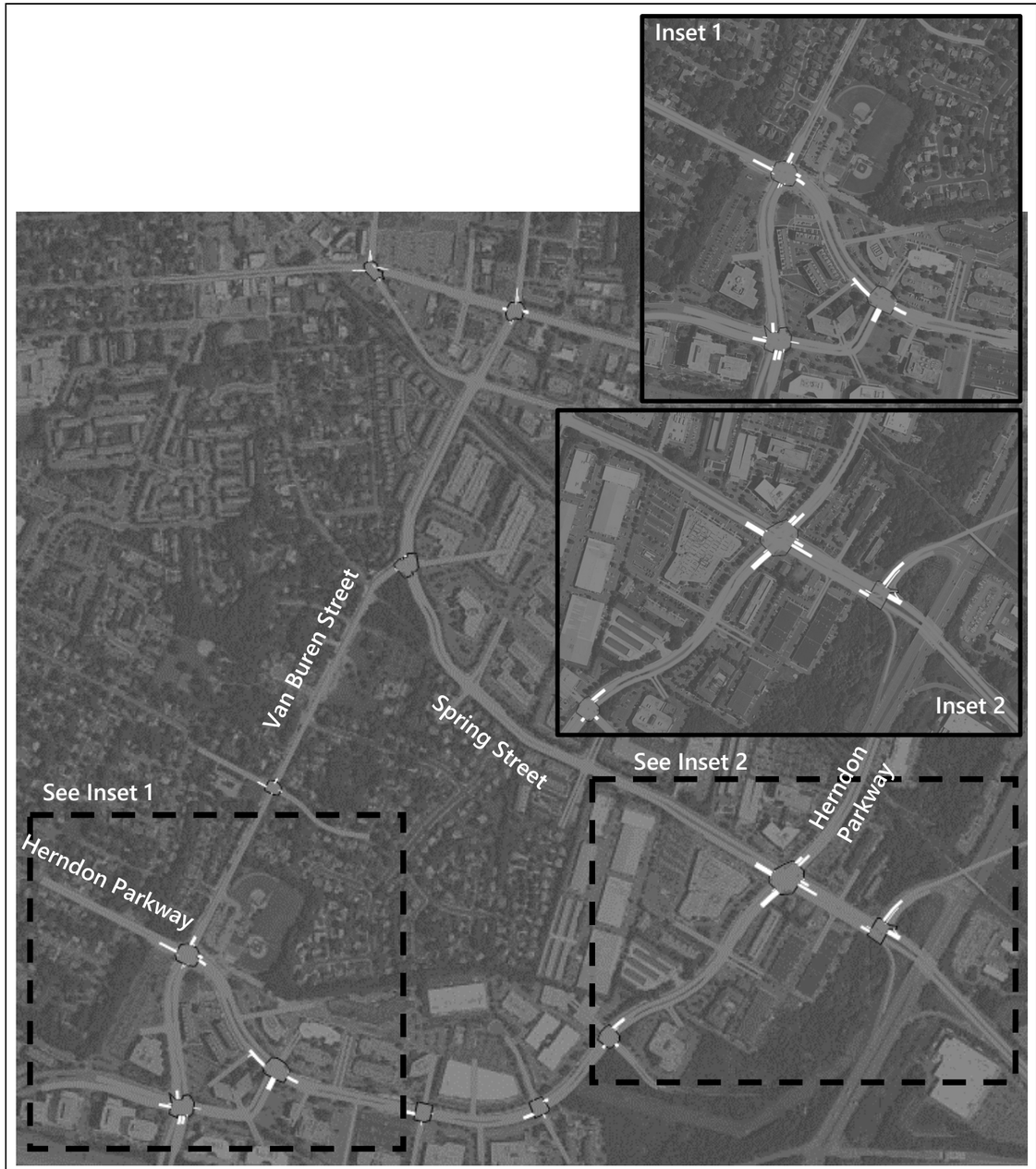
Source: Average of 7 AM Peak Hour VISSIM simulation runs.

Figure 9 No Build 2045 Congestion Heat Map – PM Peak Hour

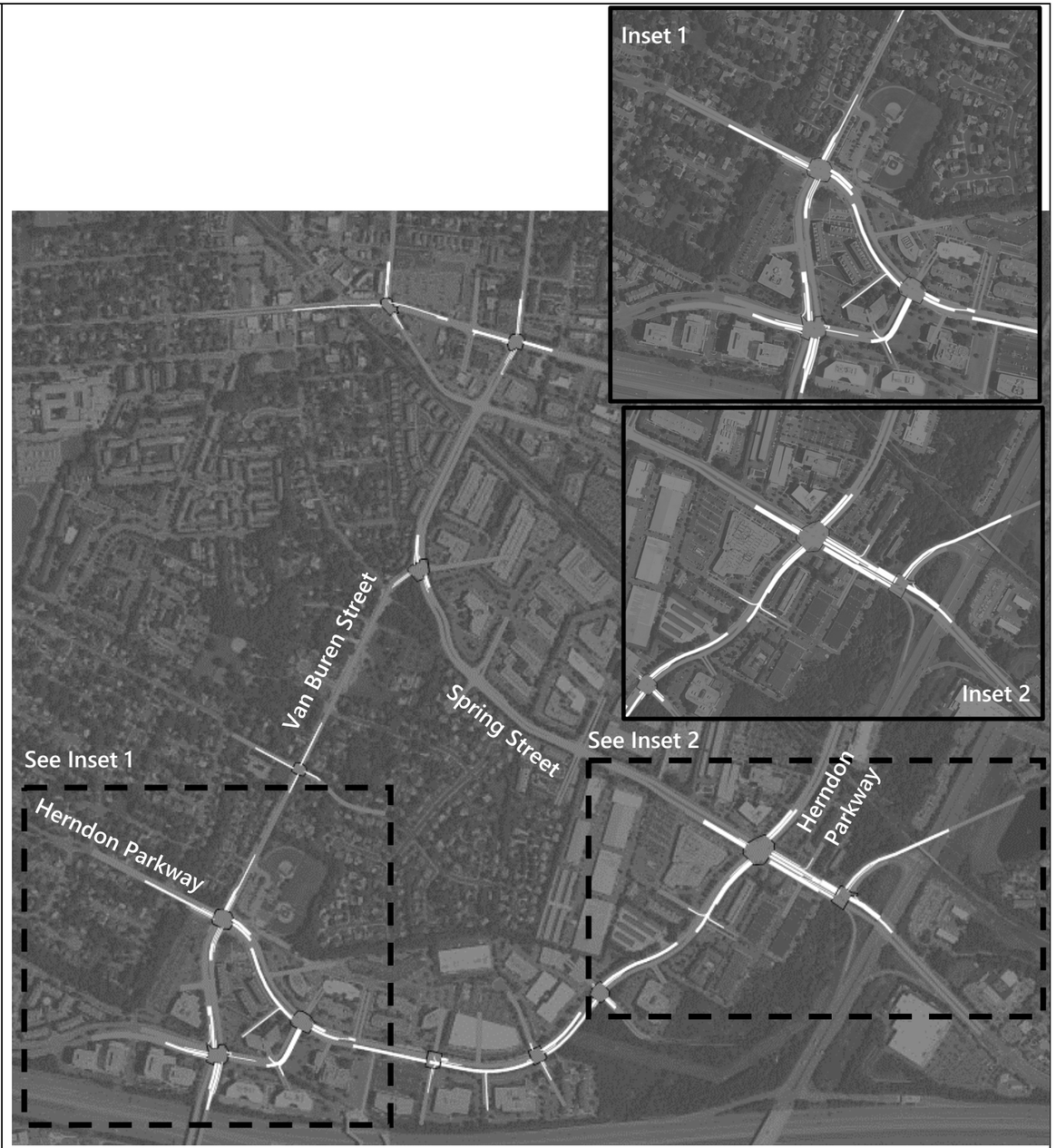


Source: Average of 20 PM Peak Hour VISSIM simulation runs.

Figure 10 No Build 2045 Queue Map – AM Peak Hour

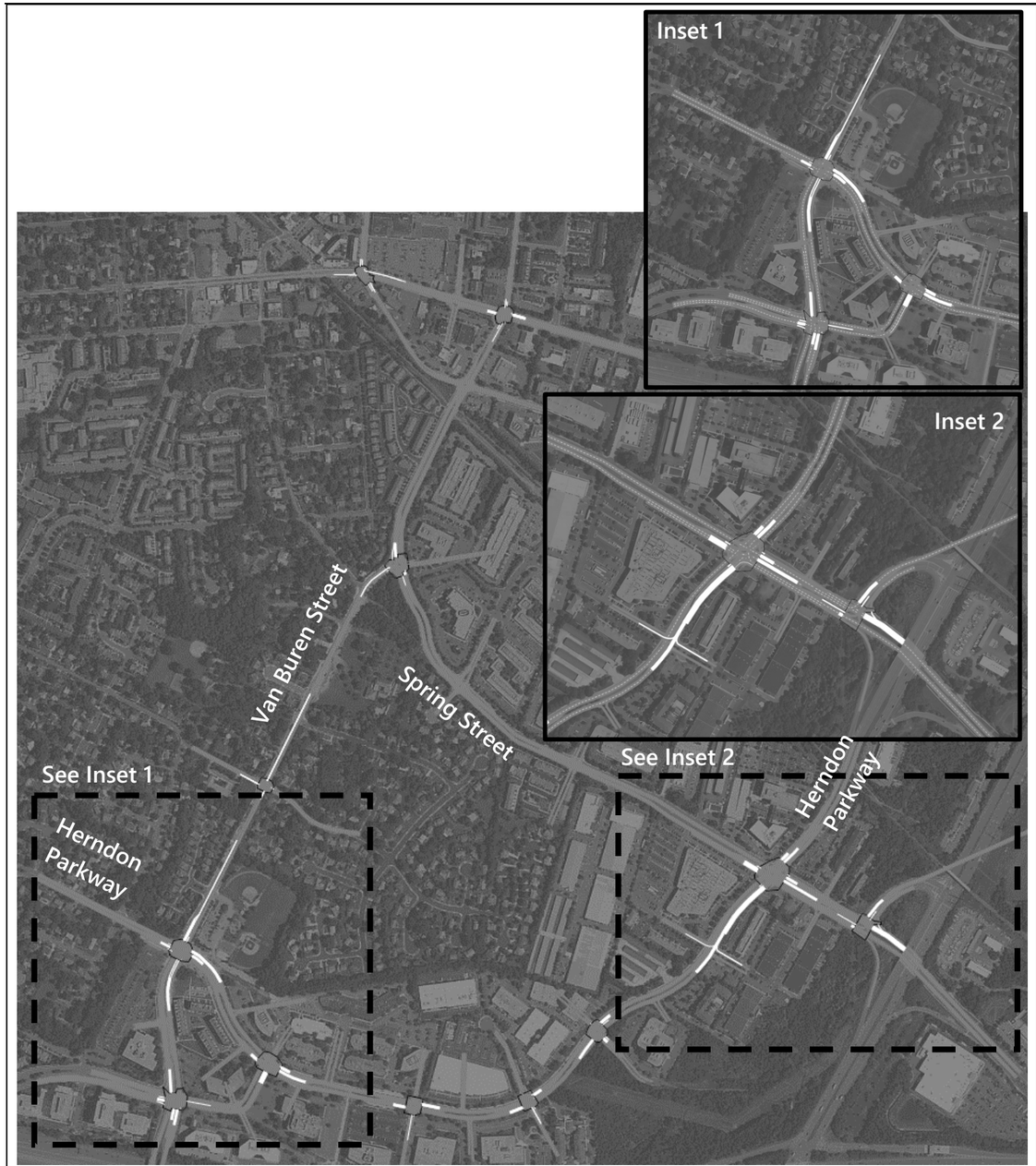


Average Queue Length

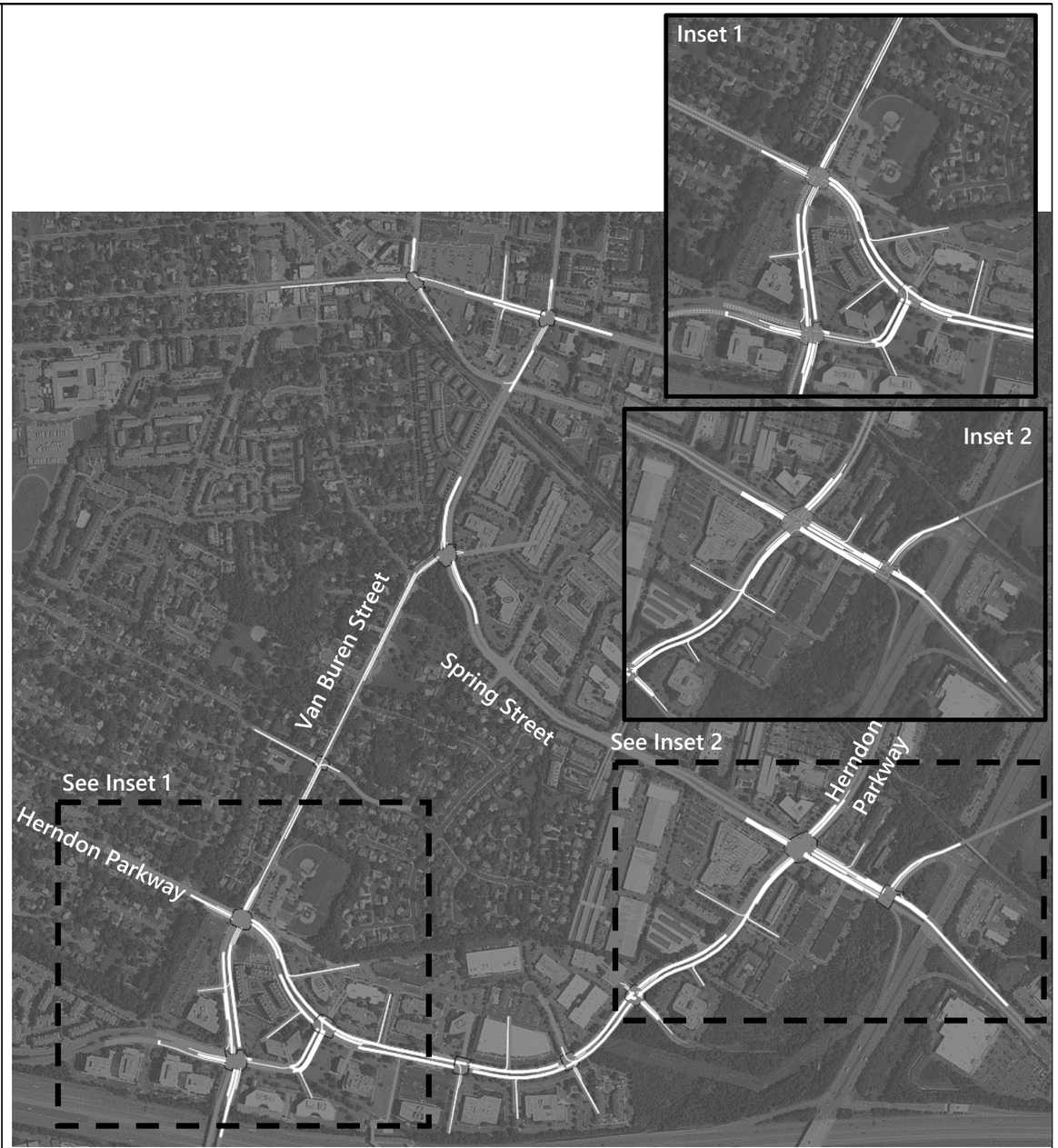


Maximum Queue Length

Figure 11 No Build 2045 Queue Map – PM Peak Hour



Average Queue Length



Maximum Queue Length

In summary, the No Build 2045 study area roadway network is projected to accommodate the increased demand via a combination of publicly funded roadway projects, optimized signal operations, and developer-funded roadway projects. Based on the findings, the Herndon Parkway intersections with Van Buren Street and Spring Street appear to be the locations with the most limited capacity. While the potential Fairbrook Drive extension would relieve a portion of the demand at the Spring Street intersection, the Van Buren Street intersection appears to potentially need additional roadway improvements to provide necessary capacity to meet the future demand of the No Build scenario.

Appendix B documents the delay, LOS, and vehicle queuing for all of the movements at each of the eleven study intersections.

3.4 No Build Traffic Conclusions – Constraints and Opportunities

The Herndon Parkway corridor is anticipated to accommodate projected 2045 volume demand (without TRG redevelopment); based on the acceptable values of projected delay, LOS, and queuing at the intersections along this corridor, it appears to have surplus capacity to handle additional demand, whether from TRG redevelopment or elsewhere. The exact quantity of this surplus capacity is difficult to estimate as the operations of this corridor are driven by closely spaced signalized intersections; the capacity of such a segment is based on a variety of factors including traffic signal parameters and local driver behavior – hence the need for VISSIM microsimulation traffic modeling to estimate traffic conditions.

While the Herndon Parkway corridor accommodates the demand, the most constrained locations within the study area system are at the two ends of Herndon Parkway – Van Buren Street and Spring Street. There are several intersection movements at these locations that are projected to operate at LOS F below the Town's acceptable threshold. In the modeled No Build condition, the Worldgate Drive extension offers the only additional access to the corridor beyond these two "bookend" intersections. Previous studies have identified a Fairbrook Drive extension as an improvement that would create an additional access route on the corridor's eastern end and relieve pressure on the Herndon Parkway / Spring Street intersection.

The operating performance of the Herndon Parkway / Van Buren Street intersection is limited by its geometry and lane configuration – both the northbound left turn and the southbound thru movement on Van Buren Street. The northbound left turn is limited by the single left turn lane while the southbound thru movement is limited by the dual thru lanes only extending approximately 150 feet. If the signal gives more green time than the time to clear the queue in this 150 feet, the approach capacity essentially drops to a single thru lane because vehicles are only arriving at the rate of a single lane. This intersection would likely need to be expanded to provide more capacity on the west end of the Herndon Parkway study corridor.

The 2017 TRG Study found that only 13% (AM) and 37% (PM) of TRG redevelopment vehicle trips would theoretically represent new traffic on the roadway network. The remaining development trips replaced existing trips; however, it should be noted that these existing trips were computed based on existing land use, not actual vehicle counts (i.e., this analysis assumed that the existing land use was 100% occupied and generating vehicle trips per ITE Trip Generation rates). A comparison of the existing peak hour turning movement counts in and out of the TRG (shown in 2017 TRG Study and utilized in this new TRG study) with the theoretical existing TRG peak hour traffic volumes (calculated in 2017 TRG Study) revealed a significant difference (the counts, which do include every parking lot driveway, were approximately 20% of the theoretical trips). If the pattern of a substantial percentage of new TRG development trips replacing existing TRG trips continues in this study, the network will more easily absorb traffic volumes associated with TRG redevelopment.

4

Three Build 2045 Scenarios with Fairbrook Drive Extension: Traffic Conditions

This section of the report documents the assumptions and findings for the traffic analysis of the three Build 2045 Scenarios with Fairbrook Drive extension. The traffic levels of these development scenarios are compared to No Build 2045 conditions to identify the impact of the additional development traffic.

4.1 Build 2045 Scenario Model Assumptions

In coordination with Town of Herndon staff and the SOM team, VHB identified the parameters that would be incorporated into the traffic analysis of the three Build scenarios.

4.1.1 Development Scenarios

The SOM team developed three (3) initial TRG development scenarios to share with the Town community and advisory committee. These three scenarios all incorporate feedback received throughout the TRG study, while each proposing a different development plan with distinct characteristics. VHB evaluated the transportation elements of each scenario, both from a qualitative connectivity perspective and a quantitative traffic analysis perspective. The three scenarios are the following:

- **Neighborhood Clusters**: Distributed density and mix of land uses throughout the TRG (i.e., multiple clusters of activity). Low to medium density throughout the TRG. Grid of streets connecting the development clusters.
- **Two Centers**: Density and activity centers focused on Metro station and Sunset Business Park. Low density development elsewhere within the TRG. Herndon Parkway and a new parallel pedestrian promenade are the transportation focus connecting the two centers.
- **Metro Center**: Density and activity center primarily focused on Metro station with low density development elsewhere within the TRG. A new roadway north of Herndon Parkway connects the development area to Spring Street.

4.1.2 Roadway Network

While each of the three development scenarios has a different internal roadway network (i.e., within the TRG redevelopment area), the external roadway network analyzed in this traffic analysis was the same for all three scenarios (e.g., Herndon Parkway, Spring Street, Van Buren Street, etc.). The external roadway network was primarily the same that was analyzed in the No Build 2045 traffic scenario with two major modifications:

- Fairbrook Drive extension to complete a connection between Herndon Parkway and the Spring Street / Fairfax County Parkway ramps intersection.
- New traffic signal at Herndon Parkway / Sunset Business Park (preidentified by Town staff as a future TRG development infrastructure element)

While the Fairbrook Drive extension to Spring Street was not included in the No Build traffic model due to potential issues with right of way acquisition, VDOT concurrence, and uncertainty regarding long-term interchange alternatives, the SOM team believes that the extension is a critical component to the full buildout of the TRG given the No Build traffic analysis findings. Due to this condition, Town staff agreed to include the Fairbrook Drive extension in these three Build Scenario traffic models to evaluate the ultimate vision for the three development scenarios. Subsequent analysis will be necessary to determine the phasing and/or "requisite triggering" of the Fairbrook Drive extension.

The extension of Fairbrook Drive to Spring Street has not been previously evaluated under 2045 projected traffic conditions. Particularly since the extension ties into the Spring Street / Fairfax County Parkway ramp intersection, VDOT will verify that the design of this modified intersection is operationally functional. Therefore, iterative traffic modeling was utilized to identify a functional intersection design that would accommodate projected traffic volumes but also not be overbuilt, which would consume developable land and lengthen pedestrian crossings. The identified intersection design is a starting point from which these development traffic models could be analyzed; as previously discussed, a future interchange modification would significantly alter these plans.

Figure 12 displays the modeled Spring Street / Fairfax County Parkway Ramps / Fairbrook Drive intersection that includes:

- All improvements in the Herndon Parkway / Spring Street roadway project.
- An additional thru lane on the Fairfax County Parkway offramp to continue straight onto Fairbrook Drive.
- A left turn lane to turn from westbound Spring Street onto Fairbrook Drive.
- Widening of the southbound Fairfax County Parkway onramp to accommodate the conversion of the existing eastbound Spring Street outside thru lane into a "choice" lane, thereby letting eastbound Spring Street traffic enter the onramp from two lanes.
- New Fairbrook Drive approach – a shared left/thru lane, a right turn lane onto eastbound Spring Street, and a right turn lane onto the southbound Fairfax County Parkway onramp.

Additionally, signal phasing and timing was optimized at all traffic signals within the three Build models. It is appropriate to include optimized signals because transportation agencies typically optimize their traffic signals every few years. It is safe to assume that the Town of Herndon will operate the signals to most efficiently serve all road users (vehicular and pedestrian). At all new or modified signals (i.e., from roadway projects), signal timings include multimodal consideration of pedestrian crossing intervals.

Figure 12 Modeled Configuration of Spring Street / Fairfax County Parkway Ramps / Fairbrook Drive Extension



Other than the Herndon Parkway / Sunset Business Park intersection and the intersections already modeled as traffic signals in the No Build 2045 model, all other intersections that provide access to the TRG were modeled as unsignalized intersections. The most significant of these unsignalized intersections is located on Spring Street west of Herndon Parkway; two of the three scenarios have a new roadway parallel to Herndon Parkway that connects at this location. The absence of a traffic signal limits the attractiveness/usefulness of this parallel connection. These models establish a baseline condition with no additional external transportation mitigation measures (e.g., a new traffic signal); a signal could be considered if needed in the final traffic model that includes any appropriate mitigation measures.

4.1.3 Traffic Volumes

The same three-part process was utilized to develop the volume datasets for each of the three Build development scenarios. The base dataset was the No Build 2045 volume dataset previously shown in Figure 6. Additional details on the new traffic volumes associated with each Build scenario are provided in the following report sections.

1. Remove volumes associated with the existing TRG development area. A decision was made to remove the

quantity of existing vehicle volumes known to turn in and out the TRG rather than remove the theoretical quantity of existing vehicle trips associated with the TRG. This approach removes substantially fewer vehicle trips per peak hour than the 2017 TRG Study (350-400 trips versus ~2,000 trips) but is more conservative and likely more representative of TRG building occupancy and travel patterns.

2. Reroute traffic volumes onto Fairbrook Drive extension. A portion of traffic will utilize the extension to bypass the Herndon Parkway / Spring Street intersection.
3. Add the new traffic volumes associated with each of the three Build development scenarios.

Site trip generation is the first step in the trip generation process, which is utilized to project the quantity of new traffic anticipated from a new development such as the TRG. This step computes an upper bound of anticipated vehicle trips associated with each type of land use; these trips may then be reduced in subsequent steps of the process. The Institute of Transportation Engineers (ITE) publishes the *Trip Generation Manual* to serve as an industry standard for site trip generation calculations. The manual contains a large quantity of real-world datasets that correlate the number of vehicle trips to the size of a development. The VHB team utilized the 11th Edition of the ITE manual, which is the most recently published edition.

Following the site trip generation step, a series of appropriate reduction factors are applied to the projected trip total to account for transit use, pass-by trips, and internal capture trips. The transit use reduction factor accounts for the percentage of person trips that utilize transit rather than vehicles to complete their trip. The TRG's proximity to Metro incentivizes a relatively high transit reduction factor. Consistent with the HTOC Study and the 2017 TRG Study, this analysis incorporated a 25% transit reduction factor.

The next type of appropriate trip reduction is pass-by trips, which are existing vehicle trips on the immediately adjacent road network that make an additional route stop at a retail development. In other words, if the development did not exist, these vehicles would still be present on the adjacent roadway. Pass-by rates are provided in the ITE manual. The final type of appropriate trip reduction is internal capture, which are trips that begin and end within the same development and never enter a surrounding roadway. They are most prevalent in mixed-use developments such as the TRG where the variety of land uses encourage multiple types of activity (i.e., "live, work, play"). Consistent with the 2017 TRG Study, this analysis incorporated a 7% internal capture reduction factor.

4.2 Build 2045 Scenario One: Neighborhood Clusters

Consistent with the Existing and No Build 2045 conditions traffic analysis, the Build models were run under the same conditions (i.e., length of individual simulation run and number of averaged simulation runs). The same traffic operations metrics were also collected to evaluate the change in system performance between No Build 2045 and Build 2045 Scenario One conditions.

4.2.1 Trip Generation

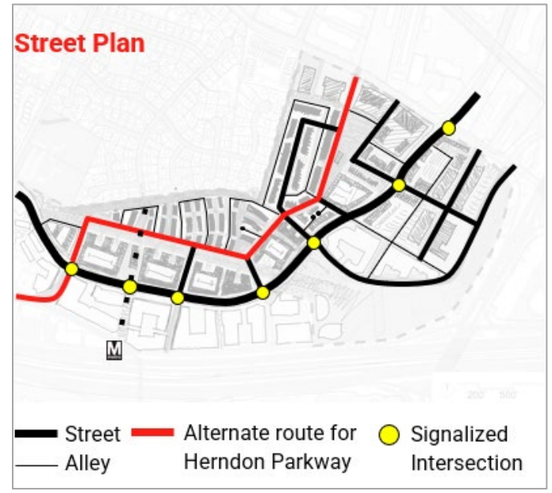
Table 6 documents the trip generation calculations for Build 2045 Scenario One: Neighborhood Clusters. Table 5 shows that after the appropriate trip reductions, the new TRG development at full buildout is expected to generate more than 2,250 AM Peak Hour trips, 2,250 PM Peak Hour trips, and 27,000 weekday trips. These new TRG trips replace the existing trips associated with existing development within the TRG. The development scenario for Scenario 1 is residential heavy, which has a predominant traffic flow of outbound in the morning and inbound in the evening. Due to this, the projected outbound trip total for Scenario 1 is higher than the inbound in the morning peak and reversed in the evening peak. This pattern is opposite of an office-heavy development pattern such as the existing TRG land use.

4.2.2 Transportation Connectivity

The Neighborhood Clusters Scenario includes a new roadway connection parallel to Herndon Parkway, as shown in red in **Figure 13**. This connection, in addition to the grid of streets proposed, will provide TRG traffic with alternate travel paths to Herndon Parkway. The No Build traffic analysis indicated that the two termini intersections on Herndon Parkway were traffic choke points; the introduction of additional street connections to Spring Street will partially relieve that traffic pressure.

As previously mentioned, the current traffic analysis assumes that the new Spring Street intersection with the alternate route roadway will be unsignalized. If signalization of this intersection is identified as a potential transportation improvement, more traffic would be capable of utilizing the alternate route – in the unsignalized condition, the capacity of the intersection to facilitate left turn movements is limited.

Figure 13 Neighborhood Clusters Scenario Street Plan



Source: SOM TRG graphics.

Figure 14 displays the traffic volume dataset that was analyzed at the study intersections in the Build Scenario 1 (Neighborhood Clusters) 2045 traffic model. The TRG traffic volumes were distributed throughout the TRG land area by subdividing the TRG into multiple zones of development density. Because the Scenario One proposed density is distributed throughout the TRG land area, the traffic volume accessing the TRG is also distributed across many access points, thereby not overloading any specific location. The proposed location of a relatively concentrated portion of density within Sunset Business Park also results in a significant percentage of new TRG traffic not utilizing the Herndon Parkway corridor adjacent to the Metro Station; instead, this traffic volume is contained to the northeast corner of the TRG and study road network.

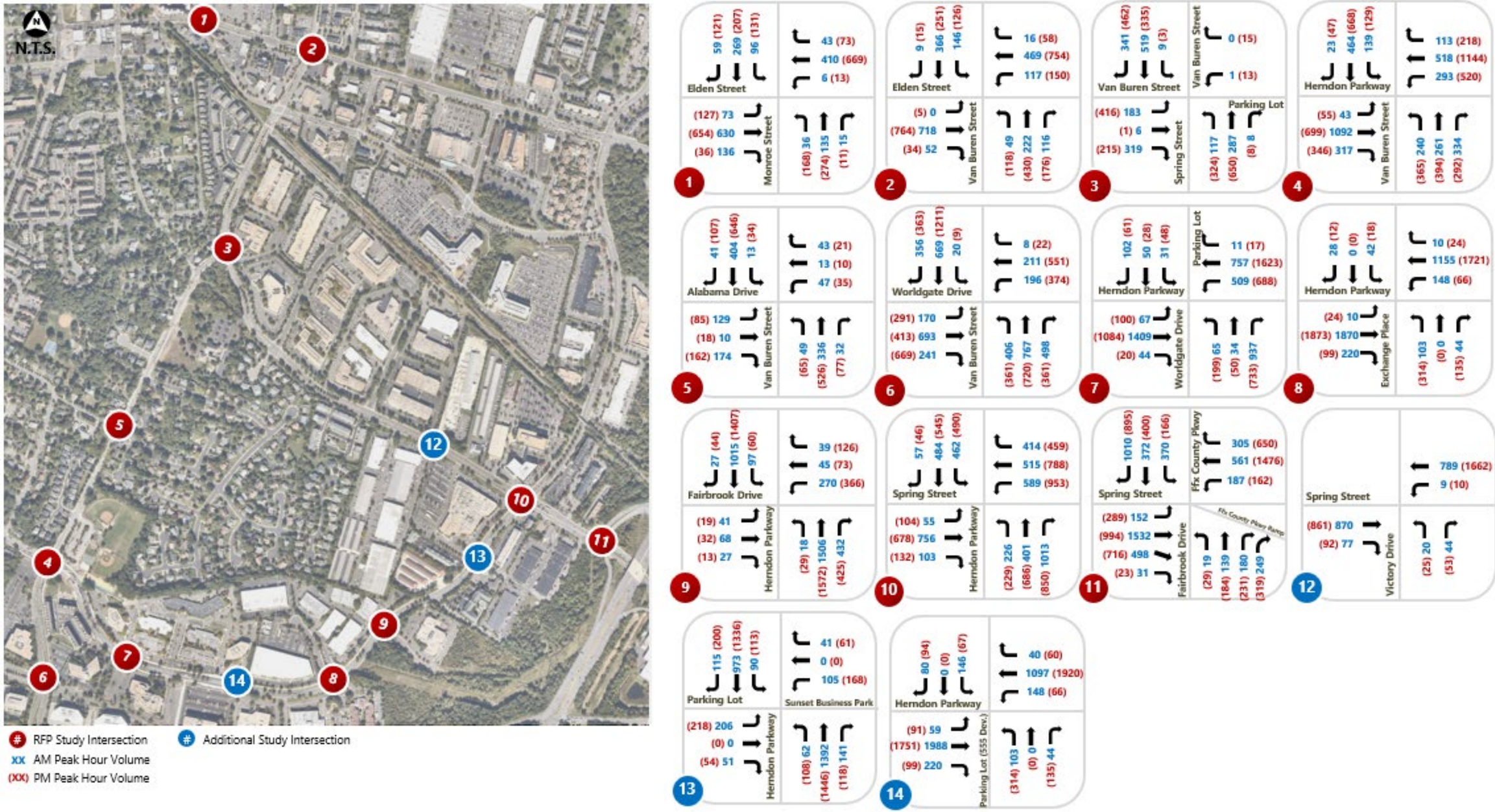
Figure 15 displays just the new site trips associated with the Preferred Build Scenario, while **Figure 16** displays just the pass-by site trips associated with the Preferred Build Scenario. **Appendix A** shows these three sets of traffic volumes for all intersections within the traffic model, including non-study intersections.

Table 6 TRG Build Scenario 1 (Neighborhood Clusters), Full Buildout, Site Trip Generation

Land Use Type	Independent Variable	Independent Variable Unit	ITE Code	ITE Land Use	AM Peak Hour (7-9 AM)			PM Peak Hour (4-6 PM)			Weekday Total		
					Trips	Enter	Exit	Trips	Enter	Exit	Trips	Enter	Exit
Residential													
Multifamily	2,939	Dwelling Units	221	Multifamily Housing (Mid-Rise)	1,282	295	987	1,147	699	447	13,973	6,986	6,986
Townhomes	84	Dwelling Units	215	Single-Family Attached Housing	38	9	28	46	27	19	590	295	295
2 over 2s	352	Dwelling Units	221	Multifamily Housing (Mid-Rise)	158	36	121	150	92	59	1,790	895	895
Residential Subtotal	3,408	Dwelling Units			**1,477**	**341**	**1,137**	**1,344**	**819**	**525**	**16,352**	**8,176**	**8,176**
Hospitality													
Hotel	364	Rooms	310	Hotel	175	98	77	241	123	118	3,522	1,761	1,761
Office													
Corporate Office	35,200	SF	710	General Office Building	68	60	8	70	12	58	468	234	234
Creative Office	116,700	SF	710	General Office Building	191	168	23	189	32	157	1,327	664	664
Office Subtotal	151,900	SF			**259**	**228**	**31**	**259**	**44**	**215**	**1,795**	**898**	**898**
Retail													
Grocery	64,300	SF	850	Supermarket	184	108	75	540	270	270	5,901	2,951	2,951
Restaurant	147,800	SF	932	High-Turnover Restaurant	1,338	816	522	1,414	778	637	15,844	7,922	7,922
Fitness Center	63,100	SF	495	Recreational Community Center	121	80	41	191	90	101	1,775	888	888
Retail Subtotal	275,200	SF			**1,642**	**1,004**	**638**	**2,146**	**1,138**	**1,008**	**23,521**	**11,760**	**11,760**
Other													
Self Storage	24,500	SF	151	Mini-Warehouse	2	1	1	4	2	2	37	18	18
All Land Uses Total (Base Trip Generation)					**3,556**	**1,672**	**1,884**	**3,993**	**2,126**	**1,868**	**45,227**	**22,614**	**22,614**
Transit Mode Split Reduction	25%				-889	-418	-471	-998	-531	-467	-11,307	-5,653	-5,653
Vehicle Trips					**2,667**	**1,254**	**1,413**	**2,995**	**1,594**	**1,401**	**33,920**	**16,960**	**16,960**
Pass-By Reduction Grocery	24%	PM. AM = ½ of PM. Weekday = average.			-17	-10	-7	-97	-49	-49	-797	-398	-398
Pass-By Reduction Restaurant	43%	PM. AM = ½ of PM. Weekday = average.			-216	-132	-84	-456	-251	-205	-3,832	-1,916	-1,916
New Vehicle Trips on Roadway Network					**2,434**	**1,113**	**1,322**	**2,442**	**1,295**	**1,147**	**29,291**	**14,646**	**14,646**
Internal Capture	7%				-170	-78	-93	-171	-91	-80	-2,050	-1,025	-1,025
Net New Vehicle Trips on External Roadway Network					**2,264**	**1,035**	**1,229**	**2,271**	**1,204**	**1,067**	**27,241**	**13,621**	**13,621**

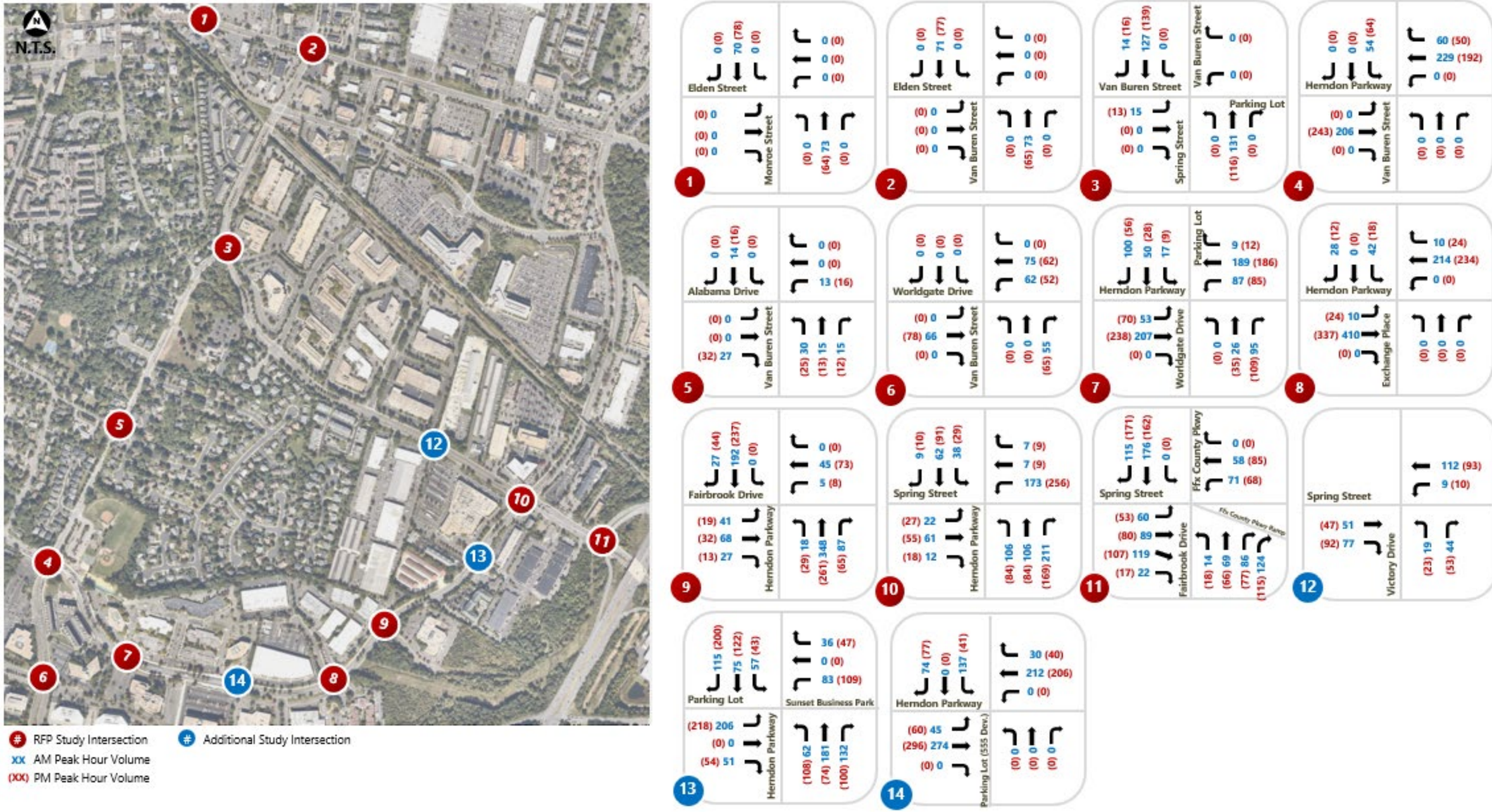
Source: Institute of Transportation Engineer's *Trip Generation Manual, 11th Edition*. Utilized "suburban" trip generation rates as decision was made with Town of Herndon to apply a consistent methodology to prior studies in the TRG, which utilized suburban base trip generation and then applied significant transit and internal capture reductions. An "urban" trip generation rate would not be compatible with this approach as it already accounts for these types of trip reductions.

Figure 14 Build Scenario 1 (Neighborhood Clusters) 2045 Traffic Volumes



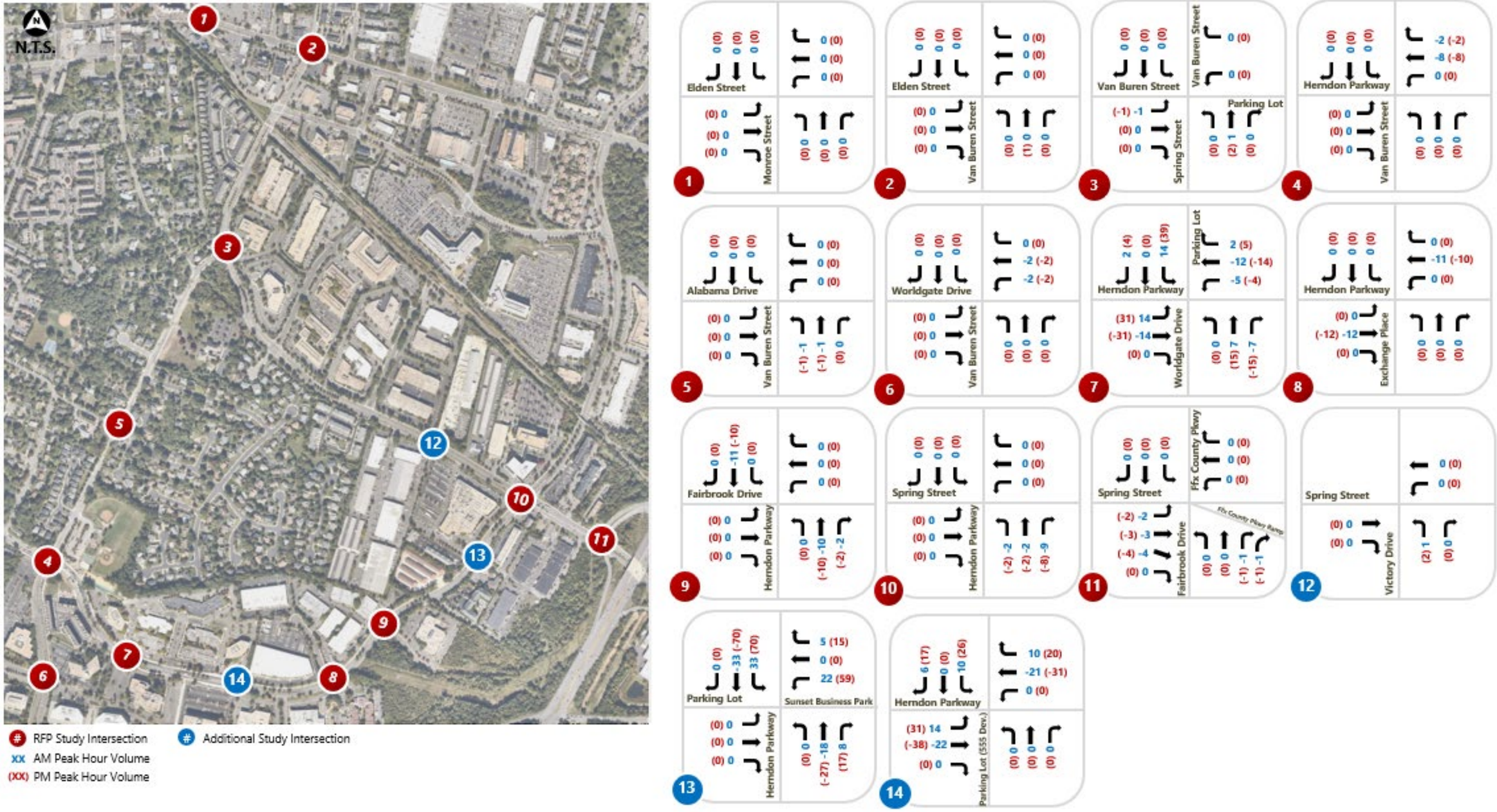
Build 2045 traffic volumes include No Build 2045 traffic volumes (Figure 6), removal of existing TRG area traffic volumes, volume shift to account for the Fairbrook Drive extension, and new TRG development traffic volumes. Basemap Source: Nearmap

Figure 15 Build Scenario 1 (Neighborhood Clusters) New Site Trips



Basemap Source: Nearmap

Figure 16 Build Scenario 1 (Neighborhood Clusters) Site Pass-By Trips



Basemap Source: Nearmap

4.2.3 Traffic Analysis

In Build 2045 Scenario One conditions, with higher traffic volumes than No Build 2045 conditions but also the addition of Fairbrook Drive extension, the transportation network within the study area is projected to experience higher levels of congestion, albeit at a manageable level. **Table 7** lists the projected intersection delay and LOS at each of the eleven study intersections, comparing No Build 2045 to Build Scenario One. Projected intersection LOS in Build Scenario One is also shown in **Figure 17**.

As seen in the delay change values in Table 7, the relative impact of the new TRG traffic volume is minimal at an intersection delay metric level. In Build Scenario One, all study intersections are projected to operate at LOS D or better in both peak hours, except for the Spring Street / Herndon Parkway intersection, which is anticipated to operate at LOS E in both peak hours. While LOS E does represent increased delay, many intersections in the Northern Virginia area operate at this condition during a peak hour and Fairfax County has adopted an LOS E intersection standard in several of its urban development areas.

In comparison to No Build, this is technically an increase from one intersection peak hour operating at LOS E to two intersection peak hours operating at LOS E; however, an examination of the delay values at the Herndon Parkway / Spring Street intersection reveals that the AM LOS change resulted from only 4 seconds of increased delay and the PM delay actually decreased by 3 seconds (improvement due to Fairbrook Drive extension relieving pressure on this intersection). The largest delay and congestion increase is at the Spring Street / Fairfax County Parkway Ramps / Fairbrook Drive extension intersection. This is due to conversion of this intersection from three to four approach legs and the addition of traffic signal phases to accommodate the new movements. A large quantity of traffic is utilizing this intersection and the modeled congestion is representative of that volume combined with a "minimal" functional design that does not overbuild the roadway for off-peak travel.

The intersection turning movements in **Table 8** operate at LOS F in Build Scenario 1 2045 conditions; the existing Town of Herndon Ordinance states "no individual turning movement level of service at an intersection falls below "LOS E"". Compared to No Build 2045 conditions, the "new" movements that operate at LOS F are located at the Herndon Parkway / Spring Street intersection and the Spring Street / Fairfax County Parkway Ramps / Fairbrook Drive intersection. The LOS at both intersections is influenced by the 150-second signal cycle length, which while best for the entire intersection, increases delay for some movements. The Parkway intersection operations are currently based on the assumed intersection design and are subject to change pending future interchange decisions made by the Town, VDOT, and Fairfax County. These two Spring Street intersections should be studied further in the future as interchange planning progresses.

Table 7 Comparison of Intersection Delay and LOS: No Build 2045 to Build Scenario 1 (Neighborhood Clusters)

Intersection [1]	No Build 2045				Build Scenario One				Change No Build to Build			
	AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Elden St / Monroe St	27.2	C	34.1	C	27.0	C	38.7	D	-0.2	-	+4.6	C→D
Elden St / Van Buren St	31.2	C	36.7	D	34.7	C	37.7	D	+3.5	-	+1.0	-
Van Buren St / Spring St	16.8	B	40.8	D	17.4	B	28.4	C	+0.6	-	-12.4	D→C
Van Buren St / Herndon Pkwy	30.5	C	44.4	D	36.1	D	50.4	D	+5.6	C→D	+6.0	-
Van Buren St / Alabama Dr	16.1	B	33.4	C	21.8	C	26.7	C	+5.7	B→C	-6.7	-
Van Buren St / Worldgate Dr	23.8	C	27.7	C	22.7	C	22.9	C	-1.1	-	-4.8	-
Herndon Pkwy / Worldgate Dr	25.2	C	22.0	C	33.4	C	32.2	C	+8.2	-	+10.2	-
Herndon Pkwy / Exchange Pl	11.0	B	15.8	B	15.1	B	17.6	B	+4.1	-	+1.8	-
Herndon Pkwy / Fairbrook Dr	14.2	B	19.9	B	17.3	B	20.6	C	+3.1	-	+0.7	B→C
Spring St / Herndon Pkwy	51.5	D	59.1	E	55.9	E	55.7	E	+4.4	D→E	-3.4	-
Spring St / FCP Ramps	22.1	C	25.8	C	41.6	D	38.9	D	+19.5	C→D	+13.1	C→D

Source: Average of 7 AM and 20 PM Peak Hour VISSIM simulation runs.

1 All study intersections are signalized in the No Build and Build scenario.

Table 8 Build Scenario 1 "LOS F" Turning Movements

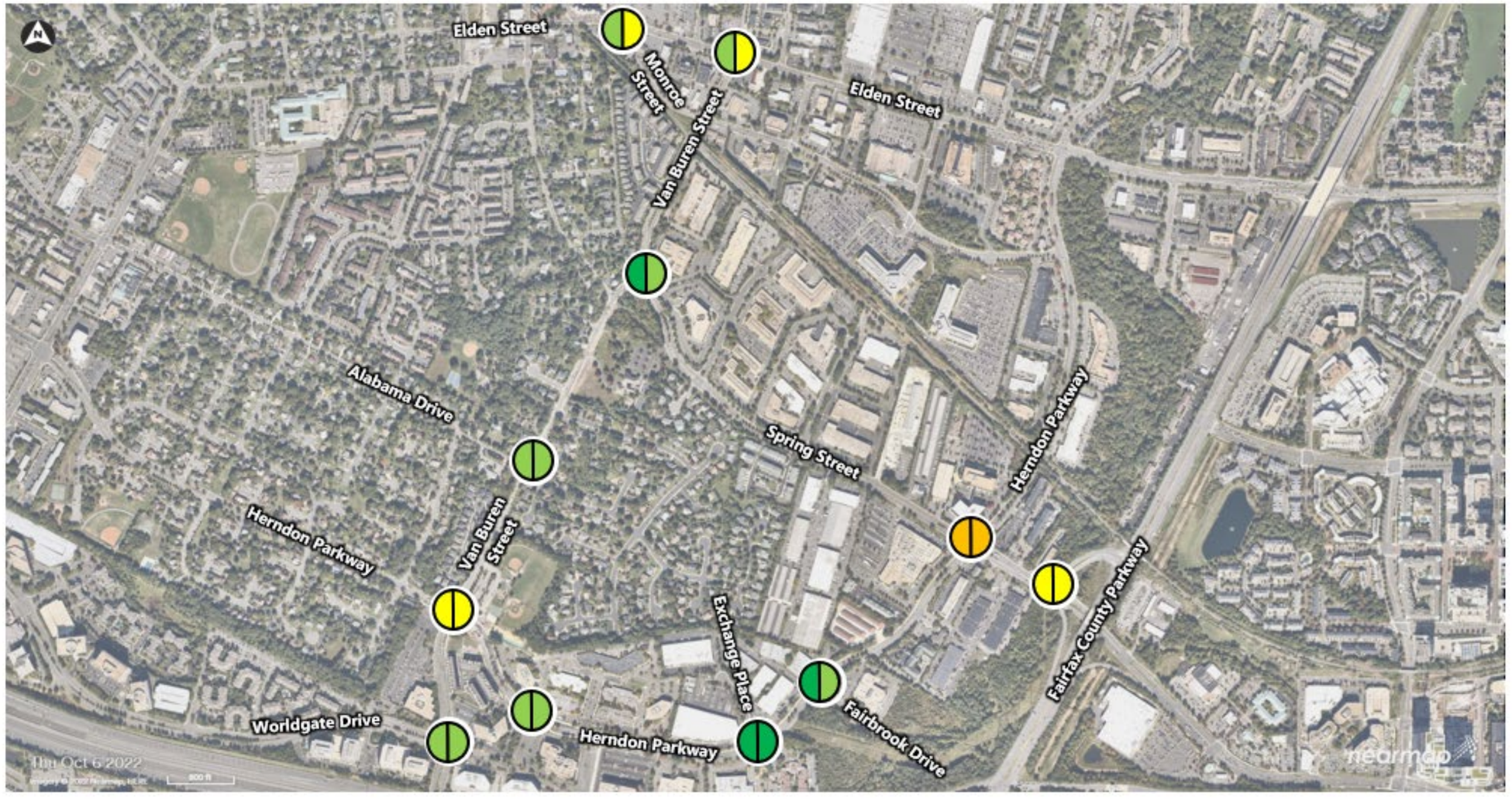
Turning Movement	Peak	LOS F in No Build?	Source of Congestion
Herndon Pkwy / Spring Street			
Southbound Left	AM	No	*Heavy Demand*
Eastbound Left	AM/PM	No	
Spring St / Fairfax County Parkway Ramps / Fairbrook Dr			
Eastbound Left	PM	No	*Heavy Demand, Assumed "Interim" Intersection Modifications*
Westbound Left	AM	No	
Northbound Left	AM/PM	No	
Northbound Thru	AM	No	
Southbound Left	AM/PM	No	
Van Buren St / Herndon Pkwy			
Northbound Left	PM	Yes	*Intersection capacity limitations*

Source: Average of 7 AM and 20 PM Peak Hour VISSIM simulation runs.

Congestion "heat" maps for each of the Build Scenario One peak hours are shown in **Figures 18** and **19**. These represent the average vehicle speeds present in different lanes and segments of the model. Slower vehicle speeds (shown in shades of red) represent areas of higher congestion and vehicle queuing, whereas higher vehicle speeds (shown in shades of green) represent areas of lower congestion and vehicle queueing. In both peak hours, the heaviest areas of congestion are the Spring Street corridor between Herndon Parkway and Fairfax County Parkway, as well as the three intersections at the junctions of Van Buren Street, Worldgate Drive, and Herndon Parkway. Additionally, in the PM peak hour, southbound Van Buren Street experiences a significant amount of congestion. This anticipated congestion pattern is largely unchanged from No Build 2045 traffic conditions.

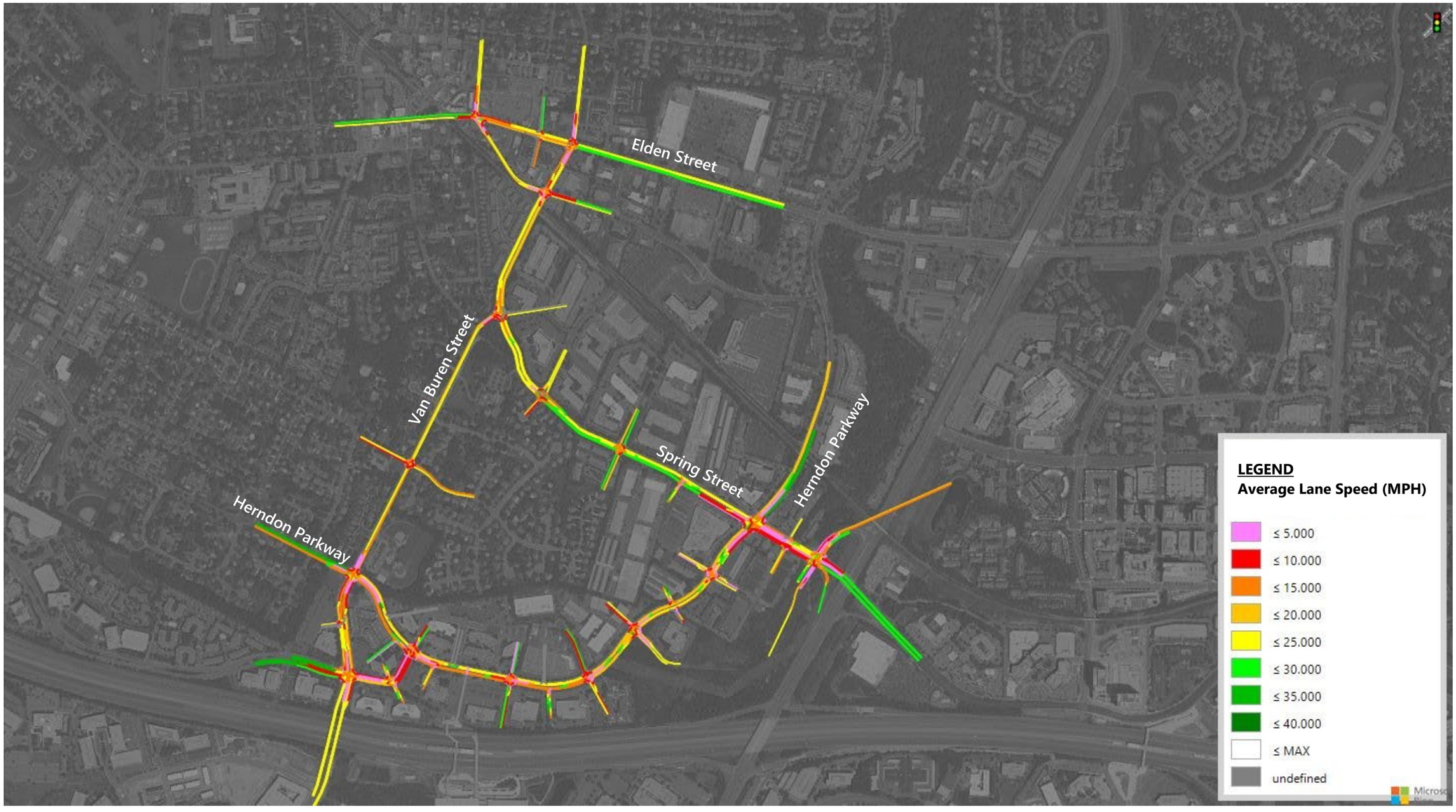
Appendix B documents the delay, LOS, and vehicle queueing for all movements at each of the eleven study intersections.

Figure 17 Build Scenario 1 (Neighborhood Clusters) 2045 Intersection Level of Service



Source: Average of 7 AM Peak Hour and 20 PM Peak Hour VISSIM simulation runs. Aerial imagery from NearMap.

Figure 18 Build Scenario 1 (Neighborhood Clusters) 2045 Congestion Heat Map – AM Peak Hour



Source: Average of 7 AM Peak Hour VISSIM simulation runs.

Figure 19 Build Scenario 1 (Neighborhood Clusters) 2045 Congestion Heat Map – PM Peak Hour



Source: Average of 20 PM Peak Hour VISSIM simulation runs.

4.3 Build 2045 Scenario Two: Two Centers

Consistent with the Existing and No Build 2045 conditions traffic analysis, the Build models were run under the same conditions (i.e., length of individual simulation run and number of averaged simulation runs). The same traffic operations metrics were also collected to evaluate the change in system performance between No Build 2045 and Build 2045 Scenario Two conditions.

4.3.1 Trip Generation

Table 9 documents the trip generation calculations for Build 2045 Scenario Two: Two Centers. Table 7 shows that after the appropriate trip reductions, the new TRG development at full buildout is expected to generate approximately 2,500 AM Peak Hour trips, 2,450 PM Peak Hour trips, and 28,500 weekday trips. These new TRG trips replace the existing trips associated with existing development within the TRG.

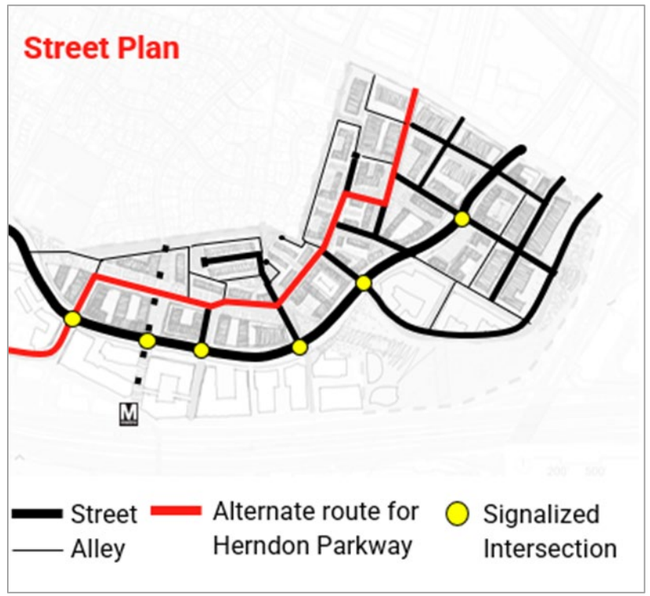
The higher quantity of office development in Scenario Two results in an approximately equal distribution between entering and exiting vehicle trips during each peak hour. In contrast to Scenario One, these anticipated vehicle trip totals are approximately 250 higher in the AM Peak Hour, 200 higher in the PM Peak hour, and 1,250 higher across an entire weekday.

4.3.2 Transportation Connectivity

The Two Centers Scenario includes a new roadway connection parallel to Herndon Parkway, as shown in "red" in **Figure 20**; however, this features an indirect connection to Spring Street that provides less connectivity than the new roadway shown in Scenario One. This connection, in addition to the grid of streets proposed, will provide TRG traffic with alternate travel paths to Herndon Parkway. The No Build traffic analysis indicated that the two termini intersections on Herndon Parkway were traffic choke points; the introduction of additional street connections to Spring Street will partially relieve that traffic pressure.

As previously mentioned, the current traffic analysis assumes that the new Spring Street intersection with the alternate route roadway will be unsignalized. If signalization of this intersection is identified as a potential transportation improvement, more traffic would be capable of utilizing the alternate route – in the unsignalized condition, the capacity of the intersection to facilitate left turn movements is limited.

Figure 20 Two Centers Scenario Street Plan



Source: SOM TRG graphics.

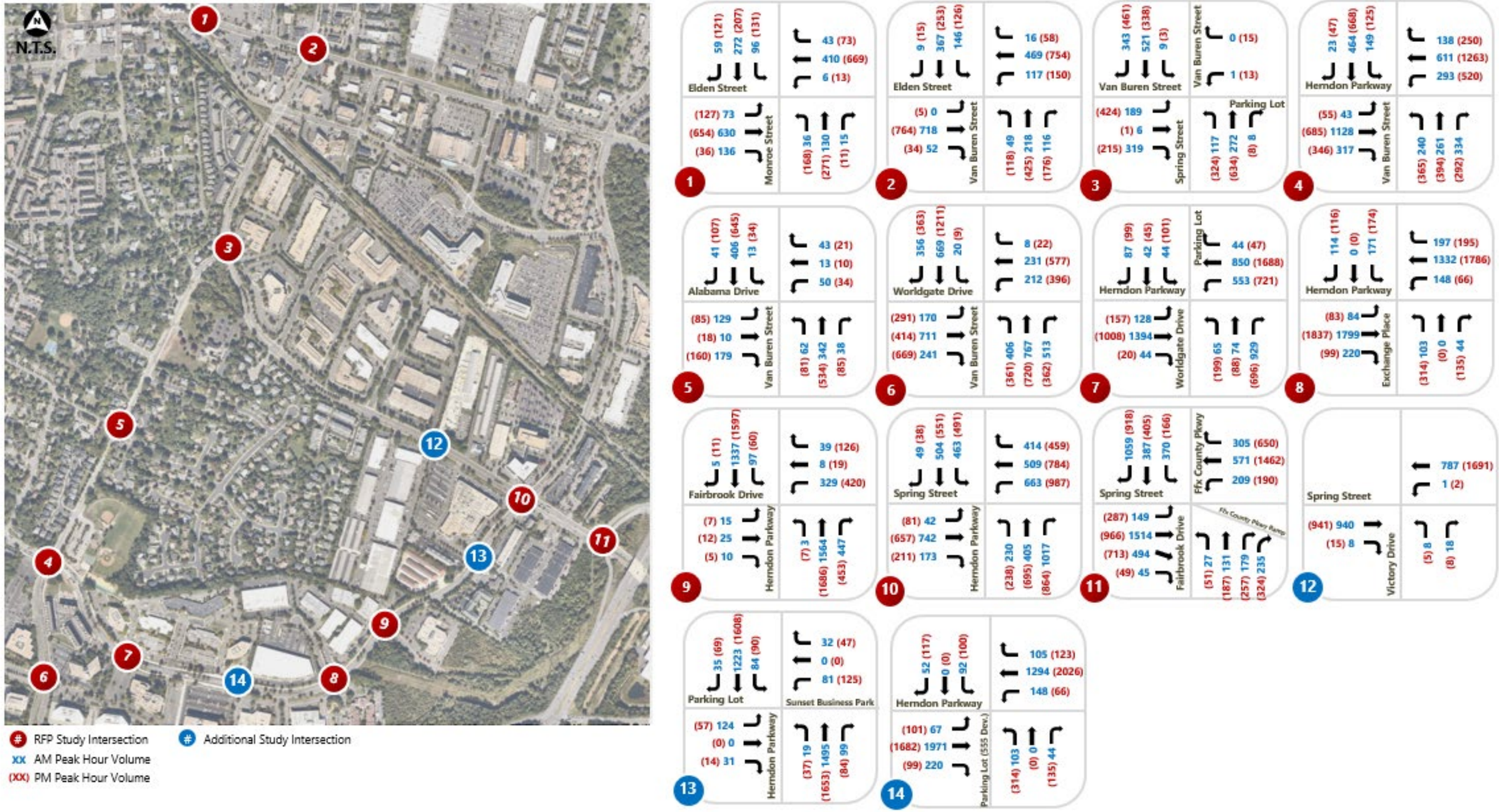
Figure 21 displays the traffic volume dataset that was analyzed at the study intersections in the Build Scenario 2 (Two Centers) 2045 traffic model. The TRG traffic volumes were distributed throughout the TRG land area by subdividing the TRG into multiple zones of development density. In Scenario Two, the proposed density is concentrated in two locations (adjacent to Metro station and within Sunset Business Park). This concentration of density, combined with the lower utilization of the proposed alternate route north of Herndon Parkway, locates a higher percentage of traffic volume along Herndon Parkway and at a few specific intersections (in contrast to Scenario One). **Figure 22** displays just the new site trips associated with the Preferred Build Scenario, while **Figure 23** displays just the pass-by site trips associated with the Preferred Build Scenario. **Appendix A** shows these three sets of traffic volumes for all intersections within the traffic model, including non-study intersections.

Table 9 TRG Build Scenario 2 (Two Centers), Full Buildout, Site Trip Generation

Land Use Type	Independent Variable	Independent Variable Unit	ITE Code	ITE Land Use	AM Peak Hour (7-9 AM)			PM Peak Hour (4-6 PM)			Weekday Total		
					Trips	Enter	Exit	Trips	Enter	Exit	Trips	Enter	Exit
Residential													
Multifamily	2,802	Dwelling Units	221	Multifamily Housing (Mid-Rise)	1,221	281	940	1,093	667	426	13,319	6,660	6,660
Townhomes	156	Dwelling Units	215	Single-Family Attached Housing	75	19	57	90	53	37	1,138	569	569
2 over 2s	392	Dwelling Units	221	Multifamily Housing (Mid-Rise)	161	37	124	153	93	60	1,823	912	912
Residential Subtotal	3,350	Dwelling Units			**1,458**	**337**	**1,121**	**1,336**	**813**	**523**	**16,281**	**8,140**	**8,140**
Hospitality													
Hotel	335	Rooms	310	Hotel	160	90	70	220	112	108	3,208	1,604	1,604
Office													
Corporate Office	252.400	SF	710	General Office Building	371	327	45	358	61	297	2,597	1,298	1,298
Creative Office	94,700	SF	710	General Office Building	160	141	19	159	27	132	1,107	553	553
Office Subtotal	347,100	SF			**531**	**467**	**64**	**517**	**88**	**429**	**3,703**	**1,852**	**1,852**
Retail													
Grocery	49,800	SF	850	Supermarket	142	84	58	439	220	220	4,692	2,346	2,346
Restaurant	169,700	SF	932	High-Turnover Restaurant	1,536	937	599	1,624	893	731	18,192	9,096	9,096
Fitness Center	54,100	SF	495	Recreational Community Center	103	68	35	171	81	91	1,527	763	763
Retail Subtotal	273,600	SF			**1,782**	**1,089**	**692**	**2,235**	**1,193**	**1,041**	**24,411**	**12,205**	**12,205**
All Land Uses Total (Base Trip Generation)					**3,930**	**1,983**	**1,947**	**4,308**	**2,207**	**2,101**	**47,603**	**23,801**	**23,801**
Transit Mode Split Reduction	25%				-983	-496	-487	-1,077	-552	-525	-11,901	-5,950	-5,950
Vehicle Trips					**2,948**	**1,487**	**1,461**	**3,231**	**1,655**	**1,576**	**35,702**	**17,851**	**17,851**
Pass-By Reduction Grocery	24%			PM. AM = ½ of PM. Weekday = average.	-13	-8	-5	-79	-40	-40	-633	-317	-317
Pass-By Reduction Restaurant	43%			PM. AM = ½ of PM. Weekday = average.	-248	-151	-97	-524	-288	-236	-4,400	-2,200	-2,200
New Vehicle Trips on Roadway Network					**2,687**	**1,328**	**1,359**	**2,628**	**1,327**	**1,300**	**30,669**	**15,334**	**15,334**
Internal Capture	7%				-188	-93	-95	-184	-93	-91	-2,147	-1,073	-1,073
Net New Vehicle Trips on External Roadway Network					**2,499**	**1,235**	**1,264**	**2,444**	**1,234**	**1,209**	**28,522**	**14,261**	**14,261**

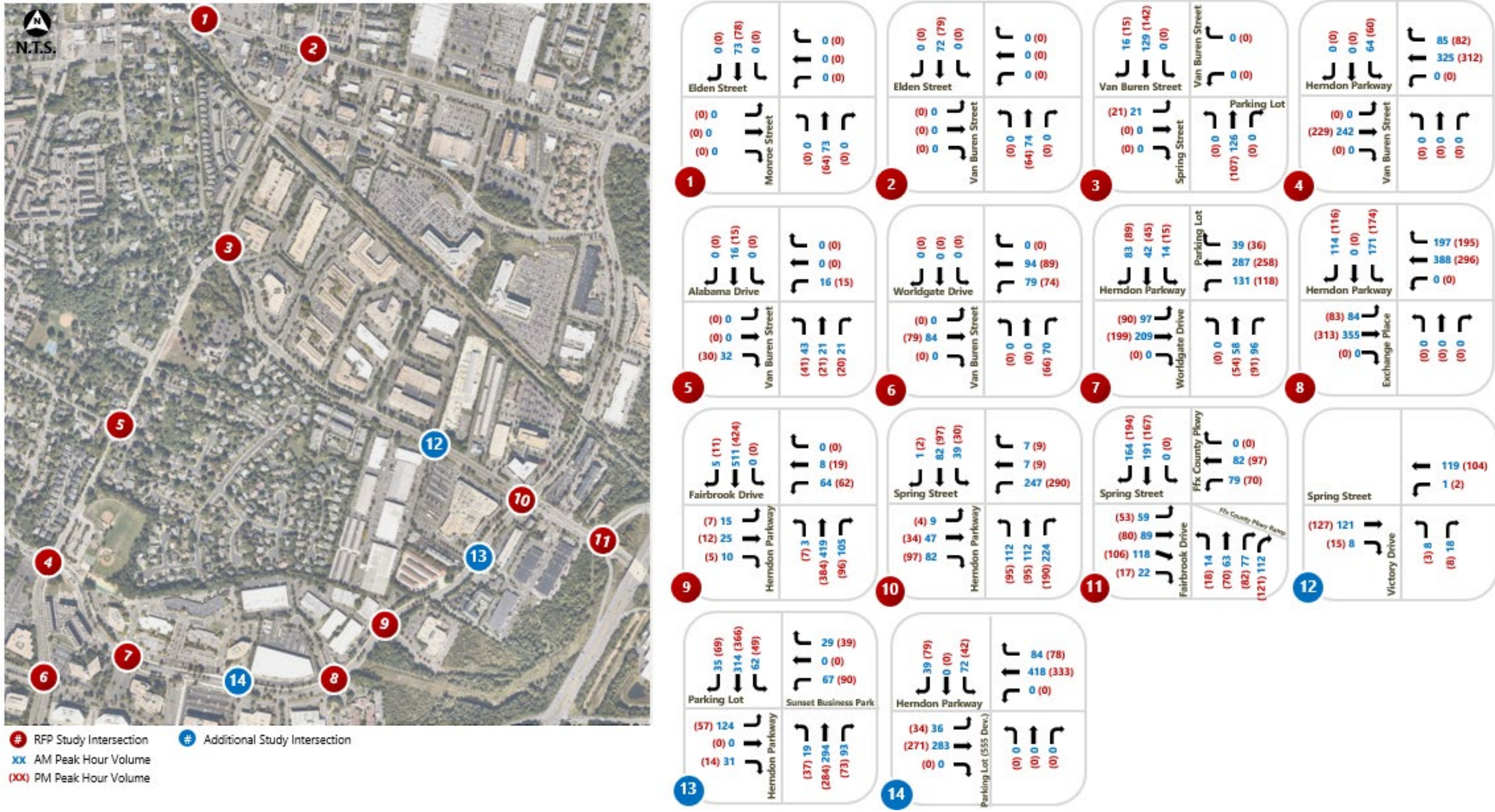
Source: Institute of Transportation Engineer's *Trip Generation Manual, 11th Edition*. Utilized "suburban" trip generation rates as decision was made with Town of Herndon to apply a consistent methodology to prior studies in the TRG, which utilized suburban base trip generation and then applied significant transit and internal capture reductions. An "urban" trip generation rate would not be compatible with this approach as it already accounts for these types of trip reductions.

Figure 21 Build Scenario 2 (Two Centers) 2045 Traffic Volumes



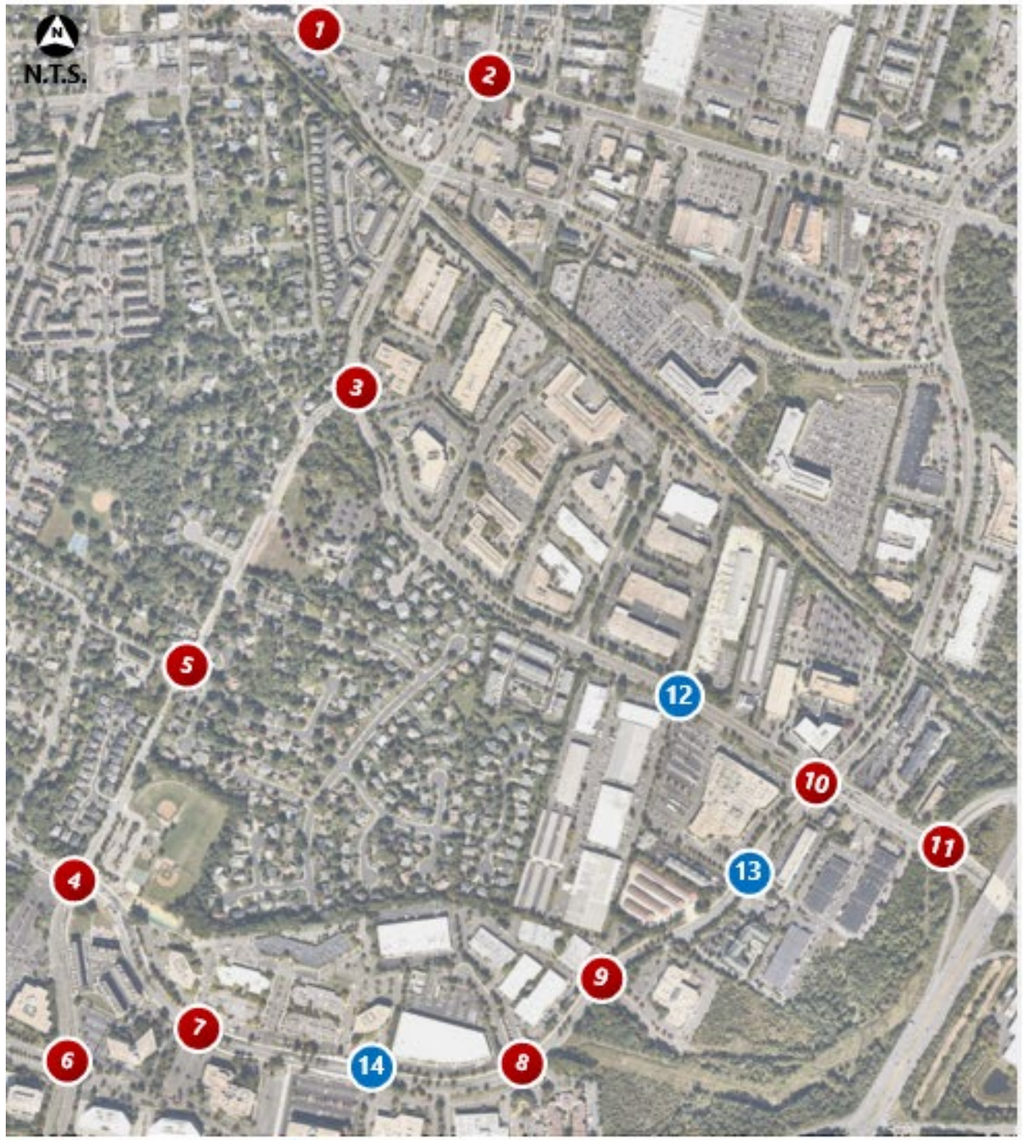
Build 2045 traffic volumes include No Build 2045 traffic volumes (Figure 6), removal of existing TRG area traffic volumes, volume shift to account for the Fairbrook Drive extension, and new TRG development traffic volumes. Basemap Source: Nearmap

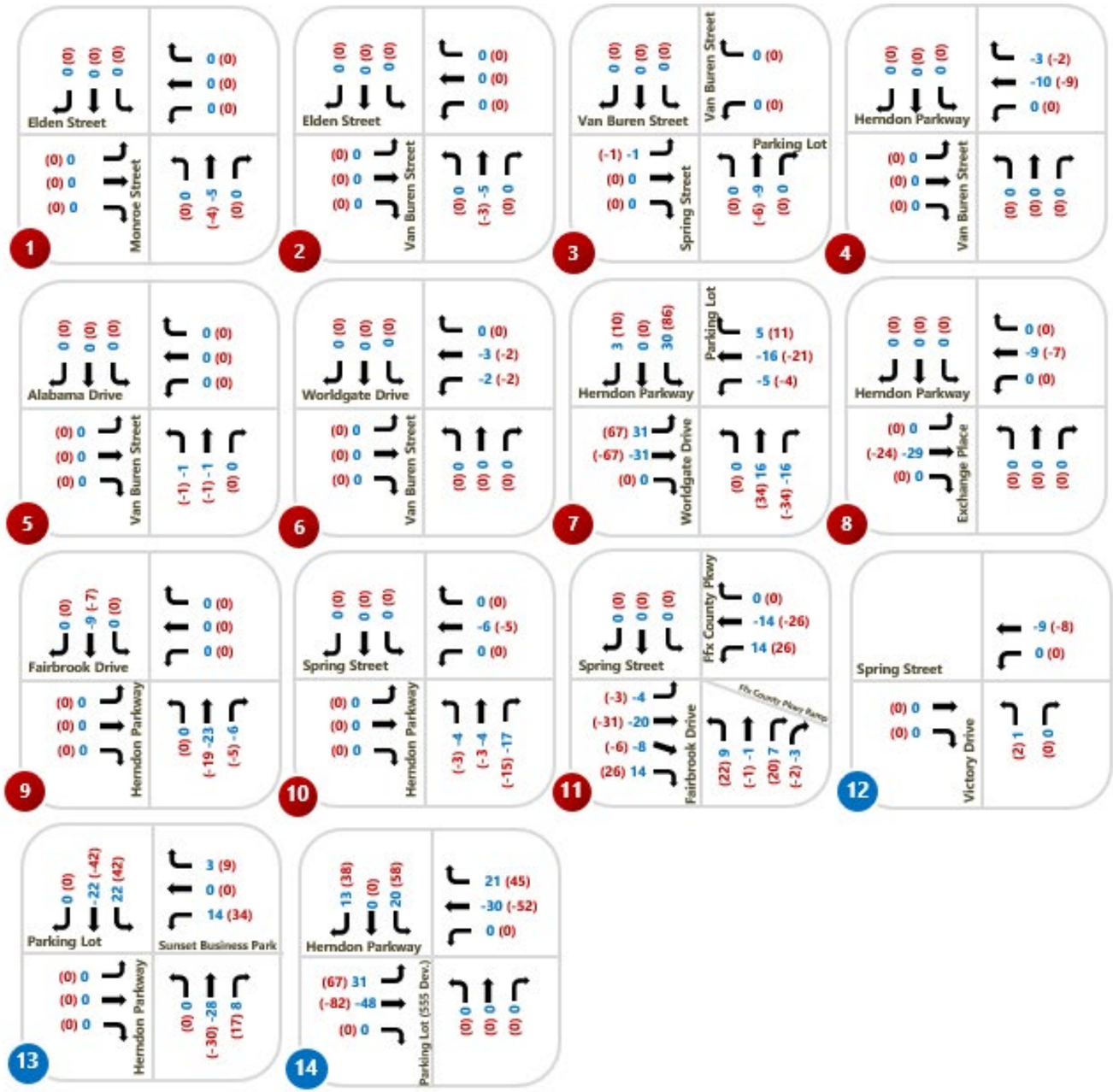
Figure 22 Build Scenario 2 (Two Centers) New Site Trips



Basemap Source: Nearmap

Figure 23 Build Scenario 2 (Two Centers) Site Pass-By Trips





Basemap Source: Nearmap

4.3.3 Traffic Analysis

In Build 2045 Scenario Two conditions, with higher traffic volumes than Build Scenario One conditions, the transportation network within the study area is projected to experience higher levels of congestion and begin to break down (i.e., exceed capacity) during the PM peak hour. **Table 10** lists the intersection delay and LOS at each of the eleven study intersections, comparing No Build 2045 to Build Scenario Two. Projected intersection LOS in Build Scenario Two is also shown in **Figure 24**.

All study intersections are projected to operate at LOS D or better in both peak hours, except for the Spring Street / Herndon Parkway intersection, which is anticipated to operate at LOS E in both peak hours. While LOS E does represent increased delay, many intersections in the Northern Virginia area operate at this condition during a peak hour and Fairfax County has adopted an LOS E intersection standard in several of its urban development areas.

In the AM peak hour, the LOS degradation from D to E at the Herndon Parkway / Spring Street intersection is the result of only an increase in 6 seconds of delay, which is a relatively insignificant change. The increased delay at the Spring Street / Fairfax County Parkway / Fairbrook Drive intersection is primarily due to the aforementioned reasons regarding the major expansion and reconfiguration of this intersection.

In the PM peak hour, the significant increase in projected intersection delay that is seen at numerous intersections, particularly within the TRG, is due to heavy traffic congestion projected along westbound Herndon Parkway. This congestion is caused by the higher traffic volumes in Build Scenario Two combined with the constrained Herndon Parkway / Van Buren Street intersection, which was documented in the No Build traffic conditions. The operational constraints of this intersection limit the signal capacity of westbound Herndon Parkway (i.e., traffic exiting the TRG/HTOC area), which contributes to incremental vehicle delay and queuing that builds within the PM peak hour along the entirety of the route thru the TRG/HTOC area.

The intersection turning movements in **Table 11** operate at LOS F in Build Scenario 2 2045 conditions; the existing Town of Herndon Ordinance states "no individual turning movement level of service at an intersection falls below "LOS E"". Compared to No Build 2045 conditions, the "new" movements that operate at LOS F are located at the Herndon Parkway / Spring Street intersection and the Spring Street / Fairfax County Parkway Ramps / Fairbrook Drive intersection – the same as Build Scenario 1. For the same previously stated reasons, these two Spring Street intersections should be studied further in the future as Parkway interchange planning progresses. While there was LOS F on the Van Buren Street corridor in No Build 2045 conditions, delay does increase in the Build scenario due to the increased demand on the capacity constrained Van Buren Street / Herndon Parkway intersection.

Table 10 Comparison of Intersection Delay and LOS: No Build 2045 to Build Scenario 2 (Two Centers)

Intersection [1]	No Build 2045				Build Scenario Two				Change No Build to Build			
	AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Elden St / Monroe St	27.2	C	34.1	C	30.4	C	36.3	D	+3.2	-	+2.2	C→D
Elden St / Van Buren St	31.2	C	36.7	D	33.4	C	39.5	D	+2.2	-	+2.8	-
Van Buren St / Spring St	16.8	B	40.8	D	17.6	B	27.8	C	+0.8	-	-13.0	D→C
Van Buren St / Herndon Pkwy	30.5	C	44.4	D	34.0	C	48.1	D	+3.5	-	+3.7	-
Van Buren St / Alabama Dr	16.1	B	33.4	C	21.7	C	51.3	D	+5.6	B→C	+17.9	C→D
Van Buren St / Worldgate Dr	23.8	C	27.7	C	23.3	C	33.6	C	-0.5	-	+5.9	-
Herndon Pkwy / Worldgate Dr	25.2	C	22.0	C	38.3	D	39.5	D	+13.1	C→D	+17.5	C→D
Herndon Pkwy / Exchange Pl	11.0	B	15.8	B	21.1	C	39.4	D	+10.1	B→C	+23.6	B→D
Herndon Pkwy / Fairbrook Dr	14.2	B	19.9	B	17.3	B	46.8	D	+3.1	-	+26.9	B→D
Spring St / Herndon Pkwy	51.5	D	59.1	E	57.2	E	76.0	E	+5.7	D→E	+16.9	-
Spring St / FCP Ramps	22.1	C	25.8	C	42.5	D	46.6	D	+20.4	C→D	+20.8	C→D

Source: Average of 7 AM and 20 PM Peak Hour VISSIM simulation runs.
1 All study intersections are signalized in the No Build and Build scenario.

Table 11 Build Scenario 2 "LOS F" Turning Movements

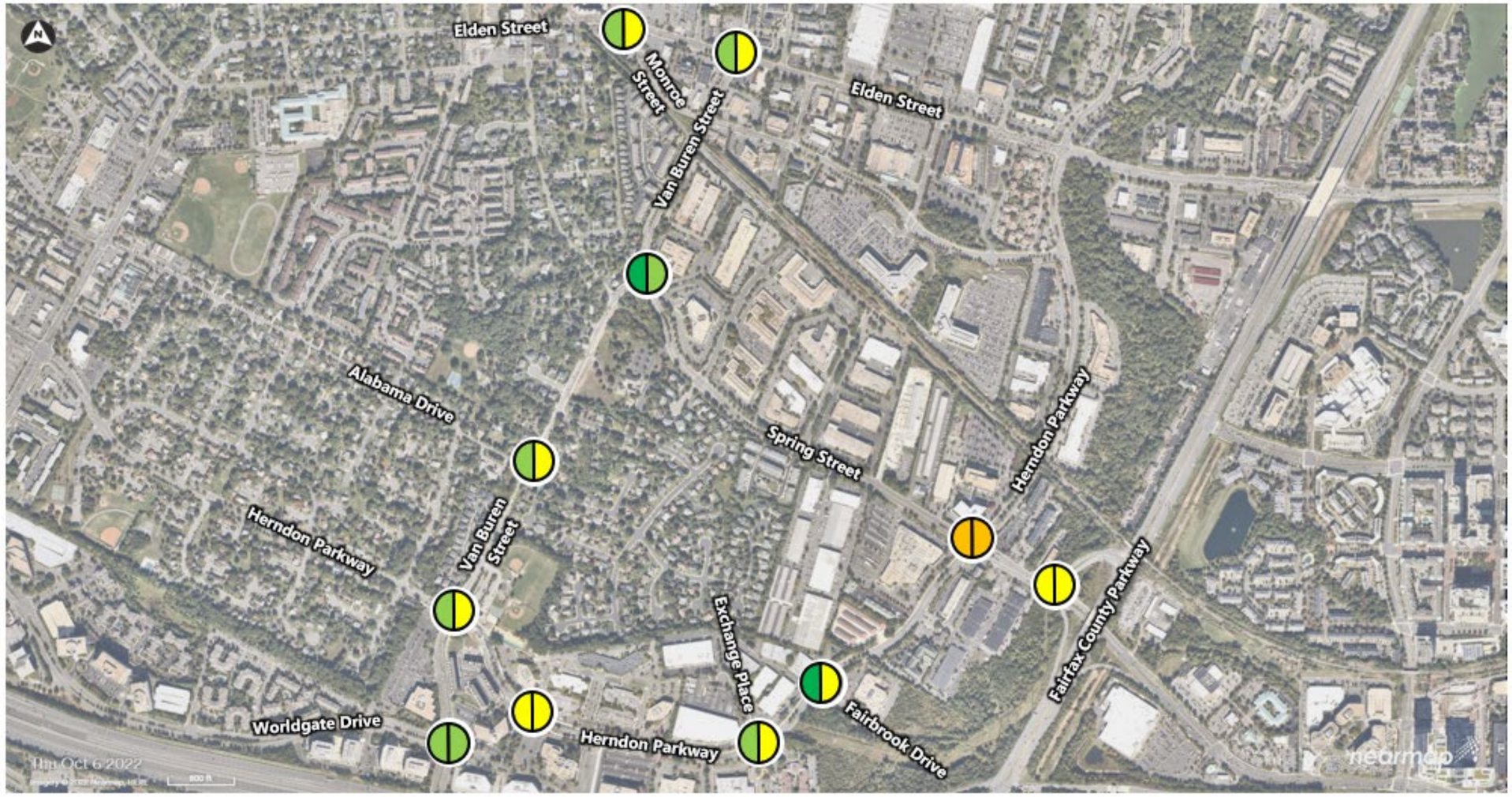
Turning Movement	Peak	LOS F in No Build?	Source of Congestion
Herndon Pkwy / Spring Street			
All Southbound	PM	No	*Heavy Demand*
Eastbound Left	AM/PM	No	
Eastbound Thru/Right	PM	No	
Spring St / Fairfax County Parkway Ramps / Fairbrook Dr			
Eastbound Left	PM	No	*Heavy Demand, "Interim" Intersection Modifications*
Westbound Left	AM	No	
Northbound Left/Thru	AM/PM	No	
Southbound Left	AM/PM	No	
Van Buren St / Herndon Pkwy			*Capacity limitations at Van Buren St / Herndon Pkwy*
Northbound Left	PM	Yes	
Van Buren St / Alabama Drive			
All Alabama Drive	PM	Yes	
Herndon Parkway / Fairbrook Drive			*TRG Street Grid*
Westbound Left/Thru	PM	No	

Source: Average of 7 AM and 20 PM Peak Hour VISSIM simulation runs.

Congestion "heat" maps for each of the Build Scenario Two peak hours are shown in **Figures 25 and 26**. These represent the average vehicle speeds present in different lanes and segments of the model. Slower vehicle speeds (shown in shades of red) represent areas of higher congestion and vehicle queuing, whereas higher vehicle speeds (shown in shades of green) represent areas of lower congestion and vehicle queueing. In the AM peak hour, the heaviest areas of congestion are the Spring Street / Herndon Parkway intersection and the three intersections at the junctions of Van Buren Street, Worldgate Drive, and Herndon Parkway, which is similar to No Build 2045 conditions. In the PM peak hour, southbound Van Buren Street experiences a significant amount of congestion, also similar to No Build 2045 conditions. The additional major congestion in the PM peak hour, which is new in the Build Two scenario, is located on westbound Herndon Parkway throughout the TRG/HTOC area.

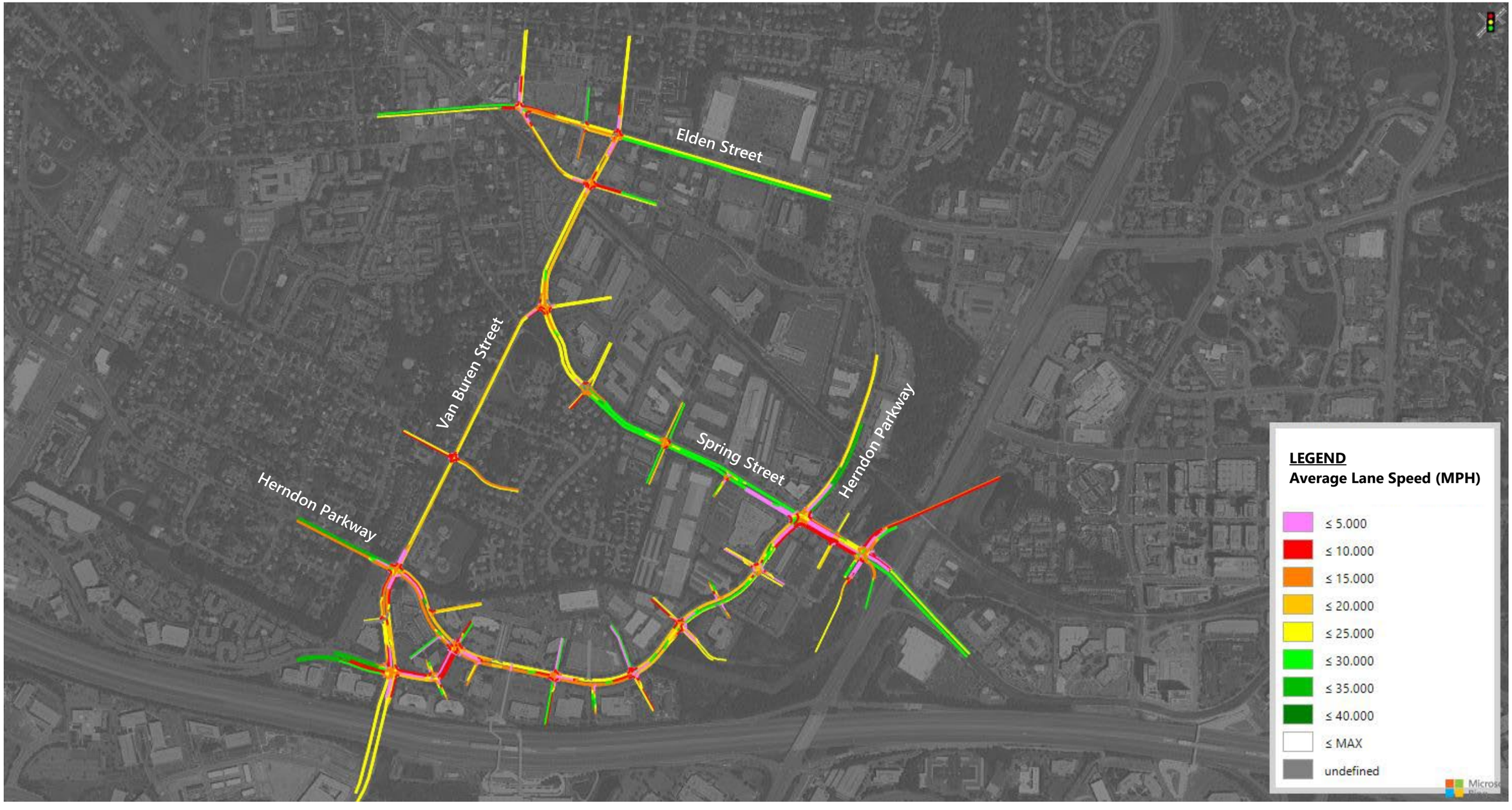
Appendix B documents the delay, LOS, and vehicle queueing for all of the movements at each of the eleven study intersections.

Figure 24 Build Scenario 2 (Two Centers) 2045 Intersection Level of Service



Source: Average of 7 AM Peak Hour and 20 PM Peak Hour VISSIM simulation runs. Aerial imagery from NearMap.

Figure 25 Build Scenario 2 (Two Centers) 2045 Congestion Heat Map – AM Peak Hour



Source: Average of 7 AM Peak Hour VISSIM simulation runs.

Figure 26 Build Scenario 2 (Two Centers) 2045 Congestion Heat Map – PM Peak Hour



Source: Average of 20 PM Peak Hour VISSIM simulation runs.

4.4 Build 2045 Scenario Three: Metro Center

Consistent with the Existing and No Build 2045 conditions traffic analysis, the Build models were run under the same conditions (i.e., length of individual simulation run and number of averaged simulation runs). The same traffic operations metrics were also collected to evaluate the change in system performance between No Build 2045 and Build 2045 Scenario Three conditions.

4.4.1 Trip Generation

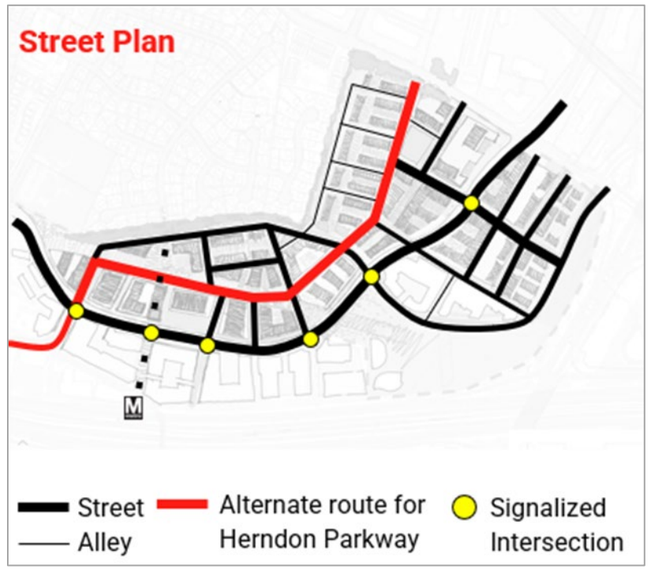
Table 12 documents the trip generation calculations for Build 2045 Scenario Three: Metro Center. Table 9 shows that after the appropriate trip reductions, the new TRG development at full buildout is expected to generate approximately 2,600 AM Peak Hour trips, 2,550 PM Peak Hour trips, and 29,250 weekday trips. These new TRG trips replace the existing trips associated with existing development within the TRG. Scenario Three has the highest ratio of office space to residential units, and as such, has the heaviest traffic pattern of inbound morning trips and outbound evening trips. The overall vehicle trip totals are also the highest of the three build scenarios – in comparison to Scenario Two, the Scenario Three trip totals are 100 vehicles higher in the AM and PM Peak Hours, and 750 vehicles higher across an entire weekday.

4.4.2 Transportation Connectivity

The Metro Center Scenario includes a new roadway connection parallel to Herndon Parkway, as shown in "red" in **Figure 27**. This connection, in addition to the grid of streets proposed, will provide TRG traffic with viable alternate travel paths to Herndon Parkway. The No Build traffic analysis indicated that the two termini intersections on Herndon Parkway were traffic choke points; the introduction of additional street connections to Spring Street will partially relieve that traffic pressure.

As previously mentioned, the current traffic analysis assumes that the new Spring Street intersection with the alternate route roadway will be unsignalized. If signalization of this intersection is identified as a potential transportation improvement, more traffic would be capable of utilizing the alternate route – in the unsignalized condition, the capacity of the intersection to facilitate left turn movements is limited.

Figure 27 Metro Center Scenario Street Plan



Source: SOM TRG graphics.

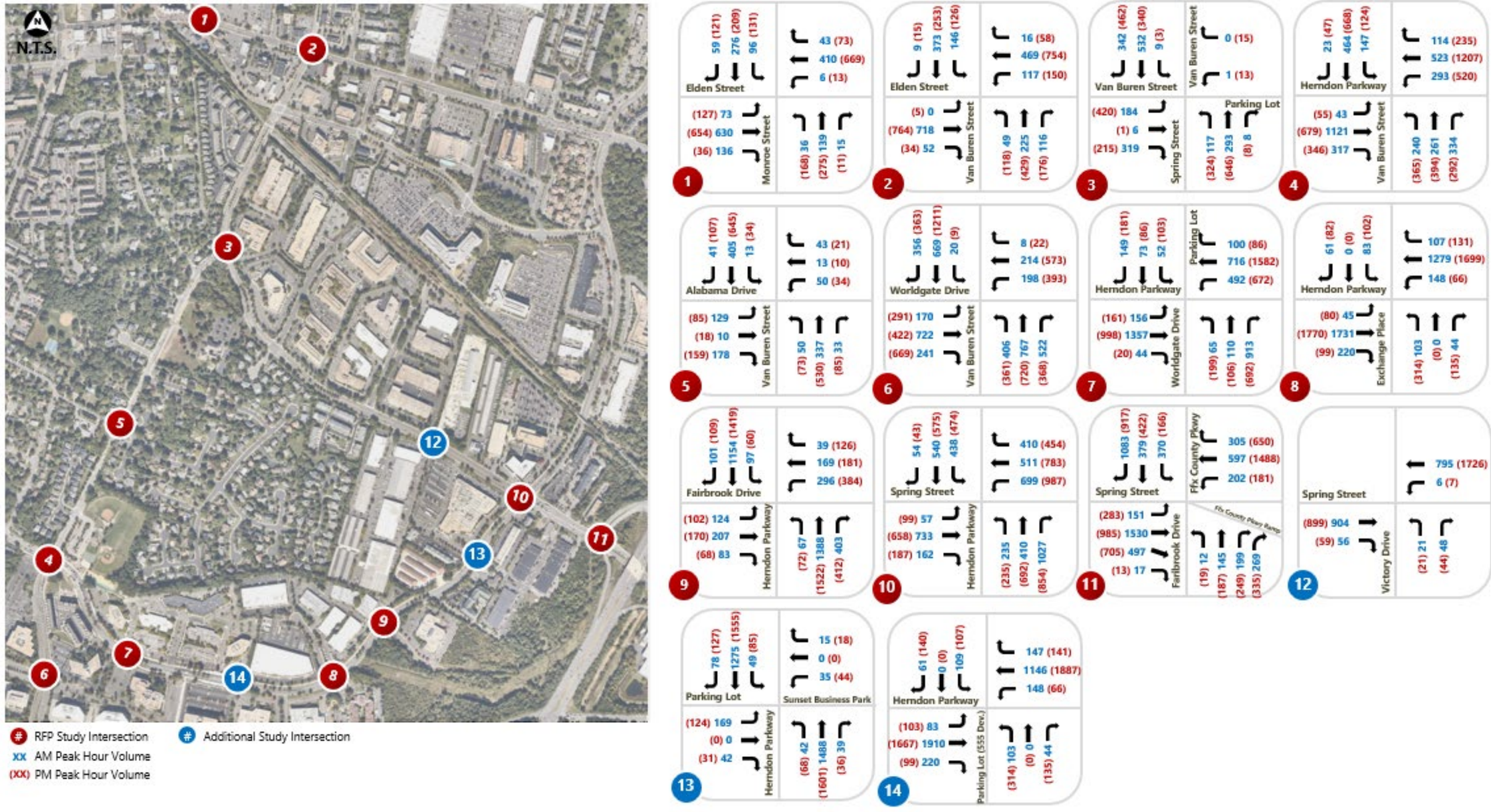
Figure 28 displays the traffic volume dataset that was analyzed at the study intersections in the Build Scenario 3 (Metro Center) 2045traffic model. The TRG traffic volumes were distributed throughout the TRG land area by subdividing the TRG into multiple zones of development density. In Scenario Three, the proposed density is concentrated adjacent to the Metro Station, which induces most of the new traffic into the center of the TRG and locates most entering/exiting traffic at a few select intersections. **Figure 29** displays just the new site trips associated with the Preferred Build Scenario, while **Figure 30** displays just the pass-by site trips associated with the Preferred Build Scenario. **Appendix A** shows these three sets of traffic volumes for all intersections within the traffic model, including non-study intersections.

Table 12 TRG Build Scenario 3 (Metro Center), Full Buildout, Site Trip Generation

Land Use Type	Independent Variable	Independent Variable Unit	ITE Code	ITE Land Use	AM Peak Hour (7-9 AM)			PM Peak Hour (4-6 PM)			Weekday Total		
					Trips	Enter	Exit	Trips	Enter	Exit	Trips	Enter	Exit
Residential													
Multifamily	2,936	Dwelling Units	221	Multifamily Housing (Mid-Rise)	1,280	294	986	1,145	699	447	13,958	6,979	6,979
Townhomes	350	Dwelling Units	215	Single-Family Attached Housing	176	44	132	206	122	84	2,617	1,308	1,308
2 over 2s	292	Dwelling Units	221	Multifamily Housing (Mid-Rise)	117	27	90	114	70	45	1,346	673	673
Residential Subtotal	3,578	Dwelling Units			**1,573**	**365**	**1,208**	**1,466**	**890**	**576**	**17,921**	**8,961**	**8,961**
Hospitality													
Hotel	294	Rooms	310	Hotel	140	78	61	190	97	93	2,763	1,382	1,382
Office													
Corporate Office	400,000	SF	710	General Office Building	552	485	66	525	89	436	3,876	1,938	1,938
Creative Office	56,000	SF	710	General Office Building	102	89	12	103	17	85	701	350	350
Office Subtotal	456,000	SF			**653**	**575**	**78**	**627**	**107**	**521**	**4,577**	**2,288**	**2,288**
Retail													
Grocery	45,400	SF	850	Supermarket	130	77	53	408	204	204	4,325	2,163	2,163
Restaurant	158,900	SF	932	High-Turnover Restaurant	1,438	877	561	1,521	836	684	17,034	8,517	8,517
Fitness Center	57,400	SF	495	Recreational Community Center	110	72	37	179	84	95	1,618	809	809
Retail Subtotal	261,700	SF			**1,678**	**1,026**	**651**	**2,107**	**1,124**	**983**	**22,977**	**11,489**	**11,489**
All Land Uses Total (Base Trip Generation)					**4,044**	**2,045**	**1,999**	**4,390**	**2,218**	**2,172**	**48,239**	**24,119**	**24,119**
Transit Mode Split Reduction	25%				-1,011	-511	-500	-1,097	-554	-543	-12,060	-6,030	-6,030
Vehicle Trips					**3,033**	**1,533**	**1,499**	**3,292**	**1,663**	**1,629**	**36,179**	**18,090**	**18,090**
Pass-By Reduction Grocery	24%			PM. AM = ½ of PM. Weekday = average.	-12	-7	-5	-73	-37	-37	-584	-292	-292
Pass-By Reduction Restaurant	43%			PM. AM = ½ of PM. Weekday = average.	-232	-141	-90	-490	-270	-221	-4,120	-2,060	-2,060
New Vehicle Trips on Roadway Network					**2,789**	**1,385**	**1,404**	**2,729**	**1,357**	**1,372**	**31,475**	**15,738**	**15,738**
Internal Capture	7%				-195	-97	-98	-191	-95	-96	-2,203	-1,102	-1,102
Net New Vehicle Trips on External Roadway Network					**2,594**	**1,288**	**1,306**	**2,538**	**1,262**	**1,276**	**29,272**	**14,636**	**14,636**

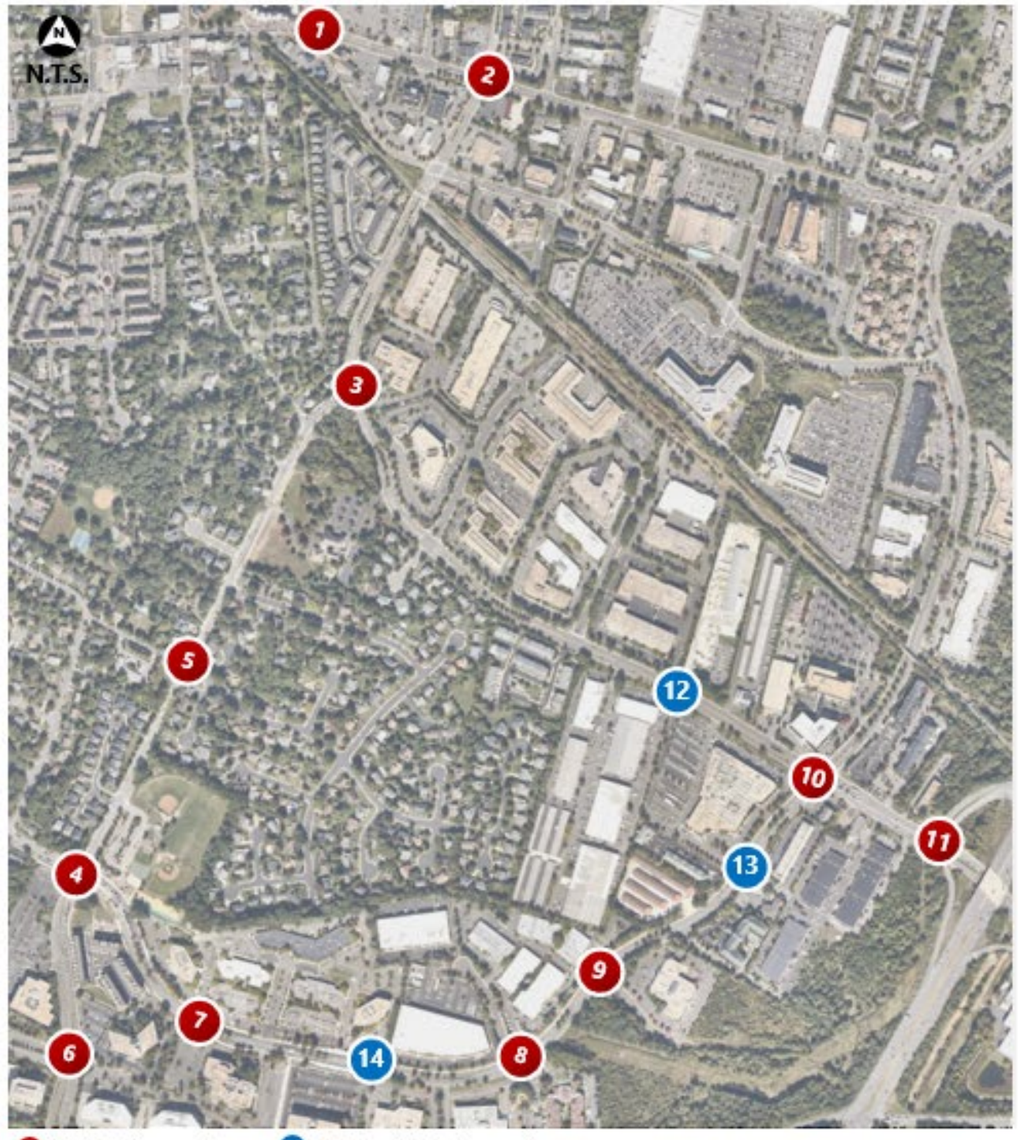
Source: Institute of Transportation Engineer's *Trip Generation Manual, 11th Edition*. Utilized "suburban" trip generation rates as decision was made with Town of Herndon to apply a consistent methodology to prior studies in the TRG, which utilized suburban base trip generation and then applied significant transit and internal capture reductions. An "urban" trip generation rate would not be compatible with this approach as it already accounts for these types of trip reductions.

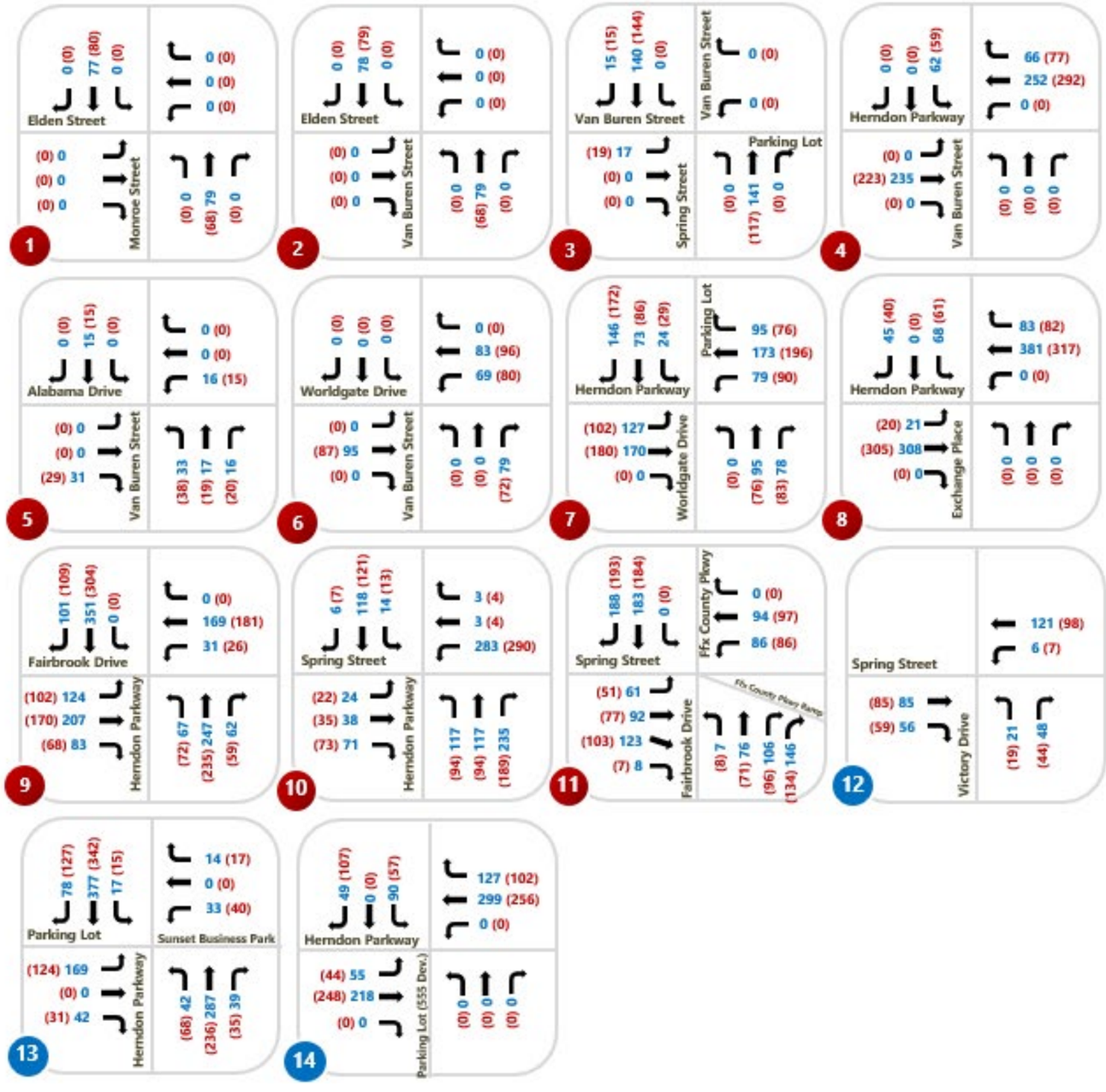
Figure 28 Build Scenario 3 (Metro Center) 2045 Traffic Volumes



Build 2045 traffic volumes include No Build 2045 traffic volumes (Figure 6), removal of existing TRG area traffic volumes, volume shift to account for the Fairbrook Drive extension, and new TRG development traffic volumes. Basemap Source: Nearmap

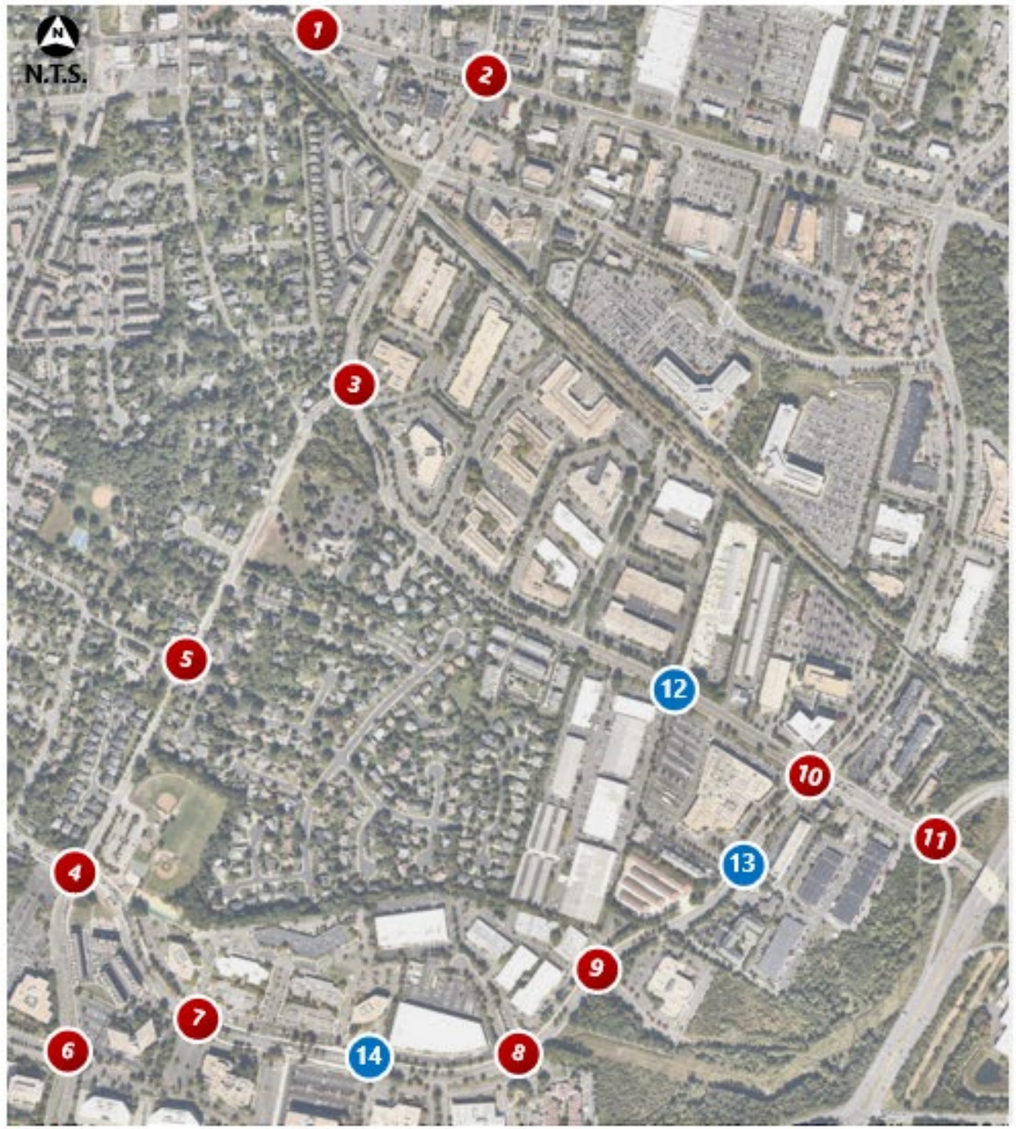
Figure 29 Build Scenario 3 (Metro Center) New Site Trips

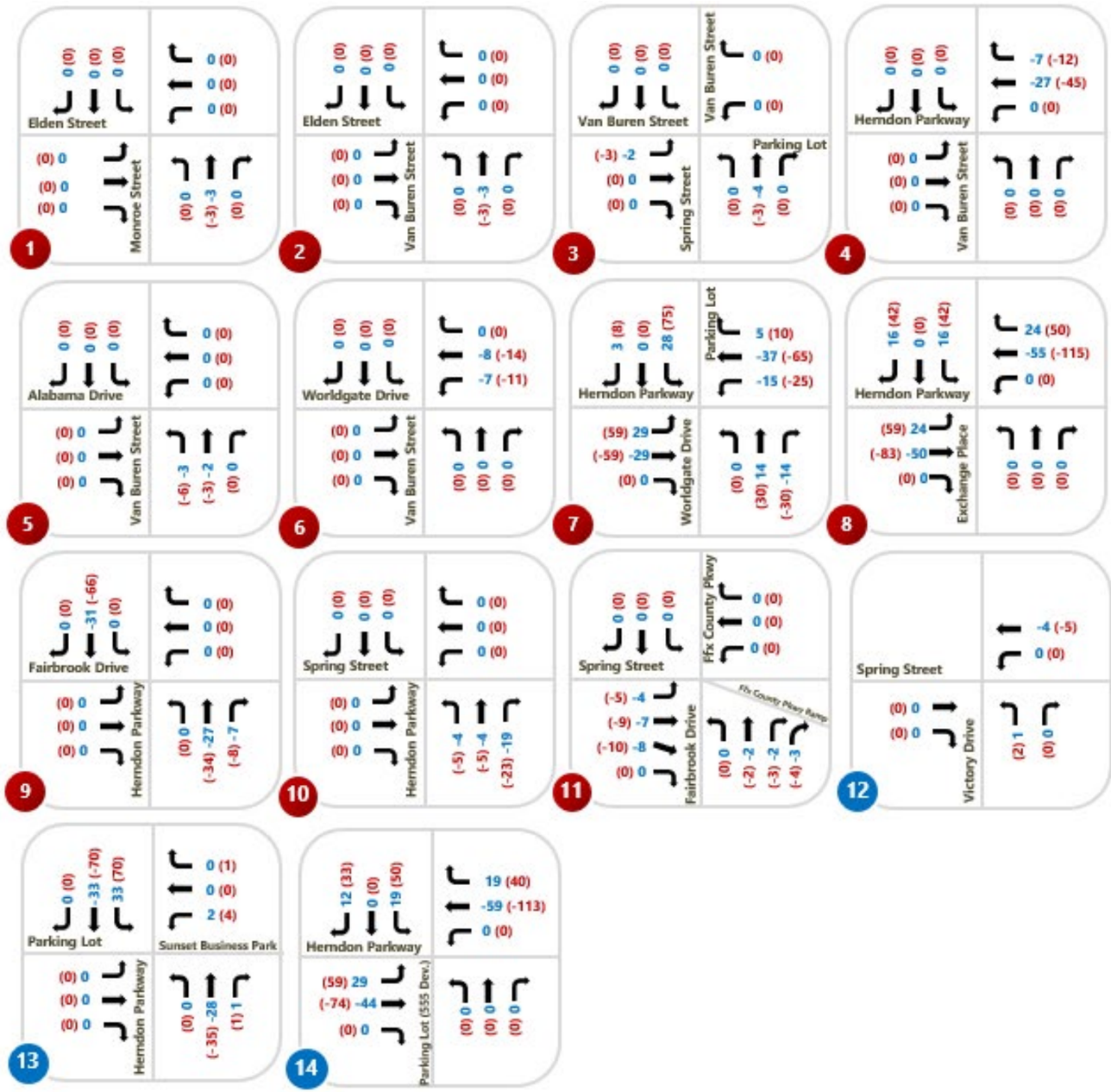




Basemap Source: Nearmap

Figure 30 Build Scenario 3 (Metro Center) Site Pass-By Trips





Basemap Source: Nearmap

4.4.3 Traffic Analysis

In Build 2045 Scenario Three conditions, traffic levels are anticipated to be stressed at a few locations; however, the general traffic condition is manageable in a peak hour urban condition. **Table 13** lists the intersection delay and LOS at each of the eleven study intersections, comparing No Build 2045 to Build Scenario Three. Projected intersection LOS is also shown in **Figure 31**. All study intersections are projected to operate at LOS D or better in both peak hours, except for the Spring Street / Herndon Parkway intersection, which is anticipated to operate at LOS E in both peak hours. While LOS E does represent increased delay, many intersections in the Northern Virginia area operate at this condition during a peak hour and Fairfax County has adopted an LOS E intersection standard in several of its urban development areas.

In comparison to No Build, this is technically an increase from one intersection peak hour operating at LOS E to two intersection peak hours operating at LOS E; however, an examination of the delay values at the Herndon Parkway / Spring Street intersection reveals that the AM LOS change resulted from only 5 seconds of increased delay and the PM delay only increased by 6 seconds (remained LOS E). As previously discussed in the first two Build Scenarios, the expansion and reconfiguration of the Spring Street / Fairfax County Parkway / Fairbrook Drive intersection resulted in increased delay.

The other significant increases in projected intersection delay in Build Scenario Three are the Herndon Parkway / Fairbrook Drive intersection and the Van Buren Street / Alabama Drive intersection (PM peak only). The latter is caused by increased traffic pressure on the constrained Van Buren Street / Herndon Parkway intersection, a condition previously discussed in No Build 2045 conditions. The former is influenced by the proposed roadway grid of Scenario Three, which of the three scenarios induces the most connectivity from Fairbrook Drive into the TRG north and west of Herndon Parkway. This higher level of connectivity induces more traffic volume and hence higher levels of anticipated congestion. Of note is that the Build Scenario Three traffic model included the same Herndon Parkway / Fairbrook Drive intersection configuration as the other Build scenarios despite this higher volume.

The intersection turning movements in **Table 14** operate at LOS F in Build Scenario 3 2045 conditions; the existing Town of Herndon Ordinance states "no individual turning movement level of service at an intersection falls below "LOS E"". Compared to No Build 2045 conditions, the "new" movements that operate at LOS F are located at the Herndon Parkway / Spring Street intersection and the Spring Street / Fairfax County Parkway Ramps / Fairbrook Drive intersection – the same as Build Scenarios 1 and 2. For the same previously stated reasons, these two Spring Street intersections should be studied further in the future as Parkway interchange planning progresses. While there was LOS F on the Van Buren Street corridor in No Build 2045 conditions, delay does increase in the Build scenario due to the increased demand on the capacity constrained Van Buren Street / Herndon Parkway intersection.

Table 13 Comparison of Intersection Delay and LOS: No Build 2045 to Build Scenario 3 (Metro Center)

Intersection [1]	No Build 2045				Build Scenario Three				Change No Build to Build			
	AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Elden St / Monroe St	27.2	C	34.1	C	30.9	C	36.9	D	+3.7	-	+2.8	C→D
Elden St / Van Buren St	31.2	C	36.7	D	33.6	C	40.2	D	+2.4	-	+3.5	-
Van Buren St / Spring St	16.8	B	40.8	D	17.6	B	28.2	C	+0.8	-	-12.6	D→C
Van Buren St / Herndon Pkwy	30.5	C	44.4	D	37.4	D	47.0	D	+6.9	C→D	+2.6	-
Van Buren St / Alabama Dr	16.1	B	33.4	C	19.9	B	50.9	D	+3.8	-	+17.5	C→D
Van Buren St / Worldgate Dr	23.8	C	27.7	C	24.5	C	33.0	C	+0.7	-	+5.3	-
Herndon Pkwy / Worldgate Dr	25.2	C	22.0	C	38.3	D	31.1	C	+13.1	C→D	+9.1	-
Herndon Pkwy / Exchange Pl	11.0	B	15.8	B	17.2	B	19.5	B	+6.2	-	+3.7	-
Herndon Pkwy / Fairbrook Dr	14.2	B	19.9	B	38.9	D	46.5	D	+24.7	B→D	+26.6	B→D
Spring St / Herndon Pkwy	51.5	D	59.1	E	56.0	E	65.3	E	+4.5	D→E	+6.2	-
Spring St / FCP Ramps	22.1	C	25.8	C	42.6	D	42.7	D	+20.5	C→D	+16.9	C→D

Source: Average of 7 AM and 20 PM Peak Hour VISSIM simulation runs.

1 All study intersections are signalized in the No Build and Build scenario.

Table 14 Build Scenario 3 "LOS F" Turning Movements

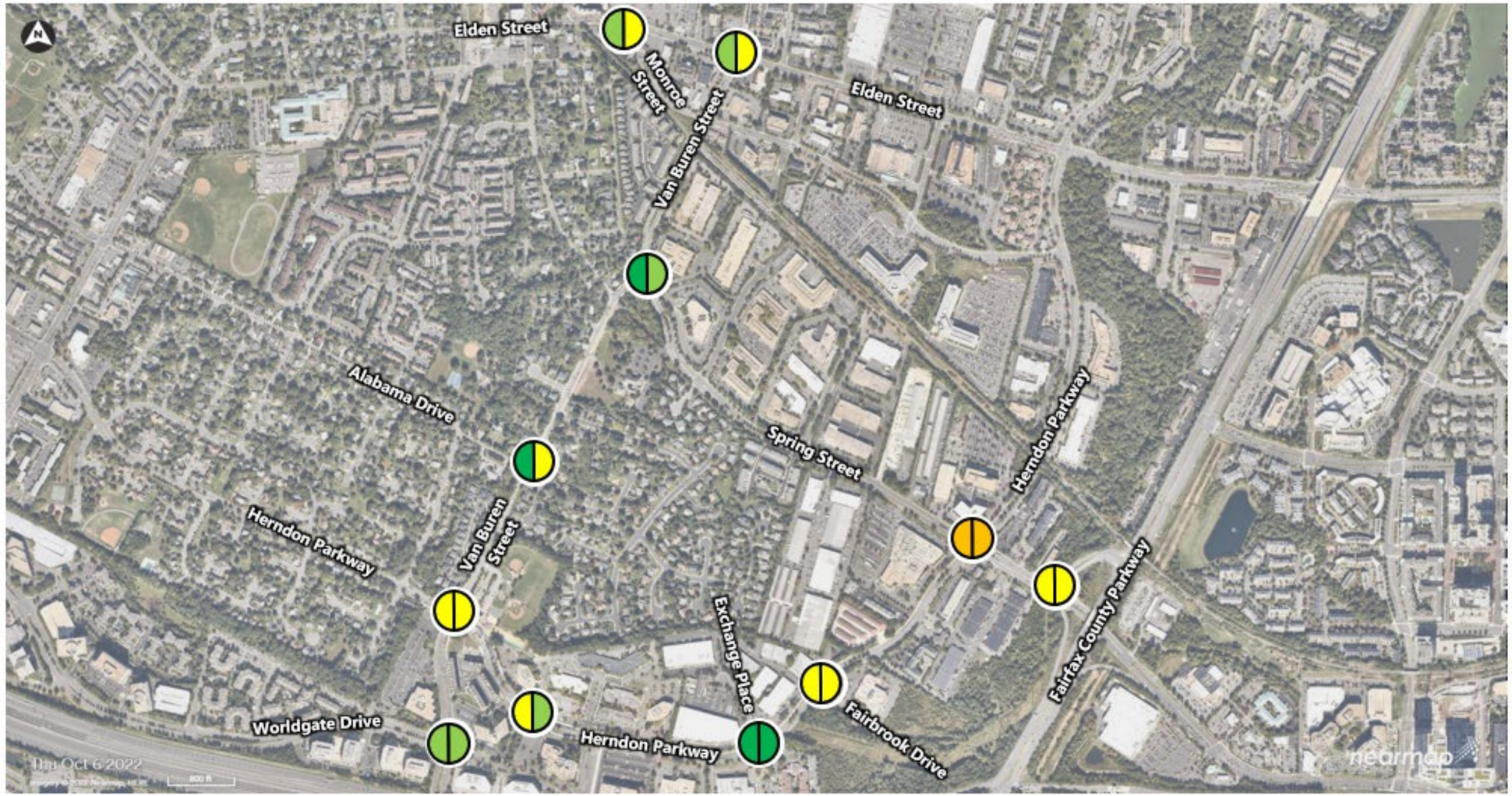
Turning Movement	Peak	LOS F in No Build?	Source of Congestion
Herndon Pkwy / Spring Street			
Eastbound Left	AM/PM	No	*Heavy Demand*
Eastbound Thru/Right	PM	No	
Spring St / Fairfax County Parkway Ramps / Fairbrook Dr			
Eastbound Left	PM	No	*Heavy Demand, "Interim" Intersection Modifications*
Westbound Left	AM	No	
Northbound Left/Thru	AM	No	
Southbound Left	AM/PM	No	
Van Buren St / Herndon Pkwy			*Capacity limitations at Van Buren St / Herndon Pkwy*
Northbound Left	PM	Yes	
Van Buren St / Alabama Drive			
All Alabama Drive	PM	Yes	
Herndon Parkway / Fairbrook Drive			*Demand, # of Lanes*
Eastbound Left/Thru	AM/PM	No	

Source: Average of 7 AM and 20 PM Peak Hour VISSIM simulation runs.

Congestion "heat" maps for each of the Build Scenario Three peak hours are shown in **Figures 32 and 33**. These represent the average vehicle speeds present in different lanes and segments of the model. Slower vehicle speeds (shown in shades of red) represent areas of higher congestion and vehicle queuing, whereas higher vehicle speeds (shown in shades of green) represent areas of lower congestion and vehicle queueing. In both peak hours, the heaviest areas of congestion are the Spring Street corridor from Herndon Parkway to Fairfax County Parkway, Fairbrook Drive, and the three intersections at the junctions of Van Buren Street, Worldgate Drive, and Herndon Parkway. In the PM peak hour, southbound Van Buren Street and westbound Herndon Parkway experience a significant amount of congestion; albeit the Herndon Parkway congestion is less severe than that in Build Scenario 2.

Appendix B documents the delay, LOS, and vehicle queueing for all of the movements at each of the eleven study intersections.

Figure 31 Build Scenario 3 (Metro Center) 2045 Intersection Level of Service



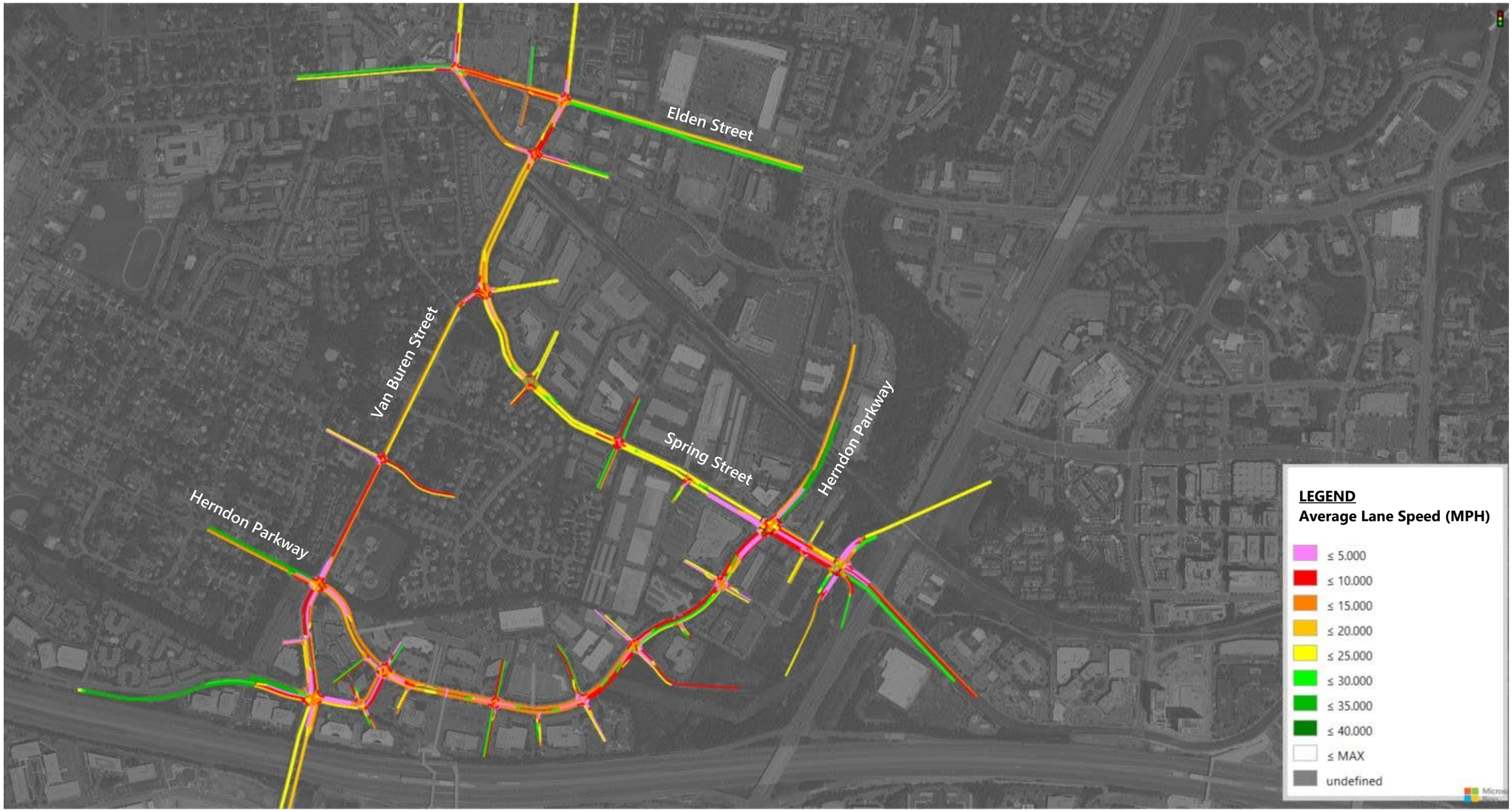
Source: Average of 7 AM Peak Hour and 20 PM Peak Hour VISSIM simulation runs. Aerial imagery from NearMap.

Figure 32 Build Scenario 3 (Metro Center) 2045 Congestion Heat Map – AM Peak Hour



Source: Average of 7 AM Peak Hour VISSIM simulation runs.

Figure 33 Build Scenario 3 (Metro Center) 2045 Congestion Heat Map – PM Peak Hour



Source: Average of 20 PM Peak Hour VISSIM simulation runs.

4.5 Comparison of Three Build Scenarios

The three preliminary TRG development scenarios all seek to redevelop the TRG into a mixed-use, multimodal community. Each scenario has distinct characteristics related to land use pattern, transportation connectivity, and traffic impacts.

4.5.1 Development Characteristics and Connectivity

Each development scenario has a different range of land use composition, location of proposed density within the TRG, and transportation connectivity. **Table 15** shows the ranking of these characteristics per Build Scenario. Land use composition influences the directionality of TRG traffic in each peak hour. Density location impacts the origin and destination of traffic and how distributed those access points are located. Connectivity affects the number of routes for traffic to access their origin and destination.

Table 15 Comparison of Build Scenarios

	Neighborhood Clusters	Two Centers	Metro Center
Land Use	Residential Heavy	Mixed	Office Heavy
Density Location	Distributed	Metro and Sunset Park	Metro
Connectivity	Middle	Lowest	Highest

4.5.2 Traffic Volumes

The different land use compositions and densities impact the quantity of projected vehicle traffic on the roadway network. Overall, the Neighborhood Clusters Scenario is anticipated to generate the least amount of new vehicle traffic, followed by the Two Centers Scenario and then by the Metro Center Scenario. The Two Centers Scenario generates a roughly equal quantity of entering and exiting traffic volume in each peak hour, while the Neighborhood Clusters Scenario generates more entering traffic in the AM peak hour and exiting traffic in the PM peak hour, and the Metro Center Scenario generates the reverse of this condition. **Table 16** summarizes the projected new vehicle traffic from each Build Scenario.

Table 16 Comparison of Build Scenario Trip Generation

		Neighborhood Clusters	Two Centers	Metro Center
AM Peak Hour	Total	2,264	2,499	2,594
	Enter	1,035	1,235	1,288
	Exit	1,229	1,264	1,306
PM Peak Hour	Total	2,271	2,444	2,538
	Enter	1,204	1,234	1,262
	Exit	1,067	1,209	1,276
Weekday Total	Total	27,241	28,522	29,272
	Enter	13,621	14,261	14,636
	Exit	13,621	14,261	14,636

Although the Metro Center Scenario generates the most overall vehicle traffic on the roadway, the Two Centers Scenario actually generates the most vehicle traffic on Herndon Parkway due to its transportation connectivity limitations.

4.5.3 Traffic Impacts

In all three Build scenarios, the Spring Street / Fairfax County Parkway / Fairbrook Drive intersection experiences increased congestion levels due to the expanded intersection design, not necessarily the new TRG traffic volume. The Neighborhood Clusters Scenario has the least relative traffic impact compared to No Build 2045 conditions, followed by the Metro Center Scenario and then the Two Centers Scenario, which has the most traffic impact. The Two Centers Scenario experiences over-capacity conditions on Herndon Parkway during the PM peak hour. **Table 17** documents the relative traffic impact of each Build scenario in comparison to No Build 2045 conditions.

Table 17 Comparison of Intersection Delay and LOS: No Build 2045 to All Three Build 2045 Scenarios

	No Build 2045				Change No Build to Build 1				Change No Build to Build 2				Change No Build to Build 3			
	AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak	
Intersection [1]	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Elden St / Monroe St	27.2	C	34.1	C	-0.2	-	+4.6	C→D	+3.2	-	+2.2	C→D	+3.7	-	+2.8	C→D
Elden St / Van Buren St	31.2	C	36.7	D	+3.5	-	+1.0	-	+2.2	-	+2.8	-	+2.4	-	+3.5	-
Van Buren St / Spring St	16.8	B	40.8	D	+0.6	-	-12.4	D→C	+0.8	-	-13.0	D→C	+0.8	-	-12.6	D→C
Van Buren St / Herndon Pkwy	30.5	C	44.4	D	+5.6	C→D	+6.0	-	+3.5	-	+3.7	-	+6.9	C→D	+2.6	-
Van Buren St / Alabama Dr	16.1	B	33.4	C	+5.7	B→C	-6.7	-	+5.6	B→C	+17.9	C→D	+3.8	-	+17.5	C→D
Van Buren St / Worldgate Dr	23.8	C	27.7	C	-1.1	-	-4.8	-	-0.5	-	+5.9	-	+0.7	-	+5.3	-
Herndon Pkwy / Worldgate Dr	25.2	C	22.0	C	+8.2	-	+10.2	-	+13.1	C→D	+17.5	C→D	+13.1	C→D	+9.1	-
Herndon Pkwy / Exchange Pl	11.0	B	15.8	B	+4.1	-	+1.8	-	+10.1	B→C	+23.6	B→D	+6.2	-	+3.7	-
Herndon Pkwy / Fairbrook Dr	14.2	B	19.9	B	+3.1	-	+0.7	B→C	+3.1	-	+26.9	B→D	+24.7	B→D	+26.6	B→D
Spring St / Herndon Pkwy	51.5	D	59.1	E	+4.4	D→E	-3.4	-	+5.7	D→E	+16.9	-	+4.5	D→E	+6.2	-
Spring St / FCP Ramps	22.1	C	25.8	C	+19.5	C→D	+13.1	C→D	+20.4	C→D	+20.8	C→D	+20.5	C→D	+16.9	C→D

Source: Average of 7 AM and 20 PM Peak Hour VISSIM simulation runs.
1 All study intersections are signalized in the No Build and Build scenarios.

5

Preferred Build 2045 Scenario with Fairbrook Drive Extension: Traffic Conditions

This section of the report documents the assumptions and findings for the traffic analysis of the Preferred Build 2045 Scenario with Fairbrook Drive extension. The traffic levels of this development scenario are compared to No Build 2045 conditions to conclude that the impact of the additional development traffic is manageable.

5.1 Preferred Build 2045 Scenario Model Assumptions

In June 2023, the SOM team presented the three Build Scenarios to the Town of Herndon Planning Commission. Based on received feedback, the SOM team developed a new Preferred Build Scenario that incorporated the most desired design elements and development characteristics. The completed transportation analysis also informed the development of the Preferred Scenario; for example, the analysis indicated the importance of transportation connectivity via the provision of a parallel, alternate route to Herndon Parkway.

The Preferred Scenario provides this parallel route north/west of Herndon Parkway, between the Worldgate Drive extension and Spring Street (west of Herndon Parkway). The development divides office development between the Metro Station and the northwest quadrant of Spring Street / Herndon Parkway, distributes residential development throughout the TRG, and focuses new retail development near Sunset Business Park.

The transportation analysis of the Preferred Build 2045 Scenario was completed under the same assumptions and methodology procedures as the initial three Build 2045 Scenarios. The external roadway network and intersection control are identical and traffic volumes for the Preferred Build were developed using the same methodology.

5.2 Preferred Build 2045 Scenario

Consistent with previous scenario traffic analysis, the Preferred Build model was run under the same conditions (i.e., length of individual simulation run and number of averaged simulation runs). The same traffic operations metrics were also collected to evaluate the change in system performance between No Build 2045 and Preferred Build 2045 Scenario conditions.

5.2.1 Trip Generation

Table 18 documents the trip generation calculations for the Preferred Build 2045 Scenario. Table 14 shows that after the appropriate trip reductions, the new TRG development at full buildout is expected to generate approximately 3,100 AM Peak Hour trips, 3,100 PM Peak Hour trips, and 33,500 weekday trips.

These new TRG trips replace the existing trips associated with existing development within the TRG. Comparing the anticipated Preferred Build trip generation to the trip generation of the three initial Build scenarios, the Preferred Build has the highest total trip projection. The Preferred Build Scenario has the lowest quantity of proposed residential development and the highest quantity of proposed office development. Compared to the three initial Build scenarios, this combination increases the percentage of entering traffic in the AM peak hour and exiting traffic in the PM peak hour.

Table 18 TRG Preferred Build Scenario, Full Buildout, Site Trip Generation

Land Use Type	Independent Variable	Independent Variable Unit	ITE Code	ITE Land Use	AM Peak Hour (7-9 AM)			PM Peak Hour (4-6 PM)			Weekday Total		
					Trips	Enter	Exit	Trips	Enter	Exit	Trips	Enter	Exit
Residential													
Multifamily	2,369	Dwelling Units	221	Multifamily Housing (Mid-Rise)	1,031	237	794	924	564	360	11,254	5,627	5,627
Townhomes	418	Dwelling Units	215	Single-Family Attached Housing	212	53	159	247	146	101	3,135	1,567	1,567
Residential Subtotal	2,787	Dwelling Units			**1,242**	**290**	**952**	**1,171**	**709**	**462**	**14,388**	**7,194**	**7,194**
Hospitality													
Hotel	463	Rooms	310	Hotel	224	125	99	315	161	154	4,595	2,298	2,298
Office													
Corporate Office	641,700	SF	710	General Office Building	828	729	99	777	132	645	5,848	2,924	2,924
Creative Office	547,700	SF	710	General Office Building	723	636	87	681	116	565	5,095	2,547	2,547
Office Subtotal	1,189,400	SF			**1,551**	**1,365**	**186**	**1,458**	**248**	**1,210**	**10,942**	**5,471**	**5,471**
Retail													
Grocery	63,600	SF	850	Supermarket	182	107	75	536	268	268	5,843	2,921	2,921
Restaurant	155,300	SF	932	High-Turnover Restaurant	1,405	857	548	1,486	817	669	16,648	8,324	8,324
Fitness Center	74,400	SF	495	Recreational Community Center	142	94	48	215	101	114	2,087	1,043	1,043
Retail Subtotal	293,300	SF			**1,729**	**1,058**	**671**	**2,237**	**1,186**	**1,051**	**24,578**	**12,289**	**12,289**
All Land Uses Total (Base Trip Generation)													
Transit Mode Split Reduction	25%				-1,187	-710	-477	-1,295	-576	-719	-13,626	-6,813	-6,813
Vehicle Trips					**3,560**	**2,129**	**1,431**	**3,885**	**1,728**	**2,157**	**40,878**	**20,439**	**20,439**
Pass-By Reduction Grocery	24%	PM. AM = ½ of PM. Weekday = average.			-16	-10	-7	-96	-48	-48	-789	-394	-394
Pass-By Reduction Restaurant	43%	PM. AM = ½ of PM. Weekday = average.			-227	-138	-88	-479	-264	-216	-4,027	-2,013	-2,013
New Vehicle Trips on Roadway Network					**3,317**	**1,981**	**1,336**	**3,310**	**1,416**	**1,893**	**36,062**	**18,031**	**18,031**
Internal Capture	7%				-232	-139	-94	-232	-99	-133	-2,524	-1,262	-1,262
Net New Vehicle Trips on External Roadway Network					**3,085**	**1,842**	**1,242**	**3,078**	**1,317**	**1,761**	**33,538**	**16,769**	**16,769**

Source: Institute of Transportation Engineer's *Trip Generation Manual, 11th Edition*. Utilized "suburban" trip generation rates as decision was made with Town of Herndon to apply a consistent methodology to prior studies in the TRG, which utilized suburban base trip generation and then applied significant transit and internal capture reductions. An "urban" trip generation rate would not be compatible with this approach as it already accounts for these types of trip reductions.

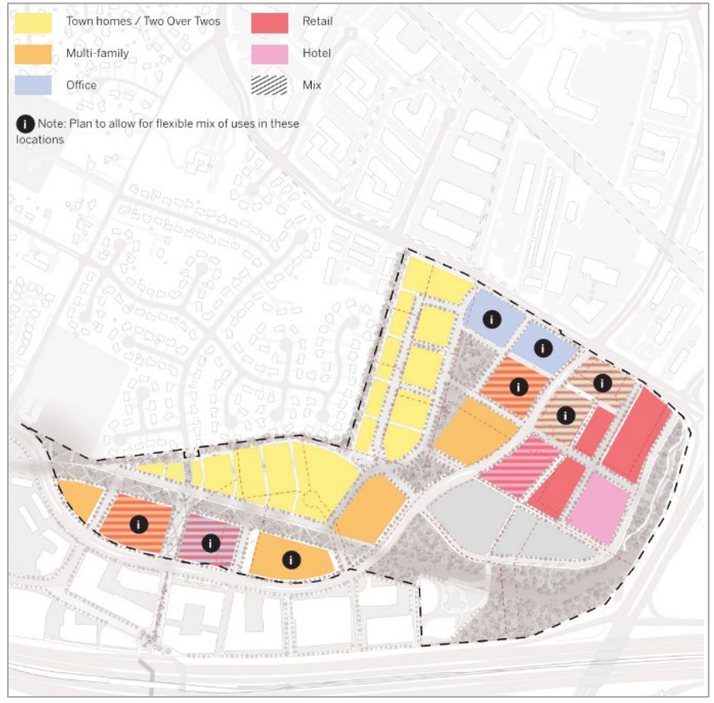
5.2.2 Transportation Connectivity

The Preferred Build Scenario includes a new roadway connection parallel to Herndon Parkway, as shown in **Figure 34** north of Herndon Parkway. This connection, in addition to the grid of streets proposed, will provide TRG traffic with viable alternatives to Herndon Parkway. The No Build traffic analysis indicated that the two termini intersections on Herndon Parkway were traffic choke points; the introduction of additional street connections to Spring Street will partially relieve that traffic pressure.

Consistent with the analysis of the three Build Scenarios, the Preferred Build traffic analysis assumes that the new Spring Street intersection with the alternate route roadway will be unsignalized. If signalization of this intersection is identified as a potential transportation improvement, more traffic would be capable of utilizing the alternate route – in the unsignalized condition, the capacity of the intersection to facilitate left turn movements is limited.

Figure 35 displays the traffic volume dataset that was analyzed at the study intersections in the Preferred Build 2045 traffic model. The TRG traffic volumes were distributed throughout the TRG land area by subdividing the TRG into multiple zones of development density. In the Preferred Build, the proposed office density is split between the Metro Station and northwest quadrant of the Spring Street / Herndon Parkway intersection, the proposed residential density is distributed throughout the TRG, and the proposed retail density is concentrated near the Herndon Parkway / Spring Street intersection. This density distribution disperses the new development traffic throughout the TRG. **Figure 36** displays just the new site trips associated with the Preferred Build Scenario, while **Figure 37** displays just the pass-by site trips associated with the Preferred Build Scenario. **Appendix A** shows these three sets of traffic volumes for all intersections within the traffic model, including non-study intersections.

Figure 34 Preferred Scenario Development Plan



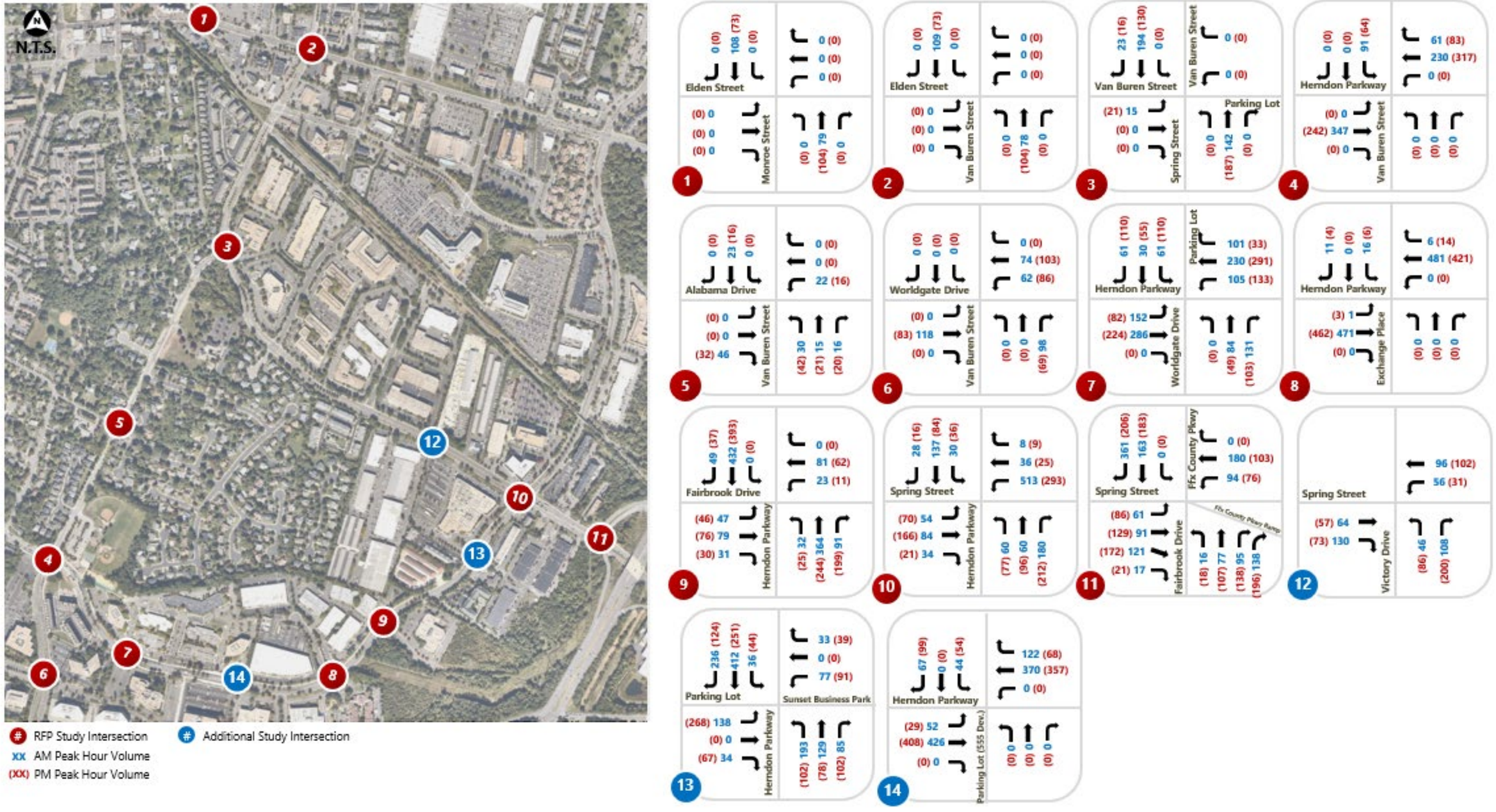
Source: SOM TRG graphics.

Figure 35 Preferred Build Scenario 2045 Traffic Volumes



Build 2045 traffic volumes include No Build 2045 traffic volumes (Figure 6), removal of existing TRG area traffic volumes, volume shift to account for the Fairbrook Drive extension, and new TRG development traffic volumes. Basemap Source: Nearmap

Figure 36 Preferred Build Scenario New Site Trips



Basemap Source: Nearmap

Figure 37 Preferred Build Scenario Site Pass-By Trips



Basemap Source: Nearmap

5.2.3 Traffic Analysis

In Preferred Build 2045 Scenario conditions, traffic levels are anticipated to be stressed at a few locations; however, the general traffic condition is manageable in a peak hour urban condition. **Table 19** lists the intersection delay and LOS at each of the eleven study intersections, comparing No Build 2045 to the Preferred Build Scenario. Projected intersection LOS is also shown in **Figure 38**.

All study intersections are projected to operate at LOS D or better in both peak hours, except for the Spring Street / Herndon Parkway intersection, which is anticipated to operate at LOS E in both peak hours. While LOS E does represent increased delay, many intersections in the Northern Virginia area operate at this condition during a peak hour and Fairfax County has adopted an LOS E intersection standard in several of its urban development areas.

In comparison to No Build, this is technically an increase from one intersection peak hour operating at LOS E to two intersection peak hours operating at LOS E; however, an examination of the delay values at the Herndon Parkway / Spring Street intersection reveals that the AM LOS change resulted from only four seconds of increased delay and the PM delay only increased by six seconds (remained LOS E). As previously discussed in the analysis of the initial three Build Scenarios, the expansion and reconfiguration of the Spring Street / Fairfax County Parkway / Fairbrook Drive intersection results in the largest delay increase between No Build and Build conditions of any of the 11 study intersections.

The other significant increases in projected intersection delay in the Preferred Build Scenario are the Herndon Parkway / Fairbrook Drive intersection, Herndon Parkway / Worldgate Drive intersection, the Van Buren Street / Herndon Parkway intersection (AM peak only), and the Van Buren Street / Alabama Drive intersection (PM peak only). The three Herndon Parkway intersections are still projected to operate at acceptable levels – LOS C and LOS D, respectively. The PM peak delay increase at Van Buren Street / Alabama Drive intersection is caused by increased traffic pressure on the constrained Van Buren Street / Herndon Parkway intersection, a condition previously discussed in No Build 2045 conditions.

The intersection turning movements in **Table 20** operate at LOS F in Preferred Build Scenario 2045 conditions; the existing Town of Herndon Ordinance states "no individual turning movement level of service at an intersection falls below 'LOS E'". Compared to No Build 2045 conditions, the "new" movements that operate at LOS F are located at the Herndon Parkway / Spring Street intersection and the Spring Street / Fairfax County Parkway Ramps / Fairbrook Drive intersection – the same as the three initial Build scenarios. For the same previously stated reasons, these two Spring Street intersections should be studied further in the future as Parkway interchange planning progresses. While there was LOS F on the Van Buren Street corridor in No Build 2045 conditions, delay does increase in the Build scenario due to the increased demand on the capacity constrained Van Buren Street / Herndon Parkway intersection.

Table 19 Comparison of Intersection Delay and LOS: No Build 2045 to Preferred Build Scenario

Intersection [1]	No Build 2045				Preferred Build Scenario				Change No Build to Build			
	AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Elden St / Monroe St	27.2	C	34.1	C	32.0	C	37.8	D	+4.8	-	+3.7	C→D
Elden St / Van Buren St	31.2	C	36.7	D	35.7	D	42.8	D	+4.5	C→D	+6.1	-
Van Buren St / Spring St	16.8	B	40.8	D	17.8	B	26.9	C	+1.0	-	-13.9	D→C
Van Buren St / Herndon Pkwy	30.5	C	44.4	D	42.5	D	49.0	D	+12.0	C→D	+4.6	-
Van Buren St / Alabama Dr	16.1	B	33.4	C	19.9	B	51.5	D	+3.8	-	+18.1	C→D
Van Buren St / Worldgate Dr	23.8	C	27.7	C	22.4	C	33.3	C	-1.4	-	+5.6	-
Herndon Pkwy / Worldgate Dr	25.2	C	22.0	C	40.5	D	33.3	C	+15.3	C→D	+11.3	-
Herndon Pkwy / Exchange Pl	11.0	B	15.8	B	7.8	A	22.0	C	-3.2	B→A	+6.2	B→C
Herndon Pkwy / Fairbrook Dr	14.2	B	19.9	B	21.5	C	34.9	C	+7.3	B→C	+15.0	B→C
Spring St / Herndon Pkwy	51.5	D	59.1	E	55.9	E	65.3	E	+4.4	D→E	+6.2	-
Spring St / FCP Ramps	22.1	C	25.8	C	38.2	D	41.6	D	+16.1	C→D	+15.8	C→D

Source: Average of 7 AM and 20 PM Peak Hour VISSIM simulation runs.
1 All study intersections are signalized in the No Build and Build scenario.

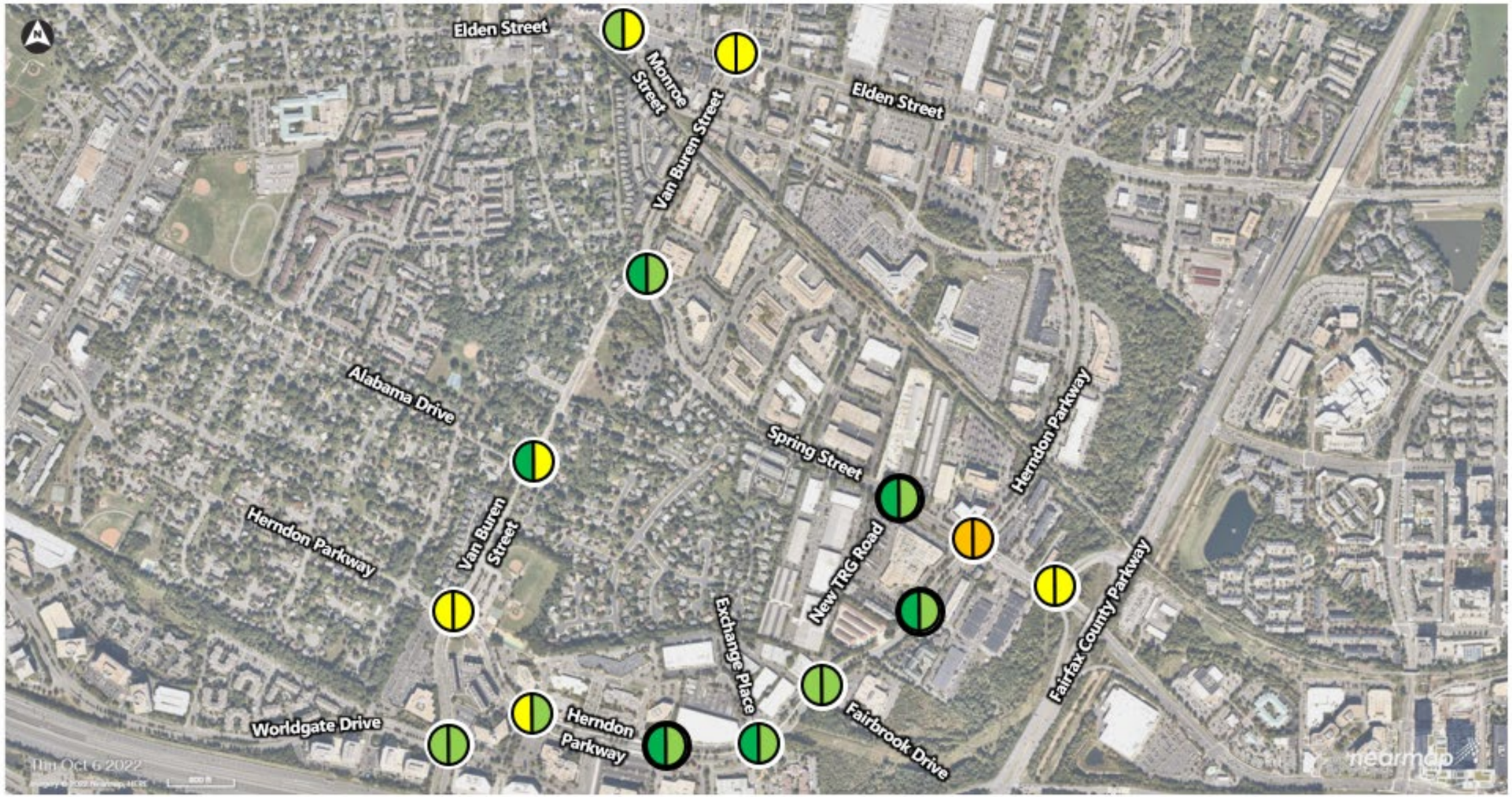
Table 20 Preferred Build "LOS F" Turning Movements

Turning Movement	Peak	LOS F in No Build?	Source of Congestion
Herndon Pkwy / Spring Street			
Eastbound Left	AM/PM	No	*Heavy Demand*
Eastbound Thru/Right	PM	No	
Southbound Left	PM	No	
Spring St / Fairfax County Parkway Ramps / Fairbrook Dr			
Westbound Left	AM	No	*"Interim" Intersection Modifications*
Northbound Left/Thru	AM/PM	No	
Van Buren Street / Worldgate Drive			*Heavy Demand*
Eastbound Left	PM	No	
Van Buren St / Herndon Pkwy			*Capacity limitations at Van Buren St / Herndon Pkwy*
Northbound Left	PM	Yes	
Van Buren St / Alabama Drive			
All Alabama Drive	PM	Yes	
Herndon Parkway / Fairbrook Drive			*Demand*
Westbound Left	PM	No	

Source: Average of 7 AM and 20 PM Peak Hour VISSIM simulation runs.

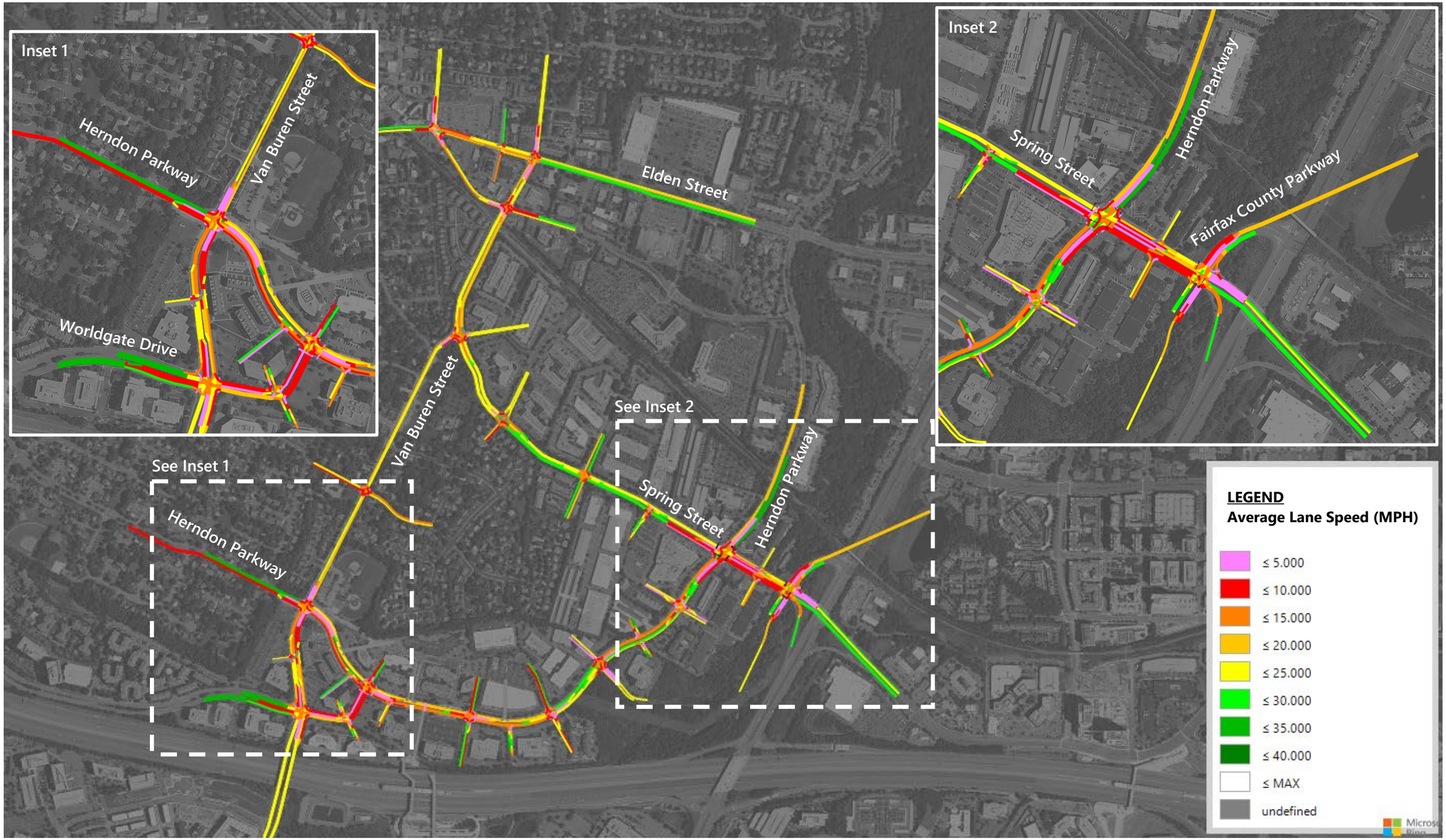
Congestion "heat" maps for each of the Preferred Build Scenario peak hours are shown in **Figures 39 and 40**. These represent the average vehicle speeds present in different lanes and segments of the model. Slower vehicle speeds (shown in shades of red) represent areas of higher congestion and vehicle queuing, whereas higher vehicle speeds (shown in shades of green) represent areas of lower congestion and vehicle queueing. In both peak hours, the heaviest areas of congestion are the Spring Street corridor from Herndon Parkway to Fairfax County Parkway and the three intersections at the junctions of Van Buren Street, Worldgate Drive, and Herndon Parkway. Additionally, in the PM peak hour, southbound Van Buren Street and westbound Herndon Parkway experience a significant amount of congestion; albeit the Herndon Parkway congestion is less severe than that projected in several of the initial Build Scenarios.

Figure 38 Preferred Build Scenario 2045 Intersection Level of Service



Source: Average of 7 AM Peak Hour and 20 PM Peak Hour VISSIM simulation runs. Aerial imagery from NearMap.

Figure 39 Preferred Build Scenario 2045 Congestion Heat Map – AM Peak Hour



Source: Average of 7 AM Peak Hour VISSIM simulation runs.

Figure 40 Preferred Build Scenario 2045 Congestion Heat Map – PM Peak Hour



Source: Average of 20 PM Peak Hour VISSIM simulation runs.

Projected average and maximum queue lengths for the Preferred Build Scenario are displayed in **Figures 41 and 42**. An important note regarding the maximum queue lengths is that each roadway segment's maximum queue length most likely does not temporally align (i.e., occur at the same time). Rather, this figure shows the maximum queue length on each segment of roadway during the peak hour. The accommodation of maximum queue lengths is also not the typical design objective as they are an indication of the absolute worst impact during the peak hour.

In the AM peak hour, average queue lengths are accommodated throughout the study network, including the Fairfax County Parkway off-ramp queue that is contained within the off-ramp. The maximum AM peak hour queue lengths, are accommodated with a few exceptions – specifically eastbound Herndon Parkway (west of Fairbrook Drive) and the Spring Street segment at Herndon Parkway and Fairfax County Parkway. The maximum queue is projected to extend onto Fairfax County Parkway; albeit the exact extents are unknown as the traffic signal on Fairfax County Parkway was not modeled as part of this study.

In the PM peak hour, the roadway network experiences increased queueing compared to the AM peak hour. Average queue lengths are still mostly accommodated, although the southbound Van Buren Street queue at Herndon Parkway and the westbound Spring Street queue at Fairfax County Parkway are significant. Maximum queue lengths fill most of the Herndon Parkway corridor and Spring Street at Herndon Parkway and the Fairfax County Parkway. As previously mentioned, these maximum queue lengths are most likely not all occurring simultaneously, so these queue findings do not equate to gridlock conditions. Queuing also does not directly correlate to delay; for instance, many of the intersections along Herndon Parkway are projected to operate at LOS C despite this level of queuing.

These findings are fairly similar to the No Build 2045 findings; the additional TRG traffic volume impacts are largely offset by the Fairbrook Drive extension and new traffic signal at Sunset Business Park.

Appendix B documents the delay, LOS, and vehicle queueing for all of the movements at each of the eleven study intersections.

5.2.4 Potential Transportation Mitigation

Given that multiple intersections demonstrate operational deficiencies in the Preferred Build traffic analysis – as defined by the Town of Herndon's LOS standard – the Project Team explored a variety of potential mitigation measures with Town of Herndon staff.

The Build traffic analysis did not substantially alter the No Build roadway network, except where previously mentioned such as at Spring Street / Fairfax County Parkway / Fairbrook Drive. The primary candidate mitigations focus on measures to increase the capacity of the roadway network in a manner that would be compatible with the mixed-used, human-scale development envisioned for the TRG. These candidate mitigations seek to improve traffic operations to an acceptable level at the three intersections that fall short of the Town's LOS standard:

- Spring Street / Herndon Parkway (overall intersection LOS E in both peaks)
- Van Buren Street / Herndon Parkway (turning movement LOS F in PM peak)
- Van Buren Street / Alabama Drive (turning movement LOS F in PM peak)

The Project Team used microsimulation tools to conduct initial screenings of a wide range of infrastructure improvements, an exercise that helped identify a set of candidate mitigations to be further modeled in VISSIM.

Table 21 lists the mitigations to be modeled in VISSIM; this traffic modeling is ongoing and the results of the analysis will be summarized in the next iteration of this technical memo.

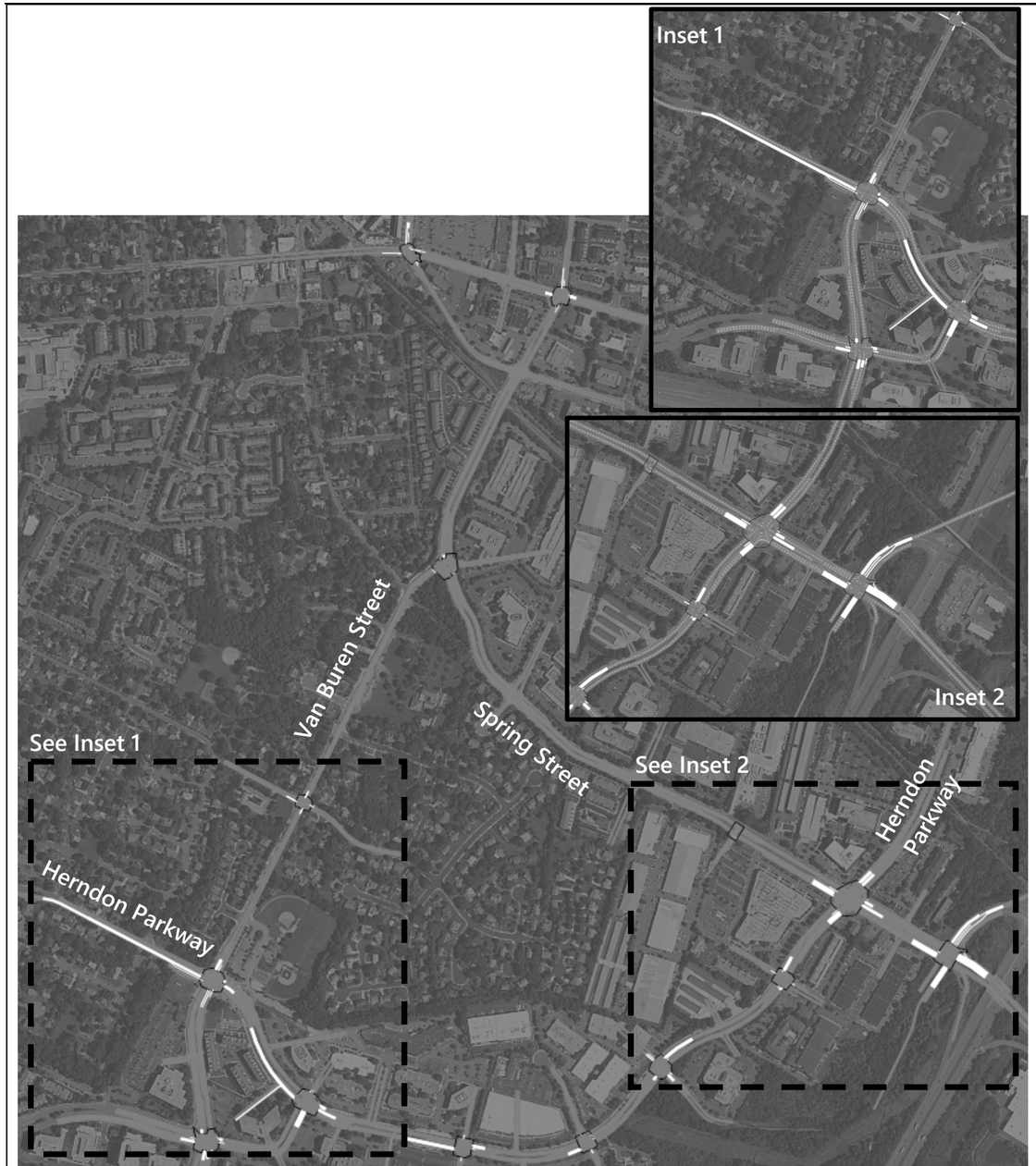
The Preferred Build traffic analysis included baseline assumptions on vehicle trips. The Town of Herndon may consider additional potential mitigation measures to reduce the amount of volume on the roadway network. Those measures could include the following:

- New or optimized active transportation facilities to encourage non-vehicle trips.
- Transportation Demand Management (TDM) strategies (e.g., transit incentives, "park once" strategies, etc.).

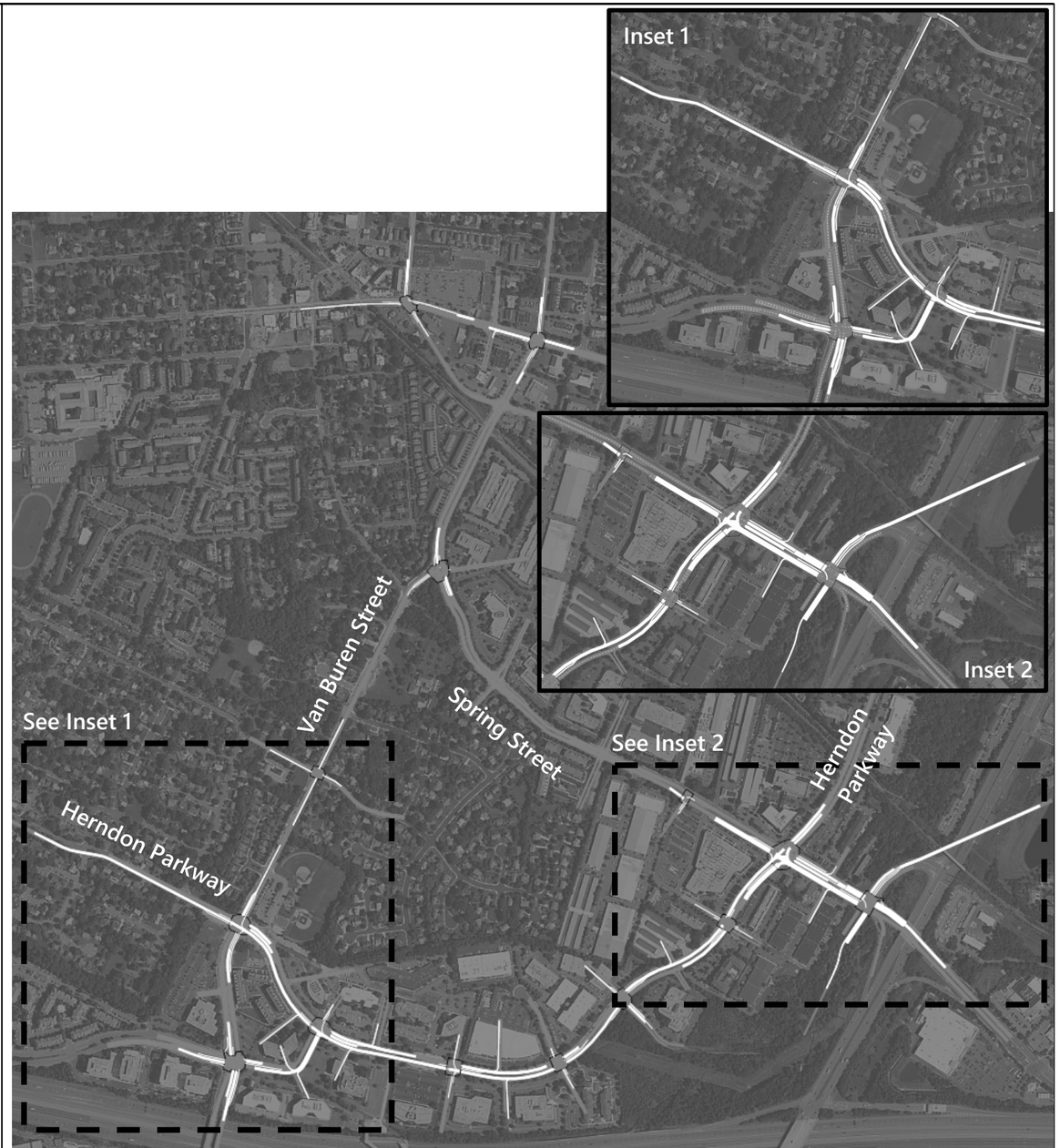
Table 21 Candidate Mitigations to be Tested in VISSIM

Intersection	Issue	Potential Solution	Notes
Herndon Parkway / Van Buren St	SB Van Buren St dual thru lanes only 150 ft in length, leading to delay	Widen SB Van Buren St to extend dual thru lanes	Roadway widening with right of way impacts
	Single NBL turn lane to serve 300+ peak-hr vehicles; competing with SB Van Buren for signal capacity	Dual NBL turn lanes	Roadway widening with right of way impacts; screened out options to get dual NBL turn lanes without widening
Spring Street / Herndon Parkway	Viability of new TRG road to relieve pressure on Herndon Parkway is limited by lack of signal at Spring Street	New traffic signal at Spring Street / new TRG road with rerouted traffic from Herndon Parkway	-
	Intersection Capacity Constraints	Dual left turn lanes from EB Spring St onto NB Herndon Pkwy	Possible roadway widening – may be accommodated within median
Spring Street / Fairbrook Dr / Fairfax County Pkwy	Queue spillback on Fairfax County Pkwy off-ramp	Dual left turn lane from off-ramp	Roadway widening with right of way impacts
	Congestion on WB Spring St	Dual left turn from WB Spring St onto Fairbrook Dr	Widening likely able to be accommodated within median
	Fairbrook Drive congestion in PM Peak	Separate left turn lane from thru lane	Requires wider cross-section for new road (Fairbrook Drive extension)
Herndon Parkway / Fairbrook Dr	Fairbrook Drive congestion	Signal optimization	-

Figure 41 Preferred Build Scenario 2045 Queue Map – AM Peak Hour

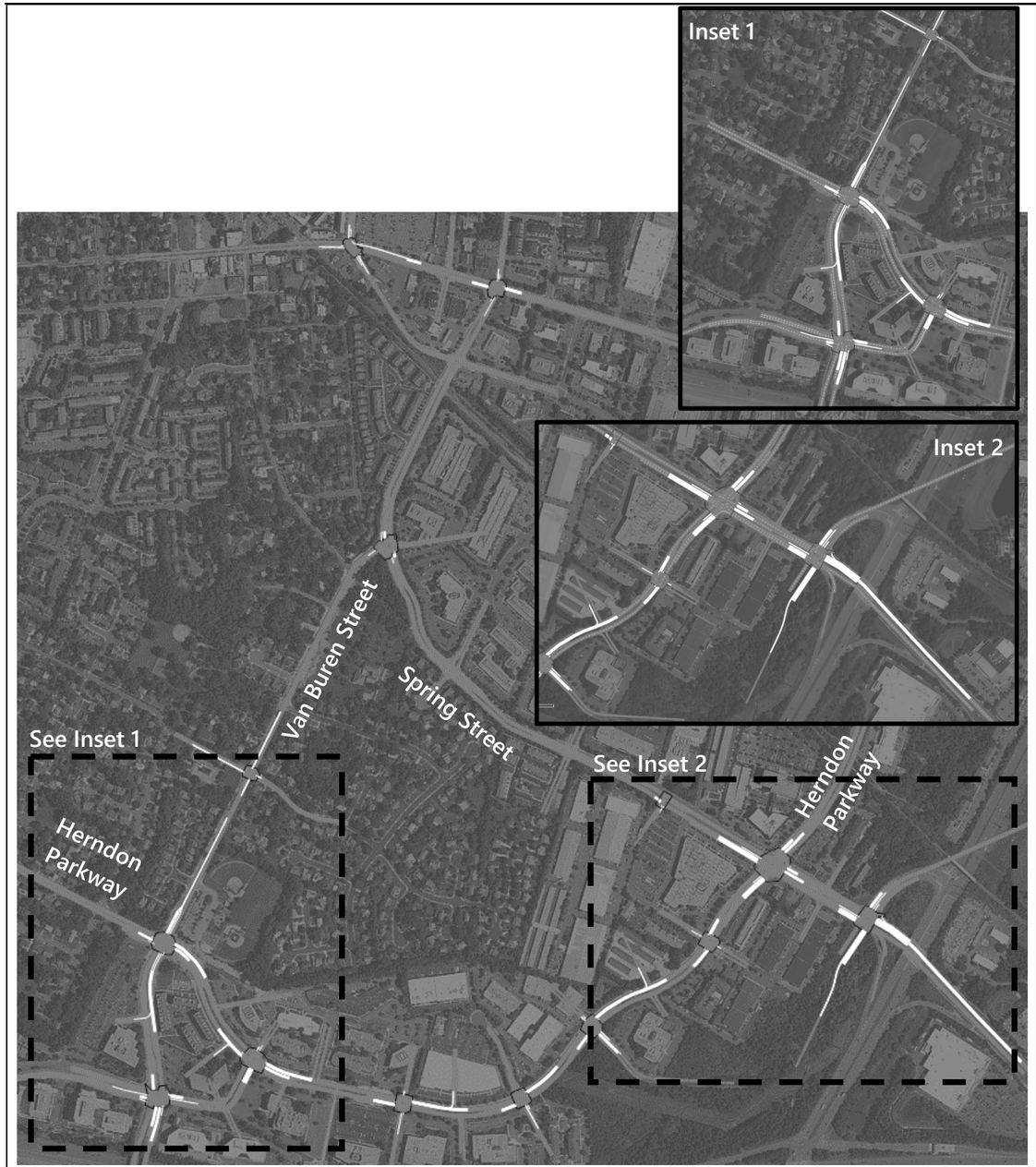


Average Queue Length

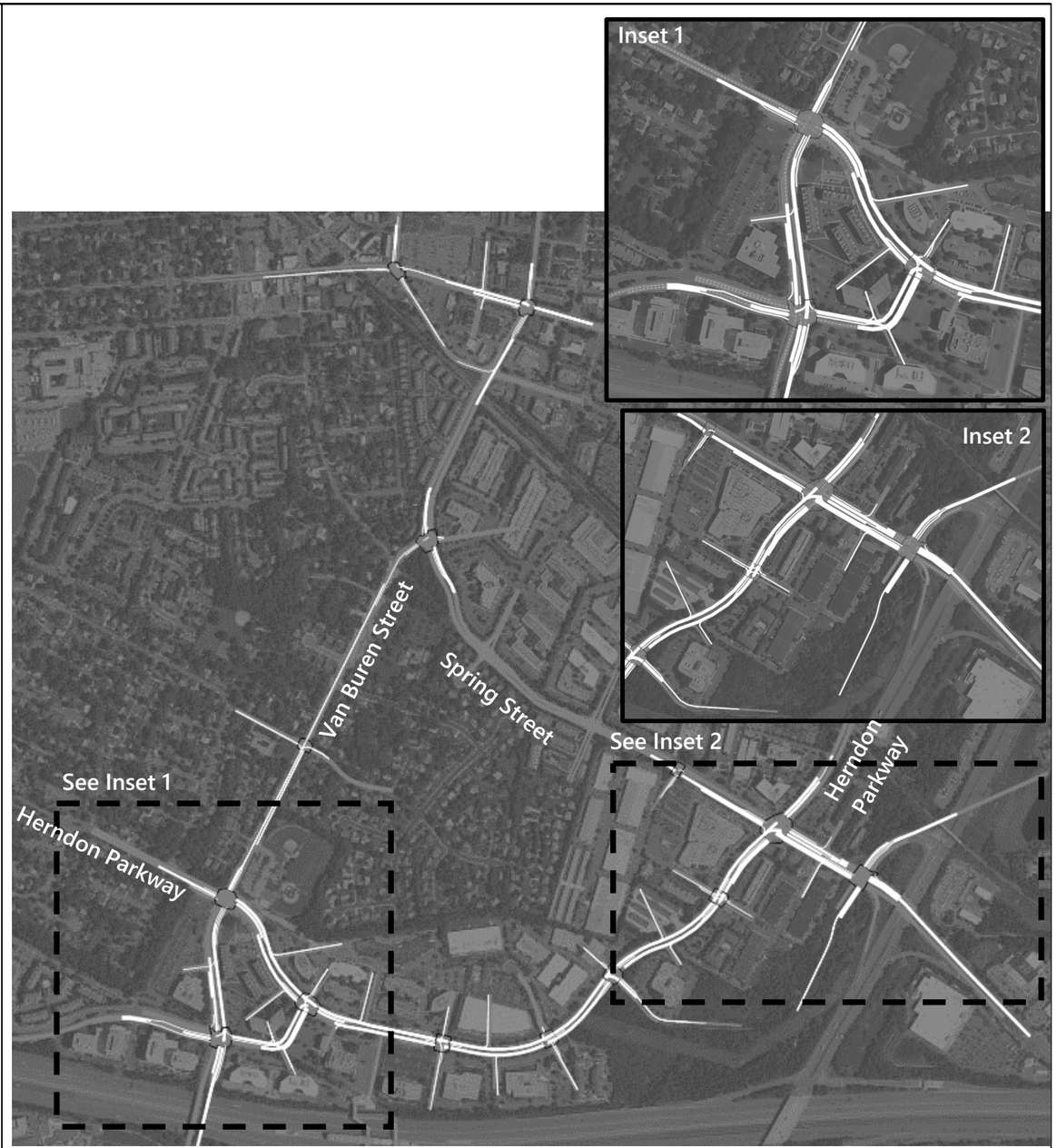


Maximum Queue Length

Figure 42 Preferred Build Scenario 2045 Queue Map – PM Peak Hour



Average Queue Length



Maximum Queue Length

Divider

This page intentionally left blank.

A

Traffic Volume Datasets – All Intersections in Model

A.1 Existing Conditions 2023 Volumes

A.2 No Build 2045 Volumes

A.3 Build Scenario 1 (Neighborhood Clusters) 2045 Volumes

A.4 Build Scenario 1 (Neighborhood Clusters) New Site Trips

A.5 Build Scenario 1 (Neighborhood Clusters) Site Pass-by Trips

A.6 Build Scenario 2 (Two Centers) 2045 Volumes

A.7 Build Scenario 2 (Two Centers) New Site Trips

A.8 Build Scenario 2 (Two Centers) Site Pass-by Trips

A.9 Build Scenario 3 (Metro Center) 2045 Volumes

A.10 Build Scenario 3 (Metro Center) New Site Trips

A.11 Build Scenario 3 (Metro Center) Site Pass-by Trips

A.12 Preferred Build Scenario 2045 Volumes

A.13 Preferred Build Scenario New Site Trips

A.14 Preferred Build Scenario Site Pass-by Trips

B

VISSIM Model Complete Intersection Metrics

B.1 Existing Conditions AM Peak Hour

B.2 Existing Conditions PM Peak Hour

B.3 No Build 2045 AM Peak Hour

B.4 No Build 2045 PM Peak Hour

B.5 Build 2045 Scenario One (Neighborhood Clusters) AM Peak Hour

B.6 Build 2045 Scenario One (Neighborhood Clusters) PM Peak Hour

B.7 Build 2045 Scenario Two (Two Centers) AM Peak Hour

B.8 Build 2045 Scenario Two (Two Centers) PM Peak Hour

B.9 Build 2045 Scenario Three (Metro Center) AM Peak Hour

B.10 Build 2045 Scenario Three (Metro Center) PM Peak Hour

B.11 Preferred Build 2045 Scenario AM Peak Hour

B.12 Preferred Build 2045 Scenario PM Peak Hour

This page intentionally left blank.

DRAFT

Herndon Transit-Related Growth Area

Assessment of Traffic Impact Associated with Small Area Plan

PREPARED FOR

Town of Herndon
Department of Community Development
777 Lynn Street
Herndon, Virginia, 20170
703.787.7380

PREPARED BY

1001 G St NW
Ste 1125
Washington, DC 20001
202.739.9555

Existing and No Build Final Submittal: January 13, 2023
3 Build Scenarios Draft Submittal: June 12, 2023
Original Preferred Build Scenario Draft Submittal: August 8, 2023
Revised Preferred Build Scenario Draft Submittal: October 16, 2023
Revised Preferred Build Scenario Draft Submittal (updated with candidate mitigations): December 4, 2023
Mitigation Draft Submittal: December 18, 2023

Table of Contents

Introduction 1

1.1 Location and Context 1
1.2 Transportation Scope of Work 1
1.2.1 Baseline Traffic Data 2
1.3 Transportation Analysis Scenarios 2

Existing Traffic Conditions 3

2.1 Traffic Model 3
2.2 Traffic Volumes 3
2.3 Existing Conditions Traffic Analysis 4
2.3.1 Performance Metrics 4
2.3.2 Existing Conditions Findings 4

No Build 2045 Traffic Conditions 9

3.1 No Build 2045 Model Assumptions 9
3.1.1 Traffic Volumes 9
3.1.2 Roadway Network 10
3.2 No Build 2045 Traffic Volumes 10
3.3 No Build 2045 Traffic Analysis 10
3.3.1 No Build 2045 Findings 12
3.4 No Build Traffic Conclusions – Constraints and Opportunities 18

Three Build 2045 Scenarios with Fairbrook Drive Extension: Traffic Conditions 19

4.1 Build 2045 Scenario Model Assumptions 19
4.1.1 Development Scenarios 19
4.1.2 Roadway Network 19
4.1.3 Traffic Volumes 20
4.2 Build 2045 Scenario One: Neighborhood Clusters 21
4.2.1 Trip Generation 21
4.2.2 Transportation Connectivity 21
4.2.3 Traffic Analysis 26
4.3 Build 2045 Scenario Two: Two Centers 30
4.3.1 Trip Generation 30
4.3.2 Transportation Connectivity 30
4.3.3 Traffic Analysis 35
4.4 Build 2045 Scenario Three: Metro Center 39
4.4.1 Trip Generation 39
4.4.2 Transportation Connectivity 39
4.4.3 Traffic Analysis 44
4.5 Comparison of Three Build Scenarios 48
4.5.1 Development Characteristics and Connectivity 48
4.5.2 Traffic Volumes 48
4.5.3 Traffic Impacts 48

Preferred Build 2045 Scenario with Fairbrook Drive Extension: Traffic Conditions 49

5.1 Preferred Build 2045 Scenario Model Assumptions 49
5.2 Preferred Build 2045 Scenario 49
5.2.1 Trip Generation 49
5.2.2 Transportation Connectivity 51
5.2.3 Traffic Analysis 55
5.2.4 Potential Transportation Mitigation 59

Preferred Build 2045 Scenario with Fairbrook Drive Extension and Additional Transportation Mitigation Measures: Traffic Conditions 62

6.1 Mitigation Roadway Network 62
6.2 Traffic Volumes 62
6.2.1 Traffic Analysis 66
6.2.2 Recommendations for Transportation Mitigation 70

Appendices

A Traffic Volume Datasets – All Intersections in Model A1

B VISSIM Model Complete Intersection Metrics B1

List of Tables

Table No.	Description	Page
Table 1	Metro Square Trip Generation	3
Table 2	Level of Service Description for Intersections	4
Table 3	Existing Condition Intersection Delay and LOS	4
Table 4	No Build 2045 Intersection Delay and LOS	12
Table 5	No Build 2045 "LOS F" Turning Movements	12
Table 6	TRG Build Scenario 1 (Neighborhood Clusters), Full Buildout, Site Trip Generation	22
Table 7	Comparison of Intersection Delay and LOS: No Build 2045 to Build Scenario 1 (Neighborhood Clusters)	26
Table 8	Build Scenario 1 "LOS F" Turning Movements	26
Table 9	TRG Build Scenario 2 (Two Centers), Full Buildout, Site Trip Generation	31
Table 10	Comparison of Intersection Delay and LOS: No Build 2045 to Build Scenario 2 (Two Centers)	35
Table 11	Build Scenario 2 "LOS F" Turning Movements	35
Table 12	TRG Build Scenario 3 (Metro Center), Full Buildout, Site Trip Generation	40
Table 13	Comparison of Intersection Delay and LOS: No Build 2045 to Build Scenario 3 (Metro Center)	44
Table 14	Build Scenario 3 "LOS F" Turning Movements	44
Table 15	Comparison of Build Scenarios	48
Table 17	Comparison of Intersection Delay and LOS: No Build 2045 to All Three Build 2045 Scenarios	48
Table 16	Comparison of Build Scenario Trip Generation	48
Table 18	TRG Preferred Build Scenario, Full Buildout, Site Trip Generation	50
Table 19	Comparison of Intersection Delay and LOS: No Build 2045 to Preferred Build Scenario	55
Table 20	Preferred Build "LOS F" Turning Movements	55
Table 21	Candidate Mitigations to be Tested in VISSIM	59
Table 22	Comparison of Intersection Delay and LOS: Preferred Build Scenario to Mitigation Build Scenario	66
Table 23	Comparison of LOS F Movements	66
Table 24	Transportation Mitigation Recommendations	70

List of Figures

Figure No.	Description	Page
Figure 1	Transit-Related Growth Area Map	2
Figure 2	Existing Conditions Traffic Volumes	5
Figure 3	Existing Conditions Intersection Level of Service	6
Figure 4	Existing Conditions Congestion Heat Map – AM Peak Hour	7
Figure 5	Existing Conditions Congestion Heat Map – PM Peak Hour	8
Figure 6	No Build 2045 Traffic Volumes	11
Figure 7	No Build 2045 Intersection Level of Service	13
Figure 8	No Build 2045 Congestion Heat Map – AM Peak Hour	14
Figure 9	No Build 2045 Congestion Heat Map – PM Peak Hour	15
Figure 10	No Build 2045 Queue Map – AM Peak Hour	16
Figure 11	No Build 2045 Queue Map – PM Peak Hour	17
Figure 12	Modeled Configuration of Spring Street / Fairfax County Parkway Ramps / Fairbrook Drive Extension	20
Figure 13	Neighborhood Clusters Scenario Street Plan	21
Figure 14	Build Scenario 1 (Neighborhood Clusters) 2045 Traffic Volumes	23
Figure 15	Build Scenario 1 (Neighborhood Clusters) New Site Trips	24
Figure 16	Build Scenario 1 (Neighborhood Clusters) Site Pass-By Trips	25
Figure 17	Build Scenario 1 (Neighborhood Clusters) 2045 Intersection Level of Service	27
Figure 18	Build Scenario 1 (Neighborhood Clusters) 2045 Congestion Heat Map – AM Peak Hour	28
Figure 19	Build Scenario 1 (Neighborhood Clusters) 2045 Congestion Heat Map – PM Peak Hour	29
Figure 20	Two Centers Scenario Street Plan	30
Figure 21	Build Scenario 2 (Two Centers) 2045 Traffic Volumes	32
Figure 22	Build Scenario 2 (Two Centers) New Site Trips	33
Figure 23	Build Scenario 2 (Two Centers) Site Pass-By Trips	34
Figure 24	Build Scenario 2 (Two Centers) 2045 Intersection Level of Service	36
Figure 25	Build Scenario 2 (Two Centers) 2045 Congestion Heat Map – AM Peak Hour	37
Figure 26	Build Scenario 2 (Two Centers) 2045 Congestion Heat Map – PM Peak Hour	38
Figure 27	Metro Center Scenario Street Plan	39
Figure 28	Build Scenario 3 (Metro Center) 2045 Traffic Volumes	41
Figure 29	Build Scenario 3 (Metro Center) New Site Trips	42
Figure 30	Build Scenario 3 (Metro Center) Site Pass-By Trips	43
Figure 31	Build Scenario 3 (Metro Center) 2045 Intersection Level of Service	45
Figure 32	Build Scenario 3 (Metro Center) 2045 Congestion Heat Map – AM Peak Hour	46
Figure 33	Build Scenario 3 (Metro Center) 2045 Congestion Heat Map – PM Peak Hour	47
Figure 34	Preferred Scenario Development Plan	51
Figure 35	Preferred Build Scenario 2045 Traffic Volumes	52
Figure 36	Preferred Build Scenario New Site Trips	53
Figure 37	Preferred Build Scenario Site Pass-By Trips	54
Figure 38	Preferred Build Scenario 2045 Intersection Level of Service	56
Figure 39	Preferred Build Scenario 2045 Congestion Heat Map – AM Peak Hour	57
Figure 40	Preferred Build Scenario 2045 Congestion Heat Map – PM Peak Hour	58
Figure 41	Preferred Build Scenario 2045 Queue Map – AM Peak Hour	60
Figure 42	Preferred Build Scenario 2045 Queue Map – PM Peak Hour	61
Figure 43	Preferred Build Scenario with Mitigation 2045 Traffic Volumes	63
Figure 44	Preferred Build Scenario with Mitigation New Site Trips	64
Figure 45	Preferred Build Scenario with Mitigation Site Pass-By Trips	65
Figure 46	Preferred Build Scenario with Mitigation 2045 Intersection Level of Service	67
Figure 47	Preferred Build Scenario with Mitigation 2045 Congestion Heat Map – AM Peak Hour	68
Figure 48	Preferred Build Scenario with Mitigation 2045 Congestion Heat Map – PM Peak Hour	69
Figure 49	Preferred Build Scenario with Mitigation 2045 Queue Map – AM Peak Hour	71
Figure 50	Preferred Build Scenario with Mitigation 2045 Queue Map – PM Peak Hour	72

1

Introduction

The Town of Herndon is preparing a Small Area Plan for the Transit-Related Growth (TRG) Area proximate to the Silver Line Metro Station. VHB is providing transportation services on the SOM-led Project Team. This report covers VHB's transportation analysis of various development scenarios, comparing the anticipated impact to no new TRG development, and identifying potential transportation mitigation strategies.

1.1 Location and Context

The TRG Area is located in the Town of Herndon, within Fairfax County, Virginia. The TRG, in conjunction with the Herndon Transit-Oriented Core (HTOC), comprises the land area that the Town has designated for mixed-use, transit-supported development. The HTOC is the area immediately adjacent to the Metro Station, located north of the Dulles Toll Road, east of Van Buren Street, south of Herndon Parkway, and west of the Fairbrook site. The TRG represents the next layer of development, and is located adjacent to the HTOC but farther away from the Metro Station in comparison to the HTOC. **Figure 1** outlines the boundaries of both the HTOC and the TRG. The TRG consists of the office and light industrial land areas both north and west of Herndon Parkway, as well as east of Herndon Parkway between the Fairbrook site, Fairfax County Parkway, and Spring Street.

The TRG Small Area Plan is not the first planning effort completed by the Town of Herndon in the vicinity of the Metro Station. The Herndon Metro Station Area Study, completed in 2012, outlined expected development within the HTOC area. In 2017, a transportation planning study (the "2017 TRG study") was completed to identify a potential density and land use mix for the TRG area that could be supported by the transportation system. This TRG Small Area Plan currently underway is a broader planning study that will encompass land use planning, placemaking, transportation, and other infrastructure.

1.2 Transportation Scope of Work

The Town of Herndon outlined specific requirements for the TRG transportation study in its Request for Proposals (RFP). These requirements include the analysis of key intersections and roadway segments along Herndon Parkway, Spring Street, and Van Buren Street. The list of study intersections is as follows:

1. Elden Street / Monroe Street
2. Elden Street / Van Buren Street
3. Van Buren Street / Spring Street
4. Van Buren Street / Herndon Parkway with scheduled roadway improvements
5. Van Buren Street / Alabama Drive with scheduled roadway improvements
6. Van Buren Street / Worldgate Drive

Figure 1 Transit-Related Growth Area Map



Source: SOM Transit-Related Growth Area Phase 1 Inception and Engagement Summary Report, Page 8, August 2022.

7. Herndon Parkway / Exchange Place
8. Herndon Parkway / Fairbrook Drive
9. Herndon Parkway / Driveway (Potential Future Worldgate Drive Extension)
10. Spring Street / Herndon Parkway with scheduled roadway improvements
11. Spring Street / Fairfax County Parkway ramps / Potential Future Fairbrook Drive Extension

1.2.1 Baseline Traffic Data

The Town's RFP also specified the utilization of the peak hour traffic counts collected in May 2017 as part of the prior TRG planning study; the use of this count data is to avoid COVID-19 pandemic-related reductions in peak hour traffic that would be present in newly collected 2022 data. This is a typical approach employed in transportation studies in the years following the start of the pandemic to account for the unknowns regarding the return to pre-COVID traffic patterns.

1.3 Transportation Analysis Scenarios

This report submittal documents Existing conditions, No Build 2045 conditions, three (3) Build 2045 Scenarios with the Fairbrook Drive extension, and a preferred Build 2045 Scenario with the Fairbrook Drive extension. The Existing and No Build analysis established the background transportation conditions with no additional development within the TRG Area. The three (3) Build Scenarios evaluated the capacity of the roadway network to handle increased demand from potential TRG development scenarios. The Town requested that these three scenarios include Fairbrook Drive extension as this new roadway is viewed as a critical TRG infrastructure connection. The Preferred Build Scenario evaluates the anticipated operating conditions of the TRG development scenario that encompasses the feedback of study stakeholders. Following are the specific transportation scenarios that have been evaluated to date and are documented in this report:

- Existing Conditions
  - 2017 Volume Data + Metro Square Development
  - 2022 Signal Timing and Phasing
- No Build 2045
  - 1% Annual Background Growth for Volumes
  - HTOC (Excluding Metro Square Acreage) + Fairbrook Development Volumes
  - Funded Roadway Improvement Projects + Worldgate Drive extension
  - HTOC + Fairbrook Roadway and Traffic Signal Improvements
- Three (3) Build 2045 Scenarios without Mitigation
  - TRG Development Scenarios, including the addition of the Fairbrook Drive extension to Spring Street
    - VHB worked with SOM and the Town to identify development density and distribution, land use composition, and internal roadway network.
    - Fairbrook Drive extension was modeled as a two-lane cross-section with a tie-in to the existing traffic signal at Spring Street / Fairfax County Parkway Ramps.
- One (1) Preferred Build 2045 Scenario without Mitigation
  - TRG Development Preferred Scenario, including the same Fairbrook Drive extension to Spring Street modeled in the three Build Scenarios
- One (1) Preferred Build 2045 Scenario with Transportation Mitigation (could include infrastructure and/or policy).

2

Existing Traffic Conditions

This chapter discusses the assumptions, methodology, and findings of the Existing conditions traffic analysis. A microsimulation traffic model was utilized to estimate the operating conditions of the existing transportation system. Existing conditions traffic operates acceptably.

2.1 Traffic Model

In the 2017 TRG transportation study, a VISSIM microscopic simulation model was developed to analyze traffic conditions at the study intersections and along the study roadway segments. A microsimulation model is the most accurate transportation modeling tool for complex traffic conditions. An example of a complex traffic condition is when the vehicular queue from one traffic signal extends into a separate, upstream signalized intersection, thereby impacting its operations; a macroscopic traffic model (e.g., Synchro) is not the appropriate tool to accurately analyze this condition.

A microscopic simulation model must also be calibrated to establish that it is an accurate representation of the modeled traffic conditions. Calibration involves modifying model behavior such that model outputs (e.g., processed volume, vehicle speeds, vehicular travel time, etc.) are consistent with field observations on the actual roadway network. This calibration data must be collected concurrently to the traffic volume dataset so that the model can replicate the calibration conditions.

The previously developed and calibrated 2017 VISSIM model was utilized as the foundation for modeling efforts in the 2022 study. The model was first reviewed, ported into the most recent software version (VISSIM 11) approved for use by the Virginia Department of Transportation (VDOT), and verified that it could be repurposed for this study. The model was then updated to more accurately represent 2022 conditions via the inclusion of the most recent traffic signal timings (provided by the Town) as well as the addition of traffic volumes associated with the Metro Square two-over-two townhome development (see **Table 1**). These updates were minor enough that the model was assumed to still be calibrated; additionally, the model could not be recalibrated as newly collected calibration data (e.g., travel times, vehicle speeds) would be five years newer than the utilized 2017 traffic volume data.

Table 1 Metro Square Trip Generation

AM Peak Hour			PM Peak Hour		
Total	Entry	Exit	Total	Entry	Exit
17	4	13	25	15	10

Source: Institute of Transportation Engineer's *Trip Generation Manual, 11th Edition*, Land Use Code 221. 64 condo units in two-over-two (four-story) buildings.

2.2 Traffic Volumes

As mentioned, the 2017 traffic volume dataset was utilized for the analysis of 2022 Existing conditions due to the impact of the COVID-19 pandemic on traffic patterns. One of the more notable impacts has been the rise of remote work, which

anecdotally appears to still be occurring at significantly higher levels than pre-pandemic conditions. More working from home activity results in lower peak hour traffic levels due to the reduction in commuting. As it remains unclear what the long-term stabilization of traffic patterns will look like, agencies such as VDOT have utilized traffic data collected prior to the COVID-19 pandemic to conservatively plan for the future (VDOT's IIM-TMPD-7.0 allows for traffic counts as old as 2015 to be utilized to establish base traffic). The balanced, Existing conditions volume dataset at the study intersections is shown in **Figure 2**. **Appendix A** shows traffic volumes for all study and non-study intersections in the traffic model.

2.3 Existing Conditions Traffic Analysis

Consistent with the 2017 TRG Study, the AM and PM peak hour traffic models were run for 90 minutes per simulation run – the first 30 minutes is a loading ("seeding") period for the traffic while the final 60 minutes represent the peak hour condition. This latter period is when the traffic performance metrics are collected from the model. It is standard policy to average the results of multiple simulation runs. VDOT's microsimulation sample size tool was utilized to determine the number of model runs that result in averaged results that have a statistical 95% confidence level. Consequently, the AM model and PM model were simulated seven and twenty times, respectively, in accordance with the output from the sample size tool.

2.3.1 Performance Metrics

In this study, vehicle delay (seconds per vehicle) and queue (feet) at intersections are the primary performance metrics, as determined by the Town. The most commonly utilized transportation metric is Level of Service (LOS), which measures the adequacy of intersection geometrics and the traffic control for the given turning volumes. Levels of service range from A through F, based on the average control delay experienced by vehicles traveling through the intersection during the peak hour. Control delay represents the portion of total delay attributed to traffic control devices (e.g., signals or stop signs). **Table 2** provides a description of various levels of service categories and delay ranges. In the Herndon and greater Northern Virginia area, it is common and acceptable to have LOS D during the peak hours.

As noted, Level of Service is defined by the *Highway Capacity Manual* as a scale based on control delay. The delay reported by VISSIM is microsimulation delay, which is actual minus expected travel time. This delay includes both control delay (e.g., due to intersection control) and roadway friction (e.g., drivers interacting with traffic). For this reason, VDOT's policy in its *Traffic Operations and Safety Analysis Manual* (TOSAM) is to not report LOS from VISSIM. Given that it is the most widely recognized traffic metric, LOS is reported in this study; however, this difference in LOS definition should be noted.

Table 2 Level of Service Description for Intersections

Level of Service	Description	Signalized Intersection / Roundabout	Unsignalized Intersection
A	Little or no delay	<= 10 sec.	<= 10 sec.
B	Short traffic delay	10-20 sec.	10-15 sec.
C	Average traffic delay	20-35 sec.	15-25 sec.
D	Long traffic delay	35-55 sec.	25-35 sec.
E	Very long traffic delay	55-80 sec.	35-50 sec.
F	Unacceptable delay	> 80 sec.	> 50 sec.

2.3.2 Existing Conditions Findings

The Existing Conditions traffic model results indicate that one of the key model calibration metrics is satisfied – the model is able to process existing traffic volume demand on each movement, approach, and intersection within an appropriate calibration threshold. While the model was not recalibrated as discussed previously, this result conveys confidence that the model is still representative of existing conditions.

In Existing conditions, the traffic models estimate that all of the signalized intersections operate at a LOS of D or better during the two peak hours, which is an acceptable condition. During the PM peak hour, the Van Buren Street / Alabama Drive all-way stop-control intersection operates at LOS E, which is primarily due to delay on the southbound Van Buren Street approach that also experiences vehicle queues extending upstream to Spring Street. A traffic signal is under construction at this intersection in Fall 2022 and will help facilitate flow at this location. **Table 3** lists the intersection delay and LOS at each of the eleven study intersections. Intersection LOS is also shown in **Figure 3**.

Table 3 Existing Condition Intersection Delay and LOS

Intersection	AM Peak Hour		PM Peak Hour	
	Delay	LOS	Delay	LOS
Elden St / Monroe St	18.0	B	22.5	C
Elden St / Van Buren St	24.3	C	22.4	C
Van Buren St / Spring St	11.7	B	44.8	D
Van Buren St / Herndon Pkwy	35.9	D	39.2	D
Van Buren St / Alabama Dr [1]	10.6	B	46.1	E
Van Buren St / Worldgate Dr	39.1	D	24.9	C
Herndon Pkwy / Driveway [1]	0.5	A	0.8	A
Herndon Pkwy / Exchange Pl [1]	0.5	A	0.6	A
Herndon Pkwy / Fairbrook Dr [1]	0.4	A	0.6	A
Spring St / Herndon Pkwy	47.4	D	46.8	D
Spring St / FCP Ramps	18.8	B	17.4	B

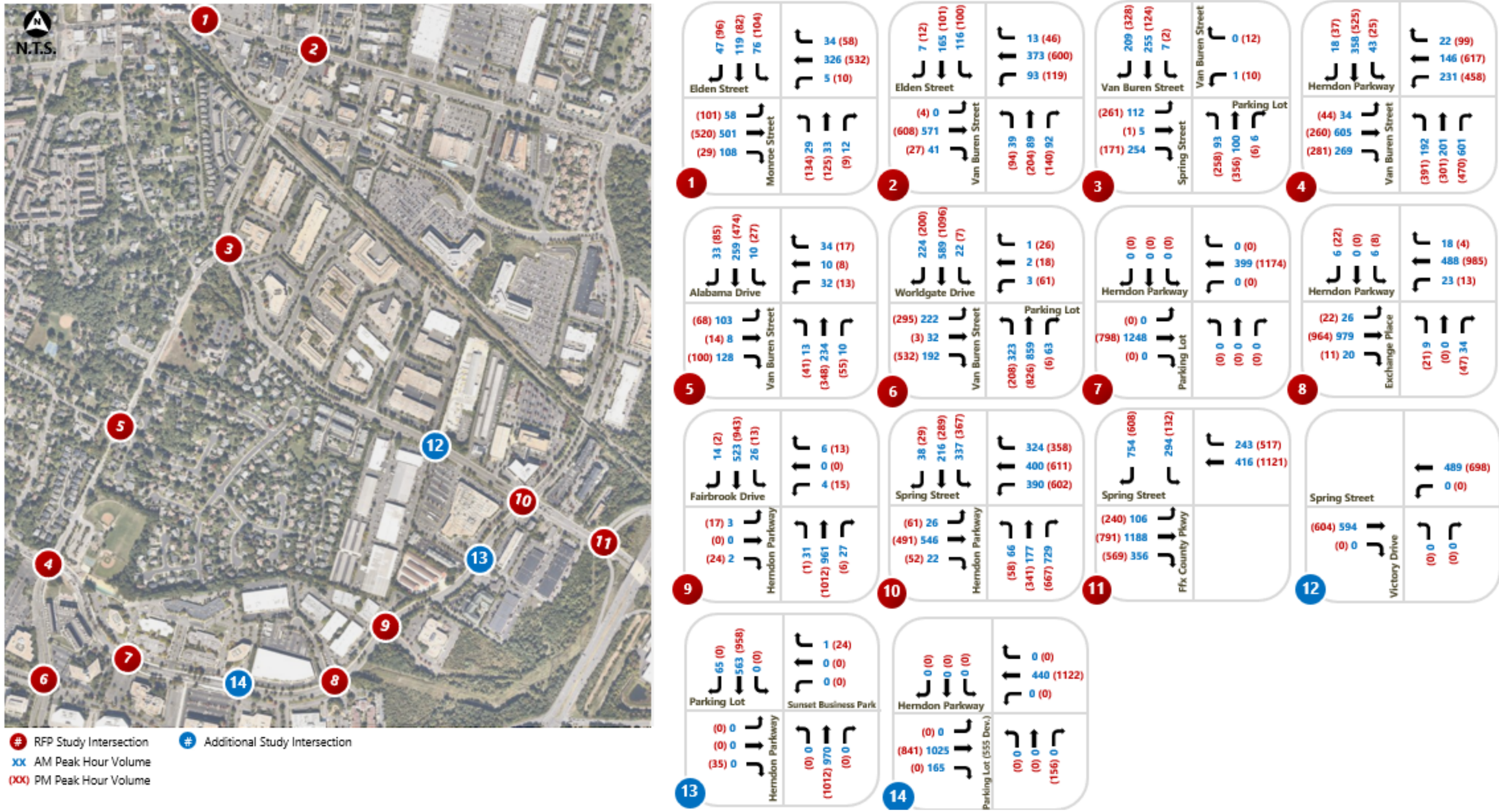
Source: Average of 7 AM and 20 PM Peak Hour VISSIM simulation runs.
1 Unsignalized intersections in Existing conditions scenario.

Congestion "heat" maps for each of the peak hours are shown in **Figures 4 and 5**. These represent the average vehicle speeds present in different lanes and segments of the model. Slower vehicle speeds (shown in shades of red) represent areas of higher congestion and vehicle queuing, whereas higher vehicle speeds (shown in shades of green) represent areas of lower congestion and vehicle queueing. In the AM peak hour, the greatest areas of congestion are northbound Van Buren Street south of Herndon Parkway and the Spring Street / Herndon Parkway intersection vicinity. In the PM peak hour, the heaviest congestion areas are the Van Buren Street corridor (notably southbound north of Alabama Drive and northbound south of Herndon Parkway) as well as the Spring Street / Herndon Parkway intersection vicinity.

As seen in the model results, in Existing conditions the transportation system is able to accommodate demand and facilitate vehicular movements in the study area at acceptable levels of traffic operations. Additionally, roadway improvement projects are under-construction or planned in the near future at Van Buren Street / Alabama Drive, Van Buren Street / Herndon Parkway, and Spring Street / Herndon Parkway; these projects will help improve conditions at the areas of with the highest levels of congestion in Existing conditions.

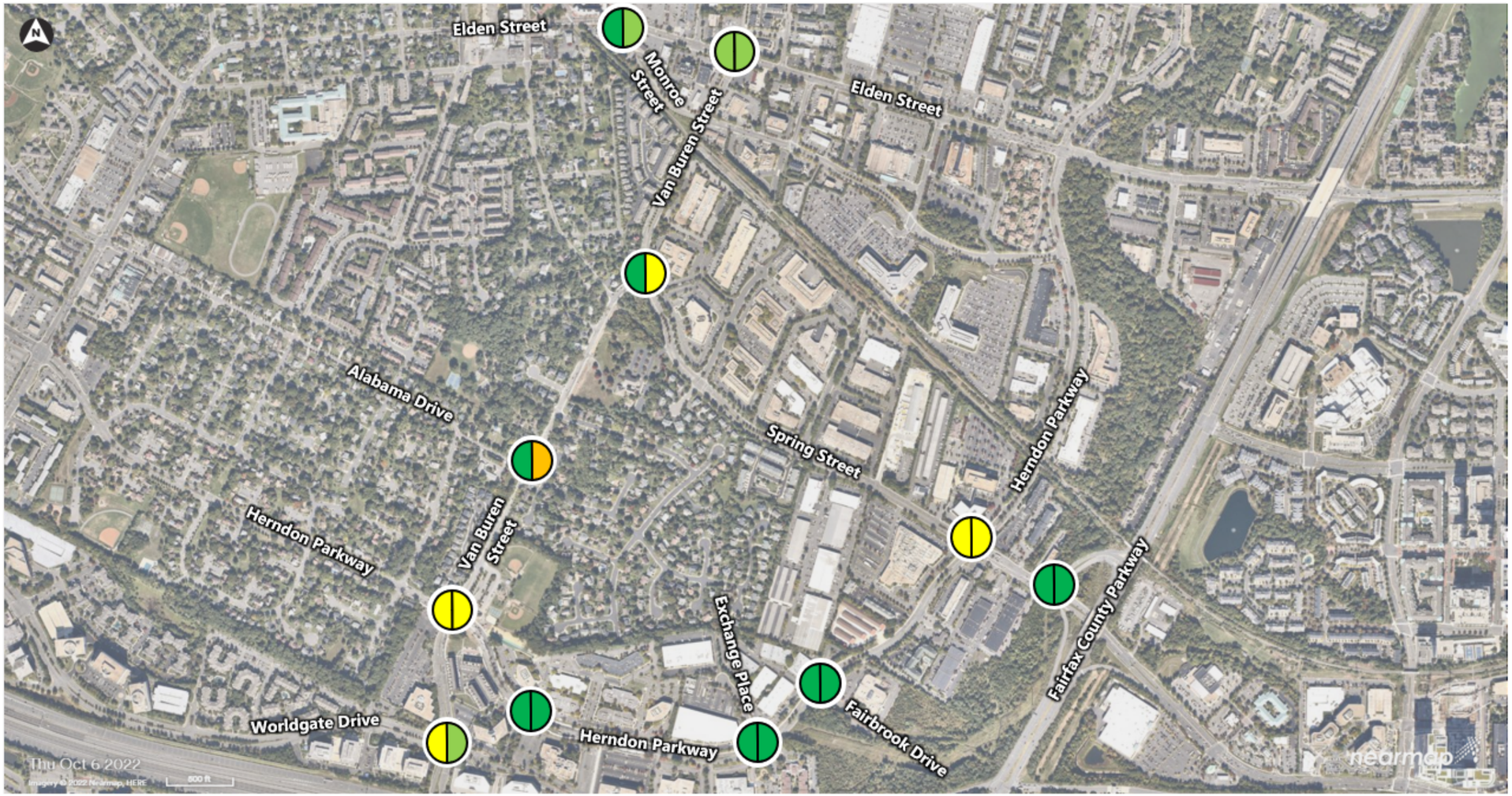
Appendix B documents the delay, LOS, and vehicle queuing for all of the movements at each of the eleven study intersections.

Figure 2 Existing Conditions Traffic Volumes



Existing traffic volumes are from May 2017 and include the addition of Metro Square townhome traffic. Basemap Source: Nearmap.

Figure 3 Existing Conditions Intersection Level of Service

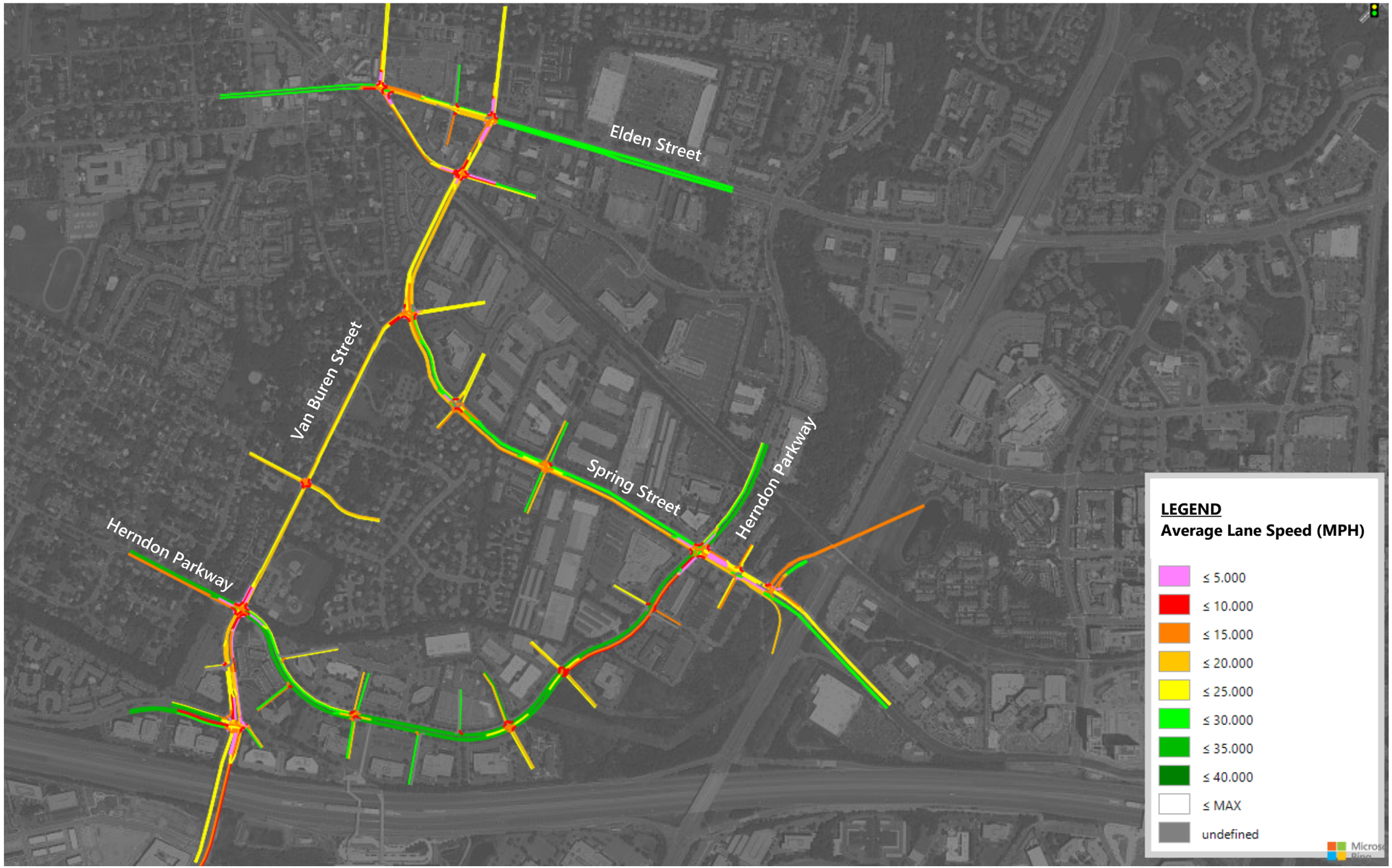


Intersection Level of Service (LOS)

- AM Peak Hour / PM Peak Hour
- LOS A / LOS B
- LOS C
- LOS D
- LOS E
- LOS F

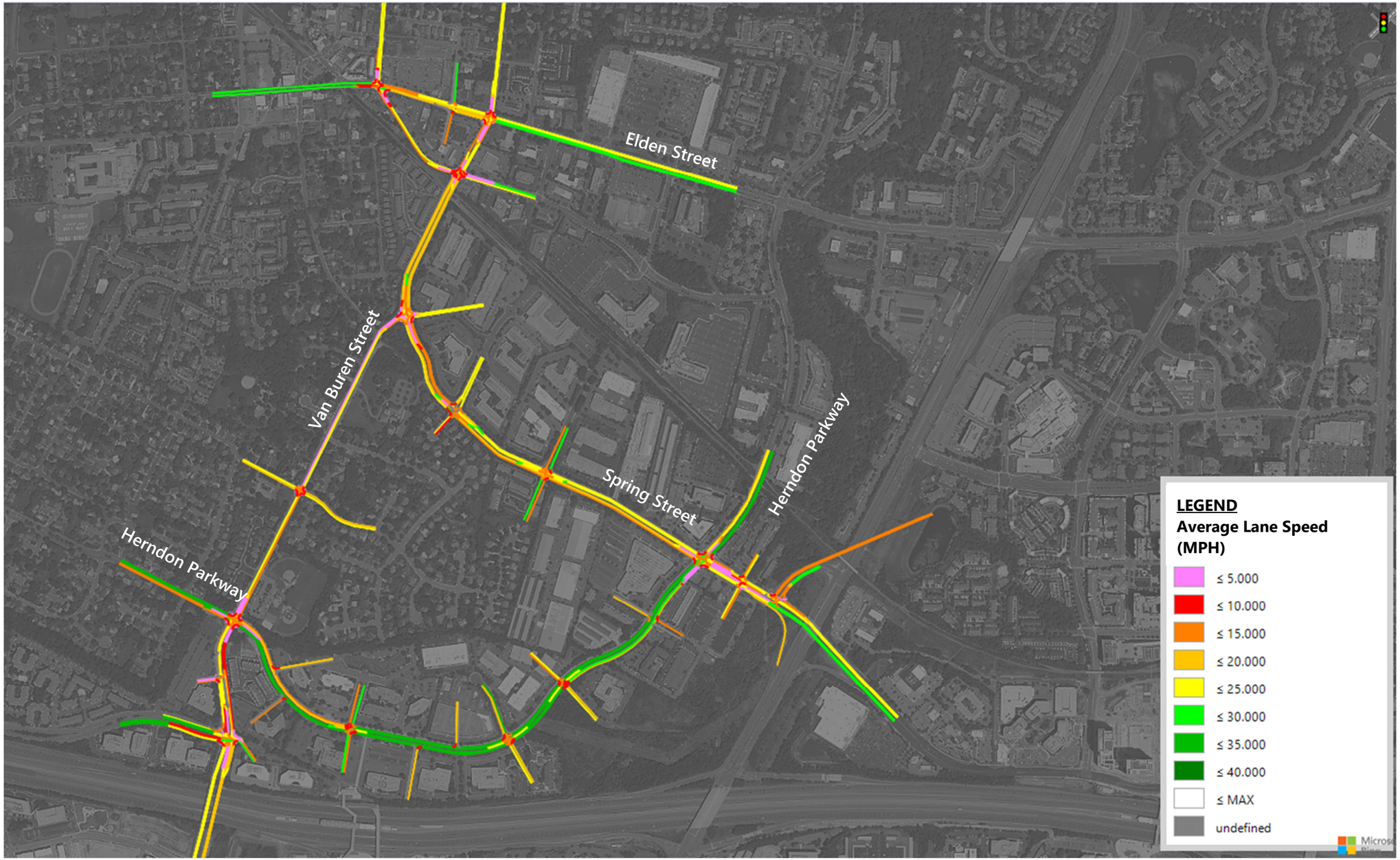
Source: Average of 7 AM Peak Hour and 20 PM Peak Hour VISSIM simulation runs. Aerial imagery from NearMap.

Figure 4 Existing Conditions Congestion Heat Map – AM Peak Hour



Source: Average of 7 AM Peak Hour VISSIM simulation runs.

Figure 5 Existing Conditions Congestion Heat Map – PM Peak Hour



Source: Average of 20 PM Peak Hour VISSIM simulation runs.

3

No Build 2045 Traffic Conditions

This section of the report documents the assumptions and findings of the No Build traffic analysis, which establishes a baseline condition for the design year to which the TRG development scenarios can be compared. Congestion is higher than Existing conditions, and the network shows unacceptable levels of traffic operations – as defined by the Town of Herndon's LOS standard – at three study intersections; however, modeling results indicate that the roadway network accommodates the increased demand based on the progression of traffic.

3.1 No Build 2045 Model Assumptions

In coordination with Town of Herndon staff, VHB set the horizon year for future-year traffic analysis as 2045. Using 2045 as the horizon year was deemed appropriate because it allows sufficient time for full buildout of the development associated with the TRG Small Area Plan.

A VISSIM microscopic simulation model was developed for No Build conditions to analyze projected traffic conditions for the 2045 horizon year. The No Build model considers traffic volume growth associated with organic growth and with known development projects outside the TRG. This No Build 2045 model provides a future-year baseline against which to evaluate traffic impacts associated with the Small Area Plan.

3.1.1 Traffic Volumes

In estimating background traffic growth for the No Build 2045 model, a 1% annual growth rate was applied to existing traffic volumes to project traffic volumes to the horizon year 2045. As mentioned in the approach to the Existing conditions traffic modeling in Chapter 2, VHB assumed zero traffic growth through 2022 as a result of sustained impacts to traffic volumes due to the COVID-19 pandemic. The 1% annual growth rate was then applied from 2022 to 2045. This rate was utilized in both the 2012 HMSAS and 2017 TRG studies and was agreed upon by Town staff for this study.

In addition to the 1% annual growth rate, VHB layered in estimated trips related to known development projects:

- Development volume growth included the HTOC-related volumes as identified in the 2012 Herndon Metro Station Area Study. To account for the Metro Square development – which was built by-right as 2-over-2 townhomes on a parcel that the HTOC assumed would develop at a substantially greater density – VHB applied a 20% trip reduction to the HTOC-related volumes. The 20% reduction is based on Metro Square acreage relative to the total HTOC site.
- Development volume growth also included volumes associated with the Fairbrook development, as identified in the 2020 Fairbrook Business Park Traffic Impact Study (TIS).

This approach to background growth estimation is consistent with the methodologies used in both the 2012 Herndon Metrorail Station Area Study and the 2017 TRG study. It should be noted that, based on a comparison to growth projections

derived from the MWCOG Regional Travel Demand Model (TDM), this approach may overstate traffic demand in the No Build 2045 scenario; however, a conservative traffic forecasting approach ensures that the infrastructure can more than accommodate the future demand.

3.1.2 Roadway Network

VHB included the following transportation network improvements in the No Build 2045 traffic model:

- Van Buren Street / Herndon Parkway intersection improvements.
- Herndon Parkway / Spring Street roadway project.
- Worldgate Drive extension to Herndon Parkway.
- Van Buren Street / Alabama Drive traffic signal. Note: the remainder of the Van Buren Street streetscape project did not necessitate modifications to the traffic model.
- Traffic signals along Herndon Parkway at Worldgate Drive extension, the Metro Promenade, 555 Herndon Parkway, Exchange Place, and Fairbrook Drive. These signals are planned to accommodate the Worldgate Drive extension, HTOC and Fairbrook developments, and the Herndon Metro Station; therefore, they are anticipated to be in operation by the 2045 analysis year.
- Fairbrook Drive approach to Herndon Parkway as shown in Fairbrook TIS.

Based on information provided by Fairfax County Department of Transportation (DOT) to the Town of Herndon, the proposed improvements to the Spring Street / Fairfax County Parkway (FCP) interchange were not included in the Future Year VISSIM models. The County's correspondence indicated that the Spring Street / FCP interchange improvements project is unfunded, is not a priority for the County, and has no associated timeline.

Furthermore, the County's correspondence implies that the Spring Street / FCP interchange conceptual design is inextricably linked with a proposed "Echelon" interchange between Fairbrook Drive extension and the Dulles Toll Road. To that point, the County's concept for the Spring Street / FCP interchange does not accommodate movements from northbound Fairfax County Parkway onto westbound Spring Street (i.e., into Herndon), as it appears that the County assumes those movements will be accommodated by a future Fairbrook Drive extension / Dulles Toll Road interchange.

Given the linking of the two interchanges, the County's concept for the Spring Street / FCP interchange improvements cannot be incorporated into a Future Year model on its own. Incorporating both interchanges is infeasible as the Project Team has already determined that the Fairbrook Drive extension / Dulles Toll Road interchange will not be included in the Future Year VISSIM models. Furthermore, one or both concepts seem likely to change if and when they advance past the conceptual stage.

The uncertainty around the timing and configuration of the Spring Street / FCP interchange improvements project led to a decision to exclude it in the Future Year models for the Herndon TRG traffic analysis. If the study were to include the current concept design and subsequently that design were to change, it could raise questions/doubts regarding the study conclusions and recommendations.

The proposed extension of Fairbrook Drive between Herndon Parkway and Spring Street was also excluded from the roadway network for the No Build 2045 model. The decision to exclude the Fairbrook Drive extension was based on input from Town of Herndon staff regarding challenges in right-of-way acquisition and VDOT concurrence on connecting Fairbrook Drive to the existing Spring Street / FCP ramp signal. These challenges cast doubt on the feasibility of constructing the Fairbrook Drive extension by 2045; therefore it was determined to include the extension not as a baseline No Build condition, but rather a potential Build condition.

The proposed Herndon Parkway / Sunset Business Park traffic signal exclusively services turning movements associated with potential TRG development; as such, this signal was not modeled in No Build conditions.

Signal phasing and timing was optimized at all traffic signals within the No Build model. It is appropriate to include optimized signals because transportation agencies typically optimize their traffic signals every few years. It is safe to assume that in 2045, the Town of Herndon will operate the signals to most efficiently serve all road users (vehicular and pedestrian). At all new or modified signals (i.e., from roadway projects), signal timings include multimodal consideration of pedestrian crossing intervals.

Through iterative testing to identify the optimal signal phasing and timing at the Spring Street / Herndon Parkway intersection, the Project Team identified a phasing strategy that is an established strategy but one that is not frequently utilized. Specifically, the westbound Spring Street left turn signal phase was modeled to reservice during the signal cycle (i.e., occur twice at separate time points within the cycle). This reservicing is needed to clear the vehicle queue in the left turn lanes to allow traffic on both westbound Spring Street and the Fairfax County Parkway offramps to consecutively enter the left turn lanes. It was otherwise found that one of these traffic streams would experience lengthy queues without this reservicing.

3.2 No Build 2045 Traffic Volumes

As mentioned in Section 3.1.1, No Build 2045 traffic volumes were derived from a 1% annual background growth rate and known development projects. The process utilized to develop the volume dataset is listed below:

1. Remove volumes associated with existing land uses on the HTOC site and the Fairbrook site, with the exception of the Metro Square development volumes that were maintained.
2. Apply a 1% annual growth rate from 2022 to 2045.
3. Shift traffic volume to account for the Worldgate Drive extension. Shift consistent with previous HMSAS.
4. Add the traffic volumes associated with the Fairbrook development, per the previously completed Fairbrook TIS.
5. Add the traffic volumes associated with 80% of the HTOC development, per the previously completed HMSAS. The 20% reduction accounts for the Metro Square property that will not developed at the anticipated HTOC density.
6. Shift a percentage of northbound Van Buren Street left turns from Herndon Parkway to Worldgate Drive in the PM peak hour only. This shift is a result of iterative traffic modeling and is discussed more in the subsequent analysis section.

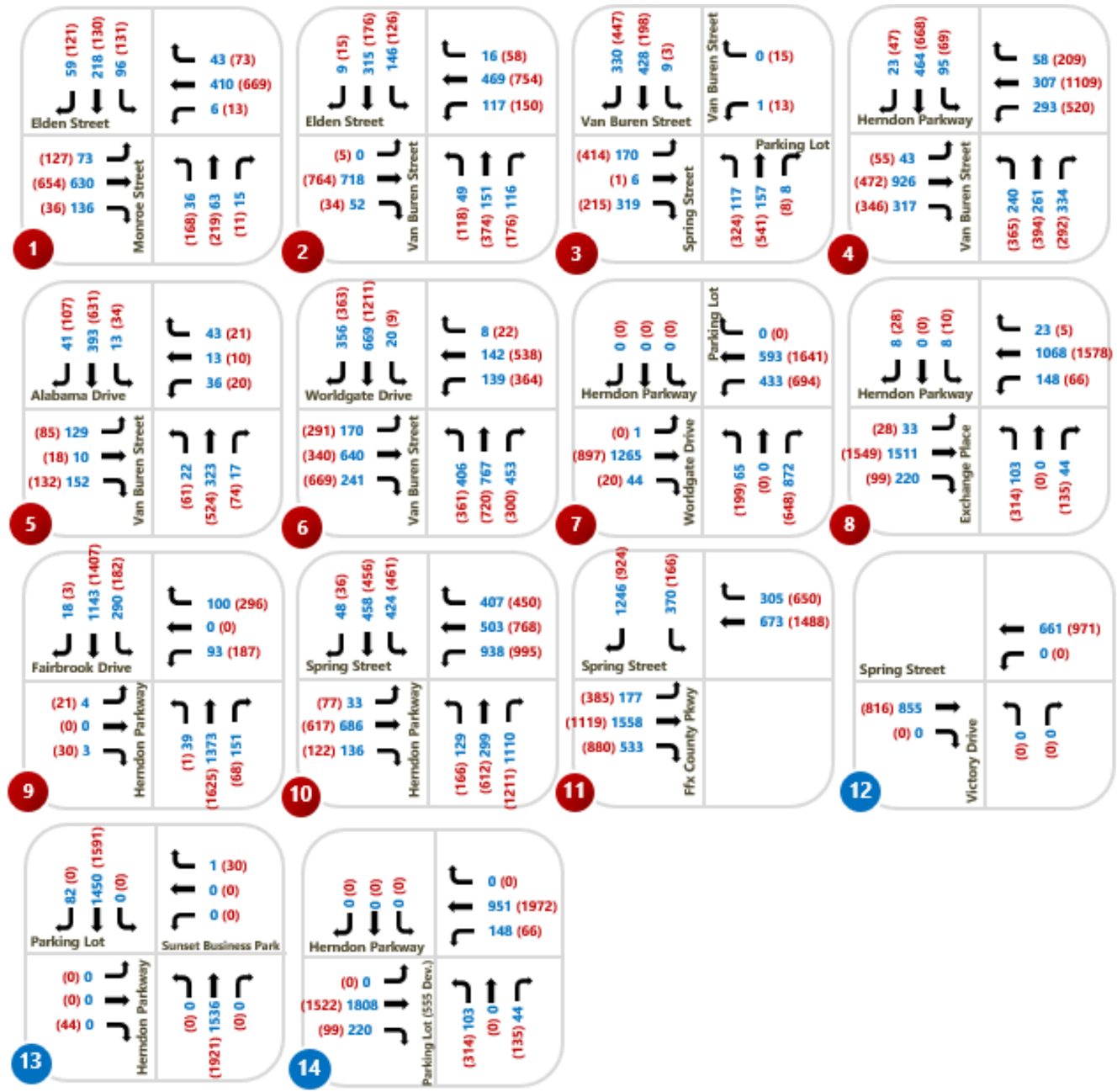
Figure 6 displays the traffic volume dataset that was analyzed at the study intersections in the No Build 2045 traffic model. These traffic volumes are substantially higher than Existing conditions traffic volumes. **Appendix A** shows traffic volumes for all study and non-study intersections in the traffic model.

3.3 No Build 2045 Traffic Analysis

Consistent with the Existing conditions traffic analysis, the No Build models were run under the same conditions (i.e., length of individual simulation run and number of averaged simulation runs). The same traffic operations metrics were also collected to evaluate the change in system performance between Existing and No Build 2045 conditions.

Figure 6 No Build 2045 Traffic Volumes





No Build 2045 traffic volumes include annual background growth, specific development projects, and volume shift to account for the Worldgate Drive extension. Basemap Source: Nearmap

3.3.1 No Build 2045 Findings

In No Build 2045 conditions, with significantly higher traffic volumes but also improved roadway configurations, three study intersections are projected to have unacceptable levels of traffic operations based on the Town's LOS standard. **Table 4** lists the intersection delay and LOS at each of the eleven study intersections. Intersection LOS is also shown in **Figure 7**.

All study intersections are projected to operate at LOS D or better in both peak hours, except for the Spring Street / Herndon Parkway intersection, which is anticipated to operate at LOS E in the PM peak hour, which does not meet the Town's intersection-level LOS standard of LOS D or higher. It should be noted that while LOS E does represent increased delay, modeling results indicate that the roadway network can accommodate the increased demand based on the progression of traffic. Many intersections in the Northern Virginia area operate at this condition during a peak hour and Fairfax County has adopted an LOS E intersection standard in several of its urban development areas.

Table 4 No Build 2045 Intersection Delay and LOS

Intersection [1]	AM Peak Hour		PM Peak Hour	
	Delay	LOS	Delay	LOS
Elden St / Monroe St	27.2	C	34.1	C
Elden St / Van Buren St	31.2	C	36.7	D
Van Buren St / Spring St	16.8	B	40.8	D
Van Buren St / Herndon Pkwy	30.5	C	44.4	D
Van Buren St / Alabama Dr	16.1	B	33.4	C
Van Buren St / Worldgate Dr	23.8	C	27.7	C
Herndon Pkwy / Worldgate	25.2	C	22.0	C
Herndon Pkwy / Exchange Pl	11.0	B	15.8	B
Herndon Pkwy / Fairbrook Dr	14.2	B	19.9	B
Spring St / Herndon Pkwy	51.5	D	59.1	E
Spring St / FCP Ramps	22.1	C	25.8	C

Source: Average of 7 AM and 20 PM Peak Hour VISSIM simulation runs.
1 All study intersections are signalized in the No Build scenario.

The heaviest volume movements at the Spring Street / Herndon Parkway intersection (in both peak hours) are the westbound Spring Street left turn and the northbound Herndon Parkway right turn. Even with the roadway improvements and signal phasing strategy that optimize the capacity of these signal movements, the heavy demand on these movements limits the overall efficiency of the intersection. Previous studies, including the 2017 TRG Study and the Fairbrook TIS, identified the need to extend Fairbrook Drive to the Spring Street / Fairfax County Parkway Ramps signal. This roadway extension would help alleviate the predicted congestion at Spring Street / Herndon Parkway by providing a second connection between the Metro Station area and Fairfax County Parkway / Reston, which would likely better distribute traffic demand across the network rather than concentrating it at a single location (i.e., Spring Street / Herndon Parkway).

As mentioned in Section 3.2, initial traffic modeling of the PM peak indicated significant and severe congestion at the Van Buren Street / Herndon Parkway intersection. Intersection constraints such as a single northbound left turn lane and only 150 feet of dual southbound thru lanes limit the capacity of the intersection. Even with optimized signal timings, the model indicates that the northbound Van Buren Street queue will extend south of the Dulles Toll Road and the southbound Van Buren Street queue will extend to Spring Street.

As a general rule, drivers will typically take the fastest path to their destinations, especially with GPS navigation so widely utilized. The northbound Van Buren Street left turn at Worldgate Drive has approximately twice the capacity of the left turn at Herndon Parkway due to the presence of dual left turn lanes. An approximate 20% shift of drivers from the left turn at Van Buren Street to the left turn at Worldgate Drive allows the system to reach an equilibrium where queue gridlock does not occur south of Herndon Parkway.

The intersection turning movements in **Table 5** operate at LOS F in No Build 2045 conditions; the existing Town of Herndon Ordinance states "no individual turning movement level of service at an intersection falls below "LOS E"".

Table 5 No Build 2045 "LOS F" Turning Movements

Turning Movement	Peak	Source of Congestion
Southbound Left Turn from Herndon Pkwy to Spring St	PM	*Heavy Demand, Lack of Alternate Access*
Eastbound Alabama Drive at Van Buren Street	PM	*Intersection capacity limitations at Van Buren Street / Herndon Parkway*
Northbound Left Turn from Van Buren St to Herndon Pkwy	PM	

Source: Average of 7 AM and 20 PM Peak Hour VISSIM simulation runs.

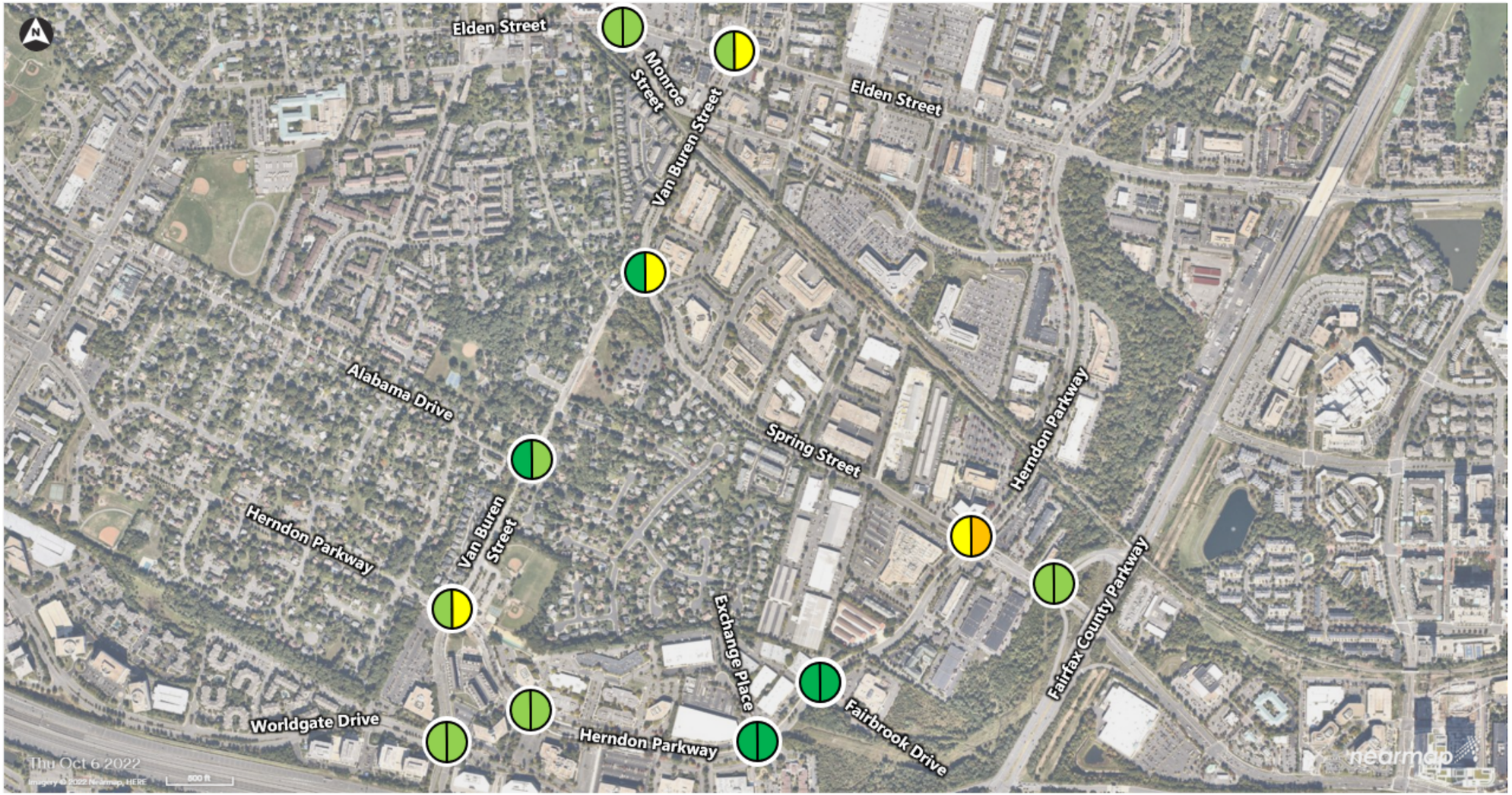
Congestion "heat" maps for each of the peak hours are shown in **Figures 8 and 9**. These represent the average vehicle speeds present in different lanes and segments of the model. Slower vehicle speeds (shown in shades of red) represent areas of higher congestion and vehicle queuing, whereas higher vehicle speeds (shown in shades of green) represent areas of lower congestion and vehicle queueing. In both peak hours, the heaviest areas of congestion are the Spring Street / Herndon Parkway intersection and the three intersections at the junctions of Van Buren Street, Worldgate Drive, and Herndon Parkway. Additionally, in the PM peak hour, southbound Van Buren Street experiences a significant amount of congestion.

Projected average and maximum queue lengths for No Build 2045 conditions are displayed in **Figures 10 and 11**. An important note regarding the maximum queue lengths is that each roadway segment's maximum queue length most likely does not temporarily align (i.e., occur at the same time). Rather, this figure shows the maximum queue length on each segment of roadway during the peak hour.

In the AM peak hour, average queue lengths throughout the study network are accommodated with no concerns. The maximum AM peak hour queue lengths, which typically exceed what is designed for, are accommodated with a few exceptions – specifically eastbound Herndon Parkway (west of Fairbrook Drive) and the Spring Street segment at Herndon Parkway and the Fairfax County Parkway. The maximum queue is projected to extend onto the Parkway; albeit the exact extents are unknown due to this study not including the traffic signal on the Parkway.

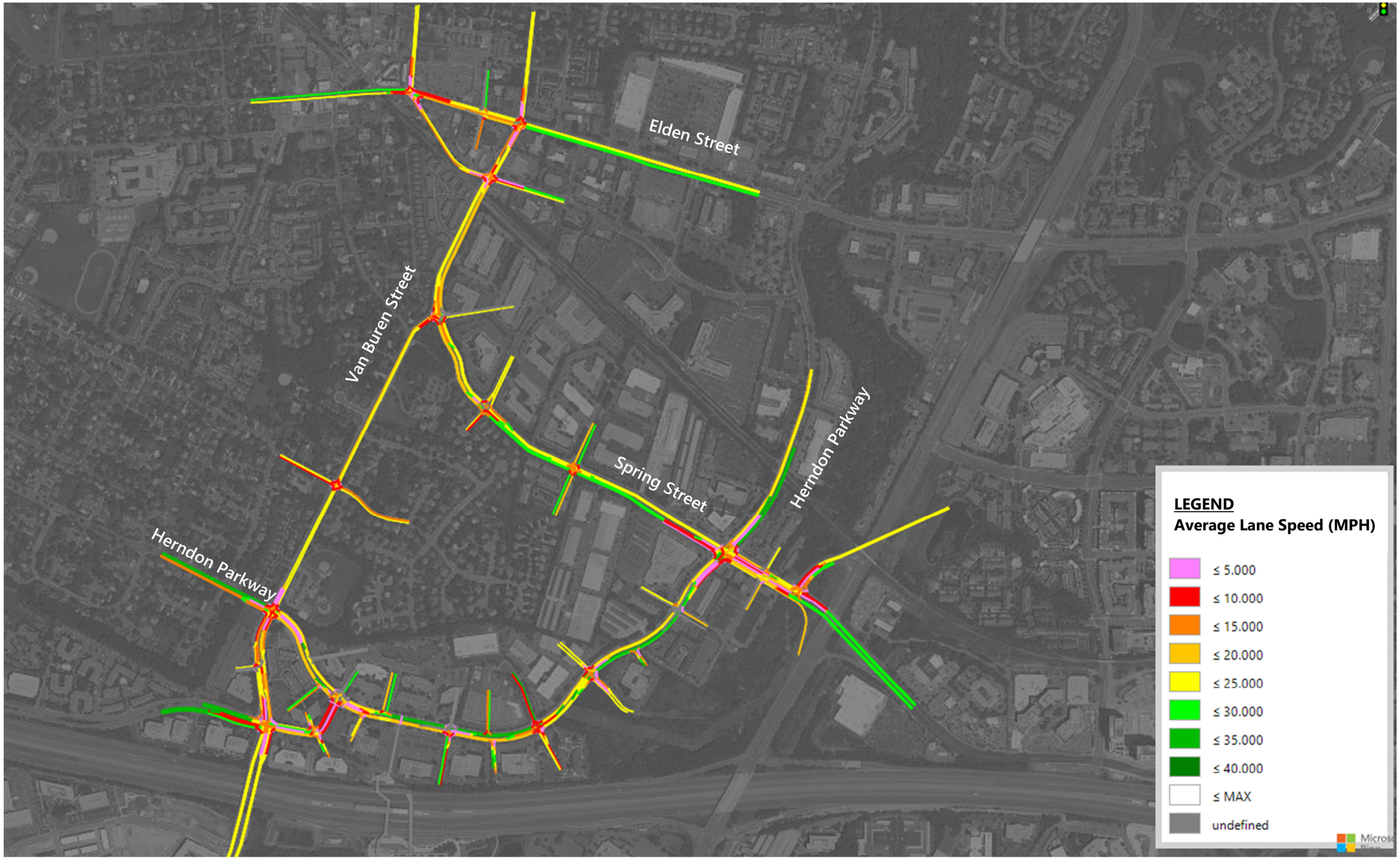
In the PM peak hour, the roadway network experiences increased queueing compared to the AM peak hour. Average queue lengths are still mostly accommodated, although the southbound Van Buren Street queue at Herndon Parkway and the northbound Herndon Parkway queue at Spring Street are significant. Maximum queue lengths fill most of the Herndon Parkway corridor and Spring Street at Herndon Parkway and the Fairfax County Parkway. As previously mentioned, these maximum queue lengths are most likely not all occurring simultaneously, so these queue findings do not equate to gridlock conditions. Queuing also does not directly correlate to delay; for instance, many of the intersections along Herndon Parkway are projected to operate at LOS B and C despite this level of queuing.

Figure 7 No Build 2045 Intersection Level of Service



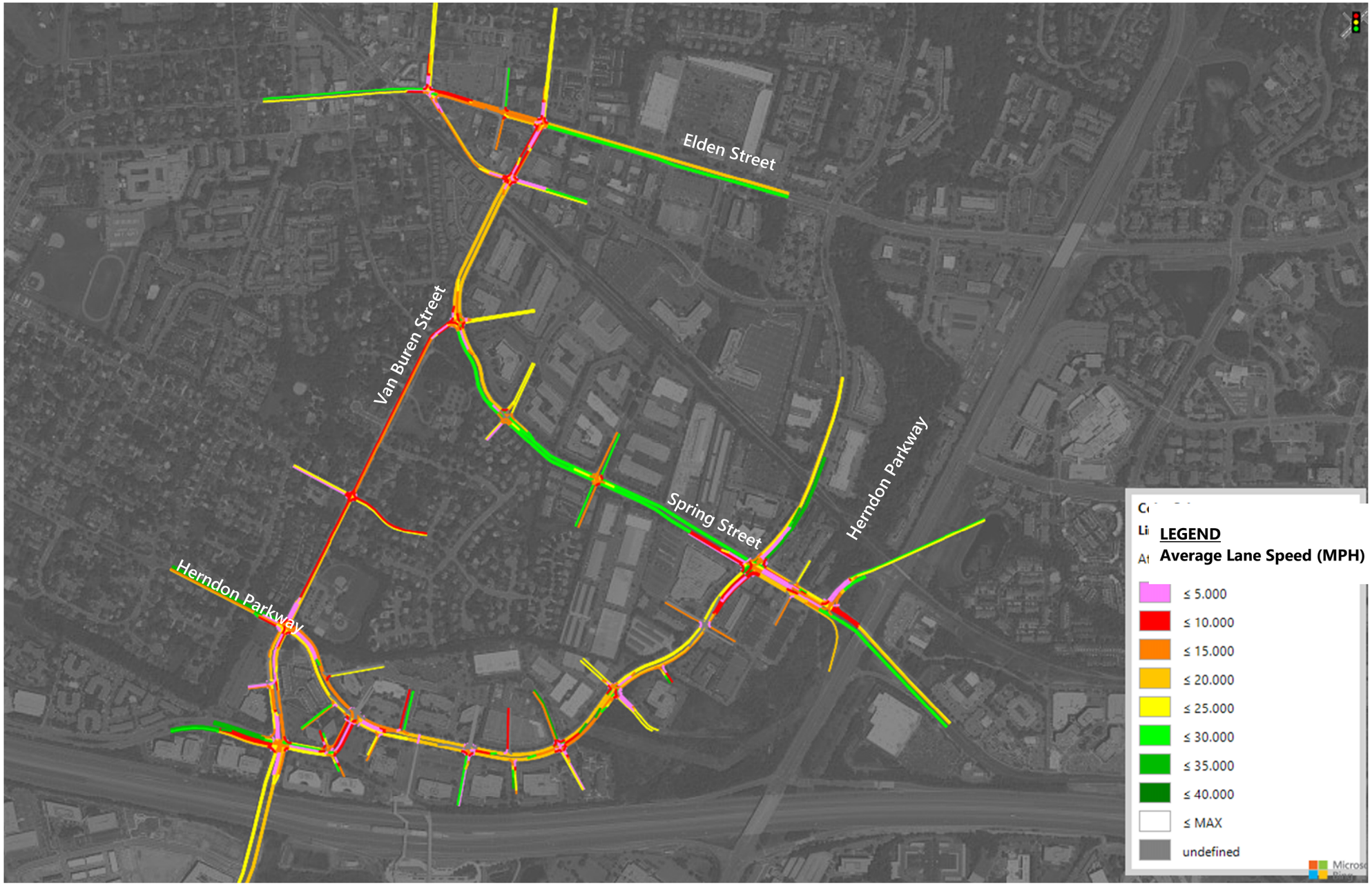
Source: Average of 7 AM Peak Hour and 20 PM Peak Hour VISSIM simulation runs. Aerial imagery from NearMap.

Figure 8 No Build 2045 Congestion Heat Map – AM Peak Hour



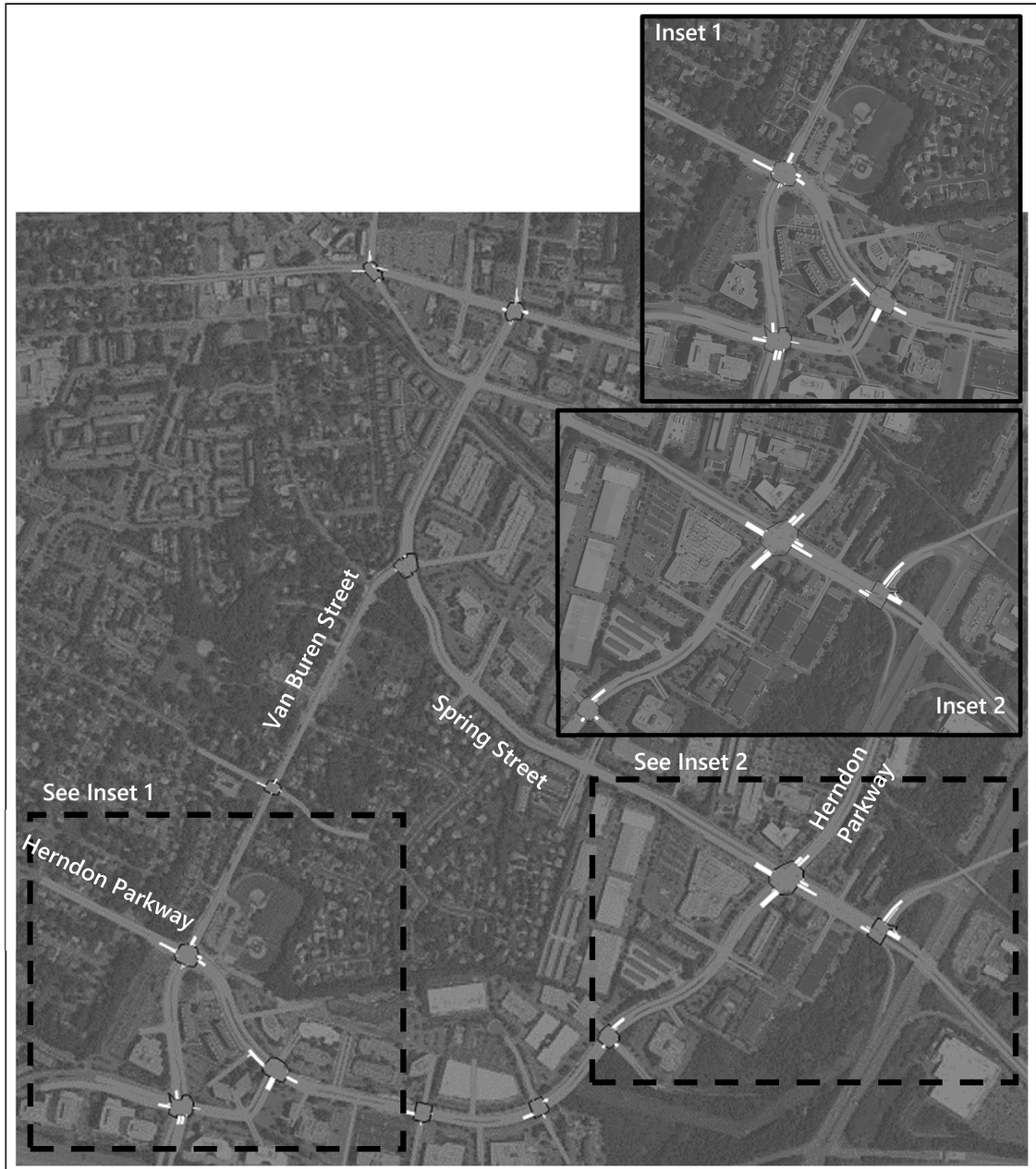
Source: Average of 7 AM Peak Hour VISSIM simulation runs.

Figure 9 No Build 2045 Congestion Heat Map – PM Peak Hour

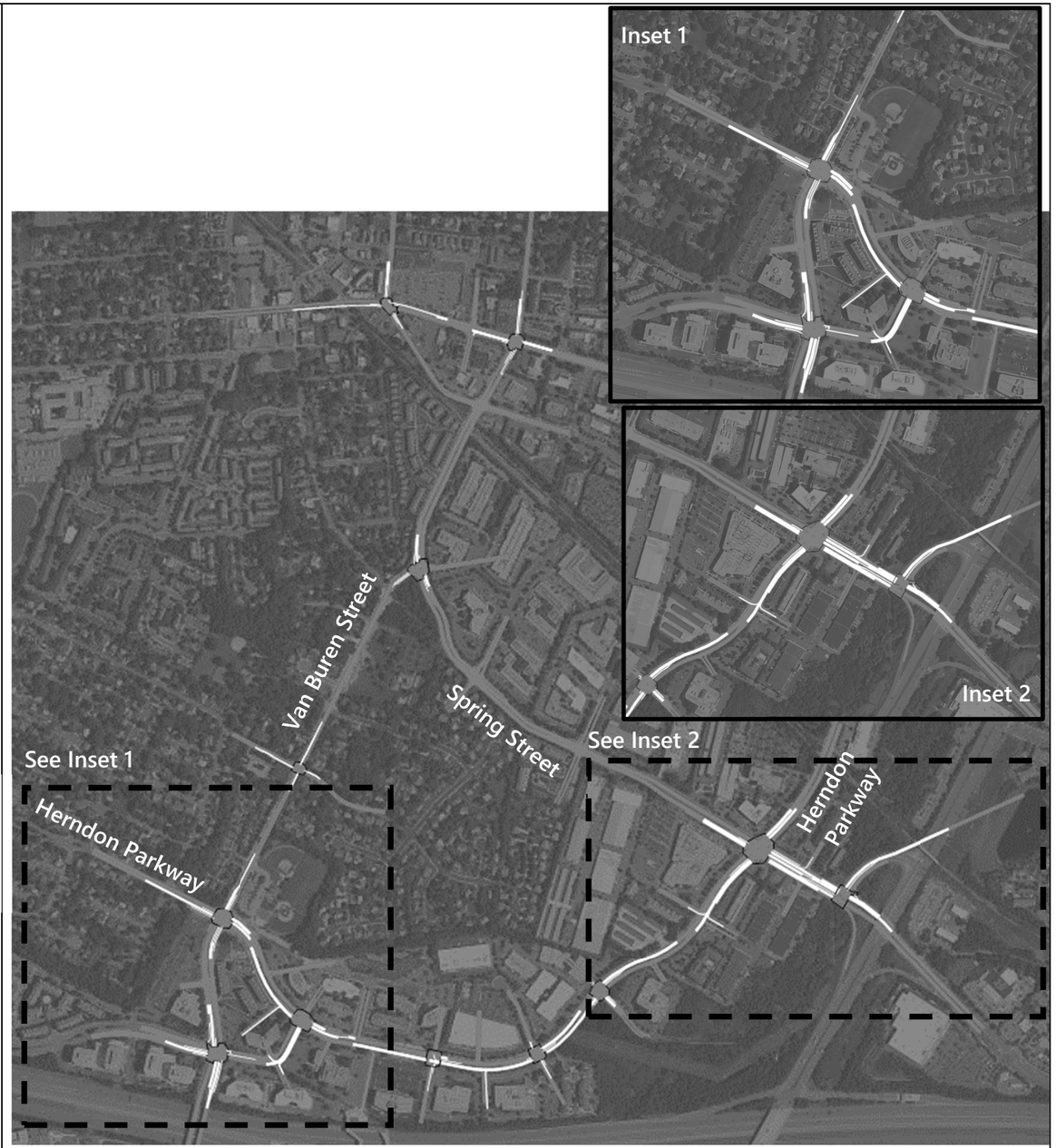


Source: Average of 20 PM Peak Hour VISSIM simulation runs.

Figure 10 No Build 2045 Queue Map – AM Peak Hour

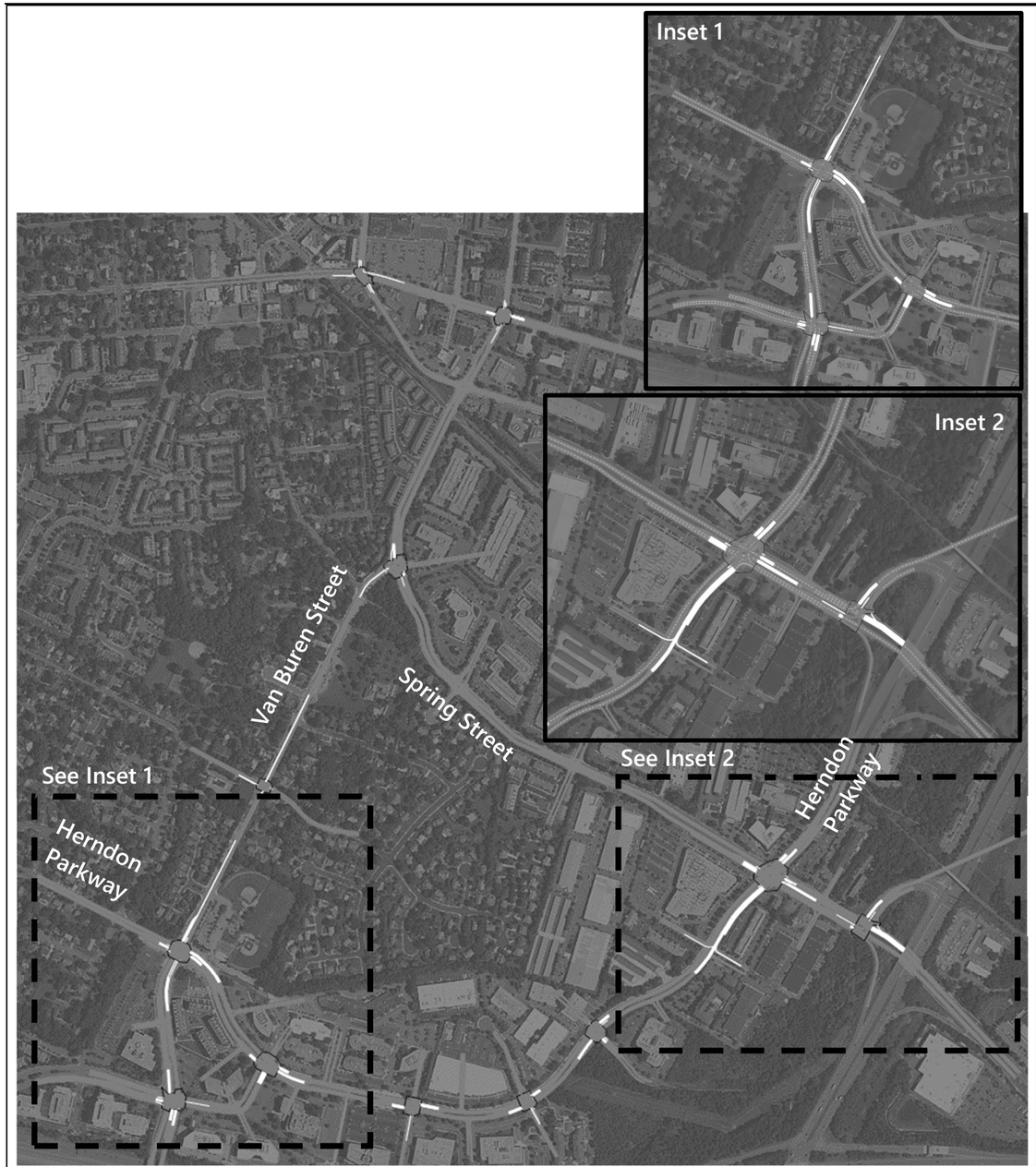


Average Queue Length

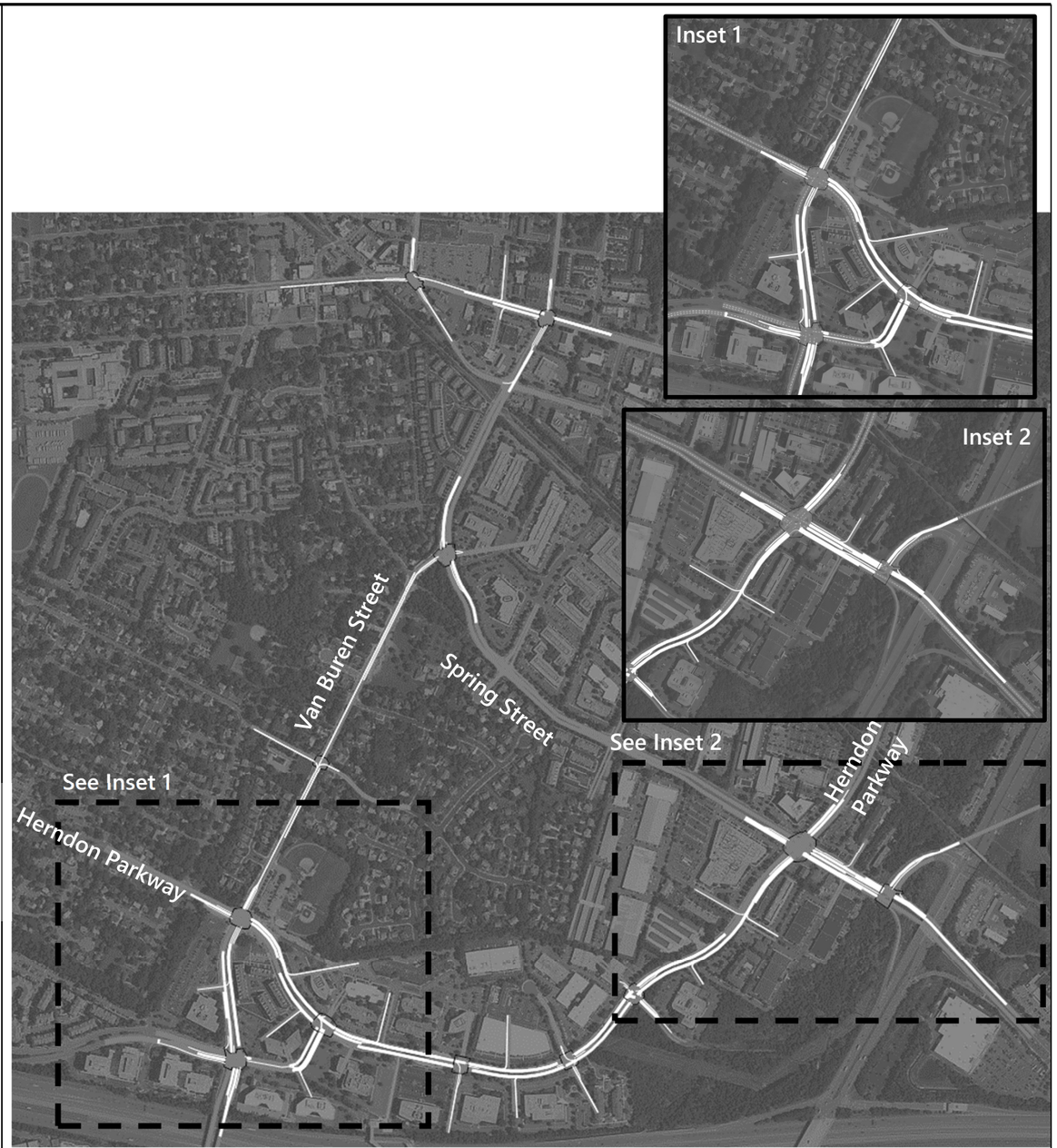


Maximum Queue Length

Figure 11 No Build 2045 Queue Map – PM Peak Hour



Average Queue Length



Maximum Queue Length

In summary, while there are multiple violations of the Town's existing LOS standards, modeling results indicate that the No Build 2045 study area roadway network can accommodate the increased demand based on progression of traffic, via a combination of publicly funded roadway projects, optimized signal operations, and developer-funded roadway projects. Based on the findings, the Herndon Parkway intersections with Van Buren Street and Spring Street appear to be the locations with the most limited capacity. While the potential Fairbrook Drive extension would relieve a portion of the demand at the Spring Street intersection, the Van Buren Street intersection appears to potentially need additional roadway improvements to provide necessary capacity to meet the future demand of the No Build scenario.

Appendix B documents the delay, LOS, and vehicle queuing for all of the movements at each of the eleven study intersections.

3.4 No Build Traffic Conclusions – Constraints and Opportunities

The Herndon Parkway corridor is anticipated to accommodate projected 2045 volume demand (without TRG redevelopment); despite a few instances of existing Town LOS standard violation, traffic progresses throughout the corridor. Based on the No Build traffic metrics, the corridor appears to have capacity to handle additional demand, whether from TRG redevelopment or elsewhere. This apparent surplus capacity is based on the progression of traffic, not the Town's existing LOS standards. The exact quantity of this surplus capacity is difficult to estimate as the operations of this corridor are driven by closely spaced signalized intersections; the capacity of such a segment is based on a variety of factors including traffic signal parameters and local driver behavior – hence the need for VISSIM microsimulation traffic modeling to estimate traffic conditions.

While the Herndon Parkway corridor accommodates the demand, the most constrained locations within the study area system are at the two ends of Herndon Parkway – Van Buren Street and Spring Street. There are several intersection movements at these locations that are projected to operate at LOS F below the Town's acceptable threshold. In the modeled No Build condition, the Worldgate Drive extension offers the only additional access to the corridor beyond these two "bookend" intersections. Previous studies have identified a Fairbrook Drive extension as an improvement that would create an additional access route on the corridor's eastern end and relieve pressure on the Herndon Parkway / Spring Street intersection.

The operating performance of the Herndon Parkway / Van Buren Street intersection is limited by its geometry and lane configuration – both the northbound left turn and the southbound thru movement on Van Buren Street. The northbound left turn is limited by the single left turn lane while the southbound thru movement is limited by the dual thru lanes only extending approximately 150 feet. If the signal gives more green time than the time to clear the queue in this 150 feet, the approach capacity essentially drops to a single thru lane because vehicles are only arriving at the rate of a single lane. This intersection would likely need to be expanded to provide more capacity on the west end of the Herndon Parkway study corridor.

The 2017 TRG Study found that only 13% (AM) and 37% (PM) of TRG redevelopment vehicle trips would theoretically represent new traffic on the roadway network. The remaining development trips replaced existing trips; however, it should be noted that these existing trips were computed based on existing land use, not actual vehicle counts (i.e., this analysis assumed that the existing land use was 100% occupied and generating vehicle trips per ITE Trip Generation rates). A comparison of the existing peak hour turning movement counts in and out of the TRG (shown in 2017 TRG Study and utilized in this new TRG study) with the theoretical existing TRG peak hour traffic volumes (calculated in 2017 TRG Study) revealed a significant difference (the counts, which do include every parking lot driveway, were approximately 20% of the theoretical trips). If the pattern of a substantial percentage of new TRG development trips replacing existing TRG trips continues in this study, the network will more easily absorb traffic volumes associated with TRG redevelopment.

4

Three Build 2045 Scenarios with Fairbrook Drive Extension: Traffic Conditions

This section of the report documents the assumptions and findings for the traffic analysis of the three Build 2045 Scenarios with Fairbrook Drive extension. The traffic levels of these development scenarios are compared to No Build 2045 conditions to identify the impact of the additional development traffic.

4.1 Build 2045 Scenario Model Assumptions

In coordination with Town of Herndon staff and the SOM team, VHB identified the parameters that would be incorporated into the traffic analysis of the three Build scenarios.

4.1.1 Development Scenarios

The SOM team developed three (3) initial TRG development scenarios to share with the Town community and advisory committee. These three scenarios all incorporate feedback received throughout the TRG study, while each proposing a different development plan with distinct characteristics. VHB evaluated the transportation elements of each scenario, both from a qualitative connectivity perspective and a quantitative traffic analysis perspective. The three scenarios are the following:

- **Neighborhood Clusters**: Distributed density and mix of land uses throughout the TRG (i.e., multiple clusters of activity). Low to medium density throughout the TRG. Grid of streets connecting the development clusters.
- **Two Centers**: Density and activity centers focused on Metro station and Sunset Business Park. Low density development elsewhere within the TRG. Herndon Parkway and a new parallel pedestrian promenade are the transportation focus connecting the two centers.
- **Metro Center**: Density and activity center primarily focused on Metro station with low density development elsewhere within the TRG. A new roadway north of Herndon Parkway connects the development area to Spring Street.

4.1.2 Roadway Network

While each of the three development scenarios has a different internal roadway network (i.e., within the TRG redevelopment area), the external roadway network analyzed in this traffic analysis was the same for all three scenarios (e.g., Herndon Parkway, Spring Street, Van Buren Street, etc.). The external roadway network was primarily the same that was analyzed in the No Build 2045 traffic scenario with two major modifications:

- Fairbrook Drive extension to complete a connection between Herndon Parkway and the Spring Street / Fairfax County Parkway ramps intersection.
- New traffic signal at Herndon Parkway / Sunset Business Park (preidentified by Town staff as a future TRG development infrastructure element)

While the Fairbrook Drive extension to Spring Street was not included in the No Build traffic model due to potential issues with right of way acquisition, VDOT concurrence, and uncertainty regarding long-term interchange alternatives, the SOM team believes that the extension is a critical component to the full buildout of the TRG given the No Build traffic analysis findings. Due to this condition, Town staff agreed to include the Fairbrook Drive extension in these three Build Scenario traffic models to evaluate the ultimate vision for the three development scenarios. Subsequent analysis will be necessary to determine the phasing and/or "requisite triggering" of the Fairbrook Drive extension.

The extension of Fairbrook Drive to Spring Street has not been previously evaluated under 2045 projected traffic conditions. Particularly since the extension ties into the Spring Street / Fairfax County Parkway ramp intersection, VDOT will verify that the design of this modified intersection is operationally functional. Therefore, iterative traffic modeling was utilized to identify a functional intersection design that would accommodate projected traffic volumes but also not be overbuilt, which would consume developable land and lengthen pedestrian crossings. The identified intersection design is a starting point from which these development traffic models could be analyzed; as previously discussed, a future interchange modification would significantly alter these plans.

Figure 12 displays the modeled Spring Street / Fairfax County Parkway Ramps / Fairbrook Drive intersection that includes:

- All improvements in the Herndon Parkway / Spring Street roadway project.
- An additional thru lane on the Fairfax County Parkway offramp to continue straight onto Fairbrook Drive.
- A left turn lane to turn from westbound Spring Street onto Fairbrook Drive.
- Widening of the southbound Fairfax County Parkway onramp to accommodate the conversion of the existing eastbound Spring Street outside thru lane into a "choice" lane, thereby letting eastbound Spring Street traffic enter the onramp from two lanes.
- New Fairbrook Drive approach – a shared left/thru lane, a right turn lane onto eastbound Spring Street, and a right turn lane onto the southbound Fairfax County Parkway onramp.

Additionally, signal phasing and timing was optimized at all traffic signals within the three Build models. It is appropriate to include optimized signals because transportation agencies typically optimize their traffic signals every few years. It is safe to assume that the Town of Herndon will operate the signals to most efficiently serve all road users (vehicular and pedestrian). At all new or modified signals (i.e., from roadway projects), signal timings include multimodal consideration of pedestrian crossing intervals.

Figure 12 Modeled Configuration of Spring Street / Fairfax County Parkway Ramps / Fairbrook Drive Extension



Other than the Herndon Parkway / Sunset Business Park intersection and the intersections already modeled as traffic signals in the No Build 2045 model, all other intersections that provide access to the TRG were modeled as unsignalized intersections. The most significant of these unsignalized intersections is located on Spring Street west of Herndon Parkway; two of the three scenarios have a new roadway parallel to Herndon Parkway that connects at this location. The absence of a traffic signal limits the attractiveness/usefulness of this parallel connection. These models establish a baseline condition with no additional external transportation mitigation measures (e.g., a new traffic signal); a signal could be considered if needed in the final traffic model that includes any appropriate mitigation measures.

4.1.3 Traffic Volumes

The same three-part process was utilized to develop the volume datasets for each of the three Build development scenarios. The base dataset was the No Build 2045 volume dataset previously shown in Figure 6. Additional details on the new traffic volumes associated with each Build scenario are provided in the following report sections.

1. Remove volumes associated with the existing TRG development area. A decision was made to remove the

quantity of existing vehicle volumes known to turn in and out the TRG rather than remove the theoretical quantity of existing vehicle trips associated with the TRG. This approach removes substantially fewer vehicle trips per peak hour than the 2017 TRG Study (350-400 trips versus ~2,000 trips) but is more conservative and likely more representative of TRG building occupancy and travel patterns.

2. Reroute traffic volumes onto Fairbrook Drive extension. A portion of traffic will utilize the extension to bypass the Herndon Parkway / Spring Street intersection.
3. Add the new traffic volumes associated with each of the three Build development scenarios.

Site trip generation is the first step in the trip generation process, which is utilized to project the quantity of new traffic anticipated from a new development such as the TRG. This step computes an upper bound of anticipated vehicle trips associated with each type of land use; these trips may then be reduced in subsequent steps of the process. The Institute of Transportation Engineers (ITE) publishes the *Trip Generation Manual* to serve as an industry standard for site trip generation calculations. The manual contains a large quantity of real-world datasets that correlate the number of vehicle trips to the size of a development. The VHB team utilized the 11th Edition of the ITE manual, which is the most recently published edition.

Following the site trip generation step, a series of appropriate reduction factors are applied to the projected trip total to account for transit use, pass-by trips, and internal capture trips. The transit use reduction factor accounts for the percentage of person trips that utilize transit rather than vehicles to complete their trip. The TRG's proximity to Metro incentivizes a relatively high transit reduction factor. Consistent with the HTOC Study and the 2017 TRG Study, this analysis incorporated a 25% transit reduction factor.

The next type of appropriate trip reduction is pass-by trips, which are existing vehicle trips on the immediately adjacent road network that make an additional route stop at a retail development. In other words, if the development did not exist, these vehicles would still be present on the adjacent roadway. Pass-by rates are provided in the ITE manual. The final type of appropriate trip reduction is internal capture, which are trips that begin and end within the same development and never enter a surrounding roadway. They are most prevalent in mixed-use developments such as the TRG where the variety of land uses encourage multiple types of activity (i.e., "live, work, play"). Consistent with the 2017 TRG Study, this analysis incorporated a 7% internal capture reduction factor.

4.2 Build 2045 Scenario One: Neighborhood Clusters

Consistent with the Existing and No Build 2045 conditions traffic analysis, the Build models were run under the same conditions (i.e., length of individual simulation run and number of averaged simulation runs). The same traffic operations metrics were also collected to evaluate the change in system performance between No Build 2045 and Build 2045 Scenario One conditions.

4.2.1 Trip Generation

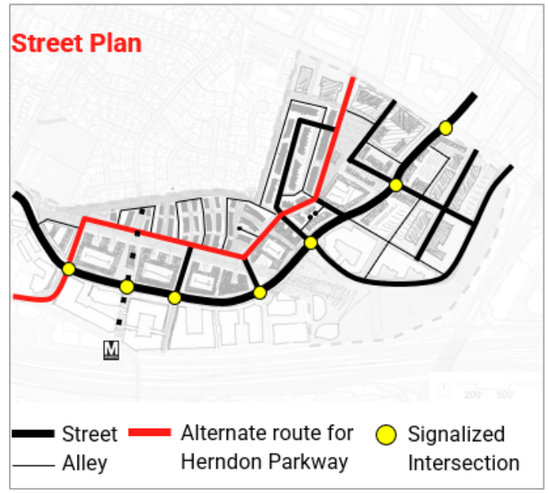
Table 6 documents the trip generation calculations for Build 2045 Scenario One: Neighborhood Clusters. Table 5 shows that after the appropriate trip reductions, the new TRG development at full buildout is expected to generate more than 2,250 AM Peak Hour trips, 2,250 PM Peak Hour trips, and 27,000 weekday trips. These new TRG trips replace the existing trips associated with existing development within the TRG. The development scenario for Scenario 1 is residential heavy, which has a predominant traffic flow of outbound in the morning and inbound in the evening. Due to this, the projected outbound trip total for Scenario 1 is higher than the inbound in the morning peak and reversed in the evening peak. This pattern is opposite of an office-heavy development pattern such as the existing TRG land use.

4.2.2 Transportation Connectivity

The Neighborhood Clusters Scenario includes a new roadway connection parallel to Herndon Parkway, as shown in red in **Figure 13**. This connection, in addition to the grid of streets proposed, will provide TRG traffic with alternate travel paths to Herndon Parkway. The No Build traffic analysis indicated that the two termini intersections on Herndon Parkway were traffic choke points; the introduction of additional street connections to Spring Street will partially relieve that traffic pressure.

As previously mentioned, the current traffic analysis assumes that the new Spring Street intersection with the alternate route roadway will be unsignalized. If signalization of this intersection is identified as a potential transportation improvement, more traffic would be capable of utilizing the alternate route – in the unsignalized condition, the capacity of the intersection to facilitate left turn movements is limited.

Figure 13 Neighborhood Clusters Scenario Street Plan



Source: SOM TRG graphics.

Figure 14 displays the traffic volume dataset that was analyzed at the study intersections in the Build Scenario 1 (Neighborhood Clusters) 2045 traffic model. The TRG traffic volumes were distributed throughout the TRG land area by subdividing the TRG into multiple zones of development density. Because the Scenario One proposed density is distributed throughout the TRG land area, the traffic volume accessing the TRG is also distributed across many access points, thereby not overloading any specific location. The proposed location of a relatively concentrated portion of density within Sunset Business Park also results in a significant percentage of new TRG traffic not utilizing the Herndon Parkway corridor adjacent to the Metro Station; instead, this traffic volume is contained to the northeast corner of the TRG and study road network.

Figure 15 displays just the new site trips associated with the Preferred Build Scenario, while **Figure 16** displays just the pass-by site trips associated with the Preferred Build Scenario. **Appendix A** shows these three sets of traffic volumes for all intersections within the traffic model, including non-study intersections.

Table 6 TRG Build Scenario 1 (Neighborhood Clusters), Full Buildout, Site Trip Generation

Land Use Type	Independent Variable	Independent Variable Unit	ITE Code	ITE Land Use	AM Peak Hour (7-9 AM)			PM Peak Hour (4-6 PM)			Weekday Total		
					Trips	Enter	Exit	Trips	Enter	Exit	Trips	Enter	Exit
Residential													
Multifamily	2,939	Dwelling Units	221	Multifamily Housing (Mid-Rise)	1,282	295	987	1,147	699	447	13,973	6,986	6,986
Townhomes	84	Dwelling Units	215	Single-Family Attached Housing	38	9	28	46	27	19	590	295	295
2 over 2s	352	Dwelling Units	221	Multifamily Housing (Mid-Rise)	158	36	121	150	92	59	1,790	895	895
Residential Subtotal	3,408	Dwelling Units			**1,477**	**341**	**1,137**	**1,344**	**819**	**525**	**16,352**	**8,176**	**8,176**
Hospitality													
Hotel	364	Rooms	310	Hotel	175	98	77	241	123	118	3,522	1,761	1,761
Office													
Corporate Office	35,200	SF	710	General Office Building	68	60	8	70	12	58	468	234	234
Creative Office	116,700	SF	710	General Office Building	191	168	23	189	32	157	1,327	664	664
Office Subtotal	151,900	SF			**259**	**228**	**31**	**259**	**44**	**215**	**1,795**	**898**	**898**
Retail													
Grocery	64,300	SF	850	Supermarket	184	108	75	540	270	270	5,901	2,951	2,951
Restaurant	147,800	SF	932	High-Turnover Restaurant	1,338	816	522	1,414	778	637	15,844	7,922	7,922
Fitness Center	63,100	SF	495	Recreational Community Center	121	80	41	191	90	101	1,775	888	888
Retail Subtotal	275,200	SF			**1,642**	**1,004**	**638**	**2,146**	**1,138**	**1,008**	**23,521**	**11,760**	**11,760**
Other													
Self Storage	24,500	SF	151	Mini-Warehouse	2	1	1	4	2	2	37	18	18
All Land Uses Total (Base Trip Generation)					**3,556**	**1,672**	**1,884**	**3,993**	**2,126**	**1,868**	**45,227**	**22,614**	**22,614**
Transit Mode Split Reduction	25%				-889	-418	-471	-998	-531	-467	-11,307	-5,653	-5,653
Vehicle Trips					**2,667**	**1,254**	**1,413**	**2,995**	**1,594**	**1,401**	**33,920**	**16,960**	**16,960**
Pass-By Reduction Grocery	24%	PM. AM = ½ of PM. Weekday = average.			-17	-10	-7	-97	-49	-49	-797	-398	-398
Pass-By Reduction Restaurant	43%	PM. AM = ½ of PM. Weekday = average.			-216	-132	-84	-456	-251	-205	-3,832	-1,916	-1,916
New Vehicle Trips on Roadway Network					**2,434**	**1,113**	**1,322**	**2,442**	**1,295**	**1,147**	**29,291**	**14,646**	**14,646**
Internal Capture	7%				-170	-78	-93	-171	-91	-80	-2,050	-1,025	-1,025
Net New Vehicle Trips on External Roadway Network					**2,264**	**1,035**	**1,229**	**2,271**	**1,204**	**1,067**	**27,241**	**13,621**	**13,621**

Source: Institute of Transportation Engineer's *Trip Generation Manual, 11th Edition*. Utilized "suburban" trip generation rates as decision was made with Town of Herndon to apply a consistent methodology to prior studies in the TRG, which utilized suburban base trip generation and then applied significant transit and internal capture reductions. An "urban" trip generation rate would not be compatible with this approach as it already accounts for these types of trip reductions.

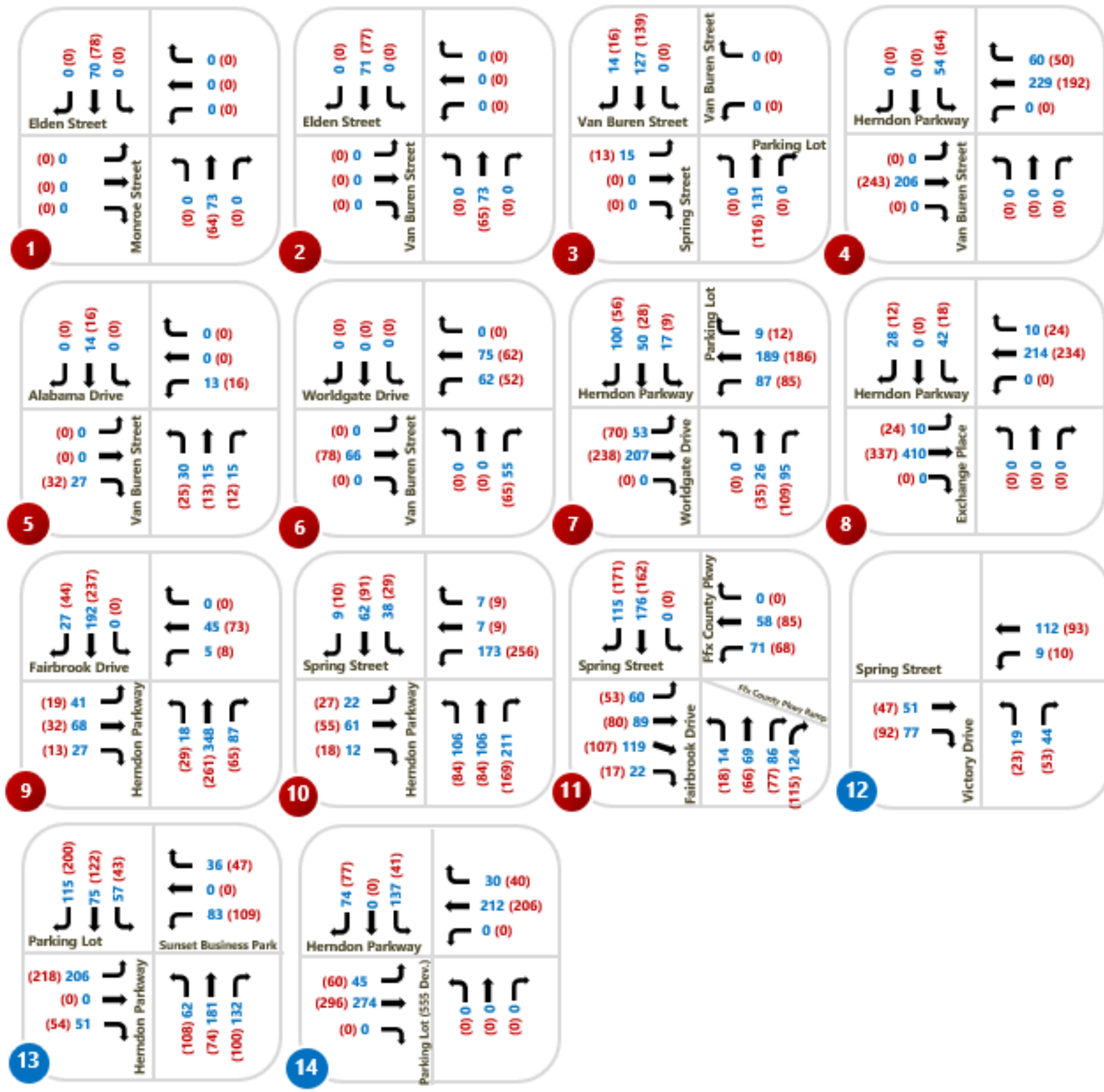
Figure 14 Build Scenario 1 (Neighborhood Clusters) 2045 Traffic Volumes



Build 2045 traffic volumes include No Build 2045 traffic volumes (Figure 6), removal of existing TRG area traffic volumes, volume shift to account for the Fairbrook Drive extension, and new TRG development traffic volumes. Basemap Source: Nearmap

Figure 15 Build Scenario 1 (Neighborhood Clusters) New Site Trips

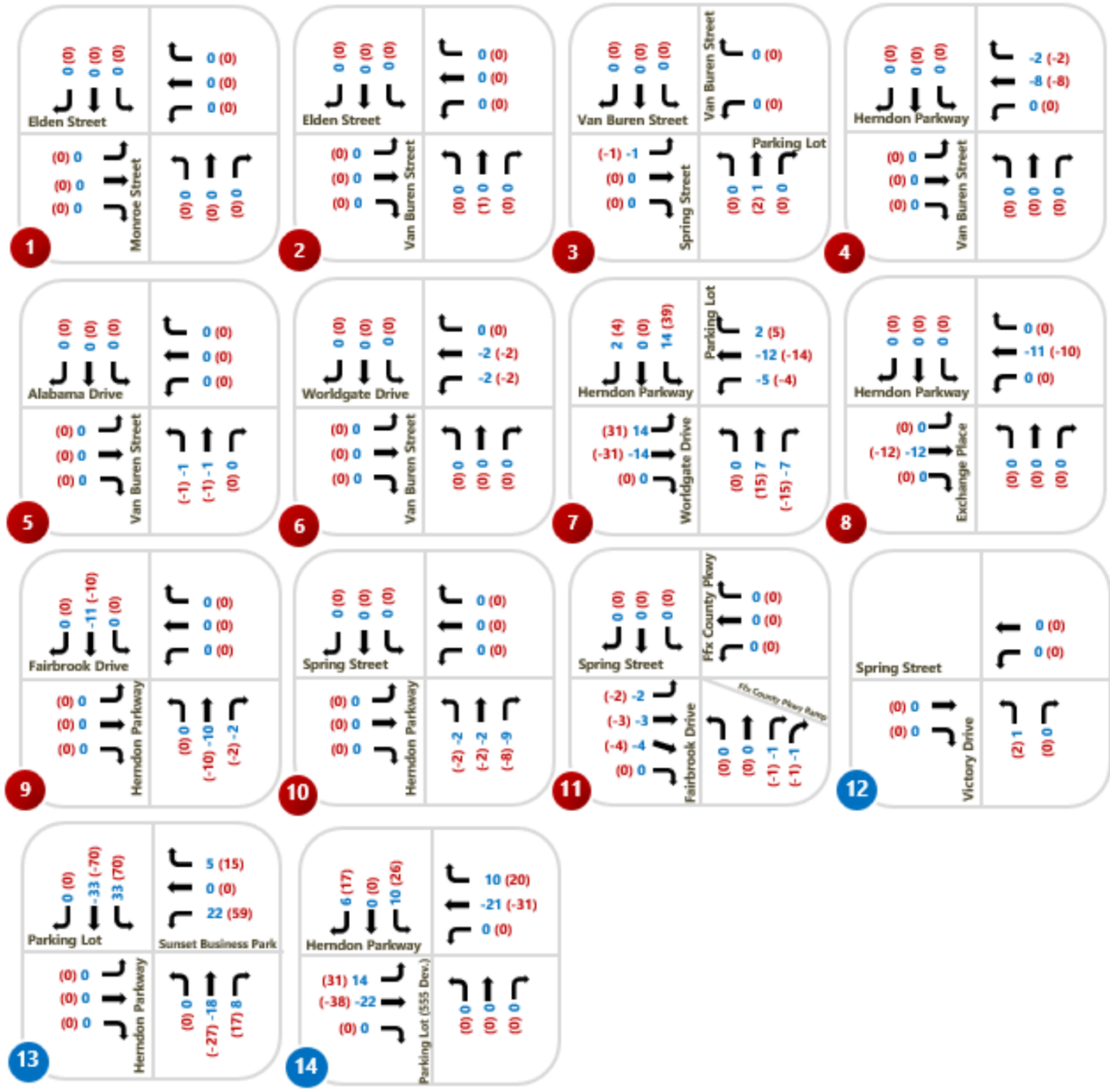




Basemap Source: Nearmap

Figure 16 Build Scenario 1 (Neighborhood Clusters) Site Pass-By Trips





Basemap Source: Nearmap

4.2.3 Traffic Analysis

In Build 2045 Scenario One conditions, with higher traffic volumes than No Build 2045 conditions but also the addition of Fairbrook Drive extension, the transportation network within the study area is projected to experience higher levels of congestion and a slight increase in the number of violations of the Town's LOS standards. **Table 7** lists the projected intersection delay and LOS at each of the eleven study intersections, comparing No Build 2045 to Build Scenario One. Projected intersection LOS in Build Scenario One is also shown in **Figure 17**.

As seen in the delay change values in Table 7, the relative impact of the new TRG traffic volume is minimal at an intersection delay metric level. In Build Scenario One, all study intersections are projected to operate at LOS D or better in both peak hours, except for the Spring Street / Herndon Parkway intersection, which is anticipated to operate at LOS E in both peak hours. While LOS E does represent increased delay, modeling results indicate that the roadway network can accommodate the increased demand based on the progression of traffic. Many intersections in the Northern Virginia area operate at this condition during a peak hour and Fairfax County has adopted an LOS E intersection standard in several of its urban development areas.

In comparison to No Build, this is technically an increase from one intersection peak hour operating at LOS E to two intersection peak hours operating at LOS E; however, an examination of the delay values at the Herndon Parkway / Spring Street intersection reveals that the AM LOS change resulted from only 4 seconds of increased delay and the PM delay actually decreased by 3 seconds (improvement due to Fairbrook Drive extension relieving pressure on this intersection). The largest delay and congestion increase is at the Spring Street / Fairfax County Parkway Ramps / Fairbrook Drive extension intersection. This is due to conversion of this intersection from three to four approach legs and the addition of traffic signal phases to accommodate the new movements. A large quantity of traffic is utilizing this intersection and the modeled congestion is representative of that volume combined with a "minimal" functional design that does not overbuild the roadway for off-peak travel.

The intersection turning movements in **Table 8** operate at LOS F in Build Scenario 1 2045 conditions; the existing Town of Herndon Ordinance states "no individual turning movement level of service at an intersection falls below "LOS E"". Compared to No Build 2045 conditions, the seven "new" movements that operate at LOS F are located at the Herndon Parkway / Spring Street intersection and the Spring Street / Fairfax County Parkway Ramps / Fairbrook Drive intersection. The LOS at both intersections is influenced by the 150-second signal cycle length, which while best for the entire intersection, increases delay for some movements. The Parkway intersection operations are currently based on the assumed intersection design and are subject to change pending future interchange decisions made by the Town, VDOT, and Fairfax County. These two Spring Street intersections should be studied further in the future as interchange planning progresses.

Table 7 Comparison of Intersection Delay and LOS: No Build 2045 to Build Scenario 1 (Neighborhood Clusters)

Intersection [1]	No Build 2045 AM Peak Delay	No Build 2045 AM Peak LOS	No Build 2045 PM Peak Delay	No Build 2045 PM Peak LOS	Build Scenario One AM Peak Delay	Build Scenario One AM Peak LOS	Build Scenario One PM Peak Delay	Build Scenario One PM Peak LOS	Change No Build to Build AM Peak Delay	Change No Build to Build AM Peak LOS	Change No Build to Build PM Peak Delay	Change No Build to Build PM Peak LOS
Elden St / Monroe St	27.2	C	34.1	C	27.0	C	38.7	D	-0.2	-	+4.6	C→D
Elden St / Van Buren St	31.2	C	36.7	D	34.7	C	37.7	D	+3.5	-	+1.0	-
Van Buren St / Spring St	16.8	B	40.8	D	17.4	B	28.4	C	+0.6	-	-12.4	D→C
Van Buren St / Herndon Pkwy	30.5	C	44.4	D	36.1	D	50.4	D	+5.6	C→D	+6.0	-
Van Buren St / Alabama Dr	16.1	B	33.4	C	21.8	C	26.7	C	+5.7	B→C	-6.7	-
Van Buren St / Worldgate Dr	23.8	C	27.7	C	22.7	C	22.9	C	-1.1	-	-4.8	-
Herndon Pkwy / Worldgate Dr	25.2	C	22.0	C	33.4	C	32.2	C	+8.2	-	+10.2	-
Herndon Pkwy / Exchange Pl	11.0	B	15.8	B	15.1	B	17.6	B	+4.1	-	+1.8	-
Herndon Pkwy / Fairbrook Dr	14.2	B	19.9	B	17.3	B	20.6	C	+3.1	-	+0.7	B→C
Spring St / Herndon Pkwy	51.5	D	59.1	E	55.9	E	55.7	E	+4.4	D→E	-3.4	-
Spring St / FCP Ramps	22.1	C	25.8	C	41.6	D	38.9	D	+19.5	C→D	+13.1	C→D

Source: Average of 7 AM and 20 PM Peak Hour VISSIM simulation runs.

1 All study intersections are signalized in the No Build and Build scenario.

Table 8 Build Scenario 1 "LOS F" Turning Movements

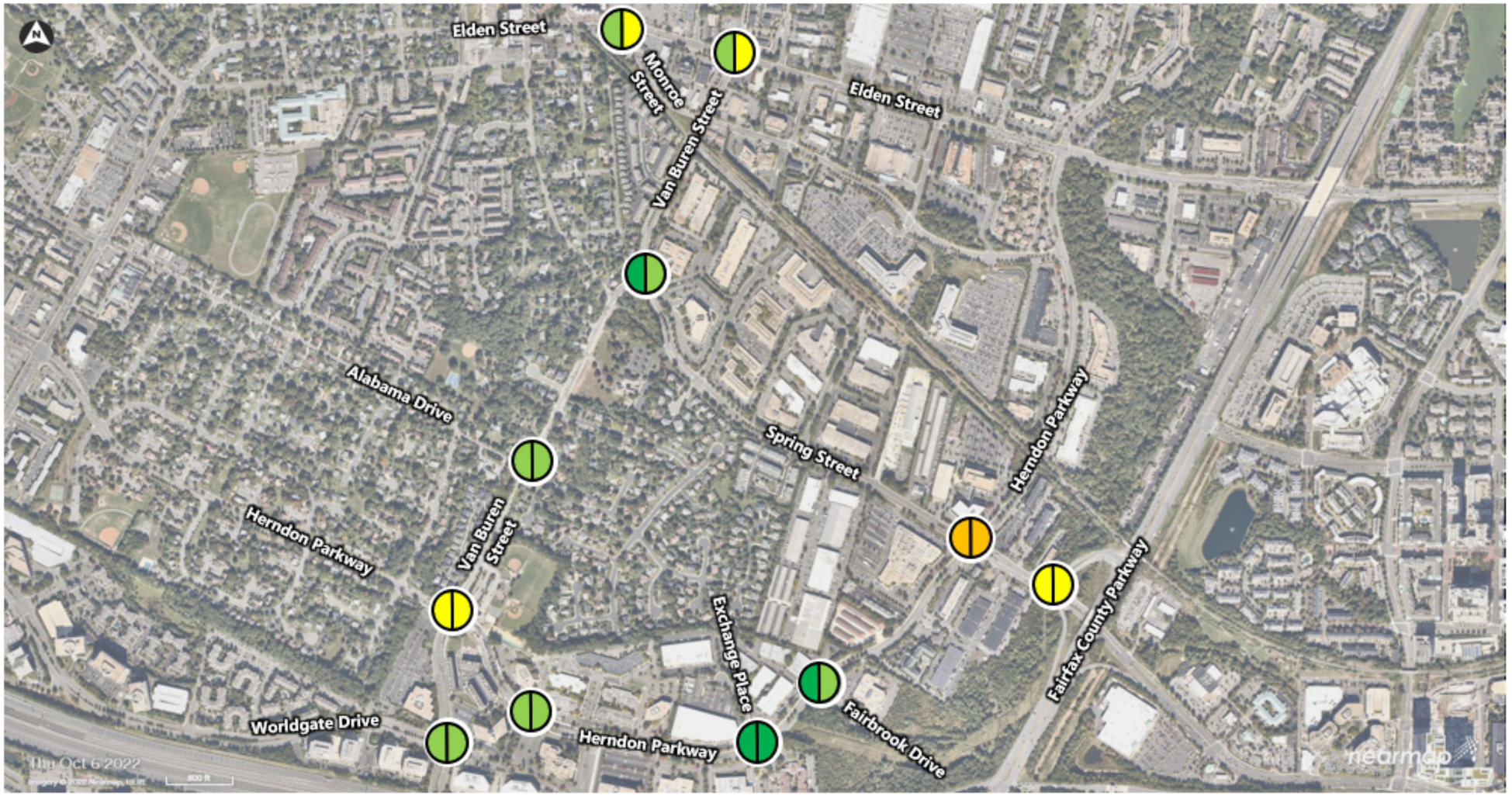
Turning Movement	Peak	LOS F in No Build?	Source of Congestion
Herndon Pkwy / Spring Street			
Southbound Left	AM	No	*Heavy Demand*
Eastbound Left	AM/PM	No	
Spring St / Fairfax County Parkway Ramps / Fairbrook Dr			
Eastbound Left	PM	No	*Heavy Demand, Assumed "Interim" Intersection Modifications*
Westbound Left	AM	No	
Northbound Left	AM/PM	No	
Northbound Thru	AM	No	
Southbound Left	AM/PM	No	
Van Buren St / Herndon Pkwy			
Northbound Left	PM	Yes	*Intersection capacity limitations*

Source: Average of 7 AM and 20 PM Peak Hour VISSIM simulation runs.

Congestion "heat" maps for each of the Build Scenario One peak hours are shown in **Figures 18** and **19**. These represent the average vehicle speeds present in different lanes and segments of the model. Slower vehicle speeds (shown in shades of red) represent areas of higher congestion and vehicle queuing, whereas higher vehicle speeds (shown in shades of green) represent areas of lower congestion and vehicle queueing. In both peak hours, the heaviest areas of congestion are the Spring Street corridor between Herndon Parkway and Fairfax County Parkway, as well as the three intersections at the junctions of Van Buren Street, Worldgate Drive, and Herndon Parkway. Additionally, in the PM peak hour, southbound Van Buren Street experiences a significant amount of congestion. This anticipated congestion pattern is largely unchanged from No Build 2045 traffic conditions.

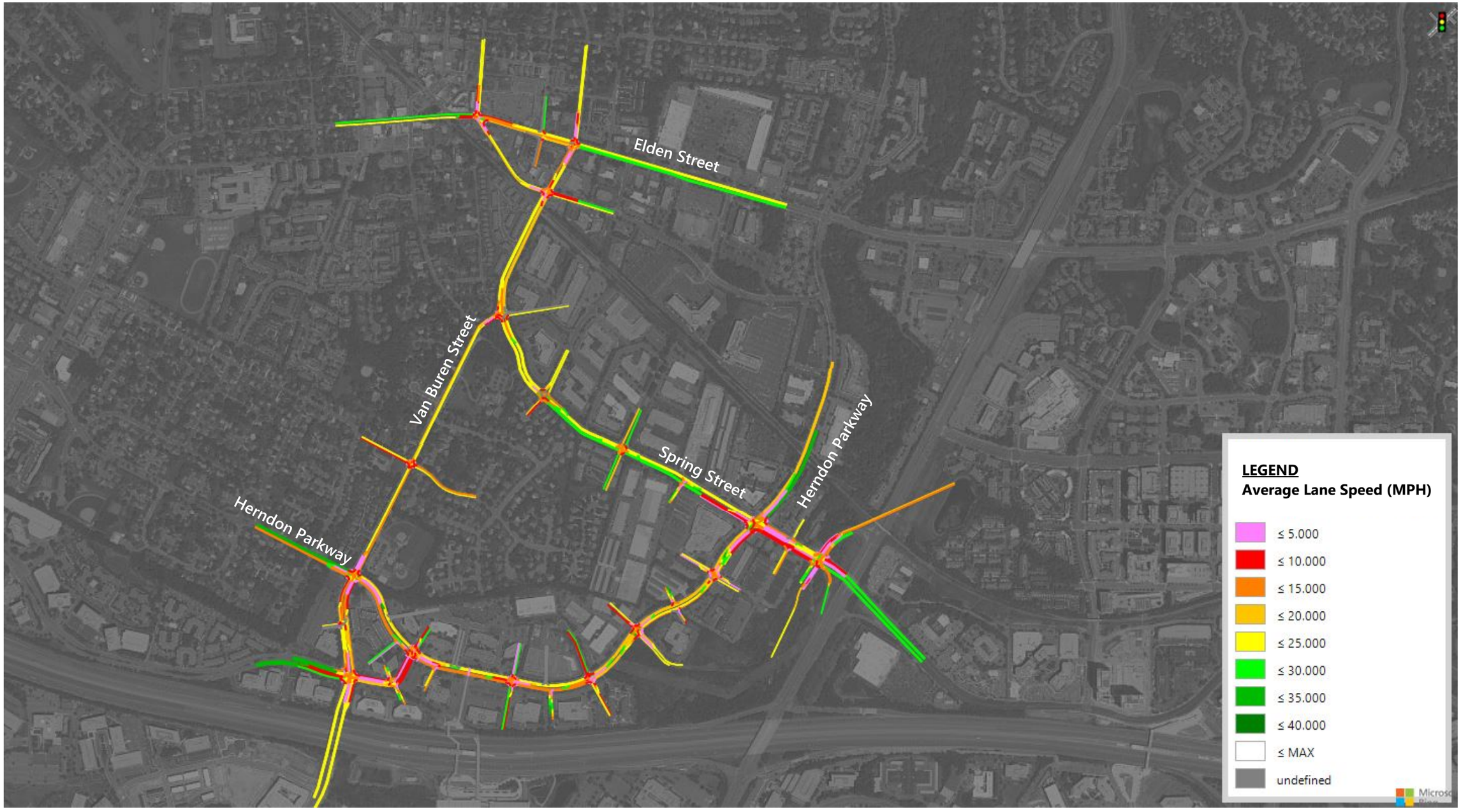
Appendix B documents the delay, LOS, and vehicle queueing for all movements at each of the eleven study intersections.

Figure 17 Build Scenario 1 (Neighborhood Clusters) 2045 Intersection Level of Service



Source: Average of 7 AM Peak Hour and 20 PM Peak Hour VISSIM simulation runs. Aerial imagery from NearMap.

Figure 18 Build Scenario 1 (Neighborhood Clusters) 2045 Congestion Heat Map – AM Peak Hour



Source: Average of 7 AM Peak Hour VISSIM simulation runs.

Figure 19 Build Scenario 1 (Neighborhood Clusters) 2045 Congestion Heat Map – PM Peak Hour



Source: Average of 20 PM Peak Hour VISSIM simulation runs.

4.3 Build 2045 Scenario Two: Two Centers

Consistent with the Existing and No Build 2045 conditions traffic analysis, the Build models were run under the same conditions (i.e., length of individual simulation run and number of averaged simulation runs). The same traffic operations metrics were also collected to evaluate the change in system performance between No Build 2045 and Build 2045 Scenario Two conditions.

4.3.1 Trip Generation

Table 9 documents the trip generation calculations for Build 2045 Scenario Two: Two Centers. Table 7 shows that after the appropriate trip reductions, the new TRG development at full buildout is expected to generate approximately 2,500 AM Peak Hour trips, 2,450 PM Peak Hour trips, and 28,500 weekday trips. These new TRG trips replace the existing trips associated with existing development within the TRG.

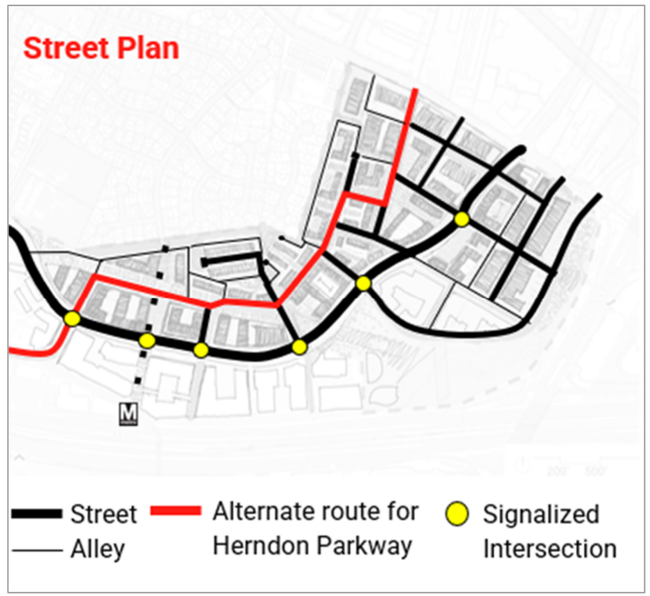
The higher quantity of office development in Scenario Two results in an approximately equal distribution between entering and exiting vehicle trips during each peak hour. In contrast to Scenario One, these anticipated vehicle trip totals are approximately 250 higher in the AM Peak Hour, 200 higher in the PM Peak hour, and 1,250 higher across an entire weekday.

4.3.2 Transportation Connectivity

The Two Centers Scenario includes a new roadway connection parallel to Herndon Parkway, as shown in "red" in **Figure 20**; however, this features an indirect connection to Spring Street that provides less connectivity than the new roadway shown in Scenario One. This connection, in addition to the grid of streets proposed, will provide TRG traffic with alternate travel paths to Herndon Parkway. The No Build traffic analysis indicated that the two termini intersections on Herndon Parkway were traffic choke points; the introduction of additional street connections to Spring Street will partially relieve that traffic pressure.

As previously mentioned, the current traffic analysis assumes that the new Spring Street intersection with the alternate route roadway will be unsignalized. If signalization of this intersection is identified as a potential transportation improvement, more traffic would be capable of utilizing the alternate route – in the unsignalized condition, the capacity of the intersection to facilitate left turn movements is limited.

Figure 20 Two Centers Scenario Street Plan



Source: SOM TRG graphics.

Figure 21 displays the traffic volume dataset that was analyzed at the study intersections in the Build Scenario 2 (Two Centers) 2045 traffic model. The TRG traffic volumes were distributed throughout the TRG land area by subdividing the TRG into multiple zones of development density. In Scenario Two, the proposed density is concentrated in two locations (adjacent to Metro station and within Sunset Business Park). This concentration of density, combined with the lower utilization of the proposed alternate route north of Herndon Parkway, locates a higher percentage of traffic volume along Herndon Parkway and at a few specific intersections (in contrast to Scenario One). **Figure 22** displays just the new site trips associated with the Preferred Build Scenario, while **Figure 23** displays just the pass-by site trips associated with the Preferred Build Scenario. **Appendix A** shows these three sets of traffic volumes for all intersections within the traffic model, including non-study intersections.

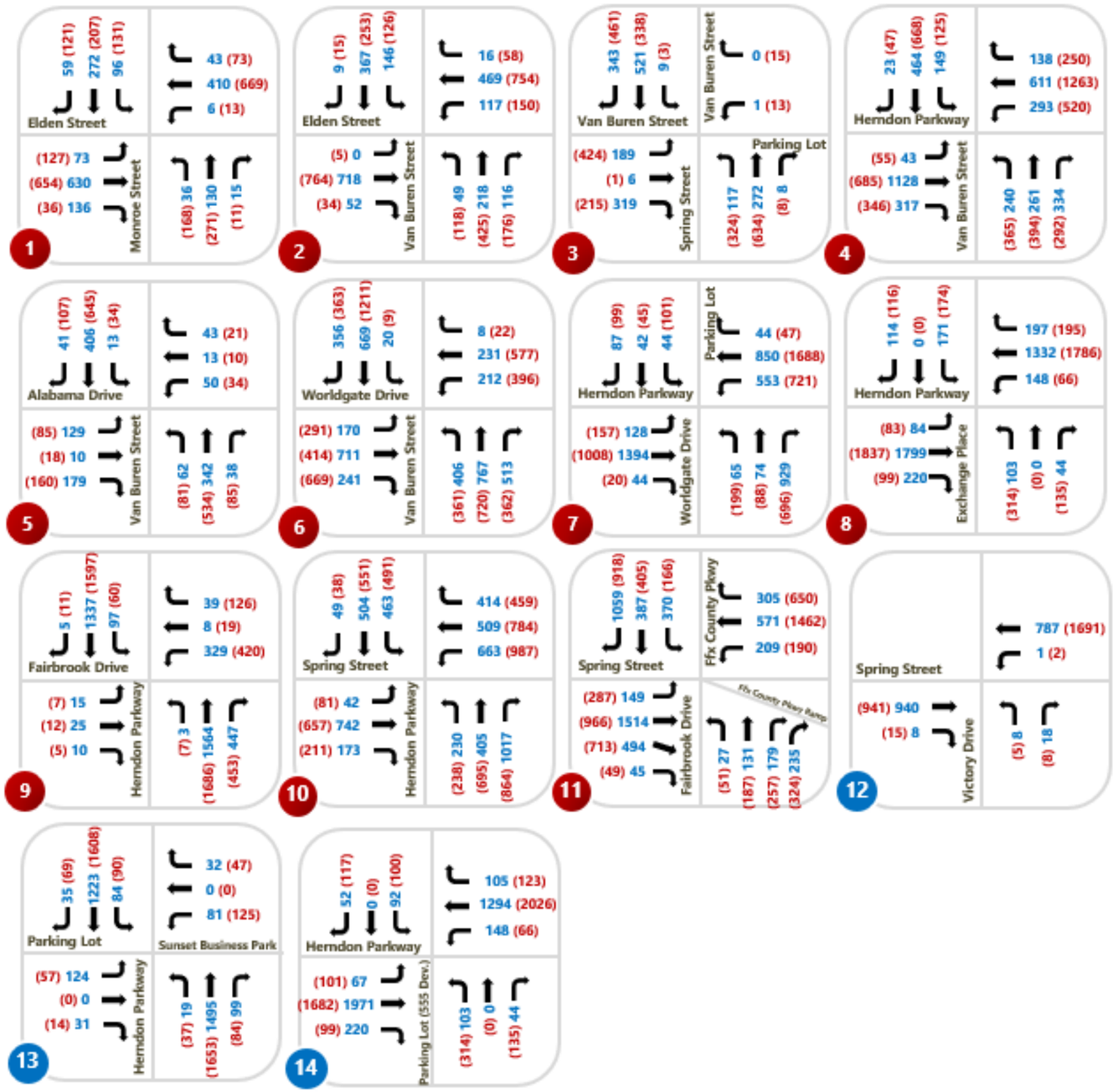
Table 9 TRG Build Scenario 2 (Two Centers), Full Buildout, Site Trip Generation

Land Use Type	Independent Variable	Independent Variable Unit	ITE Code	ITE Land Use	AM Peak Hour (7-9 AM)			PM Peak Hour (4-6 PM)			Weekday Total		
					Trips	Enter	Exit	Trips	Enter	Exit	Trips	Enter	Exit
Residential													
Multifamily	2,802	Dwelling Units	221	Multifamily Housing (Mid-Rise)	1,221	281	940	1,093	667	426	13,319	6,660	6,660
Townhomes	156	Dwelling Units	215	Single-Family Attached Housing	75	19	57	90	53	37	1,138	569	569
2 over 2s	392	Dwelling Units	221	Multifamily Housing (Mid-Rise)	161	37	124	153	93	60	1,823	912	912
Residential Subtotal	3,350	Dwelling Units			**1,458**	**337**	**1,121**	**1,336**	**813**	**523**	**16,281**	**8,140**	**8,140**
Hospitality													
Hotel	335	Rooms	310	Hotel	160	90	70	220	112	108	3,208	1,604	1,604
Office													
Corporate Office	252.400	SF	710	General Office Building	371	327	45	358	61	297	2,597	1,298	1,298
Creative Office	94,700	SF	710	General Office Building	160	141	19	159	27	132	1,107	553	553
Office Subtotal	347,100	SF			**531**	**467**	**64**	**517**	**88**	**429**	**3,703**	**1,852**	**1,852**
Retail													
Grocery	49,800	SF	850	Supermarket	142	84	58	439	220	220	4,692	2,346	2,346
Restaurant	169,700	SF	932	High-Turnover Restaurant	1,536	937	599	1,624	893	731	18,192	9,096	9,096
Fitness Center	54,100	SF	495	Recreational Community Center	103	68	35	171	81	91	1,527	763	763
Retail Subtotal	273,600	SF			**1,782**	**1,089**	**692**	**2,235**	**1,193**	**1,041**	**24,411**	**12,205**	**12,205**
All Land Uses Total (Base Trip Generation)					**3,930**	**1,983**	**1,947**	**4,308**	**2,207**	**2,101**	**47,603**	**23,801**	**23,801**
Transit Mode Split Reduction	25%				-983	-496	-487	-1,077	-552	-525	-11,901	-5,950	-5,950
Vehicle Trips					**2,948**	**1,487**	**1,461**	**3,231**	**1,655**	**1,576**	**35,702**	**17,851**	**17,851**
Pass-By Reduction Grocery	24%	PM. AM = ½ of PM. Weekday = average.			-13	-8	-5	-79	-40	-40	-633	-317	-317
Pass-By Reduction Restaurant	43%	PM. AM = ½ of PM. Weekday = average.			-248	-151	-97	-524	-288	-236	-4,400	-2,200	-2,200
New Vehicle Trips on Roadway Network					**2,687**	**1,328**	**1,359**	**2,628**	**1,327**	**1,300**	**30,669**	**15,334**	**15,334**
Internal Capture	7%				-188	-93	-95	-184	-93	-91	-2,147	-1,073	-1,073
Net New Vehicle Trips on External Roadway Network					**2,499**	**1,235**	**1,264**	**2,444**	**1,234**	**1,209**	**28,522**	**14,261**	**14,261**

Source: Institute of Transportation Engineer's *Trip Generation Manual, 11th Edition*. Utilized "suburban" trip generation rates as decision was made with Town of Herndon to apply a consistent methodology to prior studies in the TRG, which utilized suburban base trip generation and then applied significant transit and internal capture reductions. An "urban" trip generation rate would not be compatible with this approach as it already accounts for these types of trip reductions.

Figure 21 Build Scenario 2 (Two Centers) 2045 Traffic Volumes

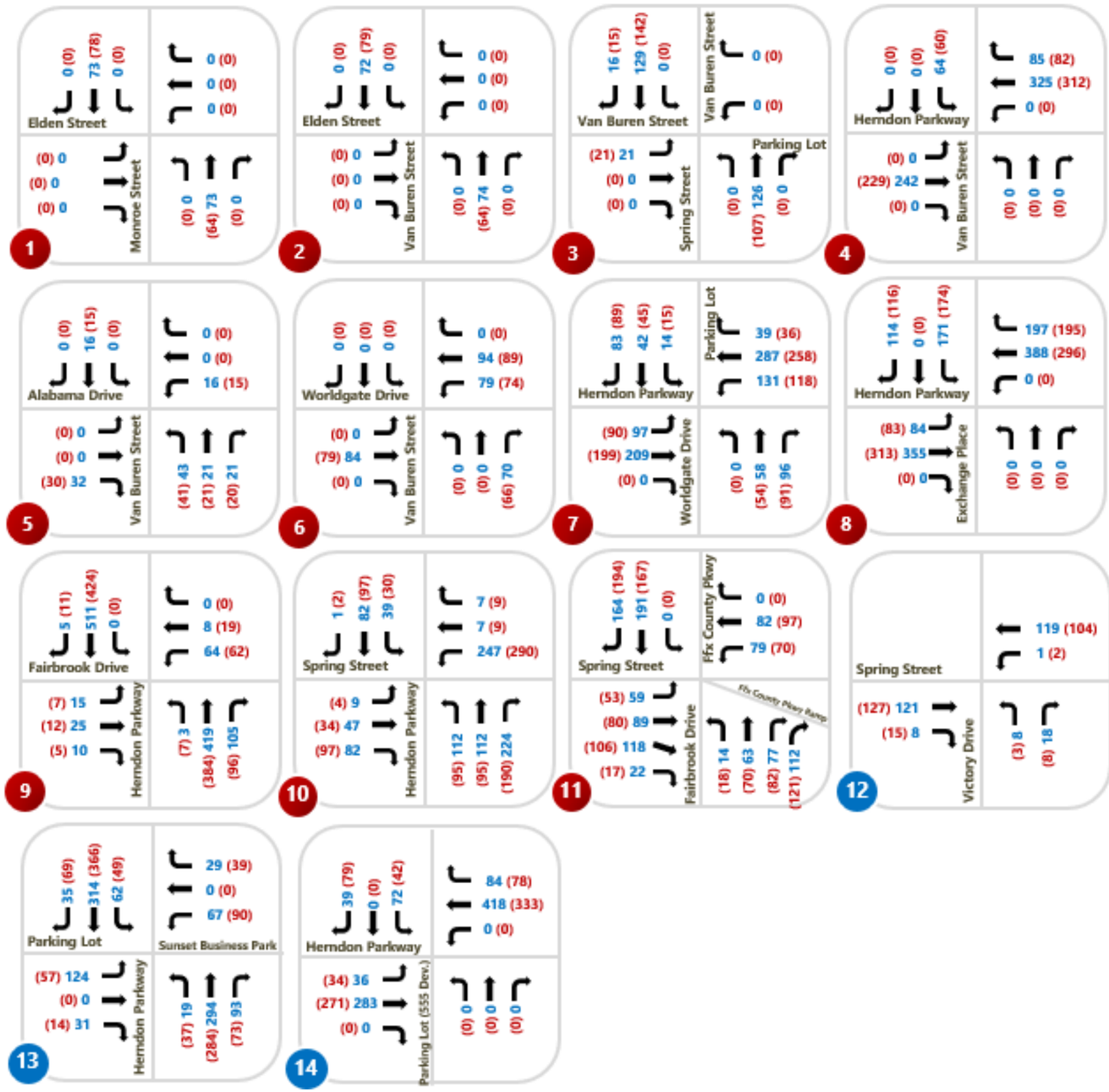




Build 2045 traffic volumes include No Build 2045 traffic volumes (Figure 6), removal of existing TRG area traffic volumes, volume shift to account for the Fairbrook Drive extension, and new TRG development traffic volumes. Basemap Source: Nearmap

Figure 22 Build Scenario 2 (Two Centers) New Site Trips

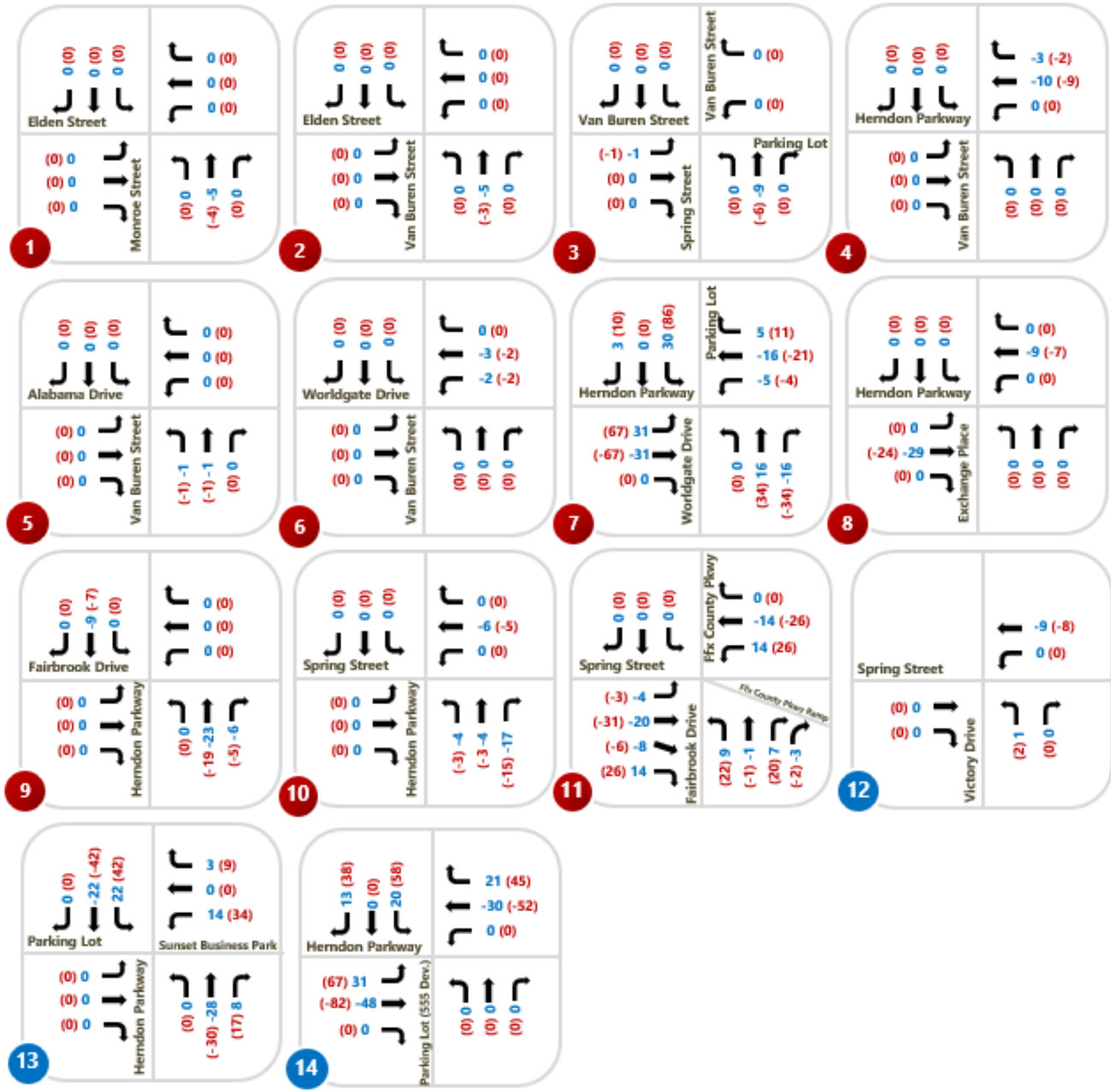




Basemap Source: Nearmap

Figure 23 Build Scenario 2 (Two Centers) Site Pass-By Trips





Basemap Source: Nearmap

4.3.3 Traffic Analysis

In Build 2045 Scenario Two conditions, with higher traffic volumes than Build Scenario One conditions, the transportation network within the study area is projected to experience higher levels of congestion and begin to break down (i.e., exceed capacity) during the PM peak hour. **Table 10** lists the intersection delay and LOS at each of the eleven study intersections, comparing No Build 2045 to Build Scenario Two. Projected intersection LOS in Build Scenario Two is also shown in **Figure 24**.

All study intersections are projected to operate at LOS D or better in both peak hours, except for the Spring Street / Herndon Parkway intersection, which is anticipated to operate at LOS E in both peak hours. While LOS E does represent increased delay, modeling results indicate that the roadway network can accommodate the increased demand based on the progression of traffic. Many intersections in the Northern Virginia area operate at this condition during a peak hour and Fairfax County has adopted an LOS E intersection standard in several of its urban development areas.

In the AM peak hour, the LOS degradation from D to E at the Herndon Parkway / Spring Street intersection is the result of an increase in 6 seconds of delay, a relatively insignificant change. The increased delay at the Spring Street / Fairfax County Parkway / Fairbrook Drive intersection is primarily due to the aforementioned reasons regarding the major expansion and reconfiguration of this intersection.

In the PM peak hour, the significant increase in projected intersection delay that is seen at numerous intersections, particularly within the TRG, is due to heavy traffic congestion projected along westbound Herndon Parkway. This congestion is caused by the higher traffic volumes in Build Scenario Two combined with the constrained Herndon Parkway / Van Buren Street intersection, as documented in the No Build traffic conditions. The operational constraints of this intersection limit the signal capacity of westbound Herndon Parkway (i.e., traffic exiting the TRG/HTOC area), which contributes to incremental vehicle delay and queuing that builds within the PM peak hour along the entirety of the route thru the TRG/HTOC area.

The intersection turning movements in **Table 11** operate at LOS F in Build Scenario 2 2045 conditions; the existing Town of Herndon Ordinance states "no individual turning movement level of service at an intersection falls below "LOS E"". Compared to No Build 2045 conditions, the eight "new" movements that operate at LOS F are located at the Herndon Parkway / Spring Street intersection and the Spring Street / Fairfax County Parkway Ramps / Fairbrook Drive intersection – the same as Build Scenario 1. For the same previously stated reasons, these two Spring Street intersections should be studied further in the future as Parkway interchange planning progresses. While there was LOS F on the Van Buren Street corridor in No Build 2045 conditions, delay does increase in the Build scenario due to the increased demand on the capacity constrained Van Buren Street / Herndon Parkway intersection.

Table 10 Comparison of Intersection Delay and LOS: No Build 2045 to Build Scenario 2 (Two Centers)

Intersection [1]	No Build 2045				Build Scenario Two				Change No Build to Build			
	AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Elden St / Monroe St	27.2	C	34.1	C	30.4	C	36.3	D	+3.2	-	+2.2	C→D
Elden St / Van Buren St	31.2	C	36.7	D	33.4	C	39.5	D	+2.2	-	+2.8	-
Van Buren St / Spring St	16.8	B	40.8	D	17.6	B	27.8	C	+0.8	-	-13.0	D→C
Van Buren St / Herndon Pkwy	30.5	C	44.4	D	34.0	C	48.1	D	+3.5	-	+3.7	-
Van Buren St / Alabama Dr	16.1	B	33.4	C	21.7	C	51.3	D	+5.6	B→C	+17.9	C→D
Van Buren St / Worldgate Dr	23.8	C	27.7	C	23.3	C	33.6	C	-0.5	-	+5.9	-
Herndon Pkwy / Worldgate Dr	25.2	C	22.0	C	38.3	D	39.5	D	+13.1	C→D	+17.5	C→D
Herndon Pkwy / Exchange Pl	11.0	B	15.8	B	21.1	C	39.4	D	+10.1	B→C	+23.6	B→D
Herndon Pkwy / Fairbrook Dr	14.2	B	19.9	B	17.3	B	46.8	D	+3.1	-	+26.9	B→D
Spring St / Herndon Pkwy	51.5	D	59.1	E	57.2	E	76.0	E	+5.7	D→E	+16.9	-
Spring St / FCP Ramps	22.1	C	25.8	C	42.5	D	46.6	D	+20.4	C→D	+20.8	C→D

Source: Average of 7 AM and 20 PM Peak Hour VISSIM simulation runs.
1 All study intersections are signalized in the No Build and Build scenario.

Table 11 Build Scenario 2 "LOS F" Turning Movements

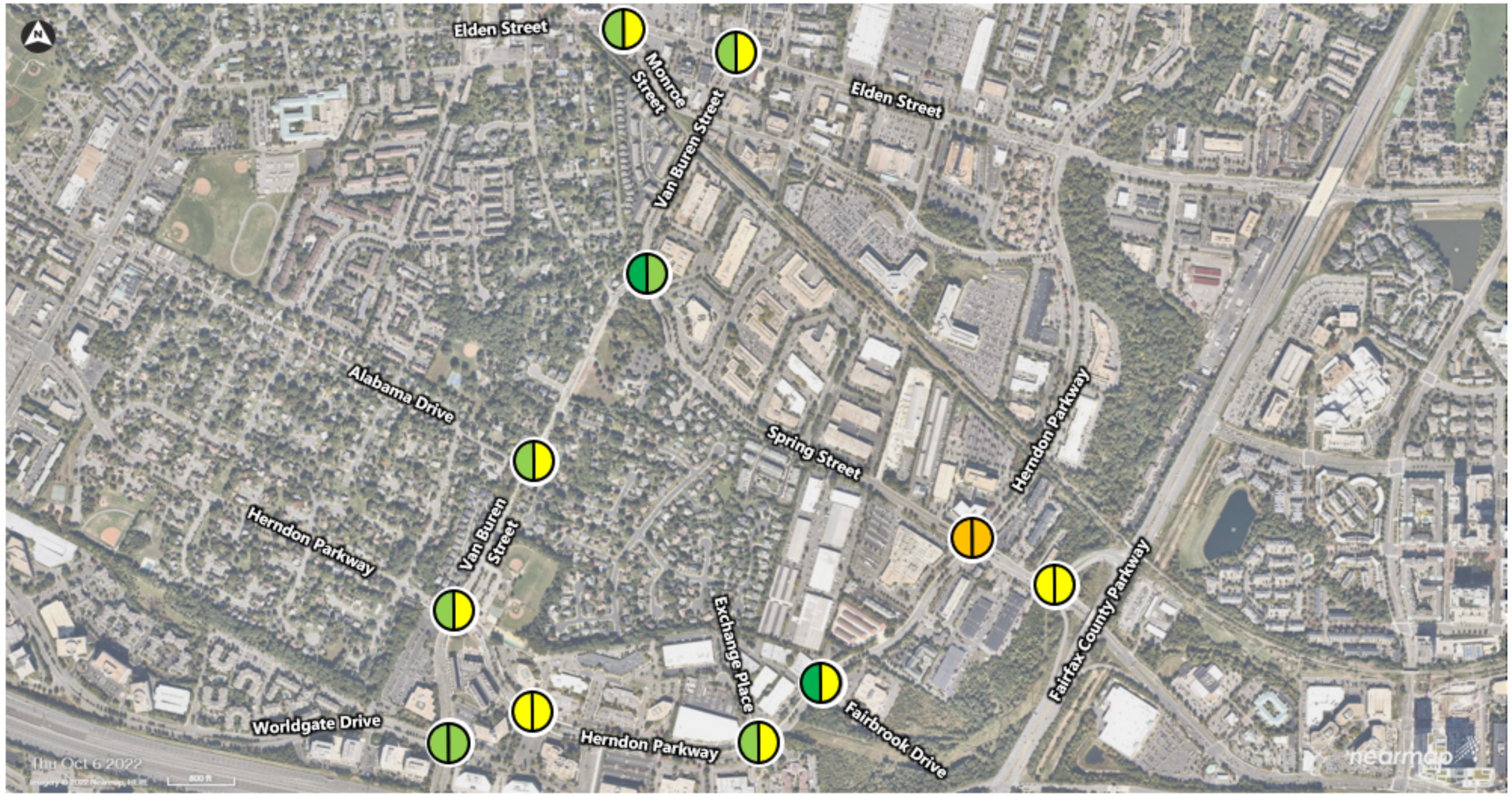
Turning Movement	Peak	LOS F in No Build?	Source of Congestion
Herndon Pkwy / Spring Street			
All Southbound	PM	No	*Heavy Demand*
Eastbound Left	AM/PM	No	
Eastbound Thru/Right	PM	No	
Spring St / Fairfax County Parkway Ramps / Fairbrook Dr			
Eastbound Left	PM	No	*Heavy Demand, "Interim" Intersection Modifications*
Westbound Left	AM	No	
Northbound Left/Thru	AM/PM	No	
Southbound Left	AM/PM	No	
Van Buren St / Herndon Pkwy			*Capacity limitations at Van Buren St / Herndon Pkwy*
Northbound Left	PM	Yes	
Van Buren St / Alabama Drive			
All Alabama Drive	PM	Yes	
Herndon Parkway / Fairbrook Drive			*TRG Street Grid*
Westbound Left/Thru	PM	No	

Source: Average of 7 AM and 20 PM Peak Hour VISSIM simulation runs.

Congestion "heat" maps for each of the Build Scenario Two peak hours are shown in **Figures 25 and 26**. These represent the average vehicle speeds present in different lanes and segments of the model. Slower vehicle speeds (shown in shades of red) represent areas of higher congestion and vehicle queuing, whereas higher vehicle speeds (shown in shades of green) represent areas of lower congestion and vehicle queueing. In the AM peak hour, the heaviest areas of congestion are the Spring Street / Herndon Parkway intersection and the three intersections at the junctions of Van Buren Street, Worldgate Drive, and Herndon Parkway, which is similar to No Build 2045 conditions. In the PM peak hour, southbound Van Buren Street experiences a significant amount of congestion, also similar to No Build 2045 conditions. The additional major congestion in the PM peak hour, which is new in the Build Two scenario, is located on westbound Herndon Parkway throughout the TRG/HTOC area.

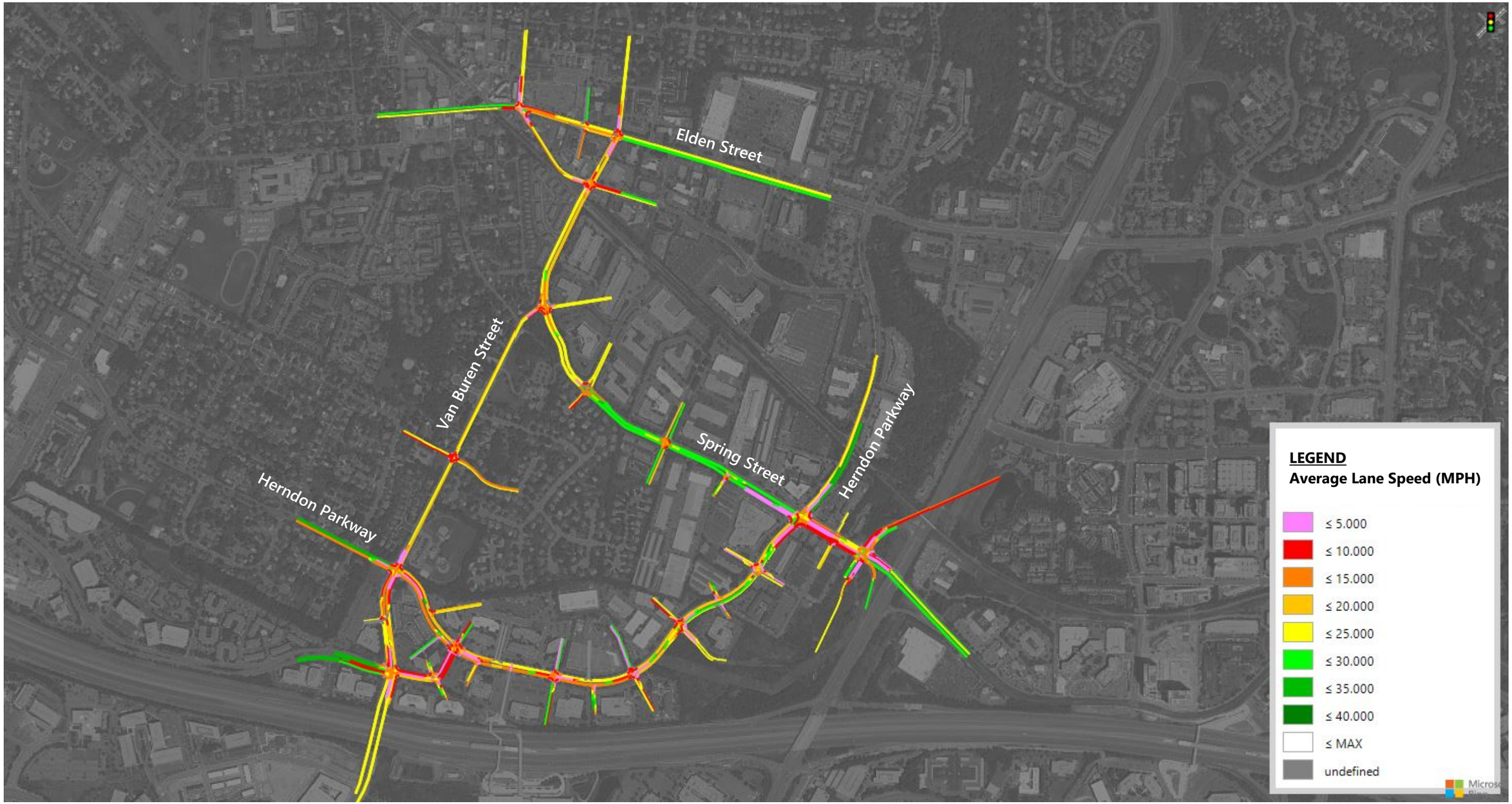
Appendix B documents the delay, LOS, and vehicle queueing for all of the movements at each of the eleven study intersections.

Figure 24 Build Scenario 2 (Two Centers) 2045 Intersection Level of Service



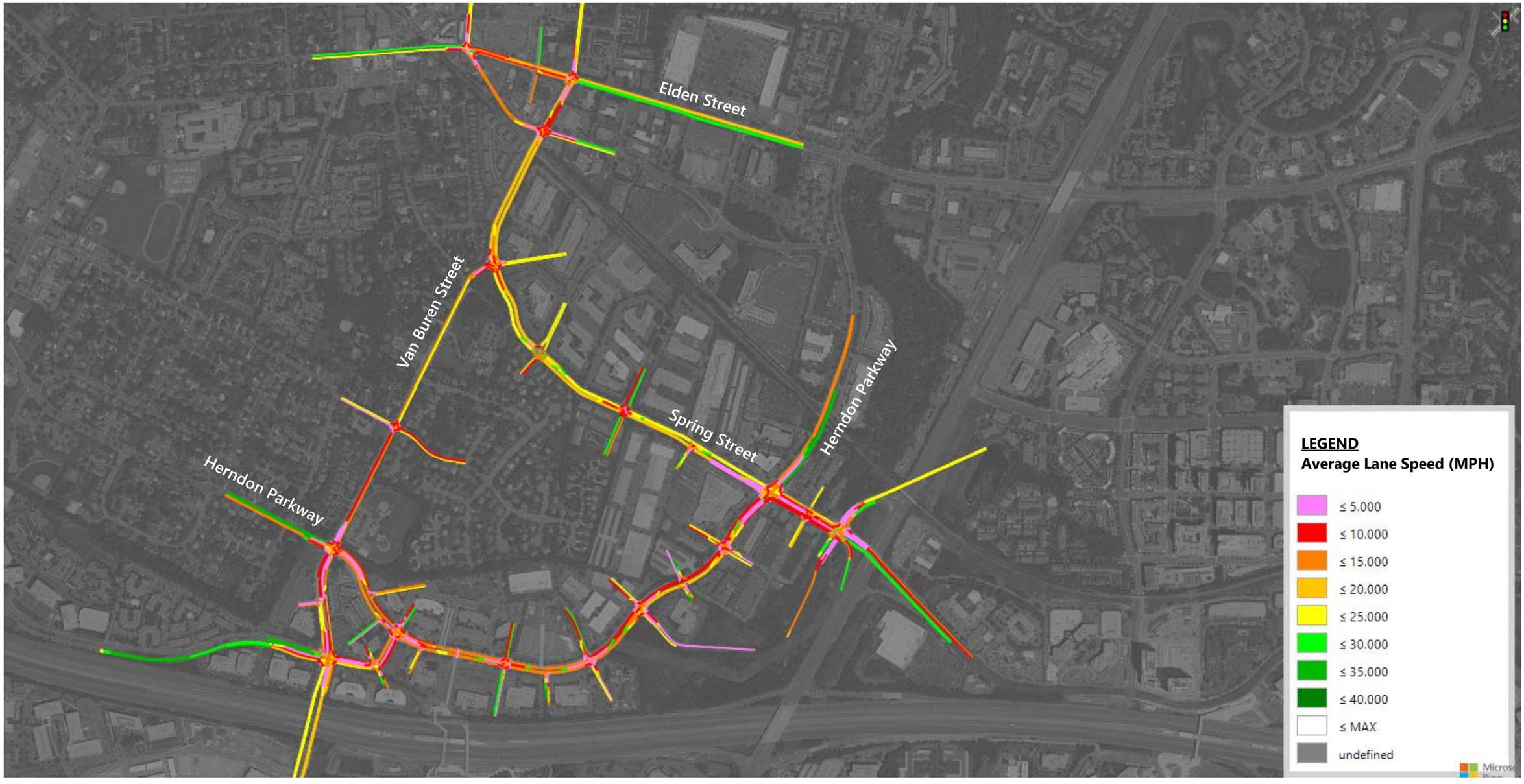
Source: Average of 7 AM Peak Hour and 20 PM Peak Hour VISSIM simulation runs. Aerial imagery from NearMap.

Figure 25 Build Scenario 2 (Two Centers) 2045 Congestion Heat Map – AM Peak Hour



Source: Average of 7 AM Peak Hour VISSIM simulation runs.

Figure 26 Build Scenario 2 (Two Centers) 2045 Congestion Heat Map – PM Peak Hour



Source: Average of 20 PM Peak Hour VISSIM simulation runs.

4.4 Build 2045 Scenario Three: Metro Center

Consistent with the Existing and No Build 2045 conditions traffic analysis, the Build models were run under the same conditions (i.e., length of individual simulation run and number of averaged simulation runs). The same traffic operations metrics were also collected to evaluate the change in system performance between No Build 2045 and Build 2045 Scenario Three conditions.

4.4.1 Trip Generation

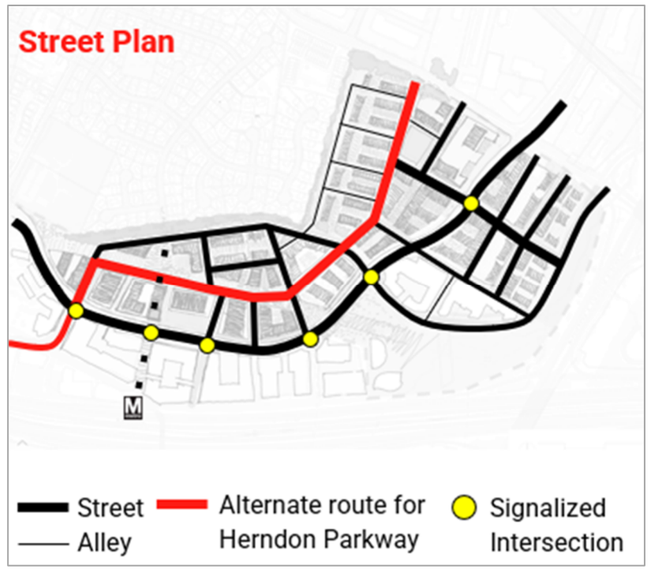
Table 12 documents the trip generation calculations for Build 2045 Scenario Three: Metro Center. Table 9 shows that after the appropriate trip reductions, the new TRG development at full buildout is expected to generate approximately 2,600 AM Peak Hour trips, 2,550 PM Peak Hour trips, and 29,250 weekday trips. These new TRG trips replace the existing trips associated with existing development within the TRG. Scenario Three has the highest ratio of office space to residential units, and as such, has the heaviest traffic pattern of inbound morning trips and outbound evening trips. The overall vehicle trip totals are also the highest of the three build scenarios – in comparison to Scenario Two, the Scenario Three trip totals are 100 vehicles higher in the AM and PM Peak Hours, and 750 vehicles higher across an entire weekday.

4.4.2 Transportation Connectivity

The Metro Center Scenario includes a new roadway connection parallel to Herndon Parkway, as shown in "red" in **Figure 27**. This connection, in addition to the grid of streets proposed, will provide TRG traffic with viable alternate travel paths to Herndon Parkway. The No Build traffic analysis indicated that the two termini intersections on Herndon Parkway were traffic choke points; the introduction of additional street connections to Spring Street will partially relieve that traffic pressure.

As previously mentioned, the current traffic analysis assumes that the new Spring Street intersection with the alternate route roadway will be unsignalized. If signalization of this intersection is identified as a potential transportation improvement, more traffic would be capable of utilizing the alternate route – in the unsignalized condition, the capacity of the intersection to facilitate left turn movements is limited.

Figure 27 Metro Center Scenario Street Plan



Source: SOM TRG graphics.

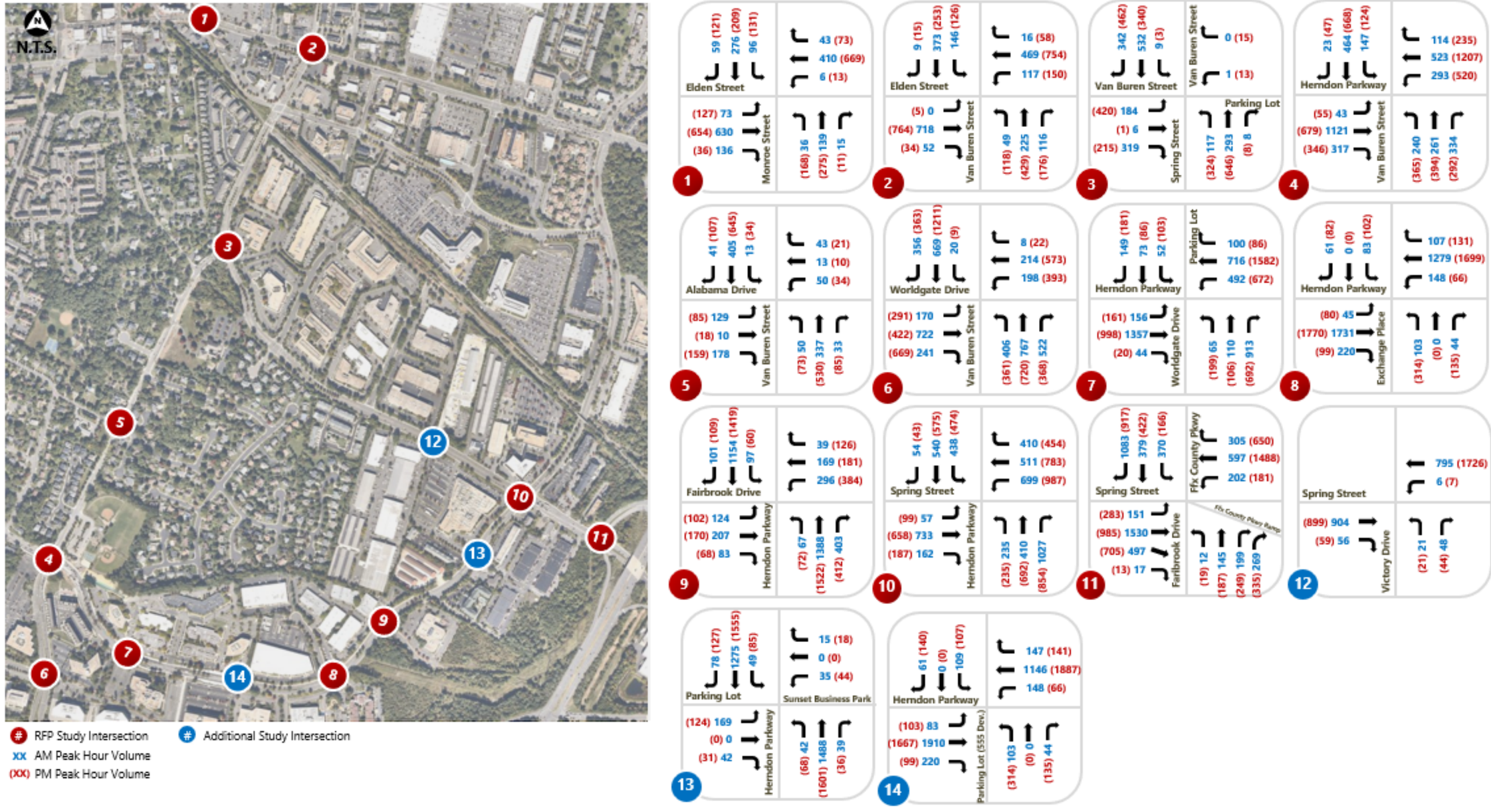
Figure 28 displays the traffic volume dataset that was analyzed at the study intersections in the Build Scenario 3 (Metro Center) 2045traffic model. The TRG traffic volumes were distributed throughout the TRG land area by subdividing the TRG into multiple zones of development density. In Scenario Three, the proposed density is concentrated adjacent to the Metro Station, which induces most of the new traffic into the center of the TRG and locates most entering/exiting traffic at a few select intersections. **Figure 29** displays just the new site trips associated with the Preferred Build Scenario, while **Figure 30** displays just the pass-by site trips associated with the Preferred Build Scenario. **Appendix A** shows these three sets of traffic volumes for all intersections within the traffic model, including non-study intersections.

Table 12 TRG Build Scenario 3 (Metro Center), Full Buildout, Site Trip Generation

Land Use Type	Independent Variable	Independent Variable Unit	ITE Code	ITE Land Use	AM Peak Hour (7-9 AM)			PM Peak Hour (4-6 PM)			Weekday Total		
					Trips	Enter	Exit	Trips	Enter	Exit	Trips	Enter	Exit
Residential													
Multifamily	2,936	Dwelling Units	221	Multifamily Housing (Mid-Rise)	1,280	294	986	1,145	699	447	13,958	6,979	6,979
Townhomes	350	Dwelling Units	215	Single-Family Attached Housing	176	44	132	206	122	84	2,617	1,308	1,308
2 over 2s	292	Dwelling Units	221	Multifamily Housing (Mid-Rise)	117	27	90	114	70	45	1,346	673	673
Residential Subtotal	3,578	Dwelling Units			**1,573**	**365**	**1,208**	**1,466**	**890**	**576**	**17,921**	**8,961**	**8,961**
Hospitality													
Hotel	294	Rooms	310	Hotel	140	78	61	190	97	93	2,763	1,382	1,382
Office													
Corporate Office	400,000	SF	710	General Office Building	552	485	66	525	89	436	3,876	1,938	1,938
Creative Office	56,000	SF	710	General Office Building	102	89	12	103	17	85	701	350	350
Office Subtotal	456,000	SF			**653**	**575**	**78**	**627**	**107**	**521**	**4,577**	**2,288**	**2,288**
Retail													
Grocery	45,400	SF	850	Supermarket	130	77	53	408	204	204	4,325	2,163	2,163
Restaurant	158,900	SF	932	High-Turnover Restaurant	1,438	877	561	1,521	836	684	17,034	8,517	8,517
Fitness Center	57,400	SF	495	Recreational Community Center	110	72	37	179	84	95	1,618	809	809
Retail Subtotal	261,700	SF			**1,678**	**1,026**	**651**	**2,107**	**1,124**	**983**	**22,977**	**11,489**	**11,489**
All Land Uses Total (Base Trip Generation)					**4,044**	**2,045**	**1,999**	**4,390**	**2,218**	**2,172**	**48,239**	**24,119**	**24,119**
Transit Mode Split Reduction	25%				-1,011	-511	-500	-1,097	-554	-543	-12,060	-6,030	-6,030
Vehicle Trips					**3,033**	**1,533**	**1,499**	**3,292**	**1,663**	**1,629**	**36,179**	**18,090**	**18,090**
Pass-By Reduction Grocery	24%	PM. AM = ½ of PM. Weekday = average.			-12	-7	-5	-73	-37	-37	-584	-292	-292
Pass-By Reduction Restaurant	43%	PM. AM = ½ of PM. Weekday = average.			-232	-141	-90	-490	-270	-221	-4,120	-2,060	-2,060
New Vehicle Trips on Roadway Network					**2,789**	**1,385**	**1,404**	**2,729**	**1,357**	**1,372**	**31,475**	**15,738**	**15,738**
Internal Capture	7%				-195	-97	-98	-191	-95	-96	-2,203	-1,102	-1,102
Net New Vehicle Trips on External Roadway Network					**2,594**	**1,288**	**1,306**	**2,538**	**1,262**	**1,276**	**29,272**	**14,636**	**14,636**

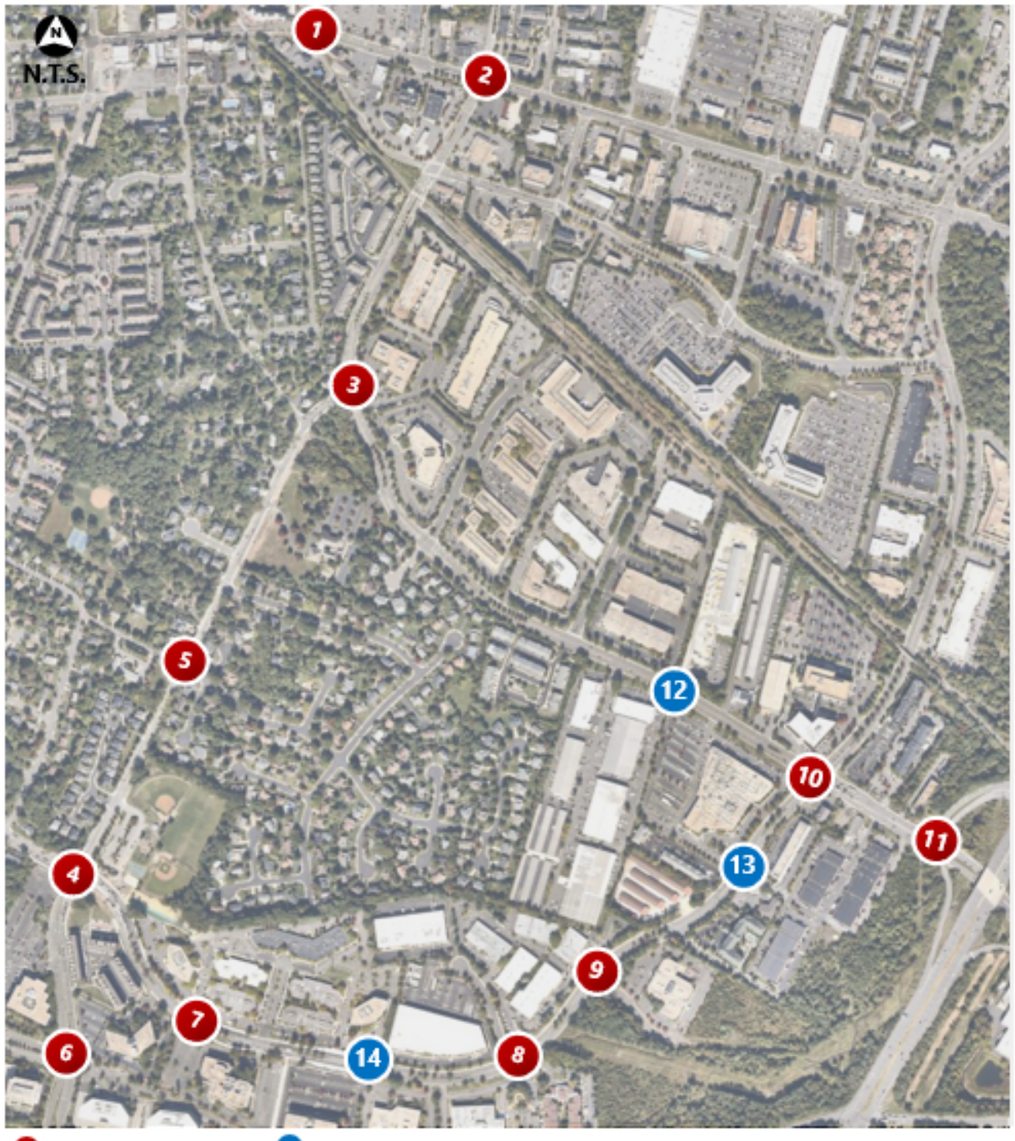
Source: Institute of Transportation Engineer's *Trip Generation Manual, 11th Edition*. Utilized "suburban" trip generation rates as decision was made with Town of Herndon to apply a consistent methodology to prior studies in the TRG, which utilized suburban base trip generation and then applied significant transit and internal capture reductions. An "urban" trip generation rate would not be compatible with this approach as it already accounts for these types of trip reductions.

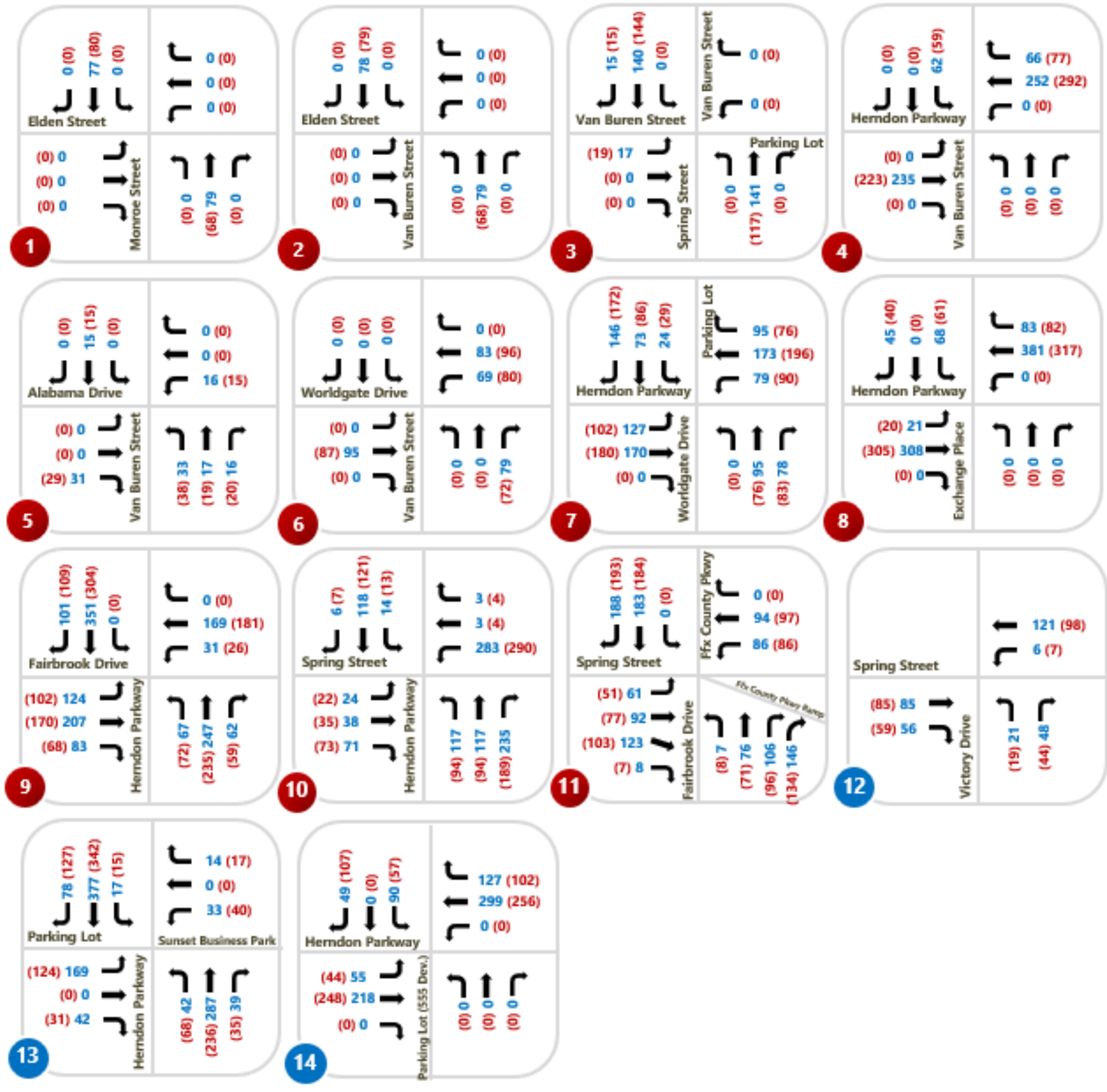
Figure 28 Build Scenario 3 (Metro Center) 2045 Traffic Volumes



Build 2045 traffic volumes include No Build 2045 traffic volumes (Figure 6), removal of existing TRG area traffic volumes, volume shift to account for the Fairbrook Drive extension, and new TRG development traffic volumes. Basemap Source: Nearmap

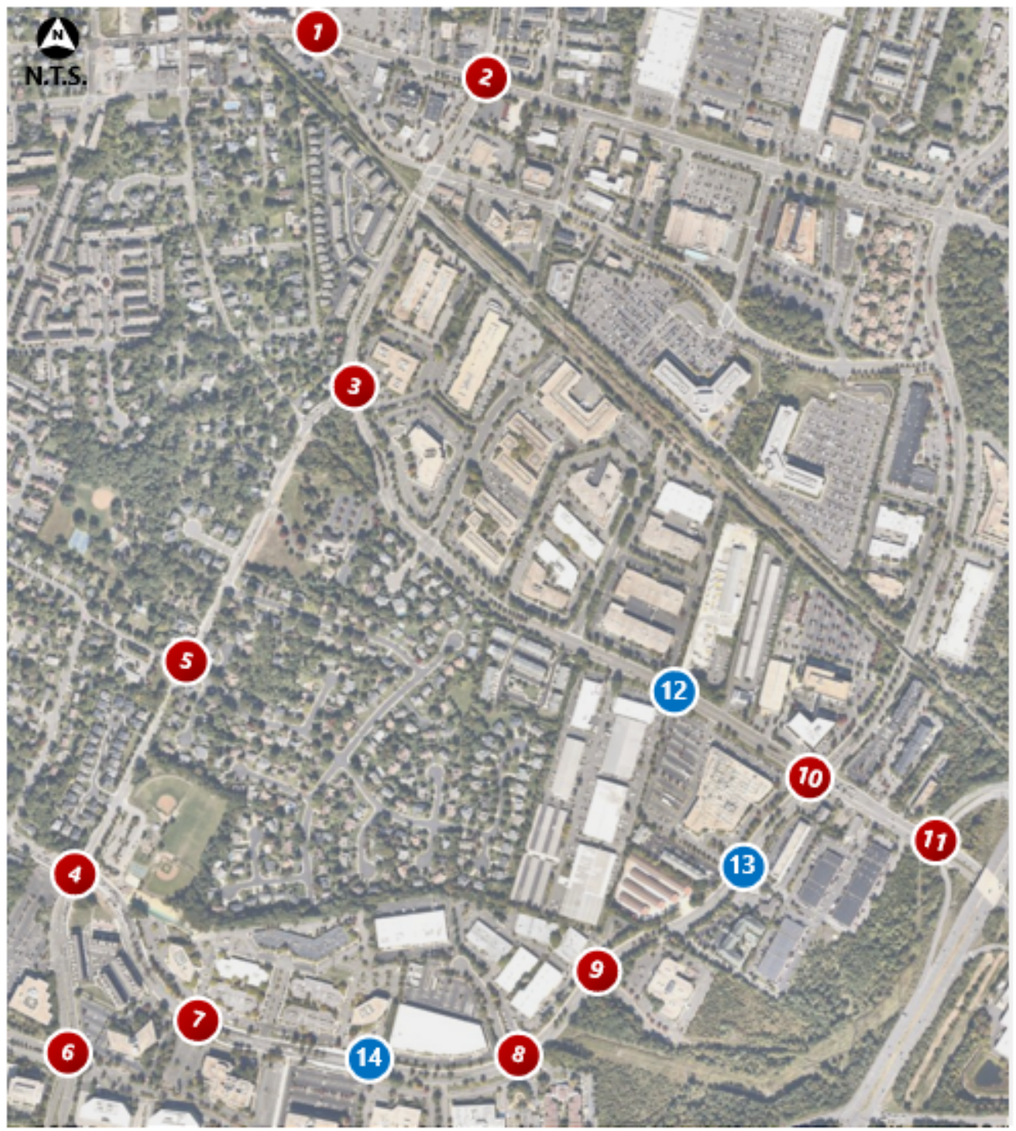
Figure 29 Build Scenario 3 (Metro Center) New Site Trips

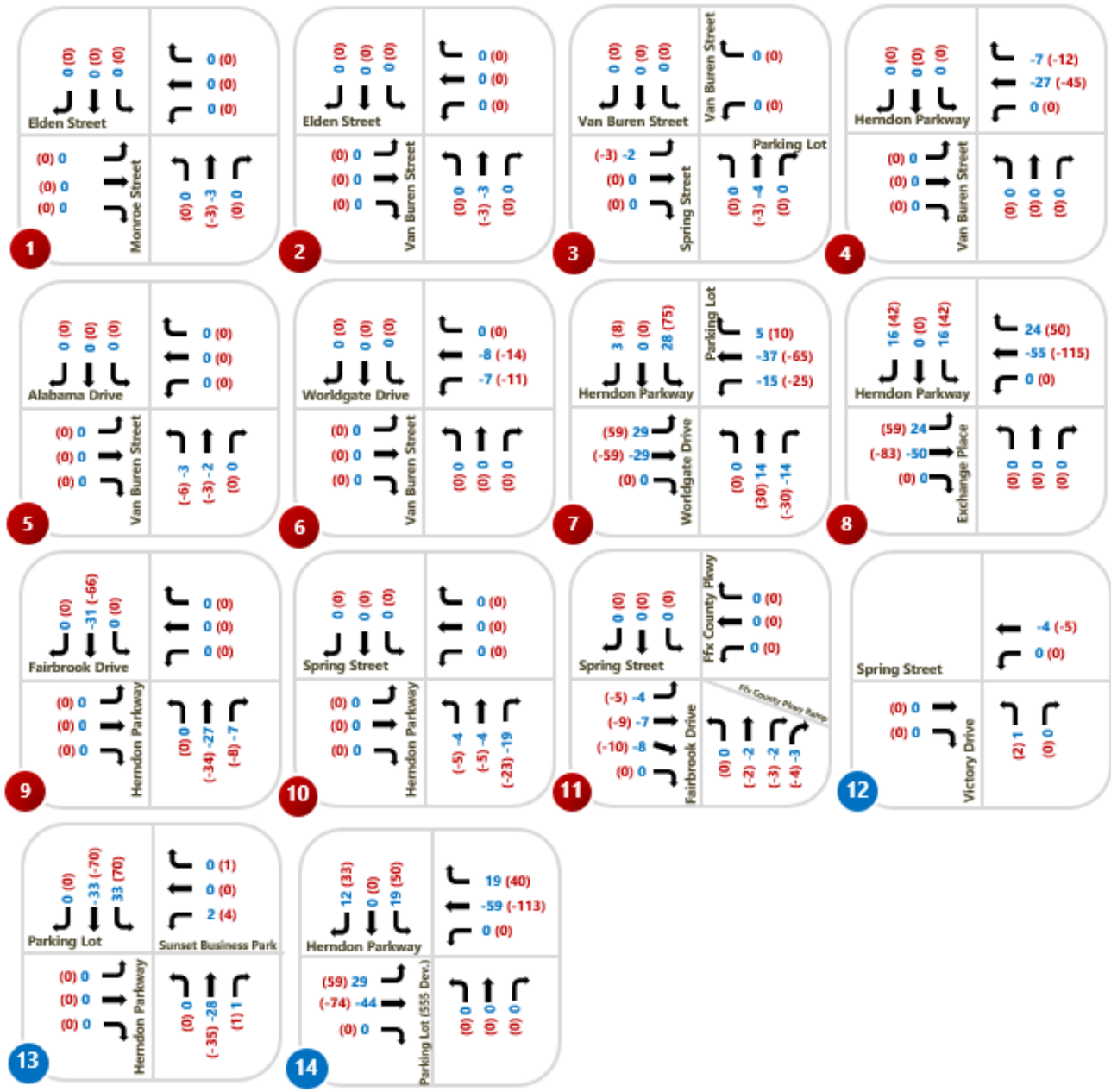




Basemap Source: Nearmap

Figure 30 Build Scenario 3 (Metro Center) Site Pass-By Trips





Basemap Source: Nearmap

4.4.3 Traffic Analysis

In Build 2045 Scenario Three conditions, traffic levels are anticipated to be stressed at a few locations – resulting in several "violations" of the Town's LOS standard. **Table 13** lists the intersection delay and LOS at each of the eleven study intersections, comparing No Build 2045 to Build Scenario Three. Projected intersection LOS is also shown in **Figure 31**. All study intersections are projected to operate at LOS D or better in both peak hours, except for the Spring Street / Herndon Parkway intersection, which is anticipated to operate at LOS E in both peak hours. While LOS E does represent increased delay, modeling results indicate that the roadway network can accommodate the increased demand based on the progression of traffic. Many intersections in the Northern Virginia area operate at this condition during a peak hour and Fairfax County has adopted an LOS E intersection standard in several of its urban development areas.

In comparison to No Build, this is technically an increase from one intersection peak hour to two intersection peak hours operating at LOS E; however, an examination of the delay values at the Herndon Parkway / Spring Street intersection reveals that the AM LOS change resulted from only 5 seconds of increased delay and the PM delay only increased by 6 seconds (remained LOS E). As previously discussed in the first two Build Scenarios, the expansion and reconfiguration of the Spring Street / Fairfax County Parkway / Fairbrook Drive intersection resulted in increased delay.

The other significant increases in projected intersection delay in Build Scenario Three are the Herndon Parkway / Fairbrook Drive intersection and the Van Buren Street / Alabama Drive intersection (PM peak only). The latter is caused by increased traffic pressure on the constrained Van Buren Street / Herndon Parkway intersection, a condition previously discussed in No Build 2045 conditions. The former is influenced by the proposed roadway grid of Scenario Three, which of the three scenarios induces the most connectivity from Fairbrook Drive into the TRG north and west of Herndon Parkway. This higher level of connectivity induces more traffic volume and hence higher levels of anticipated congestion. Of note is that the Build Scenario Three traffic model included the same Herndon Parkway / Fairbrook Drive intersection configuration as the other Build scenarios despite this higher volume.

The intersection turning movements in **Table 14** operate at LOS F in Build Scenario 3 2045 conditions; the existing Town of Herndon Ordinance states "no individual turning movement level of service at an intersection falls below "LOS E"". Compared to No Build 2045 conditions, the seven "new" movements that operate at LOS F are located at the Herndon Parkway / Spring Street intersection and the Spring Street / Fairfax County Parkway Ramps / Fairbrook Drive intersection – the same as Build Scenarios 1 and 2. For the same previously stated reasons, these two Spring Street intersections should be studied further in the future as Parkway interchange planning progresses. While there was LOS F on the Van Buren Street corridor in No Build 2045 conditions, delay does increase in the Build scenario due to the increased demand on the capacity constrained Van Buren Street / Herndon Parkway intersection.

Table 13 Comparison of Intersection Delay and LOS: No Build 2045 to Build Scenario 3 (Metro Center)

Intersection [1]	No Build 2045 AM Peak Delay	No Build 2045 AM Peak LOS	No Build 2045 PM Peak Delay	No Build 2045 PM Peak LOS	Build Scenario Three AM Peak Delay	Build Scenario Three AM Peak LOS	Build Scenario Three PM Peak Delay	Build Scenario Three PM Peak LOS	Change No Build to Build AM Peak Delay	Change No Build to Build AM Peak LOS	Change No Build to Build PM Peak Delay	Change No Build to Build PM Peak LOS
Elden St / Monroe St	27.2	C	34.1	C	30.9	C	36.9	D	+3.7	-	+2.8	C→D
Elden St / Van Buren St	31.2	C	36.7	D	33.6	C	40.2	D	+2.4	-	+3.5	-
Van Buren St / Spring St	16.8	B	40.8	D	17.6	B	28.2	C	+0.8	-	-12.6	D→C
Van Buren St / Herndon Pkwy	30.5	C	44.4	D	37.4	D	47.0	D	+6.9	C→D	+2.6	-
Van Buren St / Alabama Dr	16.1	B	33.4	C	19.9	B	50.9	D	+3.8	-	+17.5	C→D
Van Buren St / Worldgate Dr	23.8	C	27.7	C	24.5	C	33.0	C	+0.7	-	+5.3	-
Herndon Pkwy / Worldgate Dr	25.2	C	22.0	C	38.3	D	31.1	C	+13.1	C→D	+9.1	-
Herndon Pkwy / Exchange Pl	11.0	B	15.8	B	17.2	B	19.5	B	+6.2	-	+3.7	-
Herndon Pkwy / Fairbrook Dr	14.2	B	19.9	B	38.9	D	46.5	D	+24.7	B→D	+26.6	B→D
Spring St / Herndon Pkwy	51.5	D	59.1	E	56.0	E	65.3	E	+4.5	D→E	+6.2	-
Spring St / FCP Ramps	22.1	C	25.8	C	42.6	D	42.7	D	+20.5	C→D	+16.9	C→D

Source: Average of 7 AM and 20 PM Peak Hour VISSIM simulation runs.
1 All study intersections are signalized in the No Build and Build scenario.

Table 14 Build Scenario 3 "LOS F" Turning Movements

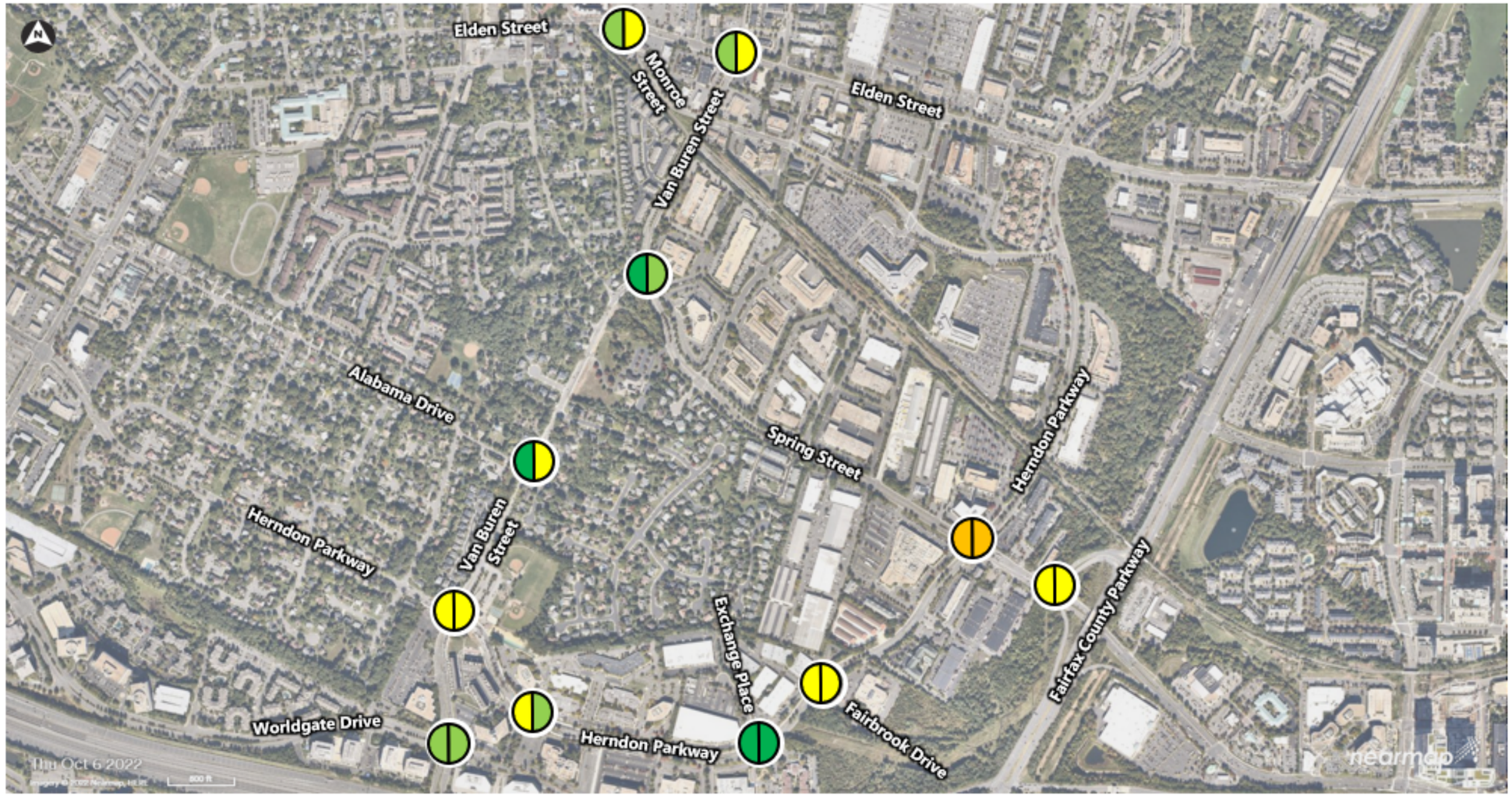
Turning Movement	Peak	LOS F in No Build?	Source of Congestion
Herndon Pkwy / Spring Street			
Eastbound Left	AM/PM	No	*Heavy Demand*
Eastbound Thru/Right	PM	No	
Spring St / Fairfax County Parkway Ramps / Fairbrook Dr			
Eastbound Left	PM	No	*Heavy Demand, "Interim" Intersection Modifications*
Westbound Left	AM	No	
Northbound Left/Thru	AM	No	
Southbound Left	AM/PM	No	
Van Buren St / Herndon Pkwy			*Capacity limitations at Van Buren St / Herndon Pkwy*
Northbound Left	PM	Yes	
Van Buren St / Alabama Drive			
All Alabama Drive	PM	Yes	
Herndon Parkway / Fairbrook Drive			*Demand, # of Lanes*
Eastbound Left/Thru	AM/PM	No	

Source: Average of 7 AM and 20 PM Peak Hour VISSIM simulation runs.

Congestion "heat" maps for each of the Build Scenario Three peak hours are shown in **Figures 32 and 33**. These represent the average vehicle speeds present in different lanes and segments of the model. Slower vehicle speeds (shown in shades of red) represent areas of higher congestion and vehicle queuing, whereas higher vehicle speeds (shown in shades of green) represent areas of lower congestion and vehicle queueing. In both peak hours, the heaviest areas of congestion are the Spring Street corridor from Herndon Parkway to Fairfax County Parkway, Fairbrook Drive, and the three intersections at the junctions of Van Buren Street, Worldgate Drive, and Herndon Parkway. In the PM peak hour, southbound Van Buren Street and westbound Herndon Parkway experience a significant amount of congestion; albeit the Herndon Parkway congestion is less severe than that in Build Scenario 2.

Appendix B documents the delay, LOS, and vehicle queueing for all of the movements at each of the eleven study intersections.

Figure 31 Build Scenario 3 (Metro Center) 2045 Intersection Level of Service



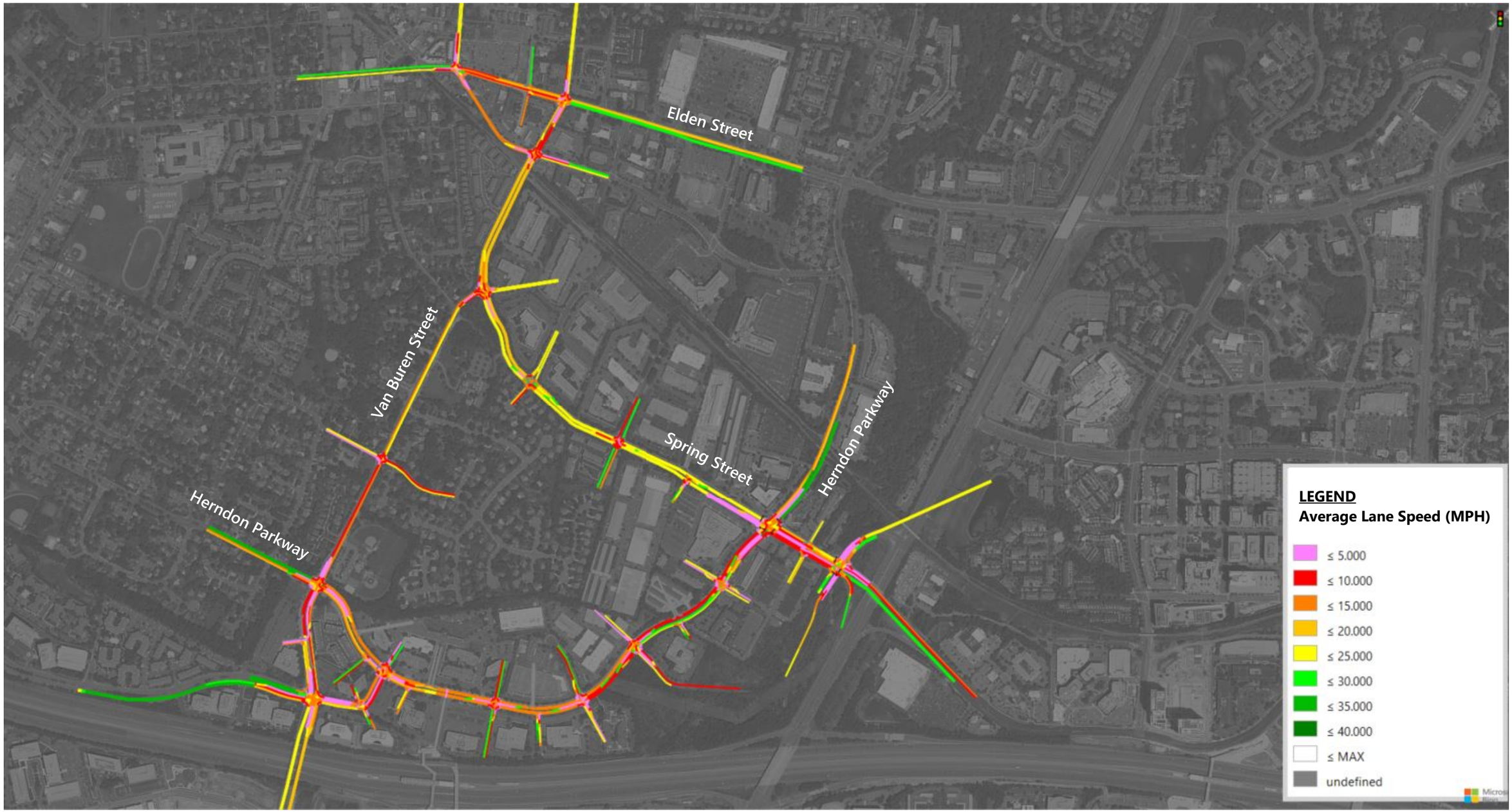
Source: Average of 7 AM Peak Hour and 20 PM Peak Hour VISSIM simulation runs. Aerial imagery from NearMap.

Figure 32 Build Scenario 3 (Metro Center) 2045 Congestion Heat Map – AM Peak Hour



Source: Average of 7 AM Peak Hour VISSIM simulation runs.

Figure 33 Build Scenario 3 (Metro Center) 2045 Congestion Heat Map – PM Peak Hour



Source: Average of 20 PM Peak Hour VISSIM simulation runs.

4.5 Comparison of Three Build Scenarios

The three preliminary TRG development scenarios all seek to redevelop the TRG into a mixed-use, multimodal community. Each scenario has distinct characteristics related to land use pattern, transportation connectivity, and traffic impacts.

4.5.1 Development Characteristics and Connectivity

Each development scenario has a different range of land use composition, location of proposed density within the TRG, and transportation connectivity. **Table 15** shows the ranking of these characteristics per Build Scenario. Land use composition influences the directionality of TRG traffic in each peak hour. Density location impacts the origin and destination of traffic and how distributed those access points are located. Connectivity affects the number of routes for traffic to access their origin and destination.

Table 15 Comparison of Build Scenarios

	Neighborhood Clusters	Two Centers	Metro Center
Land Use	Residential Heavy	Mixed	Office Heavy
Density Location	Distributed	Metro and Sunset Park	Metro
Connectivity	Middle	Lowest	Highest

4.5.2 Traffic Volumes

The different land use compositions and densities impact the quantity of projected vehicle traffic on the roadway network. Overall, the Neighborhood Clusters Scenario is anticipated to generate the least amount of new vehicle traffic, followed by the Two Centers Scenario and then by the Metro Center Scenario. The Two Centers Scenario generates a roughly equal quantity of entering and exiting traffic volume in each peak hour, while the Neighborhood Clusters Scenario generates more entering traffic in the AM peak hour and exiting traffic in the PM peak hour, and the Metro Center Scenario generates the reverse of this condition. **Table 16** summarizes the projected new vehicle traffic from each Build Scenario.

Table 16 Comparison of Build Scenario Trip Generation

		Neighborhood Clusters	Two Centers	Metro Center
AM Peak Hour	Total	2,264	2,499	2,594
	Enter	1,035	1,235	1,288
	Exit	1,229	1,264	1,306
PM Peak Hour	Total	2,271	2,444	2,538
	Enter	1,204	1,234	1,262
	Exit	1,067	1,209	1,276
Weekday Total	Total	27,241	28,522	29,272
	Enter	13,621	14,261	14,636
	Exit	13,621	14,261	14,636

Although the Metro Center Scenario generates the most overall vehicle traffic on the roadway, the Two Centers Scenario actually generates the most vehicle traffic on Herndon Parkway due to its transportation connectivity limitations.

4.5.3 Traffic Impacts

In all three Build scenarios, the Spring Street / Fairfax County Parkway / Fairbrook Drive intersection experiences increased congestion levels due to the expanded intersection design, not necessarily the new TRG traffic volume. The Neighborhood Clusters Scenario has the least relative traffic impact compared to No Build 2045 conditions, followed by the Metro Center Scenario and then the Two Centers Scenario, which has the most traffic impact. The Two Centers Scenario experiences over-capacity conditions on Herndon Parkway during the PM peak hour. **Table 17** documents the relative traffic impact of each Build scenario in comparison to No Build 2045 conditions. As noted, all three Build scenarios contain LOS E in both peak hours at the Spring Street / Herndon Parkway intersection, which is a violation of the Town's existing LOS standard of LOS D or better. While the PM peak also operates at LOS E in the No Build scenario, the AM peak operating at LOS E is new in the Build scenarios, albeit the actual delay increases that trigger the LOS change are only approximately five seconds. Despite the violation of the existing Town LOS standard, the traffic operations are manageable in an urban condition, particularly when accompanied by transportation mitigation measures that are documented later in this report.

Table 17 Comparison of Intersection Delay and LOS: No Build 2045 to All Three Build 2045 Scenarios

	No Build 2045				Change No Build to Build 1				Change No Build to Build 2				Change No Build to Build 3			
	AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak	
Intersection [1]	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Elden St / Monroe St	27.2	C	34.1	C	-0.2	-	+4.6	C→D	+3.2	-	+2.2	C→D	+3.7	-	+2.8	C→D
Elden St / Van Buren St	31.2	C	36.7	D	+3.5	-	+1.0	-	+2.2	-	+2.8	-	+2.4	-	+3.5	-
Van Buren St / Spring St	16.8	B	40.8	D	+0.6	-	-12.4	D→C	+0.8	-	-13.0	D→C	+0.8	-	-12.6	D→C
Van Buren St / Herndon Pkwy	30.5	C	44.4	D	+5.6	C→D	+6.0	-	+3.5	-	+3.7	-	+6.9	C→D	+2.6	-
Van Buren St / Alabama Dr	16.1	B	33.4	C	+5.7	B→C	-6.7	-	+5.6	B→C	+17.9	C→D	+3.8	-	+17.5	C→D
Van Buren St / Worldgate Dr	23.8	C	27.7	C	-1.1	-	-4.8	-	-0.5	-	+5.9	-	+0.7	-	+5.3	-
Herndon Pkwy / Worldgate Dr	25.2	C	22.0	C	+8.2	-	+10.2	-	+13.1	C→D	+17.5	C→D	+13.1	C→D	+9.1	-
Herndon Pkwy / Exchange Pl	11.0	B	15.8	B	+4.1	-	+1.8	-	+10.1	B→C	+23.6	B→D	+6.2	-	+3.7	-
Herndon Pkwy / Fairbrook Dr	14.2	B	19.9	B	+3.1	-	+0.7	B→C	+3.1	-	+26.9	B→D	+24.7	B→D	+26.6	B→D
Spring St / Herndon Pkwy	51.5	D	59.1	E	+4.4	D→E	-3.4	-	+5.7	D→E	+16.9	-	+4.5	D→E	+6.2	-
Spring St / FCP Ramps	22.1	C	25.8	C	+19.5	C→D	+13.1	C→D	+20.4	C→D	+20.8	C→D	+20.5	C→D	+16.9	C→D

Source: Average of 7 AM and 20 PM Peak Hour VISSIM simulation runs.
1 All study intersections are signalized in the No Build and Build scenarios.

5

Preferred Build 2045 Scenario with Fairbrook Drive Extension: Traffic Conditions

This section of the report documents the assumptions and findings for the traffic analysis of the Preferred Build 2045 Scenario with Fairbrook Drive extension. These results are compared to No Build 2045 conditions to conclude that multiple intersections do not meet the Town's LOS standard; however, modeling results indicate that the roadway network can accommodate the increased demand based on the progression of traffic.

5.1 Preferred Build 2045 Scenario Model Assumptions

In June 2023, the SOM team presented the three Build Scenarios to the Town of Herndon Planning Commission. Based on received feedback, the SOM team developed a new Preferred Build Scenario that incorporated the most desired design elements and development characteristics. The completed transportation analysis also informed the development of the Preferred Scenario; for example, the analysis indicated the importance of transportation connectivity via the provision of a parallel, alternate route to Herndon Parkway.

The Preferred Scenario provides this parallel route north/west of Herndon Parkway, between the Worldgate Drive extension and Spring Street (west of Herndon Parkway). The development divides office development between the Metro Station and the northwest quadrant of Spring Street / Herndon Parkway, distributes residential development throughout the TRG, and focuses new retail development near Sunset Business Park.

The transportation analysis of the Preferred Build 2045 Scenario was completed under the same assumptions and methodology procedures as the initial three Build 2045 Scenarios. The external roadway network and intersection control are identical and traffic volumes for the Preferred Build were developed using the same methodology.

5.2 Preferred Build 2045 Scenario

Consistent with previous scenario traffic analysis, the Preferred Build model was run under the same conditions (i.e., length of individual simulation run and number of averaged simulation runs). The same traffic operations metrics were also collected to evaluate the change in system performance between No Build 2045 and Preferred Build 2045 Scenario conditions.

5.2.1 Trip Generation

Table 18 documents the trip generation calculations for the Preferred Build 2045 Scenario. Table 14 shows that after the appropriate trip reductions, the new TRG development at full buildout is expected to generate approximately 3,100 AM Peak Hour trips, 3,100 PM Peak Hour trips, and 33,500 weekday trips.

These new TRG trips replace the existing trips associated with existing development within the TRG. Comparing the anticipated Preferred Build trip generation to the trip generation of the three initial Build scenarios, the Preferred Build has the highest total trip projection. The Preferred Build Scenario has the lowest quantity of proposed residential development and the highest quantity of proposed office development. Compared to the three initial Build scenarios, this combination increases the percentage of entering traffic in the AM peak hour and exiting traffic in the PM peak hour.

Table 18 TRG Preferred Build Scenario, Full Buildout, Site Trip Generation

Land Use Type	Independent Variable	Independent Variable Unit	ITE Code	ITE Land Use	AM Peak Hour (7-9 AM)			PM Peak Hour (4-6 PM)			Weekday Total		
					Trips	Enter	Exit	Trips	Enter	Exit	Trips	Enter	Exit
Residential													
Multifamily	2,369	Dwelling Units	221	Multifamily Housing (Mid-Rise)	1,031	237	794	924	564	360	11,254	5,627	5,627
Townhomes	418	Dwelling Units	215	Single-Family Attached Housing	212	53	159	247	146	101	3,135	1,567	1,567
Residential Subtotal	2,787	Dwelling Units			**1,242**	**290**	**952**	**1,171**	**709**	**462**	**14,388**	**7,194**	**7,194**
Hospitality													
Hotel	463	Rooms	310	Hotel	224	125	99	315	161	154	4,595	2,298	2,298
Office													
Corporate Office	641,700	SF	710	General Office Building	828	729	99	777	132	645	5,848	2,924	2,924
Creative Office	547,700	SF	710	General Office Building	723	636	87	681	116	565	5,095	2,547	2,547
Office Subtotal	1,189,400	SF			**1,551**	**1,365**	**186**	**1,458**	**248**	**1,210**	**10,942**	**5,471**	**5,471**
Retail													
Grocery	63,600	SF	850	Supermarket	182	107	75	536	268	268	5,843	2,921	2,921
Restaurant	155,300	SF	932	High-Turnover Restaurant	1,405	857	548	1,486	817	669	16,648	8,324	8,324
Fitness Center	74,400	SF	495	Recreational Community Center	142	94	48	215	101	114	2,087	1,043	1,043
Retail Subtotal	293,300	SF			**1,729**	**1,058**	**671**	**2,237**	**1,186**	**1,051**	**24,578**	**12,289**	**12,289**
All Land Uses Total (Base Trip Generation)													
Transit Mode Split Reduction	25%				-1,187	-710	-477	-1,295	-576	-719	-13,626	-6,813	-6,813
Vehicle Trips					**3,560**	**2,129**	**1,431**	**3,885**	**1,728**	**2,157**	**40,878**	**20,439**	**20,439**
Pass-By Reduction Grocery	24%	PM. AM = ½ of PM. Weekday = average.			-16	-10	-7	-96	-48	-48	-789	-394	-394
Pass-By Reduction Restaurant	43%	PM. AM = ½ of PM. Weekday = average.			-227	-138	-88	-479	-264	-216	-4,027	-2,013	-2,013
New Vehicle Trips on Roadway Network					**3,317**	**1,981**	**1,336**	**3,310**	**1,416**	**1,893**	**36,062**	**18,031**	**18,031**
Internal Capture	7%				-232	-139	-94	-232	-99	-133	-2,524	-1,262	-1,262
Net New Vehicle Trips on External Roadway Network					**3,085**	**1,842**	**1,242**	**3,078**	**1,317**	**1,761**	**33,538**	**16,769**	**16,769**

Source: Institute of Transportation Engineer's *Trip Generation Manual, 11th Edition*. Utilized "suburban" trip generation rates as decision was made with Town of Herndon to apply a consistent methodology to prior studies in the TRG, which utilized suburban base trip generation and then applied significant transit and internal capture reductions. An "urban" trip generation rate would not be compatible with this approach as it already accounts for these types of trip reductions.

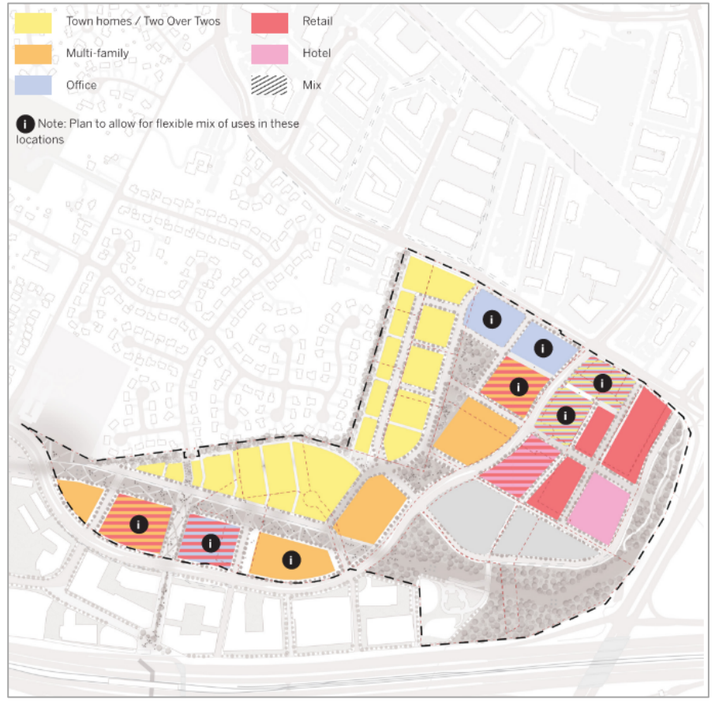
5.2.2 Transportation Connectivity

The Preferred Build Scenario includes a new roadway connection parallel to Herndon Parkway, as shown in **Figure 34** north of Herndon Parkway. This connection, in addition to the grid of streets proposed, will provide TRG traffic with viable alternatives to Herndon Parkway. The No Build traffic analysis indicated that the two termini intersections on Herndon Parkway were traffic choke points; the introduction of additional street connections to Spring Street will partially relieve that traffic pressure.

Consistent with the analysis of the three Build Scenarios, the Preferred Build traffic analysis assumes that the new Spring Street intersection with the alternate route roadway will be unsignalized. If signalization of this intersection is identified as a potential transportation improvement, more traffic would be capable of utilizing the alternate route – in the unsignalized condition, the capacity of the intersection to facilitate left turn movements is limited.

Figure 35 displays the traffic volume dataset that was analyzed at the study intersections in the Preferred Build 2045 traffic model. The TRG traffic volumes were distributed throughout the TRG land area by subdividing the TRG into multiple zones of development density. In the Preferred Build, the proposed office density is split between the Metro Station and northwest quadrant of the Spring Street / Herndon Parkway intersection, the proposed residential density is distributed throughout the TRG, and the proposed retail density is concentrated near the Herndon Parkway / Spring Street intersection. This density distribution disperses the new development traffic throughout the TRG. **Figure 36** displays just the new site trips associated with the Preferred Build Scenario, while **Figure 37** displays just the pass-by site trips associated with the Preferred Build Scenario. **Appendix A** shows these three sets of traffic volumes for all intersections within the traffic model, including non-study intersections.

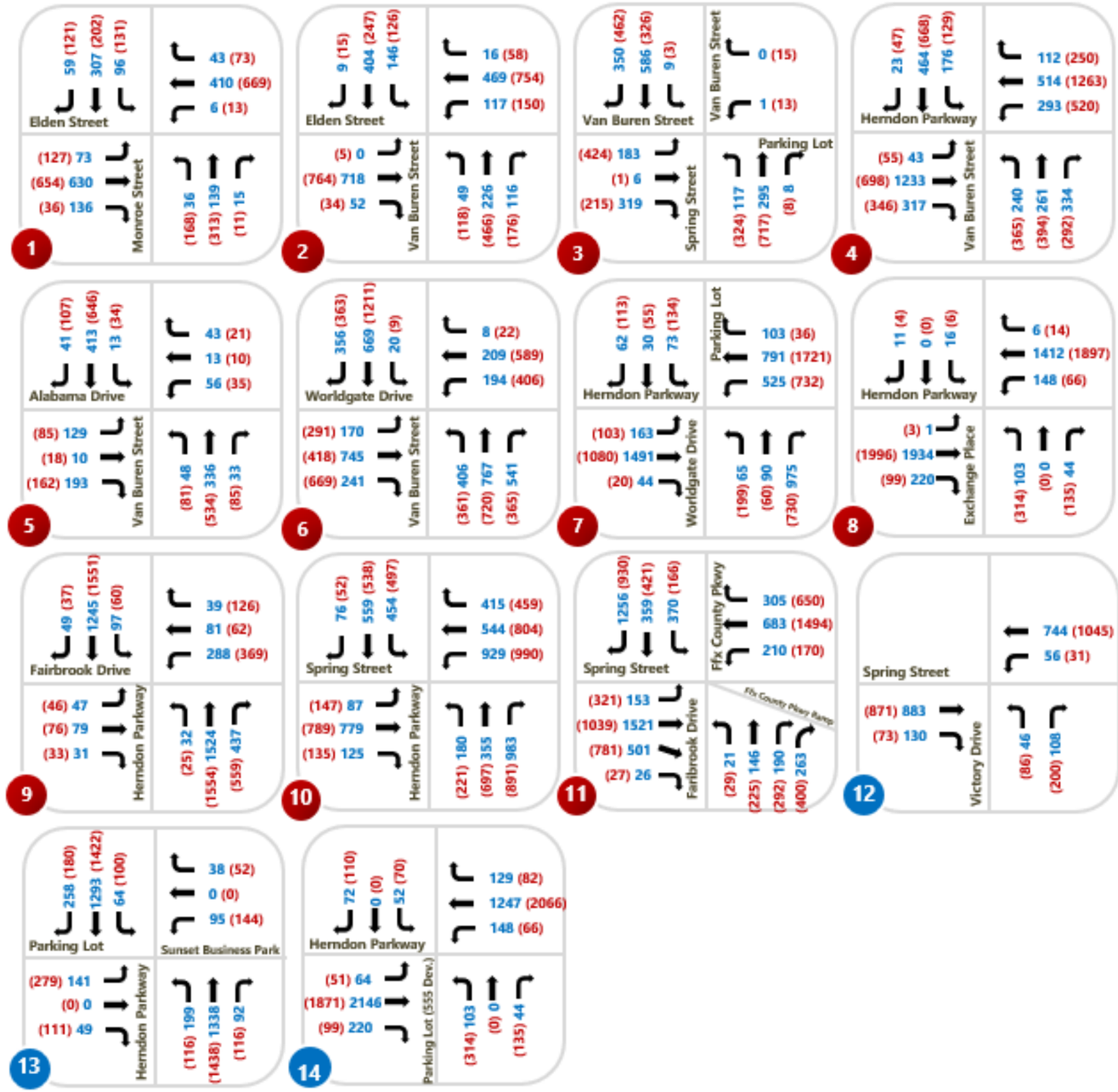
Figure 34 Preferred Scenario Development Plan



Source: SOM TRG graphics.

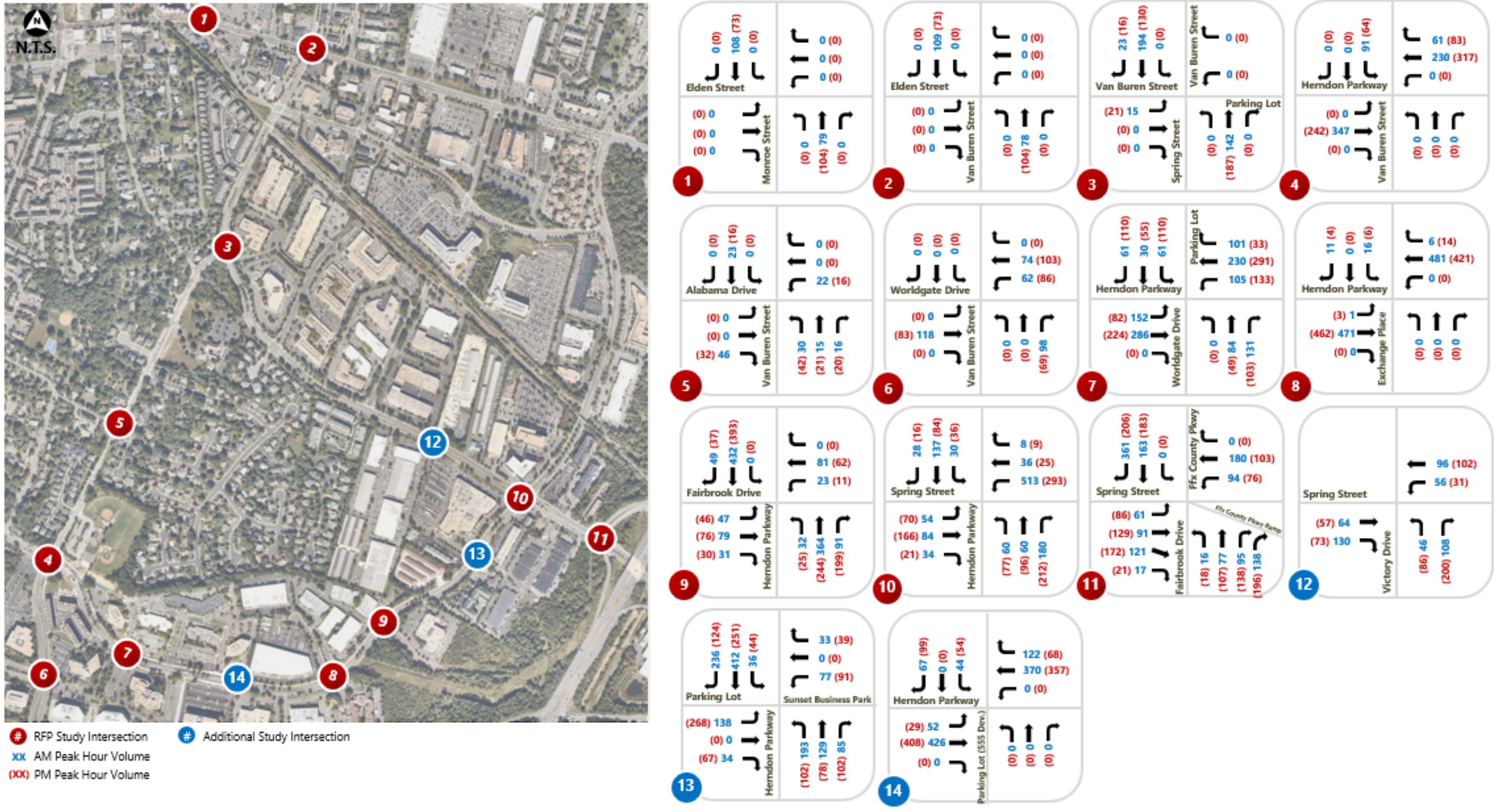
Figure 35 Preferred Build Scenario 2045 Traffic Volumes





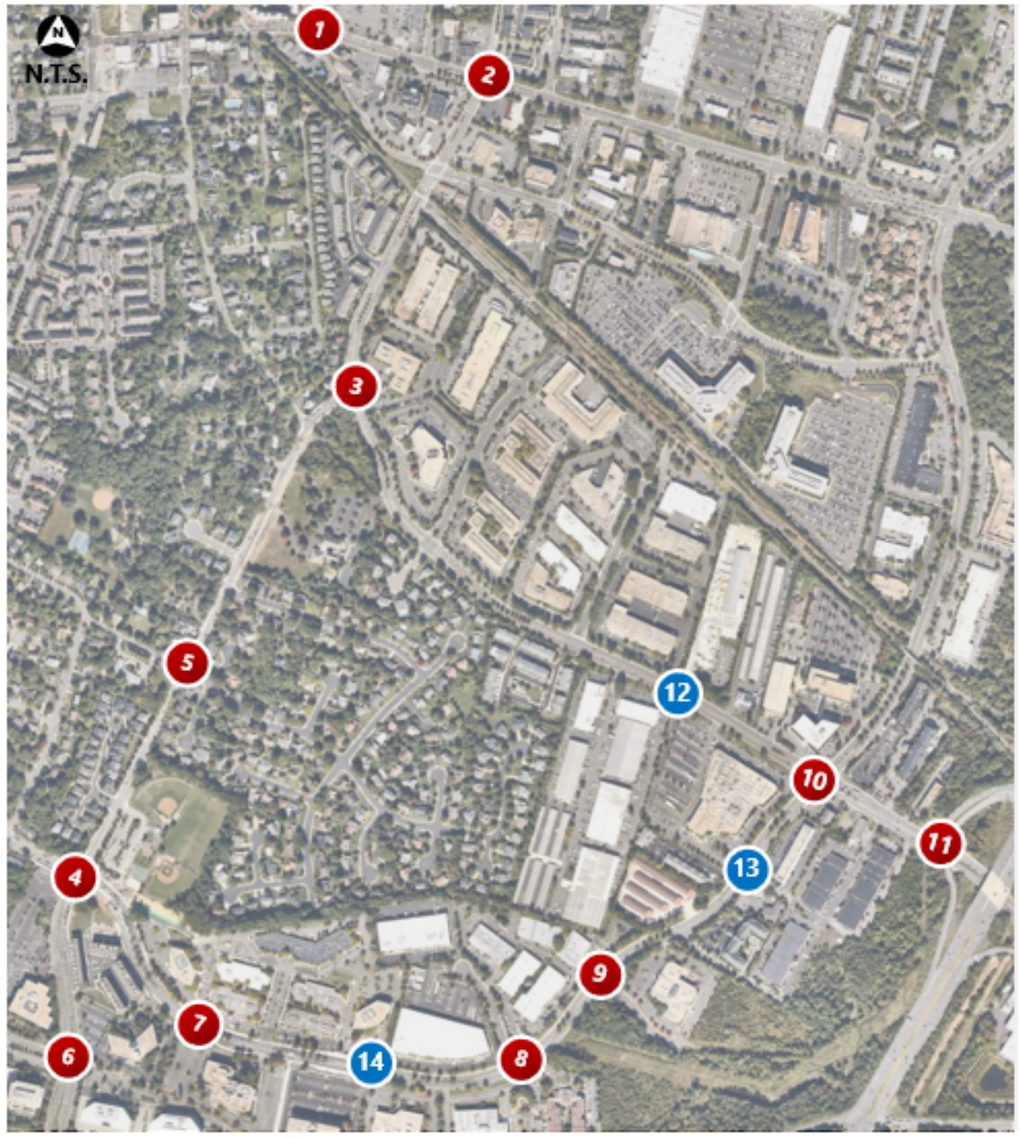
Build 2045 traffic volumes include No Build 2045 traffic volumes (Figure 6), removal of existing TRG area traffic volumes, volume shift to account for the Fairbrook Drive extension, and new TRG development traffic volumes. Basemap Source: Nearmap

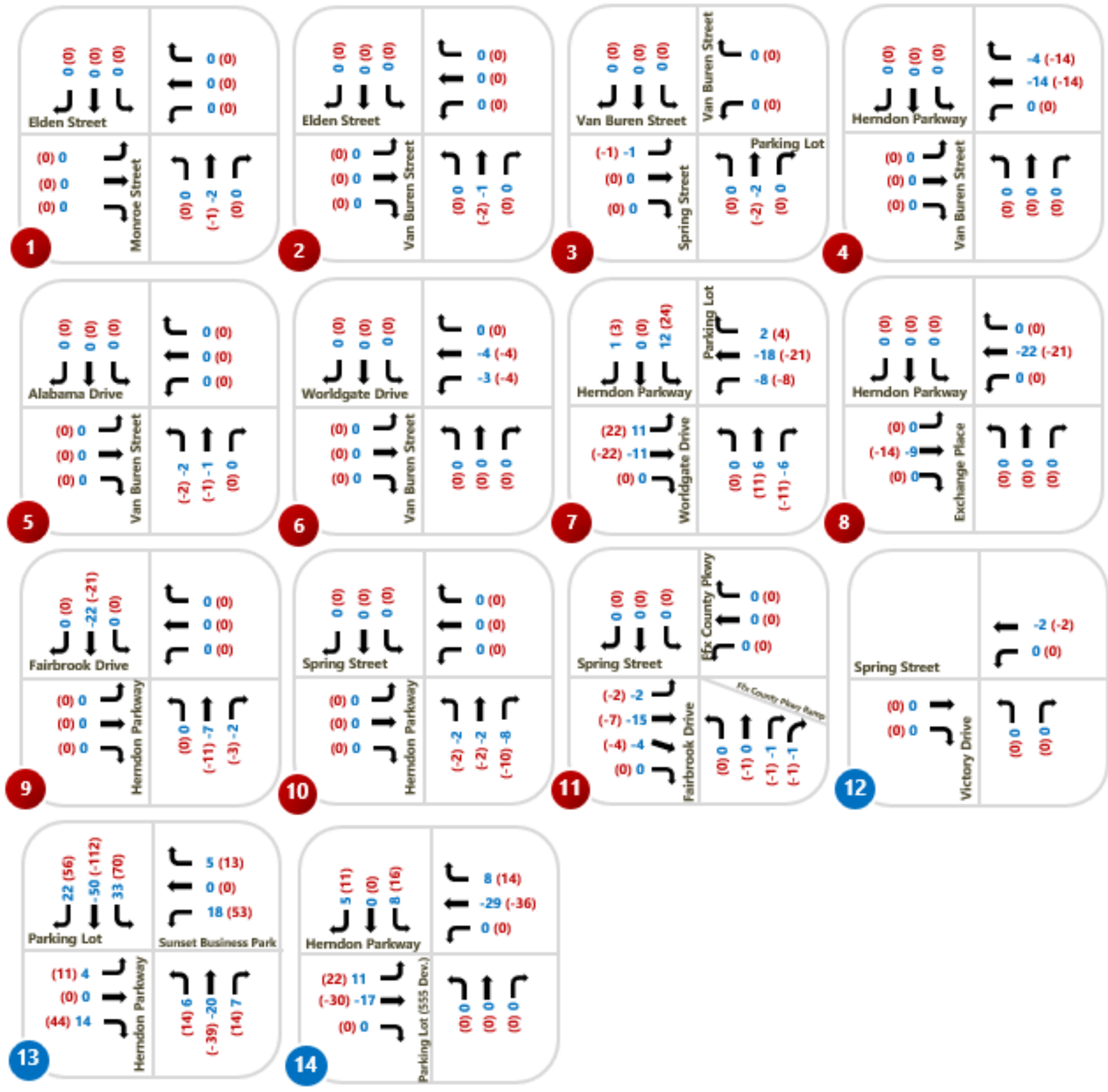
Figure 36 Preferred Build Scenario New Site Trips



Basemap Source: Nearmap

Figure 37 Preferred Build Scenario Site Pass-By Trips





Basemap Source: Nearmap

5.2.3 Traffic Analysis

In Preferred Build 2045 Scenario conditions, traffic levels are anticipated to be stressed at a few locations – resulting in several "violations" of the Town's LOS threshold; however, the general traffic condition could be considered manageable in a peak hour urban condition. **Table 19** lists the intersection delay and LOS at each of the eleven study intersections, comparing No Build 2045 to the Preferred Build Scenario. Projected intersection LOS is also shown in **Figure 38**.

All study intersections are projected to operate at LOS D or better in both peak hours, except for the Spring Street / Herndon Parkway intersection, which is anticipated to operate at LOS E in both peak hours. While LOS E does represent increased delay, modeling results indicate that the roadway network can accommodate the increased demand based on traffic progression. Many intersections in the Northern Virginia area operate at this condition during a peak hour and Fairfax County has adopted an LOS E intersection standard in several of its urban development areas.

In comparison to No Build, this is technically an increase from one intersection peak hour operating at LOS E to two intersection peak hours operating at LOS E; however, an examination of the delay values at the Herndon Parkway / Spring Street intersection reveals that the AM LOS change resulted from only four seconds of increased delay and the PM delay only increased by six seconds (remained LOS E). As previously discussed in the analysis of the initial three Build Scenarios, the expansion and reconfiguration of the Spring Street / Fairfax County Parkway / Fairbrook Drive intersection results in the largest delay increase between No Build and Build conditions of any of the 11 study intersections.

The other significant increases in projected intersection delay in the Preferred Build Scenario are the Herndon Parkway / Fairbrook Drive intersection, Herndon Parkway / Worldgate Drive intersection, the Van Buren Street / Herndon Parkway intersection (AM peak only), and the Van Buren Street / Alabama Drive intersection (PM peak only). The three Herndon Parkway intersections are still projected to operate at acceptable levels – LOS C and LOS D, respectively. The PM peak delay increase at Van Buren Street / Alabama Drive intersection is caused by increased traffic pressure on the constrained Van Buren Street / Herndon Parkway intersection, a condition previously discussed in No Build 2045 conditions.

The intersection turning movements in **Table 20** operate at LOS F in Preferred Build Scenario 2045 conditions; the existing Town of Herndon Ordinance states "no individual turning movement level of service at an intersection falls below 'LOS E'". Compared to No Build 2045 conditions, the seven "new" movements that operate at LOS F are located at the Herndon Parkway / Spring Street intersection and the Spring Street / Fairfax County Parkway Ramps / Fairbrook Drive intersection – the same as the three initial Build scenarios. For the previously stated reasons, these two Spring Street intersections should be studied further in the future as Parkway interchange planning progresses. While there was LOS F on the Van Buren Street corridor in No Build 2045 conditions, delay does increase in the Build scenario due to the increased demand on the capacity constrained Van Buren Street / Herndon Parkway intersection.

Table 19 Comparison of Intersection Delay and LOS: No Build 2045 to Preferred Build Scenario

Intersection [1]	No Build 2045				Preferred Build Scenario				Change No Build to Build			
	AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Elden St / Monroe St	27.2	C	34.1	C	32.0	C	37.8	D	+4.8	-	+3.7	C→D
Elden St / Van Buren St	31.2	C	36.7	D	35.7	D	42.8	D	+4.5	C→D	+6.1	-
Van Buren St / Spring St	16.8	B	40.8	D	17.8	B	26.9	C	+1.0	-	-13.9	D→C
Van Buren St / Herndon Pkwy	30.5	C	44.4	D	42.5	D	49.0	D	+12.0	C→D	+4.6	-
Van Buren St / Alabama Dr	16.1	B	33.4	C	19.9	B	51.5	D	+3.8	-	+18.1	C→D
Van Buren St / Worldgate Dr	23.8	C	27.7	C	22.4	C	33.3	C	-1.4	-	+5.6	-
Herndon Pkwy / Worldgate Dr	25.2	C	22.0	C	40.5	D	33.3	C	+15.3	C→D	+11.3	-
Herndon Pkwy / Exchange Pl	11.0	B	15.8	B	7.8	A	22.0	C	-3.2	B→A	+6.2	B→C
Herndon Pkwy / Fairbrook Dr	14.2	B	19.9	B	21.5	C	34.9	C	+7.3	B→C	+15.0	B→C
Spring St / Herndon Pkwy	51.5	D	59.1	E	55.9	E	65.3	E	+4.4	D→E	+6.2	-
Spring St / FCP Ramps	22.1	C	25.8	C	38.2	D	41.6	D	+16.1	C→D	+15.8	C→D

Source: Average of 7 AM and 20 PM Peak Hour VISSIM simulation runs.

1 All study intersections are signalized in the No Build and Build scenario.

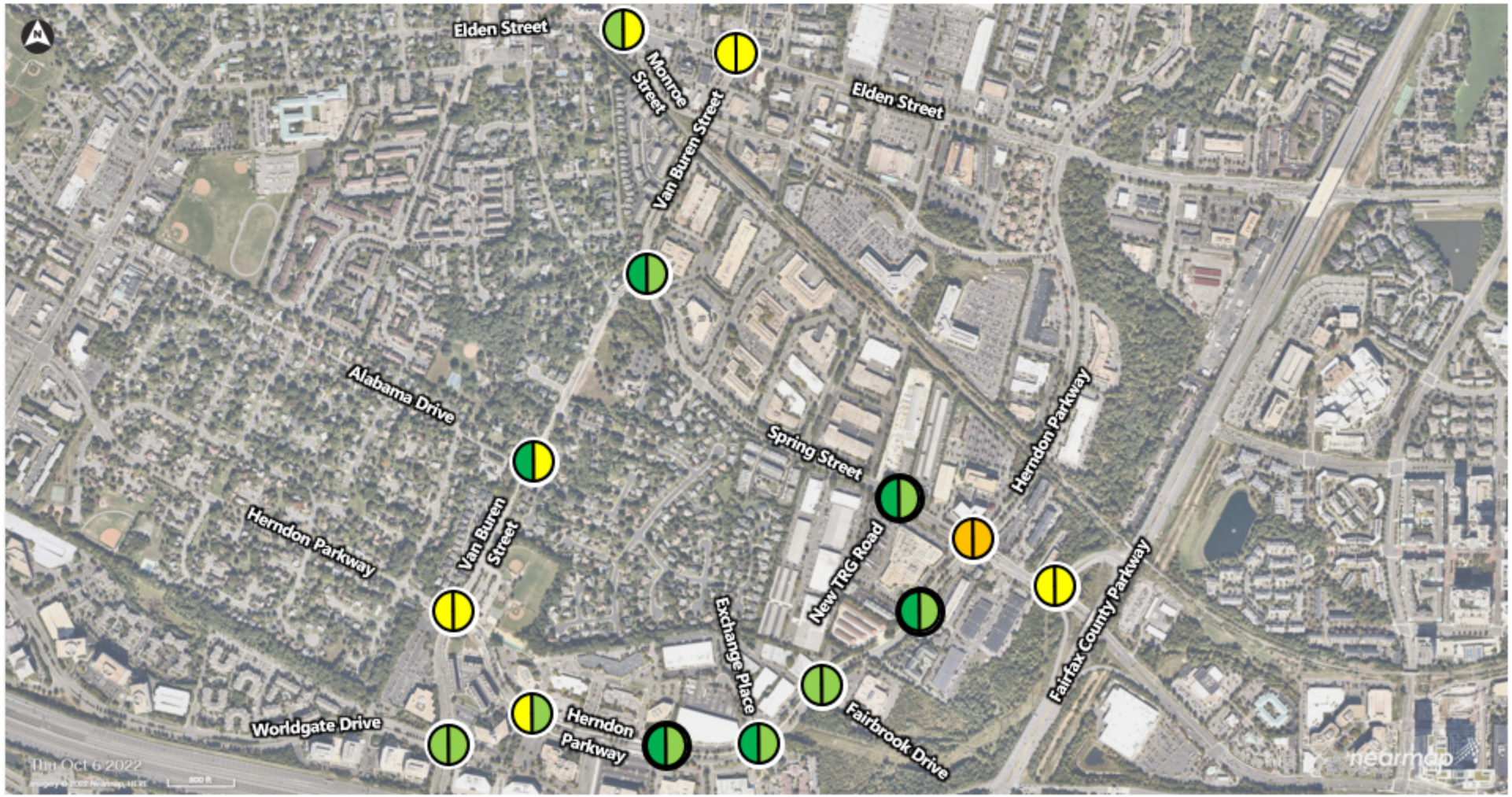
Table 20 Preferred Build "LOS F" Turning Movements

Turning Movement	Peak	LOS F in No Build?	Source of Congestion
Herndon Pkwy / Spring Street			
Eastbound Left	AM/PM	No	*Heavy Demand*
Eastbound Thru/Right	PM	No	
Southbound Left	PM	No	
Spring St / Fairfax County Parkway Ramps / Fairbrook Dr			
Westbound Left	AM	No	*"Interim" Intersection Modifications*
Northbound Left/Thru	AM/PM	No	
Van Buren Street / Worldgate Drive			*Heavy Demand*
Eastbound Left	PM	No	
Van Buren St / Herndon Pkwy			*Capacity limitations at Van Buren St / Herndon Pkwy*
Northbound Left	PM	Yes	
Van Buren St / Alabama Drive			
All Alabama Drive	PM	Yes	
Herndon Parkway / Fairbrook Drive			*Demand*
Westbound Left	PM	No	

Source: Average of 7 AM and 20 PM Peak Hour VISSIM simulation runs.

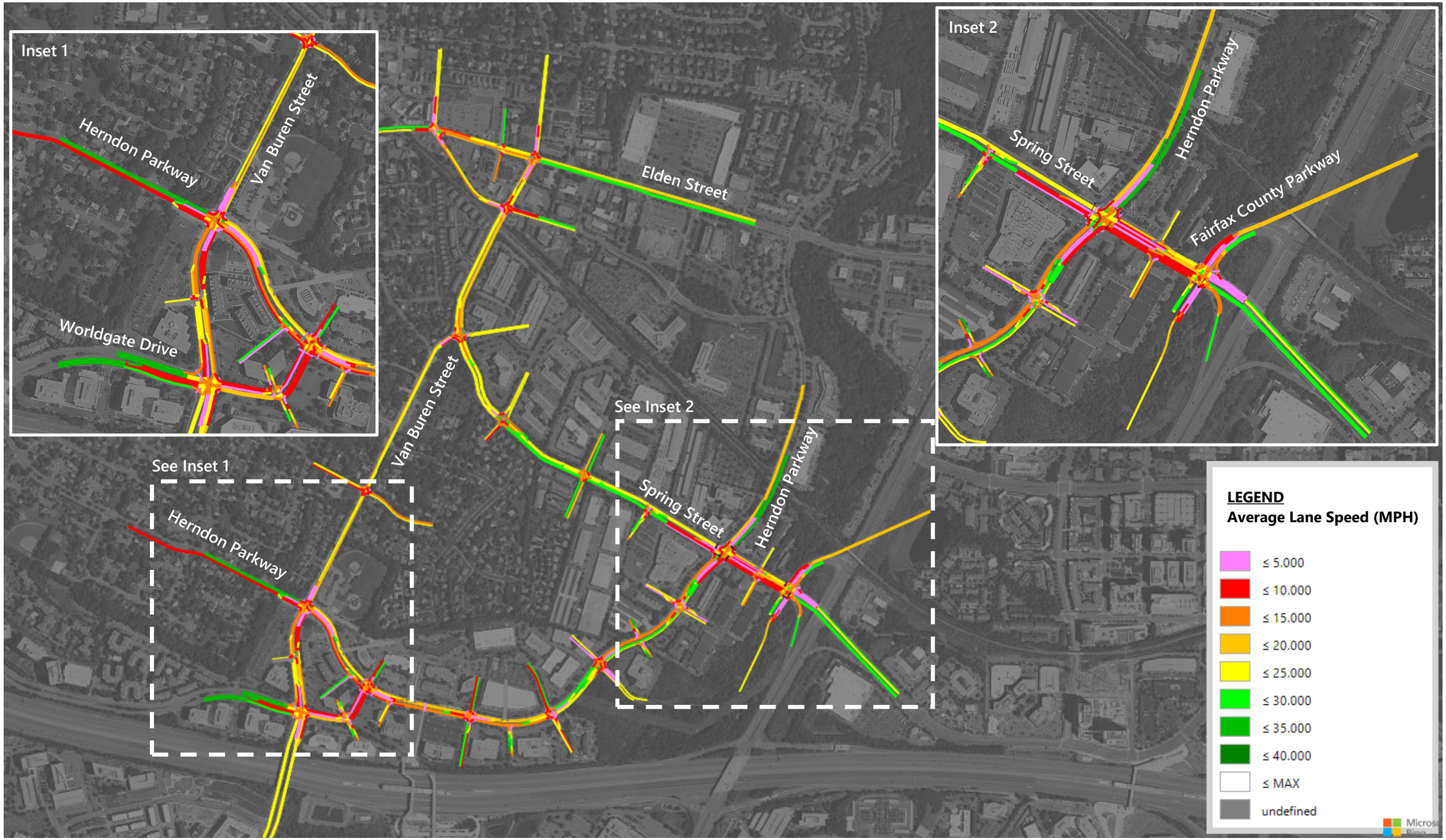
Congestion "heat" maps for the Preferred Build Scenario peak hours are shown in **Figures 39 and 40**. These represent the average vehicle speeds present in different lanes and segments of the model. Slower vehicle speeds (shown in shades of red) represent areas of higher congestion and vehicle queuing, whereas higher vehicle speeds (shown in shades of green) represent areas of lower congestion and vehicle queueing. In both peak hours, the heaviest areas of congestion are the Spring Street corridor from Herndon Parkway to Fairfax County Parkway and the three intersections at the junctions of Van Buren Street, Worldgate Drive, and Herndon Parkway. Additionally, in the PM peak hour, southbound Van Buren Street and westbound Herndon Parkway experience a significant amount of congestion; albeit the Herndon Parkway congestion is less severe than that projected in several of the initial Build Scenarios.

Figure 38 Preferred Build Scenario 2045 Intersection Level of Service



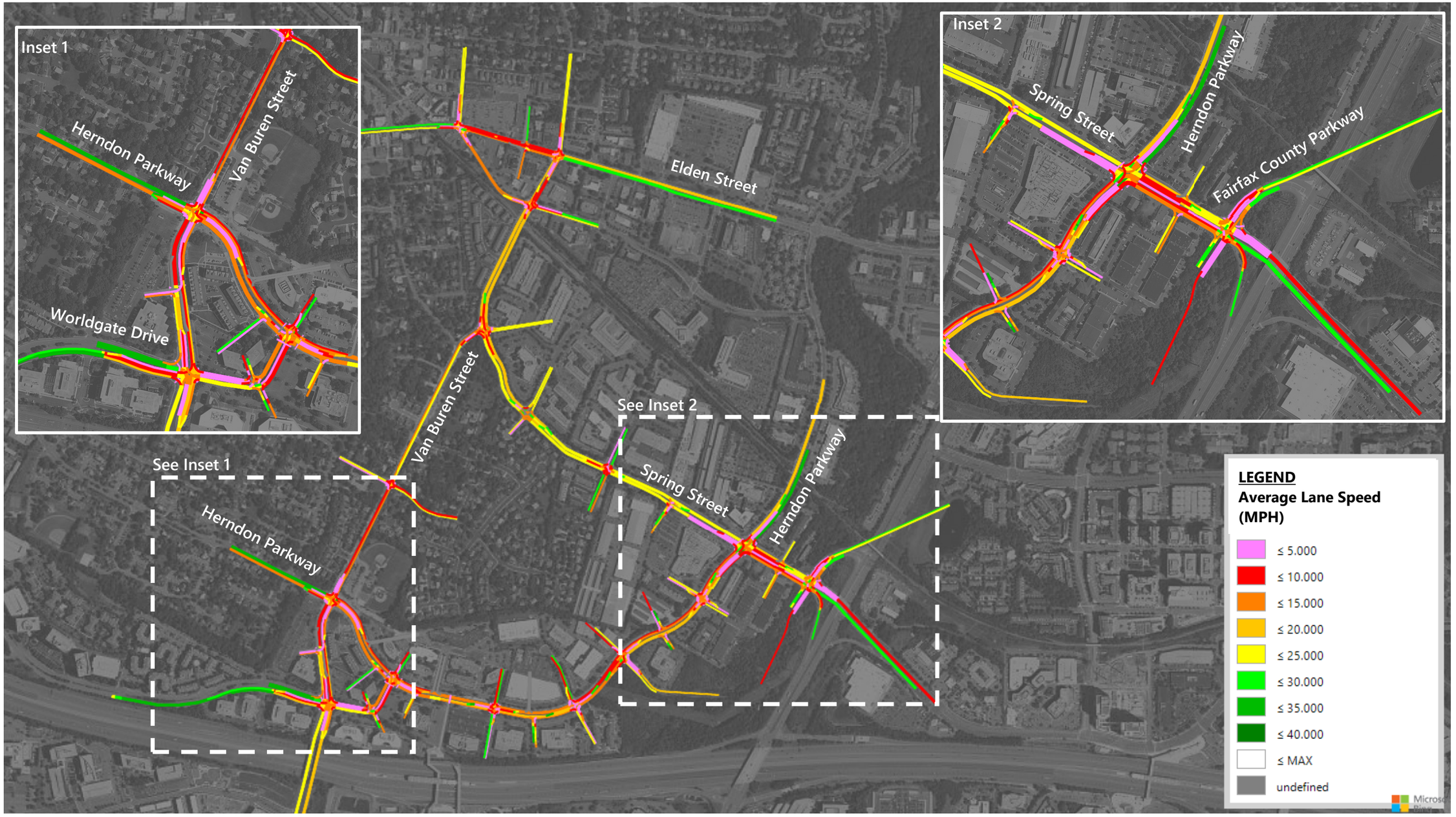
Source: Average of 7 AM Peak Hour and 20 PM Peak Hour VISSIM simulation runs. Aerial imagery from NearMap.

Figure 39 Preferred Build Scenario 2045 Congestion Heat Map – AM Peak Hour



Source: Average of 7 AM Peak Hour VISSIM simulation runs.

Figure 40 Preferred Build Scenario 2045 Congestion Heat Map – PM Peak Hour



Source: Average of 20 PM Peak Hour VISSIM simulation runs.

Projected average and maximum queue lengths for the Preferred Build Scenario are displayed in **Figures 41 and 42**. An important note regarding the maximum queue lengths is that each roadway segment's maximum queue length most likely does not temporally align (i.e., occur at the same time). Rather, this figure shows the maximum queue length on each segment of roadway during the peak hour. The accommodation of maximum queue lengths is also not the typical design objective as they are an indication of the absolute worst impact during the peak hour.

In the AM peak hour, average queue lengths are accommodated throughout the study network, including the Fairfax County Parkway off-ramp queue that is contained within the off-ramp. The maximum AM peak hour queue lengths are accommodated with a few exceptions – specifically eastbound Herndon Parkway (west of Fairbrook Drive) and the Spring Street segment at Herndon Parkway and Fairfax County Parkway. The maximum queue is projected to extend onto Fairfax County Parkway; albeit the exact extents are unknown as the traffic signal on Fairfax County Parkway was not modeled as part of this study.

In the PM peak hour, the roadway network experiences increased queueing compared to the AM peak hour. Average queue lengths are still mostly accommodated, although the southbound Van Buren Street queue at Herndon Parkway and the westbound Spring Street queue at Fairfax County Parkway are significant. Maximum queue lengths fill most of the Herndon Parkway corridor and Spring Street at Herndon Parkway and the Fairfax County Parkway. As previously mentioned, these maximum queue lengths are most likely not all occurring simultaneously, so these queue findings do not equate to gridlock conditions. Queuing also does not directly correlate to delay; for instance, many of the intersections along Herndon Parkway are projected to operate at LOS C despite this level of queuing.

These findings are fairly similar to the No Build 2045 findings; the additional TRG traffic volume impacts are largely offset by the Fairbrook Drive extension and new traffic signal at Sunset Business Park.

Appendix B documents the delay, LOS, and vehicle queueing for all of the movements at each of the eleven study intersections.

5.2.4 Potential Transportation Mitigation

Given that multiple intersections demonstrate operational deficiencies in the Preferred Build traffic analysis – as defined by the Town of Herndon's LOS standards – the Project Team explored a variety of potential mitigation measures with Town of Herndon staff.

The Build traffic analysis did not substantially alter the No Build roadway network, except where previously mentioned such as at Spring Street / Fairfax County Parkway / Fairbrook Drive. The primary candidate mitigations focus on measures to increase the capacity of the roadway network in a manner that would be compatible with the mixed-used, human-scale development envisioned for the TRG. These candidate mitigations seek to improve traffic operations to an acceptable level at the three intersections that fall short of the Town's LOS standard:

- Spring Street / Herndon Parkway (overall intersection LOS E in both peaks)
- Van Buren Street / Herndon Parkway (turning movement LOS F in PM peak)
- Van Buren Street / Alabama Drive (turning movement LOS F in PM peak)

The Project Team used macroscopic traffic tools to conduct initial screenings of a wide range of infrastructure improvements, an exercise that helped identify a set of candidate mitigations to be further modeled in VISSIM.

Table 21 lists the mitigations that were modeled VISSIM; the results of this traffic modeling are documented in the next chapter of this technical report.

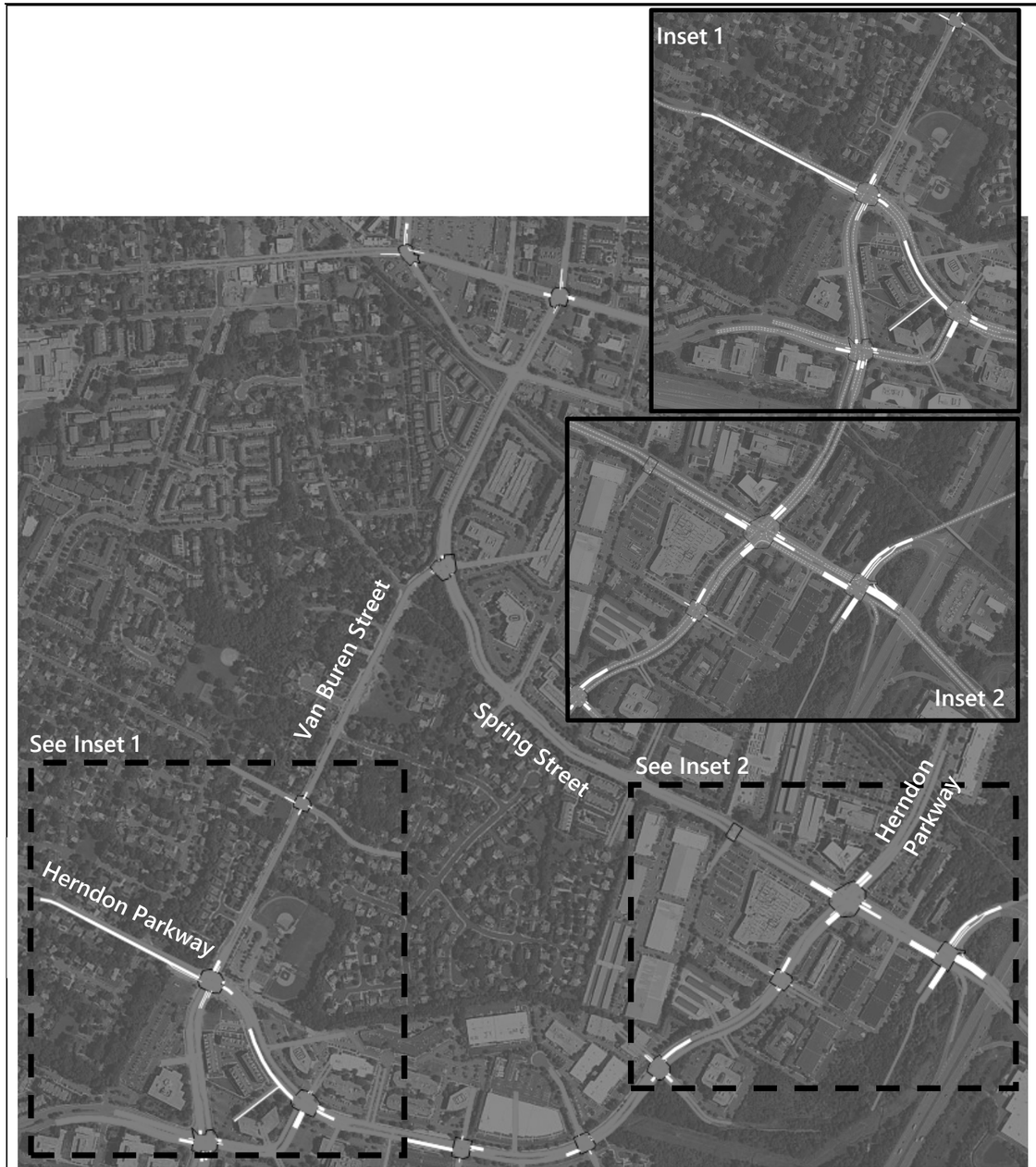
The Preferred Build traffic analysis included baseline assumptions on vehicle trips. The Town of Herndon may consider additional potential mitigation measures to reduce the amount of volume on the roadway network. Those measures could include the following:

- New or optimized active transportation facilities to encourage non-vehicle trips.
- Transportation Demand Management (TDM) strategies (e.g., transit incentives, "park once" strategies, etc.).

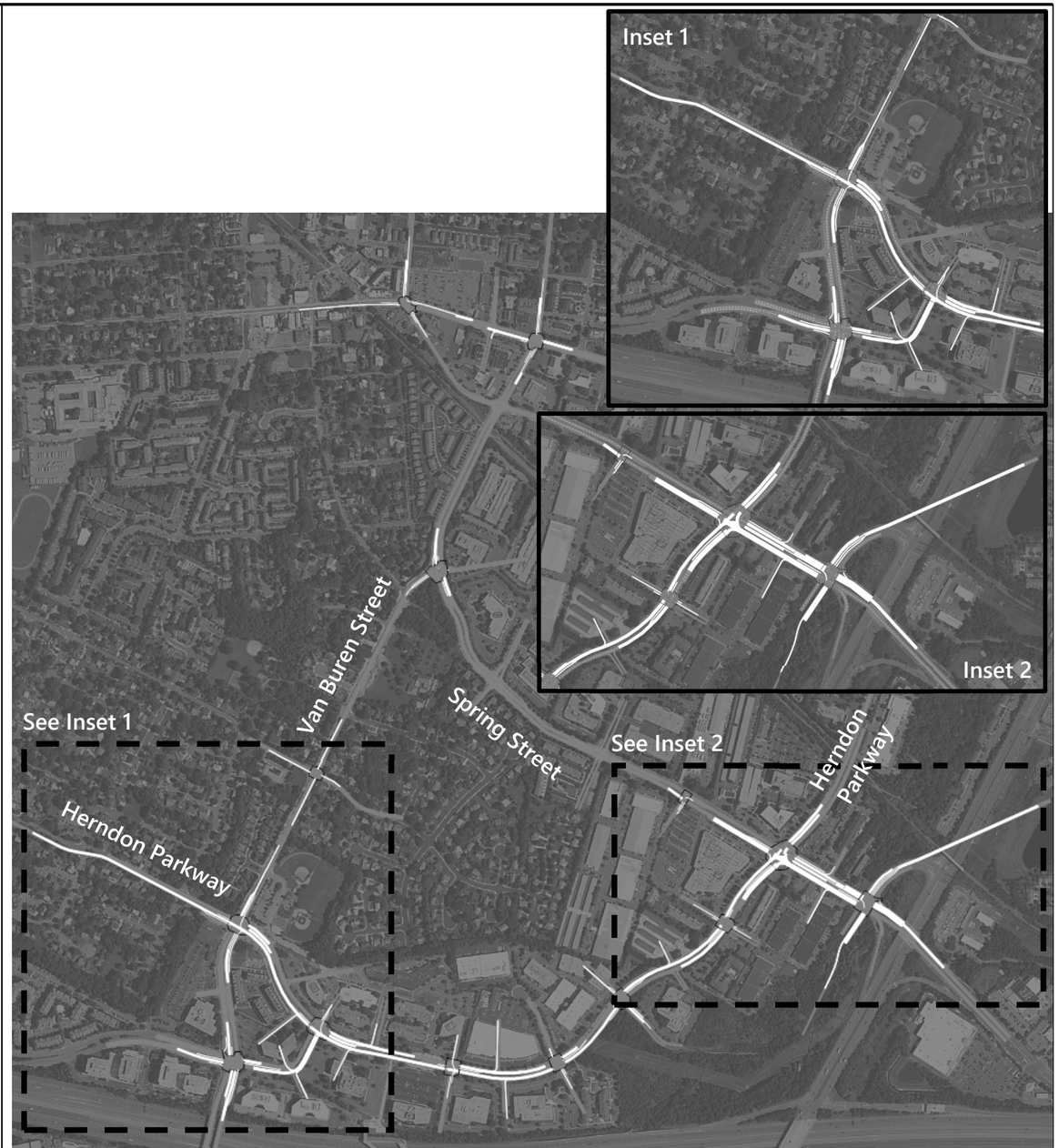
Table 21 Candidate Mitigations to be Tested in VISSIM

Intersection	Issue	Potential Solution	Notes
Herndon Parkway / Van Buren Street	Southbound Van Buren Street dual thru lanes only 150 feet in length, leading to delay	Widen southbound Van Buren Street to extend dual thru lanes	Roadway widening with right of way impacts
	Single northbound left turn lane to serve 300+ peak-hour vehicles is competing with southbound Van Buren Street for signal capacity	Dual northbound left turn lanes	Roadway widening with right of way impacts; screened out options to get dual northbound left turn lanes without widening
Spring Street / Herndon Parkway	Viability of new TRG road to relieve pressure on Herndon Parkway is limited by lack of traffic signal at Spring Street	New traffic signal at Spring Street / new TRG road with rerouted traffic from Herndon Parkway	-
	Intersection capacity constraints	Dual left turn lanes from eastbound Spring Street onto northbound Herndon Parkway	Possible roadway widening – may be accommodated within median
Spring Street / Fairbrook Drive / Fairfax County Parkway	Queue spillback on Fairfax County Pkwy off-ramp	Dual left turn lane from off-ramp	Roadway widening with right of way impacts
	Congestion on westbound Spring Street	Dual left turn from westbound Spring Street onto Fairbrook Drive	Widening likely able to be accommodated within median
	Fairbrook Drive congestion in PM Peak	Separate left turn lane from thru lane	Requires wider cross-section for new road (Fairbrook Drive extension)
Herndon Parkway / Fairbrook Drive	Fairbrook Drive congestion	Signal optimization	-

Figure 41 Preferred Build Scenario 2045 Queue Map – AM Peak Hour

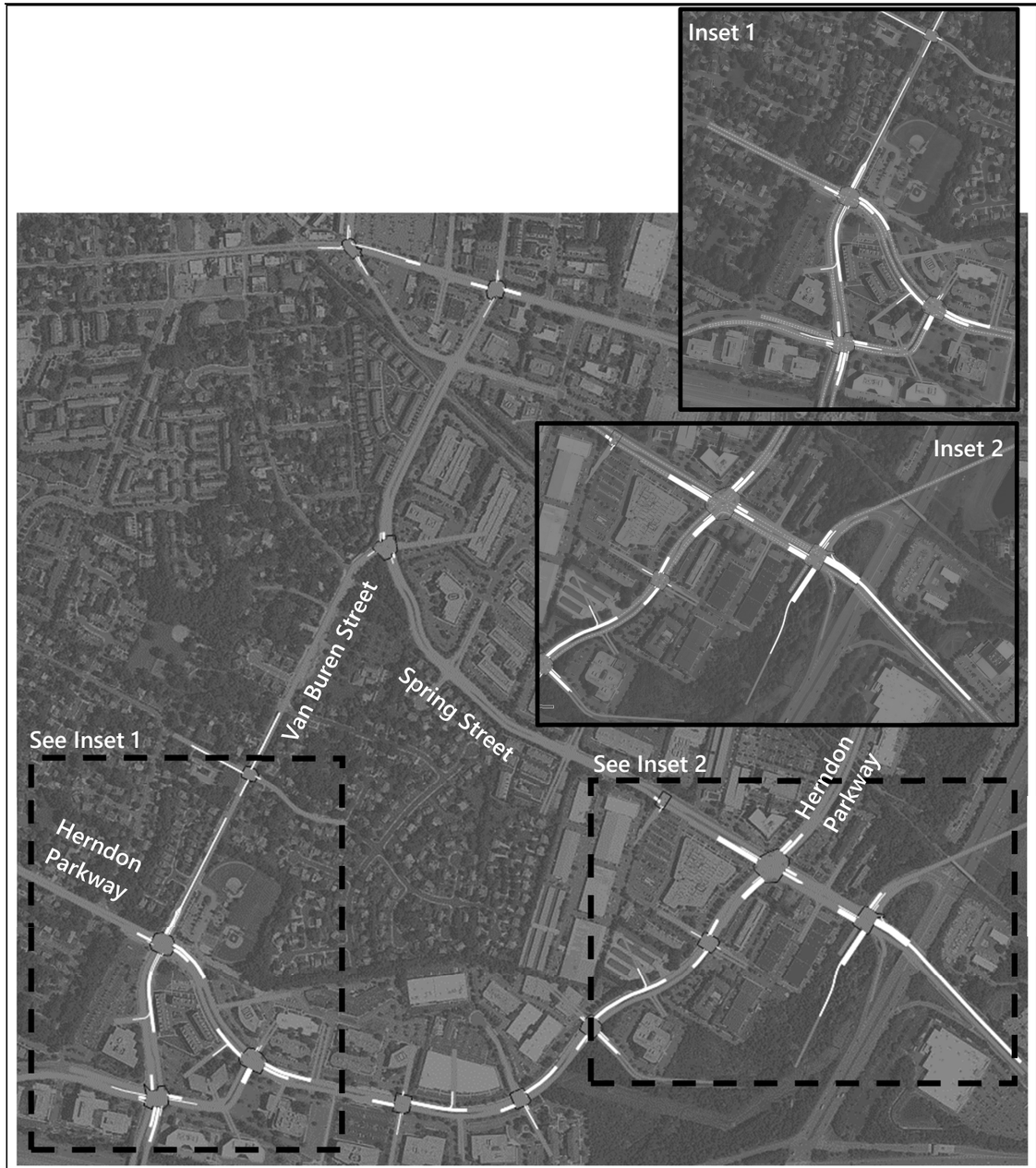


Average Queue Length

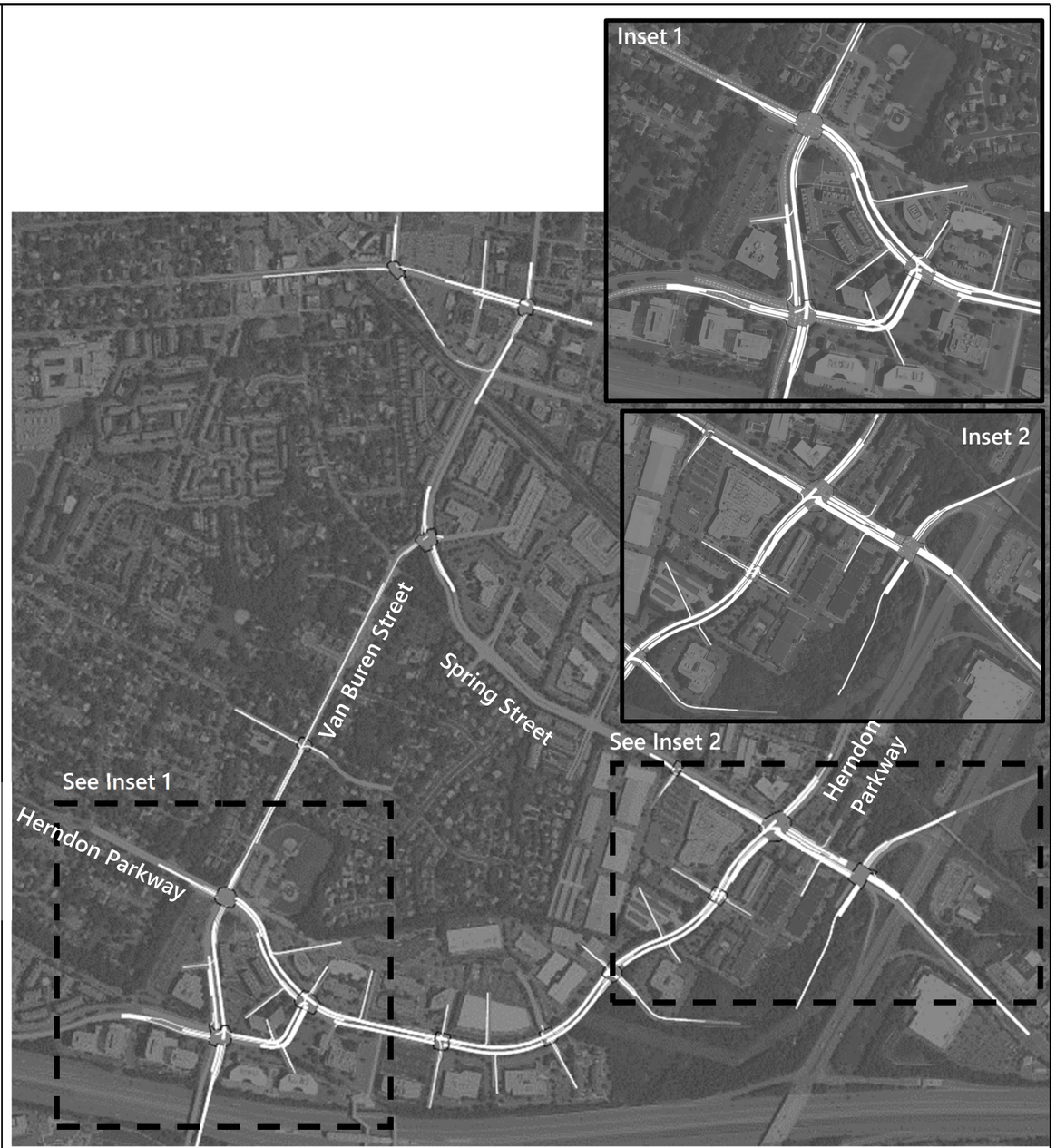


Maximum Queue Length

Figure 42 Preferred Build Scenario 2045 Queue Map – PM Peak Hour



Average Queue Length



Maximum Queue Length

6

Preferred Build 2045 Scenario with Fairbrook Drive Extension and Additional Transportation Mitigation Measures: Traffic Conditions

This section of the report documents the assumptions and findings for the traffic analysis of the Preferred Build 2045 Scenario with Fairbrook Drive extension and additional transportation mitigation measures. The traffic levels of this scenario are compared to the Preferred Build 2045 Scenario without additional transportation mitigation to assess which mitigation is recommended for implementation.

6.1 Mitigation Roadway Network

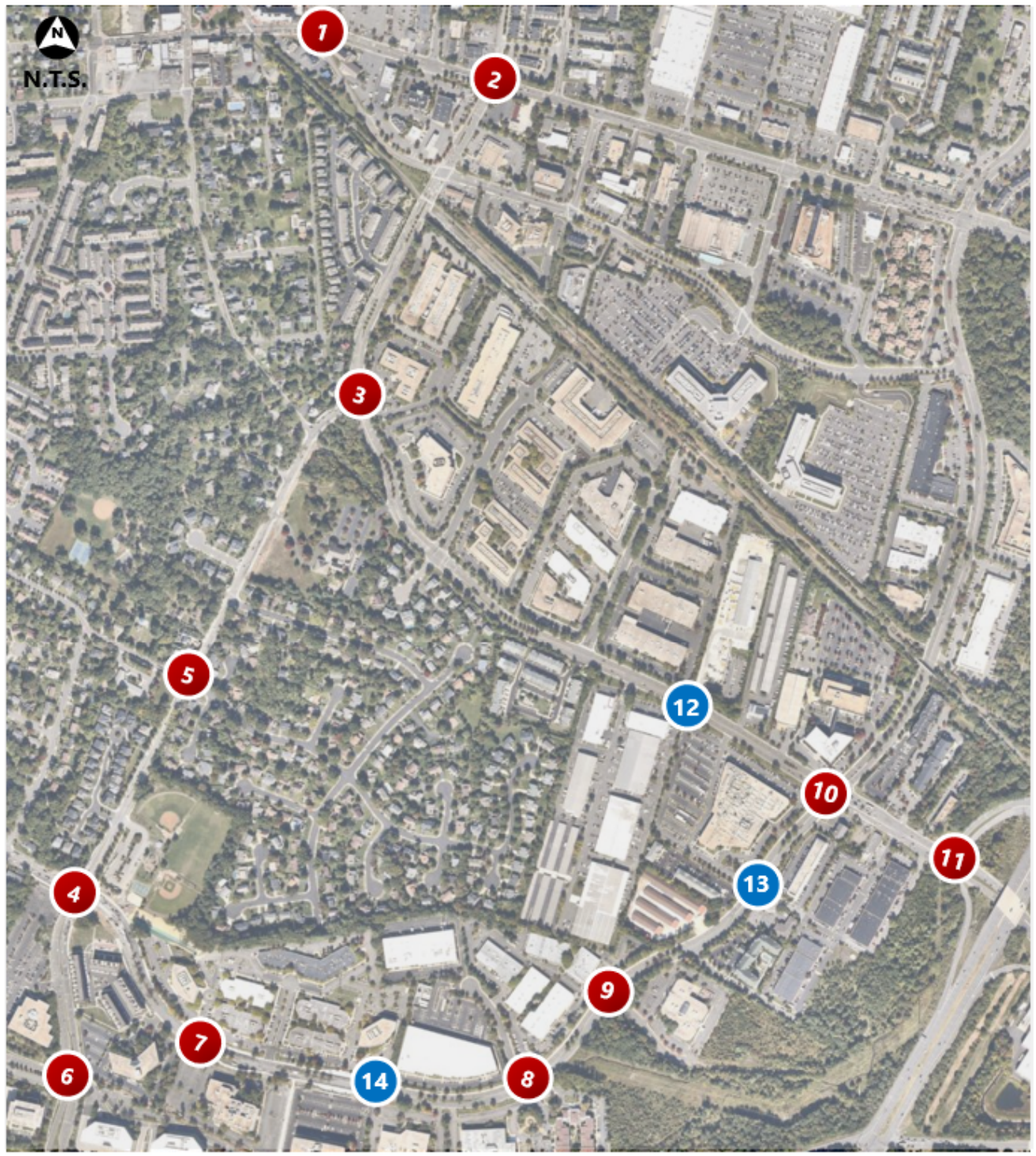
As documented in Table 21, a set of transportation infrastructure mitigation was identified via a screening process. These elements were modeled in VISSIM to assess their impact on traffic conditions. The specific elements modeled include:

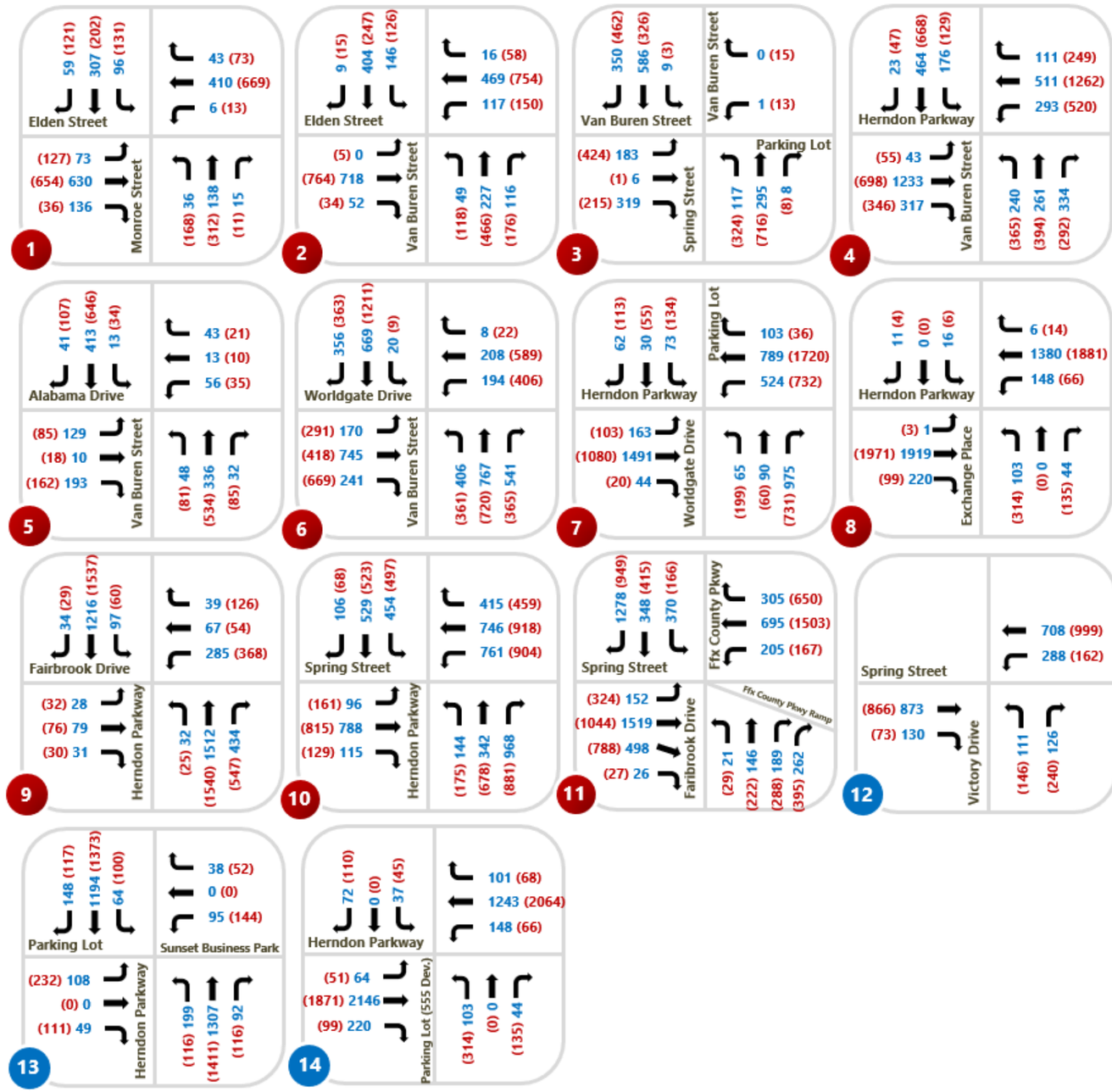
- Van Buren Street / Herndon Parkway intersection
  - Widening of southbound Van Buren Street to extend dual thru lanes to Senate Court.
  - Widening of northbound Van Buren Street to accommodate a second left turn lane of approximately 175 foot of storage length.
- Spring Street / New TRG Road
  - New traffic signal control.
  - Extension of westbound left turn storage to 200 feet.
- Spring Street / Herndon Parkway
  - Widening into median to add a second eastbound left turn lane of same storage length as existing turn lane.
- Spring Street / Fairfax County Parkway Ramps / Fairbrook Drive
  - Widening into median to add a second westbound left turn lane of same storage length as existing turn lane.
  - Widen Parkway offramp to add a second left turn lane.
  - Widen northbound Fairbrook Drive to add a standalone left turn storage lane.

6.2 Traffic Volumes

Figure 43 displays the traffic volume dataset that was analyzed at the study intersections in the Preferred Build with Transportation Mitigation 2045 traffic model. The only difference between this volume dataset and the Preferred Build without Mitigation is the rerouting of additional traffic volume onto the new TRG road. This volume inducement comes from the new traffic signal that is included as a transportation mitigation measure. This signal entices traffic to utilize the new TRG road rather than Herndon Parkway. **Figure 44** displays just the new site trips associated with the Preferred Build Scenario, while **Figure 45** displays just the pass-by site trips associated with the Preferred Build Scenario. **Appendix A** shows these three sets of traffic volumes for all intersections within the traffic model, including non-study intersections.

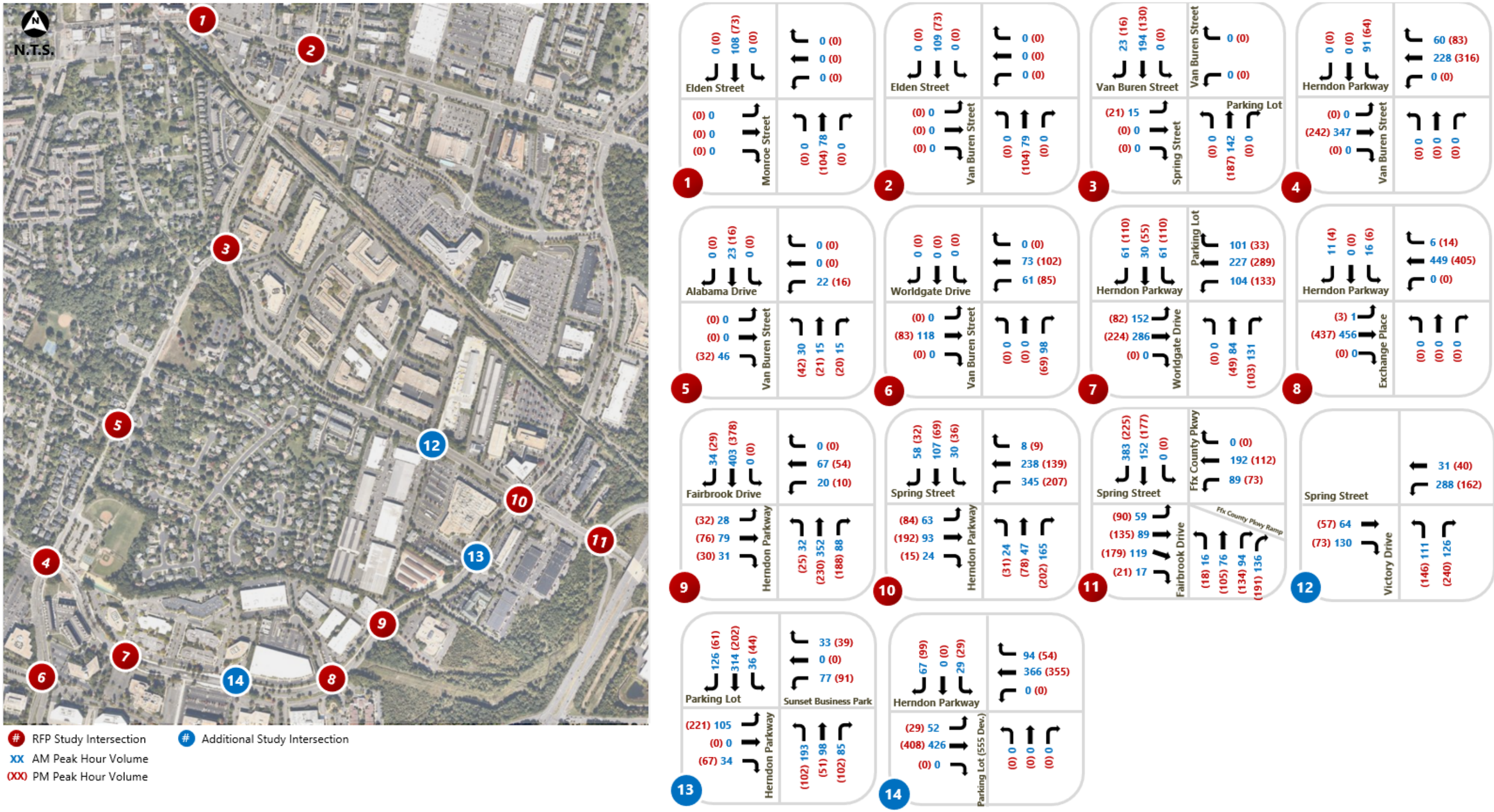
Figure 43 Preferred Build Scenario with Mitigation 2045 Traffic Volumes





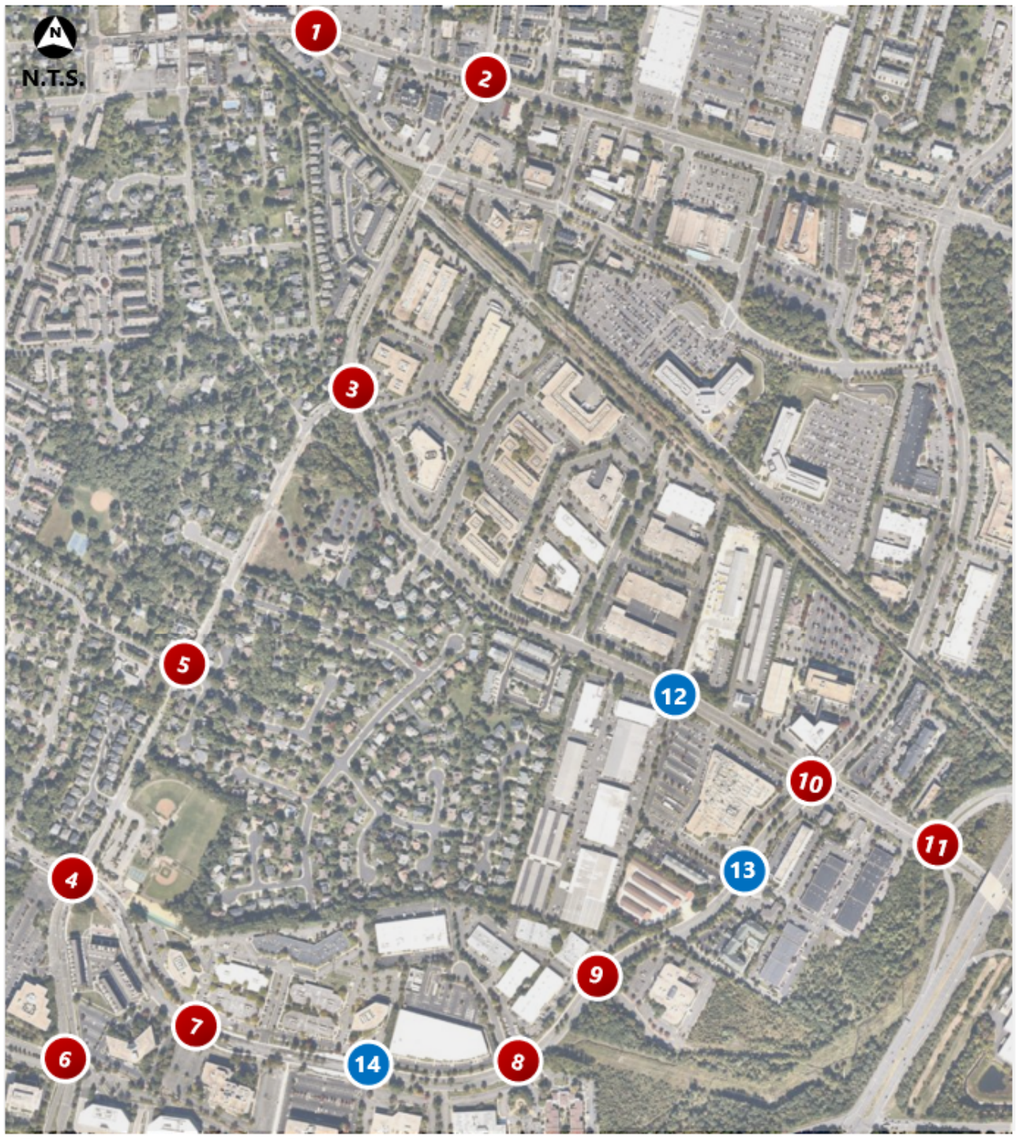
Build 2045 traffic volumes include No Build 2045 traffic volumes (Figure 6), removal of existing TRG area traffic volumes, volume shift to account for the Fairbrook Drive extension, and new TRG development traffic volumes. Basemap Source: Nearmap

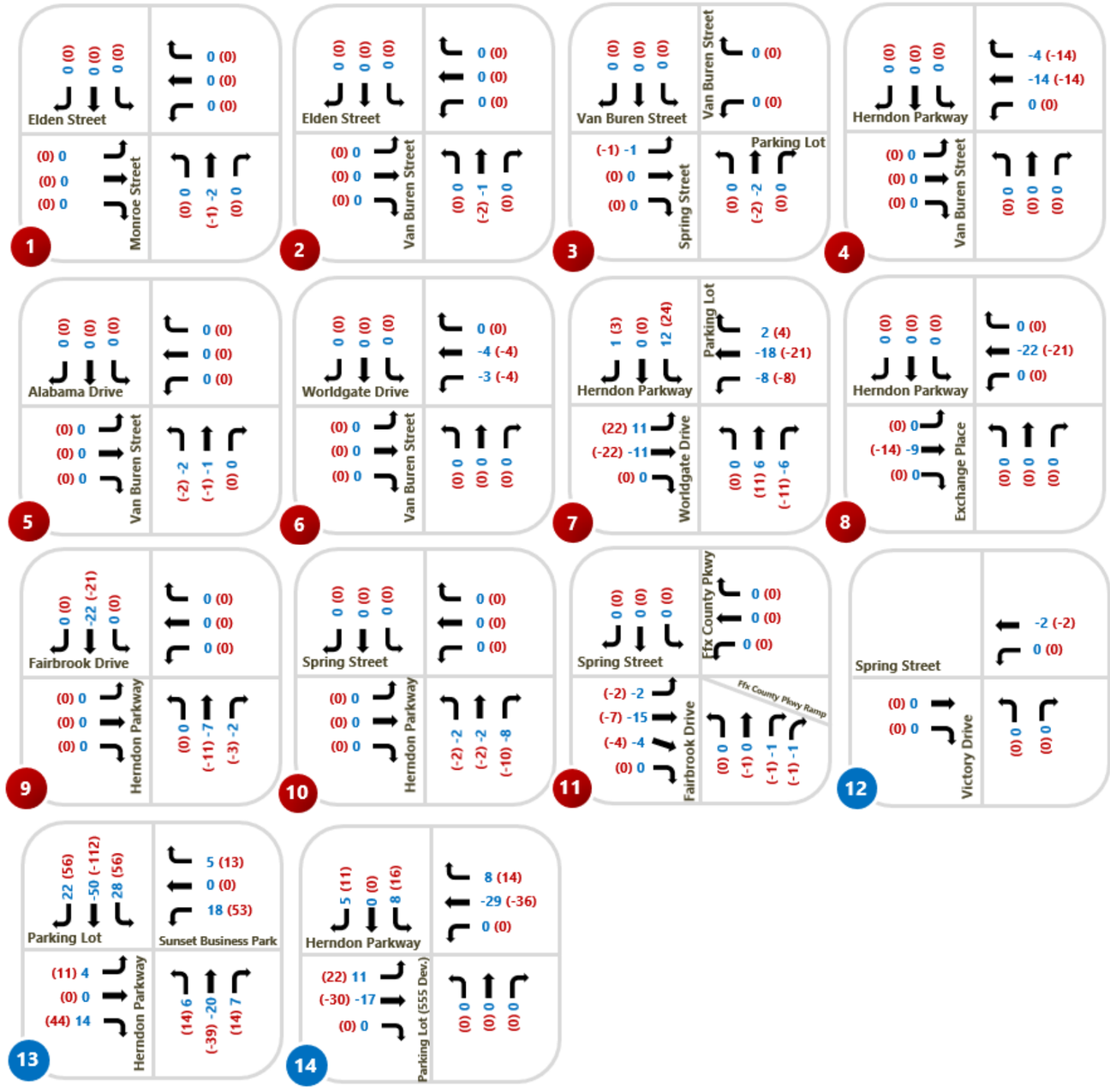
Figure 44 Preferred Build Scenario with Mitigation New Site Trips



Basemap Source: Nearmap

Figure 45 Preferred Build Scenario with Mitigation Site Pass-By Trips





Basemap Source: Nearmap

6.2.1 Traffic Analysis

In Preferred Build with Mitigation 2045 Scenario conditions, traffic levels are anticipated to be stressed at a few locations, with multiple intersections exceeding the Town's LOS standard; however, the general traffic condition could be considered manageable in a peak hour urban condition. **Table 22** lists the intersection delay and LOS at each of the eleven study intersections, comparing the Preferred Build Scenario to the Preferred Build with Mitigation Scenario. Projected intersection LOS is also shown in **Figure 46**.

At the intersection delay level, the evaluated transportation mitigation only has a significant impact on the Van Buren Street corridor (Herndon Parkway to Alabama Drive) in the PM peak. Widening southbound Van Buren Street to extend the dual thru lanes and northbound Van Buren Street to add the second left turn lane significantly improve the operations of both these intersections. Without these mitigations, the southbound queue from Herndon Parkway extends into the Alabama Drive intersection, causing significant delay. The evaluated mitigation also brings the Spring Street / Herndon Parkway intersection in the AM peak hour into compliance with the Town's existing LOS intersection standard (LOS D). Only one intersection peak – Spring Street / Herndon Parkway in the PM peak hour – remains in "violation" of the Town's intersection-based LOS standard.

At the remaining intersections, the evaluated transportation mitigation either does not have a significant impact or causes a slight increase on the intersection-level delay. These metrics are masking the movement-level improvement that occurs at multiple locations. This movement-level improvement does not translate to intersection-level due to intersection-level delay being computed as a weighted average; some of these mitigation strategies more evenly distribute the delay across movements to mitigate high delay on specific movements. This leads to some minimal intersection-level delay decrease or increase based on the weighted average computation method.

As such, it is important to consider the performance of individual turning movements. The intersection turning movements in **Table 23** operated at LOS F in either the Preferred Build without or with Mitigation Scenario 2045 conditions. The existing Town of Herndon Ordinance states "no individual turning movement level of service at an intersection falls below 'LOS E'". In summary, the evaluated transportation mitigations bring eight turning movements into compliance with Town standard of LOS E or better, have no LOS impact on three turning movements (i.e., they remain LOS F in the Mitigated scenario), and create two turning movements with LOS F (i.e., they did not operate at LOS F in the unmitigated scenario). It should be noted that these latter two movements are relatively low-volume – the higher volume movements at these intersections have been prioritized.

Table 22 Comparison of Intersection Delay and LOS: Preferred Build Scenario to Mitigation Build Scenario

Intersection [1]	Preferred Build Scenario AM Peak Delay	AM Peak LOS	Preferred Build Scenario PM Peak Delay	PM Peak LOS	Mitigation Build Scenario AM Peak Delay	AM Peak LOS	Mitigation Build Scenario PM Peak Delay	PM Peak LOS	Change Build to Mitigated AM Peak Delay	AM Peak LOS	Change Build to Mitigated PM Peak Delay	PM Peak LOS
Elden St / Monroe St	32.0	C	37.8	D	31.2	C	38.6	D	-0.8	-	+0.8	-
Elden St / Van Buren St	35.7	D	42.8	D	35.6	D	43.9	D	-0.1	-	+1.1	-
Van Buren St / Spring St	17.8	B	26.9	C	18.2	B	25.9	C	+0.4	-	-1.0	-
Van Buren St / Herndon Pkwy	42.5	D	49.0	D	39.9	D	39.3	D	-2.6	-	-9.7	-
Van Buren St / Alabama Dr	19.9	B	51.5	D	24.1	C	21.6	C	+4.2	B→C	-29.9	D→C
Van Buren St / Worldgate Dr	22.4	C	33.3	C	21.9	C	27.4	C	-0.5	-	-5.9	-
Herndon Pkwy / Worldgate Dr	40.5	D	33.3	C	42.4	D	38.1	D	+1.9	-	+4.8	C→D
Herndon Pkwy / Exchange Pl	7.8	A	22.0	C	7.3	A	23.3	C	-0.5	-	+1.3	-
Herndon Pkwy / Fairbrook Dr	21.5	C	34.9	C	24.5	C	33.5	C	+3.0	-	-1.4	-
Spring St / Herndon Pkwy	55.9	E	65.3	E	51.6	D	64.4	E	-4.3	E→D	-0.9	-
Spring St / FCP Ramps	38.2	D	41.6	D	33.6	C	44.8	D	-4.6	D→C	+3.2	-

Source: Average of 7 AM and 20 PM Peak Hour VISSIM simulation runs.
1 All study intersections are signalized in the Build and Mitigated Build scenario.

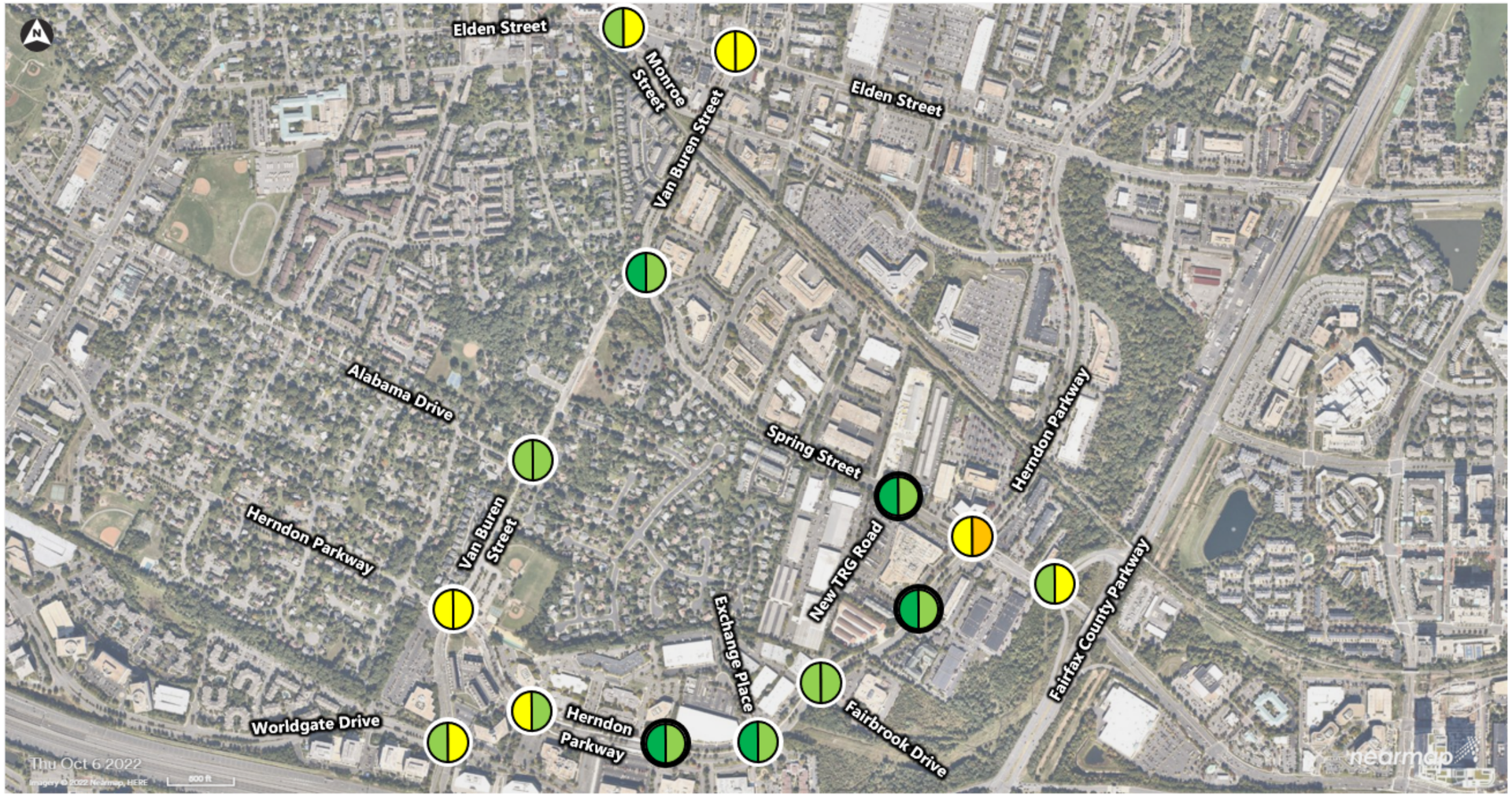
Table 23 Comparison of LOS F Movements

Turning Movement		LOS F without Mitigation?	LOS F with Mitigation?
Herndon Pkwy / Spring Street	EB Left AM	Yes	No
	EB Left PM	Yes	Yes
	EB T/R PM	Yes	Yes
	SB Left PM	Yes	No
Spring St / Fairfax Pkwy Ramps / Fairbrook Dr	WB Left AM	Yes	No
	NB Left AM	No	Yes
	NB Left PM	Yes	Yes
	NB Thru PM	Yes	No
Van Buren Street / Worldgate Drive	EB Left PM	Yes	No
Van Buren St / Herndon Pkwy	NB Left PM	Yes	No
Van Buren St / Alabama Drive	EB/WB PM	Yes	No
Herndon Parkway / Fairbrook Drive	EB Thru AM	No	Yes
	WB Left PM	Yes	No

The one intersection-level LOS and four of the five turning movement LOS that remain in "violation" of the Town's LOS standard are associated with the Fairfax County Parkway interchange – either directly or via congestion spillover to the Herndon Parkway / Spring Street intersection. This finding indicates that expanding the existing interchange ramp traffic signal on Spring Street is not a viable solution to alleviate future traffic congestion. A wholesale interchange reconfiguration appears to be needed to accommodate the future traffic demand of both Herndon and Reston.

Congestion "heat" maps for each of the Preferred Build Scenario peak hours are shown in **Figures 47 and 48**. These represent the average vehicle speeds present in different lanes and segments of the model. Slower vehicle speeds (shown in shades of red) represent areas of higher congestion and vehicle queuing, whereas higher vehicle speeds (shown in shades of green) represent areas of lower congestion and vehicle queueing. Contrasted to the Preferred Build without Mitigation scenarios, these figures show significant congestion improvement on the Van Buren Street corridor, particularly in the PM peak hour. In the AM peak hour, westbound Herndon Parkway shows less congestion heading into the TRG/HTOC due to the rerouting of inbound traffic volume to the new traffic signal at the new TRG road.

Figure 46 Preferred Build Scenario with Mitigation 2045 Intersection Level of Service



Intersection Level of Service (LOS)

RFP Study Intersection
AM Peak Hour / PM Peak Hour

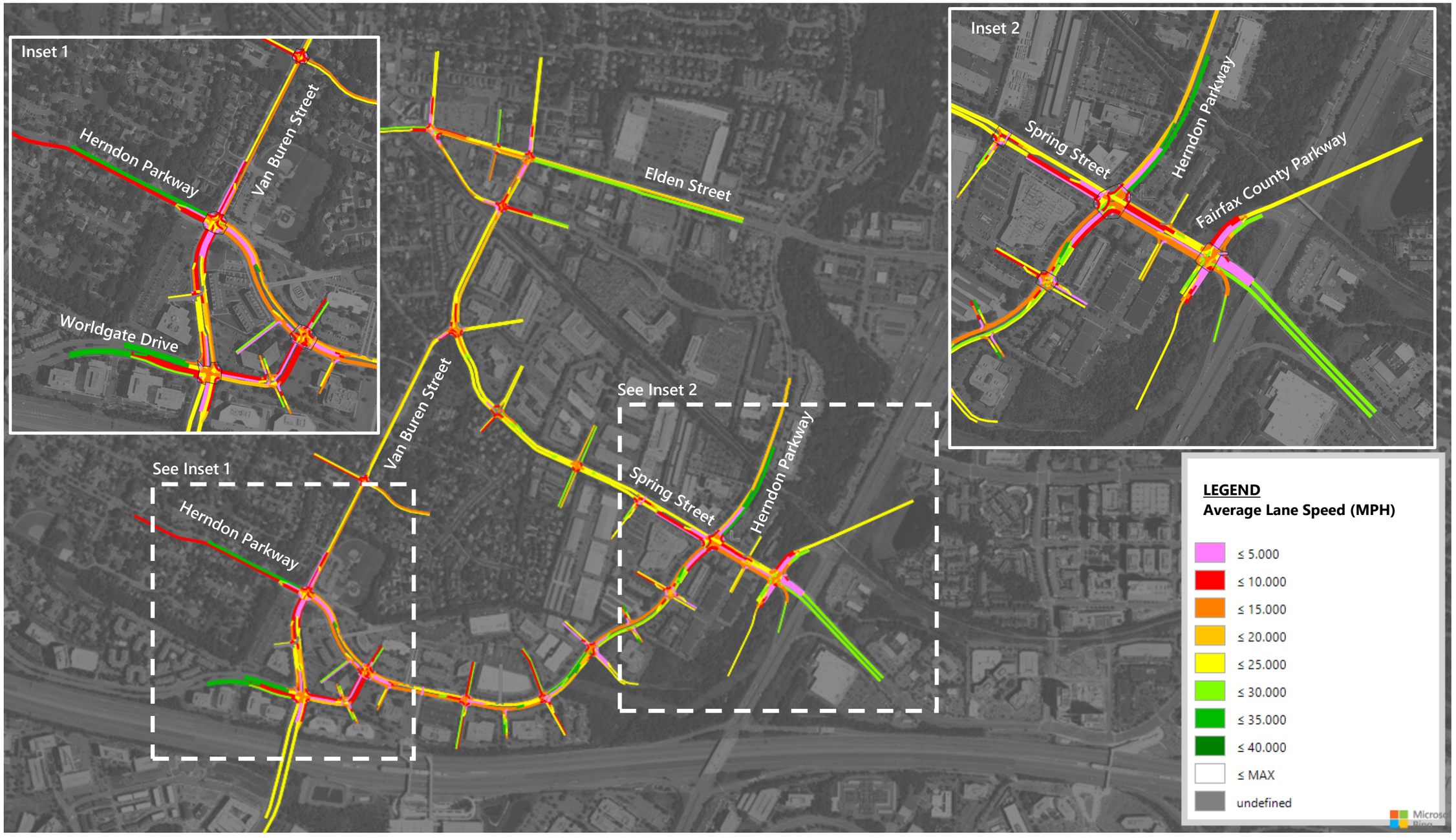
Additional Study Intersection
AM Peak Hour / PM Peak Hour

LOS A / LOS B
LOS C
LOS D
LOS E
LOS F

Note: All reported LOS is intersection LOS for signalized intersection except for Spring Street / New TRG Road, which is an unsignalized intersection with the new TRG Road operating under stop control. Reported LOS for this intersection is the worst controlled movement.

Source: Average of 7 AM Peak Hour and 20 PM Peak Hour VISSIM simulation runs. Aerial imagery from NearMap.

Figure 47 Preferred Build Scenario with Mitigation 2045 Congestion Heat Map – AM Peak Hour



Source: Average of 7 AM Peak Hour VISSIM simulation runs.

Figure 48 Preferred Build Scenario with Mitigation 2045 Congestion Heat Map – PM Peak Hour



Source: Average of 20 PM Peak Hour VISSIM simulation runs.

Projected average and maximum queue lengths for the Preferred Build Scenario with Mitigation are displayed in **Figures 49 and 50**. An important note regarding the maximum queue lengths is that each roadway segment's maximum queue length most likely does not temporally align (i.e., occur at the same time). Rather, these figures show the maximum queue length on each segment of roadway during the peak hour. The accommodation of maximum queue lengths is also not the typical design objective as they are an indication of the absolute worst impact during the peak hour.

6.2.2 Recommendations for Transportation Mitigation

Table 24 contains a summary of the evaluated transportation infrastructure mitigation measures, including the issue, the assessed traffic impact, cons/impacts of implementing the mitigation, and a recommendation for its inclusion in the Town's future planning. Based on the completed traffic analysis findings, the intersection improvements to Herndon Parkway / Van Buren Street have the most substantial benefit, mitigating three LOS F intersection movements and queue lengths that spill back through upstream intersections. The Town will need to weigh these benefits against construction right of way. If the improvements are not implemented, the anticipated traffic congestion could itself act as "mitigation" by encouraging traveling behavior that reduces vehicular traffic (e.g., traveling outside the peak hour or switching to an alternative travel mode such as bike/walk/transit).

A new traffic signal at Spring Street / TRG Road would better distribute TRG traffic between Herndon Parkway and the TRG Road, lightening the demand on the heavy turning movements between Herndon Parkway and Spring Street. This signal could be implemented without negative impact. Widening to add a second left turn lane from eastbound Herndon Parkway to Spring Street has benefit; however, it is likely only cost beneficial if the widening could be completed within the existing median width.

The evaluated improvements to the existing Fairfax County Parkway interchange signal do not significantly address the anticipated congestion issues, while having negative right of way, environmental, and pedestrian crossing implications. Rather than implementing these partial measures, the Town could partner with Fairfax County on an interchange study to identify an optimal interchange configuration.

Contrasting the Mitigation scenario queues to the unmitigated scenario queues, in the AM peak hour, the following movements have shorter (improved) queue lengths:

- Eastbound Herndon Parkway at Van Buren Street
- Southbound Van Buren Street at Herndon Parkway
- Southbound Herndon Parkway at Sunset Business Park
- Westbound Spring Street at Fairfax County Parkway
- Fairfax County Parkway Off-Ramp

In the PM peak hour, the following movements have shorter (improved) queue lengths:

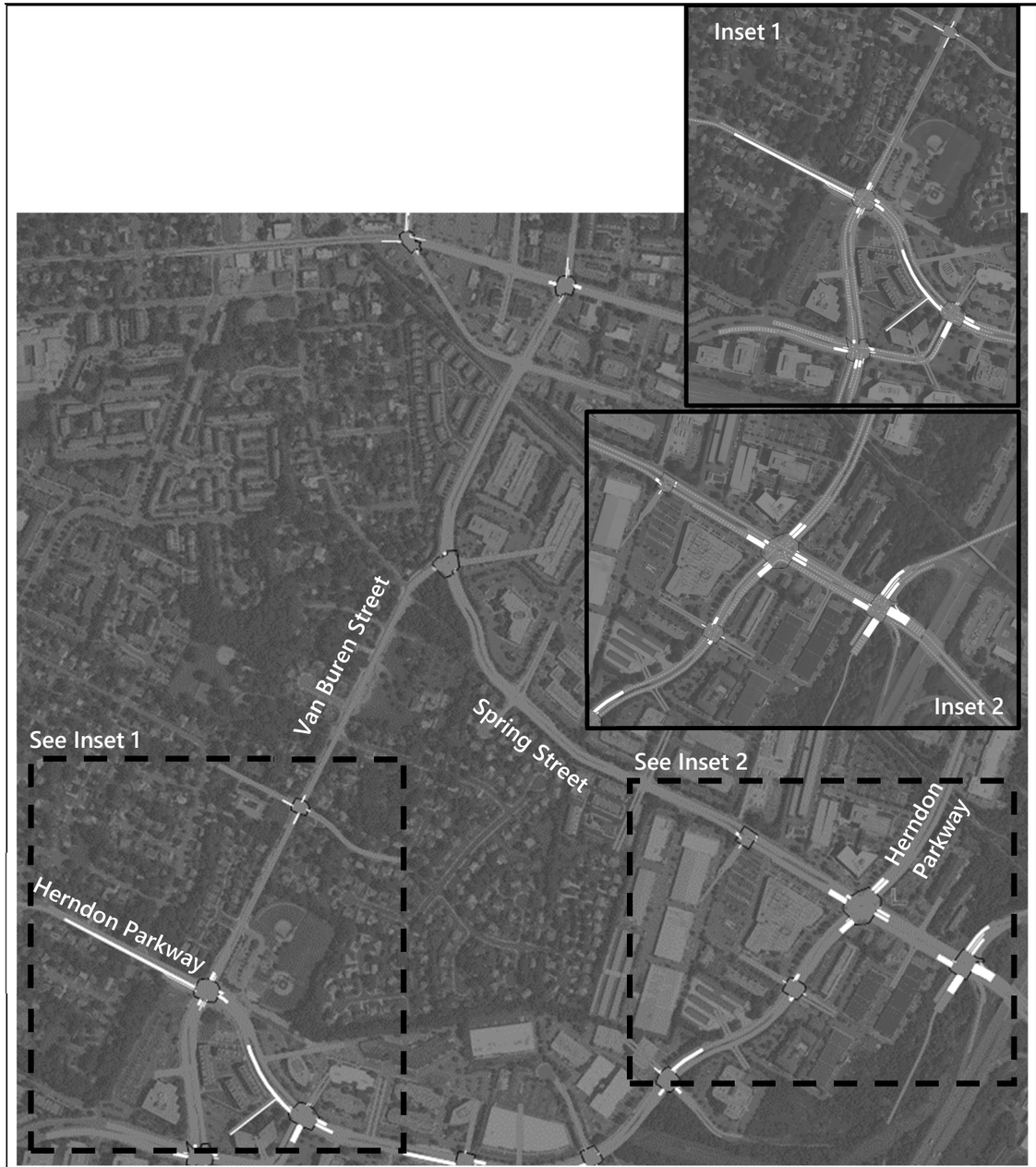
- Southbound and Northbound Van Buren Street at Herndon Parkway
- Eastbound Worldgate Drive at Van Buren Street
- Eastbound Herndon Parkway at Sunset Business Park
- Fairfax County Parkway Off-Ramp.

Appendix B documents the delay, LOS, and vehicle queueing for all of the movements at each of the eleven study intersections.

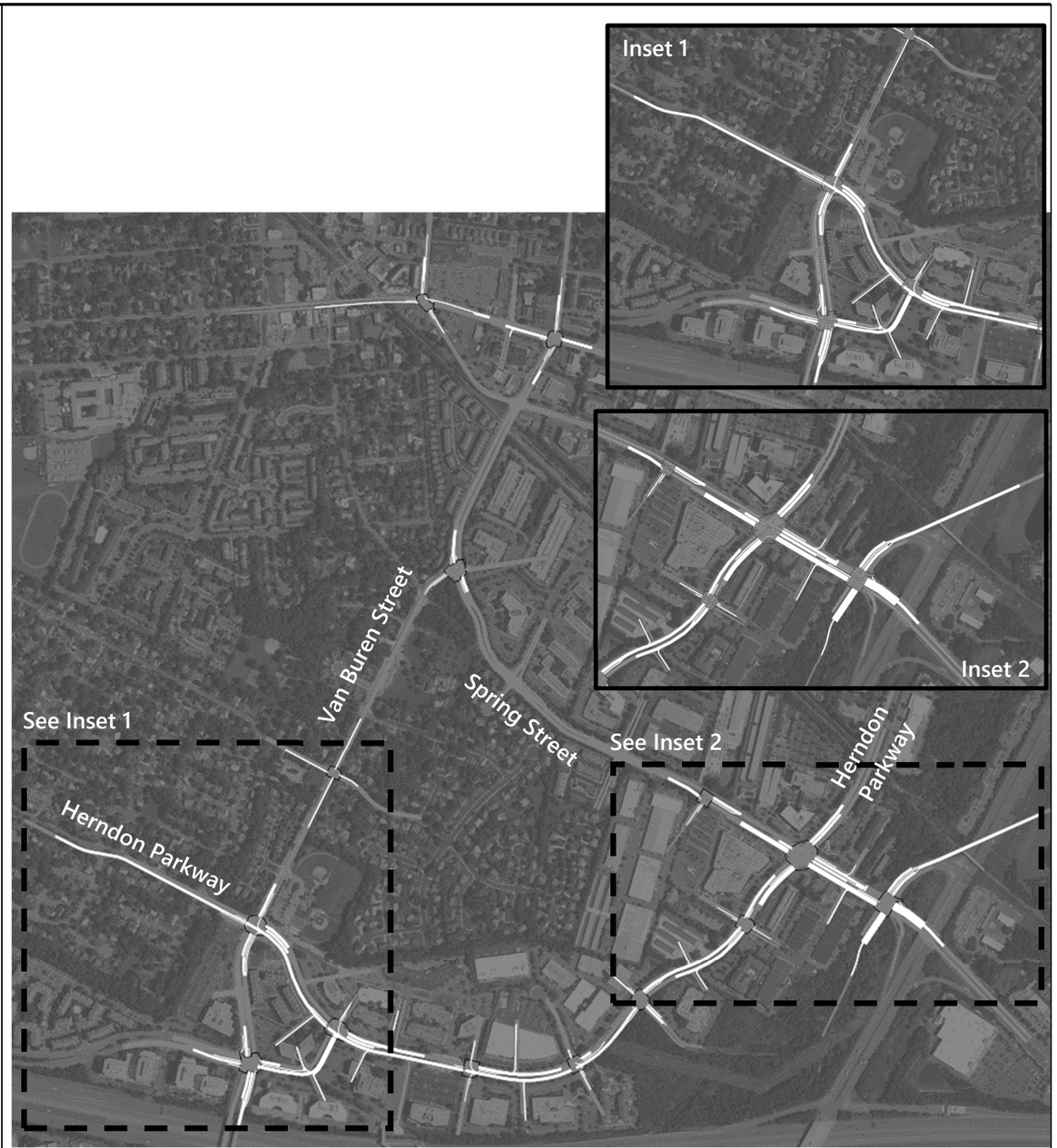
Table 24 Transportation Mitigation Recommendations

Intersection	Issue	Evaluated Mitigation	Impact on Traffic Conditions	Con/Impact	Recommendation
Herndon Parkway / Van Buren Street	Southbound Van Buren Street dual thru lanes only 150 feet in length, leading to delay	Widen southbound Van Buren Street to extend dual thru lanes	The combination of these two mitigations had a significant enhancement to traffic conditions along the entire Van Buren Street corridor	Right of way impacts to residential / park	**Strongly Consider**
	Single northbound left turn lane to serve 300+ peak-hour vehicles, competing with southbound Van Buren Street for signal capacity	Dual northbound left turn lanes from Van Buren Street to Herndon Parkway		Right of way impacts and potential Van Buren Street realignment	**Strongly Consider**
Spring Street / Herndon Parkway	Viability of new TRG road to relieve pressure on Herndon Parkway is limited by lack of traffic signal at Spring Street	New traffic signal at Spring Street / new TRG road with rerouted traffic from Herndon Parkway	The combination of these two mitigations detoured traffic from Herndon Parkway, brought the AM Peak into intersection LOS compliance, and brought two movements into movement LOS compliance	None	**Implement**
	Intersection capacity constraints	Dual left turn lanes from EB Spring Street onto NB Herndon Parkway		Possible roadway widening – may be accommodated within median	**Implement if it can be accommodated via widening into median**
Spring Street / Fairbrook Drive / Fairfax County Parkway	Queue spillback on Fairfax County Parkway off-ramp	Dual left turn lane from off-ramp	This combination of mitigations had a minimal impact on traffic conditions. Two movements still do not comply with movement LOS standards. Significant queueing remains on off-ramp and westbound Spring Street.	Right of way impact; Potential environmental impact	**Do Not Implement – does not significantly address congestion issues.** **Recommend partnering with VDOT and Fairfax County on interchange study**
	Congestion on westbound Spring Street; Curb lane acts essentially as a right turn lane due to Fairfax County Parkway on-ramp volume demand	Dual left turn from westbound Spring Street onto Fairbrook Drive		Could likely be accommodated within median; Does not address limited cross-section beneath bridge	
	Fairbrook Drive congestion in PM Peak	Separate left turn lane from thru lane		Wider cross-section for Fairbrook Drive extension	

Figure 49 Preferred Build Scenario with Mitigation 2045 Queue Map – AM Peak Hour

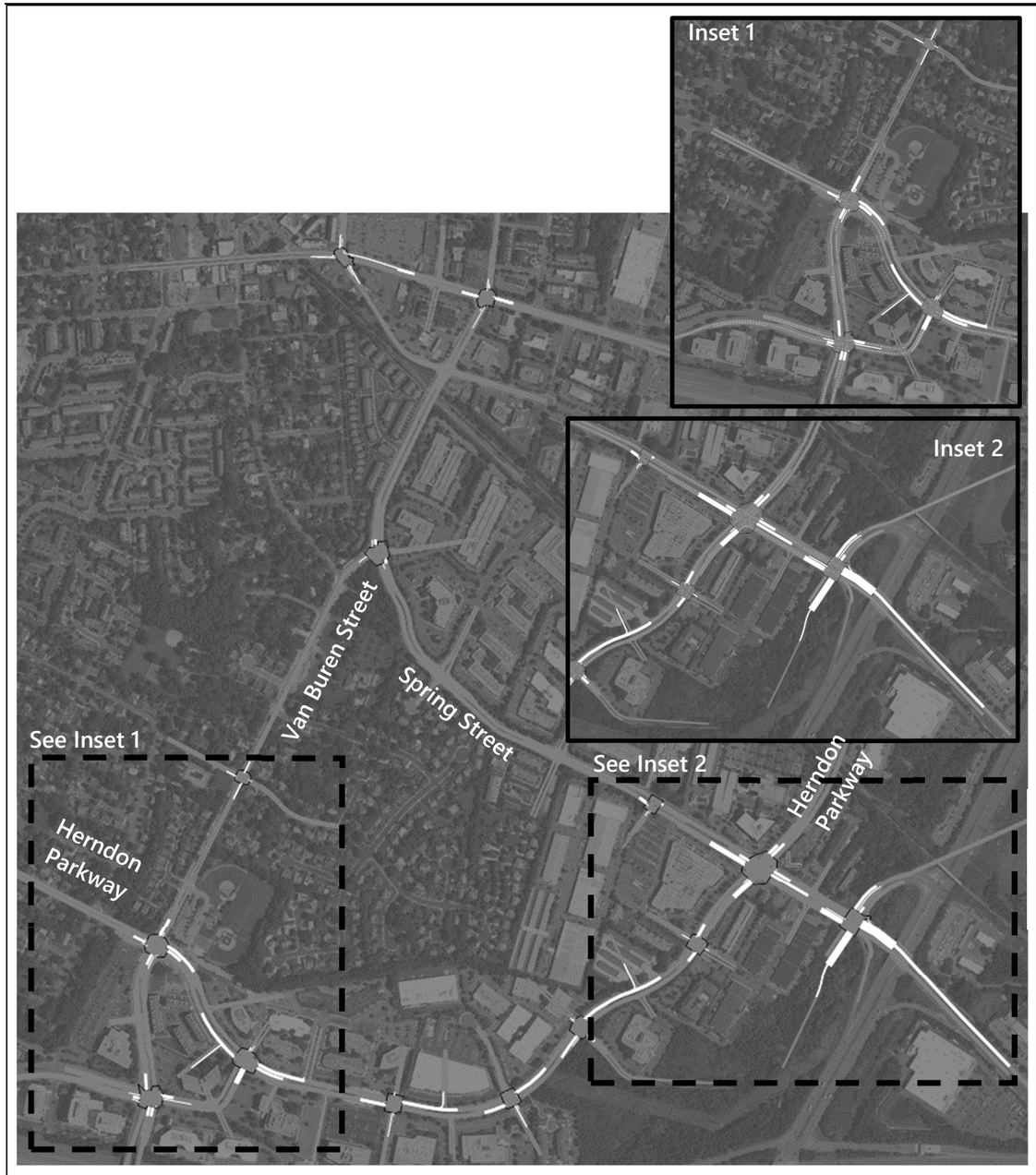


Average Queue Length

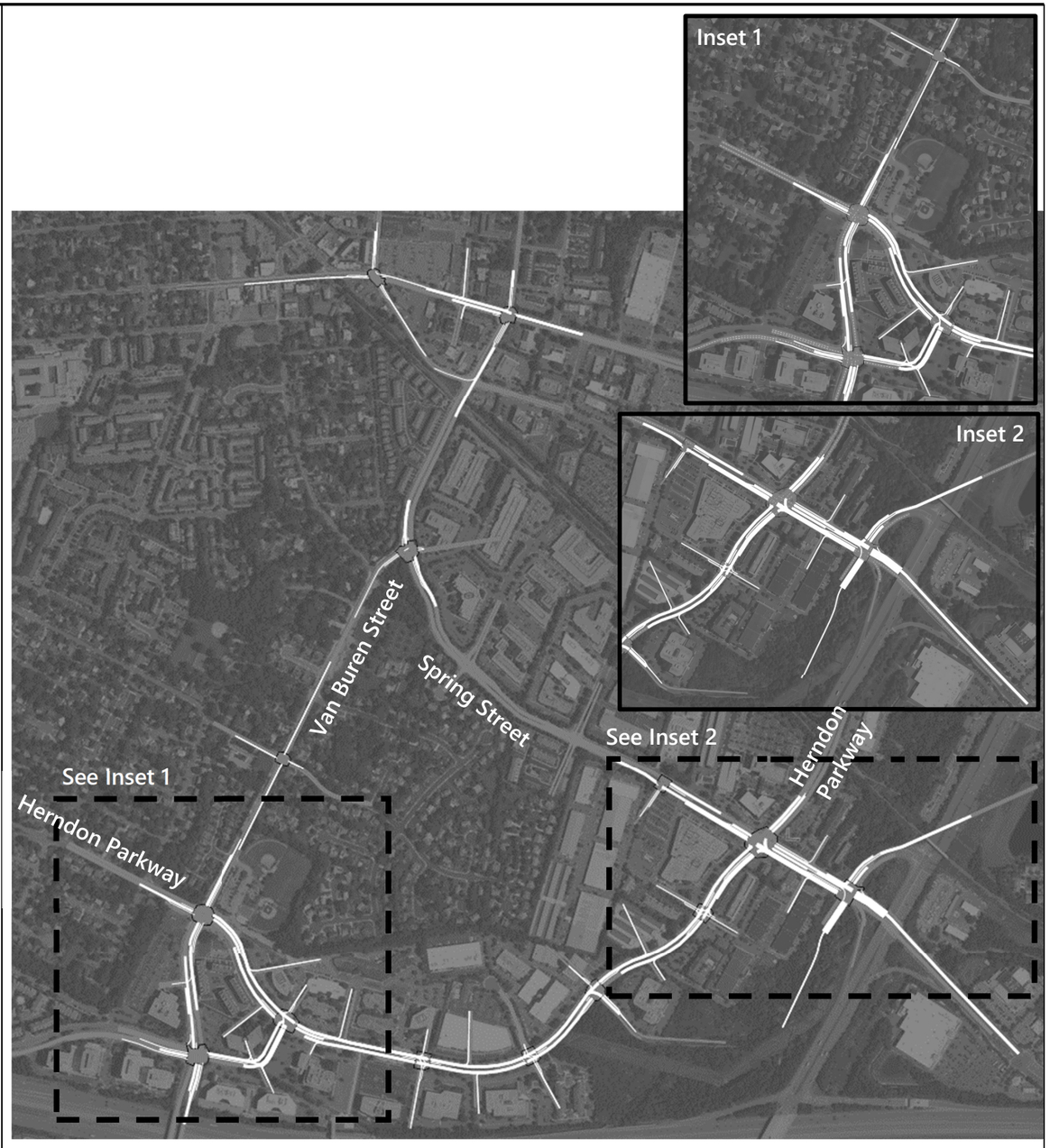


Maximum Queue Length

Figure 50 Preferred Build Scenario with Mitigation 2045 Queue Map – PM Peak Hour



Average Queue Length



Maximum Queue Length

Divider

This page intentionally left blank.

A

Traffic Volume Datasets – All Intersections in Model

A.1 Existing Conditions 2023 Volumes

A.2 No Build 2045 Volumes

A.3 Build Scenario 1 (Neighborhood Clusters) 2045 Volumes

A.4 Build Scenario 1 (Neighborhood Clusters) New Site Trips

A.5 Build Scenario 1 (Neighborhood Clusters) Site Pass-by Trips

A.6 Build Scenario 2 (Two Centers) 2045 Volumes

A.7 Build Scenario 2 (Two Centers) New Site Trips

A.8 Build Scenario 2 (Two Centers) Site Pass-by Trips

A.9 Build Scenario 3 (Metro Center) 2045 Volumes

A.10 Build Scenario 3 (Metro Center) New Site Trips

A.11 Build Scenario 3 (Metro Center) Site Pass-by Trips

A.12 Preferred Build Scenario 2045 Volumes

A.13 Preferred Build Scenario New Site Trips

A.14 Preferred Build Scenario Site Pass-by Trips

A.15 Preferred Build with Mitigation Scenario 2045 Volumes

A.16 Preferred Build with Mitigation Scenario New Site Trips

A.17 Preferred Build with Mitigation Scenario Site Pass-by Trips

B

VISSIM Model Complete Intersection Metrics

B.1 Existing Conditions AM Peak Hour

B.2 Existing Conditions PM Peak Hour

B.3 No Build 2045 AM Peak Hour

B.4 No Build 2045 PM Peak Hour

B.5 Build 2045 Scenario One (Neighborhood Clusters) AM Peak Hour

B.6 Build 2045 Scenario One (Neighborhood Clusters) PM Peak Hour

B.7 Build 2045 Scenario Two (Two Centers) AM Peak Hour

B.8 Build 2045 Scenario Two (Two Centers) PM Peak Hour

B.9 Build 2045 Scenario Three (Metro Center) AM Peak Hour

B.10 Build 2045 Scenario Three (Metro Center) PM Peak Hour

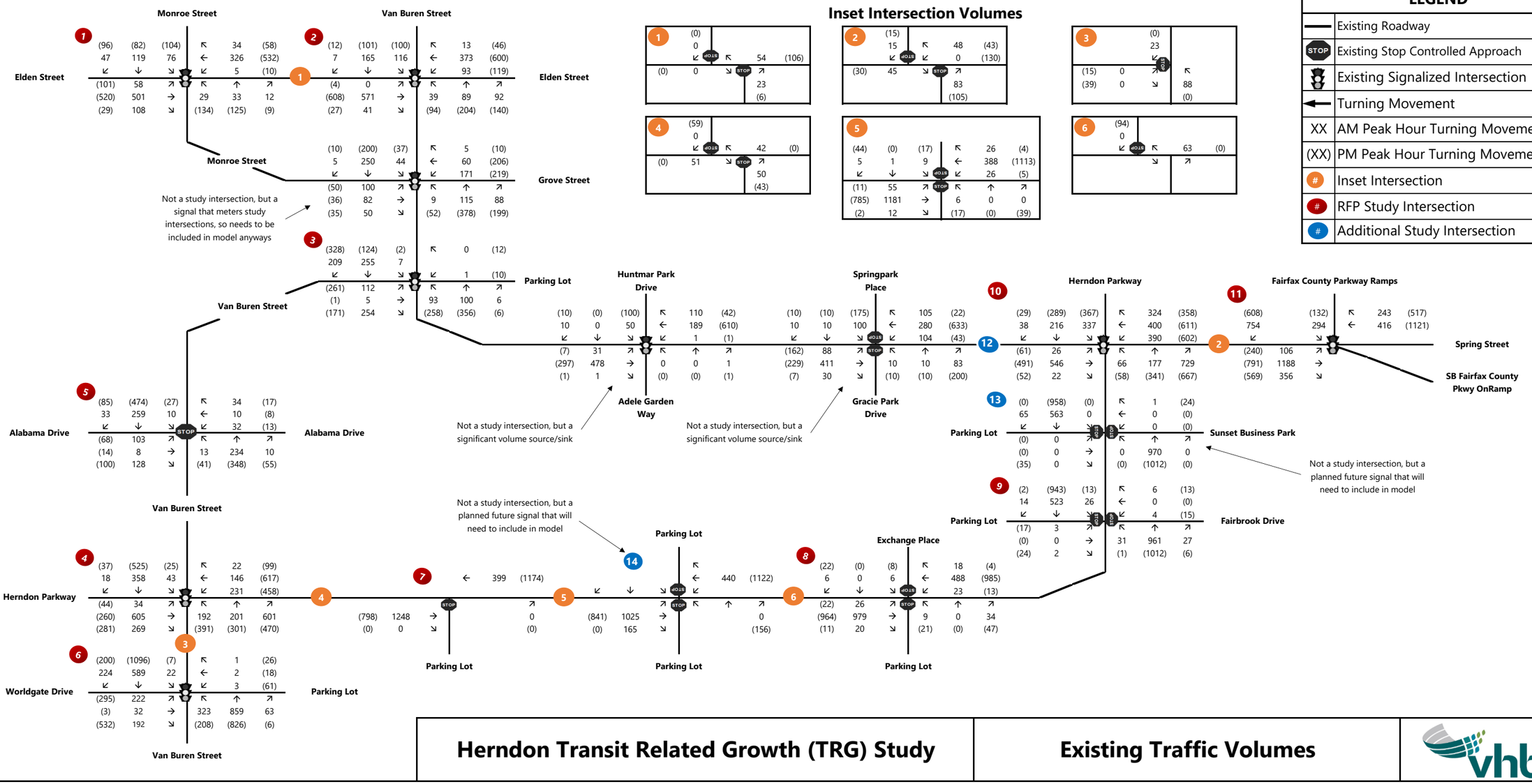
B.11 Preferred Build 2045 Scenario AM Peak Hour

B.12 Preferred Build 2045 Scenario PM Peak Hour

B.13 Preferred Build with Mitigation 2045 Scenario AM Peak Hour

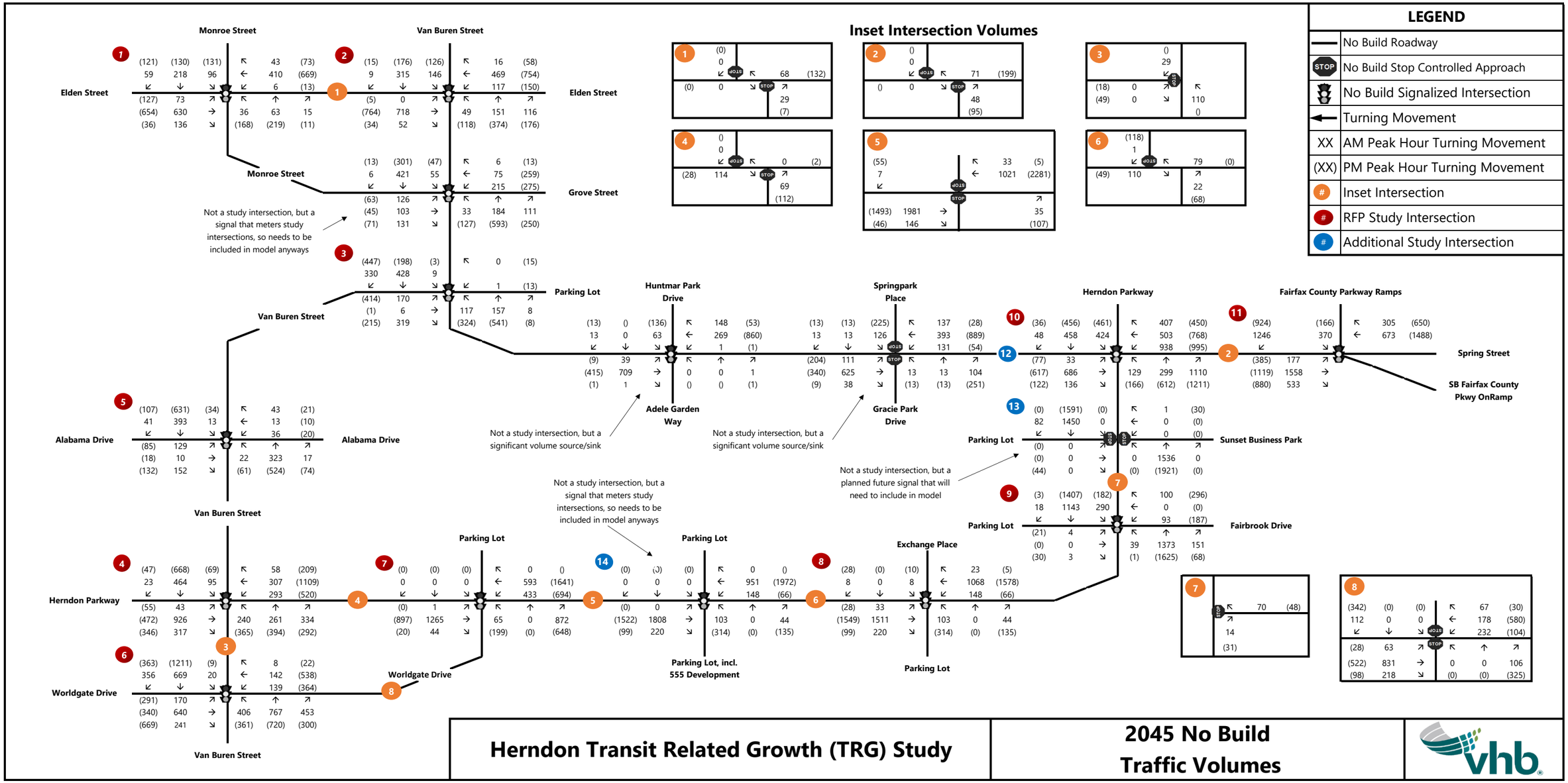
B.14 Preferred Build with Mitigation 2045 Scenario PM Peak Hour

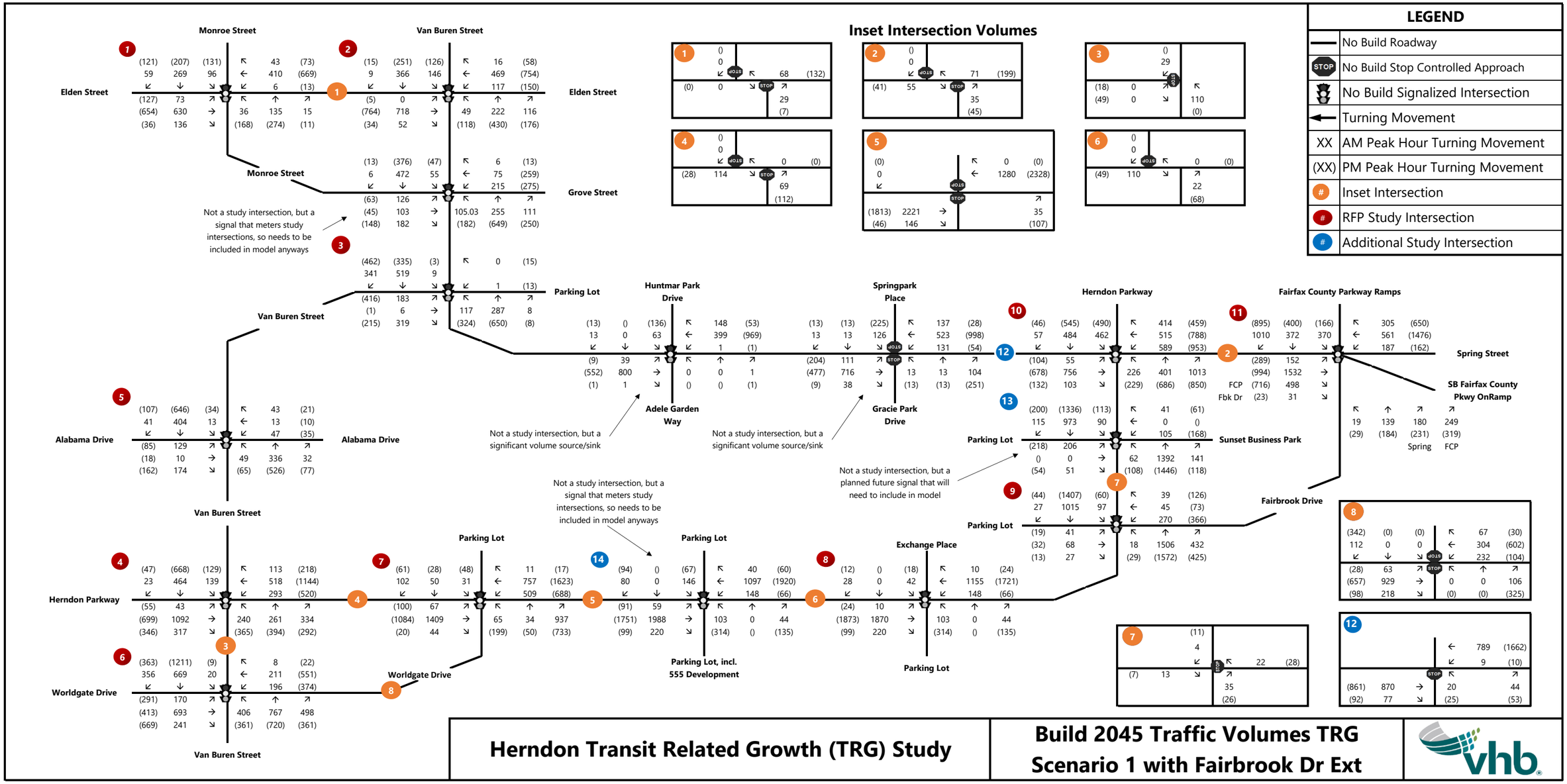
This page intentionally left blank.



Herndon Transit Related Growth (TRG) Study

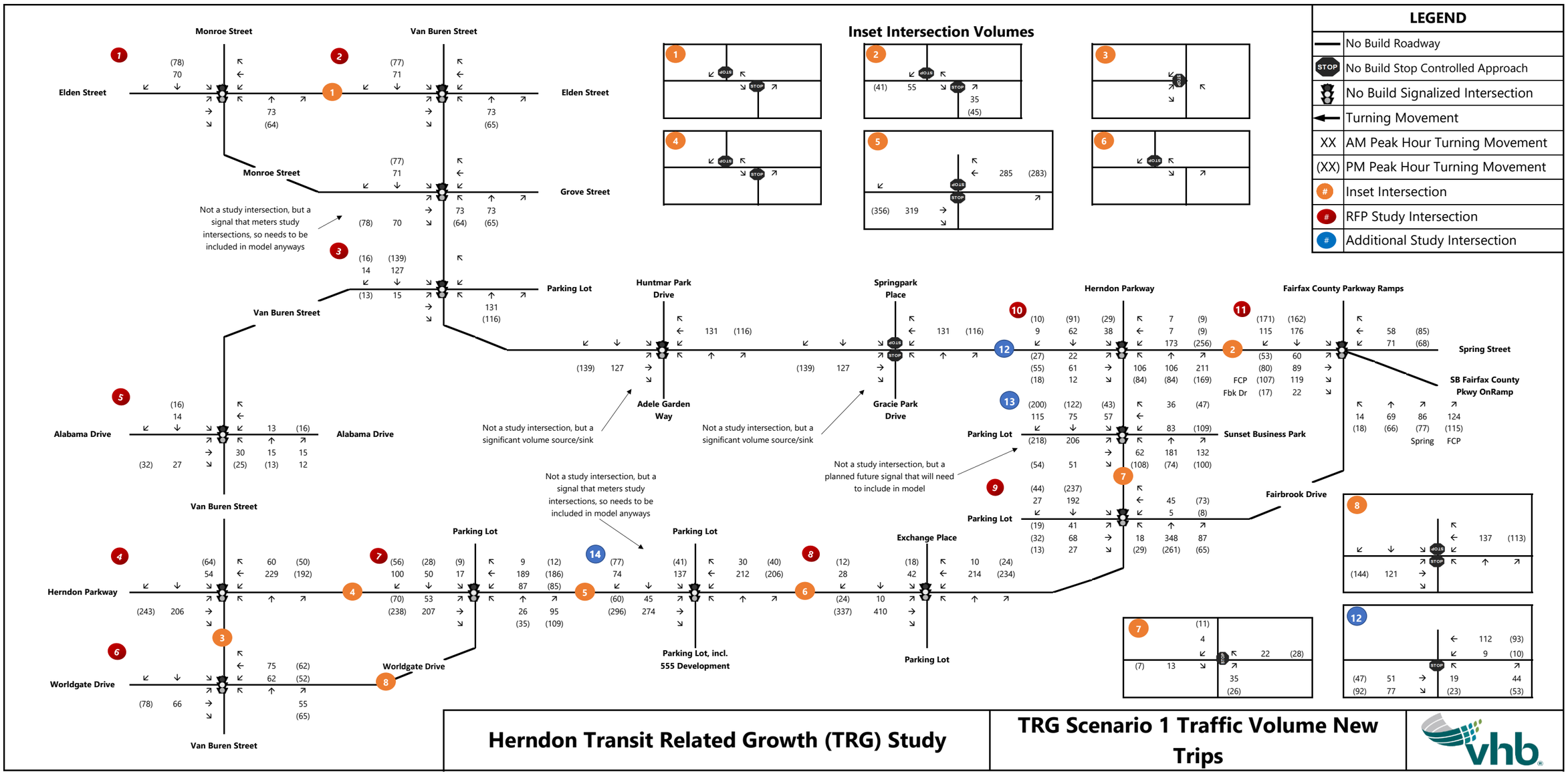
Existing Traffic Volumes


Monroe Street
Van Buren Street
Elden Street
Monroe Street
Grove Street
Van Buren Street
Parking Lot
Huntmar Park Drive
Springpark Place
Herndon Parkway
Fairfax County Parkway Ramps
Spring Street
SB Fairfax County Pkwy OnRamp
Adele Garden Way
Gracie Park Drive
Alabama Drive
Alabama Drive
Van Buren Street
Parking Lot
Sunset Business Park
Parking Lot
Fairbrook Drive
Not a study intersection, but a signal that meters study intersections, so needs to be included in model anyways
Not a study intersection, but a significant volume source/sink
Not a study intersection, but a significant volume source/sink
Not a study intersection, but a planned future signal that will need to include in model
Not a study intersection, but a signal that meters study intersections, so needs to be included in model anyways
Herndon Parkway
Worldgate Drive
Worldgate Drive
Parking Lot
Parking Lot, incl. 555 Development
Exchange Place
Parking Lot
Van Buren Street
Inset Intersection Volumes
LEGEND
No Build Roadway
No Build Stop Controlled Approach
No Build Signalized Intersection
Turning Movement
XX AM Peak Hour Turning Movement
(XX) PM Peak Hour Turning Movement
Inset Intersection
RFP Study Intersection
Additional Study Intersection
Herndon Transit Related Growth (TRG) Study
2045 No Build Traffic Volumes
vhb



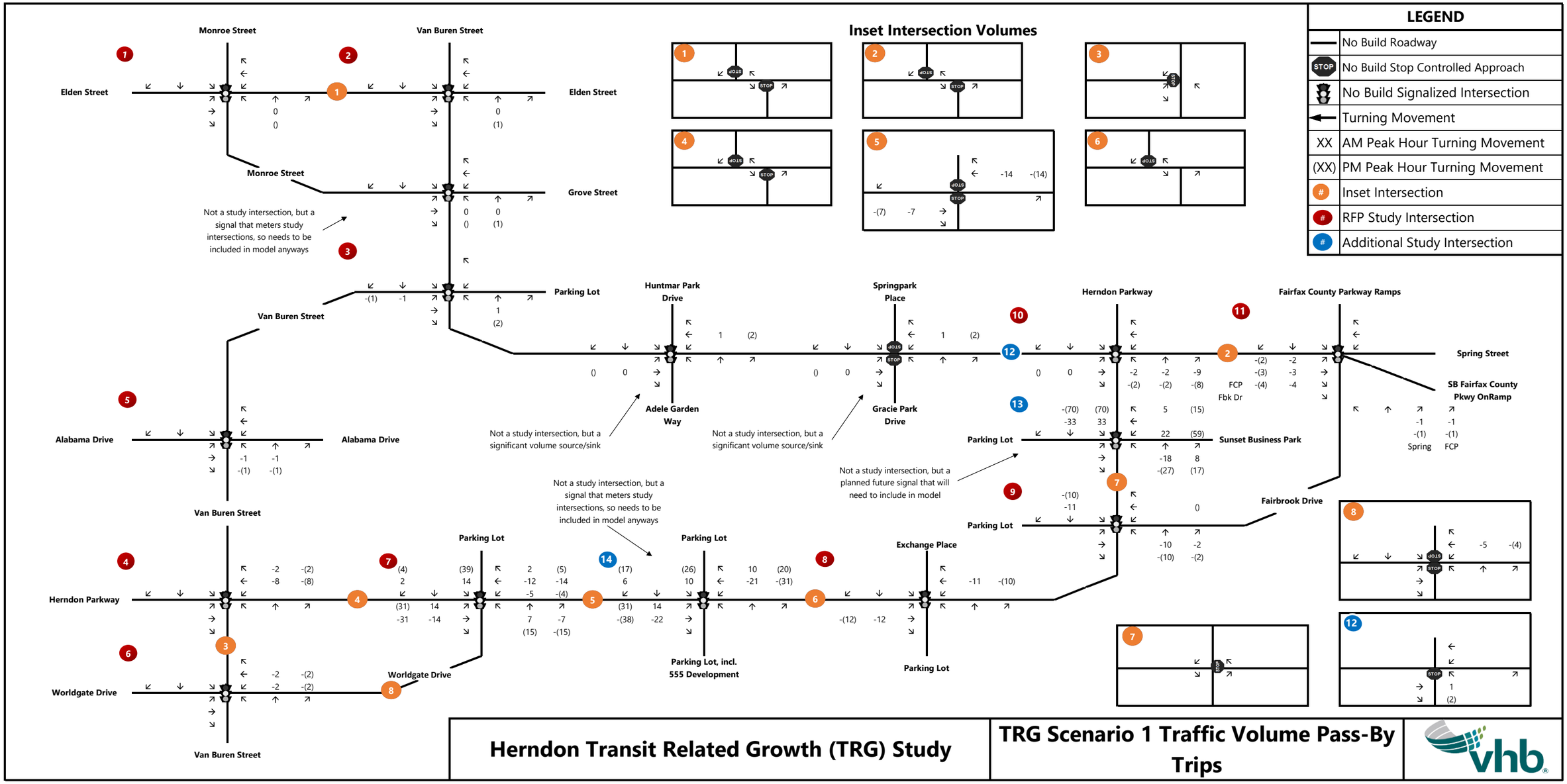
Herndon Transit Related Growth (TRG) Study

Build 2045 Traffic Volumes TRG Scenario 1 with Fairbrook Dr Ext



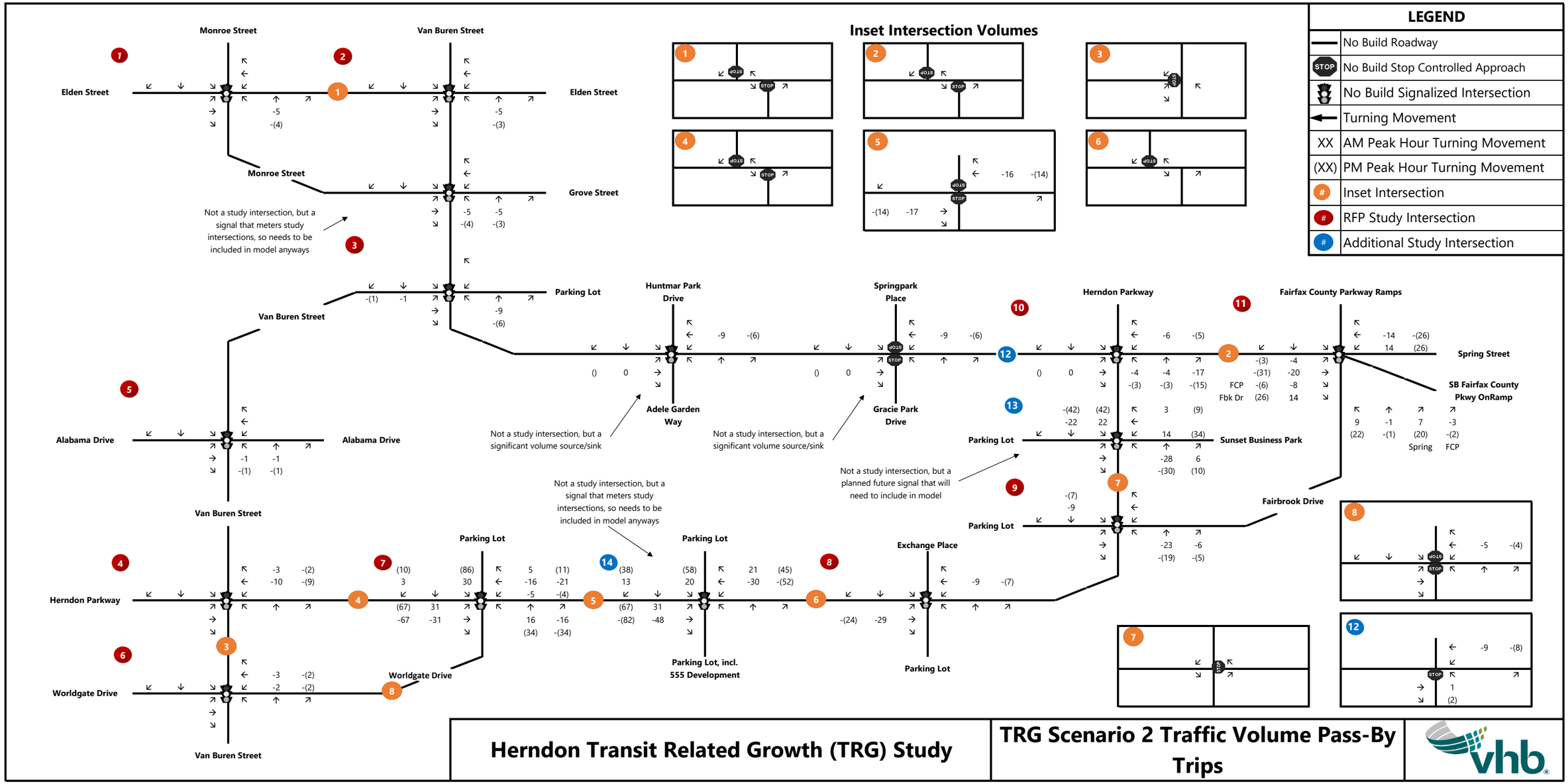
Herndon Transit Related Growth (TRG) Study

TRG Scenario 1 Traffic Volume New Trips



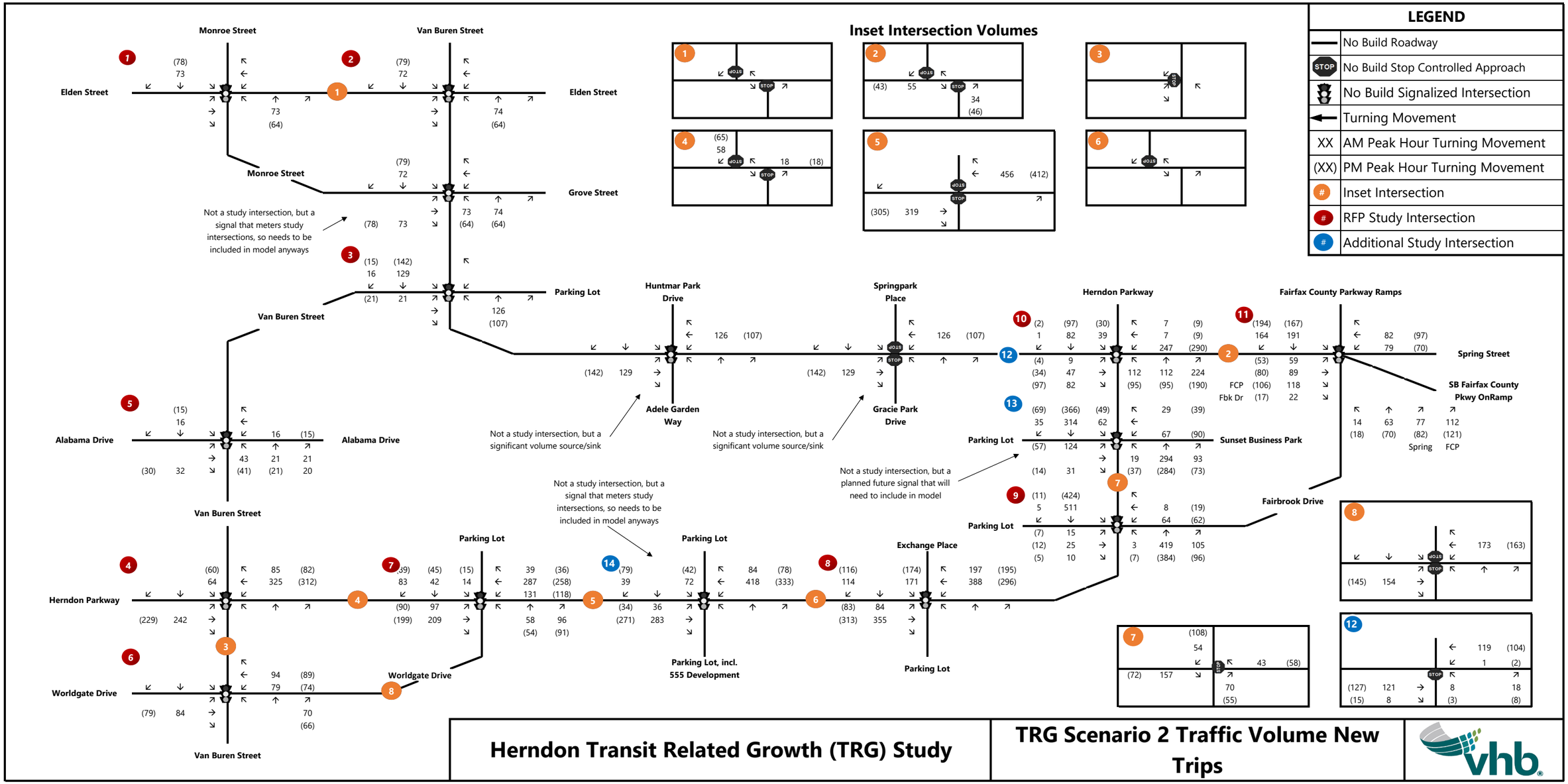
Herndon Transit Related Growth (TRG) Study

TRG Scenario 1 Traffic Volume Pass-By Trips



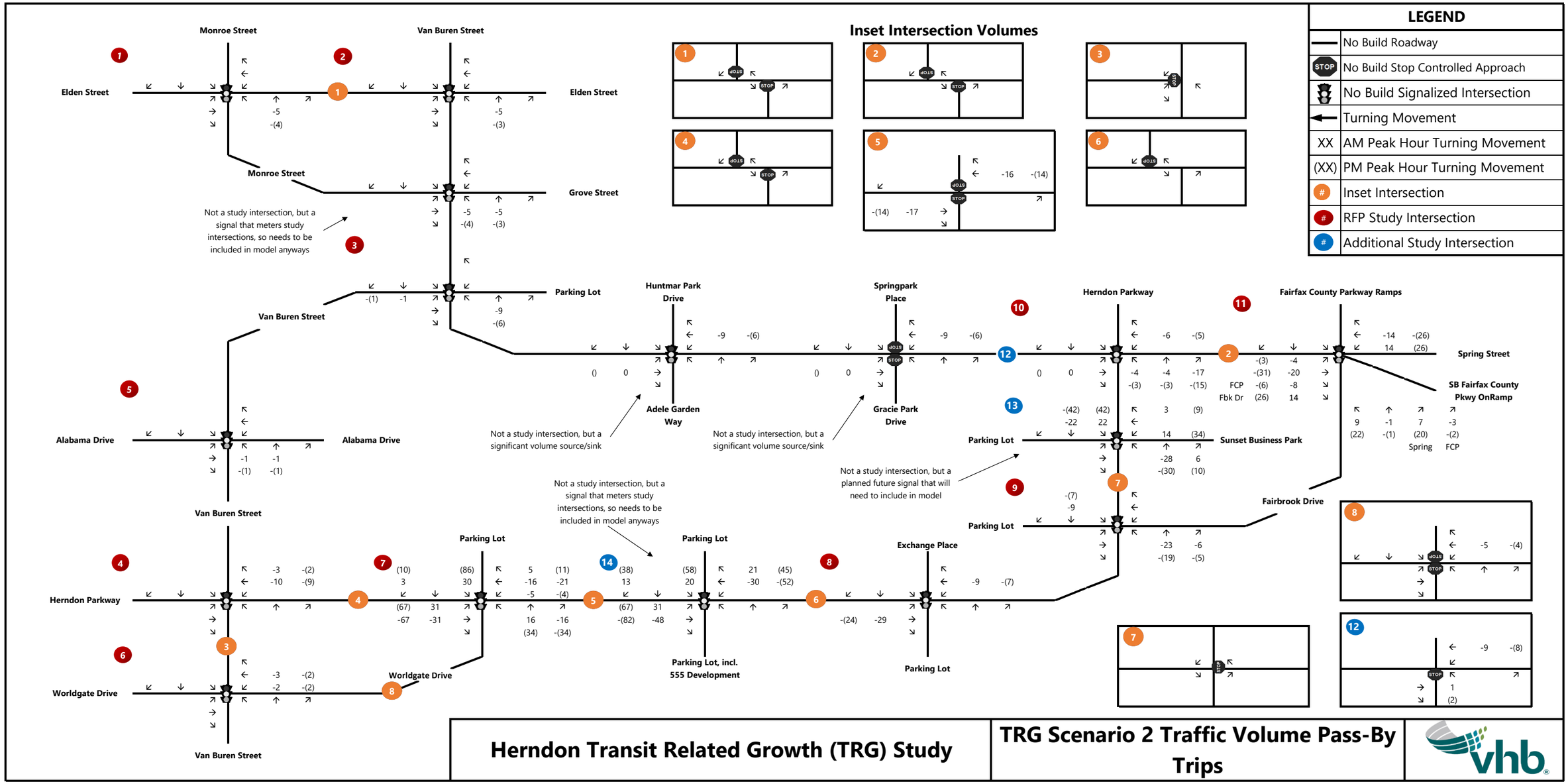
Herndon Transit Related Growth (TRG) Study

TRG Scenario 2 Traffic Volume Pass-By Trips



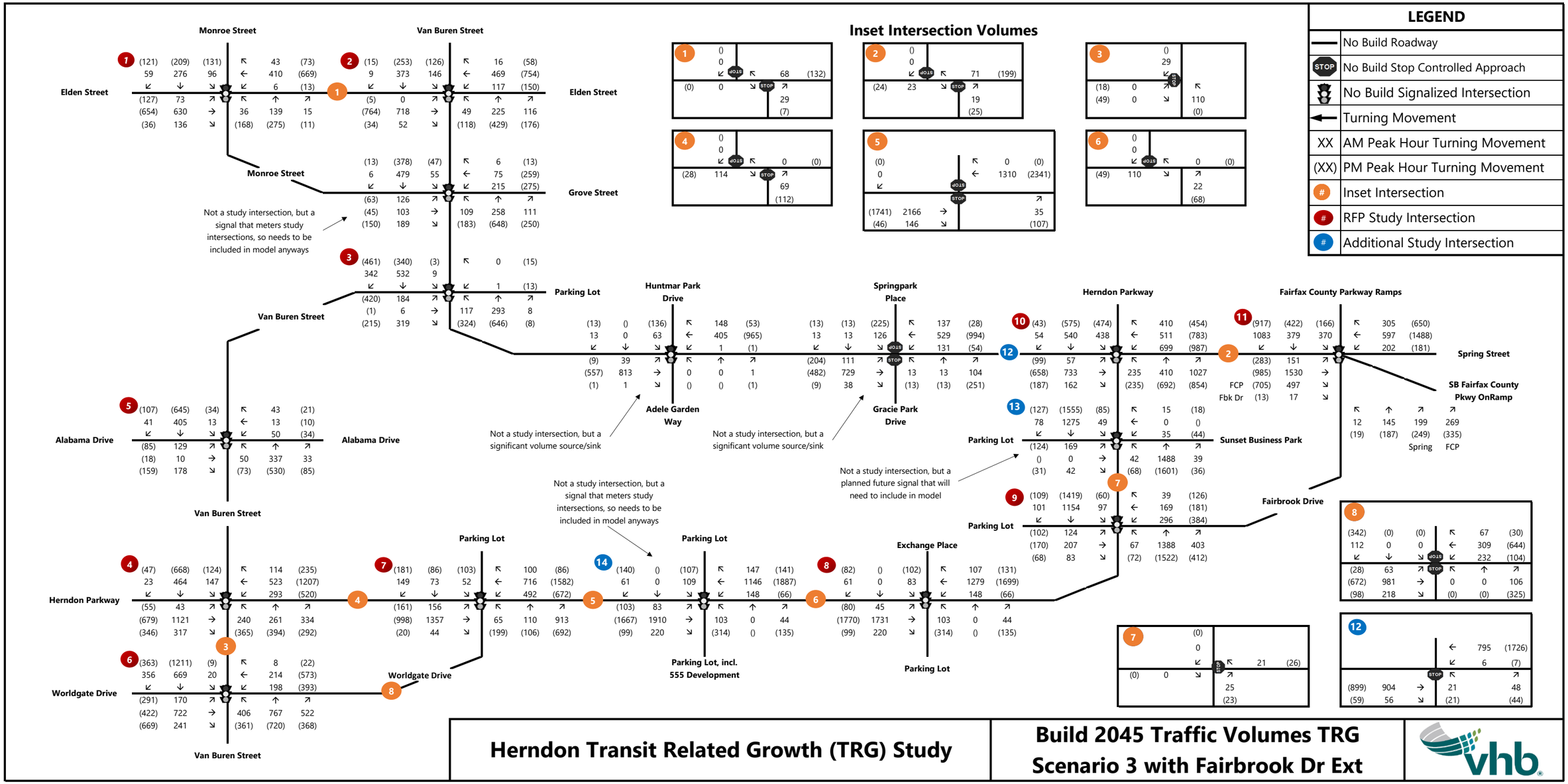
Herndon Transit Related Growth (TRG) Study

TRG Scenario 2 Traffic Volume New Trips



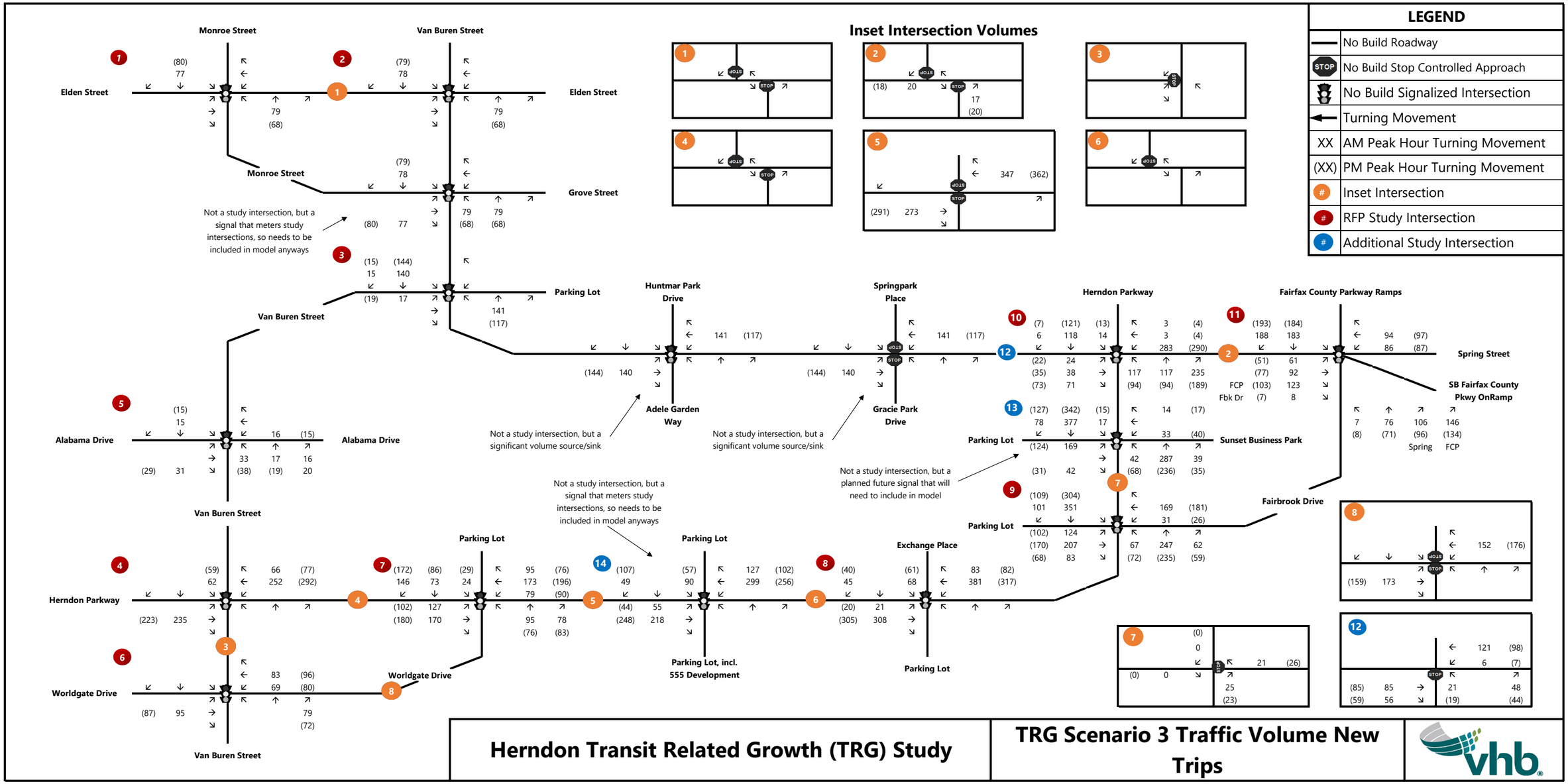
Herndon Transit Related Growth (TRG) Study

TRG Scenario 2 Traffic Volume Pass-By Trips



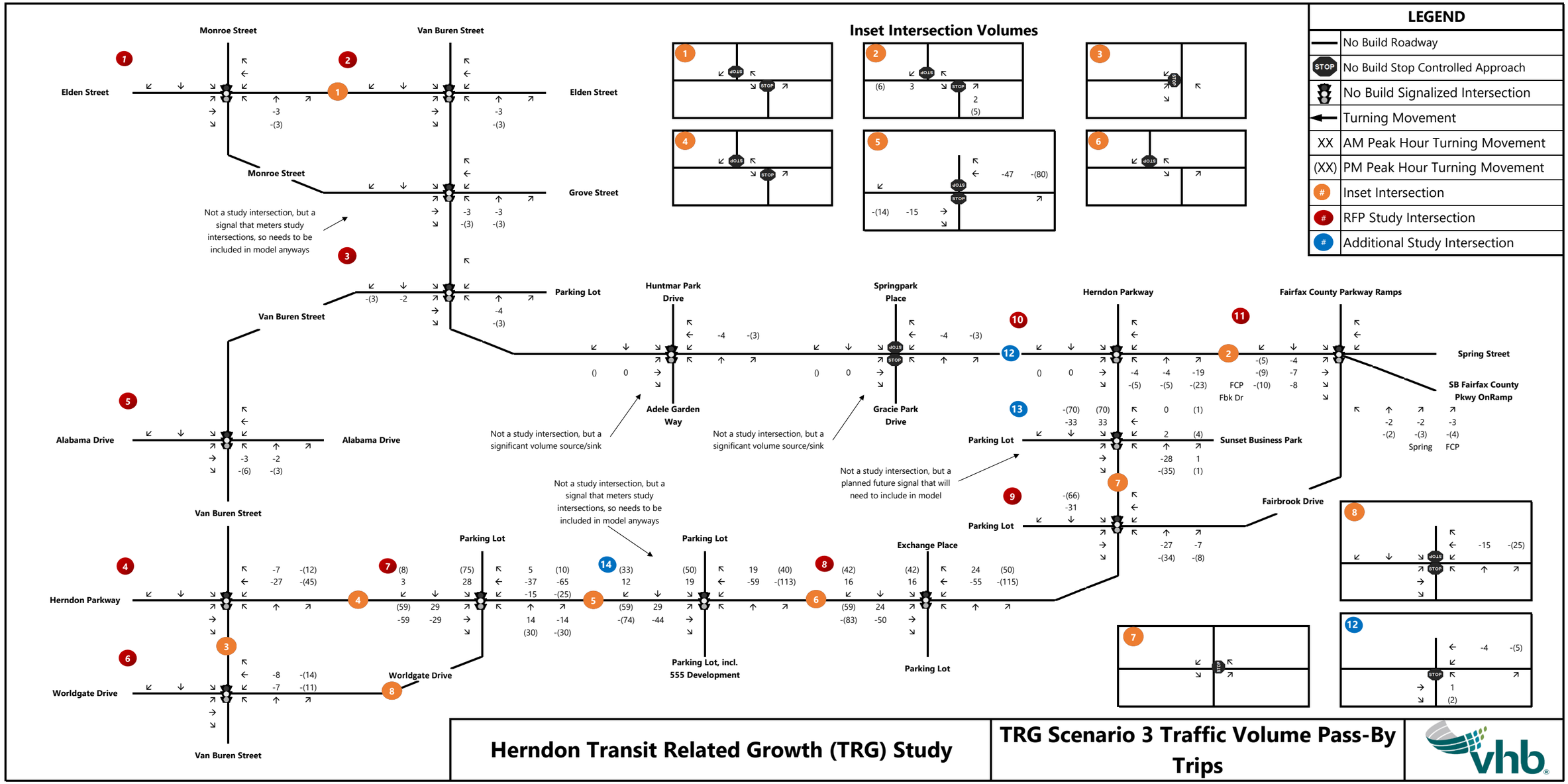
Herndon Transit Related Growth (TRG) Study

Build 2045 Traffic Volumes TRG Scenario 3 with Fairbrook Dr Ext



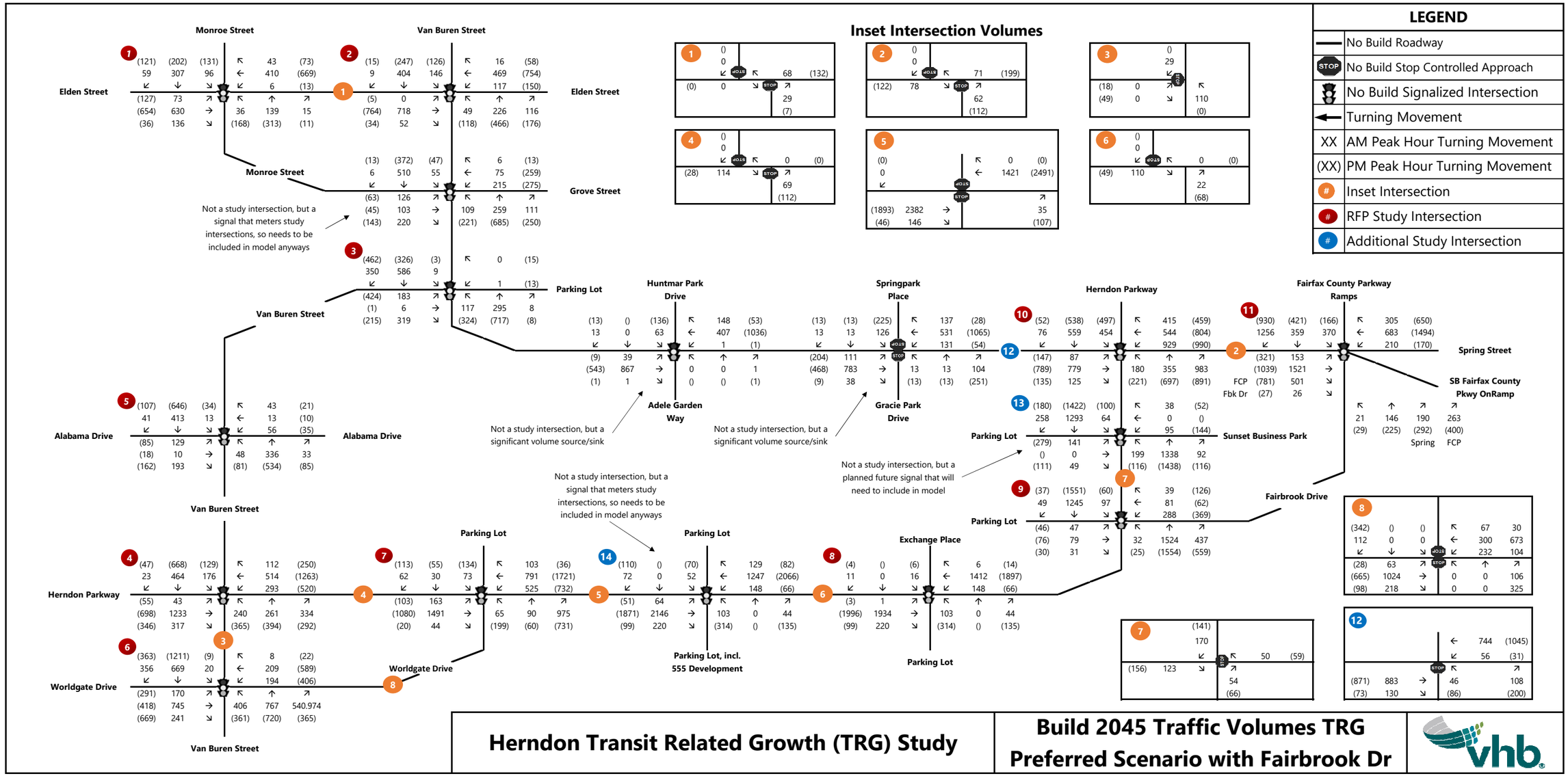
Herndon Transit Related Growth (TRG) Study

TRG Scenario 3 Traffic Volume New Trips



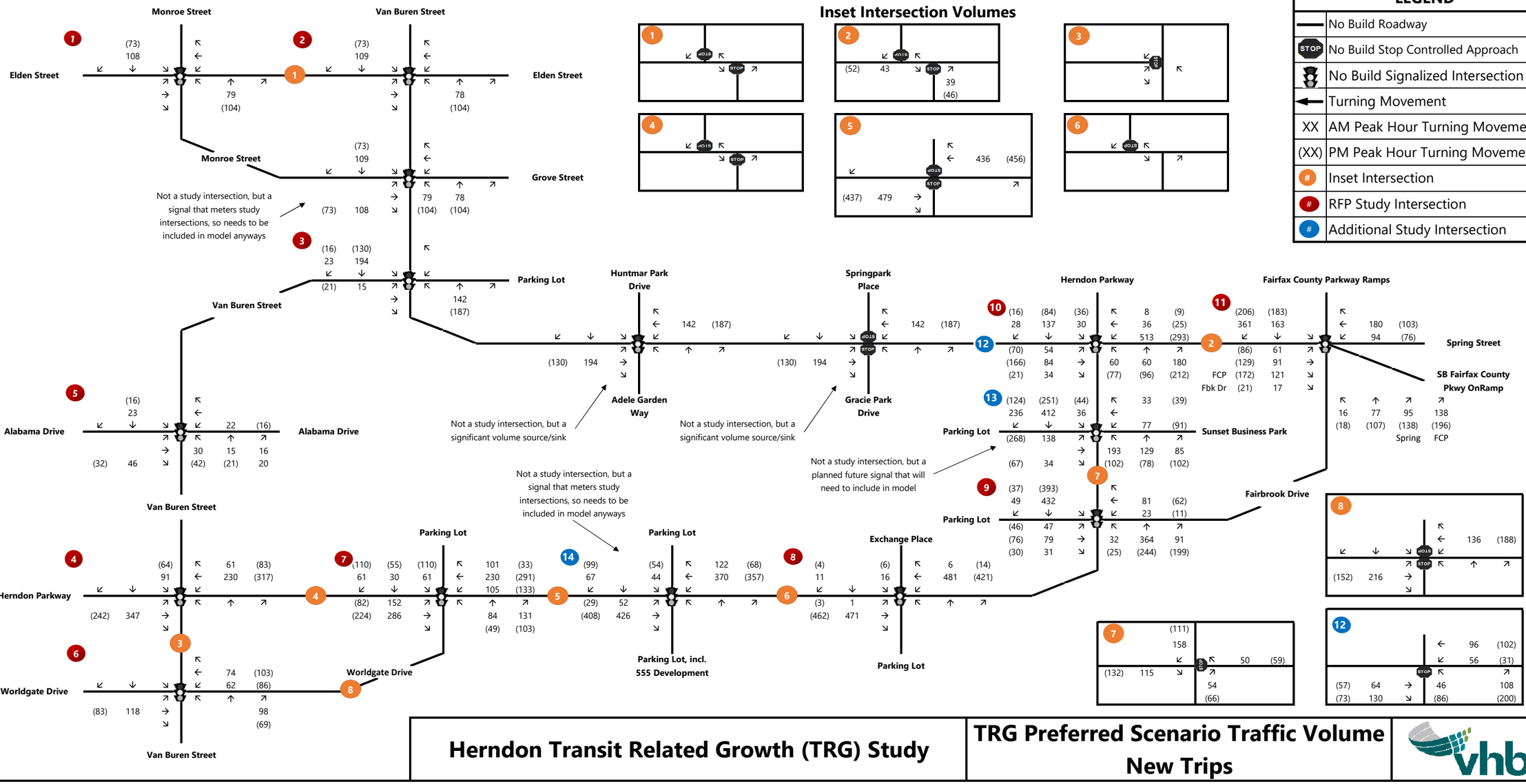
Herndon Transit Related Growth (TRG) Study

TRG Scenario 3 Traffic Volume Pass-By Trips



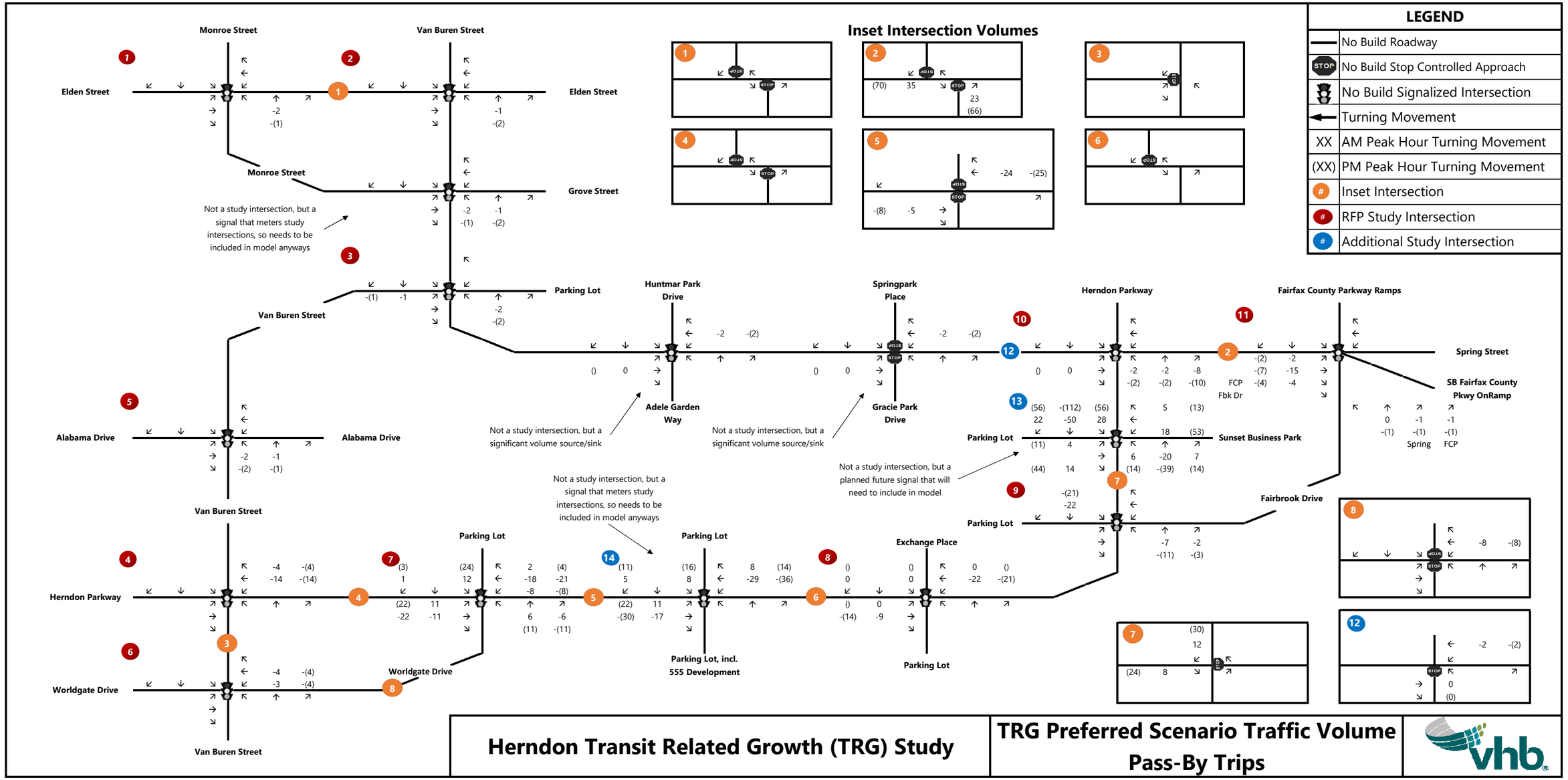
Herndon Transit Related Growth (TRG) Study

Build 2045 Traffic Volumes TRG Preferred Scenario with Fairbrook Dr



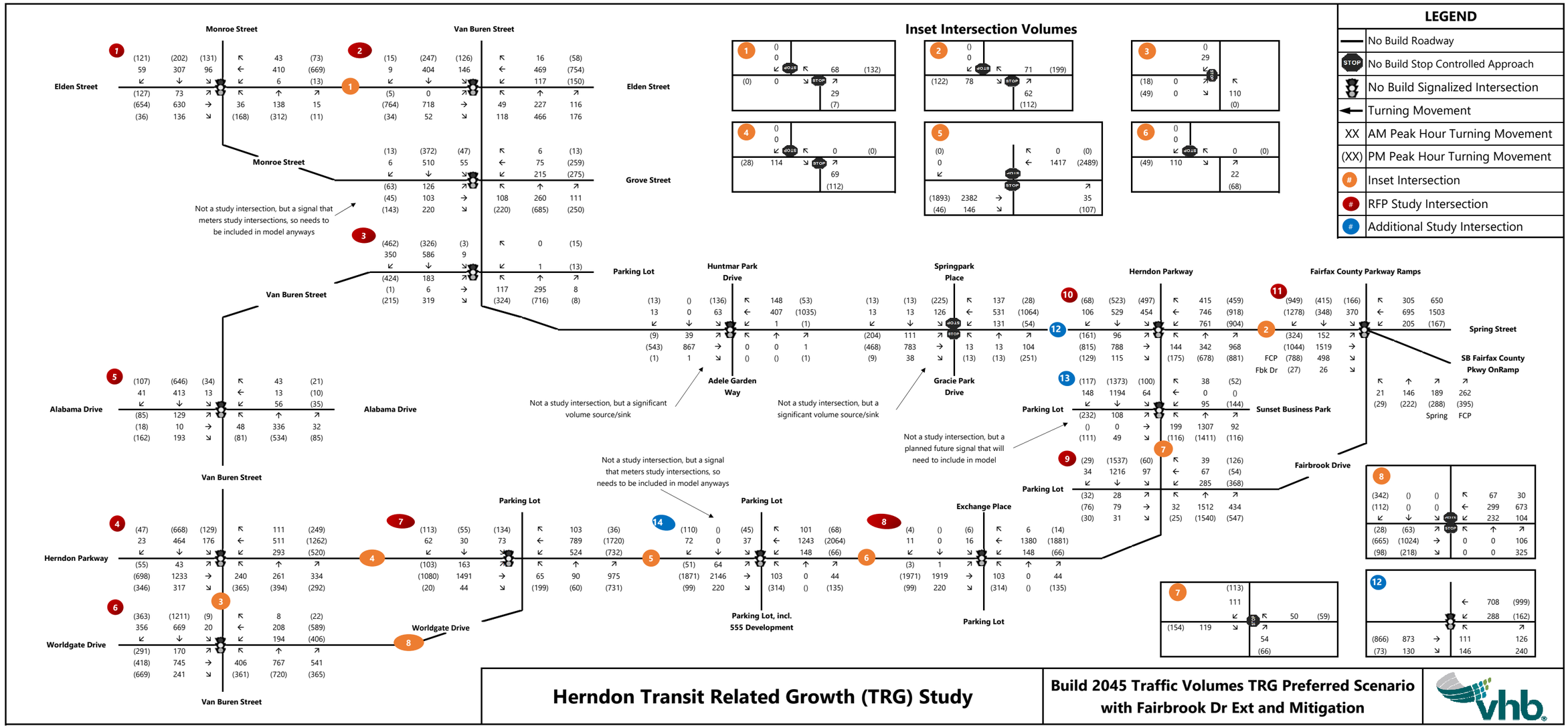
Herndon Transit Related Growth (TRG) Study

TRG Preferred Scenario Traffic Volume New Trips



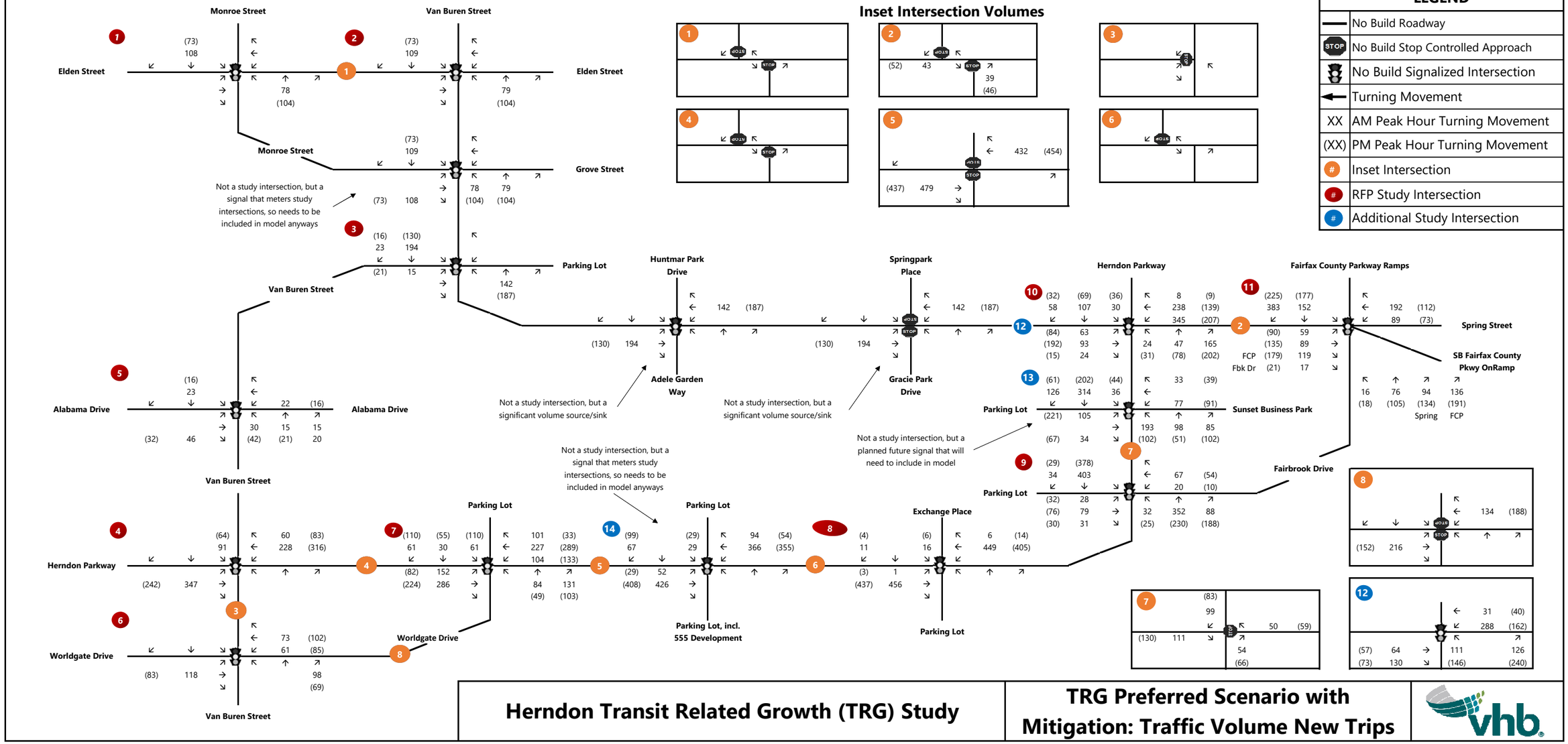
Herndon Transit Related Growth (TRG) Study

TRG Preferred Scenario Traffic Volume Pass-By Trips



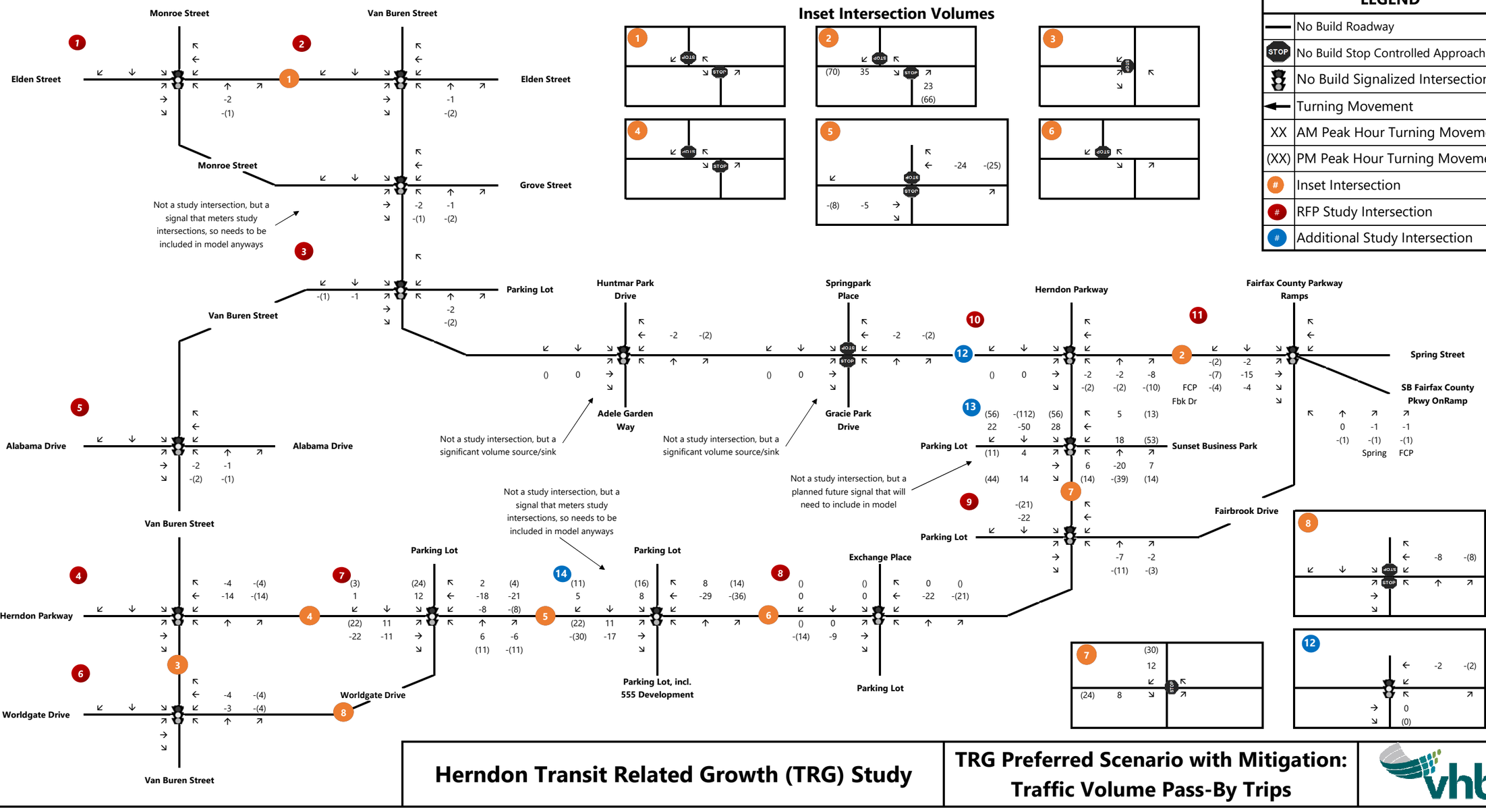
Herndon Transit Related Growth (TRG) Study

Build 2045 Traffic Volumes TRG Preferred Scenario with Fairbrook Dr Ext and Mitigation



Herndon Transit Related Growth (TRG) Study

TRG Preferred Scenario with Mitigation: Traffic Volume New Trips



Herndon Transit Related Growth (TRG) Study

TRG Preferred Scenario with Mitigation: Traffic Volume Pass-By Trips

Existing Conditions: Weekday Morning Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes												Existing Conditions MOEs						Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Calibration Threshold: Within ±	Calibration Threshold: Met Threshold? *	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Calibration Threshold: Within ±	Calibration Threshold: Met Threshold?	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	
Elden Street / Monroe Street	**Signal**	Elden Street	EBL	58	60	2	3%	20%	YES	667	662	-5	-1%	15%	YES	8.1	A	10.0	B	2	59	
			EBT	501	495	-6	-1%	15%	YES							10.5	B			37	439	
			EBR	108	107	-1	-1%	15%	YES							8.8	A			36	438	
		Elden Street	WBL	5	4	-1	-20%	20%	YES	365	356	-9	-2%	15%	YES	15.0	B	6.8	A	0	22	
			WBT	326	318	-8	-2%	15%	YES							6.9	A			13	222	
			WBR	34	34	0	0%	20%	YES							4.8	A			16	261	
		Monroe Street	NBL	29	29	0	0%	20%	YES	74	74	0	0%	20%	YES	75.4	E	63.4	E	12	74	
			NBT	33	33	0	0%	20%	YES							73.5	E			14	84	
			NBR	12	12	0	0%	20%	YES							6.9	A			2	74	
		Monroe Street	SBL	76	75	-1	-1%	20%	YES	242	248	6	2%	15%	YES	43.2	D	41.6	D	21	177	
			SBT	119	123	4	3%	15%	YES							45.7	D			40	194	
			SBR	47	50	3	6%	20%	YES							29.1	C			37	194	
		Intersection		**1,348**	**1,340**	-8	**-1%**	**10%**	**YES**	**1,348**	**1,340**	**-8**	**-1%**	**10%**	**YES**	18.0	B	**18.0**	**B**			
Elden Street / Van Buren Street	**Signal**	Elden Street	EBL	0	0	0	0%	20%	YES	612	603	-9	-1%	15%	YES	0.0	A	11.0	B	24	180	
			EBT	571	563	-8	-1%	15%	YES							11.6	B			24	180	
			EBR	41	40	-1	-2%	20%	YES							2.9	A			0	29	
		Elden Street	WBL	93	90	-3	-3%	20%	YES	479	468	-11	-2%	15%	YES	12.0	B	8.7	A	11	141	
			WBT	373	368	-5	-1%	15%	YES							8.0	A			11	141	
			WBR	13	10	-3	-23%	20%	YES*							4.9	A			15	155	
		Van Buren Street	NBL	39	39	0	0%	20%	YES	220	215	-5	-2%	15%	YES	44.4	D	28.7	C	10	94	
			NBT	89	86	-3	-3%	20%	YES							46.2	D			22	158	
			NBR	92	90	-2	-2%	20%	YES							5.2	A			2	72	
		Van Buren Street	SBL	116	117	1	1%	15%	YES	288	293	5	2%	15%	YES	47.6	D	48.9	D	33	195	
			SBT	165	168	3	2%	15%	YES							50.4	D			50	205	
			SBR	7	8	1	14%	20%	YES							36.2	D			52	215	
		Intersection		**1,311**	**1,286**	-25	**-2%**	**10%**	**YES**	**1,311**	**1,286**	**-25**	**-2%**	**10%**	**YES**	24.3	C	**24.3**	**C**			
Van Buren Street / Spring Street	**Signal**	Van Buren Street	EBL	112	105	-7	-6%	15%	YES	371	358	-13	-4%	15%	YES	12.2	B	8.5	A	0	0	
			EBT	5	5	0	0%	20%	YES							9.3	A			7	99	
			EBR	254	248	-6	-2%	15%	YES							6.9	A			8	113	
		Parking Lot	WBL	1	1	0	0%	20%	YES	1	1	0	0%	20%	YES	14.3	B	14.3	B	0	14	
			WBR	0	0	0	0%	20%	YES							0.0	A			0	0	
		Spring Street	NBL	93	94	1	1%	20%	YES	199	201	2	1%	15%	YES	8.1	A	6.2	A	2	89	
			NBT	100	102	2	2%	20%	YES							4.6	A			2	79	
			NBR	6	5	-1	-17%	20%	YES							1.9	A			1	87	
		Van Buren Street	SBL	7	6	-1	-14%	20%	YES	471	465	-6	-1%	15%	YES	6.2	A	4.8	A	0	30	
			SBT	255	248	-7	-3%	15%	YES							5.9	A			5	95	
			SBR	209	211	2	1%	15%	YES							3.5	A			2	102	
		Intersection		**571**	**560**	-11	**-2%**	**15%**	**YES**	**571**	**560**	**-11**	**-2%**	**15%**	**YES**	11.7	B	**11.7**	**B**			
Spring Street / Herndon Parkway	**Signal**	Spring Street	EBL	26	28	2	8%	20%	YES	594	584	-10	-2%	15%	YES	57.8	E	46.6	D	9	77	
			EBT	546	534	-12	-2%	15%	YES							46.5	D			84	313	
			EBR	22	22	0	0%	20%	YES							34.9	C			91	325	
		Spring Street	WBL	390	394	4	1%	15%	YES	1,114	1,139	25	2%	10%	YES	52.5	D	30.5	C	70	236	
			WBT	400	404	4	1%	15%	YES							29.8	C			41	177	
			WBR	324	341	17	5%	15%	YES							5.8	A			8	132	
		Herndon Parkway	NBL	66	65	-1	-2%	20%	YES	972	924	-48	-5%	15%	YES	32.5	C	56.2	E	6	90	
			NBT	177	169	-8	-5%	15%	YES							46.2	D			287	901	
			NBR	729	690	-39	-5%	15%	YES							60.9	E			564	998	
		Herndon Parkway	SBL	337	338	1	0%	15%	YES	591	589	-2	0%	15%	YES	20.8	C	19.9	B	38	277	
			SBT	216	212	-4	-2%	15%	YES							19.8	B			17	123	
			SBR	38	39	1	3%	20%	YES							12.8	B			16	136	
		Intersection		**2,680**	**2,647**	-33	**-1%**	**10%**	**YES**	**2,680**	**2,647**	**-33**	**-1%**	**10%**	**YES**	47.4	D	**47.4**	**D**			
Spring Street / Fairfax County Parkway	**Signal**	Spring Street	EBL	106	106	0	0%	15%	YES	1,650	1,605	-45	-3%	10%	YES	62.0	E	10.0	A	37	180	
			EBT	1,188	1,159	-29	-2%	10%	YES							7.7	A			28	354	
			EBR	356	340	-16	-4%	15%	YES							1.7	A			0	0	
		Spring Street	WBT	416	407	-9	-2%	15%	YES	659	649	-10	-2%	15%	YES	13.5	B	8.7	A	18	155	
			WBR	243	242	-1	0%	15%	YES							0.6	A			0	0	
		Fairfax County Parkway	SBL	294	294	0	0%	15%	YES	1,048	1,056	8	1%	10%	YES	46.2	D	38.5	D	261	758	
			SBR	754	762	8	1%	15%	YES							35.5	D			261	758	
		Intersection		**3,357**	**3,310**	-47	**-1%**	**10%**	**YES**	**3,357**	**3,310**	**-47**	**-1%**	**10%**	**YES**	18.8	B	**18.8**	**B**			

Note: Average results across 7 microsimulation runs.
* Low volume difference. Percentage difference is not significant. Considered Calibrated.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue.

Existing Conditions: Weekday Morning Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes												Existing Conditions MOEs						Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Calibration Threshold Within ±	Calibration Threshold Met Threshold? *	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Calibration Threshold Within ±	Calibration Threshold Met Threshold?	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	
Van Buren Street / Alabama Drive	**All-Way Stop (Future Signal)**	Alabama Drive	EBL	103	97	-6	-6%	15%	YES	239	239	0	0%	15%	YES	8.9	A	8.3	A	12	121	
			EBT	8	8	0	0%	20%	YES							10.3	B			12	122	
			EBR	128	134	6	5%	15%	YES							7.7	A			12	121	
		Alabama Drive	WBL	32	31	-1	-3%	20%	YES	76	73	-3	-4%	20%	YES	6.8	A	6.3	A	3	89	
			WBT	10	11	1	10%	20%	YES							7.4	A			3	90	
			WBR	34	31	-3	-9%	20%	YES							5.6	A			3	89	
		Van Buren Street	NBL	13	14	1	8%	20%	YES	257	250	-7	-3%	15%	YES	11.5	B	12.3	B	17	177	
			NBT	234	226	-8	-3%	15%	YES							12.5	B			18	178	
			NBR	10	10	0	0%	20%	YES							10.4	B			17	177	
		Van Buren Street	SBL	10	12	2	20%	20%	YES	302	306	4	1%	15%	YES	11.8	B	11.9	B	26	193	
			SBT	259	261	2	1%	15%	YES							12.1	B			26	193	
			SBR	33	33	0	0%	20%	YES							10.7	B			26	193	
		Intersection		**874**	**868**	-6	**-1%**	**15%**	**YES**	**874**	**868**	**-6**	**-1%**	**15%**	**YES**	10.6	B	**10.6**	**B**			
Van Buren Street / Herndon Parkway	**Signal**	Herndon Parkway	EBL	34	34	0	0%	20%	YES	908	906	-2	0%	15%	YES	22.8	C	34.7	C	4	70	
			EBT	605	609	4	1%	15%	YES							36.3	D			105	414	
			EBR	269	263	-6	-2%	15%	YES							32.7	C			120	436	
		Herndon Parkway	WBL	231	203	-28	-12%	15%	YES	399	355	-44	-11%	15%	YES	37.1	D	31.0	C	67	273	
			WBT	146	133	-13	-9%	15%	YES							24.3	C			10	86	
			WBR	22	19	-3	-14%	20%	YES							12.1	B			10	86	
		Van Buren Street	NBL	192	187	-5	-3%	15%	YES	994	952	-42	-4%	15%	YES	17.4	B	43.8	D	236	1048	
			NBT	201	197	-4	-2%	15%	YES							54.4	D			763	1047	
			NBR	601	568	-33	-5%	15%	YES							48.9	D			780	1064	
		Van Buren Street	SBL	43	41	-2	-5%	20%	YES	419	425	6	1%	15%	YES	42.1	D	24.7	C	9	92	
			SBT	358	364	6	2%	15%	YES							23.4	C			28	189	
			SBR	18	20	2	11%	20%	YES							12.0	B			28	189	
		Intersection		**2,720**	**2,638**	-82	**-3%**	**10%**	**YES**	**2,720**	**2,638**	**-82**	**-3%**	**10%**	**YES**	35.9	D	**35.9**	**D**			
Van Buren Street / Worldgate Drive	**Signal**	Worldgate Drive	EBL	222	226	4	2%	15%	YES	446	451	5	1%	15%	YES	48.9	D	28.4	C	52	257	
			EBT	32	29	-3	-9%	20%	YES							46.6	D			52	257	
			EBR	192	196	4	2%	15%	YES							2.0	A			1	77	
		Parking Lot	WBL	3	3	0	0%	20%	YES	6	6	0	0%	20%	YES	45.4	D	50.4	D	1	39	
			WBT	2	3	1	50%	20%	YES*							55.5	E			1	39	
			WBR	1	0	-1	-100%	20%	YES*							29.2	C			0	0	
		Van Buren Street	NBL	323	307	-16	-5%	15%	YES	1,245	1,182	-63	-5%	10%	YES	46.0	D	62.6	E	211	753	
			NBT	859	818	-41	-5%	15%	YES							72.1	E			733	1393	
			NBR	63	57	-6	-10%	20%	YES							16.4	B			0	53	
		Van Buren Street	SBL	22	20	-2	-9%	20%	YES	835	802	-33	-4%	15%	YES	52.8	D	10.3	B	6	66	
			SBT	589	564	-25	-4%	15%	YES							12.5	B			24	201	
			SBR	224	218	-6	-3%	15%	YES							0.7	A			0	0	
		Intersection		**2,532**	**2,441**	-91	**-4%**	**10%**	**YES**	**2,532**	**2,441**	**-91**	**-4%**	**10%**	**YES**	39.1	D	**39.1**	**D**			
Herndon Parkway / Parking Lots by Metro	**Two-Way Stop Control**	Herndon Parkway	EBL	55	58	3	5%	20%	YES	1,248	1,222	-26	-2%	10%	YES	2.0	A	0.3	A	0	51	
			EBT	1,181	1,153	-28	-2%	10%	YES							0.2	A			0	0	
			EBR	12	11	-1	-8%	20%	YES							0.5	A			0	0	
		Herndon Parkway	WBL	26	28	2	8%	20%	YES	440	438	-2	0%	15%	YES	5.4	A	0.6	A	1	57	
			WBT	388	382	-6	-2%	15%	YES							0.2	A			0	13	
			WBR	26	28	2	8%	20%	YES							0.5	A			0	18	
		Parking Lot	NBL	6	5	-1	-17%	20%	YES	6	5	-1	-17%	20%	YES	10.3	B	10.3	B	0	35	
			NBT	0	0	0	0%	20%	YES							0.0	A			0	23	
			NBR	0	0	0	0%	20%	YES							0.0	A			0	35	
		Parking Lot	SBL	9	10	1	11%	20%	YES	15	15	0	0%	20%	YES	8.8	A	7.7	A	1	48	
			SBT	1	1	0	0%	20%	YES							6.1	A			0	30	
			SBR	5	4	-1	-20%	20%	YES							5.4	A			0	47	
		Intersection		**1,709**	**1,680**	-29	**-2%**	**10%**	**YES**	**1,709**	**1,680**	**-29**	**-2%**	**10%**	**YES**	0.5	A	**0.5**	**A**			

Note: Average results across 7 microsimulation runs.
* Low volume difference. Percentage difference is not significant. Considered Calibrated.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue.

Existing Conditions: Weekday Morning Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes												Existing Conditions MOEs						Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Calibration Threshold: Within ±	Calibration Threshold: Met Threshold? *	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Calibration Threshold: Within ±	Calibration Threshold: Met Threshold?	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	
Herndon Parkway / Exchange Place	**Two-Way Stop Control (future signal)**	Herndon Parkway	EBL	26	27	1	4%	20%	YES	1,025	996	-29	-3%	10%	YES	2.1	A	0.3	A	0	57	
			EBT	979	951	-28	-3%	15%	YES							0.2	A			0	0	
			EBR	20	18	-2	-10%	20%	YES							0.5	A			0	0	
		Herndon Parkway	WBL	23	23	0	0%	20%	YES	529	528	-1	0%	15%	YES	0.6	A	0.3	A	0	0	
			WBT	488	490	2	0%	15%	YES							0.3	A			0	4	
			WBR	18	15	-3	-17%	20%	YES							0.6	A			0	4	
		Parking Lot	NBL	9	9	0	0%	20%	YES	43	43	0	0%	20%	YES	7.2	A	6.7	A	3	106	
			NBT	0	0	0	0%	20%	YES							0.0	A			0	58	
			NBR	34	34	0	0%	20%	YES							6.6	A			2	75	
		Exchange Place	SBL	6	6	0	0%	20%	YES	12	12	0	0%	20%	YES	6.7	A	5.7	A	1	55	
			SBT	0	0	0	0%	20%	YES							0.0	A			0	27	
			SBR	6	6	0	0%	20%	YES							4.8	A			1	55	
		Intersection		**1,609**	**1,579**	-30	**-2%**	**10%**	**YES**	**1,609**	**1,579**	**-30**	**-2%**	**10%**	**YES**	0.5	A	**0.5**	**A**			
Herndon Parkway / Fairbrook Drive	**Two-Way Stop Control (future signal)**	Parking Lot	EBL	3	3	0	0%	20%	YES	5	5	0	0%	20%	YES	10.8	B	9.1	A	0	51	
			EBT	0	0	0	0%	20%	YES							0.0	A			0	33	
			EBR	2	2	0	0%	20%	YES							6.5	A			0	50	
		Fairbrook Drive	WBL	4	4	0	0%	20%	YES	10	9	-1	-10%	20%	YES	9.9	A	7.9	A	0	42	
			WBT	0	0	0	0%	20%	YES							0.0	A			0	25	
			WBR	6	5	-1	-17%	20%	YES							6.4	A			0	41	
		Herndon Parkway	NBL	31	29	-2	-6%	20%	YES	1,019	988	-31	-3%	10%	YES	2.0	A	0.3	A	0	44	
			NBT	961	934	-27	-3%	15%	YES							0.2	A			0	19	
			NBR	27	25	-2	-7%	20%	YES							0.7	A			0	32	
		Herndon Parkway	SBL	26	29	3	12%	20%	YES	563	563	0	0%	15%	YES	3.8	A	0.4	A	1	67	
			SBT	523	521	-2	0%	15%	YES							0.2	A			0	19	
			SBR	14	13	-1	-7%	20%	YES							0.8	A			0	28	
		Intersection		**1,597**	**1,565**	-32	**-2%**	**10%**	**YES**	**1,597**	**1,565**	**-32**	**-2%**	**10%**	**YES**	0.4	A	**0.4**	**A**			

Note: Average results across 7 microsimulation runs.
* Low volume difference. Percentage difference is not significant. Considered Calibrated.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue.

Existing Conditions: Weekday Evening Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes												Existing Conditions MOEs						Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Calibration Threshold: Within ±	Calibration Threshold: Met Threshold? *	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Calibration Threshold: Within ±	Calibration Threshold: Met Threshold?	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	
Elden Street / Monroe Street	**Signal**	Elden Street	EBL	101	99	-2	-2%	15%	YES	650	646	-4	-1%	15%	YES	14.2	B	12.6	B	5	124	
			EBT	520	517	-3	-1%	15%	YES							12.5	B			41	416	
			EBR	29	30	1	3%	20%	YES							9.9	A			41	422	
		Elden Street	WBL	10	10	0	0%	20%	YES	600	590	-10	-2%	15%	YES	11.9	B	11.6	B	0	24	
			WBT	532	522	-10	-2%	15%	YES							11.8	B			40	429	
			WBR	58	58	0	0%	20%	YES							10.5	B			50	461	
		Monroe Street	NBL	134	129	-5	-4%	15%	YES	268	263	-5	-2%	15%	YES	55.1	E	53.8	D	41	233	
			NBT	125	125	0	0%	15%	YES							55.0	E			40	239	
			NBR	9	9	0	0%	20%	YES							18.1	B			27	233	
		Monroe Street	SBL	104	105	1	1%	15%	YES	282	285	3	1%	15%	YES	45.6	D	38.8	D	30	189	
			SBT	82	82	0	0%	20%	YES							46.4	D			35	202	
			SBR	96	98	2	2%	20%	YES							25.3	C			36	208	
		Intersection		**1,800**	**1,784**	-16	**-1%**	**10%**	**YES**	**1,800**	**1,784**	**-16**	**-1%**	**10%**	**YES**	22.5	C	**22.5**	**C**			
Elden Street / Van Buren Street	**Signal**	Elden Street	EBL	4	5	1	25%	20%	YES*	639	634	-5	-1%	15%	YES	11.7	B	11.9	B	27	199	
			EBT	608	601	-7	-1%	15%	YES							12.4	B			27	199	
			EBR	27	28	1	4%	20%	YES							2.1	A			0	34	
		Elden Street	WBL	119	120	1	1%	15%	YES	765	760	-5	-1%	15%	YES	14.5	B	11.4	B	26	219	
			WBT	600	596	-4	-1%	15%	YES							11.0	B			26	219	
			WBR	46	44	-2	-4%	20%	YES							8.7	A			26	219	
		Van Buren Street	NBL	94	93	-1	-1%	20%	YES	438	427	-11	-3%	15%	YES	45.5	D	34.6	C	23	153	
			NBT	204	197	-7	-3%	15%	YES							48.9	D			56	285	
			NBR	140	137	-3	-2%	15%	YES							6.9	A			4	104	
		Van Buren Street	SBL	100	100	0	0%	20%	YES	213	214	1	0%	15%	YES	45.5	D	45.4	D	26	154	
			SBT	101	103	2	2%	15%	YES							47.3	D			29	166	
			SBR	12	11	-1	-8%	20%	YES							26.8	C			27	176	
		Intersection		**1,842**	**1,821**	-21	**-1%**	**10%**	**YES**	**1,842**	**1,821**	**-21**	**-1%**	**10%**	**YES**	22.4	C	**22.4**	**C**			
Van Buren Street / Spring Street	**Signal**	Van Buren Street	EBL	261	257	-4	-2%	15%	YES	433	432	-1	0%	15%	YES	19.8	B	13.8	B	27	208	
			EBT	1	1	0	0%	20%	YES							24.0	C			27	208	
			EBR	171	174	3	2%	15%	YES							4.9	A			3	84	
		Parking Lot	WBL	10	11	1	10%	20%	YES	22	23	1	5%	20%	YES	25.4	C	25.3	C	1	42	
			WBR	12	12	0	0%	20%	YES							25.3	C			2	44	
		Spring Street	NBL	258	235	-23	-9%	15%	YES	620	580	-40	-6%	15%	YES	93.3	F	44.9	D	187	717	
			NBT	356	339	-17	-5%	15%	YES							12.0	B			10	184	
			NBR	6	6	0	0%	20%	YES							9.4	A			9	192	
		Van Buren Street	SBL	2	2	0	0%	20%	YES	454	452	-2	0%	15%	YES	11.2	B	30.5	C	0	19	
			SBT	124	127	3	2%	15%	YES							17.4	B			68	358	
			SBR	328	323	-5	-2%	15%	YES							35.8	D			90	380	
		Intersection		**1,075**	**1,035**	-40	**-4%**	**10%**	**YES**	**1,075**	**1,035**	**-40**	**-4%**	**10%**	**YES**	44.8	D	**44.8**	**D**			
Spring Street / Herndon Parkway	**Signal**	Spring Street	EBL	61	61	0	0%	20%	YES	604	608	4	1%	15%	YES	55.5	E	46.0	D	19	113	
			EBT	491	498	7	1%	15%	YES							45.7	D			82	303	
			EBR	52	49	-3	-6%	20%	YES							37.5	D			89	315	
		Spring Street	WBL	602	606	4	1%	15%	YES	1,571	1,574	3	0%	10%	YES	76.3	E	41.2	D	164	551	
			WBT	611	611	0	0%	15%	YES							27.4	C			63	510	
			WBR	358	357	-1	0%	15%	YES							5.2	A			6	118	
		Herndon Parkway	NBL	58	58	0	0%	20%	YES	1,066	1,053	-13	-1%	10%	YES	24.4	C	39.3	D	6	75	
			NBT	341	338	-3	-1%	15%	YES							40.6	D			147	630	
			NBR	667	657	-10	-1%	15%	YES							39.9	D			236	660	
		Herndon Parkway	SBL	367	364	-3	-1%	15%	YES	685	683	-2	0%	15%	YES	28.5	C	25.1	C	60	357	
			SBT	289	290	1	0%	15%	YES							21.8	C			23	173	
			SBR	29	29	0	0%	20%	YES							14.7	B			25	187	
		Intersection		**3,241**	**3,235**	-6	**0%**	**10%**	**YES**	**3,241**	**3,235**	**-6**	**0%**	**10%**	**YES**	46.8	D	**46.8**	**D**			
Spring Street / Fairfax County Parkway	**Signal**	Spring Street	EBL	240	241	1	0%	15%	YES	1,600	1,590	-10	-1%	10%	YES	47.5	D	11.5	B	67	319	
			EBT	791	786	-5	-1%	15%	YES							7.0	A			13	222	
			EBR	569	563	-6	-1%	15%	YES							2.3	A			0	0	
		Spring Street	WBT	1,121	1,114	-7	-1%	10%	YES	1,638	1,624	-14	-1%	10%	YES	16.1	B	11.5	B	65	452	
			WBR	517	510	-7	-1%	15%	YES							1.5	A			0	26	
		Fairfax County Parkway	SBL	132	132	0	0%	15%	YES	740	748	8	1%	15%	YES	53.2	D	42.9	D	193	608	
			SBR	608	616	8	1%	15%	YES							40.7	D			193	608	
		Intersection		**3,978**	**3,962**	-16	**0%**	**10%**	**YES**	**3,978**	**3,962**	**-16**	**0%**	**10%**	**YES**	17.4	B	**17.4**	**B**			

Note: Average results across 20 microsimulation runs.
* Low volume difference. Percentage difference is not significant. Considered Calibrated.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

Existing Conditions: Weekday Evening Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes												Existing Conditions MOEs						Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Calibration Threshold Within ±	Calibration Threshold Met Threshold? *	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Calibration Threshold Within ±	Calibration Threshold Met Threshold?	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	
Van Buren Street / Alabama Drive	All-Way Stop Control (future signal)	Alabama Drive	EBL	68	67	-1	-1%	20%	YES	182	181	-1	-1%	15%	YES	8.8	A	8.0	A	8	116	
			EBT	14	14	0	0%	20%	YES							10.0	A			8	116	
			EBR	100	100	0	0%	20%	YES							7.3	A			8	116	
		Alabama Drive	WBL	13	13	0	0%	20%	YES	38	37	-1	-3%	20%	YES	7.1	A	6.7	A	2	69	
			WBT	8	8	0	0%	20%	YES							8.5	A			2	70	
			WBR	17	16	-1	-6%	20%	YES							5.6	A			2	69	
		Van Buren Street	NBL	41	42	1	2%	20%	YES	444	443	-1	0%	15%	YES	27.3	D	28.2	D	90	398	
			NBT	348	348	0	0%	15%	YES							28.6	D			91	399	
			NBR	55	53	-2	-4%	20%	YES							25.9	D			90	398	
		Van Buren Street	SBL	27	25	-2	-7%	20%	YES	586	534	-52	-9%	15%	YES	76.7	F	76.6	F	1256	1629	
			SBT	474	432	-42	-9%	15%	YES							76.8	F			1256	1629	
			SBR	85	77	-8	-9%	20%	YES							75.4	F			1256	1629	
		Intersection		**1,250**	**1,195**	-55	**-4%**	**10%**	**YES**	**1,250**	**1,195**	**-55**	**-4%**	**10%**	**YES**	46.1	E	**46.1**	**E**			
Van Buren Street / Herndon Parkway	Signal	Herndon Parkway	EBL	44	44	0	0%	20%	YES	585	580	-5	-1%	15%	YES	25.3	C	35.2	D	6	76	
			EBT	260	258	-2	-1%	15%	YES							42.0	D			72	320	
			EBR	281	278	-3	-1%	15%	YES							30.4	C			87	342	
		Herndon Parkway	WBL	458	456	-2	0%	15%	YES	1,174	1,230	56	5%	10%	YES	48.3	D	40.8	D	154	585	
			WBT	617	675	58	9%	15%	YES							36.7	D			109	548	
			WBR	99	99	0	0%	20%	YES							34.6	C			109	548	
		Van Buren Street	NBL	391	391	0	0%	15%	YES	1,162	1,157	-5	0%	10%	YES	39.0	D	40.4	D	353	1013	
			NBT	301	300	-1	0%	15%	YES							42.7	D			439	1019	
			NBR	470	466	-4	-1%	15%	YES							40.0	D			451	1036	
		Van Buren Street	SBL	25	24	-1	-4%	20%	YES	587	545	-42	-7%	15%	YES	34.8	C	37.3	D	4	58	
			SBT	525	484	-41	-8%	15%	YES							38.1	D			65	342	
			SBR	37	37	0	0%	20%	YES							28.5	C			65	342	
		Intersection		**3,508**	**3,512**	4	**0%**	**10%**	**YES**	**3,508**	**3,512**	**4**	**0%**	**10%**	**YES**	39.2	D	**39.2**	**D**			
Van Buren Street / Worldgate Drive	Signal	Worldgate Drive	EBL	295	294	-1	0%	15%	YES	830	831	1	0%	15%	YES	49.5	D	22.9	C	61	251	
			EBT	3	3	0	0%	20%	YES							52.7	D			61	251	
			EBR	532	534	2	0%	15%	YES							8.1	A			24	304	
		Parking Lot	WBL	61	60	-1	-2%	20%	YES	105	104	-1	-1%	15%	YES	54.8	D	45.9	D	25	168	
			WBT	18	17	-1	-6%	20%	YES							56.1	E			25	168	
			WBR	26	27	1	4%	20%	YES							19.6	B			1	75	
		Van Buren Street	NBL	208	201	-7	-3%	15%	YES	1,040	1,032	-8	-1%	10%	YES	53.6	D	33.7	C	41	177	
			NBT	826	826	0	0%	15%	YES							29.1	C			118	560	
			NBR	6	5	-1	-17%	20%	YES							2.9	A			0	17	
		Van Buren Street	SBL	7	6	-1	-14%	20%	YES	1,303	1,257	-46	-4%	10%	YES	51.3	D	17.2	B	2	39	
			SBT	1,096	1,059	-37	-3%	10%	YES							20.0	B			73	378	
			SBR	200	192	-8	-4%	15%	YES							0.7	A			0	37	
		Intersection		**3,278**	**3,224**	-54	**-2%**	**10%**	**YES**	**3,278**	**3,224**	**-54**	**-2%**	**10%**	**YES**	24.9	C	**24.9**	**C**			
Herndon Parkway / Parking Lots by Metro	Two-Way Stop Control	Herndon Parkway	EBL	11	11	0	0%	20%	YES	798	790	-8	-1%	15%	YES	4.8	A	0.2	A	0	31	
			EBT	785	777	-8	-1%	15%	YES							0.1	A			0	0	
			EBR	2	2	0	0%	20%	YES							0.4	A			0	0	
		Herndon Parkway	WBL	5	5	0	0%	20%	YES	1,122	1,122	0	0%	10%	YES	1.9	A	0.4	A	0	29	
			WBT	1,113	1,113	0	0%	10%	YES							0.4	A			0	3	
			WBR	4	4	0	0%	20%	YES							0.7	A			0	4	
		Parking Lot	NBL	17	17	0	0%	20%	YES	56	55	-1	-2%	20%	YES	12.1	B	8.5	A	2	69	
			NBT	0	0	0	0%	20%	YES							0.0	A			1	55	
			NBR	39	38	-1	-3%	20%	YES							6.9	A			2	69	
		Parking Lot	SBL	17	17	0	0%	20%	YES	61	61	0	0%	20%	YES	15.7	C	10.2	B	4	82	
			SBT	0	0	0	0%	20%	YES							0.0	A			1	62	
			SBR	44	44	0	0%	20%	YES							8.1	A			3	81	
		Intersection		**2,037**	**2,028**	-9	**0%**	**10%**	**YES**	**2,037**	**2,028**	**-9**	**0%**	**10%**	**YES**	0.8	A	**0.8**	**A**			

Note: Average results across 20 microsimulation runs.
* Low volume difference. Percentage difference is not significant. Considered Calibrated.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

Existing Conditions: Weekday Evening Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes												Existing Conditions MOEs						Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Calibration Threshold		Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Calibration Threshold		Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	
								Within ±	Met Threshold? *					Within ±	Met Threshold?							
Herndon Parkway / Exchange Place	**Two-Way Stop Control (future signal)**	Herndon Parkway	EBL	22	22	0	0%	20%	YES	997	984	-13	-1%	15%	YES	2.8	A	0.2	A	0	49	
			EBT	964	951	-13	-1%	15%	YES							0.2	A			0	6	
			EBR	11	11	0	0%	20%	YES							0.5	A			0	9	
		Herndon Parkway	WBL	13	13	0	0%	20%	YES	1,002	1,003	1	0%	10%	YES	0.6	A	0.4	A	0	0	
			WBT	985	986	1	0%	15%	YES							0.4	A			0	0	
			WBR	4	4	0	0%	20%	YES							0.6	A			0	0	
		Parking Lot	NBL	21	20	-1	-5%	20%	YES	68	68	0	0%	20%	YES	7.3	A	6.9	A	5	106	
			NBT	0	0	0	0%	20%	YES							0.0	A			1	62	
			NBR	47	48	1	2%	20%	YES							6.7	A			3	78	
		Exchange Place	SBL	8	8	0	0%	20%	YES	30	31	1	3%	20%	YES	9.2	A	7.3	A	1	71	
			SBT	0	0	0	0%	20%	YES							0.0	A			0	44	
			SBR	22	23	1	5%	20%	YES							6.6	A			2	71	
		Intersection		**2,097**	**2,086**	-11	**-1%**	**10%**	**YES**	**2,097**	**2,086**	**-11**	**-1%**	**10%**	**YES**	0.6	A	**0.6**	**A**			
Herndon Parkway / Fairbrook Drive	**Two-Way Stop Control (future signal)**	Parking Lot	EBL	17	19	2	12%	20%	YES	41	43	2	5%	20%	YES	11.7	B	9.4	A	2	66	
			EBT	0	0	0	0%	20%	YES							0.0	A			1	49	
			EBR	24	24	0	0%	20%	YES							7.6	A			2	65	
		Fairbrook Drive	WBL	15	15	0	0%	20%	YES	28	28	0	0%	20%	YES	11.0	B	9.1	A	1	63	
			WBT	0	0	0	0%	20%	YES							0.0	A			0	50	
			WBR	13	13	0	0%	20%	YES							7.0	A			1	62	
		Herndon Parkway	NBL	1	1	0	0%	20%	YES	1,019	1,007	-12	-1%	10%	YES	3.8	A	0.2	A	0	13	
			NBT	1,012	999	-13	-1%	10%	YES							0.2	A			0	3	
			NBR	6	7	1	17%	20%	YES							0.6	A			0	7	
		Herndon Parkway	SBL	13	14	1	8%	20%	YES	958	979	21	2%	15%	YES	4.2	A	0.4	A	0	48	
			SBT	943	963	20	2%	15%	YES							0.4	A			0	5	
			SBR	2	2	0	0%	20%	YES							0.8	A			0	8	
		Intersection		**2,046**	**2,057**	11	**1%**	**10%**	**YES**	**2,046**	**2,057**	**11**	**1%**	**10%**	**YES**	0.6	A	**0.6**	**A**			

Note: Average results across 20 microsimulation runs.
* Low volume difference. Percentage difference is not significant. Considered Calibrated.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

No Build 2045 Conditions: Weekday Morning Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								No Build 2045 Conditions MOEs							Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	Available Queue Storage (ft)	
Elden Street / Monroe Street	**Signal**	Elden Street	EBL	73	74	1	1%	839	834	-5	-1%	20.0	C	15.4	B	4	77	150	
			EBT	630	627	-3	0%					15.2	B			90	656	250	To Lynn St signal, which is not in model
			EBR	136	133	-3	-2%					13.7	B			87	650	250	
		Elden Street	WBL	6	5	-1	-17%	459	454	-5	-1%	32.3	C	25.4	C	1	34	875	To Van Buren St signal
			WBT	410	405	-5	-1%					25.6	C			73	419	875	
			WBR	43	44	1	2%					23.2	C			78	457	875	
		Monroe Street	NBL	36	34	-2	-6%	114	115	1	1%	60.6	E	56.6	E	11	87	100	
			NBT	63	66	3	5%					64.5	E			25	140	900	To Van Buren St signal
			NBR	15	15	0	0%					12.6	B			8	130	900	
		Monroe Street	SBL	96	92	-4	-4%	373	378	5	1%	44.1	D	46.6	D	39	250	-	No upstream control within reasonable distance
			SBT	218	226	8	4%					49.9	D			79	274	-	
			SBR	59	60	1	2%					38.1	D			76	274	250	
		Intersection		**1,785**	**1,781**	-4	**0%**	**1,785**	**1,781**	**-4**	**0%**	27.2	C	**27.2**	**C**				
Elden Street / Van Buren Street	**Signal**	Elden Street	EBL	0	0	0	0%	770	751	-19	-2%	0.0	A	11.7	B	30	274	850	
			EBT	718	690	-28	-4%					12.4	B			30	274	850	To Monroe Street signal
			EBR	52	61	9	17%					3.2	A			0	46	850	
		Elden Street	WBL	117	115	-2	-2%	602	587	-15	-2%	28.5	C	18.4	B	33	217	1500	To Post Drive signal, which is not in model
			WBT	469	459	-10	-2%					16.1	B			33	217	1500	
			WBR	16	13	-3	-19%					10.6	B			40	231	1500	
		Van Buren Street	NBL	49	49	0	0%	316	312	-4	-1%	48.1	D	32.7	C	13	103	150	
			NBT	151	146	-5	-3%					49.5	D			41	204	450	To Monroe St / Grove St signal
			NBR	116	117	1	1%					5.3	A			3	90	450	
		Van Buren Street	SBL	146	146	0	0%	470	481	11	2%	38.7	D	45.2	D	39	322	325	No upstream control within reasonable distance
			SBT	315	325	10	3%					48.4	D			97	404	-	
			SBR	9	10	1	11%					36.6	D			99	415	-	
		Intersection		**1,688**	**1,650**	-38	**-2%**	**1,688**	**1,650**	**-38**	**-2%**	31.2	C	**31.2**	**C**				
Van Buren Street / Spring Street	**Signal**	Van Buren Street	EBL	170	165	-5	-3%	495	493	-2	0%	13.3	B	10.5	B	0	4	1600	To Alabama Dr signal
			EBT	6	5	-1	-17%					15.5	B			13	144	1600	
			EBR	319	323	4	1%					9.0	A			15	170	150	
		Parking Lot	WBL	1	0	-1	-100%	1	0	-1	-100%	0.0	A	0.0	A	0	0	-	
			WBR	0	0	0	0%					0.0	A			0	0	-	
		Spring Street	NBL	117	121	4	3%	282	289	7	2%	13.6	B	8.7	A	4	105	200	
			NBT	157	162	5	3%					5.3	A			3	92	800	To Huntmar Park Dr signal
			NBR	8	6	-2	-25%					3.1	A			2	100	800	
		Van Buren Street	SBL	9	9	0	0%	767	777	10	1%	5.6	A	7.0	A	0	28	275	
			SBT	428	426	-2	0%					7.8	A			13	202	1200	To Monroe St / Grove St signal
			SBR	330	342	12	4%					6.0	A			9	207	1200	
		Intersection		**778**	**782**	4	**1%**	**778**	**782**	**4**	**1%**	16.8	B	**16.8**	**B**				
Spring Street / Herndon Parkway	**Signal**	Spring Street	EBL	33	37	4	12%	855	855	0	0%	72.0	E	63.1	E	14	87	200	
			EBT	686	684	-2	0%					64.5	E			124	357	2300	To Huntmar Park Dr signal
			EBR	136	134	-2	-1%					53.3	D			125	361	2300	
		Spring Street	WBL	938	937	-1	0%	1,848	1,850	2	0%	39.6	D	31.9	C	140	606	375	
			WBT	503	508	5	1%					35.4	D			61	377	550	To Ffx County Pkwy signal
			WBR	407	405	-2	0%					9.6	A			20	233	550	
		Herndon Parkway	NBL	129	130	1	1%	1,538	1,514	-24	-2%	50.9	D	36.8	D	29	190	300	
			NBT	299	302	3	1%					46.8	D			143	652	500	To Sunset Business Park
			NBR	1,110	1,082	-28	-3%					32.4	C			143	652	500	
		Herndon Parkway	SBL	424	420	-4	-1%	930	932	2	0%	73.9	E	52.3	D	100	293	500	
			SBT	458	461	3	1%					35.2	D			57	262	2300	To Grove St signal
			SBR	48	51	3	6%					30.2	C			57	265	2300	
		Intersection		**4,241**	**4,219**	-22	**-1%**	**4,241**	**4,219**	**-22**	**-1%**	51.5	D	**51.5**	**D**				

Note: Average results across 7 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

No Build 2045 Conditions: Weekday Morning Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								No Build 2045 Conditions MOEs							Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	Available Queue Storage (ft)	
Spring Street / Fairfax County Parkway	**Signal**	Spring Street	EBL	177	177	0	0%	2,268	2,235	-33	-1%	41.1	D	12.1	B	39	294	250	
			EBT	1,558	1,533	-25	-2%					11.9	B			67	534	550	To Herndon Parkway signal
			EBR	533	525	-8	-2%					2.9	A			0	0	550	
		Spring Street	WBT	673	667	-6	-1%	978	969	-9	-1%	36.9	D	29.3	C	92	402	1650	To Target signal
			WBR	305	302	-3	-1%					12.6	B			47	385	1650	
		Fairfax County Parkway	SBL	370	370	0	0%	1,616	1,619	3	0%	45.9	D	31.7	C	138	838	600	To Ffx Pkwy signal, which is not in model
			SBR	1,246	1,249	3	0%					27.5	C			180	878	600	
		Intersection		**4,862**	**4,823**	-39	**-1%**	**4,862**	**4,823**	**-39**	**-1%**	22.1	C	**22.1**	**C**				
Van Buren Street / Alabama Drive	**Signal**	Alabama Drive	EBL	129	128	-1	-1%	291	291	0	0%	43.2	D	36.0	D	61	308	-	
			EBT	10	11	1	10%					38.7	D			61	308	-	
			EBR	152	152	0	0%					29.7	C			62	315	-	
		Alabama Drive	WBL	36	35	-1	-3%	92	88	-4	-4%	31.8	C	24.9	C	11	120	-	
			WBT	13	13	0	0%					38.6	D			11	120	-	
			WBR	43	40	-3	-7%					14.3	B			11	131	-	
		Van Buren Street	NBL	22	22	0	0%	362	364	2	1%	6.0	A	3.9	A	6	148	1125	To Herndon Parkway signal
			NBT	323	327	4	1%					3.8	A			7	149	1125	
			NBR	17	15	-2	-12%					2.9	A			5	148	1125	
		Van Buren Street	SBL	13	17	4	31%	447	461	14	3%	14.4	B	11.5	B	35	345	1600	To Van Buren St signal
			SBT	393	404	11	3%					11.5	B			35	345	1600	
			SBR	41	40	-1	-2%					10.4	B			32	324	1600	
		Intersection		**1,192**	**1,204**	12	**1%**	**1,192**	**1,204**	**12**	**1%**	16.1	B	**16.1**	**B**				
Van Buren Street / Herndon Parkway	**Signal**	Herndon Parkway	EBL	43	42	-1	-2%	1,286	1,274	-12	-1%	64.3	E	33.1	C	14	101	175	
			EBT	926	925	-1	0%					38.8	D			129	560	1950	To Campbell Way signal, which is not in model
			EBR	317	307	-10	-3%					11.8	B			20	197	1950	
		Herndon Parkway	WBL	293	290	-3	-1%	658	652	-6	-1%	58.0	E	42.0	D	57	181	350	
			WBT	307	305	-2	-1%					30.4	C			31	172	875	To Worldgate Drive signal
			WBR	58	57	-1	-2%					23.6	C			31	172	875	
		Van Buren Street	NBL	240	245	5	2%	835	848	13	2%	25.8	C	14.3	B	32	257	375	To Office Park signal
			NBT	261	268	7	3%					12.5	B			19	245	375	
			NBR	334	335	1	0%					7.3	A			10	195	300	
		Van Buren Street	SBL	95	90	-5	-5%	582	590	8	1%	37.2	D	35.5	D	17	128	175	
			SBT	464	477	13	3%					35.7	D			63	458	1125	To Alabama Dr signal
			SBR	23	23	0	0%					25.5	C			63	458	1125	
		Intersection		**3,361**	**3,364**	3	**0%**	**3,361**	**3,364**	**3**	**0%**	30.5	C	**30.5**	**C**				
Van Buren Street / Worldgate Drive	**Signal**	Worldgate Drive	EBL	170	173	3	2%	1,051	1,046	-5	0%	24.4	C	28.7	C	25	179	400	
			EBT	640	630	-10	-2%					39.9	D			82	325	-	
			EBR	241	243	2	1%					2.8	A			3	114	875	
		Worldgate Drive	WBL	139	139	0	0%	289	293	4	1%	64.5	E	32.4	C	51	207	275	
			WBT	142	147	5	4%					3.2	A			0	5	600	To Herndon Pkwy signal
			WBR	8	7	-1	-13%					9.3	A			0	39	600	
		Van Buren Street	NBL	406	379	-27	-7%	1,626	1,607	-19	-1%	44.5	D	22.6	C	62	283	250	
			NBT	767	783	16	2%					19.0	B			53	351	1650	To Eastpark Dr signal
			NBR	453	445	-8	-2%					10.3	B			21	244	250	
		Van Buren Street	SBL	20	22	2	10%	1,045	1,056	11	1%	67.5	E	18.3	B	8	60	200	
			SBT	669	673	4	1%					25.5	C			57	308	400	To Office Park signal
			SBR	356	361	5	1%					2.0	A			1	155	400	
		Intersection		**4,011**	**4,002**	-9	**0%**	**4,011**	**4,002**	**-9**	**0%**	23.8	C	**23.8**	**C**				

Note: Average results across 7 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

No Build 2045 Conditions: Weekday Morning Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								No Build 2045 Conditions MOEs							Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	Available Queue Storage (ft)	
Herndon Parkway / Worldgate Drive	**Signal**	Herndon Parkway	EBL	1	1	0	0%	1,310	1,310	0	0%	54.1	D	23.2	C	0	15	175	
			EBT	1,265	1,265	0	0%					23.3	C			140	596	850	To Van Buren St signal
			EBR	44	44	0	0%					20.4	C			141	599	850	
		Herndon Parkway	WBL	433	434	1	0%	1,026	1,022	-4	0%	58.0	E	26.0	C	81	336	250	
			WBT	593	588	-5	-1%					2.5	A			4	97	875	To 555 signal
			WBR	0	0	0	0%					0.0	A			3	107	875	
		Worldgate Drive	NBL	65	59	-6	-9%	937	924	-13	-1%	54.2	D	27.0	C	80	383	600	
			NBT	0	0	0	0%					0.0	A			80	383	600	To Van Buren St signal
			NBR	872	865	-7	-1%					25.1	C			80	383	600	
		Worldgate Drive	SBL	0	0	0	0%	0	0	0	0%	0.0	A	0.0	A	0	0	75	
			SBT	0	0	0	0%					0.0	A			0	0	-	
			SBR	0	0	0	0%					0.0	A			0	0	-	
		Intersection		**3,273**	**3,256**	-17	**-1%**	**3,273**	**3,256**	**-17**	**-1%**	25.2	C	**25.2**	**C**				
Herndon Parkway / Exchange Place	**Signal**	Herndon Parkway	EBL	33	33	0	0%	1,764	1,722	-42	-2%	8.8	A	10.3	B	1	40	175	
			EBT	1,511	1,481	-30	-2%					10.3	B			72	767	650	To 555 signal
			EBR	220	208	-12	-5%					10.9	B			73	772	650	
		Herndon Parkway	WBL	148	146	-2	-1%	1,239	1,240	1	0%	15.6	B	9.0	A	7	117	175	
			WBT	1,068	1,073	5	0%					8.2	A			28	395	550	To Fairbrook Dr signal
			WBR	23	21	-2	-9%					7.8	A			29	405	550	
		Parking Lot	NBL	103	99	-4	-4%	147	145	-2	-1%	46.0	D	33.6	C	26	153	-	
			NBT	0	0	0	0%					0.0	A			26	153	-	
			NBR	44	46	2	5%					6.8	A			1	46	75	
		Exchange Place	SBL	8	8	0	0%	16	16	0	0%	52.7	D	31.4	C	2	45	-	
			SBT	0	0	0	0%					0.0	A			2	45	-	
			SBR	8	8	0	0%					10.1	B			1	51	-	
		Intersection		**3,166**	**3,123**	-43	**-1%**	**3,166**	**3,123**	**-43**	**-1%**	11.0	B	**11.0**	**B**				
Herndon Parkway / Fairbrook Drive	**Signal**	Parking Lot	EBL	4	4	0	0%	7	7	0	0%	52.9	D	33.1	C	1	25	75	
			EBT	0	0	0	0%					0.0	A			0	0	-	
			EBR	3	3	0	0%					6.8	A			0	15	-	
		Fairbrook Drive	WBL	93	99	6	6%	193	199	6	3%	47.6	D	28.3	C	22	98	175	
			WBT	0	0	0	0%					0.0	A			22	98	-	
			WBR	100	100	0	0%					9.3	A			1	81	-	
		Herndon Parkway	NBL	39	39	0	0%	1,563	1,532	-31	-2%	2.0	A	5.0	A	0	21	150	
			NBT	1,373	1,343	-30	-2%					5.1	A			25	539	550	To Exchange Pl signal
			NBR	151	150	-1	-1%					4.8	A			0	50	125	
		Herndon Parkway	SBL	290	295	5	2%	1,451	1,438	-13	-1%	23.3	C	21.9	C	30	386	150	
			SBT	1,143	1,127	-16	-1%					21.5	C			99	621	825	To Sunset Business Park
			SBR	18	16	-2	-11%					21.7	C			100	626	825	
		Intersection		**3,214**	**3,176**	-38	**-1%**	**3,214**	**3,176**	**-38**	**-1%**	14.2	B	**14.2**	**B**				

Note: Average results across 7 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

No Build 2045 Conditions: Weekday Evening Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								No Build 2045 Conditions MOEs							Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	Available Queue Storage (ft)	
Elden Street / Monroe Street	**Signal**	Elden Street	EBL	127	125	-2	-2%	817	816	-1	0%	38.4	D	24.6	C	16	275	150	
			EBT	654	655	1	0%					22.2	C			153	890	250	To Lynn St signal, which is not in model
			EBR	36	36	0	0%					21.1	C			152	889	250	
		Elden Street	WBL	13	13	0	0%	755	747	-8	-1%	37.4	D	33.6	C	2	43	875	To Van Buren St signal
			WBT	669	663	-6	-1%					33.9	C			258	919	875	
			WBR	73	71	-2	-3%					30.2	C			268	957	875	
		Monroe Street	NBL	168	162	-6	-4%	398	391	-7	-2%	53.6	D	52.4	D	58	441	100	
			NBT	219	218	-1	0%					52.6	D			80	443	900	To Van Buren St signal
			NBR	11	11	0	0%					28.1	C			64	437	900	
		Monroe Street	SBL	131	127	-4	-3%	382	382	0	0%	40.9	D	36.4	D	39	230	-	No upstream control within reasonable distance
			SBT	130	132	2	2%					41.1	D			51	238	-	
			SBR	121	123	2	2%					26.9	C			49	238	250	
		Intersection		**2,352**	**2,336**	-16	**-1%**	**2,352**	**2,336**	**-16**	**-1%**	34.1	C	**34.1**	**C**				
Elden Street / Van Buren Street	**Signal**	Elden Street	EBL	5	5	0	0%	803	800	-3	0%	36.2	D	23.2	C	61	335	850	
			EBT	764	758	-6	-1%					24.1	C			61	335	850	To Monroe Street signal
			EBR	34	37	3	9%					3.2	A			0	33	850	
		Elden Street	WBL	150	153	3	2%	962	966	4	0%	41.0	D	27.4	C	88	414	1500	To Post Drive signal, which is not in model
			WBT	754	756	2	0%					25.3	C			88	414	1500	
			WBR	58	57	-1	-2%					19.6	B			97	428	1500	
		Van Buren Street	NBL	118	114	-4	-3%	668	650	-18	-3%	56.1	E	46.4	D	33	287	150	
			NBT	374	360	-14	-4%					60.0	E			144	528	450	To Monroe St / Grove St signal
			NBR	176	176	0	0%					12.3	B			8	162	450	
		Van Buren Street	SBL	126	125	-1	-1%	317	315	-2	-1%	42.5	D	42.6	D	32	208	325	No upstream control within reasonable distance
			SBT	176	175	-1	-1%					43.6	D			47	217	-	
			SBR	15	15	0	0%					32.3	C			49	228	-	
		Intersection		**2,433**	**2,416**	-17	**-1%**	**2,433**	**2,416**	**-17**	**-1%**	36.7	D	**36.7**	**D**				
Van Buren Street / Spring Street	**Signal**	Van Buren Street	EBL	414	396	-18	-4%	630	612	-18	-3%	54.7	D	41.9	D	279	1027	1600	To Alabama Dr signal
			EBT	1	1	0	0%					43.6	D			279	1028	1600	
			EBR	215	215	0	0%					18.4	B			16	319	150	
		Parking Lot	WBL	13	14	1	8%	28	28	0	0%	52.4	D	53.0	D	4	54	-	
			WBR	15	14	-1	-7%					53.6	D			4	54	-	
		Spring Street	NBL	324	323	-1	0%	873	869	-4	0%	35.3	D	20.6	C	70	457	200	
			NBT	541	538	-3	-1%					11.9	B			21	294	800	To Huntmar Park Dr signal
			NBR	8	8	0	0%					10.8	B			21	302	800	
		Van Buren Street	SBL	3	4	1	33%	648	639	-9	-1%	14.6	B	25.9	C	0	17	275	
			SBT	198	200	2	1%					15.5	B			89	501	1200	To Monroe St / Grove St signal
			SBR	447	435	-12	-3%					30.8	C			117	535	1200	
		Intersection		**1,531**	**1,509**	-22	**-1%**	**1,531**	**1,509**	**-22**	**-1%**	40.8	D	**40.8**	**D**				
Spring Street / Herndon Parkway	**Signal**	Spring Street	EBL	77	76	-1	-1%	816	816	0	0%	78.2	E	61.6	E	33	201	200	
			EBT	617	622	5	1%					62.6	E			107	333	2300	To Huntmar Park Dr signal
			EBR	122	118	-4	-3%					45.8	D			108	337	2300	
		Spring Street	WBL	995	1,001	6	1%	2,213	2,216	3	0%	47.5	D	34.3	C	254	659	375	
			WBT	768	770	2	0%					31.7	C			87	476	550	To Ffx County Pkwy signal
			WBR	450	445	-5	-1%					9.1	A			18	238	550	
		Herndon Parkway	NBL	166	165	-1	-1%	1,989	1,951	-38	-2%	35.6	D	55.1	E	22	195	300	
			NBT	612	609	-3	0%					60.5	E			724	1476	500	To Sunset Business Park
			NBR	1,211	1,177	-34	-3%					55.0	E			725	1476	500	
		Herndon Parkway	SBL	461	455	-6	-1%	953	950	-3	0%	90.1	F	64.0	E	134	416	500	
			SBT	456	461	5	1%					40.4	D			64	272	2300	To Grove St signal
			SBR	36	34	-2	-6%					35.0	D			64	275	2300	
		Intersection		**5,018**	**4,983**	-35	**-1%**	**5,018**	**4,983**	**-35**	**-1%**	59.1	E	**59.1**	**E**				

Note: Average results across 20 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

No Build 2045 Conditions: Weekday Evening Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								No Build 2045 Conditions MOEs							Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	Available Queue Storage (ft)	
Spring Street / Fairfax County Parkway	**Signal**	Spring Street	EBL	385	380	-5	-1%	2,384	2,347	-37	-2%	61.9	E	15.3	B	146	604	250	
			EBT	1,119	1,099	-20	-2%					7.6	A			25	317	550	To Herndon Parkway signal
			EBR	880	868	-12	-1%					4.7	A			0	0	550	
		Spring Street	WBT	1,488	1,492	4	0%	2,138	2,128	-10	0%	29.4	C	27.2	C	265	1096	1650	To Target signal
			WBR	650	636	-14	-2%					22.0	C			235	1080	1650	
		Fairfax County Parkway	SBL	166	168	2	1%	1,090	1,095	5	0%	65.9	E	45.7	D	72	319	600	To Ffx Pkwy signal, which is not in model
			SBR	924	927	3	0%					42.1	D			150	583	600	
		Intersection		**5,612**	**5,570**	-42	**-1%**	**5,612**	**5,570**	**-42**	**-1%**	25.8	C	**25.8**	**C**				
Van Buren Street / Alabama Drive	**Signal**	Alabama Drive	EBL	85	85	0	0%	235	238	3	1%	93.8	F	84.8	F	136	477	-	
			EBT	18	17	-1	-6%					96.4	F			136	477	-	
			EBR	132	136	4	3%					77.7	E			139	484	-	
		Alabama Drive	WBL	20	20	0	0%	51	50	-1	-2%	51.8	D	36.0	D	9	89	-	
			WBT	10	10	0	0%					42.8	D			9	89	-	
			WBR	21	20	-1	-5%					16.8	B			7	103	-	
		Van Buren Street	NBL	61	60	-1	-2%	659	647	-12	-2%	16.8	B	13.0	B	57	550	1125	To Herndon Parkway signal
			NBT	524	517	-7	-1%					12.9	B			57	550	1125	
			NBR	74	70	-4	-5%					10.5	B			56	550	1125	
		Van Buren Street	SBL	34	32	-2	-6%	772	732	-40	-5%	36.5	D	34.6	C	642	1450	1600	To Van Buren St signal
			SBT	631	599	-32	-5%					35.1	D			642	1452	1600	
			SBR	107	101	-6	-6%					30.9	C			640	1452	1600	
		Intersection		**1,717**	**1,667**	-50	**-3%**	**1,717**	**1,667**	**-50**	**-3%**	33.4	C	**33.4**	**C**				
Van Buren Street / Herndon Parkway	**Signal**	Herndon Parkway	EBL	55	54	-1	-2%	873	867	-6	-1%	78.5	E	36.7	D	24	124	175	
			EBT	472	472	0	0%					47.8	D			74	321	1950	To Campbell Way signal, which is not in model
			EBR	346	341	-5	-1%					14.9	B			34	227	1950	
		Herndon Parkway	WBL	520	519	-1	0%	1,838	1,846	8	0%	53.5	D	42.1	D	94	384	350	
			WBT	1,109	1,116	7	1%					37.7	D			287	993	875	To Worldgate Drive signal
			WBR	209	211	2	1%					37.3	D			287	993	875	
		Van Buren Street	NBL	365	370	5	1%	1,051	1,040	-11	-1%	88.7	F	38.8	D	355	854	375	To Office Park signal
			NBT	394	383	-11	-3%					15.7	B			289	840	375	
			NBR	292	287	-5	-2%					5.3	A			4	133	300	
		Van Buren Street	SBL	69	65	-4	-6%	784	743	-41	-5%	46.5	D	66.7	E	39	240	175	To Alabama Dr signal
			SBT	668	631	-37	-6%					69.6	E			750	1197	1125	
			SBR	47	47	0	0%					55.9	E			750	1197	1125	
		Intersection		**4,546**	**4,496**	-50	**-1%**	**4,546**	**4,496**	**-50**	**-1%**	44.4	D	**44.4**	**D**				
Van Buren Street / Worldgate Drive	**Signal**	Worldgate Drive	EBL	291	289	-2	-1%	1,300	1,298	-2	0%	26.2	C	24.5	C	45	276	400	
			EBT	340	339	-1	0%					46.7	D			52	204	-	
			EBR	669	670	1	0%					12.4	B			55	499	875	
		Parking Lot	WBL	364	351	-13	-4%	924	906	-18	-2%	56.7	E	24.1	C	161	650	275	
			WBT	538	533	-5	-1%					3.4	A			0	25	600	To Herndon Pkwy signal
			WBR	22	22	0	0%					7.2	A			1	49	600	
		Van Buren Street	NBL	361	349	-12	-3%	1,381	1,367	-14	-1%	56.5	E	31.5	C	76	333	250	
			NBT	720	722	2	0%					29.5	C			106	490	1650	To Eastpark Dr signal
			NBR	300	296	-4	-1%					6.8	A			6	155	250	
		Van Buren Street	SBL	9	9	0	0%	1,583	1,539	-44	-3%	70.2	E	29.1	C	3	50	200	
			SBT	1,211	1,178	-33	-3%					36.9	D			157	714	400	To Office Park signal
			SBR	363	352	-11	-3%					1.9	A			0	95	400	
		Intersection		**5,188**	**5,110**	-78	**-2%**	**5,188**	**5,110**	**-78**	**-2%**	27.7	C	**27.7**	**C**				

Note: Average results across 20 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

No Build 2045 Conditions: Weekday Evening Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								No Build 2045 Conditions MOEs							Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	Available Queue Storage (ft)	
Herndon Parkway / Worldgate Drive	**Signal**	Herndon Parkway	EBL	0	0	0	0%	917	909	-8	-1%	0.0	A	17.2	B	0	0	175	
			EBT	897	889	-8	-1%					17.2	B			55	411	850	To Van Buren St signal
			EBR	20	20	0	0%					13.8	B			55	415	850	
		Herndon Parkway	WBL	694	672	-22	-3%	2,335	2,330	-5	0%	49.5	D	21.4	C	192	987	250	
			WBT	1,641	1,658	17	1%					10.1	B			70	765	875	To 555 signal
			WBR	0	0	0	0%					0.0	A			70	763	875	
		Worldgate Drive	NBL	199	196	-3	-2%	847	846	-1	0%	57.5	E	28.9	C	79	343	600	
			NBT	0	0	0	0%					0.0	A			79	343	600	To Van Buren St signal
			NBR	648	650	2	0%					20.3	C			79	343	600	
		Worldgate Drive	SBL	0	0	0	0%	0	0	0	0%	0.0	A	0.0	A	0	0	75	
			SBT	0	0	0	0%					0.0	A			0	0	-	
			SBR	0	0	0	0%					0.0	A			0	0	-	
		Intersection		**4,099**	**4,085**	-14	**0%**	**4,099**	**4,085**	**-14**	**0%**	22.0	C	**22.0**	**C**				
Herndon Parkway / 555 Herndon Parkway	**Signal**	Herndon Parkway	EBL	0	0	0	0%	1,621	1,598	-23	-1%	0.0	A	12.5	B	0	0		
			EBT	1,522	1,499	-23	-2%					12.6	B			84	682		
			EBR	99	99	0	0%					12.1	B			84	685		
		Herndon Parkway	WBL	66	62	-4	-6%	2,038	2,027	-11	-1%	25.2	C	12.7	B	3	79		
			WBT	1,972	1,965	-7	0%					12.3	B			121	633		
			WBR	0	0	0	0%					0.0	A			122	636		
		Parking Lot	NBL	314	316	2	1%	449	446	-3	-1%	67.9	E	58.0	E	170	444		
			NBT	0	0	0	0%					0.0	A			0	0		
			NBR	135	130	-5	-4%					33.9	C			14	327		
		Parking Lot	SBL	0	0	0	0%	0	0	0	0%	0.0	A	0.0	A	0	0		
			SBT	0	0	0	0%					0.0	A			0	0		
			SBR	0	0	0	0%					0.0	A			0	0		
		Intersection		**4,108**	**4,071**	-37	**-1%**	**4,108**	**4,071**	**-37**	**-1%**	17.6	B	**17.6**	**B**				
Herndon Parkway / Exchange Place	**Signal**	Herndon Parkway	EBL	28	29	1	4%	1,676	1,645	-31	-2%	16.7	B	12.3	B	1	47	175	
			EBT	1,549	1,518	-31	-2%					12.3	B			93	657	650	To 555 signal
			EBR	99	98	-1	-1%					11.3	B			94	662	650	
		Herndon Parkway	WBL	66	66	0	0%	1,649	1,648	-1	0%	27.6	C	11.2	B	5	92	175	
			WBT	1,578	1,577	-1	0%					10.5	B			64	610	550	To Fairbrook Dr signal
			WBR	5	5	0	0%					8.3	A			66	620	550	
		Parking Lot	NBL	314	307	-7	-2%	449	447	-2	0%	54.6	D	46.0	D	124	391	-	
			NBT	0	0	0	0%					0.0	A			124	391	-	
			NBR	135	140	5	4%					27.2	C			16	334	75	
		Exchange Place	SBL	10	10	0	0%	38	38	0	0%	43.9	D	17.5	B	3	61	-	
			SBT	0	0	0	0%					0.0	A			3	61	-	
			SBR	28	28	0	0%					8.0	A			2	67	-	
		Intersection		**3,812**	**3,778**	-34	**-1%**	**3,812**	**3,778**	**-34**	**-1%**	15.8	B	**15.8**	**B**				
Herndon Parkway / Fairbrook Drive	**Signal**	Parking Lot	EBL	21	23	2	10%	51	53	2	4%	75.8	E	37.5	D	10	77	75	
			EBT	0	0	0	0%					0.0	A			0	14	-	
			EBR	30	30	0	0%					8.2	A			0	39	-	
		Fairbrook Drive	WBL	187	185	-2	-1%	483	482	-1	0%	50.0	D	35.3	D	36	171	175	
			WBT	0	0	0	0%					0.0	A			36	171	-	
			WBR	296	297	1	0%					26.1	C			33	314	-	
		Herndon Parkway	NBL	1	1	0	0%	1,694	1,662	-32	-2%	21.1	C	18.5	B	0	9	150	
			NBT	1,625	1,594	-31	-2%					18.9	B			157	693	550	To Exchange Pl signal
			NBR	68	67	-1	-1%					9.6	A			0	15	125	
		Herndon Parkway	SBL	182	186	4	2%	1,592	1,625	33	2%	46.1	D	16.1	B	54	551	150	
			SBT	1,407	1,435	28	2%					12.3	B			81	720	825	To Sunset Business Park
			SBR	3	4	1	33%					10.6	B			82	725	825	
		Intersection		**3,820**	**3,822**	2	**0%**	**3,820**	**3,822**	**2**	**0%**	19.9	B	**19.9**	**B**				

Note: Average results across 20 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

Build Scenario 1 with Fairbrook Drive Extended 2045 Conditions: Weekday Morning Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								Build Scenario 1 with Fairbrook Drive Extended 2045 Conditions MOEs						Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	
Elden Street / Monroe Street	**Signal**	Elden Street	EBL	73	75	2	3%	839	834	-5	-1%	24.4	C	19.4	B	5	107	
			EBT	630	626	-4	-1%					19.2	B			126	796	
			EBR	136	133	-3	-2%					17.7	B			123	796	
		Elden Street	WBL	6	5	-1	-17%	459	453	-6	-1%	24.3	C	19.4	B	0	28	
			WBT	410	404	-6	-1%					19.7	B			58	441	
			WBR	43	44	1	2%					16.8	B			66	479	
		Monroe Street	NBL	36	38	2	6%	186	186	0	0%	41.9	D	43.2	D	9	82	
			NBT	135	134	-1	-1%					46.7	D			40	276	
			NBR	15	14	-1	-7%					13.3	B			23	270	
		Monroe Street	SBL	96	96	0	0%	424	434	10	2%	39.2	D	42.6	D	40	266	
			SBT	269	278	9	3%					45.1	D			86	301	
			SBR	59	60	1	2%					36.6	D			84	301	
		Intersection		**1,908**	**1,907**	-1	**0%**	**1,908**	**1,907**	**-1**	**0%**	27.0	C	**27.0**	**C**			
Elden Street / Van Buren Street	**Signal**	Elden Street	EBL	0	0	0	0%	770	766	-4	-1%	0.0	A	18.1	B	49	325	
			EBT	718	704	-14	-2%					19.4	B			49	325	
			EBR	52	62	10	19%					4.1	A			1	52	
		Elden Street	WBL	117	116	-1	-1%	602	592	-10	-2%	32.7	C	22.3	C	40	221	
			WBT	469	463	-6	-1%					19.9	B			40	221	
			WBR	16	13	-3	-19%					14.5	B			48	235	
		Van Buren Street	NBL	49	47	-2	-4%	387	382	-5	-1%	27.1	C	24.7	C	7	102	
			NBT	222	221	-1	0%					34.3	C			44	308	
			NBR	116	114	-2	-2%					5.0	A			2	85	
		Van Buren Street	SBL	146	142	-4	-3%	521	534	13	2%	38.1	D	44.5	D	39	371	
			SBT	366	381	15	4%					47.1	D			112	474	
			SBR	9	11	2	22%					39.5	D			116	485	
		Intersection		**1,759**	**1,740**	-19	**-1%**	**1,759**	**1,740**	**-19**	**-1%**	34.7	C	**34.7**	**C**			
Van Buren Street / Spring Street	**Signal**	Van Buren Street	EBL	183	174	-9	-5%	508	503	-5	-1%	15.1	B	11.4	B	0	3	
			EBT	6	8	2	33%					15.8	B			16	223	
			EBR	319	321	2	1%					9.4	A			15	198	
		Parking Lot	WBL	1	0	-1	-100%	1	0	-1	-100%	0.0	A	0.0	A	0	0	
			WBR	0	0	0	0%					0.0	A			0	0	
		Spring Street	NBL	117	121	4	3%	412	422	10	2%	15.8	B	8.5	A	5	118	
			NBT	287	294	7	2%					5.7	A			5	132	
			NBR	8	7	-1	-13%					2.3	A			4	140	
		Van Buren Street	SBL	9	9	0	0%	869	887	18	2%	8.4	A	7.5	A	0	34	
			SBT	519	526	7	1%					8.4	A			17	230	
			SBR	341	352	11	3%					6.3	A			8	164	
		Intersection		**921**	**925**	4	**0%**	**921**	**925**	**4**	**0%**	17.4	B	**17.4**	**B**			
Spring Street / Herndon Parkway	**Signal**	Spring Street	EBL	55	60	5	9%	914	911	-3	0%	80.1	F	61.0	E	27	128	
			EBT	756	752	-4	0%					61.1	E			124	391	
			EBR	103	99	-4	-4%					49.0	D			124	394	
		Spring Street	WBL	589	589	0	0%	1,517	1,516	-1	0%	48.2	D	36.1	D	97	477	
			WBT	515	515	0	0%					41.6	D			72	322	
			WBR	414	412	-2	0%					11.9	B			27	278	
		Herndon Parkway	NBL	226	234	8	4%	1,640	1,620	-20	-1%	42.8	D	32.0	C	45	259	
			NBT	401	387	-14	-3%					44.5	D			109	466	
			NBR	1,013	999	-14	-1%					24.6	C			109	466	
		Herndon Parkway	SBL	462	456	-6	-1%	1,003	1,002	-1	0%	86.1	F	63.9	E	134	472	
			SBT	484	487	3	1%					45.9	D			79	327	
			SBR	57	59	3	4%					40.2	D			80	330	
		Intersection		**4,071**	**4,047**	-24	**-1%**	**4,071**	**4,047**	**-24**	**-1%**	55.9	E	**55.9**	**E**			

Note: Average results across 7 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

Build Scenario 1 with Fairbrook Drive Extended 2045 Conditions: Weekday Morning Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								Build Scenario 1 with Fairbrook Drive Extended 2045 Conditions MOEs						Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	
Spring Street / Fairfax County Parkway / Fairbrook Drive	**Signal**	Spring Street	EBL	152	152	0	0%	2,212	2,180	-32	-1%	42.4	D	35.2	D	28	209	
			EBT	2,030	1,997	-33	-2%					34.7	C			237	760	
			EBR	31	31	0	0%					30.5	C			233	755	
		Spring Street	WBL	187	184	-3	-2%	1,053	1,041	-12	-1%	90.4	F	41.9	D	149	482	
			WBT	561	559	-2	0%					41.3	D			149	482	
			WBR	305	298	-7	-2%					13.0	B			99	471	
		Fairbrook Drive	NBL	19	17	-2	-10%	587	592	5	1%	91.2	F	61.0	E	136	632	
			NBT	139	143	4	3%					91.7	F			136	632	
			NBR	429	432	3	1%					49.6	D			136	632	
		Fairfax County Parkway	SBL	370	367	-3	-1%	1,752	1,755	3	0%	90.7	F	42.8	D	552	1333	
			SBT	372	371	-1	0%					41.4	D			241	1180	
			SBR	1,010	1,017	7	1%					26.0	C			462	1324	
		Intersection		**5,604**	**5,568**	-36	**-1%**	**5,604**	**5,568**	**-36**	**-1%**	41.6	D	**41.6**	**D**			
Van Buren Street / Alabama Drive	**Signal**	Alabama Drive	EBL	129	128	-1	-1%	313	312	-1	0%	41.8	D	35.0	D	64	363	
			EBT	10	11	1	10%					43.1	D			64	363	
			EBR	174	173	-1	-1%					29.5	C			65	370	
		Alabama Drive	WBL	47	46	-1	-2%	103	99	-4	-4%	32.6	C	25.3	C	13	136	
			WBT	13	14	1	8%					32.0	C			13	136	
			WBR	43	39	-4	-9%					14.4	B			12	146	
		Van Buren Street	NBL	49	50	1	2%	417	415	-2	-1%	26.0	C	23.0	C	61	396	
			NBT	336	335	-1	0%					23.0	C			62	396	
			NBR	32	30	-2	-7%					18.5	B			61	396	
		Van Buren Street	SBL	13	16	3	23%	458	473	15	3%	14.6	B	11.4	B	35	347	
			SBT	404	417	13	3%					11.4	B			35	346	
			SBR	41	40	-1	-2%					9.5	A			32	345	
		Intersection		**1,292**	**1,299**	7	**1%**	**1,292**	**1,299**	**7**	**1%**	21.8	C	**21.8**	**C**			
Van Buren Street / Herndon Parkway	**Signal**	Herndon Parkway	EBL	43	41	-2	-5%	1,452	1,448	-4	0%	74.2	E	38.8	D	15	96	
			EBT	1,092	1,102	10	1%					43.6	D			250	862	
			EBR	317	305	-12	-4%					16.5	B			25	453	
		Herndon Parkway	WBL	293	291	-2	-1%	924	907	-17	-2%	51.9	D	27.2	C	52	226	
			WBT	518	508	-10	-2%					16.3	B			27	194	
			WBR	113	108	-5	-5%					12.2	B			27	194	
		Van Buren Street	NBL	240	248	8	3%	835	846	11	1%	52.9	D	37.6	D	87	391	
			NBT	261	267	6	2%					42.7	D			78	394	
			NBR	334	331	-3	-1%					22.1	C			46	331	
		Van Buren Street	SBL	139	139	0	0%	626	642	16	3%	39.2	D	40.6	D	31	229	
			SBT	464	480	16	3%					41.5	D			75	464	
			SBR	23	23	0	0%					29.4	C			75	464	
		Intersection		**3,837**	**3,843**	6	**0%**	**3,837**	**3,843**	**6**	**0%**	36.1	D	**36.1**	**D**			

Note: Average results across 7 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

Build Scenario 1 with Fairbrook Drive Extended 2045 Conditions: Weekday Morning Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								Build Scenario 1 with Fairbrook Drive Extended 2045 Conditions MOEs						Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	
Van Buren Street / Worldgate Drive	**Signal**	Worldgate Drive	EBL	170	172	2	1%	1,104	1,088	-16	-1%	36.7	D	31.0	C	38	211	
			EBT	693	672	-21	-3%					39.7	D			89	321	
			EBR	241	244	3	1%					2.9	A			3	100	
		Worldgate Drive	WBL	196	205	9	4%	415	428	13	3%	39.9	D	38.3	D	47	281	
			WBT	211	215	4	2%					37.4	D			30	152	
			WBR	8	8	0	0%					22.5	C			33	165	
		Van Buren Street	NBL	406	393	-13	-3%	1,671	1,667	-4	0%	44.1	D	22.2	C	60	250	
			NBT	767	785	18	2%					17.9	B			49	361	
			NBR	498	489	-9	-2%					11.3	B			26	254	
		Van Buren Street	SBL	20	21	1	5%	1,045	1,061	16	2%	35.2	D	8.8	A	4	67	
			SBT	669	677	8	1%					11.4	B			27	269	
			SBR	356	363	7	2%					2.4	A			1	147	
		Intersection		**4,236**	**4,244**	8	**0%**	**4,236**	**4,244**	**8**	**0%**	22.7	C	**22.7**	**C**			
Herndon Parkway / Worldgate Drive	**Signal**	Herndon Parkway	EBL	67	71	4	6%	1,520	1,526	6	0%	22.0	C	50.5	D	3	57	
			EBT	1,409	1,412	3	0%					52.4	D			352	978	
			EBR	44	43	-1	-2%					35.1	D			356	982	
		Herndon Parkway	WBL	509	498	-11	-2%	1,278	1,258	-20	-2%	47.3	D	21.3	C	83	448	
			WBT	757	750	-7	-1%					4.3	A			8	166	
			WBR	11	10	-1	-11%					3.7	A			8	176	
		Worldgate Drive	NBL	65	62	-3	-5%	1,035	1,014	-21	-2%	35.0	D	23.8	C	76	322	
			NBT	34	33	-1	-2%					34.5	C			76	322	
			NBR	937	919	-18	-2%					22.7	C			76	322	
		Worldgate Drive	SBL	31	32	1	3%	183	186	3	2%	40.8	D	28.0	C	6	109	
			SBT	50	48	-2	-4%					44.5	D			19	206	
			SBR	102	106	4	4%					16.7	B			18	210	
		Intersection		**4,016**	**3,984**	-32	**-1%**	**4,016**	**3,984**	**-32**	**-1%**	33.4	C	**33.4**	**C**			
Herndon Parkway / Exchange Place	**Signal**	Herndon Parkway	EBL	10	9	-1	-10%	2,100	2,061	-39	-2%	10.0	B	14.5	B	0	18	
			EBT	1,870	1,843	-27	-1%					14.5	B			165	850	
			EBR	220	209	-11	-5%					14.7	B			167	856	
		Herndon Parkway	WBL	148	144	-4	-3%	1,313	1,310	-3	0%	28.5	C	12.8	B	13	144	
			WBT	1,155	1,157	2	0%					10.9	B			43	385	
			WBR	10	9	-1	-10%					11.0	B			45	394	
		Parking Lot	NBL	103	99	-4	-4%	147	145	-2	-1%	45.3	D	34.0	C	25	141	
			NBT	0	0	0	0%					0.0	A			25	141	
			NBR	44	46	2	5%					9.8	A			1	56	
		Exchange Place	SBL	42	42	0	0%	70	71	1	1%	46.0	D	35.2	D	13	105	
			SBT	0	0	0	0%					0.0	A			13	105	
			SBR	28	29	1	4%					19.6	B			11	111	
		Intersection		**3,631**	**3,587**	-44	**-1%**	**3,631**	**3,587**	**-44**	**-1%**	15.1	B	**15.1**	**B**			
Herndon Parkway / Fairbrook Drive	**Signal**	Parking Lot	EBL	41	44	4	9%	135	139	4	3%	51.7	D	47.1	D	13	134	
			EBT	68	67	-1	-1%					52.1	D			25	162	
			EBR	27	28	1	4%					28.2	C			21	164	
		Fairbrook Drive	WBL	270	277	7	3%	354	360	6	2%	43.8	D	39.7	D	52	232	
			WBT	45	42	-3	-7%					43.1	D			52	232	
			WBR	39	41	2	5%					8.1	A			0	30	
		Herndon Parkway	NBL	18	17	-1	-6%	1,956	1,927	-29	-2%	4.9	A	10.7	B	0	25	
			NBT	1,506	1,481	-25	-2%					11.1	B			99	694	
			NBR	432	429	-3	-1%					9.7	A			5	291	
		Herndon Parkway	SBL	97	100	3	3%	1,139	1,119	-20	-2%	27.8	C	17.7	B	11	143	
			SBT	1,015	994	-21	-2%					16.9	B			60	518	
			SBR	27	25	-2	-7%					10.8	B			60	522	
		Intersection		**3,585**	**3,545**	-40	**-1%**	**3,585**	**3,545**	**-40**	**-1%**	17.3	B	**17.3**	**B**			

Note: Average results across 7 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

Build Scenario 1 with Fairbrook Drive Extended 2045 Conditions: Weekday Evening Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								Build Scenario 1 with Fairbrook Drive Extended 2045 Conditions MOEs						Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	
Elden Street / Monroe Street	**Signal**	Elden Street	EBL	127	125	-2	-2%	817	814	-3	0%	37.9	D	22.6	C	14	189	
			EBT	654	653	-1	0%					20.0	B			123	765	
			EBR	36	36	0	0%					18.1	B			121	765	
		Elden Street	WBL	13	13	0	0%	755	750	-5	-1%	35.9	D	27.0	C	1	46	
			WBT	669	667	-2	0%					26.9	C			210	760	
			WBR	73	70	-3	-4%					26.0	C			217	798	
		Monroe Street	NBL	168	165	-3	-2%	453	451	-2	0%	74.0	E	72.8	E	123	656	
			NBT	274	275	1	0%					73.0	E			196	708	
			NBR	11	11	0	0%					47.4	D			181	700	
		Monroe Street	SBL	131	125	-6	-5%	459	449	-10	-2%	48.6	D	53.0	D	72	368	
			SBT	207	202	-5	-2%					58.7	E			110	406	
			SBR	121	122	1	1%					48.1	D			108	406	
		Intersection		**2,484**	**2,464**	-20	**-1%**	**2,484**	**2,464**	**-20**	**-1%**	38.7	D	**38.7**	**D**			
Elden Street / Van Buren Street	**Signal**	Elden Street	EBL	5	5	0	0%	803	780	-23	-3%	28.6	C	19.4	B	55	338	
			EBT	764	738	-26	-3%					20.2	C			55	338	
			EBR	34	37	3	9%					3.6	A			0	46	
		Elden Street	WBL	150	152	2	1%	962	949	-13	-1%	41.5	D	28.4	C	91	386	
			WBT	754	742	-12	-2%					26.3	C			91	386	
			WBR	58	55	-3	-5%					20.1	C			100	399	
		Van Buren Street	NBL	118	116	-2	-2%	724	706	-18	-2%	53.1	D	45.9	D	38	363	
			NBT	430	415	-15	-3%					56.6	E			211	836	
			NBR	176	175	-1	-1%					15.7	B			8	216	
		Van Buren Street	SBL	126	126	0	0%	392	399	7	2%	40.9	D	43.6	D	33	236	
			SBT	251	257	6	2%					45.5	D			71	276	
			SBR	15	16	1	7%					34.1	C			75	286	
		Intersection		**2,489**	**2,435**	-54	**-2%**	**2,489**	**2,435**	**-54**	**-2%**	37.7	D	**37.7**	**D**			
Van Buren Street / Spring Street	**Signal**	Van Buren Street	EBL	416	405	-11	-3%	632	621	-11	-2%	20.3	C	15.8	B	1	82	
			EBT	1	2	1	100%					21.0	C			53	464	
			EBR	215	214	-1	0%					7.3	A			6	126	
		Parking Lot	WBL	13	14	1	8%	28	28	0	0%	26.3	C	27.7	C	2	46	
			WBR	15	14	-1	-7%					29.0	C			2	45	
		Spring Street	NBL	324	324	0	0%	982	980	-2	0%	51.4	D	23.8	C	100	540	
			NBT	650	648	-2	0%					10.2	B			20	276	
			NBR	8	8	0	0%					8.9	A			19	284	
		Van Buren Street	SBL	3	3	0	0%	800	810	10	1%	17.5	B	15.2	B	0	24	
			SBT	335	337	2	1%					17.0	B			33	315	
			SBR	462	470	8	2%					13.9	B			40	328	
		Intersection		**1,642**	**1,629**	-13	**-1%**	**1,642**	**1,629**	**-13**	**-1%**	28.4	C	**28.4**	**C**			
Spring Street / Herndon Parkway	**Signal**	Spring Street	EBL	104	102	-2	-2%	914	904	-10	-1%	83.0	F	74.0	E	47	266	
			EBT	678	671	-7	-1%					74.3	E			154	474	
			EBR	132	131	-1	-1%					65.7	E			155	477	
		Spring Street	WBL	953	948	-5	-1%	2,200	2,190	-10	0%	40.7	D	30.4	C	153	581	
			WBT	788	785	-3	0%					29.5	C			80	401	
			WBR	459	457	-2	0%					10.4	B			20	211	
		Herndon Parkway	NBL	229	236	7	3%	1,764	1,719	-45	-3%	48.7	D	37.1	D	49	312	
			NBT	686	656	-30	-4%					53.2	D			159	597	
			NBR	850	827	-23	-3%					21.0	C			159	597	
		Herndon Parkway	SBL	490	483	-7	-1%	1,081	1,076	-5	0%	73.0	E	65.8	E	112	347	
			SBT	545	549	4	1%					60.5	E			112	390	
			SBR	46	44	-2	-5%					53.1	D			113	393	
		Intersection		**4,878**	**4,813**	-65	**-1%**	**4,878**	**4,813**	**-65**	**-1%**	55.7	E	**55.7**	**E**			

Note: Average results across 20 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

Build Scenario 1 with Fairbrook Drive Extended 2045 Conditions: Weekday Evening Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								Build Scenario 1 with Fairbrook Drive Extended 2045 Conditions MOEs						Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	
Spring Street / Fairfax County Parkway / Fairbrook Drive	**Signal**	Spring Street	EBL	289	287	-2	-1%	2,022	1,984	-38	-2%	80.4	F	31.3	C	167	634	
			EBT	1,711	1,674	-37	-2%					23.1	C			128	624	
			EBR	23	23	0	2%					15.8	B			125	620	
		Spring Street	WBL	162	160	-2	-1%	2,289	2,257	-32	-1%	45.4	D	35.4	D	683	1613	
			WBT	1,476	1,470	-6	0%					35.6	D			683	1613	
			WBR	650	627	-23	-4%					32.5	C			663	1602	
		Fairbrook Drive	NBL	29	29	0	0%	763	764	1	0%	85.5	F	56.6	E	208	860	
			NBT	184	184	0	0%					76.9	E			208	860	
			NBR	550	551	1	0%					48.3	D			208	860	
		Fairfax County Parkway	SBL	166	170	4	2%	1,460	1,466	6	0%	101.6	F	45.4	D	116	646	
			SBT	400	404	4	1%					49.1	D			143	734	
			SBR	895	892	-3	0%					33.1	C			147	782	
		Intersection		**6,533**	**6,471**	-62	**-1%**	**6,533**	**6,471**	**-62**	**-1%**	38.9	D	**38.9**	**D**			
Van Buren Street / Alabama Drive	**Signal**	Alabama Drive	EBL	85	80	-5	-6%	265	259	-6	-2%	68.5	E	56.0	E	98	437	
			EBT	18	18	0	0%					66.9	E			98	437	
			EBR	162	161	-1	-1%					48.6	D			101	444	
		Alabama Drive	WBL	35	34	-1	-3%	66	66	0	0%	41.0	D	33.9	C	12	104	
			WBT	10	11	1	10%					42.3	D			12	104	
			WBR	21	21	0	0%					18.0	B			10	119	
		Van Buren Street	NBL	65	64	-1	-2%	668	655	-13	-2%	19.5	B	14.8	B	70	624	
			NBT	526	519	-7	-1%					14.5	B			70	624	
			NBR	77	72	-5	-7%					13.1	B			70	624	
		Van Buren Street	SBL	34	34	0	0%	787	784	-3	0%	28.6	C	26.3	C	408	1202	
			SBT	646	644	-2	0%					26.6	C			408	1201	
			SBR	107	106	-1	-1%					23.5	C			406	1200	
		Intersection		**1,787**	**1,764**	-23	**-1%**	**1,787**	**1,764**	**-23**	**-1%**	26.7	C	**26.7**	**C**			
Van Buren Street / Herndon Parkway	**Signal**	Herndon Parkway	EBL	55	56	1	2%	1,100	1,094	-6	-1%	69.9	E	42.6	D	21	118	
			EBT	699	696	-3	0%					51.7	D			126	501	
			EBR	346	342	-4	-1%					19.7	B			41	331	
		Herndon Parkway	WBL	520	505	-15	-3%	1,882	1,845	-37	-2%	77.1	E	52.0	D	141	729	
			WBT	1,144	1,125	-19	-2%					42.7	D			394	1039	
			WBR	218	215	-3	-2%					41.6	D			394	1039	
		Van Buren Street	NBL	365	369	4	1%	1,051	1,043	-8	-1%	99.8	F	49.1	D	418	874	
			NBT	394	387	-7	-2%					29.9	C			379	871	
			NBR	292	287	-5	-2%					10.1	B			24	225	
		Van Buren Street	SBL	129	125	-4	-3%	844	829	-15	-2%	59.6	E	58.6	E	71	759	
			SBT	668	657	-11	-2%					58.9	E			598	1177	
			SBR	47	47	0	0%					52.3	D			598	1177	
		Intersection		**4,878**	**4,811**	-67	**-1%**	**4,878**	**4,811**	**-67**	**-1%**	50.4	D	**50.4**	**D**			
Van Buren Street / Worldgate Drive	**Signal**	Worldgate Drive	EBL	291	286	-5	-2%	1,373	1,358	-15	-1%	50.4	D	30.5	C	121	440	
			EBT	413	407	-6	-2%					45.3	D			60	245	
			EBR	669	665	-4	-1%					12.9	B			66	512	
		Parking Lot	WBL	374	363	-11	-3%	946	933	-13	-1%	11.7	B	28.5	C	20	359	
			WBT	551	547	-4	-1%					39.9	D			77	420	
			WBR	22	23	1	5%					20.7	C			85	434	
		Van Buren Street	NBL	361	350	-11	-3%	1,442	1,431	-11	-1%	51.8	D	23.5	C	64	282	
			NBT	720	727	7	1%					18.0	B			47	368	
			NBR	361	354	-7	-2%					6.8	A			9	165	
		Van Buren Street	SBL	9	9	0	0%	1,583	1,554	-29	-2%	49.3	D	12.3	B	3	52	
			SBT	1,211	1,189	-22	-2%					15.3	B			75	558	
			SBR	363	356	-7	-2%					1.6	A			0	68	
		Intersection		**5,345**	**5,276**	-69	**-1%**	**5,345**	**5,276**	**-69**	**-1%**	22.9	C	**22.9**	**C**			

Note: Average results across 20 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

Build Scenario 1 with Fairbrook Drive Extended 2045 Conditions: Weekday Evening Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								Build Scenario 1 with Fairbrook Drive Extended 2045 Conditions MOEs						Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	
Herndon Parkway / Worldgate Drive	**Signal**	Herndon Parkway	EBL	100	97	-3	-3%	1,204	1,190	-14	-1%	54.5	D	47.7	D	12	131	
			EBT	1,084	1,072	-12	-1%					47.1	D			196	488	
			EBR	20	21	1	5%					42.6	D			198	492	
		Herndon Parkway	WBL	688	671	-17	-2%	2,327	2,283	-44	-2%	43.4	D	27.0	C	216	986	
			WBT	1,623	1,595	-28	-2%					20.2	C			205	1000	
			WBR	17	17	0	2%					17.0	B			210	1010	
		Worldgate Drive	NBL	199	197	-2	-1%	982	973	-9	-1%	43.7	D	25.5	C	91	415	
			NBT	50	49	-1	-2%					45.1	D			91	415	
			NBR	733	727	-6	-1%					19.2	B			91	415	
		Worldgate Drive	SBL	48	47	-1	-2%	137	136	-1	-1%	49.2	D	31.9	C	12	125	
			SBT	28	30	2	6%					39.2	D			9	132	
			SBR	61	59	-2	-3%					14.5	B			7	136	
		Intersection		**4,650**	**4,582**	-68	**-1%**	**4,650**	**4,582**	**-68**	**-1%**	32.2	C	**32.2**	**C**			
Herndon Parkway / 555 Herndon Parkway	**Signal**	Herndon Parkway	EBL	91	91	0	0%	1,941	1,905	-36	-2%	41.8	D	12.3	B	17	143	
			EBT	1,751	1,715	-36	-2%					10.9	B			67	570	
			EBR	99	99	0	0%					9.8	A			67	573	
		Herndon Parkway	WBL	66	65	-1	-2%	2,047	2,006	-41	-2%	45.0	D	25.2	C	6	100	
			WBT	1,920	1,880	-40	-2%					24.5	C			289	805	
			WBR	60	61	1	1%					23.8	C			291	809	
		Parking Lot	NBL	314	312	-2	-1%	449	440	-9	-2%	81.2	F	71.7	E	218	453	
			NBT	0	0	0	0%					0.0	A			0	0	
			NBR	135	128	-7	-5%					48.5	D			40	415	
		Parking Lot	SBL	67	68	1	1%	161	161	0	0%	41.3	D	31.2	C	27	220	
			SBT	0	0	0	0%					0.0	A			0	0	
			SBR	94	93	-1	-1%					23.8	C			26	226	
		Intersection		**4,598**	**4,512**	-86	**-2%**	**4,598**	**4,512**	**-86**	**-2%**	24.5	C	**24.5**	**C**			
Herndon Parkway / Exchange Place	**Signal**	Herndon Parkway	EBL	24	25	2	6%	1,996	1,932	-64	-3%	19.0	B	8.7	A	0	36	
			EBT	1,873	1,812	-61	-3%					8.6	A			84	783	
			EBR	99	95	-4	-4%					7.9	A			85	788	
		Herndon Parkway	WBL	66	66	0	0%	1,810	1,787	-23	-1%	30.9	C	18.8	B	5	93	
			WBT	1,721	1,697	-24	-1%					18.4	B			138	627	
			WBR	24	24	1	2%					16.5	B			142	637	
		Parking Lot	NBL	314	306	-8	-3%	449	445	-4	-1%	60.2	E	50.5	D	134	393	
			NBT	0	0	0	0%					0.0	A			134	393	
			NBR	135	139	4	3%					29.4	C			14	309	
		Exchange Place	SBL	18	18	0	0%	30	31	1	3%	45.0	D	30.3	C	5	67	
			SBT	0	0	0	0%					0.0	A			5	67	
			SBR	12	13	1	8%					9.9	A			3	72	
		Intersection		**4,285**	**4,195**	-90	**-2%**	**4,285**	**4,195**	**-90**	**-2%**	17.6	B	**17.6**	**B**			
Herndon Parkway / Fairbrook Drive	**Signal**	Parking Lot	EBL	19	20	1	6%	63	64	1	2%	53.9	D	49.7	D	6	72	
			EBT	32	31	-1	-2%					57.7	E			11	110	
			EBR	13	13	0	3%					24.1	C			7	111	
		Fairbrook Drive	WBL	366	365	-1	0%	565	564	-1	0%	51.6	D	42.8	D	90	465	
			WBT	73	72	-1	-1%					51.9	D			90	465	
			WBR	126	127	1	1%					12.5	B			2	85	
		Herndon Parkway	NBL	29	29	0	-1%	2,026	1,964	-62	-3%	12.1	B	11.3	B	1	41	
			NBT	1,572	1,516	-56	-4%					11.9	B			56	562	
			NBR	425	419	-6	-1%					9.0	A			10	346	
		Herndon Parkway	SBL	60	63	3	5%	1,511	1,520	9	1%	35.4	D	23.2	C	7	107	
			SBT	1,407	1,414	7	0%					22.8	C			153	766	
			SBR	44	43	-1	-2%					18.2	B			155	771	
		Intersection		**4,165**	**4,112**	-53	**-1%**	**4,165**	**4,112**	**-53**	**-1%**	20.6	C	**20.6**	**C**			

Note: Average results across 20 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

Build Scenario 2 with Fairbrook Drive Extended 2045 Conditions: Weekday Morning Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								Build Scenario 2 with Fairbrook Drive Extended 2045 Conditions MOEs						Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	
Elden Street / Monroe Street	**Signal**	Elden Street	EBL	73	74	1	1%	839	836	-3	0%	23.3	C	18.0	B	5	124	
			EBT	630	629	-1	0%					17.7	B			110	694	
			EBR	136	133	-3	-2%					16.3	B			109	693	
		Elden Street	WBL	6	5	-1	-17%	459	455	-4	-1%	25.9	C	22.5	C	0	30	
			WBT	410	406	-4	-1%					22.7	C			69	446	
			WBR	43	44	1	2%					20.1	C			76	484	
		Monroe Street	NBL	36	39	3	8%	181	188	7	4%	49.5	D	46.2	D	10	87	
			NBT	130	135	5	3%					48.6	D			39	226	
			NBR	15	14	-1	-7%					14.2	B			22	220	
		Monroe Street	SBL	96	93	-3	-3%	427	426	-1	0%	48.0	D	56.1	E	57	346	
			SBT	272	275	3	1%					60.4	E			114	399	
			SBR	59	58	-1	-2%					49.3	D			113	399	
		Intersection		**1,906**	**1,905**	-1	**0%**	**1,906**	**1,905**	**-1**	**0%**	30.4	C	**30.4**	**C**			
Elden Street / Van Buren Street	**Signal**	Elden Street	EBL	0	0	0	0%	770	751	-19	-2%	0.0	A	15.9	B	42	315	
			EBT	718	689	-29	-4%					17.0	B			42	315	
			EBR	52	62	10	19%					4.1	A			1	50	
		Elden Street	WBL	117	116	-1	-1%	602	587	-15	-2%	31.1	C	20.8	C	37	213	
			WBT	469	458	-11	-2%					18.4	B			37	213	
			WBR	16	13	-3	-19%					13.9	B			45	227	
		Van Buren Street	NBL	49	48	-1	-2%	383	381	-2	-1%	33.6	C	28.3	C	9	94	
			NBT	218	217	-1	0%					39.3	D			51	316	
			NBR	116	116	0	0%					5.4	A			2	90	
		Van Buren Street	SBL	146	141	-5	-3%	522	534	12	2%	39.2	D	42.0	D	41	323	
			SBT	367	381	14	4%					43.2	D			103	418	
			SBR	9	12	3	33%					36.1	D			107	424	
		Intersection		**1,755**	**1,719**	-36	**-2%**	**1,755**	**1,719**	**-36**	**-2%**	33.4	C	**33.4**	**C**			
Van Buren Street / Spring Street	**Signal**	Van Buren Street	EBL	189	183	-6	-3%	514	513	-1	0%	14.9	B	11.5	B	0	13	
			EBT	6	7	1	17%					13.2	B			17	220	
			EBR	319	323	4	1%					9.5	A			16	213	
		Parking Lot	WBL	1	1	0	0%	1	1	0	0%	24.1	C	24.1	C	0	14	
			WBR	0	0	0	0%					0.0	A			0	0	
		Spring Street	NBL	117	121	4	3%	397	408	11	3%	14.8	B	8.7	A	5	114	
			NBT	272	281	9	3%					6.1	A			6	125	
			NBR	8	6	-2	-25%					3.8	A			5	134	
		Van Buren Street	SBL	9	9	0	0%	873	892	19	2%	7.3	A	7.6	A	0	27	
			SBT	521	528	7	1%					8.5	A			16	227	
			SBR	343	355	12	3%					6.2	A			9	175	
		Intersection		**912**	**922**	10	**1%**	**912**	**922**	**10**	**1%**	17.6	B	**17.6**	**B**			
Spring Street / Herndon Parkway	**Signal**	Spring Street	EBL	42	35	-7	-16%	957	961	4	0%	86.5	F	74.6	E	15	83	
			EBT	742	749	7	1%					74.9	E			165	446	
			EBR	173	177	4	2%					70.8	E			167	450	
		Spring Street	WBL	663	667	4	1%	1,586	1,594	8	1%	48.3	D	35.7	D	112	497	
			WBT	509	516	7	1%					39.3	D			69	360	
			WBR	414	411	-3	-1%					10.7	B			23	262	
		Herndon Parkway	NBL	230	246	16	7%	1,652	1,615	-37	-2%	43.9	D	32.5	C	48	263	
			NBT	405	365	-40	-10%					47.0	D			107	409	
			NBR	1,017	1,004	-13	-1%					24.4	C			107	409	
		Herndon Parkway	SBL	463	457	-6	-1%	1,016	1,018	2	0%	74.4	E	56.3	E	106	357	
			SBT	504	511	7	1%					42.2	D			74	340	
			SBR	49	50	1	2%					35.9	D			75	343	
		Intersection		**4,195**	**4,170**	-25	**-1%**	**4,195**	**4,170**	**-25**	**-1%**	57.2	E	**57.2**	**E**			

Note: Average results across 7 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

Build Scenario 2 with Fairbrook Drive Extended 2045 Conditions: Weekday Morning Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								Build Scenario 2 with Fairbrook Drive Extended 2045 Conditions MOEs						Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	
Spring Street / Fairfax County Parkway / Fairbrook Drive	**Signal**	Spring Street	EBL	149	150	1	0%	2,202	2,178	-24	-1%	39.4	D	33.3	C	27	207	
			EBT	2,008	1,982	-26	-1%					33.0	C			216	763	
			EBR	45	46	1	2%					24.0	C			212	758	
		Spring Street	WBL	209	199	-10	-5%	1,085	1,060	-25	-2%	102.9	F	47.8	D	187	616	
			WBT	571	564	-7	-1%					46.4	D			187	616	
			WBR	305	297	-8	-3%					13.7	B			140	601	
		Fairbrook Drive	NBL	27	28	1	3%	572	570	-2	0%	105.8	F	62.3	E	168	478	
			NBT	131	131	0	0%					99.6	F			168	478	
			NBR	414	411	-3	-1%					47.5	D			168	478	
		Fairfax County Parkway	SBL	370	367	-3	-1%	1,816	1,811	-5	0%	93.6	F	44.1	D	678	1469	
			SBT	387	384	-3	-1%					43.6	D			276	1197	
			SBR	1,059	1,060	1	0%					27.2	C			597	1480	
		Intersection		**5,675**	**5,619**	-56	**-1%**	**5,675**	**5,619**	**-56**	**-1%**	42.5	D	**42.5**	**D**			
Van Buren Street / Alabama Drive	**Signal**	Alabama Drive	EBL	129	129	0	0%	318	318	0	0%	44.0	D	35.4	D	66	366	
			EBT	10	12	2	20%					40.1	D			66	366	
			EBR	179	177	-2	-1%					28.8	C			67	374	
		Alabama Drive	WBL	50	49	-1	-1%	106	101	-5	-4%	30.3	C	25.6	C	14	144	
			WBT	13	13	0	0%					33.1	C			14	144	
			WBR	43	39	-4	-9%					17.1	B			13	159	
		Van Buren Street	NBL	62	62	0	0%	442	440	-2	-1%	22.1	C	20.0	C	57	409	
			NBT	342	341	-1	0%					19.9	B			57	410	
			NBR	38	37	-1	-4%					17.5	B			56	409	
		Van Buren Street	SBL	13	16	3	23%	460	472	12	3%	17.8	B	13.3	B	42	348	
			SBT	406	416	10	2%					13.1	B			41	348	
			SBR	41	40	-1	-2%					13.1	B			39	347	
		Intersection		**1,326**	**1,331**	5	**0%**	**1,326**	**1,331**	**5**	**0%**	21.7	C	**21.7**	**C**			
Van Buren Street / Herndon Parkway	**Signal**	Herndon Parkway	EBL	43	41	-2	-5%	1,488	1,468	-20	-1%	72.3	E	37.6	D	15	100	
			EBT	1,128	1,123	-5	0%					42.2	D			251	791	
			EBR	317	304	-13	-4%					16.1	B			21	232	
		Herndon Parkway	WBL	293	299	6	2%	1,042	1,022	-20	-2%	47.4	D	23.8	C	47	215	
			WBT	611	591	-20	-3%					14.1	B			30	296	
			WBR	138	132	-6	-4%					13.6	B			30	296	
		Van Buren Street	NBL	240	250	10	4%	835	851	16	2%	48.2	D	35.9	D	78	372	
			NBT	261	270	9	3%					41.2	D			73	369	
			NBR	334	331	-3	-1%					22.4	C			45	315	
		Van Buren Street	SBL	149	152	3	2%	636	650	14	2%	38.3	D	39.7	D	33	257	
			SBT	464	476	12	3%					40.6	D			74	526	
			SBR	23	22	-1	-4%					29.9	C			74	526	
		Intersection		**4,001**	**3,991**	-10	**0%**	**4,001**	**3,991**	**-10**	**0%**	34.0	C	**34.0**	**C**			

Note: Average results across 7 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

Build Scenario 2 with Fairbrook Drive Extended 2045 Conditions: Weekday Morning Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								Build Scenario 2 with Fairbrook Drive Extended 2045 Conditions MOEs						Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	
Van Buren Street / Worldgate Drive	**Signal**	Worldgate Drive	EBL	170	172	2	1%	1,122	1,115	-7	-1%	36.4	D	31.1	C	38	238	
			EBT	711	700	-11	-2%					39.8	D			91	340	
			EBR	241	243	2	1%					2.3	A			2	99	
		Worldgate Drive	WBL	212	221	9	4%	451	467	16	4%	33.2	C	32.1	C	42	315	
			WBT	231	238	7	3%					31.7	C			27	137	
			WBR	8	8	0	0%					15.0	B			29	150	
		Van Buren Street	NBL	406	393	-13	-3%	1,686	1,680	-6	0%	46.1	D	23.3	C	63	338	
			NBT	767	782	15	2%					18.4	B			52	423	
			NBR	513	505	-8	-2%					13.3	B			34	345	
		Van Buren Street	SBL	20	21	1	5%	1,045	1,045	0	0%	44.0	D	10.8	B	5	58	
			SBT	669	666	-3	0%					14.3	B			32	265	
			SBR	356	358	2	1%					2.6	A			1	134	
		Intersection		**4,304**	**4,307**	3	**0%**	**4,304**	**4,307**	**3**	**0%**	23.3	C	**23.3**	**C**			
Herndon Parkway / Worldgate Drive	**Signal**	Herndon Parkway	EBL	128	135	7	6%	1,566	1,582	16	1%	25.0	C	56.1	E	4	91	
			EBT	1,394	1,405	11	1%					59.5	E			389	729	
			EBR	44	42	-2	-5%					39.4	D			393	733	
		Herndon Parkway	WBL	553	548	-5	-1%	1,447	1,433	-14	-1%	57.0	E	28.8	C	119	595	
			WBT	850	844	-6	-1%					11.4	B			36	490	
			WBR	44	41	-3	-6%					12.2	B			37	500	
		Worldgate Drive	NBL	65	62	-3	-5%	1,068	1,052	-16	-1%	36.6	D	25.8	C	89	486	
			NBT	74	70	-4	-5%					36.3	D			89	486	
			NBR	929	920	-9	-1%					24.3	C			89	486	
		Worldgate Drive	SBL	44	44	0	1%	172	172	0	0%	48.5	D	30.5	C	11	117	
			SBT	42	42	0	1%					42.1	D			15	182	
			SBR	87	86	-1	-1%					15.7	B			14	186	
		Intersection		**4,253**	**4,239**	-14	**0%**	**4,253**	**4,239**	**-14**	**0%**	38.3	D	**38.3**	**D**			
Herndon Parkway / Exchange Place	**Signal**	Herndon Parkway	EBL	84	83	-1	-2%	2,103	1,998	-105	-5%	25.7	C	19.5	B	5	86	
			EBT	1,799	1,713	-86	-5%					19.2	B			255	831	
			EBR	220	202	-18	-8%					19.5	B			258	836	
		Herndon Parkway	WBL	148	145	-3	-2%	1,677	1,674	-3	0%	35.2	D	14.1	B	19	153	
			WBT	1,332	1,333	1	0%					12.1	B			56	458	
			WBR	197	196	-1	0%					12.4	B			59	468	
		Parking Lot	NBL	103	99	-4	-4%	147	145	-2	-1%	40.1	D	29.9	C	23	150	
			NBT	0	0	0	0%					0.0	A			23	150	
			NBR	44	46	2	5%					8.0	A			1	50	
		Exchange Place	SBL	171	170	-1	-1%	285	285	0	0%	74.5	E	69.9	E	120	444	
			SBT	0	0	0	0%					0.0	A			120	444	
			SBR	114	115	1	1%					63.0	E			123	450	
		Intersection		**4,212**	**4,102**	-110	**-3%**	**4,212**	**4,102**	**-110**	**-3%**	21.1	C	**21.1**	**C**			
Herndon Parkway / Fairbrook Drive	**Signal**	Parking Lot	EBL	15	17	2	16%	49	51	2	4%	50.7	D	44.2	D	5	47	
			EBT	25	24	-1	-2%					51.1	D			7	73	
			EBR	10	10	0	2%					16.5	B			3	74	
		Fairbrook Drive	WBL	329	332	3	1%	375	380	5	1%	43.3	D	39.5	D	54	230	
			WBT	8	6	-2	-20%					52.5	D			54	230	
			WBR	39	42	3	8%					7.5	A			0	42	
		Herndon Parkway	NBL	3	3	0	0%	2,014	1,926	-88	-4%	5.9	A	10.1	B	0	6	
			NBT	1,564	1,495	-69	-4%					10.6	B			53	602	
			NBR	447	428	-19	-4%					8.4	A			7	243	
		Herndon Parkway	SBL	97	98	1	1%	1,438	1,430	-8	-1%	29.8	C	20.1	C	11	188	
			SBT	1,337	1,327	-10	-1%					19.4	B			108	603	
			SBR	5	5	1	11%					13.8	B			110	608	
		Intersection		**3,876**	**3,787**	-89	**-2%**	**3,876**	**3,787**	**-89**	**-2%**	17.3	B	**17.3**	**B**			

Note: Average results across 7 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

Build Scenario 2 with Fairbrook Drive Extended 2045 Conditions: Weekday Evening Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								Build Scenario 2 with Fairbrook Drive Extended 2045 Conditions MOEs						Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	
Elden Street / Monroe Street	**Signal**	Elden Street	EBL	127	124	-3	-2%	817	811	-6	-1%	30.0	C	21.3	C	13	217	
			EBT	654	651	-3	0%					19.8	B			117	798	
			EBR	36	36	0	0%					18.4	B			115	797	
		Elden Street	WBL	13	13	0	0%	755	746	-9	-1%	21.5	C	23.4	C	1	38	
			WBT	669	663	-6	-1%					23.7	C			206	796	
			WBR	73	70	-3	-4%					20.7	C			216	833	
		Monroe Street	NBL	168	162	-6	-4%	450	441	-9	-2%	74.0	E	72.9	E	119	591	
			NBT	271	268	-3	-1%					73.3	E			188	654	
			NBR	11	11	0	0%					48.2	D			174	648	
		Monroe Street	SBL	131	125	-6	-5%	459	451	-8	-2%	46.7	D	49.1	D	66	356	
			SBT	207	204	-3	-2%					54.2	D			99	384	
			SBR	121	122	1	1%					43.1	D			98	384	
		Intersection		**2,481**	**2,449**	-32	**-1%**	**2,481**	**2,449**	**-32**	**-1%**	36.3	D	**36.3**	**D**			
Elden Street / Van Buren Street	**Signal**	Elden Street	EBL	5	5	0	0%	803	786	-17	-2%	52.6	D	35.5	D	96	345	
			EBT	764	744	-20	-3%					37.0	D			96	345	
			EBR	34	37	3	9%					5.1	A			1	58	
		Elden Street	WBL	150	150	0	0%	962	948	-14	-1%	38.1	D	27.1	C	86	378	
			WBT	754	742	-12	-2%					25.4	C			86	378	
			WBR	58	56	-2	-3%					20.2	C			95	392	
		Van Buren Street	NBL	118	110	-8	-7%	719	674	-45	-6%	41.3	D	36.0	D	23	321	
			NBT	425	397	-28	-7%					44.4	D			135	634	
			NBR	176	167	-9	-5%					12.5	B			5	142	
		Van Buren Street	SBL	126	126	0	0%	394	401	7	2%	40.3	D	43.3	D	33	235	
			SBT	253	259	6	2%					45.2	D			72	288	
			SBR	15	16	1	7%					36.6	D			75	299	
		Intersection		**2,484**	**2,408**	-76	**-3%**	**2,484**	**2,408**	**-76**	**-3%**	39.5	D	**39.5**	**D**			
Van Buren Street / Spring Street	**Signal**	Van Buren Street	EBL	424	384	-40	-9%	640	584	-56	-9%	21.6	C	16.9	B	0	69	
			EBT	1	1	0	0%					16.9	B			55	467	
			EBR	215	199	-16	-7%					7.8	A			9	168	
		Parking Lot	WBL	13	14	1	8%	28	28	0	0%	29.1	C	28.7	C	2	49	
			WBR	15	14	-1	-7%					28.3	C			2	46	
		Spring Street	NBL	324	306	-18	-6%	966	907	-59	-6%	26.4	C	16.7	B	41	373	
			NBT	634	594	-40	-6%					11.8	B			23	301	
			NBR	8	7	-1	-13%					9.4	A			22	309	
		Van Buren Street	SBL	3	3	0	0%	802	808	6	1%	15.1	B	20.2	C	0	24	
			SBT	338	339	1	0%					20.1	C			59	420	
			SBR	461	466	5	1%					20.4	C			70	429	
		Intersection		**1,634**	**1,519**	-115	**-7%**	**1,634**	**1,519**	**-115**	**-7%**	27.8	C	**27.8**	**C**			
Spring Street / Herndon Parkway	**Signal**	Spring Street	EBL	81	74	-7	-8%	949	877	-72	-8%	105.7	F	114.2	F	136	494	
			EBT	657	613	-44	-7%					115.9	F			404	953	
			EBR	211	190	-21	-10%					112.0	F			406	956	
		Spring Street	WBL	987	904	-83	-8%	2,230	2,060	-170	-8%	62.9	E	41.5	D	289	669	
			WBT	784	726	-58	-7%					32.8	C			95	543	
			WBR	459	430	-29	-6%					11.0	B			21	299	
		Herndon Parkway	NBL	238	227	-11	-4%	1,796	1,668	-128	-7%	56.6	E	39.6	D	57	337	
			NBT	695	653	-42	-6%					55.7	E			161	570	
			NBR	864	788	-76	-9%					21.3	C			161	570	
		Herndon Parkway	SBL	491	465	-26	-5%	1,080	1,014	-66	-6%	81.8	F	97.2	F	125	422	
			SBT	551	516	-35	-6%					111.6	F			274	825	
			SBR	38	33	-5	-12%					89.4	F			275	824	
		Intersection		**4,975**	**4,605**	-370	**-7%**	**4,975**	**4,605**	**-370**	**-7%**	76.0	E	**76.0**	**E**			

Note: Average results across 20 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

Build Scenario 2 with Fairbrook Drive Extended 2045 Conditions: Weekday Evening Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								Build Scenario 2 with Fairbrook Drive Extended 2045 Conditions MOEs						Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	
Spring Street / Fairfax County Parkway / Fairbrook Drive	**Signal**	Spring Street	EBL	287	267	-20	-7%	2,015	1,866	-149	-7%	100.5	F	38.7	D	215	665	
			EBT	1,679	1,552	-127	-8%					28.6	C			177	654	
			EBR	49	47	-2	-5%					21.4	C			173	649	
		Spring Street	WBL	190	169	-21	-11%	2,302	2,090	-212	-9%	59.6	E	44.5	D	920	1617	
			WBT	1,462	1,342	-120	-8%					48.9	D			920	1617	
			WBR	650	579	-71	-11%					30.0	C			901	1607	
		Fairbrook Drive	NBL	51	51	0	0%	818	808	-10	-1%	99.2	F	67.2	E	354	1008	
			NBT	187	182	-5	-3%					88.6	F			354	1008	
			NBR	581	575	-6	-1%					57.6	E			354	1008	
		Fairfax County Parkway	SBL	166	166	0	0%	1,488	1,430	-58	-4%	109.7	F	48.5	D	141	750	
			SBT	405	397	-8	-2%					47.8	D			212	861	
			SBR	918	867	-51	-6%					37.2	D			242	913	
		Intersection		**6,624**	**6,194**	-430	**-6%**	**6,624**	**6,194**	**-430**	**-6%**	46.6	D	**46.6**	**D**			
Van Buren Street / Alabama Drive	**Signal**	Alabama Drive	EBL	85	62	-23	-27%	263	199	-64	-24%	233.8	F	220.3	F	365	521	
			EBT	18	13	-5	-28%					226.6	F			365	521	
			EBR	160	124	-36	-23%					212.8	F			372	528	
		Alabama Drive	WBL	34	32	-2	-6%	65	62	-3	-5%	89.9	F	74.7	E	24	126	
			WBT	10	10	0	0%					83.9	F			24	126	
			WBR	21	20	-1	-5%					45.8	D			26	140	
		Van Buren Street	NBL	81	76	-5	-6%	700	661	-39	-6%	25.4	C	20.6	C	109	698	
			NBT	534	508	-26	-5%					20.0	C			109	699	
			NBR	85	77	-8	-10%					19.5	B			108	698	
		Van Buren Street	SBL	34	33	-1	-3%	786	764	-22	-3%	36.5	D	32.0	C	440	1208	
			SBT	645	627	-18	-3%					32.4	C			440	1208	
			SBR	107	104	-3	-3%					28.3	C			439	1207	
		Intersection		**1,814**	**1,686**	-128	**-7%**	**1,814**	**1,686**	**-128**	**-7%**	51.3	D	**51.3**	**D**			
Van Buren Street / Herndon Parkway	**Signal**	Herndon Parkway	EBL	55	56	1	2%	1,086	1,084	-2	0%	58.9	E	33.9	C	18	108	
			EBT	685	687	2	0%					40.9	D			94	450	
			EBR	346	341	-5	-1%					15.7	B			34	273	
		Herndon Parkway	WBL	520	478	-42	-8%	2,033	1,880	-153	-8%	75.2	E	44.4	D	131	574	
			WBT	1,263	1,173	-90	-7%					33.9	C			311	997	
			WBR	250	229	-21	-8%					33.7	C			311	997	
		Van Buren Street	NBL	365	352	-13	-4%	1,051	1,003	-48	-5%	109.9	F	55.7	E	501	933	
			NBT	394	372	-22	-6%					36.9	D			485	930	
			NBR	292	279	-13	-4%					12.5	B			21	247	
		Van Buren Street	SBL	125	112	-13	-10%	840	777	-63	-8%	72.8	E	67.1	E	271	877	
			SBT	668	620	-48	-7%					66.8	E			789	1208	
			SBR	47	45	-2	-4%					57.4	E			789	1208	
		Intersection		**5,010**	**4,744**	-266	**-5%**	**5,010**	**4,744**	**-266**	**-5%**	48.1	D	**48.1**	**D**			
Van Buren Street / Worldgate Drive	**Signal**	Worldgate Drive	EBL	291	281	-10	-3%	1,374	1,355	-19	-1%	71.4	E	33.2	C	230	641	
			EBT	414	409	-5	-1%					42.3	D			80	278	
			EBR	669	665	-4	-1%					11.5	B			115	554	
		Parking Lot	WBL	396	352	-44	-11%	996	927	-69	-7%	61.6	E	47.0	D	215	690	
			WBT	577	555	-22	-4%					38.7	D			86	423	
			WBR	22	20	-2	-9%					20.9	C			94	436	
		Van Buren Street	NBL	361	337	-24	-7%	1,443	1,384	-59	-4%	53.2	D	38.4	D	133	602	
			NBT	720	703	-17	-2%					41.2	D			292	913	
			NBR	362	344	-18	-5%					17.9	B			154	609	
		Van Buren Street	SBL	9	8	-1	-11%	1,583	1,495	-88	-6%	66.5	E	21.3	C	9	61	
			SBT	1,211	1,146	-65	-5%					26.8	C			98	403	
			SBR	363	341	-22	-6%					2.0	A			0	92	
		Intersection		**5,396**	**5,161**	-235	**-4%**	**5,396**	**5,161**	**-235**	**-4%**	33.6	C	**33.6**	**C**			

Note: Average results across 20 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

Build Scenario 2 with Fairbrook Drive Extended 2045 Conditions: Weekday Evening Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								Build Scenario 2 with Fairbrook Drive Extended 2045 Conditions MOEs						Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	
Herndon Parkway / Worldgate Drive	**Signal**	Herndon Parkway	EBL	157	154	-3	-2%	1,186	1,150	-36	-3%	61.6	E	56.7	E	35	353	
			EBT	1,008	975	-33	-3%					56.0	E			236	624	
			EBR	20	21	1	5%					50.7	D			239	628	
		Herndon Parkway	WBL	721	652	-69	-10%	2,456	2,231	-225	-9%	77.9	E	36.8	D	207	975	
			WBT	1,688	1,535	-153	-9%					19.9	B			234	1003	
			WBR	47	44	-3	-7%					18.3	B			240	1012	
		Worldgate Drive	NBL	199	191	-8	-4%	983	961	-22	-2%	45.3	D	25.8	C	100	484	
			NBT	88	82	-6	-6%					43.5	D			100	484	
			NBR	696	688	-8	-1%					18.3	B			100	484	
		Worldgate Drive	SBL	101	95	-6	-6%	245	233	-12	-5%	50.9	D	36.8	D	39	225	
			SBT	45	43	-2	-4%					48.6	D			26	212	
			SBR	99	95	-4	-4%					17.4	B			25	215	
		Intersection		**4,870**	**4,575**	-295	**-6%**	**4,870**	**4,575**	**-295**	**-6%**	39.5	D	**39.5**	**D**			
Herndon Parkway / Exchange Place	**Signal**	Herndon Parkway	EBL	83	80	-3	-4%	2,020	1,860	-160	-8%	48.3	D	24.8	C	12	127	
			EBT	1,837	1,688	-149	-8%					23.7	C			245	789	
			EBR	99	92	-7	-7%					23.5	C			248	794	
		Herndon Parkway	WBL	66	58	-8	-12%	2,046	1,784	-262	-13%	45.1	D	50.2	D	6	89	
			WBT	1,786	1,557	-229	-13%					50.9	D			425	713	
			WBR	195	169	-26	-13%					46.3	D			434	723	
		Parking Lot	NBL	314	298	-16	-5%	449	432	-17	-4%	73.7	E	62.3	E	127	389	
			NBT	0	0	0	0%					0.0	A			127	389	
			NBR	135	134	-1	-1%					37.2	D			11	284	
		Exchange Place	SBL	174	168	-6	-3%	290	287	-3	-1%	42.3	D	32.9	C	41	268	
			SBT	0	0	0	0%					0.0	A			41	268	
			SBR	116	119	3	3%					19.7	B			11	81	
		Intersection		**4,805**	**4,363**	-442	**-9%**	**4,805**	**4,363**	**-442**	**-9%**	39.4	D	**39.4**	**D**			
Herndon Parkway / Fairbrook Drive	**Signal**	Parking Lot	EBL	7	8	1	11%	24	25	1	4%	51.9	D	55.9	E	2	36	
			EBT	12	12	0	0%					63.5	E			4	55	
			EBR	5	5	0	4%					44.0	D			2	55	
		Fairbrook Drive	WBL	420	345	-75	-18%	564	464	-100	-18%	178.6	F	151.4	F	780	1128	
			WBT	19	15	-4	-19%					196.2	F			780	1128	
			WBR	126	104	-22	-17%					54.7	D			68	234	
		Herndon Parkway	NBL	7	6	-1	-19%	2,146	1,998	-148	-7%	15.0	B	14.0	B	0	24	
			NBT	1,686	1,565	-121	-7%					15.2	B			118	689	
			NBR	453	427	-26	-6%					9.5	A			6	294	
		Herndon Parkway	SBL	60	53	-7	-12%	1,668	1,519	-149	-9%	53.4	D	57.9	E	38	131	
			SBT	1,597	1,457	-140	-9%					58.2	E			661	977	
			SBR	11	9	-2	-19%					34.6	C			665	981	
		Intersection		**4,402**	**4,006**	-396	**-9%**	**4,402**	**4,006**	**-396**	**-9%**	46.8	D	**46.8**	**D**			

Note: Average results across 20 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

Build Scenario 3 with Fairbrook Drive Extended 2045 Conditions: Weekday Morning Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								Build Scenario 3 with Fairbrook Drive Extended 2045 Conditions MOEs						Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	
Elden Street / Monroe Street	**Signal**	Elden Street	EBL	73	74	1	1%	839	835	-4	0%	23.7	C	18.3	B	5	140	
			EBT	630	628	-2	0%					18.0	B			112	701	
			EBR	136	133	-3	-2%					16.7	B			111	701	
		Elden Street	WBL	6	5	-1	-17%	459	454	-5	-1%	28.8	C	22.2	C	0	33	
			WBT	410	405	-5	-1%					22.5	C			68	465	
			WBR	43	44	1	2%					19.2	B			76	503	
		Monroe Street	NBL	36	39	3	8%	190	197	7	4%	48.6	D	46.7	D	10	87	
			NBT	139	143	4	3%					49.7	D			42	238	
			NBR	15	15	0	0%					13.6	B			25	233	
		Monroe Street	SBL	96	93	-3	-3%	431	429	-2	-1%	49.7	D	57.5	E	51	353	
			SBT	276	279	3	1%					61.9	E			119	420	
			SBR	59	57	-2	-3%					49.1	D			117	420	
		Intersection		**1,919**	**1,915**	-4	**0%**	**1,919**	**1,915**	**-4**	**0%**	30.9	C	**30.9**	**C**			
Elden Street / Van Buren Street	**Signal**	Elden Street	EBL	0	0	0	0%	770	748	-22	-3%	0.0	A	15.6	B	41	306	
			EBT	718	687	-31	-4%					16.7	B			41	306	
			EBR	52	61	9	17%					3.8	A			1	55	
		Elden Street	WBL	117	116	-1	-1%	602	586	-16	-3%	31.4	C	21.0	C	38	211	
			WBT	469	457	-12	-3%					18.6	B			38	211	
			WBR	16	13	-3	-19%					14.5	B			46	225	
		Van Buren Street	NBL	49	48	-1	-2%	390	385	-5	-1%	33.3	C	28.8	C	9	97	
			NBT	225	223	-2	-1%					39.7	D			53	279	
			NBR	116	114	-2	-2%					5.4	A			3	92	
		Van Buren Street	SBL	146	142	-4	-3%	528	542	14	3%	38.8	D	41.8	D	40	324	
			SBT	373	388	15	4%					43.0	D			105	429	
			SBR	9	12	3	33%					38.9	D			110	440	
		Intersection		**1,762**	**1,719**	-43	**-2%**	**1,762**	**1,719**	**-43**	**-2%**	33.6	C	**33.6**	**C**			
Van Buren Street / Spring Street	**Signal**	Van Buren Street	EBL	184	176	-8	-4%	509	504	-5	-1%	15.2	B	11.8	B	0	7	
			EBT	6	8	2	33%					14.7	B			16	175	
			EBR	319	320	1	0%					9.9	A			17	231	
		Parking Lot	WBL	1	1	0	0%	1	1	0	0%	31.3	C	31.3	C	0	14	
			WBR	0	0	0	0%					0.0	A			0	0	
		Spring Street	NBL	117	123	6	5%	418	426	8	2%	14.6	B	8.4	A	4	117	
			NBT	293	297	4	1%					5.9	A			6	136	
			NBR	8	6	-2	-25%					2.5	A			5	144	
		Van Buren Street	SBL	9	9	0	0%	883	899	16	2%	7.2	A	7.6	A	0	30	
			SBT	532	538	6	1%					8.5	A			17	241	
			SBR	342	352	10	3%					6.2	A			8	173	
		Intersection		**928**	**931**	3	**0%**	**928**	**931**	**3**	**0%**	17.6	B	**17.6**	**B**			
Spring Street / Herndon Parkway	**Signal**	Spring Street	EBL	57	65	8	14%	952	957	5	1%	85.9	F	67.1	E	31	189	
			EBT	733	731	-2	0%					68.2	E			142	436	
			EBR	162	161	-1	0%					54.5	D			144	440	
		Spring Street	WBL	699	700	1	0%	1,620	1,621	1	0%	47.1	D	35.7	D	122	549	
			WBT	511	516	5	1%					39.6	D			68	324	
			WBR	410	405	-5	-1%					11.2	B			24	258	
		Herndon Parkway	NBL	235	237	2	1%	1,672	1,628	-44	-3%	47.5	D	32.3	C	58	349	
			NBT	410	392	-18	-4%					44.5	D			105	404	
			NBR	1,027	999	-28	-3%					23.9	C			105	404	
		Herndon Parkway	SBL	438	432	-6	-1%	1,032	1,032	0	0%	78.0	E	58.8	E	105	330	
			SBT	540	543	3	1%					45.6	D			86	333	
			SBR	54	57	3	5%					40.2	D			87	336	
		Intersection		**4,244**	**4,206**	-38	**-1%**	**4,244**	**4,206**	**-38**	**-1%**	56.0	E	**56.0**	**E**			

Note: Average results across 7 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

Build Scenario 3 with Fairbrook Drive Extended 2045 Conditions: Weekday Morning Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								Build Scenario 3 with Fairbrook Drive Extended 2045 Conditions MOEs						Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	
Spring Street / Fairfax County Parkway / Fairbrook Drive	**Signal**	Spring Street	EBL	151	151	0	0%	2,195	2,143	-52	-2%	39.0	D	33.6	C	25	203	
			EBT	2,027	1,975	-52	-3%					33.3	C			220	757	
			EBR	17	17	0	1%					26.1	C			216	752	
		Spring Street	WBL	202	196	-6	-3%	1,104	1,087	-17	-2%	105.6	F	48.3	D	210	702	
			WBT	597	592	-5	-1%					48.1	D			210	702	
			WBR	305	299	-6	-2%					11.1	B			171	691	
		Fairbrook Drive	NBL	12	12	0	3%	625	632	7	1%	100.5	F	65.1	E	156	609	
			NBT	145	147	2	1%					94.8	F			156	609	
			NBR	468	473	5	1%					55.0	D			156	609	
		Fairfax County Parkway	SBL	370	366	-4	-1%	1,833	1,825	-8	0%	88.6	F	42.0	D	549	1408	
			SBT	379	374	-5	-1%					41.0	D			241	1249	
			SBR	1,083	1,085	2	0%					26.6	C			457	1419	
		Intersection		**5,757**	**5,687**	-70	**-1%**	**5,757**	**5,687**	**-70**	**-1%**	**42.6**	D	**42.6**	**D**			
Van Buren Street / Alabama Drive	**Signal**	Alabama Drive	EBL	129	130	1	1%	317	317	0	0%	42.7	D	35.0	C	65	356	
			EBT	10	11	1	10%					35.2	D			65	356	
			EBR	178	176	-2	-1%					29.3	C			66	363	
		Alabama Drive	WBL	50	49	-1	-2%	106	102	-4	-4%	31.0	C	25.8	C	14	145	
			WBT	13	13	0	0%					34.0	C			14	145	
			WBR	43	40	-3	-7%					16.7	B			14	159	
		Van Buren Street	NBL	50	51	1	2%	420	412	-8	-2%	18.0	B	14.1	B	37	383	
			NBT	337	330	-7	-2%					13.7	B			37	384	
			NBR	33	31	-2	-7%					11.8	B			36	383	
		Van Buren Street	SBL	13	16	3	23%	459	472	13	3%	14.1	B	13.5	B	43	382	
			SBT	405	416	11	3%					13.8	B			43	381	
			SBR	41	40	-1	-2%					10.7	B			41	380	
		Intersection		**1,302**	**1,303**	1	**0%**	**1,302**	**1,303**	**1**	**0%**	19.9	B	**19.9**	**B**			
Van Buren Street / Herndon Parkway	**Signal**	Herndon Parkway	EBL	43	41	-2	-5%	1,481	1,451	-30	-2%	63.8	E	40.5	D	12	96	
			EBT	1,121	1,107	-14	-1%					45.6	D			267	863	
			EBR	317	303	-14	-4%					18.6	B			49	547	
		Herndon Parkway	WBL	293	301	8	3%	930	919	-11	-1%	52.3	D	25.8	C	53	186	
			WBT	523	509	-14	-3%					13.2	B			24	267	
			WBR	114	109	-5	-5%					11.4	B			24	267	
		Van Buren Street	NBL	240	248	8	3%	835	850	15	2%	66.7	E	46.9	D	111	347	
			NBT	261	270	9	3%					57.1	E			106	344	
			NBR	334	332	-2	-1%					23.9	C			49	290	
		Van Buren Street	SBL	147	149	2	1%	634	647	13	2%	37.7	D	34.3	C	31	240	
			SBT	464	476	12	3%					33.9	C			58	453	
			SBR	23	22	-1	-4%					20.3	C			58	453	
		Intersection		**3,880**	**3,867**	-13	**0%**	**3,880**	**3,867**	**-13**	**0%**	37.4	D	**37.4**	**D**			

Note: Average results across 7 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

Build Scenario 3 with Fairbrook Drive Extended 2045 Conditions: Weekday Morning Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								Build Scenario 3 with Fairbrook Drive Extended 2045 Conditions MOEs						Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	
Van Buren Street / Worldgate Drive	**Signal**	Worldgate Drive	EBL	170	172	2	1%	1,133	1,130	-3	0%	35.7	D	31.2	C	37	204	
			EBT	722	716	-6	-1%					39.8	D			93	348	
			EBR	241	242	1	0%					2.6	A			2	104	
		Worldgate Drive	WBL	198	207	9	4%	420	437	17	4%	32.8	C	32.6	C	38	318	
			WBT	214	222	8	4%					32.9	C			27	122	
			WBR	8	8	0	0%					21.7	C			29	136	
		Van Buren Street	NBL	406	393	-13	-3%	1,695	1,687	-8	0%	46.3	D	23.3	C	63	396	
			NBT	767	782	15	2%					18.3	B			51	343	
			NBR	522	512	-10	-2%					13.4	B			35	389	
		Van Buren Street	SBL	20	21	1	5%	1,045	1,044	-1	0%	49.7	D	15.9	B	6	65	
			SBT	669	666	-3	0%					22.0	C			48	267	
			SBR	356	357	1	0%					2.4	A			1	143	
		Intersection		**4,293**	**4,298**	5	**0%**	**4,293**	**4,298**	**5**	**0%**	24.5	C	**24.5**	**C**			
Herndon Parkway / Worldgate Drive	**Signal**	Herndon Parkway	EBL	156	164	8	5%	1,557	1,543	-14	-1%	30.1	C	53.3	D	8	118	
			EBT	1,357	1,337	-20	-2%					56.4	E			442	888	
			EBR	44	42	-2	-5%					44.9	D			445	892	
		Herndon Parkway	WBL	492	488	-4	-1%	1,308	1,300	-8	-1%	59.0	E	29.3	C	98	451	
			WBT	716	715	-1	0%					11.4	B			27	351	
			WBR	100	97	-3	-3%					10.9	B			28	361	
		Worldgate Drive	NBL	65	64	-1	-2%	1,087	1,075	-12	-1%	41.5	D	29.1	C	106	502	
			NBT	110	105	-5	-4%					38.5	D			106	502	
			NBR	913	906	-7	-1%					27.1	C			106	502	
		Worldgate Drive	SBL	52	55	3	5%	274	281	7	3%	47.2	D	32.9	C	12	157	
			SBT	73	71	-2	-3%					44.7	D			35	247	
			SBR	149	155	6	4%					22.3	C			34	251	
		Intersection		**4,227**	**4,199**	-28	**-1%**	**4,227**	**4,199**	**-28**	**-1%**	38.3	D	**38.3**	**D**			
Herndon Parkway / Exchange Place	**Signal**	Herndon Parkway	EBL	45	45	0	0%	1,996	1,930	-66	-3%	18.9	B	21.5	C	1	70	
			EBT	1,731	1,682	-49	-3%					21.5	C			266	829	
			EBR	220	203	-17	-8%					21.6	C			269	834	
		Herndon Parkway	WBL	148	144	-4	-3%	1,534	1,522	-12	-1%	38.2	D	8.4	A	19	212	
			WBT	1,279	1,269	-10	-1%					5.3	A			17	285	
			WBR	107	109	2	2%					5.4	A			18	295	
		Parking Lot	NBL	103	100	-3	-3%	147	146	-1	-1%	43.8	D	33.2	C	25	152	
			NBT	0	0	0	0%					0.0	A			25	152	
			NBR	44	46	2	5%					10.1	B			1	54	
		Exchange Place	SBL	83	81	-2	-3%	144	142	-2	-1%	46.5	D	37.8	D	29	191	
			SBT	0	0	0	0%					0.0	A			29	191	
			SBR	61	61	0	0%					26.4	C			28	197	
		Intersection		**3,820**	**3,740**	-80	**-2%**	**3,820**	**3,740**	**-80**	**-2%**	17.2	B	**17.2**	**B**			
Herndon Parkway / Fairbrook Drive	**Signal**	Parking Lot	EBL	124	121	-3	-3%	414	405	-9	-2%	84.8	F	85.9	F	110	355	
			EBT	207	200	-7	-3%					90.4	F			194	353	
			EBR	83	84	1	1%					76.7	E			193	352	
		Fairbrook Drive	WBL	296	298	2	1%	503	507	4	1%	49.4	D	46.2	D	98	455	
			WBT	169	171	3	1%					48.8	D			98	455	
			WBR	39	38	-1	-3%					9.5	A			0	32	
		Herndon Parkway	NBL	67	64	-3	-5%	1,858	1,799	-59	-3%	15.7	B	25.3	C	3	63	
			NBT	1,388	1,346	-42	-3%					27.5	C			213	702	
			NBR	403	389	-14	-3%					19.4	B			34	662	
		Herndon Parkway	SBL	97	100	3	3%	1,352	1,340	-12	-1%	48.7	D	40.4	D	19	255	
			SBT	1,154	1,142	-12	-1%					39.8	D			221	880	
			SBR	101	98	-3	-3%					38.4	D			224	885	
		Intersection		**4,128**	**4,051**	-77	**-2%**	**4,128**	**4,051**	**-77**	**-2%**	38.9	D	**38.9**	**D**			

Note: Average results across 7 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

Build Scenario 3 with Fairbrook Drive Extended 2045 Conditions: Weekday Evening Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								Build Scenario 3 with Fairbrook Drive Extended 2045 Conditions MOEs						Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	
Elden Street / Monroe Street	**Signal**	Elden Street	EBL	127	124	-3	-2%	817	811	-6	-1%	29.8	C	21.4	C	12	213	
			EBT	654	651	-3	0%					19.9	B			119	787	
			EBR	36	36	0	0%					18.5	B			117	786	
		Elden Street	WBL	13	13	0	0%	755	748	-7	-1%	22.5	C	23.0	C	1	42	
			WBT	669	665	-4	-1%					23.3	C			200	794	
			WBR	73	70	-3	-4%					20.9	C			214	831	
		Monroe Street	NBL	168	164	-4	-2%	454	449	-5	-1%	74.0	E	73.9	E	128	608	
			NBT	275	274	-1	0%					74.9	E			206	676	
			NBR	11	11	0	0%					49.8	D			192	671	
		Monroe Street	SBL	131	125	-6	-5%	461	452	-9	-2%	47.5	D	50.8	D	66	342	
			SBT	209	206	-3	-1%					56.4	E			103	367	
			SBR	121	121	0	0%					44.9	D			102	366	
		Intersection		**2,487**	**2,460**	-27	**-1%**	**2,487**	**2,460**	**-27**	**-1%**	36.9	D	**36.9**	**D**			
Elden Street / Van Buren Street	**Signal**	Elden Street	EBL	5	5	0	0%	803	789	-14	-2%	52.6	D	36.0	D	98	345	
			EBT	764	746	-18	-2%					37.5	D			98	345	
			EBR	34	38	4	12%					5.1	A			1	62	
		Elden Street	WBL	150	150	0	0%	962	950	-12	-1%	38.7	D	27.3	C	87	378	
			WBT	754	744	-10	-1%					25.6	C			87	378	
			WBR	58	56	-2	-3%					20.5	C			97	392	
		Van Buren Street	NBL	118	115	-3	-3%	723	700	-23	-3%	44.0	D	37.7	D	23	304	
			NBT	429	412	-17	-4%					45.9	D			158	712	
			NBR	176	173	-3	-2%					14.0	B			7	194	
		Van Buren Street	SBL	126	126	0	0%	394	401	7	2%	40.3	D	43.2	D	33	235	
			SBT	253	259	6	2%					45.1	D			72	286	
			SBR	15	16	1	7%					36.3	D			76	297	
		Intersection		**2,488**	**2,439**	-49	**-2%**	**2,488**	**2,439**	**-49**	**-2%**	40.2	D	**40.2**	**D**			
Van Buren Street / Spring Street	**Signal**	Van Buren Street	EBL	420	389	-31	-7%	636	594	-42	-7%	21.5	C	16.9	B	0	56	
			EBT	1	1	0	0%					20.3	C			61	573	
			EBR	215	204	-11	-5%					8.1	A			6	125	
		Parking Lot	WBL	13	14	1	8%	28	28	0	0%	27.8	C	27.1	C	2	48	
			WBR	15	14	-1	-7%					26.4	C			2	49	
		Spring Street	NBL	324	322	-2	-1%	978	963	-15	-2%	29.4	C	18.2	B	49	394	
			NBT	646	634	-12	-2%					12.7	B			26	351	
			NBR	8	7	-1	-13%					9.8	A			26	359	
		Van Buren Street	SBL	3	3	0	0%	804	815	11	1%	15.9	B	20.1	C	0	21	
			SBT	340	343	3	1%					20.1	C			51	352	
			SBR	461	469	8	2%					20.1	C			63	368	
		Intersection		**1,642**	**1,585**	-57	**-3%**	**1,642**	**1,585**	**-57**	**-3%**	28.2	C	**28.2**	**C**			
Spring Street / Herndon Parkway	**Signal**	Spring Street	EBL	99	96	-3	-3%	943	919	-24	-3%	96.2	F	95.8	F	92	458	
			EBT	658	642	-16	-2%					97.5	F			276	728	
			EBR	187	181	-6	-3%					89.3	F			278	731	
		Spring Street	WBL	987	965	-22	-2%	2,224	2,180	-44	-2%	47.2	D	34.3	C	217	655	
			WBT	783	767	-16	-2%					31.5	C			88	521	
			WBR	454	448	-6	-1%					11.3	B			22	225	
		Herndon Parkway	NBL	235	234	-1	-1%	1,782	1,728	-54	-3%	52.2	D	41.6	D	51	303	
			NBT	692	679	-13	-2%					58.4	E			190	612	
			NBR	854	815	-39	-5%					24.6	C			190	612	
		Herndon Parkway	SBL	474	465	-9	-2%	1,091	1,077	-14	-1%	74.9	E	74.6	E	110	335	
			SBT	575	572	-3	-1%					74.5	E			173	557	
			SBR	43	40	-3	-6%					72.9	E			174	560	
		Intersection		**4,949**	**4,827**	-122	**-2%**	**4,949**	**4,827**	**-122**	**-2%**	65.3	E	**65.3**	**E**			

Note: Average results across 20 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

Build Scenario 3 with Fairbrook Drive Extended 2045 Conditions: Weekday Evening Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								Build Scenario 3 with Fairbrook Drive Extended 2045 Conditions MOEs						Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	
Spring Street / Fairfax County Parkway / Fairbrook Drive	**Signal**	Spring Street	EBL	283	276	-7	-3%	1,987	1,918	-69	-3%	103.8	F	39.5	D	244	733	
			EBT	1,690	1,629	-61	-4%					28.7	C			203	714	
			EBR	13	13	0	-1%					22.4	C			199	710	
		Spring Street	WBL	181	175	-6	-3%	2,318	2,231	-87	-4%	50.4	D	38.7	D	938	1630	
			WBT	1,488	1,443	-45	-3%					39.7	D			938	1630	
			WBR	650	613	-37	-6%					33.0	C			923	1619	
		Fairbrook Drive	NBL	19	21	2	10%	790	791	1	0%	76.6	E	55.0	E	192	882	
			NBT	187	185	-2	-1%					70.5	E			192	882	
			NBR	584	585	1	0%					49.4	D			192	882	
		Fairfax County Parkway	SBL	166	170	4	2%	1,506	1,509	3	0%	109.0	F	46.2	D	142	693	
			SBT	422	425	3	1%					48.3	D			166	775	
			SBR	917	914	-3	0%					33.6	C			178	857	
		Intersection		**6,601**	**6,449**	-152	**-2%**	**6,601**	**6,449**	**-152**	**-2%**	42.7	D	**42.7**	**D**			
Van Buren Street / Alabama Drive	**Signal**	Alabama Drive	EBL	85	59	-26	-31%	262	188	-74	-28%	236.8	F	222.7	F	372	528	
			EBT	18	13	-5	-28%					231.9	F			372	528	
			EBR	159	116	-43	-27%					214.6	F			378	535	
		Alabama Drive	WBL	34	32	-2	-5%	65	62	-3	-4%	98.6	F	78.6	E	25	147	
			WBT	10	10	0	0%					87.0	F			25	147	
			WBR	21	20	-1	-5%					42.4	D			27	162	
		Van Buren Street	NBL	73	71	-2	-3%	688	666	-22	-3%	25.2	C	20.2	C	111	643	
			NBT	530	517	-13	-2%					19.9	B			111	644	
			NBR	85	78	-7	-8%					17.7	B			111	643	
		Van Buren Street	SBL	34	34	0	0%	786	783	-3	0%	36.4	D	33.5	C	545	1347	
			SBT	645	643	-2	0%					34.0	C			545	1348	
			SBR	107	106	-1	-1%					29.2	C			543	1348	
		Intersection		**1,800**	**1,699**	-101	**-6%**	**1,800**	**1,699**	**-101**	**-6%**	50.9	D	**50.9**	**D**			
Van Buren Street / Herndon Parkway	**Signal**	Herndon Parkway	EBL	55	56	1	2%	1,080	1,080	0	0%	58.9	E	33.9	C	18	116	
			EBT	679	683	4	1%					40.9	D			91	416	
			EBR	346	341	-5	-1%					15.8	B			34	245	
		Herndon Parkway	WBL	520	508	-12	-2%	1,962	1,934	-28	-1%	70.7	E	39.9	D	136	563	
			WBT	1,207	1,194	-13	-1%					29.1	C			251	927	
			WBR	235	232	-3	-1%					28.0	C			251	927	
		Van Buren Street	NBL	365	355	-10	-3%	1,051	1,015	-36	-3%	114.6	F	57.2	E	530	961	
			NBT	394	377	-17	-4%					37.1	D			515	958	
			NBR	292	283	-9	-3%					11.9	B			65	330	
		Van Buren Street	SBL	124	113	-11	-9%	839	784	-55	-7%	76.6	E	69.5	E	244	879	
			SBT	668	626	-42	-6%					69.0	E			840	1207	
			SBR	47	45	-2	-4%					58.3	E			840	1207	
		Intersection		**4,931**	**4,813**	-118	**-2%**	**4,931**	**4,813**	**-118**	**-2%**	47.0	D	**47.0**	**D**			
Van Buren Street / Worldgate Drive	**Signal**	Worldgate Drive	EBL	291	286	-5	-2%	1,382	1,378	-4	0%	73.7	E	32.4	C	188	589	
			EBT	422	422	0	0%					37.2	D			51	227	
			EBR	669	670	1	0%					11.7	B			64	495	
		Parking Lot	WBL	393	381	-12	-3%	988	974	-14	-1%	50.3	D	44.6	D	175	645	
			WBT	573	570	-3	-1%					41.2	D			92	474	
			WBR	22	23	1	5%					31.9	C			99	488	
		Van Buren Street	NBL	361	339	-22	-6%	1,449	1,402	-47	-3%	52.0	D	36.9	D	180	523	
			NBT	720	709	-11	-2%					41.7	D			280	857	
			NBR	368	354	-14	-4%					12.9	B			150	579	
		Van Buren Street	SBL	9	9	0	0%	1,583	1,530	-53	-3%	68.1	E	22.6	C	3	41	
			SBT	1,211	1,171	-40	-3%					28.3	C			109	548	
			SBR	363	350	-13	-4%					2.0	A			0	96	
		Intersection		**5,402**	**5,284**	-118	**-2%**	**5,402**	**5,284**	**-118**	**-2%**	33.0	C	**33.0**	**C**			

Note: Average results across 20 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

Build Scenario 3 with Fairbrook Drive Extended 2045 Conditions: Weekday Evening Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								Build Scenario 3 with Fairbrook Drive Extended 2045 Conditions MOEs						Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	
Herndon Parkway / Worldgate Drive	**Signal**	Herndon Parkway	EBL	161	159	-2	-1%	1,179	1,137	-42	-4%	73.1	E	38.9	D	43	351	
			EBT	998	957	-41	-4%					33.4	C			138	499	
			EBR	20	21	1	5%					29.7	C			139	503	
		Herndon Parkway	WBL	672	661	-11	-2%	2,340	2,284	-56	-2%	40.7	D	25.3	C	129	879	
			WBT	1,582	1,538	-44	-3%					19.1	B			223	997	
			WBR	86	85	-1	-1%					18.6	B			228	1006	
		Worldgate Drive	NBL	199	195	-4	-2%	997	990	-7	-1%	67.5	E	33.4	C	150	533	
			NBT	106	103	-3	-3%					65.4	E			150	533	
			NBR	692	692	0	0%					19.0	B			150	533	
		Worldgate Drive	SBL	103	106	3	3%	370	369	-1	0%	47.5	D	36.4	D	34	247	
			SBT	86	86	0	0%					43.9	D			49	249	
			SBR	181	177	-4	-2%					26.0	C			49	253	
		Intersection		**4,885**	**4,780**	-105	**-2%**	**4,885**	**4,780**	**-105**	**-2%**	31.1	C	**31.1**	**C**			
Herndon Parkway / Exchange Place	**Signal**	Herndon Parkway	EBL	80	81	1	2%	1,949	1,880	-69	-4%	36.4	D	15.6	B	7	106	
			EBT	1,770	1,703	-67	-4%					14.7	B			158	820	
			EBR	99	96	-3	-3%					14.1	B			161	825	
		Herndon Parkway	WBL	66	65	-1	-2%	1,896	1,836	-60	-3%	34.4	C	18.1	B	6	85	
			WBT	1,699	1,646	-53	-3%					17.5	B			147	694	
			WBR	131	125	-6	-5%					18.3	B			152	703	
		Parking Lot	NBL	314	308	-6	-2%	449	447	-2	0%	47.3	D	39.5	D	99	386	
			NBT	0	0	0	0%					0.0	A			99	386	
			NBR	135	139	4	3%					22.3	C			9	226	
		Exchange Place	SBL	102	98	-4	-4%	184	182	-2	-1%	38.6	D	23.4	C	20	155	
			SBT	0	0	0	0%					0.0	A			20	155	
			SBR	82	84	2	3%					5.8	A			0	49	
		Intersection		**4,477**	**4,345**	-132	**-3%**	**4,477**	**4,345**	**-132**	**-3%**	19.5	B	**19.5**	**B**			
Herndon Parkway / Fairbrook Drive	**Signal**	Parking Lot	EBL	102	94	-8	-8%	340	308	-32	-9%	166.5	F	167.5	F	311	446	
			EBT	170	152	-18	-11%					172.1	F			359	447	
			EBR	68	62	-6	-9%					157.6	F			359	448	
		Fairbrook Drive	WBL	384	380	-4	-1%	691	689	-2	0%	70.5	E	63.3	E	390	971	
			WBT	181	183	2	1%					72.7	E			390	971	
			WBR	126	126	0	0%					27.9	C			5	123	
		Herndon Parkway	NBL	72	71	-1	-2%	2,007	1,935	-72	-4%	23.8	C	24.9	C	7	85	
			NBT	1,522	1,463	-59	-4%					26.4	C			171	685	
			NBR	412	401	-11	-3%					19.6	B			38	605	
		Herndon Parkway	SBL	60	58	-2	-3%	1,587	1,563	-24	-2%	52.9	D	42.2	D	10	137	
			SBT	1,419	1,400	-19	-1%					42.0	D			441	959	
			SBR	109	105	-4	-3%					38.7	D			445	964	
		Intersection		**4,625**	**4,495**	-130	**-3%**	**4,625**	**4,495**	**-130**	**-3%**	46.5	D	**46.5**	**D**			

Note: Average results across 20 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

Preferred Build Scenario with Fairbrook Drive Extended 2045 Conditions: Weekday Morning Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								Preferred Build Scenario with Fairbrook Drive Extended 2045 Conditions MOEs							Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	Available Queue Storage (ft)	
Elden Street / Monroe Street	**Signal**	Elden Street	EBL	73	74	1	1%	839	835	-4	0%	25.5	C	19.4	B	5	131	150	
			EBT	630	629	-1	0%					19.1	B			122	722	250	To Lynn St signal, which is not in model
			EBR	136	132	-4	-3%					17.3	B			121	721	250	
		Elden Street	WBL	6	5	-1	-17%	459	455	-4	-1%	22.6	C	23.2	C	0	30	875	To Van Buren St signal
			WBT	410	406	-4	-1%					23.5	C			72	466	875	
			WBR	43	44	1	2%					20.1	C			79	504	875	
		Monroe Street	NBL	36	39	3	8%	190	196	6	3%	40.1	D	38.9	D	8	100	100	
			NBT	139	143	4	3%					41.3	D			34	228	900	To Van Buren St signal
			NBR	15	14	-1	-7%					11.2	B			18	220	900	
		Monroe Street	SBL	96	92	-4	-4%	462	458	-4	-1%	56.1	E	60.9	E	69	448	-	No upstream control within reasonable distance
			SBT	307	308	1	0%					63.7	E			139	496	-	
			SBR	59	58	-1	-2%					54.2	D			137	495	250	
		Intersection		**1,951**	**1,944**	-7	**0%**	**1,951**	**1,944**	**-7**	**0%**	**32.0**	**C**	**32.0**	**C**				
Elden Street / Van Buren Street	**Signal**	Elden Street	EBL	0	0	0	0%	770	750	-20	-3%	0.0	A	16.6	B	44	316	850	
			EBT	718	689	-29	-4%					17.7	B			44	316	850	To Monroe Street signal
			EBR	52	61	9	17%					3.8	A			1	54	850	
		Elden Street	WBL	117	116	-1	-1%	602	587	-15	-2%	33.4	C	22.5	C	41	218	1500	To Post Drive signal, which is not in model
			WBT	469	458	-11	-2%					20.0	B			41	218	1500	
			WBR	16	13	-3	-19%					13.3	B			49	232	1500	
		Van Buren Street	NBL	49	47	-2	-4%	391	383	-8	-2%	39.6	D	30.2	C	10	91	150	
			NBT	226	223	-3	-1%					40.8	D			54	281	450	To Monroe St / Grove St signal
			NBR	116	113	-3	-3%					5.5	A			2	79	450	
		Van Buren Street	SBL	146	141	-5	-3%	559	572	13	2%	39.5	D	42.3	D	43	400	325	No upstream control within reasonable distance
			SBT	404	419	15	4%					43.5	D			118	512	-	
			SBR	9	12	3	33%					33.1	C			124	522	-	
		Intersection		**1,763**	**1,720**	-43	**-2%**	**1,763**	**1,720**	**-43**	**-2%**	**35.7**	**D**	**35.7**	**D**				
Van Buren Street / Spring Street	**Signal**	Van Buren Street	EBL	183	176	-7	-4%	508	507	-1	0%	16.0	B	12.2	B	0	14	1600	To Alabama Dr signal
			EBT	6	8	2	33%					14.6	B			17	165	1600	
			EBR	319	323	4	1%					10.1	B			17	217	150	
		Parking Lot	WBL	1	1	0	0%	1	1	0	0%	32.6	C	32.6	C	0	14	-	
			WBR	0	0	0	0%					0.0	A			0	0	-	
		Spring Street	NBL	117	119	2	2%	420	419	-1	0%	14.8	B	7.7	A	4	118	200	
			NBT	295	294	-1	0%					5.0	A			5	111	800	To Huntmar Park Dr signal
			NBR	8	6	-2	-25%					1.6	A			3	119	800	
		Van Buren Street	SBL	9	9	0	0%	945	958	13	1%	8.8	A	7.4	A	0	48	275	
			SBT	586	591	5	1%					8.2	A			18	260	1200	To Monroe St / Grove St signal
			SBR	350	358	8	2%					5.9	A			7	175	1200	
		Intersection		**929**	**927**	-2	**0%**	**929**	**927**	**-2**	**0%**	**17.8**	**B**	**17.8**	**B**				
Spring Street / Herndon Parkway	**Signal**	Spring Street	EBL	87	94	7	8%	991	995	4	0%	87.7	F	75.3	E	46	342	200	
			EBT	779	772	-7	-1%					75.0	E			164	466	2300	To Huntmar Park Dr signal
			EBR	125	129	4	3%					68.0	E			166	469	2300	
		Spring Street	WBL	929	940	11	1%	1,888	1,900	12	1%	40.9	D	31.7	C	156	638	375	
			WBT	544	551	7	1%					33.3	C			63	372	550	To Ffx County Pkwy signal
			WBR	415	409	-6	-1%					8.4	A			15	236	550	
		Herndon Parkway	NBL	180	181	1	0%	1,518	1,467	-51	-3%	49.6	D	31.0	C	45	259	300	
			NBT	355	347	-8	-2%					48.7	D			95	334	500	To Sunset Business Park signal
			NBR	983	939	-44	-4%					20.9	C			95	334	500	
		Herndon Parkway	SBL	454	451	-3	-1%	1,089	1,088	-1	0%	70.7	E	57.9	E	101	295	500	
			SBT	559	557	-2	0%					49.5	D			100	351	2300	To Grove St signal
			SBR	76	80	4	5%					44.6	D			101	354	2300	
		Intersection		**4,397**	**4,362**	-35	**-1%**	**4,397**	**4,362**	**-35**	**-1%**	**55.9**	**E**	**55.9**	**E**				

Note: Average results across 7 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

Preferred Build Scenario with Fairbrook Drive Extended 2045 Conditions: Weekday Morning Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								Preferred Build Scenario with Fairbrook Drive Extended 2045 Conditions MOEs							Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	Available Queue Storage (ft)	
Spring Street / Fairfax County Parkway / Fairbrook Drive	**Signal**	Spring Street	EBL	153	153	0	0%	2,201	2,143	-58	-3%	27.2	C	28.0	C	18	195	250	
			EBT	2,022	1,964	-58	-3%					28.2	C			170	693	550	To Herndon Parkway signal
			EBR	26	26	0	0%					20.5	C			167	689	550	
		Spring Street	WBL	210	209	-1	-1%	1,199	1,190	-9	-1%	84.9	F	49.5	D	211	729	250	
			WBT	683	680	-3	-1%					51.8	D			211	729	1650	To Target signal
			WBR	305	301	-4	-1%					19.7	B			167	718	1650	
		Fairbrook Drive	NBL	21	19	-2	-8%	620	628	8	1%	100.2	F	60.6	E	147	613	-	
			NBT	146	150	4	3%					96.0	F			147	613	-	
			NBR	453	459	6	1%					47.4	D			147	613	250	
		Fairfax County Parkway	SBL	370	367	-3	-1%	1,985	1,993	8	0%	77.5	E	35.4	D	388	1381	250	
			SBT	359	354	-5	-1%					46.9	D			206	1234	600	To Ffx Pkwy signal, which is not in model
			SBR	1,256	1,272	16	1%					20.0	C			359	1429	600	
		Intersection		**6,004**	**5,954**	-50	**-1%**	**6,004**	**5,954**	**-50**	**-1%**	**38.2**	**D**	**38.2**	**D**				
Van Buren Street / Alabama Drive	**Signal**	Alabama Drive	EBL	129	131	2	2%	332	332	0	0%	41.7	D	33.9	C	66	334	-	
			EBT	10	10	0	0%					40.7	D			66	334	-	
			EBR	193	191	-2	-1%					28.2	C			68	341	-	
		Alabama Drive	WBL	56	55	-1	-2%	112	109	-3	-3%	31.7	C	25.8	C	15	146	-	
			WBT	13	13	0	0%					29.6	C			15	146	-	
			WBR	43	41	-2	-5%					16.8	B			15	161	-	
		Van Buren Street	NBL	48	48	0	0%	417	412	-5	-1%	16.8	B	13.8	B	35	366	1125	To Herndon Parkway signal
			NBT	336	332	-4	-1%					13.5	B			36	367	1125	
			NBR	33	32	-1	-2%					12.8	B			35	366	1125	
		Van Buren Street	SBL	13	16	3	23%	467	474	7	1%	17.7	B	14.0	B	44	400	1600	To Van Buren St signal
			SBT	413	419	6	1%					14.0	B			44	400	1600	
			SBR	41	39	-2	-5%					12.1	B			42	399	1600	
		Intersection		**1,328**	**1,327**	-1	**0%**	**1,328**	**1,327**	**-1**	**0%**	**19.9**	**B**	**19.9**	**B**				
Van Buren Street / Herndon Parkway	**Signal**	Herndon Parkway	EBL	43	39	-4	-9%	1,593	1,524	-69	-4%	71.4	E	47.9	D	13	91	175	
			EBT	1,233	1,187	-46	-4%					52.9	D			867	1589	1950	To Campbell Way signal, which is not in model
			EBR	317	298	-19	-6%					24.9	C			530	1542	1950	
		Herndon Parkway	WBL	293	302	9	3%	919	918	-1	0%	75.8	E	30.3	C	77	221	350	
			WBT	514	508	-6	-1%					8.4	A			12	187	875	To Worldgate Drive signal
			WBR	112	108	-4	-4%					6.4	A			12	187	875	
		Van Buren Street	NBL	240	248	8	3%	835	850	15	2%	69.0	E	49.3	D	119	363	375	To Office Park signal
			NBT	261	271	10	4%					61.1	E			113	360	375	
			NBR	334	331	-3	-1%					24.7	C			50	299	300	
		Van Buren Street	SBL	176	177	1	0%	663	675	12	2%	41.3	D	38.4	D	39	327	175	
			SBT	464	475	11	2%					37.9	D			72	573	1125	To Alabama Dr signal
			SBR	23	23	0	0%					26.1	C			72	573	1125	
		Intersection		**4,010**	**3,967**	-43	**-1%**	**4,010**	**3,967**	**-43**	**-1%**	**42.5**	**D**	**42.5**	**D**				
Van Buren Street / Worldgate Drive	**Signal**	Worldgate Drive	EBL	170	174	4	2%	1,156	1,160	4	0%	34.5	C	30.7	C	35	201	400	
			EBT	745	744	-1	0%					38.9	D			93	352	-	
			EBR	241	242	1	0%					2.5	A			2	108	875	
		Worldgate Drive	WBL	194	205	11	6%	411	431	20	5%	33.1	C	32.5	C	38	289	275	
			WBT	209	218	9	4%					32.8	C			26	120	600	To Herndon Pkwy signal
			WBR	8	8	0	0%					13.2	B			28	134	600	
		Van Buren Street	NBL	406	391	-15	-4%	1,714	1,706	-8	0%	45.3	D	22.2	C	61	343	250	
			NBT	767	782	15	2%					16.7	B			47	404	1650	To Eastpark Dr signal
			NBR	541	533	-8	-1%					13.3	B			35	313	250	
		Van Buren Street	SBL	20	21	1	5%	1,045	1,036	-9	-1%	44.2	D	9.4	A	5	67	200	
			SBT	669	659	-10	-1%					12.1	B			28	238	400	To Office Park signal
			SBR	356	356	0	0%					2.3	A			1	126	400	
		Intersection		**4,326**	**4,333**	7	**0%**	**4,326**	**4,333**	**7**	**0%**	**22.4**	**C**	**22.4**	**C**				

Note: Average results across 7 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

Preferred Build Scenario with Fairbrook Drive Extended 2045 Conditions: Weekday Morning Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								Preferred Build Scenario with Fairbrook Drive Extended 2045 Conditions MOEs							Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	Available Queue Storage (ft)	
Herndon Parkway / Worldgate Drive	**Signal**	Herndon Parkway	EBL	163	167	4	2%	1,698	1,640	-58	-3%	22.7	C	58.1	E	4	98	175	
			EBT	1,491	1,431	-60	-4%					62.7	E			500	982	850	To Van Buren St signal
			EBR	44	42	-2	-5%					42.3	D			504	986	850	
		Herndon Parkway	WBL	525	537	12	2%	1,419	1,435	16	1%	64.7	E	32.2	C	122	527	250	
			WBT	791	797	6	1%					12.6	B			36	441	875	To 555 signal
			WBR	103	101	-2	-2%					13.3	B			38	451	875	
		Worldgate Drive	NBL	65	64	-1	-2%	1,130	1,124	-6	0%	33.2	C	26.4	C	98	587	600	
			NBT	90	87	-3	-3%					36.0	D			98	587	600	To Van Buren St signal
			NBR	975	973	-2	0%					25.1	C			98	587	600	
		Worldgate Drive	SBL	73	72	-1	-1%	165	166	1	1%	50.7	D	35.0	C	18	124	75	
			SBT	30	32	2	5%					39.6	D			11	129	-	
			SBR	62	62	0	0%					14.3	B			8	131	-	
		Intersection		**4,412**	**4,365**	-47	**-1%**	**4,412**	**4,365**	**-47**	**-1%**	**40.5**	**D**	**40.5**	**D**				
Herndon Parkway / 555 Herndon Parkway	**Signal**	Herndon Parkway	EBL	64	68	4	7%	2,429	2,367	-62	-3%	12.7	B	17.1	B	2	74	175	
			EBT	2,146	2,079	-67	-3%					17.2	B			240	1040	875	To Worldgate Drive signal
			EBR	220	220	0	0%					17.6	B			241	1043	875	
		Herndon Parkway	WBL	148	158	10	7%	1,524	1,550	26	2%	35.5	D	12.5	B	22	369	175	
			WBT	1,247	1,264	18	1%					9.9	A			59	540	650	To Exchange Place signal
			WBR	129	128	-1	-1%					10.1	B			60	543	650	
		Parking Lot	NBL	103	101	-2	-2%	147	144	-3	-2%	45.2	D	34.7	C	26	168	-	
			NBT	0	0	0	0%					0.0	A			0	0	-	
			NBR	44	43	-1	-2%					10.2	B			0	52	75	
		Parking Lot	SBL	52	50	-2	-4%	124	121	-3	-2%	46.1	D	30.4	C	20	179	-	
			SBT	0	0	0	0%					0.0	A			0	0	-	
			SBR	72	71	-1	-1%					19.4	B			18	185	-	
		Intersection		**4,224**	**4,182**	-42	**-1%**	**4,224**	**4,182**	**-42**	**-1%**	**16.4**	**B**	**16.4**	**B**				
Herndon Parkway / Exchange Place	**Signal**	Herndon Parkway	EBL	1	1	0	-29%	2,155	2,073	-82	-4%	12.6	B	7.8	A	0	3	175	
			EBT	1,934	1,868	-66	-3%					7.7	A			78	818	650	To 555 signal
			EBR	220	204	-16	-7%					8.7	A			79	823	650	
		Herndon Parkway	WBL	148	145	-3	-2%	1,566	1,572	6	0%	35.6	D	5.0	A	17	178	175	
			WBT	1,412	1,421	9	1%					1.9	A			5	142	550	To Fairbrook Dr signal
			WBR	6	6	0	7%					1.3	A			5	151	550	
		Parking Lot	NBL	103	99	-4	-4%	147	145	-2	-1%	47.5	D	35.0	D	28	160	-	
			NBT	0	0	0	0%					0.0	A			28	160	-	
			NBR	44	46	2	5%					8.2	A			1	46	75	
		Exchange Place	SBL	16	13	-3	-20%	27	26	-1	-4%	44.5	D	27.8	C	4	61	-	
			SBT	0	0	0	0%					0.0	A			4	61	-	
			SBR	11	13	2	20%					11.1	B			2	67	-	
		Intersection		**3,895**	**3,816**	-79	**-2%**	**3,895**	**3,816**	**-79**	**-2%**	**7.8**	**A**	**7.8**	**A**				
Herndon Parkway / Fairbrook Drive	**Signal**	Parking Lot	EBL	47	52	5	10%	157	162	5	3%	51.1	D	46.7	D	16	171	75	
			EBT	79	77	-2	-2%					51.0	D			28	196	-	
			EBR	31	33	2	5%					29.4	C			24	198	-	
		Fairbrook Drive	WBL	288	297	9	3%	408	414	6	2%	57.4	E	49.2	D	63	296	175	
			WBT	81	75	-6	-7%					34.4	C			17	148	-	
			WBR	39	42	3	8%					17.2	B			15	152	-	
		Herndon Parkway	NBL	32	31	-1	-4%	1,994	1,925	-69	-3%	3.6	A	6.6	A	0	26	150	
			NBT	1,524	1,472	-52	-3%					6.7	A			31	565	550	To Exchange Pl signal
			NBR	437	422	-15	-3%					6.7	A			3	141	125	
		Herndon Parkway	SBL	97	96	-1	-1%	1,391	1,384	-7	-1%	38.1	D	30.9	C	11	113	150	
			SBT	1,245	1,242	-3	0%					30.3	C			192	883	825	To Sunset Business Park signal
			SBR	49	46	-3	-5%					32.2	C			195	888	825	
		Intersection		**3,950**	**3,885**	-65	**-2%**	**3,950**	**3,885**	**-65**	**-2%**	**21.5**	**C**	**21.5**	**C**				

Note: Average results across 7 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

Preferred Build Scenario with Fairbrook Drive Extended 2045 Conditions: Weekday Morning Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								Preferred Build Scenario with Fairbrook Drive Extended 2045 Conditions MOEs							Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	Available Queue Storage (ft)	
Herndon Parkway / Sunset Business Park	**Signal**	Parking Lot	EBL	141	143	2	1%	190	194	4	2%	45.2	D	35.5	D	38	214	-	
			EBR	49	51	2	5%					8.3	A			0	48	100	
		Sunset Business Park	WBL	95	92	-3	-4%	133	130	-3	-2%	43.3	D	32.5	C	22	156	-	
			WBR	38	38	0	1%					6.5	A			0	29	100	
		Herndon Parkway	NBL	199	197	-2	-1%	1,629	1,573	-56	-3%	15.6	B	6.0	A	12	212	150	
			NBT	1,338	1,285	-53	-4%					4.6	A			18	481	825	To Fairbrook Dr signal
			NBR	92	91	-1	-1%					4.5	A			18	484	825	
		Herndon Parkway	SBL	64	63	-1	-2%	1,616	1,612	-4	0%	30.1	C	17.7	B	4	77	175	
			SBT	1,293	1,296	3	0%					17.2	B			98	613	525	To Spring St signal
			SBR	258	253	-5	-2%					17.5	B			105	625	525	
		Intersection		**3,567**	**3,509**	-58	**-2%**	**3,567**	**3,509**	**-58**	**-2%**	14.0	B	**14.0**	**B**				
Spring Street / Parallel TRG Road	**Two-Way Stop Control**	Spring Street	EBT	883	894	11	1%	1,013	1,021	8	1%	0.6	A	0.7	A	0	91	-	
			EBR	130	127	-3	-2%					1.6	A			1	112	-	
		Spring Street	WBL	56	56	0	0%	800	812	12	2%	5.4	A	1.0	A	1	56	125	
			WBT	744	756	12	2%					0.7	A			0	0	-	
		Parallel TRG Road	NBL	46	47	1	2%	154	155	1	1%	12.3	B	10.4	B	3	66	-	
			NBR	108	108	0	0%					9.6	A			7	103	100	
		Intersection		**1,967**	**1,988**	21	**1%**	**1,967**	**1,988**	**21**	**1%**	1.6	A	**1.6**	**A**				

Note: Average results across 7 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

Preferred Build Scenario with Fairbrook Drive Extended 2045 Conditions: Weekday Evening Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								Preferred Build Scenario with Fairbrook Drive Extended 2045 Conditions MOEs							Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	Available Queue Storage (ft)	
Elden Street / Monroe Street	**Signal**	Elden Street	EBL	127	123	-4	-3%	817	796	-21	-3%	34.1	C	25.2	C	14	209	150	
			EBT	654	638	-16	-2%					23.8	C			168	898	250	To Lynn St signal, which is not in model
			EBR	36	35	-1	-3%					20.5	C			167	898	250	
		Elden Street	WBL	13	13	0	0%	755	733	-22	-3%	29.1	C	34.9	C	1	42	875	To Van Buren St signal
			WBT	669	651	-18	-3%					35.2	D			433	955	875	
			WBR	73	69	-4	-5%					33.3	C			452	993	875	
		Monroe Street	NBL	168	166	-2	-1%	492	488	-4	-1%	54.6	D	54.6	D	68	496	100	
			NBT	313	311	-2	-1%					55.3	E			145	582	900	To Van Buren St signal
			NBR	11	11	0	0%					37.5	D			132	571	900	
		Monroe Street	SBL	131	129	-2	-2%	454	459	5	1%	44.3	D	46.3	D	58	319	-	No upstream control within reasonable distance
			SBT	202	205	3	1%					51.5	D			92	352	-	
			SBR	121	125	4	3%					40.0	D			89	352	250	
		Intersection		**2,518**	**2,476**	-42	**-2%**	**2,518**	**2,476**	**-42**	**-2%**	37.8	D	**37.8**	**D**				
Elden Street / Van Buren Street	**Signal**	Elden Street	EBL	5	5	0	0%	803	797	-6	-1%	60.4	E	41.0	D	110	340	850	
			EBT	764	755	-9	-1%					42.6	D			110	340	850	To Monroe Street signal
			EBR	34	37	3	9%					5.8	A			1	52	850	
		Elden Street	WBL	150	151	1	1%	962	958	-4	0%	47.0	D	33.5	C	109	427	1500	To Post Drive signal, which is not in model
			WBT	754	751	-3	0%					31.5	C			109	427	1500	
			WBR	58	56	-2	-3%					24.5	C			119	441	1500	
		Van Buren Street	NBL	118	113	-5	-4%	760	723	-37	-5%	39.8	D	33.6	C	20	265	150	
			NBT	466	441	-25	-5%					40.5	D			144	727	450	To Monroe St / Grove St signal
			NBR	176	169	-7	-4%					11.6	B			5	158	450	
		Van Buren Street	SBL	126	123	-3	-2%	388	388	0	0%	40.9	D	43.7	D	33	250	325	No upstream control within reasonable distance
			SBT	247	249	2	1%					45.1	D			71	319	-	
			SBR	15	16	1	7%					42.4	D			75	329	-	
		Intersection		**2,525**	**2,478**	-47	**-2%**	**2,525**	**2,478**	**-47**	**-2%**	42.8	D	**42.8**	**D**				
Van Buren Street / Spring Street	**Signal**	Van Buren Street	EBL	424	391	-33	-8%	640	596	-44	-7%	22.0	C	17.1	B	0	49	1600	To Alabama Dr signal
			EBT	1	2	1	100%					16.7	B			62	541	1600	
			EBR	215	203	-12	-6%					7.7	A			5	124	150	
		Parking Lot	WBL	13	14	1	8%	28	28	0	0%	29.3	C	29.5	C	2	48	-	
			WBR	15	14	-1	-7%					29.8	C			2	48	-	
		Spring Street	NBL	324	312	-12	-4%	1,049	1,003	-46	-4%	26.6	C	17.1	B	42	347	200	
			NBT	717	684	-33	-5%					12.8	B			29	352	800	To Huntmar Park Dr signal
			NBR	8	7	-1	-13%					13.6	B			29	360	800	
		Van Buren Street	SBL	3	3	0	0%	791	802	11	1%	22.4	C	19.5	B	0	24	275	
			SBT	326	329	3	1%					19.9	B			47	331	1200	To Monroe St / Grove St signal
			SBR	462	470	8	2%					19.3	B			60	345	1200	
		Intersection		**1,717**	**1,627**	-90	**-5%**	**1,717**	**1,627**	**-90**	**-5%**	26.9	C	**26.9**	**C**				
Spring Street / Herndon Parkway	**Signal**	Spring Street	EBL	147	139	-8	-5%	1,071	1,045	-26	-2%	103.9	F	102.5	F	148	576	200	
			EBT	789	776	-13	-2%					101.8	F			294	672	2300	To Huntmar Park Dr signal
			EBR	135	130	-5	-4%					104.9	F			296	676	2300	
		Spring Street	WBL	990	937	-53	-5%	2,253	2,132	-121	-5%	40.9	D	31.3	C	142	484	375	
			WBT	804	759	-45	-6%					31.6	C			82	373	550	To Ffx County Pkwy signal
			WBR	459	436	-23	-5%					10.2	B			19	218	550	
		Herndon Parkway	NBL	221	223	2	1%	1,809	1,792	-17	-1%	63.1	E	39.7	D	70	430	300	
			NBT	697	698	1	0%					55.1	E			178	616	500	To Sunset Business Park signal
			NBR	891	871	-20	-2%					21.3	C			178	616	500	
		Herndon Parkway	SBL	497	491	-6	-1%	1,087	1,083	-4	0%	100.0	F	73.3	E	176	547	500	
			SBT	538	542	4	1%					51.5	D			97	353	2300	To Grove St signal
			SBR	52	50	-2	-3%					46.8	D			98	356	2300	
		Intersection		**5,133**	**4,969**	-164	**-3%**	**5,133**	**4,969**	**-164**	**-3%**	65.3	E	**65.3**	**E**				

Note: Average results across 20 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

Preferred Build Scenario with Fairbrook Drive Extended 2045 Conditions: Weekday Evening Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								Preferred Build Scenario with Fairbrook Drive Extended 2045 Conditions MOEs							Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	Available Queue Storage (ft)	
Spring Street / Fairfax County Parkway / Fairbrook Drive	**Signal**	Spring Street	EBL	321	318	-3	-1%	2,167	2,117	-50	-2%	68.9	E	28.9	C	153	635	250	
			EBT	1,820	1,772	-48	-3%					22.0	C			125	558	550	To Herndon Parkway signal
			EBR	27	27	0	1%					14.7	B			122	554	550	
		Spring Street	WBL	170	154	-16	-10%	2,314	2,088	-226	-10%	45.0	D	44.3	D	1304	1649	250	
			WBT	1,494	1,363	-131	-9%					45.2	D			1304	1649	1650	To Target signal
			WBR	650	571	-79	-12%					41.9	D			1293	1639	1650	
		Fairbrook Drive	NBL	29	30	1	2%	946	911	-35	-4%	91.7	F	74.1	E	620	1019	-	
			NBT	225	214	-11	-5%					86.6	F			620	1019	-	
			NBR	692	667	-25	-4%					69.3	E			620	1019	250	
		Fairfax County Parkway	SBL	166	169	3	2%	1,517	1,521	4	0%	56.7	E	36.0	D	52	353	250	
			SBT	421	422	1	0%					46.2	D			140	734	600	To Ffx Pkwy signal, which is not in model
			SBR	930	930	0	0%					27.6	C			124	771	600	
		Intersection		**6,944**	**6,637**	-307	**-4%**	**6,944**	**6,637**	**-307**	**-4%**	41.6	D	**41.6**	**D**				
Van Buren Street / Alabama Drive	**Signal**	Alabama Drive	EBL	85	59	-26	-31%	265	191	-74	-28%	242.4	F	224.3	F	370	525	-	
			EBT	18	13	-5	-28%					240.2	F			370	525	-	
			EBR	162	119	-43	-27%					213.6	F			376	533	-	
		Alabama Drive	WBL	35	33	-2	-5%	66	64	-2	-3%	95.9	F	77.6	E	25	146	-	
			WBT	10	10	0	0%					76.0	E			25	146	-	
			WBR	21	21	0	0%					49.7	D			27	160	-	
		Van Buren Street	NBL	81	79	-2	-2%	700	678	-22	-3%	26.4	C	21.9	C	122	748	1125	
			NBT	534	520	-14	-3%					21.5	C			123	749	1125	To Herndon Parkway signal
			NBR	85	79	-6	-8%					19.6	B			122	748	1125	
		Van Buren Street	SBL	34	34	0	0%	787	776	-11	-1%	34.1	C	32.7	C	409	1246	1600	
			SBT	646	637	-9	-1%					33.3	C			409	1245	1600	To Van Buren St signal
			SBR	107	105	-2	-2%					28.4	C			407	1244	1600	
		Intersection		**1,818**	**1,709**	-109	**-6%**	**1,818**	**1,709**	**-109**	**-6%**	51.5	D	**51.5**	**D**				
Van Buren Street / Herndon Parkway	**Signal**	Herndon Parkway	EBL	55	56	1	2%	1,099	1,098	-1	0%	60.5	E	34.9	C	19	108	175	
			EBT	698	700	2	0%					41.9	D			106	462	1950	To Campbell Way signal, which is not in model
			EBR	346	342	-4	-1%					16.1	B			48	285	1950	
		Herndon Parkway	WBL	520	485	-35	-7%	2,033	1,922	-111	-5%	72.7	E	43.6	D	122	542	350	
			WBT	1,263	1,199	-64	-5%					33.9	C			299	1029	875	To Worldgate Drive signal
			WBR	250	238	-12	-5%					33.4	C			299	1029	875	
		Van Buren Street	NBL	365	358	-7	-2%	1,051	1,022	-29	-3%	114.3	F	57.8	E	525	971	375	To Office Park signal
			NBT	394	381	-13	-3%					38.0	D			510	968	375	
			NBR	292	283	-9	-3%					12.9	B			25	282	300	
		Van Buren Street	SBL	129	117	-12	-9%	844	785	-59	-7%	78.9	E	70.4	E	290	954	175	
			SBT	668	623	-45	-7%					69.5	E			836	1209	1125	To Alabama Dr signal
			SBR	47	45	-2	-4%					60.6	E			836	1209	1125	
		Intersection		**5,027**	**4,827**	-200	**-4%**	**5,027**	**4,827**	**-200**	**-4%**	49.0	D	**49.0**	**D**				
Van Buren Street / Worldgate Drive	**Signal**	Worldgate Drive	EBL	291	281	-10	-3%	1,378	1,369	-9	-1%	82.5	F	33.4	C	233	653	400	
			EBT	418	418	0	0%					35.2	D			47	205	-	
			EBR	669	670	1	0%					11.6	B			49	487	875	
		Worldgate Drive	WBL	406	387	-19	-5%	1,017	992	-25	-2%	60.8	E	47.9	D	187	703	275	
			WBT	589	583	-6	-1%					40.2	D			88	477	600	To Herndon Pkwy signal
			WBR	22	22	0	0%					26.9	C			96	490	600	
		Van Buren Street	NBL	361	344	-17	-5%	1,446	1,408	-38	-3%	52.6	D	36.1	D	134	636	250	
			NBT	720	710	-10	-1%					40.0	D			228	907	1650	To Eastpark Dr signal
			NBR	365	354	-11	-3%					12.3	B			67	475	250	
		Van Buren Street	SBL	9	9	0	0%	1,583	1,495	-88	-6%	57.1	E	20.7	C	3	47	200	
			SBT	1,211	1,141	-70	-6%					26.1	C			102	529	400	To Office Park signal
			SBR	363	345	-18	-5%					2.1	A			0	100	400	
		Intersection		**5,424**	**5,264**	-160	**-3%**	**5,424**	**5,264**	**-160**	**-3%**	33.3	C	**33.3**	**C**				

Note: Average results across 20 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

Preferred Build Scenario with Fairbrook Drive Extended 2045 Conditions: Weekday Evening Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								Preferred Build Scenario with Fairbrook Drive Extended 2045 Conditions MOEs							Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	Available Queue Storage (ft)	
Herndon Parkway / Worldgate Drive	**Signal**	Herndon Parkway	EBL	103	101	-2	-2%	1,203	1,160	-43	-4%	57.8	E	53.2	D	14	163	175	
			EBT	1,080	1,038	-42	-4%					52.8	D			231	552	850	To Van Buren St signal
			EBR	20	21	1	5%					47.5	D			233	556	850	
		Herndon Parkway	WBL	732	701	-31	-4%	2,490	2,368	-122	-5%	41.7	D	25.7	C	175	983	250	
			WBT	1,721	1,631	-90	-5%					19.0	B			312	1019	875	To 555 signal
			WBR	36	36	0	-1%					17.3	B			318	1029	875	
		Worldgate Drive	NBL	199	196	-3	-2%	990	983	-7	-1%	46.8	D	25.8	C	100	455	600	
			NBT	60	59	-1	-1%					43.4	D			100	455	600	To Van Buren St signal
			NBR	731	728	-3	0%					18.8	B			100	455	600	
		Worldgate Drive	SBL	134	134	0	0%	302	301	-1	0%	56.2	E	41.6	D	48	249	75	
			SBT	55	55	0	0%					44.7	D			27	242	-	
			SBR	113	112	-1	-1%					22.5	C			25	246	-	
		Intersection		**4,984**	**4,812**	-172	**-3%**	**4,984**	**4,812**	**-172**	**-3%**	33.3	C	**33.3**	**C**				
Herndon Parkway / 555 Herndon Parkway	**Signal**	Herndon Parkway	EBL	51	50	-1	-1%	2,021	1,965	-56	-3%	39.2	D	16.8	B	7	84	175	
			EBT	1,871	1,818	-53	-3%					16.2	B			143	729	875	To Worldgate Drive signal
			EBR	99	97	-2	-2%					16.5	B			144	731	875	
		Herndon Parkway	WBL	66	62	-4	-6%	2,215	2,083	-132	-6%	39.7	D	26.8	C	4	86	175	
			WBT	2,066	1,942	-124	-6%					26.5	C			363	812	650	To Exchange Place signal
			WBR	82	79	-3	-4%					23.8	C			366	816	650	
		Parking Lot	NBL	314	319	5	2%	449	450	1	0%	59.6	E	51.4	D	141	449	-	
			NBT	0	0	0	0%					0.0	A			0	0	-	
			NBR	135	131	-4	-3%					31.5	C			15	320	75	
		Parking Lot	SBL	70	70	0	0%	180	181	1	1%	36.5	D	25.9	C	24	208	-	
			SBT	0	0	0	0%					0.0	A			0	0	-	
			SBR	110	111	1	1%					19.2	B			24	214	-	
		Intersection		**4,865**	**4,679**	-186	**-4%**	**4,865**	**4,679**	**-186**	**-4%**	24.9	C	**24.9**	**C**				
Herndon Parkway / Exchange Place	**Signal**	Herndon Parkway	EBL	3	3	0	-12%	2,099	2,040	-59	-3%	22.9	C	10.4	B	0	11	175	
			EBT	1,996	1,940	-56	-3%					10.3	B			99	726	650	To 555 signal
			EBR	99	97	-2	-2%					10.6	B			100	732	650	
		Herndon Parkway	WBL	66	64	-2	-3%	1,976	1,865	-111	-6%	48.5	D	24.4	C	6	92	175	
			WBT	1,897	1,788	-109	-6%					23.6	C			260	699	550	To Fairbrook Dr signal
			WBR	14	13	-1	-4%					18.9	B			266	709	550	
		Parking Lot	NBL	314	304	-10	-3%	449	441	-8	-2%	74.1	E	64.9	E	170	389	-	
			NBT	0	0	0	0%					0.0	A			170	389	-	
			NBR	135	137	2	1%					44.3	D			34	354	75	
		Exchange Place	SBL	6	7	1	17%	10	11	1	10%	44.8	D	31.5	C	2	40	-	
			SBT	0	0	0	0%					0.0	A			2	40	-	
			SBR	4	4	0	0%					8.3	A			0	3	-	
		Intersection		**4,534**	**4,357**	-177	**-4%**	**4,534**	**4,357**	**-177**	**-4%**	22.0	C	**22.0**	**C**				
Herndon Parkway / Fairbrook Drive	**Signal**	Parking Lot	EBL	46	48	2	5%	152	155	3	2%	78.0	E	61.9	E	27	204	75	
			EBT	76	76	0	0%					60.1	E			37	226	-	
			EBR	30	31	1	2%					41.5	D			31	224	-	
		Fairbrook Drive	WBL	369	370	1	0%	557	557	0	0%	89.1	F	73.0	E	192	730	175	
			WBT	62	60	-2	-3%					50.8	D			76	620	-	
			WBR	126	127	1	1%					36.6	D			76	623	-	
		Herndon Parkway	NBL	25	24	-1	-3%	2,137	2,087	-50	-2%	16.7	B	18.5	B	1	45	150	
			NBT	1,554	1,514	-40	-3%					19.4	B			116	631	550	To Exchange Pl signal
			NBR	559	549	-10	-2%					16.4	B			44	569	125	
		Herndon Parkway	SBL	60	58	-2	-3%	1,649	1,572	-77	-5%	44.4	D	40.4	D	11	147	150	
			SBT	1,551	1,480	-71	-5%					40.3	D			518	922	825	To Sunset Business Park signal
			SBR	37	34	-3	-9%					38.6	D			523	927	825	
		Intersection		**4,495**	**4,371**	-124	**-3%**	**4,495**	**4,371**	**-124**	**-3%**	34.9	C	**34.9**	**C**				

Note: Average results across 20 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

Preferred Build Scenario with Fairbrook Drive Extended 2045 Conditions: Weekday Evening Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								Preferred Build Scenario with Fairbrook Drive Extended 2045 Conditions MOEs							Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	Available Queue Storage (ft)	
Herndon Parkway / Sunset Business Park	**Two-Way Stop Control (future signal)**	Parking Lot	EBL	279	280	1	0%	390	391	1	0%	44.3	D	36.5	D	80	351	-	
			EBR	111	111	0	0%					16.8	B			2	106	100	
		Sunset Business Park	WBL	144	144	0	0%	196	196	0	0%	36.4	D	28.5	C	29	214	-	
			WBR	52	52	0	0%					6.6	A			0	28	100	
		Herndon Parkway	NBL	116	114	-2	-1%	1,670	1,679	9	1%	24.7	C	16.7	B	11	216	150	
			NBT	1,438	1,451	13	1%					16.2	B			139	807	825	To Fairbrook Dr signal
			NBR	116	114	-2	-2%					16.2	B			140	810	825	
		Herndon Parkway	SBL	100	97	-3	-3%	1,702	1,597	-105	-6%	33.7	C	19.7	B	9	110	175	
			SBT	1,422	1,325	-97	-7%					18.9	B			111	638	525	To Spring St signal
			SBR	180	175	-5	-3%					18.4	B			118	650	525	
		Intersection		**3,958**	**3,863**	-95	**-2%**	**3,958**	**3,863**	**-95**	**-2%**	20.6	C	**20.6**	**C**				
Spring Street / Parallel TRG Route	**Two-Way Stop Control**	Spring Street	EBT	871	867	-4	0%	944	938	-6	-1%	5.3	A	5.3	A	28	188	-	
			EBR	73	71	-2	-2%					5.2	A			30	210	-	
		Spring Street	WBL	31	30	-1	-4%	1,076	1,033	-43	-4%	5.8	A	0.9	A	1	45	125	
			WBT	1,045	1,003	-42	-4%					0.8	A			0	0	-	
		Parallel TRG Route	NBL	86	83	-3	-3%	285	275	-10	-4%	24.4	C	30.8	C	11	133	-	
			NBR	200	192	-8	-4%					33.5	C			44	207	100	
		Intersection		**2,305**	**2,246**	-59	**-3%**	**2,305**	**2,246**	**-59**	**-3%**	6.4	A	**6.4**	**A**				

Note: Average results across 20 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

Preferred Build Scenario with Fairbrook Drive Extended and Additional Mitigation - 2045 Conditions: Weekday Morning Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								Preferred Build Scenario with Fairbrook Drive Extended 2045 Conditions MOEs							Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	Available Queue Storage (ft)	
Elden Street / Monroe Street	**Signal**	Elden Street	EBL	73	75	2	3%	839	838	-1	0%	25.4	C	19.2	B	5	81	150	
			EBT	630	630	0	0%					18.9	B			121	744	250	To Lynn St signal, which is not in model
			EBR	136	133	-3	-2%					17.4	B			120	743	250	
		Elden Street	WBL	6	5	-1	-17%	459	456	-3	-1%	26.9	C	22.4	C	0	30	875	To Van Buren St signal
			WBT	410	407	-3	-1%					22.6	C			70	453	875	
			WBR	43	44	1	2%					19.7	B			75	491	875	
		Monroe Street	NBL	36	39	3	8%	189	197	8	4%	36.4	D	39.0	D	8	77	100	
			NBT	138	143	5	3%					42.5	D			35	205	900	To Van Buren St signal
			NBR	15	15	0	0%					11.9	B			20	192	900	
		Monroe Street	SBL	96	92	-4	-4%	462	459	-3	-1%	51.8	D	58.5	E	68	425	-	No upstream control within reasonable distance
			SBT	307	309	2	0%					61.9	E			134	498	-	
			SBR	59	58	-1	-2%					51.5	D			133	497	250	
		Intersection		**1,950**	**1,950**	0	**0%**	**1,950**	**1,950**	**0**	**0%**	**31.2**	**C**	**31.2**	**C**				
Elden Street / Van Buren Street	**Signal**	Elden Street	EBL	0	0	0	0%	770	754	-16	-2%	0.0	A	16.8	B	45	307	850	To Monroe Street signal
			EBT	718	693	-25	-3%					18.0	B			45	307	850	
			EBR	52	61	9	17%					4.1	A			1	50	850	
		Elden Street	WBL	117	115	-2	-2%	602	588	-14	-2%	32.5	C	22.7	C	41	223	1500	To Post Drive signal, which is not in model
			WBT	469	460	-9	-2%					20.5	C			41	223	1500	
			WBR	16	13	-3	-19%					14.3	B			49	237	1500	
		Van Buren Street	NBL	49	48	-1	-2%	392	391	-1	0%	37.2	D	30.8	C	10	96	150	
			NBT	227	227	0	0%					42.2	D			56	305	450	To Monroe St / Grove St signal
			NBR	116	116	0	0%					5.9	A			3	88	450	
		Van Buren Street	SBL	146	141	-5	-3%	559	572	13	2%	39.0	D	41.4	D	42	386	325	No upstream control within reasonable distance
			SBT	404	419	15	4%					42.4	D			113	479	-	
			SBR	9	12	3	33%					32.4	C			119	490	-	
		Intersection		**1,764**	**1,733**	-31	**-2%**	**1,764**	**1,733**	**-31**	**-2%**	**35.6**	**D**	**35.6**	**D**				
Van Buren Street / Spring Street	**Signal**	Van Buren Street	EBL	183	176	-7	-4%	508	507	-1	0%	16.1	B	11.9	B	0	3	1600	To Alabama Dr signal
			EBT	6	8	2	33%					13.9	B			17	174	1600	
			EBR	319	323	4	1%					9.6	A			16	223	150	
		Parking Lot	WBL	1	1	0	0%	1	1	0	0%	23.3	C	23.3	C	0	14	-	
			WBR	0	0	0	0%					0.0	A			0	0	-	
		Spring Street	NBL	117	124	7	6%	420	433	13	3%	15.9	B	9.1	A	5	104	200	
			NBT	295	303	8	3%					6.4	A			6	120	800	To Huntmar Park Dr signal
			NBR	8	6	-2	-25%					4.5	A			5	128	800	
		Van Buren Street	SBL	9	9	0	0%	945	959	14	1%	10.9	B	7.4	A	0	30	275	
			SBT	586	592	6	1%					8.4	A			18	239	1200	To Monroe St / Grove St signal
			SBR	350	358	8	2%					5.8	A			8	192	1200	
		Intersection		**929**	**941**	12	**1%**	**929**	**941**	**12**	**1%**	**18.2**	**B**	**18.2**	**B**				
Spring Street / Herndon Parkway	**Signal**	Spring Street	EBL	96	107	11	11%	999	1,016	17	2%	78.2	E	56.4	E	32	110	200	
			EBT	788	791	3	0%					55.4	E			121	397	675	To new TRG Road signal
			EBR	115	118	3	3%					43.3	D			121	400	675	
		Spring Street	WBL	761	765	4	1%	1,922	1,925	3	0%	36.7	D	29.5	C	94	436	375	
			WBT	746	752	6	1%					33.3	C			84	362	550	To Ffx County Pkwy signal
			WBR	415	408	-7	-2%					8.9	A			16	174	550	
		Herndon Parkway	NBL	144	150	6	4%	1,454	1,405	-49	-3%	48.9	D	31.9	C	36	215	300	
			NBT	342	332	-10	-3%					48.2	D			98	361	500	To Sunset Business Park signal
			NBR	968	923	-45	-5%					23.3	C			98	361	500	
		Herndon Parkway	SBL	454	450	-4	-1%	1,089	1,088	-1	0%	76.1	E	59.8	E	109	297	500	
			SBT	529	528	-1	0%					49.2	D			99	357	2300	To Grove St signal
			SBR	106	110	4	4%					44.4	D			100	360	2300	
		Intersection		**4,375**	**4,346**	-29	**-1%**	**4,375**	**4,346**	**-29**	**-1%**	**51.6**	**D**	**51.6**	**D**				

Note: Average results across 7 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

Preferred Build Scenario with Fairbrook Drive Extended and Additional Mitigation - 2045 Conditions: Weekday Morning Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								Preferred Build Scenario with Fairbrook Drive Extended 2045 Conditions MOEs							Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	Available Queue Storage (ft)	
Spring Street / Fairfax County Parkway / Fairbrook Drive	**Signal**	Spring Street	EBL	152	151	-1	0%	2,195	2,148	-47	-2%	30.3	C	19.6	B	23	179	250	
			EBT	2,017	1,971	-46	-2%					18.9	B			99	559	550	To Herndon Parkway signal
			EBR	26	26	0	0%					11.9	B			96	554	550	
		Spring Street	WBL	205	205	0	0%	1,204	1,194	-10	-1%	73.5	E	43.0	D	136	461	250	
			WBT	695	689	-6	-1%					44.8	D			136	461	1650	To Target signal
			WBR	305	300	-5	-2%					17.9	B			84	450	1650	
		Fairbrook Drive	NBL	21	19	-2	-8%	617	621	4	1%	85.5	F	57.5	E	114	505	-	
			NBT	146	147	1	1%					67.5	E			114	505	-	
			NBR	450	455	5	1%					53.1	D			114	505	250	
		Fairfax County Parkway	SBL	370	369	-1	0%	1,996	2,002	6	0%	72.4	E	35.5	D	119	681	250	
			SBT	348	341	-7	-2%					49.3	D			145	951	600	To Ffx Pkwy signal, which is not in model
			SBR	1,278	1,292	14	1%					21.3	C			200	1231	600	
		Intersection		**6,012**	**5,965**	-47	**-1%**	**6,012**	**5,965**	**-47**	**-1%**	**33.6**	**C**	**33.6**	**C**				
Van Buren Street / Alabama Drive	**Signal**	Alabama Drive	EBL	129	131	2	2%	332	332	0	0%	41.5	D	34.0	C	66	338	-	
			EBT	10	10	0	0%					42.7	D			66	338	-	
			EBR	193	191	-2	-1%					28.3	C			68	345	-	
		Alabama Drive	WBL	56	55	-1	-2%	112	109	-3	-3%	31.8	C	25.4	C	15	146	-	
			WBT	13	13	0	0%					28.2	C			15	146	-	
			WBR	43	41	-2	-5%					15.8	B			15	161	-	
		Van Buren Street	NBL	48	48	0	0%	416	412	-4	-1%	32.4	C	27.9	C	74	394	1125	To Herndon Parkway signal
			NBT	336	333	-3	-1%					27.6	C			74	395	1125	
			NBR	32	31	-1	-3%					24.4	C			73	395	1125	
		Van Buren Street	SBL	13	16	3	23%	467	478	11	2%	17.4	B	13.7	B	44	404	1600	
			SBT	413	422	9	2%					13.8	B			44	403	1600	To Van Buren St signal
			SBR	41	40	-1	-2%					11.6	B			41	402	1600	
		Intersection		**1,327**	**1,331**	4	**0%**	**1,327**	**1,331**	**4**	**0%**	**24.1**	**C**	**24.1**	**C**				
Van Buren Street / Herndon Parkway	**Signal**	Herndon Parkway	EBL	43	40	-3	-7%	1,593	1,550	-43	-3%	63.4	E	46.6	D	12	91	175	
			EBT	1,233	1,213	-20	-2%					50.5	D			875	1508	1950	To Campbell Way signal, which is not in model
			EBR	317	297	-20	-6%					28.5	C			706	1489	1950	
		Herndon Parkway	WBL	293	298	5	2%	916	910	-6	-1%	70.7	E	36.4	D	70	230	350	
			WBT	511	506	-5	-1%					20.5	C			36	226	875	To Worldgate Drive signal
			WBR	111	106	-5	-5%					16.0	B			36	226	875	
		Van Buren Street	NBL	240	248	8	3%	835	850	15	2%	45.6	D	36.2	D	40	228	375	To Office Park signal
			NBT	261	271	10	4%					42.4	D			67	314	375	
			NBR	334	331	-3	-1%					24.1	C			49	321	300	
		Van Buren Street	SBL	176	173	-3	-2%	663	663	0	0%	40.6	D	34.0	C	38	200	175	
			SBT	464	467	3	1%					32.2	C			50	260	1125	To Alabama Dr signal
			SBR	23	23	0	0%					22.0	C			50	260	1125	
		Intersection		**4,007**	**3,973**	-34	**-1%**	**4,007**	**3,973**	**-34**	**-1%**	**39.9**	**D**	**39.9**	**D**				
Van Buren Street / Worldgate Drive	**Signal**	Worldgate Drive	EBL	170	171	1	1%	1,156	1,151	-5	0%	34.0	C	30.4	C	35	208	400	
			EBT	745	738	-7	-1%					38.7	D			93	359	-	
			EBR	241	242	1	0%					2.7	A			2	98	875	
		Worldgate Drive	WBL	194	204	10	5%	410	429	19	5%	31.9	C	32.5	C	37	322	275	
			WBT	208	217	9	4%					33.5	C			27	137	600	To Herndon Pkwy signal
			WBR	8	8	0	0%					22.0	C			29	150	600	
		Van Buren Street	NBL	406	391	-15	-4%	1,714	1,707	-7	0%	44.6	D	22.0	C	61	378	250	
			NBT	767	783	16	2%					16.8	B			47	393	1650	To Eastpark Dr signal
			NBR	541	533	-8	-1%					12.9	B			34	308	250	
		Van Buren Street	SBL	20	21	1	5%	1,045	1,042	-3	0%	35.1	D	8.2	A	4	62	200	
			SBT	669	663	-6	-1%					10.4	B			24	220	400	To Office Park signal
			SBR	356	358	2	1%					2.4	A			1	133	400	
		Intersection		**4,324**	**4,329**	5	**0%**	**4,324**	**4,329**	**5**	**0%**	**21.9**	**C**	**21.9**	**C**				

Note: Average results across 7 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

Preferred Build Scenario with Fairbrook Drive Extended and Additional Mitigation - 2045 Conditions: Weekday Morning Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								Preferred Build Scenario with Fairbrook Drive Extended 2045 Conditions MOEs							Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	Available Queue Storage (ft)	
Herndon Parkway / Worldgate Drive	**Signal**	Herndon Parkway	EBL	163	168	5	3%	1,698	1,653	-45	-3%	38.9	D	58.9	E	24	333	175	
			EBT	1,491	1,442	-49	-3%					61.8	E			472	988	850	To Van Buren St signal
			EBR	44	43	-1	-2%					41.0	D			476	992	850	
		Herndon Parkway	WBL	524	527	3	1%	1,415	1,417	2	0%	62.1	E	35.0	D	117	508	250	
			WBT	789	790	1	0%					18.9	B			64	572	875	To 555 signal
			WBR	103	100	-3	-3%					19.9	B			67	582	875	
		Worldgate Drive	NBL	65	64	-1	-2%	1,130	1,120	-10	-1%	35.3	D	27.7	C	110	696	600	
			NBT	90	86	-4	-4%					37.2	D			110	696	600	To Van Buren St signal
			NBR	975	970	-5	0%					26.4	C			110	696	600	
		Worldgate Drive	SBL	73	71	-2	-2%	165	164	-1	-1%	57.0	E	38.9	D	20	157	75	
			SBT	30	32	2	5%					43.4	D			12	130	-	
			SBR	62	61	-1	-2%					15.5	B			9	134	-	
		Intersection		**4,408**	**4,354**	-54	**-1%**	**4,408**	**4,354**	**-54**	**-1%**	**42.4**	**D**	**42.4**	**D**				
Herndon Parkway / 555 Herndon Parkway	**Signal**	Herndon Parkway	EBL	64	69	5	8%	2,429	2,377	-52	-2%	11.8	B	18.4	B	2	70	175	
			EBT	2,146	2,086	-60	-3%					18.6	B			317	1083	875	To Worldgate Drive signal
			EBR	220	222	2	1%					18.1	B			319	1086	875	
		Herndon Parkway	WBL	148	153	5	3%	1,492	1,503	11	1%	34.3	C	14.3	B	21	336	175	
			WBT	1,243	1,249	7	1%					12.1	B			72	603	650	To Exchange Place signal
			WBR	101	101	0	0%					12.0	B			73	607	650	
		Parking Lot	NBL	103	101	-2	-2%	147	144	-3	-2%	45.1	D	34.5	C	26	178	-	
			NBT	0	0	0	0%					0.0	A			0	0	-	
			NBR	44	43	-1	-2%					9.6	A			0	51	75	
		Parking Lot	SBL	37	35	-2	-6%	109	106	-3	-3%	44.7	D	26.1	C	15	144	-	
			SBT	0	0	0	0%					0.0	A			0	0	-	
			SBR	72	71	-1	-1%					16.9	B			14	150	-	
		Intersection		**4,177**	**4,130**	-47	**-1%**	**4,177**	**4,130**	**-47**	**-1%**	**17.6**	**B**	**17.6**	**B**				
Herndon Parkway / Exchange Place	**Signal**	Herndon Parkway	EBL	1	1	0	-29%	2,140	2,065	-75	-4%	13.9	B	7.7	A	0	8	175	
			EBT	1,919	1,858	-61	-3%					7.6	A			70	817	650	To 555 signal
			EBR	220	206	-14	-6%					8.5	A			69	822	650	
		Herndon Parkway	WBL	148	144	-4	-3%	1,534	1,530	-4	0%	32.3	C	4.0	A	15	221	175	
			WBT	1,380	1,380	0	0%					1.0	A			2	84	550	To Fairbrook Dr signal
			WBR	6	6	0	7%					1.3	A			1	88	550	
		Parking Lot	NBL	103	99	-4	-4%	147	145	-2	-1%	46.1	D	34.1	C	27	157	-	
			NBT	0	0	0	0%					0.0	A			27	157	-	
			NBR	44	46	2	5%					8.2	A			1	51	75	
		Exchange Place	SBL	16	13	-3	-20%	27	26	-1	-4%	50.1	D	31.0	C	4	64	-	
			SBT	0	0	0	0%					0.0	A			4	64	-	
			SBR	11	13	2	20%					12.0	B			3	69	-	
		Intersection		**3,848**	**3,766**	-82	**-2%**	**3,848**	**3,766**	**-82**	**-2%**	**7.3**	**A**	**7.3**	**A**				
Herndon Parkway / Fairbrook Drive	**Signal**	Parking Lot	EBL	28	32	4	14%	138	141	3	2%	77.6	E	76.4	E	17	195	75	
			EBT	79	78	-1	-1%					81.3	F			52	220	-	
			EBR	31	31	0	-1%					63.1	E			48	216	-	
		Fairbrook Drive	WBL	285	292	7	2%	391	395	4	1%	43.5	D	40.5	D	47	199	175	
			WBT	67	62	-5	-7%					39.8	D			17	135	-	
			WBR	39	41	2	5%					20.5	C			14	139	-	
		Herndon Parkway	NBL	32	30	-2	-7%	1,979	1,915	-64	-3%	3.9	A	8.8	A	0	24	150	
			NBT	1,512	1,465	-47	-3%					9.0	A			47	619	550	To Exchange Pl signal
			NBR	434	420	-14	-3%					8.2	A			6	273	125	
		Herndon Parkway	SBL	97	96	-1	-1%	1,347	1,343	-4	0%	42.8	D	36.8	D	18	296	150	
			SBT	1,216	1,217	1	0%					36.3	D			221	847	825	To Sunset Business Park signal
			SBR	34	30	-4	-12%					38.4	D			224	851	825	
		Intersection		**3,855**	**3,794**	-61	**-2%**	**3,855**	**3,794**	**-61**	**-2%**	**24.5**	**C**	**24.5**	**C**				

Note: Average results across 7 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

Preferred Build Scenario with Fairbrook Drive Extended and Additional Mitigation - 2045 Conditions: Weekday Morning Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								Preferred Build Scenario with Fairbrook Drive Extended 2045 Conditions MOEs							Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	Available Queue Storage (ft)	
Herndon Parkway / Sunset Business Park	**Signal**	Parking Lot	EBL	108	108	0	0%	157	158	1	1%	45.8	D	33.7	C	28	178	-	
			EBR	49	50	1	2%					7.8	A			0	46	100	
		Sunset Business Park	WBL	95	92	-3	-4%	133	130	-3	-2%	44.8	D	33.7	C	23	157	-	
			WBR	38	38	0	1%					6.7	A			0	24	100	
		Herndon Parkway	NBL	199	194	-5	-2%	1,598	1,535	-63	-4%	13.7	B	6.4	A	11	289	150	
			NBT	1,307	1,252	-55	-4%					5.4	A			25	598	825	To Fairbrook Dr signal
			NBR	92	89	-3	-3%					5.1	A			24	600	825	
		Herndon Parkway	SBL	64	67	3	4%	1,407	1,402	-5	0%	25.4	C	11.8	B	4	80	175	
			SBT	1,194	1,188	-6	-1%					11.1	B			46	365	525	To Spring St signal
			SBR	148	147	-1	-1%					11.0	B			51	378	525	
		Intersection		**3,294**	**3,225**	-69	**-2%**	**3,294**	**3,225**	**-69**	**-2%**	11.2	B	**11.2**	**B**				
Spring Street / Parallel TRG Road	**Signal**	Spring Street	EBT	873	892	19	2%	1,003	1,018	15	1%	7.7	A	7.8	A	25	256	-	
			EBR	130	126	-4	-3%					8.5	A			31	281	-	
		Spring Street	WBL	288	304	16	6%	995	1,013	18	2%	13.6	B	7.1	A	14	237	125	
			WBT	708	709	1	0%					4.4	A			9	234	-	
		Parallel TRG Road	NBL	111	117	6	6%	237	241	4	2%	45.2	D	24.7	C	30	184	-	
			NBR	126	124	-2	-2%					5.4	A			1	70	100	
		Intersection		**2,235**	**2,272**	37	**2%**	**2,235**	**2,272**	**37**	**2%**	9.3	A	**9.3**	**A**				

Note: Average results across 7 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

Preferred Build Scenario with Fairbrook Drive Extended and Additional Mitigation - 2045 Conditions: Weekday Evening Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								Preferred Build Scenario with Fairbrook Drive Extended 2045 Conditions MOEs							Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	Available Queue Storage (ft)	
Elden Street / Monroe Street	**Signal**	Elden Street	EBL	127	123	-4	-3%	817	799	-18	-2%	34.4	C	25.0	C	15	268	150	
			EBT	654	640	-14	-2%					23.4	C			164	874	250	To Lynn St signal, which is not in model
			EBR	36	36	0	0%					21.0	C			163	873	250	
		Elden Street	WBL	13	13	0	0%	755	734	-21	-3%	31.5	C	36.5	D	1	41	875	To Van Buren St signal
			WBT	669	652	-17	-3%					36.9	D			453	961	875	
			WBR	73	69	-4	-5%					34.4	C			471	996	875	
		Monroe Street	NBL	168	167	-1	-1%	491	489	-2	0%	56.4	E	57.0	E	67	497	100	
			NBT	312	311	-1	0%					57.9	E			146	594	900	To Van Buren St signal
			NBR	11	11	0	0%					39.8	D			132	589	900	
		Monroe Street	SBL	131	128	-3	-2%	454	457	3	1%	44.1	D	46.1	D	58	326	-	No upstream control within reasonable distance
			SBT	202	205	3	1%					51.2	D			91	357	-	
			SBR	121	124	3	2%					39.9	D			89	356	250	
		Intersection		**2,517**	**2,479**	-38	**-2%**	**2,517**	**2,479**	**-38**	**-2%**	38.6	D	**38.6**	**D**				
Elden Street / Van Buren Street	**Signal**	Elden Street	EBL	5	5	0	0%	803	797	-6	-1%	59.9	E	40.9	D	110	354	850	To Monroe Street signal
			EBT	764	755	-9	-1%					42.5	D			110	354	850	
			EBR	34	37	3	9%					6.0	A			1	53	850	
		Elden Street	WBL	150	151	1	1%	962	957	-5	-1%	49.3	D	35.2	D	123	484	1500	To Post Drive signal, which is not in model
			WBT	754	750	-4	-1%					33.2	C			123	484	1500	
			WBR	58	56	-2	-3%					25.4	C			133	498	1500	
		Van Buren Street	NBL	118	114	-4	-3%	760	729	-31	-4%	41.6	D	35.5	D	23	351	150	
			NBT	466	445	-21	-5%					42.8	D			163	754	450	To Monroe St / Grove St signal
			NBR	176	170	-6	-3%					12.5	B			6	172	450	
		Van Buren Street	SBL	126	124	-2	-2%	388	391	3	1%	40.2	D	42.8	D	31	226	325	No upstream control within reasonable distance
			SBT	247	251	4	2%					44.1	D			69	292	-	
			SBR	15	16	1	7%					42.6	D			72	303	-	
		Intersection		**2,525**	**2,483**	-42	**-2%**	**2,525**	**2,483**	**-42**	**-2%**	43.9	D	**43.9**	**D**				
Van Buren Street / Spring Street	**Signal**	Van Buren Street	EBL	424	410	-14	-3%	640	625	-15	-2%	22.0	C	17.3	B	0	38	1600	To Alabama Dr signal
			EBT	1	2	1	100%					27.7	C			65	548	1600	
			EBR	215	213	-2	-1%					8.1	A			6	133	150	
		Parking Lot	WBL	13	14	1	8%	28	28	0	0%	30.4	C	29.4	C	2	48	-	
			WBR	15	14	-1	-7%					28.4	C			2	46	-	
		Spring Street	NBL	324	310	-14	-4%	1,048	995	-53	-5%	25.1	C	16.6	B	40	366	200	
			NBT	716	678	-38	-5%					12.8	B			29	341	800	To Huntmar Park Dr signal
			NBR	8	7	-1	-13%					11.7	B			29	349	800	
		Van Buren Street	SBL	3	3	0	0%	791	806	15	2%	17.6	B	18.1	B	0	24	275	
			SBT	326	331	5	2%					19.7	B			39	311	1200	To Monroe St / Grove St signal
			SBR	462	472	10	2%					17.0	B			50	323	1200	
		Intersection		**1,716**	**1,648**	-68	**-4%**	**1,716**	**1,648**	**-68**	**-4%**	25.9	C	**25.9**	**C**				
Spring Street / Herndon Parkway	**Signal**	Spring Street	EBL	161	169	8	5%	1,105	1,096	-9	-1%	99.4	F	94.3	F	73	321	200	
			EBT	815	806	-9	-1%					93.9	F			262	700	675	To new TRG Road signal
			EBR	129	121	-8	-6%					90.3	F			265	704	675	
		Spring Street	WBL	904	818	-86	-10%	2,281	2,080	-201	-9%	67.9	E	42.6	D	275	659	375	
			WBT	918	839	-79	-9%					34.1	C			126	633	550	To Ffx County Pkwy signal
			WBR	459	423	-36	-8%					10.7	B			18	258	550	
		Herndon Parkway	NBL	175	178	3	2%	1,734	1,712	-22	-1%	51.2	D	35.7	D	44	274	300	
			NBT	678	676	-2	0%					48.4	D			149	588	500	To Sunset Business Park signal
			NBR	881	858	-23	-3%					22.5	C			149	588	500	
		Herndon Parkway	SBL	497	490	-7	-1%	1,089	1,083	-6	-1%	74.7	E	56.9	E	117	359	500	
			SBT	523	524	1	0%					42.6	D			79	314	2300	To Grove St signal
			SBR	68	69	1	1%					38.8	D			80	317	2300	
		Intersection		**5,121**	**4,888**	-233	**-5%**	**5,121**	**4,888**	**-233**	**-5%**	64.4	E	**64.4**	**E**				

Note: Average results across 20 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

Preferred Build Scenario with Fairbrook Drive Extended and Additional Mitigation - 2045 Conditions: Weekday Evening Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								Preferred Build Scenario with Fairbrook Drive Extended 2045 Conditions MOEs							Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	Available Queue Storage (ft)	
Spring Street / Fairfax County Parkway / Fairbrook Drive	**Signal**	Spring Street	EBL	324	321	-3	-1%	2,183	2,136	-47	-2%	63.5	E	32.0	C	146	671	250	
			EBT	1,832	1,788	-44	-2%					26.5	C			158	641	550	To Herndon Parkway signal
			EBR	27	27	0	1%					19.8	B			154	636	550	
		Spring Street	WBL	167	144	-23	-14%	2,320	1,995	-325	-14%	39.3	D	47.5	D	1338	1649	250	
			WBT	1,503	1,304	-199	-13%					51.3	D			1338	1649	1650	To Target signal
			WBR	650	547	-103	-16%					40.6	D			1327	1638	1650	
		Fairbrook Drive	NBL	29	30	1	2%	934	920	-14	-2%	103.6	F	69.8	E	476	1013	-	
			NBT	222	218	-4	-2%					76.4	E			476	1013	-	
			NBR	683	672	-11	-2%					66.1	E			476	1013	250	
		Fairfax County Parkway	SBL	166	168	2	1%	1,529	1,518	-11	-1%	75.6	E	44.1	D	46	152	250	
			SBT	415	413	-2	0%					55.5	E			224	921	600	To Ffx Pkwy signal, which is not in model
			SBR	949	937	-12	-1%					33.5	C			207	982	600	
		Intersection		**6,967**	**6,569**	-398	**-6%**	**6,967**	**6,569**	**-398**	**-6%**	44.8	D	**44.8**	**D**				
Van Buren Street / Alabama Drive	**Signal**	Alabama Drive	EBL	85	81	-4	-5%	265	261	-4	-2%	53.2	D	42.2	D	65	323	-	
			EBT	18	18	0	0%					53.6	D			65	323	-	
			EBR	162	162	0	0%					35.4	D			67	331	-	
		Alabama Drive	WBL	35	33	-2	-5%	66	64	-2	-3%	36.6	D	30.1	C	11	106	-	
			WBT	10	10	0	0%					37.5	D			11	106	-	
			WBR	21	21	0	0%					16.3	B			9	120	-	
		Van Buren Street	NBL	81	80	-1	-1%	700	687	-13	-2%	26.4	C	22.8	C	121	672	1125	To Herndon Parkway signal
			NBT	534	528	-6	-1%					22.6	C			121	673	1125	
			NBR	85	79	-6	-7%					20.7	C			121	672	1125	
		Van Buren Street	SBL	34	34	0	0%	787	783	-4	-1%	17.9	B	12.9	B	84	723	1600	
			SBT	646	643	-3	0%					12.8	B			83	722	1600	To Van Buren St signal
			SBR	107	106	-1	-1%					12.0	B			81	721	1600	
		Intersection		**1,818**	**1,795**	-23	**-1%**	**1,818**	**1,795**	**-23**	**-1%**	21.6	C	**21.6**	**C**				
Van Buren Street / Herndon Parkway	**Signal**	Herndon Parkway	EBL	55	56	1	2%	1,099	1,089	-10	-1%	54.1	D	32.5	C	17	104	175	
			EBT	698	692	-6	-1%					37.5	D			90	425	1950	To Campbell Way signal, which is not in model
			EBR	346	341	-5	-1%					18.8	B			41	278	1950	
		Herndon Parkway	WBL	520	481	-39	-8%	2,031	1,908	-123	-6%	66.1	E	42.4	D	107	442	350	
			WBT	1,262	1,192	-70	-6%					34.6	C			241	1018	875	To Worldgate Drive signal
			WBR	249	235	-14	-6%					33.7	C			241	1018	875	
		Van Buren Street	NBL	365	382	17	5%	1,051	1,065	14	1%	48.0	D	33.4	C	76	554	375	To Office Park signal
			NBT	394	393	-1	0%					34.0	C			97	627	375	
			NBR	292	290	-2	-1%					13.4	B			22	224	300	
		Van Buren Street	SBL	129	128	-1	-1%	844	846	2	0%	48.3	D	48.5	D	32	198	175	
			SBT	668	670	2	0%					48.9	D			121	522	1125	To Alabama Dr signal
			SBR	47	48	1	2%					44.0	D			121	522	1125	
		Intersection		**5,025**	**4,908**	-117	**-2%**	**5,025**	**4,908**	**-117**	**-2%**	39.3	D	**39.3**	**D**				
Van Buren Street / Worldgate Drive	**Signal**	Worldgate Drive	EBL	291	294	3	1%	1,378	1,386	8	1%	45.0	D	26.1	C	79	356	400	
			EBT	418	420	2	1%					35.1	D			47	204	-	
			EBR	669	672	3	0%					12.3	B			52	483	875	
		Worldgate Drive	WBL	406	385	-21	-5%	1,017	990	-27	-3%	61.9	E	45.1	D	191	683	275	
			WBT	589	583	-6	-1%					35.0	D			72	427	600	To Herndon Pkwy signal
			WBR	22	22	0	0%					20.0	C			80	441	600	
		Van Buren Street	NBL	361	347	-14	-4%	1,446	1,425	-21	-1%	50.9	D	24.4	C	63	265	250	
			NBT	720	720	0	0%					19.8	B			61	432	1650	To Eastpark Dr signal
			NBR	365	358	-7	-2%					8.0	A			12	198	250	
		Van Buren Street	SBL	9	9	0	0%	1,583	1,537	-46	-3%	60.1	E	19.8	B	3	42	200	
			SBT	1,211	1,174	-37	-3%					24.9	C			109	646	400	To Office Park signal
			SBR	363	354	-9	-2%					1.9	A			0	80	400	
		Intersection		**5,424**	**5,338**	-86	**-2%**	**5,424**	**5,338**	**-86**	**-2%**	27.4	C	**27.4**	**C**				

Note: Average results across 20 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

Preferred Build Scenario with Fairbrook Drive Extended and Additional Mitigation - 2045 Conditions: Weekday Evening Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								Preferred Build Scenario with Fairbrook Drive Extended 2045 Conditions MOEs							Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	Available Queue Storage (ft)	
Herndon Parkway / Worldgate Drive	**Signal**	Herndon Parkway	EBL	103	102	-1	-1%	1,203	1,166	-37	-3%	40.4	D	72.6	E	6	151	175	
			EBT	1,080	1,043	-37	-3%					76.2	E			351	576	850	To Van Buren St signal
			EBR	20	21	1	5%					54.7	D			355	579	850	
		Herndon Parkway	WBL	732	695	-37	-5%	2,488	2,343	-145	-6%	41.7	D	25.7	C	187	975	250	
			WBT	1,720	1,612	-108	-6%					19.0	B			319	1014	875	To 555 signal
			WBR	36	36	0	-1%					17.6	B			325	1023	875	
		Worldgate Drive	NBL	199	198	-1	-1%	990	989	-1	0%	47.4	D	26.2	C	102	423	600	
			NBT	60	60	0	1%					45.3	D			102	423	600	To Van Buren St signal
			NBR	731	731	0	0%					18.9	B			102	423	600	
		Worldgate Drive	SBL	134	134	0	0%	302	301	-1	0%	53.9	D	40.4	D	46	253	75	
			SBT	55	55	0	0%					44.8	D			27	245	-	
			SBR	113	112	-1	-1%					22.2	C			25	248	-	
		Intersection		**4,982**	**4,799**	-183	**-4%**	**4,982**	**4,799**	**-183**	**-4%**	38.1	D	**38.1**	**D**				
Herndon Parkway / 555 Herndon Parkway	**Signal**	Herndon Parkway	EBL	51	51	0	1%	2,021	1,978	-43	-2%	40.9	D	17.2	B	8	95	175	
			EBT	1,871	1,829	-42	-2%					16.5	B			168	796	875	To Worldgate Drive signal
			EBR	99	98	-1	-1%					16.8	B			169	799	875	
		Herndon Parkway	WBL	66	61	-5	-8%	2,199	2,046	-153	-7%	41.2	D	27.8	C	4	79	175	
			WBT	2,064	1,919	-145	-7%					27.5	C			362	810	650	To Exchange Place signal
			WBR	68	66	-2	-3%					24.6	C			364	813	650	
		Parking Lot	NBL	314	317	3	1%	449	447	-2	0%	64.7	E	55.9	E	157	444	-	
			NBT	0	0	0	0%					0.0	A			0	0	-	
			NBR	135	130	-5	-4%					34.5	C			20	393	75	
		Parking Lot	SBL	45	45	0	1%	155	156	1	1%	36.3	D	22.2	C	17	164	-	
			SBT	0	0	0	0%					0.0	A			0	0	-	
			SBR	110	111	1	1%					16.5	B			17	169	-	
		Intersection		**4,824**	**4,627**	-197	**-4%**	**4,824**	**4,627**	**-197**	**-4%**	25.8	C	**25.8**	**C**				
Herndon Parkway / Exchange Place	**Signal**	Herndon Parkway	EBL	3	3	0	-12%	2,074	2,021	-53	-3%	21.5	C	13.2	B	0	15	175	
			EBT	1,971	1,922	-49	-2%					13.2	B			143	781	650	To 555 signal
			EBR	99	96	-3	-3%					12.8	B			145	787	650	
		Herndon Parkway	WBL	66	63	-3	-5%	1,960	1,827	-133	-7%	49.0	D	25.4	C	6	89	175	
			WBT	1,881	1,752	-129	-7%					24.6	C			250	698	550	To Fairbrook Dr signal
			WBR	14	12	-2	-12%					20.7	C			257	708	550	
		Parking Lot	NBL	314	307	-7	-2%	449	446	-3	-1%	68.8	E	60.4	E	157	391	-	
			NBT	0	0	0	0%					0.0	A			157	391	-	
			NBR	135	139	4	3%					41.7	D			30	373	75	
		Exchange Place	SBL	6	7	1	17%	10	11	1	10%	44.2	D	30.5	C	2	40	-	
			SBT	0	0	0	0%					0.0	A			2	40	-	
			SBR	4	4	0	0%					6.4	A			0	1	-	
		Intersection		**4,493**	**4,305**	-188	**-4%**	**4,493**	**4,305**	**-188**	**-4%**	23.3	C	**23.3**	**C**				
Herndon Parkway / Fairbrook Drive	**Signal**	Parking Lot	EBL	32	34	2	8%	138	141	3	2%	55.9	E	52.3	D	12	152	75	
			EBT	76	75	-1	-1%					57.7	E			31	195	-	
			EBR	30	32	2	5%					35.8	D			27	196	-	
		Fairbrook Drive	WBL	368	371	3	1%	548	550	2	0%	45.8	D	40.4	D	62	342	175	
			WBT	54	52	-2	-3%					41.9	D			25	232	-	
			WBR	126	127	1	1%					24.0	C			25	234	-	
		Herndon Parkway	NBL	25	24	-1	-3%	2,112	2,068	-44	-2%	22.9	C	23.2	C	2	41	150	
			NBT	1,540	1,504	-36	-2%					24.3	C			174	689	550	To Exchange Pl signal
			NBR	547	540	-7	-1%					20.3	C			72	665	125	
		Herndon Parkway	SBL	60	57	-3	-5%	1,626	1,520	-106	-6%	50.3	D	43.2	D	12	164	150	
			SBT	1,537	1,434	-103	-7%					43.0	D			562	949	825	To Sunset Business Park signal
			SBR	29	29	0	1%					39.7	D			566	954	825	
		Intersection		**4,423**	**4,279**	-144	**-3%**	**4,423**	**4,279**	**-144**	**-3%**	33.5	C	**33.5**	**C**				

Note: Average results across 20 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

Preferred Build Scenario with Fairbrook Drive Extended and Additional Mitigation - 2045 Conditions: Weekday Evening Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								Preferred Build Scenario with Fairbrook Drive Extended 2045 Conditions MOEs							Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	Available Queue Storage (ft)	
Herndon Parkway / Sunset Business Park	**Signal**	Parking Lot	EBL	232	230	-2	-1%	343	344	1	0%	42.0	D	32.9	C	61	343	-	
			EBR	111	114	3	3%					14.4	B			3	96	100	
		Sunset Business Park	WBL	144	144	0	0%	196	196	0	0%	39.9	D	31.1	C	32	223	-	
			WBR	52	52	0	0%					6.7	A			0	31	100	
		Herndon Parkway	NBL	116	115	-1	-1%	1,643	1,654	11	1%	17.4	B	10.9	B	7	143	150	
			NBT	1,411	1,425	14	1%					10.5	B			75	686	825	To Fairbrook Dr signal
			NBR	116	114	-2	-2%					10.2	B			75	689	825	
		Herndon Parkway	SBL	100	97	-3	-3%	1,590	1,453	-137	-9%	31.7	C	18.8	B	9	119	175	
			SBT	1,373	1,245	-128	-9%					18.0	B			90	540	525	To Spring St signal
			SBR	117	111	-6	-5%					16.4	B			96	553	525	
		Intersection		**3,772**	**3,647**	-125	**-3%**	**3,772**	**3,647**	**-125**	**-3%**	17.2	B	**17.2**	**B**				
Spring Street / Parallel TRG Route	**Signal**	Spring Street	EBT	866	870	4	0%	938	938	0	0%	13.5	B	13.4	B	60	326	-	
			EBR	73	68	-5	-7%					11.6	B			65	346	-	
		Spring Street	WBL	162	150	-12	-8%	1,161	1,089	-72	-6%	11.9	B	6.0	A	5	138	125	
			WBT	999	939	-60	-6%					5.1	A			16	414	-	
		Parallel TRG Route	NBL	146	145	-1	-1%	386	384	-2	-1%	48.7	D	26.8	C	40	230	-	
			NBR	240	239	-1	0%					13.4	B			14	144	100	
		Intersection		**2,486**	**2,411**	-75	**-3%**	**2,486**	**2,411**	**-75**	**-3%**	12.2	B	**12.2**	**B**				

Note: Average results across 20 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

RCLCO
REAL ESTATE CONSULTING

FISCAL IMPACT ANALYSIS FOR FUTURE DEVELOPMENT

TRANSIT-RELATED GROWTH AREA

HERNDON, VA

Prepared for Skidmore, Owings & Merrill
October 17, 2023

ABOUT RCLCO

Since 1967, RCLCO has been the "first call" for real estate developers, investors, the public sector, and non-real estate companies and organizations seeking strategic and tactical advice regarding property investment, planning, and development.

RCLCO leverages quantitative analytics and a strategic planning framework to provide end-to-end business planning and implementation solutions at an entity, portfolio, or project level. With the insights and experience gained over 50 years and thousands of projects–touching over $5B of real estate activity each year–RCLCO brings success to all product types across the United States and around the world.

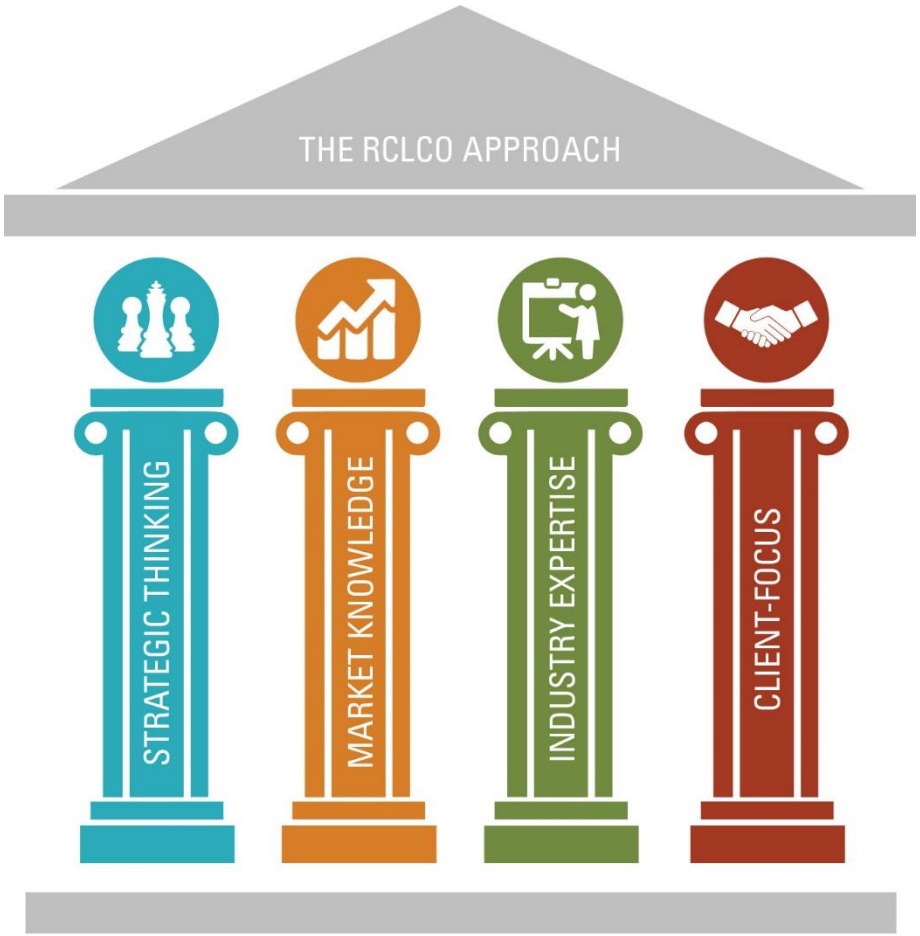
Learn more about RCLCO at www.RCLCO.com.

REPORT AUTHORS

Project Director:

Jacob Ross, Principal

- P: (240) 404-6811 | E: JROSS@RCLCO.COM



CONTENTS

OBJECTIVES & KEY FINDINGS 4

ASSUMPTIONS & METHODOLOGY 7

- Definition of Net Fiscal Impact 8
- Revenues 9
- Expenditures 12

OPPORTUNITIES FOR COST SHARING 13

DISCLAIMERS 15

APPENDIX: SUPPORTING EXHIBITS 18

OBJECTIVES & KEY FINDINGS

OBJECTIVES

Skidmore, Owings & Merrill ("SOM") is working with the Town of Herndon to create a transit-related small area plan, which would guide the development of approximately 25 privately owned parcels—collectively referred to as the Transit-Related Growth Area ("TRG")—near the future Herndon Metrorail Station. As they do so, SOM and the Town of Herndon are considering the extent to which sites in the TRG might support a number of potential land uses, including rental housing, for-sale housing, office, retail, hotel, and self-storage.

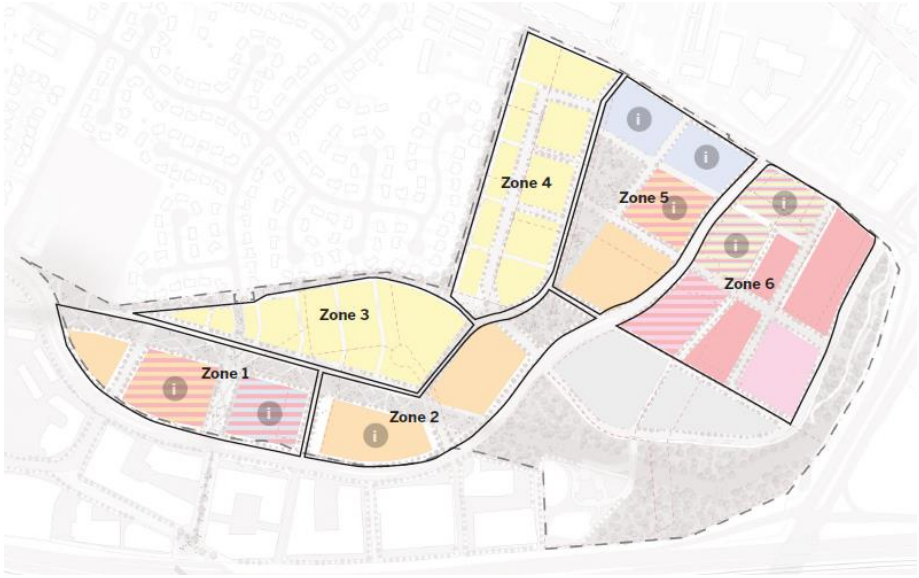
With this background in mind, SOM brought RCLCO onto the consultant team for this effort. RCLCO is a national real estate advisory firm with more than 50 years of experience serving as the "first call" for real estate developers, investors, the public sector, and non-real estate companies and organizations seeking strategic and tactical advice regarding property investment, planning, and development.

One objective of RCLCO's work on the consultant team is to provide an independent fiscal impact analysis, outlining the revenues that new development in the TRG is likely to generate to the Town of Herndon, as well as the expenditures the Town of Herndon is likely to incur while serving the users of that new development. For the purpose of this analysis, RCLCO relied on SOM for assumptions regarding the quantities of development in the TRG. These assumptions, which are shown to the right and hereafter referred to as the "Proposed Use Scenario," included:

- 2,787 housing units, including 2,369 rental apartments, 175 for-sale townhomes, and 244 for-sale two-over-twos;
- 463 hotel keys;
- 1,189,400 square feet of office, including 1,122,600 square feet of corporate office and 66,800 square feet of creative office; and
- 293,600 square feet of retail, including 63,600 square feet of grocery, 155,300 square feet of restaurants and services, and 74,700 square feet of entertainment and fitness.

RCLCO supplemented this information with data from its separately produced market analysis, which RCLCO completed in September 2022. RCLCO also incorporated data from third party sources, including public assessor's databases.

Transit-Related Small Area Plan, October 2023;
Proposed Use Scenario



	ZONE1	ZONE 2	ZONE 3	ZONE 4	ZONE 5	ZONE 6	TOTAL
Residential	**532**	**781**	**178**	**240**	**561**	**495**	**2,787 Units**
Multifamily	532	781			561	495	**2,369 Units**
Townhome			107	68			**175 Units**
Two-Over-Two			71	172			**244 Units**
Hotel	**0**	**0**	**0**	**0**	**0**	**463**	**463 Keys**
Hotel						463	**463 Keys**
Office	**641,700**	**0**	**0**	**0**	**480,900**	**66,800**	**1,189,400 SF**
Corporate Office	641,700				480,900		**1,122,600 SF**
Creative Office						66,800	**66,800 SF**
Retail	**43,100**	**0**	**0**	**0**	**86,800**	**163,700**	**293,600 SF**
Grocery					50,900	12,700	**63,600 SF**
Restaurants & Services	43,100				35,900	76,300	**155,300 SF**
Entertainment & Fitness						74,700	**74,700 SF**

Image Source: Town of Herndon, Esri

KEY FINDINGS

CUMULATIVE NET FISCAL IMPACT

From 2023 to 2045, RCLCO estimates the Proposed Use Scenario will generate roughly $221,608,000 (in nominal dollars) in revenues to the Town of Herndon. Property taxes represent the largest portion of this total (32%), followed by business license revenues (30%), transient occupancy taxes (13%), and meals taxes (11%).

Meanwhile, RCLCO estimates the Town of Herndon will incur roughly $53,067,000 (in nominal dollars) in expenditures to serve users of the Proposed Use Scenario during the same forecast period from 2023 to 2045. As a result, the Proposed Use Scenario is projected to generate a positive net fiscal impact of $168,541,000 to the Town of Herndon during this time, providing the Town of Herndon with key revenues it can use to help offset any necessary infrastructural investments. For more information, please see the table below as well as Exhibit I-1a in the appendix.

Summary of Cumulative Fiscal Impact Analysis, 2023-2045;
Proposed Use Scenario

ESTIMATED REVENUES		DIST.
Property Taxes	$69,929,000	32%
Other Local Taxes	$137,425,000	62%
Business License Revenues	$66,894,000	30%
Meals Taxes	$24,602,000	11%
Transient Occupancy Taxes	$28,093,000	13%
Local Sales Taxes	$9,570,000	4%
Other	$8,266,000	4%
Permits, Fees, and Licenses	$2,532,000	1%
Fines and Forfeitures	$1,092,000	0%
Parks and Recreation Fees	$10,630,000	5%
Total Revenues	**$221,608,000**	**100%**
ESTIMATED EXPENDITURES		**DIST.**
Total Operating Expenditures	$53,067,000	100%
Total Expenditures	**$53,067,000**	**100%**
Net Fiscal Impact	**$168,541,000**	

ANNUAL NET FISCAL IMPACT AT BUILDOUT

Looking at the amount of revenue generated by the Proposed Use Scenario in any given year, this analysis suggests that, at buildout, the redevelopment will produce an estimated $15,803,000 to the Town of Herndon each year, in 2023 dollars. This revenue compares with $3,433,000 in annual town expenditures, for an annual net fiscal impact of $12,370,000 in 2023 dollars.

RESIDENTS AND EMPLOYEES AT BUILDOUT

At buildout, RCLCO estimates the Proposed Use Scenario will support approximately 5,648 residents, including approximately 942 schoolchildren. In addition, RCLCO estimates the Proposed Use Scenario will support approximately 6,765 employees—including 5,462 office employees and 1,302 retail, hospitality, and apartment employees—at an average salary of $102,000, in 2023 dollars.

Summary of Annual Fiscal Impact Analysis, At Buildout (in 2023 Dollars);
Proposed Use Scenario

ESTIMATED REVENUES		DIST.
Property Taxes	$4,613,000	29%
Other Local Taxes	$10,287,000	65%
Business License Revenues	$5,946,000	38%
Meals Taxes	$2,040,000	13%
Transient Occupancy Taxes	$1,141,000	7%
Local Sales Taxes	$593,000	4%
Other	$568,000	4%
Permits, Fees, and Licenses	$174,000	1%
Fines and Forfeitures	$69,000	0%
Parks and Recreation Fees	$660,000	4%
Total Revenues	**$15,803,000**	**100%**
ESTIMATED EXPENDITURES		**DIST.**
Total Operating Expenditures	$3,433,000	100%
Total Expenditures	**$3,433,000**	**100%**
Net Fiscal Impact	**$12,370,000**	

ASSUMPTIONS & METHODOLOGY

DEFINITION OF NET FISCAL IMPACT

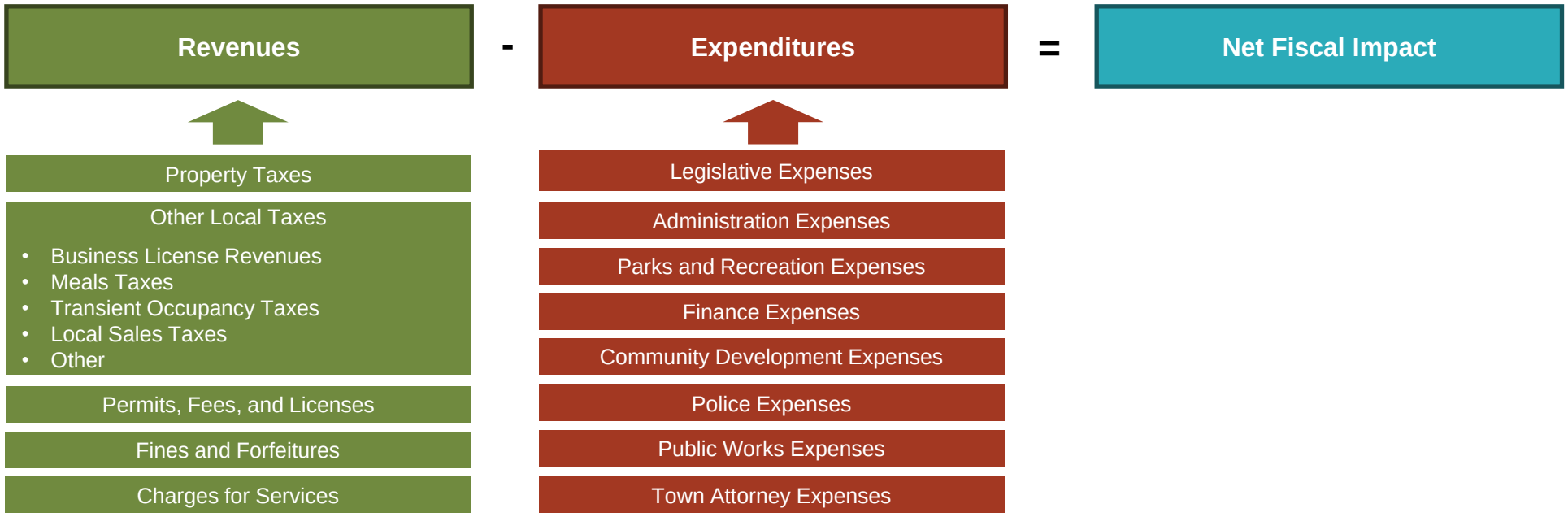
METHODOLOGY

To project the net fiscal impact of the Proposed Use Scenario, RCLCO first determined estimated revenues based on the taxes and fees that residents, businesses, and property owners are likely to pay. Then, RCLCO subtracted operating expenditures from town revenues, based on the town services the Proposed Use Scenario is likely to require. Revenues less expenditures each year are the General Fund net fiscal impact. Please see below for more information.

Exhibit I-2 shows the model assumptions for the Proposed Use Scenario, and Exhibits I-3 and I-4 show the allocation of revenues and expenditures from the adopted Fiscal Year 2024 budget. Exhibit I-5 shows the properties used to estimate the assessed value of the rental apartments, hotels, office, and retail in the Proposed Use Scenario.

Using the above assumptions and below methodology, RCLCO calculated the annual revenues, expenditures, and net fiscal impact for the Proposed Use Scenario at buildout, in 2023 dollars. In addition, RCLCO also calculated the cumulative revenues, expenditures, and net fiscal impact for the Proposed Use Scenario through 2045, based on an assumed delivery schedule of new development in the Proposed Use Scenario. Exhibit I-6 shows this assumed delivery schedule, which RCLCO developed based on a combination of the Transit-Related Small Area Plan Visioning Report from SOM, the separately produced market analysis by RCLCO, and estimated parcel-by-parcel delivery timing from the Town of Herndon. The goal of this effort was to ensure new development is not assumed to occur before there is sufficient demand to support it or land to accommodate it.

Summary of Methodology
Proposed Use Scenario



REAL PROPERTY TAX REVENUES

For the Proposed Use Scenario, RCLCO estimated the likely assessment of rental apartments to be $285,000 per unit, limited-service hotel to be $102,000 per key, full-service hotel to be $138,000 per key, corporate office to be $525 per square foot, creative office to be $243 per square foot, and retail to be $368 per square foot, based on assessments of properties in the Town of Herndon and the remainder of Fairfax County. Please see Exhibit I-5 for more information. As shown on Exhibit I-2, RCLCO estimated the likely assessment of for-sale townhomes to be $800,000 per unit and for-sale two-over-twos to be $650,000 per unit, based on the market analysis that RCLCO completed in September 2022. Using these estimates, RCLCO projected the overall site value and applied the Town of Herndon's tax rate of $0.26 per $100 valuation from the adopted Fiscal Year 2024 budget to project annual real property tax revenue. When projecting the cumulative net fiscal impact of the Proposed Use Scenario through 2045, RCLCO assumed property values would escalate at a rate of 2.5% per year.

TRANSIENT OCCUPANCY TAXES

For the Proposed Use Scenario, RCLCO assumed all hotels would deliver as limited- or select-service hotels considering the flags of hotels that operate in the area today. Next, RCLCO estimated stabilized occupancy rates of 75%, based on its experience in the market. RCLCO then relied upon the projected average daily rates ("ADRs") from the September 2022 market analysis to calculate annual gross hotel receipts for the Proposed Use Scenario. After calculating these annual gross hotel receipts, RCLCO applied the Town of Herndon's transient occupancy tax rate of 6.0% to project transient occupancy tax revenue under the Proposed Use Scenario. When projecting the cumulative net fiscal impact of the Proposed Use Scenario through 2045, RCLCO assumed hotel rates would escalate at a rate of 2.5% per year.

MEALS TAXES

For on-site restaurants in the Proposed Use Scenario, RCLCO estimated average sales of $450 per square foot, based on information from brokers and developers as well as experience in the local market. After multiplying this number by the expected amount of restaurant space in the Proposed Use Scenario, RCLCO applied the Town of Herndon's meals tax rate of 3.75% in order to project meals tax revenue generated by on-site retail under the Proposed Use Scenario.

In addition to the above, RCLCO estimated meals tax revenue generated by on-site households and employees in the Proposed Use Scenario elsewhere in the Town of Herndon.

- For on-site employees, RCLCO projected employee incomes based on data from the U.S. Census Bureau, and then estimated the percent of those incomes that is likely to go towards daytime meal purchases based on the same data from the U.S. Census Bureau as well as additional data from the International Council of Shopping Centers ("ICSC"). RCLCO multiplied these numbers to project daytime meals spending, and then assumed that 40% of this spending is likely to take place within the Town of Herndon. Finally, RCLCO applied the Town of Herndon's meals tax rate of 3.75% in order to project off-site meals tax revenue generated by on-site employees under the Proposed Use Scenario.
- For on-site residents, RCLCO projected household incomes based on the projected housing rents and prices according to the September 2022 market analysis. RCLCO then estimated the percent of those incomes that is likely to go toward restaurant purchases based on data from Esri. RCLCO multiplied these numbers to project restaurant spending, and then assumed that 40% of this spending is likely to take place within the Town of Herndon. Finally, RCLCO applied the Town of Herndon's meals tax rate of 3.75% in order to project off-site meals tax revenue generated by on-site households under the Proposed Use Scenario.

When projecting the cumulative net fiscal impact of the Proposed Use Scenario through 2045, RCLCO assumed sales would escalate at a rate of 2.5% per year.

BPOL TAXES

For the Proposed Use Scenario, RCLCO estimated annual revenues for on-site businesses, which generate business, professional, and occupational license ("BPOL") revenues to the Town of Herndon. To do so, RCLCO relied upon data from its September 2022 market analysis for retail and hospitality uses, as well as data from the U.S. Census Bureau for office uses. After projecting annual revenues for each of these uses, RCLCO applied the Town of Herndon's corresponding BPOL tax rate. These tax rates were $0.3515 per $100 in gross receipts for office, $0.1485 per $100 in gross receipts for retail, $0.1300 per $100 in gross receipts for restaurant, and $0.2600 per $100 in gross receipts for hospitality. In some cases, these tax rates reflect weighted averages for different types of businesses, the details for which are outlined on Exhibit I-2. When projecting the cumulative net fiscal impact of the Proposed Use Scenario through 2045, RCLCO assumed business revenues would escalate at a rate of 2.5% per year.

LOCAL SALES TAXES

Currently, Fairfax County levies a sales tax rate of 1.0%, half of which is distributed to jurisdictions within Fairfax County based on share of school-aged children who live within each jurisdiction. RCLCO thus calculated an effective local sales tax rate of 0.0106% based on the share of school-aged children in Fairfax County who live within the Town of Herndon.

To determine local sales taxes associated with the Proposed Use Scenario, RCLCO considered 1) on-site retail purchases, 2) off-site retail purchases from on-site households elsewhere in Fairfax County, and 3) off-site retail purchases from on-site employees elsewhere in Fairfax County, as well as 4) off-site retail purchases from all other users in Fairfax County that flow back to the Town of Herndon on the basis of it having a greater number of school-aged children under the Proposed Use Scenario.

- To determine local sales taxes from the first source, RCLCO relied upon assumptions from its September 2022 market analysis to project on-site retail sales. RCLCO then applied the effective local sales tax rate of 0.0106% to determine local sales tax revenue from on-site retail purchases.
- To determine local sales taxes from the second source, RCLCO estimated household incomes based on the projected housing rents and prices according to the September 2022 market analysis. RCLCO then estimated the percent of those incomes that is likely to go toward retail purchases based on data from Esri. RCLCO multiplied these numbers to project retail spending, and then assumed that 75% of this spending is likely to take place within Fairfax County. Finally, RCLCO applied the Town of Herndon's effective local sales tax rate of 0.0106% to project off-site local sales tax revenue generated by on-site households under the Proposed Use Scenario.
- To determine local sales taxes from the third source, RCLCO projected employee incomes based on data from the U.S. Census Bureau, and then estimated the percent of those incomes that is likely to go towards daytime retail purchases based on the same data from the U.S. Census Bureau as well as additional data from the ICSC. RCLCO multiplied these numbers to project daytime retail spending, and then assumed that 75% of this spending is likely to take place within Fairfax County. Finally, RCLCO applied the Town of Herndon's effective local sales tax rate of 0.0106% to project off-site local sales tax revenue generated by on-site employees under the Proposed Use Scenario.
- To determine local sales taxes from the fourth source, RCLCO determined the local sales taxes the Town of Herndon receives for each resident at present time. RCLCO then multiplied this number by the number of residents in the Proposed Use scenario to project off-site local sales tax revenue that is generated elsewhere in Fairfax County, but that is likely to flow back to the Town of Herndon on the basis of it having a greater number of school-aged children under the Proposed Use Scenario.

When projecting the cumulative net fiscal impact of the Proposed Use Scenario through 2045, RCLCO assumed sales would escalate at a rate of 2.5% per year.

MISCELLANEOUS REVENUES

In addition to real property tax revenues, transient occupancy taxes, meals taxes, BPOL taxes, and local sales taxes, RCLCO estimated the generation of other revenues—such as permits, fees, and licenses; fines and forfeitures; and charges for services—on a per resident and/or per employee basis. To do so, RCLCO typically identifies the total amount of each type of miscellaneous revenue collected by a jurisdiction in a given year, and then estimates the portion of those revenues that are attributable to employees in the jurisdiction and the portion attributable to residents. RCLCO followed a similar approach for this analysis, allocating 47.3% to employees and 52.7% to residents based on the current employee to population ratio in Herndon. RCLCO made certain exceptions for line items that were more attributable to residents over employees, or vice versa. Using this approach, RCLCO estimated miscellaneous revenues per resident and per employee. These estimates are summarized on Exhibit I-3.

Next, RCLCO multiplied these values by the expected number of residents and employees in the Proposed Use Scenario. The number of residents per unit by type and the amount of office and retail square footage per employee were determined from the Loudoun County Fiscal Impact Guidelines, which provide helpful benchmarks for these thresholds in the Washington region. When projecting the cumulative net fiscal impact of the Proposed Use Scenario through 2045, RCLCO assumed per person miscellaneous revenues would escalate at a rate of 2.5% per year.

OPERATING EXPENDITURES

The estimation of operating expenditures follows a similar methodology to that of miscellaneous revenues. RCLCO divided the total annual expenditures, as shown in the adopted Fiscal Year 2024 budget, among the estimated number of residents and employees in the Town of Herndon to arrive at average expenditure estimates per resident and per employee. RCLCO also estimated that some of these expenditures are fixed; in these cases, RCLCO either 1) did not scale these costs upward with each additional resident or employee or 2) scaled these costs upward but to a lesser extent than others, depending on the exact cost in question. These estimates are summarized on Exhibit I-4.

To convert the operating expenditure estimates into expenditures per household or per employee, the expenditures per resident were multiplied by the average number of residents per unit and the number of employees per square foot as discussed above. When projecting the cumulative net fiscal impact of the Proposed Use Scenario through 2045, RCLCO assumed per person operating expenditures would escalate at a rate of 2.5% per year.

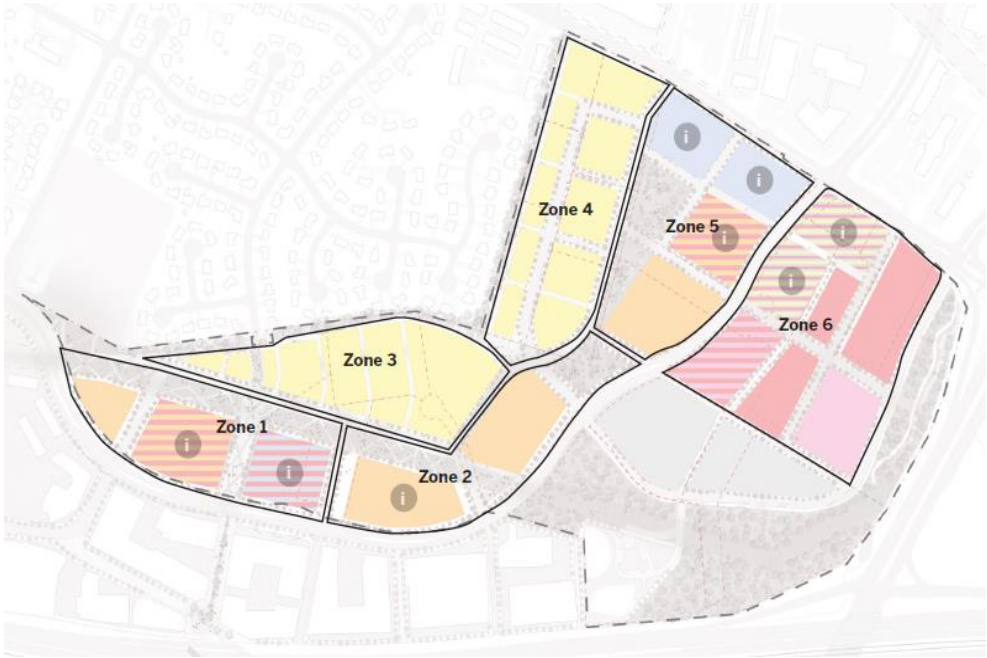
OPPORTUNITIES FOR COST SHARING

POTENTIAL FOR COST SHARING

In addition to the fiscal impact analysis, the Town of Herndon requested RCLCO comment on the potential for a cost sharing model with property owners, to help cover future infrastructure costs under the Preferred Use Scenario.

In general, RCLCO expects most property owners will be willing to accept the costs of local infrastructural improvements necessary to serve their own developments. For example, the size of the Shorenstein property is likely to require interior roads within Zones 1 and 3, regardless of any broader plans for the TRG. In these cases, property owners may be willing to work with the Town of Herndon to develop infrastructure in a way that serves their own needs, while being consistent with plans for the broader TRG.

Tax Increment Financing ("TIF") represents a potential public financing strategy for the Town of Herndon. If the Town of Herndon were to pursue this strategy, it would ideally establish the TIF in the very near term, so the baseline represents the value of property in the TRG today but then accrues over time. However, the Town of Herndon should be careful to specify the reasons for—and potential recipients of—TIF support, in order to manage requests in situations when the support may not be necessary for project feasibility.



Source: SOM; RCLCO

DISCLAIMERS

CRITICAL ASSUMPTIONS

Our conclusions are based on our analysis of the information available from our own sources and from the client as of the date of this report. We assume that the information is correct, complete, and reliable.

We made certain assumptions about the future performance of the global, national, and local economy and real estate market, and on other factors similarly outside either our control or that of the client. We analyzed trends and the information available to us in drawing these conclusions. However, given the fluid and dynamic nature of the economy and real estate markets, as well as the uncertainty surrounding particularly the near-term future, it is critical to monitor the economy and markets continuously and to revisit the aforementioned conclusions periodically to ensure that they are reflective of changing market conditions.

We assume that the economy and real estate markets will experience a period of slower growth in the next 12 to 24 months, and then return to a stable and moderate rate in 2025 and beyond. However, stable and moderate growth patterns are historically not sustainable over extended periods of time, the economy is cyclical, and real estate markets are typically highly sensitive to business cycles. Further, it is very difficult to predict when inflection points in economic and real cycles will occur.

With the above in mind, we assume that the long-term average absorption rates and price changes will be as projected, realizing that most of the time performance will be either above or below said average rates.

Our analysis does not consider the potential impact of future economic shocks on the national and/or local economy, and does not consider the potential benefits from major "booms" that may occur. Similarly, the analysis does not reflect the residual impact on the real estate market and the competitive environment of such a shock or boom. Also, it is important to note that it is difficult to predict changing consumer and market psychology.

As such, we recommend the close monitoring of the economy and the marketplace, and updating this analysis as appropriate.

Further, the project and investment economics should be “stress tested” to ensure that potential fluctuations in revenue and cost assumptions resulting from alternative scenarios regarding the economy and real estate market conditions will not cause failure.

In addition, we assume that the following will occur in accordance with current expectations:

- Economic, employment, and household growth
- Other forecasts of trends and demographic and economic patterns, including consumer confidence levels
- The cost of development and construction
- Tax laws (i.e., property and income tax rates, deductibility of mortgage interest, and so forth)
- Availability and cost of capital and mortgage financing for real estate developers, owners and buyers
- Competitive projects will be developed as planned (active and future) and that a reasonable stream of supply offerings will satisfy real estate demand
- Major public works projects occur and are completed as planned

Should any of the above change, this analysis should be updated, with the conclusions reviewed accordingly (and possibly revised).

GENERAL LIMITING CONDITIONS

Reasonable efforts have been made to ensure that the data contained in this study reflect accurate and timely information and are believed to be reliable. This study is based on estimates, assumptions, and other information developed by RCLCO from its independent research effort, general knowledge of the industry, and consultations with the client and its representatives. No responsibility is assumed for inaccuracies in reporting by the client, its agent, and representatives or in any other data source used in preparing or presenting this study. This report is based on information that to our knowledge was current as of the date of this report, and RCLCO has not undertaken any update of its research effort since such date.

Our report may contain prospective financial information, estimates, or opinions that represent our view of reasonable expectations at a particular time, but such information, estimates, or opinions are not offered as predictions or assurances that a particular level of income or profit will be achieved, that particular events will occur, or that a particular price will be offered or accepted. Actual results achieved during the period covered by our prospective financial analysis may vary from those described in our report, and the variations may be material. Therefore, no warranty or representation is made by RCLCO that any of the projected values or results contained in this study will be achieved.

Possession of this study does not carry with it the right of publication thereof or to use the name of "Robert Charles Lesser & Co." or "RCLCO" in any manner without first obtaining the prior written consent of RCLCO. No abstracting, excerpting, or summarization of this study may be made without first obtaining the prior written consent of RCLCO. This report is not to be used in conjunction with any public or private offering of securities or other similar purpose where it may be relied upon to any degree by any person other than the client without first obtaining the prior written consent of RCLCO. This study may not be used for any purpose other than that for which it is prepared or for which prior written consent has first been obtained from RCLCO.



APPENDIX: SUPPORTING EXHIBITS

LIST OF EXHIBITS

I. FISCAL IMPACT ANALYSIS 20

Exhibit I-1a Summary of Cumulative Net Fiscal Impact; Subject Site; 2023-2045
Exhibit I-1b Summary of Annual Net Fiscal Impact; Subject Site; At Buildout (In Constant 2023 Dollars)
Exhibit I-2 List of Assumptions; Proposed Use Scenario; August 2023
Exhibit I-3 Allocation of General Fund Revenues; Town of Herndon; FY 2024
Exhibit I-4 Allocation of General Fund Expenditures; Town of Herndon; FY 2024
Exhibit I-5 Select Assessed Value Comparables; Fairfax County, VA; August 2023
Exhibit I-6 Assumed Delivery Schedule; Subject Site; 2025-2045

I. FISCAL IMPACT ANALYSIS

Exhibit I-1a

Summary of Cumulative Net Fiscal Impact
Subject Site
2023-2045

PROPOSED USE SCENARIO		
ESTIMATED REVENUES		DIST.
Property Taxes	$69,929,000	32%
Other Local Taxes	$137,425,000	62%
Business License Revenues	$66,894,000	30%
Meals Taxes	$24,602,000	11%
Transient Occupancy Taxes	$28,093,000	13%
Local Sales Taxes	$9,570,000	4%
Other	$8,266,000	4%
Permits, Fees, and Licenses	$2,532,000	1%
Fines and Forfeitures	$1,092,000	0%
Parks and Recreation Fees	$10,630,000	5%
Total Revenues	$221,608,000	100%
ESTIMATED EXPENDITURES		DIST.
Total Operating Expenditures	$53,067,000	100%
Total Expenditures	$53,067,000	100%
Net Fiscal Impact	$168,541,000	

Source: RCLCO

Exhibit I-1b

Summary of Annual Net Fiscal Impact
Subject Site
At Buildout (In Constant 2023 Dollars)

PROPOSED USE SCENARIO		
ESTIMATED REVENUES		DIST.
Property Taxes	$4,613,000	29%
Other Local Taxes	$10,287,000	65%
Business License Revenues	$5,946,000	38%
Meals Taxes	$2,040,000	13%
Transient Occupancy Taxes	$1,141,000	7%
Local Sales Taxes	$593,000	4%
Other	$568,000	4%
Permits, Fees, and Licenses	$174,000	1%
Fines and Forfeitures	$69,000	0%
Parks and Recreation Fees	$660,000	4%
Total Revenues	$15,803,000	100%
ESTIMATED EXPENDITURES		DIST.
Total Operating Expenditures	$3,433,000	100%
Total Expenditures	$3,433,000	100%
Net Fiscal Impact	$12,370,000	

Source: RCLCO

Exhibit I-2

List of Assumptions
Proposed Use Scenario
August 2023

	VALUE	SOURCE	NOTES
Inflation Rate	0.00%	RCLCO	0.0% to reflect answer in today's (2023) dollars
Existing Property Assessed Value	$214,898,820	Fairfax County	
Land Assessed Value	$71,533,810	Fairfax County	
Building Assessed Value	$143,365,010	Fairfax County	
Real Property Tax Rate	$0.2600 per $100 AV	Town of Herndon Adopted FY 24 Budget	
Penalties and Interest as Percent of Real Estate Taxes	0.5%	Town of Herndon Adopted FY 24 Budget	Assumes fair share as percent of property taxes
Limited-Service Average Daily Rate	$150	RCLCO	
Full-Service Average Daily Rate	$200	RCLCO	
Herndon Transient Occupancy Tax Rate	6.0%	Town of Herndon Website	
Sales Tax Rate	6.00%	State of Virginia	
Sales Tax of Food and Hygiene Items	1.00%	State of Virginia	
Virginia State Sales Tax Rate	4.30%	Fairfax County	
● Allocated to Schools based on School Age Population	1.13%	Fairfax County	
● School Funding - Standards of Quality Formula	0.25%	Fairfax County	
● Transportation	0.90%	Fairfax County	
● Unrestricted state general fund	2.03%	Fairfax County	
Fairfax County Sales Tax Rate	1.00%	Fairfax County	
Herndon Effective Sales Tax Rate	0.011%	Esri; Fairfax County Department of Management and Budget	Sales Tax Formula; based on share of school-aged population in Fairfax County
Special Sales Tax Rate	0.70%	Fairfax County	

Exhibit I-2

List of Assumptions
Proposed Use Scenario
August 2023

	VALUE	SOURCE	NOTES
Federal Research and Development	$0.0300 per $100 in Gross Receipts	Town of Herndon Adopted FY 24 Budget	
Wholesale Merchants	$0.0500 per $100 in Gross Receipts	Town of Herndon Adopted FY 24 Budget	
Builders and Developers	$0.0500 per $100 in Gross Receipts	Town of Herndon Adopted FY 24 Budget	
Real Estate Brokers	$0.4000 per $100 in Gross Receipts	Town of Herndon Adopted FY 24 Budget	
Contractors	$0.1300 per $100 in Gross Receipts	Town of Herndon Adopted FY 24 Budget	
Retail Merchants	$0.1300 per $100 in Gross Receipts	Town of Herndon Adopted FY 24 Budget	
Commissioned Merchants	$0.2700 per $100 in Gross Receipts	Town of Herndon Adopted FY 24 Budget	
Retail/Wholesale Merchants	$0.1300 per $100 in Gross Receipts	Town of Herndon Adopted FY 24 Budget	
Restaurants	$0.1300 per $100 in Gross Receipts	Town of Herndon Adopted FY 24 Budget	
Other Business and Personal Services	$0.2100 per $100 in Gross Receipts	Town of Herndon Adopted FY 24 Budget	
Repair Services	$0.1300 per $100 in Gross Receipts	Town of Herndon Adopted FY 24 Budget	
Money Lenders	$0.2000 per $100 in Gross Receipts	Town of Herndon Adopted FY 24 Budget	
Utilities	$0.5000 per $100 in Gross Receipts	Town of Herndon Adopted FY 24 Budget	
Telephone Companies	$0.5000 per $100 in Gross Receipts	Town of Herndon Adopted FY 24 Budget	
Amusements	$0.3600 per $100 in Gross Receipts	Town of Herndon Adopted FY 24 Budget	
Hotels/Motels	$0.2600 per $100 in Gross Receipts	Town of Herndon Adopted FY 24 Budget	
Professional and Specialized	$0.4000 per $100 in Gross Receipts	Town of Herndon Adopted FY 24 Budget	
BPOL Rate for Construction	$0.0900 per $100 in Gross Receipts	RCLCO	Assumes 50% Builders and Developers, 50% Contractors
BPOL Rate for Retail	$0.1485 per $100 in Gross Receipts	RCLCO	Assumes 80% Retail Merchants, 5% Commissioned Merchants, 5% Retail/Wholesale Merchants, 5% Repair Services, and 5% Amusements
BPOL Rate for Restaurant	$0.1300 per $100 in Gross Receipts	RCLCO	Assumes 100% Restaurants
BPOL Rate for Office	$0.3515 per $100 in Gross Receipts	RCLCO	Assumes 75% Professional and Specialized, 15% Other Business and Personal Services, 10% Money Lenders, and 5% Real Estate Brokers
BPOL Rate for Hotel	$0.2600 per $100 in Gross Receipts	RCLCO	Assumes 100% Hotels/Motels
BPOL Rate for Self-Storage	$0.2100 per $100 in Gross Receipts	RCLCO	Assumes 100% Other Business and Personal Services
Subject Site Restaurant Sales Per Square Foot	$450 per SF	RCLCO	
Subject Site Grocery & Drug Sales Per Square Foot	$500 per SF	RCLCO	
Subject Site Entertainment & Fitness Sales Per Square Foot	$250 per SF	RCLCO	
Subject Site Services Sales Per Square Foot	$400 per SF	RCLCO	
Subject Site Hard & Soft Goods Sales Per Square Foot	$375 per SF	RCLCO	
Subject Site Self-Storage Annual Rent Per Square Foot	$24 per SF	RCLCO	
Herndon Meals Tax	3.75%	Town of Herndon Website	
% of Employee Income Spent on Day-Time Meals	1.6%	ICSC; RCLCO	
% of Employee Day-Time Meal Spending in Herndon	40.0%	RCLCO	
% of Resident Income Spent on Restaurants	3.5%	Esri; RCLCO	
% of Resident Restaurant Spending in Herndon	40.0%	RCLCO	

Exhibit I-2

List of Assumptions
Proposed Use Scenario
August 2023

	VALUE	SOURCE	NOTES
% of Employee Income Spent on Day-Time Retail	2.2%	ICSC; RCLCO	
% of Employee Day-Time Retail Spending in Fairfax County	75.0%	RCLCO	
% of Employee Retail Spending in Herndon	35.0%	RCLCO	
% of Resident Income Spent on Retail	23.0%	Esri; RCLCO	
% of Resident Retail Spending in Fairfax County	75.0%	RCLCO	
% of Resident Retail Spending in Herndon	50.0%	RCLCO	
Residents in Herndon	24,574	Town of Herndon Adopted FY 24 Budget	
Employees in Herndon	22,045	ESRI	
Total	46,619	Calculation	
% Residents in Herndon	52.71%	Calculation	
% Employees in Herndon	47.29%	Calculation	
Residents per Employee in Herndon	1.11	Calculation	
Office Square Feet per Employee	438	Moody's; CoStar	Based on ratio of occupied office space in the Washington, D.C., MSA and the number of office-using employees
2022 Virginia Population Age: 5-19	1,622,203	ESRI	
2022 Fairfax County Population Age: 5-19	225,189	ESRI	
2022 Herndon Population Age: 5-19	4,791	ESRI	
% Herndon of Fairfax County Population Age 5-19	2.13%	Calculation	
Construction Cost			
Mid-Rise Apartment	$180 / SF	Marshall & Swift; RCLCO	
High-Rise Apartment	$290 / SF	Marshall & Swift; RCLCO	
Rental Townhome	$130 / SF	Marshall & Swift; RCLCO	
Townhome	$135 / SF	Marshall & Swift; RCLCO	
Two-Over-Two	$160 / SF	Marshall & Swift; RCLCO	
Flat	$180 / SF	Marshall & Swift; RCLCO	
Limited-Service Hotel	$195 / SF	Marshall & Swift; RCLCO	
Full-Service Hotel	$225 / SF	Marshall & Swift; RCLCO	
Corporate Office	$360 / SF	Marshall & Swift; RCLCO	
Creative Office	$285 / SF	Marshall & Swift; RCLCO	
Grocery & Drug	$170 / SF	Marshall & Swift; RCLCO	
Restaurant	$295 / SF	Marshall & Swift; RCLCO	
Entertainment & Fitness	$195 / SF	Marshall & Swift; RCLCO	
Services	$140 / SF	Marshall & Swift; RCLCO	
Hard & Soft Goods	$195 / SF	Marshall & Swift; RCLCO	
Self-Storage	$110 / SF	Marshall & Swift; RCLCO	

Exhibit I-2

List of Assumptions
Proposed Use Scenario
August 2023

	VALUE	SOURCE	NOTES
Construction Costs Attributable to Materials	50%	RCLCO	
% Materials Purchased in Fairfax County	15%	Esri; RCLCO	Based on share of building materials and supplies spending in the Washington region
Occupancy Rate			
Mid-Rise Apartment	93.5%	Loudoun County 2020 Fiscal Impact Guidelines	
High-Rise Apartment	93.5%	Loudoun County 2020 Fiscal Impact Guidelines	
Rental Townhome	97.5%	Loudoun County 2020 Fiscal Impact Guidelines	
Townhome	97.5%	Loudoun County 2020 Fiscal Impact Guidelines	
Two-Over-Two	94.4%	Loudoun County 2020 Fiscal Impact Guidelines	
Flat	93.5%	Loudoun County 2020 Fiscal Impact Guidelines	
Limited-Service Hotel	75.0%	RCLCO	
Full-Service Hotel	70.0%	RCLCO	
Corporate Office	90.0%	Loudoun County 2020 Fiscal Impact Guidelines	
Creative Office	90.0%	Loudoun County 2020 Fiscal Impact Guidelines	
Grocery & Drug	100.0%	RCLCO	
Restaurant	94.0%	Loudoun County 2020 Fiscal Impact Guidelines	
Entertainment & Fitness	94.0%	Loudoun County 2020 Fiscal Impact Guidelines	
Services	94.0%	Loudoun County 2020 Fiscal Impact Guidelines	
Hard & Soft Goods	94.0%	Loudoun County 2020 Fiscal Impact Guidelines	
Self-Storage	100.0%	RCLCO	
Residential Pricing			
Mid-Rise Apartment	$2,425 / Month	RCLCO	Based on Market Analysis for TRG
High-Rise Apartment	$2,850 / Month	RCLCO	Based on Market Analysis for TRG
Rental Townhome	$3,750 / Month	RCLCO	Based on Market Analysis for TRG
Townhome	$800,000	RCLCO	Based on Market Analysis for TRG
Two-Over-Two	$650,000	RCLCO	Based on Market Analysis for TRG
Flat	$575,000	RCLCO	Based on Market Analysis for TRG
Household Size			
Mid-Rise Apartment	2.06	Loudoun County 2020 Fiscal Impact Guidelines	
High-Rise Apartment	2.06	Loudoun County 2020 Fiscal Impact Guidelines	
Rental Townhome	3.12	Loudoun County 2020 Fiscal Impact Guidelines	
Townhome	3.12	Loudoun County 2020 Fiscal Impact Guidelines	
Two-Over-Two	2.41	Loudoun County 2020 Fiscal Impact Guidelines	
Flat	2.06	Loudoun County 2020 Fiscal Impact Guidelines	

Exhibit I-2

List of Assumptions
Proposed Use Scenario
August 2023

	VALUE	SOURCE	NOTES
Student Generation Rate			
Mid-Rise Apartment	0.32	Loudoun County 2020 Fiscal Impact Guidelines	
High-Rise Apartment	0.32	Loudoun County 2020 Fiscal Impact Guidelines	
Rental Townhome	0.72	Loudoun County 2020 Fiscal Impact Guidelines	
Townhome	0.72	Loudoun County 2020 Fiscal Impact Guidelines	
Two-Over-Two	0.48	Loudoun County 2020 Fiscal Impact Guidelines	
Flat	0.32	Loudoun County 2020 Fiscal Impact Guidelines	
Avg. Household Income			
Mid-Rise Apartment	$97,000	RCLCO	Assumes 30% of income is spent on housing
High-Rise Apartment	$114,000	RCLCO	Assumes 30% of income is spent on housing
Rental Townhome	$150,000	RCLCO	Assumes 30% of income is spent on housing
Townhome	$165,000	RCLCO	Assumes 25% of income is spent on mortgage payments, at a rate of 5% and with a down-payment of 20%
Two-Over-Two	$134,000	RCLCO	Assumes 25% of income is spent on mortgage payments, at a rate of 5% and with a down-payment of 20%
Flat	$119,000	RCLCO	Assumes 25% of income is spent on mortgage payments, at a rate of 5% and with a down-payment of 20%
Employees Per SF			
Mid-Rise Apartment	0.03 / Unit	RCLCO	
High-Rise Apartment	0.03 / Unit	RCLCO	
Rental Townhome	0.03 / Unit	RCLCO	
Limited-Service Hotel	0.80 / Key	RCLCO	
Full-Service Hotel	1.10 / Key	RCLCO	
Corporate Office	195 / SF	Loudoun County 2020 Fiscal Impact Guidelines	
Creative Office	214 / SF	Loudoun County 2020 Fiscal Impact Guidelines	
Grocery & Drug	325 / SF	Loudoun County 2020 Fiscal Impact Guidelines	
Restaurant	325 / SF	Loudoun County 2020 Fiscal Impact Guidelines	
Entertainment & Fitness	325 / SF	Loudoun County 2020 Fiscal Impact Guidelines	
Services	325 / SF	Loudoun County 2020 Fiscal Impact Guidelines	
Hard & Soft Goods	325 / SF	Loudoun County 2020 Fiscal Impact Guidelines	
Self-Storage	850 / SF	Loudoun County 2020 Fiscal Impact Guidelines	

Exhibit I-2

List of Assumptions
Proposed Use Scenario
August 2023

	VALUE	SOURCE	NOTES
Gross Receipts Per Employee			
Mid-Rise Apartment	$132,000	2017 Economic Census Core Statistics; RCLCO	
High-Rise Apartment	$132,000	2017 Economic Census Core Statistics; RCLCO	
Rental Townhome	$132,000	2017 Economic Census Core Statistics; RCLCO	
Limited-Service Hotel	$166,000	2017 Economic Census Core Statistics; RCLCO	
Full-Service Hotel	$166,000	2017 Economic Census Core Statistics; RCLCO	
Corporate Office	$295,000	2017 Economic Census Core Statistics; RCLCO	
Creative Office	$295,000	2017 Economic Census Core Statistics; RCLCO	
Grocery & Drug	$380,000	2017 Economic Census Core Statistics; RCLCO	
Restaurant	$84,000	2017 Economic Census Core Statistics; RCLCO	
Entertainment & Fitness	$111,000	2017 Economic Census Core Statistics; RCLCO	
Services	$99,000	2017 Economic Census Core Statistics; RCLCO	
Hard & Soft Goods	$190,000	2017 Economic Census Core Statistics; RCLCO	
Self-Storage	$113,000	2017 Economic Census Core Statistics; RCLCO	
Avg. Employee Salary			
Mid-Rise Apartment	$62,000	2017 Economic Census Core Statistics; RCLCO	
High-Rise Apartment	$62,000	2017 Economic Census Core Statistics; RCLCO	
Rental Townhome	$62,000	2017 Economic Census Core Statistics; RCLCO	
Limited-Service Hotel	$30,000	2017 Economic Census Core Statistics; RCLCO	
Full-Service Hotel	$30,000	2017 Economic Census Core Statistics; RCLCO	
Corporate Office	$120,000	2017 Economic Census Core Statistics; RCLCO	
Creative Office	$120,000	2017 Economic Census Core Statistics; RCLCO	
Grocery & Drug	$36,000	2017 Economic Census Core Statistics; RCLCO	
Restaurant	$23,000	2017 Economic Census Core Statistics; RCLCO	
Entertainment & Fitness	$14,000	2017 Economic Census Core Statistics; RCLCO	
Services	$31,000	2017 Economic Census Core Statistics; RCLCO	
Hard & Soft Goods	$38,000	2017 Economic Census Core Statistics; RCLCO	
Self-Storage	$43,000	2017 Economic Census Core Statistics; RCLCO	

Exhibit I-2

List of Assumptions
Proposed Use Scenario
August 2023

	VALUE	SOURCE	NOTES
Assessed Value of New Development			
Mid-Rise Apartment	$285,000 / Unit	Fairfax County; RCLCO	Based on assessed value of other new properties; see Exhibit I-5
High-Rise Apartment	$353,000 / Unit	Fairfax County; RCLCO	Based on assessed value of other new properties; see Exhibit I-5
Rental Townhome	$391,000 / Unit	Fairfax County; RCLCO	Based on assessed value of other new properties; see Exhibit I-5
Townhome	$800,000 / Unit	RCLCO	Based on projected sales prices of homes
Two-Over-Two	$650,000 / Unit	RCLCO	Based on projected sales prices of homes
Flat	$575,000 / Unit	RCLCO	Based on projected sales prices of homes
Limited-Service Hotel	$102,000 / Key	Fairfax County; RCLCO	Based on assessed value of other new properties; see Exhibit I-5
Full-Service Hotel	$138,000 / Key	Fairfax County; RCLCO	Based on assessed value of other new properties; see Exhibit I-5
Corporate Office	$525 / GSF	Fairfax County; RCLCO	Based on assessed value of other new properties; see Exhibit I-5
Creative Office	$243 / GSF	Fairfax County; RCLCO	Based on assessed value of other new properties; see Exhibit I-5
Grocery & Drug	$368 / GSF	Fairfax County; RCLCO	Based on assessed value of other new properties; see Exhibit I-5
Restaurant	$368 / GSF	Fairfax County; RCLCO	Based on assessed value of other new properties; see Exhibit I-5
Entertainment & Fitness	$368 / GSF	Fairfax County; RCLCO	Based on assessed value of other new properties; see Exhibit I-5
Services	$368 / GSF	Fairfax County; RCLCO	Based on assessed value of other new properties; see Exhibit I-5
Hard & Soft Goods	$368 / GSF	Fairfax County; RCLCO	Based on assessed value of other new properties; see Exhibit I-5
Self-Storage	$168 / GSF	Fairfax County; RCLCO	Based on assessed value of other new properties; see Exhibit I-5

Source: RCLCO

Exhibit I-3

Allocation of General Fund Revenues
Town of Herndon
FY 2024

Employees	22,045	47%
Residents	24,574	53%
Total	46,619	

	FY23 ADOPTED	ALLOCATION UNALLOCATED	EMPLOYEE	RESIDENT	ALLOCATED REVENUES PER EMPLOYEE	PER RESIDENT
PROPERTY TAXES						
Real Property Tax	$13,869,500	100%	0%	0%	$0.00	$0.00
Public Service Corp Tax	$320,000	100%	0%	0%	$0.00	$0.00
Elderly Tax Relief	-$125,000	100%	0%	0%	$0.00	$0.00
Penalties and Interest	$56,400	100%	0%	0%	$0.00	$0.00
TOTAL PROPERTY TAX	$14,120,900	100%	0%	0%	$0.00	$0.00
OTHER LOCAL TAXES						
Consumer Utility Tax	$775,000	0%	47%	53%	$16.62	$16.62
Rights of Way Use Fee	$120,000	0%	47%	53%	$2.57	$2.57
Cigarette Tax	$165,000	0%	47%	53%	$3.54	$3.54
Transient Occupancy Tax	$1,642,000	100%	0%	0%	$0.00	$0.00
Meals Tax	$3,500,000	100%	0%	0%	$0.00	$0.00
Bank Stock Tax	$425,000	0%	47%	53%	$9.12	$9.12
Cable TV PEG Fees	$145,000	0%	47%	53%	$3.11	$3.11
Business Licenses - BPOL	$5,600,000	100%	0%	0%	$0.00	$0.00
Utility Consumption Tax	$83,000	0%	47%	53%	$1.78	$1.78
Vehicle License Fee	$420,000	0%	47%	53%	$9.01	$9.01
Local Sales Tax	$2,520,000	0%	0%	100%	$0.00	$102.55
TOTAL OTHER LOCAL TAX	$15,395,000	70%	7%	24%	$45.75	$148.30
PERMITS, FEES, LICENSES						
Residential Parking Permits	$300	0%	0%	100%	$0.00	$0.01
Planning Fees	$130,000	0%	47%	53%	$2.79	$2.79
VA Storm Water Mgmt Permit Fee	$4,000	0%	47%	53%	$0.09	$0.09
Bldg Inspect Fees/Permits	$504,000	0%	47%	53%	$10.81	$10.81
Right of Way Permit Fee	$15,000	0%	47%	53%	$0.32	$0.32
TOTAL PERMITS, FEES, LICENSES	$653,300	0%	47%	53%	$14.01	$14.02

Exhibit I-3

Allocation of General Fund Revenues
Town of Herndon
FY 2024

Employees	22,045	47%
Residents	24,574	53%
Total	46,619	

	FY23 ADOPTED	ALLOCATION			ALLOCATED REVENUES PER EMPLOYEE	ALLOCATED REVENUES PER RESIDENT
		UNALLOCATED	EMPLOYEE	RESIDENT		
FINES AND FORFEITURES						
Fines/Local (Parking)	$29,000	0%	10%	90%	$0.13	$1.06
Fines/Fairfax County Court	$235,000	0%	10%	90%	$1.07	$8.61
Fines/Court Maintenance Fees	$5,000	0%	10%	90%	$0.02	$0.18
Fines/E-Summons Fees	$20,000	0%	10%	90%	$0.09	$0.73
Fines/Zoning Fines	$1,500	0%	10%	90%	$0.01	$0.05
TOTAL FINES AND FORFEITURES	$290,500	0%	11%	97%	$1.32	$10.64
USE OF MONEY & PROPERTY						
Interest on Investments	$1,298,000	N/A	N/A	N/A	$0.00	$0.00
Interest on SNAP Investments	$39,740	N/A	N/A	N/A	$0.00	$0.00
Interest on Notes Rec	$0	N/A	N/A	N/A	$0.00	$0.00
Interest Drug Asset Forfeiture	$0	N/A	N/A	N/A	$0.00	$0.00
Escrow Bank Interest	$0	N/A	N/A	N/A	$0.00	$0.00
Adjustment for FMV	-$7,900	N/A	N/A	N/A	$0.00	$0.00
Rental Income	$8,408	N/A	N/A	N/A	$0.00	$0.00
Interest on Lease	$8,642	N/A	N/A	N/A	$0.00	$0.00
TOTAL USE OF MONEY & PROPERTY	$1,346,890	N/A	N/A	N/A	$0.00	$0.00

Exhibit I-3

Allocation of General Fund Revenues
Town of Herndon
FY 2024

Employees	22,045	47%
Residents	24,574	53%
Total	46,619	

	FY23 ADOPTED	ALLOCATION UNALLOCATED	EMPLOYEE	RESIDENT	ALLOCATED REVENUES PER EMPLOYEE	PER RESIDENT
CHARGES FOR SERVICES						
Franchise Lease	$75,110	0%	100%	0%	$3.41	$0.00
Special Refuse Collection	$25,000	0%	0%	100%	$0.00	$1.02
Recycle Collection Fee	$395,000	0%	0%	100%	$0.00	$16.07
Recreation Programs	$1,475,475	0%	0%	100%	$0.00	$60.04
Admission Fees	$174,300	0%	0%	100%	$0.00	$7.09
Park Operation	$31,000	0%	0%	100%	$0.00	$1.26
Herndon Festival	$305,000	0%	0%	100%	$0.00	$12.41
Concession	$5,500	0%	0%	100%	$0.00	$0.22
P&R Rental Income	$138,000	0%	0%	100%	$0.00	$5.62
Tennis/Multi-Use Facility	$195,000	0%	0%	100%	$0.00	$7.94
UB Penalties & Late Payments	$0	0%	0%	100%	$0.00	$0.00
Annual Parking Space Maint Fee	$15,522	0%	0%	100%	$0.00	$0.63
Newspaper Sales	$10,000	0%	0%	100%	$0.00	$0.41
Quasi Revenue from Water&Sewer	$0	0%	0%	100%	$0.00	$0.00
Quasi Revenue From Cemetery	$0	0%	0%	100%	$0.00	$0.00
Quasi Revenue From Golf Fund	$0	0%	0%	100%	$0.00	$0.00
Lease Revenue	$430,127	0%	0%	100%	$0.00	$17.50
TOTAL CHARGES FOR SERVICES	$3,275,034	0%	3%	97%	$3.41	$130.22
MISCELLANEOUS REVENUES						
VRSA Safety Grant	$4,000	N/A	N/A	N/A	$0.00	$0.00
Not Otherwise Classified	$10,000	N/A	N/A	N/A	$0.00	$0.00
Sponsorships and Donations	$0	N/A	N/A	N/A	$0.00	$0.00
TOTAL MISCELLANEOUS REVENUES	$14,000	0%	0%	0%	$0.00	$0.00

Exhibit I-3

Allocation of General Fund Revenues
Town of Herndon
FY 2024

Employees	22,045	47%
Residents	24,574	53%
Total	46,619	

	FY23 ADOPTED	ALLOCATION UNALLOCATED	EMPLOYEE	RESIDENT	ALLOCATED REVENUES PER EMPLOYEE	PER RESIDENT
ADDITIONAL REVENUES						
INTERGOV REVENUES						
FFX County Grants	$140,000	N/A	N/A	N/A	$0.00	$0.00
State-Vehicle Rental Tax	$50,000	N/A	N/A	N/A	$0.00	$0.00
State-5% Communications Tax	$1,240,000	N/A	N/A	N/A	$0.00	$0.00
State-ICAC Grant	$40,000	N/A	N/A	N/A	$0.00	$0.00
State-Police 599 Funds	$640,000	N/A	N/A	N/A	$0.00	$0.00
State-LOLE Block Grant	$5,000	N/A	N/A	N/A	$0.00	$0.00
State-Seized Assets	$0	N/A	N/A	N/A	$0.00	$0.00
State-Fire Progams Funds	$90,000	N/A	N/A	N/A	$0.00	$0.00
State-VDOT Street Const/Maint	$2,100,000	N/A	N/A	N/A	$0.00	$0.00
State-Litter Control Grant	$7,800	N/A	N/A	N/A	$0.00	$0.00
State-Forestry Grant	$0	N/A	N/A	N/A	$0.00	$0.00
State-Dept of Emergency Mgmt	$0	N/A	N/A	N/A	$0.00	$0.00
State-VDOT Revenue Sharing	$0	N/A	N/A	N/A	$0.00	$0.00
State-CTB Paving Grant	$0	N/A	N/A	N/A	$0.00	$0.00
State-Commission for Arts Grnt	$4,500	N/A	N/A	N/A	$0.00	$0.00
Fed Grnt-Bullet Proof Vests	$4,995	N/A	N/A	N/A	$0.00	$0.00
Federal Grnt-Byrne Jag	$0	N/A	N/A	N/A	$0.00	$0.00
Federal Grnt-DMV Speed	$50,755	N/A	N/A	N/A	$0.00	$0.00
Federal Grnt-DMV Alcohol	$15,770	N/A	N/A	N/A	$0.00	$0.00
Federal Grant-HIDTA	$20,000	N/A	N/A	N/A	$0.00	$0.00
Fed thru Vienna-Gang Task Frc	$0	N/A	N/A	N/A	$0.00	$0.00
Federal Grnt-FEMA	$0	N/A	N/A	N/A	$0.00	$0.00
Federal Grant-CARES Act	$0	N/A	N/A	N/A	$0.00	$0.00
Federal Grnt-Seized Assets	$0	N/A	N/A	N/A	$0.00	$0.00
Federal Grant-CD Bloc Grant	$167,000	N/A	N/A	N/A	$0.00	$0.00
TOTAL INTERGOV REVENUES	$4,575,820	N/A	N/A	N/A	$0.00	$0.00

Exhibit I-3

Allocation of General Fund Revenues
Town of Herndon
FY 2024

Employees	22,045	47%
Residents	24,574	53%
Total	46,619	

	FY23 ADOPTED	ALLOCATION UNALLOCATED	EMPLOYEE	RESIDENT	ALLOCATED REVENUES PER EMPLOYEE	PER RESIDENT
OTHER FINANCE SOURCE						
Surplus/Obsolete Property	$50,000	N/A	N/A	N/A	$0.00	$0.00
Other Sources of Proceeds	$0	N/A	N/A	N/A	$0.00	$0.00
Insurance Recoveries	$50,000	N/A	N/A	N/A	$0.00	$0.00
Transfer In from IS Improv Fnd	$0	N/A	N/A	N/A	$0.00	$0.00
Use of Fund Balance	$1,002,167	N/A	N/A	N/A	$0.00	$0.00
Other Sources Lease Fin GASB87	$0	N/A	N/A	N/A	$0.00	$0.00
TOTAL OTHER FINANCE SOURCE	$1,102,167	N/A	N/A	N/A	$0.00	$0.00
TOTAL GENERAL FUND REVENUES	$40,773,611				$64	$303

Source: Adopted Budget Fiscal Year 2023; RCLCO

Exhibit I-4

Allocation of General Fund Expenditures
Town of Herndon
FY 2024

Employees	22,045	47.3%
Residents	24,574	52.7%
Total	46,619	

		APPLICABLE TO:				APPLICABLE TO:		ALLOCATION			
	FY 24 ADOPTED	NEW DEVELOPMENT, GENERALLY	SUBJECT SITE, SPECIFICALLY	SUBJECT SITE	FY 24 ADOPTED	EMPLOYEES	RESIDENTS	EMPLOYEE	RESIDENT	ALLOCATED EXPENSES PER EMPLOYEE	ALLOCATED EXPENSES PER RESIDENT
LEGISLATIVE EXPENSES											
Personnel Services	$668,237	10%	100%	10%	$66,824	No	Yes	0%	100%	$0.00	$2.72
Operations and Maint	$233,287	10%	100%	10%	$23,329	No	Yes	0%	100%	$0.00	$0.95
TOTAL LEGISLATIVE EXPENSES	$901,524	10%	100%	10%	$90,152					$0.00	$3.67
ADMINISTRATION EXPENSES											
Personnel Services	$2,328,278	25%	100%	25%	$582,070	No	Yes	0%	100%	$0.00	$23.69
Operations and Maint	$1,403,089	50%	100%	50%	$701,545	No	Yes	0%	100%	$0.00	$28.55
Capital Outlay	$71,750	0%	100%	0%	$0	No	No	N/A	N/A	$0.00	$0.00
TOTAL ADMINISTRATION EXPENSES	$3,803,117	34%	100%	34%	$1,283,614					$0.00	$52.23
PARKS AND RECREATION EXPENSES											
Administration	$752,181	25%	100%	25%	$188,045	No	Yes	0%	100%	$0.00	$7.65
Recreation Programs	$1,614,713	100%	100%	100%	$1,614,713	No	Yes	0%	100%	$0.00	$65.71
Community Center Operations	$1,266,501	90%	100%	90%	$1,139,851	No	Yes	0%	100%	$0.00	$46.38
Aquatics Programs & Operations	$869,187	25%	100%	25%	$217,297	No	Yes	0%	100%	$0.00	$8.84
Park Ops & Development	$200,348	100%	100%	100%	$200,348	No	Yes	0%	100%	$0.00	$8.15
TOTAL PARKS AND RECREATION EXPENSES	$4,702,930	71%	100%	71%	$3,360,254					$0.00	$136.74
FINANCE EXPENSES											
Revenue Operations	$1,658,514	50%	100%	50%	$829,257	Yes	Yes	47%	53%	$17.79	$17.79
Administration	$172,656	25%	100%	25%	$43,164	Yes	Yes	47%	53%	$0.93	$0.93
TOTAL FINANCE EXPENSES	$1,831,170	48%	100%	48%	$872,421					$18.71	$18.71
COMMUNITY DEVELOPMENT EXPENSES											
Community Planning	$2,464,108	50%	100%	50%	$1,232,054	Yes	Yes	47%	53%	$26.43	$26.43
Community Inspections	$251,869	75%	100%	75%	$188,902	Yes	Yes	47%	53%	$4.05	$4.05
TOTAL COMMUNITY DEVELOPMENT EXPENSES	$2,715,977	52%	100%	52%	$1,420,956					$30.48	$30.48

Exhibit I-4

Allocation of General Fund Expenditures
Town of Herndon
FY 2024

Employees	22,045	47.3%
Residents	24,574	52.7%
Total	46,619	

		APPLICABLE TO:				APPLICABLE TO:		ALLOCATION			
	FY 24 ADOPTED	NEW DEVELOPMENT, GENERALLY	SUBJECT SITE, SPECIFICALLY	SUBJECT SITE	FY 24 ADOPTED	EMPLOYEES	RESIDENTS	EMPLOYEE	RESIDENT	ALLOCATED EXPENSES PER EMPLOYEE	ALLOCATED EXPENSES PER RESIDENT
POLICE EXPENSES											
Personnel Services	$9,769,694	25%	100%	25%	$2,442,424	Yes	Yes	47%	53%	$52.39	$52.39
Operations and Main	$904,700	75%	100%	75%	$678,525	Yes	Yes	47%	53%	$14.55	$14.55
Capital Outlay	$241,400	25%	100%	25%	$60,350	Yes	Yes	47%	53%	$1.29	$1.29
TOTAL POLICE EXPENSES	$10,915,794	29%	100%	29%	$3,181,299					$68.24	$68.24
PUBLIC WORKS EXPENSES											
Administration	$1,175,720	25%	100%	25%	$293,930	Yes	Yes	47%	53%	$6.30	$6.30
Engineering	$933,766	50%	100%	50%	$466,883	Yes	Yes	47%	53%	$10.01	$10.01
Program & Project Management	$725,012	50%	100%	50%	$362,506	No	Yes	0%	100%	$0.00	$14.75
Building Inspections	$715,031	100%	100%	100%	$715,031	Yes	Yes	47%	53%	$15.34	$15.34
Building Maintenance	$1,695,042	100%	0%	0%	$0	No	No	N/A	N/A	$0.00	$0.00
Grounds Maintenance	$1,206,341	100%	10%	10%	$120,634	Yes	Yes	47%	53%	$2.59	$2.59
Street Maintenance & Construct	$2,001,253	100%	100%	100%	$2,001,253	Yes	Yes	47%	53%	$42.93	$42.93
Refuse/Recycling	$2,254,308	100%	9%	9%	$202,066	No	Yes	0%	100%	$0.00	$8.22
General Services	$1,796,421	100%	100%	100%	$1,796,421	No	Yes	0%	100%	$0.00	$73.10
Traffic Engineering	$440,445	100%	100%	100%	$440,445	Yes	Yes	47%	53%	$9.45	$9.45
Right of Way Inspections	$433,000	100%	100%	100%	$433,000	Yes	Yes	47%	53%	$9.29	$9.29
TOTAL PUBLIC WORKS EXPENSES	$13,376,339	87%	64%	51%	$6,832,169					$95.91	$191.99
TOWN ATTORNEY EXPENSES											
Personnel Services	$733,174	50%	100%	50%	$366,587	Yes	Yes	47%	53%	$7.86	$7.86
Operations and Maint	$129,395	50%	100%	50%	$64,698	Yes	Yes	47%	53%	$1.39	$1.39
Capital Outlay	$0	0%	0%	0%	$0	No	No	N/A	N/A	$0.00	$0.00
TOTAL TOWN ATTORNEY EXPENSES	$862,569	50%	100%	50%	$431,285					$9.25	$9.25

Exhibit I-4

Allocation of General Fund Expenditures
Town of Herndon
FY 2024

Employees	22,045	47.3%
Residents	24,574	52.7%
Total	46,619	

		APPLICABLE TO:				APPLICABLE TO:		ALLOCATION			
	FY 24 ADOPTED	NEW DEVELOPMENT, GENERALLY	SUBJECT SITE, SPECIFICALLY	SUBJECT SITE	FY 24 ADOPTED	EMPLOYEES	RESIDENTS	EMPLOYEE	RESIDENT	ALLOCATED EXPENSES PER EMPLOYEE	ALLOCATED EXPENSES PER RESIDENT
TRANSFERS AND RESERVES EXPENSES											
Grants	$19,738	0%	0%	0%	$0	No	No	N/A	N/A	$0.00	$0.00
Commercial Leases	$149,500	0%	0%	0%	$0	No	No	N/A	N/A	$0.00	$0.00
CARES ACT	$0	0%	0%	0%	$0	No	No	N/A	N/A	$0.00	$0.00
Transfers	$250,000	0%	0%	0%	$0	No	No	N/A	N/A	$0.00	$0.00
Non-Departmental	-$32,483	0%	0%	0%	$0	No	No	N/A	N/A	$0.00	$0.00
Debt Service	$1,277,434	0%	0%	0%	$0	No	No	N/A	N/A	$0.00	$0.00
TOTAL TRANSFERS AND RESERVES EXPENSES	$1,664,189	0%	0%	0%	$0					$0.00	$0.00
TOTAL GENERAL FUND EXPENDITURES	$40,773,609	55%	84%	43%	$17,472,149					$222.59	$511.31

Source: Adopted Budget Fiscal Year 2023; RCLCO

Exhibit I-5

Select Assessed Value Comparables
Fairfax County, VA
August 2023

MAP KEY	PARCEL NUMBER	NAME	ADDRESS	YEAR BUILT	SF	UNITS	ASSESSED VALUE LAND	ASSESSED VALUE IMPROVED	ASSESSED VALUE TOTAL	TOTAL / SF	TOTAL / UNIT	WEIGHT
MID-RISE APARTMENT										$319	$285,020	100%
1	0164 27 0002	The Ian	2249 Woodland Grove Pl	2021	408,315	375	$13,500,000	$91,755,240	$105,255,240	$258	$280,681	14%
2	0174 141A0003A	The Point at Reston	1925 Roland Clarke Pl	2021	291,650	306	$12,540,950	$102,830,520	$115,371,470	$396	$377,031	14%
3	0174 12 0011B1	Russell at Reston Station	11500 Commerce Park Dr	2020	221,000	260	$9,880,000	$81,391,040	$91,271,040	$413	$351,042	14%
4	0174 19 A	The Aperture	11410 Reston Station Blvd	2017	336,800	412	$22,228,800	$94,332,360	$116,561,160	$346	$282,915	14%
5	0183 06 0006A	Faraday Park	11201 Reston Station Blvd	2021	252,680	407	$10,440,960	$66,621,620	$77,062,580	$305	$189,343	14%
6	0173 08 0001C3	The Edmund	2025 Fulton Pl	2021	336,465	353	$16,340,000	$81,694,870	$98,034,870	$291	$277,719	14%
7	0163 01 0004D1	Passport Apartments	13455 Sunrise Valley Dr	2022	359,900	344	$10,322,630	$71,001,600	$81,324,230	$226	$236,408	14%
HIGH-RISE APARTMENT										$344	$352,675	100%
1	0172 01 0024	Harrison at Reston Town Center	1800 Jonathan Way	2015	380,000	360	$18,662,400	$120,183,590	$138,845,990	$365	$385,683	25%
2	0173 20 0300	Avant at Reston Town Center	12025 Town Square St	2013	329,195	359	$17,232,000	$108,280,450	$125,512,450	$381	$349,617	25%
3	0171 37 0004	The Signature	11850 Freedom Dr	2018	517,783	508	$24,424,410	$160,332,890	$184,757,300	$357	$363,695	25%
4	0174 01 0007B & 0174 37 B	Exo Reston	1900 Oracle Way	2018	520,151	457	$21,660,220	$120,788,280	$142,448,500	$274	$311,704	25%
RENTAL TOWNHOME										$242	$391,407	100%
1	0162 02 0315	The Townes at Herndon Center	508 Pride Ave	2002	349,520	216	$11,449,840	$73,094,090	$84,543,930	$242	$391,407	100%
LIMITED-SERVICE HOTEL										$153	$101,954	100%
1	0183 08 0010A3	Homewood Suites by Hilton Reston	1735 Business Center Dr	2020	82,242	135	$2,955,000	$11,303,300	$14,258,300	$173	$105,617	60%
2	0154 05 0004A	Courtyard Dulles Airport Herndon	13715 Sayward Blvd	2009	106,260	187	$4,968,000	$3,285,400	$8,253,400	$78	$44,136	10%
3	0171 02 0016	Hampton by Hilton Inn & Suites Herndon-Reston	435 Herndon Pky	2007	117,184	96	$2,592,000	$6,998,110	$9,590,110	$82	$99,897	10%
4	1013 01 0096	TownPlace Suites Alexandria Fort Belvoir	8632 Woodlawn Ct	2016	131,396	93	$2,116,000	$9,989,380	$12,105,380	$92	$130,165	10%
5	0513 01 0001C	Hampton by Hilton Inn & Suites Falls Church	6430 Arlington Blvd	2016	75,000	160	$3,840,000	$14,022,910	$17,862,910	$238	$111,643	10%
FULL-SERVICE HOTEL										$181	$138,365	100%
1	0174 31 H	Westin Reston Heights	11750 Sunrise Valley Dr	2009	309,113	191	$6,876,000	$7,946,240	$14,822,240	$48	$77,603	33%
2	0303 28 D3	Archer Hotel Tysons	7599 Colshire Dr	2021	72,312	178	$5,252,090	$12,716,700	$17,968,790	$248	$100,948	33%
3	0294 01 0035F	Hyatt Regency Tysons Corner Center	7901 Tysons One Pl	2015	289,249	300	$9,930,850	$61,032,360	$70,963,210	$245	$236,544	33%
CORPORATE OFFICE										$525		120%
1	0171 16 0005A1	17Fifty	1750 Presidents St	2020	276,000		$12,432,280	$143,180,140	$155,612,420	$564		20%
2	0174 01 0017E	Reston Station - Phase I, II & III	1900 Reston Metro Plz	2017	792,957		$60,028,110	$531,584,570	$591,612,680	$746		20%
3	0173 22 0003	RTC Next - Tower A & B	2000 Opportunity Wy	2022	1,061,987		$46,753,260	$400,267,340	$447,020,600	$421		20%
4	0183 01 0011B2	General Dynamics HQ	11011 Sunset Hills Rd	2020	160,000		$12,273,130	$44,798,650	$57,071,780	$357		20%
5	0342 01 0002C2	Dulles Discovery 2	3453 Historic Sully Way	2018	480,000		$11,820,780	$115,174,960	$126,995,740	$265		20%
6	0342 01 0003C2	Dulles Discovery 3	3443 Historic Sully Way	2018	471,994		$9,019,520	$120,231,670	$129,251,190	$274		20%
CREATIVE OFFICE										$243		100%
1	0332 04 0008A4	4140 Pleasan Valley Rd	4140 Pleasan Valley Rd	2012	9,800		$556,730	$1,673,300	$2,230,030	$228		50%
2	0161 02 0019C	Elden Place	1141 Elden St	2009	51,627		$5,076,750	$8,220,300	$13,297,050	$258		50%

Exhibit I-5

Select Assessed Value Comparables
Fairfax County, VA
August 2023

MAP KEY	PARCEL NUMBER	NAME	ADDRESS	YEAR BUILT	SF	UNITS	ASSESSED VALUE LAND	IMPROVED	TOTAL	TOTAL / SF	TOTAL / UNIT	WEIGHT
RETAIL										$368		100%
1	0064 21 B	CVS Pharmacy	1020 Seneca Rd	2017	12,351		$2,026,730	$4,624,730	$6,651,460	$539		20%
2	0162 51 0001	700 Lynn St	700 Lynn St	2018	3,414		$175,000	$1,215,810	$1,390,810	$407		20%
3	123-45-6789	902 Alabama Dr	902 Alabama Dr	2019	10,000		$1,244,770	$2,462,180	$3,706,950	$371		20%
4	0163 02 0001B	Worldgate Center	13001-13079 Worldgate Dr	1990/2001	229,568		$13,219,750	$40,692,130	$53,911,880	$235		20%
5	0251 01 0018F	2655 West Ox Rd	2655 West Ox Rd	2015	15,969		$1,093,500	$3,525,010	$4,618,510	$289		20%
SELF-STORAGE										$168		100%
1	0183 05 0006	Self Storage Plus	1808 Michael Faraday Ct	2020	93,700		$4,190,480	$15,187,980	$19,378,460	$207		25%
2	0162 02 0182A1	Extra Space Storage	250 Spring Street	2000	87,130		$2,613,900	$13,939,890	$16,553,790	$190		25%
3	0162 02 0173B	Security Public Storage	385 Spring St	1985/2004	49,000		$900,660	$6,123,880	$7,024,540	$143		25%
4	0173 083A0003D	Public Storage	2055 Mercator Dr	2007	113,472		$3,905,400	$11,131,880	$15,037,280	$133		25%

Source: RCLCO

Exhibit I-6

Assumed Delivery Schedule
Subject Site
2025-2045

	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
ANNUAL DELIVERY SCHEDULE																					
RENTAL HOUSING				532 Units		406 Units					272 Units			375 Units		245 Units		316 Units		223 Units	
Mid-Rise Apartment				532 Units		406 Units					272 Units			375 Units		245 Units		316 Units		223 Units	
FOR-SALE HOUSING				42 Units		53 Units			64 Units	47 Units	41 Units			19 Units	45 Units		60 Units	47 Units			
Townhome				32 Units		36 Units			19 Units	13 Units	12 Units			19 Units	13 Units		17 Units	13 Units			
Two-Over-Two				10 Units		17 Units			45 Units	34 Units	30 Units				32 Units		43 Units	34 Units			
HOSPITALITY				200 Rooms		263 Rooms															
Limited-Service Hotel				200 Units		263 Units															
OFFICE											676,600 SF					223,400 SF			257,500 SF	31,900 SF	
Corporate Office											641,700 SF					223,400 SF			257,500 SF		
Creative Office											34,900 SF									31,900 SF	
RETAIL				42,800 SF							28,300 SF					66,000 SF		20,800 SF		135,700 SF	
Grocery & Drug																50,900 SF				12,700 SF	
Restaurant				22,050 SF							19,810 SF					10,570 SF		14,560 SF		41,720 SF	
Entertainment & Fitness				11,300 SF																63,400 SF	
Services				9,450 SF							8,490 SF					4,530 SF		6,240 SF		17,880 SF	
CUMULATIVE DEVELOPMENT																					
RENTAL HOUSING				532 Units	532 Units	938 Units	938 Units	938 Units	938 Units	938 Units	1,210 Units	1,210 Units	1,210 Units	1,585 Units	1,585 Units	1,830 Units	1,830 Units	2,146 Units	2,146 Units	2,369 Units	2,369 Units
Mid-Rise Apartment				532 Units	532 Units	938 Units	938 Units	938 Units	938 Units	938 Units	1,210 Units	1,210 Units	1,210 Units	1,585 Units	1,585 Units	1,830 Units	1,830 Units	2,146 Units	2,146 Units	2,369 Units	2,369 Units
FOR-SALE HOUSING				42 Units	42 Units	95 Units	95 Units	95 Units	159 Units	206 Units	247 Units	247 Units	247 Units	266 Units	311 Units	311 Units	371 Units	418 Units	418 Units	418 Units	418 Units
Townhome				32 Units	32 Units	68 Units	68 Units	68 Units	87 Units	101 Units	112 Units	112 Units	112 Units	132 Units	144 Units	144 Units	161 Units	175 Units	175 Units	175 Units	175 Units
Two-Over-Two				10 Units	10 Units	26 Units	26 Units	26 Units	71 Units	105 Units	135 Units	135 Units	135 Units	135 Units	167 Units	167 Units	210 Units	244 Units	244 Units	244 Units	244 Units
HOSPITALITY				200 Rooms	200 Rooms	463 Rooms	463 Rooms	463 Rooms	463 Rooms	463 Rooms	463 Rooms	463 Rooms	463 Rooms	463 Rooms	463 Rooms	463 Rooms	463 Rooms	463 Rooms	463 Rooms	463 Rooms	463 Rooms
Limited-Service Hotel				200 Rooms	200 Rooms	463 Rooms	463 Rooms	463 Rooms	463 Rooms	463 Rooms	463 Rooms	463 Rooms	463 Rooms	463 Rooms	463 Rooms	463 Rooms	463 Rooms	463 Rooms	463 Rooms	463 Rooms	463 Rooms
OFFICE											676,600 SF	676,600 SF	676,600 SF	676,600 SF	676,600 SF	900,000 SF	900,000 SF	900,000 SF	1,157,500 SF	1,189,400 SF	1,189,400 SF
Corporate Office											641,700 SF	641,700 SF	641,700 SF	641,700 SF	641,700 SF	865,100 SF	865,100 SF	865,100 SF	1,122,600 SF	1,122,600 SF	1,122,600 SF
Creative Office											34,900 SF	34,900 SF	34,900 SF	34,900 SF	34,900 SF	34,900 SF	34,900 SF	34,900 SF	34,900 SF	66,800 SF	66,800 SF
RETAIL				42,800 SF	42,800 SF	42,800 SF	42,800 SF	42,800 SF	42,800 SF	42,800 SF	71,100 SF	71,100 SF	71,100 SF	71,100 SF	71,100 SF	137,100 SF	137,100 SF	157,900 SF	157,900 SF	293,600 SF	293,600 SF
Grocery & Drug																50,900 SF	50,900 SF	50,900 SF	50,900 SF	63,600 SF	63,600 SF
Restaurant				22,050 SF	22,050 SF	22,050 SF	22,050 SF	22,050 SF	22,050 SF	22,050 SF	41,860 SF	41,860 SF	41,860 SF	41,860 SF	41,860 SF	52,430 SF	52,430 SF	66,990 SF	66,990 SF	108,710 SF	108,710 SF
Entertainment & Fitness				11,300 SF	11,300 SF	11,300 SF	11,300 SF	11,300 SF	11,300 SF	11,300 SF	11,300 SF	11,300 SF	11,300 SF	11,300 SF	11,300 SF	11,300 SF	11,300 SF	11,300 SF	11,300 SF	74,700 SF	74,700 SF
Services				9,450 SF	9,450 SF	9,450 SF	9,450 SF	9,450 SF	9,450 SF	9,450 SF	17,940 SF	17,940 SF	17,940 SF	17,940 SF	17,940 SF	22,470 SF	22,470 SF	28,710 SF	28,710 SF	46,590 SF	46,590 SF

Source: RCLCO

RCLCO
REAL ESTATE CONSULTING

AUSTIN

501 Congress Ave, Suite 150
Austin, TX 78701

LOS ANGELES

11601 Wilshire Boulevard, Suite 1650
Los Angeles, CA 90025

ORLANDO

964 Lake Baldwin Lane, Suite 100
Orlando, FL 32814

WASHINGTON, DC

7200 Wisconsin Avenue, Suite 1110
Bethesda, MD 20814

Comprehensive Plan Amendment (CPA) #23-01
Transit Related Growth (TRG) Small Area Plan

Planning Commission Work Session

January 8, 2024

Ahmad Zaki

Lead Planner/ Long-range Planning

Background

- ✓ **The Comprehensive Plan Amendment (CPA # 23-01)** was initiated by the Town Council on December 12, 2023, through Resolution (23-G-77) and was referred to the Planning Commission for review and recommendation.

- ✓ **The amendment will adopt the Transit Related Growth Small Area Plan and incorporate it by reference into the 2030 Comprehensive Plan** adopted August 12, 2008, as amended through May 24, 2022

- ✓ Pursuant to Section 15.2-2223 of the Code of Virginia, **local planning commissions prepare and recommend by resolution comprehensive plan amendments** for adoption by the local governing body.

Background

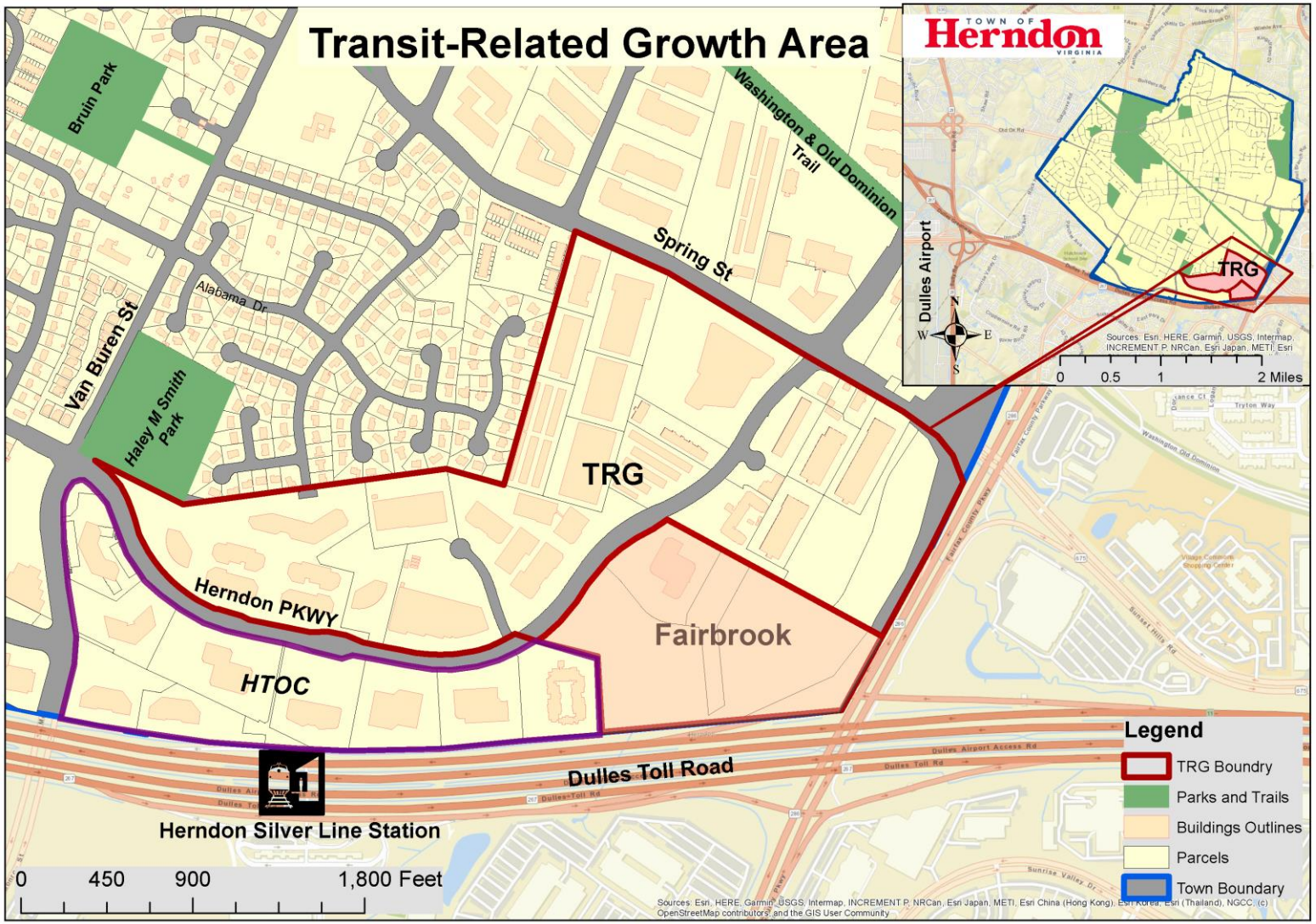
- ✓ **The comprehensive plan is a general plan that establishes a basis for decision-making** and **regulates public policies on land use**, transportation, utilities, recreation, and housing;

- ✓ Amendment to the Comp Plan also covers general and policy level frameworks and does NOT elaborate on the details;

- ✓ **CPA #23-01** will incorporate the TRG Small Area Plan into chapter III, of the Comp Plan in general terms without specificity of plan content. This approach allows the small area plan document to stand independently as an extension of the comprehensive plan.;

Transit Related Growth (TRG)
Project Summary

TRG – Site Plan



Planning Process

1. Initiated in April 2022 by the Town of Herndon, the project is currently in its culminating phase,
2. The project was started with data collection, baseline study and analysis, market analysis, constraints and opportunity study and infrastructure analysis,
3. Three alternative concepts emerged from these studies, shared with the public, stakeholders, TRG Advisory Committee (AC), and governing bodies,
4. Following robust public engagement and guidance from the governing bodies, and (AC), a preferred alternative was selected and refined into the draft plan,
5. The draft plan underwent discussion and feedback at a joint PC and AC session on December 11, 2023.

Planning Process

1. A second draft of the TRG small area plan was submitted which is currently under staff review and shared as an attachment with the PC,
2. As outlined in Section 15.2-2223 of the Code of Virginia, the planning commission will conduct a thorough review of the TRG Plan and its associated amendment and make recommendations for adoption, adoption with amendments or denial, to the Town Council.
3. Public engagement has been a key part of the planning process
4. The TRG plan is anticipated to embody the collective vision and aspiration of the community, serving as a long-term plan for the future redevelopment of the TRG area

Next Steps

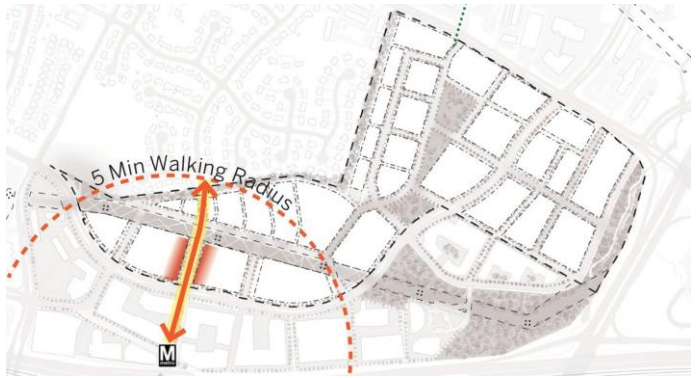
1. As we move forward there are sessions where the public can share their comments and aspirations, including upcoming Planning Commissions and Town Council sessions in January and February
2. Once approved, the small area plan will serve as the primary source for guidance on the development of the 94 acres of 25 privately owned properties within the Town of Herndon Transit-Related Growth area,
3. The development of TRG will be incremental, and no schedule is foreseen.

Transit Related Growth (TRG) Small Area Plan

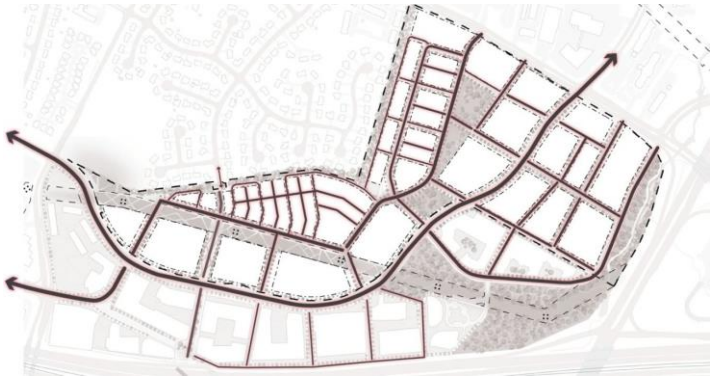
Major Elements of the Plan

Design Objectives

A METRO ARRIVAL PLAZA AS THE CORE OF A VIBRANT DEVELOPMENT



A MULTIMODAL STREET GRID AS THE FRAMEWORK FOR DEVELOPMENT



A NETWORK OF OPEN SPACES WITH INTERSTITIAL MOBILITY



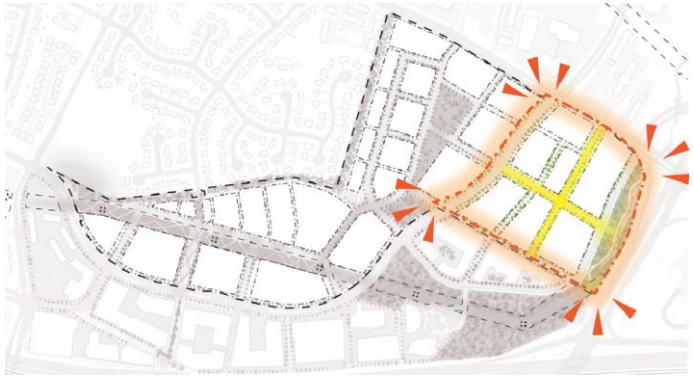
A TRANSITIONAL RESIDENTIAL AREA BETWEEN LOWER AND HIGHER DENSITIES



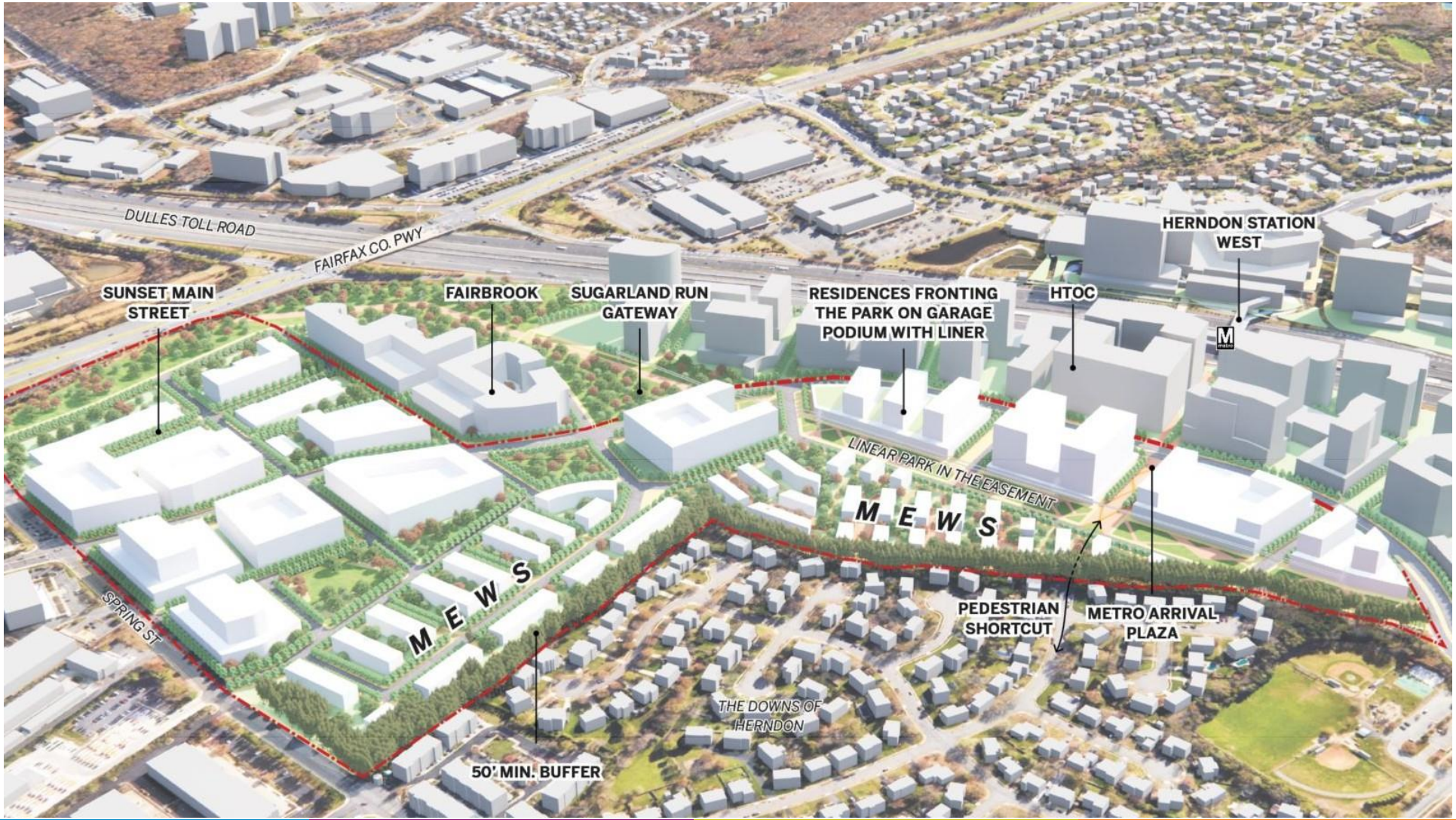
AN URBAN STREET FRONT FRAMING THE TRG GATEWAY INTERSECTION AND EDGES



AN EXPANDED AND REVAMPED "SUNSET DISTRICT"



Urban Design Framework



Urban Design Framework

Land Use

Low Density Residential: Attached or stacked single-family units, commonly known as "townhomes" and "two-over-twos." Units have front and backyards, with sideyards at the ends of the unit rows.

Medium Density Residential: Mid-rise apartment buildings with parking garage.

Office: "Class A" multi-story commercial office on parking garage podiums in the Metro Arrival area and Spring Street; and "creative office," or a type other than"class A", such as but not limited to, ground floor long-span makers space with access to outdoor working areas, as well as low rise buildings with atypical office floor plates in the Sunset District.

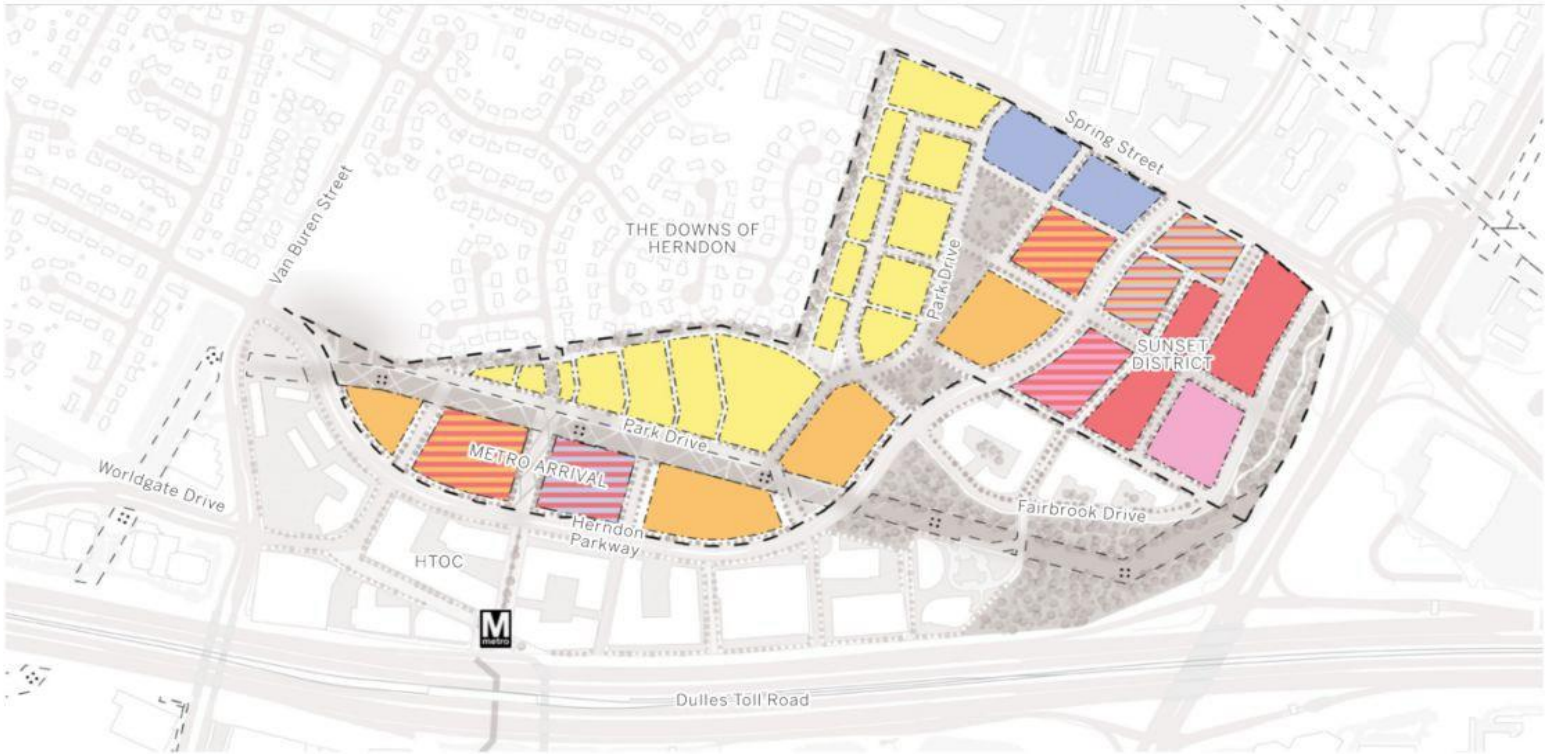
Retail: Neighborhood serving shops and restaurants, grocery, entertainment, fitness and services

Hospitality: Mid-rise hotel use with related amenities.

Mixed-Use: In addition to the mix of uses planned throughout the TRG, the depicted hatched areas denote development blocks with a stacked mix of uses.

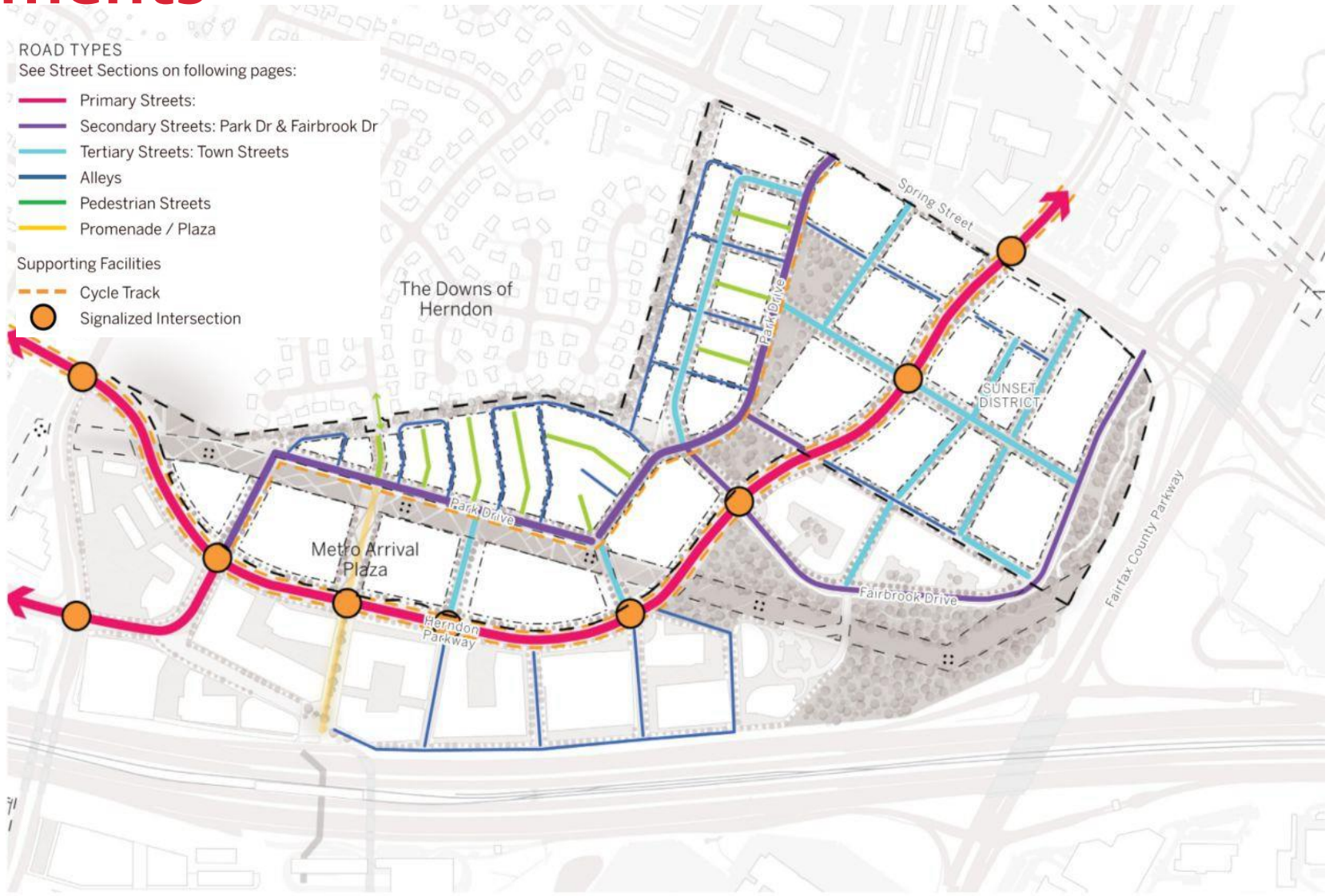
Dominion Easement

Existing Parcels



TRG- Key Plan Elements

- Change to an urban layout and experience



Road Types Plan

TRG- Key Plan Elements

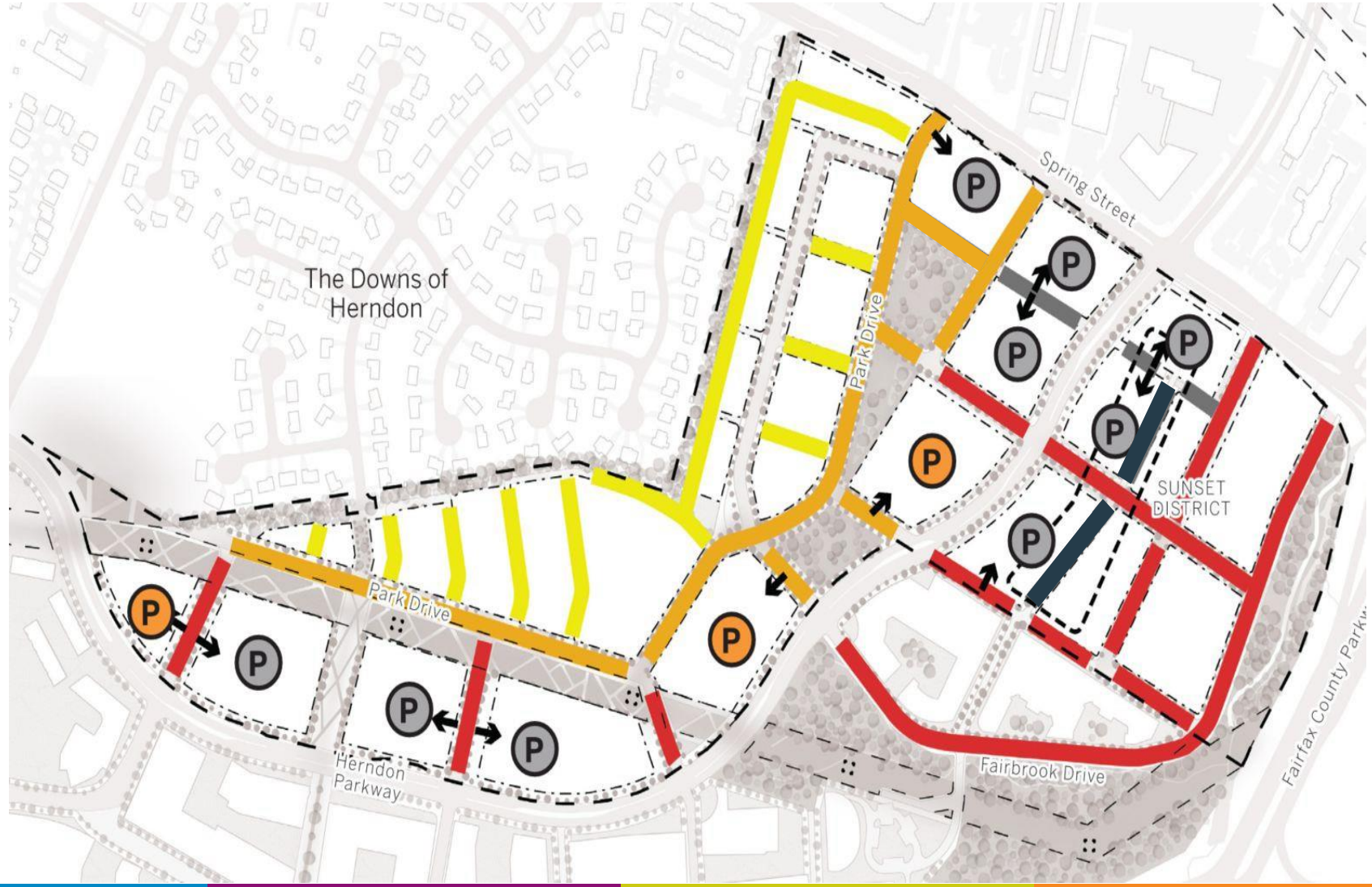
- Change to an urban layout and experience



Urban Design Framework

Parking Strategies

- Garage - shared parking
- Garage - residents only
- On-street parking - all uses
- On-street parking - primarily residential
- On-Street Parking - service street
- Low-density residential private
- Service area at Sunset District
- Access



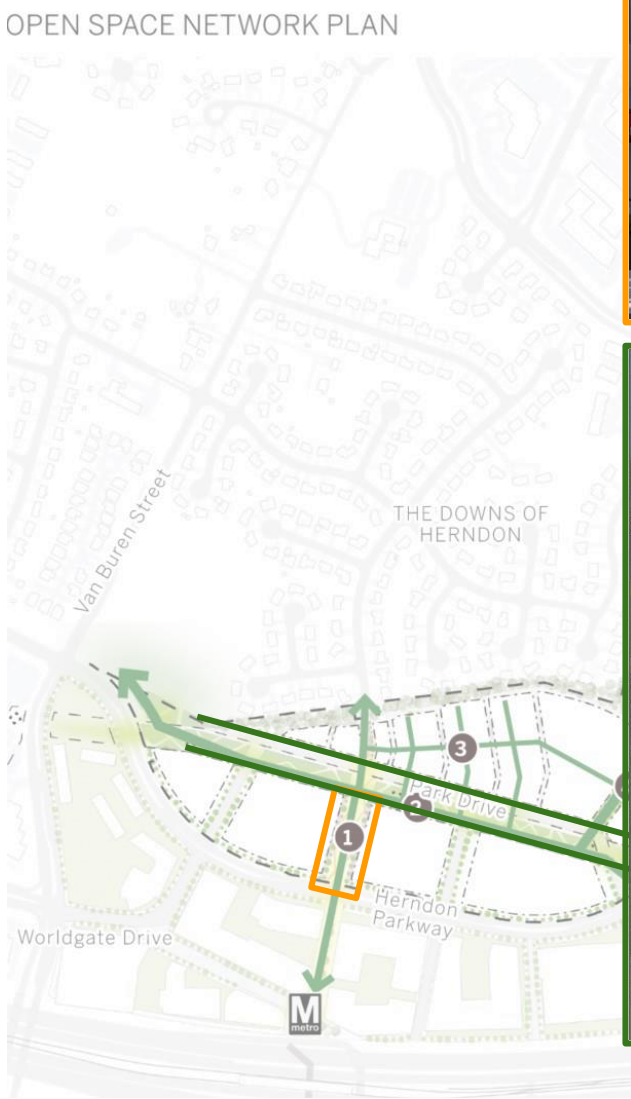
TRG- Key Plan Elements

- Network of road and green spaces

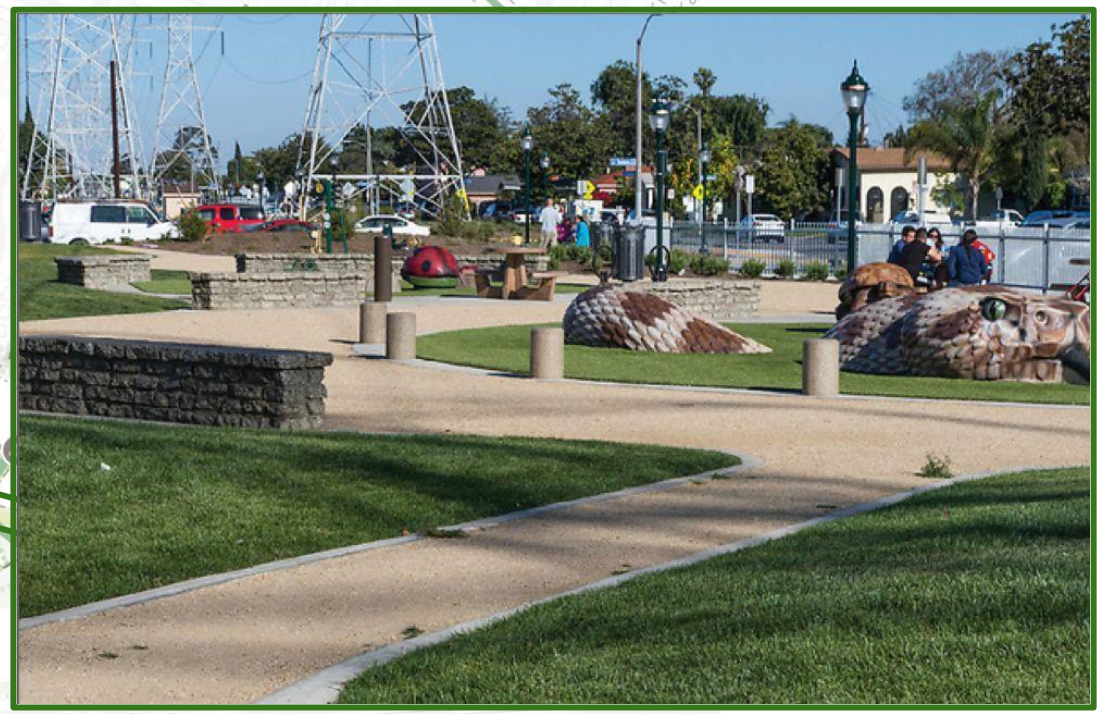


Urban Design Framework

Open Space Network

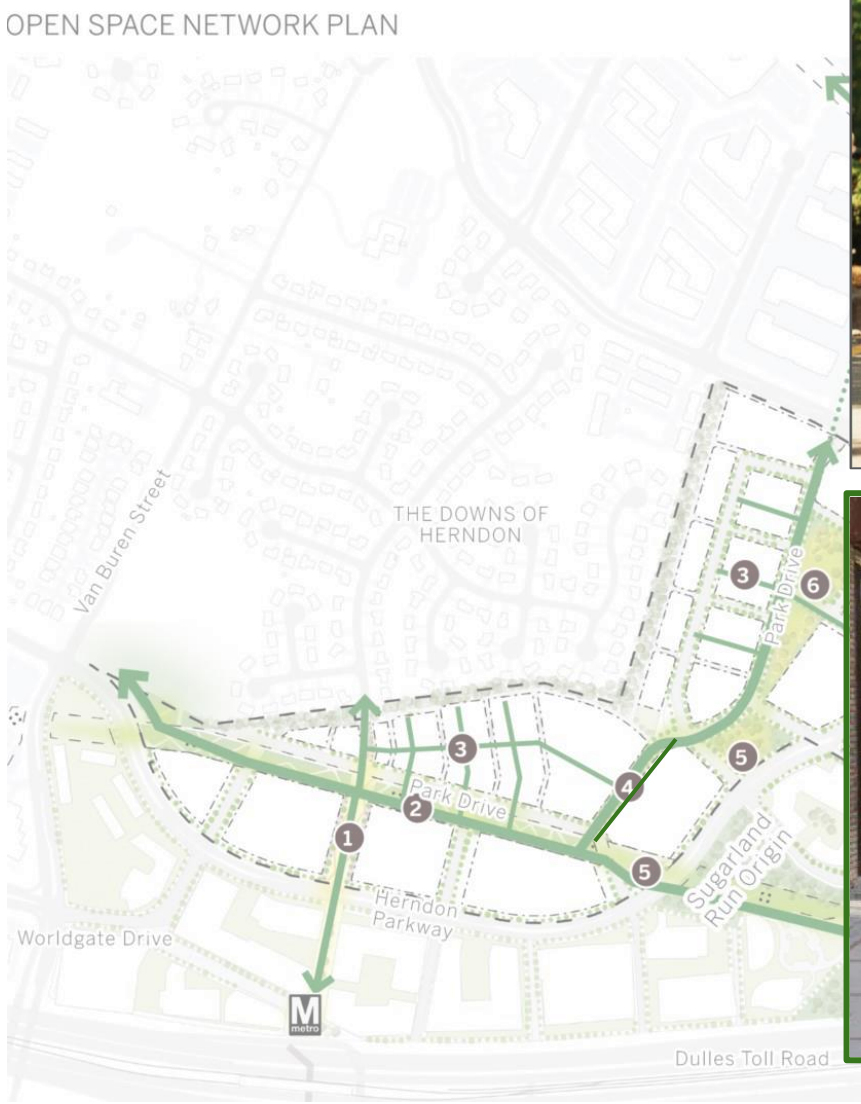






Urban Design Framework

Open Space Network







TRG- Key Plan Elements

- Building façade and porosity to make eyes on the park and street.



TRG- Key Plan Elements

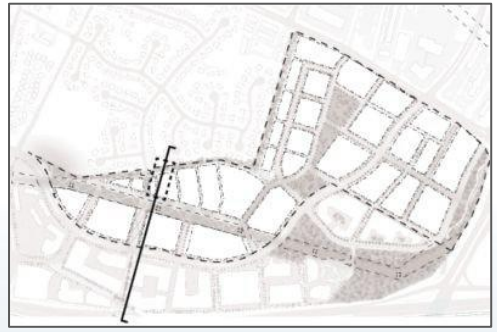
Height and massing:

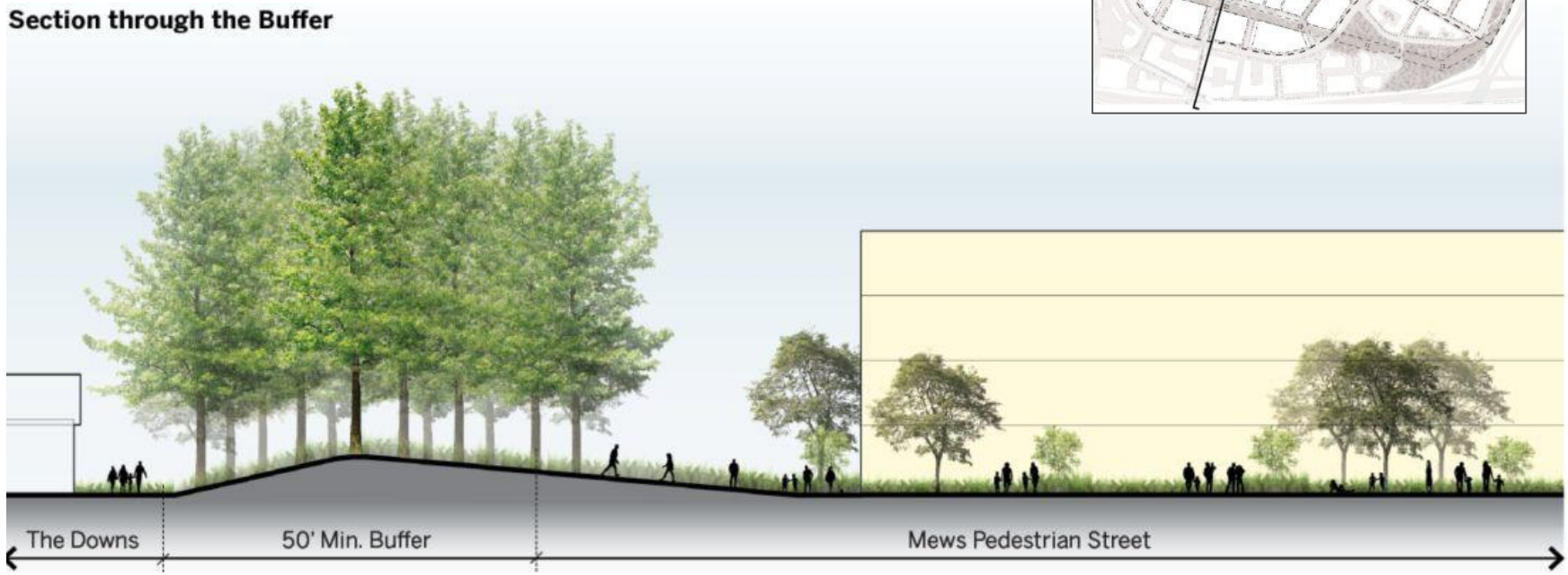
- Residential Mews: 3 to 4-story
- Metro Arrival: 5 to 10-Story
- Herndon Parkway Multifamily: 5 to 7-Story
- Sunset District: up to 5-story
- Spring St & Herndon Pkwy Mixed Use: up to 7-Story

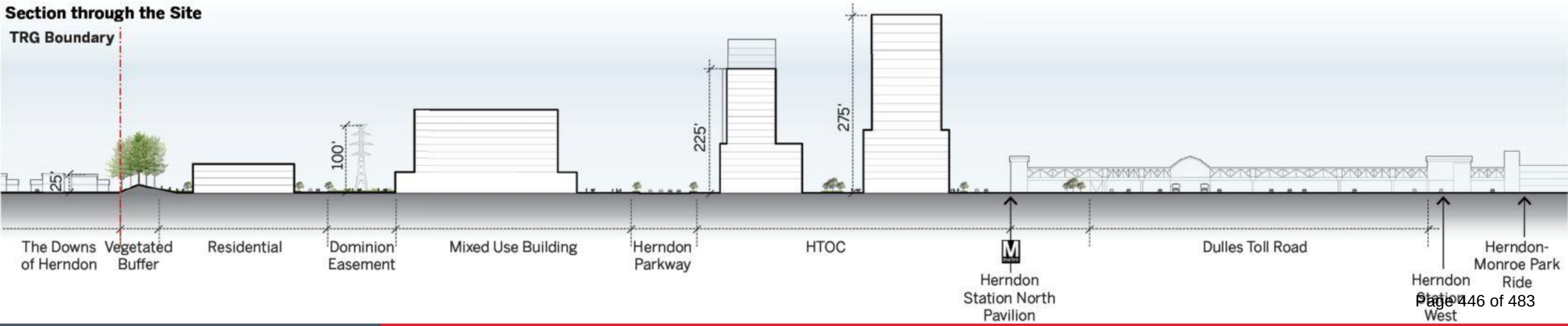


Urban Design Framework

Heights and Massing



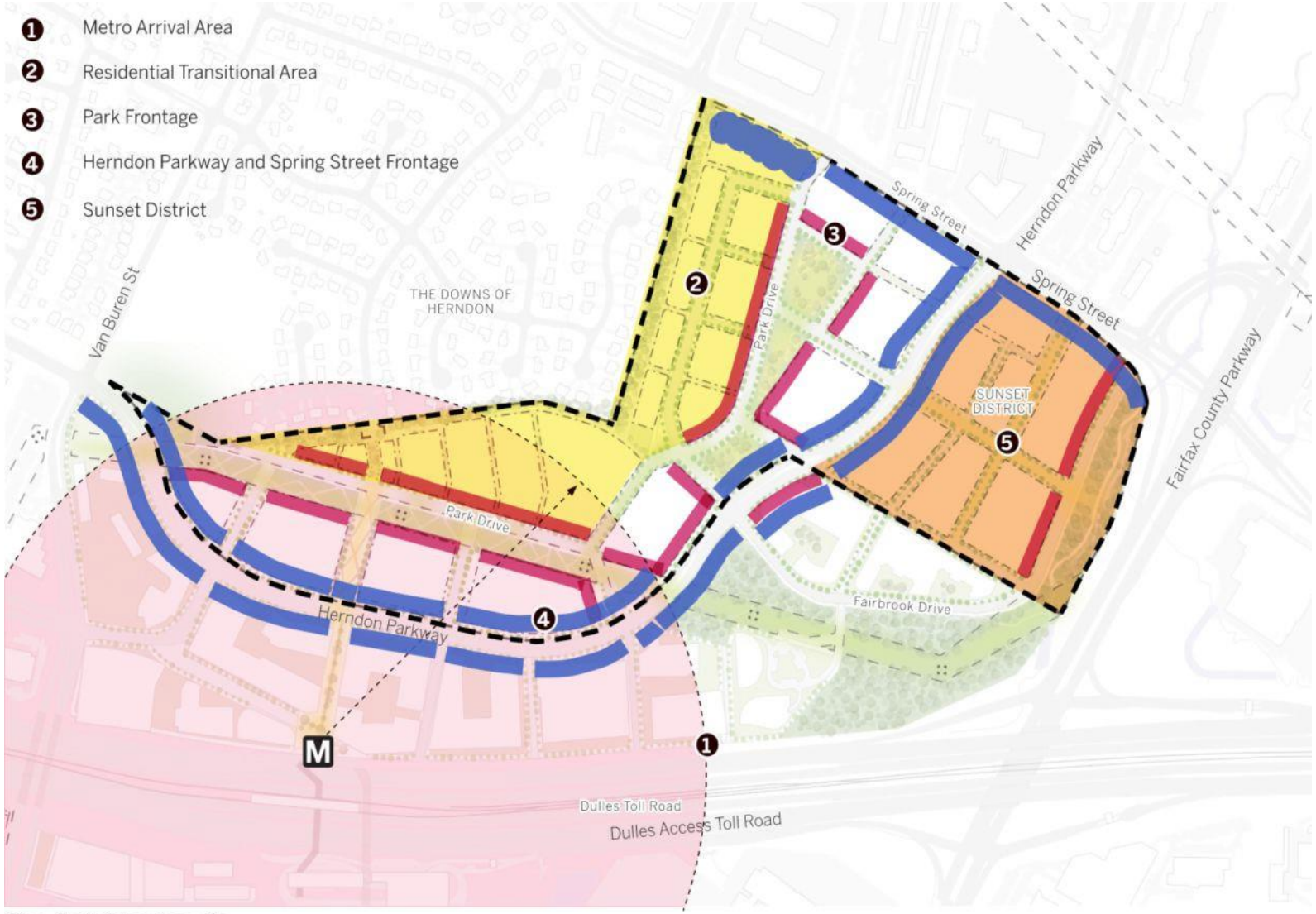




TRG- Key Plan Elements

Designation of future TRG into 5 districts:

1. Metro arrival plaza,
2. Transition District to Downs neighborhood,
3. Park frontage,
4. HPKWY/Spring St. frontage,
5. Sunset district

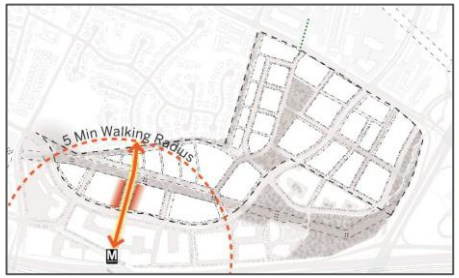


The Neighborhoods

Urban Design Framework

The Neighborhoods

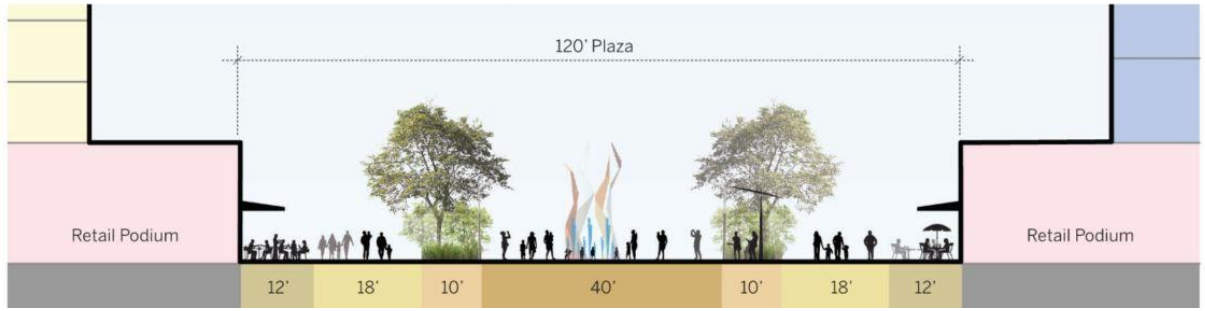
Metro Arrival





View rendering of the Linear Park looking towards the Plaza

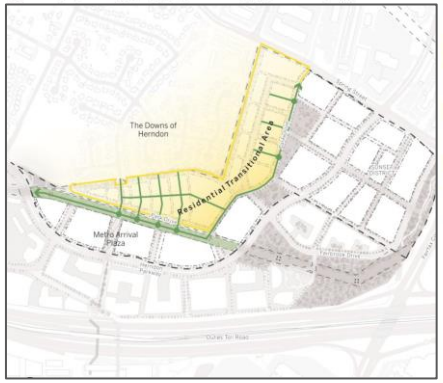
- Seating/Front or Side Yard
- Pedestrian Path or Shared Street
- Landscape and Site Furnishings
- Seasonal Program/Activities Feature Zone



Urban Design Framework

The Neighborhoods

Residential Transitional Area



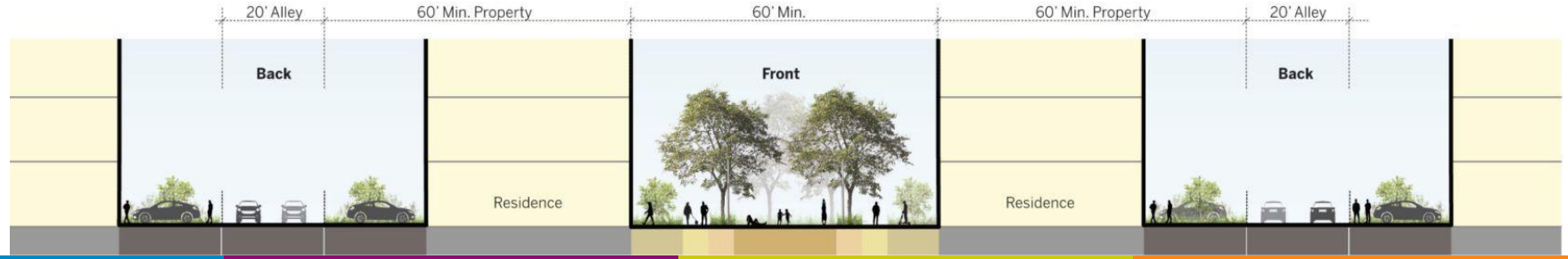
Seating/Front or Side Yard

Pedestrian Path or Shared Street

Landscape and Site Furnishings



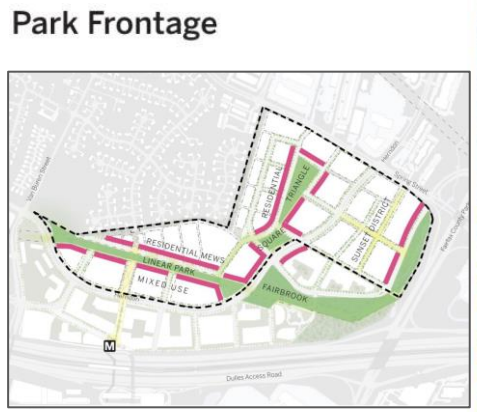
View rendering of a mew-style pedestrian street



Urban Design Framework

The Neighborhoods

Park Frontage



- Seating/Front or Side Yard
- Pedestrian Path or Shared Street
- Landscape and Site Furnishings
- Cycle Track



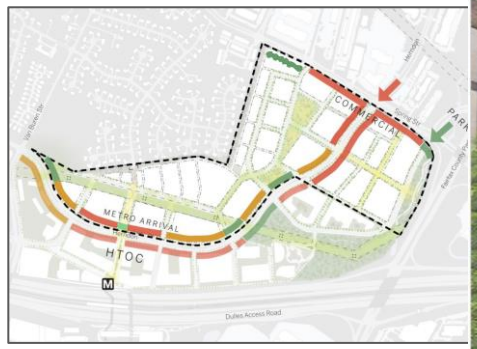
View rendering of the Triangular Park



Urban Design Framework

The Neighborhoods

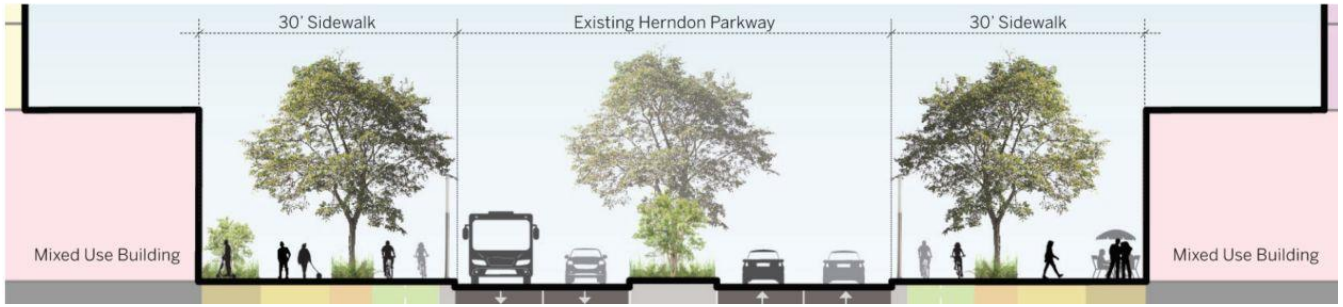
Herndon Parkway & Springs Street Frontage



- Seating/Front or Side Yard
- Pedestrian Path or Shared Street
- Landscape and Site Furnishings
- Cycle Track



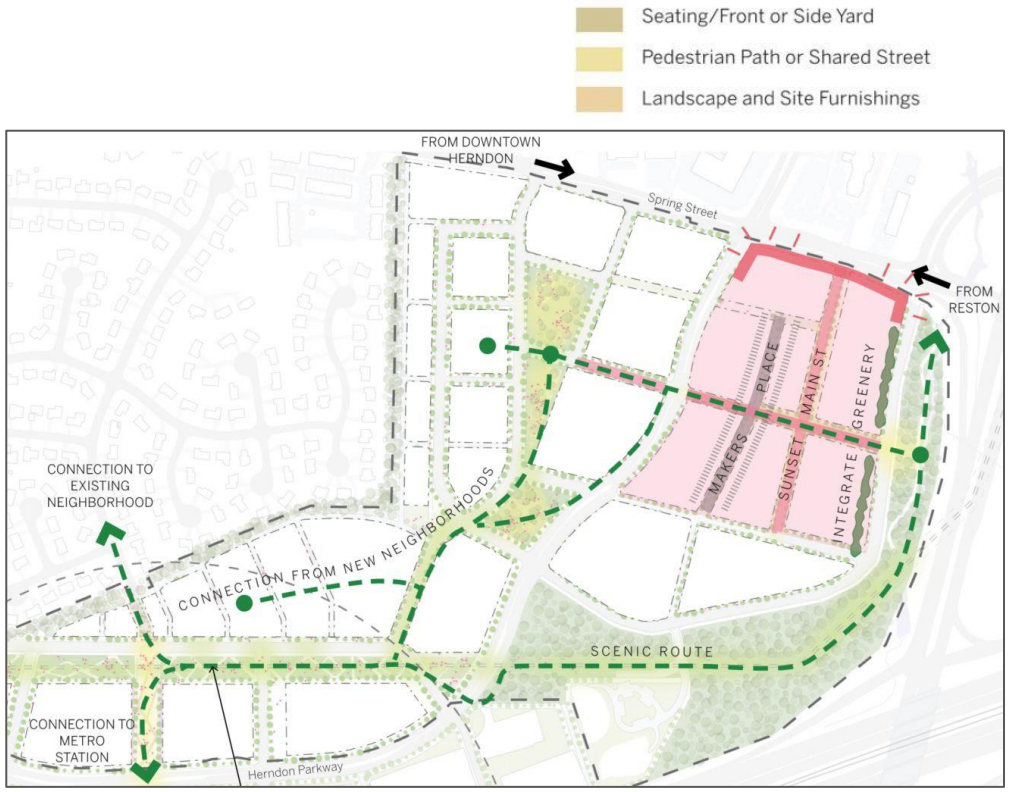
View rendering of the Herndon and Spring Street gateway to the TRG



Urban Design Framework

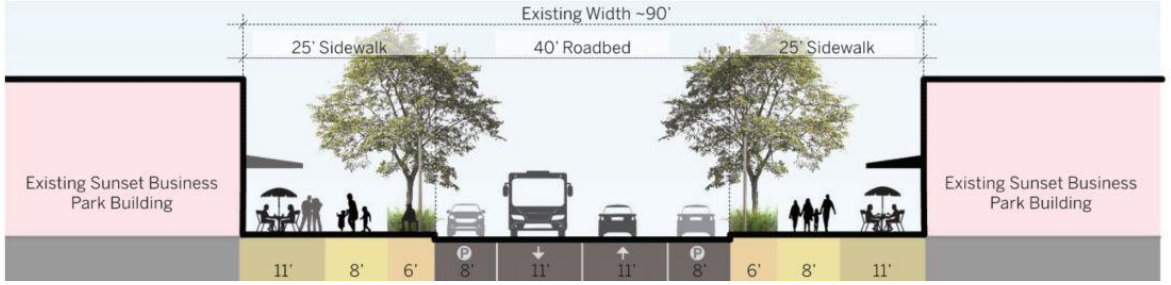
The Neighborhoods

Sunset District





View rendering of Sunset Main Street



Transit Related Growth (TRG) Small Area Plan

Discussion Items

Outstanding issues

The TRG planning is still in progress and certain elements are still being developed that could change policy guidelines, including :

- Transportation mitigation
- Design Guidelines
  - Building character, massing
- Parking measures
- Traffic Level of Service (LOS)
- Implementation Phases

Discussion Items

Staff seeks the planning commission's thoughts on the plan in general and particularly on the below elements:

- The line between flexibility and prescriptive
- Sense of place, building character and design
- Parking measures
- Traffic Level of Service Policy Recommendations
  - Similar to some other jurisdictions, the town should consider adopting LOS E as an acceptable condition during peak hours where pedestrians and active modes are a priority, rather than the existing LOS D policy
- Implementation phasing of TRG

Comprehensive Plan Amendment (CPA) #23-01

Planning Commission Work Session
Agenda Item 3.a.

Agenda Item: **Resolution to amend and restate the Bylaws of the Town of Herndon Planning Commission**

Meeting Date: January 8, 2024

Category: New Business

Prepared by: Lesa Yeatts, Town Attorney

Description:
The current Bylaws of the Planning Commission of the Town of Herndon, Virginia, were last amended and adopted on April 25, 2022. The Department of Community Development in coordination with the Town Clerk's Office and the Town Attorney's Office, initiated a project to review and revise the Bylaws of all the Town's board and commissions (HDRB, Architectural Review Board, Board of Zoning Appeals and Planning Commission) to provide for more consistency among the boards and commissions when possible, update terminology to be consistent with language in the Herndon Town Code and the Code of Virginia, update meeting procedure to reflect current practices and propose a new meeting attendance obligation on all town council appointed boards to be consistent with the Town Council's plan to amend Town Code Sec. 2-5, the town's Code of Ethics.

ARTICLE I(d) REMOVAL of the current Planning Commission Bylaws already contains language about attendance and this was carried forward in ARTICLE I(e) of the proposed amended and restated Bylaws. The removal and attendance authority for the Planning Commission can be found in Town Code Sec. 2-40, which mirrors Virginia Code Section 15.2-2212, and is as follows: "Sec. 2-40. - Removal of Members. Any member of the planning commission may be removed from office for malfeasance in office. Notwithstanding the foregoing provision, a member of a local planning commission may be removed from office by the town council without limitation in the event that the commission member is absent from any three consecutive meetings of the commission, or is absent from any four meetings of the commission within any 12-month period, beginning upon the date of the planning commissioner's assumption of office. In either such event, a successor shall be appointed by the town council for the unexpired portion of the term of the member who has been removed."

The Town Council recently requested staff to bring forward an Ordinance amending Sec. 2-5, the Town's Code of Ethics, to reflect the responsibility Town Council members have and members of council appointed Boards and Commissions have to faithfully and regularly attend meetings of their body. This ordinance amendment will be considered at the first set of Town Council meetings in January 2024. The proposed amendment to

Sec. 2-5 specifies the ethical responsibility of Town Council members as public officials to regularly attend council meetings and specifies that Town Council members who fail to attend four (4) consecutive meetings or 25% of work sessions, regular meetings, and special meetings in a 12-month period without good cause are subject to censure by the Town Council for dereliction of their duties. This amendment further specifies that members of council appointed boards and commissions continue to be subject to the rules of attendance proscribed by the Code of Virginia, Herndon Town Code, and their applicable Bylaws. To be consistent with this expectation, the other appointed boards are all currently considering the addition of attendance language to their Bylaws which is similar to the Planning Commission's.

A substantive amendment to the Planning Comission's proposed Bylaws can be found in ARTICLE IV, MEETINGS where subsections have been amended to be consistent with the language in Town Code Sec. 2-1, regarding the scheduling of Town Council meetings including the rescheduling of meetings due to unforeseen circumstances.

Changes to the Article regarding the conduct of persons appearing before the commission (proposed ARTICLE VII) now includes the language about maintaining proper decorum which now more closely mirrors direction given in opening remarks at the Regular Town Council meeting.

In the Article regarding voting and transaction of business (proposed ARTICLE VIII) the order of business has changed slightly but these changes will be implemented across all Boards and Commission.

Pursuant to Article IX. of the current Bylaws, a proposal for a modification to the Bylaws must be submitted to the commission at a regular meeting and then scheduled for consideration and action at the next regular meeting. The revisions to the Bylaws are being introduced to the commission at this work session for discussion and will be formally submitted again at the January 22, 2024, regular meeting for further review and discussion. This item will also be placed on the agenda for the February 26, 2024, regular meeting for consideration of the revisions and a final vote.

Background:
N/A

Fiscal Impact:
None

Recommendation:
Recommend approval of the Resolution to amend and restate the Bylaws of the Town of Herndon Planning Commission.

Attachments:
1. Resolution (Proposed)

2. PC Redline Proposed Bylaws
3. PC Proposed Bylaws

TOWN OF HERNDON, VIRGINIA
PLANNING COMMISSION

RESOLUTION

FEBRUARY 26, 2024

Resolution- to amend and restate the Bylaws of the Town of Herndon Planning Commission.

BE IT RESOLVED by the Planning Commission of the Town of Herndon, Virginia that:

1. The Planning Commission Bylaws are amended and restated as outlined in the attached.

~~**Town of Herndon, Virginia Planning Commission**~~

~~**By-Laws**~~

~~**Introduction**~~

INTRODUCTION

This Planning Commission ~~was created~~*(Commission) is established* pursuant to ~~the~~ §*Sec.* 15.2-2210 of the Code of Virginia and *Chapter 2,* Article ~~I~~*II*, Division 2 of the *Code of the Town of* Herndon *(*Town Code*).*

ARTICLE I ~~COMMISSIONERS~~ *COMMISSION MEMBERS*

a. COMPOSITION/QUALIFICATIONS OF MEMBERS. ~~The Planning~~ *In accordance with Town Code Sec. 2-37, the* Commission ~~("Commission")~~ shall consist of ~~SEVEN (7)~~*seven* members~~,~~ appointed by the Town Council*,* all of whom shall be residents of the town, qualified by knowledge and experience to make decisions on questions of community growth and development; provided, however, that at least half of the members so appointed shall be owners of real property. One member of the Commission may be a member of the ~~town council~~*Town Council*.

b. TERM. ~~The~~ *In accordance with Town Code Sec. 2-37, the* term of ~~the councilmanic~~*a* member *of the Town Council serving on the Commission* shall ~~in all cases correspond~~*be coextensive* with ~~their tenure~~*the term* of office *to which they have been elected or appointed,* unless the ~~town council~~*Town Council*, at the first regular meeting each fiscal year, appoints others to serve as their representative. The ~~term of the~~ remaining members of the Commission shall ~~be~~*serve* for *terms of* four ~~(4)~~ years~~.~~ ~~If a member serving on the Commission becomes a member of the Town Council, he shall be deemed to have vacated, and shall vacate, his term of office on the~~

~~Commission on the date of his taking office on the town council.~~ *each.*

c. RESIGNATION. Any member who resigns from the Commission prior to the end of their term shall do so in writing to the Chair. The effective date of such resignation shall be the date of the letter to the Chair unless another date is stated within the letter of resignation.

d. VACANCIES. ~~Vacancies~~*In accordance with Town Code Sec. 2-41, vacancies upon the Commission, however caused,* shall be filled by ~~appointment by~~ the Town Council for the unexpired term only. ~~Any member is eligible for reappointment.~~*In accordance with Town Code Sec. 2-37, if a member serving on the Commission becomes a member of the Town Council, they shall be deemed to have vacated, and shall vacate, their term of office on the Commission on the date of their taking office on the Town Council.*

~~a.~~ *e.* REMOVAL. ~~Any member~~*In accordance with Town Code Sec. 2-40, any member of the Commission* may be removed ~~by the Town Council~~*from office* for malfeasance in office. Notwithstanding the foregoing provision, a member of ~~a local planning commission~~*the Commission* may be removed from office by the ~~town council~~*Town Council* without limitation in the event that the Commission member is absent from any three consecutive meetings of the Commission, or is absent from any four meetings of the Commission within any 12-month period, beginning upon the date of the ~~planning commissioner's~~*member's* assumption of office. In either such event, a successor shall be appointed by the ~~town council~~*Town Council* for the unexpired portion of the term of the member who has been removed.

e. COMPENSATION. ~~**All**~~*In accordance with Town Code Sec. 2-38, all* members of the Commission shall receive ~~**monthly**~~*as* compensation ~~**in an amount approved by**~~*such amounts as may be or have been determined by resolution of* the Town Council and shall be reimbursed for actual expenses incurred.

f. TRAINING. In accordance with Town Code Sec. 78-150.2, newly appointed members of the Commission shall be offered training and certification by the Citizens Planning Education Association of Virginia or similar certification to be completed within two years of appointment.

ARTICLE II
ELECTION AND DUTIES OF OFFICERS ~~OF THE COMMISSION~~

a. ELECTION OF ~~CHAIR/VICE-CHAIR. The~~ *OFFICERS. In accordance with Code of Virginia Sec. 15.2-2217 and Town Code Sec. 2-39, the* Commission shall ~~annually~~

~~at its first public hearing in January,~~ elect from ~~its~~*the* appointed members a Chair and ~~a~~ Vice Chair*,* whose terms shall be for one year~~ or until a successor takes office.~~*. Elections of officers shall occur annually at the Commission's regular meeting in January. Elections shall be conducted through the Commission's usual voting process.* If the office of Chair becomes vacant, the Vice Chair automatically becomes Chair*,* and the office of Vice Chair becomes vacant. The Commission shall then, after a new member has been appointed, elect from its appointed members a new Vice Chair. If the office of Chair becomes vacant at a time when there is no Vice Chair, the Commission shall elect from its current members both a Chair and a Vice Chair.

b. DUTIES OF CHAIR. The Chair shall preside over all ~~hearings and~~ meetings of the Commission, with the same powers and duties as the other members, with vote but no veto power. ~~He~~*They* shall be the official head of the Commission and shall perform such other duties not inconsistent with ~~his office including~~*their office including presiding at all meetings, deciding points of order with the assistance of the Parliamentarian, taking action to preserve the order and integrity of proceedings before the Commission,* being informed of any official communication and reporting about such to the Commission at the next regular Commission meeting*,* and appointing all committees *of the Commission*.

c. DUTIES OF VICE- CHAIR. The Vice- Chair~~,~~ shall act in the absence or inability of the Chair to act, serve as aide to the Chair and represent the Chair upon request~~ and assist in providing orientation to new Commission members~~.

d. CHAIR PRO TEM. In the absence of both the ~~Chairman~~*Chair* and Vice~~ Chairman~~ *Chair*, the Commission shall elect by a majority vote a Chair Pro Tem, who shall preside over the meeting and shall act as ~~Chairman~~*Chair*.

ARTICLE III
DESIGNATION AND DUTIES OF THE SECRETARY ~~OF THE COMMISSION~~*AND STAFF*

a. DESIGNATION OF ~~SECRETARY~~*STAFF*. The Commission shall designate the *Director of* Community Development~~ Director~~*, or their designee,* to serve, in addition to any regular duties, as *professional staff to the Commission. Duties of the staff representative shall include the preparation and presentation of applications before the Commission.*

~~a.~~*b. DESIGNATION AND DUTIES OF SECRETARY. The Commission shall designate the Director of Community Development, or their designee, to serve in addition to any other appointed duties, as* Secretary of the Commission. *The Secretary shall attend all meetings of the Commission and their duties shall include preparation of draft minutes, preparation and compilation of a written record of the official actions of the Commission, which shall be posted on the town's website and filed in the Department of Community Development, and preparation of official correspondence to and from the Commission as directed by the Chair.*

~~a. DUTIES OF SECRETARY. The Secretary or his designee shall attend all regular meetings and work sessions of the Commission, as well as the meetings of any special committees, if required and shall record the attendance and the minutes of such meetings. The record (minutes) Commission proceedings shall be available for public inspection at the office of the Director of Community Development, 777 Lynn Street, Herndon, Virginia, during normal working hours.~~

~~The Secretary or his designee shall:~~

~~1) Provide notice to all members of all meetings.~~

~~2) Maintain a file of all official Commission records and reports.~~

~~(3) Ensure that any correspondence addressed to the Commission is promptly transmitted to the Chair and/or other members as appropriate.~~

~~(4) Prepare for publication all public notices for Commission public hearings.~~

~~(5) Monitor applicant's notification of adjacent property owners regarding applications for changes in zoning and special exceptions.~~

ARTICLE IV.~~.~~ COMMITTEES

~~Standing or special~~*In accordance with Code of Virginia Sec. 15.2-2221, advisory* committees may be established by the Commission to make studies or carry out functions of the Commission~~: the~~. *The* members of ~~the~~ committees shall be appointed by the Chair for the purposes and terms approved.

ARTICLE V.~~.~~ MEETINGS

~~(a) REGULAR MEETINGS~~

~~The~~

a. *MEETING SCHEDULE. In accordance with Town Code Sec. 2-42, the* Commission ~~shall~~*may* meet in regular session on the fourth Monday of each month*, and in work session on the second Monday of each month,* at 7:00 p.m.~~ in the Town Council Chambers,~~ *., at* 765 Lynn Street, Herndon, Virginia~~. In the event such date falls on a legal holiday, the meeting shall be held on the third Monday of the month unless otherwise provided~~ *or at such other time and place as may be fixed* by resolution ~~of~~*, so long as* the Commission~~. The Commission may also meet at such other times or places within the boundaries of the Town of Herndon that the Commission designates by duly adopted resolution~~ *meets at least every two months*.

~~Persons desiring to address or make a presentation to the Commission, other than during a public hearing or a designated citizen comment period, shall request such privilege in writing prior to the meeting date. The Chair shall decide whether or not to approve the request. The requirement for an advance written request may be waived by the Chair.~~

b. *POSTPONED OR CANCELED.* Should the conduct of a ~~regular~~ meeting be unnecessary due to a lack of ~~applications~~*items* for consideration ~~or~~*,* impossible due to the inability to obtain a quorum, or due to weather or other condition such that it is hazardous for members to attend the ~~regular~~ meeting, as declared in writing by the ~~chair~~*Chair*, the ~~regular~~ meeting ~~shall~~*may* be ~~continued to~~ *postponed or canceled and notice of such postponement or cancelation and* the ~~next regular meeting day at 7:00 p.m. in the Town Council Chambers. The press~~*rescheduled date,* shall be ~~notified as promptly as possible. All~~*published by staff. All public* hearings and other matters previously advertised shall be conducted at the ~~continued~~*rescheduled* meeting and no further advertisement is required*, unless required by law*.

~~(b)~~ SPECIAL MEETINGS ~~AND REGULAR WORK SESSIONS~~

~~The Commission shall meet in regular work session on that Monday of each month that precedes by two weeks the regular session. The work session shall begin at 7:00 p.m. and shall take place in the~~*. In accordance with* Town ~~Council work session room, 765 Lynn Street,~~

c. ~~Herndon, Virginia. In the event such date falls on a legal holiday, the meeting shall be held on either the preceding Monday or following Monday of the month, unless~~

~~otherwise provided by resolution of the Commission. Special~~ *Code Sec. 2-42, special* meetings ~~or additional work sessions~~ of the Commission may be called ~~when necessary~~ by the Chair or by any two members upon written request to the Secretary. ~~At~~ *Written notice fixing the time and place of the meeting and the purpose shall be mailed to the Commission members by staff at* least ~~5~~*five* days in advance*. Formal rules of procedure may be suspended for Commission work sessions.* ~~of a special meeting or additional work session, the Secretary shall mail (or e-mail) to all Commission members, and post in a conspicuous public place, a written notice fixing the time, place, and purpose of the meeting. However, written~~ *Written* notice of a special meeting ~~or additional work session~~ is not required if the time ~~and place~~ of the special meeting ~~or additional work session have~~*has* been fixed at a regular meeting*, or if all members are present at the special meeting or file a written waiver of notice*.

~~Formal rules of procedure may be suspended for Commission work sessions.~~

~~(e)~~ PUBLIC HEARINGS

d. . Public hearings are *scheduled during regular meetings, are* open to the public*, and members of the public* ~~and citizens~~ are encouraged to speak. The purpose of *public* hearings is to receive testimony from the public. ~~Members of the Commission are not expected to respond to general questions. Response to questions shall be made at the discretion of the Chair.~~ In addition to those required by law, the Commission may hold public hearings on any matter referred to the Commission by the ~~Town Council of the Town of Herndon~~*town council* or on other planning issues in the interest of the Town of Herndon citizens*. Notice of public hearing shall be provided in accordance with the Code of Virginia, and the Town Code, and may be supplemented with additional notices as deemed appropriate by the Commission or staff*.

1. *ORDER OF PUBLIC HEARING.*
   - i. *Presentation by staff summarizing the item*
   - ii. *Presentation by the applicant*
   - iii. *Testimony of members of the public desiring to speak*
   - iv. *Concluding comments by the applicant; questions by Commission members, if the Chair determines such are necessary*
   - v. *Concluding comments by staff; questions by Commission members, if the Chair determines such are necessary*

vi. Public hearing closed by the Chair

vii. Motion

~~Notice of public hearing shall be provided in accordance with§ 15.2-2204, Code of Virginia, and may be supplemented with additional notices as deemed appropriate by the Commission or staff.~~

~~Sign-in forms, if deemed necessary by the Chair, shall be completed by persons desiring to speak, listing printed name, phone number, and address of the person desiring to speak, and application number of the issue to be addressed.~~

~~Members of the public or their representatives desiring to address the Commission shall proceed to the appointed place, clearly state their names and addresses, and shall be subject to the following time limitations: 10 minutes total for the applicant and any of the applicant's representatives; 3 minutes per individual for all others. The Chair may, at personal discretion, allow additional time for speakers.~~

~~Members of the Commission shall limit their comments to ensure public participation without Commission interference.~~ *Discussion by Commission members*~~At the completion of each presentation, members of the Commission shall have an opportunity to ask questions or clarify points made during the speaker's presentation.~~

~~Written testimony may be submitted to the Commission either prior to or at the public hearing. Written comments should be submitted at least one week prior to the hearing to ensure distribution to the individual Commission members in time for prior review. The Commission may establish a time to receive written testimony in addition to or in lieu of public appearance. Such written testimony thus received shall become part of the public record.~~

viii.

ix. Vote roll call (or other means if deemed necessary by the Chair)

e. *CONTINUED DELIBERATION OF PUBLIC HEARING ITEMS.* At the completion of the hearing on each item, the Commission shall proceed with its deliberation on that item and members shall have an additional opportunity for discussion, and then a vote shall be taken. ~~After discussion, upon request by two members of the Commission in cases in which additional time for data gathering, analysis and/or further consideration is warranted, the Chair may defer final action until later in the meeting and then proceed to other agenda items.~~ Continuing an item to another meeting shall only occur upon motion, second, and vote of the Commission properly made, and the motion shall specify the date when the item will again be considered.

~~(d) ORDER OF PUBLIC HEARING~~

- ~~Presentation by staff summarizing the item.~~
- ~~Presentation by the applicant.~~
- ~~Testimony of citizens desiring to speak.~~
- ~~Concluding comments by the applicant, if the Chair determines such are necessary~~ questions by Commission members.
- ~~Concluding comments by staff, if the Chair determines such are necessary;~~ questions by Commission members.
- ~~Public hearing closed by the Chair.~~
- ~~Discussion by Commission members.~~

~~i. Motion~~

- ~~Vote (roll call vote if deemed necessary by the Chair)~~

~~(e)~~ ELECTRONIC PARTICIPATION IN MEETINGS

f. ~~A~~. *In accordance with Town Code Sec. 2-4, a* member of the ~~Planning~~ Commission may participate in a meeting *that is not a public hearing* from a remote location ~~only pursuant to the requirements set forth in Sec. 2-4 of the Code of the Town of Herndon.~~.

ARTICLE VI
CONDUCT OF THE *COMMISSION* MEMBERS

CODE OF ~~THE PLANNING COMMISSION~~

a. ~~Section 2-5 of the Code of the~~*ETHICS.* Town ~~of Herndon~~*Code Sec. 2-5*, "Code of Ethics for the Members of the Town Council and Council Appointed Board and Commission Members" is hereby incorporated by reference and members of the Commission shall so govern their actions.

b. ENCOURAGE PUBLIC PARTICIPATION. Members of the Commission shall limit their comments to ensure public participation without Commission interference. At the completion of each presentation, members of the Commission shall have an opportunity to ask questions or clarify points made during the speaker's presentation.

c. COMMISSION RESPONSE. Members of the Commission are not expected to respond to general questions. Response to questions shall be made at the discretion of the Chair.

ARTICLE VII.~~-~~
CONDUCT OF PERSONS~~-~~
APPEARING BEFORE THE PLANNING COMMISSION

a. *PUBLIC ATTENDANCE.* During all regular and special meetings of the Commission, the public may be present, and a specific time shall be reserved for receipt of public comments. At other times, the public shall remain silent unless specifically invited by a member of the Commission *and permitted by the Chair* to provide comment.

~~Comments should be addressed to the item before the Commission. If a comment is irrelevant,~~

~~inflammatory, or prejudicial, the Chair may instruct the Commissioners to "disregard" the comment, which nevertheless remains in the public record.~~

b. PROPER DECORUM. During all Commission proceedings, members of the public have the obligation to maintain proper decorum. Individuals should be respectful, clear, and concise and demonstrate integrity in comments and actions. The use of profane, vulgar, obscene, or threatening remarks is not permitted and may result in removal from the meeting. Individuals should refrain from participating unless recognized by the Chair; this includes booing, clapping, and cheering.

c. TIME AND PLACE. Members of the public, applicants, or their representatives

desiring to address the Commission shall proceed to the appointed place, clearly state their names and addresses, and shall be subject to the following time limitations: ten minutes total for the applicant and any of the applicant's representatives; three minutes per individual for all others. The Chair may, at their discretion, allow additional time for speakers.

d. SIGN-IN. Sign-in forms, if deemed necessary by the Chair, shall be completed by persons desiring to speak, listing printed name, phone number, address of the person desiring to speak, and application number of the issue to be addressed.

e. WRITTEN COMMENTS AND TESTIMONY. Written comments may be submitted at least twenty-four hours prior to the meeting to ensure distribution to the Commission members in time for review. Any written comments and testimony received shall become part of the public record.

f. WORK SESSIONS. During all work sessions of the Commission, the public may be present but shall remain silent unless specifically invited by ~~a member~~*the Chair* of the Commission to provide comment*. Formal rules of procedure may be suspended for Commission work sessions*.

~~During all Commission proceedings, members of the public have the obligation to remain in civil order. Any conduct that interferes with the equitable rights of another to provide comment or which interferes with a proper execution of Commission affairs may be ruled by the Chair as "out-of-order" and the offending person be directed by the Chair to remain silent. Once having been so directed, if a person persists in disruptive conduct, the Chair may entertain a motion to "eject" that individual from the Commission hearing or meeting. If that person fails to comply with the successful motion to eject, the Chair may then call upon civil authority to physically remove the individual from the meeting place for the duration of the hearing or deliberation on that item.~~

ARTICLE VIII.~~–~~
VOTING AND TRANSACTION OF BUSINESS

~~(a) Parliamentary Authority~~

a. *PARLIAMENTARY AUTHORITY.* Parliamentary procedure at *all* Commission meetings shall be governed by the most recent edition of Robert's Rules of Order, newly revised, as applicable to boards, except to the extent set out otherwise in these bylaws*, Town Code,* or the Code of Virginia. The Town Attorney*, or their designee,* is Parliamentarian of the Commission.

~~(b) Quorum (As set forth in§ 15.2-2215,~~*QUORUM. In accordance with Town* Code ~~of Virginia)~~

b. ~~A~~*Sec. 2-43, a* majority of the members *of the Commission* shall constitute a quorum and no action of the Commission shall be valid unless authorized by a majority vote of those present and voting. *A member who knows they will be absent from or will have to abstain from any matter shall notify the Chair and staff at least twenty-four hours prior to the meeting of such fact.*

c. LACK OF QUORUM. If a quorum is not present at the time set for the meeting, the Chair shall wait until there is a quorum. If no quorum is present after a reasonable time, at the discretion of the Chair, and there appears to be no prospect that a quorum will assemble with additional reasonable time, then the Chair shall call the meeting to order, announce the absence of a quorum, and entertain a motion to adjourn.

~~b.~~*d. VOTING. All members of the Commission shall be entitled to vote.* Unless otherwise specified by the Chair, actions shall be by oral vote with the vote of each member recorded in *the minutes.*

~~the minutes.~~

~~(c) Lack of a Quorum~~

~~If a quorum is not present at the time set for the meeting, the Chair or Chair Pro tem shall wait until there is a quorum. If no quorum is present after a reasonable time, the discretion of the Chair or Chair Pro tem and there appears to be no prospect that a quorum will assemble, then the Chair or Chair Pro tem shall call the meeting to order, announce the absence of a quorum, and entertain a motion to adjourn.~~

~~(d) Suspension of the Rules~~

e. SUSPENSION OF THE RULES. No rule of the Commission shall be suspended without the concurrence of three-fourths of the members present and such suspension shall be limited to the meeting then in progress.

~~(e) Agenda~~

f. AGENDA. The activities at any ~~regular~~ meeting of the Commission shall be in accordance with ~~a formal~~*an* agenda. Such *an* agenda shall be distributed to the Commission and made available to the public prior to each meeting.

~~(d) Order of Business (Regular Meeting)~~

g. ORDER OF BUSINESS (REGULAR MEETING). At regular meetings of the Commission, business shall be conducted in the following manner:

1. Call to ~~order and roll call~~*Order*

~~1. Approval of minutes of the last meeting(s)~~

~~2. Citizen comment period~~

~~3. Public Hearings~~

~~4. Special items deferred from previous meetings~~

~~5. Old Business~~

~~6. New Business~~

2. *Election of Officers, when necessary*
3. Staff ~~Reports~~*Comment*
4. *Commissioner Comment*
5. Committee Reports

~~7. Commission reports and requests~~

~~Future~~*5. Public Comment*

6. *Public Hearings*
7. *Regular* Business
8. *Consent (includes minutes)*
9. Adjournment

~~(e) Order of Business (Special Meetings)~~

h. ORDER OF BUSINESS (WORK SESSIONS AND SPECIAL MEETINGS). The order of business at special meetings *and work sessions* shall be in accordance with the agenda set by the ~~Secretary~~*Chair* for such ~~special~~ meetings.

~~(f) Amendments to Agenda~~

i. AMENDMENTS TO AGENDA. Agendas may be amended ~~and/or items added or deleted from the agenda~~ by majority concurrence of the ~~members~~*Commissioners present*.

ARTICLE IX.~~-~~ SEPARABILITY

Should any article of the Commission bylaws be found to be void, the remaining articles shall remain in effect.

ARTICLE X.~~ MODIFICATION OF BYLAWS~~ *MODIFICATION OF BYLAWS*

Modification of these bylaws shall be approved by the Commission in *a* regular ~~session~~*meeting*. Proposals for modification shall be submitted to the Commission at a regular meeting and shall be scheduled for consideration and action at the next regular meeting. ~~An~~*In accordance with Town Code Sec. 78-150.2(c) an* affirmative vote of ~~two-thirds~~*a majority* of the entire Commission shall be required to modify the bylaws.

TOWN OF Herndon VIRGINIA

PLANNING COMMISSION BYLAWS
DRAFT AMENDMENTS

INTRODUCTION

This Planning Commission (Commission) is established pursuant to Sec. 15.2-2210 of the Code of Virginia and Chapter 2, Article II, Division 2 of the Code of the Town of Herndon (Town Code).

ARTICLE I
COMMISSION MEMBERS

a. COMPOSITION/QUALIFICATIONS OF MEMBERS. In accordance with Town Code Sec. 2-37, the Commission shall consist of seven members appointed by the Town Council, all of whom shall be residents of the town, qualified by knowledge and experience to make decisions on questions of community growth and development; provided, however, that at least half of the members so appointed shall be owners of real property. One member of the Commission may be a member of the Town Council.

b. TERM. In accordance with Town Code Sec. 2-37, the term of a member of the Town Council serving on the Commission shall be coextensive with the term of office to which they have been elected or appointed, unless the Town Council, at the first regular meeting each fiscal year, appoints others to serve as their representative. The remaining members of the Commission shall serve for terms of four years each.

c. RESIGNATION. Any member who resigns from the Commission prior to the end of their term shall do so in writing to the Chair. The effective date of such resignation shall be the date of the letter to the Chair unless another date is stated within the letter of resignation.

d. VACANCIES. In accordance with Town Code Sec. 2-41, vacancies upon the Commission, however caused, shall be filled by the Town Council for the unexpired term only. In accordance with Town Code Sec. 2-37, if a member serving on the Commission becomes a member of the Town Council, they shall be deemed to have vacated, and shall vacate, their term of office on the Commission on the date of their taking office on the Town Council.

e. REMOVAL. In accordance with Town Code Sec. 2-40, any member of the Commission may be removed from office for malfeasance in office. Notwithstanding the foregoing provision, a member of the Commission may be removed from office by the Town Council without limitation in the event that the Commission member is

absent from any three consecutive meetings of the Commission, or is absent from any four meetings of the Commission within any 12-month period, beginning upon the date of the member's assumption of office. In either such event, a successor shall be appointed by the Town Council for the unexpired portion of the term of the member who has been removed.

e. COMPENSATION. In accordance with Town Code Sec. 2-38, all members of the Commission shall receive as compensation such amounts as may be or have been determined by resolution of the Town Council and shall be reimbursed for actual expenses incurred.

f. TRAINING. In accordance with Town Code Sec. 78-150.2, newly appointed members of the Commission shall be offered training and certification by the Citizens Planning Education Association of Virginia or similar certification to be completed within two years of appointment.

ARTICLE II
ELECTION AND DUTIES OF OFFICERS

a. ELECTION OF OFFICERS. In accordance with Code of Virginia Sec. 15.2-2217 and Town Code Sec. 2-39, the Commission shall elect from the appointed members a Chair and Vice Chair, whose terms shall be for one year. Elections of officers shall occur annually at the Commission's regular meeting in January. Elections shall be conducted through the Commission's usual voting process. If the office of Chair becomes vacant, the Vice Chair automatically becomes Chair, and the office of Vice Chair becomes vacant. The Commission shall then, after a new member has been appointed, elect from its appointed members a new Vice Chair. If the office of Chair becomes vacant at a time when there is no Vice Chair, the Commission shall elect from its current members both a Chair and a Vice Chair.

b. DUTIES OF CHAIR. The Chair shall preside over all meetings of the Commission, with the same powers and duties as the other members, with vote but no veto power. They shall be the official head of the Commission and shall perform such other duties not inconsistent with their office including presiding at all meetings, deciding points of order with the assistance of the Parliamentarian, taking action to preserve the order and integrity of proceedings before the Commission, being informed of any official communication and reporting about such to the Commission at the next regular Commission meeting, and appointing all committees of the Commission.

c. DUTIES OF VICE CHAIR. The Vice Chair shall act in the absence or inability of the Chair to act, serve as aide to the Chair and represent the Chair upon request.

d. CHAIR PRO TEM. In the absence of both the Chair and Vice Chair, the Commission shall elect by a majority vote a Chair Pro Tem, who shall preside over the meeting and shall act as Chair.

ARTICLE III
DESIGNATION AND DUTIES OF THE SECRETARY AND STAFF

a. DESIGNATION OF STAFF. The Commission shall designate the Director of Community Development, or their designee, to serve, in addition to any regular duties, as professional staff to the Commission. Duties of the staff representative shall include the preparation and presentation of applications before the Commission.

b. DESIGNATION AND DUTIES OF SECRETARY. The Commission shall designate the Director of Community Development, or their designee, to serve in addition to any other appointed duties, as Secretary of the Commission. The Secretary shall attend all meetings of the Commission and their duties shall include preparation of draft minutes, preparation and compilation of a written record of the official actions of the Commission, which shall be posted on the town's website and filed in the Department of Community Development, and preparation of official correspondence to and from the Commission as directed by the Chair.

ARTICLE IV
COMMITTEES

In accordance with Code of Virginia Sec. 15.2-2221, advisory committees may be established by the Commission to make studies or carry out functions of the Commission. The members of committees shall be appointed by the Chair for the purposes and terms approved.

ARTICLE V
MEETINGS

a. MEETING SCHEDULE. In accordance with Town Code Sec. 2-42, the Commission may meet in regular session on the fourth Monday of each month, and in work session on the second Monday of each month, at 7:00 p.m., at 765 Lynn Street, Herndon, Virginia or at such other time and place as may be fixed by resolution, so long as the Commission meets at least every two months.

b. POSTPONED OR CANCELED. Should the conduct of a meeting be unnecessary due to a lack of items for consideration, impossible due to the inability to obtain a quorum, or due to weather or other condition such that it is hazardous for members

to attend the meeting, as declared in writing by the Chair, the meeting may be postponed or canceled and notice of such postponement or cancelation and the rescheduled date, shall be published by staff. All public hearings and other matters previously advertised shall be conducted at the rescheduled meeting and no further advertisement is required, unless required by law.

c. SPECIAL MEETINGS. In accordance with Town Code Sec. 2-42, special meetings of the Commission may be called by the Chair or by any two members upon written request to the Secretary. Written notice fixing the time and place of the meeting and the purpose shall be mailed to the Commission members by staff at least five days in advance. Formal rules of procedure may be suspended for Commission work sessions. Written notice of a special meeting is not required if the time of the special meeting has been fixed at a regular meeting, or if all members are present at the special meeting or file a written waiver of notice.

d. PUBLIC HEARINGS. Public hearings are scheduled during regular meetings, are open to the public, and members of the public are encouraged to speak. The purpose of public hearings is to receive testimony from the public. In addition to those required by law, the Commission may hold public hearings on any matter referred to the Commission by the town council or on other planning issues in the interest of the Town of Herndon citizens. Notice of public hearing shall be provided in accordance with the Code of Virginia, and the Town Code, and may be supplemented with additional notices as deemed appropriate by the Commission or staff.

1. ORDER OF PUBLIC HEARING.
   i. Presentation by staff summarizing the item
   ii. Presentation by the applicant
   iii. Testimony of members of the public desiring to speak
   iv. Concluding comments by the applicant; questions by Commission members, if the Chair determines such are necessary
   v. Concluding comments by staff; questions by Commission members, if the Chair determines such are necessary
   vi. Public hearing closed by the Chair
   vii. Motion
   viii. Discussion by Commission members

ix. Vote roll call (or other means if deemed necessary by the Chair)

e. CONTINUED DELIBERATION OF PUBLIC HEARING ITEMS. At the completion of the hearing on each item, the Commission shall proceed with its deliberation on that item and members shall have an additional opportunity for discussion, and then a vote shall be taken. Continuing an item to another meeting shall only occur upon motion, second, and vote of the Commission properly made, and the motion shall specify the date when the item will again be considered.

f. ELECTRONIC PARTICIPATION IN MEETINGS. In accordance with Town Code Sec. 2-4, a member of the Commission may participate in a meeting that is not a public hearing from a remote location.

ARTICLE VI
CONDUCT OF THE COMMISSION MEMBERS

a. CODE OF ETHICS. Town Code Sec. 2-5, "Code of Ethics for the Members of the Town Council and Council Appointed Board and Commission Members" is hereby incorporated by reference and members of the Commission shall so govern their actions.

b. ENCOURAGE PUBLIC PARTICIPATION. Members of the Commission shall limit their comments to ensure public participation without Commission interference. At the completion of each presentation, members of the Commission shall have an opportunity to ask questions or clarify points made during the speaker's presentation.

c. COMMISSION RESPONSE. Members of the Commission are not expected to respond to general questions. Response to questions shall be made at the discretion of the Chair.

ARTICLE VII
CONDUCT OF PERSONS
APPEARING BEFORE THE PLANNING COMMISSION

a. PUBLIC ATTENDANCE. During all regular and special meetings of the Commission, the public may be present, and a specific time shall be reserved for receipt of public comments. At other times, the public shall remain silent unless specifically invited by a member of the Commission and permitted by the Chair to provide comment.

b. PROPER DECORUM. During all Commission proceedings, members of the public have the obligation to maintain proper decorum. Individuals should be respectful, clear, and concise and demonstrate integrity in comments and actions. The use of profane, vulgar, obscene, or threatening remarks is not permitted and may result in removal from the meeting. Individuals should refrain from participating unless recognized by the Chair; this includes booing, clapping, and cheering.

c. TIME AND PLACE. Members of the public, applicants, or their representatives desiring to address the Commission shall proceed to the appointed place, clearly state their names and addresses, and shall be subject to the following time limitations: ten minutes total for the applicant and any of the applicant's representatives; three minutes per individual for all others. The Chair may, at their discretion, allow additional time for speakers.

d. SIGN-IN. Sign-in forms, if deemed necessary by the Chair, shall be completed by persons desiring to speak, listing printed name, phone number, address of the person desiring to speak, and application number of the issue to be addressed.

e. WRITTEN COMMENTS AND TESTIMONY. Written comments may be submitted at least twenty-four hours prior to the meeting to ensure distribution to the Commission members in time for review. Any written comments and testimony received shall become part of the public record.

f. WORK SESSIONS. During all work sessions of the Commission, the public may be present but shall remain silent unless specifically invited by the Chair of the Commission to provide comment. Formal rules of procedure may be suspended for Commission work sessions.

ARTICLE VIII
VOTING AND TRANSACTION OF BUSINESS

a. PARLIAMENTARY AUTHORITY. Parliamentary procedure at all Commission meetings shall be governed by the most recent edition of Robert's Rules of Order, newly revised, as applicable to boards, except to the extent set out otherwise in these bylaws, Town Code, or the Code of Virginia. The Town Attorney, or their designee, is Parliamentarian of the Commission.

b. QUORUM. In accordance with Town Code Sec. 2-43, a majority of the members of the Commission shall constitute a quorum and no action of the Commission shall be valid unless authorized by a majority vote of those present and voting. A member who knows they will be absent from or will have to abstain from any matter shall notify

the Chair and staff at least twenty-four hours prior to the meeting of such fact.

c. LACK OF QUORUM. If a quorum is not present at the time set for the meeting, the Chair shall wait until there is a quorum. If no quorum is present after a reasonable time, at the discretion of the Chair, and there appears to be no prospect that a quorum will assemble with additional reasonable time, then the Chair shall call the meeting to order, announce the absence of a quorum, and entertain a motion to adjourn.

d. VOTING. All members of the Commission shall be entitled to vote. Unless otherwise specified by the Chair, actions shall be by oral vote with the vote of each member recorded in the minutes.

e. SUSPENSION OF THE RULES. No rule of the Commission shall be suspended without the concurrence of three-fourths of the members present and such suspension shall be limited to the meeting then in progress.

f. AGENDA. The activities at any meeting of the Commission shall be in accordance with an agenda. Such an agenda shall be distributed to the Commission and made available to the public prior to each meeting.

g. ORDER OF BUSINESS (REGULAR MEETING). At regular meetings of the Commission, business shall be conducted in the following manner:

1. Call to Order
2. Election of Officers, when necessary
3. Staff Comment
4. Commissioner Comment
5. Committee Reports
5. Public Comment
6. Public Hearings
7. Regular Business
8. Consent (includes minutes)
9. Adjournment

h. ORDER OF BUSINESS (WORK SESSIONS AND SPECIAL MEETINGS). The order of business at special meetings and work sessions shall be in accordance with the agenda set by the Chair for such meetings.

i. AMENDMENTS TO AGENDA. Agendas may be amended by majority concurrence of the Commissioners present.

ARTICLE IX
SEPARABILITY

Should any article of the Commission bylaws be found to be void, the remaining articles shall remain in effect.

ARTICLE X
MODIFICATION OF BYLAWS

Modification of these bylaws shall be approved by the Commission in a regular meeting. Proposals for modification shall be submitted to the Commission at a regular meeting and shall be scheduled for consideration and action at the next regular meeting. In accordance with Town Code Sec. 78-150.2(c) an affirmative vote of a majority of the entire Commission shall be required to modify the bylaws.

Planning Commission Work Session
Agenda Item 3.b.

Agenda Item: **Discussion - Election of Officers**

Meeting Date: January 8, 2024

Category: New Business

Prepared by: Lesa Yeatts, Town Attorney

Description:
In accordance with the Planning Commission Bylaws, Code of Virginia Sec. 15.2-2217 and Town Code Sec. 2-39, the Planning Commission holds its election of officers annually at the first public hearing (regular meeting) of the Board in January. The Board will nominate and elect from its members a Chair and Vice Chair and designate a Secretary and Parliamentarian for one-year terms at the January 22, 2024, Planning Commission regular meeting.

Background:
N/A

Fiscal Impact:
None

Recommendation:
This is a discussion item; no staff recommendation.

Attachments:
1. Resolution (Proposed)

TOWN OF HERNDON, VIRGINIA
PLANNING COMMISSION

RESOLUTION

JANUARY 22, 2024

Resolution - to elect the Officers and designate the Parliamentarian and Secretary of the Planning Commission.

BE IT RESOLVED by the Planning Commission of the Town of Herndon, Virginia that:

1. _____is elected Chair for a one-year term effective January 22, 2024.

2. _____ is elected Vice Chair for a one-year term effective January 22, 2024.

3. The Director of Community Development or their designee is designated as Secretary for a one-year term effective January 22, 2024.

4. The Town Attorney or their designee is designated as Parliamentarian for a one-year term effective January 22, 2024.