# PLANNING COMMISSION SPECIAL WORK SESSION AGENDA

Town Council Chambers
765 Lynn Street, Herndon, VA 20170

Thursday, February 22, 2024 | 7:00 PM

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1. **Call to Order**

2. **Public Hearings**

   a. 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. **Comments**

   a. Comments from the Commissioners

   b. Comments from the Staff Members

4. **Adjournment**

# Planning Commission Special Work Session
## Agenda Item 2.a.

**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:** February 22, 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.

**Budget Impact:**
None

**Recommendation:**
Staff is withholding a recommendation at this time.

**Attachments:**
1. Staff Memo

2. 01.10.2024 TRG Advisory Committee Minutes Draft
3. 02.12.2024 TRG Small Area Plan - Final Draft with Appendices

TOWN OF Herndon VIRGINIA

MEMORANDUM

To: Chairman Romeo & Members of the Planning Commission

From: Ahmad Zaki, AICP
Lead Planner, Long-Range Planning
ahmad.zaki@herndon-va.gov

Date: February 22, 2024

Subject: CPA# 23-01, Final Draft Transit-Related Growth (TRG) Small Area Plan

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**Purpose and Summary:**

This memo presents the final draft report for the Transit-Related Growth (TRG) Small Area Plan, which was submitted by the project's consultant, SOM, on February 12, 2024. This is the culmination of comprehensive revisions based on technical committee input, the motions set forth by the TRG Advisory Committee during their meeting on January 10, 2024, as well as the invaluable recommendations and guidance provided by the Planning Commission in their previous sessions.

Staff is currently reviewing the final draft and will be developing an errata sheet with suggested edits. While this draft updates all plan elements, the executive summary, architectural character section, traffic mitigation pages, and multi-modal transportation section, are all new information and receiving close examination by staff. The final draft of the plan and the draft Advisory Committee motions are included within this dispatch.

**Next Steps**

Staff will present the final draft and an overview of pending staff-suggested edits at the February 22, 2024, special work session. Staff plan to have a draft resolution prepared for inclusion in the dispatch for the Planning Commission's February 26, 2024, regular meeting. Following the Commission's thorough review and subsequent recommendation, the plan will advance to the Town Council for a final decision. The errata sheet will be diligently maintained, documenting changes suggested during the various reviews. Once the plan receives approval, the final version will be promptly updated to incorporate these changes.

**TRANSIT-RELATED GROWTH (TRG)**
**ADVISORY COMMITTEE**
**Meeting**
**Wednesday, January 10, 2024**

The Transit-Related Growth (TRG) Area Advisory Committee of the Town of Herndon, Virginia, met on Wednesday, June 8, 2023, at 7:00 p.m. in the Town of Herndon Council Chambers, 765 Lynn Street, Herndon, Virginia. In attendance were: Bryce Perry, Greg Riegle, Emlyn Marsteller, Ken Wire, Vice Chair Meron Yohannes, and Chair George Burke. Committee Members Rajesh Ramasubramanian and Andrew Snowhite were absent.

Staff members present: Lisa Gilleran, Director of Community Development; Ahmad Zaki, Lead Planner, Long-Range Planning; and Collin Okoniewski, Planning Operations Manager.

## 1. Call to Order

Chair Burke called the meeting to order at 7:01 p.m. and stated that five members of the advisory committee were present, which constituted a quorum.

## 2. Approval of Minutes

a. December 11, 2023, Joint Planning Commission & TRG Advisory Committee Meeting Minutes

On the motion by Committee Member Riegle, seconded by Committee Member Perry, the minutes from the December 11, 2023, Joint Planning Commission & TRG Advisory Committee Meeting were approved by a 5-0 vote.

The vote was: Committee Members Perry, Riegle, Marstellar, Wire, Chair George Burke voting "Aye." Vice Chair Yohannes was not yet present.

## 3. New Business

### a. Formulation of recommendations to the Planning Commission and Town Council

The committee decided to break down each section of the proposed plan into topics to formulate a recommendation. To facilitate discussion a variety of questions were proposed relevant to each section. The questions and the responses were used to formulate a recommending motion.

**<u>Land Use & Density</u>**

a. Is the preferred balance of uses achieved?
b. Is the correct degree of flexibility achieved?
c. Is the AC comfortable with the loss of small office and light industrial uses?
d. Does the two poles of activity (Metro Arrival and Sunset District) make sense?
e. Is the transition to the SFD neighborhoods adequate?
f. Should specific widths between buildings be indicated within the SAP?
g. What other land use items should be considered moving forward?

Committee members had a directed discussion on land use and density within the TRG. Staff provided answers to questions.

Chair Burke inquired of staff on the development and use surrounding the Sunset District in the TRG draft plan. Staff provided comments and further explained the proposal.

Chair Burke inquired as to the density of office space. Staff provided information on the importance of retaining a good balance between office/business and residential uses.

Vice Chair Yohannes spoke about the importance of keeping multi-use in the mix and allowing for the most flexibility in the future as trends develop.

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Committee Member Riegle spoke on the memo he submitted as part of the staff memo and the points relevant to the land use and density topic. He further spoke towards the idea of ensuring flexibility and the durability of that flexibility throughout the lifespan of this plan. Committee Member Perry further stated that specific measurements and requirements are not appropriate, and the plan should focus more on larger-picture issues, like character and community-suggested offerings. Committee members agreed with these concepts and further explained that prescriptive language for land use would not be something that should appear in this plan.

Chair Burke spoke about the retention of the Sunset Business Park being important, and the development of this area cannot be too aspirational, but some practical updates should be encouraged.

Commissioners agreed not to replace community-based valuable uses like those in the Sunset Business Park. This is a unique case for this type of land use in the Town.

Commissioners had no issues with height and density and the transition of buildings from commercial, into the current existing Downs neighborhood.

Commissioners had a brief discussion on the metro plaza.

New uses that may not be known shouldn't be excluded from the plan, and the plan should allow for future use innovation and development.

A motion to recommend the following four points of emphasis in the area of Land Use & Density as they relate to the draft TRG plan was made by Committee Member Riegle.

1. The advisory committee generally supports the proposed land uses and density recommendations as proposed in the draft small area plan but furthers the idea that prescriptive land use be avoided.

2. Clarify in the TRG small area plan that specific design direction (such as site design, architecture, open space elements, etc.) and dimensions (including setbacks; building heights and footprints; separation between buildings, etc.) are conceptual and intended to show general massing, hierarchy of uses, scale and proportion, but are meant to be refined and finalized as part of final site design developed in subsequent land use processes in a manner that still respects the concepts and design principals generally described in the TRG Small Area Plan.

3. Clarify and provide guidance in the TRG small area plan regarding impacts to and needs for expanded public and community services.

4. The draft plan should recognize the logical evolution of uses and not preclude future, undefined uses that are otherwise compatible to the intent of the small area plan.

The motion was seconded by Vice Chair Yohannes.

There was no discussion on the motion. The question was called on the motion, which was carried by a vote of 6-0. The vote was Committee Members Marstellar, Perry, Riegle, Wire, Vice Chair Yohannes, and Chair Burke voting "Aye."

**<u>Transportation Network & Traffic Impacts</u>**

a. Is the overall grid acceptable?
b. Is a reduction in LOS appropriate?
c. Does the grid provide suitable access to the various property owners?
d. Is the correct amount of emphasis placed on multi-modal improvements and TDM strategies?
e. Should specific roads be identified as public vs private?
f. Are the necessary intersection improvements acceptable?
g. What other transportation/traffic items should be considered moving forward?

Staff advised of issues DPW Engineering staff have with the grid and its links to Herndon Parkway, specifically noting that the spine road is too short. The committee agreed that the spine roads relocation would help, but technically may not be at all possible.

The committee also discussed multi-modal transportation improvements.

A motion to recommend the following five points of emphasis in the area of Transportation Network & Traffic Impacts as they relate to the draft TRG plan was made by Committee Member Riegle.

1. The Committee supports a land use pattern that reflects multi-modal transportation opportunities. The Committee further supports the use of reasonable TDM measures reflecting the proximity to the metro station.

2. The Committee supports the concepts of connectivity and the hierarchy of streets, both public and private, generally reflected in the draft small area plan.

3. This plan acknowledges that the proposed increase in urban development within the TRG will necessitate changes to the intersection level of service standards.

4. The final configuration of the street grid can and should be refined to reflect further feedback from town staff and practical development configurations.

5. Traffic impacts and mitigation measures should be evaluated in connection with specific development applications.

The motion was seconded by Chair Burke.

There was no discussion on the motion. The question was called on the motion, which was carried by a vote of 6-0. The vote was Committee Members Marstellar, Perry, Riegle, Wire, Vice Chair Yohannes, and Chair Burke voting "Aye."

**Open Space Network**

a. Is the overall open space network appropriate?
b. Is enough open space provided?
c. Should the plan include more specificity on intended active vs passive opportunities for recreation?
d. Are the open spaces appropriately shared between individual property owners?
e. What other open space and recreational items should be considered moving forward?
f. Is the degree of connectivity to abutting neighborhoods sufficient?

Committee Member Wire recommended that the committee allow for flexibility in open space areas, to ensure that developers have options over time.

Chair Burke inquired as to whether the plan adequately incorporates public comment on open space, specifically the mix of active and passive open spaces.

Committee Member Wire commented that open space shouldn't only be limited to grass, but also include complimentary uses like kiosks, food trucks, and pop-up areas. Recommended that it may be more appropriate that the committee advise broad definitions of open space and programmable space to include these uses.

The committee agreed that the scope and depth of connectivity should be evaluated as it relates to existing residential areas like the Downs. Further, the committee wanted to ensure the connection of the linear park to Haley Smith Park.

A motion to recommend the following point of emphasis in the area of Open Space Network as it relates to the draft TRG plan was made by Committee Member Riegle.

1. The Committee supports the concepts of the draft TRG plan with the expectation

of appropriate combinations of active, passive, and programmable opportunities within the open spaces.

The motion was seconded by Chair Burke.
There was no discussion on the motion. The question was called on the motion, which was carried by a vote of 6-0. The vote was Committee Members Marstellar, Perry, Riegle, Wire, Vice Chair Yohannes, and Chair Burke voting "Aye."

**Urban and Architectural Design & Character**

a. What level of design and form guidance should be included within the plan?
b. In what specific ways should the plan establish and reinforce a unique Herndon character and sense of place? Does the plan effectively address this?
c. Should the TRG have a cohesive design narrative that is distinct for the TRG or that is more seamless with other character-defining townscapes?
d. Should the various neighborhoods of the TRG have design elements distinct from each other?
e. Are the building heights appropriate? Do they make sense for the various construction types?
f. How should structured parking be screened? Should open parking garages be visible from public right-of-ways or highly visible viewsheds?
g. What other design and character items should be considered moving forward?

Committee Member Perry explained that design guidelines should be objective because the zoning code does not get into aesthetic language.

The committee agreed that it should ensure that public input on character was acknowledged and incorporated into the plan.

Vice Chair Yohannes voiced that this section should be the section where ARB should have the ability to decipher. The plan should encourage multi-texture and encourage a variety of materials.

The committee had a brief discussion on building height and transition points.

Committee Member Wire voiced a recommendation that staff work with the consultant to make up a plan that provides direction for the ARB. This plan should utilize a handful of design principles to guide architects as they work on developments within the SAP.

The committee agreed further that cohesion along public and private rights of way and in open spaces within visible areas would be positive, but at the same time this should not reflect uniformity or duplication, but urban design cohesion.

A motion to recommend the following three points of emphasis in the area of Urban and Architectural Design & Character as it relates to the draft TRG plan was made by Committee Member Riegle.

1. The Committee directs staff to work with the architectural consultants (SOM) to further study and provide guidance and high level design principles within the TRG small area plan to assist the ARB and subsequent land use processes.

2. The Committee recommends consideration for architectural backs, but appropriate levels of screening and design should be implemented.

3. The Committee recommends that architectural variety and creativity should be encouraged.

The motion was seconded by Chair Burke.

There was no discussion on the motion. The question was called on the motion, which was carried by a vote of 6-0. The vote was Committee Members Marstellar, Perry, Riegle, Wire, Vice Chair Yohannes, and Chair Burke voting "Aye."

## Parking Strategies

a. Does the reliance on shared parking make sense?
b. Should on-street parking be leveraged to the degree recommended?
c. Should parking ratios be permitted to be reduced from current standards?
d. What other parking items should be considered moving forward?

The committee held discussion and agreed upon the following:

- Shared parking is the goal where you have common ownership.
- On-street parking is encouraged on primary streets and should be on-site.
- Developers should build parking to meet demand. Ratios should not be explicitly stated in the plan but saved for zoning approvals down the road.

A motion to recommend the following four points of emphasis in the area of Parking Strategies as it relates to the draft TRG plan was made by Committee Member Wire.

1. The Committee supports staff's efforts to work with SOM to reduce and correct graphics for streets and parking that are not currently labeled correctly in the draft TRG plan. The alignment between parking strategies and actual street designations should be the same.

2. The Committee supports parallel parking on primary and secondary streets.

3. The Committee is supportive of flexible parking options as part of the subsequent zoning ordinance updates.

4. The Committee endorses shared parking where common ownership is present, but not otherwise.

The motion was seconded by Committee Member Riegle.

There was no discussion on the motion. The question was called on the motion, which was carried by a vote of 6-0. The vote was Committee Members Marstellar, Perry, Riegle, Wire, Vice Chair Yohannes, and Chair Burke voting "Aye."

## Plan Implementation & Phasing

a. Is the current approach to how best to implement an incremental plan appropriate?
b. Should mitigating off-site impacts be shared amongst the property owners?
c. Should more guidance be provided on interim conditions?
d. What other implementation/phasing items should be considered moving forward?

Committee Member Perry voiced that the implementation part of the plan will be an intense administrative endeavor. The committee won't play as big of a role.

The committee agreed that mitigating offsite impacts should be shared amongst property owners.

A motion to recommend the following two points of emphasis in the area of Plan Implementation & Phasing as it relates to the draft TRG plan was made by Committee Member Riegle.

1. The Committee recommends that mitigating off-site impacts should be shared amongst property owners.

2. The Committee recommends that there should be guidance to existing businesses which acknowledges the retention of successful community service uses.

The motion was seconded by Chair Burke.

There was no discussion on the motion. The question was called on the motion, which was carried by a vote of 6-0. The vote was Committee Members Marstellar, Perry, Riegle, Wire, Vice Chair Yohannes, and Chair Burke voting "Aye."

5. **Comments**

**a. Comments from Staff Members**

No comments were offered.

**b. Comments from Committee Members**

Committee members voiced an appreciation for the staff for putting the meeting together and seeing this project through its development.

**c. Comments from Members of the Public**

No members of the public were present to provide comment.

6. **Adjournment**

There being no further business, and without objection, the January 10, 2024, TRG Advisory Committee meeting was adjourned at 9:21 p.m. on the motion of Committee Member Wire and seconded by Committee Member Reigle.

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**Minutes approved by the Transit-Related Growth (TRG) Advisory Committee:**

TRG
TRANSIT - RELATED GROWTH AREA

TOWN OF Herndon
SOM

FINAL DRAFT

Town of Herndon

# Transit-Related Small Area Plan

## Final Report

February 12, 2024

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# Acknowledgments

*The Transit-Related Growth Area (TRG) Small Area Plan (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 subject matter experts & designers -- are recognized for their invaluable contributions to this ambitious plan.

Special recognition is due to the seven-member TRG Advisory Committee, comprised of members of the Planning Commission, members of the adjacent residential community, TRG property owners, and town staff. Likewise, the Architectural Review Board's deep familiarity with the Town of Herndon provided the team with critical design guidance. The Planning Commission and Town Council, which represents the myriad of voices within the Town of Herndon community, supplied guidance and oversight of this TRG SAP.

**Mayor**
Sheila A. Olem

**Vice Mayor**
Clark Hendrick

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

**Planning Commission**
Michael G. Romeo, Chair
George Burke, Vice Chair
Jay Donahue
Dua'a Elbarasse
Mike McFarlane
Kevin G. Moses
Meron Yohannes

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Director of Community Development

Bryce A. Perry
Deputy Director of Community Development

Ahmad Zaki, AICP
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 Blaker-Glass, Chair
Eric Boll
Melody Fetske
Amy Oleinick
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**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

Paul LeReche (Alternate 03/2022 - 08/2022)

# Executive Summary

The Herndon Transit-Related Growth Area (TRG) Small Area Plan (SAP) represents the culmination of an extensive collaborative 20-month effort led by Town of Herndon staff and a consultant team led by SOM. Aimed at leveraging the recent opening of the Silver Line Metro Station at Herndon, the Small Area Plan seeks to establish a vision for the TRG as a vibrant urban district fostering economic growth, supporting job creation, and accommodating a diverse mix of residential, retail, office, and recreational amenities. The strategic framework outlined in this report provides a roadmap for realizing this ambitious yet achievable vision.

This effort began with an exhaustive examination of the current TRG area encompassing factors such as past planning endeavors, real estate market dynamics, transportation infrastructure, civil utilities, open space, urban design elements, and architectural character. Situated in the southwest corner of the Town of Herndon immediately north of the Dulles Toll Road and west of Fairfax County Parkway, the TRG is a 93-acre area including 26 discrete parcels. The TRG occupies a pivotal location proximate to major thoroughfares and the newly operational Herndon Metro stop, is predominantly characterized by a mix of low-density office and industrial spaces with notable vacancy rates, but notably boasts a vibrant retail complex known as the Sunset Business Park. Despite being predominantly developed, the TRG lacks a vibrant mix of land uses and lacks significant open spaces. Due to the many diverse interest groups invested in the TRG, it is anticipated that redevelopment within the planning horizon will occur piecemeal over time.

The real estate market analysis conducted by RCLCO exhibited a strong potential for various development types, including mid-rise apartments, townhomes, retail establishments, and office spaces. The market analysis also identified key opportunities for growth, particularly in the residential and retail sectors, alongside moderate prospects for hospitality and creative office ventures. In order to understand transportation impacts of any proposed development, a study of current traffic patterns was also conducted by VHB. The study indicated that with mitigation measures in place and a new networked street grid, the existing infrastructure can be built upon to create acceptable traffic conditions, in line with the surrounding context. Given expected growth trends in the surrounding area, even without any redevelopment within the TRG, traffic levels are projected to increase and levels of service are anticipated to decline in the future.



A cornerstone of the planning process for the SAP was robust public engagement, fostering inclusive dialogue and gathering a broad range of community input. Right from the outset the plan was focused on understanding priorities, gathering public input, and building collective support for the plan. This was done through establishing a Project Advisory Committee, direct outreach methods such as open houses, public meetings and tri-lingual surveys as well as indirectly through pop-ups at the WinterMarkt , a project podcast, and a dedicated TRG website. As the plan was developed, progress was shared through the website and public meetings and opportunities for feedback were provided through in-person interactive meetings, paper and online surveys.

Based on the site analysis, market analysis, infrastructure study, and initial public input, a vision emerged emphasizing the creation of a mixed-use community anchored by an integrated network of open spaces, pedestrian-friendly streetscapes, and transit-oriented developments. Three distinct concept scenarios were developed and used to solicit feedback, with the intention of synthesizing the most successful elements into a cohesive design framework. Guiding principles such as regional compatibility, appropriate density distribution and a distinctive Herndon character aimed to accommodate diverse land uses over a 20-year planning horizon.

Based on the site analysis, market analysis, infrastructure study, and initial public input, a vision emerged emphasizing the creation of a mixed-use community anchored by an integrated network of open spaces, pedestrian-friendly streetscapes, and transit-oriented developments. Three distinct concept scenarios were developed and used to solicit feedback, with the intention of synthesizing the most successful elements into a cohesive design framework. Guiding principles such as regional compatibility, appropriate density distribution and a distinctive Herndon character aimed to accommodate diverse land uses over a 20-year planning horizon.

**Vision**

The TRG SAP identified the following Plan Principles to guide the visioning process:

- Regionally Complementary and Differentiated
- The Right Density, In The Right Places
- A Character That Is Uniquely “Herndon”
- A Live-Work-Ride-Play Community
- Connected Redevelopment
- Landscape As A Driver

# Executive Summary

## Vision

The Design Objectives guiding the Small Area Plan were informed by project stakeholders, the public, and the Town of Herndon. These are:

- 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"

The Design Objectives led to the development of a viable Plan for the TRG that that focuses on the following aspects:

**Land Use, Density & Building Heights**
The plan envisions a diverse mix of development that could potentially amount to approximately 5.5 million square feet, comprising residential, retail, and office spaces. Higher densities and mixed-use development are recommended for concentration along Herndon Parkway and within a 5-minute walking radius of the Herndon Metro. A residential transitional area is envisioned between the existing single-family neighborhood to the north of the TRG and the higher-density mixed-use buildings, featuring townhouse developments of 3-4 stories. This transitional area is essential to create an urban neighborhood that is well incorporated into the small-town character of Herndon.

**Redevelopment Framework Plan**
The Redevelopment Framework Plan lays down the foundation for future development, as it takes into account the Plan Principles, and gives shape to the Design Objectives, allocating 24 right-sized development blocks anchored on a network of open spaces, integrating an urban street grid of multimodal mobility and designating building frontages and service areas, while setting ample distances between the blocks to allow for a public realm that accommodates planned circulation needs and amenities including on-street parking, bioretention landscaping, front yards and outdoor seating, tree canopy, and site furnishings throughout.

**Mobility**
To support the mobility aspirations of the TRG, a fine-grained grid of streets, sidewalks, and bike lanes was developed to facilitate movement, expand user choices, increase safety, and enhance transportation experiences. The proposed network will 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 proposed to provide traffic relief, especially given the higher densities anticipated by the plan. In addition to this, pedestrian-scale, permeable blocks were designed to promote walkability and enhance neighborhood character. All sidewalks and pedestrian zones were designed to be generous, incorporating landscape elements with stormwater management capacity.

**Urban Design & Architectural Character**
The architecture and urban design for the TRG incorporates the most successful elements of small-town, character-rich, Downtown Herndon, while allowing for a higher level of density and contemporary expression. Throughout the planning process, members of the public shared their conviction that the unique character of Herndon should be preserved even in the context of significant new development, and even given community members' equally strong desire for new, contemporary spaces. A carefully crafted set of urban design guidelines, and example illustrations are included in this document to ensure that these important criteria are met.

**Open Space**
In addition to land use, density, mobility and urban design considerations, the vision for the TRG is also anchored by an ambitious approach to open space. This includes creating new open spaces and fostering pedestrian connections that extend beyond the TRG to the W&OD and Sugarland Run trails. Of the approximately 93 acres of the TRG, 14 acres (15%) would be dedicated to open space, including three main open spaces as follows:

- Arrival Plaza – located near the metro, a 120'-wide main central square lined with retail and including opportunities for community programming
- Linear Park – located within the 100'-wide powerline easement, a unifying green feature that provides viewsheds and allows for the opportunities for performative green infrastructure & small-scale community programming
- Triangle Park and Square Park – large community spaces serving an area which is presently outside of a 10-minute walking distance of a park. Would serve a diverse mix of users, including residents, office workers & shoppers, and the planned "Sunset District" across Herndon Parkway.

**Neighborhoods**
While the Urban Design Framework provides design guidance for the TRG overall, the idea of "The Neighborhoods" introduces human scale, by identifying specific context-based areas meriting a higher level of design guidance for walkability and legibility of space, as follows: the Metro Arrival Area, Residential Transitional Area, Park Frontage, Herndon Parkway and Spring Street Frontage and Sunset District.

**Fiscal Impact**
A market projection conducted for the TRG project suggested a positive net fiscal impact on the Town of Herndon, with anticipated revenues outweighing operating expenditures stemming from the proposed development. At full buildout, the TRG is expected to accommodate a significant resident population and support a sizable workforce across various sectors, contributing to the town's economic vitality.

In summary, the Herndon TRG SAP offers a strategic yet flexible blueprint for realizing a vibrant, sustainable, and economically thriving urban district in Herndon. By capitalizing on existing assets, fostering community engagement, and adhering to a cohesive design framework, the plan sets the stage for transformative growth and prosperity in the years to come.

# Plan Purpose

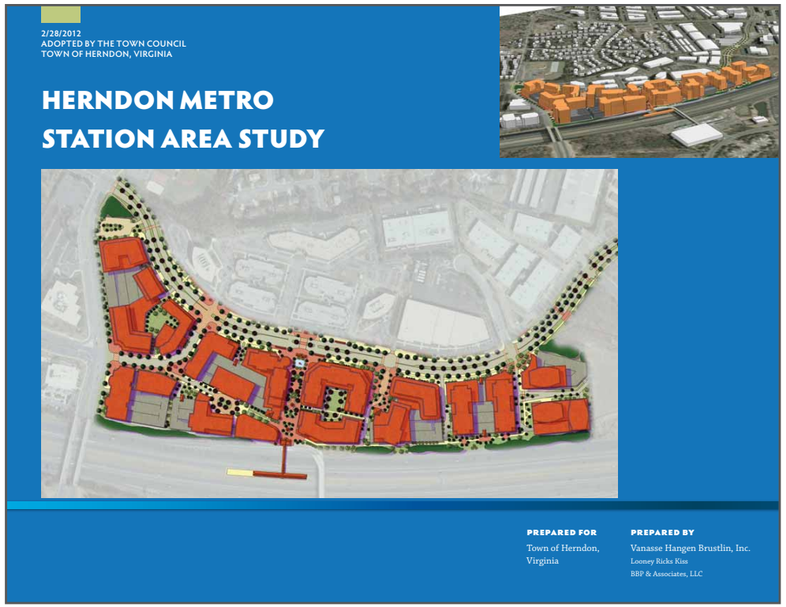
*In Fall 2021, the Town of Herndon issued a request for proposals for a Small Area Plan (SAP), to be referred to as the Transit-Related Growth Area (TRG). A consultant team was selected shortly thereafter, and work on the project began in April, 2022.*

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 Fall 2023).

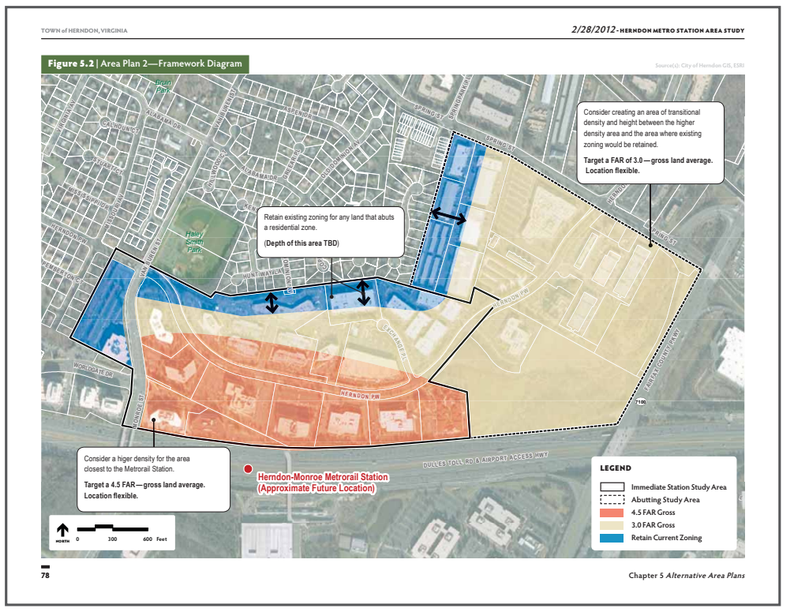
At the outset of the study, the boundary of the Herndon Metro Station Area Study originally included the TRG's study area. During the planning process, it was determined that the HMSAS would focus on the portion of the study area located along the south side of the Herndon Parkway, immediately adjacent to the Herndon 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 HTOC plan calls for mixed-use redevelopment, a significant increase in density, and a maximum building heights of 275 feet. The allowable density and building heights of the HTOC are considerably higher than the densities and heights within the remainder of the town. The TRG plan represents a transition zone between the density and heights of the HTOC and the single family residential development that borders the TRG to the north and west.

While the TRG plan serves to negotiate the transition between the HTOC and adjacent areas, it also presents an opportunity to create a vibrant, walkable, mixed-use district 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 FROM HMSAS, SHOWING INITIAL STUDY AREA INCLUDING THE TRG

# Plan Aspiration

*With the opening of the Herndon Metro Station in November 2022, the Town of Herndon is now linked by the Silver Line to Washington, D.C., to the east and Dulles International Airport to the west. A new paradigm has emerged for the TRG, which in 2024 consists of relatively low density office, light industrial, and hotel development. With the advent of Metro, the TRG has the opportunity to transform into a new, multi-modal mixed-use community leveraging its proximity to Metro.*

Over the coming decades, the incremental redevelopment of the TRG will usher in a 21st-century transit-related urbanism that will elevate the social and economic value of the TRG and the Town. Through this transformation, the area will provide residents, businesses, visitors and the larger Herndon community with the unique benefit of a 15 minute walkable neighborhood with transit connections throughout the region and the world. The TRG will be further enhanced by its unique position along the Metro Silver Line as the only modern transit-oriented development to lie within a highly diverse and historic small town and its established community.

The fruition of this plan is dependent upon individual property owners sharing in the vision, and accepting the challenges while recognizing the significant benefits of redeveloping their property. The 93 acres of the TRG forms one of the largest areas of generally under-developed land proximate to the Metro in all of Fairfax County. The TRG's location, immediately adjacent to the HTOC and the Herndon Metro Station, with direct access to the Fairfax County Parkway and the Dulles Toll Road, and multi-modal access to Herndon's retail centers and historic downtown, makes it a unique draw for the development community.

The transformation of the TRG will realize millions of square feet of future residential, commercial and retail development. Furthermore, it will create new open spaces and enhance some existing assets. Access to Metro, while the driver of the reinvestment, cannot be the only enhancement behind the creation of the future TRG. Investment by the private sector in the development of an integrated grid of streets and other multi-modal transportation improvements, in concert with the Town's continued efforts to obtain transportation grant funding, will assist in alleviating traffic in the vicinity, as will the development of opportunities to live, work, recreate, shop and obtain services within a 15-minute walk of one's home or workplace. An emphasis on healthy development incorporating sustainable practices in architecture, infrastructure and landscape, as well as thoughtfully and purposefully designed open spaces and multi-model linkages created in concert with private development, will fuel the marketability and the lasting appeal of the TRG.

As indicated above, the transformation of the TRG hinges on private investment, augmented by public grant funding and fees, in infrastructure and the public realm improvements and amenities,



as well as carefully coordinated but fragmentary redevelopment of private parcels over an unknown period of time. As a tool to guide both public policies and help inform developers of the future vision for the cohesive transformation of the area, the TRG SAP describes that vision, the mission and the opportunity for the desired transit-related redevelopment of the TRG. The plan elaborates on the Town's vision for redevelopment and establishes critical bounds and elements essential to its cohesive success as a successful live, work, and recreate transit-oriented neighborhood, a unique experience along the Silver Line and as an enhancement to the Town. In doing so, the TRG SAP 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. Due to 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**

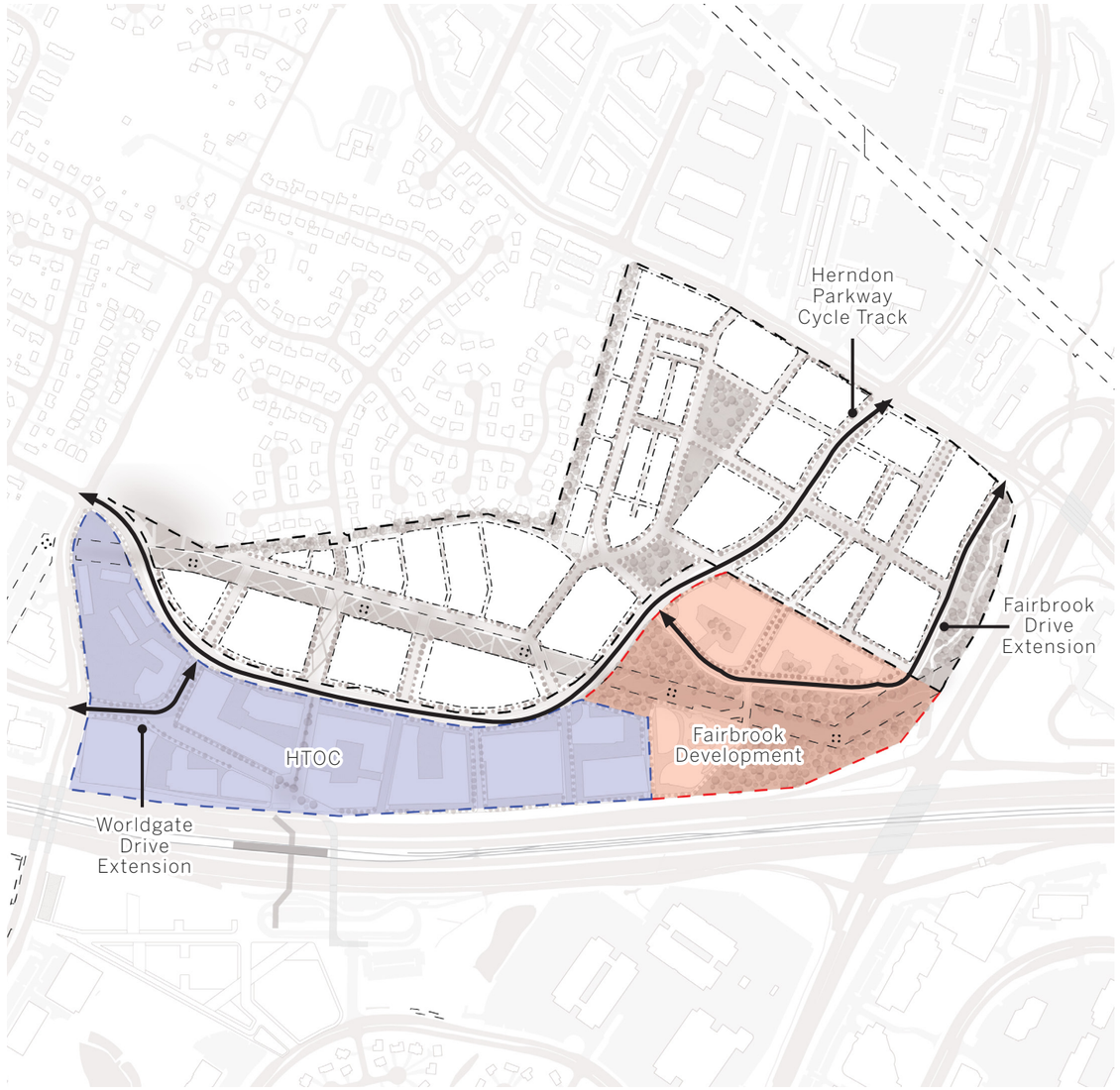
Fairbrook Drive is a proposed road that would branch off Herndon Parkway, pass through the Fairbrook development, and turn north along Sugar Land Run before intersecting with Spring Street. At present, the status of the Fairbrook Drive extension is not clear, but for the purposes of the TRG SAP, it is 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 was divided into five Phases over the course of nearly two years, from Information Gathering to Finalization. Broadly, the 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:

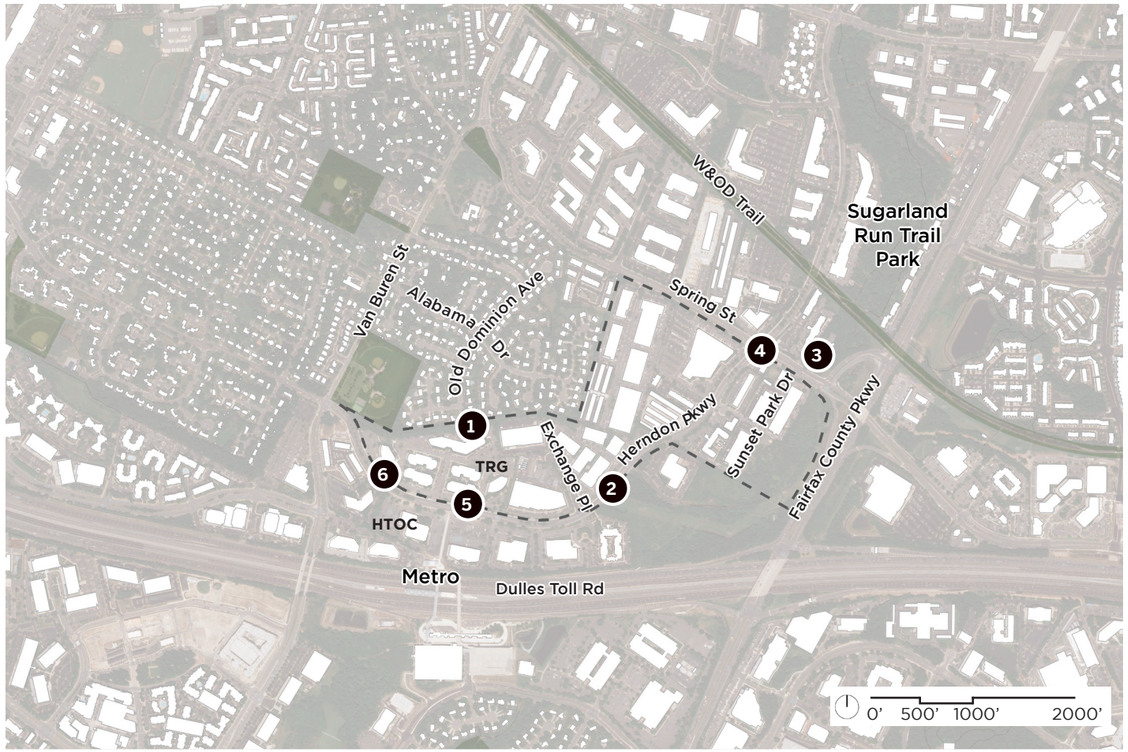
- Public surveys
  - Qualitative and quantitative
- Public communication
  - Public meetings
  - Project website
  - Podcast
- Data analysis
  - Existing conditions
  - Computer modeling of proposed conditions
- Urban design
  - Existing conditions analysis
  - Design iterations
  - Design refinement

PROJECT TIMELINE

| | |
|---|---|
| PHASE 1: **Information Gathering** | • Participated in introductory meetings and site visit<br>• 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<br>• Prepared stakeholder and public engagement plan<br>• Researched critical site and context issues<br>• Developed the project website<br>• Conducting three stakeholder engagement workshops<br>• 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<br>• Prepared an urban design Site Analysis Report<br>• Prepared and delivered the Constraints and Opportunities memo |
| PHASE 3: **Visioning** | • Prepared a fiscal impact analysis<br>• Developed three draft urban design frameworks with narratives for Staff review.<br>• Evaluated and iterated the urban design frameworks, both qualitatively and quantitatively.<br>• Presented urban design concept options to the Town of Herndon Staff, Advisory Committee, Planning Commission and Town Council members<br>• 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<br>• Prepared the draft Master Plan including sketches, drawings, 2D and 3D concept imagery, vignettes, and study models<br>• Prepared appendices and revise financial analysis<br>• Presented the draft Master Plan to the Town of Herndon Staff, Advisory Committee and Town Council members |
| PHASE 5: **Finalization**<br><br>TO BE COMPLETED | • Integrating feedback from project stakeholders<br>• Reviewing the draft Master Plan, appendices with fiscal analysis with Town of Herndon staff<br>• Finalizing and delivering the Master Plan |

# Site Exploration & Analysis

# Existing Conditions - Views from Within the TRG




The TRG is built out with auto-oriented and aging office and light industrial parks mixed with some retail and self-storage uses and a single hotel. Buildings are predominantly low-rise and parking is handled with surface lots. Landscaping is mature but sparse with most trees along Herndon Parkway and within the buffer along the boundaries with the residential neighborhoods to the north and west.

The bookend intersections at either end of the TRG not only serve as major points of access but also as important gateways in to the area while the Herndon Parkway serves as the spine of the TRG providing continuous frontage and connection.

The images on the right show views from various character-defining viewsheds within the TRG.



1 PATH TO RESIDENTIAL NEIGHBORHOOD



2 HERNDON PARKWAY FRONTAGE



3 SUNSET BUSINESS PARK



4 TRG GATEWAY AT SPRING ST & HERNDON PKWY



5 BISECTING DOMINION ENERGY TRANSMISSION LINES



6 METRO STATION PEDESTRIAN CROSSING BETWEEN TRG AND HTOC

# Existing Conditions - Vistas from within the TRG




The TRG currently offers certain view corridors and scenic vistas that can be leveraged with this SAP. The slightly elevated topography of the TRG and the limitations on development under the transmission lines has afforded straight and largely unobstructed visibility of the Sugarland Run headwaters and Resource Protection Area in addition to the Reston skyline. Another important off-site view includes the interim promenade leading down to the Herndon Metrorail Station and eventually the redeveloped mixed-use building of the HTOC.



8 VIEW TOWARDS THE METRO



7 SUGARLAND RUN STREAM



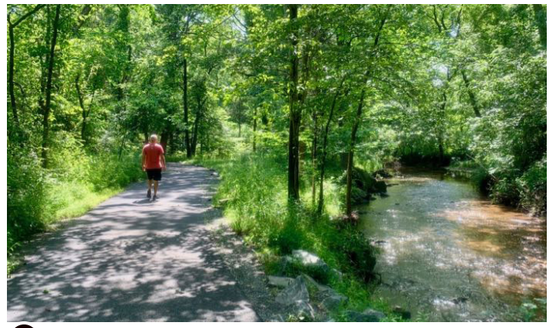
9 VIEW OF THE NEW RESTON GATEWAY SKYLINE FROM THE TRG

# Existing Conditions - Views Around the Site




The TRG area lies at the southeast corner of the Town of Herndon, framed by Fairfax County Parkway to the east, Spring Street to the north, Herndon Parkway to the south, and two single-family residential neighborhoods to the northwest, The Downs and Van Buren Estates. The area abuts the Herndon Transit-Oriented Core and is mostly within a 5 to 10-minute walk to the Herndon Metrorail Station. It has regional visibility from the Dulles Toll Road and surrounds the town's last remaining undeveloped land largely comprised of protected natural areas of the Sugarland Run.

The TRG is strategically located in an area that provides connections to the HTOC, downtown Herndon, and the Reston Town Center. The latter two are within a 7-minute bike ride from the TRG via the nearby W&OD Regional trail.



10 SUGARLAND RUN STREAM VALLEY PARK



11 W & OD TRAIL



12 THE DOWNS OF HERNDON




13 HERNDON METRO STATION



14 DOWNTOWN HERNDON



15 DOWNTOWN HERNDON, NEW JUNCTION SQUARE MIXED USE DEVELOPMENT

# Existing Conditions - Property Ownership Patterns

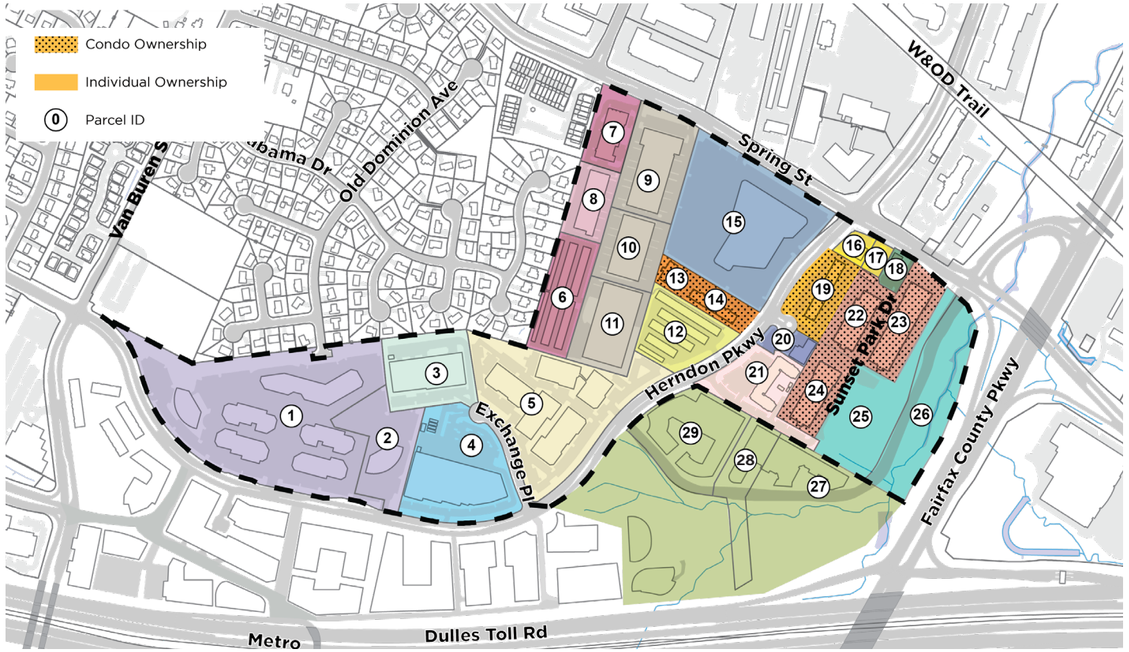
## PROPERTY OWNERSHIP

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 (e.g., 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 likely in need of major renovation in the near future.

Approximately half of the buildings in the TRG are single-story, one fifth are 2-story and there only three 3-story buildings and a single 4-story building. This yields a low median FAR of 0.46, which may fit existing zoning in a pre-transit era, but may not be appropriate for a transit-oriented development.




## EXISTING CONDITIONS (2023)

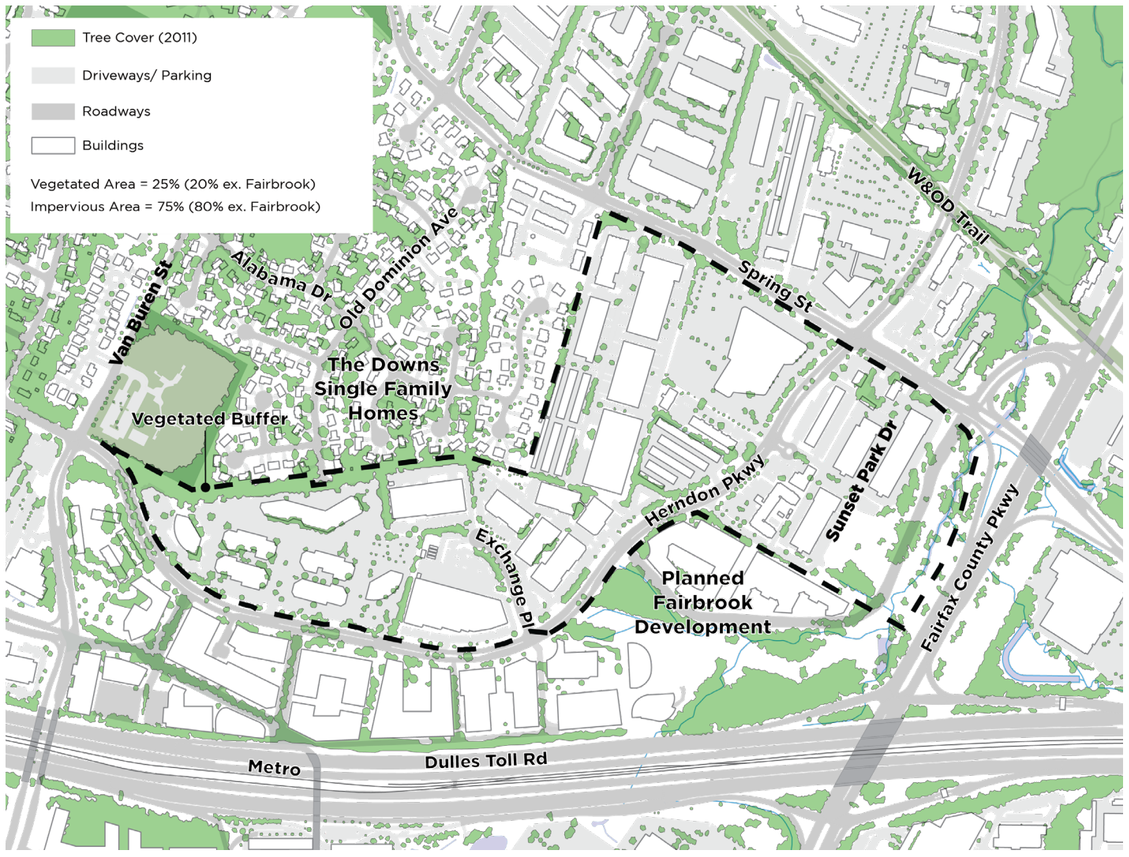
| Parcel ID | Address | Year Built | Number of Owners | Year Built / Added | Building Age (Years) | Property Land Area (SF) | Property GFA (SF) | FAR | Height (Stories) |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 570 HERNDON PKWY (Monroe Business Center) | 1986 | 1 | 1986 | 37 | | | | 1, 1, 3 |
| 2 | 560 HERNDON PKWY | 1988 | | 1988 | 35 | 822,649 | 253,263 | 0.31 | 3 |
| 3 | 253 EXCHANGE PL (Beanstalk) | 1985 | 1 | 1985 | 38 | 158,158 | 73,094 | 0.46 | 1 |
| 4 | 544 HERNDON PKWY (Freddie Mac / Data Center) | 1985 | 1 | 1985 | 38 | 272,598 | 136,603 | 0.50 | 2 |
| 5 | 250 EXCHANGE PL (Rooney, Exchange Pl) | 1985 | 1 | 1985 | 38 | 410,222 | 108,402 | 0.26 | 1 |
| 6 | 303 VICTORY DR (Security Public Storage) | 1985 | 1 | 1985 | 38 | | | | 1 |
| 7 | 385 SPRING ST | 2004 | | 2004 | 19 | 207,645 | 102,663 | 0.49 | 1 |
| 8 | 331 VICTORY DR | 1982 | 1 | 1982 | 41 | 77,390 | 36,921 | 0.48 | 1 |
| 9 | 309 SPRING ST | 1975 | 1 | 1980 | 43 | | | | 1 |
| 10 | 308 VICTORY DR | 1975 | | 1975 | 48 | | | | 1 |
| 11 | 302 VICTORY DR | 1975 | | 1977 | 46 | 422,766 | 204,635 | 0.48 | 1 |
| 12 | 466 HERNDON PKWY (Public Storage) | 1985 | 1 | 1985 | 38 | 131,586 | 45,520 | 0.35 | 1 |
| 13 | 464 HERNDON PKWY, STE 116 (Springwood Professional Center) | 1988 | 5 | 1988 | 35 | | | | 2 |
| 14 | 462 HERNDON PKWY, STE 108B | 1988 | 14 | 1988 | 35 | 76,200 | 31,400 | | 2 |
| 15 | 231 SPRING ST (Boeing) | 1985 | 1 | 1985 | 38 | 432,166 | 208,265 | 0.48 | 2 |
| 16 | 151 SPRING ST (Office Center) | 1987 | 1 | 1987 | 36 | | | | 3 |
| 17 | 149 SPRING ST (vacant) | n/a | | n/a | n/a | 38,016 | 10,760 | 0.28 | 1 |
| 18 | 141 SPRING ST (Dunkin Donuts) | 1969 | 1 | 1969 | 54 | 22,223 | 4,469 | 0.20 | 1 |
| 19 | 459 HERNDON PKWY, STE 10 (Parkway Crossing) | 2005 | 18 | 2005 | 18 | 97,200 | 36,000 | 0.37 | 2 |
| 20 | 465 HERNDON PKWY (465 Herndon Parkway) | 1985 | 1 | 1995 | 28 | 33,621 | 16,678 | 0.50 | 2 |
| 21 | 467 HERNDON PKWY (Hyatt House) | 1999 | 1 | 1999 | 24 | 127,894 | 87,100 | 0.68 | 4 |
| 22 | 305 SUNSET PARK DR, STE 305 (Sunset Business Park) | 1984 | 12 | 1984 | 39 | | | | 1 |
| 23 | 139 SPRING ST STE 1 | 1984 | 14 | 1984 | 39 | | | | 1 |
| 24 | 265 SUNSET PARK DR, STE 265 | 1984 | 17 | 1984 | 39 | 309,100 | 125,300 | 0.41 | 1 |
| 25 | 232 SUNSET PARK DR (vacant, green area) | n/a | 1 | n/a | n/a | | | | n/a |
| 26 | n/a (vacant, green area) | n/a | | n/a | n/a | 415,580 | | - | n/a |
| | TRG (without Fairbrook) Totals: | | 94 | | | 4,055,014 | 1,481,073 | 0.37 | |
| 27 | 100 FAIRBROOK DR, STE O (Fairbrook) | n/a | 1 | n/a | n/a | | | | n/a |
| 28 | 150 FAIRBROOK DR, STE H | n/a | | n/a | n/a | | | | n/a |
| 29 | 200 FAIRBROOK DR | 1985 | | 1985 | 38 | 1,200,741 | 89,000 | 0.07 | 2 |
| | TRG (including Fairbrook) Totals: | | 95 | | | 5,255,755 | 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 |
| | | | | |
| Herndon Parkway w/in TR | 197,200 | 4.5 | | |

# Existing Conditions

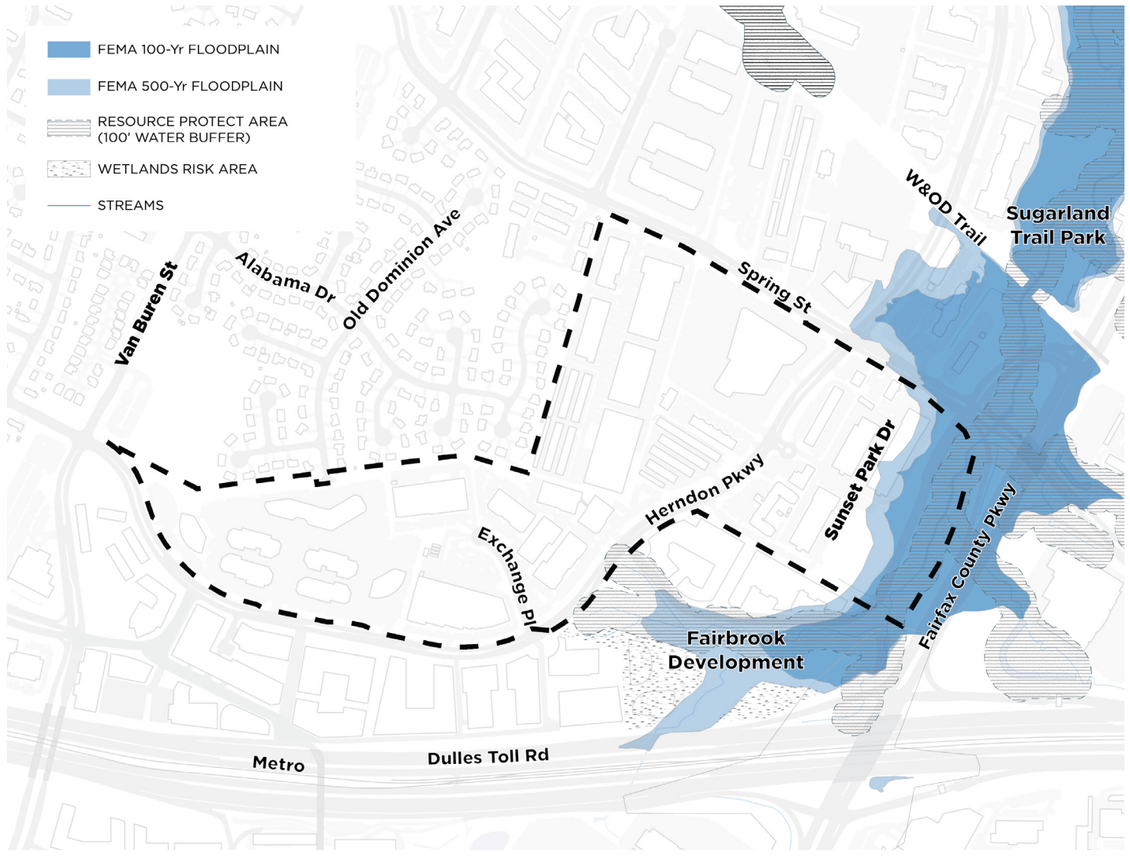
## TREE CANOPY

A significant portion of the TRG is developed with impervious surfaces, including buildings, parking lots and drive aisles. What little tree canopy exists within these developments is very limited and relegated to parking lot tree islands and setbacks along the Herndon Parkway. There are, however, two significant exceptions to this: a forested buffer separating the Downs of Herndon neighborhood from the TRG, and the green space around Sugarland Run.




## NATURAL RESOURCES & FLOOD RISK

Due to the fact that 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 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, which is within a 5-minute walk from the Metro and across the Herndon Parkway from the planned HTOC development.

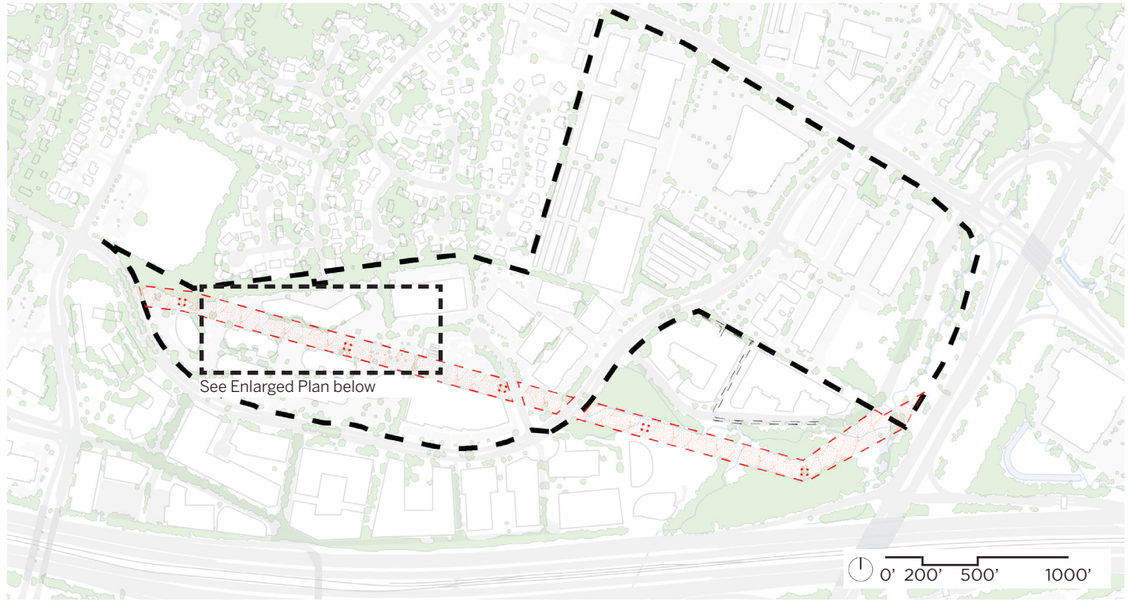
Buildings presently flank the easement on both sides, making its 100-foot clear zone readily apparent in maps and aerial photos, such as the bird's eye view below. Most of the clear zone is being used for driveways, parking lots, and low landscaping.

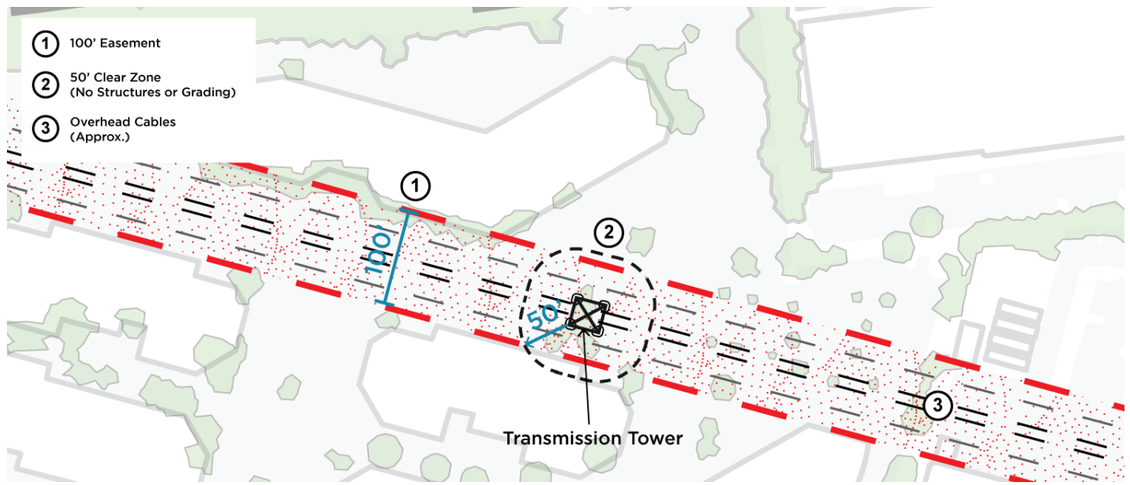


Although the easement poses a major constraint on the TRG, it could also be viewed as an opportunity: is it a divider or a connector; a parking lot or a park?

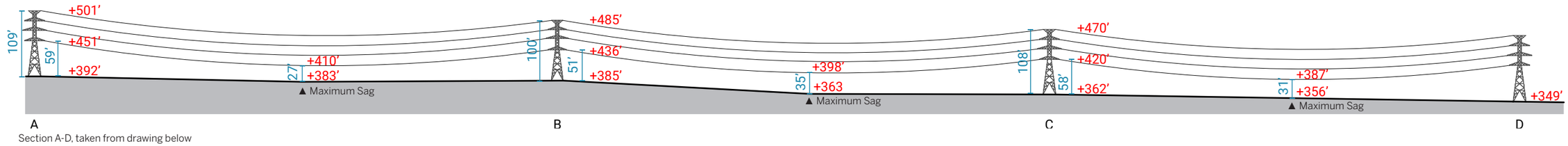
**General Restrictions on the Easement**
The general restrictions improvements on the easement are listed below. Final requirements will be determined by an official agreement between property owners and Dominion.

- 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"

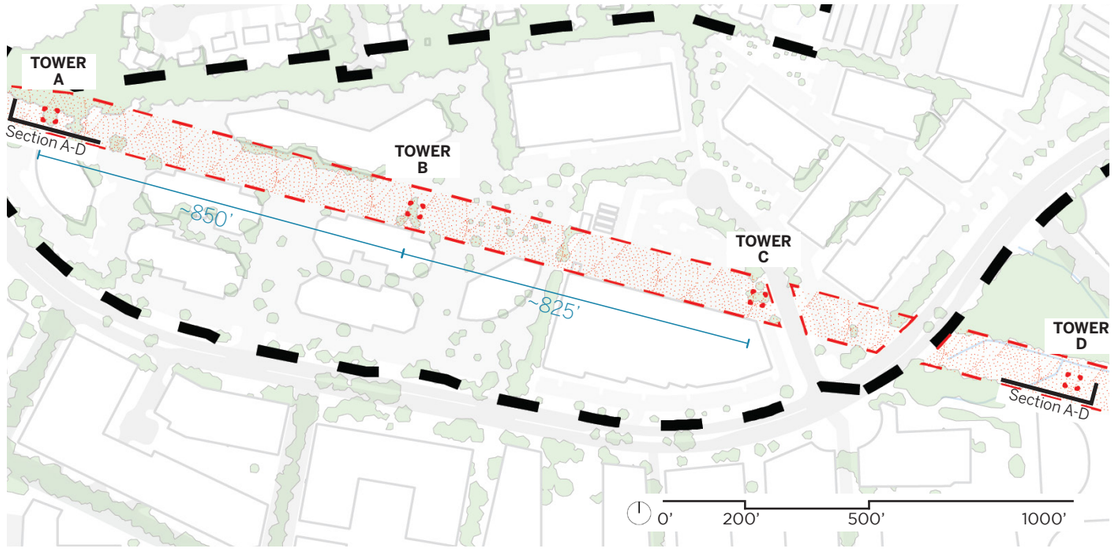


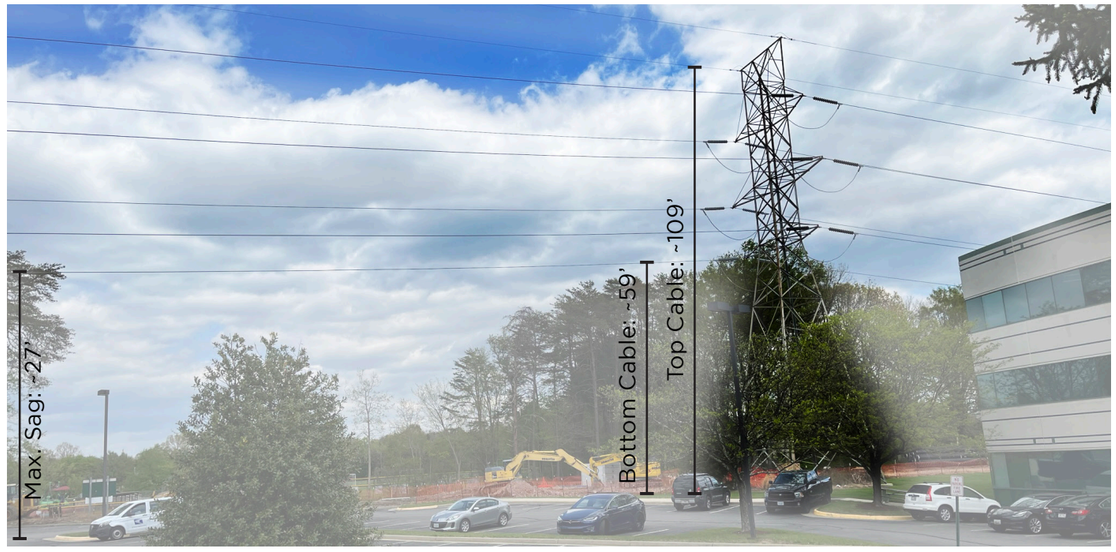



# Existing Conditions - Dominion Easement




Section A-D, taken from drawing below



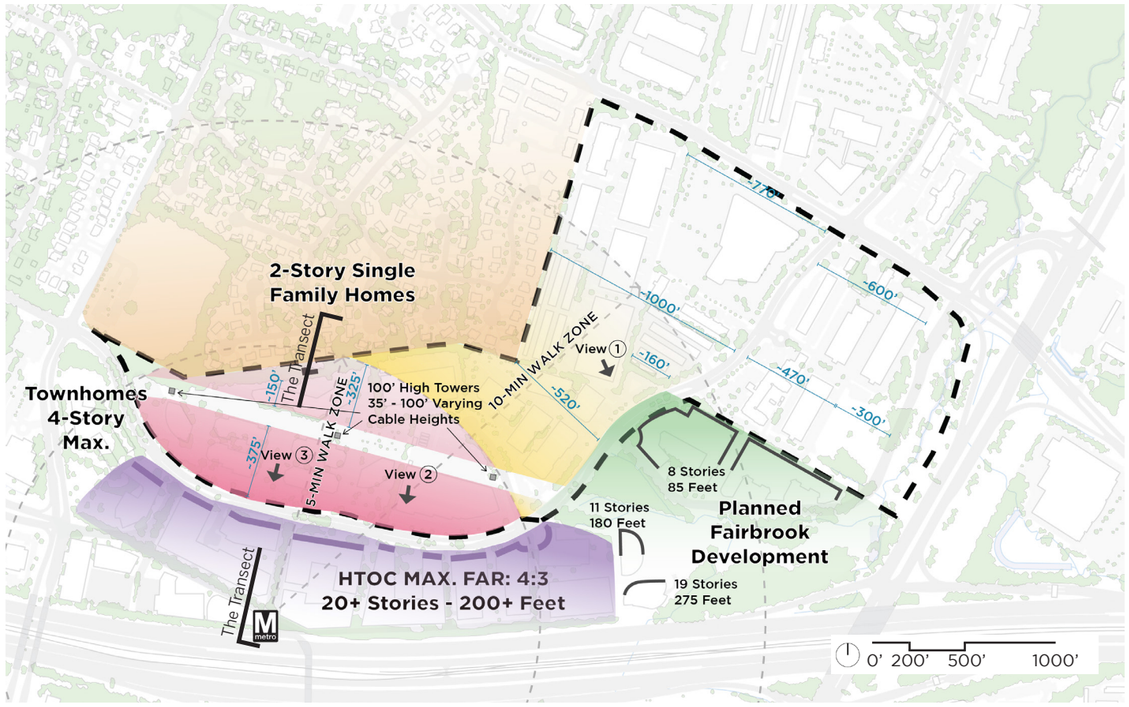

Three transmission towers are located within the easement between Exchange Place and the far western edge of the TRG. These towers are approximately 825 to 850 feet apart, roughly the distance of two large city blocks.
The towers are at least twice as tall as the buildings around them, as seen in the 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. In the future, 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 occurs at property divisions, such as between the Monroe Business Park and Freddie Mac parcels, as seen in photo to the right.

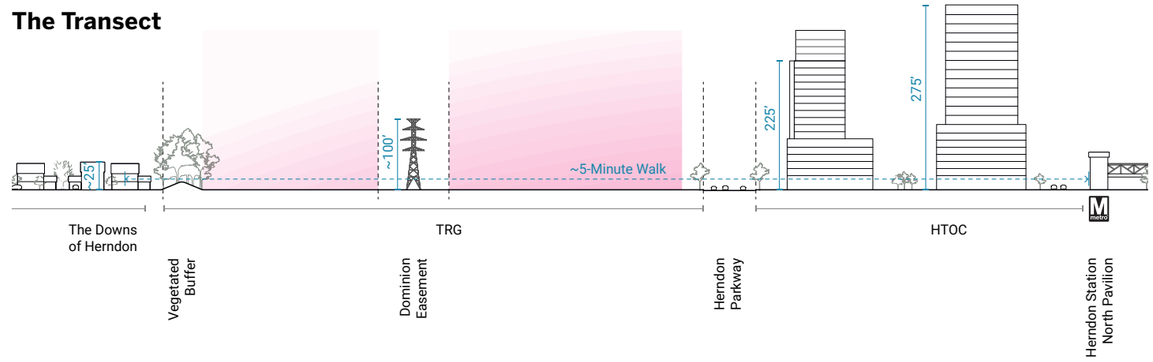


# Existing Conditions - Heights




The transect study illustrates the heights of structures adjacent to and across a significant portion of the TRG. The HTOC has an established maximum height of 225 feet, while the existing low-density Downs residential development has heights of approximately 25 feet (maximum of 35 feet to mid-gable permitted by zoning). The existing one and three-story buildings in the TRG respond well to the heights of the abutting Downs development, but will not relate well to the future HTOC development. In order to do this, the TRG must provide a gradual and visually sympathetic transition. Heights, as well as massing, of future development in the TRG, will need to acknowledge and address these disparate edge conditions across a relatively short distance.

The existing Dominion towers and 100'-max cable heights may present a physical and visual challenge for future surrounding buildings, but their location provides an opportunity to establish a natural divide and a visual rationale for the disparity of height and scale that needs to occur within the TRG. Taller building heights and greater massing of buildings south of the easement provide a more appropriate response to the future development in the HTOC. On the north side of the easement, lower 3 and 4-story buildings exhibiting a residential scale can provide an appropriate transition to the existing Downs neighborhood. The open space of the easement, as well as the towers and wires, provide a strong separation and line of demarcation between building types within the TRG and contribute to a more logical transition across a relatively short distance.




## Ongoing Developments Across the Herndon Parkway



ONE OF THE FAIRBROOK DEVELOPMENT OPTIONS



PARKVIEW



555 HERNDON PARKWAY

# Summary of Market Analysis Conducted by RCLCO

*Note: The text below is a summary of the* Fiscal Impact Analysis *prepared by RCLCO, which is included in full in Appendix C.*

**Regional Overview**
The Northern Virginia market is strong and 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.

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.

**Rental Housing**
Competition is increasing, but the TRG is very well-located for rental apartments, and this use is likely to act synergistically with others. While not widely present today, rental townhomes could be a similarly attractive use, which could mitigate some of the risk associated with apartments alone.

**For Sale Housing**
There is growing demand for a range of housing options, and the TRG is likely to be an attractive location for households that value proximity to employment, transit, and other walkable neighborhood amenities.

**Office**
Demand for suburban office is moderating, as the Washington market continues to mature, and as users gravitate to newer and more efficient spaces. There is also a robust pipeline, and the TRG faces significant competition for corporate users, including from sites in more established employment cores (e.g., Tysons and Reston) or with other physical features (e.g., immediate transit access) that often make them more compelling to such users. However, the TRG presents compelling opportunities for smaller and/or creative users, given its historically local-serving feel.

**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.

**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**
The TRG presents market opportunities for a range of product types. The above summary matrix outlines cumulative demand for new space in the TRG, as well as the general level of market opportunity for each product type. In general, the TRG presents strong opportunities for mid-rise rental apartments, rental townhomes, for-sale townhomes, for-sale two-over-twos, and most types of retail, as well as moderately strong opportunities for limited-service hotel and creative office. For more information, please see above.

# Summary of Market Analysis

The table at right, the Summary of Opportunities in The TRG, outlines the estimated market demand by sector and building type within the TRG at multiple time scales.

SUMMARY OF OPPORTUNITIES IN THE TRG

| | | 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 |

# Summary of Transportation Analysis Conducted by VHB

*Note: The text below is a summary of the* Herndon TRG Traffic Study *prepared by VHB, which is included in full in Appendix B.*

**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.

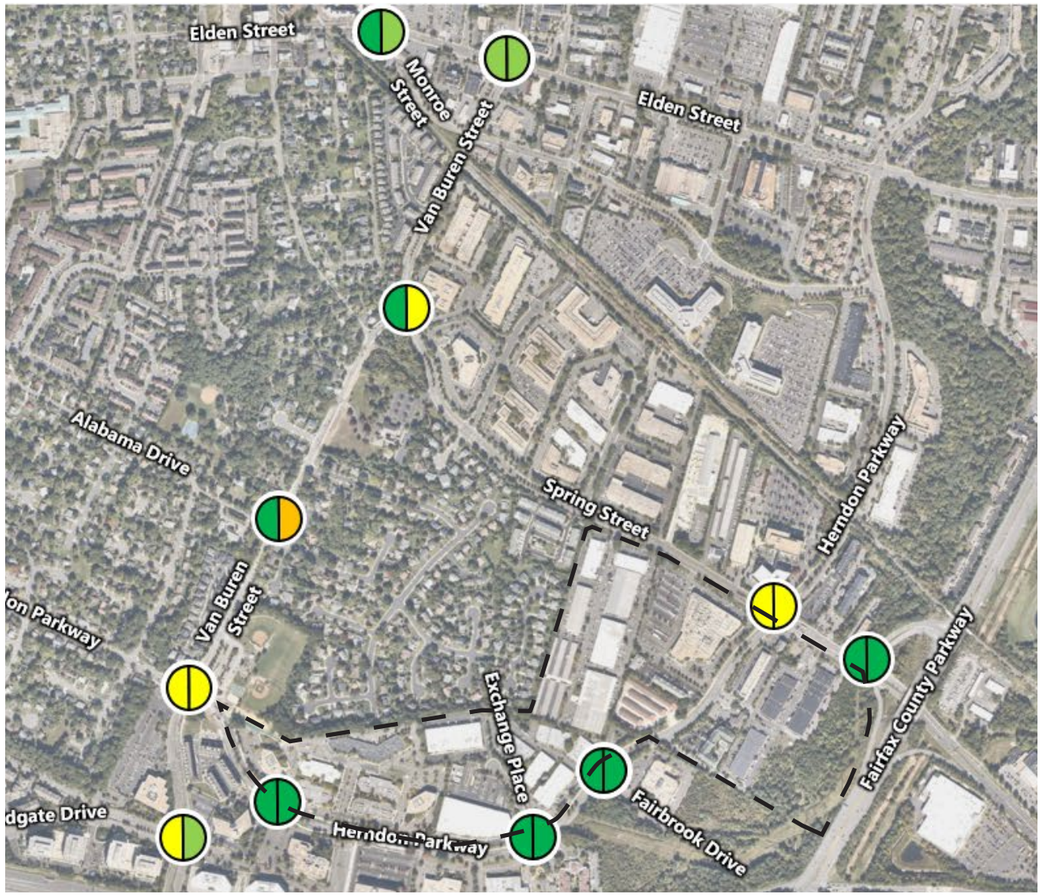
**Existing Traffic Conditions**
A microsimulation traffic model was utilized to estimate the operation conditions of the existing motor vehicle transportation system. Existing conditions were found to operate acceptably. Traffic performance was measured using Level of Service metrics. As defined by the U.S. Department of Transportation, "Level of Service (LOS) is the term used to refer to a collection of measures of automobile congestion and travel time delay, and it is among the longest-standing and most widely adopted metrics for reporting transportation system performance in the country. LOS is intended to represent a traveler's perception of the quality of service provided by an individual intersection or roadway segment, as measured by the standard of free-flowing automobile traffic." LOS is also intended to easily communicate the results of detailed technical analyses to non-technical audiences. Traditionally, transportation engineers and planners use LOS in planning, design, and land use applications, as well as operational and environmental analyses.

In Herndon and the greater Northern Virginia area, LOS D, in a range extending from LOS A (free flow) to LOS F (forced traffic flow), is common and generally considered acceptable during peak hours. Fairfax County's adopted LOS standard for some roadway classifications in the Tyson Corner Urban Center Plan is LOS E.

At the studied intersections, the traffic model estimates that all signalized intersections operate at LOS D or better with one exception. The Van Buren Street/Alabama Drive all-way stop-controlled intersection operates at LOS E during the PM peak, however a traffic signal has been installed here since the model was run and has improved vehicular traffic operations. Level of Service E is used as an exception when densely-urbanized areas are planned to balance or even prioritize walkability, cycling, transit, and other modes of transportation when compared to motorized vehicles. Currently, a town ordinance holds LOS D as the standard for all intersections however there is an opportunity for this plan to allow acceptance of LOS E if impacts are effectively mitigated through Travel Demand Management programs and specific and exceptional multi-modal infrastructure enhancements.

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, at the time of this study, improvements to the Van Buren/Alabama Drive and Van Buren/Herndon Parkway intersections are nearing completion and the Spring Street/Herndon Parkway intersection improvements have begun. These projects will help improve conditions at the three intersections that were shown by the model to have the highest level of congestion within the study area.

INTERSECTION LEVEL OF SERVICE (LOS) - EXISTING CONDITIONS



# Summary of Utilities Analysis

*Note: The text below is a summary of the* Utilities and Storm Water Analysis Report *conducted by Urban, Ltd, which is included in full in Appendix D.*

**Water Distribution**
The current water distribution system within the TRG consists of a water mains 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.

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.

**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.

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 and Analysis phase, the following critical Constraints and Opportunities were identified.

| | Constraints | Opportunities |
|---|---|---|
| **Urban Design** | • Multiple property owners across the site, particularly at the lots controlled by condos, will likely require complex stakeholder consensus building.<br>• 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<br>• 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<br>• 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<br>• The SAP focuses on 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** | • Demand for suburban office is moderating, as the Washington market continues to mature, and as users gravitate to newer and more efficient spaces. There is also a robust pipeline, and the TRG faces significant competition for corporate users, including from sites in more established employment cores (e.g., Tysons and Reston) or with other physical features (e.g., immediate transit access) that often make them more compelling to such users<br>• 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<br>• Additionally, the TRG presents compelling opportunities for smaller and/ or creative users, given its historically local-serving feel |
| **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.) |
| **Transportation 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<br>• 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<br>• The Dominion power easement bisects the 5-minute Metro walk zone, which constrains urban block design as well as building placement and orientation | • With an improved road grid within the TRG and appropriate mitigation strategies, additional density can be accommodated while staying within an acceptable LOS<br>• Additional roads and improved route options could improve traffic conditions for all users<br>• 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 |



# Public Engagement

# Opportunities for Input

Comprehensive and consistent public engagement was a core tenet of the plan development process. Direct outreach to stakeholders provided valuable information that assisted in understanding community aspirations and framing a shared vision.

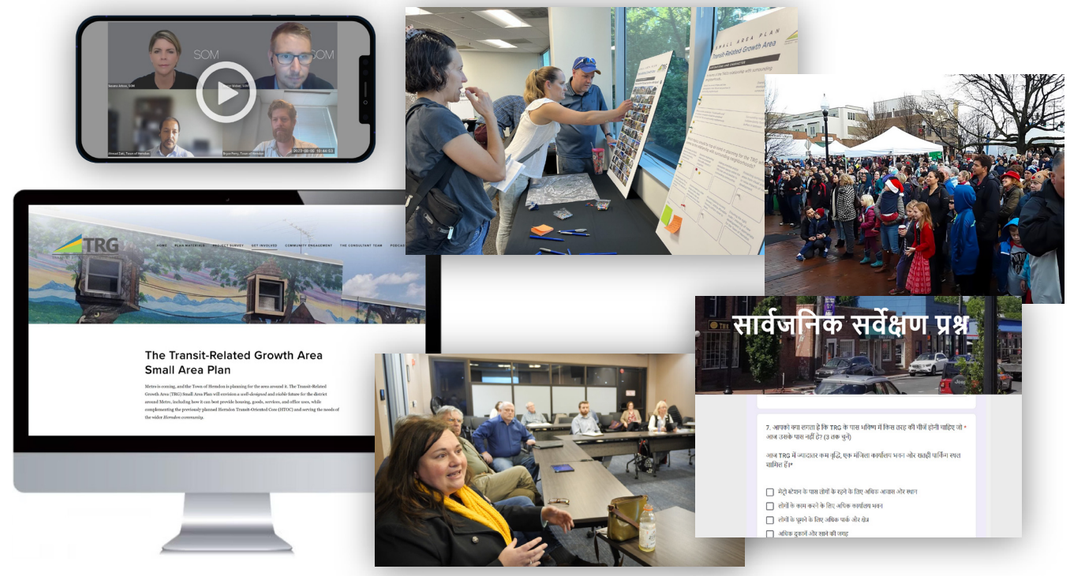
The public engagement approach was designed to ensure meaningful, inclusive, and open dialogue. The process aimed to:

- *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*

An intentional diversity of outreach initiatives were utilized. Modes of engagement included numerous public meetings and workshops, which are listed on the following page. Of those meetings, some were directed at specific stakeholder groups such as the TRG property owners and residents of adjacent neighborhoods. A TRG Advisory Committee comprised of TRG property owner representatives, staff, Town of Herndon officials, and residents of adjacent neighborhoods was created to help steer the plan. That group held seven public meetings at plan development milestones. There were also public meetings with the Town Council, the Planning Commission, and the Architectural Review Board. One-on-one sessions with Town Council members and, by request, with local residents and businesses were also held. An additional Town Staff technical committee was also formed to assist with plan development. This group met regularly and provided expertise on zoning, legal, engineering, transportation, finance, public safety, parks and recreation, and economic development.

For many of these engagements, extensive notifications and mailings were provided. Town staff conducted door-to-door in-person outreach to the nearby neighborhoods and spoke directly to over 100 residents during that effort. A dedicated website was created for the project, in addition to the project webpage on the Town's website, that provided up-to-date information on the project. Online surveys were conducted through the website and became a very important tool for eliciting public input. Over 500 surveys were completed. Town staff also maintained booths at the Herndon Winter Markt to elicit public feedback on the project and spent a day at Herndon High School teaching a session on local government planning and the TRG SAP. Lastly, a podcast was recorded with the staff and consultants that covered the project and social media was heavily relied upon to enhance awareness throughout the process.

MODES OF ENGAGEMENT




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

Public Engagement

# Opportunities for Input

Public engagement opportunities were held throughout the TRG process. These events included various stakeholder groups, and subject matter discussions.

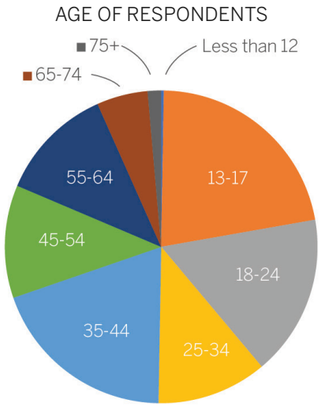
PUBLIC MEETINGS

| | | |
|---|---|---|
| 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** | Open discussion with Project Team & property owners |
| August 3. 2022 | **Property Owners Meeting** | Open discussion with Project Team & property owners |
| 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 |
| January 4, 2023 | **Advisory Committee Meeting** | Presentation update from Project Team to Advisory Committee |
| February 16, 2023 | **Town Council and Planning Commission Presentation** | Update on Site Analysis and Constraints & Opportunities and preliminary Visioning Workshop |
| March 14, 2023 | **Herndon High School Sessions** | Background presentation of TRG SAP and solicitation of young-adult feedback |
| March 29, 2023 | **Advisory Committee Meeting** | Discussion of Concept Scenarios |
| May 24, 2023 | **Public Meeting** | Presentation and discussion of Concept Scenarios. |
| June 8, 2023 | **Advisory Committee Meeting** | Presentation and discussion of Concept Scenarios. |
| June 20, 2023 | **Town Council and Planning Commission Presentation** | Discussion of Concept Scenarios; introduction to Preferred Scenario |
| December 11, 2023 | **Joint Advisory Committee / Planning Commission Meeting** | Presentation and discussion of Draft Plan |

# Online Survey 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**
The surveys show that a majority of respondents expressed enthusiasm about the newly opened Metro stop in Herndon and indicated that they would use it.

**Desire for Change around the Metro Station**
Respondents were asked about their views on the potential for change in the land within the TRG. 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. The Urban Design Framework chapter analyzes and illustrates many of the hopes and concerns regarding urban design and architecture the Project Team heard during the engagement process.

**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.

VISUAL SURVEY OF RESPONDENTS PREFERRED BUILDING & OPEN SPACE TYPOLOGIES



Public Engagement

# 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

WORDCLOUD OF REPRESENTATIVE FEEDBACK RECEIVED BY PROJECT TEAM




**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



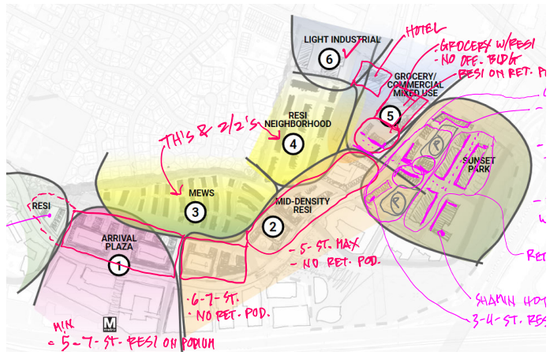
# Plan Vision

# Summary of Concept Scenarios

The consultant 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.

## Scenario 1

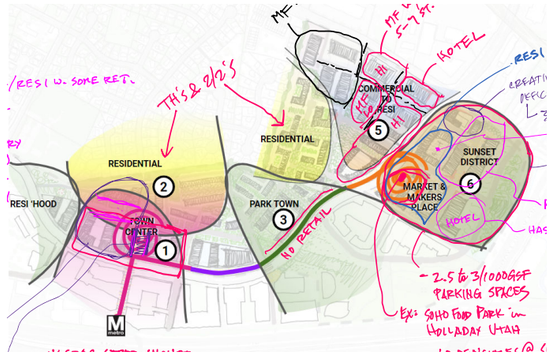








## Scenario 2

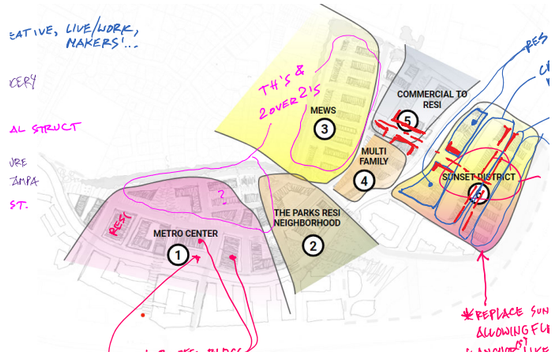








## Scenario 3






# Concept Scenarios — Scenario 1: Neighborhood Clusters

**Scenario 1: Neighborhood Clusters**

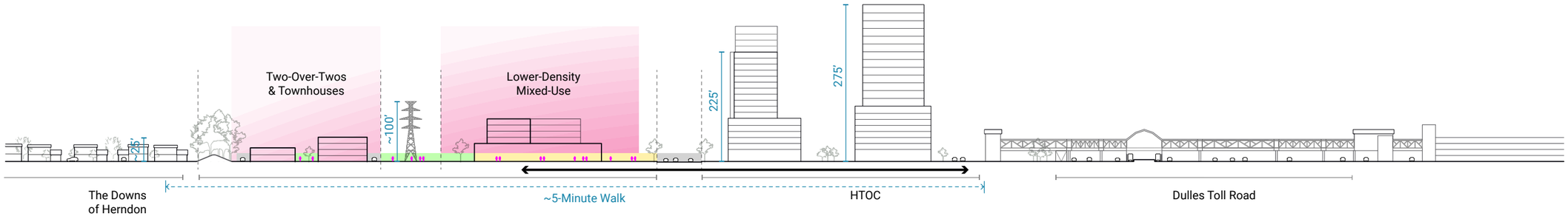
This scheme would generally disperse urban intensity across the site, creating multiple neighborhood clusters rather that a single TRG urban core.

- 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







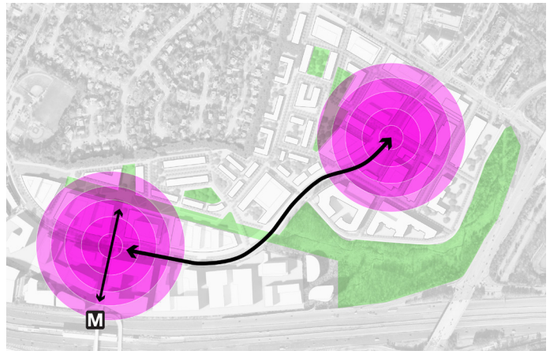



# Concept Scenarios — Scenario 2: Two Centers

**Scenario 2: Two Centers**

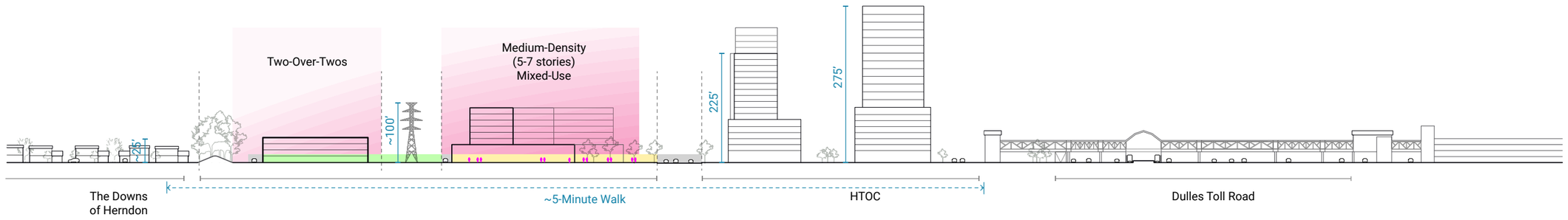
This scheme would concentrate development along two centers, one at the point in the TRG nearest the metro, and one at the Sunset Business Park. The two would be connected by an activated promenade.

- 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**

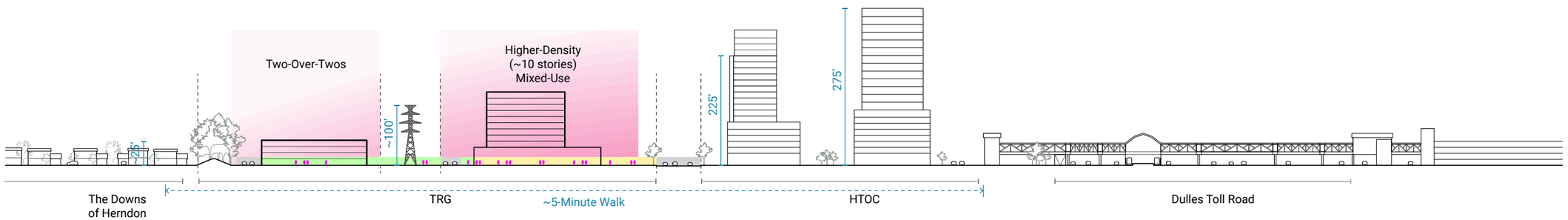
This scheme would concentrate high intensity development within a five-minute walking radius of the Metro. The rest of the TRG would be more neighborhood-focused.

- 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.





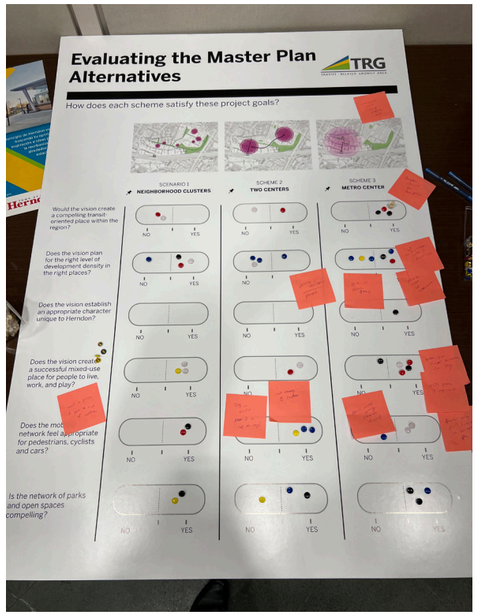


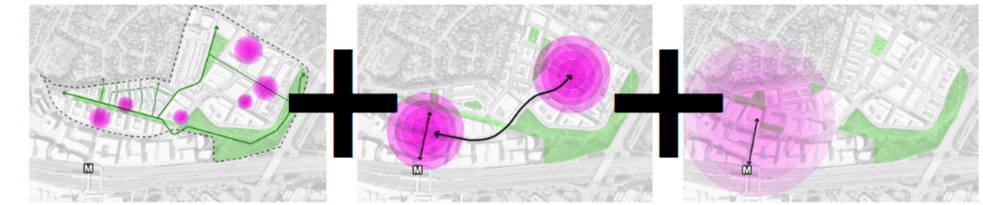
# Preferred Vision

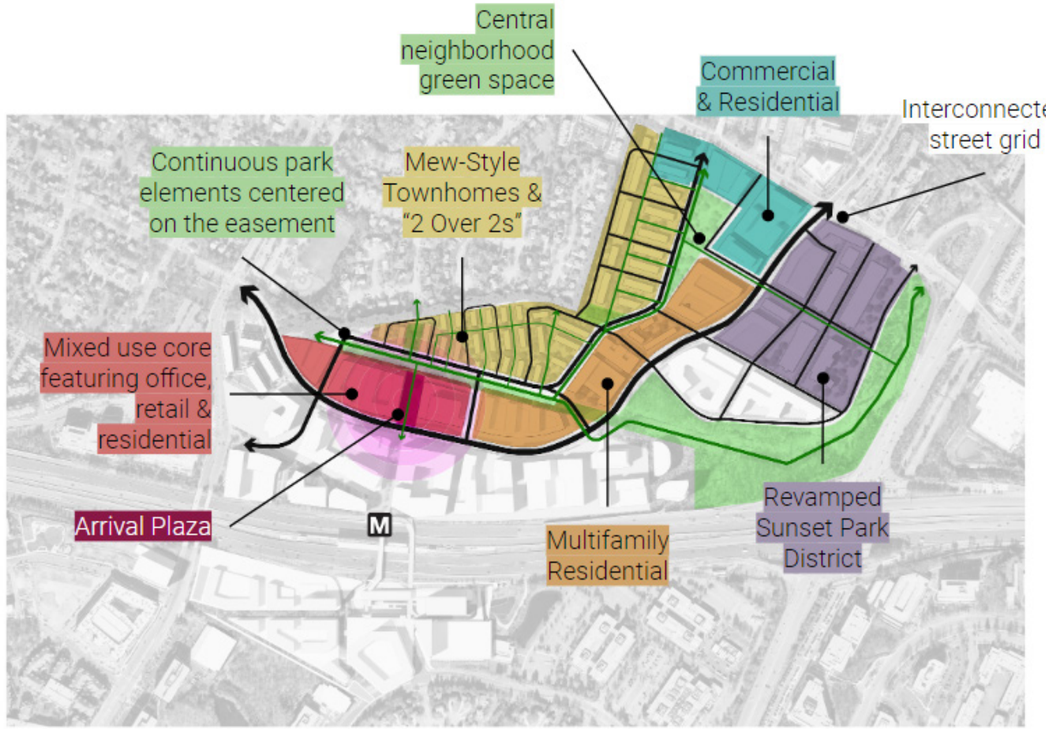
The three concept scenarios were publicly presented twice: once in May, 2023 to the general public, and once in June, 2023 to the Town Council and Planning Commission. At the public presentation, the community was encouraged to provide input in dynamic ways: verbally, in one-on-one chats with the Project 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 neighborhoods to the north.
- The character will be both unique & appropriate.
- While additional density is desired, this must be balanced with small town character of Herndon
- 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.
- 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 parallel 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.





# Plan Principles


Sterling
Great Falls
Dulles Greenway
Potomac Falls
Old Ox Rd
Dulles Toll Rd
Dulles Toll Rd
Dulles Greenway
Dulles Greenway
Dulles Toll Rd
Dulles Toll Rd
Dulles Toll Rd

# Plan 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

The TRG will be defined by a rich landscape environment. 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.

# Design Objectives



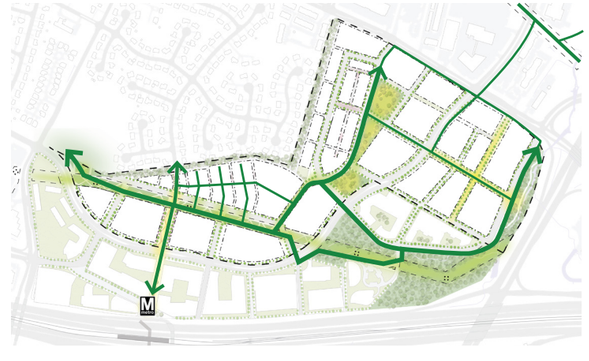

## A METRO ARRIVAL PLAZA AS THE CORE OF A VIBRANT DEVELOPMENT

Anchor the denser mixed use development in the TRG within the 5-minute walk zone right across the HTOC, landing in an iconic, vibrant plaza framed by retail and connected to the network of parks.



## A MULTIMODAL STREET GRID AS THE FRAMEWORK FOR DEVELOPMENT

Establish a walkable, multmodal, urban street grid as the basic framework for redevelopment, integrating development blocks anchored on a network of open spaces.



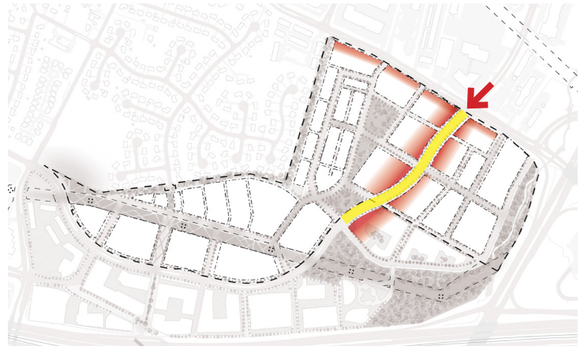

## A NETWORK OF OPEN SPACES WITH INTERSTITIAL MOBILITY

Design an open space network connecting neighborhoods and parks within the TRG and beyond, providing interstitial, walkable mobility throughout.



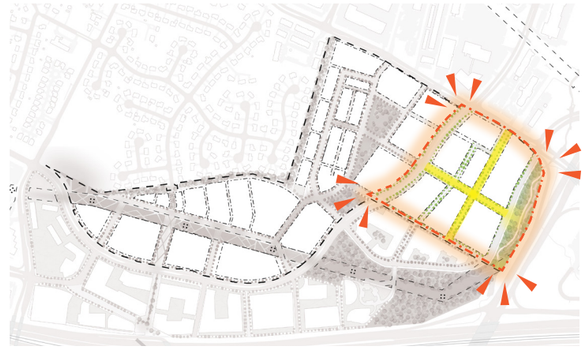
## A TRANSITIONAL RESIDENTIAL AREA BETWEEN LOWER AND HIGHER DENSITITES

Respect the neighboring low-height, low-density context by reservng an area for low density residential transitioning to higher and denser areas approacing Herndon Parkway.



## AN URBAN STREET FRONT FRAMING THE TRG GATEWAY INTERSECTION AND EDGES

Create an engaging first impression upon entering the TRG, by framing the corners with iconic architecture.



## AN EXPANDED AND REVAMPED "SUNSET DISTRICT"

Expand and celebrate Sunset Busines Park by capitalizing on its unique mix of uses and making a great place out of its public realm.

# 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 use, 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.

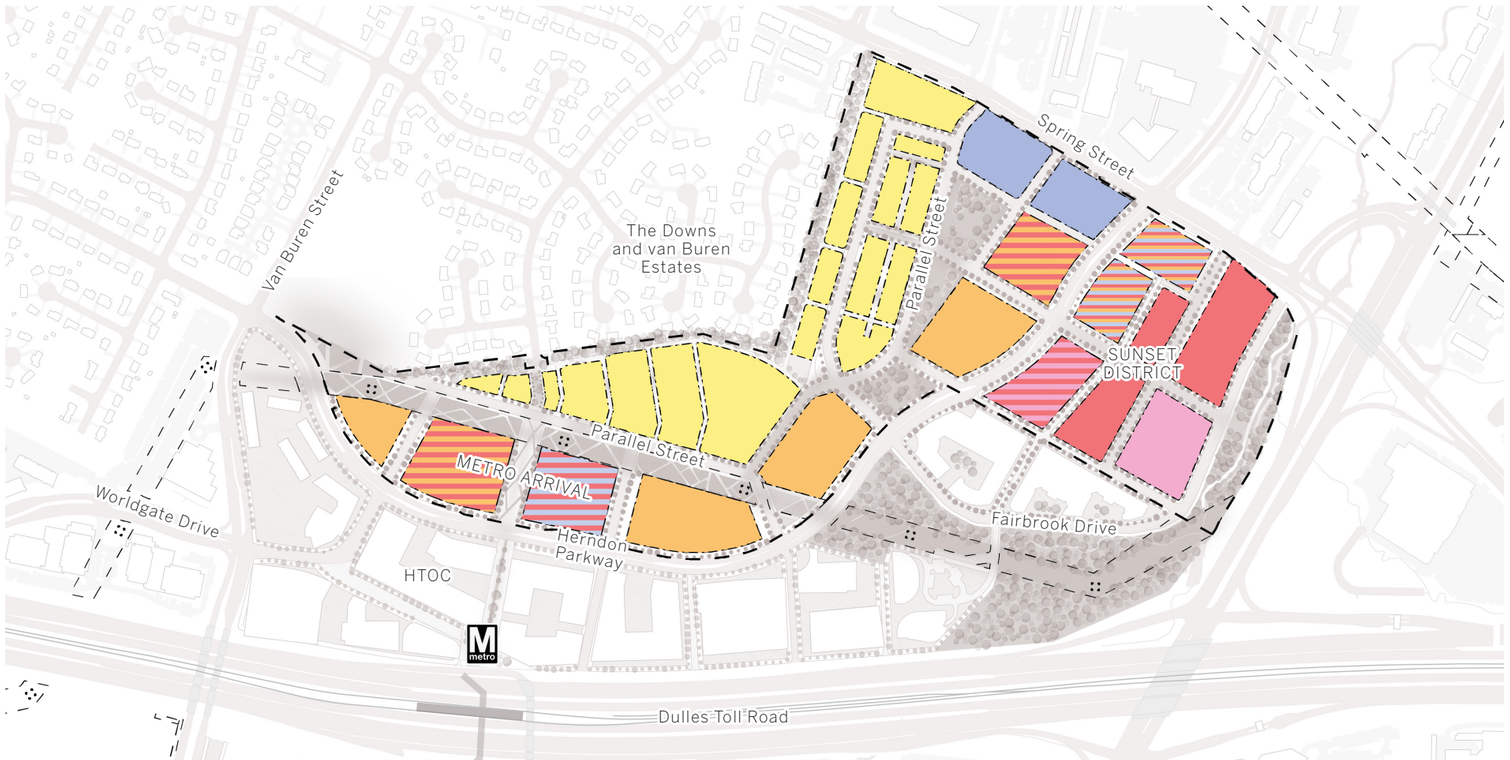
**Retail:** Neighborhood serving shops and restaurants, grocery, entertainment, fitness and services

**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 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 strategy follows the design objectives of providing a low density residential area adjacent to the neighborhoods to the north, 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 consultant 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.

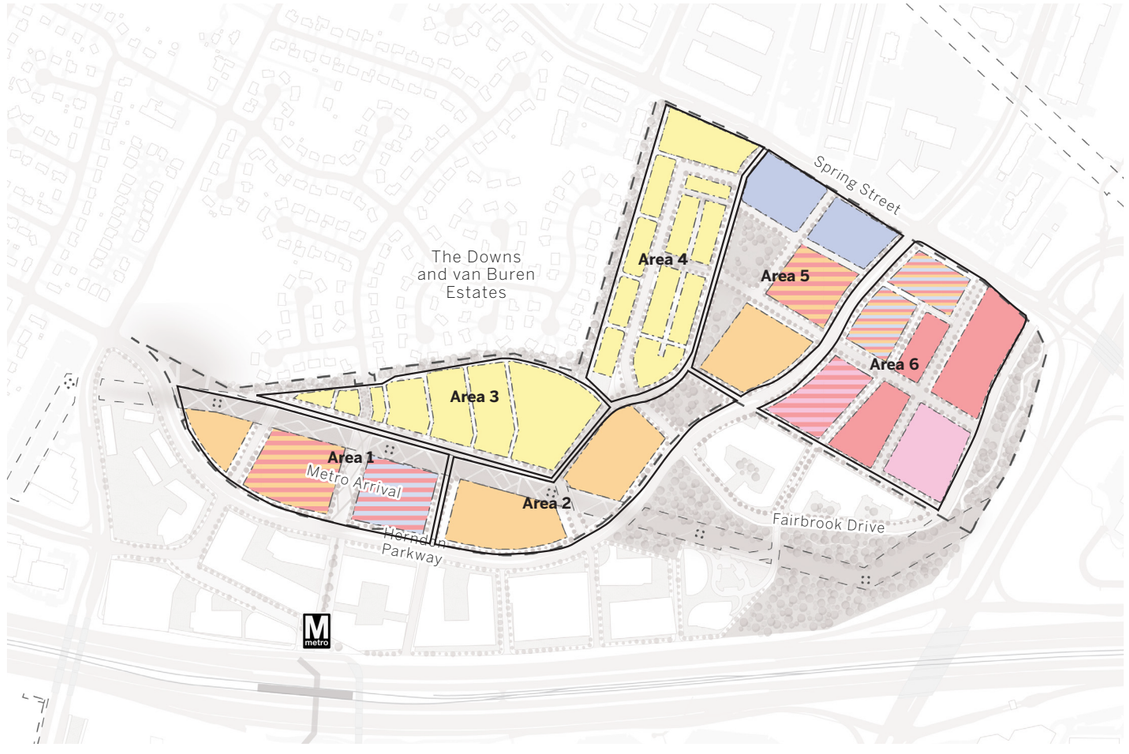
DEVELOPMENT DATA SUMMARY

| 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) |
|---|---|---|---|
| Area 1 | R-Multifamily | 638,700 | 532 |
| | Corporate | 641,700 | |
| | Restaurant Services | 43,100 | |
| Area 2 | R-Multifamily | 937,500 | 781 |
| Area 3 | R-TH | 355,700 | 178 |
| Area 4 | R-TH | 480,600 | 240 |
| Area 5 | R-Multifamily | 673,500 | 561 |
| | Corporate | 480,900 | |
| | Grocery | 50,900 | |
| | Restaurant Services | 35,900 | |
| Area 6 | R-Multifamily | 593,500 | 495 |
| | Hotel | 277,500 | 463 |
| | Creative | 66,800 | |
| | Entertainment Fitness | 74,400 | |
| | Retail | 89,000 | |
| Grand Total | | 5,439,700 sf | |

DEVELOPMENT DATA AREAS



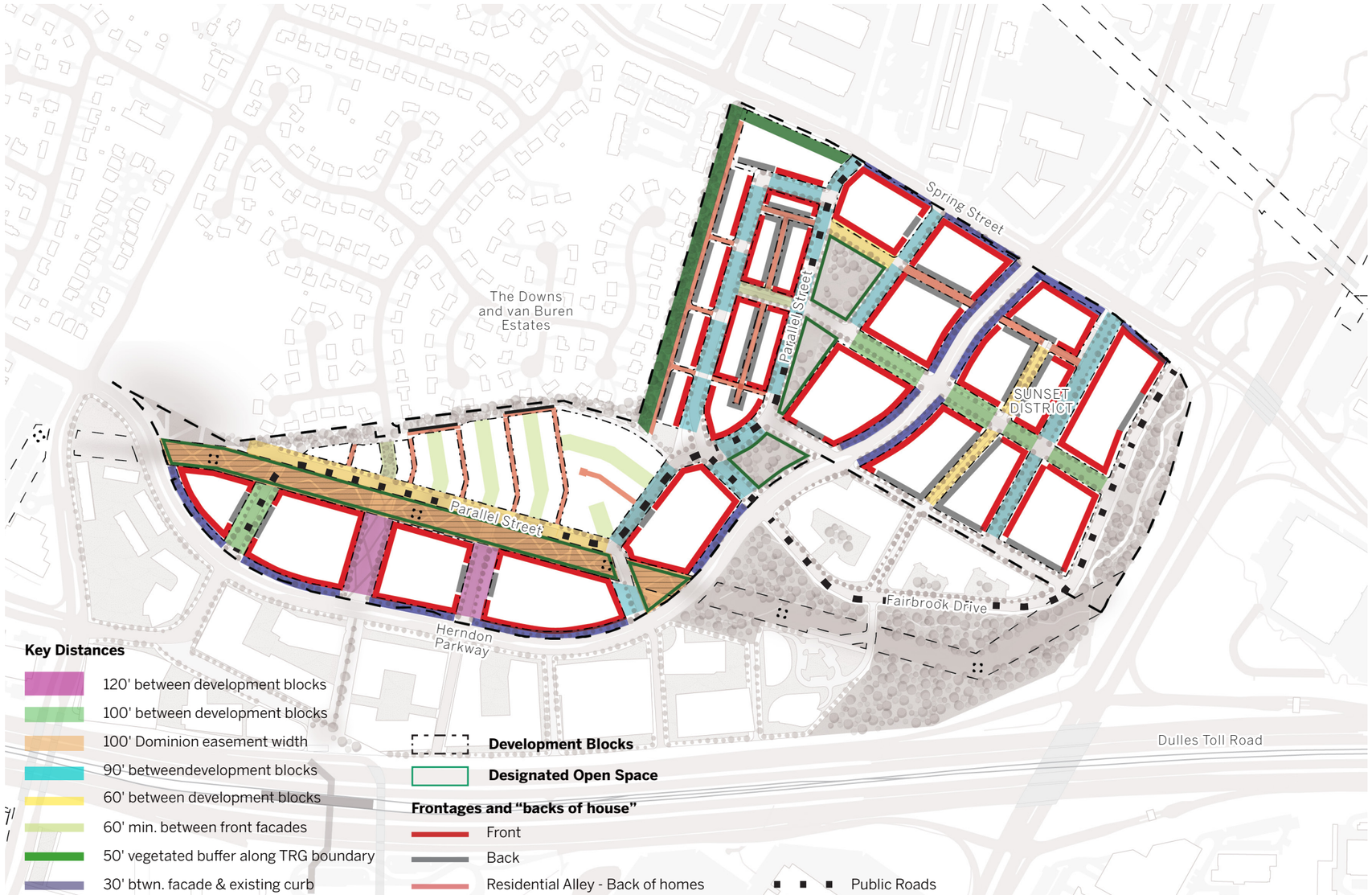
# Urban Design and Architectural Character

## Redevelopment Framework

The Redevelopment Framework Plan (right-hand graphic) lays down the foundation for future development, as it takes into account the Plan Principles, and gives shape to the Design Objectives, illustrating the following features:

- Key distances – between the development blocks and at the TRG boundary – to achieve an amenable public realm and practical multimodal circulation, as explained and illustrated in the rest of the Urban Design Framework Chapter
- Development blocks – with sizes commensurate to planned development densities
- Designated open space – public space on private property
- Frontages and "backs of house" – "Front" refers to public facades with presentable materiality, fenestration and primary access, and "Back" refers to facades reserved for parking and service access.
- Mobility Grid – street grid (see next section)

The"key distances" as shown in the right-hand graphic, are necessary to accommodate planned circulation needs and amenities consisting of on-street parking, bioretentive landscaping, front yards and outdoor seating, tree canopy, and site furnishings throughout. Generally, wider separation between blocks exists at higher densities and areas with more intended activation and pedestrian capacity. See subsequent "Street Sections" for guidance on how these distances are broken down to populate the public realm.




**Redevelopment Framework Plan**

# Transportation Network

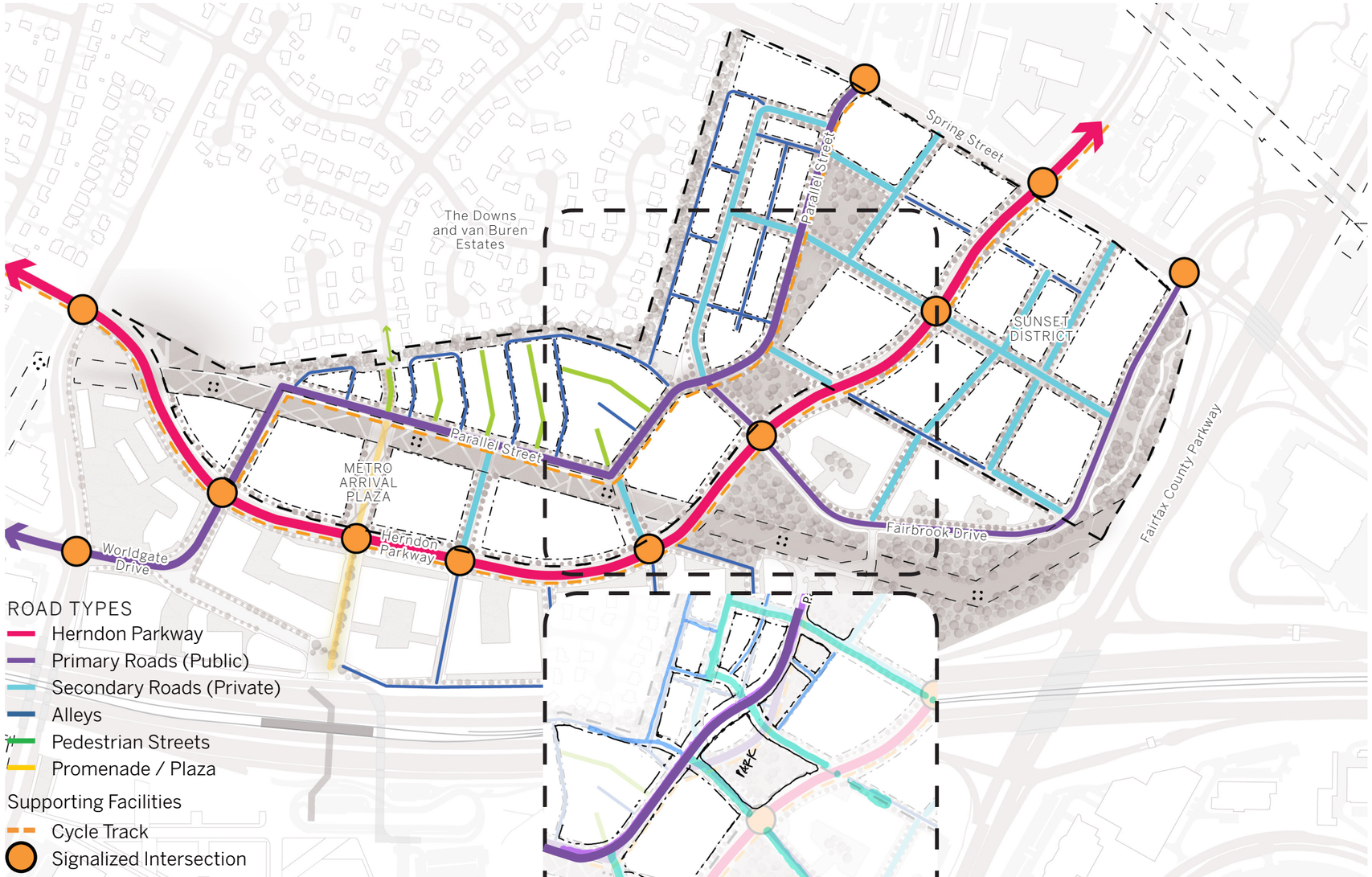
## Mobility Grid

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, named Parallel Street, 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 road type are listed on the right-hand graphic and depicted in the following pages.

**Flexibility**
Road geometry may vary from what is shown in the Road Types Plan to the right to accommodate future development needs, due to the anticipated piecemeal development phasing. An example of applying flexibility is shown in the inset.

**Traffic Signal Coordination**
Traffic signals at various intersections will be necessary to move vehicles effectively and safely throughout the TRG and provide safe crossing conditions for pedestrians and cyclists. Most of the new signals would be located along Herndon Parkway and will require coordinated timing. To achieve a fully coordinated signal system in this area, new signal control equipment including cabling between signals and signal cabinets would be necessary.




**Road Types Plan**

**Inset: example of optional alignment for Parallell Road**

# Transportation Network

## Road Types – Residential Mews

Two street typologies outline the parameters for the mews developments. They are designed to create a park-like, lower-density residential context that is highly walkable and family-friendly. The townhomes open onto pedestrian streets, and the only vehicular access is permitted through alleys which run behind the townhomes. The alley street section also applies to the residential area between the Van Buren Estates and the TRG triangular park.

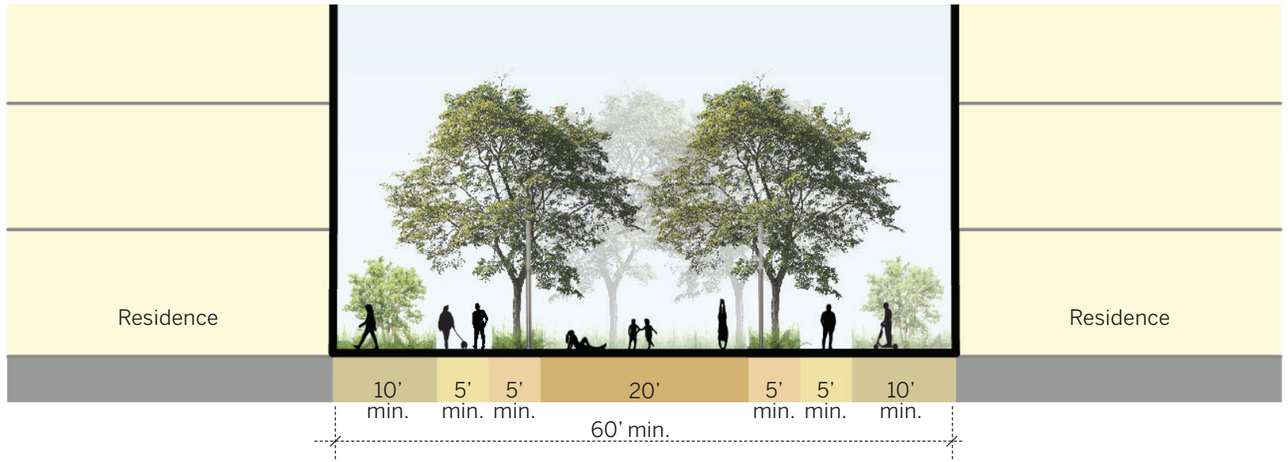



Key Plan

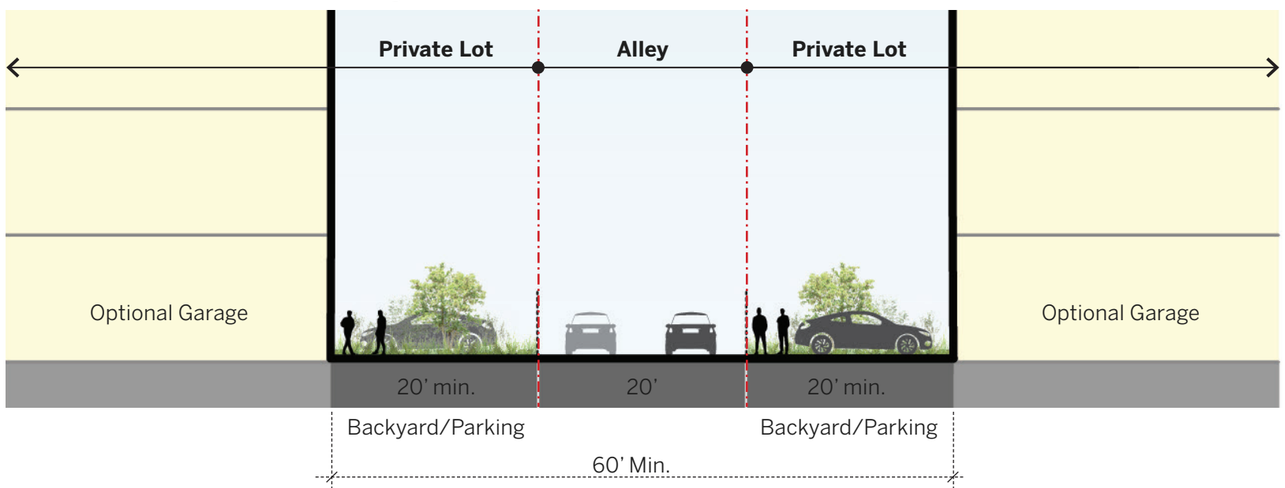
**Amenities**

- Front Yard
- Pedestrian Circulation
- Landscape and Site Furnishings
- Pedestrian Activities Zone

**1. Street Section at Mews Pedestrian Street**




**2. Street Section at Mews Alley**

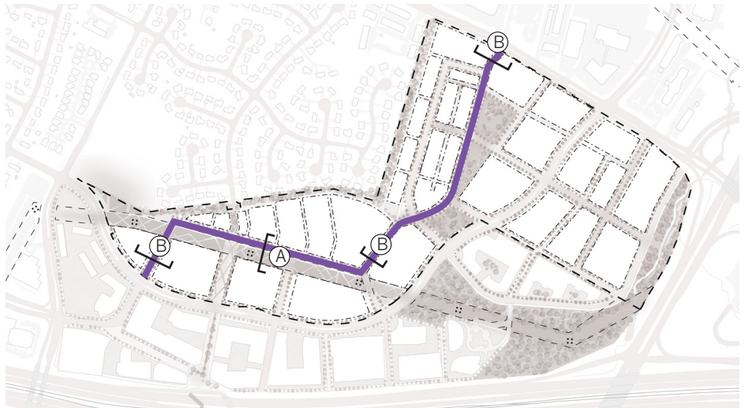



*Note: Street sections provide a guideline of how to program the area between the development blocks; however, there is flexibility for the shown dimensions and features to change depending on future development needs, e.g., subsitituting on-street parking for turning lanes.*

# Transportation Network

## Road Types – Parallel Street

Parallel Street is a proposed road which runs through the TRG parallel to the Herndon Parkway. It is the most significant TRG roadway, both in terms of the amount of traffic it is expected to carry and in terms of the connectivity it provides through the TRG. As such, it offers on-street parking, dedicated bicycle facilities, generous sidewalks and landscape elements throughout.

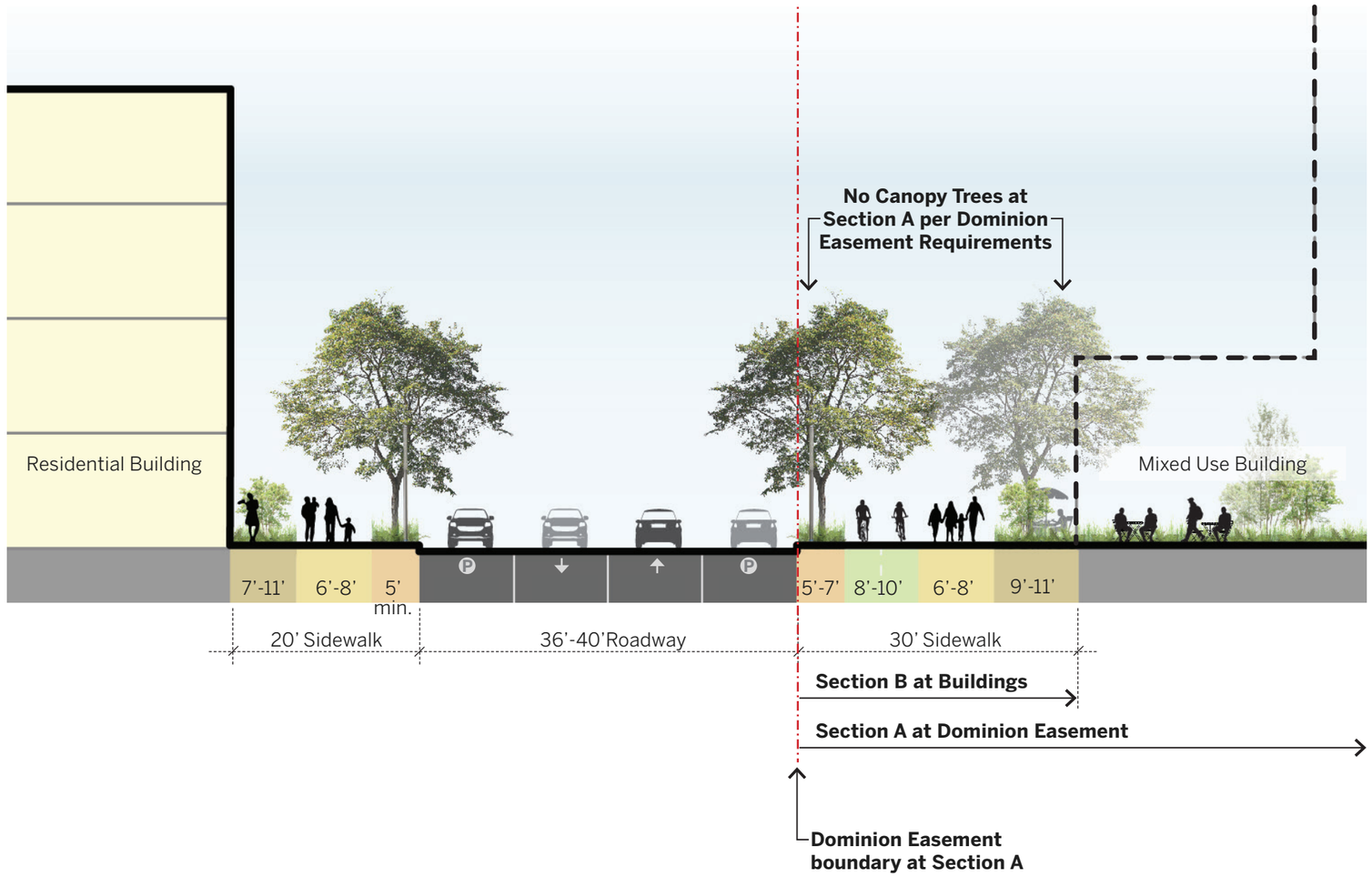



Key Plan

**Amenities**

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

**Street Section at Parallel Street**



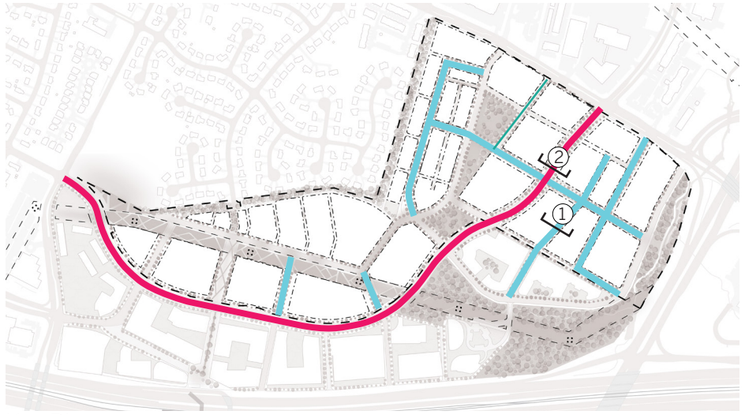

*Note: Street sections provide a guideline of how to program the area between the development blocks; however, there is flexibility for the shown dimensions and features to change depending on future development needs, e.g., subsitituting on-street parking for turning lanes.*

# Transportation Network

## Road Types – Typical Streets

Private streets are bidirectional with shared bicycle lanes and offer on-street parking. The sidewalks are wide enough to offer distinct zones for pedestrian circulation and amenties per the legend below.

The TRG plan does not call for alterations to the Herndon Parkway roadway, which would include the current lanes of vehicular traffic, medians and planned cycletrack. Curb cuts along the Herndon Parkway must be limited to the proposed TRG streets, with no mid-block vehicular access.

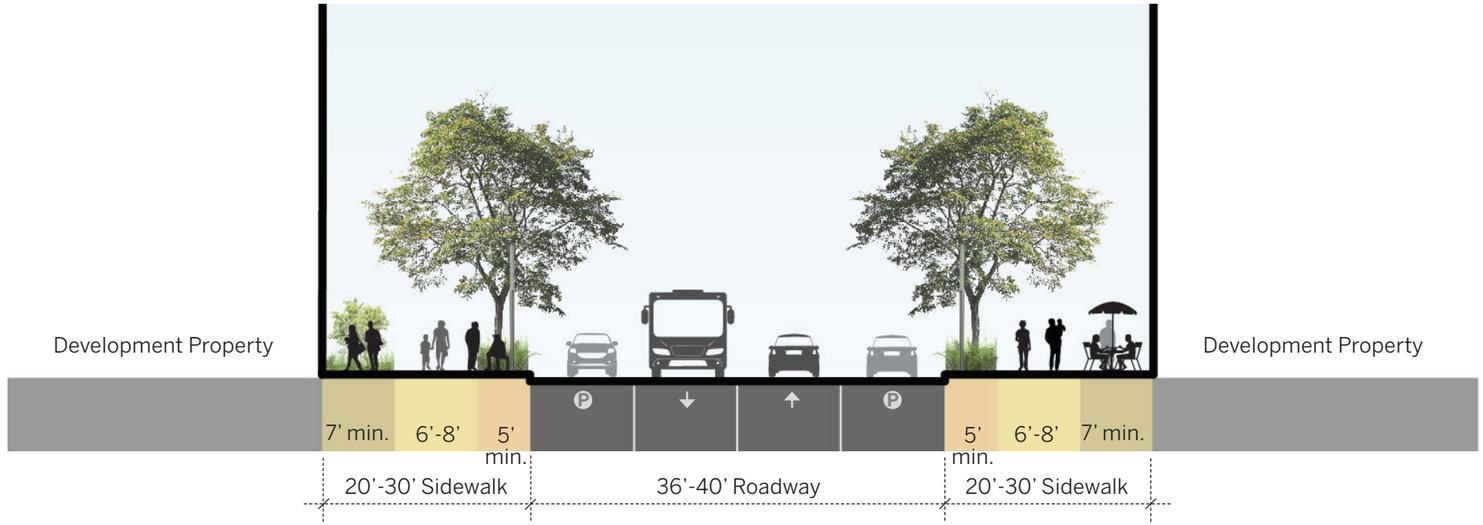



Key Plan

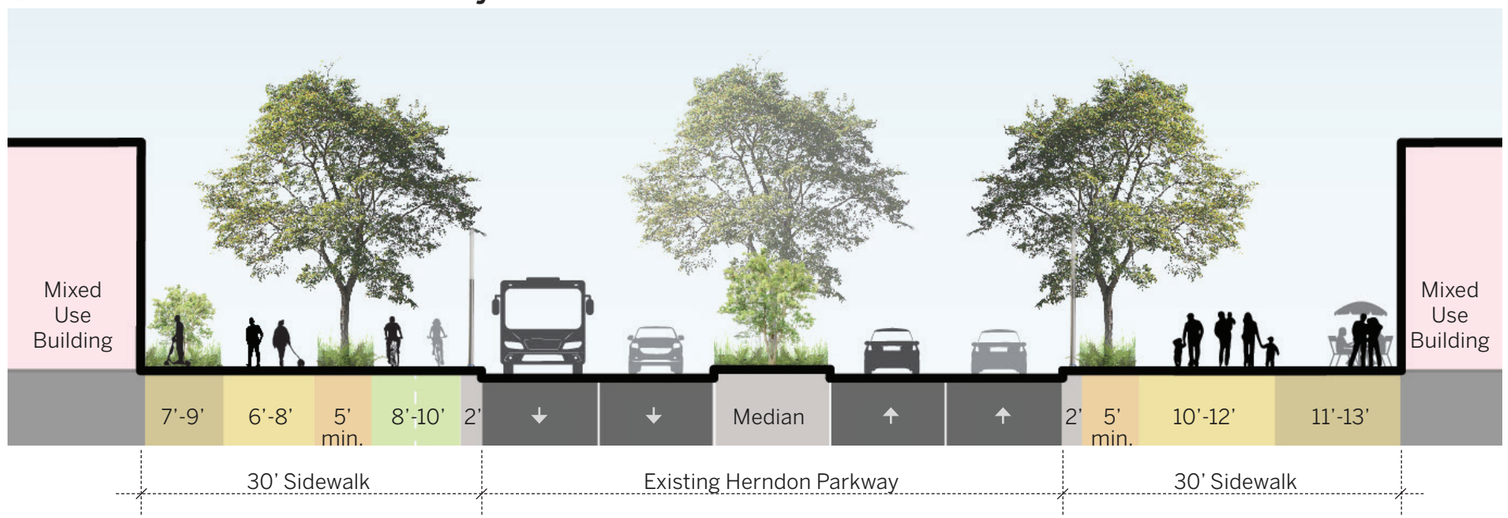
**Amenities**

- Property frontage area
- Pedestrian Circulation
- Landscape and Site Furnishings
- Cycle Track
- Buffer

**1. Street Section at Private Streets (Secondary Roads)**




**2. Street Section at Herndon Parkway**

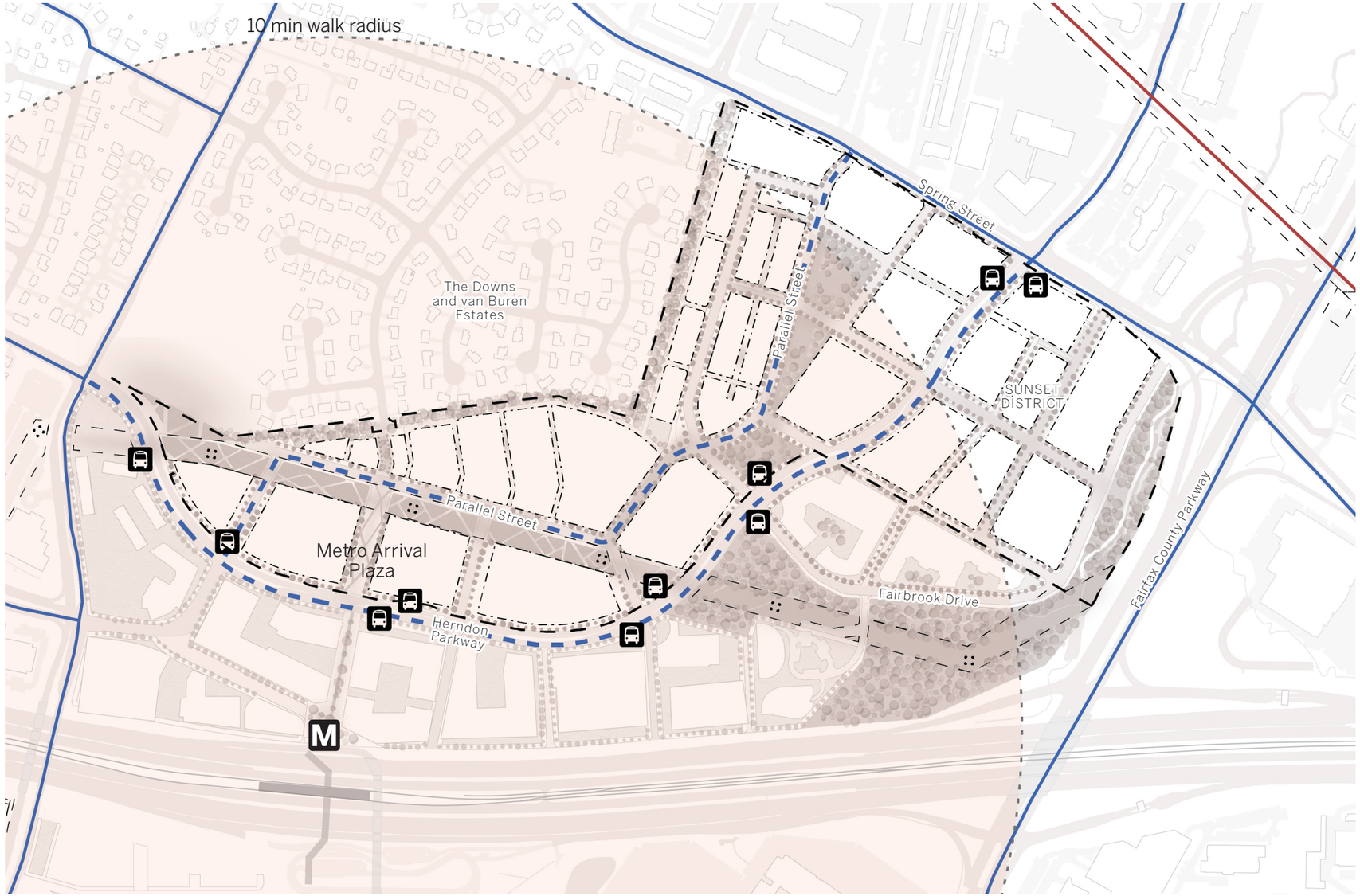



*Note: Street sections provide a guideline of how to program the area between the development blocks; however, there is flexibility for the shown dimensions and features to change depending on future development needs, e.g., subsitituting on-street parking for turning lanes.*

# Transportation Network

## Multimodal Streets

The TRG SAP covers an area which was previously dominated by private vehicles, to the detriment of other users, notably cyclists and pedestrians. Together, the arrival of the Silver Line in Fall 2022, bus infrastructure upgrades at the Herndon Parkway near the Metro, and new cycletracks (both those already under development, and those proposed by this plan) will form a new, truly multimodal district in Herndon.

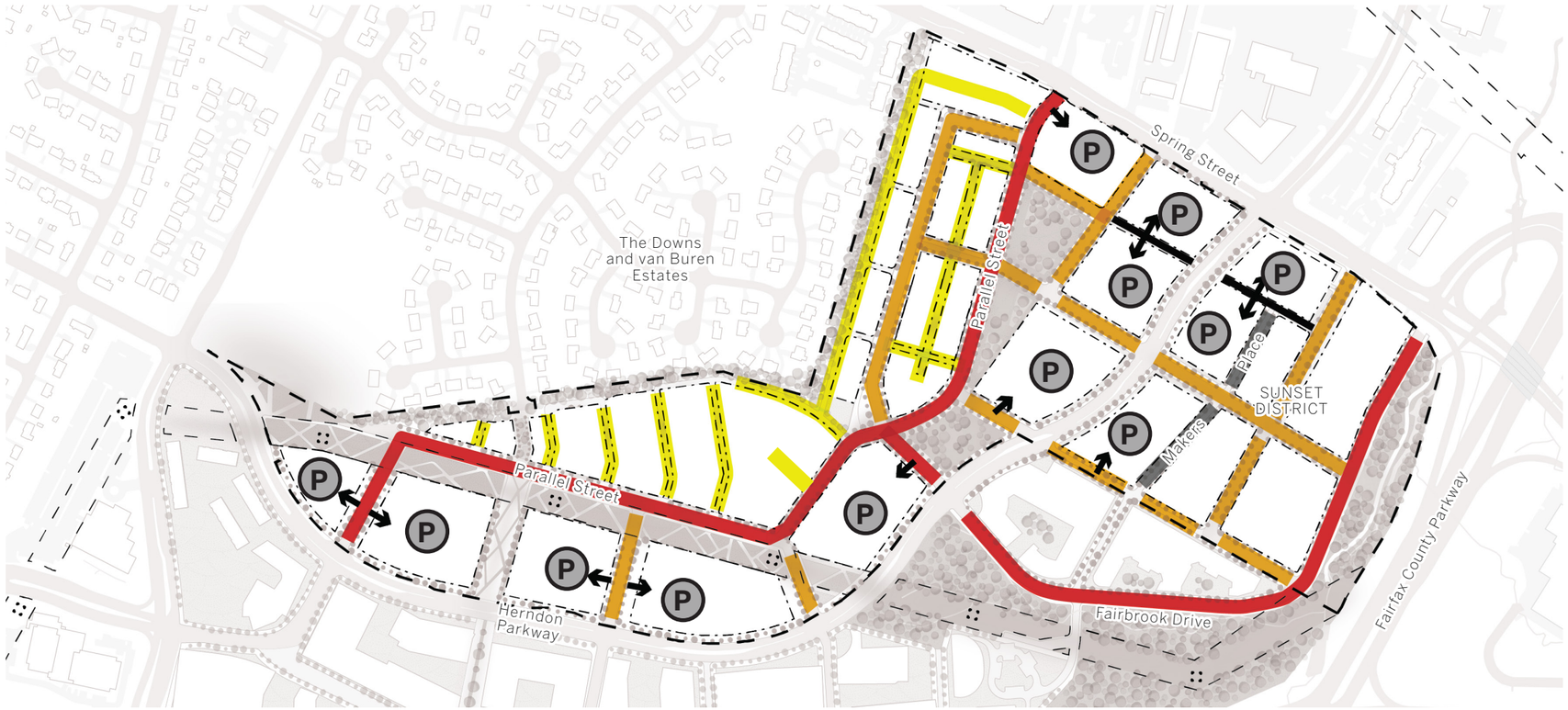



**Multimodal Streets**

# Parking Strategies

Parking must be carefully considered in a methodical and coordinated manner across the TRG given its proximity to the Herndon Metrorail Station, the increased densities, and introduction of publicly accessible open spaces. The following parking strategies should be employed:

- For development blocks outside the residential transitional areas, provide all off-street parking within the block in lined and screened structured parking garages.
- Shared structured parking between blocks should be considered in instances with abutting blocks of the same ownership.
- Coordinate structured parking garage entrances with architectural and functional back-of-house conditions, with consideration of queuing and other potential traffic impacts.
- Provide public on-street parking for the Primary Roads (Fairbrook Drive and Parallel Street) and private on-street parking for the Secondary (Private) Roads.
- The low-density residential roads should be designed with private individual garages and driveways accessible via alleys.
- Public on-street parking will require management to ensure spaces are available to the public and not used for long-term purposes
- Private on-street parking must also be managed however these may be available to the public or be user-specific. Certain private roads may work best for strictly residential parking for adjacent residences and other private roads may work best for strictly retail or other commercial purposes. The TRG would benefit from a coordinated private on-street parking program throughout the entire district. There may be opportunity to even involve the parking on public streets within this program.
- Off-street surface parking is generally discouraged. If provided, it should be minimal, with no visibility from public streets or important TRG viewsheds, and by designed and screened in a manner to limit its visibility on-site.
- On-street parking is particularly important within the Sunset District. This plan calls for the retention and renovation of the existing buildings and businesses, which do have the benefit or space available for consolidated structured parking. While the conversion to a dynamic and robust pedestrian environment necessitates the conversion of the Sunset District streets to parallel on-street parking, diagonal on-street parking on one side of the street may be an option to ensure optimal parking available to support the shops, restaurants, and maker spaces of the Sunset District.




**Parking Strategy Recommendations**

# 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 approach is to:

- Respect the Downs' 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-storybuilding frontages, transforming the feel of the Parkway from freeway to urban street
- Provide transitioning heights from HTOC to TRG to the Downs

**Residential Area** between Parallel Street and the existing residential neighborhood to the north 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 proposed Parallel Street.

**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**, bounded by Fairbrook Drive, Spring Street and Herndon Parkway, is the area envisioned to have a unique mix of creative uses with buildings ranging from 1-story up to 8 stories. The idea is to allow for long-span "makers" space or entertainment and fitness destinations, as well as multi-story buildings with parking podiums.

**Multistory Buildings** fronting Spring Street and straddling Herndon Parkway between Parallel Street and Spring Street, may range between 5 and 8 stories. These buildings will play an important role in creating a first impression upon entering the TRG while coming from Reston or Downtown Herndon, framing the Parkway with an urban "street wall."

The *Building Heights Areas* diagram to the right of this page depicts the boundaries for each of the height ranges previously described and keyed in below:

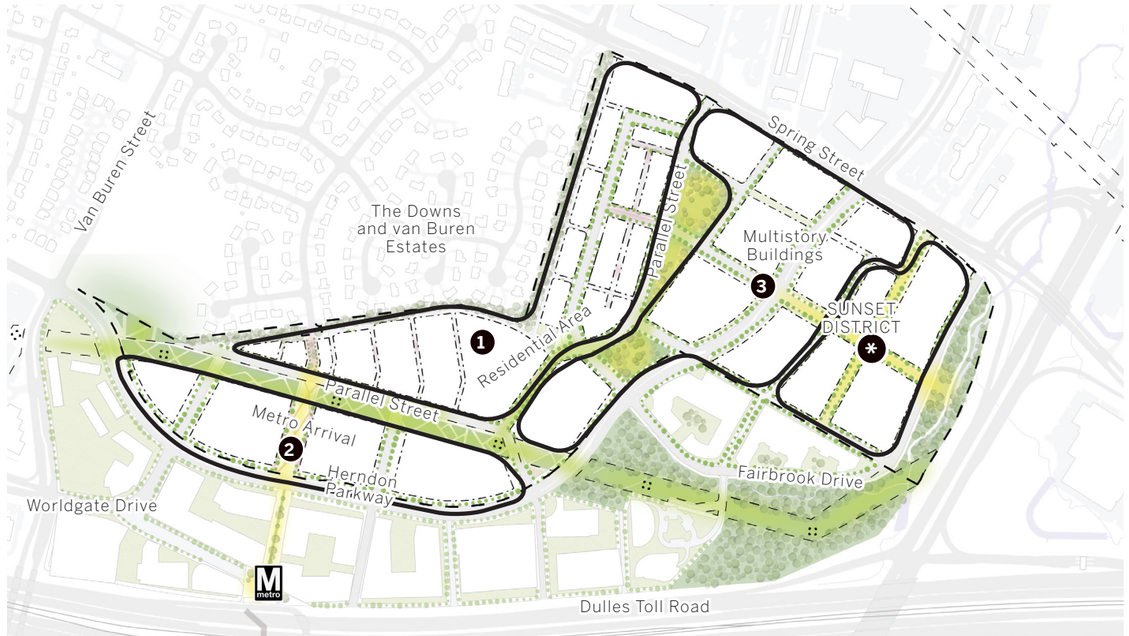
❶ Low Density Residential: 3-4-Story

❷ Metro Arrival: 5 to 12-Story

❸ Herndon Parkway Podium Buildings: 5 to 8-Story

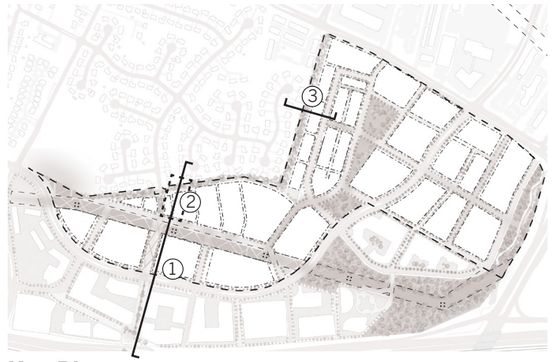
✱ As directed by the Town of Herndon, the three existing Sunset Business Park buildings are expected to remain as-is and the proposed Shamin Hotel is expected to be implemented as currently proposed and approved.

BUILDING HEIGHTS AREAS

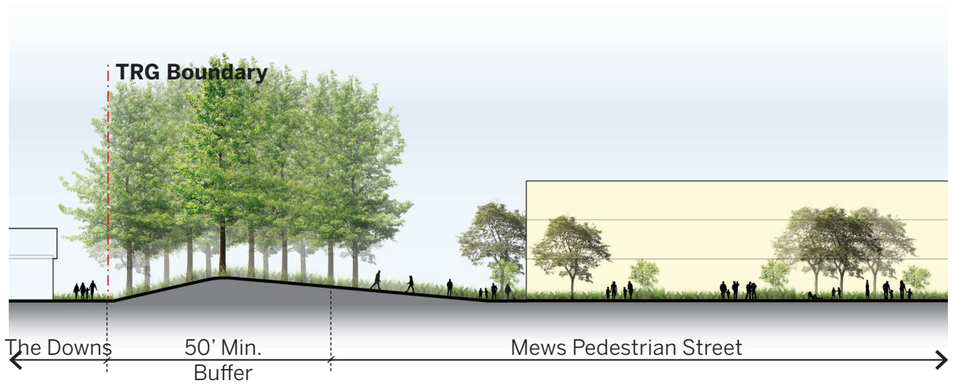


# Urban Design and Architectural Character

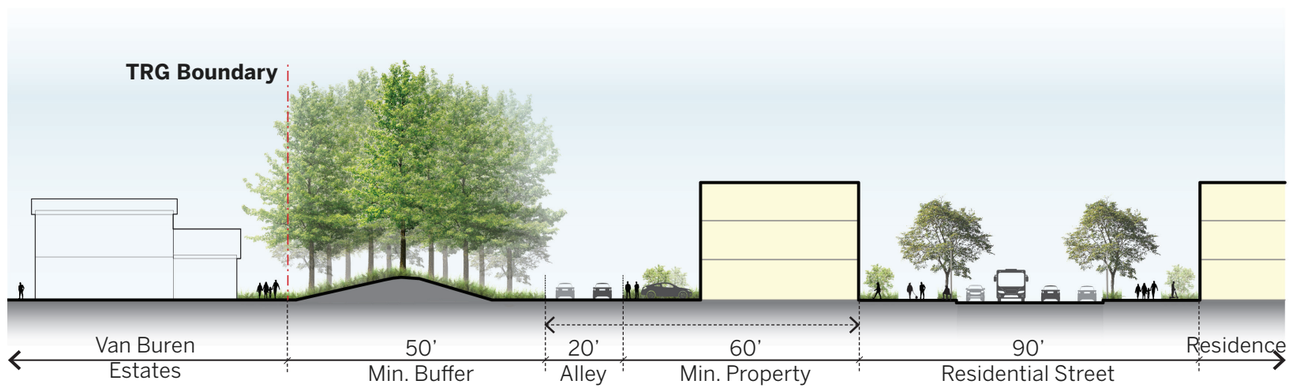
## Heights and Massing




**Key Plan**

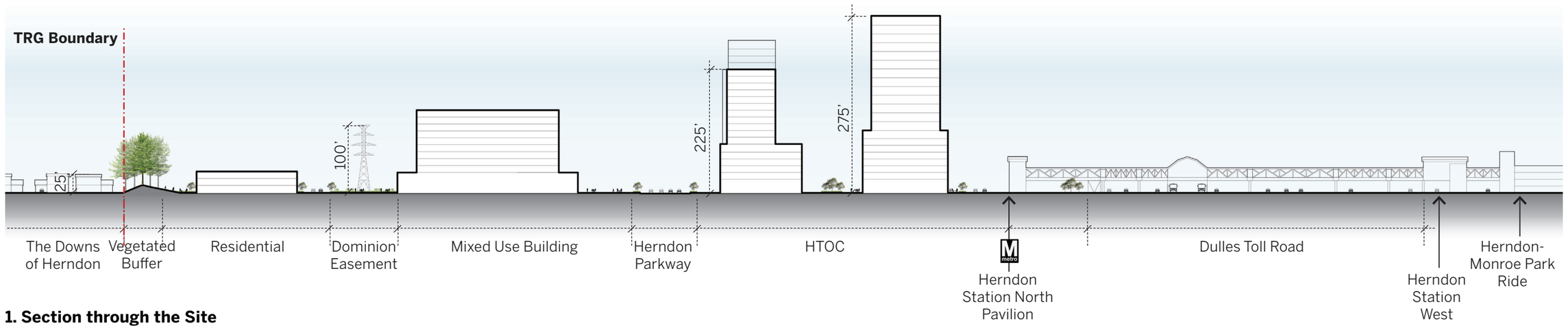



**2. Section through the Buffer**




**3. Section through the Buffer on the Northern Boundary**

**TRANSECT** | THE DOWNS - TRG - HTOC - HERNDON STATION



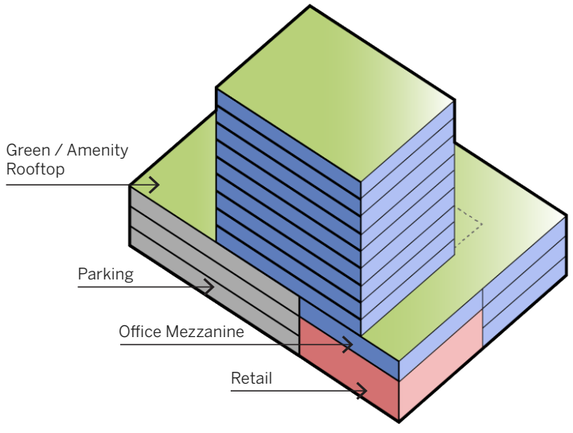

**1. Section through the Site**

# Urban Design and Architectural Character

## Building Typologies

For much of the TRG, "podium" style buildings are appropriate for mixed-use development. Typical podium buildings feature bases of one to three stories (podiums) that have large footprints which can accomodate structured parking wrapped in "liners" of retail space, residential units or office lobbies, with office or residential towers on top.

The following guidance is created to ensure that these buildings are built and designed in such a way so as promote a vibrant urban realm in the TRG.




**Preferred Podium Design**

- Four-sided active ground floors are preferred
- Active ground floors provide a high level of transparency
- Architecturally appropriate awnings should be used to screen sun glare when necessary
- Appropriate active uses include restaurant, retail, public art andrecreational facilities open to the public
- Appropriate active uses can also include highly transparentoccupant activity centers and lobbies visible from the adjacent sidewalk, as well as private entries to dwellings
- Building zones shared with the public are encouraged with both multi-family and office
- Along sidewalks facades should abut hardscape to emphasize accessibility and transparency of the ground floor with potted plants to
- soften the experience and add interest
- Openings that provide public views into courtyards add interest
- Ground floor design should encourage a range of retail types and sizes
- Lower levels should reflect traditional storefront patterns and rhythms to ensure a sense of pedestrian and small town scale
- A consistent façade pediment not to exceed 40 feet in height is preferred
- Traditional materials of brick or stone should comprise the majority of the facing on all sides of the lower levels of the building
- Warmer tones are encouraged
- The general architectural aesthetic, colors and materials should take their cue from the neighborhood in which they are located
- All materials should be durable and resistant to fading, denting and fading
- Painted brick may be appropriate to differentiate storefronts
- Service portals should be located along secondary streets
- Service portals should be screened with solid overhead doors that reflect the aesthetic of the building
- Windowless walls are generally not appropriate along the ground floor, if a windowless wall is necessary due to internal operations art work and patterns should be incorporated
- Pick-up and delivery zones public streets should be designated and carefully designed as integral to the building
- Retail ground floors should incorporate standing space for curbside pick-up and delivery

**Preferred Tower Design**

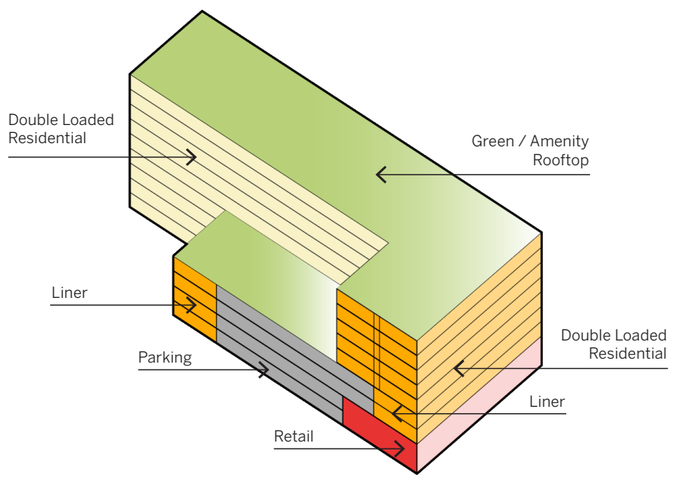
- Upper floors should be set back from the lower façade pediment
- While upper floors are distinct they should relate to the podium
- Rooflines should be visibly distinctive
- Mechanical rooftop units should be screened by the building's parapet other architectural rooftop structures or other methods of screening
- Windows should be operable
- Balconies extending or recessed are encouraged
- Rooftop and podium exterior outdoor space and work space for offices and multi-family is encouraged
- Facade materials should incorporate the ground floor primary material but additional materials may be appropriate
- Extensive fields of flat materials are not appropriate
- The general architectural aesthetic, colors and materials should take their cue from the neighborhood in which they are located

# Urban Design and Architectural Character

## Building Typologies – Parking Garages

It is preferred that all garages are wrapped with "liners" having building program or active uses. If an exposed garage elevation is necessary, however, the following apply:

- No exposure along ground floor level
- No exposure along the Herndon Parkway
- No exposure along the arrival plaza
- Any exposed elevations above the ground floor should be screened from view
- Screening should be designed to add appeal and reflect the style of the building
- No wire mesh screens
- Kneewalls should be tall enough to obscure vehicle headlights
- If visible from an open space, screening can be used to further activate the space




## Parking Garage Screening




**Residential Liners**

- Wrap parking garages with active uses facing main streets, such as residential liners or retail frontage



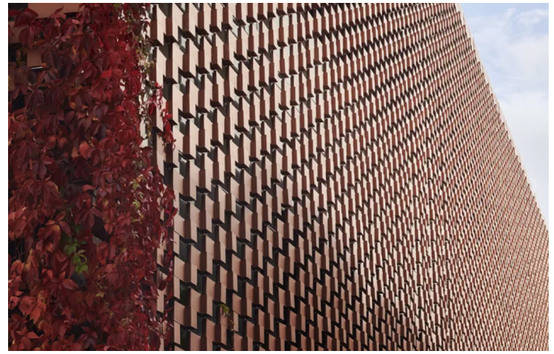
**Mural on Exposed Facade**

- 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 screening can also be achieved architecturally, by creating visually compelling facades that mask the parking behind them.

# Urban Design and Architectural Character

## Architectural Character

The TRG plan is ultimately about creating a singular place that reflects its identity as a part of the town, while remaining a distinct location divided into several neighborhoods.

As the TRG develops over time, in most cases parcel by parcel, clear guidance is needed to create a sense of cohesiveness across the TRG, while still allowing for flexibility.

As the TRG develops, changes will occur in architectural tastes, technology and market realities.

The following guidance is to establish the core elements that will create an overarching cohesiveness. This is to set the stage for individuality of its smaller components and ensure a sense of place that is reflective of Herndon's historic small town identity without attempting to stylistically emulate the past.











# Urban Design and Architectural Character

## Vision Survey

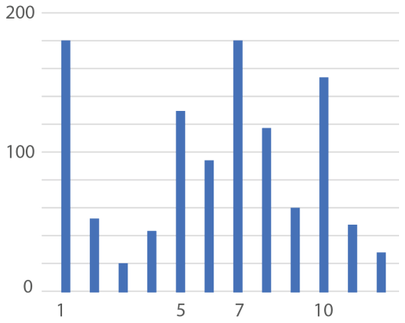
The community survey conducted in the Spring and Fall of 2022 invited respondents to share their visual and aesthetic preferences for the TRG. The survey solicited both open-ended and specific feedback.It included prompts calling for respondents to select preferred building typologies from a collection of images, including imagery from Herndon itself, other recent nearby developments and other transit-oriented development projects.

Overall, the respondents expressed a fondness for both the "unique character" and "small town charm" of Downtown Herndon, as well as for newer, more contemporary developments that nonetheless feature traditional building materials and tactile architectural detailing.

The open spaces, parks and streets selected by the community were images rich in programmable space, areas for gatherings, active transportation facilities, ample sidewalks, and extensive landscaping. The preferred sidewalk scenes show a variety of surface materials, activated building frontages, and room for landscaping and small group interaction without inhibiting passage. Each of the selected images is a visual representation of walkability, a core attribute of both small towns and successful transit-oriented development. Trees and other landscaping feature prominently, reiterating the community's voiced desire for environmentally sustainable development with an emphasis on parks.

To preserve Herndon's special sense of place, it's important to understand the elements that make the architectural fabric of the town's symbolic core, the historic downtown, special and how these same elements can be imbued into the architecture, landscape architecture and rights-of-way of the TRG.

**Top Types of Buildings and Development Preferred within the TRG area**





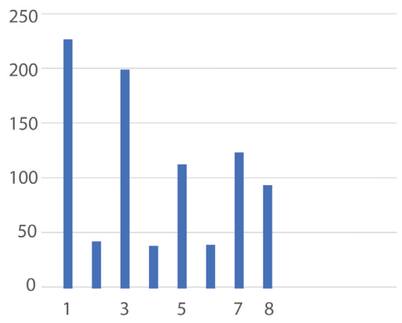








**Top Types of Open Spaces, Parks and Streets Preferred within the TRG area**












# Urban Design and Architectural Character

## Downtown Herndon

Throughout the TRG SAP process, the residents, Town staff and officials, and the project team emphasized the critical importance of the Town of Herndon's distinct character. These annotated images illustrate the successful architectural, landscape and urban design elements that give the downtown its small town charm and pedestrian appeal.

Throughout Downtown, there are certain architectural and urban design elements which create an environment that is inviting, unique and memorable to visitors. There are clear lessons that can be learned from this special area which can be applied to the TRG, in accordance with the clear preferences of the Herndon community.

The most successful of the Downtown blocks feature pedestrian-friendly elements such as continuous street walls, ground-level transparency and frequent, at-grade building entrances. These features make Downtown feel safe, friendly and human-scaled.

The architecture in some of the most compelling Downtown buildings features quality, tactile materials such as brick, rather than colder, less intimate material pallets, such as glass curtain wall systems. Attention to architectural detailing also contributes to the overall uniqueness of Downtown.

The outdoor spaces form a unique public realm. Tactile paving materials distinguish Downtown as special space within Herndon, and street trees, landscaping, and lawns introduce nature and provide shade and heat reduction, while plazas add informal as well as programmable gathering spaces.



















MATRIX OF IMAGES OF DOWNTOWN HERNDON

URBAN DESIGN | ARCHITECTURE | OPEN SPACE

# Urban Design and Architectural Character

## Recent and Proposed Nearby Developments

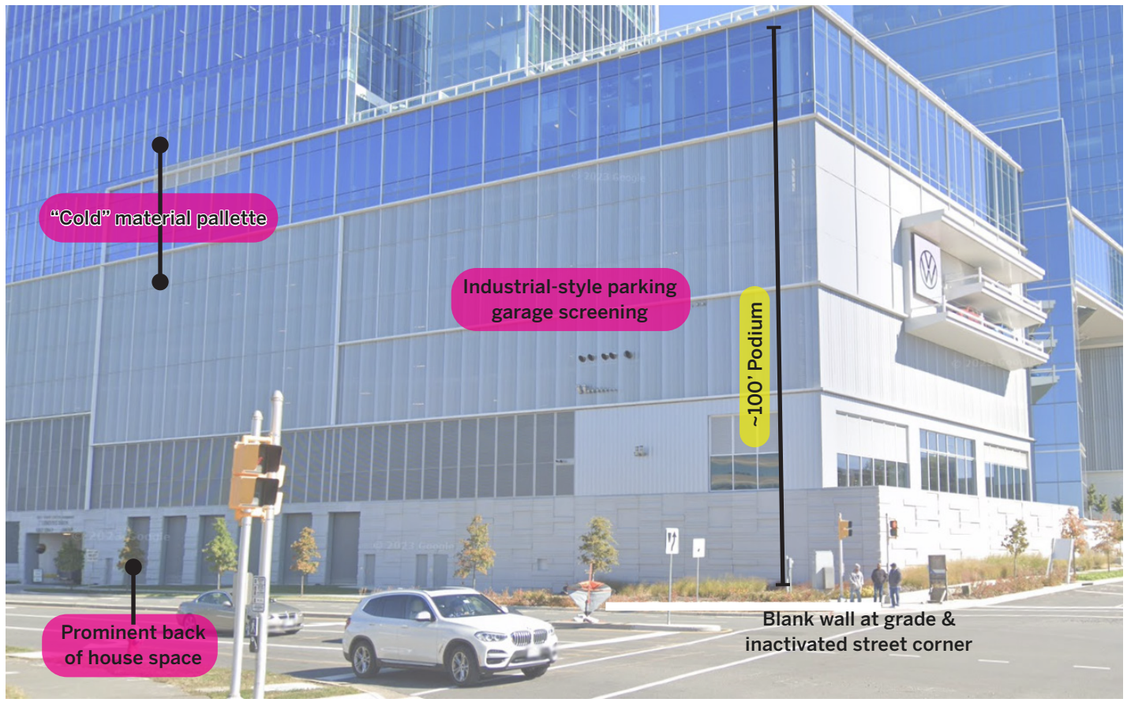
Throughout the public engagement process, significant feedback was received about the relationship of Herndon to the rest of Northern Virginia. While community comments and survey responses generally support adding density near the Metro in accordance with the principles outlined in this plan, many community members expressed concerns that added density would necessarily result in urban and architectural conditions similar to other recent developments along the Silver Line.

A common sentiment received during the engagement process was "we like to be near Reston, but we don't want to be Reston." Concerns were voiced in regard to the aesthetic quality of recent nearby developments. Common aesthetic criticisms of recent construction along the Silver Line included that both individual buildings and larger developments are "too cold," "overscaled," and "unfriendly" for "small-town Herndon."

An example of one building that was identified as not appropriate for Herndon is shown to the right. While its design may be appropriate for the building's location outside of Herndon, this development can be seen as emblematic of the style that Herndon residents would not like to see replicated in their community. The annotations explain some of the design elements that are not appropriate for the TRG. These include the scale of the buildings, the lack of ground-floor activation, and prominent poorly screened or un-lined parking garages.

The public engagement process also demonstrated that the density which planned in the HTOC is out of scale for the TRG, which much act as the transition from the heights and density allowed along the Toll Road, to the low density residential neighborhoods to the north of the TRG.

**ARCHITECTURAL ELEMENTS TO AVOID IN THE TRG**




FANNIE MAE AT RESTON TOWN CENTER (EXISTING)




555 HERNDON PARKWAY IN HTOC (PROPOSED)

URBAN DESIGN | ARCHITECTURE | OPEN SPACE

# Urban Design and Architectural Character

## TRG Aesthetic

Based on the visual preference survey, public comments, and planning staff and public officials concerns, and to ensure that the new TRG development is infused with the small town charm of Herndon, the following parameters should guide future development.

It is important to recognize that in order to create new housing opportunities, provide more, higher quatlity public and open spaces, and the economic potential of the TRG,  this plan envisions development density and building scale (height and massing) that is considerably greater than what exists in Historic Herndon.

While not as dense or at the scale of Reston Town Center or the HTOC, development of the TRG is significantly larger that what currently exists on the site and in downtown Herndon.  Accordingly, development of the Transit Related Growth area will need to adhere to certain planning principals, urban design parameters, and architectural design considerations in order to fulfill the community's overwhelming desire to preserve the unique character of Herndon. As follows, these include Ground Floor Activation, Building Setbacks, and Landscape / Open Space considerations.

**Ground Floor Activation**

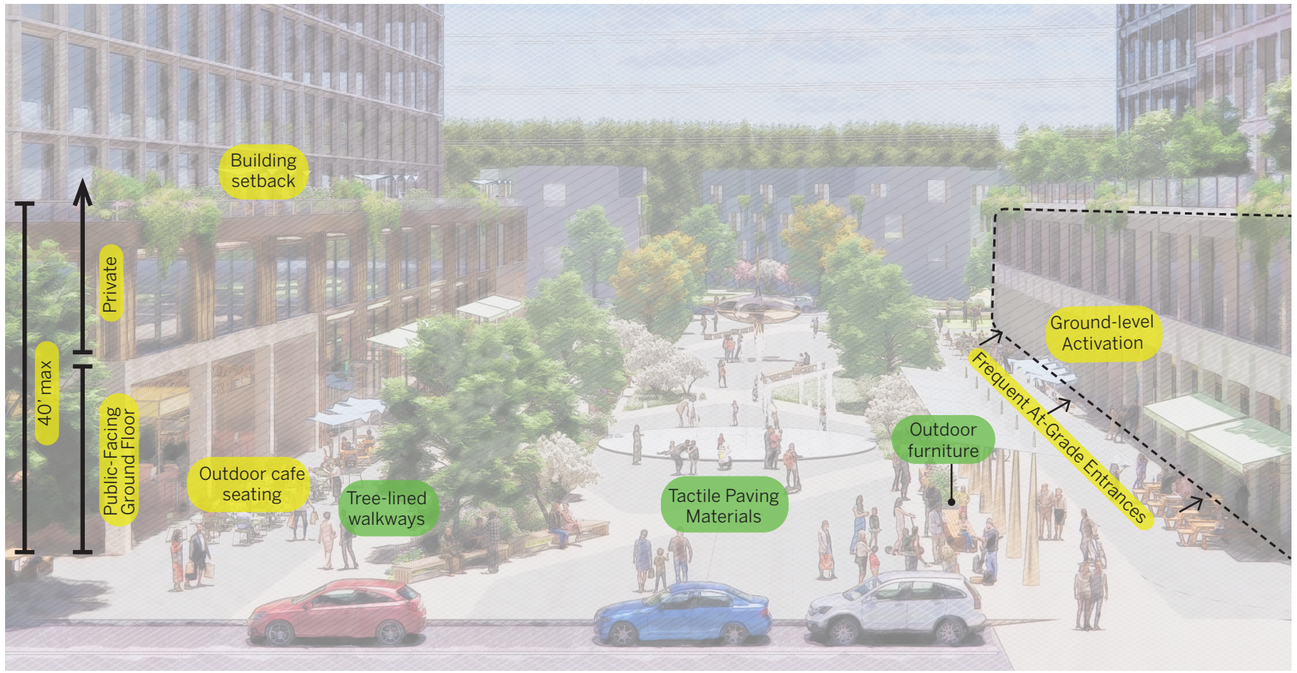
Successful urban mixed-use neighborhoods, large or small, feature strategically located retail, lobby, and similar ground floor uses along building frontages. In the TRG, these spaces serve to activate the adjacent public realm and must be thoughtfully designed with appropriate architectural variety, articulation, and scale. Transparency, porosity, and depth of the frontage in these areas are key for ensuring vibrant and interesting urban design.

**Building Setbacks & Typology**

In the TRG, a consistent podium height for mixed-use, office, and multi-family buildings with setbacks for upper floors should be employed. The height of the podium should be similar to the height of the buildings within the transitional residential zones and should, in many cases, be composed of lined parking garages.  Having a clearly defined podium will help set continuous street walls and, with the appropriate setback, will reinforce a perception of height and scale proportional with downtown Herndon buildings.

**Open Space**

Open spaces in the TRG should be dynamic with a multitude of decorative surface materials, opportunities for programmable spaces, both passive and active recreational amenities, gardens and shade trees, focal points such as artwork, interactive elements, wayfinding signage, and a variety of immobile and movable furnishings. Some amenities should reflect specific references to the Town of Herndon.




URBAN DESIGN ARCHITECTURE OPEN SPACE

# 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, connecting with the W&OD and Sugarland Run trails.

Of the 93 acres in the TRG, 14 acres (15%) would be dedicated to open space, as shown in the overall space allocation table below:

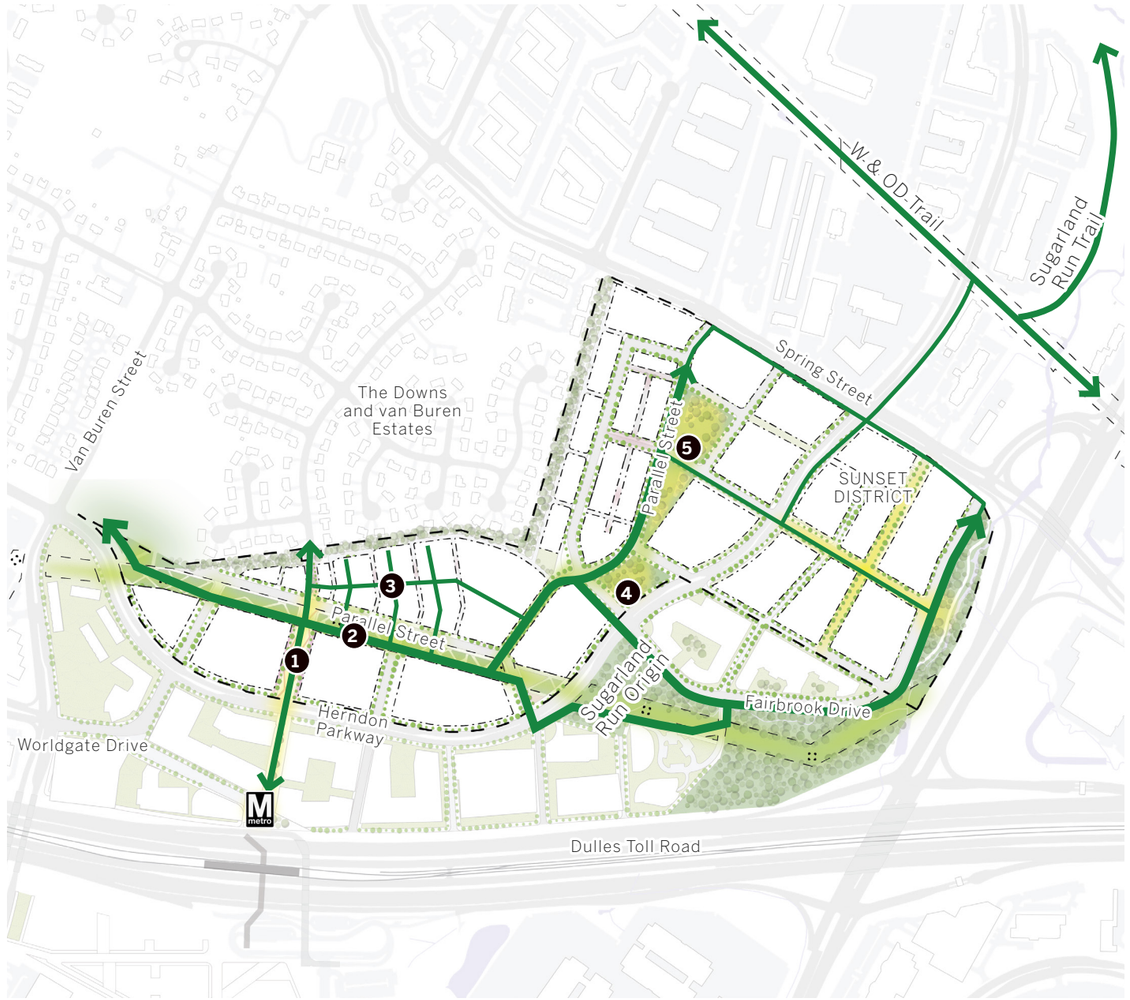
| | Acres | % |
|---|---|---|
| Open Space | 14 | 15 |
| Development Blocks | 48 | 52 |
| Circulation | 28.1 | 30 |
| Buffer | 3 | 3 |
| **TRG** | **93.1** | **100** |
| Herndon Pkwy ROW | 3 | N/A |

The TRG open spaces would be on private land, however they would be publicly accessible, and available for activities, programs, and events held and hosted by the Town of Herndon. The network of open spaces will allow for a mix of passive and active recreation as well as bioretention for stormwater management and maximized green infrastructure.

See following page for a description of each of the numbered spaces marked on the right-hand graphic.

General design guidance for open spaces:

- Design of plazas and parks should be inclusive and equitable
- Design of plazas and parks should exceed ADA minimum standards and allow ease of use and a positive experience for all members of the community
- Plazas, parks and other open spaces should be designed with intent and drive as well as respond to the spatial arrangement of the neighborhood
- The general architectural aesthetic, colors and materials of plazas and parks should take their cue from the neighborhood in which they are located
- Plaza, parks and other open spaces should not be “remnant” or “residual” space
- Ground plains should emphasize safe yet tactile paving materials, and designs and colors should be incorporated
- Native species should be used extensively with use of non-native/non-invasive plants for seasonal color
- Low-impact stormwater management systems should be integrated within the landscape to the greatest extent possible while retaining usable and programmable open space for both active and passive recreation.
- Each neighborhood should share its own identifiable site furnishing aesthetic while the Town’s circumscribed streetscape furnishing are employed along the Herndon Parkway




**Open Space Network Plan**

# Recreation and Open Space Design

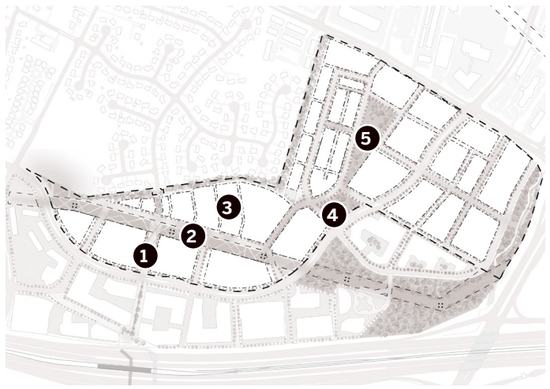
## A Network of Open Spaces

### 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. The Arrival Plaza provides an opportunity for community programming and evens such as markets, film screenings or other gatherings. *(More information and imagery for the Arrival Plaza is included in the "Neighborhoods" section below)*



ARRIVAL PLAZA PRECEDENT IMAGE




**Key Plan**

### ❷ Linear Park

The 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 a corridor of green interstitial mobility through the site. The park would allow for small-scale community programming, such as busking or outdoor exercise classes.

The Linear Park should create a green swath through the community with design features that orient the eye to the ground plain and surrounding area and away from the overhead lines. It is both a recreational area and the location of dedicated pedestrian and cycling facilities.

The Herndon Parkway terminus of the linear park should provide a comfortable space for pedestrians and cyclists to enter and exit the Herndon Parkway streetscape while providing a shared use area for the public and occupants of the abutting property. The design can transition into a private space as it approaches the building which should have immediate access onto this open space.



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 walkable neighborhoods, and for making safe space for children to play.



PRECEDENT IMAGE, SHOWING CHILDREN SAFELY PLAYING ON THE STREET

### ❹ Gateway to Sugarland Run

This park offers a break in the Herndon Parkway street wall and offers a connection to the Sugarland Run origin, visible across the Parkway on the Fairbrook property. Sugarland Run runs along the Fairbrook property and borders the TRG at the Sunset District, this being the sole natural feature in the TRG.



OBSERVED ORIGIN OF SUGARLAND RUN

### ❺ Triangle Park

Due to its central location, the Triangular Green will serve a diverse set of users including office workers, retail customers and residents, creating a vibrant space throughout the day. Due to its substantial footprint,central location and adjacencies, the Triangular Green is an ideal location for active recreation spaces, such as volleyball courts or workout equipment.



PRECEDENT IMAGE FOR TRIANGULAR GREEN

# Recreation and Open Space Design

## Linear Park

General design guidance:

- Residential towers should be oriented perpendicular to the power lines to minimize views to the overhead cables
- Podiums should have a consistent height of 30' to stay below the power lines and avoid direct views to the cables
- On podiums, place amenity or support program such a gym directly in front of a power tower, not resideidential units
- All design guidance listed in the Park Frontages section applies to the Linear Park.
- See precedeing Existing Conditions – Dominion Easement for Dominion Energy's restrictions for easement future improvements.



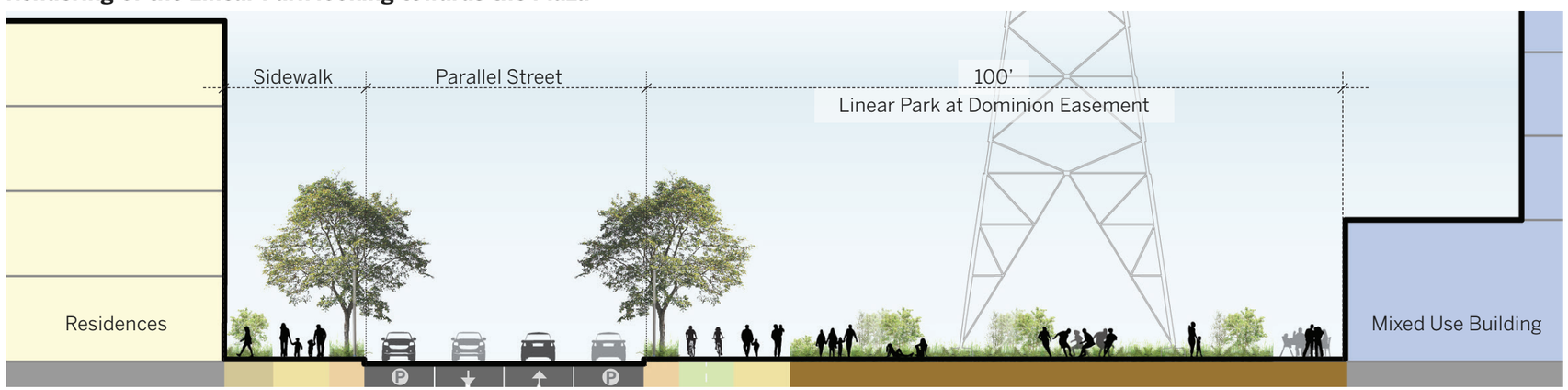
**Key Plan**

**Amenities**

- Seating/Front or Side Yard
- Pedestrian Circulation
- Landscape and Site Furnishings
- Cycle Track
- Linear Park



**Rendering of the Linear Park looking towards the Plaza**




**Section though Linear Park**

*See Street Sections in the "Transportation Network" section for street and sidewalk meansurements*

# 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.

Future development in the TRG should maximize green infrastructure to capture stormwater throughout the TRG, by employing the following strategies:

**Vegetated roofs**, or green roofs, should be used to cover parking garage podiums, not only for stormwater management, but also to provide amenities for building users by avoiding views to exposed garages and enhancing the property with amenity decks, adding a competitive advantage to the property.

**Bioretention and biofiltration** should be installed in green areas on the designated parks: Linear, Triangle and Square (see Open Space section), and should be designed to be a landscape utility and park amenity. Bioretention and biofiltration measures should also be installed on sidewalks, in the form of rain gardens or bioswales running along the landscape and site furnishings zone (see Transportation Network street sections).

**Stormwater infiltration** strategies should be employed, if the soil allows, for stormwater capture and drainage into the soil, allowing streams to recharge, such as the contiguous Sugarland Run.

**Rain gardens**, or bioretention planters, should be maximized on sidewalks. The SAP allows for wide rights-of-way with ample distance between the development blocks (see Redevelopment Framework) to accommodate circulation and landscape amenity panels along the sidewalks with bioretention.

**Rainwater harvesting cisterns** should be employed as double-duty strategy for stormwater capture and potable water use reduction.

**Pervious paving** reduces runoff by infiltration, and should be maximized on hardscaped areas throughout the TRG, preferably by building frontages such as entrances and outdoor seating, parking/backyard and pedestrian streets on the Residential Transitional Area, and the Arrival Plaza.



**Vegetaded roof on parking garage, Fairfax, VA**




**Rainwater harvesting cistern**



**Tanner Springs Park, Portland, OR, featuring park as both stormwater management utility and neighborhood amenity**



**Bioretention bioswale on sidewalk, Baltimore, MD**



**Pervious pavers demarcating entryways and pedestrian circulation next to fully grown rain garden**



**Pervious paving at on-street parking, pervious pavers at step-out zone, and narrow rain garden on sidewalk**

# Recreation and Open Space Design

## Sustainability Principles

Redevelopment in the TRG should follow environmentally sustainable practices. The strategies highlighted here are important for ensuring responsible and resilient growth in the TRG. These strategies apply to both landscape design and function, and building design and maintenance. Many of the strategies are depicted within the park section to visualize and exemplify options for implementation. Close coordination between the Town and property owners will be essential for ensuring and comprehensively deploying these measures throughout the TRG.

**Ecology & Environment**
- Use native plant species
- Find opportunities for pollinator gardens
- Leverage otherwise encumbered and residual open spaces for natural landscaping
- Support options for community gardens and urban agriculture
- Maximize tree canopy
- Discourage use of pesticides

**Resiliency**
- Employ urban bio-retention within parks and along streets
- Encourage green roofs and delayed release methodology
- Incentivize third party green building and infrastructure certification
- Minimize open asphalt and concrete areas

**Energy and Carbon**
- Seek passive building energy reduction
- Encourage use of on-site renewable energy sources
- Provide EV charging stations

**Water**
- Use low flow fixtures within buildings
- Support availability of on-site water recycling for irrigation

**Waste**
- Pursue options for limiting construction waste
- Support programs for waste reduction and increased recycling
- Ensure appropriate open space receptacles for litter management

**Mobility**
- Seek a modal balance for trips generated
- Ensure high service levels for pedestrians, cyclists, and transit users
- Provide safe, comfortable, and convenient facilities for active transportation
- Reduce single occupancy vehicle trips though TDM programs

**Livability and Wellness**
- Ensure connectivity of open spaces and pedestrian/bicycle paths
- Design blocks and street frontages around the pedestrian experience
- Allow a mix of uses where various activities can occur without the use of a car
- Allow a mix of housing types

**Materials**
- Encourage use of locally sourced, sustainable, carbon-negative, and recycled materials
- Pursue methods for reducing heat island impacts
- Apply dark sky strategies to manage light pollution
- Use bird safe glass and other similar exterior elements
- Support the use energy efficient appliances and mechanical systems

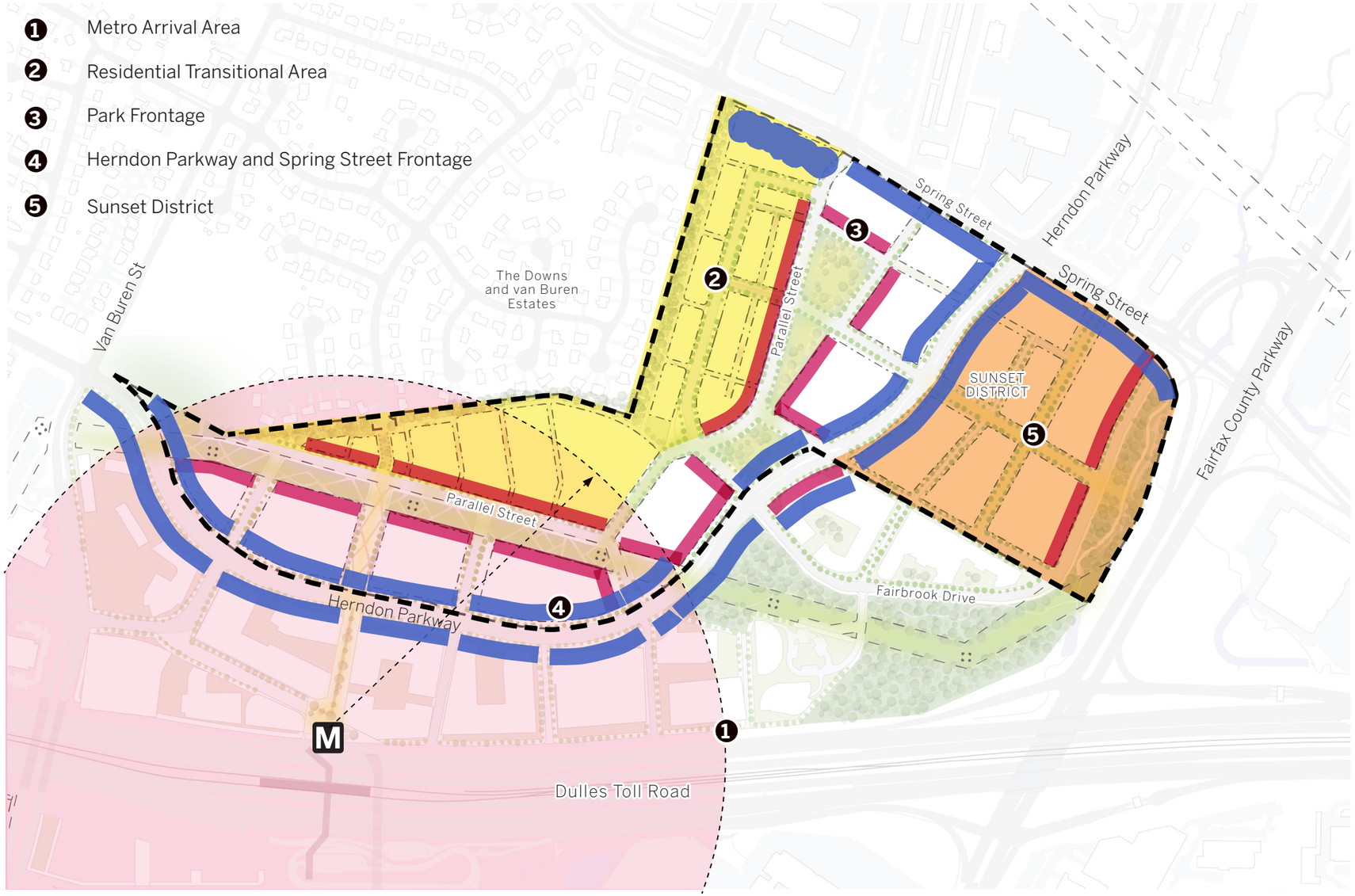


# The Neighborhoods

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, thus meriting more specific design guidance. Also, they can overlap each other and not be limited in the same way the current arrangement of sub areas are.

While the Urban Design Framework provides design guidance for the TRG overall, "The Neighborhoods" gets closer to human scale, by identifying specific context-based areas meriting a higher level of design guidance, as follows: the Metro Arrival Area, Residential Transitional Area, Park Frontage, Herndon Parkway and Spring Street Frontage and Sunset District.




**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 blocks closer to Metro along Herndon Parkway should be multi-story buildings (see preceding Heights and Massing section) with concealed parking garage structures (see preceding Building Typologies), leaving the area between the Linear Park and the existing neighborhood with low residential townhomes and/or two-over-two's.

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.

The three photos to the right were top ranking images in the public Vision Survey for preferred open space type.



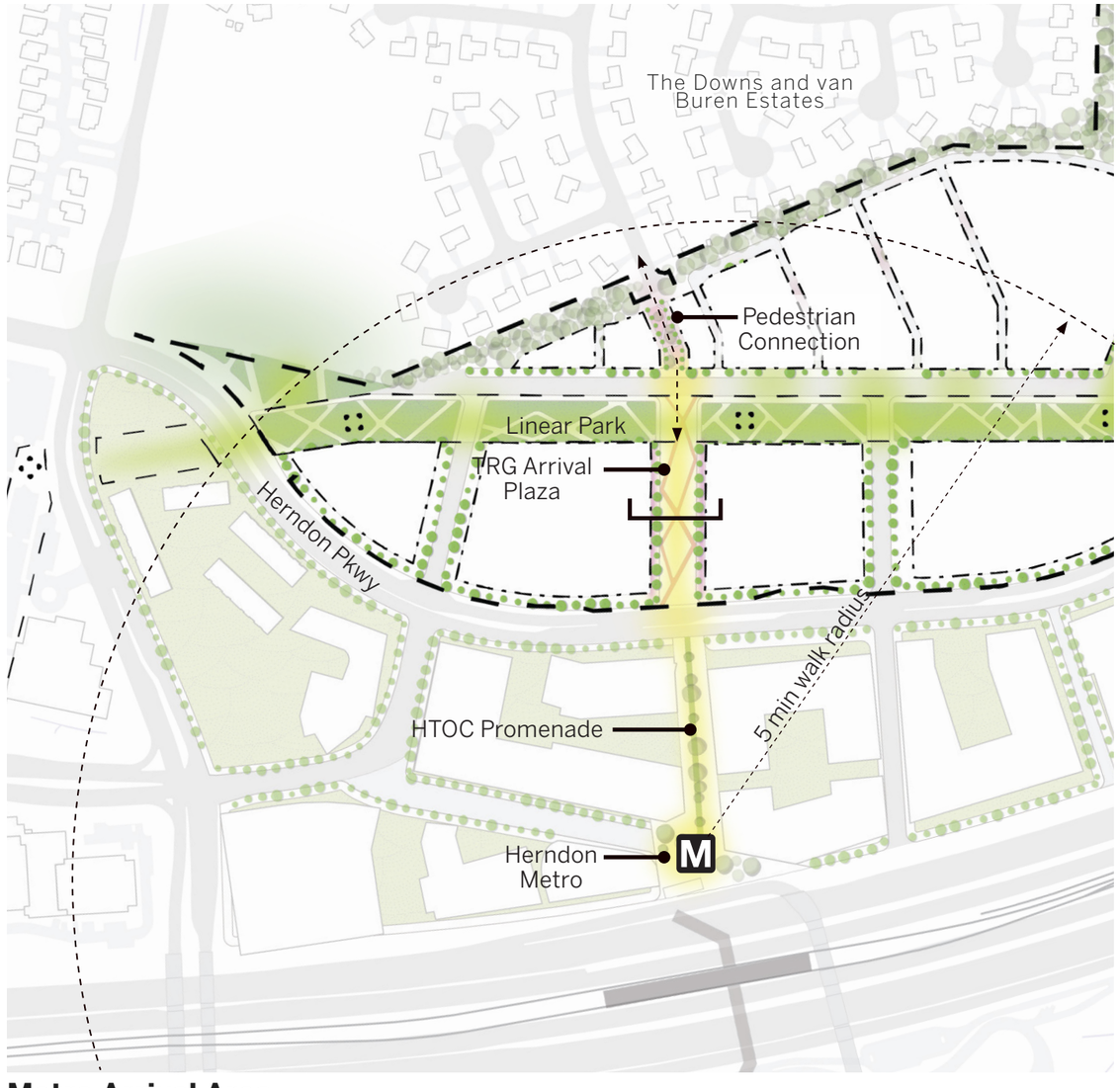
**Union Station, Denver**



**Mosaic District, VA**



**City Center, DC**



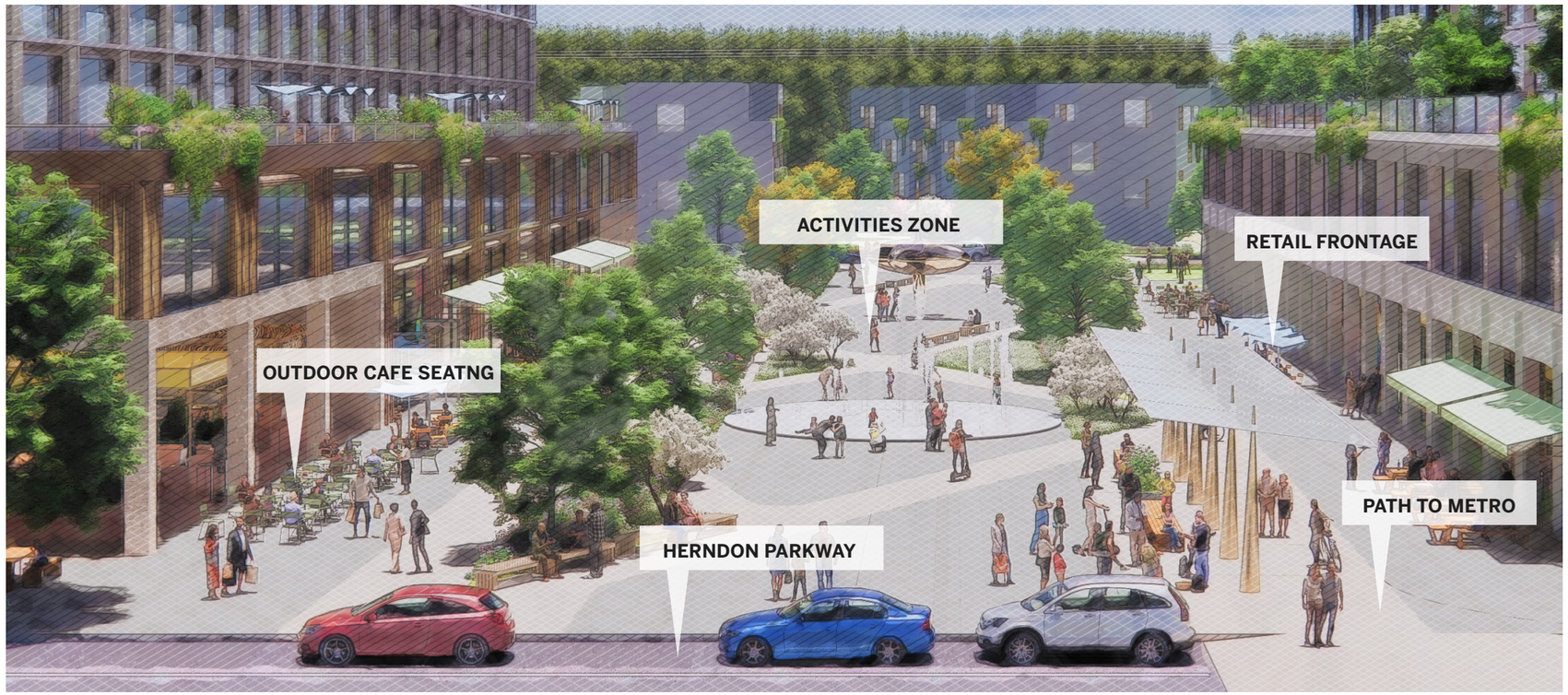

**Metro Arrival Area**

# The Neighborhoods

## Metro Arrival Plaza

General design guidance:

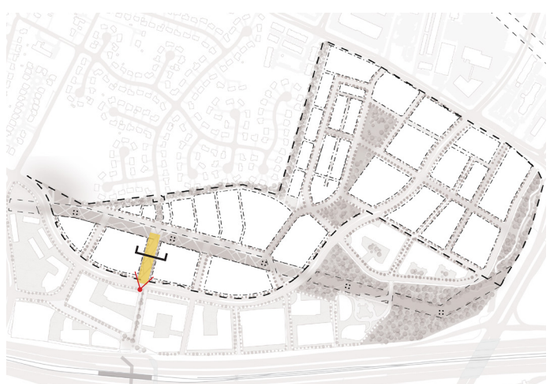
- Design of plaza should be inclusive and equitable
- Design of plaza should exceed ADA minimum standards and allow ease of use and a positive experience for all members of the community
- The plazas should be designed with intent and drive as well as respond to the spatial arrangement of the neighborhood
- Parking garages should not be exposed along the plaza
- The general architectural aesthetic, colors and materials of the plaza should take their cue from the neighborhood in which they are located
- The arrival plaza should incorporate trees but provide adequate hardscape and open vistas to permit active programming of the space, with additional shade provided by a pavilion
- The arrival plaza should incorporate an interactive feature to encourage visitors and residents to collect and enjoy activities



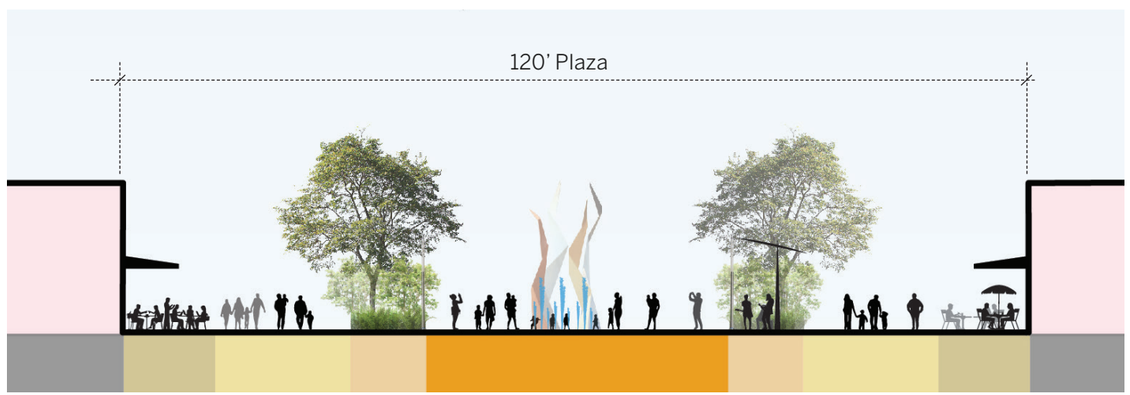

**View rendering of the Linear Park looking towards the Plaza**

**Amenities**

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



**Key Plan**




**Section through Metro Arrival Plaza**

# The Neighborhoods

## 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 and Van Buren Estates, and the planned higher density area fronting Herndon Parkway, separated by a 50'-minimum vegetated buffer.

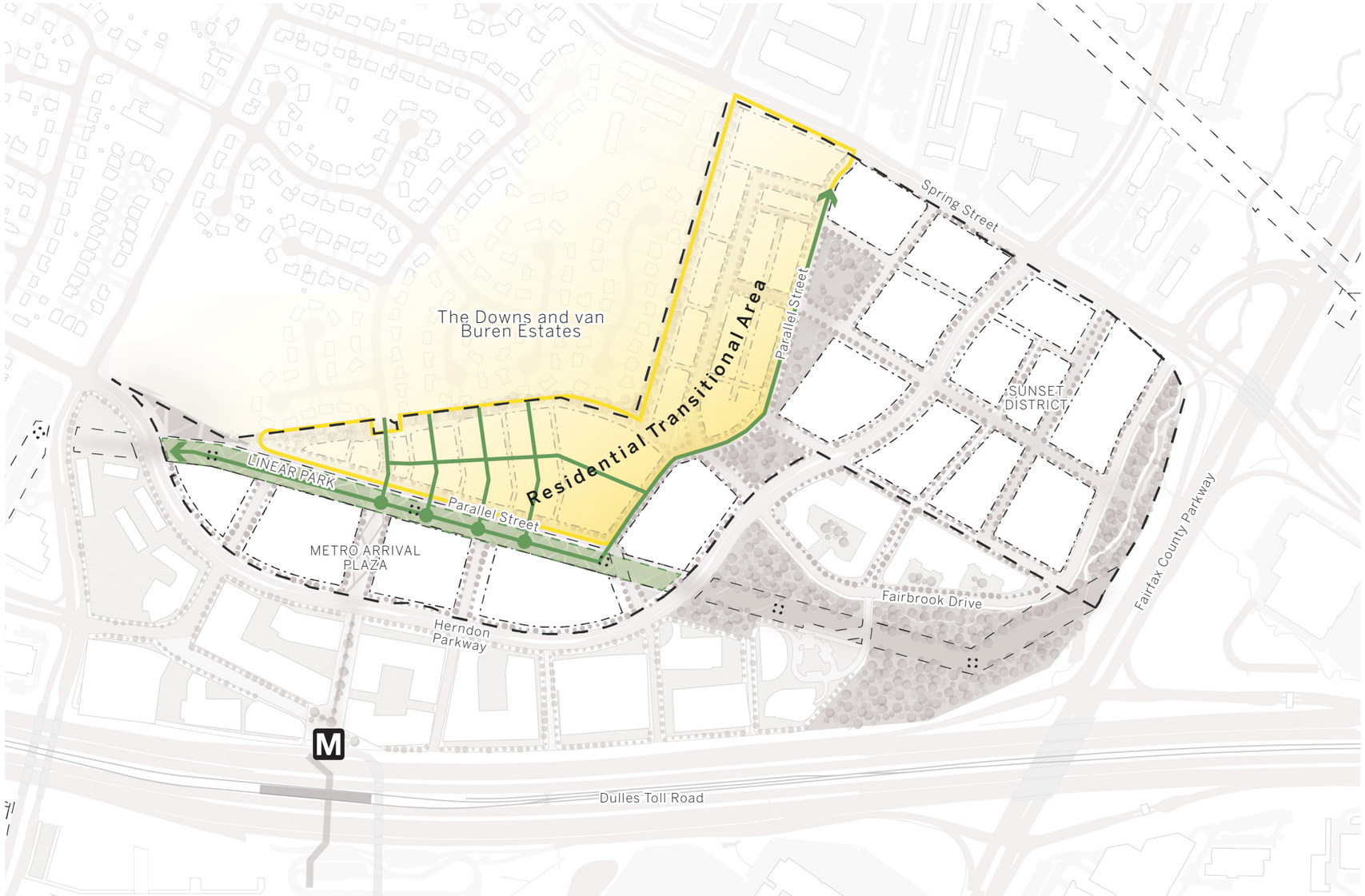
*Pedestrians out front, cars in the back.*

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**



# The Neighborhoods

## Residential Transitional Area

The conceptual rendering to the right depicts the vision for the mews: facing townhomes framing a residential open space, a combination of hardscaped and softscaped surfaces with tree-lined edges. The Typical Section shows the overall block dimensions:

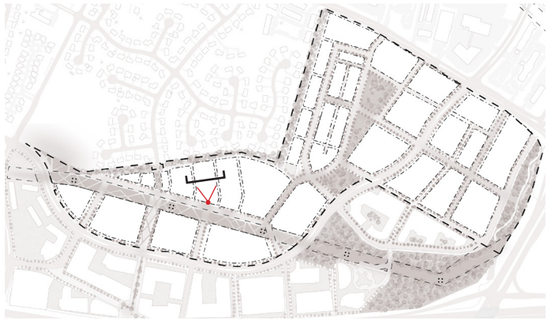
- 60' minimum open area between the front of the buildings,
- 60' minimum property area, and
- 20' alleys are required for fire access.

Town house and two-over-two's design guidance:

- Brick or stone should be the primary front and side façade material
- Other materials may be introduced for decorative features and on the rear of the structure
- Rooflines should be consistent
- Materials should be durable and resistant to fading, denting and warping
- Colonial and Federal design character and elements are not appropriate
- Color, and the style of brick or stone should take their cue from the neighborhood in which they are located and the architectural style of the building
- Additional rooftop structure adjacent to existing single-family detached residential should be limited
- The general architectural aesthetic, colors and materials should take their cue from the neighborhood in which they are located

**Amenities**

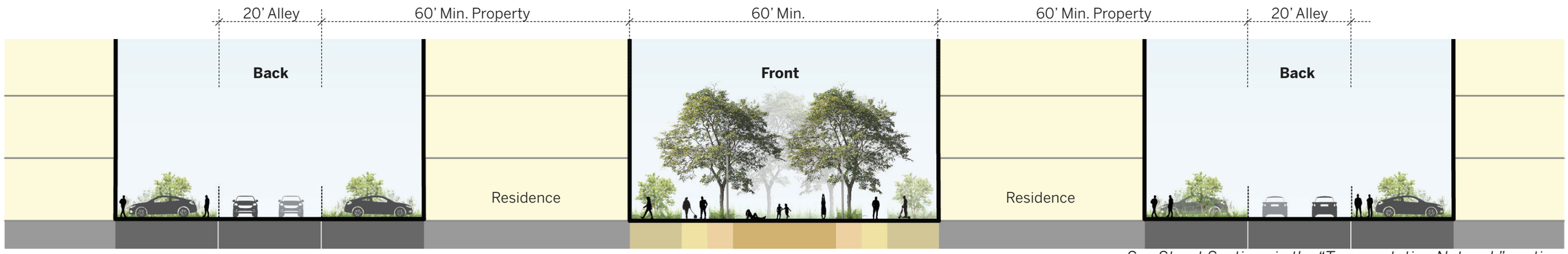
- Front Yard
- Pedestrian Circulation
- Landscape and Site Furnishings
- Pedestrian Activities Zone



**Key Plan**




**Rendering of a mew-style pedestrian street**




**Typical Section through residential mews**

*See Street Sections in the "Transportation Network" section for street and sidewalk meansurements*

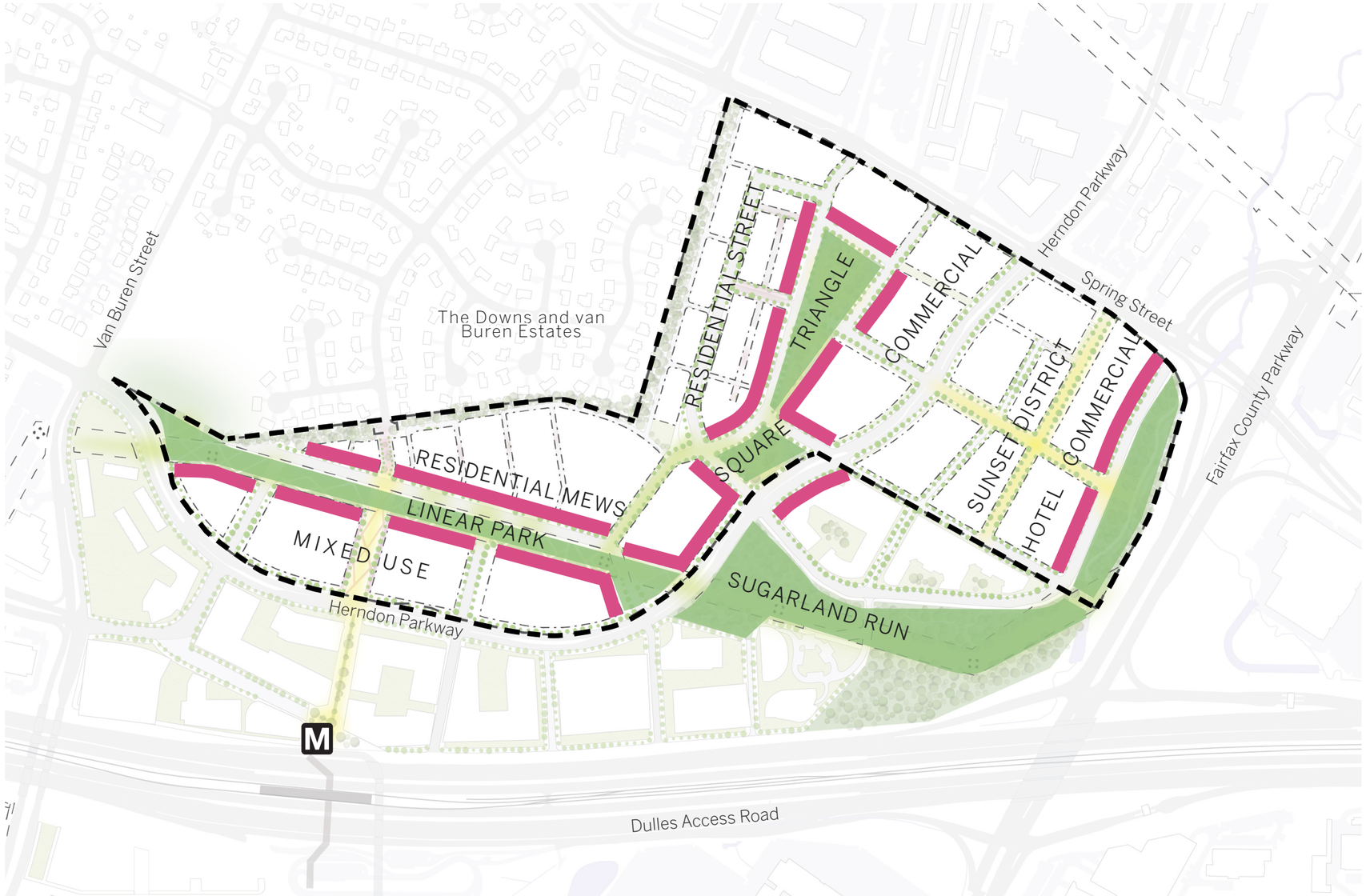
# The Neighborhoods

## 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.

General design guidance for buildings facing parks:

- Facades should have fenestration on all floors with building program having views to the parks
- Parking garages should be concealed by building liners, see preceding Building Typologies section for “liners” definition and graphics
- Ground level access to parks is encouraged, such as: garden apartments and access to amenities or retail
- Potential amenities with park access could include office lobbies, coworking spaces, gyms, cafes, libraries, among others




Park Frontage

# The Neighborhoods

## Park Frontage

The conceptual rendering to the right offers a potential view to an area of the Triangle Park, taken from the residences fronting it.

The Triangle Park should form a green oasis within the TRG, where larger shade trees and lawn offer a mix of shade and open space. Lawn games can be incorporated into the design as well as quite areas for relaxing, reading and conversing. This rendering offers just an idea of a way to populate the park, such as, with child's play area, picnic or lunch tables, and a combination of hardscaped and softscaped surfaces. The surrounding buildings are fully fenestrated, with "eyes on the park."

The Square Park forms an important transition and gateway from the TRG Spring Street neighborhoods to the more urban Metro-centric HTOC and portions of the TRG. This green space extends the natural Sugarland Run parkland on the south side of the Herndon Parkway, to the north side of the Parkway. Emphasis should be on the lawn and trees while providing a small pop-up retail structure or programmable food truck area in its ultimate buildout.



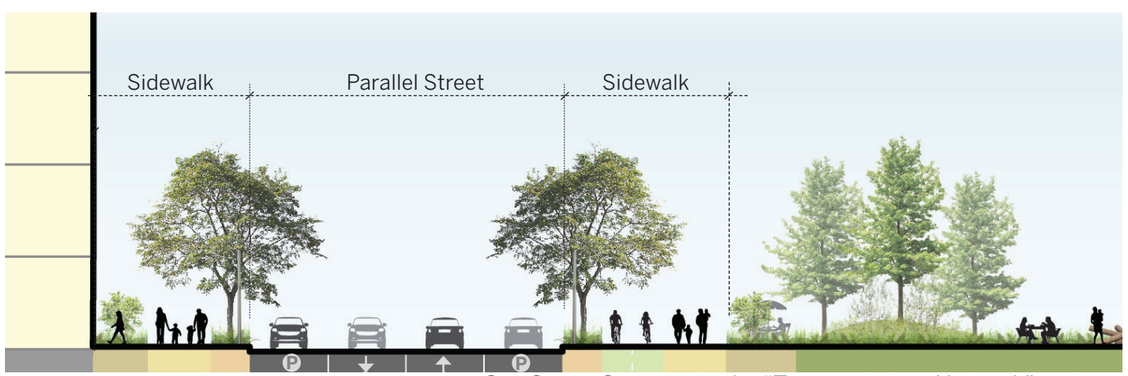
**Rendering of the Triangle Park**

**Amenities**

- Seating/Front or Side Yard
- Pedestrian Circulation
- Landscape and Site Furnishings
- Cycle Track
- Park



**Key Plan**




**Site Section through the Triangle Park**

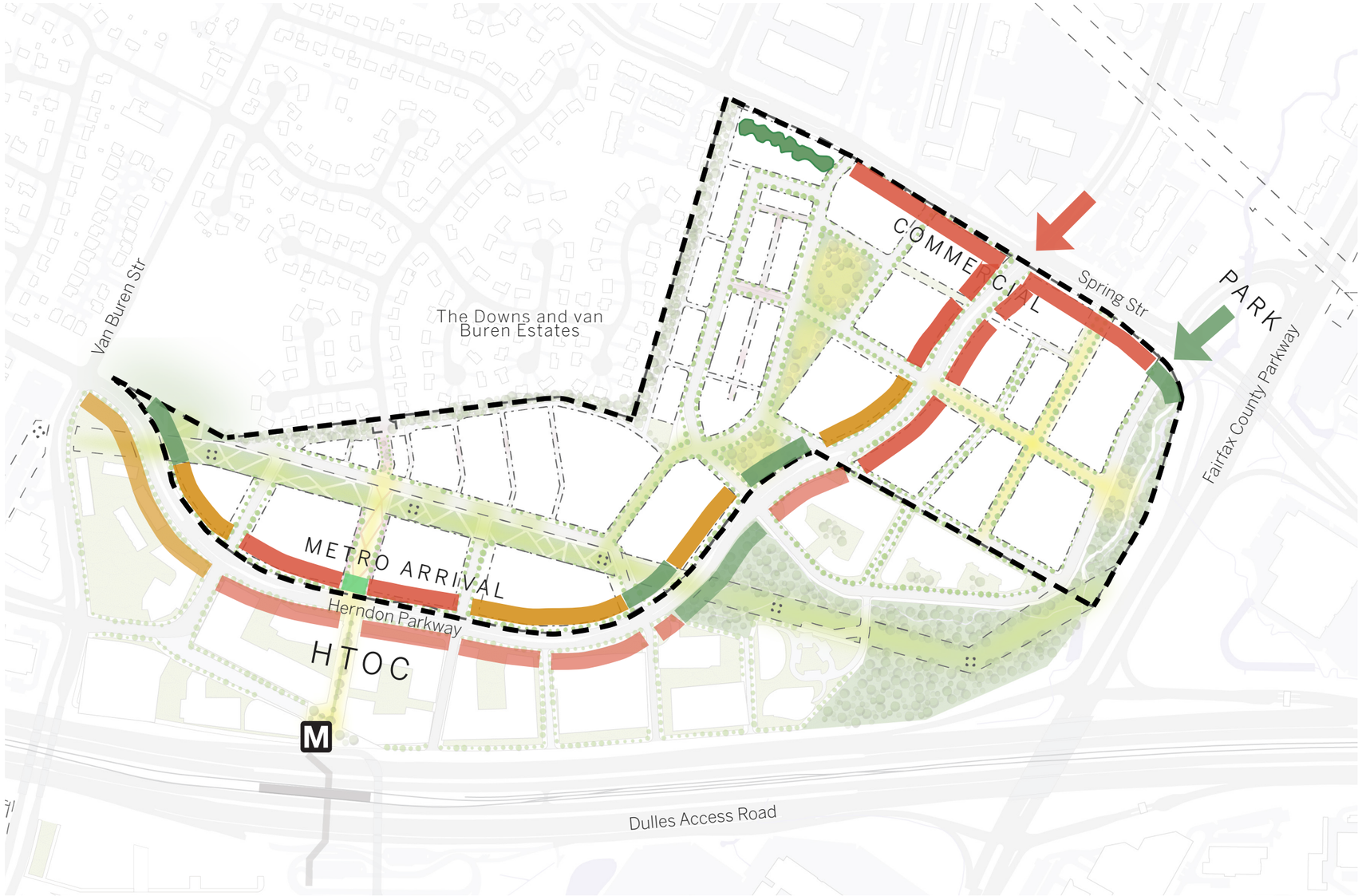
*See Street Sections in the "Transportation Network" section for street and sidewalk meansurements*

# 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 its look and feel from "throughput" to "place", establishing an area with a new sense of identity for the Town of Herndon.

- Building frontage must be at 30' from the existing curb, to frame the parkway with an urban streetwall, while also allowing ample sidewalk for multimodal circulation and amenities (see Street Sections)
- Parking garage structures along Herndon Parkway must be concealed behind building liners (see Building Typologies)
- Mixed use - commercial buildings will have offices and some retail
- Building frontage - residential will have fenestration and entryways, with no anticipated




**Street Frontage Diagram**

# The Neighborhoods

## Herndon Parkway and Spring Street Frontage

This conceptual rendering illustrates the potential Herndon Parkway upon entering the TRG coming from Reston or Downtown Herndon. The depicted urban streetwall is at the aforementioned 30' offset from the curb, however architectural articulation in the form arcades, clonnades, overhangs and upper setbacks may be used to add to visual variety.



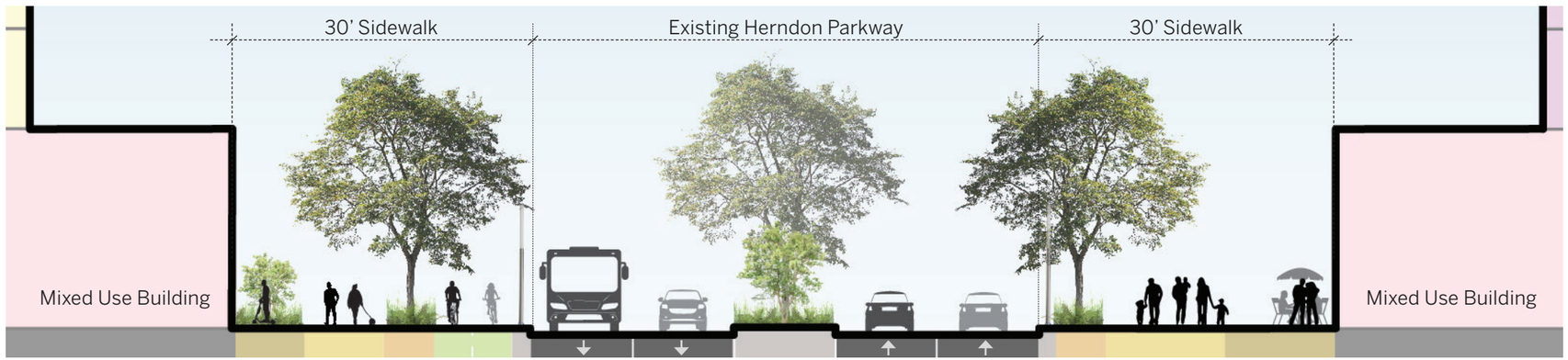
**Key Plan**

**Amenities**

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




**Rendering of the Herndon and Spring Street gateway to the TRG**




**Section through Herndon Parkway**

# The Neighborhoods

## Sunset District

A new 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 transform this area from a parking lot driven business park to a great urban public realm. To achieve this, some of the front door parking along the renamed "Sunset Main St" must be relocated to back of house areas. "Makers Place" is the designated service street and "back of house" for the district.

Building facades along Makers Place are not required to be on the edge of the block, so that buildings can be pulled back and allow open air areas like service yards or outdoor work areas or surface parking; this is the only area in the TRG where surface parking is allowed, as long as there is building frontage on Herndon Parkway, Sunses Main Street, and Spring Street.

The existing Sunset Park Drive would be transformed into a "main street," hence the new name "Sunset Main Street." A reduced roadway 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.



# The Neighborhoods

## Sunset District

This conceptual rendering illustrates the parking conversion to sidewalk, with on-street parallel parking. Am area presently filled with cars becomes a place, alive with human interaction and greenery.



**Key Plan**




**Rendering of Sunset Main Street**

**Amenities**

- Seating/Front or Side Yard
- Pedestrian Circulation
- Landscape and Site Furnishings



# 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 an 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 Equity metrics established by the Town of Herndon at regular intervals to advance the Plan's objectives through stakeholder collaboration. As a part of this process, 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 Town of Herndon collaborates closely with the stakeholder community including property owners 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 design 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. All 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. All future initiatives should 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. As exhibited by the plan, 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 future TRG area. 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 by development partners 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 and an important goal of the TRG Vision. 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 are accessible to a broad and inclusive community with the TRG and beyond.

# Traffic Impact

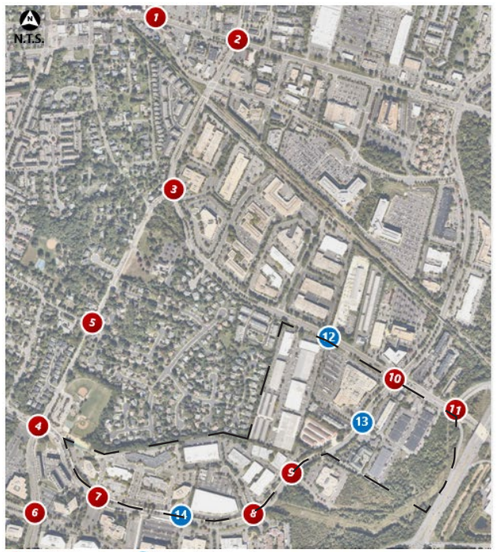
# Background

*Note: The text below is a summary of the Transportation Analysis conducted by VHB included in Appendix B.*

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.

**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 comprise the TRG transportation study area in support of the Small Area Plan




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.

**Level of Service Metric**

A microsimulation traffic model was utilized to estimate the operation conditions of the existing motor vehicle transportation system. Existing conditions were found to operate acceptably. Traffic performance was measured using Level of Service metrics. As defined by the U.S. Department of Transportation, "Level of Service (LOS) is the term used to refer to a collection of measures of automobile congestion and travel time delay, and it is a long-standing and widely adopted metrics for reporting transportation system performance in the country. LOS is intended to represent a traveler's perception of the quality of service provided by an individual intersection or roadway segment, as measured by the standard of free-flowing automobile traffic. LOS is also intended to easily communicate the results of detailed technical analyses to non-technical audiences. Traditionally, transportation engineers and planners have used LOS in planning, design, and land use applications, as well as operational and environmental analyses."

In the Highway Capacity Manual, LOS is described 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 has been reported for studying the TRG Small Area Plan.

It is important to note that in recent years, the U.S. Department of Transportation has indicated that the extensive use of LOS as a metric that produces a single letter grade to indicate congested or free-flowing conditions may provide only a narrow view of transportation system performance. Many communities across the United States are finding that they prefer using a broader set of performance measures that can provide a more comprehensive assessment of transportation system

# Background

performance. As transportation goals evolve from just congestion associated capacity expansion, there has been increasing discussion of the role of LOS as a performance metric. Assessing LOS has a single mode bias as it focuses only on vehicle moments and tends to focus on specific segments of the transportation network, such as individual roadways or intersections, rather than considering the entire transportation system as a holistic entity. LOS also overlooks the interconnected nature of transportation and land use.

Further, LOS does not consider Sustainable Transportation Goals that are increasinlgly important. Therefore, communities that have adopted goals such as improving safety for other roadway users (e.g., pedestrians, bicyclists, and transit users), or encouraging infill development, find that the way LOS standards are traditionally used is not helpful in reaching those goals. Comprehensive transportation performance management requires consideration of factors like travel speed, reliability, safety, asset preservation, quality of life, etc. when making planning decisions.

In Herndon and the greater Northern Virginia area, LOS D, in a range extending from LOS A (free-flow) to LOS F (forced traffic flow), is common and generally considered acceptable during the peak hours.  Fairfax County's adopted LOS standard for some roadway classification in the Tyson Corner Urban Center Plan is LOS E.  Fairfax County does allow Level of Service E as an exception when densely-urbanized areas are planned to balance or even prioritize walkability, cycling, transit, and other modes of transportation when compared to motorized vehicles. Currently, a town ordinance holds LOS D as the standard for all intersections. However, there is an opportunity for this plan to allow acceptance of LOS E if impacts are effectively mitigated through Travel Demand Management programs and specific and exceptional multi-modal infrastructure enhancements.

**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.

**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. |

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. 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. The future configuration of this interchange will be determined in partnership and coordination with Fairfax County

**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 | |

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.

**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,

# Transportation Impacts

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.

**Mitigation Measures**

Given that multiple intersections demonstrated operational deficiencies in the Preferred Build traffic analysis – as defined by the Town of Herndon's LOS standards – a variety of potential mitigation measures were explored.
It is important to note that even if there was no development in the TRG area, operational deficiencies may arise due to development in the

# Transportation Impacts - Mitigation Strategies

surrounding areas in the long term.

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. The 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 Table below 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.

Traffic signals at various intersections will be necessary to move vehicles effectively and safely throughout the TRG and provide safe crossing conditions for pedestrians and cyclists. Most of the new signals would be located along Herndon Parkway and will require coordinated timing. To achieve a fully coordinated signal system in this area, new signal control equipment including cabling between signals and signal cabinets would be necessary.

Moreover, New or optimized active transportation facilities have the ability encourage non-vehicle trips. Once the plan is realized, other Transportation Demand Management (TDM) strategies like transit incentives, "park once" strategies, etc. can also be implemented as mitigation measures.

| 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 | |

# Transportation Impacts - Multimodality

**Multimodal Streets**

As a part of the design process, based on feedback received from the public, a distribution of vehicular demand along a TRG network of 'Complete Streets' will provide regional vehicle, transit and bicycle access to the TRG as well as local and inter-parcel access between uses. These interventions (increased walkability, improved bicycle infrastructure, and new transit access) are expected to significantly reduce all forms of traffic congestion in the TRG, but are not accounted for in the VISSIM analysis described above.

There is a robust internal grid of streets that are designed with a focus on multi-modal access to promote the safe and efficient travel for active transportation and transit uses to/from residences, businesses, and transit facilities. Through this, the TRG area will enhance accessibility to transit facilities such as the bus stops along Herndon Parkway and Spring Street as well as the Metro station. It will also encourage residents to utilize public transportation options, reducing reliance on private vehicles and alleviating congestion.The design also recommends safety features such well-marked crosswalks, and traffic calming measures, ensuring the safety of transit users as they navigate the streets.

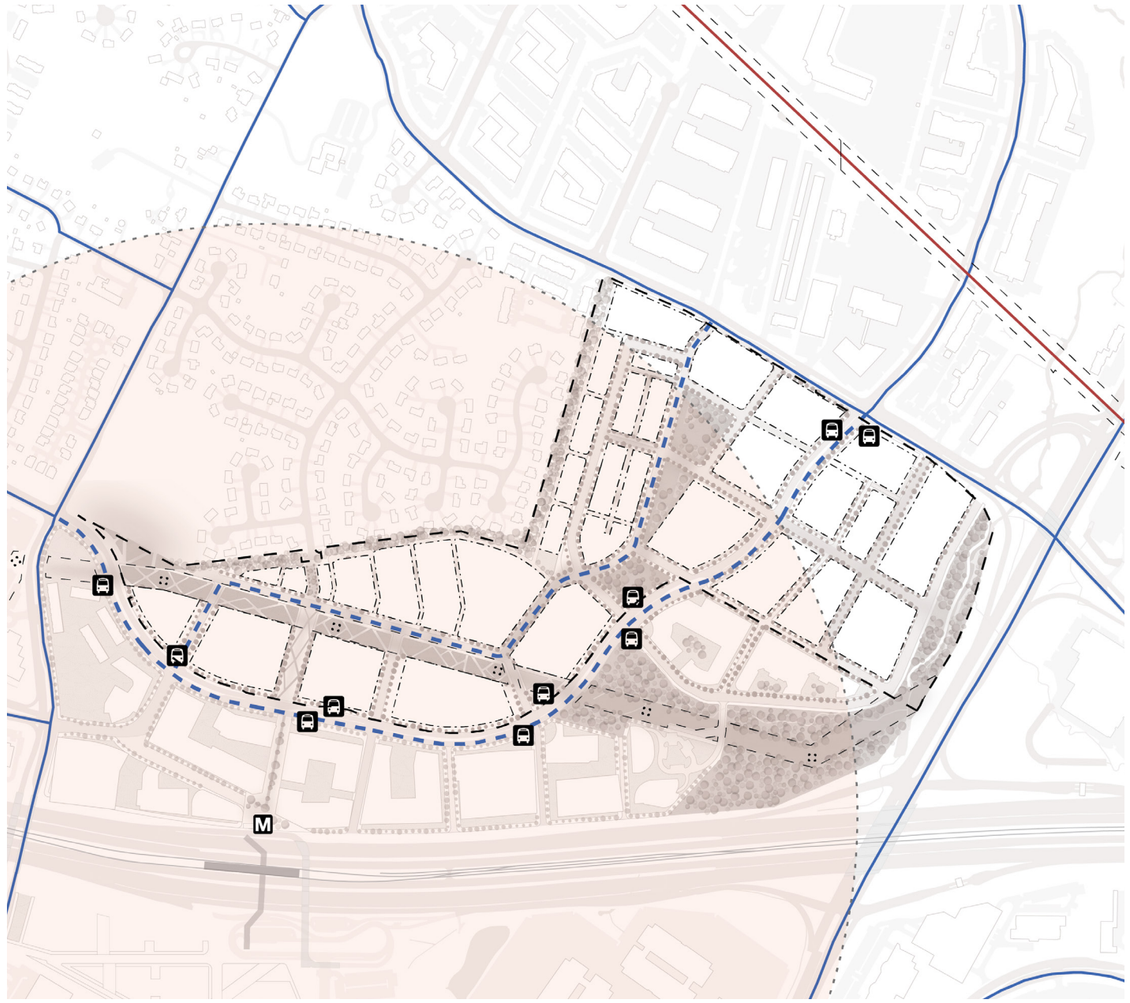
Larger bicycle facilities (Herndon Parkway Cycle Track, W&OD Trail, Van Buren Street bicycle lanes) are connected to TRG land uses via shared-use internal streets. Implementing the proposed infrastructure upgrades such as bike lanes, sidewalks, and pedestrian-friendly crossings alongside transit corridors will encourage active transportation and support first/last-mile connectivity to Herndon station. Walking and cycling can be regarded as viable alternatives to driving, reducing carbon emissions and promoting public health.

The plan focuses on creating pedestrian-friendly environments around Herndon station. Mixed-use developments with housing, retail, and office spaces within walking distance of transit facilities can thrive, reducing car dependency and creating a vibrant, transit-friendly neighborhood. As a rule, it is estimated that riders are willing to walk 10 minutes to reach transit. Accordingly, the TRG is strategically designed to concentrate development within the ten minute walkshed. By improving transit access and fostering a pedestrian-friendly environment through creating a coherent street network, human-scaled block lengths and quality sidewalks, the TRG area in Herndon can attract investment in local businesses and stimulate economic activity as a hub of commerce and culture, generating revenue and enhancing the local economy.

Last but not least, planning for multiple modes of transportation will make Herndon more resilient to future challenges such as climate change and population growth. By diversifying transportation options and promoting sustainable land use patterns through this plan, the community will have the opportunity to adapt to changing needs and transit related growth.

- Bike Lanes
- New TRG Cycletracks
- W&OD Trail
- Bus Stops
- Metro Stop
- 10-min walk radius (1/2 mi)

10 MIN WALKING RADIUS



# Public Infrastructure Impacts

# Water Distribution & Sewer Collection Impacts

*Note: The text below is a summary of the Utilities and Storm Water Analysis Report conducted by the Town of Herndon included in Appendix E.*

**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

# Fiscal Impacts

*Note: The text below is a summary of the Market Analysis conducted by RCLCO included in Appendix C.*

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.

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 | |

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

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.

Please note that the above analyses reflect the net fiscal impact of redevelopment in the TRG to the General Fund of the Town of Herndon. This analysis does not take into account capital expenditures, which typically run through separate funds, and which often go toward investments that serve larger audiences than just people who live and work in the TRG. However, the excess of revenues discussed above is likely to provide the Town of Herndon with key revenues it can use to help offset capital expenditures needed to fund key infrastructural investments.

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.

# Overview

**Market Strategies**
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**
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

# Transforming Vision into Reality

The Implementation Report of the Transit-Related Growth (TRG) Small Area Plan is a roadmap outlining the most effective strategies for applying the principles and objectives of this plan. Effective implementation will help the Town realize the plan's visionary framework and reshape the south-eastern corner of the Town of Herndon into a dynamic, mixed-use hub that is seamlessly integrated into the broader townscape. This transformative initiative envisions a vibrant, sustainable, and accessible TRG district, designed and programmed to foster social, economic, and environmental harmony. A comprehensive and carefully considered implementation report underscores the importance of clear direction for the successful implementation of the plan. The report will identify specific actions and align those actions with the various plan goals.

Turning the TRG vision into reality relies on a coordinated effort. Recognizing that the TRG comprises of 26 privately owned parcels, collaboration is key. The implementation strategies must address the means and methods for managing transportation and utility infrastructure improvements, ensuring economic development and social sustainability, protecting, and expanding public services and programs, providing parks, natural areas, and other open spaces, and reinforcing a unique Herndon sense of place, character, and community. The plan acknowledges that the achievement of these goals necessitates the combined efforts of property owners, public entities, other stakeholders, and particularly effective coordination for the implementation of privately owned but publicly serving roadways and open spaces. The success of implementation hinges on establishing a range of clearly defined and ground-truthed measures. It will focus on regulatory actions, procedural strategies, mitigation practices, guideline and standard refinement, and policy deployment.

The TRG Small Area Plan sets the stage for a transformative journey for the town and the Implementation Report provides the itinerary. The report calls for collective and collaborative action, envisioning a future where TRG stands as a testament to Herndon's commitment to innovation, sustainability, and community well-being. It serves as a dynamic toolkit to guide the multifaceted strategies that will shape the evolution of the Transit-Related Growth Area.  A systematic and coordinated approach for the successful implementation of the TRG is crucial. Successful plan implementation will turn this vision into a thriving reality for the Town of Herndon.

# Appendix


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# Herndon Transit-Related Growth Area

## Assessment of Traffic Impact Associated with Small Area Plan

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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

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# 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 |

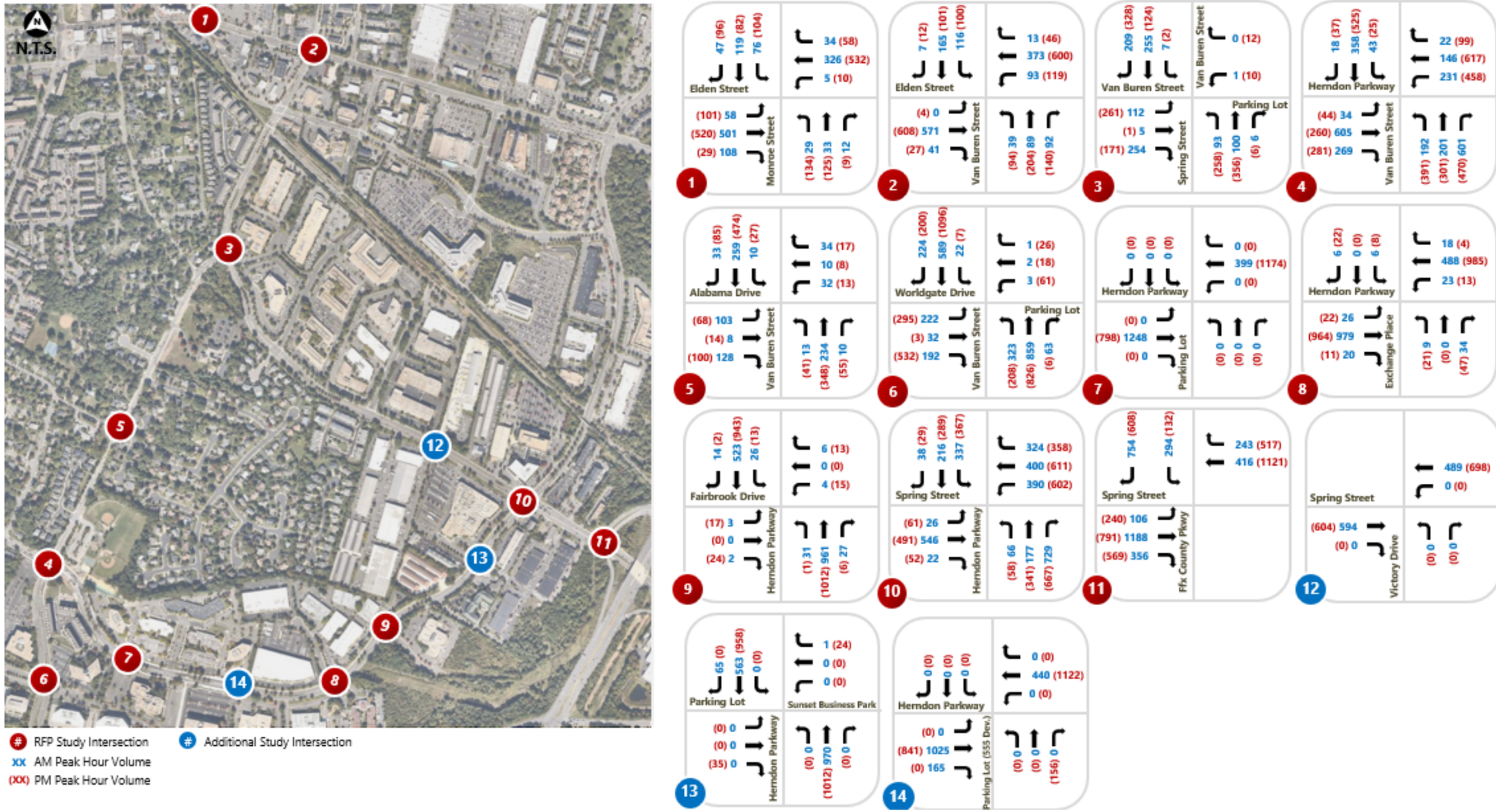
Source: Average of 7 AM and 20 PM Peak Hour VISSIM simulation runs.
1 Unsignalized intersections in Existing conditions scenario.

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.

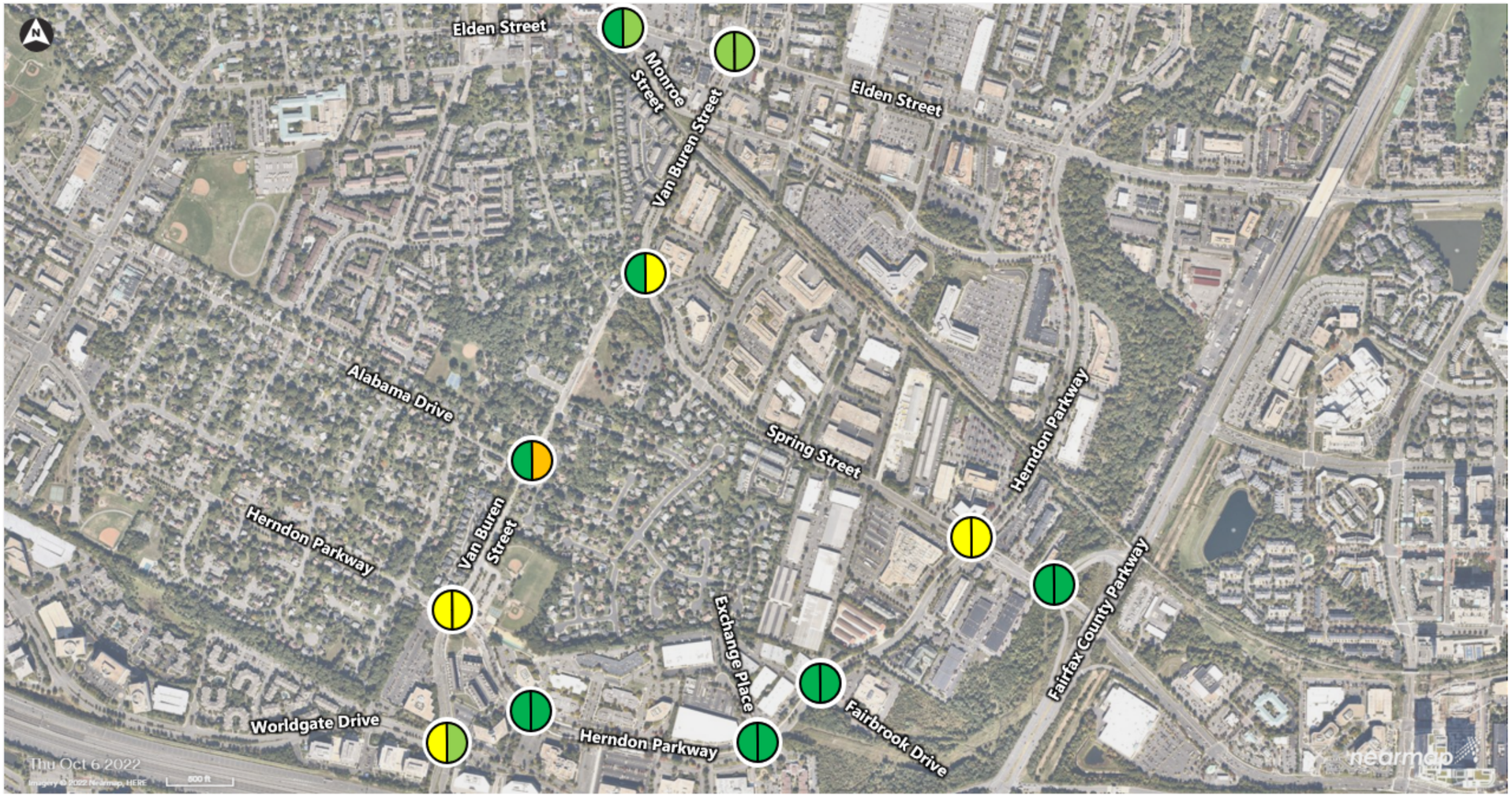
**Appendix B** documents the delay, LOS, and vehicle queuing for all of the movements at each of the eleven study intersections.

## 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**

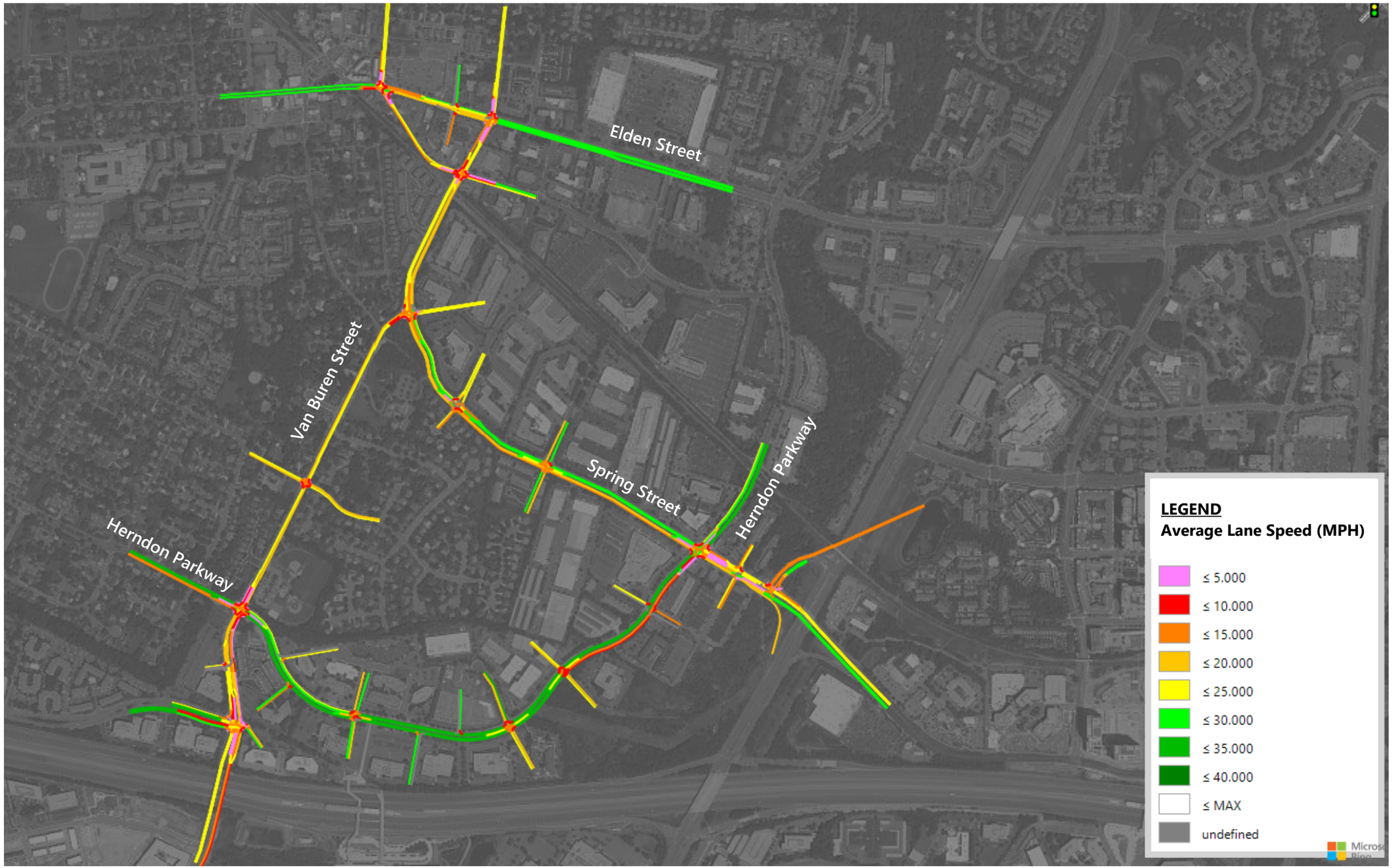



**Intersection Level of Service (LOS)**

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

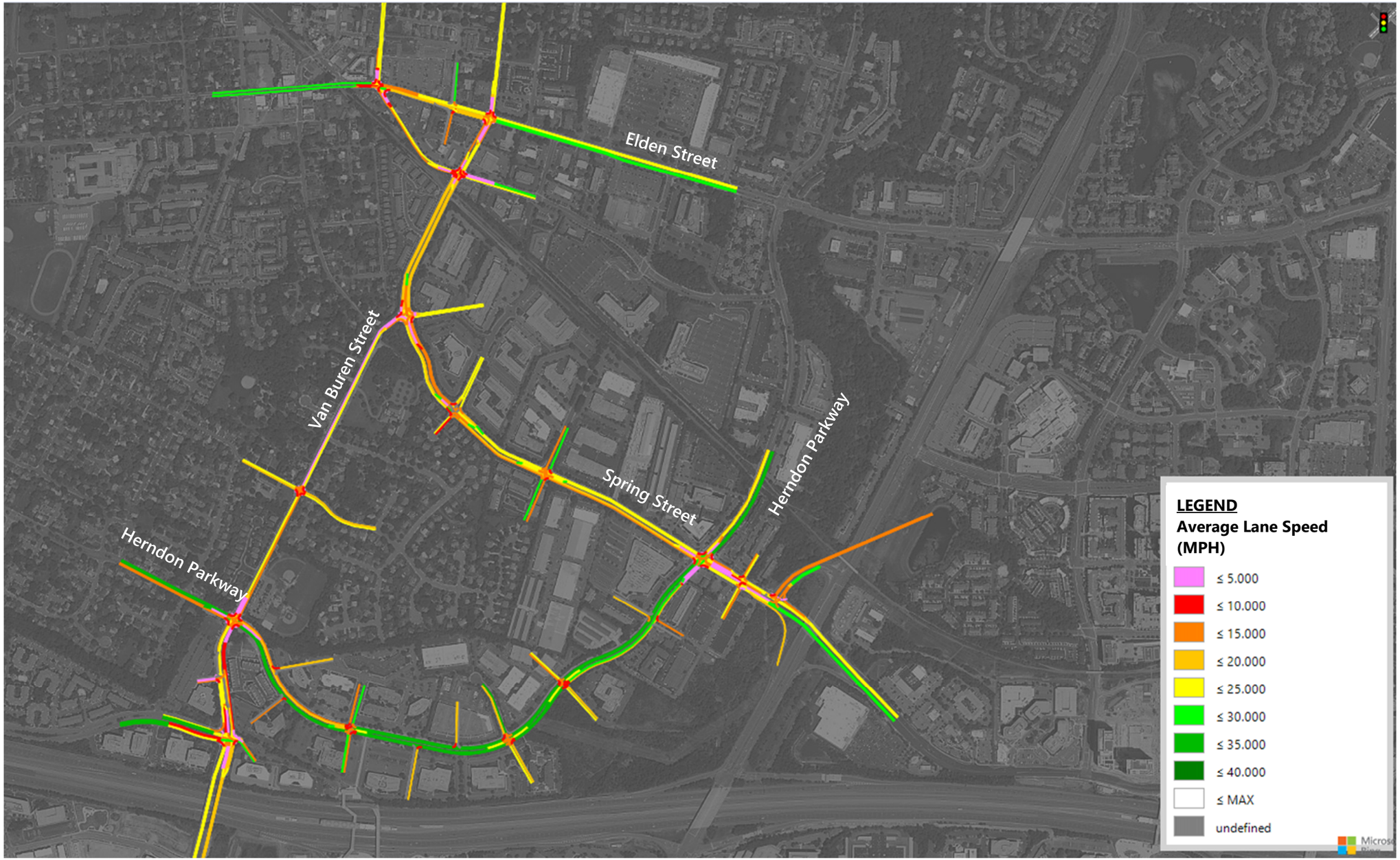
Source: Average of 7 AM Peak Hour and 20 PM Peak Hour VISSIM simulation runs. Aerial imagery from NearMap.

**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.

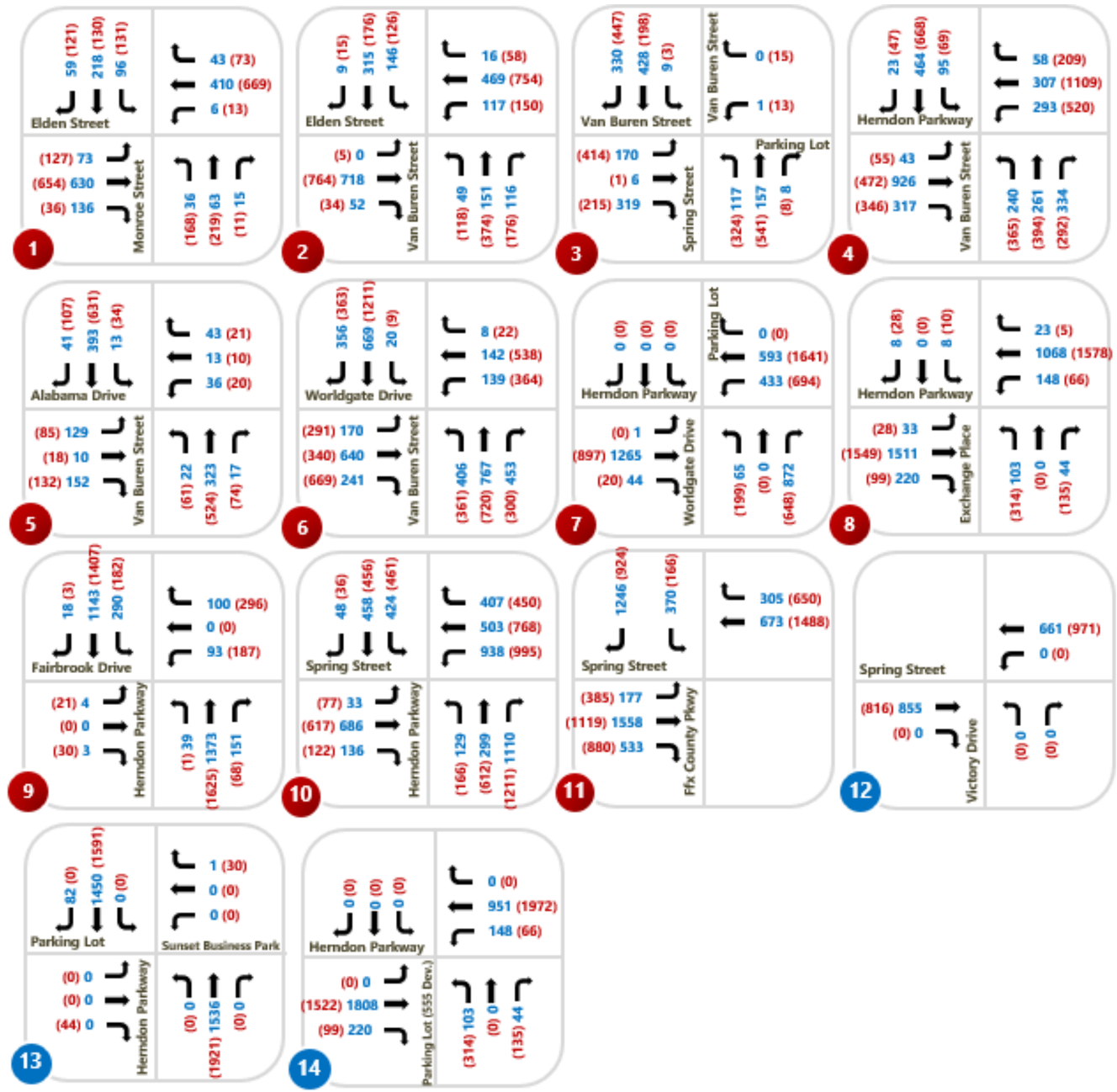
**Figure 6** displays the traffic volume dataset that was analyzed at the study intersections in the No Build 2045 traffic model. These traffic volumes are substantially higher than Existing conditions traffic volumes. **Appendix A** shows traffic volumes for all study and non-study intersections in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

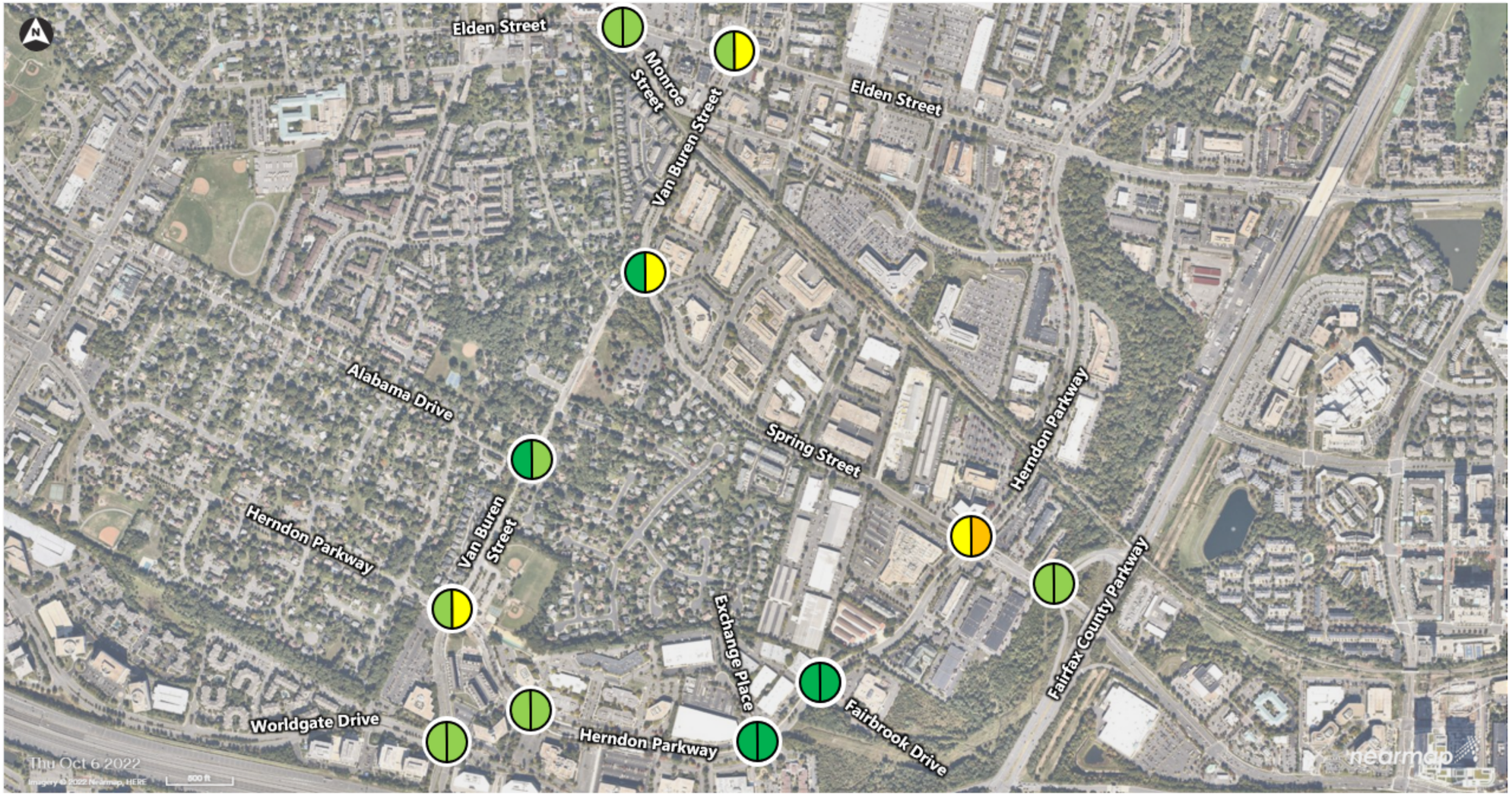
Congestion "heat" maps for each of the peak hours are shown in **Figures 8 and 9**. These represent the average vehicle speeds present in different lanes and segments of the model. Slower vehicle speeds (shown in shades of red) represent areas of higher congestion and vehicle queuing, whereas higher 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.

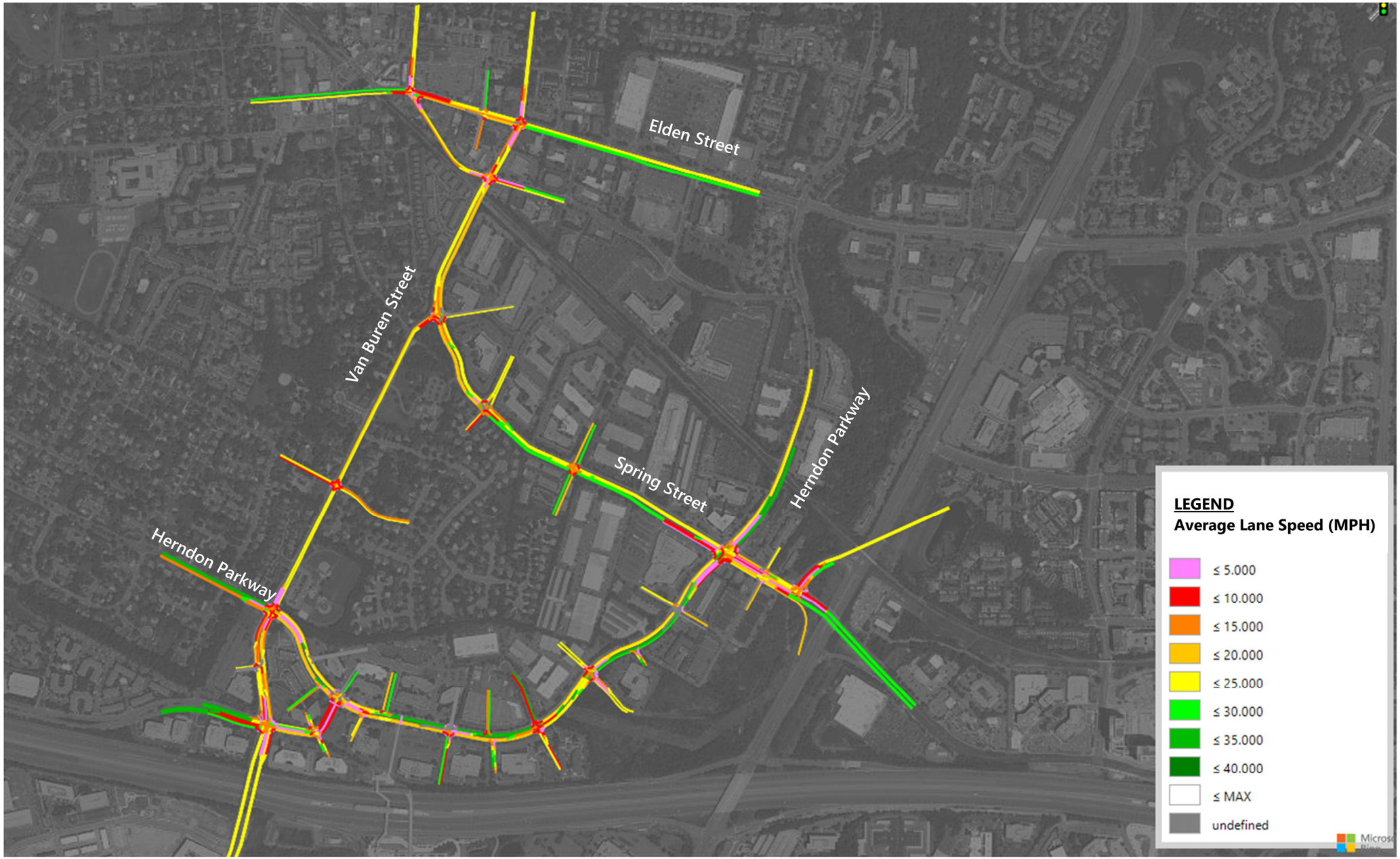
In the PM peak hour, the roadway network experiences increased queueing compared to the AM peak hour. Average queue lengths are still mostly accommodated, although the southbound Van Buren Street queue at Herndon Parkway and the northbound Herndon Parkway queue at Spring Street are significant. Maximum 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**



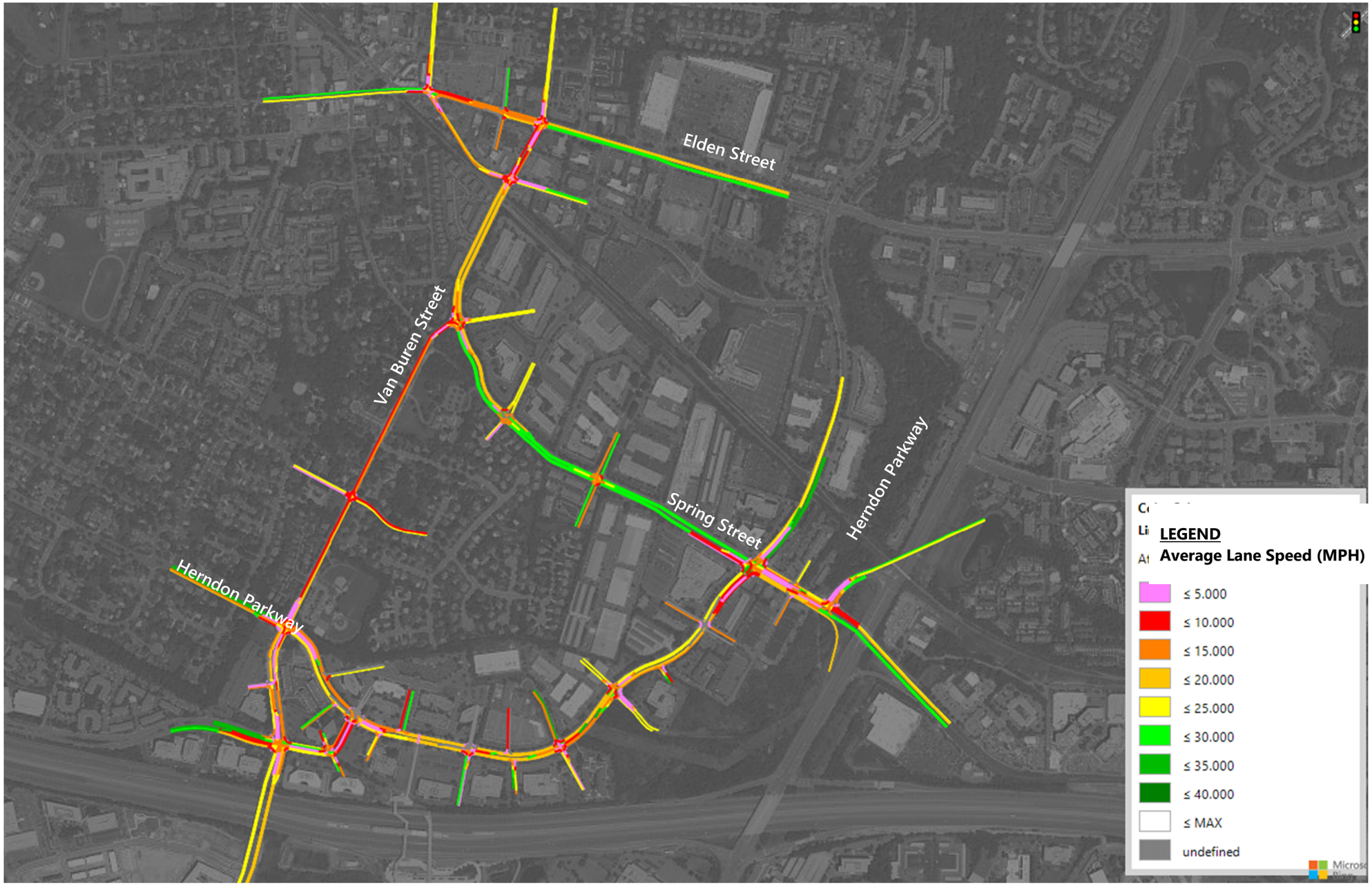

Source: Average of 7 AM Peak Hour and 20 PM Peak Hour VISSIM simulation runs. Aerial imagery from NearMap.

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



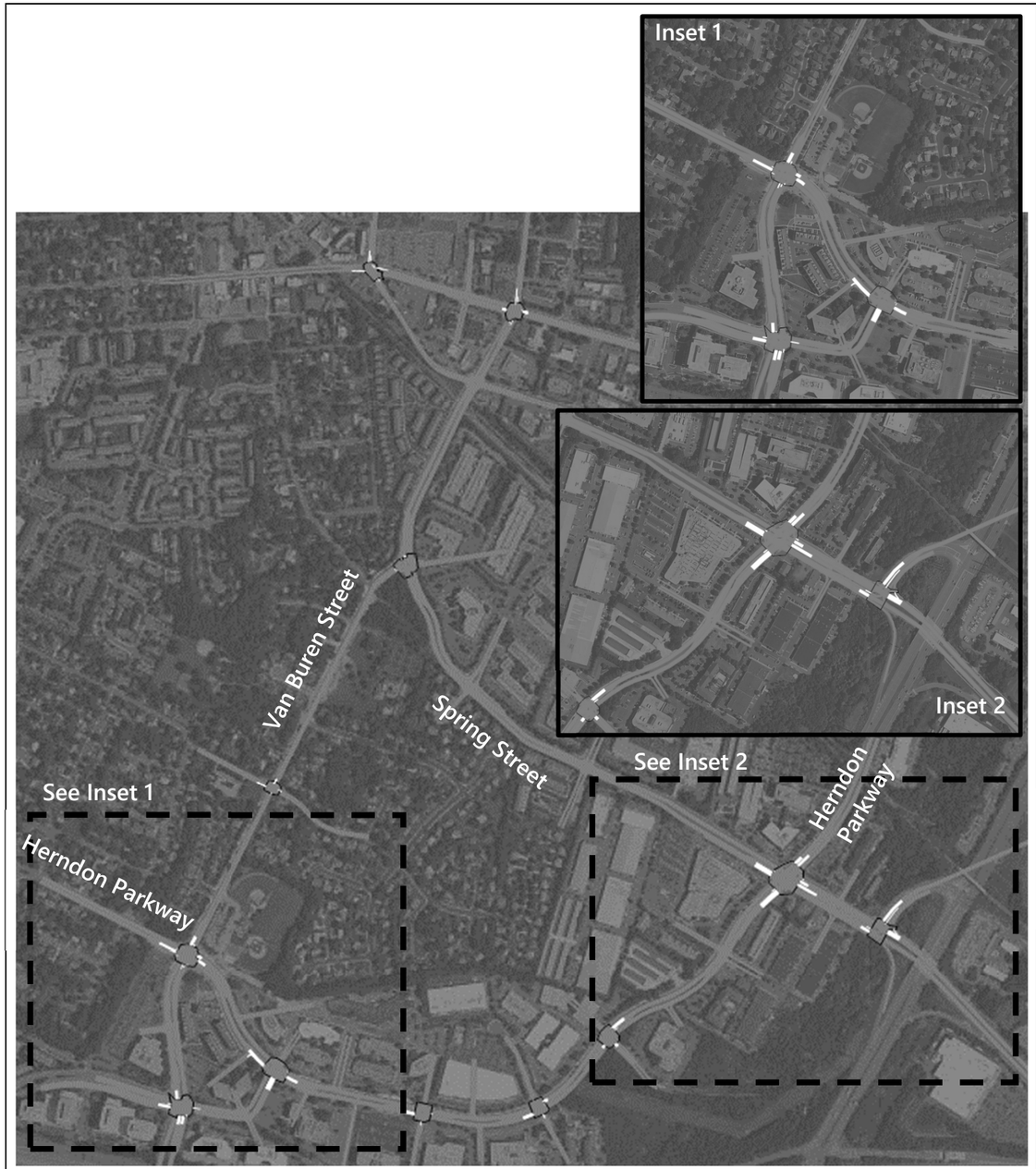

Source: Average of 7 AM Peak Hour VISSIM simulation runs.

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

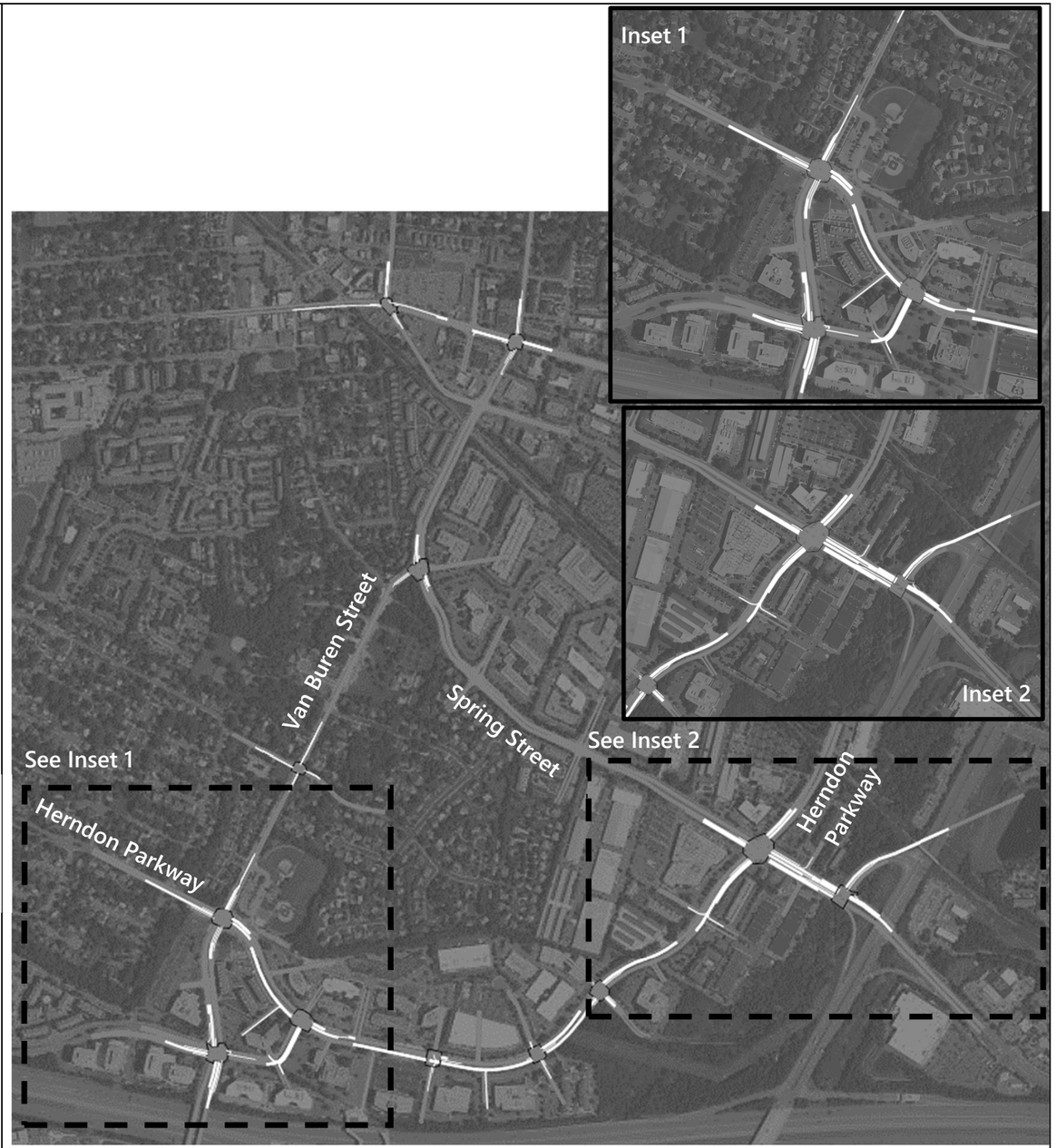



Source: Average of 20 PM Peak Hour VISSIM simulation runs.

**Figure 10 No Build 2045 Queue Map – AM Peak Hour**

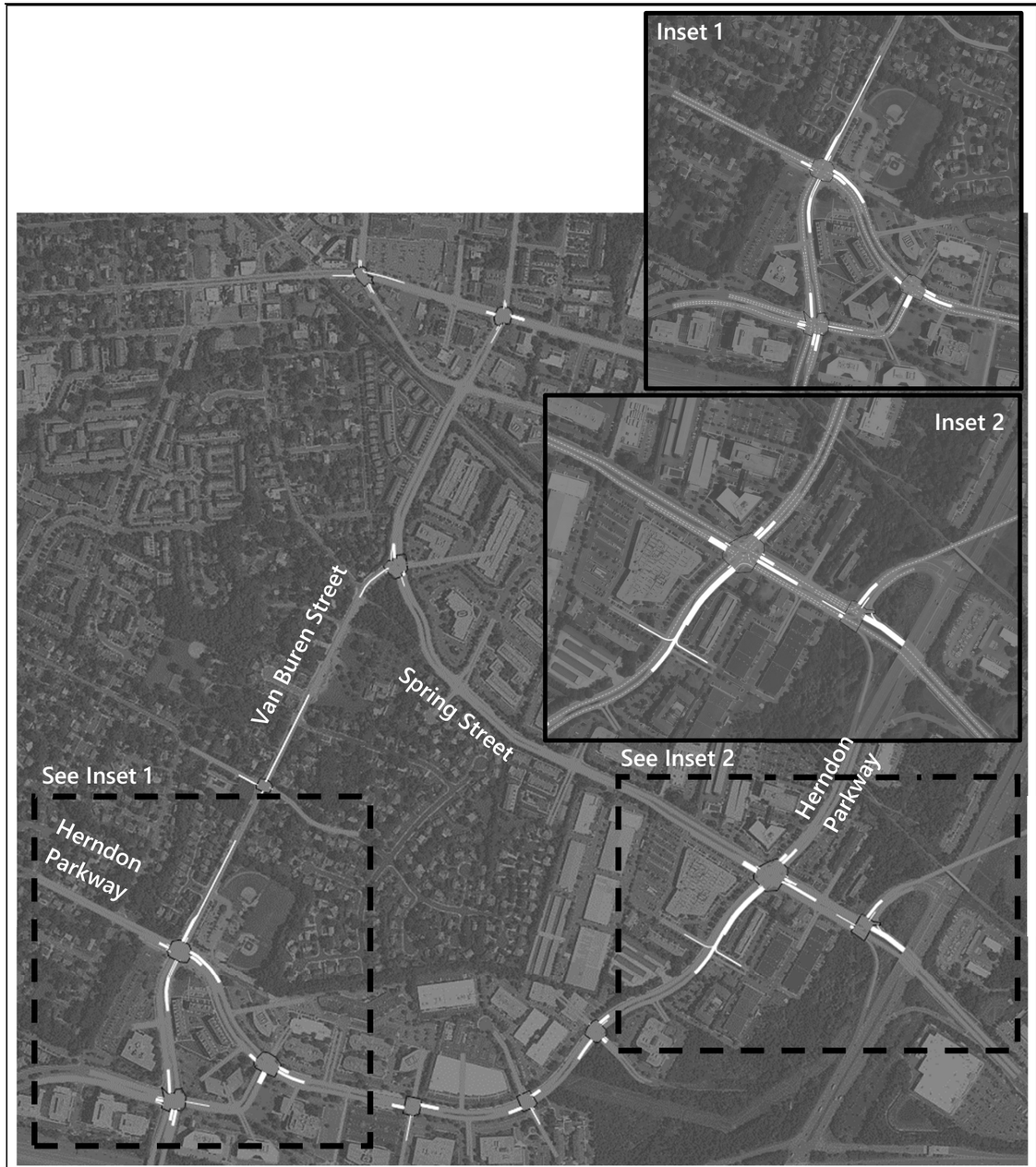



**Average Queue Length**

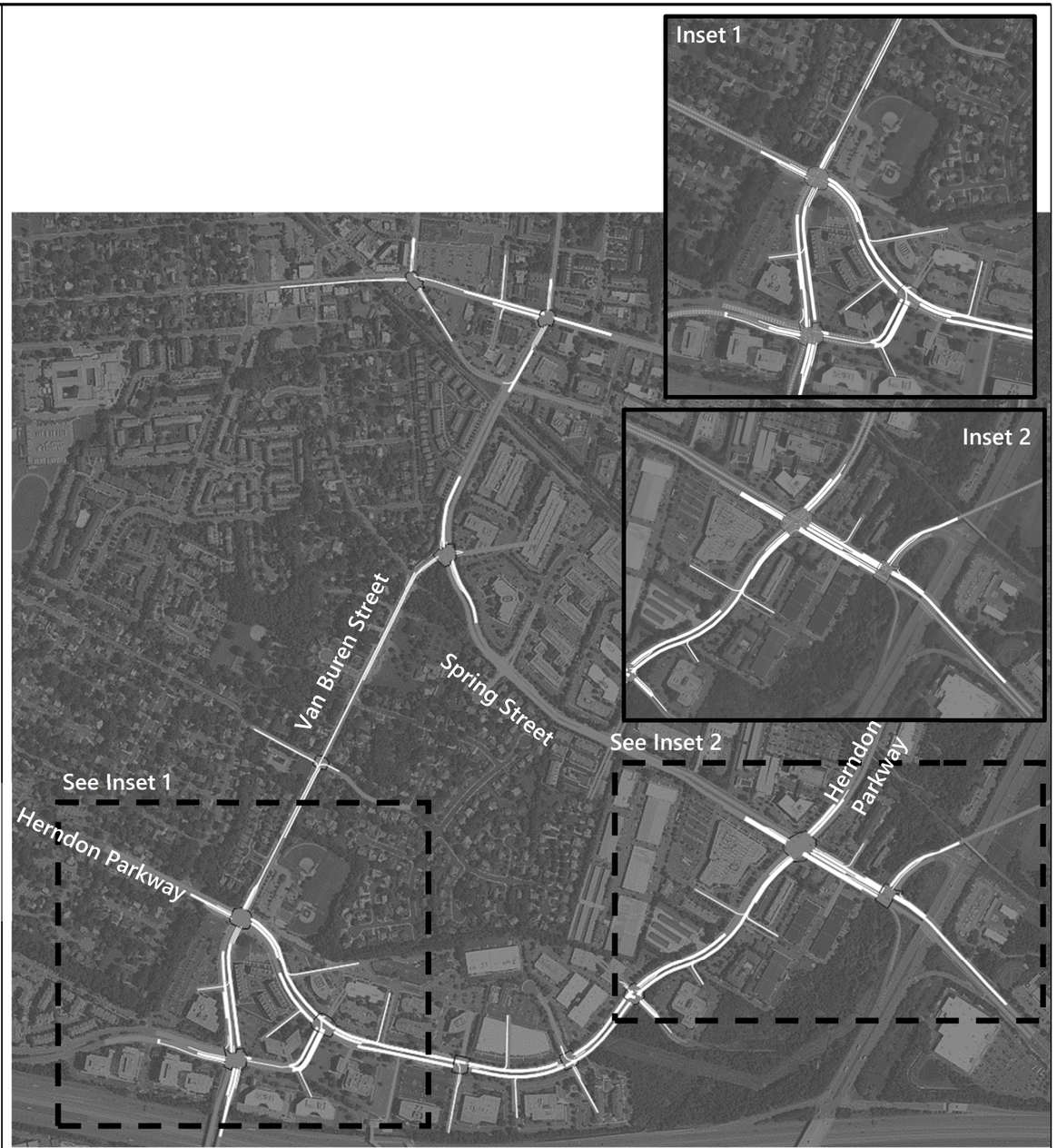



**Maximum Queue Length**

**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

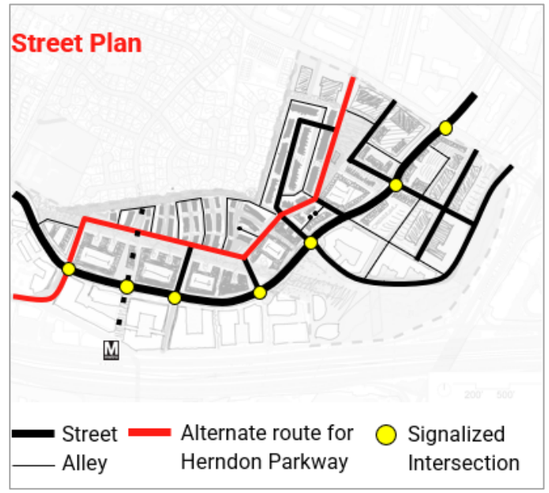
**Table 6** documents the trip generation calculations for Build 2045 Scenario One: Neighborhood Clusters. Table 5 shows that after the appropriate trip reductions, the new TRG development at full buildout is expected to generate more than 2,250 AM Peak Hour trips, 2,250 PM Peak Hour trips, and 27,000 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.

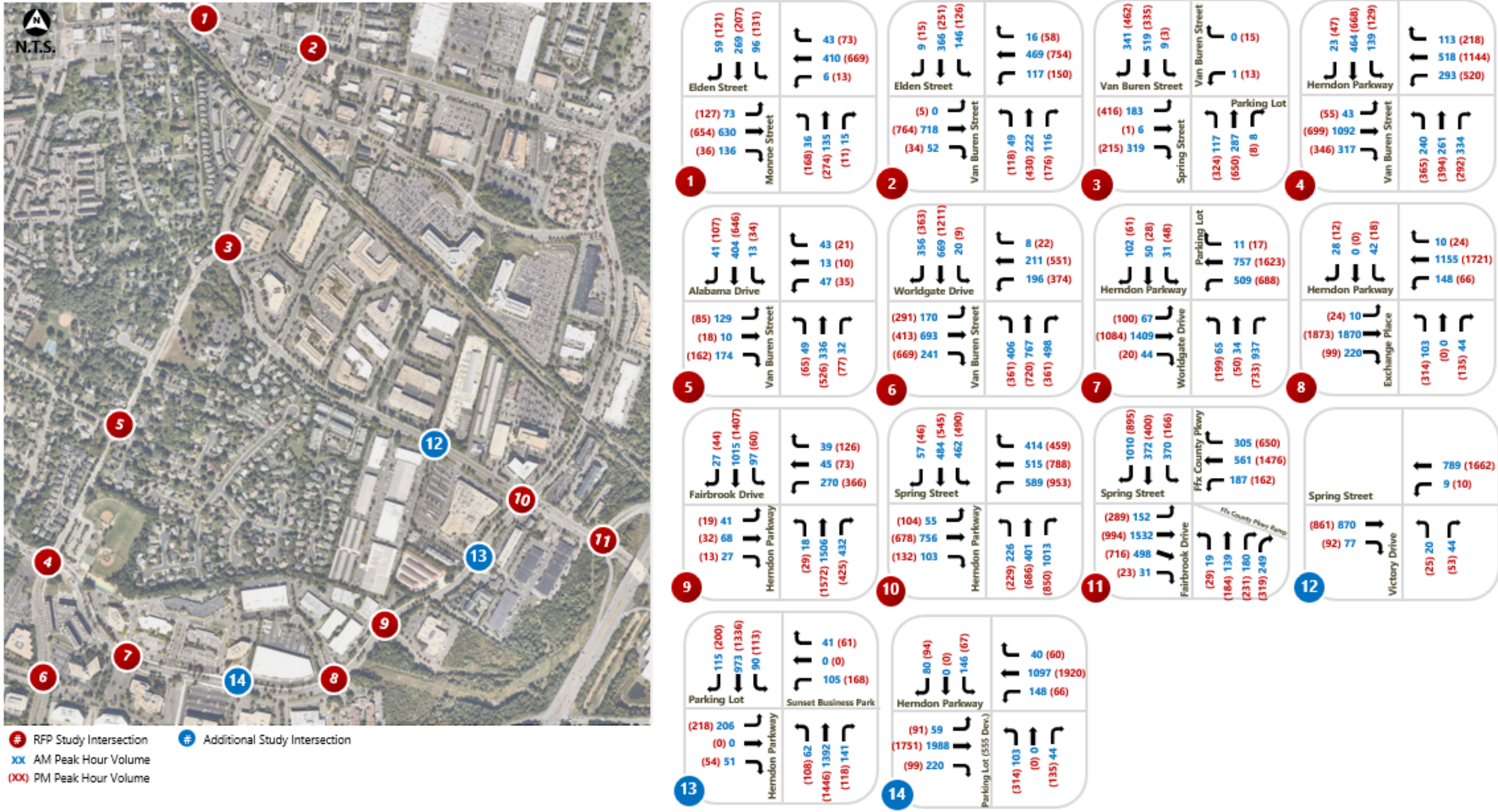
**Figure 15** displays just the new site trips associated with the Preferred Build Scenario, while **Figure 16** displays just the pass-by site trips associated with the Preferred Build Scenario. **Appendix A** shows these three sets of traffic volumes for all intersections within the traffic model,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

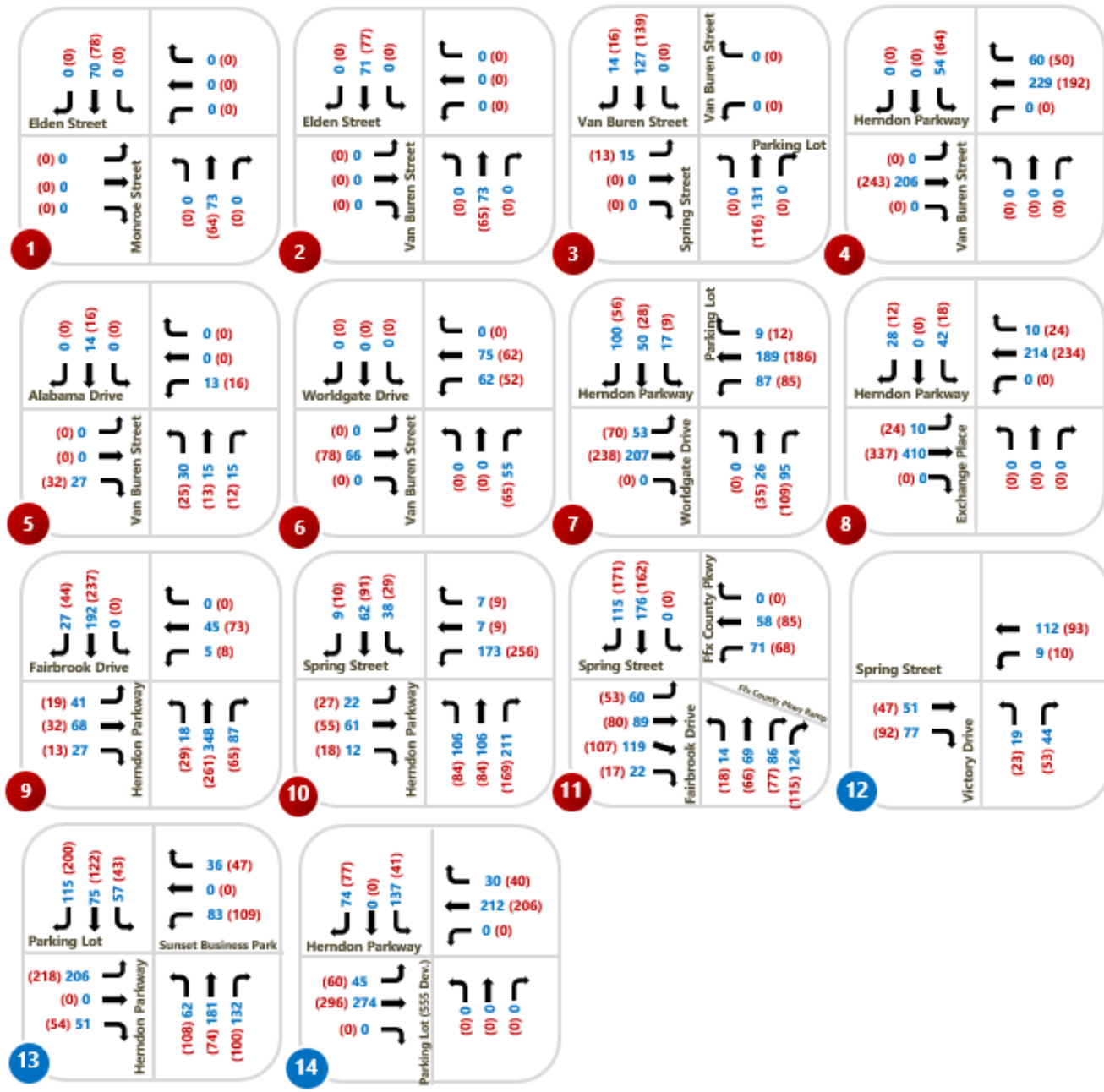
## Figure 14 Build Scenario 1 (Neighborhood Clusters) 2045 Traffic Volumes




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

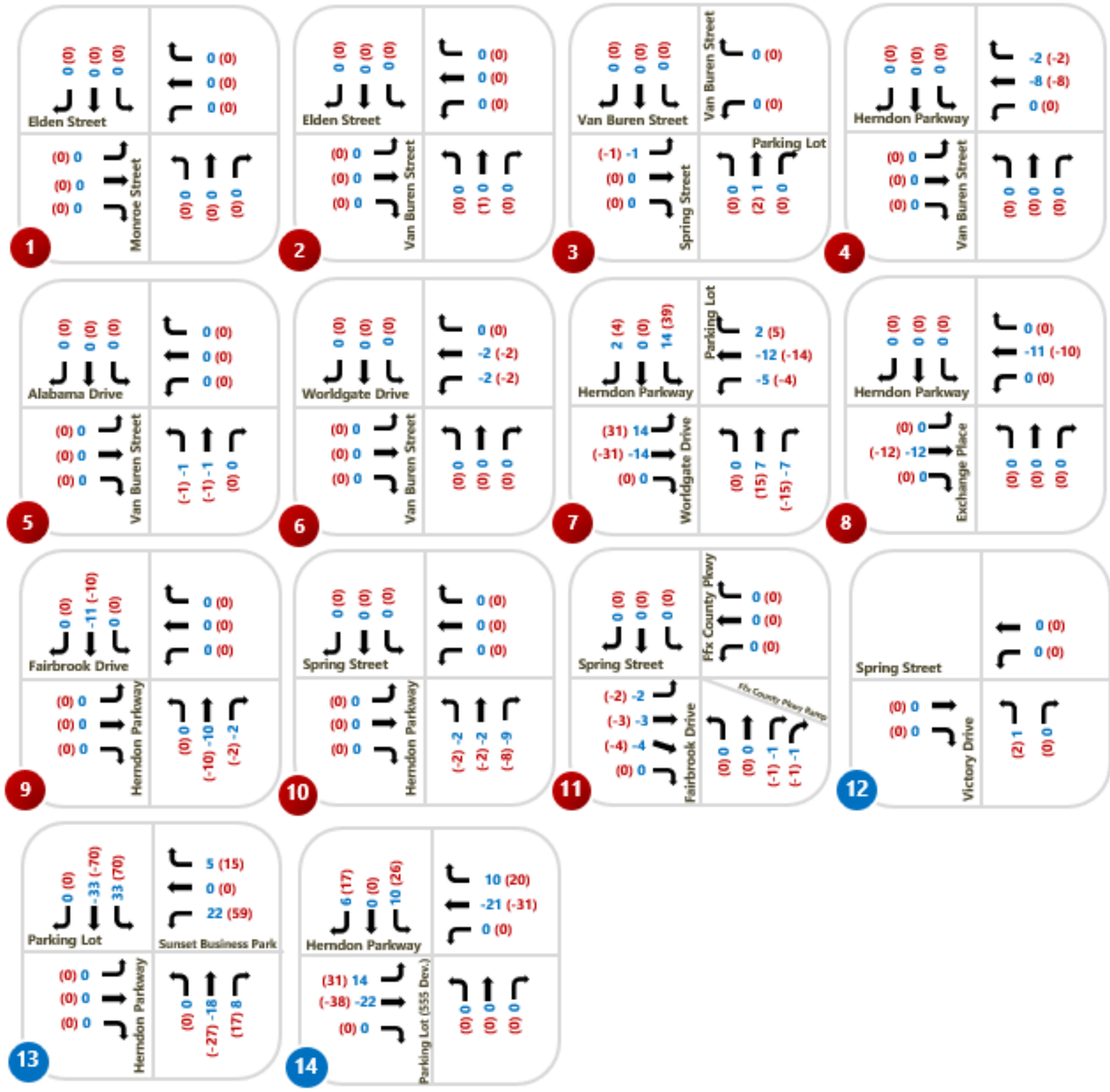



Basemap Source: Nearmap

## 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**

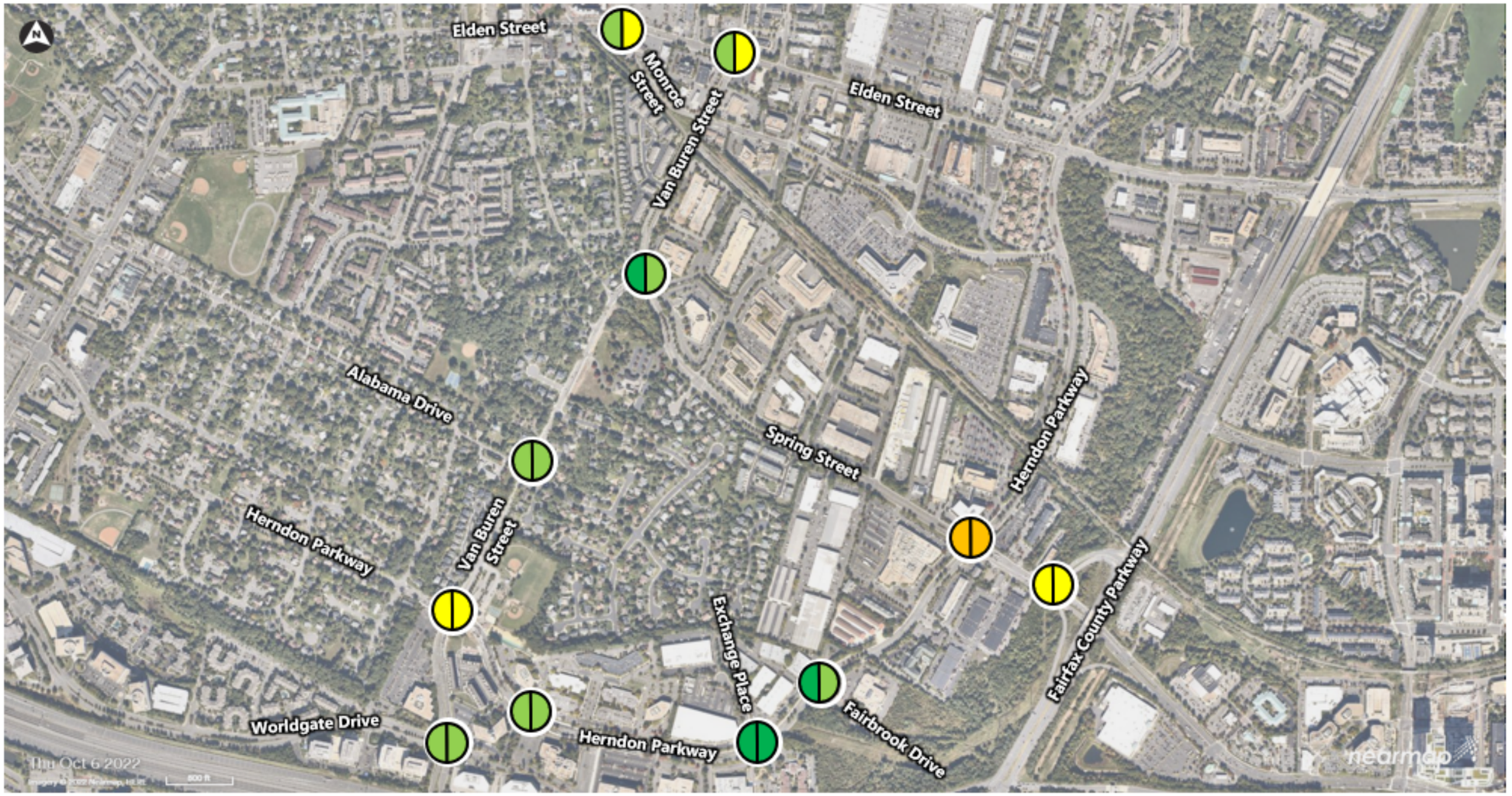
| Turning Movement | Peak | LOS F in No Build? | Source of Congestion |
|---|---|---|---|
| Herndon Pkwy / Spring Street | | | |
| Southbound Left | AM | No | *Heavy Demand* |
| Eastbound Left | AM/PM | No | |
| Spring St / Fairfax County Parkway Ramps / Fairbrook Dr | | | |
| Eastbound Left | PM | No | *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.

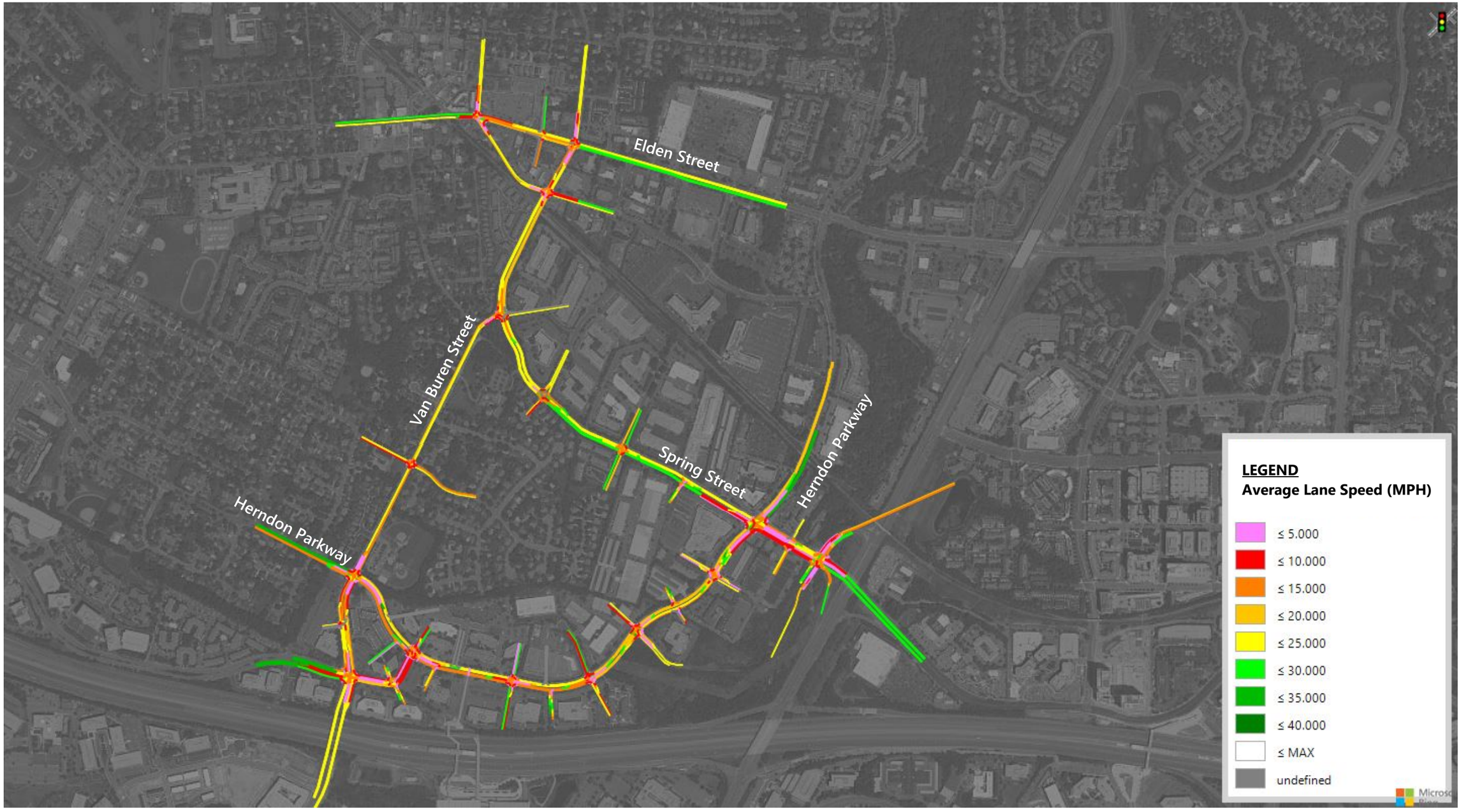
**Appendix B** documents the delay, LOS, and vehicle queueing for all movements at each of the eleven study intersections.

**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.

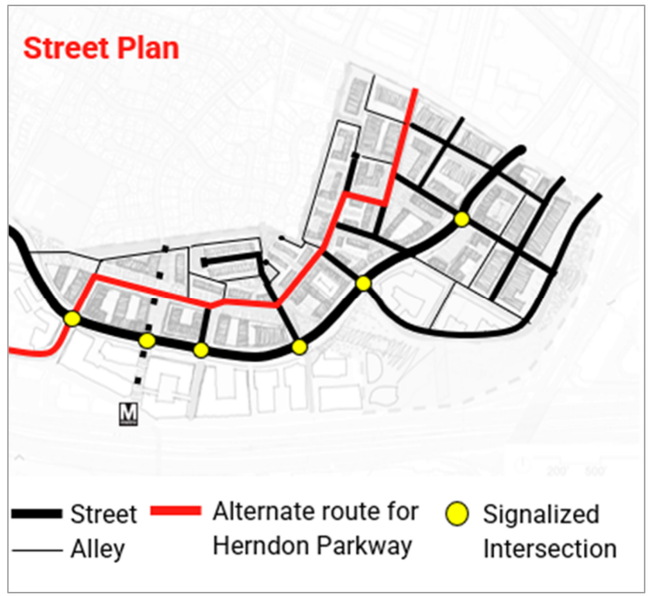
The higher quantity of office development in Scenario Two results in an approximately equal distribution between entering and exiting vehicle trips during each peak hour. In contrast to Scenario One, these anticipated vehicle trip totals are approximately 250 higher in the AM Peak Hour, 200 higher in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

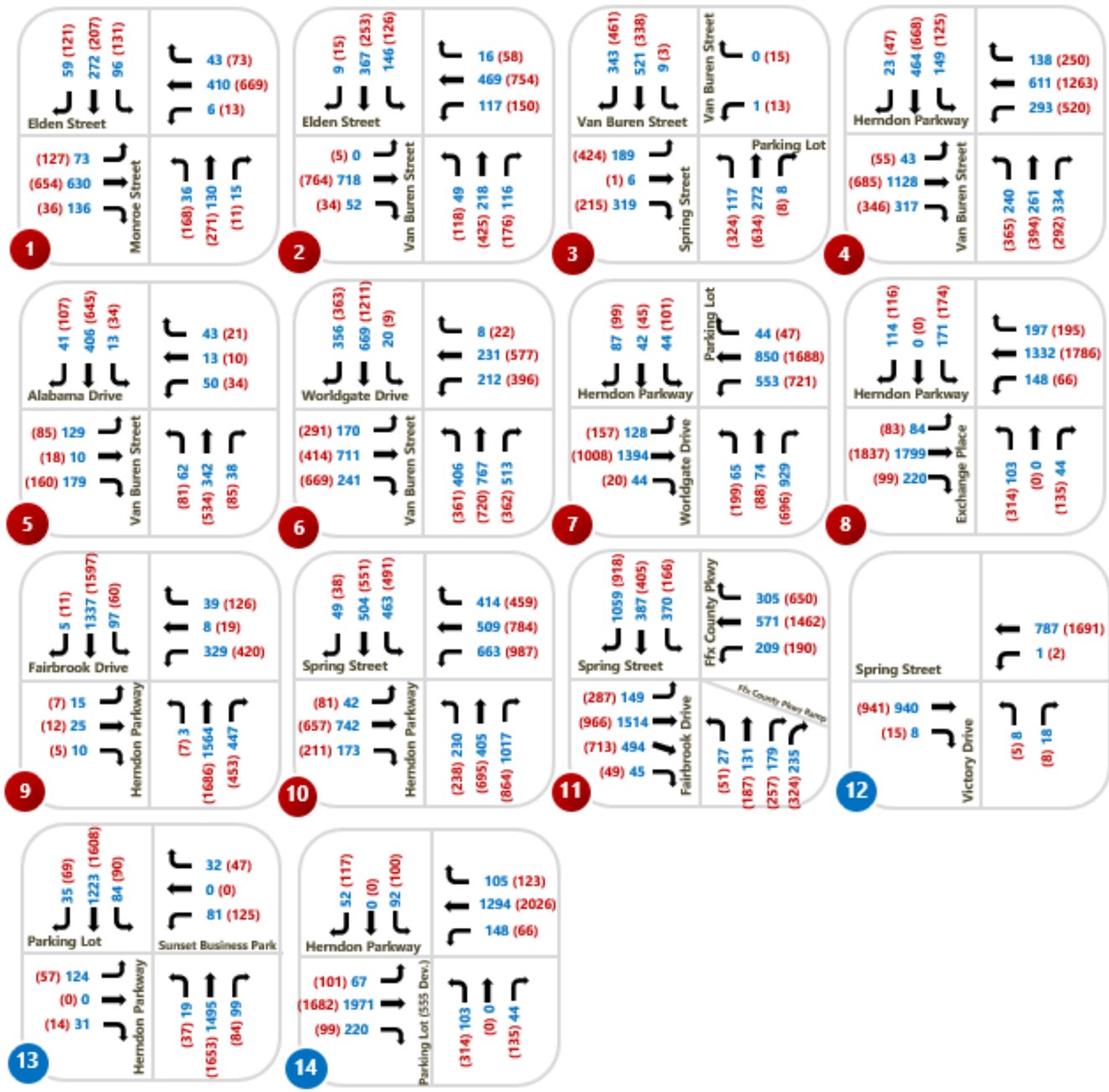
**Table 9 TRG Build Scenario 2 (Two Centers), Full Buildout, Site Trip Generation**

| 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

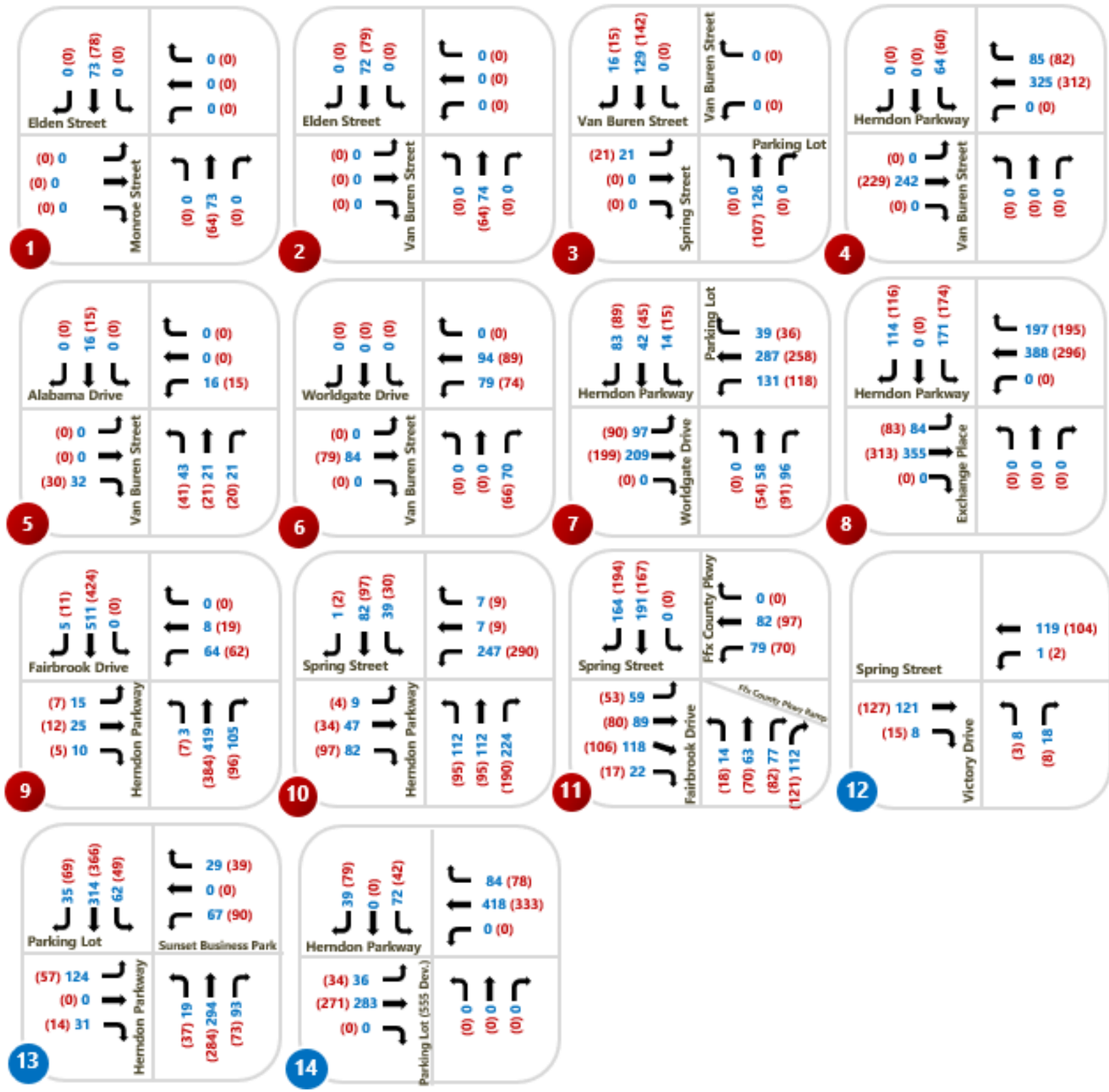



Build 2045 traffic volumes include No Build 2045 traffic volumes (Figure 6), removal of existing TRG area traffic volumes, volume shift to account for the Fairbrook Drive extension, and new TRG development traffic volumes. Basemap Source: Nearmap

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

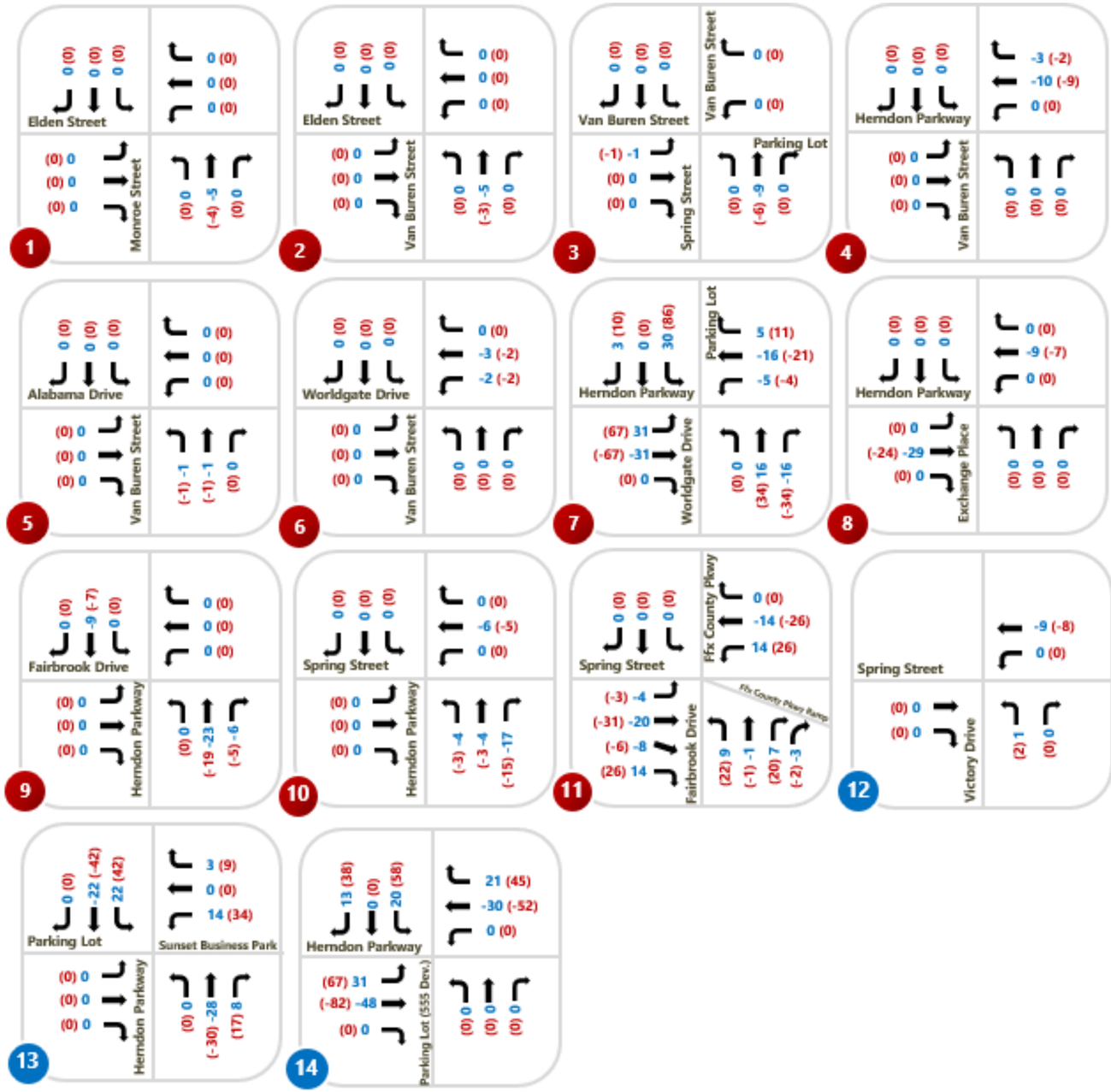



Basemap Source: Nearmap

**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**

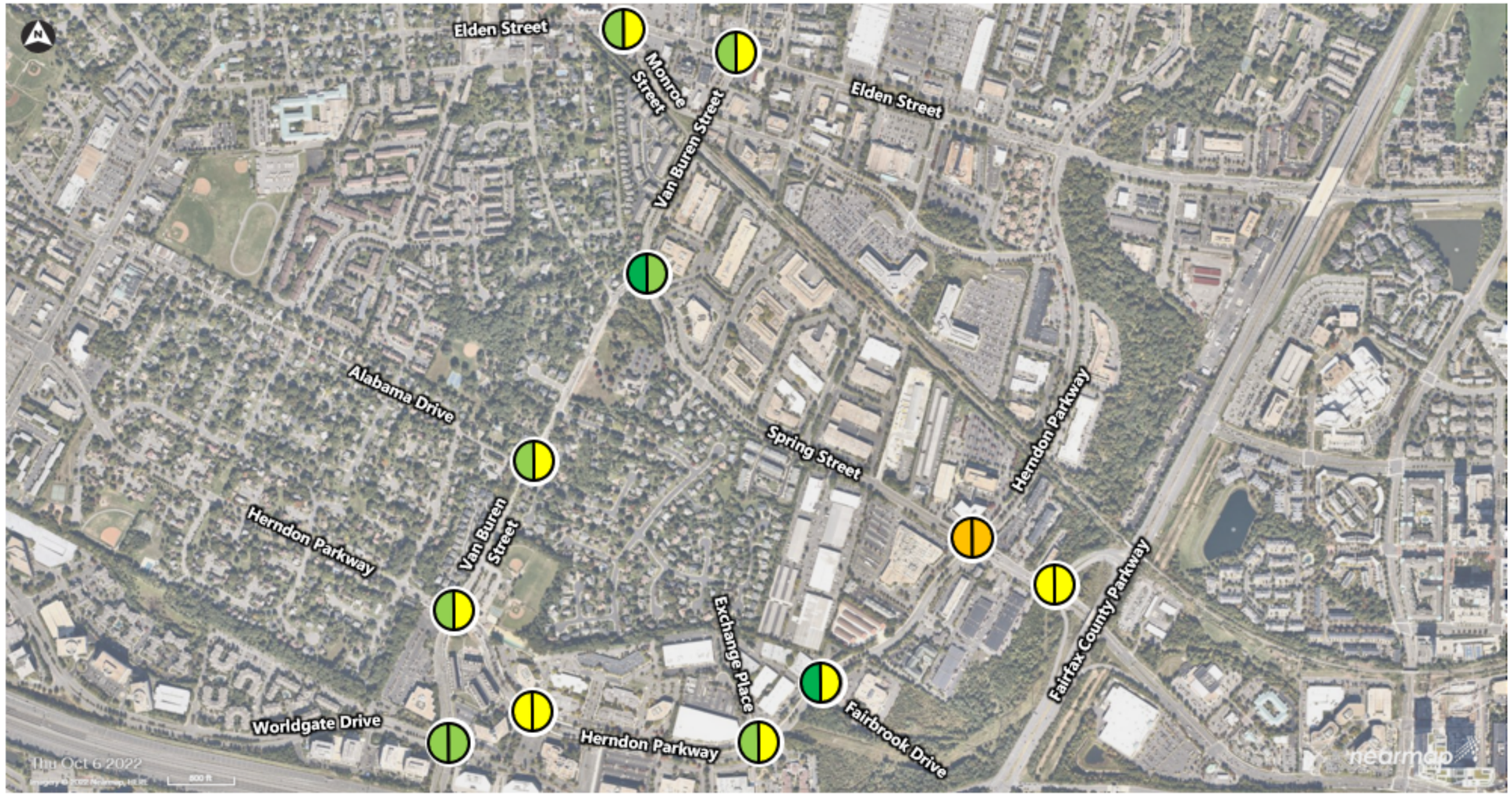
| Turning Movement | Peak | LOS F in No Build? | Source of Congestion |
|---|---|---|---|
| Herndon Pkwy / Spring Street | | | |
| All Southbound | PM | No | *Heavy Demand* |
| Eastbound Left | AM/PM | No | |
| Eastbound Thru/Right | PM | No | |
| Spring St / Fairfax County Parkway Ramps / Fairbrook 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.

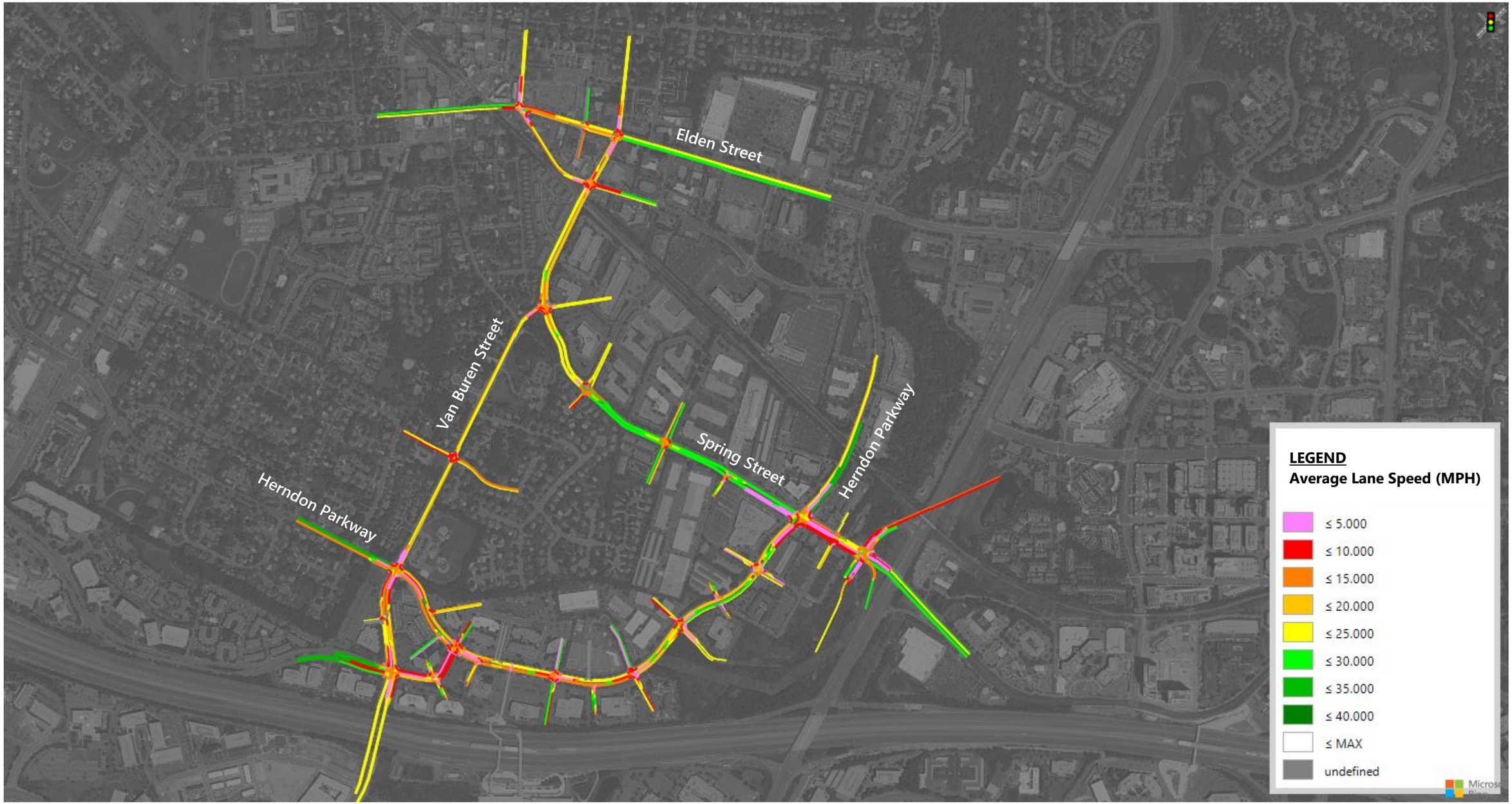
**Appendix B** documents the delay, LOS, and vehicle queueing for all of the movements at each of the eleven study intersections.

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



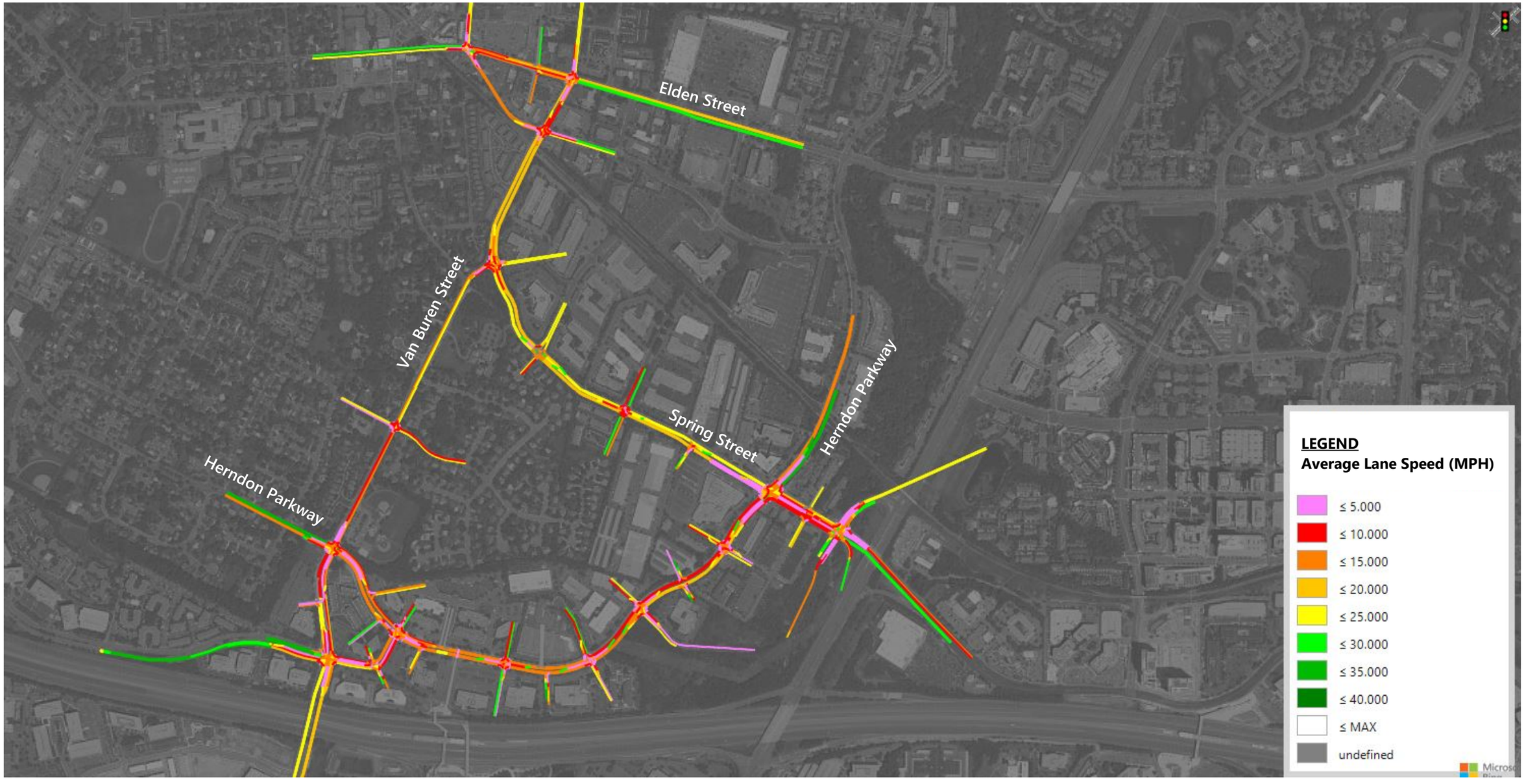

Source: Average of 7 AM Peak Hour and 20 PM Peak Hour VISSIM simulation runs. Aerial imagery from NearMap.

**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

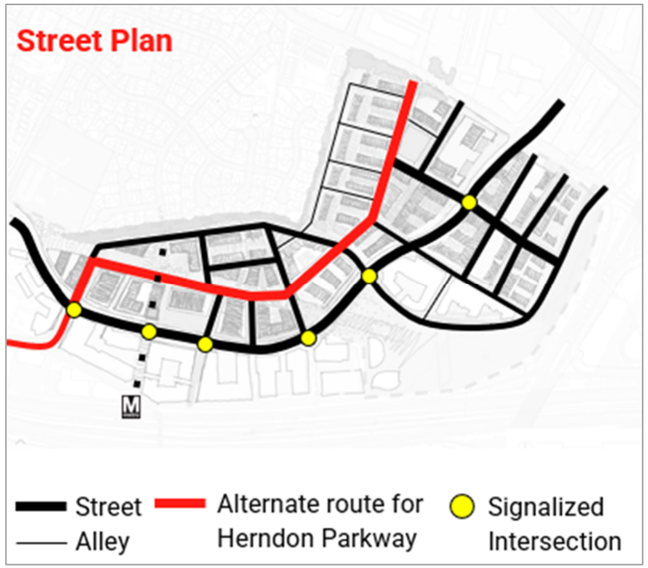
**Table 12** documents the trip generation calculations for Build 2045 Scenario Three: Metro Center. Table 9 shows that after the appropriate trip reductions, the new TRG development at full buildout is expected to generate approximately 2,600 AM Peak Hour trips, 2,550 PM Peak Hour trips, and 29,250 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.

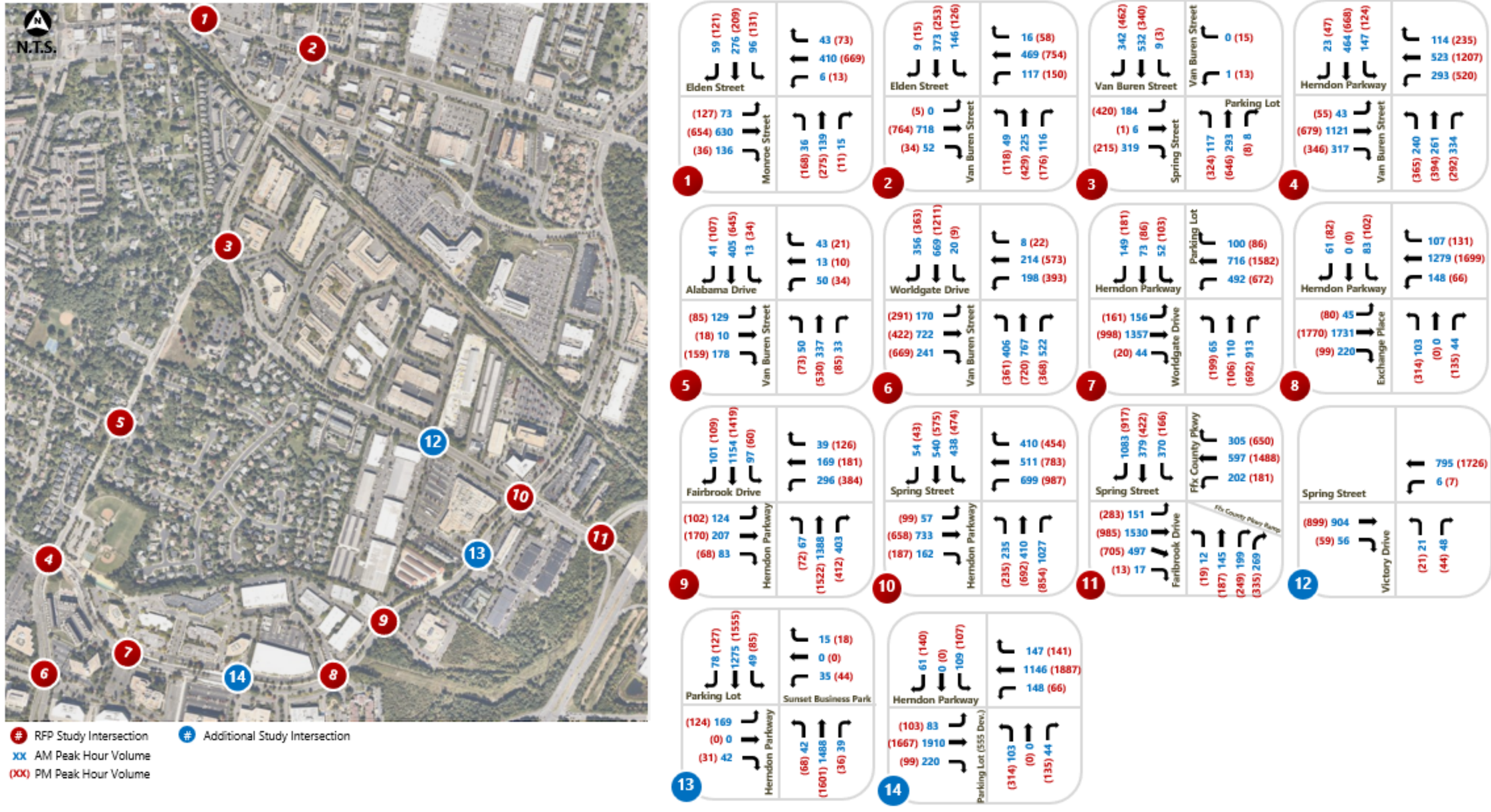
**Figure 28** displays the traffic volume dataset that was analyzed at the study intersections in the Build Scenario 3 (Metro Center) 2045traffic model. The TRG traffic volumes were distributed throughout the TRG land area by subdividing the TRG into multiple zones of development density. In Scenario 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** |

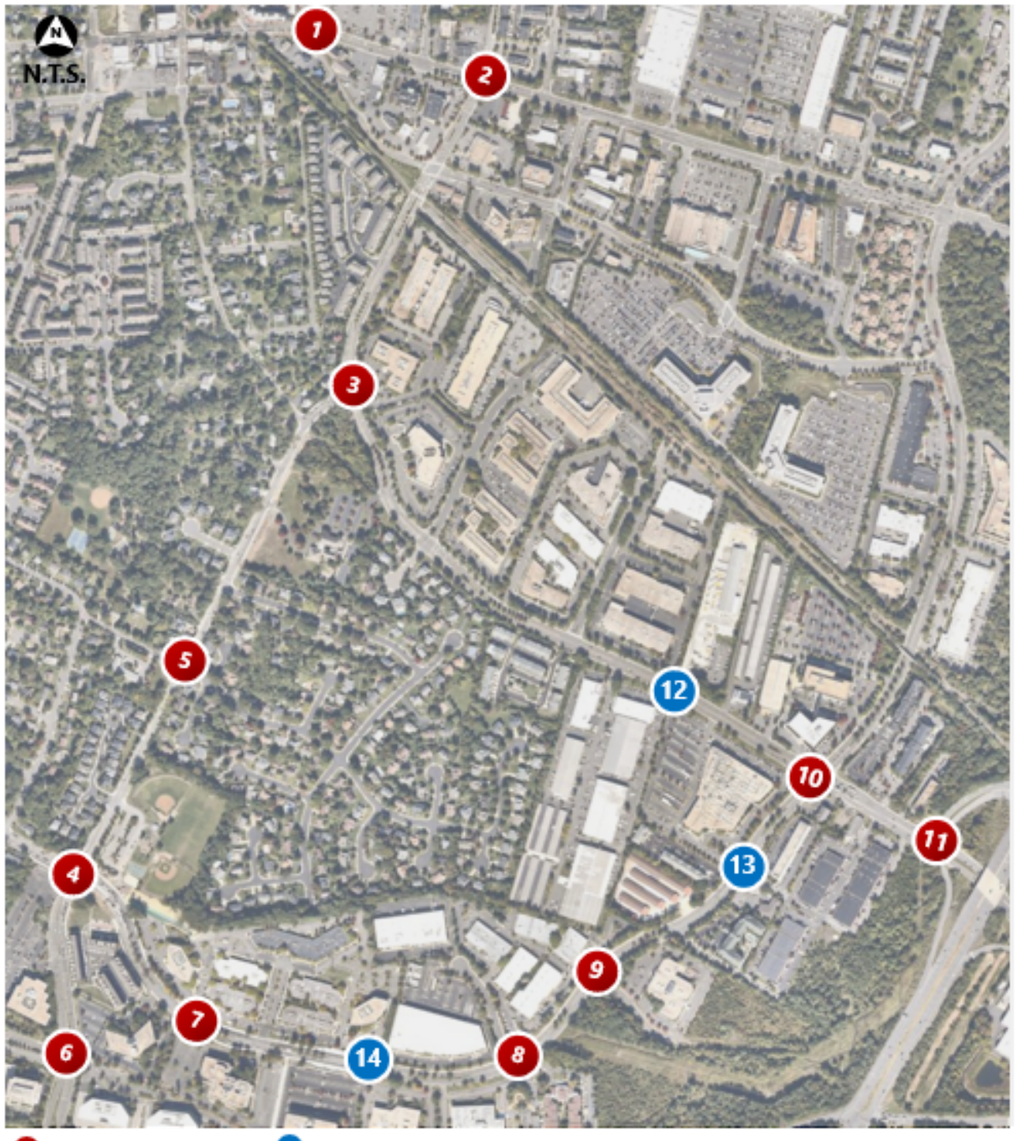
Source: Institute of Transportation Engineer's *Trip Generation Manual, 11th Edition*. Utilized "suburban" trip generation rates as decision was made with Town of Herndon to apply a consistent methodology to prior studies in the TRG, which utilized suburban base trip generation and then applied significant 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.

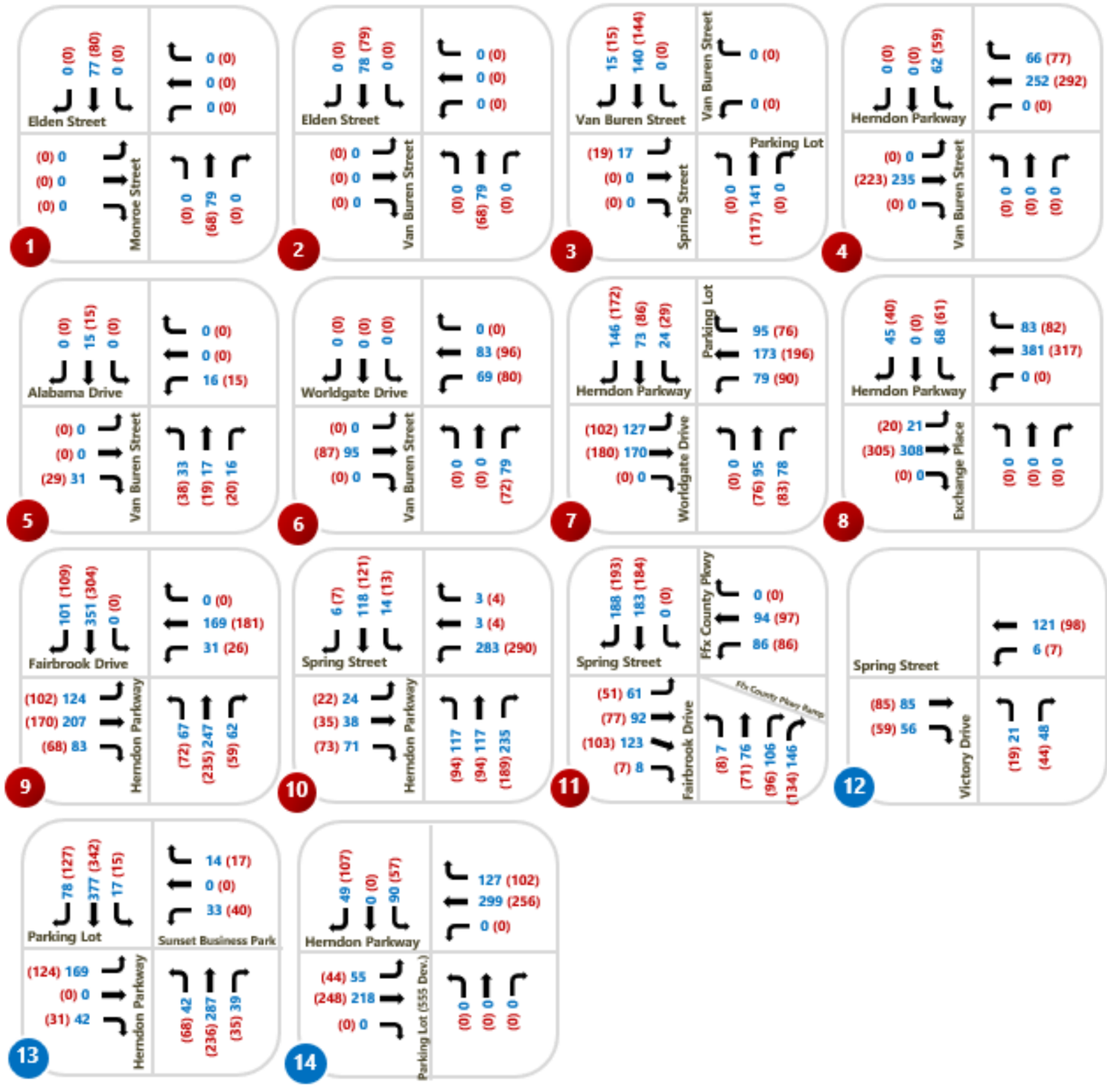
## Figure 28 Build Scenario 3 (Metro Center) 2045 Traffic Volumes




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

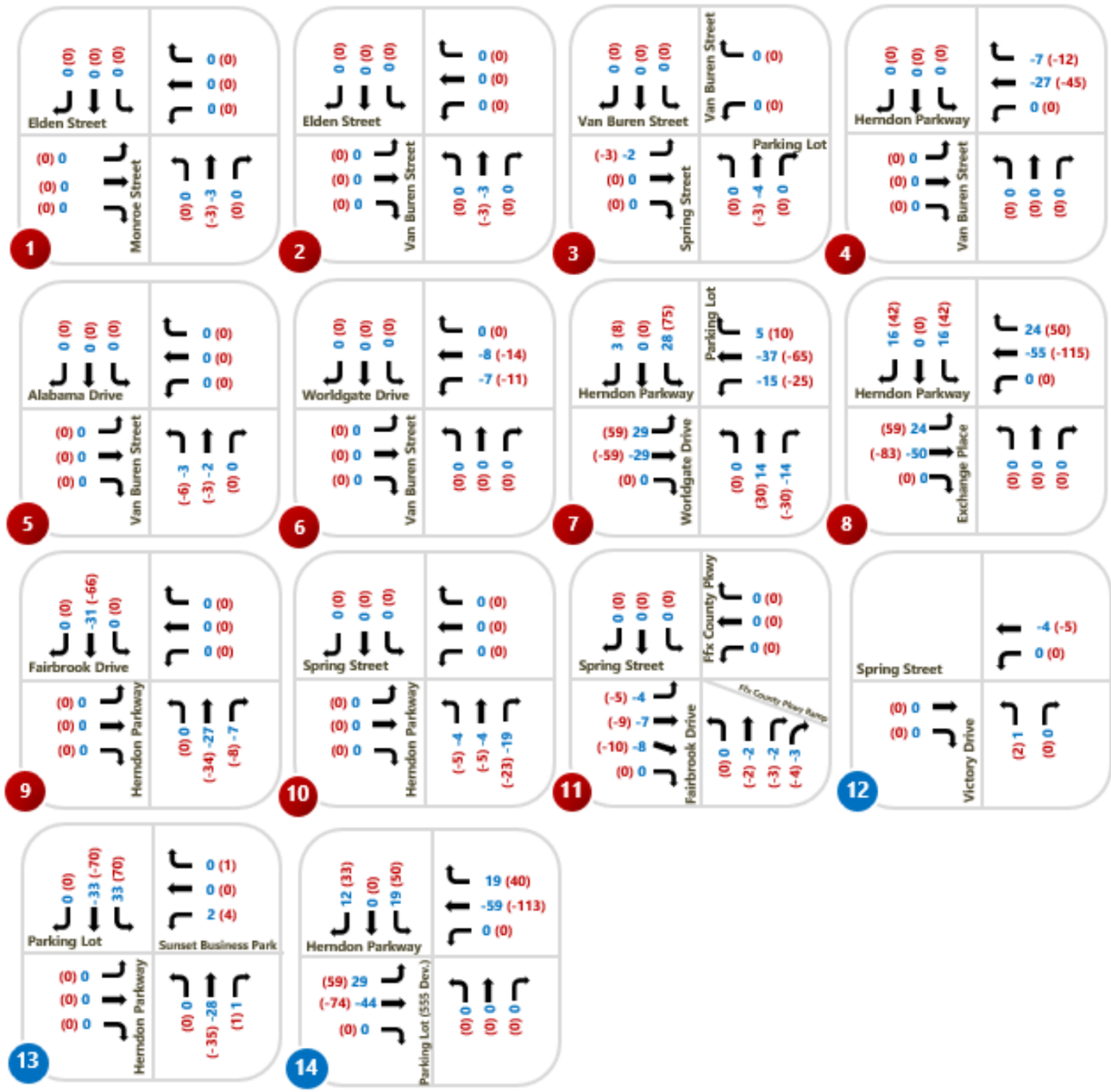



Basemap Source: Nearmap

## 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**

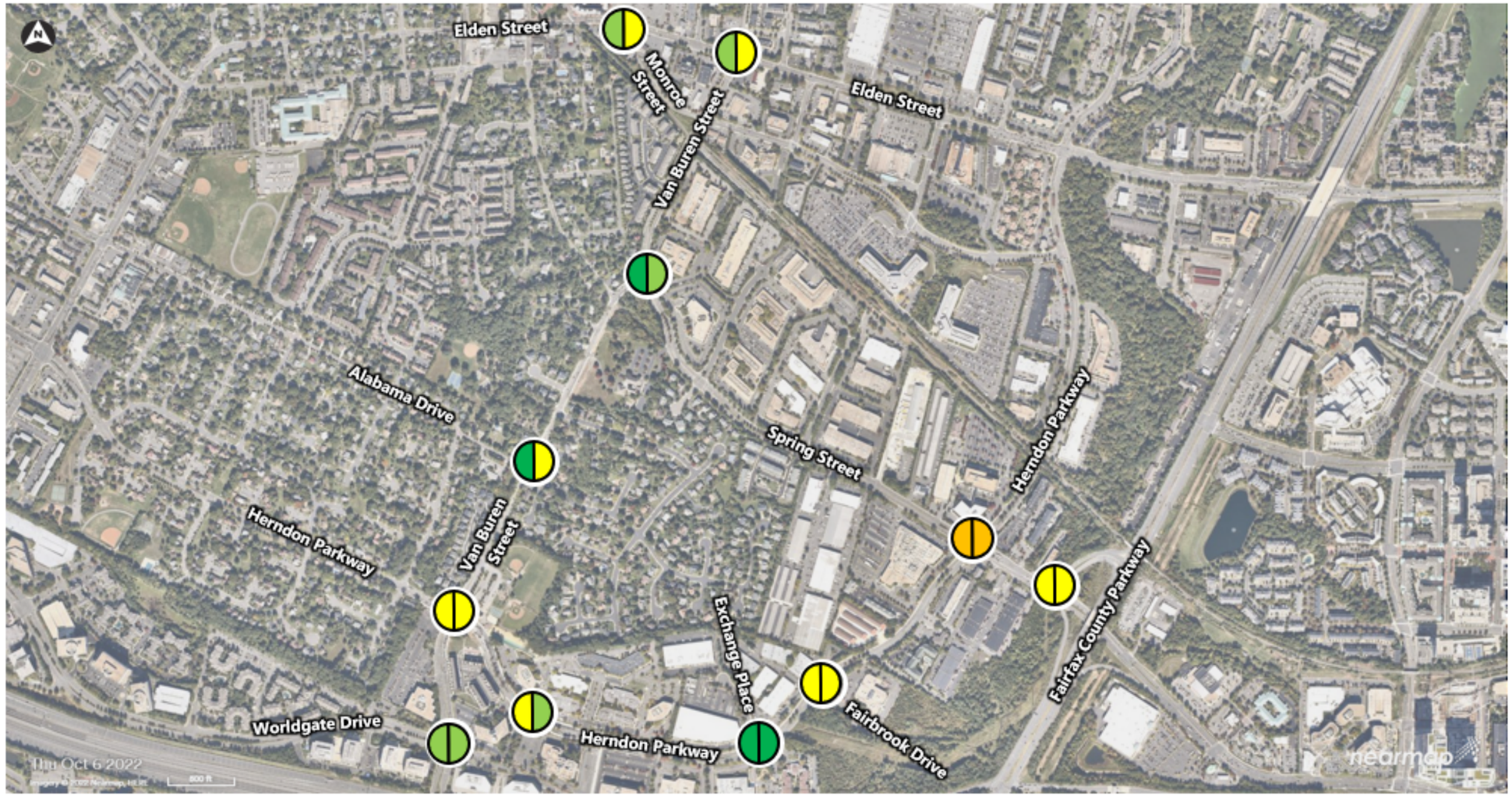
| Turning Movement | Peak | LOS F in No Build? | Source of Congestion |
|---|---|---|---|
| Herndon Pkwy / Spring Street | | | |
| Eastbound Left | AM/PM | No | *Heavy Demand* |
| Eastbound Thru/Right | PM | No | |
| Spring St / Fairfax County Parkway Ramps / Fairbrook Dr | | | |
| Eastbound Left | PM | 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**



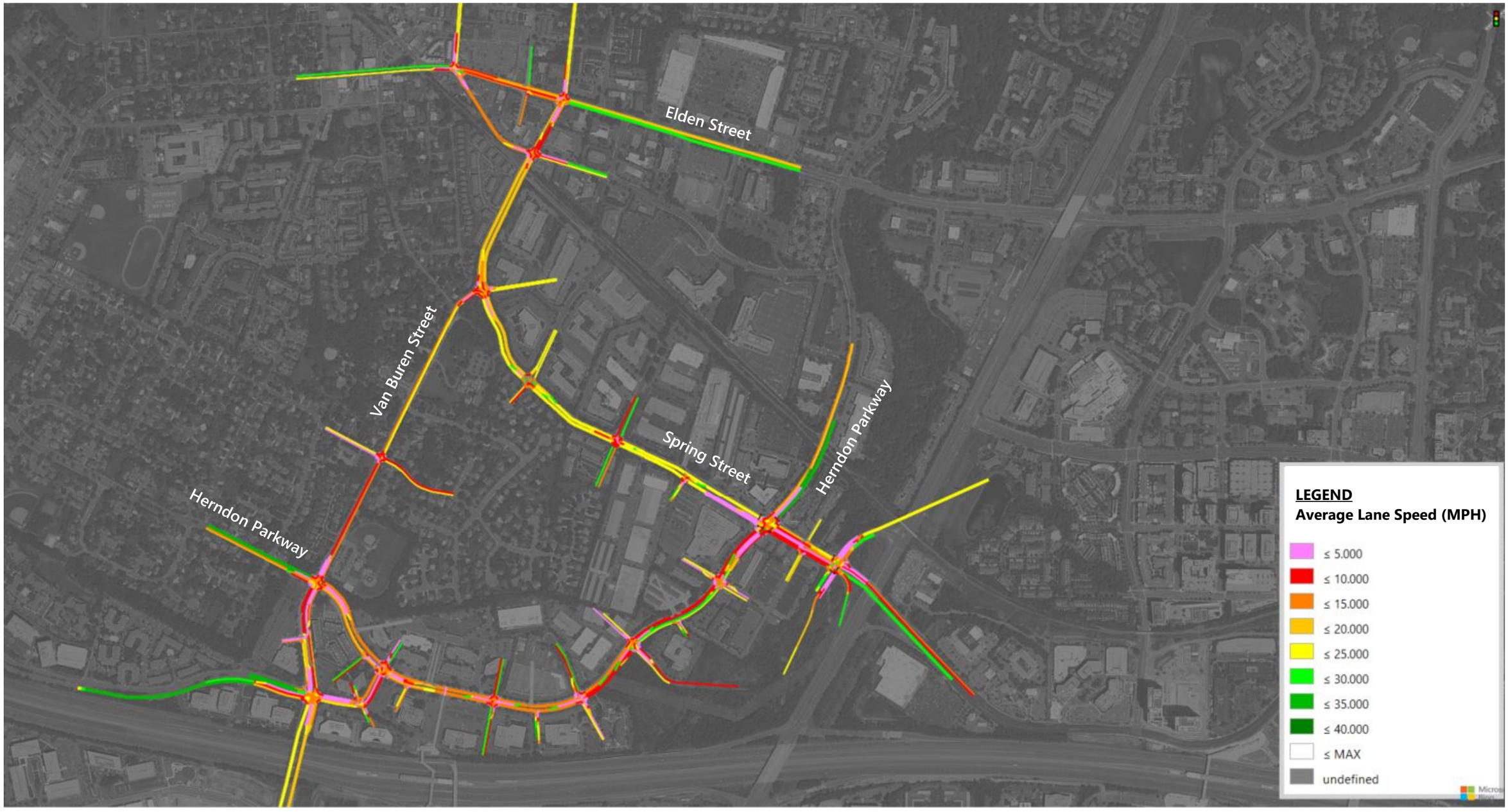

Source: Average of 7 AM Peak Hour and 20 PM Peak Hour VISSIM simulation runs. Aerial imagery from NearMap.

**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.

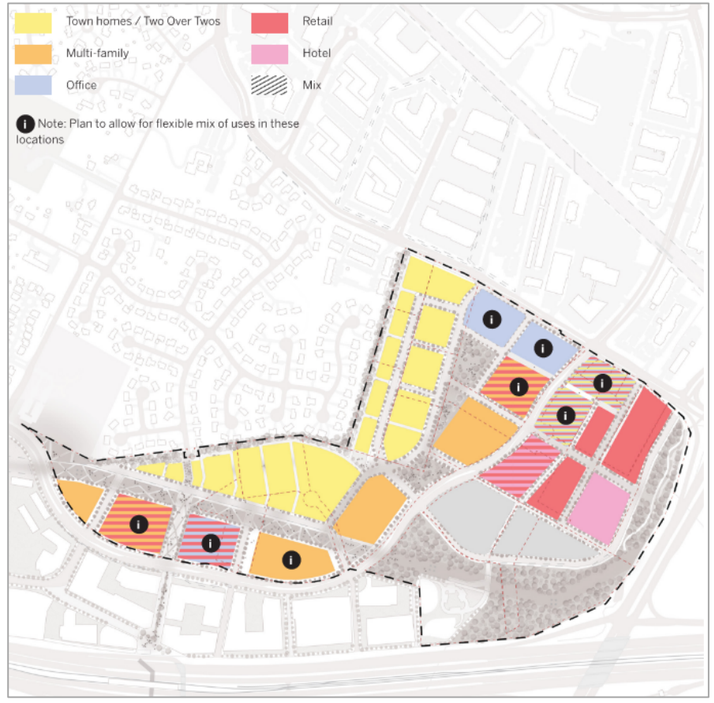
### 5.2.2 Transportation Connectivity

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.

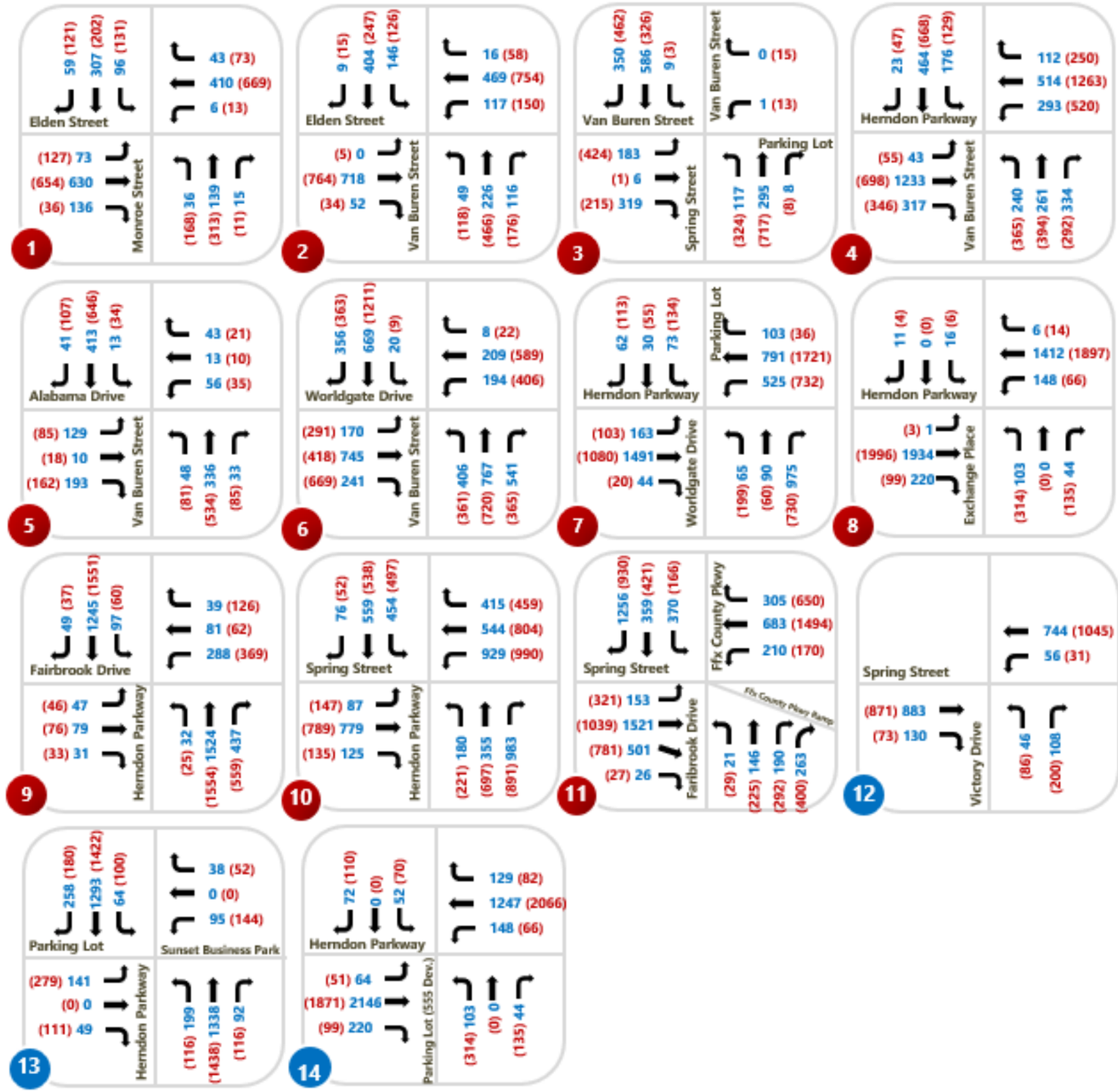
**Figure 34 Preferred Scenario Development Plan**




Source: SOM TRG graphics.

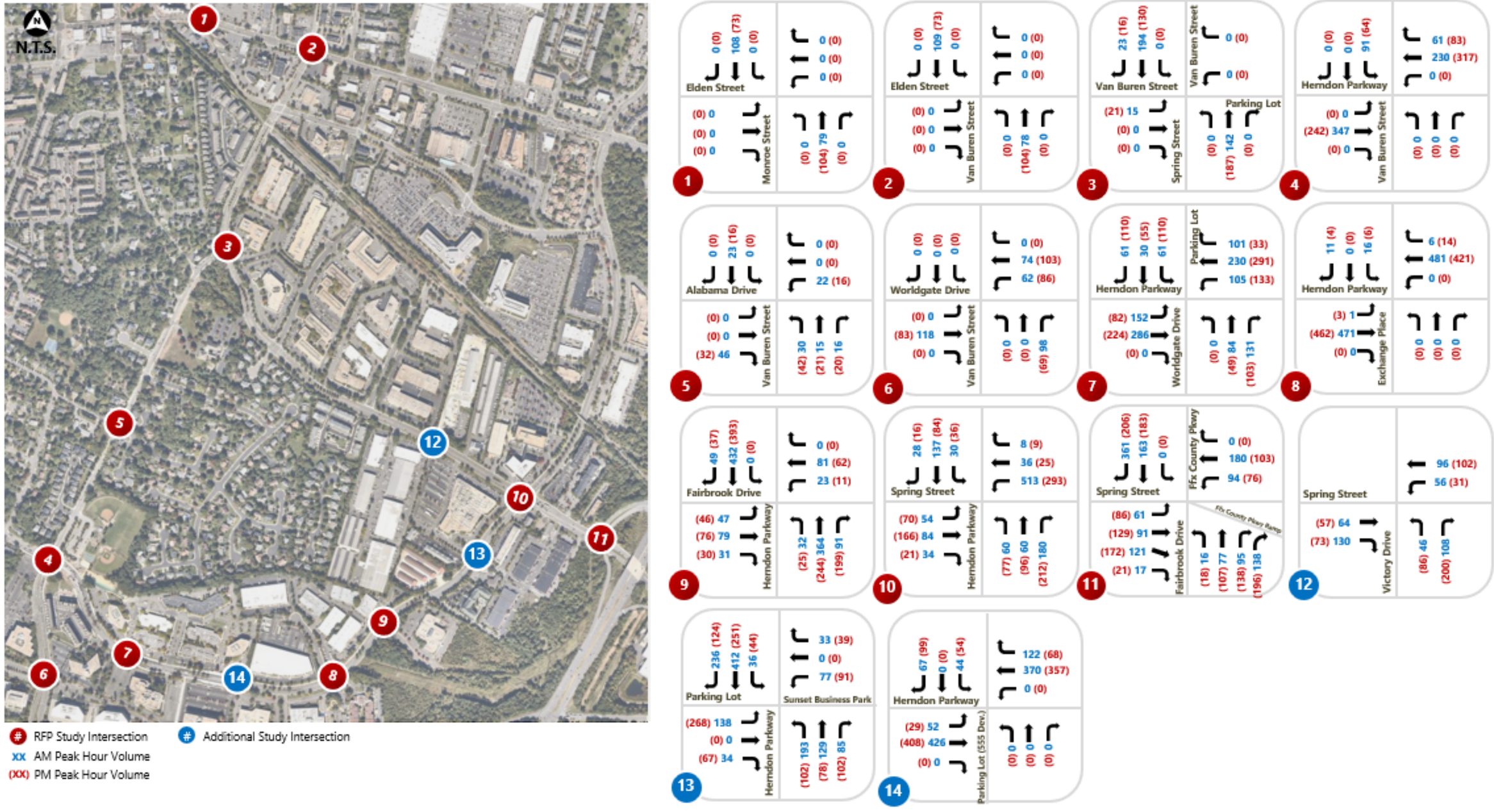
## Figure 35 Preferred Build Scenario 2045 Traffic Volumes



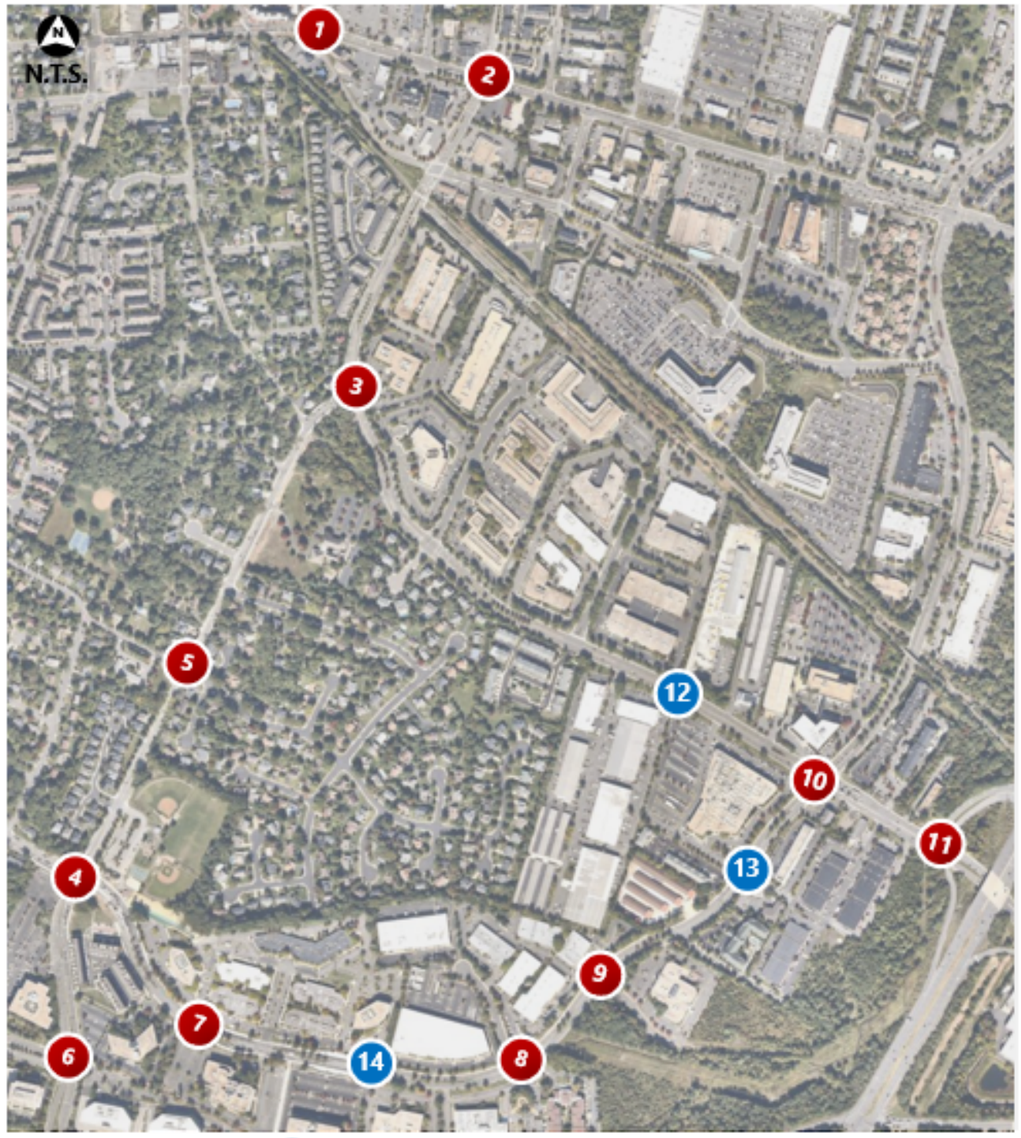

Build 2045 traffic volumes include No Build 2045 traffic volumes (Figure 6), removal of existing TRG area traffic volumes, volume shift to account for the Fairbrook Drive extension, and new TRG development traffic volumes. Basemap Source: Nearmap

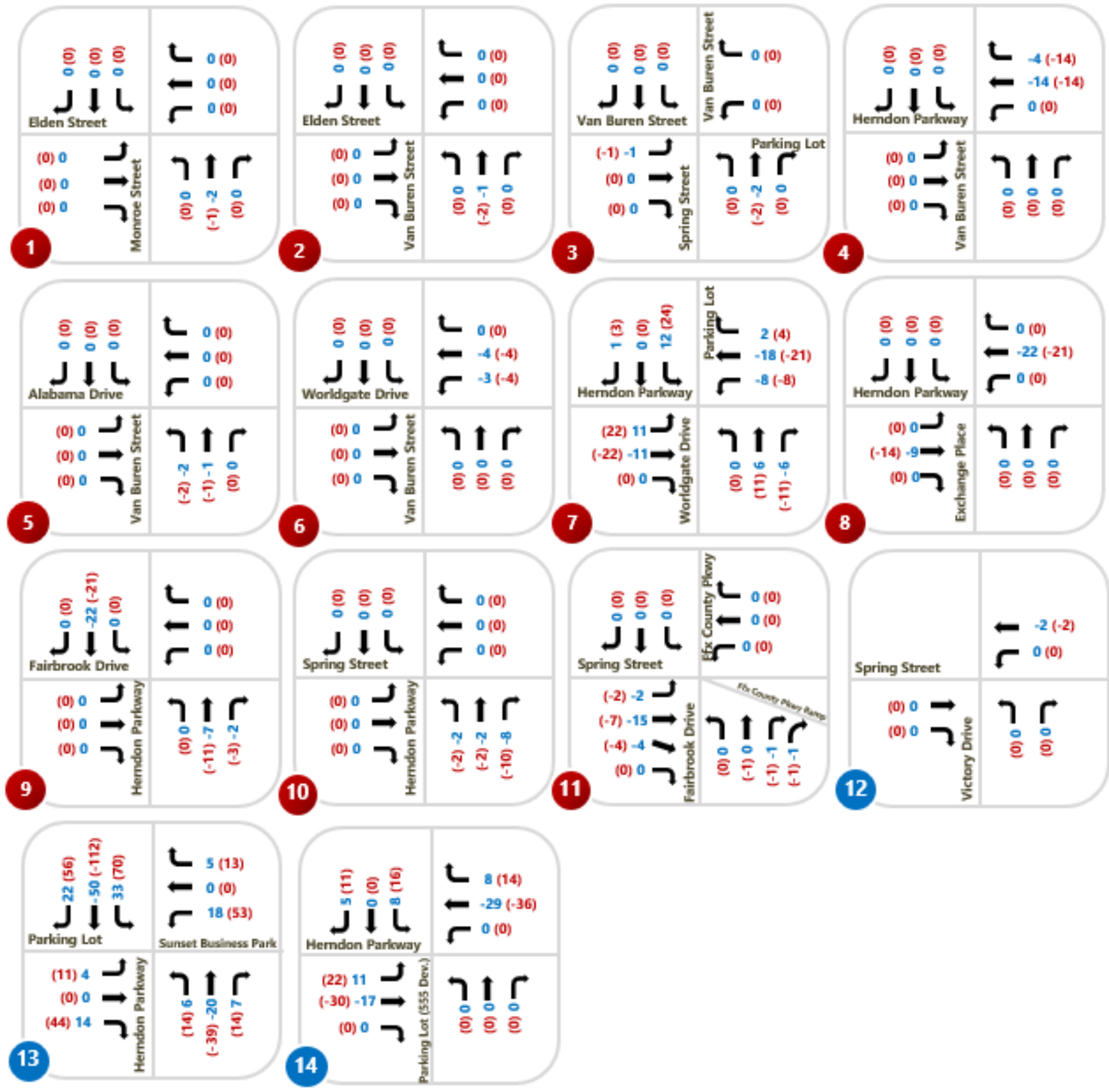
## Figure 36 Preferred Build Scenario New Site Trips




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.

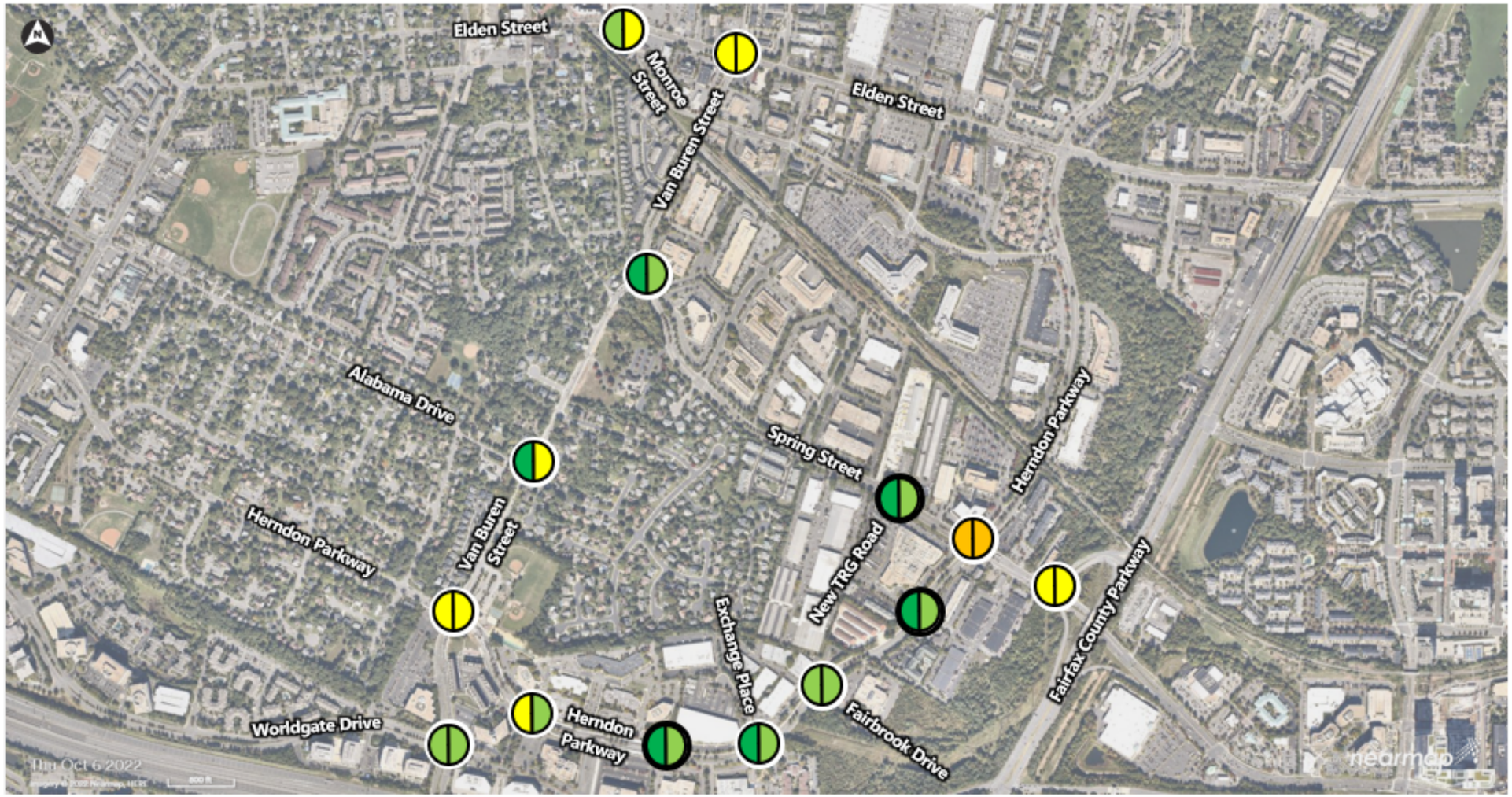
**Table 20 Preferred Build "LOS F" Turning Movements**

| 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 | | | |
| Eastbound Left | PM | No | *Heavy Demand* |
| Van Buren St / Herndon Pkwy | | | |
| Northbound Left | PM | Yes | *Capacity limitations at Van Buren St / Herndon Pkwy* |
| Van Buren St / Alabama Drive | | | |
| All Alabama Drive | PM | Yes | |
| Herndon Parkway / Fairbrook Drive | | | |
| Westbound Left | PM | No | *Demand* |

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

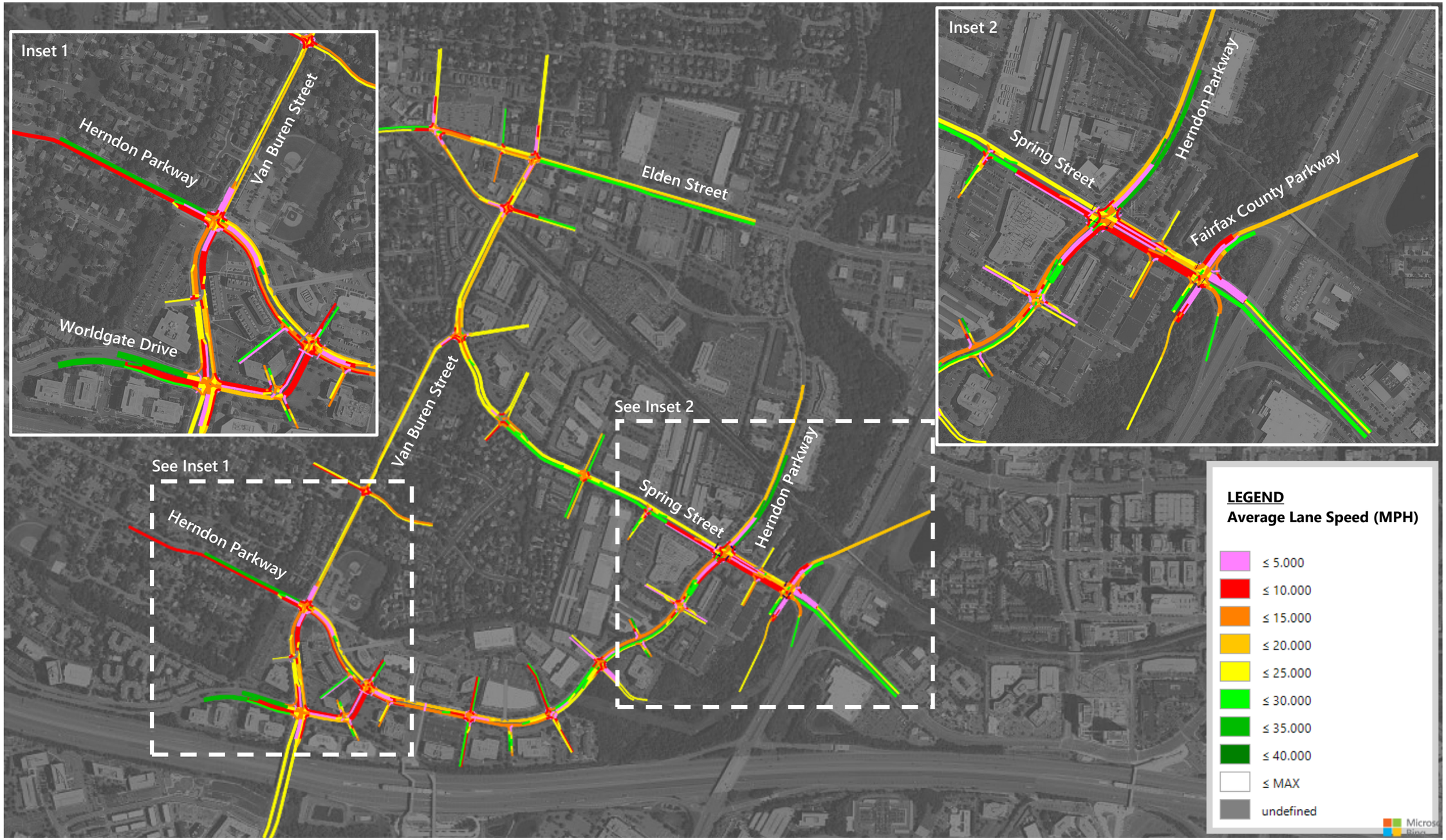
Congestion "heat" maps for the Preferred Build Scenario peak hours are shown in **Figures 39 and 40**. These represent the average vehicle speeds present in different lanes and segments of the model. Slower vehicle speeds (shown in shades of red) represent areas of higher congestion and vehicle queuing, 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**



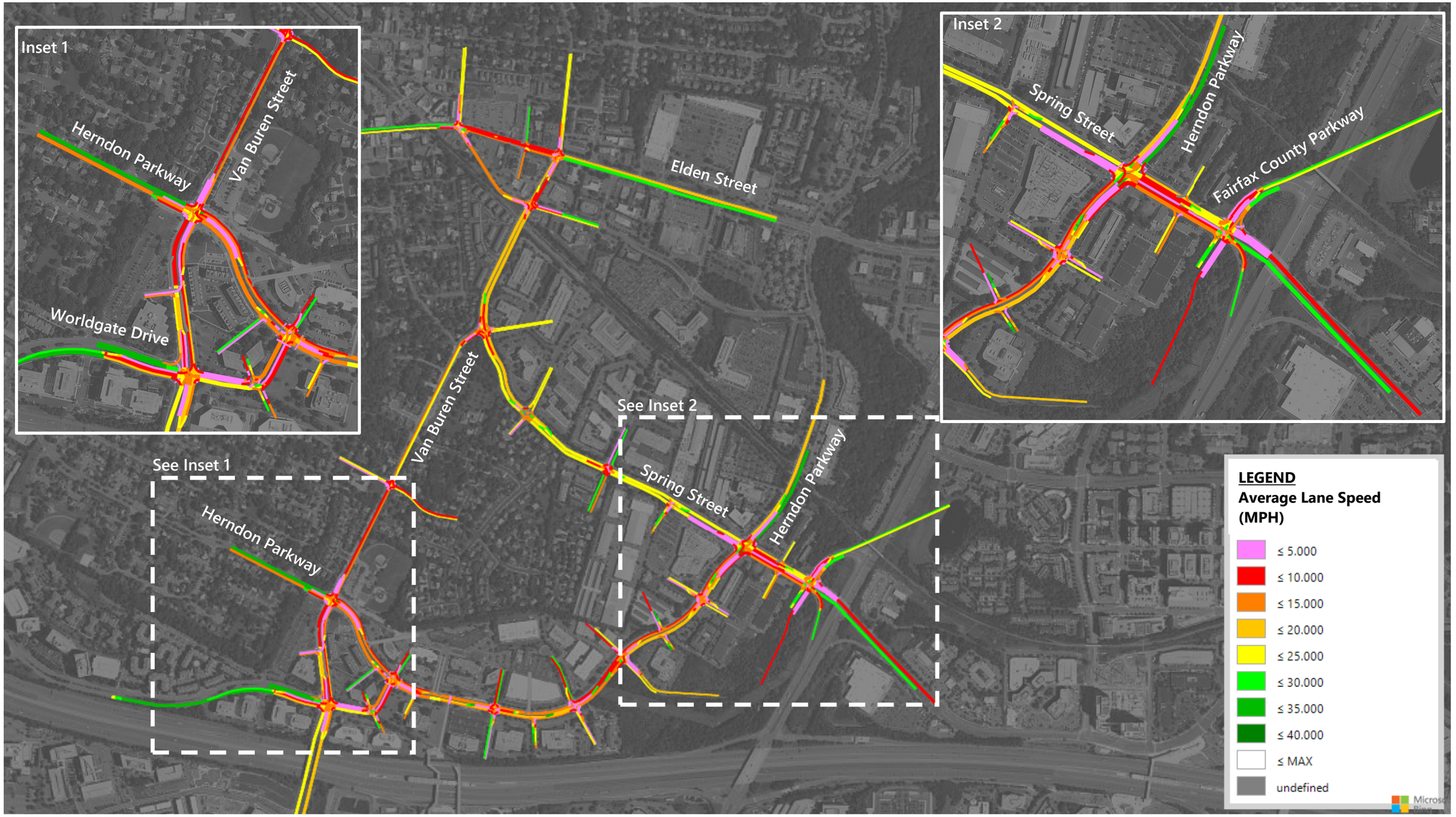

Source: Average of 7 AM Peak Hour and 20 PM Peak Hour VISSIM simulation runs. Aerial imagery from NearMap.

**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.

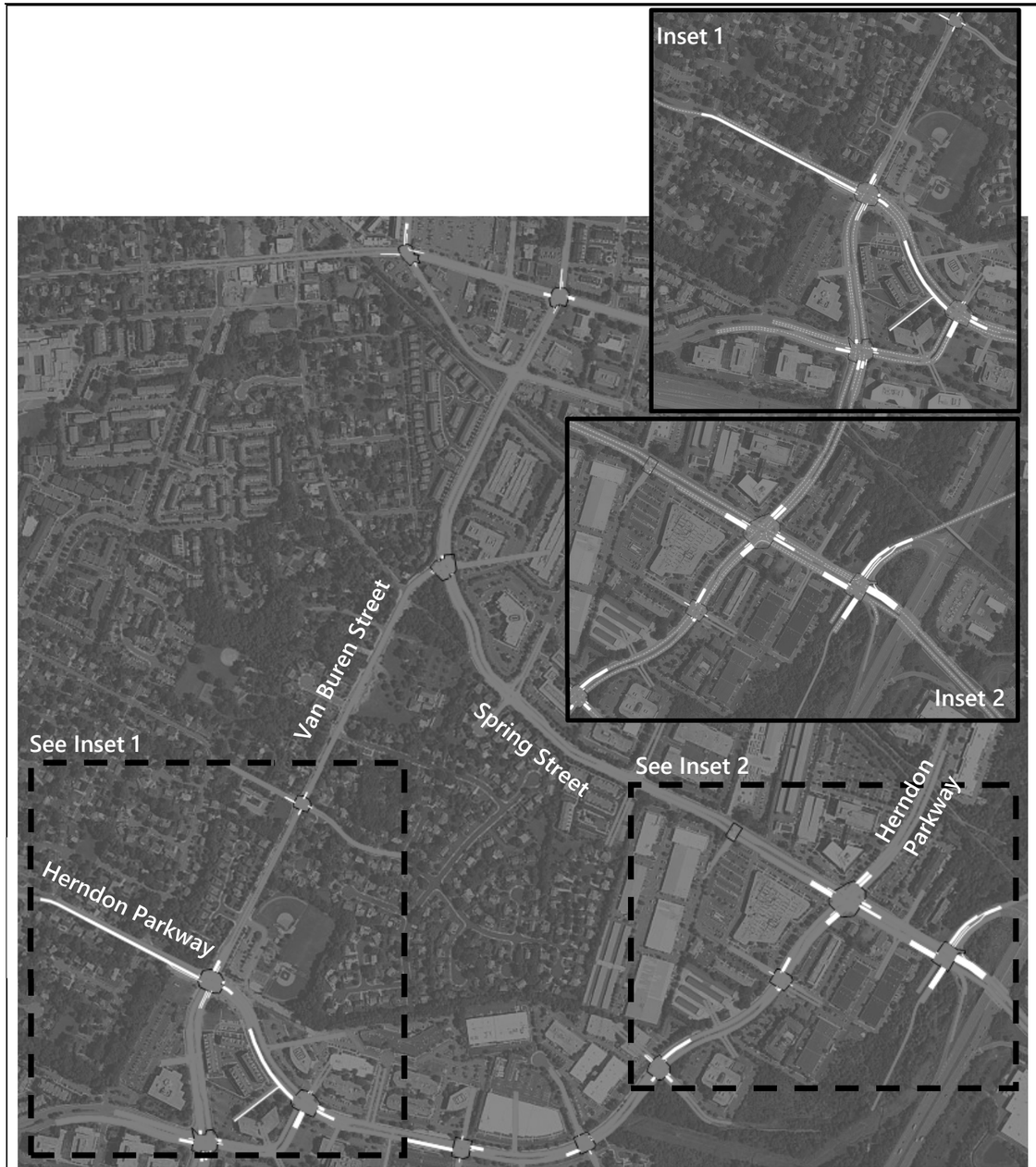
The Preferred Build traffic analysis included baseline assumptions on vehicle trips. The Town of Herndon may consider additional potential mitigation measures to reduce the amount of volume on the roadway network. Those measures could include the following:

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

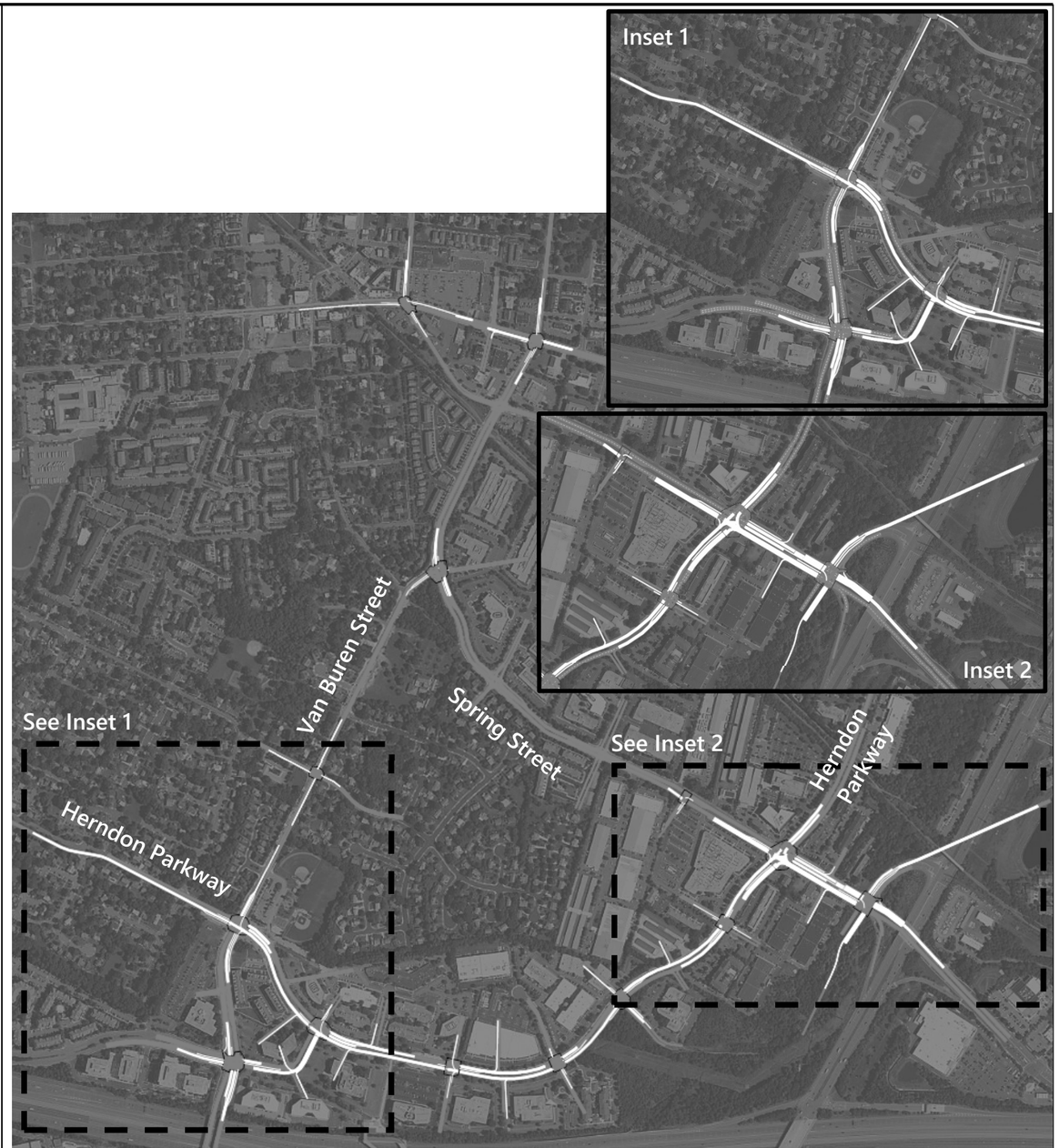
**Table 21 Candidate Mitigations to be Tested in VISSIM**

| 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**

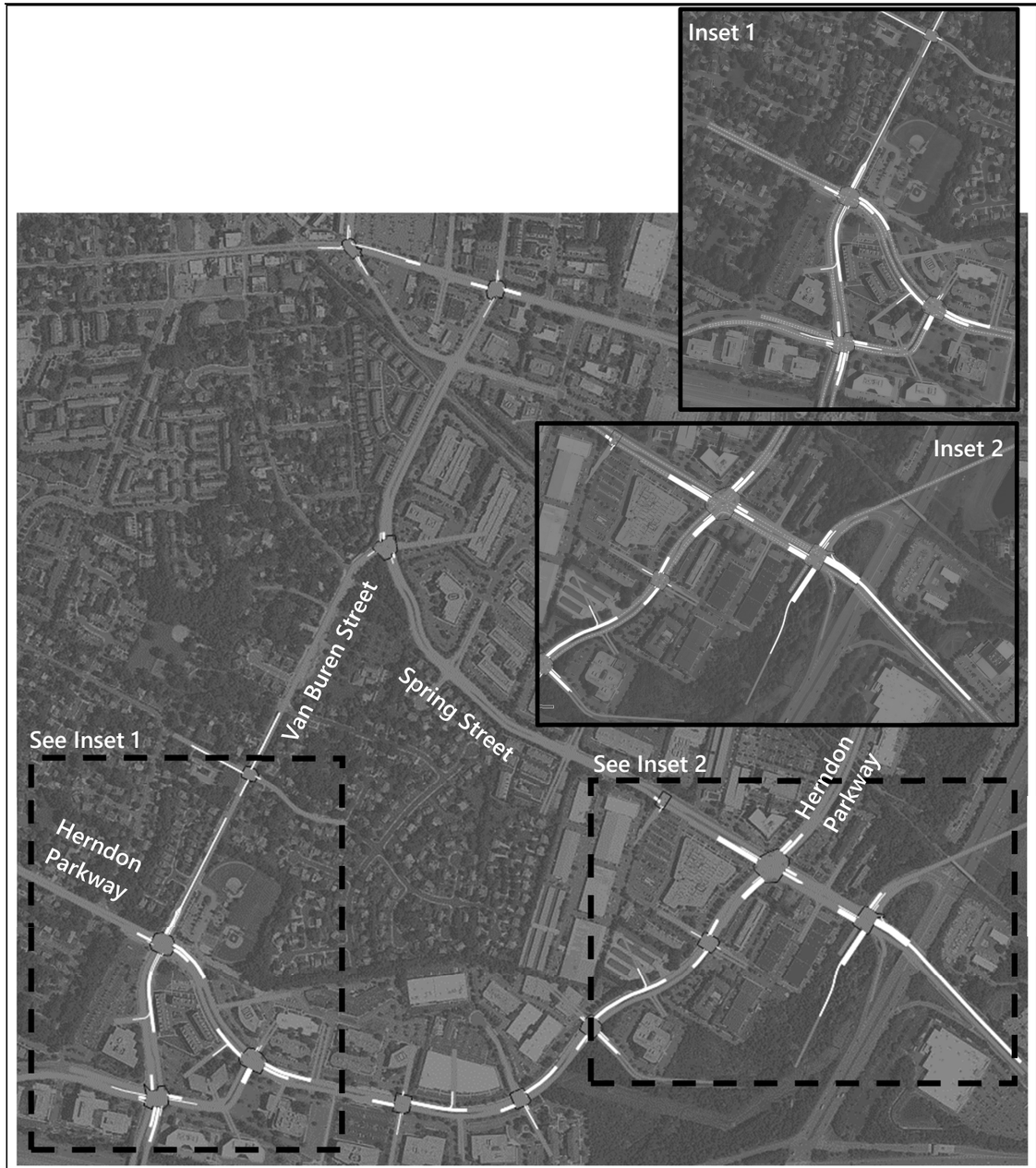



**Average Queue Length**

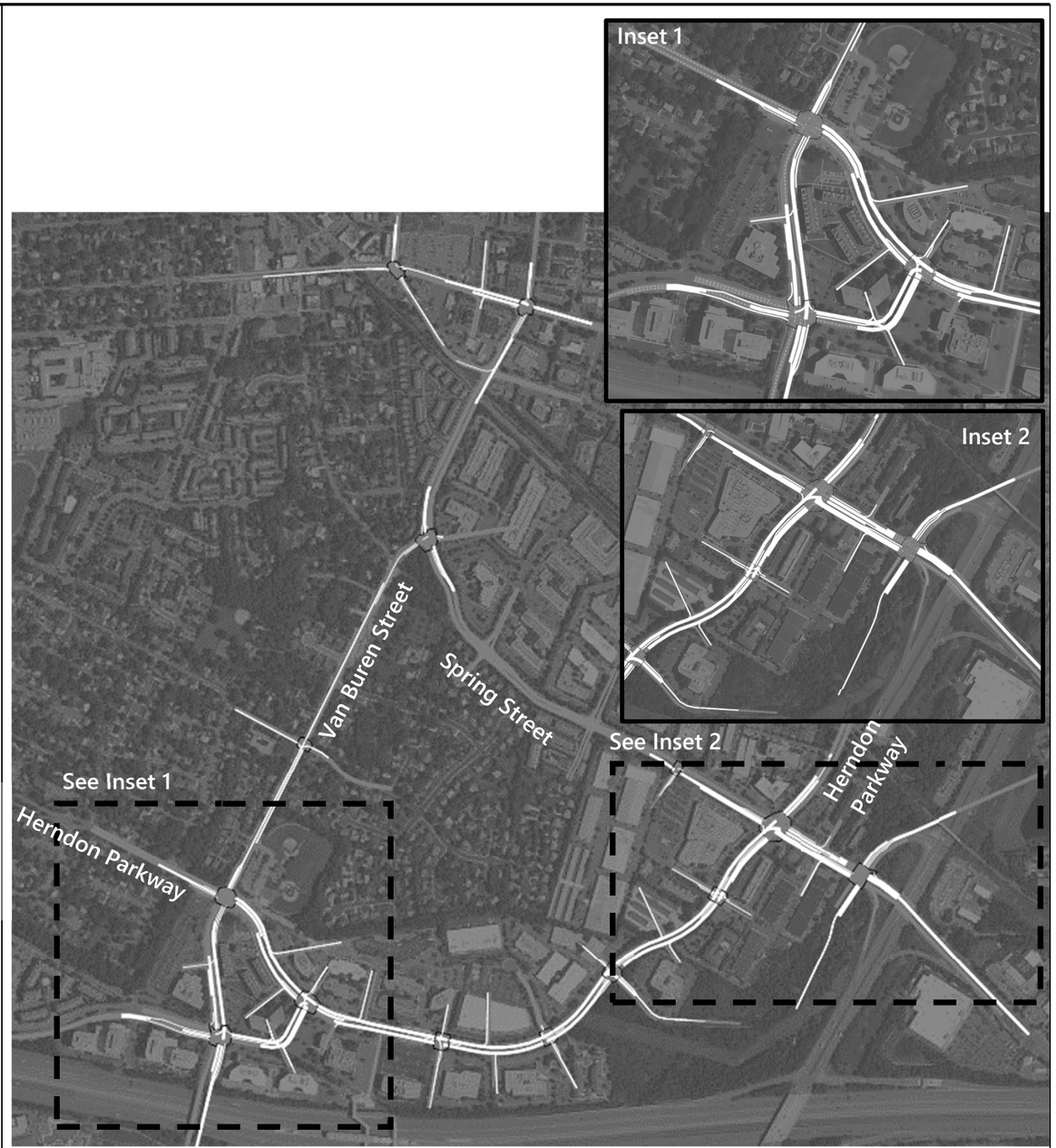



**Maximum Queue Length**

**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

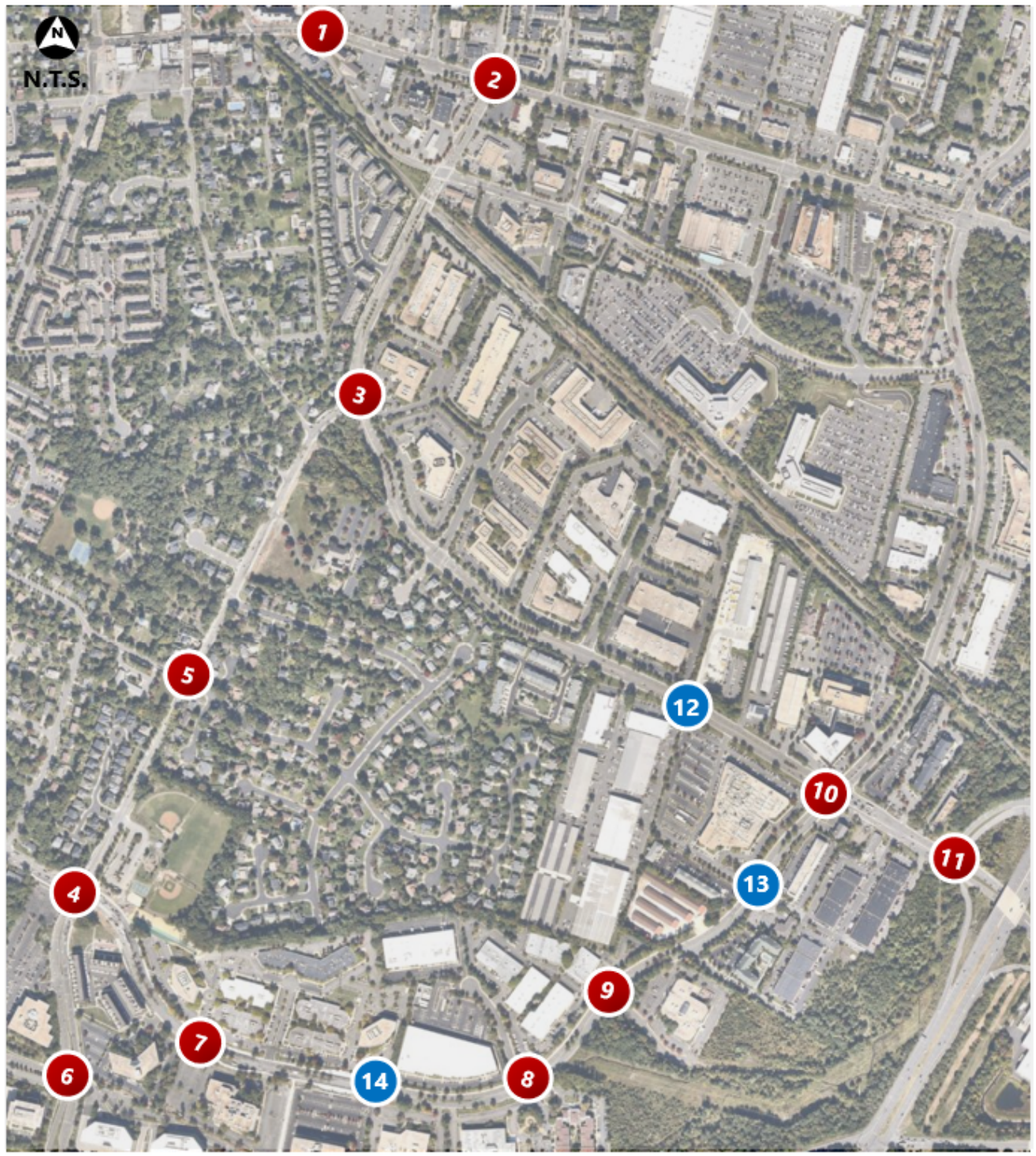
As documented in Table 21, a set of transportation infrastructure mitigation was identified via a screening process. These elements were modeled in VISSIM to assess their impact on traffic conditions. The specific elements modeled include:

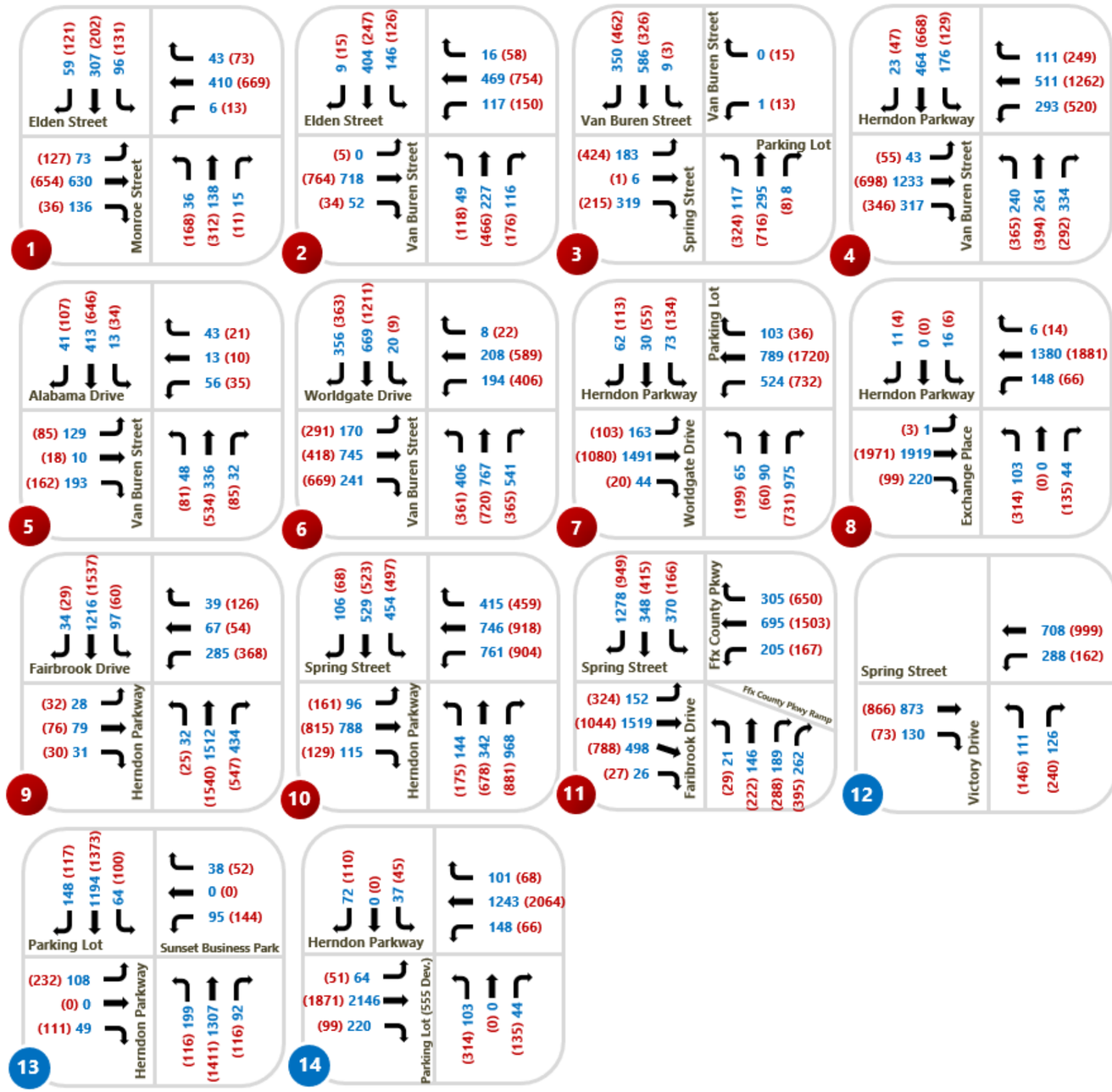
- Van Buren Street / Herndon Parkway intersection
  - Widening of southbound Van Buren Street to extend dual thru lanes to Senate Court.
  - Widening of northbound Van Buren Street to accommodate a second left turn lane of approximately 175 foot of storage length.
- Spring Street / New TRG Road
  - New 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.

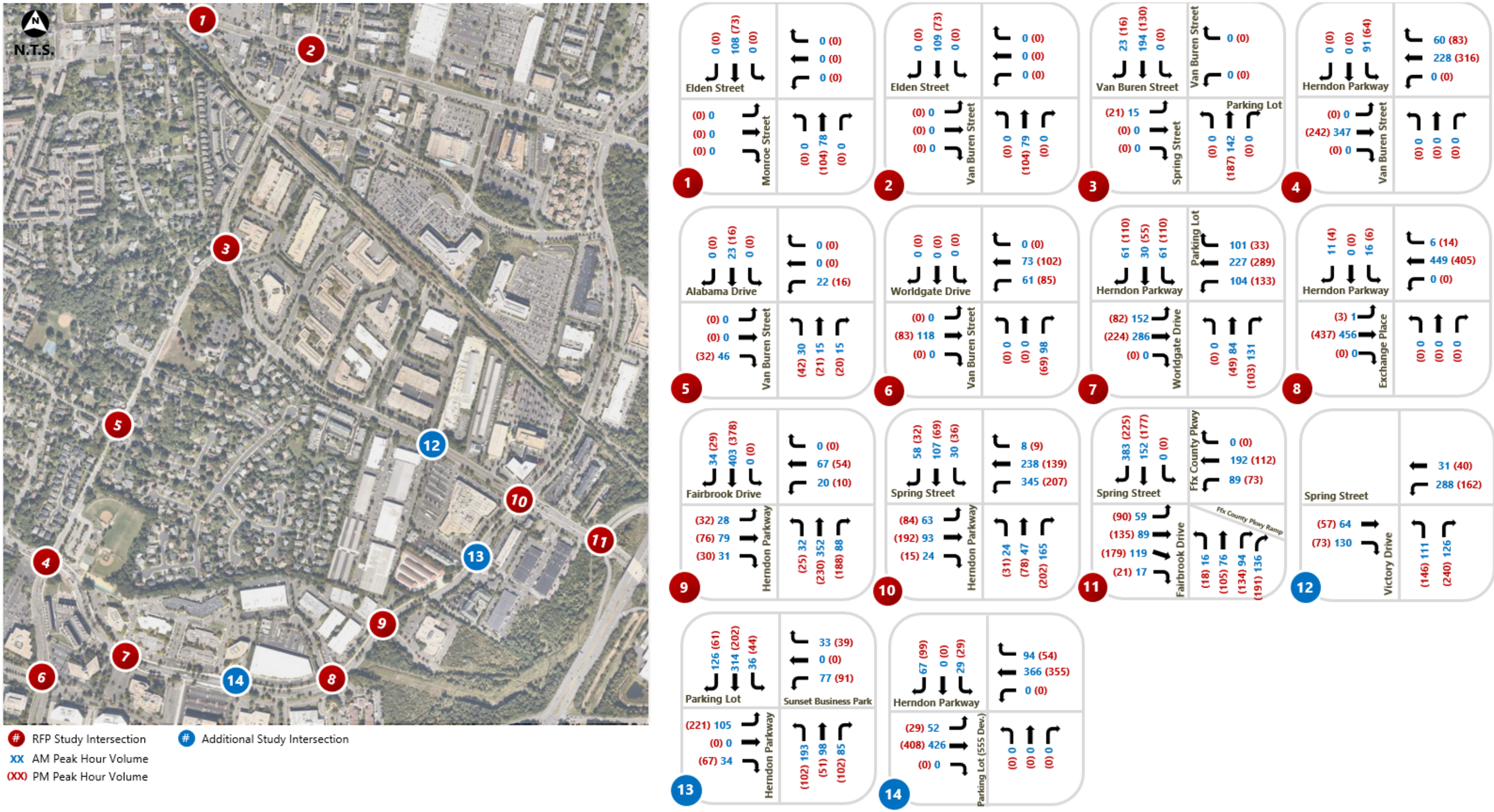
## Figure 43 Preferred Build Scenario with Mitigation 2045 Traffic Volumes



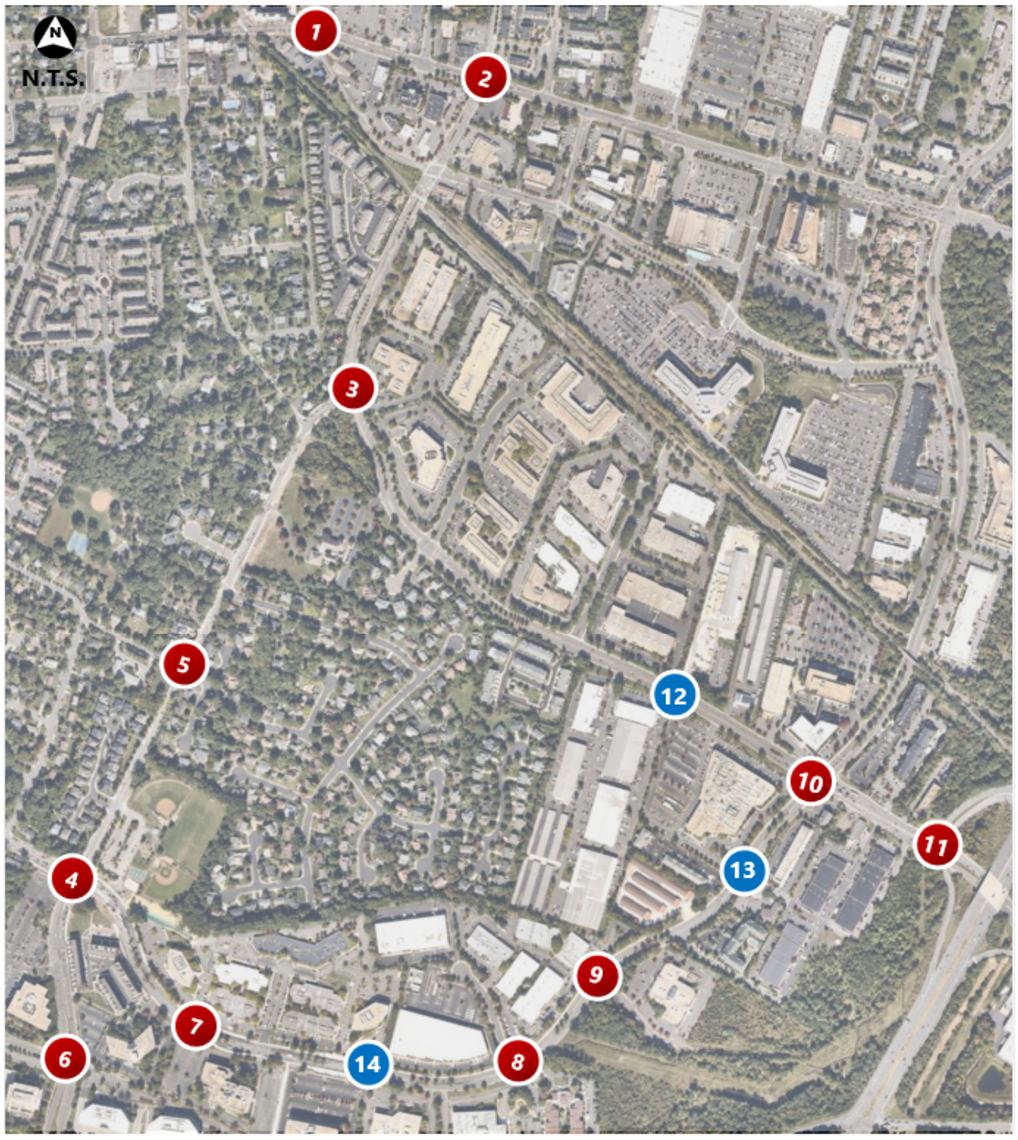

Build 2045 traffic volumes include No Build 2045 traffic volumes (Figure 6), removal of existing TRG area traffic volumes, volume shift to account for the Fairbrook Drive extension, and new TRG development traffic volumes. Basemap Source: Nearmap

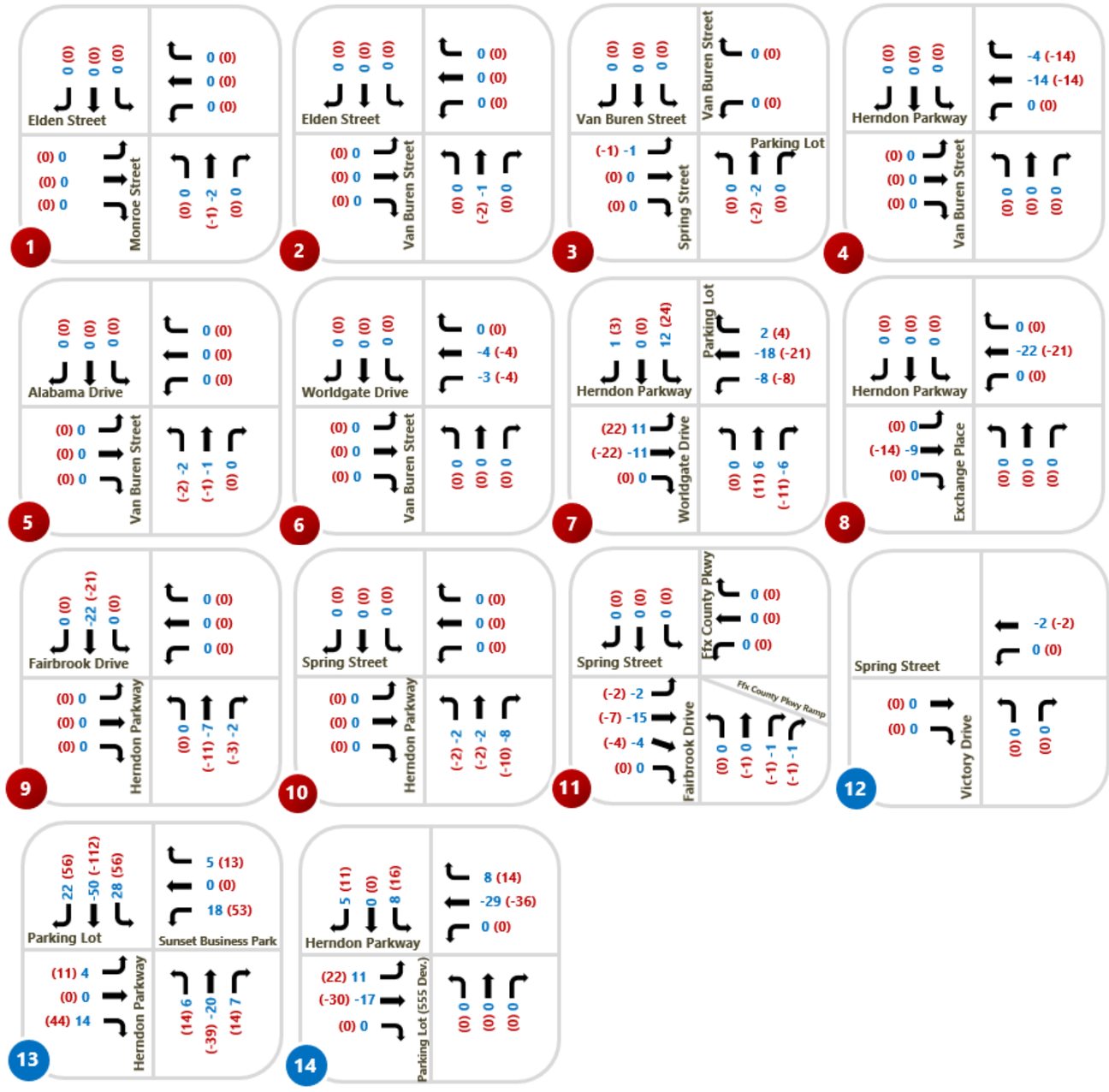
## Figure 44 Preferred Build Scenario with Mitigation New Site Trips




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 | PM Peak Delay | PM Peak LOS | Mitigation Build Scenario AM Peak Delay | AM Peak LOS | PM Peak Delay | PM Peak LOS | Change Build to Mitigated AM Peak Delay | AM Peak LOS | 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.

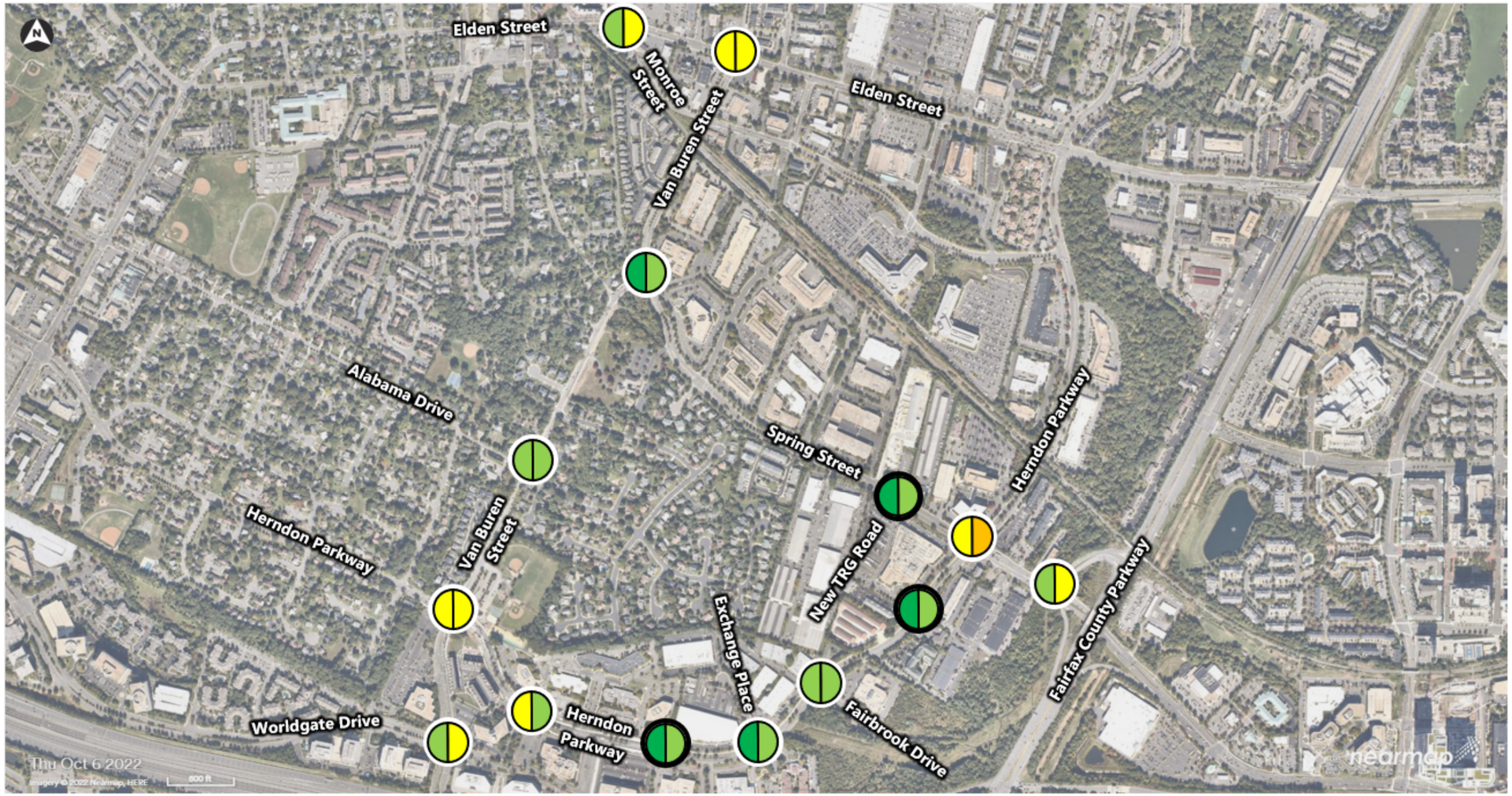
**Table 23 Comparison of LOS F Movements**

| 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

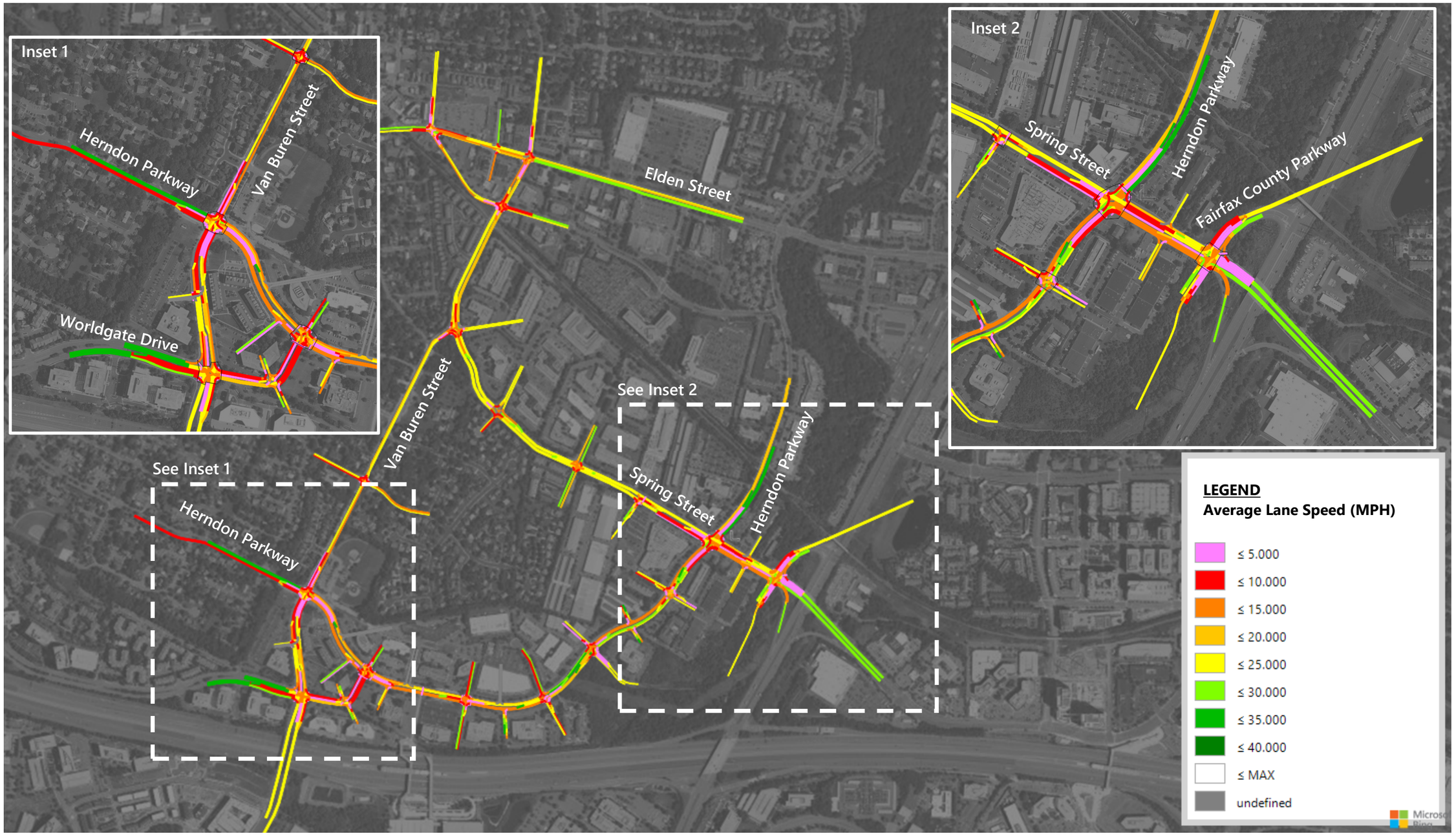
Additional Study Intersection
AM Peak Hour / PM Peak Hour

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:

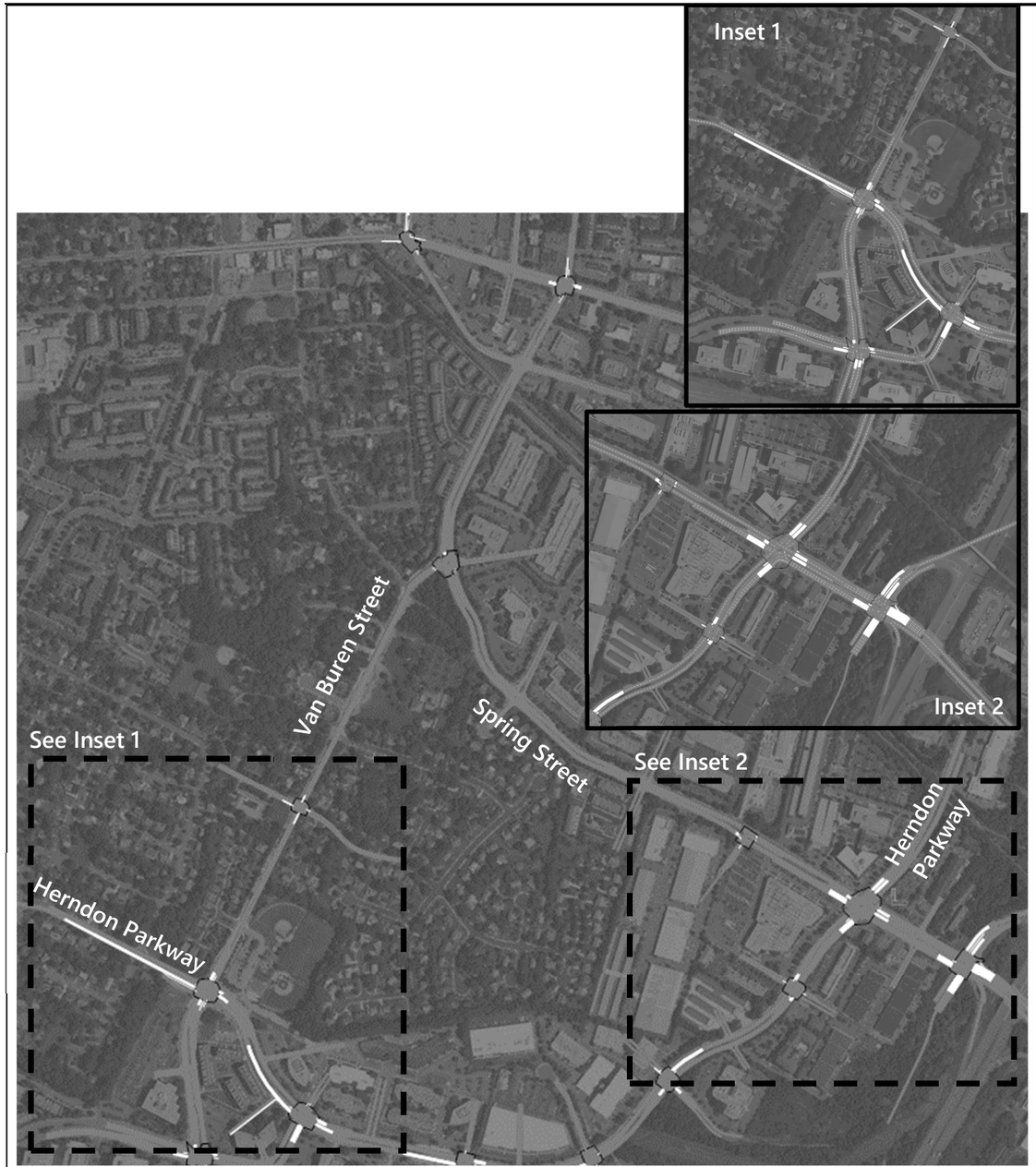
- Southbound and Northbound Van Buren Street at Herndon Parkway
- Eastbound Worldgate Drive at Van Buren Street
- Eastbound Herndon Parkway at Sunset Business Park
- Fairfax County Parkway Off-Ramp.

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

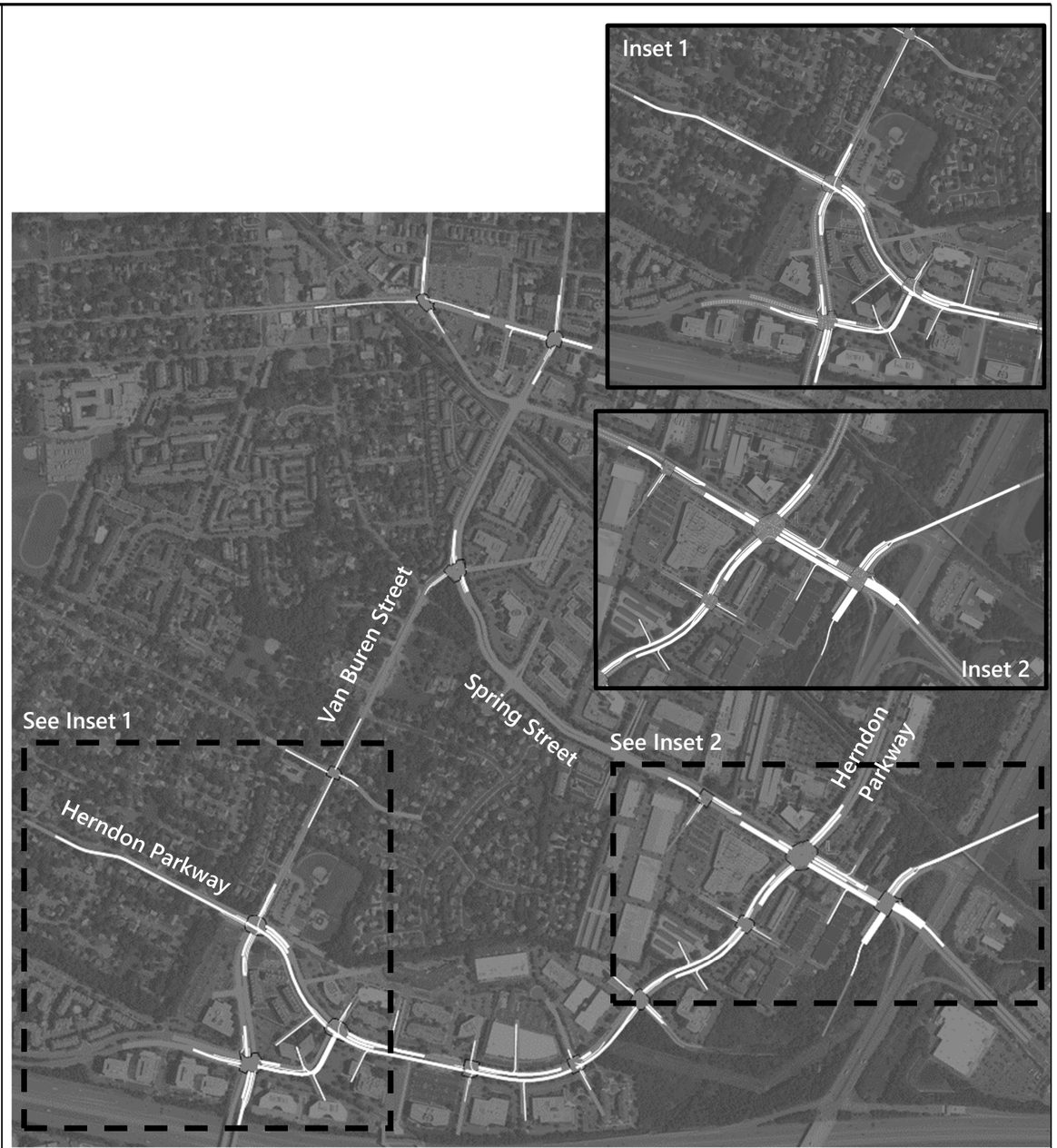
**Table 24 Transportation Mitigation Recommendations**

| 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.**<br><br>**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**

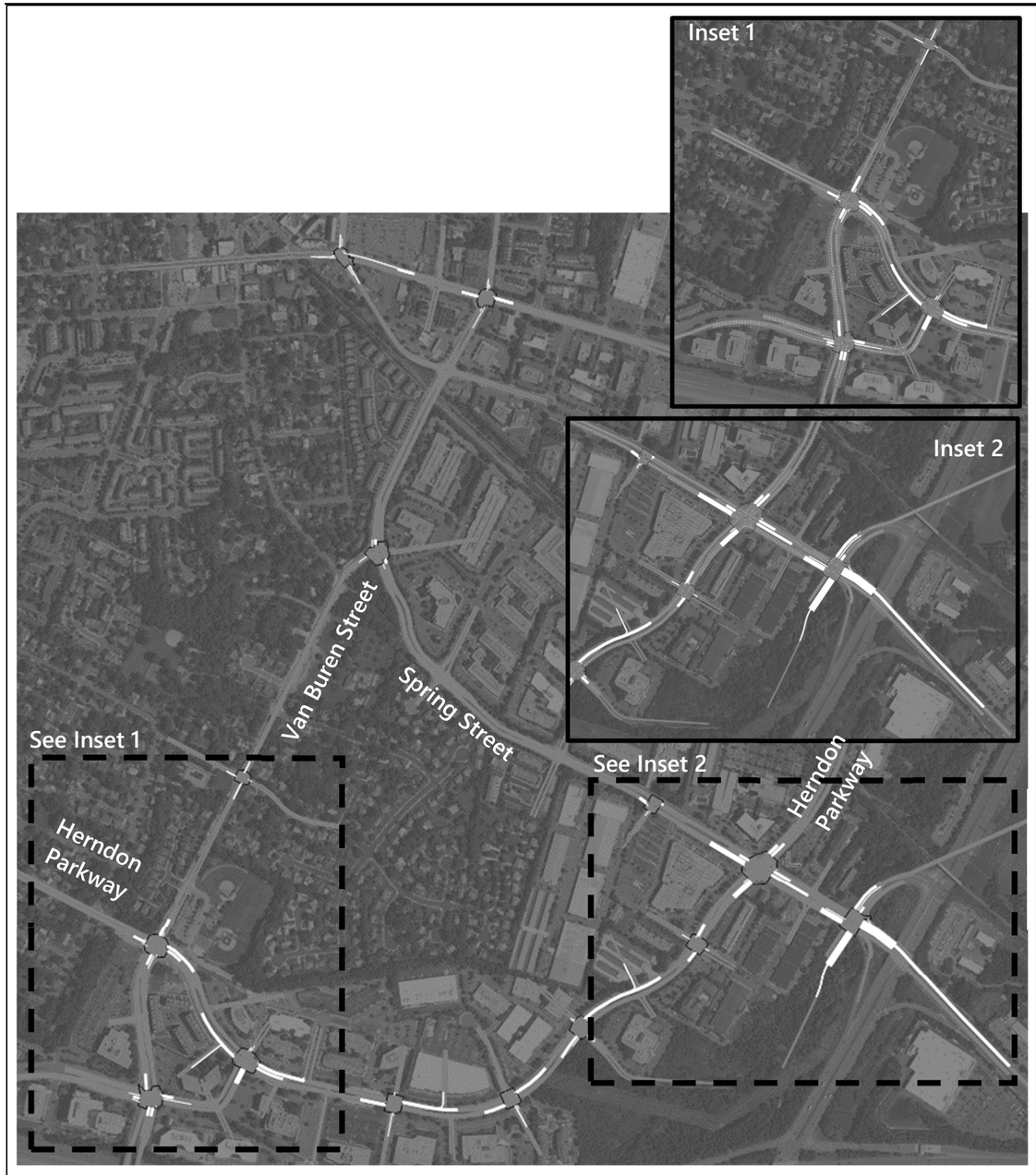



**Average Queue Length**

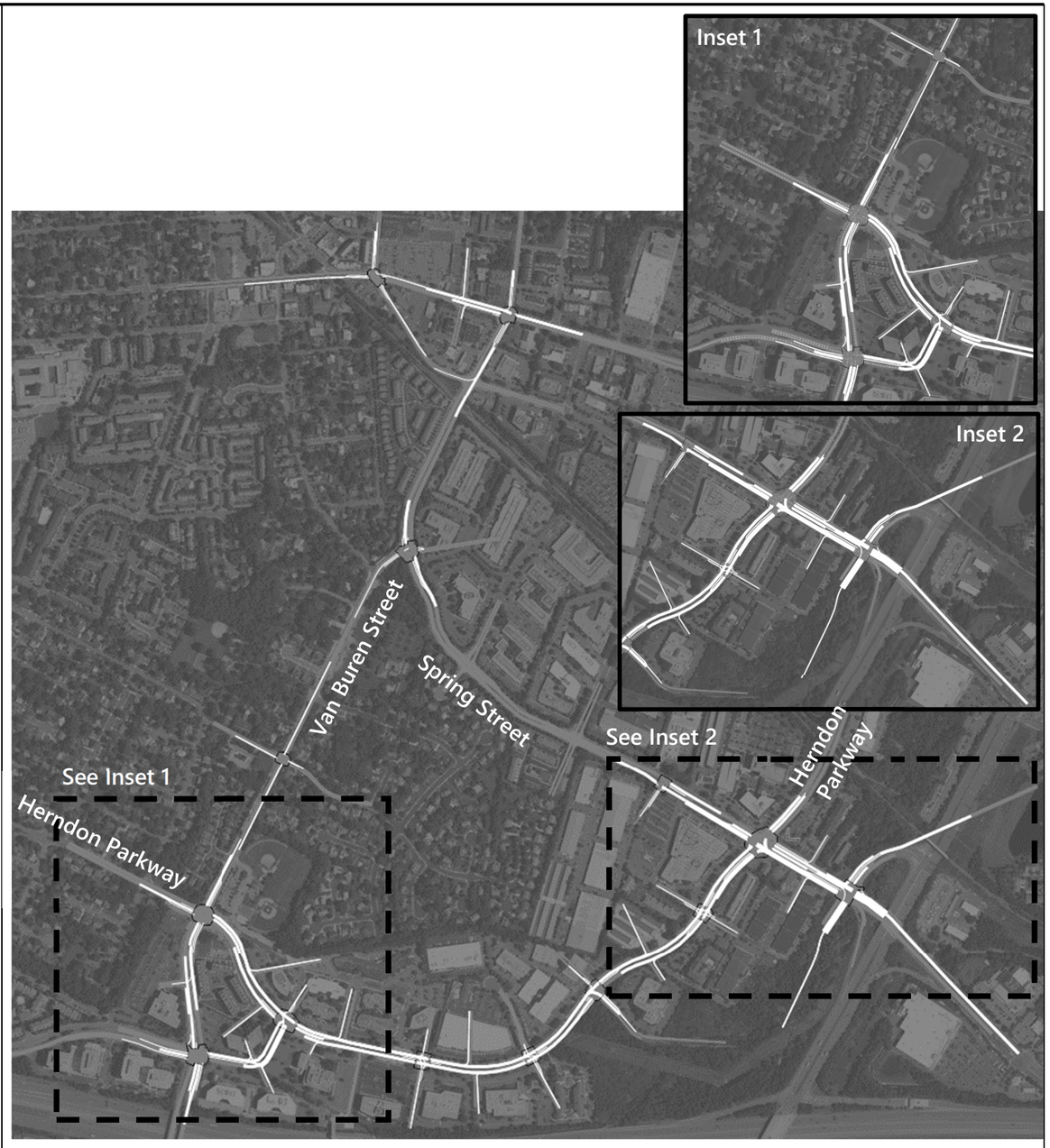



**Maximum Queue Length**

**Figure 50 Preferred Build Scenario with Mitigation 2045 Queue Map – PM Peak Hour**




**Average Queue Length**




**Maximum Queue Length**

## Divider

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# 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

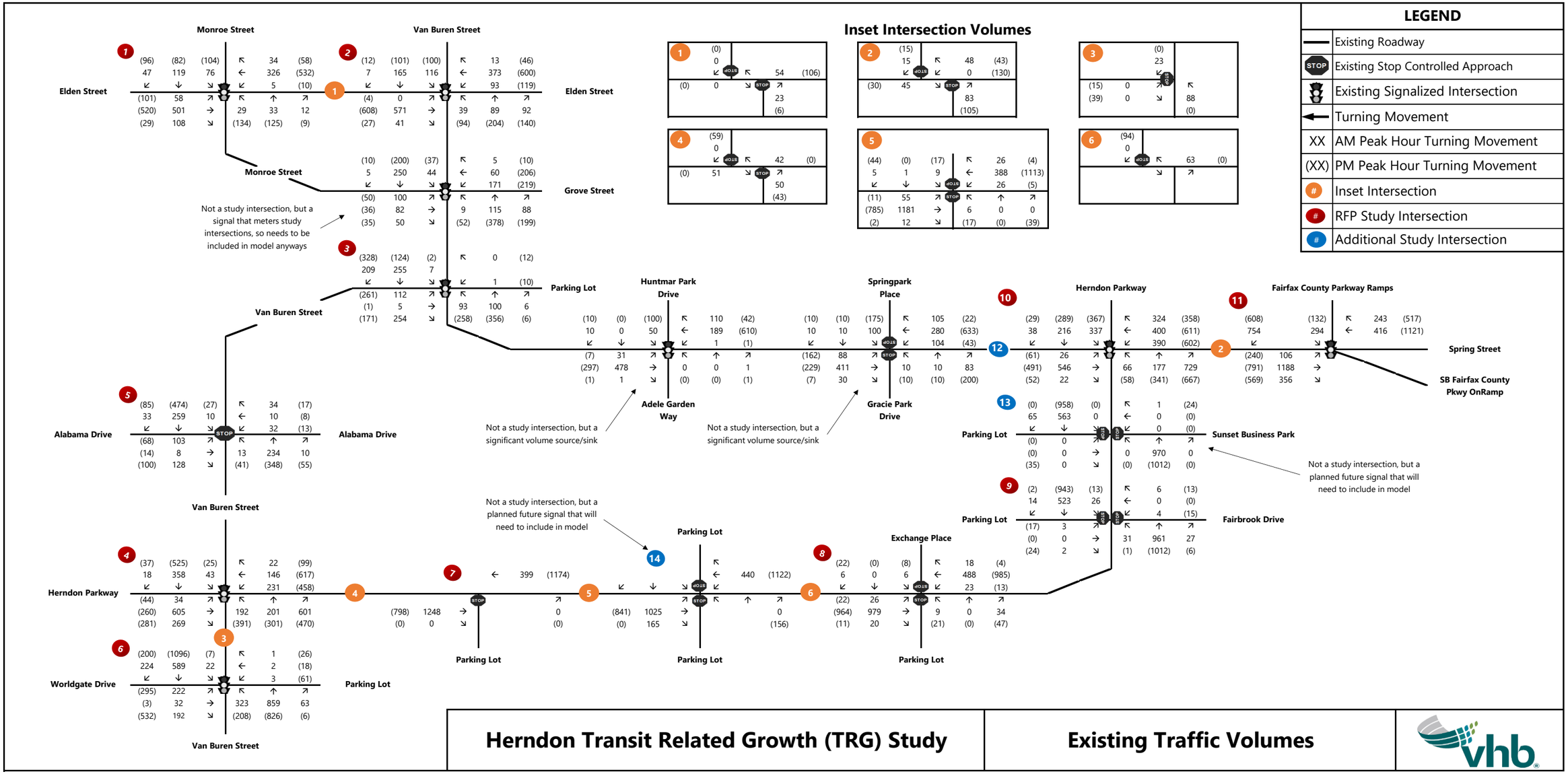
**B.11** Preferred Build 2045 Scenario AM Peak Hour

**B.12** Preferred Build 2045 Scenario PM Peak Hour

**B.13** Preferred Build with Mitigation 2045 Scenario AM Peak Hour

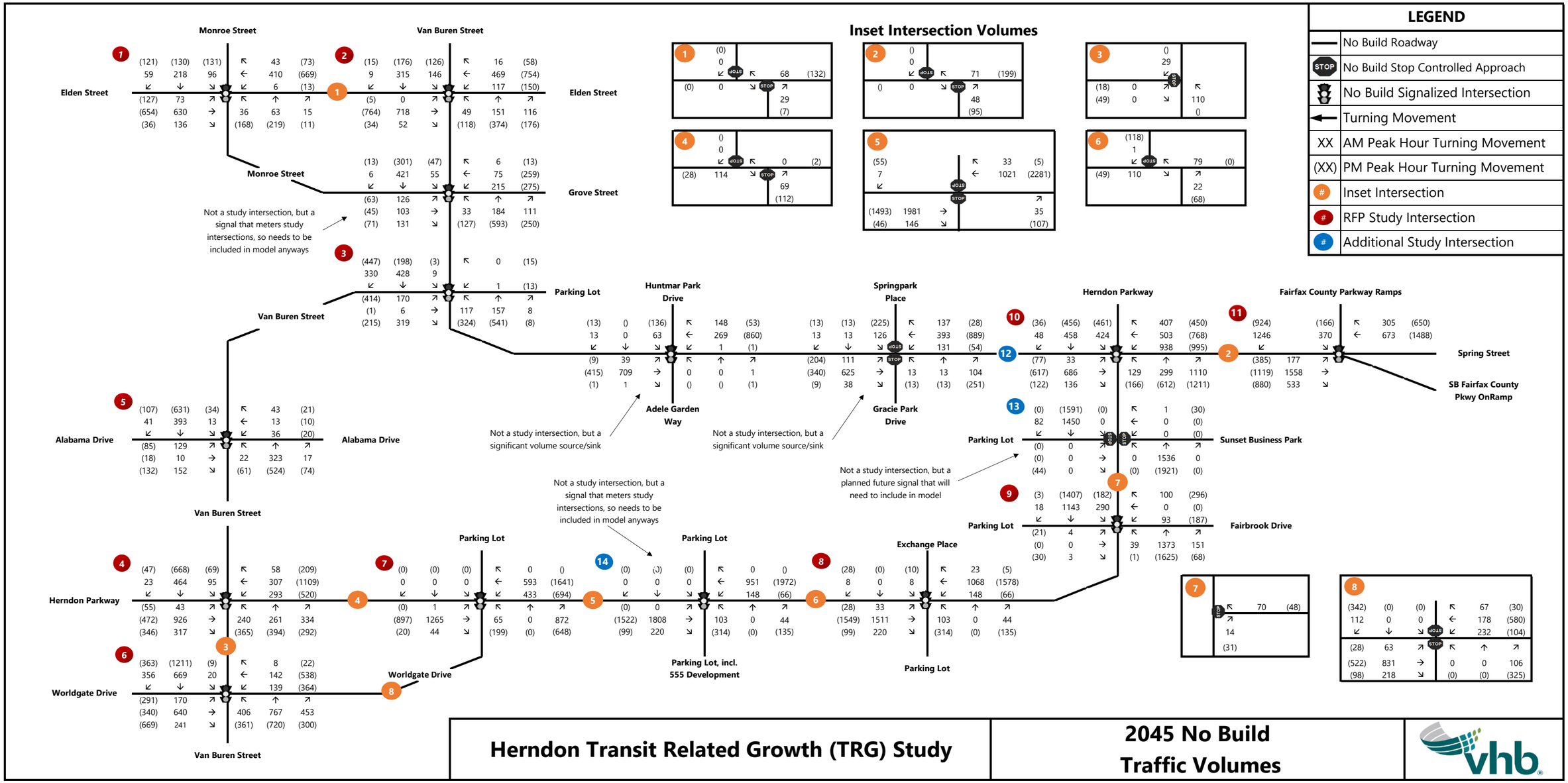
**B.14** Preferred Build with Mitigation 2045 Scenario PM Peak Hour

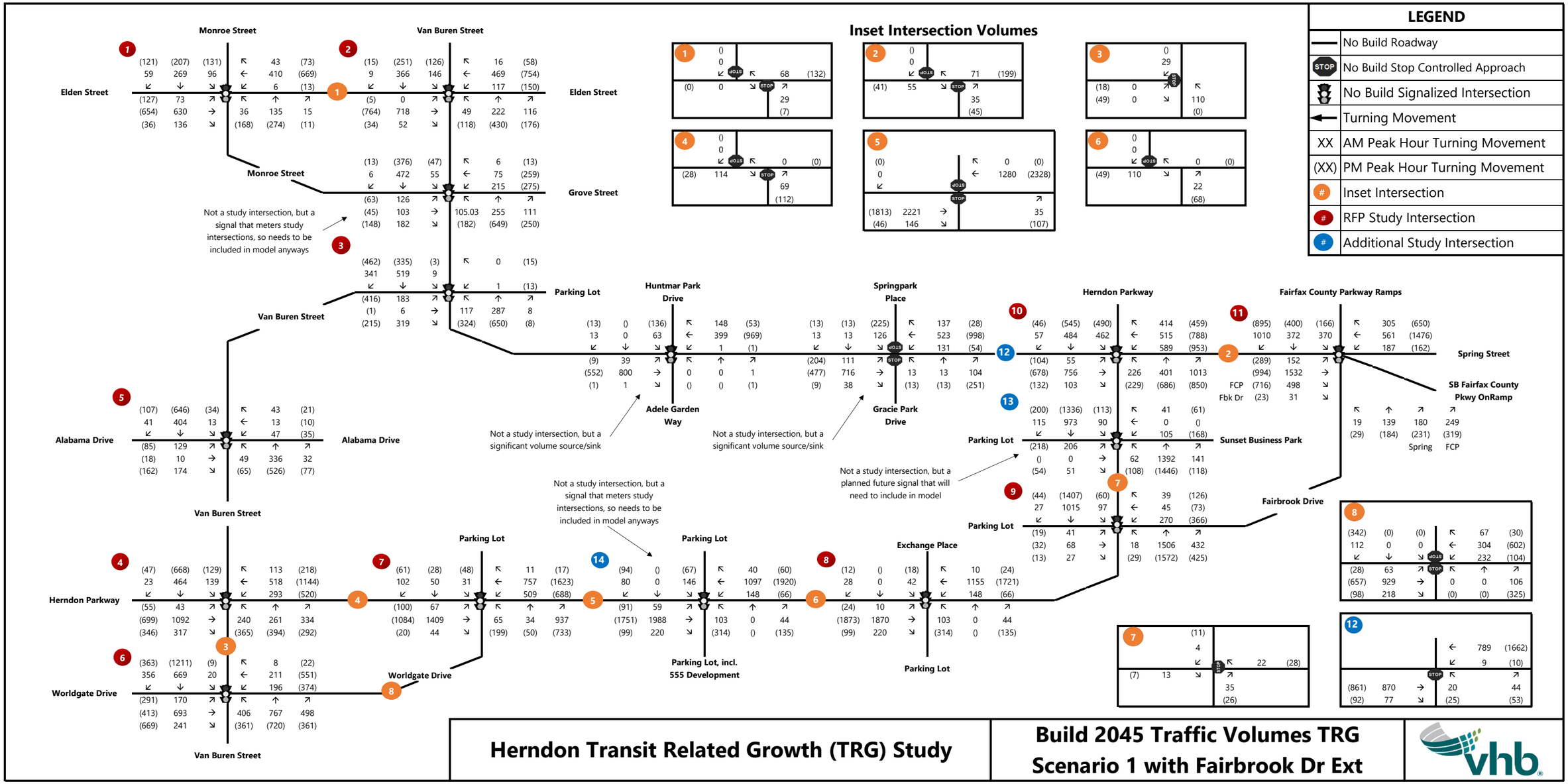
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# Herndon Transit Related Growth (TRG) Study

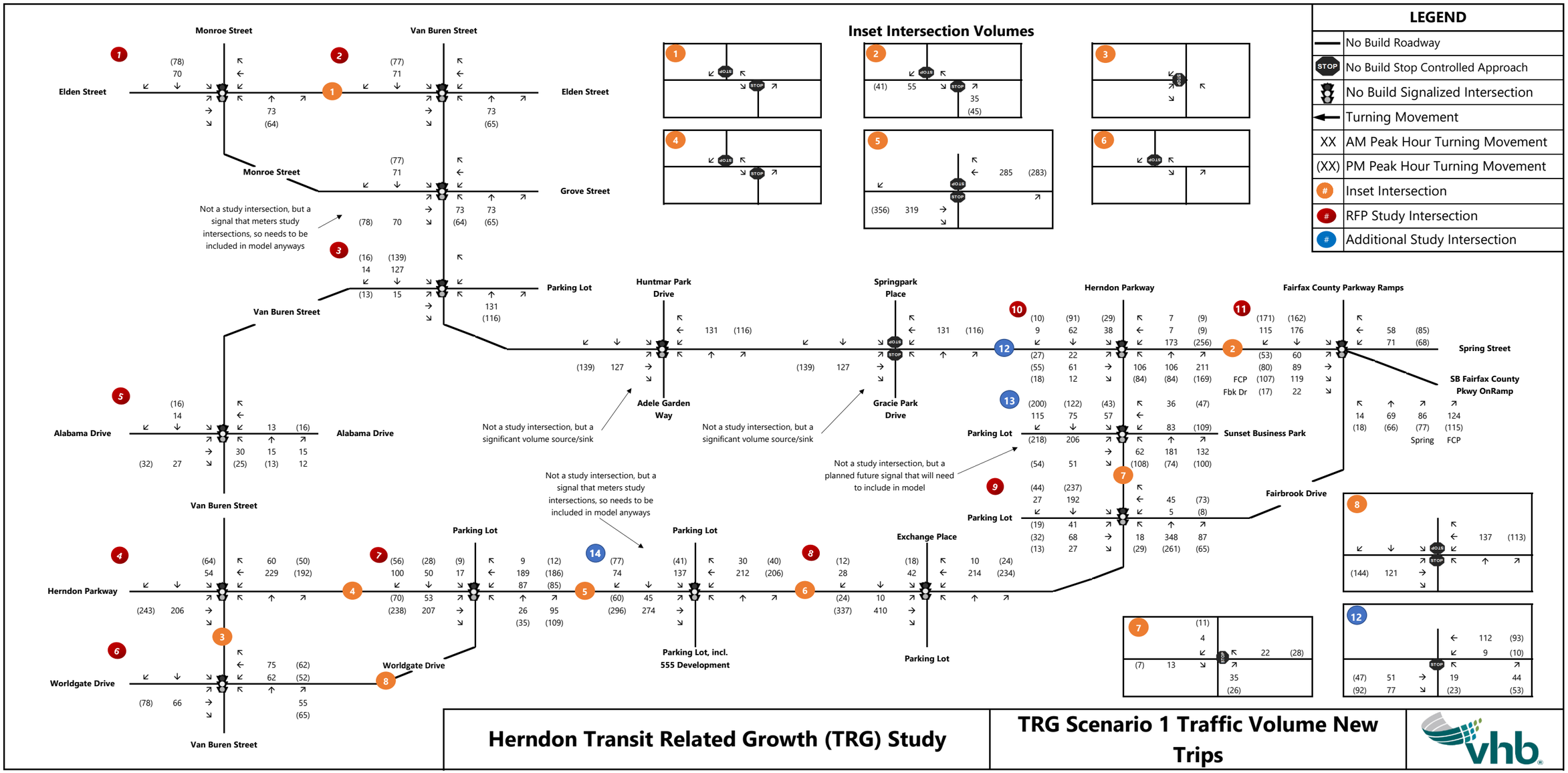
## Existing Traffic Volumes


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
Van Buren Street
Parking Lot
Parking Lot, incl. 555 Development
Exchange Place
Parking Lot
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



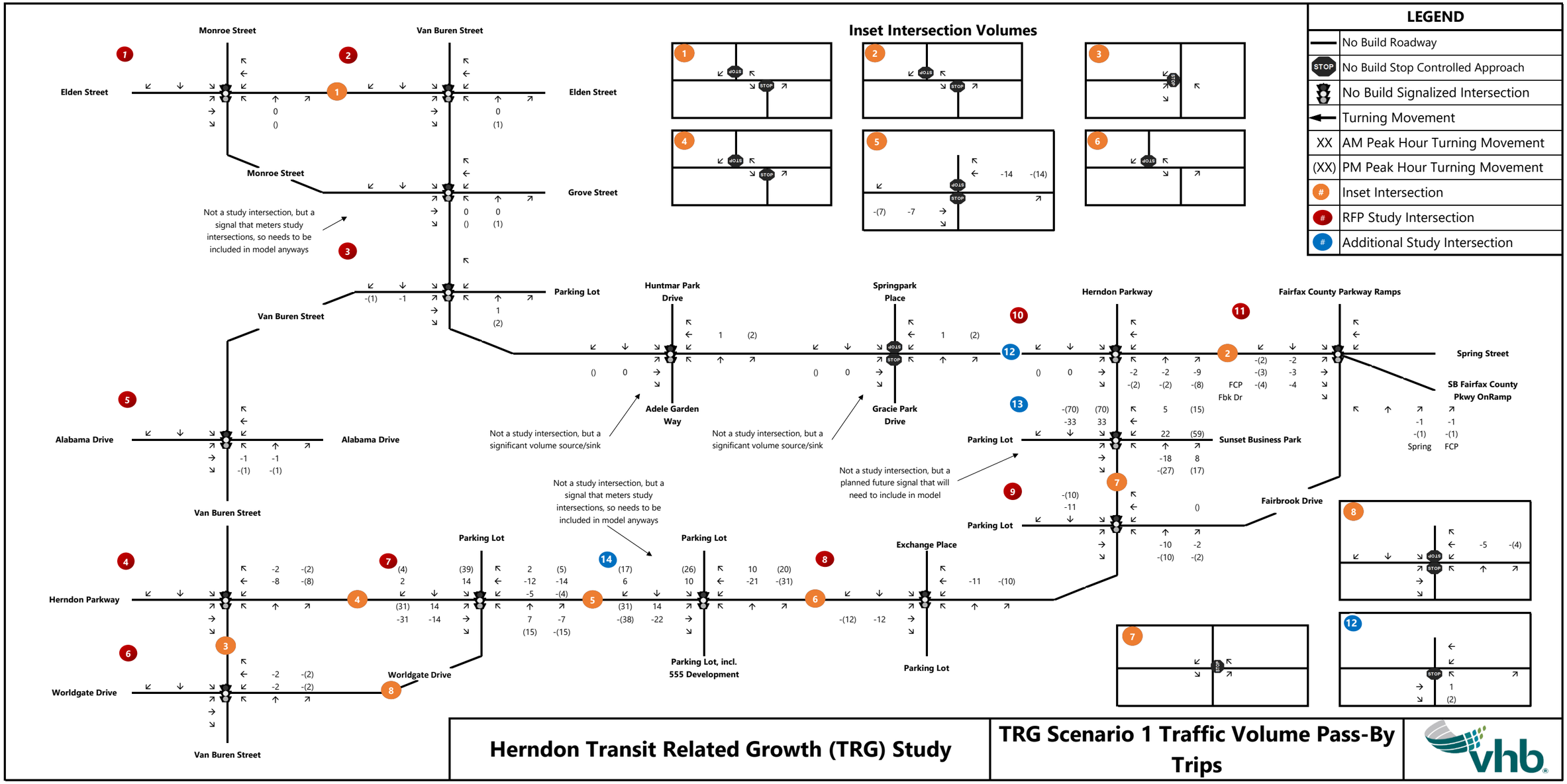

# Herndon Transit Related Growth (TRG) Study

## Build 2045 Traffic Volumes TRG Scenario 1 with Fairbrook Dr Ext



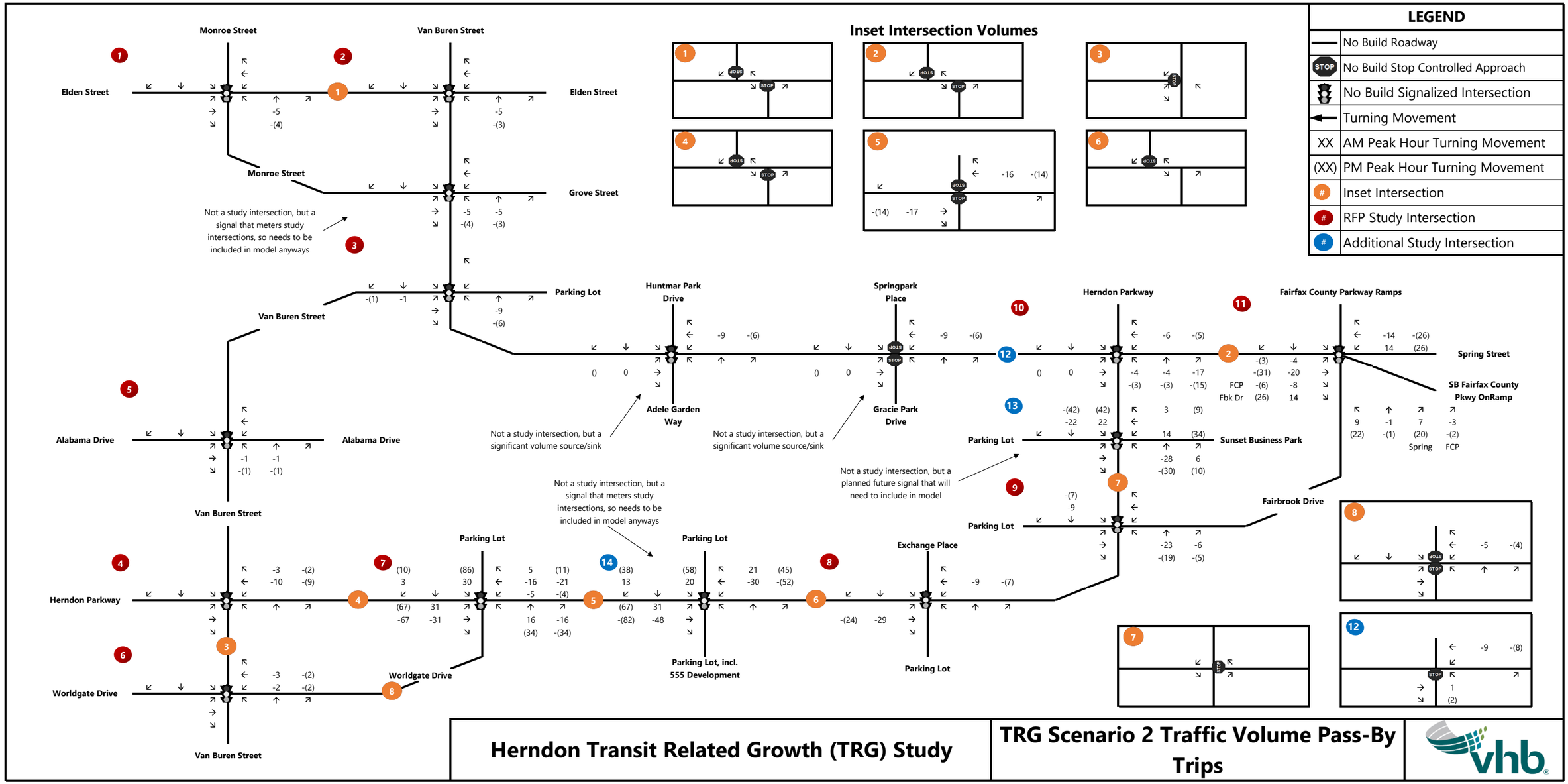

# Herndon Transit Related Growth (TRG) Study

# TRG Scenario 1 Traffic Volume New Trips



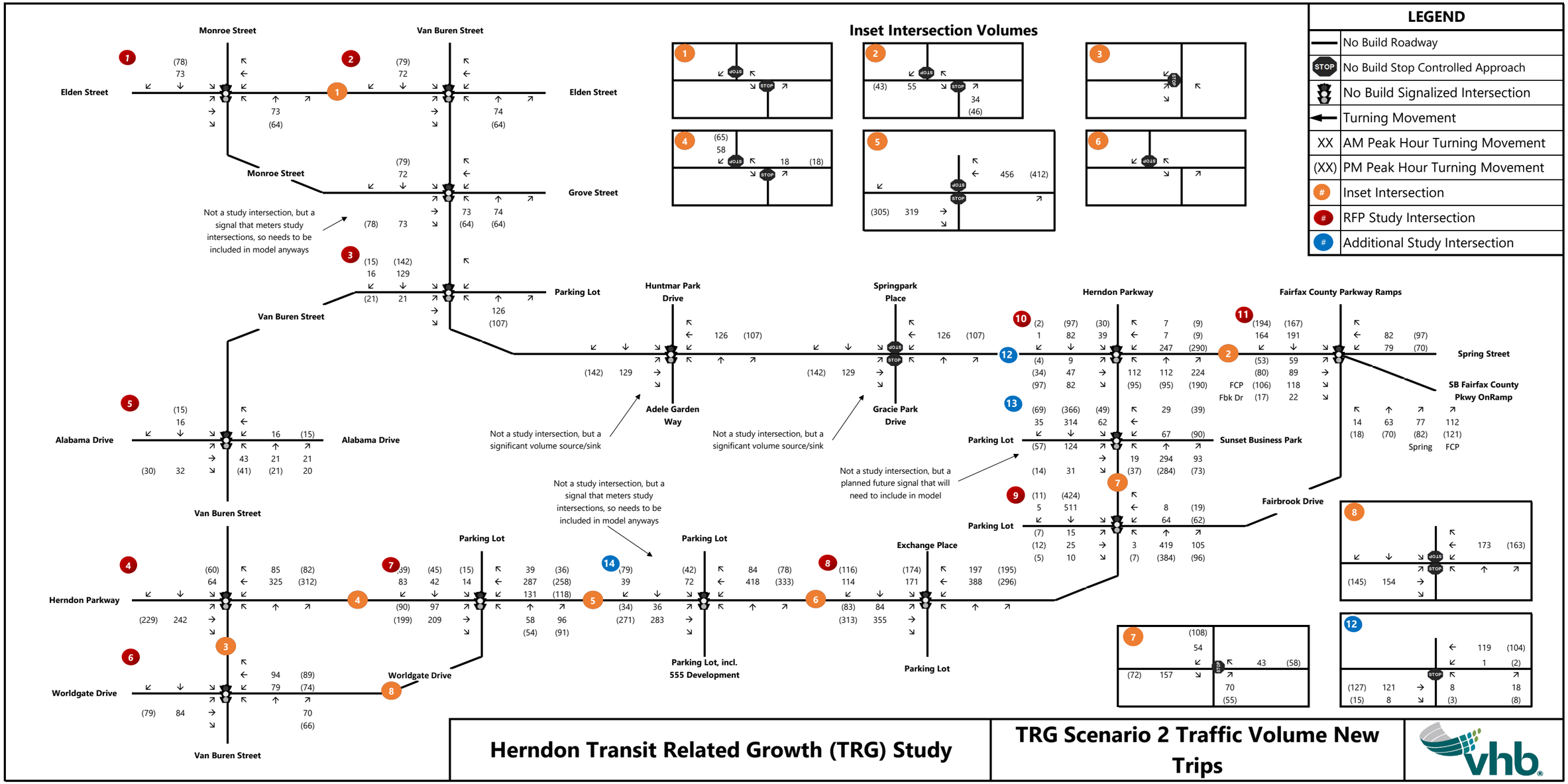

# Herndon Transit Related Growth (TRG) Study

## TRG Scenario 1 Traffic Volume Pass-By Trips



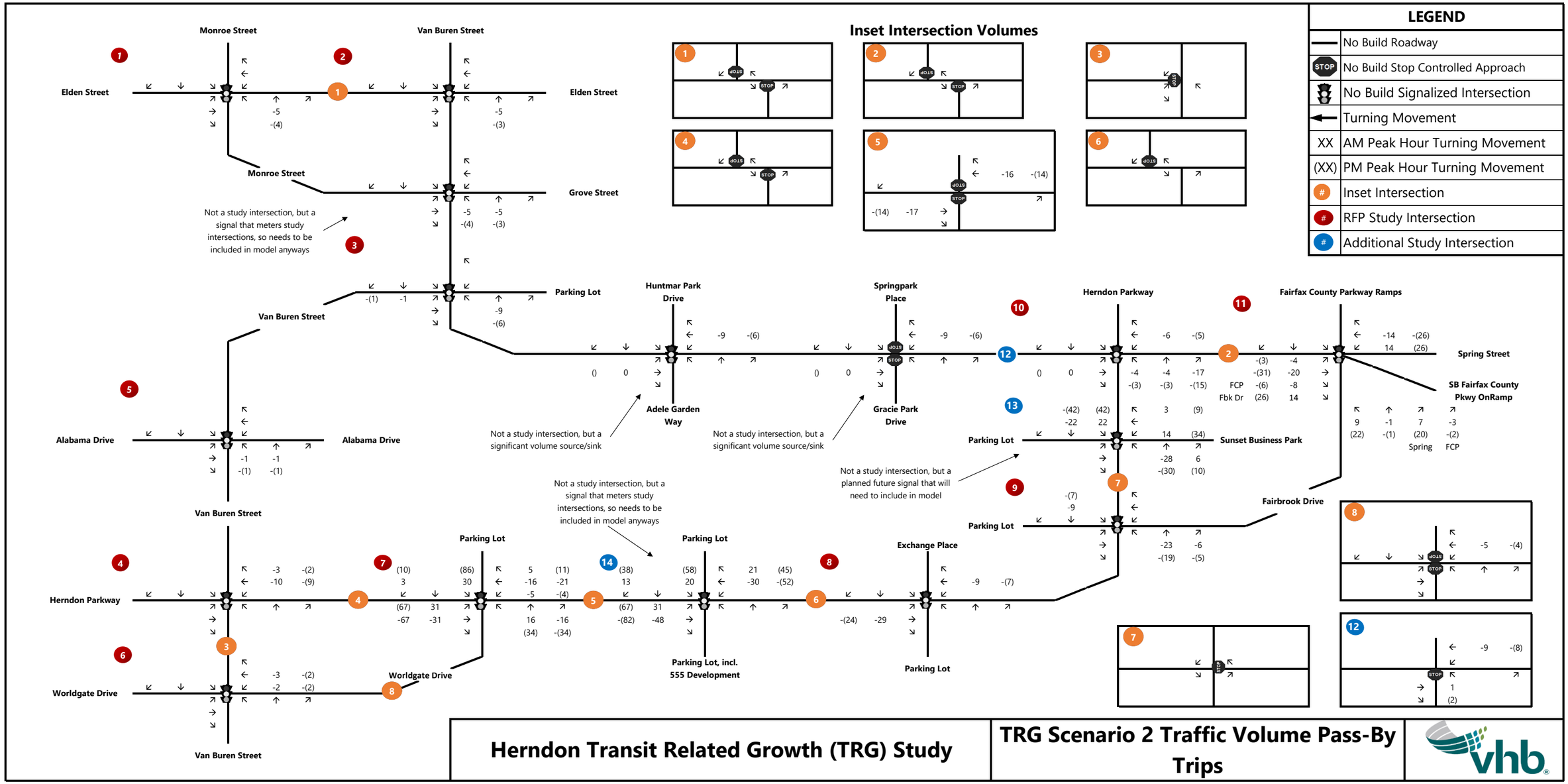

# Herndon Transit Related Growth (TRG) Study

## TRG Scenario 2 Traffic Volume Pass-By Trips



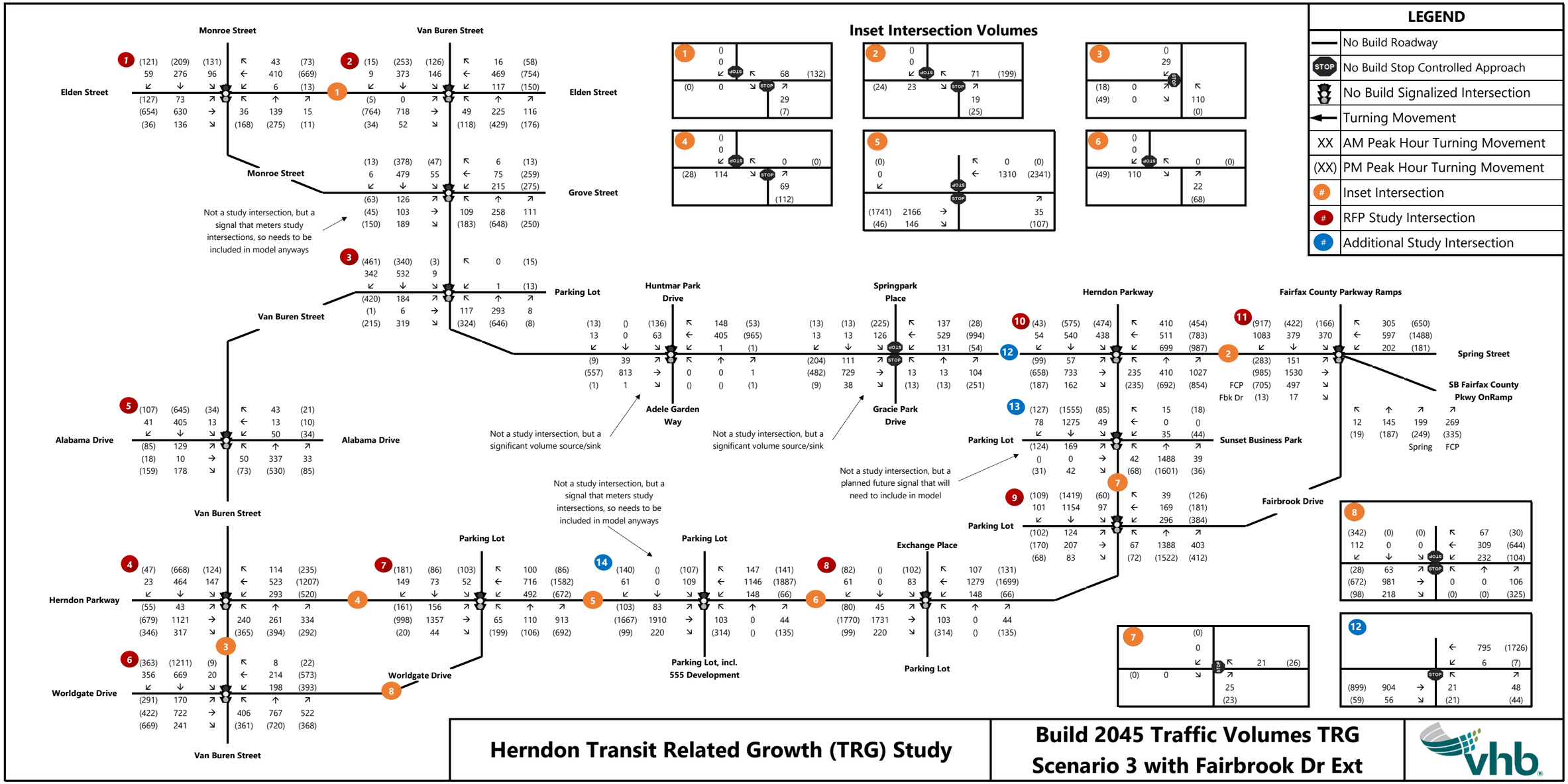

# Herndon Transit Related Growth (TRG) Study

## TRG Scenario 2 Traffic Volume New Trips



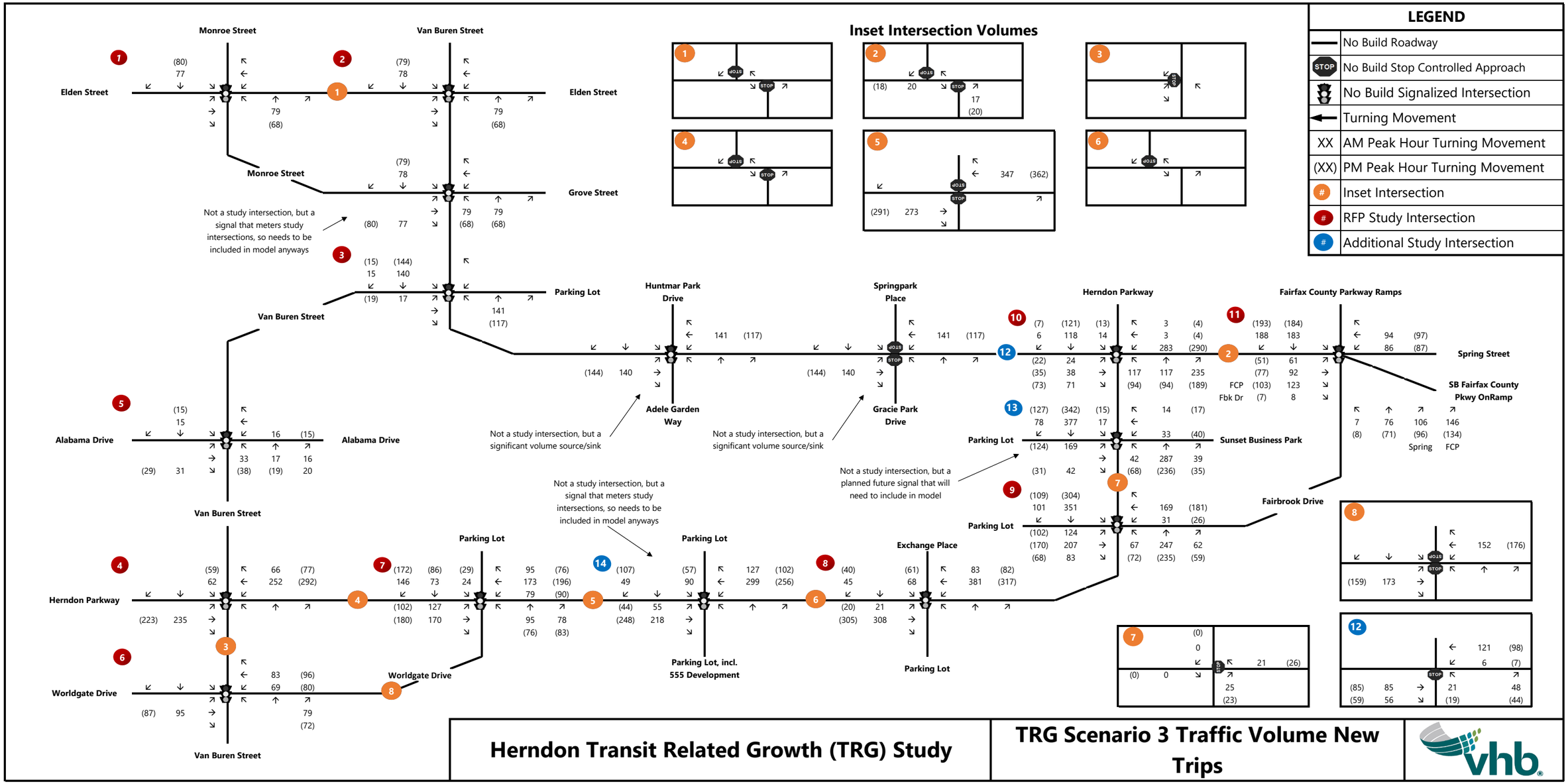

# Herndon Transit Related Growth (TRG) Study

## TRG Scenario 2 Traffic Volume Pass-By Trips



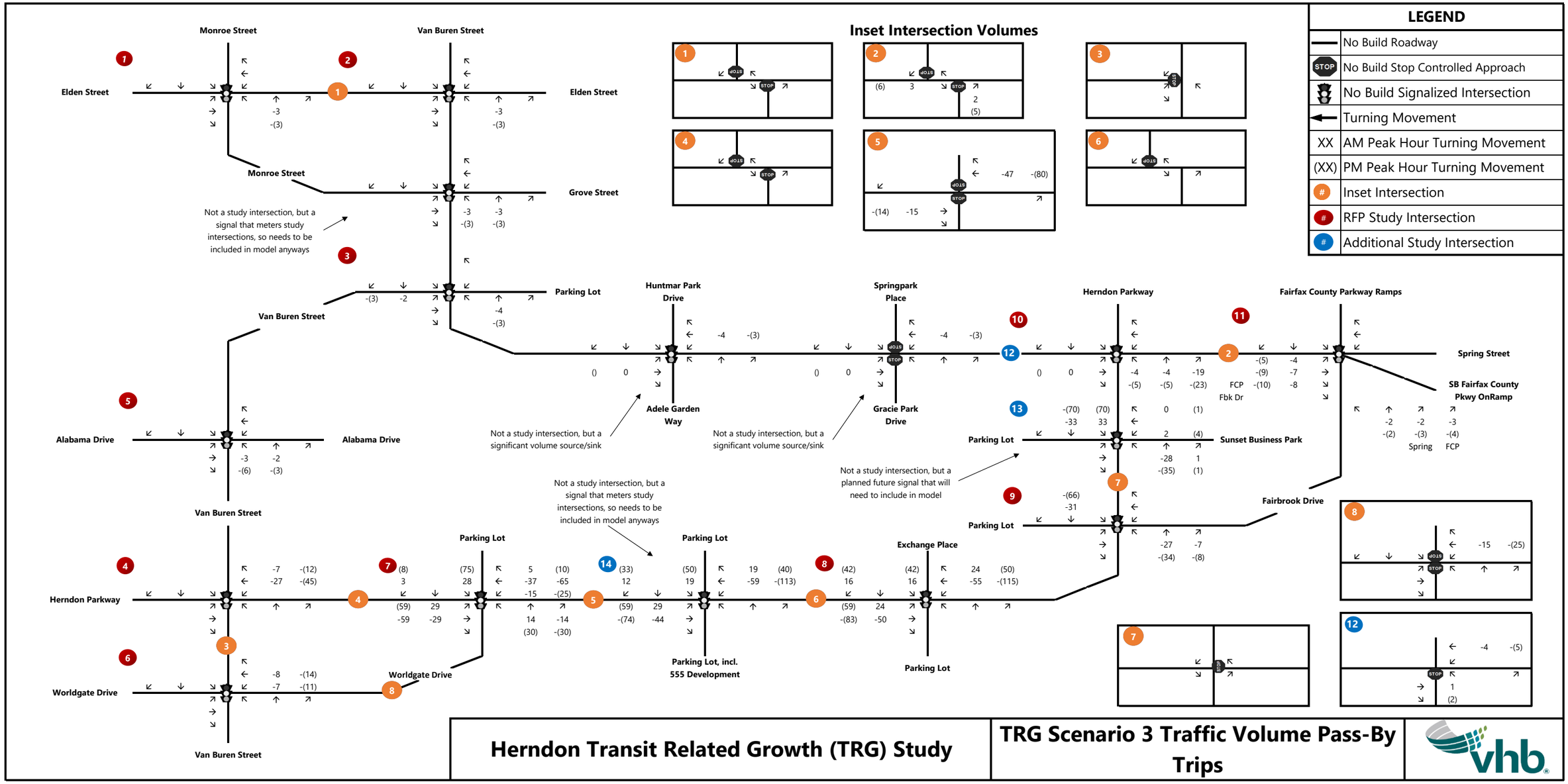

# Herndon Transit Related Growth (TRG) Study

## Build 2045 Traffic Volumes TRG Scenario 3 with Fairbrook Dr Ext



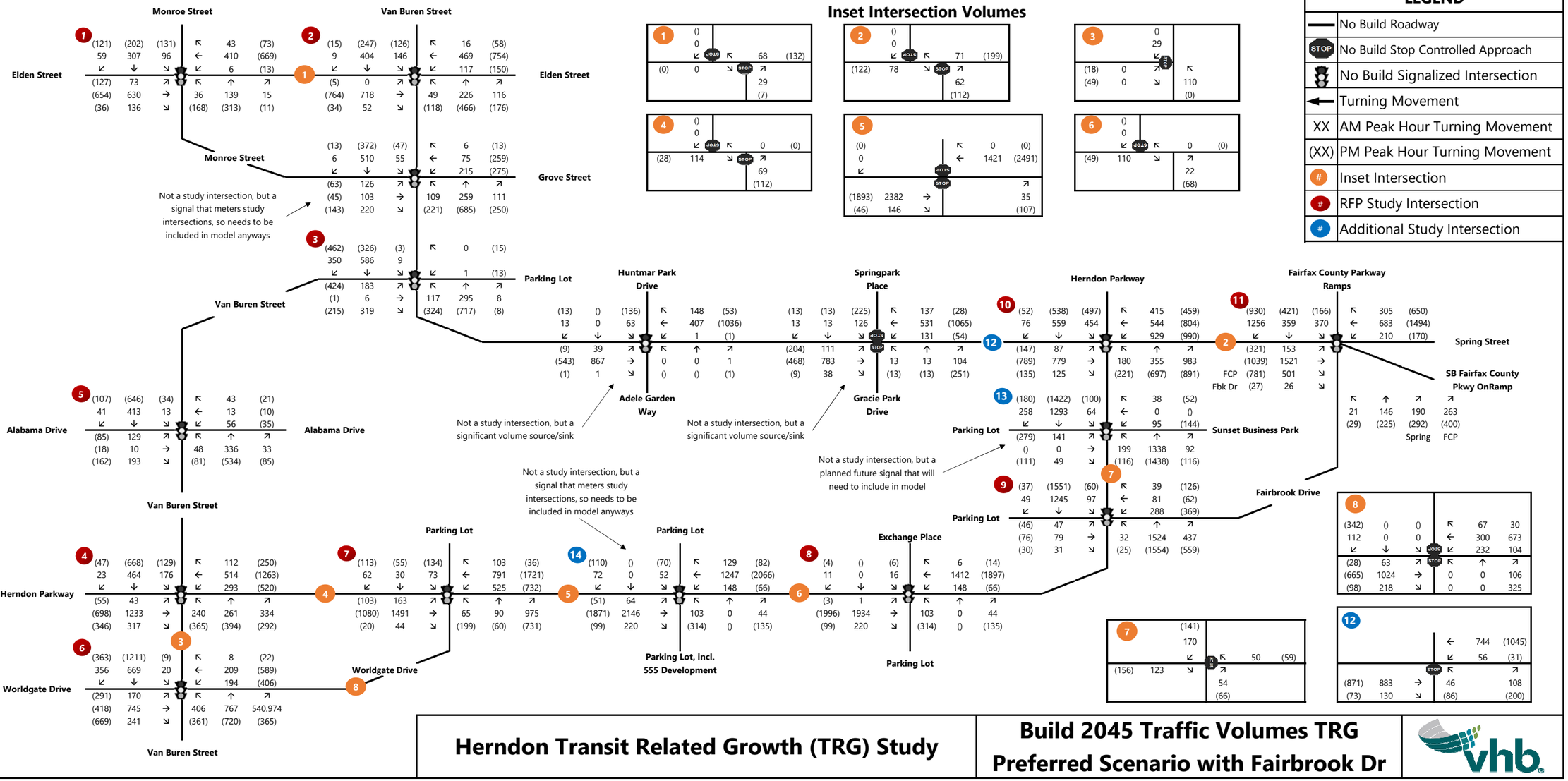

# Herndon Transit Related Growth (TRG) Study

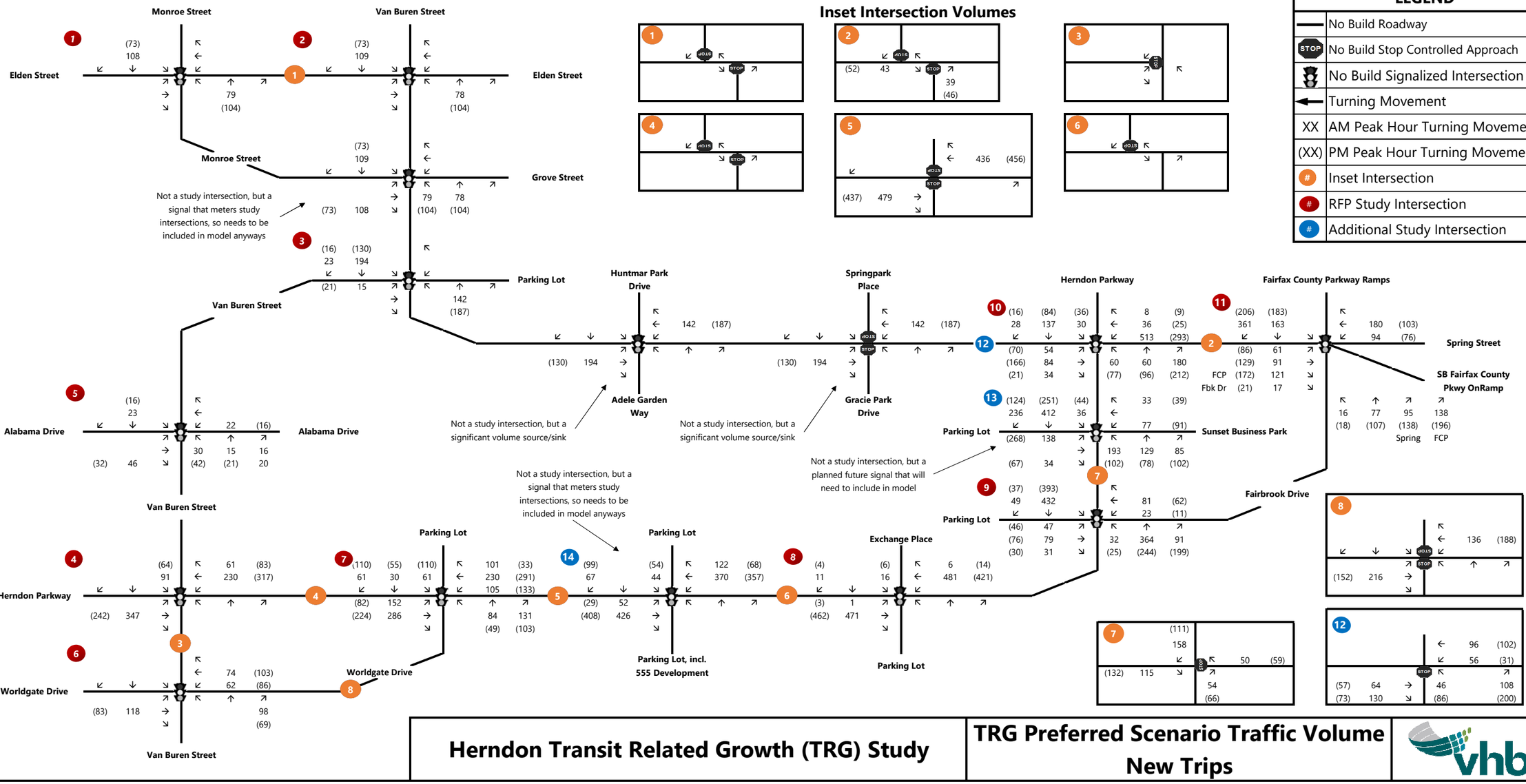
## TRG Scenario 3 Traffic Volume New Trips




# Herndon Transit Related Growth (TRG) Study

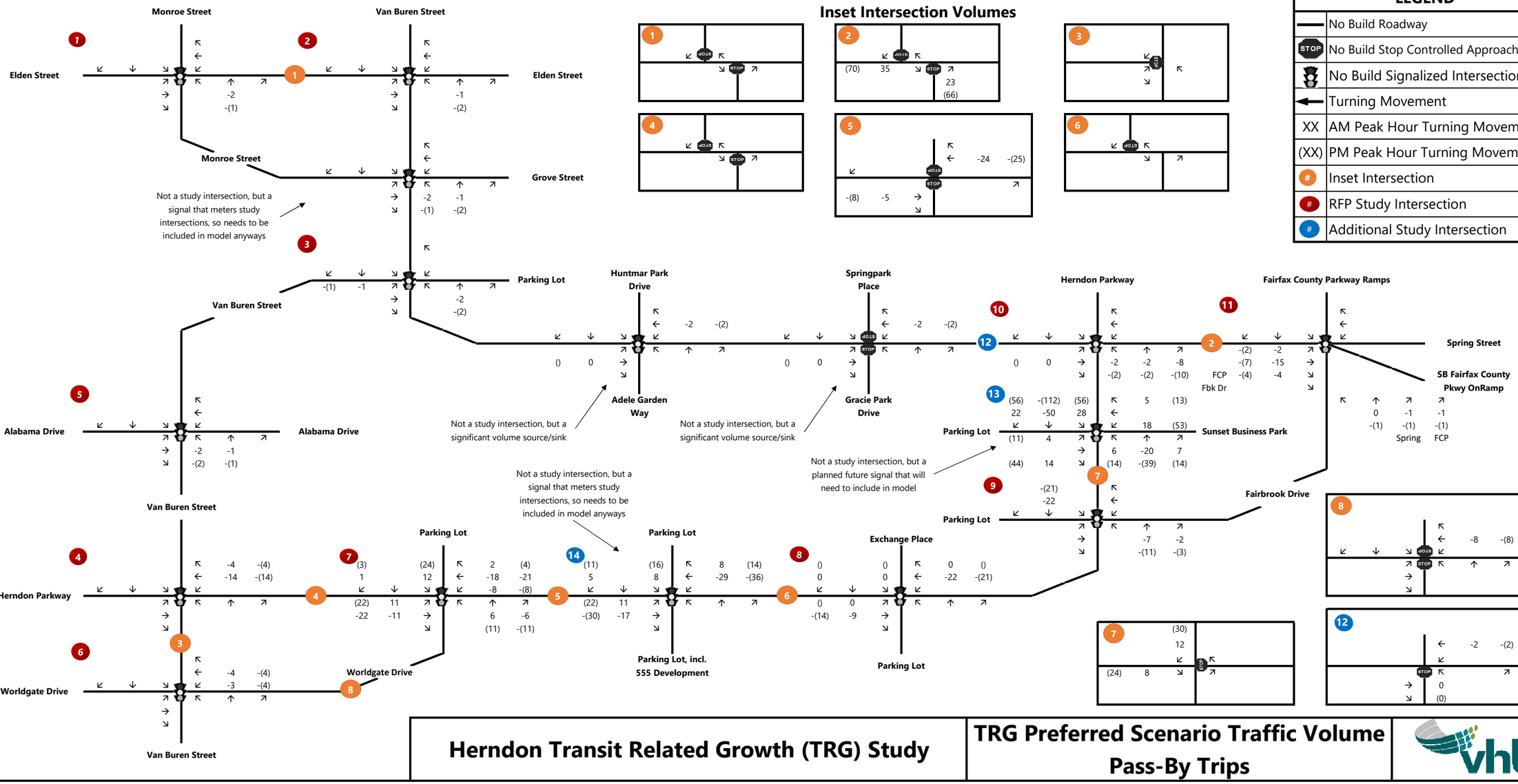
## TRG Scenario 3 Traffic Volume Pass-By Trips


Monroe Street
Van Buren Street
Elden Street
Grove Street
Parking Lot
Alabama Drive
Herndon Parkway
Worldgate Drive
Huntmar Park Drive
Springpark Place
Adele Garden Way
Gracie Park Drive
Herndon Parkway
Fairfax County Parkway Ramps
Spring Street
SB Fairfax County Pkwy OnRamp
Sunset Business Park
Fairbrook Drive
Exchange Place
Parking Lot, incl. 555 Development
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 planned future signal that will need to include in model
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
Build 2045 Traffic Volumes TRG
Preferred Scenario with Fairbrook Dr
vhb



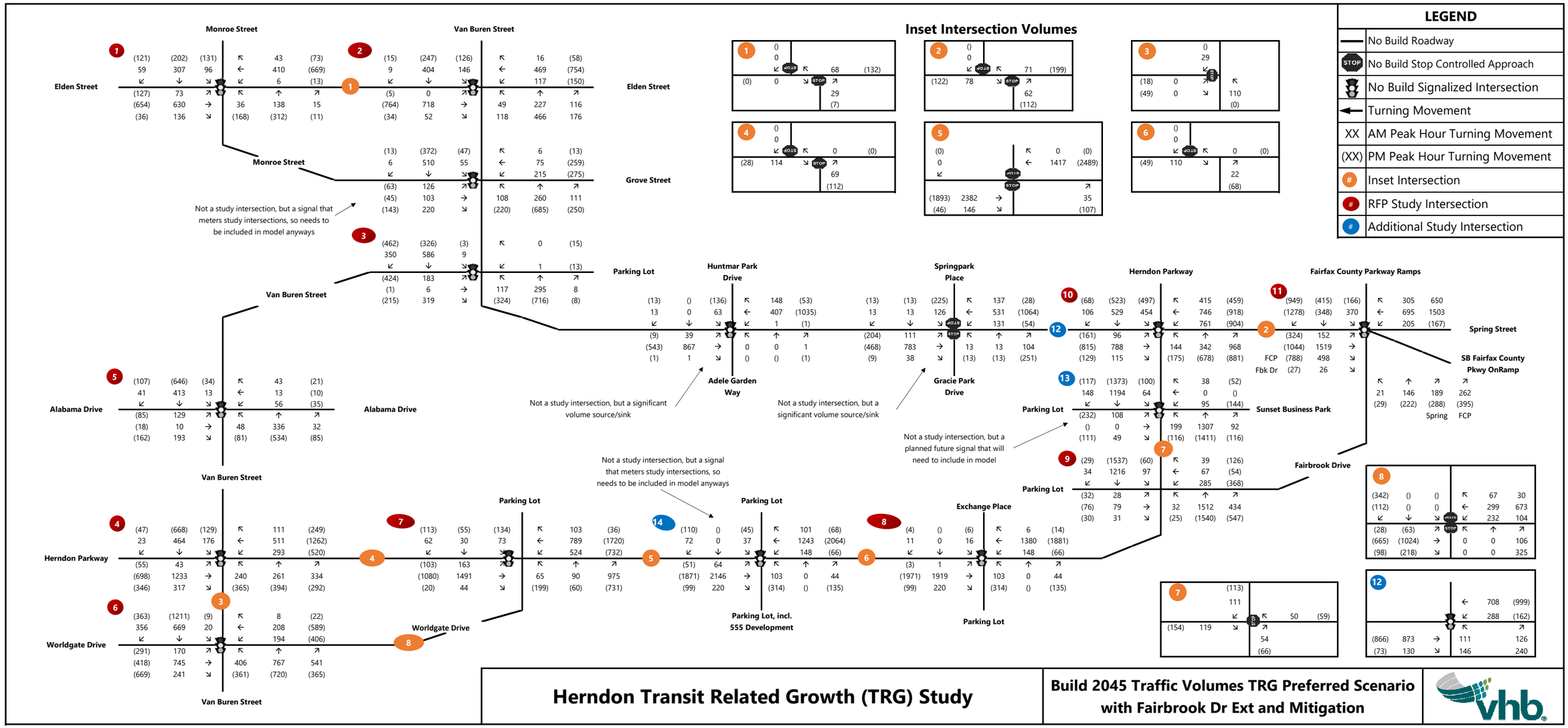

# Herndon Transit Related Growth (TRG) Study

## TRG Preferred Scenario Traffic Volume New Trips




# Herndon Transit Related Growth (TRG) Study

## TRG Preferred Scenario Traffic Volume Pass-By Trips




## Inset Intersection Volumes

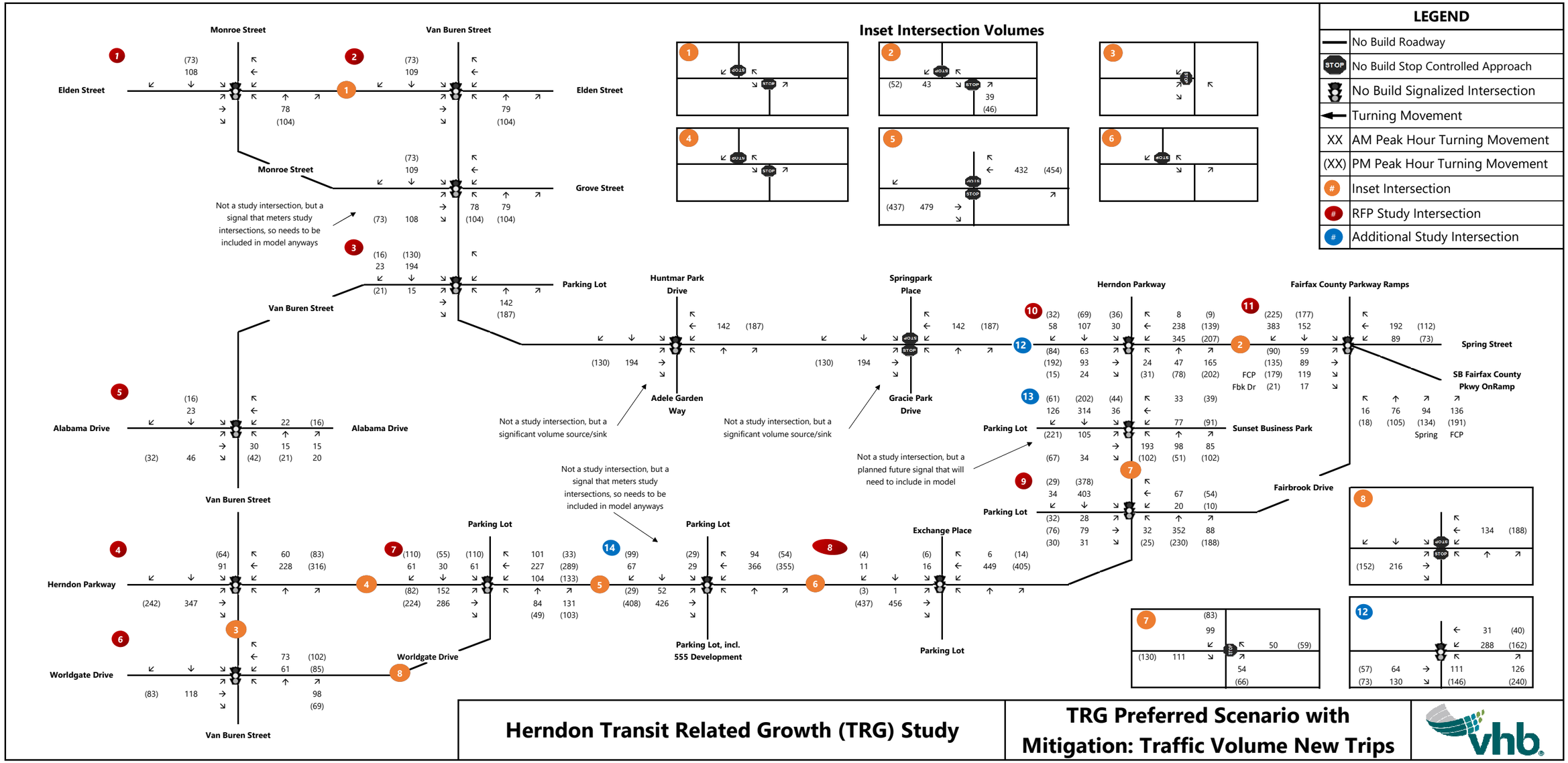


## LEGEND

| | |
|---|---|
| | No Build Roadway |
| STOP | 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 |

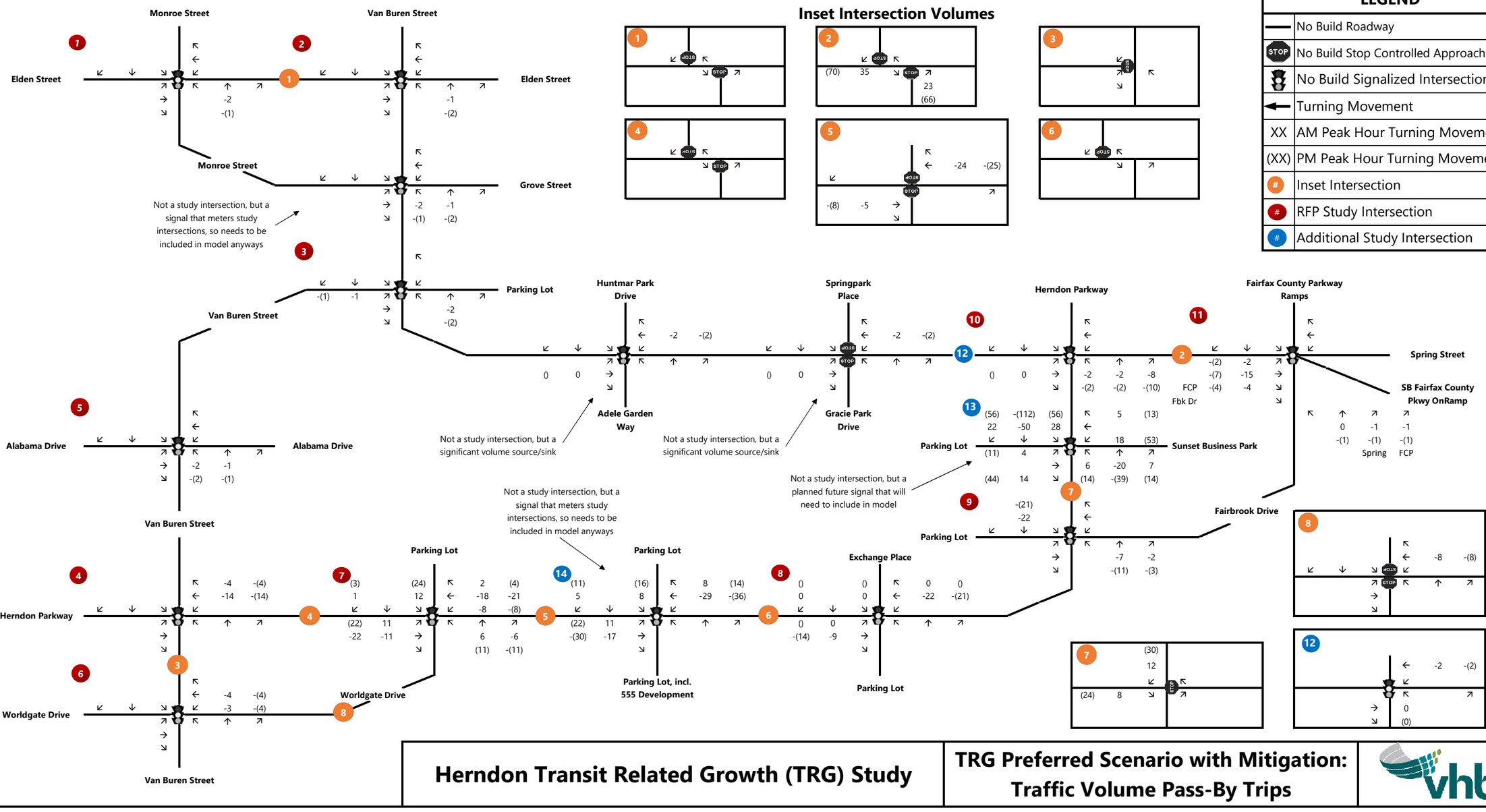
# Herndon Transit Related Growth (TRG) Study

## 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 | To Monroe Street signal |
| | | | EBT | 718 | 690 | -28 | -4% | | | | | 12.4 | B | | | 30 | 274 | 850 | |
| | | | 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 | |
| | | | EBT | 764 | 755 | -9 | -1% | | | | | 42.5 | D | | | 110 | 354 | 850 | To Monroe Street signal |
| | | | 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

TRG
TRANSIT - RELATED GROWTH AREA

TOWN OF Herndon
SOM

# SITE CONDITIONS ANALYSIS

TOWN OF HERNDON TRANSIT-RELATED SMALL AREA PLAN
NOVEMBER 2022

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# 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

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# INTRODUCTION

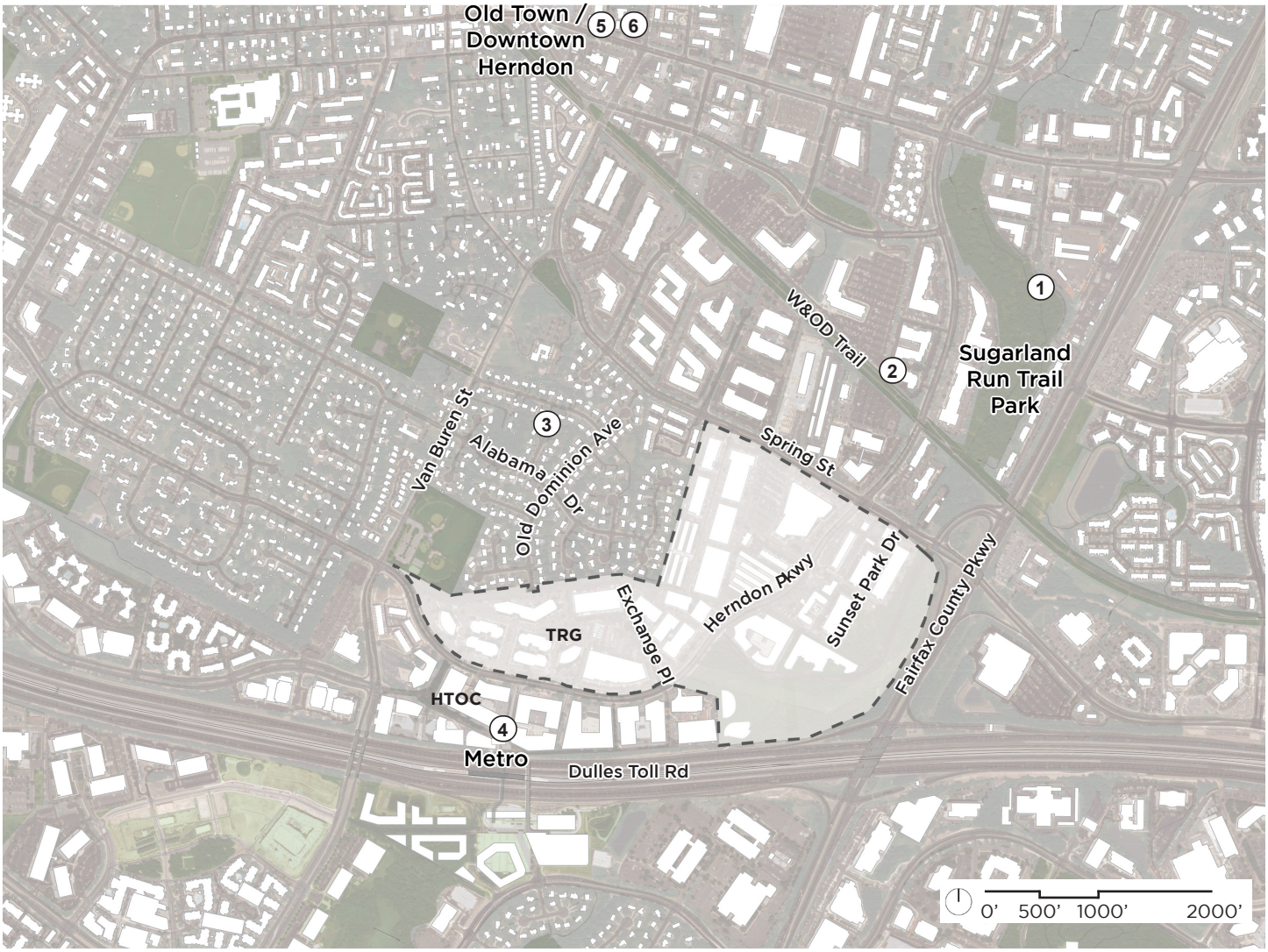
The purpose of this study is to analyze site conditions and highlight key features on the TRG that will help inform the Constraints and Opportunities Report, with the ultimate goal of shaping the design vision for the TRG.

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.

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# 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.



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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



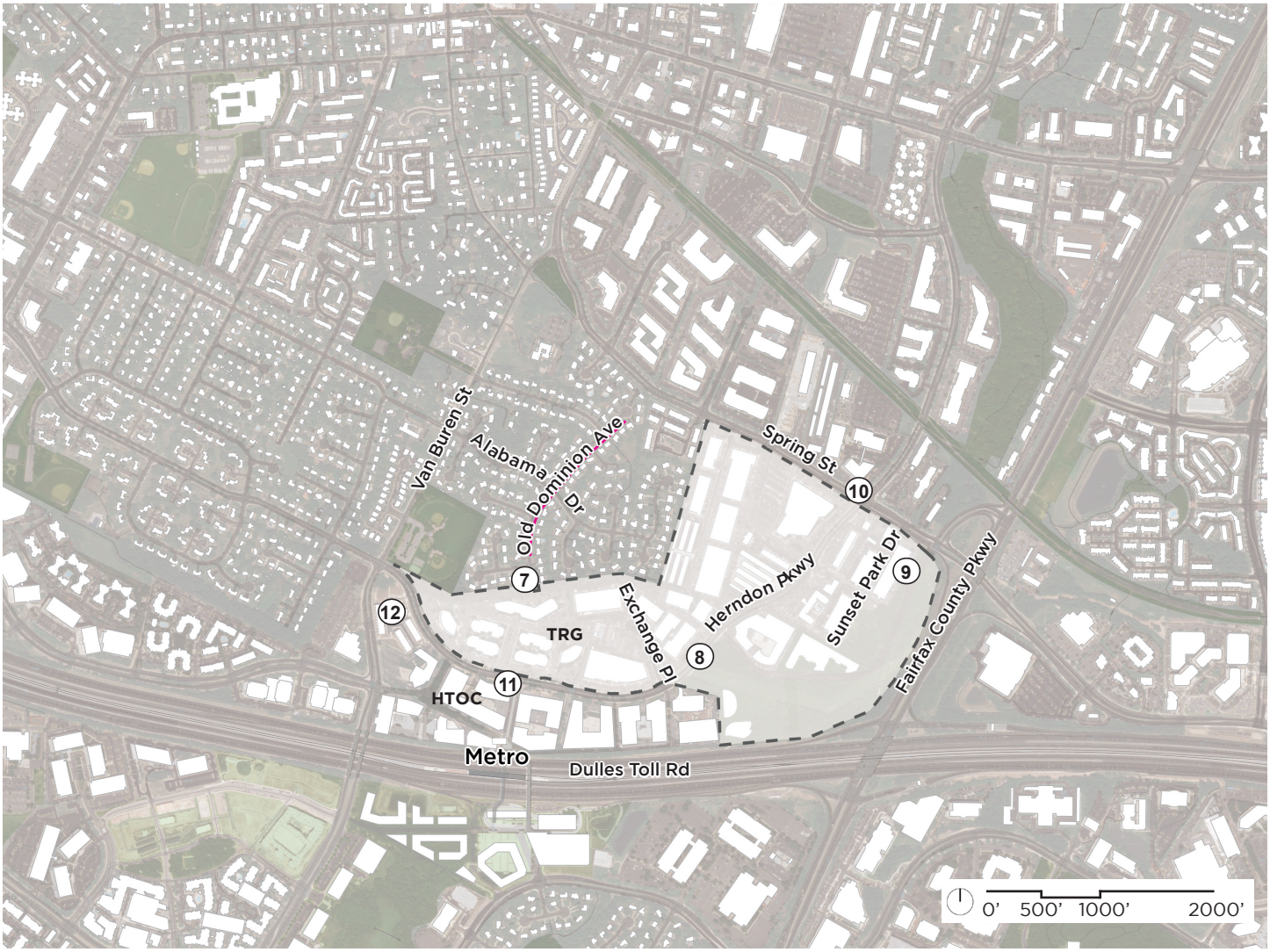

5 Downtown Herndon, landmark shop by the W&OD Trail



6 Downtown Herndon, new Junction Square mixed use development

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# 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.



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⑦ Pedestrian dirt path through vegetated to Old Dominion Avenue



⑧ Herndon Parkway



⑨ Sunset Business Park



⑩ Spring Street



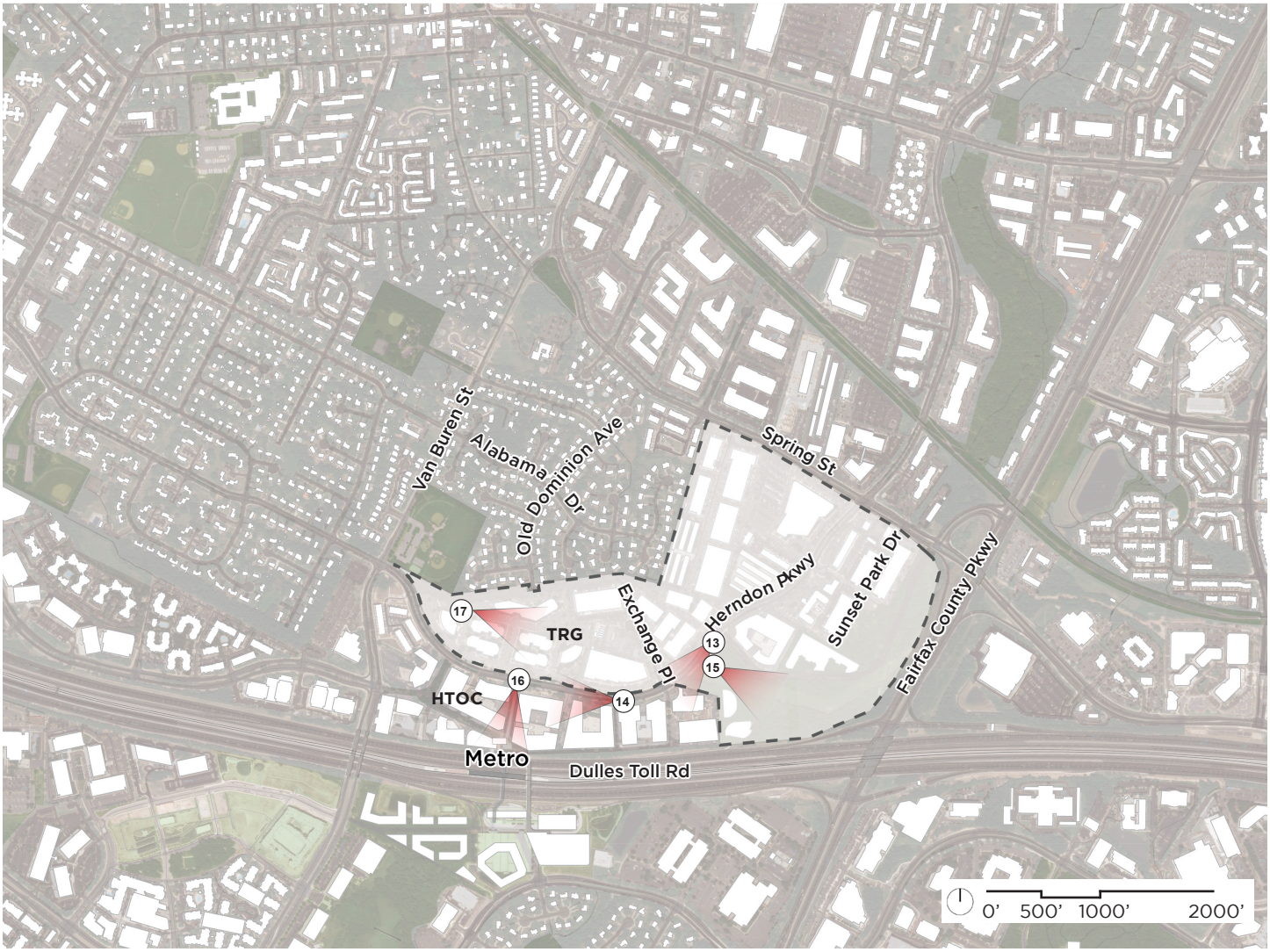
⑪ Metro Station pedestrian crossing to TRG at Herndon Pkwy



⑫ Metro Square Condo Complex

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# 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.



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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



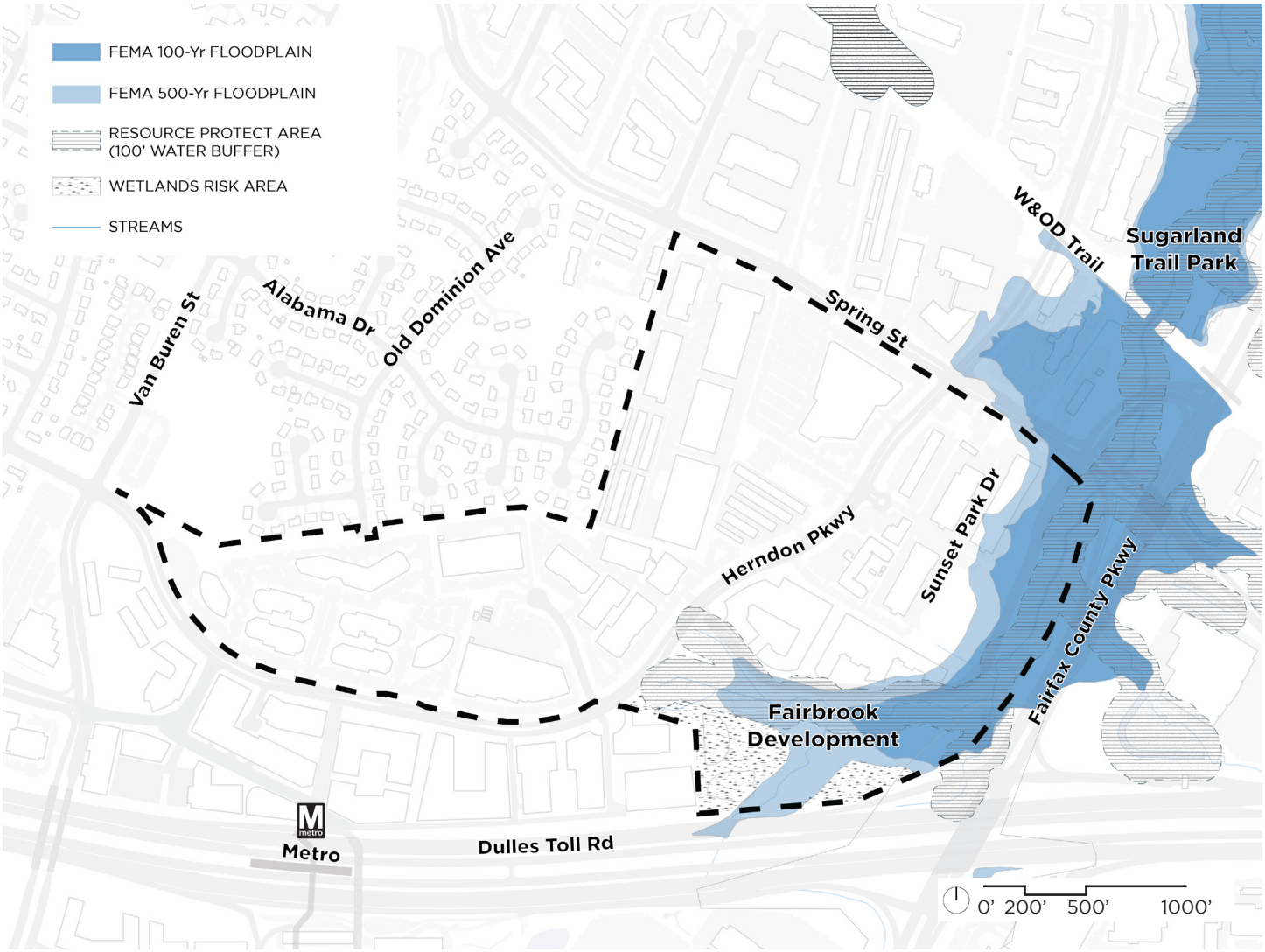
⑯ View towards the Metro pavilion, to be flanked by HTOC development



⑰ View of the new Reston Gateway skyline from the TRG

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# Site Features | **Natural Resources**



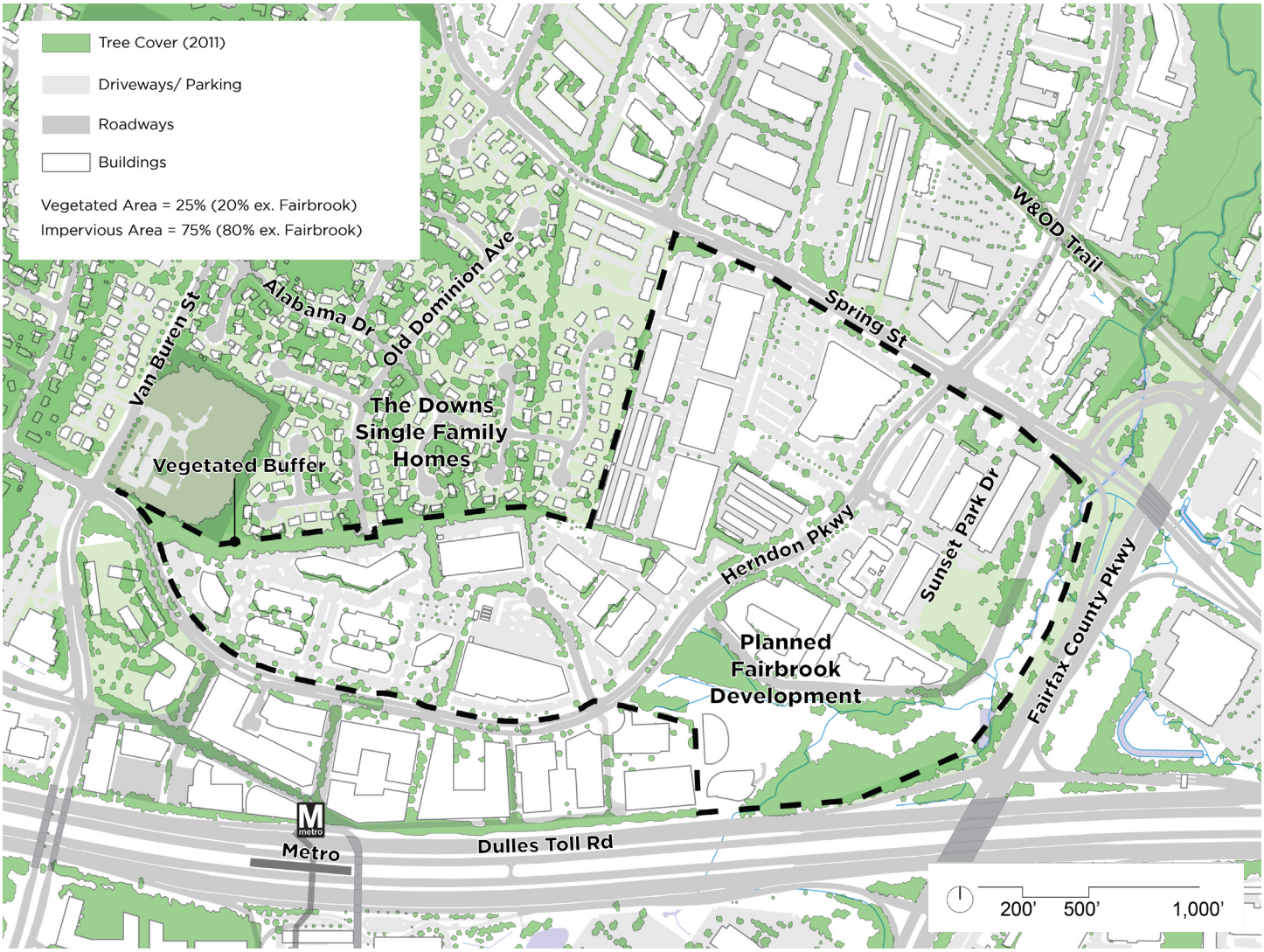

Wetlands and RPA's shall be field verified by a wetlands expert prior to any design or site plan submission. Impacts are subject to Army Corps of Engineers approval, and shall be analyzed at the site plan level. Field surveys and assessments have already been done as part of the Fairbrook Development 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



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# Site Features | **Tree Cover**

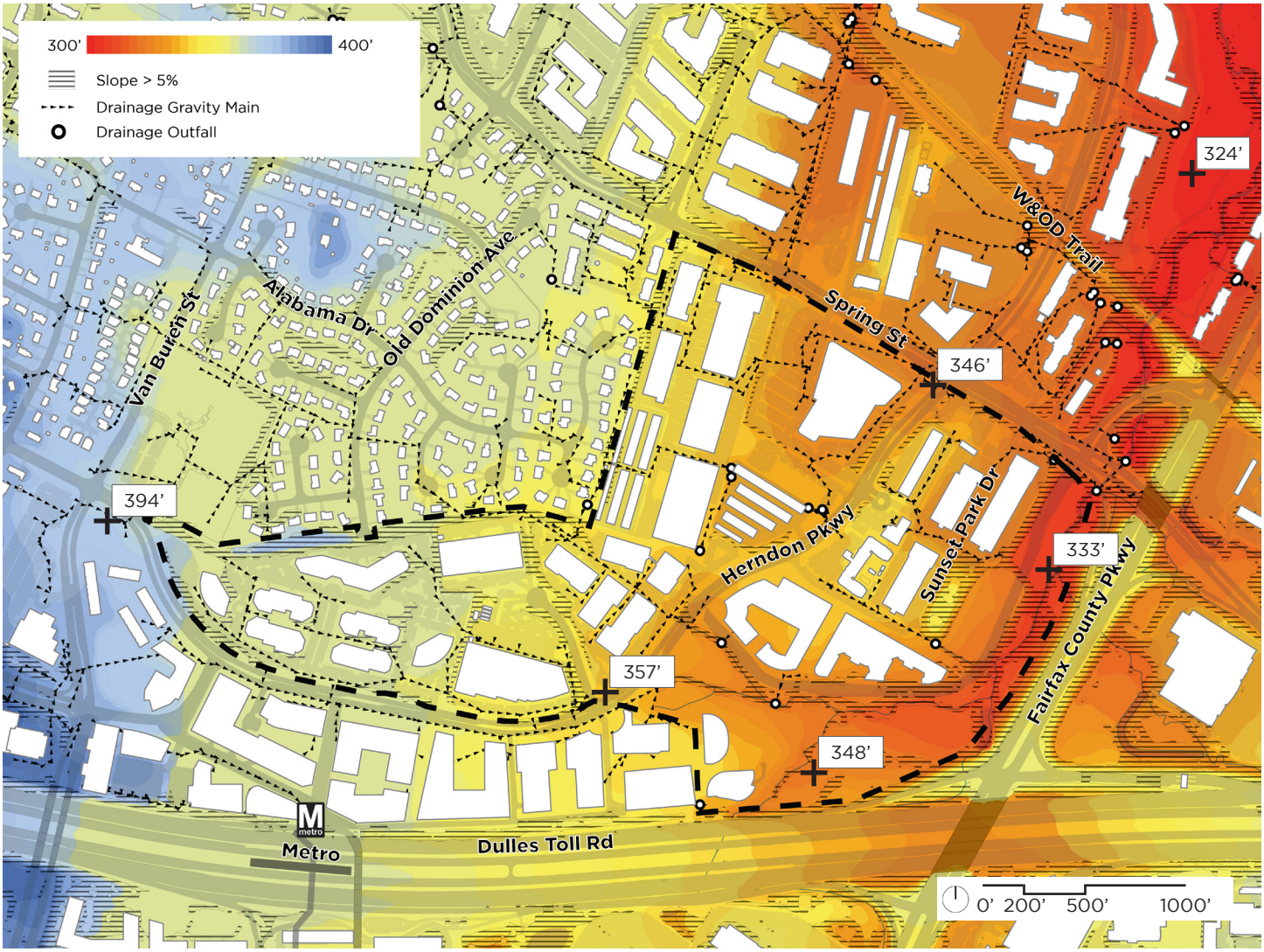



is subject to FEMA approval. Any development within the "wetlands risk area" will be difficult due to the presence of natural resources. Since the potential development areas containing natural resources are low in quantity, the potential for wetland remediation, mitigation, credits, stream restoration, 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.

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# 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.

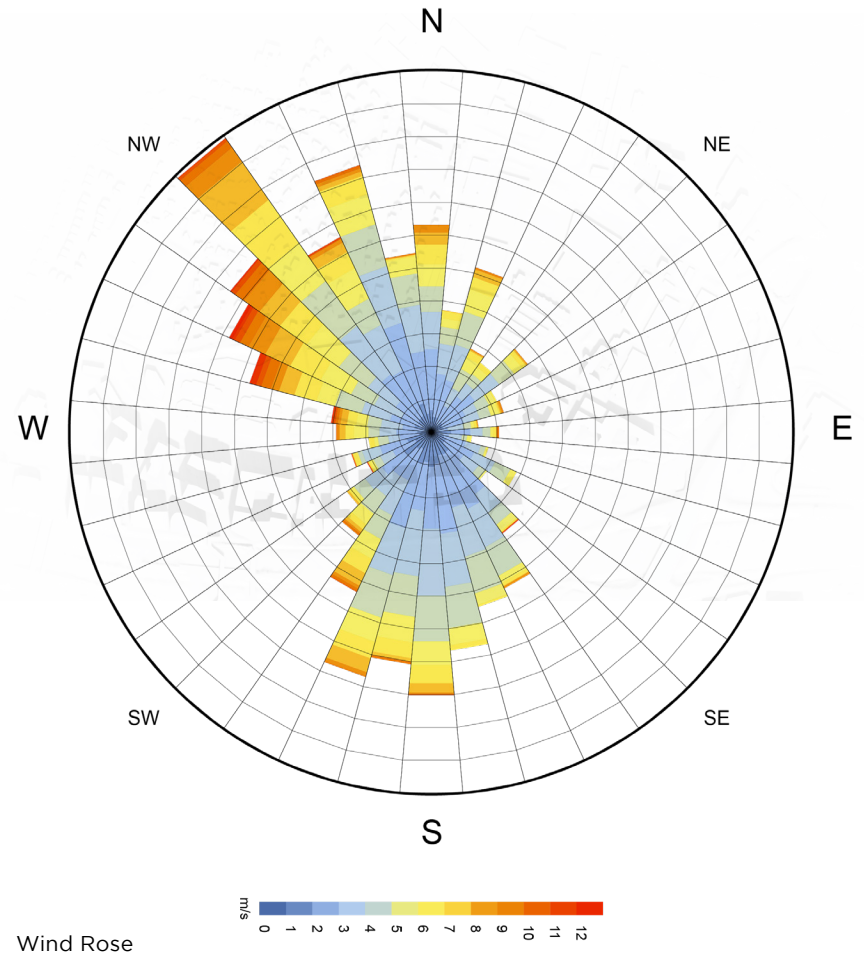
The existing drainage and sewer gravity mains follow the east to west slope and outfall primarily into Sugarland Run, at the east of the site.



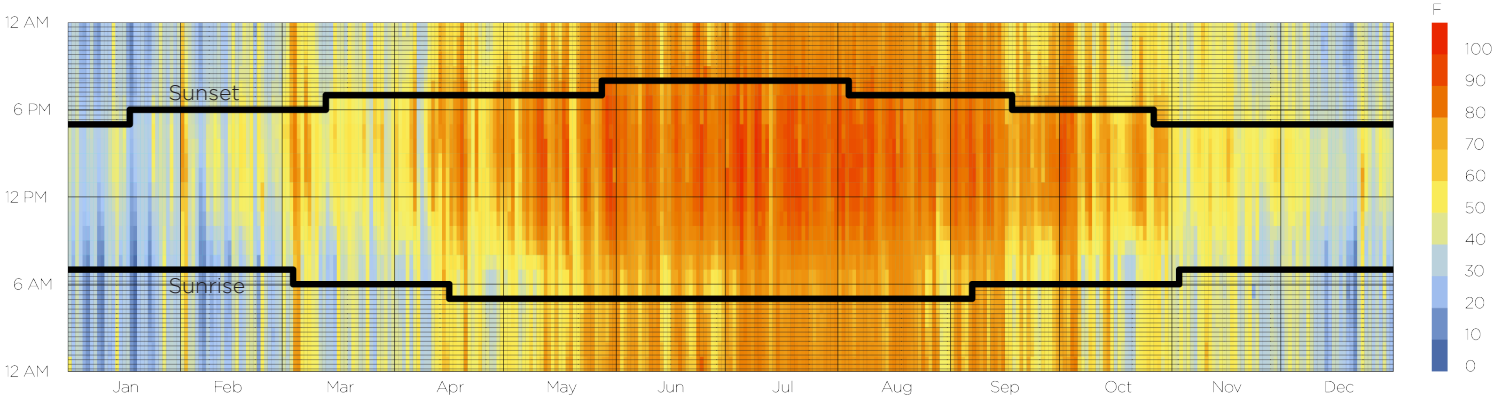
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Overall, Herndon's climate is characterized by hot, humid summers and mild winters. Design strategies should seek to mitigate high temperatures in the summertime. Open, public space should have areas which are shaded in the summer. Paving and landscape 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)

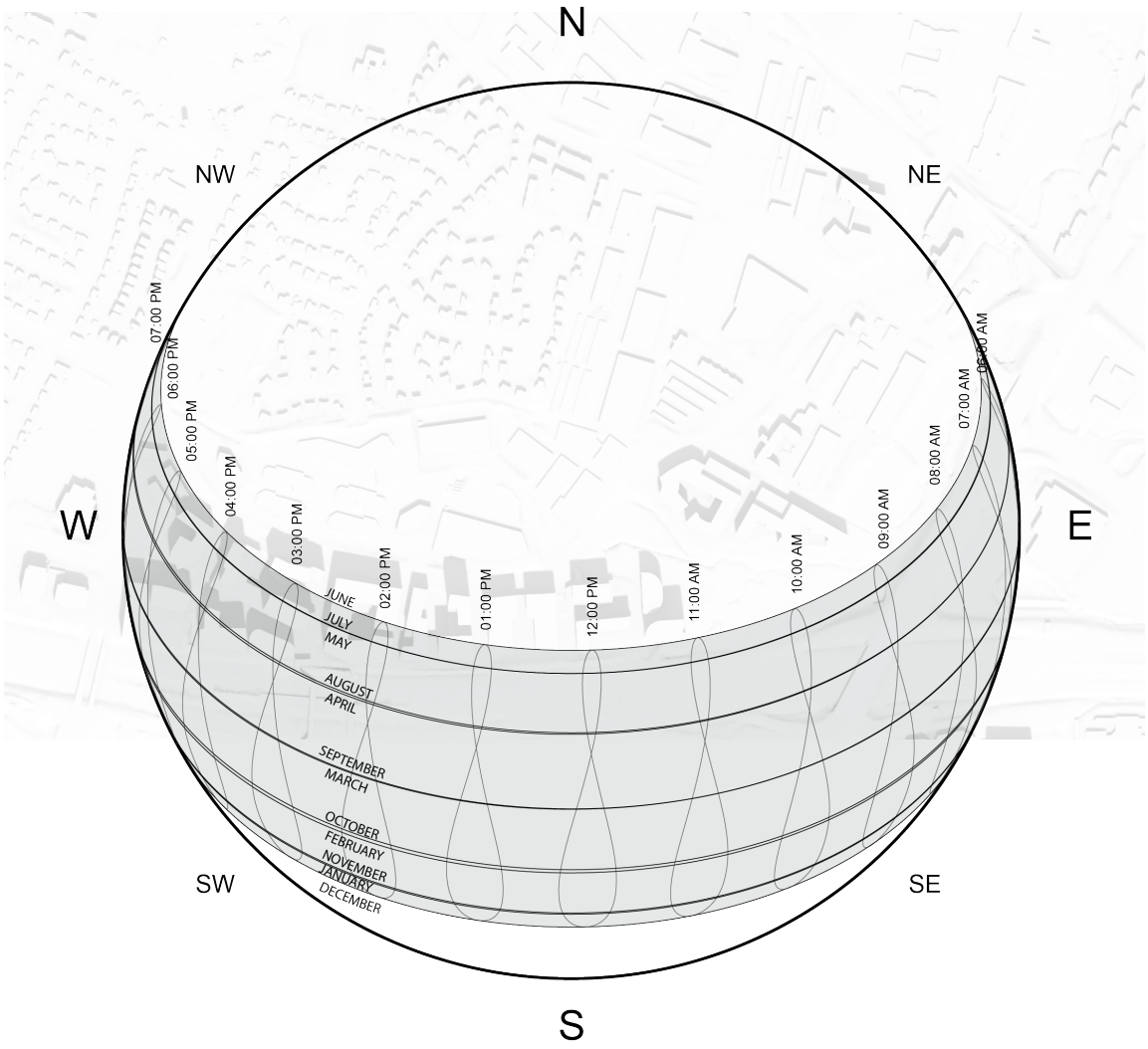
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# Site Features | **Sun Orientation & Shading**

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.

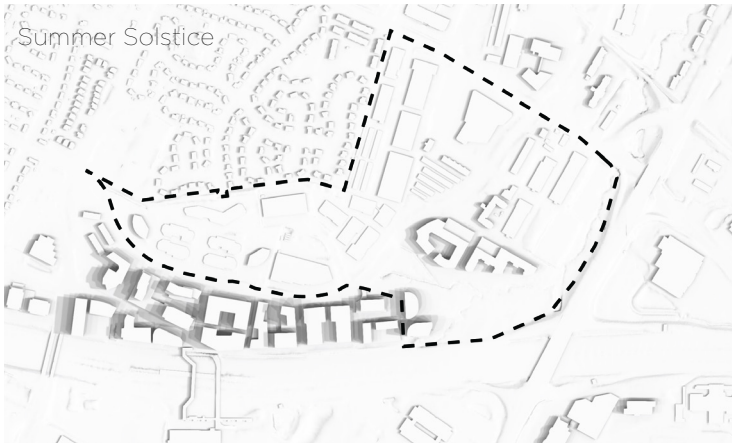
In the Visioning Phase, consideration to sun orientation and shading should be prioritized, especially when it comes to building mass orientation.

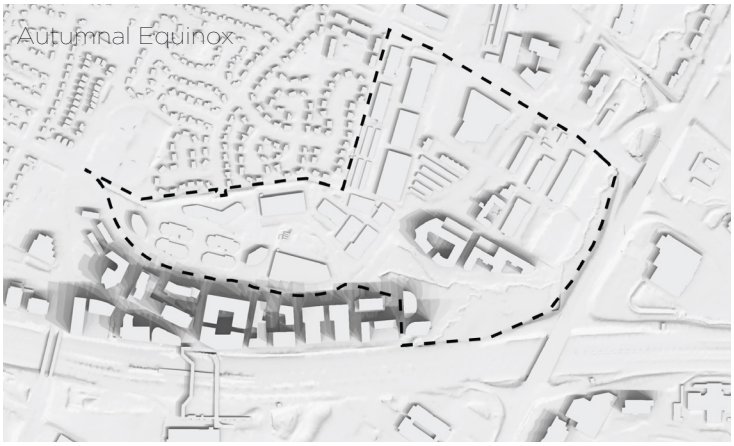


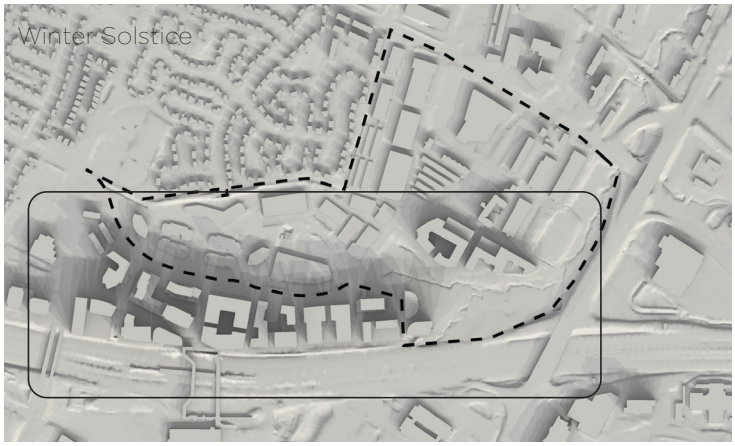



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Vernal Equinox


Summer Solstice

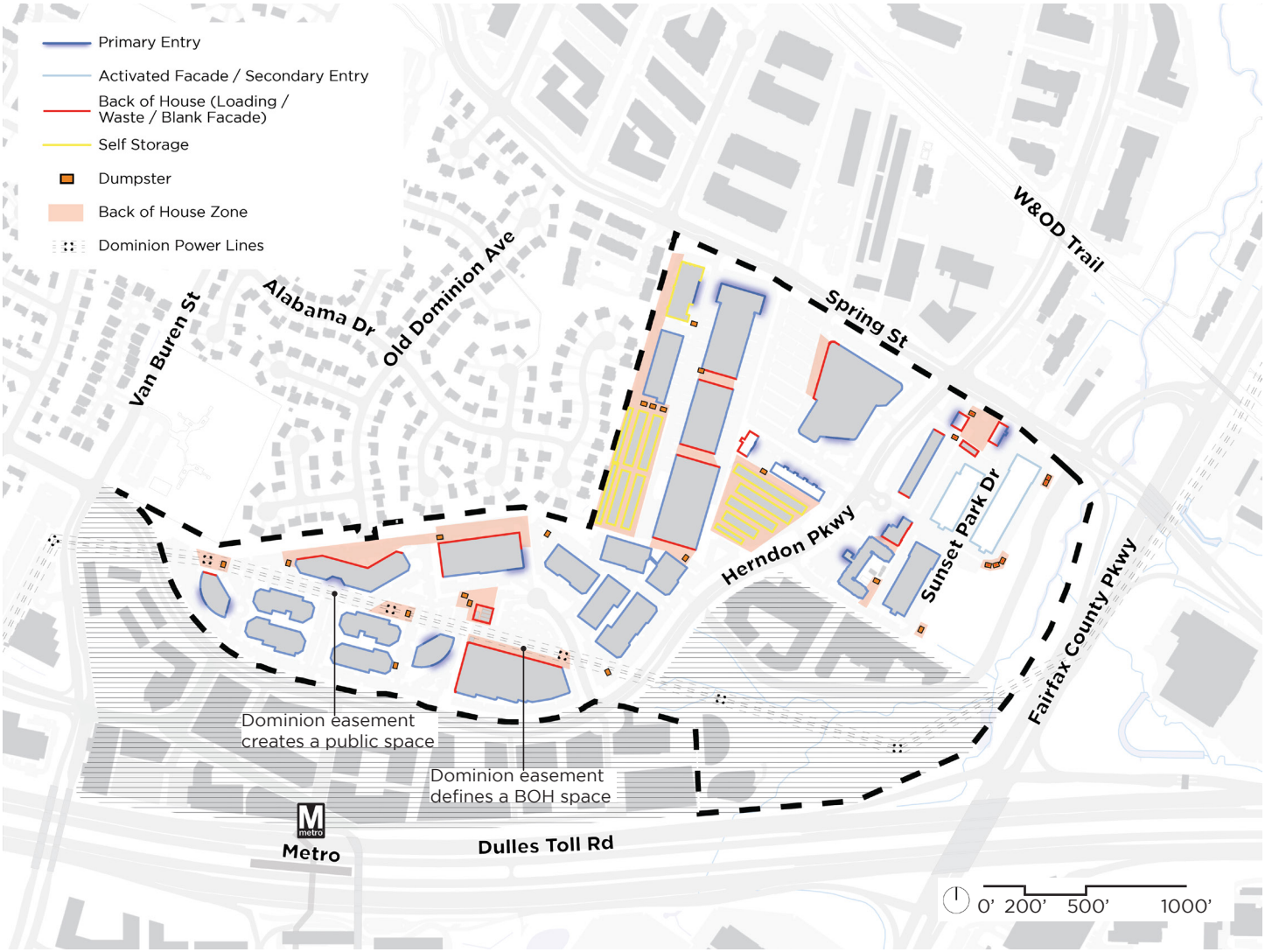

Autumnal Equinox


Winter Solstice


Winter Solstice (Zoom In)

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# Site Features | **Building Orientation**



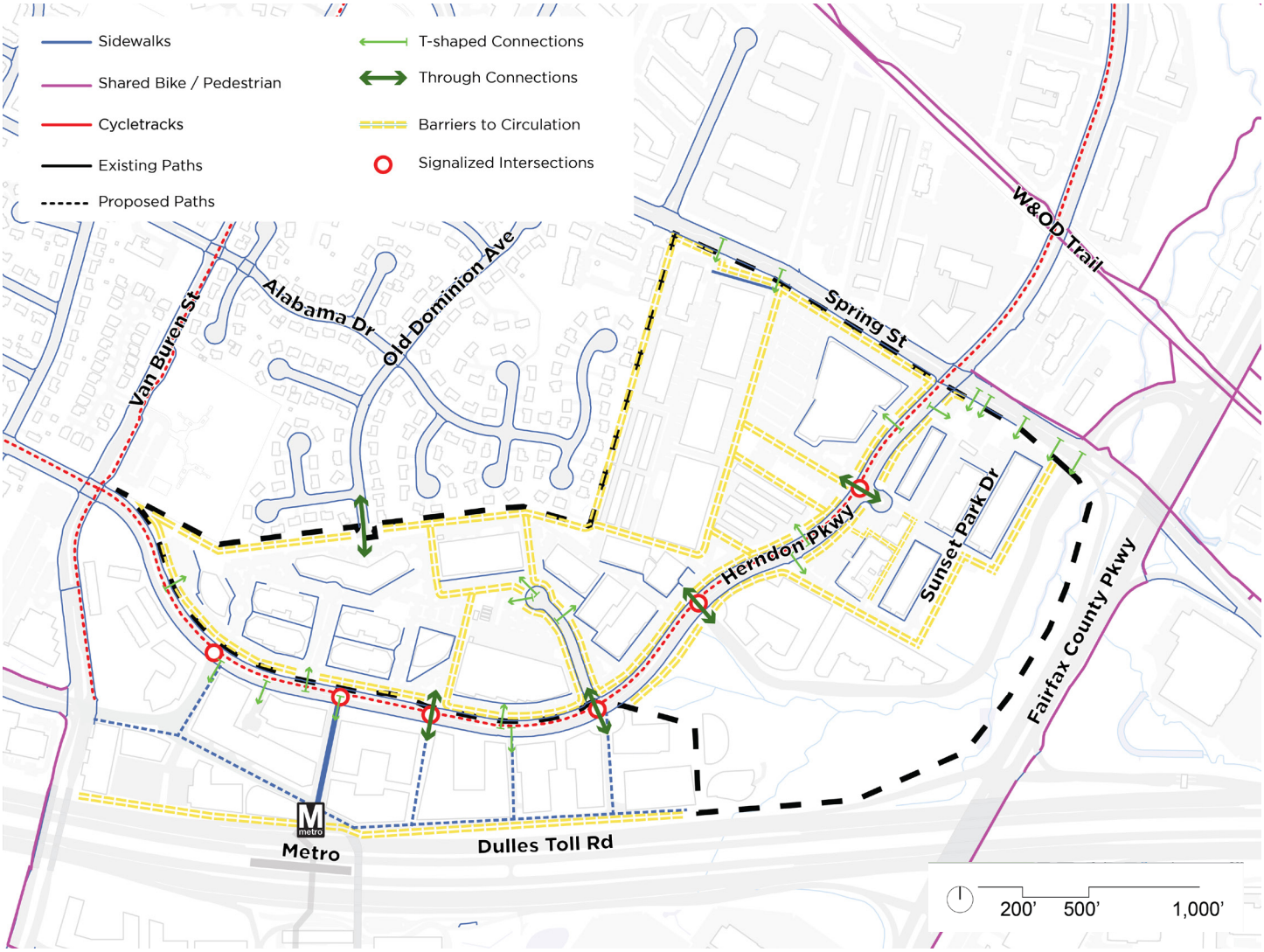

The map above illustrates the existing building orientations within the TRG, and the way in which front of house (FOH) vs back of house (BOH) spaces are organized. In its current configuration, there is little differentiation in the way in which FOH and BOH zones are distributed throughout site. In some 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



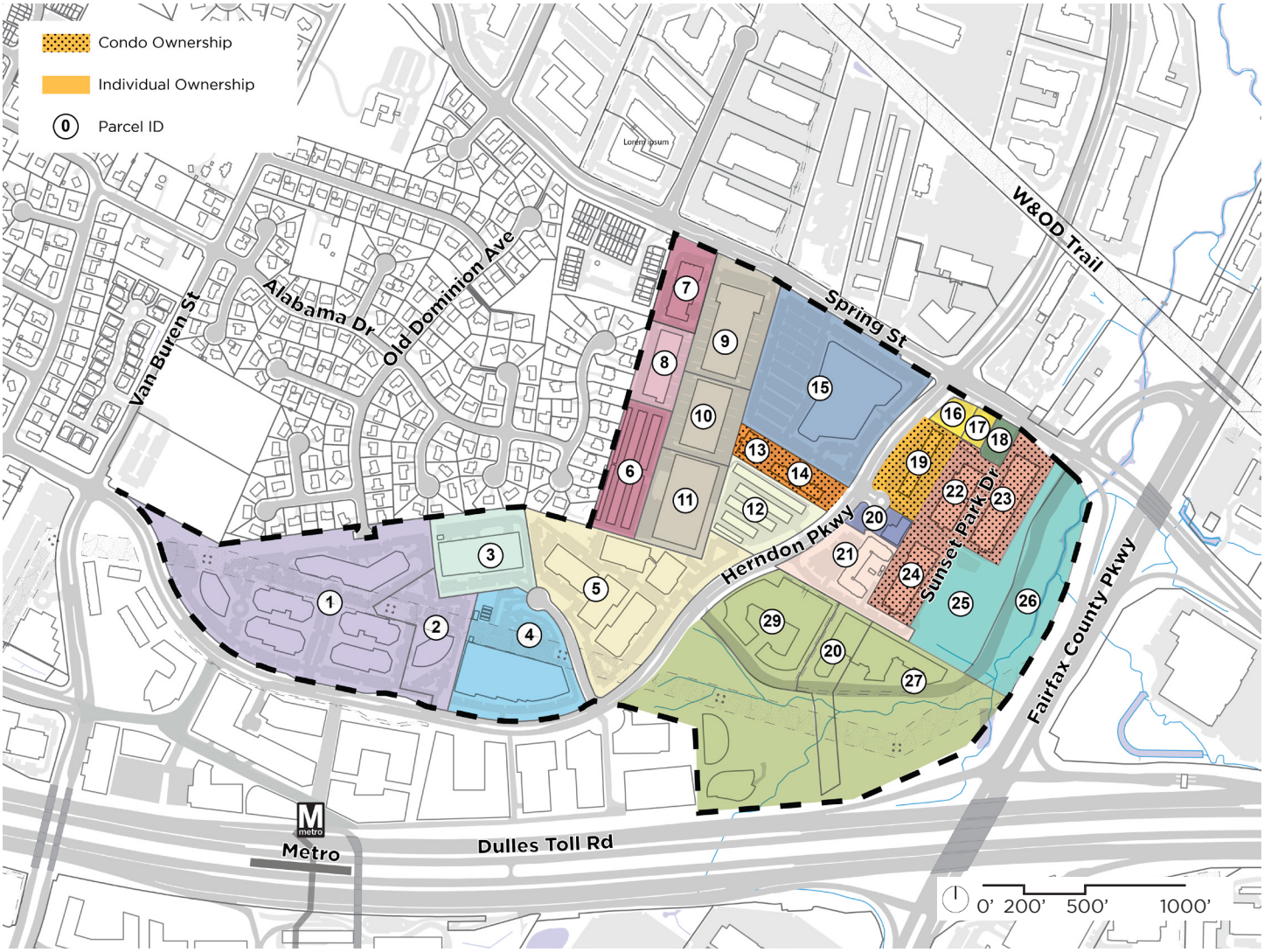
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out in a "sea of parking," without a continuous street network. This configuration works well for passenger vehicles, which use Herndon Parkway to reach their parking lot, and leave the same way. For pedestrians or cyclists, however, who might need 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.

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# 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.



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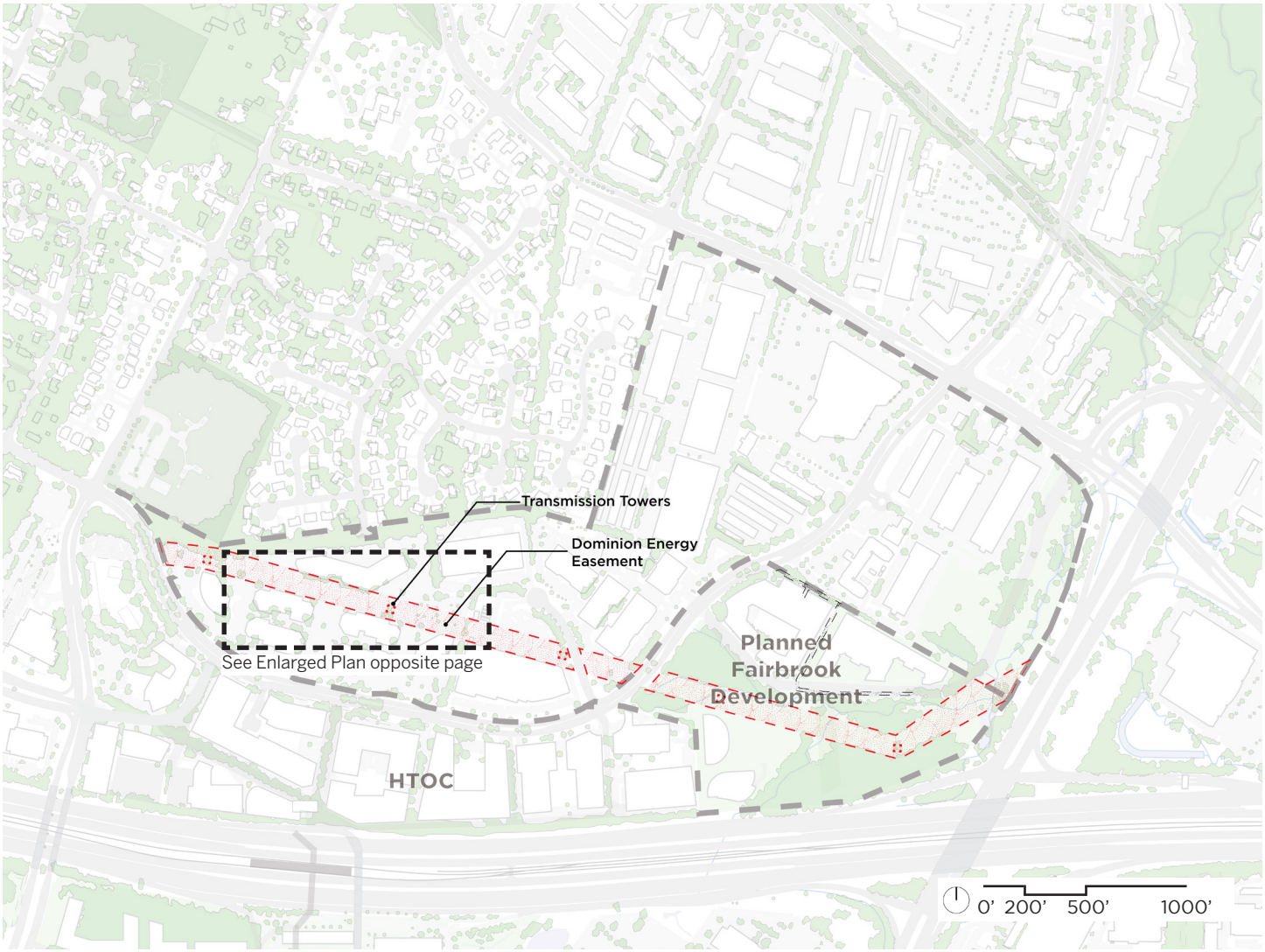
| Parcel ID | Property / Main User | Number of Owners | Year Built / Added | Building Age (Years) | Property Land Area (SF) | Property Land Area (Acres) | Property GFA (SF) | FAR | Height (Stories) |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Shorenstein, Monroe Business Center | 1 | 1986 | 37 | | | | | 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.

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## 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.

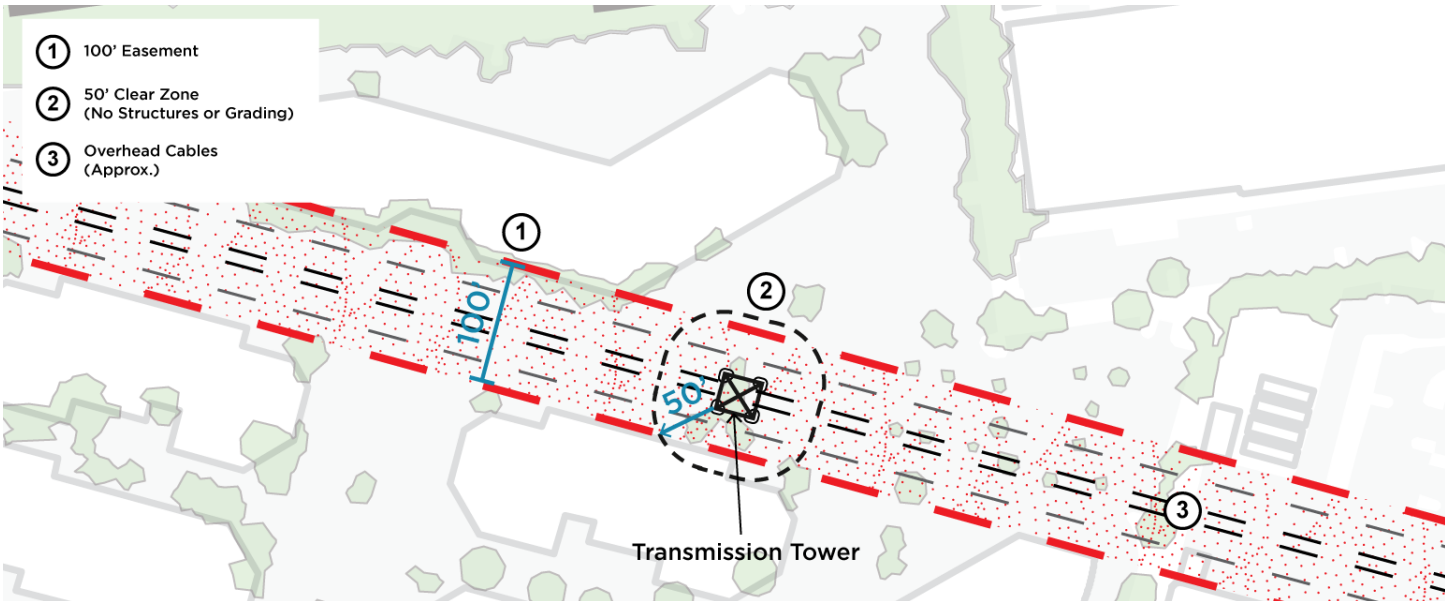
Buildings presently flank the easement on both sides, making its 100-foot clear zone readily apparent in maps and aerial photos, such as the bird's eye view on opposite page. Most of the clear zone is being used for driveways, parking lots, and low landscaping. Dumpster enclosures also exist on the easement,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



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## 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"

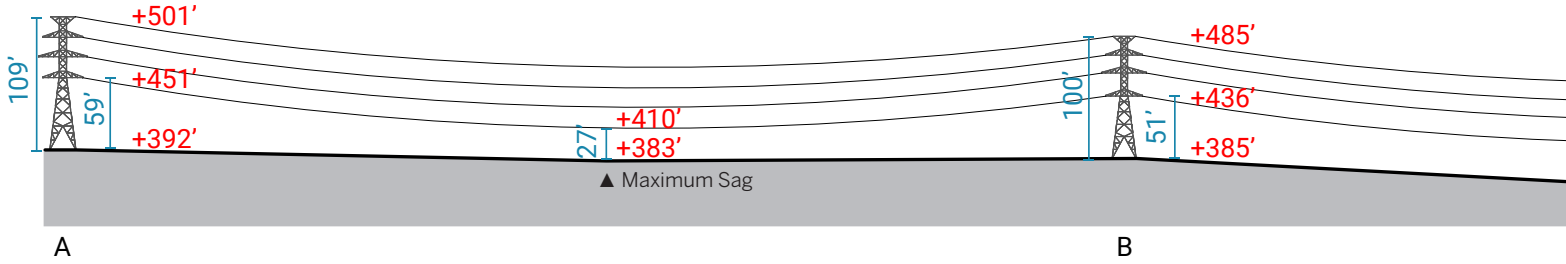
Note that final requirements are determined by an agreement with Dominion.



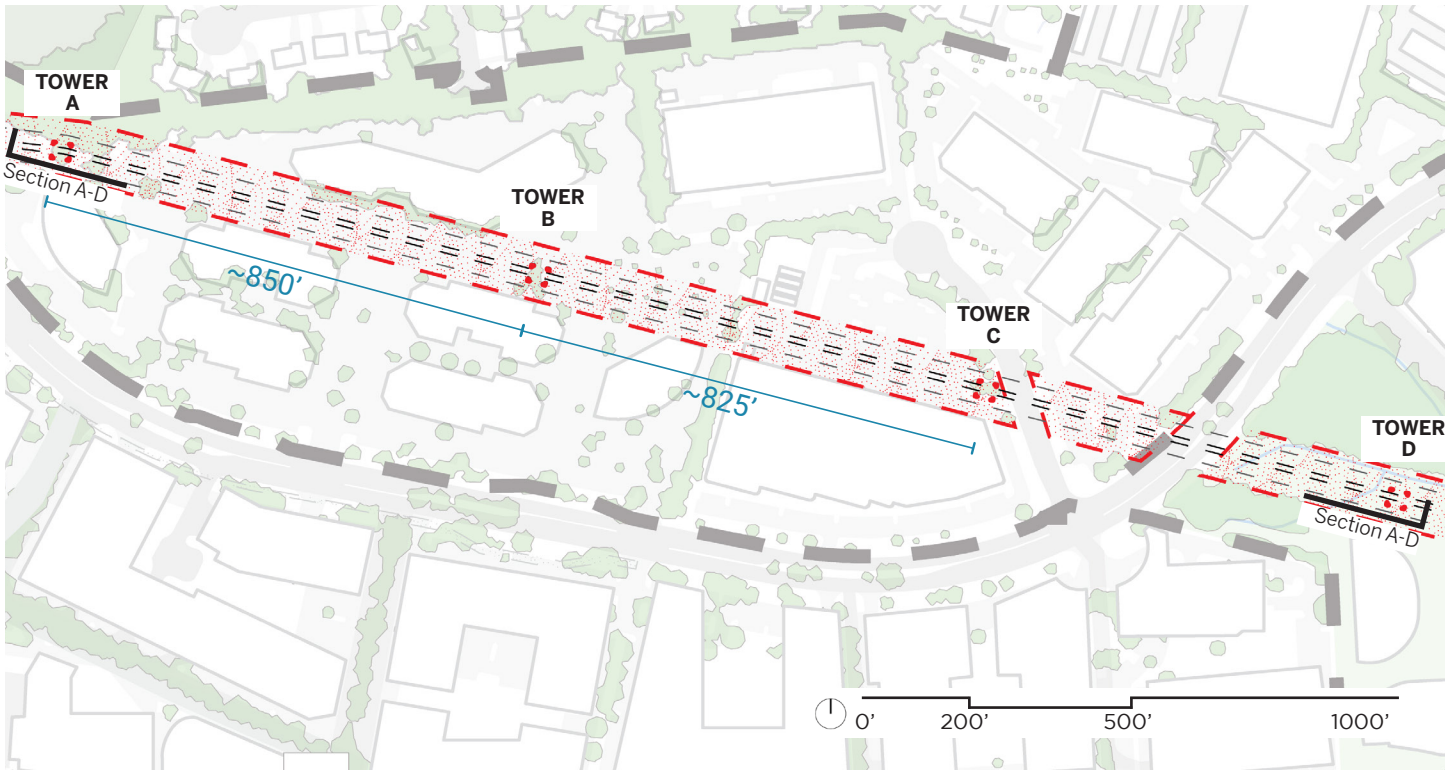
Bird's eye view of the Dominion Easement from the Sugarland Run stream

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# Constraints & Opportunities | **Dominion Easement**




Section A-D, taken from drawing below



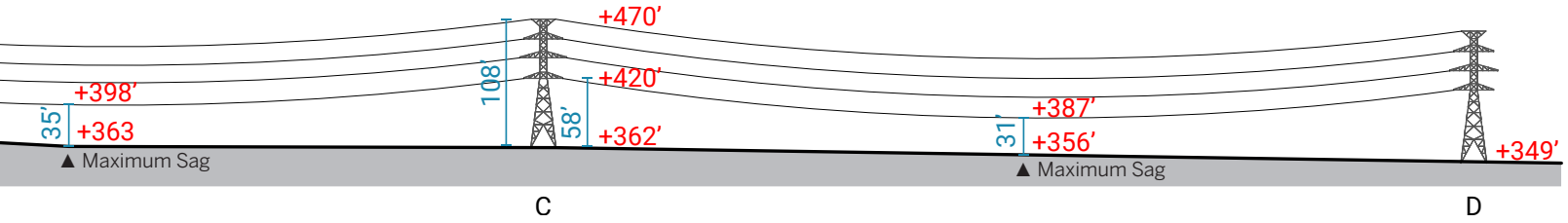

There are three transmission towers on the contiguous western portion of the TRG bounded by Herndon Parkway. Those towers are approximately 825 to 850 feet apart, roughly the distance of two large city blocks. The towers are at least twice as tall as the buildings around them, as seen in the photo on 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.



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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.



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## 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.

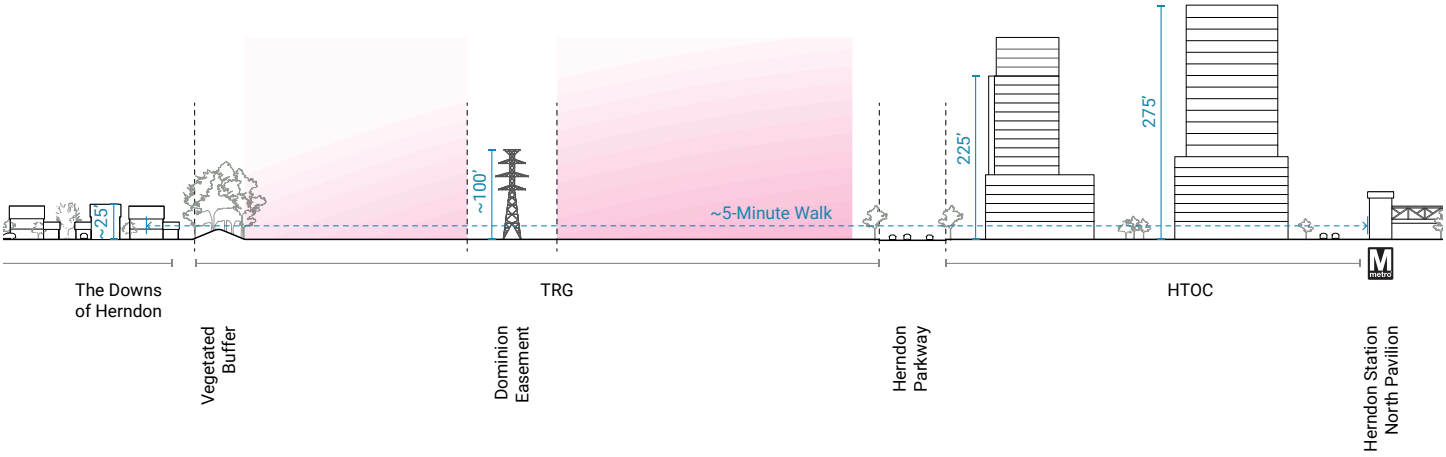
**The Opportunity** for the TRG lies in higher building heights and development densities within the Metro Station 5-minute walk radius, that could gradually decrease towards the Downs neighborhood and the 10-minute walk zone going eastward towards Spring Street.

**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.



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## 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

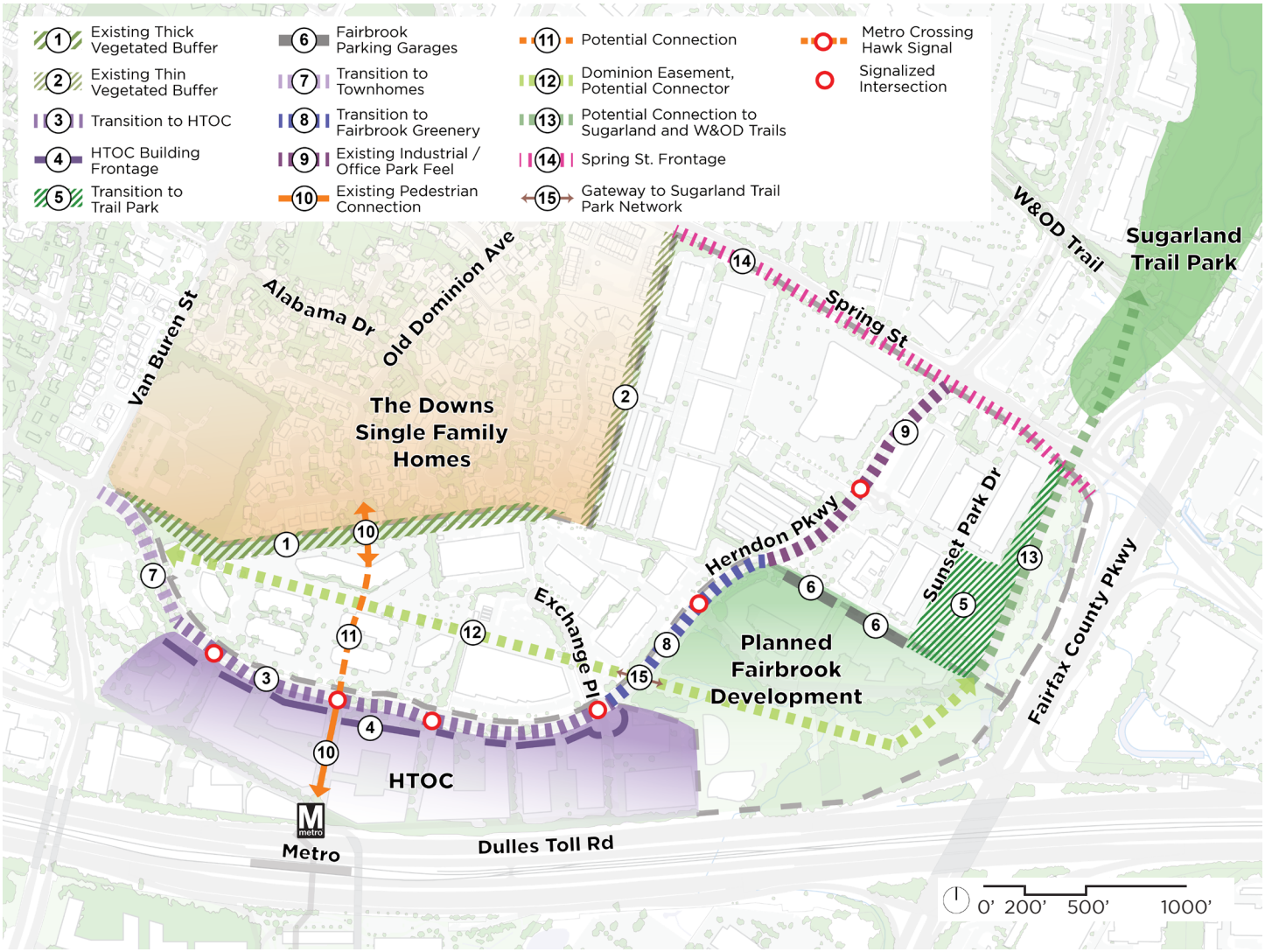


**View 3** 555 Herndon Parkway

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# Constraints & Opportunities

## 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,



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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


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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.

# MEMORANDUM

**Date:** December 1, 2023

**To:** Town of Herndon
**From:** Jacob Fisher
**Subject:** Herndon Transit-Related Growth Hydraulic Analysis
**CC:** Francis Bonkowski, Dean Westman

**Work Order Number:** 18516-045
**Project:** TRG Hydraulic Analysis

## TRG Water Demand Analysis

Whitman, Requardt and Associates conducted a hydraulic analysis of the water and wastewater infrastructure in the Transit-Related Growth Area (TRG) in the southeast corner of Herndon. The TRG is a 94-acre collection of property parcels along the northern side of the Herndon Parkway. The TRG incorporates an area previously referred to as the Landmark District, the Gateway District and an unnamed area that straddles Herndon parkway in the northeast section of the project area. **Figure 1** depicts the extents of the TRG Area and the existing water mains. The TRG is contiguous to the Fairbrook District and the HTOC (Herndon Transit Oriented Corridor) which share water distribution and wastewater collection infrastructure with the TRG.




**Figure 1 – TRG Water Main Map**

The TRG area is undergoing redevelopment driven by proximity to the new Metro Station. Existing commercial buildings will be replaced by housing and new commercial/retail/office development. For this hydraulic analysis, water demand and wastewater loadings were calculated for the redeveloped TRG Area using development data generated by the Herndon Community Development Department and their consultant, Skidmore, Owings & Merrill (SOM). Water demand and wastewater loadings were added to demands and loadings for the Fairbrook and HTOC areas which share water distribution and wastewater collection infrastructure with the TRG. The results of the hydraulic analysis are used to determine the necessary upgrades needed to the infrastructure.

TRG Area redevelopment includes apartments, townhouses, office space, retail space, and a hotel. 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 and are shown on **Table 1**.

**Table 1: TRG Projected Demands**

| Development | TRG 1/2 Mile GPD | TRG NOP GPD | TRG SOP GPD |
|---|---|---|---|
| Apartments | 263,519 | 112,593 | 99,347 |
| Townhouses | 50,944 | 68,688 | 0 |
| Hotel | 0 | 0 | 48615 |
| Office | 38,502 | 28,854 | 4,008 |
| Retail (SF) | 6,034 | 12,110 | 22,876 |
| **TOTAL TRG WATER DEMAND (MGD)** | **0.359** | **0.222** | **0.175** |

GPD = gallons per day NOP = north of Herndon Parkway SOP = south of Parkway
TRG ½ mile = TRG area within ½ mile of the Herndon Metro Station

Water demands within the TRG Area and the contiguous HTOC and Fairbrook Districts were including in the 2016 Water Utility Master Plan and the 2019 Water Utility Master Plan Update for the Town of Herndon. **Table 2** compares the change in demand between the previous TRG water demands used in the 2018 utility master plan (UMP) and the new TRG data based on the SOM analysis.

**Table 2: Water Demand Comparison**

| 2018 UMP Average Demand (MGD) | Location | 2022 SOM Plan Average Demand (MGD) |
|---|---|---|
| 0.295 | Within 1/2 Mile of Metro Station Zone | 0.359 |
| 0.09 | North of Parkway | 0.222 |
| 0.072 | South of Parkway | 0.175 |
| **0.457** | **Total** | **0.756** |

This model update will increase the demand of both water and sewer by approximately 65%.

**Water Distribution System Evaluation**

The increased water demands from the SOM estimates were used in 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 demonstrate 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. **Figure 2** and **Figure 3** display the minimum system pressure Town-wide before and after the TRG demands were added.

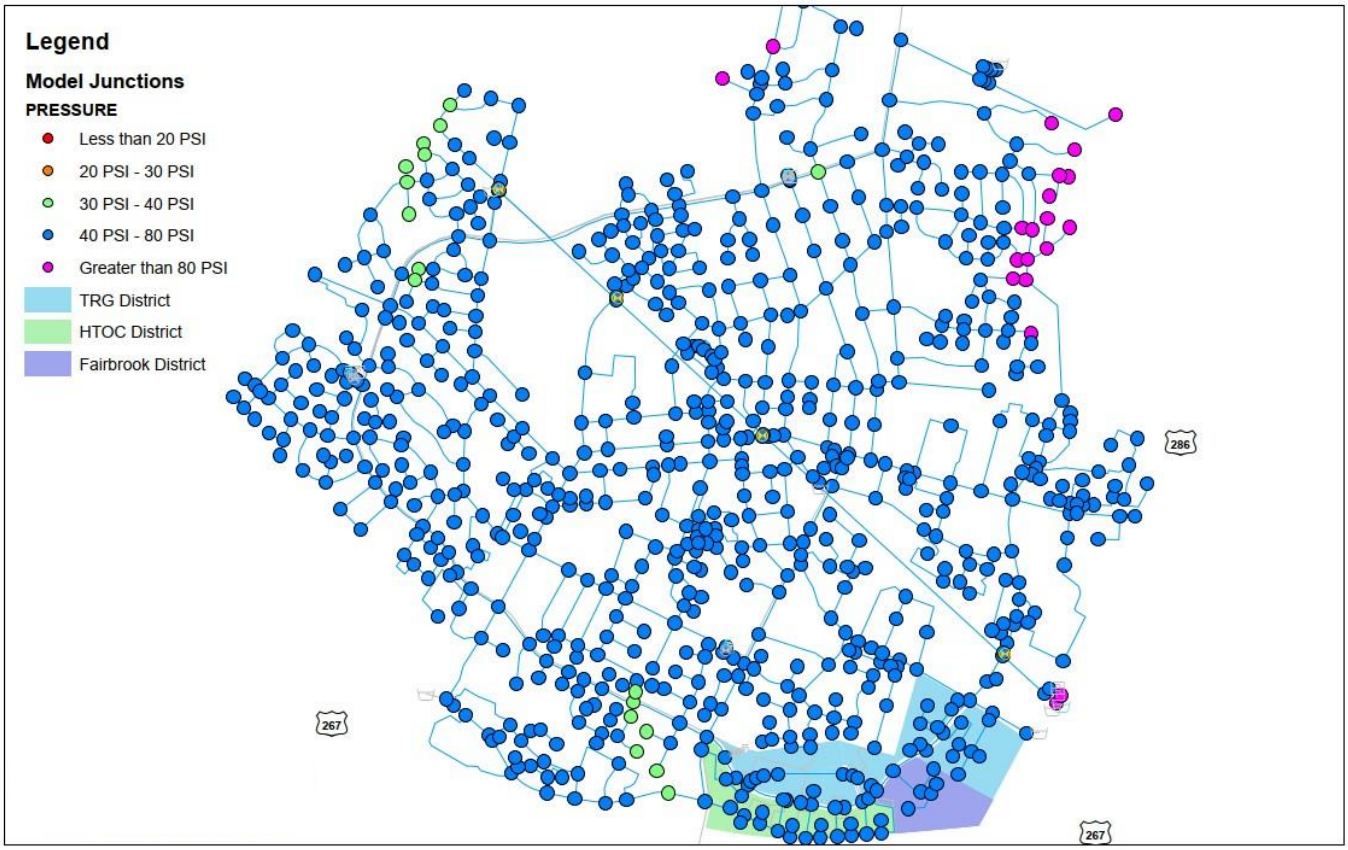



**Figure 2 - Minimum System Pressure, Pre-TRG Upgrades**

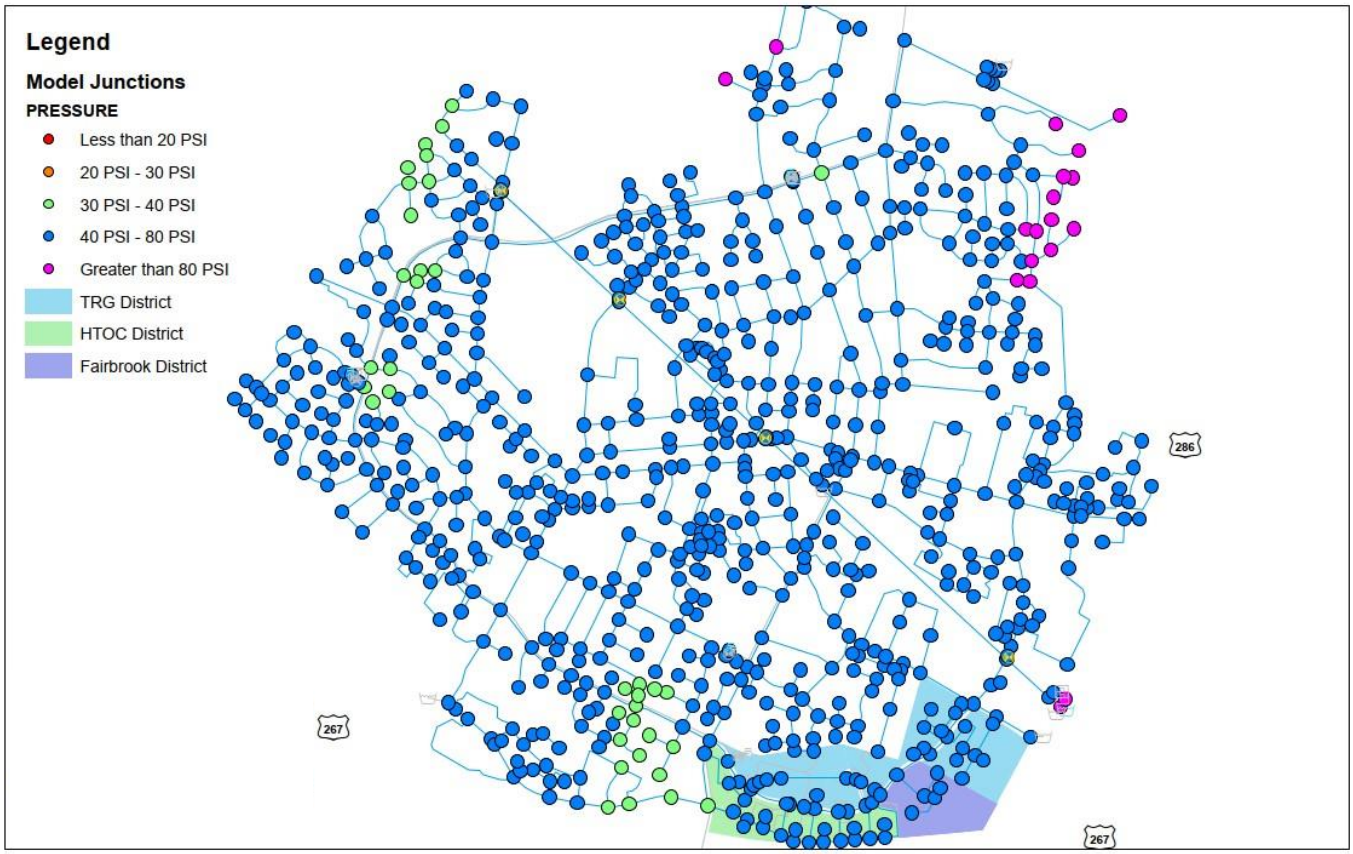



**Figure 3 - Minimum System Pressure, Post-TRG Upgrades**

With TRG demands added, in place of the previously modeled 2045 max day demands, water pressure to the west of the TRG is negatively impacted (<40 psi) in some nodes.

**Figure 4** and **Figure 5** display the fire flows at each node Town-wide before and after the TRG demands were updated.

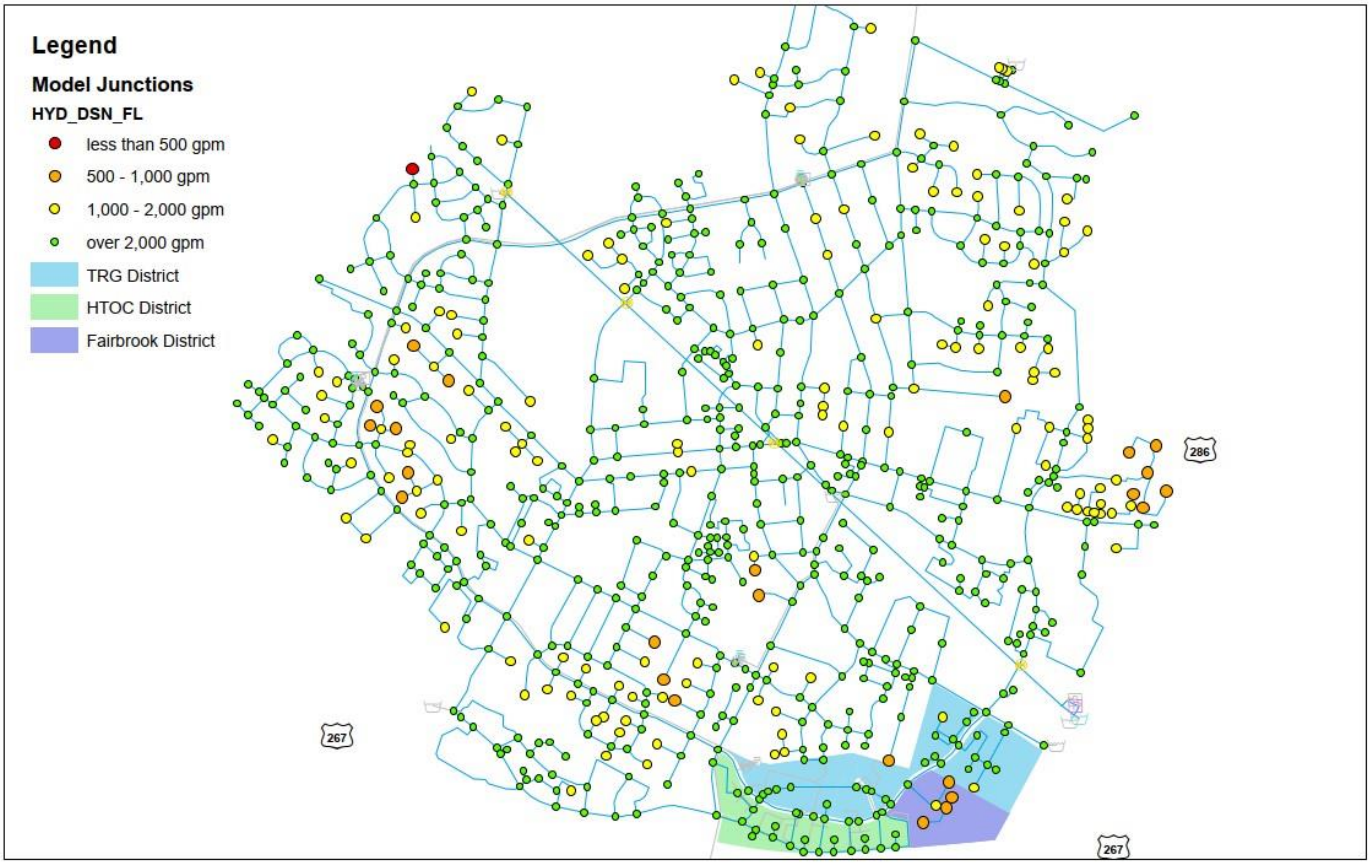



**Figure 4 - Town of Herndon Fire Flows, Pre-TRG Upgrades**

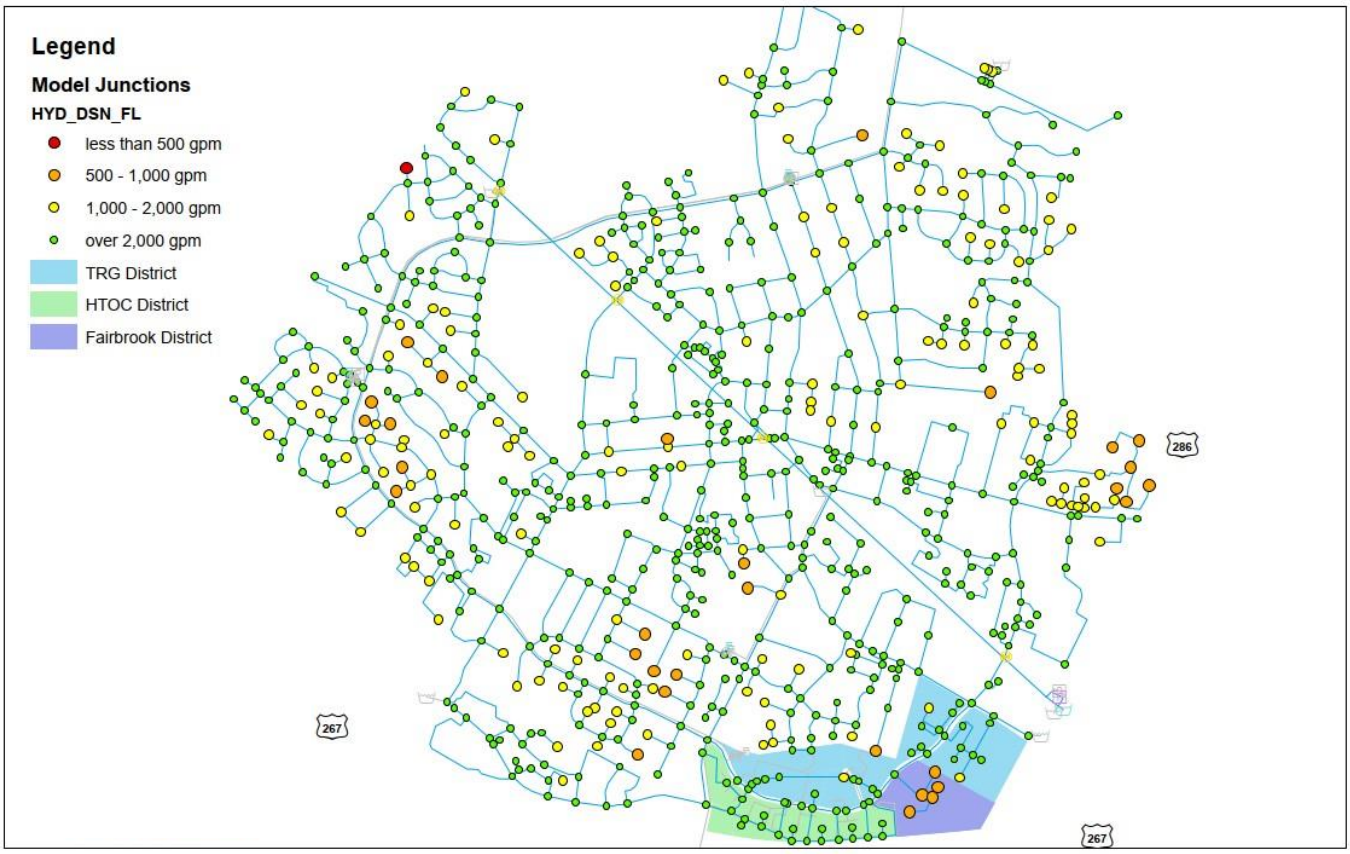



**Figure 5 - Town of Herndon Fire Flows, Post-TRG Upgrades**

With TRG demands added to the model fire flow is 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. The system includes an 8-inch and 10-inch gravity sewer which merge into a 12-inch pipe in the Fairbrook District. The existing gravity sewer is depicted on **Figure 6**.

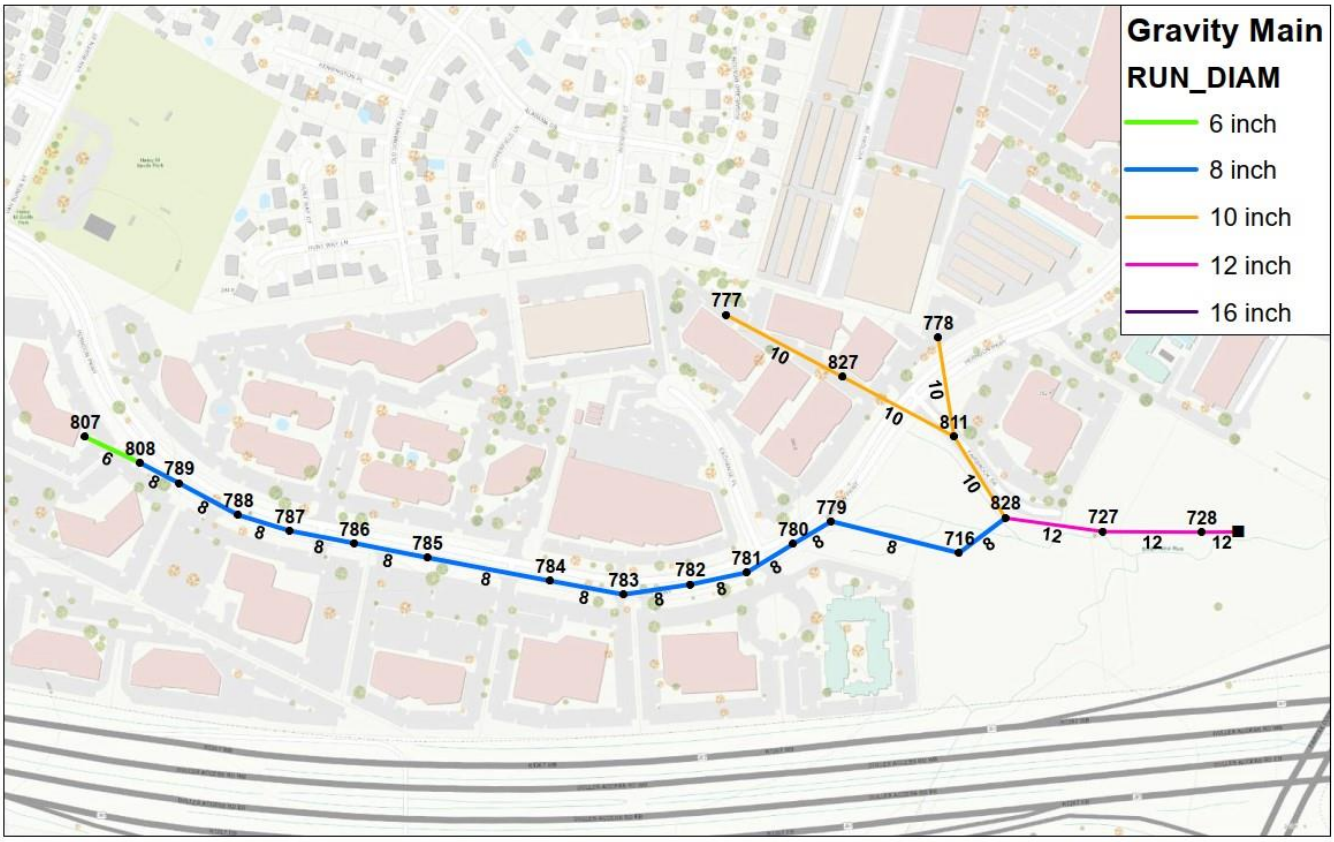



**Figure 6 – Existing Sewer Infrastructure**

TRG wastewater loadings were added into the Herndon InfoSewer hydraulic model. 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. **Table 3** shows the peak loading at corresponding manholes as shown in Figure 6.

| Table 3: Spring Downs Wastewater Model Loadings | | | |
|---|---|---|---|
| **Manhole Location** | **Source** | **Avg Total (MGD)** | **Peak Total (MGD)** |
| 807 | TRG - 1/2 Mile | 0.359 | **0.696** |
| 808 | HTOC | 0.75 | **1.455** |
| 777 | TRG – NOP | 0.222 | **0.431** |
| 778 | TRG – SOP | 0.175 | **0.34** |
| 811 | Fairbrook | 0.125 | **0.243** |
| **Peaking Factor: 1.94** | | | |

The InfoSewer model was initially run using the peak flows from Table 3 with the existing infrastructure in place to determine where pipe upgrades would be needed. **Figure 7** shows the Spring Downs system in this scenario and the areas where surcharging is anticipated.

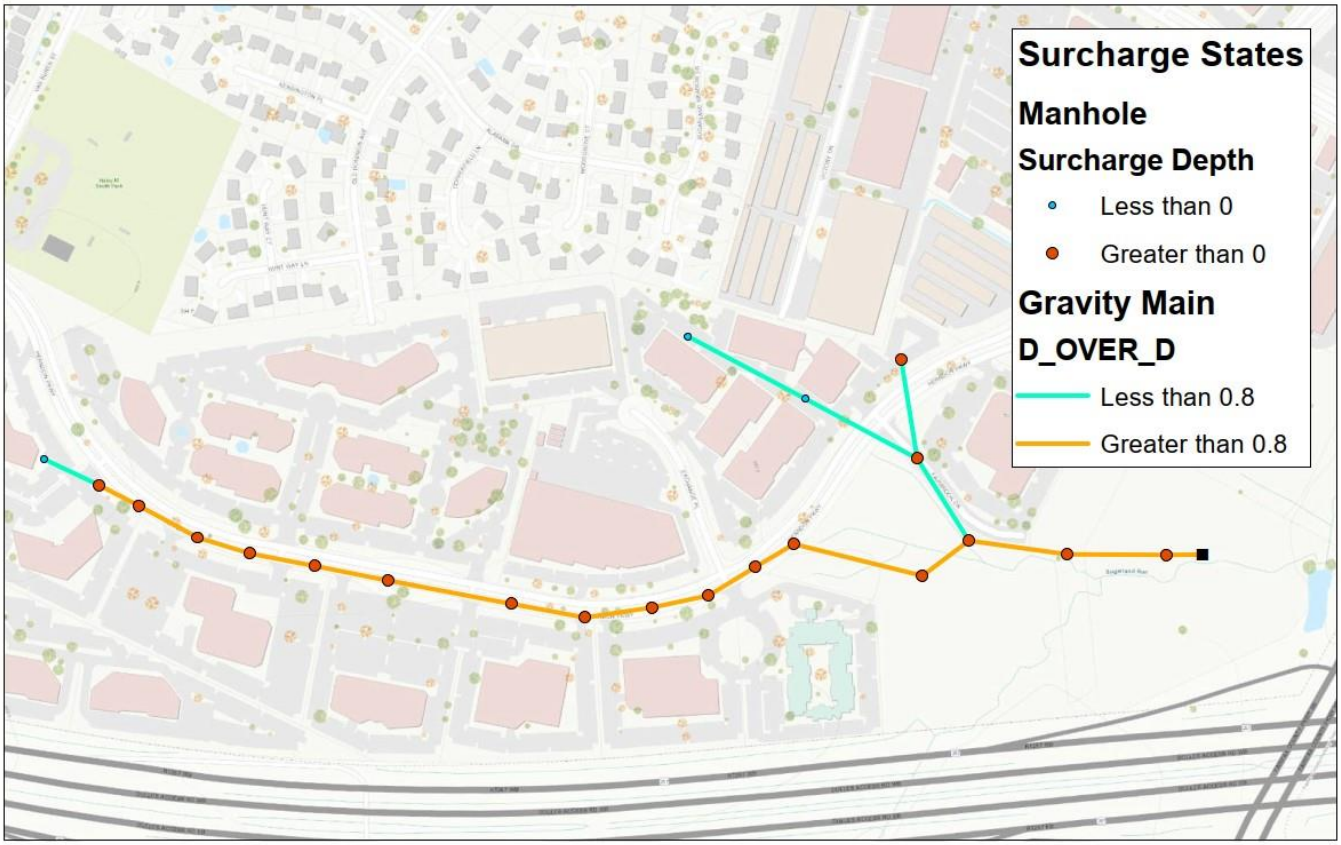



**Figure 7 – Sewer Surcharging with TRG Flows**

The model run indicates 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.

Appropriate wastewater collection system pipe sizes that eliminate surcharging are shown in **Figure 8**.

Impact from proposed development to wastewater infrastructure in the TRG Area, HTOC and Fairbrook Districts was evaluated by WRA in 2019 and improvements to the wastewater infrastructure were designed by WRA in 2020. Those improvements have not been constructed. The necessary improvements for the TRG Area wastewater conveyance are consistent with the 2020 design. The 2020 wastewater improvement plans are at the 90% complete design phase and only marginal changes to the plans are needed to accommodate the TRG Area development.

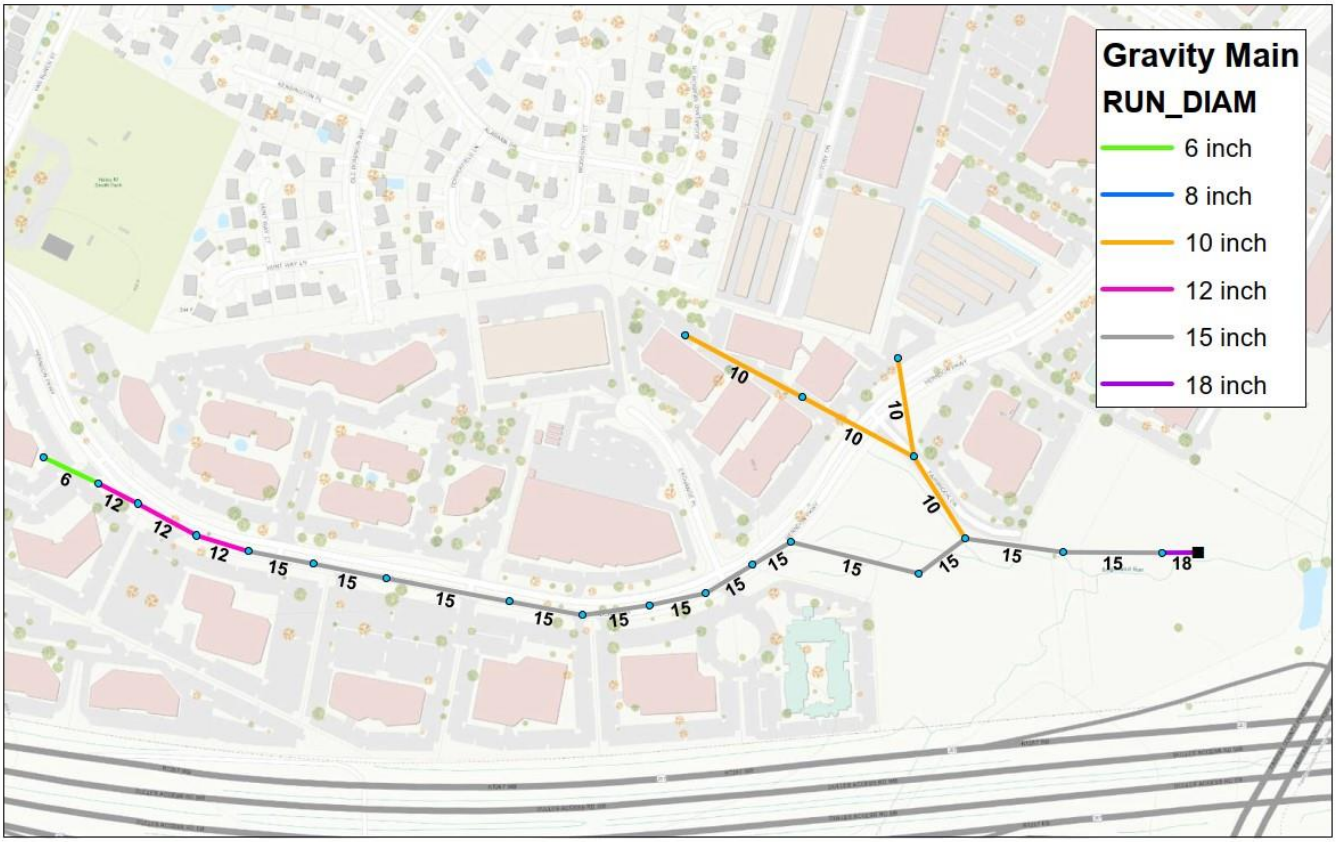



**Figure 8 – Upgraded Sewer Infrastructure**

# Town of Herndon TRG: Utilities and Storm Water Analysis (DRAFT)

**October 5th, 2022**




**PREPARED FOR:**
**Town of Herndon**

**PREPARED BY:**
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## Introduction

The purpose of this report is to analyze the existing conditions of the water, sanitary sewer, and storm water systems within the TRG study area. The analysis is based off of GIS data provided by the town of Herndon. This report also aims to identify potential work to be done with these existing systems/networks mentioned above based on future development conditions. Pipes which may need to be increased in size or pipes that may have to be removed have been identified in the following sections. Note that this is just very preliminary analysis, and a more precise analysis will be needed once future development conditions and layouts are determined.

# Exhibit 1

DRAINAGE
- Storm Manhole
- Detention Pond
- Inlet Point
- Outfalls
- Drainage Pond Pipe
- Drainage Stormwater Filter
- Drainage Gravity Main
- Drainage Pond

SEWER
- Sewer Manhole
- Sewer Meter Station
- Sewer Pump
- Sewer Vault
- Sewer Gravity Main
- Sewer Force Main

WATER SUPPLY
- Water System Valve
- Water Control Valve
- WaterPressurized Main
- Water Service Line
- Water Underground Enclosure

**Water distribution system**

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 and serves each individual parcel within the TRG.

The watermains 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.

Local, onsite water distribution networks (within each parcel) will most 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 large multifamily building with a garage, then a new waterline network will need to be designed to avoid conflicts with structures and other constraints.

Note that current uses within the TRG are mostly industrial, retail, and office park, and have low densities overall (low FAR's) per parcel. Redevelopment to higher densities like multifamily will cause a significant increase in demands. See Tables below for comparisons of flow demands for multifamily to low density industrial.

| Type of Dwelling Unit | Persons/Dwelling Unit |
|---|---|
| Single Family | 3.57 |
| Duplex | 3.22 |
| Multiplex | 2.42 |
| Mobile Home | 2.61 |
| Garden Apartment | 2.50 |
| Elevator Apartment | 1.50 |

The average daily water consumption rates for planning purposes shall be in accordance with the Virginia Department of Health, Waterworks Regulations, as follows:

| Service | Gallons Per Day |
|---|---|
| Dwellings, per person | 100 |
| High Schools with Showers, per person | 16 |
| Elementary Schools without showers, per person | 10 |
| Boarding Schools, per person | 75 |
| Motels at 65 gallons per person, minimum per room | 130 |
| Restaurants, per seat | 50 |
| Factories, per person, per eight-hour shift | 15-35 |
| Shopping Centers, per 1,000 sq. ft. of ultimate floor space | 200-300 |
| Hospitals, per bed | 300 |
| Nursing Homes, per bed | 200 |
| Home for the Aged, per bed | 100 |
| Doctor's Office in Medical Center | 500 |
| Laundromats, 9 to 12 machines, per machine | 500 |
| Community Colleges, per student and faculty member | 15 |
| Swimming Pools, per swimmer | 10 |
| Theaters, Auditorium Type, per seat | 5 |
| Picnic areas, per person | 5 |

Source: Town of Herndon, Water Main Design and Construction standards

| Table 10.1 Average Design Flows for Development Types | |
|---|---|
| **Type of Development** | **Design Flow (GPD)** |
| **Residential:** | |
| General, Mixed-use and Planned Developments | 100/person |
| Single family detached | 350/residence |
| Single family attached | 280/unit |
| Multifamily | 280/unit |
| **Commercial:** | |
| General | 2,000/acre |
| Motel | 130/unit |
| Office | 30/employee |
| | 0.20/net $ft^2$ |
| **Industrial:** | |
| General | 10,000/acre |
| Warehouse | 600/acre |
| Varies with type of industry | |
| **School Site:** | |
| general | 16/student |

Source: Fairfax County Public Facilities Manual

Ultimate development will also depend on the capacity of the existing system, which will need to be coordinated with the Town. Potential for system capacity increases to handle future development may be available.

Note that once future development scenarios are finalized, accurate water demands shall be entered into the Town's water model. This water model analysis with future scenarios will determine which watermains within the main streets will need upsizing. The water model will also determine sizing of branches serving each parcel. See exhibit 2 for more detail.

# Exhibit 2

EX PIPE TO BE DEMOLISHED AND REALIGNED BASED ON NEW SITE LAYOUT

EX PIPE TO BE POTENTIALLY UPSIZED BASED ON ULTIMATE DEVELOPMENT

DRAINAGE
- Storm Manhole
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**Sanity Sewer collection system**

Existing sewer system consists of collection mains that cross Herndon Pkwy and spring street. These sewers drain offsite residential areas as well as parcels within the TRG. Some sewage drains across Spring St. along Sugarland run, and another sewage main drains across Herndon Pkwy into a sewage pump station.

Note that current uses within the TRG are mostly industrial, retail, and office park, and have low densities overall (low FAR's) per parcel. Redevelopment to higher densities like multifamily will cause a significant increase in sewage flows, similar to those of water demands described above. See Tables above for comparisons of flow demands for multifamily to low density industrial. Similar to water, the trunk mains may be able to remain as is, but onsite local collector sewers on each parcel will need to be realigned to work with the future development layout. In a worst-case scenario, the trunk mains and even pump station capacity may need to be increased, which can include improvements beyond the TRG area.

Ultimate development will also depend on the capacity of the existing system, which will need to be coordinated with the Town. Potential for system capacity increases to handle future development may be available.

Note that once future development scenarios are finalized, accurate sewage demands shall be entered into the Town's sewer system model. This sewer model analysis with future scenarios will determine which sewer mains, pump stations, or sewer trunks will need upsizing. The sewer model will also determine sizing of branches serving each parcel. See exhibit 3 for more detail

# Exhibit 3

EX PIPE TO BE DEMOLISHED AND REALIGNED BASED ON NEW SITE LAYOUT

EX PIPE TO BE POTENTIALLY UPSIZED BASED ON ULTIMATE DEVELOPMENT

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**Storm Sewer system**

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.

Fortunately, it is important to note that since the parcels within the TRG are mainly non-residential, 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 shall strive to provide an increase in pervious areas or small LID measures to avoid an increase in runoff. Doing so within the TRG is much easier than redevelopment from agricultural or R1 sites to commercial or mixed use for example.

As mentioned above, onsite storm sewer systems will have to be removed and redesigned to align with the future development layouts. Some of the larger collection storm drains can potentially remain as is. See exhibit 4 for more detail.

# Exhibit 4

EX PIPE TO BE DEMOLISHED AND REALIGNED BASED ON NEW SITE LAYOUT

EX PIPE TO BE POTENTIALLY UPSIZED BASED ON ULTIMATE DEVELOPMENT

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**Storm water quantity and quality**

As mentioned above in the storm sewer section, a significant increase in stormwater runoff is not anticipated since the current TRG parcels are already most impervious. Also, due to proximity to the major floodplain around Sugarland run, there will most likely not be a need to detain stormwater (reduce runoff quantity). Adequate outfall may be achievable without any new stormwater management facilities.

Stormwater quality improvements however may be required as a best management practice, even if overall impervious areas are not increasing. This shall be coordinated with the Town of Herndon. Any stormwater quality measures shall be included within each parcel, (storm filters, tree box filters, hydrodynamic separators. Urban bioretention basins, etc...). Alternatively, water quality credit purchase is another viable option, and shall be coordinated with the Town.