PLANNING COMMISSION REGULAR MEETING AGENDA

Town Council Chambers
765 Lynn Street, Herndon, VA 20170

Monday, March 25, 2024 | 7:00 PM

---

1. **Call to Order**
2. **Approval of Minutes**
   a. February 12, 2024, Planning Commission Work Session
   b. February 22, 2024, Planning Commission Special Work Session
   c. February 26, 2024, Planning Commission Regular Meeting
3. **Comments**
   a. Comments from the Staff Members
   b. Comments from the Commissioners
   c. Comments from Citizens
      Members of the public may, for one 3-minute period, provide public comments, requests, consent or general item comments, and comments on matters not included on the agenda.
4. **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.
5. **Adjournment**

Planning Commission Regular Meeting
Agenda Item 2.a.

Agenda Item: **February 12, 2024, Planning Commission Work Session**

Meeting Date: March 25, 2024

Category: Approval of Minutes

Prepared by: Aaron Zoellick, Clerk of Boards and Commissions

Description:
This is a request to approve the February 12, 2024, Planning Commission Work Session minutes.

Background:
N/A

Budget Impact:
None

Recommendation:
Recommend approval, as presented.

Attachments:
1. 02.12.2024 Planning Commission Work Session Minutes

HERNDON PLANNING COMMISSION
Work Session Minutes
Monday, February 12, 2024

1. Call to Order

The Planning Commission met in work session on Monday, February 12, 2024, at 7:02 p.m. in the Town of Herndon Council Chambers Building, 765 Lynn Street, Herndon, Virginia. In attendance were: Commissioners Jay Donahue, Dua'a Elbarasse, Mike McFarlane, Kevin Moses, and Meron Yohannes. Vice Chair George Burke and Chair Mike Romeo were absent.

Staff present during the meeting: Bill Ashton, Town Manager; Lesa Yeatts, Town Attorney; Lisa Gilleran, Director of Community Development; Scott Robinson, Director of Public Works; Bryce Perry, Deputy Director of Community Development; John Irish, Deputy Director of Public Works; John Verdin, CIP Program Manager; Ahmad Zaki, Lead Planner/Long-Range Planning; and Aaron Zoellick, Clerk of Boards and Commissions

Lesa Yeatts, Town Attorney, stated that a Chair Pro Tem needed to be elected in the absence of the Chair and Vice Chair.

Commissioner McFarlane motioned to nominate Meron Yohannes as Chair Pro Tem.
Motion seconded by Kevin Moses.
Commissioner Yohannes was elected as Chair Pro Tem through unanimous consent.

Chair Pro Tem Yohannes called the meeting to order at 7:02 p.m. and stated that five members of the Planning Commission were present which constitutes a quorum.

2. Public Hearings

a. PROPOSED FY 2025 - FY 2030 CAPITAL IMPROVEMENT PROGRAM (CIP)

Chair Pro Tem Yohannes opened the work session and called on Mr. Verdin for the

staff presentation.

Mr. Verdin delivered the staff report and presentation dated February 12, 2024. Mr. Verdin stated that staff is recommending approval of the proposed FY 2025 - FY 2030 Capital Improvement Program in accordance with the draft resolution.

There was a discussion among the commissioners and staff on this item, including (1) concern about future parking in the downtown, (2) downtown redevelopment and the impact on private parking, and (3) suggestion that project readiness selection slide be positioned before the new projects slide. Mr. Verdin, Mr. Irish, and Mr. Ashton responded to the commissioners' questions and comments.

b. ZONING MAP AMENDMENT - ZMA #22-02, 13100 and 13150 Worldgate Drive, in the PD-W, Planned Development-Worldgate zoning district with proffered conditions to allow the redevelopment of the site with single-family attached and multi-family residential uses. (Continued from the December 18, 2023, and January 22, 2024, regular meetings.)

Chair Pro Tem Yohannes opened the work session and called on Mr. Perry for the staff presentation.

Mr. Perry delivered the staff report and presentation dated February 12, 2024. Mr. Perry stated that staff is withholding a recommendation at this time.

There was a discussion among the commissioners and staff on this item, including (1) whether staff is ready to put ZMA #22-02 to a vote at the February 26, 2024, Planning Commission regular meeting. Mr. Perry responded that staff will be ready for the regular meeting.

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

Chair Pro Tem Yohannes opened the work session and called on Mr. Zaki for the staff presentation.

Mr. Zaki delivered the staff report and presentation dated February 12, 2024. Mr. Zaki stated that staff is withholding a recommendation at this time.

There was a discussion among the commissioners and staff on this item, including (1) wheter the Small Area Plan will include a summary of a sense of Herndon that property owners can follow, (2) how walkability distinguishes Herndon from the rest of Fairfax County, (3) the desire to not be excessively prescriptive and the need for community input and discussion with developers, (4) the helpfulness and responsiveness of the consultants, and (5) the importance of walkability and open

spaces. Ms. Gilleran and Mr. Zaki responded to the commissioners questions and comments.

3. Comments

a. Comments from the Commissioners

No comments were offered.

b. Comments from the Staff Members

No comments were offered.

4. Adjournment

On the motion of commissioner Moses, seconded by commissioner Donahue, and without objection, the February 12, 2024, Planning Commission work session was adjourned at 7:52 p.m.

Planning Commission Regular Meeting
Agenda Item 2.b.

Agenda Item: **February 22, 2024, Planning Commission Special Work Session**

Meeting Date: March 25, 2024

Category: Approval of Minutes

Prepared by: Aaron Zoellick, Clerk of Boards and Commissions

Description:
This is a request to approve the February 22, 2024, Planning Commission special work session minutes.

Background:
N/A

Budget Impact:
None

Recommendation:
Recommend approval, as presented.

Attachments:
1. 02.22.2024 Planning Commission Special Work Session Minutes

HERNDON PLANNING COMMISSION
Special Work Session Minutes
Thursday, February 22, 2024

1. Call to Order

The Planning Commission of the Town of Herndon, Virginia, met in special work session on Thursday, February 22, 2024, at 7:00 p.m. in the Town of Herndon Council Chambers Building, 765 Lynn Street, Herndon, Virginia. In attendance were: Chair Mike Romeo, Vice Chair George Burke, and Commissioners: Mike McFarlane and Kevin Moses. Commissioners Jay Donahue, Dua'a Elbarasse, and and Meron Yohannes were absent.

Staff present during the meeting: Lisa Gilleran, Director of Community Development; Lesa Yeatts, Town Attorney; Bryce Perry, Deputy Director of Community Development; Ahmad Zaki, Lead Planner/Long-range Planning; and Collin Okoniewski, Planning Operation Manager.

Chair Romeo called the February 22, 2024, Planning Commission Special Work Session to order at 7:17 PM and stated that 4 Commissioners were present, which constituted a quorum.

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

Chair Romeo opened the work session and called on Ahmad Zaki for the staff presentation.

Mr. Zaki delivered the staff presentation dated February 22, 2024, which is on file with the Department of Community Development.

Chair Romeo opened the floor for questions by asking about discrepancies

between the staff memo and the PowerPoint presentation sections regarding the staff recommendation section. Ms. Gilleran advised that since sending the agenda and materials out for the meeting staff's position has evolved. Ms. Gilleran stated that centralized edits to the plan would be necessary as both the staff and members of the TRG Advisory Committee were disappointed in the current state of the plan.

Vice Chair Burke voiced his concern and disappointment on behalf of the TRG Advisory Committee.

The Planning Commissioners also voiced discomfort at seeing additional materials including a possible errata sheet outlining necessary changes at the public hearing on February 26th, and said that they would be averse to motion for a continuance with the hopes of sorting the plan and the errata sheet out in the March meetings.

Staff advised that they were looking at the possibility of holding an special regular meeting to meet the legal ad deadlines, but they needed to discuss it further with the Town Clerk and then run additional dates by the Planning Commission in order to obtain a quorum. Staff explained that they were still working out the planning of how this application would be presented and heard in the March meetings by the planning commission.

Chair Romeo asked that any additional meeting dates be promptly run by commissioners for quorum maintenance purposes by email, of which staff agreed.

3. Comments

a. Comments from the Commissioners

Chair Romeo recognized the Commissioners for additional comments.

There were no comments from Commissioners.

b. Comments from the Staff Members

Chair Romeo recognized staff members for additional comments.

Staff advised that the Town was looking to begin broadcasting work sessions July 1, 2024, but nothing had been set yet.

4. Adjournment

There being no further business, Chair Romeo adjourned the February 22, 2024 Planning Commission Special Work Session at 7:44 PM.

Planning Commission Regular Meeting
Agenda Item 2.c.

Agenda Item: **February 26, 2024, Planning Commission Regular Meeting**

Meeting Date: March 25, 2024

Category: Approval of Minutes

Prepared by: Aaron Zoellick, Clerk of Boards and Commissions

Description:
This is a request to approve the February 26, 2024, Planning Commission regular meeting minutes.

Background:
N/A

Budget Impact:
None

Recommendation:
Recommend approval, as presented.

Attachments:
1. 02.26.2024 Planning Commisson Regular Meeting Minutes

HERNDON PLANNING COMMISSION
Regular Meeting Minutes
Monday, February 26, 2024

1. Call to Order

Vice Chair Burke called the February 26, 2024, Planning Commission regular meeting to order at 7:00 p.m.in the Herndon Council Chambers Building, 765 Lynn Street, Herndon, Virginia. In attendance were: Vice Chair George Burke and commissioners Jay Donahue, Dua'a Elbarasse, and Mike McFarlane. Commissioners Kevin Moses, Meron Yohannes, and Chair Mike Romeo were absent.

Staff present during the meeting: Lesa Yeatts, Town Attorney; Lisa Gilleran, Director of Community Development; Scott Robinson, Director of the Department of Public Works; John Irish, Deputy Director of Department of Public Works; David Stromberg, Zoning Administrator; John Verdin, CIP Program Manager; Ahmad Zaki, Lead Planner/Long-Range Planning; and Aaron Zoellick, Clerk of Boards and Commissions.

Vice Chair Burke stated that four commissioners were present, which constituted a quorum.

2. Approval of Minutes

a. January 8, 2024, Planning Commission Work Session

b. January 22, 2024, Planning Commission Regular Meeting

Commissioner Donahue motioned to approve the January 8, 2024, Planning Commission work session minutes and the January 22, 2024, Planning Commission regular meeting minutes.
Motion seconded by commissioner McFarlane.
The question was called on the motion, which was carried by at 4 - 0 roll call vote.
The vote was commissioners Donahue, Elbarasse, McFarlane, and Vice Chair Burke voting "Aye."

3. Comments

a. Comments from the Commissioners

No comments were offered.

b. Comments from the Staff Members

No comments were offered.

c. Comments from Citizens

No comments were offered.

4. Public Hearings

Ms. Gilleran stated that the public hearing items were properly advertised in the February 16 and February 23, 2024, issues of the Fairfax County Times newspapers.

a. PROPOSED FY 2025 - FY 2030 CAPITAL IMPROVEMENT PROGRAM (CIP)

Vice Chair Burke opened the public hearing and called on Mr. Verdin for the staff presentation.

Mr. Verdin delivered the staff presentation dated February 26, 2024, which is on file with the Department of Community Development.

Staff recommended approval of the FY 2025 - FY 2030 Capital Improvement Program in accordance with the draft resolution.

There was discussion among the Planning Commission and staff on this item, including: (1) AARPA funding deadlines.

Vice Chair Burke recognized members of the public for comments.

No comments were offered.

Vice Chair Burke closed the public hearing and moved to the commission level for discussion.

Commissioner McFarlane motioned to approve FY 2025 - FY 2030 Capital Improvement Program in accordance with the draft resolution.
Motion seconded by Commissioner Elbarasse.
The question was called on the motion, which was carried by a 4 - 0 roll call vote.
The vote was: Commissioners Donahue, Elbarasse, McFarlane, and Vice Chair Burke voting "Aye."

b. ZONING MAP AMENDMENT - ZMA #22-02, 13100 and 13150 Worldgate Drive, in the PD-W, Planned Development-Worldgate zoning district with proffered conditions to allow the redevelopment of the site with single-family attached and multi-family residential uses. (Continued from the December 18, 2023, and January 22, 2024, regular meetings.)

Vice Chair Burke opened the public hearing and called on Mr. Stromberg for the staff presentation.

Mr. Stromberg delivered the staff presentation dated February 26, 2024, which is on file with the Department of Community Development.

Staff recommended approval of ZMA #22-02 with further conditions in accordance with the draft resolution.

There was discussion among the Planning Commission and staff on this item, including: (1) whether the Fire Marshall has expressed concern in their review.

Vice Chair Burke recognized the applicant for comment.

The applicant Ken Wire was present and provided brief comments.

Vice Chair Burke recognized the commissioners for questions of the applicant.

No questions or comments were offered.

Vice Chair Burke recognized members of the public for comments.

No comments were offered.

Vice Chair Burke closed the public hearing and moved to the commission level for discussion.

Commissioner Elbarasse motioned to approve ZMA #22-02 with the proffered conditions and in accordance with the amended draft resolution.
Motion was seconded by commissioner McFarlane.
The question was called on the motion, which was carried by a 4 - 0 roll call vote.
The vote was: commissioners Donahue, Elbarasse, McFarlane, and Vice Chair Burke voting "Aye."

c. COMPREHENSIVE PLAN AMENDMENT - CPA #23-01, Resolution to consider Comprehensive Plan Amendment, CPA #23-01, pursuant to Section 15.2-2229

of the Code of Virginia, an amendment to the Town of Herndon 2030 Comprehensive Plan, adopted August 12, 2008, as amended through May 24, 2022

Vice Chair Burke opened the public hearing and called on Mr. Zaki for the staff presentation.

Mr. Zaki delivered the staff presentation dated February 26, 2024, which is on file with the Department of Community Development.

Mr. Zaki presented an errata sheet for review of the final draft of the TRG Small Area Plan.

Mr. Zaki asked Ms. Gilleran to facilitate further discussion about the final draft of the TRG Small Area Plan.

There was discussion among the Planning Commission and staff on this item, including: (1) concerns over prescriptiveness in the current draft; and (2) whether the language of a flexible nature is adequate or whether specific measurements should be removed.

Staff recommended that the public hearing remain open and there be a continuance to the March 25, 2024, Planning Commission regular meeting.

Vice Chair Burke recognized Commissioners for comments.

Commissioners offered comments regarding (1) appropriateness of flexibility and avoiding prescriptiveness, (2) the need to provide language that elaborates on goals like walkability, and (3) reducing subjectivity by using the term "best practices."

Ms. Gilleran and Mr. Zaki responded to the commissioners questions and comments.

Vice Chair Burke asked Ms. Yeatts for clarification on a motion for continue.

Ms. Yeatts responded to Vice Chair Burke's question.

Vice Chair Burke recognized members of the public for comments.

Ken Wire provided comments regarding features and flexibility.

Vice Chair Burke left the public hearing open and moved to the Commission level for discussion.

Commissioner McFarlane motioned to continue CPA #23-02 to the March 25,

2024, Planning Commission regular meeting.
Motion seconded by commissioner Donahue.
The question was called on the motion, which was carried by a 4 - 0 roll call vote.
The vote was: commissioners Donahue, Elbarasse, McFarlane, and Vice Chair Burke voting "Aye."

5. Adjournment

Commission Donahue motioned to adjourn.
Motion seconded by commissioner Elbarasse.
Having no further business, and without objection, Vice Chair Burke adjourned the February 26, 2024, Planning Commission regular meeting at 7:57 p.m.

Planning Commission Regular Meeting
Agenda Item 4.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: March 25, 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.

Staff continues to review the draft plan and develop an errata sheet that will be delivered with a draft resolution to the Planning Commission at a date prior to the Planning Commission's public hearing on CPA #23-01 on March 25, 2024.

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 recommends certification and a recommendation for approval with amendments in accordance with the draft resolution provided and as required by Section 15.2-2229 of the Code of Virginia.

Attachments:

1. Staff Memo
2. Resolution (Proposed)
3. 02.12.2024 Final Draft Report with Appendices
4. Amendment Text (Proposed)
5. TRG Errata-Refinement Sheet

TOWN OF Herndon VIRGINIA

MEMORANDUM

To: Chair Romeo & Members of the Planning Commission

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

Date: March 25, 2024

Subject: CPA# 23-01, Proposed Errata / Refinements to the Final Draft Transit-Related Growth (TRG) Small Area Plan

---

Updates

This memo provides an update on the ongoing review process for the adoption of the Transit-Related Growth (TRG) Small Area Plan, outlined in Comprehensive Plan Amendment (CPA) #23-01. Over the past several weeks, staff, in collaboration with the Planning Commission, have been diligently reviewing the final draft of the TRG Small Area Plan.

A key outcome of this review process is the preparation of an Errata/Refinement Sheet by staff. This document carefully documents the edits proposed for the draft TRG Small Area Plan, based on input from the Planning Commission, the TRG Advisory Committee, the technical staff committee, the TRG property owners, and the public. The refinements primarily focus on enhancing clarity and consistency throughout the plan. Some additional guiding language is also included to complement existing information and enrich the explanation of various aspects of the TRG Small Area Plan.

The Errata/Refinement Sheet serves as a comprehensive record of the proposed changes to the draft plan. It plays a critical role as a legal component of the CPA process. The sheet will be attached as part of the Planning Commission's resolution, providing a transparent and legally binding outline for the finalization of the TRG Small Area Plan.

Background

The TRG Small Area Plan aims to encapsulate the collective vision and aspirations of the community, serving as a long-term guide for the future redevelopment of 94 privately owned acres into a well-designed, viable mixed-use district. It emphasizes encouraging redevelopment, establishing buffers to abutting neighborhoods, creating a distinctive sense of place integral to Herndon's identity, contributing to a multi-modal transportation network, and establishing expectations for architectural and urban excellence.

Once approved, the TRG Small Area Plan will serve as a 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, and establishes the general framework for future zoning language.

The Town of Herndon initiated the TRG planning project in early 2022, involving comprehensive data collection, analysis, constraint and opportunity assessment, market study, infrastructure analysis, and traffic study and modeling. Three alternative concepts emerged from these studies and were shared with the public, stakeholders, and governing bodies for feedback. Following robust public engagement and guidance from the Town Council, the Planning Commission, and the TRG Advisory Committee, a preferred alternative was selected and refined into the draft plan.

From that time the project has undergone three drafts with the third and final draft (dated February 12, 2024) now under consideration by the Planning Commission.

CPA #23-01 was initiated by the Town Council on December 12, 2023, via Resolution 23-G-77, and subsequently referred to the Planning Commission for review. The Planning Commission conducted comprehensive reviews of the TRG Small Area Plan at their work sessions and meetings in January, February, and March 2024, including an additional work session in February.

Concurrently, the TRG Advisory Committee engaged in rigorous discussions and provided valuable recommendations to the Planning Commission at its final meeting on January 10, 2024. The TRG technical committee, composed of Town of Herndon professional staff, also conducted a thorough review of the draft TRG Small Area Plan. The input garnered from these committees has been invaluable in shaping the TRG Small Area Plan, demonstrating a commitment to aligning it with the community's vision expressed during public engagement programs.

Next Steps
In accordance with Section 15.2-2223 of the Code of Virginia, the Planning Commission is tasked with conducting a thorough review of the TRG Small Area Plan and its associated appendices. Following the completion of the review process, the Planning Commission will determine the approvability of the TRG Small Area Plan. Once the plan is found to be approvable, the Planning Commission will certify it and provide a recommendation to the Town Council for adoption. Subsequently, the Town Council will deliberate on the plan, either approving and adopting it, amending, and adopting it, or disapproving it.

The updated Errata/Refinement Sheet will be presented during the March 25th Planning Commission regular meeting. This sheet will continue to be maintained through the Town Council review process, with potential comments incorporated as needed. If approved by the Town Council, a record copy of the plan will be promptly updated to incorporate these corrections and refinements and that document will serve as the final TRG Small Area Plan.

Staff is grateful for the Planning Commission’s invaluable guidance and feedback throughout this planning process and appreciates the commission’s continued commitment and expertise as we approach the finalization of the TRG Small Area Plan.

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

1. Certification and recommendation for approval,
2. Certification and recommendation for approval with amendments,
3. Recommendation for disapproval, or
4. Continuance of the CPA to the March 25, 2024, regular meeting.

Staff Recommendation
Staff recommends a certification and a recommendation for approval with amendments in accordance with the draft resolution provided and as required by Section 15.2-2229 of the Code of Virginia.

TOWN OF HERNDON, VIRGINIA
PLANNING COMMISSION

RESOLUTION

MARCH 25, 2024

Resolution- **To certify and recommend for approval Comprehensive Plan Amendment, CPA #23-01 to amend Chapter 3, Land Use Plan, of the 2030 Comprehensive Plan adopted August 12, 2008, as amended through May 24, 2022, to adopt the Transit-Related Growth (TRG) Small Area Plan and incorporate it by reference into the 2030 Comprehensive Plan.**

On December 12, 2023, the Town Council initiated consideration of Comprehensive Plan Amendment, CPA #23-01 with approved Resolution 23-G-7, referring and authorizing Planning Commission study and recommendation, in accordance with Section 15.2-2223 and 15.2-2232 of the Code of Virginia.

The Planning Commission reviewed this Comprehensive Plan Amendment and held public hearings on January 22, 2024, February 26, 2024, and March 25, 2024, with due notice as required under Section 15.2-2225 of the Code of Virginia.

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

1. The Planning Commission recommends Comprehensive Plan Amendment, CPA #23-01 for approval with the amendments specified in the TRG Small Area Plan Errata and Refinement Sheet as incorporated into the resolution and as presented by staff at the public hearing on March 25, 2024, to the Town Council as an amendment to the Herndon 2030 Comprehensive Plan as adopted on August 12, 2008, and as amended through May 24, 2022.

2. The Planning Commission certifies a copy of the amendment to the Town Council as shown on the attached Herndon 2030 Comprehensive Plan, Chapter III 2030 Land Use Plan.

3. The Planning Commission recognizes the importance of clear implementation strategies and endorses the generation of a separate implementation report, to be completed by the staff technical committee with possible outside consultant services, for later adoption.

TRG
TRANSIT - RELATED GROWTH AREA

TOWN OF Herndon
SOM

FINAL DRAFT

Town of Herndon

Transit-Related Small Area Plan

Final Report

February 12, 2024

Table of Contents

I	**Introduction** Acknowledgments Executive Summary Plan Purpose Plan Aspiration Plan Assumptions Plan Development Process & Methodology	Pg. 00-09
II	**Site Exploration & Analysis** Existing Conditions Summary of Existing Market Analysis Summary of Existing Transportation Analysis Summary of Utilities Analysis Constraints and Opportunities	Pg. 10-23
III	**Public Engagement** Opportunities for Input Summary of Findings	Pg. 24-28
IV	**Plan Vision** Summary of Concept Scenarios Preferred Vision Principles, Goals & Objectives	Pg. 29-37
V	**Urban Design Framework** Land Use & Density Urban Design and Architectural Character Recreation & Open Space Design Neighborhood Design Transportation Network Parking Strategies Equity Framework	Pg. 38-74
VI	**Traffic Impact** Summary of Model Findings Explanation of Mitigation Measures Level of Service Policy	Pg. 75-80
VII	**Public Infrastructure Impacts** Summary of Model Findings Explanation of Mitigation Measures	Pg.81-82
VIII	**Fiscal Impacts & Market Strategies** Summary of Findings Explanation of Mitigation Measures	Pg. 83-85
IX	**Community Service Impacts** Summary of Findings Explanation of Mitigation Measures	Pg. 86-87
X	**Plan Implementation** Small Area Plan Execution Strategies	Pg. 88-89
XI	**Appendices** A - Site Conditions Analysis B - Herndon TRG Traffic Study (VHB) C - Fiscal Impact Analysis (RCLCO) D - Utilities and Storm Water Analysis Report E - TRG Water and Sewer Analysis	

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

Town Staff
Elizabeth M. Gilleran, AICP
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
William Savage

TRG Advisory Committee
George Burke, Chair
Vice Chair Planning Commission

Meron Yohannes
Planning Commission Member

Andrew Snowhite
Community Member

Rajesh Ramasubramanian
Community Member

Greg Riegle
Representative for the Property Owners

Ken Wire
Representative for the Property Owners

Bryce Perry
Voting Staff Member

Michael Romeo (Alternate)
Planning Commission Member

Emlyn Marsteller (Alternate)
Community Member

Fadrique Iglesias (Alternate)
Community Development Staff

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

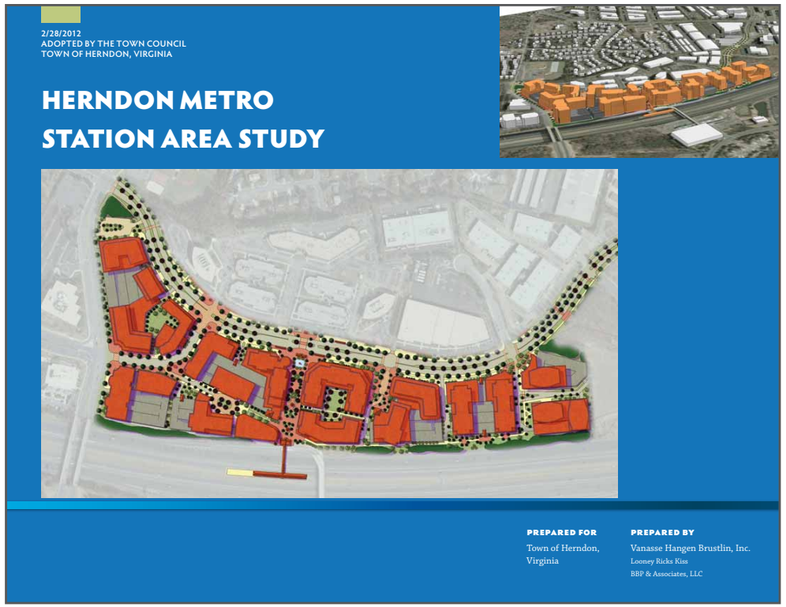
In Fall 2021, the Town of Herndon issued a request for proposals for a Small Area Plan (SAP), to be referred to as the Transit-Related Growth Area (TRG). A consultant team was selected shortly thereafter, and work on the project began in April, 2022.

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).

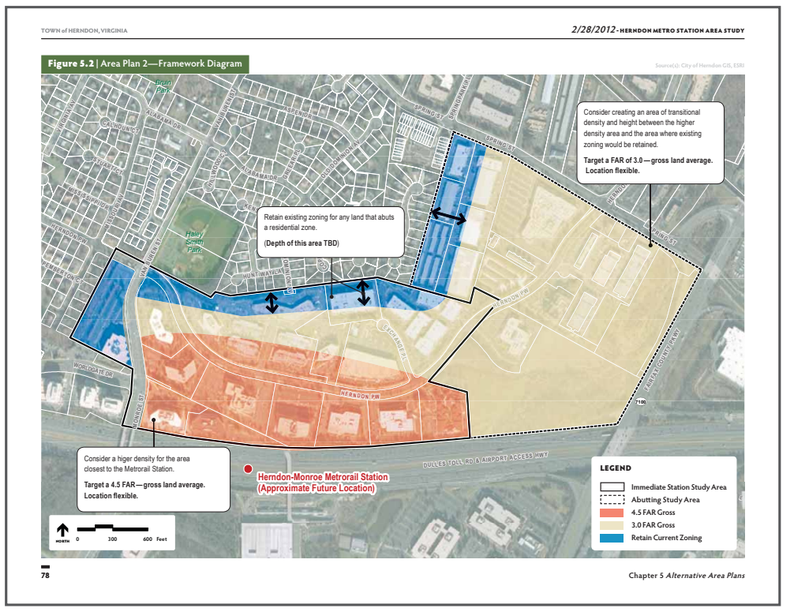
At the outset of the study, the boundary of the Herndon Metro Station Area Study originally included the TRG's study area. During the planning process, it was determined that the HMSAS would focus on the portion of the study area located along the south side of the Herndon Parkway, immediately adjacent 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

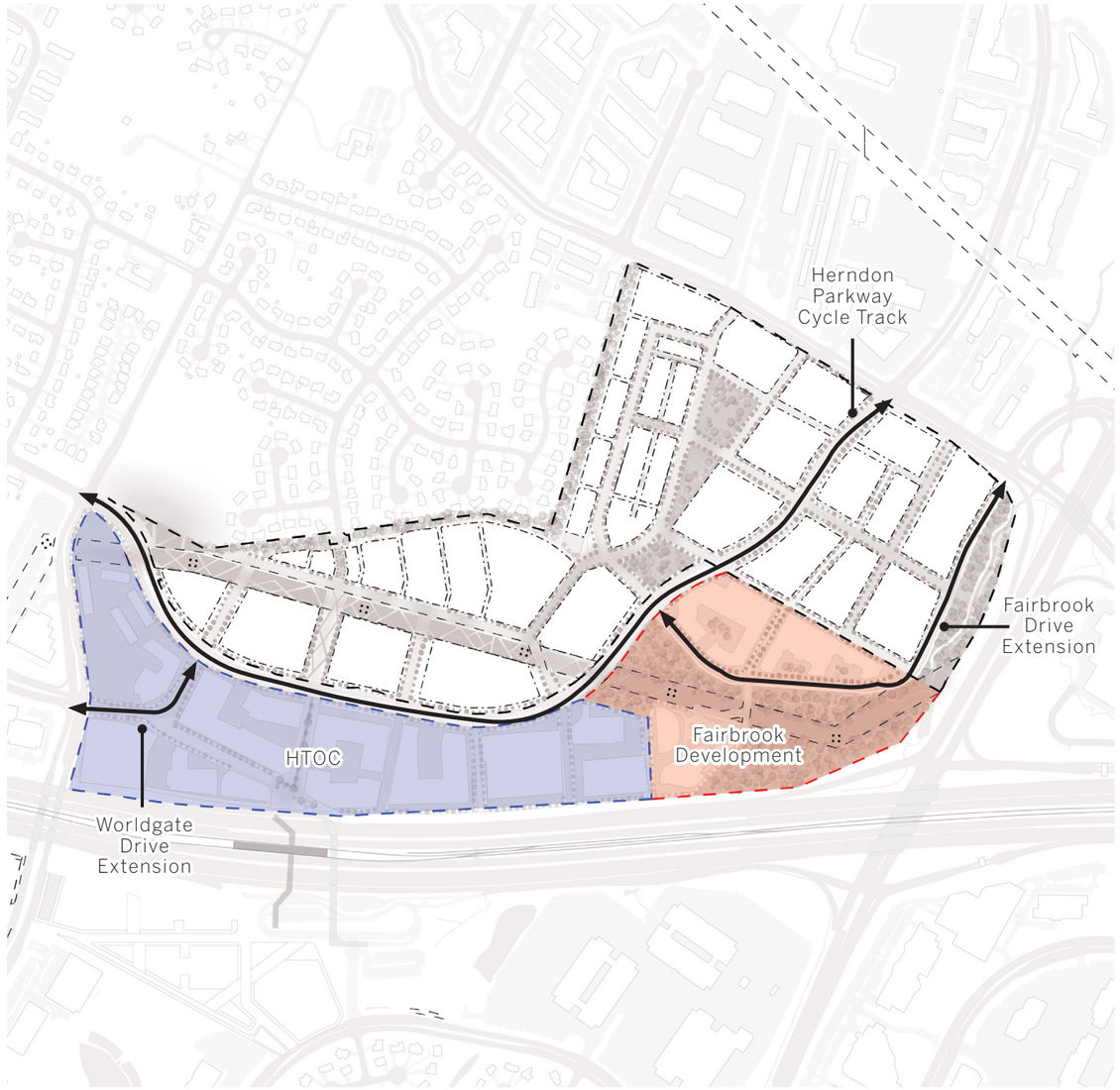
Fairbrook Drive is a proposed road that would branch off Herndon Parkway, pass through the Fairbrook development, and turn north along Sugar Land Run before intersecting with Spring Street. At present, the status of the Fairbrook Drive extension is not clear, but for the purposes of the TRG SAP, it is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

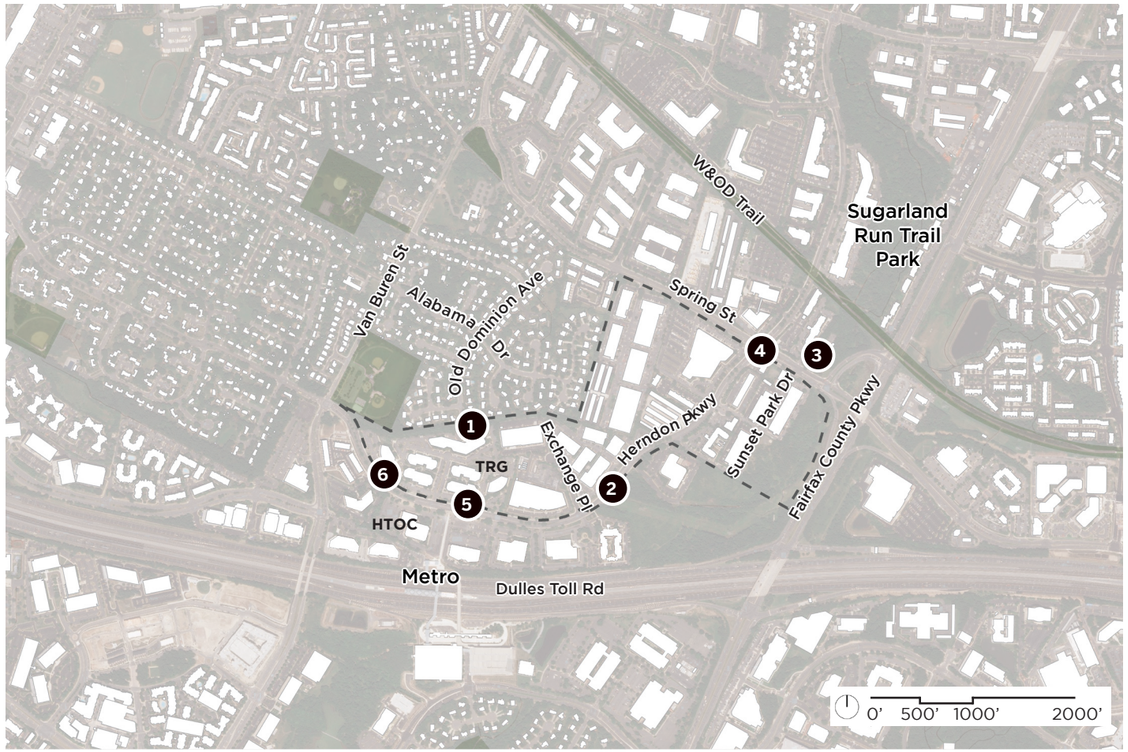
- Public surveys
  - Qualitative and quantitative
- Public communication
  - Public meetings
  - Project website
  - Podcast
- Data analysis
  - Existing conditions
  - Computer modeling of proposed conditions
- Urban design
  - Existing conditions analysis
  - Design iterations
  - Design refinement

PROJECT TIMELINE

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

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



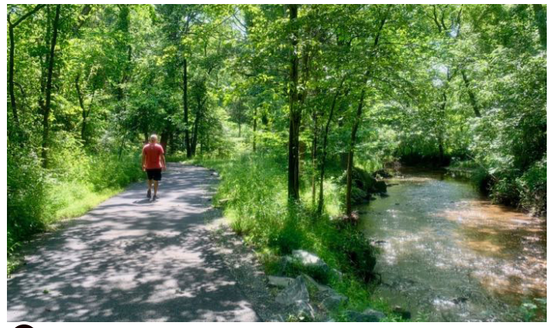
9 VIEW OF THE NEW RESTON GATEWAY SKYLINE FROM THE TRG

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

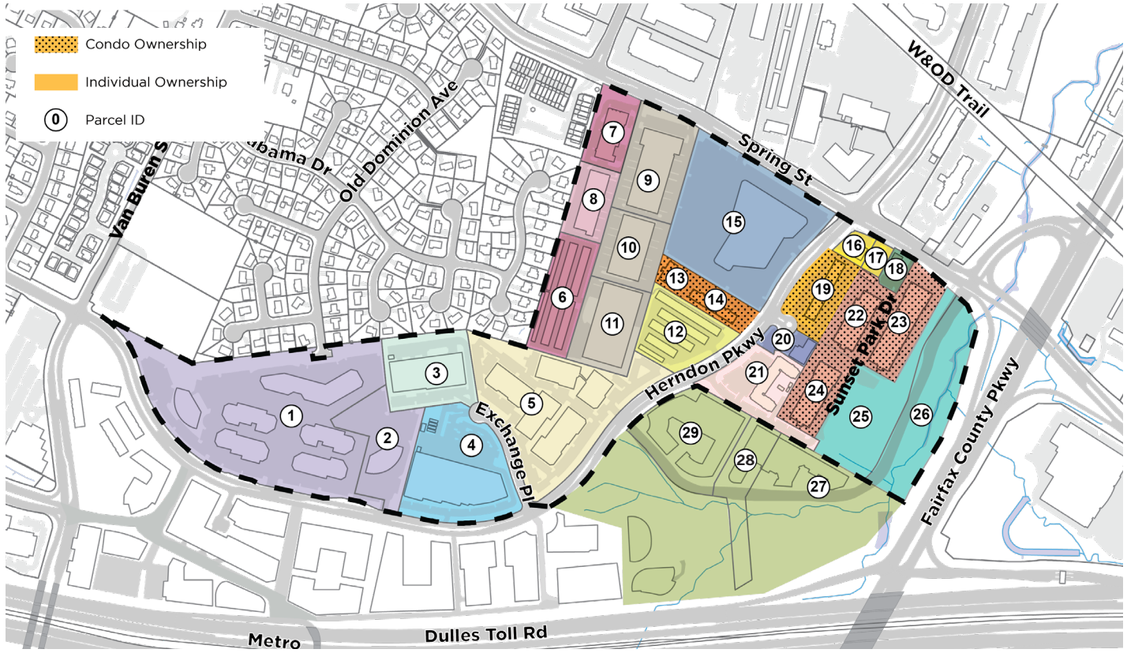
PROPERTY OWNERSHIP

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)

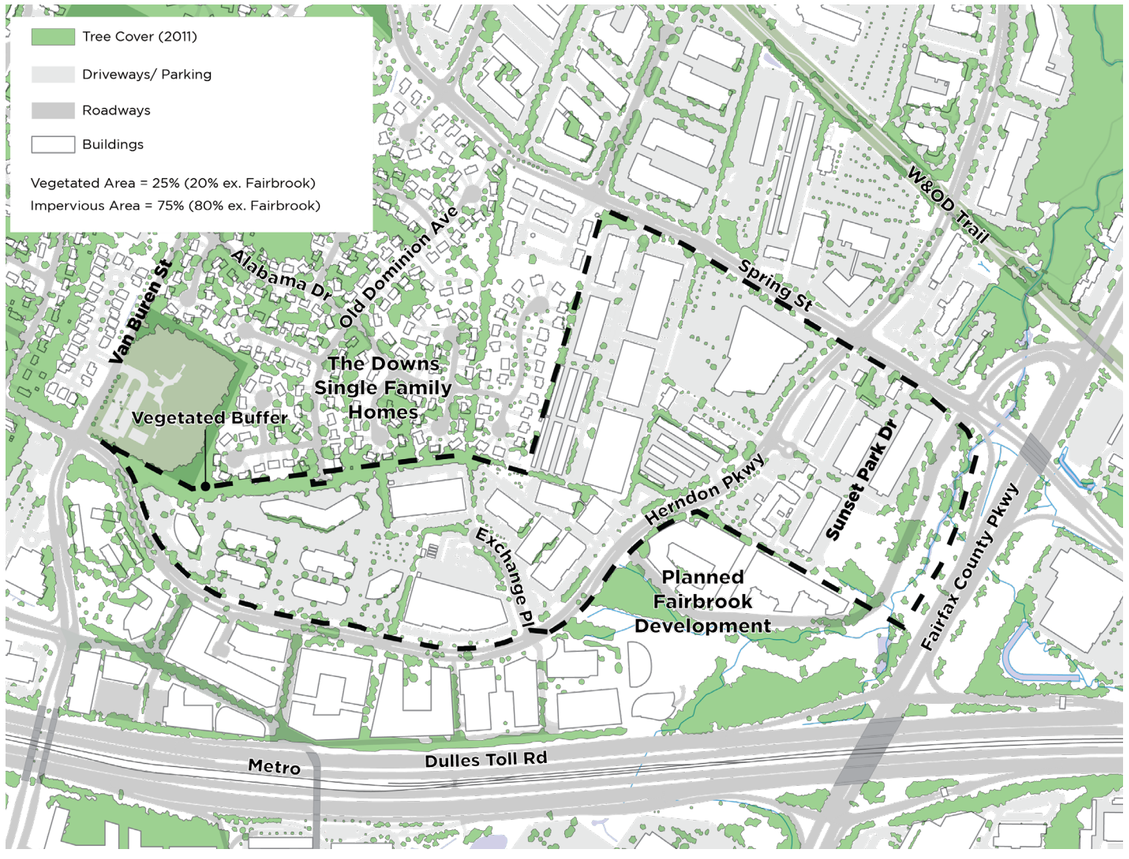
Parcel ID	Address	Year Built	Number of Owners	Year Built / Added	Building Age (Years)	Property Land Area (SF)	Property GFA (SF)	FAR	Height (Stories)
1	570 HERNDON PKWY (Monroe Business Center)	1986	1	1986	37				1, 1, 3
2	560 HERNDON PKWY	1988		1988	35	822,649	253,263	0.31	3
3	253 EXCHANGE PL (Beanstalk)	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

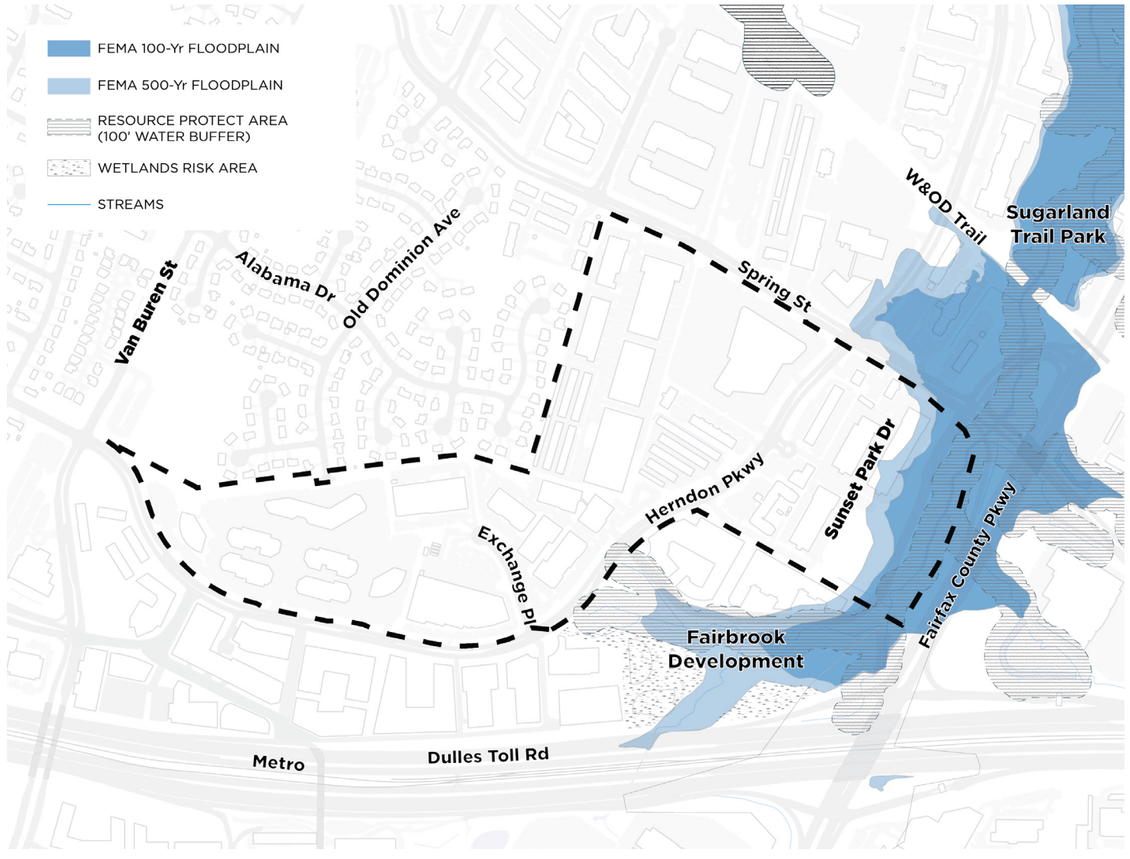
TREE CANOPY

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.

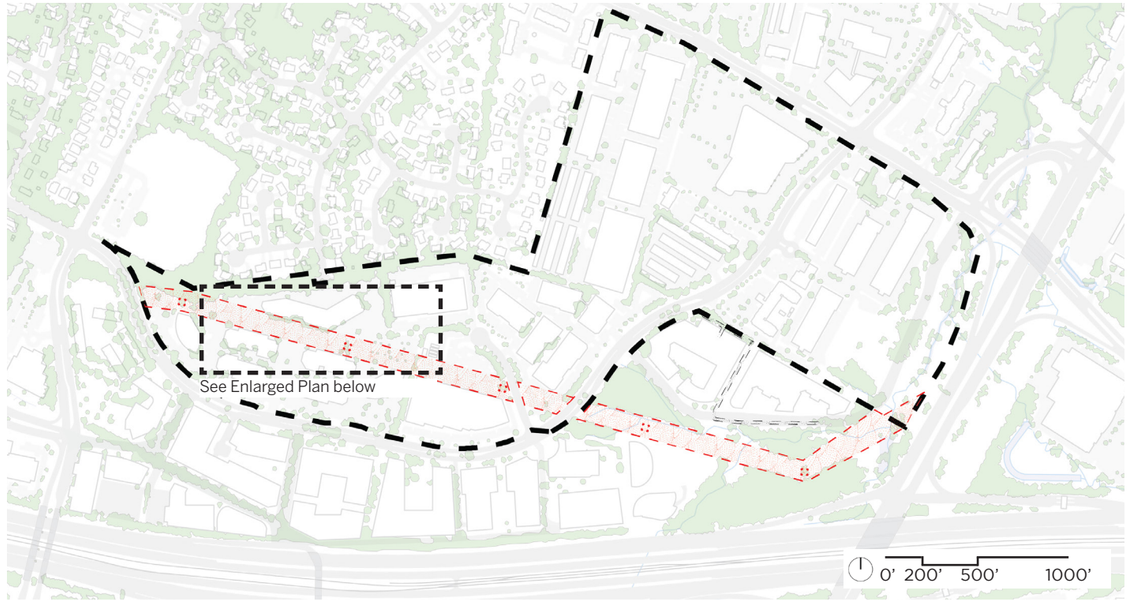
Buildings presently flank the easement on both sides, making its 100-foot clear zone readily apparent in maps and aerial photos, such as the bird's eye view below. Most of the clear zone is being used for driveways, parking lots, and low landscaping.

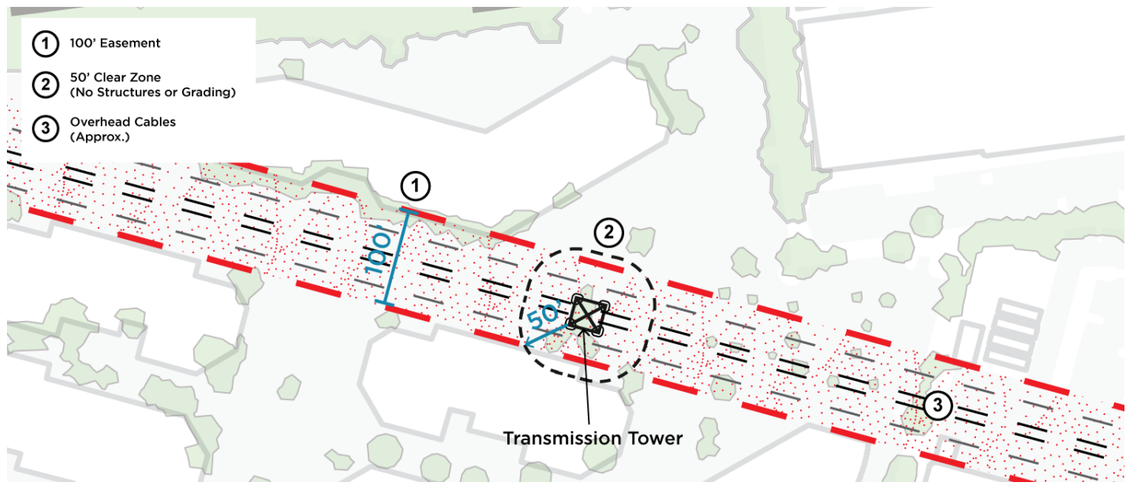


Although the easement poses a major constraint on the TRG, it could also be viewed as an opportunity: is it a divider or a connector; a parking lot or a park?

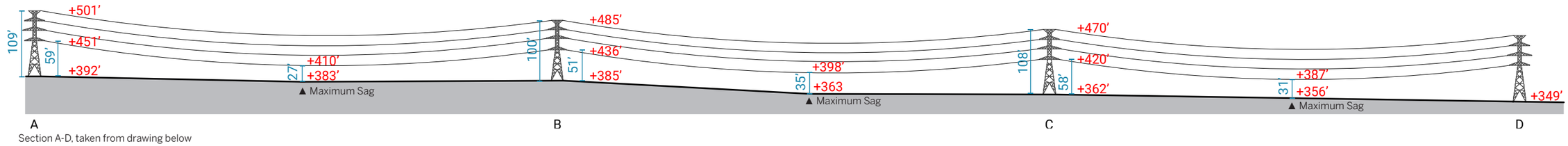
General Restrictions on the Easement
The general restrictions improvements on the easement are listed below. Final requirements will be determined by an official agreement between property owners and Dominion.

- 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"

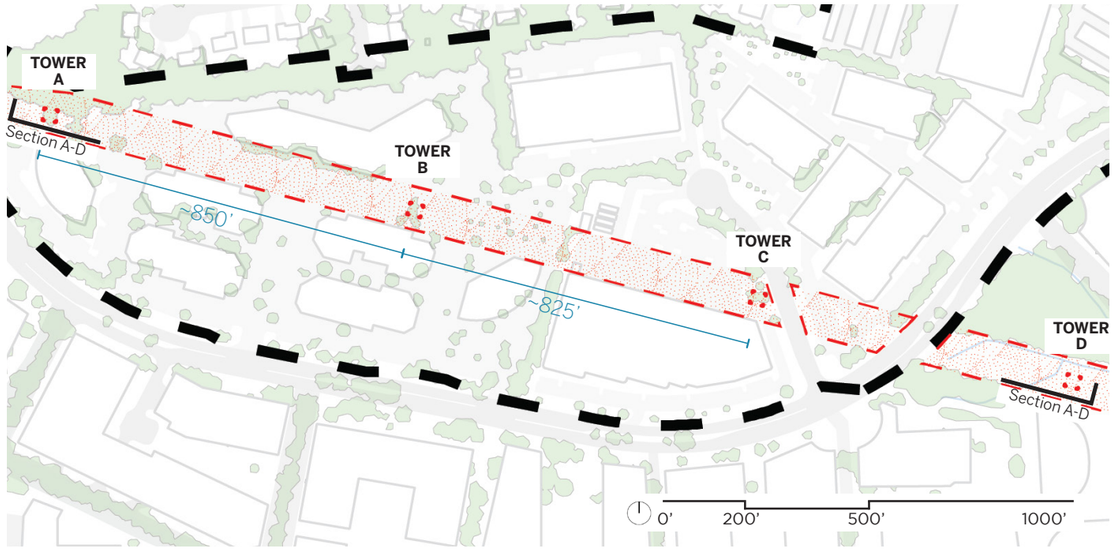


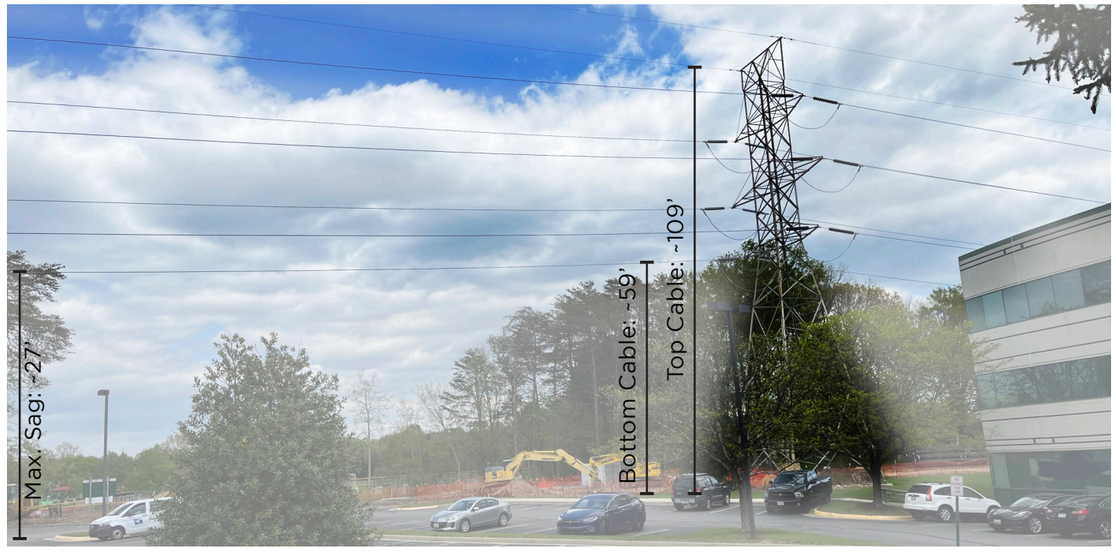


Existing Conditions - Dominion Easement



Section A-D, taken from drawing below





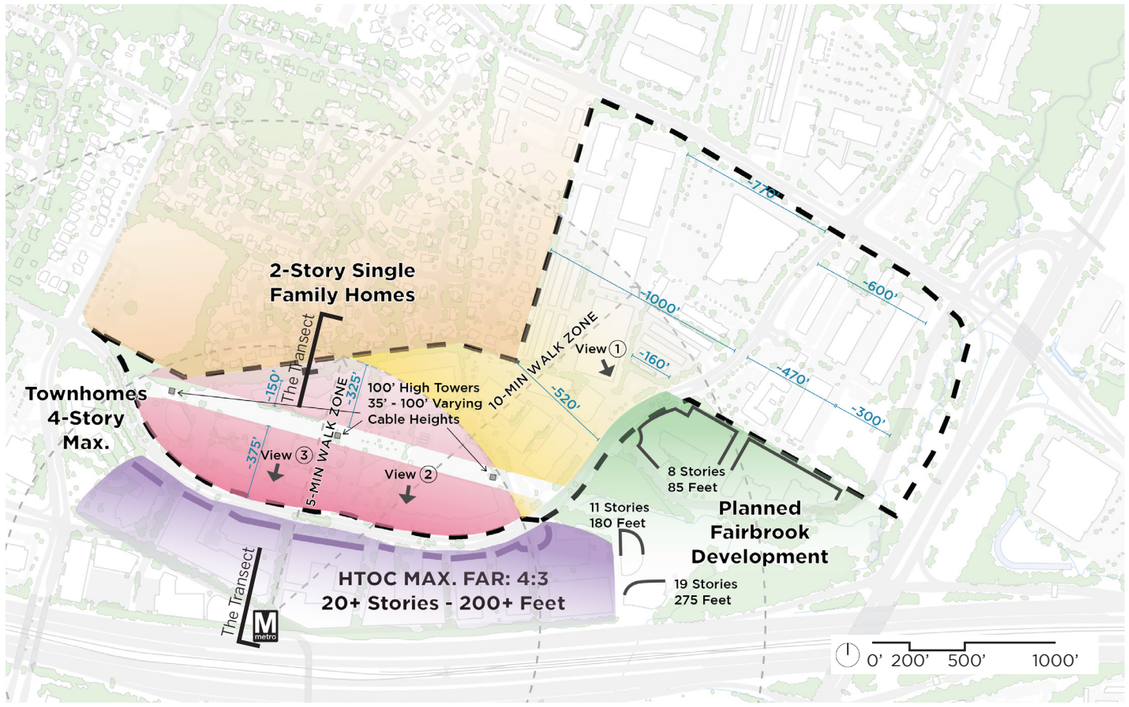
Three transmission towers are located within the easement between Exchange Place and the far western edge of the TRG. These towers are approximately 825 to 850 feet apart, roughly the distance of two large city blocks.
The towers are at least twice as tall as the buildings around them, as seen in the 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.

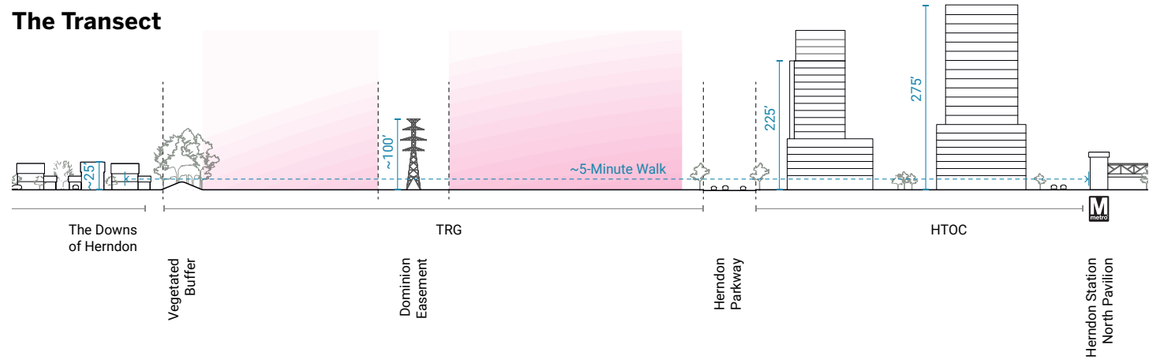


Existing Conditions - Heights



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.

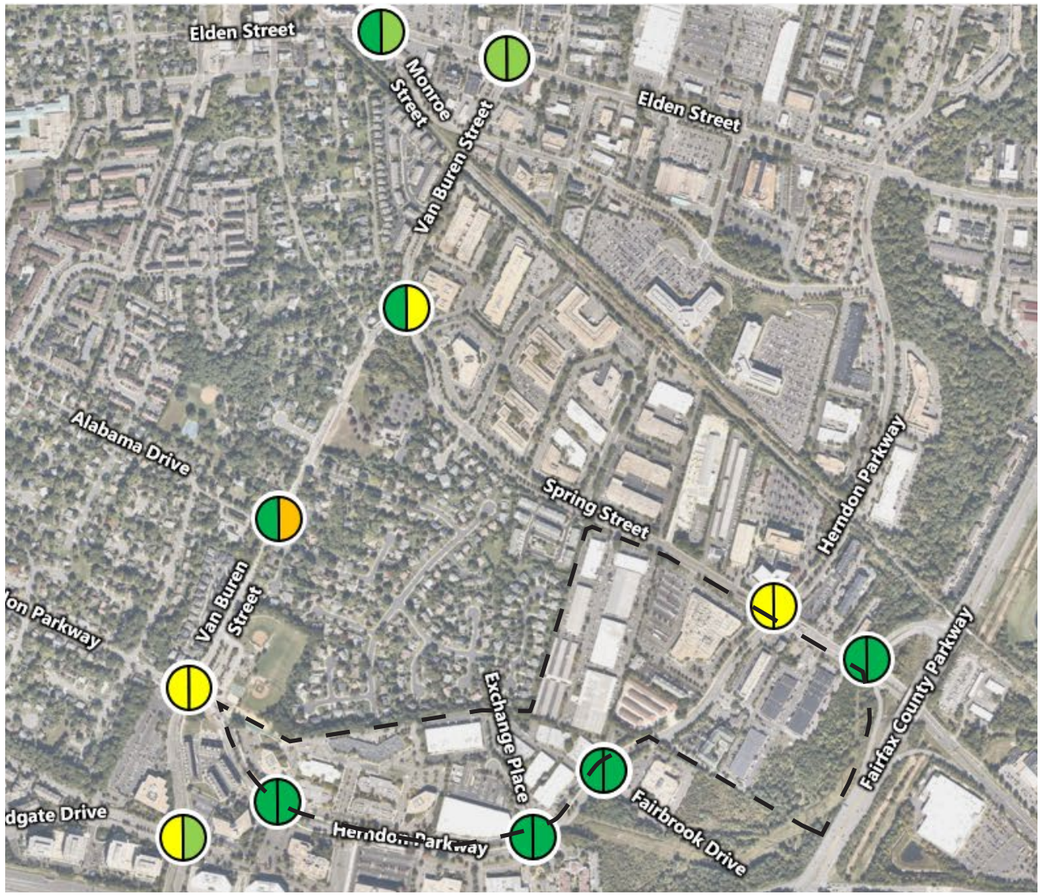
Existing Traffic Conditions
A microsimulation traffic model was utilized to estimate the operation conditions of the existing motor vehicle transportation system. Existing conditions were found to operate acceptably. Traffic performance was measured using Level of Service metrics. As defined by the U.S. 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. • Lack of a circulation network or mobility grid connecting the parcels, as well as the existing grade changes and other man-made features which prevent cross-parcel connectivity • The low density, low height residential neighborhood to one side of the TRG, and the high-rise, high density development planned on the other characterize the clearly defined, and contrasting boundaries of the site The TRG development should strive to reconcile both conditions	• Many buildings are dated and due for refurbishment or redevelopment • There is the opportunity to enhance Sunset Business Park: while the myriad of businesses, shops and restaurants in this area are an asset to the TRG and a local destination, the complex currently lacks a holistic sense of place • 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 • 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 • 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 • 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 • 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 • Additional roads and improved route options could improve traffic conditions for all users • 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.

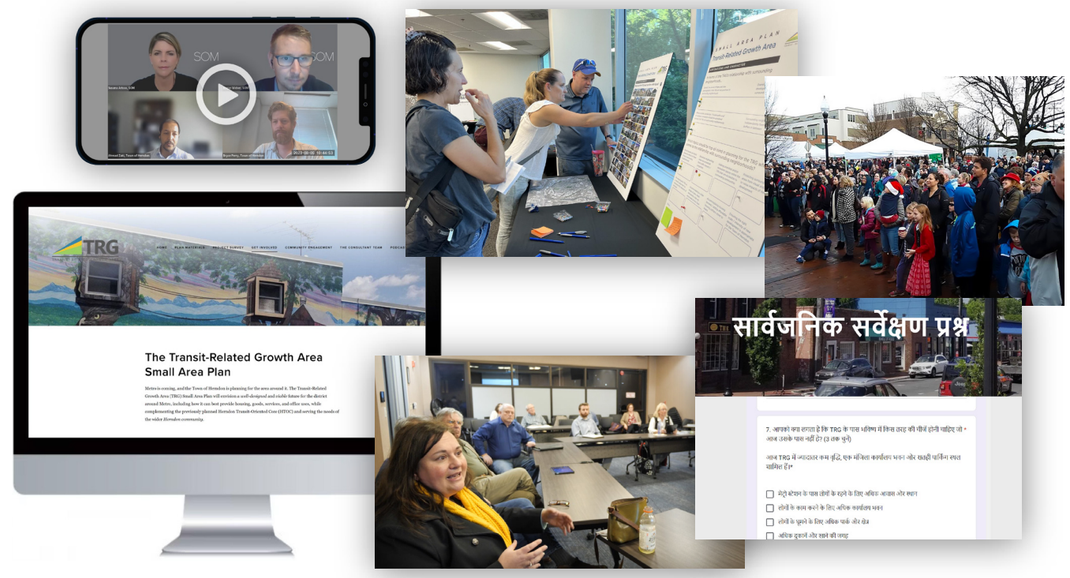
The public engagement approach was designed to ensure meaningful, inclusive, and open dialogue. The process aimed to:

- *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

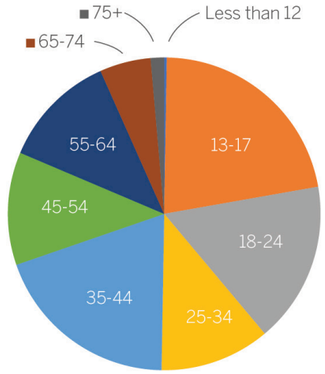
May 25, 2022	**Advisory Committee Meeting**	Introductory meeting between project team and Advisory Committee
June 10, 2022	**Town Council Meeting**	
June 21, 2022	**TRG Property Owners Meeting**	Opportunity for Project Team to hear from the TRG Property Ownership Community
June 22, 2022	**TRG Neighbors 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

AGE OF RESPONDENTS



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

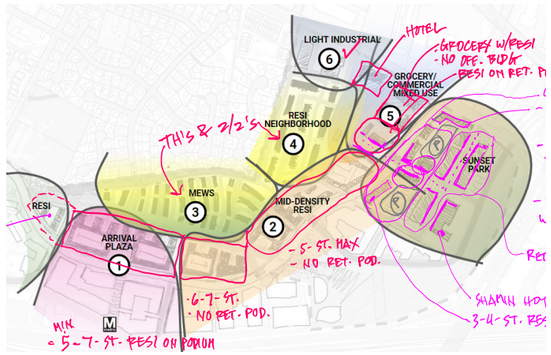
Plan Vision

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.

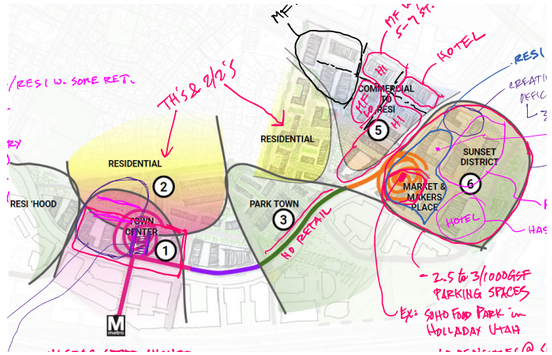
For each of the three proposals, sketches were prepared, computer models were updated and real estate data were calculated. This analysis-heavy approach allowed the project team and general public to readily compare between the three options.

Scenario 1



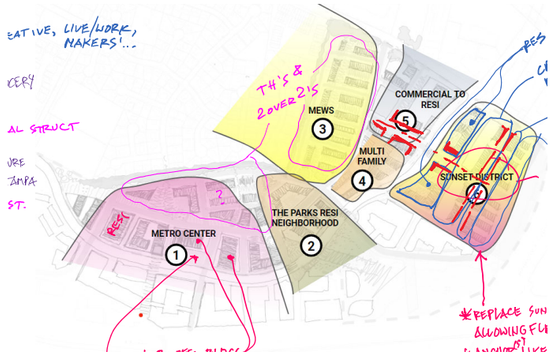


Scenario 2





Scenario 3





Concept Scenarios — Scenario 1: Neighborhood Clusters

Scenario 1: Neighborhood Clusters

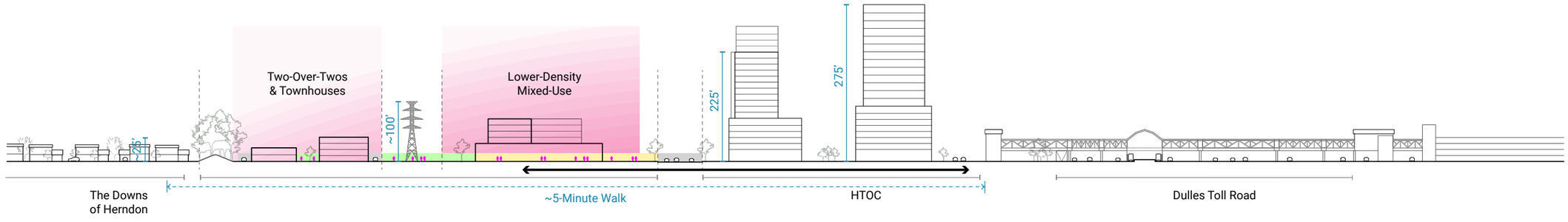
This scheme would generally disperse urban intensity across the site, creating multiple neighborhood clusters rather that a single TRG urban core.

- 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







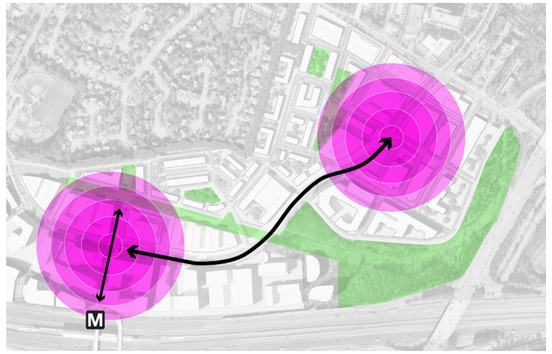


Concept Scenarios — Scenario 2: Two Centers

Scenario 2: Two Centers

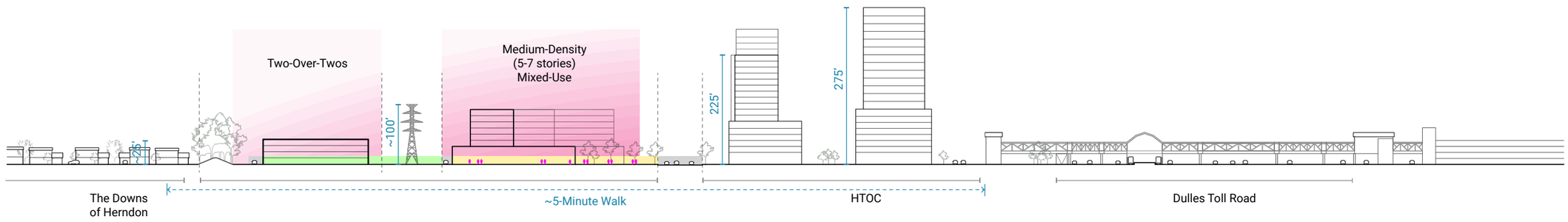
This scheme would concentrate development along two centers, one at the point in the TRG nearest the metro, and one at the Sunset Business Park. The two would be connected by an activated promenade.

- 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

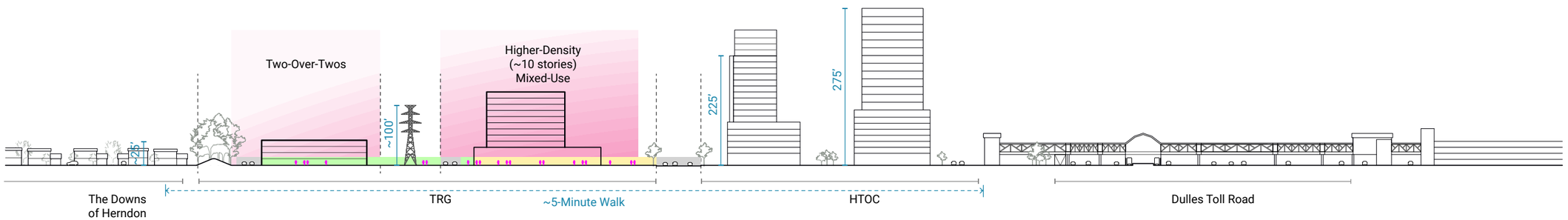
This scheme would concentrate high intensity development within a five-minute walking radius of the Metro. The rest of the TRG would be more neighborhood-focused.

- 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.





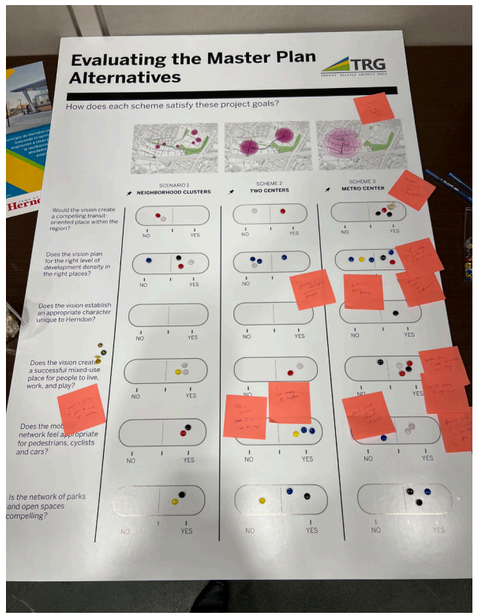




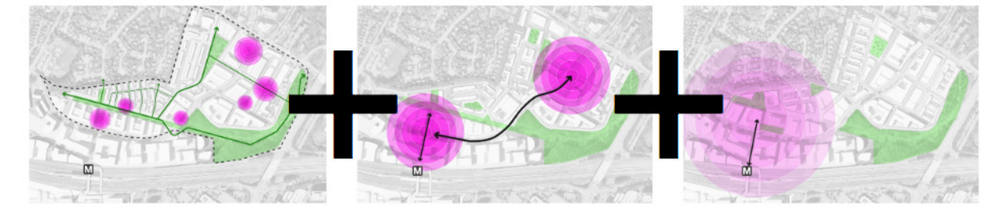
Preferred Vision

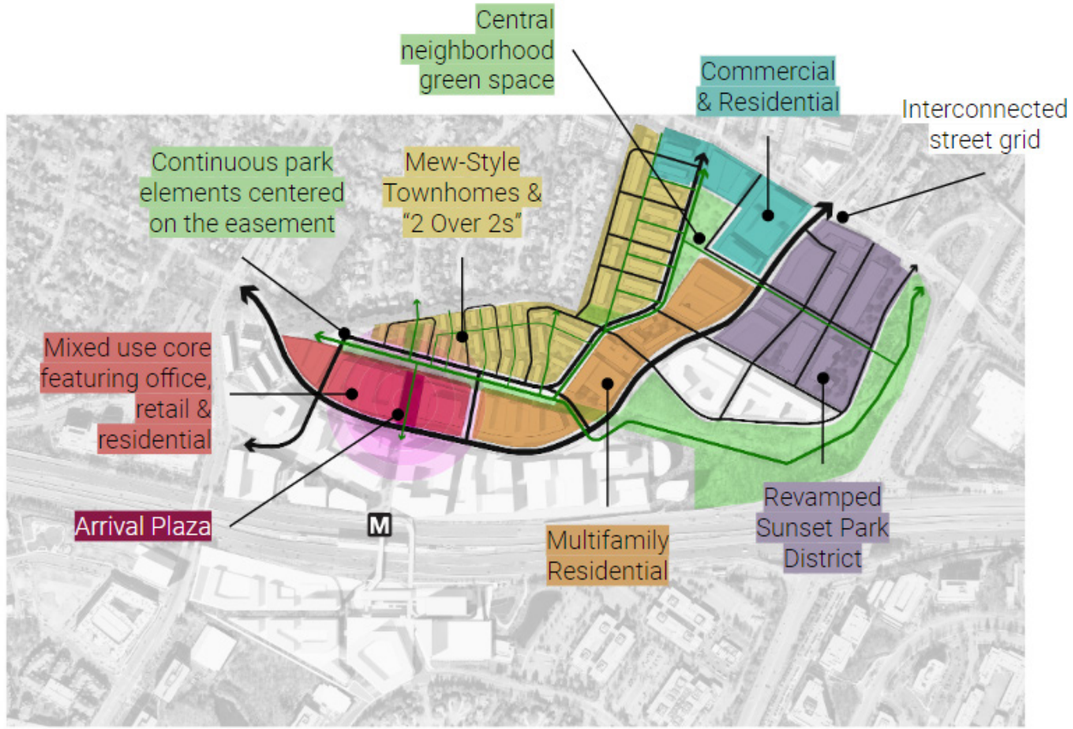
The three concept scenarios were publicly presented twice: once in May, 2023 to the general public, and once in June, 2023 to the Town Council and Planning Commission. At the public presentation, the community was encouraged to provide input in dynamic ways: verbally, in one-on-one chats with the Project 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



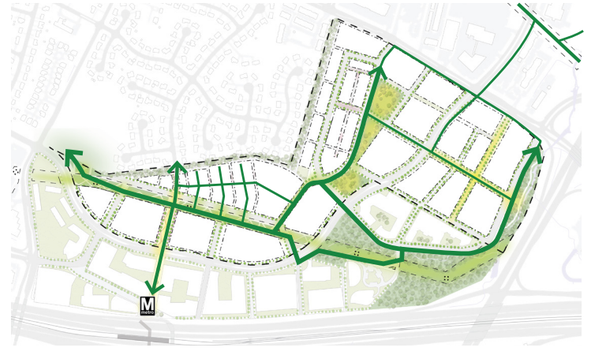
A METRO ARRIVAL PLAZA AS THE CORE OF A VIBRANT DEVELOPMENT

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.



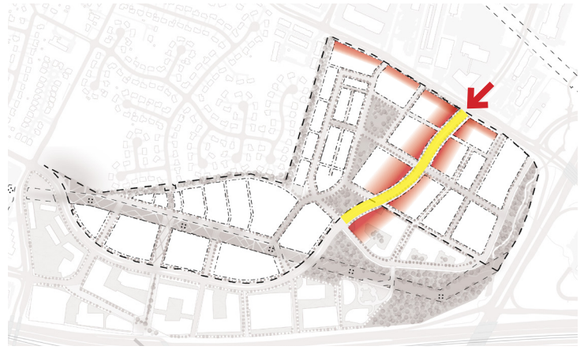
A NETWORK OF OPEN SPACES WITH INTERSTITIAL MOBILITY

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



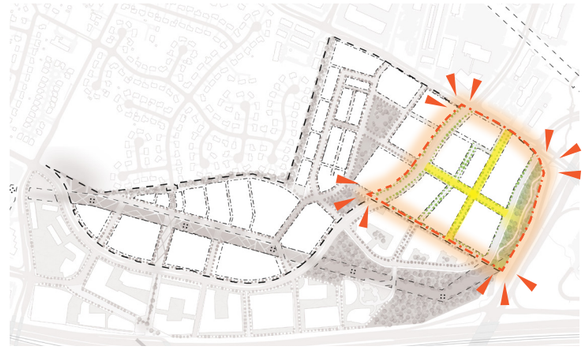
A TRANSITIONAL RESIDENTIAL AREA BETWEEN LOWER AND HIGHER DENSITITES

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.

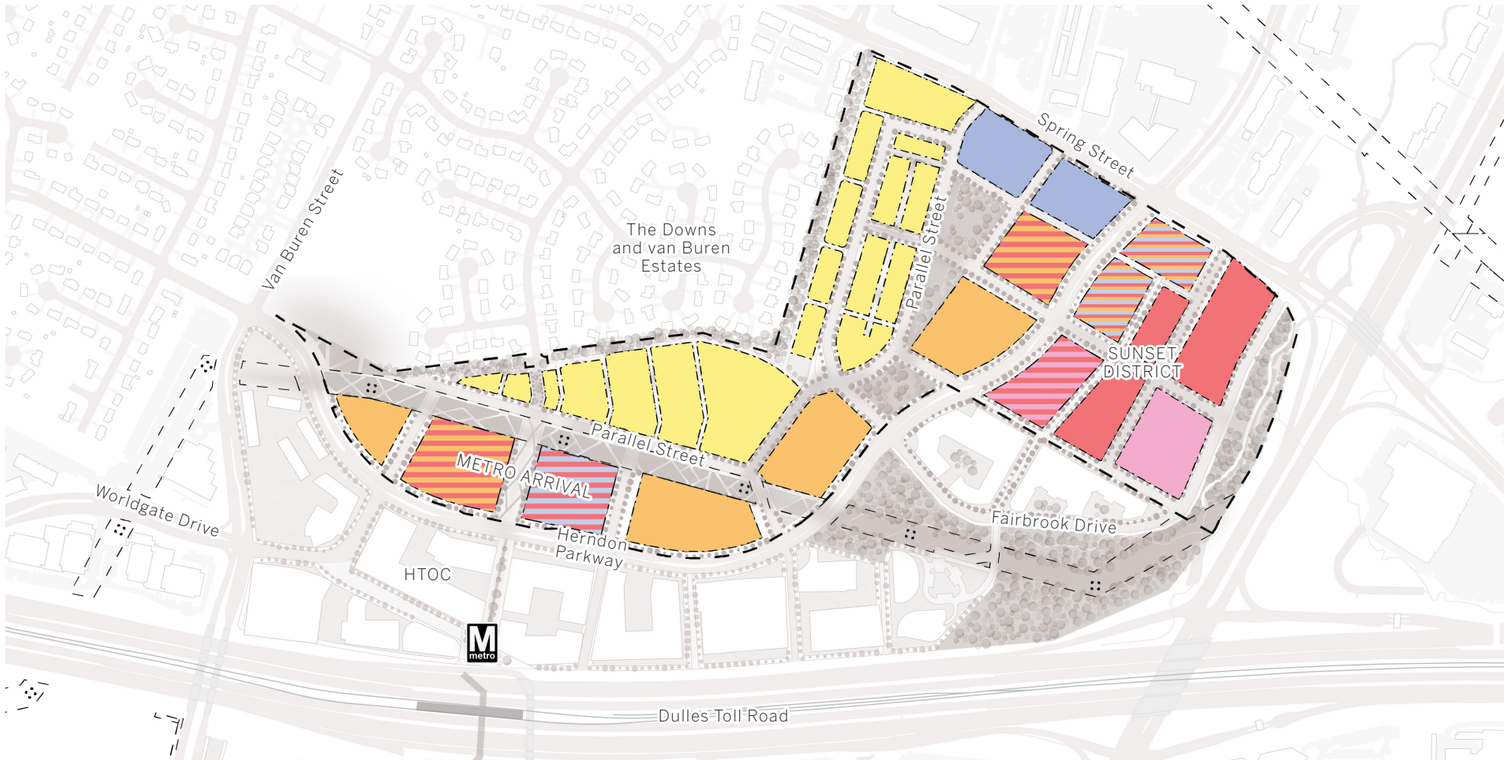
Retail: Neighborhood serving shops and restaurants, grocery, entertainment, fitness and services

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.

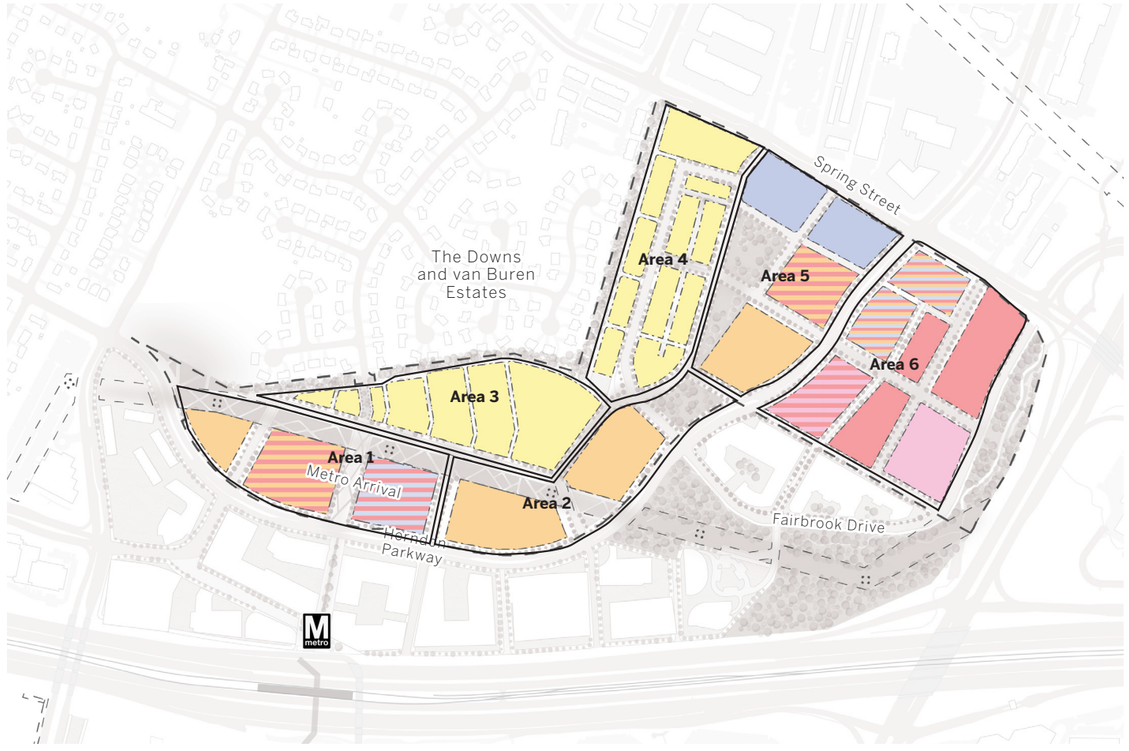
DEVELOPMENT DATA SUMMARY

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



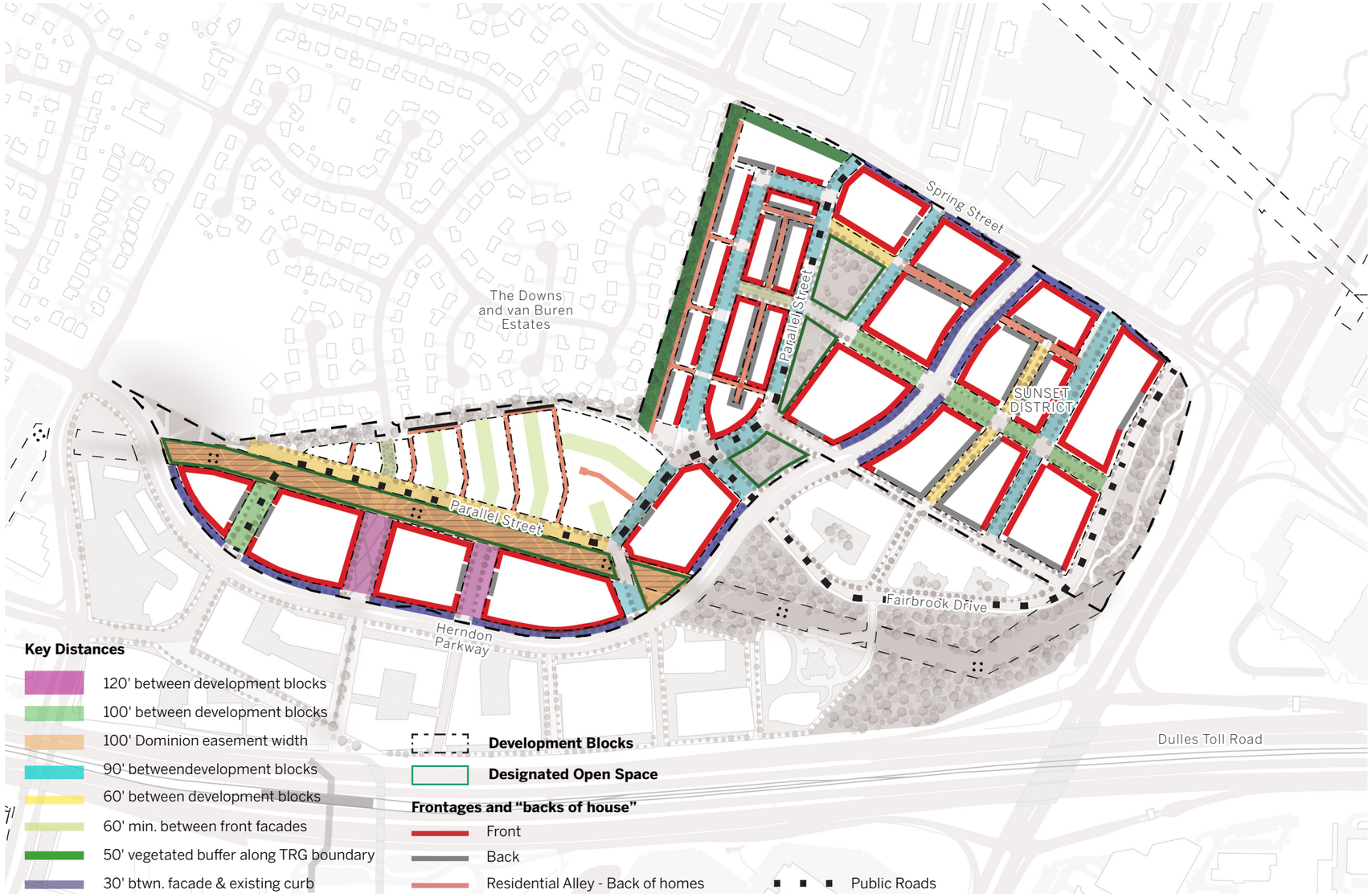
Urban Design and Architectural Character

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

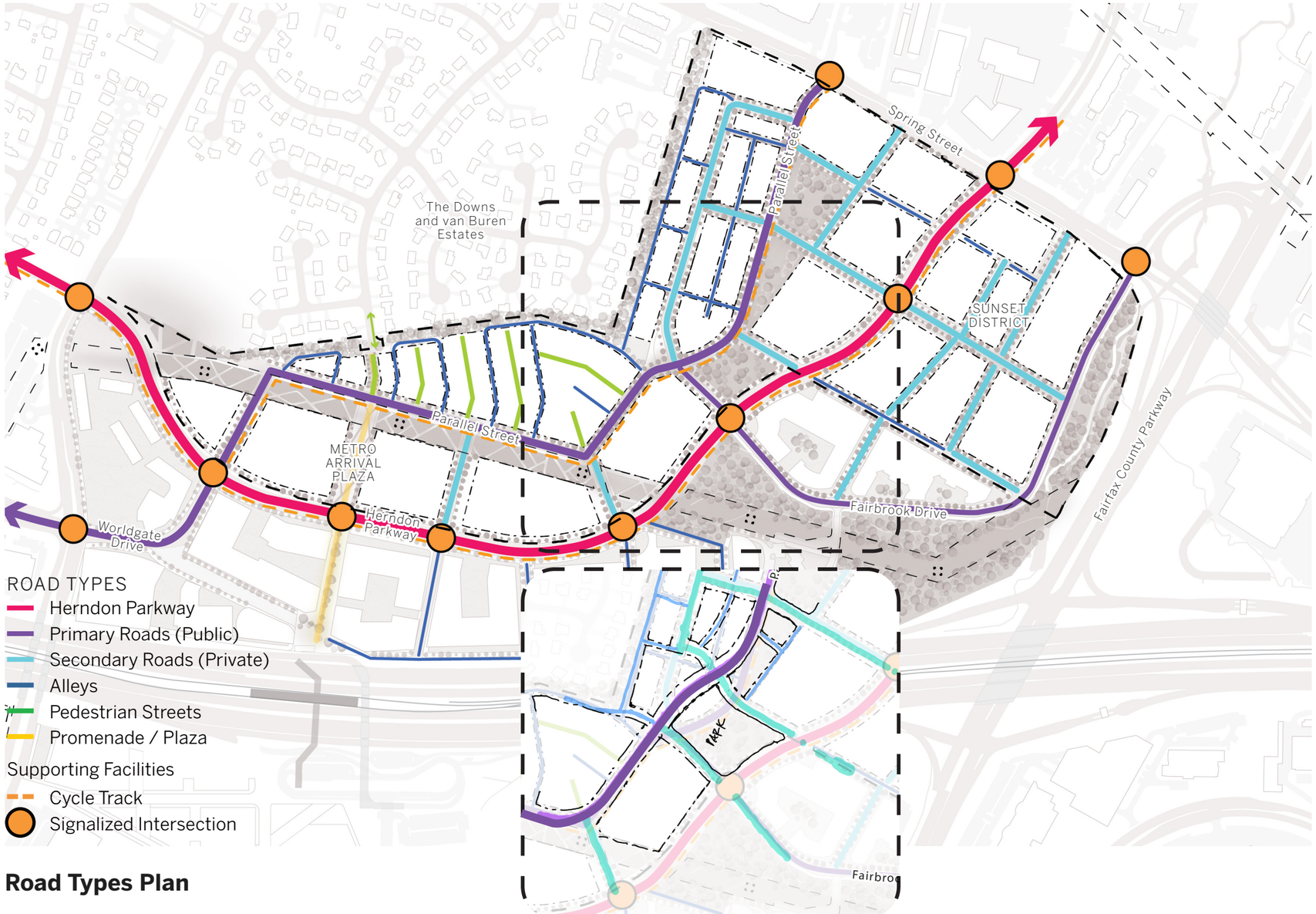
Mobility Grid

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.

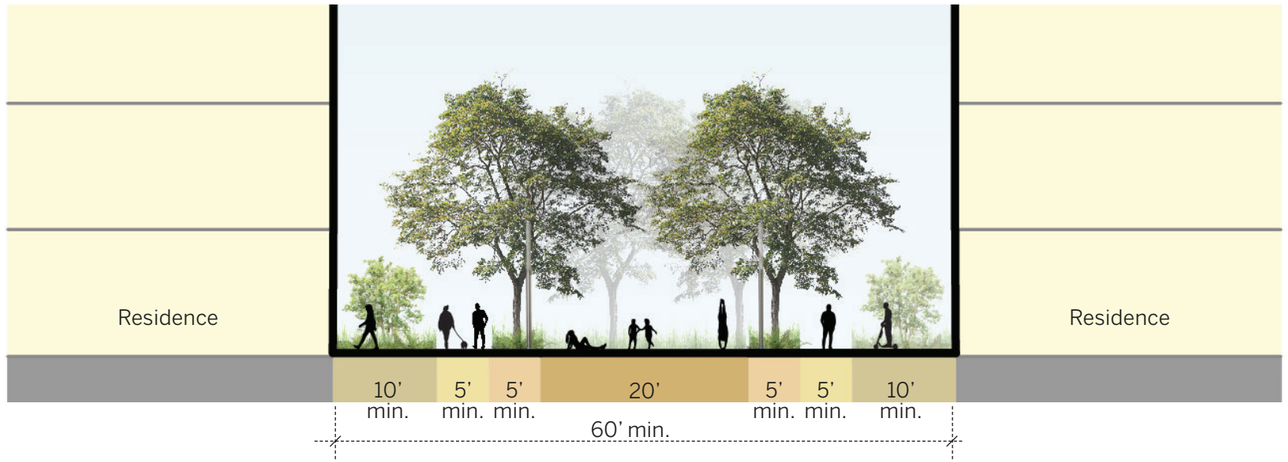


Key Plan

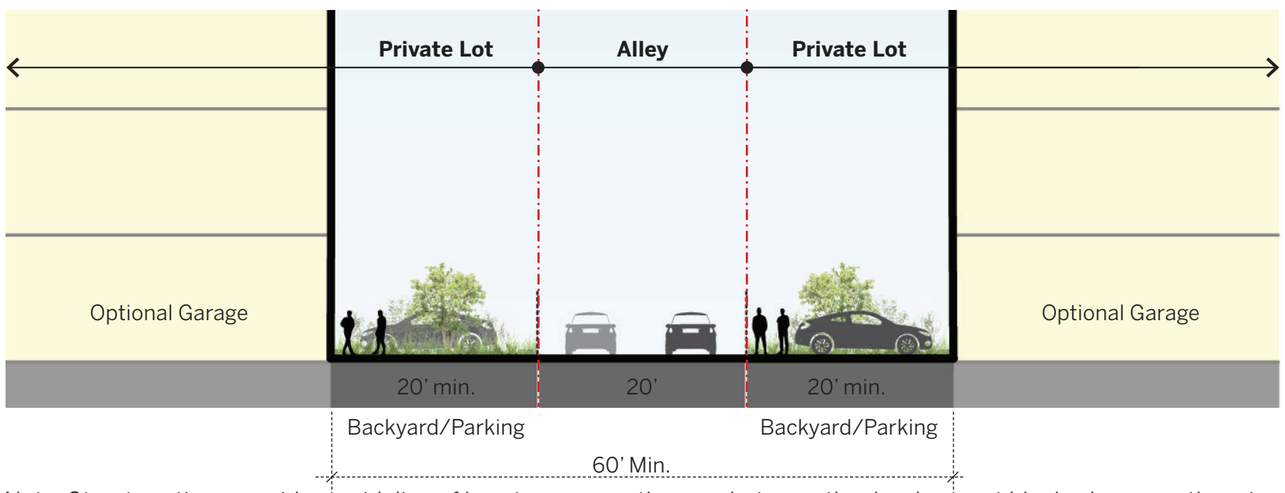
Amenities

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

1. Street Section at Mews Pedestrian Street



2. Street Section at Mews Alley

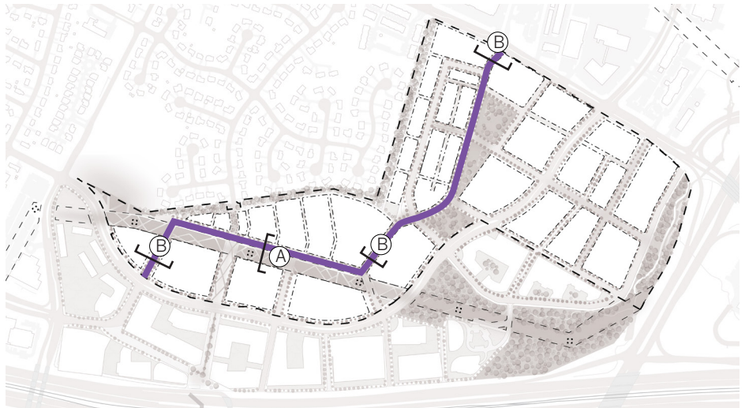


Note: Street sections provide a guideline of how to program the area between the development blocks; however, there is flexibility for the shown dimensions and features to change depending on future development needs, e.g., subsitituting on-street parking for turning lanes.

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.

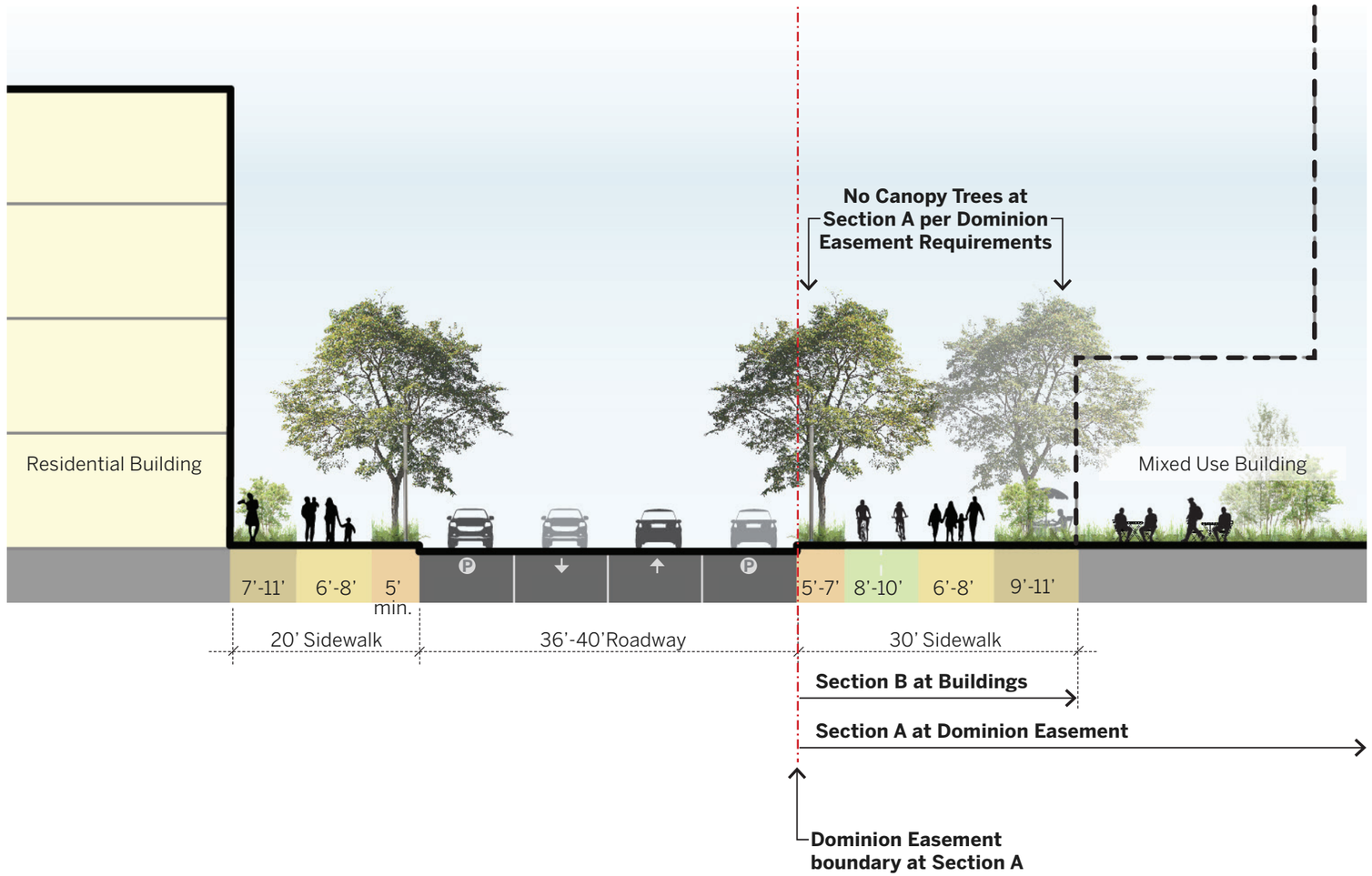


Key Plan

Amenities

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

Street Section at Parallel Street



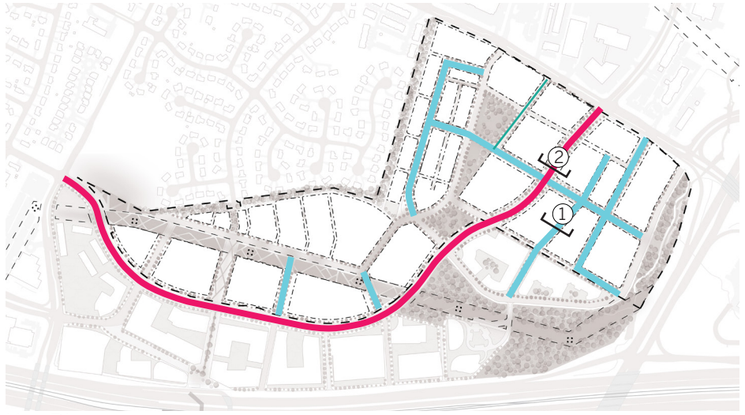
Note: Street sections provide a guideline of how to program the area between the development blocks; however, there is flexibility for the shown dimensions and features to change depending on future development needs, e.g., subsitituting on-street parking for turning lanes.

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.

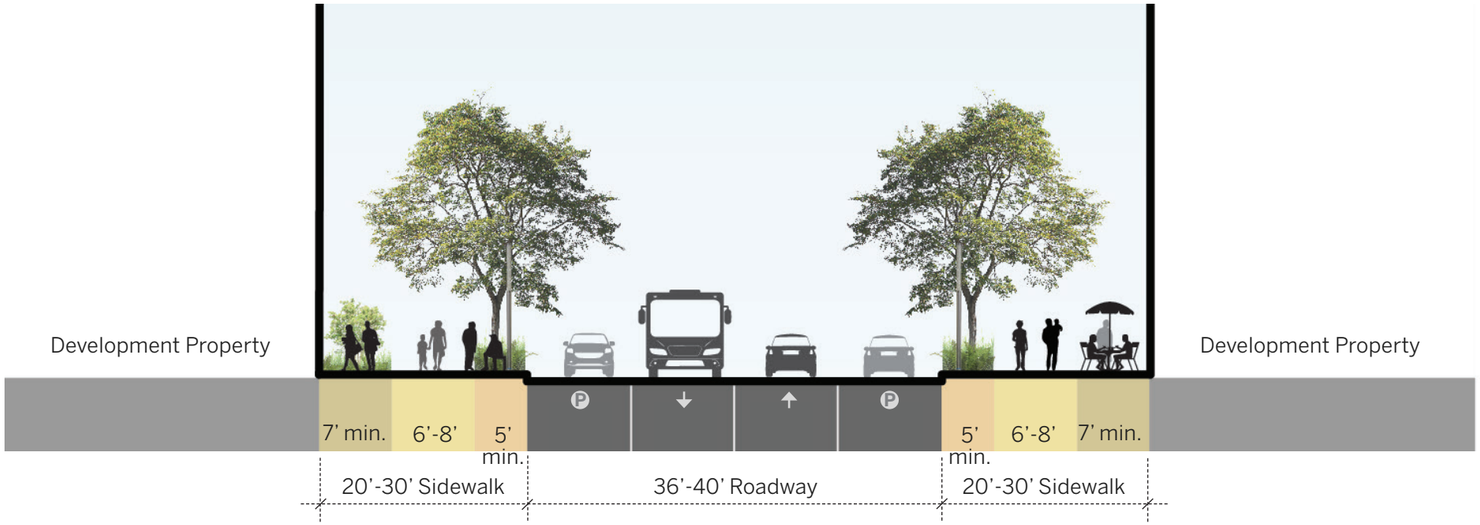


Key Plan

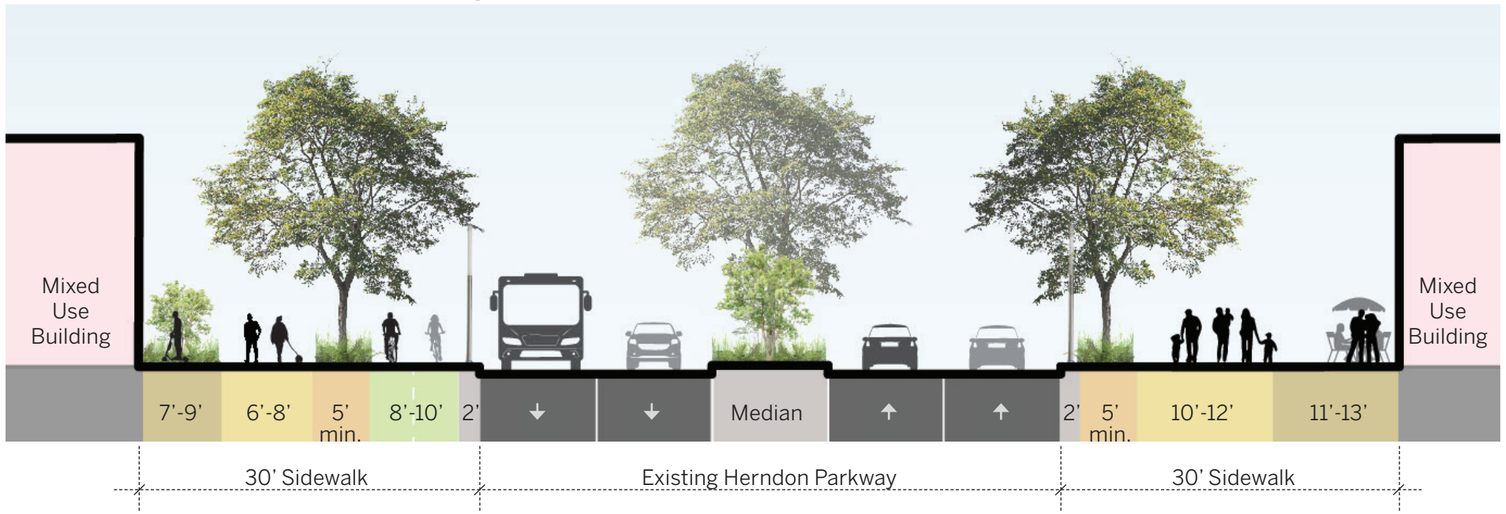
Amenities

- 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

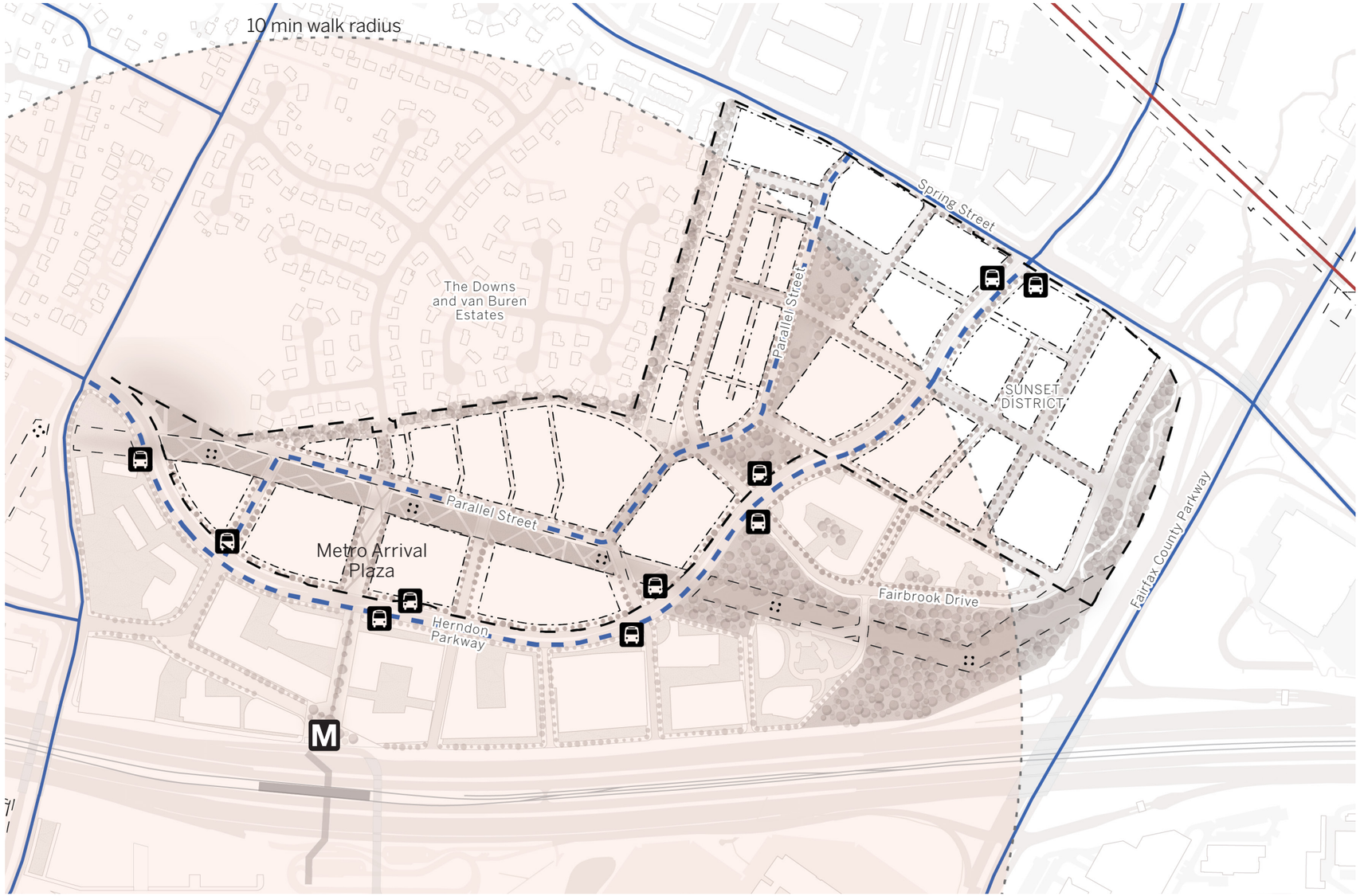


Note: Street sections provide a guideline of how to program the area between the development blocks; however, there is flexibility for the shown dimensions and features to change depending on future development needs, e.g., subsitituting on-street parking for turning lanes.

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.

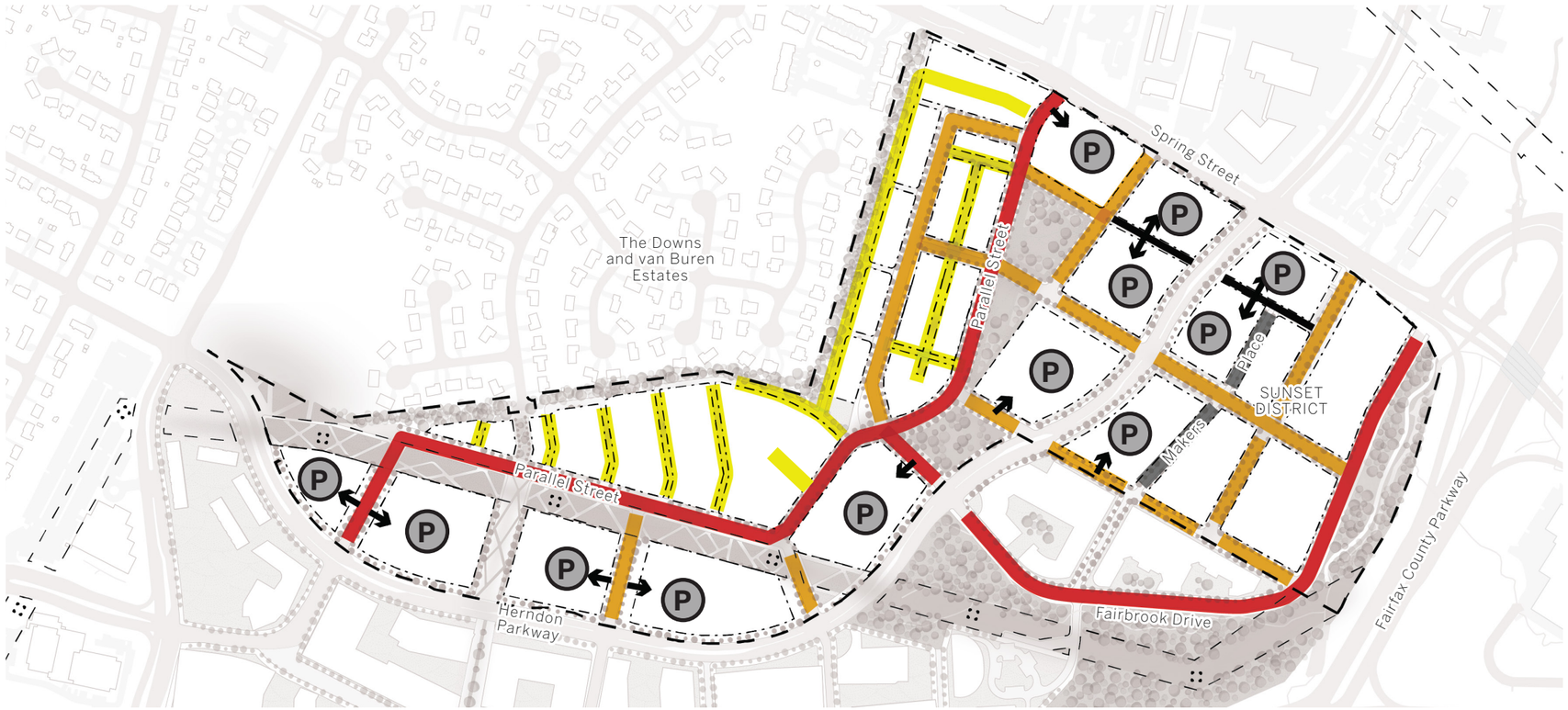


Multimodal Streets

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:

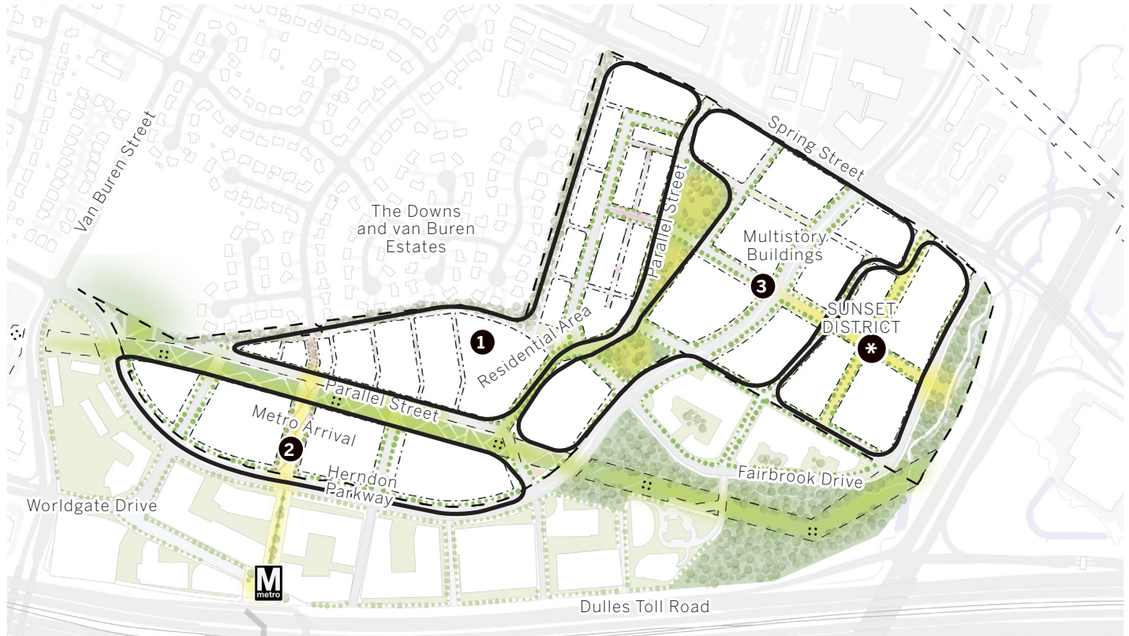
❶ Low Density Residential: 3-4-Story

❷ Metro Arrival: 5 to 12-Story

❸ Herndon Parkway Podium Buildings: 5 to 8-Story

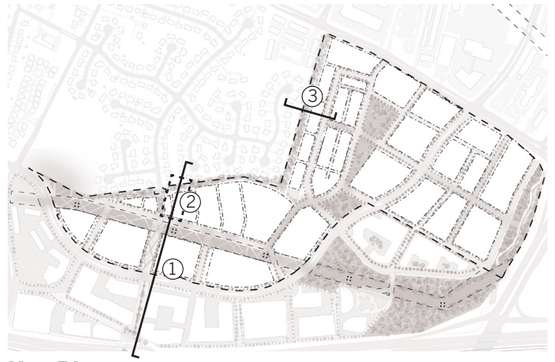
✱ As directed by the Town of Herndon, the three existing Sunset Business Park buildings are expected to remain as-is and the proposed Shamin Hotel is expected to be implemented as currently proposed and approved.

BUILDING HEIGHTS AREAS

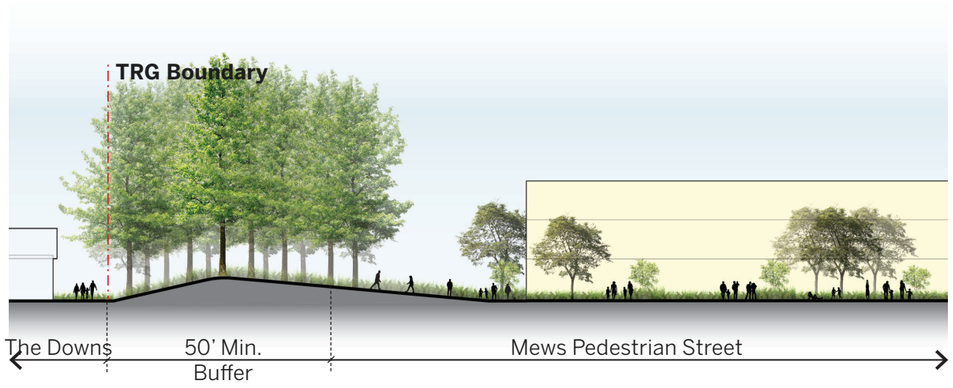


Urban Design and Architectural Character

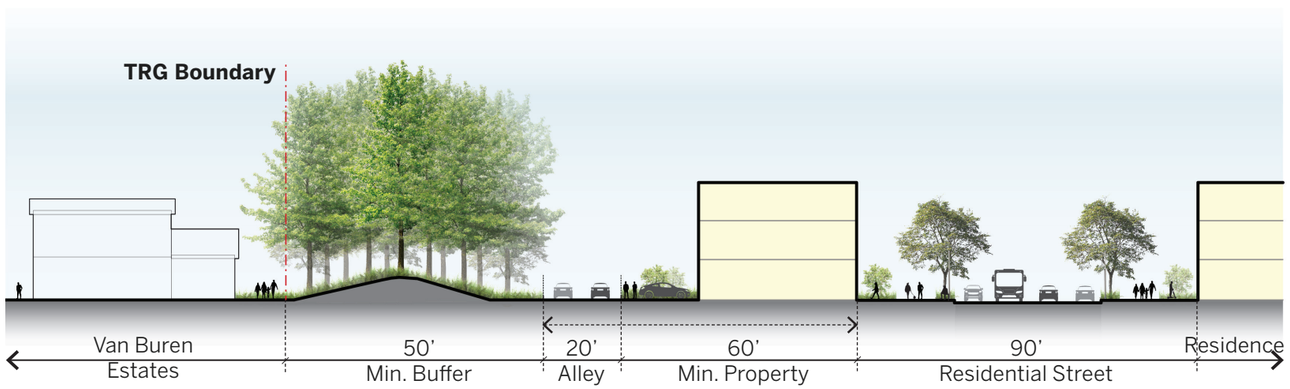
Heights and Massing



Key Plan

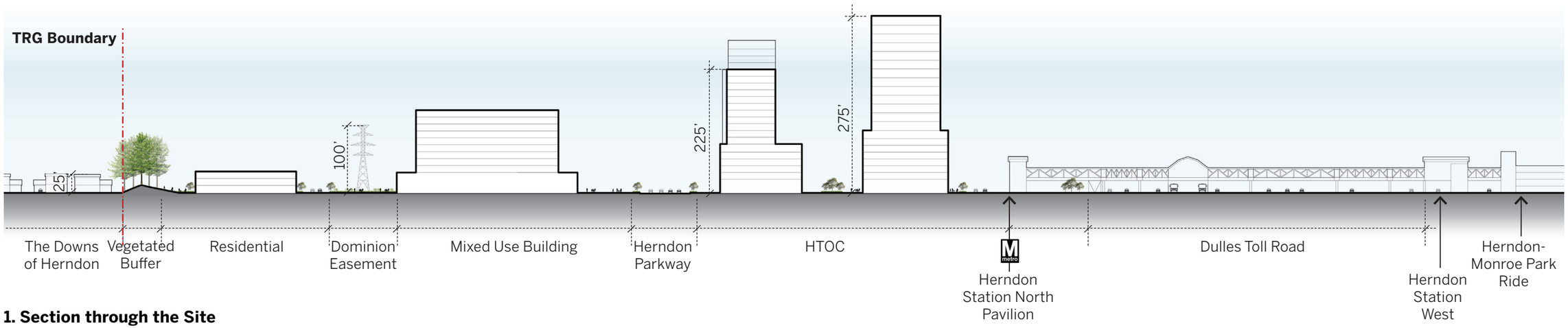


2. Section through the Buffer



3. Section through the Buffer on the Northern Boundary

TRANSECT | THE DOWNS - TRG - HTOC - HERNDON STATION



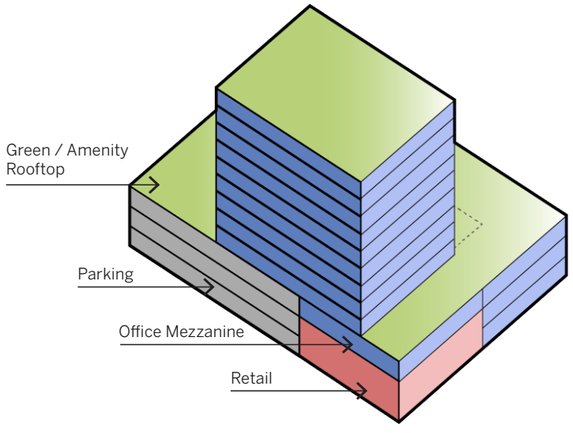
1. Section through the Site

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

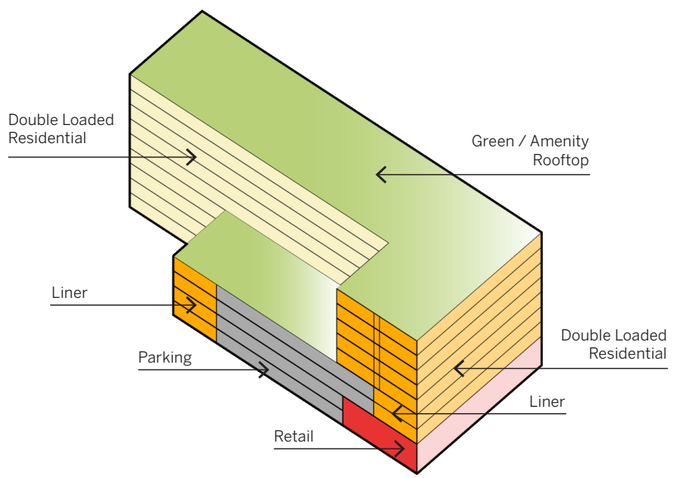
- Upper floors should be set back from the lower façade pediment
- While upper floors are distinct they should relate to the podium
- Rooflines should be visibly distinctive
- Mechanical rooftop units should be screened by the building's parapet other architectural rooftop structures or other methods 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



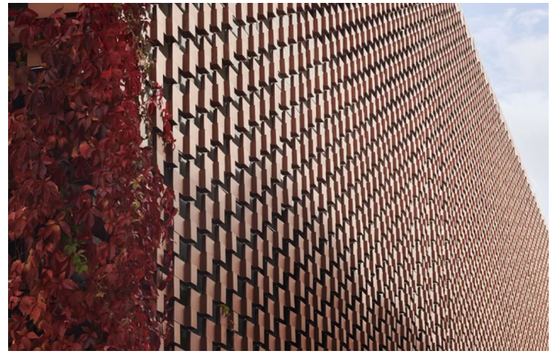
Mural on Exposed Facade

- 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.











Page 73 of 338

Urban Design and Architectural Character

Vision Survey

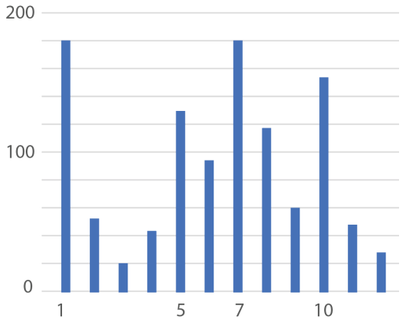
The community survey conducted in the Spring and Fall of 2022 invited respondents to share their visual and aesthetic preferences for the TRG. The survey solicited both open-ended and specific feedback.It included prompts calling for respondents to select preferred building typologies from a collection 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

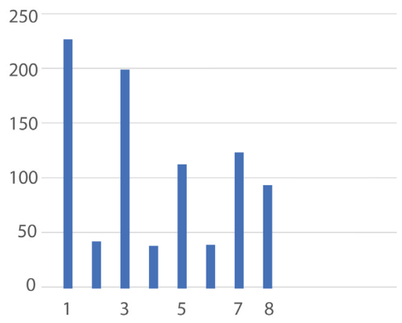








Top Types of Open Spaces, Parks and Streets Preferred within the TRG area









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

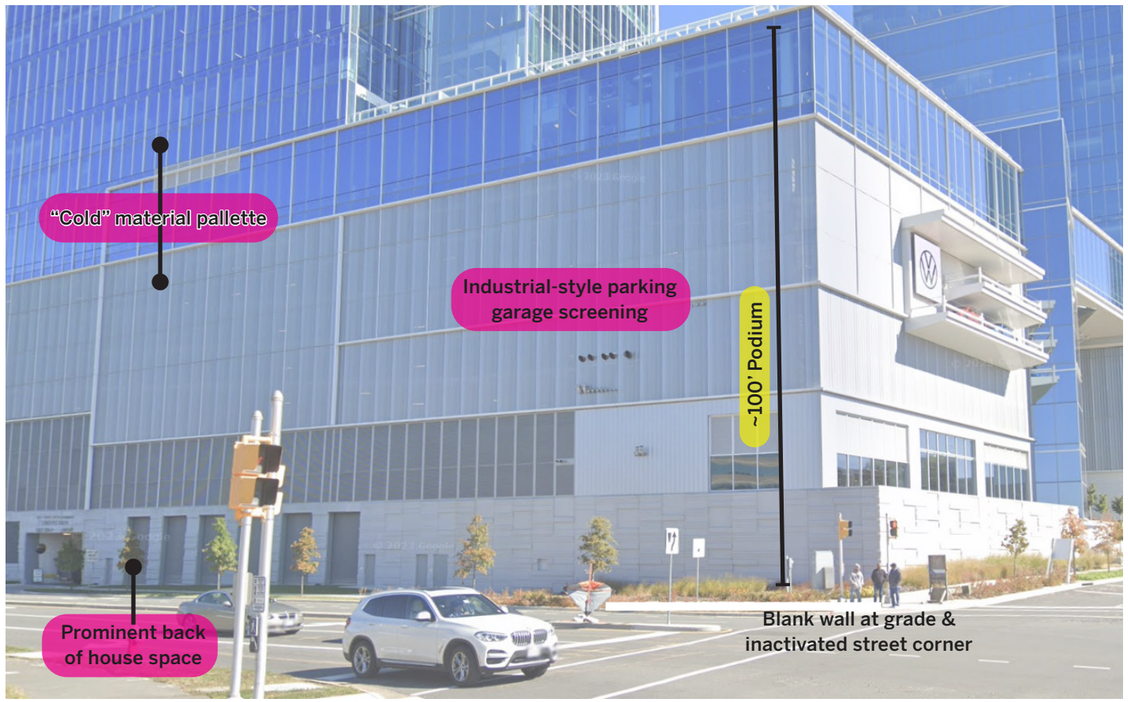
Throughout the public engagement process, significant feedback was received about the relationship of Herndon to the rest of Northern Virginia. While community comments and survey responses generally support adding density near the Metro in accordance with the principles outlined in this plan, many community 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

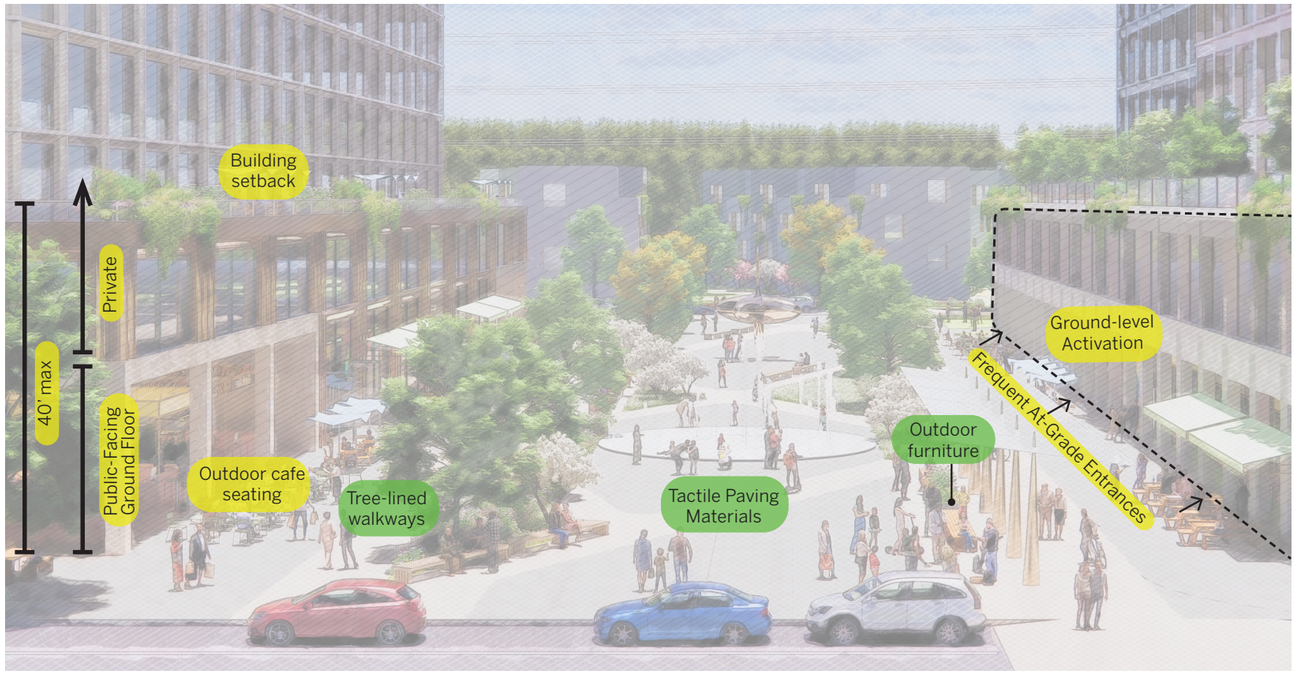
Successful urban mixed-use neighborhoods, large or small, feature strategically located retail, lobby, and similar ground floor uses along building frontages. In the TRG, these spaces serve to activate the adjacent public realm and must be thoughtfully designed with appropriate architectural variety, 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:

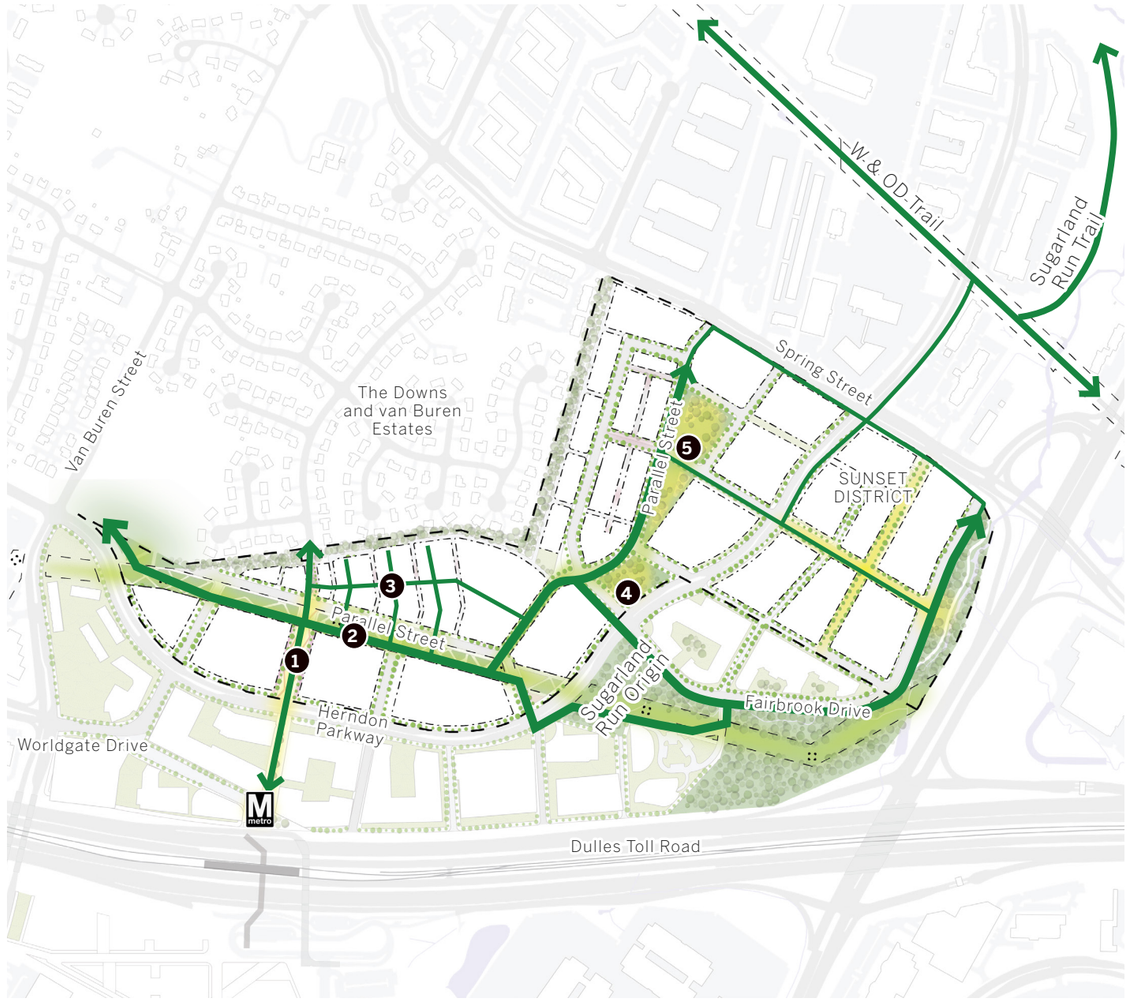
	Acres	%
Open Space	14	15
Development Blocks	48	52
Circulation	28.1	30
Buffer	3	3
TRG	**93.1**	**100**
Herndon Pkwy ROW	3	N/A

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

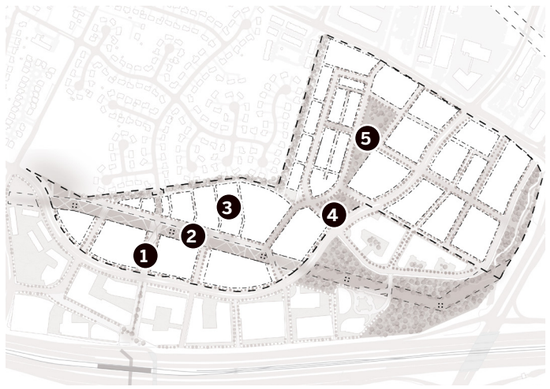
A Network of Open Spaces

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.



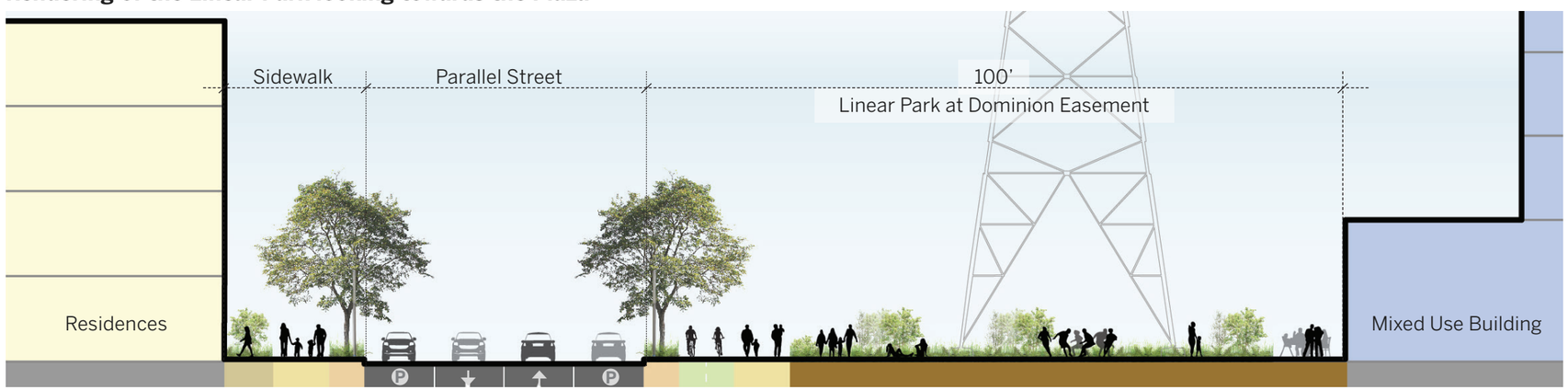
Key Plan

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

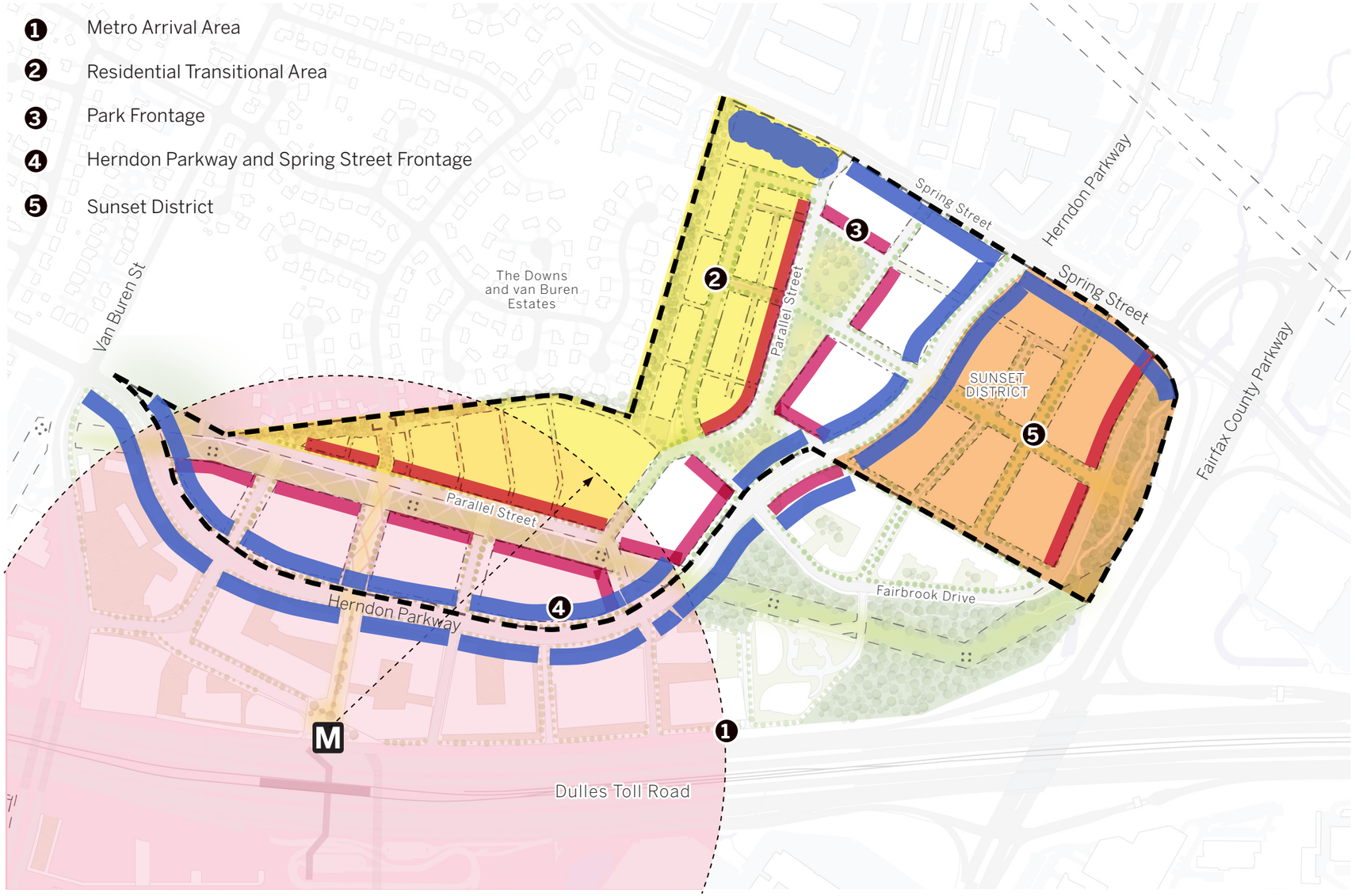


The Neighborhoods

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.



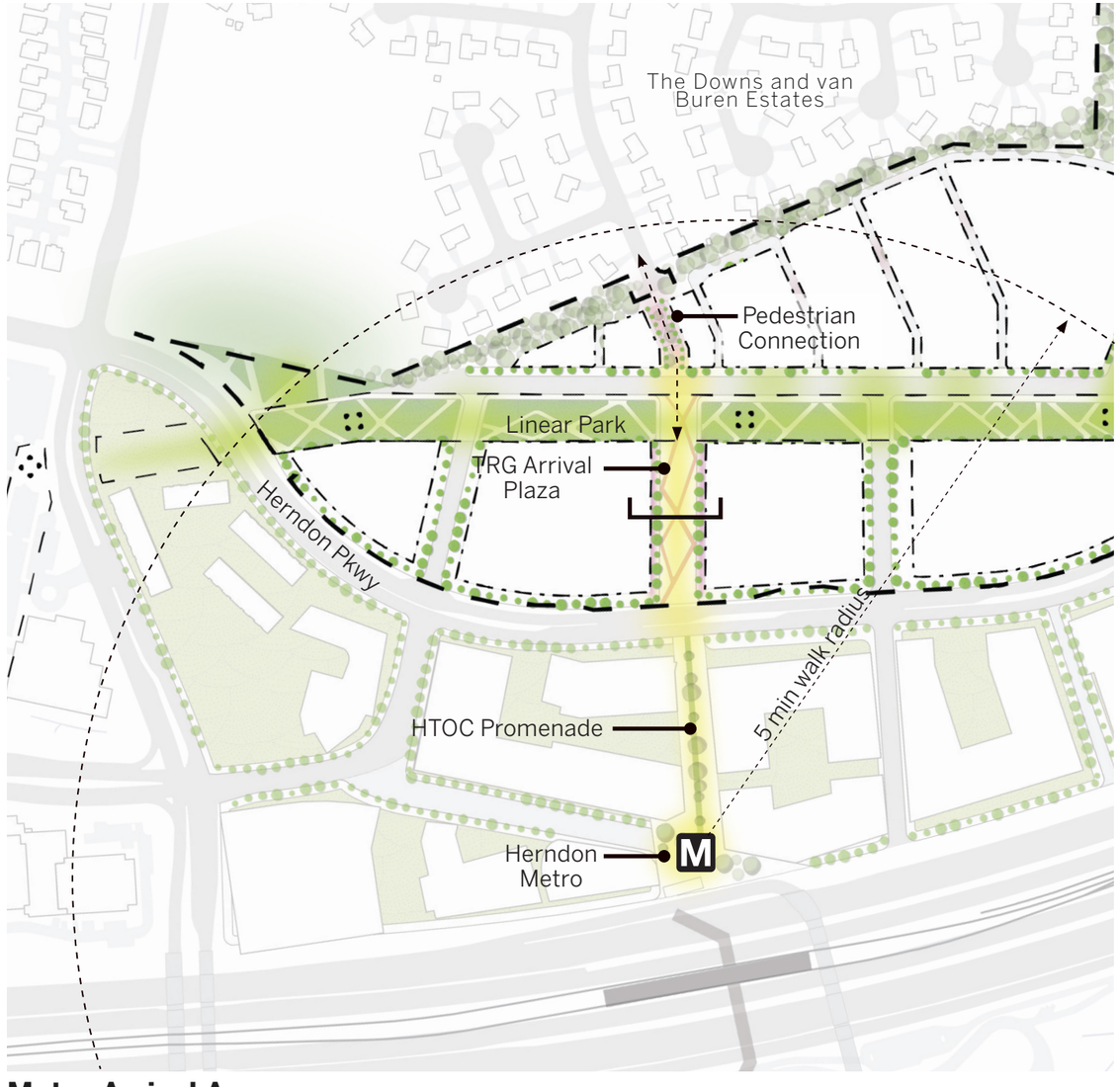
Union Station, Denver



Mosaic District, VA



City Center, DC

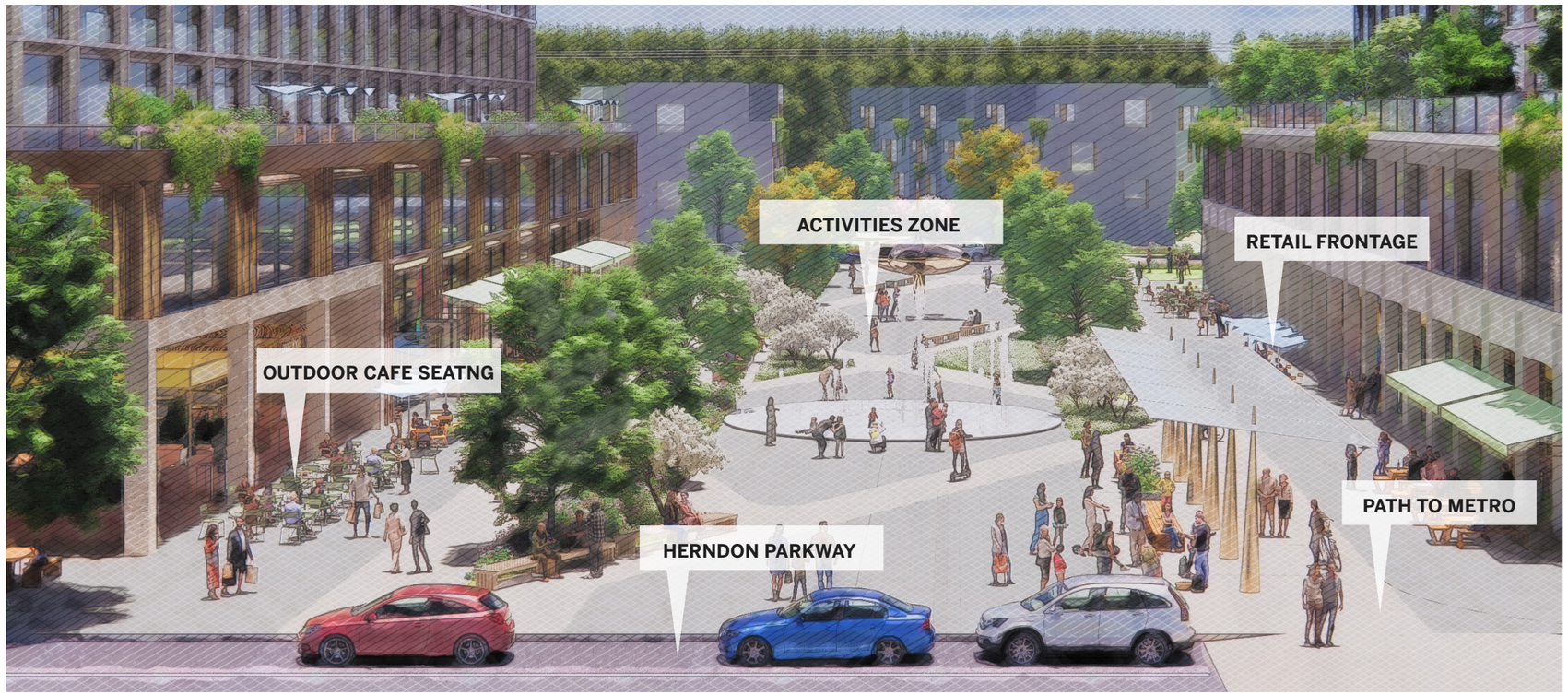


Metro Arrival Area

Metro Arrival Plaza

General design guidance:

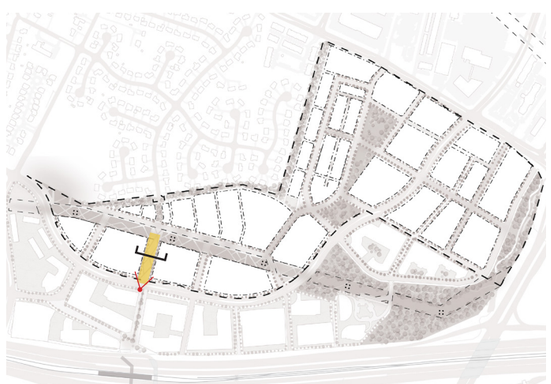
- Design of plaza should be inclusive and equitable
- Design of plaza should exceed ADA minimum standards and allow ease of use and a positive experience for all members of the community
- The plazas should be designed with intent and drive as well as respond to the spatial arrangement of the neighborhood
- 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



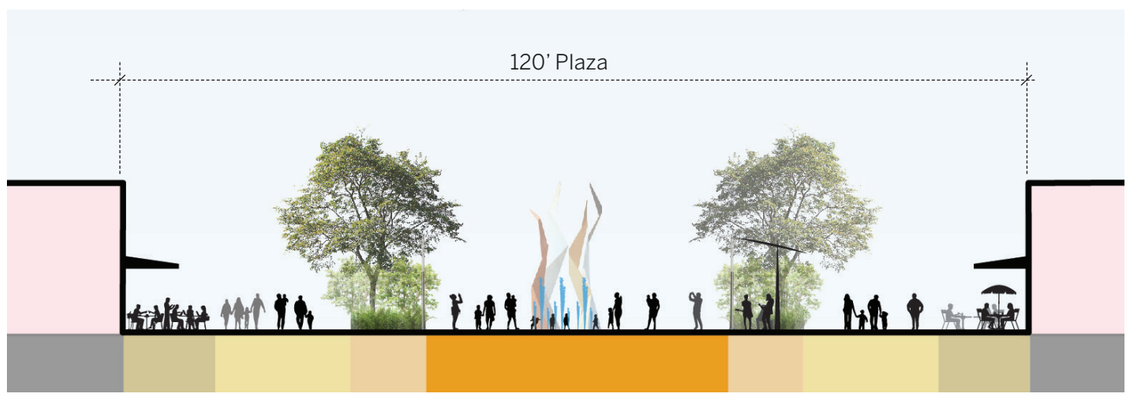
View rendering of the Linear Park looking towards the Plaza

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.

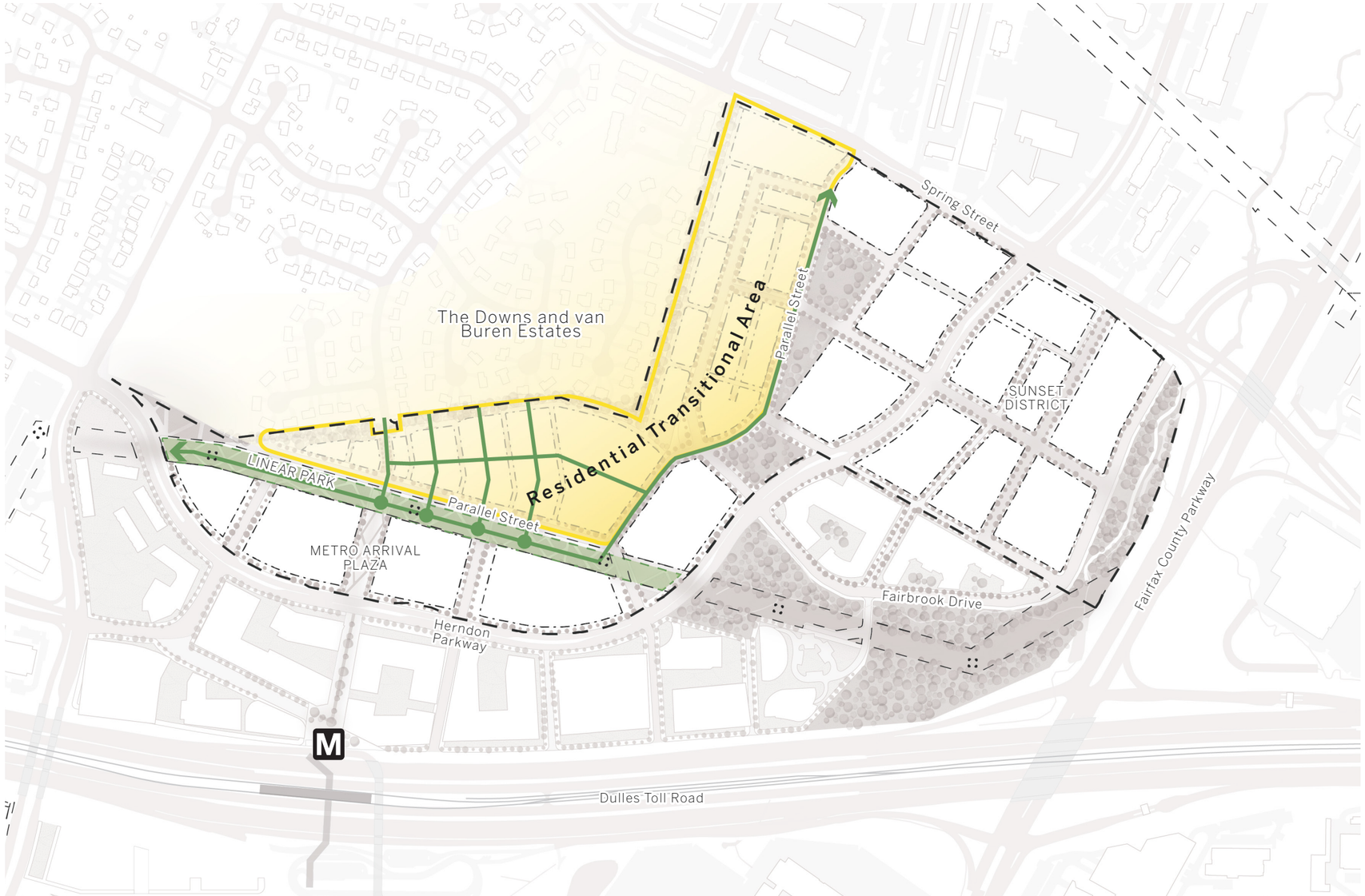
Pedestrians out front, cars in the back.

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:

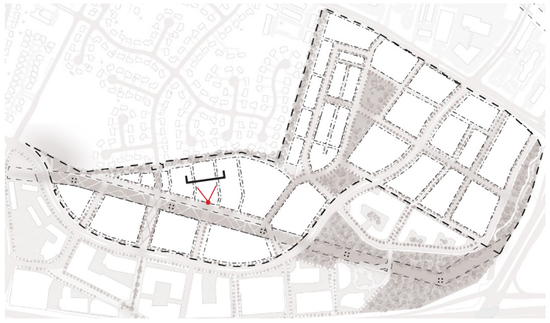
- 60' minimum open area between the front of the buildings,
- 60' minimum property area, and
- 20' alleys are required for fire access.

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

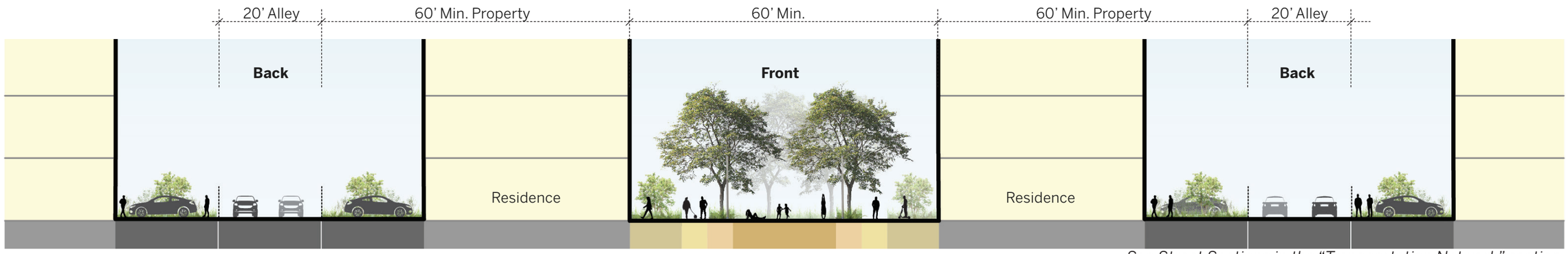
- Front Yard
- Pedestrian Circulation
- Landscape and Site Furnishings
- Pedestrian Activities Zone



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

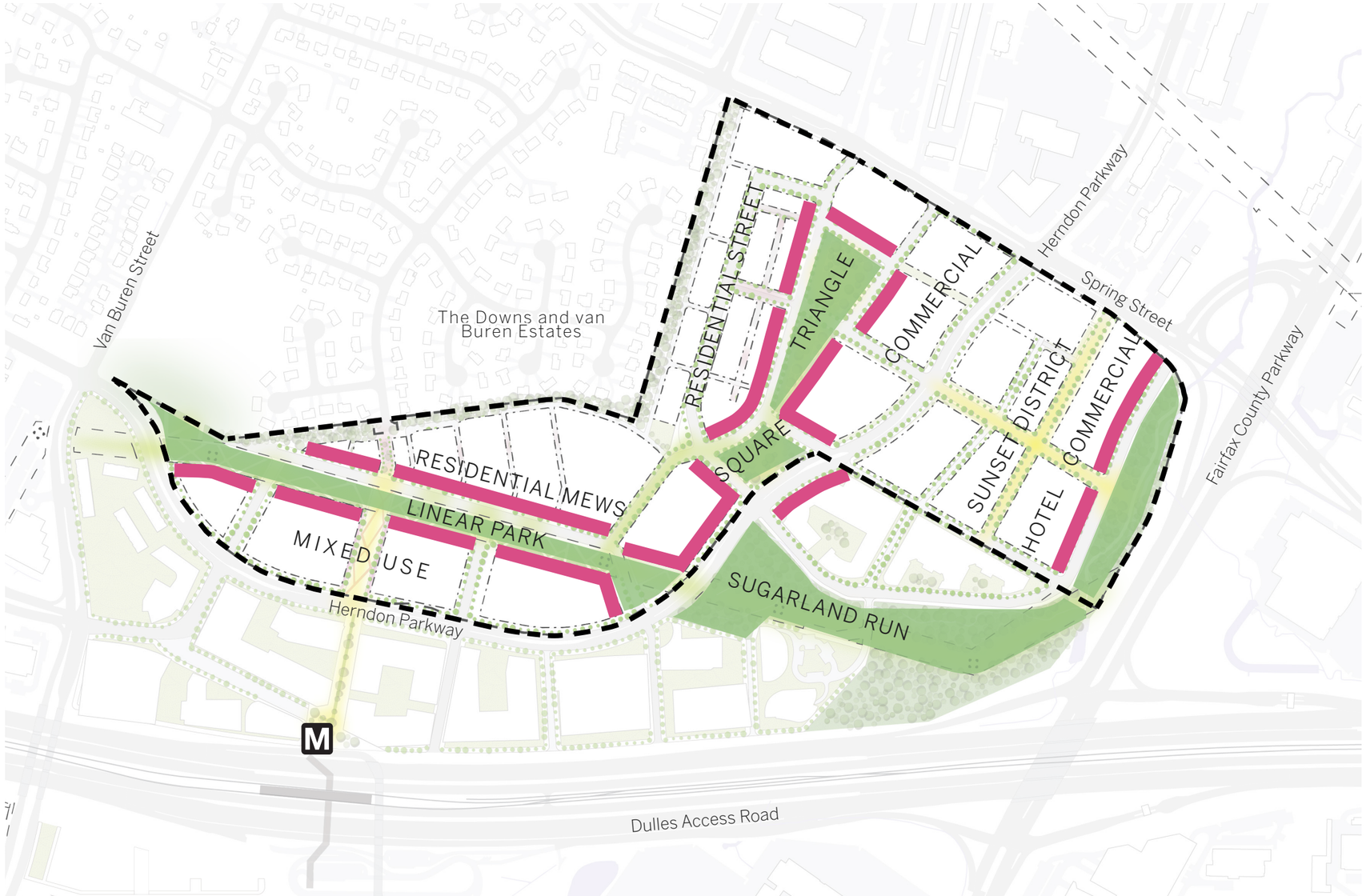
The Neighborhoods

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.



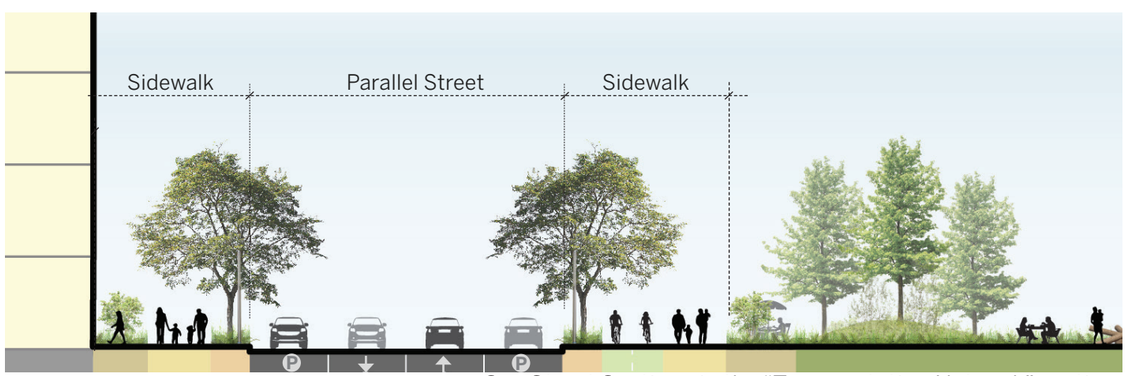
Rendering of the Triangle Park

Amenities

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



Key Plan



Site Section through the Triangle Park

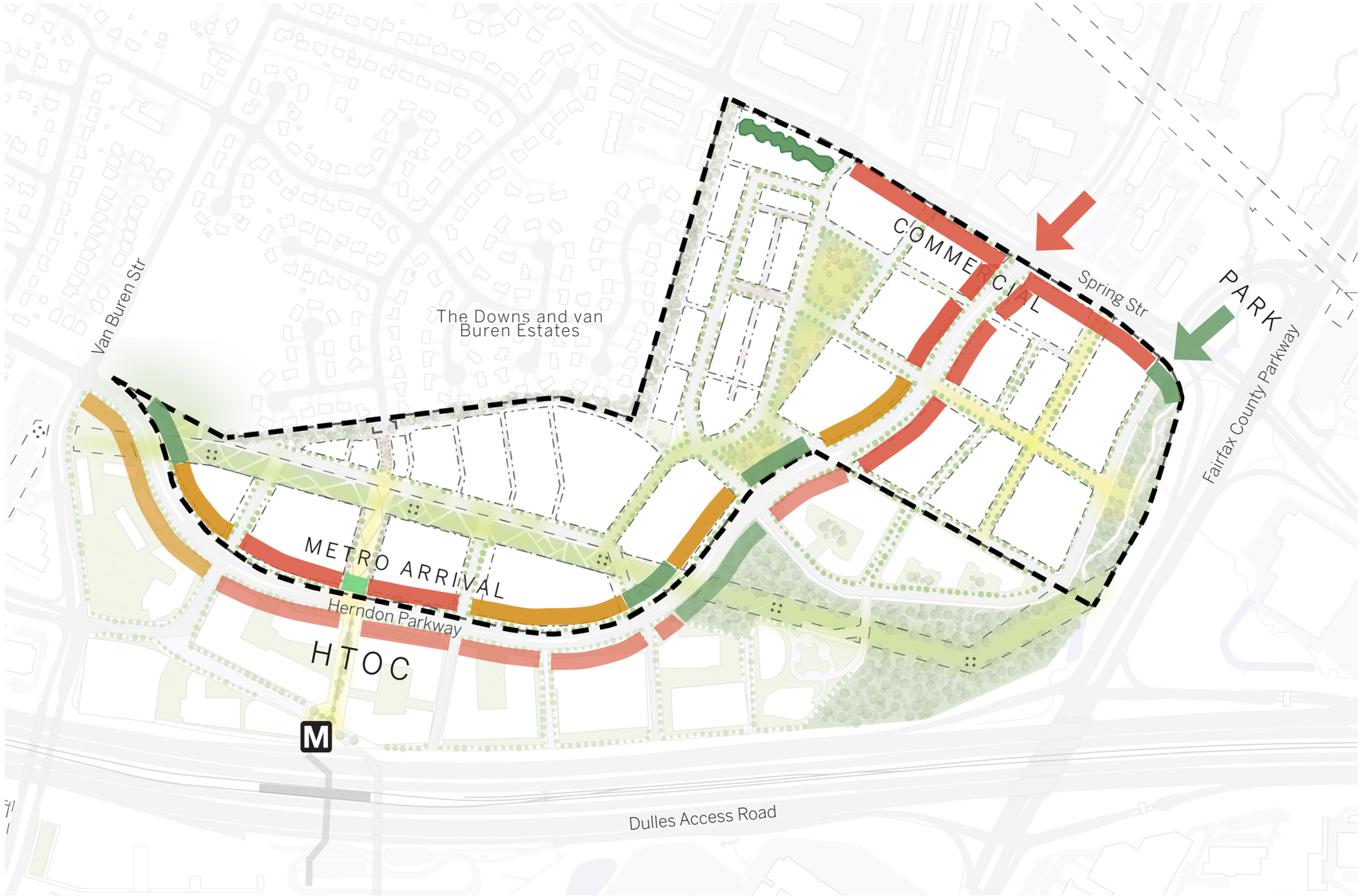
See Street Sections in the "Transportation Network" section for street and sidewalk meansurements

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.



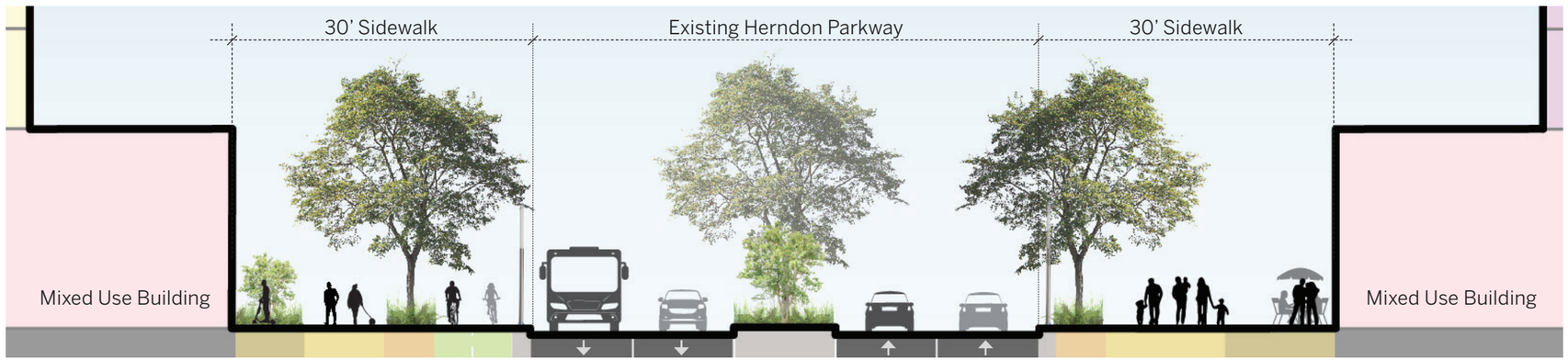
Key Plan

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.



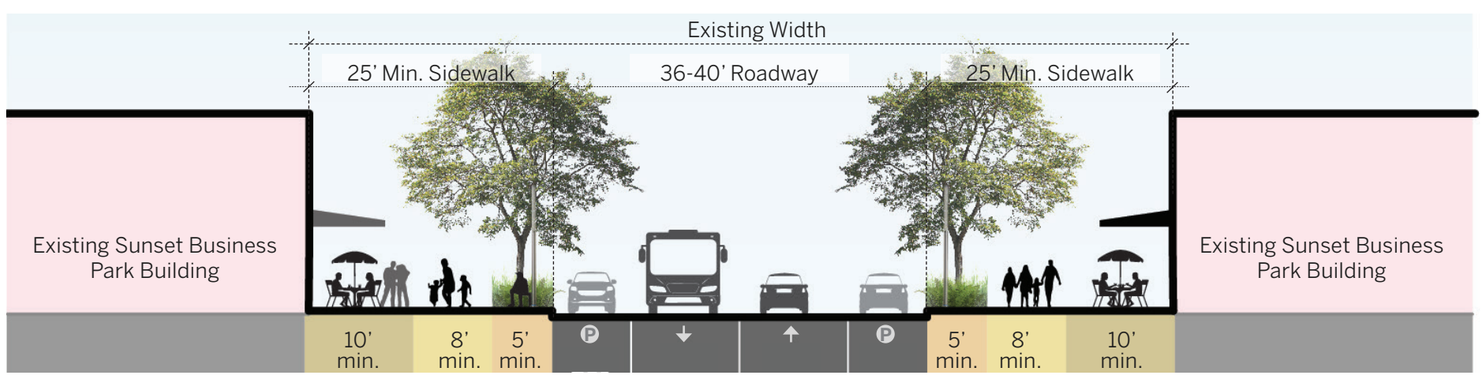
Key Plan

Amenities

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



Rendering of Sunset Main Street



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

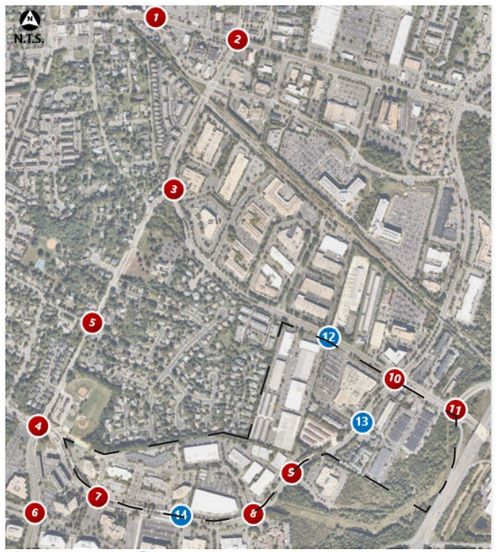
Background

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.

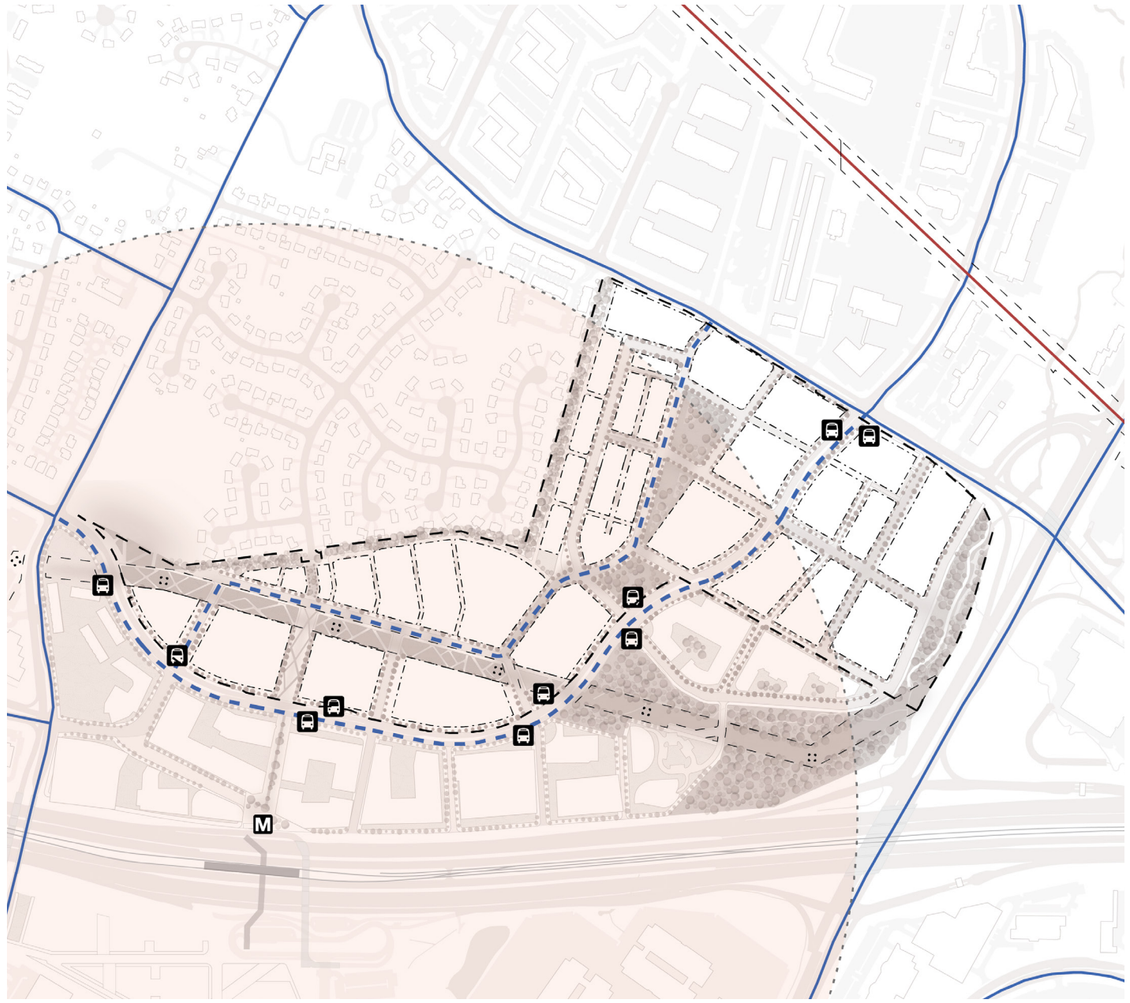
Larger bicycle facilities (Herndon Parkway Cycle Track, W&OD Trail, Van Buren Street bicycle lanes) are connected to TRG land uses via shared-use internal streets. Implementing the proposed infrastructure upgrades such as bike lanes, sidewalks, and pedestrian-friendly crossings alongside transit corridors 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

Page 110 of 338

DRAFT

Herndon Transit-Related Growth Area

Assessment of Traffic Impact Associated with Small Area Plan

PREPARED FOR

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

PREPARED BY

1001 G St NW
Ste 1125
Washington, DC 20001
202.739.9555

Existing and No Build Final Submittal: January 13, 2023
3 Build Scenarios Draft Submittal: June 12, 2023
Original Preferred Build Scenario Draft Submittal: August 8, 2023
Revised Preferred Build Scenario Draft Submittal: October 16, 2023
Revised Preferred Build Scenario Draft Submittal (updated with candidate mitigations): December 4, 2023
Mitigation Draft Submittal: December 18, 2023

Table of Contents

Introduction 1

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

Existing Traffic Conditions 3

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

No Build 2045 Traffic Conditions 9

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

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

4.1 Build 2045 Scenario Model Assumptions 19
4.1.1 Development Scenarios 19
4.1.2 Roadway Network 19
4.1.3 Traffic Volumes 20
4.2 Build 2045 Scenario One: Neighborhood Clusters 21
4.2.1 Trip Generation 21
4.2.2 Transportation Connectivity 21
4.2.3 Traffic Analysis 26
4.3 Build 2045 Scenario Two: Two Centers 30
4.3.1 Trip Generation 30
4.3.2 Transportation Connectivity 30
4.3.3 Traffic Analysis 35
4.4 Build 2045 Scenario Three: Metro Center 39
4.4.1 Trip Generation 39
4.4.2 Transportation Connectivity 39
4.4.3 Traffic Analysis 44
4.5 Comparison of Three Build Scenarios 48
4.5.1 Development Characteristics and Connectivity 48
4.5.2 Traffic Volumes 48
4.5.3 Traffic Impacts 48

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

5.1 Preferred Build 2045 Scenario Model Assumptions 49
5.2 Preferred Build 2045 Scenario 49
5.2.1 Trip Generation 49
5.2.2 Transportation Connectivity 51
5.2.3 Traffic Analysis 55
5.2.4 Potential Transportation Mitigation 59

Preferred Build 2045 Scenario with Fairbrook Drive Extension and Additional Transportation Mitigation Measures: Traffic Conditions 62

6.1 Mitigation Roadway Network 62
6.2 Traffic Volumes 62
6.2.1 Traffic Analysis 66
6.2.2 Recommendations for Transportation Mitigation 70

Appendices

A Traffic Volume Datasets – All Intersections in Model A1

B VISSIM Model Complete Intersection Metrics B1

List of Tables

Table No.	Description	Page
Table 1	Metro Square Trip Generation	3
Table 2	Level of Service Description for Intersections	4
Table 3	Existing Condition Intersection Delay and LOS	4
Table 4	No Build 2045 Intersection Delay and LOS	12
Table 5	No Build 2045 "LOS F" Turning Movements	12
Table 6	TRG Build Scenario 1 (Neighborhood Clusters), Full Buildout, Site Trip Generation	22
Table 7	Comparison of Intersection Delay and LOS: No Build 2045 to Build Scenario 1 (Neighborhood Clusters)	26
Table 8	Build Scenario 1 "LOS F" Turning Movements	26
Table 9	TRG Build Scenario 2 (Two Centers), Full Buildout, Site Trip Generation	31
Table 10	Comparison of Intersection Delay and LOS: No Build 2045 to Build Scenario 2 (Two Centers)	35
Table 11	Build Scenario 2 "LOS F" Turning Movements	35
Table 12	TRG Build Scenario 3 (Metro Center), Full Buildout, Site Trip Generation	40
Table 13	Comparison of Intersection Delay and LOS: No Build 2045 to Build Scenario 3 (Metro Center)	44
Table 14	Build Scenario 3 "LOS F" Turning Movements	44
Table 15	Comparison of Build Scenarios	48
Table 17	Comparison of Intersection Delay and LOS: No Build 2045 to All Three Build 2045 Scenarios	48
Table 16	Comparison of Build Scenario Trip Generation	48
Table 18	TRG Preferred Build Scenario, Full Buildout, Site Trip Generation	50
Table 19	Comparison of Intersection Delay and LOS: No Build 2045 to Preferred Build Scenario	55
Table 20	Preferred Build "LOS F" Turning Movements	55
Table 21	Candidate Mitigations to be Tested in VISSIM	59
Table 22	Comparison of Intersection Delay and LOS: Preferred Build Scenario to Mitigation Build Scenario	66
Table 23	Comparison of LOS F Movements	66
Table 24	Transportation Mitigation Recommendations	70

List of Figures

Figure No.	Description	Page
Figure 1	Transit-Related Growth Area Map	2
Figure 2	Existing Conditions Traffic Volumes	5
Figure 3	Existing Conditions Intersection Level of Service	6
Figure 4	Existing Conditions Congestion Heat Map – AM Peak Hour	7
Figure 5	Existing Conditions Congestion Heat Map – PM Peak Hour	8
Figure 6	No Build 2045 Traffic Volumes	11
Figure 7	No Build 2045 Intersection Level of Service	13
Figure 8	No Build 2045 Congestion Heat Map – AM Peak Hour	14
Figure 9	No Build 2045 Congestion Heat Map – PM Peak Hour	15
Figure 10	No Build 2045 Queue Map – AM Peak Hour	16
Figure 11	No Build 2045 Queue Map – PM Peak Hour	17
Figure 12	Modeled Configuration of Spring Street / Fairfax County Parkway Ramps / Fairbrook Drive Extension	20
Figure 13	Neighborhood Clusters Scenario Street Plan	21
Figure 14	Build Scenario 1 (Neighborhood Clusters) 2045 Traffic Volumes	23
Figure 15	Build Scenario 1 (Neighborhood Clusters) New Site Trips	24
Figure 16	Build Scenario 1 (Neighborhood Clusters) Site Pass-By Trips	25
Figure 17	Build Scenario 1 (Neighborhood Clusters) 2045 Intersection Level of Service	27
Figure 18	Build Scenario 1 (Neighborhood Clusters) 2045 Congestion Heat Map – AM Peak Hour	28
Figure 19	Build Scenario 1 (Neighborhood Clusters) 2045 Congestion Heat Map – PM Peak Hour	29
Figure 20	Two Centers Scenario Street Plan	30
Figure 21	Build Scenario 2 (Two Centers) 2045 Traffic Volumes	32
Figure 22	Build Scenario 2 (Two Centers) New Site Trips	33
Figure 23	Build Scenario 2 (Two Centers) Site Pass-By Trips	34
Figure 24	Build Scenario 2 (Two Centers) 2045 Intersection Level of Service	36
Figure 25	Build Scenario 2 (Two Centers) 2045 Congestion Heat Map – AM Peak Hour	37
Figure 26	Build Scenario 2 (Two Centers) 2045 Congestion Heat Map – PM Peak Hour	38
Figure 27	Metro Center Scenario Street Plan	39
Figure 28	Build Scenario 3 (Metro Center) 2045 Traffic Volumes	41
Figure 29	Build Scenario 3 (Metro Center) New Site Trips	42
Figure 30	Build Scenario 3 (Metro Center) Site Pass-By Trips	43
Figure 31	Build Scenario 3 (Metro Center) 2045 Intersection Level of Service	45
Figure 32	Build Scenario 3 (Metro Center) 2045 Congestion Heat Map – AM Peak Hour	46
Figure 33	Build Scenario 3 (Metro Center) 2045 Congestion Heat Map – PM Peak Hour	47
Figure 34	Preferred Scenario Development Plan	51
Figure 35	Preferred Build Scenario 2045 Traffic Volumes	52
Figure 36	Preferred Build Scenario New Site Trips	53
Figure 37	Preferred Build Scenario Site Pass-By Trips	54
Figure 38	Preferred Build Scenario 2045 Intersection Level of Service	56
Figure 39	Preferred Build Scenario 2045 Congestion Heat Map – AM Peak Hour	57
Figure 40	Preferred Build Scenario 2045 Congestion Heat Map – PM Peak Hour	58
Figure 41	Preferred Build Scenario 2045 Queue Map – AM Peak Hour	60
Figure 42	Preferred Build Scenario 2045 Queue Map – PM Peak Hour	61
Figure 43	Preferred Build Scenario with Mitigation 2045 Traffic Volumes	63
Figure 44	Preferred Build Scenario with Mitigation New Site Trips	64
Figure 45	Preferred Build Scenario with Mitigation Site Pass-By Trips	65
Figure 46	Preferred Build Scenario with Mitigation 2045 Intersection Level of Service	67
Figure 47	Preferred Build Scenario with Mitigation 2045 Congestion Heat Map – AM Peak Hour	68
Figure 48	Preferred Build Scenario with Mitigation 2045 Congestion Heat Map – PM Peak Hour	69
Figure 49	Preferred Build Scenario with Mitigation 2045 Queue Map – AM Peak Hour	71
Figure 50	Preferred Build Scenario with Mitigation 2045 Queue Map – PM Peak Hour	72

1

Introduction

The Town of Herndon is preparing a Small Area Plan for the Transit-Related Growth (TRG) Area proximate to the Silver Line Metro Station. VHB is providing transportation services on the SOM-led Project Team. This report covers VHB's transportation analysis of various development scenarios, comparing the anticipated impact to no new TRG development, and identifying potential transportation mitigation strategies.

1.1 Location and Context

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

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

1.2 Transportation Scope of Work

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

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

Figure 1 Transit-Related Growth Area Map



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

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

1.2.1 Baseline Traffic Data

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

1.3 Transportation Analysis Scenarios

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

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

2

Existing Traffic Conditions

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

2.1 Traffic Model

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

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

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

Table 1 Metro Square Trip Generation

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

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

2.2 Traffic Volumes

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

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

2.3 Existing Conditions Traffic Analysis

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

2.3.1 Performance Metrics

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

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

Table 2 Level of Service Description for Intersections

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

2.3.2 Existing Conditions Findings

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

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

Table 3 Existing Condition Intersection Delay and LOS

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

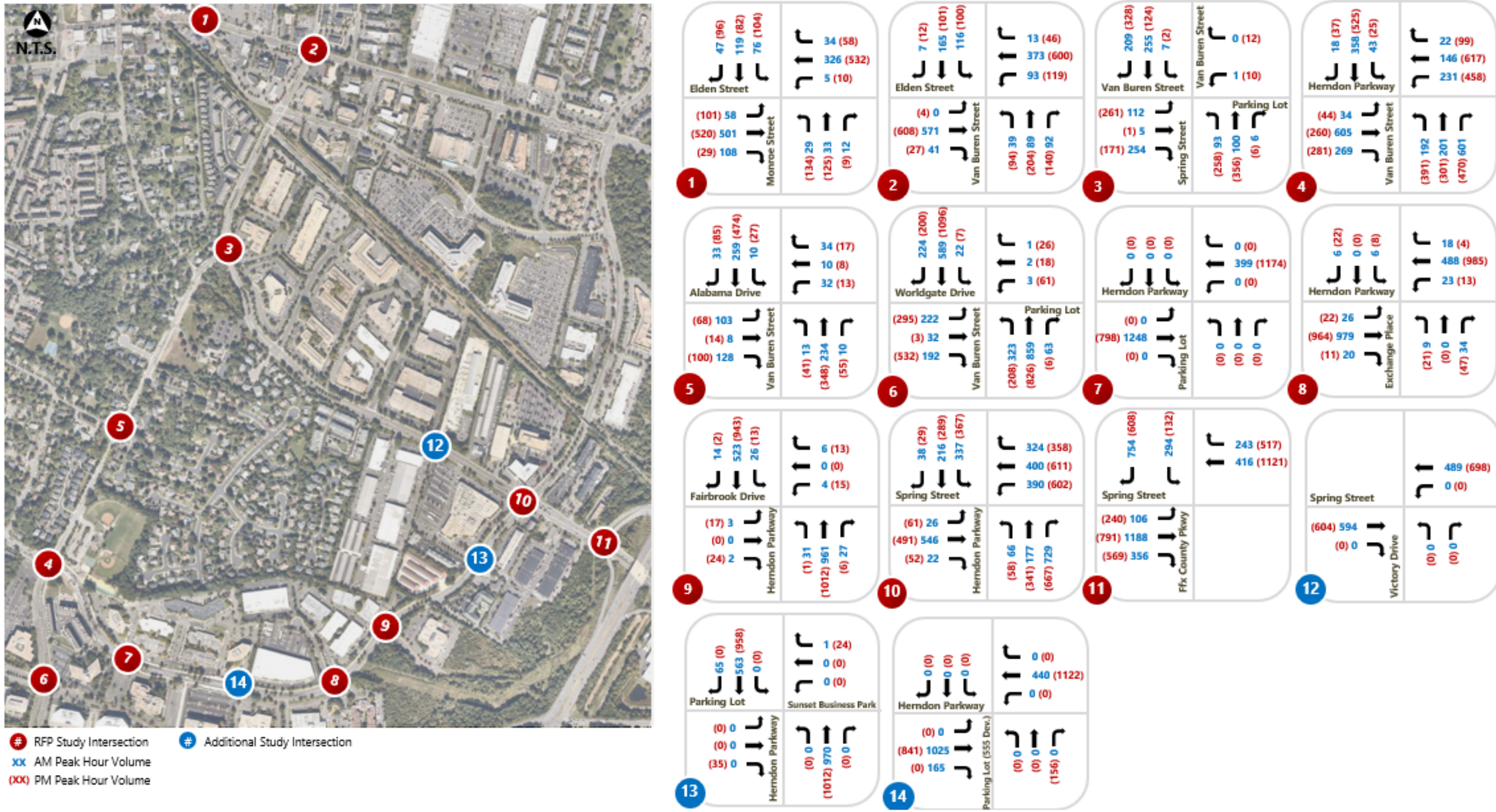
Source: Average of 7 AM and 20 PM Peak Hour VISSIM simulation runs.
1 Unsignalized intersections in Existing conditions scenario.

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

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

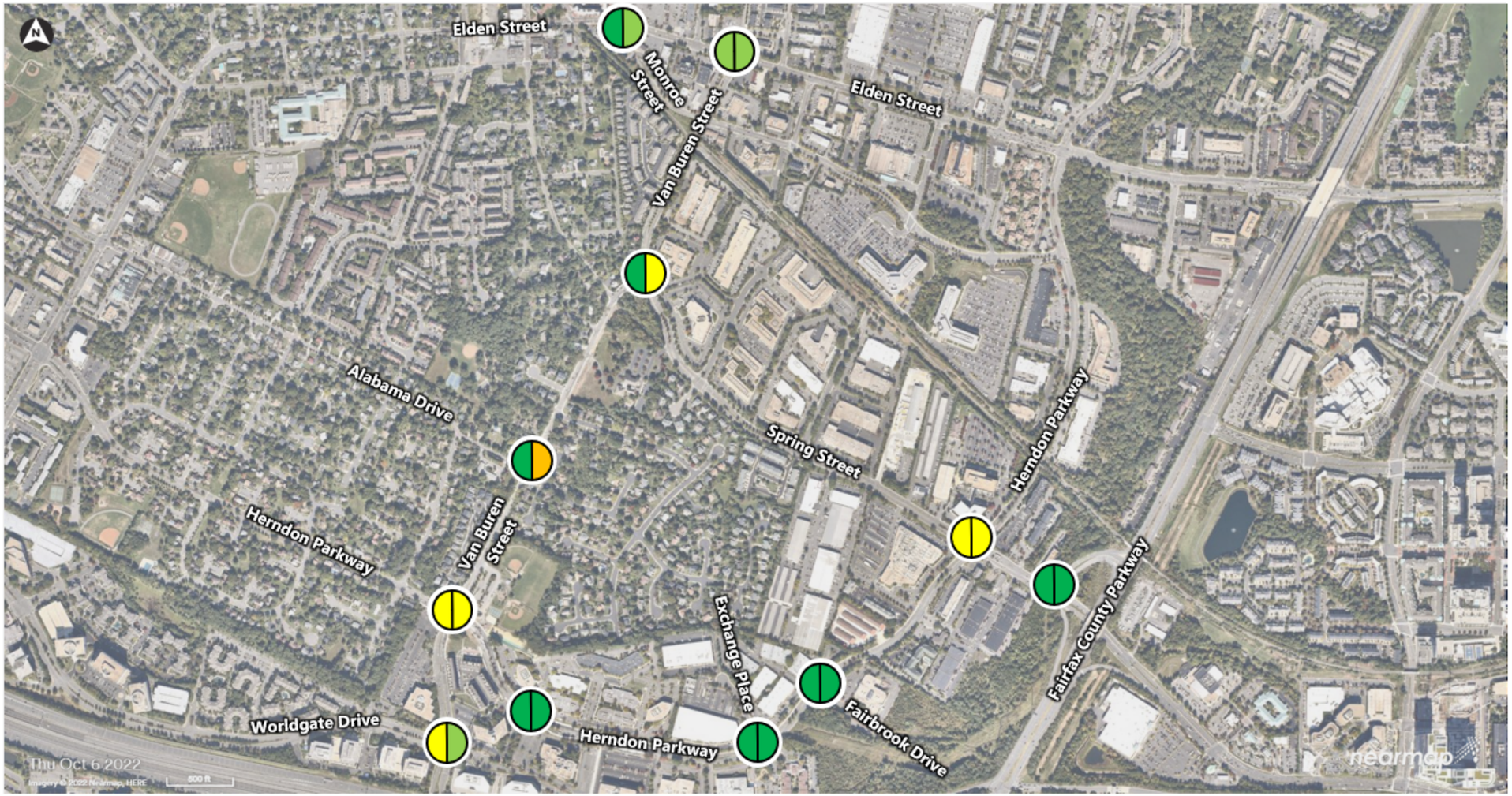
Appendix B documents the delay, LOS, and vehicle queuing for all of the movements at each of the eleven study intersections.

Figure 2 Existing Conditions Traffic Volumes



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

Figure 3 Existing Conditions Intersection Level of Service

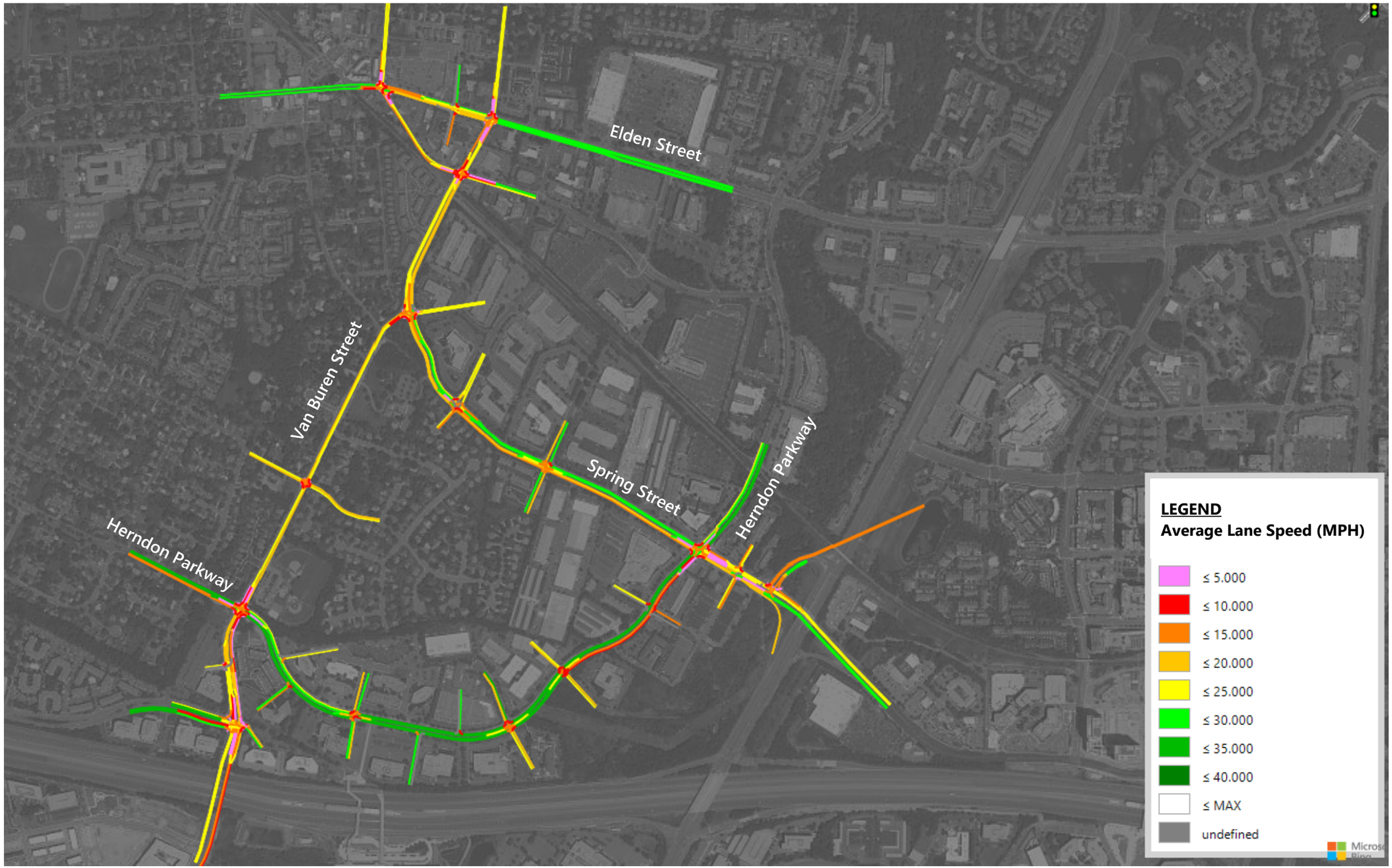


Intersection Level of Service (LOS)

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

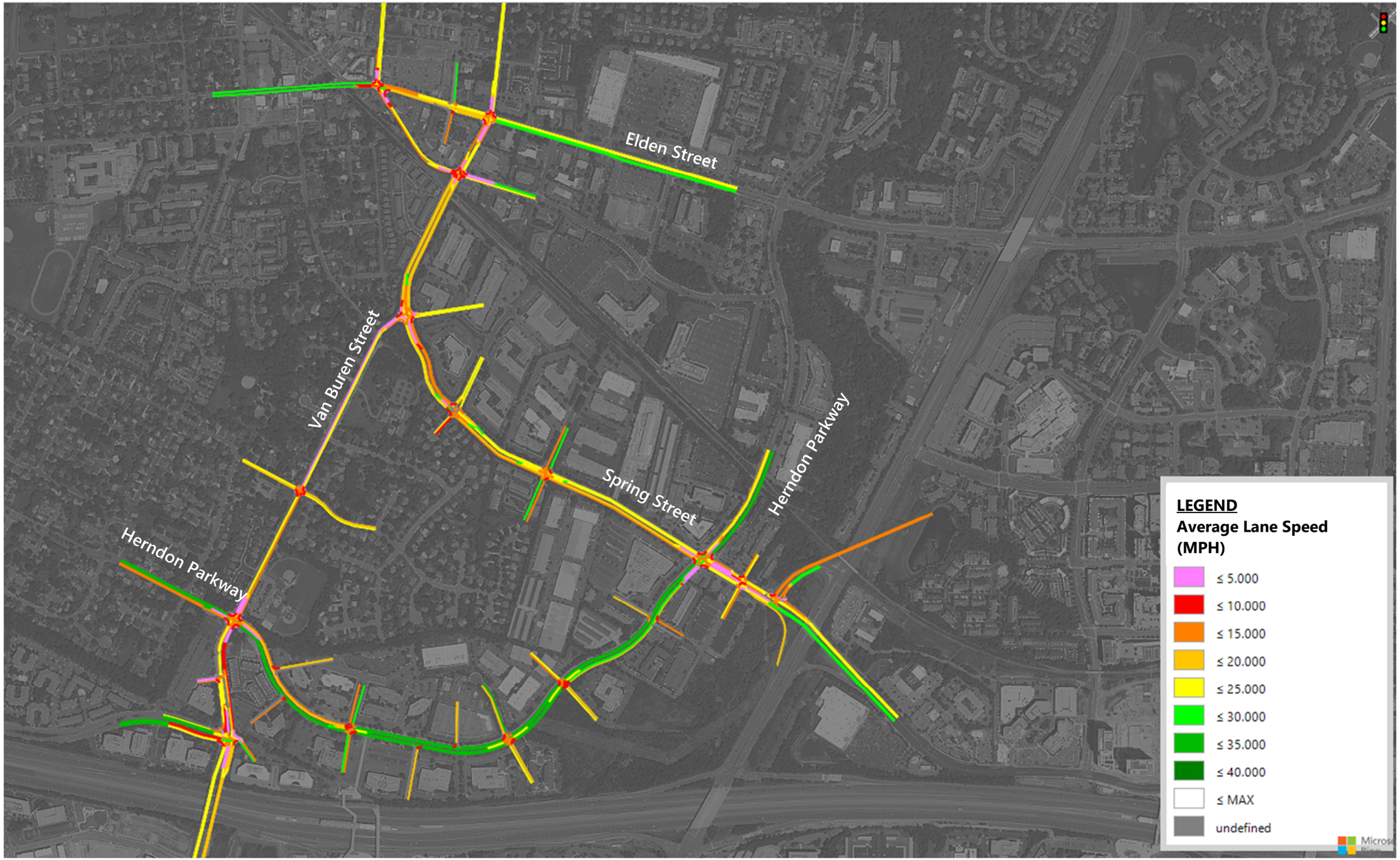
Source: Average of 7 AM Peak Hour and 20 PM Peak Hour VISSIM simulation runs. Aerial imagery from NearMap.

Figure 4 Existing Conditions Congestion Heat Map – AM Peak Hour



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

Figure 5 Existing Conditions Congestion Heat Map – PM Peak Hour



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

3

No Build 2045 Traffic Conditions

This section of the report documents the assumptions and findings of the No Build traffic analysis, which establishes a baseline condition for the design year to which the TRG development scenarios can be compared. Congestion is higher than Existing conditions, and the network shows unacceptable levels of traffic operations – as defined by the Town of Herndon's LOS standard – at three study intersections; however, modeling results indicate that the roadway network accommodates the increased demand based on the progression of traffic.

3.1 No Build 2045 Model Assumptions

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

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

3.1.1 Traffic Volumes

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

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

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

This approach to background growth estimation is consistent with the methodologies used in both the 2012 Herndon Metrorail Station Area Study and the 2017 TRG study. It should be noted that, based on a comparison to growth projections

derived from the MWCOG Regional Travel Demand Model (TDM), this approach may overstate traffic demand in the No Build 2045 scenario; however, a conservative traffic forecasting approach ensures that the infrastructure can more than accommodate the future demand.

3.1.2 Roadway Network

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

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

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

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

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

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

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

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

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

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

3.2 No Build 2045 Traffic Volumes

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

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

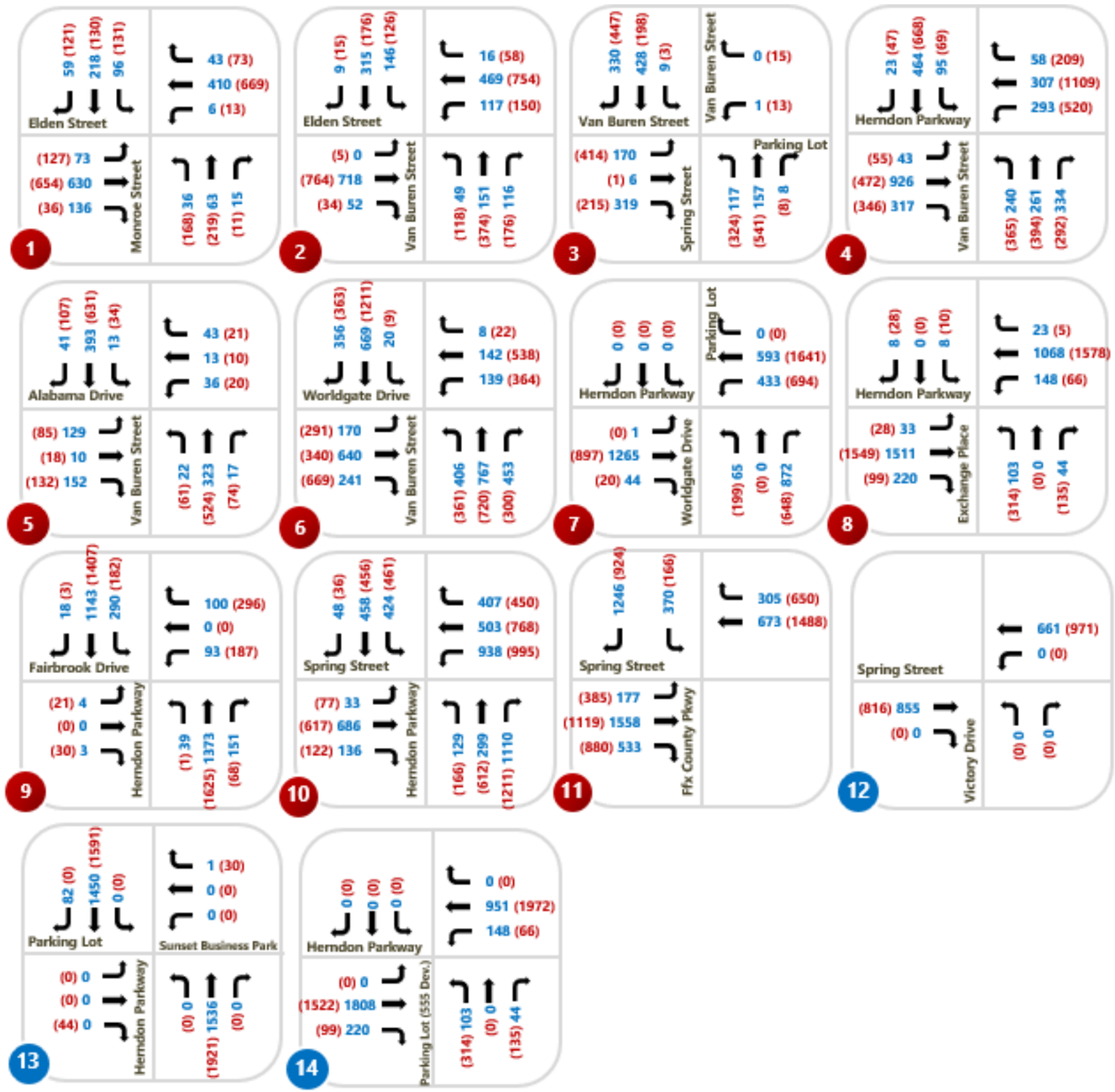
Figure 6 displays the traffic volume dataset that was analyzed at the study intersections in the No Build 2045 traffic model. These traffic volumes are substantially higher than Existing conditions traffic volumes. **Appendix A** shows traffic volumes for all study and non-study intersections in the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

3.3 No Build 2045 Traffic Analysis

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

Figure 6 No Build 2045 Traffic Volumes





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

3.3.1 No Build 2045 Findings

In No Build 2045 conditions, with significantly higher traffic volumes but also improved roadway configurations, three study intersections are projected to have unacceptable levels of traffic operations based on the Town's LOS standard. **Table 4** lists the intersection delay and LOS at each of the eleven study intersections. Intersection LOS is also shown in **Figure 7**.

All study intersections are projected to operate at LOS D or better in both peak hours, except for the Spring Street / Herndon Parkway intersection, which is anticipated to operate at LOS E in the PM peak hour, which does not meet the Town's intersection-level LOS standard of LOS D or higher. It should be noted that while LOS E does represent increased delay, modeling results indicate that the roadway network can accommodate the increased demand based on the progression of traffic. Many intersections in the Northern Virginia area operate at this condition during a peak hour and Fairfax County has adopted an LOS E intersection standard in several of its urban development areas.

Table 4 No Build 2045 Intersection Delay and LOS

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

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

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

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

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

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

Table 5 No Build 2045 "LOS F" Turning Movements

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

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

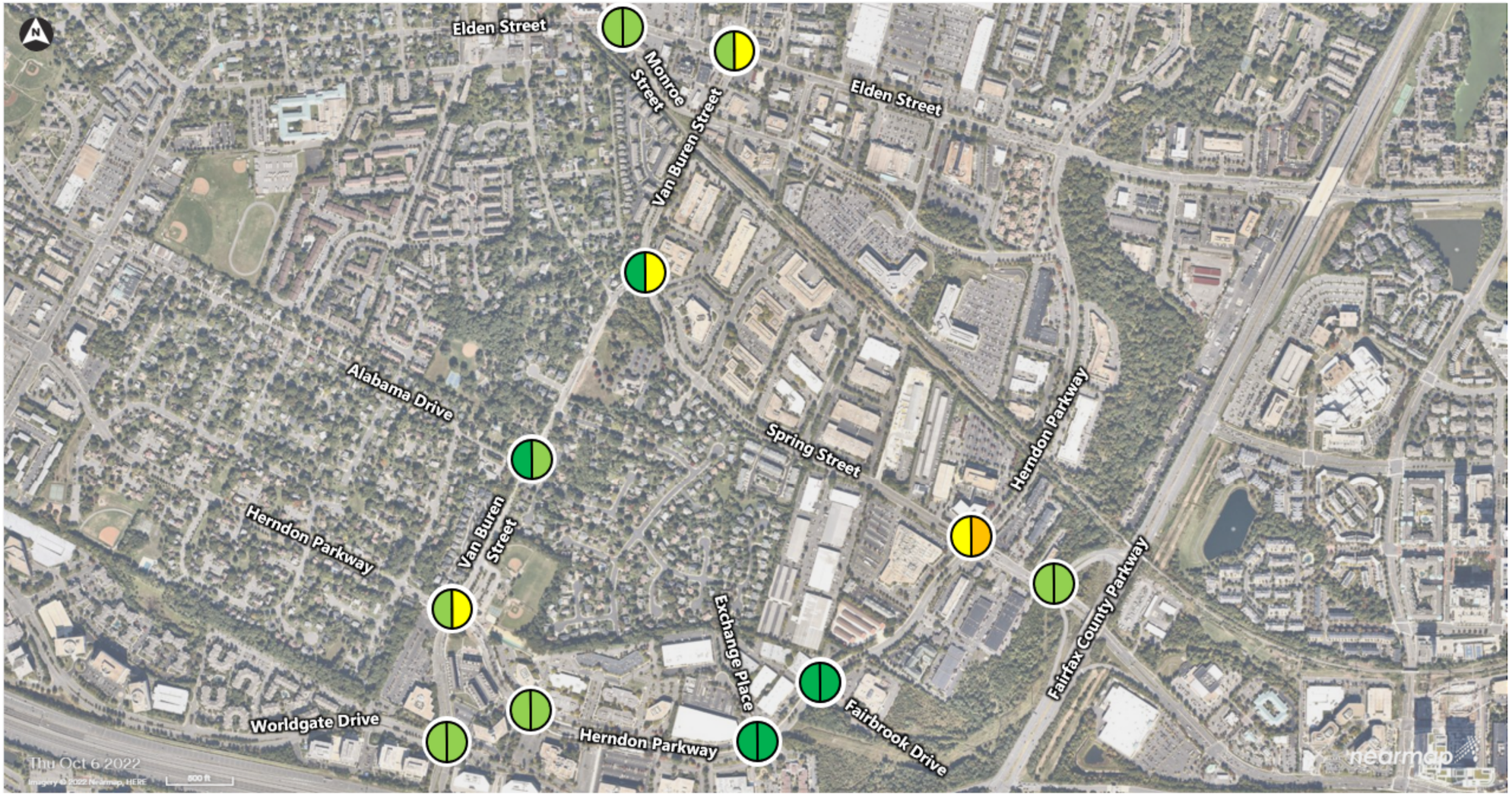
Congestion "heat" maps for each of the peak hours are shown in **Figures 8 and 9**. These represent the average vehicle speeds present in different lanes and segments of the model. Slower vehicle speeds (shown in shades of red) represent areas of higher congestion and vehicle queuing, whereas higher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

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

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

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

Figure 7 No Build 2045 Intersection Level of Service

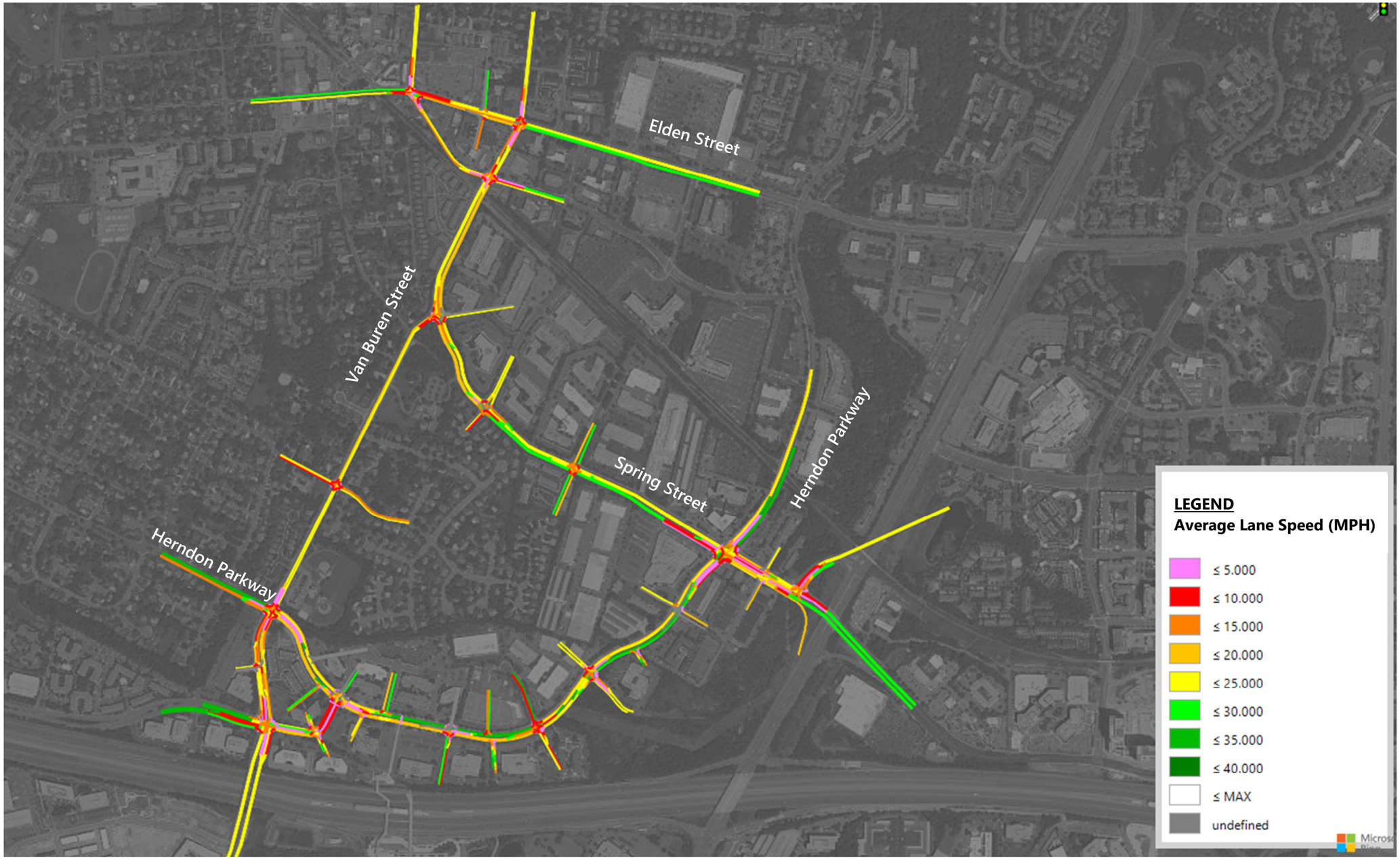


Intersection Level of Service (LOS)

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

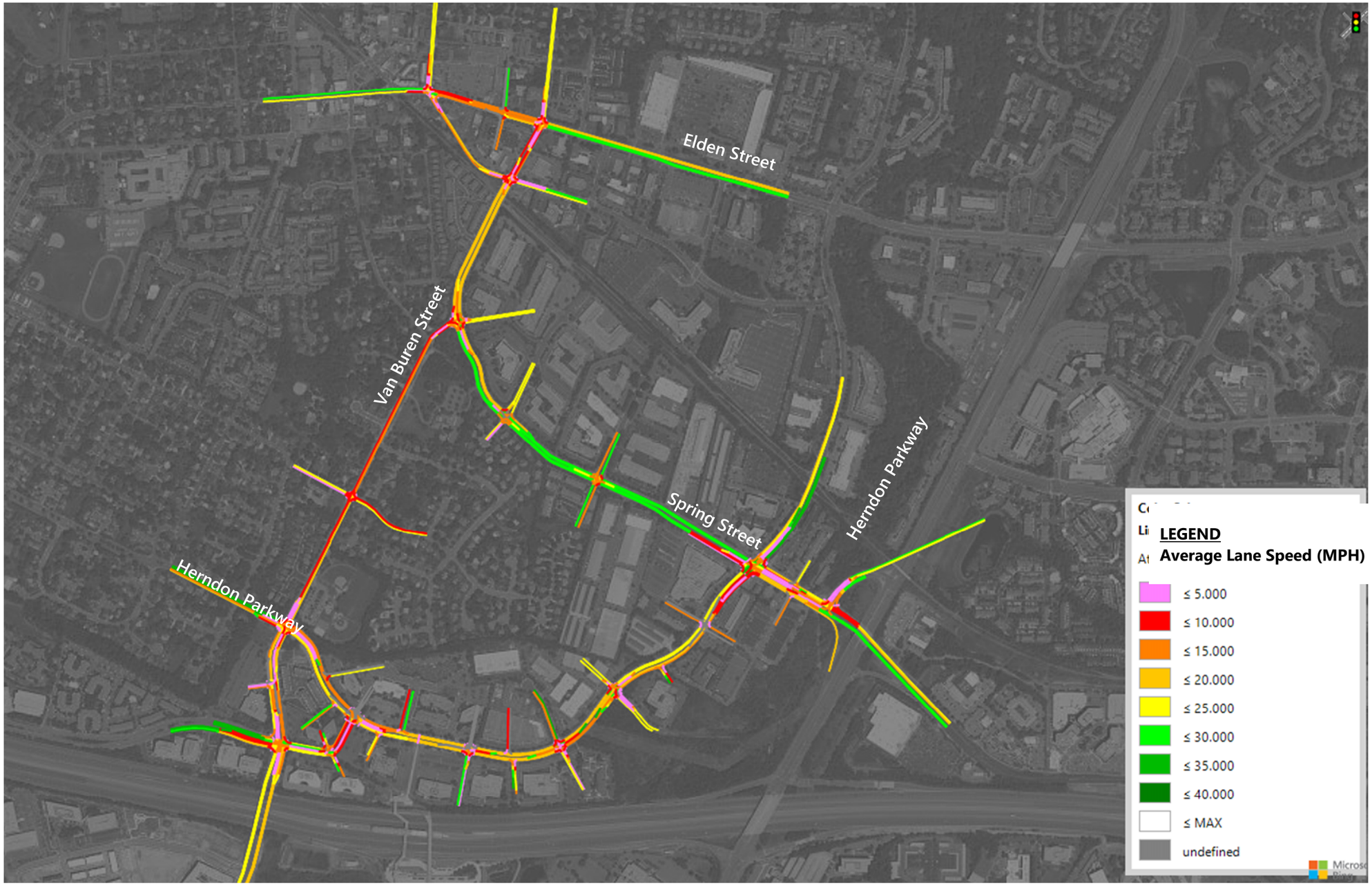
Source: Average of 7 AM Peak Hour and 20 PM Peak Hour VISSIM simulation runs. Aerial imagery from NearMap.

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



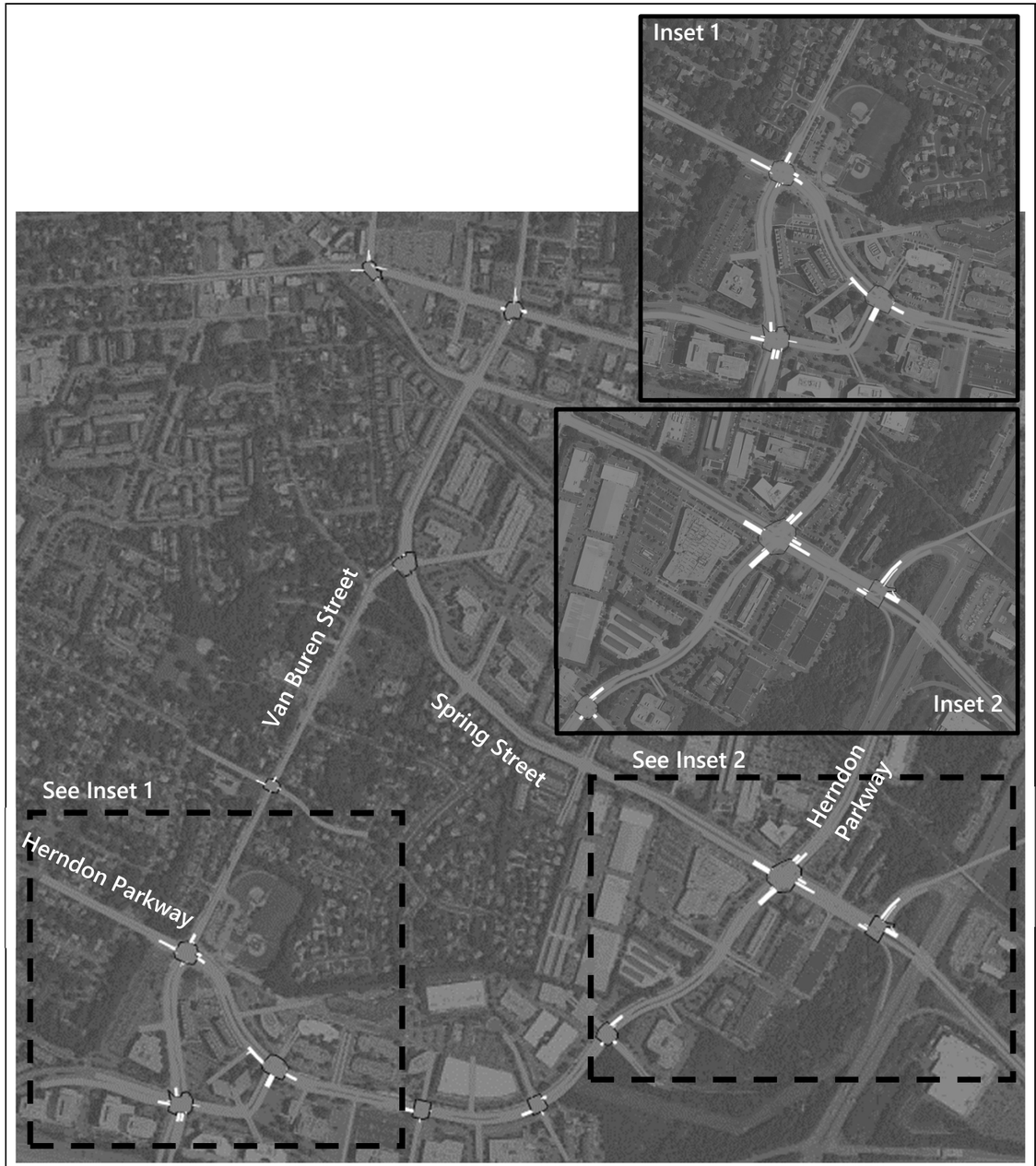
Source: Average of 7 AM Peak Hour VISSIM simulation runs.

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

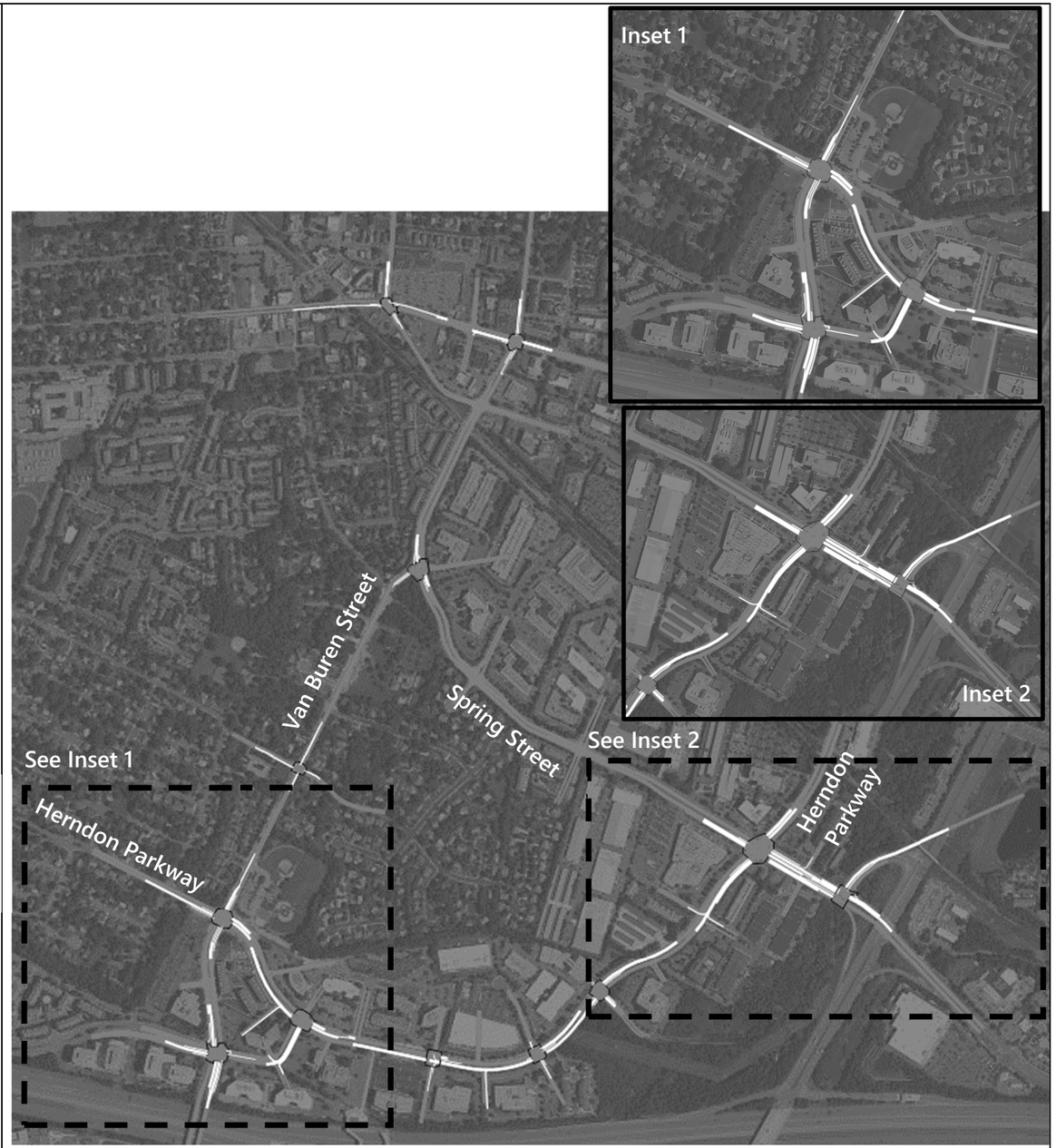


Source: Average of 20 PM Peak Hour VISSIM simulation runs.

Figure 10 No Build 2045 Queue Map – AM Peak Hour

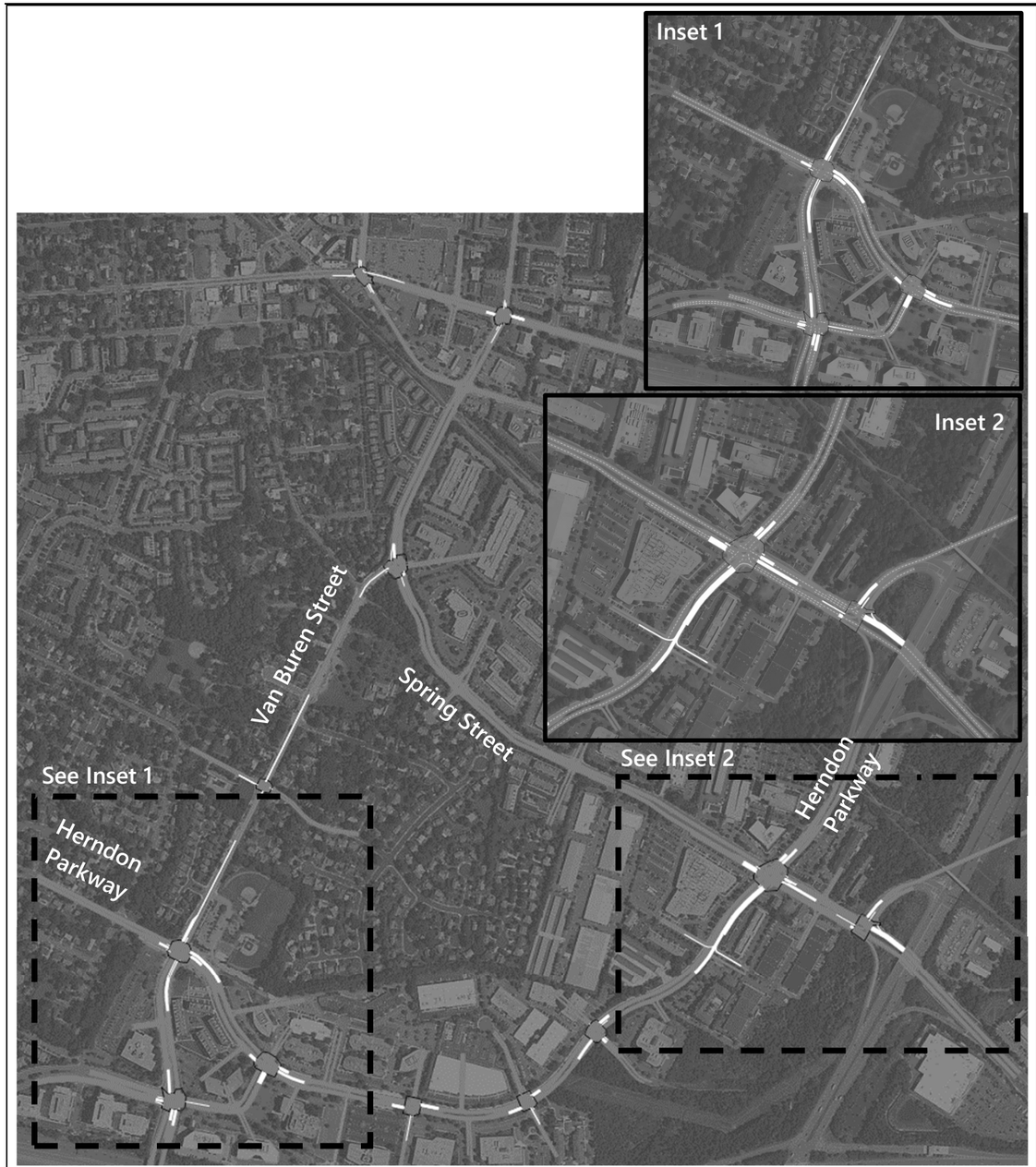


Average Queue Length

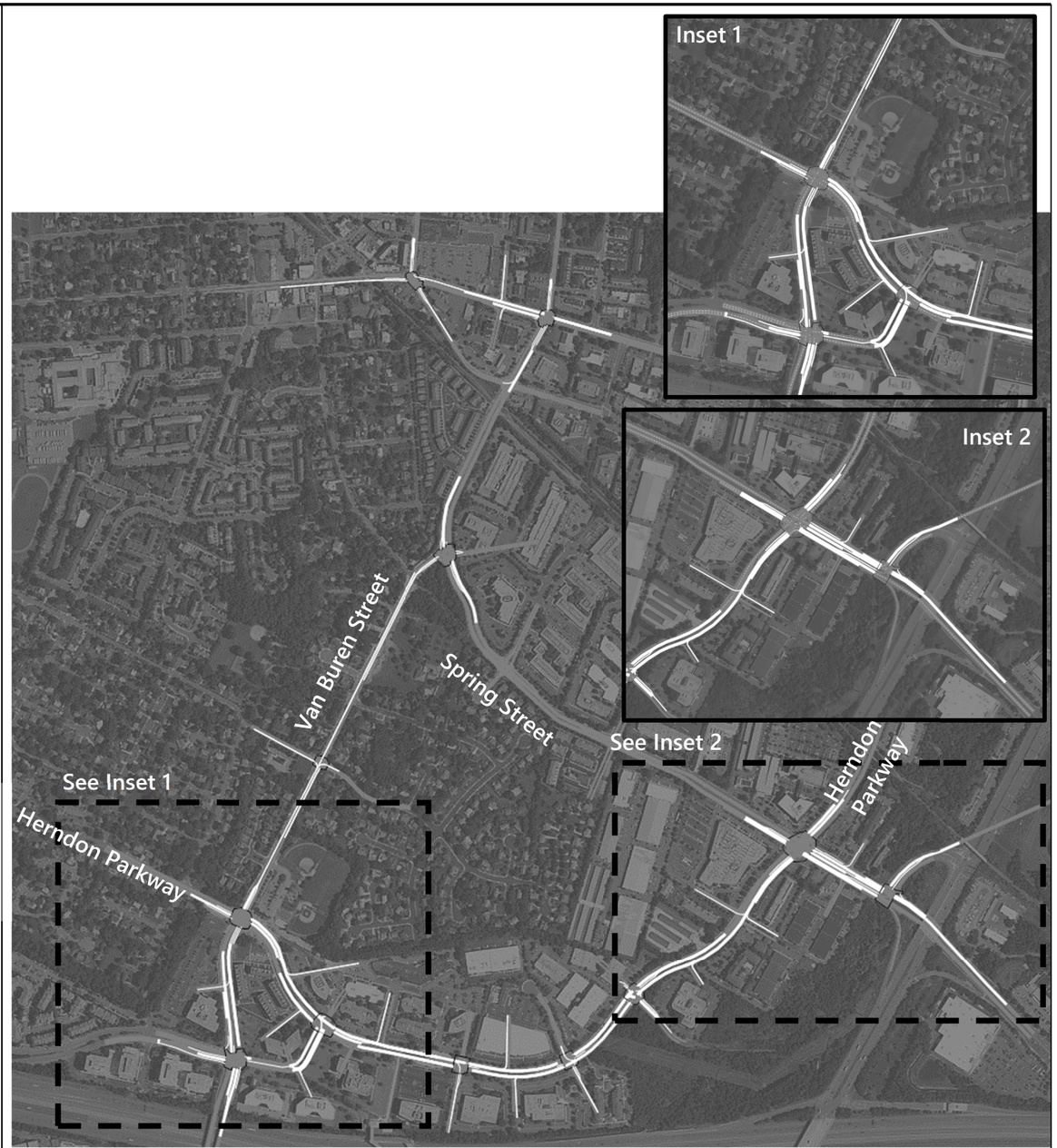


Maximum Queue Length

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

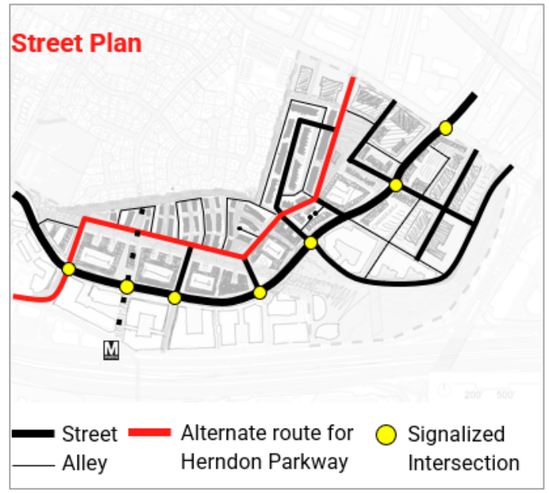
Table 6 documents the trip generation calculations for Build 2045 Scenario One: Neighborhood Clusters. Table 5 shows that after the appropriate trip reductions, the new TRG development at full buildout is expected to generate more than 2,250 AM Peak Hour trips, 2,250 PM Peak Hour trips, and 27,000 weekday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

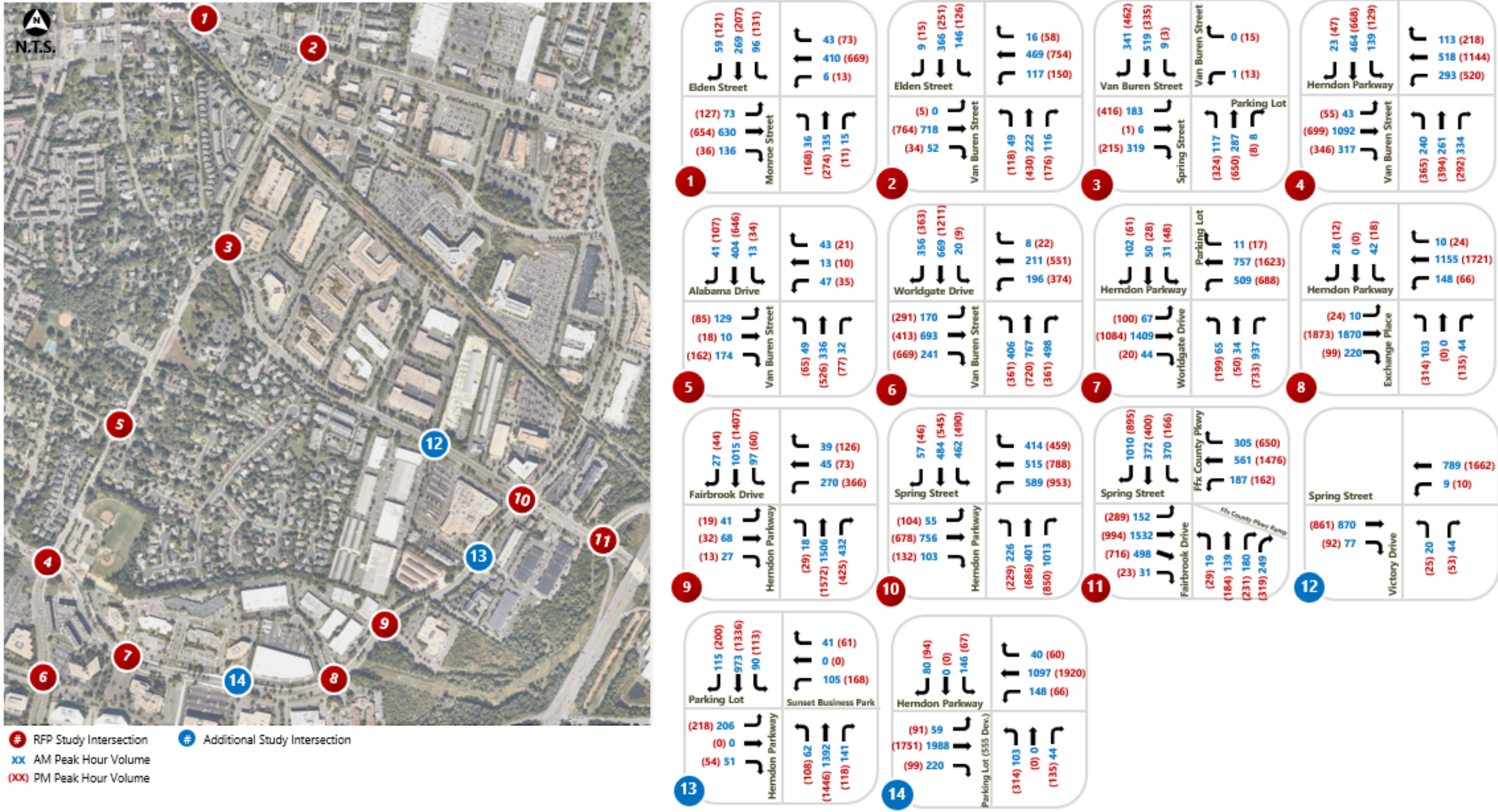
Figure 15 displays just the new site trips associated with the Preferred Build Scenario, while **Figure 16** displays just the pass-by site trips associated with the Preferred Build Scenario. **Appendix A** shows these three sets of traffic volumes for all intersections within the traffic model, including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

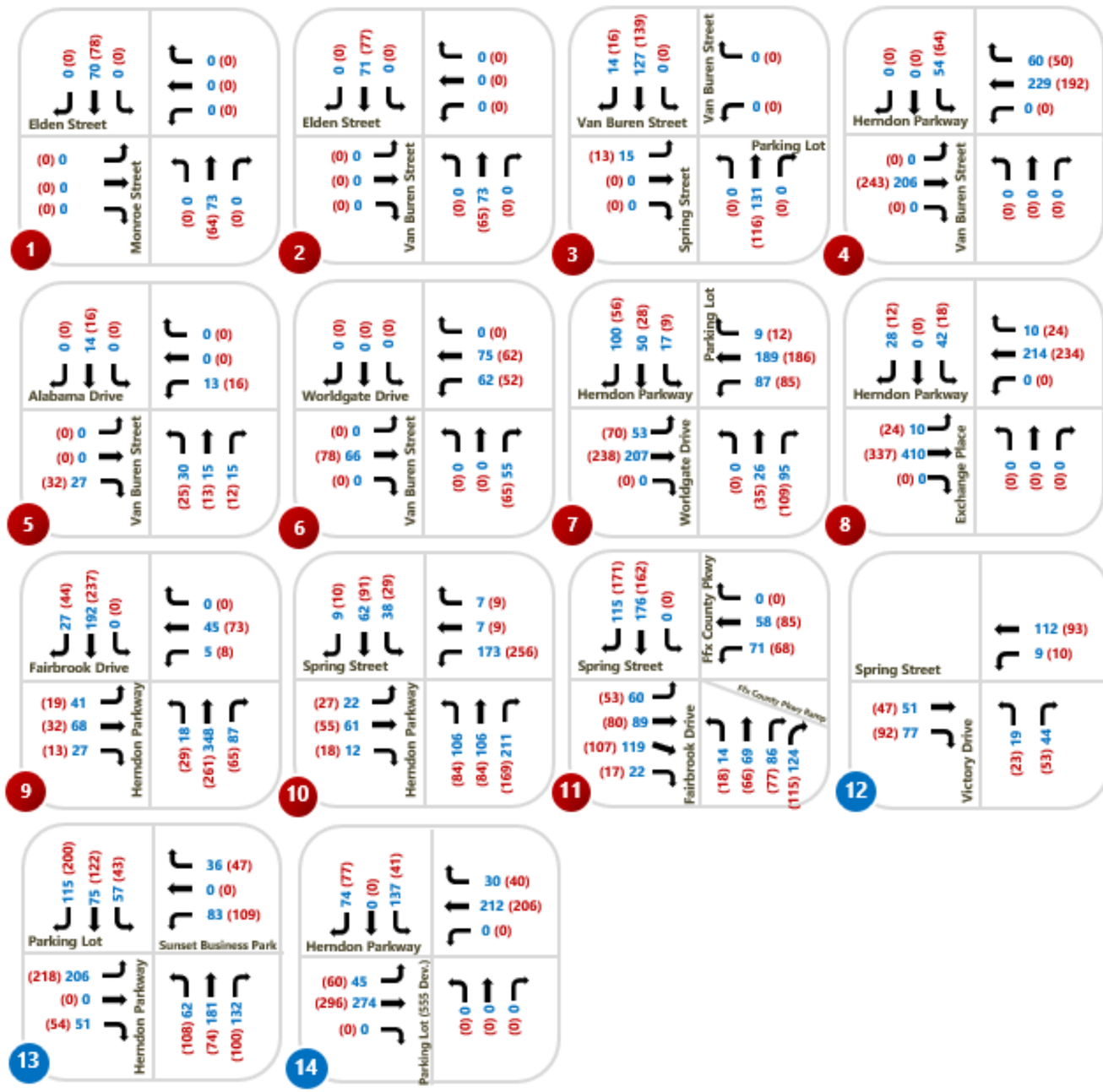
Figure 14 Build Scenario 1 (Neighborhood Clusters) 2045 Traffic Volumes



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

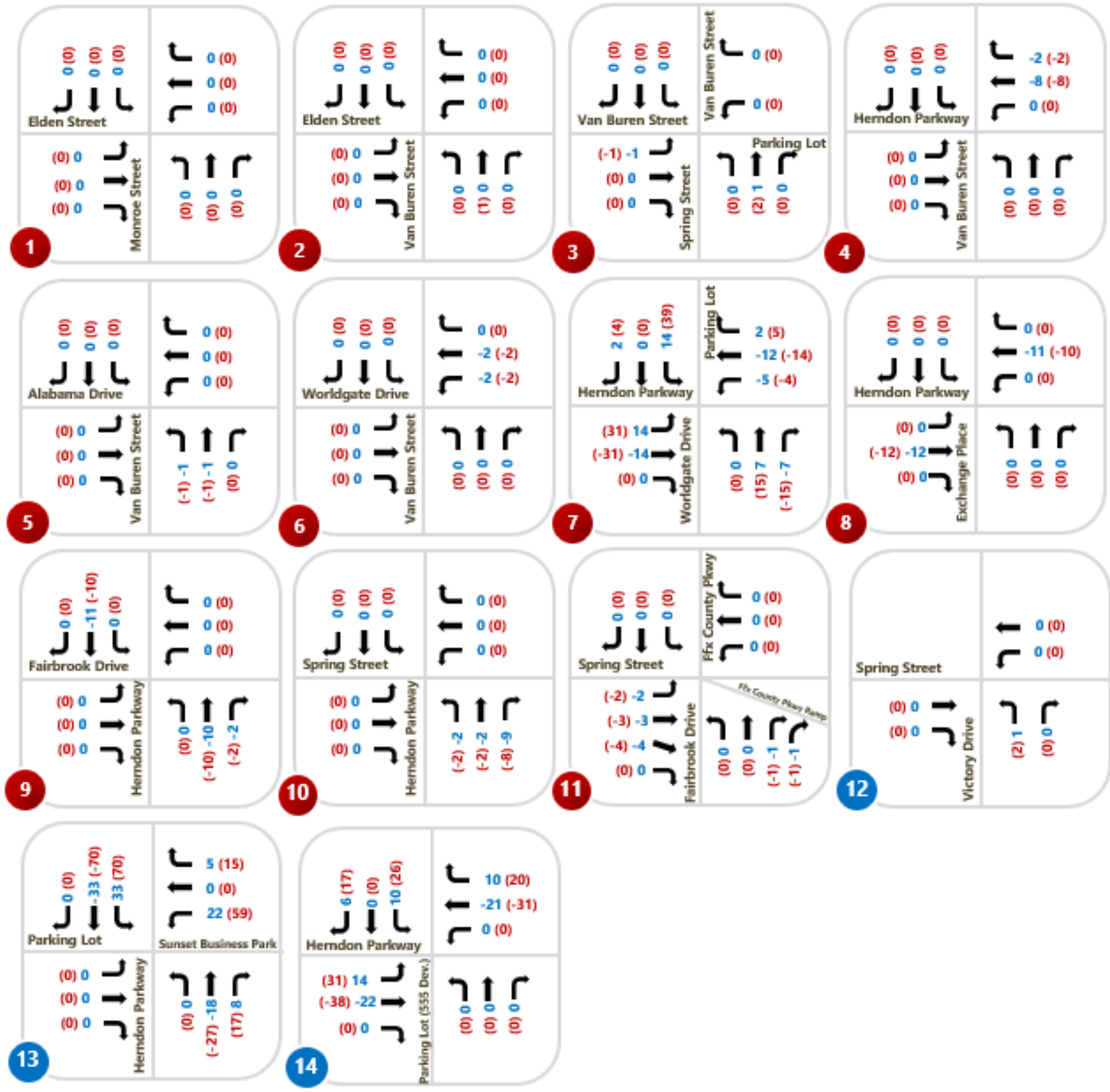




Basemap Source: Nearmap

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

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

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

Table 8 Build Scenario 1 "LOS F" Turning Movements

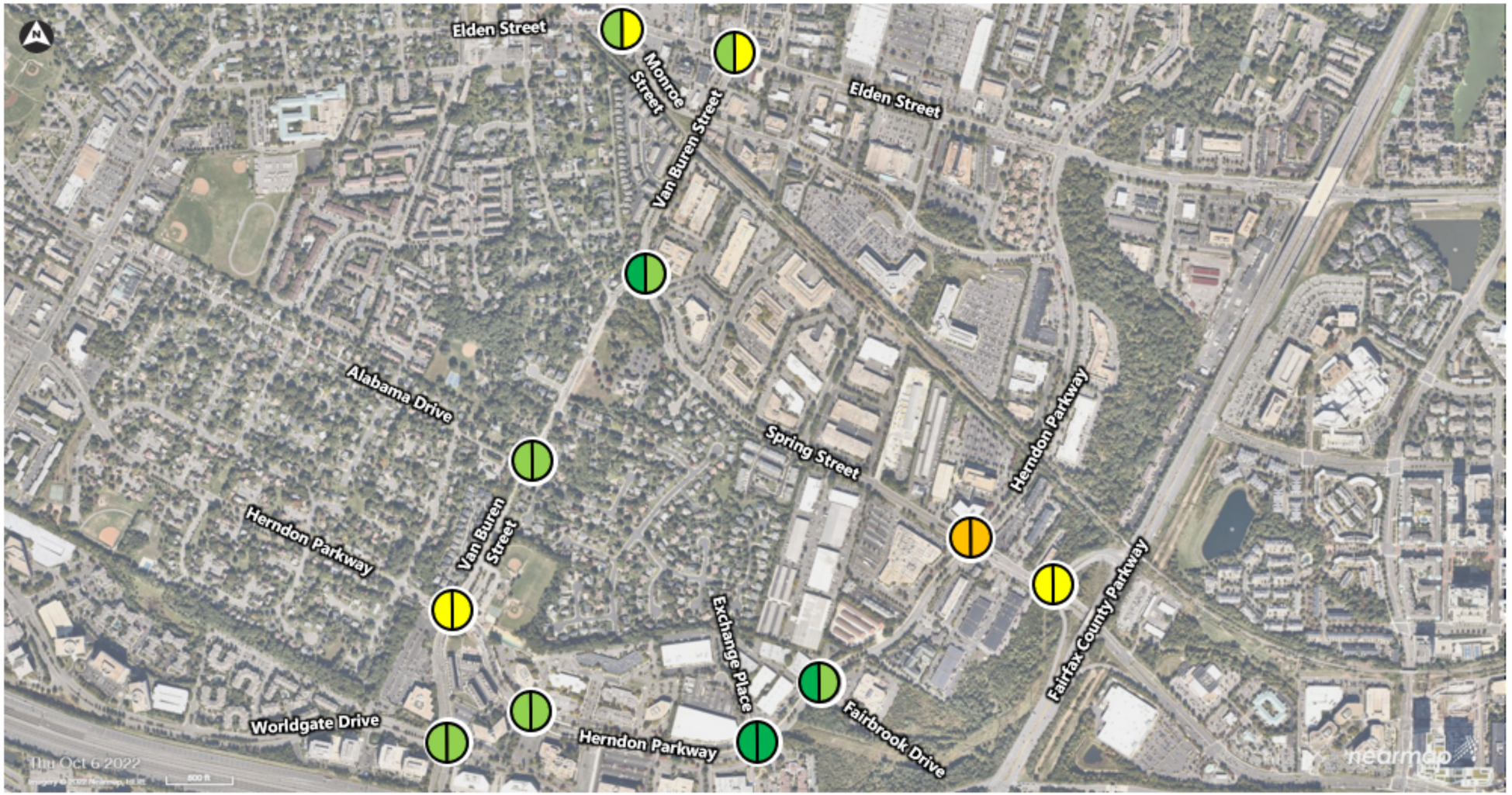
Turning Movement	Peak	LOS F in No Build?	Source of Congestion
Herndon Pkwy / Spring Street			
Southbound Left	AM	No	*Heavy Demand*
Eastbound Left	AM/PM	No	
Spring St / Fairfax County Parkway Ramps / Fairbrook Dr			
Eastbound Left	PM	No	*Heavy Demand, Assumed "Interim" Intersection Modifications*
Westbound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

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

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

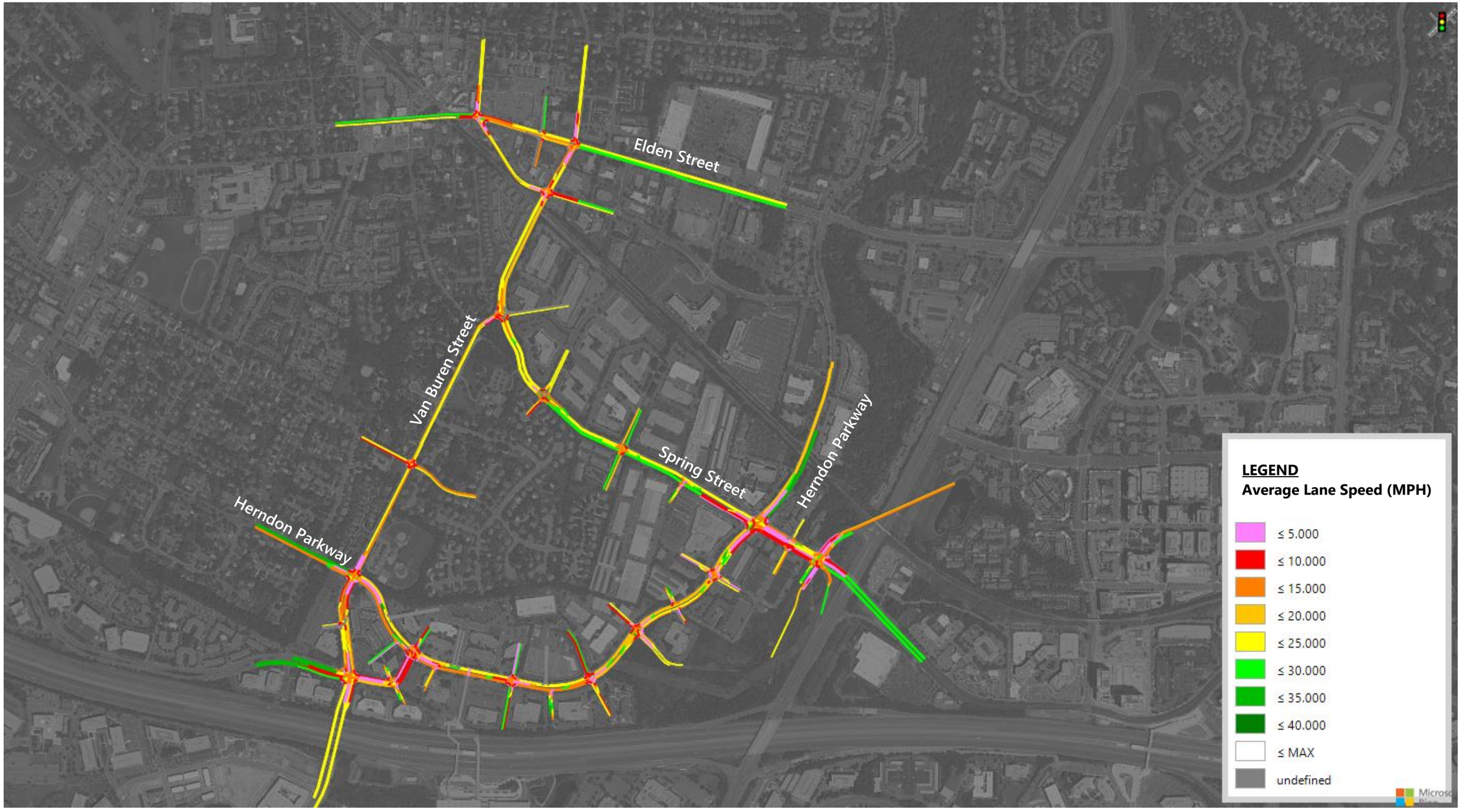
Appendix B documents the delay, LOS, and vehicle queueing for all movements at each of the eleven study intersections.

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



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

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



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

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



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

4.3 Build 2045 Scenario Two: Two Centers

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

4.3.1 Trip Generation

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

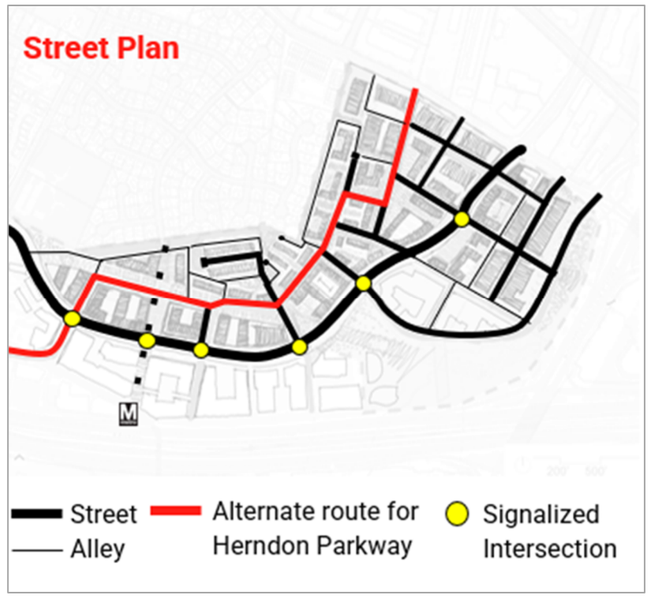
The higher quantity of office development in Scenario Two results in an approximately equal distribution between entering and exiting vehicle trips during each peak hour. In contrast to Scenario One, these anticipated vehicle trip totals are approximately 250 higher in the AM Peak Hour, 200 higher in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

4.3.2 Transportation Connectivity

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

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

Figure 20 Two Centers Scenario Street Plan



Source: SOM TRG graphics.

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

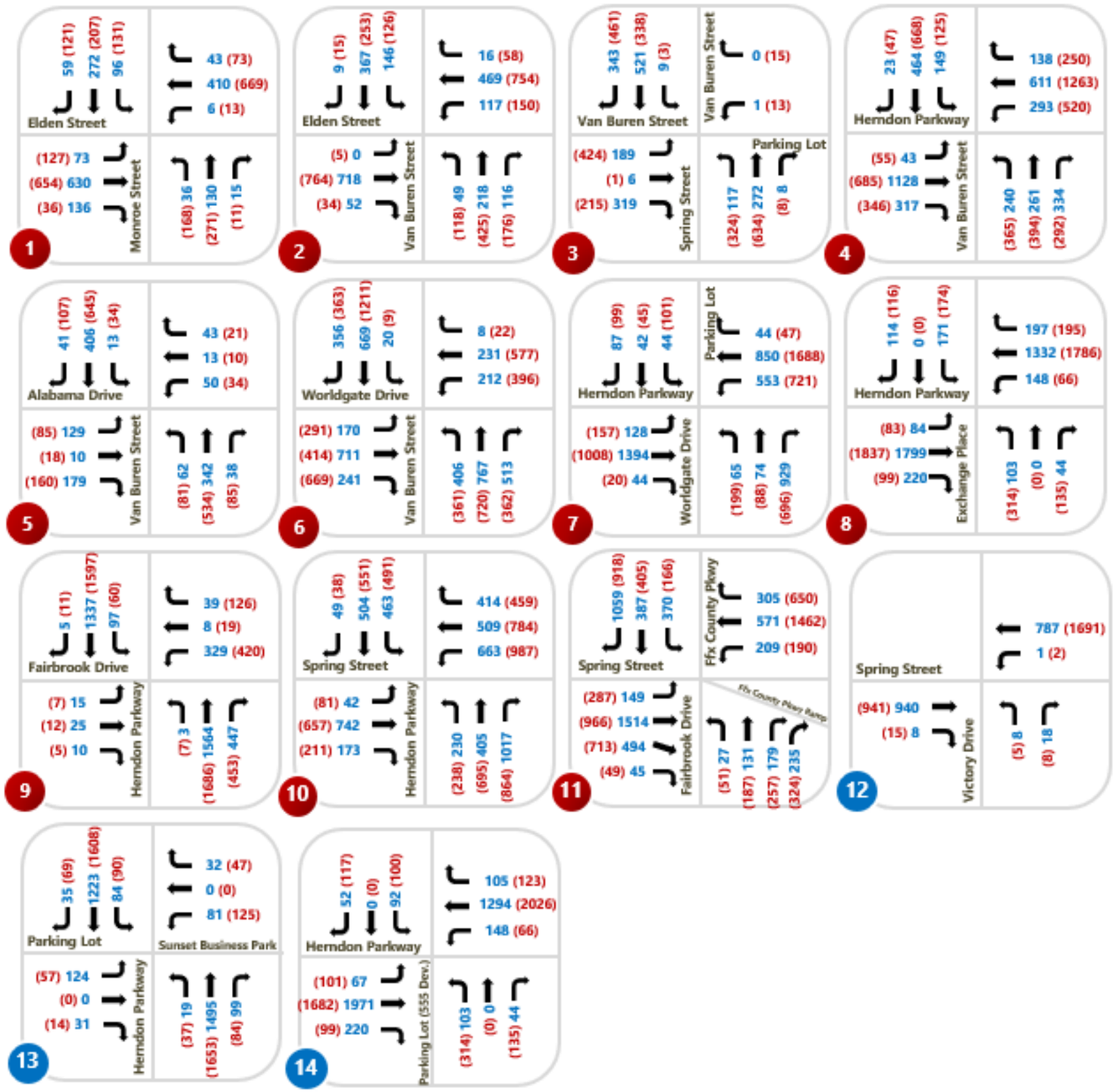
Table 9 TRG Build Scenario 2 (Two Centers), Full Buildout, Site Trip Generation

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

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

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

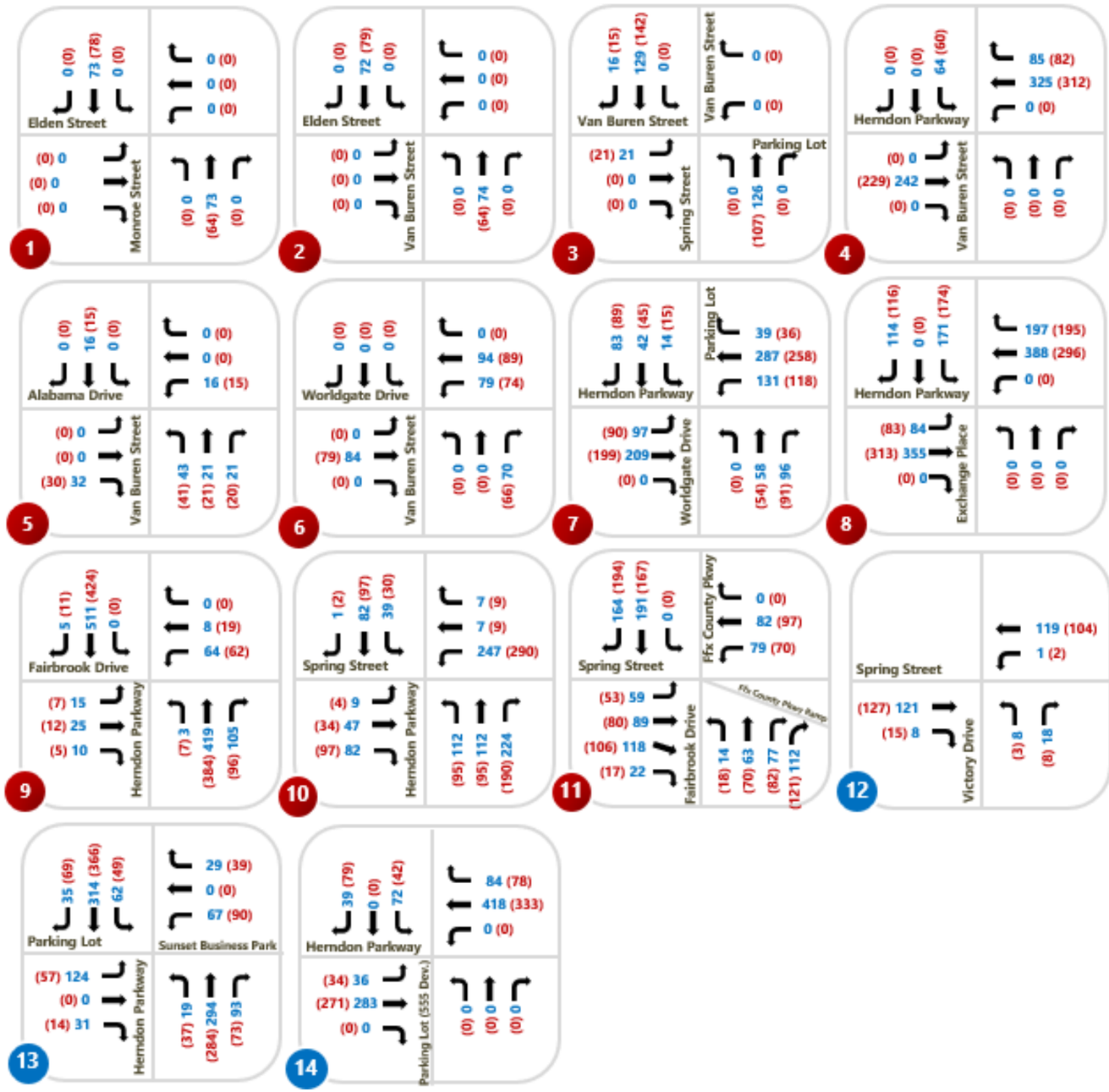




Build 2045 traffic volumes include No Build 2045 traffic volumes (Figure 6), removal of existing TRG area traffic volumes, volume shift to account for the Fairbrook Drive extension, and new TRG development traffic volumes. Basemap Source: Nearmap

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

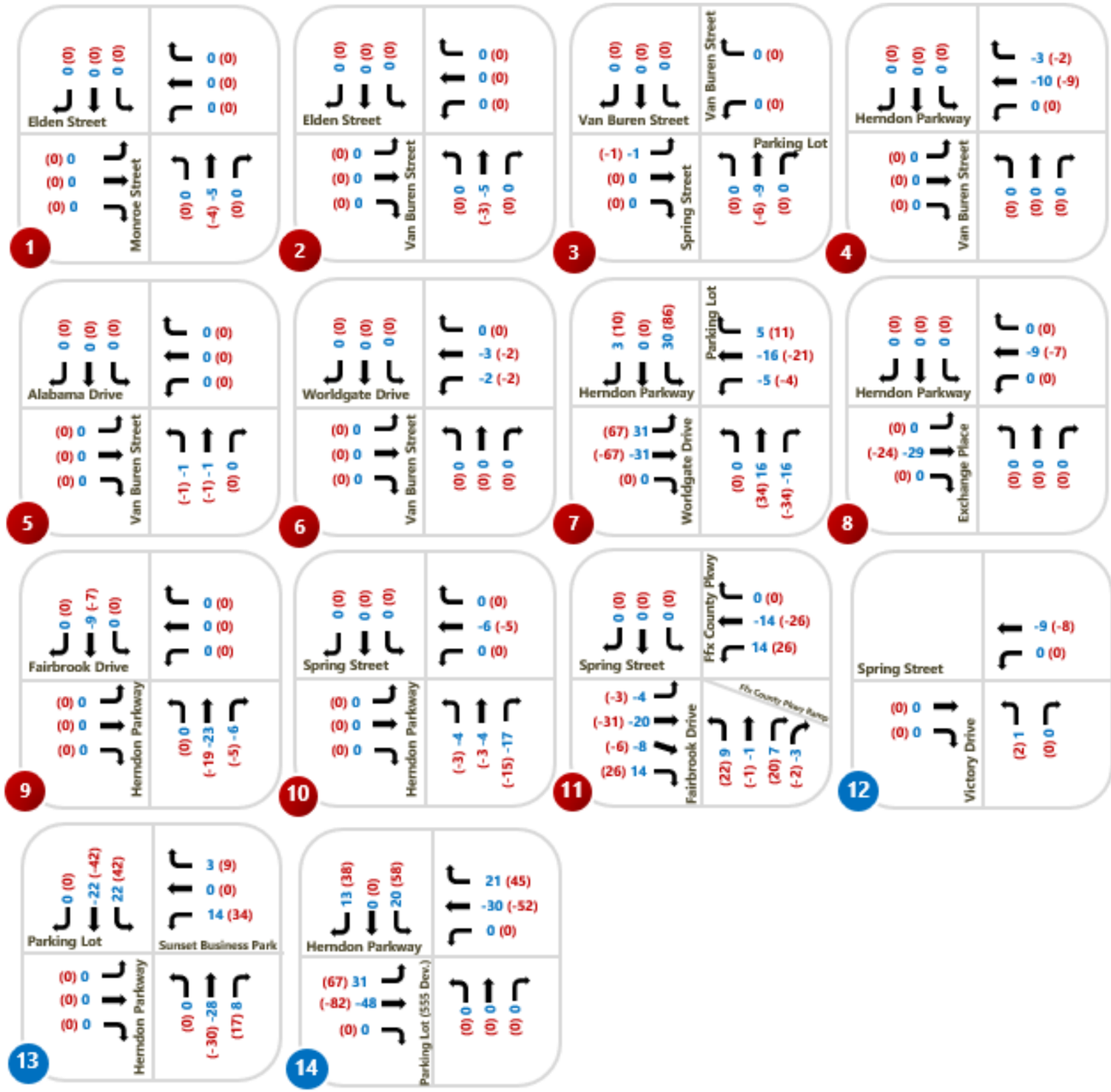




Basemap Source: Nearmap

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





Basemap Source: Nearmap

4.3.3 Traffic Analysis

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

All study intersections are projected to operate at LOS D or better in both peak hours, except for the Spring Street / Herndon Parkway intersection, which is anticipated to operate at LOS E in both peak hours. While LOS E does represent increased delay, modeling results indicate that the roadway network can accommodate the increased demand based on the progression of traffic. Many intersections in the Northern Virginia area operate at this condition during a peak hour and Fairfax County has adopted an LOS E intersection standard in several of its urban development areas.

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

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

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

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

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

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

Table 11 Build Scenario 2 "LOS F" Turning Movements

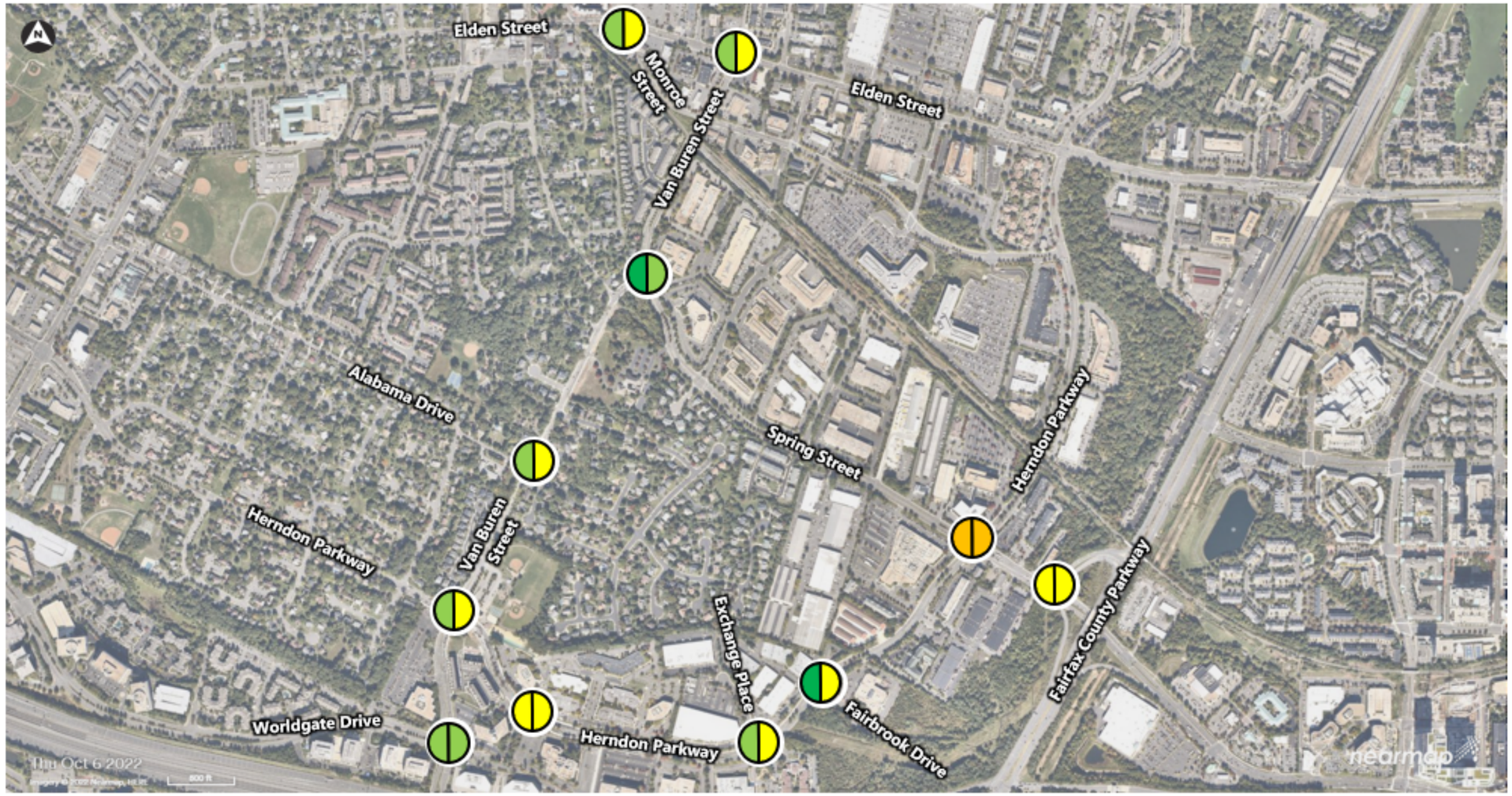
Turning Movement	Peak	LOS F in No Build?	Source of Congestion
Herndon Pkwy / Spring Street			
All Southbound	PM	No	*Heavy Demand*
Eastbound Left	AM/PM	No	
Eastbound Thru/Right	PM	No	
Spring St / Fairfax County Parkway Ramps / Fairbrook Dr			
Eastbound Left	PM	No	*Heavy Demand, "Interim" Intersection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

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

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

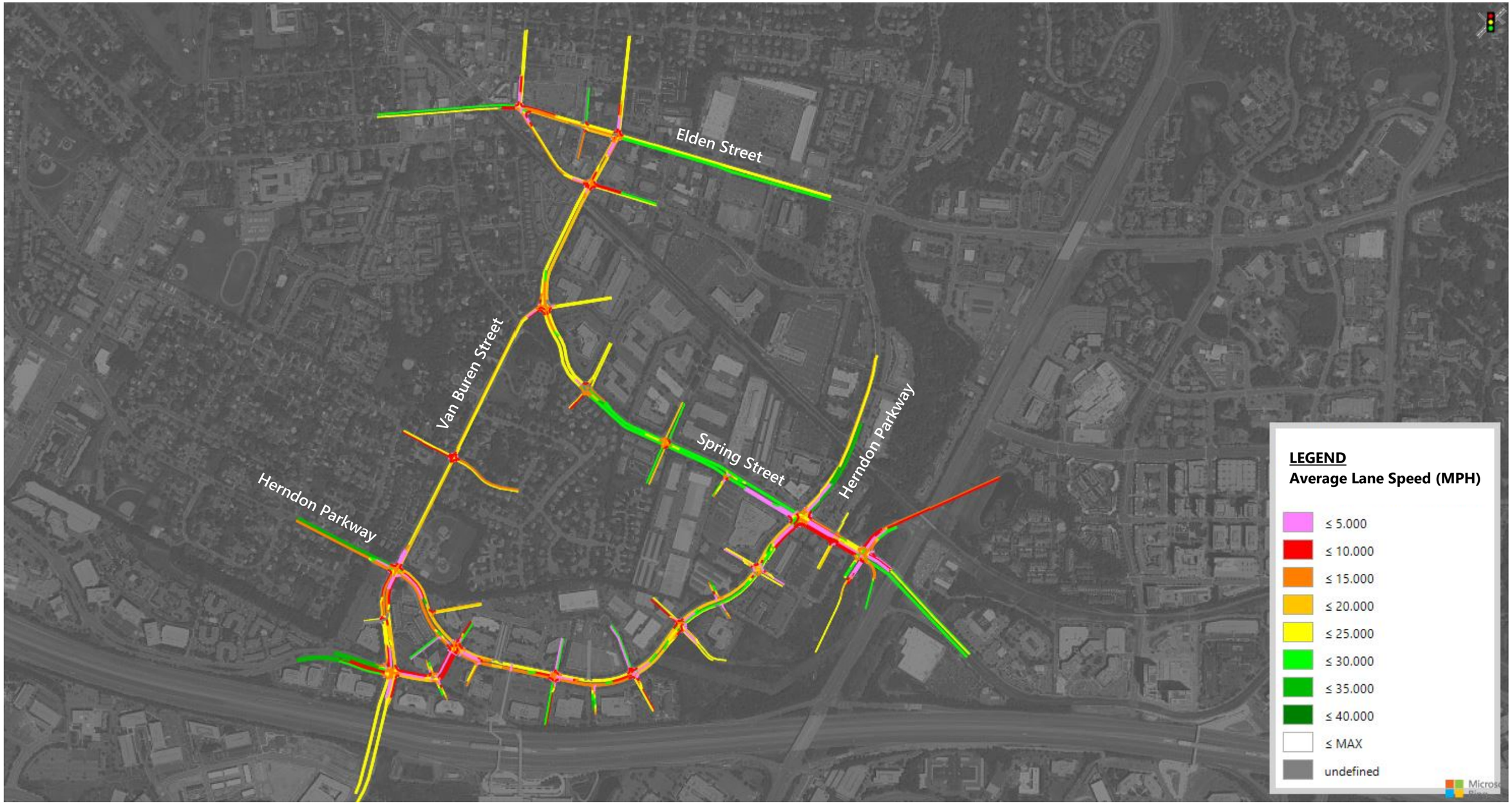
Appendix B documents the delay, LOS, and vehicle queueing for all of the movements at each of the eleven study intersections.

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



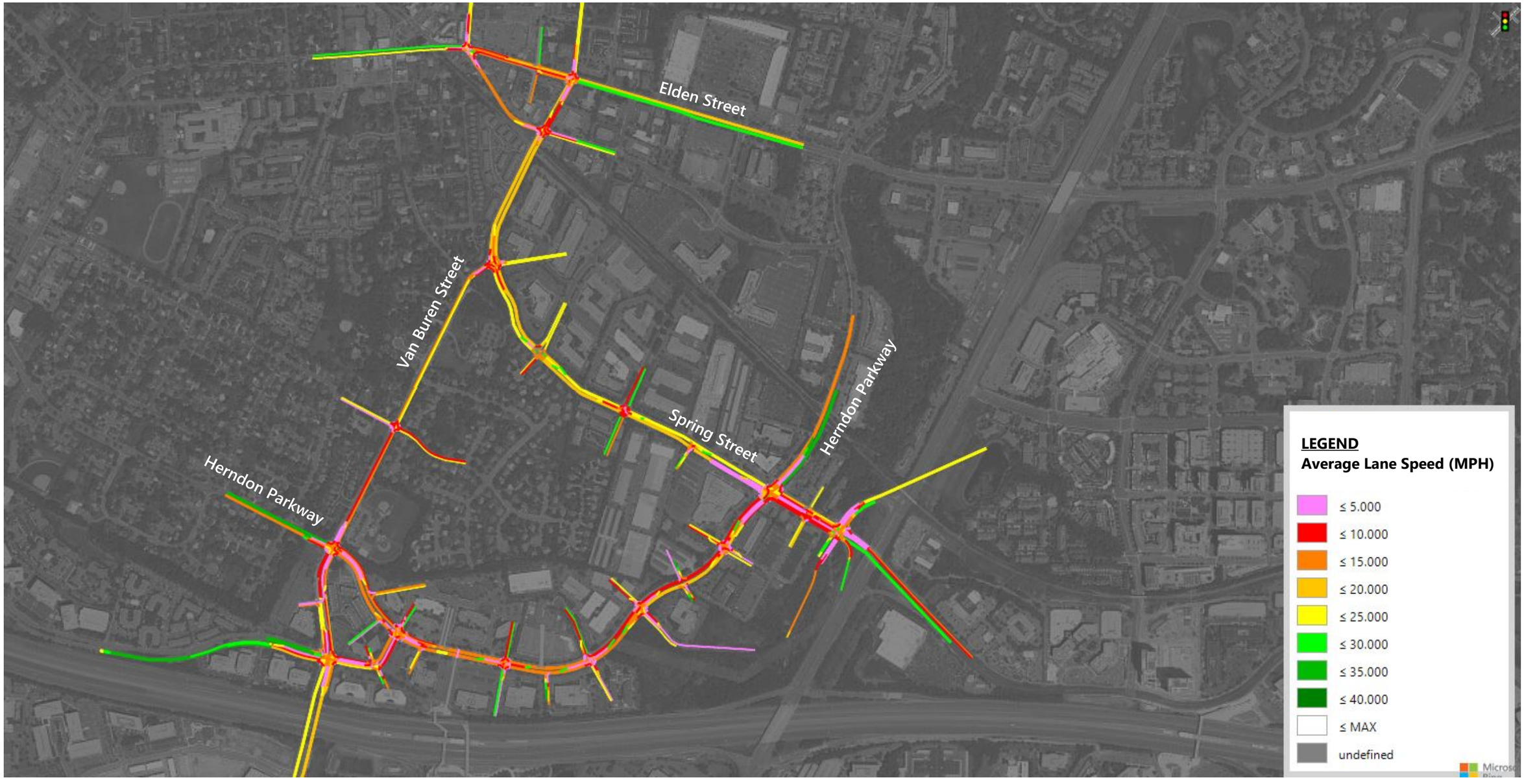
Source: Average of 7 AM Peak Hour and 20 PM Peak Hour VISSIM simulation runs. Aerial imagery from NearMap.

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



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

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



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

4.4 Build 2045 Scenario Three: Metro Center

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

4.4.1 Trip Generation

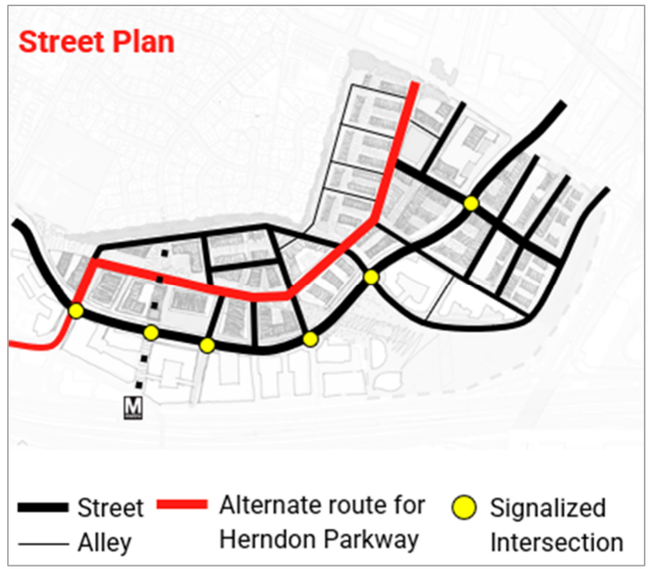
Table 12 documents the trip generation calculations for Build 2045 Scenario Three: Metro Center. Table 9 shows that after the appropriate trip reductions, the new TRG development at full buildout is expected to generate approximately 2,600 AM Peak Hour trips, 2,550 PM Peak Hour trips, and 29,250 weekday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

4.4.2 Transportation Connectivity

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

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

Figure 27 Metro Center Scenario Street Plan



Source: SOM TRG graphics.

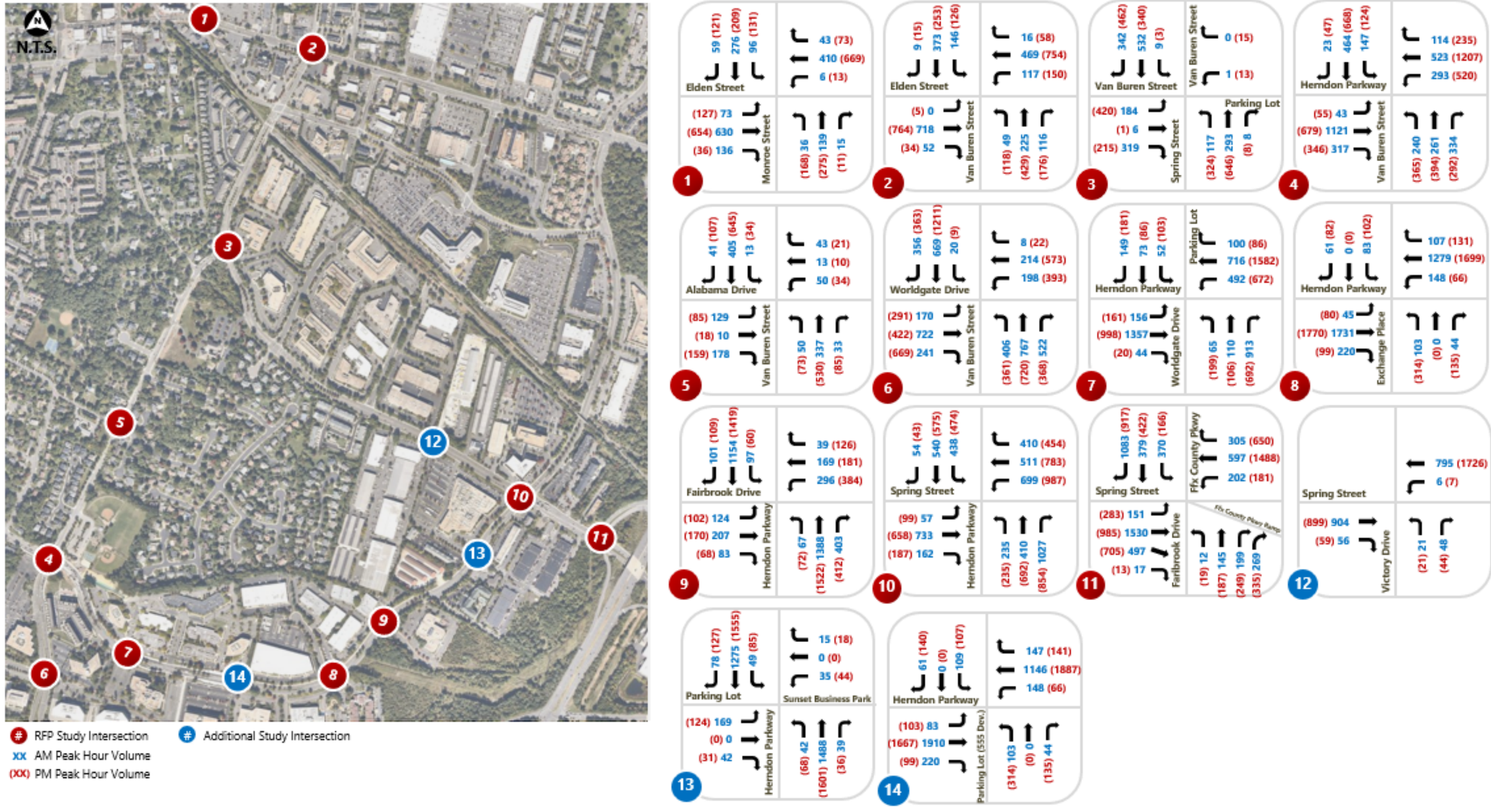
Figure 28 displays the traffic volume dataset that was analyzed at the study intersections in the Build Scenario 3 (Metro Center) 2045traffic model. The TRG traffic volumes were distributed throughout the TRG land area by subdividing the TRG into multiple zones of development density. In Scenario Three,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

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

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

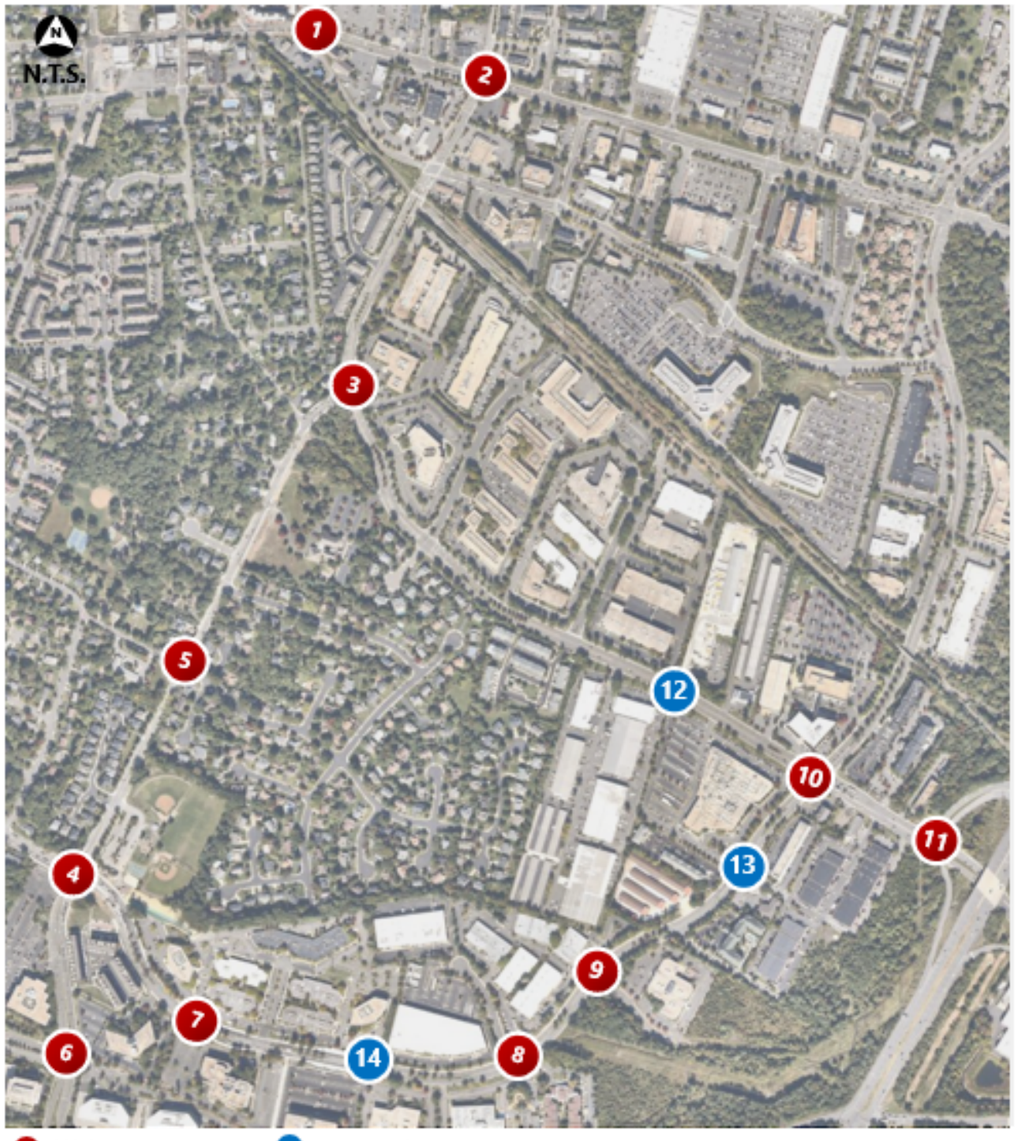
Source: Institute of Transportation Engineer's *Trip Generation Manual, 11th Edition*. Utilized "suburban" trip generation rates as decision was made with Town of Herndon to apply a consistent methodology to prior studies in the TRG, which utilized suburban base trip generation and then applied significant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

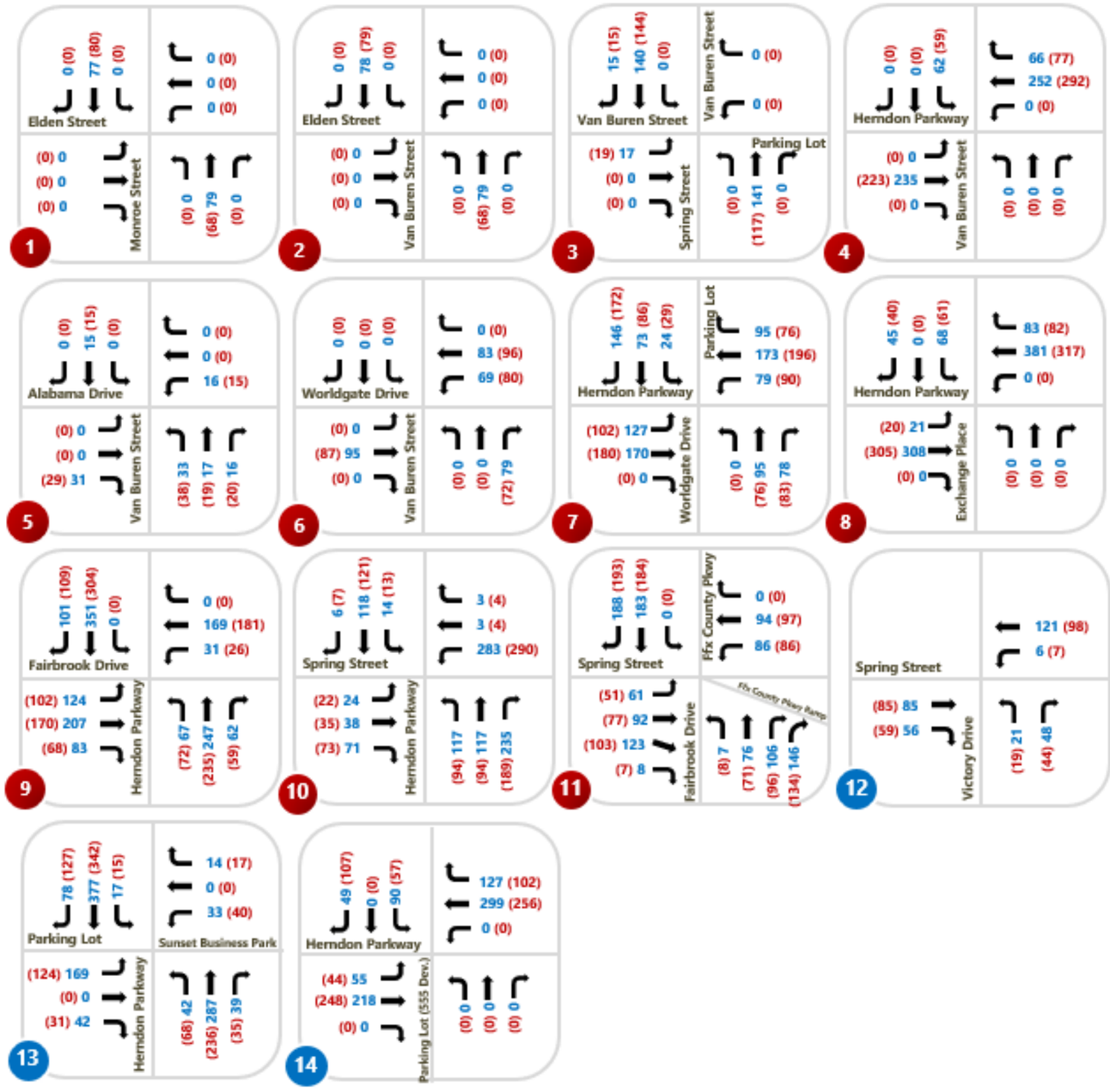
Figure 28 Build Scenario 3 (Metro Center) 2045 Traffic Volumes



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

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

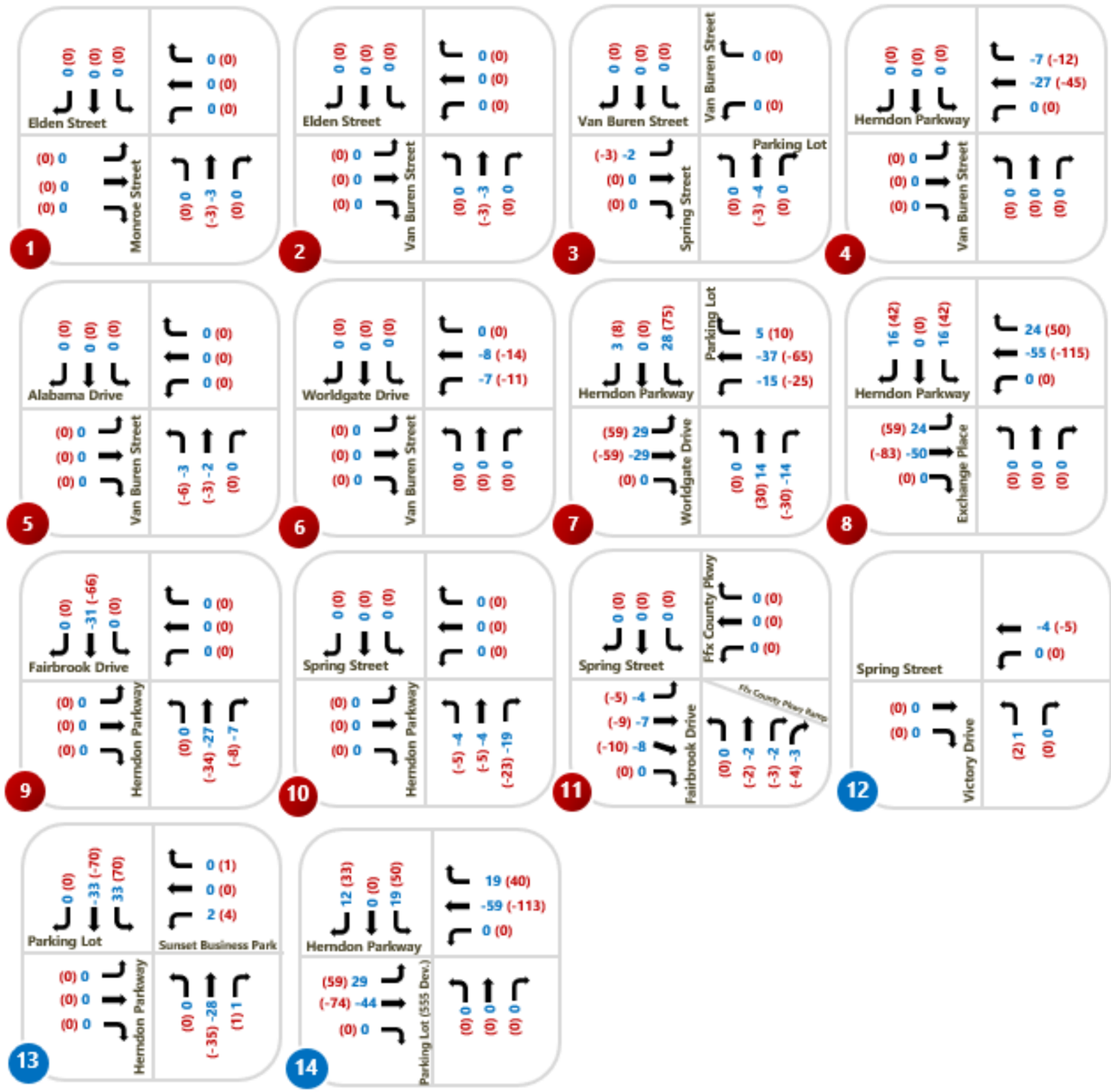




Basemap Source: Nearmap

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





Basemap Source: Nearmap

4.4.3 Traffic Analysis

In Build 2045 Scenario Three conditions, traffic levels are anticipated to be stressed at a few locations – resulting in several "violations" of the Town's LOS standard. **Table 13** lists the intersection delay and LOS at each of the eleven study intersections, comparing No Build 2045 to Build Scenario Three. Projected intersection LOS is also shown in **Figure 31**. All study intersections are projected to operate at LOS D or better in both peak hours, except for the Spring Street / Herndon Parkway intersection, which is anticipated to operate at LOS E in both peak hours. While LOS E does represent increased delay, modeling results indicate that the roadway network can accommodate the increased demand based on the progression of traffic. Many intersections in the Northern Virginia area operate at this condition during a peak hour and Fairfax County has adopted an LOS E intersection standard in several of its urban development areas.

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

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

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

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

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

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

Table 14 Build Scenario 3 "LOS F" Turning Movements

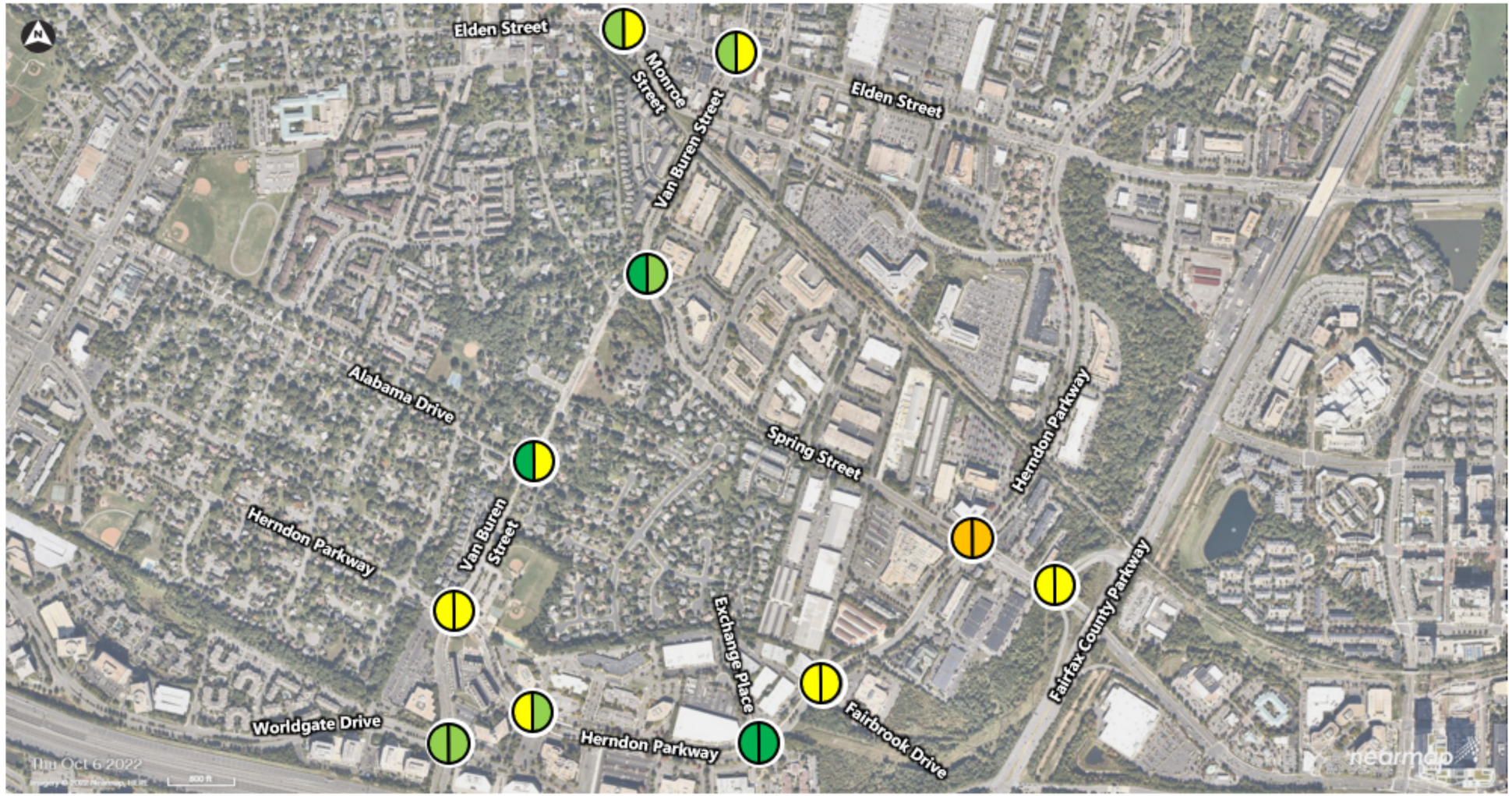
Turning Movement	Peak	LOS F in No Build?	Source of Congestion
Herndon Pkwy / Spring Street			
Eastbound Left	AM/PM	No	*Heavy Demand*
Eastbound Thru/Right	PM	No	
Spring St / Fairfax County Parkway Ramps / Fairbrook Dr			
Eastbound Left	PM	No	*Heavy Demand, "Interim" Intersection Modifications*
Westbound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

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

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

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

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



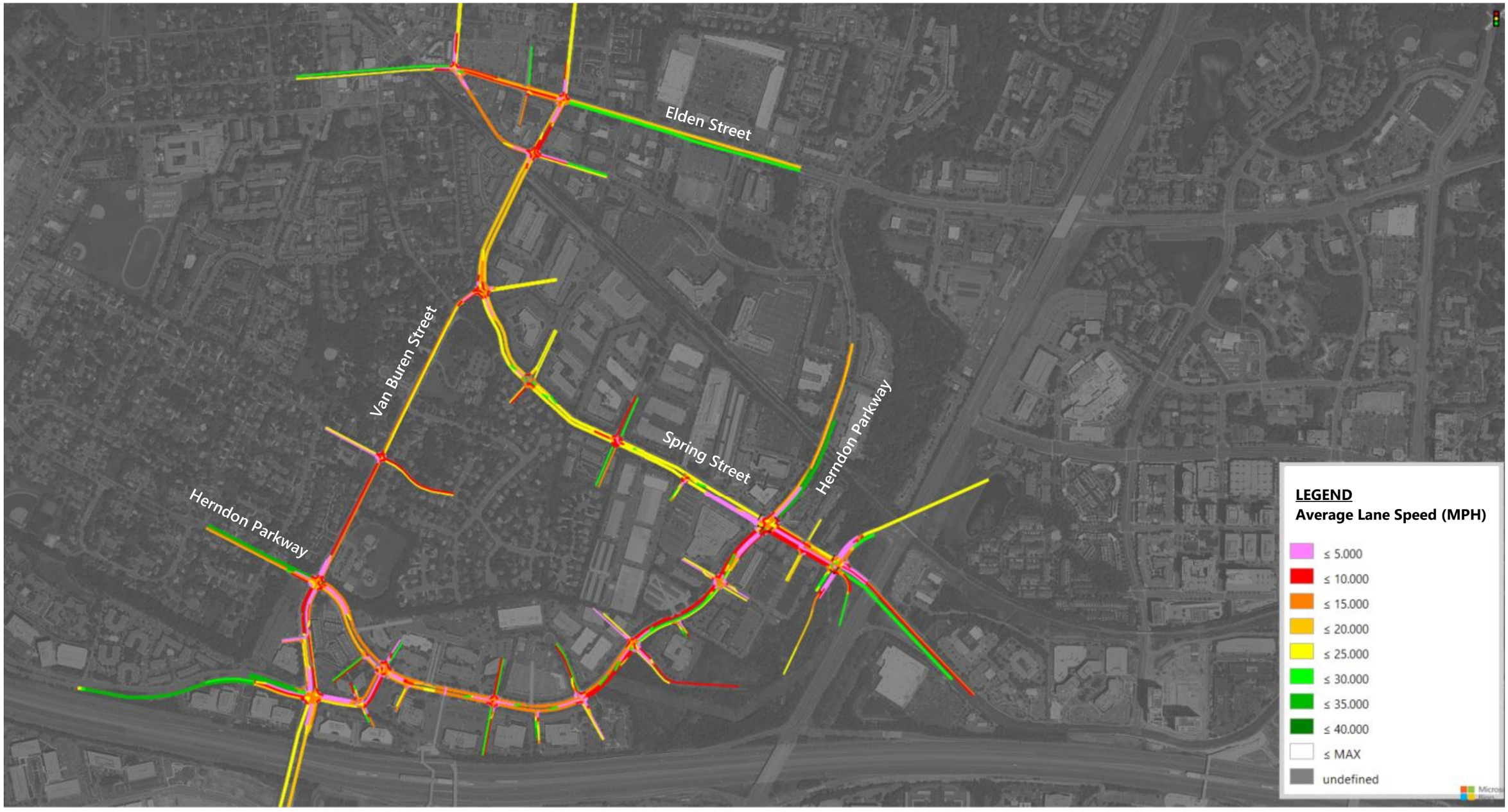
Source: Average of 7 AM Peak Hour and 20 PM Peak Hour VISSIM simulation runs. Aerial imagery from NearMap.

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



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

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



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

4.5 Comparison of Three Build Scenarios

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

4.5.1 Development Characteristics and Connectivity

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

Table 15 Comparison of Build Scenarios

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

4.5.2 Traffic Volumes

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

Table 16 Comparison of Build Scenario Trip Generation

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

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

4.5.3 Traffic Impacts

In all three Build scenarios, the Spring Street / Fairfax County Parkway / Fairbrook Drive intersection experiences increased congestion levels due to the expanded intersection design, not necessarily the new TRG traffic volume. The Neighborhood Clusters Scenario has the least relative traffic impact compared to No Build 2045 conditions, followed by the Metro Center Scenario and then the Two Centers Scenario, which has the most traffic impact. The Two Centers Scenario experiences over-capacity conditions on Herndon Parkway during the PM peak hour. **Table 17** documents the relative traffic impact of each Build scenario in comparison to No Build 2045 conditions. As noted, all three Build scenarios contain LOS E in both peak hours at the Spring Street / Herndon Parkway intersection, which is a violation of the Town's existing LOS standard of LOS D or better. While the PM peak also operates at LOS E in the No Build scenario, the AM peak operating at LOS E is new in the Build scenarios, albeit the actual delay increases that trigger the LOS change are only approximately five seconds. Despite the violation of the existing Town LOS standard, the traffic operations are manageable in an urban condition, particularly when accompanied by transportation mitigation measures that are documented later in this report.

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

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

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

5

Preferred Build 2045 Scenario with Fairbrook Drive Extension: Traffic Conditions

This section of the report documents the assumptions and findings for the traffic analysis of the Preferred Build 2045 Scenario with Fairbrook Drive extension. These results are compared to No Build 2045 conditions to conclude that multiple intersections do not meet the Town's LOS standard; however, modeling results indicate that the roadway network can accommodate the increased demand based on the progression of traffic.

5.1 Preferred Build 2045 Scenario Model Assumptions

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

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

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

5.2 Preferred Build 2045 Scenario

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

5.2.1 Trip Generation

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

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

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

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

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

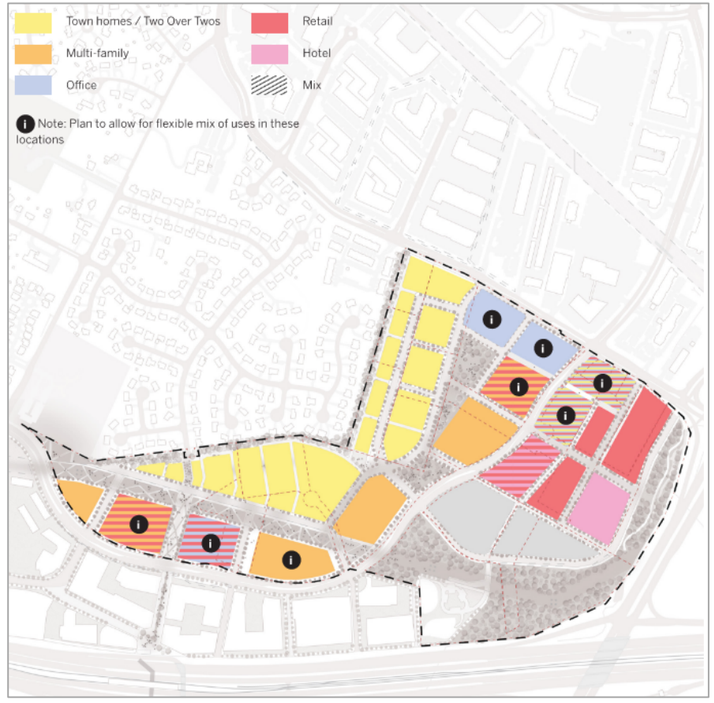
5.2.2 Transportation Connectivity

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

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

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

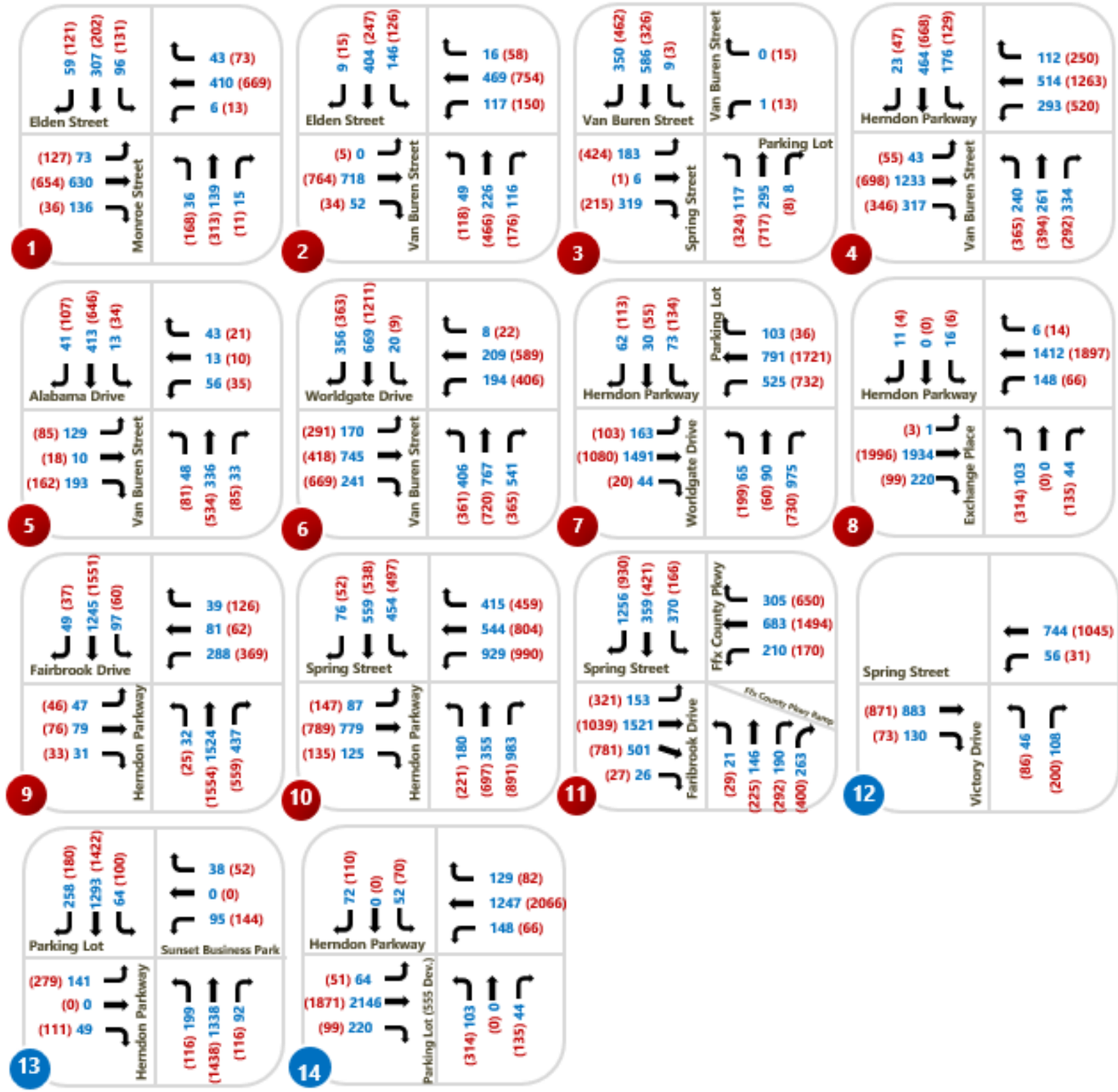
Figure 34 Preferred Scenario Development Plan



Source: SOM TRG graphics.

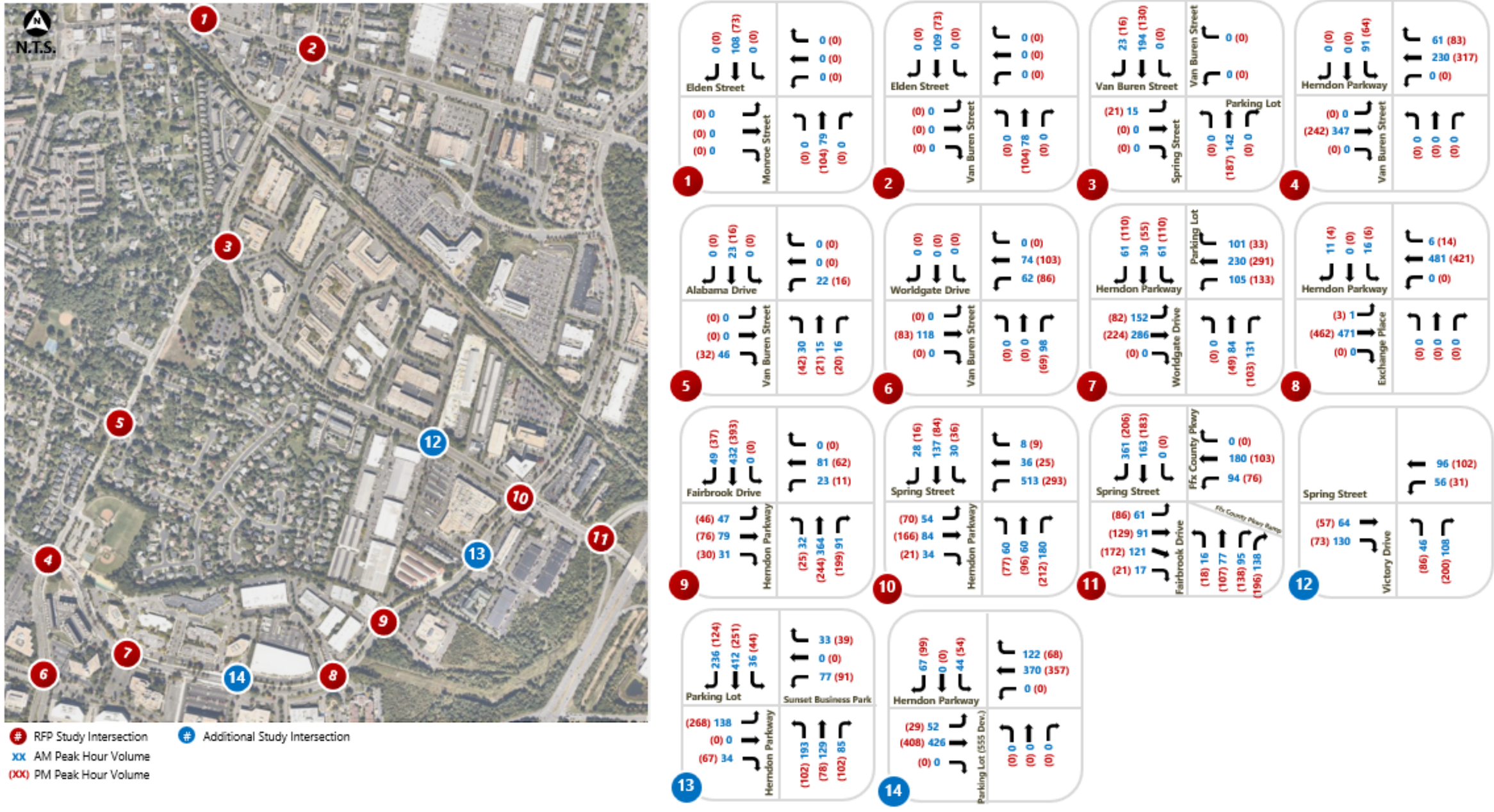
Figure 35 Preferred Build Scenario 2045 Traffic Volumes





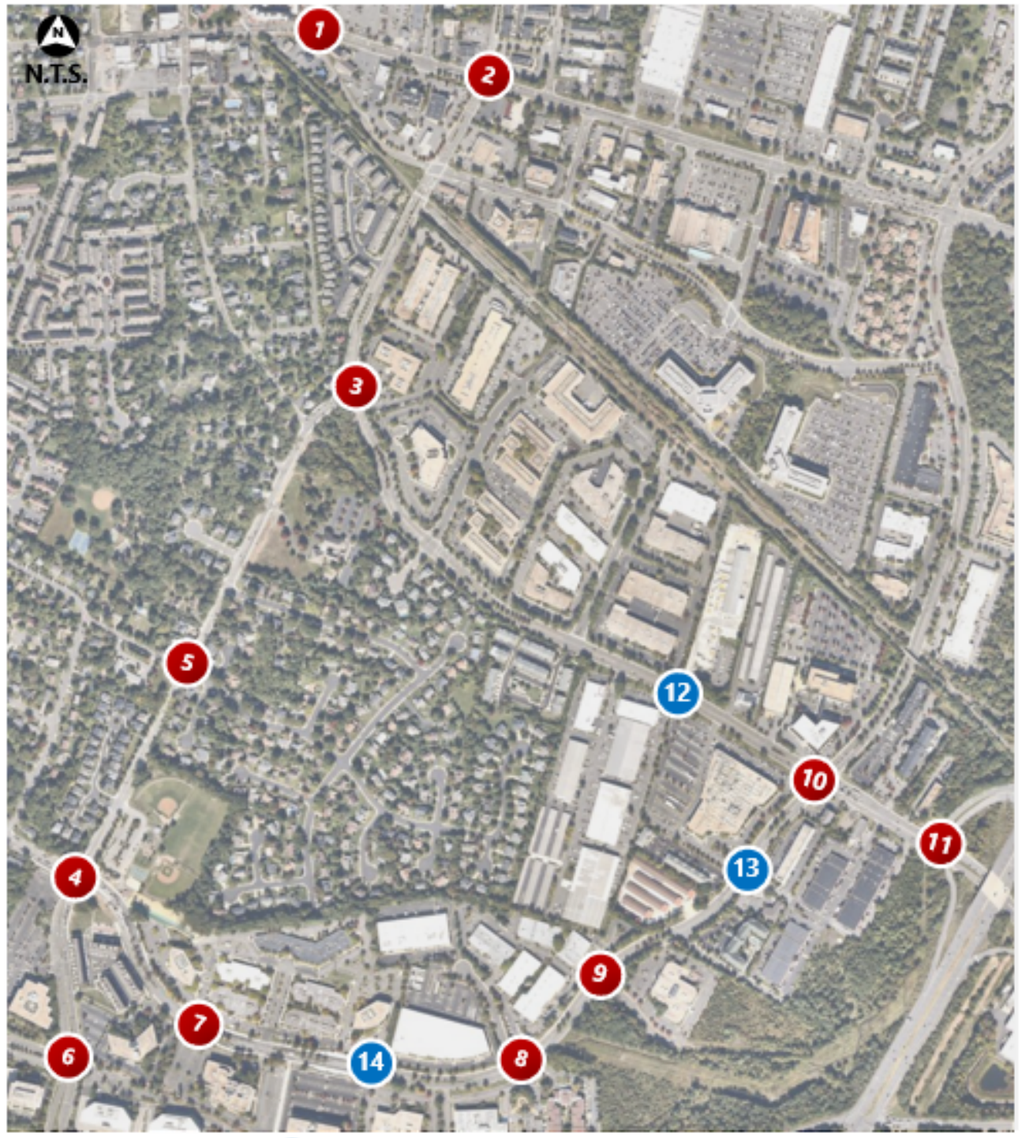
Build 2045 traffic volumes include No Build 2045 traffic volumes (Figure 6), removal of existing TRG area traffic volumes, volume shift to account for the Fairbrook Drive extension, and new TRG development traffic volumes. Basemap Source: Nearmap

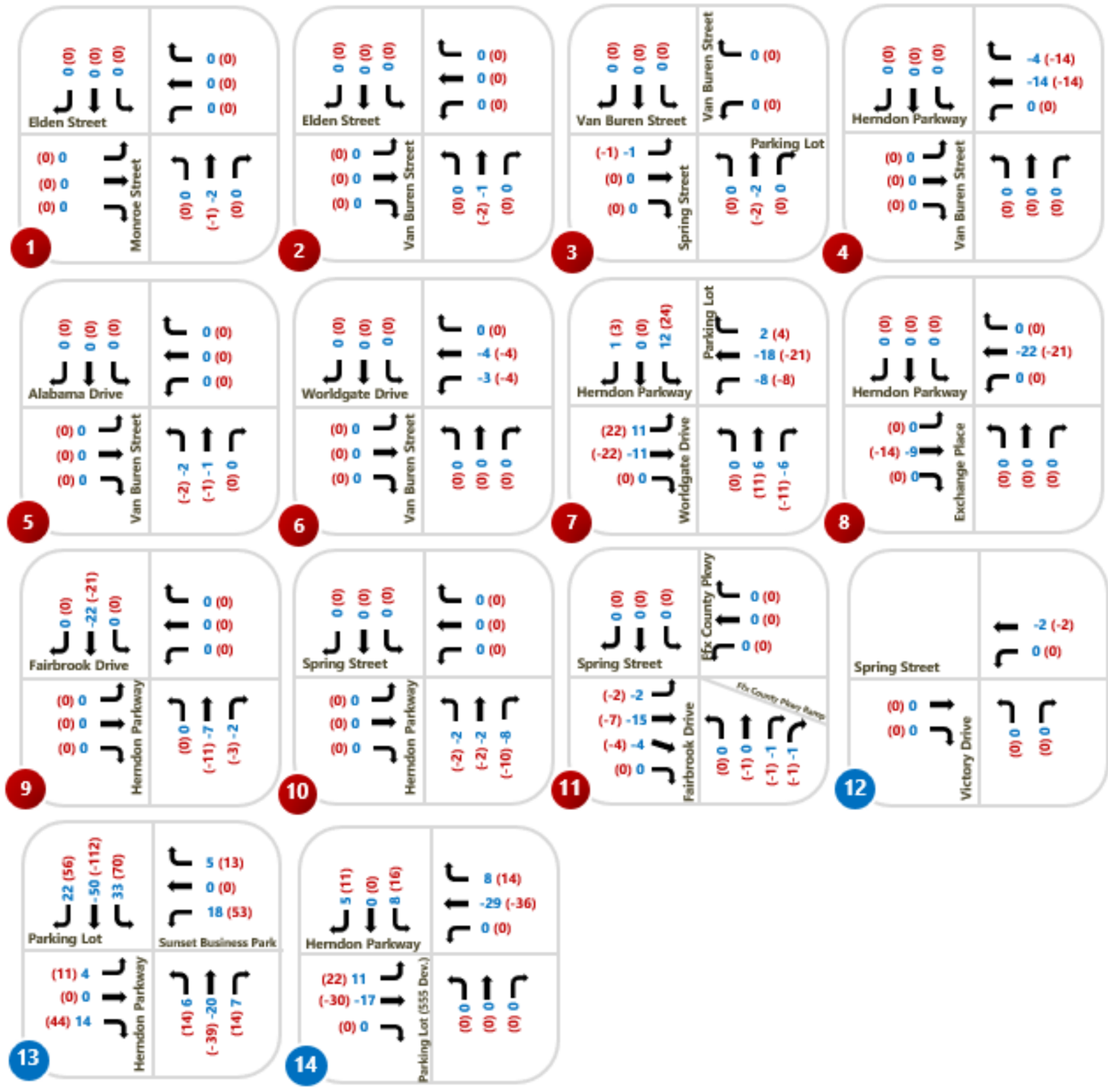
Figure 36 Preferred Build Scenario New Site Trips



Basemap Source: Nearmap

Figure 37 Preferred Build Scenario Site Pass-By Trips





Basemap Source: Nearmap

5.2.3 Traffic Analysis

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

All study intersections are projected to operate at LOS D or better in both peak hours, except for the Spring Street / Herndon Parkway intersection, which is anticipated to operate at LOS E in both peak hours. While LOS E does represent increased delay, modeling results indicate that the roadway network can accommodate the increased demand based on traffic progression. Many intersections in the Northern Virginia area operate at this condition during a peak hour and Fairfax County has adopted an LOS E intersection standard in several of its urban development areas.

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

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

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

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

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

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

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

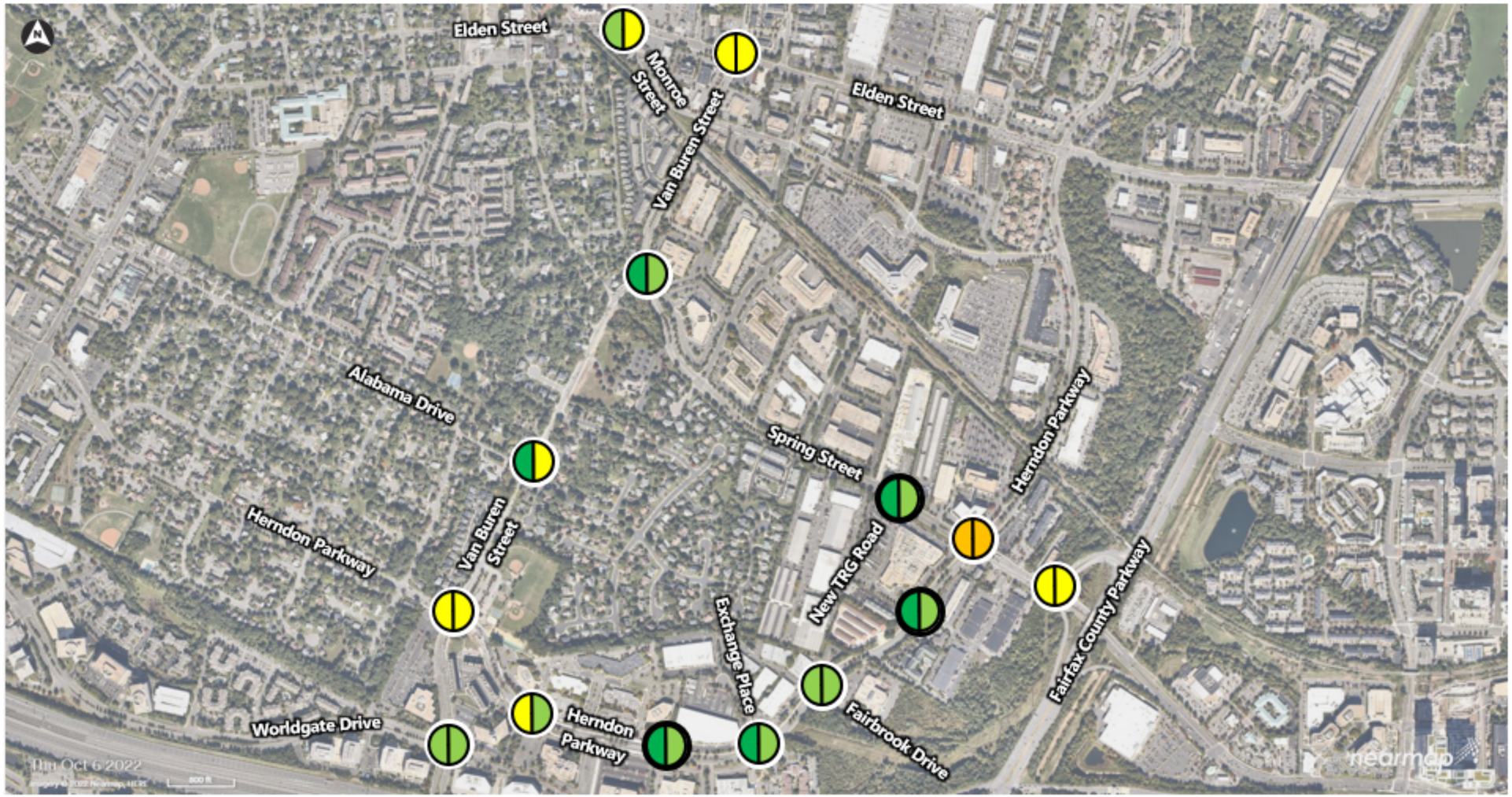
Table 20 Preferred Build "LOS F" Turning Movements

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

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

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

Figure 38 Preferred Build Scenario 2045 Intersection Level of Service



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

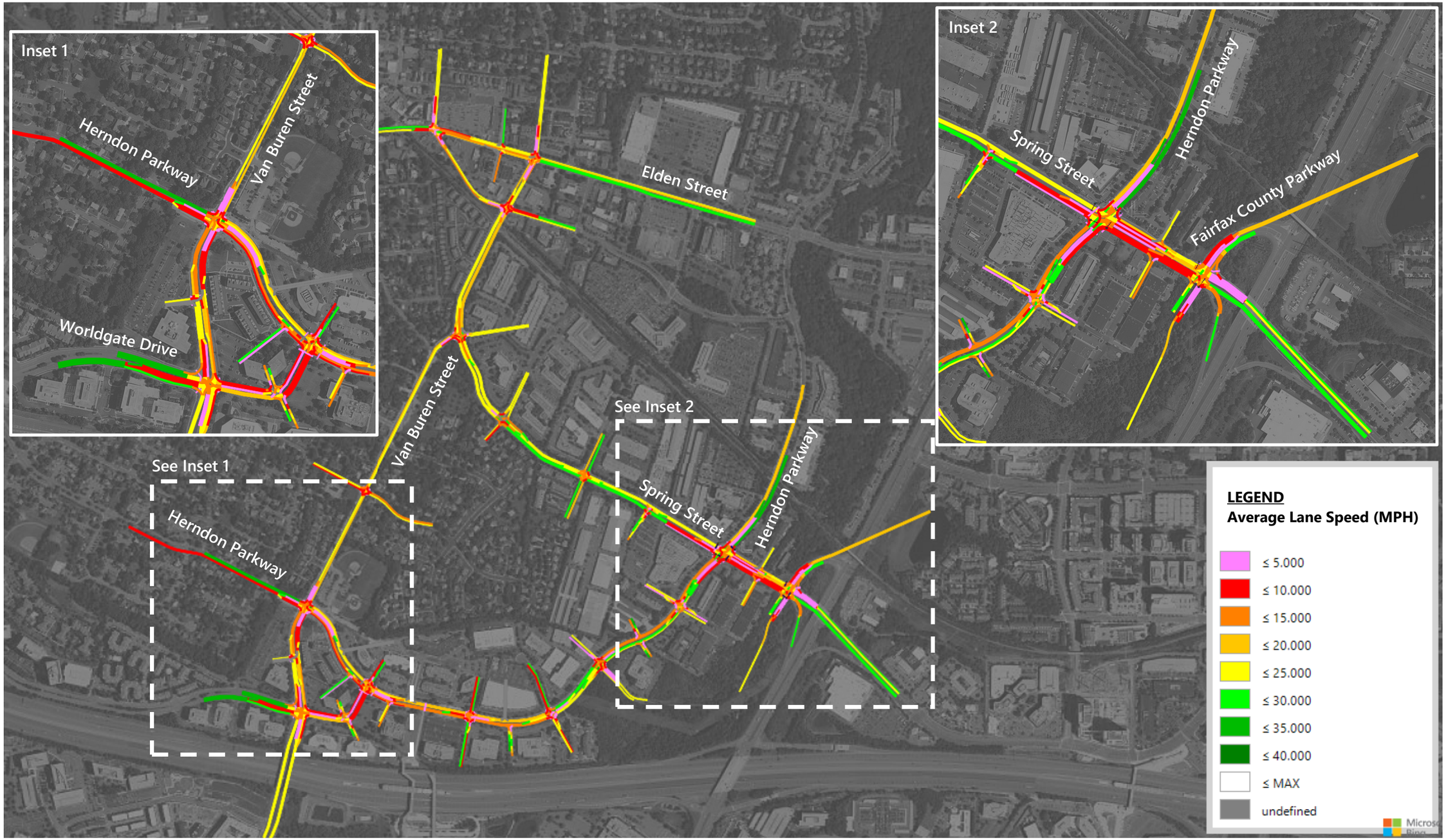
LOS E

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.

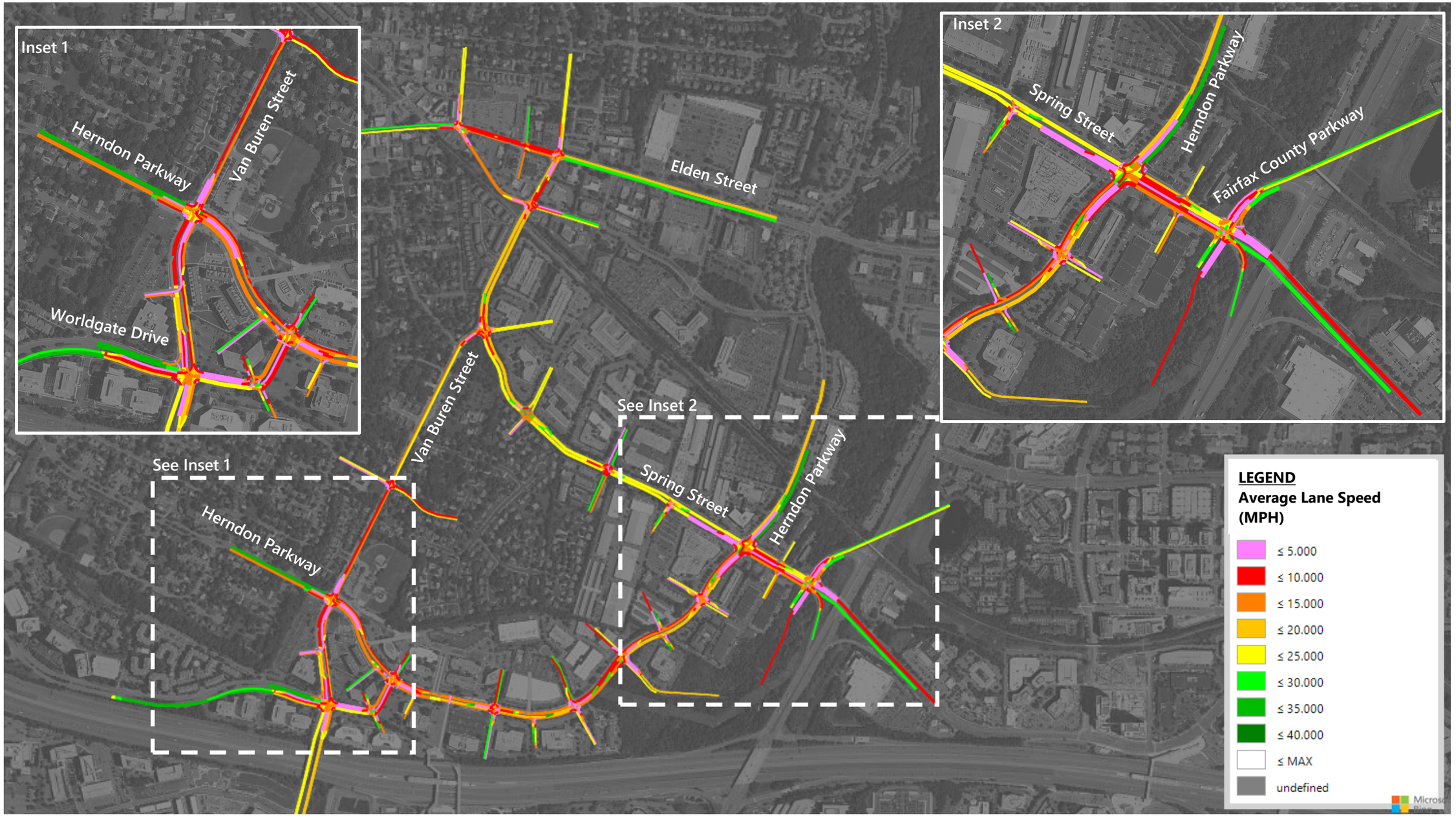
Source: Average of 7 AM Peak Hour and 20 PM Peak Hour VISSIM simulation runs. Aerial imagery from NearMap.

Figure 39 Preferred Build Scenario 2045 Congestion Heat Map – AM Peak Hour



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

Figure 40 Preferred Build Scenario 2045 Congestion Heat Map – PM Peak Hour



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

Projected average and maximum queue lengths for the Preferred Build Scenario are displayed in **Figures 41 and 42**. An important note regarding the maximum queue lengths is that each roadway segment's maximum queue length most likely does not temporally align (i.e., occur at the same time). Rather, this figure shows the maximum queue length on each segment of roadway during the peak hour. The accommodation of maximum queue lengths is also not the typical design objective as they are an indication of the absolute worst impact during the peak hour.

In the AM peak hour, average queue lengths are accommodated throughout the study network, including the Fairfax County Parkway off-ramp queue that is contained within the off-ramp. The maximum AM peak hour queue lengths are accommodated with a few exceptions – specifically eastbound Herndon Parkway (west of Fairbrook Drive) and the Spring Street segment at Herndon Parkway and Fairfax County Parkway. The maximum queue is projected to extend onto Fairfax County Parkway; albeit the exact extents are unknown as the traffic signal on Fairfax County Parkway was not modeled as part of this study.

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

These findings are fairly similar to the No Build 2045 findings; the additional TRG traffic volume impacts are largely offset by the Fairbrook Drive extension and new traffic signal at Sunset Business Park.

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

5.2.4 Potential Transportation Mitigation

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

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

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

The Project Team used macroscopic traffic tools to conduct initial screenings of a wide range of infrastructure improvements, an exercise that helped identify a set of candidate mitigations to be further modeled in VISSIM.

Table 21 lists the mitigations that were modeled VISSIM; the results of this traffic modeling are documented in the next chapter of this technical report.

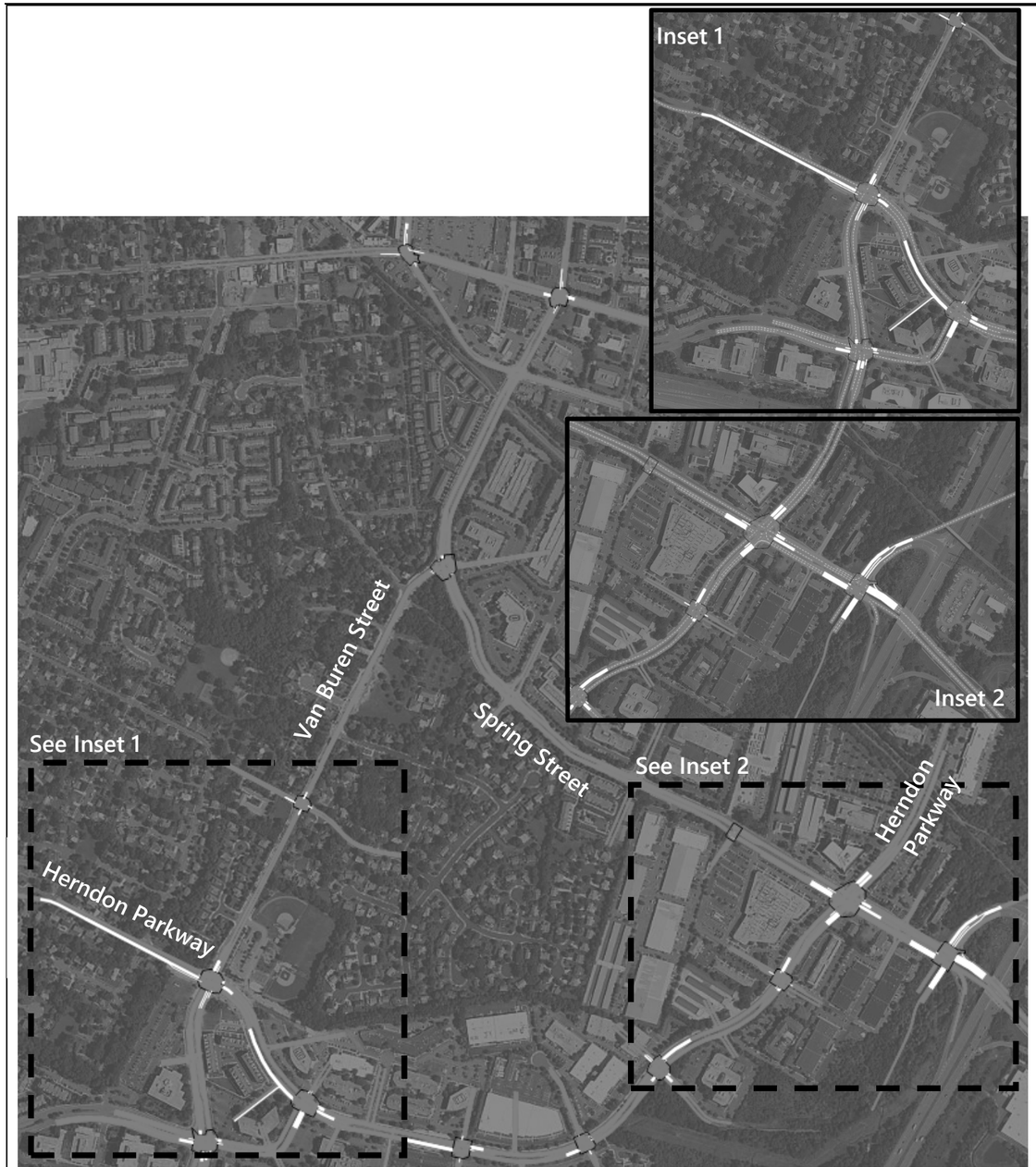
The Preferred Build traffic analysis included baseline assumptions on vehicle trips. The Town of Herndon may consider additional potential mitigation measures to reduce the amount of volume on the roadway network. Those measures could include the following:

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

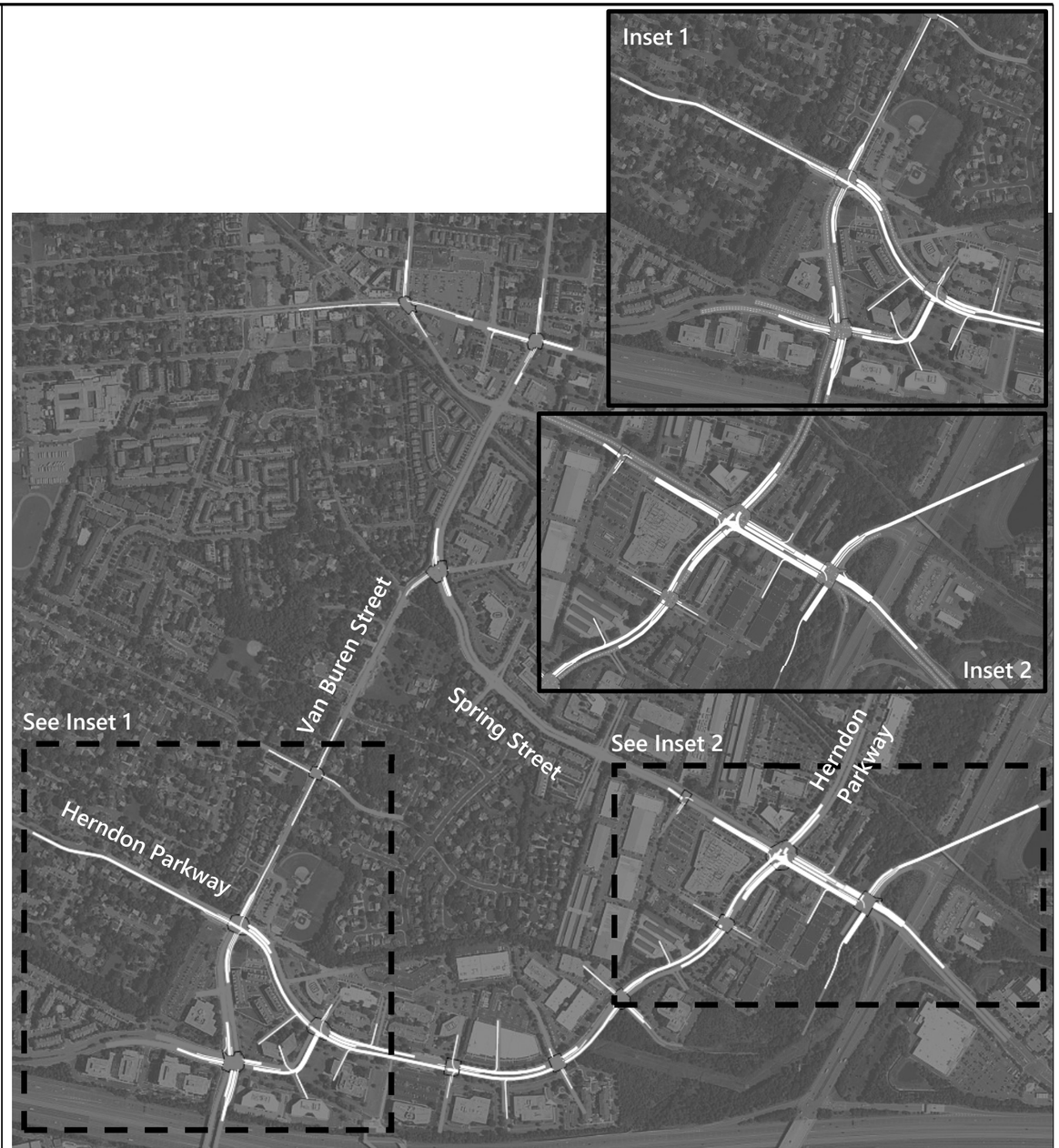
Table 21 Candidate Mitigations to be Tested in VISSIM

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

Figure 41 Preferred Build Scenario 2045 Queue Map – AM Peak Hour

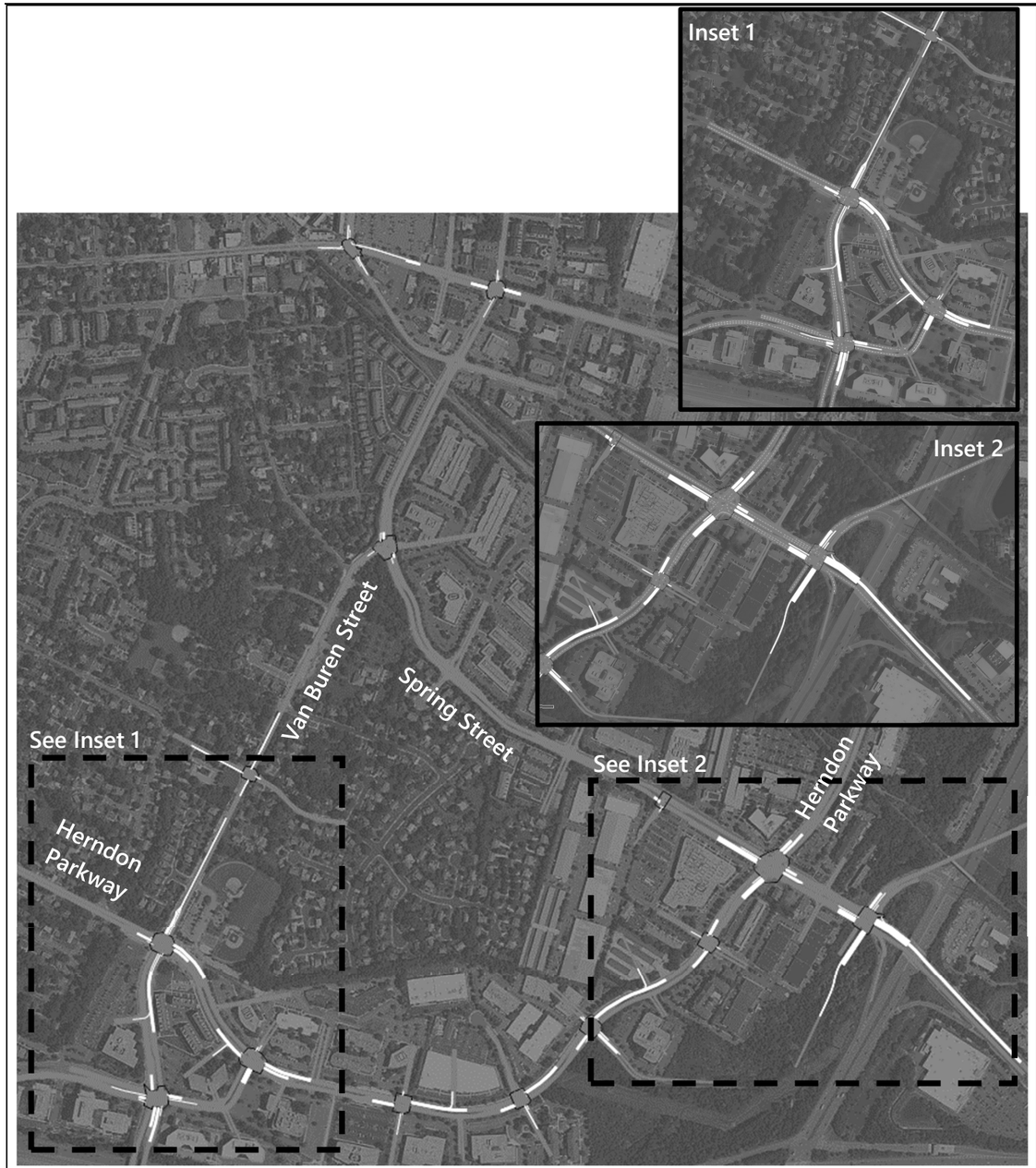


Average Queue Length

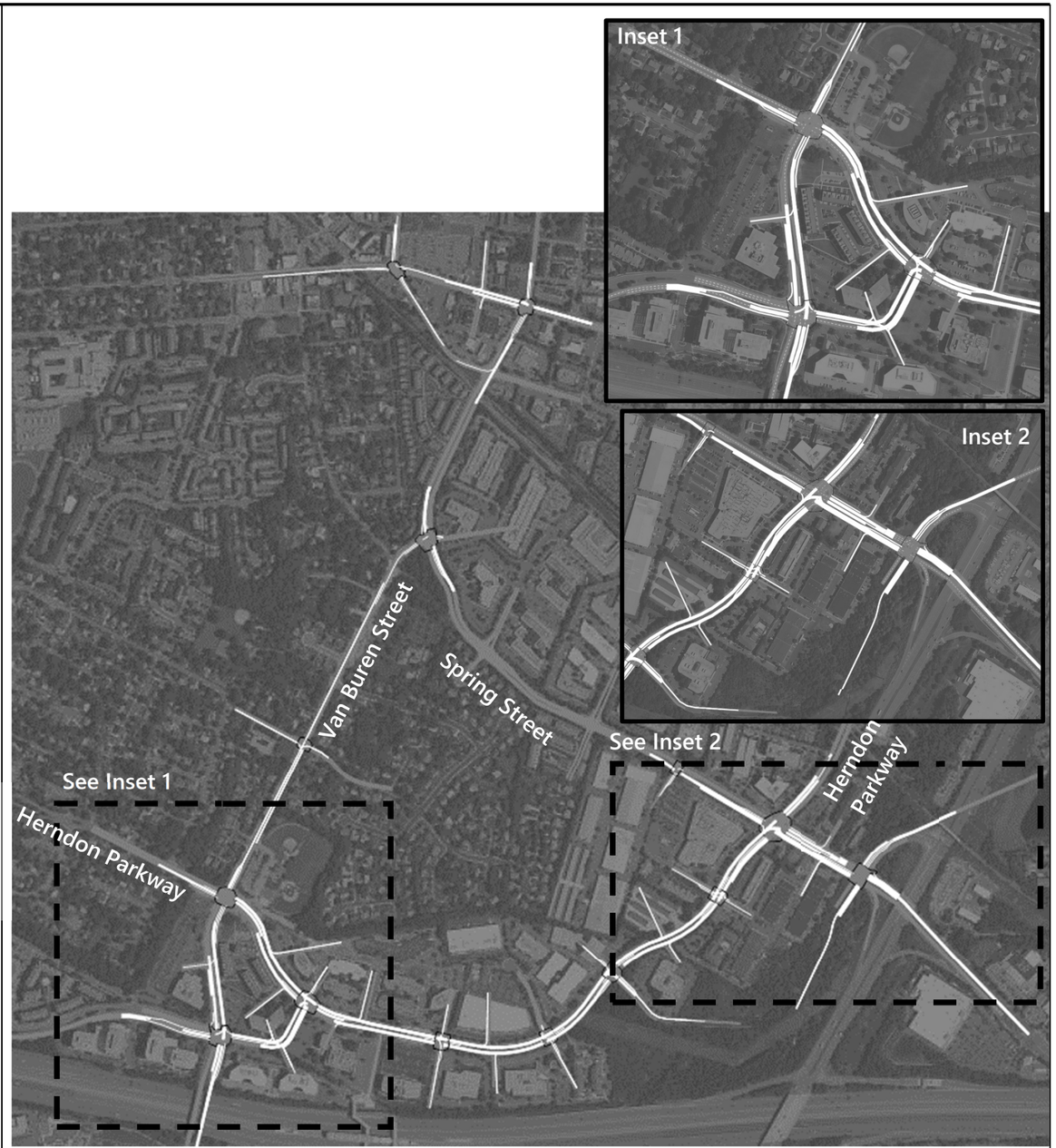


Maximum Queue Length

Figure 42 Preferred Build Scenario 2045 Queue Map – PM Peak Hour



Average Queue Length



Maximum Queue Length

6

Preferred Build 2045 Scenario with Fairbrook Drive Extension and Additional Transportation Mitigation Measures: Traffic Conditions

This section of the report documents the assumptions and findings for the traffic analysis of the Preferred Build 2045 Scenario with Fairbrook Drive extension and additional transportation mitigation measures. The traffic levels of this scenario are compared to the Preferred Build 2045 Scenario without additional transportation mitigation to assess which mitigation is recommended for implementation.

6.1 Mitigation Roadway Network

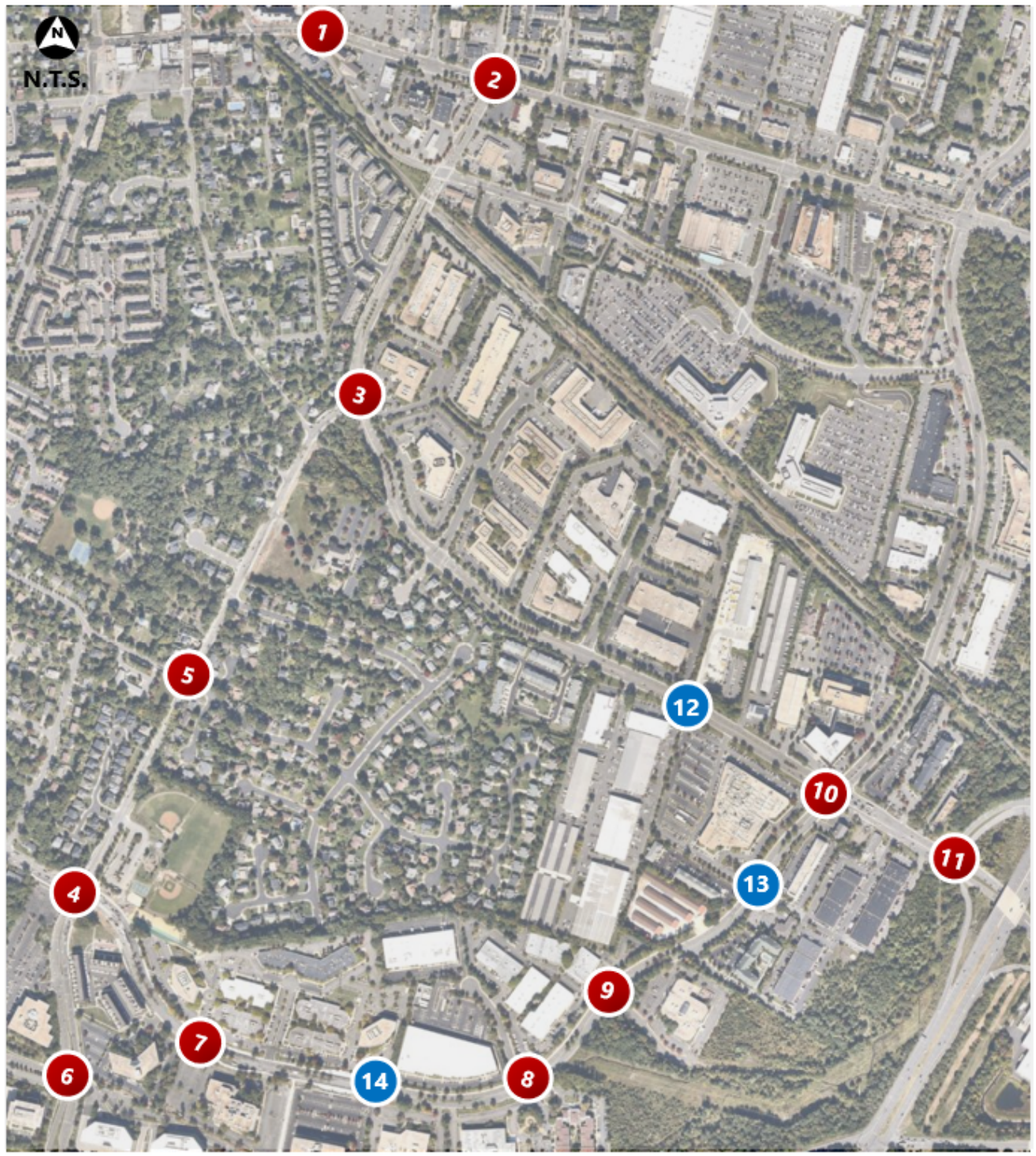
As documented in Table 21, a set of transportation infrastructure mitigation was identified via a screening process. These elements were modeled in VISSIM to assess their impact on traffic conditions. The specific elements modeled include:

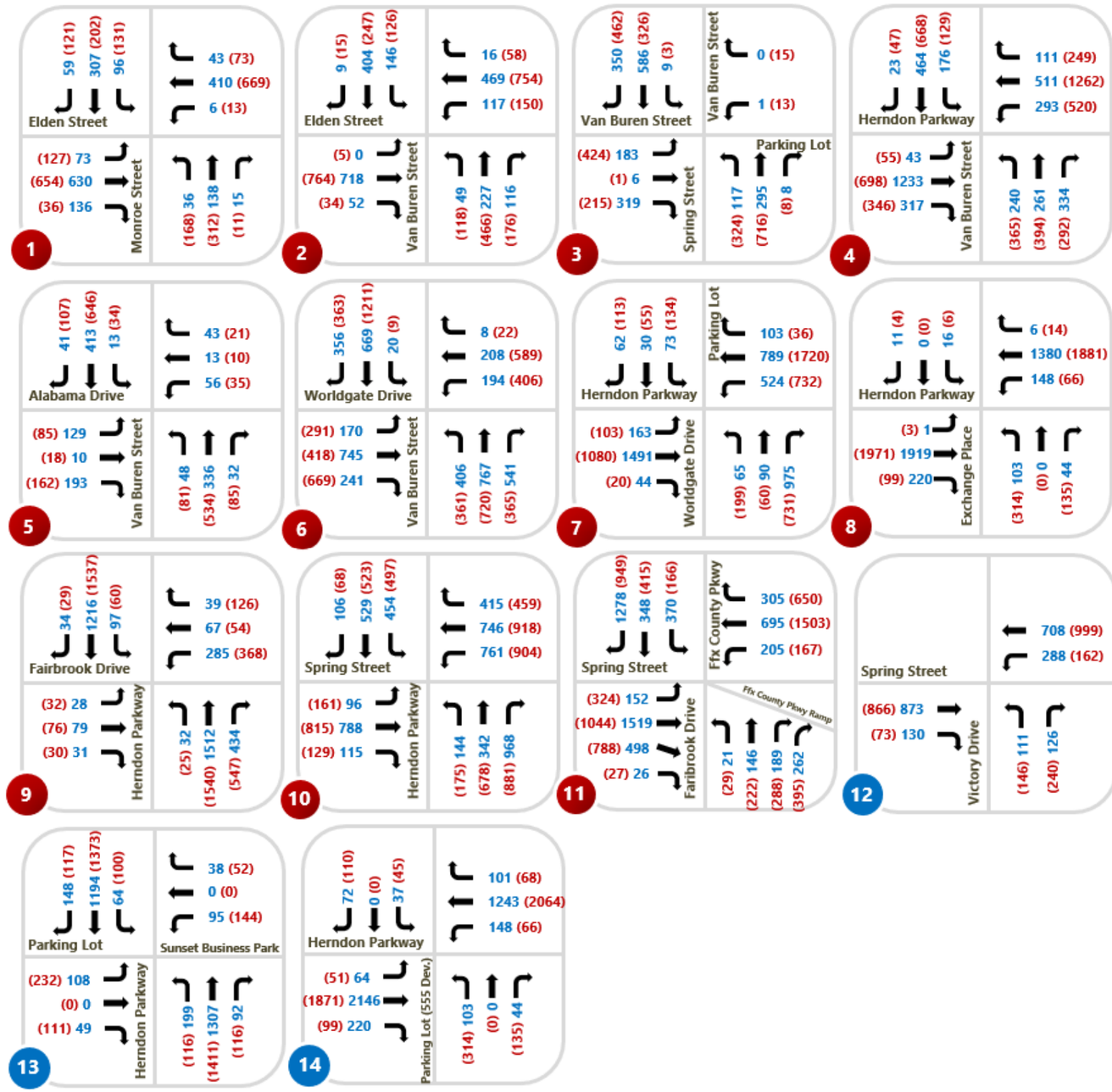
- Van Buren Street / Herndon Parkway intersection
  - Widening of southbound Van Buren Street to extend dual thru lanes to Senate Court.
  - Widening of northbound Van Buren Street to accommodate a second left turn lane of approximately 175 foot of storage length.
- Spring Street / New TRG Road
  - New traffic signal control.
  - Extension of westbound left turn storage to 200 feet.
- Spring Street / Herndon Parkway
  - Widening into median to add a second eastbound left turn lane of same storage length as existing turn lane.
- Spring Street / Fairfax County Parkway Ramps / Fairbrook Drive
  - Widening into median to add a second westbound left turn lane of same storage length as existing turn lane.
  - Widen Parkway offramp to add a second left turn lane.
  - Widen northbound Fairbrook Drive to add a standalone left turn storage lane.

6.2 Traffic Volumes

Figure 43 displays the traffic volume dataset that was analyzed at the study intersections in the Preferred Build with Transportation Mitigation 2045 traffic model. The only difference between this volume dataset and the Preferred Build without Mitigation is the rerouting of additional traffic volume onto the new TRG road. This volume inducement comes from the new traffic signal that is included as a transportation mitigation measure. This signal entices traffic to utilize the new TRG road rather than Herndon Parkway. **Figure 44** displays just the new site trips associated with the Preferred Build Scenario, while **Figure 45** displays just the pass-by site trips associated with the Preferred Build Scenario. **Appendix A** shows these three sets of traffic volumes for all intersections within the traffic model, including non-study intersections.

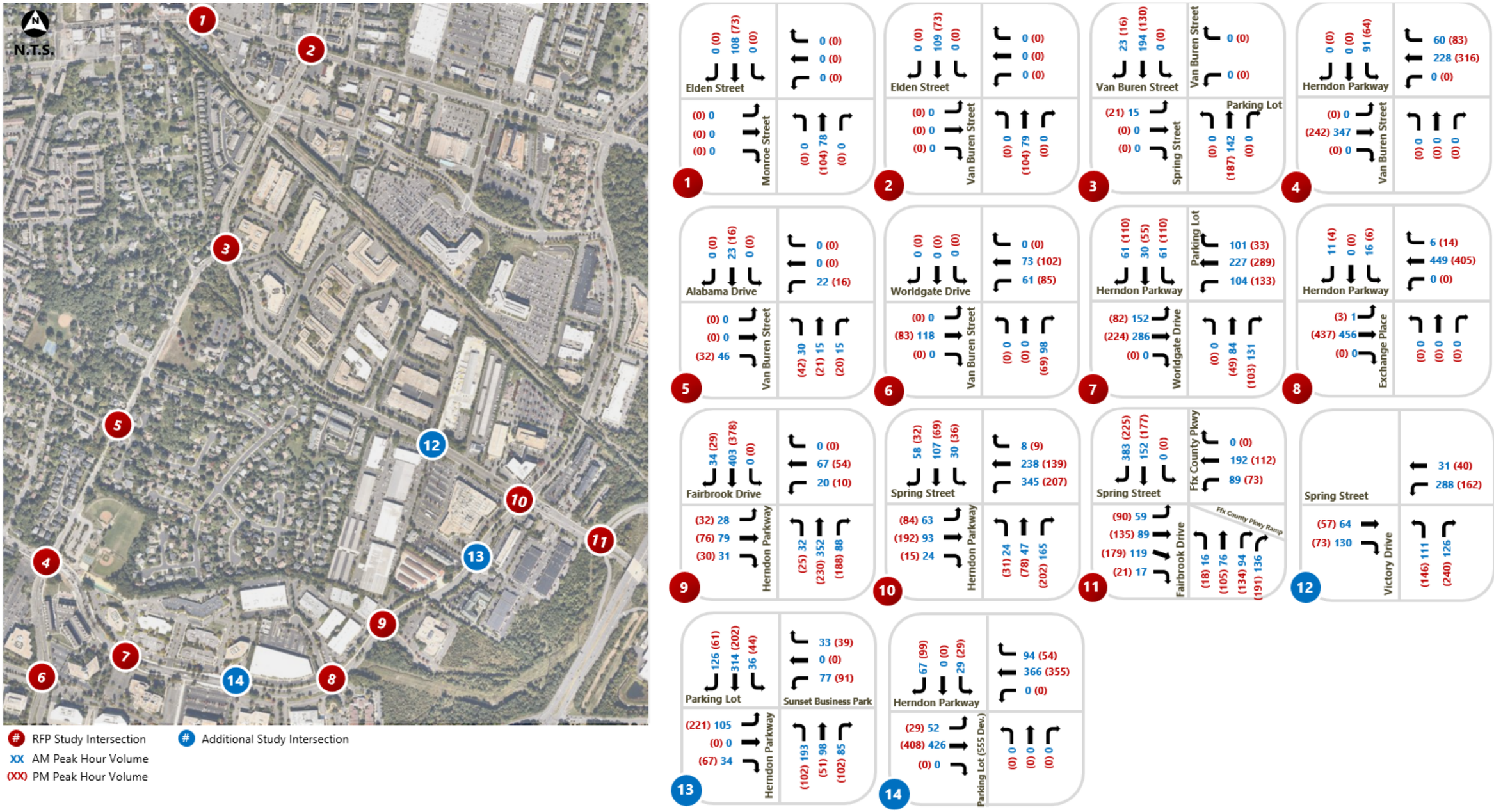
Figure 43 Preferred Build Scenario with Mitigation 2045 Traffic Volumes





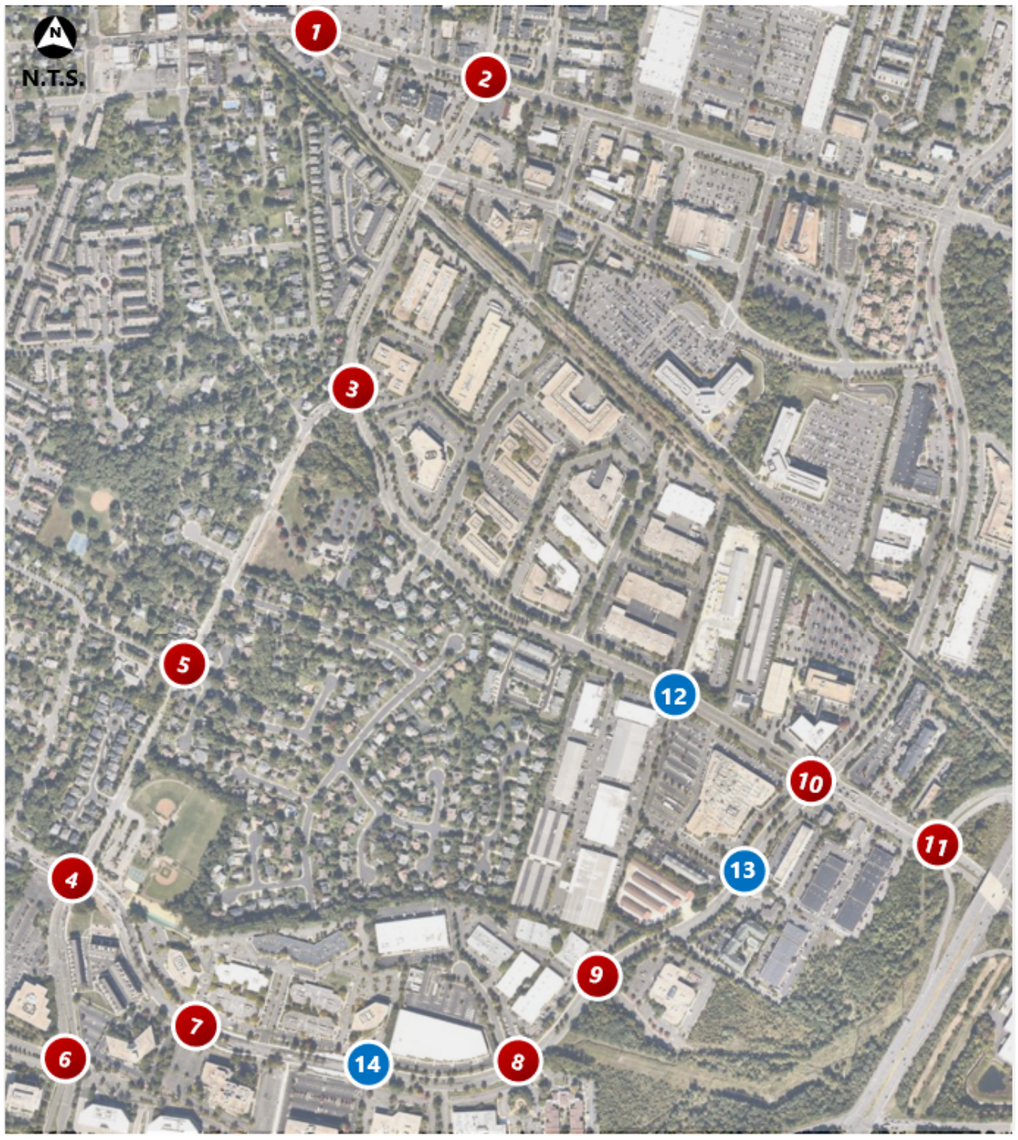
Build 2045 traffic volumes include No Build 2045 traffic volumes (Figure 6), removal of existing TRG area traffic volumes, volume shift to account for the Fairbrook Drive extension, and new TRG development traffic volumes. Basemap Source: Nearmap

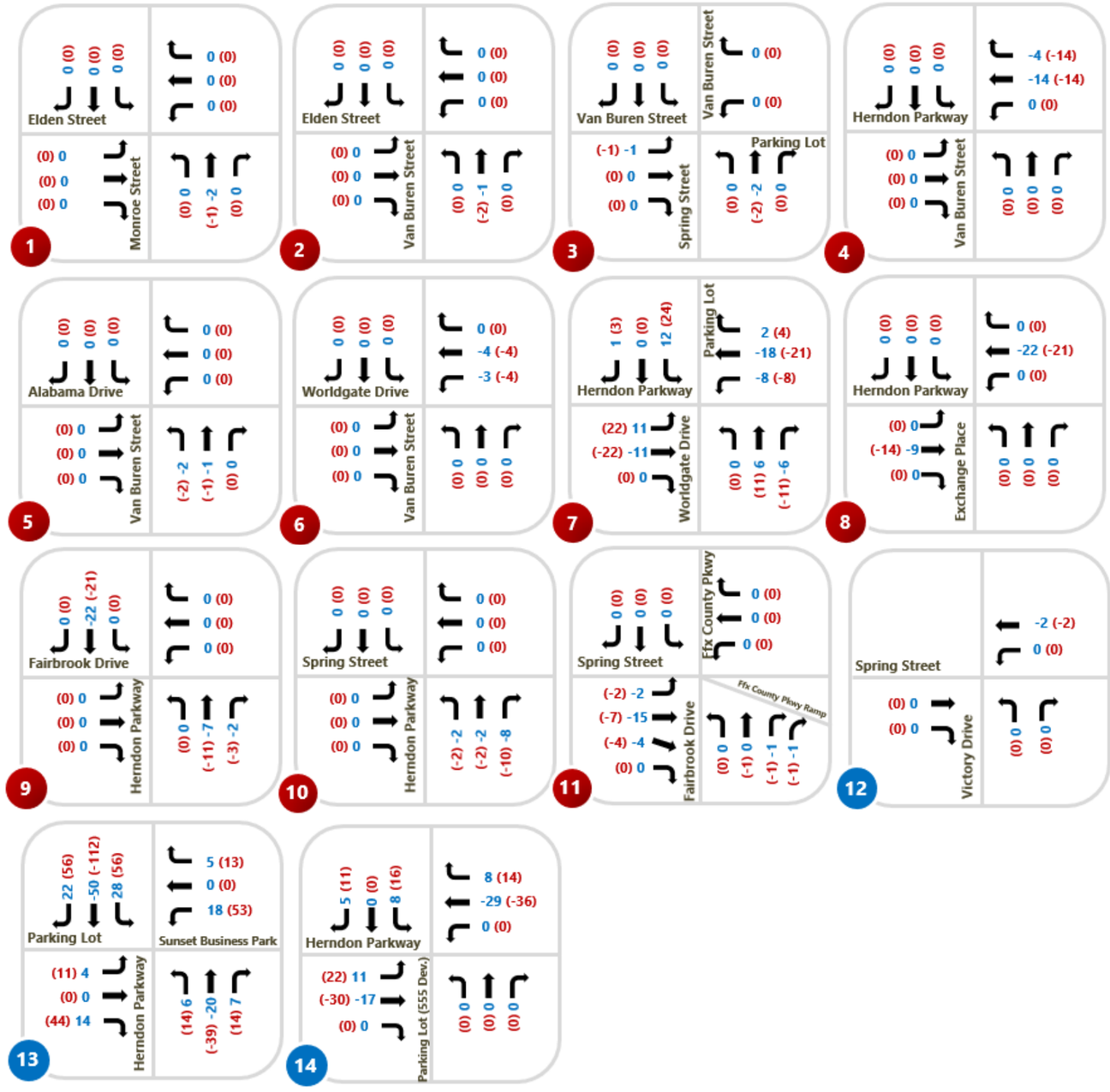
Figure 44 Preferred Build Scenario with Mitigation New Site Trips



Basemap Source: Nearmap

Figure 45 Preferred Build Scenario with Mitigation Site Pass-By Trips





Basemap Source: Nearmap

6.2.1 Traffic Analysis

In Preferred Build with Mitigation 2045 Scenario conditions, traffic levels are anticipated to be stressed at a few locations, with multiple intersections exceeding the Town's LOS standard; however, the general traffic condition could be considered manageable in a peak hour urban condition. **Table 22** lists the intersection delay and LOS at each of the eleven study intersections, comparing the Preferred Build Scenario to the Preferred Build with Mitigation Scenario. Projected intersection LOS is also shown in **Figure 46**.

At the intersection delay level, the evaluated transportation mitigation only has a significant impact on the Van Buren Street corridor (Herndon Parkway to Alabama Drive) in the PM peak. Widening southbound Van Buren Street to extend the dual thru lanes and northbound Van Buren Street to add the second left turn lane significantly improve the operations of both these intersections. Without these mitigations, the southbound queue from Herndon Parkway extends into the Alabama Drive intersection, causing significant delay. The evaluated mitigation also brings the Spring Street / Herndon Parkway intersection in the AM peak hour into compliance with the Town's existing LOS intersection standard (LOS D). Only one intersection peak – Spring Street / Herndon Parkway in the PM peak hour – remains in "violation" of the Town's intersection-based LOS standard.

At the remaining intersections, the evaluated transportation mitigation either does not have a significant impact or causes a slight increase on the intersection-level delay. These metrics are masking the movement-level improvement that occurs at multiple locations. This movement-level improvement does not translate to intersection-level due to intersection-level delay being computed as a weighted average; some of these mitigation strategies more evenly distribute the delay across movements to mitigate high delay on specific movements. This leads to some minimal intersection-level delay decrease or increase based on the weighted average computation method.

As such, it is important to consider the performance of individual turning movements. The intersection turning movements in **Table 23** operated at LOS F in either the Preferred Build without or with Mitigation Scenario 2045 conditions. The existing Town of Herndon Ordinance states "no individual turning movement level of service at an intersection falls below 'LOS E'". In summary, the evaluated transportation mitigations bring eight turning movements into compliance with Town standard of LOS E or better, have no LOS impact on three turning movements (i.e., they remain LOS F in the Mitigated scenario), and create two turning movements with LOS F (i.e., they did not operate at LOS F in the unmitigated scenario). It should be noted that these latter two movements are relatively low-volume – the higher volume movements at these intersections have been prioritized.

Table 22 Comparison of Intersection Delay and LOS: Preferred Build Scenario to Mitigation Build Scenario

Intersection [1]	Preferred Build Scenario AM Peak Delay	AM Peak LOS	Preferred Build Scenario PM Peak Delay	PM Peak LOS	Mitigation Build Scenario AM Peak Delay	AM Peak LOS	Mitigation Build Scenario PM Peak Delay	PM Peak LOS	Change Build to Mitigated AM Peak Delay	AM Peak LOS	Change Build to Mitigated PM Peak Delay	PM Peak LOS
Elden St / Monroe St	32.0	C	37.8	D	31.2	C	38.6	D	-0.8	-	+0.8	-
Elden St / Van Buren St	35.7	D	42.8	D	35.6	D	43.9	D	-0.1	-	+1.1	-
Van Buren St / Spring St	17.8	B	26.9	C	18.2	B	25.9	C	+0.4	-	-1.0	-
Van Buren St / Herndon Pkwy	42.5	D	49.0	D	39.9	D	39.3	D	-2.6	-	-9.7	-
Van Buren St / Alabama Dr	19.9	B	51.5	D	24.1	C	21.6	C	+4.2	B→C	-29.9	D→C
Van Buren St / Worldgate Dr	22.4	C	33.3	C	21.9	C	27.4	C	-0.5	-	-5.9	-
Herndon Pkwy / Worldgate Dr	40.5	D	33.3	C	42.4	D	38.1	D	+1.9	-	+4.8	C→D
Herndon Pkwy / Exchange Pl	7.8	A	22.0	C	7.3	A	23.3	C	-0.5	-	+1.3	-
Herndon Pkwy / Fairbrook Dr	21.5	C	34.9	C	24.5	C	33.5	C	+3.0	-	-1.4	-
Spring St / Herndon Pkwy	55.9	E	65.3	E	51.6	D	64.4	E	-4.3	E→D	-0.9	-
Spring St / FCP Ramps	38.2	D	41.6	D	33.6	C	44.8	D	-4.6	D→C	+3.2	-

Source: Average of 7 AM and 20 PM Peak Hour VISSIM simulation runs.
1 All study intersections are signalized in the Build and Mitigated Build scenario.

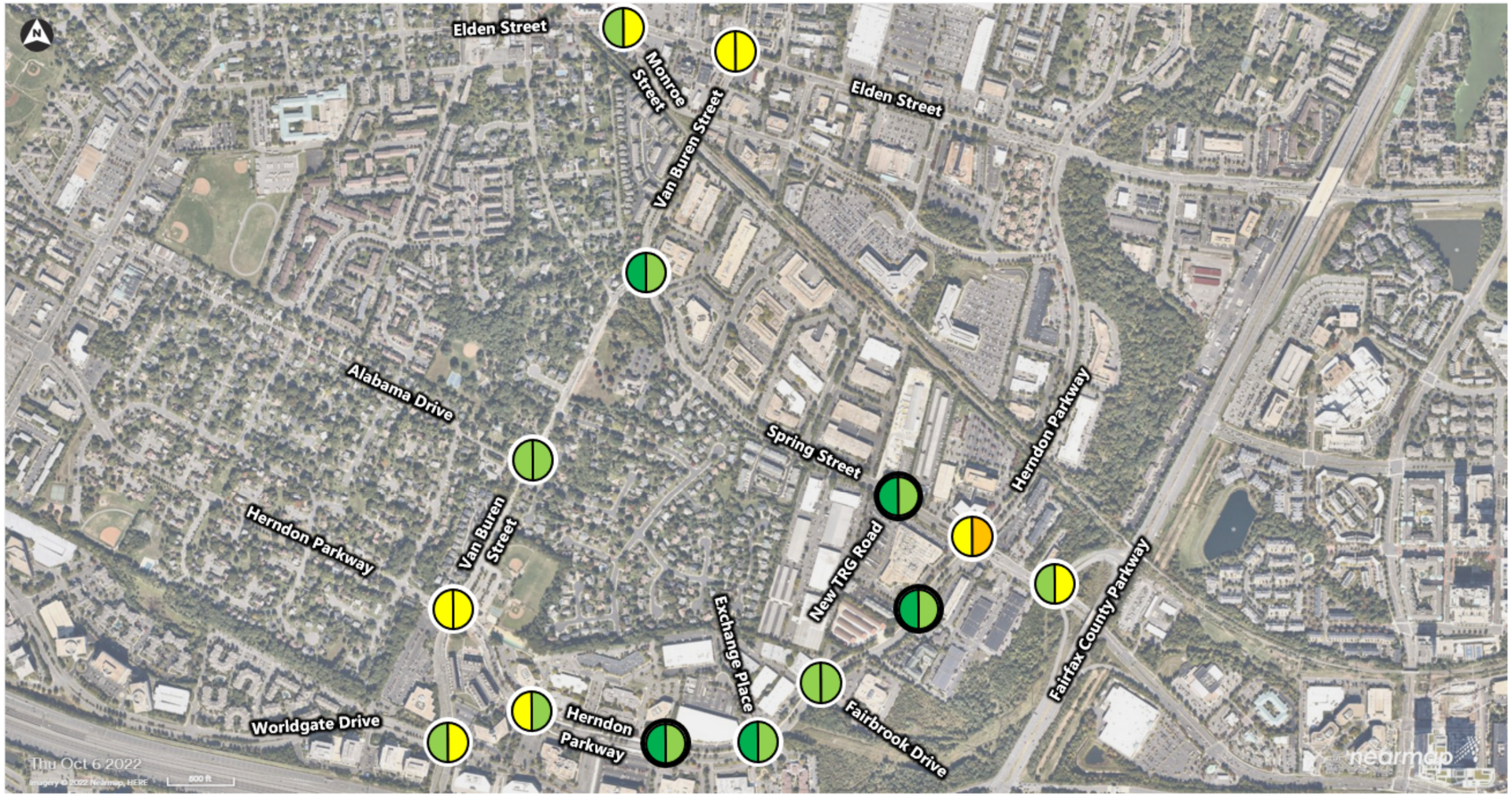
Table 23 Comparison of LOS F Movements

Turning Movement		LOS F without Mitigation?	LOS F with Mitigation?
Herndon Pkwy / Spring Street	EB Left AM	Yes	No
	EB Left PM	Yes	Yes
	EB T/R PM	Yes	Yes
	SB Left PM	Yes	No
Spring St / Fairfax Pkwy Ramps / Fairbrook Dr	WB Left AM	Yes	No
	NB Left AM	No	Yes
	NB Left PM	Yes	Yes
	NB Thru PM	Yes	No
Van Buren Street / Worldgate Drive	EB Left PM	Yes	No
Van Buren St / Herndon Pkwy	NB Left PM	Yes	No
Van Buren St / Alabama Drive	EB/WB PM	Yes	No
Herndon Parkway / Fairbrook Drive	EB Thru AM	No	Yes
	WB Left PM	Yes	No

The one intersection-level LOS and four of the five turning movement LOS that remain in "violation" of the Town's LOS standard are associated with the Fairfax County Parkway interchange – either directly or via congestion spillover to the Herndon Parkway / Spring Street intersection. This finding indicates that expanding the existing interchange ramp traffic signal on Spring Street is not a viable solution to alleviate future traffic congestion. A wholesale interchange reconfiguration appears to be needed to accommodate the future traffic demand of both Herndon and Reston.

Congestion "heat" maps for each of the Preferred Build Scenario peak hours are shown in **Figures 47 and 48**. These represent the average vehicle speeds present in different lanes and segments of the model. Slower vehicle speeds (shown in shades of red) represent areas of higher congestion and vehicle queuing, whereas higher vehicle speeds (shown in shades of green) represent areas of lower congestion and vehicle queueing. Contrasted to the Preferred Build without Mitigation scenarios, these figures show significant congestion improvement on the Van Buren Street corridor, particularly in the PM peak hour. In the AM peak hour, westbound Herndon Parkway shows less congestion heading into the TRG/HTOC due to the rerouting of inbound traffic volume to the new traffic signal at the new TRG road.

Figure 46 Preferred Build Scenario with Mitigation 2045 Intersection Level of Service



Intersection Level of Service (LOS)

RFP Study Intersection
AM Peak Hour / PM Peak Hour

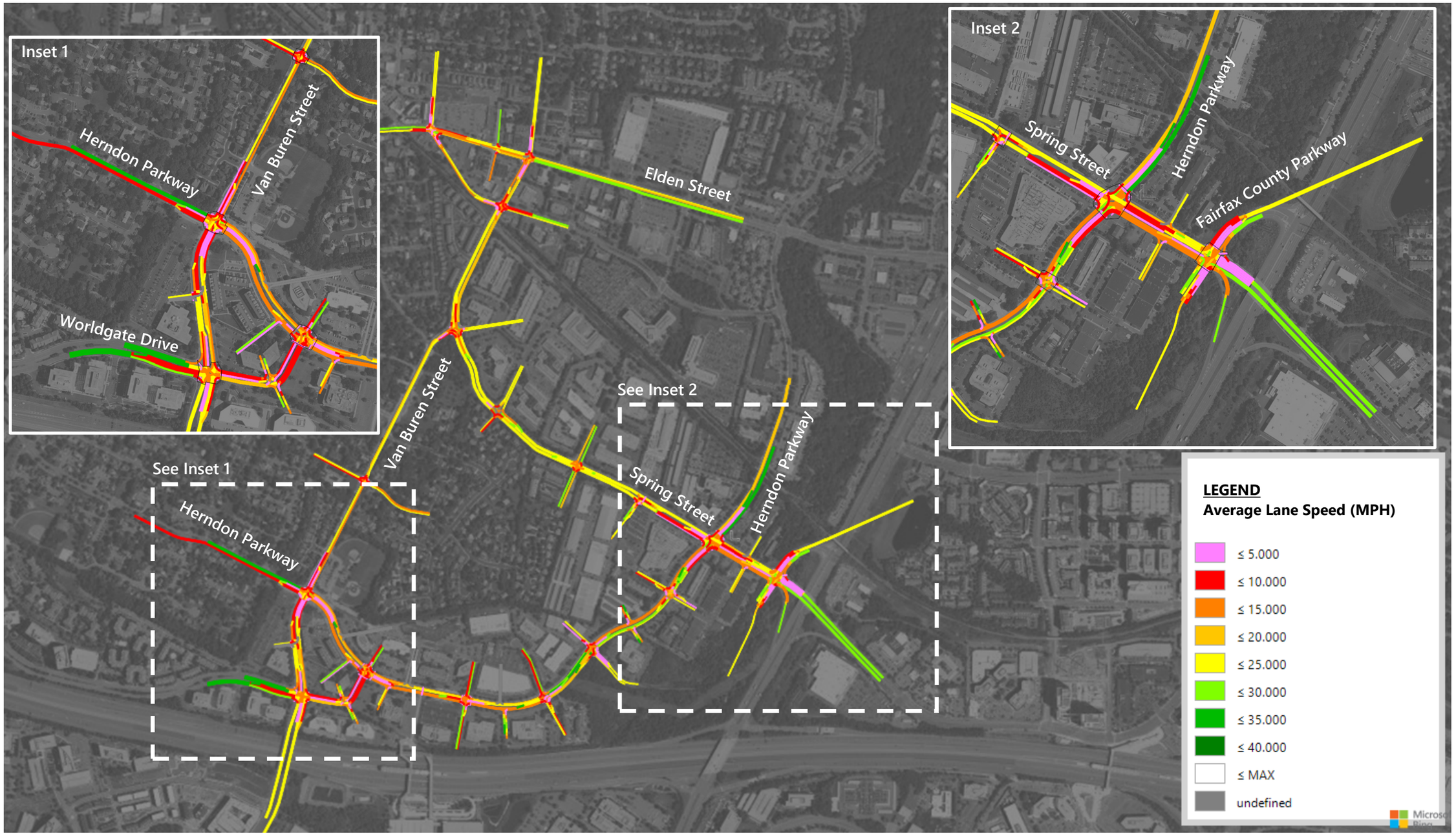
Additional Study Intersection
AM Peak Hour / PM Peak Hour

LOS A / LOS B
LOS C
LOS D
LOS E
LOS F

Note: All reported LOS is intersection LOS for signalized intersection except for Spring Street / New TRG Road, which is an unsignalized intersection with the new TRG Road operating under stop control. Reported LOS for this intersection is the worst controlled movement.

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

Figure 47 Preferred Build Scenario with Mitigation 2045 Congestion Heat Map – AM Peak Hour



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

Figure 48 Preferred Build Scenario with Mitigation 2045 Congestion Heat Map – PM Peak Hour



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

Projected average and maximum queue lengths for the Preferred Build Scenario with Mitigation are displayed in **Figures 49 and 50**. An important note regarding the maximum queue lengths is that each roadway segment's maximum queue length most likely does not temporally align (i.e., occur at the same time). Rather, these figures show the maximum queue length on each segment of roadway during the peak hour. The accommodation of maximum queue lengths is also not the typical design objective as they are an indication of the absolute worst impact during the peak hour.

6.2.2 Recommendations for Transportation Mitigation

Table 24 contains a summary of the evaluated transportation infrastructure mitigation measures, including the issue, the assessed traffic impact, cons/impacts of implementing the mitigation, and a recommendation for its inclusion in the Town's future planning. Based on the completed traffic analysis findings, the intersection improvements to Herndon Parkway / Van Buren Street have the most substantial benefit, mitigating three LOS F intersection movements and queue lengths that spill back through upstream intersections. The Town will need to weigh these benefits against construction right of way. If the improvements are not implemented, the anticipated traffic congestion could itself act as "mitigation" by encouraging traveling behavior that reduces vehicular traffic (e.g., traveling outside the peak hour or switching to an alternative travel mode such as bike/walk/transit).

A new traffic signal at Spring Street / TRG Road would better distribute TRG traffic between Herndon Parkway and the TRG Road, lightening the demand on the heavy turning movements between Herndon Parkway and Spring Street. This signal could be implemented without negative impact. Widening to add a second left turn lane from eastbound Herndon Parkway to Spring Street has benefit; however, it is likely only cost beneficial if the widening could be completed within the existing median width.

The evaluated improvements to the existing Fairfax County Parkway interchange signal do not significantly address the anticipated congestion issues, while having negative right of way, environmental, and pedestrian crossing implications. Rather than implementing these partial measures, the Town could partner with Fairfax County on an interchange study to identify an optimal interchange configuration.

Contrasting the Mitigation scenario queues to the unmitigated scenario queues, in the AM peak hour, the following movements have shorter (improved) queue lengths:

- Eastbound Herndon Parkway at Van Buren Street
- Southbound Van Buren Street at Herndon Parkway
- Southbound Herndon Parkway at Sunset Business Park
- Westbound Spring Street at Fairfax County Parkway
- Fairfax County Parkway Off-Ramp

In the PM peak hour, the following movements have shorter (improved) queue lengths:

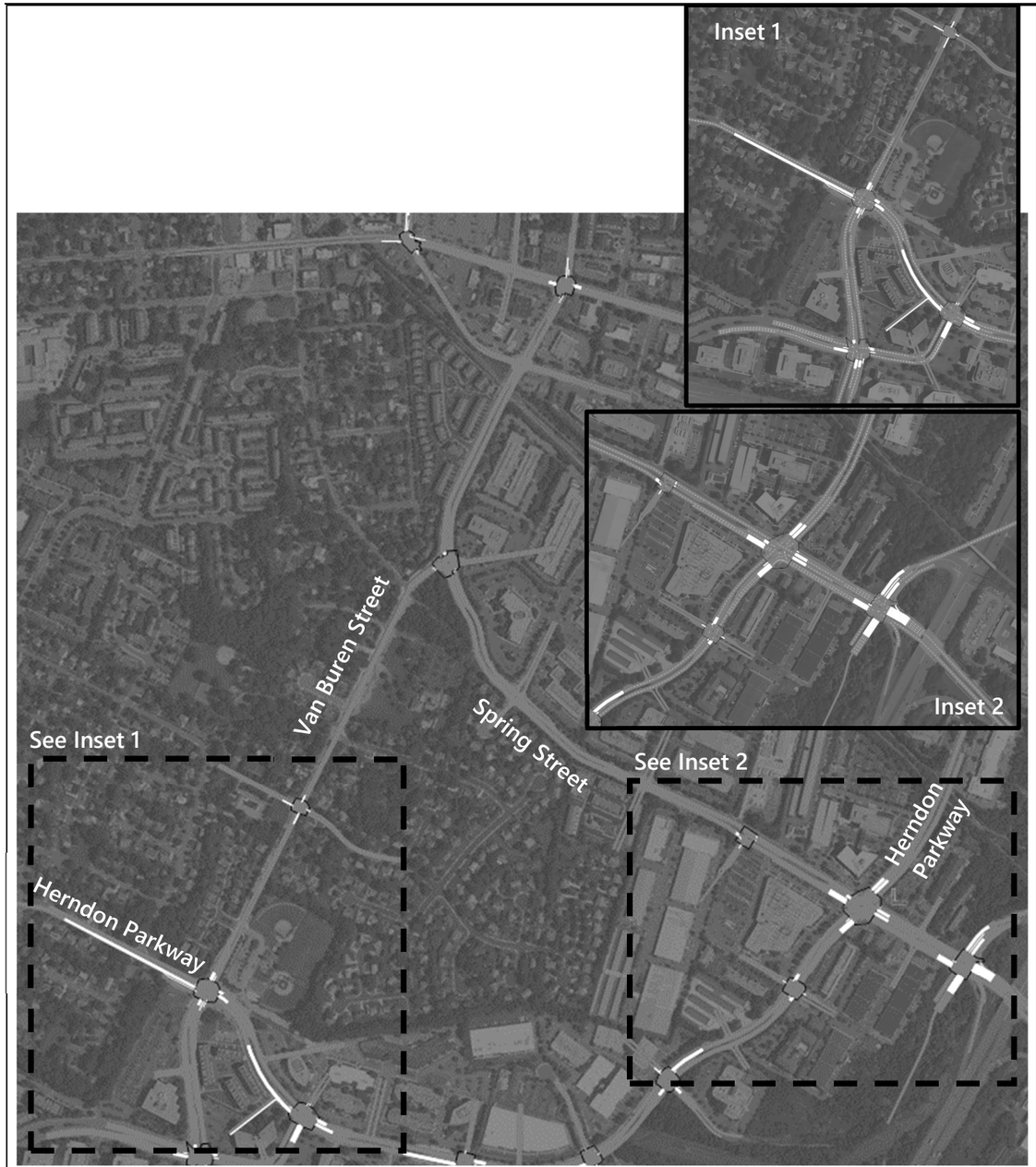
- Southbound and Northbound Van Buren Street at Herndon Parkway
- Eastbound Worldgate Drive at Van Buren Street
- Eastbound Herndon Parkway at Sunset Business Park
- Fairfax County Parkway Off-Ramp.

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

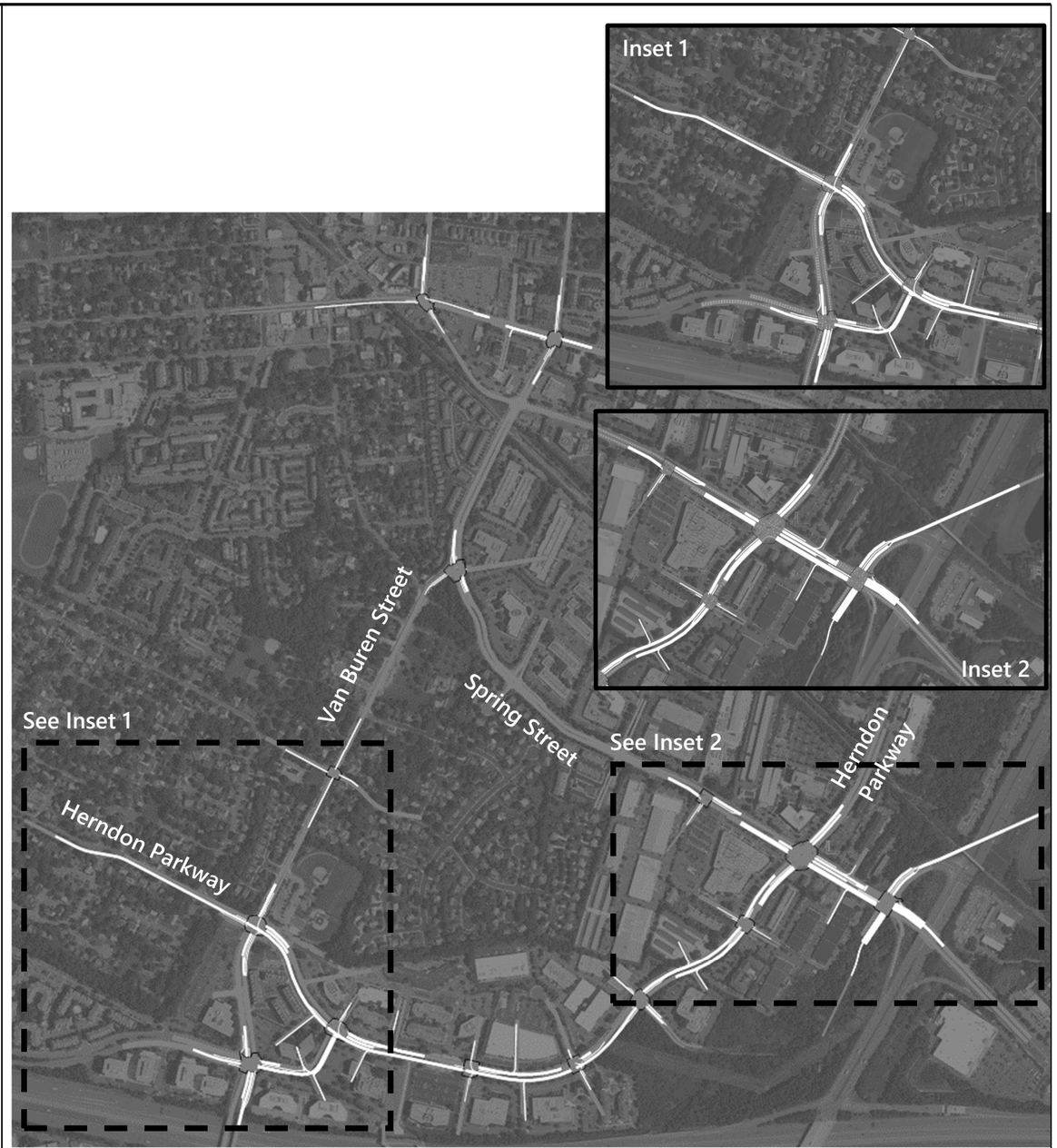
Table 24 Transportation Mitigation Recommendations

Intersection	Issue	Evaluated Mitigation	Impact on Traffic Conditions	Con/Impact	Recommendation
Herndon Parkway / Van Buren Street	Southbound Van Buren Street dual thru lanes only 150 feet in length, leading to delay	Widen southbound Van Buren Street to extend dual thru lanes	The combination of these two mitigations had a significant enhancement to traffic conditions along the entire Van Buren Street corridor	Right of way impacts to residential / park	**Strongly Consider**
	Single northbound left turn lane to serve 300+ peak-hour vehicles, competing with southbound Van Buren Street for signal capacity	Dual northbound left turn lanes from Van Buren Street to Herndon Parkway		Right of way impacts and potential Van Buren Street realignment	**Strongly Consider**
Spring Street / Herndon Parkway	Viability of new TRG road to relieve pressure on Herndon Parkway is limited by lack of traffic signal at Spring Street	New traffic signal at Spring Street / new TRG road with rerouted traffic from Herndon Parkway	The combination of these two mitigations detoured traffic from Herndon Parkway, brought the AM Peak into intersection LOS compliance, and brought two movements into movement LOS compliance	None	**Implement**
	Intersection capacity constraints	Dual left turn lanes from EB Spring Street onto NB Herndon Parkway		Possible roadway widening – may be accommodated within median	**Implement if it can be accommodated via widening into median**
Spring Street / Fairbrook Drive / Fairfax County Parkway	Queue spillback on Fairfax County Parkway off-ramp	Dual left turn lane from off-ramp	This combination of mitigations had a minimal impact on traffic conditions. Two movements still do not comply with movement LOS standards. Significant queueing remains on off-ramp and westbound Spring Street.	Right of way impact; Potential environmental impact	**Do Not Implement – does not significantly address congestion issues.** **Recommend partnering with VDOT and Fairfax County on interchange study**
	Congestion on westbound Spring Street; Curb lane acts essentially as a right turn lane due to Fairfax County Parkway on-ramp volume demand	Dual left turn from westbound Spring Street onto Fairbrook Drive		Could likely be accommodated within median; Does not address limited cross-section beneath bridge	
	Fairbrook Drive congestion in PM Peak	Separate left turn lane from thru lane		Wider cross-section for Fairbrook Drive extension	

Figure 49 Preferred Build Scenario with Mitigation 2045 Queue Map – AM Peak Hour

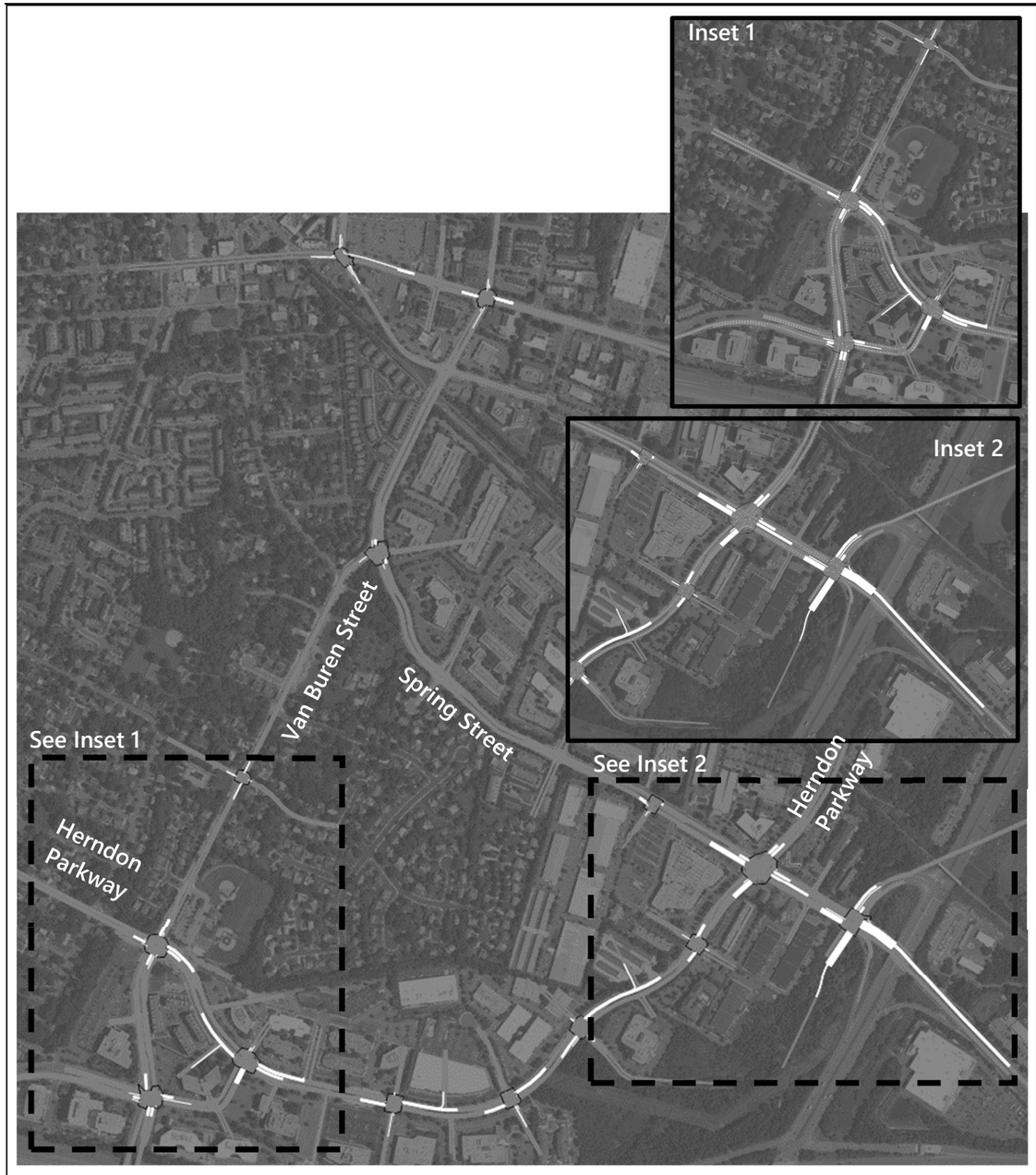


Average Queue Length

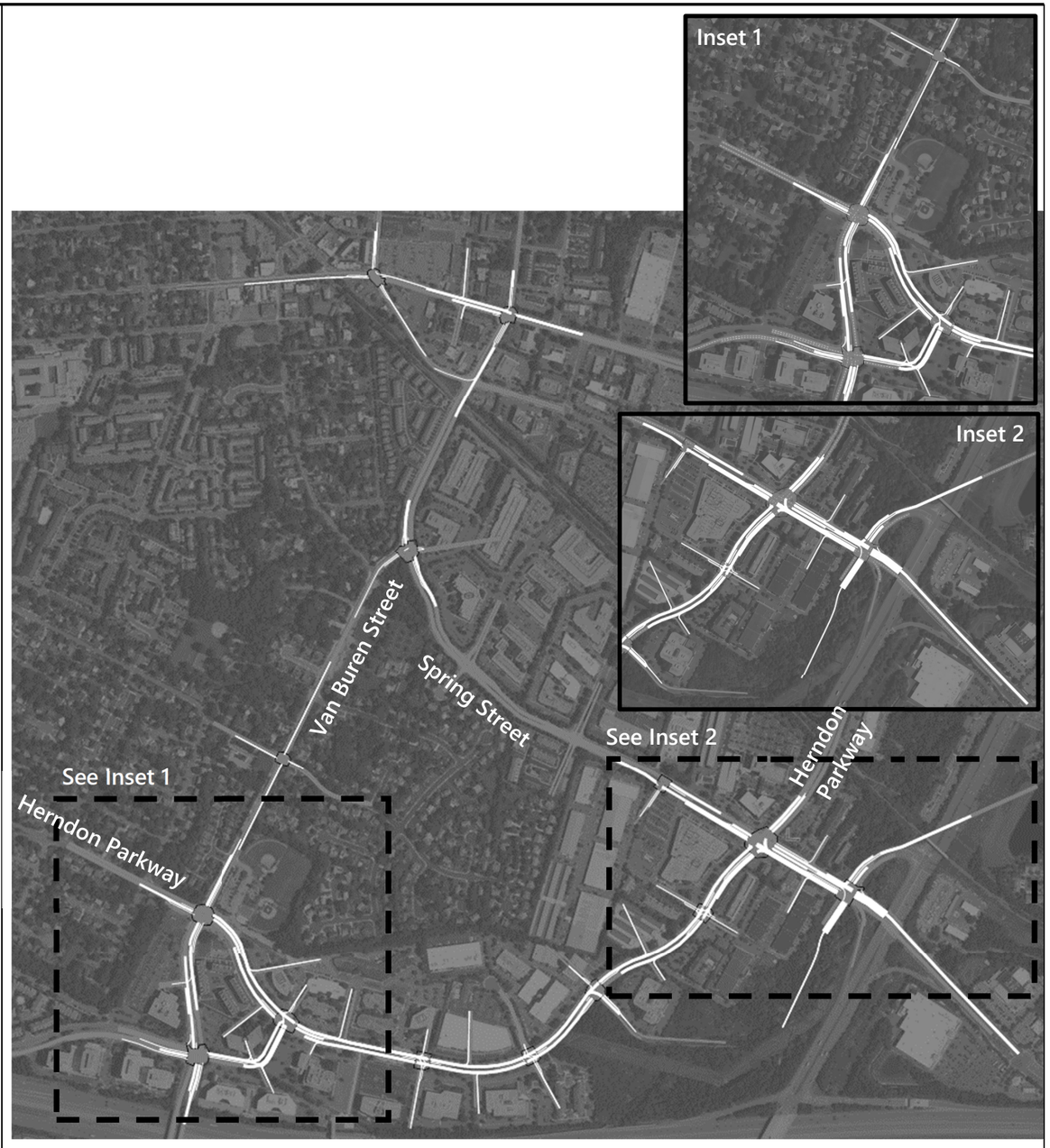


Maximum Queue Length

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



Average Queue Length



Maximum Queue Length

Divider

This page intentionally left blank.

A

Traffic Volume Datasets – All Intersections in Model

A.1 Existing Conditions 2023 Volumes

A.2 No Build 2045 Volumes

A.3 Build Scenario 1 (Neighborhood Clusters) 2045 Volumes

A.4 Build Scenario 1 (Neighborhood Clusters) New Site Trips

A.5 Build Scenario 1 (Neighborhood Clusters) Site Pass-by Trips

A.6 Build Scenario 2 (Two Centers) 2045 Volumes

A.7 Build Scenario 2 (Two Centers) New Site Trips

A.8 Build Scenario 2 (Two Centers) Site Pass-by Trips

A.9 Build Scenario 3 (Metro Center) 2045 Volumes

A.10 Build Scenario 3 (Metro Center) New Site Trips

A.11 Build Scenario 3 (Metro Center) Site Pass-by Trips

A.12 Preferred Build Scenario 2045 Volumes

A.13 Preferred Build Scenario New Site Trips

A.14 Preferred Build Scenario Site Pass-by Trips

A.15 Preferred Build with Mitigation Scenario 2045 Volumes

A.16 Preferred Build with Mitigation Scenario New Site Trips

A.17 Preferred Build with Mitigation Scenario Site Pass-by Trips

B

VISSIM Model Complete Intersection Metrics

B.1 Existing Conditions AM Peak Hour

B.2 Existing Conditions PM Peak Hour

B.3 No Build 2045 AM Peak Hour

B.4 No Build 2045 PM Peak Hour

B.5 Build 2045 Scenario One (Neighborhood Clusters) AM Peak Hour

B.6 Build 2045 Scenario One (Neighborhood Clusters) PM Peak Hour

B.7 Build 2045 Scenario Two (Two Centers) AM Peak Hour

B.8 Build 2045 Scenario Two (Two Centers) PM Peak Hour

B.9 Build 2045 Scenario Three (Metro Center) AM Peak Hour

B.10 Build 2045 Scenario Three (Metro Center) PM Peak Hour

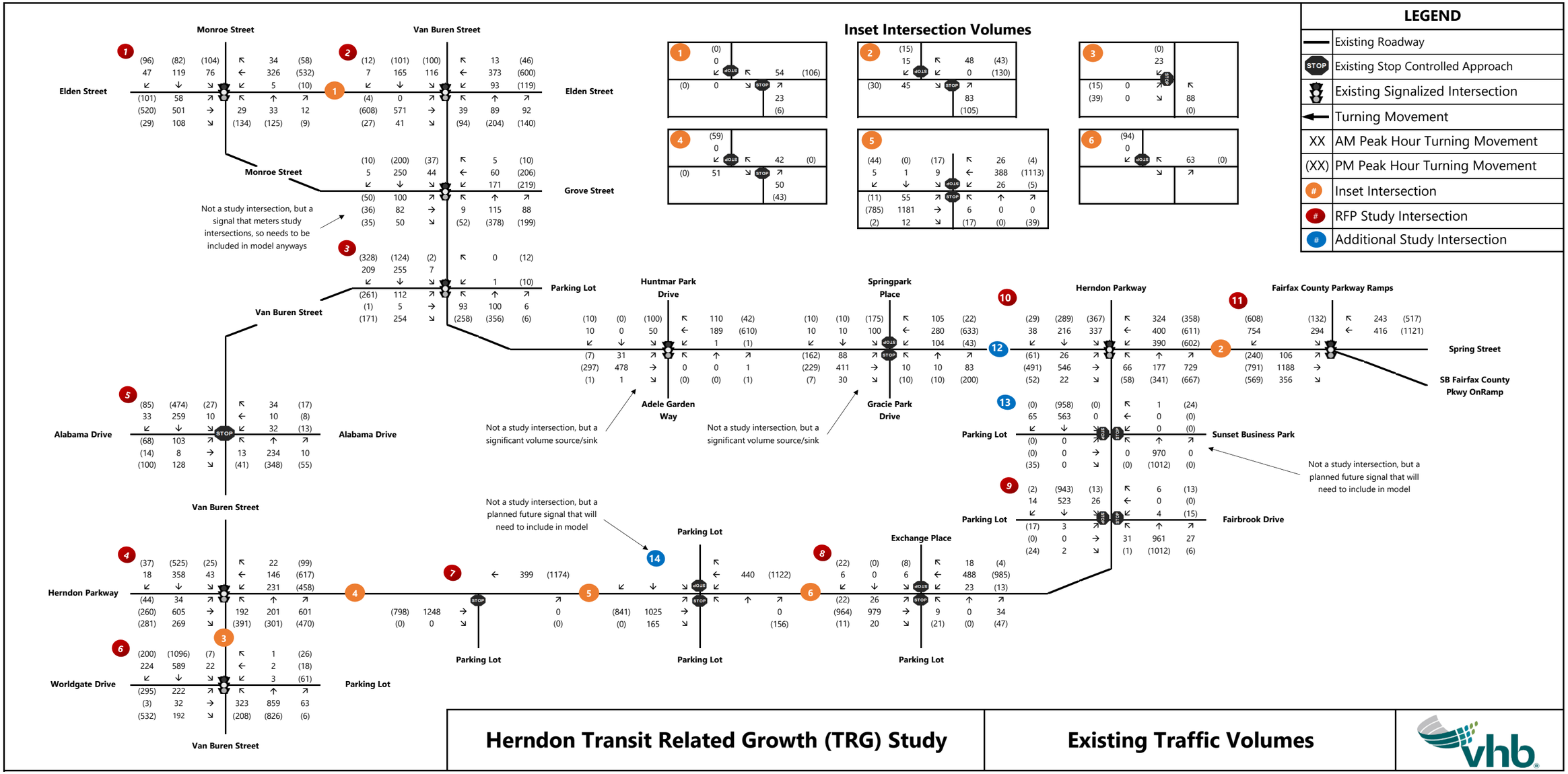
B.11 Preferred Build 2045 Scenario AM Peak Hour

B.12 Preferred Build 2045 Scenario PM Peak Hour

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

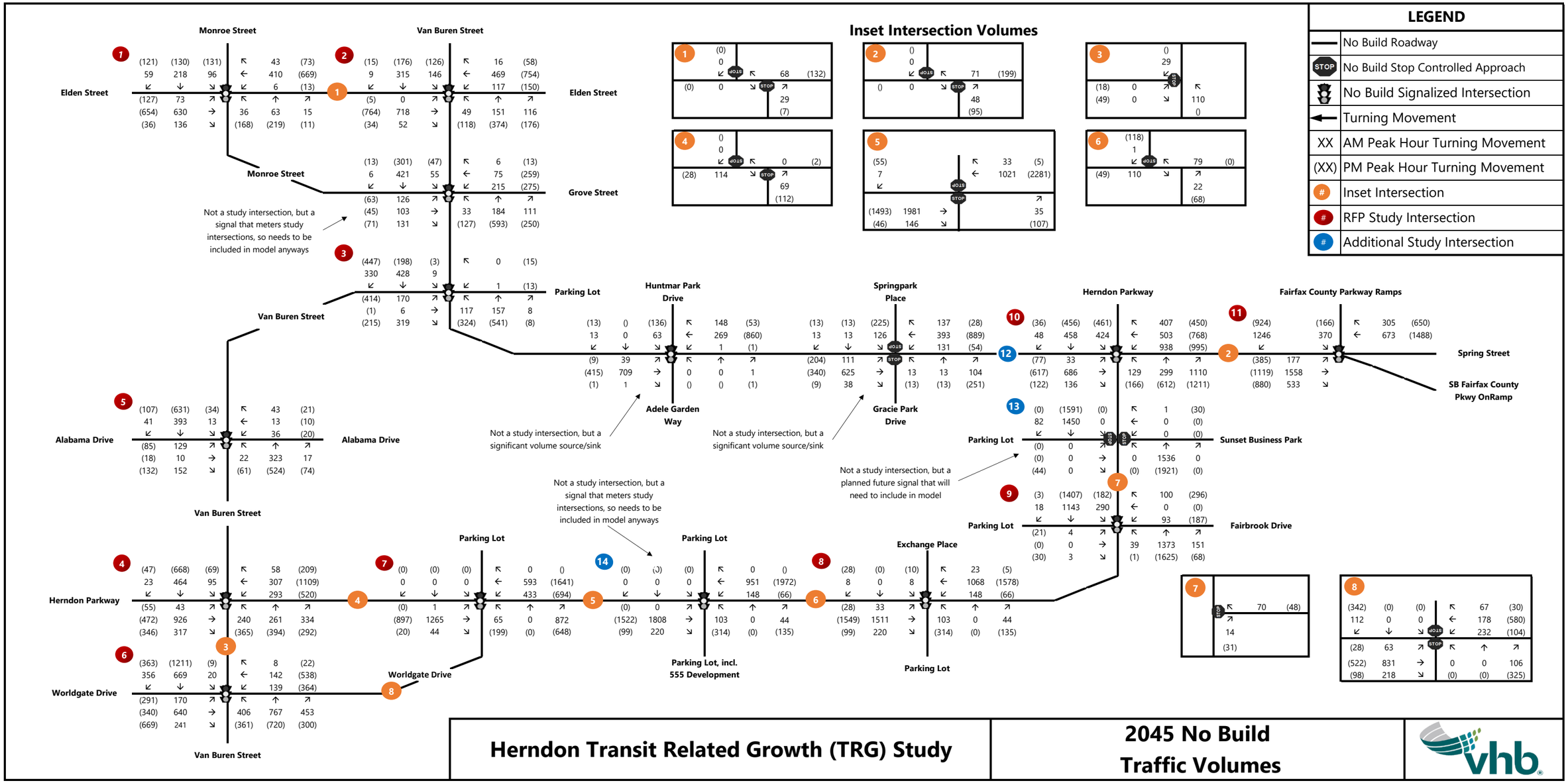
B.14 Preferred Build with Mitigation 2045 Scenario PM Peak Hour

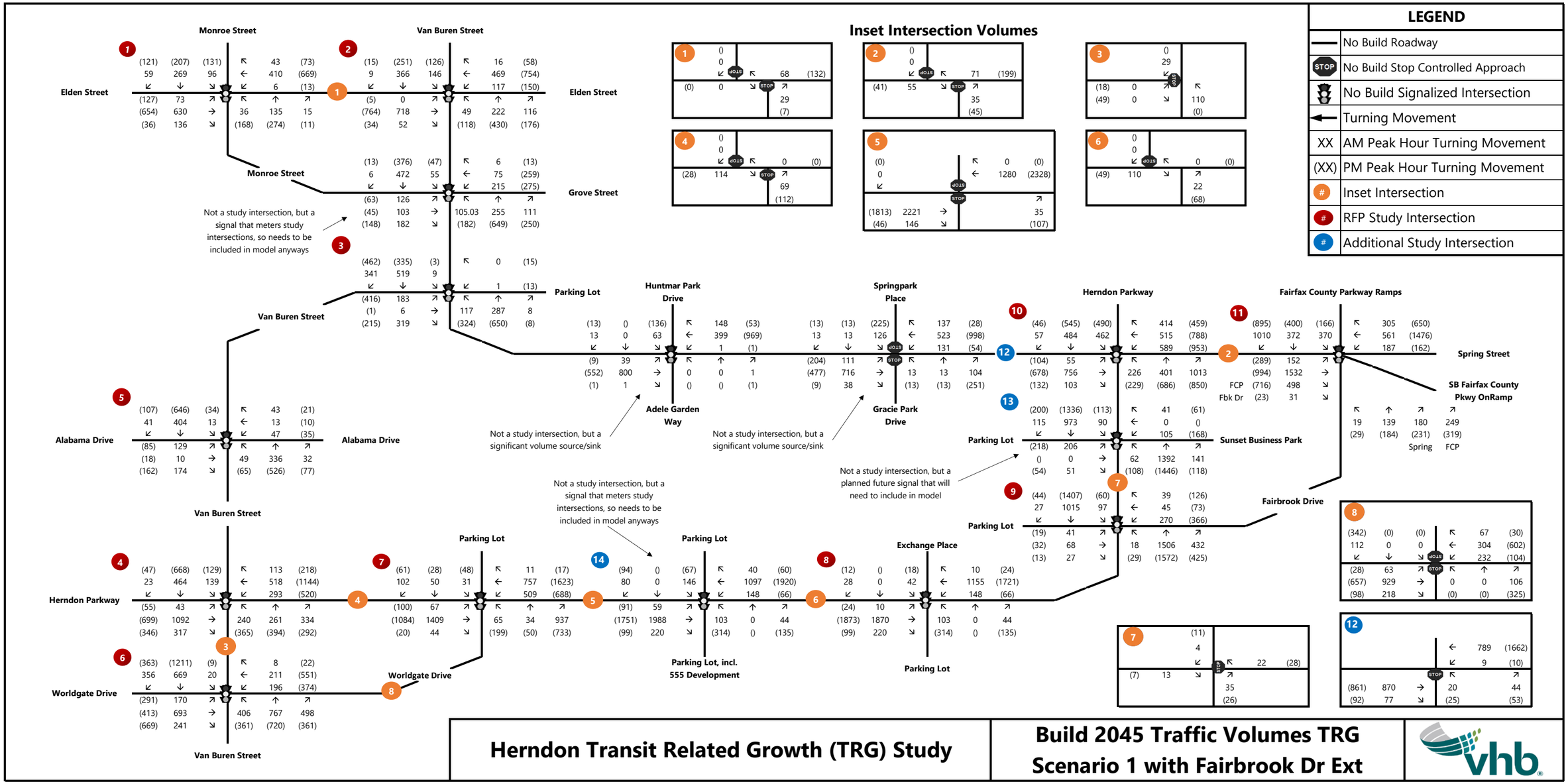
This page intentionally left blank.



Herndon Transit Related Growth (TRG) Study

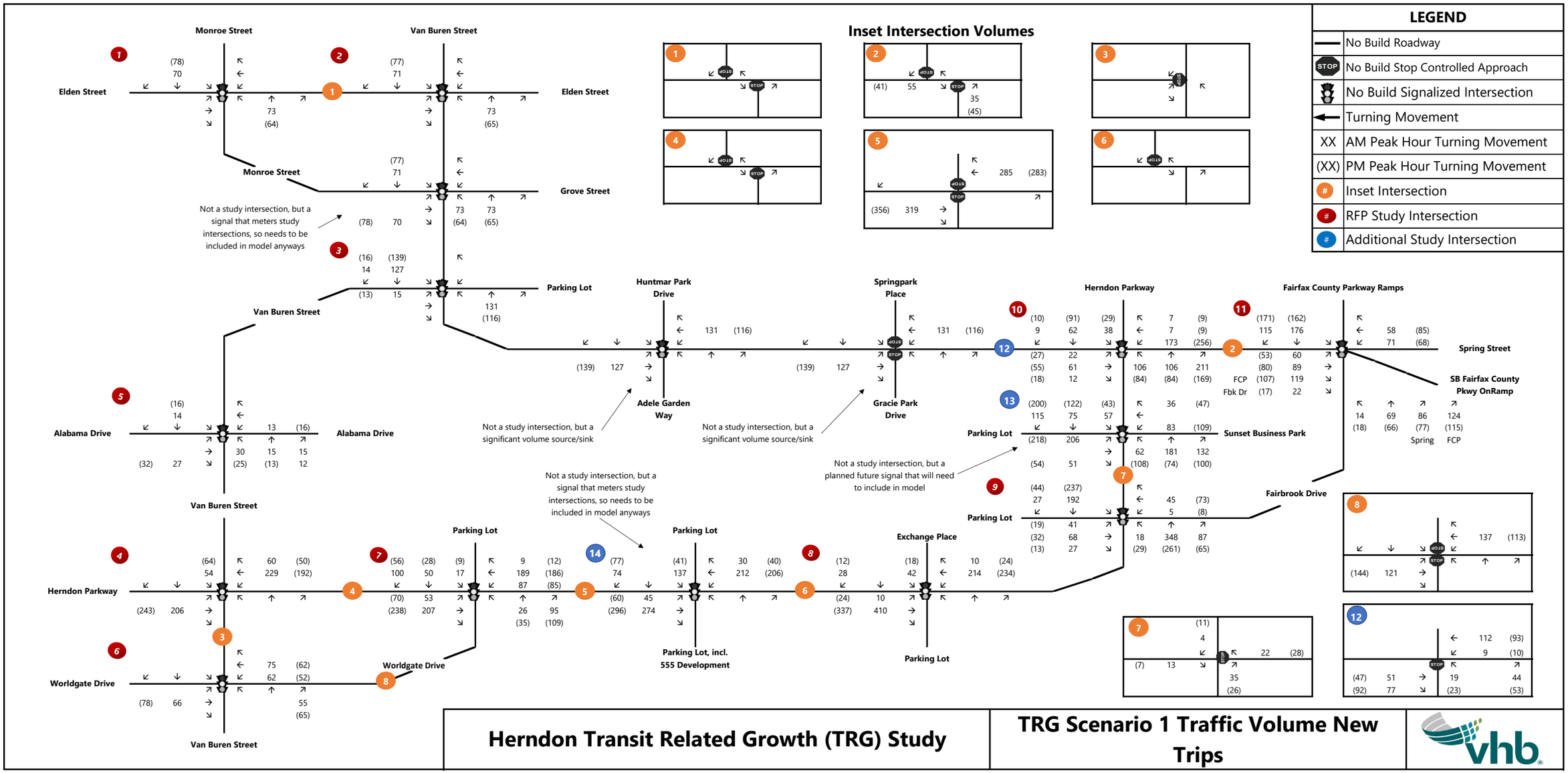
Existing Traffic Volumes


Monroe Street
Van Buren Street
Elden Street
Monroe Street
Grove Street
Van Buren Street
Parking Lot
Huntmar Park Drive
Springpark Place
Herndon Parkway
Fairfax County Parkway Ramps
Spring Street
SB Fairfax County Pkwy OnRamp
Adele Garden Way
Gracie Park Drive
Alabama Drive
Alabama Drive
Van Buren Street
Parking Lot
Sunset Business Park
Parking Lot
Fairbrook Drive
Not a study intersection, but a signal that meters study intersections, so needs to be included in model anyways
Not a study intersection, but a significant volume source/sink
Not a study intersection, but a significant volume source/sink
Not a study intersection, but a planned future signal that will need to include in model
Not a study intersection, but a signal that meters study intersections, so needs to be included in model anyways
Herndon Parkway
Worldgate Drive
Worldgate Drive
Parking Lot
Parking Lot, incl. 555 Development
Exchange Place
Parking Lot
Van Buren Street
Inset Intersection Volumes
LEGEND
No Build Roadway
No Build Stop Controlled Approach
No Build Signalized Intersection
Turning Movement
XX AM Peak Hour Turning Movement
(XX) PM Peak Hour Turning Movement
Inset Intersection
RFP Study Intersection
Additional Study Intersection
Herndon Transit Related Growth (TRG) Study
2045 No Build Traffic Volumes
vhb



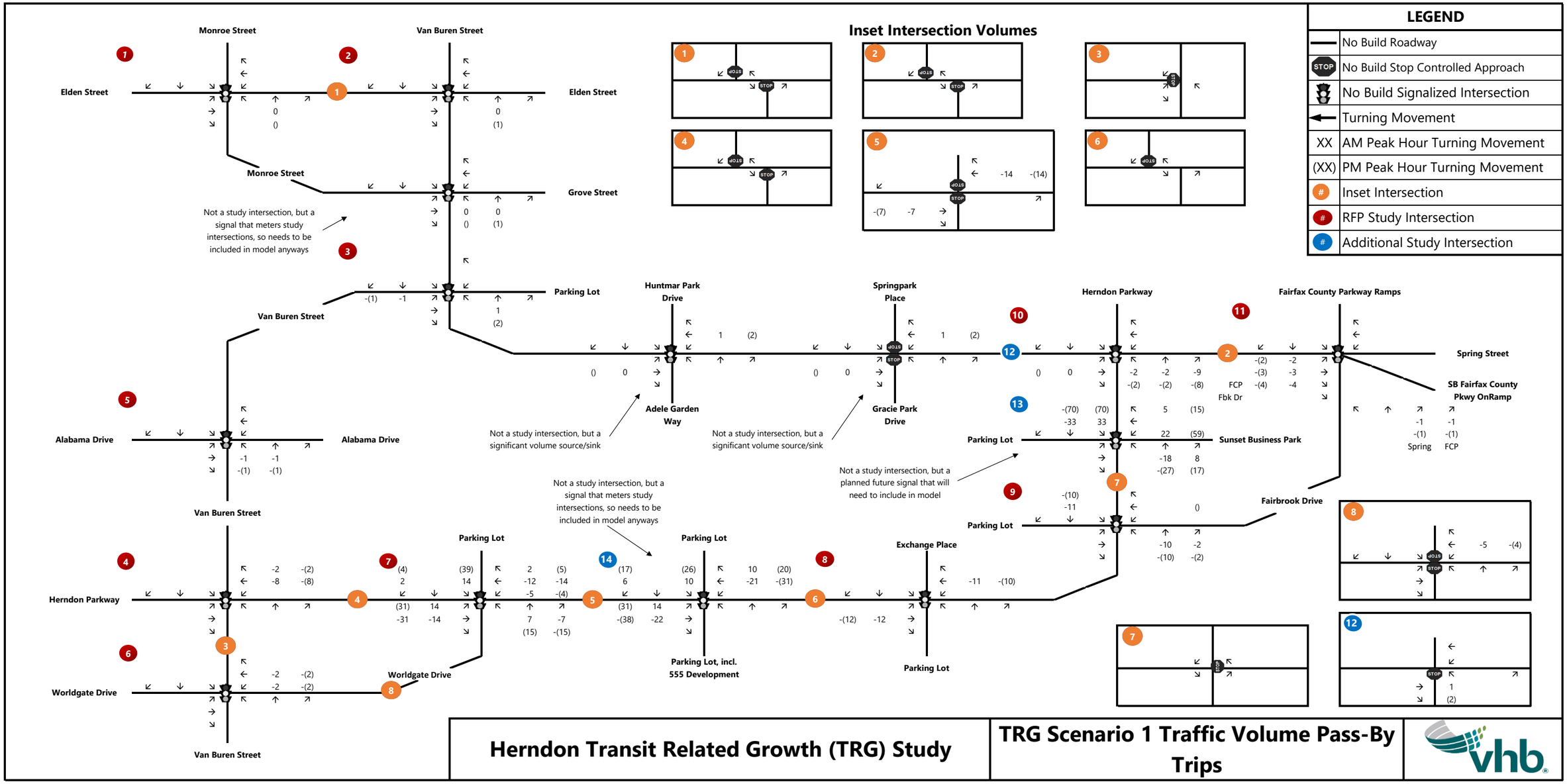
Herndon Transit Related Growth (TRG) Study

Build 2045 Traffic Volumes TRG Scenario 1 with Fairbrook Dr Ext



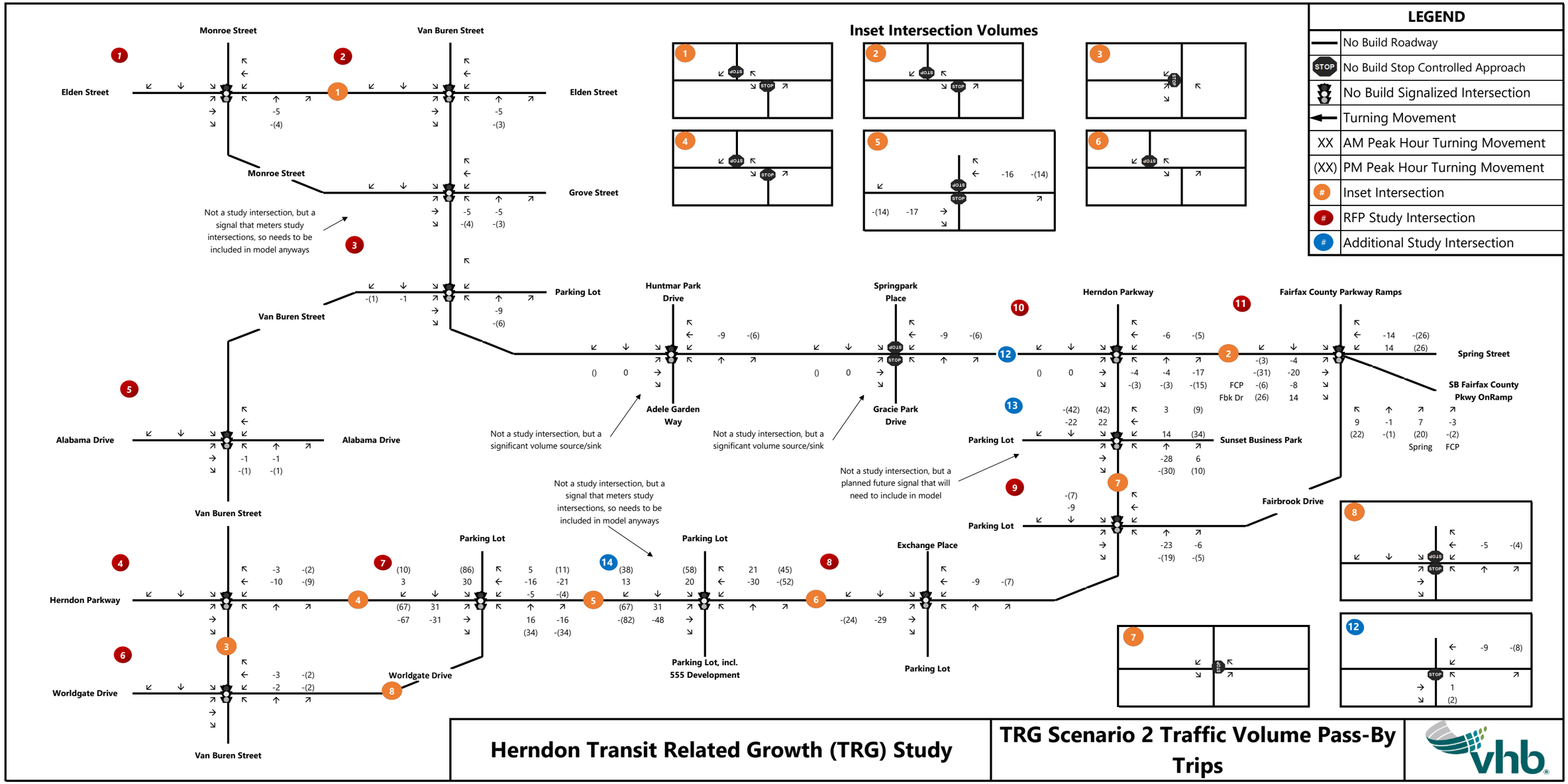
Herndon Transit Related Growth (TRG) Study

TRG Scenario 1 Traffic Volume New Trips



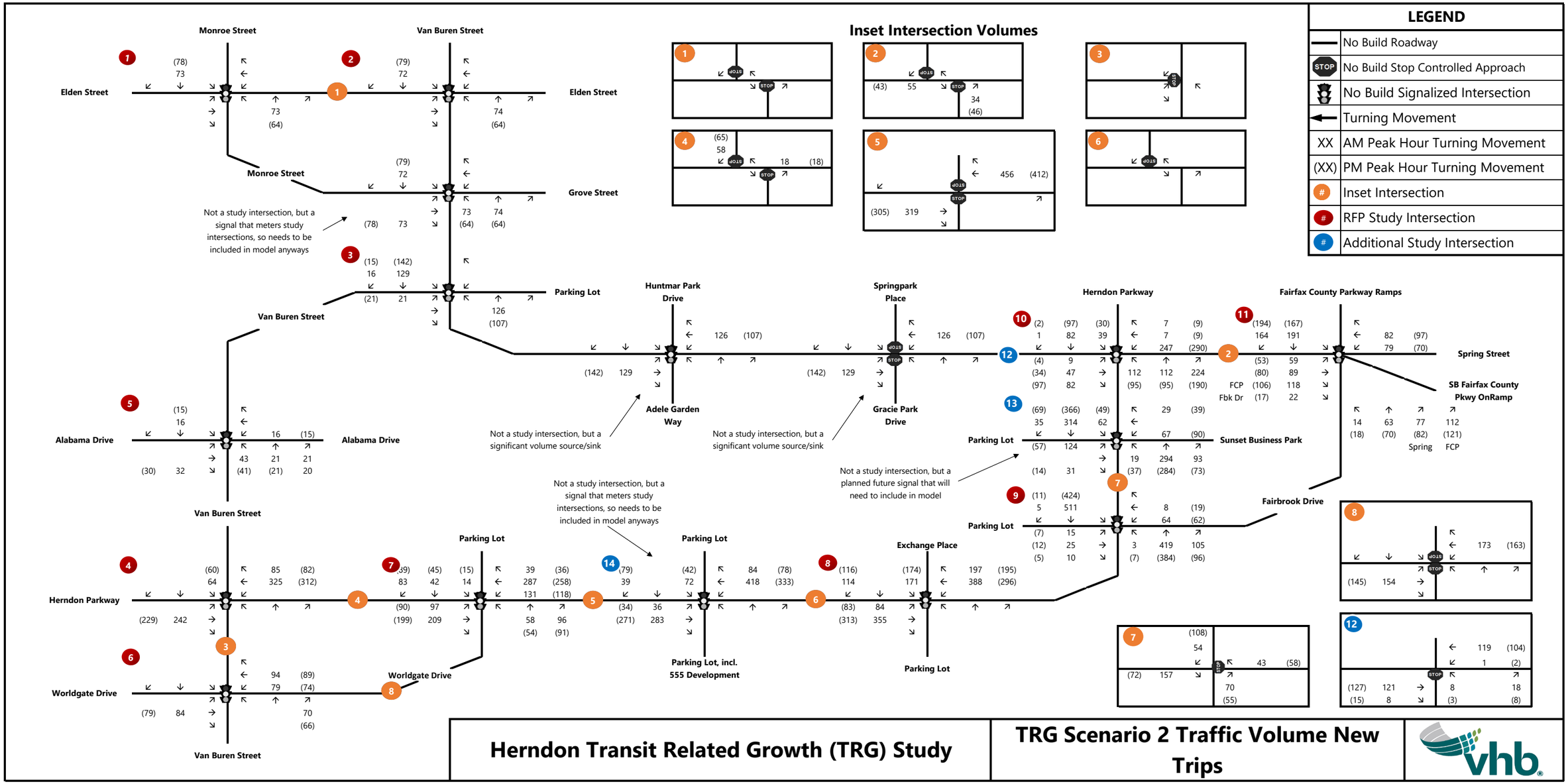
Herndon Transit Related Growth (TRG) Study

TRG Scenario 1 Traffic Volume Pass-By Trips



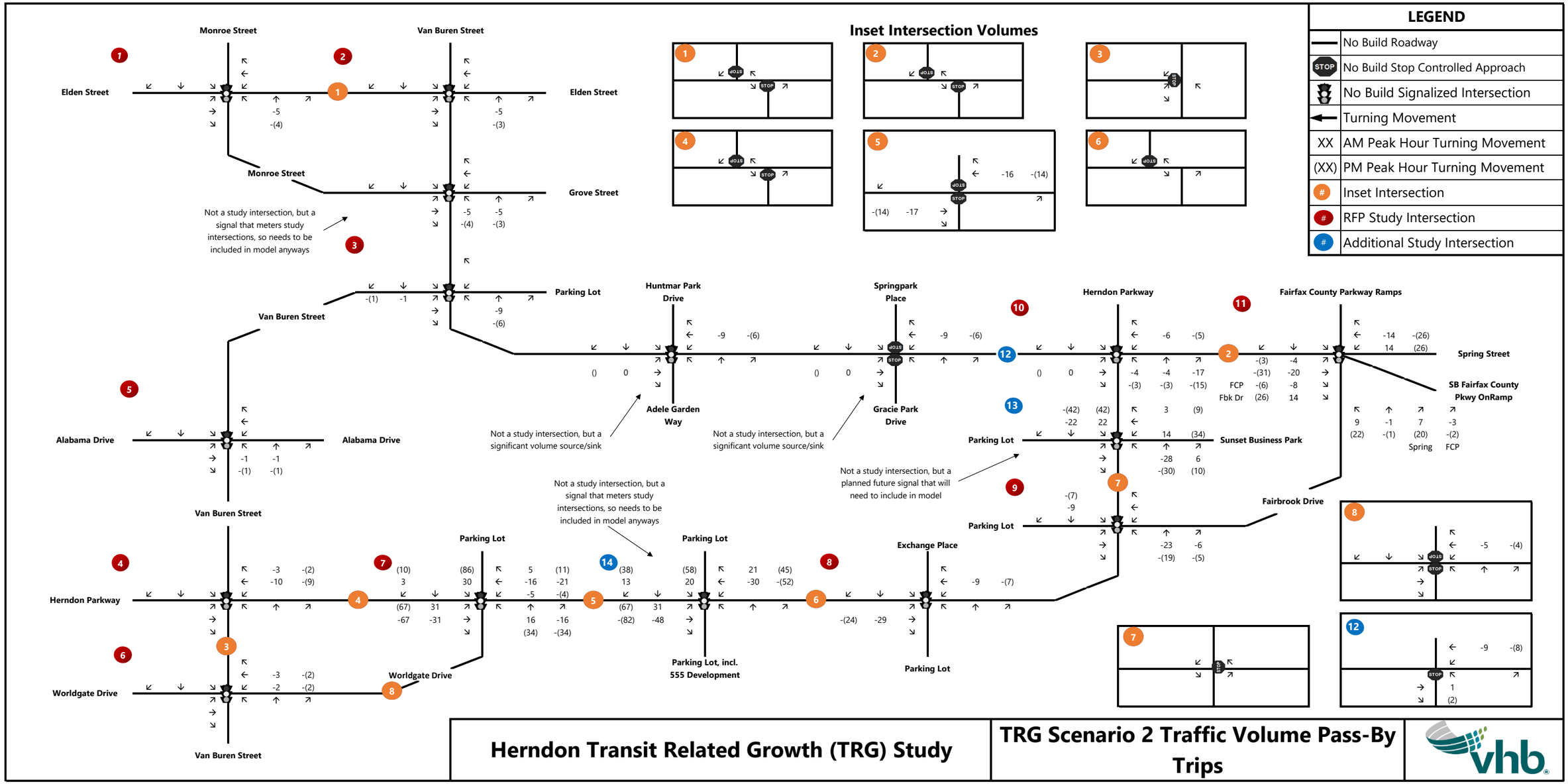
Herndon Transit Related Growth (TRG) Study

TRG Scenario 2 Traffic Volume Pass-By Trips



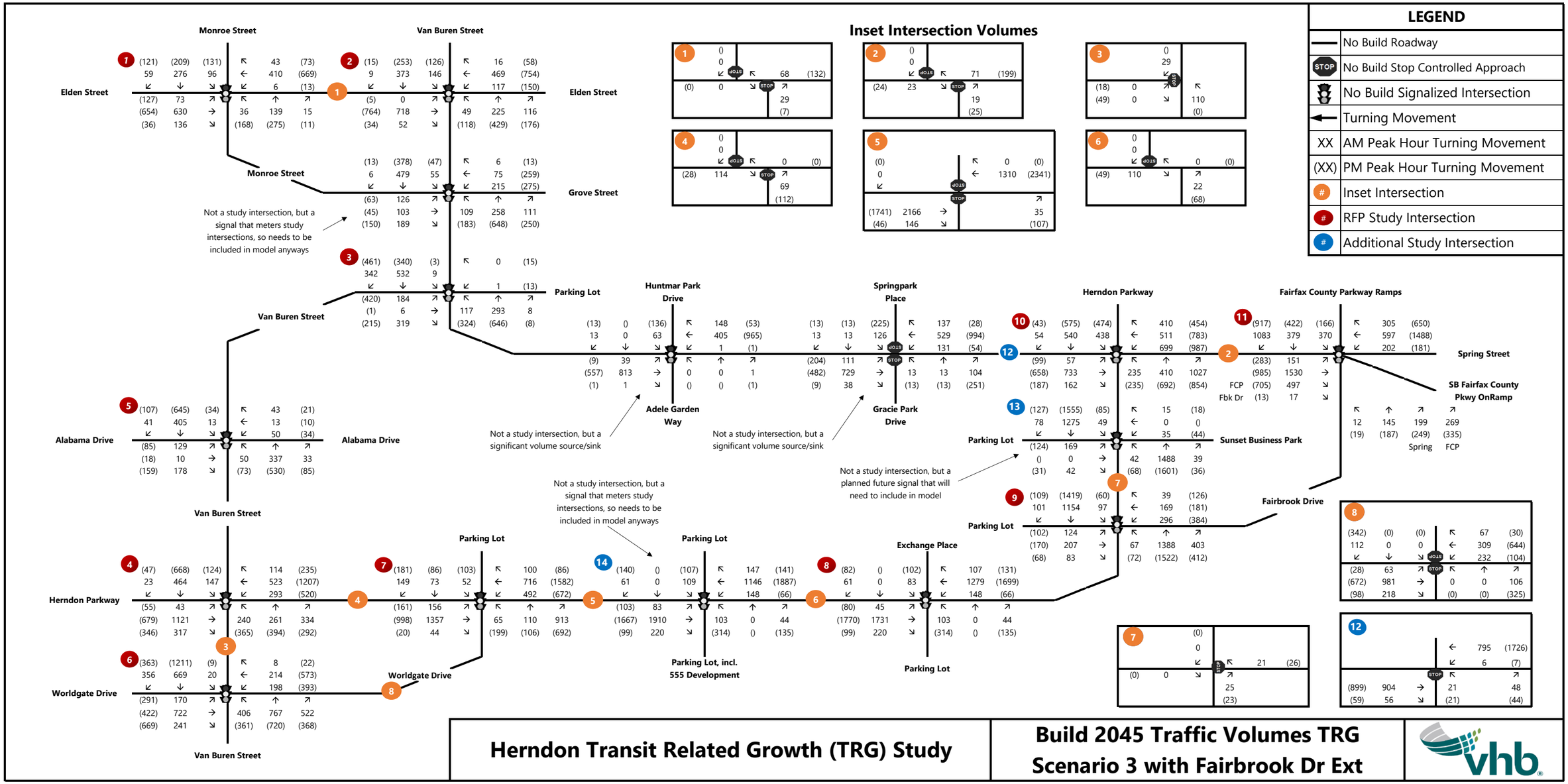
Herndon Transit Related Growth (TRG) Study

TRG Scenario 2 Traffic Volume New Trips



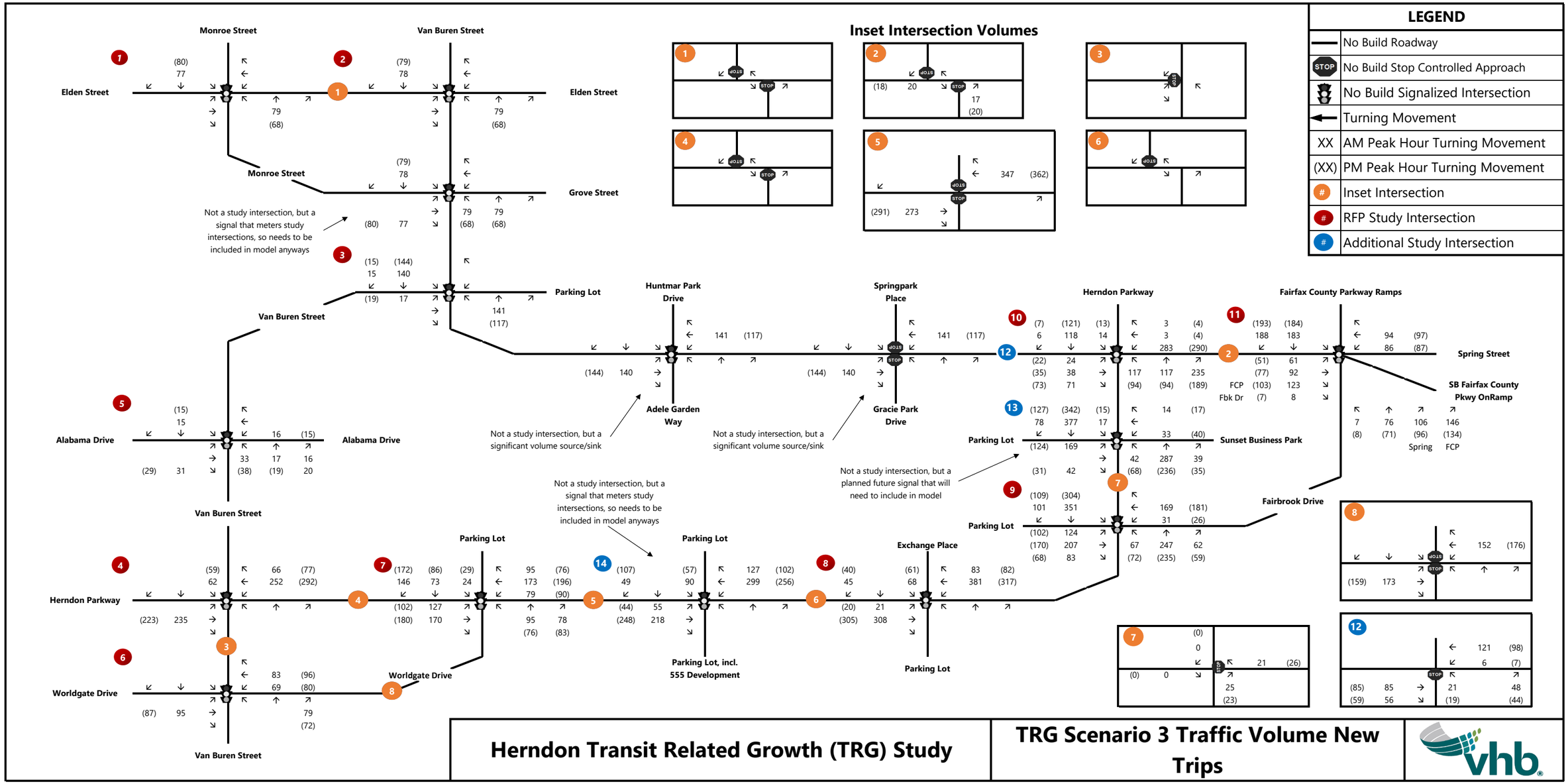
Herndon Transit Related Growth (TRG) Study

TRG Scenario 2 Traffic Volume Pass-By Trips



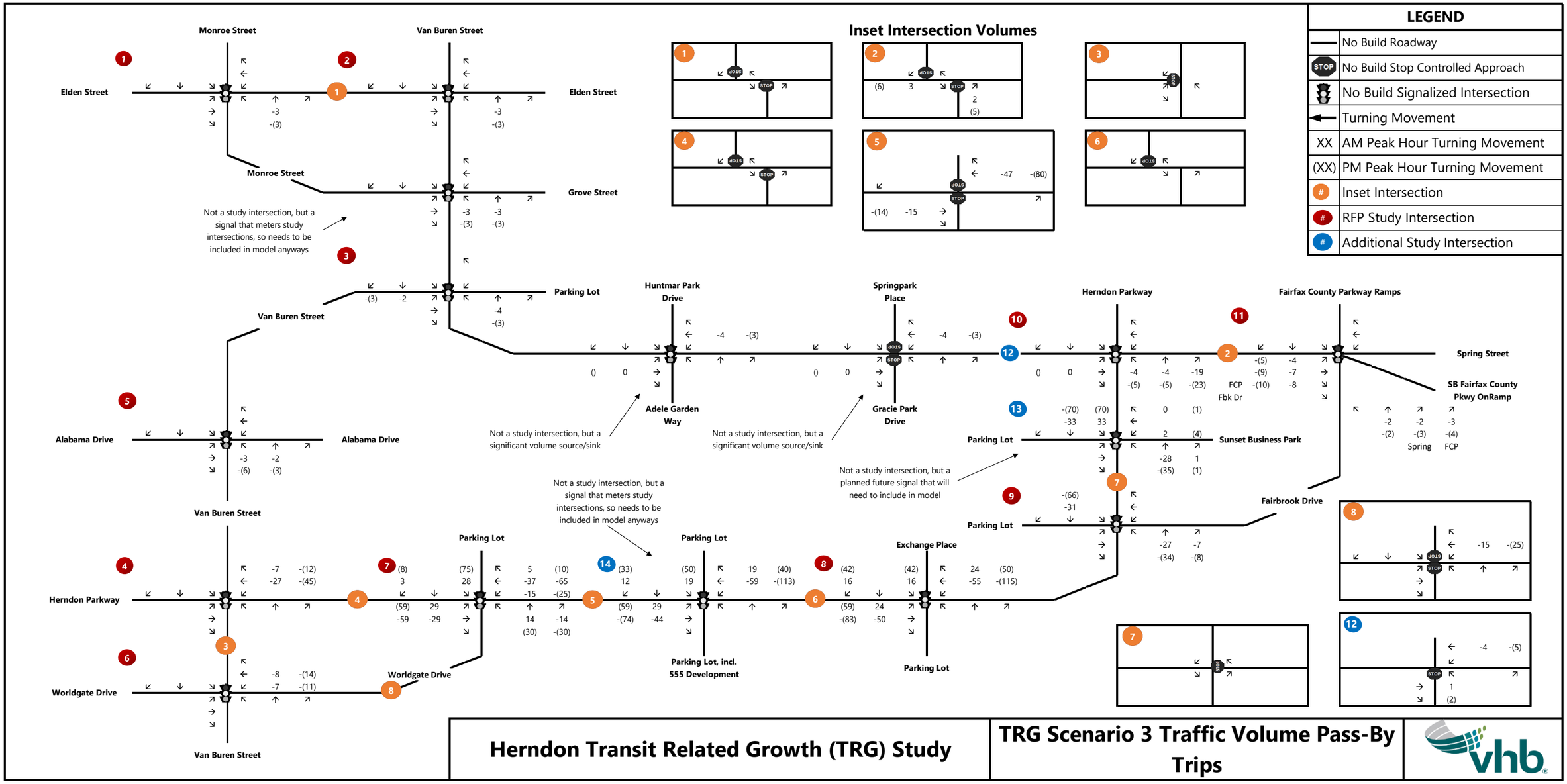
Herndon Transit Related Growth (TRG) Study

Build 2045 Traffic Volumes TRG Scenario 3 with Fairbrook Dr Ext



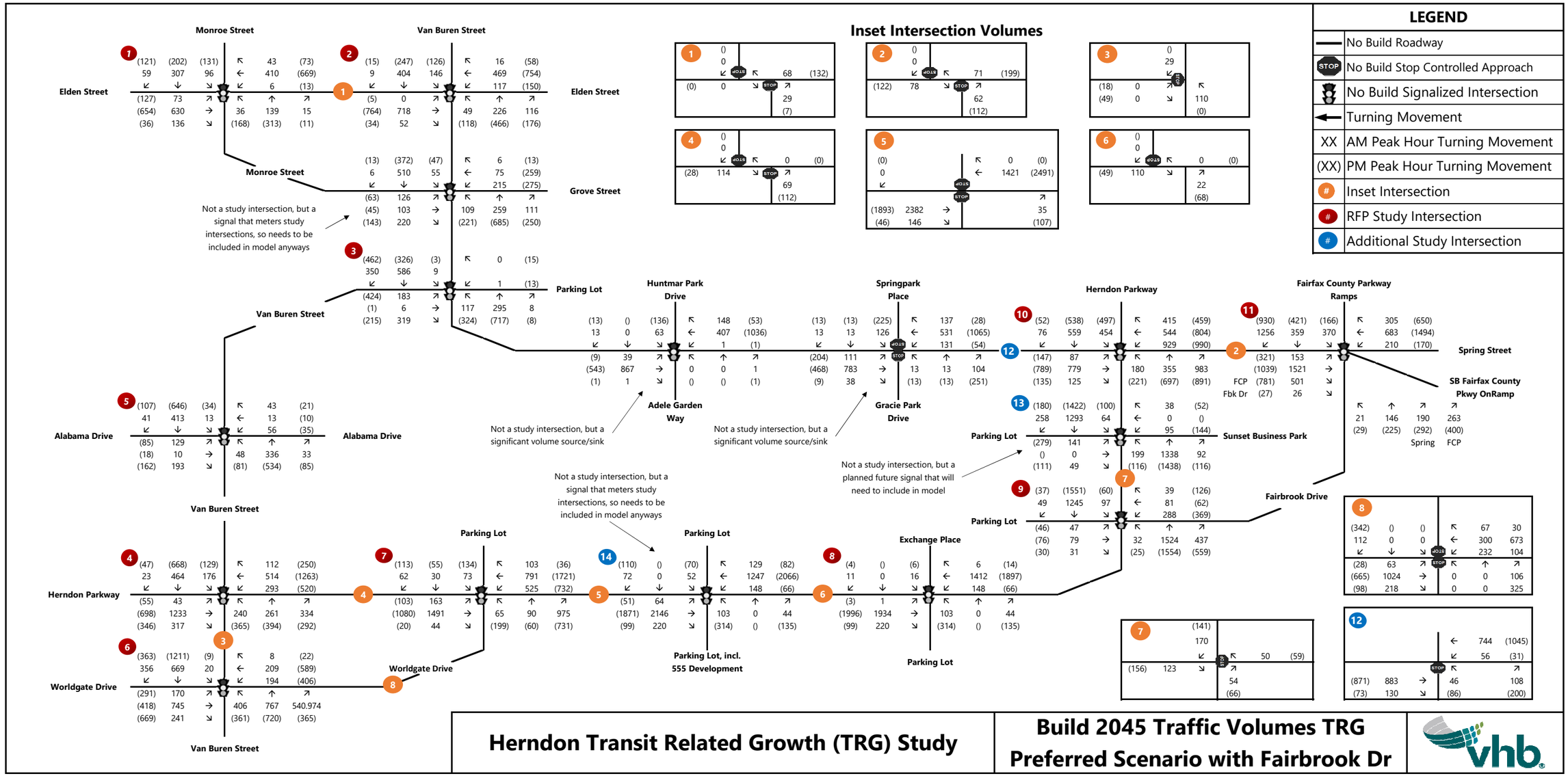
Herndon Transit Related Growth (TRG) Study

TRG Scenario 3 Traffic Volume New Trips



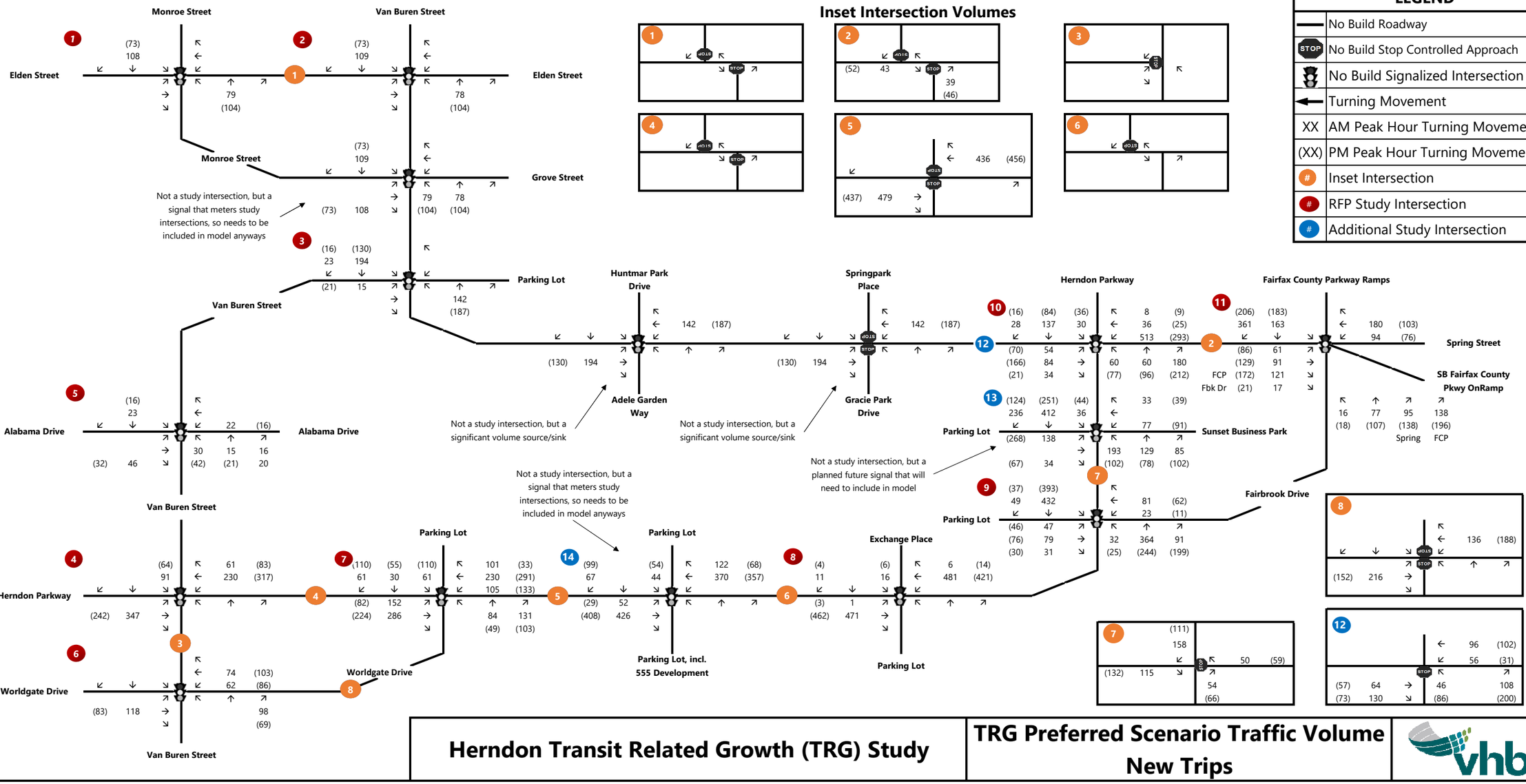
Herndon Transit Related Growth (TRG) Study

TRG Scenario 3 Traffic Volume Pass-By Trips



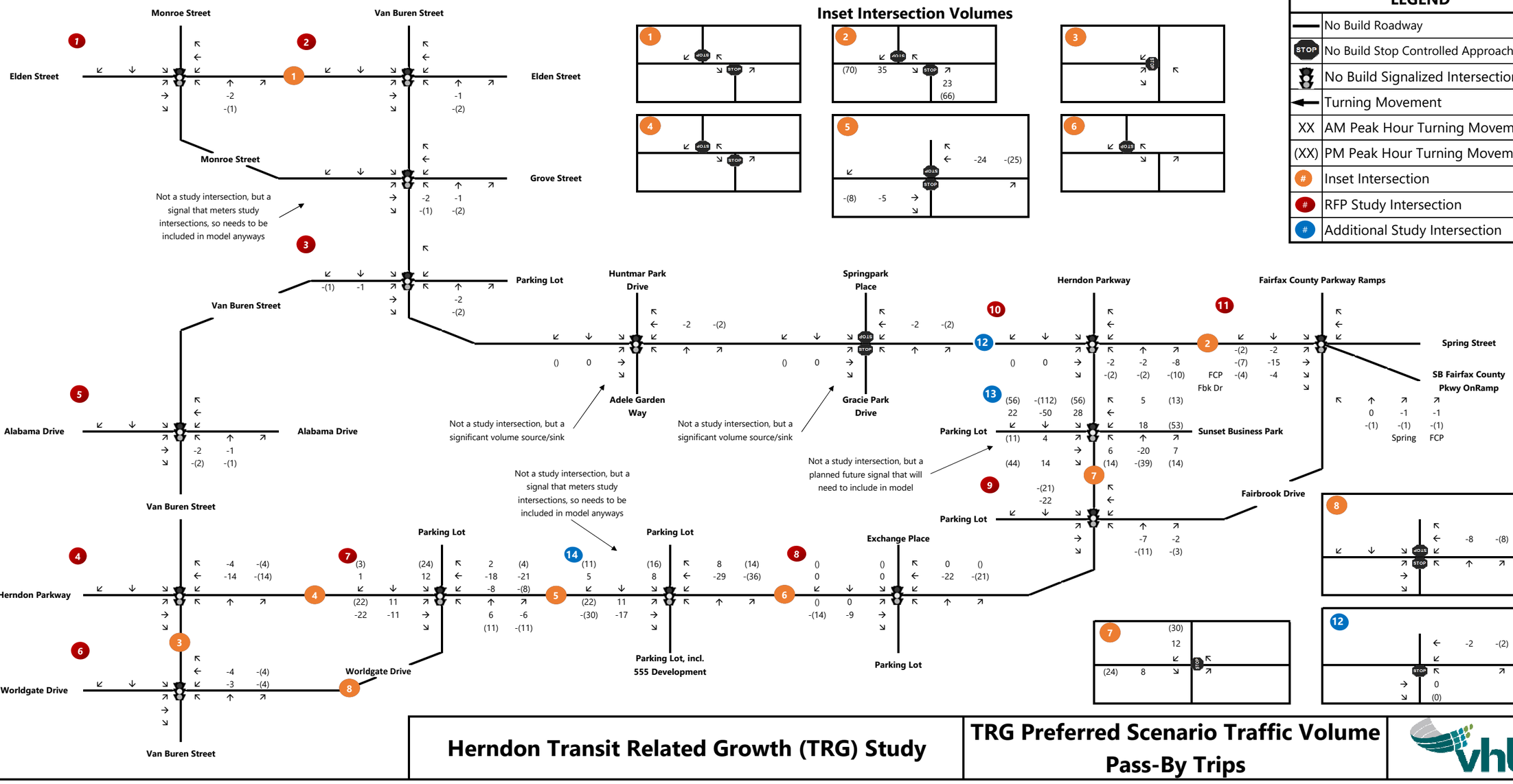
Herndon Transit Related Growth (TRG) Study

Build 2045 Traffic Volumes TRG Preferred Scenario with Fairbrook Dr



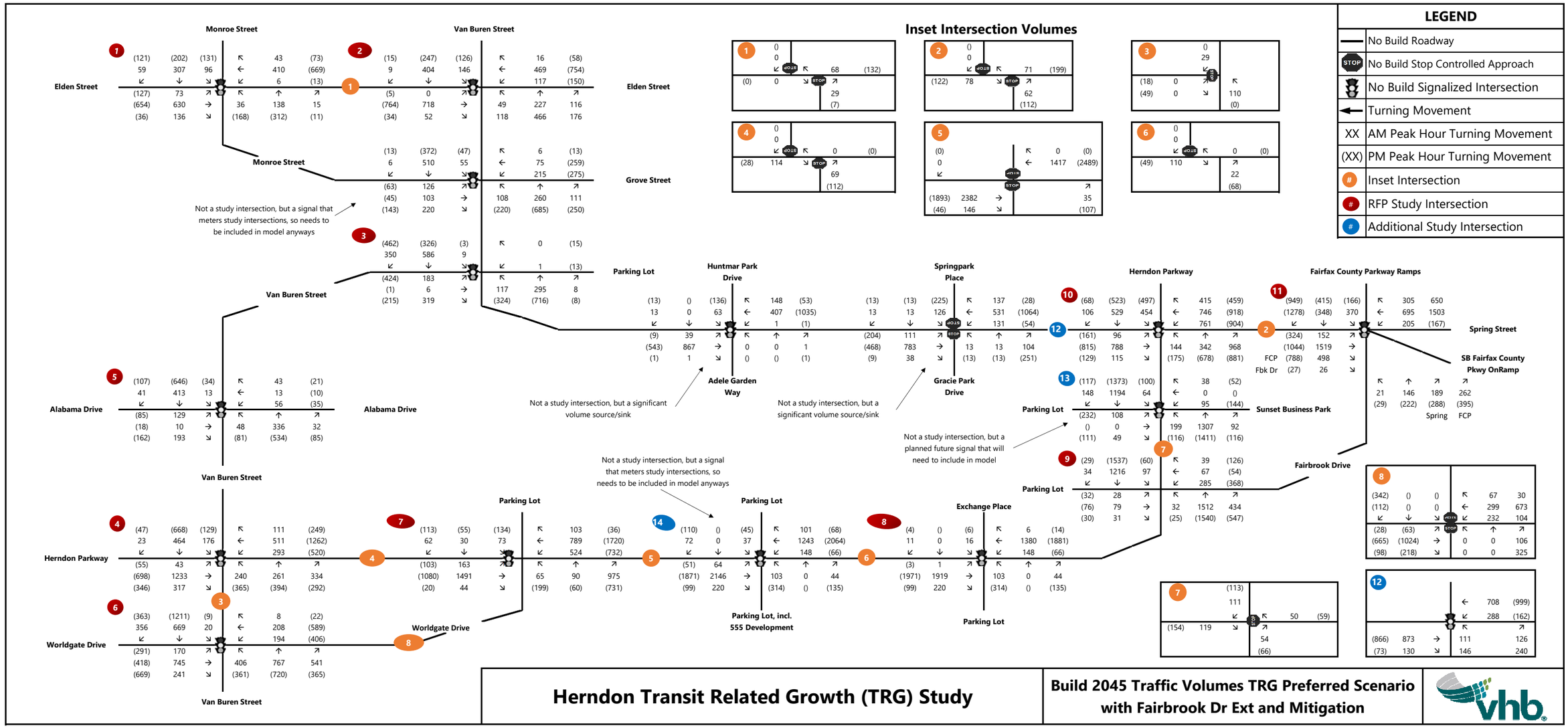
Herndon Transit Related Growth (TRG) Study

TRG Preferred Scenario Traffic Volume New Trips



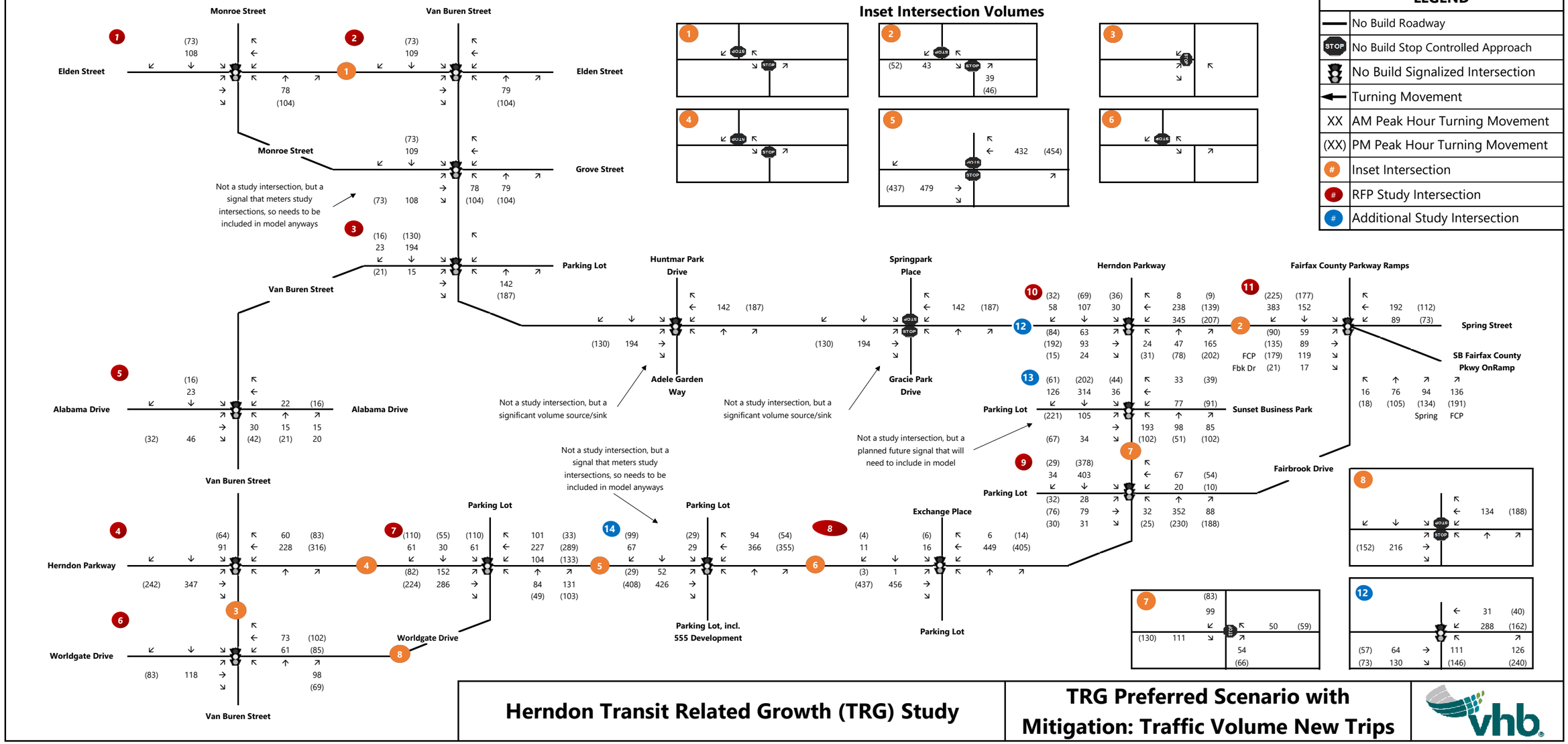
Herndon Transit Related Growth (TRG) Study

TRG Preferred Scenario Traffic Volume Pass-By Trips



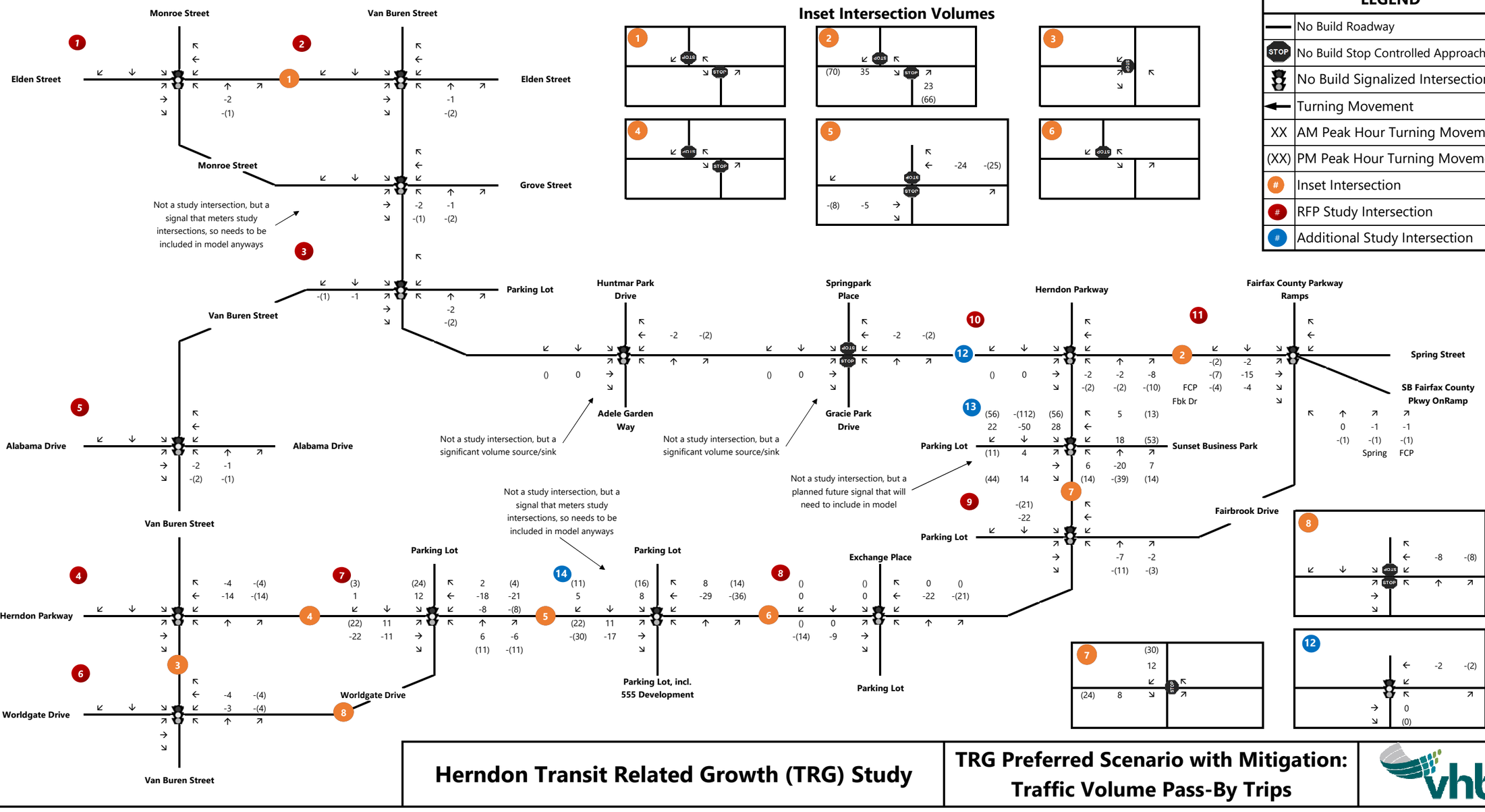
Herndon Transit Related Growth (TRG) Study

Build 2045 Traffic Volumes TRG Preferred Scenario with Fairbrook Dr Ext and Mitigation



Herndon Transit Related Growth (TRG) Study

TRG Preferred Scenario with Mitigation: Traffic Volume New Trips



Herndon Transit Related Growth (TRG) Study

TRG Preferred Scenario with Mitigation: Traffic Volume Pass-By Trips

Existing Conditions: Weekday Morning Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes												Existing Conditions MOEs						Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Calibration Threshold: Within ±	Calibration Threshold: Met Threshold? *	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Calibration Threshold: Within ±	Calibration Threshold: Met Threshold?	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	
Elden Street / Monroe Street	**Signal**	Elden Street	EBL	58	60	2	3%	20%	YES	667	662	-5	-1%	15%	YES	8.1	A	10.0	B	2	59	
			EBT	501	495	-6	-1%	15%	YES							10.5	B			37	439	
			EBR	108	107	-1	-1%	15%	YES							8.8	A			36	438	
		Elden Street	WBL	5	4	-1	-20%	20%	YES	365	356	-9	-2%	15%	YES	15.0	B	6.8	A	0	22	
			WBT	326	318	-8	-2%	15%	YES							6.9	A			13	222	
			WBR	34	34	0	0%	20%	YES							4.8	A			16	261	
		Monroe Street	NBL	29	29	0	0%	20%	YES	74	74	0	0%	20%	YES	75.4	E	63.4	E	12	74	
			NBT	33	33	0	0%	20%	YES							73.5	E			14	84	
			NBR	12	12	0	0%	20%	YES							6.9	A			2	74	
		Monroe Street	SBL	76	75	-1	-1%	20%	YES	242	248	6	2%	15%	YES	43.2	D	41.6	D	21	177	
			SBT	119	123	4	3%	15%	YES							45.7	D			40	194	
			SBR	47	50	3	6%	20%	YES							29.1	C			37	194	
		Intersection		**1,348**	**1,340**	-8	**-1%**	**10%**	**YES**	**1,348**	**1,340**	**-8**	**-1%**	**10%**	**YES**	18.0	B	**18.0**	**B**			
Elden Street / Van Buren Street	**Signal**	Elden Street	EBL	0	0	0	0%	20%	YES	612	603	-9	-1%	15%	YES	0.0	A	11.0	B	24	180	
			EBT	571	563	-8	-1%	15%	YES							11.6	B			24	180	
			EBR	41	40	-1	-2%	20%	YES							2.9	A			0	29	
		Elden Street	WBL	93	90	-3	-3%	20%	YES	479	468	-11	-2%	15%	YES	12.0	B	8.7	A	11	141	
			WBT	373	368	-5	-1%	15%	YES							8.0	A			11	141	
			WBR	13	10	-3	-23%	20%	YES*							4.9	A			15	155	
		Van Buren Street	NBL	39	39	0	0%	20%	YES	220	215	-5	-2%	15%	YES	44.4	D	28.7	C	10	94	
			NBT	89	86	-3	-3%	20%	YES							46.2	D			22	158	
			NBR	92	90	-2	-2%	20%	YES							5.2	A			2	72	
		Van Buren Street	SBL	116	117	1	1%	15%	YES	288	293	5	2%	15%	YES	47.6	D	48.9	D	33	195	
			SBT	165	168	3	2%	15%	YES							50.4	D			50	205	
			SBR	7	8	1	14%	20%	YES							36.2	D			52	215	
		Intersection		**1,311**	**1,286**	-25	**-2%**	**10%**	**YES**	**1,311**	**1,286**	**-25**	**-2%**	**10%**	**YES**	24.3	C	**24.3**	**C**			
Van Buren Street / Spring Street	**Signal**	Van Buren Street	EBL	112	105	-7	-6%	15%	YES	371	358	-13	-4%	15%	YES	12.2	B	8.5	A	0	0	
			EBT	5	5	0	0%	20%	YES							9.3	A			7	99	
			EBR	254	248	-6	-2%	15%	YES							6.9	A			8	113	
		Parking Lot	WBL	1	1	0	0%	20%	YES	1	1	0	0%	20%	YES	14.3	B	14.3	B	0	14	
			WBR	0	0	0	0%	20%	YES							0.0	A			0	0	
		Spring Street	NBL	93	94	1	1%	20%	YES	199	201	2	1%	15%	YES	8.1	A	6.2	A	2	89	
			NBT	100	102	2	2%	20%	YES							4.6	A			2	79	
			NBR	6	5	-1	-17%	20%	YES							1.9	A			1	87	
		Van Buren Street	SBL	7	6	-1	-14%	20%	YES	471	465	-6	-1%	15%	YES	6.2	A	4.8	A	0	30	
			SBT	255	248	-7	-3%	15%	YES							5.9	A			5	95	
			SBR	209	211	2	1%	15%	YES							3.5	A			2	102	
		Intersection		**571**	**560**	-11	**-2%**	**15%**	**YES**	**571**	**560**	**-11**	**-2%**	**15%**	**YES**	11.7	B	**11.7**	**B**			
Spring Street / Herndon Parkway	**Signal**	Spring Street	EBL	26	28	2	8%	20%	YES	594	584	-10	-2%	15%	YES	57.8	E	46.6	D	9	77	
			EBT	546	534	-12	-2%	15%	YES							46.5	D			84	313	
			EBR	22	22	0	0%	20%	YES							34.9	C			91	325	
		Spring Street	WBL	390	394	4	1%	15%	YES	1,114	1,139	25	2%	10%	YES	52.5	D	30.5	C	70	236	
			WBT	400	404	4	1%	15%	YES							29.8	C			41	177	
			WBR	324	341	17	5%	15%	YES							5.8	A			8	132	
		Herndon Parkway	NBL	66	65	-1	-2%	20%	YES	972	924	-48	-5%	15%	YES	32.5	C	56.2	E	6	90	
			NBT	177	169	-8	-5%	15%	YES							46.2	D			287	901	
			NBR	729	690	-39	-5%	15%	YES							60.9	E			564	998	
		Herndon Parkway	SBL	337	338	1	0%	15%	YES	591	589	-2	0%	15%	YES	20.8	C	19.9	B	38	277	
			SBT	216	212	-4	-2%	15%	YES							19.8	B			17	123	
			SBR	38	39	1	3%	20%	YES							12.8	B			16	136	
		Intersection		**2,680**	**2,647**	-33	**-1%**	**10%**	**YES**	**2,680**	**2,647**	**-33**	**-1%**	**10%**	**YES**	47.4	D	**47.4**	**D**			
Spring Street / Fairfax County Parkway	**Signal**	Spring Street	EBL	106	106	0	0%	15%	YES	1,650	1,605	-45	-3%	10%	YES	62.0	E	10.0	A	37	180	
			EBT	1,188	1,159	-29	-2%	10%	YES							7.7	A			28	354	
			EBR	356	340	-16	-4%	15%	YES							1.7	A			0	0	
		Spring Street	WBT	416	407	-9	-2%	15%	YES	659	649	-10	-2%	15%	YES	13.5	B	8.7	A	18	155	
			WBR	243	242	-1	0%	15%	YES							0.6	A			0	0	
		Fairfax County Parkway	SBL	294	294	0	0%	15%	YES	1,048	1,056	8	1%	10%	YES	46.2	D	38.5	D	261	758	
			SBR	754	762	8	1%	15%	YES							35.5	D			261	758	
		Intersection		**3,357**	**3,310**	-47	**-1%**	**10%**	**YES**	**3,357**	**3,310**	**-47**	**-1%**	**10%**	**YES**	18.8	B	**18.8**	**B**			

Note: Average results across 7 microsimulation runs.
* Low volume difference. Percentage difference is not significant. Considered Calibrated.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue.

Existing Conditions: Weekday Morning Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes												Existing Conditions MOEs						Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Calibration Threshold Within ±	Calibration Threshold Met Threshold? *	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Calibration Threshold Within ±	Calibration Threshold Met Threshold?	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	
Van Buren Street / Alabama Drive	**All-Way Stop (Future Signal)**	Alabama Drive	EBL	103	97	-6	-6%	15%	YES	239	239	0	0%	15%	YES	8.9	A	8.3	A	12	121	
			EBT	8	8	0	0%	20%	YES							10.3	B			12	122	
			EBR	128	134	6	5%	15%	YES							7.7	A			12	121	
		Alabama Drive	WBL	32	31	-1	-3%	20%	YES	76	73	-3	-4%	20%	YES	6.8	A	6.3	A	3	89	
			WBT	10	11	1	10%	20%	YES							7.4	A			3	90	
			WBR	34	31	-3	-9%	20%	YES							5.6	A			3	89	
		Van Buren Street	NBL	13	14	1	8%	20%	YES	257	250	-7	-3%	15%	YES	11.5	B	12.3	B	17	177	
			NBT	234	226	-8	-3%	15%	YES							12.5	B			18	178	
			NBR	10	10	0	0%	20%	YES							10.4	B			17	177	
		Van Buren Street	SBL	10	12	2	20%	20%	YES	302	306	4	1%	15%	YES	11.8	B	11.9	B	26	193	
			SBT	259	261	2	1%	15%	YES							12.1	B			26	193	
			SBR	33	33	0	0%	20%	YES							10.7	B			26	193	
		Intersection		**874**	**868**	-6	**-1%**	**15%**	**YES**	**874**	**868**	**-6**	**-1%**	**15%**	**YES**	10.6	B	**10.6**	**B**			
Van Buren Street / Herndon Parkway	**Signal**	Herndon Parkway	EBL	34	34	0	0%	20%	YES	908	906	-2	0%	15%	YES	22.8	C	34.7	C	4	70	
			EBT	605	609	4	1%	15%	YES							36.3	D			105	414	
			EBR	269	263	-6	-2%	15%	YES							32.7	C			120	436	
		Herndon Parkway	WBL	231	203	-28	-12%	15%	YES	399	355	-44	-11%	15%	YES	37.1	D	31.0	C	67	273	
			WBT	146	133	-13	-9%	15%	YES							24.3	C			10	86	
			WBR	22	19	-3	-14%	20%	YES							12.1	B			10	86	
		Van Buren Street	NBL	192	187	-5	-3%	15%	YES	994	952	-42	-4%	15%	YES	17.4	B	43.8	D	236	1048	
			NBT	201	197	-4	-2%	15%	YES							54.4	D			763	1047	
			NBR	601	568	-33	-5%	15%	YES							48.9	D			780	1064	
		Van Buren Street	SBL	43	41	-2	-5%	20%	YES	419	425	6	1%	15%	YES	42.1	D	24.7	C	9	92	
			SBT	358	364	6	2%	15%	YES							23.4	C			28	189	
			SBR	18	20	2	11%	20%	YES							12.0	B			28	189	
		Intersection		**2,720**	**2,638**	-82	**-3%**	**10%**	**YES**	**2,720**	**2,638**	**-82**	**-3%**	**10%**	**YES**	35.9	D	**35.9**	**D**			
Van Buren Street / Worldgate Drive	**Signal**	Worldgate Drive	EBL	222	226	4	2%	15%	YES	446	451	5	1%	15%	YES	48.9	D	28.4	C	52	257	
			EBT	32	29	-3	-9%	20%	YES							46.6	D			52	257	
			EBR	192	196	4	2%	15%	YES							2.0	A			1	77	
		Parking Lot	WBL	3	3	0	0%	20%	YES	6	6	0	0%	20%	YES	45.4	D	50.4	D	1	39	
			WBT	2	3	1	50%	20%	YES*							55.5	E			1	39	
			WBR	1	0	-1	-100%	20%	YES*							29.2	C			0	0	
		Van Buren Street	NBL	323	307	-16	-5%	15%	YES	1,245	1,182	-63	-5%	10%	YES	46.0	D	62.6	E	211	753	
			NBT	859	818	-41	-5%	15%	YES							72.1	E			733	1393	
			NBR	63	57	-6	-10%	20%	YES							16.4	B			0	53	
		Van Buren Street	SBL	22	20	-2	-9%	20%	YES	835	802	-33	-4%	15%	YES	52.8	D	10.3	B	6	66	
			SBT	589	564	-25	-4%	15%	YES							12.5	B			24	201	
			SBR	224	218	-6	-3%	15%	YES							0.7	A			0	0	
		Intersection		**2,532**	**2,441**	-91	**-4%**	**10%**	**YES**	**2,532**	**2,441**	**-91**	**-4%**	**10%**	**YES**	39.1	D	**39.1**	**D**			
Herndon Parkway / Parking Lots by Metro	**Two-Way Stop Control**	Herndon Parkway	EBL	55	58	3	5%	20%	YES	1,248	1,222	-26	-2%	10%	YES	2.0	A	0.3	A	0	51	
			EBT	1,181	1,153	-28	-2%	10%	YES							0.2	A			0	0	
			EBR	12	11	-1	-8%	20%	YES							0.5	A			0	0	
		Herndon Parkway	WBL	26	28	2	8%	20%	YES	440	438	-2	0%	15%	YES	5.4	A	0.6	A	1	57	
			WBT	388	382	-6	-2%	15%	YES							0.2	A			0	13	
			WBR	26	28	2	8%	20%	YES							0.5	A			0	18	
		Parking Lot	NBL	6	5	-1	-17%	20%	YES	6	5	-1	-17%	20%	YES	10.3	B	10.3	B	0	35	
			NBT	0	0	0	0%	20%	YES							0.0	A			0	23	
			NBR	0	0	0	0%	20%	YES							0.0	A			0	35	
		Parking Lot	SBL	9	10	1	11%	20%	YES	15	15	0	0%	20%	YES	8.8	A	7.7	A	1	48	
			SBT	1	1	0	0%	20%	YES							6.1	A			0	30	
			SBR	5	4	-1	-20%	20%	YES							5.4	A			0	47	
		Intersection		**1,709**	**1,680**	-29	**-2%**	**10%**	**YES**	**1,709**	**1,680**	**-29**	**-2%**	**10%**	**YES**	0.5	A	**0.5**	**A**			

Note: Average results across 7 microsimulation runs.
* Low volume difference. Percentage difference is not significant. Considered Calibrated.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue.

Existing Conditions: Weekday Morning Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes												Existing Conditions MOEs						Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Calibration Threshold: Within ±	Calibration Threshold: Met Threshold? *	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Calibration Threshold: Within ±	Calibration Threshold: Met Threshold?	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	
Herndon Parkway / Exchange Place	**Two-Way Stop Control (future signal)**	Herndon Parkway	EBL	26	27	1	4%	20%	YES	1,025	996	-29	-3%	10%	YES	2.1	A	0.3	A	0	57	
			EBT	979	951	-28	-3%	15%	YES							0.2	A			0	0	
			EBR	20	18	-2	-10%	20%	YES							0.5	A			0	0	
		Herndon Parkway	WBL	23	23	0	0%	20%	YES	529	528	-1	0%	15%	YES	0.6	A	0.3	A	0	0	
			WBT	488	490	2	0%	15%	YES							0.3	A			0	4	
			WBR	18	15	-3	-17%	20%	YES							0.6	A			0	4	
		Parking Lot	NBL	9	9	0	0%	20%	YES	43	43	0	0%	20%	YES	7.2	A	6.7	A	3	106	
			NBT	0	0	0	0%	20%	YES							0.0	A			0	58	
			NBR	34	34	0	0%	20%	YES							6.6	A			2	75	
		Exchange Place	SBL	6	6	0	0%	20%	YES	12	12	0	0%	20%	YES	6.7	A	5.7	A	1	55	
			SBT	0	0	0	0%	20%	YES							0.0	A			0	27	
			SBR	6	6	0	0%	20%	YES							4.8	A			1	55	
		Intersection		**1,609**	**1,579**	-30	**-2%**	**10%**	**YES**	**1,609**	**1,579**	**-30**	**-2%**	**10%**	**YES**	0.5	A	**0.5**	**A**			
Herndon Parkway / Fairbrook Drive	**Two-Way Stop Control (future signal)**	Parking Lot	EBL	3	3	0	0%	20%	YES	5	5	0	0%	20%	YES	10.8	B	9.1	A	0	51	
			EBT	0	0	0	0%	20%	YES							0.0	A			0	33	
			EBR	2	2	0	0%	20%	YES							6.5	A			0	50	
		Fairbrook Drive	WBL	4	4	0	0%	20%	YES	10	9	-1	-10%	20%	YES	9.9	A	7.9	A	0	42	
			WBT	0	0	0	0%	20%	YES							0.0	A			0	25	
			WBR	6	5	-1	-17%	20%	YES							6.4	A			0	41	
		Herndon Parkway	NBL	31	29	-2	-6%	20%	YES	1,019	988	-31	-3%	10%	YES	2.0	A	0.3	A	0	44	
			NBT	961	934	-27	-3%	15%	YES							0.2	A			0	19	
			NBR	27	25	-2	-7%	20%	YES							0.7	A			0	32	
		Herndon Parkway	SBL	26	29	3	12%	20%	YES	563	563	0	0%	15%	YES	3.8	A	0.4	A	1	67	
			SBT	523	521	-2	0%	15%	YES							0.2	A			0	19	
			SBR	14	13	-1	-7%	20%	YES							0.8	A			0	28	
		Intersection		**1,597**	**1,565**	-32	**-2%**	**10%**	**YES**	**1,597**	**1,565**	**-32**	**-2%**	**10%**	**YES**	0.4	A	**0.4**	**A**			

Note: Average results across 7 microsimulation runs.
* Low volume difference. Percentage difference is not significant. Considered Calibrated.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue.

Existing Conditions: Weekday Evening Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes												Existing Conditions MOEs						Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Calibration Threshold: Within ±	Calibration Threshold: Met Threshold? *	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Calibration Threshold: Within ±	Calibration Threshold: Met Threshold?	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	
Elden Street / Monroe Street	**Signal**	Elden Street	EBL	101	99	-2	-2%	15%	YES	650	646	-4	-1%	15%	YES	14.2	B	12.6	B	5	124	
			EBT	520	517	-3	-1%	15%	YES							12.5	B			41	416	
			EBR	29	30	1	3%	20%	YES							9.9	A			41	422	
		Elden Street	WBL	10	10	0	0%	20%	YES	600	590	-10	-2%	15%	YES	11.9	B	11.6	B	0	24	
			WBT	532	522	-10	-2%	15%	YES							11.8	B			40	429	
			WBR	58	58	0	0%	20%	YES							10.5	B			50	461	
		Monroe Street	NBL	134	129	-5	-4%	15%	YES	268	263	-5	-2%	15%	YES	55.1	E	53.8	D	41	233	
			NBT	125	125	0	0%	15%	YES							55.0	E			40	239	
			NBR	9	9	0	0%	20%	YES							18.1	B			27	233	
		Monroe Street	SBL	104	105	1	1%	15%	YES	282	285	3	1%	15%	YES	45.6	D	38.8	D	30	189	
			SBT	82	82	0	0%	20%	YES							46.4	D			35	202	
			SBR	96	98	2	2%	20%	YES							25.3	C			36	208	
		Intersection		**1,800**	**1,784**	-16	**-1%**	**10%**	**YES**	**1,800**	**1,784**	**-16**	**-1%**	**10%**	**YES**	22.5	C	**22.5**	**C**			
Elden Street / Van Buren Street	**Signal**	Elden Street	EBL	4	5	1	25%	20%	YES*	639	634	-5	-1%	15%	YES	11.7	B	11.9	B	27	199	
			EBT	608	601	-7	-1%	15%	YES							12.4	B			27	199	
			EBR	27	28	1	4%	20%	YES							2.1	A			0	34	
		Elden Street	WBL	119	120	1	1%	15%	YES	765	760	-5	-1%	15%	YES	14.5	B	11.4	B	26	219	
			WBT	600	596	-4	-1%	15%	YES							11.0	B			26	219	
			WBR	46	44	-2	-4%	20%	YES							8.7	A			26	219	
		Van Buren Street	NBL	94	93	-1	-1%	20%	YES	438	427	-11	-3%	15%	YES	45.5	D	34.6	C	23	153	
			NBT	204	197	-7	-3%	15%	YES							48.9	D			56	285	
			NBR	140	137	-3	-2%	15%	YES							6.9	A			4	104	
		Van Buren Street	SBL	100	100	0	0%	20%	YES	213	214	1	0%	15%	YES	45.5	D	45.4	D	26	154	
			SBT	101	103	2	2%	15%	YES							47.3	D			29	166	
			SBR	12	11	-1	-8%	20%	YES							26.8	C			27	176	
		Intersection		**1,842**	**1,821**	-21	**-1%**	**10%**	**YES**	**1,842**	**1,821**	**-21**	**-1%**	**10%**	**YES**	22.4	C	**22.4**	**C**			
Van Buren Street / Spring Street	**Signal**	Van Buren Street	EBL	261	257	-4	-2%	15%	YES	433	432	-1	0%	15%	YES	19.8	B	13.8	B	27	208	
			EBT	1	1	0	0%	20%	YES							24.0	C			27	208	
			EBR	171	174	3	2%	15%	YES							4.9	A			3	84	
		Parking Lot	WBL	10	11	1	10%	20%	YES	22	23	1	5%	20%	YES	25.4	C	25.3	C	1	42	
			WBR	12	12	0	0%	20%	YES							25.3	C			2	44	
		Spring Street	NBL	258	235	-23	-9%	15%	YES	620	580	-40	-6%	15%	YES	93.3	F	44.9	D	187	717	
			NBT	356	339	-17	-5%	15%	YES							12.0	B			10	184	
			NBR	6	6	0	0%	20%	YES							9.4	A			9	192	
		Van Buren Street	SBL	2	2	0	0%	20%	YES	454	452	-2	0%	15%	YES	11.2	B	30.5	C	0	19	
			SBT	124	127	3	2%	15%	YES							17.4	B			68	358	
			SBR	328	323	-5	-2%	15%	YES							35.8	D			90	380	
		Intersection		**1,075**	**1,035**	-40	**-4%**	**10%**	**YES**	**1,075**	**1,035**	**-40**	**-4%**	**10%**	**YES**	44.8	D	**44.8**	**D**			
Spring Street / Herndon Parkway	**Signal**	Spring Street	EBL	61	61	0	0%	20%	YES	604	608	4	1%	15%	YES	55.5	E	46.0	D	19	113	
			EBT	491	498	7	1%	15%	YES							45.7	D			82	303	
			EBR	52	49	-3	-6%	20%	YES							37.5	D			89	315	
		Spring Street	WBL	602	606	4	1%	15%	YES	1,571	1,574	3	0%	10%	YES	76.3	E	41.2	D	164	551	
			WBT	611	611	0	0%	15%	YES							27.4	C			63	510	
			WBR	358	357	-1	0%	15%	YES							5.2	A			6	118	
		Herndon Parkway	NBL	58	58	0	0%	20%	YES	1,066	1,053	-13	-1%	10%	YES	24.4	C	39.3	D	6	75	
			NBT	341	338	-3	-1%	15%	YES							40.6	D			147	630	
			NBR	667	657	-10	-1%	15%	YES							39.9	D			236	660	
		Herndon Parkway	SBL	367	364	-3	-1%	15%	YES	685	683	-2	0%	15%	YES	28.5	C	25.1	C	60	357	
			SBT	289	290	1	0%	15%	YES							21.8	C			23	173	
			SBR	29	29	0	0%	20%	YES							14.7	B			25	187	
		Intersection		**3,241**	**3,235**	-6	**0%**	**10%**	**YES**	**3,241**	**3,235**	**-6**	**0%**	**10%**	**YES**	46.8	D	**46.8**	**D**			
Spring Street / Fairfax County Parkway	**Signal**	Spring Street	EBL	240	241	1	0%	15%	YES	1,600	1,590	-10	-1%	10%	YES	47.5	D	11.5	B	67	319	
			EBT	791	786	-5	-1%	15%	YES							7.0	A			13	222	
			EBR	569	563	-6	-1%	15%	YES							2.3	A			0	0	
		Spring Street	WBT	1,121	1,114	-7	-1%	10%	YES	1,638	1,624	-14	-1%	10%	YES	16.1	B	11.5	B	65	452	
			WBR	517	510	-7	-1%	15%	YES							1.5	A			0	26	
		Fairfax County Parkway	SBL	132	132	0	0%	15%	YES	740	748	8	1%	15%	YES	53.2	D	42.9	D	193	608	
			SBR	608	616	8	1%	15%	YES							40.7	D			193	608	
		Intersection		**3,978**	**3,962**	-16	**0%**	**10%**	**YES**	**3,978**	**3,962**	**-16**	**0%**	**10%**	**YES**	17.4	B	**17.4**	**B**			

Note: Average results across 20 microsimulation runs.
* Low volume difference. Percentage difference is not significant. Considered Calibrated.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

Existing Conditions: Weekday Evening Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes												Existing Conditions MOEs						Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Calibration Threshold Within ±	Calibration Threshold Met Threshold? *	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Calibration Threshold Within ±	Calibration Threshold Met Threshold?	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	
Van Buren Street / Alabama Drive	**All-Way Stop Control (future signal)**	Alabama Drive	EBL	68	67	-1	-1%	20%	YES	182	181	-1	-1%	15%	YES	8.8	A	8.0	A	8	116	
			EBT	14	14	0	0%	20%	YES							10.0	A			8	116	
			EBR	100	100	0	0%	20%	YES							7.3	A			8	116	
		Alabama Drive	WBL	13	13	0	0%	20%	YES	38	37	-1	-3%	20%	YES	7.1	A	6.7	A	2	69	
			WBT	8	8	0	0%	20%	YES							8.5	A			2	70	
			WBR	17	16	-1	-6%	20%	YES							5.6	A			2	69	
		Van Buren Street	NBL	41	42	1	2%	20%	YES	444	443	-1	0%	15%	YES	27.3	D	28.2	D	90	398	
			NBT	348	348	0	0%	15%	YES							28.6	D			91	399	
			NBR	55	53	-2	-4%	20%	YES							25.9	D			90	398	
		Van Buren Street	SBL	27	25	-2	-7%	20%	YES	586	534	-52	-9%	15%	YES	76.7	F	76.6	F	1256	1629	
			SBT	474	432	-42	-9%	15%	YES							76.8	F			1256	1629	
			SBR	85	77	-8	-9%	20%	YES							75.4	F			1256	1629	
		Intersection		**1,250**	**1,195**	-55	**-4%**	**10%**	**YES**	**1,250**	**1,195**	**-55**	**-4%**	**10%**	**YES**	46.1	E	**46.1**	**E**			
Van Buren Street / Herndon Parkway	**Signal**	Herndon Parkway	EBL	44	44	0	0%	20%	YES	585	580	-5	-1%	15%	YES	25.3	C	35.2	D	6	76	
			EBT	260	258	-2	-1%	15%	YES							42.0	D			72	320	
			EBR	281	278	-3	-1%	15%	YES							30.4	C			87	342	
		Herndon Parkway	WBL	458	456	-2	0%	15%	YES	1,174	1,230	56	5%	10%	YES	48.3	D	40.8	D	154	585	
			WBT	617	675	58	9%	15%	YES							36.7	D			109	548	
			WBR	99	99	0	0%	20%	YES							34.6	C			109	548	
		Van Buren Street	NBL	391	391	0	0%	15%	YES	1,162	1,157	-5	0%	10%	YES	39.0	D	40.4	D	353	1013	
			NBT	301	300	-1	0%	15%	YES							42.7	D			439	1019	
			NBR	470	466	-4	-1%	15%	YES							40.0	D			451	1036	
		Van Buren Street	SBL	25	24	-1	-4%	20%	YES	587	545	-42	-7%	15%	YES	34.8	C	37.3	D	4	58	
			SBT	525	484	-41	-8%	15%	YES							38.1	D			65	342	
			SBR	37	37	0	0%	20%	YES							28.5	C			65	342	
		Intersection		**3,508**	**3,512**	4	**0%**	**10%**	**YES**	**3,508**	**3,512**	**4**	**0%**	**10%**	**YES**	39.2	D	**39.2**	**D**			
Van Buren Street / Worldgate Drive	**Signal**	Worldgate Drive	EBL	295	294	-1	0%	15%	YES	830	831	1	0%	15%	YES	49.5	D	22.9	C	61	251	
			EBT	3	3	0	0%	20%	YES							52.7	D			61	251	
			EBR	532	534	2	0%	15%	YES							8.1	A			24	304	
		Parking Lot	WBL	61	60	-1	-2%	20%	YES	105	104	-1	-1%	15%	YES	54.8	D	45.9	D	25	168	
			WBT	18	17	-1	-6%	20%	YES							56.1	E			25	168	
			WBR	26	27	1	4%	20%	YES							19.6	B			1	75	
		Van Buren Street	NBL	208	201	-7	-3%	15%	YES	1,040	1,032	-8	-1%	10%	YES	53.6	D	33.7	C	41	177	
			NBT	826	826	0	0%	15%	YES							29.1	C			118	560	
			NBR	6	5	-1	-17%	20%	YES							2.9	A			0	17	
		Van Buren Street	SBL	7	6	-1	-14%	20%	YES	1,303	1,257	-46	-4%	10%	YES	51.3	D	17.2	B	2	39	
			SBT	1,096	1,059	-37	-3%	10%	YES							20.0	B			73	378	
			SBR	200	192	-8	-4%	15%	YES							0.7	A			0	37	
		Intersection		**3,278**	**3,224**	-54	**-2%**	**10%**	**YES**	**3,278**	**3,224**	**-54**	**-2%**	**10%**	**YES**	24.9	C	**24.9**	**C**			
Herndon Parkway / Parking Lots by Metro	**Two-Way Stop Control**	Herndon Parkway	EBL	11	11	0	0%	20%	YES	798	790	-8	-1%	15%	YES	4.8	A	0.2	A	0	31	
			EBT	785	777	-8	-1%	15%	YES							0.1	A			0	0	
			EBR	2	2	0	0%	20%	YES							0.4	A			0	0	
		Herndon Parkway	WBL	5	5	0	0%	20%	YES	1,122	1,122	0	0%	10%	YES	1.9	A	0.4	A	0	29	
			WBT	1,113	1,113	0	0%	10%	YES							0.4	A			0	3	
			WBR	4	4	0	0%	20%	YES							0.7	A			0	4	
		Parking Lot	NBL	17	17	0	0%	20%	YES	56	55	-1	-2%	20%	YES	12.1	B	8.5	A	2	69	
			NBT	0	0	0	0%	20%	YES							0.0	A			1	55	
			NBR	39	38	-1	-3%	20%	YES							6.9	A			2	69	
		Parking Lot	SBL	17	17	0	0%	20%	YES	61	61	0	0%	20%	YES	15.7	C	10.2	B	4	82	
			SBT	0	0	0	0%	20%	YES							0.0	A			1	62	
			SBR	44	44	0	0%	20%	YES							8.1	A			3	81	
		Intersection		**2,037**	**2,028**	-9	**0%**	**10%**	**YES**	**2,037**	**2,028**	**-9**	**0%**	**10%**	**YES**	0.8	A	**0.8**	**A**			

Note: Average results across 20 microsimulation runs.
* Low volume difference. Percentage difference is not significant. Considered Calibrated.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

Existing Conditions: Weekday Evening Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes												Existing Conditions MOEs						Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Calibration Threshold		Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Calibration Threshold		Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	
								Within ±	Met Threshold? *					Within ±	Met Threshold?							
Herndon Parkway / Exchange Place	**Two-Way Stop Control (future signal)**	Herndon Parkway	EBL	22	22	0	0%	20%	YES	997	984	-13	-1%	15%	YES	2.8	A	0.2	A	0	49	
			EBT	964	951	-13	-1%	15%	YES							0.2	A			0	6	
			EBR	11	11	0	0%	20%	YES							0.5	A			0	9	
		Herndon Parkway	WBL	13	13	0	0%	20%	YES	1,002	1,003	1	0%	10%	YES	0.6	A	0.4	A	0	0	
			WBT	985	986	1	0%	15%	YES							0.4	A			0	0	
			WBR	4	4	0	0%	20%	YES							0.6	A			0	0	
		Parking Lot	NBL	21	20	-1	-5%	20%	YES	68	68	0	0%	20%	YES	7.3	A	6.9	A	5	106	
			NBT	0	0	0	0%	20%	YES							0.0	A			1	62	
			NBR	47	48	1	2%	20%	YES							6.7	A			3	78	
		Exchange Place	SBL	8	8	0	0%	20%	YES	30	31	1	3%	20%	YES	9.2	A	7.3	A	1	71	
			SBT	0	0	0	0%	20%	YES							0.0	A			0	44	
			SBR	22	23	1	5%	20%	YES							6.6	A			2	71	
		Intersection		**2,097**	**2,086**	-11	**-1%**	**10%**	**YES**	**2,097**	**2,086**	**-11**	**-1%**	**10%**	**YES**	0.6	A	**0.6**	**A**			
Herndon Parkway / Fairbrook Drive	**Two-Way Stop Control (future signal)**	Parking Lot	EBL	17	19	2	12%	20%	YES	41	43	2	5%	20%	YES	11.7	B	9.4	A	2	66	
			EBT	0	0	0	0%	20%	YES							0.0	A			1	49	
			EBR	24	24	0	0%	20%	YES							7.6	A			2	65	
		Fairbrook Drive	WBL	15	15	0	0%	20%	YES	28	28	0	0%	20%	YES	11.0	B	9.1	A	1	63	
			WBT	0	0	0	0%	20%	YES							0.0	A			0	50	
			WBR	13	13	0	0%	20%	YES							7.0	A			1	62	
		Herndon Parkway	NBL	1	1	0	0%	20%	YES	1,019	1,007	-12	-1%	10%	YES	3.8	A	0.2	A	0	13	
			NBT	1,012	999	-13	-1%	10%	YES							0.2	A			0	3	
			NBR	6	7	1	17%	20%	YES							0.6	A			0	7	
		Herndon Parkway	SBL	13	14	1	8%	20%	YES	958	979	21	2%	15%	YES	4.2	A	0.4	A	0	48	
			SBT	943	963	20	2%	15%	YES							0.4	A			0	5	
			SBR	2	2	0	0%	20%	YES							0.8	A			0	8	
		Intersection		**2,046**	**2,057**	11	**1%**	**10%**	**YES**	**2,046**	**2,057**	**11**	**1%**	**10%**	**YES**	0.6	A	**0.6**	**A**			

Note: Average results across 20 microsimulation runs.
* Low volume difference. Percentage difference is not significant. Considered Calibrated.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

No Build 2045 Conditions: Weekday Morning Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								No Build 2045 Conditions MOEs							Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	Available Queue Storage (ft)	
Elden Street / Monroe Street	**Signal**	Elden Street	EBL	73	74	1	1%	839	834	-5	-1%	20.0	C	15.4	B	4	77	150	
			EBT	630	627	-3	0%					15.2	B			90	656	250	To Lynn St signal, which is not in model
			EBR	136	133	-3	-2%					13.7	B			87	650	250	
		Elden Street	WBL	6	5	-1	-17%	459	454	-5	-1%	32.3	C	25.4	C	1	34	875	To Van Buren St signal
			WBT	410	405	-5	-1%					25.6	C			73	419	875	
			WBR	43	44	1	2%					23.2	C			78	457	875	
		Monroe Street	NBL	36	34	-2	-6%	114	115	1	1%	60.6	E	56.6	E	11	87	100	
			NBT	63	66	3	5%					64.5	E			25	140	900	To Van Buren St signal
			NBR	15	15	0	0%					12.6	B			8	130	900	
		Monroe Street	SBL	96	92	-4	-4%	373	378	5	1%	44.1	D	46.6	D	39	250	-	No upstream control within reasonable distance
			SBT	218	226	8	4%					49.9	D			79	274	-	
			SBR	59	60	1	2%					38.1	D			76	274	250	
		Intersection		**1,785**	**1,781**	-4	**0%**	**1,785**	**1,781**	**-4**	**0%**	27.2	C	**27.2**	**C**				
Elden Street / Van Buren Street	**Signal**	Elden Street	EBL	0	0	0	0%	770	751	-19	-2%	0.0	A	11.7	B	30	274	850	
			EBT	718	690	-28	-4%					12.4	B			30	274	850	To Monroe Street signal
			EBR	52	61	9	17%					3.2	A			0	46	850	
		Elden Street	WBL	117	115	-2	-2%	602	587	-15	-2%	28.5	C	18.4	B	33	217	1500	To Post Drive signal, which is not in model
			WBT	469	459	-10	-2%					16.1	B			33	217	1500	
			WBR	16	13	-3	-19%					10.6	B			40	231	1500	
		Van Buren Street	NBL	49	49	0	0%	316	312	-4	-1%	48.1	D	32.7	C	13	103	150	
			NBT	151	146	-5	-3%					49.5	D			41	204	450	To Monroe St / Grove St signal
			NBR	116	117	1	1%					5.3	A			3	90	450	
		Van Buren Street	SBL	146	146	0	0%	470	481	11	2%	38.7	D	45.2	D	39	322	325	No upstream control within reasonable distance
			SBT	315	325	10	3%					48.4	D			97	404	-	
			SBR	9	10	1	11%					36.6	D			99	415	-	
		Intersection		**1,688**	**1,650**	-38	**-2%**	**1,688**	**1,650**	**-38**	**-2%**	31.2	C	**31.2**	**C**				
Van Buren Street / Spring Street	**Signal**	Van Buren Street	EBL	170	165	-5	-3%	495	493	-2	0%	13.3	B	10.5	B	0	4	1600	To Alabama Dr signal
			EBT	6	5	-1	-17%					15.5	B			13	144	1600	
			EBR	319	323	4	1%					9.0	A			15	170	150	
		Parking Lot	WBL	1	0	-1	-100%	1	0	-1	-100%	0.0	A	0.0	A	0	0	-	
			WBR	0	0	0	0%					0.0	A			0	0	-	
		Spring Street	NBL	117	121	4	3%	282	289	7	2%	13.6	B	8.7	A	4	105	200	
			NBT	157	162	5	3%					5.3	A			3	92	800	To Huntmar Park Dr signal
			NBR	8	6	-2	-25%					3.1	A			2	100	800	
		Van Buren Street	SBL	9	9	0	0%	767	777	10	1%	5.6	A	7.0	A	0	28	275	
			SBT	428	426	-2	0%					7.8	A			13	202	1200	To Monroe St / Grove St signal
			SBR	330	342	12	4%					6.0	A			9	207	1200	
		Intersection		**778**	**782**	4	**1%**	**778**	**782**	**4**	**1%**	16.8	B	**16.8**	**B**				
Spring Street / Herndon Parkway	**Signal**	Spring Street	EBL	33	37	4	12%	855	855	0	0%	72.0	E	63.1	E	14	87	200	
			EBT	686	684	-2	0%					64.5	E			124	357	2300	To Huntmar Park Dr signal
			EBR	136	134	-2	-1%					53.3	D			125	361	2300	
		Spring Street	WBL	938	937	-1	0%	1,848	1,850	2	0%	39.6	D	31.9	C	140	606	375	
			WBT	503	508	5	1%					35.4	D			61	377	550	To Ffx County Pkwy signal
			WBR	407	405	-2	0%					9.6	A			20	233	550	
		Herndon Parkway	NBL	129	130	1	1%	1,538	1,514	-24	-2%	50.9	D	36.8	D	29	190	300	
			NBT	299	302	3	1%					46.8	D			143	652	500	To Sunset Business Park
			NBR	1,110	1,082	-28	-3%					32.4	C			143	652	500	
		Herndon Parkway	SBL	424	420	-4	-1%	930	932	2	0%	73.9	E	52.3	D	100	293	500	
			SBT	458	461	3	1%					35.2	D			57	262	2300	To Grove St signal
			SBR	48	51	3	6%					30.2	C			57	265	2300	
		Intersection		**4,241**	**4,219**	-22	**-1%**	**4,241**	**4,219**	**-22**	**-1%**	51.5	D	**51.5**	**D**				

Note: Average results across 7 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

No Build 2045 Conditions: Weekday Morning Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								No Build 2045 Conditions MOEs							Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	Available Queue Storage (ft)	
Spring Street / Fairfax County Parkway	**Signal**	Spring Street	EBL	177	177	0	0%	2,268	2,235	-33	-1%	41.1	D	12.1	B	39	294	250	
			EBT	1,558	1,533	-25	-2%					11.9	B			67	534	550	To Herndon Parkway signal
			EBR	533	525	-8	-2%					2.9	A			0	0	550	
		Spring Street	WBT	673	667	-6	-1%	978	969	-9	-1%	36.9	D	29.3	C	92	402	1650	To Target signal
			WBR	305	302	-3	-1%					12.6	B			47	385	1650	
		Fairfax County Parkway	SBL	370	370	0	0%	1,616	1,619	3	0%	45.9	D	31.7	C	138	838	600	To Ffx Pkwy signal, which is not in model
			SBR	1,246	1,249	3	0%					27.5	C			180	878	600	
		Intersection		**4,862**	**4,823**	-39	**-1%**	**4,862**	**4,823**	**-39**	**-1%**	22.1	C	**22.1**	**C**				
Van Buren Street / Alabama Drive	**Signal**	Alabama Drive	EBL	129	128	-1	-1%	291	291	0	0%	43.2	D	36.0	D	61	308	-	
			EBT	10	11	1	10%					38.7	D			61	308	-	
			EBR	152	152	0	0%					29.7	C			62	315	-	
		Alabama Drive	WBL	36	35	-1	-3%	92	88	-4	-4%	31.8	C	24.9	C	11	120	-	
			WBT	13	13	0	0%					38.6	D			11	120	-	
			WBR	43	40	-3	-7%					14.3	B			11	131	-	
		Van Buren Street	NBL	22	22	0	0%	362	364	2	1%	6.0	A	3.9	A	6	148	1125	To Herndon Parkway signal
			NBT	323	327	4	1%					3.8	A			7	149	1125	
			NBR	17	15	-2	-12%					2.9	A			5	148	1125	
		Van Buren Street	SBL	13	17	4	31%	447	461	14	3%	14.4	B	11.5	B	35	345	1600	To Van Buren St signal
			SBT	393	404	11	3%					11.5	B			35	345	1600	
			SBR	41	40	-1	-2%					10.4	B			32	324	1600	
		Intersection		**1,192**	**1,204**	12	**1%**	**1,192**	**1,204**	**12**	**1%**	16.1	B	**16.1**	**B**				
Van Buren Street / Herndon Parkway	**Signal**	Herndon Parkway	EBL	43	42	-1	-2%	1,286	1,274	-12	-1%	64.3	E	33.1	C	14	101	175	
			EBT	926	925	-1	0%					38.8	D			129	560	1950	To Campbell Way signal, which is not in model
			EBR	317	307	-10	-3%					11.8	B			20	197	1950	
		Herndon Parkway	WBL	293	290	-3	-1%	658	652	-6	-1%	58.0	E	42.0	D	57	181	350	
			WBT	307	305	-2	-1%					30.4	C			31	172	875	To Worldgate Drive signal
			WBR	58	57	-1	-2%					23.6	C			31	172	875	
		Van Buren Street	NBL	240	245	5	2%	835	848	13	2%	25.8	C	14.3	B	32	257	375	To Office Park signal
			NBT	261	268	7	3%					12.5	B			19	245	375	
			NBR	334	335	1	0%					7.3	A			10	195	300	
		Van Buren Street	SBL	95	90	-5	-5%	582	590	8	1%	37.2	D	35.5	D	17	128	175	
			SBT	464	477	13	3%					35.7	D			63	458	1125	To Alabama Dr signal
			SBR	23	23	0	0%					25.5	C			63	458	1125	
		Intersection		**3,361**	**3,364**	3	**0%**	**3,361**	**3,364**	**3**	**0%**	30.5	C	**30.5**	**C**				
Van Buren Street / Worldgate Drive	**Signal**	Worldgate Drive	EBL	170	173	3	2%	1,051	1,046	-5	0%	24.4	C	28.7	C	25	179	400	
			EBT	640	630	-10	-2%					39.9	D			82	325	-	
			EBR	241	243	2	1%					2.8	A			3	114	875	
		Worldgate Drive	WBL	139	139	0	0%	289	293	4	1%	64.5	E	32.4	C	51	207	275	
			WBT	142	147	5	4%					3.2	A			0	5	600	To Herndon Pkwy signal
			WBR	8	7	-1	-13%					9.3	A			0	39	600	
		Van Buren Street	NBL	406	379	-27	-7%	1,626	1,607	-19	-1%	44.5	D	22.6	C	62	283	250	
			NBT	767	783	16	2%					19.0	B			53	351	1650	To Eastpark Dr signal
			NBR	453	445	-8	-2%					10.3	B			21	244	250	
		Van Buren Street	SBL	20	22	2	10%	1,045	1,056	11	1%	67.5	E	18.3	B	8	60	200	
			SBT	669	673	4	1%					25.5	C			57	308	400	To Office Park signal
			SBR	356	361	5	1%					2.0	A			1	155	400	
		Intersection		**4,011**	**4,002**	-9	**0%**	**4,011**	**4,002**	**-9**	**0%**	23.8	C	**23.8**	**C**				

Note: Average results across 7 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

No Build 2045 Conditions: Weekday Morning Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								No Build 2045 Conditions MOEs							Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	Available Queue Storage (ft)	
Herndon Parkway / Worldgate Drive	**Signal**	Herndon Parkway	EBL	1	1	0	0%	1,310	1,310	0	0%	54.1	D	23.2	C	0	15	175	
			EBT	1,265	1,265	0	0%					23.3	C			140	596	850	To Van Buren St signal
			EBR	44	44	0	0%					20.4	C			141	599	850	
		Herndon Parkway	WBL	433	434	1	0%	1,026	1,022	-4	0%	58.0	E	26.0	C	81	336	250	
			WBT	593	588	-5	-1%					2.5	A			4	97	875	To 555 signal
			WBR	0	0	0	0%					0.0	A			3	107	875	
		Worldgate Drive	NBL	65	59	-6	-9%	937	924	-13	-1%	54.2	D	27.0	C	80	383	600	
			NBT	0	0	0	0%					0.0	A			80	383	600	To Van Buren St signal
			NBR	872	865	-7	-1%					25.1	C			80	383	600	
		Worldgate Drive	SBL	0	0	0	0%	0	0	0	0%	0.0	A	0.0	A	0	0	75	
			SBT	0	0	0	0%					0.0	A			0	0	-	
			SBR	0	0	0	0%					0.0	A			0	0	-	
		Intersection		**3,273**	**3,256**	-17	**-1%**	**3,273**	**3,256**	**-17**	**-1%**	25.2	C	**25.2**	**C**				
Herndon Parkway / Exchange Place	**Signal**	Herndon Parkway	EBL	33	33	0	0%	1,764	1,722	-42	-2%	8.8	A	10.3	B	1	40	175	
			EBT	1,511	1,481	-30	-2%					10.3	B			72	767	650	To 555 signal
			EBR	220	208	-12	-5%					10.9	B			73	772	650	
		Herndon Parkway	WBL	148	146	-2	-1%	1,239	1,240	1	0%	15.6	B	9.0	A	7	117	175	
			WBT	1,068	1,073	5	0%					8.2	A			28	395	550	To Fairbrook Dr signal
			WBR	23	21	-2	-9%					7.8	A			29	405	550	
		Parking Lot	NBL	103	99	-4	-4%	147	145	-2	-1%	46.0	D	33.6	C	26	153	-	
			NBT	0	0	0	0%					0.0	A			26	153	-	
			NBR	44	46	2	5%					6.8	A			1	46	75	
		Exchange Place	SBL	8	8	0	0%	16	16	0	0%	52.7	D	31.4	C	2	45	-	
			SBT	0	0	0	0%					0.0	A			2	45	-	
			SBR	8	8	0	0%					10.1	B			1	51	-	
		Intersection		**3,166**	**3,123**	-43	**-1%**	**3,166**	**3,123**	**-43**	**-1%**	11.0	B	**11.0**	**B**				
Herndon Parkway / Fairbrook Drive	**Signal**	Parking Lot	EBL	4	4	0	0%	7	7	0	0%	52.9	D	33.1	C	1	25	75	
			EBT	0	0	0	0%					0.0	A			0	0	-	
			EBR	3	3	0	0%					6.8	A			0	15	-	
		Fairbrook Drive	WBL	93	99	6	6%	193	199	6	3%	47.6	D	28.3	C	22	98	175	
			WBT	0	0	0	0%					0.0	A			22	98	-	
			WBR	100	100	0	0%					9.3	A			1	81	-	
		Herndon Parkway	NBL	39	39	0	0%	1,563	1,532	-31	-2%	2.0	A	5.0	A	0	21	150	
			NBT	1,373	1,343	-30	-2%					5.1	A			25	539	550	To Exchange Pl signal
			NBR	151	150	-1	-1%					4.8	A			0	50	125	
		Herndon Parkway	SBL	290	295	5	2%	1,451	1,438	-13	-1%	23.3	C	21.9	C	30	386	150	
			SBT	1,143	1,127	-16	-1%					21.5	C			99	621	825	To Sunset Business Park
			SBR	18	16	-2	-11%					21.7	C			100	626	825	
		Intersection		**3,214**	**3,176**	-38	**-1%**	**3,214**	**3,176**	**-38**	**-1%**	14.2	B	**14.2**	**B**				

Note: Average results across 7 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

No Build 2045 Conditions: Weekday Evening Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								No Build 2045 Conditions MOEs							Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	Available Queue Storage (ft)	
Elden Street / Monroe Street	**Signal**	Elden Street	EBL	127	125	-2	-2%	817	816	-1	0%	38.4	D	24.6	C	16	275	150	
			EBT	654	655	1	0%					22.2	C			153	890	250	To Lynn St signal, which is not in model
			EBR	36	36	0	0%					21.1	C			152	889	250	
		Elden Street	WBL	13	13	0	0%	755	747	-8	-1%	37.4	D	33.6	C	2	43	875	To Van Buren St signal
			WBT	669	663	-6	-1%					33.9	C			258	919	875	
			WBR	73	71	-2	-3%					30.2	C			268	957	875	
		Monroe Street	NBL	168	162	-6	-4%	398	391	-7	-2%	53.6	D	52.4	D	58	441	100	
			NBT	219	218	-1	0%					52.6	D			80	443	900	To Van Buren St signal
			NBR	11	11	0	0%					28.1	C			64	437	900	
		Monroe Street	SBL	131	127	-4	-3%	382	382	0	0%	40.9	D	36.4	D	39	230	-	No upstream control within reasonable distance
			SBT	130	132	2	2%					41.1	D			51	238	-	
			SBR	121	123	2	2%					26.9	C			49	238	250	
		Intersection		**2,352**	**2,336**	-16	**-1%**	**2,352**	**2,336**	**-16**	**-1%**	34.1	C	**34.1**	**C**				
Elden Street / Van Buren Street	**Signal**	Elden Street	EBL	5	5	0	0%	803	800	-3	0%	36.2	D	23.2	C	61	335	850	
			EBT	764	758	-6	-1%					24.1	C			61	335	850	To Monroe Street signal
			EBR	34	37	3	9%					3.2	A			0	33	850	
		Elden Street	WBL	150	153	3	2%	962	966	4	0%	41.0	D	27.4	C	88	414	1500	To Post Drive signal, which is not in model
			WBT	754	756	2	0%					25.3	C			88	414	1500	
			WBR	58	57	-1	-2%					19.6	B			97	428	1500	
		Van Buren Street	NBL	118	114	-4	-3%	668	650	-18	-3%	56.1	E	46.4	D	33	287	150	
			NBT	374	360	-14	-4%					60.0	E			144	528	450	To Monroe St / Grove St signal
			NBR	176	176	0	0%					12.3	B			8	162	450	
		Van Buren Street	SBL	126	125	-1	-1%	317	315	-2	-1%	42.5	D	42.6	D	32	208	325	No upstream control within reasonable distance
			SBT	176	175	-1	-1%					43.6	D			47	217	-	
			SBR	15	15	0	0%					32.3	C			49	228	-	
		Intersection		**2,433**	**2,416**	-17	**-1%**	**2,433**	**2,416**	**-17**	**-1%**	36.7	D	**36.7**	**D**				
Van Buren Street / Spring Street	**Signal**	Van Buren Street	EBL	414	396	-18	-4%	630	612	-18	-3%	54.7	D	41.9	D	279	1027	1600	To Alabama Dr signal
			EBT	1	1	0	0%					43.6	D			279	1028	1600	
			EBR	215	215	0	0%					18.4	B			16	319	150	
		Parking Lot	WBL	13	14	1	8%	28	28	0	0%	52.4	D	53.0	D	4	54	-	
			WBR	15	14	-1	-7%					53.6	D			4	54	-	
		Spring Street	NBL	324	323	-1	0%	873	869	-4	0%	35.3	D	20.6	C	70	457	200	
			NBT	541	538	-3	-1%					11.9	B			21	294	800	To Huntmar Park Dr signal
			NBR	8	8	0	0%					10.8	B			21	302	800	
		Van Buren Street	SBL	3	4	1	33%	648	639	-9	-1%	14.6	B	25.9	C	0	17	275	
			SBT	198	200	2	1%					15.5	B			89	501	1200	To Monroe St / Grove St signal
			SBR	447	435	-12	-3%					30.8	C			117	535	1200	
		Intersection		**1,531**	**1,509**	-22	**-1%**	**1,531**	**1,509**	**-22**	**-1%**	40.8	D	**40.8**	**D**				
Spring Street / Herndon Parkway	**Signal**	Spring Street	EBL	77	76	-1	-1%	816	816	0	0%	78.2	E	61.6	E	33	201	200	
			EBT	617	622	5	1%					62.6	E			107	333	2300	To Huntmar Park Dr signal
			EBR	122	118	-4	-3%					45.8	D			108	337	2300	
		Spring Street	WBL	995	1,001	6	1%	2,213	2,216	3	0%	47.5	D	34.3	C	254	659	375	
			WBT	768	770	2	0%					31.7	C			87	476	550	To Ffx County Pkwy signal
			WBR	450	445	-5	-1%					9.1	A			18	238	550	
		Herndon Parkway	NBL	166	165	-1	-1%	1,989	1,951	-38	-2%	35.6	D	55.1	E	22	195	300	
			NBT	612	609	-3	0%					60.5	E			724	1476	500	To Sunset Business Park
			NBR	1,211	1,177	-34	-3%					55.0	E			725	1476	500	
		Herndon Parkway	SBL	461	455	-6	-1%	953	950	-3	0%	90.1	F	64.0	E	134	416	500	
			SBT	456	461	5	1%					40.4	D			64	272	2300	To Grove St signal
			SBR	36	34	-2	-6%					35.0	D			64	275	2300	
		Intersection		**5,018**	**4,983**	-35	**-1%**	**5,018**	**4,983**	**-35**	**-1%**	59.1	E	**59.1**	**E**				

Note: Average results across 20 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

No Build 2045 Conditions: Weekday Evening Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								No Build 2045 Conditions MOEs							Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	Available Queue Storage (ft)	
Spring Street / Fairfax County Parkway	**Signal**	Spring Street	EBL	385	380	-5	-1%	2,384	2,347	-37	-2%	61.9	E	15.3	B	146	604	250	
			EBT	1,119	1,099	-20	-2%					7.6	A			25	317	550	To Herndon Parkway signal
			EBR	880	868	-12	-1%					4.7	A			0	0	550	
		Spring Street	WBT	1,488	1,492	4	0%	2,138	2,128	-10	0%	29.4	C	27.2	C	265	1096	1650	To Target signal
			WBR	650	636	-14	-2%					22.0	C			235	1080	1650	
		Fairfax County Parkway	SBL	166	168	2	1%	1,090	1,095	5	0%	65.9	E	45.7	D	72	319	600	To Ffx Pkwy signal, which is not in model
			SBR	924	927	3	0%					42.1	D			150	583	600	
		Intersection		**5,612**	**5,570**	-42	**-1%**	**5,612**	**5,570**	**-42**	**-1%**	25.8	C	**25.8**	**C**				
Van Buren Street / Alabama Drive	**Signal**	Alabama Drive	EBL	85	85	0	0%	235	238	3	1%	93.8	F	84.8	F	136	477	-	
			EBT	18	17	-1	-6%					96.4	F			136	477	-	
			EBR	132	136	4	3%					77.7	E			139	484	-	
		Alabama Drive	WBL	20	20	0	0%	51	50	-1	-2%	51.8	D	36.0	D	9	89	-	
			WBT	10	10	0	0%					42.8	D			9	89	-	
			WBR	21	20	-1	-5%					16.8	B			7	103	-	
		Van Buren Street	NBL	61	60	-1	-2%	659	647	-12	-2%	16.8	B	13.0	B	57	550	1125	To Herndon Parkway signal
			NBT	524	517	-7	-1%					12.9	B			57	550	1125	
			NBR	74	70	-4	-5%					10.5	B			56	550	1125	
		Van Buren Street	SBL	34	32	-2	-6%	772	732	-40	-5%	36.5	D	34.6	C	642	1450	1600	To Van Buren St signal
			SBT	631	599	-32	-5%					35.1	D			642	1452	1600	
			SBR	107	101	-6	-6%					30.9	C			640	1452	1600	
		Intersection		**1,717**	**1,667**	-50	**-3%**	**1,717**	**1,667**	**-50**	**-3%**	33.4	C	**33.4**	**C**				
Van Buren Street / Herndon Parkway	**Signal**	Herndon Parkway	EBL	55	54	-1	-2%	873	867	-6	-1%	78.5	E	36.7	D	24	124	175	
			EBT	472	472	0	0%					47.8	D			74	321	1950	To Campbell Way signal, which is not in model
			EBR	346	341	-5	-1%					14.9	B			34	227	1950	
		Herndon Parkway	WBL	520	519	-1	0%	1,838	1,846	8	0%	53.5	D	42.1	D	94	384	350	
			WBT	1,109	1,116	7	1%					37.7	D			287	993	875	To Worldgate Drive signal
			WBR	209	211	2	1%					37.3	D			287	993	875	
		Van Buren Street	NBL	365	370	5	1%	1,051	1,040	-11	-1%	88.7	F	38.8	D	355	854	375	To Office Park signal
			NBT	394	383	-11	-3%					15.7	B			289	840	375	
			NBR	292	287	-5	-2%					5.3	A			4	133	300	
		Van Buren Street	SBL	69	65	-4	-6%	784	743	-41	-5%	46.5	D	66.7	E	39	240	175	To Alabama Dr signal
			SBT	668	631	-37	-6%					69.6	E			750	1197	1125	
			SBR	47	47	0	0%					55.9	E			750	1197	1125	
		Intersection		**4,546**	**4,496**	-50	**-1%**	**4,546**	**4,496**	**-50**	**-1%**	44.4	D	**44.4**	**D**				
Van Buren Street / Worldgate Drive	**Signal**	Worldgate Drive	EBL	291	289	-2	-1%	1,300	1,298	-2	0%	26.2	C	24.5	C	45	276	400	
			EBT	340	339	-1	0%					46.7	D			52	204	-	
			EBR	669	670	1	0%					12.4	B			55	499	875	
		Parking Lot	WBL	364	351	-13	-4%	924	906	-18	-2%	56.7	E	24.1	C	161	650	275	
			WBT	538	533	-5	-1%					3.4	A			0	25	600	To Herndon Pkwy signal
			WBR	22	22	0	0%					7.2	A			1	49	600	
		Van Buren Street	NBL	361	349	-12	-3%	1,381	1,367	-14	-1%	56.5	E	31.5	C	76	333	250	
			NBT	720	722	2	0%					29.5	C			106	490	1650	To Eastpark Dr signal
			NBR	300	296	-4	-1%					6.8	A			6	155	250	
		Van Buren Street	SBL	9	9	0	0%	1,583	1,539	-44	-3%	70.2	E	29.1	C	3	50	200	
			SBT	1,211	1,178	-33	-3%					36.9	D			157	714	400	To Office Park signal
			SBR	363	352	-11	-3%					1.9	A			0	95	400	
		Intersection		**5,188**	**5,110**	-78	**-2%**	**5,188**	**5,110**	**-78**	**-2%**	27.7	C	**27.7**	**C**				

Note: Average results across 20 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

No Build 2045 Conditions: Weekday Evening Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								No Build 2045 Conditions MOEs							Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	Available Queue Storage (ft)	
Herndon Parkway / Worldgate Drive	**Signal**	Herndon Parkway	EBL	0	0	0	0%	917	909	-8	-1%	0.0	A	17.2	B	0	0	175	
			EBT	897	889	-8	-1%					17.2	B			55	411	850	To Van Buren St signal
			EBR	20	20	0	0%					13.8	B			55	415	850	
		Herndon Parkway	WBL	694	672	-22	-3%	2,335	2,330	-5	0%	49.5	D	21.4	C	192	987	250	
			WBT	1,641	1,658	17	1%					10.1	B			70	765	875	To 555 signal
			WBR	0	0	0	0%					0.0	A			70	763	875	
		Worldgate Drive	NBL	199	196	-3	-2%	847	846	-1	0%	57.5	E	28.9	C	79	343	600	
			NBT	0	0	0	0%					0.0	A			79	343	600	To Van Buren St signal
			NBR	648	650	2	0%					20.3	C			79	343	600	
		Worldgate Drive	SBL	0	0	0	0%	0	0	0	0%	0.0	A	0.0	A	0	0	75	
			SBT	0	0	0	0%					0.0	A			0	0	-	
			SBR	0	0	0	0%					0.0	A			0	0	-	
		Intersection		**4,099**	**4,085**	-14	**0%**	**4,099**	**4,085**	**-14**	**0%**	22.0	C	**22.0**	**C**				
Herndon Parkway / 555 Herndon Parkway	**Signal**	Herndon Parkway	EBL	0	0	0	0%	1,621	1,598	-23	-1%	0.0	A	12.5	B	0	0		
			EBT	1,522	1,499	-23	-2%					12.6	B			84	682		
			EBR	99	99	0	0%					12.1	B			84	685		
		Herndon Parkway	WBL	66	62	-4	-6%	2,038	2,027	-11	-1%	25.2	C	12.7	B	3	79		
			WBT	1,972	1,965	-7	0%					12.3	B			121	633		
			WBR	0	0	0	0%					0.0	A			122	636		
		Parking Lot	NBL	314	316	2	1%	449	446	-3	-1%	67.9	E	58.0	E	170	444		
			NBT	0	0	0	0%					0.0	A			0	0		
			NBR	135	130	-5	-4%					33.9	C			14	327		
		Parking Lot	SBL	0	0	0	0%	0	0	0	0%	0.0	A	0.0	A	0	0		
			SBT	0	0	0	0%					0.0	A			0	0		
			SBR	0	0	0	0%					0.0	A			0	0		
		Intersection		**4,108**	**4,071**	-37	**-1%**	**4,108**	**4,071**	**-37**	**-1%**	17.6	B	**17.6**	**B**				
Herndon Parkway / Exchange Place	**Signal**	Herndon Parkway	EBL	28	29	1	4%	1,676	1,645	-31	-2%	16.7	B	12.3	B	1	47	175	
			EBT	1,549	1,518	-31	-2%					12.3	B			93	657	650	To 555 signal
			EBR	99	98	-1	-1%					11.3	B			94	662	650	
		Herndon Parkway	WBL	66	66	0	0%	1,649	1,648	-1	0%	27.6	C	11.2	B	5	92	175	
			WBT	1,578	1,577	-1	0%					10.5	B			64	610	550	To Fairbrook Dr signal
			WBR	5	5	0	0%					8.3	A			66	620	550	
		Parking Lot	NBL	314	307	-7	-2%	449	447	-2	0%	54.6	D	46.0	D	124	391	-	
			NBT	0	0	0	0%					0.0	A			124	391	-	
			NBR	135	140	5	4%					27.2	C			16	334	75	
		Exchange Place	SBL	10	10	0	0%	38	38	0	0%	43.9	D	17.5	B	3	61	-	
			SBT	0	0	0	0%					0.0	A			3	61	-	
			SBR	28	28	0	0%					8.0	A			2	67	-	
		Intersection		**3,812**	**3,778**	-34	**-1%**	**3,812**	**3,778**	**-34**	**-1%**	15.8	B	**15.8**	**B**				
Herndon Parkway / Fairbrook Drive	**Signal**	Parking Lot	EBL	21	23	2	10%	51	53	2	4%	75.8	E	37.5	D	10	77	75	
			EBT	0	0	0	0%					0.0	A			0	14	-	
			EBR	30	30	0	0%					8.2	A			0	39	-	
		Fairbrook Drive	WBL	187	185	-2	-1%	483	482	-1	0%	50.0	D	35.3	D	36	171	175	
			WBT	0	0	0	0%					0.0	A			36	171	-	
			WBR	296	297	1	0%					26.1	C			33	314	-	
		Herndon Parkway	NBL	1	1	0	0%	1,694	1,662	-32	-2%	21.1	C	18.5	B	0	9	150	
			NBT	1,625	1,594	-31	-2%					18.9	B			157	693	550	To Exchange Pl signal
			NBR	68	67	-1	-1%					9.6	A			0	15	125	
		Herndon Parkway	SBL	182	186	4	2%	1,592	1,625	33	2%	46.1	D	16.1	B	54	551	150	
			SBT	1,407	1,435	28	2%					12.3	B			81	720	825	To Sunset Business Park
			SBR	3	4	1	33%					10.6	B			82	725	825	
		Intersection		**3,820**	**3,822**	2	**0%**	**3,820**	**3,822**	**2**	**0%**	19.9	B	**19.9**	**B**				

Note: Average results across 20 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

Build Scenario 1 with Fairbrook Drive Extended 2045 Conditions: Weekday Morning Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								Build Scenario 1 with Fairbrook Drive Extended 2045 Conditions MOEs						Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	
Elden Street / Monroe Street	**Signal**	Elden Street	EBL	73	75	2	3%	839	834	-5	-1%	24.4	C	19.4	B	5	107	
			EBT	630	626	-4	-1%					19.2	B			126	796	
			EBR	136	133	-3	-2%					17.7	B			123	796	
		Elden Street	WBL	6	5	-1	-17%	459	453	-6	-1%	24.3	C	19.4	B	0	28	
			WBT	410	404	-6	-1%					19.7	B			58	441	
			WBR	43	44	1	2%					16.8	B			66	479	
		Monroe Street	NBL	36	38	2	6%	186	186	0	0%	41.9	D	43.2	D	9	82	
			NBT	135	134	-1	-1%					46.7	D			40	276	
			NBR	15	14	-1	-7%					13.3	B			23	270	
		Monroe Street	SBL	96	96	0	0%	424	434	10	2%	39.2	D	42.6	D	40	266	
			SBT	269	278	9	3%					45.1	D			86	301	
			SBR	59	60	1	2%					36.6	D			84	301	
		Intersection		**1,908**	**1,907**	-1	**0%**	**1,908**	**1,907**	**-1**	**0%**	27.0	C	**27.0**	**C**			
Elden Street / Van Buren Street	**Signal**	Elden Street	EBL	0	0	0	0%	770	766	-4	-1%	0.0	A	18.1	B	49	325	
			EBT	718	704	-14	-2%					19.4	B			49	325	
			EBR	52	62	10	19%					4.1	A			1	52	
		Elden Street	WBL	117	116	-1	-1%	602	592	-10	-2%	32.7	C	22.3	C	40	221	
			WBT	469	463	-6	-1%					19.9	B			40	221	
			WBR	16	13	-3	-19%					14.5	B			48	235	
		Van Buren Street	NBL	49	47	-2	-4%	387	382	-5	-1%	27.1	C	24.7	C	7	102	
			NBT	222	221	-1	0%					34.3	C			44	308	
			NBR	116	114	-2	-2%					5.0	A			2	85	
		Van Buren Street	SBL	146	142	-4	-3%	521	534	13	2%	38.1	D	44.5	D	39	371	
			SBT	366	381	15	4%					47.1	D			112	474	
			SBR	9	11	2	22%					39.5	D			116	485	
		Intersection		**1,759**	**1,740**	-19	**-1%**	**1,759**	**1,740**	**-19**	**-1%**	34.7	C	**34.7**	**C**			
Van Buren Street / Spring Street	**Signal**	Van Buren Street	EBL	183	174	-9	-5%	508	503	-5	-1%	15.1	B	11.4	B	0	3	
			EBT	6	8	2	33%					15.8	B			16	223	
			EBR	319	321	2	1%					9.4	A			15	198	
		Parking Lot	WBL	1	0	-1	-100%	1	0	-1	-100%	0.0	A	0.0	A	0	0	
			WBR	0	0	0	0%					0.0	A			0	0	
		Spring Street	NBL	117	121	4	3%	412	422	10	2%	15.8	B	8.5	A	5	118	
			NBT	287	294	7	2%					5.7	A			5	132	
			NBR	8	7	-1	-13%					2.3	A			4	140	
		Van Buren Street	SBL	9	9	0	0%	869	887	18	2%	8.4	A	7.5	A	0	34	
			SBT	519	526	7	1%					8.4	A			17	230	
			SBR	341	352	11	3%					6.3	A			8	164	
		Intersection		**921**	**925**	4	**0%**	**921**	**925**	**4**	**0%**	17.4	B	**17.4**	**B**			
Spring Street / Herndon Parkway	**Signal**	Spring Street	EBL	55	60	5	9%	914	911	-3	0%	80.1	F	61.0	E	27	128	
			EBT	756	752	-4	0%					61.1	E			124	391	
			EBR	103	99	-4	-4%					49.0	D			124	394	
		Spring Street	WBL	589	589	0	0%	1,517	1,516	-1	0%	48.2	D	36.1	D	97	477	
			WBT	515	515	0	0%					41.6	D			72	322	
			WBR	414	412	-2	0%					11.9	B			27	278	
		Herndon Parkway	NBL	226	234	8	4%	1,640	1,620	-20	-1%	42.8	D	32.0	C	45	259	
			NBT	401	387	-14	-3%					44.5	D			109	466	
			NBR	1,013	999	-14	-1%					24.6	C			109	466	
		Herndon Parkway	SBL	462	456	-6	-1%	1,003	1,002	-1	0%	86.1	F	63.9	E	134	472	
			SBT	484	487	3	1%					45.9	D			79	327	
			SBR	57	59	3	4%					40.2	D			80	330	
		Intersection		**4,071**	**4,047**	-24	**-1%**	**4,071**	**4,047**	**-24**	**-1%**	55.9	E	**55.9**	**E**			

Note: Average results across 7 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

Build Scenario 1 with Fairbrook Drive Extended 2045 Conditions: Weekday Morning Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								Build Scenario 1 with Fairbrook Drive Extended 2045 Conditions MOEs						Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	
Spring Street / Fairfax County Parkway / Fairbrook Drive	**Signal**	Spring Street	EBL	152	152	0	0%	2,212	2,180	-32	-1%	42.4	D	35.2	D	28	209	
			EBT	2,030	1,997	-33	-2%					34.7	C			237	760	
			EBR	31	31	0	0%					30.5	C			233	755	
		Spring Street	WBL	187	184	-3	-2%	1,053	1,041	-12	-1%	90.4	F	41.9	D	149	482	
			WBT	561	559	-2	0%					41.3	D			149	482	
			WBR	305	298	-7	-2%					13.0	B			99	471	
		Fairbrook Drive	NBL	19	17	-2	-10%	587	592	5	1%	91.2	F	61.0	E	136	632	
			NBT	139	143	4	3%					91.7	F			136	632	
			NBR	429	432	3	1%					49.6	D			136	632	
		Fairfax County Parkway	SBL	370	367	-3	-1%	1,752	1,755	3	0%	90.7	F	42.8	D	552	1333	
			SBT	372	371	-1	0%					41.4	D			241	1180	
			SBR	1,010	1,017	7	1%					26.0	C			462	1324	
		Intersection		**5,604**	**5,568**	-36	**-1%**	**5,604**	**5,568**	**-36**	**-1%**	41.6	D	**41.6**	**D**			
Van Buren Street / Alabama Drive	**Signal**	Alabama Drive	EBL	129	128	-1	-1%	313	312	-1	0%	41.8	D	35.0	D	64	363	
			EBT	10	11	1	10%					43.1	D			64	363	
			EBR	174	173	-1	-1%					29.5	C			65	370	
		Alabama Drive	WBL	47	46	-1	-2%	103	99	-4	-4%	32.6	C	25.3	C	13	136	
			WBT	13	14	1	8%					32.0	C			13	136	
			WBR	43	39	-4	-9%					14.4	B			12	146	
		Van Buren Street	NBL	49	50	1	2%	417	415	-2	-1%	26.0	C	23.0	C	61	396	
			NBT	336	335	-1	0%					23.0	C			62	396	
			NBR	32	30	-2	-7%					18.5	B			61	396	
		Van Buren Street	SBL	13	16	3	23%	458	473	15	3%	14.6	B	11.4	B	35	347	
			SBT	404	417	13	3%					11.4	B			35	346	
			SBR	41	40	-1	-2%					9.5	A			32	345	
		Intersection		**1,292**	**1,299**	7	**1%**	**1,292**	**1,299**	**7**	**1%**	21.8	C	**21.8**	**C**			
Van Buren Street / Herndon Parkway	**Signal**	Herndon Parkway	EBL	43	41	-2	-5%	1,452	1,448	-4	0%	74.2	E	38.8	D	15	96	
			EBT	1,092	1,102	10	1%					43.6	D			250	862	
			EBR	317	305	-12	-4%					16.5	B			25	453	
		Herndon Parkway	WBL	293	291	-2	-1%	924	907	-17	-2%	51.9	D	27.2	C	52	226	
			WBT	518	508	-10	-2%					16.3	B			27	194	
			WBR	113	108	-5	-5%					12.2	B			27	194	
		Van Buren Street	NBL	240	248	8	3%	835	846	11	1%	52.9	D	37.6	D	87	391	
			NBT	261	267	6	2%					42.7	D			78	394	
			NBR	334	331	-3	-1%					22.1	C			46	331	
		Van Buren Street	SBL	139	139	0	0%	626	642	16	3%	39.2	D	40.6	D	31	229	
			SBT	464	480	16	3%					41.5	D			75	464	
			SBR	23	23	0	0%					29.4	C			75	464	
		Intersection		**3,837**	**3,843**	6	**0%**	**3,837**	**3,843**	**6**	**0%**	36.1	D	**36.1**	**D**			

Note: Average results across 7 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

Build Scenario 1 with Fairbrook Drive Extended 2045 Conditions: Weekday Morning Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								Build Scenario 1 with Fairbrook Drive Extended 2045 Conditions MOEs						Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	
Van Buren Street / Worldgate Drive	**Signal**	Worldgate Drive	EBL	170	172	2	1%	1,104	1,088	-16	-1%	36.7	D	31.0	C	38	211	
			EBT	693	672	-21	-3%					39.7	D			89	321	
			EBR	241	244	3	1%					2.9	A			3	100	
		Worldgate Drive	WBL	196	205	9	4%	415	428	13	3%	39.9	D	38.3	D	47	281	
			WBT	211	215	4	2%					37.4	D			30	152	
			WBR	8	8	0	0%					22.5	C			33	165	
		Van Buren Street	NBL	406	393	-13	-3%	1,671	1,667	-4	0%	44.1	D	22.2	C	60	250	
			NBT	767	785	18	2%					17.9	B			49	361	
			NBR	498	489	-9	-2%					11.3	B			26	254	
		Van Buren Street	SBL	20	21	1	5%	1,045	1,061	16	2%	35.2	D	8.8	A	4	67	
			SBT	669	677	8	1%					11.4	B			27	269	
			SBR	356	363	7	2%					2.4	A			1	147	
		Intersection		**4,236**	**4,244**	8	**0%**	**4,236**	**4,244**	**8**	**0%**	22.7	C	**22.7**	**C**			
Herndon Parkway / Worldgate Drive	**Signal**	Herndon Parkway	EBL	67	71	4	6%	1,520	1,526	6	0%	22.0	C	50.5	D	3	57	
			EBT	1,409	1,412	3	0%					52.4	D			352	978	
			EBR	44	43	-1	-2%					35.1	D			356	982	
		Herndon Parkway	WBL	509	498	-11	-2%	1,278	1,258	-20	-2%	47.3	D	21.3	C	83	448	
			WBT	757	750	-7	-1%					4.3	A			8	166	
			WBR	11	10	-1	-11%					3.7	A			8	176	
		Worldgate Drive	NBL	65	62	-3	-5%	1,035	1,014	-21	-2%	35.0	D	23.8	C	76	322	
			NBT	34	33	-1	-2%					34.5	C			76	322	
			NBR	937	919	-18	-2%					22.7	C			76	322	
		Worldgate Drive	SBL	31	32	1	3%	183	186	3	2%	40.8	D	28.0	C	6	109	
			SBT	50	48	-2	-4%					44.5	D			19	206	
			SBR	102	106	4	4%					16.7	B			18	210	
		Intersection		**4,016**	**3,984**	-32	**-1%**	**4,016**	**3,984**	**-32**	**-1%**	33.4	C	**33.4**	**C**			
Herndon Parkway / Exchange Place	**Signal**	Herndon Parkway	EBL	10	9	-1	-10%	2,100	2,061	-39	-2%	10.0	B	14.5	B	0	18	
			EBT	1,870	1,843	-27	-1%					14.5	B			165	850	
			EBR	220	209	-11	-5%					14.7	B			167	856	
		Herndon Parkway	WBL	148	144	-4	-3%	1,313	1,310	-3	0%	28.5	C	12.8	B	13	144	
			WBT	1,155	1,157	2	0%					10.9	B			43	385	
			WBR	10	9	-1	-10%					11.0	B			45	394	
		Parking Lot	NBL	103	99	-4	-4%	147	145	-2	-1%	45.3	D	34.0	C	25	141	
			NBT	0	0	0	0%					0.0	A			25	141	
			NBR	44	46	2	5%					9.8	A			1	56	
		Exchange Place	SBL	42	42	0	0%	70	71	1	1%	46.0	D	35.2	D	13	105	
			SBT	0	0	0	0%					0.0	A			13	105	
			SBR	28	29	1	4%					19.6	B			11	111	
		Intersection		**3,631**	**3,587**	-44	**-1%**	**3,631**	**3,587**	**-44**	**-1%**	15.1	B	**15.1**	**B**			
Herndon Parkway / Fairbrook Drive	**Signal**	Parking Lot	EBL	41	44	4	9%	135	139	4	3%	51.7	D	47.1	D	13	134	
			EBT	68	67	-1	-1%					52.1	D			25	162	
			EBR	27	28	1	4%					28.2	C			21	164	
		Fairbrook Drive	WBL	270	277	7	3%	354	360	6	2%	43.8	D	39.7	D	52	232	
			WBT	45	42	-3	-7%					43.1	D			52	232	
			WBR	39	41	2	5%					8.1	A			0	30	
		Herndon Parkway	NBL	18	17	-1	-6%	1,956	1,927	-29	-2%	4.9	A	10.7	B	0	25	
			NBT	1,506	1,481	-25	-2%					11.1	B			99	694	
			NBR	432	429	-3	-1%					9.7	A			5	291	
		Herndon Parkway	SBL	97	100	3	3%	1,139	1,119	-20	-2%	27.8	C	17.7	B	11	143	
			SBT	1,015	994	-21	-2%					16.9	B			60	518	
			SBR	27	25	-2	-7%					10.8	B			60	522	
		Intersection		**3,585**	**3,545**	-40	**-1%**	**3,585**	**3,545**	**-40**	**-1%**	17.3	B	**17.3**	**B**			

Note: Average results across 7 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

Build Scenario 1 with Fairbrook Drive Extended 2045 Conditions: Weekday Evening Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								Build Scenario 1 with Fairbrook Drive Extended 2045 Conditions MOEs						Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	
Elden Street / Monroe Street	**Signal**	Elden Street	EBL	127	125	-2	-2%	817	814	-3	0%	37.9	D	22.6	C	14	189	
			EBT	654	653	-1	0%					20.0	B			123	765	
			EBR	36	36	0	0%					18.1	B			121	765	
		Elden Street	WBL	13	13	0	0%	755	750	-5	-1%	35.9	D	27.0	C	1	46	
			WBT	669	667	-2	0%					26.9	C			210	760	
			WBR	73	70	-3	-4%					26.0	C			217	798	
		Monroe Street	NBL	168	165	-3	-2%	453	451	-2	0%	74.0	E	72.8	E	123	656	
			NBT	274	275	1	0%					73.0	E			196	708	
			NBR	11	11	0	0%					47.4	D			181	700	
		Monroe Street	SBL	131	125	-6	-5%	459	449	-10	-2%	48.6	D	53.0	D	72	368	
			SBT	207	202	-5	-2%					58.7	E			110	406	
			SBR	121	122	1	1%					48.1	D			108	406	
		Intersection		**2,484**	**2,464**	-20	**-1%**	**2,484**	**2,464**	**-20**	**-1%**	38.7	D	**38.7**	**D**			
Elden Street / Van Buren Street	**Signal**	Elden Street	EBL	5	5	0	0%	803	780	-23	-3%	28.6	C	19.4	B	55	338	
			EBT	764	738	-26	-3%					20.2	C			55	338	
			EBR	34	37	3	9%					3.6	A			0	46	
		Elden Street	WBL	150	152	2	1%	962	949	-13	-1%	41.5	D	28.4	C	91	386	
			WBT	754	742	-12	-2%					26.3	C			91	386	
			WBR	58	55	-3	-5%					20.1	C			100	399	
		Van Buren Street	NBL	118	116	-2	-2%	724	706	-18	-2%	53.1	D	45.9	D	38	363	
			NBT	430	415	-15	-3%					56.6	E			211	836	
			NBR	176	175	-1	-1%					15.7	B			8	216	
		Van Buren Street	SBL	126	126	0	0%	392	399	7	2%	40.9	D	43.6	D	33	236	
			SBT	251	257	6	2%					45.5	D			71	276	
			SBR	15	16	1	7%					34.1	C			75	286	
		Intersection		**2,489**	**2,435**	-54	**-2%**	**2,489**	**2,435**	**-54**	**-2%**	37.7	D	**37.7**	**D**			
Van Buren Street / Spring Street	**Signal**	Van Buren Street	EBL	416	405	-11	-3%	632	621	-11	-2%	20.3	C	15.8	B	1	82	
			EBT	1	2	1	100%					21.0	C			53	464	
			EBR	215	214	-1	0%					7.3	A			6	126	
		Parking Lot	WBL	13	14	1	8%	28	28	0	0%	26.3	C	27.7	C	2	46	
			WBR	15	14	-1	-7%					29.0	C			2	45	
		Spring Street	NBL	324	324	0	0%	982	980	-2	0%	51.4	D	23.8	C	100	540	
			NBT	650	648	-2	0%					10.2	B			20	276	
			NBR	8	8	0	0%					8.9	A			19	284	
		Van Buren Street	SBL	3	3	0	0%	800	810	10	1%	17.5	B	15.2	B	0	24	
			SBT	335	337	2	1%					17.0	B			33	315	
			SBR	462	470	8	2%					13.9	B			40	328	
		Intersection		**1,642**	**1,629**	-13	**-1%**	**1,642**	**1,629**	**-13**	**-1%**	28.4	C	**28.4**	**C**			
Spring Street / Herndon Parkway	**Signal**	Spring Street	EBL	104	102	-2	-2%	914	904	-10	-1%	83.0	F	74.0	E	47	266	
			EBT	678	671	-7	-1%					74.3	E			154	474	
			EBR	132	131	-1	-1%					65.7	E			155	477	
		Spring Street	WBL	953	948	-5	-1%	2,200	2,190	-10	0%	40.7	D	30.4	C	153	581	
			WBT	788	785	-3	0%					29.5	C			80	401	
			WBR	459	457	-2	0%					10.4	B			20	211	
		Herndon Parkway	NBL	229	236	7	3%	1,764	1,719	-45	-3%	48.7	D	37.1	D	49	312	
			NBT	686	656	-30	-4%					53.2	D			159	597	
			NBR	850	827	-23	-3%					21.0	C			159	597	
		Herndon Parkway	SBL	490	483	-7	-1%	1,081	1,076	-5	0%	73.0	E	65.8	E	112	347	
			SBT	545	549	4	1%					60.5	E			112	390	
			SBR	46	44	-2	-5%					53.1	D			113	393	
		Intersection		**4,878**	**4,813**	-65	**-1%**	**4,878**	**4,813**	**-65**	**-1%**	55.7	E	**55.7**	**E**			

Note: Average results across 20 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

Build Scenario 1 with Fairbrook Drive Extended 2045 Conditions: Weekday Evening Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								Build Scenario 1 with Fairbrook Drive Extended 2045 Conditions MOEs						Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	
Spring Street / Fairfax County Parkway / Fairbrook Drive	**Signal**	Spring Street	EBL	289	287	-2	-1%	2,022	1,984	-38	-2%	80.4	F	31.3	C	167	634	
			EBT	1,711	1,674	-37	-2%					23.1	C			128	624	
			EBR	23	23	0	2%					15.8	B			125	620	
		Spring Street	WBL	162	160	-2	-1%	2,289	2,257	-32	-1%	45.4	D	35.4	D	683	1613	
			WBT	1,476	1,470	-6	0%					35.6	D			683	1613	
			WBR	650	627	-23	-4%					32.5	C			663	1602	
		Fairbrook Drive	NBL	29	29	0	0%	763	764	1	0%	85.5	F	56.6	E	208	860	
			NBT	184	184	0	0%					76.9	E			208	860	
			NBR	550	551	1	0%					48.3	D			208	860	
		Fairfax County Parkway	SBL	166	170	4	2%	1,460	1,466	6	0%	101.6	F	45.4	D	116	646	
			SBT	400	404	4	1%					49.1	D			143	734	
			SBR	895	892	-3	0%					33.1	C			147	782	
		Intersection		**6,533**	**6,471**	-62	**-1%**	**6,533**	**6,471**	**-62**	**-1%**	38.9	D	**38.9**	**D**			
Van Buren Street / Alabama Drive	**Signal**	Alabama Drive	EBL	85	80	-5	-6%	265	259	-6	-2%	68.5	E	56.0	E	98	437	
			EBT	18	18	0	0%					66.9	E			98	437	
			EBR	162	161	-1	-1%					48.6	D			101	444	
		Alabama Drive	WBL	35	34	-1	-3%	66	66	0	0%	41.0	D	33.9	C	12	104	
			WBT	10	11	1	10%					42.3	D			12	104	
			WBR	21	21	0	0%					18.0	B			10	119	
		Van Buren Street	NBL	65	64	-1	-2%	668	655	-13	-2%	19.5	B	14.8	B	70	624	
			NBT	526	519	-7	-1%					14.5	B			70	624	
			NBR	77	72	-5	-7%					13.1	B			70	624	
		Van Buren Street	SBL	34	34	0	0%	787	784	-3	0%	28.6	C	26.3	C	408	1202	
			SBT	646	644	-2	0%					26.6	C			408	1201	
			SBR	107	106	-1	-1%					23.5	C			406	1200	
		Intersection		**1,787**	**1,764**	-23	**-1%**	**1,787**	**1,764**	**-23**	**-1%**	26.7	C	**26.7**	**C**			
Van Buren Street / Herndon Parkway	**Signal**	Herndon Parkway	EBL	55	56	1	2%	1,100	1,094	-6	-1%	69.9	E	42.6	D	21	118	
			EBT	699	696	-3	0%					51.7	D			126	501	
			EBR	346	342	-4	-1%					19.7	B			41	331	
		Herndon Parkway	WBL	520	505	-15	-3%	1,882	1,845	-37	-2%	77.1	E	52.0	D	141	729	
			WBT	1,144	1,125	-19	-2%					42.7	D			394	1039	
			WBR	218	215	-3	-2%					41.6	D			394	1039	
		Van Buren Street	NBL	365	369	4	1%	1,051	1,043	-8	-1%	99.8	F	49.1	D	418	874	
			NBT	394	387	-7	-2%					29.9	C			379	871	
			NBR	292	287	-5	-2%					10.1	B			24	225	
		Van Buren Street	SBL	129	125	-4	-3%	844	829	-15	-2%	59.6	E	58.6	E	71	759	
			SBT	668	657	-11	-2%					58.9	E			598	1177	
			SBR	47	47	0	0%					52.3	D			598	1177	
		Intersection		**4,878**	**4,811**	-67	**-1%**	**4,878**	**4,811**	**-67**	**-1%**	50.4	D	**50.4**	**D**			
Van Buren Street / Worldgate Drive	**Signal**	Worldgate Drive	EBL	291	286	-5	-2%	1,373	1,358	-15	-1%	50.4	D	30.5	C	121	440	
			EBT	413	407	-6	-2%					45.3	D			60	245	
			EBR	669	665	-4	-1%					12.9	B			66	512	
		Parking Lot	WBL	374	363	-11	-3%	946	933	-13	-1%	11.7	B	28.5	C	20	359	
			WBT	551	547	-4	-1%					39.9	D			77	420	
			WBR	22	23	1	5%					20.7	C			85	434	
		Van Buren Street	NBL	361	350	-11	-3%	1,442	1,431	-11	-1%	51.8	D	23.5	C	64	282	
			NBT	720	727	7	1%					18.0	B			47	368	
			NBR	361	354	-7	-2%					6.8	A			9	165	
		Van Buren Street	SBL	9	9	0	0%	1,583	1,554	-29	-2%	49.3	D	12.3	B	3	52	
			SBT	1,211	1,189	-22	-2%					15.3	B			75	558	
			SBR	363	356	-7	-2%					1.6	A			0	68	
		Intersection		**5,345**	**5,276**	-69	**-1%**	**5,345**	**5,276**	**-69**	**-1%**	22.9	C	**22.9**	**C**			

Note: Average results across 20 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

Build Scenario 1 with Fairbrook Drive Extended 2045 Conditions: Weekday Evening Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								Build Scenario 1 with Fairbrook Drive Extended 2045 Conditions MOEs						Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	
Herndon Parkway / Worldgate Drive	**Signal**	Herndon Parkway	EBL	100	97	-3	-3%	1,204	1,190	-14	-1%	54.5	D	47.7	D	12	131	
			EBT	1,084	1,072	-12	-1%					47.1	D			196	488	
			EBR	20	21	1	5%					42.6	D			198	492	
		Herndon Parkway	WBL	688	671	-17	-2%	2,327	2,283	-44	-2%	43.4	D	27.0	C	216	986	
			WBT	1,623	1,595	-28	-2%					20.2	C			205	1000	
			WBR	17	17	0	2%					17.0	B			210	1010	
		Worldgate Drive	NBL	199	197	-2	-1%	982	973	-9	-1%	43.7	D	25.5	C	91	415	
			NBT	50	49	-1	-2%					45.1	D			91	415	
			NBR	733	727	-6	-1%					19.2	B			91	415	
		Worldgate Drive	SBL	48	47	-1	-2%	137	136	-1	-1%	49.2	D	31.9	C	12	125	
			SBT	28	30	2	6%					39.2	D			9	132	
			SBR	61	59	-2	-3%					14.5	B			7	136	
		Intersection		**4,650**	**4,582**	-68	**-1%**	**4,650**	**4,582**	**-68**	**-1%**	32.2	C	**32.2**	**C**			
Herndon Parkway / 555 Herndon Parkway	**Signal**	Herndon Parkway	EBL	91	91	0	0%	1,941	1,905	-36	-2%	41.8	D	12.3	B	17	143	
			EBT	1,751	1,715	-36	-2%					10.9	B			67	570	
			EBR	99	99	0	0%					9.8	A			67	573	
		Herndon Parkway	WBL	66	65	-1	-2%	2,047	2,006	-41	-2%	45.0	D	25.2	C	6	100	
			WBT	1,920	1,880	-40	-2%					24.5	C			289	805	
			WBR	60	61	1	1%					23.8	C			291	809	
		Parking Lot	NBL	314	312	-2	-1%	449	440	-9	-2%	81.2	F	71.7	E	218	453	
			NBT	0	0	0	0%					0.0	A			0	0	
			NBR	135	128	-7	-5%					48.5	D			40	415	
		Parking Lot	SBL	67	68	1	1%	161	161	0	0%	41.3	D	31.2	C	27	220	
			SBT	0	0	0	0%					0.0	A			0	0	
			SBR	94	93	-1	-1%					23.8	C			26	226	
		Intersection		**4,598**	**4,512**	-86	**-2%**	**4,598**	**4,512**	**-86**	**-2%**	24.5	C	**24.5**	**C**			
Herndon Parkway / Exchange Place	**Signal**	Herndon Parkway	EBL	24	25	2	6%	1,996	1,932	-64	-3%	19.0	B	8.7	A	0	36	
			EBT	1,873	1,812	-61	-3%					8.6	A			84	783	
			EBR	99	95	-4	-4%					7.9	A			85	788	
		Herndon Parkway	WBL	66	66	0	0%	1,810	1,787	-23	-1%	30.9	C	18.8	B	5	93	
			WBT	1,721	1,697	-24	-1%					18.4	B			138	627	
			WBR	24	24	1	2%					16.5	B			142	637	
		Parking Lot	NBL	314	306	-8	-3%	449	445	-4	-1%	60.2	E	50.5	D	134	393	
			NBT	0	0	0	0%					0.0	A			134	393	
			NBR	135	139	4	3%					29.4	C			14	309	
		Exchange Place	SBL	18	18	0	0%	30	31	1	3%	45.0	D	30.3	C	5	67	
			SBT	0	0	0	0%					0.0	A			5	67	
			SBR	12	13	1	8%					9.9	A			3	72	
		Intersection		**4,285**	**4,195**	-90	**-2%**	**4,285**	**4,195**	**-90**	**-2%**	17.6	B	**17.6**	**B**			
Herndon Parkway / Fairbrook Drive	**Signal**	Parking Lot	EBL	19	20	1	6%	63	64	1	2%	53.9	D	49.7	D	6	72	
			EBT	32	31	-1	-2%					57.7	E			11	110	
			EBR	13	13	0	3%					24.1	C			7	111	
		Fairbrook Drive	WBL	366	365	-1	0%	565	564	-1	0%	51.6	D	42.8	D	90	465	
			WBT	73	72	-1	-1%					51.9	D			90	465	
			WBR	126	127	1	1%					12.5	B			2	85	
		Herndon Parkway	NBL	29	29	0	-1%	2,026	1,964	-62	-3%	12.1	B	11.3	B	1	41	
			NBT	1,572	1,516	-56	-4%					11.9	B			56	562	
			NBR	425	419	-6	-1%					9.0	A			10	346	
		Herndon Parkway	SBL	60	63	3	5%	1,511	1,520	9	1%	35.4	D	23.2	C	7	107	
			SBT	1,407	1,414	7	0%					22.8	C			153	766	
			SBR	44	43	-1	-2%					18.2	B			155	771	
		Intersection		**4,165**	**4,112**	-53	**-1%**	**4,165**	**4,112**	**-53**	**-1%**	20.6	C	**20.6**	**C**			

Note: Average results across 20 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

Build Scenario 2 with Fairbrook Drive Extended 2045 Conditions: Weekday Morning Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								Build Scenario 2 with Fairbrook Drive Extended 2045 Conditions MOEs						Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	
Elden Street / Monroe Street	**Signal**	Elden Street	EBL	73	74	1	1%	839	836	-3	0%	23.3	C	18.0	B	5	124	
			EBT	630	629	-1	0%					17.7	B			110	694	
			EBR	136	133	-3	-2%					16.3	B			109	693	
		Elden Street	WBL	6	5	-1	-17%	459	455	-4	-1%	25.9	C	22.5	C	0	30	
			WBT	410	406	-4	-1%					22.7	C			69	446	
			WBR	43	44	1	2%					20.1	C			76	484	
		Monroe Street	NBL	36	39	3	8%	181	188	7	4%	49.5	D	46.2	D	10	87	
			NBT	130	135	5	3%					48.6	D			39	226	
			NBR	15	14	-1	-7%					14.2	B			22	220	
		Monroe Street	SBL	96	93	-3	-3%	427	426	-1	0%	48.0	D	56.1	E	57	346	
			SBT	272	275	3	1%					60.4	E			114	399	
			SBR	59	58	-1	-2%					49.3	D			113	399	
		Intersection		**1,906**	**1,905**	-1	**0%**	**1,906**	**1,905**	**-1**	**0%**	30.4	C	**30.4**	**C**			
Elden Street / Van Buren Street	**Signal**	Elden Street	EBL	0	0	0	0%	770	751	-19	-2%	0.0	A	15.9	B	42	315	
			EBT	718	689	-29	-4%					17.0	B			42	315	
			EBR	52	62	10	19%					4.1	A			1	50	
		Elden Street	WBL	117	116	-1	-1%	602	587	-15	-2%	31.1	C	20.8	C	37	213	
			WBT	469	458	-11	-2%					18.4	B			37	213	
			WBR	16	13	-3	-19%					13.9	B			45	227	
		Van Buren Street	NBL	49	48	-1	-2%	383	381	-2	-1%	33.6	C	28.3	C	9	94	
			NBT	218	217	-1	0%					39.3	D			51	316	
			NBR	116	116	0	0%					5.4	A			2	90	
		Van Buren Street	SBL	146	141	-5	-3%	522	534	12	2%	39.2	D	42.0	D	41	323	
			SBT	367	381	14	4%					43.2	D			103	418	
			SBR	9	12	3	33%					36.1	D			107	424	
		Intersection		**1,755**	**1,719**	-36	**-2%**	**1,755**	**1,719**	**-36**	**-2%**	33.4	C	**33.4**	**C**			
Van Buren Street / Spring Street	**Signal**	Van Buren Street	EBL	189	183	-6	-3%	514	513	-1	0%	14.9	B	11.5	B	0	13	
			EBT	6	7	1	17%					13.2	B			17	220	
			EBR	319	323	4	1%					9.5	A			16	213	
		Parking Lot	WBL	1	1	0	0%	1	1	0	0%	24.1	C	24.1	C	0	14	
			WBR	0	0	0	0%					0.0	A			0	0	
		Spring Street	NBL	117	121	4	3%	397	408	11	3%	14.8	B	8.7	A	5	114	
			NBT	272	281	9	3%					6.1	A			6	125	
			NBR	8	6	-2	-25%					3.8	A			5	134	
		Van Buren Street	SBL	9	9	0	0%	873	892	19	2%	7.3	A	7.6	A	0	27	
			SBT	521	528	7	1%					8.5	A			16	227	
			SBR	343	355	12	3%					6.2	A			9	175	
		Intersection		**912**	**922**	10	**1%**	**912**	**922**	**10**	**1%**	17.6	B	**17.6**	**B**			
Spring Street / Herndon Parkway	**Signal**	Spring Street	EBL	42	35	-7	-16%	957	961	4	0%	86.5	F	74.6	E	15	83	
			EBT	742	749	7	1%					74.9	E			165	446	
			EBR	173	177	4	2%					70.8	E			167	450	
		Spring Street	WBL	663	667	4	1%	1,586	1,594	8	1%	48.3	D	35.7	D	112	497	
			WBT	509	516	7	1%					39.3	D			69	360	
			WBR	414	411	-3	-1%					10.7	B			23	262	
		Herndon Parkway	NBL	230	246	16	7%	1,652	1,615	-37	-2%	43.9	D	32.5	C	48	263	
			NBT	405	365	-40	-10%					47.0	D			107	409	
			NBR	1,017	1,004	-13	-1%					24.4	C			107	409	
		Herndon Parkway	SBL	463	457	-6	-1%	1,016	1,018	2	0%	74.4	E	56.3	E	106	357	
			SBT	504	511	7	1%					42.2	D			74	340	
			SBR	49	50	1	2%					35.9	D			75	343	
		Intersection		**4,195**	**4,170**	-25	**-1%**	**4,195**	**4,170**	**-25**	**-1%**	57.2	E	**57.2**	**E**			

Note: Average results across 7 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

Build Scenario 2 with Fairbrook Drive Extended 2045 Conditions: Weekday Morning Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								Build Scenario 2 with Fairbrook Drive Extended 2045 Conditions MOEs						Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	
Spring Street / Fairfax County Parkway / Fairbrook Drive	**Signal**	Spring Street	EBL	149	150	1	0%	2,202	2,178	-24	-1%	39.4	D	33.3	C	27	207	
			EBT	2,008	1,982	-26	-1%					33.0	C			216	763	
			EBR	45	46	1	2%					24.0	C			212	758	
		Spring Street	WBL	209	199	-10	-5%	1,085	1,060	-25	-2%	102.9	F	47.8	D	187	616	
			WBT	571	564	-7	-1%					46.4	D			187	616	
			WBR	305	297	-8	-3%					13.7	B			140	601	
		Fairbrook Drive	NBL	27	28	1	3%	572	570	-2	0%	105.8	F	62.3	E	168	478	
			NBT	131	131	0	0%					99.6	F			168	478	
			NBR	414	411	-3	-1%					47.5	D			168	478	
		Fairfax County Parkway	SBL	370	367	-3	-1%	1,816	1,811	-5	0%	93.6	F	44.1	D	678	1469	
			SBT	387	384	-3	-1%					43.6	D			276	1197	
			SBR	1,059	1,060	1	0%					27.2	C			597	1480	
		Intersection		**5,675**	**5,619**	-56	**-1%**	**5,675**	**5,619**	**-56**	**-1%**	42.5	D	**42.5**	**D**			
Van Buren Street / Alabama Drive	**Signal**	Alabama Drive	EBL	129	129	0	0%	318	318	0	0%	44.0	D	35.4	D	66	366	
			EBT	10	12	2	20%					40.1	D			66	366	
			EBR	179	177	-2	-1%					28.8	C			67	374	
		Alabama Drive	WBL	50	49	-1	-1%	106	101	-5	-4%	30.3	C	25.6	C	14	144	
			WBT	13	13	0	0%					33.1	C			14	144	
			WBR	43	39	-4	-9%					17.1	B			13	159	
		Van Buren Street	NBL	62	62	0	0%	442	440	-2	-1%	22.1	C	20.0	C	57	409	
			NBT	342	341	-1	0%					19.9	B			57	410	
			NBR	38	37	-1	-4%					17.5	B			56	409	
		Van Buren Street	SBL	13	16	3	23%	460	472	12	3%	17.8	B	13.3	B	42	348	
			SBT	406	416	10	2%					13.1	B			41	348	
			SBR	41	40	-1	-2%					13.1	B			39	347	
		Intersection		**1,326**	**1,331**	5	**0%**	**1,326**	**1,331**	**5**	**0%**	21.7	C	**21.7**	**C**			
Van Buren Street / Herndon Parkway	**Signal**	Herndon Parkway	EBL	43	41	-2	-5%	1,488	1,468	-20	-1%	72.3	E	37.6	D	15	100	
			EBT	1,128	1,123	-5	0%					42.2	D			251	791	
			EBR	317	304	-13	-4%					16.1	B			21	232	
		Herndon Parkway	WBL	293	299	6	2%	1,042	1,022	-20	-2%	47.4	D	23.8	C	47	215	
			WBT	611	591	-20	-3%					14.1	B			30	296	
			WBR	138	132	-6	-4%					13.6	B			30	296	
		Van Buren Street	NBL	240	250	10	4%	835	851	16	2%	48.2	D	35.9	D	78	372	
			NBT	261	270	9	3%					41.2	D			73	369	
			NBR	334	331	-3	-1%					22.4	C			45	315	
		Van Buren Street	SBL	149	152	3	2%	636	650	14	2%	38.3	D	39.7	D	33	257	
			SBT	464	476	12	3%					40.6	D			74	526	
			SBR	23	22	-1	-4%					29.9	C			74	526	
		Intersection		**4,001**	**3,991**	-10	**0%**	**4,001**	**3,991**	**-10**	**0%**	34.0	C	**34.0**	**C**			

Note: Average results across 7 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

Build Scenario 2 with Fairbrook Drive Extended 2045 Conditions: Weekday Morning Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								Build Scenario 2 with Fairbrook Drive Extended 2045 Conditions MOEs						Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	
Van Buren Street / Worldgate Drive	**Signal**	Worldgate Drive	EBL	170	172	2	1%	1,122	1,115	-7	-1%	36.4	D	31.1	C	38	238	
			EBT	711	700	-11	-2%					39.8	D			91	340	
			EBR	241	243	2	1%					2.3	A			2	99	
		Worldgate Drive	WBL	212	221	9	4%	451	467	16	4%	33.2	C	32.1	C	42	315	
			WBT	231	238	7	3%					31.7	C			27	137	
			WBR	8	8	0	0%					15.0	B			29	150	
		Van Buren Street	NBL	406	393	-13	-3%	1,686	1,680	-6	0%	46.1	D	23.3	C	63	338	
			NBT	767	782	15	2%					18.4	B			52	423	
			NBR	513	505	-8	-2%					13.3	B			34	345	
		Van Buren Street	SBL	20	21	1	5%	1,045	1,045	0	0%	44.0	D	10.8	B	5	58	
			SBT	669	666	-3	0%					14.3	B			32	265	
			SBR	356	358	2	1%					2.6	A			1	134	
		Intersection		**4,304**	**4,307**	3	**0%**	**4,304**	**4,307**	**3**	**0%**	23.3	C	**23.3**	**C**			
Herndon Parkway / Worldgate Drive	**Signal**	Herndon Parkway	EBL	128	135	7	6%	1,566	1,582	16	1%	25.0	C	56.1	E	4	91	
			EBT	1,394	1,405	11	1%					59.5	E			389	729	
			EBR	44	42	-2	-5%					39.4	D			393	733	
		Herndon Parkway	WBL	553	548	-5	-1%	1,447	1,433	-14	-1%	57.0	E	28.8	C	119	595	
			WBT	850	844	-6	-1%					11.4	B			36	490	
			WBR	44	41	-3	-6%					12.2	B			37	500	
		Worldgate Drive	NBL	65	62	-3	-5%	1,068	1,052	-16	-1%	36.6	D	25.8	C	89	486	
			NBT	74	70	-4	-5%					36.3	D			89	486	
			NBR	929	920	-9	-1%					24.3	C			89	486	
		Worldgate Drive	SBL	44	44	0	1%	172	172	0	0%	48.5	D	30.5	C	11	117	
			SBT	42	42	0	1%					42.1	D			15	182	
			SBR	87	86	-1	-1%					15.7	B			14	186	
		Intersection		**4,253**	**4,239**	-14	**0%**	**4,253**	**4,239**	**-14**	**0%**	38.3	D	**38.3**	**D**			
Herndon Parkway / Exchange Place	**Signal**	Herndon Parkway	EBL	84	83	-1	-2%	2,103	1,998	-105	-5%	25.7	C	19.5	B	5	86	
			EBT	1,799	1,713	-86	-5%					19.2	B			255	831	
			EBR	220	202	-18	-8%					19.5	B			258	836	
		Herndon Parkway	WBL	148	145	-3	-2%	1,677	1,674	-3	0%	35.2	D	14.1	B	19	153	
			WBT	1,332	1,333	1	0%					12.1	B			56	458	
			WBR	197	196	-1	0%					12.4	B			59	468	
		Parking Lot	NBL	103	99	-4	-4%	147	145	-2	-1%	40.1	D	29.9	C	23	150	
			NBT	0	0	0	0%					0.0	A			23	150	
			NBR	44	46	2	5%					8.0	A			1	50	
		Exchange Place	SBL	171	170	-1	-1%	285	285	0	0%	74.5	E	69.9	E	120	444	
			SBT	0	0	0	0%					0.0	A			120	444	
			SBR	114	115	1	1%					63.0	E			123	450	
		Intersection		**4,212**	**4,102**	-110	**-3%**	**4,212**	**4,102**	**-110**	**-3%**	21.1	C	**21.1**	**C**			
Herndon Parkway / Fairbrook Drive	**Signal**	Parking Lot	EBL	15	17	2	16%	49	51	2	4%	50.7	D	44.2	D	5	47	
			EBT	25	24	-1	-2%					51.1	D			7	73	
			EBR	10	10	0	2%					16.5	B			3	74	
		Fairbrook Drive	WBL	329	332	3	1%	375	380	5	1%	43.3	D	39.5	D	54	230	
			WBT	8	6	-2	-20%					52.5	D			54	230	
			WBR	39	42	3	8%					7.5	A			0	42	
		Herndon Parkway	NBL	3	3	0	0%	2,014	1,926	-88	-4%	5.9	A	10.1	B	0	6	
			NBT	1,564	1,495	-69	-4%					10.6	B			53	602	
			NBR	447	428	-19	-4%					8.4	A			7	243	
		Herndon Parkway	SBL	97	98	1	1%	1,438	1,430	-8	-1%	29.8	C	20.1	C	11	188	
			SBT	1,337	1,327	-10	-1%					19.4	B			108	603	
			SBR	5	5	1	11%					13.8	B			110	608	
		Intersection		**3,876**	**3,787**	-89	**-2%**	**3,876**	**3,787**	**-89**	**-2%**	17.3	B	**17.3**	**B**			

Note: Average results across 7 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

Build Scenario 2 with Fairbrook Drive Extended 2045 Conditions: Weekday Evening Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								Build Scenario 2 with Fairbrook Drive Extended 2045 Conditions MOEs						Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	
Elden Street / Monroe Street	**Signal**	Elden Street	EBL	127	124	-3	-2%	817	811	-6	-1%	30.0	C	21.3	C	13	217	
			EBT	654	651	-3	0%					19.8	B			117	798	
			EBR	36	36	0	0%					18.4	B			115	797	
		Elden Street	WBL	13	13	0	0%	755	746	-9	-1%	21.5	C	23.4	C	1	38	
			WBT	669	663	-6	-1%					23.7	C			206	796	
			WBR	73	70	-3	-4%					20.7	C			216	833	
		Monroe Street	NBL	168	162	-6	-4%	450	441	-9	-2%	74.0	E	72.9	E	119	591	
			NBT	271	268	-3	-1%					73.3	E			188	654	
			NBR	11	11	0	0%					48.2	D			174	648	
		Monroe Street	SBL	131	125	-6	-5%	459	451	-8	-2%	46.7	D	49.1	D	66	356	
			SBT	207	204	-3	-2%					54.2	D			99	384	
			SBR	121	122	1	1%					43.1	D			98	384	
		Intersection		**2,481**	**2,449**	-32	**-1%**	**2,481**	**2,449**	**-32**	**-1%**	36.3	D	**36.3**	**D**			
Elden Street / Van Buren Street	**Signal**	Elden Street	EBL	5	5	0	0%	803	786	-17	-2%	52.6	D	35.5	D	96	345	
			EBT	764	744	-20	-3%					37.0	D			96	345	
			EBR	34	37	3	9%					5.1	A			1	58	
		Elden Street	WBL	150	150	0	0%	962	948	-14	-1%	38.1	D	27.1	C	86	378	
			WBT	754	742	-12	-2%					25.4	C			86	378	
			WBR	58	56	-2	-3%					20.2	C			95	392	
		Van Buren Street	NBL	118	110	-8	-7%	719	674	-45	-6%	41.3	D	36.0	D	23	321	
			NBT	425	397	-28	-7%					44.4	D			135	634	
			NBR	176	167	-9	-5%					12.5	B			5	142	
		Van Buren Street	SBL	126	126	0	0%	394	401	7	2%	40.3	D	43.3	D	33	235	
			SBT	253	259	6	2%					45.2	D			72	288	
			SBR	15	16	1	7%					36.6	D			75	299	
		Intersection		**2,484**	**2,408**	-76	**-3%**	**2,484**	**2,408**	**-76**	**-3%**	39.5	D	**39.5**	**D**			
Van Buren Street / Spring Street	**Signal**	Van Buren Street	EBL	424	384	-40	-9%	640	584	-56	-9%	21.6	C	16.9	B	0	69	
			EBT	1	1	0	0%					16.9	B			55	467	
			EBR	215	199	-16	-7%					7.8	A			9	168	
		Parking Lot	WBL	13	14	1	8%	28	28	0	0%	29.1	C	28.7	C	2	49	
			WBR	15	14	-1	-7%					28.3	C			2	46	
		Spring Street	NBL	324	306	-18	-6%	966	907	-59	-6%	26.4	C	16.7	B	41	373	
			NBT	634	594	-40	-6%					11.8	B			23	301	
			NBR	8	7	-1	-13%					9.4	A			22	309	
		Van Buren Street	SBL	3	3	0	0%	802	808	6	1%	15.1	B	20.2	C	0	24	
			SBT	338	339	1	0%					20.1	C			59	420	
			SBR	461	466	5	1%					20.4	C			70	429	
		Intersection		**1,634**	**1,519**	-115	**-7%**	**1,634**	**1,519**	**-115**	**-7%**	27.8	C	**27.8**	**C**			
Spring Street / Herndon Parkway	**Signal**	Spring Street	EBL	81	74	-7	-8%	949	877	-72	-8%	105.7	F	114.2	F	136	494	
			EBT	657	613	-44	-7%					115.9	F			404	953	
			EBR	211	190	-21	-10%					112.0	F			406	956	
		Spring Street	WBL	987	904	-83	-8%	2,230	2,060	-170	-8%	62.9	E	41.5	D	289	669	
			WBT	784	726	-58	-7%					32.8	C			95	543	
			WBR	459	430	-29	-6%					11.0	B			21	299	
		Herndon Parkway	NBL	238	227	-11	-4%	1,796	1,668	-128	-7%	56.6	E	39.6	D	57	337	
			NBT	695	653	-42	-6%					55.7	E			161	570	
			NBR	864	788	-76	-9%					21.3	C			161	570	
		Herndon Parkway	SBL	491	465	-26	-5%	1,080	1,014	-66	-6%	81.8	F	97.2	F	125	422	
			SBT	551	516	-35	-6%					111.6	F			274	825	
			SBR	38	33	-5	-12%					89.4	F			275	824	
		Intersection		**4,975**	**4,605**	-370	**-7%**	**4,975**	**4,605**	**-370**	**-7%**	76.0	E	**76.0**	**E**			

Note: Average results across 20 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

Build Scenario 2 with Fairbrook Drive Extended 2045 Conditions: Weekday Evening Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								Build Scenario 2 with Fairbrook Drive Extended 2045 Conditions MOEs						Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	
Spring Street / Fairfax County Parkway / Fairbrook Drive	**Signal**	Spring Street	EBL	287	267	-20	-7%	2,015	1,866	-149	-7%	100.5	F	38.7	D	215	665	
			EBT	1,679	1,552	-127	-8%					28.6	C			177	654	
			EBR	49	47	-2	-5%					21.4	C			173	649	
		Spring Street	WBL	190	169	-21	-11%	2,302	2,090	-212	-9%	59.6	E	44.5	D	920	1617	
			WBT	1,462	1,342	-120	-8%					48.9	D			920	1617	
			WBR	650	579	-71	-11%					30.0	C			901	1607	
		Fairbrook Drive	NBL	51	51	0	0%	818	808	-10	-1%	99.2	F	67.2	E	354	1008	
			NBT	187	182	-5	-3%					88.6	F			354	1008	
			NBR	581	575	-6	-1%					57.6	E			354	1008	
		Fairfax County Parkway	SBL	166	166	0	0%	1,488	1,430	-58	-4%	109.7	F	48.5	D	141	750	
			SBT	405	397	-8	-2%					47.8	D			212	861	
			SBR	918	867	-51	-6%					37.2	D			242	913	
		Intersection		**6,624**	**6,194**	-430	**-6%**	**6,624**	**6,194**	**-430**	**-6%**	46.6	D	**46.6**	**D**			
Van Buren Street / Alabama Drive	**Signal**	Alabama Drive	EBL	85	62	-23	-27%	263	199	-64	-24%	233.8	F	220.3	F	365	521	
			EBT	18	13	-5	-28%					226.6	F			365	521	
			EBR	160	124	-36	-23%					212.8	F			372	528	
		Alabama Drive	WBL	34	32	-2	-6%	65	62	-3	-5%	89.9	F	74.7	E	24	126	
			WBT	10	10	0	0%					83.9	F			24	126	
			WBR	21	20	-1	-5%					45.8	D			26	140	
		Van Buren Street	NBL	81	76	-5	-6%	700	661	-39	-6%	25.4	C	20.6	C	109	698	
			NBT	534	508	-26	-5%					20.0	C			109	699	
			NBR	85	77	-8	-10%					19.5	B			108	698	
		Van Buren Street	SBL	34	33	-1	-3%	786	764	-22	-3%	36.5	D	32.0	C	440	1208	
			SBT	645	627	-18	-3%					32.4	C			440	1208	
			SBR	107	104	-3	-3%					28.3	C			439	1207	
		Intersection		**1,814**	**1,686**	-128	**-7%**	**1,814**	**1,686**	**-128**	**-7%**	51.3	D	**51.3**	**D**			
Van Buren Street / Herndon Parkway	**Signal**	Herndon Parkway	EBL	55	56	1	2%	1,086	1,084	-2	0%	58.9	E	33.9	C	18	108	
			EBT	685	687	2	0%					40.9	D			94	450	
			EBR	346	341	-5	-1%					15.7	B			34	273	
		Herndon Parkway	WBL	520	478	-42	-8%	2,033	1,880	-153	-8%	75.2	E	44.4	D	131	574	
			WBT	1,263	1,173	-90	-7%					33.9	C			311	997	
			WBR	250	229	-21	-8%					33.7	C			311	997	
		Van Buren Street	NBL	365	352	-13	-4%	1,051	1,003	-48	-5%	109.9	F	55.7	E	501	933	
			NBT	394	372	-22	-6%					36.9	D			485	930	
			NBR	292	279	-13	-4%					12.5	B			21	247	
		Van Buren Street	SBL	125	112	-13	-10%	840	777	-63	-8%	72.8	E	67.1	E	271	877	
			SBT	668	620	-48	-7%					66.8	E			789	1208	
			SBR	47	45	-2	-4%					57.4	E			789	1208	
		Intersection		**5,010**	**4,744**	-266	**-5%**	**5,010**	**4,744**	**-266**	**-5%**	48.1	D	**48.1**	**D**			
Van Buren Street / Worldgate Drive	**Signal**	Worldgate Drive	EBL	291	281	-10	-3%	1,374	1,355	-19	-1%	71.4	E	33.2	C	230	641	
			EBT	414	409	-5	-1%					42.3	D			80	278	
			EBR	669	665	-4	-1%					11.5	B			115	554	
		Parking Lot	WBL	396	352	-44	-11%	996	927	-69	-7%	61.6	E	47.0	D	215	690	
			WBT	577	555	-22	-4%					38.7	D			86	423	
			WBR	22	20	-2	-9%					20.9	C			94	436	
		Van Buren Street	NBL	361	337	-24	-7%	1,443	1,384	-59	-4%	53.2	D	38.4	D	133	602	
			NBT	720	703	-17	-2%					41.2	D			292	913	
			NBR	362	344	-18	-5%					17.9	B			154	609	
		Van Buren Street	SBL	9	8	-1	-11%	1,583	1,495	-88	-6%	66.5	E	21.3	C	9	61	
			SBT	1,211	1,146	-65	-5%					26.8	C			98	403	
			SBR	363	341	-22	-6%					2.0	A			0	92	
		Intersection		**5,396**	**5,161**	-235	**-4%**	**5,396**	**5,161**	**-235**	**-4%**	33.6	C	**33.6**	**C**			

Note: Average results across 20 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

Build Scenario 2 with Fairbrook Drive Extended 2045 Conditions: Weekday Evening Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								Build Scenario 2 with Fairbrook Drive Extended 2045 Conditions MOEs						Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	
Herndon Parkway / Worldgate Drive	**Signal**	Herndon Parkway	EBL	157	154	-3	-2%	1,186	1,150	-36	-3%	61.6	E	56.7	E	35	353	
			EBT	1,008	975	-33	-3%					56.0	E			236	624	
			EBR	20	21	1	5%					50.7	D			239	628	
		Herndon Parkway	WBL	721	652	-69	-10%	2,456	2,231	-225	-9%	77.9	E	36.8	D	207	975	
			WBT	1,688	1,535	-153	-9%					19.9	B			234	1003	
			WBR	47	44	-3	-7%					18.3	B			240	1012	
		Worldgate Drive	NBL	199	191	-8	-4%	983	961	-22	-2%	45.3	D	25.8	C	100	484	
			NBT	88	82	-6	-6%					43.5	D			100	484	
			NBR	696	688	-8	-1%					18.3	B			100	484	
		Worldgate Drive	SBL	101	95	-6	-6%	245	233	-12	-5%	50.9	D	36.8	D	39	225	
			SBT	45	43	-2	-4%					48.6	D			26	212	
			SBR	99	95	-4	-4%					17.4	B			25	215	
		Intersection		**4,870**	**4,575**	-295	**-6%**	**4,870**	**4,575**	**-295**	**-6%**	39.5	D	**39.5**	**D**			
Herndon Parkway / Exchange Place	**Signal**	Herndon Parkway	EBL	83	80	-3	-4%	2,020	1,860	-160	-8%	48.3	D	24.8	C	12	127	
			EBT	1,837	1,688	-149	-8%					23.7	C			245	789	
			EBR	99	92	-7	-7%					23.5	C			248	794	
		Herndon Parkway	WBL	66	58	-8	-12%	2,046	1,784	-262	-13%	45.1	D	50.2	D	6	89	
			WBT	1,786	1,557	-229	-13%					50.9	D			425	713	
			WBR	195	169	-26	-13%					46.3	D			434	723	
		Parking Lot	NBL	314	298	-16	-5%	449	432	-17	-4%	73.7	E	62.3	E	127	389	
			NBT	0	0	0	0%					0.0	A			127	389	
			NBR	135	134	-1	-1%					37.2	D			11	284	
		Exchange Place	SBL	174	168	-6	-3%	290	287	-3	-1%	42.3	D	32.9	C	41	268	
			SBT	0	0	0	0%					0.0	A			41	268	
			SBR	116	119	3	3%					19.7	B			11	81	
		Intersection		**4,805**	**4,363**	-442	**-9%**	**4,805**	**4,363**	**-442**	**-9%**	39.4	D	**39.4**	**D**			
Herndon Parkway / Fairbrook Drive	**Signal**	Parking Lot	EBL	7	8	1	11%	24	25	1	4%	51.9	D	55.9	E	2	36	
			EBT	12	12	0	0%					63.5	E			4	55	
			EBR	5	5	0	4%					44.0	D			2	55	
		Fairbrook Drive	WBL	420	345	-75	-18%	564	464	-100	-18%	178.6	F	151.4	F	780	1128	
			WBT	19	15	-4	-19%					196.2	F			780	1128	
			WBR	126	104	-22	-17%					54.7	D			68	234	
		Herndon Parkway	NBL	7	6	-1	-19%	2,146	1,998	-148	-7%	15.0	B	14.0	B	0	24	
			NBT	1,686	1,565	-121	-7%					15.2	B			118	689	
			NBR	453	427	-26	-6%					9.5	A			6	294	
		Herndon Parkway	SBL	60	53	-7	-12%	1,668	1,519	-149	-9%	53.4	D	57.9	E	38	131	
			SBT	1,597	1,457	-140	-9%					58.2	E			661	977	
			SBR	11	9	-2	-19%					34.6	C			665	981	
		Intersection		**4,402**	**4,006**	-396	**-9%**	**4,402**	**4,006**	**-396**	**-9%**	46.8	D	**46.8**	**D**			

Note: Average results across 20 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

Build Scenario 3 with Fairbrook Drive Extended 2045 Conditions: Weekday Morning Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								Build Scenario 3 with Fairbrook Drive Extended 2045 Conditions MOEs						Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	
Elden Street / Monroe Street	**Signal**	Elden Street	EBL	73	74	1	1%	839	835	-4	0%	23.7	C	18.3	B	5	140	
			EBT	630	628	-2	0%					18.0	B			112	701	
			EBR	136	133	-3	-2%					16.7	B			111	701	
		Elden Street	WBL	6	5	-1	-17%	459	454	-5	-1%	28.8	C	22.2	C	0	33	
			WBT	410	405	-5	-1%					22.5	C			68	465	
			WBR	43	44	1	2%					19.2	B			76	503	
		Monroe Street	NBL	36	39	3	8%	190	197	7	4%	48.6	D	46.7	D	10	87	
			NBT	139	143	4	3%					49.7	D			42	238	
			NBR	15	15	0	0%					13.6	B			25	233	
		Monroe Street	SBL	96	93	-3	-3%	431	429	-2	-1%	49.7	D	57.5	E	51	353	
			SBT	276	279	3	1%					61.9	E			119	420	
			SBR	59	57	-2	-3%					49.1	D			117	420	
		Intersection		**1,919**	**1,915**	-4	**0%**	**1,919**	**1,915**	**-4**	**0%**	30.9	C	**30.9**	**C**			
Elden Street / Van Buren Street	**Signal**	Elden Street	EBL	0	0	0	0%	770	748	-22	-3%	0.0	A	15.6	B	41	306	
			EBT	718	687	-31	-4%					16.7	B			41	306	
			EBR	52	61	9	17%					3.8	A			1	55	
		Elden Street	WBL	117	116	-1	-1%	602	586	-16	-3%	31.4	C	21.0	C	38	211	
			WBT	469	457	-12	-3%					18.6	B			38	211	
			WBR	16	13	-3	-19%					14.5	B			46	225	
		Van Buren Street	NBL	49	48	-1	-2%	390	385	-5	-1%	33.3	C	28.8	C	9	97	
			NBT	225	223	-2	-1%					39.7	D			53	279	
			NBR	116	114	-2	-2%					5.4	A			3	92	
		Van Buren Street	SBL	146	142	-4	-3%	528	542	14	3%	38.8	D	41.8	D	40	324	
			SBT	373	388	15	4%					43.0	D			105	429	
			SBR	9	12	3	33%					38.9	D			110	440	
		Intersection		**1,762**	**1,719**	-43	**-2%**	**1,762**	**1,719**	**-43**	**-2%**	33.6	C	**33.6**	**C**			
Van Buren Street / Spring Street	**Signal**	Van Buren Street	EBL	184	176	-8	-4%	509	504	-5	-1%	15.2	B	11.8	B	0	7	
			EBT	6	8	2	33%					14.7	B			16	175	
			EBR	319	320	1	0%					9.9	A			17	231	
		Parking Lot	WBL	1	1	0	0%	1	1	0	0%	31.3	C	31.3	C	0	14	
			WBR	0	0	0	0%					0.0	A			0	0	
		Spring Street	NBL	117	123	6	5%	418	426	8	2%	14.6	B	8.4	A	4	117	
			NBT	293	297	4	1%					5.9	A			6	136	
			NBR	8	6	-2	-25%					2.5	A			5	144	
		Van Buren Street	SBL	9	9	0	0%	883	899	16	2%	7.2	A	7.6	A	0	30	
			SBT	532	538	6	1%					8.5	A			17	241	
			SBR	342	352	10	3%					6.2	A			8	173	
		Intersection		**928**	**931**	3	**0%**	**928**	**931**	**3**	**0%**	17.6	B	**17.6**	**B**			
Spring Street / Herndon Parkway	**Signal**	Spring Street	EBL	57	65	8	14%	952	957	5	1%	85.9	F	67.1	E	31	189	
			EBT	733	731	-2	0%					68.2	E			142	436	
			EBR	162	161	-1	0%					54.5	D			144	440	
		Spring Street	WBL	699	700	1	0%	1,620	1,621	1	0%	47.1	D	35.7	D	122	549	
			WBT	511	516	5	1%					39.6	D			68	324	
			WBR	410	405	-5	-1%					11.2	B			24	258	
		Herndon Parkway	NBL	235	237	2	1%	1,672	1,628	-44	-3%	47.5	D	32.3	C	58	349	
			NBT	410	392	-18	-4%					44.5	D			105	404	
			NBR	1,027	999	-28	-3%					23.9	C			105	404	
		Herndon Parkway	SBL	438	432	-6	-1%	1,032	1,032	0	0%	78.0	E	58.8	E	105	330	
			SBT	540	543	3	1%					45.6	D			86	333	
			SBR	54	57	3	5%					40.2	D			87	336	
		Intersection		**4,244**	**4,206**	-38	**-1%**	**4,244**	**4,206**	**-38**	**-1%**	56.0	E	**56.0**	**E**			

Note: Average results across 7 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

Build Scenario 3 with Fairbrook Drive Extended 2045 Conditions: Weekday Morning Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								Build Scenario 3 with Fairbrook Drive Extended 2045 Conditions MOEs						Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	
Spring Street / Fairfax County Parkway / Fairbrook Drive	**Signal**	Spring Street	EBL	151	151	0	0%	2,195	2,143	-52	-2%	39.0	D	33.6	C	25	203	
			EBT	2,027	1,975	-52	-3%					33.3	C			220	757	
			EBR	17	17	0	1%					26.1	C			216	752	
		Spring Street	WBL	202	196	-6	-3%	1,104	1,087	-17	-2%	105.6	F	48.3	D	210	702	
			WBT	597	592	-5	-1%					48.1	D			210	702	
			WBR	305	299	-6	-2%					11.1	B			171	691	
		Fairbrook Drive	NBL	12	12	0	3%	625	632	7	1%	100.5	F	65.1	E	156	609	
			NBT	145	147	2	1%					94.8	F			156	609	
			NBR	468	473	5	1%					55.0	D			156	609	
		Fairfax County Parkway	SBL	370	366	-4	-1%	1,833	1,825	-8	0%	88.6	F	42.0	D	549	1408	
			SBT	379	374	-5	-1%					41.0	D			241	1249	
			SBR	1,083	1,085	2	0%					26.6	C			457	1419	
		Intersection		**5,757**	**5,687**	-70	**-1%**	**5,757**	**5,687**	**-70**	**-1%**	**42.6**	D	**42.6**	**D**			
Van Buren Street / Alabama Drive	**Signal**	Alabama Drive	EBL	129	130	1	1%	317	317	0	0%	42.7	D	35.0	C	65	356	
			EBT	10	11	1	10%					35.2	D			65	356	
			EBR	178	176	-2	-1%					29.3	C			66	363	
		Alabama Drive	WBL	50	49	-1	-2%	106	102	-4	-4%	31.0	C	25.8	C	14	145	
			WBT	13	13	0	0%					34.0	C			14	145	
			WBR	43	40	-3	-7%					16.7	B			14	159	
		Van Buren Street	NBL	50	51	1	2%	420	412	-8	-2%	18.0	B	14.1	B	37	383	
			NBT	337	330	-7	-2%					13.7	B			37	384	
			NBR	33	31	-2	-7%					11.8	B			36	383	
		Van Buren Street	SBL	13	16	3	23%	459	472	13	3%	14.1	B	13.5	B	43	382	
			SBT	405	416	11	3%					13.8	B			43	381	
			SBR	41	40	-1	-2%					10.7	B			41	380	
		Intersection		**1,302**	**1,303**	1	**0%**	**1,302**	**1,303**	**1**	**0%**	19.9	B	**19.9**	**B**			
Van Buren Street / Herndon Parkway	**Signal**	Herndon Parkway	EBL	43	41	-2	-5%	1,481	1,451	-30	-2%	63.8	E	40.5	D	12	96	
			EBT	1,121	1,107	-14	-1%					45.6	D			267	863	
			EBR	317	303	-14	-4%					18.6	B			49	547	
		Herndon Parkway	WBL	293	301	8	3%	930	919	-11	-1%	52.3	D	25.8	C	53	186	
			WBT	523	509	-14	-3%					13.2	B			24	267	
			WBR	114	109	-5	-5%					11.4	B			24	267	
		Van Buren Street	NBL	240	248	8	3%	835	850	15	2%	66.7	E	46.9	D	111	347	
			NBT	261	270	9	3%					57.1	E			106	344	
			NBR	334	332	-2	-1%					23.9	C			49	290	
		Van Buren Street	SBL	147	149	2	1%	634	647	13	2%	37.7	D	34.3	C	31	240	
			SBT	464	476	12	3%					33.9	C			58	453	
			SBR	23	22	-1	-4%					20.3	C			58	453	
		Intersection		**3,880**	**3,867**	-13	**0%**	**3,880**	**3,867**	**-13**	**0%**	37.4	D	**37.4**	**D**			

Note: Average results across 7 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

Build Scenario 3 with Fairbrook Drive Extended 2045 Conditions: Weekday Morning Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								Build Scenario 3 with Fairbrook Drive Extended 2045 Conditions MOEs						Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	
Van Buren Street / Worldgate Drive	**Signal**	Worldgate Drive	EBL	170	172	2	1%	1,133	1,130	-3	0%	35.7	D	31.2	C	37	204	
			EBT	722	716	-6	-1%					39.8	D			93	348	
			EBR	241	242	1	0%					2.6	A			2	104	
		Worldgate Drive	WBL	198	207	9	4%	420	437	17	4%	32.8	C	32.6	C	38	318	
			WBT	214	222	8	4%					32.9	C			27	122	
			WBR	8	8	0	0%					21.7	C			29	136	
		Van Buren Street	NBL	406	393	-13	-3%	1,695	1,687	-8	0%	46.3	D	23.3	C	63	396	
			NBT	767	782	15	2%					18.3	B			51	343	
			NBR	522	512	-10	-2%					13.4	B			35	389	
		Van Buren Street	SBL	20	21	1	5%	1,045	1,044	-1	0%	49.7	D	15.9	B	6	65	
			SBT	669	666	-3	0%					22.0	C			48	267	
			SBR	356	357	1	0%					2.4	A			1	143	
		Intersection		**4,293**	**4,298**	5	**0%**	**4,293**	**4,298**	**5**	**0%**	24.5	C	**24.5**	**C**			
Herndon Parkway / Worldgate Drive	**Signal**	Herndon Parkway	EBL	156	164	8	5%	1,557	1,543	-14	-1%	30.1	C	53.3	D	8	118	
			EBT	1,357	1,337	-20	-2%					56.4	E			442	888	
			EBR	44	42	-2	-5%					44.9	D			445	892	
		Herndon Parkway	WBL	492	488	-4	-1%	1,308	1,300	-8	-1%	59.0	E	29.3	C	98	451	
			WBT	716	715	-1	0%					11.4	B			27	351	
			WBR	100	97	-3	-3%					10.9	B			28	361	
		Worldgate Drive	NBL	65	64	-1	-2%	1,087	1,075	-12	-1%	41.5	D	29.1	C	106	502	
			NBT	110	105	-5	-4%					38.5	D			106	502	
			NBR	913	906	-7	-1%					27.1	C			106	502	
		Worldgate Drive	SBL	52	55	3	5%	274	281	7	3%	47.2	D	32.9	C	12	157	
			SBT	73	71	-2	-3%					44.7	D			35	247	
			SBR	149	155	6	4%					22.3	C			34	251	
		Intersection		**4,227**	**4,199**	-28	**-1%**	**4,227**	**4,199**	**-28**	**-1%**	38.3	D	**38.3**	**D**			
Herndon Parkway / Exchange Place	**Signal**	Herndon Parkway	EBL	45	45	0	0%	1,996	1,930	-66	-3%	18.9	B	21.5	C	1	70	
			EBT	1,731	1,682	-49	-3%					21.5	C			266	829	
			EBR	220	203	-17	-8%					21.6	C			269	834	
		Herndon Parkway	WBL	148	144	-4	-3%	1,534	1,522	-12	-1%	38.2	D	8.4	A	19	212	
			WBT	1,279	1,269	-10	-1%					5.3	A			17	285	
			WBR	107	109	2	2%					5.4	A			18	295	
		Parking Lot	NBL	103	100	-3	-3%	147	146	-1	-1%	43.8	D	33.2	C	25	152	
			NBT	0	0	0	0%					0.0	A			25	152	
			NBR	44	46	2	5%					10.1	B			1	54	
		Exchange Place	SBL	83	81	-2	-3%	144	142	-2	-1%	46.5	D	37.8	D	29	191	
			SBT	0	0	0	0%					0.0	A			29	191	
			SBR	61	61	0	0%					26.4	C			28	197	
		Intersection		**3,820**	**3,740**	-80	**-2%**	**3,820**	**3,740**	**-80**	**-2%**	17.2	B	**17.2**	**B**			
Herndon Parkway / Fairbrook Drive	**Signal**	Parking Lot	EBL	124	121	-3	-3%	414	405	-9	-2%	84.8	F	85.9	F	110	355	
			EBT	207	200	-7	-3%					90.4	F			194	353	
			EBR	83	84	1	1%					76.7	E			193	352	
		Fairbrook Drive	WBL	296	298	2	1%	503	507	4	1%	49.4	D	46.2	D	98	455	
			WBT	169	171	3	1%					48.8	D			98	455	
			WBR	39	38	-1	-3%					9.5	A			0	32	
		Herndon Parkway	NBL	67	64	-3	-5%	1,858	1,799	-59	-3%	15.7	B	25.3	C	3	63	
			NBT	1,388	1,346	-42	-3%					27.5	C			213	702	
			NBR	403	389	-14	-3%					19.4	B			34	662	
		Herndon Parkway	SBL	97	100	3	3%	1,352	1,340	-12	-1%	48.7	D	40.4	D	19	255	
			SBT	1,154	1,142	-12	-1%					39.8	D			221	880	
			SBR	101	98	-3	-3%					38.4	D			224	885	
		Intersection		**4,128**	**4,051**	-77	**-2%**	**4,128**	**4,051**	**-77**	**-2%**	38.9	D	**38.9**	**D**			

Note: Average results across 7 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

Build Scenario 3 with Fairbrook Drive Extended 2045 Conditions: Weekday Evening Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								Build Scenario 3 with Fairbrook Drive Extended 2045 Conditions MOEs						Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	
Elden Street / Monroe Street	**Signal**	Elden Street	EBL	127	124	-3	-2%	817	811	-6	-1%	29.8	C	21.4	C	12	213	
			EBT	654	651	-3	0%					19.9	B			119	787	
			EBR	36	36	0	0%					18.5	B			117	786	
		Elden Street	WBL	13	13	0	0%	755	748	-7	-1%	22.5	C	23.0	C	1	42	
			WBT	669	665	-4	-1%					23.3	C			200	794	
			WBR	73	70	-3	-4%					20.9	C			214	831	
		Monroe Street	NBL	168	164	-4	-2%	454	449	-5	-1%	74.0	E	73.9	E	128	608	
			NBT	275	274	-1	0%					74.9	E			206	676	
			NBR	11	11	0	0%					49.8	D			192	671	
		Monroe Street	SBL	131	125	-6	-5%	461	452	-9	-2%	47.5	D	50.8	D	66	342	
			SBT	209	206	-3	-1%					56.4	E			103	367	
			SBR	121	121	0	0%					44.9	D			102	366	
		Intersection		**2,487**	**2,460**	-27	**-1%**	**2,487**	**2,460**	**-27**	**-1%**	36.9	D	**36.9**	**D**			
Elden Street / Van Buren Street	**Signal**	Elden Street	EBL	5	5	0	0%	803	789	-14	-2%	52.6	D	36.0	D	98	345	
			EBT	764	746	-18	-2%					37.5	D			98	345	
			EBR	34	38	4	12%					5.1	A			1	62	
		Elden Street	WBL	150	150	0	0%	962	950	-12	-1%	38.7	D	27.3	C	87	378	
			WBT	754	744	-10	-1%					25.6	C			87	378	
			WBR	58	56	-2	-3%					20.5	C			97	392	
		Van Buren Street	NBL	118	115	-3	-3%	723	700	-23	-3%	44.0	D	37.7	D	23	304	
			NBT	429	412	-17	-4%					45.9	D			158	712	
			NBR	176	173	-3	-2%					14.0	B			7	194	
		Van Buren Street	SBL	126	126	0	0%	394	401	7	2%	40.3	D	43.2	D	33	235	
			SBT	253	259	6	2%					45.1	D			72	286	
			SBR	15	16	1	7%					36.3	D			76	297	
		Intersection		**2,488**	**2,439**	-49	**-2%**	**2,488**	**2,439**	**-49**	**-2%**	40.2	D	**40.2**	**D**			
Van Buren Street / Spring Street	**Signal**	Van Buren Street	EBL	420	389	-31	-7%	636	594	-42	-7%	21.5	C	16.9	B	0	56	
			EBT	1	1	0	0%					20.3	C			61	573	
			EBR	215	204	-11	-5%					8.1	A			6	125	
		Parking Lot	WBL	13	14	1	8%	28	28	0	0%	27.8	C	27.1	C	2	48	
			WBR	15	14	-1	-7%					26.4	C			2	49	
		Spring Street	NBL	324	322	-2	-1%	978	963	-15	-2%	29.4	C	18.2	B	49	394	
			NBT	646	634	-12	-2%					12.7	B			26	351	
			NBR	8	7	-1	-13%					9.8	A			26	359	
		Van Buren Street	SBL	3	3	0	0%	804	815	11	1%	15.9	B	20.1	C	0	21	
			SBT	340	343	3	1%					20.1	C			51	352	
			SBR	461	469	8	2%					20.1	C			63	368	
		Intersection		**1,642**	**1,585**	-57	**-3%**	**1,642**	**1,585**	**-57**	**-3%**	28.2	C	**28.2**	**C**			
Spring Street / Herndon Parkway	**Signal**	Spring Street	EBL	99	96	-3	-3%	943	919	-24	-3%	96.2	F	95.8	F	92	458	
			EBT	658	642	-16	-2%					97.5	F			276	728	
			EBR	187	181	-6	-3%					89.3	F			278	731	
		Spring Street	WBL	987	965	-22	-2%	2,224	2,180	-44	-2%	47.2	D	34.3	C	217	655	
			WBT	783	767	-16	-2%					31.5	C			88	521	
			WBR	454	448	-6	-1%					11.3	B			22	225	
		Herndon Parkway	NBL	235	234	-1	-1%	1,782	1,728	-54	-3%	52.2	D	41.6	D	51	303	
			NBT	692	679	-13	-2%					58.4	E			190	612	
			NBR	854	815	-39	-5%					24.6	C			190	612	
		Herndon Parkway	SBL	474	465	-9	-2%	1,091	1,077	-14	-1%	74.9	E	74.6	E	110	335	
			SBT	575	572	-3	-1%					74.5	E			173	557	
			SBR	43	40	-3	-6%					72.9	E			174	560	
		Intersection		**4,949**	**4,827**	-122	**-2%**	**4,949**	**4,827**	**-122**	**-2%**	65.3	E	**65.3**	**E**			

Note: Average results across 20 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

Build Scenario 3 with Fairbrook Drive Extended 2045 Conditions: Weekday Evening Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								Build Scenario 3 with Fairbrook Drive Extended 2045 Conditions MOEs						Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	
Spring Street / Fairfax County Parkway / Fairbrook Drive	**Signal**	Spring Street	EBL	283	276	-7	-3%	1,987	1,918	-69	-3%	103.8	F	39.5	D	244	733	
			EBT	1,690	1,629	-61	-4%					28.7	C			203	714	
			EBR	13	13	0	-1%					22.4	C			199	710	
		Spring Street	WBL	181	175	-6	-3%	2,318	2,231	-87	-4%	50.4	D	38.7	D	938	1630	
			WBT	1,488	1,443	-45	-3%					39.7	D			938	1630	
			WBR	650	613	-37	-6%					33.0	C			923	1619	
		Fairbrook Drive	NBL	19	21	2	10%	790	791	1	0%	76.6	E	55.0	E	192	882	
			NBT	187	185	-2	-1%					70.5	E			192	882	
			NBR	584	585	1	0%					49.4	D			192	882	
		Fairfax County Parkway	SBL	166	170	4	2%	1,506	1,509	3	0%	109.0	F	46.2	D	142	693	
			SBT	422	425	3	1%					48.3	D			166	775	
			SBR	917	914	-3	0%					33.6	C			178	857	
		Intersection		**6,601**	**6,449**	-152	**-2%**	**6,601**	**6,449**	**-152**	**-2%**	42.7	D	**42.7**	**D**			
Van Buren Street / Alabama Drive	**Signal**	Alabama Drive	EBL	85	59	-26	-31%	262	188	-74	-28%	236.8	F	222.7	F	372	528	
			EBT	18	13	-5	-28%					231.9	F			372	528	
			EBR	159	116	-43	-27%					214.6	F			378	535	
		Alabama Drive	WBL	34	32	-2	-5%	65	62	-3	-4%	98.6	F	78.6	E	25	147	
			WBT	10	10	0	0%					87.0	F			25	147	
			WBR	21	20	-1	-5%					42.4	D			27	162	
		Van Buren Street	NBL	73	71	-2	-3%	688	666	-22	-3%	25.2	C	20.2	C	111	643	
			NBT	530	517	-13	-2%					19.9	B			111	644	
			NBR	85	78	-7	-8%					17.7	B			111	643	
		Van Buren Street	SBL	34	34	0	0%	786	783	-3	0%	36.4	D	33.5	C	545	1347	
			SBT	645	643	-2	0%					34.0	C			545	1348	
			SBR	107	106	-1	-1%					29.2	C			543	1348	
		Intersection		**1,800**	**1,699**	-101	**-6%**	**1,800**	**1,699**	**-101**	**-6%**	50.9	D	**50.9**	**D**			
Van Buren Street / Herndon Parkway	**Signal**	Herndon Parkway	EBL	55	56	1	2%	1,080	1,080	0	0%	58.9	E	33.9	C	18	116	
			EBT	679	683	4	1%					40.9	D			91	416	
			EBR	346	341	-5	-1%					15.8	B			34	245	
		Herndon Parkway	WBL	520	508	-12	-2%	1,962	1,934	-28	-1%	70.7	E	39.9	D	136	563	
			WBT	1,207	1,194	-13	-1%					29.1	C			251	927	
			WBR	235	232	-3	-1%					28.0	C			251	927	
		Van Buren Street	NBL	365	355	-10	-3%	1,051	1,015	-36	-3%	114.6	F	57.2	E	530	961	
			NBT	394	377	-17	-4%					37.1	D			515	958	
			NBR	292	283	-9	-3%					11.9	B			65	330	
		Van Buren Street	SBL	124	113	-11	-9%	839	784	-55	-7%	76.6	E	69.5	E	244	879	
			SBT	668	626	-42	-6%					69.0	E			840	1207	
			SBR	47	45	-2	-4%					58.3	E			840	1207	
		Intersection		**4,931**	**4,813**	-118	**-2%**	**4,931**	**4,813**	**-118**	**-2%**	47.0	D	**47.0**	**D**			
Van Buren Street / Worldgate Drive	**Signal**	Worldgate Drive	EBL	291	286	-5	-2%	1,382	1,378	-4	0%	73.7	E	32.4	C	188	589	
			EBT	422	422	0	0%					37.2	D			51	227	
			EBR	669	670	1	0%					11.7	B			64	495	
		Parking Lot	WBL	393	381	-12	-3%	988	974	-14	-1%	50.3	D	44.6	D	175	645	
			WBT	573	570	-3	-1%					41.2	D			92	474	
			WBR	22	23	1	5%					31.9	C			99	488	
		Van Buren Street	NBL	361	339	-22	-6%	1,449	1,402	-47	-3%	52.0	D	36.9	D	180	523	
			NBT	720	709	-11	-2%					41.7	D			280	857	
			NBR	368	354	-14	-4%					12.9	B			150	579	
		Van Buren Street	SBL	9	9	0	0%	1,583	1,530	-53	-3%	68.1	E	22.6	C	3	41	
			SBT	1,211	1,171	-40	-3%					28.3	C			109	548	
			SBR	363	350	-13	-4%					2.0	A			0	96	
		Intersection		**5,402**	**5,284**	-118	**-2%**	**5,402**	**5,284**	**-118**	**-2%**	33.0	C	**33.0**	**C**			

Note: Average results across 20 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

Build Scenario 3 with Fairbrook Drive Extended 2045 Conditions: Weekday Evening Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								Build Scenario 3 with Fairbrook Drive Extended 2045 Conditions MOEs						Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	
Herndon Parkway / Worldgate Drive	**Signal**	Herndon Parkway	EBL	161	159	-2	-1%	1,179	1,137	-42	-4%	73.1	E	38.9	D	43	351	
			EBT	998	957	-41	-4%					33.4	C			138	499	
			EBR	20	21	1	5%					29.7	C			139	503	
		Herndon Parkway	WBL	672	661	-11	-2%	2,340	2,284	-56	-2%	40.7	D	25.3	C	129	879	
			WBT	1,582	1,538	-44	-3%					19.1	B			223	997	
			WBR	86	85	-1	-1%					18.6	B			228	1006	
		Worldgate Drive	NBL	199	195	-4	-2%	997	990	-7	-1%	67.5	E	33.4	C	150	533	
			NBT	106	103	-3	-3%					65.4	E			150	533	
			NBR	692	692	0	0%					19.0	B			150	533	
		Worldgate Drive	SBL	103	106	3	3%	370	369	-1	0%	47.5	D	36.4	D	34	247	
			SBT	86	86	0	0%					43.9	D			49	249	
			SBR	181	177	-4	-2%					26.0	C			49	253	
		Intersection		**4,885**	**4,780**	-105	**-2%**	**4,885**	**4,780**	**-105**	**-2%**	31.1	C	**31.1**	**C**			
Herndon Parkway / Exchange Place	**Signal**	Herndon Parkway	EBL	80	81	1	2%	1,949	1,880	-69	-4%	36.4	D	15.6	B	7	106	
			EBT	1,770	1,703	-67	-4%					14.7	B			158	820	
			EBR	99	96	-3	-3%					14.1	B			161	825	
		Herndon Parkway	WBL	66	65	-1	-2%	1,896	1,836	-60	-3%	34.4	C	18.1	B	6	85	
			WBT	1,699	1,646	-53	-3%					17.5	B			147	694	
			WBR	131	125	-6	-5%					18.3	B			152	703	
		Parking Lot	NBL	314	308	-6	-2%	449	447	-2	0%	47.3	D	39.5	D	99	386	
			NBT	0	0	0	0%					0.0	A			99	386	
			NBR	135	139	4	3%					22.3	C			9	226	
		Exchange Place	SBL	102	98	-4	-4%	184	182	-2	-1%	38.6	D	23.4	C	20	155	
			SBT	0	0	0	0%					0.0	A			20	155	
			SBR	82	84	2	3%					5.8	A			0	49	
		Intersection		**4,477**	**4,345**	-132	**-3%**	**4,477**	**4,345**	**-132**	**-3%**	19.5	B	**19.5**	**B**			
Herndon Parkway / Fairbrook Drive	**Signal**	Parking Lot	EBL	102	94	-8	-8%	340	308	-32	-9%	166.5	F	167.5	F	311	446	
			EBT	170	152	-18	-11%					172.1	F			359	447	
			EBR	68	62	-6	-9%					157.6	F			359	448	
		Fairbrook Drive	WBL	384	380	-4	-1%	691	689	-2	0%	70.5	E	63.3	E	390	971	
			WBT	181	183	2	1%					72.7	E			390	971	
			WBR	126	126	0	0%					27.9	C			5	123	
		Herndon Parkway	NBL	72	71	-1	-2%	2,007	1,935	-72	-4%	23.8	C	24.9	C	7	85	
			NBT	1,522	1,463	-59	-4%					26.4	C			171	685	
			NBR	412	401	-11	-3%					19.6	B			38	605	
		Herndon Parkway	SBL	60	58	-2	-3%	1,587	1,563	-24	-2%	52.9	D	42.2	D	10	137	
			SBT	1,419	1,400	-19	-1%					42.0	D			441	959	
			SBR	109	105	-4	-3%					38.7	D			445	964	
		Intersection		**4,625**	**4,495**	-130	**-3%**	**4,625**	**4,495**	**-130**	**-3%**	46.5	D	**46.5**	**D**			

Note: Average results across 20 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

Preferred Build Scenario with Fairbrook Drive Extended 2045 Conditions: Weekday Morning Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								Preferred Build Scenario with Fairbrook Drive Extended 2045 Conditions MOEs							Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	Available Queue Storage (ft)	
Elden Street / Monroe Street	**Signal**	Elden Street	EBL	73	74	1	1%	839	835	-4	0%	25.5	C	19.4	B	5	131	150	
			EBT	630	629	-1	0%					19.1	B			122	722	250	To Lynn St signal, which is not in model
			EBR	136	132	-4	-3%					17.3	B			121	721	250	
		Elden Street	WBL	6	5	-1	-17%	459	455	-4	-1%	22.6	C	23.2	C	0	30	875	To Van Buren St signal
			WBT	410	406	-4	-1%					23.5	C			72	466	875	
			WBR	43	44	1	2%					20.1	C			79	504	875	
		Monroe Street	NBL	36	39	3	8%	190	196	6	3%	40.1	D	38.9	D	8	100	100	
			NBT	139	143	4	3%					41.3	D			34	228	900	To Van Buren St signal
			NBR	15	14	-1	-7%					11.2	B			18	220	900	
		Monroe Street	SBL	96	92	-4	-4%	462	458	-4	-1%	56.1	E	60.9	E	69	448	-	No upstream control within reasonable distance
			SBT	307	308	1	0%					63.7	E			139	496	-	
			SBR	59	58	-1	-2%					54.2	D			137	495	250	
		Intersection		**1,951**	**1,944**	-7	**0%**	**1,951**	**1,944**	**-7**	**0%**	**32.0**	**C**	**32.0**	**C**				
Elden Street / Van Buren Street	**Signal**	Elden Street	EBL	0	0	0	0%	770	750	-20	-3%	0.0	A	16.6	B	44	316	850	
			EBT	718	689	-29	-4%					17.7	B			44	316	850	To Monroe Street signal
			EBR	52	61	9	17%					3.8	A			1	54	850	
		Elden Street	WBL	117	116	-1	-1%	602	587	-15	-2%	33.4	C	22.5	C	41	218	1500	To Post Drive signal, which is not in model
			WBT	469	458	-11	-2%					20.0	B			41	218	1500	
			WBR	16	13	-3	-19%					13.3	B			49	232	1500	
		Van Buren Street	NBL	49	47	-2	-4%	391	383	-8	-2%	39.6	D	30.2	C	10	91	150	
			NBT	226	223	-3	-1%					40.8	D			54	281	450	To Monroe St / Grove St signal
			NBR	116	113	-3	-3%					5.5	A			2	79	450	
		Van Buren Street	SBL	146	141	-5	-3%	559	572	13	2%	39.5	D	42.3	D	43	400	325	No upstream control within reasonable distance
			SBT	404	419	15	4%					43.5	D			118	512	-	
			SBR	9	12	3	33%					33.1	C			124	522	-	
		Intersection		**1,763**	**1,720**	-43	**-2%**	**1,763**	**1,720**	**-43**	**-2%**	**35.7**	**D**	**35.7**	**D**				
Van Buren Street / Spring Street	**Signal**	Van Buren Street	EBL	183	176	-7	-4%	508	507	-1	0%	16.0	B	12.2	B	0	14	1600	To Alabama Dr signal
			EBT	6	8	2	33%					14.6	B			17	165	1600	
			EBR	319	323	4	1%					10.1	B			17	217	150	
		Parking Lot	WBL	1	1	0	0%	1	1	0	0%	32.6	C	32.6	C	0	14	-	
			WBR	0	0	0	0%					0.0	A			0	0	-	
		Spring Street	NBL	117	119	2	2%	420	419	-1	0%	14.8	B	7.7	A	4	118	200	
			NBT	295	294	-1	0%					5.0	A			5	111	800	To Huntmar Park Dr signal
			NBR	8	6	-2	-25%					1.6	A			3	119	800	
		Van Buren Street	SBL	9	9	0	0%	945	958	13	1%	8.8	A	7.4	A	0	48	275	
			SBT	586	591	5	1%					8.2	A			18	260	1200	To Monroe St / Grove St signal
			SBR	350	358	8	2%					5.9	A			7	175	1200	
		Intersection		**929**	**927**	-2	**0%**	**929**	**927**	**-2**	**0%**	**17.8**	**B**	**17.8**	**B**				
Spring Street / Herndon Parkway	**Signal**	Spring Street	EBL	87	94	7	8%	991	995	4	0%	87.7	F	75.3	E	46	342	200	
			EBT	779	772	-7	-1%					75.0	E			164	466	2300	To Huntmar Park Dr signal
			EBR	125	129	4	3%					68.0	E			166	469	2300	
		Spring Street	WBL	929	940	11	1%	1,888	1,900	12	1%	40.9	D	31.7	C	156	638	375	
			WBT	544	551	7	1%					33.3	C			63	372	550	To Ffx County Pkwy signal
			WBR	415	409	-6	-1%					8.4	A			15	236	550	
		Herndon Parkway	NBL	180	181	1	0%	1,518	1,467	-51	-3%	49.6	D	31.0	C	45	259	300	
			NBT	355	347	-8	-2%					48.7	D			95	334	500	To Sunset Business Park signal
			NBR	983	939	-44	-4%					20.9	C			95	334	500	
		Herndon Parkway	SBL	454	451	-3	-1%	1,089	1,088	-1	0%	70.7	E	57.9	E	101	295	500	
			SBT	559	557	-2	0%					49.5	D			100	351	2300	To Grove St signal
			SBR	76	80	4	5%					44.6	D			101	354	2300	
		Intersection		**4,397**	**4,362**	-35	**-1%**	**4,397**	**4,362**	**-35**	**-1%**	**55.9**	**E**	**55.9**	**E**				

Note: Average results across 7 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

Preferred Build Scenario with Fairbrook Drive Extended 2045 Conditions: Weekday Morning Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								Preferred Build Scenario with Fairbrook Drive Extended 2045 Conditions MOEs							Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	Available Queue Storage (ft)	
Spring Street / Fairfax County Parkway / Fairbrook Drive	**Signal**	Spring Street	EBL	153	153	0	0%	2,201	2,143	-58	-3%	27.2	C	28.0	C	18	195	250	
			EBT	2,022	1,964	-58	-3%					28.2	C			170	693	550	To Herndon Parkway signal
			EBR	26	26	0	0%					20.5	C			167	689	550	
		Spring Street	WBL	210	209	-1	-1%	1,199	1,190	-9	-1%	84.9	F	49.5	D	211	729	250	
			WBT	683	680	-3	-1%					51.8	D			211	729	1650	To Target signal
			WBR	305	301	-4	-1%					19.7	B			167	718	1650	
		Fairbrook Drive	NBL	21	19	-2	-8%	620	628	8	1%	100.2	F	60.6	E	147	613	-	
			NBT	146	150	4	3%					96.0	F			147	613	-	
			NBR	453	459	6	1%					47.4	D			147	613	250	
		Fairfax County Parkway	SBL	370	367	-3	-1%	1,985	1,993	8	0%	77.5	E	35.4	D	388	1381	250	
			SBT	359	354	-5	-1%					46.9	D			206	1234	600	To Ffx Pkwy signal, which is not in model
			SBR	1,256	1,272	16	1%					20.0	C			359	1429	600	
		Intersection		**6,004**	**5,954**	-50	**-1%**	**6,004**	**5,954**	**-50**	**-1%**	**38.2**	**D**	**38.2**	**D**				
Van Buren Street / Alabama Drive	**Signal**	Alabama Drive	EBL	129	131	2	2%	332	332	0	0%	41.7	D	33.9	C	66	334	-	
			EBT	10	10	0	0%					40.7	D			66	334	-	
			EBR	193	191	-2	-1%					28.2	C			68	341	-	
		Alabama Drive	WBL	56	55	-1	-2%	112	109	-3	-3%	31.7	C	25.8	C	15	146	-	
			WBT	13	13	0	0%					29.6	C			15	146	-	
			WBR	43	41	-2	-5%					16.8	B			15	161	-	
		Van Buren Street	NBL	48	48	0	0%	417	412	-5	-1%	16.8	B	13.8	B	35	366	1125	To Herndon Parkway signal
			NBT	336	332	-4	-1%					13.5	B			36	367	1125	
			NBR	33	32	-1	-2%					12.8	B			35	366	1125	
		Van Buren Street	SBL	13	16	3	23%	467	474	7	1%	17.7	B	14.0	B	44	400	1600	To Van Buren St signal
			SBT	413	419	6	1%					14.0	B			44	400	1600	
			SBR	41	39	-2	-5%					12.1	B			42	399	1600	
		Intersection		**1,328**	**1,327**	-1	**0%**	**1,328**	**1,327**	**-1**	**0%**	**19.9**	**B**	**19.9**	**B**				
Van Buren Street / Herndon Parkway	**Signal**	Herndon Parkway	EBL	43	39	-4	-9%	1,593	1,524	-69	-4%	71.4	E	47.9	D	13	91	175	
			EBT	1,233	1,187	-46	-4%					52.9	D			867	1589	1950	To Campbell Way signal, which is not in model
			EBR	317	298	-19	-6%					24.9	C			530	1542	1950	
		Herndon Parkway	WBL	293	302	9	3%	919	918	-1	0%	75.8	E	30.3	C	77	221	350	
			WBT	514	508	-6	-1%					8.4	A			12	187	875	To Worldgate Drive signal
			WBR	112	108	-4	-4%					6.4	A			12	187	875	
		Van Buren Street	NBL	240	248	8	3%	835	850	15	2%	69.0	E	49.3	D	119	363	375	To Office Park signal
			NBT	261	271	10	4%					61.1	E			113	360	375	
			NBR	334	331	-3	-1%					24.7	C			50	299	300	
		Van Buren Street	SBL	176	177	1	0%	663	675	12	2%	41.3	D	38.4	D	39	327	175	
			SBT	464	475	11	2%					37.9	D			72	573	1125	To Alabama Dr signal
			SBR	23	23	0	0%					26.1	C			72	573	1125	
		Intersection		**4,010**	**3,967**	-43	**-1%**	**4,010**	**3,967**	**-43**	**-1%**	**42.5**	**D**	**42.5**	**D**				
Van Buren Street / Worldgate Drive	**Signal**	Worldgate Drive	EBL	170	174	4	2%	1,156	1,160	4	0%	34.5	C	30.7	C	35	201	400	
			EBT	745	744	-1	0%					38.9	D			93	352	-	
			EBR	241	242	1	0%					2.5	A			2	108	875	
		Worldgate Drive	WBL	194	205	11	6%	411	431	20	5%	33.1	C	32.5	C	38	289	275	
			WBT	209	218	9	4%					32.8	C			26	120	600	To Herndon Pkwy signal
			WBR	8	8	0	0%					13.2	B			28	134	600	
		Van Buren Street	NBL	406	391	-15	-4%	1,714	1,706	-8	0%	45.3	D	22.2	C	61	343	250	
			NBT	767	782	15	2%					16.7	B			47	404	1650	To Eastpark Dr signal
			NBR	541	533	-8	-1%					13.3	B			35	313	250	
		Van Buren Street	SBL	20	21	1	5%	1,045	1,036	-9	-1%	44.2	D	9.4	A	5	67	200	
			SBT	669	659	-10	-1%					12.1	B			28	238	400	To Office Park signal
			SBR	356	356	0	0%					2.3	A			1	126	400	
		Intersection		**4,326**	**4,333**	7	**0%**	**4,326**	**4,333**	**7**	**0%**	**22.4**	**C**	**22.4**	**C**				

Note: Average results across 7 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

Preferred Build Scenario with Fairbrook Drive Extended 2045 Conditions: Weekday Morning Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								Preferred Build Scenario with Fairbrook Drive Extended 2045 Conditions MOEs							Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	Available Queue Storage (ft)	
Herndon Parkway / Worldgate Drive	**Signal**	Herndon Parkway	EBL	163	167	4	2%	1,698	1,640	-58	-3%	22.7	C	58.1	E	4	98	175	
			EBT	1,491	1,431	-60	-4%					62.7	E			500	982	850	To Van Buren St signal
			EBR	44	42	-2	-5%					42.3	D			504	986	850	
		Herndon Parkway	WBL	525	537	12	2%	1,419	1,435	16	1%	64.7	E	32.2	C	122	527	250	
			WBT	791	797	6	1%					12.6	B			36	441	875	To 555 signal
			WBR	103	101	-2	-2%					13.3	B			38	451	875	
		Worldgate Drive	NBL	65	64	-1	-2%	1,130	1,124	-6	0%	33.2	C	26.4	C	98	587	600	
			NBT	90	87	-3	-3%					36.0	D			98	587	600	To Van Buren St signal
			NBR	975	973	-2	0%					25.1	C			98	587	600	
		Worldgate Drive	SBL	73	72	-1	-1%	165	166	1	1%	50.7	D	35.0	C	18	124	75	
			SBT	30	32	2	5%					39.6	D			11	129	-	
			SBR	62	62	0	0%					14.3	B			8	131	-	
		Intersection		**4,412**	**4,365**	-47	**-1%**	**4,412**	**4,365**	**-47**	**-1%**	**40.5**	**D**	**40.5**	**D**				
Herndon Parkway / 555 Herndon Parkway	**Signal**	Herndon Parkway	EBL	64	68	4	7%	2,429	2,367	-62	-3%	12.7	B	17.1	B	2	74	175	
			EBT	2,146	2,079	-67	-3%					17.2	B			240	1040	875	To Worldgate Drive signal
			EBR	220	220	0	0%					17.6	B			241	1043	875	
		Herndon Parkway	WBL	148	158	10	7%	1,524	1,550	26	2%	35.5	D	12.5	B	22	369	175	
			WBT	1,247	1,264	18	1%					9.9	A			59	540	650	To Exchange Place signal
			WBR	129	128	-1	-1%					10.1	B			60	543	650	
		Parking Lot	NBL	103	101	-2	-2%	147	144	-3	-2%	45.2	D	34.7	C	26	168	-	
			NBT	0	0	0	0%					0.0	A			0	0	-	
			NBR	44	43	-1	-2%					10.2	B			0	52	75	
		Parking Lot	SBL	52	50	-2	-4%	124	121	-3	-2%	46.1	D	30.4	C	20	179	-	
			SBT	0	0	0	0%					0.0	A			0	0	-	
			SBR	72	71	-1	-1%					19.4	B			18	185	-	
		Intersection		**4,224**	**4,182**	-42	**-1%**	**4,224**	**4,182**	**-42**	**-1%**	**16.4**	**B**	**16.4**	**B**				
Herndon Parkway / Exchange Place	**Signal**	Herndon Parkway	EBL	1	1	0	-29%	2,155	2,073	-82	-4%	12.6	B	7.8	A	0	3	175	
			EBT	1,934	1,868	-66	-3%					7.7	A			78	818	650	To 555 signal
			EBR	220	204	-16	-7%					8.7	A			79	823	650	
		Herndon Parkway	WBL	148	145	-3	-2%	1,566	1,572	6	0%	35.6	D	5.0	A	17	178	175	
			WBT	1,412	1,421	9	1%					1.9	A			5	142	550	To Fairbrook Dr signal
			WBR	6	6	0	7%					1.3	A			5	151	550	
		Parking Lot	NBL	103	99	-4	-4%	147	145	-2	-1%	47.5	D	35.0	D	28	160	-	
			NBT	0	0	0	0%					0.0	A			28	160	-	
			NBR	44	46	2	5%					8.2	A			1	46	75	
		Exchange Place	SBL	16	13	-3	-20%	27	26	-1	-4%	44.5	D	27.8	C	4	61	-	
			SBT	0	0	0	0%					0.0	A			4	61	-	
			SBR	11	13	2	20%					11.1	B			2	67	-	
		Intersection		**3,895**	**3,816**	-79	**-2%**	**3,895**	**3,816**	**-79**	**-2%**	**7.8**	**A**	**7.8**	**A**				
Herndon Parkway / Fairbrook Drive	**Signal**	Parking Lot	EBL	47	52	5	10%	157	162	5	3%	51.1	D	46.7	D	16	171	75	
			EBT	79	77	-2	-2%					51.0	D			28	196	-	
			EBR	31	33	2	5%					29.4	C			24	198	-	
		Fairbrook Drive	WBL	288	297	9	3%	408	414	6	2%	57.4	E	49.2	D	63	296	175	
			WBT	81	75	-6	-7%					34.4	C			17	148	-	
			WBR	39	42	3	8%					17.2	B			15	152	-	
		Herndon Parkway	NBL	32	31	-1	-4%	1,994	1,925	-69	-3%	3.6	A	6.6	A	0	26	150	
			NBT	1,524	1,472	-52	-3%					6.7	A			31	565	550	To Exchange Pl signal
			NBR	437	422	-15	-3%					6.7	A			3	141	125	
		Herndon Parkway	SBL	97	96	-1	-1%	1,391	1,384	-7	-1%	38.1	D	30.9	C	11	113	150	
			SBT	1,245	1,242	-3	0%					30.3	C			192	883	825	To Sunset Business Park signal
			SBR	49	46	-3	-5%					32.2	C			195	888	825	
		Intersection		**3,950**	**3,885**	-65	**-2%**	**3,950**	**3,885**	**-65**	**-2%**	**21.5**	**C**	**21.5**	**C**				

Note: Average results across 7 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

Preferred Build Scenario with Fairbrook Drive Extended 2045 Conditions: Weekday Morning Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								Preferred Build Scenario with Fairbrook Drive Extended 2045 Conditions MOEs							Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	Available Queue Storage (ft)	
Herndon Parkway / Sunset Business Park	**Signal**	Parking Lot	EBL	141	143	2	1%	190	194	4	2%	45.2	D	35.5	D	38	214	-	
			EBR	49	51	2	5%					8.3	A			0	48	100	
		Sunset Business Park	WBL	95	92	-3	-4%	133	130	-3	-2%	43.3	D	32.5	C	22	156	-	
			WBR	38	38	0	1%					6.5	A			0	29	100	
		Herndon Parkway	NBL	199	197	-2	-1%	1,629	1,573	-56	-3%	15.6	B	6.0	A	12	212	150	
			NBT	1,338	1,285	-53	-4%					4.6	A			18	481	825	To Fairbrook Dr signal
			NBR	92	91	-1	-1%					4.5	A			18	484	825	
		Herndon Parkway	SBL	64	63	-1	-2%	1,616	1,612	-4	0%	30.1	C	17.7	B	4	77	175	
			SBT	1,293	1,296	3	0%					17.2	B			98	613	525	To Spring St signal
			SBR	258	253	-5	-2%					17.5	B			105	625	525	
		Intersection		**3,567**	**3,509**	-58	**-2%**	**3,567**	**3,509**	**-58**	**-2%**	14.0	B	**14.0**	**B**				
Spring Street / Parallel TRG Road	**Two-Way Stop Control**	Spring Street	EBT	883	894	11	1%	1,013	1,021	8	1%	0.6	A	0.7	A	0	91	-	
			EBR	130	127	-3	-2%					1.6	A			1	112	-	
		Spring Street	WBL	56	56	0	0%	800	812	12	2%	5.4	A	1.0	A	1	56	125	
			WBT	744	756	12	2%					0.7	A			0	0	-	
		Parallel TRG Road	NBL	46	47	1	2%	154	155	1	1%	12.3	B	10.4	B	3	66	-	
			NBR	108	108	0	0%					9.6	A			7	103	100	
		Intersection		**1,967**	**1,988**	21	**1%**	**1,967**	**1,988**	**21**	**1%**	1.6	A	**1.6**	**A**				

Note: Average results across 7 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

Preferred Build Scenario with Fairbrook Drive Extended 2045 Conditions: Weekday Evening Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								Preferred Build Scenario with Fairbrook Drive Extended 2045 Conditions MOEs							Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	Available Queue Storage (ft)	
Elden Street / Monroe Street	**Signal**	Elden Street	EBL	127	123	-4	-3%	817	796	-21	-3%	34.1	C	25.2	C	14	209	150	
			EBT	654	638	-16	-2%					23.8	C			168	898	250	To Lynn St signal, which is not in model
			EBR	36	35	-1	-3%					20.5	C			167	898	250	
		Elden Street	WBL	13	13	0	0%	755	733	-22	-3%	29.1	C	34.9	C	1	42	875	To Van Buren St signal
			WBT	669	651	-18	-3%					35.2	D			433	955	875	
			WBR	73	69	-4	-5%					33.3	C			452	993	875	
		Monroe Street	NBL	168	166	-2	-1%	492	488	-4	-1%	54.6	D	54.6	D	68	496	100	
			NBT	313	311	-2	-1%					55.3	E			145	582	900	To Van Buren St signal
			NBR	11	11	0	0%					37.5	D			132	571	900	
		Monroe Street	SBL	131	129	-2	-2%	454	459	5	1%	44.3	D	46.3	D	58	319	-	No upstream control within reasonable distance
			SBT	202	205	3	1%					51.5	D			92	352	-	
			SBR	121	125	4	3%					40.0	D			89	352	250	
		Intersection		**2,518**	**2,476**	-42	**-2%**	**2,518**	**2,476**	**-42**	**-2%**	37.8	D	**37.8**	**D**				
Elden Street / Van Buren Street	**Signal**	Elden Street	EBL	5	5	0	0%	803	797	-6	-1%	60.4	E	41.0	D	110	340	850	
			EBT	764	755	-9	-1%					42.6	D			110	340	850	To Monroe Street signal
			EBR	34	37	3	9%					5.8	A			1	52	850	
		Elden Street	WBL	150	151	1	1%	962	958	-4	0%	47.0	D	33.5	C	109	427	1500	To Post Drive signal, which is not in model
			WBT	754	751	-3	0%					31.5	C			109	427	1500	
			WBR	58	56	-2	-3%					24.5	C			119	441	1500	
		Van Buren Street	NBL	118	113	-5	-4%	760	723	-37	-5%	39.8	D	33.6	C	20	265	150	
			NBT	466	441	-25	-5%					40.5	D			144	727	450	To Monroe St / Grove St signal
			NBR	176	169	-7	-4%					11.6	B			5	158	450	
		Van Buren Street	SBL	126	123	-3	-2%	388	388	0	0%	40.9	D	43.7	D	33	250	325	No upstream control within reasonable distance
			SBT	247	249	2	1%					45.1	D			71	319	-	
			SBR	15	16	1	7%					42.4	D			75	329	-	
		Intersection		**2,525**	**2,478**	-47	**-2%**	**2,525**	**2,478**	**-47**	**-2%**	42.8	D	**42.8**	**D**				
Van Buren Street / Spring Street	**Signal**	Van Buren Street	EBL	424	391	-33	-8%	640	596	-44	-7%	22.0	C	17.1	B	0	49	1600	To Alabama Dr signal
			EBT	1	2	1	100%					16.7	B			62	541	1600	
			EBR	215	203	-12	-6%					7.7	A			5	124	150	
		Parking Lot	WBL	13	14	1	8%	28	28	0	0%	29.3	C	29.5	C	2	48	-	
			WBR	15	14	-1	-7%					29.8	C			2	48	-	
		Spring Street	NBL	324	312	-12	-4%	1,049	1,003	-46	-4%	26.6	C	17.1	B	42	347	200	
			NBT	717	684	-33	-5%					12.8	B			29	352	800	To Huntmar Park Dr signal
			NBR	8	7	-1	-13%					13.6	B			29	360	800	
		Van Buren Street	SBL	3	3	0	0%	791	802	11	1%	22.4	C	19.5	B	0	24	275	
			SBT	326	329	3	1%					19.9	B			47	331	1200	To Monroe St / Grove St signal
			SBR	462	470	8	2%					19.3	B			60	345	1200	
		Intersection		**1,717**	**1,627**	-90	**-5%**	**1,717**	**1,627**	**-90**	**-5%**	26.9	C	**26.9**	**C**				
Spring Street / Herndon Parkway	**Signal**	Spring Street	EBL	147	139	-8	-5%	1,071	1,045	-26	-2%	103.9	F	102.5	F	148	576	200	
			EBT	789	776	-13	-2%					101.8	F			294	672	2300	To Huntmar Park Dr signal
			EBR	135	130	-5	-4%					104.9	F			296	676	2300	
		Spring Street	WBL	990	937	-53	-5%	2,253	2,132	-121	-5%	40.9	D	31.3	C	142	484	375	
			WBT	804	759	-45	-6%					31.6	C			82	373	550	To Ffx County Pkwy signal
			WBR	459	436	-23	-5%					10.2	B			19	218	550	
		Herndon Parkway	NBL	221	223	2	1%	1,809	1,792	-17	-1%	63.1	E	39.7	D	70	430	300	
			NBT	697	698	1	0%					55.1	E			178	616	500	To Sunset Business Park signal
			NBR	891	871	-20	-2%					21.3	C			178	616	500	
		Herndon Parkway	SBL	497	491	-6	-1%	1,087	1,083	-4	0%	100.0	F	73.3	E	176	547	500	
			SBT	538	542	4	1%					51.5	D			97	353	2300	To Grove St signal
			SBR	52	50	-2	-3%					46.8	D			98	356	2300	
		Intersection		**5,133**	**4,969**	-164	**-3%**	**5,133**	**4,969**	**-164**	**-3%**	65.3	E	**65.3**	**E**				

Note: Average results across 20 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

Preferred Build Scenario with Fairbrook Drive Extended 2045 Conditions: Weekday Evening Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								Preferred Build Scenario with Fairbrook Drive Extended 2045 Conditions MOEs							Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	Available Queue Storage (ft)	
Spring Street / Fairfax County Parkway / Fairbrook Drive	**Signal**	Spring Street	EBL	321	318	-3	-1%	2,167	2,117	-50	-2%	68.9	E	28.9	C	153	635	250	
			EBT	1,820	1,772	-48	-3%					22.0	C			125	558	550	To Herndon Parkway signal
			EBR	27	27	0	1%					14.7	B			122	554	550	
		Spring Street	WBL	170	154	-16	-10%	2,314	2,088	-226	-10%	45.0	D	44.3	D	1304	1649	250	
			WBT	1,494	1,363	-131	-9%					45.2	D			1304	1649	1650	To Target signal
			WBR	650	571	-79	-12%					41.9	D			1293	1639	1650	
		Fairbrook Drive	NBL	29	30	1	2%	946	911	-35	-4%	91.7	F	74.1	E	620	1019	-	
			NBT	225	214	-11	-5%					86.6	F			620	1019	-	
			NBR	692	667	-25	-4%					69.3	E			620	1019	250	
		Fairfax County Parkway	SBL	166	169	3	2%	1,517	1,521	4	0%	56.7	E	36.0	D	52	353	250	
			SBT	421	422	1	0%					46.2	D			140	734	600	To Ffx Pkwy signal, which is not in model
			SBR	930	930	0	0%					27.6	C			124	771	600	
		Intersection		**6,944**	**6,637**	-307	**-4%**	**6,944**	**6,637**	**-307**	**-4%**	41.6	D	**41.6**	**D**				
Van Buren Street / Alabama Drive	**Signal**	Alabama Drive	EBL	85	59	-26	-31%	265	191	-74	-28%	242.4	F	224.3	F	370	525	-	
			EBT	18	13	-5	-28%					240.2	F			370	525	-	
			EBR	162	119	-43	-27%					213.6	F			376	533	-	
		Alabama Drive	WBL	35	33	-2	-5%	66	64	-2	-3%	95.9	F	77.6	E	25	146	-	
			WBT	10	10	0	0%					76.0	E			25	146	-	
			WBR	21	21	0	0%					49.7	D			27	160	-	
		Van Buren Street	NBL	81	79	-2	-2%	700	678	-22	-3%	26.4	C	21.9	C	122	748	1125	
			NBT	534	520	-14	-3%					21.5	C			123	749	1125	To Herndon Parkway signal
			NBR	85	79	-6	-8%					19.6	B			122	748	1125	
		Van Buren Street	SBL	34	34	0	0%	787	776	-11	-1%	34.1	C	32.7	C	409	1246	1600	
			SBT	646	637	-9	-1%					33.3	C			409	1245	1600	To Van Buren St signal
			SBR	107	105	-2	-2%					28.4	C			407	1244	1600	
		Intersection		**1,818**	**1,709**	-109	**-6%**	**1,818**	**1,709**	**-109**	**-6%**	51.5	D	**51.5**	**D**				
Van Buren Street / Herndon Parkway	**Signal**	Herndon Parkway	EBL	55	56	1	2%	1,099	1,098	-1	0%	60.5	E	34.9	C	19	108	175	
			EBT	698	700	2	0%					41.9	D			106	462	1950	To Campbell Way signal, which is not in model
			EBR	346	342	-4	-1%					16.1	B			48	285	1950	
		Herndon Parkway	WBL	520	485	-35	-7%	2,033	1,922	-111	-5%	72.7	E	43.6	D	122	542	350	
			WBT	1,263	1,199	-64	-5%					33.9	C			299	1029	875	To Worldgate Drive signal
			WBR	250	238	-12	-5%					33.4	C			299	1029	875	
		Van Buren Street	NBL	365	358	-7	-2%	1,051	1,022	-29	-3%	114.3	F	57.8	E	525	971	375	To Office Park signal
			NBT	394	381	-13	-3%					38.0	D			510	968	375	
			NBR	292	283	-9	-3%					12.9	B			25	282	300	
		Van Buren Street	SBL	129	117	-12	-9%	844	785	-59	-7%	78.9	E	70.4	E	290	954	175	
			SBT	668	623	-45	-7%					69.5	E			836	1209	1125	To Alabama Dr signal
			SBR	47	45	-2	-4%					60.6	E			836	1209	1125	
		Intersection		**5,027**	**4,827**	-200	**-4%**	**5,027**	**4,827**	**-200**	**-4%**	49.0	D	**49.0**	**D**				
Van Buren Street / Worldgate Drive	**Signal**	Worldgate Drive	EBL	291	281	-10	-3%	1,378	1,369	-9	-1%	82.5	F	33.4	C	233	653	400	
			EBT	418	418	0	0%					35.2	D			47	205	-	
			EBR	669	670	1	0%					11.6	B			49	487	875	
		Worldgate Drive	WBL	406	387	-19	-5%	1,017	992	-25	-2%	60.8	E	47.9	D	187	703	275	
			WBT	589	583	-6	-1%					40.2	D			88	477	600	To Herndon Pkwy signal
			WBR	22	22	0	0%					26.9	C			96	490	600	
		Van Buren Street	NBL	361	344	-17	-5%	1,446	1,408	-38	-3%	52.6	D	36.1	D	134	636	250	
			NBT	720	710	-10	-1%					40.0	D			228	907	1650	To Eastpark Dr signal
			NBR	365	354	-11	-3%					12.3	B			67	475	250	
		Van Buren Street	SBL	9	9	0	0%	1,583	1,495	-88	-6%	57.1	E	20.7	C	3	47	200	
			SBT	1,211	1,141	-70	-6%					26.1	C			102	529	400	To Office Park signal
			SBR	363	345	-18	-5%					2.1	A			0	100	400	
		Intersection		**5,424**	**5,264**	-160	**-3%**	**5,424**	**5,264**	**-160**	**-3%**	33.3	C	**33.3**	**C**				

Note: Average results across 20 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

Preferred Build Scenario with Fairbrook Drive Extended 2045 Conditions: Weekday Evening Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								Preferred Build Scenario with Fairbrook Drive Extended 2045 Conditions MOEs							Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	Available Queue Storage (ft)	
Herndon Parkway / Worldgate Drive	**Signal**	Herndon Parkway	EBL	103	101	-2	-2%	1,203	1,160	-43	-4%	57.8	E	53.2	D	14	163	175	
			EBT	1,080	1,038	-42	-4%					52.8	D			231	552	850	To Van Buren St signal
			EBR	20	21	1	5%					47.5	D			233	556	850	
		Herndon Parkway	WBL	732	701	-31	-4%	2,490	2,368	-122	-5%	41.7	D	25.7	C	175	983	250	
			WBT	1,721	1,631	-90	-5%					19.0	B			312	1019	875	To 555 signal
			WBR	36	36	0	-1%					17.3	B			318	1029	875	
		Worldgate Drive	NBL	199	196	-3	-2%	990	983	-7	-1%	46.8	D	25.8	C	100	455	600	
			NBT	60	59	-1	-1%					43.4	D			100	455	600	To Van Buren St signal
			NBR	731	728	-3	0%					18.8	B			100	455	600	
		Worldgate Drive	SBL	134	134	0	0%	302	301	-1	0%	56.2	E	41.6	D	48	249	75	
			SBT	55	55	0	0%					44.7	D			27	242	-	
			SBR	113	112	-1	-1%					22.5	C			25	246	-	
		Intersection		**4,984**	**4,812**	-172	**-3%**	**4,984**	**4,812**	**-172**	**-3%**	33.3	C	**33.3**	**C**				
Herndon Parkway / 555 Herndon Parkway	**Signal**	Herndon Parkway	EBL	51	50	-1	-1%	2,021	1,965	-56	-3%	39.2	D	16.8	B	7	84	175	
			EBT	1,871	1,818	-53	-3%					16.2	B			143	729	875	To Worldgate Drive signal
			EBR	99	97	-2	-2%					16.5	B			144	731	875	
		Herndon Parkway	WBL	66	62	-4	-6%	2,215	2,083	-132	-6%	39.7	D	26.8	C	4	86	175	
			WBT	2,066	1,942	-124	-6%					26.5	C			363	812	650	To Exchange Place signal
			WBR	82	79	-3	-4%					23.8	C			366	816	650	
		Parking Lot	NBL	314	319	5	2%	449	450	1	0%	59.6	E	51.4	D	141	449	-	
			NBT	0	0	0	0%					0.0	A			0	0	-	
			NBR	135	131	-4	-3%					31.5	C			15	320	75	
		Parking Lot	SBL	70	70	0	0%	180	181	1	1%	36.5	D	25.9	C	24	208	-	
			SBT	0	0	0	0%					0.0	A			0	0	-	
			SBR	110	111	1	1%					19.2	B			24	214	-	
		Intersection		**4,865**	**4,679**	-186	**-4%**	**4,865**	**4,679**	**-186**	**-4%**	24.9	C	**24.9**	**C**				
Herndon Parkway / Exchange Place	**Signal**	Herndon Parkway	EBL	3	3	0	-12%	2,099	2,040	-59	-3%	22.9	C	10.4	B	0	11	175	
			EBT	1,996	1,940	-56	-3%					10.3	B			99	726	650	To 555 signal
			EBR	99	97	-2	-2%					10.6	B			100	732	650	
		Herndon Parkway	WBL	66	64	-2	-3%	1,976	1,865	-111	-6%	48.5	D	24.4	C	6	92	175	
			WBT	1,897	1,788	-109	-6%					23.6	C			260	699	550	To Fairbrook Dr signal
			WBR	14	13	-1	-4%					18.9	B			266	709	550	
		Parking Lot	NBL	314	304	-10	-3%	449	441	-8	-2%	74.1	E	64.9	E	170	389	-	
			NBT	0	0	0	0%					0.0	A			170	389	-	
			NBR	135	137	2	1%					44.3	D			34	354	75	
		Exchange Place	SBL	6	7	1	17%	10	11	1	10%	44.8	D	31.5	C	2	40	-	
			SBT	0	0	0	0%					0.0	A			2	40	-	
			SBR	4	4	0	0%					8.3	A			0	3	-	
		Intersection		**4,534**	**4,357**	-177	**-4%**	**4,534**	**4,357**	**-177**	**-4%**	22.0	C	**22.0**	**C**				
Herndon Parkway / Fairbrook Drive	**Signal**	Parking Lot	EBL	46	48	2	5%	152	155	3	2%	78.0	E	61.9	E	27	204	75	
			EBT	76	76	0	0%					60.1	E			37	226	-	
			EBR	30	31	1	2%					41.5	D			31	224	-	
		Fairbrook Drive	WBL	369	370	1	0%	557	557	0	0%	89.1	F	73.0	E	192	730	175	
			WBT	62	60	-2	-3%					50.8	D			76	620	-	
			WBR	126	127	1	1%					36.6	D			76	623	-	
		Herndon Parkway	NBL	25	24	-1	-3%	2,137	2,087	-50	-2%	16.7	B	18.5	B	1	45	150	
			NBT	1,554	1,514	-40	-3%					19.4	B			116	631	550	To Exchange Pl signal
			NBR	559	549	-10	-2%					16.4	B			44	569	125	
		Herndon Parkway	SBL	60	58	-2	-3%	1,649	1,572	-77	-5%	44.4	D	40.4	D	11	147	150	
			SBT	1,551	1,480	-71	-5%					40.3	D			518	922	825	To Sunset Business Park signal
			SBR	37	34	-3	-9%					38.6	D			523	927	825	
		Intersection		**4,495**	**4,371**	-124	**-3%**	**4,495**	**4,371**	**-124**	**-3%**	34.9	C	**34.9**	**C**				

Note: Average results across 20 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

Preferred Build Scenario with Fairbrook Drive Extended 2045 Conditions: Weekday Evening Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								Preferred Build Scenario with Fairbrook Drive Extended 2045 Conditions MOEs							Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	Available Queue Storage (ft)	
Herndon Parkway / Sunset Business Park	**Two-Way Stop Control (future signal)**	Parking Lot	EBL	279	280	1	0%	390	391	1	0%	44.3	D	36.5	D	80	351	-	
			EBR	111	111	0	0%					16.8	B			2	106	100	
		Sunset Business Park	WBL	144	144	0	0%	196	196	0	0%	36.4	D	28.5	C	29	214	-	
			WBR	52	52	0	0%					6.6	A			0	28	100	
		Herndon Parkway	NBL	116	114	-2	-1%	1,670	1,679	9	1%	24.7	C	16.7	B	11	216	150	
			NBT	1,438	1,451	13	1%					16.2	B			139	807	825	To Fairbrook Dr signal
			NBR	116	114	-2	-2%					16.2	B			140	810	825	
		Herndon Parkway	SBL	100	97	-3	-3%	1,702	1,597	-105	-6%	33.7	C	19.7	B	9	110	175	
			SBT	1,422	1,325	-97	-7%					18.9	B			111	638	525	To Spring St signal
			SBR	180	175	-5	-3%					18.4	B			118	650	525	
		Intersection		**3,958**	**3,863**	-95	**-2%**	**3,958**	**3,863**	**-95**	**-2%**	20.6	C	**20.6**	**C**				
Spring Street / Parallel TRG Route	**Two-Way Stop Control**	Spring Street	EBT	871	867	-4	0%	944	938	-6	-1%	5.3	A	5.3	A	28	188	-	
			EBR	73	71	-2	-2%					5.2	A			30	210	-	
		Spring Street	WBL	31	30	-1	-4%	1,076	1,033	-43	-4%	5.8	A	0.9	A	1	45	125	
			WBT	1,045	1,003	-42	-4%					0.8	A			0	0	-	
		Parallel TRG Route	NBL	86	83	-3	-3%	285	275	-10	-4%	24.4	C	30.8	C	11	133	-	
			NBR	200	192	-8	-4%					33.5	C			44	207	100	
		Intersection		**2,305**	**2,246**	-59	**-3%**	**2,305**	**2,246**	**-59**	**-3%**	6.4	A	**6.4**	**A**				

Note: Average results across 20 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

Preferred Build Scenario with Fairbrook Drive Extended and Additional Mitigation - 2045 Conditions: Weekday Morning Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								Preferred Build Scenario with Fairbrook Drive Extended 2045 Conditions MOEs							Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	Available Queue Storage (ft)	
Elden Street / Monroe Street	**Signal**	Elden Street	EBL	73	75	2	3%	839	838	-1	0%	25.4	C	19.2	B	5	81	150	
			EBT	630	630	0	0%					18.9	B			121	744	250	To Lynn St signal, which is not in model
			EBR	136	133	-3	-2%					17.4	B			120	743	250	
		Elden Street	WBL	6	5	-1	-17%	459	456	-3	-1%	26.9	C	22.4	C	0	30	875	To Van Buren St signal
			WBT	410	407	-3	-1%					22.6	C			70	453	875	
			WBR	43	44	1	2%					19.7	B			75	491	875	
		Monroe Street	NBL	36	39	3	8%	189	197	8	4%	36.4	D	39.0	D	8	77	100	
			NBT	138	143	5	3%					42.5	D			35	205	900	To Van Buren St signal
			NBR	15	15	0	0%					11.9	B			20	192	900	
		Monroe Street	SBL	96	92	-4	-4%	462	459	-3	-1%	51.8	D	58.5	E	68	425	-	No upstream control within reasonable distance
			SBT	307	309	2	0%					61.9	E			134	498	-	
			SBR	59	58	-1	-2%					51.5	D			133	497	250	
		Intersection		**1,950**	**1,950**	0	**0%**	**1,950**	**1,950**	**0**	**0%**	**31.2**	**C**	**31.2**	**C**				
Elden Street / Van Buren Street	**Signal**	Elden Street	EBL	0	0	0	0%	770	754	-16	-2%	0.0	A	16.8	B	45	307	850	To Monroe Street signal
			EBT	718	693	-25	-3%					18.0	B			45	307	850	
			EBR	52	61	9	17%					4.1	A			1	50	850	
		Elden Street	WBL	117	115	-2	-2%	602	588	-14	-2%	32.5	C	22.7	C	41	223	1500	To Post Drive signal, which is not in model
			WBT	469	460	-9	-2%					20.5	C			41	223	1500	
			WBR	16	13	-3	-19%					14.3	B			49	237	1500	
		Van Buren Street	NBL	49	48	-1	-2%	392	391	-1	0%	37.2	D	30.8	C	10	96	150	
			NBT	227	227	0	0%					42.2	D			56	305	450	To Monroe St / Grove St signal
			NBR	116	116	0	0%					5.9	A			3	88	450	
		Van Buren Street	SBL	146	141	-5	-3%	559	572	13	2%	39.0	D	41.4	D	42	386	325	No upstream control within reasonable distance
			SBT	404	419	15	4%					42.4	D			113	479	-	
			SBR	9	12	3	33%					32.4	C			119	490	-	
		Intersection		**1,764**	**1,733**	-31	**-2%**	**1,764**	**1,733**	**-31**	**-2%**	**35.6**	**D**	**35.6**	**D**				
Van Buren Street / Spring Street	**Signal**	Van Buren Street	EBL	183	176	-7	-4%	508	507	-1	0%	16.1	B	11.9	B	0	3	1600	To Alabama Dr signal
			EBT	6	8	2	33%					13.9	B			17	174	1600	
			EBR	319	323	4	1%					9.6	A			16	223	150	
		Parking Lot	WBL	1	1	0	0%	1	1	0	0%	23.3	C	23.3	C	0	14	-	
			WBR	0	0	0	0%					0.0	A			0	0	-	
		Spring Street	NBL	117	124	7	6%	420	433	13	3%	15.9	B	9.1	A	5	104	200	
			NBT	295	303	8	3%					6.4	A			6	120	800	To Huntmar Park Dr signal
			NBR	8	6	-2	-25%					4.5	A			5	128	800	
		Van Buren Street	SBL	9	9	0	0%	945	959	14	1%	10.9	B	7.4	A	0	30	275	
			SBT	586	592	6	1%					8.4	A			18	239	1200	To Monroe St / Grove St signal
			SBR	350	358	8	2%					5.8	A			8	192	1200	
		Intersection		**929**	**941**	12	**1%**	**929**	**941**	**12**	**1%**	**18.2**	**B**	**18.2**	**B**				
Spring Street / Herndon Parkway	**Signal**	Spring Street	EBL	96	107	11	11%	999	1,016	17	2%	78.2	E	56.4	E	32	110	200	
			EBT	788	791	3	0%					55.4	E			121	397	675	To new TRG Road signal
			EBR	115	118	3	3%					43.3	D			121	400	675	
		Spring Street	WBL	761	765	4	1%	1,922	1,925	3	0%	36.7	D	29.5	C	94	436	375	
			WBT	746	752	6	1%					33.3	C			84	362	550	To Ffx County Pkwy signal
			WBR	415	408	-7	-2%					8.9	A			16	174	550	
		Herndon Parkway	NBL	144	150	6	4%	1,454	1,405	-49	-3%	48.9	D	31.9	C	36	215	300	
			NBT	342	332	-10	-3%					48.2	D			98	361	500	To Sunset Business Park signal
			NBR	968	923	-45	-5%					23.3	C			98	361	500	
		Herndon Parkway	SBL	454	450	-4	-1%	1,089	1,088	-1	0%	76.1	E	59.8	E	109	297	500	
			SBT	529	528	-1	0%					49.2	D			99	357	2300	To Grove St signal
			SBR	106	110	4	4%					44.4	D			100	360	2300	
		Intersection		**4,375**	**4,346**	-29	**-1%**	**4,375**	**4,346**	**-29**	**-1%**	**51.6**	**D**	**51.6**	**D**				

Note: Average results across 7 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

Preferred Build Scenario with Fairbrook Drive Extended and Additional Mitigation - 2045 Conditions: Weekday Morning Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								Preferred Build Scenario with Fairbrook Drive Extended 2045 Conditions MOEs							Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	Available Queue Storage (ft)	
Spring Street / Fairfax County Parkway / Fairbrook Drive	**Signal**	Spring Street	EBL	152	151	-1	0%	2,195	2,148	-47	-2%	30.3	C	19.6	B	23	179	250	
			EBT	2,017	1,971	-46	-2%					18.9	B			99	559	550	To Herndon Parkway signal
			EBR	26	26	0	0%					11.9	B			96	554	550	
		Spring Street	WBL	205	205	0	0%	1,204	1,194	-10	-1%	73.5	E	43.0	D	136	461	250	
			WBT	695	689	-6	-1%					44.8	D			136	461	1650	To Target signal
			WBR	305	300	-5	-2%					17.9	B			84	450	1650	
		Fairbrook Drive	NBL	21	19	-2	-8%	617	621	4	1%	85.5	F	57.5	E	114	505	-	
			NBT	146	147	1	1%					67.5	E			114	505	-	
			NBR	450	455	5	1%					53.1	D			114	505	250	
		Fairfax County Parkway	SBL	370	369	-1	0%	1,996	2,002	6	0%	72.4	E	35.5	D	119	681	250	
			SBT	348	341	-7	-2%					49.3	D			145	951	600	To Ffx Pkwy signal, which is not in model
			SBR	1,278	1,292	14	1%					21.3	C			200	1231	600	
		Intersection		**6,012**	**5,965**	-47	**-1%**	**6,012**	**5,965**	**-47**	**-1%**	**33.6**	**C**	**33.6**	**C**				
Van Buren Street / Alabama Drive	**Signal**	Alabama Drive	EBL	129	131	2	2%	332	332	0	0%	41.5	D	34.0	C	66	338	-	
			EBT	10	10	0	0%					42.7	D			66	338	-	
			EBR	193	191	-2	-1%					28.3	C			68	345	-	
		Alabama Drive	WBL	56	55	-1	-2%	112	109	-3	-3%	31.8	C	25.4	C	15	146	-	
			WBT	13	13	0	0%					28.2	C			15	146	-	
			WBR	43	41	-2	-5%					15.8	B			15	161	-	
		Van Buren Street	NBL	48	48	0	0%	416	412	-4	-1%	32.4	C	27.9	C	74	394	1125	To Herndon Parkway signal
			NBT	336	333	-3	-1%					27.6	C			74	395	1125	
			NBR	32	31	-1	-3%					24.4	C			73	395	1125	
		Van Buren Street	SBL	13	16	3	23%	467	478	11	2%	17.4	B	13.7	B	44	404	1600	
			SBT	413	422	9	2%					13.8	B			44	403	1600	To Van Buren St signal
			SBR	41	40	-1	-2%					11.6	B			41	402	1600	
		Intersection		**1,327**	**1,331**	4	**0%**	**1,327**	**1,331**	**4**	**0%**	**24.1**	**C**	**24.1**	**C**				
Van Buren Street / Herndon Parkway	**Signal**	Herndon Parkway	EBL	43	40	-3	-7%	1,593	1,550	-43	-3%	63.4	E	46.6	D	12	91	175	
			EBT	1,233	1,213	-20	-2%					50.5	D			875	1508	1950	To Campbell Way signal, which is not in model
			EBR	317	297	-20	-6%					28.5	C			706	1489	1950	
		Herndon Parkway	WBL	293	298	5	2%	916	910	-6	-1%	70.7	E	36.4	D	70	230	350	
			WBT	511	506	-5	-1%					20.5	C			36	226	875	To Worldgate Drive signal
			WBR	111	106	-5	-5%					16.0	B			36	226	875	
		Van Buren Street	NBL	240	248	8	3%	835	850	15	2%	45.6	D	36.2	D	40	228	375	To Office Park signal
			NBT	261	271	10	4%					42.4	D			67	314	375	
			NBR	334	331	-3	-1%					24.1	C			49	321	300	
		Van Buren Street	SBL	176	173	-3	-2%	663	663	0	0%	40.6	D	34.0	C	38	200	175	
			SBT	464	467	3	1%					32.2	C			50	260	1125	To Alabama Dr signal
			SBR	23	23	0	0%					22.0	C			50	260	1125	
		Intersection		**4,007**	**3,973**	-34	**-1%**	**4,007**	**3,973**	**-34**	**-1%**	**39.9**	**D**	**39.9**	**D**				
Van Buren Street / Worldgate Drive	**Signal**	Worldgate Drive	EBL	170	171	1	1%	1,156	1,151	-5	0%	34.0	C	30.4	C	35	208	400	
			EBT	745	738	-7	-1%					38.7	D			93	359	-	
			EBR	241	242	1	0%					2.7	A			2	98	875	
		Worldgate Drive	WBL	194	204	10	5%	410	429	19	5%	31.9	C	32.5	C	37	322	275	
			WBT	208	217	9	4%					33.5	C			27	137	600	To Herndon Pkwy signal
			WBR	8	8	0	0%					22.0	C			29	150	600	
		Van Buren Street	NBL	406	391	-15	-4%	1,714	1,707	-7	0%	44.6	D	22.0	C	61	378	250	
			NBT	767	783	16	2%					16.8	B			47	393	1650	To Eastpark Dr signal
			NBR	541	533	-8	-1%					12.9	B			34	308	250	
		Van Buren Street	SBL	20	21	1	5%	1,045	1,042	-3	0%	35.1	D	8.2	A	4	62	200	
			SBT	669	663	-6	-1%					10.4	B			24	220	400	To Office Park signal
			SBR	356	358	2	1%					2.4	A			1	133	400	
		Intersection		**4,324**	**4,329**	5	**0%**	**4,324**	**4,329**	**5**	**0%**	**21.9**	**C**	**21.9**	**C**				

Note: Average results across 7 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

Preferred Build Scenario with Fairbrook Drive Extended and Additional Mitigation - 2045 Conditions: Weekday Morning Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								Preferred Build Scenario with Fairbrook Drive Extended 2045 Conditions MOEs							Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	Available Queue Storage (ft)	
Herndon Parkway / Worldgate Drive	**Signal**	Herndon Parkway	EBL	163	168	5	3%	1,698	1,653	-45	-3%	38.9	D	58.9	E	24	333	175	
			EBT	1,491	1,442	-49	-3%					61.8	E			472	988	850	To Van Buren St signal
			EBR	44	43	-1	-2%					41.0	D			476	992	850	
		Herndon Parkway	WBL	524	527	3	1%	1,415	1,417	2	0%	62.1	E	35.0	D	117	508	250	
			WBT	789	790	1	0%					18.9	B			64	572	875	To 555 signal
			WBR	103	100	-3	-3%					19.9	B			67	582	875	
		Worldgate Drive	NBL	65	64	-1	-2%	1,130	1,120	-10	-1%	35.3	D	27.7	C	110	696	600	
			NBT	90	86	-4	-4%					37.2	D			110	696	600	To Van Buren St signal
			NBR	975	970	-5	0%					26.4	C			110	696	600	
		Worldgate Drive	SBL	73	71	-2	-2%	165	164	-1	-1%	57.0	E	38.9	D	20	157	75	
			SBT	30	32	2	5%					43.4	D			12	130	-	
			SBR	62	61	-1	-2%					15.5	B			9	134	-	
		Intersection		**4,408**	**4,354**	-54	**-1%**	**4,408**	**4,354**	**-54**	**-1%**	**42.4**	**D**	**42.4**	**D**				
Herndon Parkway / 555 Herndon Parkway	**Signal**	Herndon Parkway	EBL	64	69	5	8%	2,429	2,377	-52	-2%	11.8	B	18.4	B	2	70	175	
			EBT	2,146	2,086	-60	-3%					18.6	B			317	1083	875	To Worldgate Drive signal
			EBR	220	222	2	1%					18.1	B			319	1086	875	
		Herndon Parkway	WBL	148	153	5	3%	1,492	1,503	11	1%	34.3	C	14.3	B	21	336	175	
			WBT	1,243	1,249	7	1%					12.1	B			72	603	650	To Exchange Place signal
			WBR	101	101	0	0%					12.0	B			73	607	650	
		Parking Lot	NBL	103	101	-2	-2%	147	144	-3	-2%	45.1	D	34.5	C	26	178	-	
			NBT	0	0	0	0%					0.0	A			0	0	-	
			NBR	44	43	-1	-2%					9.6	A			0	51	75	
		Parking Lot	SBL	37	35	-2	-6%	109	106	-3	-3%	44.7	D	26.1	C	15	144	-	
			SBT	0	0	0	0%					0.0	A			0	0	-	
			SBR	72	71	-1	-1%					16.9	B			14	150	-	
		Intersection		**4,177**	**4,130**	-47	**-1%**	**4,177**	**4,130**	**-47**	**-1%**	**17.6**	**B**	**17.6**	**B**				
Herndon Parkway / Exchange Place	**Signal**	Herndon Parkway	EBL	1	1	0	-29%	2,140	2,065	-75	-4%	13.9	B	7.7	A	0	8	175	
			EBT	1,919	1,858	-61	-3%					7.6	A			70	817	650	To 555 signal
			EBR	220	206	-14	-6%					8.5	A			69	822	650	
		Herndon Parkway	WBL	148	144	-4	-3%	1,534	1,530	-4	0%	32.3	C	4.0	A	15	221	175	
			WBT	1,380	1,380	0	0%					1.0	A			2	84	550	To Fairbrook Dr signal
			WBR	6	6	0	7%					1.3	A			1	88	550	
		Parking Lot	NBL	103	99	-4	-4%	147	145	-2	-1%	46.1	D	34.1	C	27	157	-	
			NBT	0	0	0	0%					0.0	A			27	157	-	
			NBR	44	46	2	5%					8.2	A			1	51	75	
		Exchange Place	SBL	16	13	-3	-20%	27	26	-1	-4%	50.1	D	31.0	C	4	64	-	
			SBT	0	0	0	0%					0.0	A			4	64	-	
			SBR	11	13	2	20%					12.0	B			3	69	-	
		Intersection		**3,848**	**3,766**	-82	**-2%**	**3,848**	**3,766**	**-82**	**-2%**	**7.3**	**A**	**7.3**	**A**				
Herndon Parkway / Fairbrook Drive	**Signal**	Parking Lot	EBL	28	32	4	14%	138	141	3	2%	77.6	E	76.4	E	17	195	75	
			EBT	79	78	-1	-1%					81.3	F			52	220	-	
			EBR	31	31	0	-1%					63.1	E			48	216	-	
		Fairbrook Drive	WBL	285	292	7	2%	391	395	4	1%	43.5	D	40.5	D	47	199	175	
			WBT	67	62	-5	-7%					39.8	D			17	135	-	
			WBR	39	41	2	5%					20.5	C			14	139	-	
		Herndon Parkway	NBL	32	30	-2	-7%	1,979	1,915	-64	-3%	3.9	A	8.8	A	0	24	150	
			NBT	1,512	1,465	-47	-3%					9.0	A			47	619	550	To Exchange Pl signal
			NBR	434	420	-14	-3%					8.2	A			6	273	125	
		Herndon Parkway	SBL	97	96	-1	-1%	1,347	1,343	-4	0%	42.8	D	36.8	D	18	296	150	
			SBT	1,216	1,217	1	0%					36.3	D			221	847	825	To Sunset Business Park signal
			SBR	34	30	-4	-12%					38.4	D			224	851	825	
		Intersection		**3,855**	**3,794**	-61	**-2%**	**3,855**	**3,794**	**-61**	**-2%**	**24.5**	**C**	**24.5**	**C**				

Note: Average results across 7 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

Preferred Build Scenario with Fairbrook Drive Extended and Additional Mitigation - 2045 Conditions: Weekday Morning Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								Preferred Build Scenario with Fairbrook Drive Extended 2045 Conditions MOEs							Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	Available Queue Storage (ft)	
Herndon Parkway / Sunset Business Park	**Signal**	Parking Lot	EBL	108	108	0	0%	157	158	1	1%	45.8	D	33.7	C	28	178	-	
			EBR	49	50	1	2%					7.8	A			0	46	100	
		Sunset Business Park	WBL	95	92	-3	-4%	133	130	-3	-2%	44.8	D	33.7	C	23	157	-	
			WBR	38	38	0	1%					6.7	A			0	24	100	
		Herndon Parkway	NBL	199	194	-5	-2%	1,598	1,535	-63	-4%	13.7	B	6.4	A	11	289	150	
			NBT	1,307	1,252	-55	-4%					5.4	A			25	598	825	To Fairbrook Dr signal
			NBR	92	89	-3	-3%					5.1	A			24	600	825	
		Herndon Parkway	SBL	64	67	3	4%	1,407	1,402	-5	0%	25.4	C	11.8	B	4	80	175	
			SBT	1,194	1,188	-6	-1%					11.1	B			46	365	525	To Spring St signal
			SBR	148	147	-1	-1%					11.0	B			51	378	525	
		Intersection		**3,294**	**3,225**	-69	**-2%**	**3,294**	**3,225**	**-69**	**-2%**	11.2	B	**11.2**	**B**				
Spring Street / Parallel TRG Road	**Signal**	Spring Street	EBT	873	892	19	2%	1,003	1,018	15	1%	7.7	A	7.8	A	25	256	-	
			EBR	130	126	-4	-3%					8.5	A			31	281	-	
		Spring Street	WBL	288	304	16	6%	995	1,013	18	2%	13.6	B	7.1	A	14	237	125	
			WBT	708	709	1	0%					4.4	A			9	234	-	
		Parallel TRG Road	NBL	111	117	6	6%	237	241	4	2%	45.2	D	24.7	C	30	184	-	
			NBR	126	124	-2	-2%					5.4	A			1	70	100	
		Intersection		**2,235**	**2,272**	37	**2%**	**2,235**	**2,272**	**37**	**2%**	9.3	A	**9.3**	**A**				

Note: Average results across 7 microsimulation runs.

Orange/Red Highlight = LOS E/F
Yellow Highlight = Problematic Queue

Preferred Build Scenario with Fairbrook Drive Extended and Additional Mitigation - 2045 Conditions: Weekday Evening Peak Hour Intersection MOEs Summary

Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes								Preferred Build Scenario with Fairbrook Drive Extended 2045 Conditions MOEs							Notes
				Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)	Available Queue Storage (ft)	
Elden Street / Monroe Street	**Signal**	Elden Street	EBL	127	123	-4	-3%	817	799	-18	-2%	34.4	C	25.0	C	15	268	150	
			EBT	654	640	-14	-2%					23.4	C			164	874	250	To Lynn St signal, which is not in model
			EBR	36	36	0	0%					21.0	C			163	873	250	
		Elden Street	WBL	13	13	0	0%	755	734	-21	-3%	31.5	C	36.5	D	1	41	875	To Van Buren St signal
			WBT	669	652	-17	-3%					36.9	D			453	961	875	
			WBR	73	69	-4	-5%					34.4	C			471	996	875	
		Monroe Street	NBL	168	167	-1	-1%	491	489	-2	0%	56.4	E	57.0	E	67	497	100	
			NBT	312	311	-1	0%					57.9	E			146	594	900	To Van Buren St signal
			NBR	11	11	0	0%					39.8	D			132	589	900	
		Monroe Street	SBL	131	128	-3	-2%	454	457	3	1%	44.1	D	46.1	D	58	326	-	No upstream control within reasonable distance
			SBT	202	205	3	1%					51.2	D			91	357	-	
			SBR	121	124	3	2%					39.9	D			89	356	250	
		Intersection		**2,517**	**2,479**	-38	**-2%**	**2,517**	**2,479**	**-38**	**-2%**	38.6	D	**38.6**	**D**				
Elden Street / Van Buren Street	**Signal**	Elden Street	EBL	5	5	0	0%	803	797	-6	-1%	59.9	E	40.9	D	110	354	850	
			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

DRAFT

DRAFT

SITE CONDITIONS ANALYSIS

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

DRAFT

DRAFT

INTRODUCTION

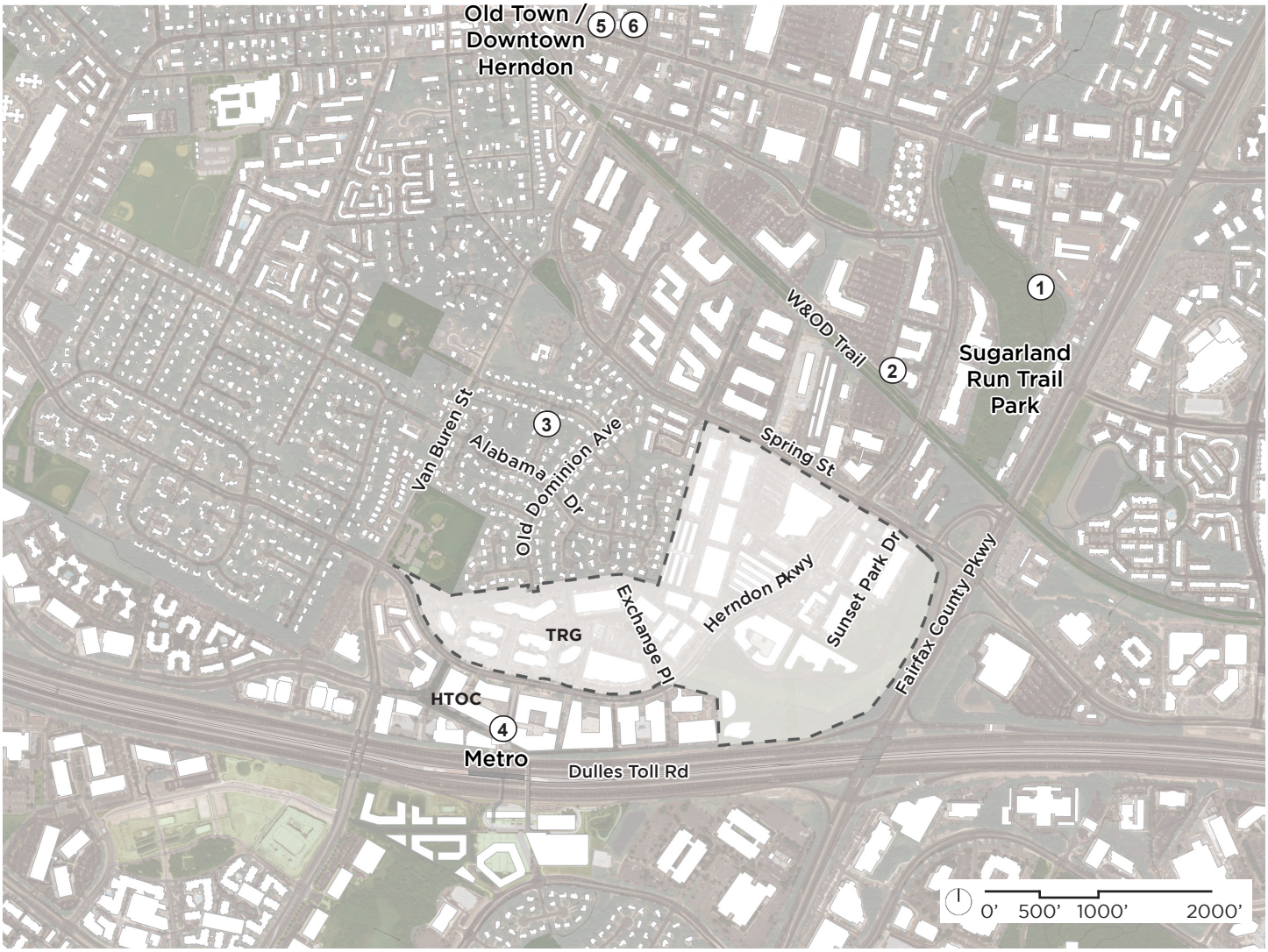
The purpose of this study is to analyze site conditions and highlight key features on the TRG that will help inform the Constraints and Opportunities Report, with the ultimate goal of shaping the design vision for the TRG.

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

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

DRAFT

Site Context | **Views of the Vicinity**



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

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

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

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

DRAFT



1 Sugarland Run Stream Valley Park



2 W & OD Trail



3 The Downs of Herndon



4 Herndon Metro Station, pavilion and path to Herndon Parkway



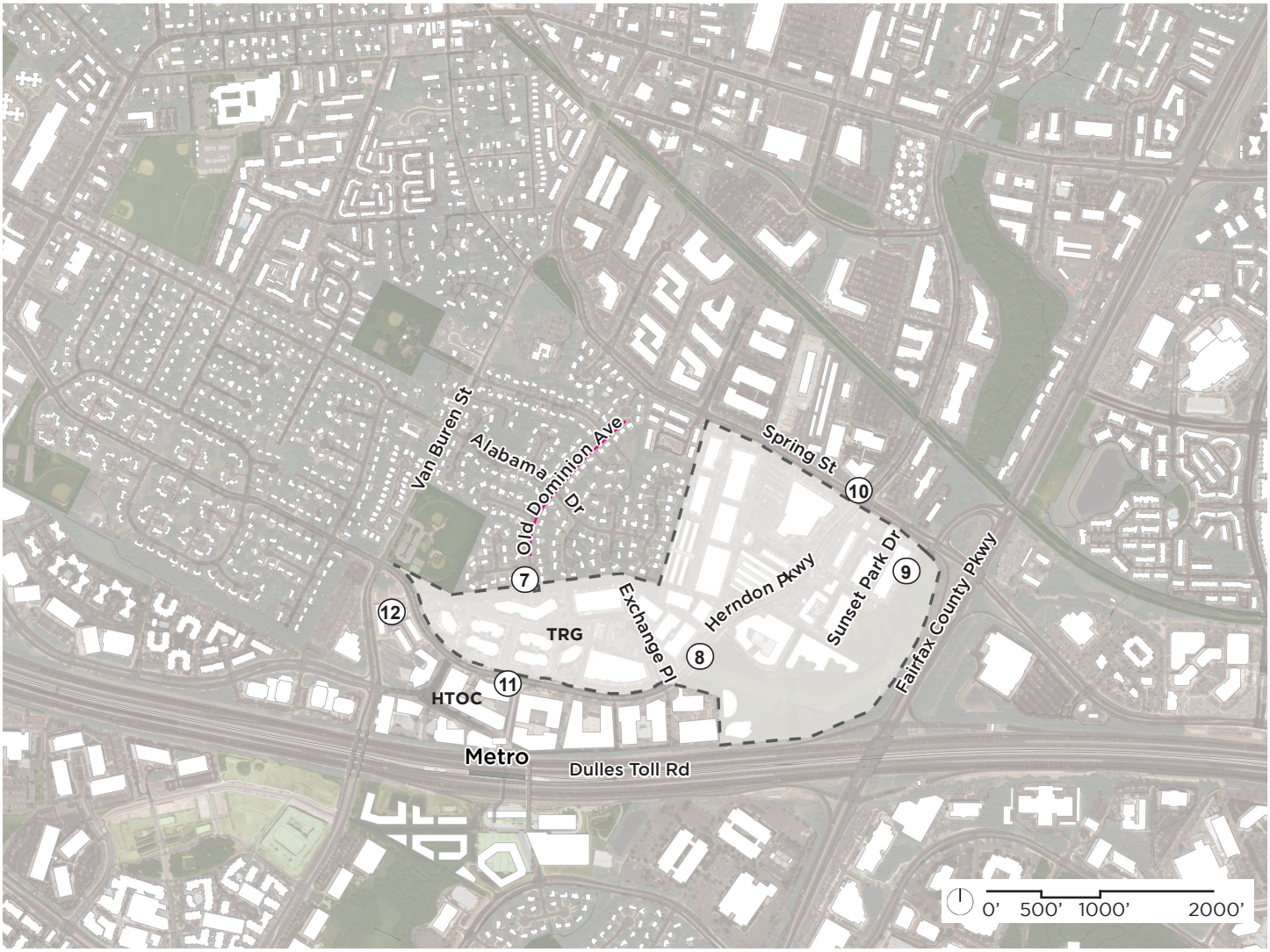
5 Downtown Herndon, landmark shop by the W&OD Trail



6 Downtown Herndon, new Junction Square mixed use development

DRAFT

Site Context | **Views Around the Site**



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

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

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

DRAFT



⑦ Pedestrian dirt path through vegetated to Old Dominion Avenue



⑧ Herndon Parkway



⑨ Sunset Business Park



⑩ Spring Street



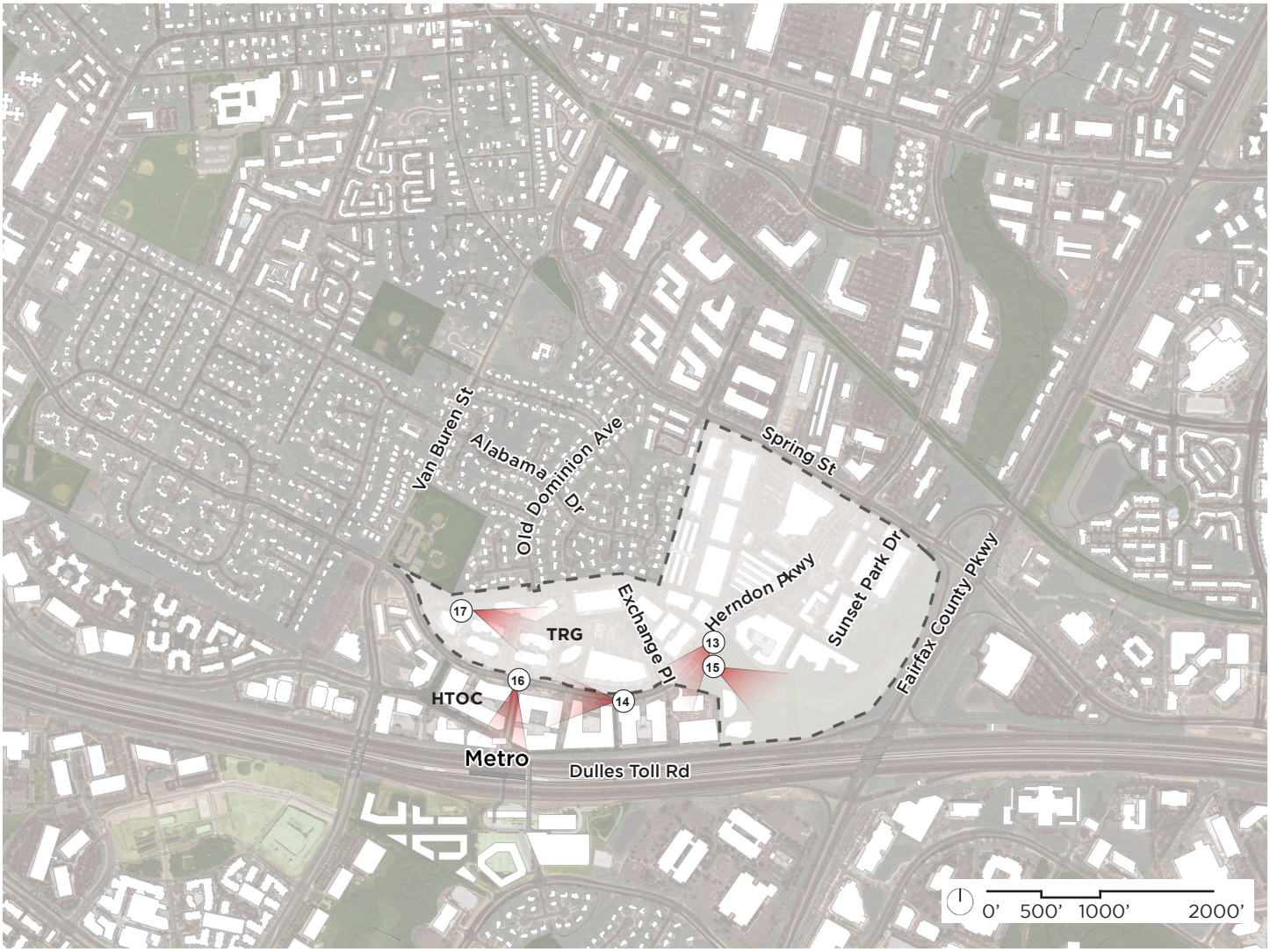
⑪ Metro Station pedestrian crossing to TRG at Herndon Pkwy



⑫ Metro Square Condo Complex

DRAFT

Site Context | **View Corridors**



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

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

DRAFT



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



⑭ Typical view along the Herndon Parkway



⑮ Potential Sugarland Run stream and trail gateway



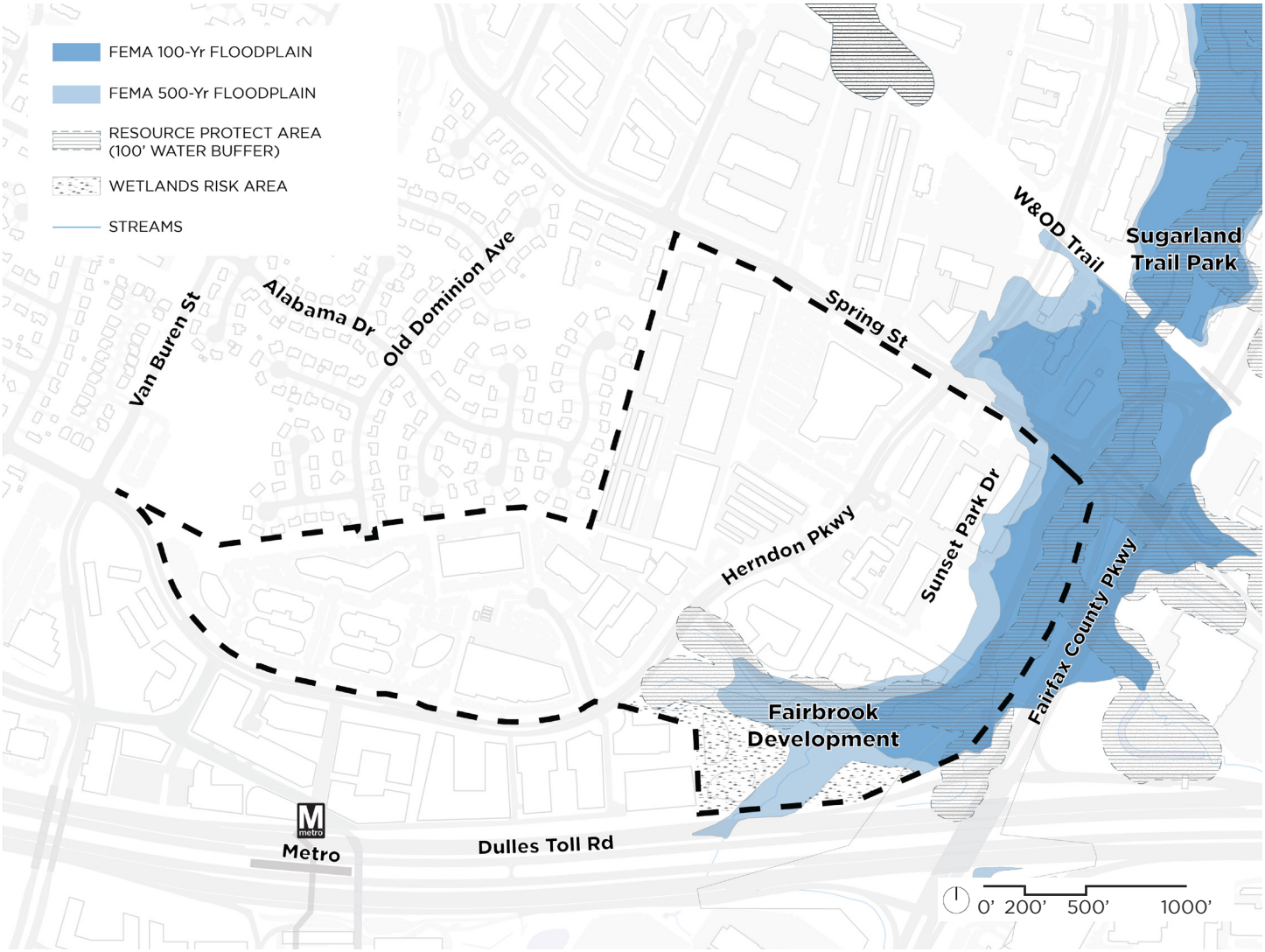
⑯ View towards the Metro pavilion, to be flanked by HTOC development



⑰ View of the new Reston Gateway skyline from the TRG

DRAFT

Site Features | **Natural Resources**

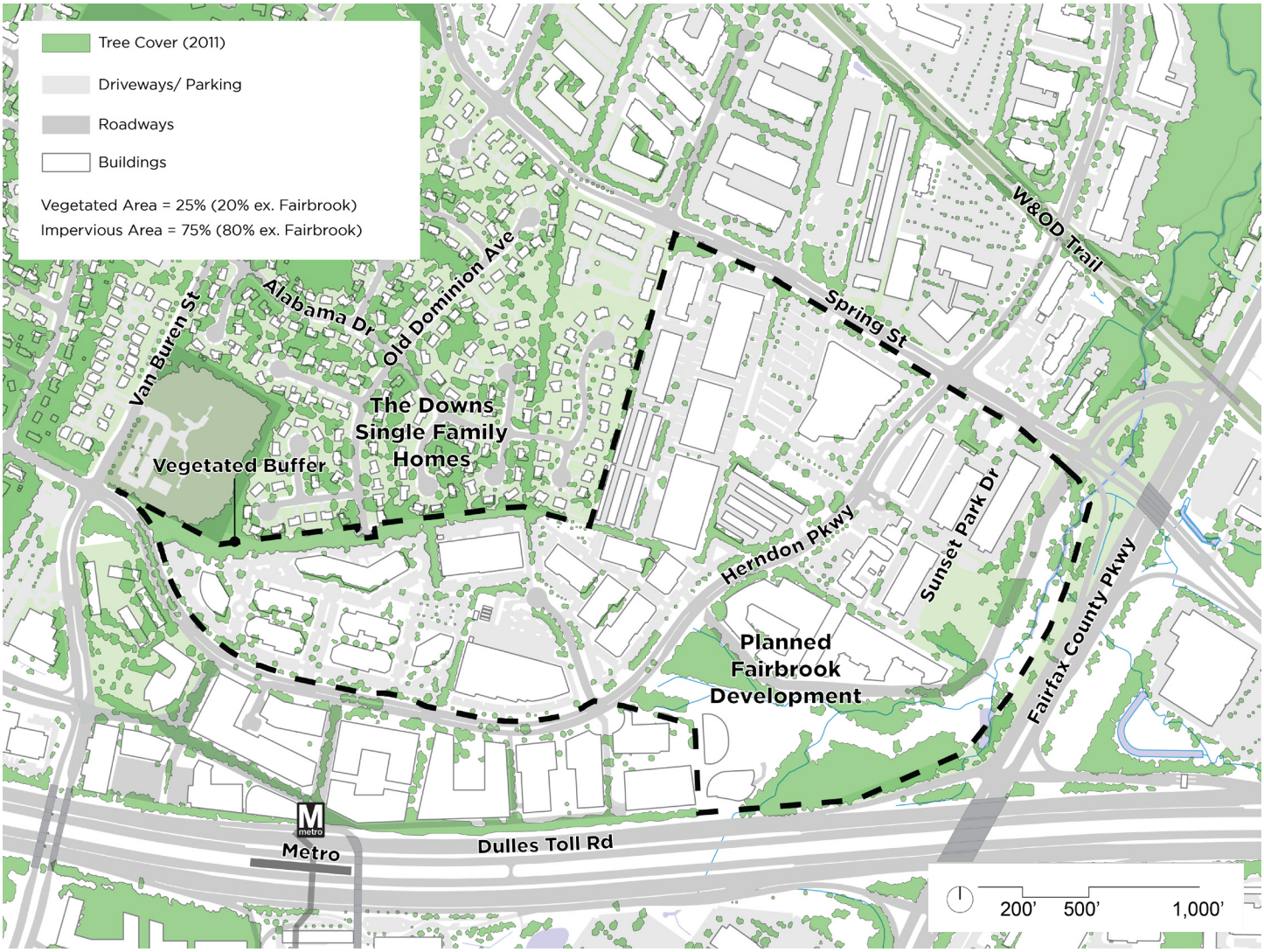


Wetlands and RPA's shall be field verified by a wetlands expert prior to any design or site plan submission. Impacts are subject to Army Corps of Engineers approval, and shall be analyzed at the site plan level. Field surveys and assessments have already been done as part of the Fairbrook Development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

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

DRAFT

Site Features | **Tree Cover**

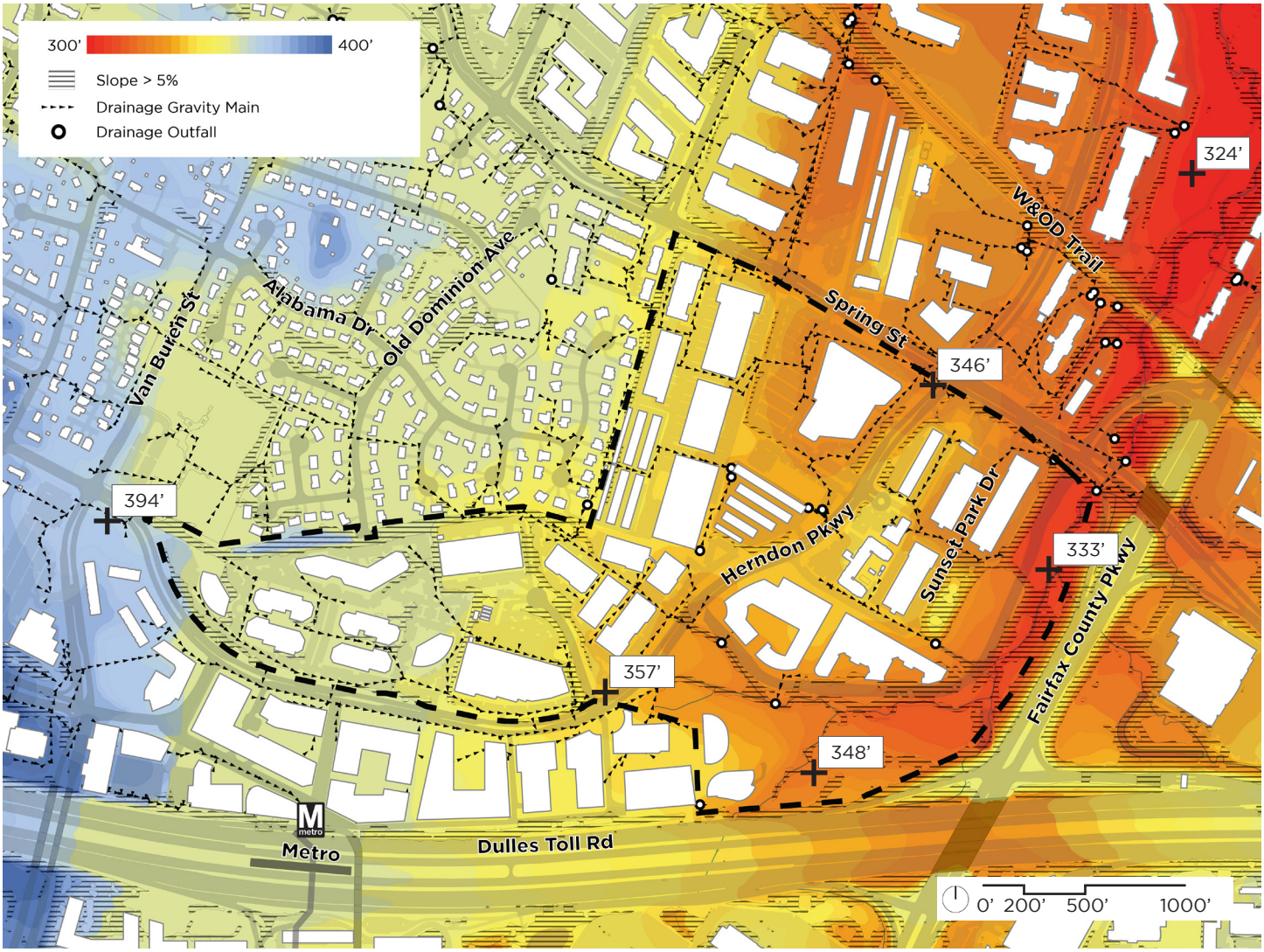


is subject to FEMA approval. Any development within the "wetlands risk area" will be difficult due to the presence of natural resources. Since the potential development areas containing natural resources are low in quantity, the potential for wetland remediation, mitigation, credits, stream restoration,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

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

DRAFT

Site Features | **Topography**



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

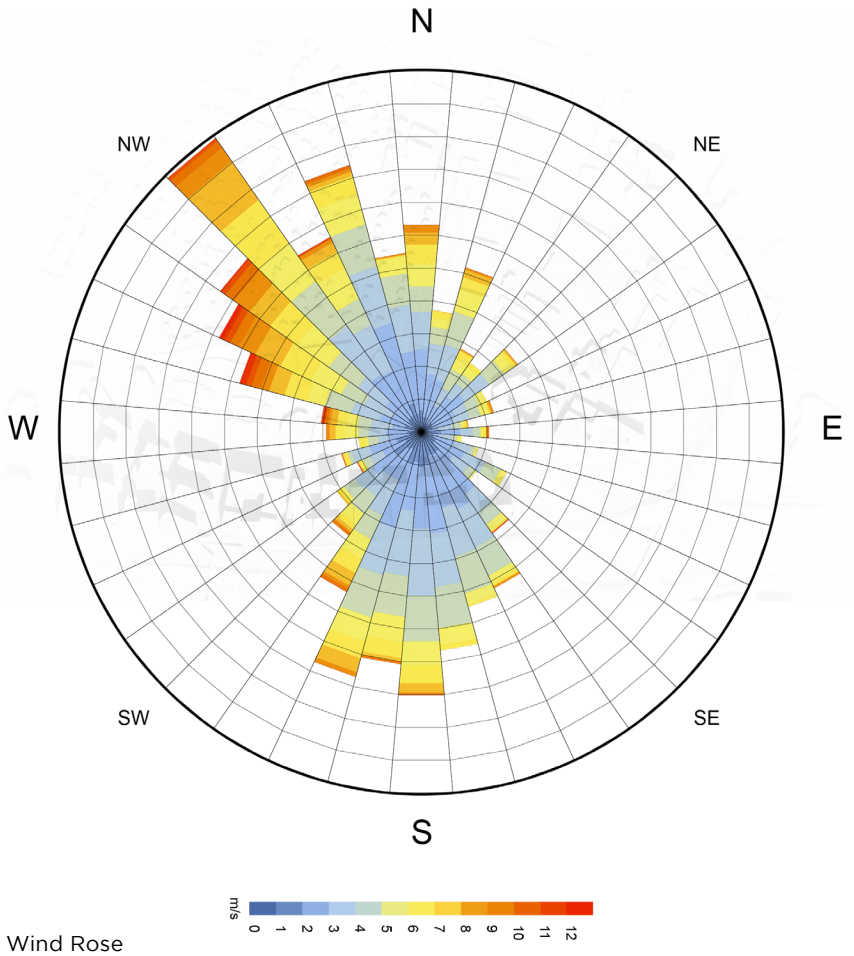
Within the TRG, there are steeply sloped areas: the banks of Sugarland Run; the embankments of the Fairfax County Parkway and the Dulles Toll Road; and the vegetated buffer separating the TRG from the Downs. These areas more or less fixed, but should have minimal impact on any redevelopment within the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

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

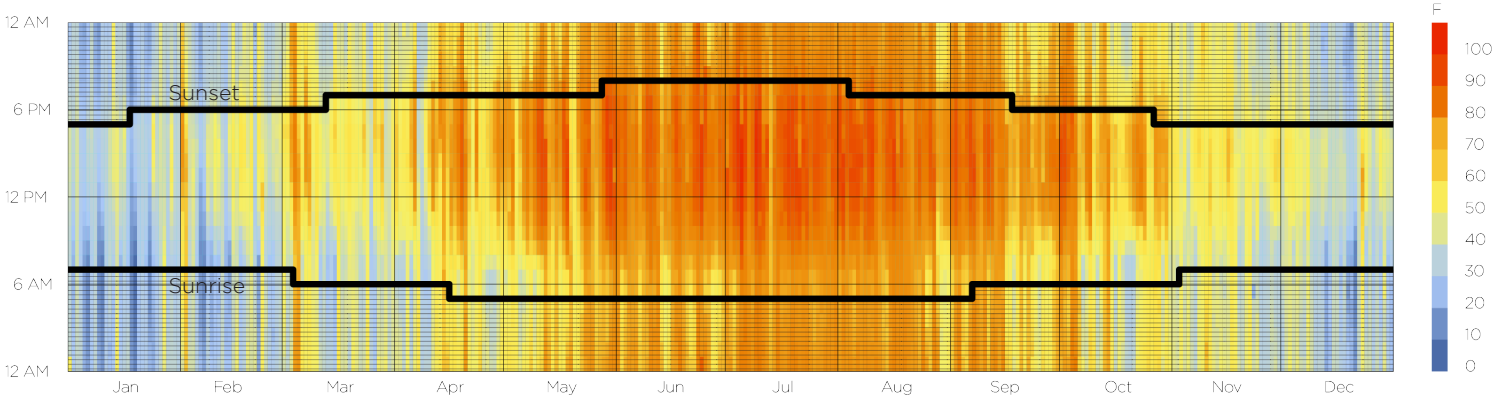
DRAFT

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

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



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



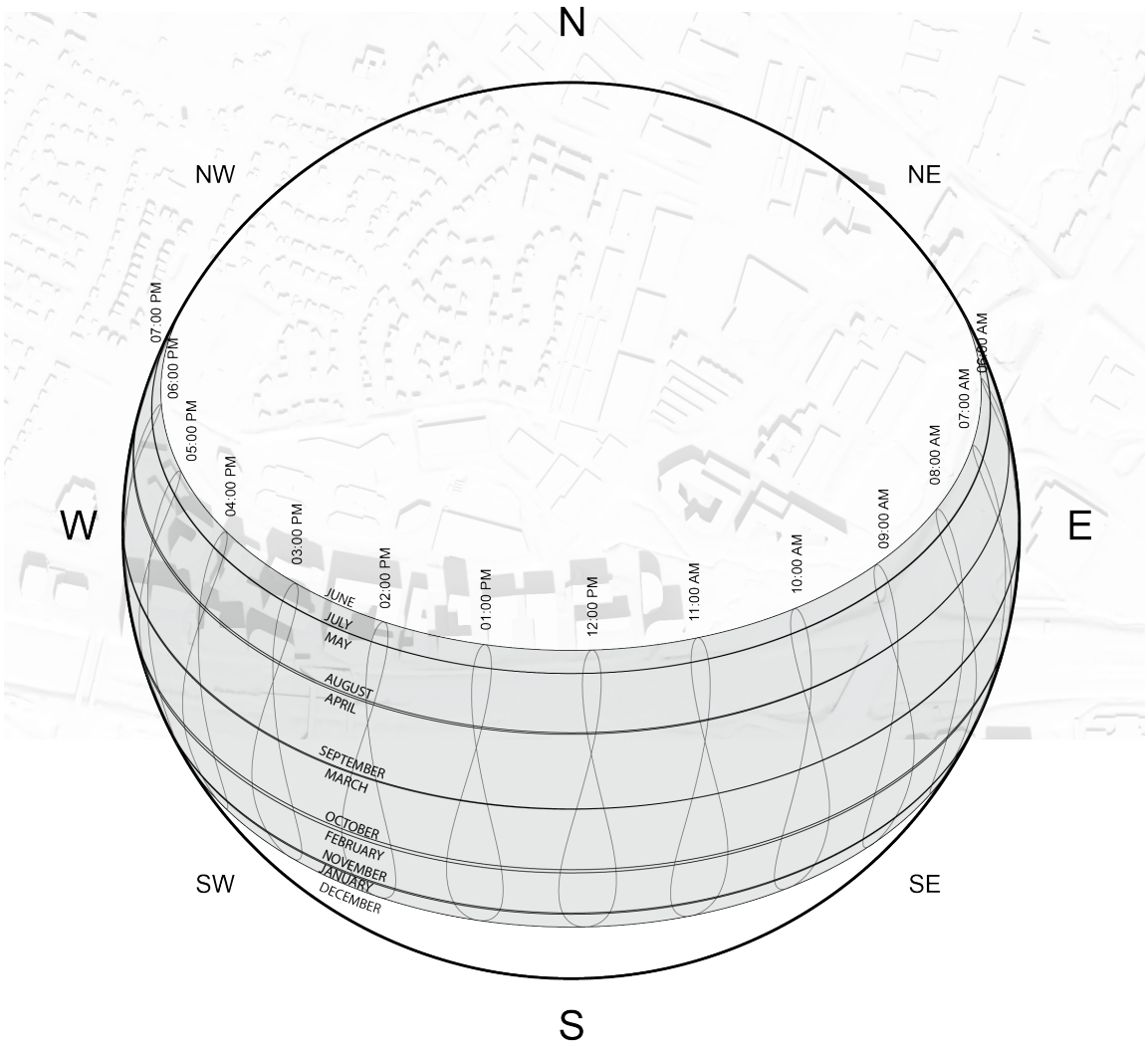
Hourly Dry Bulb Temperature (30-yr average)

DRAFT

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

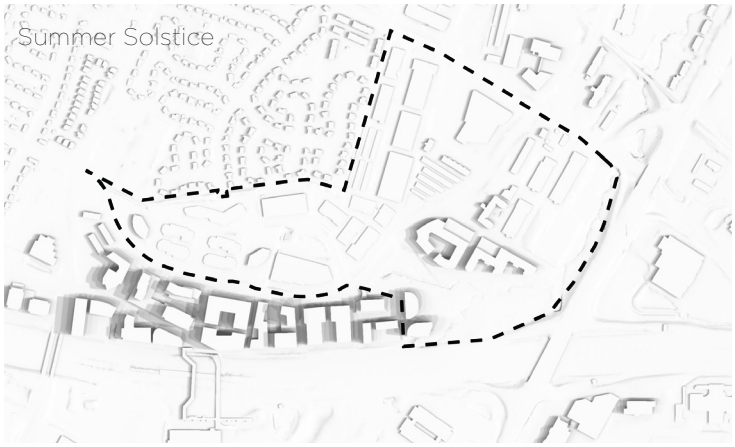
However, the stretch of the Herndon Parkway immediately adjacent to the HTOC would be shaded at least some part of the day throughout the year. In the weeks surrounding the winter solstice, some shading should be expected to cross the Parkway and impact the TRG for ~200 feet at the ground plane.

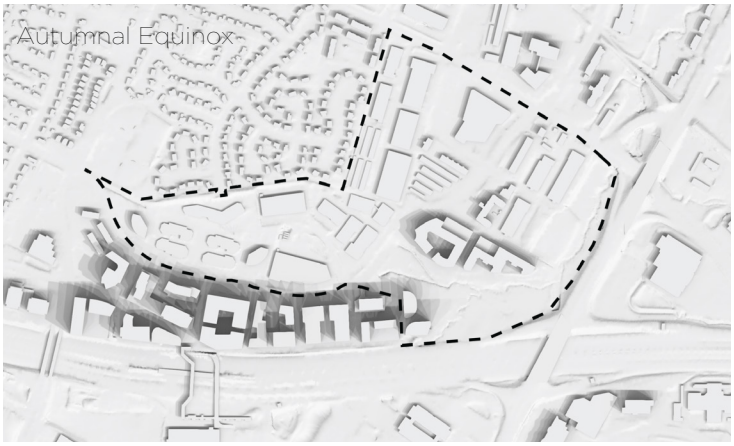
In the Visioning Phase, consideration to sun orientation and shading should be prioritized, especially when it comes to building mass orientation.

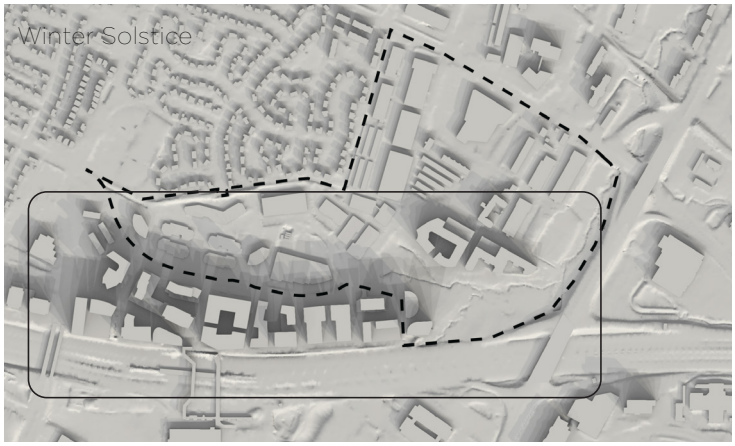


DRAFT


Vernal Equinox


Summer Solstice

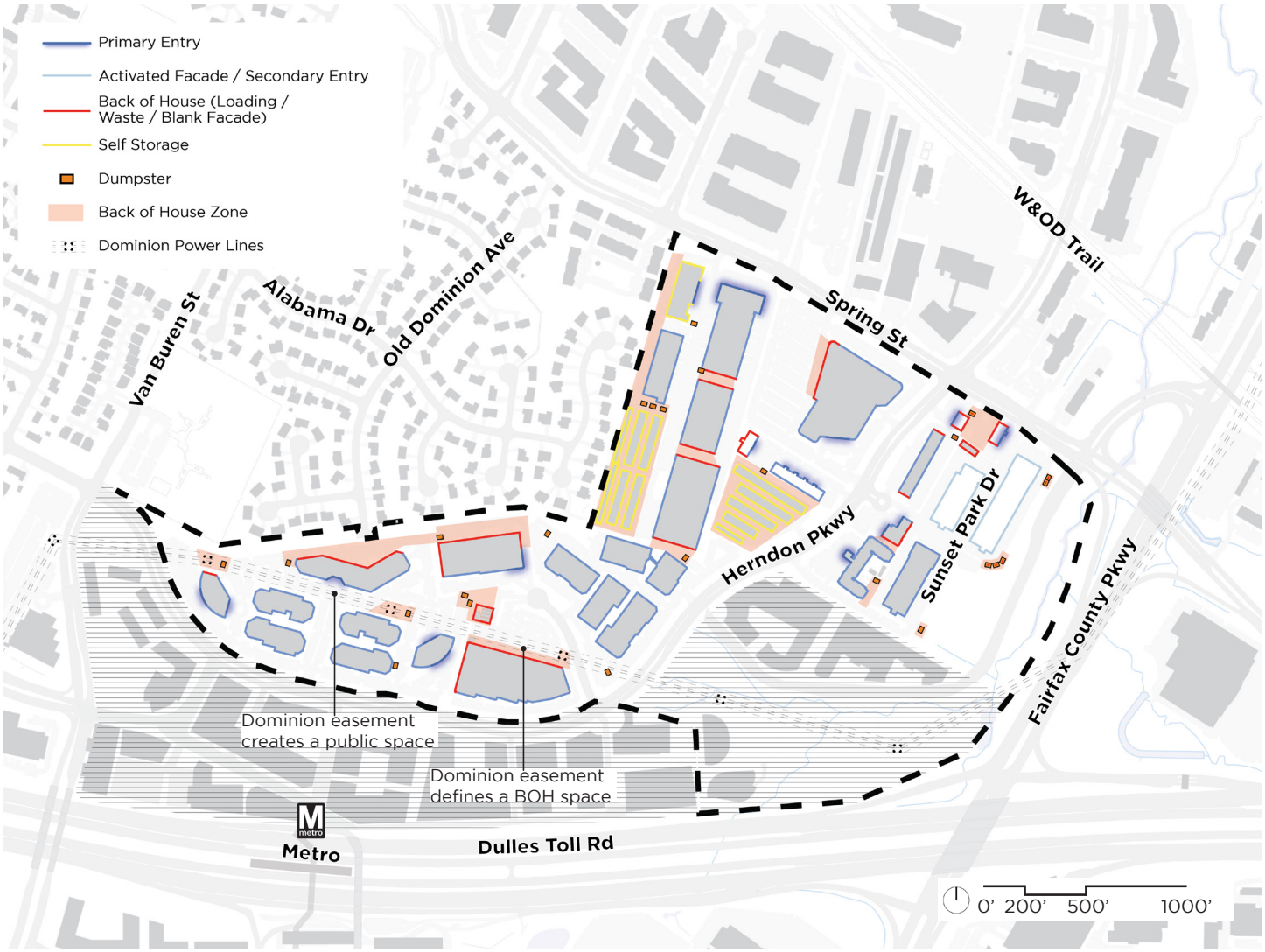

Autumnal Equinox


Winter Solstice


Winter Solstice (Zoom In)

DRAFT

Site Features | **Building Orientation**

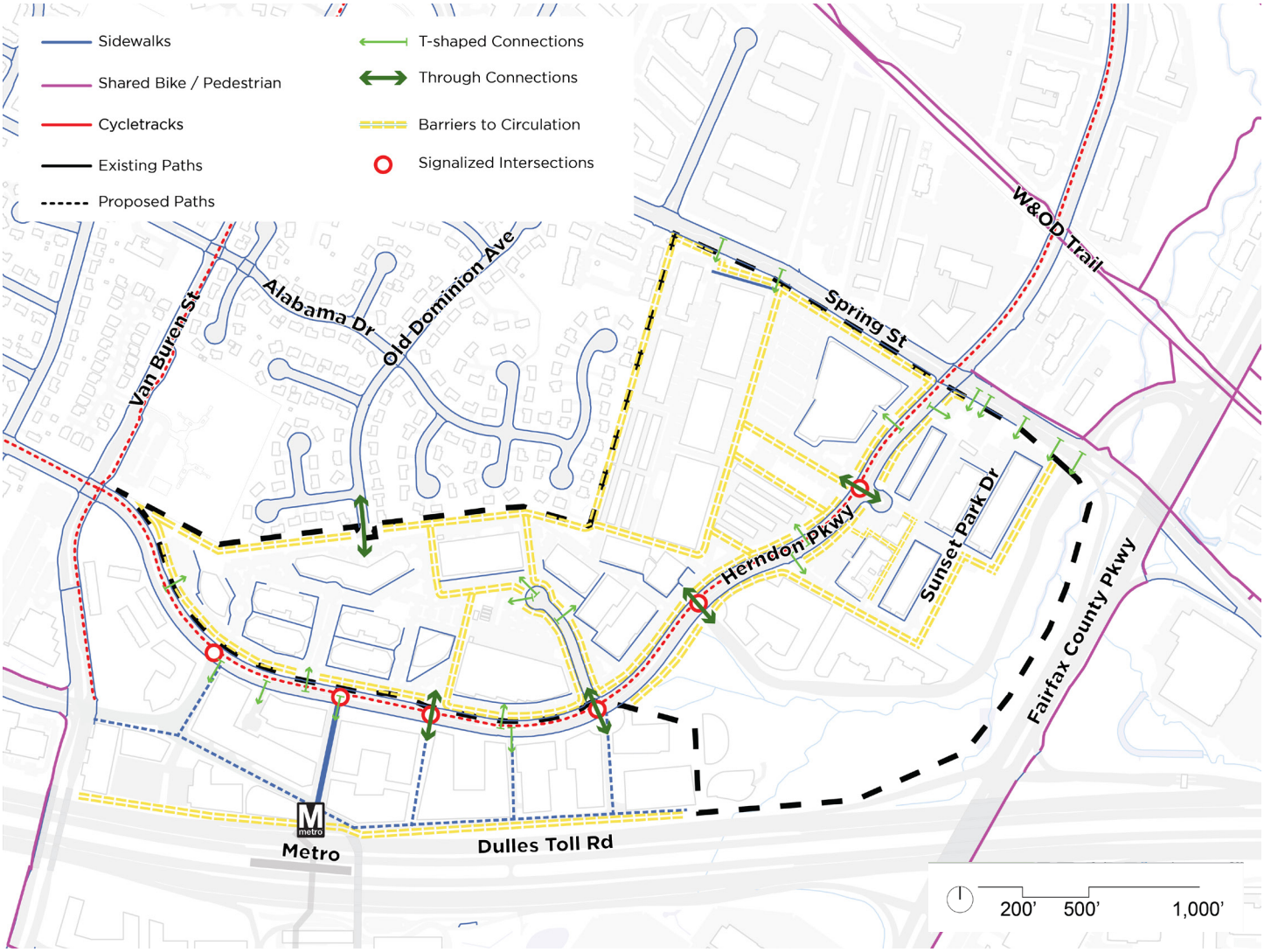


The map above illustrates the existing building orientations within the TRG, and the way in which front of house (FOH) vs back of house (BOH) spaces are organized. In its current configuration, there is little differentiation in the way in which FOH and BOH zones are distributed throughout site. In some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

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

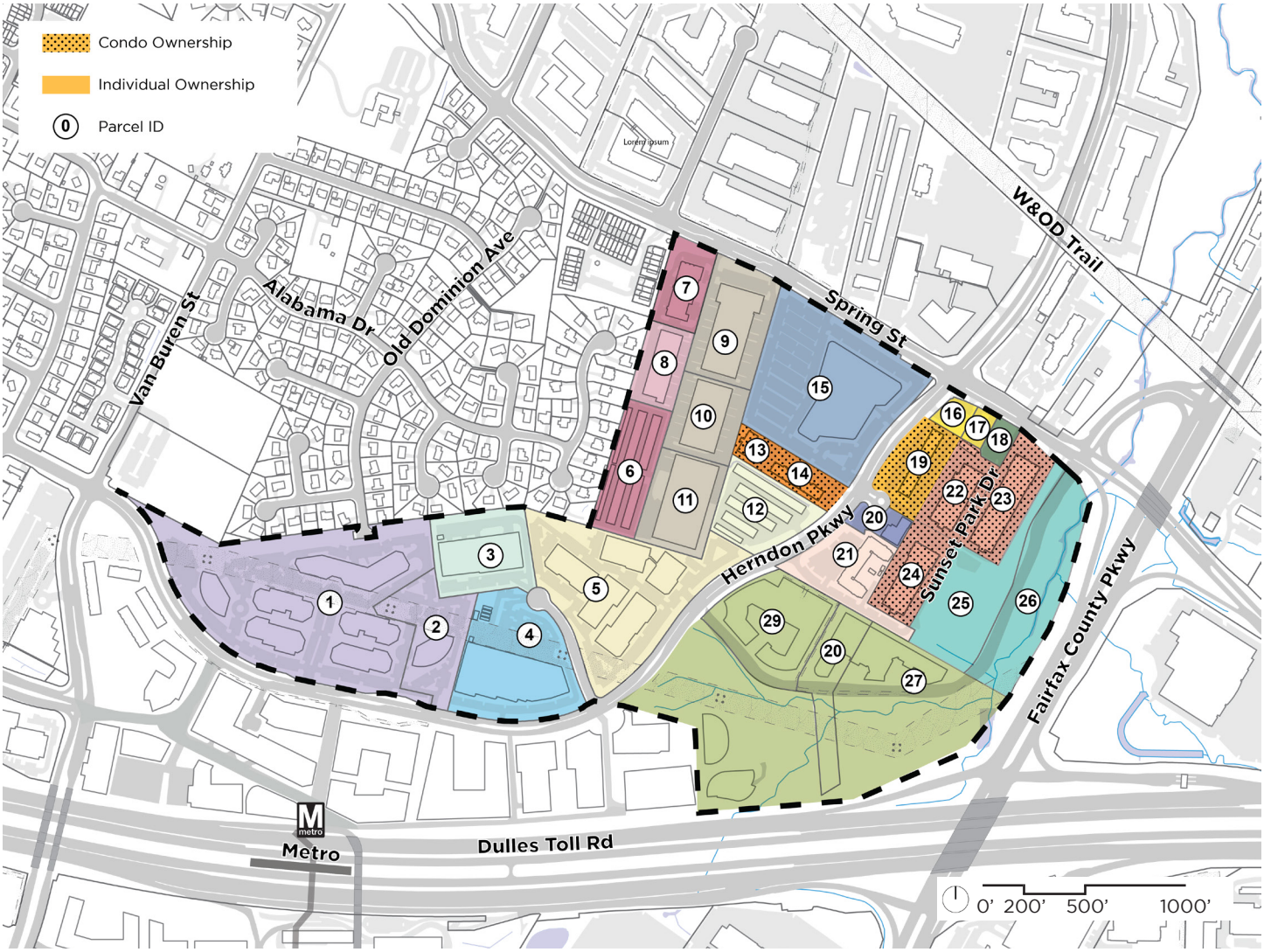
This lack of spatial organization can also be seen in the existing circulation patterns. Generally, buildings within the TRG are laid

DRAFT



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

DRAFT



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

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

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

DRAFT

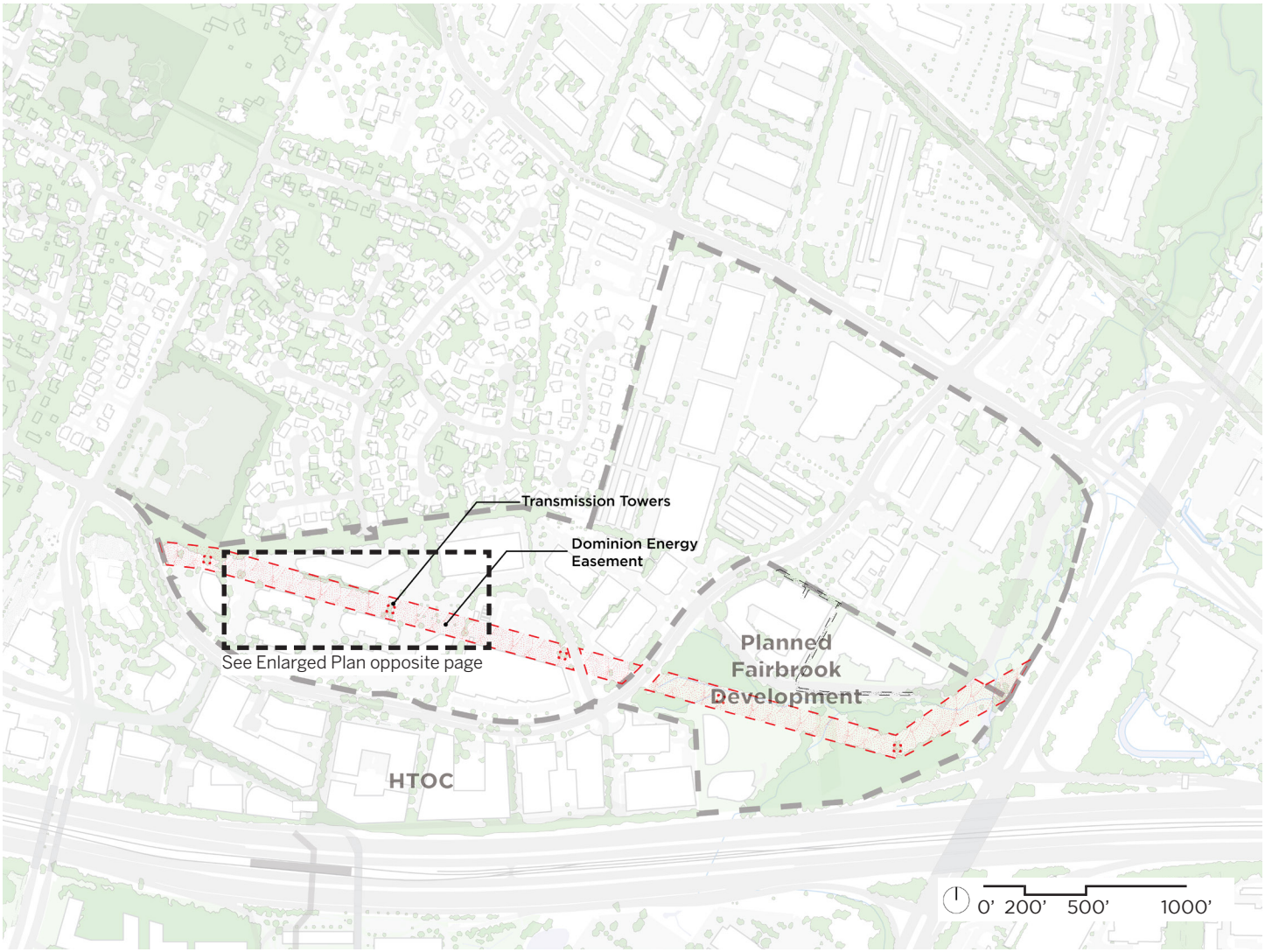
Parcel ID	Property / Main User	Number of Owners	Year Built / Added	Building Age (Years)	Property Land Area (SF)	Property Land Area (Acres)	Property GFA (SF)	FAR	Height (Stories)
1	Shorenstein, Monroe Business Center	1	1986	37					1, 1, 3
2			1988	35	822,649		253,263	0.31	3
3	Beanstalk	1	1985	38	158,158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

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

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

DRAFT

Location



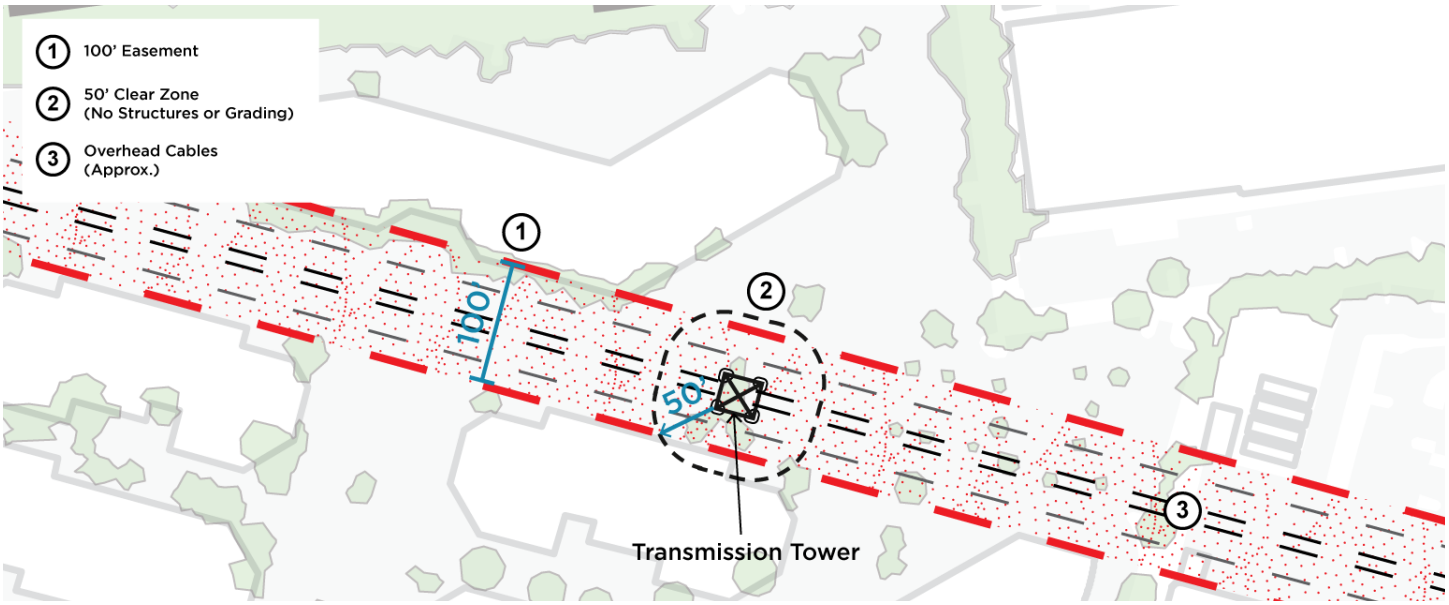
The Dominion Easement bisects the western portion of the TRG site, the area within a 5-minute walk from the Metro and across the Herndon Parkway from the planned HTOC development.

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

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

DRAFT

Requirements



Enlarged Plan showing clearance requirements

General Requirements:

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

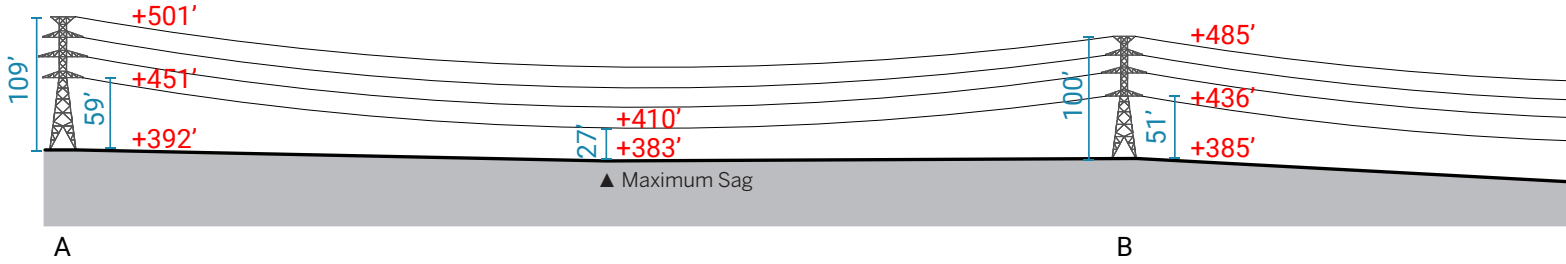
Note that final requirements are determined by an agreement with Dominion.



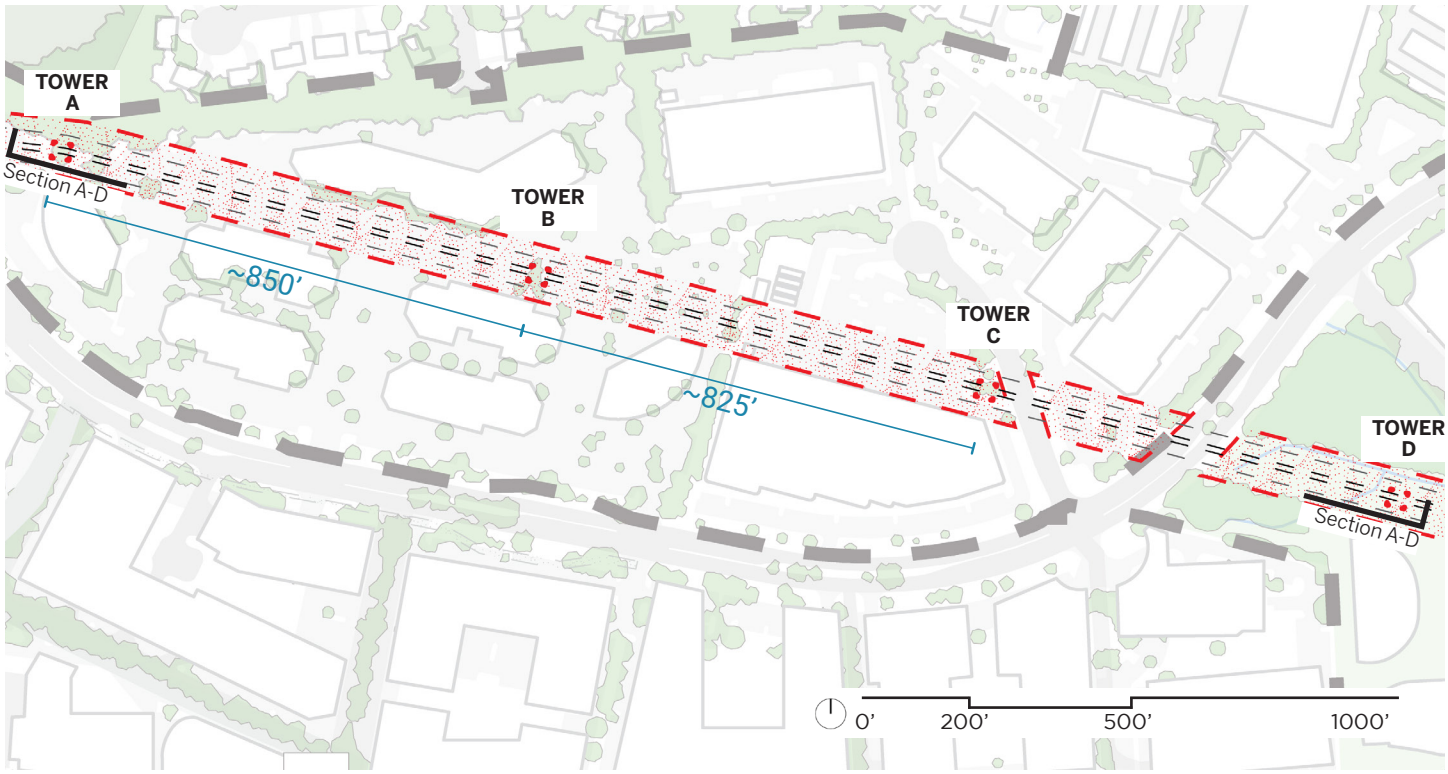
Bird's eye view of the Dominion Easement from the Sugarland Run stream

DRAFT

Constraints & Opportunities | **Dominion Easement**



Section A-D, taken from drawing below

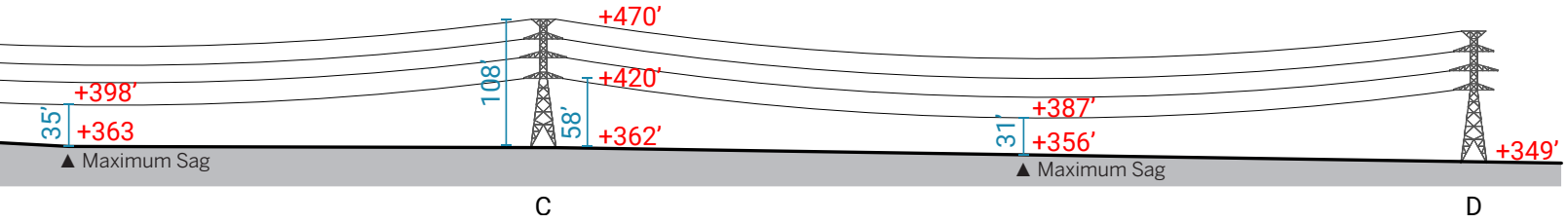


There are three transmission towers on the contiguous western portion of the TRG bounded by Herndon Parkway. Those towers are approximately 825 to 850 feet apart, roughly the distance of two large city blocks. The towers are at least twice as tall as the buildings around them, as seen in the photo on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

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

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

DRAFT





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

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



DRAFT

The Opportunity



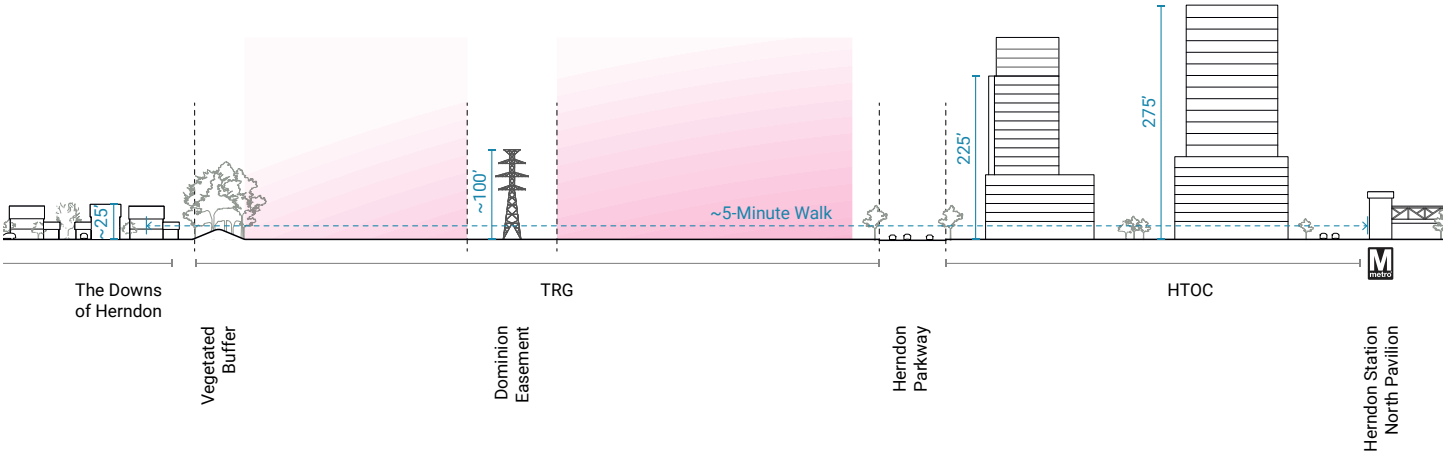
The TRG Small Area Plan will null current zoning height limitations in favor of new ones, to be attune with transit-oriented densities given the opening of the Herndon Metro Station.

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

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

DRAFT

The Transect



Ongoing Developments Across the Herndon Parkway



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



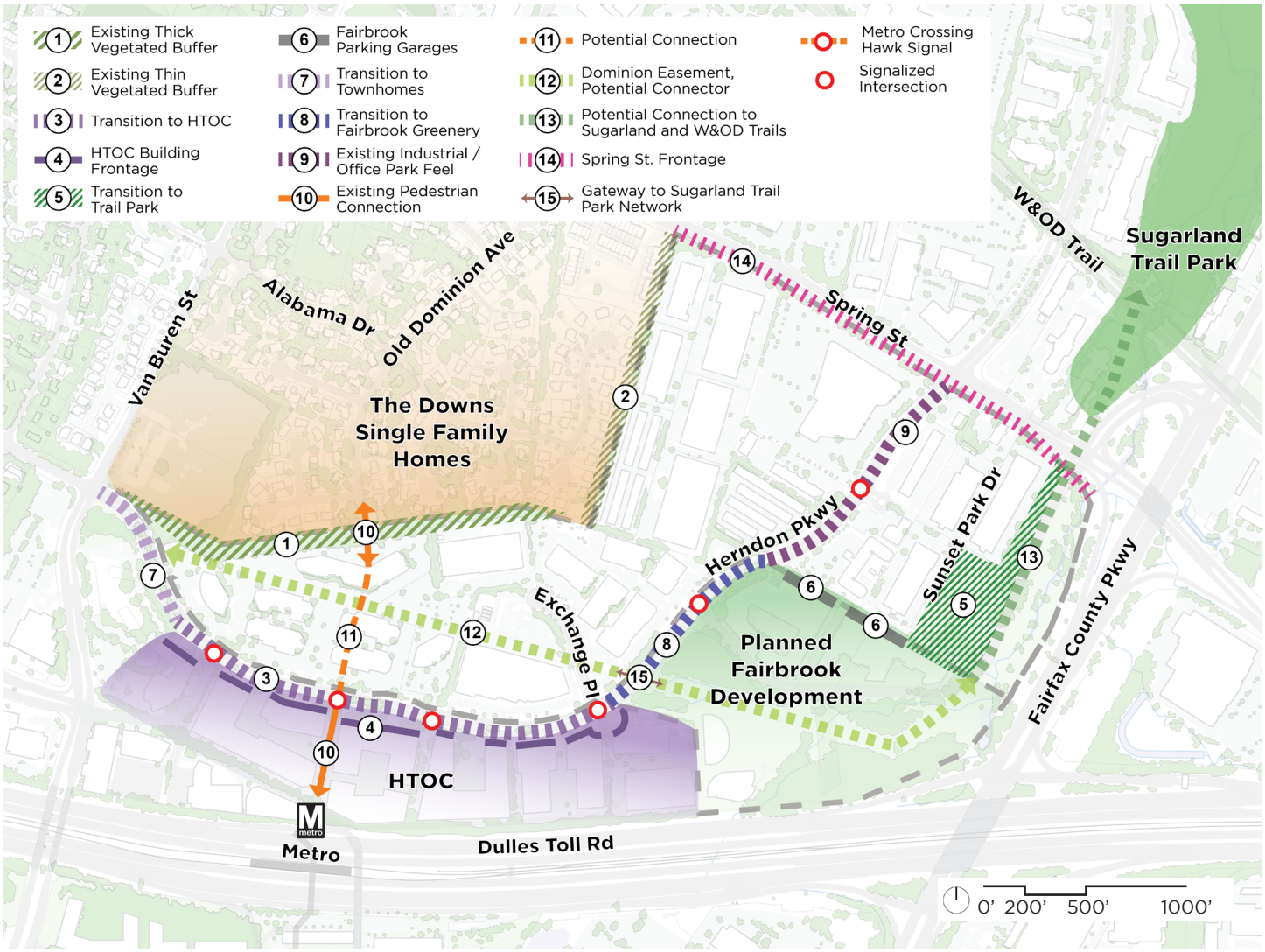
View 2 Parkview



View 3 555 Herndon Parkway

DRAFT

Transitional Spaces, Frontages & Buffers



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

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

Of these four transitions along the Parkway,

DRAFT

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

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

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

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

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

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

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

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

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

Conclusions

Context

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

Property Ownership Patterns:

Note:

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

Multiple-owner challenges:

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

5-Minute Walk from Metro Area:

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

Natural Resources

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

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

Topography

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

Climate, Sun Orientation & Shading

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

Circulation

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

Dominion Easement

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

DRAFT

spaces should be researched.

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

Heights

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

Transitional Space, Frontages and Buffers

The TRG site is rich in opportunities for character diversity.

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

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

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.

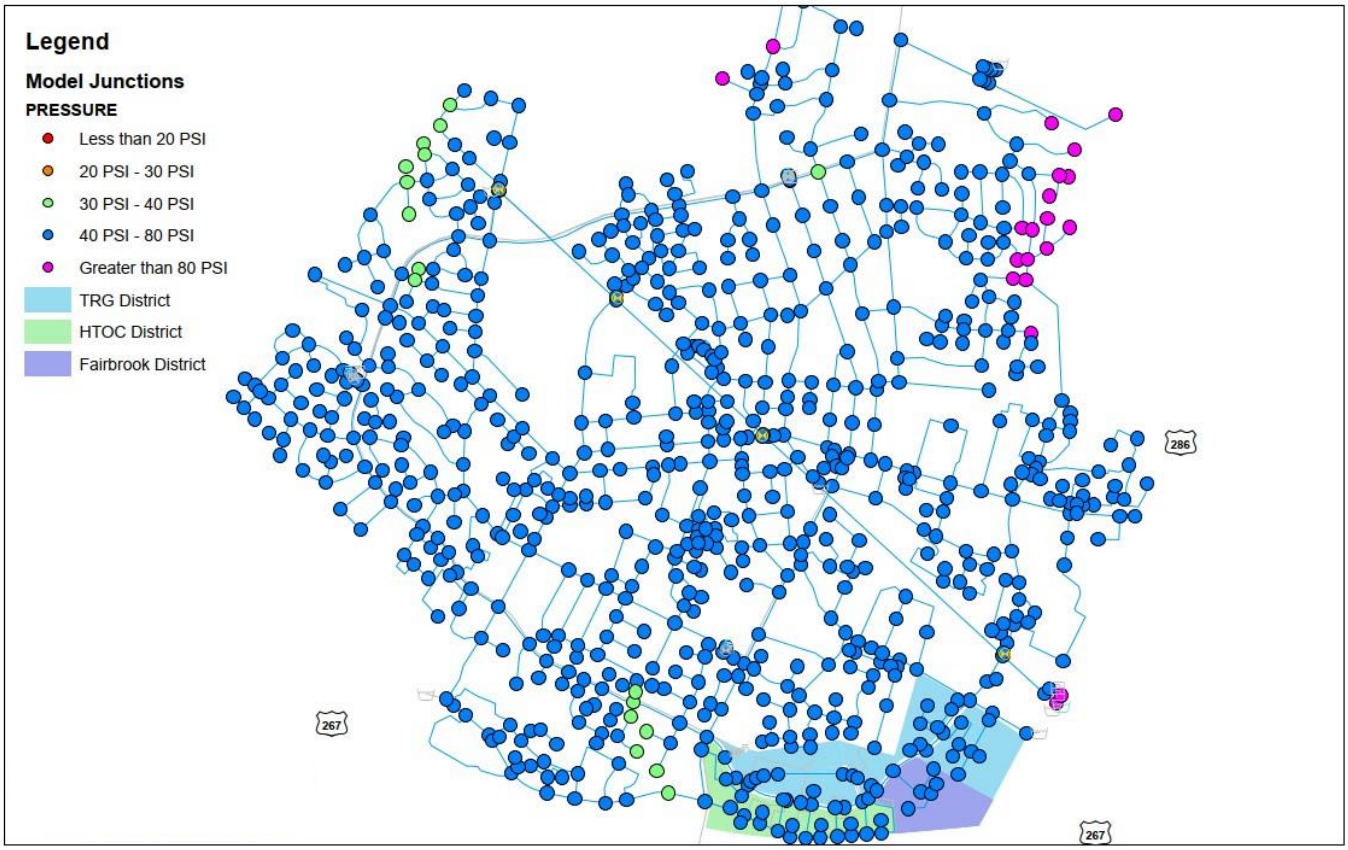


Figure 2 - Minimum System Pressure, Pre-TRG Upgrades

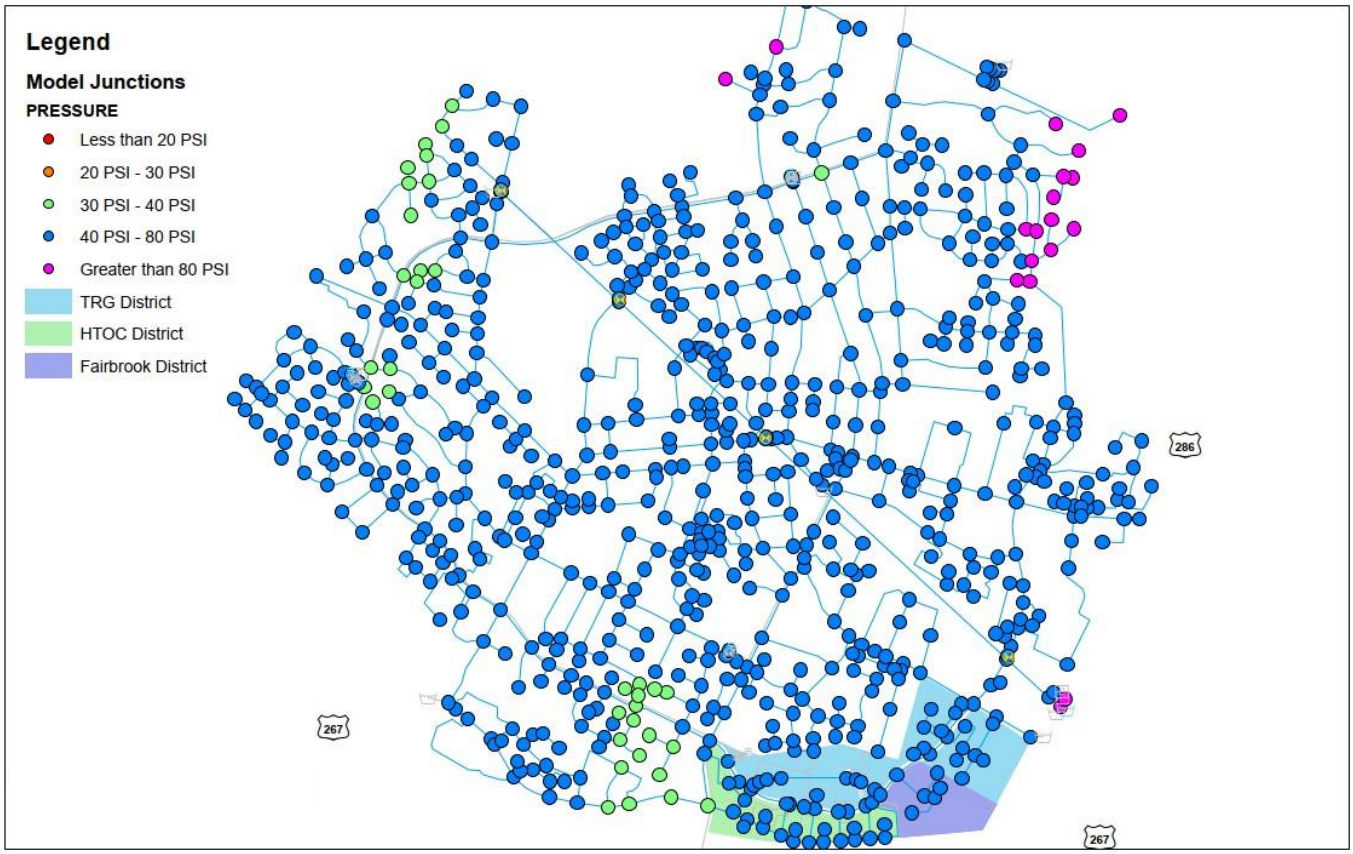


Figure 3 - Minimum System Pressure, Post-TRG Upgrades

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.

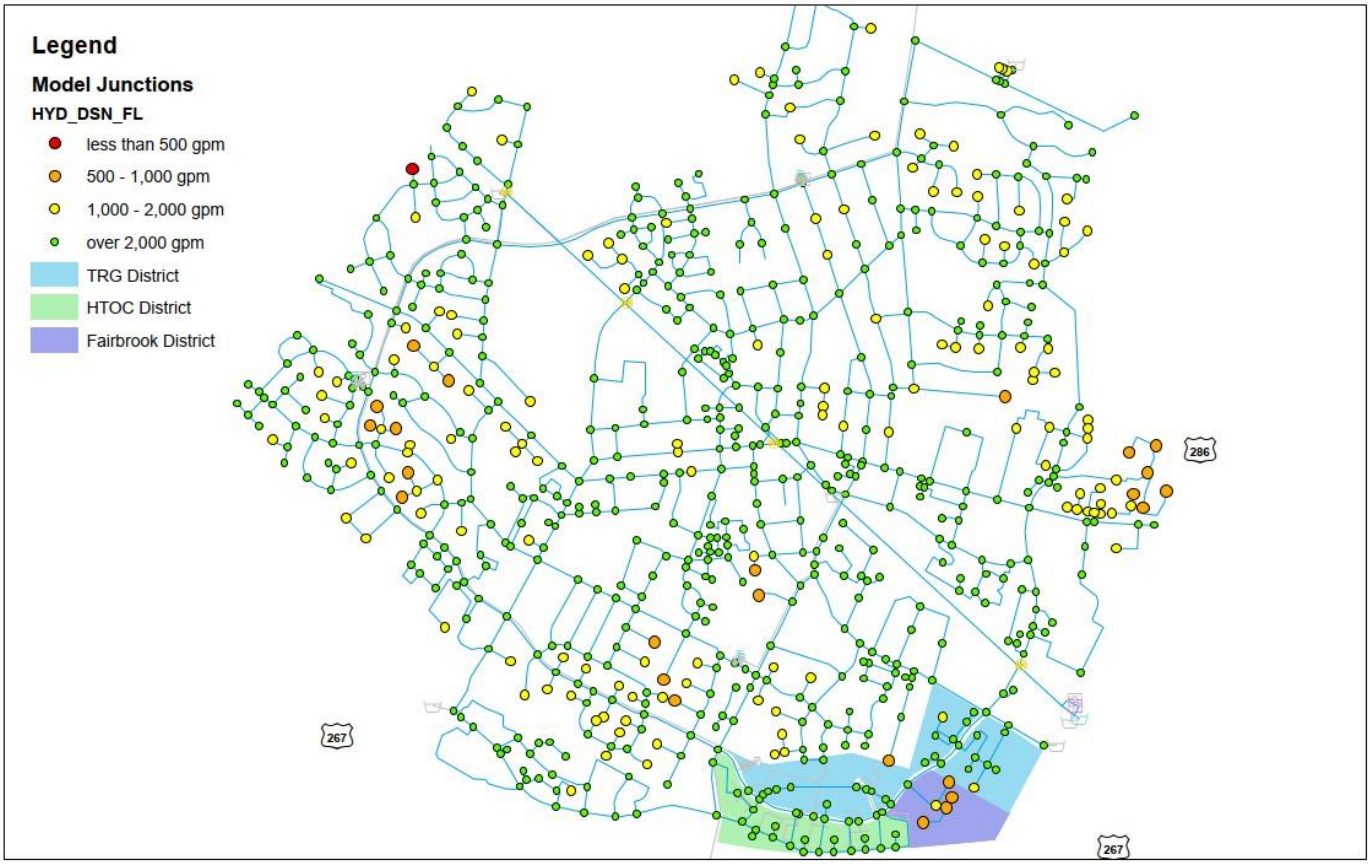


Figure 4 - Town of Herndon Fire Flows, Pre-TRG Upgrades

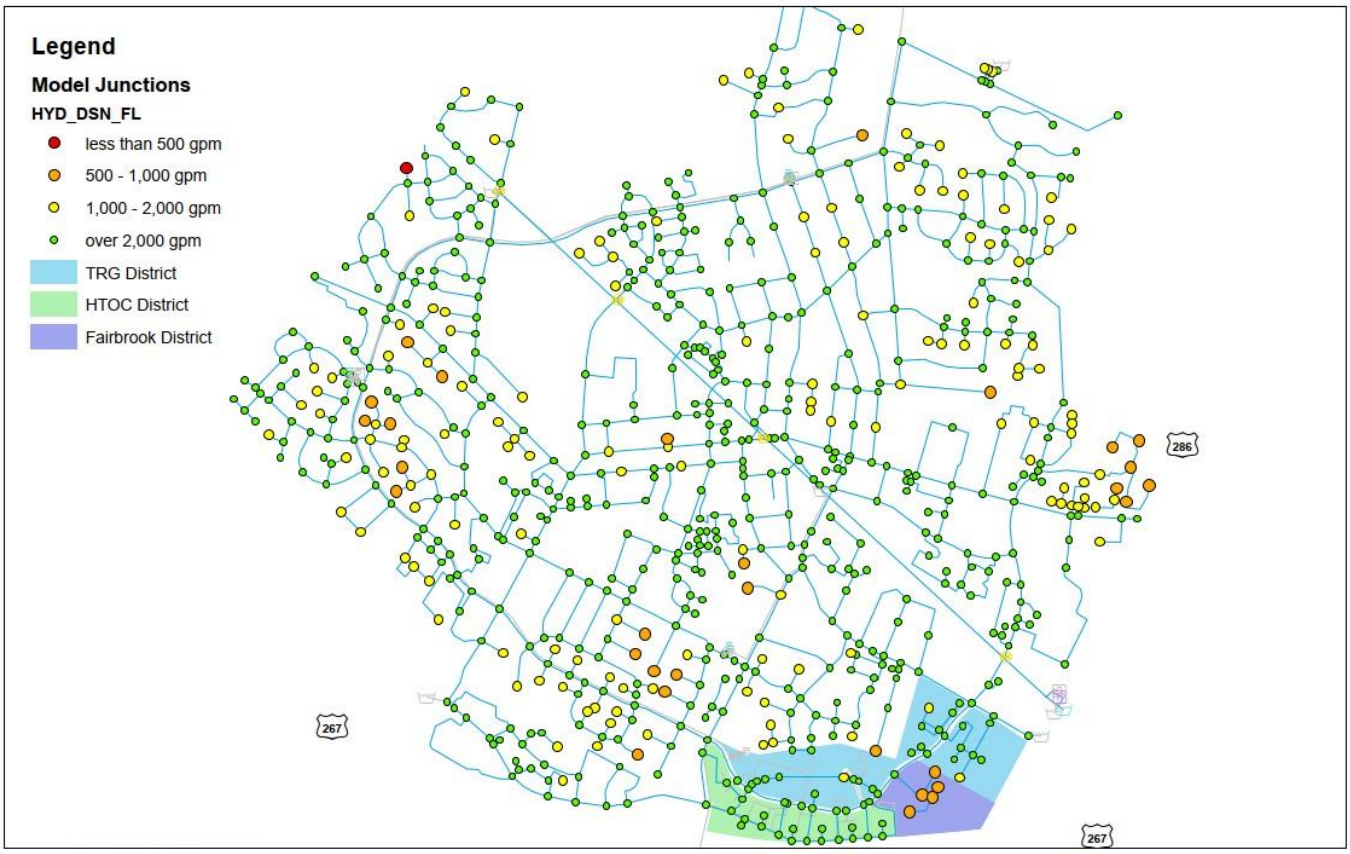


Figure 5 - Town of Herndon Fire Flows, Post-TRG Upgrades

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**.

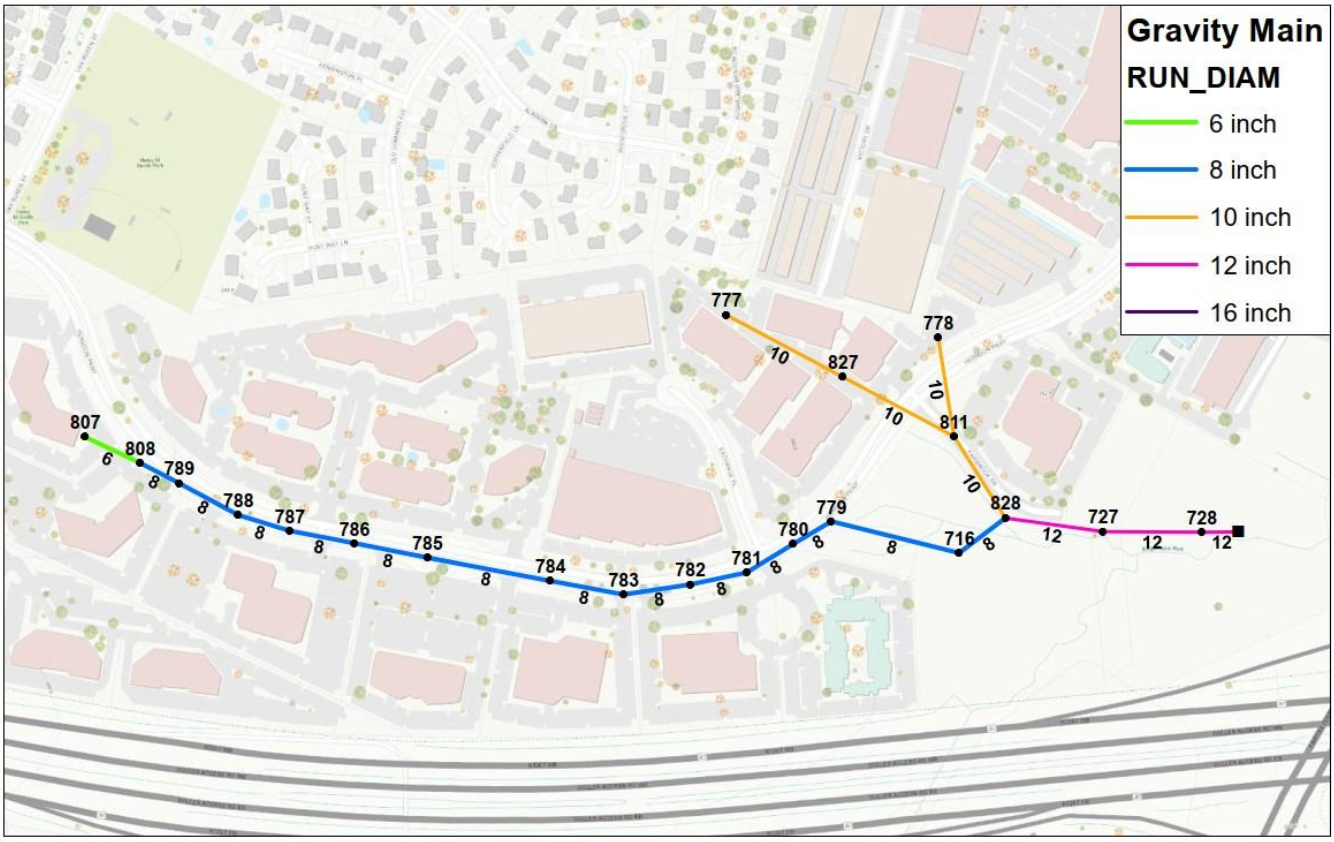


Figure 6 – Existing Sewer Infrastructure

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.

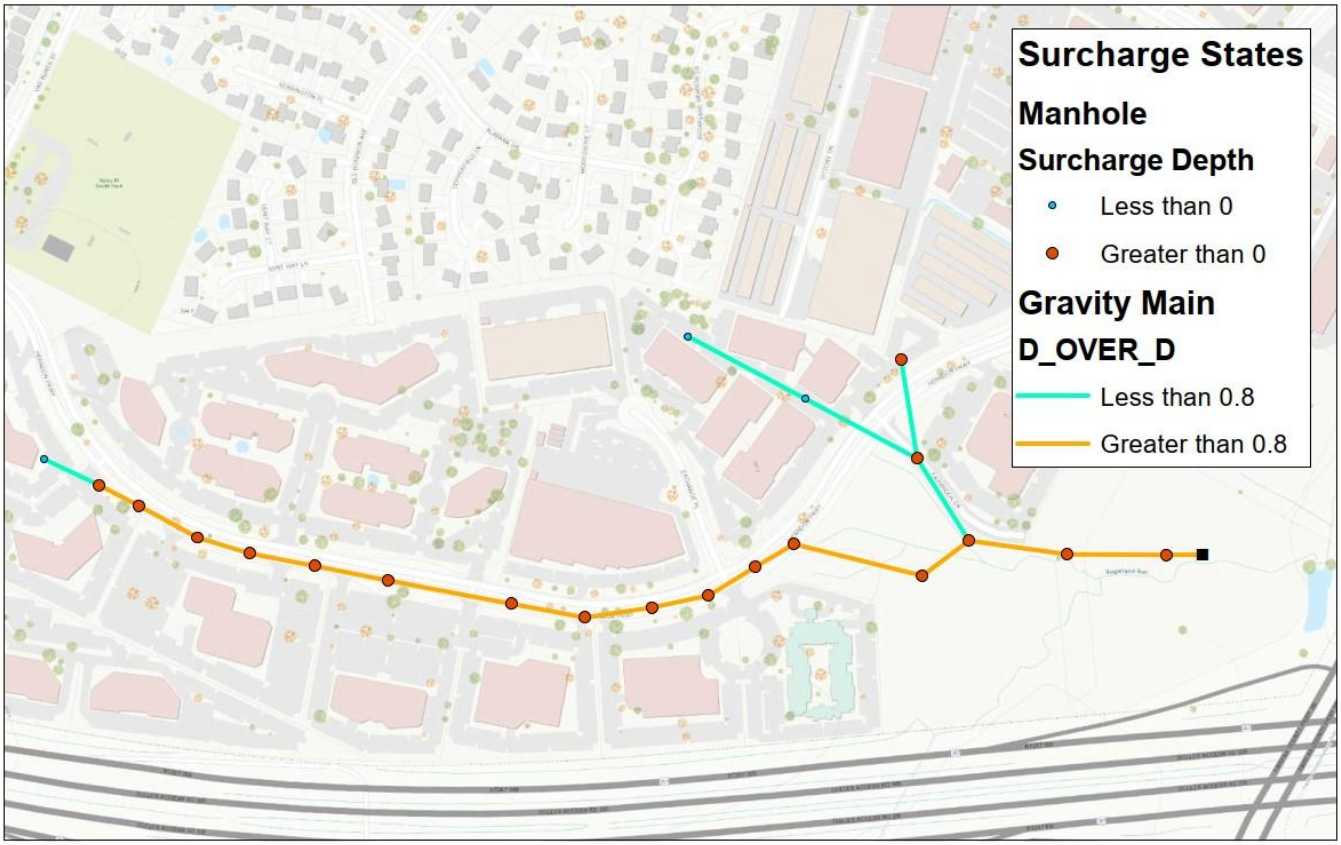


Figure 7 – Sewer Surcharging with TRG Flows

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.

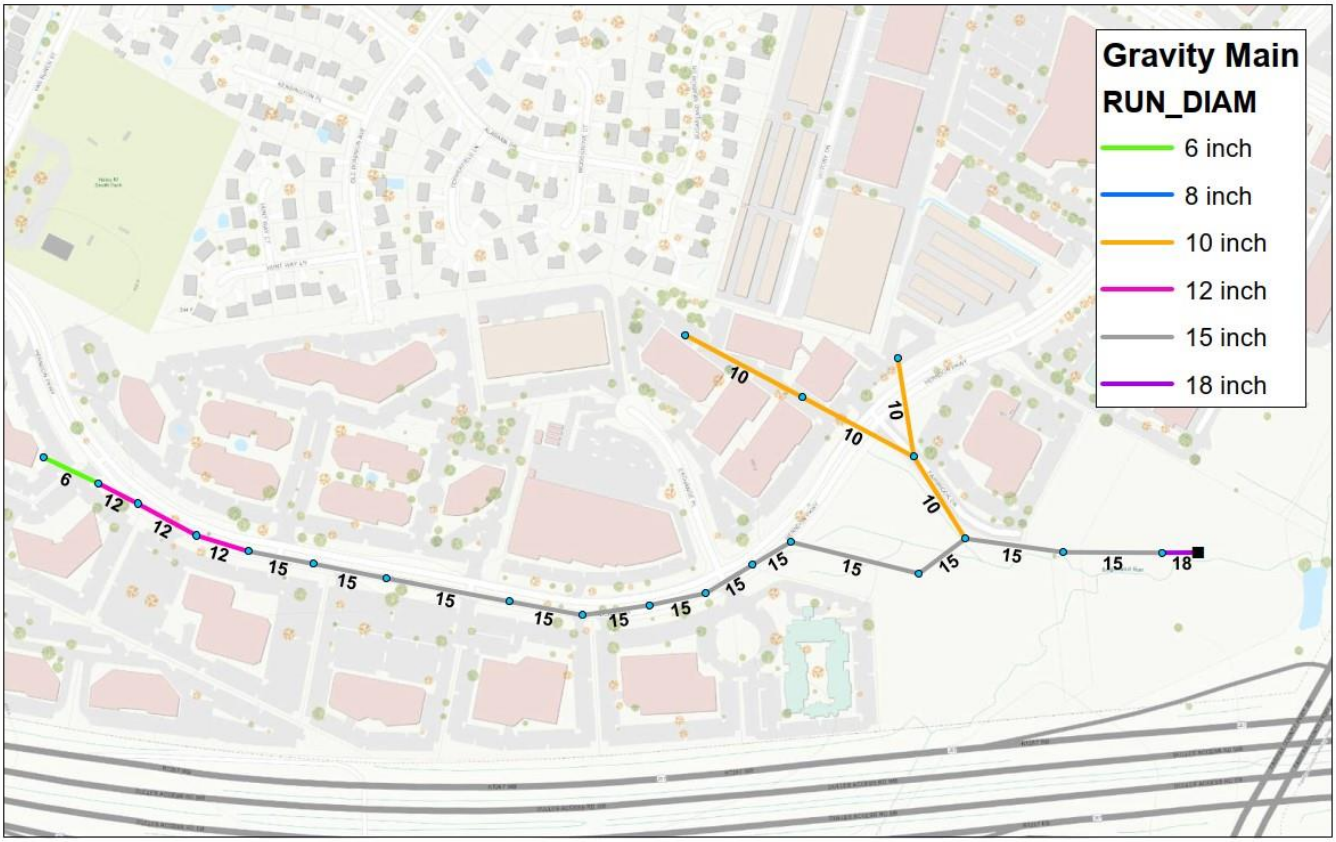


Figure 8 – Upgraded Sewer Infrastructure

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

October 5th, 2022



PREPARED FOR:
Town of Herndon

PREPARED BY:
Firaas Hakim, PE
URBAN, LTD.
7700 Little River Tpk, Suite 503
Annandale, VA 22003
PHONE: 703.642.8080
www.urban-ltd.com

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
- 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

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

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

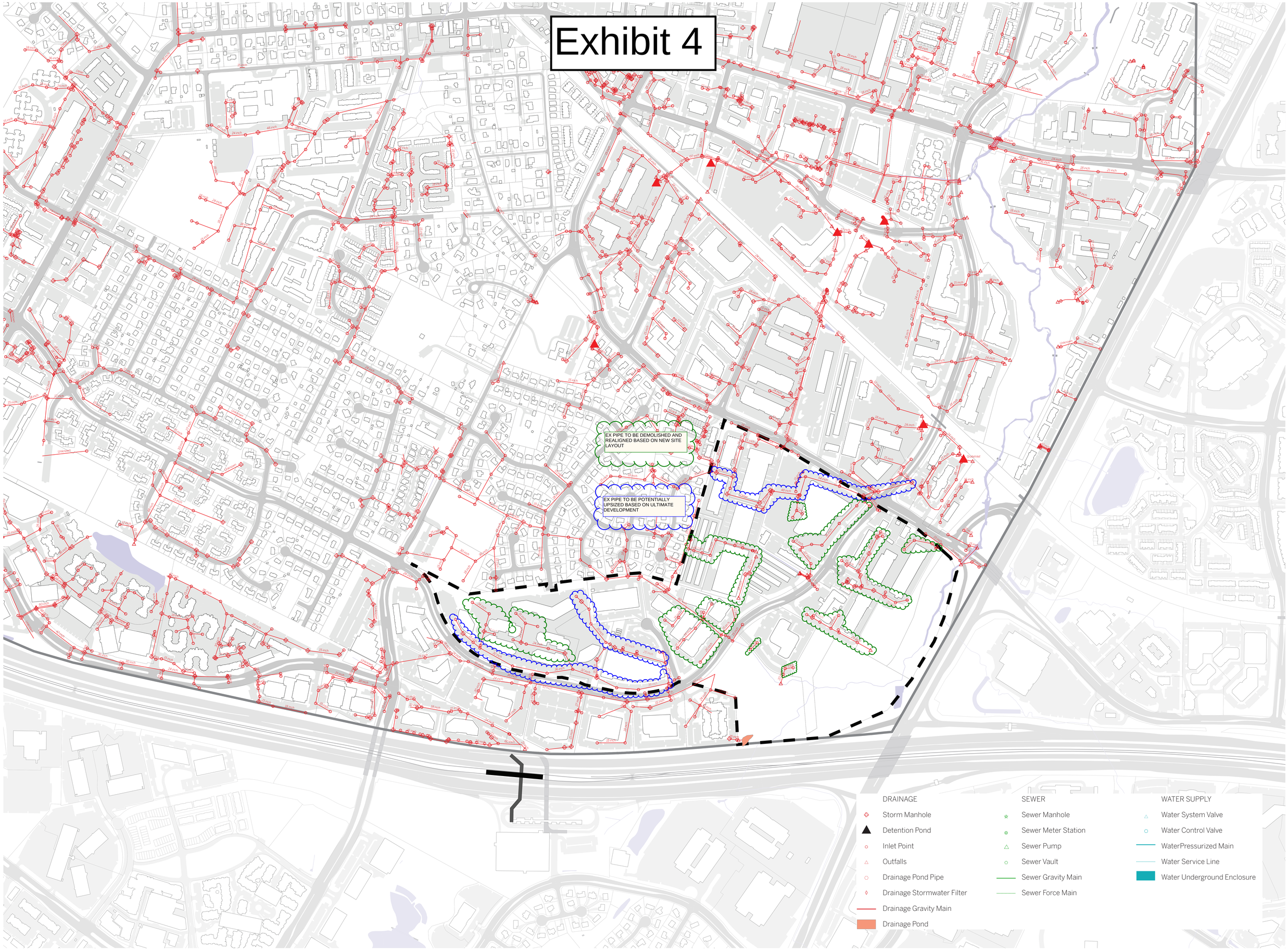
Storm Sewer system

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
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

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.

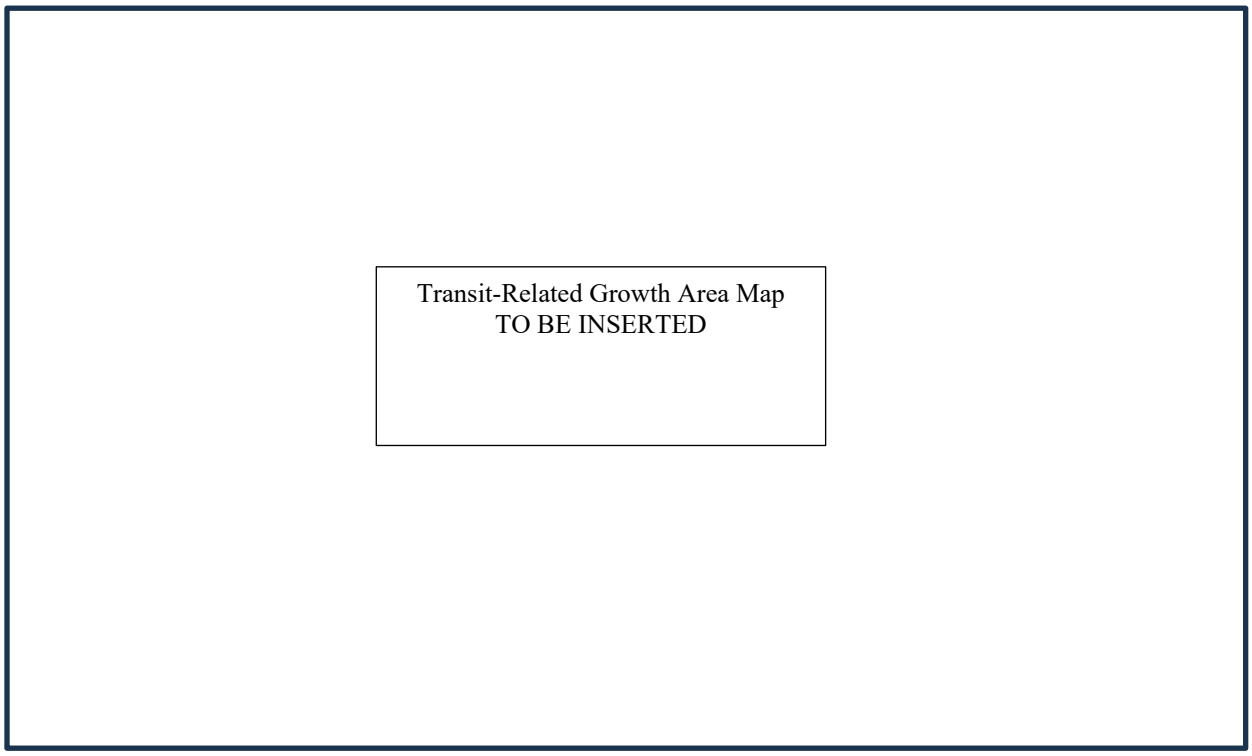
Transit-Related Growth (TRG) Small Area Plan

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

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

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

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



Town of Herndon
Final Draft TRG Small Area Plan
Errata / Refinement Sheet

No	Page No.	Paragraph No	Verbatim/In line edits	Exhibit Edits / Comments
1.	Cover		Strike "Final Report" in title	
2.			Replace "Final Report" with Small Area Plan on all page footers	
3.			Update date of Town Council action to adoption date	
4.			Strike "Final Draft" watermark	
5.	#2		Table of contents titles should be hyperlinked to each chapter	
6.			Change Appendix E to "Water and Sewer Infrastructure Capacity Analysis (WRA)"	
7.			Change Appendix D to "Utilities and Storm Water Assessment Report (URBAN)"	
8.			Correct order of Appendices; URBAN assessment is below WRA analysis	
9.	#3	1st	1st sentence; replace with The Transit-Related Growth Area (TRG) Small Area Plan (SAP) is the result of a highly collaborative effort lasting nearly two years. Informed by extensive public input, the process was facilitated by and the plan produced by a consultant team with guidance from the TRG Advisory Committee, Planning Commission, Town Council and town staff.	
10.		2nd	Line 1; replace "Town staff" with town staff	
11.		Names	Correct name; Vice Mayor Clark Hedrick	
12.		Names	Strike "Dharam Cost Estimating" from consultant team	
13.	#4	1st	1st sentence; remove "staff"	
14.		1st	2nd sentence; replace "…Silver Line Metro Station at Herndon" with Silver Line Herndon Metro Station	
15.		2nd	2nd sentence; replace "southwest" with southeast	
16.		2nd	Split 3rd sentence into 2 sentences; …operation Herndon Metro stop. Today's TRG is predominantly characterized by a mix of low-density office and industrial spaces, with some experiencing notable vacancy rates, yet the TRG boasts a vibrant retail complex known as Sunset Business Park, and a significant Federal and federal contractor presence.	

17.		3rd	3rd sentence; "…a study of current and projected traffic patterns was also conducted by VHB."	
18.		4th	3rd sentence; remove space after "WinterMarkt"	
19.		5th	Remove paragraph (duplicate)	
20.		6th	Remove "**Vision**" heading	
21.	#5	1st	1st sentence; replace with The Design Objectives guiding the SAP were informed by the public, town entities and the consultant design team.	
22.		2nd	Change "Plan" to plan, and remove extra “that”	
23.		Land Use, Density & Building Heights	3rd sentence; add …featuring townhouse and 2-over-2 developments of 3-4 stories.	
24.		Redevelopment Framework Plan	1st sentence; split into three sentences; 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. The framework allocates 24 right-sized development blocks anchored on a network of open spaces with an integrated multimodal urban street grid~~, and designated building frontages and service areas~~. Ample distance between ~~the blocks and between curb and~~ buildings allow for a public realm that accommodates planned circulation needs and amenities including on-street parking, bioretention landscaping, front yards/building amenity zones, tree canopy, and site furnishings.	
25.		Urban Design & Architectural Character	1st sentence; The architecture and urban design for the TRG incorporates the most successful elements of Herndon’s small-town and character rich historic downtown ~~Downtown Herndon~~, while allowing for a higher level of density and contemporary expression.	
26.		Open Space	Bullet 2; 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, passive recreation and off-street multimodal facilities.	

27.		Open Space	Bullet 3; …Triangle Park and Square Park - located outside of a 10-minute walking distance to an existing park, these large community spaces serve a diverse mix of users, including residents, office workers, and the general public visiting the facility or doing nearby shopping or dining. ~~shoppers, and the Sunset District across the Herndon Parkway.~~	Sentence re-arranged. Assuming "existing" was meant when referencing 10-minute walk.
28.		Neighborhoods	Re-title to "Context-specific Guidance"	Town staff continues to contend that the term "neighborhoods" is not reflective of the intent. Staff is proposing "Context-specific Guidance."
29.		Neighborhoods	1st/2nd sentences: While the Urban Design Framework provides design guidance for the TRG overall, the idea of additional direction for specific areas of the TRG, based upon context, is meant to identify where further design emphasis should be applied due to unique land use conditions. Those areas include: the Metro Arrival Area, Residential Transitional Area, Park Frontage, Herndon Parkway and Spring Street Frontage and Sunset District.	
30.		Fiscal Impact	1st paragarph; delete ….~~A market projection conducted for the TRG project suggested a positive net fiscal impact on the Town of Herndon, with anticipated revenues outweighing operation expenditures stemming from the proposed development.~~ And replace with: 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. A market projection, conducted for the TRG study, indicates that the redevelopment of the TRG will generate a substantial increase in the real estate tax base and other local taxes.	
31.	#6	2nd	2nd sentence; replace with: The HMSAS is a small area plan that encompasses a large part of the territory within approximately ¾ mile from the then-anticipated and now open Herndon Metrorail Station. ~~(the Herndon station has since been completed; it opened in Fall 2023)~~	
32.		Section on Fairbrook Both	Replace with: When the HMSAS was adopted the Fairbrook parcels were part of the TRG. Since that time, a generalized development plan, governing the development of Fairbrook, has been approved. Since the Fairbrook parcels stand as the only TRG parcels with a currently approved plan for redevelopment, it has intentionally been excluded from the design considerations outlined in this plan. The Fairbrook parcels, though no longer within the defined TRG SAP boundary, play a pivotal role in shaping the future of the Herndon Transit zone and are intricately linked to key facilities and transportation	

33.		5th (Fairbrook Drive)	Amend 2nd sentence; …..At present, the status of the Fairbrook Drive extension is not clear, but it is a feature in the town's adopted Comprehensive Plan. Due to the roadway's inclusion in the Comprehensive Plan, it has been assumed to be completed for purposes of the TRG SAP.	
34.	#9	Phase 1 Replace bullets with	• Participated introductory meetings and site visit • Collected internal and external stakeholder input from the Advisory Committee, technical sources, and town staff to collect additional information and align expectations for public engagement • Prepared stakeholder and public engagement plan • Researched critical site and context issues • Developed and launched project website • Conducted three stakeholder engagement workshops to include TRG property owners, adjacent residential neighbors, and the general public • Conducted additional meeting with TRG property owners • Met with the Architectural Review Board to discuss sense of place and potential architectural solutions • Prepared Inception Report, including the summary of engagement activities	The entire statement has been shown as edited if any portion of it has a proposed change.

35.		Phase 2 Replace bullets with	• Prepared existing conditions reports for local economy & market conditions, transportation, and infrastructure and utilities • Prepared the Urban Design Site Analysis Report • Prepared and delivered the constraints and opportunities memo	
36.		Phase 3 Replace bullets with	• Prepared fiscal impact analysis • Developed three draft urban design frameworks with narratives for town staff review • Performed iterative evaluation of the urban design frameworks, both qualitatively and quantitatively • Presented urban design framework options to the Advisory Committee, Planning Commission and Town Council • Selected a preferred concept option in coordination with project stakeholders	
37.		Phase 4 Replace bullets with	• Prepared and reviewed the small area plan outline with town staff • Prepared the draft small area plan including sketches, drawings, 2D and 3D concept imagery, vignettes, and study models • Prepared appendices and a revised financial analysis • Presented the draft small area plan to the Advisory Committee, Planning Commission and Town Council at public meetings	
38.	#9 cont.	Phase 5 Replace bullets with	• Integrated feedback from town staff, the Advisory Committee, Planning Commission and Town Council and other stakeholders • Finalized and delivered the TRG Small Area Plan	
39.	#11	Map		Incorrect locations on map of #5, #5, #6
40.	#12	1st	Last sentence; …. buildings should be plural	
41.	#13	Photos/Map		replace #14 with photo (provided by staff) of office building on Spring Street, adjust map accordingly
42.		Photos/Map		replace #15 with photo (provided by staff) of Haley Smith Park, adjust map accordingly

43.	#14	1st	3rd sentence; …. Condo ownership (~~e.g.~~ parcels 13, 14, 19, 22,23, 24) may….	
44.		4th	Last sentence on page; edit as follows: This yields a low median FAR of 0.46, which may fit existing zoning in a pre-transit era, but ~~may not be~~ is not appropriate for a transit-oriented development.	
45.		Table and Map		Remove Fairbrook properties
46.	#14-#17	Exhibits	Add captions to all exhibits	
47.	#17	1st	left justify paragraph	
48.		all	add spaces between last paragraph and one above	
49.	#19	intro note	Replace "Fiscal Impact Analysis" with Market Study to align with title	
50.		Office	1st sentence; remove "suburban"	
51.		Office	last sentence; strike "given its historically local-serving feel"	
52.		Market Constraints…	2nd sentence; replace "The above summary" with ...the summary matrix on the following page	
53.		Market Constraints…	Strike last sentence – “For more information, please see above”	It’s on the next page, not above
54.	# 21	intro note	Reference Appendix A (instead of B)	
55.	#22	intro note	Change to; Note The text below is a summary of the assessment conducted by Urban, Ltd of the existing public water, public sanitary sewer, and public storm sewer infrastructure within and associated with the TRG, which is included in full in Appendix D	
56.		Storm Sewer 1st Paragraph	1st sentence; ~~run~~ Run	
57.		Storm Sewer 4th Paragraph	1st sentence; ~~run~~ Run	
58.		Storm Sewer 5th Paragraph	Last sentence; …and ~~shall~~ must be coordinated …	
59.	#23	Intro	Capitalize “Phase”	
60.			6th bullet under Opportunities, correct typo from “unsized” to "up-sized"	
61.		Urban Design Constraints	• Incremental development of public and private facilities due to multiple property owners • Complexity of consensus building due to some parcels under condominium ownership	Replace bullets with those shown on left

			• Lack of a circulation network or mobility grid connecting the parcels, as well as challenges posed by existing grade changes and other man-made features • Location between low density, two to three story established residential neighborhoods, and the high-rise, higher density of the HTOC	
62.	#23	Market Conditions Constraints	• ~~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 of new office space, and the TRG faces significant competition for corporate users, including from employment cores along the Silver Line that have already commenced building and leasing. ~~in more established employment cores (e.g., Tysons and Reston)~~ Some parcels within the TRG will need to compete with sites that have immediate transit access including those in Reston and Tysons. ~~with other physical features (e.g., immediate transit access) that often make them more compelling to such users.~~ • Demand for full service-hotels is likely to be moderate/weak	Removal of first sentence since the new offices in the TRG would be newer and more efficient - thus shouldn't be a constraint.
63.	#23	Market Conditions Opportunities	• Overall, there is strong market opportunity for the following uses: rental residential~~;~~, for-sale residential~~;~~, creative/smaller office~~;~~, and retail. • While there is heavy competition, new corporate office incorporating newer, more sustainable and efficient building design remains attractive to users. • Additionally, the TRG presents compelling opportunities for smaller and/or creative users~~, given its historically local serving feel~~.	

64.	# 25	New paragraph or page if necessary	As ~~we~~ the consultant team gathered information, ~~and~~ worked to determine opportunities and constraints, and establish the foundation for the Plan Vision and Urban Design Framework, ~~for the site, we~~ the team focused on discovering the answers for the following questions: • What mix of uses can establish the TRG as a place to live, work, shop, and recreate in conjunction with the HTOC and Fair brook? • What is an appropriate mix of uses for the TRG that makes sense now and, in the future, based upon market expectations and the town's vision for the area? • How should density be addressed across the TRG? • What is the best way to create an appropriate transition to the abutting single-family detached and attached neighborhoods? • What is the best way to handle the transition between the HTOC and the TRG? • How can roadway capacity constraints be addressed? • How can the TRG have a unique sense of place while ensuring its identification with the Town of Herndon? • What are the appropriate layout and size of pedestrian and cycling facilities for traversing the TRG and connecting to other areas of the town? • What is the appropriate placement and size of passive and active recreational open space for the TRG? • How can social, economic, and environmentally sustainable practices be infused into the future development and lifestyle of the TRG? • How can the plan ensure economically feasible building footprints and ample space to provide for an enhanced outdoor and pedestrian-oriented lifestyle?	In the previous draft these questions were included. Town staff requested that a short description of the findings be provided, but the questions were deleted instead. Please reinsert the questions but with the edited introduction.

65.	# 26	Opportunities for Input	Add the following meetings to the list: PCWS: January 8th, 2024 PCPH: January 22nd, 2024 PCWS: February 12, 2024 PC Special WS: February 22, 2024 PHPH: February 26 PC WS: March 11, 2024 PC PH: March 25, 2024 TC WS: April 15, 2024 TC PH: April 22, 2024	
66.	# 27	Regional Inspiration	Add new paragraph after 1st paragraph; In response to the survey question, the community expressed a strong preference for certain locales that exemplify particular characteristics. The Mosaic District in Fairfax emerged as a highly ranked example, with its pedestrian-oriented design, engaging open spaces and plazas that invite community gatherings and interaction. Additionally, Downtown Herndon was also among the community's top choices, for its active, pedestrian-friendly atmosphere and preservation of historic design elements that contribute significantly to the community's cherished identity. The survey results underscore the community's desire for a TRG that reflects the successful attributes of these well-regarded yet in some regards very different built environments. These preferences were instrumental in shaping the next phases of the TRG SAP process as were the community's responses to other survey questions.	
67.	# 34	Bullets	Replace the designated bullets with the following: Bullet 4 Character that is both unique and appropriate. Bullet 5 Additional density balanced with small town character Bullet 6 Sustainable design elements in buildings and open space, identifying Herndon as a community that cares about health, resilience, and environment. Bullet 7 A highly integrated rich mix of uses.	To align structure with first 3 bullets

			Bullet 8 A Metro arrival area providing a rich mix of uses.	
			Bullet 9 Building design scaled appropriately with materiality and textural diversity and compositions that reinforce the unique Herndon character.	
			Bullet 10 Parity between transportation modes.	
			Bullet 11 A highly developed grid, reliant upon a spine road parallel to the Herndon Parkway.	
			Bullet 12 Current and future modes of transit, particularly non-motorized, planned for and highlighted.	
			Bullet 13 A landscape scheme centered around the power easement and viewshed of Fairbrook's Sugarland Run Park.	
			Bullet 14 A strategy of continuous landscape elements connecting across the TRG and uniting various zones.	
			Bullet 15 Attractive and interesting landscape designs used to achieve sustainability goals.	
68.	# 35	1st principle	1st sentence; replace ~~Area~~ with area	
69.	# 36	4th principle	2nd sentence; strike "~~affordable"~~	
70.		5th principle	1st sentence; strike "~~more like a truly integrated part of the town of Herndon~~" and replace with ".....reflecting Herndon's traditional town-scale mobility patterns, rather than concentrating all circulation and access on the Herndon Parkway.	

71.	New Page after page 36	New Paragraph	**Addressing Affordable Housing** The proposed plan could result in the addition of over 2,000 multifamily residential units and over 400 combined townhouse and two-over-two units. While the addition of residential units helps to ease the regional housing shortage, additional units do not ensure affordable housing for low-to-moderate income households. As a town within the Commonwealth of Virginia, the town must partner with the Fairfax County Redevelopment and Housing Authority (FCRHA) to secure low-to-moderate income housing within the town. Fairfax County's housing programs encourage dedicated affordable and workforce multifamily development, as well as the inclusion of affordable housing in market-rate residential developments. Dedicated affordable housing development in Fairfax County has been predicated on the FCRHA's partnership with private sector developers dedicated to the development of affordable rental communities. Through various forms of financial assistance, and often pre-existing property ownership, the County has successfully secured hundreds of affordable units contained within dedicated affordable development. Such developments offer the fastest way to provide the 10,000 affordable dwelling units that Fairfax County Board of Supervisors has committed to develop by 2034. Without publicly owned land within the TRG, such dedicated affordable housing is unlikely. The ability to obtain incremental affordable units in market rate development will require cooperation with FCRHA to assist in the administration of the units, as well as policy and regulatory action by the town. As the town moves towards the inclusion of affordable housing, it should seek to ensure that those whose income falls within the affordable range are accommodated as well as those whose salaries qualify them for workforce housing. Those at the lowest average median income levels are the most vulnerable and insecure with housing and consideration of their needs should be a key component of any future housing policies for the town.	
72.	# 39	2nd	Strike ~~framing the Plan.~~	
73.		3rd	1st sentence; The rendered aerial view, shown on ~~in~~ this page,	
74.		3rd	1st sentence; …and direction from the ~~Town of Herndon~~ committee, commission, and council.	

75.		New 4th paragraph	The foundation for future development, the Urban Design Framework takes into account the Plan Principles and gives shape to the Design Objectives. The following pages provide guidance to ensure that individual parcel development reflects the Plan, enabling the TRG as a whole to ultimately achieve the vision. The Framework is comprised of six key elements: Land Use and Density, Transportation Network and Street Space, Parking Strategies, Architectural Character, Recreation and Open Space, and Sustainability.	
76.	# 40	1st	2nd sentence; …A broad and balanced ~~mix~~ variety of land uses….	
77.		Low Density Residential	Change title to: Low Density Residential/Low Impact Commercial; ~~Attached or stacked single-family residential units, commonly know as "townhouses homes" and "two-over-twos." Units have front yards and backyards, with and side yards at the ends of the unit rows~~ Townhomes and two-over-two units ~~-~~with garages along rear alleys and frontage along streets and mews. On parcels currently zoned PD-B, alternative uses include low impact commercial and light industrial such as: multi-story interior self-storage; makers spaces and business incubators with interior operations only, as well as retail along Spring Street.	
78.		Exhibit	Update map and legend with new color for Reston-Herndon Business Park to match with land use new category. Symbol representing "Existing Parcels" on map indicates future blocks and not existing parcels – remove "Existing Parcels" from the legend.	
79.		Office	Replace this paragraph with; "Class A" multi-story ~~commercial~~ office on parking garage podiums with activated ground floors in the Metro Arrival area and along the southwest corner of the Herndon Parkway and Spring Street; and…."	
80.	# 41	Title	Re-title from "Potential Development Densities" to "Testing Development Density"	
81.		1st	The ~~planning~~ consultant team developed……ratios (FARs)[remove apostrophe in FAR's] used ~~as a test-fit basis for transportation, cost modeling, and fiscal impact analysis.~~ to test and analyze infrastructure capacity and potential tax revenue. 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~~ Town Council, Planning Commission, Advisory Committee, and town staff recommendations.	

82.		3rd	The new and expanded “Sunset District” retains its existing….	
83.	# 42	1st	Replace all narrative with: This page establishes the framework or pattern for development within the TRG based largely on the location of necessary streets, existing property lines, the various building height zones, and the intended locations of important open spaces. It considers the Plan Principles and gives shape to the various development blocks. The Redevelopment Framework Plan indicates building lines based on the street and open space facility and the amenities included within those facilities. Specific distances between development blocks are not established, however robust urban streetscapes to include street tree verges, on-street bio-retention, extra wide sidewalks, and on-street parking are anticipated. In addition, certain open spaces will dictate specific widths if they are to function as intended, such as the landscape buffer separating the TRG from the neighborhoods to the north and the Metro Arrival Plaza across from the HTOC Promenade	Per Advisory Committee and Planning Commission remove prescriptive measurements from the plan – rely on verbal descriptions and defined elements.
84.		Map		Remove all shading (key distances, fronts/backs), only keep boundary for "Development Blocks" and boundary for "Designated Open Spaces", which should include the triangle park, the linear park, and the park along Herndon Parkway.
85.	#43	1st	3rd sentence; replace "named Parallel Street" with referred to as the “parallel street”	
86.		3rd	Replace “Flexibility” paragraph with: Road alignment is likely to vary to some degree from what is shown in the Road Types Plan on this page to accommodate future development needs, due to the anticipated piecemeal development phasing and the necessity to adhere to required geometric design guidelines. An example of how a road may require some realignment is provided in the inset exhibit, which shows refined geometry of the parallel street. It is expected that other portions of the parallel street, and likely some other streets, will require modified alignments when full design and engineering is being completed as part of development applications.	
87.	# 44	Subtitle	Change Title: Road Types – Residential Mews and Alleys	
88.		1st	1st sentence; Two private street typologies….	
89.		Sections		remove dimensions from both sections

90.		Note	Change note to: *Note: Street sections provide a guideline of how to program the area between the development blocks and create an attractive and functional street space. While dimensions are not shown, best industry standards and urban design tenets for the types of activities to be accommodated and level of adjacent density are necessary to create an attractive, comfortable, safe and functional street realm; ~~however, there is~~* ~~flexibility for the shown dimensions and features to change depending on future development needs, e.g., substituting on-street parking for turn lanes.~~	
91.	New Page	Title	New title: "Road Types - Herndon Parkway"	
92.		Section		add Herndon parkway section, without any dimensions
93.		Map		add a map inset with Herndon Parkway section location.
94.		New 1st	Add this paragraph: "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 cycle track on the east side of the roadway. Curb cuts along the Herndon Parkway must be limited to the proposed TRG street~~s~~ grid, with no mid-block vehicular access. The cycle track, constructed with the Spring Street intersection improvements, will require redesign and construction, consistent with the standard layout shown within the section drawing, at time of adjacent parcel redevelopment. A dedicated cycle facility will be provided on the west side of the TRG along the parallel street.	
95.		Note	Add note: *"Note: Street sections provide a guideline of how to program the area between the development blocks and create an attractive and functional street space. While dimensions are not shown, best industry standards and urban design tenets for the types of activities to be accommodated and level of adjacent density are necessary to create an attractive, comfortable, safe and functional street realm."*	
96.	# 45	1st	1st sentence: The ~~P~~parallel ~~S~~street is a proposed ….	
97.		Section		remove dimensions from section

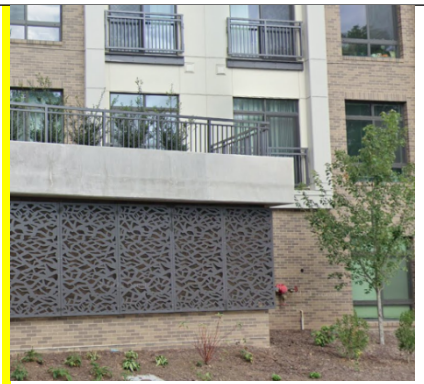
98.		Note	Change note to: *Note: Street sections provide a guideline of how to program the area between the development blocks* *and create an attractive and functional street space. While dimensions are not shown, best industry standards and urban design tenets for the types of activities to be accommodated and level of adjacent density are necessary to create an attractive, comfortable, safe and functional street realm. however, there is* flexibility for the shown dimensions and features to change depending on future development needs, e.g., substituting on-street parking for turn lanes.	
99.	# 46	Section, 2nd paragraph and map		Remove Herndon Parkway (section, 2nd paragraph, map) from this page.
100		Note	Change note to: *Note: Street sections provide a guideline of how to program the area between the development blocks* *and create an attractive and functional street space. While dimensions are not shown, best industry standards and urban design tenets for the types of activities to be accommodated and level of adjacent density are necessary to create an attractive, comfortable, safe, and functional street realm.; however, there is* flexibility for the shown dimensions and features to change depending on future development needs, e.g., substituting on-street parking for turn lanes.	
101		1st	Replace with: The streets labeled as secondary streets in the mobility grid are expected to have on-street parking and pedestrian-friendly urban streetscapes with ample space for street trees and extra wide sidewalks, and a private zone between the sidewalk and building frontage that appropriately separates and softens the building edge with the streetscape. This separation distance depends on the height of the building and the ground floor use.	
102	# 47	New Paragraph	Add 2nd paragraph: Streets in the TRG should employ both dedicated and shared bicycle facilities with on-street and off-street public and private bicycle parking. Accommodation for other micro-mobility vehicles, including charging stations and parking corrals, is expected and the walking environment must be convenient, comfortable well-connected, and scaled for high amounts of pedestrian activity. All transit facilities should have exemplary amenities to provide shade and respite for transit users.	

103	# 48	Bullets	Revise bullet 8: 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~~ be designed and screened in a manner ~~to~~ that limits visibility on -site and. Within the transitional residential area, some visitor parking will most likely be needed. Alternative surfaces such as pervious pavers should be used for off-street parking to decrease stormwater run-off. Off-street parking should be designed to avoid the creation of heat islands through landscaping and/or selection of surface treatment.	
104	# 49-57			Change page order; start with pages 53-57, then pages 49-50, then pages 51-52
105	# 49	Subtitle	Replace with: Building Height Zones	
106		1st	Replace with: Building heights are informed by site capacity, transportation and utility capacities, building and construction types, market feasibility, and feedback from the public, Advisory Committee, Planning Commission, Town Council, Architectural Review Board and town staff.	
107		Bullets	1st bullet, replace with: Respect the adjacent low density residential neighborhood context	
108		Map		remove zone names on map
109		3rd	Replace paragraph with: Building Height Zone 1 is bounded by the northern and western edges of the TRG and the proposed new public street parallel to Herndon Parkway. Buildings in this area should be either 3 or 4 stories and include residential townhouses or two-over-two and should be situated to ensure a continuous buffer with the abutting neighborhoods. If non-residential uses are incorporated, heights and design should respect the scale of residential structures within Building Height Zone 1.	
110		4th	Replace paragraph with; Building Height Zone 2 should contain the tallest buildings within the TRG with heights between 5 and 12 stories. This area is closest to the Herndon Metrorail Station and serves to provide height transition from the potential 20+ story heights of the HTOC across Herndon Parkway.	

111		5th	Replace with; Building Height Zone 3, comprised of buildings fronting the Herndon Parkway and portions of Spring Street, the heights in this zone range from 5 to 8 stories. These buildings play an important role in defining the image of the TRG when arriving from Reston and traveling down the Parkway and help to establish the urban street wall of the TRG.	
112		6th	Replace paragraph with; Building Height Zone 4 does not establish any different building heights from what exists today and that which has already been already approved for this area. Composed mainly of the Sunset Business Park, this area is envisioned to be updated but retained largely in its current form to include one-story buildings and a multi-story hotel.	
113		Note / map		Replace the asterisk on the map and legend with the number 4; and remove the note in the legend.
114		Legend	Change the legend to; 1: 3-4 Story Building Heights; 2: 5-12 Story Building Heights; 3: 5-8 Building Heights; 4: Existing and Approved Heights Retained	
115		7th	Replace paragraph with: The proposed Building Height Areas shown on this page delineate a strategic categorization of zones within the TRG area. The prescribed heights take into account proximity to the Herndon Metro Station, and their direct access to major thoroughfares, such as Herndon Parkway and Spring Street, as well as their relationship to nearby residential uses. The diagram serves as a visual representation of the planned distribution of building heights and densities throughout the TRG. This categorization, reflects a thoughtful strategy to optimize development intensity in areas with enhanced connectivity and direct access to arterial roadways and transit. This distribution of heights promotes efficient land use, seamless transition from the HTOC to residential community on the north side of the TRG, and contributes to the overall vision of a vibrant, transit-oriented community for the TRG.	
116	# 50	Subtitle	Retitle to: Building Heights	
117		Sections		Change building height sections from 3 to 4 stories within residential transitional area to reflect language in other sections of the plan

118		Sections		Remove horizontal dimensions from both sections
119	# 51	Bullets	Bullet 5: Appropriate active uses can also include highly transparent [add space] occupant activity centers and lobbies…	
120		Bullets	Combine bullets 7 and 8: Along sidewalks, facades should abut hardscape to emphasize accessibility and transparency of the ground floor, with ~~potted plants~~ planters or periodic planting beds to soften the experience and add interest	
121		Bullets	Bullet 9: Openings that provide public views into private or semi-private courtyards add ~~interest~~ to the pedestrian experience and provide an expanded sense of public space	
122		Bullets	Bullet 13: ~~Traditional materials of brick or stone should comprise the majority of the facing on all sides of the lower levels of the building~~ Facades, particularly on the lower levels, should utilize materials that provide ~~texture~~ and human scale.	
123	# 52	Bullets	Replace the bullets under Garage Typologies with the following: • Exposed garage elevations along the Herndon Parkway are not appropriate. • Exposed garage elevations along the arrival plaza on the ground level are not appropriate. • Any exposed garage elevations above the ground floor should be screened in a manner that enhances the building façade and obscures the openings. • Garage knee walls should extend to a height that obscures headlights and taillights. • Uninterrupted expanses of wall along ground floor facades, created by a garage or other factor, are not appropriate along the Herndon Parkway and the arrival plaza. • Uninterrupted expanses of wall along ground floor facades, other than along the Herndon Parkway and the arrival plaza, should be avoided and minimized, but when present art or other decorative features should be incorporated. • Screening should extend across the entirety of the exposed garage wall. • Screening should be designed to add appeal and reflect the style of the building. • Heavily vegetated panels may form an appropriate garage screen. • Generally, mesh screens are not appropriate, but in some instances multidimensional screens that provide color or color and images may be appropriate. • If visible from open space, the facade of the garage can be used to	Refinements and additions to the garage screening guidance

124		Photos		Replace 2nd photo with: 
125		Bullets	Under 2nd photo, replace bullet with: **Adding Color**: • Where garage facades must be exposed, consider creative screening approaches that add color, design and dimensional interest, as well as a significant level of visual screening. Art installations or murals are encouraged and should be community centric and designed in concert with the local community.	
126		Bullets	Under 3rd photo, add the following paragraph: **Vegetated Screens:** • Incorporate vegetated screens as a means of creatively screening garage facades. Integrate greenery in a way that not only serves a functional purpose, but also contributes to the overall aesthetic and landscape of the TRG area. Employ native evergreen plant material selected for its ability to grow in the anticipated conditions.	

127		Photo and Bullet	Bullet: **Architectural Screening** Elements found within the architecture of the building, such as these horizontal bars, can be used to integrate the garage façade with the building façade and minimizing the visual impact of the garage.	Replace 4th photo – Image to be provided by staff
128		New photo and bullet	Under photo to right provide the following bullet: **Texture and Interest:** • If a garage opening along the ground floor façade is unavoidable, decorative pierced metal panels obscure parking and add texture. Consider incorporating art and aesthetic elements that resonate with the local identity, reinforcing a sense of place and seek community preferences.	
129		1st	Last line: …~~divided into several neighborhoods~~ with various building height zoning and context-based guidance on open space and building design.	
130	# 53	4th	1st and 2nd sentence: ~~The following guidance~~ The guidance on the following pages ~~is to~~ establishes the core elements that will create an overarching cohesiveness. ~~This is to set the stage for individuality of its smaller components~~ This guidance is further intended to provide direction on some specific character definition in certain areas and ensure...	
131	# 54		Replace narrative with the following: The collective voice of the community's response to the TRG visioning survey and the Architectural Review Board's feedback, call for the TRG to establish a unique architectural character that retains the experience of Herndon's small town atmosphere while successfully transitioning to the higher density and height of the HTOC. The response to the Vision Survey demonstrates the community's love for the image of historic downtown Herndon, evidence of its contribution to Herndon's very special and unique sense of place. In addition to the downtown, the majority of respondents preferred images that exhibit traditional brick and tactile detailing, attributes of historic downtowns, but with a contemporary aesthetic. 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	

132		Bar Graphs		Remove #5 from below the Top Types of Buildings and Development graph since a photo of #5 is not shown. Remove #5 and #8 from below Top Types of Open Spaces graph since photos of #5 and #8 are not shown.
133	# 57		Replace entire narrative: The architecture and urban design planned for the TRG should incorporate the most successful elements of Downtown Herndon and other urbanism best practices, while allowing for a higher level of density and contemporary expression. While the building masses shown in the TRG plan are considerably larger than those in Downtown Herndon, the experiential and aesthetic conditions of the downtown should be comparable when adjusted for scale. Future buildings in the TRG should eschew corporate or regionally repetitive design. An important aspect of ensuring a unique sense of place is architectural design that acknowledges its immediate surroundings, the recognizable aspects of the town, and the developing aesthetic of the TRG. While this plan distinguishes various areas of the TRG with specific building typologies, land uses, and some specific context-based characteristics, with the exception of the Sunset District, the TRG's overall design narrative should be coordinated with a singular aesthetic legible across the entire plan area. Diverse yet unifying landscape and building design techniques should be utilized to create a sense of place customized for the TRG but with identifiable references and compositions reflective of the Town of Herndon. Context-specific design strategies will help generate a unique character for the TRG. The specific contexts of the Metro Arrival, Sunset District, Park Frontage, Parkway Frontage, and Residential Transition all present opportunities for specific design objectives.	

134	#58	1st	Replace with; The vision for redevelopment in the TRG is largely anchored by new open spaces. A network of parks, green spaces, and thoughtfully designed pedestrian-focused connections serve to define and connect the various neighborhoods of the TRG, provide amenity and recreation opportunities for those living, working, and visiting, and reinforce a unique Herndon townscape.	
135		Bullets	Bullet 9; An identifiable site furnishings aesthetic should be employed throughout the TRG to adhere to town standards within streetscapes.	
136		Bullets	Add bullet; Open spaces should incorporate creative focal points and opportunites for interaction, and programmable spaces for various events and pop-up uses.	
137	#59	Photos		replace mews photo with one provided by staff
138		Arrival Plaza	3rd sentence; replace "evens" with "events"	
139		Arrival Plaza	In note; replace "Neighborhoods section below" with "Context-specific Guidance section of this plan."	
140	# 60	New paragraph	Add intro paragraph; The guidance below focuses on the design and function of the linear as a character-defining and unifying feature of the TRG.	

141		Bullets	Replace bullets with new paragraph; A consistent design narrative should be employed for the extent of the entire park, from its east to west termini with Herndon Parkway. Where streets cross the park, decorative pavement treatments should be employed to offer visual cues of the pedestrian-centric zone and connect the various park segments into a continuous composition. The park should contain a dynamic and diverse palette of materiality, passive and small active recreation uses, and focal points such as artwork, interactive play features, and shade structures. The landscaping should allow for open lawn space and natural plantings with opportunities for pollinator gardens, small scale urban farming, urban bio-retention, and other environmental sustainability measure demonstration areas.	
142		Section		ensure whether easement should be centered on either side of the towers and adjust accordingly.
143	# 62	Title	Change from "Recreation and Open Space Design" to "Sustainability Strategies"	
144	# 63	Title	Change from "Recreation and Open Space Design" to "Sustainability Strategies"	
145		Bullets	Last category; replace "Materials" with "Building Design"	
146		Subtitle	Change from "Sustainability Principles" to "Measures for Environmental Sustainability"	
147	#63-73	Title	Retitle these pages from "The Neighborhoods" to "Context-Specific Guidance"	
148	#63	1st	Change: …this section ~~addresses the future neighborhoods likley to form with future development at the TRG~~ establishes objectives for specific areas within the TRG."	
149		2nd	Change: ~~The neighborhoods (right-hand exhibit)~~ The exhibit on this page…	
150		2nd	Replace 2nd sentence with: These areas occasionally overlap and the specific guidance for both contexts would apply in those instances.	
151		3rd	Replace paragraph with: More detailed direction on form and character for certain contexts are meant to ensure a diversity in creative and unique experiences and design treatments throughout the TRG that both respond to and reinforcement the function and activation of open spaces and streetscapes, and the scale and use of the buildings.	

152		Map		Move the #1, Metro Arrival, area to the four blocks south of the linear park
153		Map		Retitle to "Location of Various Contexts"
154		Map		Widen linework for park frontage and Herndon Parkway / Spring Street frontage – They look wide enough to me – I don't really think that Sunset B.P. has park frontage – they have road and ramp frontage
155		Map		Remove park frontage linework from Fairbrook parcel parkway frontage where there is a building and the Rooney parcel parkway frontage where there is a building
156		Map		Replace parkway frontage linework with park frontage linework in all instances where a park fronts the Herndon Parkway (3 locations)
157		Map		Remove squiggly line from Spring Street frontage and replace with Spring Street frontage linework
158	#64	1st	Last sentence; change "three" to "two"	
159		4th	Add 2nd sentence: These serve as precedent images showing the general atmosphere, depth and diversity in landscape design and function, and architectural and urban design elements at the podium level expected in similar fashion for the buildings and open spaces within the Metro Arrival area.	
160	# 65		Move this page to after page 60 (since it is dealing with open space design)	
161		Section		remove dimension
162		Title	Retitle to "Recreation and Open Space Design"	
163		bullets	Add new bullet; The design of the plaza and its individual features should encourage year-round use through shade during summer months and maximum sun and protection from wind during winter months	

164		New Paragraph	Add intro paragraph… The guidance below focuses on the design and function of the Metro Arrival Plaza as a primary character-defining feature of the TRG and important focal point for the town.	
165	New Page		Insert a new page after current page 64 (Metro Arrival): Entitled Context-Specific Guidance and subtitle of Metro Arrival Design Strategies this new page should show the perspective renderings of both the linear park and the metro arrival plaza.	
166		1st	Add intro paragraph: The guidance below delineates preferred approaches for the Metro Arrival area as a gateway for the town and dynamic space with the highest concentration of density and most balanced mix of uses in the TRG.	
167		Bullets	Add the following bullets after intro paragraph: - Ground floors should be designed with activated facades and uses when fronting Herndon Parkway, the Metro Arrival Plaza, and the Linear Park. - Activation can include lobby entrances, shop and restaurant entrances, private build zones with features such as café seating, and dynamic façade designs with transparency, pedestrian scaled elements, and diverse materiality. - Podiums should have a consistent height around 30' with step backs for the upper floors to establish a consistent scale and stay below the transmission line cables. - Façade design should avoid long spans without notable wall offsets, bays with unadorned walls, low opening to void ratios, and back of house service entrances or utility areas within areas of high visibility and pedestrian activity. - The renderings offer representative concepts of building scale and mass, some basic strategies for ground floor design, and concepts for the open space designs. The building facade designs are not developed and are not intended to illustrate any specific architectural style.	
168	# 66	1st	Edit as follows: This is a low density residential area consisting of a combination of townhomes and two-over-two's serving to transitions density and heights between the existing single-family detached ~~homes~~ and townhome neighborhoods~~, the Downs and Van Buren Estates,~~ and the planned higher density area fronting Herndon Parkway. ~~separated by a 50' -minimum vegetated buffer.~~	

169		2nd	Edit as follows: ~~Most of this area~~ The portion of this area located south and west of the "Square Park" is envisioned as "mews," anchored on open space, with pedestrian streets emanating from the planned linear park. This ~~Vision~~ vision aspires to the highest standard of pedestrianized amenities,	
170		3rd	remove paragraph	
171		Photo		change caption to "Image of pedestrian oriented mews"
172	# 67	1st	2nd sentence, edit as follows: The Typical Section shows the ~~overall block dimensions:~~ elements to be incorporated and their arrangement. ~~· 60' minimum open area between the front of the buildings.~~ ~~· 60' minimum property area, and~~ ~~· 20' alleys are required for fire access.~~	
173		Section		remove dimensions
174		Section		remove note
175		Bullets	Remove the following bullets: ~~· Rooflines should be consistent~~ ~~· Colonial and Federal design character and elements are not appropriate · Color, and style of brick or stone should take their cue from the neighborhood in which they are located and the architectural style of the building · The general architectural aesthetic, colors and materials should take their cue from the neighborhood in which they are located~~	
176		Bullets	Add the following bullets: • The dimensions of the mews provide adequate space for multiple simultaneous activities and significant levels of sunlight. • Façade materials display texture and a residential scale while keeping with the contemporary aesthetic of the TRG. • A broad vegetative screen or buffer shields the existing residential homes outside the TRG from development within the TRG. • Alleys, rather than through streets, are located in proximity to the edge of the TRG. • The buffer area can include open space amenities and pedestrian areas but must provide a continuous screen	
177	# 68	Section		remove note
178		Section		remove dimensions

179		Bullets	Add bullet: Curb cuts along Herndon Parkway must be limited to the public and private streets. Mid-block vehicle access should not be provided.	
180		1st	2nd sentence: …"The planned linear, square and triangle parks ~~on~~ in the TRG provide the…	
181	# 69	Section		remove note
182		Section		remove dimensions
183		New paragraph	Add 4th paragraph: Guidance on linear park is provided in the Open Space and Recreation section of the Urban Design Framework chapter.	
184		Map		include linear park on map
185	# 70	Map		remove buffer from Spring Street
186		Map		widen linework for parking/street frontage
187		Map		remove arrows
188		Map		remove "COMMERCIAL" and "METRO ARRIVAL" call outs
189		New paragraph	Add 2nd paragraph: This frontage will serve to define the identity of the TRG and in many cases the town given its visibility for those traversing the town to and from Reston and those accessing the Herndon Metrorail Station. As such, thoughtful and quality building and streetscape design will be important.	
190		1st	3rd sentence, replace with: While the purpose of Herndon Parkway will still be to convey motorized vehicles, it will change its look and feel from "throughput" to "place", establishing an area with a new sense of identity for the Town of Herndon.	
191		Bullets	Bullet 1; replace "must" with "should"	
192		Bullets	Bullet 2; replace "must" with "should"	
193		Bullets	Replace bullet 3 with; Mixed-use and commercial buildings are expected to have activated ground floors along these frontages, with lobby entrances, shop and restaurant entrances, private build zones with features such as café seating, and dynamic façade designs with transparency, pedestrian scaled elements, and diverse materiality	
194		Bullets	Replace bullet 4 with: Residential frontage are expected to have activated ground floors along these frontages with lobby and amenities entrances, walk-out residential units, and diverse and appropriately scaled building elements	

195		Bullets	Add bullet 5: These frontages should not have large spans of facades without notable wall offsets, bays with unadorned walls, low opening to void ratios, and back of house service entrances or utility areas	
196	# 71	Section		remove dimensions
197		New paragraph	Add 2nd paragraph: The rendering offers an idea of the building scale and mass, some basic strategies for ground floor design, and concepts for the streetscape designs. The building facade designs are not developed and are not intended to illustrate any specific architectural style.	
198	# 72	1st	Replace with: The TRG-SAP envisions a transformative landscape seamlessly integrating creative office spaces within the Sunset Business Park to enrich connections with Sugarland Run. This vision revitalizes the business park, positioning it as a dynamic hub fostering economic growth and community engagement. The incorporation of creative office spaces is pivotal, fostering collaboration, innovation, and a progressive work environment. With a commitment to connectivity, the TRG project strives to forge links to Sugarland Run, cultivating a holistic urban experience that emphasizes sustainability, accessibility, and a dynamic mix of uses in the Sunset District.	
199	# 73	1st	2nd sentence; change "Am" to "An"	
200		New paragraph	Add 2nd paragraph: Buildings within the Sunset District should embrace and reinforce the eclectic atmosphere of Sunset Business Park with creative and innovative architectural expressions that, while still designed at pedestrian scale and oriented for the pedestrian experience, exhibit some bolder expressions that establish a character specific to the Sunset District. The use of artwork and colors in the building and close integration of the building with equally eclectic and very robust streetscape should be employed within this area. There is also the opportunity for specific signage standards that provide more flexibility in design and location.	
201	# 76	1st	Replace bolded language with: With the Fairbrook Drive extension, as well as a robust internal street grid within the proposed TRG, the transportation system is able to absorb the incremental traffic generated by the TRG development with supplementary transportation improvement projects.	
202		4th	4th sentence: …to alleviate pressure from Herndon Parkway and provide multimodal access to TRG parcels.	

203		6th	4th sentence: …LOS has been utilized for studying the TRG Small Area Plan and aid in the communication of results.	
204	# 77	1st	Replace "vehicle moments" with "the vehicular element"	
205		4th		adjust 2nd line
206		5th	2nd sentence; convert 2nd half to separate sentence starting with "There are multiple…"	
207		5th	2nd sentence, replace with: Under No Build 2045 Conditions, no intersection operates at LOS F. Only the intersection of Herndon Parkway and Spring Street operates at LOS E during the PM peak hour while all other intersections operate at LOS D or better.	
208		6th	Add space between 5th and 6th paragraphs – the 5th paragraph should end with: "…Herndon Parkway/Spring Street intersection."	
209		6th	Last sentence; separate last sentence as it's own paragraph and revise to; The Future Configuration of this intersection and interchange with Fairfax County Parkway will be determined in partnership and coordination with Fairfax County and VDOT	
210		3rd	Replace last two sentences with: Currently, the town zoning ordinance holds LOS D as the standard for average overall intersection delay when evaluating traffic impacts of development. However, there is an opportunity for this plan to allow an exemption for LOS E in the planned area if impacts are effectively mitigated through documented/ proffered Travel Demand Management programs and committed and qualified multimodal infrastructure enhancements.	
211	# 78	5th	Replace paragraph with: Given that multiple intersections demonstrated operational deficiencies in the Preferred Build traffic analysis, a variety of potential mitigation measures were explored.	
212		2nd	Remove 2nd sentence	
213		3rd	2nd sentence, add "Fairfax" in front of "Parkway"	
214		Exhibit		move table to end of 4th paragraph so it doesn't break the paragraph and split a sentence.
215		4th	Add sentence at end of paragraph: However, queuing could cause safety concerns as vehicles may queue across driveways or pedestrian facilities.	

216		6th Mitigation Measures		add space to separate last paragraph
217		6th	Last sentence incomplete. Remainder of paragraph is on the top of the next page	
218	# 79	1st Line		start page with start of paragraph, first line should be move to previous page
219		9th	Last sentence: replace "~~cabling~~" with "communication"	
220	# 80	Legend	Change "~~New TRG Cycle tracks~~" to "New TRG Bicycle Facility"	
221		1st	Last sentence: …are expected to ~~significantly~~ reduce ~~all forms of~~ traffic congestion in the TRG ~~but are not accounted for in the VISSAM analysis described above~~.	
222		2nd	Last sentence: …crosswalk~~, and traffic calming measures,~~ ensuring...	
223	# 84	Note	Note references Appendix C but the analysis still needs to be added to Appendix	
224		Exhibit		correct spacing of table with paragraph and reference in paragraph to "the table below"
225	# 85	1st, 2nd	Remove "Zoning and Entitlements" and "Funding Mechanism" paragraphs.	
226		4th	Revise for singular vs. plural agreement and punctuation: 'Public services that should be assessed for impact management include, but ~~is~~ are not limited to, those services related to town administration, Fairfax County public schools, public safety and security, public emergency, public parks, and public recreational programs."	
227			Add after existing narrative: It is understood that the multifamily buildings will be rich in recreational amenities for their residents, such as but not limited to, swimming pools, exercise rooms, rooftop gardens, dog parks, small footprint exterior and interior games, and outdoor kitchens. It is anticipated that offices within the TRG will also provide rooftop gardens and patios, vegetated balconies, and (potentially) exercise rooms and small footprint recreational pursuits for employees' health and wellness. The growth within the TRG will warrant more outdoor and indoor public recreational facilities as well. While the plan does not call for dedicated public parks and ball fields, smaller facilities with public access within the TRG that have some degree of active recreation will help to offset this demand. A playground, volleyball court, shuffleboard courts, and similar small footprint	

228	# 89	New paragraphs	Replace existing text with; Turning the TRG vision into reality relies on a coordinated effort. A comprehensive and carefully considered implementation guide is necessary to secure the successful execution of TRG SAP. The implementation strategies must address the means and methods for managing transportation and utility infrastructure improvements, ensuring economic development and social and environmental sustainability, expanding town services, providing ample parks and other open spaces, and reinforcing a unique Herndon sense of place. The TRG SAP vision is the destination of a transformative journey for the Town of Herndon. The implementation guide will provide the itinerary, a map of incremental steps that the town must take to make the vision a thriving reality. The implementation guide will identify specific actions and align those actions with TRG SAP's various goals. In some instances, actions will be to ensure development proposals observe the goals, intent, and features of the plan, while other actions will require the town to devise the programming of complex infrastructure improvements, and creation of supporting regulations and policies. As an action plan, the guide will state the goal, the action, desired timeline, and lead department as well as other supporting staff. While the implementation guide charts the actions that the town must take, the successful fulfillment of the vision relies equally on the private sector. The vision cannot become a reality without the cooperation and investment of the property owners and development community. It is up to the private sector, property owners and developers, to decide when to come forward with redevelopment plans. It is within their power to work in a cooperative manner with the town by ensuring that the guidance afforded by the TRG SAP is reflected in their development proposals, and that they adhere to the building forms, open spaces, land uses, densities, and sustainable measures, while mitigating the added costs and negative impacts of their development proposals. By embracing the TRG SAP vision and adhering to its guidance, with the flexibility necessary to adapt to advances and changes in lifestyle, market, construction and technology, the Herndon community can bring to fulfillment the vision they have created.	