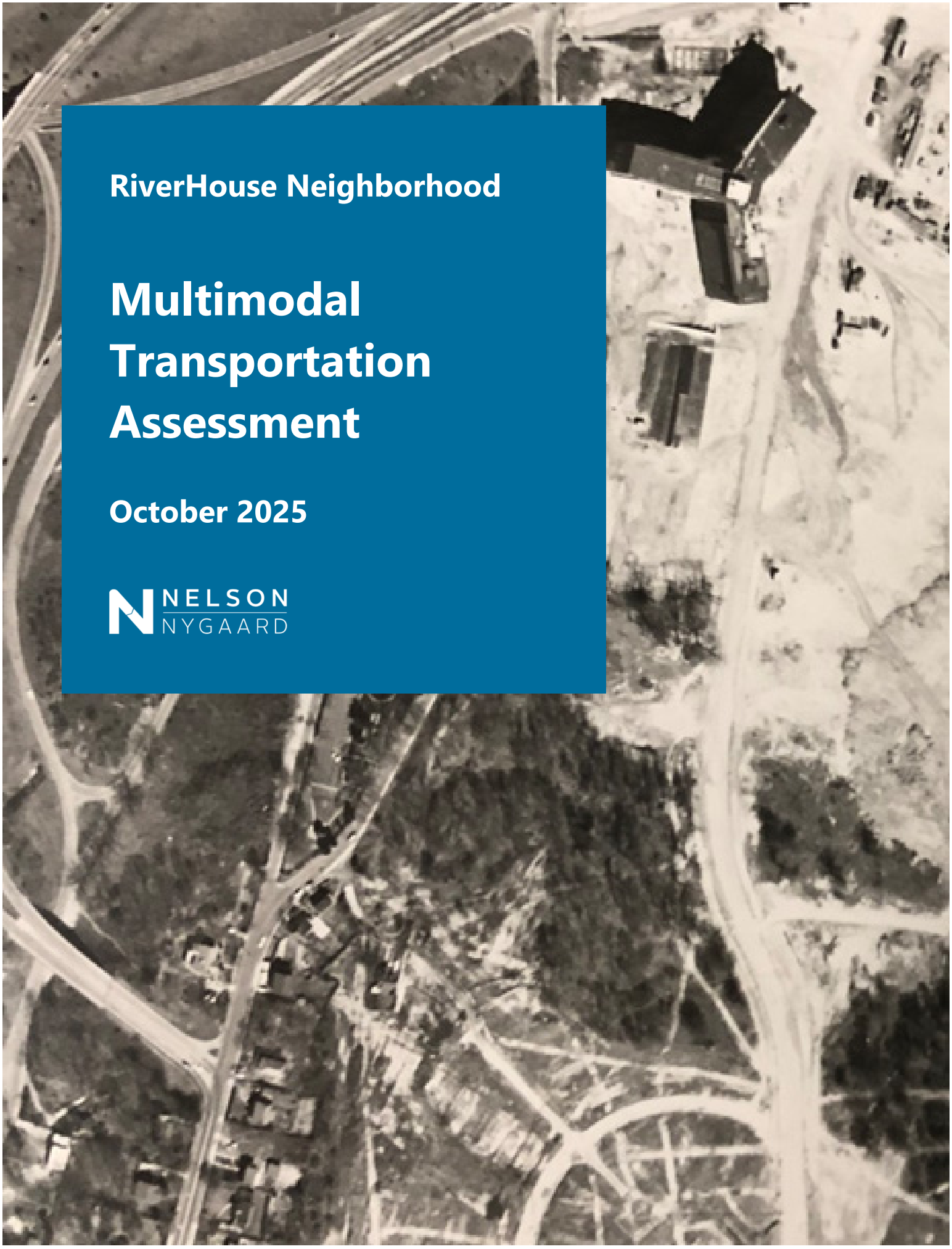


RiverHouse Neighborhood

Multimodal Transportation Assessment

October 2025

NELSON NYGAARD

Table of Contents

Page

Appendices provided under separate cover

Table of Figures

Table of Tables

SUMMARY

This multimodal transportation assessment (MMTA) of the proposed RiverHouse Neighborhood PDSP and site plans concludes that the proposed development will have impacts on the surrounding transportation and roadway network that can be managed with planned site design elements and recommended mitigation measures as described in this MMTA.

The proposed PDSP would preserve the existing residential towers and add 2,790 new residential units and approximately 19,000 square feet (sf) of new retail space.[1] The first phase of the PDSP comprises the 4.1 site plans for Landbay S, Building N1, and Building C1 and would add 743 units and 15,000 sf of retail with anticipated completion by 2028. The remaining phases of the PDSP, to be detailed in future 4.1 site plans, would add 2,047 residential units with an anticipated completion by 2035. At full buildout, the PDSP provides 2,790 new homes and 15,000 sf of retail space, largely concentrated on the existing surface parking lots, with 235 net new off-street parking spaces.

The PDSP proposes significant changes to S. Joyce St., in both the arterial segment between Army Navy Dr. and 15th St. S., and in the local segment between 15th St. S. and 16th St. S. The right-of-way for the arterial segment is proposed to be reallocated to create space for a two-way protected cycletrack along with vehicle traffic, curb uses, and emergency access.

The proposed road diet for S. Joyce St. keeps the east curb as currently located, with the typical cross-section including (from east to west) the current parking lane (periodically replaced by curb extensions), painted bike lane, one (1) northbound vehicle travel lane, one (1) center turn lane (or median), one (1) southbound vehicle travel lane, a parking lane, a buffer area, a two-way protected cycle track, the curb, a buffer area, and a more ample sidewalk.

A capacity analysis was developed to compare the future roadway network with and without the proposed development. Traffic projections for 2023, 2028, and 2035 are based on existing volumes, plus traffic generated by approved nearby developments, regional growth on the roadways, and traffic generated by the proposed RiverHouse development.

The development and its design have many positive elements that minimize potential transportation impacts, including:

- The proposed development's close proximity to the Pentagon City Metro Station, and multiple bus routes.

[1] This represents an increase from 2,693 new residential units specified in the Scoping Form dated 3/13/2025 and included in MMTA Appendix A. The increase is due to evolving project details between scoping, filing in April 2025, and subsequent discussions with Arlington County.

- The implementation of a two-way cycle track along S. Joyce St. north of 15th St. S.
- The realignment of S. Joyce St. to align with 14th St. S. and create more contiguous park space.
- Improvements to the pedestrian facilities adjacent to the site that meet or exceed Arlington County and ADA requirements.
- Limited on-site vehicle parking, which will promote the use of non-auto modes of travel to and from the proposed development.
- The inclusion of publicly accessible plazas and parks that improve pedestrian circulation.
- The inclusion of secure long-term bicycle parking and short-term bicycle parking spaces.
- Transportation Management Plans (TMPs) that aim to reduce the demand of single-occupancy, private vehicles to/from the proposed development during peak-period travel times or shifts single-occupancy vehicular demand to off-peak periods.

As noted above, this MMTA concludes that the proposed development will have a minimal impact on the surrounding transportation and roadway network assuming that all planned site design elements are implemented.

1. INTRODUCTION

This report presents the findings of a Multimodal Transportation Assessment (MMTA) undertaken for the proposed RiverHouse Neighborhood phased development site plan (PDSP) in Arlington, VA. The RiverHouse site comprises 36.6 acres in the Pentagon City area of Arlington, bounded by S. Joyce St. to the east, 16th St. S. to the south, S. Lynn St. to the west, and Army Navy Dr. to the north. The existing site consists of three residential towers with 1,676 total residential units served by 1,820 surface and structured parking spaces. The site is currently zoned mostly RA6-15 and is shown as high density residential on the northern portion of the site and high-medium residential on the southern portion of the site in the General Land Use Plan (GLUP).

The proposed PDSP would preserve the existing residential towers and add 2,790 new residential units and approximately 15,000 square feet (sf) of new retail space. Accompanying 4.1 site plans for Landbay S, Building C1, and Building N1 would add 743 units with 15,000 sf of retail. Future site plans will detail buildings providing the remaining residential units.[2] These new developments are largely concentrated on the existing surface parking lots. As a result, the PDSP provides 2,790 new homes and 15,000 sf of retail space with 235 net new off-street parking spaces.

The eastern edge of the site is within 1000' of the entrance to the Pentagon City Metrorail station (served by the Blue and Yellow lines), while the furthest corners of the site are just 2400' from that station. Metrobus route 10A runs along S. Joyce St. adjacent to the site, while numerous Metrobus and Arlington Transit (ART) routes stop at Pentagon City station and/or along S. Army Navy Dr. near the site. S. Army Navy Dr. includes painted bike lanes that are currently being upgraded to protected bike lanes. S. Joyce St. includes painted bike lanes, but this project proposes to upgrade them to protected facilities.

Purpose of Study

The purpose of this study is to evaluate the transportation network in the vicinity of the proposed RiverHouse Neighborhood development and identify any transportation impacts that may result from the proposed development. This report includes a description of the existing and proposed development, an evaluation of the existing multi-modal network, and findings of a vehicular analysis utilizing the Synchro software.

The proposed RiverHouse plan consists of two related elements. The first, the PDSP, addresses the entire site, including buildings to be preserved, new buildings for which 4.1 site

[2] Traffic analysis will use 2028 as the year site plans are delivered, and 2035 as the year of full PDSP build-out, recognizing that is a conservative estimate of the earliest possible completion date.

plans have been submitted (Landbay S, Building C1, Building N1), and new buildings for which 4.1 site plans will be submitted at some point in the future (Buildings C2, C3, N2, and N3). This MMTA analyzes two scenarios: the full PDSP, as appropriate given the focus of transportation analysis on disclosure and mitigation of the impacts of site-wide changes; and the anticipated nearer-term delivery of the site plans and associated infrastructure improvements for Landbay S, Building C1, and Building N1. Each site plan is accompanied by a Transportation Management Plan (TMP) proposal describing site-specific demand-management and other approaches to encourage multimodal travel.

This MMTA considers the RiverHouse Neighborhood PDSP and site plans as submitted to Arlington County in October 2025.

Study Tasks

The following tasks were completed as a part of this study.

- Scoping and analysis has occurred in several iterations.
    - A preliminary scoping meeting was held in May 2022 with Arlington County staff to discuss parameters of the study and relevant background information. A scoping form and supporting memo for analysis of a potential road diet on S. Joyce St. were developed and approved in August 2022, resulting in the analysis shown in Appendix B.
    - A revised MMTA scoping form was submitted to Arlington County, a scoping meeting held, and scoping approved in June 2023. A full MMTA accompanied the PDSP filed in October 2023.
    - Subsequently the PDSP was revised and refiled in April 2025. The scoping was revised and approved by Arlington County in March 2025, resulting in a fully revised MMTA in July. The methodology follows the guidelines outlined by Arlington County and VDOT on the evaluations of site development.
    - The MMTA scoping information was submitted to VDOT and a scoping meeting held in July 2025, and VDOT approved scoping in September 2025. The July MMTA was submitted to VDOT in September 2025. The approved MMTA scoping form is included as Appendix A.
    - Arlington County provided comments on the July MMTA in September 2025. Revisions in this version of the MMTA reflect responses to those comments as well as changes to RiverHouse driveways, streets, and the surrounding street network. These changes are described in Chapter 6.

- Field visits in the vicinity of the site were performed to collect information relating to existing traffic controls, signal timings, roadway geometry, traffic flow characteristics, sidewalk conditions, bicycle facilities and transit stop amenities.
- Traffic counts at the study area intersections were conducted in Spring 2019 and updated in September 2023 during the weekday morning and afternoon peak periods.
- Future developments in the vicinity of the site were assumed to be in place for the analysis of future traffic conditions. The 2022 Pentagon City Sector Plan (PCSP) describes possible future development at the RiverHouse site as well as throughout the sector. In addition, other specific developments and redevelopments are approved and/or underway as of 2023 when counts were taken, and 2025 when this analysis was completed.
- Traffic volumes for the proposed RiverHouse PDSP were generated based on the methodology outlined in Trip Generation, 11th Edition published by the Institute of Transportation Engineers (ITE).
- Intersection capacity analyses were performed for the morning and afternoon peak hours at the study area intersections using Synchro software.
- An analysis of recent crash data was conducted with methodology outlined in recent Arlington County guidance.
- A Transportation Demand Management (TDM) framework was developed as required to meet County regulations.

Contents of Study

This report contains a Summary section followed by nine chapters:

1. The **Introduction** (this section) describes the purpose and nature of this Multimodal Transportation Assessment (MMTA).
2. **Project Information** describes the location, planning context, proposed development, and study area. It provides details of the transportation components of the proposed development, including both on-site changes and proposed modifications to the surrounding street network
3. **Background** reviews the current transportation context of the project area and describes County mobility plans.
4. **Multimodal Transportation Facilities Assessment** includes information on walking and rolling and on transit service. It describes access to the site for people on foot and on small personal vehicles (bicycles, scooters, mobility-assist devices, etc.),

outlines impacts of the development, and presents recommendations as needed. Transit analysis summarizes the existing and future transit service adjacent to the site, reviews how the project's transit demand will be accommodated, outlines impacts, and presents recommendations as needed.

5. **Estimated Travel Demand** outlines the expected trips to and from the proposed project. It summarizes the expected mode splits, multimodal trip generation, and trip distribution of the project.
6. **Traffic Analysis** provides a summary of the existing and future roadway facilities, and existing and future roadway capacity in the study area. It summarizes the distribution and routing assumptions used in the analysis. This chapter highlights the vehicular impacts of the project, including presenting mitigation measures for minimizing impacts as needed.
7. **Safety Analysis** presents data on recent crashes near the site and examines factors contributing to them. It also describes planned improvements to improve safety outcomes.
8. **Transportation Management Plan** (TMP) recommendations outline the various components of the plan to encourage walking, rolling, and transit through a variety of techniques and incentives.
9. **Conclusions** summarizes the assessment including analysis results, proposed mitigations, and overall performance.

2. PROJECT INFORMATION

Site Location

The RiverHouse PDSP site is a part of the Pentagon City area in Arlington, VA. Figure 1 shows the site and its immediate vicinity. The RiverHouse site comprises 36.6 acres, bounded by S. Joyce St. to the east, 16th St. S. to the south, S. Lynn St. to the west, and Army Navy Dr. to the north. The existing site includes three residential towers with 1,676 total residential units served by 1,820 surface and structured parking spaces.

Figure 2 shows the location of the project within the region and its relationship to nearby transit, trails, and highways. Figure 3, Figure 4, and Figure 5, from the Arlington County Master Transportation Map current in January 2025, show the street, transit, and walking and biking networks, respectively.

Figure 1: RiverHouse Development Site Location

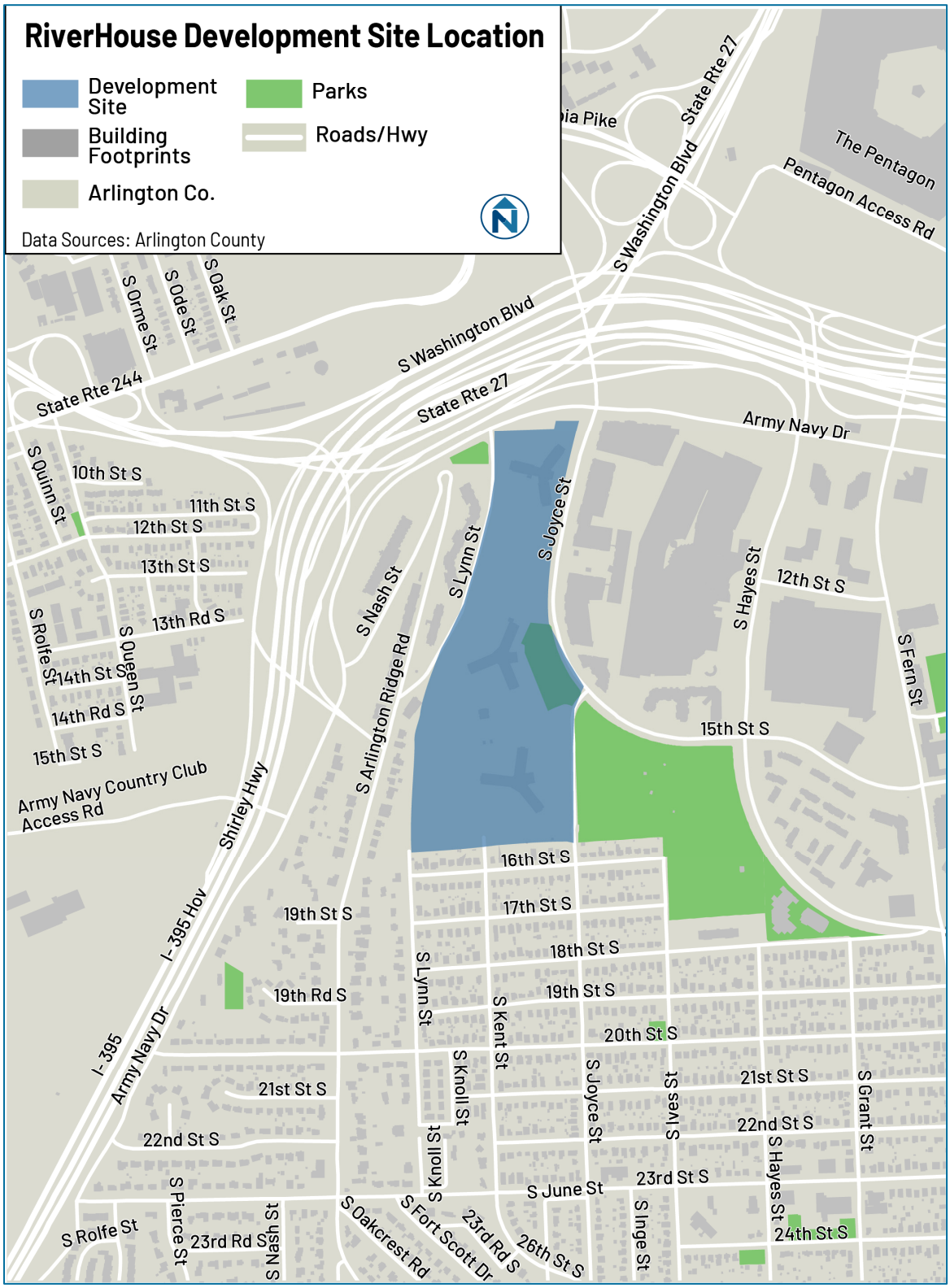


Figure 2: Regional Transportation Facilities

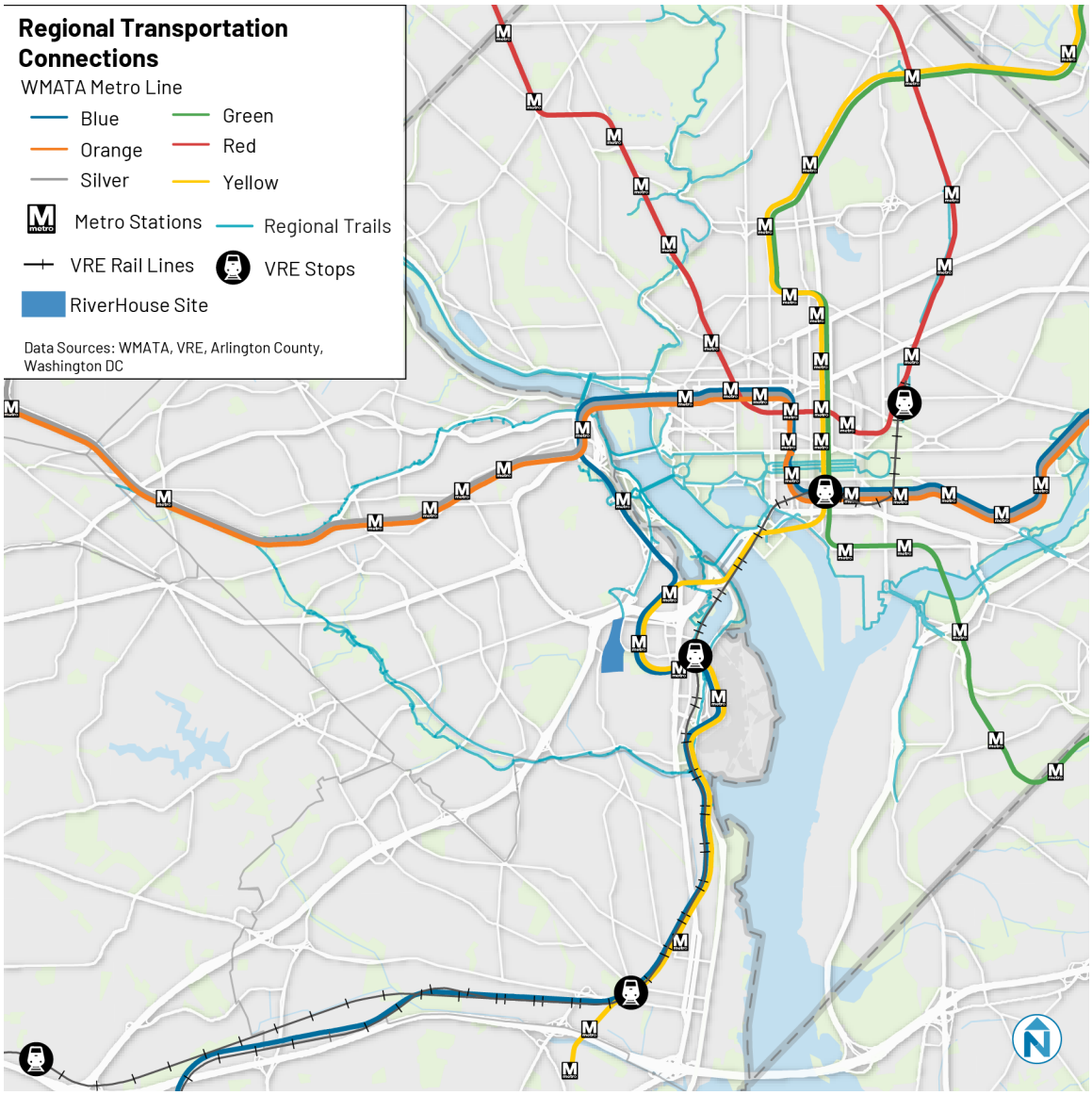


Figure 3: Master Transportation Plan (MTP) Street Network

Figure 4: Master Transportation Plan (MTP) Transit Network

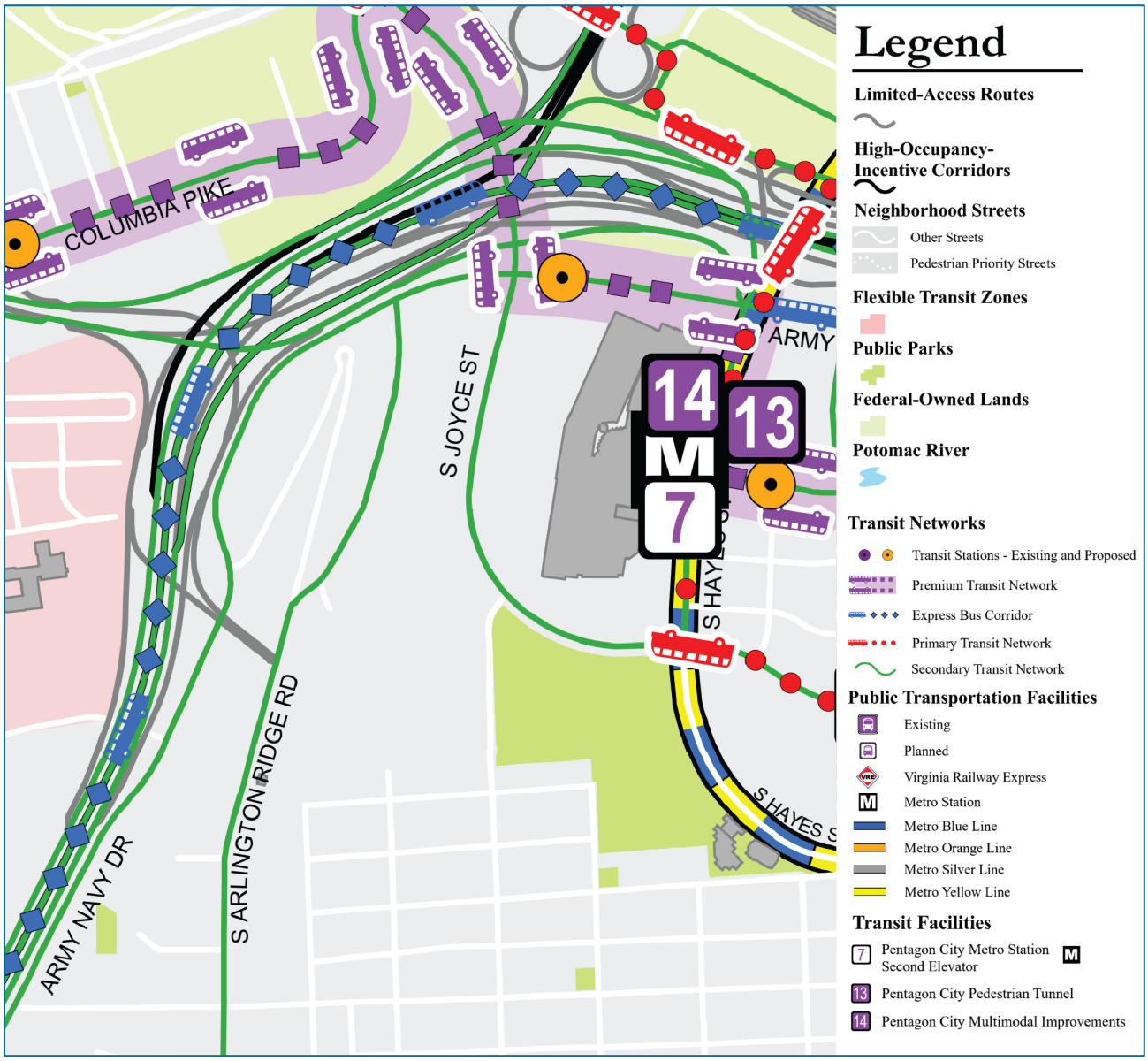
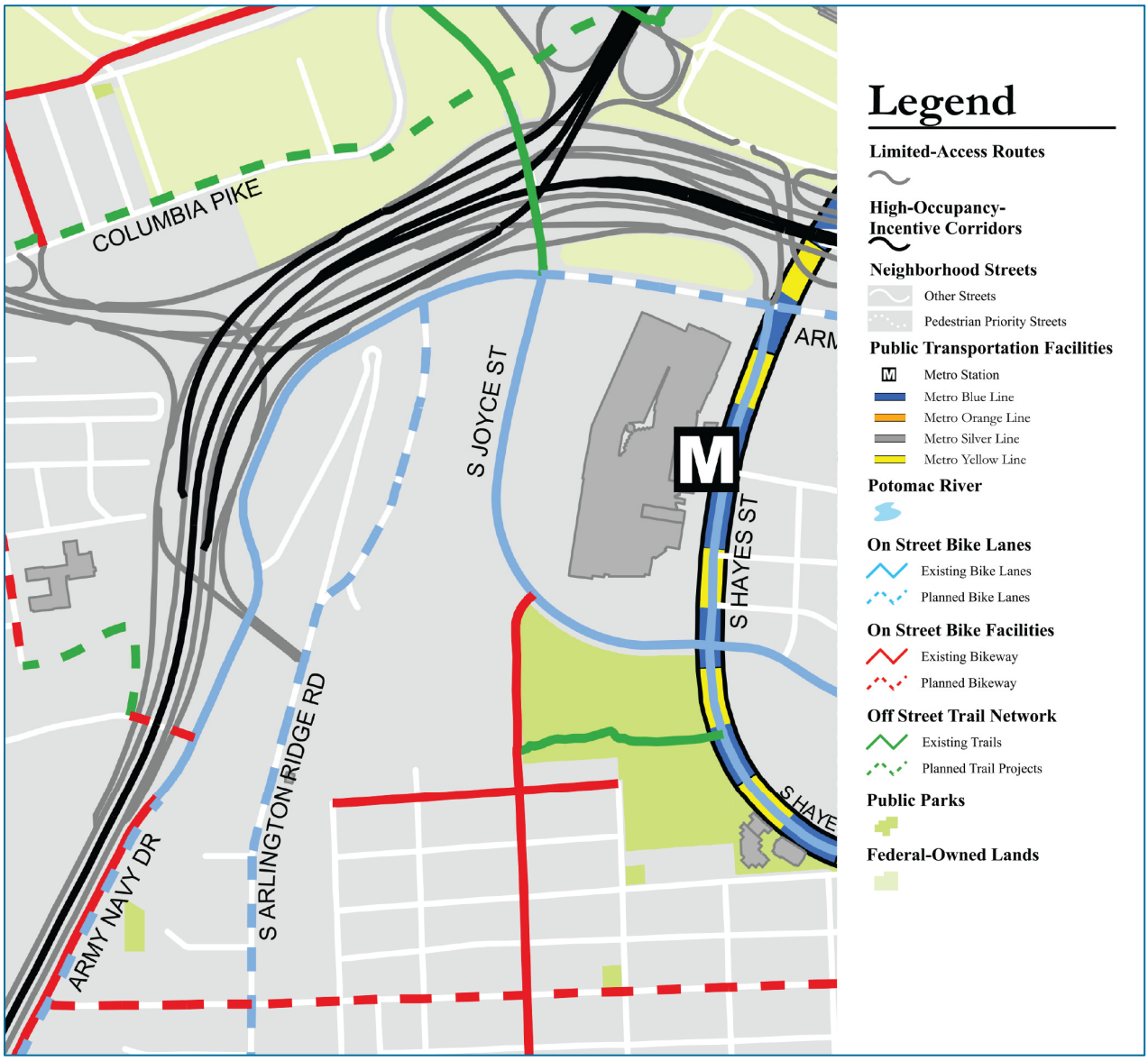


Figure 5: Master Transportation Plan (MTP) Bike, Walk, and Trail Network



RiverHouse PDSP

The proposed PDSP would preserve the existing residential towers and add 2,790 new residential units and approximately 15,000 square feet (sf) of new retail space. Phase 1 of the PDSP comprises the 4.1 site plans for Landbays S, N1, and C1 and would add 743 units and 15,000 sf of retail with anticipated completion by 2028. The remaining phases of the PDSP, to be detailed in future 4.1 site plans, would add 2,047 residential units with an anticipated completion by 2035. At full buildout, the PDSP provides 2,790 new homes and 15,000 sf of retail space, largely concentrated on the existing surface parking lots. Figure 6 shows the RiverHouse Neighborhood PDSP at full buildout. Table 1 shows the proposed PDSP program by location, number of units (or sf), and amount of parking.

The remaining residential towers – Ashley (to the south), Potomac (in the center), and James (to the north) – continue to provide 1,676 units but with parking reduced from 1,820 spaces (1.09 per unit) to 671 spaces (0.40 per unit). This includes 279 spaces in garages and lots to remain, and 392 replacement spaces to be delivered with current and future site plans as described below.

Landbay S, on the southern portion of the RiverHouse property, provides 132 townhouse multifamily residences along with 240 parking spaces, including 26 on-street, for a parking ratio of 1.62 spaces per unit.

Landbay C includes three new buildings:

1. C1, a multifamily residential building just south of the existing Ashley tower, with 102 units and 48 spaces (including 6 visitor spaces) for a ratio of 0.41 spaces per unit plus 0.05 for visitors;
2. C2, a multifamily residential building just north of the existing Ashley tower, with 366 units and 148 parking spaces for a ratio of 0.40 spaces per unit; and
3. C3, a multifamily residential building just south of the existing Potomac tower, with 325 units and 130 spaces for a ratio of 0.40 spaces per unit.

Landbay N comprises three buildings.

1. N1 provides 509 residential units and 265 spaces for a ratio of 0.50 spaces per unit plus 0.05 for visitors. Building N1 also includes 14,793 square feet of retail space, served by 32 parking spaces (2.16/1000sf).
2. N2 provides 871 residential units and 349 spaces for a ratio of 0.40 spaces per unit. Building N2 also includes 4000 square feet of retail space, served by 4 parking spaces (1/1000sf).
3. N3 provides 485 units and 194 spaces for a ratio of 0.40 spaces per unit.

An additional 33 on-street parking spaces result from proposed changes to S. Joyce St.

Figure 6: RiverHouse PDSP and Landbays (Source: PDSP Submission, Sheet CIV260)

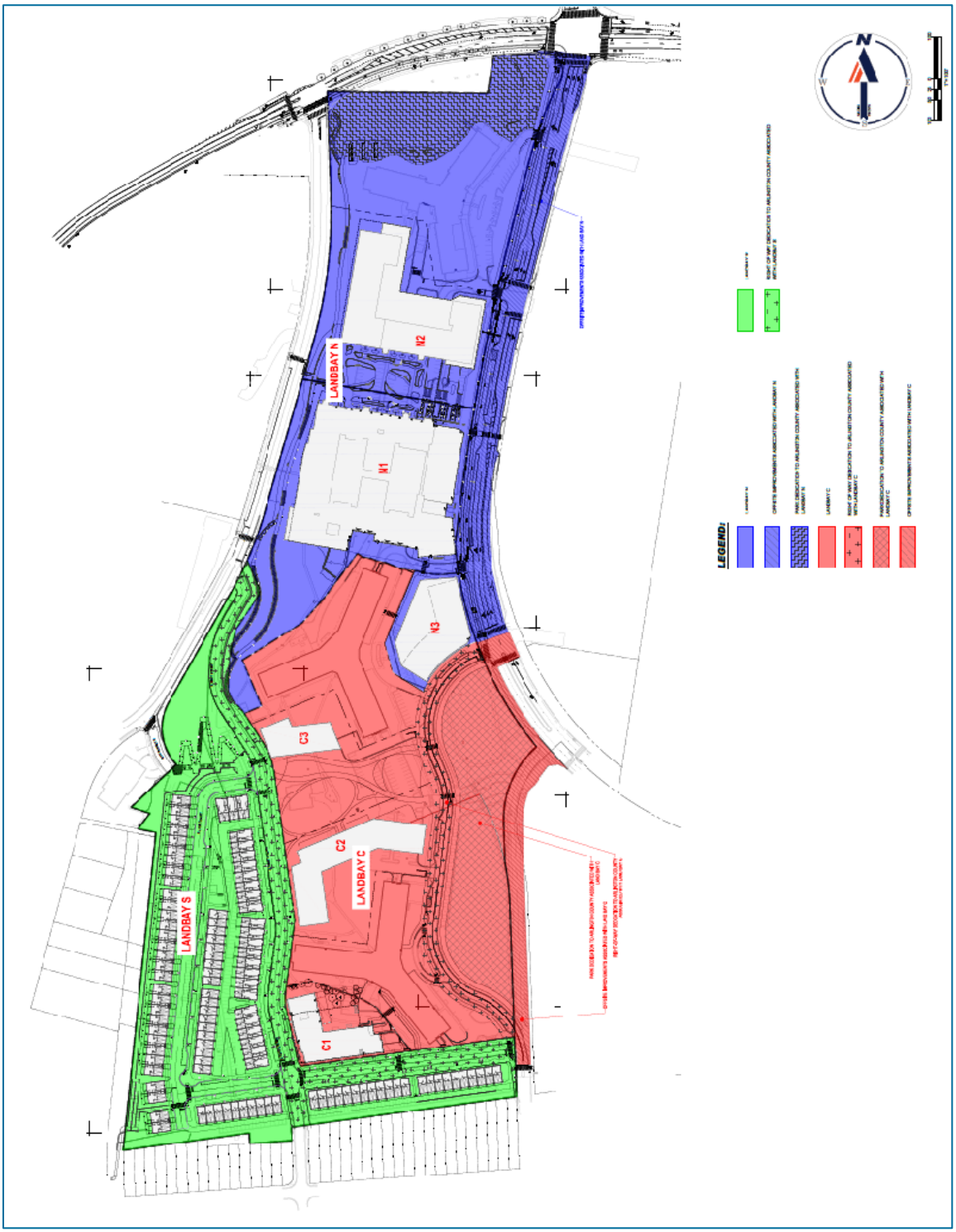


Table 1: RiverHouse PDSP Development & Parking Program (Source: PDSP Submission, Sheet G-005)

Parking Provided - PDSP Full Buildout

Use			Units or Sq Ft	Req. Ratio	Req. Spaces	Proposed Ratio	Proposed Spaces	Provided Location of Spaces	
Off-Street Residential	Existing Multifamily**	James/Pctomac/Ashley (Existin	1,676	125/du first 200 + 1/du remaining	1,751	0.40 Spaces/Unit	671	671	Existing Surface Lots/Existing Garages/N1, N2, C2 Garages**
	New Development	C1	102	125/du first 200 + 1/du remaining	115	0.41 Spaces/Unit	42	42	C1 Garage (See Sheet OG-07 in LB C Submission for breakdown)
		C1 Visitor Parking		0.05 for first 200 du	6	0.05 Spaces/Unit (first 200 units)	6	6	C1 Garage (See Sheet OG-07 in LB C Submission for breakdown)
		LB S - TH / Stacked Flats	132	2.00	264	1.62 Spaces/Unit	214	214	Garage Parking (See Sheet A.S-002 in LB S Submission for breakdown
	PDSP Pctential Future Buildings*	N1	509	125/du first 200 + 1/du remaining	534	0.50 Spaces/Unit	255	255	N1 Garage (See Sheet OG-08 in LB N Submission for breakdown)
		N1 Visitor Parking		0.05 for first 200 du	10	0.05 Spaces/Unit (first 200 units)	10	10	N1 Garage (See Sheet OG-08 in LB N Submission for breakdown)
		C2*	366	125/du first 200 + 1/du remaining	391	0.40 Spaces/Unit	148	148	C2 Garage
		C3*	325	125/du first 200 + 1/du remaining	350	0.40 Spaces/Unit	130	130	C3 Garage
		N2*	871	125/du first 200 + 1/du remaining	896	0.40 Spaces/Unit	349	349	N2 Garage
		N3*	485	125/du first 200 + 1/du remaining	510	0.40 Spaces/Unit	194	194	N3 Garage
	Total Off-Street Residential		4,466			0.45 Spaces/Unit	2,019		
Off-Street Retail	New Development	N1 Retail	14,793	1sp/150 for first 5,000sf + 1sp/200 for next 10,000sf	83	1sp/463 Sq Ft	32	32	N1 Garage - 1st Floor
	Existing	The James Retail	1,130	1sp/1,000 SqFt	2		0	0	
	Future Buildings*	N2 Retail*	4,000	1sp/1,000 SqFt	4	1sp/1,000 Sq Ft	4	4	N2 Garage
						Total Off-Street	2,055		
On-Street	New Development	LB S, Public					26	26	On-Street
		Joyce On-Street, Public					15	15	S. Joyce Street Spaces
	Future Buildings*	FDSP* On-Street, Public					17	17	Rerouted Joyce St. (On-Street)
						Total On Street	58		

*Density statistics to be confirmed in connection with forthcoming Site Plan Applications

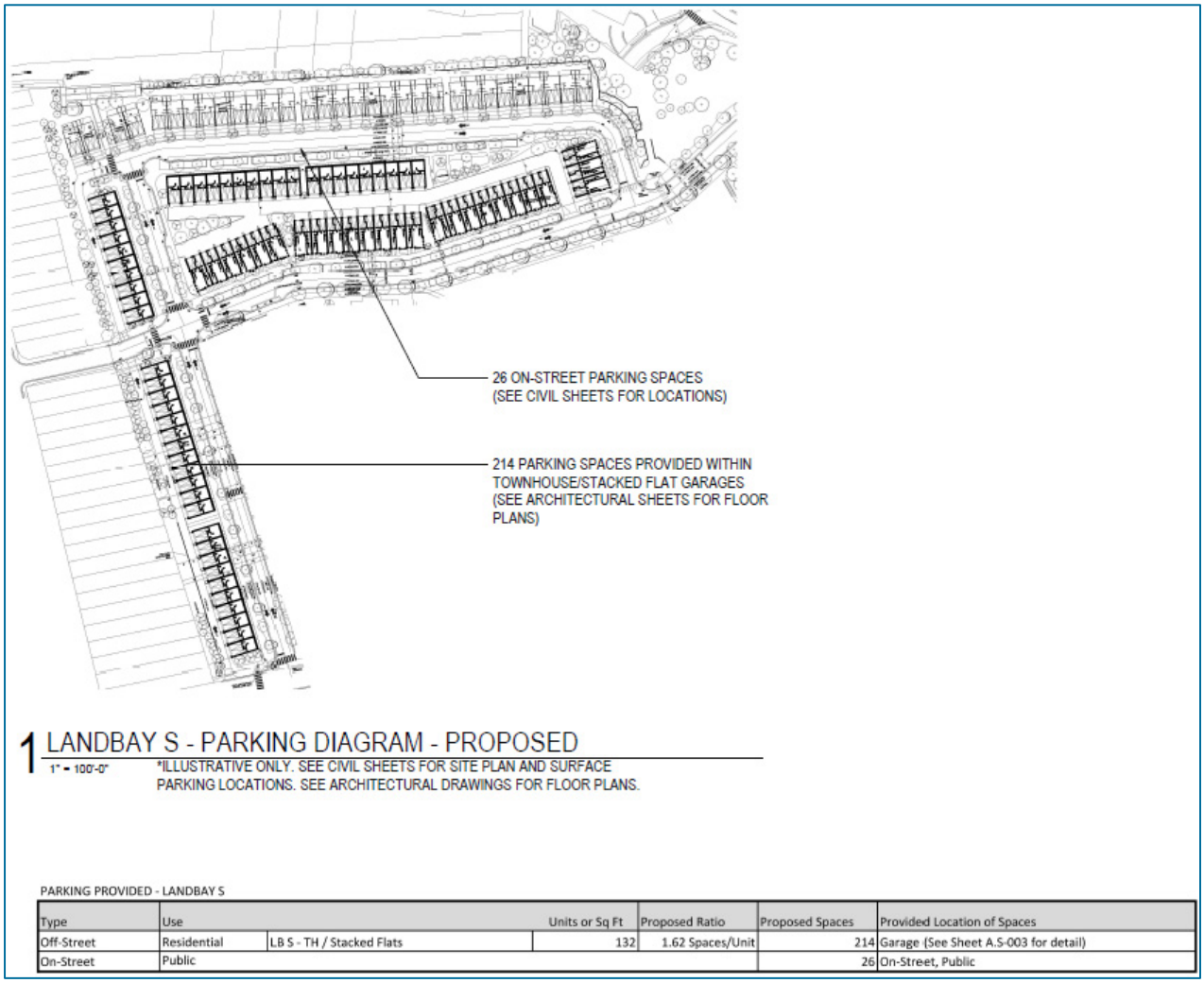
**Included within the 671 spaces for the James, Potomac and Ashley are 10 spaces per building (30 sp total) for visitor parking.

RiverHouse 4.1 Site Plans

Three 4.1 Site Plans accompany the PDSP, describing in detail proposed developments of Landbay S, Building C1, and Building N1. These site plans are proposed to be developed roughly concurrently and together comprise Phase 1 of proposed development.

As described under the PDSP section above, Landbay S consists of 132 townhome multifamily units with 214 garage parking spaces (1.62 per unit) for residents and 26 on-street spaces (0.20 per unit) for visitors. Figure 7 depicts the location and parking for Landbay S.

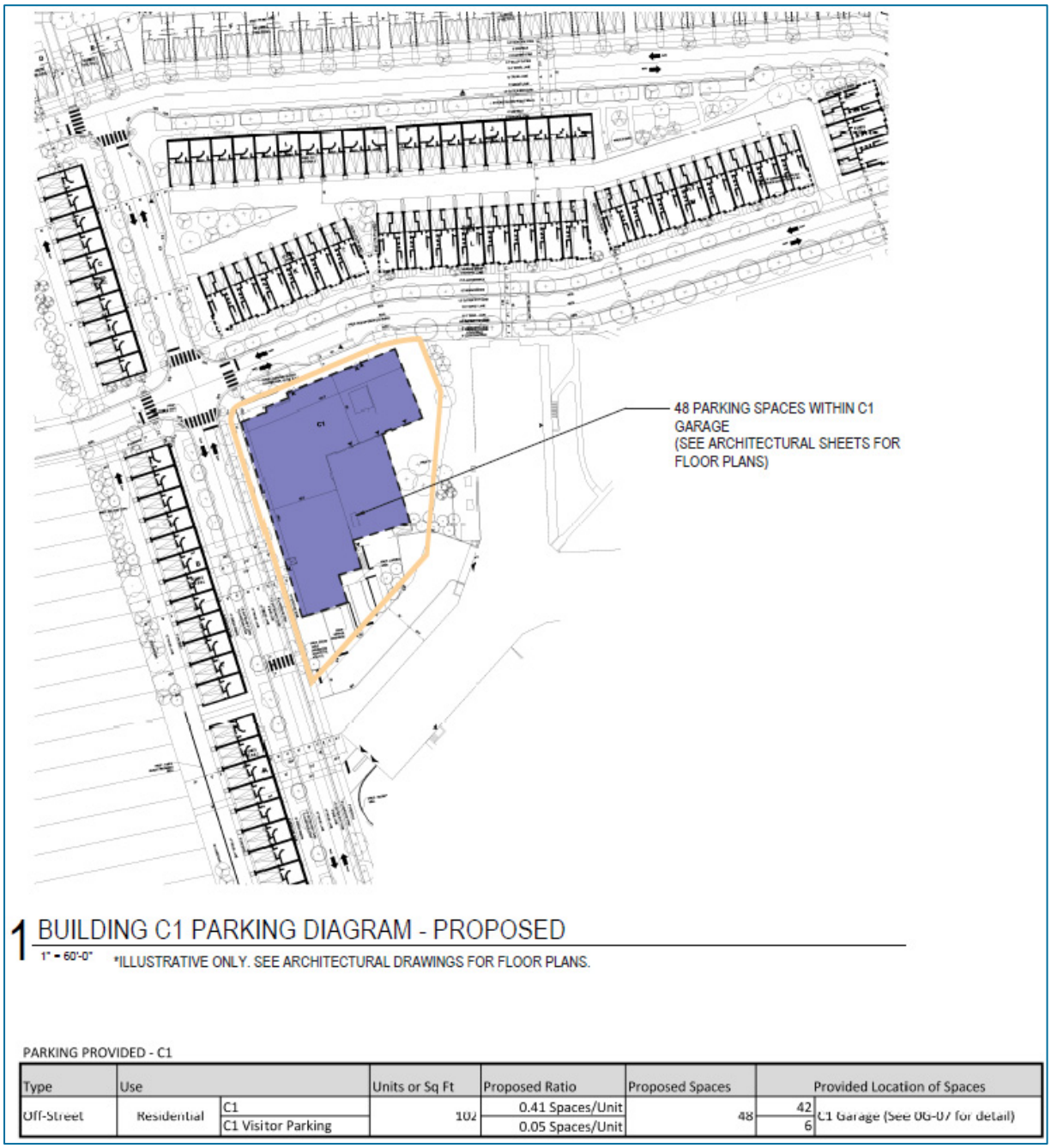
Figure 7: Landbay S (Source: 4.1 Submission, Sheet 0G-05)



Type	Use		Units or Sq Ft	Proposed Ratio	Proposed Spaces	Provided Location of Spaces
Off-Street	Residential	LB S - TH / Stacked Flats	132	1.62 Spaces/Unit	214	Garage (See Sheet A.S-003 for detail)
On-Street	Public				26	On-Street, Public

Building C1 consists of 102 multifamily units with 42 garage parking spaces (0.41 per unit) for residents and 6 garage spaces (0.05 per unit) for visitors, as shown in Figure 8.

Figure 8: Building C1 (Source: 4.1 Submission, Sheet 0G-05)



Type	Use		Units or Sq Ft	Proposed Ratio	Proposed Spaces	Provided Location of Spaces	
Off-Street	Residential	C1	102	0.41 Spaces/Unit	48	42	C1 Garage (See 0G-07 for detail)
		C1 Visitor Parking		0.05 Spaces/Unit		6	

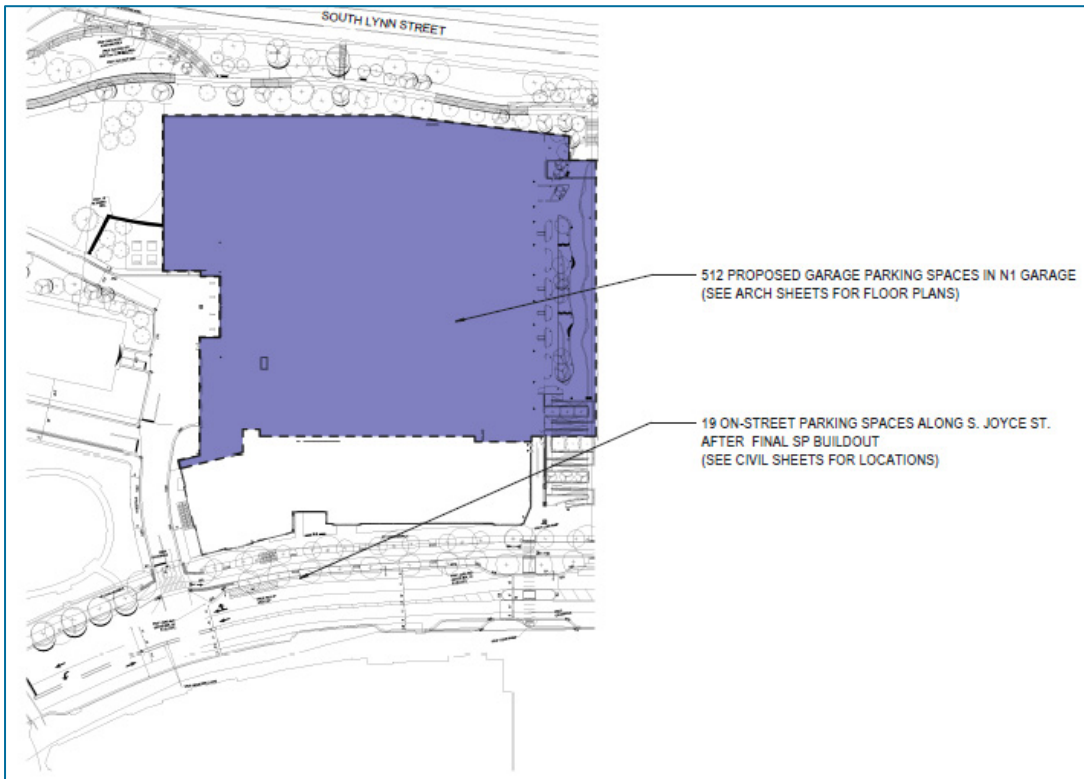
Building N1 consists of 509 multifamily units and 14,793 square feet of retail space, along with a 512-space parking garage. The parking is apportioned as follows:

- 255 spaces for residents of building N1 (0.5 spaces per unit);
- 10 spaces for visitors to residents of building N1;

- 32 spaces for retail customers and employees; and
- 215 spaces replacing parking that currently exists on this site, which can be shared by residents of and visitors to any RiverHouse buildings based on demand.
- Building N1 replaces an existing parking structure with 254 spaces. Parking in Building N1 includes 238 spaces on the ground floor, behind street-fronting retail and backed against the grade, and 274 spaces on the second floor. Retail parking is located on the ground floor, immediately adjacent to the retail.

In addition, the transformation of S Joyce St adjacent to RiverHouse provides 19 on-street parking spaces that can serve Building N1 and other users. (After "little" Joyce is relocated during full PDSP development, 15 spaces remain on-street on "big" Joyce.) Figure 9 shows the building layout and parking location for Building N1.

Figure 9: Building N1 (Source: 4.1 Submission, Sheet 0G-05)



1 BUILDING N1 PARKING DIAGRAM - PROPOSED

1" = 60'-0"

*ILLUSTRATIVE ONLY. SEE CIVIL SHEETS FOR SITE PLAN AND SURFACE PARKING LOCATIONS. SEE ARCHITECTURAL DRAWINGS FOR FLOOR PLANS.

PARKING PROVIDED - N1

Type	Use		Units or Sq Ft	Proposed Ratio	Proposed Spaces	Provided	Location of Spaces
Off-Street	Residential	N1	509	0.5 Spaces/Unit	265	255	N1 Garage
		N1 Visitor Parking		0.05 Spaces/Unit (first 200 du)		10	N1 Garage
		Replacement Parking*			215	215	N1 Garage
	Retail	N1 Retail	14,793	1 sp/463 sq. ft.	32	32	N1 Garage - 1st Floor (See A.N1-201 for detail)
				Total Off-Street	**512**		
On-Street	Public				19	19	S. Joyce Street
				Total On-Street	**19**		

*N1 replacement spaces can be shared by all buildings within Riverhouse based on actual demand

Site Access and Circulation

The RiverHouse PDSP illustrates significant improvements in access to and circulation through the site for people walking, rolling on or in small personal vehicles, or in cars and other motor vehicles.

Adjacent roadways include S. Joyce St. to the east, 16th St. S. to the south, S. Lynn St. to the west, and Army Navy Dr. to the north. Army Navy Dr. currently includes three travel lanes in each direction adjacent to RiverHouse, but it is currently being reconstructed to include protected bike lanes. It is classified in the MTP as a Type D Arterial, as is S. Lynn St. along the western edge of the RiverHouse site. 16th St. S. is classified as a Neighborhood Local Street, as is the segment of S. Joyce St. along the southeastern edge of the RiverHouse site. S. Joyce St. along the majority of the eastern edge is classified as a Type-A Arterial.

A new internal access road connected to S. Kent St. at the southern boundary of the site and continuing north through to S. Lynn St is proposed. It is anticipated that this street will almost entirely serve for site access and not through traffic as the demand for that through movement should be quite low. This street provides for pickup/dropoff access to the Landbay C buildings as well as direct access to many of the Landbay S townhouse multifamily residences. Other internal streets also serve Landbay S, connecting S. Kent St. to S. Joyce St., and forming a new block west of the street connected to S. Kent St. These streets also provide access to the Ashley tower's garage and loading bay.

The site design dictates that all access to Building N1 comes from S. Joyce St. Landbay S and Building C1 have access via the new 15th Rd. S. connection to S. Joyce St. and the S. Kent St. connections to both 16th St. S. and S. Lynn St.

Figure 10 shows the multimodal access and circulation facilities (streets and paths) to be delivered with the full PDSP, including green elements and space for people walking, biking, driving. Figure 11 shows the same, but for Phase 1 (site plans for Landbay S, Building C1, and Building N1).

Figure 12 indicates where typical cross-sections are taken for existing streets, and those dimensions are shown in Figure 13. Figure 14 and Figure 15 show the future elements and dimensions proposed as part of the RiverHouse PDSP.

Figure 10: PDSP Multimodal Facilities and Design Elements

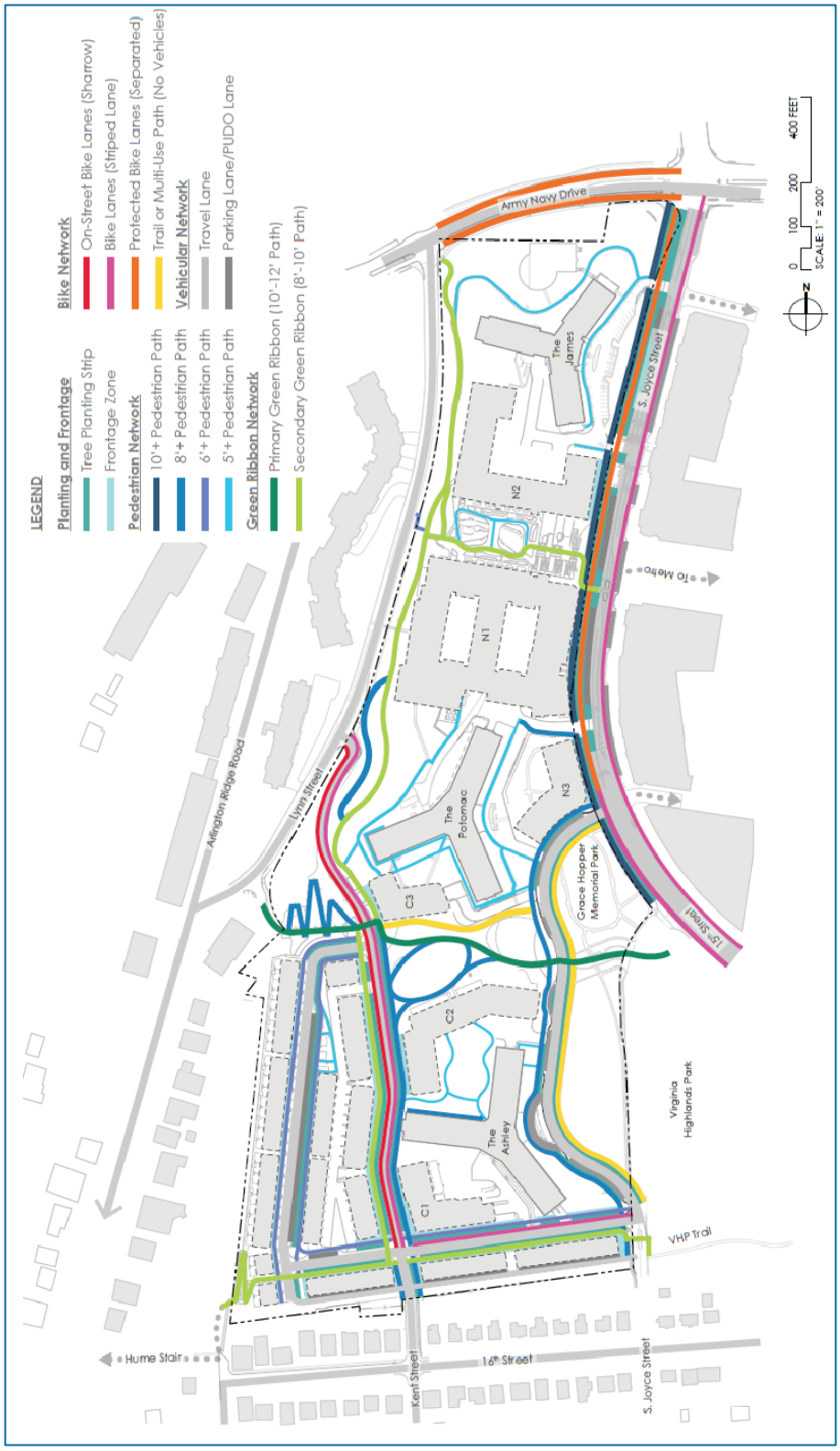


Figure 11: Phase 1 Multimodal Facilities and Design Elements

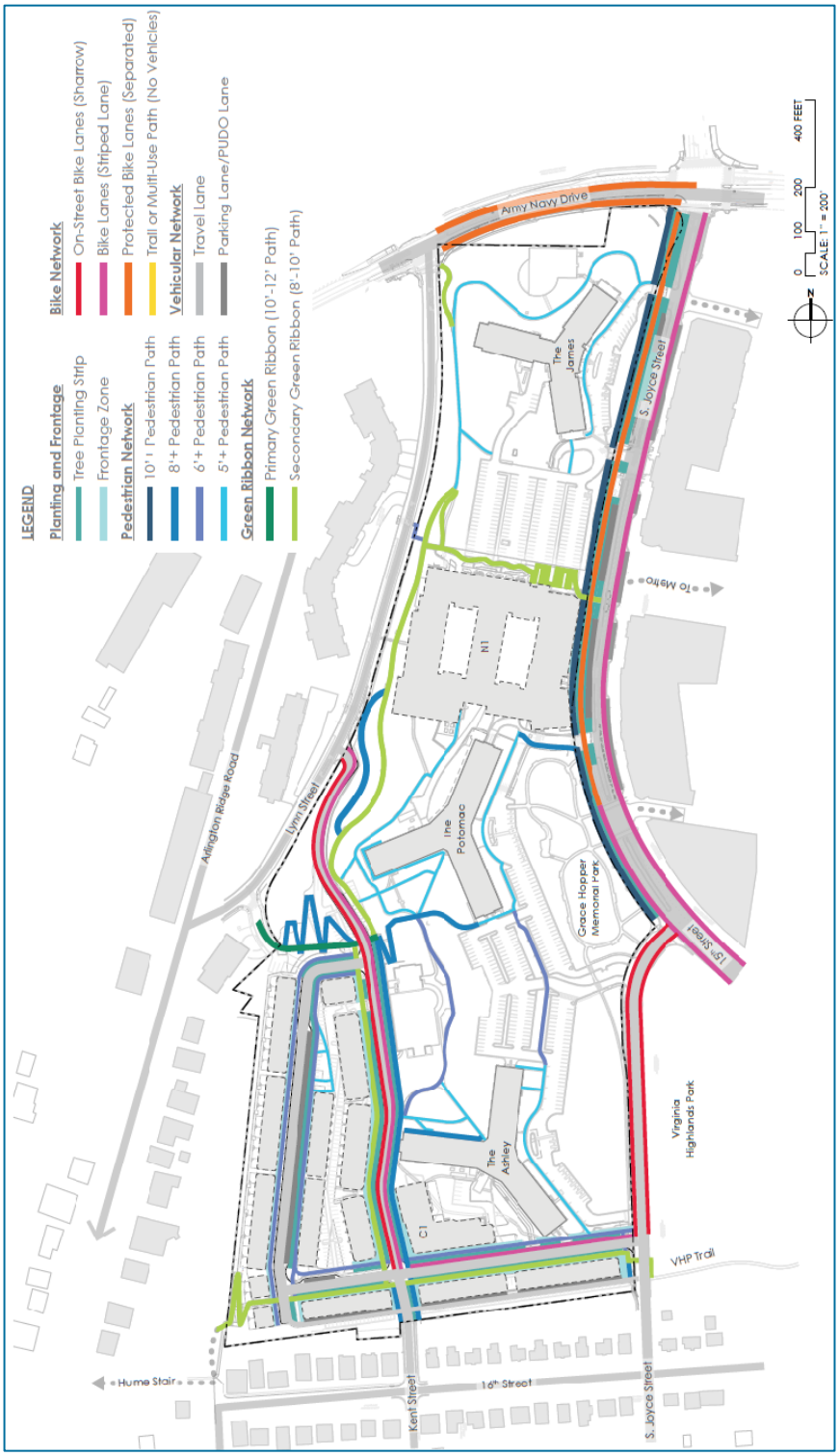


Figure 12: Existing Street Cross-Section Location Key (Source: PDSP Submission, Sheet CIV703)

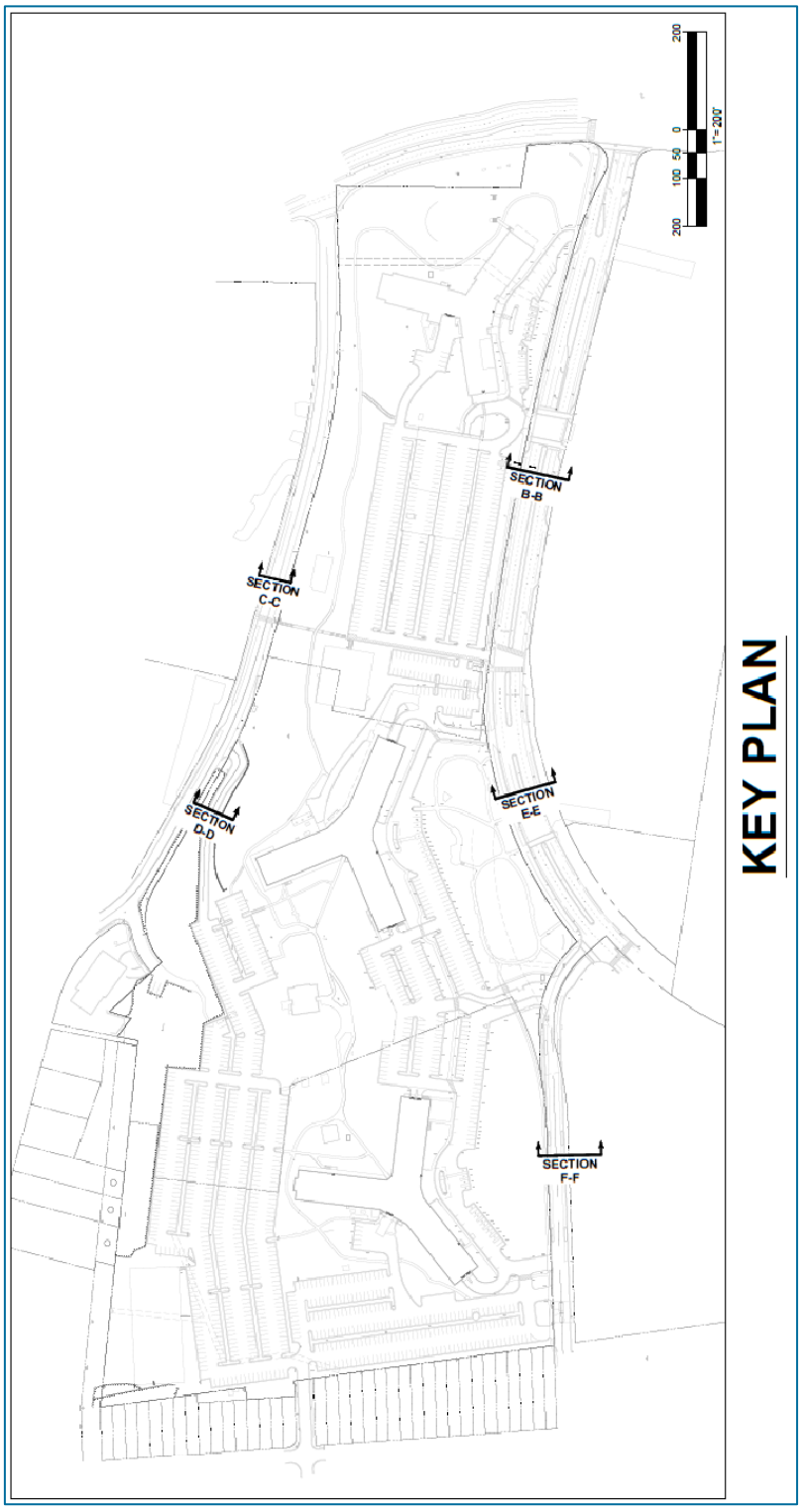
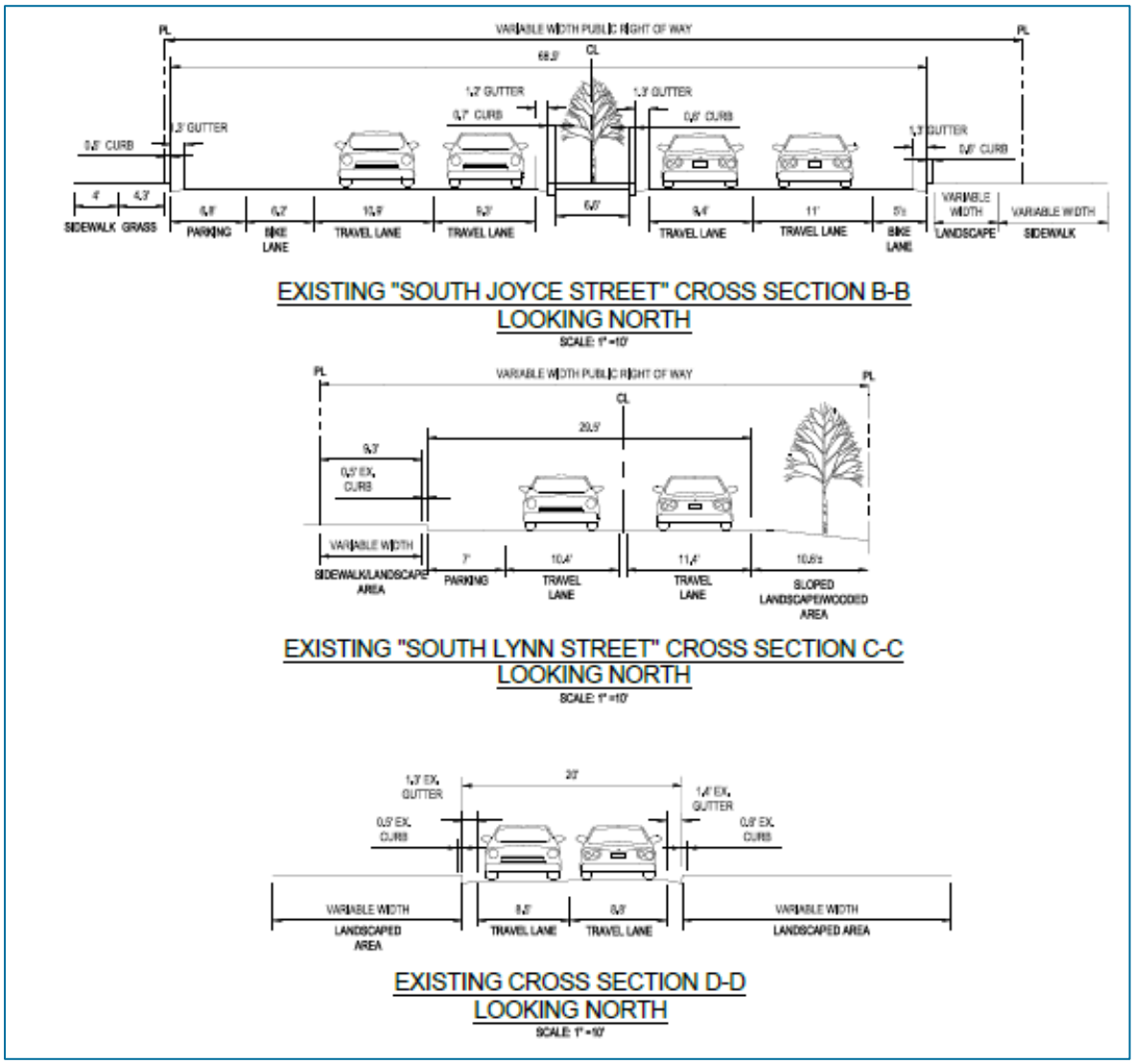
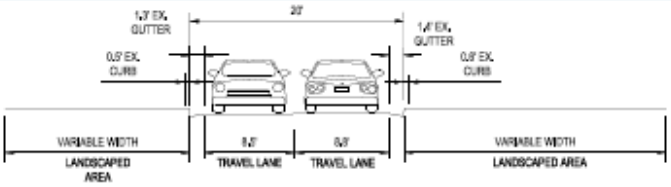
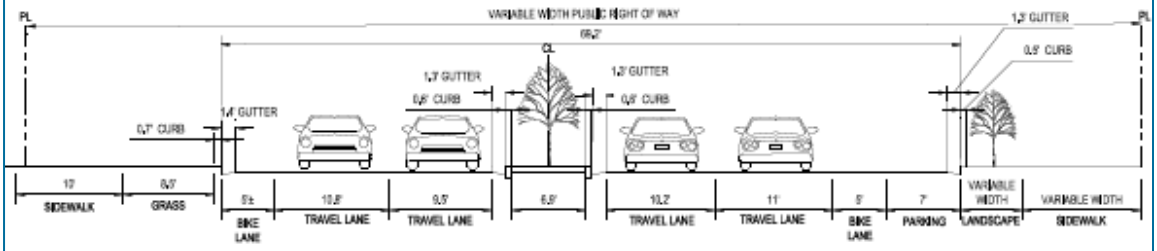


Figure 13: Existing Street Cross-Sections (Source: PDSP Submission, Sheet CIV703)

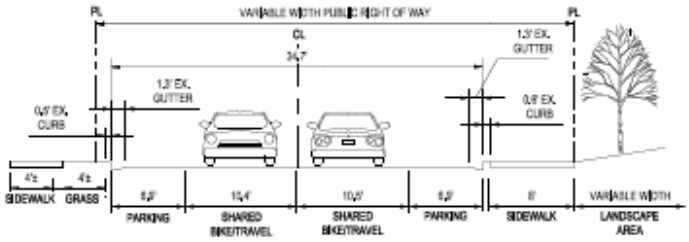




EXISTING CROSS SECTION D-D
LOOKING NORTH
SCALE: 1" =10'



EXISTING "SOUTH JOYCE STREET" CROSS SECTION E-E
LOOKING NORTH
SCALE: 1" =10'



EXISTING "SOUTH JOYCE STREET" CROSS SECTION F-F

Figure 14: Proposed Street Cross-Section Location Key (Source: PDSP Submission, Sheet CIV704)

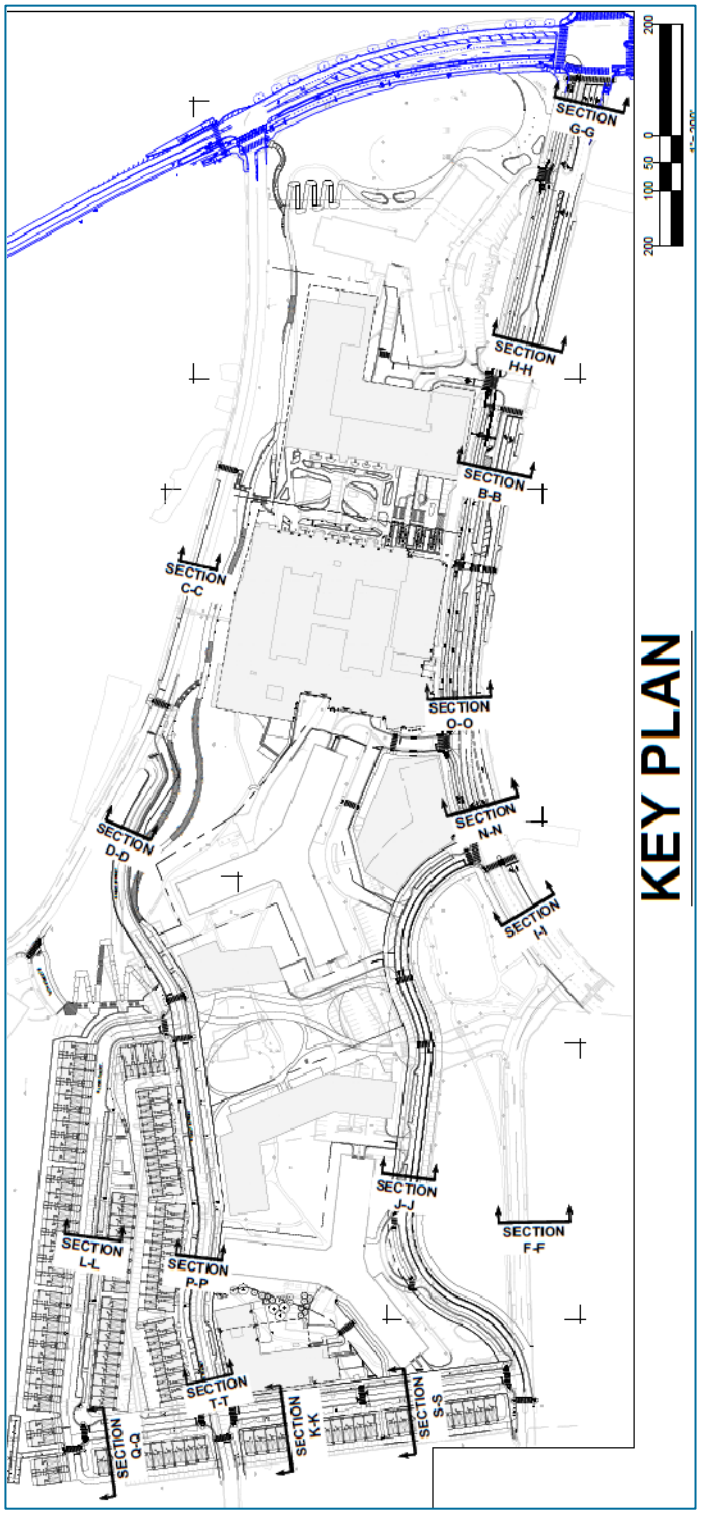
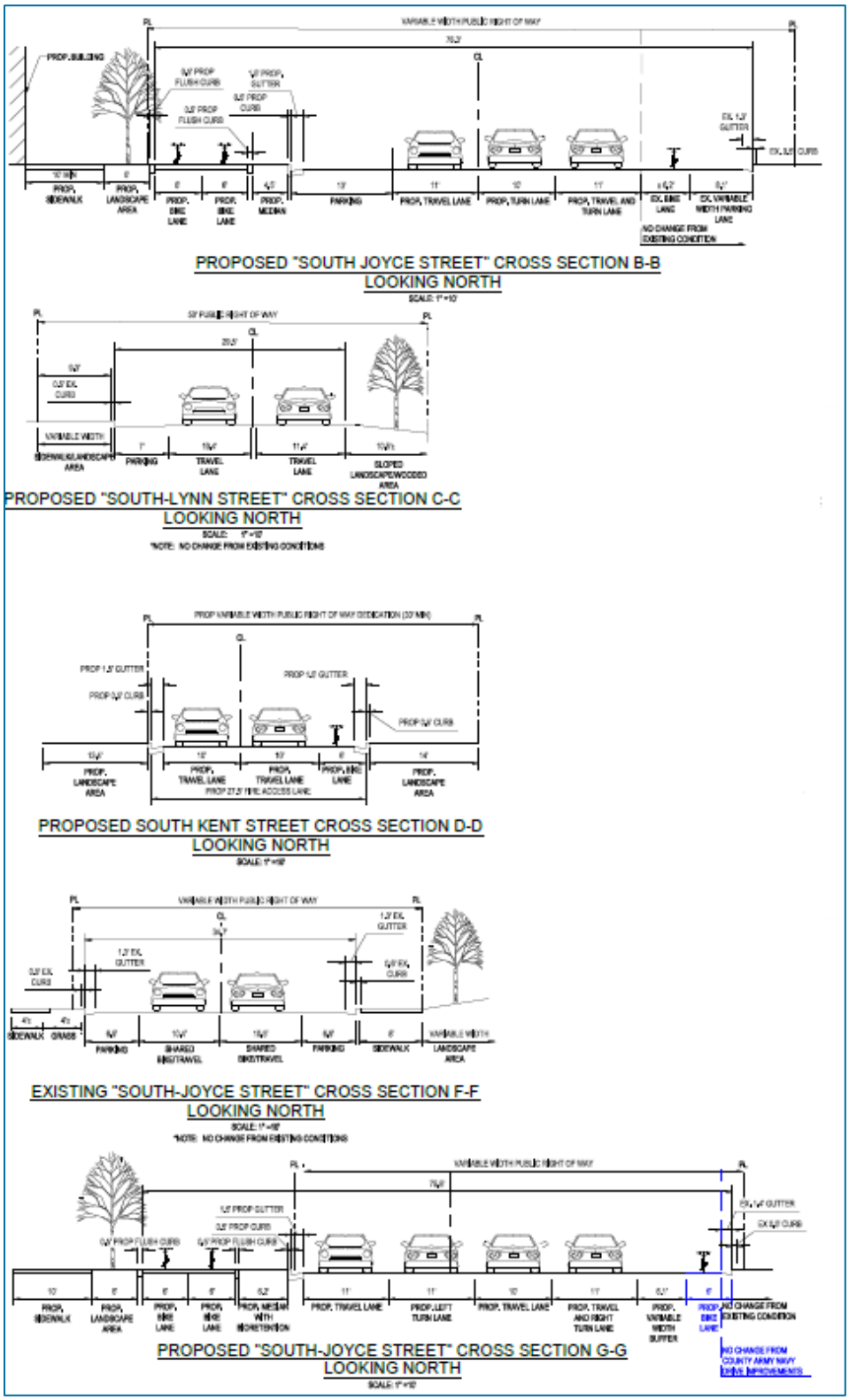
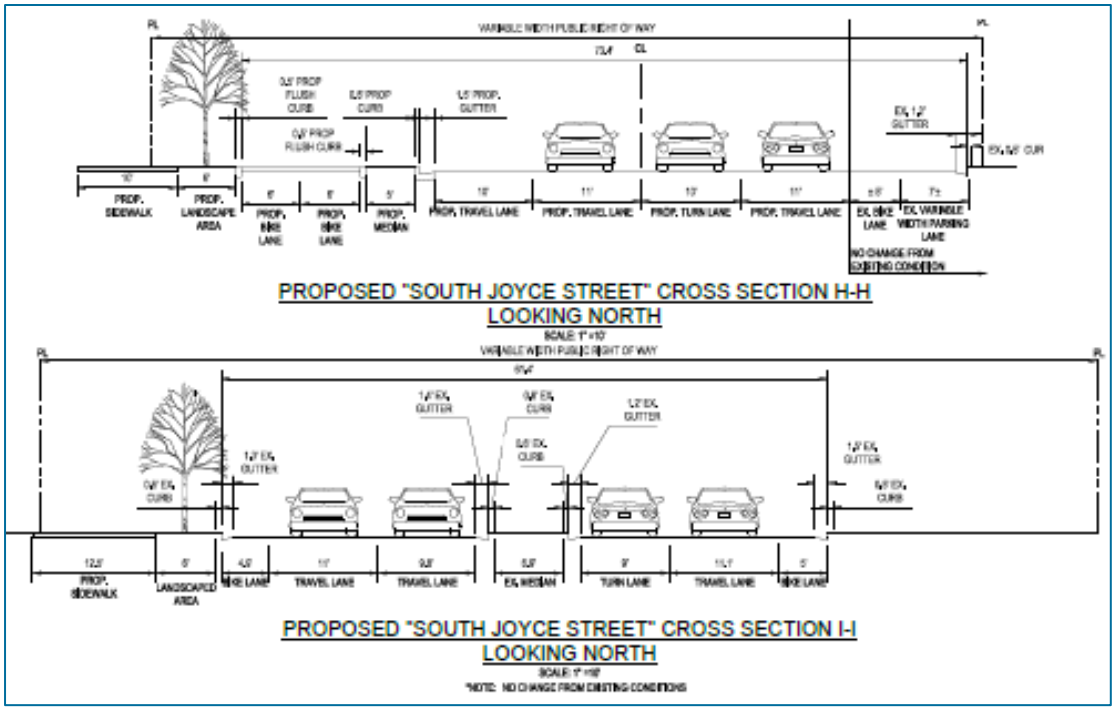
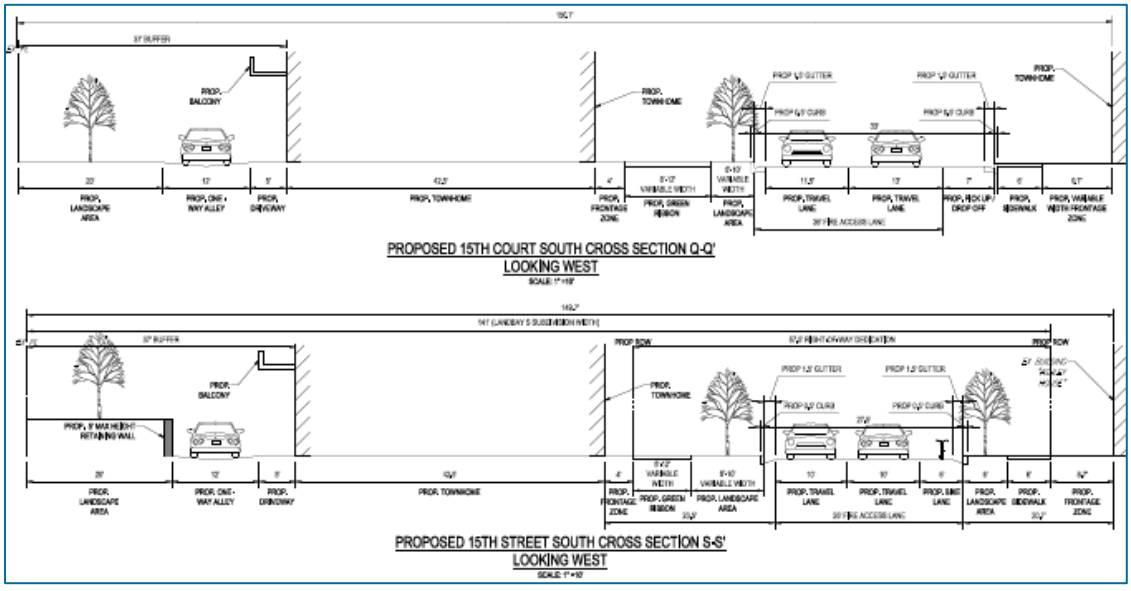
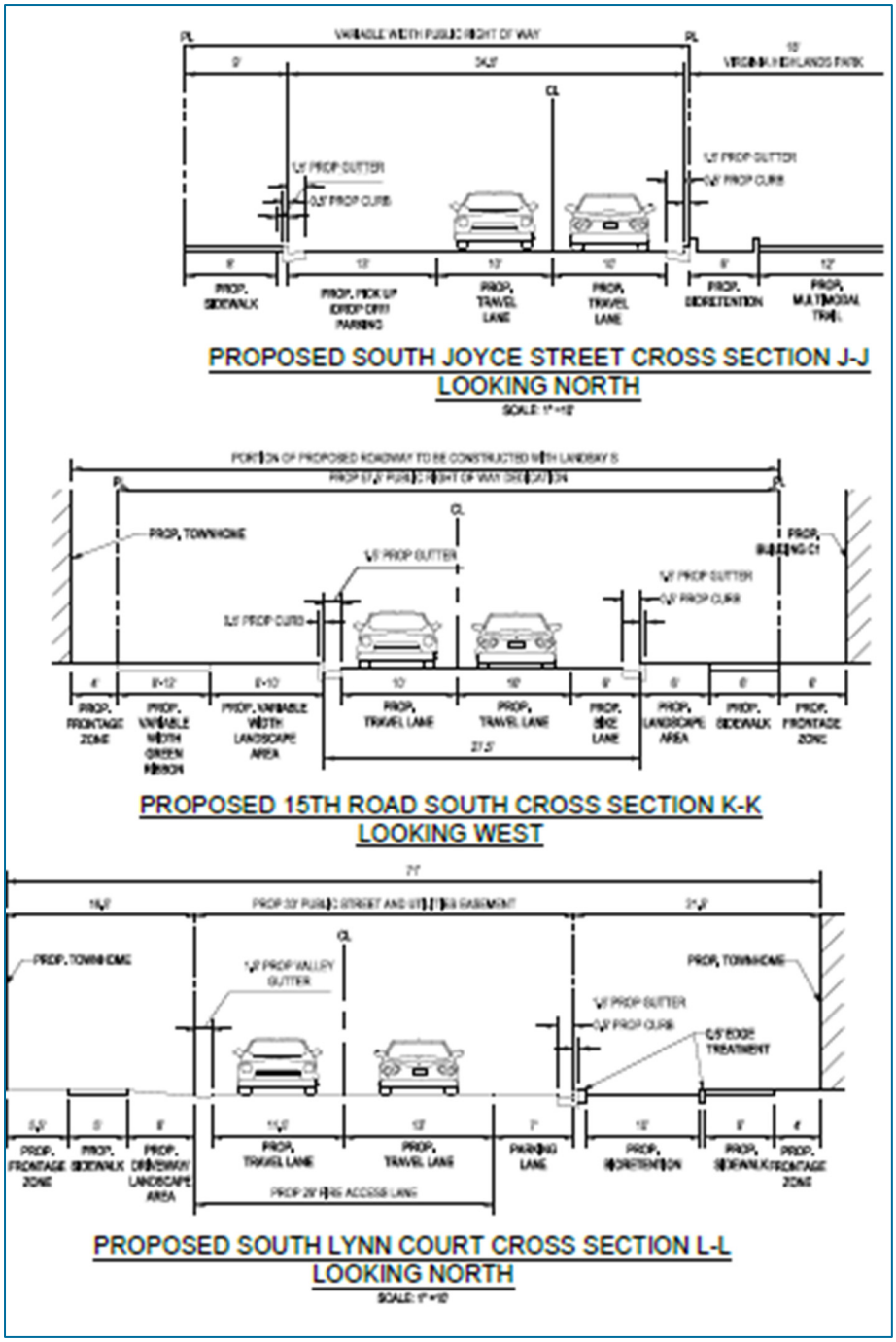


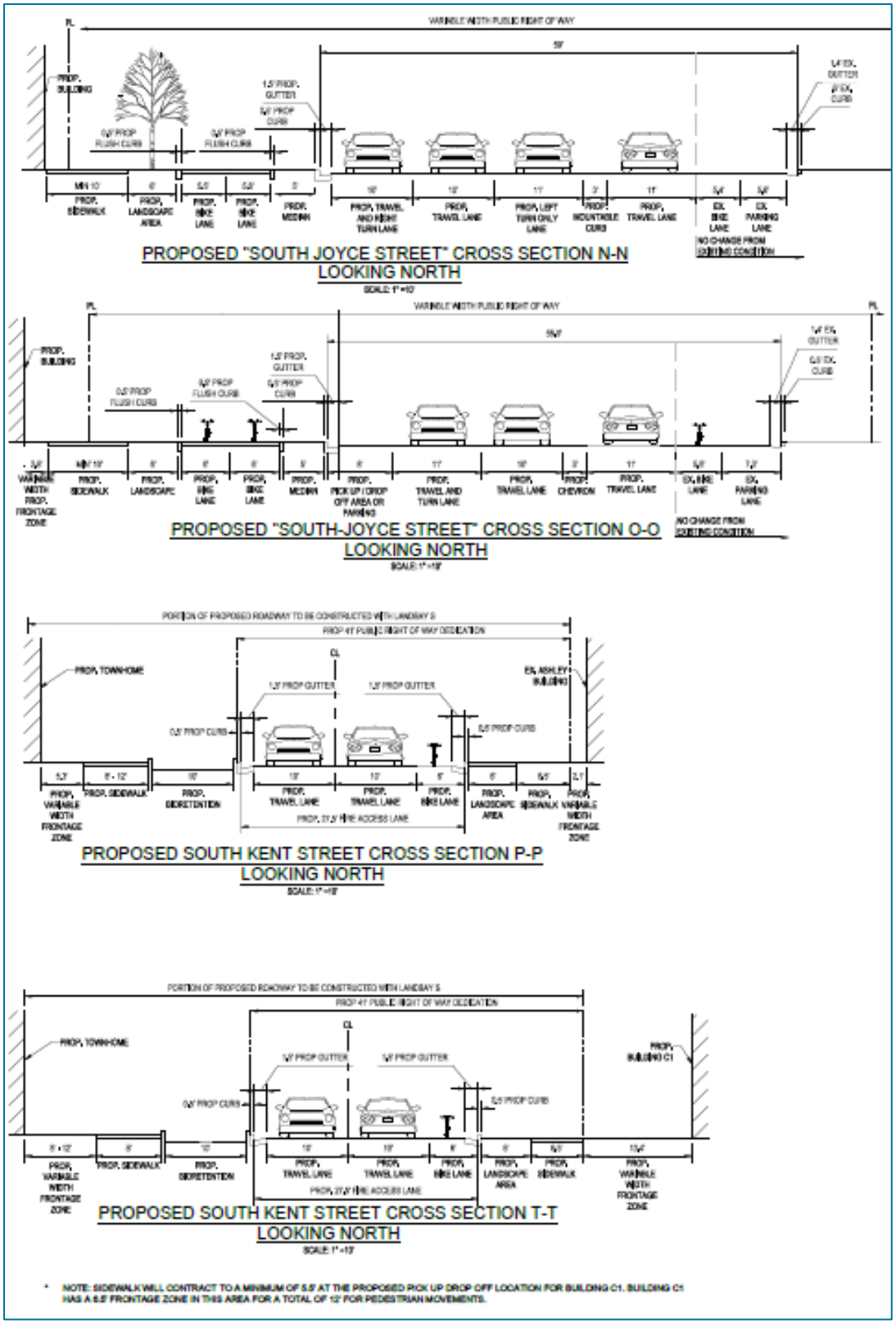
Figure 15: Proposed Street Cross-Sections (Source: PDSP Submission, Sheet CIV704)




PROPOSED "SOUTH JOYCE STREET" CROSS SECTION H-H
LOOKING NORTH
PROPOSED "SOUTH JOYCE STREET" CROSS SECTION I-I
LOOKING NORTH


PROPOSED 15TH COURT SOUTH CROSS SECTION Q-Q'
LOOKING WEST
PROPOSED 15TH STREET SOUTH CROSS SECTION S-S'
LOOKING WEST


PROPOSED SOUTH JOYCE STREET CROSS SECTION J-J
LOOKING NORTH
PROPOSED 15TH ROAD SOUTH CROSS SECTION K-K
LOOKING WEST
PROPOSED SOUTH LYNN COURT CROSS SECTION L-L
LOOKING NORTH


PROPOSED "SOUTH JOYCE STREET" CROSS SECTION N-N
LOOKING NORTH
PROPOSED "SOUTH-JOYCE STREET" CROSS SECTION O-O
LOOKING NORTH
PROPOSED SOUTH KENT STREET CROSS SECTION P-P
LOOKING NORTH
PROPOSED SOUTH KENT STREET CROSS SECTION T-T
LOOKING NORTH
* NOTE: SIDEWALK WILL CONTRACT TO A MINIMUM OF 5.5' AT THE PROPOSED PICK UP DROP OFF LOCATION FOR BUILDING C1. BUILDING C1 HAS A 6.5' FRONTAGE ZONE IN THIS AREA FOR A TOTAL OF 12' FOR PEDESTRIAN MOVEMENTS.

Road Diet of S. Joyce St. Arterial Segment

The PDSP proposes significant changes to S. Joyce St., in both the arterial segment between Army Navy Dr. and 15th St. S., and in the local segment between 15th St. S. and 16th St. S. The arterial segment is proposed for a road diet. Separate analysis prepared for Arlington County in 2023 supported the feasibility and desirability of this road diet under all reasonable future traffic scenarios and is included as Appendix B.

S. Joyce St. between Army Navy Dr. (to the north) and 15th St. S. (to the south) currently consists of two (2) vehicle travel lanes in each direction, separated by a center median that transitions to a left-turn lane at some intersections. Each direction of S. Joyce St. includes a painted bike lane between the vehicle travel lanes and an on-street parallel parking lane, which is occasionally replaced by curb extensions to facilitate safer crossing by people walking or rolling. Beyond the curb, each direction includes a small grass buffer and then a sidewalk, currently four (4) feet wide on the RiverHouse (west) side and of varying but more ample width on the east (Pentagon Row) side.

The conceptual plan for the proposed "road diet" redesign of S. Joyce St. is described in Figure 16 and Figure 17, using the color scheme shown. While keeping the east curb as currently located, the proposed cross-section includes (from east to west) the current parking lane (periodically replaced by curb extensions), painted bike lane, one (1) northbound vehicle travel lane, one (1) center turn lane (or median), one (1) southbound vehicle travel lane, a parking lane, a buffer area, a two-way protected cycle track, the curb, a buffer area, and a more ample sidewalk.

Figure 16: S. Joyce St. Existing Configuration

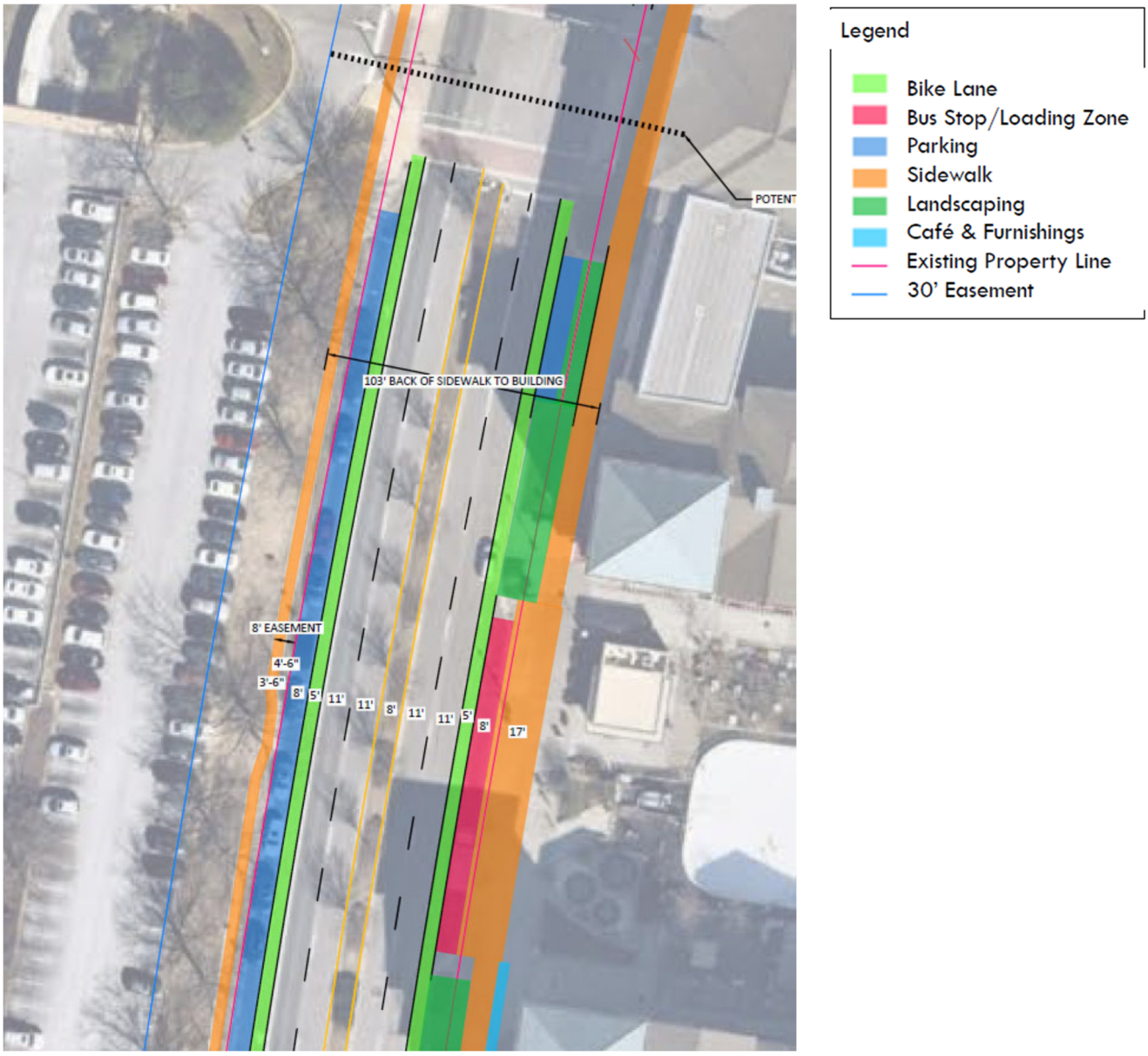


Figure 17: S. Joyce St. Proposed Road Diet Conditions

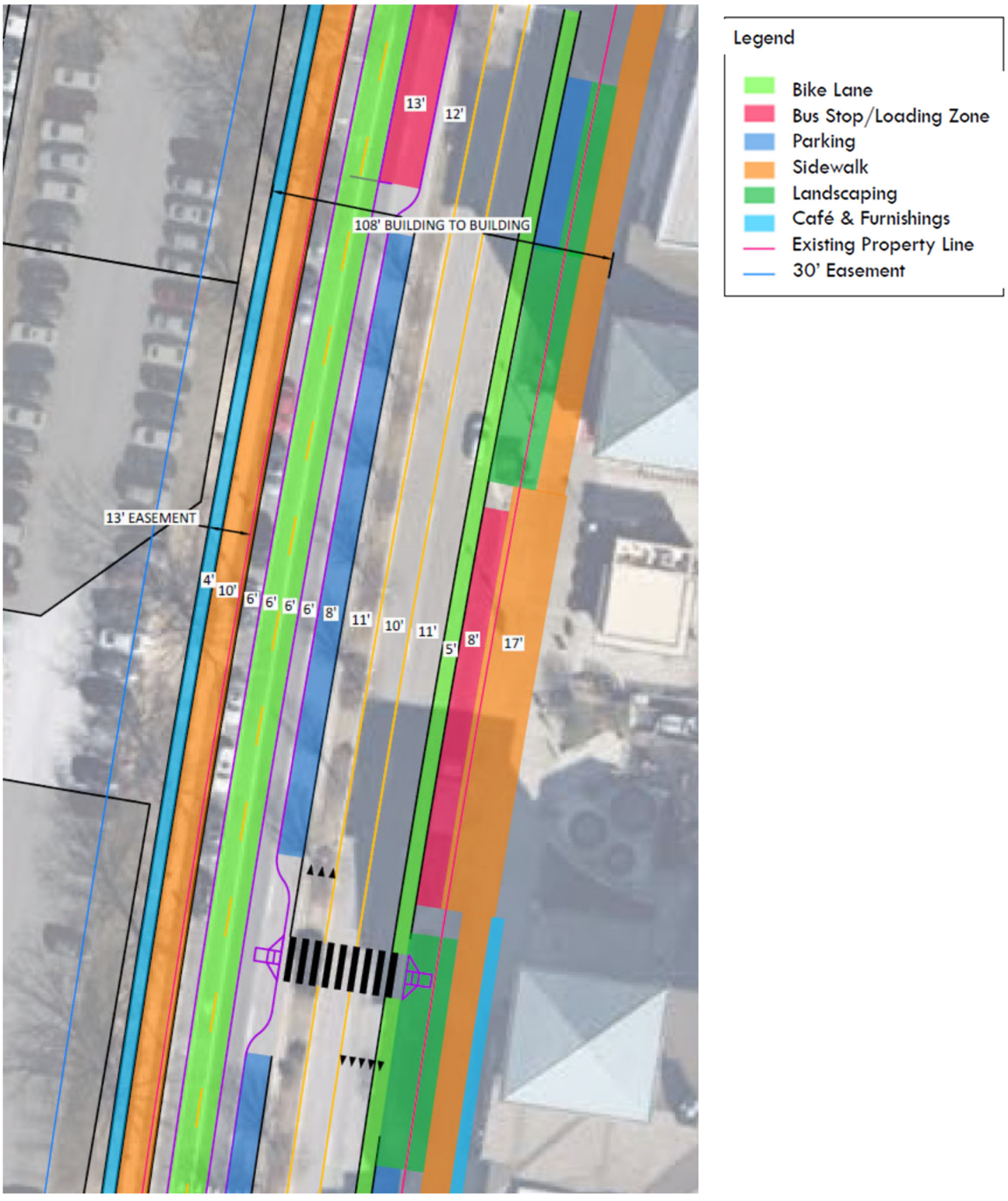
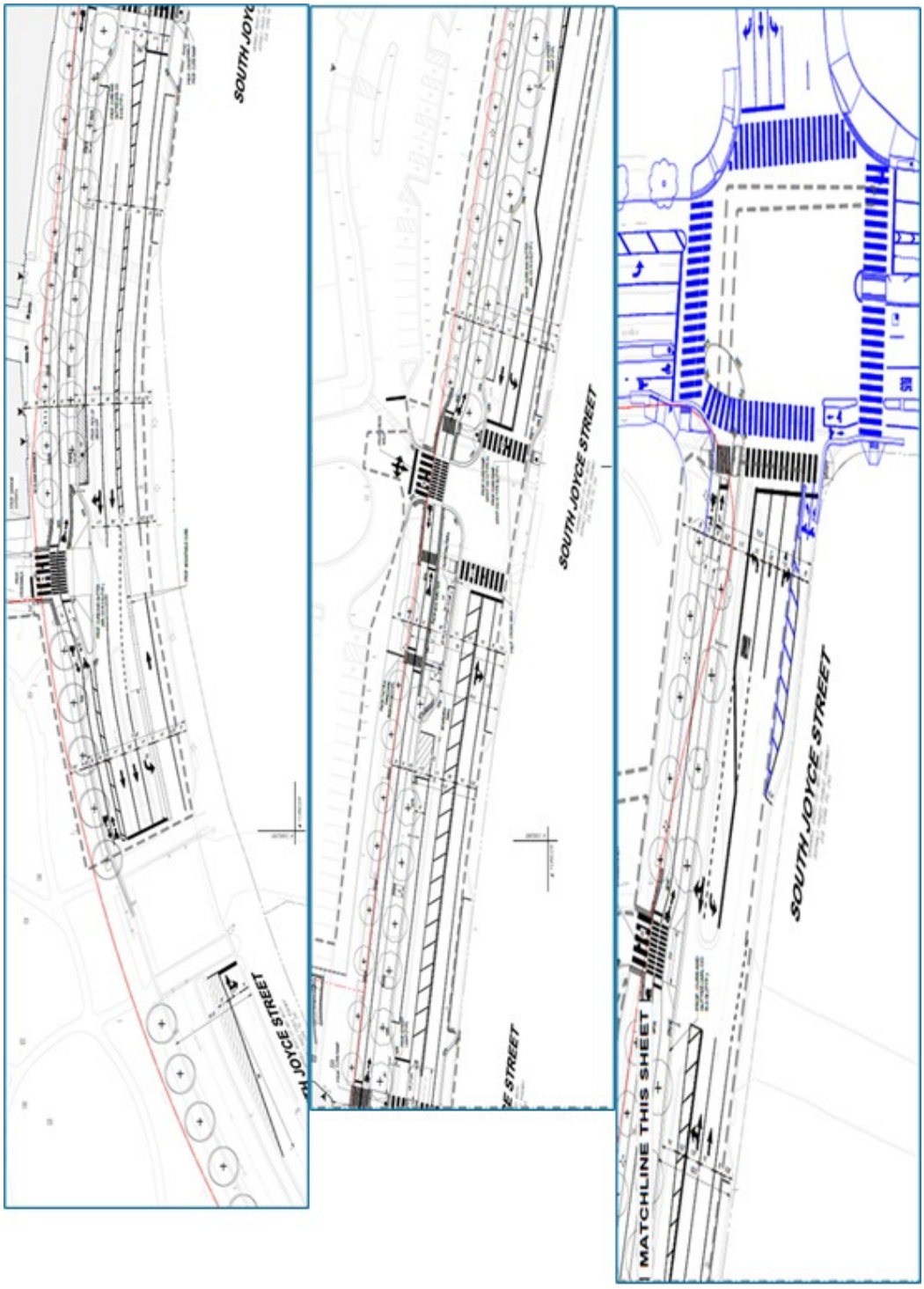


Figure 18: Redesigned S. Joyce St. (from N1 Site Plan, Sheets 500N-504N)



The detailed design for S. Joyce St. as submitted in the site plan for Building N1 is shown in Figure 18.

Existing S. Joyce St. includes marked pedestrian crossings at an unsignalized intersection with a RiverHouse driveway (intersection #5 in Table 3 and on Figure 21). The road diet included in the PDSP eliminates that driveway and provides a marked pedestrian crossing connecting directly to the Pentagon Row Plaza. Figure 44 and Figure 45 show that the existing crosswalk sees some 99 people cross on foot in the morning peak hour and 170 in the evening peak hour. New development will create additional walking trips that may warrant consideration of this crossing for controls such as warning signs, rectangular rapid flashing beacons (RRFB), or HAWK signals. However, the road diet also significantly narrows the crossing distance from the current 56′ (across 4 lanes of moving vehicle traffic and 2 bike lanes) to three short crossing segments of 12′ (across 2 bike lanes), 12′ (across 1 vehicle lane), and 16′ (across 1 vehicle lane and 1 bike lane), separated by protected median refuges. Safer crossing and slower vehicle speeds may make additional treatments unnecessary.

Realignment of S. Joyce St. Neighborhood Local Segment

At the intersection of S. Joyce St. with 15th St. S., S. Joyce St. continues running north/south while 15th St. S. runs east/west. A southbound traveler wishing to remain on S. Joyce St. must make a right turn, while a westbound traveler on 15th St. S. must make an unprotected left. Northbound travelers on S. Joyce St. must make an unprotected left to continue on S. Joyce St. past 15th St. S. The segment of S. Joyce St. south of 15th St. S. has a very different character than described above. Its cross-section includes one travel lane in each direction, and on-street parking in segments.

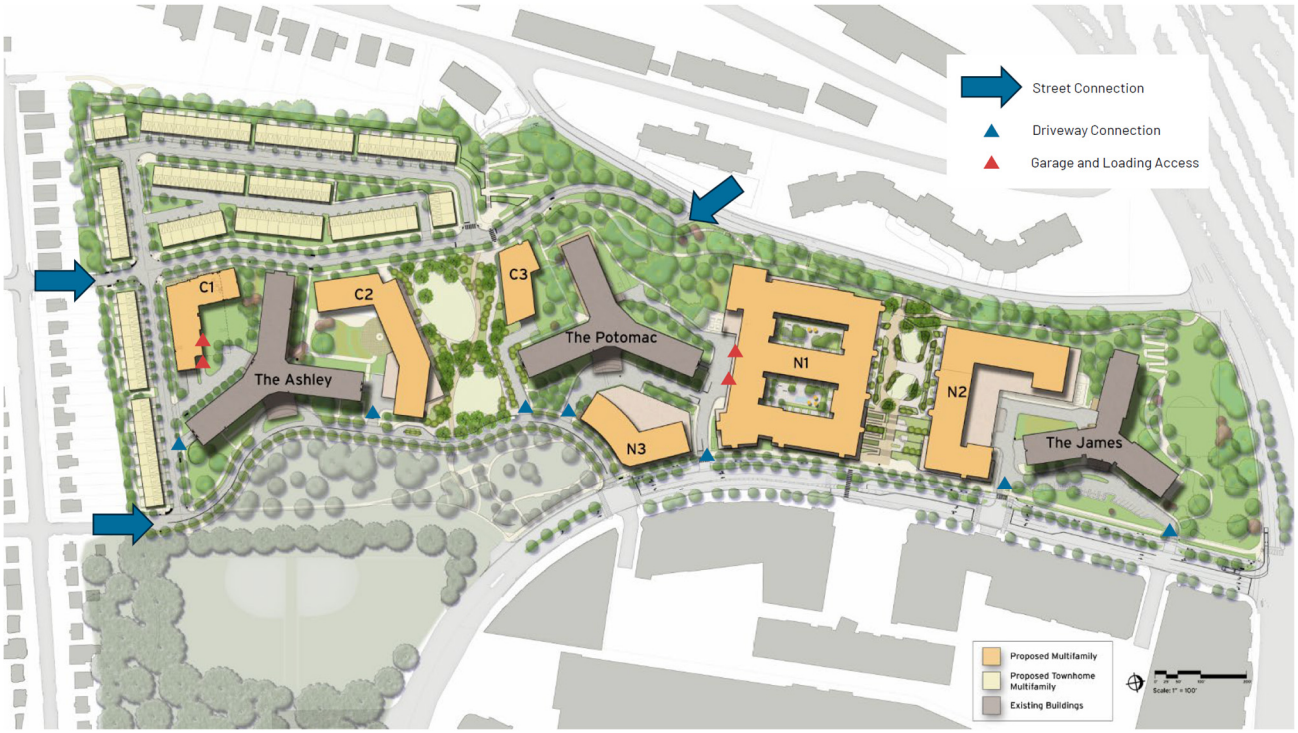
Arlington County requested the relocation of this segment to connect at the current signal at Grace Murray Hopper Park, where a driveway that connects from the east could be a future segment of 14th St. S. The RiverHouse PDSP reflects this relocation, allowing for an expanded Virginia Highlands Park. The resulting street maintains its function as a Neighborhood Local, with one travel lane in each direction and on-street parking in segments.

Loading

The PDSP documents that loading will be provided within existing and new buildings, and will be accessed from site driveways. Loading details are addressed in the 4.1 site plan submissions. Figure 19 depicts street connections, driveway connections, and garage/loading access locations for the RiverHouse PDSP. Loading access for site plan Building N1 comes from a site driveway connecting to S. Joyce St. Loading access for site plan Building C1 comes from a site driveway connecting to the new 15th Rd. S., which itself connects to S.

Joyce St. and S. Kent St. Loading access to site plan Landbay S buildings is via individual garages as well as streets and driveways within the site.

Figure 19: Site Access for Vehicles and Loading



Parking

The existing RiverHouse site provides 1,820 vehicle parking spaces, of which 1,491 are located in surface lots. Redevelopment proposed in the RiverHouse PDSP will replace most of the surface lots and the existing garage between the James and Potomac towers. Vehicle parking for full PDSP development is provided throughout the site, as described in Table 1.

- On Landbay S, 772 surface parking spaces are being replaced by 132 townhouse multifamily residential units with 214 garage/tandem spaces and 26 on-street spaces.
- On Landbay C, 259 surface parking spaces will be replaced by 793 multifamily residential units served by 326 parking spaces in underground garages. The new underground garages in Landbay C will also provide 113 spaces partially replacing the surface lots that currently serve the Ashley tower.
- On Landbay N, 501 existing spaces in surface lots and a two-level garage will be replaced by 1,865 multifamily residential units and 15,000 square feet of retail space, served by 808 parking spaces in new underground garages. The new garages will also

provide 266 spaces partially replacing the garage and surface parking that currently serves the James and Potomac towers.

Access points to the site and to garages for Landbay S, Building C1, and Building N1 are indicated in Figure 19. Vehicle parking by site plan is detailed in the Site Plans section above but summarized as:

- Landbay S: 214 garage spaces for 132 units (1.62/unit)
  - Plus 26 on-street spaces for visitors
  - New buildings and streets replace 772 surface parking spaces
- Building C1: 48 spaces for 102 units (0.41/unit + visitors)
  - Building replaces 44 surface parking spaces
- Building N1: 512 garage spaces
  - 265 garage spaces for 509 units (0.50/unit + visitors)
  - Plus 32 garage spaces for 15,000sf retail (2.15/1000sf)
  - Plus 215 garage spaces to replace existing parking, available to all RiverHouse
  - Plus 14 on-street spaces on rebuilt S Joyce St
  - Building replaces 256 surface parking spaces

Bicycle and Pedestrian Facilities

S. Joyce St. adjacent to the RiverHouse site is proposed to be redesigned to provide ample and attractive space for walking and safe rolling, as described in the previous section on Adjacent Roadways. Other site boundaries including Army Navy Dr. and S. Lynn St. are proposed to remain as-is. Internal streets are designed with ample sidewalks and other features to ensure low vehicle speeds and thereby support a safe and attractive environment for walking and biking.

Bike parking is provided throughout the site, as shown in Table 2 and detailed in the 4.1 site plans. Each building in Landbays C and N is providing secure, convenient indoor bike storage meeting code requirements of 1 space per 2.5 residential units, 1 space per 50 residential units for visitors, and 1 space per 2 employees.

Table 2: Proposed Bicycle Parking Quantities and Locations (Source: PDSP Submission, Sheet G-005)

Bicycle Parking Provided - PDSP						
Use			Units or Sq Ft	Ratio	Proposed Spaces	
Residential	New Development	C1 Resident	102	1 space/2.5 units	46	
		C1 Visitor		1 space/50 units	3	(Outdoor Racks, Class III)
		TH / Stacked Flats	132	**		
		TH / Stacked Flats Visitor		1 space/50 units	3	(Outdoor Racks, Class III)
		N1 Resident	509	1 space/2.5 units	204	
		N1 Visitor		1 space/50 units	11	(Outdoor Racks, Class III)
	Future Buildings*	C2*	366	1 space/2.5 units	147	
		C3*	325	1 space/2.5 units	130	
		N2*	871	1 space/2.5 units	349	
		N3*	485	1 space/2.5 units	194	
Retail	New Development	N1 Retail	14,793 sq. ft.	2 space/10,000 SF	3	(Outdoor Racks, Class III)
		N1 Retail Employee		1 space/25,000 SF	1	
	Future Buildings*	N2 Retail*	4,000 sq. ft.	2 space/10,000 SF	2	(Outdoor Racks, Class III)
		N2 Retail Employee*		1 space/25,000 SF	1	
Total					1,094	

*Density statistics to be confirmed in connection with forthcoming Site Plan Applications
** TH Garages can accommodate bikes

Curbside Management

The S. Joyce St. frontage presents the major curbside management challenge for the RiverHouse site. The proposed redesign of S. Joyce St. north of 15th St. S. to be a more full-featured complete street puts more demands on the curb than the current regime of on-street parking and two bus stops requires. The new S. Joyce St. will have multiple layers of curbs: adjacent to the sidewalk will be a buffered, protected two-way cycletrack, beyond which will be a mix of on-street parking, turn lanes, and bus stops, depending on the location. The current 32 on-street parking spaces on the west side of S. Joyce St. will be replaced by 18 new spaces, with parking restrictions set by the County. Additional curb spaces in front of the retail use are set aside for pickup and drop-off. For more detail, see the design in Appendix B and the Building N1 site plan.

The southern segment of S. Joyce St. will be narrowed and relocated closer to existing RiverHouse buildings to expand Virginia Highlands Park and contiguous Grace Hopper Park. This segment will be delivered with future PDSP buildings and will replace approximately 42 existing on-street parking spaces (on both sides) with 19 on the west side of the narrower street.

Landbay S provides 26 on-street parking spaces on newly constructed streets, approximately 2 on the extension of 15th Rd. S. near the southwest corner of the site, and 24 on the new street parallel to extended S. Kent St. to the west. These spaces are intended to be reserved for visitors to the RiverHouse Neighborhood.

Scope and Limits of the Study Area

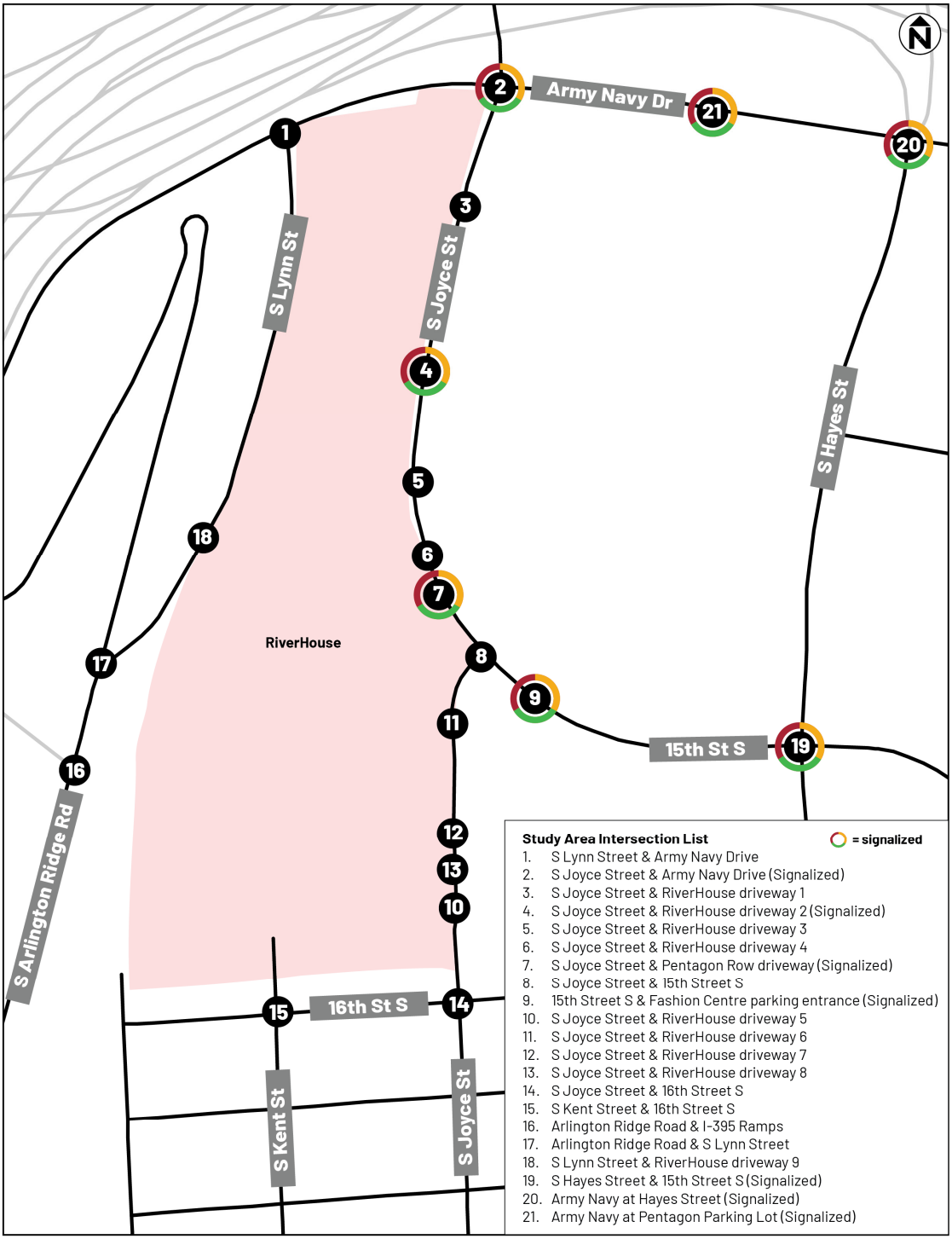
The study area for analyzing transportation impacts is generally bounded by S. Hayes St. to the east, I-395 to the west, Army-Navy Dr. to the north, and 16th St. S. to the south. The multimodal study area is depicted in Figure 20 and includes the study intersections listed in Table 3 and shown in Figure 21.

Table 3: Study Area Intersections

Number	Cross Streets	Signalized?
1	S Lynn St & Army Navy Dr	No
2	S Joyce St & Army Navy Dr	Yes
3	S Joyce St & RiverHouse driveway 1	No
4	S Joyce St & RiverHouse driveway 2	Yes
5	S Joyce St & RiverHouse driveway 3	No
6	S Joyce St & RiverHouse driveway 4	No
7	S Joyce St & Pentagon Row driveway	Yes
8	S Joyce St & 15th St S	No
9	15th St S & Fashion Centre parking entrance	Yes
10	S Joyce St & RiverHouse driveway 5	No
11	S Joyce St & RiverHouse driveway 6	No
12	S Joyce St & RiverHouse driveway 7	No
13	S Joyce St & RiverHouse driveway 8	No
14	S Joyce St & 16th St S	No
15	S Kent St & 16th St S	No
16	Arlington Ridge Rd & I-395 Ramps	No
17	Arlington Ridge Rd & S Lynn St	No
18	S Lynn St & RiverHouse driveway 9	No
19	S Hayes St & 15th St S	Yes
20	Army Navy Dr @ Hayes St	Yes
21	Army Navy Dr @ Fashion Centre parking entrance	Yes

Figure 20: Development Site and Multimodal Study Area

Figure 21: Study Area Intersections



Data Sources

Sources of data for this study include Arlington County, the Virginia Department of Transportation (VDOT), the Institute of Transportation Engineers (ITE) Trip Generation, 11th Edition, National Household Travel Survey (NHTS), and the office files and field reconnaissance efforts of Nelson\Nygaard Consulting Associates.

3. BACKGROUND

This chapter reviews the existing conditions of the transportation network surrounding the site and includes an overview of the site location, including a summary of the major transportation features of the area and of future regional projects. Detailed attributes of the various modes operating within the study area will be highlighted in the following chapters.

The following conclusions are reached within this chapter:

- The site is surrounded by an extensive regional and local transportation system that will accommodate the existing and new residents of the proposed development.
- The site is well served by public transportation with access to the Metrorail's Blue and Yellow lines, the VRE, and several local and regional bus lines.
- The site is surrounded by a well-connected pedestrian environment. In the vicinity of the site, sidewalks generally meet standards recommended by the Arlington County Master Transportation Plan with some gaps in the system.
- The site has access to several on- and off-street bicycle facilities, including bicycle lanes on S. Eads St., 12th St. S., S. Hayes St., 15th St. S., 18th St. S., and S. Bell St., which connect to the Mt. Vernon Trail to the east and Four Mile Run Trail to the south. Capital Bikeshare stations are located on S. Joyce St. across from Landbay N (16 bikes/docks) and on S. Joyce St. across from Landbay S (15 bikes/docks).
- A reconfiguration of S. Joyce St. is proposed as part of this project. It includes construction of a two-way cycle track on the west (RiverHouse) side of S. Joyce St. from Army Navy Dr. to 15th St. S., and the relocation of S. Joyce St. from its intersection with 15th St. S. to the southern end of RiverHouse.
- Several local initiatives will positively impact the study area, including the S. Eads St. Complete Street project, Army Navy Dr. Complete Street and PBL Missing Link projects, the 12th St. S. Complete Street project, S. Arlington Ridge Rd. & S. Lynn St. Safety Improvements, the 15th St. S. Complete Street project, and the Route 1 Multimodal Improvements Study.

Current Transportation Context

Regional Access

The proposed development site offers easy access to local vehicles and transit-based transportation choices that connect it to locations in Virginia, the District of Columbia, and Maryland, as illustrated in Figure 2. Several major thoroughfares, including VA-27 (Washington Boulevard), VA-244 (Columbia Pike), Route 1 (Richmond Hwy), and VA-110, lead

to the RiverHouse neighborhood. The arterials establish connections to the Capital Beltway (I-495) and I-95, as well as to I-395, I-66, and George Washington Memorial Parkway. Vehicular access closer to the site is provided by minor arterials, collectors, and local roads.

The Pentagon City Metro Station (4 to 9-minute walk), Pentagon Metro Station (18-minute walk), and Crystal City Metro Station (21-minute walk) are all accessible to the location and provide access to the Blue and Yellow Lines, which link to locations in Virginia, the District of Columbia, and Maryland. Both lines provide access to the central area of Pentagon City: the Blue Line connects Springfield, Virginia, with Largo, Maryland, while the Yellow Line connects Huntington, Virginia, with Greenbelt, Maryland. Both lines link to the Red Line, which runs directly to Union Station, a center for commuter train services including Amtrak, MARC, and VRE in addition to all other Metrorail lines, giving access to much of the Washington, DC metropolitan region. The Crystal City VRE station is a 9–17-minute metro ride, 8-minute bike trip, or 18-minute walk from the RiverHouse site.

The Mount Vernon Trail is approximately 1 mile from the RiverHouse site. It is an 18-mile off-street bicycle route that runs beside the Potomac River from George Washington's Mount Vernon residence to Theodore Roosevelt Island, and it is just across the river from downtown Washington, DC. Rosslyn and the District can be reached by bicycle thanks to the Mount Vernon Trail's connections to the W&OD, Four Mile Run, and Custis Trails in Arlington County and the Capital Crescent Trail in Washington, DC. A thorough analysis of the current bicycle infrastructure is presented om the Walking and Rolling chapter of this MMTA.

Overall, the location is highly accessible via a number of local street, highway, public transportation, and cycling choices, creating simple trips for traveling within and throughout Virginia, the District of Columbia, and Maryland.

Local Access

Figure 22 illustrates the numerous local transportation alternatives that accommodate driving, bus, walking, and bicycle trips. A local street network comprised of several small arterials and collectors, such as S. Arlington Ridge Rd., Army Navy Dr., S. Joyce St., S. Hayes St., and 23rd St. S., serves the site in addition to a number of major arterials.

The site is accessible by several bus services, including links to a number of Virginia neighborhoods, the District, and additional Metro stations. Existing cycling facilities, including connections like the Mount Vernon Trail and 14th Street Bridge path, connect the site to regions within Arlington, Virginia, and the District. Bike lanes exist on S. Eads St., S. Joyce St. and Army Navy Dr., and those facilities are being expanded and improved. A detailed review of existing and proposed bicycle facilities and connectivity is provided in a later chapter of this report.

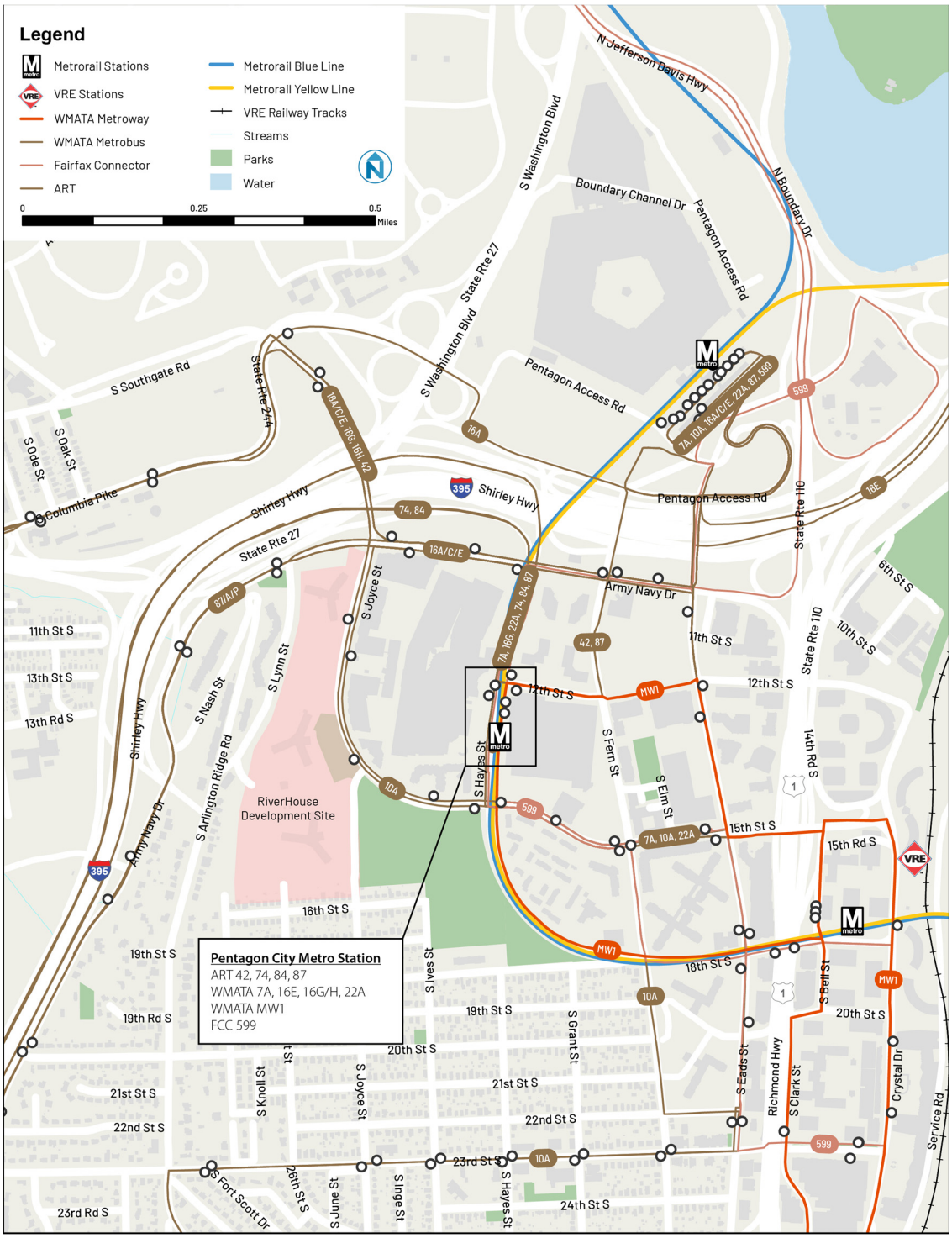
Figure 23 illustrates walking paths to key neighborhood destinations including the Metro station (for rail and most bus service) and the local branch of Arlington Public Library.

Predicted pedestrian routes offer well-connected pedestrian facilities, such as those to public transportation stops, retail areas, nearby residential areas, and community amenities. A detailed review of existing and proposed pedestrian access and infrastructure is provided in a later chapter of this report. Any pedestrian facilities adjacent to the site found to be non-compliant with the latest ADA standards will be brought into compliance with construction of the proposed site plans and PDSP.

Figure 24 shows the nearby locations of shared mobility opportunities including Capital Bikeshare and carsharing. Other shared mobility providers including Bird, Lime, and Spin, along with Capital Bikeshare provide over 1000 available vehicles in Arlington at typical times, per Arlington's Ride Report.

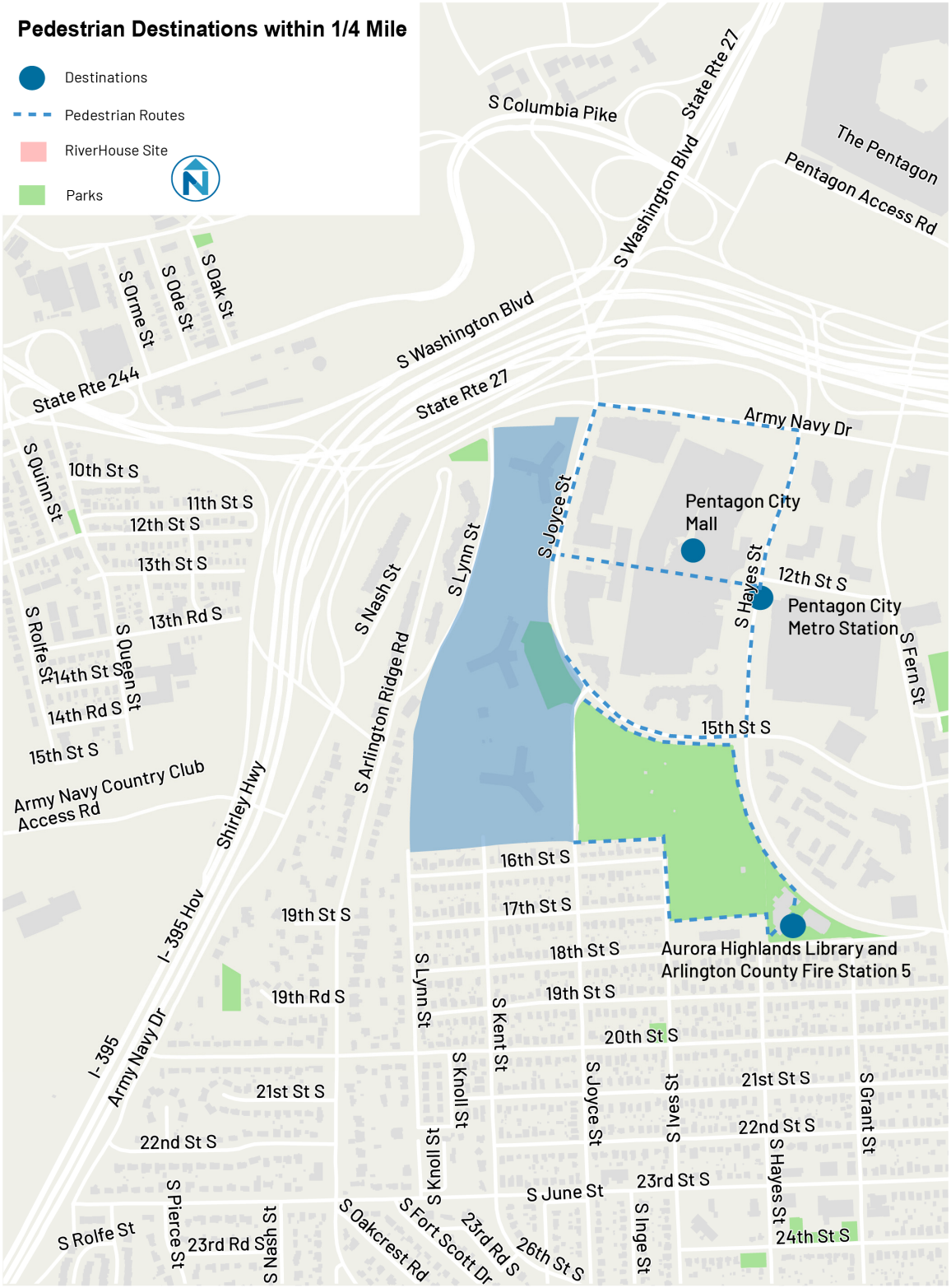
In general, the site is surrounded by a well-connected local transportation network that makes multi-modal transportation possible.

Figure 22: Study Area Local Transportation Facilities



**Other bus routes in the vicinity that exclusively serve The Pentagon or Crystal City and do not serve the RiverHouse site were omitted from this map*

Figure 23: Pedestrian Destinations within 1/4 Mile of RiverHouse



Capital Bikeshare

Capital Bikeshare serves the region with more than 6000 shared bikes and ebikes at over 700 stations in seven jurisdictions including Arlington. Riders can access bikes as a single use, daily pass, or annual membership. Seven Capital Bikeshare stations are located within a half-mile of the RiverHouse site, as described in Table 4.

Table 4: Capital Bikeshare Stations

Location	No. of Bikes/Docks
1. Pentagon Row Plaza (opposite Landbay N)	16
2. Army Navy Dr. and S. Nash St.	11
3. S. Joyce St. and S. 16th St.	16
4. Aurora Hills Community Center	12
5. Pentagon City Metro	18
6. Army Navy Dr. and Fern St.	15
7. S. 23rd St. and Hayes St.	15

Mobility Corrals

Arlington County has installed more than 100 bicycle and scooter parking corrals as a safe place for people to park micromobility devices upright and out of the way of pedestrians. There are five (5) micromobility corrals within a half-mile of the RiverHouse site. These locations are listed in

Table 5: Mobility Corrals

Location
1. S. Joyce St. and Pentagon Row
2. Pentagon City Metro
3. S. Fern St. and S. 12th St.
4. S. Fern St. and S. 13th St.
5. 23rd St. and S. Hayes St.

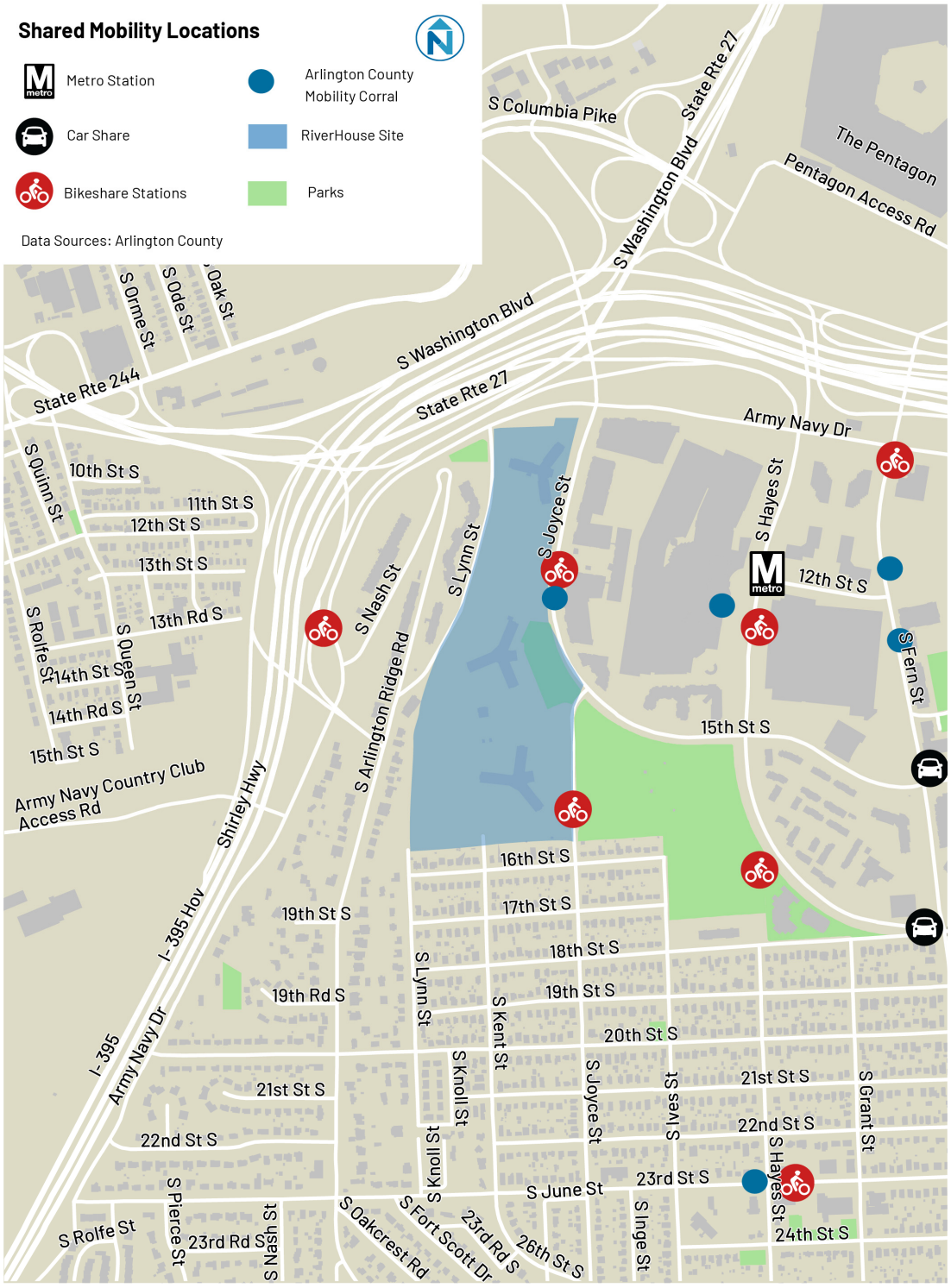
Car Sharing

Arlington allows two forms of car-sharing: reserved-space car-sharing and free-floating car-share. ZipCar, a private company that provides registered users access to a variety of automobiles, provides reserved-space car-sharing service in Arlington. Zipcar has designated spaces for their vehicles. Two (2) Zipcar locations are currently located within a half-mile of the site. These locations and the number of available vehicles are listed in Table 6. Free2Move is the only free-floating car-share operator in Arlington. Arlington awarded Free2Move a free-floating car-share contract in March 2025. Free2Move vehicles are identified with a free-floating program sticker and are allowed to park for free in metered spaces and in Residential Parking Permit zones without a permit.

Table 6: Car Share Locations

Location	No. of Vehicles
1. 1480 S. Fern. St.	2
2. 1800 Richmond Hwy	2

Figure 24: Shared Mobility Locations



Shared Micro-Mobility Devices

Three shared micro-mobility companies provide “dockless” Shared Mobility Device (SMD) service in Arlington County: Bird, Lime, and Spin. The devices are provided by private companies that give users access to a variety of e-scooter and e-bicycle options. While operators are encouraged to deploy devices in a corral if there is enough room, riders are encouraged to end trips at corrals but are not required to do so. All riders must end trips and park safely and courteously. The operator fleet sizes based on the County’s 2022 fleet cap are shown in Table 7.

Table 7: Shared Micro-Mobility Devices Fleet Size

Operator Name	E-Scooter Fleet Allocation	E-Bike Fleet Allocation
Bird	600	150
Lime	600	205
Spin	400	150
Total	**1,600**	**505**
Current Permit Cap	**2,000**	**1,000**

Walk and Bike Access

The website Walkscore.com rates locations based on proximity to useful destinations and ease of access to them by walking. Destinations include retail and other uses but also quality bike connections and transit services. RiverHouse currently has a walk score of 88 (or "Very Walkable"), a transit score of 75 (or "Excellent Transit"), and a cycling score of 88 (or "Very Bikeable"). Figure 25 and Figure 26 illustrate heat maps for walkability and bikeability.

The study area is considered “Very Walkable” because of the availability of neighborhood-serving retail establishments in the area that allow for multiple errands to be accomplished in one day by foot. The study area is considered to have “Excellent Transit” because of Metrorail, Metrobus, and ART bus access along S. Joyce St. and at the Pentagon City Metro station. The study area is considered “Very Bikeable” because of its proximity to numerous bicycle lanes and trails, low traffic roads, and generally flat topography to the south, east, and north.

Figure 25: Walk Score Heat Map (*WalkScore.com*)

Figure 26: Bike Score Heat Map (*WalkScore.com*)

Future Mobility Priorities

Arlington County's mobility vision is for a "system that provides equity and access to all users." Six goals support that vision:

- Provide High-Quality Transportation Services
- Move More People Without More Traffic
- Promote Safety
- Establish Equity
- Manage Effectively and Efficiently
- Advance Environmental Sustainability[3]

Arlington County plans to accomplish these goals by implementing the following policies:

- Integrate Transportation with Land Use
- Support the Design and Operation of Complete Streets
- Manage Travel Demand and Transportation Systems[4]

Under these policies come mode specific policies which will be implemented through future projects and initiatives that are planned or already in the works for Pentagon City and Arlington County as a whole.

County-Wide Initiatives[5]

- **Pedestrians:** The County will implement policies with the focus of accommodating intra-county travel. These policies include initiatives focused on enhancing safety, security, pedestrian mobility, and accessibility for marginalized people. Arlington plans to use these policies to increase walking trips while also managing and maintaining pedestrian facilities.
- **Bicycles:** Arlington's bicycle policies will inform the development of bikeways and transportation programs to support bicycling as a mode of transportation within the

[3] Arlington County Master Transportation Plan (MTP) (2017), https://www.arlingtonva.us/Government/Projects/Plans-Studies/Transportation-Plans-Studies/Master-Transportation-Plan, accessed 3/2025.

[4] Arlington County MTP 2017

[5] Arlington County MTP (2017)

County. Arlington plans to complete the bikeway network, incentivize bicycling as a mode of transportation through safety and amenity enhancements. Data will be collected to help improve the maintenance and management of these facilities.

- **Premium Transit Network:** Arlington will institute Premium, Primary, and Secondary Transit Networks (PrTN, PTN, STN) to focus investment on corridors projected to support most of the anticipated future trips. The PrTN and PTN will both support high frequency bus service that provides rides all day. New passenger amenities will be included on the PrTN as well. The STN will serve as the main service for intra-county transit mobility.
- **Metrorail System Capacity Improvements:** New rail cars are being purchased to enable more eight-car trains to fully utilize the station platform capacity and alleviate the capacity issues causing riders to have to let trains pass until they can comfortably enter a car. Additional bus routes are planned to create more "one seat" rides from Arlington County into the District of Columbia. "One seat" rides are trips that eliminate the need for transfers between modes or vehicles. The changes are to be bolstered by planned re-routings of trains in Northern Virginia allowing the system to move more passengers without building new infrastructure.
  In addition, a new infill Metrorail station recently opened in the Alexandria portion of Potomac Yard. This station will serve new development including a Virginia Tech campus and other employment, retail, and recreation opportunities attractive to RiverHouse residents.
- **Station Enhancements and Access Improvements:** Arlington County will implement improvements to Metrorail stations to increase passenger flow and help make the stations more accessible. There will also be a focus on multimodal transportation improvements in the forms of enhancing how pedestrians and bicyclists approach the stations. Improvements consist of better street markings and crossings, widened sidewalks, wayfinding, bicycle lanes, and secure and covered bicycle parking.

4. MULTIMODAL TRANSPORTATION FACILITIES ASSESSMENT

Walking and Rolling

This chapter presents and assesses the existing and planned facilities to support safe, convenient walking and rolling (whether on bikes, scooters, wheelchairs, or other personal vehicles) around the RiverHouse site.

Pentagon City's initial design was not developed with bicycles in mind. S. Hayes St. and S. Joyce St., among other streets, now feature on-street bicycle facilities thanks to street improvements. A protected bike facility and other improvements are under construction along Army Navy Dr, with additional sections to follow as part of the PenPlace redevelopment.[6]

Bike/Pedestrian Existing Conditions

The Pentagon City study area is host to many on-street bike lanes and other bicycle facilities. Regional trails in the vicinity include Arlington's Four Mile Run Trail and the Mount Vernon Trail along the George Washington Memorial Pkwy (which has a direct trail connection to Crystal Dr. in the study area). Other local trails and shared-use paths include the Alexandria Four Mile Run Trail and Nature Path, Potomac Yard Trail along Potomac Ave, Washington Blvd Trail, Route 1 Path south of Four Mile Run, and Long Bridge Park Path. The Crystal City Metro Station has infrastructure supporting travel by bike to ride north to south and east to west of the station. The geography and network of Pentagon City and Crystal City provide more east-west connections, concentrating bicycle volumes on the limited number of north-south facilities. Figure 27 and Figure 28 map existing pedestrian infrastructure and planned improvements, respectively. Figure 29 and Figure 30 show the existing and proposed bike infrastructure, respectively.

[6] Pentagon City Sector Plan 2022

Figure 27: Existing Pedestrian Infrastructure Network

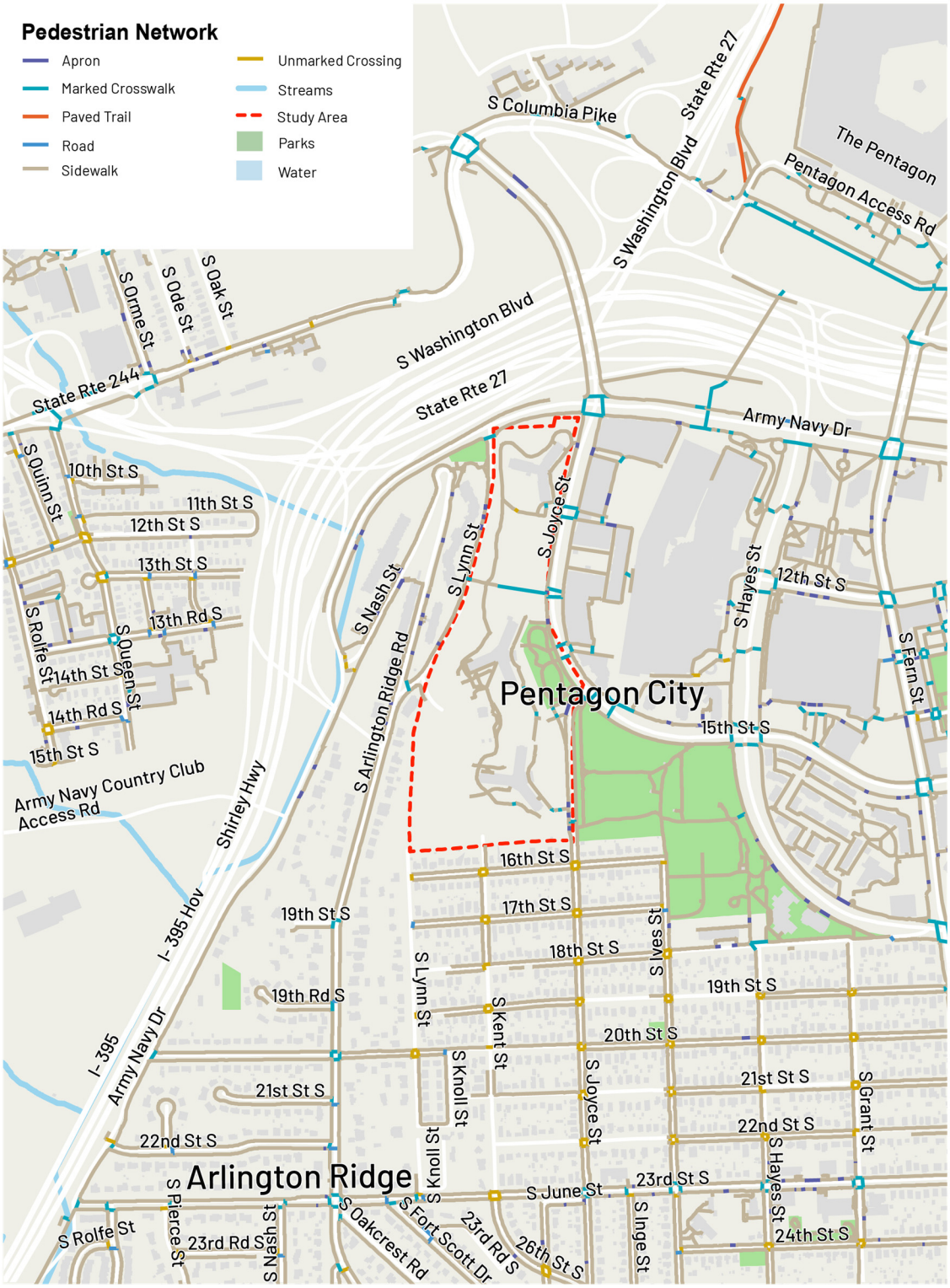


Figure 28: Planned and Proposed Pedestrian Improvements

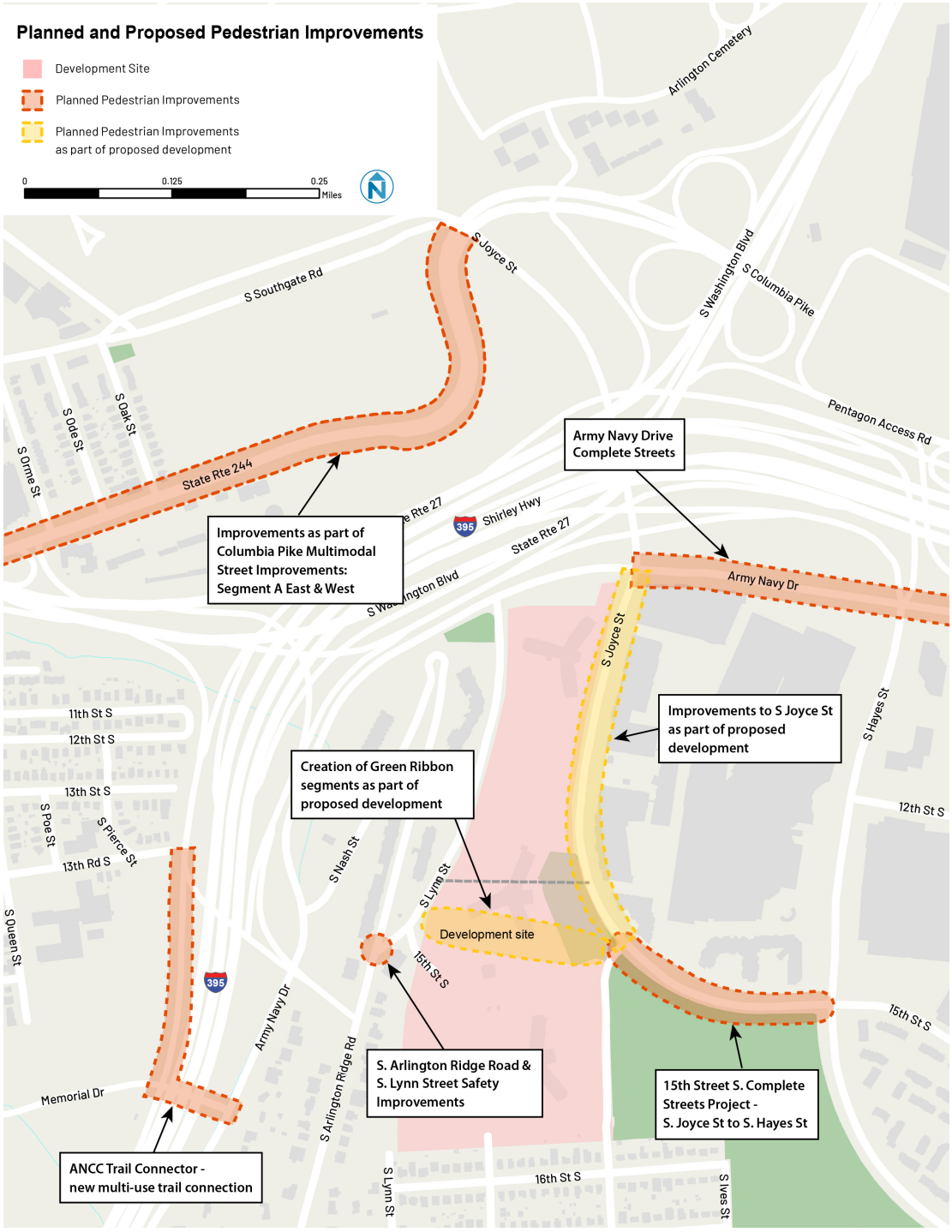


Figure 29: Existing Bike Infrastructure Network

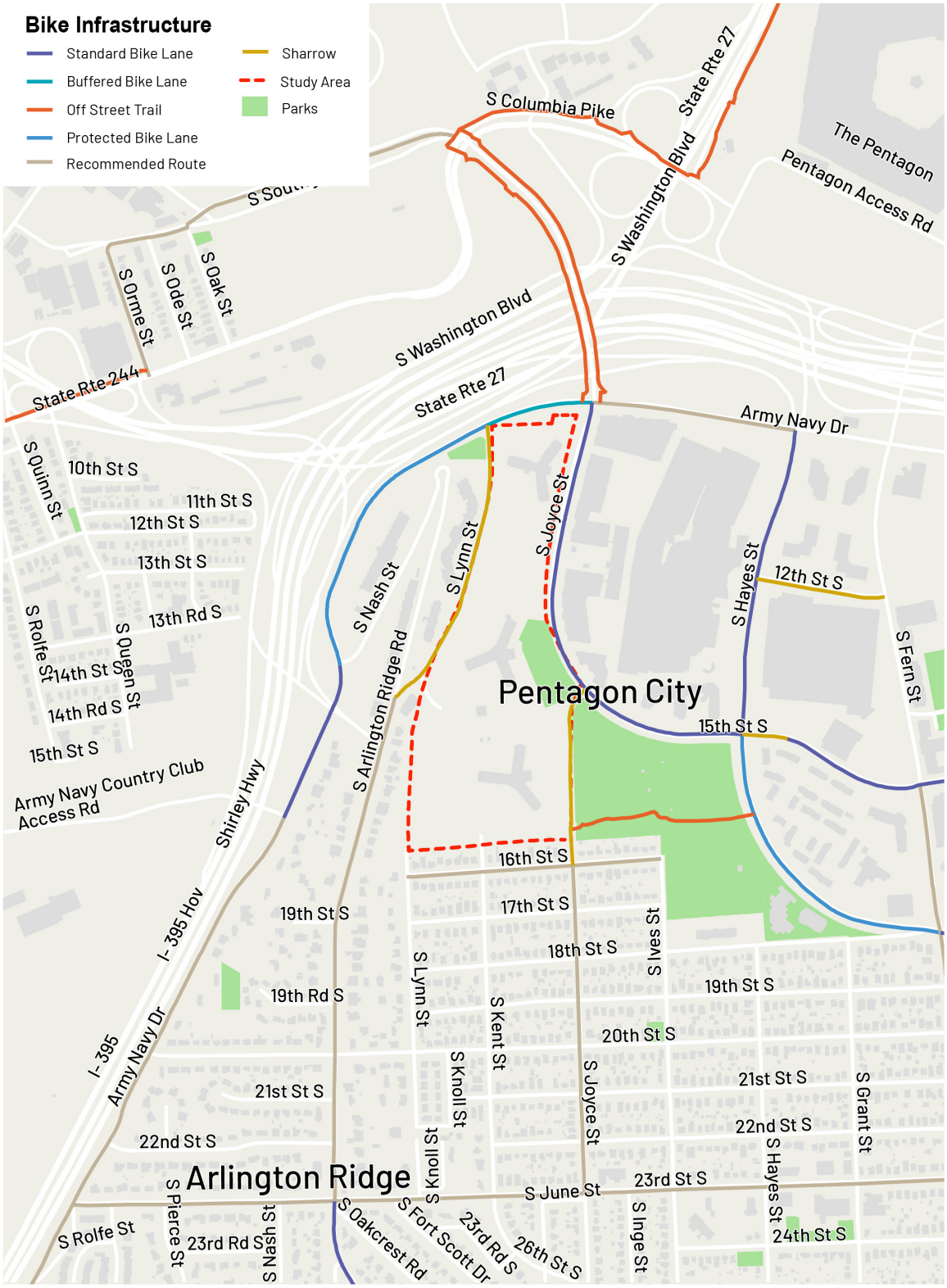
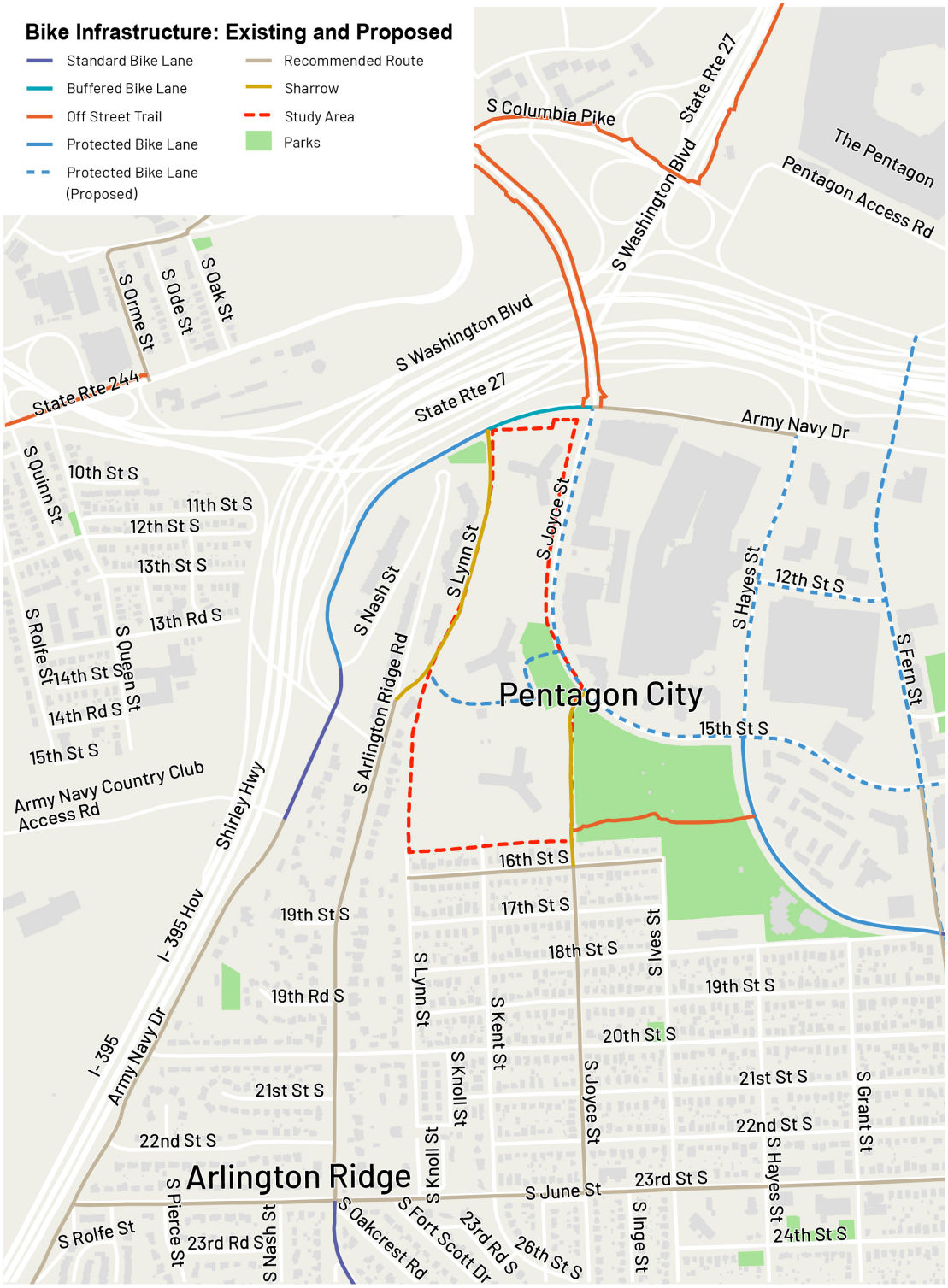


Figure 30: Existing and Proposed Bike Infrastructure Network



According to the 2019 Bicycle Element of Arlington's MTP, the bicycle network consisted of 52 miles of multi-use trails, 29.6 miles of bike lanes, 3.8 miles of buffered lanes, 2.9 miles of protected lanes, 63 miles of on-street routes, and 95 bike share stations in 2018.

Arlingtonians claim safety and comfortability are existing challenges that serve as barriers or hindrances for increased biking. According to the 2017 Public Survey for Bike Element Update, 45% of respondents were concerned for the safety of cycling on streets, 64% wanted more protected bike lanes, and 45% favored an expanded multi-use trail system.[7]

Arlington County has 13 Primary Bicycling Corridors (PBCs) where survey respondents identified them as most frequently used. Seven run north to south and six run east to west. Some of the trails that run north to south and east to west intersect forming a countywide grid of routes. The PBCs near the Pentagon City Study Area include the Mount Vernon Trail (a regional off-street trail east of the study area) and Four Mile Run Trail (a regional off-street trail south of the study area).[8]

Figure 31 shows locations accessible from RiverHouse by walking within 10, 20, and 30 minutes. The analysis assumes that all streets (except highways and ramps) are walkable, regardless of the presence of sidewalks. Figure 32 illustrates locations accessible by biking within 10, 20, and 30 minutes, again assuming all streets are bikeable (except highways, ramps, and paths in Arlington Cemetery). Figure 33, excerpted from the 2024 BikeArlington Comfort Map, shows the "level of comfort" for people biking on streets surrounding RiverHouse and beyond.

[7] MTP Bicycle Element 2019

[8] Pentagon City Sector Plan 2021

Figure 31: Areas Accessible By Walking

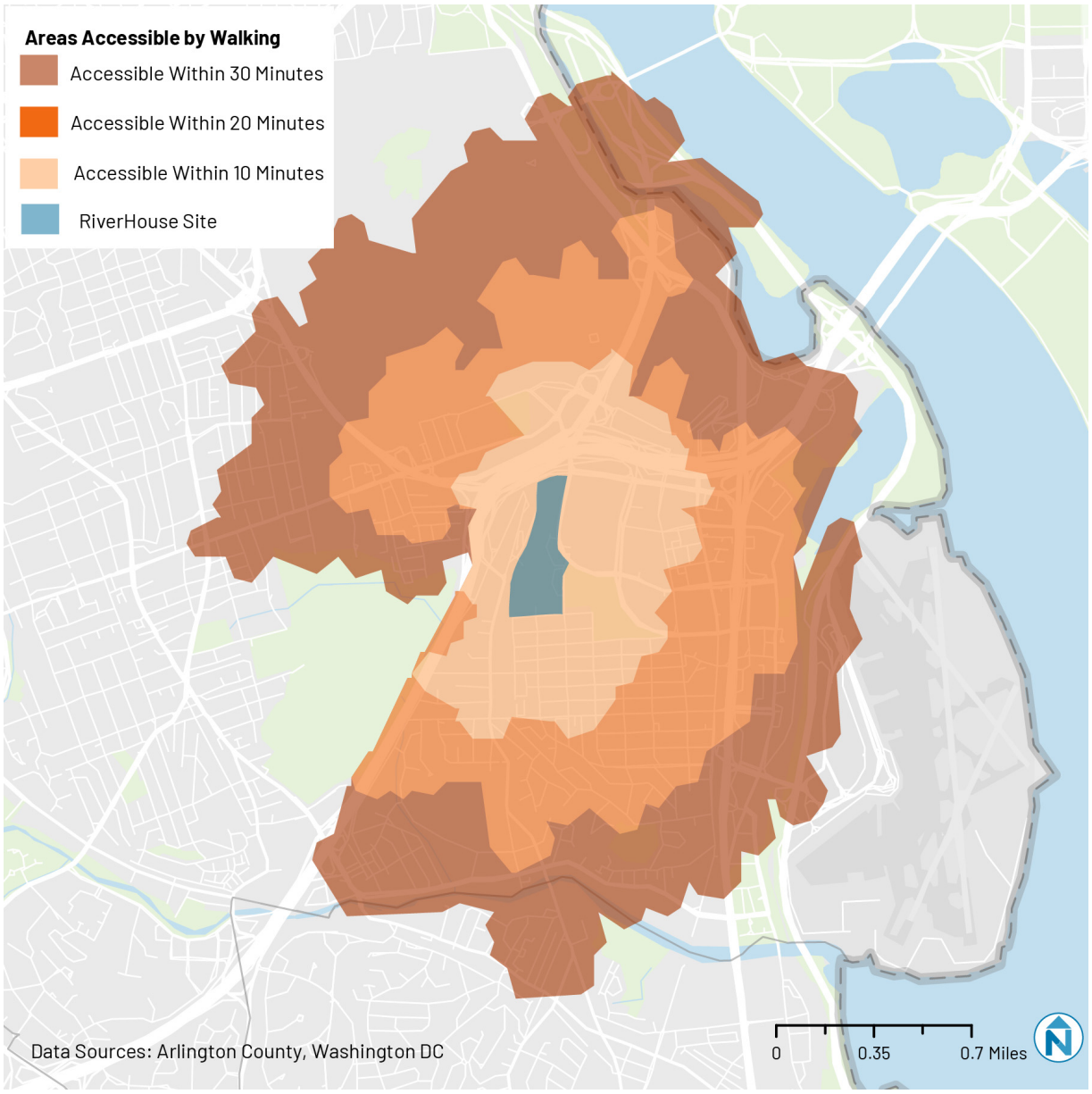


Figure 32: Areas Accessible By Biking

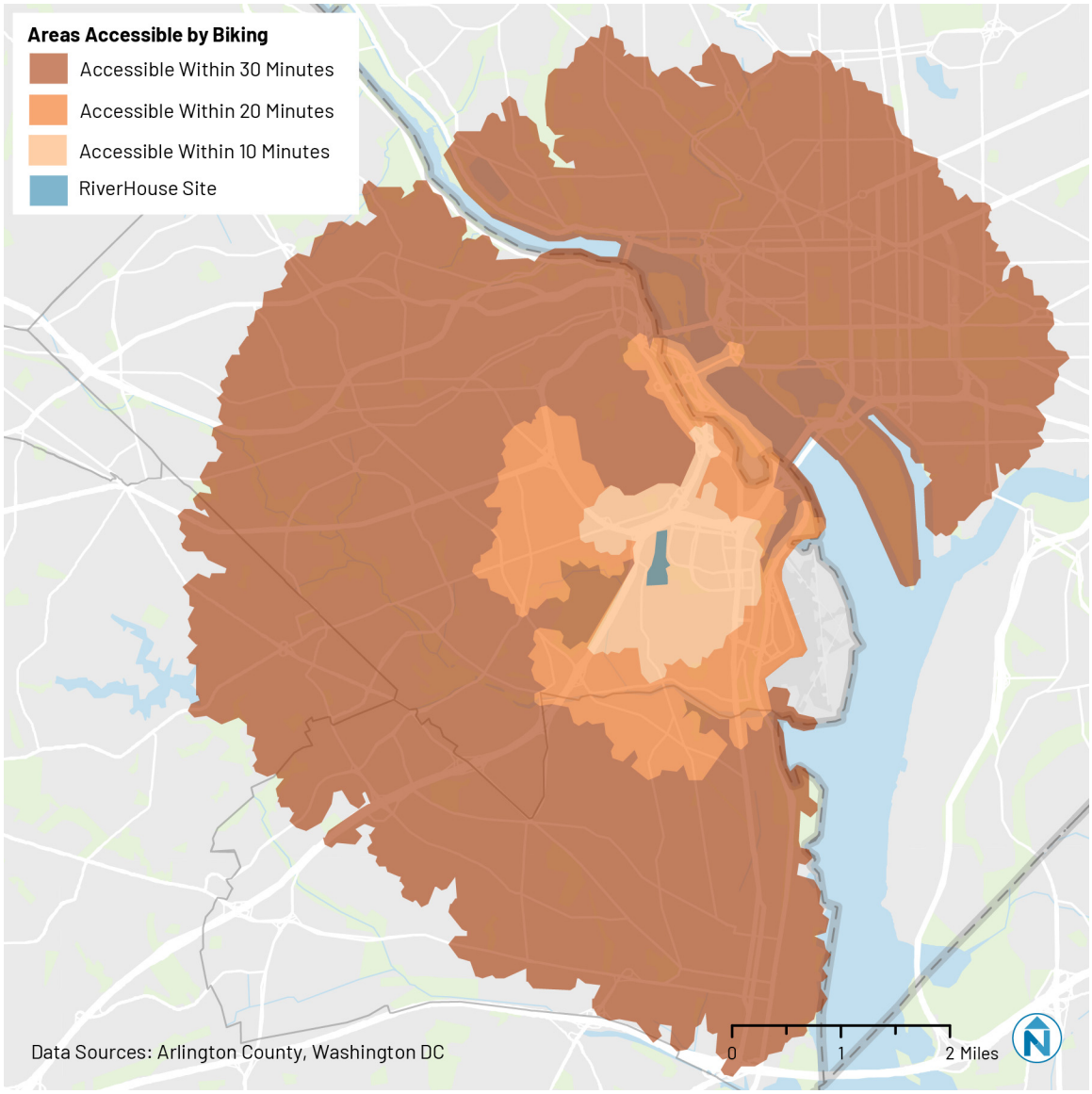
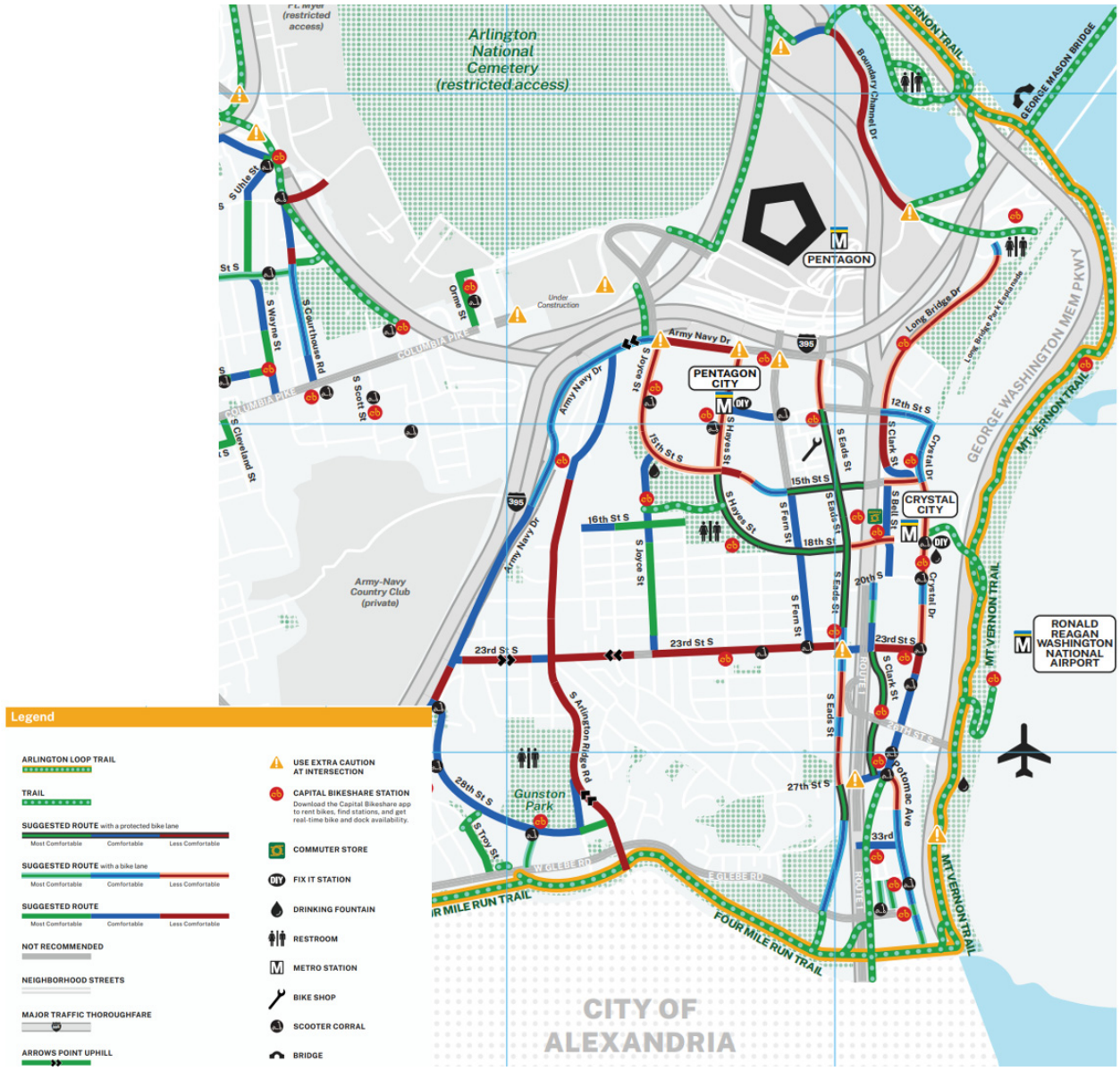


Figure 33: Bicycle Level of Comfort Map (Existing Conditions)



Vision and Goals

The Pentagon City Sector Plan predicts there will be a continued growth trend of people in Pentagon City using bikeshare, scooters, and other micromobility options to get around.

According to the Sector Plan, building-level transportation studies have shown that 79% of trips in Crystal City and Pentagon City are made by non-single occupancy vehicle modes. The Sector Plan states that continuing to build out pedestrian-focused infrastructure will support the continuation of this trend.

Figure 34 and Figure 35 depict the Sector Plan intentions for streets, paths, and bike infrastructure on and near the RiverHouse site.

Figure 34: Street and Path Network (Pentagon City Sector Plan 2022)

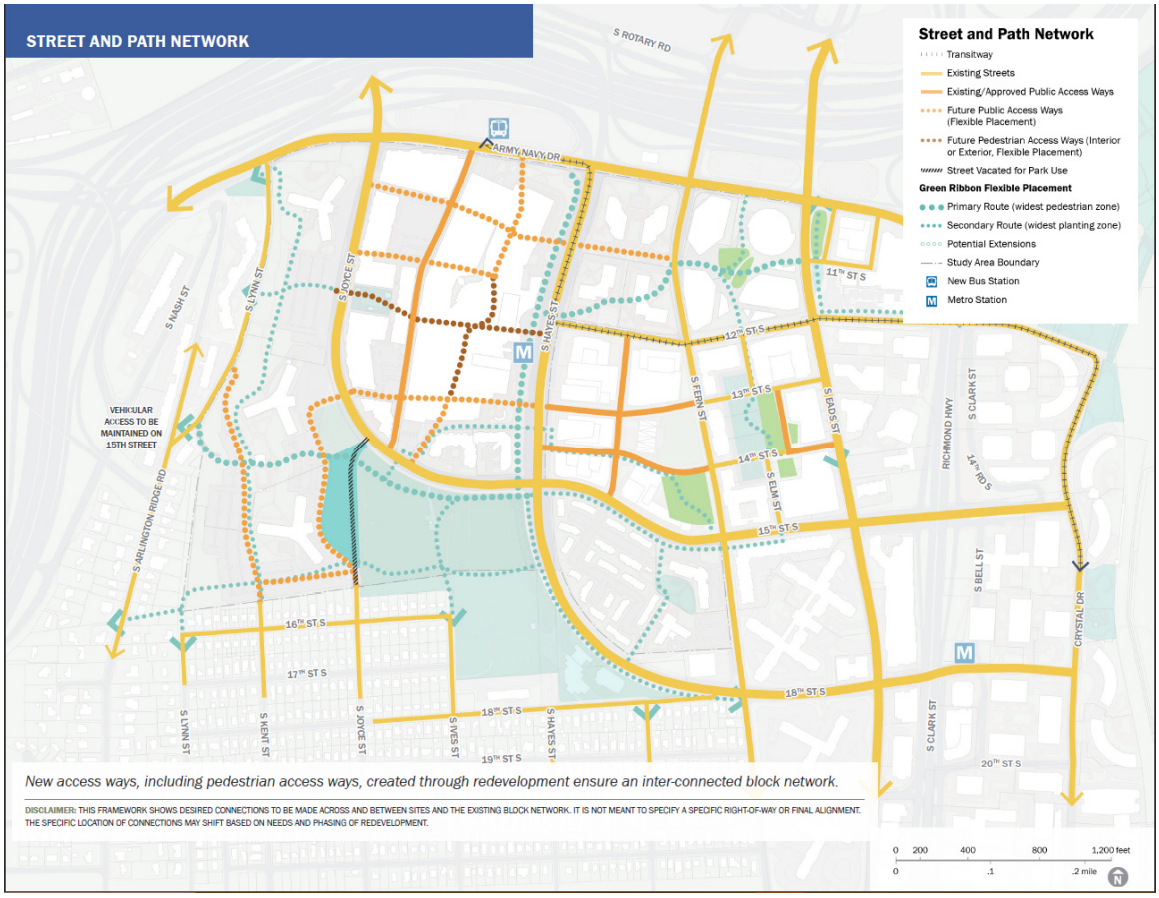
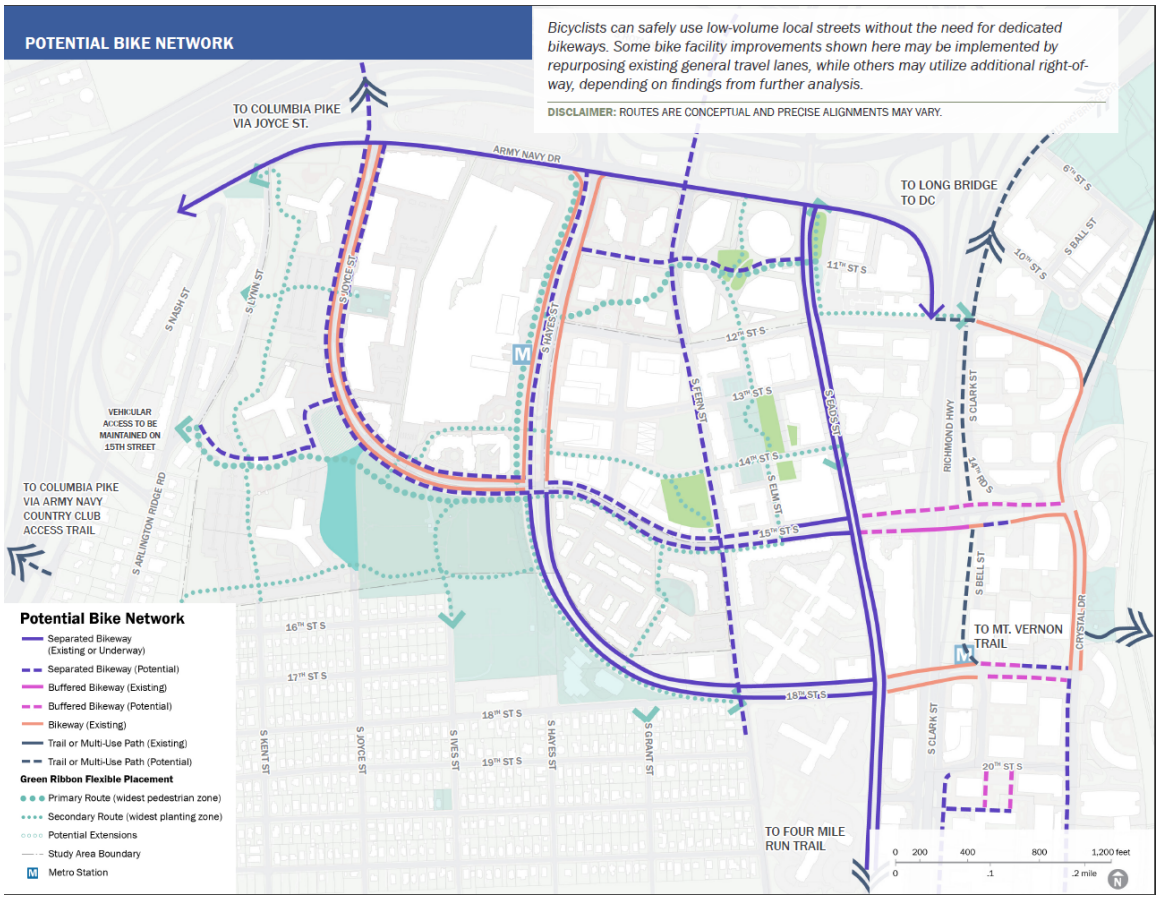


Figure 35: Potential Bike Network (*Pentagon City Sector Plan 2022*)



Arlington County developed a Bicycle Element for the MTP and included the following goals:

- Provide an environment in which people of all ages and abilities can get places by bicycle safely and comfortably.
- Make all of Arlington accessible by bicycle using easy-to-follow, low-stress routes.
- Increase the mode share of bicycle travel, aiming to have the population of persons who bicycle for transportation be demographically reflective of the population of Arlington overall.
- Provide an excellent trail system that serves the needs of people walking and bicycling for transportation and for recreation.
- Properly manage, maintain, and operate the infrastructure that supports bicycling in Arlington.
- Integrate bicycling into an efficient, sustainable, and equitable transportation system.

Planned/Recommended Changes

The improvements proposed by the Arlington County Board in Fall 2021 will support east-west links to Pentagon City with the goal of increasing cycling mode share and comfort in the Pentagon City area.[9] The bicycle network will continue to provide connections to activity centers, Metrorail and VRE, local trail networks, and Washington, DC, as well as Alexandria.

Some planned and under-construction bicycle projects from the Bicycle Element of the MTP and other planning documents that could impact the study area are listed below[10]:

- **Army Navy Dr.**: Reconstruct Army Navy Dr. between 12th St. S. and S. Joyce St. to include a bidirectional protected bicycle lane. This 1.6-mile corridor is currently under construction.[11] An additional phase will fill the "Army Navy Dr. PBL Missing Link" west of S. Joyce St., anticipated to be completed in 2025.[12]
- **Buffered/Protected Bike Lanes**: S. Joyce St. is proposed to be reconstructed as part of the RiverHouse redevelopment to include a two-way protected cycletrack on the west (RiverHouse) side. Separately, the County's "15th St. S. Complete Streets Project" will improve biking and walking conditions between its intersections with S. Joyce St. and S. Hayes St. East of the study area, a combination of fully and partially buffered/protected bike lanes are planned in Crystal City for 15th St. S. and 18th St. S. as well as a pair of protected bike lanes on Crystal Dr. and Clark St./Bell St. These will provide better access to the Mt. Vernon Trail and other regional connections including into DC.
- **Shared-Use Path**: The Green Ribbon defined in the Pentagon City Sector Plan is principally a walking path. It is not intended to be a high-speed trail and will be designed to encourage slower speeds. Parallel bikeways alongside the Green Ribbon are indicated to accommodate higher volumes and speed of bicycle travel in some sections. Sections of the Green Ribbon are proposed to be implemented as part of the RiverHouse redevelopment.
- **Army Navy Country Club Emergency Access Road:** Construct an emergency access street suitable for bicycle and pedestrian use, from the edge of the Hoffman Boston School in the Arlington View neighborhood to Army Navy Drive in the Arlington

[9] Pentagon City Sector Plan (2022).

[10] Pentagon City Sector Plan (2022), https://www.arlingtonva.us/Government/Projects/Plans-Studies/Land-Use/Pentagon-City-Planning-Study, accessed 10/2022.

[11] "Army Navy Drive Complete Street," https://www.arlingtonva.us/Government/Projects/Project-Types/Transportation-Projects/Army-Navy-Drive-Complete-Street, accessed 1/2023.

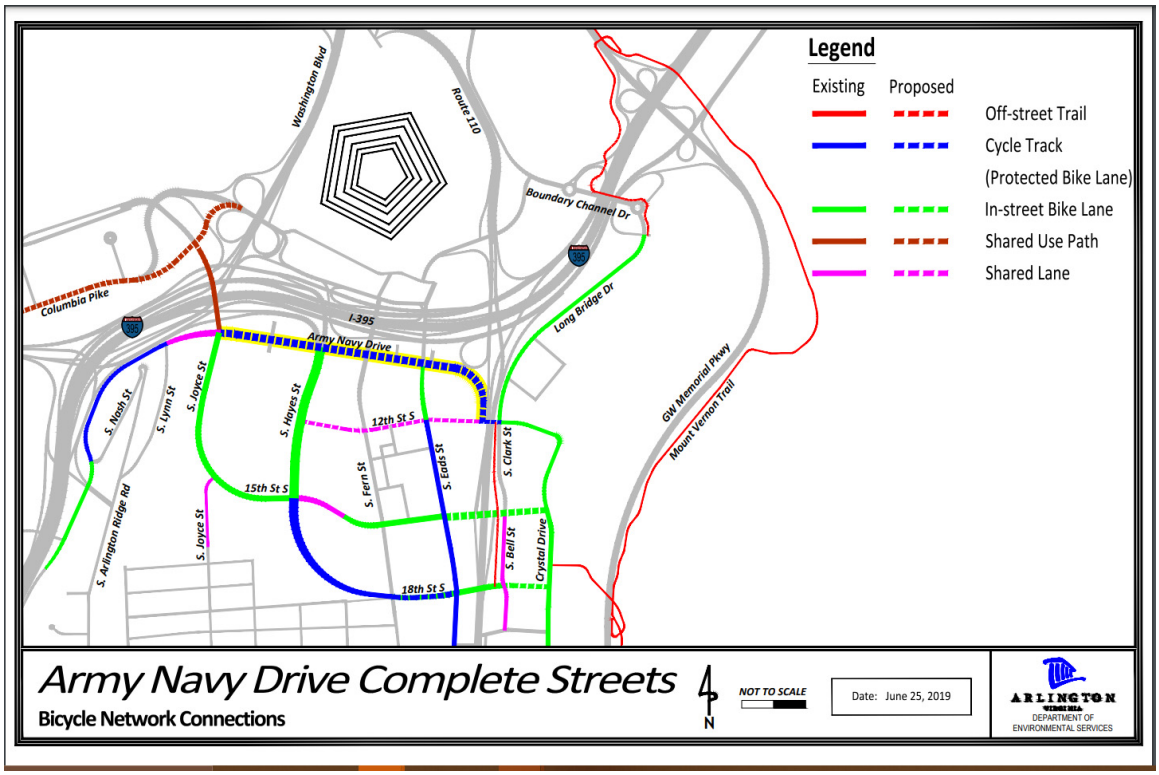
[12] "Army Navy Drive PBL Missing Link," https://www.arlingtonva.us/Government/Projects/Project-Types/Transportation-Projects/Army-Navy-Drive-PBL-Missing-Link, accessed 1/2023.

Ridge/Pentagon City area. The facility will utilize public easement across the country club property and an existing public street underpass of Shirley Highway (I- 395) to enhance north-south access for pedestrians and bicyclists. Initiate construction prior to August 2032 to vest the public easement. (0.7 mile)

- **20th St. S. Bicycle Boulevard:** Develop a bicycle boulevard on 20th St. S., between S. Fern St. and Army Navy Dr., to provide a low-stress bicycling route through the Arlington Ridge and Aurora Highlands neighborhoods and to connect with other bikeways in the Pentagon City area. (0.9 mile)
- **Mount Vernon Trail Widening:** Widen the pavement of the entire Mount Vernon Trail between the Roosevelt Island parking area and Four Mile Run to a minimum 12-foot pavement width. (NPS) (4.8 miles)
- **Four Mile Run Trail Enhancements:** Widen the Four Mile Run Trail pavement to a minimum of 10 feet of paved width where trail usage averages at least 1,000 persons per day and natural features would not be significantly impacted. Undertake spot safety improvements to enhance safety and reduce conflicts between users between Columbia Pike and Shirlington Road including below the George Mason Drive overpass. Incorporate the trail improvements identified in the Four Mile Run Valley – Park Master Plan (1.8 miles)
- **Four Mile Run Bridge:** Construct a bicycle/pedestrian bridge over Four Mile Run to connect S. Eads Street to Commonwealth Avenue and connect the two trails paralleling Four Mile Run on the Arlington and Alexandria sides of the stream. Also identified in the Four Mile Run Restoration Master Plan. (Arlington, Alexandria) (0.2 mile)

Figure 36 shows the Army Navy Dr. protected bike lanes and other existing and then-proposed improvements near the RiverHouse site.

Figure 36: Army Navy Complete Streets Bike Network (*Army Navy Dr Complete Street Open House 2019*)



Transit Facilities and Network

This chapter discusses the existing and planned transit facilities in the vicinity of the site, accessibility to transit, and evaluates the overall transit impacts of the project.

The RiverHouse site is well connected to many local and regional transit options. By walking distance, there are:

- 22 bus stops and 1 Metrorail station within 0.25 miles of the site.
- 53 bus stops and 1 Metrorail station within 0.5 miles of the site.

Figure 22 illustrates the locations of rail stations and bus stops relative to the redevelopment site, as well as the 14 bus routes that serve stops within 0.5 miles of the site.

In terms of multimodal interchanges or transit hubs, Pentagon City Metro Station serves as the closest facility located 0.5 miles to the east of the RiverHouse site. It can be accessed on foot through the Pentagon Row and Pentagon City malls, or around the malls via South Joyce Street. Pentagon City on South Hayes Street features a dedicated bus-only siding, direct access to the Metrorail underground portal, and sheltered bicycle racks. There is also a dedicated driveway for pick-ups and drop-offs by car.

Pentagon Metro Station is the area's major bus interchange, and a hub for intercity and regional connections. This facility alone serves 38 bus routes, of which 30 are weekday commuter express buses from other counties in Virginia. A full inventory of regional bus connections accessible at the Pentagon Metro Station is listed in Table 8.

The RiverHouse site also has access to intercity rail services operated by the Virginia Railway Express (VRE), providing external connections to Manassas and Fredericksburg. The closest VRE station is located 1 mile east of the site at Crystal City Train Station on Crystal Drive.

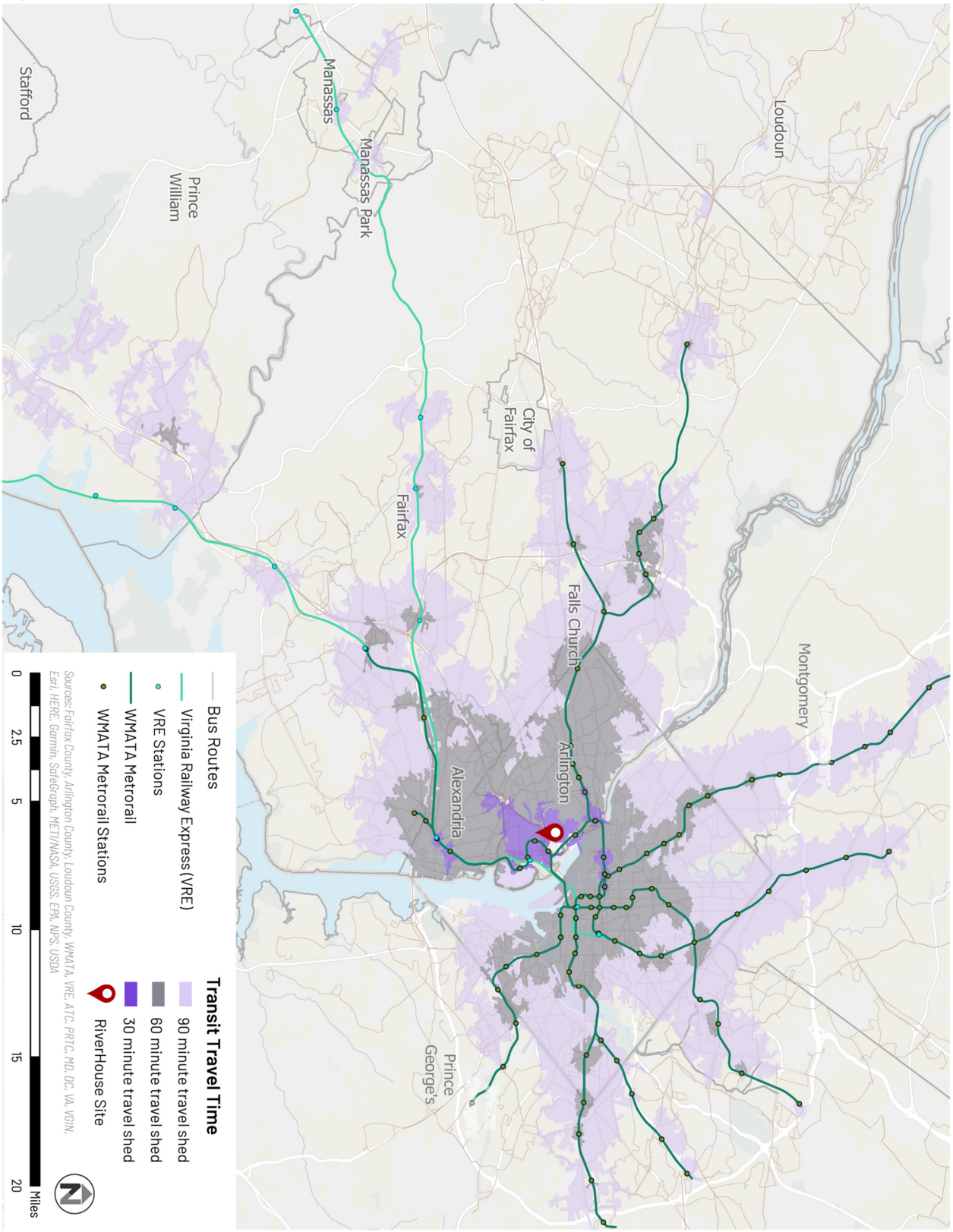
Figure 37 illustrates the possible extent of travel by public transit 30, 60, and 90 minutes from the RiverHouse site, assuming 5pm on a weekday. This "transit shed" is sizeable, with most of Washington D.C. and large parts of Arlington and Alexandria accessible within 60 minutes. The 90-minute shed brings much of the rail and commuter bus network into play, with connections as far as Manassas and Prince William County and extensive parts of Maryland.

Table 8: Bus Service Inventory at Pentagon Metro Station

Pentagon Metro Station Bus Services – Local and Regional Connections			
Route No.	**Route Name**	**Service Provider**	**Classification**
35	Van Dorn Metro - Yoakum Pkwy - Beauregard St - Pentagon Metro	Alexandria Transit Company DASH	Local Bus
103	Braddock Metro - Russell Rd - Glebe Rd - Pentagon Metro	Alexandria Transit Company DASH	Commuter Bus

104	Braddock Metro - Cameron Mills Dr - Parkfairfax - Pentagon Metro	Alexandria Transit Company DASH	Commuter Bus
42	Ballston-Pentagon	Arlington Transit	Local Bus
87	Pentagon Metro - Army Navy Drive - Shirlington	Arlington Transit	Local Bus
306	GMU - Pentagon	Fairfax County Connector	Commuter Bus
393	Saratoga - Pentagon - Mark Center	Fairfax County Connector	Commuter Bus
394	Saratoga - Pentagon Express	Fairfax County Connector	Commuter Bus
395	Gambrill - Pentagon Express	Fairfax County Connector	Commuter Bus
396	Backlick - Pentagon Expess	Fairfax County Connector	Commuter Bus
599	Pentagon - Crystal City Express	Fairfax County Connector	Commuter Bus
698	Vienna Pentagon	Fairfax County Connector	Commuter Bus
834/835	Annandale - Pentagon	Fairfax County Connector	Commuter Bus
282/682	Dulles South, East Gate - Pentagon, Crystal City	Loudoun County Transit	Commuter Bus
284/684	Dulles South, East Gate - Pentagon, Crystal City	Loudoun County Transit	Commuter Bus
482/882	Leesburg, Dulles North - Pentagon, Crystal City	Loudoun County Transit	Commuter Bus
602	Manassas	PRTC OmniRide	Commuter Bus
612	Gainesville - Pentagon - L'Enfant Plaza - Navy Yard	PRTC OmniRide	Commuter Bus
942	Stafford-Pentagon	PRTC OmniRide	Commuter Bus
D-100	Dale City - Washington	PRTC OmniRide	Commuter Bus
D-200	Dale City - Pentagon & Rosslyn/Ballston	PRTC OmniRide	Commuter Bus
D-300	Dale City - Washington Navy Yard	PRTC OmniRide	Commuter Bus
L-100	Lake Ridge - Washington	PRTC OmniRide	Commuter Bus
L-200	Lake Ridge - Pentagon & Crystal City	PRTC OmniRide	Commuter Bus
MC-100/200	Montclair	PRTC OmniRide	Commuter Bus
RS	RS South Route 1	PRTC OmniRide	Commuter Bus
10A	Alexandria-Pentagon	WMATA Metrobus	Local Bus
16A/C/E	Columbia Pike	WMATA Metrobus	Local Bus
17B/G/K/M	Kings Park - North Springfield	WMATA Metrobus	Commuter Bus
18G/J	Orange Hunt	WMATA Metrobus	Commuter Bus
18P	Burke Centre	WMATA Metrobus	Commuter Bus
21C	Landmark-Holmes Run Parkway	WMATA Metrobus	Commuter Bus
22A/F	Barcroft-South Fairlington	WMATA Metrobus	Local Bus
28F	Skyline City	WMATA Metrobus	Commuter Bus
29G	Annandale	WMATA Metrobus	Commuter Bus
7A	Landmark-North Fairlington	WMATA Metrobus	Local Bus
7M	Mark Center - Pentagon	WMATA Metrobus	Local Bus
8W	Foxchase-Seminary Valley	WMATA Metrobus	Commuter Bus

Figure 37: Transit Travel Shed from the RiverHouse Site, Weekday 5pm



Rail Service

Metrorail services are operated by WMATA, while regional commuter rail services are provided by the Virginia Railway Express (VRE). Besides Pentagon City Metro Station within a 10-minute walk, RiverHouse is also located less than 1 mile away from both Pentagon Metro and Crystal City Metro Stations. Table 9 summarizes the service spans as of 2022.

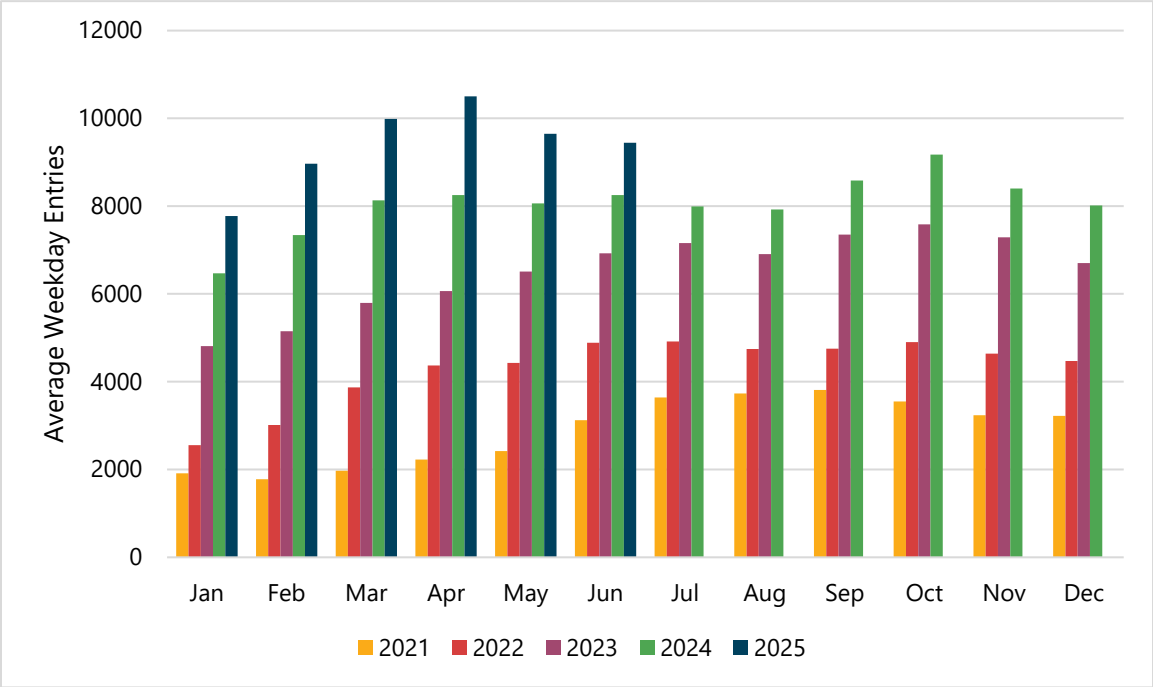
Table 9: Rail Service Information

			Weekday		Weekend	
Route Name	Operating Agency	Classification	Service Span	Headway	Service Span	Headway
Metro Blue Line	WMATA Metrorail	Metro Heavy Rail	5AM - 12AM	Every 12-15 minutes	7AM - 12AM	Every 12-15 minutes
Metro Yellow Line	WMATA Metrorail	Metro Heavy Rail	5AM - 12AM	Every 12-15 minutes	5AM - 12AM	Every 12-15 minutes
Manassas Line	Virginia Railway Express	Intercity Rail	5AM - 9AM, 1PM - 8PM	Every 30-50 minutes	-	-
Fredericksburg Line	Virginia Railway Express	Intercity Rail	5AM - 9AM, 1PM - 8PM	Every 20-40 minutes	-	-

Crystal City Train Station is located on the east side of Crystal Drive, by the Crystal City Water Park. The station proper is accessible by a small unnamed driveway with limited wayfinding information. The VRE shares its tracks with Amtrak services, however the latter does not serve this station. Both VRE lines terminate at Washington D.C. Union Station as their northernmost extent, and respectively provide connections to Manassas and Fredericksburg. VRE services do not operate on weekends or holidays, specifically targeting office commuters as their primary ridership base. As of May 2025, the Manassas Line sees an average of 2,300 northbound boardings and 2,400 daily southbound boardings while the Fredericksburg Line sees 3,700 daily northbound boardings and 3,600 daily southbound boardings across all trains.

As previously described, Pentagon City Metro Station serves as a significant multimodal transit hub in proximity to the RiverHouse site. Metrorail Blue and Yellow Lines serve this station, providing regional connections to downtown Washington D.C., University of Maryland and Largo, Maryland to the northeast; Alexandria, Ronald Reagan Washington National Airport, and Springfield, Virginia to the south and southwest. Each Metrorail line operates typically at 12 to 15-minute headways, which is effectively halved to 6 to 7.5-minute headways by the overlap of both Blue and Yellow Lines.

Figure 38: Pentagon City Metro Station - Average Weekday Entries by Month, 2021-2025



Prior to the COVID-19 pandemic, WMATA Metrorail ridership at Pentagon City Metro Station ranged from 10,000-14,000 entries each day. However, ridership collapsed in 2020 to less than 2,000 entries per day, seeing an 80-85% decline. As of June 2025, passenger activity at Pentagon City has gradually rebounded to roughly 77% of pre-pandemic levels, illustrated in Figure 38[13].

Entry activity at the Pentagon City Metro Station has largely retained peak hour commute patterns that existed prior to the pandemic, with sharp peaks of activity between Open-9:30AM (AM Peak) and 3PM-7PM (PM Peak) on weekdays (Figure 39). The afternoon peak sees greater activity than the morning peak, which suggests that people are travelling to Pentagon City for recreational reasons or errands during after work hours.

Pentagon City Metro Station sits amidst multiple shopping malls and stores, making it a prominent regional destination for shopping and recreation. This is reflected in substantial ridership activity on weekends, with consistent station entries and exits throughout the day (Figure 40). When considered on top of bus ridership, it can be surmised that the Pentagon City area sees consistent and large levels of foot traffic, from both residents and visitors alike.

[13] https://www.wmata.com/initiatives/ridership-portal/

Figure 39: Pentagon City Metro Station - Average Daily Weekday Entries by Time Period, May 2025

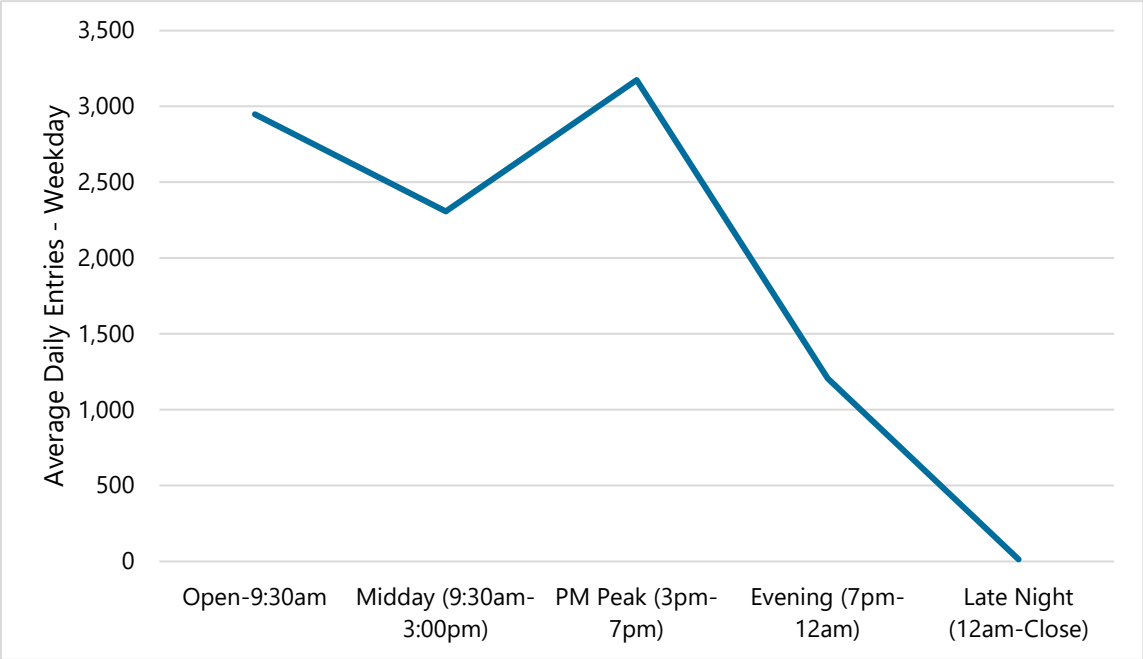
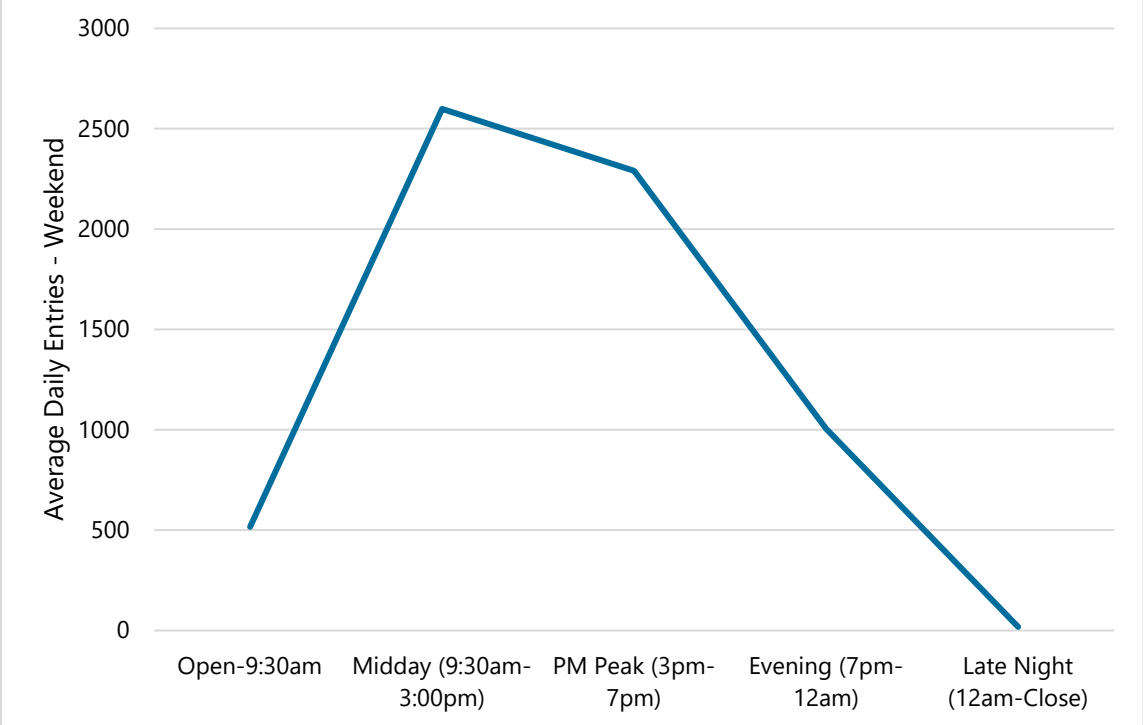


Figure 40: Pentagon City Metro Station - Average Daily Weekend Entries by Time Period, May 2025



Bus Service

The site is served by 22 bus stops within a quarter-mile radius, with ten (10) to the site's west and north on Army Navy Drive, one (1) across the I-395 Freeway on Columbia Pike, six (6) to the east on South Joyce Street, and five (5) at the Pentagon City Metro Station interchange on South Hayes Street.

There are 10 publicly operated bus routes serving the immediate (quarter-mile) vicinity of the RiverHouse site. These routes are operated by WMATA Metrobus, WMATA Metroway, Arlington Transit (ART), and the Fairfax County Connector. An inventory of available bus routes and their service spans is provided in Table 10.

The majority of these public bus routes operate at 15-30 minute headways, with the Metroway being the only high frequency route (under 15 minute headways).

The bus route with the closest stop to the RiverHouse site is WMATA Metrobus 10A, which stops right by the site on S. Joyce St. and provides connections between Alexandria and the Pentagon.

WMATA also operates a Bus Rapid Transit (BRT) route, Metroway MW1, which runs every 12 minutes from the Pentagon City Metro Station to Braddock Road Station in Alexandria. While both ends of the route terminate at a WMATA Blue/Yellow Metrorail Station, the Metroway serves as a high-capacity, high-frequency transit option that bridges the destinations between rail stations. Ridership for 2024 is shown in Figure 41

Figure 41: BRT Route MW1 - Average Weekday Boardings by Month, 2024

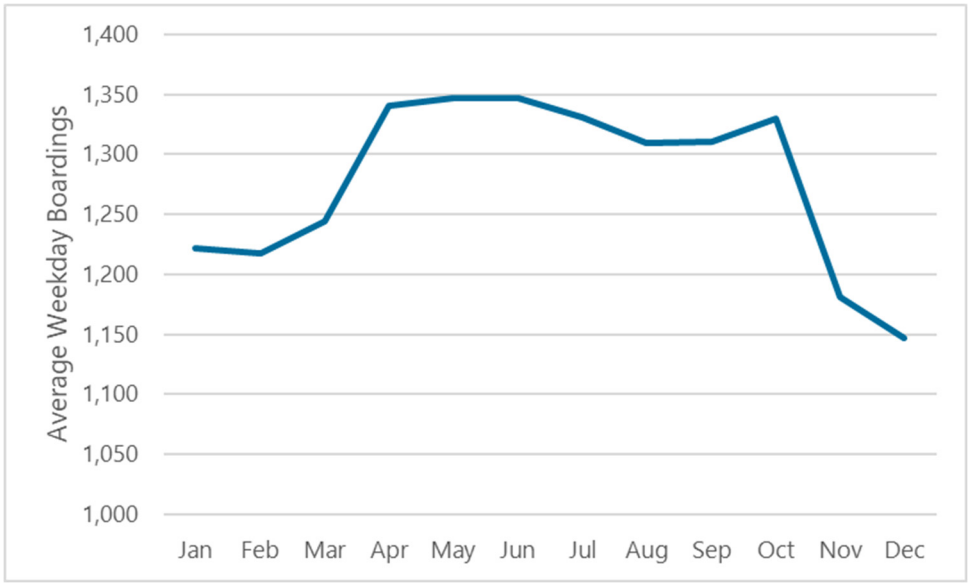


Table 10: Weekday Bus Service Information (within 0.25 miles) - Before Better Bus

Route	Route Name	Operating Agency	Classification	Headway	Weekday Hours
7A	Landmark-North Fairlington Line	WMATA	Local Bus	M-F, 20-30 mins	4:40AM – 1:52AM
10A	Alexandria-Pentagon	WMATA	Local Bus	M-F, 30 mins	4:25AM – 2:33AM
16A	Columbia Pike	WMATA	Local Bus	M-F, 30 mins	5:37AM - 11:46PM
16C	Columbia Pike	WMATA	Local Bus	M-F, 30 mins	4:33AM – 10:33PM
16E	Columbia Pike	WMATA	Local Bus	M-F, 30 mins	10:37PM - 2:44AM
22A	Barcroft-South Fairlington	WMATA	Local Bus	M-F, 60 mins	6:00AM – 10:14PM
42	Ballston-Pentagon	ART	Local Bus	M-F 15-30 mins	6:00AM – 10:52AM 3:00PM – 8:22PM
87	Pentagon Metro - Shirlington	ART	Local Bus	M-F, 15-30 mins	5:50AM – 11:32PM
599	Pentagon – Crystal City Express	Fairfax Connector	Commuter Bus	M-F, 20-40 mins	5:35AM – 8:55AM 3:20PM – 6:50PM
MW1	Metroway – Potomac Yard	WMATA	BRT	M-F, 12 mins	5:34AM – 10:24PM

Planned and Upcoming Transit Projects

Several transit-related projects and facilities are planned or under development around the RiverHouse Site. Highlights are captured in Table 11 and Figure 42.

Table 11: Planned Transit Improvement Projects

Project	Construction	Opening
Transitway Extension to Pentagon City	Spring 2025	Summer 2026
Pentagon City Center Bus Bays Project	TBD	TBD
Army Navy Drive Complete Streets Project	Fall 2022	Summer 2025
Columbia Pike Multimodal Street Improvements / Arlington National Cemetery Defense Access Roads (DAR) Project	Spring 2022 Fall 2021	Late 2025 Summer 2025

Sources: Transportation Projects, Arlington County Government
https://www.arlingtonva.us/Government/Projects/Project-Types/Transportation-Projects

The Army Navy Drive Complete Streets Project, combined with the Transitway Extension to Pentagon City, will see Metroway BRT and other bus services to Alexandria connected directly to the heart of Pentagon City. In conjunction with each other, these projects will bring travel time reductions, bus priority lanes, and the conversion of an existing parking lot

into a multi-route bus hub just north of Army Navy Drive between S. Joyce St. and S. Hayes St. The existing busway currently ends in Crystal City, on 15th Street S.

The Columbia Pike Premium Transit Network will significantly enhance Arlington Transit services travelling from the west, featuring new stations, expanded service spans, and a new network of high frequency bus services bridging the Columbia Pike corridor with Pentagon City and Crystal City. Transit Signal Prioritization (TSP) improvements are also being considered.

WMATA's Better Bus Network redesign will go into effect on June 29, 2025. The bus routes that will serve Pentagon City and/or have a stop within 0.25 miles of the RiverHouse site are shown in Table 12.

Table 12: Weekday Bus Service Information (within 0.25 miles) - Better Bus Network

	Route Name	Operating Agency	Classification	Headway	Weekday Hours
A27	Van Dorn St – Pentagon	WMATA	Local Bus	M-F, 20-30 mins	5:00AM – 2:00AM Trips from 9:00AM – 3:00PM and after 7:00PM stop at Pentagon City
A11	Huntington - Pentagon	WMATA	Local Bus	M-F, 30-45 mins	4:30AM – 2:00AM
A40	Skyline City – Crystal City	WMATA	Local Bus	M-F, 6-20 mins	5:30AM - 2:00AM
F44	Annandale-Pentagon	WMATA	Local Bus	M-F, 30 mins	5:30AM – 12:00AM
A66	Culmore-Pentagon	WMATA	Local Bus	M-F, 30 mins	6:00AM – 10:00PM
42	Ballston-Pentagon	ART	Local Bus	M-F 15-30 mins	6:00AM – 10:52AM 3:00PM – 8:22PM
87	Pentagon Metro - Shirlington	ART	Local Bus	M-F, 15-30 mins	5:50AM – 11:32PM
599	Pentagon – Crystal City Express	Fairfax Connector	Commuter Bus	M-F, 20-40 mins	5:35AM – 8:55AM 3:20PM – 6:50PM
A1X	Metroway – Braddock Road – Pentagon City	WMATA	BRT	M-F, 12 mins	5:30AM – 10:00PM

Figure 42: Planned and Proposed Transit Improvements

5. ESTIMATED TRAVEL DEMAND

This chapter outlines the transportation demand of the proposed RiverHouse development. It reviews the trip generation from the existing uses, the expected mode splits and multimodal trip generation, which forms the foundation to the traffic operations analysis.

Mode Split Methodology

Mode split is the percentage of travelers using individual modes of transportation when traveling whether that be commuting or other day to day activities. The primary source of mode split information was based on data from Arlington County staff who reviewed mode share data for sources including 1) the 2016 American Community Survey (ACS), 2) the 2016 Arlington County Commercial Building Survey, and 3) the 2007-2008 Metropolitan Washington Council of Governments (MWCOG) Regional Household Travel Survey with Arlington County add-on data. Arlington County Mode Share assumptions for the different areas of the County are shown in Table 13.

Table 13: Arlington County Mode Share Assumptions using Household Travel Survey Data (Productions)

Mode	Vehicle %	Transit %	Active %	Total
Ballston	35%	56%	9%	100%
Clarendon/Courthouse	39%	52%	9%	100%
Columbia Pike Corridor	59%	34%	7%	100%
Crystal City	32%	59%	9%	100%
I-66 Corridor	52%	41%	7%	100%
North Arlington	76%	17%	7%	100%
Pentagon City	27%	64%	9%	100%
Rosslyn	32%	58%	9%	100%
Route 50 Corridor	58%	35%	7%	100%
S. Arlington/Shirlington	52%	41%	7%	100%

Based upon the proposed land-uses on the RiverHouse site, the following mode split for the residential and commercial uses has been assumed.

Table 14: Proposed Mode Split for RiverHouse Site

Mode	Condo/Apartment	Townhome	Commercial
Walk/Bike	9%	9%	20%
Transit	64%	64%	40%
Vehicular	27%	27%	40%
Total / all modes	100%	100%	100%

Trip Generation Methodology

Trip generation is estimated using ITE Trip Generation 11th Edition person-trip equations based on "Dense Multi-Use Urban—Close to Transit" for residential uses and "General Urban/Suburban—All Sites" conditions for health clinic uses. ITE provides person-trip generation rates for high-rise, mid-rise residential, and townhouse multifamily but not for the retail (specifically, health clinic) as proposed. In order to derive multimodal trips for new high-rise, mid-rise residential and townhouse development, the following methodology applies:

1. Estimate person-based based on ITE 11th Edition equations for "Dense Multi Use Urban—Close to Transit" conditions.
2. Estimate mode-specific person trips from total person trips by applying mode splits (Table 13).[14]
3. Convert person trips to vehicle trips based on the 2017 NHTS average vehicle occupancies (Table 17).

For health clinic uses, the following methodology applies:

1. Estimate vehicle trips for the AM peak hour and person trips for the PM peak hour based on ITE 11th Edition equations for "General Urban/Suburban" conditions.
2. Estimate person trips by adjusting the calculated vehicle trips based on average vehicle occupancies reported in the 2017 National Household Travel Survey (Table 17).
3. Estimate mode-specific person trips from total person trips by applying mode splits (Table 13).
4. Convert person trips to vehicle trips based on the same 2017 NHTS average vehicle occupancies (Table 17).

The same trip-generation analysis method is applied for new RiverHouse development and to PCSP background development. Its application is illustrated in Table 15 and Table 16 for

[14] Mode splits are based on Arlington County guidance "MMTA Mode Share Assumptions" which combines Census data, MWCOG regional model data, and other sources.

the RiverHouse Neighborhood PDSP (2035) and Phase 1 (2028) respectively. Each focuses on the results of the person-trip generation method described above, but includes (in a greyed-out row) the results of conventional vehicle-trip generation methods for reference.

Table 15: Estimated Trip Generation at Full PDSP Build Out (2035)

Use	Units		ITE LUC	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total	Daily
High-Rise Residential	3,723	DU	222	188 veh/hr	668 veh/hr	856 veh/hr	600 veh/hr	368 veh/hr	968 veh/hr	14,743 veh/day
Person Trips(2)				581 ppl/hr	1,839 ppl/hr	2,420 ppl/hr	1,464 ppl/hr	658 ppl/hr	2,122 ppl/hr	27,252 ppl/day
Walk/Bike	9%			52 ppl/hr	166 ppl/hr	218 ppl/hr	132 ppl/hr	59 ppl/hr	191 ppl/hr	2,453 ppl/day
Transit	64%			372 ppl/hr	1,177 ppl/hr	1,549 ppl/hr	937 ppl/hr	421 ppl/hr	1,358 ppl/hr	17,442 ppl/day
Vehicular	27%			133 veh/hr	421 veh/hr	554 veh/hr	335 veh/hr	151 veh/hr	486 veh/hr	6,236 veh/day
Mid-Rise Residential	611	DU	221	70 veh/hr	125 veh/hr	196 veh/hr	115 veh/hr	62 veh/hr	177 veh/hr	2,902 veh/day
Person Trips(2)				69 ppl/hr	243 ppl/hr	312 ppl/hr	198 ppl/hr	132 ppl/hr	330 ppl/hr	5,548 ppl/day
Walk/Bike	9%			6 ppl/hr	22 ppl/hr	28 ppl/hr	18 ppl/hr	12 ppl/hr	30 ppl/hr	499 ppl/day
Transit	64%			44 ppl/hr	156 ppl/hr	199 ppl/hr	127 ppl/hr	84 ppl/hr	211 ppl/hr	3,551 ppl/day
Vehicular	27%			16 veh/hr	56 veh/hr	71 veh/hr	45 veh/hr	30 veh/hr	75 veh/hr	1,269 veh/day
Townhomes	132	DU	215	17 veh/hr	34 veh/hr	51 veh/hr	24 veh/hr	14 veh/hr	38 veh/hr	780 veh/day
Person Trips(2)				66 ppl/hr	71 ppl/hr	137 ppl/hr	33 ppl/hr	30 ppl/hr	63 ppl/hr	921 ppl/day
Walk/Bike	9%			6 ppl/hr	6 ppl/hr	12 ppl/hr	3 ppl/hr	3 ppl/hr	6 ppl/hr	83 ppl/day
Transit	64%			42 ppl/hr	46 ppl/hr	88 ppl/hr	21 ppl/hr	19 ppl/hr	41 ppl/hr	589 ppl/day
Vehicular	27%			15 veh/hr	16 veh/hr	31 veh/hr	8 veh/hr	7 veh/hr	14 veh/hr	211 veh/day
Total Residential				276 veh/hr	828 veh/hr	1,103 veh/hr	739 veh/hr	444 veh/hr	1,183 veh/hr	18,425 veh/day
Person Trips(1 &2)				715 ppl/hr	2,154 ppl/hr	2,869 ppl/hr	1,695 ppl/hr	820 ppl/hr	2,515 ppl/hr	33,721 ppl/day
Walk/Bike				64 ppl/hr	194 ppl/hr	258 ppl/hr	153 ppl/hr	74 ppl/hr	226 ppl/hr	3,035 ppl/day
Transit				458 ppl/hr	1,378 ppl/hr	1,836 ppl/hr	1,085 ppl/hr	525 ppl/hr	1,610 ppl/hr	21,581 ppl/day
Vehicular				164 veh/hr	493 veh/hr	656 veh/hr	388 veh/hr	188 veh/hr	576 veh/hr	7,716 veh/day
Walk-In Clinic	12,885	sf	630	29 veh/hr	7 veh/hr	35 veh/hr	14 veh/hr	33 veh/hr	48 veh/hr	484 veh/day
Person Trips(1)			630	52 ppl/hr	12 ppl/hr	64 ppl/hr	58 ppl/hr	47 ppl/hr	105 ppl/hr	572 ppl/day
Walk/Bike	20%			10 ppl/hr	2 ppl/hr	13 ppl/hr	12 ppl/hr	9 ppl/hr	21 ppl/hr	114 ppl/day
Transit	40%			21 ppl/hr	5 ppl/hr	26 ppl/hr	23 ppl/hr	19 ppl/hr	42 ppl/hr	229 ppl/day
Vehicular	40%			11 veh/hr	3 veh/hr	14 veh/hr	12 veh/hr	10 veh/hr	22 veh/hr	126 veh/day
Total Site				304 veh/hr	834 veh/hr	1,139 veh/hr	754 veh/hr	477 veh/hr	1,231 veh/hr	18,910 veh/day
Person Trips				767 ppl/hr	2,166 ppl/hr	2,933 ppl/hr	1,753 ppl/hr	867 ppl/hr	2,620 ppl/hr	34,292 ppl/day
Walk/Bike				75 ppl/hr	196 ppl/hr	271 ppl/hr	164 ppl/hr	83 ppl/hr	247 ppl/hr	3,149 ppl/day
Transit				479 ppl/hr	1,383 ppl/hr	1,862 ppl/hr	1,108 ppl/hr	544 ppl/hr	1,652 ppl/hr	21,810 ppl/day
Vehicular				175 veh/hr	495 veh/hr	**671 veh/hr**	400 veh/hr	198 veh/hr	**598 veh/hr**	**7,841 veh/day**

Notes:
For each use, numbers in grey represent direct vehicle-trip generation and are provided for comparison only.
(1) Person Trip conversion based on average vehicle occupancies noted in Table 16 of 2017 National Household Travel Survey
(2) Person Trip conversion based on ITE Trip Generation Manual 11th Edition where data is available

Table 16 Estimated Trip Generation for Phase 1 Site Plans (2028)

Use	Units		ITE LUC	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total	Daily
High-Rise Residential	1,676	DU	222	85 veh/hr	301 veh/hr	385 veh/hr	270 veh/hr	166 veh/hr	436 veh/hr	6,637 veh/hr
Person Trips(2)				261 ppl/hr	828 ppl/hr	1,089 ppl/hr	659 ppl/hr	296 ppl/hr	955 ppl/hr	12,268 ppl/day
Walk/Bike	9%			24 ppl/hr	75 ppl/hr	98 ppl/hr	59 ppl/hr	27 ppl/hr	86 ppl/hr	1,104 ppl/day
Transit	64%			167 ppl/hr	530 ppl/hr	697 ppl/hr	422 ppl/hr	190 ppl/hr	611 ppl/hr	7,852 ppl/day
Vehicular	27%			60 veh/hr	189 veh/hr	249 veh/hr	151 veh/hr	68 veh/hr	219 veh/hr	2,807 veh/day
Mid-Rise Residential	611	DU	221	70 veh/hr	125 veh/hr	196 veh/hr	115 veh/hr	62 veh/hr	177 veh/hr	2,902 veh/hr
Person Trips(2)				69 ppl/hr	243 ppl/hr	312 ppl/hr	198 ppl/hr	132 ppl/hr	330 ppl/hr	5,548 ppl/day
Walk/Bike	9%			6 ppl/hr	22 ppl/hr	28 ppl/hr	18 ppl/hr	12 ppl/hr	30 ppl/hr	499 ppl/day
Transit	64%			44 ppl/hr	156 ppl/hr	199 ppl/hr	127 ppl/hr	84 ppl/hr	211 ppl/hr	3,551 ppl/day
Vehicular	27%			16 veh/hr	56 veh/hr	71 veh/hr	45 veh/hr	30 veh/hr	75 veh/hr	1,269 veh/day
Townhomes	132	DU	215	17 veh/hr	34 veh/hr	51 veh/hr	24 veh/hr	14 veh/hr	38 veh/hr	780 veh/hr
Person Trips(2)				66 ppl/hr	71 ppl/hr	137 ppl/hr	33 ppl/hr	30 ppl/hr	63 ppl/hr	921 ppl/day
Walk/Bike	9%			6 ppl/hr	6 ppl/hr	12 ppl/hr	3 ppl/hr	3 ppl/hr	6 ppl/hr	83 ppl/day
Transit	64%			42 ppl/hr	46 ppl/hr	88 ppl/hr	21 ppl/hr	19 ppl/hr	41 ppl/hr	589 ppl/day
Vehicular	27%			15 veh/hr	16 veh/hr	31 veh/hr	8 veh/hr	7 veh/hr	14 veh/hr	211 veh/day
Total Residential				172 veh/hr	460 veh/hr	632 veh/hr	409 veh/hr	242 veh/hr	651 veh/hr	10,319 veh/day
Person Trips(1 &2)				396 ppl/hr	1,142 ppl/hr	1,538 ppl/hr	890 ppl/hr	459 ppl/hr	1,349 ppl/hr	18,737 ppl/day
Walk/Bike				36 ppl/hr	103 ppl/hr	138 ppl/hr	80 ppl/hr	41 ppl/hr	121 ppl/hr	1,686 ppl/day
Transit				253 ppl/hr	731 ppl/hr	985 ppl/hr	570 ppl/hr	293 ppl/hr	863 ppl/hr	11,992 ppl/day
Vehicular				91 veh/hr	261 veh/hr	352 veh/hr	204 veh/hr	105 veh/hr	309 veh/hr	4,287 veh/day
Walk-In Clinic	12,885	sf	630	29 veh/hr	7 veh/hr	35 veh/hr	14 veh/hr	33 veh/hr	48 veh/hr	484 veh/hr
Person Trips(1)			630	52 ppl/hr	12 ppl/hr	64 ppl/hr	58 ppl/hr	47 ppl/hr	105 ppl/hr	572 ppl/day
Walk/Bike	20%			10 ppl/hr	2 ppl/hr	13 ppl/hr	12 ppl/hr	9 ppl/hr	21 ppl/hr	114 ppl/day
Transit	40%			21 ppl/hr	5 ppl/hr	26 ppl/hr	23 ppl/hr	19 ppl/hr	42 ppl/hr	229 ppl/day
Vehicular	40%			11 veh/hr	3 veh/hr	14 veh/hr	13 veh/hr	10 veh/hr	23 veh/hr	126 veh/day
Total Site				201 veh/hr	467 veh/hr	668 veh/hr	424 veh/hr	275 veh/hr	699 veh/hr	10,804 veh/day
Person Trips				448 ppl/hr	1,155 ppl/hr	1,603 ppl/hr	948 ppl/hr	506 ppl/hr	1,454 ppl/hr	19,308 ppl/day
Walk/Bike				46 ppl/hr	105 ppl/hr	151 ppl/hr	92 ppl/hr	51 ppl/hr	142 ppl/hr	1,801 ppl/day
Transit				274 ppl/hr	736 ppl/hr	1,010 ppl/hr	593 ppl/hr	312 ppl/hr	905 ppl/hr	12,220 ppl/day
Vehicular				102 veh/hr	264 veh/hr	**366 veh/hr**	216 veh/hr	115 veh/hr	**332 veh/hr**	**4,413 veh/day**

Notes:
For each use, numbers in grey represent direct vehicle-trip generation and are provided for comparison only.
(1) Person Trip conversion based on average vehicle occupancies noted in Table 16 of 2017 National Household Travel Survey
(2) Person Trip conversion based on ITE Trip Generation Manual 11th Edition where data is available

Table 17: 2017 NHTS Average Vehicle Occupancies

Table 16. Average Vehicle Occupancy for Selected Trip Purposes
(Person Mile per Vehicle Mile)

Survey Year	Trip Purpose				
	To / From Work	Shopping	Other Family / Personal Errands	Social / Recreation	All Purposes
1977	1.30	2.10	2.00	2.40	1.90
1983	1.29	1.79	1.81	2.12	1.75
1990	1.14	1.71	1.84	2.08	1.64
1995	1.14	1.74	1.78	2.04	1.59
2001	1.14	1.79	1.83	2.03	1.63
2009	1.13	1.78	1.84	2.20	1.67
2009 MOE	0.05	0.78	0.84	1.20	0.67
2017	1.18	1.82	1.82	2.10	1.67
2017 MOE	0.01	0.05	0.13	0.04	0.04

6. TRAFFIC ANALYSIS

This chapter provides a summary of an analysis of the existing and future roadway capacity in the study area for the 2028 future build with 4.1 Site Plan development and the 2035 future build PDSP redevelopment. This includes analysis of the background conditions in both 2028 and 2035 without the proposed RiverHouse development. The analysis included use of the Synchro modeling software to estimate potential traffic impacts of the proposed development and a discussion of potential improvements.

The purpose of the roadway capacity analysis is to:

- Determine the existing capacity of the study area roadways;
- Determine the overall impact of the proposed development on the study area roadways; and
- Discuss any needed improvements and mitigation measures to accommodate the additional vehicular trips generated by the proposed development.

The capacity analysis focuses on the morning and afternoon commuter peak hours, as determined by the existing traffic volumes in the study area.

This October MMTA updates traffic analysis presented in the July version. The updates respond to comments received from Arlington County in September as well as ongoing internal review. The updated analysis reflects four types of changes:

- Changes to intersection configurations in the October 2025 site plans and PDSP:
  - RiverHouse driveway connecting to South Joyce Street (study area intersections#4) has modified orientation
  - Dedicated right-turn lane from southbound South Joyce Street to westbound Army Navy Drive (#2)
  - Changes to south/eastbound lanes at study area intersections #7 and #8
- Inclusion of background trips from other approved developments. The most significant changes flow through intersections at the edges of the RiverHouse study area. Examples include trips from background developments accessing I-395 via Army Navy Drive (#20). Table 21 describes the background trips.
- Corrected coding to include:
  - Right turn volume from westbound Army Navy Drive to northbound South Joyce Street
  - Site trip assignments consistent with driveway configurations and trip distribution in the approved scoping document.

- Updated MOE tables to reflect the HCM methodology specified in the VDOT approved scoping document.

The updated analysis does not significantly change the results or materially affect recommendations.

Study Area, Scope and Methodology

This section outlines the assumptions used to develop the existing and future roadway capacity analysis, including volumes, roadway geometries, and traffic operations. The scope of the analysis contained within this report was extensively discussed with and approved by Arlington County and VDOT staff and documented in the approved scoping form included in Appendix A. The general methodology follows national, Arlington County, and VDOT guidelines on the preparation of transportation impact evaluations of site development.

Capacity Analysis Scenarios

The vehicular capacity analyses are performed to determine if the proposed development will lead to adverse impacts on the adjacent roadway network. This process is undertaken by comparing future scenarios: (1) without the proposed development (Background conditions) and (2) with the proposed development constructed (Future conditions).

Specifically, this chapter examines the following analysis scenarios:

1. 2023 Existing Conditions
2. 2028 Future Conditions without the development (2028 Background)
3. 2028 Future Conditions with the RiverHouse 4.1 Site Plan development (2028 Future)
4. 2035 Future Conditions without the development (2035 Background)
5. 2035 Future Conditions with the RiverHouse PDSP development (2035 Future)

Study Area

The study area for analysis includes twenty-one (21) intersections for which detailed capacity analyses was undertaken. See Figure 21 in Chapter 2 for details. Roadway characteristics, including classification, number of lanes, speed limit, the presence of on-street parking, and average daily traffic volumes (ADT) are outlined in Table 18.

Table 18: Existing Roadway Network

Roadway	Classification*	Lanes	Speed	On-Street Parking	ADT**
S Joyce Street	Minor Arterial (VDOT) Arterial Type A (Arlington)	4-5	25 mph	Yes	8,300
Army-Navy Drive	Major Collector (VDOT) Arterial Type B (Arlington)	4-5	25 mph	Yes	6,100
15th Street	Minor Arterial (VDOT) Arterial Type A (Arlington)	4-5	25 mph	Yes	8,300
S. Lynn Street	Major Collector (VDOT) Arterial Type D (Arlington)	2	25 mph	Yes	1,800
S Kent Street	Neighborhood Minor (Arlington)	2	25 mph	Yes	n/a

* From VDOT and Arlington GIS

** From VDOT ADT Data

Traffic Volume Assumptions

The following section reviews the traffic volume assumptions and methodologies used in the roadway capacity analyses.

Base Year

The MMTA assumes a base year for analysis purposes of 2023. The RiverHouse Neighborhood redevelopment was first proposed in 2023, with supporting multimodal traffic counts collected in September 2023. VDOT and Arlington County guidance specify that counts must be taken within two years to be considered current. Traffic volume estimates available for S. Joyce St. from VDOT's annual program[15] estimate average daily traffic (AADT) of 9,900 vehicles in 2023, in line with pre-COVID volumes reported by Arlington County ranging from 9,600 to 11,100 between 2010 and 2019[16]. With such stable volumes, the base year of 2023 should result in robust analysis.

[15] AADT 2023 Arlington County - Dataset - Virginia Open Data Portal. https://data.virginia.gov/dataset/aadt-2023-arlington-county.

[16] https://arlingtonva.s3.amazonaws.com/wp-content/uploads/sites/31/2020/09/DES-22202-Update_Part-3_final.pdf, linked from 22202 Transportation and Planning Data – Official Website of Arlington County Virginia Government https://www.arlingtonva.us/Government/Projects/22202-Data.

Existing Traffic Volumes

The existing traffic volumes are comprised of turning movement count data collected by the consultant team in September 2023. Based on the average peak hours from all of the count data, the system peak hours assumed were 8:00 AM to 9:00 AM for the morning peak hour and 4:45 PM to 5:45 PM for the afternoon peak hour. The existing turning movement counts are included in Appendix C.

The existing peak hour traffic volumes for intersections within the study area are shown in Figure 44 (for the morning peak) and Figure 45 (for the afternoon peak). Figure 43 summarizes vehicles accessing RiverHouse via each segment of street: "big" Joyce north of 15th, "little" Joyce south of 15th, Kent at 16th, and Kent at Lynn. For example, in the morning peak-hour in 2023, 115 vehicles accessed (exited or entered) RiverHouse via "big" Joyce St.

Figure 43: Existing AM Peak Hour Vehicles Accessing by Street Segment

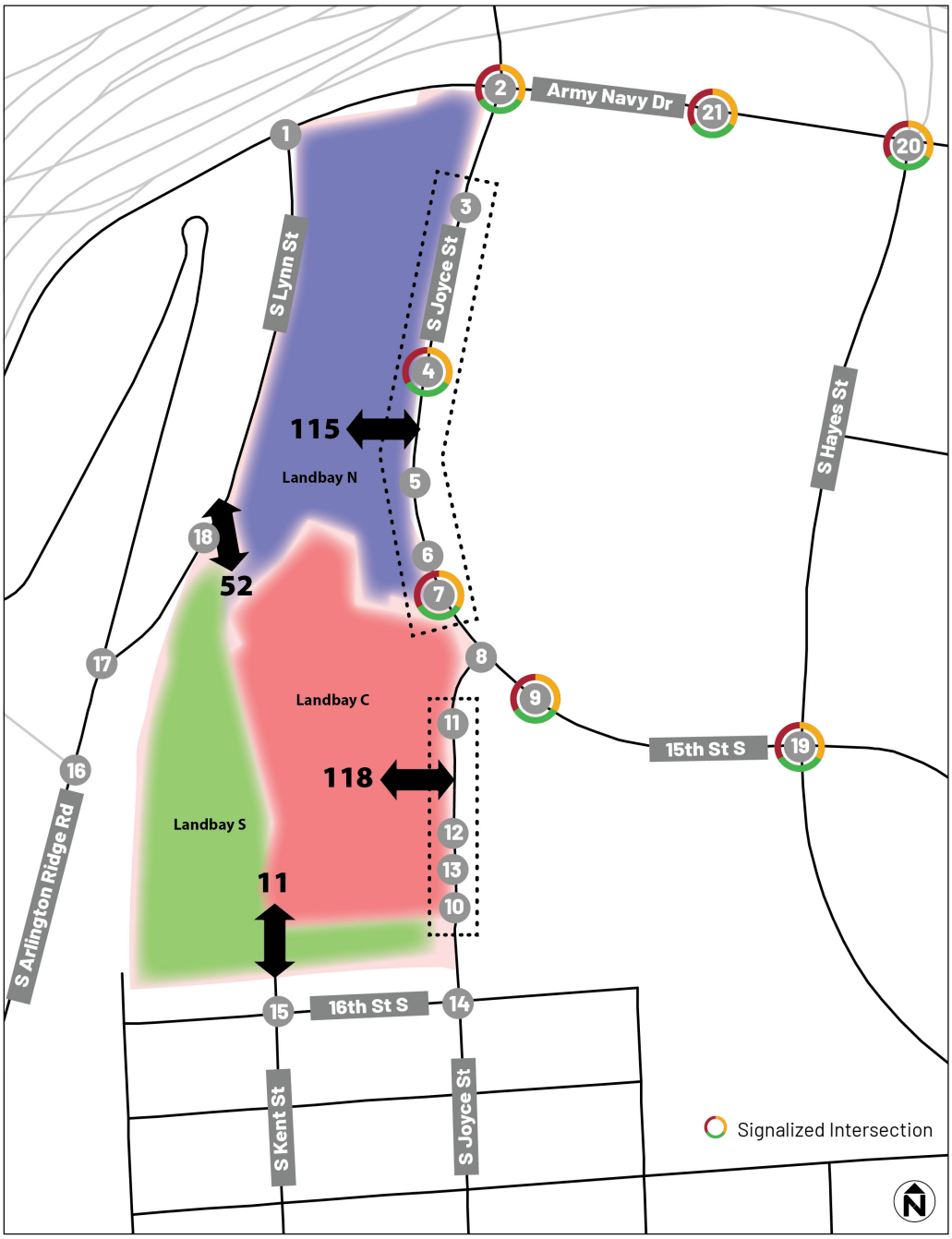


Figure 44: Existing AM Peak Hour Vehicle Volumes

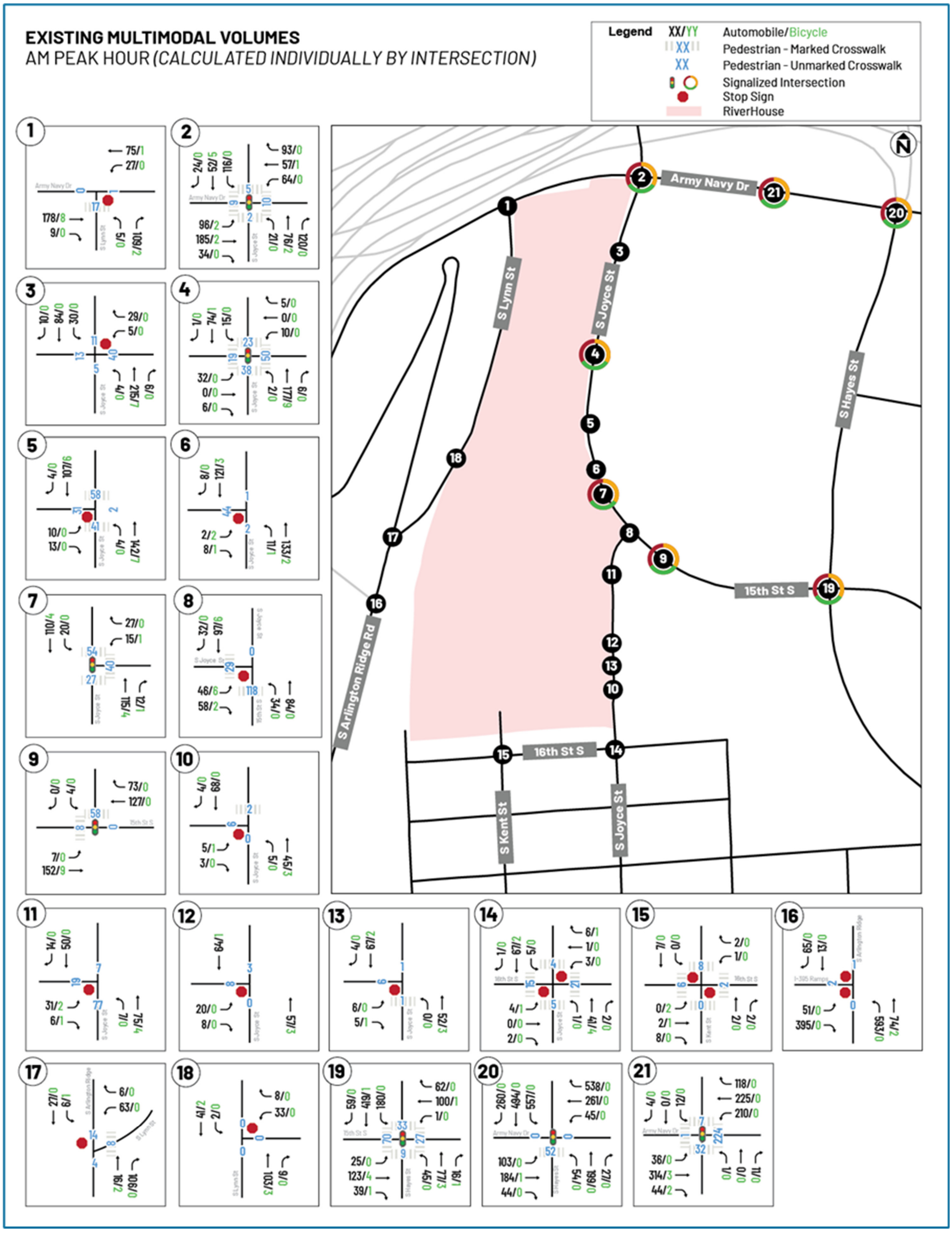
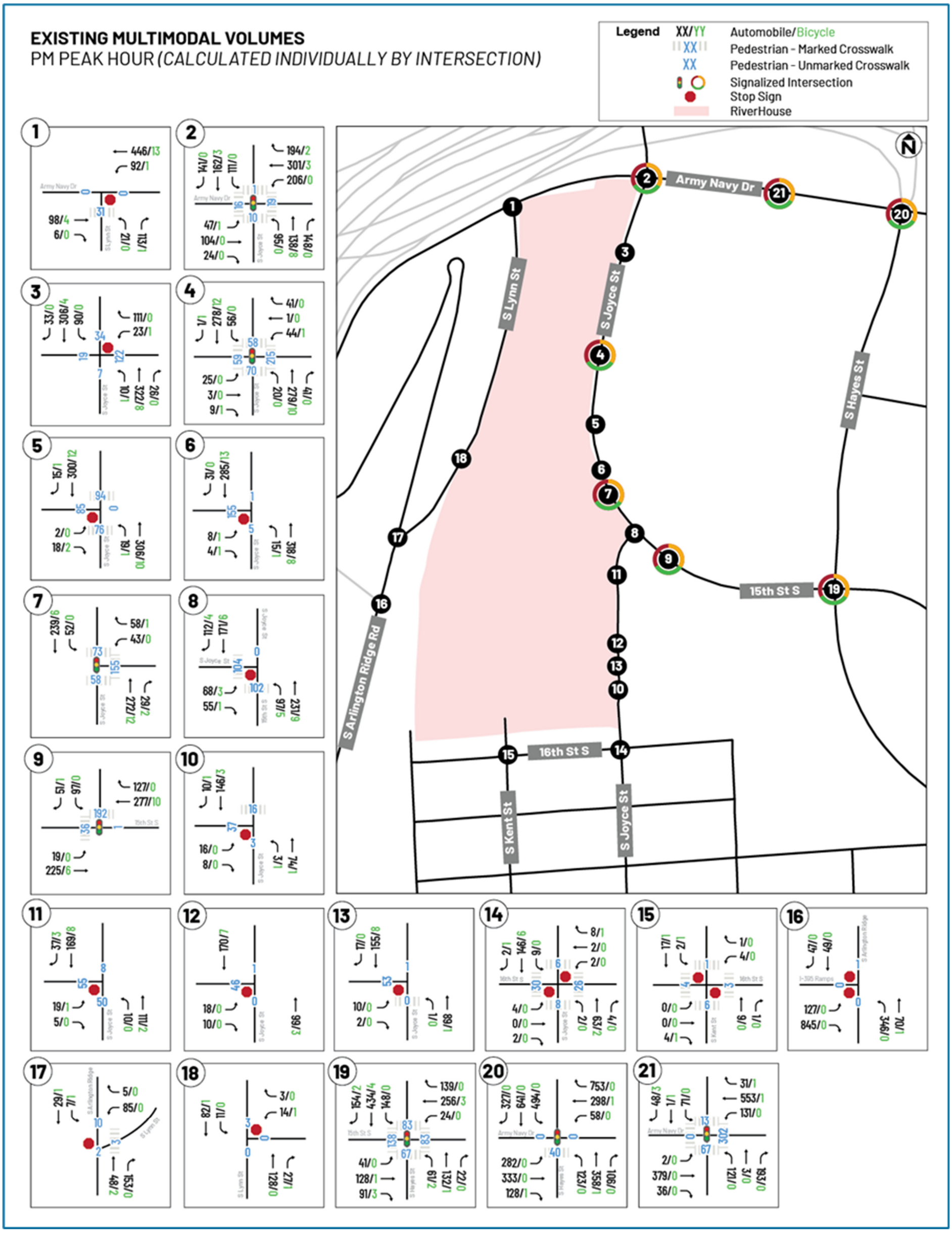


Figure 45: Existing PM Peak Hour Vehicle Volumes



2028 and 2035 Background Traffic Volumes

Traffic projections for the 2028 and 2035 Background Conditions consist of the existing volumes with the addition of a) an annual vehicle trip growth rate of 0.5% (in order to remain consistent with recently completed studies for other nearby developments); and b) traffic growth along local roadways in the study area generated by developments expected to be completed prior to the 2028 and 2035 horizon years (known as background developments).

Background Developments

Background development includes any projects completed since the base year of 2023 and other projects anticipated to be delivered before the analysis years of 2028 and 2035. Recently approved projects are listed in Table 19.

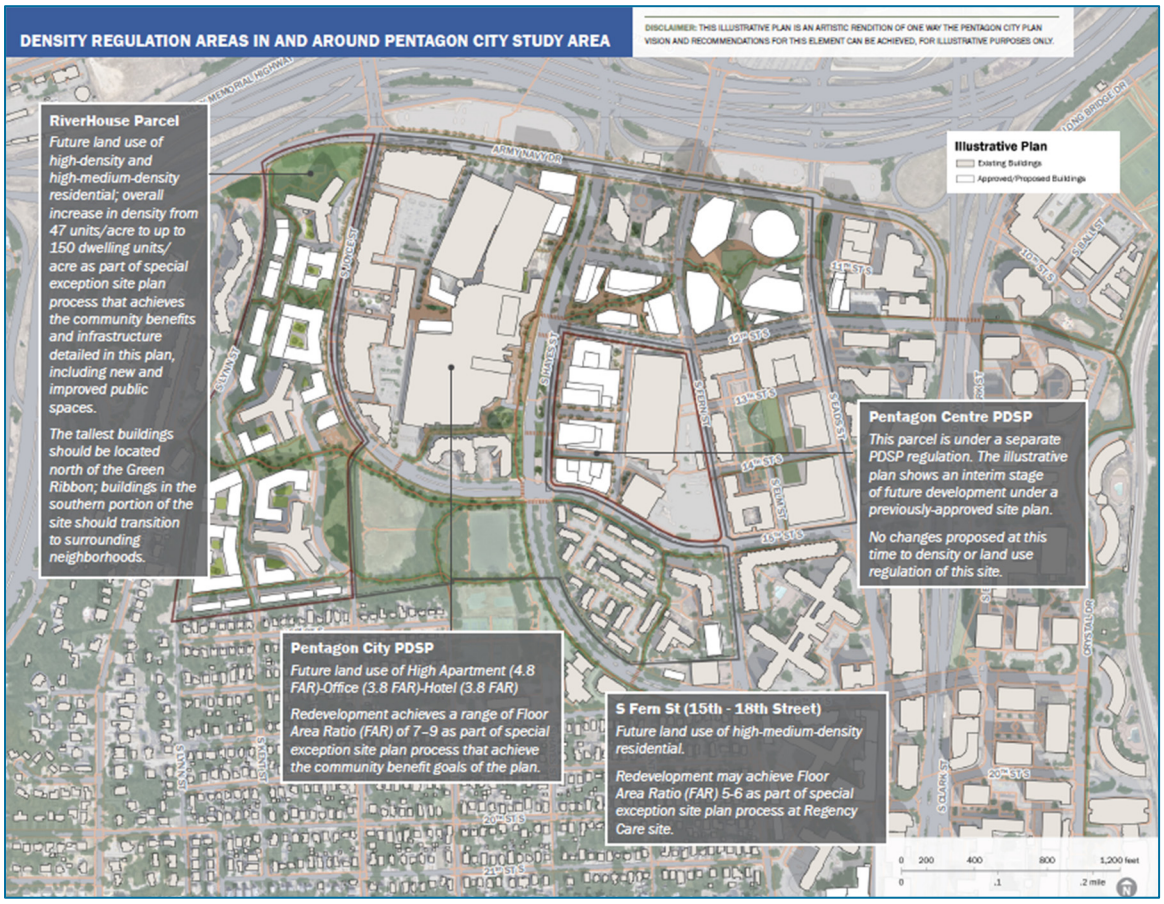
Table 19: Recently Approved and/or Built Projects Near RiverHouse

Project Location & Name	Status as of February 2025
400 11th St S. / Verizon	Built
Metropolitan Park 6 & 7/8	Built
PenPlace	Approved (2022)
1400 Richmond Hwy / American Hotel	Under construction
1600 S. Eads St / Crystal Towers 3	Approved (2023)
1900 S. Eads St / Crystal Houses 7 & 8	Approved (2024)

Projects considered under the Pentagon City Sector Plan (PCSP) but not yet approved should also be considered when estimating future traffic volumes. The PCSP describes allowable redevelopment throughout the sector including RiverHouse plus specific callouts for other areas identified in Figure 46 from the PCSP**:**

- Pentagon City PDSP
- Pentagon Centre PDSP
- S. Fern Street (15th to 18th Street)
- TSA/DEA block (not specifically noted on diagram)

Figure 46: Pentagon City Sector Plan Density Regulations



To reflect this anticipated redevelopment in the "background" of future traffic forecasts, the model requires translation of FARs into anticipated square footage by use and number of housing units. Specifically, the analysis requires:

- Total square feet of commercial office space
- Total square feet of retail and restaurant space
- Total square feet of community facilities
- Total number of housing units

The anticipated number of future housing units for the Pentagon City PCSP area is described on page 28 of the adopted draft PCSP. Similar information is required for the non-residential uses described above. Background development assumed by parcel is reflected in Table 20.

Table 20: Background Development per PCSP

Uses/ Development		Office	Residential*	Residential Units	Commercial	Hotel
	PenPlace	2,800,000	0	0	14,600 daycare	
	PenPlace				26,500 community space	
	PenPlace				391,800 amenity space	
	PenPlace				94,400 retail	
	Met Park 6,7,8	2,100,000	0	0	55,000 retail	
	Americana Hotel			644	3,800 retail	
	400 11th Street			306	10,908 retail	
PCSP Phase 1						
	Brookfield	570,600	623,800	567	40,000	0
	Simon (infill sites along Hayes/Army Navy)	0	212,000	193	14,000	212,000
	Regency Care (additional building)	0	124,400	113	0	0
	Total	**570,600**	**960,200**	**873**	**54,000**	**212,000**
PCSP Phase 2						
	Simon (garage redevelopment on 12th Street)	266,000	460,400	419	20,200	0
	Brookfield (2nd office building)	556,175	0	0	17,000	0
	Total	**822,175**	**460,400**	**419**	**37,200**	0
PCSP Phase 3						
	FRIT/Westpost (parking lot infill)	400,000	285,000	259	0	0
	Total	**400,000**	**285,000**	**259**	**0**	**0**

* Residential Uses (as described in the Sector Plan) rely on an average size of 1,100 SF when converted to unit totals for each phase

The total traffic generated by the background developments in 2028 and 2035 is shown in Table 21. Trips generated by the approved background developments are included in Appendix E. The traffic volumes generated by background developments within the greater study area were added to the existing traffic volumes and the annual growth in order to establish the 2028 and 2035 Background traffic volumes. Trip distribution assumptions for the background developments were based on the distributions included in their respective studies or based on those determined for the RiverHouse development and altered where necessary based on anticipated travel patterns. The traffic volumes for the 2028 and 2035 Background conditions are shown on Figure 47 and Figure 48.

Table 21: Traffic Generated by Background Developments (all included in 2028 and 2035)

	AM Peak Hour Vehicle Trips			PM Peak Hour Vehicle Trips		
Development Name	In	Out	Total	In	Out	Total
1.400 11th Street	12	30	42	23	17	40
2. Met Park	485	73	558	87	437	524
3. Pen Place	723	144	867	173	648	821
4. Americana Hotel	23	66	89	54	39	93
5. Crystal Towers	5	20	25	17	7	24
6. Crystal Houses	39	98	137	97	64	161
7. Brookfield (12th Street Landing)	237	108	345	130	241	371
8. Simon	137	85	222	104	156	260
9. FRIT	46	26	72	25	47	72
10. Regency	3	7	10	8	4	12
11. Pentagon Centre Phase 1	139	55	194	79	170	249
Total Trips	**1,849**	**712**	**2,561**	**797**	**1,830**	**2,627**

(1)Extracted from Verizon Site MMTA (7.19.2019) prepared by Gorove Slade Associates
(2) Extracted from Metropolitan Park 6, 7, 8 MMTA (10.22.2019) prepared by Gorove Slade Associates
(3) Extracted from Pen Place MMTA (2.11.2022) prepared by Gorove Slade Associates
(4) Extracted from Americana Hotel MMTA (7.25.2022) prepared by Gorove Slade Associates
(5) Extracted from Crystal Towers MMTA (7.26.2022) prepared by Gorove Slade Associates
(6) Extracted from Crystal Houses 3, 4, 5, 6 TIA (10.19.2018) prepared by Wells + Associates and calculated using 11th Edition ITE methodology for Crystal Houses 7, 8
(7) Extracted from 12th Street Landing MMTA (4.7.2024) prepared by Gorove Slade Associates
(8, 9, 10) Calculated using 11th Edition ITE methodology
(11) Extracted from Pentagon Centre PDSP MMTA (9.1.2023) prepared by VIKA Virginia

Figure 47: 2028 Background AM/PM Peak Hour Vehicle Volumes

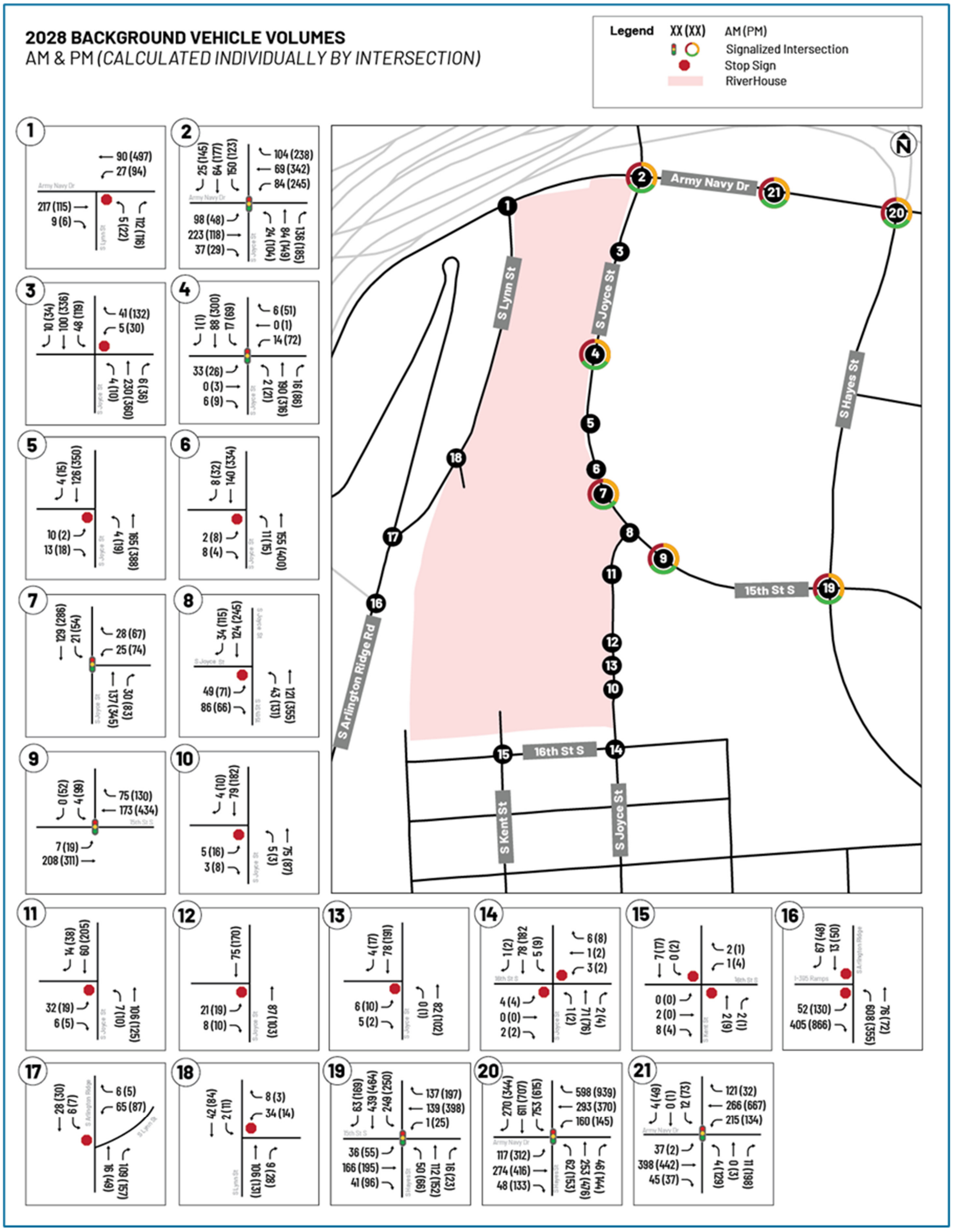
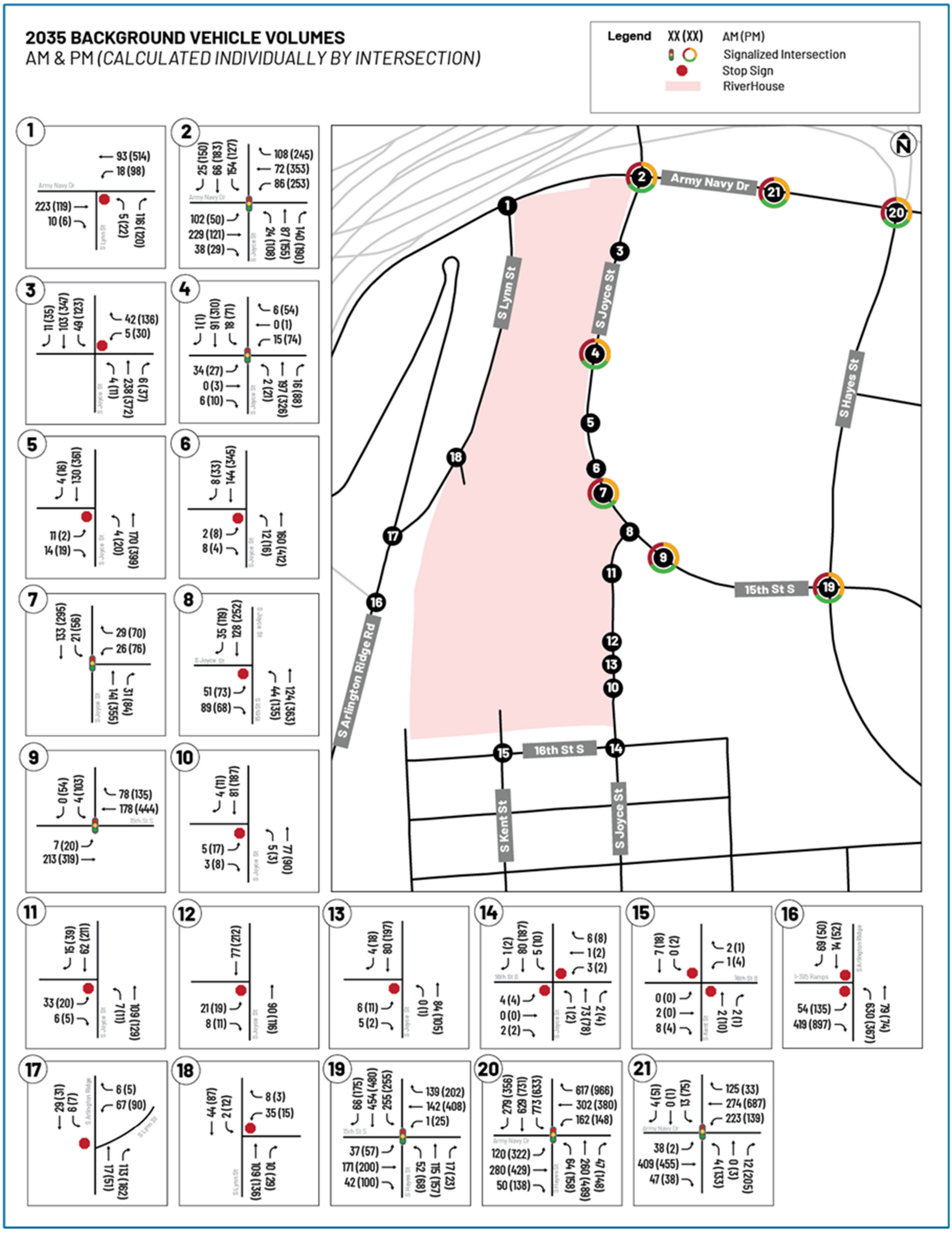


Figure 48: 2035 Background AM/PM Peak Hour Vehicle Volumes



Future Condition Traffic Volumes

Trip distribution analysis assesses where individual trips will access the surrounding street and multimodal network. This analysis focuses on the potential impacts of private vehicle trips at the numerous entry/exit points (driveways) onto the surrounding street network. This section describes the process of distributing trips for the RiverHouse PDSP. A similar process was followed independently for other background development sites within the Pentagon City Sector Plan area, as previously described.

Access is currently available via driveways connecting to S. Joyce St., S. Kent St., and S. Lynn St. Table 22 shows the distribution of vehicle trips based on 2023 counts. Overall, most people coming to and from RiverHouse walk, bike, or take transit. Driving trips, which make up the minority of overall trips, will likely disproportionately be connecting to the region via I-395. Proposed buildings located on the southern end of the RiverHouse property, namely the townhouse-style multifamily, will have improved access via S Kent St to S Lynn St and I-395 just beyond. An estimated 70% of vehicle trips to/from the southern portion of the site will use that access point. Remaining buildings on the site, with primary access to S Joyce St., will produce driving trips as shown in Figure 49.

2028 Future Condition Traffic Volumes

The 2028 Future Conditions traffic volumes consist of the 2028 Background volumes with the addition of the traffic volumes generated by the proposed 4.1 Site Plan development (site-generated trips).

Based on the trip distribution and assignment assumptions, site-generated trips were distributed though the study area intersections and distributed by driveway as shown in Table 23. Existing (2023) RiverHouse trips were reassigned as required by driveway access changes. The site-generated traffic volumes for the 2028 horizon year are shown in Appendix G. The 2028 Future Conditions traffic volumes, which are comprised of existing volumes, background developments, and the proposed development are shown in Figure 50.

2035 Future Condition Traffic Volumes

The 2035 Future Conditions traffic volumes consist of the 2035 Background volumes with the addition of the traffic volumes generated by the proposed PDSP development (site-generated trips).

Based on the trip distribution and assignment assumptions, site-generated trips were distributed though the study area intersections and distributed by driveway as shown in Table 24. Existing (2023) RiverHouse trips were reassigned as required by driveway access changes.

The site-generated traffic volumes for the 2035 horizon year are shown in Appendix G. The 2035 Future Conditions traffic volumes, which are comprised of existing volumes, background developments, and the proposed development are shown in Figure 51.

Figure 49: RiverHouse Site Trip Distribution

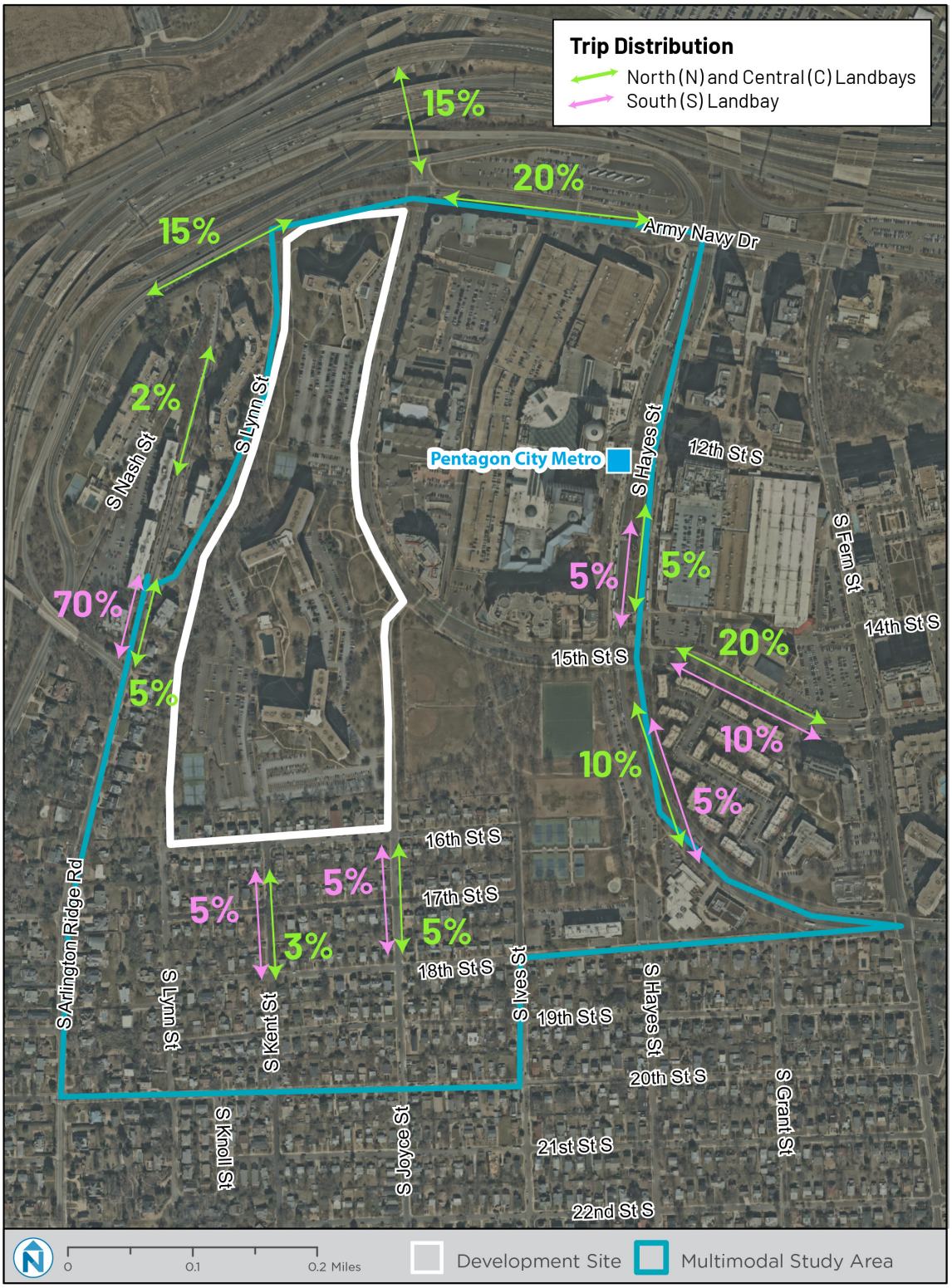


Table 22: Existing Driveway Trip Counts

	AM System Peak Vehicle Trips 8:00 – 9:00am				PM System Peak Vehicle Trips 4:45 – 5:45pm			
Driveway	**In**	**Out**	**Total**	**Dist. %**	**In**	**Out**	**Total**	**Dist. %**
S Joyce Street/HT-BBB Driveway/RiverHouse Driveway 1 (Intersection 3)	12	-	12	4%	37	-	37	8%
S Joyce Street/Loft Driveway/RiverHouse Driveway 2 (Intersection 4)	2	38	40	14%	3	37	40	9%
S Joyce Street/RiverHouse Driveway 3 (Intersection 5)	5	23	28	10%	29	20	49	11%
S Joyce Street/RiverHouse Driveway 4 (Intersection 6)	18	10	28	10%	44	12	56	13%
S Joyce Street/RiverHouse Driveway 5 (Intersection 10)	9	8	17	6%	13	24	37	8%
S Joyce Street/RiverHouse Driveway 6 (Intersection 11)	20	37	57	20%	46	22	68	16%
S Joyce Street/RiverHouse Driveway 7 (Intersection 12)	2	28	30	10%	8	28	36	8%
S Joyce Street/RiverHouse Driveway 8 (Intersection 13)	4	11	15	5%	18	12	30	7%
S Kent Street/16th Street S (Intersection 15)	4	7	11	4%	10	19	29	7%
S Lynn Street/RiverHouse Driveway 9 (Intersection 17)	11	41	52	18%	38	17	55	13%
Total	**87**	**203**	**290**	**100%**	**246**	**191**	**437**	**100%**

Table 23 Estimated Future 2028 Driveway Counts at RiverHouse

	AM System Peak Vehicle Trips 8:00 – 9:00am				PM System Peak Vehicle Trips 4:45 – 5:45pm			
Driveway	**In**	**Out**	**Total**	**Dist. %**	**In**	**Out**	**Total**	**Dist. %**
S Joyce Street / RiverHouse Driveway 1 (Intersection #3)	17	0	17	4%	66	0	66	11%
S Joyce Street / RiverHouse Driveway 2 (Intersection #4)	0	39	39	9%	0	38	38	6%
S Joyce Street / RiverHouse Driveway 4 (Intersection 6)	73	138	211	50%	189	119	308	51%
S Joyce Street / RiverHouse Driveway 6 (Intersection #11)	20	53	73	17%	61	39	100	17%
S Joyce Street / RiverHouse Driveway 7 (Intersection #12)	0	8	8	2%	0	10	10	2%
S Joyce Street / RiverHouse Driveway 8 (Intersection #13)	12	23	35	8%	24	13	37	6%
S Kent Street / 16th Street S	5	8	13	3%	10	19	29	5%
S Lynn Street / S Kent Street	10	12	22	5%	6	5	11	2%
Total	**137**	**281**	**418**	**100%**	**356**	**243**	**599**	**100%**

Table 24: Estimated Future 2035 Future Driveway Counts at Riverhouse

	AM System Peak Vehicle Trips 8:00 – 9:00am				PM System Peak Vehicle Trips 4:45 – 5:45pm			
Driveway	**In**	**Out**	**Total**	**Dist. %**	**In**	**Out**	**Total**	**Dist. %**
S Joyce Street / RiverHouse Driveway 1 (Intersection #3)	4	0	4	1%	13	0	13	2%
S Joyce Street / RiverHouse Driveway 2 (Intersection #4)	47	140	187	29%	139	80	219	27%
S Joyce Street / RiverHouse Driveway 4 (Intersection 6)	67	124	191	30%	180	106	286	35%
S Joyce Street / RiverHouse Driveway 6 (Intersection #11)	18	47	65	10%	42	21	63	8%
S Joyce Street / RiverHouse Driveway 7 (Intersection #12)	31	93	124	19%	77	58	135	17%
S Joyce Street / RiverHouse Driveway 8 (Intersection #13)	12	23	35	5%	24	13	37	5%
S Kent Street / 16th Street S	5	8	13	2%	11	20	31	4%
S Lynn Street / S Kent Street	**11**	**13**	24	4%	8	6	14	2%
Total	**195**	**448**	**643**	**100%**	**494**	**304**	**798**	**100%**

Figure 50: Future 2028 AM/PM Peak Hour Vehicle Volumes

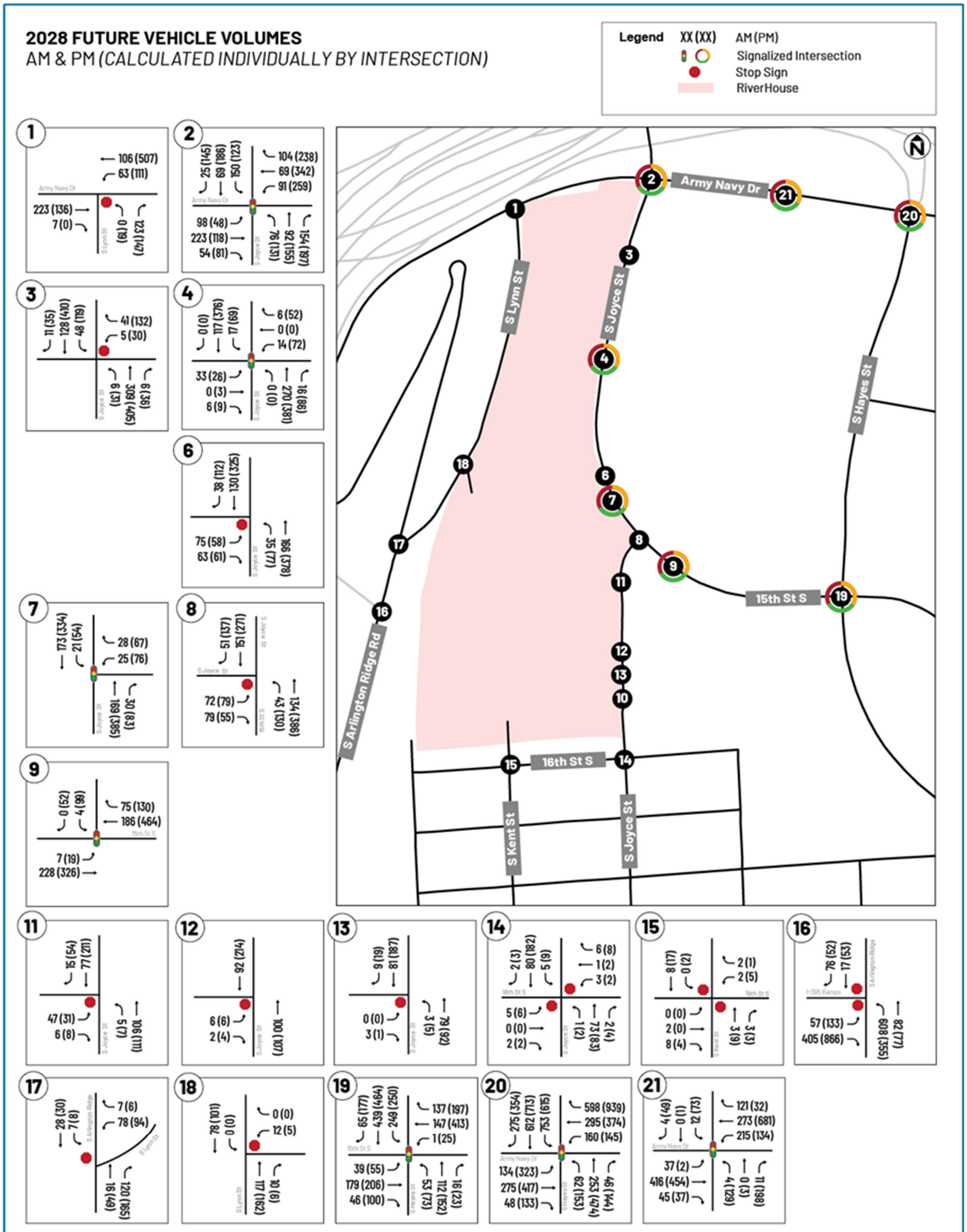
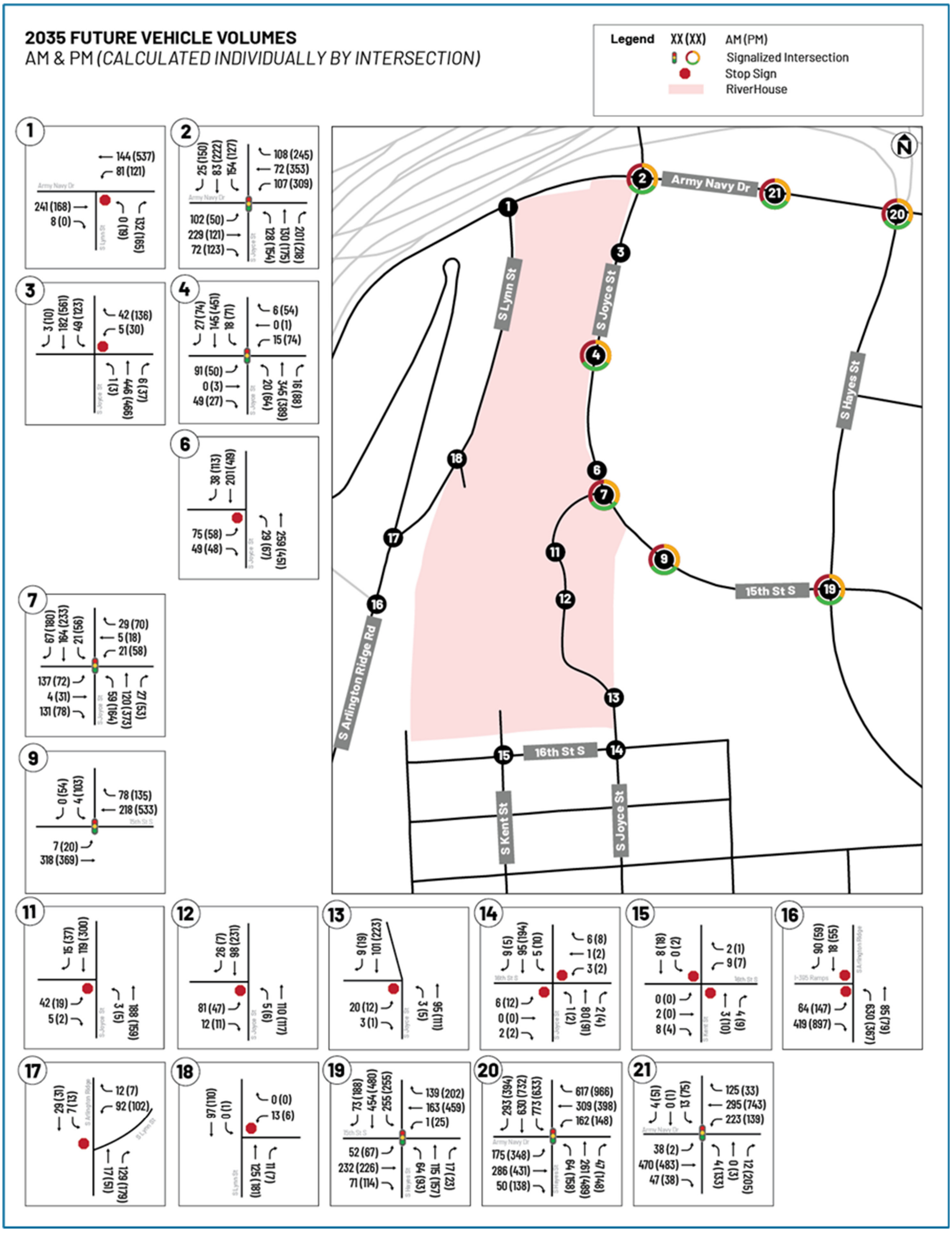


Figure 51: Future 2035 AM/PM Peak Hour Vehicle Volumes



Geometry and Operations Assumptions

The following section reviews the roadway geometry and operations assumptions made and the methodologies used in the 2035 horizon year.

2023 Existing Geometry and Operations Assumptions

The geometry and operations assumed in the existing conditions scenario are those present when the data collection occurred. The Nelson\Nygaard team made observations and confirmed the existing lane configurations and traffic controls at the intersections within the study area. Existing signal timings and operations were obtained from Arlington County and confirmed during field visits. These existing timings were used as the basis for Synchro analysis.

A description of the roadways within the study area is presented in Table 18. The existing local roadway network including lane configurations and intersection control is detailed in and illustrated in Figure 52.

2028 and 2035 Background Geometry and Operations Assumptions

Based on industry standards, a background improvement is considered if the improvement is fully funded and has a timeline for completion prior to or at the build-out of the proposed development. With these standards, the following geometric and operational improvements are included in the 2028 and 2035 Background analysis:

1. **Army Navy Drive Complete Streets Project**

   The Army Navy Drive Complete Street project includes the following changes to roadway geometry and operations to Army Navy Drive from S. Joyce Street to S Hayes Street and the reconfiguration of the Army Navy Drive and S Joyce Street intersection to convert:

   - The southbound approach remains unchanged.
   - The eastbound approach from one left-turn lane, one thru lane and one right-turn lane to one left-turn lane, one thru lane and one thru/right-turn lane
   - The westbound approach from one left-turn lane, two thru lanes, and one thru/right lane to one left-turn lane, one thru lane, and one right-turn lane.
   - The northbound approach from one left-turn lane, two thru lanes and one right-turn lane to one left-turn lane, one thru lane and one thru/right lane.

- Arlington County provided signal timing and phasing modifications to accommodate the Complete Streets improvements, effective at intersections with S. Joyce St., the Fashion Centre garage entrance, and S. Hayes St. Note that these proposed signal timings were modified to illustrate potential mitigation in 2028 & 2035 scenarios.

2028 Future Geometry and Operations Assumptions (with proposed development)

The configurations and traffic controls for the 2028 Future Conditions were based on those for the 2028 Background Conditions with the addition of the RiverHouse development. Site access to the RiverHouse development in 2028 was altered removing an access point from S. Joyce Street with the cross-section of S Joyce Street also reconfigured to enable a road diet from 15th Street S. to Army Navy Drive. The reconfiguration changes from a four-lane cross section to a two-lane cross section with the incorporation of a west-side two-way protected cycletrack and is highlighted in Figure 17.

1. Army Navy Drive at S Hayes Street intersection (study area #20) in the AM and PM peak hour has increased delay at the high-volume movements associated with background growth and at the eastbound left movement associated with new Riverhouse trips. As such, timings were adjusted under 2028 Background and Future Conditions to mitigate those delays.
2. The northbound approach at the Army Navy Drive / S Joyce Street intersection (#2) would remain as the proposed Army Navy Complete Streets configuration of one left-turn lane, one thru lane and one thru/right lane.

The 2028 Future Condition lane configurations and intersection control are detailed and illustrated in Figure 53.

2035 Future Geometry and Operations Assumptions (with proposed development)

The configurations and traffic controls for the 2035 Future Conditions were based on those for the 2035 Background Conditions with the addition of the RiverHouse development. Site access to the RiverHouse development was altered by consolidating the existing access drives from ten (10) to three (3). The RiverHouse driveway onto S Joyce Street at the signalized entrance to WestPost (study area intersection #4) is converted to allow vehicles to enter or exit. Additionally, S Joyce Street at 15th Street South is relocated to a modified intersection creating a signalized S. Joyce St/S. Joyce St. intersection opposite the Pentagon Row parking access.

The cross-section of S Joyce Street reconfigured in the 2028 scenario remains and constitutes a road diet from 15th Street S. to Army Navy Drive. The reconfiguration changes from a four-lane cross section to a two-lane cross section with the incorporation of a west-side two-way protected cycletrack and is highlighted in Figure 17.

1. Army Navy Drive at S Hayes Street intersection (study area #20) in the AM and PM peak hour has increased delay at the high-volume movements associated with background growth and at the eastbound left movement associated with new Riverhouse trips. As such, timings were adjusted under 2028 Background and Future Conditions to mitigate those delays.
2. The northbound approach at the Army Navy Drive / S Joyce Street intersection (#2) would remain as the proposed Army Navy Complete Streets configuration of one left-turn lane, one thru lane and one thru/right lane.

The 2035 Future Condition lane configurations and intersection control are detailed in and illustrated in Figure 54.

Figure 52: Existing Roadway Lane Configuration

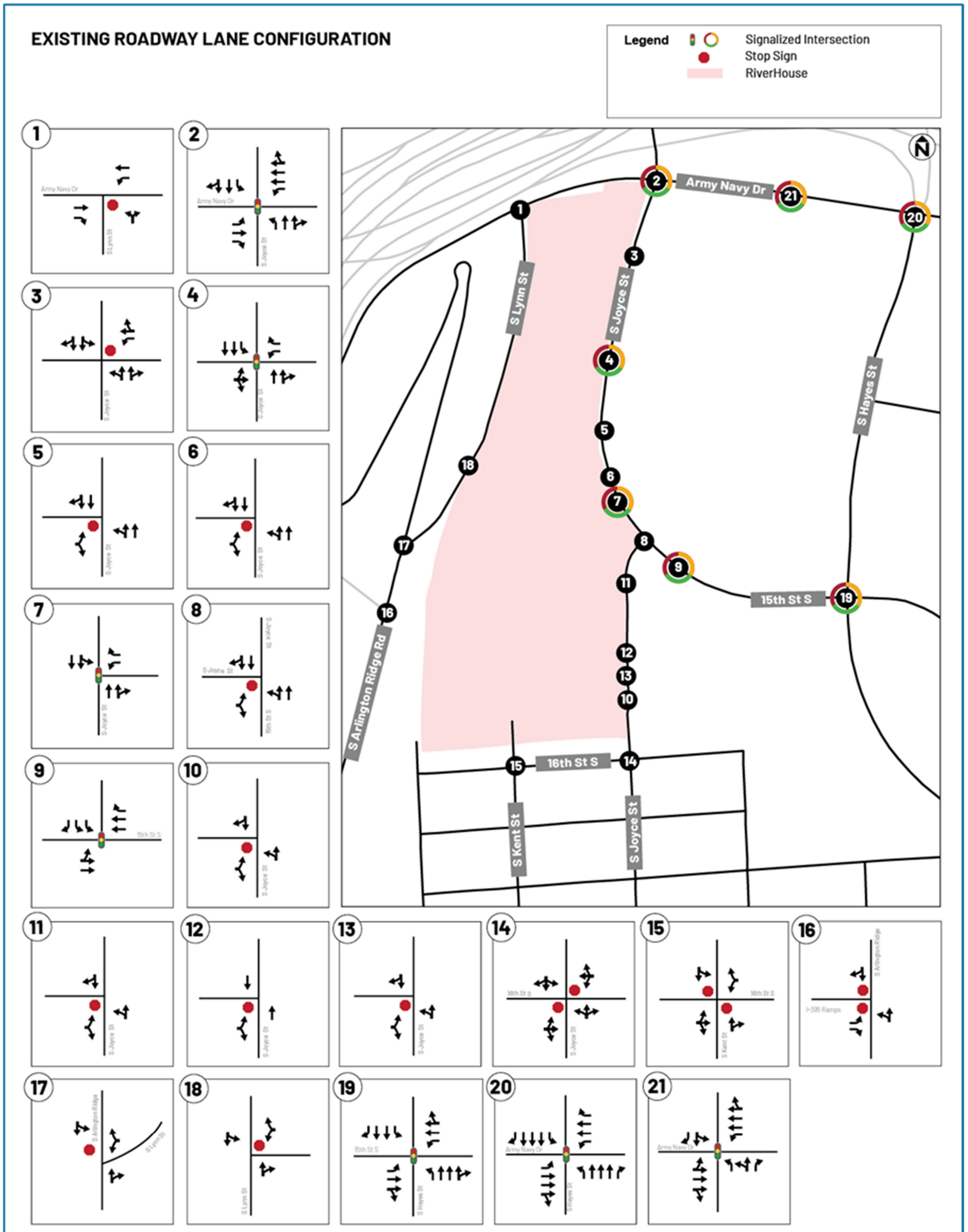


Figure 53: 2028 Future Roadway Lane Configuration

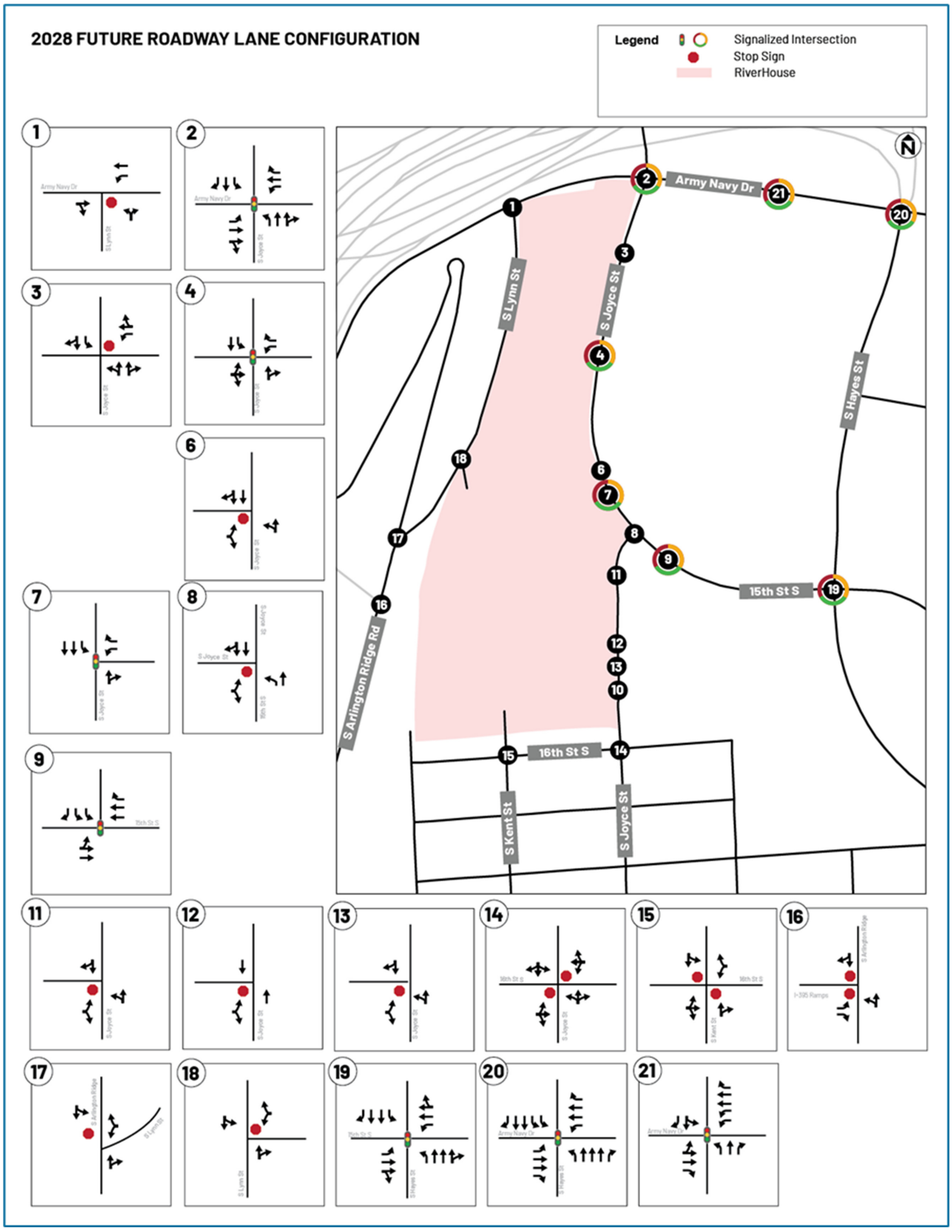
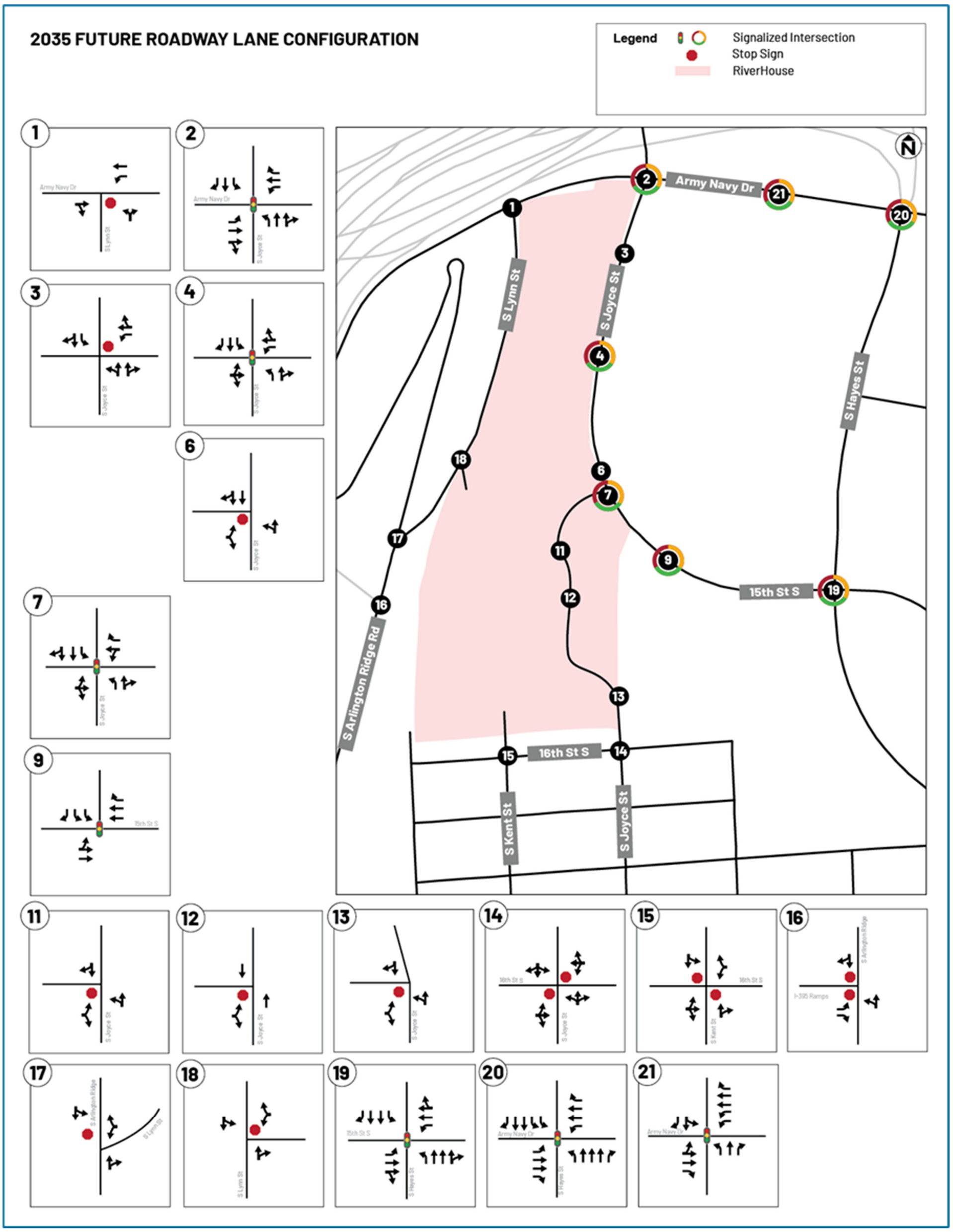


Figure 54: 2035 Future Roadway Lane Configuration



Operations Analysis Results

The vehicle traffic analysis considered the Level of service calculations for existing, background and future conditions without and with development in accordance with Highway Capacity Manual (HCM) methodology, as computed by Synchro 11 software. Typical Synchro parameters in this analysis are consistent with those values provided in VDOT's TOSAM and Arlington County standards.

- Intersection Level of Service (LOS)
- Intersection Volume to Capacity Ratio (V/C)
- Queue Length

Level of Service and Delay

The results of the capacity analyses are expressed in level of service (LOS) and delay (seconds per vehicle) for each approach. A LOS grade is a letter grade based on the average delay (in seconds) experienced by motorists traveling through an intersection. LOS results range from "A" being the least delay (and highest vehicle speeds) to "F" being the most delay (and slowest vehicle speeds). Arlington evaluates changes in vehicle delay against other transportation and broader performance measures in deciding how to allocate roadway space and signal cycle times.

The LOS capacity analyses were based on: (1) the peak hour traffic volumes; (2) the lane use and traffic controls; and (3) the Highway Capacity Manual (HCM) methodologies (using the Synchro software). The average delay of each movement and LOS is shown for the signalized intersections in addition to the overall average delay and intersection LOS grade. The HCM does not give guidelines for calculating the average delay for a two-way stop-controlled intersection, as the approaches without stop signs would technically have no delay. Detailed analysis worksheets for the existing, background and future conditions are contained in the Appendix.

Queuing Analysis

In addition to the capacity analyses, a queuing analysis was performed at the study intersections. The queuing analysis was performed using Synchro. The 50_{th} percentile queue lengths are shown for each lane group at the study area signalized intersections. The 50_{th} percentile queue is the maximum back of queue on a median cycle. For unsignalized intersections, only the 95_{th} percentile queue is reported for each lane group (including free-flowing left turns and stop-controlled movements) based on the HCM 6^{th} Edition

calculations. Queuing information is included in the Capacity Analysis tables that follow as well as in the Synchro worksheets in the Appendix.

2023 Existing Conditions Analysis

The Existing (2023) results of the intersection capacity analyses for the AM and PM peak hours are expressed in level of service (LOS) and delay (seconds per vehicle) per movement, and to facilitate comparison to current conditions are presented in each of the 2028 and 2035 tables described below (for example, the first columns of Table 25). The capacity analysis results indicate that all intersections operate at acceptable LOS under the Existing (2023) Conditions.

2028 Background and Future Conditions Analysis (without/with the proposed 4.1 Site Plan development)

The Background and Future (2028) results of the intersection capacity analyses for the AM and PM peak hours are expressed in level of service (LOS) and delay (seconds per vehicle) per movement and presented in Table 25 and Table 27. The capacity analysis results indicate that all intersections operate at acceptable LOS under both the 2028 Background and Future Conditions with the exception of the following intersections:

1. Hayes Street at 15th Street S intersection in the PM peak hour as a result of background growth and the delay from the southbound left turn movement.
    a. Signal timing changes in the future scenario offer mitigation of the delay at the southbound left movement.

2035 Background and Future Conditions Analysis (without/with the proposed PDSP development)

The Background and Future (2035) results of the intersection capacity analyses for the AM and PM peak hours are expressed in level of service (LOS) and delay (seconds per vehicle) per movement and presented in Table 26 and Table 28. The capacity analysis results indicate that all intersections operate at acceptable LOS under both the 2035 Background and Future Conditions with the exception of the following intersections:

1. Army Navy Drive at S Hayes Street intersection in the PM peak hour as a result of background growth and signal changes associated with the Army Navy Dr. Complete Streets project.

   a. Potential mitigation of the increased delay in the eastbound left movement associated with new RiverHouse trips could be created by signal timing changes.

2. Hayes Street at 15th Street S intersection in the PM peak hour as a result of background growth and the delay from the southbound left turn movement.
   a. Signal timing changes in the future scenario offer mitigation of the delay at the southbound left movement.

Table 25: Existing, 2028 Background and 2028 Future Capacity Analysis Results - AM Peak Hour

#	Intersection	Movement	Existing				Background-2028				Future 2028			
			LOS	Delay (s)	V/C	Queue (ft)	LOS	Delay (s)	V/C	Queue (ft)	LOS	Delay (s)	V/C	Queue (ft)
1	S Lynn St & Army Navy Dr	EBT	A	0	0	0	A	0	0	0	A	0	0	0
		EBR	A	0	0	0	A	0	0	0	A	0	0	0
		WBL	A	7.9	0.029	0.1	A	7.9	0.023	0.1	A	8	0.055	0.2
		WBT	A	0	0	0	A	0	0	0	A	0	0	0
		NB	B	10.6	0.176	0.6	B	10.8	0.17	0.6	B	10.8	0.177	0.6
		Intersection	A	3.4	-	-	A	3.2	-	-	A	3.5	-	-
2	S Joyce St & Army Navy Dr (Signalized)	EBL	B	12.9	0.15	92	B	17.5	0.17	88	B	19.9	0.15	86
		EBT	B	13.3	0.24	159	C	24.8	0.2	145	C	25.9	0.22	156
		EBR	B	11.5	0.05	0	C	24.7	0.21	-	C	26.1	0.23	-
		WBL	B	16.4	0.14	88	E	77.6	0.85	98	E	76.1	0.86	142
		WBT (R)	B	11.1	0.03	43	A	7.4	0.1	93	C	20.8	0.14	103
		WBR	-	-	-	-	A	5.3	0.15	79	A	5.9	0.2	104
		NBL	D	38.9	0.11	34	D	39.1	0.09	35	D	40.9	0.28	85
		NBT	D	40.4	0.33	51	D	52.1	0.34	133	D	51.1	0.35	147
		NBR	D	43.1	0.6	-	D	54.8	0.64	-	E	55.5	0.68	-
		SBL	C	33.2	0.46	83	D	46.5	0.61	152	D	48	0.65	154
		SBTR	C	26.9	0.08	24	D	41.9	0.12	45	D	45.8	0.21	91
		SBR (Future)	C	26.5	0.09	-	D	41.5	0.14	-	B	12.2	0.05	0
		Intersection	C	24.5	-	-	D	35.7	-	-	D	37.5	-	-
3	S Joyce St & RH driveway 1	WBL	B	12.1	0.013	0	B	12.7	0.011	0	B	14.1	0.013	0
		WBTR	B	10	0.05	0.2	B	10	0.055	0.2	B	10.3	0.059	0.2
		NB	A	7.4	0.003	0	A	7.5	0.003	0	A	7.5	0.004	0
		SB	A	8.2	0.029	0.1	A	8.1	0.041	0.1	A	8.3	0.044	0.1
		Intersection	A	1.6	-	-	A	2	-	-	A	1.7	-	-
4	S Joyce St & RH driveway 2 (Signalized) HCM 2000 Future 2035	EB	C	25.3	0.15	16	C	25.1	0.09	18	B	18.7	0.08	35
		WBL	C	25.2	0.03	15	C	25.4	0.04	17	B	18.5	0.04	17
		WBTR	C	24.4	0.02	0	C	24.5	0.01	0	B	18.3	0	0
		NBL	-	-	-	-	A	6	-	-	-	-	-	-
		NBTR	A	6.2	0.12	42	A	6.1	0.14	44	B	19.1	0.44	195
		SBL	A	6.6	0.02	13	A	6.5	0.04	14	E	59.5	0.56	28
		SBT (R)	A	5.8	0.04	21	A	5.7	0.06	22	B	10.7	0.15	58
		SBR	-	-	-	-	A	5.7	-	-	-	-	-	-
		Intersection	A	9.6	-	-	A	9	-	-	B	18.4	-	-

(~) Volume exceeds capacity, queue is theoretically infinite
(#) 95th percentile volume exceeds capacity, queue may be longer
(M) volume for 95th percentile queue is metered by upstream signal

#	Intersection	Movement	Existing				Background-2028				Future 2028			
			LOS	Delay (s)	V/C	Queue (ft)	LOS	Delay (s)	V/C	Queue (ft)	LOS	Delay (s)	V/C	Queue (ft)
5	S Joyce St & RH driveway 3	EB	B	10.2	0.037	0.1	B	10.2	0.035	0.1	-	-	-	-
		NB	A	7.6	0.003	0	A	7.6	0.003	0	-	-	-	-
		SB	A	0	0	0	A	0	0	0	-	-	-	-
		Intersection	B	0.9	-	-	A	0.8	-	-	-	-	-	-
6	S Joyce St & RH driveway 4	EB	A	9.5	0.015	0	A	9.6	0.014	0	B	12.9	0.248	1
		NB	A	7.7	0.01	0	A	7.8	0.009	0	A	7.9	0.029	0.1
		SB	A	0	0	0	A	0	0	0	A	0	0	0
		Intersection	A	0.6	-	-	A	0.6	-	-	A	4.1	-	-
7	S Joyce St & Pentagon Row driveway (Signalized)	EB (Future 2035)	-	-	-	-	-	-	-	-	-	-	-	-
		WBL (T)	D	50.4	0.35	25	D	52.7	0.46	35	D	52.7	0.46	35
		WBR	E	59.5	0.65	18	D	54.8	0.53	23	D	54.8	0.53	23
		NBL	-	-	-	-	-	-	-	-	-	-	-	-
		NBT	A	1.6	0.05	26	A	1.6	0.07	30	-	0	0	82
		NBR	A	1.6	0.05	-	A	1.6	0.07	-	A	1.9	0.16	-
		SBL	A	1.5	0.06	-	A	1.6	0.07	-	A	2	0.02	14
		SBT	A	1.6	0.06	29	A	1.6	0.06	31	A	1.6	0.07	35
		SBR	-	-	-	-	-	-	-	-	-	-	-	-
		Intersection	B	10.6	-	-	A	9	-	-	A	7.9	-	-
8	S Joyce St & 15th St S	EB	B	11.6	0.192	0.7	B	12.4	0.231	0.9	B	13.9	0.289	1.2
		NB	A	7.8	0.027	0.1	A	7.9	0.036	0.1	A	8	0.037	0.1
		SB	A	0	0	0	A	0	0	0	A	0	0	0
		Intersection	A	4.5	-	-	A	4.4	-	-	A	4.6	-	-
9	15th St S & Mall Main Garage (Signalized)	EB	A	1.5	0.07	41	A	1.6	0.09	56	A	1.6	0.1	61
		WBT	A	1.5	0.05	34	A	1.4	0.07	45	A	1.4	0.08	48
		WBR	A	1.5	0.07	22	A	1.5	0.08	23	A	1.5	0.08	23
		SB	D	48.7	0.25	3	D	54.5	0.24	3	D	54.5	0.24	3
		Intersection	A	2.4	-	-	A	1.9	-	-	A	1.9	-	-
10	S Joyce St & RH driveway 5	EB	A	9.2	0.011	0	A	9.3	0.01	0	-	-	-	-
		NB	A	7.4	0.004	0	A	7.4	0.004	0	-	-	-	-
		SB	A	0	0	0	A	0	0	0	-	-	-	-
		Intersection	A	0.8	-	-	A	0.7	-	-	-	-	-	-
11	S Joyce St & RH driveway 6	EB	B	10	0.057	0.2	B	10.2	0.056	0.2	B	10.4	0.079	0.3
		NB	A	7.5	0.006	0	A	7.5	0.005	0	A	7.5	0.004	0
		SB	A	0	0	0	A	0	0	0	A	0	0	0
		Intersection	A	2.3	-	-	A	2	-	-	A	2.3	-	-

#	Intersection	Movement	Existing				Background-2028				Future 2028			
			LOS	Delay (s)	V/C	Queue (ft)	LOS	Delay (s)	V/C	Queue (ft)	LOS	Delay (s)	V/C	Queue (ft)
12	S Joyce St & RH driveway 7	EB	A	8.1	0.028	0.1	A	9.4	0.037	0.1	A	9.5	0.011	0
		NB	A	0	0	0	A	0	0	0	A	0	0	0
		SB	A	0	0	0	A	0	0	0	A	0	0	0
		Intersection	A	1.5	-	-	A	1.4	-	-	A	0.4	-	-
13	S Joyce St & RH driveway 8	EB	A	9.1	0.015	0	A	9.2	0.013	0	A	8.8	0.002	0
		NB	A	0	0	0	A	0	0	0	A	7.4	0.003	0
		SB	A	0	0	0	A	0	0	0	A	0	0	0
		Intersection	A	0.7	-	-	A	0.6	-	-	A	0.3	-	-
14	S Joyce St & 16th St S	EB	A	9.3	0.011	0	A	9.5	0.008	0	A	9.6	0.01	0
		WB	A	9.2	0.018	0.1	A	9.4	0.013	0	A	9.4	0.13	0
		NB	A	7.4	0.001	0	A	7.4	0.001	0	A	7.4	0.001	0
		SB	A	7.4	0.003	0	A	7.4	0.004	0	A	7.4	0.004	0
		Intersection	A	1.8	-	-	A	1.1	-	-	A	1.1	-	-
15	S Kent St & 16th St S	EB	A	0	0	0	A	0	0	0	A	0	0	0
		WB	A	7.2	0.001	0	A	7.2	0.001	0	A	7.2	0.001	0
		NB	A	8.8	0.004	0	A	8.8	0.005	0	A	8.8	0.007	0
		SB	A	9.2	0.019	0.1	A	9.2	0.009	0	A	9.2	0.01	0
		Intersection	A	5.2	-	-	A	4.4	-	-	A	5	-	-
16	S Arlington Ridge & I-395 HCM 2000 Background and Future	EBL	A	9.9	-	-	A	9.6	-	-	A	9.8	-	-
		EBR	A	8.4	-	-	A	8.1	-	-	A	8.2	-	-
		NBL	-	-	-	-	-	-	-	-	-	-	-	-
		NB	D	34.6	-	-	D	27.4	-	-	D	29.2	-	-
		SB	A	8.2	-	-	A	7.9	-	-	A	8.1	-	-
		Intersection	C	22.6	-	-	C	19	-	-	C	19.9	-	-
17	Arlington Ridge Rd & S Lynn St	WB	A	0	0	0	A	0	0	0	A	0	0	0
		NB	A	0	0	0	A	0	0	0	A	0	0	0
		SB	A	9.1	0.044	0.1	A	9	0.04	0.1	A	9.1	0.41	0.1
		Intersection	A	2	-	-	A	1.9	-	-	A	1.9	-	-
18	S Lynn St & RH driveway 9	WB	A	0	0	0	A	9.5	0.054	0.2	A	9.8	0.017	0.1
		NB	A	9.6	0.058	0.2	A	0	0	0	A	0	0	0
		SB	A	7.5	0.002	0	A	7.5	0.001	0	A	0	0	0
		Intersection	A	2.1	-	-	A	2.1	-	-	A	0.5	-	-

#	Intersection	Movement	Existing				Background-2028				Future 2028			
			LOS	Delay (s)	V/C	Queue (ft)	LOS	Delay (s)	V/C	Queue (ft)	LOS	Delay (s)	V/C	Queue (ft)
19	S Hayes St & 15th St S (Signalized)	EBL	D	42.1	0.15	40	D	45.3	0.2	52	D	45.5	0.26	56
		EBT	D	37.7	0.3	72	D	36.3	0.31	94	D	36.4	0.36	102
		EBR	D	37.5	0.33	-	D	36.2	-	-	D	36.7	0.38	-
		WBL	D	40	0.01	5	D	39	0	5	D	39.4	0.01	5
		WBT	D	38.1	0.32	60	D	38.1	0.39	85	D	38.3	0.48	88
		WBR	D	38	0.36	-	D	38.7	-	-	D	39.5	0.53	-
		NBL	F	91.6	0.85	#91	F	92.1	0.66	#101	F	94	0.85	#110
		NBT	B	17.9	0.06	30	C	22.4	0.11	40	C	22.6	0.09	40
		NBR	B	17.8	0.07	-	C	22.5	-	-	C	22.9	0.1	-
		SBL	E	57.5	0.91	199	E	66.1	0.91	#296	E	66.1	0.93	#296
		SBT	B	13.2	0.3	136	B	14.5	0.31	141	B	14.8	0.3	141
		SBR	B	11.7	0.11	6	B	12.9	0.12	8	B	13.2	0.12	9
		Intersection	C	31.1	-	-	D	35.1	-	-	D	35.6	-	-
20	S Hayes St & Army Navy Dr (Signalized) HCM 2000	EBL	D	36/9	0.48	#128	E	66.9	0.77	189	E	69	0.79	211
		EBT	D	44.4	0.31	80	E	74.7	0.46	201	E	75.1	0.46	202
		EBR	D	45	0.34	-	F	96.7	0.35	99	F	104.7	0.34	97
		WBL	D	37.6	0.24	53	F	104.4	0.94	#299	F	104.4	0.94	#299
		WBT	D	43.1	0.47	169	D	43.5	0.44	182	D	45.1	0.47	188
		WBR	-	-	-	-	A	1.1	0.47	0	A	1.1	0.47	0
		NBL	F	86.5	0.68	#108	F	81.6	0.71	#118	F	81.6	0.71	#118
		NBT	D	38.8	0.28	75	D	54	0.43	121	D	54.5	0.44	121
		NBR	D	37.6	0.12	45	C	31.9	0.12	31	C	32.2	0.12	31
		SBL	D	46.2	0.94	#578	F	199.3	1.3	#614	F	199.3	1.3	#614
		SBT	C	20.2	0.29	124	D	46	0.71	#499	D	46.6	0.71	#401
		SBR	-	0	0	52	C	22.4	0.41	231	B	19.1	0.23	58
		Intersection	D	38.6	-	-	E	76.8	-	-	E	76.8	-	-
21	Parking Garage & Army Navy Dr (Signalized)	EBL	-	-	-	-	D	38.9	0.32	-	A	2	0.33	-
		EBT	B	18.3	0.22	120	D	39.5	0.37	170	A	2.1	0.34	298
		EBR	-	-	-	-	C	32.1	0.07	16	A	1.1	0.07	M16
		WBL	A	9.4	0.42	m155	E	71.2	0.8	120	E	71.3	0.8	97
		WBT (R)	A	8.7	0.12	m61	C	24.2	0.14	25	C	24.3	0.15	29
		WBR	-	-	-	-	C	24.6	0.15	0	C	24.6	0.15	0
		NBL	D	37.5	0	5	D	39.9	0.01	13	D	39.9	0.01	13
		NBR	D	37.6	0.01	0	D	39.2	0.04	0	D	39.2	0.04	0
		SBL	D	38.5	0.08	22	D	38.5	0.04	-	D	39.3	0.04	28
		SBR	C	37.5	0	0	D	38.8	0.01	28	D	38.8	0.01	0
		Intersection	B	13.6	-	-	D	39.9	-	-	C	23.9	-	-

Table 26: Existing, 2035 Background, and 2035 Future Capacity Analysis Results - AM Peak Hour

#	Intersection	Movement	Existing				Background-2035				Future 2035			
			LOS	Delay (s)	V/C	Queue (ft)	LOS	Delay (s)	V/C	Queue (ft)	LOS	Delay (s)	V/C	Queue (ft)
1	S Lynn St & Army Navy Dr	EBT	A	0	0	0	A	0	0	0	A	0	0	0
		EBR	A	0	0	0	A	0	0	0	A	0	0	0
		WBL	A	7.9	0.029	0.1	A	7.9	0.016	0	A	8.3	0.207	0.2
		WBT	A	0	0	0	A	0	0	0	A	0	0	0
		NB	B	10.6	0.176	0.6	B	10.9	0.177	0.6	B	11.5	0.074	0.8
		Intersection	A	3.4	-	-	A	3.1	-	-	A	3.6	-	-
2	S Joyce St & Army Navy Dr (Signalized)	EBL	B	12.9	0.15	92	B	17.7	0.18	91	C	23.6	0.18	90
		EBT	B	13.3	0.24	159	C	24.9	0.21	151	C	30.8	0.26	154
		EBR	B	11.5	0.05	0	C	24.8	0.21	-	C	30.7	0.27	-
		WBL	B	16.4	0.14	88	E	77.1	0.85	60	F	81.9	0.87	163
		WBT (R)	B	11.1	0.03	43	A	7.6	0.1	79	C	26.7	0.14	107
		WBR	-	-	-	-	A	5.4	0.16	91	A	7.6	0.21	105
		NBL	D	38.9	0.11	34	D	38.9	0.09	35	D	40.9	0.43	135
		NBT	D	40.4	0.33	51	D	52	0.35	137	D	48.1	0.41	100
		NBR	D	43.1	0.6	-	D	54.8	0.65	-	D	52.7	0.74	158
		SBL	C	33.2	0.46	83	D	47	0.63	156	D	45.8	0.67	106
		SBTR	C	26.9	0.08	24	D	41.7	0.13	46	D	42.1	0.22	0
		SBR (Future)	C	26.5	0.09	-	D	41.3	0.14	-	B	12.2	0.05	-
		Intersection	C	24.5	-	-	D	35.6	-	-	D	39.8	-	-
3	S Joyce St & RH driveway 1	WBL	B	12.1	0.013	0	B	12.4	0.011	0	C	16.2	0.016	0
		WBTR	B	10	0.05	0.2	B	10	0.057	0.2	B	10.6	0.064	0.2
		NB	A	7.4	0.003	0	A	7.5	0.003	0	A	7.6	0.001	0
		SB	A	8.2	0.029	0.1	A	8.1	0.043	0.1	A	8.7	0.049	0.2
		Intersection	A	1.6	-	-	A	2	-	-	A	1.3	-	-
4	S Joyce St & RH driveway 2 (Signalized) HCM 2000 Future 2035	EB	C	25.3	0.15	16	C	25.1	0.11	18	C	21.6	0.32	113
		WBL	C	25.2	0.03	15	C	25.4	0.04	18	C	20	0.04	19
		WBTR	C	24.4	0.02	0	C	24.5	0.02	0	B	19.2	0.02	0
		NBL	-	-	-	-	A	6.1	0.1	-	E	63.4	0.69	32
		NTBR	A	6.2	0.12	42	A	6.1	0.12	45	B	18.8	0.52	254
		SBL	A	6.6	0.02	13	A	6.5	0.03	15	E	64	0.68	30
		SBT (R)	A	5.8	0.04	21	A	5.7	0.05	23	B	14.5	0.21	100
		SBR	-	-	-	-	A	5.7	0.05	-	B	12.9	0.05	0
		Intersection	A	9.6	-	-	A	9	-	-	C	20.7	-	-

(~) Volume exceeds capacity, queue is theoretically infinite
(#) 95th percentile volume exceeds capacity, queue may be longer
(M) volume for 95th percentile queue is metered by upstream signal

#	Intersection	Movement	Existing				Background-2035				Future 2035			
			LOS	Delay (s)	V/C	Queue (ft)	LOS	Delay (s)	V/C	Queue (ft)	LOS	Delay (s)	V/C	Queue (ft)
5	S Joyce St & RH driveway 3	EB	B	10.2	0.037	0.1	B	10.3	0.038	0.1	-	-	-	-
		NB	A	7.6	0.003	0	A	7.7	0.003	0	-	-	-	-
		SB	A	0	0	0	A	0	0	0	-	-	-	-
		Intersection	B	0.9	-	-	A	0.9	-	-	-	-	-	-
6	S Joyce St & RH driveway 4	EB	A	9.5	0.015	0	A	9.6	0.014	0	B	13.6	0.243	0.9
		NB	A	7.7	0.01	0	A	7.8	0.01	0	A	7.8	0.024	0.1
		SB	A	0	0	0	A	0	0	0	A	0	0	0
		Intersection	A	0.6	-	-	A	0.5	-	-	A	2.9	-	-
7	S Joyce St & Pentagon Row driveway (Signalized)	EB (Future 2035)	-	-	-	-	-	-	-	-	D	37.3	0.72	-
		WBL (T)	D	50.4	0.35	25	D	52.6	0.47	36	C	27.9	0.08	230
		WBR	E	59.5	0.65	18	E	55.3	0.55	23	C	28.8	0.11	29
		NBL	-	-	-	-	-	-	-	-	E	63.8	0.8	77
		NBT	A	1.6	0.05	26	A	1.6	0.07	31	-	-	-	87
		NBR	A	1.6	0.05	-	A	1.6	0.07	-	A	8.4	0.16	-
		SBL	A	1.5	0.06	-	A	1.6	0.07	-	B	12.7	0.03	29
		SBT	A	1.6	0.06	29	A	1.6	0.07	32	B	13.8	0.16	79
		SBR	-	-	-	-	-	-	-	-	B	13.6	0.17	-
		Intersection	B	10.6	-	-	A	9.2	-	-	C	25.7	-	-
8	S Joyce St & 15th St S	EB	B	11.6	0.192	0.7	B	12.5	0.242	0.9	-	-	-	-
		NB	A	7.8	0.027	0.1	A	7.9	0.037	0.1	-	-	-	-
		SB	A	0	0	0	A	0.1	0	0	-	-	-	-
		Intersection	A	4.5	-	-	A	4.5	-	-	-	-	-	-
9	15th St S & Mall Main Garage (Signalized)	EB	A	1.5	0.07	41	A	1.5	0.1	57	A	1.7	0.14	82
		WBT	A	1.5	0.05	34	A	1.4	0.08	46	A	1.5	0.09	56
		WBR	A	1.5	0.07	22	A	1.5	0.08	23	A	1.5	0.08	23
		SB	D	48.7	0.25	3	D	54.5	0.24	3	D	54.5	0.24	3
		Intersection	A	2.4	-	-	A	1.9	-	-	A	1.9	-	-
10	S Joyce St & RH driveway 5	EB	A	9.2	0.011	0	A	9.3	0.01	0	-	-	-	-
		NB	A	7.4	0.004	0	A	7.4	0.004	0	-	-	-	-
		SB	A	0	0	0	A	0	0	0	-	-	-	-
		Intersection	A	0.8	-	-	A	0.7	-	-	-	-	-	-
11	S Joyce St & RH driveway 6	EB	B	10	0.057	0.2	B	10.2	0.058	0.2	B	11.1	0.086	0.3
		NB	A	7.5	0.006	0	A	7.5	0.005	0	A	7.5	0.002	0
		SB	A	0	0	0	A	0	0	0	A	0	-	-
		Intersection	A	2.3	-	-	A	2	-	-	A	1.5	-	-

#	Intersection	Movement	Existing				Background-2035				Future 2035			
			LOS	Delay (s)	V/C	Queue (ft)	LOS	Delay (s)	V/C	Queue (ft)	LOS	Delay (s)	V/C	Queue (ft)
12	S Joyce St & RH driveway 7	EB	A	8.1	0.028	0.1	A	9.4	0.037	0.1	-	-	-	-
		NB	A	0	0	0	A	0	0	0	-	-	-	-
		SB	A	0	0	0	A	0	0	0	-	-	-	-
		Intersection	A	1.5	-	-	A	1.4	-	-	-	-	-	-
13	S Joyce St & RH driveway 8	EB	A	9.1	0.015	0	A	9.2	0.014	0	A	9.7	0.031	0.01
		NB	A	0	0	0	A	0	0	0	A	7.5	0.002	0
		SB	A	0	0	0	A	0	0	0	A	0	0	0
		Intersection	A	0.7	-	-	A	0.6	-	-	A	1.1	-	-
14	S Joyce St & 16th St S	EB	A	9.3	0.011	0	A	9.6	0.008	0	A	9.8	0.012	0
		WB	A	9.2	0.018	0.1	A	9.4	0.013	0	A	9.4	0.013	0
		NB	A	7.4	0.001	0	A	7.4	0.001	0	A	7.4	0.004	0
		SB	A	7.4	0.003	0	A	7.4	0.004	0	A	7.5	0.001	0
		Intersection	A	1.8	-	-	A	1.1	-	-	A	1	-	-
15	S Kent St & 16th St S	EB	A	0	0	0	A	0	0	0	A	0	0	0
		WB	A	7.2	0.001	0	A	7.2	0.001	0	A	7.2	0.006	0
		NB	A	8.8	0.004	0	A	8.8	0.005	0	A	8.8	0.008	0
		SB	A	9.2	0.019	0.1	A	9.2	0.009	0	A	9.3	0.001	0
		Intersection	A	5.2	-	-	A	4.4	-	-	A	5.6	-	-
16	S Arlington Ridge & I-395 HCM 2000 Background and Future	EBL	A	9.9	-	-	A	9.7	-	-	A	10	-	-
		EBR	A	8.4	-	-	A	8.2	-	-	A	8.2	-	-
		NBL			-	-	-	-	-	-	-	-	-	-
		NB	D	34.6	-	-	D	31.4	-	-	D	34.8	-	-
		SB	A	8.2	-	-	A	8	-	-	A	8.3	-	-
		Intersection	C	22.6	-	-	C	21.2	-	-	C	22.9	-	-
17	Arlington Ridge Rd & S Lynn St	WB	A	0	0	0	A	0	0	0	A	0	0	0
		NB	A	0	0	0	A	0	0	0	A	0	0	0
		SB	A	9.1	0.044	0.1	A	9.1	0.041	0.1	A	9.1	0.043	0.1
		Intersection	A	2	-	-	A	1.9	-	-	A	1.8	-	-
18	S Lynn St & RH driveway 9	WB	A	0	0	0	A	9.6	0.056	0.2	A	0	0	0
		NB	A	9.6	0.058	0.2	A	0	0	0	A	0	0	0
		SB	A	7.5	0.002	0	A	7.5	0.001	0	A	9.5	0.156	0.6
		Intersection	A	2.1	-	-	A	2.1	-	-	A	5.5	-	-

#	Intersection	Movement	Existing				Background-2035				Future 2035			
			LOS	Delay (s)	V/C	Queue (ft)	LOS	Delay (s)	V/C	Queue (ft)	LOS	Delay (s)	V/C	Queue (ft)
19	S Hayes St & 15th St S (Signalized)	EBL	D	42.1	0.15	40	D	45.5	0.25	54	D	47.2	0.35	72
		EBT	D	37.7	0.3	72	D	36.3	0.35	97	D	37.6	0.46	131
		EBR	D	37.5	0.33	-	D	36.5	36	-	C	37.9	0.48	-
		WBL	D	40	0.01	5	D	39.1	0	5	D	41.3	0.01	5
		WBT	D	38.1	0.32	60	D	38.1	0.46	86	D	38.8	0.5	95
		WBR	D	38	0.36	-	D	38.7	0.54		D	38.8	0.54	-
		NBL	F	91.6	0.85	#91	F	93.6	0.85	#107	F	98.4	0.84	#135
		NBT	B	17.9	0.06	30	C	22.8	0.09	41	C	22.9	0.09	41
		NBR	B	17.8	0.07	-	C	22.9	0.1		C	22.9	0.1	-
		SBL	E	57.5	0.91	199	E	66.7	0.93	#308	E	66.7	0.93	#308
		SBT	B	13.2	0.3	136	B	14.8	0.31	146	B	15.6	0.32	146
		SBR	B	11.7	0.11	6	B	13.1	0.12	10	B	14	0.13	14
		Intersection	C	31.1	-	-	D	35.4	-	-	D	36.7	-	-
20	S Hayes St & Army Navy Dr (Signalized) HCM 2000	EBL	D	36.9	0.48	#128	E	68	0.77	192	E	79	0.86	265
		EBT	D	44.4	0.31	80	E	74.8	0.47	204	E	75.4	0.48	209
		EBR	D	45	0.34	-	F	93.7	0.35	100	F	101.8	0.35	100
		WBL	D	37.6	0.24	53	F	104.1	0.94	#302	F	104.1	0.94	#302
		WBT	D	43.1	0.47	169	D	43.5	0.45	189	D	49.1	0.55	202
		WBR	-	-	-	-	A	1.2	0.48	-	A	1.2	0.48	0
		NBL	F	86.5	0.68	#108	F	83.2	0.73	#125	F	83.2	0.73	#125
		NBT	D	38.8	0.28	75	E	55.8	0.47	124	E	55.9	0.47	124
		NBR	D	37.6	0.12	45	C	32.7	0.13	31	C	32.8	0.13	31
		SBL	D	46.2	0.94	#578	F	202.1	1.31	#630	F	202.1	1.31	#640
		SBT	C	20.2	0.29	124	D	48.1	0.74	#421	D	48.3	0.75	#422
		SBR	-	0	0	52	C	20.5	0.24	70	B	17.7	0.26	77
		Intersection	D	38.6	-	-	E	77.6	-	-	E	78.1	-	-
21	Parking Garage & Army Navy Dr (Signalized)	EBL	-	-	-	-	D	39.4	0.33	-	A	0.5	0.25	-
		EBT	B	18.3	0.22	120	D	40	0.34	174	A	0.6	0.26	318
		EBR	-	-	-	-	C	32.4	0.08	m18	A	0.1	0.05	m15
		WBL	A	9.4	0.42	m155	E	71.2	0.81	112	E	71.2	0.81	108
		WBT (R)	A	8.7	0.12	m61	C	24.3	0.15	28	B	10.3	0.12	32
		WBR	-	-	-	-	C	24.8	0.15	0	B	10.2	0.11	0
		NBL	D	37.5	0	5	D	40	0.01	13	E	68.7	0.06	13
		NBR	D	37.6	0.01	0	D	39.3	0.05	0	E	69	0.22	0
		SBL	D	38.5	0.08	22	D	38.6	0.05	10	E	67.4	0.14	29
		SBR	C	37.5	0	0	D	38.8	0.01	0	E	69.1	0.11	0
		Intersection	B	13.6	-	-	D	40.2	-	-	B	18.4	-	-

Table 27: Existing, 2028 Background, and 2028 Future Capacity Analysis Results - PM Peak Hour

#	Intersection	Movement	Existing				Background-2028				Future 2028			
			LOS	Delay (s)	V/C	Queue (ft)	LOS	Delay (s)	V/C	Queue (ft)	LOS	Delay (s)	V/C	Queue (ft)
1	S Lynn St & Army Navy Dr	EBT	A	0	0	0	A	0	0	0	A	0	0	0
		EBR	A	0	0	0	-	-	-	-	A	0	0	0
		WBL	A	7.8	0.076	0.2	A	7.8	0.075	0.2	A	7.9	0.089	0.3
		WBT	A	0	0	0	A	0	0	0	A	0	0	0
		NB	B	11.8	0.217	0.8	B	12.3	0.23	0.9	B	12.5	0.274	1.1
		Intersection	A	2.9	-	-	A	2.8	-	-	A	3.2	-	-
2	S Joyce St & Army Navy Dr (Signalized)	EBL	B	14.9	0.1	48	B	18	0.13	46	C	30.7	0.13	47
		EBT	B	14.4	0.15	85	C	34.5	0.16	94	D	38.7	0.24	86
		EBR	B	13.3	0.04	0	C	34.4	0.17	-	D	39.2	0.27	-
		WBL	A	7.5	0.41	202	E	76	0.94	#363	F	81.2	0.94	#428
		WBT (R)	A	4	0.15	117	B	10.4	0.147	358	C	21	0.57	410
		WBR	-	-	-	-	A	7.8	0.37	62	A	6.4	0.42	94
		NBL	D	40.6	0.46	118	D	41.2	0.46	117	D	41.2	0.52	141
		NBT	D	39.4	0.5	80	D	48.8	0.48	204	D	48.4	0.49	115
		NBR	D	40.1	0.64	-	D	53.3	0.7	-	E	55.4	0.73	136
		SBL	C	30.8	0.51	93	D	52	0.67	139	D	44.9	0.63	243
		SBTR	C	26.5	0.33	67	D	50.5	0.55	130	D	50.5	0.58	36
		SBR	C	26	0.35	-	D	50.3	0.6	-	B	17.6	0.37	-
		Intersection	C	21.6	-	-	D	38.9	-	-	D	39.7	-	-
3	S Joyce St & RH driveway 1	WBL	B	24.2	0.147	0.5	D	30.2	0.186	0.7	F	51	0.296	1.1
		WBTR	B	13.7	0.274	1.1	B	13.9	0.261	1	B	14.3	0.271	1.1
		NB	A	8.1	0.009	0	A	8.2	0.009	0	A	8.5	0.031	0.1
		SB	A	9.2	0.105	0.4	A	9.5	0.14	8	A	9.8	0.146	0.5
		Intersection	A	3.8	-	-	A	4	-	-	A	4.1	-	-
4	S Joyce St & RH driveway 2 (Signalized) HCM 2000 Future 2035	EB	B	19.6	0.1	11	B	19.4	0.09	30	B	16.4	0.07	10
		WBL	C	20	0.13	18	C	20.3	0.17	55	B	17.3	0.2	25
		WBTR	B	19.4	0.14	0	B	19.4	0.15	23	D	37.5	0	0
		NBL	A	0.6	0.22	-	A	0.7	0.27	-	-	-	-	-
		NBTR	A	0.9	0.25	17	A	1.3	0.31	66	D	46.4	0.95	114
		SBL	A	8.9	0.11	16	A	9.2	0.14	47	D	54.3	0.71	33
		SBT (R)	A	9.1	0.18	41	A	9.1	0.18	66	B	15.6	0.5	121
		SBR	A	9.1	0.18	-	A	9.1	0.18	-	-	-	-	-
		Intersection	A	7.4	-	-	A	7.4	-	-	C	32.7	-	-

(~) Volume exceeds capacity, queue is theoretically infinite
(#) 95th percentile volume exceeds capacity, queue may be longer
(M) volume for 95th percentile queue is metered by upstream signal

#	Intersection	Movement	Existing				Background-2028				Future 2028			
			LOS	Delay (s)	V/C	Queue (ft)	LOS	Delay (s)	V/C	Queue (ft)	LOS	Delay (s)	V/C	Queue (ft)
5	S Joyce St & RH driveway 3	EB	B	12.3	0.046	0.1	B	12.5	0.043	0.1	-	-	-	-
		NB	A	8.6	0.022	0.1	A	8.7	0.021	0.1	-	-	-	-
		SB	A	0	0	0	A	0	0	0	-	-	-	-
		Intersection	A	0.7	-	-	A	0.6	-	-	-	-	-	-
6	S Joyce St & RH driveway 4	EB	C	16.8	0.044	0.1	C	17.6	0.044	0.1	E	43.1	0.593	3.4
		NB	A	9.1	0.02	0.1	A	9.2	0.018	0.1	A	9.8	0.101	0.3
		SB	A	0	0	0	A	0	0	0	A	0	0	0
		Intersection	A	0.6	-	-	A	0.5	-	-	A	5.8	-	-
7	S Joyce St & Pentagon Row driveway (Signalized)	EB	-	-	-	-	-	-	-	-	-	-	-	-
		WBL (T)	D	35.1	0.45	36	D	38.5	0.63	57	D	38.9	0.65	59
		WBR	D	40.5	0.69	16	D	39.9	0.65	27	D	39.8	0.65	27
		NBL	-	-	-	-	-		-	-	-	-	-	-
		NBT	A	3	0.14	98	A	3.2	0.21	142	A	4.9	0.45	339
		NBR	A	3	0.14	-	A	3.2	0.22	-	-	-	-	-
		SBL	A	0.3	0.15	-	A	0.4	0.18	-	A	1.3	0.1	m40
		SBT	A	0.3	0.14	69	A	0.3	0.17	55	A	0.1	0.15	84
		SBR	-	-	-	-	-	-	-	-	-	-	-	-
		Intersection	A	8.5	-	-	A	7.7	-	-	A	8.1	-	-
8	S Joyce St & 15th St S	EB	C	20.7	0.372	1.7	D	33.7	0.55	3	F	60.4	0.728	4.7
		NB	A	8.7	0.097	0.3	A	9.3	0.143	0.5	A	9.5	0.148	0.5
		SB	A	0	0	0	A	0.5	0	0	A	0	0	0
		Intersection	A	4.9	-	-	A	6.1	-	-	A	8.8	-	-
9	15th St S & Mall Main Garage (Signalized)	EB	A	3.2	0.12	66	A	3.2	0.15	60	B	3.2	0.16	86
		WBT	A	3.1	0.13	69	B	3.1	0.2	106	B	3.2	0.22	114
		WBR	A	3.3	0.15	30	A	3.1	0.15	30	A	3.1	0.15	30
		SBL	D	35.4	0.45	30	B	35.9	0.44	29	B	35.9	0.44	29
		SBR	D	40.1	0.51	19	A	40.8	0.5	21	A	40.8	0.5	21
		Intersection	B	10.1	-	-	A	8.1	-	-	A	7.9	-	-
10	S Joyce St & RH driveway 5	EB	B	10.6	0.042	0.1	B	10.8	0.04	0.1	-	-	-	-
		NB	A	7.8	0.003	0	A	7.8	0.003	0	-	-	-	-
		SB	A	0	0	0	A	0	0	0	-	-	-	-
		Intersection	A	1.1	-	-	A	0.9	-	-	-	-	-	-
11	S Joyce St & RH driveway 6	EB	B	12	0.052	0.2	B	12.2	0.05	0.2	B	12.4	0.081	0.3
		NB	A	8	0.01	0	A	8.1	0.009	0	A	8.1	0.007	0
		SB	A	0	0	0	A	0	0	0	A	0	0	0
		Intersection	A	1.1	-	-	A	0.9	-	-	A	1.3	-	-

#	Intersection	Movement	Existing				Background-2028				Future 2028			
			LOS	Delay (s)	V/C	Queue (ft)	LOS	Delay (s)	V/C	Queue (ft)	LOS	Delay (s)	V/C	Queue (ft)
12	S Joyce St & RH driveway 7	EB	B	10.2	0.045	0.1	B	10.4	0.043	0.1	B	10.2	0.015	0
		NB	A	0	0	0	A	0	0	0	A	0	0	0
		SB	A	0	0	0	A	0	0	0	A	0	0	0
		Intersection	A	1	-	-	A	0.8	-	-	A	0.3	-	-
13	S Joyce St & RH driveway 8	EB	B	11	0.023	0.1	B	11.3	0.022	0.1	A	9.9	0.001	0
		NB	A	7.9	0.001	0	A	7.9	0.001	0	A	7.9	0.004	0
		SB	A	0	0	0	A	0	0	0	A	0	0	0
		Intersection	A	0.5	-	-	A	0.5	-	-	A	0.2	-	-
14	S Joyce St & 16th St S	EB	B	10.7	0.021	0.1	B	10.7	0.01	0	B	11	0.014	0
		WB	A	9.8	0.025	0.1	A	9.8	0.017	0.1	A	9.9	0.017	0.1
		NB	A	7.7	0.002	0	A	7.7	0.002	0	A	7.7	0.002	0
		SB	A	7.5	0.007	0	A	7.5	0.007	0	A	7.5	0.007	0
		Intersection	A	1.4	-	-	A	0.9	-	-	A	0.9	-	-
15	S Kent St & 16th St S	EB	A	0	0	0	A	0	0	0	A	0	0	0
		WB	A	7.2	0.004	0	A	7.2	0.003	0	A	7.2	0.003	0
		NB	A	9.2	0.015	0	A	9.1	0.012	0	A	9	0.014	0
		SB	A	9.3	0.038	0.1	A	9.2	0.025	0.1	A	9.2	0.024	0.1
		Intersection	A	7.8	-	-	A	7.8	-	-	A	7.8	-	-
16	S Arlington Ridge & I-395	EBL	A	10	-	-	A	9.9	-	-	A	10	-	-
		EBR	C	19.9	-	-	C	19.3	-	-	C	19.3	-	-
		NBL			-	-			-	-			-	-
		NB	B	14.6	-	-	B	14	-	-	B	14.3	-	-
		SB	A	8.4	-	-	A	8.3	-	-	A	8.4	-	-
		Intersection	C	16.8	-	-	C	16.3	-	-	C	16.4	-	-
17	Arlington Ridge Rd & S Lynn St	WB	A	0	0	0	A	0	0	0	A	0	0	0
		NB	A	0	0	0	A	0	0	0	A	0	0	0
		SB	A	9.5	0.066	0.2	A	9.4	0.047	0.1	A	9.4	0.048	0.2
		Intersection	A	1.8	-	-	A	1.4	-	-	A	1.4	-	-
18	S Lynn St & RH driveway 9	WB	B	10.2	0.028	0.1	B	10	0.025	0.1	B	10.2	0.008	0
		NB	A	-	-	-	A	0	0	0	A	0	0	0
		SB	A	7.6	0.009	0	A	7.6	0.009	0	A	0	0	0
		Intersection	A	1	-	-	A	0.9	-	-	A	0.2	-	-

#	Intersection	Movement	Existing				Background-2028				Future 2028			
			LOS	Delay (s)	V/C	Queue (ft)	LOS	Delay (s)	V/C	Queue (ft)	LOS	Delay (s)	V/C	Queue (ft)
19	S Hayes St & 15th St S (Signalized)	EBL	D	50.6	0.35	64	D	50.8	0.44	#87	D	51.6	0.45	#96
		EBT	C	34.5	0.34	77	C	28.7	0.34	102	C	28.8	0.35	110
		EBR	C	34.5	0.39	-	C	28.6	0.37	-	C	29.2	0.38	-
		WBL	D	39.3	0.13	39	C	33.5	0.11	35	C	33.8	0.11	36
		WBT	D	39	0.66	163	D	37.5	0.72	-	D	38.1	0.73	-
		WBR	D	39.9	0.69	-	D	38.3	0.73	251	D	39.5	0.74	261
		NBL	F	81	0.83	#106	E	71.1	0.62	#118	F	83.6	0.83	#133
		NBT	B	17	0.09	34	C	22	0.12	44	C	22.2	0.12	44
		NBR	B	17	0.1	-	C	22.2	0.13	-	C	22.6	0.13	-
		SBL	F	175	1.17	#269	F	464.5	1.87	#459	F	464.5	1.87	#459
		SBT	B	17.3	0.34	147	C	24.7	0.42	180	C	23.6	0.41	180
		SBR	B	18.5	0.34	34	C	27.7	0.46	73	C	26.8	0.46	88
		Intersection	D	42.9	-	-	F	83.9	-	-	F	83.4	-	-
20	S Hayes St & Army Navy Dr (Signalized) HCM 2000	EBL	F	113.3	1.08	#426	F	132.5	1.08	#555	F	142.6	1.12	#577
		EBT	C	33.6	0.59	76	D	51.4	0.55	280	E	57.5	0.55	281
		EBR	D	35.6	0.64	-	D	52.6	0.73	136	E	61.6	0.73	157
		WBL	D	39.5	0.33	57	F	82	0.83	218	F	82	0.83	218
		WBT	D	46.9	0.66	#301	E	56.4	0.71	242	E	56.1	0.72	245
		WBR	-	-	-	-	A	3.3	0.73	0	A	3.3	0.73	0
		NBL	F	180.1	1.16	#241	F	218.2	1.24	#338	F	218.2	1.24	#338
		NBT	C	34.5	0.36	130	E	67.3	0.8	205	E	67.1	0.8	204
		NBR	D	37	0.37	140	D	40.6	0.43	82	D	40.6	0.43	82
		SBL	F	65.6	1	#557	F	145.4	1.16	#537	F	145.4	1.16	#537
		SBT	C	24.1	0.39	177	F	81	0.99	#508	F	83.3	1	#515
		SBR	-	7.8	-	91	B	19.6	0.41	200	B	19.8	0.43	209
		Intersection	D	53.5	-	-	E	69.6	-	-	E	71.3	-	-
21	Parking Garage & Army Navy Dr (Signalized)	EBL	A	3.5	0.22	-	A	0.7	0.29	-	A	0.8	0.3	-
		EBT	A	3.8	0.24	110	A	0.9	0.3	230	A	1	0.31	137
		EBR	A	3.5	0.25	-	A	0.1	0.06	m18	A	0.1	0.06	m3
		WBL	B	12	0.29	m75	E	71.2	0.75	m95	E	71.2	0.75	m89
		WBT	A	0.1	0.25	m107	C	30.8	0.35	m71	C	31.7	0.37	m71
		WBR	A	0.2	0.25	-	C	21.1	0.04	m0	C	21.6	0.04	m1
		NBL	D	37.8	0.28	76	E	61.7	0.63	182	E	61.4	0.63	179
		NBT	-	0	0	78	D	39	0.01	10	D	38.1	0.01	10
		NBR	D	50.8	0.78	50	E	65.1	0.83	76	E	63.8	0.82	74
		SBT	C	30.9	0.27	89	D	43.4	0.29	116	D	43.6	0.3	114
		SBR	C	30	0.2	2	D	41.9	0.21	6	D	41	0.2	6
		Intersection	B	13.6	-	-	C	32.5	-	-	C	32.4	-	-

Table 28: Existing, 2035 Background, and 2035 Future Capacity Analysis Results - PM Peak Hour

#	Intersection	Movement	Existing				Background-2035				Future 2035			
			LOS	Delay (s)	V/C	Queue (ft)	LOS	Delay (s)	V/C	Queue (ft)	LOS	Delay (s)	V/C	Queue (ft)
1	S Lynn St & Army Navy Dr	EBT	A	0	0	0	A	0	0	0	A	0	0	0
		EBR	A	0	0	0	-	-	-	-	A	0	0	0
		WBL	A	7.8	0.076	0.2	A	7.9	0.078	0.3	A	8.1	0.102	0.3
		WBT	A	0	0	0	A	0	0	0	A	0	0	0
		NB	B	11.8	0.217	0.8	B	12.5	0.243	1	B	13.7	0.326	1.4
		Intersection	A	2.9	-	-	A	2.9	-	-	A	3.5	-	-
2	S Joyce St & Army Navy Dr (Signalized)	EBL	B	14.9	0.1	48	B	18.2	0.14	47	C	32.8	0.14	49
		EBT	B	14.4	0.15	85	D	35.4	0.17	96	D	40.9	0.3	92
		EBR	B	13.3	0.04	0	D	35.2	0.18	-	D	41.6	0.36	-
		WBL	A	7.5	0.41	202	E	76.8	0.94	#380	F	185.5	1.25	#591
		WBT (R)	A	4	0.15	117	B	10.8	0.94	376	C	22.3	0.62	412
		WBR	-	-	-	-	A	8.1	0.38	67	A	6.9	0.45	92
		NBL	D	40.6	0.46	118	D	41.2	0.48	129	E	55.6	0.74	169
		NBT	D	39.4	0.5	80	D	48.8	0.49	211	D	48.9	0.55	138
		NBR	D	40.1	0.64	-	D	53.9	0.71	-	E	58.6	0.78	-
		SBL	C	30.8	0.51	93	D	54.5	0.7	142	D	45.7	0.65	137
		SBT	C	26.5	0.33	67	D	50.8	0.57	137	D	54.8	0.71	290
		SBR	C	26	0.35	-	D	50.8	0.62	-	B	17.8	0.39	38
		Intersection	C	21.6	-	-	D	39.5	-	-	E	57.5	-	-
3	S Joyce St & RH driveway 1	WBL	B	24.2	0.147	0.5	D	32.3	0.199	0.7	E	47.7	0.281	1.1
		WBTR	B	13.7	0.274	1.1	B	14.1	0.272	1.1	B	12.2	0.228	0.9
		NB	A	8.1	0.009	0	A	8.2	0.11	0	A	8.8	0.003	0
		SB	A	9.2	0.105	0.4	A	9.6	0.146	0	A	9.3	0.138	0.5
		Intersection	A	3.8	-	-	A	4	-	-	A	3.2	-	-
4	S Joyce St & RH driveway 2 (Signalized) HCM 2000 Future 2035	EB	B	19.6	0.1	11	B	19.4	0.1	31	C	21.3	0.2	52
		WBL	C	20	0.13	18	C	20.4	0.18	56	C	21.4	0.19	62
		WBTR	B	19.4	0.14	0	B	19.4	0.15	23	C	20.2	0.16	25
		NBL	A	0.6	0.22	-	A	0.8	0.28	-	D	53.1	0.8	69
		NBTR	A	0.9	0.25	17	A	1.3	0.32	28	C	25.6	0.74	#443
		SBL	A	8.9	0.11	16	A	9.3	0.15	49	D	51.1	0.8	75
		SBT (R)	A	9.1	0.18	41	A	9.2	0.19	68	C	23.2	0.68	#417
		SBR	A	9.1	0.18	-	A	9.2	0.19	-	B	13.6	0.13	20
		Intersection	A	7.4	-	-	A	7.4	-	-	C	26.1	-	-

(~) Volume exceeds capacity, queue is theoretically infinite
(#) 95th percentile volume exceeds capacity, queue may be longer
(M) volume for 95th percentile queue is metered by upstream signal

#	Intersection	Movement	Existing				Background-2035				Future 2035			
			LOS	Delay (s)	V/C	Queue (ft)	LOS	Delay (s)	V/C	Queue (ft)	LOS	Delay (s)	V/C	Queue (ft)
5	S Joyce St & RH driveway 3	EB	B	12.3	0.046	0.1	B	12.6	0.046	0.1	-	-	-	-
		NB	A	8.6	0.022	0.1	A	8.7	0.022	0.1	-	-	-	-
		SB	A	0	0	0	A	0	0	0	-	-	-	-
		Intersection	A	0.7	-	-	A	0.6	-	-	-	-	-	-
6	S Joyce St & RH driveway 4	EB	C	16.8	0.044	0.1	C	18	0.045	0.1	D	27.1	0.417	2
		NB	A	9.1	0.02	0.1	A	9.2	0.02	0.1	A	8.9	0.073	0.2
		SB	A	0	0	0	A	0	0	0	A	0	0	0
		Intersection	A	0.6	-	-	A	0.5	-	-	A	3	-	-
7	S Joyce St & Pentagon Row driveway (Signalized)	EB	-	-	-	-	-	-	-	-	C	24.1	0.45	131
		WBT (L)	D	35.1	0.45	36	D	38.3	0.63	59	C	21.5	0.19	61
		WBR	D	40.5	0.69	16	D	39.7	0.66	27	C	22.1	0.23	4
		NBL	-	-	-	-	-	-	-	-	D	44.5	0.83	#156
		NBT	A	3	0.14	98	A	3.3	0.22	147	-	-	-	-
		NBR	A	3	0.14	-	A	3.3	0.22	-	B	11.9	0.52	318
		SBL	A	0.3	0.15	-	A	0.4	0.18	-	B	18.1	0.15	56
		SBT	A	0.3	0.14	69	A	0.4	0.18	87	C	21.4	0.43	94
		SBR	-	-	-	-	-	-	-	-	C	22.1	0.45	-
		Intersection	A	8.5	-	-	A	7.8	-	-	C	21.6	-	-
8	S Joyce St & 15th St S	EB	C	20.7	0.372	1.7	E	36.8	0.585	3.4	-	-	-	-
		NB	A	8.7	0.097	0.3	A	9.3	0.149	0.5	-	-	-	-
		SB	A	0	0	0	A	0	0	0	-	-	-	-
		Intersection	A	4.9	-	-	A	6.6	-	-	-	-	-	-
9	15th St S & Mall Main Garage (Signalized)	EB	A	3.2	0.12	66	A	3.3	0.16	88	A	3.3	0.18	96
		WBT	A	3.1	0.13	69	A	3.2	0.21	109	A	3.3	0.24	132
		WBR	A	3.3	0.15	30	A	3.2	0.16	31	A	3.3	0.15	31
		SBL	D	35.4	0.45	30	D	35.8	0.44	30	D	35.8	0.44	30
		SBR	D	40.1	0.51	19	D	40.6	0.5	21	D	40.6	0.5	21
		Intersection	B	10.1	-	-	A	8.2	-	-	A	7.7	-	-
10	S Joyce St & RH driveway 5	EB	B	10.6	0.042	0.1	B	10.9	0.042	0.1	-	-	-	-
		NB	A	7.8	0.003	0	A	7.8	0.003	0	-	-	-	-
		SB	A	0	0	0	A	0	0	0	-	-	-	-
		Intersection	A	1.1	-	-	A	1	-	-	-	-	-	-
11	S Joyce St & RH driveway 6	EB	B	12	0.052	0.2	B	12.4	0.053	0.2	B	12.7	0.05	0.2
		NB	A	8	0.01	0	A	8.1	0.01	0	A	8.1	0.005	0
		SB	A	0	0	0	A	0	0	0	A	0	0	0
		Intersection	A	1.1	-	-	A	0.9	-	-	A	0.6	-	-

#	Intersection	Movement	Existing				Background-2035				Future 2035			
			LOS	Delay (s)	V/C	Queue (ft)	LOS	Delay (s)	V/C	Queue (ft)	LOS	Delay (s)	V/C	Queue (ft)
12	S Joyce St & RH driveway 7	EB	B	10.2	0.045	0.1	B	10.4	0.047	0.1	B	12.1	0.118	0.4
		NB	A	0	0	0	A	0	0	0	A	8	0.006	0
		SB	A	0	0	0	A	0	0	0	A	0	0	0
		Intersection	A	1	-	-	A	0.9	-	-	A	1.6	-	-
13	S Joyce St & RH driveway 8	EB	B	11	0.023	0.1	B	11.4	0.024	0.1	B	10.9	0.023	10
		NB	A	7.9	0.001	0	A	8	0.001	0	A	7.8	0.004	2
		SB	A	0	0	0	A	0	0	0	A	0	0	0
		Intersection	A	0.5	-	-	A	0.5	-	-	A	0.5	-	-
14	S Joyce St & 16th St S	EB	B	10.7	0.021	0.1	B	10.8	0.01	0	B	11.2	0.025	0.1
		WB	A	9.8	0.025	0.1	A	9.9	0.017	0.1	A	9.8	0.017	0.1
		NB	A	7.7	0.002	0	A	7.7	0.002	0	A	7.7	0.002	0
		SB	A	7.5	0.007	0	A	7.5	0.007	0	A	7.5	0.007	0
		Intersection	A	1.4	-	-	A	0.9	-	-	A	1.1	-	-
15	S Kent St & 16th St S	EB	A	0	0	0	A	0	0	0	A	0	0	0
		WB	A	7.2	0.004	0	A	7.2	0.003	0	A	7.2	0.005	0
		NB	A	9.2	0.015	0	A	9.1	0.013	0	A	8.9	0.022	0.1
		SB	A	9.3	0.038	0.1	A	9.2	0.025	0.1	A	9.2	0.025	0.1
		Intersection	A	7.8	-	-	A	7.8	-	-	A	7.9	-	-
16	S Arlington Ridge & I-395	EBL	A	10	-	-	B	10	-	-	B	10.6	-	-
		EBR	C	19.9	-	-	C	21.7	-	-	C	21.7	-	-
		NBL			-	-			-	-	-	-	-	-
		NB	B	14.6	-	-	B	14.7	-	-	C	15.5	-	-
		SB	A	8.4	-	-	A	8.4	-	-	A	8.7	-	-
		Intersection	C	16.8	-	-	C	17.9	-	-	C	18.1	-	-
17	Arlington Ridge Rd & S Lynn St	WB	A	0	0	0	A	0	0	0	B	10.7	0.158	0.6
		NB	A	0	0	0	A	0	0	0	A	0	0	0
		SB	A	9.5	0.066	0.2	A	9.4	0.48	0.2	A	7.8	0.011	0
		Intersection	A	1.8	-	-	A	1.4	-	-	A	3.3	-	-
18	S Lynn St & RH driveway 9	WB	B	10.2	0.028	0.1	B	10.1	0.027	0.1	B	10.4	0.01	0
		NB	A	-	-	-	A	0	0	0	A	0	0	0
		SB	A	7.6	0.009	0	A	7.6	0.009	0	A	7.6	0.001	0
		Intersection	A	1	-	-	A	1	-	-	A	0.2	-	-

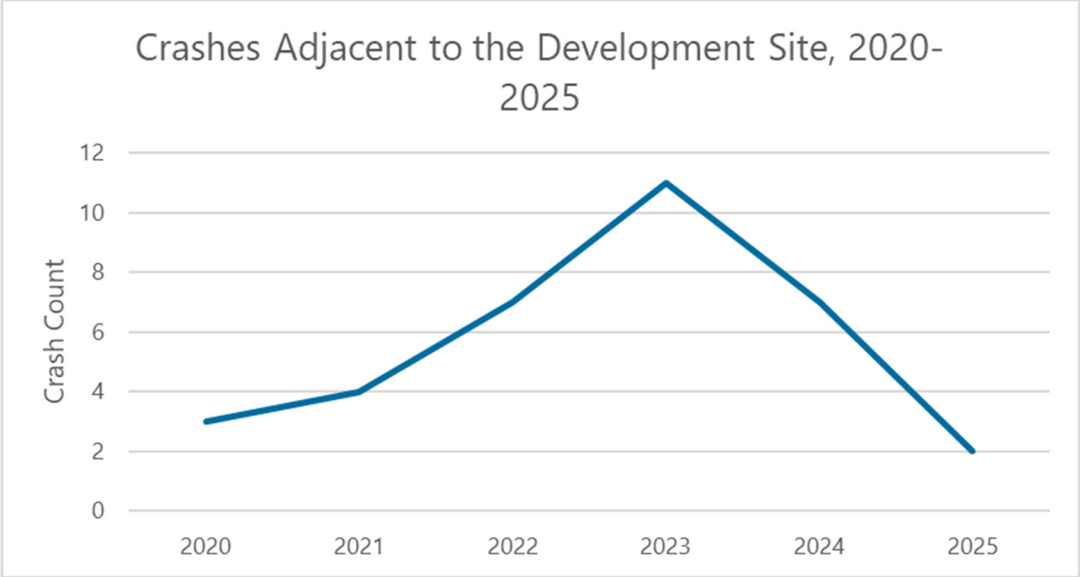
#	Intersection	Movement	Existing				Background-2035				Future 2035			
			LOS	Delay (s)	V/C	Queue (ft)	LOS	Delay (s)	V/C	Queue (ft)	LOS	Delay (s)	V/C	Queue (ft)
19	S Hayes St & 15th St S (Signalized)	EBL	D	50.6	0.35	64	D	51.8	0.47	#96	E	60.1	0.78	#130
		EBT	C	34.5	0.34	77	C	28.7	0.35	105	C	29.2	0.29	122
		EBR	C	34.5	0.39	-	C	28.6	0.37	-	C	29.6	0.31	-
		WBL	D	39.3	0.13	39	C	33.5	0.11	35	C	34.6	0.11	36
		WBT	D	39	0.66	163	D	38.1	0.73	259	D	40.6	0.87	293
		WBR	D	39.9	0.69	-	D	38.9	0.74	-	D	40.9	0.87	-
		NBL	F	81	0.83	#106	F	81.8	0.83	#123	F	103.9	0.84	#179
		NBT	B	17	0.09	34	C	22.3	0.12	45	C	22.3	0.16	45
		NBR	B	17	0.1	-	C	22.4	0.13	-	C	22.5	0.17	-
		SBL	F	175	1.17	#269	F	479.5	1.9	#469	F	493.3	0.93	#472
		SBT	B	17.3	0.34	147	C	23.5	0.42	187	C	25.1	0.41	187
		SBR	B	18.5	0.34	34	C	26.2	0.45	82	C	28.1	0.44	86
		Intersection	D	42.9	-	-	F	85.3	-	-	F	86.7	-	-
20	S Hayes St & Army Navy Dr (Signalized) HCM 2000	EBL	F	113.3	1.08	#426	F	142.1	1.12	#572	F	234.8	1.35	#667
		EBT	C	33.6	0.59	76	D	52.4	0.56	287	E	62.2	0.61	289
		EBR	D	35.6	0.64	-	E	61	0.75	162	E	78.4	0.83	#178
		WBL	D	39.5	0.33	57	F	81.8	0.83	220	F	98.1	0.9	#268
		WBT	D	46.9	0.66	#301	E	57.3	0.73	250	E	59	0.78	263
		WBR	-	-	-	-	A	3.6	0.75	0	A	3.9	0.76	0
		NBL	F	180.1	1.16	#241	F	235.2	1.28	#351	F	303.9	1.45	#365
		NBT	C	34.5	0.36	130	E	67.1	0.8	210	E	70.2	0.85	216
		NBR	D	37	0.37	140	D	40.1	0.44	84	D	36.8	0.41	85
		SBL	F	65.6	1	#557	F	167.3	1.22	#561	F	185	1.26	#555
		SBT	C	24.1	0.39	177	F	90	1.02	#535	F	90.3	1.03	#536
		SBR	-	7.8	-	91	B	19.9	0.43	211	C	20.7	0.48	251
		Intersection	D	53.5	-	-	E	75.3	-	-	F	88.4	-	-
21	Parking Garage & Army Navy Dr (Signalized)	EBL	A	3.5	0.22	-	A	0.8	0.3	-	A	0.6	0.28	-
		EBT	A	3.8	0.24	110	A	1	0.31	234	A	0.8	0.29	130
		EBR	A	3.5	0.25	-	A	0.2	0.06	m17	A	0.1	0.05	m3
		WBL	B	12	0.29	m75	E	71	0.76	m90	E	70.6	0.76	m92
		WBT	A	0.1	0.25	m107	C	32.2	0.37	m71	C	28.8	0.37	m92
		WBR	A	0.2	0.25	-	C	22	0.04	m1	B	18.1	0.04	m1
		NBL	D	37.8	0.28	76	E	61.1	0.64	185	E	63.2	0.62	185
		NBT	-	0	0	78	D	37.6	0.01	10	D	43	0.01	10
		NBR	D	50.8	0.78	50	E	64.5	0.83	77	E	57.4	0.72	67
		SBT	C	30.9	0.27	89	D	42.1	0.29	117	D	47	0.28	110
		SBR	C	30	0.2	2	D	40.6	0.21	7	D	45.2	0.18	16
		Intersection	B	13.6	-	-	C	32.9	-	-	C	30.6	-	-

7. SAFETY ANALYSIS

The safety analysis was conducted according to guidelines provided by the Arlington County Department of Environmental Services (Safety Analysis Guidance, May 2021). Crash data from five years (2020 to 2025) occurring adjacent to the site was obtained from the VDOT Crash Analysis Tool. These include crashes along segments of S. Lynn St., 16th St. S., S. Joyce St., and Army Navy Dr. bordering the site as well as at study intersections, excluding those that are not directly adjacent to the site (intersections 8, 15 and 18). A total of 34 crashes occurred adjacent to the development site from 2020 to March 2025 (Figure 55 and Figure 56).

Figure 55: Crashes by Type and Pedestrian/Bicyclist Involvement (2020-March 2025)

Figure 56: Historical Crash Data



General Crash Characteristics

Crash Severity

VDOT codes crash severity using the KABCO scale, as per Model Minimum Uniform Crash Criteria (MMUCC) published by the National Highway Traffic Safety Association (NHTSA). The KABCO scale assigns one of the following levels of crash severity based on the most severe injury to any person involved in the crash:

- K: Fatal Injury
- A: Suspected Serious Injury
- B: Suspected Minor Injury
- C: Possible Injury
- O: Property Damage Only (No Apparent Injury)

More detailed definitions and information can be found in VDOT's Crash Data Analysis Manual Version 1.0 (November 2017).

No crashes from 2020 to 2025 resulted in fatal injuries. Two crashes resulted in suspected serious injuries and 5 crashes resulted in suspected minor injuries. The majority of crashes (76%) are property damage only crashes. The breakdown of crashes by severity on the KABCO scale is shown in Table 29.

Table 29: Crashes by Severity

Severity	Count	% of Total
K: Fatal Injury	0	0%
A: Suspected Serious Injury	2	6%
B: Suspected Minor Injury	5	15%
C: Possible Injury	1	3%
O: Property Damage Only	26	76%
Total	**34**	**100%**

Collision Type

Of fifteen (15) possible collision types defined by VDOT, seven (6) distinct collision types occurred adjacent to the development site from 2020 to March 2025. Angle collisions were the most common collision type, accounting for 56% of crashes. Sideswipe (same direction) collisions were the second most common at 24%. The breakdown of crashes by collision type is shown in Table 30.

Table 30: Crashes by Collision Type

Collision Type	Count	As % Total
Rear End	1	3%
Angle	19	56%
Head On	2	6%
Sideswipe – Same Direction	8	24%
Fixed Object – Off Road	1	3%
Pedestrian	3	9%
Total	**34**	**100%**

Crash Factors

Many factors can contribute to crashes and predict their frequency and severity. This section reviews some of the common environmental, behavioral, and vehicle characteristics that contribute to crashes. It also includes a more detailed analysis of crashes involving pedestrians and bicyclists.

Environmental Factors: Light Condition

Of the 34 crashes analyzed, all occurred in daylight or on lighted roads at night as shown in Table 31. This suggests that light conditions are not a strong predictor or cause of crashes around the site.

Table 31: Crashes by Light Condition

Light Condition	Count	As % Total
Dawn	3	9%
Daylight	22	65%
Dusk	2	6%
Darkness – Road Lighted	7	21%
Darkness – Road Not Lighted	0	0%
Darkness – Unknown Road Lighting	0	0%
Total	**34**	**100%**

Behavioral Factors: Driver Behavior

Risky or negligent driver behavior, whether intentional or not, can often contribute to crashes and increase their severity. Table 32 shows the crash counts by driver behaviors, including speeding, alcohol consumption, and distracted driving. Of these three behaviors, speeding was most common and was reported in 12% of crashes, while alcohol consumption was least common and was reported for one (1) crash. All three (3) distracted driver incidents resulted in property damage only. One (1) of the four (4) speeding-related crashes led to an injury, with severity level A: Suspected Serious Injury. Data on this crash indicates that the driver was driving 25 mph over the speed limit and collided with a fixed object off the road. While this does not necessarily indicate that driver behavior is a primary cause of crashes, it suggests that dangerous driver behavior may increase the severity of a crash.

Table 32: Crashes by Driver Behavior

Driver Behavior	Count	As % Total
Speeding?		
Yes	4	12%
No	30	88%
Alcohol Involved?		
Yes	0	0%
No	34	100%
Distracted Driver?		
Yes	3	9%
No	31	91%

Vehicle Characteristics: Large Truck and Motorcycle Involvement

In the last five years, no crashes near the development site involved motorcycles. Four (4) crashes involved large trucks, with each resulting in property damage only. This data suggests that vehicle size is not a strong predictor of crash frequency or severity in the vicinity of the site.

Table 33: Crashes by Vehicle Characteristics

Vehicle Characteristics	Count	As % Total
Large Truck Involved?		
Yes	4	12%
No	30	88%
Motorcycle Involved?		
Yes	0	0%
No	34	100%

Pedestrian- and Bicyclist-Involved Crashes

Three (3) crashes involved pedestrians, accounting for 9% of crashes. No crashes involved a bicyclist. All pedestrian-involved crashes resulted in injuries: two (2) of the three (3) were

severity level B: Suspected Visible Injury, with one crash involving two injured pedestrians. These crashes did not involve any of the driver behaviors identified above.

Table 34: Crashes by Pedestrian/Bicyclist Involvement

Pedestrian/Bicyclist Involvement	Count	As % Total
Pedestrian Involved?		
Yes	3	9%
No	31	91%
Bicyclist Involved?		
Yes	0	0%
No	34	100%

Findings

The streets surrounding the proposed RiverHouse redevelopment have shown a modest number of crashes over the recent five-year period. Crash numbers have risen slightly since the end of the COVID-19 pandemic but have fallen after a peak in 2023. Of note, 73% of all crashes near RiverHouse were at or near the intersection of Army Navy Dr. and S. Joyce St or along one of those two streets. Current and proposed changes including the Army Navy Dr. Complete Streets project (under construction) and the S. Joyce St. road diet proposed as part of this project will contribute to much safer conditions at this intersection, for all travelers whether in motor vehicles, on bikes, or walking. All three pedestrian-involved crashes were along S. Joyce St., where conditions will also be substantially improved by the road diet proposed as part of this project.

8. TRANSPORTATION MANAGEMENT PLANS

This preliminary Transportation Demand Management (TDM) proposal accompanies the Phased Development Site Plan (PDSP) and Site Plans (4.1) for RiverHouse. It considers the proposal by JBG SMITH (the Developer) as described below and responds to the current Standard Site Plan Conditions (revised August 2, 2022) and specifically condition #40. The TDM proposals will be expanded into a Transportation Management Plan (TMP) during the Site Plan process involving Arlington County staff, County Commissions, the Site Plan Review Committee, and other stakeholders. The ultimate goal of the TMPs will be to ensure the RiverHouse site plan incorporates an appropriate set of TDM services and approaches to provide quality alternatives to driving and parking, create incentives for travelers to use those alternatives, and manage resulting travel to/from the site.

As Developer, JBG SMITH agrees to obtain approval from the County Manager of a Final TMP prior to the issuance of the first Certificate of Occupancy (CO) for each building in the Site Plan or as defined in adopted Site Plan conditions. The Final TMP will comply with all adopted Site Plan conditions.

Upon approval of the TMP by the County Manager, the Developer agrees to implement all elements of the TMP with assistance, when appropriate, by agencies of the County. The Developer agrees to ensure consistency between this TMP and the Parking Management Plan (PMP), to the extent TMP provisions are applicable to the operation and management of parking facilities.

The TMP for each building will include a schedule and description of implementation and continued operation, throughout the life of the Site Plan, of all elements which may include but not be limited to the following:

A. Participation and Funding

1. Establish and maintain an active, ongoing relationship with Arlington Transportation Partners (ATP), or successor entity as designated by Arlington County Commuter Services (ACCS), on behalf of the property owner and at no cost to the Developer.
2. Designate and keep current a member of building management as Property Transportation Coordinator (PTC) to be primary point of contact with the County and undertake the responsibility for coordinating and completing all Transportation Management Plan obligations. The PTC shall be trained, to the satisfaction of ACCS, to provide multimodal and other travel information provided by the County intended to assist with transportation to and from the site.

3. Contribute annually to ACCS, or successor, to sustain direct and indirect on-site and off-site services in support of TMP activities, at a rate defined in the adopted Site Plan Conditions. Payment on this commitment shall begin as a condition of issuance of the first CO for each respective building or phase of construction. Subsequent payments shall be made annually.

B. Facilities and Improvements

1. Provide, in the lobby or lobbies, transportation information display(s), the number/content/design/location of which will be approved by ACCS. The Developer agrees that the required transportation information displays shall meet the Arlington County Neighborhood Transportation Information Display Standards in effect on the date of the site plan approval, or equivalent as approved by the County Manager.
2. Ensure the PMP, bicycle parking and storage facilities, and any other bicycle facilities on-site comply with requirements of adopted Site Plan conditions.

C. ~~Carpool and Vanpool Parking~~ (intentionally omitted)

D. Promotions, Services, and Policies

1. Prepare, reproduce, and distribute materials provided by Arlington County, including multimodal travel and related information, to each new residential lessee or purchaser and each new office, retail, property management, or maintenance employee, from initial occupancy through the life of the Site Plan. These materials shall be distributed as a part of prospective tenant marketing materials, as well as communications associated with lease signing, on-boarding, or similar activities.
2. Provide one time, per person, to each new residential lessee or purchaser, and each new office, retail, hotel, property management, or maintenance employee, whether employed part-time or full-time, directly employed or contracted, who moves into or begins employment in the building throughout initial occupancy, the choice of one of the following:
   a. Metro fare on a SmarTrip card or successor fare medium, in an amount stated in the adopted Site Plan conditions
   b. A one year bikeshare membership
   c. A one year carshare membership

   The County Manager may approve additions to, or substitution of, one or more of these choices with a comparable transportation program incentive, as technology

and service options change, if he/she finds that an incentive shall be designed to provide the individual with an option other than driving alone in a personal vehicle, either by removing a barrier to program entry, such as a membership cost, or by providing a similar level of subsidized access to a public or shared transportation system, program or service.

3. Provide, administer, or cause the provision of a sustainable commute benefit program for each on-site property management, maintenance, and hotel employee, whether employed part-time or full-time, directly employed or contracted. This commute benefit program shall offer, at a minimum, a monthly pre-tax transit and vanpool benefit, as defined by the IRS, or a monthly subsidized/direct transit and vanpool benefit, as defined by the IRS.
4. Provide, under a "transportation information" heading on the Developer and property manager's websites regarding this development:

   Links to the most appropriate ACCS and/or external transportation-related web pages. Obtain confirmation of most appropriate links from ACCS.

   A description of key transportation benefits and services provided at the building, pursuant to the TMP.

E. **Performance and Monitoring**

1. During the first year of start-up of the TMP and on an annual basis thereafter, the Developer shall submit an annual report, to the County Manager, which may be provided online or via e-mail, describing completely and correctly, all TMP-related activities at the site and changes in commercial tenants during each year.
2. The Developer agrees to actively participate in a transportation and parking performance monitoring study at two years, five years, and each subsequent five years (at the County's option), after issuance of the first CO, for the life of the site plan. The County may conduct the study or ask the owner to conduct the study (in the latter case, no reimbursement payment shall be required).
3. As part of the study, a report shall be produced as specified by the County. The study may include:
   a. Building occupancy rates, by use
   b. A seven-day count of vehicle trips to and from the site
   c. Average vehicle occupancy for driving trips
   d. Average garage occupancy at various days of the week and times of day
   e. Average parking availability at various days of the week and times of day

f. Average duration of stay for short term parkers on various days of the week and times of day
g. Hourly, monthly, and special event parking fee rates
h. The share of parking permits/visits subject to each type of fee
i. Drop-off/pickup and delivery trips at loading docks and site-adjacent curbs, on various days of the week and times of day
j. Walking trips (pedestrian traffic), on various days of the week and times of day
k. Biking trips, on various days of the week and times of day
l. A voluntary mode-split survey including trips arriving by walking, biking, driving/parking, and drop-off/pickup. The building owner/operator/management shall notify, assist, and encourage building occupants and visitors on site to participate in mode-split surveys which may be of an on-line or email variety.

9. CONCLUSIONS

This multimodal transportation assessment (MMTA) of the proposed RiverHouse Neighborhood PDSP and site plans concludes that the proposed development will have impacts on the surrounding transportation and roadway network that can be managed with planned site design elements and recommended mitigation measures as described in this MMTA.

The proposed PDSP would preserve the existing residential towers and add 2,790 new residential units and approximately 15,000 square feet (sf) of new retail space. The first phase of the PDSP comprises the 4.1 site plans for Landbay S, Building N1, and Building C1 and would add 743 units and 15,000 sf of retail with anticipated completion by 2028. The remaining phases of the PDSP, to be detailed in future 4.1 site plans, would add 2,047 residential units with an anticipated completion by 2035. At full buildout, the PDSP provides 2,790 new homes and 19,000 sf of retail space, largely concentrated on the existing surface parking lots, with 235 net new off-street parking spaces.

The PDSP proposes significant changes to S. Joyce St., in both the arterial segment between Army Navy Dr. and 15th St. S., and in the local segment between 15th St. S. and 16th St. S. The right-of-way for the arterial segment is proposed to be reallocated to create space for a two-way protected cycletrack along with vehicle traffic, curb uses, and emergency access.

The proposed road diet for S. Joyce St. keeps the east curb as currently located, with the typical cross-section including (from east to west) the current parking lane (periodically replaced by curb extensions), painted bike lane, one (1) northbound vehicle travel lane, one (1) center turn lane (or median), one (1) southbound vehicle travel lane, a parking lane, a buffer area, a two-way protected cycle track, the curb, a buffer area, and a more ample sidewalk.

A capacity analysis was developed to compare the future roadway network with and without the proposed development. Traffic projections for 2023, 2028, and 2035 are based on existing volumes, plus traffic generated by approved nearby developments, regional growth on the roadways, and traffic generated by the proposed RiverHouse development. Vehicle traffic from RiverHouse can be accommodated on existing streets including reconfigured S. Joyce St. with signal timing and other minor changes. These changes should yield improved safety for drivers as well as those walking and biking.

Improvements and modifications are tied to phases of the PDSP:

- The S. Joyce St. road diet will be delivered along with the N1 site plan. This includes the cycletrack and associated signal modifications.
- Improved connection to S. Lynn St. will be delivered along with the Landbay S site plan.

- The relocation of the southern segment of S. Joyce St. will be delivered along with future PDSP development, not tied to current site plans. The relocation also requires modification to the existing signal at 14th St. S. (Walgreens).

Mobility improvements delivered in Phase 1 with proposed site plans are shown in Figure 11. Improvements delivered with the full PDSP are shown in Figure 10.

Multimodal travel will be supported and improved to, from, within, and around the RiverHouse Neighborhood. Ample connected sidewalks, predominantly shaded by street trees and separated from vehicle traffic, provide attractive places to walk. Crossing S. Joyce St. will be safer due to slower speeds and shorter crossing distances. The Green Ribbon paths through RiverHouse have additional amenities, including width, landscaping, and places to gather. People on bikes and others rolling can use slow streets and paths within RiverHouse, and protected lanes or shared-use paths on S. Joyce St. Transit stops will have additional amenities, and paths to Pentagon City Metrorail and bus service are enhanced.

The development and its design have many positive elements that minimize potential transportation impacts, including:

- The proposed development's close proximity to the Pentagon City Metro Station, and multiple bus routes.
- The implementation of a two-way cycle track along S. Joyce St. north of 15th St. S.
- The realignment of S. Joyce St. to align with 14th St. S. and create more contiguous park space.
- Improvements to the pedestrian facilities adjacent to the site that meet or exceed Arlington County and ADA requirements.
- Limited on-site vehicle parking, which will promote the use of non-auto modes of travel to and from the proposed development.
- The inclusion of publicly accessible plazas and parks that improve pedestrian circulation.
- The inclusion of secure long-term bicycle parking and short-term bicycle parking spaces.
- Transportation Management Plans (TMPs) that aim to reduce the demand of single-occupancy, private vehicles to/from the proposed development during peak-period travel times or shifts single-occupancy vehicular demand to off-peak periods.

As noted above, this MMTA concludes that the proposed development will have minimal and mitigatable traffic impacts assuming that all planned site design elements are implemented. Most mobility impacts of the proposed RiverHouse Neighborhood site plans and PDSP are positive for people going to or from RiverHouse and for the public.