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ALFRED STREET BAPTIST CHURCH
TRAFFIC IMPACT STUDY
CITY OF ALEXANDRIA, VIRGINIA

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INNOVATION + SOLUTIONS

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Alfred Street Baptist Church

SECTION 1
INTRODUCTION

Study Scope

This report presents a Traffic Impact Study (TIS) for the Alfred Street Baptist Church project located in the City of Alexandria, Virginia.

The site is located within the Old Town Small Area Plan and is bounded by Duke Street to the north, Wolfe Street to the south, South Patrick Street to the west and South Alfred Street to the east. The subject site is currently occupied by a 43,784 SF church with an observed typical attendance of approximately 1,208 parishioners per service. Additionally, 22 affordable townhouses are located on the southern portion of the site that are currently built and occupied. The site location is shown generally on Figure 1-1.

The applicant proposes to raze the townhomes and redevelop and expand the existing church with approximately 232,368 total square feet of church space (from an observed 1,208 to proposed 2,163 seats) and a structured parking garage. The existing 1,208 seats is a recorded attendance of a typical Sunday service, with 920 seats provided within the existing sanctuary and chapel. The number of seats included in the proposed church space consists of the proposed main sanctuary and restored main chapel with their corresponding balconies. Of the total, 1,906 seats would be located in the proposed main sanctuary 257 seats would be located in the restored chapel. Parking would be provided via a proposed two level below-grade parking garage on site (216 spaces), a two level below-grade parking garage across South Patrick Street from the site (194 spaces), and a surface lot across of South Patrick Street (48 spots) totaling 458 spaces. A total of 34 bicycle parking spaces will be provided at grade and/or within the below grade parking garage.

Access to the proposed parking garage would be located on the opposite side of South Patrick Street from the existing Alexandria Gateway garage just north of the U-turn connection between South Henry Street and South Patrick Street. An additional entrance to the below-grade garage under the church would be located on Wolfe Street, with an internal connection to the site entrance on S. Patrick Street. Exiting vehicles would be able to exit the site from both the S. Patrick Street and Wolfe Street access points during the weekday peak hours. On Sunday, vehicles exiting onto Wolfe Street would be restricted to making a right onto S. Alfred Street to head south. A service entrance and exit will also be located along Wolfe Street to the south of the site.

The scope of this traffic study was established in consultation with the City of Alexandria Transportation & Environmental Services (T&ES) staff, and the study evaluates existing

2015 conditions and future 2022 traffic conditions without and with the proposed development, and build-out plus six (6) years with the proposed development.

Based on the trip generation analyses, the development would not meet the 5,000 daily vehicle trip threshold for a formal Virginia Department of Transportation (VDOT) Chapter 870 review.

Purpose

The purpose of this traffic study is to evaluate the adequacy of the existing transportation network in conjunction with the proposed development and identify potential mitigation measures to offset the development's traffic impacts.

This study was conducted in accordance with guidelines set forth in the City of Alexandria's Zoning Ordinance, Section 11-700. The proposed development is classified as a Large Development per the *Transportation Planning Administrative Guidelines, Multi-modal Transportation Studies*, dated March 25, 2013. The study area and scope was determined with City staff based on a review of key study intersections and roadways that potentially would be affected by the proposed development and accounting for the number of new trips expected to be generated by the site. The approved study agreement is included as Appendix A.

Based on discussions with City staff, the project is exempt from creating a Transportation Demand Management (TDM) in order to satisfy the need for the Transportation Management Plan (TMP).

Study Objective/Methodology

Tasks undertaken in this study included the following:

- Confirmation of the traffic study scope and parameters from the City of Alexandria Transportation & Environmental Services (T&ES) that must be addressed in this study.

- Review of the proposed development plans, development schedule, parking plans, and other background materials.

- A field reconnaissance of the subject site, adjacent properties, surrounding public roadways, and traffic conditions.

- Collection of AM and PM peak hour traffic counts on a typical weekday from 6:30 to 9:30 AM and from 4:30 AM to 7:30 PM at key off-site intersections. Peak hour traffic counts were also conducted on a typical Sunday from 7:00AM-3:00PM.

- Collection of the on-street parking occupancy from 4:30 to 7:30 PM on one (1) typical weekday (Tuesday, Wednesday or Thursday), and on two (2) Sundays from 7:00 AM to 3:00 PM within a two (2) block radius of the site.

- Collection of various other field observations and measurements as are required to provide additional support for recommendations and conclusions.

- Obtained existing traffic signal phasing/timing plans and electronic analysis files from T&ES.

- Compiled an inventory of transit services and other non-auto facilities in the site vicinity.

- Calculation of the existing weekday AM, weekday PM, and Sunday midday peak hour levels of service and 50th and 95th percentile queues at key study intersections.

- Estimated of the number of weekday AM, weekday PM, and Sunday midday peak hour trips that would be generated by the pipeline developments and the proposed development based on standard Institute of Transportation Engineers (ITE), Trip Generation Manual, 9th Edition rates and equations.

- Identification of near-term background traffic volumes for the study area based on the existing traffic counts, ambient traffic growth, and un-built developments (pipeline developments) adjacent to the site.

- Analysis of future intersection levels of service and 50th and 95th percentile queues in 2022 without and with the proposed development.

- Analysis of future intersection levels of service and 50th and 95th percentile queues in 2028 with the proposed development (buildout plus six (6) years).

- Identification of traffic operations and potential road improvements required to adequately accommodate total future traffic forecasts in 2022.

- Identification of the number of parking spaces required based on the proposed development and a parking demand study based on the surrounding street network as agreed during the scoping process.

Sources of data for this study included information provided by the City of Alexandria; VDOT; traffic data collected and field surveys conducted by Wells + Associates Inc.; Institute of Traffic Engineers (ITE); the Highway Capacity Manual (HCM); Alfred Street Baptist Church, Christopher Consultants, Kerns Group Architects, and the files of Wells + Associates Inc.

Study Area

This traffic study includes the following existing and planned intersections listed below. The traffic impacts were evaluated for existing conditions, at project buildout in 2022 and in 2028 (project buildout plus 6 years).

1. Cameron Street/S. Alfred Street
2. S. Henry Street/King Street
3. S. Patrick Street/King Street
4. S. Alfred Street/King St.
5. S. Washington Street/King Street
6. S. Henry Street/Prince Street
7. S. Alfred Street/Prince Street
8. S. Henry Street/Duke Street
9. S. Patrick Street/Duke Street
10. S. Alfred Street/Duke Street
11. S. Columbus Street/Duke Street
12. S. Washington Street/Duke Street
13. Turn Movements from S. Henry Street/South Patrick Street
14. S. Alfred Street/Wolfe Street
15. S. Patrick Street/Gibbon Street
16. S. Alfred Street/Gibbon Street
17. S. Patrick Street/Franklin Street
18. S. Patrick St./one (1) existing garage driveway/one (1) proposed driveway, and
19. One (1) proposed garage driveway/Wolfe Street
20. S. Columbus Street/Wolfe Street

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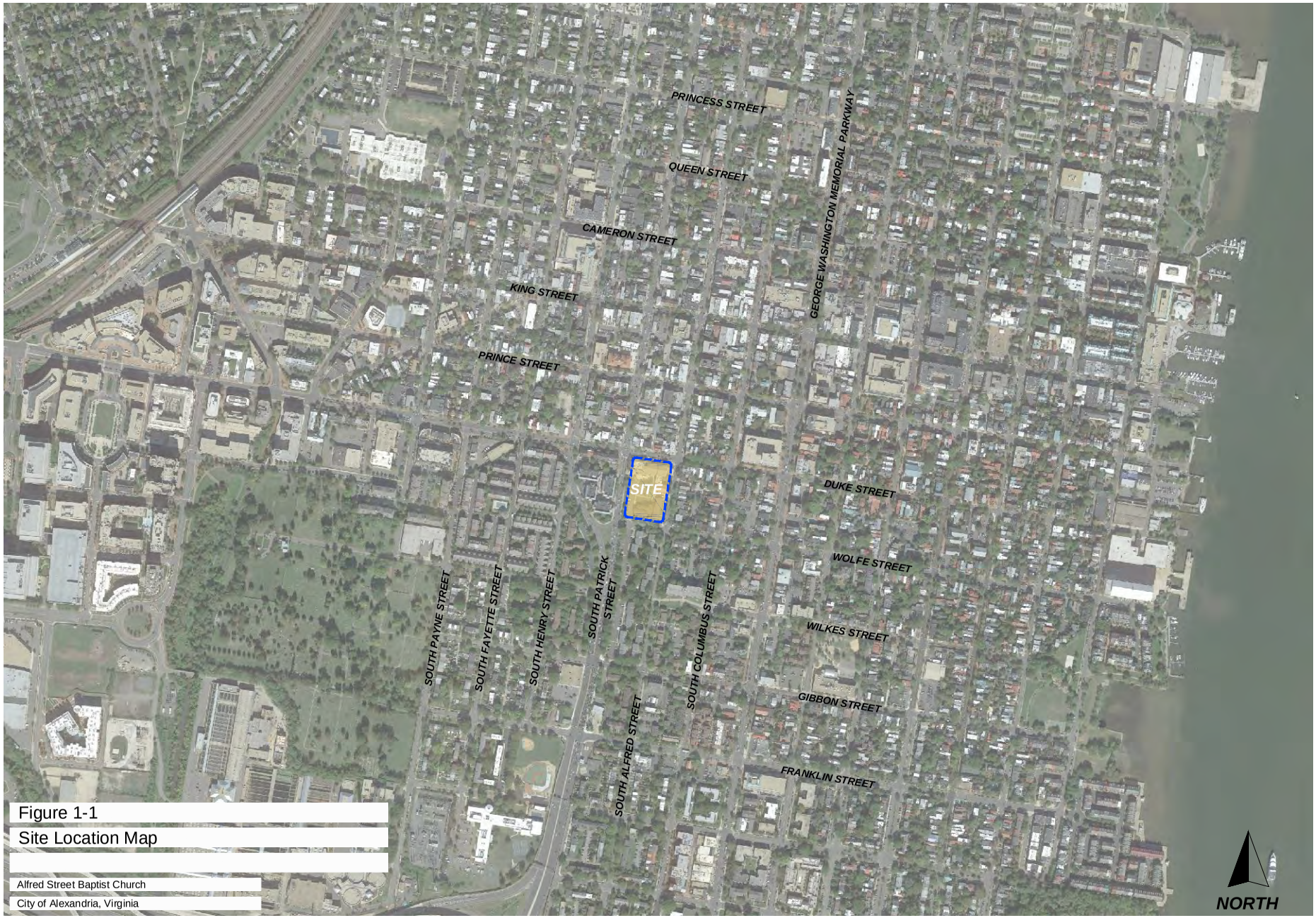

Figure 1-1

Site Location Map

Alfred Street Baptist Church

City of Alexandria, Virginia

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SECTION 2
BACKGROUND INFORMATION

Description of Proposed Development

The Applicant (Alfred Street Baptist Church) proposes to redevelop an existing 43,784 GSF church and 22 affordable townhomes into a 232,368 GSF church facility and parking structure. The site is generally located in the southeast quadrant of the S. Patrick Street/Duke Street intersection in the Old Town area of the City of Alexandria, Virginia.

The site would be served by approximately 406 below-grade parking spaces and 48 above grade parking spaces for church use. Of the 458 total spaces provided, 216 spaces would be provided below the proposed building within the two (2) story parking garage, 194 would be provided within the Alexandria Gateway garage, and 48 would be provided on the surface lot across S. Patrick Street, all within 300 feet of the property. A total of 34 bicycle parking spaces will be provided at grade and within the below grade parking garage. Vehicular access to parking and the site would be provided via S. Patrick Street, directly opposite of the existing parking garage utilized on the western side of the roadway, and S. Alfred Street with an internal connecting driveway segment between the two curb cuts.

For purposes of this study, the entire development was assumed to be fully built and occupied by 2022.

Site Location

The existing site is bounded by Duke Street to the north, Wolfe Street to the south, S. Patrick Street to the west and S. Alfred Street to the east, as shown on Figure 1-1. The existing site is currently occupied by a 43,784 SF church and 22 townhomes.

Description of Parcel

The parcels are identified as Tax Map Numbers 074.03-04-01 and 074.03-04-02. The site is currently zoned RM (Townhouse Zone). As proposed, the site would be expanded and redeveloped. The Concept II Plan is shown on Figure 2-2.

Old Town Small Area Plan

The Old Town Small Area Plan (OT SAP) is located in Planning District I in the central third of the City and is bound by the Potomac River on the east, Oronoco Street to the north, Washington Street generally to the west with an extension along King and Duke Streets to West Street, and the Capitol Beltway (I-395) to the south. The OT SAP was adopted in 1992

(Ordinance 3576) and has been amended through November 15, 2014. Old Town consists of primarily residential uses.

Washington Street, Henry Street, and Patrick Street are the major north/south roadways which connect Alexandria to National Airport and Washington D.C. and serve regional traffic from other Northern Virginia jurisdictions and Maryland. As noted, it is planned that most north/south traffic utilize these roadways and carpool traffic uses the HOV lanes on all three of the roadways. As a result, Washington Street, Henry Street, and Patrick Street are all heavily traveled in the morning and evening by commuters.

Roadway Network

Regional access to the subject site is provided by Washington Street, US Route 1 (S. Henry Street and S. Patrick Street), King Street and Duke Street which provide connections to Interstate 495/95 and Interstate 395 to the north, west and south. Local access to the site is provided via signalized intersections along Duke Street at S. Patrick Street and S. Alfred Street. Direct access to the existing and proposed parking garages is provided along S. Patrick Street and S. Alfred Street.

US Route 1 (Henry Street/ Patrick Street) are south/north one-way urban principal arterial roads typically with three (3) lanes in their respective directions. The roads have posted speed limits of 25 mph.

Washington Street is a four-lane urban principal arterial with a posted speed limit of 25 mph that serves local land uses with traffic signals located at major intersections. The curb lane in the northbound direction from 7:00 to 9:00 AM and in the southbound direction from 4:00 to 6:00 PM is restricted to HOV 2+ only. On-street parking is permitted in northbound curb lanes except between 7:00 to 9:00 AM and in the southbound curb lanes except for between 4:00 to 6:00 PM.

Alfred Street is a local two-way street with one travel lane in both the northbound and southbound directions. It has a posted speed limit of 25 mph. On-street parking is permitted along the east side of the street from Duke Street to Gibbon Street but is restricted to two-hour parking between Duke Street and Wolfe Street Monday through Saturday from 8:00 AM to 11:00 PM except for "holders of dist 4 permits." Parking is not permitted on the west side of Alfred Street from Duke Street to Gibbon Street except for Sundays from 7:30 AM to 9:00 PM.

Wolfe Street is a local road that operates one lane in each direction near the proposed site. It has a posted speed limit of 25 mph. Parking is unrestricted on both sides of Wolfe Street between Alfred Street to its termination point at S. Patrick Street to the south of the site. Two-hour parking exists only on the north side of the street from Alfred Street to Columbus Street from 8:00 AM to 11:00 PM Monday through Saturday except for "holders of dist 4 permits."

The existing lane use and traffic control are shown on Figure 2-3. The following study intersections currently operate under signal control:

- Cameron Street/S. Alfred Street
- S. Henry Street/King Street
- S. Patrick Street/King Street
- Alfred Street/King Street
- S. Washington Street/King Street
- S. Henry Street/Prince Street
- S. Alfred Street/Prince Street
- S. Henry Street/Duke Street
- S. Patrick Street/Duke Street
- S. Alfred Street/Duke Street
- S. Columbus Street/Duke Street
- S. Washington Street/Duke Street
- S. Patrick Street/Gibbon Street
- S. Alfred Street/Gibbon Street
- S. Patrick Street/Franklin Street

Special Event Operations (Funerals and Weddings)

The Alfred Street Baptist Church has a detailed operations plan for special events which includes parking attendants and Alexandria police officers for implementation. The parking attendants and police officers are instructed to direct traffic, provide information as to where members or visitors may park, as well as monitor for possible violators and advise them of proper operations. Staff is notified prior to events which parking areas are available for that time period. The amount of available parking varies, with the most parking available outside of typical work hours and on weekends. Table 2-1 below summarizes the available parking for special events based on time, Sunday parking totals are discussed in Section 8.

Table 2-1
Alfred Street Baptist Church
Existing Special Event Parking Spaces

Time of Day	Alexandria Gateway Garage	Church Garage	Old Town West	Bedford Townhouse Comm.	Total
Monday-Friday 9AM-5PM	64	21	27	-	112
Monday-Friday 5PM-10PM	194	21	27	48	290
Saturday (All Day)	194	21	27	48	290

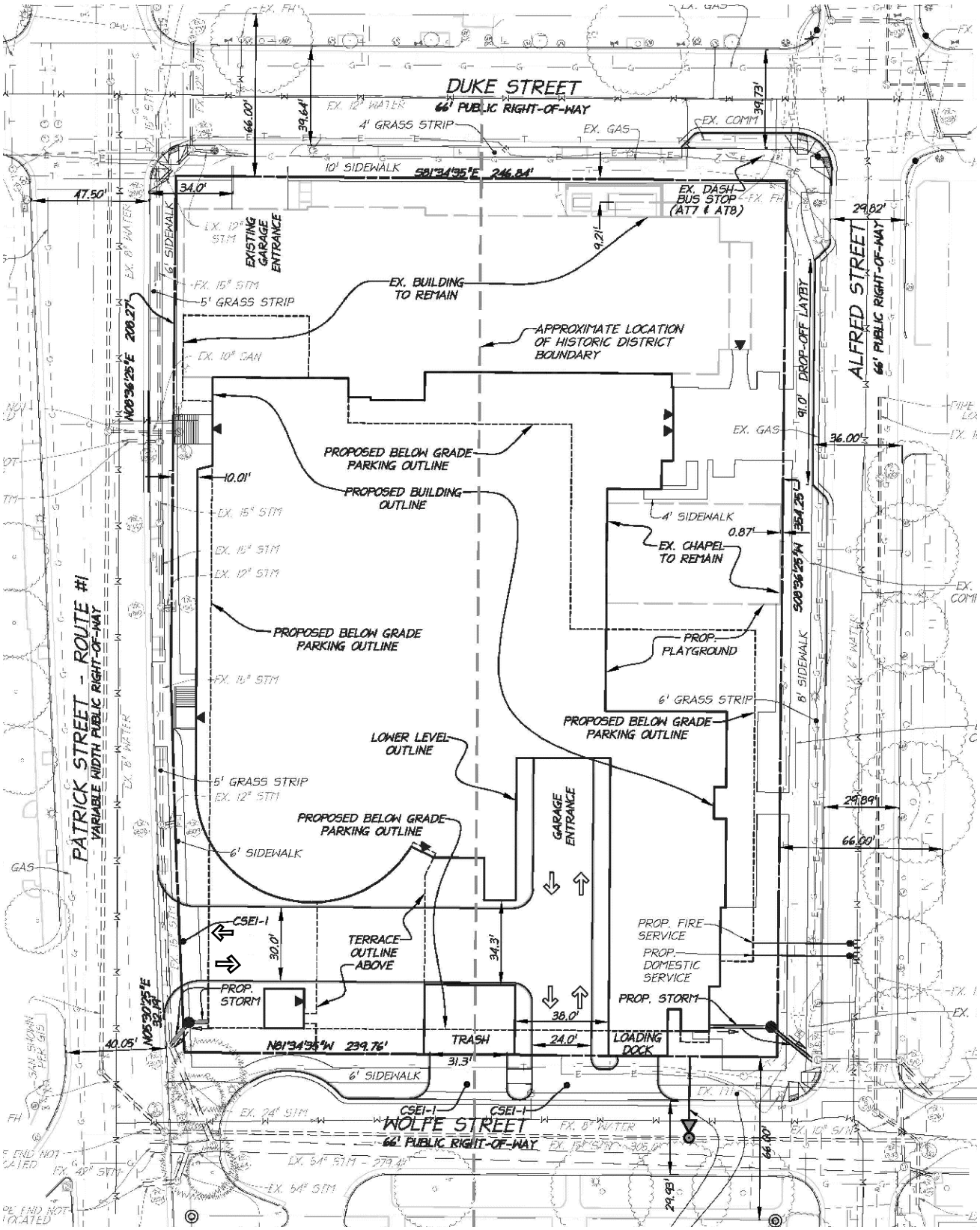

Figure 2-1
Conceptual Development Plan

Alfred Street Baptist Church
City of Alexandria

NORTH

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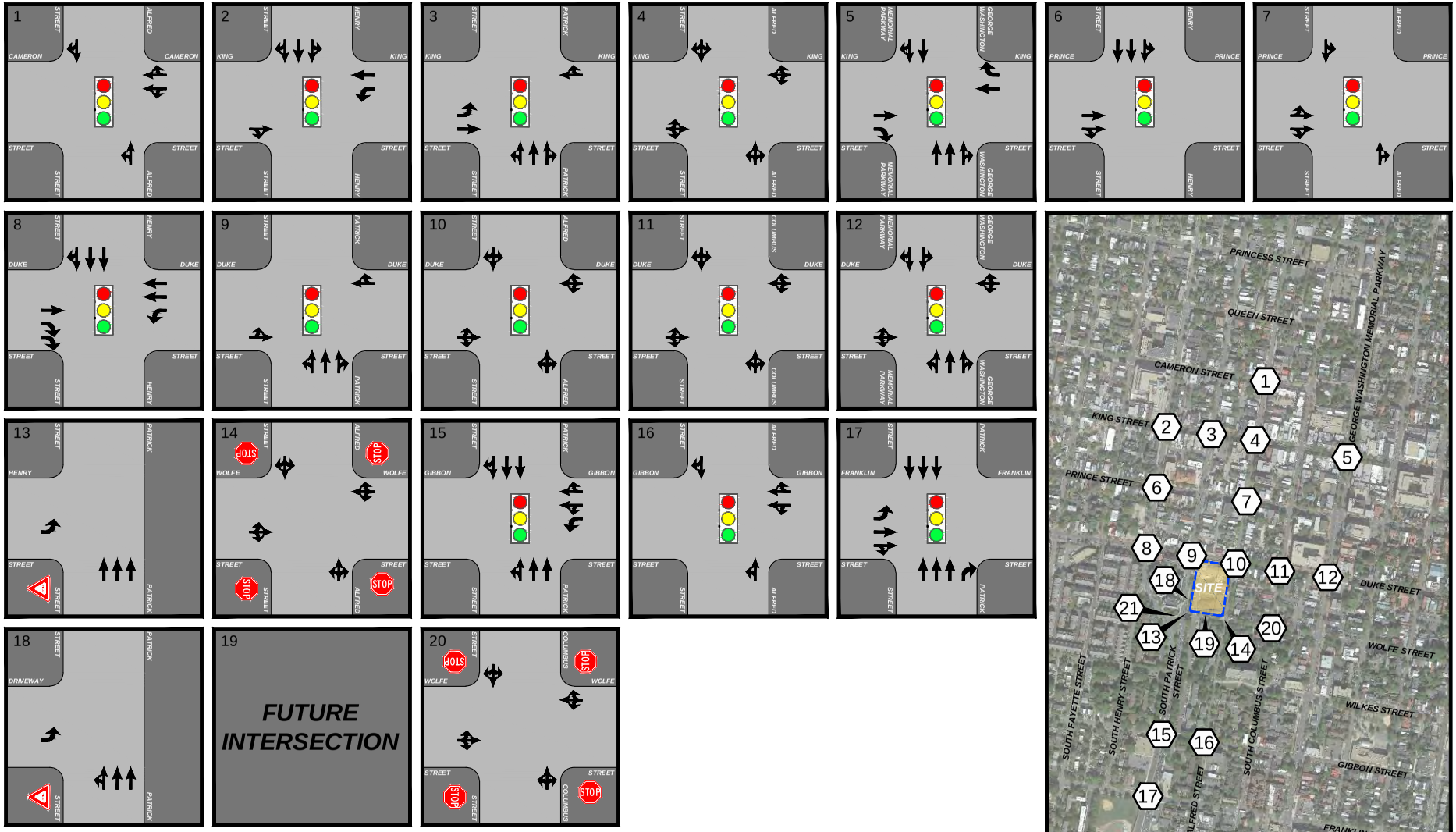

Figure 2-2
Existing Lane Use and Traffic Controls

Alfred Street Baptist Church
City of Alexandria, Virginia

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SECTION 3
ANALYSIS OF EXISTING CONDITIONS

Traffic Volumes

Wells + Associates conducted weekday vehicular, pedestrian and bicycle counts on Tuesday, May 19, 2015 and Wednesday May 20, 2015 from 6:30 to 9:30 AM and 4:30 to 7:30 PM and on Sunday May 31, 2015 from 7:00 AM to 3:00 PM at the following intersections listed below. In addition, the S. Columbus Street/Wolfe Street intersection was counted on Wednesday, February 24, 2016 from 6:30 AM to 9:30 AM, 4:30 PM to 7:30 PM, and on Sunday, February 28, 2016 from 7:00 AM to 3:00 PM. Individual peak hours for the AM, PM, and Sunday peak periods used throughout the analyses herein were respectively identified next to each studied intersection, respectively.

- Cameron Street/S. Alfred Street (7:30AM-8:30AM, 5:30PM-6:30PM, 12:30PM-1:30PM)
- S. Henry Street/King Street (7:45AM-8:45AM, 6:30PM-7:30PM, 1:45PM-2:45PM)
- S. Patrick Street/King Street (7:00AM-8:00AM, 5:30PM-6:30PM, 2:00PM-3:00PM)
- Alfred Street/King St. (7:30AM-8:30AM, 5:45PM-6:45PM, 12:00PM-1:00PM)
- S. Washington Street/King Street (6:45AM-7:45AM, 4:30PM-5:30PM, 12:45PM-1:45PM)
- S. Henry Street/Prince Street (7:45AM-8:45AM, 5:15PM-6:15PM, 12:45PM-1:45PM)
- S. Alfred Street/Prince Street (8:15AM-9:15AM, 6:00PM-7:00PM, 12:45PM-1:45PM)
- S. Henry Street/Duke Street (8:00AM-9:00AM, 5:15PM-6:15PM, 1:15PM-2:15PM)
- S. Patrick Street/Duke Street (8:30AM-9:30AM, 4:30PM-5:30PM, 2:00PM-3:00PM)
- S. Alfred Street/Duke Street (7:30AM-8:30AM, 5:45PM-6:45PM, 12:15PM-1:15PM)
- S. Columbus Street/Duke Street (7:45AM-8:45AM, 5:15PM-6:15PM, 12:00PM-1:00PM)
- S. Washington St./Duke St. (6:45AM-7:45AM, 4:30PM-5:30PM, 1:15PM-2:15PM)
- S. Henry St./S. Patrick St. (8:30AM-9:30AM, 6:00PM-7:00PM, 10:00AM-11:00AM)
- S. Alfred Street/Wolfe Street (7:45AM-8:45AM, 5:15PM-6:15PM, 12:45PM-1:45PM)
- S. Patrick Street/Gibbon Street (7:30AM-8:30AM, 5:30PM-6:30PM, 2:00PM-3:00PM)
- S. Alfred Street/Gibbon Street (7:30AM-8:30AM, 5:15PM-6:15PM, 12:45PM-1:45PM)
- S. Patrick Street/Franklin Street (8:15AM-9:15AM, 5:30PM-6:30PM, 1:45PM-2:45PM)
- S. Columbus St./Wolfe St. (7:45AM-8:45AM, 5:15PM-6:15PM, 11:30AM-12:30PM)

The existing peak hour vehicular volumes are shown in Figure 3-1 and 3-2. The peak hour pedestrian and bicycle volumes are shown in Section 7 of the report. The count worksheets are included in Appendix B. For purposes of this traffic analysis and in the interest of conservatism, the peak hours of individual intersections were utilized. Intersections without gaps or other development were balanced up so that the total segment traffic volumes were within 10%.

Figure 3-1 indicates that S. Alfred Street south Duke Street presently carries 428 AM peak hour trips, 384 PM peak hour trips, and 192 Sunday peak hour trips. Duke Street east of

South Patrick Street presently carries 920 AM peak hour trips, 930 PM peak hour trips, and 984 Sunday peak hour Trips.

S. Patrick Street which runs only in the northbound direction carries approximately 2,204 AM peak hour trips, 1,559 PM peak hour trips, and 1,815 Sunday peak hour trips south of Duke Street. South Henry Street, which runs only in the southbound direction presently carries 1,530 AM peak hour trips, 2,316 PM peak hour trips, and 2,016 Sunday peak hour trips south of Duke Street. The count data shows that the majority of traffic regionally traveling northbound into Alexandria during the AM peak hour, southbound out of Alexandria during the PM peak hour, and relatively equally northbound and southbound during the Sunday peak hour.

Operational Analysis

Existing peak hour levels of service (LOS) and the 50th and 95th percentile queues were calculated at key study intersections based on the existing lane use and traffic control shown on Figure 2-3; existing traffic signal phasing/timings obtained from T&ES; peak hour traffic, pedestrian and bicycle volumes shown in Figures 7-7 and 7-8, HCM 2010 methodologies, as reported by Synchro 9.1. HCM 2000 methodologies were used for intersections unable to calculate levels of service using HCM 2010 and are marked individually on the respective summary tables. The base Synchro files were provided by T&ES. The files were reviewed and account for the effects of the HOV lanes on N. Washington Street, South Henry Street, and South Patrick Street, on-street parking maneuvers, bus blockages, and lane restrictions during the peak periods. Additionally, peak hour factors between 0.85 and 0.92 were used based on the existing peak hour traffic counts.

In addition, it is noted that the Central Business District (CBD) factor was used for the analysis for weekday AM and PM conditions to accurately reflect conditions experienced along the heavily traveled corridors in the study area. Field observations indicate that queueing between the closely spaced intersections reduces capacity during the weekday AM and PM periods. The CBD factor reduces the saturated flow rate and better accounts for the delay and queuing effects of closely spaced signalized intersections.

Levels of Service. The existing LOS results are summarized in Table 3-1 and indicate the following:

- All signalized study intersections currently operate at overall acceptable LOS "D" or better during the weekday AM and PM peak hours. Some specific turning movements along U.S. Route 1 (S. Patrick Street and S. Henry Street) currently operate at near or at capacity (LOS "E" or LOS "F") during the weekday AM and PM peak hours.

- All of the approaches at the stop controlled study intersections currently operate at acceptable levels of service (LOS "D" or better) during the AM and PM hours.

- All signalized study intersections currently operate at acceptable levels of service (LOS "D" or better) during the Sunday midday peak hour.

The existing LOS Synchro worksheets are included in Appendix C.

Queues. The 50th and 95th percentile queues of existing conditions are used to establish a datum against which to compare future conditions. The 50th percentile (or average) queue is defined as the maximum back of queue associated with a typical signal cycle. The 95th percentile queue is defined as the maximum back of queue with 95th percentile traffic volumes. The 95th percentile queue is not necessarily ever observed, it is simply based on statistical calculations.

As shown on Table 3-2, peak hour queueing along both S. Henry Street and S. Patrick Street for thru movements at study intersections is consistent with commuter travel patterns. Longer queues were observed in the northbound direction during the AM peak hour and in the southbound direction during the PM peak hour. The estimated 95th percentile queue exceeded available storage for the eastbound right movement on Duke Street at S. Henry Street (weekday PM Peak Hour).

Table 3-1
Alfred Street Baptist Church
Existing Intersection Level of Service Summary [1]

Intersection	Intersection Control	Approach/ Movement	Existing Conditions AM Peak Hour LOS	AM Peak Hour Delay (sec.)	PM Peak Hour LOS	PM Peak Hour Delay (sec.)	Sunday Peak Hour LOS	Sunday Peak Hour Delay (sec.)
1. Alfred Street/Cameron Street	Signalized	WBLT	B	14.6	C	20.1	B	15.5
		WBTR	B	14.5	B	19.3	B	15.5
		NBLT	A	5.4	A	5.6	A	1.0
		SBTR	B	12.7	B	19.4	B	12.0
		Overall	**A**	**9.3**	**B**	**17.8**	**B**	**10.8**
2. Henry Street/King Street	Signalized	EBTR	C	23.4	D	44.9	C	32.2
		WBL	B	12.9	C	20.7	C	20.7
		WBT	B	19.6	C	26.5	C	26.5
		SBL	D	46.2	D	41.5	C	25.3
		SBT	D	38.2	C	33.5	C	22.4
		SBR	D	37.3	C	31.2	C	22.1
		Overall	**D**	**35.1**	**D**	**35.4**	**C**	**24.6**
3. Patrick Street/King Street	Signalized	EBL	C	21.5	B	16.4	B	16.5
		EBT	C	26.4	C	23.8	C	24.1
		WBTR	B	19.1	C	26.4	B	17.7
		NBL	F	71.2	D	44.0	D	39.0
		NBT	E	56.6	D	39.8	D	35.9
		NBR	D	54.1	D	39.3	D	36.2
		Overall	**D**	**54.1**	**D**	**35.9**	**C**	**32.2**
4. Alfred Street/King Street	Signalized	EBLTR	B	13.5	B	15.6	B	16.9
		WBLTR	A	1.2	A	4.0	B	15.1
		NBLTR	D	38.9	A	3.5	A	3.5
		SBLTR	B	14.4	A	6.4	B	14.0
		Overall	**C**	**24.6**	**A**	**7.5**	**B**	**13.9**
5. Washington Street/King Street	Signalized	EBT	C	34.4	C	31.6	C	26.7
		EBR	C	31.6	C	29.0	C	22.7
		WBT	C	33.4	C	34.5	C	25.8
		WBR	C	31.2	C	29.3	C	23.0
		NBT	D	45.3	C	33.4	A	2.4
		NBR	D	47.9	C	33.3	A	2.5
		SBT	A	9.4	C	21.6	C	24.3
		SBR	A	9.4	C	24.2	C	23.8
		Overall	**D**	**38.9**	**C**	**26.9**	**B**	**15.8**
6. Henry Street/Prince Street	Signalized	EBT	B	15.1	D	48.4	B	17.0
		EBR	B	15.2	D	52.6	B	17.4
		SBL	D	39.0	C	33.9	C	34.3
		SBT	D	37.9	C	33.5	C	33.1
		Overall	**C**	**31.0**	**D**	**41.2**	**C**	**30.3**
7. Alfred Street/Prince Street	Signalized	EBLT	C	24.7	C	27.3	C	22.1
		EBR	C	24.0	C	26.5	C	21.9
		NBTR	D	37.4	A	2.8	A	2.7
		SBLT	B	16.1	A	5.5	A	2.7
		Overall	**C**	**29.5**	**B**	**16.9**	**B**	**13.4**
8. Henry Street/Duke Street	Signalized	EBT	A	4.7	A	6.7	D	39.3
		EBR	A	3.5	A	6.8	C	28.3
		WBL	A	1.1	A	1.5	C	21.9
		WBT	A	0.2	A	0.2	A	5.6
		Overall	**A**	**2.4**	**A**	**3.9**	**C**	**28.1**
9. Patrick Street/Duke Street	Signalized	EBL	D	43.4	B	12.9	A	4.4
		WBR	D	54.0	A	7.2	B	11.6
		NBL	C	32.6	D	49.9	C	29.5
		NBT	C	25.3	D	39.4	C	25.4
		NBR	C	24.0	D	38.7	C	25.0
		Overall	**C**	**33.5**	**C**	**30.3**	**C**	**20.8**
10. Alfred Street/Duke Street	Signalized	EBLTR	B	15.1	B	11.8	B	11.9
		WBLTR	A	1.7	A	1.9	A	1.7
		NBLTR	C	31.9	B	19.0	B	18.9
		SBLTR	B	18.2	C	27.4	C	20.8
		Overall	**B**	**16.4**	**B**	**12.9**	**A**	**9.3**
11. Columbus Street/Duke Street	Signalized	EBLTR	B	16.9	A	6.6	A	1.2
		WBLTR	B	19.6	C	21.0	B	12.3
		NBLTR	C	23.4	B	15.2	C	21.1
		SBLTR	B	11.6	C	21.6	C	27.1
		Overall	**B**	**19.9**	**B**	**17.4**	**B**	**12.1**
12. Washington Street/Duke Street	Signalized	EBLTR	D	49.6	D	35.5	C	28.7
		WBLTR	C	34.4	C	30.3	C	26.5
		NBL	C	25.1	B	17.6	C	26.4
		NBT	C	29.3	B	18.1	-	-
		NBR	C	27.4	B	11.6	C	27.6
		SBL	C	25.6	D	48.0	B	10.3
		SBTR	C	26.0	D	50.6	A	4.3
		Overall	**C**	**29.5**	**D**	**38.7**	**B**	**19.7**
13. Patrick Street/U-Turns from Henry Street *HCM 2010 analyses unavailable.	Unsignalized	EBL	B	10.9	A	9.7	B	11.4
		NBT	A	0.0	A	0.0	A	0.0
14. Alfred Street/Wolfe Street	Unsignalized	EBLTR	A	8.2	A	8.2	A	7.6
		WBLTR	A	7.9	A	9.3	A	7.6
		NBLTR	B	10.5	A	8.1	A	7.8
		SBLTR	A	7.9	B	10.3	A	8.0
15. Patrick Street/Gibbon Street *HCM 2010 analysis is unavailable for the existing intersection geometry at this intersection.	Signalized	WBL	F	82.0	F	126.0	C	27.5
		WBLTR	D	49.7	C	25.6	C	20.4
		NBLT	B	10.2	B	18.6	B	11.8
		SBTR	A	5.6	C	30.3	B	10.0
		Overall	**B**	**15.3**	**D**	**36.9**	**B**	**12.7**
16. Alfred Street/Gibbon Street	Signalized	WBLT	B	15.5	B	11.9	A	9.0
		WBTR	B	15.2	B	11.8	A	8.7
		NBLT	C	21.4	C	33.6	B	11.7
		SBTR	B	12.9	B	17.8	B	11.1
		Overall	**B**	**18.2**	**B**	**17.0**	**A**	**9.8**
17. Patrick Street/Franklin Street	Signalized	EBL	E	65.8	E	63.0	E	69.6
		EBT	E	69.0	E	66.7	E	72.7
		EBR	E	69.8	E	69.2	E	73.7
		NBT	A	7.4	A	4.2	A	2.0
		NBR	F	77.4	A	6.6	A	2.6
		SBT	A	0.4	F	6.0	A	0.6
		Overall	**C**	**22.9**	**A**	**8.0**	**A**	**2.9**
18. Existing Garage Driveway/Patrick Street/	Unsignalized	EBL	C	20.4	C	16.1	F	65.6
		NBLTR*	A	0.0	A	0.0	A	0.0
19. Proposed Site Driveway/S. Alfred Street	Unsignalized	SBLR	Proposed Site Driveway					
20. S. Columbus Street/Wolfe Street	Unsignalized	EBLTR	A	9.0	A	9.6	A	8.5
		WBLTR	A	9.1	B	12.2	A	8.5
		NBLTR	B	14.4	A	10.0	A	9.3
		SBLTR	A	8.6	C	20.9	A	8.8

Notes:
(1) Capacity analysis based on Highway Capacity Manual 2010 methodology, using Synchro 9.1 unless otherwise noted.

Table 3-2
Alfred Street Baptist Church
Existing Intersection Queue Summary [1]

Intersection	Intersection Control	Approach/ Movement	Storage Length (ft)	Existing Conditions AM Peak Hour 50th	AM Peak Hour 95th	PM Peak Hour 50th	PM Peak Hour 95th	Sunday Peak Hour 50th	Sunday Peak Hour 95th
1. Alfred Street/Cameron Street	Signalized	WBLTR	-	48	72	134	187	45	72
		NBLT	-	19	m22	25	m39	29	m46
		SBTR	-	13	37	173	291	21	46
2. Henry Street/King Street	Signalized	EBTR	-	143	221	179	#357	131	#238
		WBL	100	17	m18	47	m53	44	m52
		WBT	-	89	m110	127	m159	119	m162
		SBLTR	-	~284	#394	~532	#586	310	383
3. Patrick Street/King Street	Signalized	EBL	100	55	m77	17	m18	30	m34
		EBT	-	92	m136	140	m150	124	m173
		WBTR	-	37	m56	42	#235	99	138
		NBLTR	-	~1310	m#827	55	#358	61	76
4. Alfred Street/King Street	Signalized	EBLTR	-	23	m28	26	m36	61	m77
		WBLTR	-	41	m58	70	m98	50	76
		NBLTR	-	305	m#467	21	34	13	21
		SBLTR	-	9	21	102	197	23	41
5. Washington Street/King Street	Signalized	EBT	-	68	111	89	143	153	221
		EBR	100	0	17	10	34	2	23
		WBT	-	50	93	141	205	128	195
		WBR	-	0	8	0	24	16	43
		NBTR	-	30	m25	98	146	138	172
		SBTR	-	88	108	604	#789	278	347
6. Henry Street/Prince Street	Signalized	EBTR	-	111	156	~351	#478	78	115
		SBLT	-	15	m14	35	m30	26	30
7. Alfred Street/Prince Street	Signalized	EBLTR	-	168	m181	25	31	4	7
		NBTR	-	251	m278	26	m49	32	60
		SBLT	-	19	38	150	226	40	m63
8. Henry Street/Duke Street	Signalized	EBT	-	178	267	155	#261	159	#281
		EBR	125	80	114	~183	#258	79	120
		WBL	-	8	m8	40	m44	41	m54
		WBT	-	60	m55	81	m90	82	m105
		SBTR	-	36	m#320	~440	m#496	24	31
9. Patrick Street/Duke Street	Signalized	EBT	-	94	184	98	m140	74	m137
		WBTR	-	~286	m#449	140	#458	112	#483
		NBLTR	-	~654	#739	330	#415	294	367
10. Alfred Street/Duke Street	Signalized	EBLTR	-	50	m65	36	m42	51	m49
		WBLTR	-	79	m132	90	m128	91	157
		NBLTR	-	226	#419	30	60	38	73
		SBLTR	-	0	34	88	#295	11	36
11. Columbus Street/Duke Street	Signalized	EBLTR	-	51	m103	73	m83	105	111
		WBLTR	-	120	189	150	226	131	192
		NBLTR	-	268	#489	57	100	83	137
		SBLTR	-	30	49	180	m242	45	89
12. Washington Street/Duke Street	Signalized	EBLTR	-	~282	#428	187	#325	212	324
		WBLTR	-	123	183	154	221	210	283
		NBTR	-	~851	#925	217	261	360	426
		SBLTR	-	38	50	37	m#54	94	108
13. Patrick Street/U-Turns from Henry Street	Unsignalized	EBL	115	-	15	-	6	-	17
		NBTR	-	-	0	-	0	-	0
14. Alfred Street/Wolfe Street	Unsignalized	EBLTR	-	-	3	-	3	-	3
		WBLTR	-	-	5	-	23	-	5
		NBLTR	-	-	55	-	5	-	10
		SBLTR	-	-	8	-	45	-	15
15. Patrick Street/Gibbon Street	Signalized	WBL	-	297	#470	~467	m#643	127	209
		WBT	-	139	201	159	m#246	70	99
		NBLT	-	720	13	230	392	198	334
		SBTR	-	106	112	~205	m26	202	523
16. Alfred Street/Gibbon Street	Signalized	WBLTR	-	81	118	76	125	49	81
		NBLT	-	193	295	55	#159	33	67
		SBTR	-	5	21	46	106	5	29
17. Patrick Street/Franklin Street	Signalized	EBL	-	5	16	22	47	8	22
		EBTR	-	49	68	95	122	51	68
		NBT	-	358	951	140	260	92	229
		NBR	-	~1585	#1831	0	22	0	20
		SBT	-	71	270	~1494	m#1465	60	610
18. Existing Garage Driveway/Patrick Street	Unsignalized	EBL	-	-	3	-	2	-	95
		NBLT	-	-	1	-	1	-	10
19. Prioposed Site Driveway/S. Alfred Street	Unsignalized	SBLR	-	Proposed Site Driveway					
20. S. Columbus Street/Wolfe Street	Unsignalized	EBLTR	-	-	5	-	10	-	10
		WBLTR	-	-	18	-	43	-	13
		NBLTR	-	-	105	-	18	-	28
		SBLTR	-	-	8	-	158	-	20

Notes:
(1) Queue length is based on the 50th and 95th percentile queues in feet as reported by Synchro, Version 9.
(2) "~" - 50th percentile volume exceeds capacity, queue may be longer than shown.
(3) "#" - 95th percentile volume exceeds capacity, queue may be longer than shown.
(4) "m" - Volume for 95th percentile queue is metered by upstream signal.

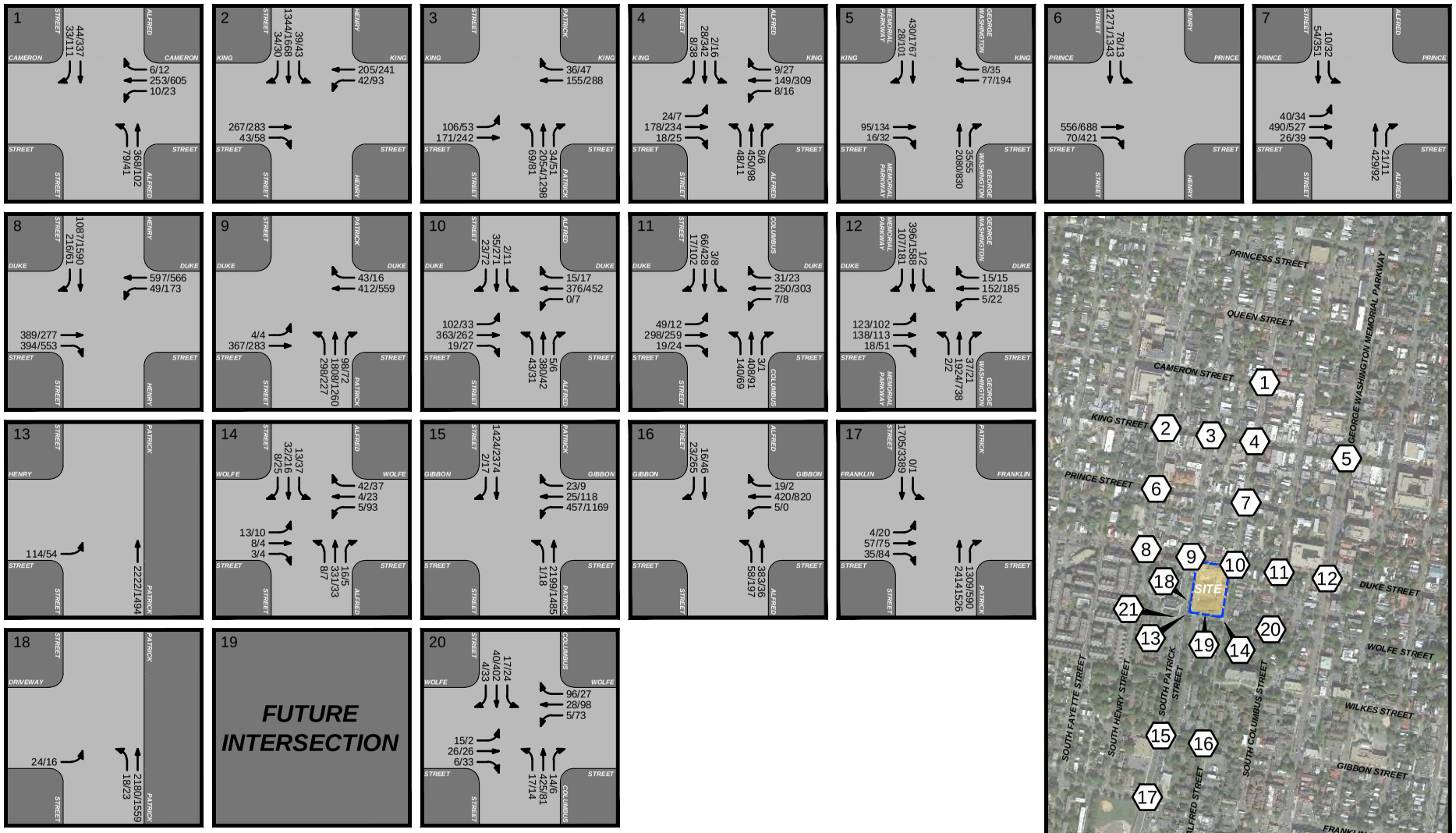

Figure 3-1
Existing Peak Hour Vehicular Traffic Volumes (Weekday)

Alfred Street Baptist Church
City of Alexandria, Virginia

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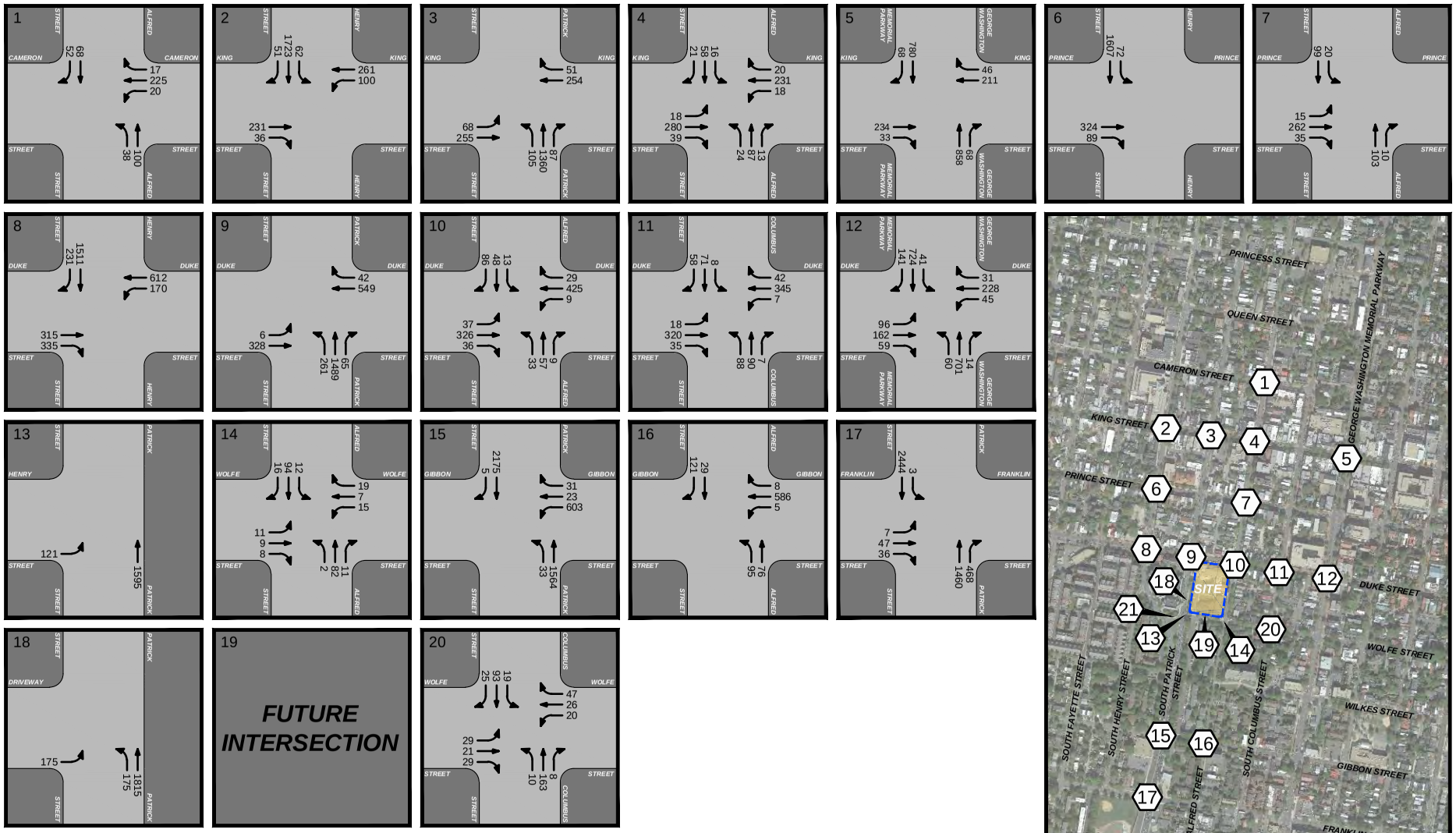

Figure 3-2
Existing Peak Hour Vehicular Traffic Volumes (Sunday)

Alfred Street Baptist Church
City of Alexandria, Virginia

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SECTION 4
ANALYSIS OF FUTURE CONDITIONS WITHOUT DEVELOPMENT

Traffic Volumes

This section presents an analysis of future transportation conditions including projections of 2022 and 2028 future traffic forecasts without the proposed development, as well as capacity and queuing analyses.

Methodology/Assumptions. It was assumed that the proposed development would be complete and fully occupied by 2022 as specified in the traffic scoping document. Future traffic forecasts without the proposed development were derived based on baseline traffic counts, regional traffic growth and traffic generated by two (2) pipeline projects.

Regional Growth. An increase in traffic associated with regional growth from 2015 to 2022 was estimated at 0.5 percent per year compounded annually for all roadways. This conservative growth rate was applied to all turning movements and accounts for increases in traffic resulting from potential development and influences outside of the immediate study area. Baseline volumes were grown for seven (7) years, with the resultant growth in trips are shown on Figure 4-1 and 4-2. Baseline Traffic Volumes were grown for thirteen years at 0.5 percent per year for the 2028 total future condition and the resulting growth is shown on Figure 4-3 and 4-4.

Pipeline Developments. Traffic expected to be generated by the two (2) pipeline developments was included as part of this study and is shown on Figure 4-5. The two (2) pipeline developments included herein are:

- Carr Hotel (220 S. Union Street)
- Robinson Terminal South

As shown in Table 4-1, the two (2) pipeline developments are expected to generate a total of 160 AM peak hour trips, 171 PM peak hour trips and 211 Sunday peak hour trips upon completion. The peak hour traffic forecasts of the combined developments are shown on Figure 4-6 and 4-7. The peak hour traffic forecasts for each pipeline development are included in Appendix D.

2022 Future Traffic Volumes without Development. Future traffic forecasts without the proposed development were prepared for 2022 based on existing traffic counts, regional traffic growth (2015 to 2022), and the two (2) pipeline developments. The future traffic forecasts without development are shown on Figure 4-8 and 4-9.

Operational Analysis

Future peak hour levels of service without the proposed development in 2022 were calculated at the key study intersections based on the existing lane use and traffic control shown on Figure 2-3; the future traffic forecasts without the proposed development shown on Figure 4-3; the existing traffic signal phasings/timings obtained from the City of Alexandria T&ES: and the Highway Capacity Manual (HCM) 2000 methodology, HCM 2010 methodology, using Synchro 9.

Levels of Service. The 2022 LOS results without the proposed development and the addition of regional growth and the two (2) pipeline developments are summarized in Table 4-2 and indicate the following:

All signalized study intersections would continue to operate at overall acceptable LOS "D" or better during the AM, PM, and Sunday peak hours except for the following intersections:

- S. Patrick Street/King Street operates at LOS "F" during the weekday AM peak hour

Some turning movements along U.S. Route 1 (S. Patrick Street and S. Henry Street) currently operate at LOS "E" or "F" during the AM, PM, and/or Sunday peak hours. All signalized study intersections continue to operate at acceptable levels of service (LOS "D" or better) during the Sunday midday peak hour.

All of the approaches at the stop controlled study intersections would continue to operate at acceptable levels of service (LOS "D" or better) during the weekday AM, PM, and Sunday peak hours with the exception of the site driveway which operates an LOS "E" during the Sunday peak hour.

Capacity analysis worksheets for the future conditions without the proposed development are included in Appendix E.

Queues. The future peak hour queue results without the proposed development for the turning movements are presented in Appendix E and summarized in Table 4-3. As shown in Table 4-3, the estimated 50th and 95th percentile queues at study intersections would increase marginally with the addition of the two (2) pipeline developments and regional growth. Consistent with existing conditions, the estimated 95th percentile queues for the eastbound right turns at Henry Street/Duke Street would extend beyond the available storage during the PM peak hour. Consistent with the existing condition, peak hour queueing along both S. Henry Street and S. Patrick Street for thru movements at study intersections is consistent with commuter travel patterns. Longer queues were observed in the northbound direction during the AM peak hour and in the southbound direction during the PM peak hour.

Table 4-1
Alfred Street Church
Pipeline Trip Generation Analysis [1]

Land Use (ITE Code)	ITE Land Use Code	Size	Units	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total	ADT Total	Sunday In	Sunday Out	Sunday Total	Sunday ADT Total
220 South Union Street														
Hotel	310	120	Rooms	46	34	84	41	43	84	1,070	45	45	90	714
220 South Union Street Total Trips				**46**	**34**	**84**	**41**	**43**	**84**	**1,070**	**45**	**45**	**90**	**714**
Robinson Terminal South														
Existing Uses														
Office	710	4,750	SF	6	1	7	1	6	7	52	1	0	1	5
Warehouse	150	89,650	SF	21	6	27	7	22	29	319	3	3	6	70
Total Existing Trips				**27**	**7**	**34**	**8**	**28**	**36**	**371**	**4**	**3**	**7**	**75**
Proposed Uses														
Residential Condominium/Townhouse	230	96	DU	9	41	50	39	19	58	621	29	30	59	658
Residential Non-Auto Mode Adjustment - 10%				*-1*	*-4*	*-5*	*-4*	*-2*	*-6*	*-155*	*-3*	*-3*	*-6*	*-66*
Net New Residential				8	37	45	35	17	52	466	26	27	53	592
Specialty Retail	826	5,299	SF	18	2	20	15	19	34	264	5	6	11	108
High-Turnover Sit Down Restaurant	932	6,174	SF	37	30	67	37	24	61	785	63	51	114	814
Retail Non-Auto Mode Adjustment - 25% Weekday & 40% Sunday				*-14*	*-8*	*-22*	*-13*	*-11*	*-24*	*-196*	*-27*	*-23*	*-50*	*-204*
Net New Retail Trips				41	24	65	39	32	71	853	41	34	75	718
Total Proposed Trips				**49**	**61**	**110**	**74**	**49**	**123**	**1,319**	**67**	**61**	**128**	**1,310**
Robinson Terminal Net New Trips				**22**	**54**	**76**	**66**	**21**	**87**	**948**	**63**	**58**	**121**	**644**
Total Pipeline Trips				**68**	**88**	**160**	**107**	**64**	**171**	**2,018**	**108**	**103**	**211**	**1,358**

Notes:
(1) All trip number were taken from the *Robinson Terminal South TIA,* dated October 21, 2014 by Wells + Associates.

Table 4-2
Alfred Street Baptist Church
Total Future without Development Intersection Level of Service Summary [1]

Intersection	Intersection Control	Approach/ Movement	Existing Conditions						2022 Future Conditions without Development					
			AM Peak Hour		PM Peak Hour		Sunday Peak Hour		AM Peak Hour		PM Peak Hour		Sunday Peak Hour	
			LOS	Delay (sec.)	LOS	Delay (sec.)	LOS	Delay (sec.)	LOS	Delay (sec.)	LOS	Delay (sec.)	LOS	Delay (sec.)
1. Alfred Street/Cameron Street	Signalized	WBLT	B	14.6	C	20.1	B	15.5	B	14.6	C	20.4	B	15.6
		WBTR	B	14.5	B	19.3	B	15.5	B	14.4	B	19.5	B	15.5
		NBLT	A	5.4	A	5.6	A	1.0	A	5.7	A	5.7	A	1.0
		SBTR	B	12.7	B	19.4	B	12.0	B	12.7	B	19.6	B	12.0
		Overall	**A**	**9.3**	**B**	**17.8**	**B**	**10.8**	**A**	**9.4**	**B**	**18.2**	**B**	**10.9**
2. Henry Street/King Street	Signalized	EBTR	C	23.4	D	44.9	C	32.2	C	22.8	D	46.5	C	32.2
		WBL	B	12.9	C	20.7	C	20.7	B	12.7	C	20.8	C	20.9
		WBT	B	19.6	C	26.5	C	26.5	B	19.8	C	26.2	C	26.7
		SBL	D	46.2	D	41.5	C	25.3	D	51.8	D	37.0	C	27.7
		SBT	D	38.2	C	33.5	C	22.4	D	41.4	C	31.0	C	23.9
		SBR	D	37.3	C	31.2	C	22.1	D	40.5	C	28.8	C	23.6
		Overall	**D**	**35.1**	**D**	**35.4**	**C**	**24.6**	**D**	**38.2**	**C**	**33.4**	**C**	**25.9**
3. Patrick Street/King Street	Signalized	EBL	C	21.5	B	16.4	B	16.5	C	21.4	B	16.3	B	16.4
		EBT	C	26.4	C	23.8	C	24.1	C	26.5	C	23.5	C	24.3
		WBTR	B	19.1	C	26.4	B	17.7	B	18.7	C	26.2	B	16.9
		NBL	F	71.2	D	44.0	D	39.0	F	80.5	D	47.0	D	40.5
		NBT	E	56.6	D	39.8	D	35.9	F	63.0	D	41.7	D	36.9
		NBR	D	54.1	D	39.3	D	36.2	F	60.6	D	41.2	D	37.3
		Overall	**D**	**54.1**	**D**	**35.9**	**C**	**32.2**	**E**	**60.5**	**D**	**37.7**	**C**	**33.0**
4. Alfred Street/King Street	Signalized	EBLTR	B	13.5	B	15.6	B	16.9	B	13.4	B	15.8	B	16.7
		WBLTR	A	1.2	A	4.0	B	15.1	A	1.1	A	4.2	B	15.2
		NBLTR	D	38.9	A	3.5	A	3.5	D	40.4	A	3.4	A	3.4
		SBLTR	B	14.4	A	6.4	B	14.0	B	14.4	A	6.6	B	14.0
		Overall	**C**	**24.6**	**A**	**7.5**	**B**	**13.9**	**C**	**26.0**	**A**	**7.7**	**B**	**13.9**
5. Washington Street/King Street	Signalized	EBT	C	34.4	C	31.6	C	26.7	C	34.2	C	31.6	C	26.6
		EBR	C	31.6	C	29.0	C	22.7	C	31.6	C	29.0	C	22.6
		WBT	C	33.4	C	34.5	C	25.8	C	33.5	C	34.0	C	26.0
		WBR	C	31.2	C	29.3	C	23.0	C	31.5	C	29.3	C	23.3
		NBT	D	45.3	C	33.4	A	2.4	D	48.1	C	34.6	A	2.8
		NBR	D	47.9	C	33.3	A	2.5	D	51.3	C	34.5	A	2.9
		SBT	A	9.4	C	21.6	C	24.3	A	9.4	C	23.4	C	25.3
		SBR	A	9.4	C	24.2	C	23.8	A	9.4	C	26.6	C	24.8
		Overall	**D**	**38.9**	**C**	**26.9**	**B**	**15.8**	**D**	**41.4**	**C**	**28.4**	**B**	**16.2**
6. Henry Street/Prince Street	Signalized	EBT	B	15.1	D	48.4	B	17.0	B	15.4	F	53.9	B	17.1
		EBR	B	15.2	D	52.6	B	17.4	B	15.5	F	59.0	B	17.4
		SBL	D	39.0	C	33.9	C	34.3	D	40.9	D	35.6	D	36.1
		SBT	D	37.9	C	33.5	C	33.1	D	39.7	D	35.2	C	34.7
		Overall	**C**	**31.0**	**D**	**41.2**	**C**	**30.3**	**C**	**32.3**	**D**	**44.7**	**C**	**31.7**
7. Alfred Street/Prince Street	Signalized	EBLT	C	24.7	C	27.3	C	22.1	C	25.1	C	27.4	C	22.4
		EBR	C	24.0	C	26.5	C	21.9	C	24.3	C	26.6	C	22.2
		NBTR	D	37.4	A	2.8	A	2.7	D	35.9	A	2.7	A	2.7
		SBLT	B	16.1	A	5.5	A	2.7	B	15.6	A	5.2	A	2.6
		Overall	**C**	**29.5**	**B**	**16.9**	**B**	**13.4**	**C**	**28.9**	**B**	**17.2**	**B**	**14.2**
8. Henry Street/Duke Street	Signalized	EBT	A	4.7	A	6.7	D	39.3	A	4.7	A	6.7	D	43.4
		EBR	A	3.5	A	6.8	C	28.3	A	3.5	A	6.7	C	28.6
		WBL	A	1.1	A	1.5	C	21.9	A	1.1	A	1.5	C	23.4
		WBT	A	0.2	A	0.2	A	5.6	A	0.2	A	0.2	A	5.7
		Overall	**A**	**2.4**	**A**	**3.9**	**C**	**28.1**	**A**	**2.4**	**A**	**3.8**	**C**	**29.5**
9. Patrick Street/Duke Street	Signalized	EBL	D	43.4	B	12.9	A	4.4	E	60.6	B	12.9	A	4.6
		WBR	D	54.0	A	7.2	B	11.6	F	70.3	A	6.8	B	15.4
		NBL	C	32.6	D	49.9	C	29.5	D	37.9	F	55.9	C	32.0
		NBT	C	25.3	D	39.4	C	25.4	C	27.9	D	42.9	C	26.8
		NBR	C	24.0	D	38.7	C	25.0	C	26.7	D	42.2	C	26.4
		Overall	**C**	**33.5**	**C**	**30.3**	**C**	**20.8**	**D**	**41.1**	**C**	**33.4**	**C**	**22.6**
10. Alfred Street/Duke Street	Signalized	EBLTR	B	15.1	B	11.8	B	11.9	B	16.1	B	11.7	B	12.3
		WBLTR	A	1.7	A	1.9	A	1.7	A	1.8	A	2.3	A	1.7
		NBLTR	C	31.9	B	19.0	B	18.9	C	32.9	B	19.0	B	18.7
		SBLTR	B	18.2	C	27.4	C	20.8	B	18.2	C	28.2	C	20.6
		Overall	**B**	**16.4**	**B**	**12.9**	**A**	**9.3**	**B**	**17.1**	**B**	**13.1**	**A**	**9.4**
11. Columbus Street/Duke Street	Signalized	EBLTR	B	16.9	A	6.6	A	1.2	B	17.8	A	6.9	A	1.3
		WBLTR	B	19.6	C	21.0	B	12.3	C	20.0	C	21.1	B	12.4
		NBLTR	C	23.4	B	15.2	C	21.1	C	24.7	B	15.1	C	20.8
		SBLTR	B	11.6	C	21.6	C	27.1	B	11.5	C	22.6	C	26.9
		Overall	**B**	**19.9**	**B**	**17.4**	**B**	**12.1**	**C**	**20.8**	**B**	**17.8**	**B**	**11.7**
12. Washington Street/Duke Street	Signalized	EBLTR	D	49.6	D	35.5	C	28.7	E	55.3	D	38.9	C	31.2
		WBLTR	C	34.4	C	30.3	C	26.5	D	36.9	C	32.3	C	28.7
		NBL	C	25.1	B	17.6	C	26.4	C	24.8	B	17.3	C	25.7
		NBT	C	29.3	B	18.1	-	-	C	28.9	B	17.8	-	-
		NBR	C	27.4	B	11.6	C	27.6	C	27.1	B	11.6	C	27.0
		SBL	C	25.6	D	48.0	B	10.3	C	26.3	D	49.9	B	11.1
		SBTR	C	26.0	D	50.6	A	4.3	C	26.7	D	53.0	A	4.8
		Overall	**C**	**29.5**	**D**	**38.7**	**B**	**19.7**	**C**	**30.2**	**D**	**40.6**	**C**	**20.3**
13. Patrick Street/U-Turns from Henry Street *HCM 2010 analyses unavailable.	Unsignalized	EBL	B	10.9	A	9.7	B	11.4	B	10.9	A	9.8	B	11.0
		NBT	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0
14. Alfred Street/Wolfe Street	Unsignalized	EBLTR	A	8.2	A	8.2	A	7.6	A	8.3	A	8.2	A	7.6
		WBLTR	A	7.9	A	9.3	A	7.6	A	7.8	A	9.2	A	7.6
		NBLTR	B	10.5	A	8.1	A	7.8	B	10.6	A	8.1	A	7.8
		SBLTR	A	7.9	B	10.3	A	8.0	A	7.9	B	10.2	A	7.9
15. Patrick Street/Gibbon Street *HCM 2010 analysis is unavailable for the existing intersection geometry at this intersection.	Signalized	WBL	F	82.0	F	126.0	C	27.5	F	81.3	F	139.6	C	27.7
		WBLTR	D	49.7	C	25.6	C	20.4	D	49.0	C	27.1	C	20.0
		NBLT	B	10.2	B	18.6	B	11.8	B	11.8	C	20.6	B	13.7
		SBTR	A	5.6	C	30.3	B	10.0	A	4.9	D	41.8	B	11.5
		Overall	**B**	**15.3**	**D**	**36.9**	**B**	**12.7**	**B**	**15.8**	**D**	**44.6**	**B**	**14.1**
16. Alfred Street/Gibbon Street	Signalized	WBLT	B	15.5	B	11.9	A	9.0	B	15.7	B	12.4	A	9.1
		WBTR	B	15.2	B	11.8	A	8.7	B	15.3	B	12.2	A	8.7
		NBLT	C	21.4	C	33.6	B	11.7	C	21.2	D	35.4	B	11.4
		SBTR	B	12.9	B	17.8	B	11.1	B	12.8	B	18.5	B	11.0
		Overall	**B**	**18.2**	**B**	**17.0**	**A**	**9.8**	**B**	**18.1**	**B**	**17.7**	**A**	**9.7**
17. Patrick Street/Franklin Street	Signalized	EBL	E	65.8	E	63.0	E	69.6	E	65.8	E	63.0	E	69.6
		EBT	E	69.0	E	66.7	E	72.7	E	68.9	E	66.7	E	72.5
		EBR	E	69.8	E	69.2	E	73.7	E	69.6	E	69.2	E	73.4
		NBT	A	7.4	A	4.2	A	2.0	A	7.9	A	4.2	A	2.0
		NBR	F	77.4	A	6.6	A	2.6	F	86.5	A	6.6	A	2.6
		SBT	A	0.4	F	6.0	A	0.6	A	0.4	F	14.9	A	0.6
		Overall	**C**	**22.9**	**A**	**8.0**	**A**	**2.9**	**C**	**25.3**	**B**	**13.2**	**A**	**2.8**
18. Existing Garage Driveway/Patrick Street/	Unsignalized	EBL	C	20.4	C	16.1	F	65.6	C	18.0	B	14.0	E	43.2
		NBLT	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0
19. Proposed Site Driveway/S. Alfred Street	Unsignalized	SBLR	Proposed Site Driveway											
20. S. Columbus Street/Wolfe Street	Unsignalized	EBLTR	A	9.0	A	9.6	A	8.5	A	9.0	A	9.3	A	8.3
		WBLTR	A	9.1	B	12.2	A	8.5	A	9.1	B	11.4	A	8.3
		NBLTR	B	14.4	A	10.0	A	9.3	B	14.4	A	9.6	A	9.0
		SBLTR	A	8.6	C	20.9	A	8.8	A	8.6	C	17.4	A	8.6

Notes:
(1) Capacity analysis based on Highway Capacity Manual 2010 methodology, using Synchro 9.1 unless otherwise noted.

Table 4-3
Alfred Street Baptist Church
Intersection Queue Summary [1]

Intersection	Intersection Control	Approach/ Movement	Storage Length (ft)	Existing Conditions AM Peak Hour 50th	Existing Conditions AM Peak Hour 95th	Existing Conditions PM Peak Hour 50th	Existing Conditions PM Peak Hour 95th	Existing Conditions Sunday Peak Hour 50th	Existing Conditions Sunday Peak Hour 95th	2022 Future Conditions without Development AM Peak Hour 50th	2022 Future Conditions without Development AM Peak Hour 95th	2022 Future Conditions without Development PM Peak Hour 50th	2022 Future Conditions without Development PM Peak Hour 95th	2022 Future Conditions without Development Sunday Peak Hour 50th	2022 Future Conditions without Development Sunday Peak Hour 95th
1. Alfred Street/Cameron Street	Signalized	WBLTR	-	48	72	134	187	45	72	47	73	140	194	46	73
		NBLT	-	19	m22	25	m39	29	m46	19	m20	25	m40	29	m48
		SBTR	-	13	37	173	291	21	46	13	38	177	298	19	49
2. Henry Street/King Street	Signalized	EBTR	-	143	221	179	#357	131	#238	134	228	~195	#371	131	#243
		WBL	100	17	m18	47	m53	44	m52	17	m19	45	m49	45	m55
		WBT	-	89	m110	127	m159	119	m162	89	m108	122	m149	122	m170
		SBLTR	-	~284	#394	~532	#586	310	383	~325	#420	~501	#614	336	#464
3. Patrick Street/King Street	Signalized	EBL	100	55	m77	17	m18	30	m34	56	m85	16	m17	31	m36
		EBT	-	92	m136	140	m150	124	m173	93	m142	135	m141	127	m177
		WBTR	-	37	m56	42	#235	99	138	38	m58	42	m#304	91	#141
		NBLTR	-	~1310	m#827	55	#358	61	76	~1395	m#822	54	#383	71	#90
4. Alfred Street/King Street	Signalized	EBLTR	-	23	m28	26	m36	61	m77	20	m26	28	m40	55	m71
		WBLTR	-	41	m58	70	m98	50	76	39	m58	63	89	51	77
		NBLTR	-	305	m#467	21	34	13	21	314	#483	20	35	12	22
		SBLTR	-	9	21	102	197	23	41	8	22	109	206	22	43
5. Washington Street/King Street	Signalized	EBT	-	68	111	89	143	153	221	64	114	88	147	151	225
		EBR	100	0	17	10	34	2	23	0	18	10	36	1	24
		WBT	-	50	93	141	205	128	195	51	96	134	211	133	202
		WBR	-	0	8	0	24	16	43	0	18	0	26	23	54
		NBTR	-	30	m25	98	146	138	172	~50	m26	100	142	148	190
		SBTR	-	88	108	604	#789	278	347	88	117	~746	#857	306	380
6. Henry Street/Prince Street	Signalized	EBTR	-	111	156	~351	#478	78	115	116	164	~375	#504	80	117
		SBLT	-	15	m14	35	m30	26	30	15	m14	38	m33	27	m30
7. Alfred Street/Prince Street	Signalized	EBLTR	-	168	m181	25	31	4	7	178	m205	32	42	6	8
		NBTR	-	251	m278	26	m49	32	60	239	m260	25	m50	31	m62
		SBLT	-	19	38	150	226	40	m63	17	38	139	233	39	m64
8. Henry Street/Duke Street	Signalized	EBT	-	178	267	155	#261	159	#281	181	286	155	#289	175	#316
		EBR	125	80	114	~183	#258	79	120	78	116	~161	#265	82	124
		WBL	-	8	m8	40	m44	41	m54	9	m8	44	m48	48	m54
		WBT	-	60	m55	81	m90	82	m105	60	m51	91	m100	91	m99
		SBLTR*	-	36	m#320	~440	m#496	24	31	41	m#121	~432	m#480	25	32
9. Patrick Street/Duke Street	Signalized	EBT	-	94	184	98	m140	74	m137	102	#341	98	m140	89	m137
		WBTR	-	~286	m#449	140	#458	112	#483	~334	m#496	131	m#490	129	#545
		NBLTR	-	~654	#739	330	#415	294	367	~734	#644	~354	#465	298	371
10. Alfred Street/Duke Street	Signalized	EBLTR	-	50	m65	36	m42	51	m49	52	m83	36	m46	52	m41
		WBLTR	-	79	m132	90	m128	91	157	78	m148	97	m137	88	177
		NBLTR	-	226	#419	30	60	38	73	235	#435	29	63	36	74
		SBLTR	-	0	34	88	#295	11	36	0	36	97	#310	10	38
11. Columbus Street/Duke Street	Signalized	EBLTR	-	51	m103	73	m83	105	111	59	m100	80	m92	104	110
		WBLTR	-	120	189	150	226	131	192	129	215	152	250	136	218
		NBLTR	-	268	#489	57	100	83	137	287	#515	54	103	78	140
		SBLTR	-	30	49	180	m242	45	89	22	54	183	m#406	42	91
12. Washington Street/Duke Street	Signalized	EBLTR	-	~282	#428	187	#325	212	324	~305	#492	216	#388	242	372
		WBLTR	-	123	183	154	221	210	283	161	250	186	285	261	378
		NBTR	-	~851	#925	217	261	360	426	~841	#953	207	268	342	#485
		SBLTR	-	38	50	37	m#54	94	108	44	57	~49	m#715	104	119
13. Patrick Street/U-Turns from Henry Street	Unsignalized	EBL	115	-	15	-	6	-	17	-	16	-	6	-	17
		NBTR	-	-	0	-	0	-	0	-	0	-	0	-	0
14. Alfred Street/Wolfe Street	Unsignalized	EBLTR	-	-	3	-	3	-	3	-	3	-	3	-	3
		WBLTR	-	-	5	-	23	-	5	-	5	-	23	-	5
		NBLTR	-	-	55	-	5	-	10	-	60	-	5	-	10
		SBLTR	-	-	8	-	45	-	15	-	5	-	45	-	13
15. Patrick Street/Gibbon Street	Signalized	WBL	-	297	#470	~467	m#643	127	209	298	#490	~494	m#672	129	234
		WBT	-	139	201	159	m#246	70	99	136	206	166	m#292	72	102
		NBLT	-	720	13	230	392	198	334	800	13	257	426	227	364
		SBTR	-	106	112	~205	m26	202	523	89	96	~244	m39	304	541
16. Alfred Street/Gibbon Street	Signalized	WBLTR	-	81	118	76	125	49	81	84	123	80	133	50	83
		NBLT	-	193	295	55	#159	33	67	190	303	55	#165	31	70
		SBTR	-	5	21	46	106	5	29	5	22	50	#120	5	31
17. Patrick Street/Franklin Street	Signalized	EBL	-	5	16	22	47	8	22	4	15	22	47	8	23
		EBTR	-	49	68	95	122	51	68	47	71	95	125	49	70
		NBT	-	358	951	140	260	92	229	382	1029	135	267	86	234
		NBR	-	~1585	#1831	0	22	0	20	~1672	#1915	0	30	0	28
		SBT	-	71	270	~1494	m#1465	60	610	64	264	~1603	m#1480	83	688
18. Existing Garage Driveway/Patrick Street	Unsignalized	EBL	-	-	3	-	2	-	95	-	3	-	2	-	88
		NBLT	-	-	1	-	1	-	10	-	0	-	0	-	0
19. Prioposed Site Driveway/S. Alfred Street	Unsignalized	SBLR	-	Proposed Site Driveway											
20. S. Columbus Street/Wolfe Street	Unsignalized	EBLTR	-	-	5	-	10	-	10	-	5	-	8	-	10
		WBLTR	-	-	18	-	43	-	13	-	18	-	38	-	10
		NBLTR	-	-	105	-	18	-	28	-	105	-	15	-	25
		SBLTR	-	-	8	-	158	-	20	-	8	-	120	-	18

Notes:
(1) Queue length is based on the 50th and 95th percentile queues in feet as reported by Synchro, Version 9.
(2) "~" - 50th percentile volume exceeds capacity, queue may be longer than shown.
(3) "#" - 95th percentile volume exceeds capacity, queue may be longer than shown.
(4) "m" - Volume for 95th percentile queue is metered by upstream signal.

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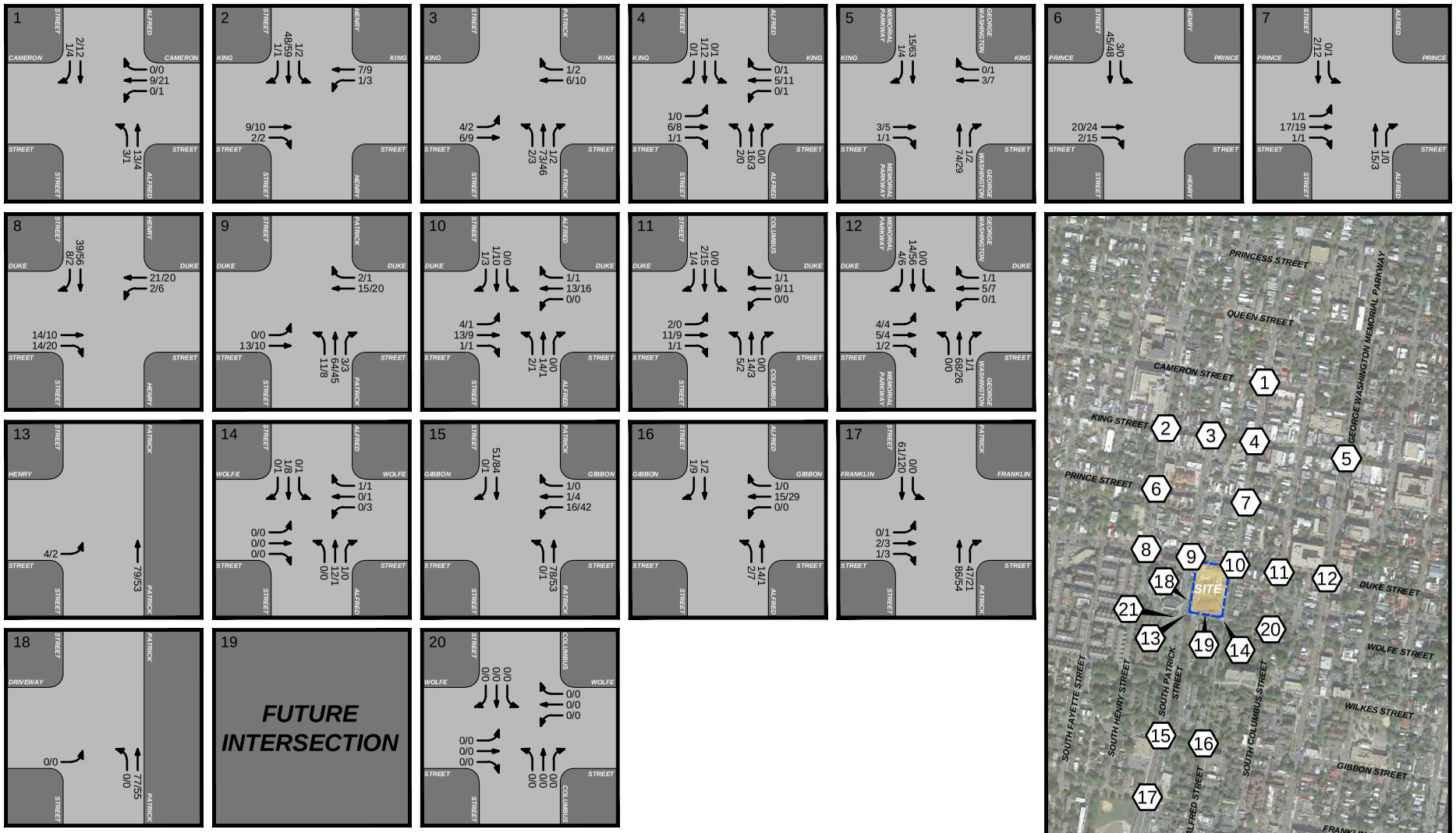

Figure 4-1
Regional Growth 1 (2015 - 2022) (Weekday)

Alfred Street Baptist Church
City of Alexandria, Virginia

JCP

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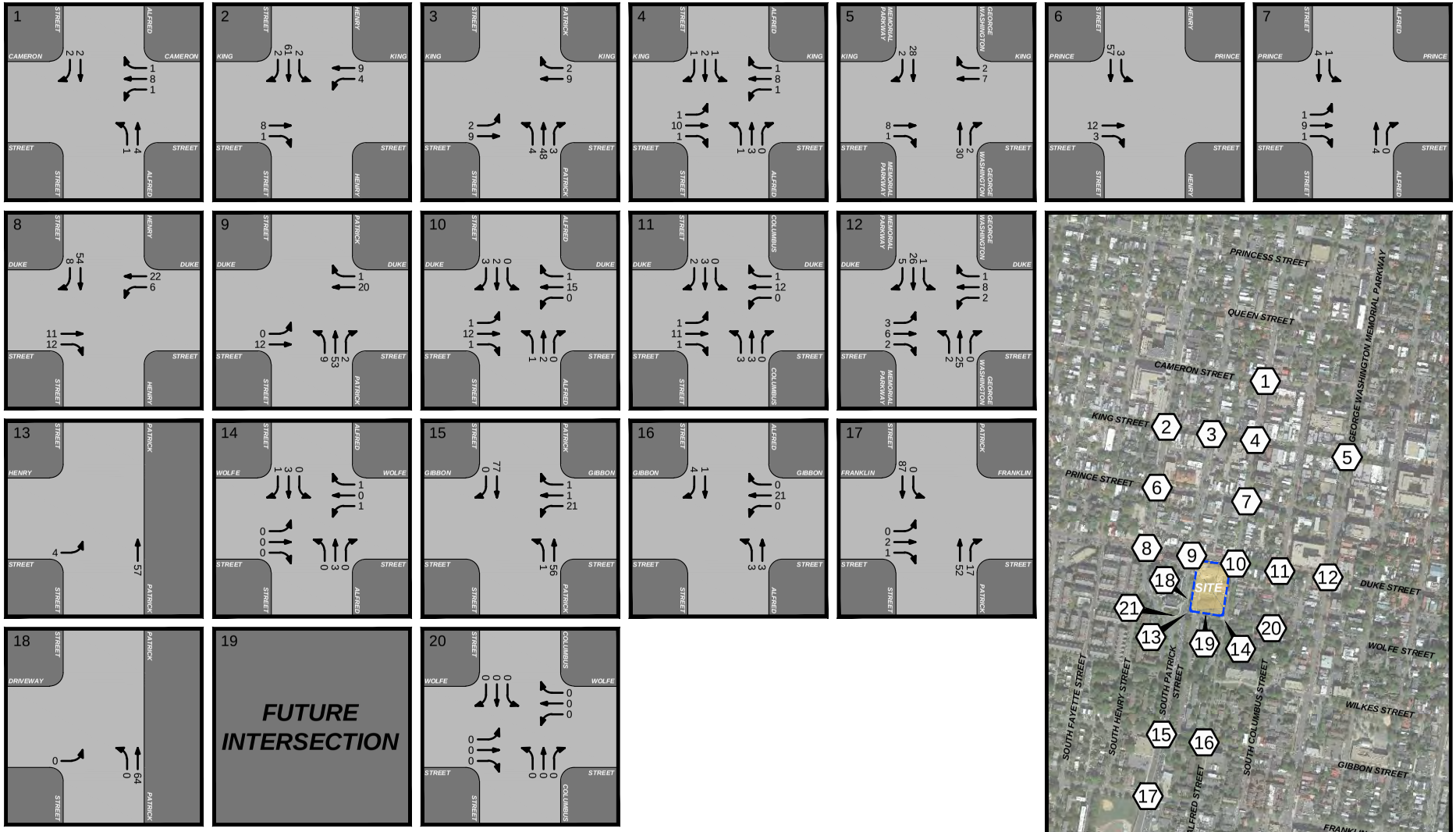

Figure 4-2
Regional Growth 1 (2015 - 2022) (Sunday)

Alfred Street Baptist Church
City of Alexandria, Virginia

JCP

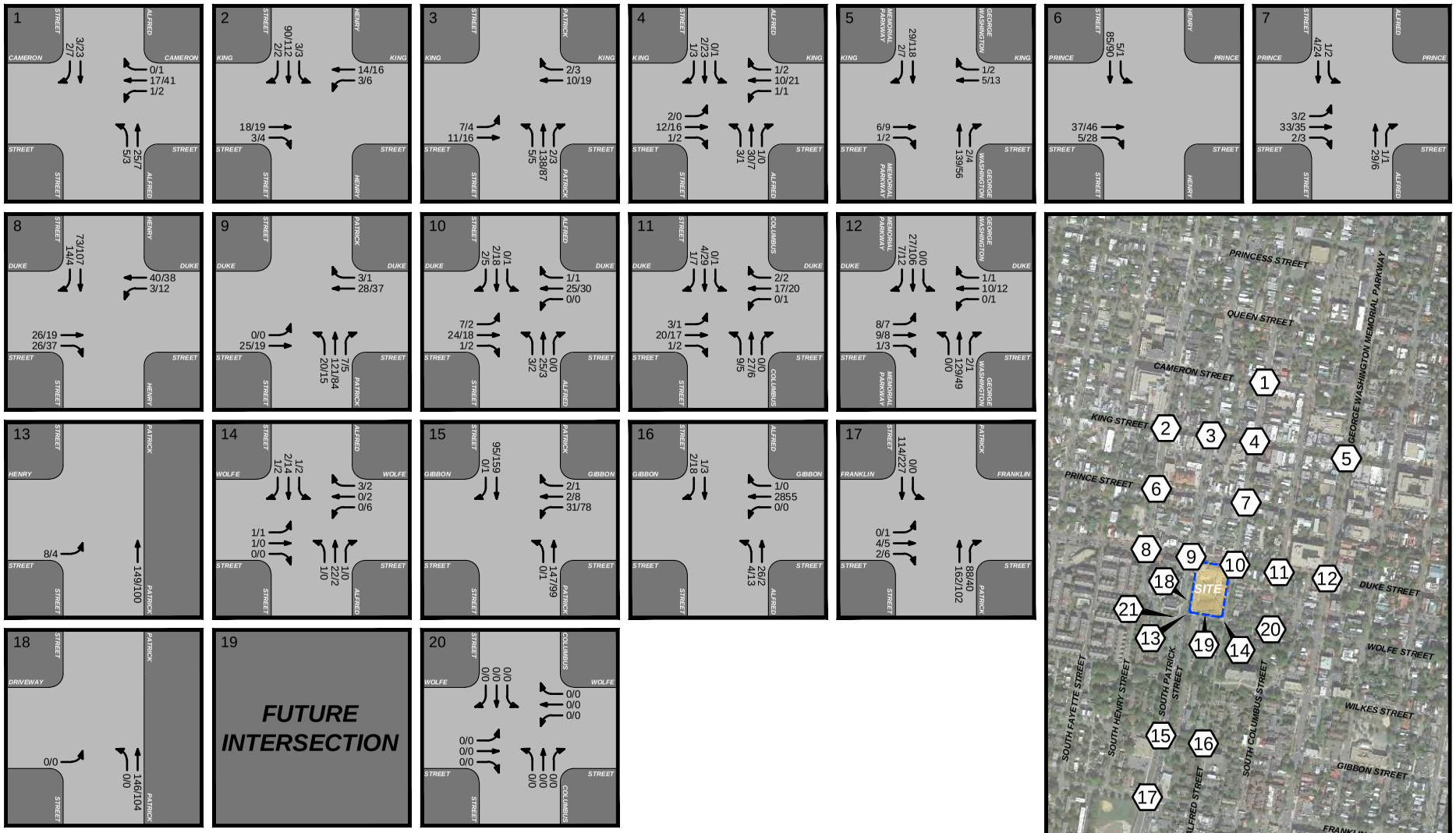

Figure 4-3
Regional Growth 2 (2015 - 2028) (Weekday)

Alfred Street Baptist Church
City of Alexandria, Virginia

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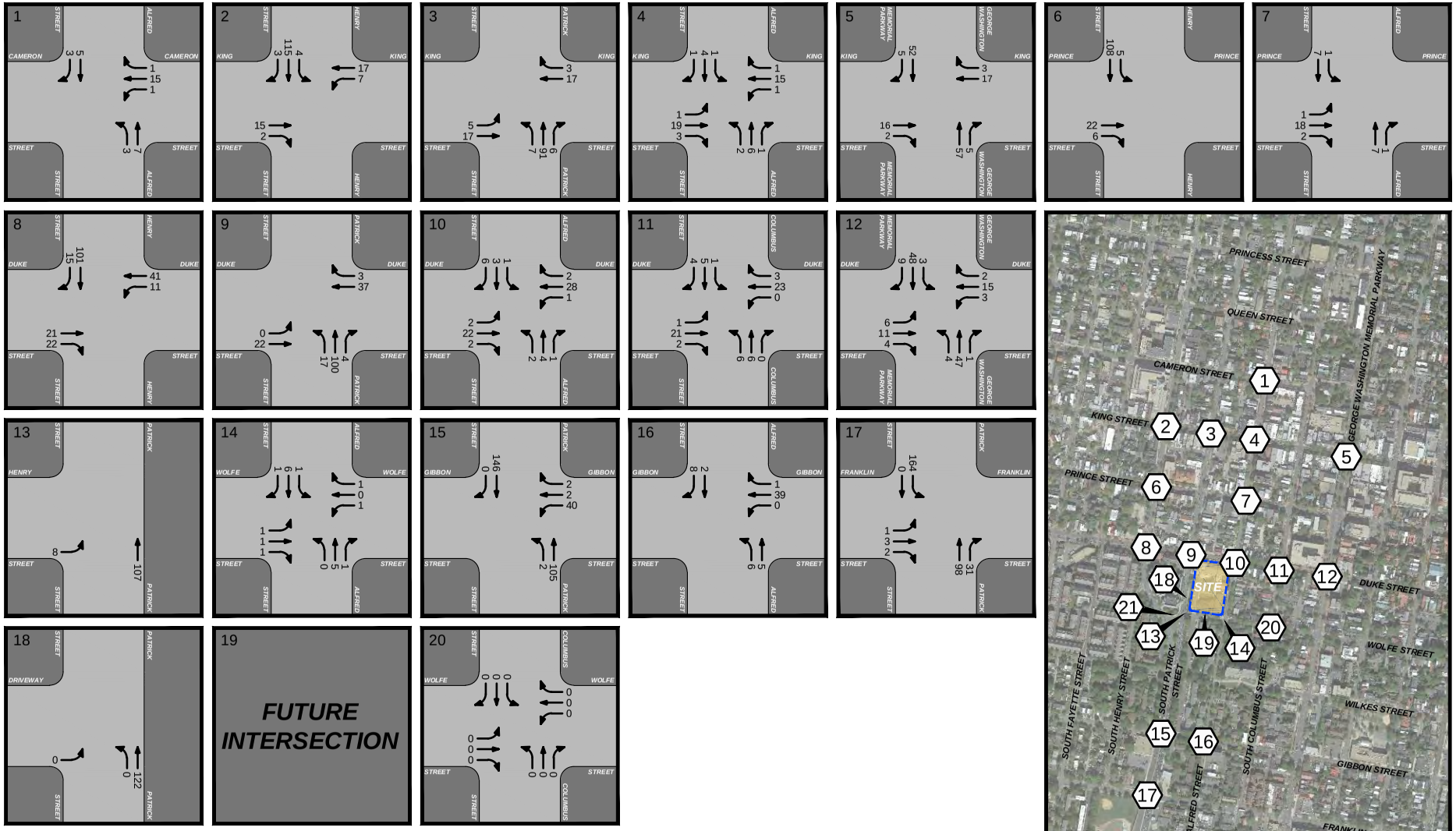

Figure 4-4
Regional Growth 2 (2015 - 2028) (Sunday)

Alfred Street Baptist Church
City of Alexandria, Virginia

NORTH

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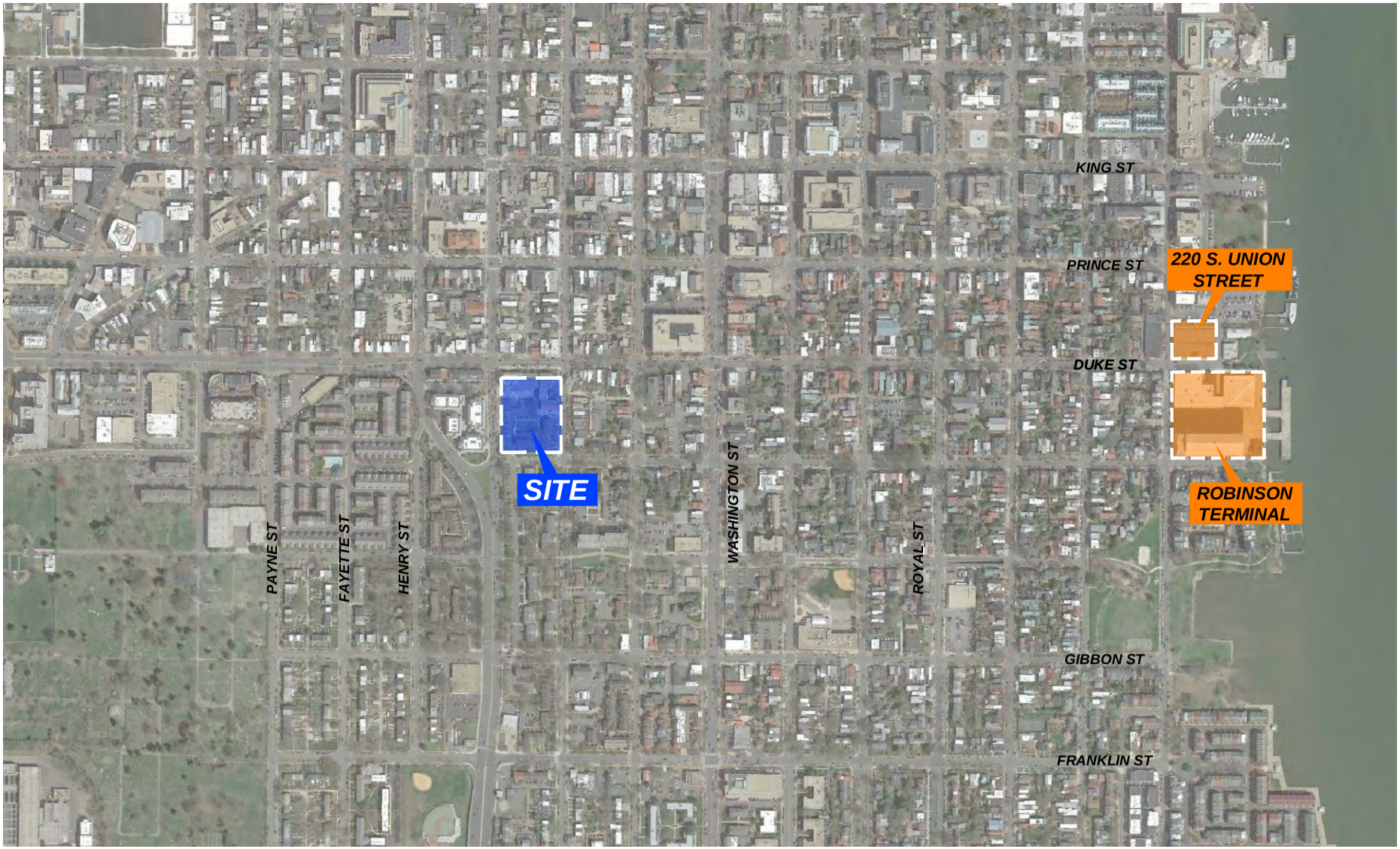

Figure 4-5
Pipeline Development Locations

Alfred Street Baptist Church
City of Alexandria, Virginia

NORTH

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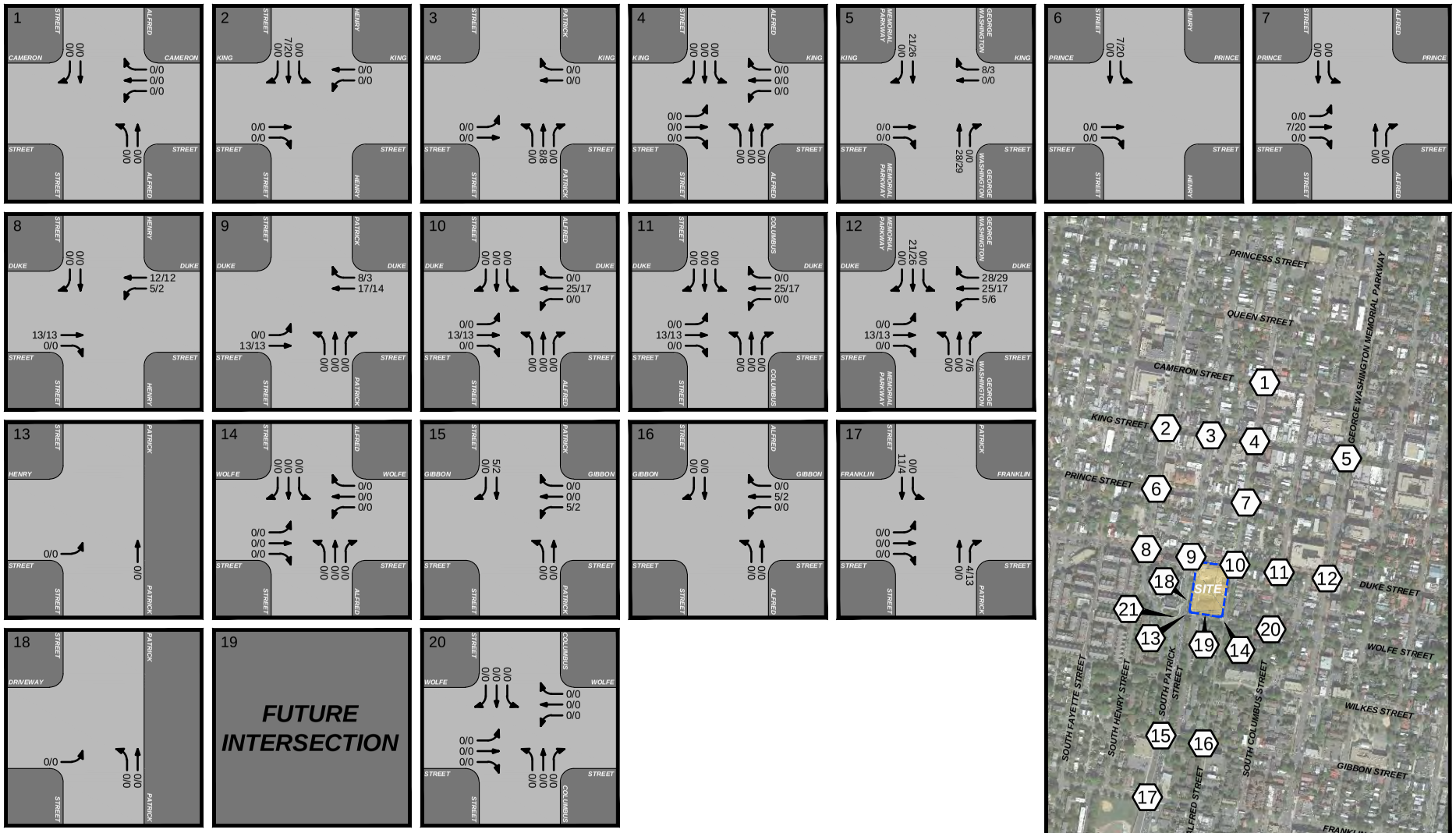

Figure 4-6

Total Pipeline Development Peak Hour Traffic Forecasts (Weekday)

Alfred Street Baptist Church

City of Alexandria, Virginia

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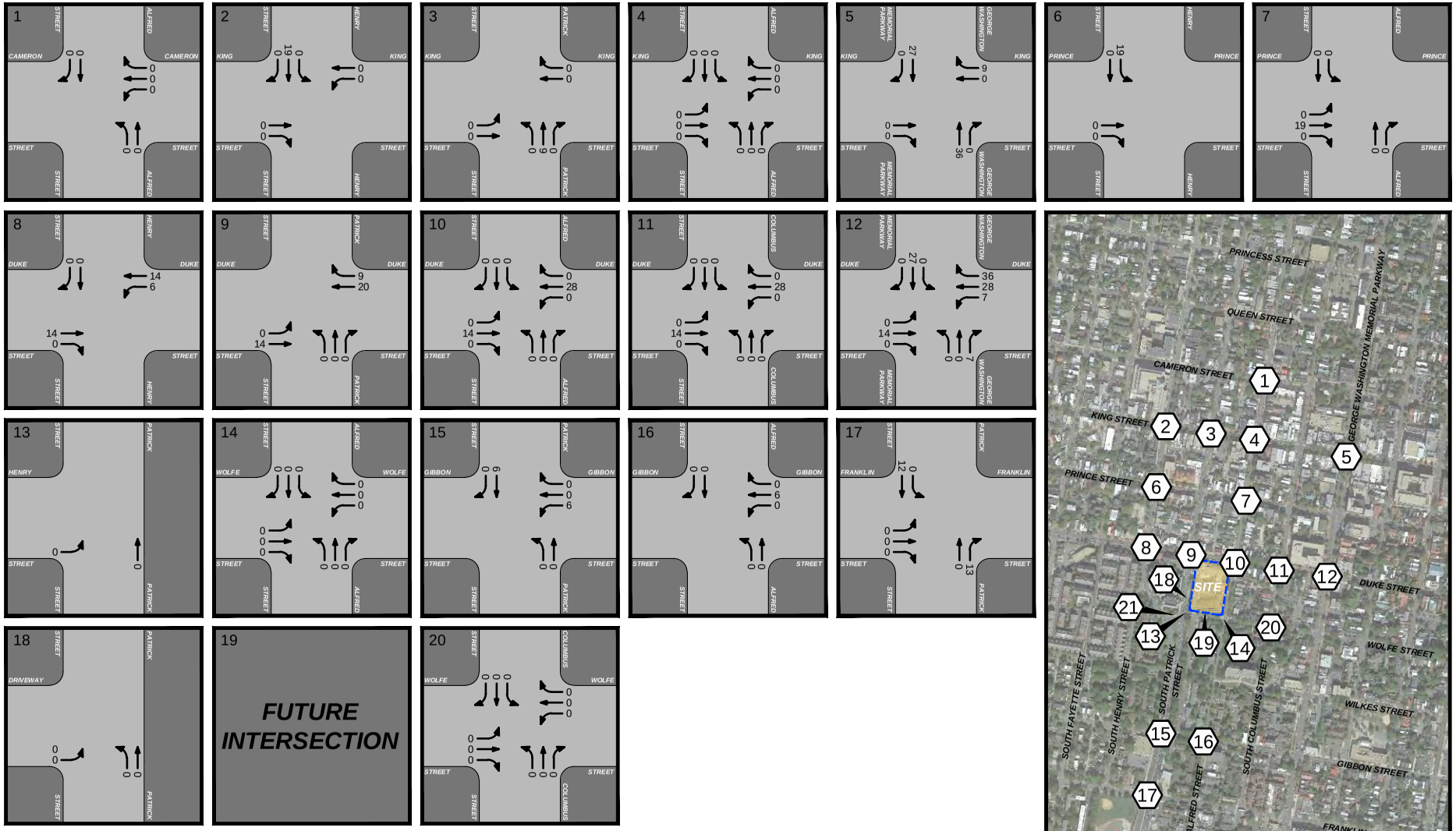

Figure 4-7
Total Pipeline Development Peak Hour Traffic Forecasts (Sunday)

Alfred Street Baptist Church
City of Alexandria, Virginia

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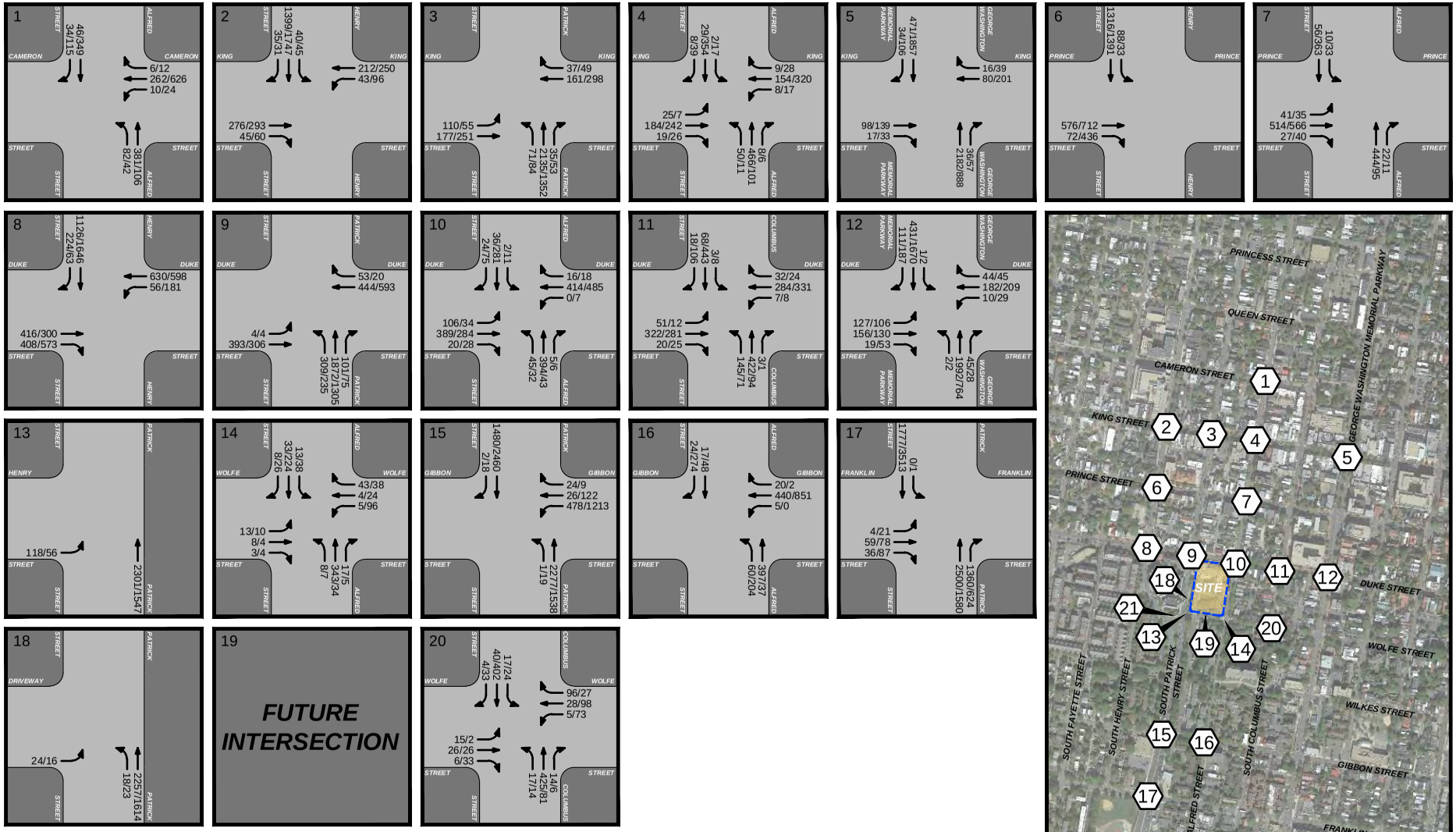

Figure 4-8

Future Peak Hour Traffic Forecasts

Without Development (2022) - Weekday

Alfred Street Baptist Church

City of Alexandria, Virginia

JCP

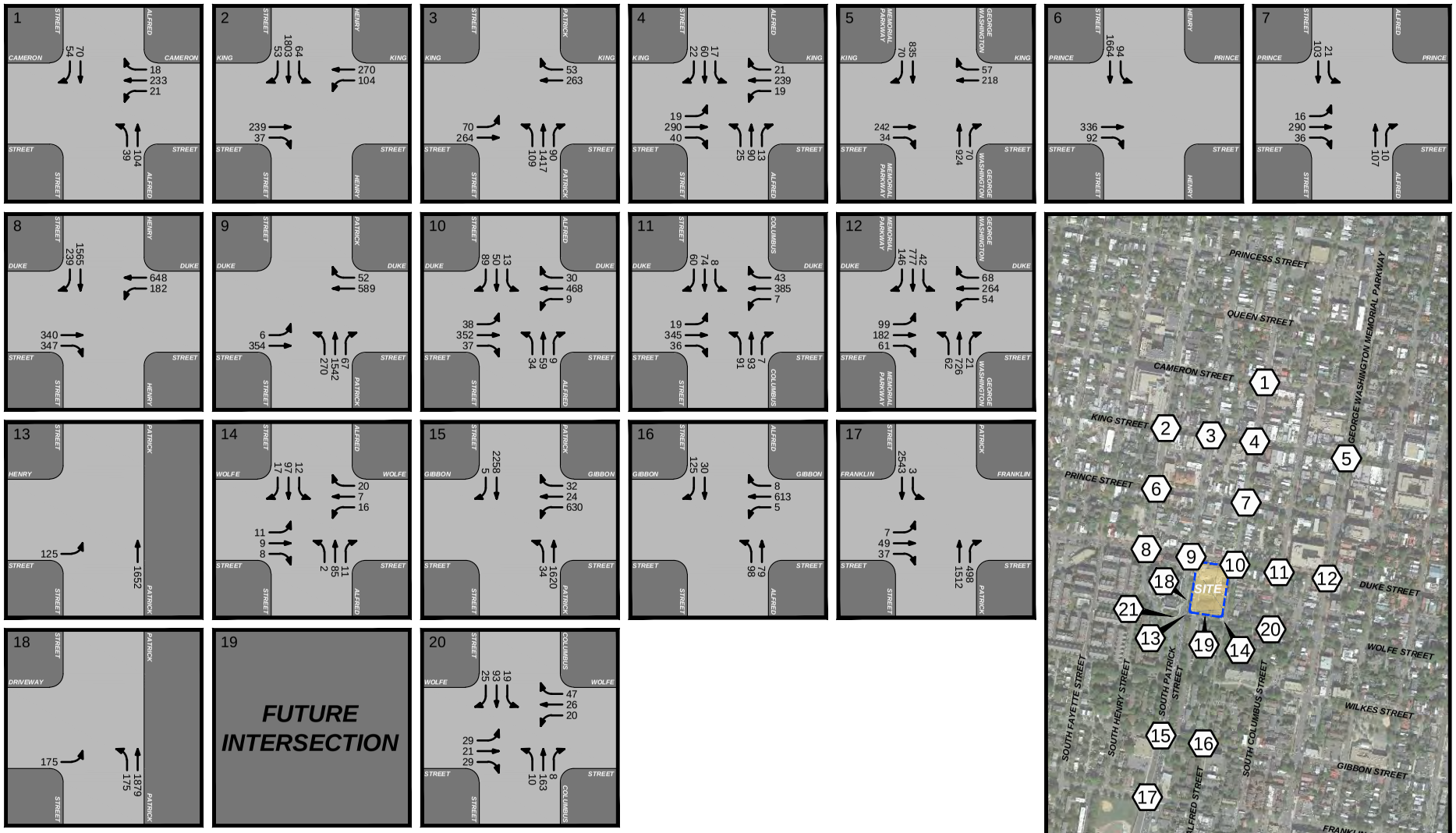

Figure 4-9
Future Peak Hour Traffic Forecasts
Without Development (2022) - Sunday

Alfred Street Baptist Church
City of Alexandria, Virginia

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SECTION 5
TRIP GENERATION, DISTRIBUTION AND ASSIGNMENT

Trip Generation

The number of AM, PM, and Sunday peak hour trips that would be generated by the proposed development were estimated based on the Institute of Transportation Engineers (ITE) Trip Generation Manual, 9th Edition trip rates and equations. The ITE methodology was utilized as the most accurate way to calculate additional site trips for the expanded facility based on the complicated pick-up/drop-off during peak Sunday periods that exists under existing conditions. The ITE Trip Generation Manual is a commonly used standard for trip generation regardless of the proposed development's location. Information, such as survey data, was used during the scoping process for this project that was specific to the study site, and was utilitzed to determine the effected the distribution percentages and trip reductions.

As shown in Table 5-1, the proposed development (232,368 GSF Church with 2,163 seats) is expected to generate 65 weekday AM peak hour trips, 44 weekday PM peak hour trips, 1,188 Sunday peak hour trips, 1,057 weekday daily (24-hour) trips, and 3,602 total Sunday (24-hour) trips upon completion and full occupancy by 2022. These estimates account for a 10 percent non-auto mode split reduction as agreed during the scoping process. The non-auto reduction was based on the subject site's distance to King Street Metro station, survey data provided by the church, shuttle service that is available to the church, and the primarily residential area surrounding the church facilities.

A seat count of 1,208 was used for the existing trip generation based on an observed attendance of a typical Sunday peak hour service. The 1,208 seats are distributed between the main sanctuary, chapel, and meeting or classroom areas with telecast access. Under existing conditions, the additional meeting areas and classroom spaces are utilized by parishioners attending services during the Sunday peak hours.

Under proposed conditions, it is not anticipated that the additional rooms outfitted with modern technology typical in newly constructed facilities be used during peak Sunday services or that these areas would generate additional traffic or parking demand outside the normal peak service traffic. Additional rooms include meeting rooms, gathering areas, fellowship hall, offices, storage, and a café/bookstore. The main goal of the proposed project is to accommodate the church community within the main sanctuary for all services.

Currently, there are three (3) Sunday services at 7:15 AM, 10:00 AM, and 12:00 PM. While there are other events at the church throughout the day on Sundays, there are typically no classes or events scheduled at the same time as one of the three (3) worship services. It is a goal of the proposed development to reduce the number of services from three (3) to two (2) during a typical Sunday, and space the services so that the ingress and egress traffic do

not overlap. It is noted that the trip generation analysis completed within this report accounts for peak hour services both entering and exiting the site within the same peak hour. As planned, the services would be spaced to not overlap inbound and outbound traffic and would only require inbound or outbound traffic be added to the background conditions to quantify impact. This would greatly reduce the impact on the surrounding roadway network and likely improve existing conditions. Therefore, the analysis containing both inbound and outbound traffic provided herein should be considered conservative.

Site Trip Generation Reductions

The synergy that would occur between the proposed development and adjacent mix of uses in Old Town was included in the 10% non-auto reduction. Additionally, the non-auto reduction accounted for the shuttle service provided to the metro and local residences and bus routes adjacent to the church. The shuttle service records, on average, approximately 370 trips per month, and runs on a continuous loop. It is noted that the majority of trips are requested during the peak service on Sunday. A covered bicycle parking area is proposed within the new parking structure. Therefore, the results of this study should be considered conservative.

Site Trip Distribution

The distribution of peak hour trips generated by the proposed development was based on information provided by church staff including parishioner residence data, a review of existing traffic patterns in the study area, local knowledge, previously prepared traffic studies in the vicinity, and input from City staff. The following distributions, as agreed upon during the scoping process, were used in this study:

Direction (To/From)	Residential
North via S. Washington Street	30%
North via U.S. Route 1 (S. Patrick Street)	5%
West via Duke Street	10%
East via Duke Street	5%
South via S. Washington Street	10%
South via U.S. Route 1 (S. Henry Street)	40%
Total	100%

Patrons will be able to take advantage of the grid street system in Old Town North in order to access the site from the north and south. Depending on the time of day, patrons will need to take slightly different routes to available parking in due to turning movement restrictions along S. Washington Street and S. Patrick Street.

Site Access

The subject site is bounded by Duke Street to the north, Wolfe Street to the south, S. Patrick Street to the west and S. Alfred Street to the east. Direct access to the below grade parking

garage is proposed on S. Patrick Street and at Wolfe Street as shown on Figure 2-2. Access to the loading area is proposed on Wolfe Street, to the south of the proposed site. A truck would enter Wolfe Street, a dead-end street, and back into the designated service entrance. Trucks would exit the property onto S. Alfred Street by turning right and heading southbound, then turn right onto Gibbon Street and use U.S. Route 1 to head either north or south.

Rerouted Traffic Volumes

Traffic volumes were rerouted to the proposed garage entrance and exit from the garage across S. Patrick Street in order reflect proper traffic flow once the development has been completed. All weekday vehicle trips will utilize the proposed garage underneath the site during weekday peak hours. Rerouted weekday AM and PM peak hour traffic volumes are shown on Figure 5-1. Sunday site trips that currently utilize the existing spaces that are to be removed with the proposed development were rerouted to other available parking facilities for the Sunday midday peak hour and are shown on Figure 5-2. Sunday traffic will continue to utilize the existing Alexandria Gateway garage in the future conditions.

Site Trip Assignments

The peak hour vehicle-trips shown in Table 5-1 were assigned to the public road network according to the directional distribution described above. All new trips were directed to the proposed on-site garage, as the number of net-new trips would fill the proposed garage to capacity. The existing trips would remain on the network and utilize the several available off-site parking locations as under current conditions. These net-new site generated traffic assignments for the proposed development are shown on Figures 5-3 and 5-4. Figures 5-5 to 5-7 show the traffic routes to and from the church during the AM and PM weekday peak hours and Sunday peak hours, respectively.

Table 5-1
Alfred Street Baptist Church
Site Trip Generation Analysis[1]

Land Use	ITE Land Use Code	Size	Units	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total	Weekday ADT [2]	Sunday Peak Hour In	Sunday Peak Hour Out	Sunday Peak Hour Total	Sunday ADT
Existing [2]														
Church	560	43,784	SF	14	11	25	10	10	20	399				
		1,208	seats								369	369	737	2,235
Townhomes	230	22	DU	3	12	15	11	6	17	172	27	28	55	106
Existing Subtotal				17	23	40	21	16	37	571	396	397	792	2,341
Proposed Development														
Church	560	232,368	SF	72	58	130	40	44	84	2,117				
		2,163	seats [3]								660	660	1,320	4,002
10% Non-auto Reduction				*(7)*	*(6)*	*(13)*	*(4)*	*(4)*	*(8)*	*(212)*	*(66)*	*(66)*	*(132)*	*(400)*
Total Proposed Site Trips				65	52	117	36	40	76	1,905	594	594	1,188	3,602
NET NEW TRIPS (Proposed vs. Existing)				**48**	**29**	**77**	**15**	**24**	**39**	**1,334**	**199**	**198**	**396**	**1,261**

Notes: (1) Traffic estimates based on Institute of Transportation Engineers (ITE) Trip Generation, Ninth Edition.
(2) Existing seat count was quantified using attendence recorded during a typical Sunday service.
(3) Proposed seat number includes both seats in the main sanctuary and overflow seating in the chapel.

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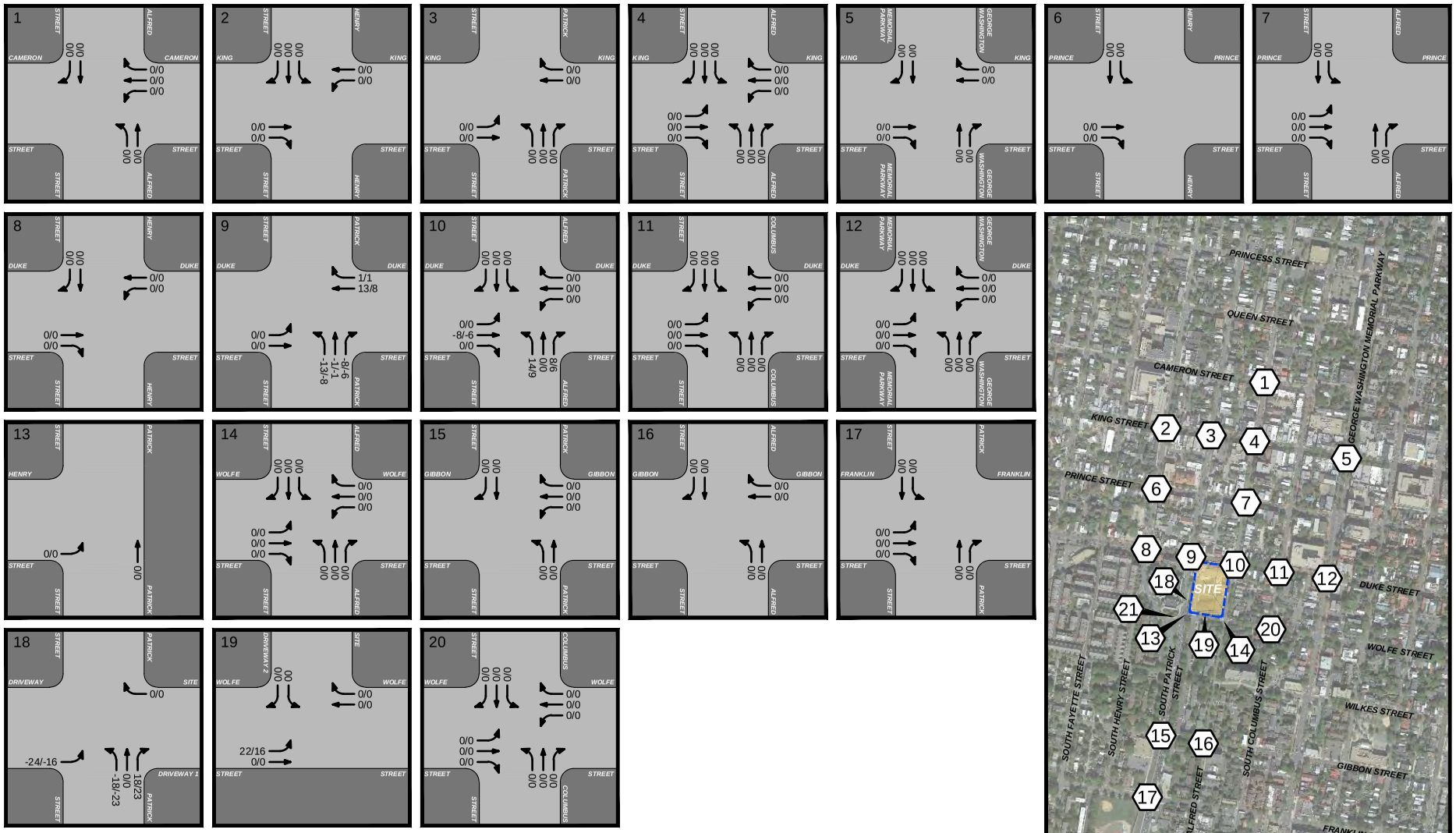

Figure 5-1
Existing Rerouted Weekday Traffic (Weekday)

Alfred Street Baptist Church
City of Alexandria, Virginia

JCP

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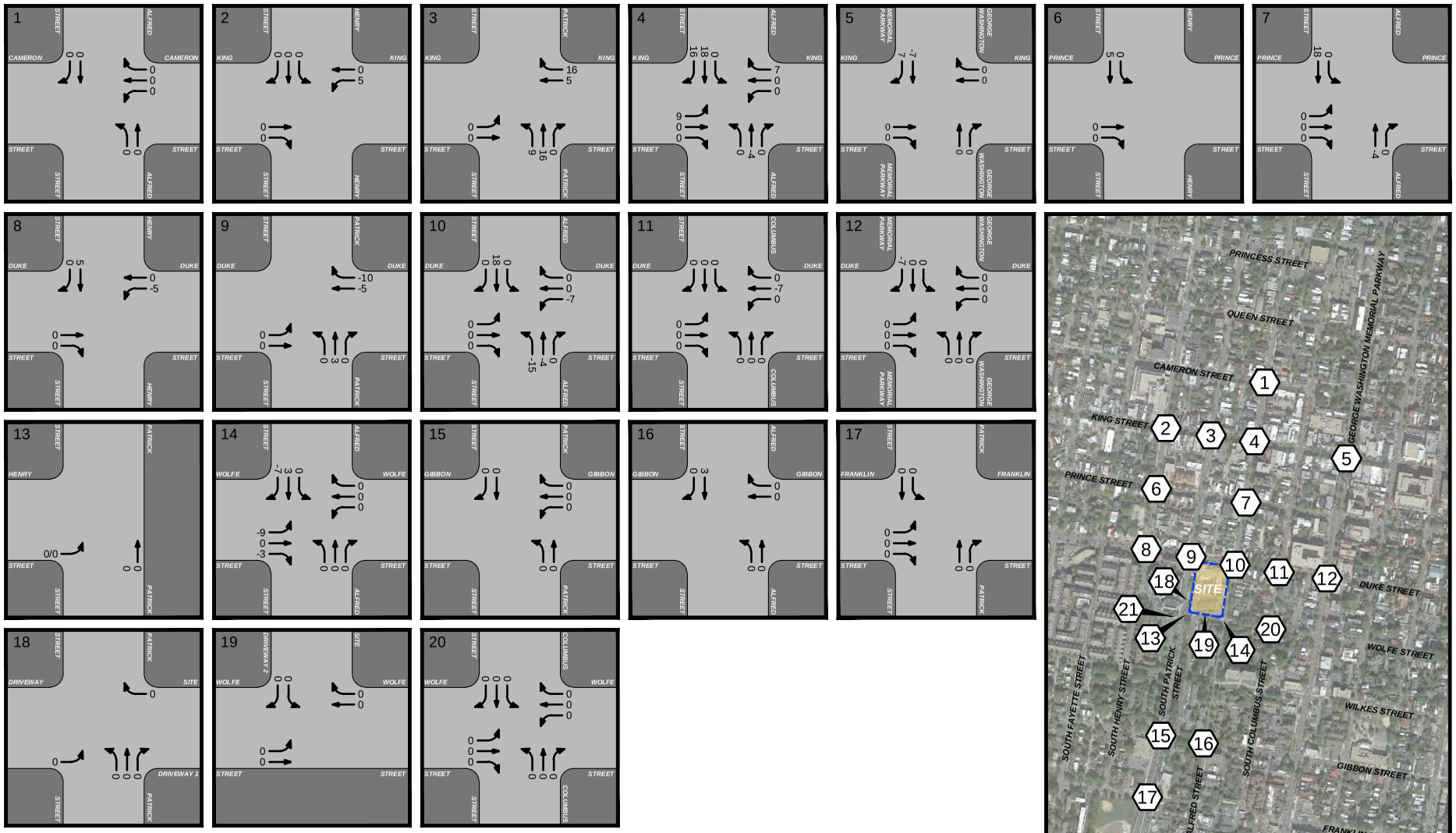

Figure 5-2
Existing Rerouted Weekday Traffic (Sunday)

Alfred Street Baptist Church
City of Alexandria, Virginia

AM PEAK HOUR
PM PEAK HOUR
000 / 000

NORTH

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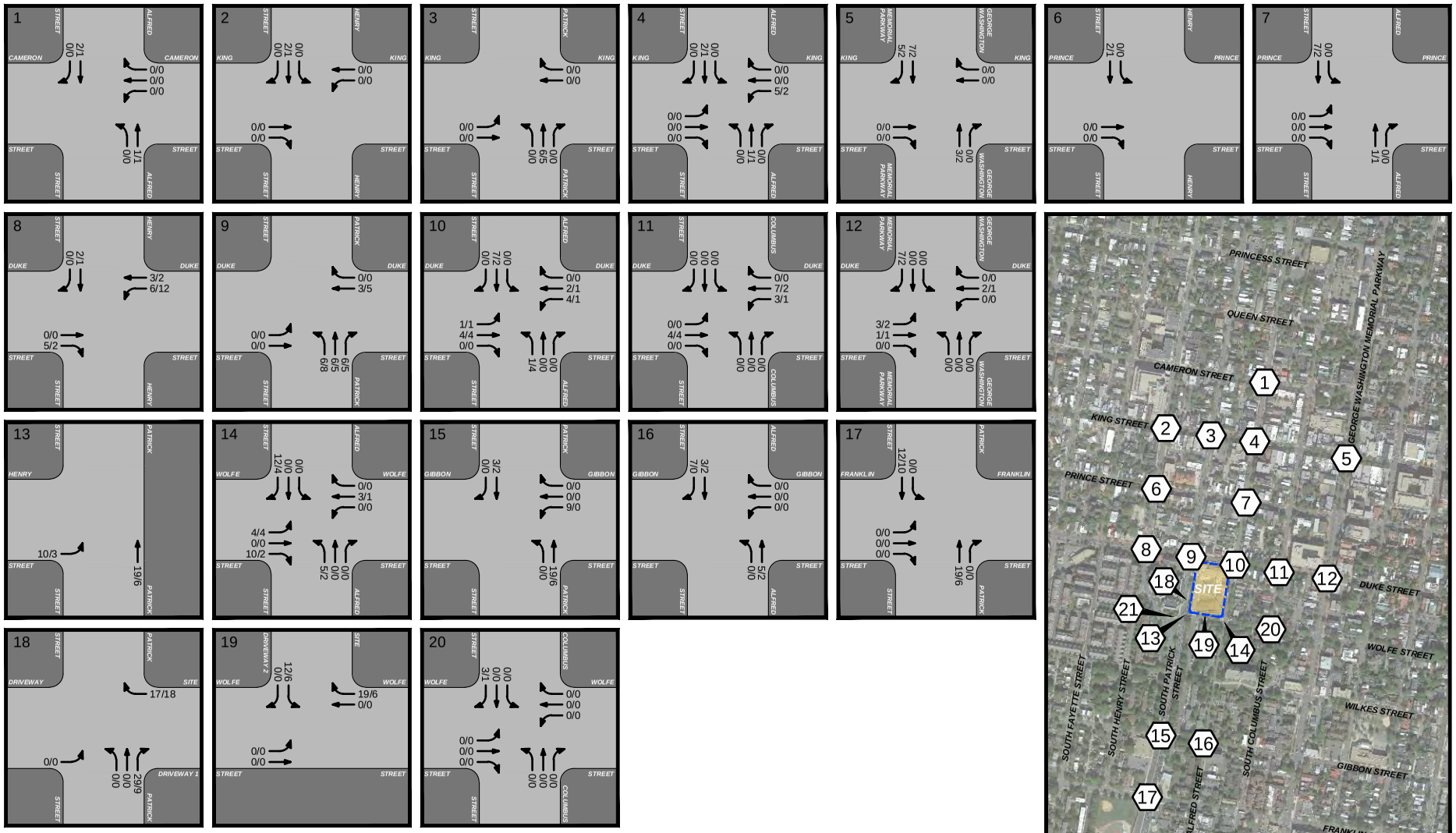

Figure 5-3

Site Generated Peak Hour Traffic Forecasts (Weekday)

Alfred Street Baptist Church

City of Alexandria, Virginia

JCP

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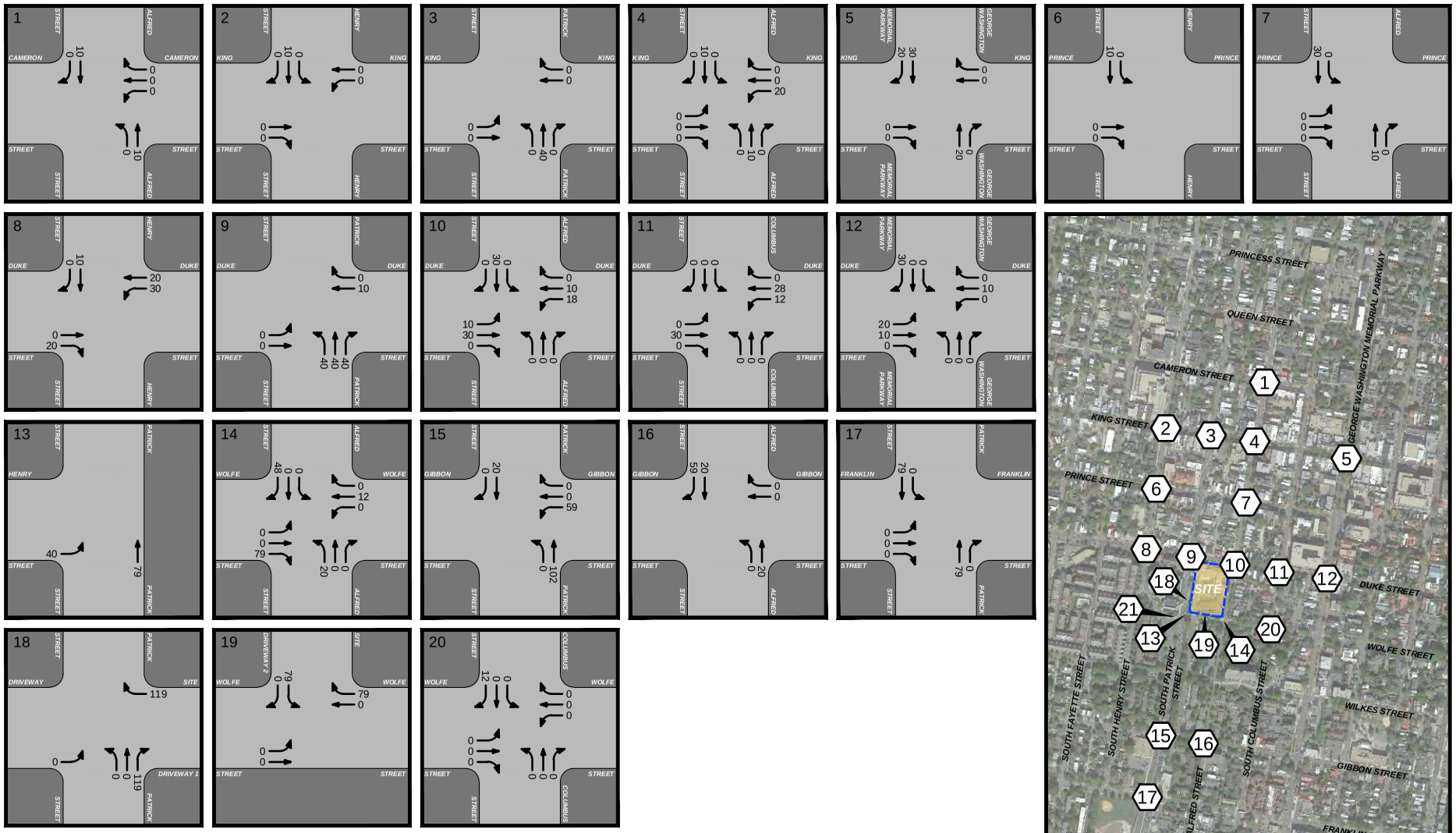

Figure 5-4

Site Generated Peak Hour Traffic Forecasts (Sunday)

Alfred Street Baptist Church

City of Alexandria, Virginia

JCP

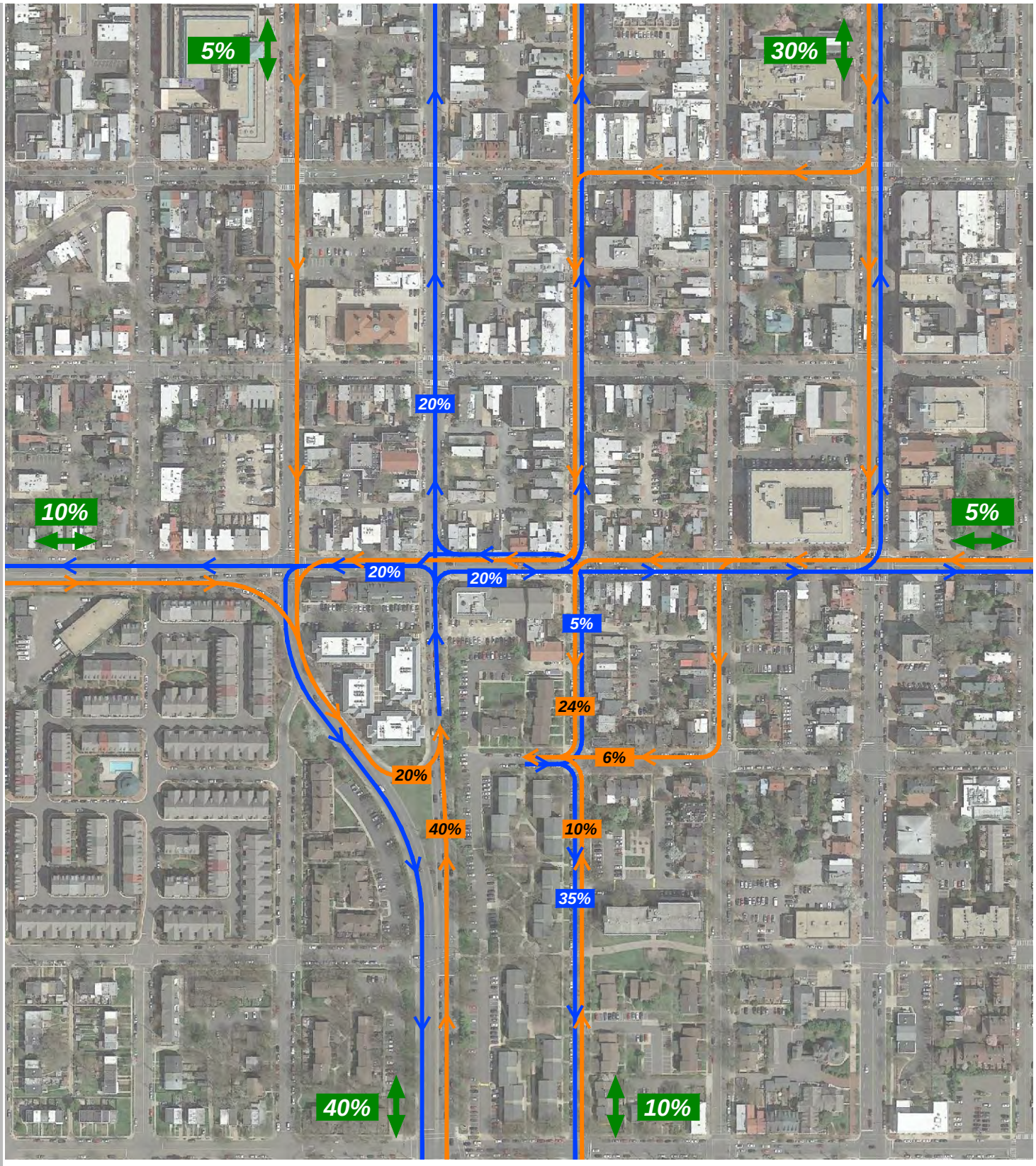

Figure 5-5
AM Peak Hour Site Trip Routes

Alfred Street Baptist Church
City of Alexandria

JCP

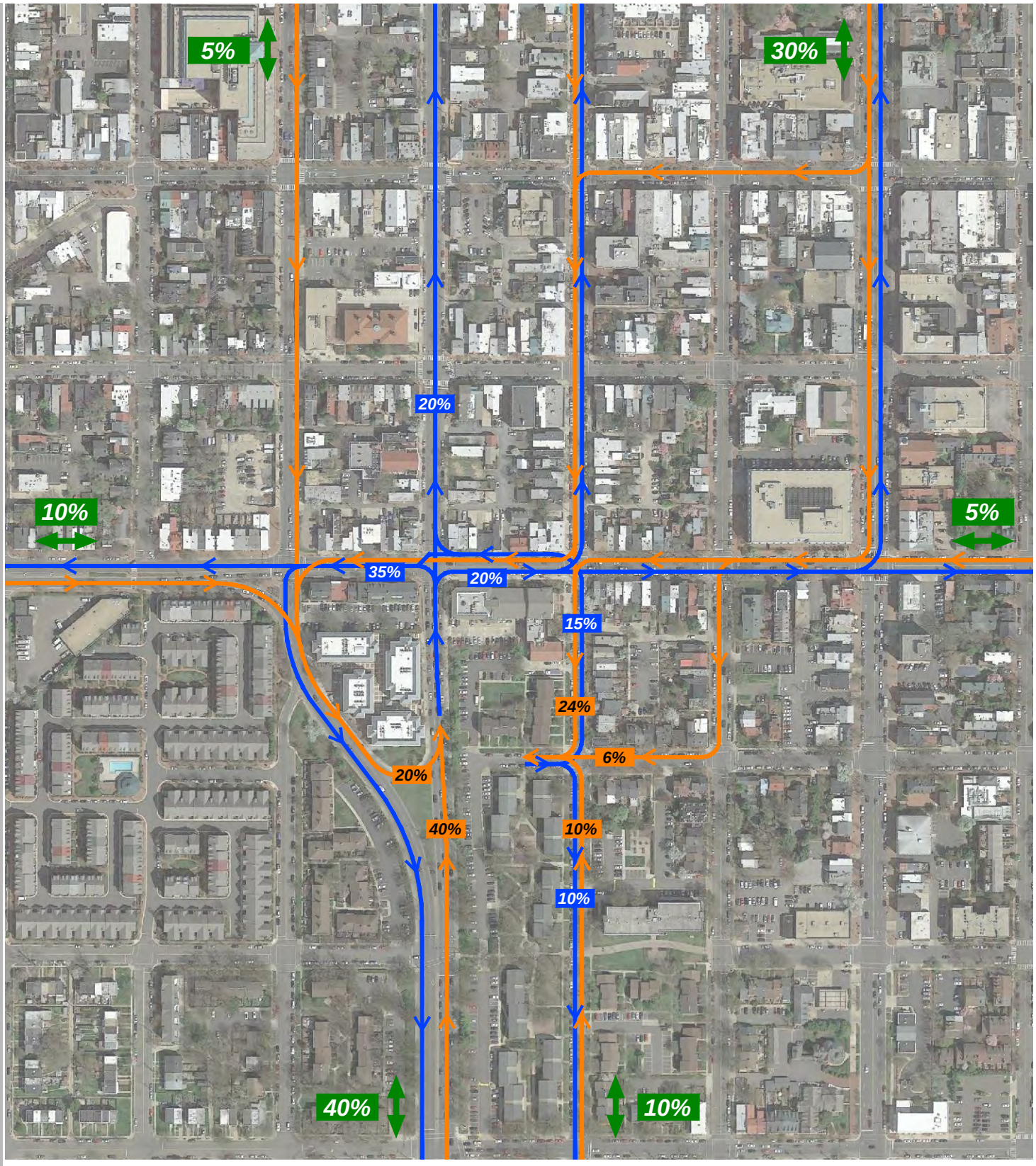

Figure 5-6
PM Peak Hour Site Trip Routes

Alfred Street Baptist Church
City of Alexandria

INBOUND TRAFFIC
OUTBOUND TRAFFIC

NORTH

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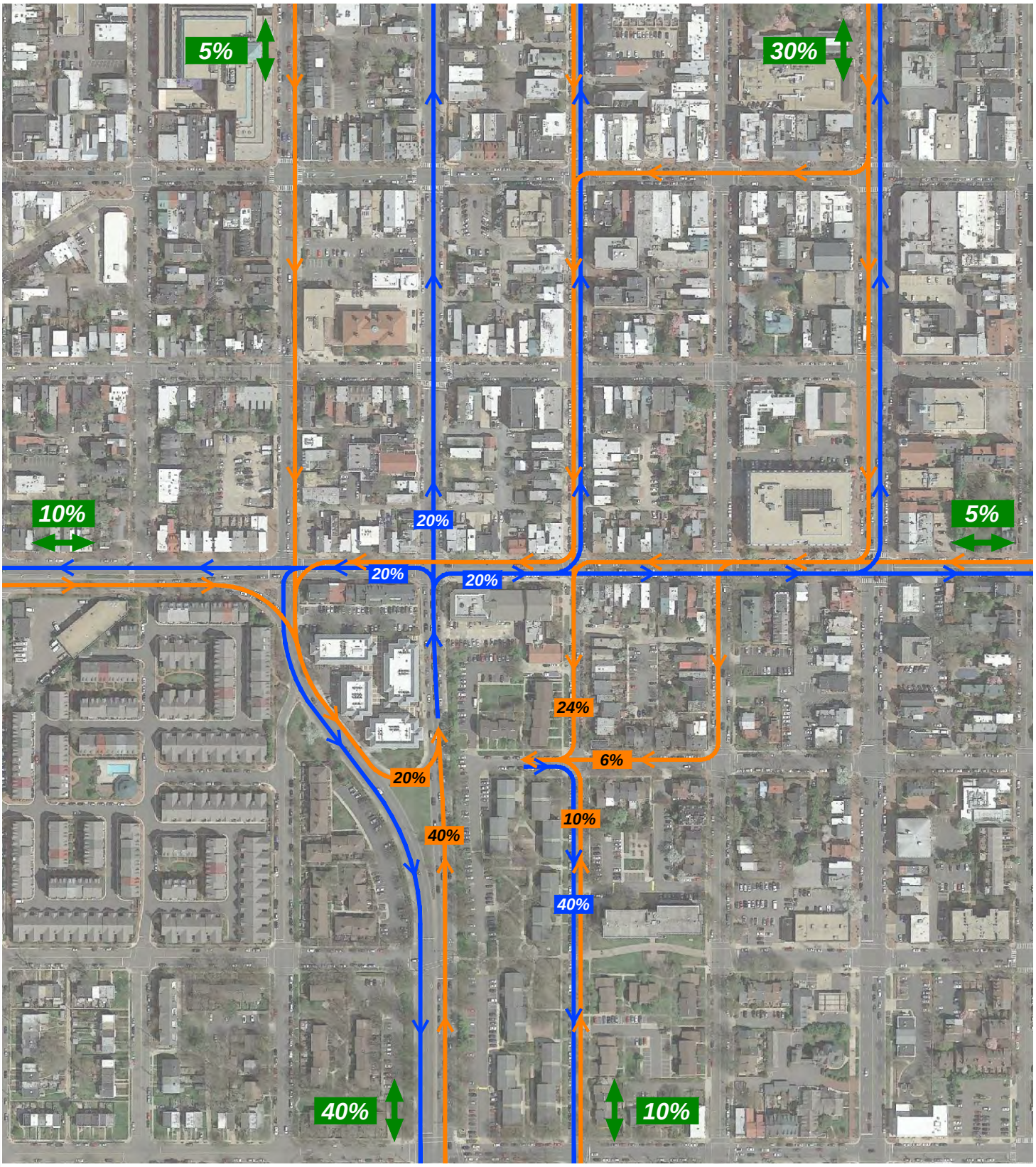

Figure 5-7
Sunday Site Trip Routes

Alfred Street Baptist Church
City of Alexandria

JCP
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SECTION 6
ANALYSIS OF FUTURE CONDITIONS WITH DEVELOPMENT

Traffic Volumes

Future traffic forecasts with the proposed development were developed based on a composite of existing peak hour traffic volumes, regional growth and the proposed developments primary trips. Future lane-use including proposed site driveways is shown on Figure 6-1. The future peak hour traffic forecast for year 2022 (project build-out) are shown on Figure 6-2 and 6-3, and for year 2028 (build-out plus six years) are shown on Figure 6-4 and 6-5.

Capacity Analysis

Future peak hour levels of service and 50th and 95th percentile queues with the proposed development are summarized in Tables 6-1 and 6-2, respectively. The results were identified for the key study intersections based on the future traffic forecasts shown on Figures 6-1 and 6-2, and the Highway Capacity Manual 2010 methodology using Synchro 9.1. It is noted that a peak hour factor of 0.5 was used for the site driveways to model the spike in traffic before and after services.

Levels of Service. The 2022 LOS results with the proposed development are summarized in Table 6-1 and indicate the following:

- All signalized study intersections would continue to operate at overall acceptable LOS "D" or better during the AM, PM, and Sunday peak hours except for the following intersections:

    - S. Patrick Street/King Street which operates at LOS "E" during the weekday AM peak hour

  Some turning movements along Route 1 (S. Patrick Street and S. Henry Street) would continue to operate at LOS "E" or "F" during the AM, PM, and/or Sunday peak hours, consistent with future conditions without development.

- When compared to future conditions without development, the overall delay per vehicle at each of the signalized study intersections would increase by less than three (3) seconds during the AM or PM peak hours, and four (4) seconds during the Sunday peak hour. Thus, the proposed development would have only a minor impact on overall traffic operations in the area.

- All of the approaches at the stop controlled study intersections would continue to operate at acceptable levels of service (LOS "D" or better) during the AM, PM, and

Sunday peak hours with the proposed development with the exception of the site driveway during the Sunday peak hour.

The LOS results for build-out plus six (6) years (2028) are also summarized in Table 6-1. As shown in Table 6-1, with an additional six (6) years of regional growth both signalized and stop controlled study intersections would operate at levels of service consistent with build-out conditions (2022).

Given the magnitude of regional traffic along U.S. Route 1 and Washington Street and the modest impact of development-related traffic, no vehicular geometric improvements are recommended at the study intersections.

Capacity analysis worksheets for 2022 and 2028 conditions with development are included in Appendix F.

Queues. The future peak hour queue results with the proposed development for the turning movements are presented in Appendix F and summarized in Table 6-2. As shown in Table 6-2, the estimated 50th and 95th percentile queues at study intersections would operate generally consistent with future conditions without development along throughout the study area and along U.S. Route 1 (S. Patrick Street and S. Henry Street). Consistent with existing and future conditions without development the 95th percentile queues of eastbound right turns at S. Henry Street/Duke Street could exceed the available storage.

Site Driveway Modeling Alternative

The site driveway on S. Patrick Street is shown to operates at LOS "F" for the Sunday peak hour conditions when modeled as stop controlled. However, this intersection would be controlled by a police officer during the peak periods on Sundays. In order to properly analyze the police controlled conditions the site driveway on Route 1 was analyzed as a three-phase traffic signal, with each approach operating during its own phase. The model also includes a lowered peak hour factor to demonstrate the observed spike in traffic at the beginning and end of main church services. These results are summarized in Table 6-1 and 6-2 and show that the intersection operates at LOS "D" or better for all movements when under police control.

Network Alternatives

Left-Turn Restriction from Wolfe Street to Alfred Street. During the Sunday midday peak hour, vehicles exiting the garage onto Wolfe Street would be required to turn right onto S. Alfred Street and head south towards Gibbon Street. S. Alfred Street at the intersection of Duke Street becomes congested at the beginning and end of major weekend services. Restricting outbound traffic to making a right on S. Alfred Street would reduce potential conflicts at the pick-up/drop-off area to the north near the main entrance to the church. Outbound traffic that wishes to head north can utilize the exit onto S. Patrick Street. The site access points connect at the top of the ramp up from the below-grade garage, allowing

any driver in the garage to select which exit to use after reaching the top of the ramp. Weekday AM and PM peak hour traffic would be allowed to head to the north and south on S. Alfred Street from Wolfe Street, but would likely still utilize the S. Patrick Street exit to travel north. Vehicles would be prohibited from making a southbound right from S. Alfred Street onto Gibbon Street during the PM peak hour. For this reason, southbound traffic would likely head north on S. Alfred Street to exit.

The restriction of left-turns onto S. Alfred Street from Wolfe Street alleviates congestion at the main entrance and reduces potential safety concerns of pedestrian and vehicle conflicts at the intersection of S. Alfred Street and Duke Street. The restriction can be implement by signage or a police officer directing traffic.

Layby Lanes.

A pickup/dropoff survey was conducted on Sunday April 3, 2016 to determine the frequency of drivers dropping off and picking up passengers on Alfred Street in front of the church. Motorists, including shuttle bus drivers, travelling southbound on Alfred Street pull along the curb and, with the help of security personnel, drop-off or pick-up passengers. Observations indicated that a curb side coned area of approximately 50 feet is kept clear of parked vehicles to allow for the pick-up/drop-off area. Prior to the peak 10:00 AM service, approximately 70 parishioners from 45 vehicles were dropped off in front of the church. Approximately 23 parishioners were picked up after the 10:00AM service. On average it took less than 30 seconds for each individual pick-up or drop-off to occur. It was noted that many of these parishioners were elderly. For this purpose, a 91-foot layby lane has been proposed on S. Alfred Street. An additional layby lane on the south side of Duke Street between S. Patrick Street and S. Alfred Street would help facilitate traffic on the local grid of streets. A summary of the field observations are included in Appendix B.

Forecasting Alternatives

Based on comments received from the City of Alexandria, several forecasting alternatives were analyzed to determine the impact of hypothetical future situations. The following scenarios were analyzed for future conditions in addition to what is proposed:

- *Wolfe Street connection to Route 1 (Parking distributed to several lots as proposed)* - Wolfe Street now terminates at S. Patrick Street but would be extended to connect to S. Patrick Street. A connection would also be built to connect across the existing median to southbound S. Henry Street. A traffic signal would be installed at both the Wolfe Street/S. Patrick Street and Wolfe Street/S. Henry Street intersections. Parking would be available at the same on and off site parking lots that exist today as well as the proposed parking garage under the proposed building.

- *Wolfe Street connection to Route 1 (All parking contained on the site)* – As described in the scenario above, Wolfe Street would be extended to connect to S. Patrick Street. A connection would also be built to connect across the existing median to southbound S.

Henry Street. A traffic signal would be installed at both the Wolfe Street/S. Patrick Street and Wolfe Street/S. Henry Street intersections. All parking in this scenario is assumed to be provided in a parking lot under the proposed site.

- *Wolfe Street not connected to Route 1 (All parking contained on the site)* – Under this scenario, Wolfe Street now terminates at S. Patrick Street but would not connect to Route 1. All parking would be provided in a parking lot under the proposed site.

The three hypothetical scenarios described above were evaluated to assess the potential impacts of each alternative. Total future traffic forecasts for each of the three alternatives described above are shown on Figures 6-6 to 6-8. The levels of service and queueing results are summarized in Tables 6-3 and 6-4, respectively. Capacity analysis worksheets for the future conditions forecasting alternatives with development are included in Appendix G.

It is noted that the operations at the site driveways would be monitored by stationed police officers and church staff during the Sunday peak hour to reduce long delays. These alternatives are provided based on a request received from City staff for comparison purposes only, and are not proposed or recommended with the development.

The analysis shows negligible differences in network levels of service and queues except for the study intersections immediately along the site frontage. The two (2) scenarios with Wolfe Street extending to Patrick Street show that queues for the u-turn movement from S. Henry Street would exceed past the available storage area and would block southbound Route 1 traffic. Due to insufficient spacing between S. Henry Street and S. Patrick Street to accommodate potential queueing, the extension of Wolfe Street to Route 1 is not recommended.

Providing all parking on site also shows negligible differences in network levels of service and queues except for the study intersections immediately along the site frontage. However, delay and queueing would increase when compared to the conditions with the proposed distributed parking supply.

Table 6-1
Alfred Street Baptist Church
Total Future with Development Intersection Level of Service Summary [1]

Intersection	Intersection Control	Approach/ Movement	Existing Conditions						2022 Future Conditions without Development						2022 Future Conditions with Development						2028 Future Condisitons with Development					
			AM Peak Hour		PM Peak Hour		Sunday Peak Hour		AM Peak Hour		PM Peak Hour		Sunday Peak Hour		AM Peak Hour		PM Peak Hour		Sunday Peak Hour		AM Peak Hour		PM Peak Hour		Sunday Peak Hour	
			LOS	Delay (sec.)	LOS	Delay (sec.)	LOS	Delay (sec.)	LOS	Delay (sec.)	LOS	Delay (sec.)	LOS	Delay (sec.)	LOS	Delay (sec.)	LOS	Delay (sec.)	LOS	Delay (sec.)	LOS	Delay (sec.)	LOS	Delay (sec.)	LOS	Delay (sec.)
1. Alfred Street/Cameron Street	Signalized	WBLT	B	14.6	C	20.1	B	15.5	B	14.6	C	20.4	B	15.6	B	14.6	C	20.4	B	15.6	B	14.6	C	20.7	B	15.6
		WBTR	B	14.5	B	19.3	B	15.5	B	14.4	B	19.5	B	15.5	B	14.4	B	19.5	B	15.5	B	14.4	B	19.8	B	15.5
		NBLT	A	5.4	A	5.6	A	1.0	A	5.7	A	5.7	A	1.0	A	5.8	A	5.7	A	1.0	A	6.1	A	6.5	A	1.0
		SBTR	B	12.7	B	19.4	B	12.0	B	12.7	B	19.6	B	12.0	B	12.7	B	19.7	B	12.1	B	12.8	C	20.2	B	12.1
		Overall	**A**	**9.3**	**B**	**17.8**	**B**	**10.8**	**A**	**9.4**	**B**	**18.2**	**B**	**10.9**	**A**	**9.4**	**B**	**18.2**	**B**	**10.7**	**A**	**9.6**	**B**	**18.6**	**B**	**10.8**
2. Henry Street/King Street	Signalized	EBTR	C	23.4	D	44.9	C	32.2	C	22.8	D	46.5	C	32.2	C	22.8	D	46.5	C	32.2	C	23.2	D	50.6	C	32.8
		WBL	B	12.9	C	20.7	C	20.7	B	12.7	C	20.8	C	20.9	B	12.7	C	20.8	C	21.1	B	12.9	C	21.3	C	21.4
		WBT	B	19.6	C	26.5	C	26.5	B	19.8	C	26.2	C	26.7	B	19.8	C	26.2	C	26.7	B	20.0	C	26.3	C	26.9
		SBL	D	46.2	D	41.5	C	25.3	D	51.8	D	37.0	C	27.7	D	52.0	D	37.1	C	28.0	F	57.2	D	41.1	C	30.0
		SBT	D	38.2	C	33.5	C	22.4	D	41.4	C	31.0	C	23.9	D	41.6	C	31.0	C	24.1	D	44.6	C	33.3	C	25.2
		SBR	D	37.3	C	31.2	C	22.1	D	40.5	C	28.8	C	23.6	D	40.6	C	28.8	C	23.8	D	43.6	C	31.0	C	24.9
		Overall	**D**	**35.1**	**D**	**35.4**	**C**	**24.6**	**D**	**38.2**	**C**	**33.4**	**C**	**25.9**	**D**	**38.3**	**C**	**33.4**	**C**	**26.1**	**D**	**41.1**	**D**	**36.2**	**C**	**27.3**
3. Patrick Street/King Street	Signalized	EBL	C	21.5	B	16.4	B	16.5	C	21.4	B	16.3	B	16.4	C	21.4	B	16.3	B	16.8	C	21.6	B	16.6	B	17.0
		EBT	C	26.4	C	23.8	C	24.1	C	26.5	C	23.5	C	24.3	C	26.5	C	23.5	C	24.3	C	26.7	C	23.7	C	24.5
		WBTR	B	19.1	C	26.4	B	17.7	B	18.7	C	26.2	B	16.9	B	18.7	C	26.2	B	18.8	B	18.9	C	27.0	B	19.4
		NBL	F	71.2	D	44.0	D	39.0	F	80.5	D	47.0	D	40.5	F	81.2	D	47.3	D	42.7	F	89.5	D	50.0	D	44.8
		NBT	E	56.6	D	39.8	D	35.9	F	63.0	D	41.7	D	36.9	F	63.4	D	41.9	D	38.4	F	68.9	D	43.5	D	39.7
		NBR	D	54.1	D	39.3	D	36.2	F	60.6	D	41.2	D	37.3	F	61.0	D	41.3	D	38.8	F	66.8	D	42.9	D	40.3
		Overall	**D**	**54.1**	**D**	**35.9**	**C**	**32.2**	**E**	**60.5**	**D**	**37.7**	**C**	**33.0**	**E**	**61.0**	**D**	**37.8**	**C**	**34.6**	**E**	**66.6**	**D**	**39.4**	**D**	**35.9**
4. Alfred Street/King Street	Signalized	EBLTR	B	13.5	B	15.6	B	16.9	B	13.4	B	15.8	B	16.7	B	13.4	B	15.8	B	16.9	B	13.5	B	16.0	B	17.2
		WBLTR	A	1.2	A	4.0	B	15.1	A	1.1	A	4.2	B	15.2	A	1.2	A	4.2	B	15.8	A	1.2	A	4.4	B	15.9
		NBLTR	D	38.9	A	3.5	A	3.5	D	40.4	A	3.4	A	3.4	D	40.5	A	3.4	A	3.5	D	42.0	A	3.5	A	3.5
		SBLTR	B	14.4	A	6.4	B	14.0	B	14.4	A	6.6	B	14.0	B	14.5	A	6.7	A	3.6	B	14.5	A	7.0	A	3.6
		Overall	**C**	**24.6**	**A**	**7.5**	**B**	**13.9**	**C**	**26.0**	**A**	**7.7**	**B**	**13.9**	**C**	**25.9**	**A**	**7.7**	**B**	**12.6**	**C**	**26.7**	**A**	**7.9**	**B**	**12.8**
5. Washington Street/King Street	Signalized	EBT	C	34.4	C	31.6	C	26.7	C	34.2	C	31.6	C	26.6	C	34.2	C	31.6	C	26.6	C	34.3	C	31.7	C	26.8
		EBR	C	31.6	C	29.0	C	22.7	C	31.6	C	29.0	C	22.6	C	31.6	C	29.0	C	22.6	C	31.6	C	29.1	C	22.7
		WBT	C	33.4	C	34.5	C	25.8	C	33.5	C	34.0	C	26.0	C	33.5	C	34.0	C	26.0	C	33.6	C	34.3	C	26.2
		WBR	C	31.2	C	29.3	C	23.0	C	31.5	C	29.3	C	23.3	C	31.5	C	29.3	C	23.3	C	31.5	C	29.4	C	23.3
		NBT	D	45.3	C	33.4	A	2.4	D	48.1	C	34.6	A	2.8	D	48.1	C	34.6	A	3.0	D	50.3	D	35.2	A	3.2
		NBR	D	47.9	C	33.3	A	2.5	D	51.3	C	34.5	A	2.9	D	51.4	C	34.6	A	3.0	D	54.0	D	35.2	A	3.2
		SBT	A	9.4	C	21.6	C	24.3	A	9.4	C	23.4	C	25.3	A	9.5	C	23.5	C	24.3	A	9.6	C	24.9	C	24.7
		SBR	A	9.4	C	24.2	C	23.8	A	9.4	C	26.6	C	24.8	A	9.5	C	26.8	C	24.4	A	9.6	C	28.7	C	24.9
		Overall	**D**	**38.9**	**C**	**26.9**	**B**	**15.8**	**D**	**41.4**	**C**	**28.4**	**B**	**16.2**	**D**	**41.4**	**C**	**28.5**	**B**	**16.1**	**D**	**43.2**	**C**	**29.6**	**B**	**16.4**
6. Henry Street/Prince Street	Signalized	EBT	B	15.1	D	48.4	B	17.0	B	15.4	F	53.9	B	17.1	B	15.4	F	53.9	B	17.1	B	15.6	F	59.1	B	17.2
		EBR	B	15.2	D	52.6	B	17.4	B	15.5	F	59.0	B	17.4	B	15.5	F	59.0	B	17.4	B	15.7	F	65.4	B	17.6
		SBL	D	39.0	C	33.9	C	34.3	D	40.9	D	35.6	D	36.1	D	41.0	D	35.6	D	36.4	D	42.5	D	36.7	D	37.7
		SBT	D	37.9	C	33.5	C	33.1	D	39.7	D	35.2	C	34.7	D	39.8	D	35.2	C	35.0	D	41.5	D	36.4	D	36.1
		Overall	**C**	**31.0**	**D**	**41.2**	**C**	**30.3**	**C**	**32.3**	**D**	**44.7**	**C**	**31.7**	**C**	**32.4**	**D**	**44.7**	**C**	**31.9**	**C**	**33.6**	**D**	**47.9**	**C**	**32.9**
7. Alfred Street/Prince Street	Signalized	EBLT	C	24.7	C	27.3	C	22.1	C	25.1	C	27.4	C	22.4	C	25.1	C	27.4	C	22.4	C	25.3	C	27.8	C	22.5
		EBR	C	24.0	C	26.5	C	21.9	C	24.3	C	26.6	C	22.2	C	24.3	C	26.6	C	22.2	C	24.6	C	26.9	C	22.3
		NBTR	D	37.4	A	2.8	A	2.7	D	35.9	A	2.7	A	2.7	D	36.0	A	2.7	A	2.7	D	36.9	A	2.8	A	2.7
		SBLT	B	16.1	A	5.5	A	2.7	B	15.6	A	5.2	A	2.6	B	15.6	A	5.2	A	2.8	B	15.9	A	5.4	A	2.9
		Overall	**C**	**29.5**	**B**	**16.9**	**B**	**13.4**	**C**	**28.9**	**B**	**17.2**	**B**	**14.2**	**C**	**28.8**	**B**	**17.2**	**B**	**13.3**	**C**	**29.3**	**B**	**17.4**	**B**	**13.4**
8. Henry Street/Duke Street	Signalized	EBT	A	4.7	A	6.7	D	39.3	A	4.7	A	6.7	D	43.4	A	4.7	A	6.7	A	6.4	A	4.8	A	6.8	D	45.2
		EBR	A	3.5	A	6.8	C	28.3	A	3.5	A	6.7	C	28.6	A	3.5	A	6.7	A	5.2	A	3.5	A	6.8	C	29.4
		WBL	A	1.1	A	1.5	C	21.9	A	1.1	A	1.5	C	23.4	A	1.2	A	1.6	A	1.4	A	1.2	A	1.6	C	27.4
		WBT	A	0.2	A	0.2	A	5.6	A	0.2	A	0.2	A	5.7	A	0.2	A	0.2	A	0.2	A	0.2	A	0.2	A	5.8
		Overall	**A**	**2.4**	**A**	**3.9**	**C**	**28.1**	**A**	**2.4**	**A**	**3.8**	**C**	**29.5**	**A**	**2.4**	**A**	**3.8**	**A**	**2.8**	**A**	**2.4**	**A**	**3.8**	**C**	**30.7**
9. Patrick Street/Duke Street	Signalized	EBL	D	43.4	B	12.9	A	4.4	E	60.6	B	12.9	A	4.6	E	60.6	B	12.9	B	17.5	F	65.9	B	13.0	A	4.7
		WBR	D	54.0	A	7.2	B	11.6	F	70.3	A	6.8	B	15.4	F	77.7	A	7.5	B	15.7	F	84.3	A	8.3	B	17.8
		NBL	C	32.6	D	49.9	C	29.5	D	37.9	F	55.9	C	32.0	D	37.5	F	56.2	D	38.9	F	42.8	F	61.9	D	42.9
		NBT	C	25.3	D	39.4	C	25.4	C	27.9	D	42.9	C	26.8	C	27.7	D	43.1	C	30.4	C	30.4	D	46.7	C	32.4
		NBR	C	24.0	D	38.7	C	25.0	C	26.7	D	42.2	C	26.4	C	26.5	D	42.3	C	30.4	C	29.5	D	46.0	C	32.5
		Overall	**C**	**33.5**	**C**	**30.3**	**C**	**20.8**	**D**	**41.1**	**C**	**33.4**	**C**	**22.6**	**D**	**42.2**	**C**	**33.5**	**C**	**27.7**	**D**	**46.6**	**D**	**36.6**	**C**	**28.5**
10. Alfred Street/Duke Street	Signalized	EBLTR	B	15.1	B	11.8	B	11.9	B	16.1	B	11.7	B	12.3	B	16.1	B	11.7	B	12.9	B	16.7	B	11.9	B	13.1
		WBLTR	A	1.7	A	1.9	A	1.7	A	1.8	A	2.3	A	1.7	A	1.6	A	2.3	A	1.9	0	0.0	A	2.4	A	2.0
		NBLTR	C	31.9	B	19.0	B	18.9	C	32.9	B	19.0	B	18.7	D	36.3	C	20.0	B	18.4	D	37.9	C	20.2	B	18.4
		SBLTR	B	18.2	C	27.4	C	20.8	B	18.2	C	28.2	C	20.6	B	18.3	C	28.4	C	21.7	B	18.3	C	29.1	C	21.8
		Overall	**B**	**16.4**	**B**	**12.9**	**A**	**9.3**	**B**	**17.1**	**B**	**13.1**	**A**	**9.4**	**B**	**18.3**	**B**	**13.3**	**B**	**10.1**	**B**	**19.0**	**B**	**13.6**	**B**	**10.3**
11. Columbus Street/Duke Street	Signalized	EBLTR	B	16.9	A	6.6	A	1.2	B	17.8	A	6.9	A	1.3	B	17.9	A	7.0	A	1.4	B	18.4	A	7.1	A	1.5
		WBLTR	B	19.6	C	21.0	B	12.3	C	20.0	C	21.1	B	12.4	C	20.3	C	21.2	B	13.0	C	20.6	C	21.6	B	13.2
		NBLTR	C	23.4	B	15.2	C	21.1	C	24.7	B	15.1	C	20.8	C	24.7	B	15.1	C	20.8	C	26.0	B	15.8	C	21.0
		SBLTR	B	11.6	C	21.6	C	27.1	B	11.5	C	22.6	C	26.9	B	11.5	C	22.6	C	26.9	B	11.6	C	23.5	C	27.1
		Overall	**B**	**19.9**	**B**	**17.4**	**B**	**12.1**	**C**	**20.8**	**B**	**17.8**	**B**	**11.7**	**C**	**20.9**	**B**	**17.8**	**B**	**11.8**	**C**	**21.6**	**B**	**18.4**	**B**	**12.0**
12. Washington Street/Duke Street	Signalized	EBLTR	D	49.6	D	35.5	C	28.7	E	55.3	D	38.9	C	31.2	E	57.0	D	39.3	D	35.0	E	60.8	D	40.6	D	36.7
		WBLTR	C	34.4	C	30.3	C	26.5	D	36.9	C	32.3	C	28.7	D	37.0	C	32.3	C	29.1	D	37.2	C	32.6	C	29.6
		NBL	C	25.1	B	17.6	C	26.4	C	24.8	B	17.3	C	25.7	C	24.8	B	17.3	C	25.8	C	26.5	B	17.6	C	26.5
		NBT	C	29.3	B	18.1	-	-	C	28.9	B	17.8	-	-	C	28.9	B	17.8	-	-	C	31.1	B	18.1	-	-
		NBR	C	27.4	B	11.6	C	27.6	C	27.1	B	11.6	C	27.0	C	27.1	B	11.6	C	27.1	C	29.2	B	11.6	C	27.8
		SBL	C	25.6	D	48.0	B	10.3	C	26.3	D	49.9	B	11.1	C	26.4	D	49.9	B	12.2	C	26.7	D	51.6	B	17.2
		SBTR	C	26.0	D	50.6	A	4.3	C	26.7	D	53.0	A	4.8	C	26.8	D	53.1	A	5.2	C	27.1	E	55.5	A	5.6
		Overall	**C**	**29.5**	**D**	**38.7**	**B**	**19.7**	**C**	**30.2**	**D**	**40.6**	**C**	**20.3**	**C**	**30.4**	**D**	**40.6**	**C**	**21.3**	**C**	**32.2**	**D**	**42.1**	**C**	**22.9**
13. Patrick Street/U-Turns from Henry Street	Unsignalized	EBL	B	10.9	A	9.7	B	11.4	B	10.9	A	9.8	B	11.0	B	11.1	A	9.9	B	6.8	B	11.2	A	9.9	B	12.8
*HCM 2010 analyses unavailable.		NBT	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0
14. Alfred Street/Wolfe Street	Unsignalized	EBLTR	A	8.2	A	8.2	A	7.6	A	8.3	A	8.2	A	7.6	A	8.3	A	8.2	A	7.8	A	8.4	A	8.3	A	7.8
		WBLTR	A	7.9	A	9.3	A	7.6	A	7.8	A	9.2	A	7.6	A	8.0	A	9.3	A	8.0	A	8.1	A	9.4	A	8.0
		NBLTR	B	10.5	A	8.1	A	7.8	B	10.6	A	8.1	A	7.8	B	11.1	A	8.2	A	8.3	B	11.3	A	8.2	A	8.4
		SBLTR	A	7.9	B	10.3	A	8.0	A	7.9	B	10.2	A	7.9	A	7.9	B	10.3	A	8.5	A	8.0	B	10.5	A	8.5
15. Patrick Street/Gibbon Street	Signalized	WBL	F	82.0	F	126.0	C	27.5	F	81.3	F	139.6	C	27.7	F	83.3	F	139.6	C	29.7	F	85.5	F	151.0	C	30.3
*HCM 2010 analysis is unavailable for the existing intersection geometry at this intersection.		WBLTR	D	49.7	C	25.6	C	20.4	D	49.0	C	27.1	C	20.0	D	49.3	C	27.1	C	20.3	D	49.2	C	28.7	C	20.3
		NBLT	B	10.2	B	18.6	B	11.8	B	11.8	C	20.6	B	13.7	B	12.4	C	20.8	B	16.6	B	14.7	C	22.9	B	18.6
		SBTR	A	5.6	C	30.3	B	10.0	A	4.9	D	41.8	B	11.5	A	5.0	D	42.0	B	12.2	A	5.3	D	51.7	B	14.6
		Overall	**B**	**15.3**	**D**	**36.9**	**B**	**12.7**	**B**	**15.8**	**D**	**44.6**	**B**	**14.1**	**B**	**16.4**	**D**	**44.8**	**B**	**15.8**	**B**	**17.8**	**D**	**51.4**	**B**	**17.7**
16. Alfred Street/Gibbon Street	Signalized	WBLT	B	15.5	B	11.9	A	9.0	B	15.7	B	12.4	A	9.1	B	15.7	B	12.4	A	9.1	B	15.8	B	12.8	A	9.3
		WBTR	B	15.2	B	11.8	A	8.7	B	15.3	B	12.2	A	8.7	B	15.3	B	12.2	A	8.7	B	15.5	B	12.6	A	8.9
		NBLT	C	21.4	C	33.6	B	11.7	C	21.2	D	35.4	B	11.4	C	21.4	D	36.1	B	12.7	C	22.0	D	41.0	B	12.9
		SBTR	B	12.9	B	17.8	B	11.1	B	12.8	B	18.5	B	11.0	B	13.0	B	18.6	B	12.7	B	13.0	B	19.4	B	12.8
		Overall	**B**	**18.2**	**B**	**17.0**	**A**	**9.8**	**B**	**18.1**	**B**	**17.7**	**A**	**9.7**	**B**	**18.2**	**B**	**17.8**	**B**	**10.5**	**B**	**18.5**	**B**	**19.1**	**B**	**10.6**
17. Patrick Street/Franklin Street	Signalized	EBL	E	65.8	E	63.0	E	69.6	E	65.8	E	63.0	E	69.6	E	65.8	E	63.0	E	69.6	E	65.8	E	62.8	E	69.6
		EBT	E	69.0	E	66.7	E	72.7	E	68.9	E	66.7	E	72.5	E	68.9	E	66.7	E	72.5	E	69.0	E	66.5	E	72.6
		EBR	E	69.8	E	69.2	E	73.7	E	69.6	E	69.2	E	73.4	E	69.6	E	69.2	E	73.4	E	69.7	E	69.2	E	73.6
		NBT	A	7.4	A	4.2	A	2.0	A	7.9	A	4.2	A	2.0	A	8.1	A	4.2	A	2.0	A	9.0	A	4.3	A	2.1
		NBR	F	77.4	A	6.6	A	2.6	F	86.5	A	6.6	A	2.6	F	86.5	A	6.6	A	2.6	F	97.0	A	7.0	A	2.7
		SBT	A	0.4	F	6.0	A	0.6	A	0.4	F	14.9	A	0.6	A	0.4	F	15.7	A	0.6	A	0.4	F	25.4	A	0.6
		Overall	**C**	**22.9**	**A**	**8.0**	**A**	**2.9**	**C**	**25.3**	**B**	**13.2**	**A**	**2.8**	**C**	**25.2**	**B**	**13.7**	**A**	**2.7**	**C**	**28.1**	**B**	**19.5**	**A**	**2.7**
18. Existing Garage Driveway/Patrick Street/ *Northbound right and westbound approach are future movements only*	Unsignalized	EBL	C	20.4	C	16.1	F	65.6	C	18.0	B	14.0	E	43.2	A	0.0	A	0.0	F	*	A	0.0	A	0.0	F	*
		WBR	-	-	-	-	-	-	-	-	-	-	-	-	E	42.1	C	22.1	F	119.6	E	45.3	C	23.0	F	133.3
		NBLTR*	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A	0.0
*Police Controlled Alternative Modeling	Signalized	EBL																	D	47.2					D	47.2
		WBR																	D	40.2					D	40.2
		NBLTR*																	D	40.4					D	44.8
		Overall																	**D**	**41.2**					**D**	**44.7**
19. Proposed Site Driveway/S. Alfred Street	Unsignalized	SBLR	Proposed Site Driveway												A	9.0	A	9.0	A	9.9	A	9.0	A	9.0	B	10.0
20. S. Columbus Street/Wolfe Street	Unsignalized	EBLTR	A	9.0	A	9.6	A	8.5	A	9.0	A	9.3	A	8.3	A	9.0	A	9.3	A	8.4	A	9.0	A	9.3	A	8.4
		WBLTR	A	9.1	B	12.2	A	8.5	A	9.1	B	11.4	A	8.3	A	9.1	B	11.4	A	8.3	A	9.1	B	11.4	A	8.3
		NBLTR	B	14.4	A	10.0	A	9.3	B	14.4	A	9.6	A	9.0	B	14.4	A	9.6	A	9.1	B	14.4	A	9.6	A	9.1
		SBLTR	A	8.6	C	20.9	A	8.8	A	8.6	C	17.4	A	8.6	A	8.6	C	17.5	A	8.6	A	8.6	C	17.5	A	8.6

Notes:
(1) Capacity analysis based on Highway Capacity Manual 2010 methodology, using Synchro 9.1 unless otherwise noted.

Table 6-2
Alfred Street Baptist Church
Total Future with Development Intersection Queue Summary [1]

Intersection	Intersection Control	Approach/ Movement	Storage Length (ft)	Existing Conditions						2022 Future Conditions without Development						2022 Future Conditions with Development						2028 Future Condisitons with Development					
				AM Peak Hour		PM Peak Hour		Sunday Peak Hour		AM Peak Hour		PM Peak Hour		Sunday Peak Hour		AM Peak Hour		PM Peak Hour		Sunday Peak Hour		AM Peak Hour		PM Peak Hour		Sunday Peak Hour	
				50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th
1. Alfred Street/Cameron Street	Signalized	WBLTR	-	48	72	134	187	45	72	47	73	140	194	46	73	47	73	140	194	46	73	48	75	146	203	48	74
		NBLT	-	19	m22	25	m39	29	m46	19	m20	25	m40	29	m48	19	m20	25	m40	34	m56	20	m20	26	m41	35	m56
		SBTR	-	13	37	173	291	21	46	13	38	177	298	19	49	14	39	177	299	23	53	14	39	186	314	23	55
2. Henry Street/King Street	Signalized	EBTR	-	143	221	179	#357	131	#238	134	228	~195	#371	131	#243	134	228	~195	#371	131	#243	140	237	~215	#386	135	#254
		WBL	100	17	m18	47	m53	44	m52	17	m19	45	m49	45	m55	17	m19	45	m49	46	m52	18	m19	47	m50	48	m53
		WBT	-	89	m110	127	m159	119	m162	89	m108	122	m149	122	m170	89	m108	122	m149	122	m154	92	m110	126	m149	126	m155
		SBLTR	-	~284	#394	~532	#586	310	383	~325	#420	~501	#614	336	#464	~326	#420	~502	#615	340	#469	~345	#440	~529	#643	358	#493
3. Patrick Street/King Street	Signalized	EBL	100	55	m77	17	m18	30	m34	56	m85	16	m17	31	m36	56	m85	16	m17	31	m36	57	m82	17	m17	32	m36
		EBT	-	92	m136	140	m150	124	m173	93	m142	135	m141	127	m177	93	m142	135	m141	128	m177	96	m142	139	m141	132	m178
		WBTR	-	37	m56	42	#235	99	138	38	m58	42	m#304	91	#141	38	m58	42	m#303	102	#277	39	m59	44	m#301	105	#289
		NBLTR	-	~1310	m#827	55	#358	61	76	~1395	m#822	54	#383	71	#90	~1400	m#827	54	#384	69	#400	~1470	m#1305	52	#402	81	#423
4. Alfred Street/King Street	Signalized	EBLTR	-	23	m28	26	m36	61	m77	20	m26	28	m40	55	m71	20	m26	28	m40	56	m74	20	m27	28	m41	56	m76
		WBLTR	-	41	m58	70	m98	50	76	39	m58	63	89	51	77	40	m60	63	89	56	84	42	m62	67	#297	57	85
		NBLTR	-	305	m#467	21	34	13	21	314	#483	20	35	12	22	314	#484	20	35	12	21	324	#859	21	36	13	23
		SBLTR	-	9	21	102	197	23	41	8	22	109	206	22	43	9	22	110	207	33	60	9	23	117	#215	34	61
5. Washington Street/King Street	Signalized	EBT	-	68	111	89	143	153	221	64	114	88	147	151	225	64	114	88	147	151	225	66	117	90	150	157	234
		EBR	100	0	17	10	34	2	23	0	18	10	36	1	24	0	18	10	36	1	24	0	18	10	37	2	24
		WBT	-	50	93	141	205	128	195	51	96	134	211	133	202	51	96	134	211	133	202	53	98	139	218	139	209
		WBR	-	0	8	0	24	16	43	0	18	0	26	23	54	0	18	0	26	23	54	0	18	0	27	23	56
		NBTR	-	30	m25	98	146	138	172	~50	m26	100	142	148	190	~51	m26	100	142	142	178	~885	m27	107	156	179	204
		SBTR	-	88	108	604	#789	278	347	88	117	~746	#857	306	380	90	120	~750	#861	334	414	94	124	~793	#904	350	433
6. Henry Street/Prince Street	Signalized	EBTR	-	111	156	~351	#478	78	115	116	164	~375	#504	80	117	116	164	~375	#504	80	117	122	171	~397	#527	83	121
		SBLT	-	15	m14	35	m30	26	30	15	m14	38	m33	27	m30	15	m14	38	m33	28	m31	16	m14	39	m34	28	m31
7. Alfred Street/Prince Street	Signalized	EBLTR	-	168	m181	25	31	4	7	178	m205	32	42	6	8	178	m205	33	42	5	7	184	m211	36	47	6	9
		NBTR	-	251	m278	26	m49	32	60	239	m260	25	m50	31	m62	235	m248	26	m51	38	m71	245	m251	27	m52	39	m72
		SBLT	-	19	38	150	226	40	m63	17	38	139	233	39	m64	18	39	140	234	54	m84	20	41	148	m239	53	m83
8. Henry Street/Duke Street	Signalized	EBT	-	178	267	155	#261	159	#281	181	286	155	#289	175	#316	181	286	155	#289	175	#316	188	297	160	#301	181	#329
		EBR	125	80	114	~183	#258	79	120	78	116	~161	#265	82	124	79	118	~163	#267	88	131	82	121	~178	#278	91	135
		WBL	-	8	m8	40	m44	41	m54	9	m8	44	m48	48	m54	9	m8	46	m50	63	m67	10	m8	47	m51	67	m68
*Southbound left turn only available on Sunday		WBT	-	60	m55	81	m90	82	m105	60	m51	91	m100	91	m99	58	m48	89	m96	98	m104	60	m48	92	m97	103	m104
		SBLTR*	-	36	m#320	~440	m#496	24	31	41	m#121	~432	m#480	25	32	41	m#117	~432	m#480	25	32	~59	m#319	~459	m#482	26	m#36
9. Patrick Street/Duke Street	Signalized	EBT	-	94	184	98	m140	74	m137	102	#341	98	m140	89	m137	110	#355	98	m140	89	m137	123	#385	103	m139	99	m142
		WBTR	-	~286	m#449	140	#458	112	#483	~334	m#496	131	m#490	129	#545	~354	m#502	142	m#507	132	#555	~371	m#512	149	m#524	~140	#578
		NBLTR	-	~654	#739	330	#415	294	367	~734	#644	~354	#465	298	371	~731	#629	~356	#467	318	383	~694	#1043	~398	#509	336	#470
10. Alfred Street/Duke Street	Signalized	EBLTR	-	50	m65	36	m42	51	m49	52	m83	36	m46	52	m41	50	m53	35	m45	80	m65	51	m51	37	m46	77	m66
		WBLTR	-	79	m132	90	m128	91	157	78	m148	97	m137	88	177	79	m155	97	m137	88	179	80	m162	101	m141	91	192
		NBLTR	-	226	#419	30	60	38	73	235	#435	29	63	36	74	~282	#469	35	76	28	61	~296	#486	37	79	29	64
		SBLTR	-	0	34	88	#295	11	36	0	36	97	#310	10	38	0	41	97	#314	35	77	0	42	98	#327	38	78
11. Columbus Street/Duke Street	Signalized	EBLTR	-	51	m103	73	m83	105	111	59	m100	80	m92	104	110	57	m136	84	m97	102	107	58	m143	84	m97	102	108
		WBLTR	-	120	189	150	226	131	192	129	215	152	250	136	218	134	224	154	253	153	245	139	232	160	263	159	256
		NBLTR	-	268	#489	57	100	83	137	287	#515	54	103	78	140	287	#515	54	103	78	140	~306	#535	56	108	81	145
		SBLTR	-	30	49	180	m242	45	89	22	54	183	m#406	42	91	22	54	182	m#406	42	92	23	55	194	m#431	45	96
12. Washington Street/Duke Street	Signalized	EBLTR	-	~282	#428	187	#325	212	324	~305	#492	216	#388	242	372	~313	#500	219	#393	286	#474	~330	#520	233	#418	301	#501
		WBLTR	-	123	183	154	221	210	283	161	250	186	285	261	378	162	253	187	286	273	395	167	259	192	293	281	407
		NBTR	-	~851	#925	217	261	360	426	~841	#953	207	268	342	#485	~841	#953	207	268	345	#491	~888	#1000	216	280	372	#529
		SBLTR	-	38	50	37	m#54	94	108	44	57	~49	m#715	104	119	45	57	~50	m#717	101	136	46	60	~741	m#760	118	167
13. Patrick Street/U-Turns from Henry Street	Unsignalized	EBL	115	-	15	-	6	-	17	-	16	-	6	-	17	-	17	-	6	-	29	-	18	-	7	-	29
		NBTR	-	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0
		EBL														-	-	-	-	0	m0	-	-	-	-	0	m0
		NBTR														-	-	-	-	260	311	-	-	-	-	280	325
14. Alfred Street/Wolfe Street	Unsignalized	EBLTR	-	-	3	-	3	-	3	-	3	-	3	-	3	-	5	-	3	-	10	-	5	-	3	-	10
		WBLTR	-	-	5	-	23	-	5	-	5	-	23	-	5	-	5	-	23	-	5	-	8	-	23	-	5
		NBLTR	-	-	55	-	5	-	10	-	60	-	5	-	10	-	63	-	5	-	15	-	65	-	5	-	15
		SBLTR	-	-	8	-	45	-	15	-	5	-	45	-	13	-	8	-	48	-	20	-	8	-	48	-	23
15. Patrick Street/Gibbon Street	Signalized	WBL	-	297	#470	~467	m#643	127	209	298	#490	~494	m#672	129	234	305	#506	~494	m#671	143	301	317	#527	~519	m#691	148	313
		WBT	-	139	201	159	m#246	70	99	136	206	166	m#292	72	102	141	212	166	m#292	79	114	150	224	179	m#303	82	118
		NBLT	-	720	13	230	392	198	334	800	13	257	426	227	364	821	13	259	430	272	437	905	14	278	480	297	#531
		SBTR	-	106	112	~205	m26	202	523	89	96	~244	m39	304	541	90	97	~245	m40	399	#559	96	103	~278	m52	448	#583
16. Alfred Street/Gibbon Street	Signalized	WBLTR	-	81	118	76	125	49	81	84	123	80	133	50	83	84	123	80	133	50	83	87	126	84	#144	52	86
		NBLT	-	193	295	55	#159	33	67	190	303	55	#165	31	70	193	307	56	#166	36	79	202	321	~63	#173	37	81
		SBTR	-	5	21	46	106	5	29	5	22	50	#120	5	31	6	26	50	#122	15	51	6	26	53	#148	17	54
17. Patrick Street/Franklin Street	Signalized	EBL	-	5	16	22	47	8	22	4	15	22	47	8	23	4	15	22	47	8	23	4	15	22	47	8	23
		EBTR	-	49	68	95	122	51	68	47	71	95	125	49	70	47	71	95	125	49	70	50	73	98	128	50	72
		NBT	-	358	951	140	260	92	229	382	1029	135	267	86	234	391	1053	135	268	93	252	445	1174	145	281	98	263
		NBR	-	~1585	#1831	0	22	0	20	~1672	#1915	0	30	0	28	~1674	#1918	0	30	0	28	~1773	#2017	0	30	0	28
		SBT	-	71	270	~1494	m#1465	60	610	64	264	~1603	m#1480	83	688	64	270	~1611	m#1487	128	707	67	m282	~1709	m#1504	173	733
18. Existing Garage Driveway/Patrick Street	Unsignalized	EBL	-	-	3	-	2	-	95	-	3	-	2	-	88	-	0	-	0	-	Err	-	0	-	0	-	Err
		NBTR	-	-	0	-	0	-	0	-	1	-	1	-	10	-	5	-	3	-	45	-	5	-	3	-	45
*Northbound right movement in future conditions only.		NBLTR	-	-	1	-	1	-	10	-	0	-	0	-	0	-	0	-	0	-	10	-	0	-	0	-	10
*Police Controlled Alternative Modeling	Signalized	EBL	-																	190	156					190	156
		WBR	-																	90	63					90	63
		NBLTR	-																	~461	#676					~513	#704
19. Priopposed Site Driveway/S. Alfred Street	Unsignalized	SBLR	-	Proposed Site Driveway												-	3	-	2	-	16	-	3	-	2	-	16
20. S. Columbus Street/Wolfe Street	Unsignalized	EBLTR	-	-	5	-	10	-	10	-	5	-	8	-	10	-	5	-	8	-	10	-	5	-	8	-	10
		WBLTR	-	-	18	-	43	-	13	-	18	-	38	-	10	-	18	-	38	-	10	-	18	-	38	-	10
		NBLTR	-	-	105	-	18	-	28	-	105	-	15	-	25	-	105	-	15	-	25	-	105	-	15	-	25
		SBLTR	-	-	8	-	158	-	20	-	8	-	120	-	18	-	8	-	120	-	18	-	8	-	120	-	18

Notes:
(1) Queue length is based on the 50th and 95th percentile queues in feet as reported by Synchro, Version 9.
(2) "~" - 50th percentile volume exceeds capacity, queue may be longer than shown.
(3) "#" - 95th percentile volume exceeds capacity, queue may be longer than shown.
(4) "m" - Volume for 95th percentile queue is metered by upstream signal.

Table 6-3
Alfred Street Baptist Church
Total Future with Development Intersection Level of Service Summary [1]

Intersection	Intersection Control	Approach/ Movement	2022 Future Conditions with Development Sunday Peak Hour							
			Without Route 1 Connection				With Route 1 Connection			
			Parking On and Off Site		All Parking On Site		Parking On and Off Site		All Parking On Site	
			LOS	Delay (sec.)	LOS	Delay (sec.)	LOS	Delay (sec.)	LOS	Delay (sec.)
1. Alfred Street/Cameron Street	Signalized	WBLT	B	15.6	B	15.6	B	15.6	B	15.6
		WBTR	B	15.5	B	15.5	B	15.5	B	15.5
		NBLT	A	1.0	A	1.0	A	1.0	A	1.0
		SBTR	B	12.1	B	12.1	B	12.1	B	12.1
		Overall	**B**	**10.7**	**B**	**10.7**	**B**	**10.7**	**B**	**10.7**
2. Henry Street/King Street	Signalized	EBTR	C	32.2	C	32.2	C	32.2	C	32.2
		WBL	C	21.1	C	21.1	C	21.1	C	21.1
		WBT	C	26.7	C	26.7	C	26.7	C	26.7
		SBL	C	28.0	C	28.0	C	28.0	C	28.0
		SBT	C	24.1	C	24.1	C	24.1	C	24.1
		SBR	C	23.8	C	23.8	C	23.8	C	23.8
		Overall	**C**	**26.1**	**C**	**26.1**	**C**	**26.1**	**C**	**26.1**
3. Patrick Street/King Street	Signalized	EBL	B	16.8	B	16.8	B	16.8	B	16.8
		EBT	C	24.3	C	24.3	C	24.3	C	24.3
		WBTR	B	18.8	B	18.8	B	18.8	B	18.8
		NBL	D	42.7	D	42.7	D	42.7	D	42.7
		NBT	D	38.4	D	38.4	D	38.4	D	38.4
		NBR	D	38.8	D	38.8	D	38.8	D	38.8
		Overall	**C**	**34.6**	**C**	**34.6**	**C**	**34.6**	**C**	**34.6**
4. Alfred Street/King Street	Signalized	EBLTR	B	16.9	B	16.9	B	16.9	B	16.9
		WBLTR	B	15.8	B	15.8	B	15.8	B	15.8
		NBLTR	A	3.5	A	3.7	A	3.5	A	3.7
		SBLTR	A	3.6	A	3.9	A	3.6	A	3.9
		Overall	**B**	**12.6**	**B**	**11.8**	**B**	**12.6**	**B**	**11.8**
5. Washington Street/King Street	Signalized	EBT	C	26.6	C	26.6	C	26.6	C	26.6
		EBR	C	22.6	C	22.6	C	22.6	C	22.6
		WBT	C	26.0	C	26.0	C	26.0	C	26.0
		WBR	C	23.3	C	23.3	C	23.3	C	23.3
		NBT	A	3.0	A	3.0	A	3.0	A	3.0
		NBR	A	3.0	A	3.0	A	3.0	A	3.0
		SBT	C	24.3	C	24.3	C	24.3	C	24.3
		SBR	C	24.4	C	24.4	C	24.4	C	24.4
		Overall	**B**	**16.1**	**B**	**16.1**	**B**	**16.1**	**B**	**16.1**
6. Henry Street/Prince Street	Signalized	EBT	B	17.1	B	17.1	B	17.1	B	17.1
		EBR	B	17.4	B	17.4	B	17.4	B	17.4
		SBL	D	36.4	D	36.4	D	36.4	D	36.4
		SBT	C	35.0	C	35.0	C	35.0	C	35.0
		Overall	**C**	**31.9**	**C**	**31.9**	**C**	**31.9**	**C**	**31.9**
7. Alfred Street/Prince Street	Signalized	EBLT	C	22.4	C	22.4	C	22.4	C	22.4
		EBR	C	22.2	C	22.2	C	22.2	C	22.2
		NBTR	A	2.7	A	2.9	A	2.7	A	2.9
		SBLT	A	2.8	A	3.1	A	2.8	A	3.1
		Overall	**B**	**13.3**	**B**	**12.0**	**B**	**13.3**	**B**	**12.0**
8. Henry Street/Duke Street	Signalized	EBT	A	6.4	D	43.4	D	43.4	D	43.4
		EBR	A	5.2	C	29.1	C	29.1	C	29.1
		WBL	A	1.4	C	26.2	C	26.2	C	26.2
		WBT	A	0.2	A	5.7	A	5.7	A	5.7
		Overall	**A**	**2.8**	**C**	**29.1**	**C**	**29.1**	**C**	**29.1**
9. Patrick Street/Duke Street	Signalized	EBL	B	17.5	A	4.6	A	4.6	A	4.6
		WBR	B	15.7	B	15.7	B	15.7	B	15.7
		NBL	D	38.9	D	38.9	D	51.2	D	51.2
		NBT	C	30.4	C	30.4	D	42.5	D	42.5
		NBR	C	30.4	C	30.4	D	42.5	D	42.5
		Overall	**C**	**27.7**	**C**	**26.2**	**C**	**34.3**	**C**	**34.3**
10. Alfred Street/Duke Street	Signalized	EBLTR	B	12.9	B	12.9	B	12.9	B	12.9
		WBLTR	A	1.9	A	1.9	A	1.9	A	1.9
		NBLTR	B	18.4	B	19.2	B	18.4	B	19.2
		SBLTR	C	21.7	C	23.0	C	21.7	C	23.0
		Overall	**B**	**10.1**	**B**	**11.1**	**B**	**10.1**	**B**	**11.1**
11. Columbus Street/Duke Street	Signalized	EBLTR	A	1.4	A	1.4	A	1.4	A	1.4
		WBLTR	B	13.0	B	13.0	B	13.0	B	13.0
		NBLTR	C	20.8	C	20.8	C	20.8	C	20.8
		SBLTR	C	26.9	C	26.9	C	26.9	C	26.9
		Overall	**B**	**11.8**	**B**	**11.8**	**B**	**11.8**	**B**	**11.8**
12. Washington Street/Duke Street	Signalized	EBLTR	D	35.0	D	35.0	D	35.0	D	35.0
		WBLTR	C	29.1	C	29.1	C	29.1	C	29.1
		NBL	C	25.8	C	25.8	C	25.8	C	25.8
		NBT	-	-	-	-	-	-	-	-
		NBR	C	27.1	C	27.1	C	27.1	C	27.1
		SBL	B	12.2	B	12.2	B	12.2	B	12.2
		SBTR	A	5.2	A	5.2	A	5.2	A	5.2
		Overall	**C**	**21.3**	**C**	**21.3**	**C**	**21.3**	**C**	**21.3**
13. Patrick Street/U-Turns from Henry Street	Unsignalized	EBL	A	0.0	A	0.0	-	-	-	-
	Signalized	EBL	-	-	-	-	D	44.5	D	44.5
		WBTR	-	-	-	-	D	35.2	D	37.1
		NBT	-	-	-	-	A	9.1	B	14.6
14. Alfred Street/Wolfe Street	Unsignalized	EBLTR	A	7.8	A	9.7	A	7.5	A	8.4
		WBLTR	A	8.0	A	9.0	A	7.9	A	8.6
		NBLTR	A	8.3	A	9.9	A	8.1	A	9.0
		SBLTR	A	8.5	A	9.9	A	8.2	A	8.9
15. Patrick Street/Gibbon Street *HCM 2010 analysis is unavailable for the existing intersection geometry at this intersection. Results are shown in HCM 2000.	Signalized	WBL	C	29.7	C	33.1	C	27.7	C	25.7
		WBLTR	C	24.7	C	20.6	C	20.1	C	20.2
		NBLT	B	16.6	B	19.2	B	15.4	B	13.4
		SBTR	B	12.2	B	13.2	B	10.4	A	8.3
		Overall	**B**	**15.8**	**B**	**17.7**	**B**	**14.1**	**B**	**12.1**
16. Alfred Street/Gibbon Street	Signalized	WBLT	A	9.1	A	9.1	A	9.1	A	9.1
		WBTR	A	8.7	A	8.7	A	8.7	A	8.7
		NBLT	B	12.7	B	15.8	B	11.7	B	10.9
		SBTR	B	12.7	B	16.4	B	11.3	A	10.0
		Overall	**B**	**10.5**	**B**	**12.3**	**A**	**9.9**	**A**	**9.5**
17. Patrick Street/Franklin Street	Signalized	EBL	E	69.6	E	69.6	E	69.6	E	69.6
		EBT	E	72.5	E	72.5	E	72.5	E	72.5
		EBR	E	73.4	E	73.4	E	73.4	E	73.4
		NBT	A	2.0	A	2.0	A	2.0	A	2.0
		NBR	A	2.6	A	2.6	A	2.6	A	2.6
		SBT	A	0.6	A	0.6	A	0.6	A	0.7
		Overall	**A**	**2.7**	**A**	**2.7**	**A**	**2.8**	**A**	**2.8**
18. Existing Garage Driveway/Patrick Street	Unsignalized	EBL	F	*	A	0.0	F	*	A	0.0
		WBR	F	119.6	F	1015.4	F	119.6	F	1015.4
		NBLTR	A	0.0	A	0.0	A	0.0	A	0.0
19. Proposed Site Driveway/S. Alfred Street	Unsignalized	SBLR	A	9.9	B	14.5	A	9.4	C	15.8
20. S. Columbus Street/Wolfe Street	Unsignalized	EBLTR	A	8.4	A	8.7	A	8.4	A	8.7
		WBLTR	A	8.3	A	8.6	A	8.3	A	8.6
		NBLTR	A	9.1	A	9.5	A	9.1	A	9.5
		SBLTR	A	8.6	A	8.9	A	8.6	A	8.9
21. S. Henry Street/Wolfe Street	Unsignalized	SBL	-	-	-	-	B	12.8	B	12.8
		SBT	-	-	-	-	B	12.5	B	12.5

Notes:
(1) Capacity analysis based on Highway Capacity Manual methodology, using Synchro 9.

Table 6-4
Alfred Street Baptist Church
Total Future with Development Intersection Queue Summary[1]

Intersection	Intersection Control	Approach/ Movement	Storage (ft)	2022 Future Conditions with Development Sunday Peak Hour							
				Without Route 1 Connection				With Route 1 Connection			
				Parking On and Off Site		All Parking On Site		Parking On and Off Site		All Parking On Site	
				50th	95th	50th	90th	50th	95th	50th	95th
1. Alfred Street/Cameron Street	Signalized	WB	-	46	73	46	73	46	73	46	73
		NBLT	-	34	m56	25	m41	34	m56	25	m41
		SBTL	-	23	53	23	53	23	53	23	53
2. Henry Street/King Street	Signalized	EBTR	-	131	#243	131	#243	131	#243	131	#243
		WBL	100	46	m52	46	m52	47	m52	47	m52
		WBT	-	122	m154	122	m154	123	m154	123	m154
		SBLTR	-	340	#469	340	#469	340	#469	340	#469
3. Patrick Street/King Street	Signalized	EBL	100	31	m36	31	m36	31	m36	31	m36
		EBT	-	128	m177	128	m177	128	m177	128	m177
		WBTR	-	102	#277	103	#278	102	#277	103	#278
		NBLTR	-	71	#400	68	#400	63	#401	63	#401
4. Alfred Street/King Street	Signalized	EBLTR	-	56	m74	56	m74	54	m74	54	m74
		WBLTR	-	56	84	56	84	56	84	56	84
		NBLTR	-	12	21	15	25	12	21	15	25
		SBLTR	-	33	60	53	90	33	60	53	90
5. Washington Street/King Street	Signalized	EBT	-	151	225	151	225	151	225	151	225
		EBR	100	1	24	1	24	1	24	1	24
		WBT	-	133	202	133	202	133	202	133	202
		WBR	-	23	54	23	54	23	54	23	54
		NBTR	-	156	178	142	178	156	194	156	194
		SBTR	-	463	592	334	414	334	414	334	414
6. Henry Street/Prince Street	Signalized	EBTR	-	80	117	80	117	80	117	80	117
		SBLTR	-	28	m31	28	m31	28	m31	28	m31
7. Alfred Street/Prince Street	Signalized	EBLTR	-	5	7	5	7	6	8	6	8
		NBTR	-	38	m71	39	70	38	m71	39	70
		SBLT	-	54	m84	59	m89	54	m84	59	m89
8. Henry Street/Duke Street	Signalized	EBT	-	175	#316	175	#316	175	#316	175	#316
		EBR	125	88	131	88	131	88	131	88	131
		WBL	-	63	m67	63	m67	64	m67	64	m67
		WBT	-	98	m104	98	m104	98	m104	98	m104
		SBTR	-	25	32	25	32	25	32	25	32
9. Patrick Street/Duke Street	Signalized	EBLT	-	89	m137	89	m137	89	m137	89	m137
		WBTR	-	132	#555	135	#555	132	#555	135	#555
		NBLTR	-	314	382	319	383	426	452	426	451
10. Alfred Street/Duke Street	Signalized	EBLTR	-	79	m65	80	m65	83	m83	83	m83
		WBLTR	-	88	179	88	179	88	179	88	179
		NBLTR	-	28	61	50	94	28	61	50	94
		SBLTR	-	35	77	75	117	36	77	75	117
11. Columbus Street/Duke Street	Signalized	EBLTR	-	102	107	103	108	102	107	103	108
		WBLTR	-	153	245	153	245	153	245	153	245
		NBLTR	-	78	140	78	140	78	140	78	140
		SBLTR	-	42	92	42	92	42	92	42	92
12. Washington Street/Duke Street	Signalized	EBLTR	-	286	#474	286	#474	286	#474	286	#474
		WBLTR	-	273	395	273	395	273	395	273	395
		NBLTR	-	377	#536	345	#491	345	#491	345	#491
		SBLTR	-	155	#735	101	136	110	147	110	147
13. Patrick Street/U-Turns from Henry Street	Unsignalized	EBL	-	-	29	-	29				
		NBT	-	-	0	-	0				
* with improvements	Signalized	EBL	100					99	#192	100	m#155
		WBT	-					29	65	132	194
		NBT	-					160	230	132	235
14. Alfred Street/Wolfe Street	Unsignalized	EBLTR	-	-	15	-	25	-	13	-	23
		WBLTR	-	-	10	-	33	-	3	-	3
		NBLTR	-	-	5	-	10	-	5	-	10
		SBLTR	-	-	20	-	33	-	20	-	28
15. Patrick Street/Gibbon Street	Signalized	WBL	-	143	301	196	#376	129	234	116	160
		WBLTR	-	79	114	95	134	73	103	67	90
		NBLT	-	272	437	295	435	257	438	227	429
		SBTR	-	399	#559	427	532	179	#580	190	#583
16. Alfred Street/Gibbon Street	Signalized	WBLTR	-	50	83	50	83	73	103	20	67
		NBLT	-	36	79	39	#110	257	438	15	227
		SBTR	-	15	51	35	88	179	#580	14	190
17. Patrick Street/Franklin Street	Signalized	EBL	-	8	23	8	23	8	23	8	23
		EBTR	-	49	70	49	70	49	70	49	70
		NBT	-	93	252	93	252	93	252	93	252
		NBR	-	0	28	0	28	0	28	0	28
		SBT	-	128	707	166	701	108	710	68	712
18. Existing Garage Driveway/Patrick Street	Unsignalized	EBL	-	-	154	-	0	-	496	-	0
		WBR	-	-	18	-	734	-	30	-	375
		NBLTR	-	-	10	-	0	-	20	-	0
19. Proposed Site Driveway/S. Alfred Street	Unsignalized	EBLT	-	-	0	-	0	-	0	-	0
		WBTR	-	-	0	-	0	-	0	-	0
		SBLR	-	-	16	-	82	-	15	-	117
20. S. Columbus Street/Wolfe Street	Unsignalized	EBLTR	-	-	25	-	28	-	25	-	28
		WBLTR	-	-	10	-	13	-	10	-	13
		NBLTR	-	-	10	-	13	-	10	-	13
		SBLTR	-	-	18	-	20	-	18	-	20
21. S. Henry Street/Wolfe Street	Unsignalized	WBL	-					36	77	159	187
		SBT	-					96	103	308	478

Notes:

(1) Queue length is based on the 50th and 95th percentile queues in feet as reported by Synchro, Version 9.
(2) "~" - 50th percentile volume exceeds capacity, queue may be longer than shown.
(4) "m" - Volume for 95th percentile queue is metered by upstream signal.

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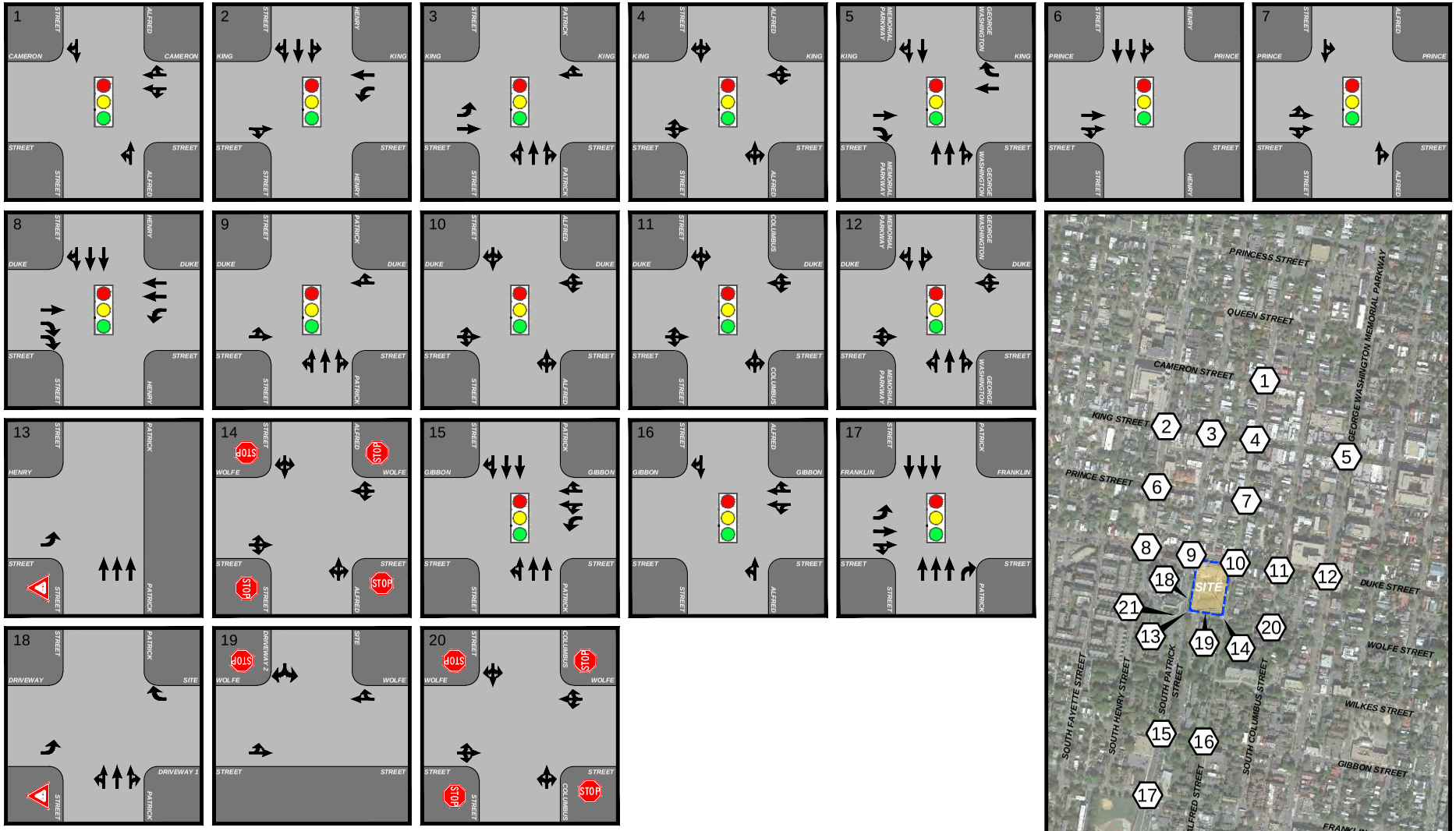

Figure 6-1

Total Future Lane Use and Traffic Controls

Alfred Street Baptist Church

City of Alexandria, Virginia

JCP

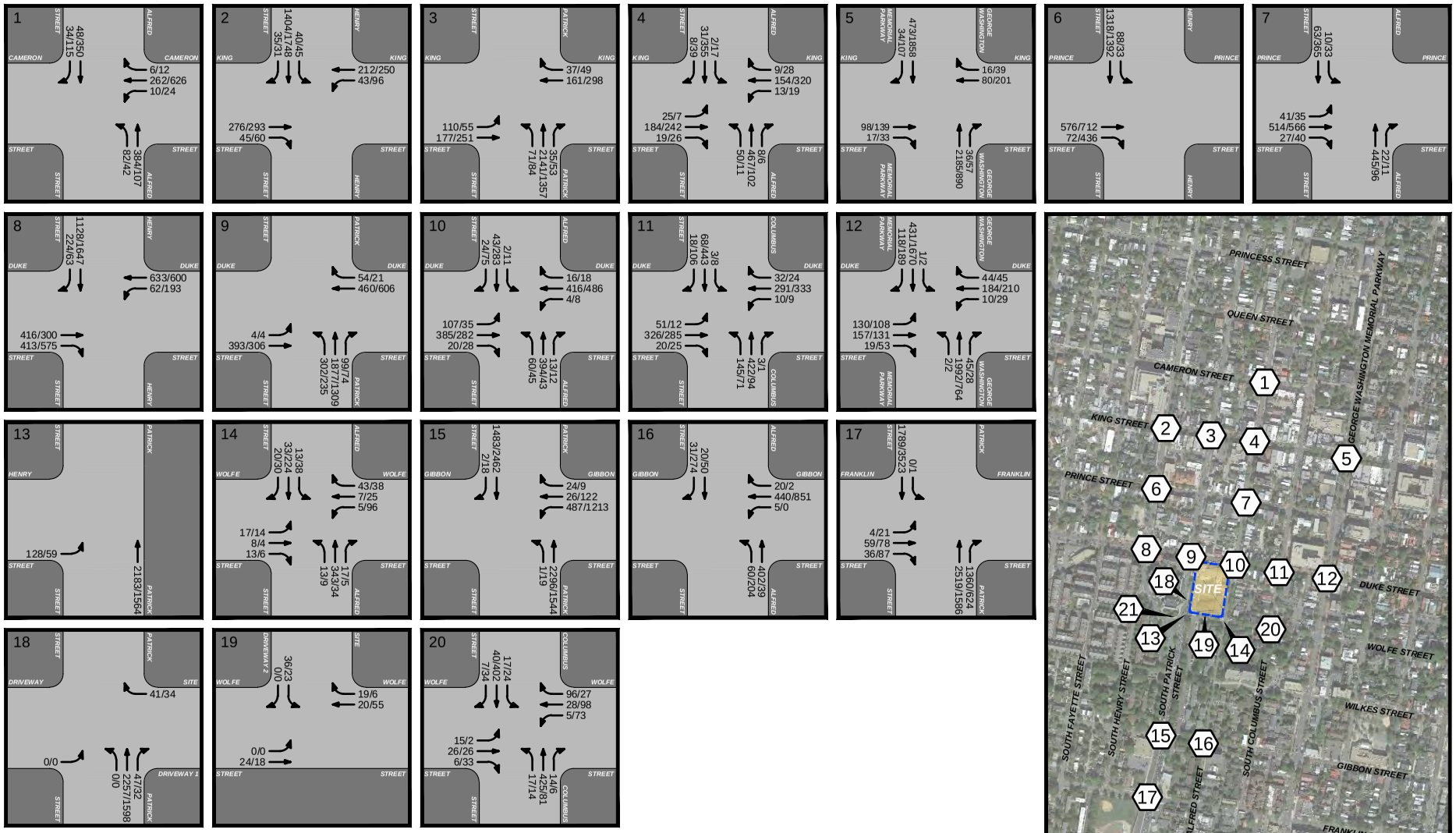

Figure 6-2
Future Peak Hour Traffic Forecasts
With Development (2022) - Weekday
Alfred Street Baptist Church
City of Alexandria, Virginia

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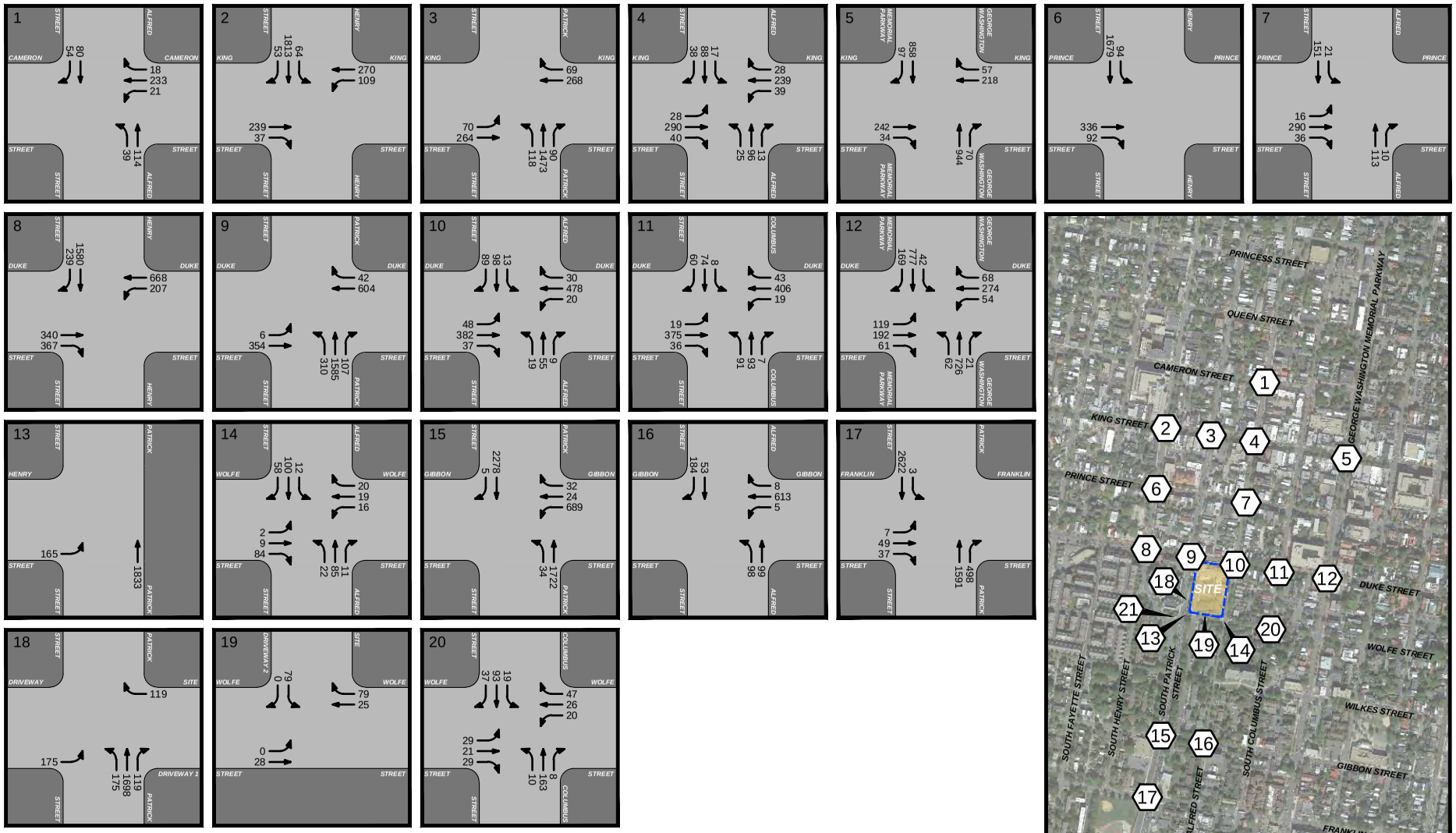

Figure 6-3
Future Peak Hour Traffic Forecasts
With Development (2022) - Sunday
Alfred Street Baptist Church
City of Alexandria, Virginia

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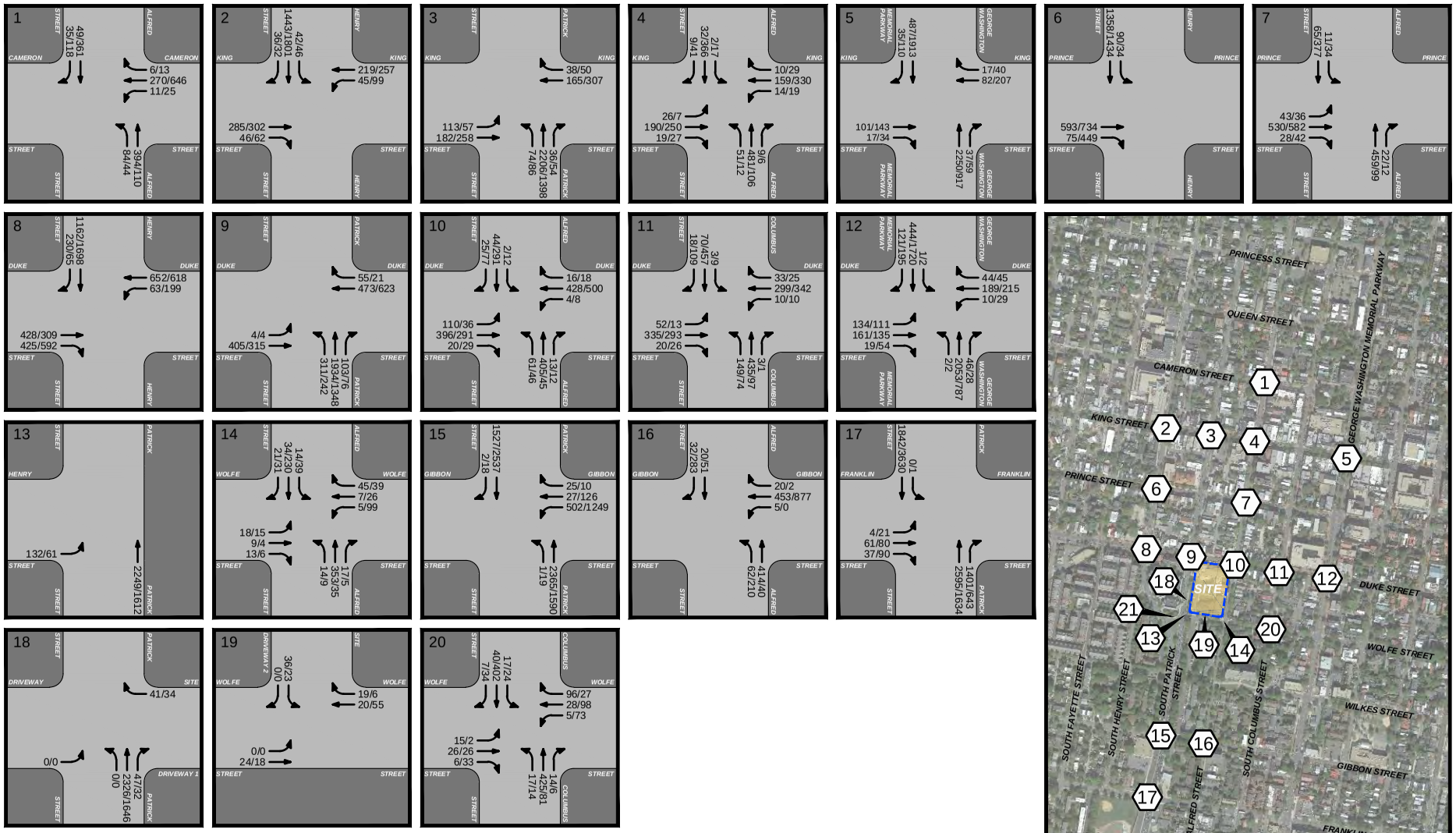

Figure 6-4

Future Peak Hour Traffic Forecasts

With Development (2028) - Weekday

Alfred Street Baptist Church

City of Alexandria, Virginia

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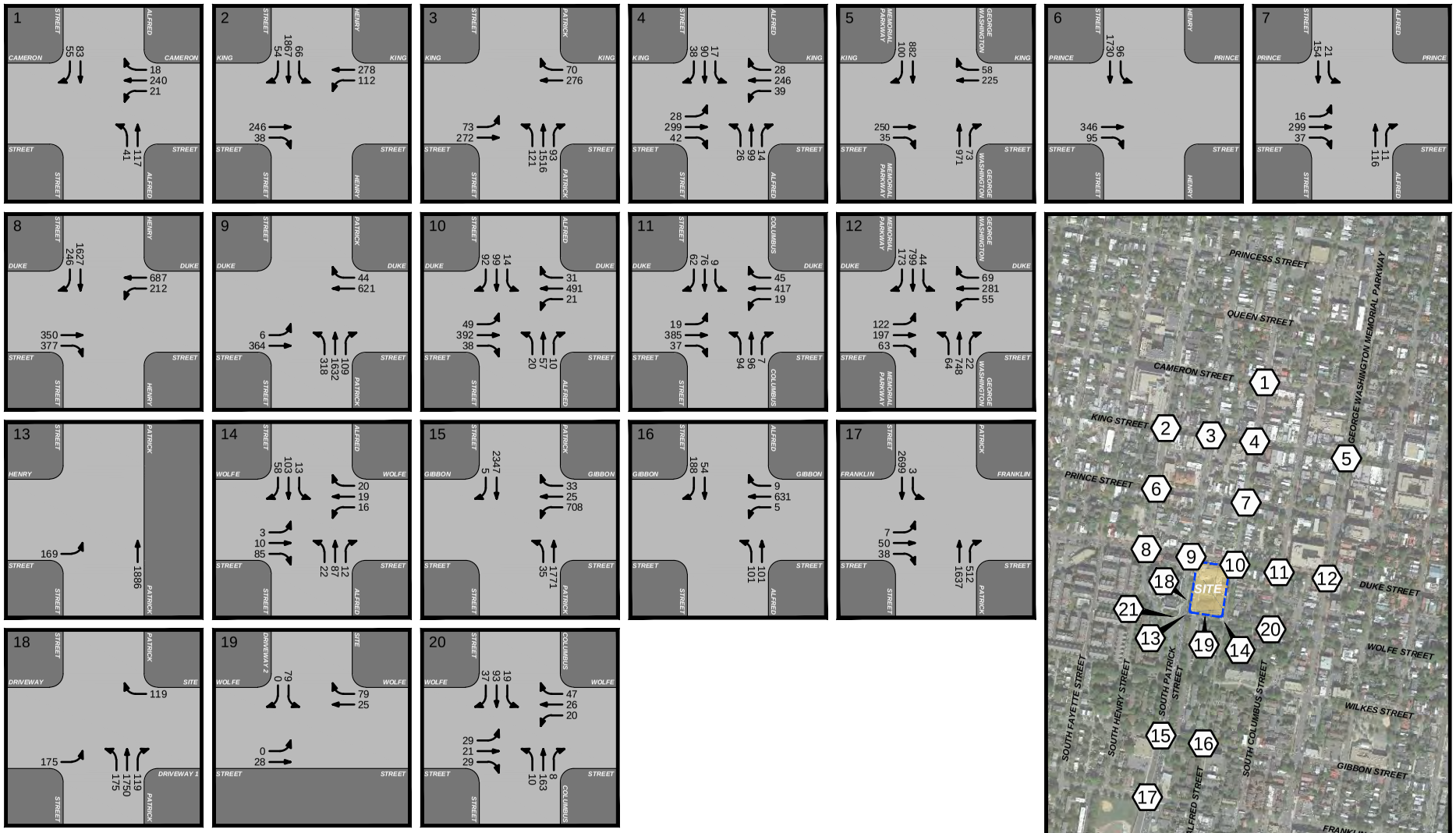

Figure 6-5
Future Peak Hour Traffic Forecasts
With Development (2028) - Sunday

Alfred Street Baptist Church
City of Alexandria, Virginia

JCP

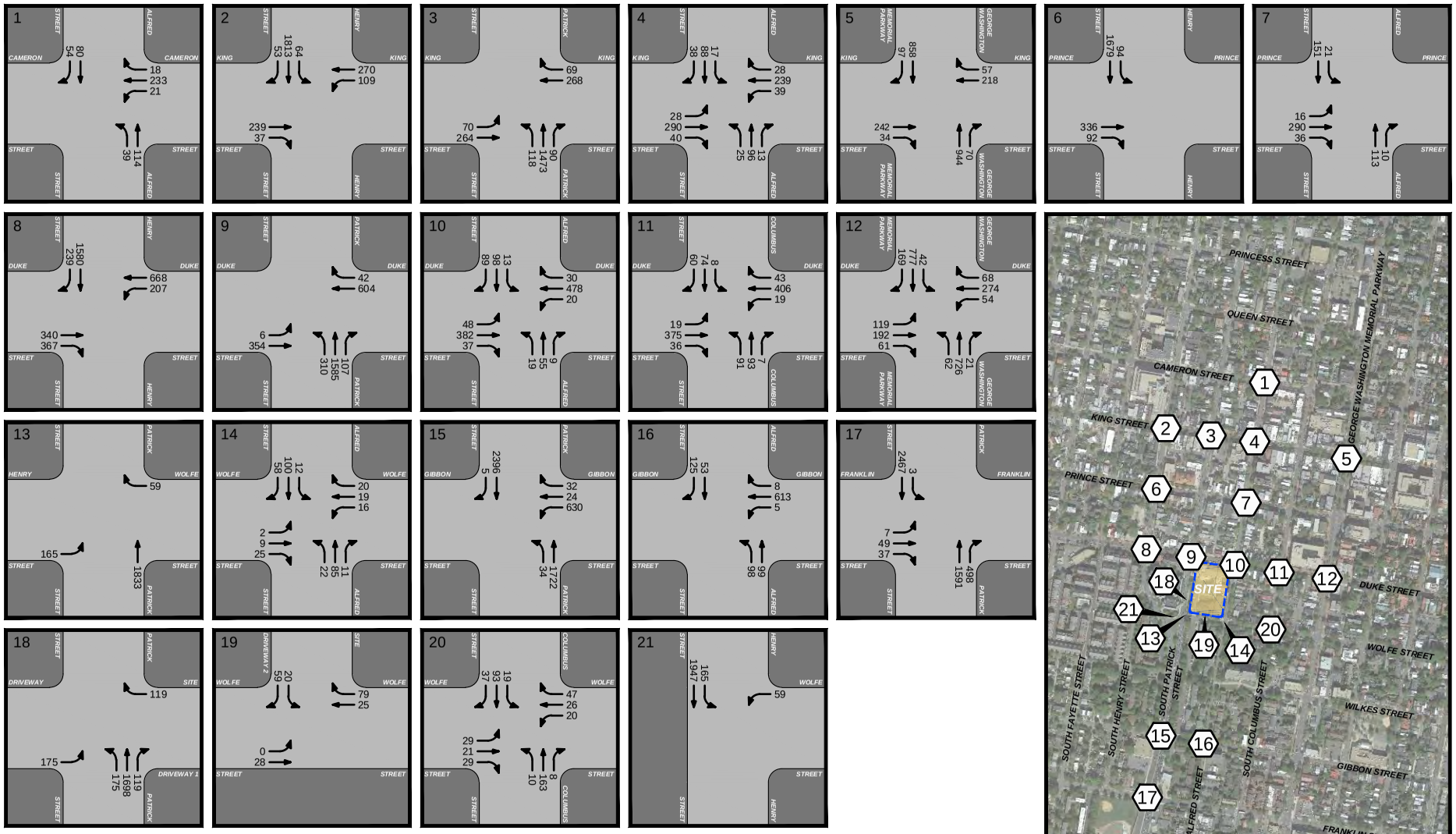

Figure 6-6

Future Peak Hour Traffic Forecasts

With Route 1 Connection and Distributed Parking (2022) - Sunday

Alfred Street Baptist Church

City of Alexandria, Virginia

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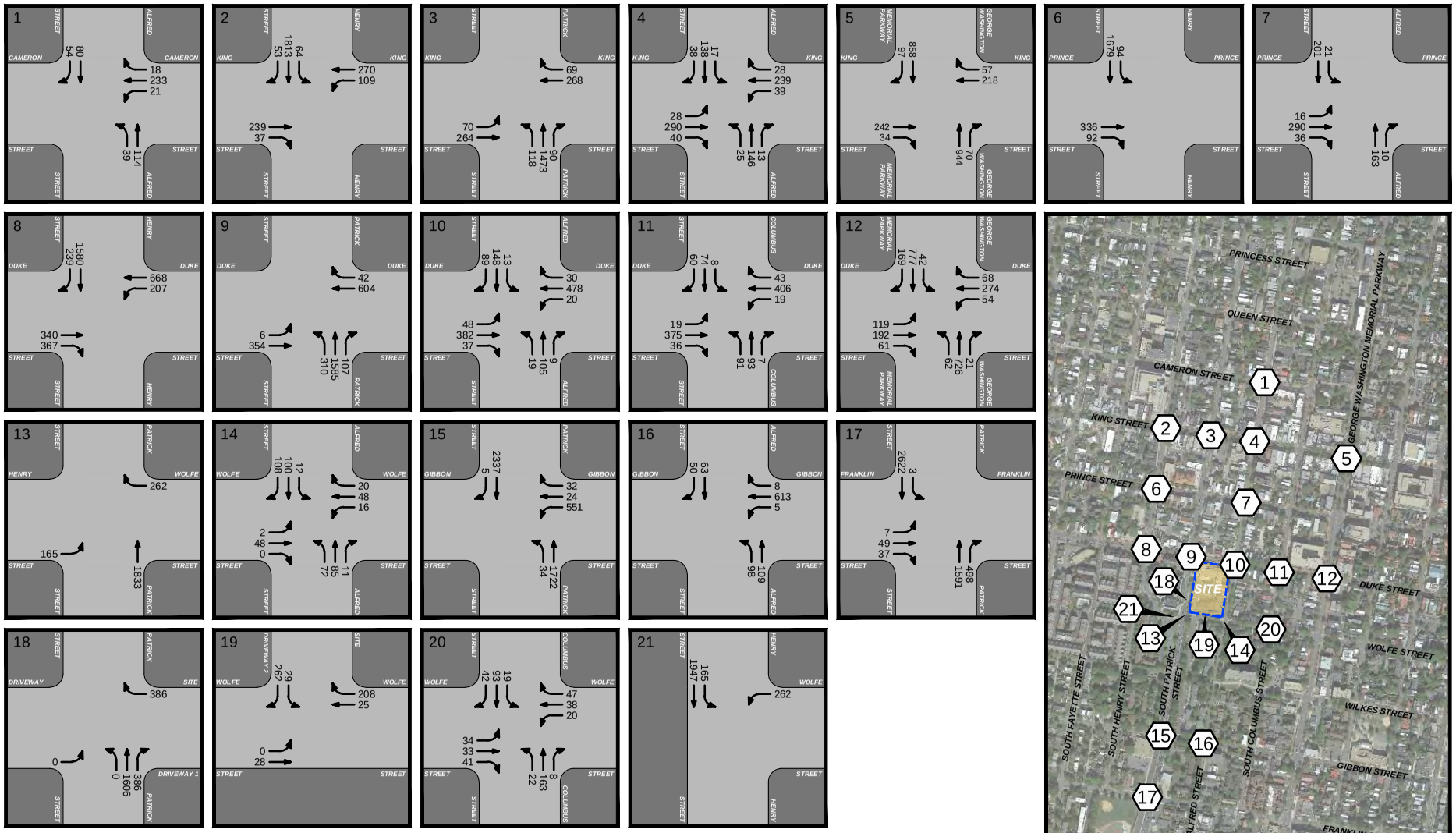

Figure 6-7

Future Peak Hour Traffic Forecasts

With Route 1 Connection and All Parking under Site (2022) - Sunday

Alfred Street Baptist Church

City of Alexandria, Virginia

JCP

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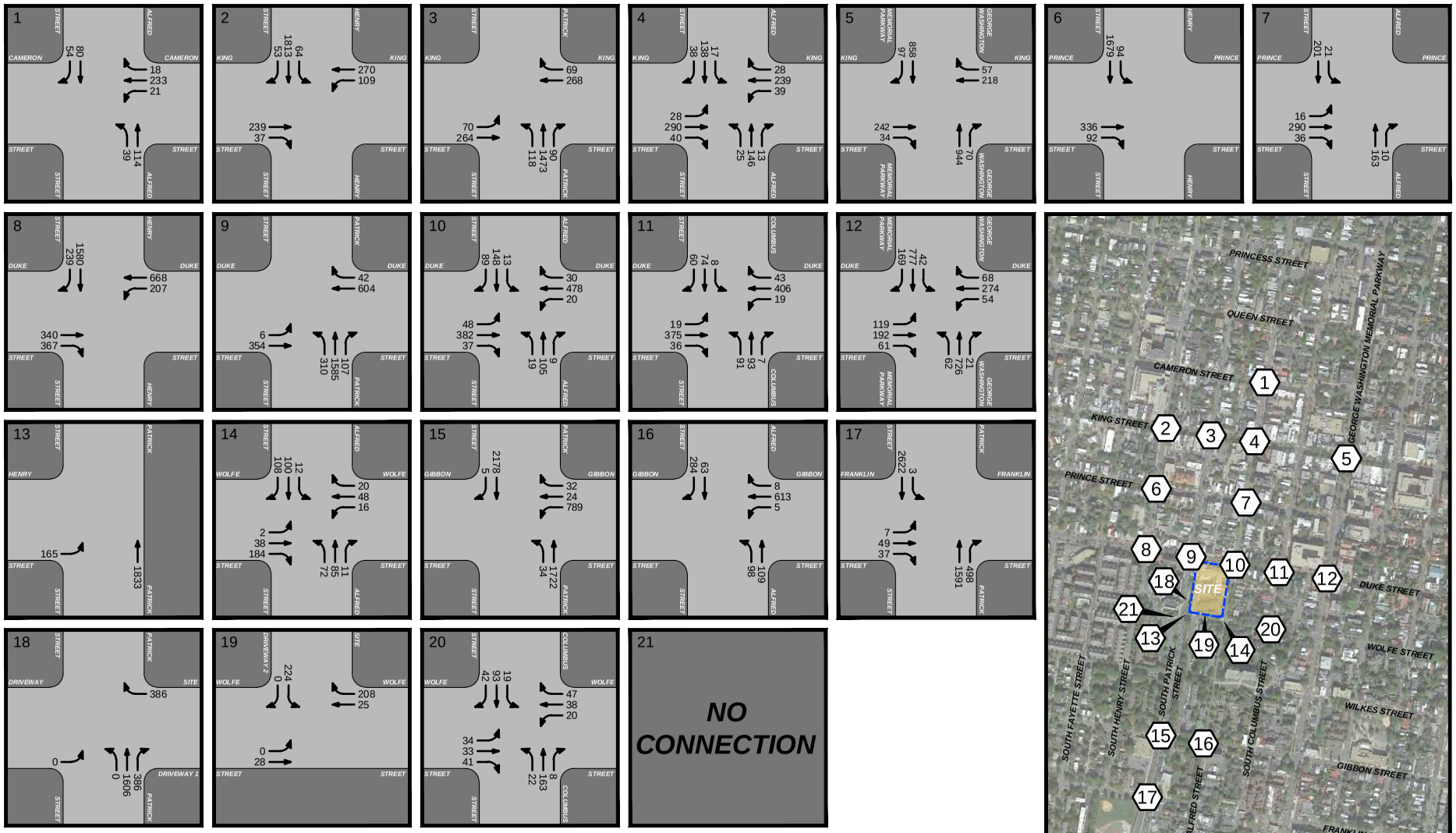

Figure 6-8

Future Peak Hour Traffic Forecasts

Without Route 1 Connection and All Parking under Site (2022) - Sunday

Alfred Street Baptist Church

City of Alexandria, Virginia

JCP

SECTION 7
NON-AUTO FACILITIES EVALUATION

Introduction

This section evaluates the non-auto facilities within the site vicinity. It includes the safe and efficient pedestrian and bicycle access and circulation and identifies transit service in the area. It is a goal of the City of Alexandria to create an integrated, multimodal transportation system that is accessible and safe for all users, including pedestrians and bicyclists. To help achieve this goal, the City Council adopted a Complete Streets Policy in 2010. The term Complete Streets describes a comprehensive, integrated transportation network with infrastructure and design that allows safe and convenient travel along and across streets for all users. The policy is intended to promote equality for pedestrians, bicyclists, riders and drivers of public transportation, as well as drivers of other motor vehicles, and people of all ages and abilities, including children, older adults, and individuals with disabilities.

Per the City's Guidelines, the bicycle and pedestrian study area is based on the size of the proposed development. As agreed during the scoping process the study area includes bicycle and pedestrian data, analysis and reporting of infrastructure and deficiencies within a ½ mile radius from the site.

Existing Conditions

The Old Town area has a connected network of sidewalks that provides the safe and efficient movement of pedestrians between residences, places of employment, retail shops, open space, transit facilities and other destinations within the area. A review of existing conditions confirms that within ½ mile from the subject site, sidewalks are present along both sides of all streets with the following exceptions, as shown on Figure 7-1 through 7-5.

- West side of S. Payne Street from Wilkes Street to the end of roadway.

A total of 53 signalized intersections are located within the pedestrian and bicycle study area. A review of the existing signalized intersections confirms that crosswalks are provided on all legs of the intersections where pedestrian ramps are located connecting to the sidewalk. Pedestrian countdown signal heads are provided for each marked crosswalk at the signalized intersections with exception of the following intersections or leg of an intersection as noted below and shown on Figure 7-1 through 7-5:

- N. Henry Street/Princess Street
- N. Alfred Street/Cameron Street
- N. St Asaph Street/Cameron Street
- Peyton Street/King Street

- West Street/King Street
- S. Alfred Street/Duke Street
- S. Columbus Street/Duke Street
- S. Columbus Street/Gibbon Street
- S. Patrick Street/Gibbon Street

Public Transit Service

The Old Town area is well served by transit as shown on Figure 7-6. This includes bus and Metrorail. Boarding and alighting information for certain bus lines including DASH and WMATA, as provided by the City of Alexandria, are summarized in Table 7-1.

DASH Service. DASH service is provided by lines AT2, AT3-4, AT5, AT7, AT8, and KST in the vicinity of the site as shown on Figure 7-6. Line AT2 provides service from the Landmark Plaza to the Braddock Road Metrorail stations; additional stops include Mark Center, the King Street Metro station, City Hall and Old Town. In the vicinity of the site the line travels along King Street. Line AT3-4 Loop provides service to and from Old Town Alexandria. Major stops along this route include Parkfairfax, Braddock Metro Station, and City Hall. In the vicinity of the site the line travels along Royal Street. Line AT5 provides service between the Van Dorn Metrorail station and the Braddock Metrorail station; additional stops include Landmark Mall, George Washington Masonic National Memorial, King Street Metrorail station, and City Hall. In the vicinity of the site the line travels along King Street. Line AT7 provides service between the Landmark Mall and Nannie J. Lee Center. Additional stops along this line include the Van Dorn Metrorail station, the Eisenhower Metrorail station, the U.S. Federal Courthouse, and the Kind Street Metrorail station. The line runs along Duke Street in the vicinity of the site. Line AT8 provides service between the Van Dorn Metrorail station and Old Town Alexandria; including stops at the Landmark Mall, Cameron Station, and the King Street Metrorail station. In the vicinity of the site the line runs along Duke Street. The KST (King Street Trolley) provides local service to and from the King Street Metrorail station to Potomac Yard. The King Street trolley serves all of the major attractions along King Street. It should be noted that all of the bus lines listed above serve the area 7 days a week, with the exception of AT7, which only runs on weekdays. Refer to Figure 7-6 for the location of existing bus stops, metrorail, and bus lines.

Metrorail Service. The King Street-Old Town Metrorail station is located approximately 0.6 miles (straight line distance) west of the subject site. This station is served by the by the Yellow, Green, and Blue Lines. These metro lines provide regional access to Arlington County, Fairfax County, Washington DC, Montgomery County, and Prince Georges County. The subject property is located just outside the ½ mile walkshed from the station based on the City of Alexandria Metro Station Walkshed Map. Refer to Figure 7-6 for the location of existing bus stops, metrorail, and bus lines. Alfred Street Baptist Church provides a shuttle service to the closest Metrorail station and off-site parking. The shuttle route is provided on Figure 7-9.

Metrobus Service. Metrobus service is provided by lines 9A, 10A, and 11Y which run along Washington Street. Line 9A operates seven (7) days a week and provides service between the Huntington Avenue and Pentagon Metro stations. Line 10A operates seven (7) days a week and provides service to the Pentagon Metrorail station and Hunting Point. Line 11Y operates Monday through Friday and provides service from Mount Vernon to Potomac Park in Washington, D.C. In the vicinity of the site all of the Metrobus lines run along Washington Street. Refer to Figure 7-6 for the location of existing bus stops, metrorail, and bus lines.

Pedestrian and Bicycle Traffic Volumes

Pedestrian and bicycle counts were conducted on Tuesday, May 19, 2015 from 6:30 to 9:30 AM and 4:30 to 7:30 PM at each study intersection. Pedestrian and bicycle counts were also conducted for Sunday conditions on Sunday, May 31, 2015 from 7:00 AM to 3:00 PM. Existing peak hour pedestrian and bicycle counts are shown in Figures 7-7 and 7-8, respectively and are summarized in Appendix B.

Bicycle Network

There are few dedicated bicycle lanes within the Old Town North area. Many riders simply utilize the travel lanes since vehicle speeds are relatively low in this area. The lack of bike lanes is primarily due to the existing street geometry with narrow lane widths and the inability to remove curb parking for dedicated bike lanes.

As shown on Figure 7-10, within vicinity of the site S. Henry Street (to the west) is classified as a shared roadway. Wilkes Street (to the south) is classified as a shared roadway with some trails where the roadway does not continue. S. Columbus Street (to the east) is classified as a shared roadway, as well. Prince Street (to the north) has dedicated bike lanes. King Street (to the north) has dedicated bike lanes and some shared roadway segments. Access to the Mount Vernon trail running along the Potomac River can be gained through Wilkes Street. The Mount Vernon Trail connects to Arlington County to the north and Fairfax County to the south.

The closest Capital Bikeshare station is at the intersection of King Street & Patrick Street, two blocks north of the Alfred Street Baptist Church. Additional Capital Bikeshare stations can be found along King Street and also at the King Street Metrorail station. Refer to Figure 7-5 for locations of Capital Bikeshare stations, in the vicinity of the site.

As mentioned previously, a total of 34 bicycle parking spaces will be provided at grade and within the below grade parking garage serving the proposed development.

Pedestrian Access

Access for pedestrians are facilitated by marked crosswalks and ramps at the intersections of Duke Street/Patrick Street, Duke Street/S. Alfred Street, and Wolfe Street/S. Alfred Street. Ramps exist on all quadrants of the intersections with marked crosswalks. All three of the immediate intersections surrounding the site, mentioned previously, have pedestrian signals with the exceptions of the Duke Street/S. Alfred Street intersection.

The nearest transit stops are located on the north side of the property along Duke Street where DASH service can be found via line AT7 and AT8. The King Street Metro station is approximately 0.6 miles west of the site and is accessible via a connected grid of sidewalks or via one of the nearby transit lines. Also as noted previously the church operates shuttles on Sundays providing access to additional parking areas and the King Street Metro station.

Shuttle Bus

Two church shuttle busses are available during Sunday services to assist patrons to church. The shuttles run on a continuous circuit route from approximately 6:00 AM until 3:00 PM and serve the King Street Metro, the 117 Alfred Street parking garage, and the Coal Lot. Shuttle buses can also be called on as needed basis to pick up or drop off church members outside of the typical shuttle route for individual transport services.

A bus occupancy count was conducted on Sunday, April 3, 2016 between the hours of 6:00 AM and 3:00 PM. A total of 43 patrons were dropped off and 46 picked up. The average was 1.4 persons per drop off and 1.5 persons per pickup. It is anticipated that this service will continue. Of the people picked up and dropped off, survey results indicate that 30% of riders come from the metro, while 35% come from each the satellite lots and individual transport requests. The results of the shuttle bus occupancy count of boarding and alighting is found in Appendix B.

Table 7-1
Alfred Street Baptist Church
Boarding and Alighting Information

On Street	X Street	Direction	Average Daily On[1]	Average Daily Off[1]	Bus Routes	Sunday On	Sunday Off
Duke	S Alfred	EB	0	13	DASH AT8	1	13
Duke	S Alfred	WB	29	2	DASH AT8	15	1
Duke	S Payne	EB	3	10	DASH AT8	0	7
Duke	S Washington	EB	1	18	DASH AT8	0	6
Duke	S Washington	WB	3	0	DASH AT7 (Does not operate on Sundays)	-	-
Duke	Henry	WB	8	0	DASH AT8	1	1
S Washington	Prince	SB	11	8	DASH AT8, WMATA 10A,B	3	1
S Washington	Duke	SB	7	21	WMATA 10A,B	1	4
S Washington	Duke	NB	28	12	WMATA 10A,B	16	17
S Washington	King	NB	243	189	DASH AT8, WMATA 10A,B	186	123
S Washington	King	SB	155	80	DASH AT8, WMATA 10A,B	99	178
S Washington	Wilkes	SB	17	45	WMATA 10A,B	25	15
S Washington	Wilkes	NB	67	22	WMATA 10A,B	60	33
King	S. Washington	EB	15	76	-	-	-
King	S. Washington	WB	46	14	-	-	-
King	Columbus	EB	18	109	-	-	-
King	Columbus	WB	154	22	-	-	-
King	Alfred	EB	1	26	-	-	-
King	Alfred	WB	28	4	-	-	-

1. Average Daily Ridership only includes ridership between Monday-Friday.

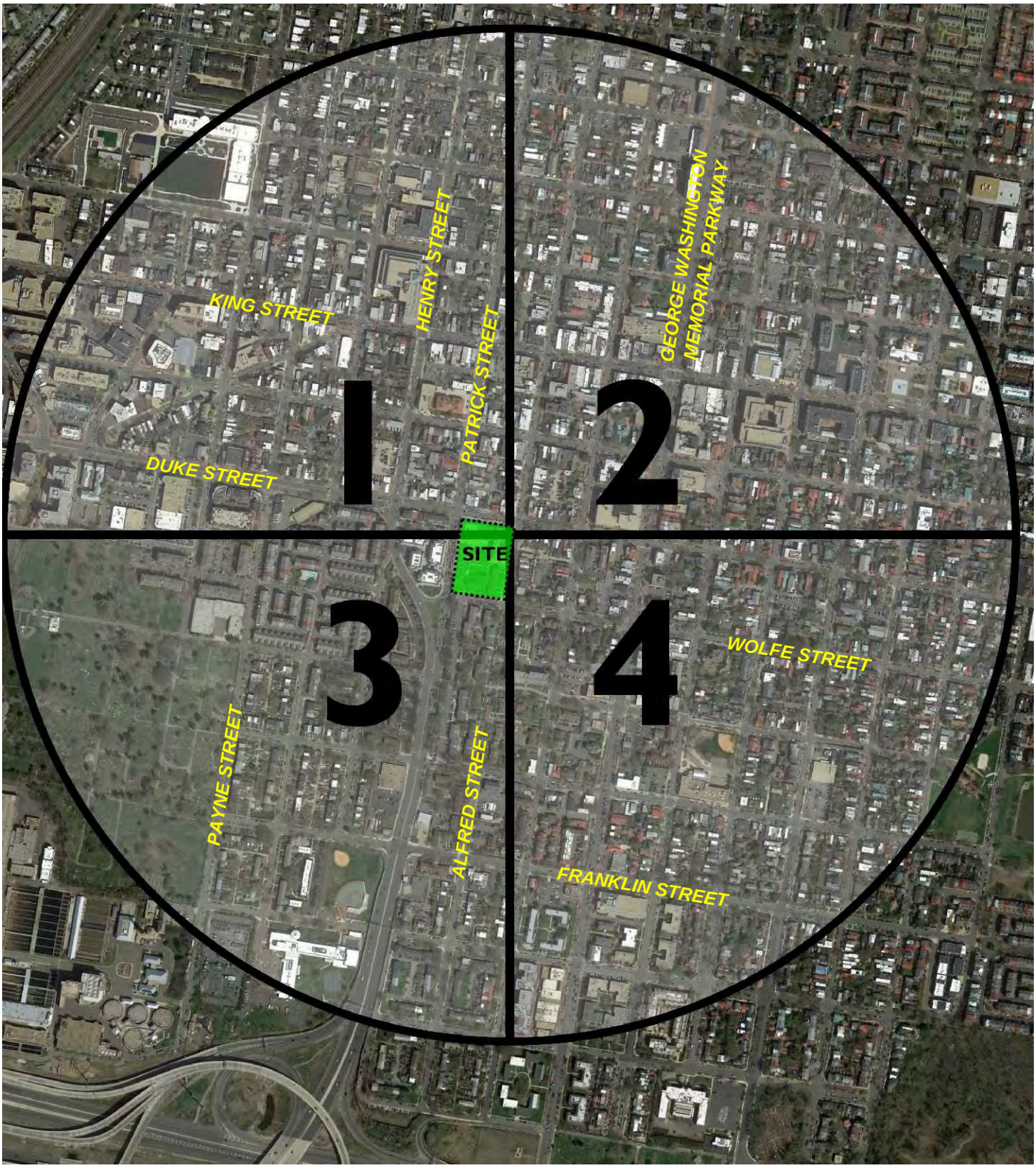

Figure 7-1
Sidewalk & Crosswalk Inventory

Alfred Street Baptist Church
City of Alexandria

NORTH

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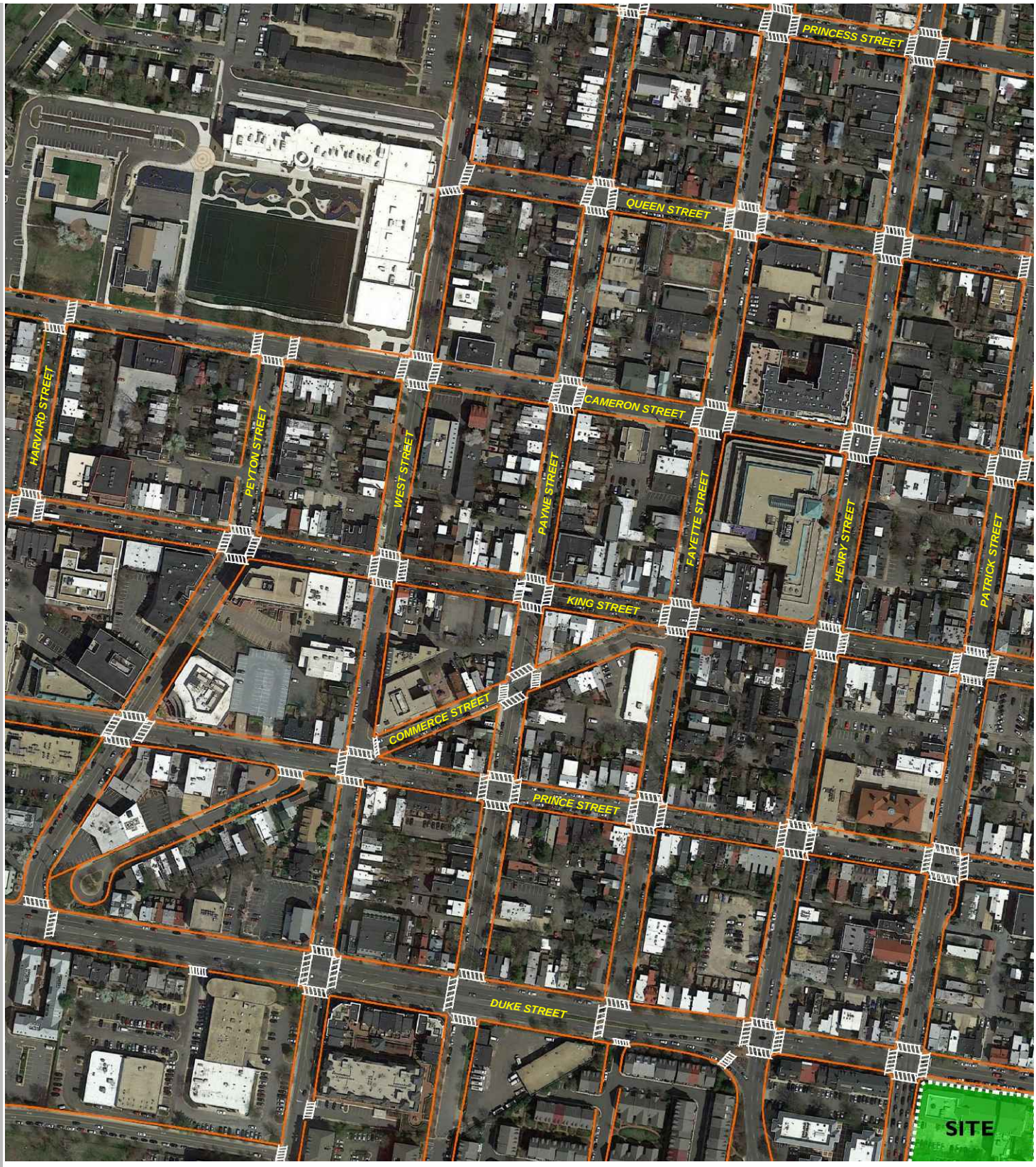

Figure 7-2
Area 1 Sidewalk & Crosswalk Inventory

Alfred Street Baptist Church
City of Alexandria

NORTH

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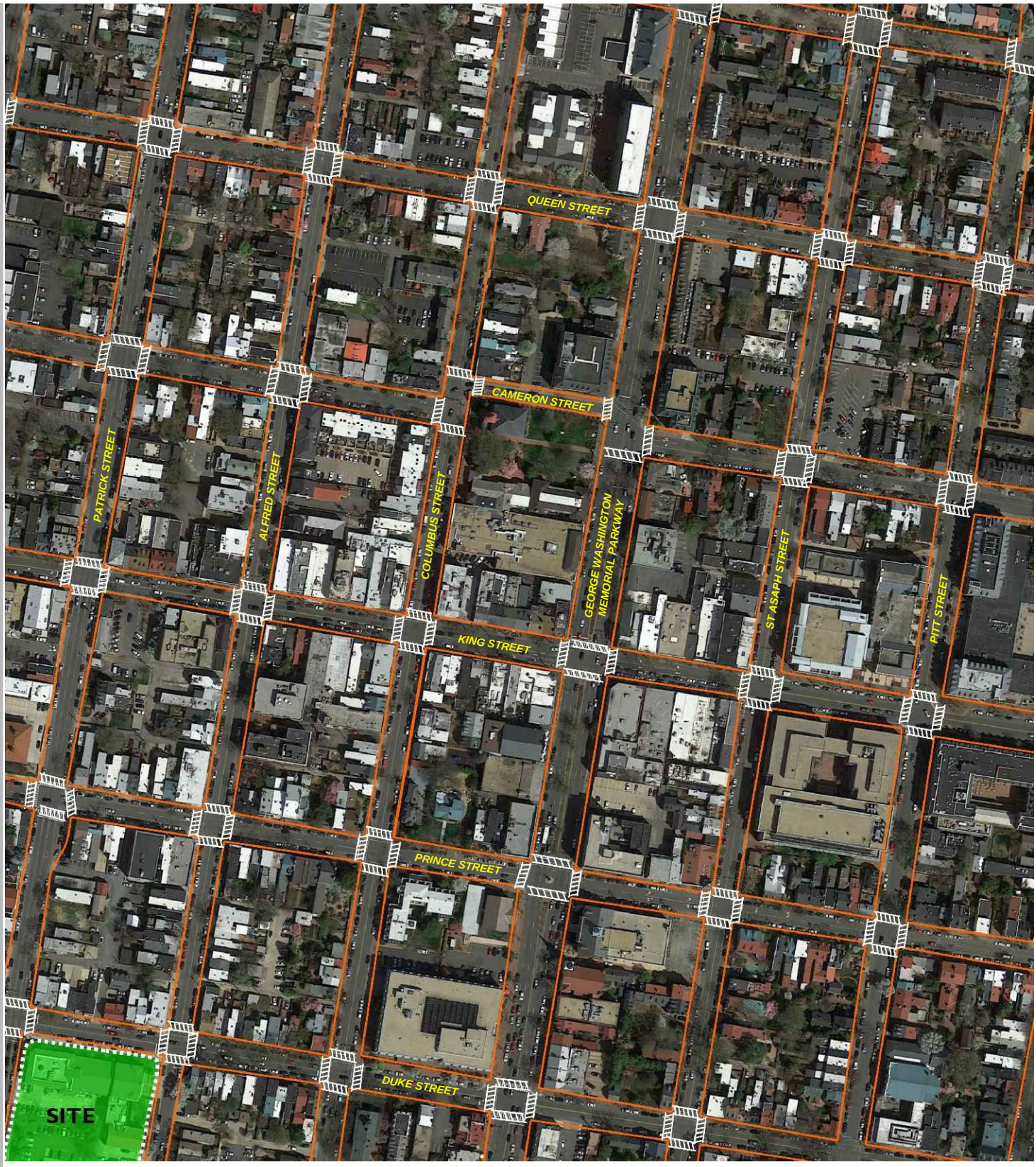

Figure 7-3
Area 2 Sidewalk & Crosswalk Inventory

Alfred Street Baptist Church
City of Alexandria

NORTH

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Figure 7-4
Area 3 Sidewalk & Crosswalk Inventory

Alfred Street Baptist Church
City of Alexandria

NORTH

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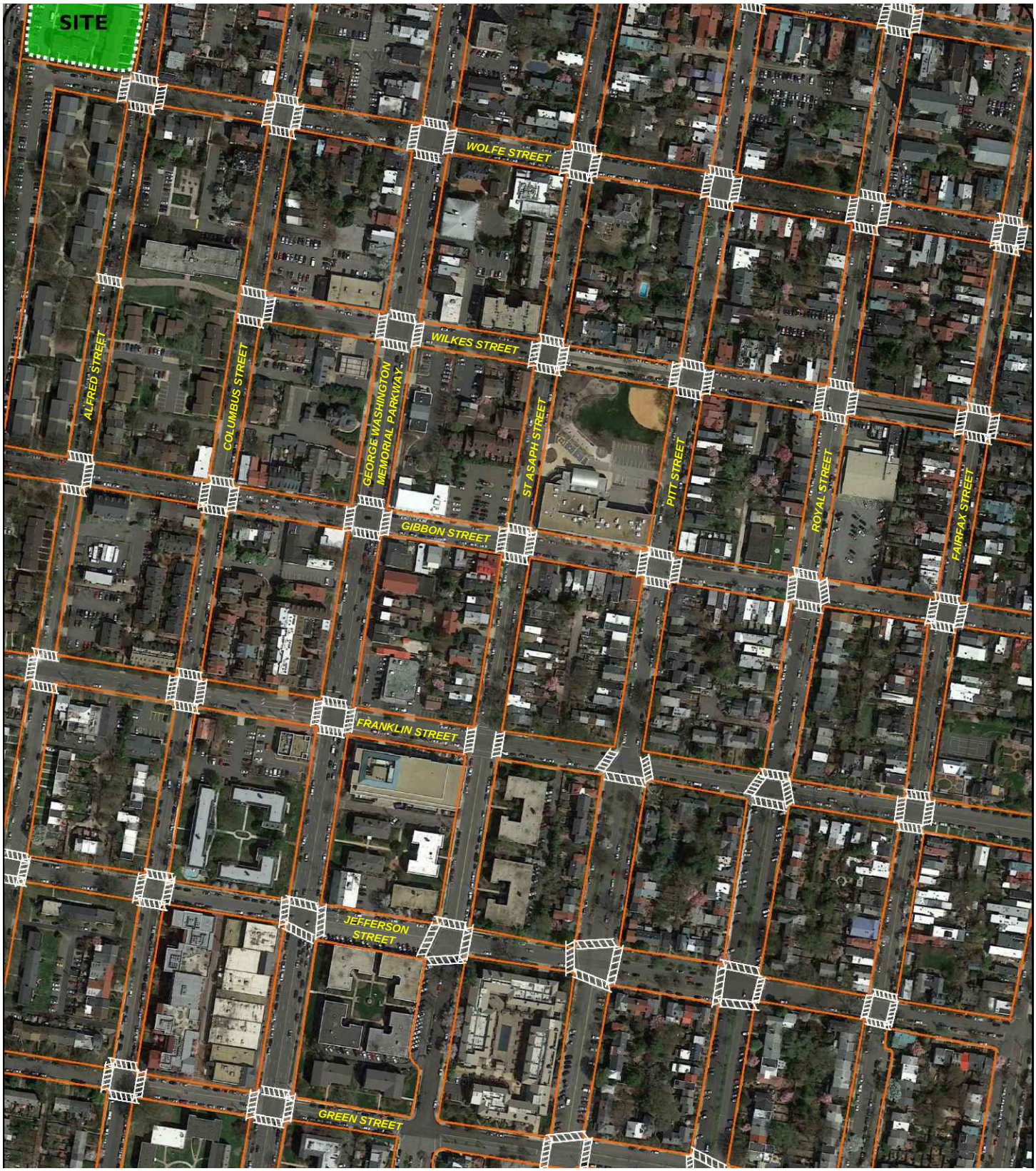

Figure 7-5
Area 4 Sidewalk & Crosswalk Inventory

Alfred Street Baptist Church
City of Alexandria

NORTH

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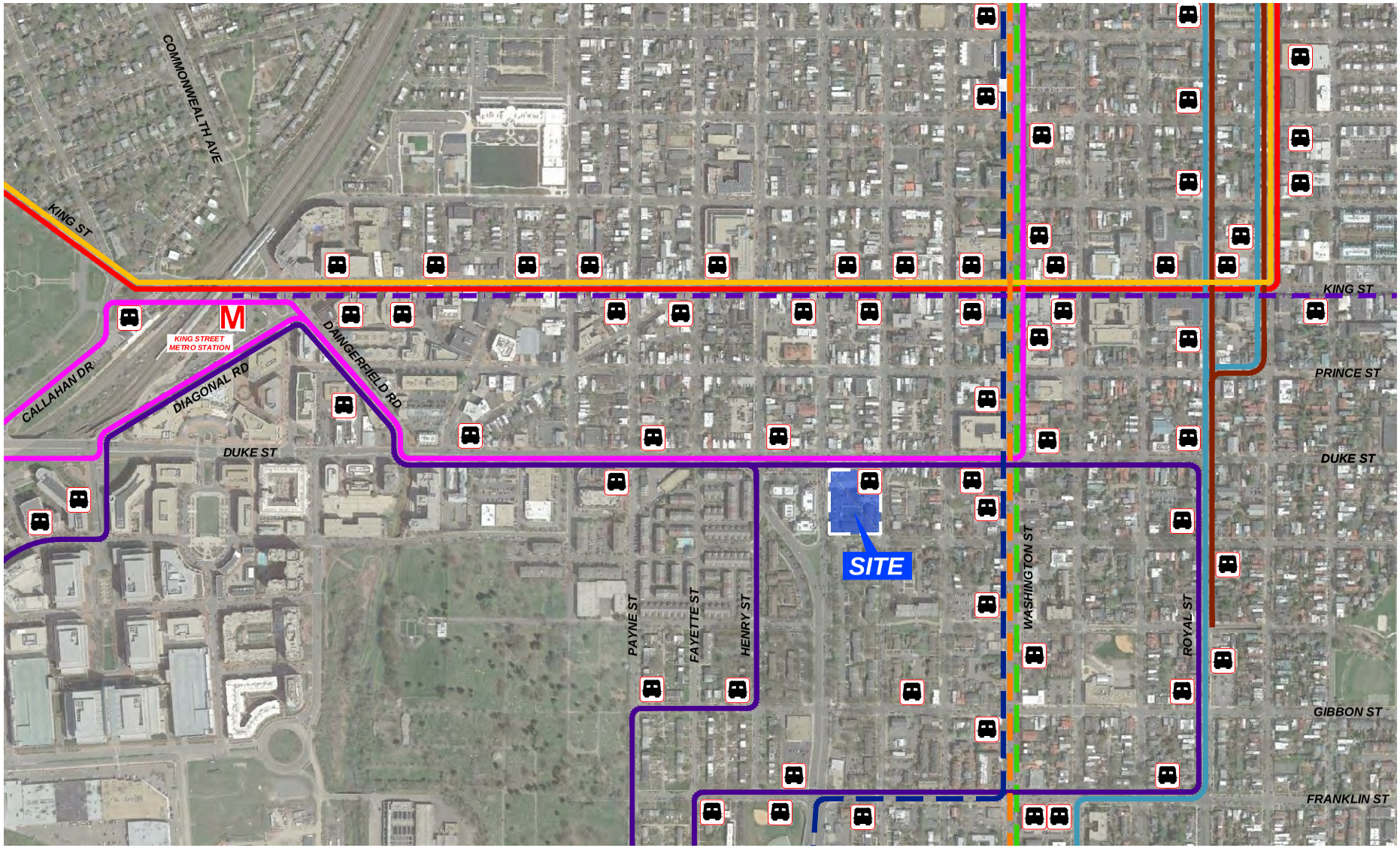

Figure 7-6
Existing Bus Stops/Metro Rail/Bus Lines

Alfred Street Baptist Church
City of Alexandria, Virginia

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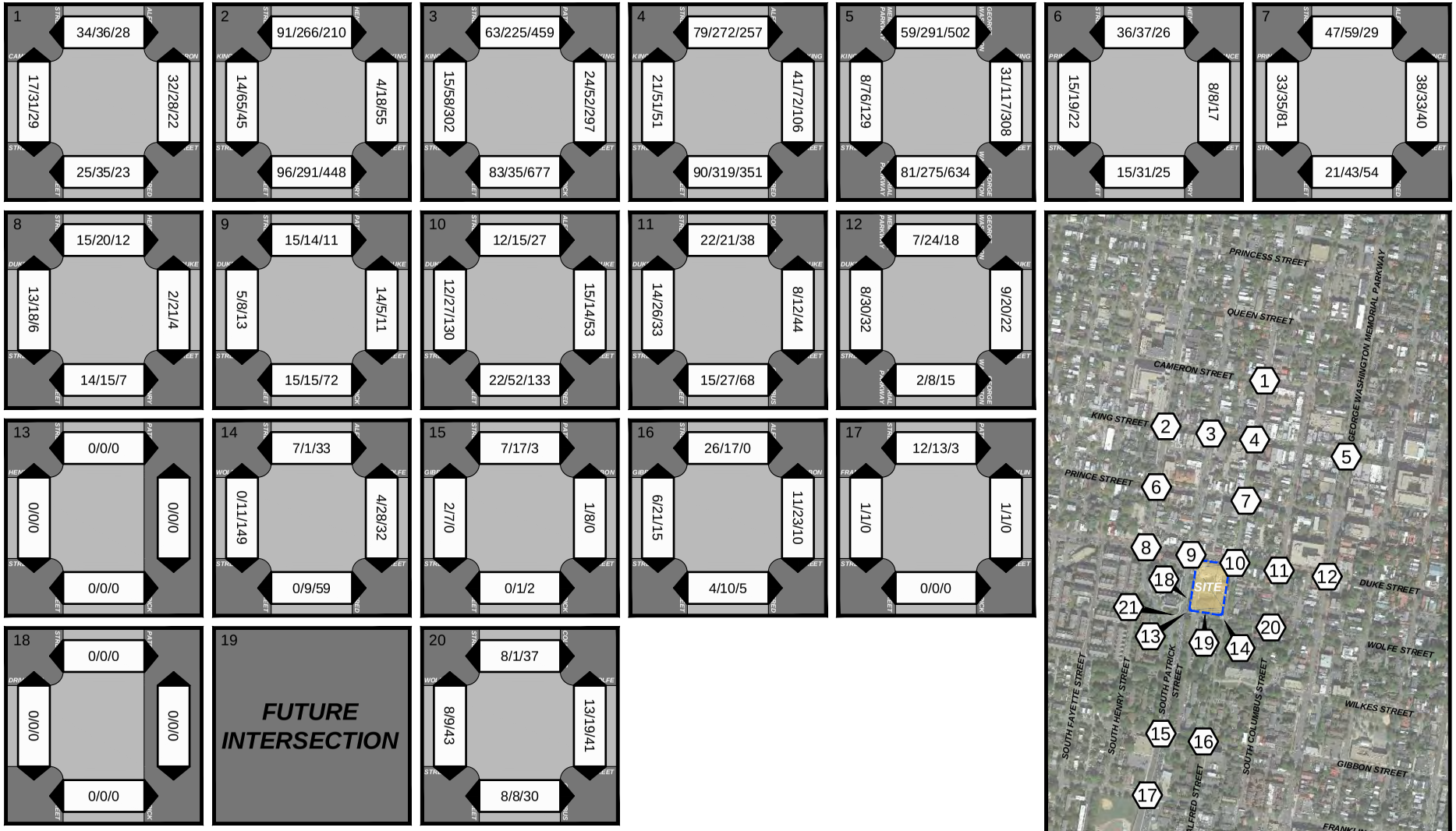

Figure 7-7
Existing Pedestrian Traffic Volumes

Alfred Street Baptist Church
City of Alexandria, Virginia

JCP

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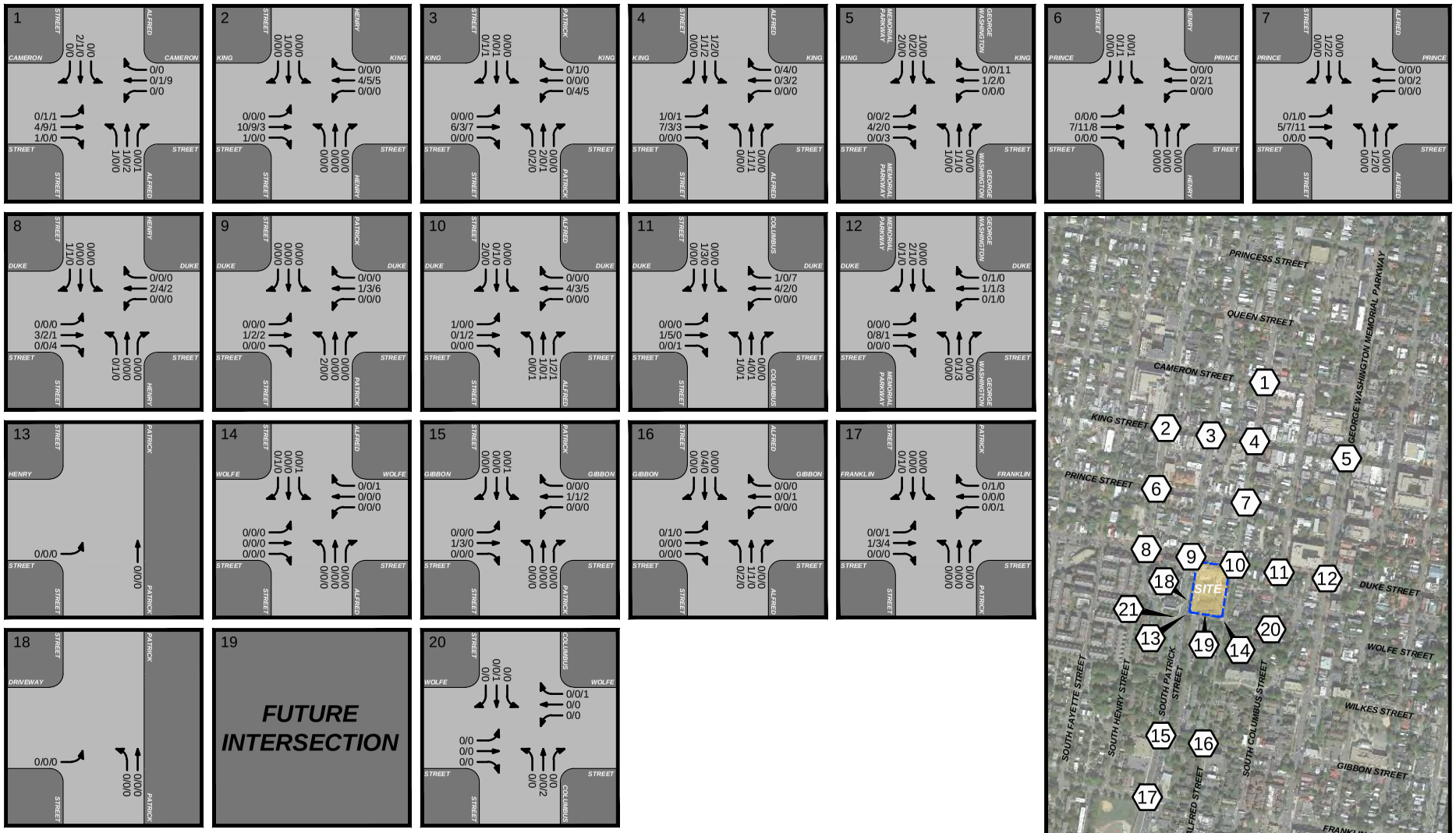

Figure 7-8
Existing Bicycle Traffic Volumes

Alfred Street Baptist Church
City of Alexandria, Virginia

JCP

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Figure 7-9

Parking Locations and Shuttle Route

Alfred Street Baptist Church

City of Alexandria, Virginia

JCP

Figure 7-10
Alexandria Bike Master Plan

Alfred Street Baptist Church
City of Alexandria

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SECTION 8
PARKING DEMAND ANALYSIS

Overview

This section provides an evaluation of the observed parking occupancy characteristics of the existing church parking facilities and surrounding area. Also included are details regarding the existing shuttle service that will remain in operation subsequent to the redevelopment, an on-street parking occupancy survey along the adjacent roadways, and a parking management plan to serve the site.

Code Requirement and Proposed Parking Ratio

The City of Alexandria Code requires one (1) space per every five (5) seats for churches. As shown on Table 8-1, the existing church (920 seats, including the chapel) would require 184 spaces, and provides a total of 292 spaces on-site (194 in the Alexandria Gateway Garage, 48 on the surface lot, 50 on-site). The existing required parking ratios are calculated using the number of provided seats within the building, not an observed attendance. This excludes the overflow spaces used on Sundays through agreements with other property owners provided in off-site facilities.

Based on the proposed development program of 2,163 seats, a total of 433 parking spaces are required. The proposed parking supply of 292 spaces (216 in proposed garage, 194 in Alexandria Gateway Garage, and 48 on surface lot) would meet the required amount of on-site parking spaces. In addition to the requirement being met, the church will maintain the existing off-site overflow parking and shuttle service. It is noted that of the 194 spaces rented in the Alexandria Gateway Buidling, 64 spaces are controlled by the Alfred Street Baptist Church by their condo ownership.

Parking Occupancy

In accordance with the City's guidelines, on-street parking occupancy data surrounding the site was collected for the area covering a two (2) block radius from the site. Figure 8-1 highlights the surveyed area. As agreed during the scoping process, the occupancy survey was conducted on Wednesday, May 20, 2015 from 6:30 to 9:30 AM and 4:30 to 7:30 PM and on Sunday, May 31 and Sunday June 7, 2015 from 7:00 AM to 3:00 PM.

Weekdays. The results of the weekday on-street parking survey are shown on Figures 8-2 and 8-3 and indicate that on-street parking is generally available during the AM and PM peak hours on weekdays. During the weekday AM peak hour, a maximum of 396 parked vehicles (or 51 percent occupied spaces) were observed at 9:30 AM. A maximum of 558 vehicles (or 72 percent occupied spaces) were observed at 7:00 PM.

Sundays. The results of the Sunday counts (average of both count days) of on-street parking are shown on Figure 8-4 and indicate that a maximum of 766 parked vehicles (or 99 percent occupied spaces) were observed at 12:30 PM.

The parking occupancy counts collected at the existing Coal Lot, 117 N. Alfred Street Garage, surface parking next to the Gateway Garage, and the Alexandria Gateway Garage are summarized on Figure 8-5, and indicate that a maximum of 357 parked vehicles (or 83 percent occupied spaces) were observed at 11:45 AM during the Sunday midday peak hour. This indicates that a surplus of approximately 75 spaces is available during this period. It is noted that the Alexandria Gateway Garage and its surface parking were 100% occupied during this period (194/194 spaces and 48/48 spaces, respectively), but spaces were available in the other lots. On average, the 117 Alfred Street lot was 40% occupied (60/150 spaces) and the Coal lot was 69% occupied (28/40 spaces) at 11:45 AM during the peak occupancy period. The average peak Sunday occupancy for Coal Lot of 69% (28/40 spaces) occurred at both 11:45 AM and 12:00 PM and the average peak Sunday occupancy for the 117 Alfred Street Garage of 43% (64/150 spaces) occurred at 12:15 PM.

Observations did not note any church patrons parking south of Gibbon Street.

Detailed summaries of each of the parking areas surveyed as well as the signed parking agreements are contained in Appendix H.

Parking on Alfred Street

As discussed above, on-street parking is permitted along the east side of Alfred Street from Duke Street to Gibbon Street but is restricted to two-hour parking between Duke Street and Wolfe Street Monday through Saturday from 8:00 AM to 11:00 PM except for "holders of dist 4 permits." Parking is not permitted on the west side of Alfred Street from Duke Street to Gibbon Street except for Sundays from 7:30 AM to 9:00 PM.

On Sundays, vehicles are parked along the west side and recent observations indicated that nearly all available parking spaces are occupied from 8:00 AM until 1:00 PM between Duke Street and Gibbon Street. A travel time study was conducted on Saturday May 21, 2016 and on Sunday, May 22, 2016 from 9:00 AM to 12:00 PM to determine both the average and maximum travel times for motorists to traverse Alfred Street from Duke Street to Gibbon Street. The results indicate that the average time for a motorist to travel between Duke Street and Wolfe Street on a Saturday is 15 seconds with parking restricted on the west side of S. Alfred Street; the maximum time is 48 seconds. On Sunday with parking allowed on the west side, the average travel time increases to 19 seconds; the maximum to 115 seconds. From Wolfe Street to Gibbon Street, the average travel time is 19 seconds on a Saturday and increases to 35 seconds on a Sunday. The maximum time is 43 seconds on a Saturday but increases to 190 seconds on a Sunday inbetween peak services. The maximum time noted was primarily due to vehilces either stopping to pick-up/drop-off in front of the church or vehicles parallel parking. The proposed layby lane will alleviate the the extended delays in front of the church inbetween Sunday peak services. Although

vehicles passing one other in opposing direction can create potential delays, there is only a total average time increase for the two segments of 20 seconds. While delays along S. Alfred Street are anticipated with the church expansion, these periods will continue to be short (15 – 30 minutes before and after two planned services) and isolated to Sundays. A police officer is recommended at the S. Alfred Street/Wolfe Street intersection initially to help control the traffic in this area and ease congestion.

The grid of streets in the vicinity of the site provides motorist multiple alternatives to Alfred Street if motorists wish to travel in a north-south direction. If delays on Alfred Street become an issue during peak periods, existing and site traffic could divert to other roads. It was also noted during the on-site review that on-street parking serves as a traffic calming feature to keep speeds low in a primarily residential neighborhood. The traffic volume along Alfred Street is typically light.

Recorded accident data provided by the City from January, 2012 through May, 2016 revealed that one accident occurred between Duke Street and Gibbon Street involving either a side swipe or parked vehicle. The report did not state what day of the week it occurred. The data suggests that an ongoing accident problem does not exist. The accidents report summaries are included in Appendix B.

To allow greater space for vehicles to execute a right-turn from eastbound Wolfe Street to southbound Alfred Street, on-street parking along Alfred Street should be restricted within 50 feet of the intersection.

Parking Management Plan

The church currently utilizes an extensive parking management plan in order to accommodate parking demands on typical Sundays. These measures include traffic control personnel at key intersections, agreements for additional off-street parking, and shuttle service provided to the off-site parking facilities and metro. Church administration frequently updates parishioners of available parking and shuttle services in order to most effectively circulate traffic during peak service times. Traffic control personnel, including both church staff and police officers, are instructed to lead parishioners to the off-site lots once the most proximate spaces have reached maximum occupancy. Similar to the shuttle, personnel are on site approximately between the hours of 6:00 AM to 3:00 PM. Church personnel and staff are generally located at the entrance to the Alexandria Gatewat Garage, on-site parking spaces, outside the main entrance on Alfred Street, and along typical pedestrian routes on the immediate site frontage to help direct pedestrian and vehicular traffic. It is noted with the proposed expansion the church would be required to provide additional personnel and modify the policies for circulation and parking as needed. A police officer is present on Patrick Street at the Alexandria Gateway Garage to stop northbound traffic to allow for the parking garage traffic to exit after services.

As shown on Table 8-1, the off-site parking facilities would provide for 190 additional spaces, or a combined total of 648 parking spaces. The proposed parking supply is 215

more spaces than required by the zoning code. Further, the church has formal agreements for the use of these spaces. Thus, the additional parking provided on-site and use of the off-site parking facilities would adequately accommodate the parking demands of the church.

Table 8-1
Alfred Street Baptist Church
Existing and Proposed Parking Supply vs. Requirements

Existing		
Seats [1]	920	seats
Parking Requirement at 1 space / 5 seats [2]	184	spaces
On-Site Parking Provided [3]	292	spaces
Difference	*+108*	*spaces*
Proposed		
Seats [1]	2,163	seats
Parking Requirement at 1 space / 5 seats [2]	**433**	**spaces**
Parking in Proposed Garage	216	spaces
Additional Parking Provided within 300 feet of Buidling	242	spaces
Total On-Site Parking Provided	**458**	**spaces**
Difference between Required and Proposed	*+25*	*spaces*
Percent Over	**5.77%**	
Additional Off-Street Parking Supply		
Coal Lot	40	spaces
117 N. Alfred Street	150	spaces
Total Additional Off-Site Parking	*190*	*spaces*
Total Off-Street Proposed Supply (On and Off Site)	**648**	**spaces**
Surplus Parking Supply	**215**	**spaces**
Proposed Parking Ration On and Off Site	***1 space / 3.3 seats***	

(1) Seating number includes chapel seating seperated from the main sanctuary.

(2) Zoning Ordinance Section 8-200

(3) Includes additional parking made addition for Tuesday night activites and Sunday services.

Figure 8-1
On-Street Parking Restrictions

Alfred Street Baptist Church
City of Alexandria

NORTH

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2 HOUR PAY PARKING
MON - SAT, 8 AM - 9 PM

2 HOUR PARKING, RESTRICTIONS APPLY, DAILY 8 AM - 2 AM,
SUN 11 AM - MON 2 AM, HOLDERS OF DIST. 1 RES PERMITS EXEMPTS, $40 FINE

2 HOUR PARKING
MON - SAT, 8 AM - 5 PM

3 HOUR PARKING
8 AM - 5 PM, MON - FRI, EXCEPT HOLDERS OF DIST 4 PERMITS

2 HOUR PARKING, 8 AM - 11 PM, MON -SAT
EXCEPT HOLDERS OF DIST 4 PERMITS

NO PARKING, EXCEPT SUNDAY
7:30 AM - 9 PM

3 HOUR PARKING
MON - FRI, 8 AM - 5 PM

3 HOUR PAY PARKING
MON - SAT, 8 AM - 9 PM

2 HOUR PARKING MON - FRI, 8 AM - 11 PM
EXCEPT HOLDERS OF DIST. 4 PERMITS

2 HOUR PARKING
MON - FRI, 9 AM - 5 PM

2 HOUR PARKING, 8 AM - 11 PM, MON - SAT,
11 AM - 11 PM SUN, EXCEPT DIST. 4 PERMIT

2 HOUR PARKING, 8 AM - 11 PM, MON - SAT
EXCEPT HOLDERS OF DIST. 4 PERMITS

2 HOUR PARKING
9 AM - 5 PM, MON - FRI, EXCEPT HOLIDAYS

2 HOUR PAID PARKING, MON - FRI, 8 AM - 4 PM,6 PM - 9 PM,
SAT 8 AM - 9 PM

Figure 8-1
On-Street Parking Restrictions - Legends

Alfred Street Baptist Church
City of Alexandria

NORTH

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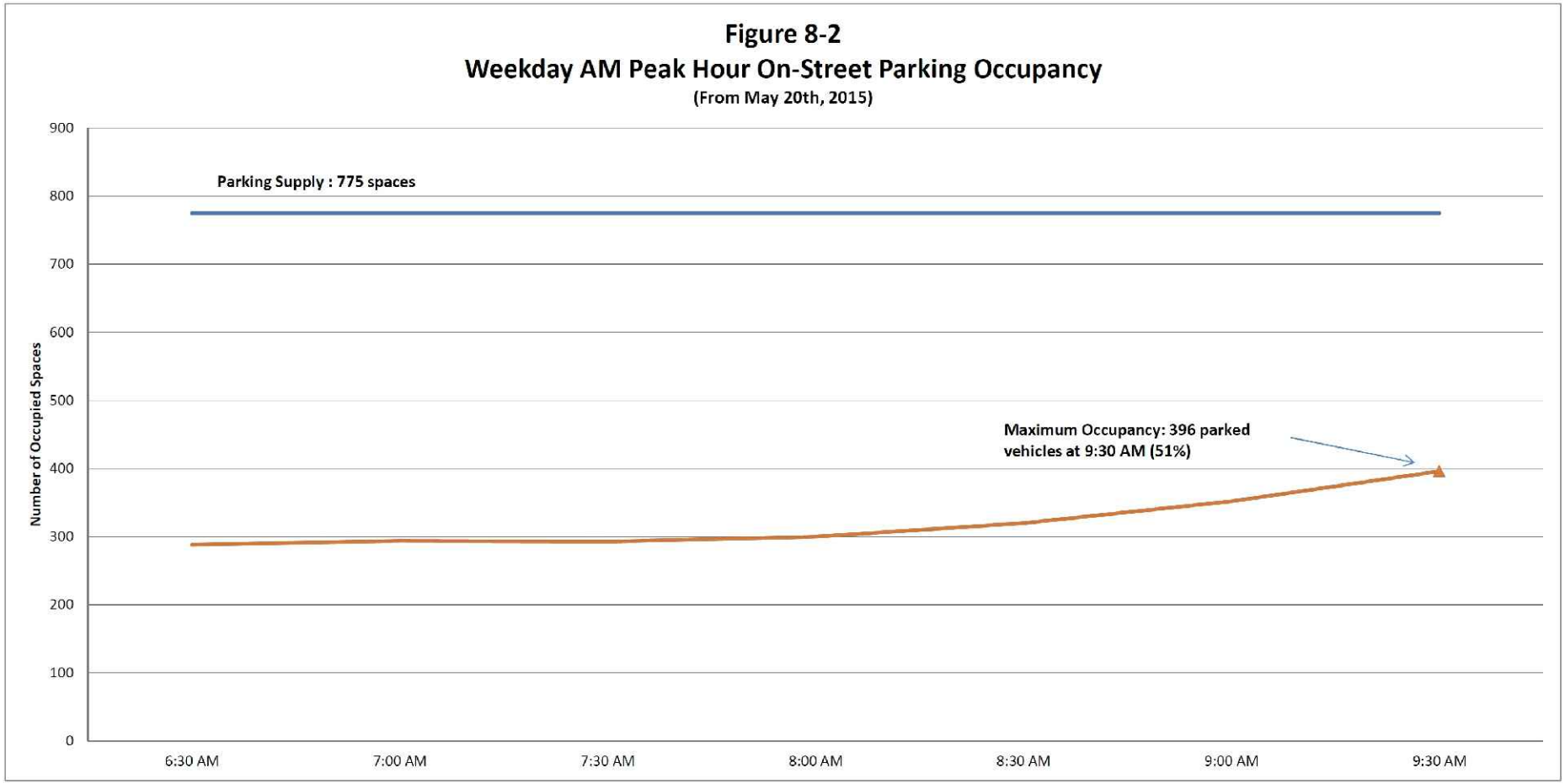

Figure 8-2
Weekday AM Peak Hour On-Street Parking Occupancy

Alfred Street Baptist Church
City of Alexandria, Virginia

NORTH

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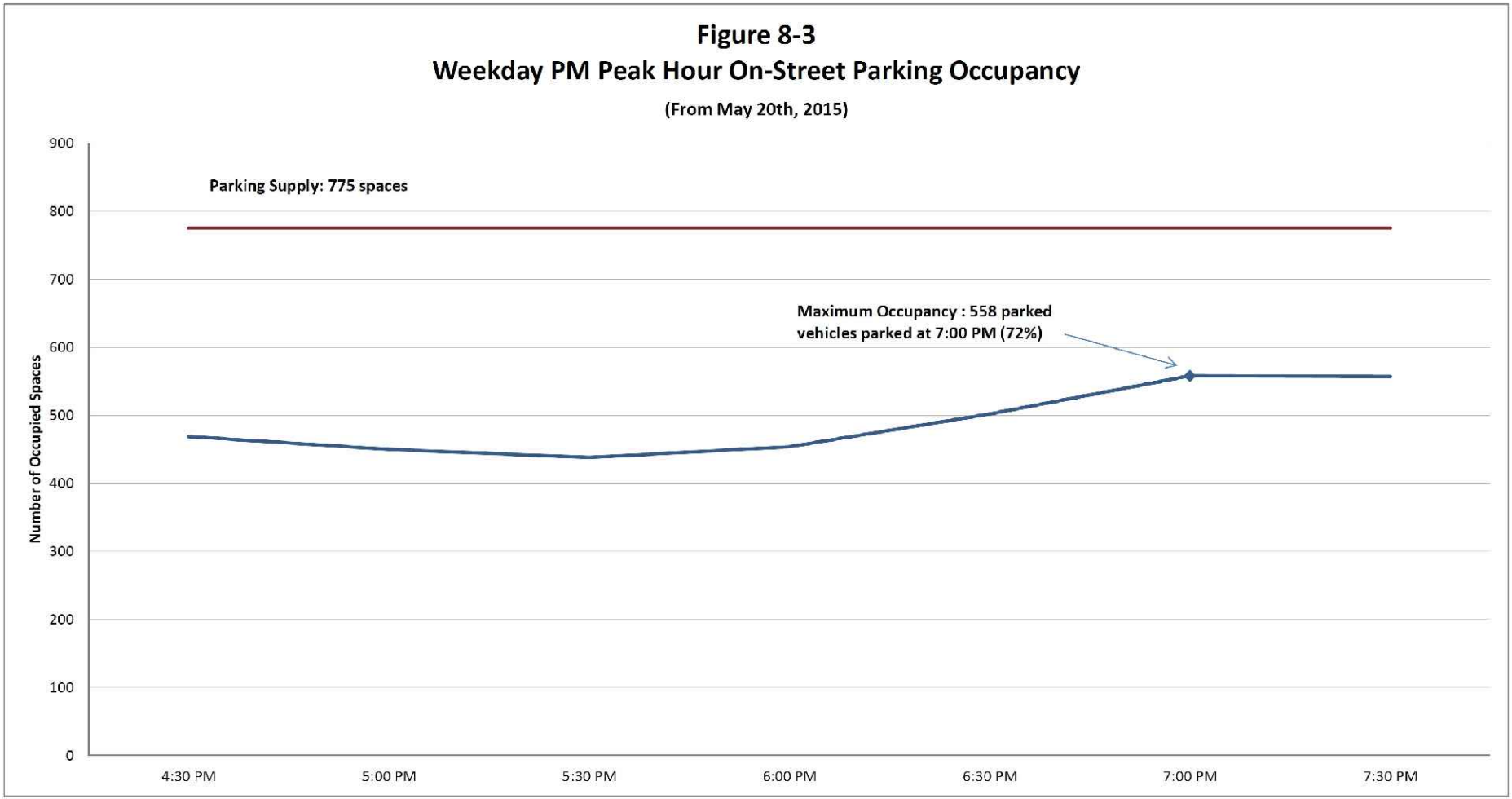

Figure 8-3
Weekday PM Peak Hour On-Street Parking Occupancy

Alfred Street Baptist Church
City of Alexandria, Virginia

NORTH

JCP

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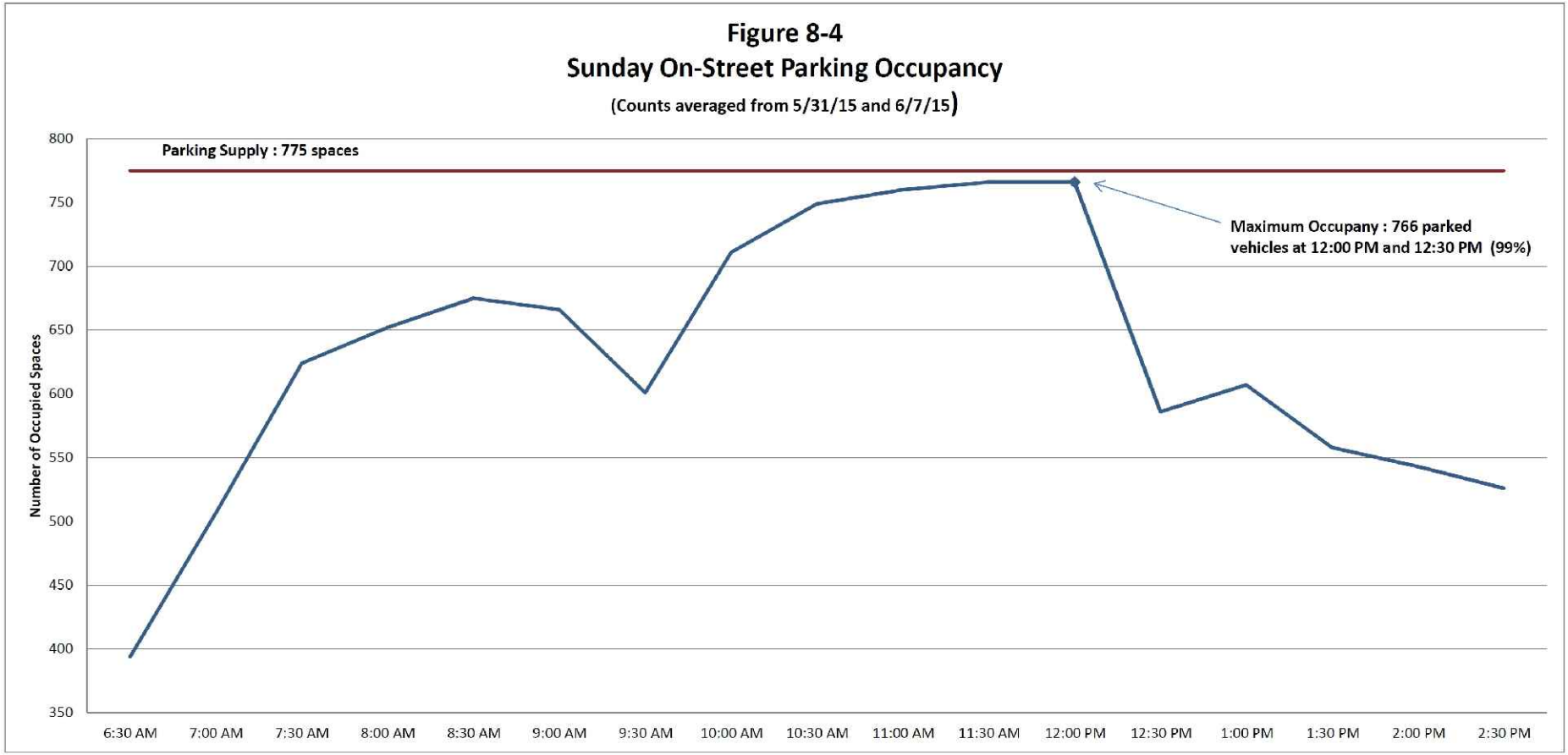

Figure 8-4
Sunday Peak Hour On-Street Parking Occupancy

Alfred Street Baptist Church
City of Alexandria, Virginia

NORTH

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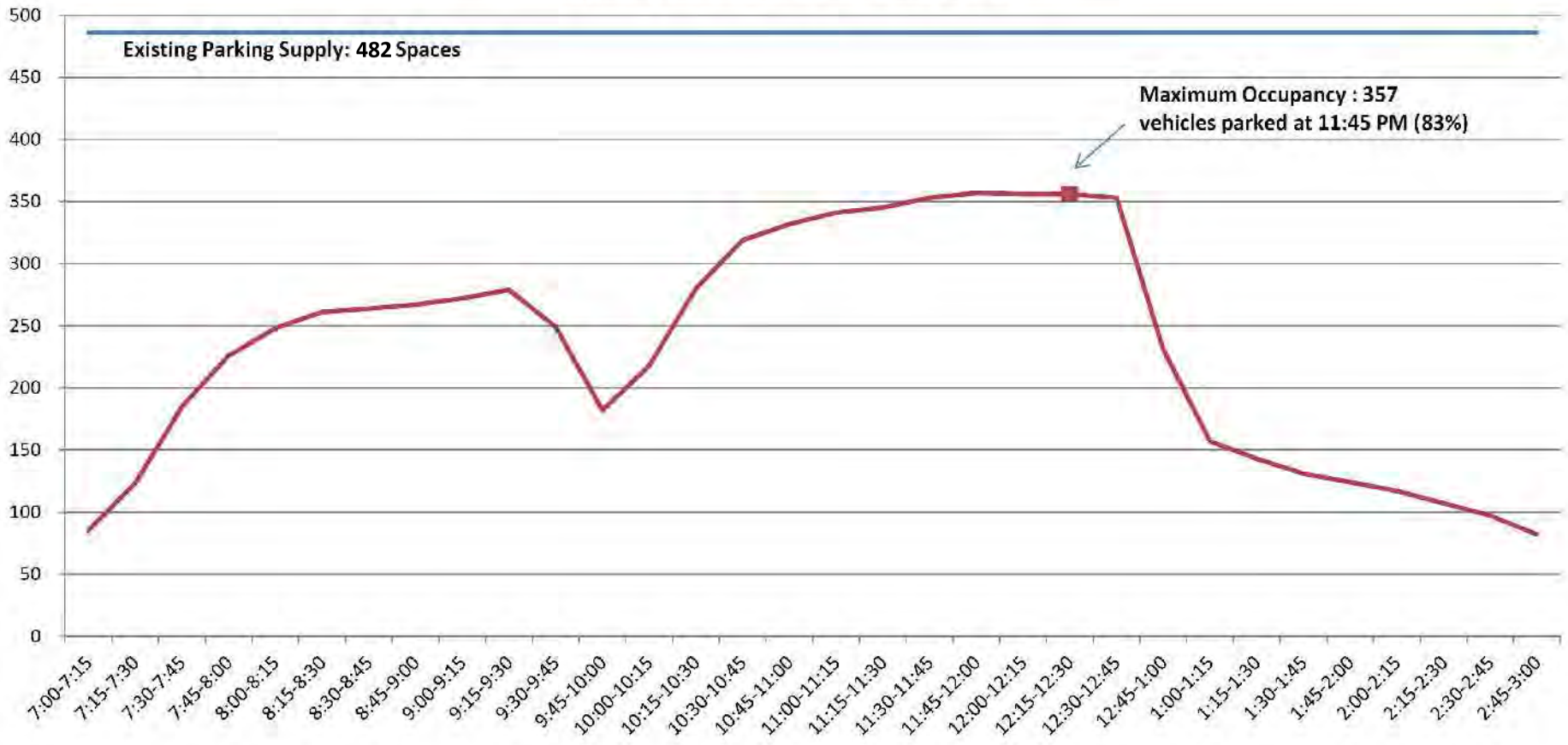

Figure 8-5
Sunday Peak Hour Off-Street Parking Occupancy

Alfred Street Baptist Church
City of Alexandria, Virginia

JCP

NORTH

SECTION 9
CONCLUSIONS AND RECOMMENDATIONS

The conclusions of this traffic impact study are as follows:

1. The 15 signalized study intersections currently operate at overall acceptable levels of service (LOS "D" or better) during the weekday AM, weekday PM and Sunday midday peak periods with the exception of Patrick Street/King Street (weekday AM peak). Some minor street approaches at these intersections operate at LOS "E" or "F" during the AM, PM, and/or Sunday peak periods, this is in part due to long cycle lengths and the majority of time being allocated to mainline U.S. Route 1 (Henry Street and Patrick Street). All of the approaches at the stop controlled intersections currently operate at acceptable levels of service with minimal delay.

2. The results for 2022 conditions without development are generally consistent with those identified under existing conditions. The signalized intersections on Washington Street and U.S. Route 1 would continue to experience peak hour, peak direction congestion. The approaches at the stop controlled intersections would continue to operate at acceptable levels of service during peak periods with minimal delay.

3. The Alfred Street Baptist Church project (232,368 GSF Church with 2,163 seats) is expected to generate an additional 23 weekday AM peak hour trips, 5 weekday PM peak hour trips, 396 Sunday peak hour trips, 444 weekday daily (24-hour) trips, and 1,261 Sunday (24-hour) trips upon completion and full occupancy by 2022. These estimates account for a 10 percent non-auto mode split reduction. The non-auto mode split is related to the bus route that runs directly past the church's main entrance and the existing shuttle service to the King Street Metrorail Station.

4. The results of the 2022 conditions with development indicate that the redevelopment of the site would have only a minor impact on overall delays at the study intersections. At all signalized study intersections, the overall delay would have a net increase of four (4) seconds or less with addition of site generated traffic when compared to future conditions without development during peak periods. Approaches at the stop controlled intersections would realize little or no increase (less than five (5) seconds) in delay with the proposed development when compared to future conditions without development. Given the magnitude of regional traffic along U.S. Route 1 and Washington Street, and the minimal site impact, no vehicular geometric improvements are recommended at the study intersections.

5. The Applicant exceeds the parking requirement of 433 spaces with 458 proposed on-site parking spaces. Additional off-site parking and shuttle service is also offered during service periods and will continue to be offered after the expansion.

6. The church is exempt from providing a formal Transportation Management Plan (TMP). However, the church provides an extensive traffic and parking program for typical

Sundays. The plan includes traffic control personnel at key intersections, agreements for additional off-street parking, and shuttle service provided to the off-site parking facilities and metro. Church administration frequently updates parishioners of available parking and shuttle services in order to most effectively circulate traffic during peak service times. The continued use of this program would help increase the non-auto mode share and reduce traffic and parking impacts.

7. During Sunday peak periods, vehicles on eastbound Wolfe Street could be restricted from turning left onto S. Alfred Street to reduce conflict with the pick-up and drop-off area to the north at the main entrance to the facilities.

8. A layby lane on Alfred Street of approximately 91 feet should be provided to allow for vehicles to Drop-off and pick-up passengers. The existing parking area along the south side of Duke Street between S. Patrick Street and S. Alfred Street is recommended as additional layby lane on Sunday. These measures will allow for overall improvement in traffic flow in the area.

9. To allow greater space for vehicles to execute a right-turn maneuver from eastbound Wolfe Street to southbound Alfred Street, on-street parking along Alfred Street should be restricted within 50 feet of the intersection. During the Sunday peak periods, vehicles on eastbound Wolfe Street should be restricted from turning left onto Alfred Streed to reduced conflicts within the drop-off/pick-up area at the church. These measures will enhance traffic flow operations at this intersection.

10. A hypothetical extension of Wolfe Street to Route 1 is not recommended because the storage length between S. Patrick Street and S. Henry Street is not sufficient to accommodate anticipated queueing. Additionally, it is not recommended that all parking be provided under the site due to the increase in delay and queueing when compared to the proposed distributed parking supply.