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TRAFFIC, TRANSPORTATION, AND PARKING CONSULTANTS

Memorandum

TO: CB Richard Ellis, Inc.,
On Behalf of - The Office of Property Management for the District of Columbia

FROM: Martin J. Wells
Robert T. Kohler

SUBJECT: Transportation Impact Study Addendum

RE: Anacostia Gateway Government Center
Washington, DC

DATE: February 4, 2005

Introduction

This memorandum serves as an addendum to the transportation impact study (TIS) dated January 24, 2005, in support of the Anacostia Gateway Government Center development. This addendum analyzes an alternative two-way operation for Martin Luther King, Jr. Avenue, in the Anacostia area of Southeast Washington, DC. The purpose of this analysis is strictly to compare two (2) two-way scenarios under background and total future conditions.

The TIS accounted for the following two roadway network scenarios:

1. Martin Luther King, Jr. Avenue operating as it does today (two-way conditions south of W Street and one-way conditions north of W Street)

2. Martin Luther King, Jr. Avenue operating under two-way conditions between W Street and the site's proposed traffic circle in front of the MLK Wing of the Anacostia Gateway Government Center

The project team requested that operations of a potential third scenario should be reviewed. This scenario would allow two-way traffic flow on Martin Luther King, Jr. Avenue between W Street and Good Hope Road. This roadway network implements the same improvements and changes as shown in the two-way scenario in the TIS, with one exception: northbound movements on Martin Luther King, Jr. Avenue north of Good Hope Road would be restricted.

Trip Distribution

With the restriction of northbound movements north of Good Hope Road on Martin Luther King, Jr. Avenue, the only changes in trips would occur to those trips to and from the AEDC and Anacostia

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EXHIBIT NO.1E1

Gateway Government Center developments. Therefore, the trip distribution for AEDC and Anacostia Gateway Government Center trips, under this two-way scenario, is the same as under the existing one-way operations of Martin Luther King, Jr. Avenue (as shown in the TIS). The trip assignments for AEDC and Anacostia Gateway Government Center are illustrated on Figures 1A and 2A, respectively.

Analysis

Trips anticipated to be generated by the AEDC development under this two-way scenario were then added to the redistributed and grown existing traffic volumes under the same methodologies employed in the TIS. The resulting background traffic forecasts are depicted on Figure 3A.

The Anacostia Gateway Government Center trips anticipated under this two-way scenario were then added to the background traffic forecasts, depicted on Figure 3A. The resulting total future forecasts are shown on Figure 4A.

Both background and total future levels of service were calculated based on the forecasts on Figures 3A and 4A, respectively. The lane use and traffic controls used for the two-way analyses in the TIS were retained for this analysis, except for the restricted northbound movements on Martin Luther King, Jr. Avenue, north of Good Hope Road. In accord with the TIS, levels of service were calculated using the Highway Capacity Manual (HCM) 2000 methodologies, with Synchro 6 software. Additionally, the signal timings from the TIS were used in this analysis to generate an exact comparison between the scenarios.

Results

The analysis sheets from the capacity analysis for background and total future scenarios are included in Appendices A and B, respectively. Additionally, the levels of service from these reports are summarized in Table 1. Table 1 presents the two-way levels of service from the TIS followed by the two-way levels of service from this alternative scenario, for both background and total future scenarios.

When comparing the both two-way scenarios, overall levels of service at each intersection operate consistent with one another whether Martin Luther King, Jr. Avenue is two-way up to Good Hope Road or the site's traffic circle. However, under total future conditions, the northbound approach at the intersection of Good Hope Road and 13th Street would operate at LOS "F" (with a delay of 83.7 seconds) during the AM peak hour with two-way conditions on Martin Luther King, Jr. Avenue to Good Hope Road, whereas with two-way conditions to the site's traffic circle, this approach would operate at LOS "E" (with a delay of 67.9 seconds). Further, this intersection would be expected to have a slight increase in overall delay (6.5 seconds) when compared to the two-way scenario analyzed in the TIS, during the AM peak hour.

Under total future conditions, the intersection of 13th Street and the site access would be expected to incur a 13.5 second increase in delay for the eastbound left movement, when compared to the two-way scenario in the TIS, during the AM peak hour.

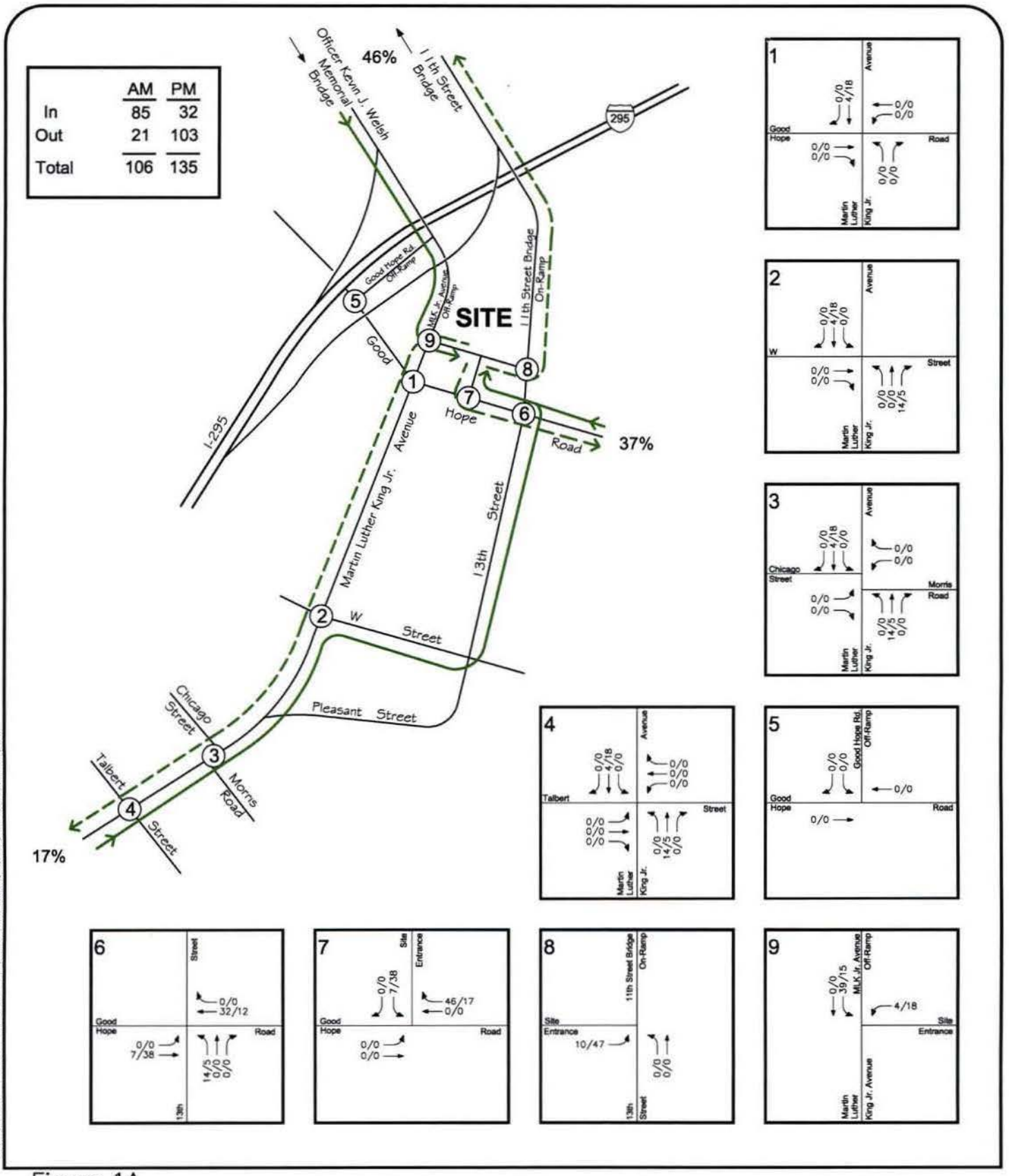


Figure 1A
A.E.D.C. Traffic Assignments And Directional Distribution, With Two-Way Street Network
(Between W Street And Good Hope Road)

Outbound
Inbound
AM PEAK HOUR
PM PEAK HOUR
000/000
North Schematic

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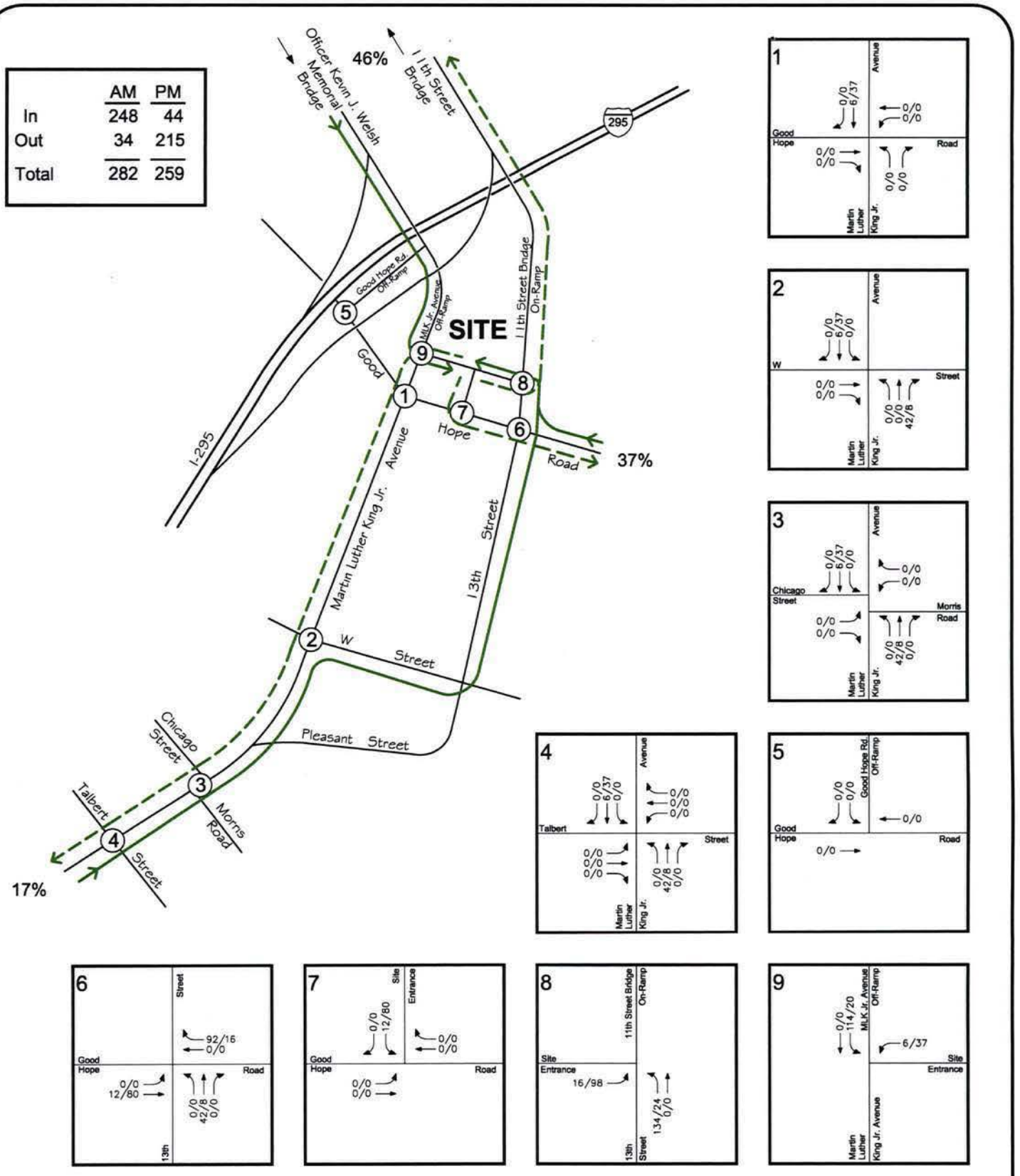


Figure 2A
Site-Generated Traffic Assignments And Directional Distribution, With Two-Way Street Network (Between W Street And Good Hope Road)

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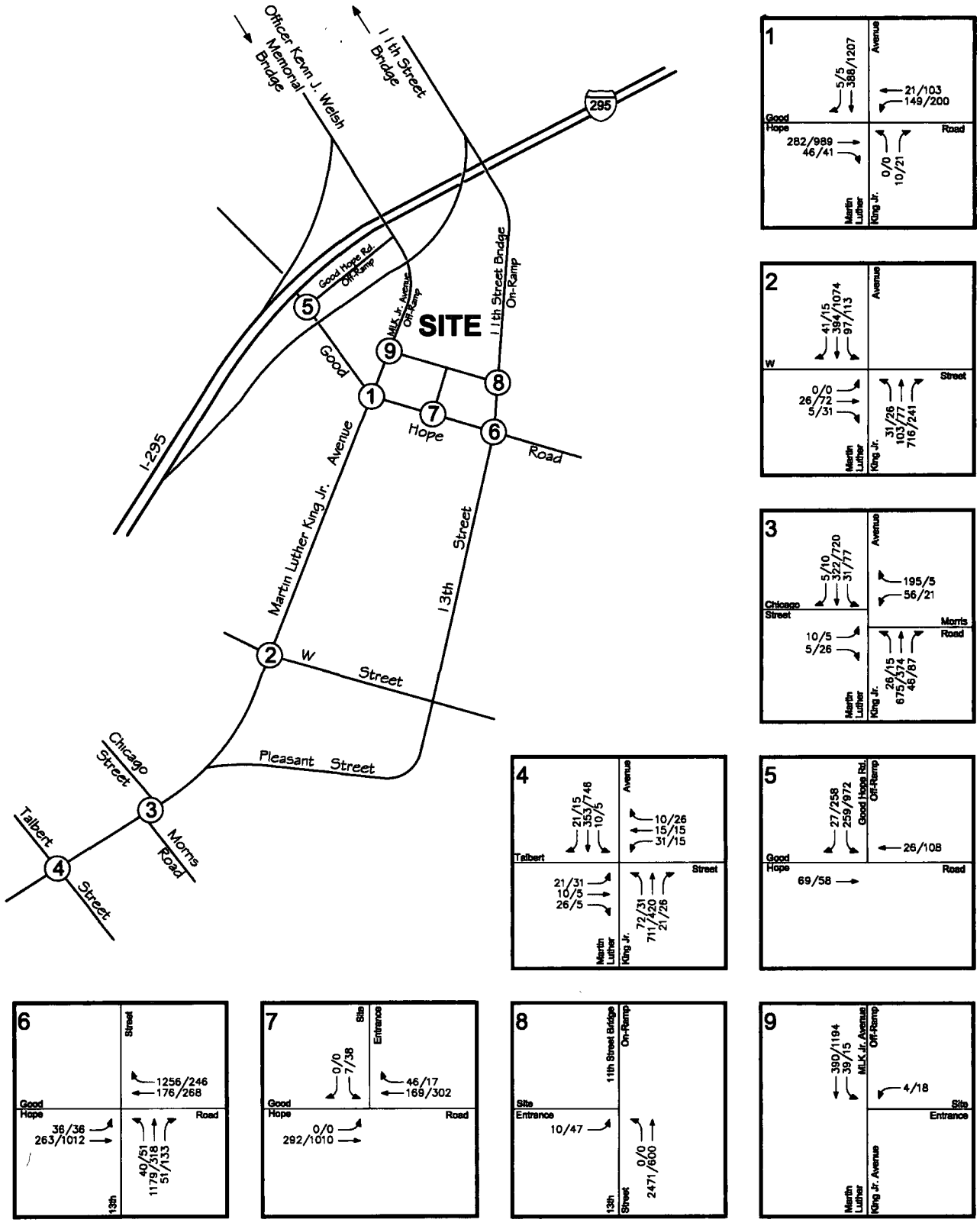


Figure 3A
Background Future Peak Hour Traffic Forecasts,
With Two-Way Street Network
(Between W Street And Good Hope Raod)

AM PEAK HOUR
PM PEAK HOUR
000/000

North
Schematic

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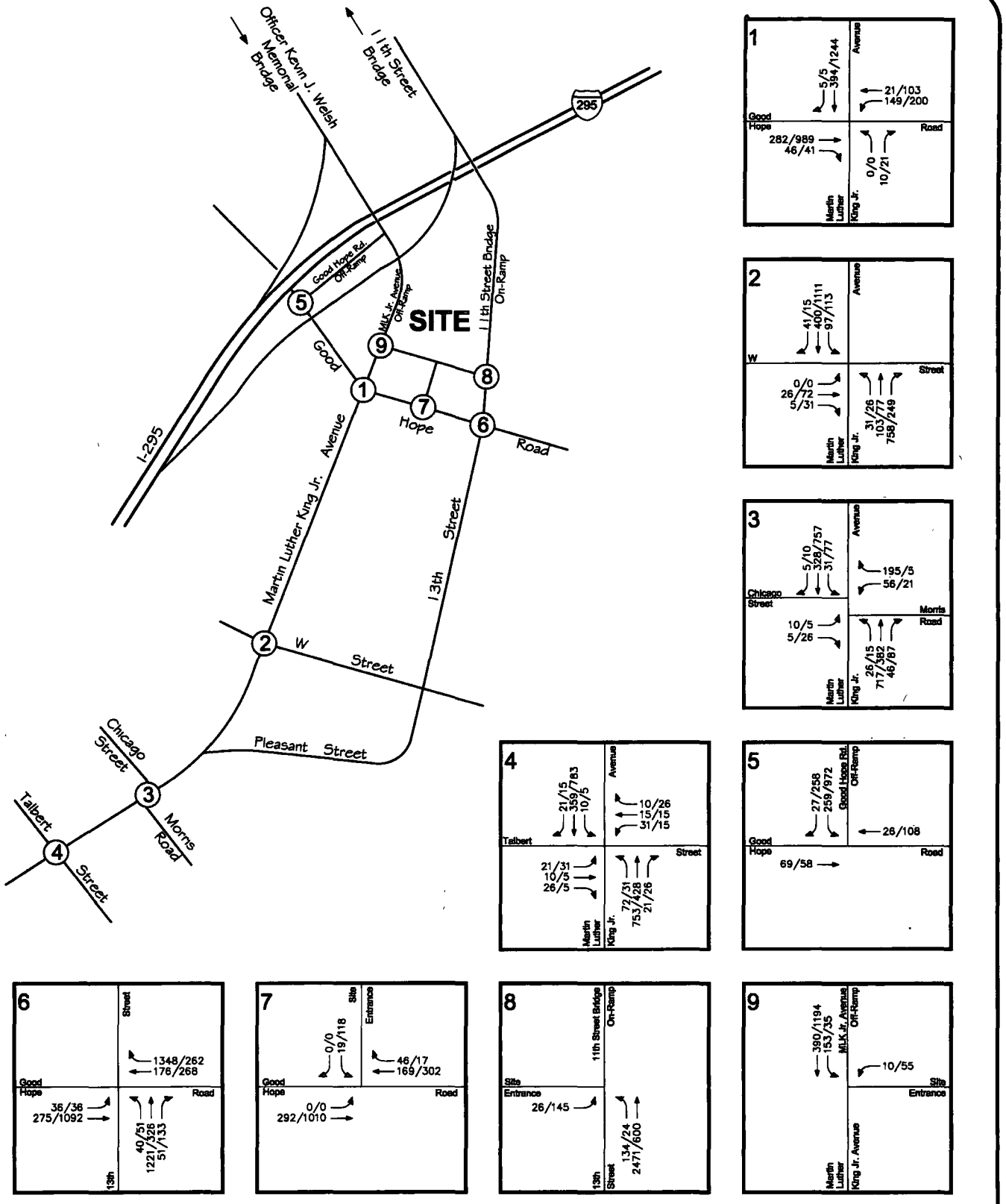


Figure 4A
Total Future Peak Hour Traffic Forecasts,
With Two-Way Street Network
(Between W Street And Good Hope Road)

AM PEAK HOUR
PM PEAK HOUR
000/000

North
Schematic

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Table 1
Anacostia Gateway Government Center
Level of Service Summary (1) (2) (3) (4)

Intersection	Traffic Control	Critical Movement	Future Without AGGC (FROM TIS) Two-Way (5) AM	Future Without AGGC (FROM TIS) Two-Way (5) PM	Future Without AGGC Two-Way (5) AM	Future Without AGGC Two-Way (5) PM	Future With AGGC (FROM TIS) Two-Way (5) AM	Future With AGGC (FROM TIS) Two-Way (5) PM	Future With AGGC Two-Way (5) AM	Future With AGGC Two-Way (5) PM
1. Martin Luther King Jr Avenue/	SIGNAL	EB	C (20.1)	F (117.1)	C (20 1)	F (117 1)	C (20 0)	F (117.1)	C (20.0)	F (117.1)
MLK, Jr. Avenue Off-Ramp/		WB	C (24.9)	F (121 9)	C (24 9)	F (121 9)	C (24.9)	F (121.9)	C (24.8)	F (121.9)
Good Hope Road		NB	A (9.3)	D (46.5)	B (19.8)	C (20 5)	B (11 8)	D (35.8)	B (19.8)	C (20.5)
		SB	C (23.4)	F (87.2)	C (23.4)	F (87.2)	C (23.5)	F (100.1)	C (23.5)	F (100.1)
		Overall	**C (21.2)**	**F (104.5)**	**C (22.0)**	**F (104.2)**	**C (20.3)**	**F (108.2)**	**C (22.0)**	**F (108.9)**
2. Martin Luther King, Jr. Avenue/	SIGNAL	EB	C (29 5)	C (33 5)	C (29.5)	C (33.5)	C (29 5)	C (33.5)	C (29.5)	C (33.5)
W Street		NB	B (15.6)	A (6 5)	B (15.1)	A (6.1)	B (18 6)	A (7 7)	B (15.9)	A (6.4)
		SB	A (4.7)	A (4.5)	A (4.6)	A (4.3)	A (4.9)	A (5.7)	A (4.7)	A (5.2)
		Overall	**B (12.6)**	**A (7.0)**	**B (12.1)**	**A (6.7)**	**B (14.9)**	**A (8.1)**	**B (12.8)**	**A (7.4)**
3a. Martin Luther King, Jr Avenue/	SIGNAL	EB	C (25.5)	C (34.3)	C (25.5)	C (34.3)	C (25.5)	C (34.3)	C (25.5)	C (34 3)
Chicago Street/		NB	A (2.0)	A (0.6)	A (2.0)	A (0 6)	A (2.2)	A (0.6)	A (2.2)	A (0.6)
		SB	C (28.9)	B (10.2)	C (28.9)	A (10.0)	C (29.0)	A (9.9)	C (29.0)	A (9.4)
		Overall	**B (10.4)**	**A (8.3)**	**B (10.4)**	**A (8.1)**	**B (10.4)**	**A (8.1)**	**B (10.4)**	**A (7.7)**
3b. Martin Luther King, Jr. Avenue/	SIGNAL	WB	D (42 9)	C (34 7)	D (42 9)	C (34 7)	D (42.9)	C (34.7)	D (42.9)	C (34.7)
Morris Street/		NB	D (48.1)	A (8 3)	D (48.1)	A (8.3)	E (56.9)	A (8.3)	E (56.9)	A (8.3)
		SB	A (0.2)	A (0.5)	A (0.2)	A (0.5)	A (0.2)	A (0.5)	A (0.2)	A (0.5)
		Overall	**D (35.2)**	**A (4.1)**	**D (35.2)**	**A (4.1)**	**D (40.1)**	**A (4.6)**	**D (40.1)**	**A (4.6)**
4 Martin Luther King, Jr Avenue/	SIGNAL	EB	B (19.6)	C (20 1)	B (19.6)	C (20 1)	C (20 1)	C (20.1)	C (20.1)	C (20.1)
Talbert Street		WB	C (20.0)	B (20.0)	C (20.0)	B (20 0)	C (20 5)	B (20.0)	C (20.5)	B (20 0)
		NB	A (4 5)	B (11.3)	A (4 5)	B (11 3)	A (4.6)	B (11.3)	A (4.6)	B (11 3)
		SB	A (3.7)	B (17.6)	A (3.7)	B (17.8)	A (3.7)	B (17.0)	A (3.7)	B (17.5)
		Overall	**A (6.1)**	**B (15.7)**	**A (6.1)**	**B (15.8)**	**A (6.1)**	**B (15.4)**	**A (6.1)**	**B (15.7)**
5 Good Hope Road/	SIGNAL	EB	B (12.8)	C (22.5)	B (12.8)	C (22.5)	B (12.8)	C (22.5)	B (12.8)	C (22.5)
Good Hope Road Off-Ramp		WB	B (15 6)	D (36.1)	B (15.6)	D (36.1)	B (16.5)	C (34 7)	B (16 5)	C (34.7)
		SB	B (13.6)	B (13.4)	B (13.6)	B (13.4)	B (13.6)	B (13.4)	B (13.6)	B (13.4)
		Overall	**B (13.6)**	**B (15.5)**	**B (13.6)**	**B (15.5)**	**B (13.6)**	**B (15.4)**	**B (13.6)**	**B (15.4)**
6. Good Hope Road/	SIGNAL	EB	B (15 8)	C (24.9)	B (15.8)	C (24.9)	B (19.9)	C (23 8)	B (19.9)	C (23.8)
13th Street		WB	D (44.3)	A (9.0)	D (44.3)	A (9.0)	E (58.5)	A (7.1)	E (58.5)	A (7.1)
		NB	E (67.9)	D (36.2)	E (72.1)	D (36.3)	E (67.9)	D (40.8)	F (83.7)	D (41.1)
		Overall	**D (50.1)**	**C (23.4)**	**D (51.9)**	**C (23.5)**	**E (57.1)**	**C (23.4)**	**E (63.6)**	**C (23.6)**
7 Good Hope Road/	STOP	EBLT	-	-	-	-	-	-	-	-
Site Access		SBLR	B [11 0]	C [20 8]	B [11.0]	C [20 9]	B [11 1]	D [29.7]	B [11.2]	D [29.9]
8 13th Street/	STOP	EBL	D [32.2]	B [11.1]	D [32.2]	B [11 1]	F [55.2]	B [13.0]	F [68.7]	B [13.4]
11th Street Bridge On-Ramp/		NBL	-	-	-	-	A [1 6]	A [0.6]	A [2.3]	A [0.9]
Site Access										
9 Martin Luther King, Jr. Avenue/	STOP	WBL	B [10.6]	B [15.0]	B [10.6]	B [15.0]	B [13 8]	C [17.3]	B [13 8]	C [17.3]
Site Access		SBLT	A [1.8]	A [0.4]	A [1 8]	A [0 4]	A [4.5]	A [0.8]	A [4.4]	A [0.6]

Notes:

(1) Analyses based on HCM method using Synchro Software, Version 6.

(2) Numbers in parentheses, ( ), represent approach delay, in seconds per vehicle for signalized intersections.

(3) Numbers in brackets, [ ], represent approach delay, in seconds per vehicle for unsignalized intersections

(4) Err signifies a delay that Synchro does not report

(5) Improvements include the following:

- Martin Luther King, Jr Avenue: Remove curb parking to create a northbound travel lane, up to Good Hope Road.
- Good Hope Road/Good Hope Road Off-Ramp Restripe existing pavement to create a designated southbound left and shared left-right turn lane, and signalize intersection
- Good Hope Road between Good Hope Road Off-Ramp and CSX railroad tracks Widen pavement to 36 feet.
- Good Hope Road between CSX railroad tracks and about 100 feet east of 13th Street: Restrict curb parking during peak hours
- Signalized intersections: Adjust signal timings and offsets to yield better levels of service

Conclusion

In conclusion, there is no substantial difference in traffic operations when Martin Luther King, Jr. Avenue operates two-way up to Good Hope Road or the site's proposed traffic circle, aside from the delays as referenced above.

If you have any additional comments or questions, please do not hesitate to contact me or Robert Kohler of my office at 703.917.6620.

Sincerely,

Martin J. Wells
President

ANACOSTIA GATEWAY GOVERNMENT CENTER
TRANSPORTATON IMPACT STUDY
WASHINGTON, D.C.

Prepared on Behalf of:
The Office of Property Management
For the District of Columbia

Prepared for:
CB Richard Ellis, Inc.

Prepared by:
Wells & Associates, LLC

January 24, 2005

WELLS & ASSOCIATES, LLC
TRAFFIC, TRANSPORTATION, AND PARKING CONSULTANTS

ANACOSTIA GATEWAY GOVERNMENT CENTER
TRANSPORTATON IMPACT STUDY
WASHINGTON, D.C.

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INTRODUCTION

Study Purpose

This report presents the results of a transportation impact study of the proposed Anacostia Gateway Government Center (AGGC).

The subject site, which is owned by the District of Columbia government, generally is located north of Good Hope Road, south of the railroad right-of-way that will be used by the light rail starter line, east of Martin Luther King, Jr. Avenue, and west of 13th Street, in the southeast quadrant of Washington, D.C., as shown on Figure 1. The site is located at the south end of the Officer Kevin J. Welsh Memorial Bridge, approximately one half mile from the entrance to the Anacostia Metro Station and adjacent to the light rail starter line station.

The site consists of: Parcel 224/31; Lot 17 of Square 5600; Lots 54, 858, 859, 860, and part of Lot 857 in Square 5601; the public alleys that traverses Square 5601; and the portion of S Street that divides Squares 5600 and 5601. Both alleys and this portion of S Street are proposed to be closed by the District government.

The site presently is improved with an Amoco gas station on Lot 54. The subject property presently is zoned C-M-1, C-3-A, and R-3.

CB Richard Ellis, Inc. has been retained to advise the District government as they develop the subject site with a general office building totaling approximately 350,000 S.F. of space. As shown on Figure 2, a 310,000 S.F. office building (Martin Luther King, Jr. Wing, hereafter MLK Wing) would be constructed north of a new east-west service road. Additionally, a 40,000 S.F. office building (Good Hope Wing) would be constructed south of the service road, in the northwest quadrant of the 13th Street/Good Hope Road intersection. The AGGC will become the new headquarters for the District Department of Transportation (DDOT).

A 25-children capacity day care center also would be included in the AGGC. Use of the day care center would be limited to employees of the building. Ancillary ground-floor retail uses may be added in the future.

The Anacostia Economic Development Corporation (AEDC) proposes separately to develop a multi-level office building in the northeast quadrant of the Martin Luther King, Jr. Avenue/Good Hope Road intersection. This project is distinct from the AGGC project.

Both wings of the AGGC office building would be served by a three-level, underground parking garage. The District government is seeking to reduce the District of Columbia Municipal Regulations (hereafter referred to as Municipal Regulations) parking requirement of 581 spaces by 25 percent, to 436 spaces.

Vehicular access to the garage would be provided by: (1) a full-movement driveway that will be located at the intersection of new, on-site, east-west and north-south service roads, and (2) a secondary access point that will be located on 13th Street. Loading would be provided from the east-west service road, immediately east of the garage driveway. Vehicular access to the AEDC building would be provided by the new north-south service road that would connect Good Hope Road and the new east-west service road.

This transportation impact study was prepared in support of a Planned Unit Development (PUD) application for the AGGC.

Previous Studies

The Anacostia Gateway Transportation Study recently was completed for DDOT by JMT[1]. JMT also conducted a traffic impact analysis of the proposed AGGC and AEDC office buildings[2].

One of the goals of the Anacostia Gateway Transportation Study was to develop a multi-modal transportation design and management plan that preserves, strengthens, or creates a vibrant, diversified residential and commercial neighborhood. DDOT is considering several innovative transportation improvements that would affect the subject site, consistent with this goal. Martin Luther King, Jr. Avenue may be transformed from a one-way street that begins at an exit ramp from the southbound Officer Kevin J. Welsh Memorial Bridge (hereafter referred to as the MLK, Jr. Avenue Off-Ramp) to a local, two-way street with a sense of place, emphasizing the uniqueness of the Anacostia Gateway community. The two-way section could terminate at a roundabout on the west side of the MLK Wing building entry.

The southbound Officer Kevin J. Welsh Memorial Bridge also has an off-ramp that intersects with Good Hope Road near Anacostia Park. To differentiate between both of the off-ramps, this ramp will be referred to as the Good Hope Road Off-Ramp.

The proposed light rail starter line recommended in the Anacostia Waterfront Initiative (AWI) also would run along the northern boundary of the site. This line, which presently is under construction, will link Bolling Air Force Base, Barry Farms, the Anacostia Metro Station, the AGGC, Fairlawn/16th Street, and Pennsylvania Avenue.

[1] JMT, Anacostia Gateway Transportation Study, August, 2003.
[2] JMT, Traffic Impact Study for the Proposed Government Center in Anacostia, D.C., September 10, 2004.

Study Scope

The following intersections are included in the study area:

1. Martin Luther King, Jr. Avenue/MLK, Jr. Avenue Off-Ramp/ Good Hope Road,
2. Martin Luther King, Jr. Avenue/W Street,
3. Martin Luther King, Jr. Avenue/Morris Road/Chicago Street,
4. Martin Luther King, Jr. Avenue/Talbert Street,
5. Good Hope Road/Good Hope Road Off-Ramp,
6. Good Hope Road/13th Street,
7. Good Hope Road/Proposed Site Driveway,
8. 13th Street/Proposed Site Driveway, and
9. Martin Luther King, Jr. Avenue/MLK, Jr. Avenue Off-Ramp/ Proposed Site Driveway.

Tasks undertaken in this study included the following:

1. Review C.B. Richard Ellis and Heery International's proposed development plans, previous transportation studies, and other background data.

2. A field reconnaissance of existing roadway and intersection geometrics, traffic controls, traffic signal phasing/timings, and speed limits.

3. Coordination with DDOT staff regarding the traffic study scope.

4. Compilation of counts of existing vehicular and pedestrian traffic at six key off-site intersections.

5. Re-assignment of existing traffic to reflect the possible conversion of Martin Luther King, Jr. Avenue from one-way to two-way operation.

6. Analysis of existing levels of service, with both one-way and two-way operation of Martin Luther King, Jr. Avenue.

7. Background future traffic volumes were forecasted for project buildout, with both one-way and two-way operation of Martin Luther King, Jr. Avenue.

8. Background levels of service were calculated at key intersections with both one-way and two-way operation of Martin Luther King, Jr. Avenue.

9. The number of AM and PM peak hour trips that would be generated by the proposed project were estimated based on: (1) Institute of Transportation Engineers (ITE) trip generation rates, (2) the proximity of the project to the Anacostia Metro Station, and (3) experience with other comparable projects in Washington, D.C.

10. Total future traffic volumes were forecasted for 2008, with the current one-way street pattern and potential future two-way street pattern.

11. Total future levels of service were calculated at key intersections with both one-way and two-way operation of Martin Luther King, Jr. Avenue.

12. Physical and operational improvements required to adequately accommodate projected traffic volumes were identified.

Sources of data for this analysis included traffic counts conducted by Wells & Associates and JMT, ITE, the Washington Metropolitan Area Transit Authority (WMATA), the District of Columbia, Heery International, and C.B. Richard Ellis.

The conclusions of this study are as follows:

1. ***The Anacostia Gateway Government Center (AGGC) site is well served by a connected network of arterial and local streets, Metrobus and Metrorail services, and the light rail starter line that is now under construction.***

2. ***The Martin Luther King, Jr. Avenue/MLK, Jr. Off-Ramp/Good Hope Road, Martin Luther King, Jr. Avenue/W Street, and Good Hope Road/13th Street intersections presently operate at or near capacity at level of service (LOS) "E" or "F" during the AM or PM peak hours. These failures are attributable to the heavy volumes of motorists traveling from home to work in the D.C. core in the morning and traveling from work to home in the afternoon.***

3. ***The approved AEDC building would generate a total of 106 AM peak hour vehicle-trips and 135 PM peak hour vehicle-trips, upon completion and full occupancy.***

4. ***Background traffic growth is estimated at one-half percent per year.***

5. ***The AEDC and background traffic growth would not significantly change projected background future intersection level of service. The Martin Luther King, Jr. Avenue/MLK, Jr. Avenue Off-Ramp/Good Hope Road, Martin Luther King, Jr. Avenue/W Street, and Good Hope Road/13th Street intersections would operate at LOS "F" during the AM or PM peak hours.***

6. ***The AGGC is anticipated to generate 282 AM peak hour trips, and 259 PM peak hour trips, at project buildout. These estimates reflect a 40 percent non-auto mode split and average auto occupancy of 1.20 persons per vehicle. It is estimated that about half of all parking spaces would turn over during peak hours.***

7. ***Nearly half of all AGGC traffic would not use the streets in Anacostia; they would enter and exit the area via the MLK, Jr. Avenue Off-Ramp and the 11th Street Bridge instead.***

8. ***The AGGC would not significantly change projected future intersection levels of service. The Martin Luther King, Jr. Avenue/MLK, Jr. Off-Ramp/Good Hope Road, Martin Luther King, Jr. Avenue/W Street, and Good Hope Road/13th Street intersections would continue to operate at LOS "F" during the AM or PM peak hours.***

9. ***Converting Martin Luther King, Jr. Avenue from one-way to two-way operation between W Street and the roundabout on the west side of the main AGGC building entry would mitigate projected background future capacity deficiencies. Two-way conversion of Martin Luther King, Jr. Avenue would require the following improvements:***

    A. ***Prohibit southbound left turns from the MLK, Jr. Off-Ramp onto eastbound Good Hope Road,***
    B. ***Install a new traffic signal at the Good Hope Road/Good Hope Road Off-Ramp intersection,***
    C. ***Widen Good Hope Road between the Good Hope Road Off-Ramp and the existing CSX railroad tracks,***
    D. ***Re-stripe the Good Hope Road Off-Ramp to include two lanes,***
    E. ***Prohibit curb parking on both sides of Good Hope Road between the Good Hope Road Off-Ramp and approximately 100 feet east of 13th Street during peak hours , and***
    F. ***Install appropriate signs and pavement marking and modify existing traffic signals on Martin Luther King, Jr. Avenue.***

10. ***The results of the analyses with Martin Luther King, Jr. Avenue operating under two-way conditions would remain the same, so long as Martin Luther King, Jr. Avenue is operated as two-way between W Street and the site's east-west service road, whether or not a roundabout is constructed in front of the MLK Wing. Additionally, we are aware that the District Department of Transportation (DDOT) may consider two-way conditions on Martin Luther King, Jr. Avenue between W Street and Good Hope Road. This analysis will be submitted in a supplemental document.***

11. ***A 25 percent parking reduction is justified at the AGGC based on: the proximity of the AGGC to the new light rail starter line; superior Metrobus service; and DDOT's commitment to smart commuting habits. A 25 percent reduction would result in a requirement for 436 spaces, which would: adequately accommodate actual AGGC parking demands; provide a reasonable, 52-space, 13 percent buffer between parking supply and demand; and ensure that there would be no spillover parking into adjacent residential neighborhoods.***



Figure 1
Site Location

North
Schematic

Anacostia Gateway Government Center
Washington, D.C.

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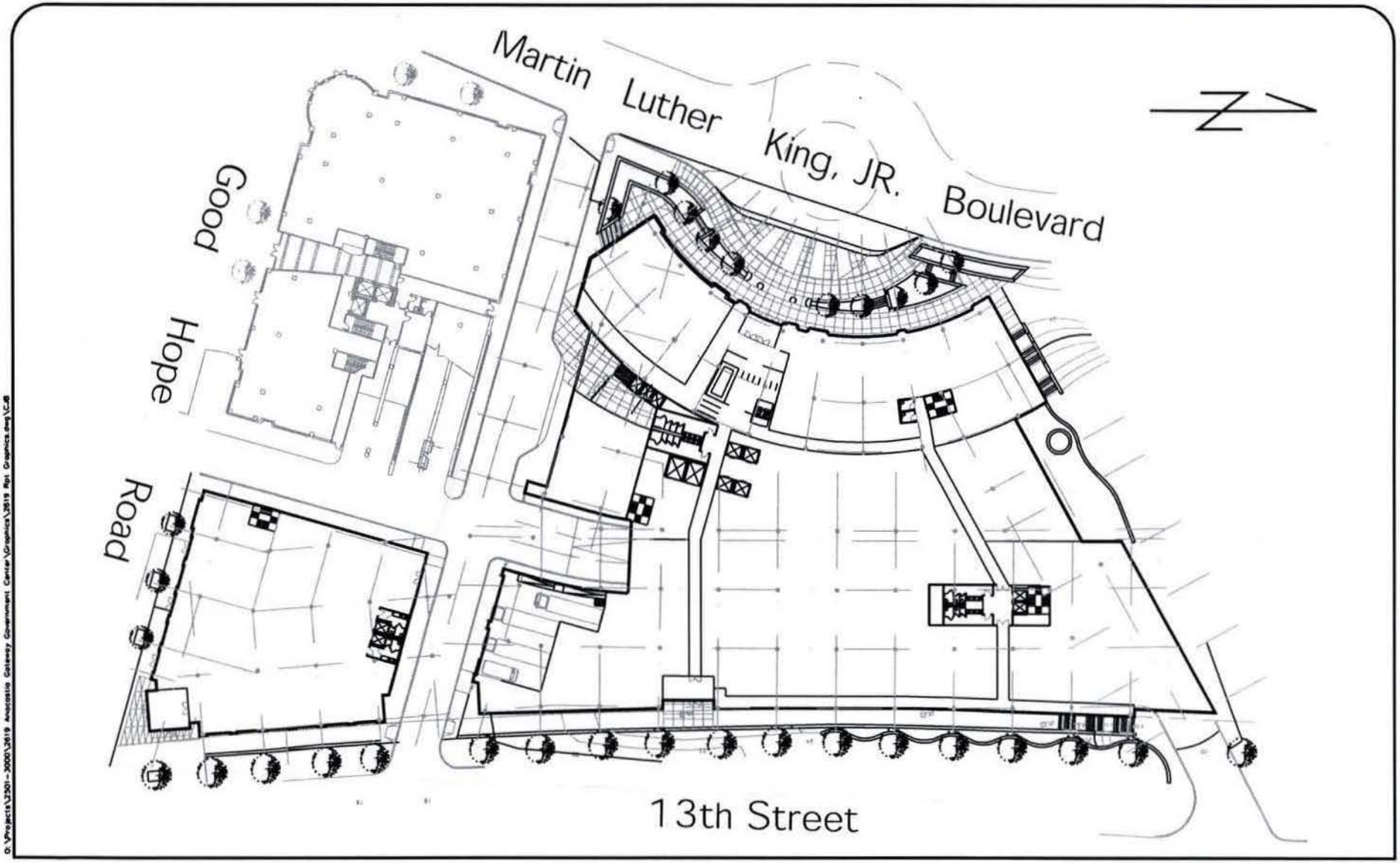


Figure 2
Proposed Site Plan

Anacostia Gateway Government Center
Washington, D.C.

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BACKGROUND DATA

Public Road Network

Overview. Regional access to the AGGC is provided by I-395 (Southeast Freeway), I-295 (Anacostia Freeway), and the Officer Kevin J. Welsh Memorial and 11th Street Bridges. Local access is provided by Martin Luther King, Jr. Avenue, 13th Street, and Good Hope Road. Existing intersection lane use and traffic control at key intersections in the site vicinity are shown on Figure 3.

Martin Luther King, Jr. Avenue operates one-way southbound from the MLK, Jr. Avenue Off-Ramp to W Street. This street is four lanes wide, with two travel lanes and two curb parking lanes. Two-hour curb parking is permitted on the west (or right) side of MLK Avenue between 9:30 AM and 4:00 PM, Monday through Friday; curb parking on this side of the street is prohibited from 7:00 to 9:30 AM and from 4:00 to 6:30 PM. Parking is limited to 30 minutes or one hour on the east (or left) side of MLK from 7:00 AM to 6:30 PM, Monday through Friday. Traffic signals control the intersections of Martin Luther King, Jr. Avenue with Good Hope Road, W Street, Morris Road/Chicago Street, and Talbert Street. DDOT classifies Martin Luther King, Jr. Avenue as a minor arterial.

13th Street operates one-way northbound from W Street to the 11th Street Bridge. This street is three lanes wide with one travel lane and two curb parking lanes. Curb parking is prohibited on both sides of 13th Street from 7:00 to 9:30 AM and from 4:00 to 6:30 PM.

Good Hope Road is a two-way minor arterial with traffic signals at Martin Luther King, Jr. Avenue, 13th Street, 14th Street, Minnesota Avenue, and 16th Street.

Two-Way Conversion. DDOT is considering converting Martin Luther King, Jr. Avenue from a one-way street to a local, two-way street with a sense of place, emphasizing the uniqueness of the Anacostia Gateway community. The two-way section could terminate at a roundabout on the west side of the MLK Wing building entry. Left turns from the southbound MLK, Jr. Avenue Off-Ramp onto eastbound Good Hope Road could be prohibited. Instead, motorists could exit at the Good Hope Road Off-Ramp adjacent to Anacostia Park, turn left onto Good Hope Road, and then proceed straight through the Martin Luther King, Jr. Avenue intersection.

If Martin Luther King, Jr. Avenue is converted to two-way operations, it is recommended that the Good Hope Road Off-Ramp be operated as a left turn lane and an optional left/right turn lane at a signalized intersection with Good Hope Road. Curb parking should be prohibited during peak periods on both sides of Good Hope Road between this off-ramp and approximately 100 feet east of 13th Street.

Figure 4 shows the potential future intersection lane use and traffic control at key intersections with this one-way to two-way conversion and left turn prohibition.

Vehicular Access Concept

Vehicular access to the garage would be provided by: (1) a full-movement driveway that will be located at the intersection of new, on-site, east-west and north-south service roads, and (2) a secondary access point that will be located on 13th Street, as shown on Figure 2. The east-west service road would connect Martin Luther King, Jr. Avenue and 13th Street. Loading also would be provided from this east-west service road. Vehicular access to the adjacent, proposed AEDC building would be provided by a new north-south service road that would connect Good Hope Road and the new east-west service road.

Existing Traffic Counts

One-Way Street Network. Most of the existing AM and PM peak period vehicular and pedestrian traffic counts that were used in this study were obtained from the Anacostia Gateway Transportation Study. Wells & Associates conducted additional counts at the Good hope Road/Good Hope Road Off-Ramp intersection. The results are included in Appendix A and summarized on Figure 5.

Traffic on the MLK, Jr. Avenue Off-Ramp from the Officer Kevin J. Welsh Memorial Bridge, and the 11th Street Bridge On-Ramp, clearly is oriented northbound towards the central business district (CBD) in the morning and southbound away from the CBD in the afternoon. The southbound MLK, Jr. Avenue Off-Ramp is used by only 630 vehicles during the AM peak hour and 2,065 vehicles during the PM peak hour. Conversely, the northbound 11th Street Bridge On-Ramp is used by 2,410 vehicles during the AM peak hour and only 585 vehicles during the PM peak hour. Northbound vehicles outnumber southbound vehicles nearly four to one during the AM peak hour; southbound vehicles outnumber northbound vehicles 3.5 to one during the PM peak hour.

Figure 5 indicates that the one-way southbound Martin Luther King, Jr. Avenue presently carries 565 AM peak hour trips and 1,395 PM peak hour trips; the one-way northbound 13th Street presently carries 1,235 AM peak hour trips and 505 PM peak hour trips. Good Hope Road, east of 13th Street, presently carries 1,665 AM peak hour trips and 1,570 PM peak hour trips.

Two-Way Street Network. Figure 6 shows these existing traffic counts re-assigned to a two-way Martin Luther King, Jr. Avenue.

Public Transportation Facilities and Services

The AGGC site is served by nine Metrobus lines; the nearby Anacostia Metro Station is served by 23 Metrobus lines. The Anacostia Metro station is located approximately one-half mile south of the AGGC site via Martin Luther King, Jr. Avenue and Howard Road.

The new Anacostia Rail Project, which presently is under construction, is scheduled to be open for revenue service in 2006. This project uses three miles of existing railroad right-of-way. Stations are planned at Bolling Air Force Base, Barry Farms, the Anacostia Metro Station, Old Anacostia, Fairlawn/16th Street, and Pennsylvania Avenue, as shown on Figure 7. The Old Anacostia stop is within easy walking distance of the AGGC.

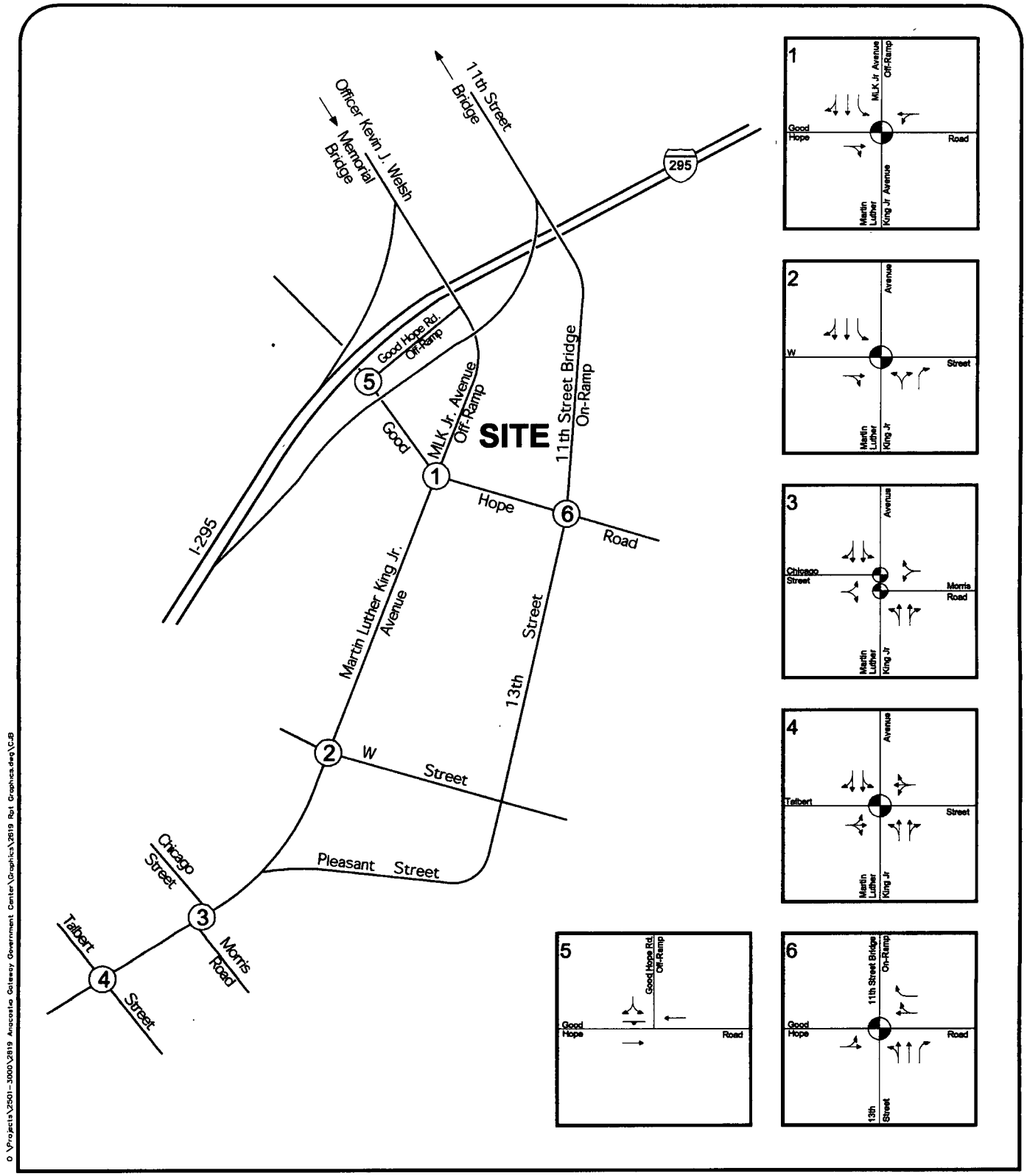


Figure 3
Intersection Lane Use and Traffic Controls, With One-Way Street Network

Represents One Travel Lane
Signalized Intersection
Stop Sign
North Schematic

Anacostia Gateway Government Center
Washington, D.C.

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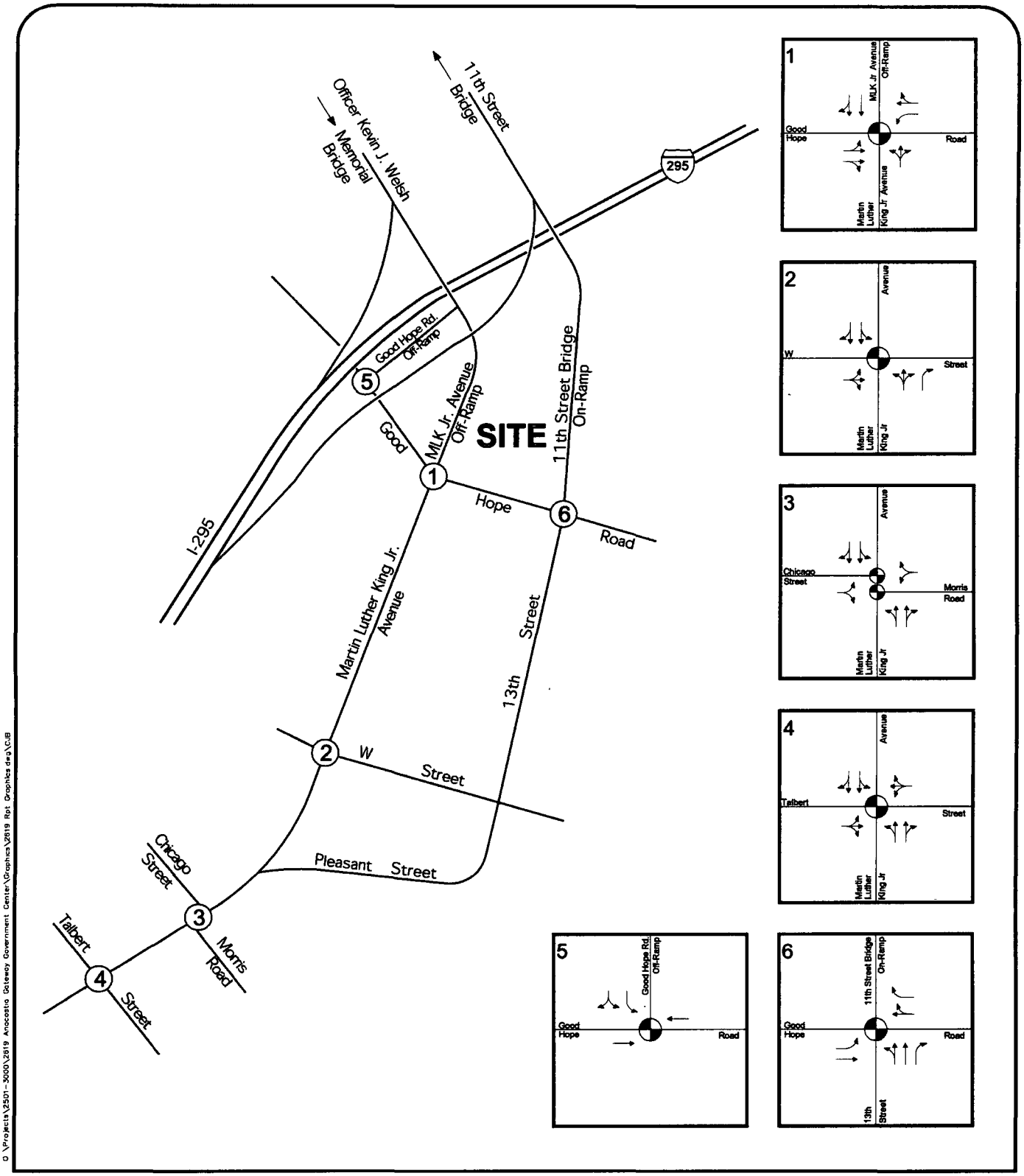


Figure 4
Intersection Lane Use and Traffic Controls,
With Two-Way Street Network

Represents One Travel Lane
Signalized Intersection
Stop Sign

North
Schematic

Anacostia Gateway Government Center
Washington, D.C.

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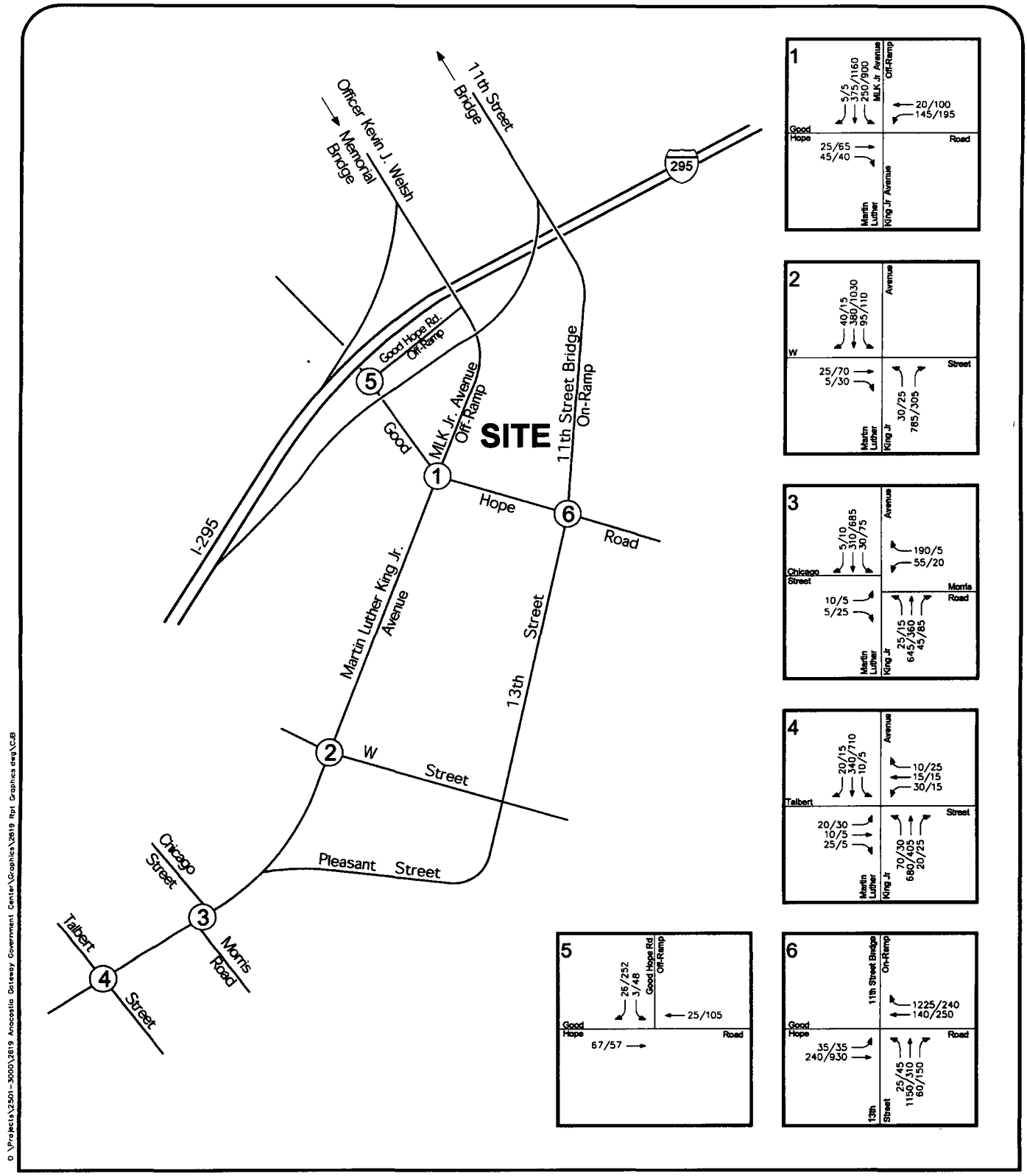


Figure 5
Existing Peak Hour Vehicular Traffic Counts,
With One-Way Street Network

AM PEAK HOUR
PM PEAK HOUR
000/000

North Schematic

Anacostia Gateway Government Center
Washington, D C

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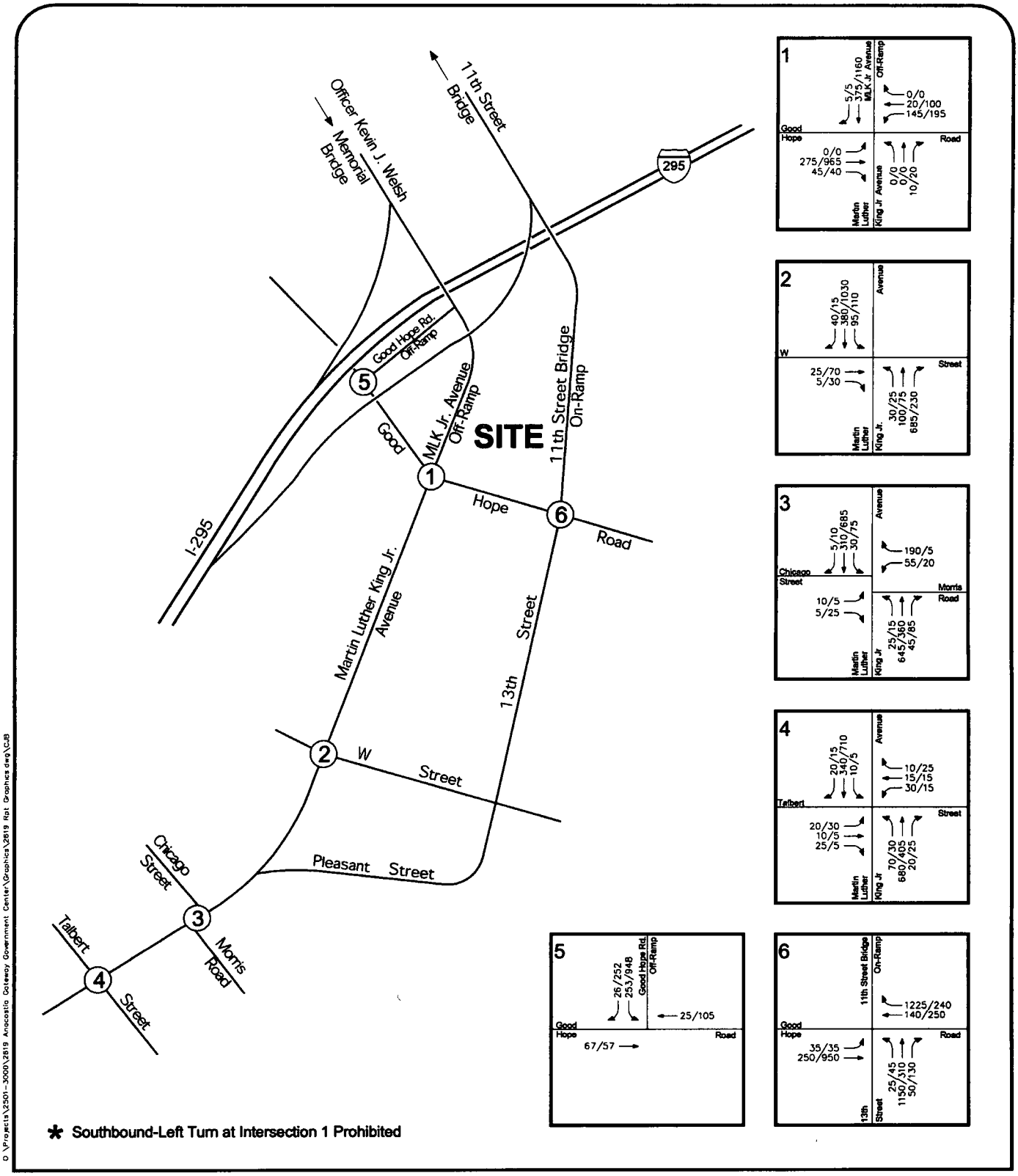


Figure 6
Re-assigned Existing Vehicular Traffic Counts,
With Two-Way Street Network

AM PEAK HOUR
PM PEAK HOUR
000/000

North
Schematic

Anacostia Gateway Government Center
Washington, D C

WELLS & ASSOCIATES, LLC
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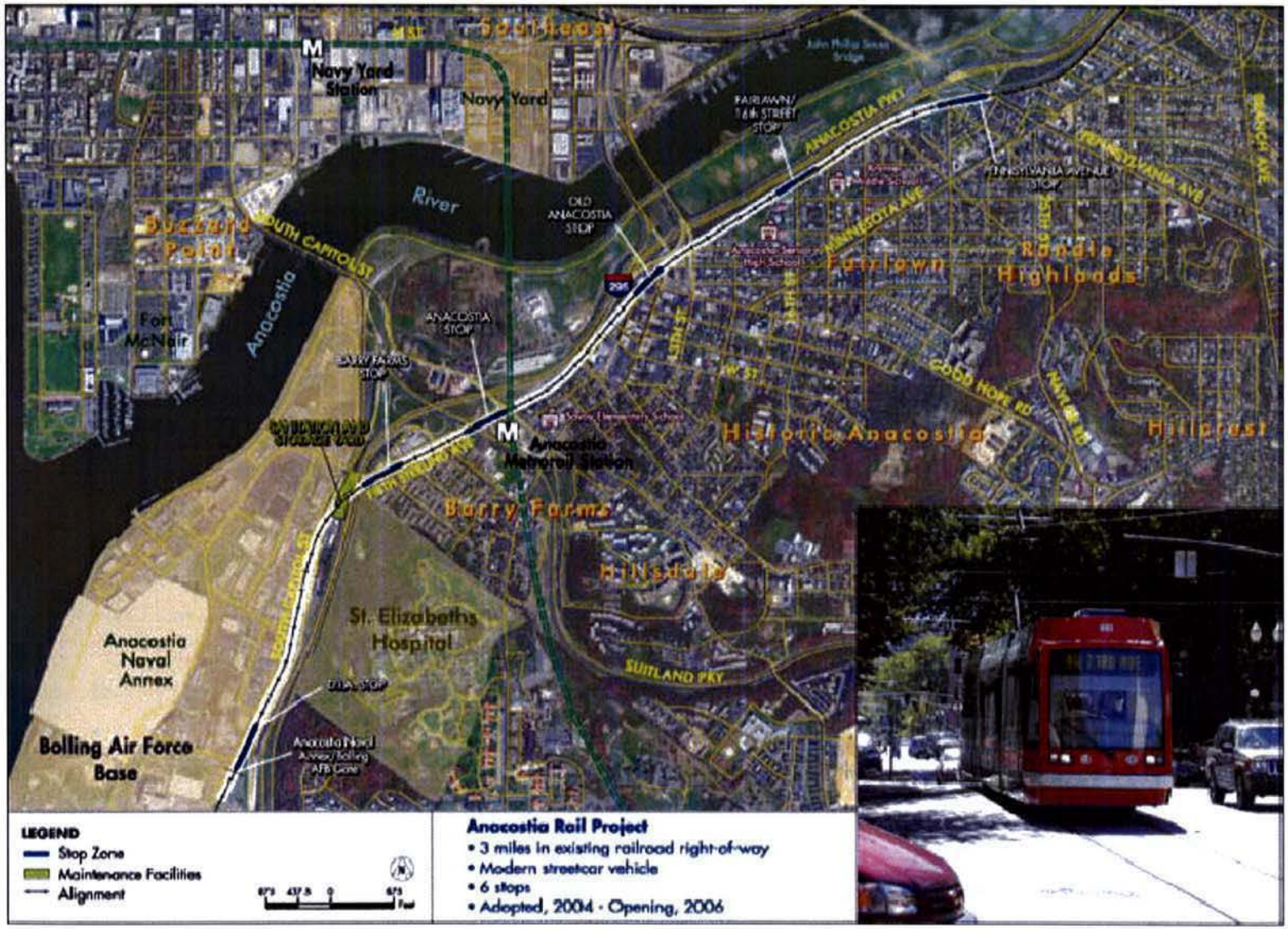


Figure 7
~~Anacostia~~ Rail ~~Project~~

North
Schematic

~~Anacostia Gateway Government Center~~
~~Washington, D.C.~~

WELLS & ASSOCIATES, LLC
TRAFFIC, TRANSPORTATION, and PARKING CONSULTANTS

ANALYSIS

Existing Levels of Service

One-Way Street Network. Existing peak hour levels of service, with the one-way Martin Luther King, Jr. Avenue, were estimated at the six key intersections in the study area based on: the existing lane usage and traffic control shown on Figure 3; the existing vehicular traffic counts shown on Figure 5; existing traffic signal phasing/timings; and the Highway Capacity Manual. The results are presented in Appendix B and summarized in Table 1.

Table 1 indicates that: the Martin Luther King, Jr. Avenue/MLK, Jr. Avenue Off-Ramp/Good Hope Road intersection presently operates at capacity at level of service (LOS) "F" during the PM peak hour; the Martin Luther King, Jr. Avenue/W Street intersection operates at capacity at LOS "F" during the AM peak hour; and the Good Hope Road/13th Street intersection operates near capacity at LOS "E" during the AM peak hour. These failures are attributable to the heavy volumes of motorists traveling from home to work in the D.C. core in the morning and traveling from work to home in the afternoon. All other intersections in the study presently operate at LOS "D" or better during both the AM and PM peak hours.

Two-Way Street Network. Converting Martin Luther King, Jr. Avenue from one-way to two-way operation between W Street and the proposed roundabout on the west side of the main entrance to the MLK Wing would mitigate existing capacity deficiencies. The Martin Luther King, Jr. Avenue/Good Hope Road intersection would continue to operate at LOS "F" during the PM peak hour but with significantly reduced delay. The Martin Luther King, Jr. Avenue/W Street, Good Hope Road/13th Street, and all other intersections in the study area would operate at an overall acceptable LOS "D" or better during peak hours.

AEDC Trip Generation Analysis

The number of peak hour trips that will be generated by the AEDC office and retail building were estimated based on: (1) Institute of Transportation Engineers (ITE) trip generation rates, (2) the proximity of the project to the Anacostia Metro Station, and (3) experience with other comparable projects in Washington, D.C.

As shown in Table 2, it is estimated that the 43,430 S.F. of office space and 14,070 S.F. of retail space would generate a total of 106 AM peak hour vehicle-trips and 135 PM peak hour vehicle-trips, upon completion and full occupancy. These estimates reflect a 20 percent non-auto mode split for the office component, and a 40 percent non-auto mode split for the retail component, of the AEDC project.

AEDC Trip Distribution

The distribution of peak hour trips generated by the AEDC building was determined based on prevailing traffic patterns as determined from existing traffic counts and local knowledge. It is estimated that approximately 46 percent of all trips will approach the AEDC site from the north and west via the Officer Kevin J. Welsh Memorial Bridge (MLK, Jr. Avenue Off-Ramp); 37 percent will approach from the east on Good Hope Road; and 17 percent will approach from the south via Martin Luther King, Jr. Avenue.

AEDC Traffic Assignments

The trips shown in Table 2 were assigned to the public road network based on this trip distribution. The results are shown on Figures 8 and 9 for the one-way and two-way street networks, respectively.

Background Traffic Growth

Consistent with other previous studies, annual background traffic growth was estimated at one-half percent per year compounded for five years from the date of the traffic counts (2003) to project buildout (2008). This growth rate was applied to all movements at each of the study intersections.

Background Future Traffic Forecasts

Background peak hour traffic forecasts, without development of the AGGC, were estimated based on existing traffic counts, traffic generated by the approved but incomplete AEDC project, and historic background traffic growth. The background traffic forecasts for the year of project buildout (2008) are shown on Figures 10 and 11 for the one-way and two-way street networks, respectively.

Background Future Levels of Service

Future peak hour levels of service, without the AGGC were estimated for the year of project buildout (2008) based on the intersection lane usage and traffic control shown on Figures 3 and 4; the background traffic forecasts shown on Figures 10 and 11; existing one-way signal phasing/ timings; appropriate traffic signal phasing/timing changes for two-way operations; and the Highway Capacity Manual. The results are presented in Appendix C, and are summarized in Table 1.

Table 1 indicates that background traffic growth and the approved AEDC project would not significantly change existing levels of service, except for the Good Hope Road/13th Street intersection, which would operate at LOS "F" instead of LOS "E" during the AM peak hour, with the current one-way street network. Delays would increase slightly at most intersections during both the AM and PM peak hours. Converting Martin Luther King, Jr. Avenue from one-way to two-way operation between W Street and the proposed roundabout west of the MLK Wing entrance would mitigate projected background future capacity deficiencies, as described under existing conditions.

AGGC Site Trip Generation Analysis

The numbers of trips that will be generated by AGGC were estimated based on: (1) Institute of Transportation Engineers (ITE) trip generation rates, (2) the proximity of the project to the Anacostia Metro Station, and (3) experience with other comparable projects in Washington, D.C.

The AGGC is anticipated to generate 282 AM peak hour trips, and 259 PM peak hour trips, at project buildout, as shown in Table 3. These estimates reflect a 40 percent non-auto mode split and average auto occupancy of 1.20 persons per vehicle. It is estimated that about half of all parking spaces would turn over during peak hours.

AGGC Trip Distribution

The distribution of AGGC trips was determined based on an analysis of DDOT employee home zip codes. Based on a review of that data, it is estimated that: approximately 46 percent of all trips will approach the AGGC site from the north and west via the Officer Kevin J. Welsh Memorial Bridge (MLK, Jr. Avenue Off-Ramp); 37 percent will approach from the north and east via I-295, Minnesota Avenue, and Good Hope Road; and 17 percent will approach from the south via I-295, Suitland Parkway, and Martin Luther King, Jr. Avenue. Thus, nearly half of all AGGC traffic would not use the streets in Anacostia; they would enter and exit the area via the MLK, Jr. Avenue Off-Ramp and 11th Street Bridge instead.

AGGC Traffic Assignments

The site-generated traffic volumes were assigned to the public road network according to the directional distribution described above. The resulting site traffic assignments are shown on Figures 12 and 13 for the existing one-way and potential two-way street networks, respectively.

Total Future Traffic Forecasts

These site traffic assignments were added to the future background traffic volumes shown on Figures 10 and 11 to yield the total future traffic forecasts shown on Figures 14 and 15 for the existing one-way and potential future two-way street networks, respectively.

Total Future Levels of Service

Future peak hour levels of service with the AGGC were estimated at the key intersections in the study area based on: the existing intersection lane usage and traffic controls shown on Figures 3 and 4; the total future traffic forecasts shown on Figures 14 and 15; the road improvements shown on Figure 16; existing signal phasing/timings; appropriate changes to those timings with the one-way to two-way conversion on Martin Luther King, Jr. Avenue; and the Highway Capacity Manual. The results are presented in Appendix D and summarized in Table 1.

Table 1 indicates that the AGGC would not significantly change projected background future intersection levels of service. The Martin Luther King, Jr. Avenue/MLK, Jr. Avenue Off-Ramp/Good Hope Road intersection would continue to operate at LOS "F" during the PM peak hour. The Martin Luther King, Jr. Avenue/W Street intersection would continue to operate at LOS "F" during the AM peak hour. With the restriction of parking along Good Hope Road between the site access and approximately 100 feet east of 13th Street during peak hours, an improvement in the overall level of service at the Good Hope Road/13th Street intersection is realized, when compared to background conditions. The site access on 13th Street would operate at LOS "F" for the 26 exiting vehicles during the AM peak hour. These failures, again, are attributable to the heavy volumes of motorists traveling from home to work in the D.C. core in the morning and traveling from work to home in the afternoon. All other intersections in the study would operate at LOS "D" or better during both the AM and PM peak hours.

Converting Martin Luther King, Jr. Avenue from one-way to two-way operation between W Street and the proposed roundabout west of the MLK Wing entrance would mitigate projected future capacity deficiencies, as described under existing conditions.

Recommended Improvements

The following improvements, shown on Figure 16, are recommended if Martin Luther King, Jr. Avenue is converted from one-way to two-way operations:

1. Prohibit southbound left turns from the MLK, Jr. Off-Ramp onto eastbound Good Hope Road,
2. Install a new traffic signal at the Good Hope Road/Good Hope Road Off-Ramp intersection,

3. Widen Good Hope Road between the Good Hope Road Off-Ramp and the existing CSX railroad tracks,
4. Re-stripe the Good Hope Road Off-Ramp to include two lanes,
5. Prohibit curb parking on both sides of Good Hope Road between the Good Hope Road Off-Ramp and approximately 100 feet east of 13th Street during peak hours, and
6. Install appropriate signs and pavement marking and modify existing traffic signals on Martin Luther King, Jr. Avenue.

Parking Analysis

The Municipal Regulations establish a requirement for one parking space for every 600 S.F. of office space over 2,000 S.F. in the subject zone. A total of 581 spaces, therefore, are required by the Municipal Regulations for the 350,000 S.F. of office space planned at the AGGC.

DDOT plans to promote the use of public transportation and reduce reliance on private automobiles at their new headquarters. It is estimated, based on discussions with DDOT staff, that the AGGC parking demand is approximately 384 spaces for DDOT staff, departmental cars, visitors, and consultants. This is 197 (or 34 percent) fewer spaces than required by the Municipal Regulations.

The Municipal Regulations permit a reduction in the parking requirements for PUD developments. The subject site is located approximately one half mile from the Anacostia Metrorail Station and within 600 feet of the new light rail starter line that presently is under construction. A 25 percent (or 145-space) reduction is justified at the AGGC based on: the proximity of the AGGC to the new light rail starter line; superior Metrobus service; and DDOT's commitment to smart commuting habits by its employees, contractors, and visitors. A 25 percent reduction would result in a requirement for 436 spaces.

Four-hundred-thirty-six (436) spaces would: adequately accommodate actual AGGC parking demands; provide a reasonable, 52-space, 13 percent buffer between parking supply and demand; and ensure that there would be no spillover parking into adjacent residential neighborhoods.

Table 1
Anacostia Gateway Government Center
Level of Service Summary (1) (2) (3) (4)

Intersection	Traffic Control	Critical Movement	Existing				Future Without AGGC				Future With AGGC			
			One-Way		Two-Way (5)		One-Way		Two-Way (5)		One-Way (6)		Two-Way (5)	
			AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
1 Martin Luther King Jr Avenue/ MLK, Jr Avenue Off-Ramp/ Good Hope Road	SIGNAL	EB	C (26.6)	D (36.4)	C (21 2)	F (104 7)	C (26 7)	D (36 8)	C (20 1)	F (117 1)	C (26 7)	D (36 8)	C (20 0)	F (117.1)
		WB	C (23 7)	E (57 0)	C (24 8)	F (114 3)	C (24 0)	E (64 2)	C (24.9)	F (121 9)	C (24 0)	E (64.2)	C (24.9)	F (121.9)
		NB	N/A	N/A	B (19 8)	C (20 5)	N/A	N/A	A (9 3)	D (46 5)	N/A	N/A	B (11.8)	D (35 8)
		SB	B (18.3)	F (139.6)	C (23.2)	E (72.2)	B (18.4)	F (146.7)	C (23.4)	F (87.2)	B (18.4)	F (144.7)	C (23.5)	F (100.1)
		Overall	**C (20.3)**	**F (123.4)**	**C (22.5)**	**F (91.7)**	**C (20.5)**	**F (130.2)**	**C (21.2)**	**F (104.5)**	**C (20.4)**	**F (128.7)**	**C (20.3)**	**F (108.2)**
2. Martin Luther King, Jr Avenue/ W Street	SIGNAL	EB	C (28.5)	D (39 1)	C (29 4)	C (32.2)	C (28.5)	D (39.4)	C (29.5)	C (33.5)	C (28.5)	D (39.4)	C (29.5)	C (33.5)
		NB	F (189 8)	F (157 0)	B (14 3)	A (6 8)	F (214 4)	F (180 5)	B (15 6)	A (6 5)	F (240 5)	F (192.2)	B (18 6)	A (7 7)
		SB	A (7.8)	A (2.4)	A (2.4)	A (3.7)	A (7.8)	A (2.4)	A (4.7)	A (4.5)	A (7.8)	A (2.3)	A (4.9)	A (5.7)
		Overall	**F (115.7)**	**D (35.9)**	**B (10.9)**	**A (6.5)**	**F (130.6)**	**D (40.3)**	**B (12.6)**	**A (7.0)**	**F (148.1)**	**D (42.4)**	**B (14.9)**	**A (8.1)**
3a Martin Luther King, Jr. Avenue/ Chicago Street/	SIGNAL	EB	C (25.5)	C (34 3)	C (25 5)	C (34.3)	C (25.5)	C (34.3)	C (25.5)	C (34.3)	C (25.5)	C (34.3)	C (25 5)	C (34.3)
		NB	A (1.9)	A (0.6)	A (1.9)	A (0 6)	A (2 0)	A (0.6)	A (2.0)	A (0.6)	A (2.2)	A (0.6)	A (2.2)	A (0.6)
		SB	C (28.6)	B (13.3)	C (28.6)	A (8.2)	C (28.9)	B (13.6)	C (28.9)	B (10.2)	C (29.0)	B (13.8)	C (29.0)	A (9.9)
		Overall	**B (10.3)**	**B (10.3)**	**B (10.3)**	**A (7.0)**	**B (10.4)**	**B (10.5)**	**B (10.4)**	**A (8.3)**	**B (10.4)**	**B (10.7)**	**B (10.4)**	**A (8.1)**
3b. Martin Luther King, Jr Avenue/ Morris Street/	SIGNAL	WB	D (41.8)	C (34.6)	D (41 8)	C (34 6)	D (42 9)	C (34.7)	D (42.9)	C (34.7)	D (42.9)	C (34.7)	D (42.9)	C (34.7)
		NB	D (43 3)	A (8 3)	D (43 3)	A (8 3)	D (48 1)	A (8.3)	D (48.1)	A (8 3)	E (56.2)	A (8 3)	E (56.9)	A (8 3)
		SB	A (0.2)	A (0.5)	A (0.2)	A (0.5)	A (0.2)	A (0.5)	A (0.2)	A (0.5)	A (0.2)	A (0.5)	A (0.2)	A (0.5)
		Overall	**C (32.4)**	**A (4.1)**	**C (32.4)**	**A (4.1)**	**D (35.2)**	**A (4.1)**	**D (35.2)**	**A (4.1)**	**D (39.8)**	**A (4.0)**	**D (40.1)**	**A (4.0)**
4 Martin Luther King, Jr Avenue/ Talbert Street	SIGNAL	EB	B (19.5)	C (20.0)	B (19.5)	C (20.0)	B (19.6)	C (20.1)	B (19.6)	C (20 1)	C (20 1)	C (20 1)	C (20.1)	C (20.1)
		WB	B (19 9)	B (19 9)	B (19 9)	B (19 9)	C (20 0)	B (20.0)	C (20 0)	B (20.0)	C (20 5)	B (20.0)	C (20.5)	B (20.0)
		NB	A (4 6)	B (11 1)	A (4 6)	B (11 1)	A (4 5)	B (11 3)	A (4 5)	B (11 3)	A (4.6)	B (11.3)	A (4 6)	B (11.3)
		SB	A (3.8)	A (7.3)	A (3.8)	B (18.1)	A (3.7)	A (7.9)	A (3.7)	B (17.6)	A (3.7)	A (8.5)	A (3.7)	B (17.0)
		Overall	**A (8.2)**	**A (9.9)**	**A (8.2)**	**B (15.9)**	**A (8.1)**	**B (10.2)**	**A (8.1)**	**B (15.7)**	**A (8.1)**	**B (10.5)**	**A (8.1)**	**B (15.4)**
5. Good Hope Road/ Good Hope Road Off-Ramp	STOP	EBT	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		WBT	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		SBLR	A [8.6]	B [11 1]	N/A	N/A	A [8.6]	B [11 2]	N/A	N/A	A [8.6]	B [11.2]	N/A	N/A
	SIGNAL	EB	N/A	N/A	B (12.8)	C (22.5)	N/A	N/A	B (12.8)	C (22.5)	N/A	N/A	B (12.8)	C (22.5)
		WB	N/A	N/A	B (13.9)	D (35.3)	N/A	N/A	B (15.6)	D (36.1)	N/A	N/A	B (16.5)	C (34.7)
		SB	N/A	N/A	B (13.5)	B (13.1)	N/A	N/A	B (13.6)	B (13.4)	N/A	N/A	B (13.6)	B (13.4)
		Overall	**N/A**	**N/A**	**B (13.4)**	**B (15.2)**	**N/A**	**N/A**	**B (13.6)**	**B (15.5)**	**N/A**	**N/A**	**B (13.6)**	**B (15.4)**
6. Good Hope Road/ 13th Street	SIGNAL	EB	F (127.1)	C (31.2)	B (15.4)	C (27 0)	F (288.4)	C (30.7)	B (15.8)	C (24.9)	C (23.4)	C (29.4)	B (19.9)	C (23.8)
		WB	E (59 1)	B (10.6)	D (39 9)	B (10 8)	E (70 9)	A (9.0)	D (44.3)	A (9 0)	F (93.5)	A (8.6)	E (58.5)	A (7.1)
		NB	D (39.0)	C (32.7)	E (55.4)	C (32.3)	D (42.2)	D (36.2)	E (67.9)	D (36.2)	D (46.1)	D (37.5)	E (67.9)	D (40.8)
		Overall	**E (59.3)**	**C (26.1)**	**D (43.1)**	**C (24.0)**	**F (86.3)**	**C (28.3)**	**D (50.1)**	**C (23.4)**	**E (65.7)**	**C (28.0)**	**E (57.1)**	**C (23.4)**
7 Good Hope Road/ Site Access	STOP	EBLT	N/A	N/A	N/A	N/A	-	-	-	-	-	-	-	-
		SBLR	N/A	N/A	N/A	N/A	B [12.0]	E [42.6]	B [11.0]	C [20.8]	B [12.2]	F [96.2]	B [11 1]	D [29 7]
8. 13th Street/ 11th Street Bridge On-Ramp/ Site Access	STOP	EBL	N/A	N/A	N/A	N/A	D [32.2]	B [11 1]	D [32.2]	B [11 1]	F [82.6]	B [12.1]	F [55.2]	B [13.0]
		NBL	N/A	N/A	N/A	N/A	-	-	-	-	A [2.3]	A [0.9]	A [1.6]	A [0.6]
9 Martin Luther King, Jr. Avenue/ Site Access	STOP	WBL	N/A	N/A	N/A	N/A	B [11 7]	D [27.4]	B [10.6]	B [15.0]	C [15.6]	E [38.2]	B [13.6]	C [17 3]
		SBLT	N/A	N/A	N/A	N/A	A [1 3]	A [0.3]	A [1.6]	A [0.4]	A [3 7]	A [0 6]	A [4 5]	A [0 8]

Notes:

(1) Analyses based on HCM method using Synchro Software, Version 6.

(2) Numbers in parentheses, ( ), represent approach delay, in seconds per vehicle for signalized intersections.

(3) Numbers in brackets, [ ], represent approach delay, in seconds per vehicle for unsignalized intersections.

(4) Err signifies a delay that Synchro does not report.

(5) Improvements include the following.

- Martin Luther King, Jr Avenue. Remove curb parking to create a northbound travel lane.
- Good Hope Road/Good Hope Road Off-Ramp: Restripe existing pavement to create a designated southbound left and shared left-right turn lane, and signalize intersection.
- Good Hope Road between Good Hope Road Off-Ramp and CSX railroad tracks: Widen pavement to 36 feet.
- Good Hope Road between CSX railroad tracks and about 100 feet east of 13th Street: Restrict curb parking during peak hours.
- Signalized intersections: Adjust signal timings and offsets to yield better levels of service.

(6) Improvements include the following:

- Good Hope Road between site access and about 100 feet east of 13th Street. Retrict curb parking during peak hours.

Table 2
Anacostia Gateway Government Center
Background Site Trip Generation Summary (1) (2) (3)

Land Use		ITE 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
AEDC:										
Office -										
	ITE Vehicle Trips:	710	43,430	S.F.	84	12	96	22	105	127
	ITE Person Trips:				92	13	106	24	116	140
	Office Vehicle Trips:				67	10	77	18	84	102
Retail -										
	ITE Vehicle Trips:	(4)	14,070	S.F.	29	19	48	24	31	55
	ITE Person Trips:				32	21	53	26	34	61
	Retail Vehicle Trips:				17	11	29	14	19	33
			Total		85	21	106	32	103	135

Notes.

(1) Trips generated using Institute of Transportation Engineers (ITE) Trip Generation, 7th Edition.

(2) Base average vehicle occupancy: 1.10 persons per vehicle.

(3) Assumed non-auto mode split: 20% Office 40% Retail

(4) Retail trips generated using Land Use Code 820 for AM peak hour and 814 for the PM peak hour trips.

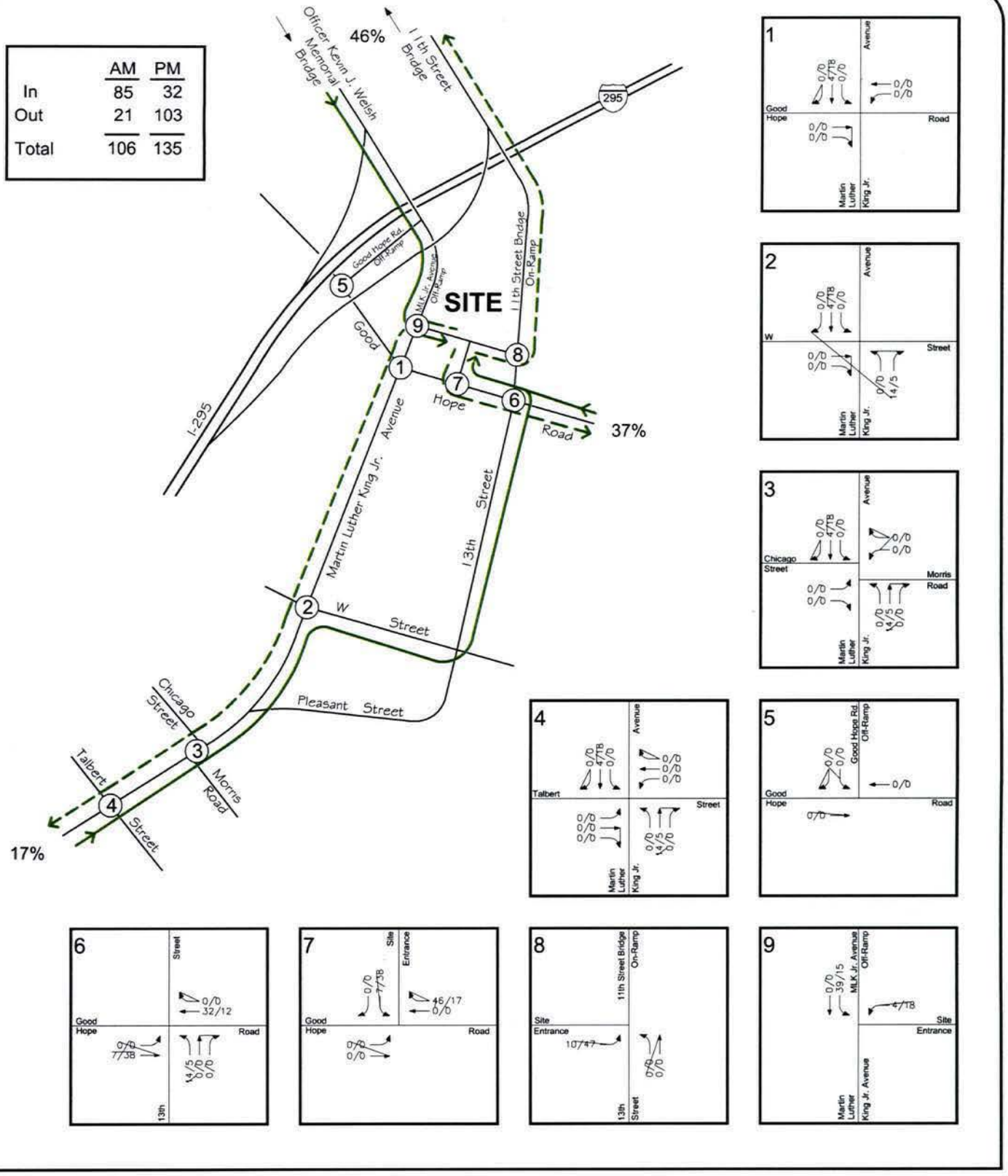
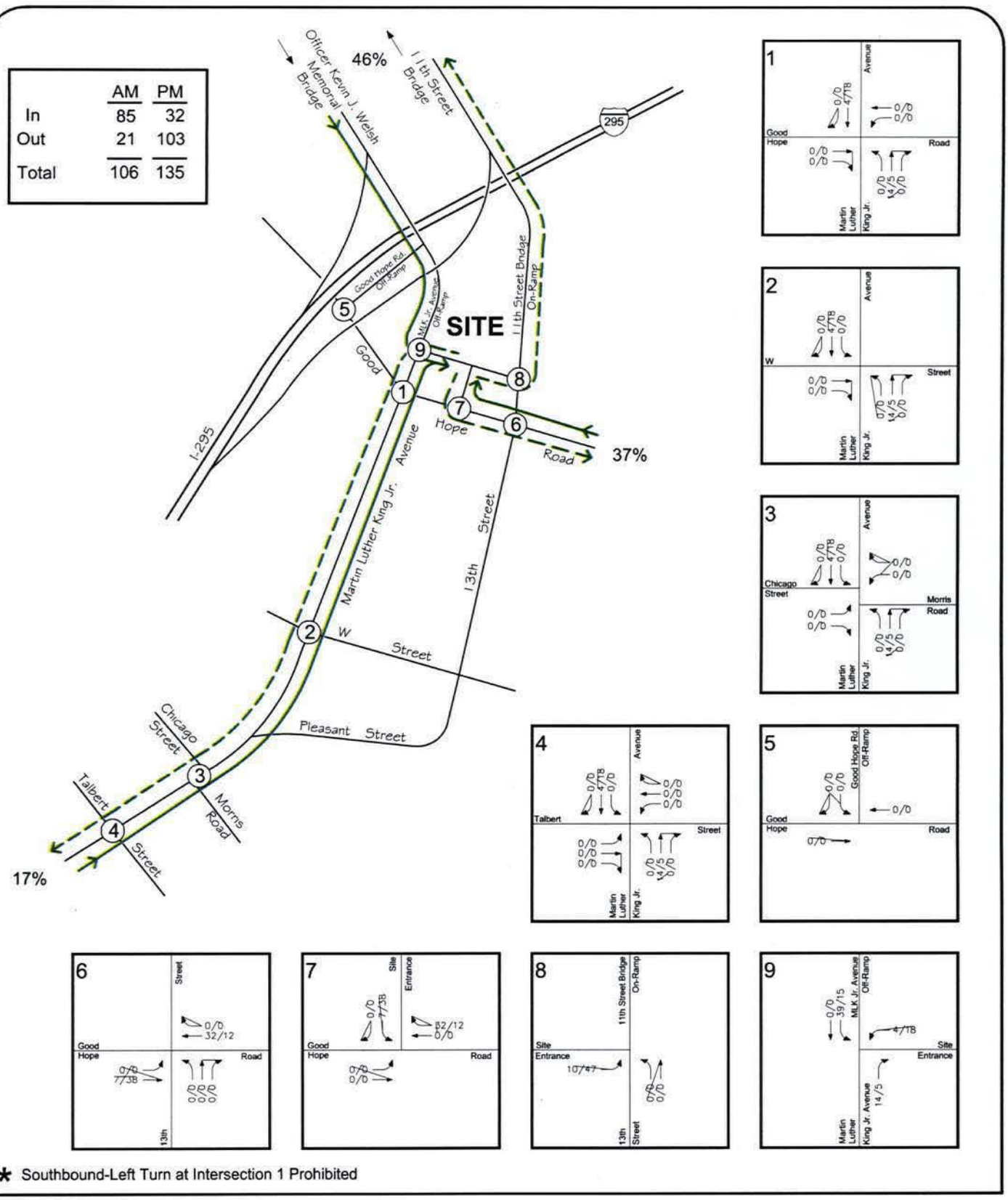


Figure 8
A.F.D.C. Traffic Assignments And Directional Distribution, With One-Way Street Network

Outbound
Inbound
AM PEAK HOUR
PM PEAK HOUR
000/000
North Schematic

Anacostia Gateway Government Center
Washington, D.C.

WELLS & ASSOCIATES, LLC
TRAFFIC, TRANSPORTATION, AND PARKING CONSULTANTS



* Southbound-Left Turn at Intersection 1 Prohibited

Figure 9
A.E.D.C. Traffic Assignments And Directional Distribution, With Two-Way Street Network

Outbound
Inbound
AM PEAK HOUR
PM PEAK HOUR
000/000
North Schematic

Anacostia Gateway Government Center
Washington, D.C.

WELLS & ASSOCIATES, LLC
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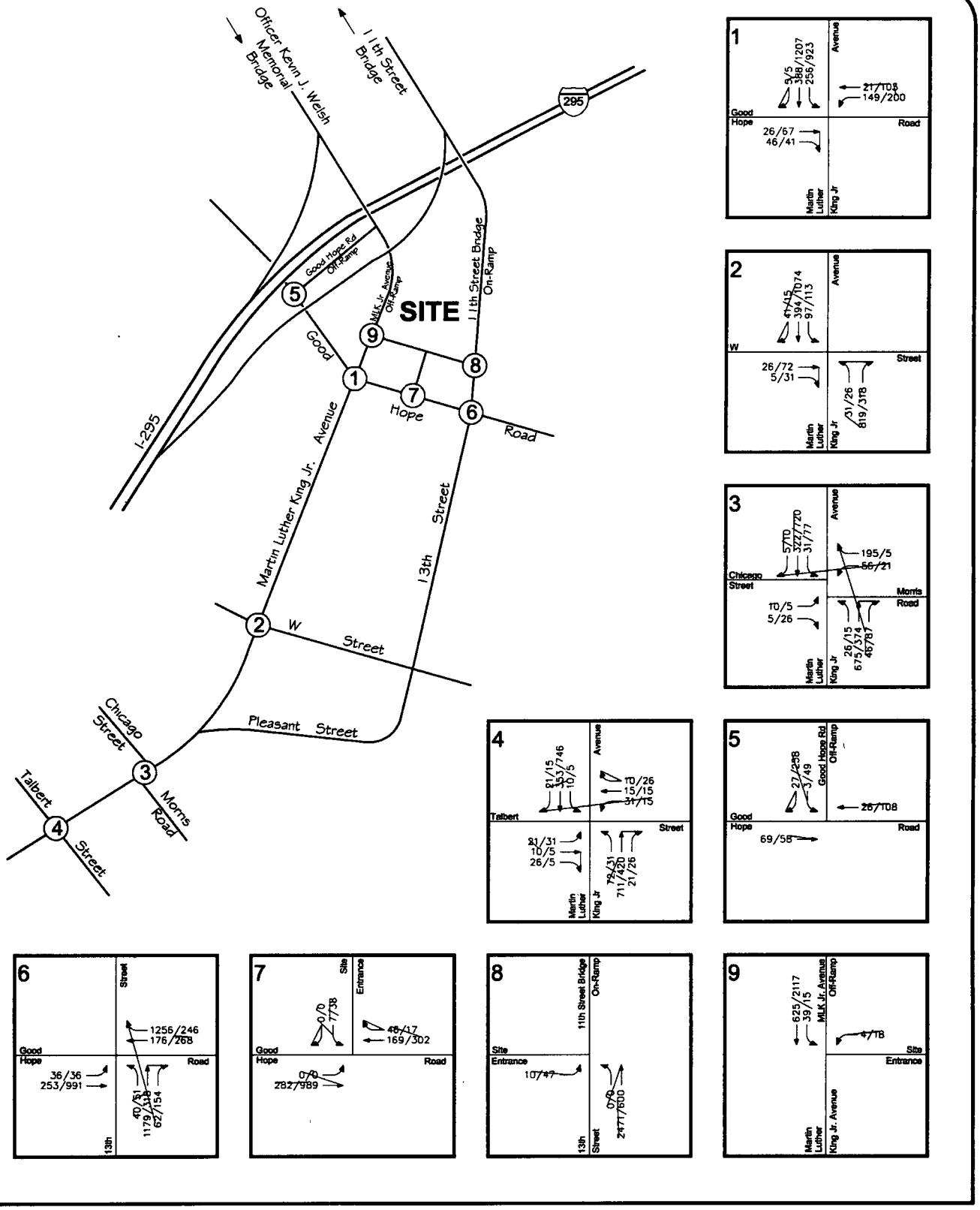


Figure 10
Background Future Peak Hour Traffic Forecasts,
With One-Way Street Network

AM PEAK HOUR / PM PEAK HOUR
000/000

North Schematic

Anacostia Gateway Government Center
Washington, D.C.

WELLS & ASSOCIATES, LLC
TRAFFIC, TRANSPORTATION, and PARKING CONSULTANTS

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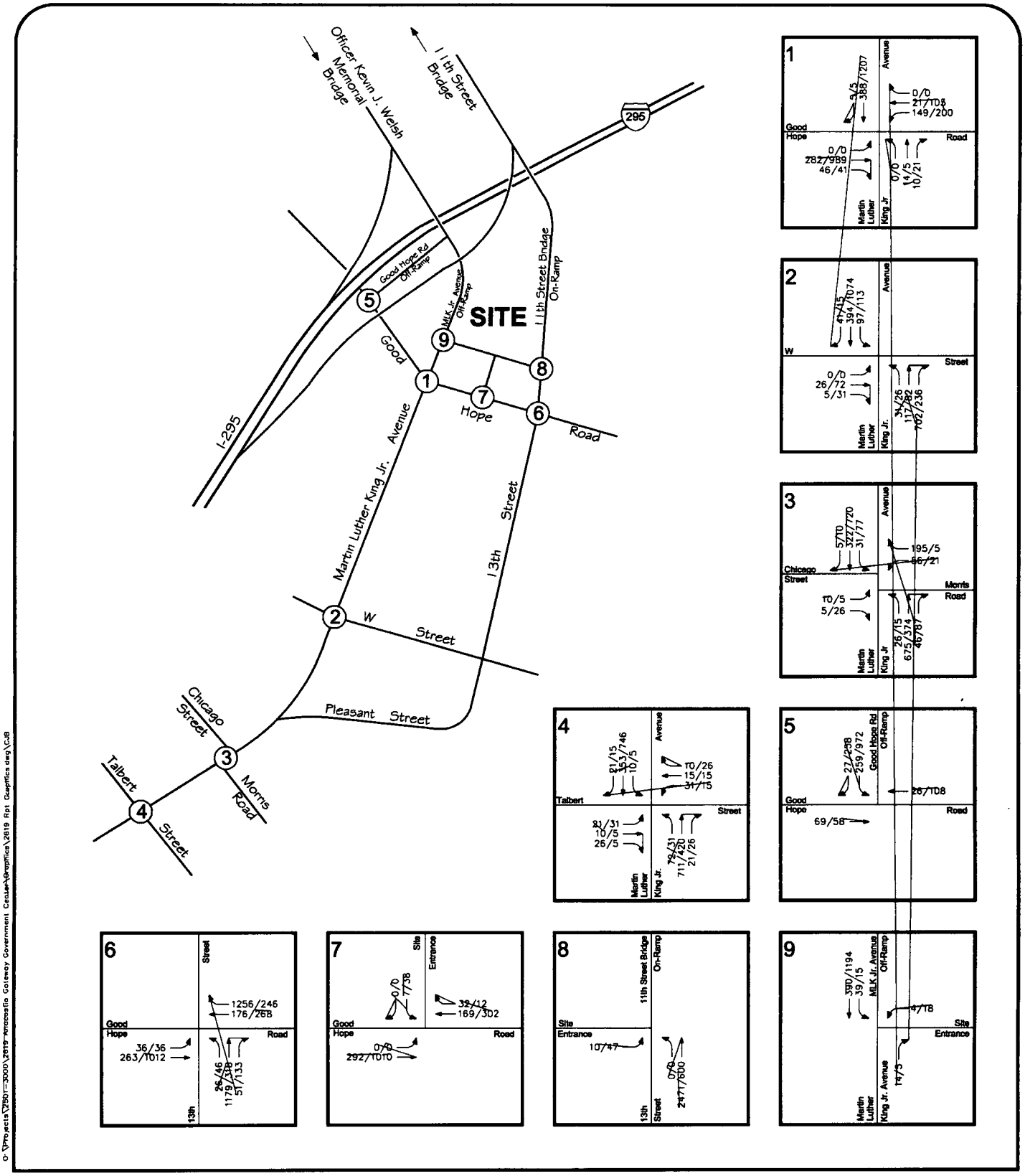


Figure 11
Background Future Peak Hour Traffic Forecasts,
With Two-Way Street Network

AM PEAK HOUR
PM PEAK HOUR
000/000

North Schematic

Anacostia Gateway Government Center
Washington, D C

WELLS & ASSOCIATES, LLC
TRAFFIC, TRANSPORTATION, and PARKING CONSULTANTS

Table 3
Anacostia Gateway Government Center
Site Trip Generation Summary (1) (2) (3)

Land Use	ITE 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
Anacostia Gateway Government Center:									
ITE Vehicle Trips:	710	350,000	S.F.	450	61	511	80	391	471
ITE Person Trips:				495	67	562	88	430	518
AGGC Vehicle Trips:				248	34	282	44	215	259
AGGC Vehicle Trips per Parking Space:		Code -		0.43	0.06	0.49	0.08	0.37	0.45
		Proposed -		0.57	0.08	0.65	0.10	0.49	0.59

Notes:

(1) Trips generated using Institute of Transportation Engineers (ITE) Trip Generation, 7th Edition.

(2) Base average vehicle occupancy: 1.10 persons per vehicle.

(3) Assumed future average vehicle occupancy: 1.20 persons per vehicle.

Assumed non-auto mode split: 40%

Proposed parking spaces: Code: 581

Proposed: 436

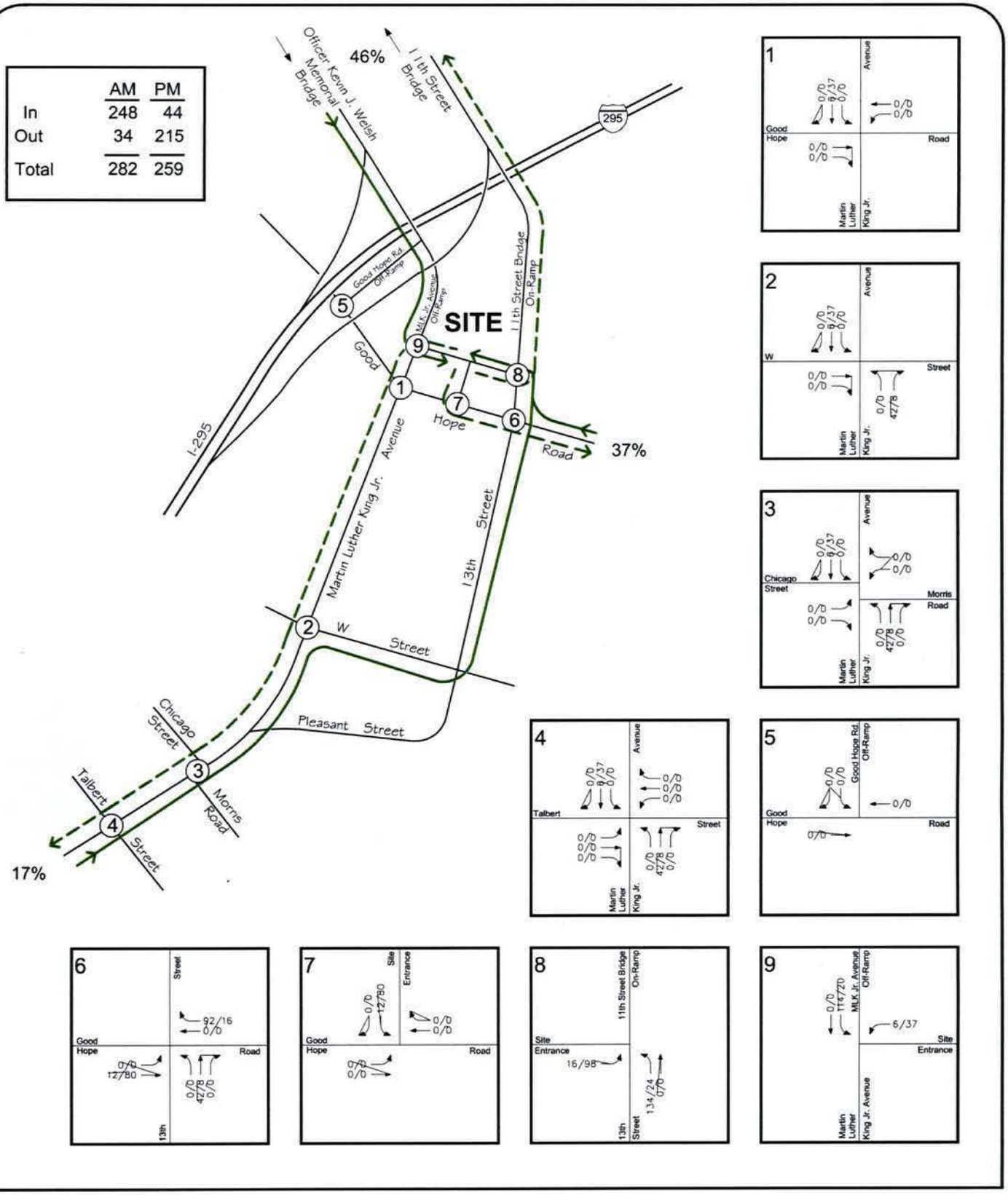
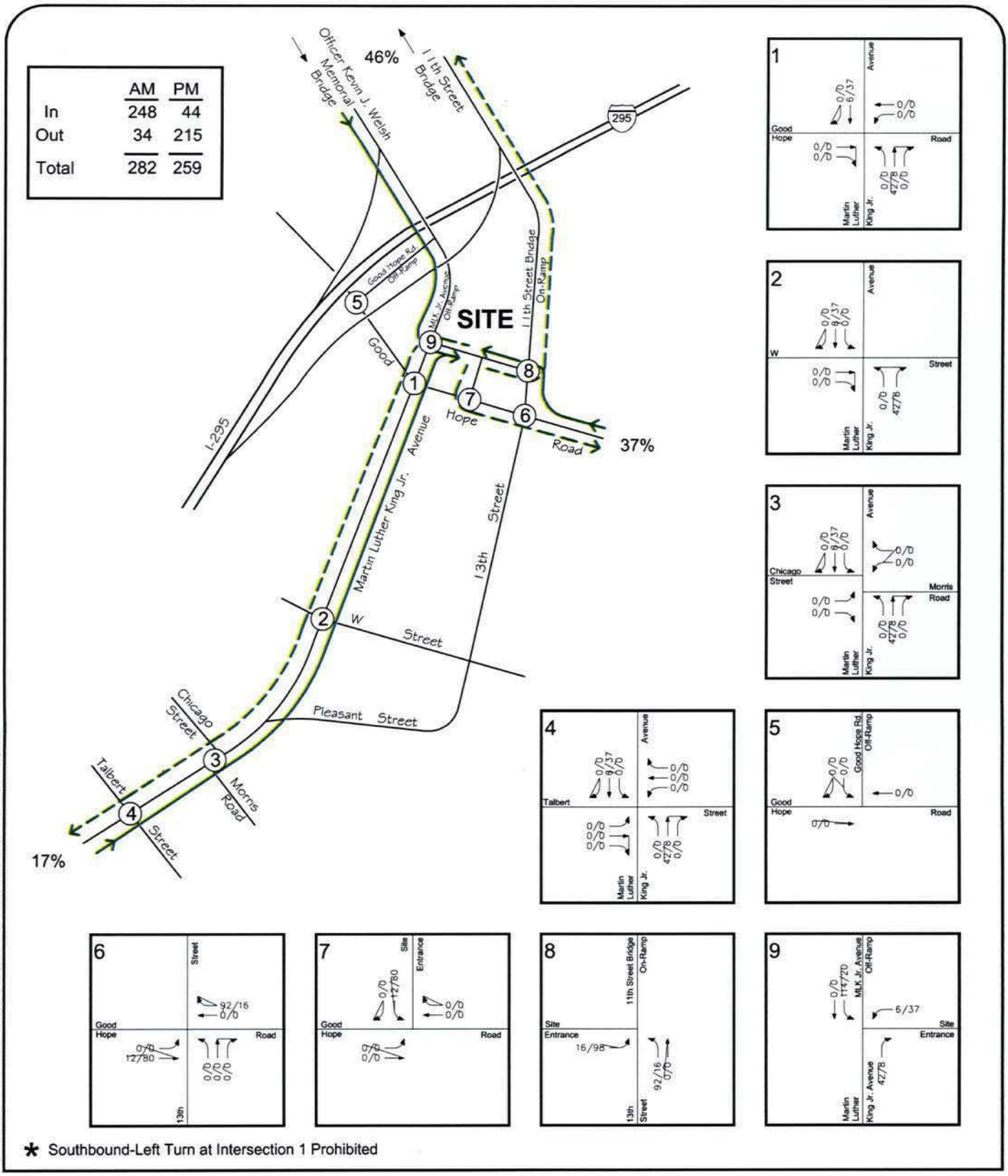


Figure 12
Site-Generated Traffic Assignments And Directional Distribution, With One-Way Street Network

Outbound
Inbound
AM PEAK HOUR
PM PEAK HOUR
000/000
North Schematic

Anacostia Gateway Government Center
Washington, D.C.

WELLS & ASSOCIATES, LLC
TRAFFIC, TRANSPORTATION, and PARKING CONSULTANTS



* Southbound-Left Turn at Intersection 1 Prohibited

Figure 13
Site-Generated Traffic Assignments And Directional Distribution, With Two-Way Street Network

Anacostia Gateway Government Center
Washington, D.C.

WELLS & ASSOCIATES, LLC
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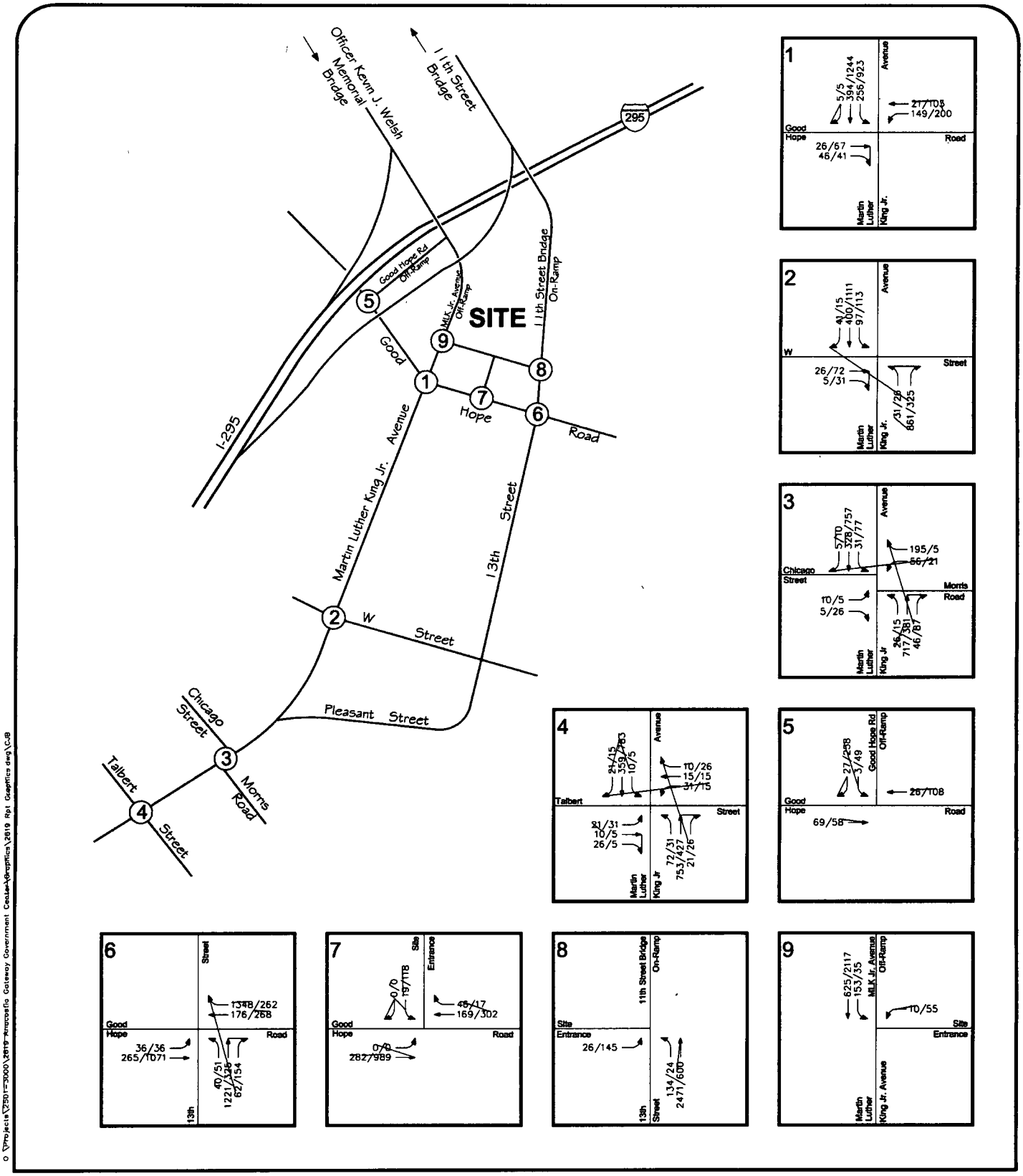


Figure 14
Total Future Peak Hour Traffic Forecasts,
With One-Way Street Network

AM PEAK HOUR
PM PEAK HOUR
000/000

North
Schematic

Anacostia Gateway Government Center
Washington, D.C.

WELLS & ASSOCIATES, LLC
TRAFFIC, TRANSPORTATION, and PARKING CONSULTANTS

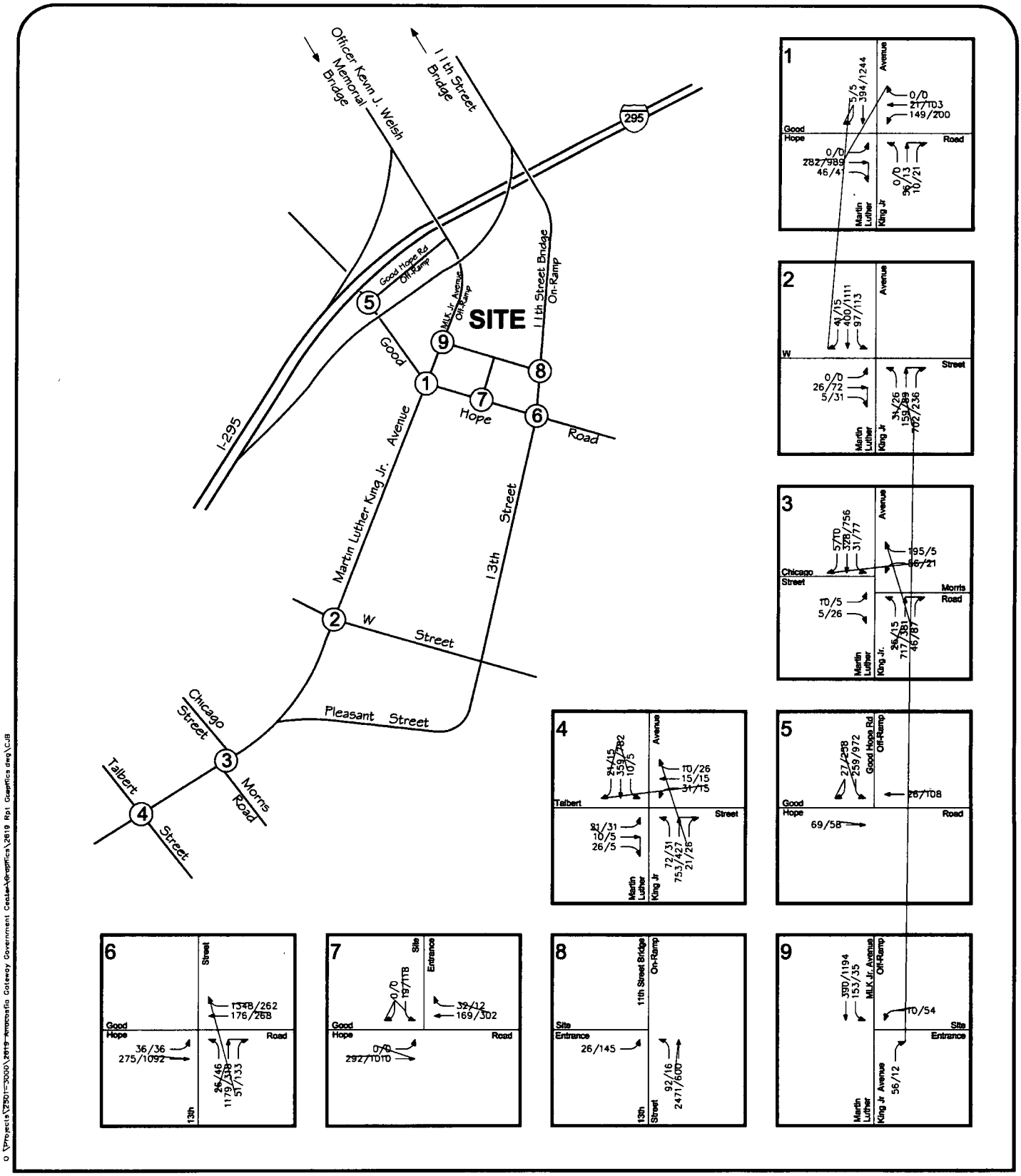


Figure 15
Total Future Peak Hour Traffic Forecasts,
With Two-Way Street Network

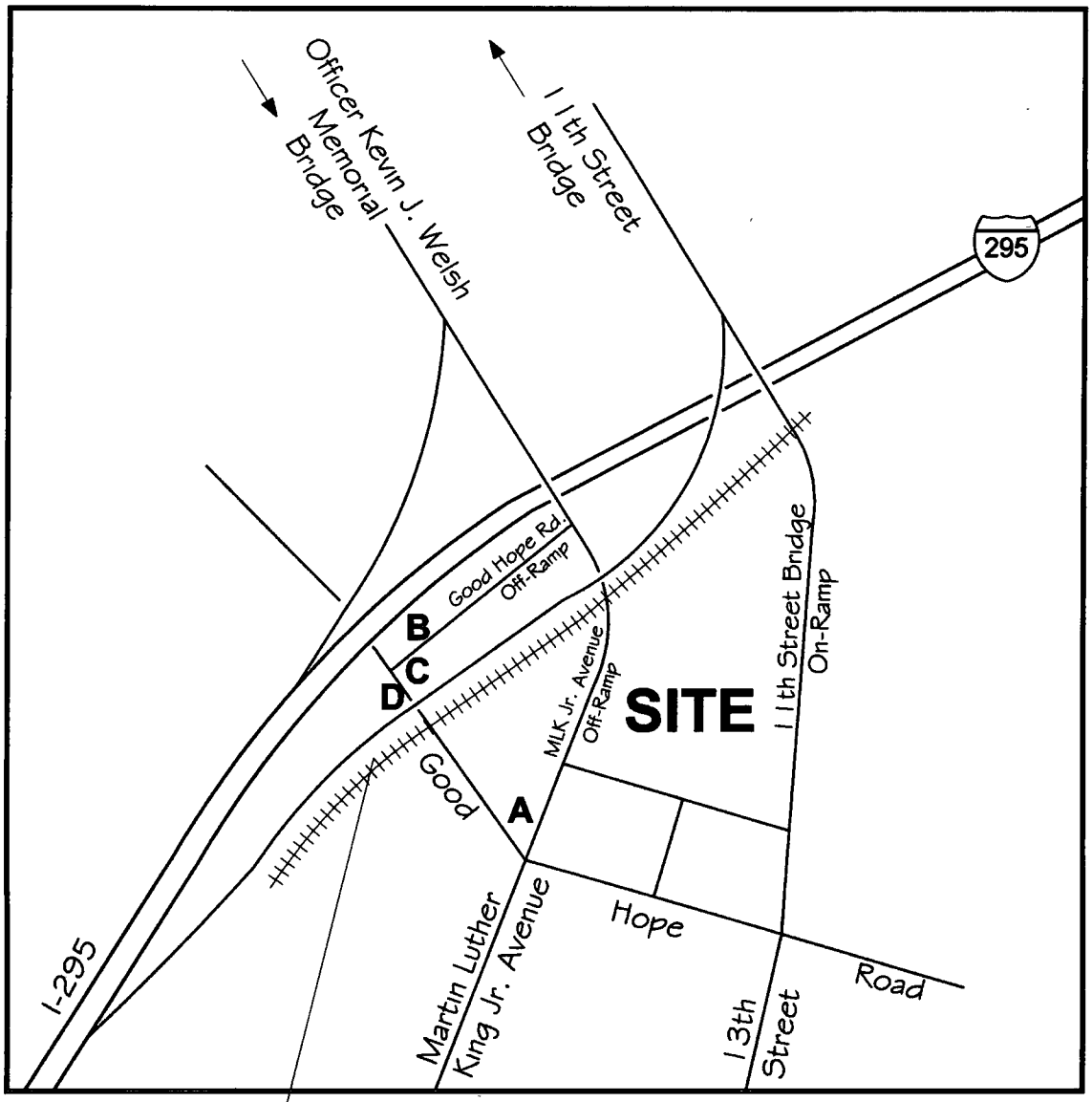
AM PEAK HOUR
PM PEAK HOUR
000/000

North
Schematic

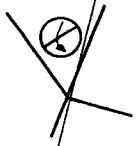
Anacostia Gateway Government Center
Washington, D.C.

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TRAFFIC, TRANSPORTATION, and PARKING CONSULTANTS

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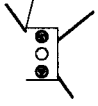
A. Prohibit Southbound Left Turns



B. Stripe Off-Ramp as Two Lanes



C. Install New Traffic Signal



D. Widen Roadway to 36'

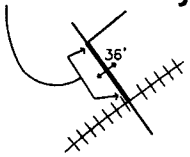


Figure 16
Improvements to Convert Martin Luther King, Jr. Avenue to Two-Way Operation

North Schematic

Anacostia Gateway Government Center
Washington, D C

WELLS & ASSOCIATES, LLC
TRAFFIC, TRANSPORTATION, and PARKING CONSULTANTS

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CONCLUSIONS

The conclusions of this study are as follows:

1. The Anacostia Gateway Government Center (AGGC) site is well served by a connected network of arterial and local streets, Metrobus and Metrorail services, and the light rail starter line that is now under construction.

2. The Martin Luther King, Jr. Avenue/MLK, Jr. Off-Ramp/Good Hope Road, Martin Luther King, Jr. Avenue/W Street, and Good Hope Road/13th Street intersections presently operate at or near capacity at level of service (LOS) "E" or "F" during the AM or PM peak hours. These failures are attributable to the heavy volumes of motorists traveling from home to work in the D.C. core in the morning and traveling from work to home in the afternoon.

3. The approved AEDC building would generate a total of 106 AM peak hour vehicle-trips and 135 PM peak hour vehicle-trips, upon completion and full occupancy.

4. Background traffic growth is estimated at one-half percent per year.

5. The AEDC and background traffic growth would not significantly change projected background future intersection level of service. The Martin Luther King, Jr. Avenue/MLK, Jr. Avenue Off-Ramp/Good Hope Road, Martin Luther King, Jr. Avenue/W Street, and Good Hope Road/13th Street intersections would operate at LOS "F" during the AM or PM peak hours.

6. The AGGC is anticipated to generate 282 AM peak hour trips, and 259 PM peak hour trips, at project buildout. These estimates reflect a 40 percent non-auto mode split and average auto occupancy of 1.20 persons per vehicle. It is estimated that about half of all parking spaces would turn over during peak hours.

7. Nearly half of all AGGC traffic would not use the streets in Anacostia; they would enter and exit the area via the MLK, Jr. Avenue Off-Ramp and the 11th Street Bridge instead.

8. The AGGC would not significantly change projected future intersection levels of service. The Martin Luther King, Jr. Avenue/MLK, Jr. Off-Ramp/Good Hope Road, Martin Luther King, Jr. Avenue/W Street, and Good Hope Road/13th

Street intersections would continue to operate at LOS "F" during the AM or PM peak hours.

9. Converting Martin Luther King, Jr. Avenue from one-way to two-way operation between W Street and the roundabout on the west side of the main AGGC building entry would mitigate projected background future capacity deficiencies. Two-way conversion of Martin Luther King, Jr. Avenue would require the following improvements:

   A. Prohibit southbound left turns from the MLK, Jr. Off-Ramp onto eastbound Good Hope Road,
   B. Install a new traffic signal at the Good Hope Road/Good Hope Road Off-Ramp intersection,
   C. Widen Good Hope Road between the Good Hope Road Off-Ramp and the existing CSX railroad tracks,
   D. Re-stripe the Good Hope Road Off-Ramp to include two lanes,
   E. Prohibit curb parking on both sides of Good Hope Road between the Good Hope Road Off-Ramp and approximately 100 feet east of 13th Street during peak hours , and
   F. Install appropriate signs and pavement marking and modify existing traffic signals on Martin Luther King, Jr. Avenue.

10. The results of the analyses with Martin Luther King, Jr. Avenue operating under two-way conditions would remain the same, so long as Martin Luther King, Jr. Avenue is operated as two-way between W Street and the site's east-west service road, whether or not a roundabout is constructed in front of the MLK Wing. Additionally, we are aware that the District Department of Transportation (DDOT) may consider two-way conditions on Martin Luther King, Jr. Avenue between W Street and Good Hope Road. This analysis will be submitted in a supplemental document.

11. A 25 percent parking reduction is justified at the AGGC based on: the proximity of the AGGC to the new light rail starter line; superior Metrobus service; and DDOT's commitment to smart commuting habits. A 25 percent reduction would result in a requirement for 436 spaces, which would: adequately accommodate actual AGGC parking demands; provide a reasonable, 52-space, 13 percent buffer between parking supply and demand; and ensure that there would be no spillover parking into adjacent residential neighborhoods.

Appendix A

Existing Traffic Counts

Wells & Associates, LLC

McLean, Virginia

Existing Traffic Count

PROJECT: Anacostia Gateway Government Center
W & A JOB NO.: 2619
INTERSECTION: Good Hope Rd.& exit from I-295
LOCATION: Washington,DC
DATE: 10/14/2004
DAY: Thursday
WEATHER: Clear
COUNTED BY: GiVanna
INPUTED BY: agan
SOUTHBOUND ROAD: Exit from I-295
NORTHBOUND ROAD: 0
WESTBOUND ROAD: Good Hope Road
EASTBOUND ROAD: Good Hope Road

Time Period	Turning Movements: Southbound Exit from I-295				Westbound Good Hope Road				Northbound 0				Eastbound Good Hope Road				North & South	East & West	Total	PHF	Time Period
	1 Right	2 Thru	3 Left	Total	4 Right	5 Thru	6 Left	Total	7 Right	8 Thru	9 Left	Total	10 Right	11 Thru	12 Left	Total					
AM																					
6:30-6:45	2	0	6	8	0	3	0	3	0	0	0	0	0	5	0	5	8	8	16		6:30-6:45
6:45-7:00	4	0	3	7	0	4	0	4	0	0	0	0	0	4	0	4	7	8	15		6:45-7:00
7:00-7:15	14	0	2	16	0	6	0	6	0	0	0	0	0	4	0	4	16	10	26		7:00-7:15
7:15-7:30	4	0	1	5	0	3	0	3	0	0	0	0	0	9	0	9	5	12	17		7:15-7:30
7:30-7:45	6	0	0	6	0	2	0	2	0	0	0	0	0	8	0	8	6	10	16		7:30-7:45
7:45-8:00	9	0	1	10	0	4	0	4	0	0	0	0	0	23	0	23	10	27	37		7:45-8:00
8:00-8:15	5	0	2	7	0	6	0	6	0	0	0	0	0	10	0	10	7	16	23		8:00-8:15
8:15-8:30	9	0	1	10	0	6	0	6	0	0	0	0	0	21	0	21	10	27	37		8:15-8:30
8:30-8:45	4	0	2	6	0	4	0	4	0	0	0	0	0	19	0	19	6	23	29		8:30-8:45
8:45-9:00	10	0	1	11	0	5	0	5	0	0	0	0	0	27	0	27	11	32	43		8:45-9:00
9:00-9:15	3	0	1	4	0	5	0	5	0	0	0	0	0	26	0	26	4	31	35		9:00-9:15
9:15-9:30	6	0	3	9	0	4	0	4	0	0	0	0	0	23	0	23	9	27	36		9:15-9:30
3 Hour Totals	76	0	23	99	0	52	0	52	0	0	0	0	0	179	0	179	99	231	330		
1 Hour Totals																					
6:30-7:30	24	0	12	36	0	16	0	16	0	0	0	0	0	22	0	22	38	38	74	0.71	6:30-7:30
6:45-7:45	28	0	6	34	0	15	0	15	0	0	0	0	0	25	0	25	34	40	74	0.71	6:45-7:45
7:00-8:00	33	0	4	37	0	15	0	15	0	0	0	0	0	44	0	44	37	59	96	0.65	7:00-8:00
7:15-8:15	24	0	4	28	0	15	0	15	0	0	0	0	0	50	0	50	28	65	93	0.63	7:15-8:15
7:30-8:30	29	0	4	33	0	18	0	18	0	0	0	0	0	62	0	62	33	80	113	0.76	7:30-8:30
7:45-8:45	27	0	6	33	0	20	0	20	0	0	0	0	0	73	0	73	33	93	126	0.85	7:45-8:45
8:00-9:00	28	0	6	34	0	21	0	21	0	0	0	0	0	77	0	77	34	98	132	0.77	8:00-9:00
8:15-9:15	26	0	5	31	0	20	0	20	0	0	0	0	0	93	0	93	31	113	144	0.84	8:15-9:15
8:30-9:30	23	0	7	30	0	18	0	18	0	0	0	0	0	95	0	95	30	113	143	0.83	8:30-9:30
AM Peak																					**AM Peak**
8:15-9:15	**26**	**0**	**5**	**31**	**0**	**20**	**0**	**20**	**0**	**0**	**0**	**0**	**0**	**93**	**0**	**93**	**31**	**113**	**144**	**0.84**	**8:15-9:15**
PM																					
4:00-4:15	51	0	10	61	0	3	0	3	0	0	0	0	0	21	0	21	61	24	85		4:00-4:15
4:15-4:30	48	0	11	59	0	13	0	13	0	0	0	0	0	19	0	19	59	32	91		4:15-4:30
4:30-4:45	56	0	11	67	0	8	0	8	0	0	0	0	0	11	0	11	67	19	86		4:30-4:45
4:45-5:00	48	0	11	59	0	10	0	10	0	0	0	0	0	18	0	18	59	28	87		4:45-5:00
5:00-5:15	62	0	13	75	0	6	0	6	0	0	0	0	0	15	0	15	75	21	96		5:00-5:15
5:15-5:30	72	0	14	86	0	7	0	7	0	0	0	0	0	9	0	9	86	16	102		5:15-5:30
5:30-5:45	70	0	12	82	0	2	0	2	0	0	0	0	0	17	0	17	82	19	101		5:30-5:45
5:45-6:00	59	0	8	67	0	6	0	6	0	0	0	0	0	14	0	14	67	20	87		5:45-6:00
6:00-6:15	51	0	4	55	0	4	0	4	0	0	0	0	0	16	0	16	55	20	75		6:00-6:15
6:15-6:30	24	0	4	28	0	9	0	9	0	0	0	0	0	16	0	16	28	25	53		6:15-6:30
6:30-6:45	26	0	1	27	0	2	0	2	0	0	0	0	0	17	0	17	27	19	46		6:30-6:45
6:45-7:00	10	0	1	11	0	3	0	3	0	0	0	0	0	13	0	13	11	16	27		6:45-7:00
3 Hour Totals	577	0	100	677	0	73	0	73	0	0	0	0	0	186	0	186	677	259	936		
1 Hour Totals																					
4:00-5:00	203	0	43	246	0	34	0	34	0	0	0	0	0	69	0	69	246	103	349	0.96	4:00-5:00
4:15-5:15	214	0	46	260	0	37	0	37	0	0	0	0	0	63	0	63	260	100	360	0.94	4:15-5:15
4:30-5:30	238	0	49	287	0	31	0	31	0	0	0	0	0	53	0	53	287	84	371	0.91	4:30-5:30
4:45-5:45	252	0	50	302	0	25	0	25	0	0	0	0	0	59	0	59	302	84	386	0.95	4:45-5:45
5:00-6:00	263	0	47	310	0	21	0	21	0	0	0	0	0	55	0	55	310	76	386	0.95	5:00-6:00
5:15-6:15	252	0	38	290	0	19	0	19	0	0	0	0	0	56	0	56	290	75	365	0.89	5:15-6:15
5:30-6:30	204	0	28	232	0	21	0	21	0	0	0	0	0	63	0	63	232	84	316	0.78	5:30-6:30
5:45-6:45	160	0	17	177	0	21	0	21	0	0	0	0	0	63	0	63	177	84	261	0.75	5:45-6:45
6:00-7:00	111	0	10	121	0	18	0	18	0	0	0	0	0	62	0	62	121	80	201	0.67	6:00-7:00
PM Peak																					**PM Peak**
4:45-5:45	**252**	**0**	**50**	**302**	**0**	**25**	**0**	**25**	**0**	**0**	**0**	**0**	**0**	**59**	**0**	**59**	**302**	**84**	**386**	**0.95**	**4:45-5:45**

Wells & Associates, LLC
McLean, Virginia

Pedestrian Volume Survey

North

Project Name: Anacostia Gateway Government Center

Project Number: 2619

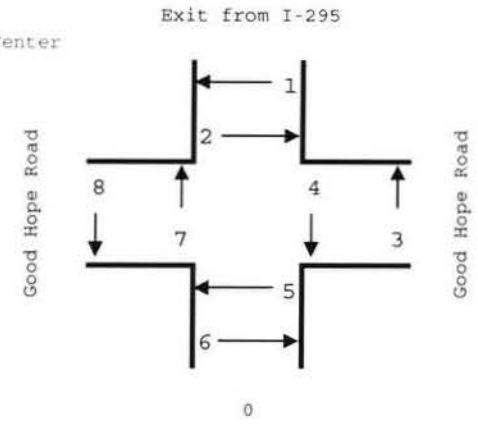
Location: Washington,DC

Intersection: Good Hope Rd.& exit from I-2

Weather: Clear

Date: 10/14/2004

Surveyor: GiVanna



TIME	Movement							
	1	2	3	4	5	6	7	8
AM								
6:30-6:45								
6:45-7:00								
7:00-7:15								
7:15-7:30								
7:30-7:45	1							
7:45-8:00								
8:00-8:15								
8:15-8:30								
8:30-8:45		1						
8:45-9:00	2							
9:00-9:15								
9:15-9:30		1						
PM								
4:00-4:15								
4:15-4:30	2							
4:30-4:45								
4:45-5:00		1						
5:00-5:15	1							
5:15-5:30	2							
5:30-5:45		1						
5:45-6:00	1							
6:00-6:15								
6:15-6:30	1							
6:30-6:45		1						
6:45-7:00								

Wells & Associates, LLC

McLean, Virginia

Existing Traffic Count

PROJECT:	Anacostia Gateway Government Center	DATE:	10/14/2004	SOUTHBOUND ROAD:	Exit from I-295	
W & A JOB NO.:	2619	DAY:	Thursday	NORTHBOUND ROAD:	Martin Luther King Jr Avenue	
INTERSECTION:	Martin Luther King Jr Ave & Good Hope F	WEATHER:	Clear	WESTBOUND ROAD:	Good Hope Road	
LOCATION:	Washington.DC	COUNTED BY:	Stuarts	EASTBOUND ROAD:	Good Hope Road	
		INPUTED BY:	agan			

Time Period	Turning Movements: Southbound Exit from I-295				Westbound Good Hope Road				Northbound Martin Luther King Jr.Avenu				Eastbound Good Hope Road				North & South	East & West	Total	PHF	Time Period
	1 Right	2 Thru	3 Left	Total	4 Right	5 Thru	6 Left	Total	7 Right	8 Thru	9 Left	Total	10 Right	11 Thru	12 Left	Total					
AM																					
6:30-6:45	4	26	36	66	0	2	16	18	0	0	0	0	0	7	0	7	66	25	91		6:30-6:45
6:45-7:00	3	28	33	64	0	6	6	12	0	0	0	0	0	2	0	2	64	14	78		6:45-7:00
7:00-7:15	1	37	34	72	0	4	12	16	0	0	0	0	2	6	0	8	72	24	96		7:00-7:15
7:15-7:30	2	58	31	91	0	3	9	12	0	0	0	0	10	7	0	17	91	29	120		7:15-7:30
7:30-7:45	1	47	46	94	0	6	12	18	0	0	0	0	4	3	0	7	94	25	119		7:30-7:45
7:45-8:00	5	53	41	99	0	6	17	23	0	0	0	0	14	9	0	23	99	46	145		7:45-8:00
8:00-8:15	3	46	43	92	0	3	21	24	0	0	0	0	4	5	0	9	92	33	125		8:00-8:15
8:15-8:30	9	64	62	135	0	3	18	21	0	0	0	0	13	4	0	17	135	38	173		8:15-8:30
8:30-8:45	7	65	60	132	0	2	21	23	0	0	0	0	11	9	0	20	132	43	175		8:30-8:45
8:45-9:00	5	79	66	150	0	2	31	33	0	0	0	0	17	16	0	33	150	66	216		8:45-9:00
9:00-9:15	15	57	76	148	0	3	36	39	0	0	0	0	16	8	0	24	148	63	211		9:00-9:15
9:15-9:30	3	78	66	147	0	4	31	35	0	0	0	0	17	9	0	26	147	61	208		9:15-9:30
3 Hour Totals	58	638	594	1,290	0	44	230	274	0	0	0	0	108	85	0	193	1,290	467	1,757		
1 Hour Totals																					
6:30-7:30	10	149	134	293	0	15	43	58	0	0	0	0	12	22	0	34	293	92	385	0.80	6:30-7:30
6:45-7:45	7	170	144	321	0	19	39	58	0	0	0	0	16	18	0	34	321	92	413	0.86	6:45-7:45
7:00-8:00	9	195	152	356	0	19	50	69	0	0	0	0	30	25	0	55	356	124	480	0.83	7:00-8:00
7:15-8:15	11	204	161	376	0	18	59	77	0	0	0	0	32	24	0	56	376	133	509	0.88	7:15-8:15
7:30-8:30	18	210	192	420	0	18	68	86	0	0	0	0	35	21	0	56	420	142	562	0.81	7:30-8:30
7:45-8:45	24	228	206	458	0	14	77	91	0	0	0	0	42	27	0	69	458	160	618	0.88	7:45-8:45
8:00-9:00	24	254	231	509	0	10	91	101	0	0	0	0	45	34	0	79	509	180	689	0.80	8:00-9:00
8:15-9:15	36	265	264	565	0	10	106	116	0	0	0	0	57	37	0	94	565	210	775	0.90	8:15-9:15
8:30-9:30	30	279	268	577	0	11	119	130	0	0	0	0	61	42	0	103	577	233	810	0.94	8:30-9:30
AM Peak 8:30-9:30	**30**	**279**	**268**	**577**	**0**	**11**	**119**	**130**	**0**	**0**	**0**	**0**	**61**	**42**	**0**	**103**	**577**	**233**	**810**	**0.94**	**AM Peak 8:30-9:30**
PM																					
4:00-4:15	0	278	188	466	0	3	33	36	0	0	0	0	7	15	0	22	466	58	524		4:00-4:15
4:15-4:30	0	254	165	419	0	12	64	76	0	0	0	0	16	21	0	37	419	113	532		4:15-4:30
4:30-4:45	0	332	193	525	0	5	28	33	0	0	0	0	6	18	0	24	525	57	582		4:30-4:45
4:45-5:00	0	288	188	476	0	8	39	47	0	0	0	0	8	18	0	26	476	73	549		4:45-5:00
5:00-5:15	0	337	209	546	0	5	36	41	0	0	0	0	9	15	0	24	546	65	611		5:00-5:15
5:15-5:30	0	259	203	462	0	4	47	51	0	0	0	0	10	20	0	30	462	81	543		5:15-5:30
5:30-5:45	0	324	213	537	0	6	34	40	0	0	0	0	2	22	0	24	537	64	601		5:30-5:45
5:45-6:00	0	248	204	452	0	8	35	43	0	0	0	0	9	18	0	27	452	70	522		5:45-6:00
6:00-6:15	0	281	222	503	0	4	30	34	0	0	0	0	5	15	0	20	503	54	557		6:00-6:15
6:15-6:30	1	180	219	400	0	7	41	48	0	0	0	0	5	10	0	15	400	63	463		6:15-6:30
6:30-6:45	0	152	159	311	0	1	56	57	0	0	0	0	7	20	0	27	311	84	395		6:30-6:45
6:45-7:00	1	95	145	241	0	2	49	51	0	0	0	0	6	4	0	10	241	61	302		6:45-7:00
3 Hour Totals	2	3,028	2,308	5,338	0	65	492	557	0	0	0	0	90	196	0	286	5,338	843	6,181		
1 Hour Totals																					
4:00-5:00	0	1,152	734	1,886	0	28	164	192	0	0	0	0	37	72	0	109	1,886	301	2,187	0.94	4:00-5:00
4:15-5:15	0	1,211	755	1,966	0	30	167	197	0	0	0	0	39	72	0	111	1,966	308	2,274	0.93	4:15-5:15
4:30-5:30	0	1,216	793	2,009	0	22	150	172	0	0	0	0	33	71	0	104	2,009	276	2,285	0.93	4:30-5:30
4:45-5:45	0	1,208	813	2,021	0	23	156	179	0	0	0	0	29	75	0	104	2,021	283	2,304	0.94	4:45-5:45
5:00-6:00	0	1,168	829	1,997	0	23	152	175	0	0	0	0	30	75	0	105	1,997	280	2,277	0.93	5:00-6:00
5:15-6:15	0	1,112	842	1,954	0	22	146	168	0	0	0	0	26	75	0	101	1,954	269	2,223	0.92	5:15-6:15
5:30-6:30	1	1,033	858	1,892	0	25	140	165	0	0	0	0	21	65	0	86	1,892	251	2,143	0.89	5:30-6:30
5:45-6:45	1	861	804	1,666	0	20	162	182	0	0	0	0	26	63	0	89	1,668	271	1,937	0.87	5:45-6:45
6:00-7:00	2	708	745	1,455	0	14	176	190	0	0	0	0	23	49	0	72	1,455	262	1,717	0.77	6:00-7:00
PM Peak 4:45-5:45	**0**	**1,208**	**813**	**2,021**	**0**	**23**	**156**	**179**	**0**	**0**	**0**	**0**	**29**	**75**	**0**	**104**	**2,021**	**283**	**2,304**	**0.94**	**PM Peak 4:45-5:45**

Wells & Associates, LLC
McLean, Virginia

Pedestrian Volume Survey



Project Name: Anacostia Gateway Government Center

Project Number: 2619

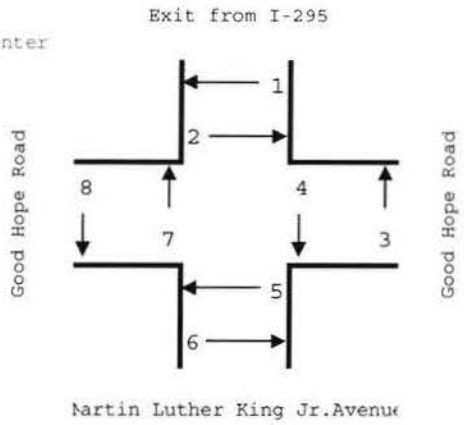
Location: Washington,DC

Intersection: Martin Luther King Jr.Ave.&

Weather: Clear

Date: 10/14/2004

Surveyor: Stuarts



TIME	Movement							
	1	2	3	4	5	6	7	8
AM								
6:30-6:45			1	1	1			
6:45-7:00		1			2	1		
7:00-7:15			1	4	3	1		
7:15-7:30				7	6	2	2	
7:30-7:45	1		2	7	2	1		
7:45-8:00	2			2	9	1		1
8:00-8:15	3	1	2	3	9	3	1	
8:15-8:30	1			9	6	2	1	
8:30-8:45	1		1	3	7	1		1
8:45-9:00	3			2	3	4	1	
9:00-9:15	1		2	7	4	2		2
9:15-9:30	1		3	4	10	5	2	
PM								
4:00-4:15	3		4	3	4	8	1	2
4:15-4:30	1		2	2	9	12		3
4:30-4:45	1		6	11	7	4	2	1
4:45-5:00	1	1	2	3	5	10		2
5:00-5:15	2		3	4	4	8	3	5
5:15-5:30			7	7	3	12	1	3
5:30-5:45	3	1	2	2	5	7		2
5:45-6:00	1		1	3	2	2	1	1
6:00-6:15	1		2	4	2	4		1
6:15-6:30				4	3	3	2	2
6:30-6:45	2			2	2	2		
6:45-7:00				6	4	5		

Appendix B

Existing Levels of Service

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0					4.0	4.0	
Lane Util. Factor		1.00			1.00					1.00	0.95	
Frt		0.92			1.00					1.00	1.00	
Flt Protected		1.00			0.96					0.95	1.00	
Satd. Flow (prot)		1713			1786					1770	3526	
Flt Permitted		1.00			0.67					0.95	1.00	
Satd. Flow (perm)		1713			1256					1770	3526	
Volume (vph)	0	25	45	145	20	0	0	0	0	250	375	5
Peak-hour factor, PHF	0.25	0.56	0.68	0.82	0.71	0.25	0.25	0.25	0.25	0.88	0.94	0.50
Adj. Flow (vph)	0	45	66	177	28	0	0	0	0	284	399	10
RTOR Reduction (vph)	0	52	0	0	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	59	0	0	205	0	0	0	0	284	407	0
Turn Type				Prot						Prot		
Protected Phases		8		7	4					1	1 2	
Permitted Phases					4							
Actuated Green, G (s)		16.0			26.0					19.0	43.0	
Effective Green, g (s)		17.0			27.0					21.0	45.0	
Actuated g/C Ratio		0.21			0.34					0.26	0.56	
Clearance Time (s)		5.0			5.0					6.0		
Lane Grp Cap (vph)		364			464					465	1983	
v/s Ratio Prot		0.03			c0.03					c0.16	c0.12	
v/s Ratio Perm					c0.12							
v/c Ratio		0.16			0.44					0.61	0.21	
Uniform Delay, d1		25.7			20.6					25.9	8.7	
Progression Factor		1.00			1.00					1.00	1.00	
Incremental Delay, d2		1.0			3.0					5.9	0.2	
Delay (s)		26.6			23.7					31.8	8.9	
Level of Service		C			C					C	A	
Approach Delay (s)		26.6			23.7			0.0			18.3	
Approach LOS		C			C			A			B	

Intersection Summary			
HCM Average Control Delay	20.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	36.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00						0.95	0.95	1.00	0.95	
Frt		0.95						0.88	0.85	1.00	0.98	
Flt Protected		1.00						0.99	1.00	0.95	1.00	
Satd. Flow (prot)		1762						1538	1504	1770	3471	
Flt Permitted		1.00						0.84	1.00	0.95	1.00	
Satd. Flow (perm)		1762						1303	1504	1770	3471	
Volume (vph)	0	25	5	0	0	0	30	0	785	95	380	40
Peak-hour factor, PHF	0.25	0.82	0.25	0.25	0.25	0.25	0.52	0.25	0.92	0.94	0.90	0.64
Adj. Flow (vph)	0	30	20	0	0	0	58	0	853	101	422	62
RTOR Reduction (vph)	0	17	0	0	0	0	0	0	0	0	15	0
Lane Group Flow (vph)	0	34	0	0	0	0	0	327	584	101	469	0
Turn Type							Perm		Perm	Prot		
Protected Phases		4						2		1	1 5 2	
Permitted Phases							2		2			
Actuated Green, G (s)		13.0						20.0	20.0	17.0	57.0	
Effective Green, g (s)		14.0						21.0	21.0	18.0	58.0	
Actuated g/C Ratio		0.18						0.26	0.26	0.22	0.72	
Clearance Time (s)		5.0						5.0	5.0	5.0		
Lane Grp Cap (vph)		308						342	395	398	2516	
v/s Ratio Prot		c0.02								c0.06	c0.14	
v/s Ratio Perm								0.25	c0.39			
v/c Ratio		0.11						0.96	1.48	0.25	0.19	
Uniform Delay, d1		27.8						29.0	29.5	25.5	3.5	
Progression Factor		1.00						1.00	1.00	0.67	1.57	
Incremental Delay, d2		0.7						38.7	228.6	1.3	0.1	
Delay (s)		28.5						67.8	258.1	18.2	5.6	
Level of Service		C						E	F	B	A	
Approach Delay (s)		28.5			0.0			189.8			7.8	
Approach LOS		C			A			F			A	

Intersection Summary			
HCM Average Control Delay	115.7	HCM Level of Service	F
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	64.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0			4.0	
Lane Util. Factor		1.00						0.95			0.95	
Frt		0.95						1.00			1.00	
Flt Protected		0.97						1.00			1.00	
Satd. Flow (prot)		1711						3533			3532	
Flt Permitted		0.89						0.94			1.00	
Satd. Flow (perm)		1572						3339			3532	
Volume (vph)	10	0	5	0	0	0	25	835	0	0	340	5
Peak-hour factor, PHF	0.67	0.25	0.50	0.25	0.25	0.25	0.67	0.86	0.25	0.25	0.78	0.88
Adj. Flow (vph)	15	0	10	0	0	0	37	971	0	0	436	6
RTOR Reduction (vph)	0	8	0	0	0	0	0	0	0	0	1	0
Lane Group Flow (vph)	0	17	0	0	0	0	0	1008	0	0	441	0
Turn Type	Perm			Perm			custom					
Protected Phases		4			8		1 9	6 9			2	
Permitted Phases	4			8			6				2	
Actuated Green, G (s)		20.0						53.0			22.0	
Effective Green, g (s)		21.0						54.0			23.0	
Actuated g/C Ratio		0.24						0.62			0.26	
Clearance Time (s)		5.0									5.0	
Lane Grp Cap (vph)		379						2133			934	
v/s Ratio Prot								c0.15			0.12	
v/s Ratio Perm		c0.01						c0.15				
v/c Ratio		0.05						0.47			0.47	
Uniform Delay, d1		25.3						8.9			26.9	
Progression Factor		1.00						0.18			1.00	
Incremental Delay, d2		0.2						0.4			1.7	
Delay (s)		25.5						1.9			28.6	
Level of Service		C						A			C	
Approach Delay (s)		25.5			0.0			1.9			28.6	
Approach LOS		C			A			A			C	

Intersection Summary			
HCM Average Control Delay	10.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	87.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	46.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0						4.0	
Lane Util. Factor		0.95			0.95						1.00	
Frt		0.99			1.00						0.89	
Flt Protected		1.00			0.99						0.99	
Satd. Flow (prot)		3496			3521						1640	
Flt Permitted		1.00			0.93						0.94	
Satd. Flow (perm)		3496			3280						1560	
Volume (vph)	0	670	45	30	315	0	0	0	0	55	0	190
Peak-hour factor, PHF	0.25	0.88	0.66	0.75	0.90	0.25	0.25	0.25	0.25	0.86	0.25	0.61
Adj. Flow (vph)	0	761	68	40	350	0	0	0	0	64	0	311
RTOR Reduction (vph)	0	7	0	0	0	0	0	0	0	0	201	0
Lane Group Flow (vph)	0	822	0	0	390	0	0	0	0	0	174	0
Turn Type				pm+pt			Perm			Perm		
Protected Phases		2		1 8	6 8			13			9	
Permitted Phases		2		6 8	8		13			9		
Actuated Green, G (s)		22.0			62.0						15.0	
Effective Green, g (s)		23.0			63.0						16.0	
Actuated g/C Ratio		0.26			0.72						0.18	
Clearance Time (s)		5.0									5.0	
Lane Grp Cap (vph)		924			2475						287	
v/s Ratio Prot		c0.24			c0.07							
v/s Ratio Perm					0.05						c0.11	
v/c Ratio		0.89			0.16						0.61	
Uniform Delay, d1		30.8			3.7						32.6	
Progression Factor		1.00			0.01						1.00	
Incremental Delay, d2		12.5			0.1						9.2	
Delay (s)		43.3			0.2						41.8	
Level of Service		D			A						D	
Approach Delay (s)		43.3			0.2			0.0			41.8	
Approach LOS		D			A			A			D	

Intersection Summary			
HCM Average Control Delay	32.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	87.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	53.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕			↕			↕↕			↕↕	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			0.95			0.95	
Frt		0.94			0.97			1.00			0.99	
Flt Protected		0.98			0.98			0.99			1.00	
Satd. Flow (prot)		1718			1772			3504			3486	
Flt Permitted		0.85			0.85			0.84			0.86	
Satd. Flow (perm)		1496			1541			2970			3012	
Volume (vph)	20	10	25	30	15	10	70	680	20	10	340	20
Peak-hour factor, PHF	0.50	0.75	0.63	0.79	0.40	0.45	0.73	0.92	0.80	0.25	0.81	0.54
Adj. Flow (vph)	40	13	40	38	38	22	96	739	25	40	420	37
RTOR Reduction (vph)	0	32	0	0	15	0	0	2	0	0	6	0
Lane Group Flow (vph)	0	61	0	0	83	0	0	858	0	0	491	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		8			4			2			6	
Permitted Phases	8			4			2	2		6	6	
Actuated Green, G (s)		9.9			9.9			36.5			36.5	
Effective Green, g (s)		10.9			10.9			37.5			37.5	
Actuated g/C Ratio		0.19			0.19			0.66			0.66	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		289			298			1975			2003	
v/s Ratio Prot												
v/s Ratio Perm		0.04			c0.05			c0.29			0.16	
v/c Ratio		0.21			0.28			0.43			0.25	
Uniform Delay, d1		19.1			19.4			4.5			3.8	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.4			0.5			0.2			0.1	
Delay (s)		19.5			19.9			4.6			3.8	
Level of Service		B			B			A			A	
Approach Delay (s)		19.5			19.9			4.6			3.8	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM Average Control Delay	6.2	HCM Level of Service	A
HCM Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	56.4	Sum of lost time (s)	8.0
Intersection Capacity Utilization	52.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		Y	
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	67	25	0	3	26
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	73	27	0	3	28
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)			272			
pX, platoon unblocked						
vC, conflicting volume	27				100	27
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	27				100	27
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	97
cM capacity (veh/h)	1587				899	1048

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	73	27	32
Volume Left	0	0	3
Volume Right	0	0	28
cSH	1700	1700	1031
Volume to Capacity	0.04	0.02	0.03
Queue Length 95th (ft)	0	0	2
Control Delay (s)	0.0	0.0	8.6
Lane LOS			A
Approach Delay (s)	0.0	0.0	8.6
Approach LOS			A

Intersection Summary			
Average Delay		2.1	
Intersection Capacity Utilization		13.5%	ICU Level of Service A
Analysis Period (min)		15	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0		4.0	4.0			
Lane Util. Factor		1.00			0.95	0.95		0.95	1.00			
Frt		1.00			0.88	0.85		1.00	0.85			
Flt Protected		0.99			1.00	1.00		1.00	1.00			
Satd. Flow (prot)		1852			1555	1504		3535	1583			
Flt Permitted		0.37			1.00	1.00		1.00	1.00			
Satd. Flow (perm)		694			1555	1504		3535	1583			
Volume (vph)	35	240	0	0	140	1225	25	1150	60	0	0	0
Peak-hour factor, PHF	0.75	0.65	0.25	0.25	0.87	0.88	0.75	0.91	0.73	0.25	0.25	0.25
Adj. Flow (vph)	47	369	0	0	161	1392	33	1264	82	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	40	0	0	0
Lane Group Flow (vph)	0	416	0	0	840	713	0	1297	42	0	0	0
Turn Type	Perm					Perm	Perm		Perm			
Protected Phases		4			8			2				
Permitted Phases	4					8	2		2			
Actuated Green, G (s)		60.0			60.0	60.0		47.0	47.0			
Effective Green, g (s)		62.0			62.0	62.0		50.0	50.0			
Actuated g/C Ratio		0.52			0.52	0.52		0.42	0.42			
Clearance Time (s)		6.0			6.0	6.0		7.0	7.0			
Vehicle Extension (s)		3.0			3.0	3.0		3.0	3.0			
Lane Grp Cap (vph)		359			803	777		1473	660			
v/s Ratio Prot					0.54							
v/s Ratio Perm		c0.60				0.47		0.37	0.03			
v/c Ratio		1.16			1.05	0.92		0.88	0.06			
Uniform Delay, d1		29.0			29.0	26.7		32.2	21.0			
Progression Factor		1.00			1.00	1.00		1.00	1.00			
Incremental Delay, d2		98.1			44.5	15.6		7.9	0.2			
Delay (s)		127.1			73.5	42.2		40.1	21.2			
Level of Service		F			E	D		D	C			
Approach Delay (s)		127.1			59.1			39.0			0.0	
Approach LOS		F			E			D			A	

Intersection Summary			
HCM Average Control Delay	59.3	HCM Level of Service	E
HCM Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	107.6%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0					4.0	4.0	
Lane Util. Factor		1.00			1.00					1.00	0.95	
Frt		0.96			1.00					1.00	1.00	
Flt Protected		1.00			0.97					0.95	1.00	
Satd. Flow (prot)		1783			1800					1770	3535	
Flt Permitted		1.00			0.58					0.95	1.00	
Satd. Flow (perm)		1783			1075					1770	3535	
Volume (vph)	0	65	40	195	100	0	0	0	0	900	1160	5
Peak-hour factor, PHF	0.25	0.57	0.75	0.84	0.99	0.25	0.25	0.25	0.25	0.88	0.94	0.50
Adj. Flow (vph)	0	114	53	232	101	0	0	0	0	1023	1234	10
RTOR Reduction (vph)	0	19	0	0	0	0	0	0	0	0	1	0
Lane Group Flow (vph)	0	148	0	0	333	0	0	0	0	1023	1243	0
Turn Type				Prot						Prot		
Protected Phases		8		7	4					1	1 2	
Permitted Phases					4							
Actuated Green, G (s)		16.0			26.0					31.0	53.0	
Effective Green, g (s)		17.0			27.0					33.0	55.0	
Actuated g/C Ratio		0.19			0.30					0.37	0.61	
Clearance Time (s)		5.0			5.0					6.0		
Lane Grp Cap (vph)		337			371					649	2160	
v/s Ratio Prot		0.08			c0.06					c0.58	c0.35	
v/s Ratio Perm					c0.21							
v/c Ratio		0.44			0.90					1.58	0.58	
Uniform Delay, d1		32.3			30.2					28.5	10.5	
Progression Factor		1.00			1.00					1.00	1.00	
Incremental Delay, d2		4.1			26.9					266.7	1.1	
Delay (s)		36.4			57.0					295.2	11.6	
Level of Service		D			E					F	B	
Approach Delay (s)		36.4			57.0			0.0			139.6	
Approach LOS		D			E			A			F	

Intersection Summary			
HCM Average Control Delay	123.4	HCM Level of Service	F
HCM Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	79.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00						0.95	0.95	1.00	0.95	
Frt		0.96						0.90	0.85	1.00	1.00	
Flt Protected		1.00						0.98	1.00	0.95	1.00	
Satd. Flow (prot)		1793						1571	1504	1770	3528	
Flt Permitted		1.00						0.48	1.00	0.95	1.00	
Satd. Flow (perm)		1793						767	1504	1770	3528	
Volume (vph)	0	70	30	0	0	0	25	0	305	110	1030	15
Peak-hour factor, PHF	0.25	0.72	0.81	0.25	0.25	0.25	0.69	0.25	0.96	0.73	0.91	0.63
Adj. Flow (vph)	0	97	37	0	0	0	36	0	318	151	1132	24
RTOR Reduction (vph)	0	15	0	0	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	119	0	0	0	0	0	100	254	151	1154	0
Turn Type							Perm		Perm	Prot		
Protected Phases		4						2		1	1 5 2	
Permitted Phases							2		2			
Actuated Green, G (s)		13.0						11.0	11.0	36.0	67.0	
Effective Green, g (s)		14.0						12.0	12.0	37.0	68.0	
Actuated g/C Ratio		0.16						0.13	0.13	0.41	0.76	
Clearance Time (s)		5.0						5.0	5.0	5.0		
Lane Grp Cap (vph)		279						102	201	728	2666	
v/s Ratio Prot		c0.07								0.09	c0.33	
v/s Ratio Perm								0.13	c0.17			
v/c Ratio		0.43						0.98	1.26	0.21	0.43	
Uniform Delay, d1		34.4						38.9	39.0	17.1	4.0	
Progression Factor		1.00						0.61	0.63	0.59	0.28	
Incremental Delay, d2		4.7						83.6	151.9	0.3	0.2	
Delay (s)		39.1						107.4	176.5	10.3	1.3	
Level of Service		D						F	F	B	A	
Approach Delay (s)		39.1			0.0			157.0			2.4	
Approach LOS		D			A			F			A	

Intersection Summary			
HCM Average Control Delay	35.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	61.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0						4.0			4.0	
Lane Util. Factor	0.95	0.95						0.95			0.95	
Frt	1.00	0.85						1.00			1.00	
Flt Protected	0.95	1.00						1.00			1.00	
Satd. Flow (prot)	1681	1504						3531			3533	
Flt Permitted	0.76	1.00						0.91			1.00	
Satd. Flow (perm)	1340	1504						3227			3533	
Volume (vph)	5	0	25	0	0	0	15	365	0	0	760	10
Peak-hour factor, PHF	0.67	0.25	0.50	0.25	0.25	0.25	0.67	0.86	0.25	0.25	0.78	0.88
Adj. Flow (vph)	7	0	50	0	0	0	22	424	0	0	974	11
RTOR Reduction (vph)	0	43	0	0	0	0	0	0	0	0	1	0
Lane Group Flow (vph)	7	7	0	0	0	0	0	446	0	0	984	0
Turn Type	Perm			Perm			custom			Perm		
Protected Phases		4			8		1 9	6 9			2	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)	11.0	11.0						65.0			46.0	
Effective Green, g (s)	12.0	12.0						66.0			47.0	
Actuated g/C Ratio	0.13	0.13						0.73			0.52	
Clearance Time (s)	5.0	5.0									5.0	
Lane Grp Cap (vph)	179	201						2417			1845	
v/s Ratio Prot		0.00						c0.03			c0.28	
v/s Ratio Perm	c0.01							0.10				
v/c Ratio	0.04	0.03						0.18			0.53	
Uniform Delay, d1	34.0	34.0						3.7			14.2	
Progression Factor	1.00	1.00						0.13			0.87	
Incremental Delay, d2	0.4	0.3						0.2			1.0	
Delay (s)	34.4	34.3						0.6			13.3	
Level of Service	C	C						A			B	
Approach Delay (s)		34.3			0.0			0.6			13.3	
Approach LOS		C			A			A			B	

Intersection Summary			
HCM Average Control Delay	10.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	31.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0						4.0	
Lane Util. Factor		0.95			0.95						1.00	
Frt		0.97			1.00						0.97	
Flt Protected		1.00			1.00						0.96	
Satd. Flow (prot)		3428			3524						1743	
Flt Permitted		1.00			0.86						0.81	
Satd. Flow (perm)		3428			3055						1471	
Volume (vph)	0	375	85	75	710	0	0	0	0	20	0	5
Peak-hour factor, PHF	0.25	0.89	0.76	0.99	0.90	0.25	0.25	0.25	0.25	0.85	0.25	0.82
Adj. Flow (vph)	0	421	112	76	789	0	0	0	0	24	0	6
RTOR Reduction (vph)	0	26	0	0	0	0	0	0	0	0	5	0
Lane Group Flow (vph)	0	507	0	0	865	0	0	0	0	0	25	0
Turn Type	Perm			pm+pt			Perm			Perm		
Protected Phases		2		1 8	6 8			13			9	
Permitted Phases	2	2		6 8	8		13			9		
Actuated Green, G (s)		46.0			68.0						12.0	
Effective Green, g (s)		47.0			69.0						13.0	
Actuated g/C Ratio		0.52			0.77						0.14	
Clearance Time (s)		5.0									5.0	
Lane Grp Cap (vph)		1790			2436						212	
v/s Ratio Prot		0.15			c0.07							
v/s Ratio Perm					c0.20						c0.02	
v/c Ratio		0.28			0.36						0.12	
Uniform Delay, d1		12.1			3.4						33.5	
Progression Factor		0.66			0.04						1.00	
Incremental Delay, d2		0.4			0.4						1.1	
Delay (s)		8.3			0.5						34.6	
Level of Service		A			A						C	
Approach Delay (s)		8.3			0.5			0.0			34.6	
Approach LOS		A			A			A			C	

Intersection Summary			
HCM Average Control Delay	4.1	HCM Level of Service	A
HCM Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	53.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			0.95			0.95	
Frt		0.99			0.96			0.99			1.00	
Flt Protected		0.96			0.99			1.00			1.00	
Satd. Flow (prot)		1770			1773			3492			3522	
Flt Permitted		0.78			0.95			0.87			0.95	
Satd. Flow (perm)		1431			1700			3039			3346	
Volume (vph)	30	5	5	15	15	25	30	405	25	5	710	15
Peak-hour factor, PHF	0.58	0.65	0.88	0.79	0.33	1.00	0.91	0.91	0.72	0.58	0.87	0.63
Adj. Flow (vph)	52	8	6	19	45	25	33	445	35	9	816	24
RTOR Reduction (vph)	0	4	0	0	15	0	0	6	0	0	2	0
Lane Group Flow (vph)	0	62	0	0	74	0	0	507	0	0	847	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		8			4			2			6	
Permitted Phases	8			4			2	2		6	6	
Actuated Green, G (s)		31.0			31.0			49.0			49.0	
Effective Green, g (s)		32.0			32.0			50.0			50.0	
Actuated g/C Ratio		0.36			0.36			0.56			0.56	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Lane Grp Cap (vph)		509			604			1688			1859	
v/s Ratio Prot												
v/s Ratio Perm		c0.04			0.04			0.17			c0.25	
v/c Ratio		0.12			0.12			0.30			0.46	
Uniform Delay, d1		19.5			19.5			10.7			11.9	
Progression Factor		1.00			1.00			1.00			0.55	
Incremental Delay, d2		0.5			0.4			0.5			0.8	
Delay (s)		20.0			19.9			11.1			7.3	
Level of Service		C			B			B			A	
Approach Delay (s)		20.0			19.9			11.1			7.3	
Approach LOS		C			B			B			A	

Intersection Summary			
HCM Average Control Delay	9.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	52.4%	ICU Level of Service	A
Analysis Period (min)	15		

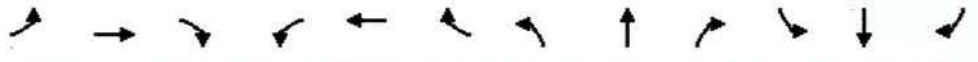
c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		Y	
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	57	105	0	48	252
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	62	114	0	52	274
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)			272			
pX, platoon unblocked						
vC, conflicting volume	114				176	114
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	114				176	114
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				94	71
cM capacity (veh/h)	1475				814	938

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	62	114	326
Volume Left	0	0	52
Volume Right	0	0	274
cSH	1700	1700	916
Volume to Capacity	0.04	0.07	0.36
Queue Length 95th (ft)	0	0	41
Control Delay (s)	0.0	0.0	11.1
Lane LOS			B
Approach Delay (s)	0.0	0.0	11.1
Approach LOS			B

Intersection Summary			
Average Delay	7.2		
Intersection Capacity Utilization	30.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0		4.0	4.0			
Lane Util. Factor		1.00			0.95	0.95		0.95	1.00			
Frt		1.00			0.98	0.85		1.00	0.85			
Flt Protected		1.00			1.00	1.00		0.99	1.00			
Satd. Flow (prot)		1859			1737	1504		3512	1583			
Flt Permitted		0.98			1.00	1.00		0.99	1.00			
Satd. Flow (perm)		1817			1737	1504		3512	1583			
Volume (vph)	35	930	0	0	250	240	45	310	150	0	0	0
Peak-hour factor, PHF	0.90	0.93	0.25	0.25	0.88	0.76	0.66	0.85	0.95	0.25	0.25	0.25
Adj. Flow (vph)	39	1000	0	0	284	316	68	365	158	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	109	0	0	0
Lane Group Flow (vph)	0	1039	0	0	324	276	0	433	49	0	0	0
Turn Type	Perm					Perm	Perm		Perm			
Protected Phases		4			8			2				
Permitted Phases	4					8	2		2			
Actuated Green, G (s)		72.9			72.9	72.9		34.1	34.1			
Effective Green, g (s)		74.9			74.9	74.9		37.1	37.1			
Actuated g/C Ratio		0.62			0.62	0.62		0.31	0.31			
Clearance Time (s)		6.0			6.0	6.0		7.0	7.0			
Vehicle Extension (s)		3.0			3.0	3.0		3.0	3.0			
Lane Grp Cap (vph)		1134			1084	939		1086	489			
v/s Ratio Prot					0.19							
v/s Ratio Perm		c0.57				0.18		0.12	0.03			
v/c Ratio		0.92			0.30	0.29		0.40	0.10			
Uniform Delay, d1		19.8			10.4	10.4		32.7	29.5			
Progression Factor		1.00			1.00	1.00		1.00	1.00			
Incremental Delay, d2		11.4			0.2	0.2		1.1	0.4			
Delay (s)		31.2			10.6	10.6		33.8	30.0			
Level of Service		C			B	B		C	C			
Approach Delay (s)		31.2			10.6			32.7			0.0	
Approach LOS		C			B			C			A	

Intersection Summary			
HCM Average Control Delay	26.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	92.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor		0.95		1.00	1.00			1.00			0.95	
Frt		0.98		1.00	1.00			0.86			1.00	
Flt Protected		1.00		0.95	1.00			1.00			1.00	
Satd. Flow (prot)		3476		1770	1863			1611			3526	
Flt Permitted		1.00		0.95	1.00			1.00			1.00	
Satd. Flow (perm)		3476		1770	1863			1611			3526	
Volume (vph)	0	275	45	145	20	0	0	0	10	0	375	5
Peak-hour factor, PHF	0.25	0.56	0.68	0.82	0.71	0.25	0.25	0.25	0.25	0.88	0.94	0.50
Adj. Flow (vph)	0	491	66	177	28	0	0	0	40	0	399	10
RTOR Reduction (vph)	0	13	0	0	0	0	0	28	0	0	2	0
Lane Group Flow (vph)	0	544	0	177	28	0	0	12	0	0	407	0
Turn Type	Perm			Prot			Perm					
Protected Phases		8		7	4			6			2	
Permitted Phases	8				4		6					
Actuated Green, G (s)		23.0		19.0	47.0			22.0			22.0	
Effective Green, g (s)		24.0		20.0	48.0			24.0			24.0	
Actuated g/C Ratio		0.30		0.25	0.60			0.30			0.30	
Clearance Time (s)		5.0		5.0	5.0			6.0			6.0	
Lane Grp Cap (vph)		1043		443	1118			483			1058	
v/s Ratio Prot		c0.16		c0.10	0.02			0.01			c0.12	
v/s Ratio Perm												
v/c Ratio		0.52		0.40	0.03			0.02			0.38	
Uniform Delay, d1		23.2		25.0	6.5			19.7			22.2	
Progression Factor		0.83		1.00	1.00			1.00			1.00	
Incremental Delay, d2		1.9		2.7	0.0			0.1			1.1	
Delay (s)		21.2		27.7	6.5			19.8			23.2	
Level of Service		C		C	A			B			C	
Approach Delay (s)		21.2			24.8			19.8			23.2	
Approach LOS		C			C			B			C	

Intersection Summary			
HCM Average Control Delay	22.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	37.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0	4.0		4.0	
Lane Util. Factor		1.00						0.95	0.95		0.95	
Frt		0.95						0.96	0.85		0.98	
Flt Protected		1.00						1.00	1.00		0.99	
Satd. Flow (prot)		1762						1695	1504		3453	
Flt Permitted		1.00						0.91	1.00		0.71	
Satd. Flow (perm)		1762						1542	1504		2464	
Volume (vph)	0	25	5	0	0	0	30	100	685	95	380	40
Peak-hour factor, PHF	0.25	0.82	0.25	0.25	0.25	0.25	0.52	0.25	0.92	0.94	0.90	0.64
Adj. Flow (vph)	0	30	20	0	0	0	58	400	745	101	422	62
RTOR Reduction (vph)	0	17	0	0	0	0	0	0	0	0	11	0
Lane Group Flow (vph)	0	33	0	0	0	0	0	612	591	0	574	0
Turn Type	Perm						Perm		Perm	pm+pt		
Protected Phases		4						2		1	6	
Permitted Phases	4						2		2	6		
Actuated Green, G (s)		12.0						47.0	47.0		58.0	
Effective Green, g (s)		13.0						48.0	48.0		59.0	
Actuated g/C Ratio		0.16						0.60	0.60		0.74	
Clearance Time (s)		5.0						5.0	5.0		5.0	
Lane Grp Cap (vph)		286						925	902		1904	
v/s Ratio Prot		c0.02									c0.03	
v/s Ratio Perm								c0.40	0.39		0.20	
v/c Ratio		0.12						0.66	0.66		0.30	
Uniform Delay, d1		28.6						10.6	10.5		3.5	
Progression Factor		1.00						1.00	1.00		0.57	
Incremental Delay, d2		0.8						3.7	3.7		0.4	
Delay (s)		29.4						14.3	14.2		2.4	
Level of Service		C						B	B		A	
Approach Delay (s)		29.4			0.0			14.3			2.4	
Approach LOS		C			A			B			A	

Intersection Summary			
HCM Average Control Delay	10.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	62.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0			4.0	
Lane Util. Factor		1.00						0.95			0.95	
Frt		0.95						1.00			1.00	
Flt Protected		0.97						1.00			1.00	
Satd. Flow (prot)		1711						3533			3532	
Flt Permitted		0.89						0.94			1.00	
Satd. Flow (perm)		1572						3339			3532	
Volume (vph)	10	0	5	0	0	0	25	835	0	0	340	5
Peak-hour factor, PHF	0.67	0.25	0.50	0.25	0.25	0.25	0.67	0.86	0.25	0.25	0.78	0.88
Adj. Flow (vph)	15	0	10	0	0	0	37	971	0	0	436	6
RTOR Reduction (vph)	0	8	0	0	0	0	0	0	0	0	1	0
Lane Group Flow (vph)	0	17	0	0	0	0	0	1008	0	0	441	0
Turn Type	Perm			Perm			custom					
Protected Phases		4			8		1 9	6 9			2	
Permitted Phases	4			8			6				2	
Actuated Green, G (s)		20.0						53.0			22.0	
Effective Green, g (s)		21.0						54.0			23.0	
Actuated g/C Ratio		0.24						0.62			0.26	
Clearance Time (s)		5.0									5.0	
Lane Grp Cap (vph)		379						2133			934	
v/s Ratio Prot								c0.15			0.12	
v/s Ratio Perm		c0.01						c0.15				
v/c Ratio		0.05						0.47			0.47	
Uniform Delay, d1		25.3						8.9			26.9	
Progression Factor		1.00						0.18			1.00	
Incremental Delay, d2		0.2						0.4			1.7	
Delay (s)		25.5						1.9			28.6	
Level of Service		C						A			C	
Approach Delay (s)		25.5			0.0			1.9			28.6	
Approach LOS		C			A			A			C	

Intersection Summary					
HCM Average Control Delay	10.3	HCM Level of Service		B	
HCM Volume to Capacity ratio	0.35				
Actuated Cycle Length (s)	87.0	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	46.7%	ICU Level of Service		A	
Analysis Period (min)	15				

c Critical Lane Group

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0						4.0	
Lane Util. Factor		0.95			0.95						1.00	
Frt		0.99			1.00						0.89	
Flt Protected		1.00			0.99						0.99	
Satd. Flow (prot)		3496			3521						1640	
Flt Permitted		1.00			0.93						0.94	
Satd. Flow (perm)		3496			3280						1560	
Volume (vph)	0	670	45	30	315	0	0	0	0	55	0	190
Peak-hour factor, PHF	0.25	0.88	0.66	0.75	0.90	0.25	0.25	0.25	0.25	0.86	0.25	0.61
Adj. Flow (vph)	0	761	68	40	350	0	0	0	0	64	0	311
RTOR Reduction (vph)	0	7	0	0	0	0	0	0	0	0	201	0
Lane Group Flow (vph)	0	822	0	0	390	0	0	0	0	0	174	0
Turn Type				pm+pt			Perm			Perm		
Protected Phases		2		1 8	6 8			13			9	
Permitted Phases		2		6 8	8		13			9		
Actuated Green, G (s)		22.0			62.0						15.0	
Effective Green, g (s)		23.0			63.0						16.0	
Actuated g/C Ratio		0.26			0.72						0.18	
Clearance Time (s)		5.0									5.0	
Lane Grp Cap (vph)		924			2475						287	
v/s Ratio Prot		c0.24			c0.07							
v/s Ratio Perm					0.05						c0.11	
v/c Ratio		0.89			0.16						0.61	
Uniform Delay, d1		30.8			3.7						32.6	
Progression Factor		1.00			0.01						1.00	
Incremental Delay, d2		12.5			0.1						9.2	
Delay (s)		43.3			0.2						41.8	
Level of Service		D			A						D	
Approach Delay (s)		43.3			0.2			0.0			41.8	
Approach LOS		D			A			A			D	

Intersection Summary			
HCM Average Control Delay	32.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	87.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	53.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			0.95			0.95	
Frt		0.94			0.97			1.00			0.99	
Flt Protected		0.98			0.98			0.99			1.00	
Satd. Flow (prot)		1718			1772			3504			3486	
Flt Permitted		0.85			0.85			0.84			0.86	
Satd. Flow (perm)		1496			1541			2970			3012	
Volume (vph)	20	10	25	30	15	10	70	680	20	10	340	20
Peak-hour factor, PHF	0.50	0.75	0.63	0.79	0.40	0.45	0.73	0.92	0.80	0.25	0.81	0.54
Adj. Flow (vph)	40	13	40	38	38	22	96	739	25	40	420	37
RTOR Reduction (vph)	0	32	0	0	15	0	0	2	0	0	6	0
Lane Group Flow (vph)	0	61	0	0	83	0	0	858	0	0	491	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		8			4			2			6	
Permitted Phases	8			4			2	2		6	6	
Actuated Green, G (s)		9.9			9.9			36.5			36.5	
Effective Green, g (s)		10.9			10.9			37.5			37.5	
Actuated g/C Ratio		0.19			0.19			0.66			0.66	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		289			298			1975			2003	
v/s Ratio Prot												
v/s Ratio Perm		0.04			c0.05			c0.29			0.16	
v/c Ratio		0.21			0.28			0.43			0.25	
Uniform Delay, d1		19.1			19.4			4.5			3.8	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.4			0.5			0.2			0.1	
Delay (s)		19.5			19.9			4.6			3.8	
Level of Service		B			B			A			A	
Approach Delay (s)		19.5			19.9			4.6			3.8	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM Average Control Delay	6.2	HCM Level of Service	A
HCM Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	56.4	Sum of lost time (s)	8.0
Intersection Capacity Utilization	52.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↰↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	
Lane Util. Factor		1.00	1.00		0.97	
Frt		1.00	1.00		0.99	
Flt Protected		1.00	1.00		0.96	
Satd. Flow (prot)		1863	1863		3409	
Flt Permitted		1.00	1.00		0.96	
Satd. Flow (perm)		1863	1863		3409	
Volume (vph)	0	67	25	0	253	26
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	73	27	0	275	28
RTOR Reduction (vph)	0	0	0	0	10	0
Lane Group Flow (vph)	0	73	27	0	293	0
Turn Type						
Protected Phases		4	8		6	
Permitted Phases						
Actuated Green, G (s)		35.0	35.0		34.0	
Effective Green, g (s)		36.0	36.0		36.0	
Actuated g/C Ratio		0.45	0.45		0.45	
Clearance Time (s)		5.0	5.0		6.0	
Lane Grp Cap (vph)		838	838		1534	
v/s Ratio Prot		c0.04	0.01		c0.09	
v/s Ratio Perm						
v/c Ratio		0.09	0.03		0.19	
Uniform Delay, d1		12.6	12.3		13.2	
Progression Factor		1.00	1.13		1.00	
Incremental Delay, d2		0.2	0.1		0.3	
Delay (s)		12.8	13.9		13.5	
Level of Service		B	B		B	
Approach Delay (s)		12.8	13.9		13.5	
Approach LOS		B	B		B	

Intersection Summary			
HCM Average Control Delay	13.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.14		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	18.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0	4.0			
Lane Util. Factor	1.00	1.00			0.95	0.95		0.95	1.00			
Frt	1.00	1.00			0.88	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		1.00	1.00			
Satd. Flow (prot)	1770	1863			1555	1504		3535	1583			
Flt Permitted	0.10	1.00			1.00	1.00		1.00	1.00			
Satd. Flow (perm)	185	1863			1555	1504		3535	1583			
Volume (vph)	35	250	0	0	140	1225	25	1150	50	0	0	0
Peak-hour factor, PHF	0.75	0.65	0.25	0.25	0.87	0.88	0.75	0.91	0.73	0.25	0.25	0.25
Adj. Flow (vph)	47	385	0	0	161	1392	33	1264	68	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	33	0	0	0
Lane Group Flow (vph)	47	385	0	0	840	713	0	1297	36	0	0	0
Turn Type	Perm					Perm	Perm		Perm			
Protected Phases		4			8			2				
Permitted Phases	4					8	2		2			
Actuated Green, G (s)	65.0	65.0			65.0	65.0		42.0	42.0			
Effective Green, g (s)	67.0	67.0			67.0	67.0		45.0	45.0			
Actuated g/C Ratio	0.56	0.56			0.56	0.56		0.38	0.38			
Clearance Time (s)	6.0	6.0			6.0	6.0		7.0	7.0			
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0	3.0			
Lane Grp Cap (vph)	103	1040			868	840		1326	594			
v/s Ratio Prot		0.21			c0.54							
v/s Ratio Perm	0.25					0.47		0.37	0.02			
v/c Ratio	0.46	0.37			0.97	0.85		0.98	0.06			
Uniform Delay, d1	15.7	14.8			25.5	22.2		37.0	24.0			
Progression Factor	1.00	1.00			1.00	1.00		1.00	1.00			
Incremental Delay, d2	3.2	0.2			22.7	8.0		20.0	0.2			
Delay (s)	18.9	15.0			48.2	30.3		57.0	24.2			
Level of Service	B	B			D	C		E	C			
Approach Delay (s)		15.4			39.9			55.4			0.0	
Approach LOS		B			D			E			A	

Intersection Summary			
HCM Average Control Delay	43.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	106.4%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor		0.95		1.00	1.00			1.00			0.95	
Frt		1.00		1.00	1.00			0.86			1.00	
Flt Protected		1.00		0.95	1.00			1.00			1.00	
Satd. Flow (prot)		3523		1770	1863			1611			3535	
Flt Permitted		1.00		0.95	1.00			1.00			1.00	
Satd. Flow (perm)		3523		1770	1863			1611			3535	
Volume (vph)	0	965	40	195	100	0	0	0	20	0	1160	5
Peak-hour factor, PHF	0.25	0.57	0.75	0.84	0.99	0.25	0.25	0.25	0.25	0.88	0.94	0.50
Adj. Flow (vph)	0	1693	53	232	101	0	0	0	80	0	1234	10
RTOR Reduction (vph)	0	2	0	0	0	0	0	53	0	0	1	0
Lane Group Flow (vph)	0	1744	0	232	101	0	0	27	0	0	1243	0
Turn Type	Perm			Prot			Perm					
Protected Phases		8		7	4			6			2	
Permitted Phases	8				4		6					
Actuated Green, G (s)		37.0		9.0	51.0			28.0			28.0	
Effective Green, g (s)		38.0		10.0	52.0			30.0			30.0	
Actuated g/C Ratio		0.42		0.11	0.58			0.33			0.33	
Clearance Time (s)		5.0		5.0	5.0			6.0			6.0	
Lane Grp Cap (vph)		1487		197	1076			537			1178	
v/s Ratio Prot		c0.49		c0.13	0.05			0.02			c0.35	
v/s Ratio Perm												
v/c Ratio		1.17		1.18	0.09			0.05			1.06	
Uniform Delay, d1		26.0		40.0	8.5			20.3			30.0	
Progression Factor		0.77		1.00	1.00			1.00			1.00	
Incremental Delay, d2		84.8		120.2	0.2			0.2			42.2	
Delay (s)		104.7		160.2	8.7			20.5			72.2	
Level of Service		F		F	A			C			E	
Approach Delay (s)		104.7			114.3			20.5			72.2	
Approach LOS		F			F			C			E	

Intersection Summary			
HCM Average Control Delay	91.7	HCM Level of Service	F
HCM Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	81.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0	4.0		4.0	
Lane Util. Factor		1.00						0.95	0.95		0.95	
Frt		0.96						1.00	0.85		1.00	
Flt Protected		1.00						0.99	1.00		0.99	
Satd. Flow (prot)		1793						1760	1504		3509	
Flt Permitted		1.00						0.79	1.00		0.77	
Satd. Flow (perm)		1793						1405	1504		2728	
Volume (vph)	0	70	30	0	0	0	25	75	230	110	1030	15
Peak-hour factor, PHF	0.25	0.72	0.81	0.25	0.25	0.25	0.69	0.25	0.96	0.73	0.91	0.63
Adj. Flow (vph)	0	97	37	0	0	0	36	300	240	151	1132	24
RTOR Reduction (vph)	0	15	0	0	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	119	0	0	0	0	0	336	240	0	1306	0
Turn Type	Perm						Perm		Perm	pm+pt		
Protected Phases		4						2		1	6	
Permitted Phases	4						2		2	6		
Actuated Green, G (s)		18.0						45.0	45.0		62.0	
Effective Green, g (s)		19.0						46.0	46.0		63.0	
Actuated g/C Ratio		0.21						0.51	0.51		0.70	
Clearance Time (s)		5.0						5.0	5.0		5.0	
Lane Grp Cap (vph)		379						718	769		2022	
v/s Ratio Prot		c0.07									c0.09	
v/s Ratio Perm								0.24	0.16		c0.36	
v/c Ratio		0.31						0.47	0.31		0.65	
Uniform Delay, d1		30.0						14.1	12.8		7.4	
Progression Factor		1.00						0.39	0.35		0.48	
Incremental Delay, d2		2.2						2.2	1.1		0.1	
Delay (s)		32.2						7.7	5.6		3.7	
Level of Service		C						A	A		A	
Approach Delay (s)		32.2			0.0			6.8			3.7	
Approach LOS		C			A			A			A	

Intersection Summary			
HCM Average Control Delay	6.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	62.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0						4.0			4.0	
Lane Util. Factor	0.95	0.95						0.95			0.95	
Frt	1.00	0.85						1.00			1.00	
Flt Protected	0.95	1.00						1.00			1.00	
Satd. Flow (prot)	1681	1504						3531			3533	
Flt Permitted	0.76	1.00						0.91			1.00	
Satd. Flow (perm)	1340	1504						3227			3533	
Volume (vph)	5	0	25	0	0	0	15	365	0	0	760	10
Peak-hour factor, PHF	0.67	0.25	0.50	0.25	0.25	0.25	0.67	0.86	0.25	0.25	0.78	0.88
Adj. Flow (vph)	7	0	50	0	0	0	22	424	0	0	974	11
RTOR Reduction (vph)	0	43	0	0	0	0	0	0	0	0	1	0
Lane Group Flow (vph)	7	7	0	0	0	0	0	446	0	0	984	0
Turn Type	Perm			Perm			custom			Perm		
Protected Phases		4			8		1 9	6 9			2	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)	11.0	11.0						65.0			46.0	
Effective Green, g (s)	12.0	12.0						66.0			47.0	
Actuated g/C Ratio	0.13	0.13						0.73			0.52	
Clearance Time (s)	5.0	5.0									5.0	
Lane Grp Cap (vph)	179	201						2417			1845	
v/s Ratio Prot		0.00						c0.03			c0.28	
v/s Ratio Perm	c0.01							0.10				
v/c Ratio	0.04	0.03						0.18			0.53	
Uniform Delay, d1	34.0	34.0						3.7			14.2	
Progression Factor	1.00	1.00						0.13			0.52	
Incremental Delay, d2	0.4	0.3						0.2			0.9	
Delay (s)	34.4	34.3						0.6			8.2	
Level of Service	C	C						A			A	
Approach Delay (s)		34.3			0.0			0.6			8.2	
Approach LOS		C			A			A			A	

Intersection Summary					
HCM Average Control Delay	7.0	HCM Level of Service		A	
HCM Volume to Capacity ratio	0.37				
Actuated Cycle Length (s)	90.0	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	31.3%	ICU Level of Service		A	
Analysis Period (min)	15				

c Critical Lane Group

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0						4.0	
Lane Util. Factor		0.95			0.95						1.00	
Frt		0.97			1.00						0.97	
Flt Protected		1.00			1.00						0.96	
Satd. Flow (prot)		3428			3524						1743	
Flt Permitted		1.00			0.86						0.81	
Satd. Flow (perm)		3428			3055						1471	
Volume (vph)	0	375	85	75	710	0	0	0	0	20	0	5
Peak-hour factor, PHF	0.25	0.89	0.76	0.99	0.90	0.25	0.25	0.25	0.25	0.85	0.25	0.82
Adj. Flow (vph)	0	421	112	76	789	0	0	0	0	24	0	6
RTOR Reduction (vph)	0	26	0	0	0	0	0	0	0	0	5	0
Lane Group Flow (vph)	0	507	0	0	865	0	0	0	0	0	25	0
Turn Type	Perm			pm+pt			Perm			Perm		
Protected Phases		2		1 8	6 8			13			9	
Permitted Phases	2	2		6 8	8		13			9		
Actuated Green, G (s)		46.0			68.0						12.0	
Effective Green, g (s)		47.0			69.0						13.0	
Actuated g/C Ratio		0.52			0.77						0.14	
Clearance Time (s)		5.0									5.0	
Lane Grp Cap (vph)		1790			2436						212	
v/s Ratio Prot		0.15			c0.07							
v/s Ratio Perm					c0.20						c0.02	
v/c Ratio		0.28			0.36						0.12	
Uniform Delay, d1		12.1			3.4						33.5	
Progression Factor		0.66			0.04						1.00	
Incremental Delay, d2		0.4			0.4						1.1	
Delay (s)		8.3			0.5						34.6	
Level of Service		A			A						C	
Approach Delay (s)		8.3			0.5			0.0			34.6	
Approach LOS		A			A			A			C	

Intersection Summary			
HCM Average Control Delay	4.1	HCM Level of Service	A
HCM Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	53.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			0.95			0.95	
Frt		0.99			0.96			0.99			1.00	
Flt Protected		0.96			0.99			1.00			1.00	
Satd. Flow (prot)		1770			1773			3492			3522	
Flt Permitted		0.78			0.95			0.87			0.95	
Satd. Flow (perm)		1431			1700			3039			3346	
Volume (vph)	30	5	5	15	15	25	30	405	25	5	710	15
Peak-hour factor, PHF	0.58	0.65	0.88	0.79	0.33	1.00	0.91	0.91	0.72	0.58	0.87	0.63
Adj. Flow (vph)	52	8	6	19	45	25	33	445	35	9	816	24
RTOR Reduction (vph)	0	4	0	0	15	0	0	6	0	0	2	0
Lane Group Flow (vph)	0	62	0	0	74	0	0	507	0	0	847	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		8			4			2			6	
Permitted Phases	8			4			2	2		6	6	
Actuated Green, G (s)		31.0			31.0			49.0			49.0	
Effective Green, g (s)		32.0			32.0			50.0			50.0	
Actuated g/C Ratio		0.36			0.36			0.56			0.56	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Lane Grp Cap (vph)		509			604			1688			1859	
v/s Ratio Prot												
v/s Ratio Perm		c0.04			0.04			0.17			c0.25	
v/c Ratio		0.12			0.12			0.30			0.46	
Uniform Delay, d1		19.5			19.5			10.7			11.9	
Progression Factor		1.00			1.00			1.00			1.45	
Incremental Delay, d2		0.5			0.4			0.5			0.8	
Delay (s)		20.0			19.9			11.1			18.1	
Level of Service		C			B			B			B	
Approach Delay (s)		20.0			19.9			11.1			18.1	
Approach LOS		C			B			B			B	

Intersection Summary			
HCM Average Control Delay	15.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	52.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↰↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	
Lane Util. Factor		1.00	1.00		0.97	
Frt		1.00	1.00		0.97	
Flt Protected		1.00	1.00		0.96	
Satd. Flow (prot)		1863	1863		3367	
Flt Permitted		1.00	1.00		0.96	
Satd. Flow (perm)		1863	1863		3367	
Volume (vph)	0	57	105	0	948	252
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	62	114	0	1030	274
RTOR Reduction (vph)	0	0	0	0	28	0
Lane Group Flow (vph)	0	62	114	0	1276	0
Turn Type						
Protected Phases		4	8		6	
Permitted Phases						
Actuated Green, G (s)		27.0	27.0		52.0	
Effective Green, g (s)		28.0	28.0		54.0	
Actuated g/C Ratio		0.31	0.31		0.60	
Clearance Time (s)		5.0	5.0		6.0	
Lane Grp Cap (vph)		580	580		2020	
v/s Ratio Prot		0.03	c0.06		c0.38	
v/s Ratio Perm						
v/c Ratio		0.11	0.20		0.63	
Uniform Delay, d1		22.1	22.7		11.6	
Progression Factor		1.00	1.52		1.00	
Incremental Delay, d2		0.4	0.8		1.5	
Delay (s)		22.5	35.3		13.1	
Level of Service		C	D		B	
Approach Delay (s)		22.5	35.3		13.1	
Approach LOS		C	D		B	

Intersection Summary			
HCM Average Control Delay	15.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	47.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0	4.0			
Lane Util. Factor	1.00	1.00			0.95	0.95		0.95	1.00			
Frt	1.00	1.00			0.98	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.99	1.00			
Satd. Flow (prot)	1770	1863			1737	1504		3512	1583			
Flt Permitted	0.51	1.00			1.00	1.00		0.99	1.00			
Satd. Flow (perm)	942	1863			1737	1504		3512	1583			
Volume (vph)	35	950	0	0	250	240	45	310	130	0	0	0
Peak-hour factor, PHF	0.90	0.93	0.25	0.25	0.88	0.76	0.66	0.85	0.95	0.25	0.25	0.25
Adj. Flow (vph)	39	1022	0	0	284	316	68	365	137	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	94	0	0	0
Lane Group Flow (vph)	39	1022	0	0	324	276	0	433	43	0	0	0
Turn Type	Perm					Perm	Perm		Perm			
Protected Phases		4			8			2				
Permitted Phases	4					8	2		2			
Actuated Green, G (s)	72.3	72.3			72.3	72.3		34.7	34.7			
Effective Green, g (s)	74.3	74.3			74.3	74.3		37.7	37.7			
Actuated g/C Ratio	0.62	0.62			0.62	0.62		0.31	0.31			
Clearance Time (s)	6.0	6.0			6.0	6.0		7.0	7.0			
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0	3.0			
Lane Grp Cap (vph)	583	1154			1075	931		1103	497			
v/s Ratio Prot		c0.55			0.19							
v/s Ratio Perm	0.04					0.18		0.12	0.03			
v/c Ratio	0.07	0.89			0.30	0.30		0.39	0.09			
Uniform Delay, d1	9.1	19.3			10.7	10.7		32.2	29.0			
Progression Factor	1.00	1.00			1.00	1.00		1.00	1.00			
Incremental Delay, d2	0.0	8.4			0.2	0.2		1.1	0.3			
Delay (s)	9.1	27.7			10.9	10.8		33.2	29.4			
Level of Service	A	C			B	B		C	C			
Approach Delay (s)		27.0			10.8			32.3			0.0	
Approach LOS		C			B			C			A	

Intersection Summary			
HCM Average Control Delay	24.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	70.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			