

**Traffic Impact and Parking Study**

**1700 Block East Capitol Street**  
Southeast Washington D.C.

**November 27, 2006**

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## EXECUTIVE SUMMARY

The following report presents the findings of a traffic impact study conducted for the proposed East Capitol Street development in Southeast D.C. The proposed development is located north of A Street, east of 17th Street, west of 18th Street, and south of East Capitol Street.

The proposed East Capitol site consists of approximately 134 units. The construction of the project site is anticipated to be complete in 2009. Access to the site will be provided via an entrance on the alley located adjacent the southern boundary of the site.

According to DDOT standards, it is desirable to achieve a minimum overall and per approach level of service (LOS) E or maintain existing LOS, if LOS E is not achieved under existing conditions. Based on these guidelines, the analysis presented in this report supports the following major conclusions:

- ***Existing Conditions –***

The preliminary analysis reveals that all six studied intersections operate at acceptable levels in both the morning and afternoon peaks.

- ***Future Conditions without the Proposed Development –***

Analysis of the future conditions without the proposed development shows that study intersections will operate at acceptable levels of service in both the morning and afternoon peaks.

- ***Future Conditions with the Proposed Development –***

Based on the results of the capacity analysis, the study intersections will operate under acceptable levels of service in both the morning and afternoon peak hours in the future with the proposed development.

The proposed development will generate approximately 33 morning peak hour trips, approximately 39 afternoon peak hour trips, and approximately 412 average daily trips.

The alley on the southern edge of the property will be converted to one-way (westbound) from existing two-way configuration. The rerouting of the traffic volumes due to this change will have a negligible impact on the intersections along 17<sup>th</sup> Street. Operations will improve at the study intersections along East Capitol Street as well as 18<sup>th</sup> Street, as the rerouting will direct drivers to the south towards Independence Avenue and away from East Capitol Street.

The flexibility requested for the loading berth and loading space should be granted because the 55-foot berth is not necessary, and the granting of the flexibility will not negatively impact the neighborhood traffic pattern or loading requirements of the site.



## INTRODUCTION

This report presents the findings of a traffic impact study conducted for the proposed 1700 East Capitol Street redevelopment in Southeast Washington. The proposed development is located north of A Street, east of 17<sup>th</sup> Street, west of 18<sup>th</sup> Street, and south of East Capitol Street. A regional map showing the site location is included in **Figure 1**.

The proposed East Capitol development plan consists of approximately 134 units. The proposed development plan is shown in **Figure 2**. The construction of the project site is anticipated to be complete in 2009. Access to the site will be provided via an entrance from an alley extending between 17<sup>th</sup> and 18<sup>th</sup> Streets. The alley adjacent the site is proposed to be converted to one-way (westbound) as a part of the development proposal, based on requests received from neighborhood residents.

The scope of this effort is to determine traffic and transportation improvements necessary to facilitate site access during the full build-out year. This analysis has been based on current information regarding the status of the existing roadway that will serve the site and the transportation needs of the proposed development. Roadway improvements will be identified to accommodate site traffic needs and to mitigate traffic impacts on the roadway network.

The following tasks were undertaken as part of this study:

- Field reconnaissance in the vicinity of the site was performed to collect information related to existing traffic controls, roadway geometry, and traffic flow characteristics.
- Traffic counts were conducted on Wednesday, May 10, 2006, and Thursday, May 11, 2006, between the hours of 6:00 a.m. to 9:00 a.m. and 4:00 p.m. to 7:00 p.m. at the intersections located within the study area.
- Traffic volumes under the future conditions without development were projected using historical data obtained from DDOT and other traffic studies performed for background developments near the site. A conservative inherent regional growth rate of 1% per year over a three-year period was considered along the study roadway network to account for regional growth in the area.
- Traffic volume for the proposed site was generated for the weekday morning and afternoon peak hours using the methodology outlined in the Institute of Transportation Engineers' (ITE) Trip Generation, 7<sup>th</sup> Edition publication.
- Intersection capacity analyses were performed for the existing (2006), future conditions without development (2009), and future conditions with development (2009) peak hour traffic conditions at the intersections located within the study area.

Sources of data for this study include Washington DC Department of Public Works and Department of Planning, DDOT, Comstock Homes, and the office files and field reconnaissance efforts of Gorove/Slade Associates, Inc.

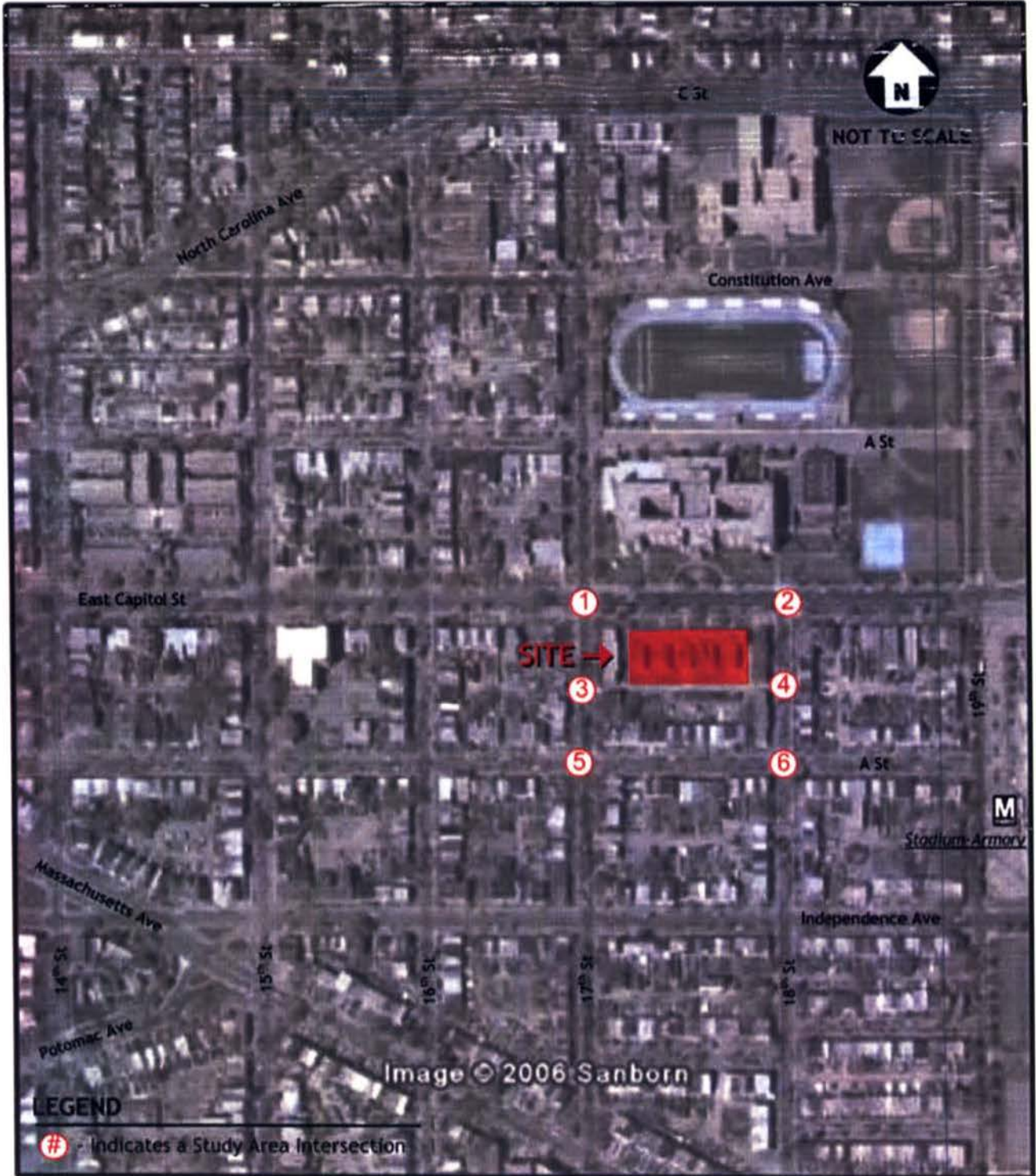


Figure 1: Regional Map and Site Location



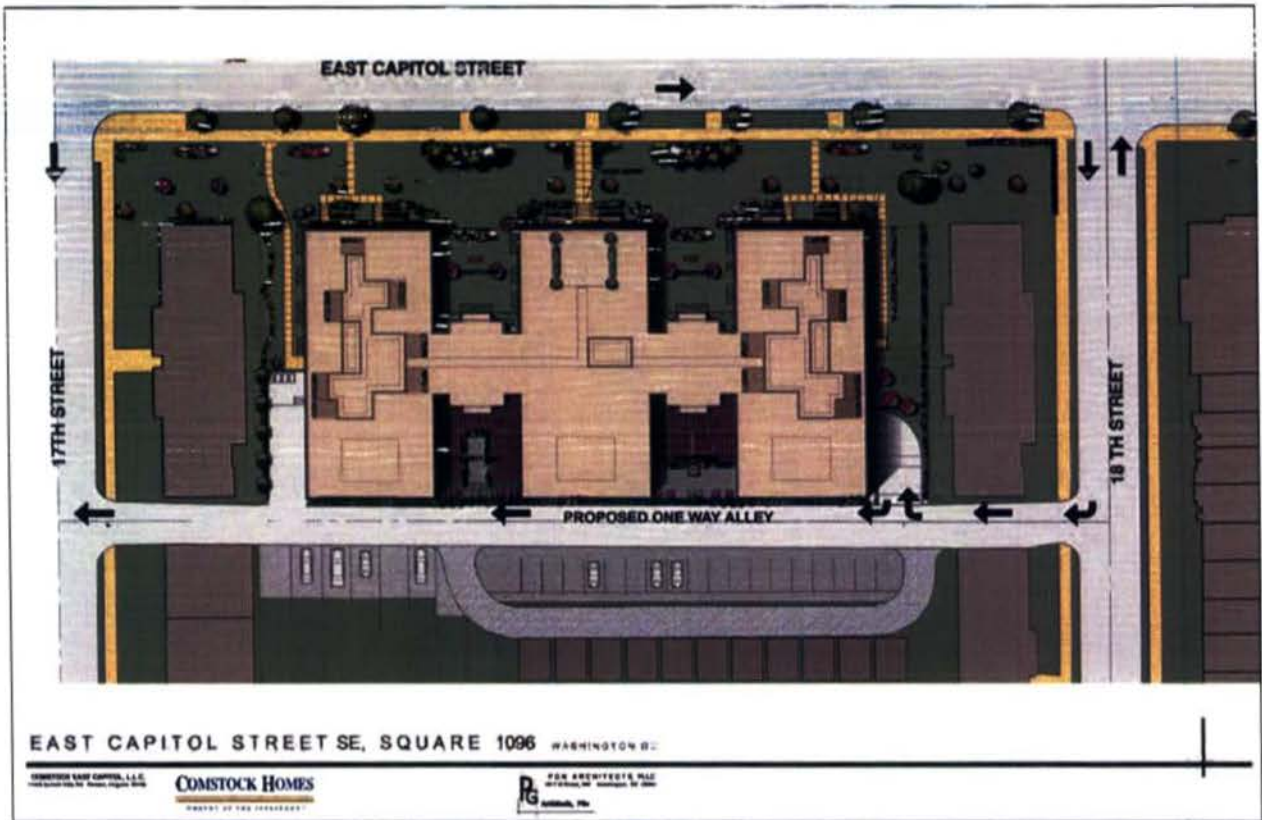


Figure 2: Proposed Development Plan





### ***Scope of Study***

The following intersections were identified for inclusion in this study:

- 1) East Capitol Street SE and 17<sup>th</sup> Street SE
- 2) East Capitol Street SE and 18<sup>th</sup> Street SE
- 3) 17<sup>th</sup> Street SE and Alley
- 4) 18<sup>th</sup> Street SE and Alley
- 5) 17<sup>th</sup> Street SE and A Street SE
- 6) 18<sup>th</sup> Street SE and A Street SE

### ***Report Outline***

This report presents the findings of analyses performed for the following traffic conditions:

- ***Existing Conditions (2006):*** Consider existing traffic volumes and roadway configurations during the weekday morning and afternoon peak hours.
- ***Future Conditions without Development (2009):*** Considers future traffic conditions resulting from inherent traffic growth and nearby approved developments, but does not include volumes generated by the proposed East Capitol development.
- ***Future Conditions with Development (2009):*** Considers future traffic volumes with the background growth and traffic generated by the proposed East Capitol development.

The results of the analysis and the traffic impacts associated with the proposed development plan are presented in the Conclusion section of this report.



## EXISTING CONDITIONS (2006)

### *Existing Roadway Network*

The existing roadway network within the vicinity of the proposed East Capitol site is described below:

- East Capitol Street is a three-lane undivided roadway adjacent the proposed site. On-street parking is available on both sides of the street, except across from the site in front of Eastern High School. West of 17<sup>th</sup> Street, East Capitol Street narrows to two lanes with on-street parking, while east of 18<sup>th</sup> Street it widens to four lanes with parking. There is no posted speed limit on Capitol Street within the vicinity of the site.
- 17th Street is a two-lane, one-way southbound, undivided roadway located west of the proposed site. On-street parking is available on both sides of the street. The current posted speed limit is 25 mph within the vicinity of the proposed site.
- 18th Street is a two-lane undivided roadway located east of the proposed site. On-street parking is available on the east side of the street. The current posted speed limit is 25 mph within the vicinity of the proposed site.
- A Street is a two-lane undivided roadway with on-street parking located south of the proposed site. There is currently no posted speed limit on A Street within the vicinity of the site.
- The alley is a two-lane connection that will provide immediate access to the proposed site.

**Figure 3** illustrates the existing roadway network with the current lane configuration, traffic control devices, distances between intersections, and length of turn bays.

### *Public Transportation*

#### *WMATA Metrorail*

The Stadium-Armory Metro Station is located approximately two blocks southeast of the site. The station is located along 19<sup>th</sup> Street SE and services the Orange (with service between Vienna/Fairfax and New Carrollton) and Blue Lines (with service between Largo Town Center and Franconia/Springfield).

#### *WMATA Metrobus*

Several Metrobus routes are within walking distance of the site. These routes include the following:

- *East Capitol Street Cardozo Line (Routes 96 and 97)*

The East Capitol Street Cardozo line services five Metro-rail stations including the Capitol Heights station, Benning Road station, Stadium-Armory station, Union Station, and the U-Street/African-American Civil War Memorial/Cardozo station. The East Capitol Street Cardozo Line also services several locations which include the D.C. General Hospital, Capitol Hill, New Jersey Ave N.W., the Reeves Center, Adams Morgan, and Duke Ellington Bridge.



- *Bladensburg Road - Anacostia Line (Route B2)*

The Bladensburg Road - Anacostia Line provides service to the Stadium Armory station, Potomac Avenue station, and the Anacostia Station, as well as the Mount Rainier terminal, Hechinger Mall, D.C. General Hospital, 15<sup>th</sup> Street and Pennsylvania Avenue S.E., and the Frederick Douglass National Historic Site.

- *Sibley Hospital - Stadium-Armory Line (Route D6)*

Route D6 provides service to six Metro stations and three other localities. These include Sibley Hospital, Georgetown University Hospital, Georgetown, Dupont Circle station, Farragut North station, Farragut West station, Metro Center station, and the Stadium-Armory station.

- *Eastern High School Line (Route E32)*

The Eastern High School bus line serves Eastern High School, Benning Heights, and Benning Road & East Capitol Street (Benning Road station).

### ***Existing Traffic Volumes***

In order to determine the weekday peak hour turning movement volumes, traffic counts were conducted on Wednesday May 10, 2006, and Thursday May 11, 2006, between the hours of 6:00 AM to 9:00 AM and 4:00 PM to 7:00 PM at the intersections contained within the study area. Analysis of the existing traffic data determined the following peak hours:

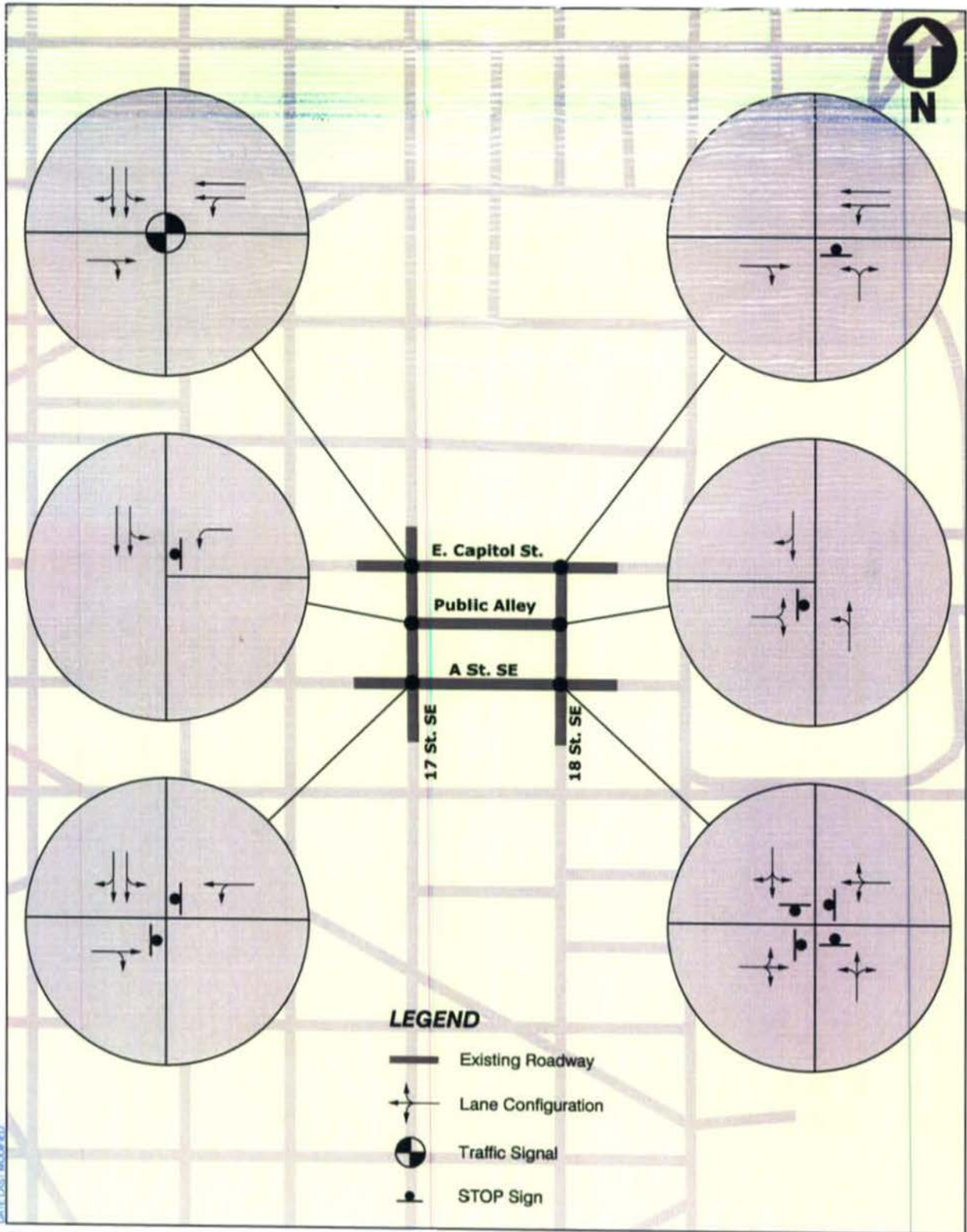
- AM Peak Hour – 7:45 AM to 8:45 AM
- PM Peak Hour – 5:15 PM to 6:15 PM

The existing weekday morning and afternoon peak hour traffic volumes for the intersections contained within the study area are shown in **Figure 4**. The existing turning movement counts are included in the Technical Appendix.

In addition to collecting turning movement counts, the geometry of the study area and traffic control information including signal timings was also collected. Annual Average Daily Traffic (AADT) volumes collected by the District Department of Transportation in 2002 for the portions of roadway near the study area can be found in **Table 1**.

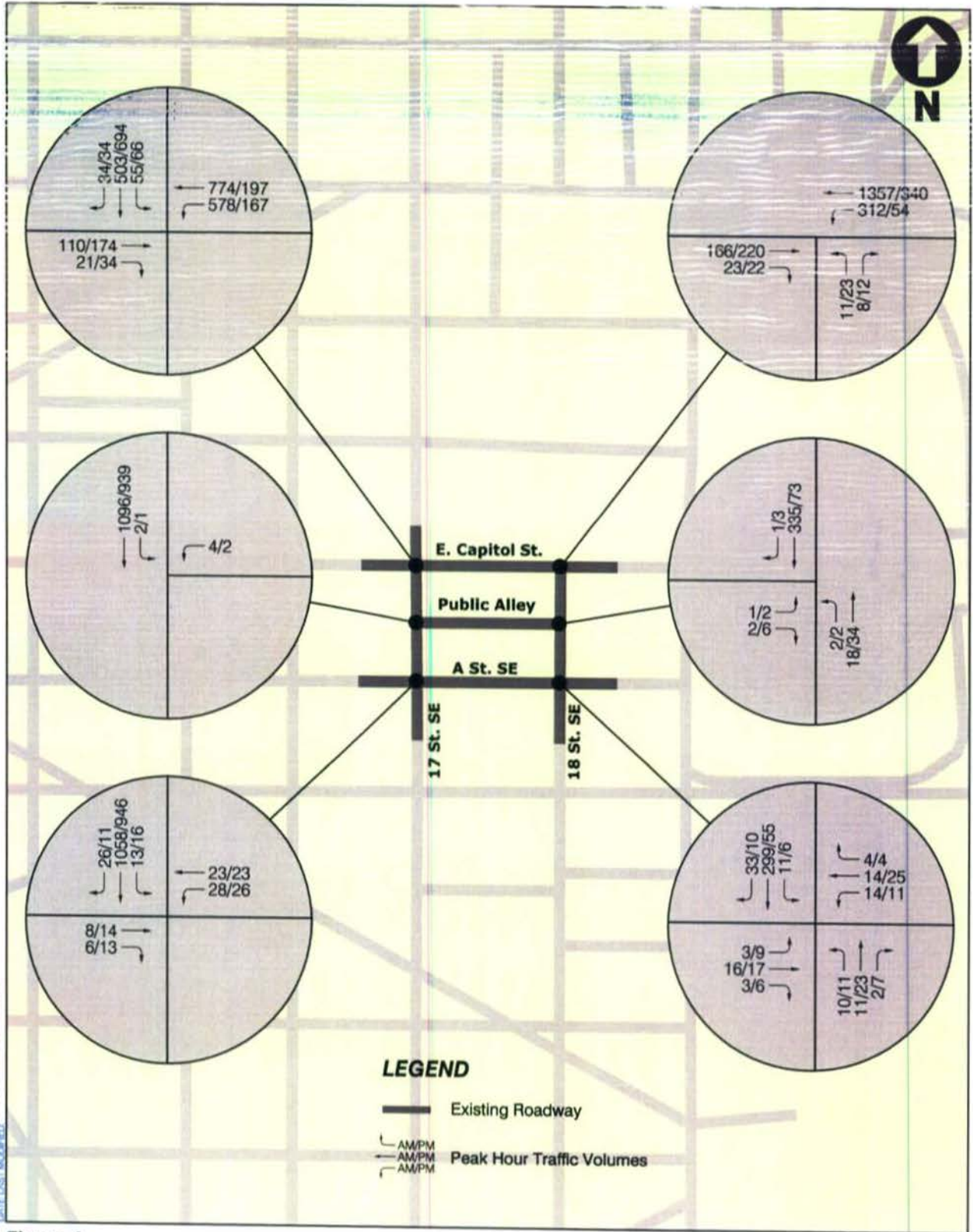
**Table 1: AADT of Roadways around Study Area**

Roadway	AADT <i>Vehicle Trips</i>
17 <sup>th</sup> Street, SE North of East Capitol St	11,900
19 <sup>th</sup> Street, SE bet. East Capitol & A St.	5,000
East Capitol Street, SE, West of 17 <sup>th</sup> St.	9,300
East Capitol Street, SE, bet. 17 <sup>th</sup> St & 18 <sup>th</sup> St.	11,300
East Capitol St. East of 18 <sup>th</sup> St, SE	14,000
Independence Ave., West of 17 <sup>th</sup> St SE	12,800
Independence Ave SE., bet 17 <sup>th</sup> & 18 <sup>th</sup> St.	13,100
Independence Ave East of 18 <sup>th</sup> St, SE	12,900



**Figure 3**  
Existing Conditions (2006) Local Roadway Network





**Figure 4**  
Existing Conditions (2006) Traffic Volumes



### Existing Conditions Capacity Analysis and Results

Capacity analyses were performed at the intersections contained within the study area during the weekday morning and afternoon peak hours under the existing conditions. Intersection capacity analyses were performed using *Synchro*, version 6.0 with results based on the Highway Capacity Manual (HCM) methodology.

The results of the intersection capacity analyses are presented in **Table 2**, and are expressed in terms of level of service (LOS), delay (in seconds per vehicle), and 95<sup>th</sup> percentile queue lengths (in feet). A description of the different LOS and delay as well as the detailed analysis worksheets for the existing conditions is included in the Technical Appendix.

**Table 2: Existing Conditions (2006) Intersection Capacity Analysis**

Intersection (Approach)	AM Peak Hour			PM Peak Hour		
	LOS	Delay (s/veh)	Queue (feet)	LOS	Delay (s/veh)	Queue (feet)
17 <sup>th</sup> Street & East Capitol Street						
Overall	C	27.8	n/a	B	11.7	n/a
Eastbound	A	9.2	59'	B	17.8	106'
Westbound	C	29.8	#598'	C	20.1	95'
Southbound	C	27.5	235'	A	6.3	123'
17 <sup>th</sup> Street & Alley						
Westbound	B	12.1	1'	B	11.3	0'
17 <sup>th</sup> Street & A Street						
Eastbound	C	19.6	5'	C	17.5	8'
Westbound	C	21.8	19'	C	19.7	16'
Southbound Left Turn	A	0.3	1'	A	0.3	1'
18 <sup>th</sup> Street & East Capitol Street						
Westbound	A	5.2	25'	A	2.8	4'
Northbound	E	42.5	15'	B	12.6	6'
18 <sup>th</sup> Street and Alley						
Eastbound	B	10.5	0'	A	8.8	1'
Northbound	A	0.8	0'	A	0.4	0'
18 <sup>th</sup> Street & A Street						
Overall	A	9.6	n/a	A	7.4	n/a
Eastbound	A	7.9	n/a	A	7.4	n/a
Westbound	A	8.1	n/a	A	7.5	n/a
Northbound	A	7.6	n/a	A	7.4	n/a
Southbound	A	10.0	n/a	A	7.5	n/a

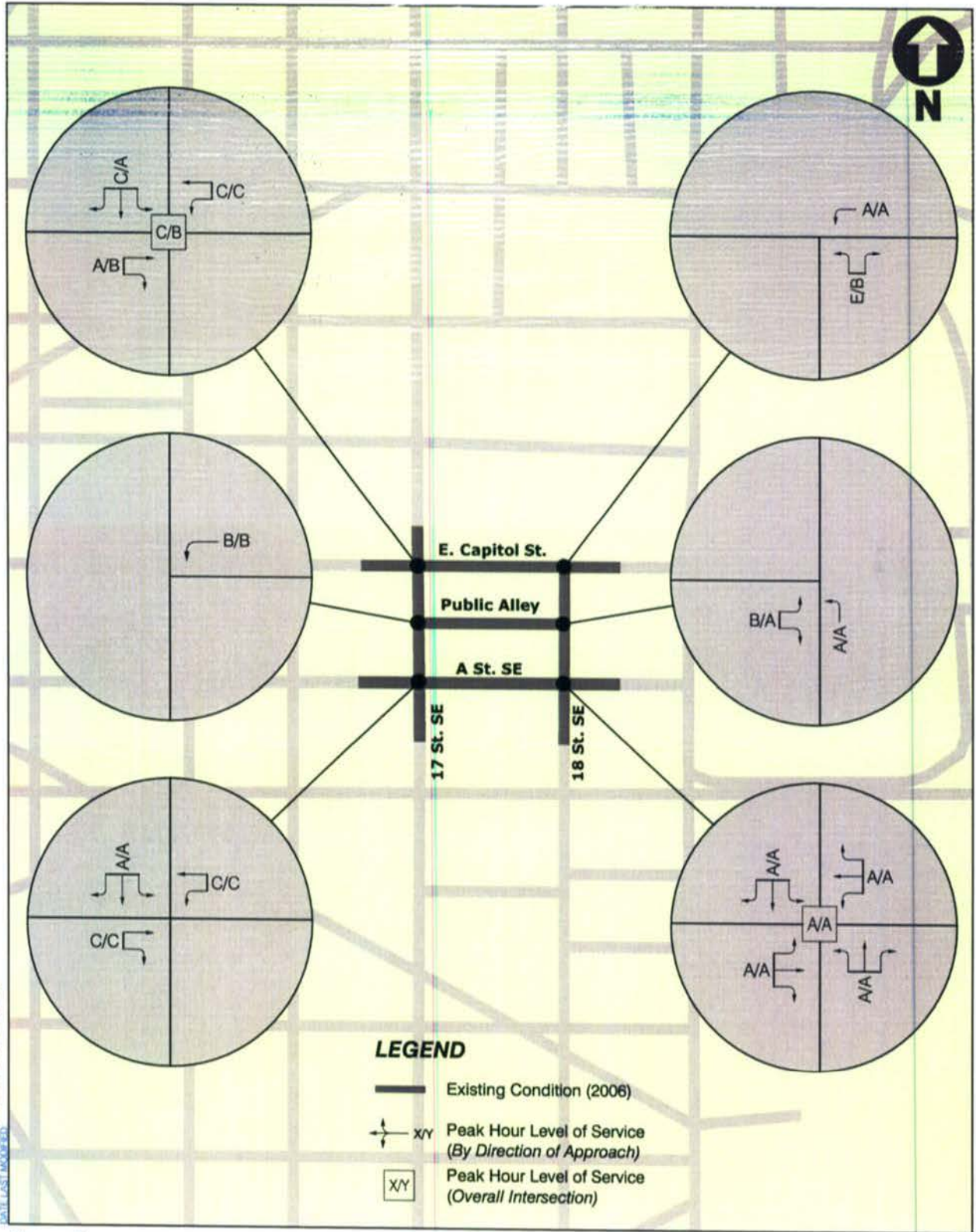
Note: N/A means not available.

# 95<sup>th</sup> percentile volume exceeds capacity, queue may be longer. Queue shown is after two cycles.

m · Volume for 95th percentile queue is metered by upstream signal

As was agreed upon through conversations with DDOT, the minimum overall and per approach level of service acceptable for this area is a LOS E. The results presented in **Table 2** show that all study intersections are currently operating at acceptable levels of service. **Figure 5** illustrates graphically the intersection capacity analysis results.





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**Figure 5**  
Existing Conditions (2006) Levels of Service



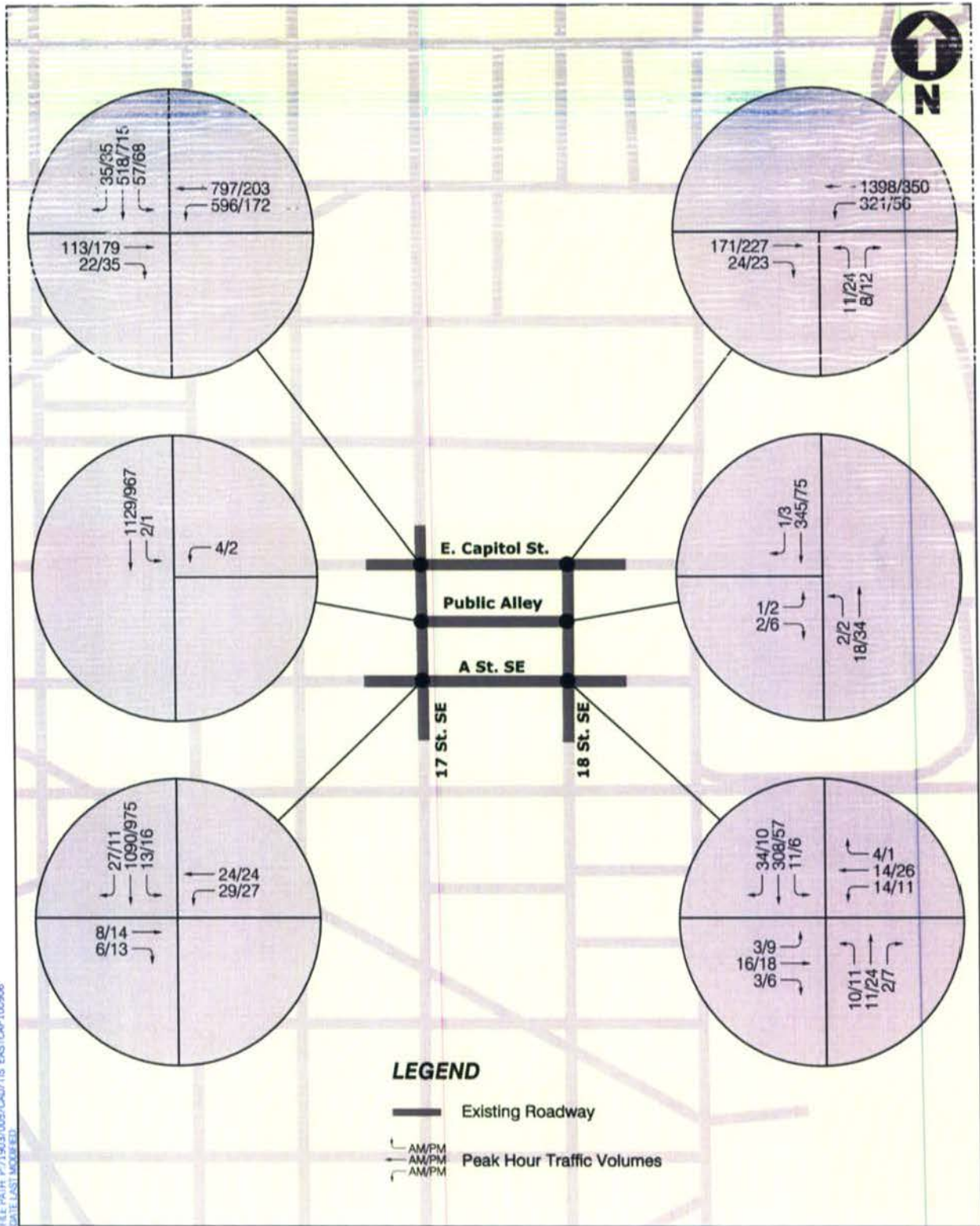


## **FUTURE CONDITIONS WITHOUT DEVELOPMENT (2009)**

### ***Future Conditions without Development Traffic Volumes***

The construction of the proposed development is anticipated to be complete in 2009. Typically, future traffic volumes are projected by increasing existing traffic volumes to the build out year using a growth rate based on historical traffic growth. The existing volumes were increased based on an inherent regional growth rate of one percent (1%) compounded annually over a three-year period to account for regional increase in traffic due to background growth.

The inherent background growth was added to the existing volumes in order to estimate the future conditions without development traffic volumes as shown in **Figure 6**.



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**Figure 6**  
Future Conditions (2009) Without Development Traffic Volumes



### Future Conditions without Development Capacity Analysis and Results

Capacity analyses were performed at the intersections contained within the study area during the morning and afternoon peak hours under the future conditions without development. The results of the intersection capacity analyses are presented in **Table 3**, and are expressed in terms of level of service (LOS), delay (in seconds per vehicle), and 95<sup>th</sup> percentile queue lengths (in feet). **Figure 7** illustrates graphically the intersection capacity analysis results. The detailed analysis worksheets are contained in the Technical Appendix.

**Table 3: Future Conditions without Development (2009) Intersection Capacity Analysis**

Intersection (Approach)	AM Peak Hour			PM Peak Hour		
	LOS	Delay (s/veh)	Queue (feet)	LOS	Delay (s/veh)	Queue (feet)
<b>17<sup>th</sup> Street &amp; East Capitol Street</b>						
Overall	C	29.7	n/a	B	11.9	n/a
Eastbound	A	9.0	60'	B	17.7	109'
Westbound	C	31.9	#632'	C	20.2	97'
Southbound	C	29.2	243'	A	6.6	136'
<b>17<sup>th</sup> Street &amp; Alley</b>						
Westbound	B	12.2	1'	B	11.4	0'
<b>17<sup>th</sup> Street &amp; A Street</b>						
Eastbound	C	20.4	5'	C	18.0	8'
Westbound	C	23.0	21'	C	20.5	17'
Southbound Left Turn	A	0.3	1'	A	0.3	1'
<b>18<sup>th</sup> Street &amp; East Capitol Street</b>						
Westbound	A	5.4	26'	A	2.9	4'
Northbound	E	46.3	17'	B	12.9	6'
<b>18<sup>th</sup> Street and Alley</b>						
Eastbound	B	10.6	0'	A	8.8	1'
Northbound	A	0.8	0'	A	0.4	0'
<b>18<sup>th</sup> Street &amp; A Street</b>						
Overall	A	9.7	n/a	A	7.4	n/a
Eastbound	A	8.0	n/a	A	7.4	n/a
Westbound	A	8.1	n/a	A	7.5	n/a
Northbound	A	7.6	n/a	A	7.4	n/a
Southbound	B	10.1	n/a	A	7.5	n/a

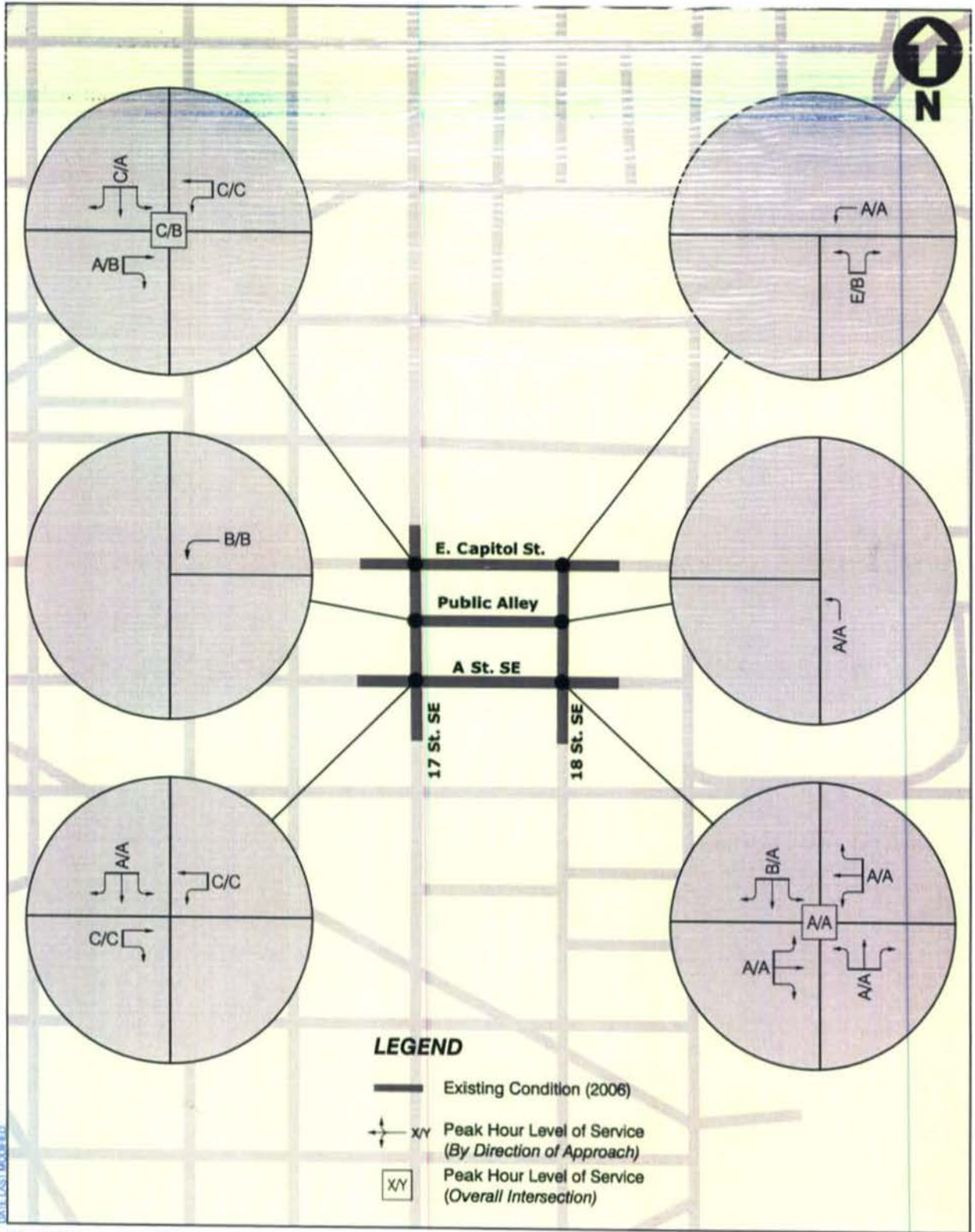
Note: N/A means not available.

# 95<sup>th</sup> percentile volume exceeds capacity, queue may be longer. Queue shown is after two cycles.

m - Volume for 95<sup>th</sup> percentile queue is metered by upstream signal

As was agreed upon through conversations with DDOT, the minimum overall and per approach level of service acceptable for this area is a LOS E. The results presented in **Table 3** show that all study intersections will operate at acceptable levels of service in the future without the proposed development. **Figure 6** illustrates graphically the intersection capacity analysis results.





**Figure 7**  
Future Conditions (2009) Without Development Levels of Service



## FUTURE CONDITIONS WITH DEVELOPMENT (2009)

### Site Description and Access

The proposed site is located north of A Street SE, east of 17<sup>th</sup> Street SE, west of 18<sup>th</sup> Street SE, and south of East Capitol Street. The development consists of approximately 134 units. The construction of the project site is anticipated to be complete in 2009.

Access to the site will be provided via an entrance from the alley extending from 17<sup>th</sup> Street to 18<sup>th</sup> Street, parallel to East Capitol Street. This application proposes, at the request of and with the support of local residents in the area, to change the alley adjacent the site to a one-way operation from 18<sup>th</sup> Street towards 17<sup>th</sup> Street. The change in configuration reduces the vehicular impact on the intersection of 18<sup>th</sup> Street and East Capitol Street, as well as the 18<sup>th</sup> Street corridor, by forcing residents to leave the site by traveling south on 17<sup>th</sup> Street towards Independence Avenue. The existing traffic traveling eastbound was rerouted around the study intersections to account for this proposed change.

### Site Generated Volumes

In order to calculate the trip generation for the proposed development, the ITE's Trip Generation, 7<sup>th</sup> Edition publication was used to determine the trips into and out of the proposed site for the weekday morning and afternoon peak hours. As the Stadium-Armory Metrorail Station is located approximately 1-2 blocks from the site, a 50% transit reduction was considered in the trip generation calculations. This reduction rate is consistent with other residential developments within this distance to a Metro station within the Central Business District as concluded in the *2005 Development-Related Ridership Survey* prepared by the Washington Metropolitan Area Transit Authority (WMATA). **Table 4** presents the total new trips generated by the proposed development.

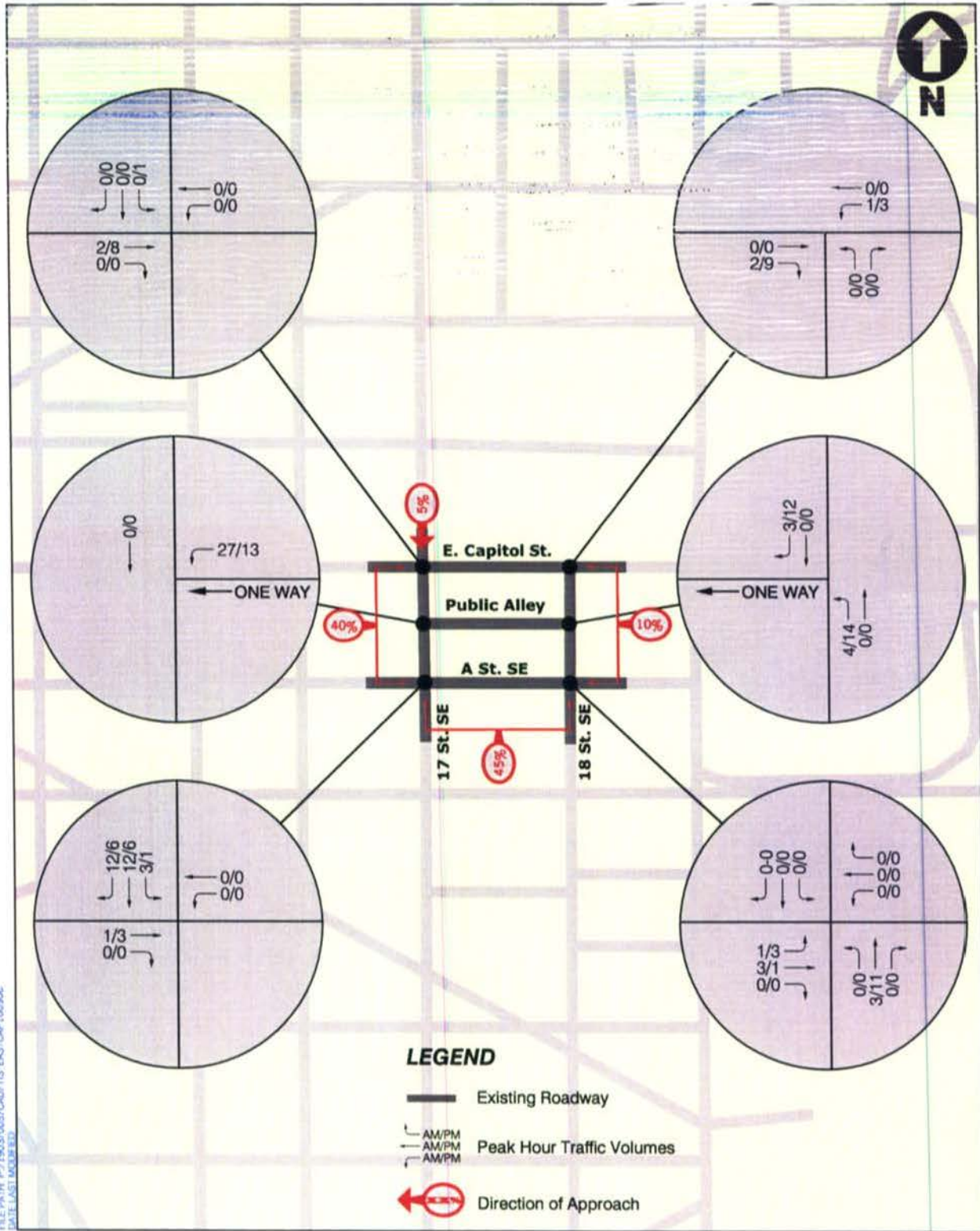
**Table 4: Site Trip Generation Calculations (2009)**

Land Use	ITE Code	Size	Weekday						
			AM Peak Hour			PM Peak Hour			Daily Total
			In	Out	Total	In	Out	Total	
Condominium	230	134 DU	12	54	66	52	25	77	824
<i>Transit Reduction:</i>	<i>50%</i>		<i>-6</i>	<i>-27</i>	<i>-33</i>	<i>-26</i>	<i>-12</i>	<i>-38</i>	<i>-412</i>
<b>Total Trips Generated</b>			<b>6</b>	<b>27</b>	<b>33</b>	<b>27</b>	<b>13</b>	<b>39</b>	<b>412</b>



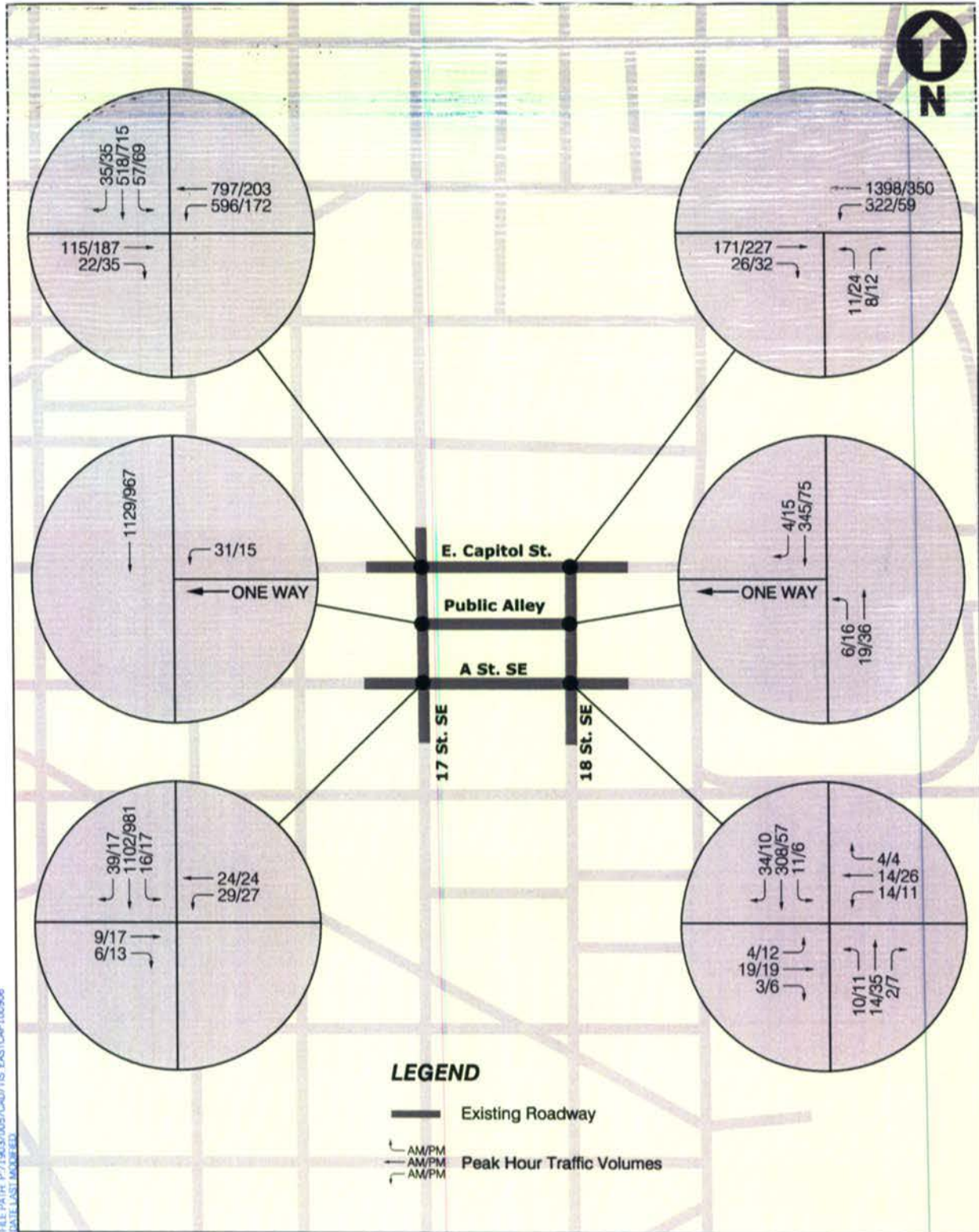
### ***Future Conditions with Development Traffic Volumes***

The distribution of site trips was based on existing volumes and anticipated traffic patterns. The inbound and outbound trips calculated for the morning and afternoon peak hours were routed in the roadway network to the site based on the location of the proposed site and the existing traffic data. The site traffic assignment for the weekday morning and afternoon peak hours is illustrated in **Figure 8**. The proposed redevelopment site trips were added to the future without development volumes in order to establish the future with development 2009 traffic volumes as shown in **Figure 9**.



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**Figure 9**  
Future Conditions (2009) With Development Traffic Volumes



### ***Future Conditions with Development Capacity Analysis and Results***

Capacity analyses were performed at the intersections contained within the study area during the morning and afternoon peak hours under the future conditions with development. The results of the intersection capacity analyses are presented in **Table 5**, and are expressed in terms of level of service (LOS), delay (in seconds per vehicle), and 95<sup>th</sup> percentile queue lengths (in feet). The detailed analysis worksheets are contained in the Technical Appendix.

**Table 5: Future Conditions with Development (2009) Intersection Capacity Analysis**

Intersection (Approach)	AM Peak Hour			PM Peak Hour		
	LOS	Delay (s/veh)	Queue (feet)	LOS	Delay (s/veh)	Queue (feet)
<b>17<sup>th</sup> Street &amp; East Capitol Street</b>						
Overall	C	29.8	n/a	B	12.0	n/a
Eastbound	A	9.0	61'	B	17.9	113'
Westbound	C	32.0	#632'	C	20.4	97'
Southbound	C	29.2	243'	A	6.6	137'
<b>17<sup>th</sup> Street &amp; Alley</b>						
Westbound	B	12.6	6'	B	11.6	3'
<b>17<sup>th</sup> Street &amp; A Street</b>						
Eastbound	C	21.2	5'	C	19.3	10'
Westbound	C	24.3	22'	C	21.3	18'
Southbound Left Turns	A	0.3	1'	A	0.4	1'
<b>18<sup>th</sup> Street &amp; East Capitol Street</b>						
Westbound	A	5.4	26'	A	3.0	4'
Northbound	E	46.7	E'	B	13.1	7'
<b>18<sup>th</sup> Street and Alley</b>						
Northbound	A	1.6	0'	A	2.4	1'
<b>18<sup>th</sup> Street &amp; A Street</b>						
Overall	A	9.7	n/a	A	7.5	n/a
Eastbound	A	8.0	n/a	A	7.5	n/a
Westbound	A	8.1	n/a	A	7.5	n/a
Northbound	A	7.7	n/a	A	7.5	n/a
Southbound	B	10.1	n/a	A	7.5	n/a

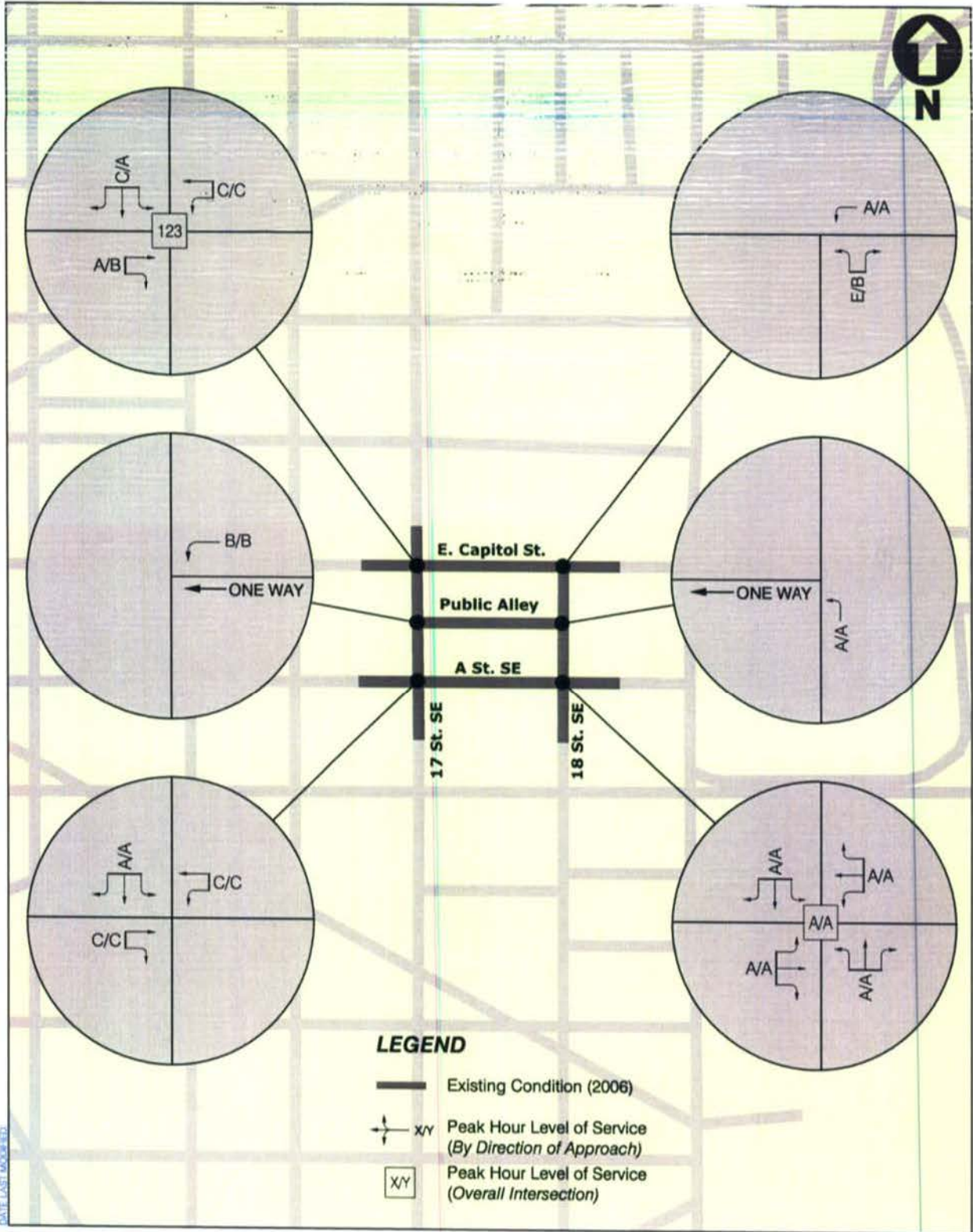
Note: N/A means not available.

# 95<sup>th</sup> percentile volume exceeds capacity, queue may be longer. Queue shown is after two cycles.

m - Volume for 95th percentile queue is metered by upstream signal

As was agreed upon through conversations with DDOT, the minimum overall and per approach level of service acceptable for this area is a LOS E. The results presented in **Table 5** show that all study intersections will be operating at acceptable levels of service. **Figure 10** illustrates graphically the intersection capacity analysis results.





**Figure 10**  
Future Conditions (2009) With Development Levels of Service



## ***Parking***

Parking on the site will be provided in two underground levels. Based on a requirement of 0.5 spaces per unit a total of 67 spaces are required. The applicant is proposing to provide 116 parking spaces, 49 spaces above the requirement. These extra spaces will reduce the demand for on street parking on neighborhood streets.

Field observations of on-street parking utilization in the neighborhood were performed on a typical Thursday and Sunday evening. The results showed that along East Capitol Street, from 16<sup>th</sup> Street and 17<sup>th</sup> Street and 18<sup>th</sup> Street to 19<sup>th</sup> Street, there was approximately 65% vacancy in the on-street parking. This does not include the twenty spaces between 17<sup>th</sup> and 18<sup>th</sup> Streets adjacent the site, which were all vacant during both periods of observation.

Similar to East Capitol Street, approximately 67% (20 of the 30 spaces) of the on-street parking spaces along 17<sup>th</sup> Street from East Capitol Street to A Street were available. However, south of the site along A Street from 17<sup>th</sup> Street to 18<sup>th</sup> Street, and 18<sup>th</sup> Street from East Capitol Street to A Street, the on-street parking was at capacity with only 0% to 15% of the spaces available.

Considering the existing availability of on-street parking directly adjacent the site and the provision of 49 more underground spaces onsite than is required, the development will have a negligible impact on the surrounding on-street parking network.

## ***Loading***

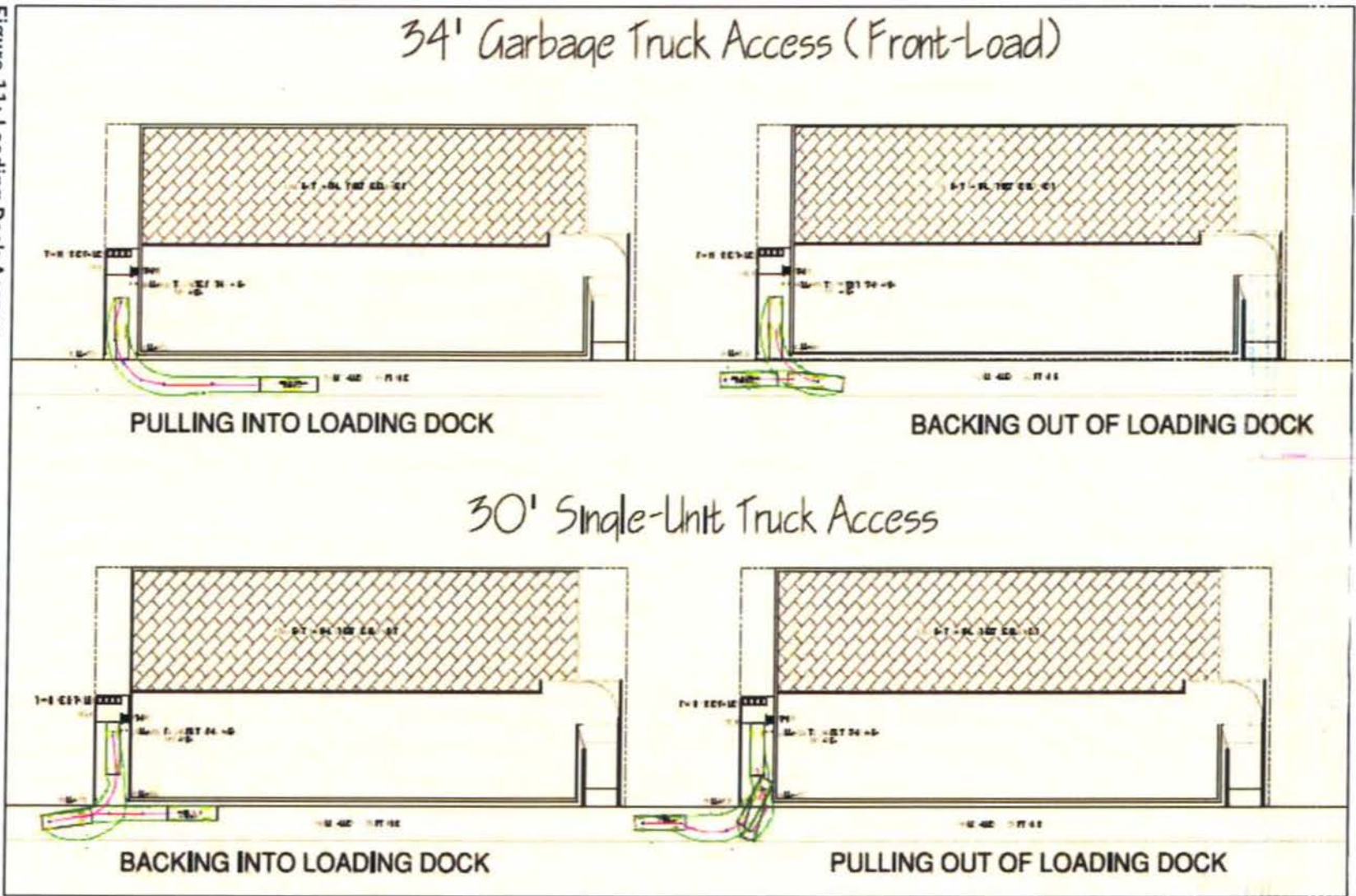
The loading dock for the site will be located on the west end of the building. The dock will be 48 feet deep and 17 feet wide, allowing up to two delivery cars or vans in tandem, or one 30' single unit truck, i.e. a delivery truck, and a 34' front load garbage truck, which will satisfy the loading requirements of the development. Access to the loading area was analyzed with *Autoturn* and shown below in **Figure 11**.

The units proposed for the development average approximately 793 SF/unit and due to the size of the units it is expected that the residents would utilize a small delivery or moving vehicle for moving in and out of the development. Previous traffic studies in the District of Columbia have indicated that surveys of similar existing residential projects have shown that the average number of moves per month is one or two, large tractor-trailer vehicles rarely deliver to the sites, none of the sites surveyed provided 55-foot loading berths, many sites restrict the times and dates for moves, and that a 14 or 15 foot van or small truck is the most common vehicle used for moving purposes. In the rare event that a move takes place by a non local moving firm employing a large tractor-trailer designed to accommodate several residences within the trailer, a temporary DDOT permit may be obtained to reserve a few parking spaces in front of the development along East Capitol Street to allow the large tractor-trailer to park during the scheduled time for loading or unloading.



The size of the residential units, use of the property, and results of the survey show that allowing flexibility of the loading requirements to remove the 55-foot loading berth will not create an undesirable impact on the loading or surrounding traffic of the development.

Figure 11: Loading Dock Access





## CONCLUSIONS

This report presents the findings of a traffic impact study conducted for the proposed East Capitol Street development in Southeast D.C. The proposed development is located north of A Street, east of 17th Street, west of 18th Street, and south of East Capitol Street.

The proposed East Capitol site consists of approximately 134 units. The construction of the project site is anticipated to be complete in 2009. Access to the site will be provided via an entrance on the alley located adjacent the southern boundary of the site.

According to DDOT standards, it is desirable to achieve a minimum overall and per approach level of service (LOS) E or maintain existing LOS, if LOS E is not achieved under existing conditions. Based on these guidelines, the analysis presented in this report supports the following major conclusions:

- ***Existing Conditions –***

The preliminary analysis reveals that all six studied intersections operate at acceptable levels in both the morning and afternoon peaks.

- ***Future Conditions without the Proposed Development –***

Analysis of the future conditions without the proposed development shows that study intersections will operate at acceptable levels of service in both the morning and afternoon peaks.

- ***Future Conditions with the Proposed Development –***

Based on the results of the capacity analysis, the study intersections will operate under acceptable levels of service in both the morning and afternoon peak hours in the future with the proposed development.

The proposed development will generate approximately 33 morning peak hour trips, approximately 39 afternoon peak hour trips, and approximately 412 average daily trips.

The alley on the southern edge of the property will be converted to one-way (westbound) from existing two-way configuration. The rerouting of the traffic volumes due to this change will have a negligible impact on the intersections along 17<sup>th</sup> Street. Operations will improve at the study intersections along East Capitol Street as well as 18<sup>th</sup> Street, as the rerouting will direct drivers to the south towards Independence Avenue and away from East Capitol Street.

The flexibility requested for the loading berth and loading space should be granted because the 55-foot berth is not necessary, and the granting of the flexibility will not negatively impact the neighborhood traffic pattern or loading requirements of the site.





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*INTERSECTION CAPACITY ANALYSIS RESULTS – FUTURE CONDITIONS WITH DEVELOPMENT (2009)*



**APPENDIX A**

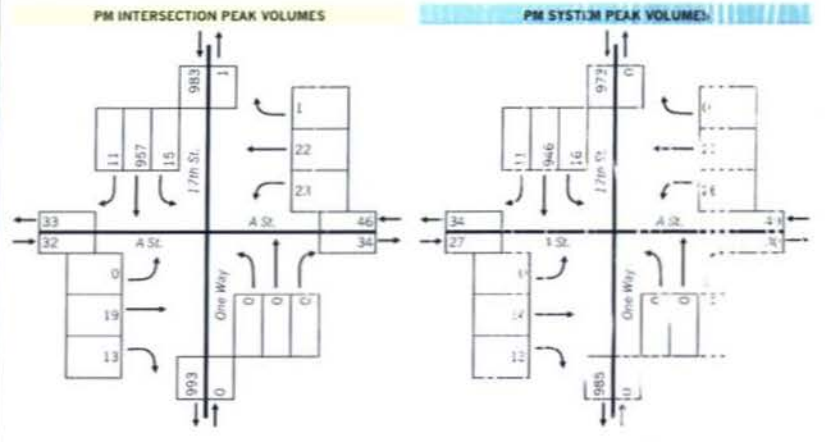
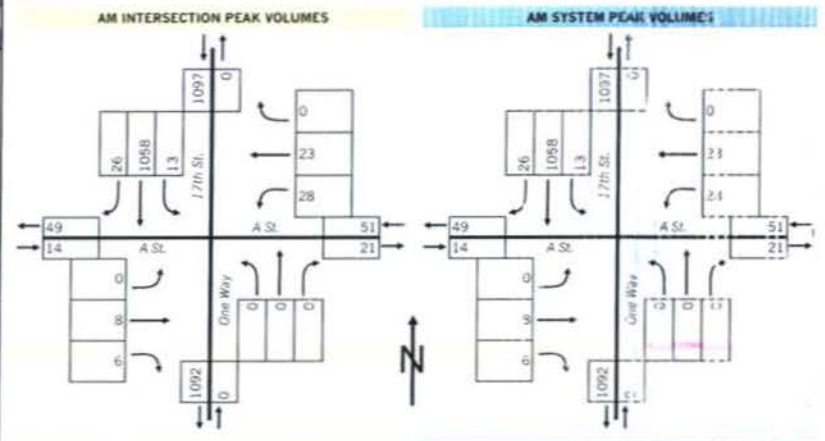
*EXISTING (2006) TRAFFIC VOLUMES & COUNT SHEETS*

**Gorove/Slade Associates**

Project Name : 1700 East Capitol Street  
 Project # : 1903.007  
 Location : DC  
 Data Source : Gorove/Slade Associates

Intersection: 17th Street at A Street Southeast																	
Direction:		Southbound 17th St.				Westbound A St.				Northbound One Way				Eastbound A St.			
Roadway:		Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
Movement:		Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
6:00 AM to 6:15 AM		1	150	2	0	0	2	0	0	0	0	0	1	0	0	0	0
6:15 AM to 6:30 AM		1	183	2	0	0	1	2	1	0	0	0	2	1	1	0	2
6:30 AM to 6:45 AM		1	191	3	1	0	1	2	0	0	0	0	0	0	0	0	1
6:45 AM to 7:00 AM		2	232	1	1	0	2	0	0	0	0	0	1	0	1	0	0
7:00 AM to 7:15 AM		2	227	1	1	0	4	3	0	0	0	0	3	0	1	0	0
7:15 AM to 7:30 AM		7	269	5	6	0	3	2	3	0	0	0	5	4	2	0	1
7:30 AM to 7:45 AM		9	230	2	6	0	5	4	0	0	0	0	6	0	0	0	3
7:45 AM to 8:00 AM		2	269	5	6	0	3	4	2	0	0	0	8	2	5	0	0
8:00 AM to 8:15 AM		5	265	1	5	0	8	8	4	0	0	0	11	2	1	0	0
8:15 AM to 8:30 AM		10	243	5	6	0	3	5	0	0	0	0	6	1	1	0	1
8:30 AM to 8:45 AM		9	281	2	13	0	9	11	1	0	0	0	2	1	1	0	4
8:45 AM to 9:00 AM		3	256	7	7	0	4	13	0	0	0	0	8	0	1	0	3
PM PEAK		Southbound 17th St.				Westbound A St.				Northbound One Way				Eastbound A St.			
Roadway:		Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
Movement:		Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
4:00 PM to 4:15 PM		1	173	0	3	0	3	9	0	0	0	0	3	1	2	0	3
4:15 PM to 4:30 PM		4	208	1	6	0	8	2	2	0	0	0	3	2	1	0	1
4:30 PM to 4:45 PM		2	189	0	5	0	3	3	5	0	0	0	8	3	3	0	0
4:45 PM to 5:00 PM		1	202	0	5	1	5	5	6	0	0	0	6	0	1	0	5
5:00 PM to 5:15 PM		0	227	2	7	1	6	6	0	0	0	0	4	2	7	0	0
5:15 PM to 5:30 PM		6	244	5	6	0	9	5	0	0	0	0	3	0	5	0	2
5:30 PM to 5:45 PM		4	233	7	4	0	4	6	2	0	0	0	6	4	5	0	8
5:45 PM to 6:00 PM		1	253	1	4	0	3	6	2	0	0	0	6	7	2	0	3
6:00 PM to 6:15 PM		0	216	3	4	0	7	9	1	0	0	0	6	2	2	0	5
6:15 PM to 6:30 PM		1	181	4	6	0	3	5	1	0	0	0	16	2	2	0	18
6:30 PM to 6:45 PM		4	201	1	6	0	4	2	3	0	0	0	8	5	4	0	0
6:45 PM to 7:00 PM		6	180	3	7	0	2	5	0	0	0	0	7	2	2	0	5
PEAK HOURS		Southbound 17th St.				Westbound A St.				Northbound One Way				Eastbound A St.			
Direction:		Southbound 17th St.				Westbound A St.				Northbound One Way				Eastbound A St.			
Roadway:		Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
Movement:		Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
AM INTERSECTION PEAK HOUR 7:45 AM to 8:45 AM		26	1058	13	30	0	23	28	7	0	0	0	27	6	8	0	5
PM INTERSECTION PEAK HOUR 5:00 PM to 6:00 PM		11	957	15	21	1	22	23	4	0	0	0	19	13	19	0	13
AM SYSTEM PEAK HOUR 7:45 AM to 8:45 AM		26	1058	13	30	0	23	28	7	0	0	0	27	6	8	0	5
PM SYSTEM PEAK HOUR 5:15 PM to 6:15 PM		11	946	16	18	0	23	26	5	0	0	0	21	13	14	0	18
PEAK HOUR FACTORS		Southbound 17th St.				Westbound A St.				Northbound One Way				Eastbound A St.			
AM PEAK HOUR		0.65	0.94	0.65	N/A	0.00	0.64	0.64	N/A	0.00	0.00	0.00	N/A	0.75	0.40	0.00	N/A
PM PEAK HOUR		0.45	0.93	0.57	N/A	0.00	0.84	0.72	N/A	0.00	0.00	0.00	N/A	0.46	0.70	0.00	N/A
Overall AM PEAK HOUR FACTOR		= 0.93				Overall PM PEAK HOUR FACTOR				= 0.96							
AM Period Intersection Volume:		2200				PM Period Intersection Volume:				2752							

Date of Counts: Wednesday, May 10, 2006  
 AM Weather Conditions: Clear, Mild  
 PM Weather Conditions: Clear, Mild

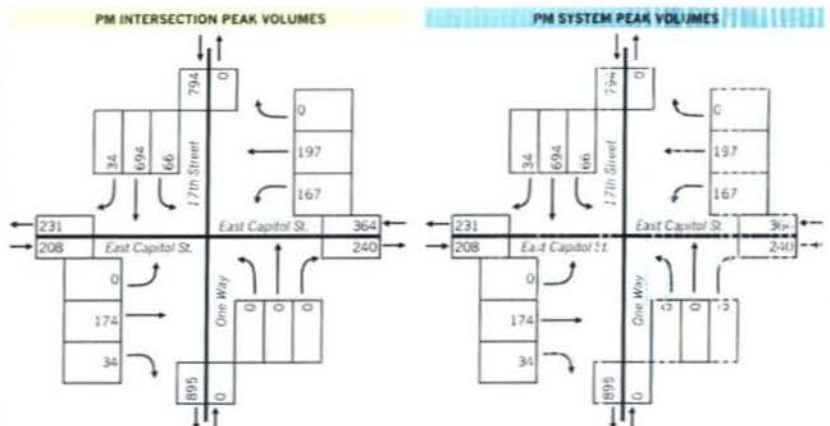
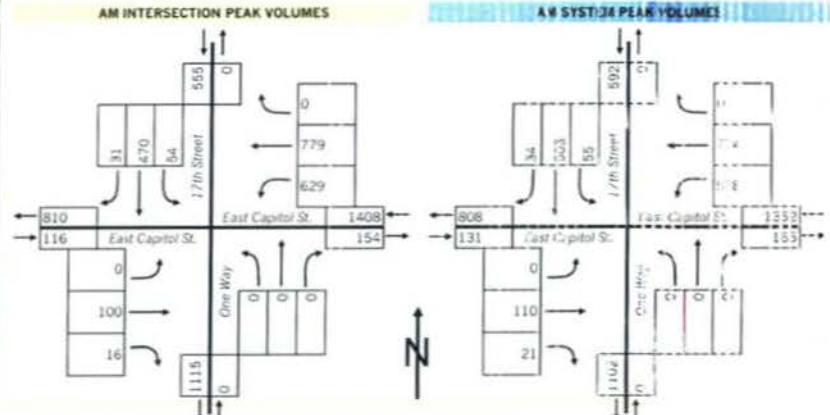


Gorove/Slade Associates

Project Name : 1700 East Capitol Street  
 Project # : 1903-007  
 Location : DC  
 Data Source : Gorove/Slade Associates

Intersection: 17th Street at East Capitol Street																	
AM PEAK	Direction: Roadway: Movement:	Southbound 17th Street				Westbound East Capitol St.				Northbound One Way				Eastbound East Capitol St.			
		Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
6:00 AM to 6:15 AM		0	45	0	0	0	61	101	0	0	0	0	2	0	9	0	0
6:15 AM to 6:30 AM		2	60	8	0	0	76	131	0	0	0	0	0	1	8	0	3
6:30 AM to 6:45 AM		0	61	3	3	0	118	142	0	0	0	0	1	1	14	0	2
6:45 AM to 7:00 AM		3	68	6	1	0	141	160	3	0	0	0	4	1	17	0	0
7:00 AM to 7:15 AM		6	88	6	2	0	166	158	0	0	0	0	1	1	15	0	5
7:15 AM to 7:30 AM		6	108	10	10	0	185	169	1	0	0	0	1	4	15	0	7
7:30 AM to 7:45 AM		6	108	13	3	0	206	174	2	0	0	0	3	2	21	0	20
7:45 AM to 8:00 AM		7	106	10	16	0	204	165	1	0	0	0	2	3	25	0	7
8:00 AM to 8:15 AM		8	129	14	3	0	194	148	0	0	0	0	9	5	26	0	11
8:15 AM to 8:30 AM		10	127	17	3	0	175	142	5	0	0	0	4	6	28	0	20
8:30 AM to 8:45 AM		9	141	14	10	0	201	123	0	0	0	0	10	7	31	0	11
8:45 AM to 9:00 AM		3	111	13	1	0	174	146	2	0	0	0	5	4	19	0	1
PM PEAK	Direction: Roadway: Movement:	Southbound 17th Street				Westbound East Capitol St.				Northbound One Way				Eastbound East Capitol St.			
		Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
4:00 PM to 4:15 PM		5	145	15	4	0	49	31	6	0	0	0	2	2	37	0	3
4:15 PM to 4:30 PM		8	157	22	1	0	52	38	4	0	0	0	4	2	33	0	3
4:30 PM to 4:45 PM		4	148	19	6	0	56	45	3	0	0	0	2	2	39	4	0
4:45 PM to 5:00 PM		3	155	18	4	0	42	43	3	0	0	0	2	4	49	0	7
5:00 PM to 5:15 PM		5	172	9	1	0	42	27	2	0	0	0	0	12	38	0	19
5:15 PM to 5:30 PM		1	178	20	1	0	54	40	2	0	0	0	2	8	46	0	11
5:30 PM to 5:45 PM		7	175	13	3	0	53	53	6	0	0	0	2	13	41	0	2
5:45 PM to 6:00 PM		10	182	17	2	0	45	39	2	0	0	0	4	2	41	0	3
6:00 PM to 6:15 PM		16	159	16	1	0	45	35	4	0	0	0	1	11	46	0	2
6:15 PM to 6:30 PM		7	142	20	8	8	50	26	4	0	0	0	4	3	30	0	3
6:30 PM to 6:45 PM		6	147	21	2	0	44	33	4	0	0	0	3	6	30	0	1
6:45 PM to 7:00 PM		5	139	14	0	0	45	31	7	0	0	0	5	13	25	0	3
PEAK HOURS	Direction: Roadway: Movement:	Southbound 17th Street				Westbound East Capitol St.				Northbound One Way				Eastbound East Capitol St.			
		Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
<b>AM INTERSECTION PEAK HOUR</b>																	
7:30 AM to 8:30 AM		31	470	54	25	0	779	629	8	0	0	0	18	16	100	0	58
<b>PM INTERSECTION PEAK HOUR</b>																	
5:15 PM to 6:15 PM		34	694	66	7	0	197	167	14	0	0	0	9	34	174	0	18
<b>AM SYSTEM PEAK HOUR</b>																	
7:45 AM to 8:45 AM		34	503	55	32	0	774	578	6	0	0	0	25	21	110	0	49
<b>PM SYSTEM PEAK HOUR</b>																	
5:15 PM to 6:15 PM		34	694	66	7	0	197	167	14	0	0	0	9	34	174	0	18
PEAK HOUR FACTORS	Direction: Roadway: Movement:	Southbound 17th Street				Westbound East Capitol St.				Northbound One Way				Eastbound East Capitol St.			
		Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
<b>AM PEAK HOUR</b>																	
		0.85	0.89	0.81	N/A	0.00	0.95	0.88	N/A	0.00	0.00	0.00	N/A	0.75	0.89	0.00	N/A
<b>PM PEAK HOUR</b>																	
		0.53	0.95	0.83	N/A	0.00	0.91	0.79	N/A	0.00	0.00	0.00	N/A	0.65	0.95	0.00	N/A
<b>Overall AM PEAK HOUR FACTOR = 0.99</b>																	
<b>Overall PM PEAK HOUR FACTOR = 0.96</b>																	
<b>AM Period Intersection Volume: 3327</b>																	
<b>PM Period Intersection Volume: 2743</b>																	

Date of Counts: Wednesday, May 10, 2006  
 AM Weather Conditions: Clear, Mild  
 PM Weather Conditions: Clear, Mild



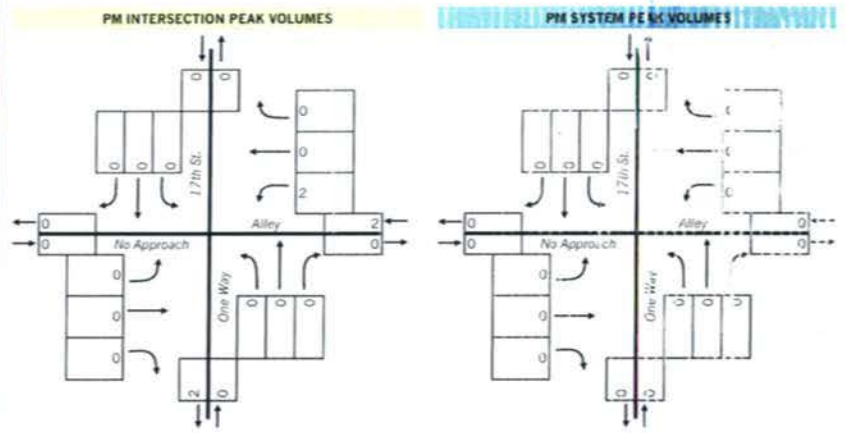
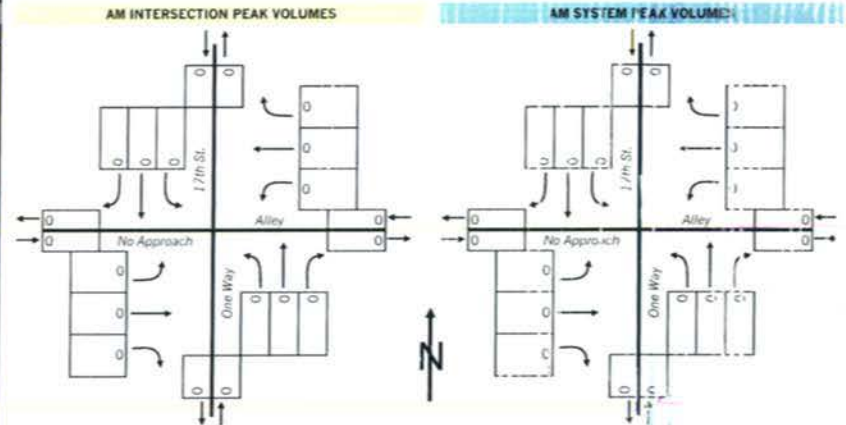


**Gorve/Slade Associates**

Project Name :	1700 East Capitol Street
Project Number:	1903-007
Location:	DC
Data Source:	Gorve/Slade Associates

Intersection: 17th Street Alley Between East Capitol Street and A Street Southeast 1/2Hr. Spot Count																	
AM PEAK		Southbound 17th St.				Westbound Alley				Northbound One Way				Eastbound No Approach			
Direction:		Right		Thru		Left		Peds		Right		Thru		Left		Peds	
Roadway:		Right		Thru		Left		Peds		Right		Thru		Left		Peds	
Movement:		Right		Thru		Left		Peds		Right		Thru		Left		Peds	
6:00 AM to 6:15 AM																	
6:15 AM to 6:30 AM																	
6:30 AM to 6:45 AM																	
6:45 AM to 7:00 AM																	
7:00 AM to 7:15 AM																	
7:15 AM to 7:30 AM						0		0									
7:30 AM to 7:45 AM						0		0									
7:45 AM to 8:00 AM																	
8:00 AM to 8:15 AM																	
8:15 AM to 8:30 AM																	
8:30 AM to 8:45 AM																	
8:45 AM to 9:00 AM																	
PM PEAK		Southbound 17th St.				Westbound Alley				Northbound One Way				Eastbound No Approach			
Direction:		Right		Thru		Left		Peds		Right		Thru		Left		Peds	
Roadway:		Right		Thru		Left		Peds		Right		Thru		Left		Peds	
Movement:		Right		Thru		Left		Peds		Right		Thru		Left		Peds	
4:00 PM to 4:15 PM																	
4:15 PM to 4:30 PM						0		0									
4:30 PM to 4:45 PM						0		2									
4:45 PM to 5:00 PM																	
5:00 PM to 5:15 PM																	
5:15 PM to 5:30 PM																	
5:30 PM to 5:45 PM																	
5:45 PM to 6:00 PM																	
6:00 PM to 6:15 PM																	
6:15 PM to 6:30 PM																	
6:30 PM to 6:45 PM																	
6:45 PM to 7:00 PM																	
PEAK HOURS		Southbound 17th St.				Westbound Alley				Northbound One Way				Eastbound No Approach			
Direction:		Right		Thru		Left		Peds		Right		Thru		Left		Peds	
Roadway:		Right		Thru		Left		Peds		Right		Thru		Left		Peds	
Movement:		Right		Thru		Left		Peds		Right		Thru		Left		Peds	
<b>AM INTERSECTION PEAK HOUR</b>		0		0		0		0		0		0		0		0	
6:00 AM to 7:00 AM		0		0		0		0		0		0		0		0	
<b>PM INTERSECTION PEAK HOUR</b>		0		0		0		0		0		0		2		0	
4:00 PM to 5:00 PM		0		0		0		0		0		0		2		0	
<b>AM SYSTEM PEAK HOUR</b>		0		0		0		0		0		0		0		0	
7:45 AM to 8:45 AM		0		0		0		0		0		0		0		0	
<b>PM SYSTEM PEAK HOUR</b>		0		0		0		0		0		0		0		0	
5:15 PM to 6:15 PM		0		0		0		0		0		0		0		0	
PEAK HOUR FACTORS		Southbound 17th St.				Westbound Alley				Northbound One Way				Eastbound No Approach			
Direction:		Right		Thru		Left		Peds		Right		Thru		Left		Peds	
Roadway:		Right		Thru		Left		Peds		Right		Thru		Left		Peds	
Movement:		Right		Thru		Left		Peds		Right		Thru		Left		Peds	
<b>AM PEAK HOUR</b>		0.00		0.00		0.00		N/A		0.00		0.00		0.00		N/A	
<b>PM PEAK HOUR</b>		0.00		0.00		0.00		N/A		0.00		0.00		0.00		N/A	
<b>Overall AM PEAK HOUR FACTOR</b>		= #####															
<b>Overall PM PEAK HOUR FACTOR</b>		= #####															
<b>AM Period Intersection Volume:</b>		0															
<b>PM Period Intersection Volume:</b>		2															

Date of Counts: Thursday, May 11, 2006  
 AM Weather Conditions: Clear, Mild  
 FBI Weather Conditions: Clear, Mild

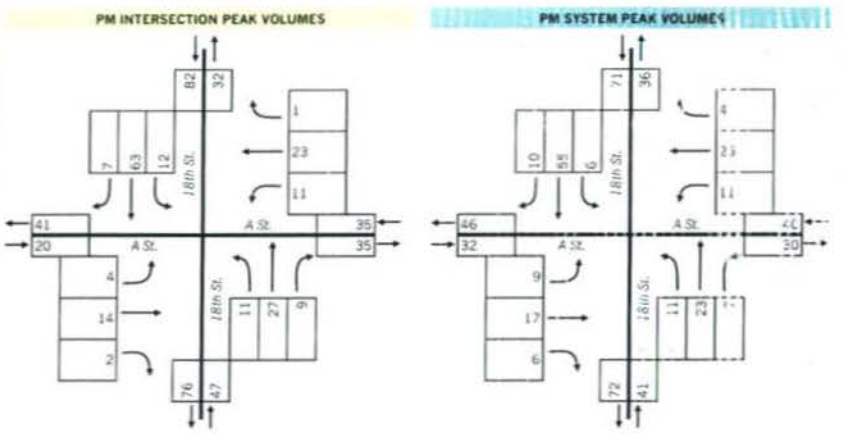
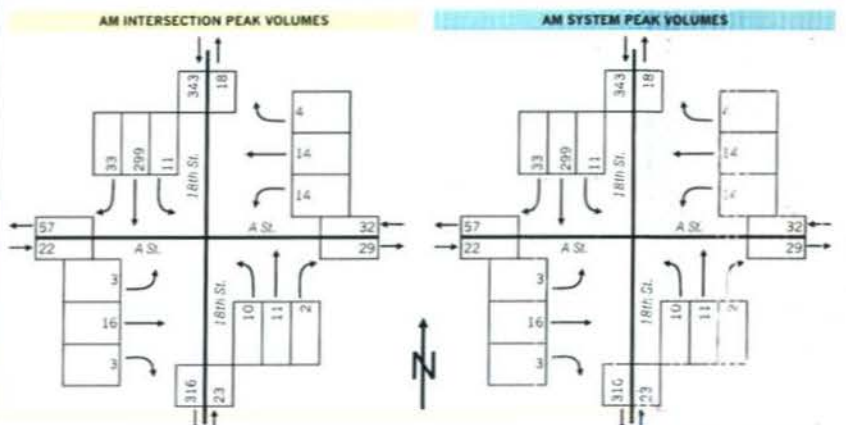


**Gorove/Slade Associates**

Project Name : 1700 East Capitol Street  
 Project Number: 1903-007  
 Location: DC  
 Data Source: Gorove/Slade Associates

Intersection:		18th Street at A Street Southeast															
AM PEAK	Direction: Roadway: Movement:	Southbound 18th St				Westbound A St				Northbound 18th St				Eastbound A St			
		Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
6:00 AM to 6:15 AM		0	30	0	2	1	1	0	2	1	1	0	1	0	2	0	0
6:15 AM to 6:30 AM		0	39	2	1	0	2	2	2	1	0	0	1	0	2	1	0
6:30 AM to 6:45 AM		1	39	4	2	0	2	2	1	0	1	0	1	1	3	0	0
6:45 AM to 7:00 AM		0	37	1	1	0	0	2	1	0	4	1	1	1	1	0	0
7:00 AM to 7:15 AM		1	57	3	5	1	2	2	1	0	4	4	3	1	2	0	0
7:15 AM to 7:30 AM		1	52	1	16	0	1	4	6	1	2	2	7	2	6	0	0
7:30 AM to 7:45 AM		4	53	2	10	0	2	3	4	0	2	1	9	0	4	0	0
7:45 AM to 8:00 AM		7	76	2	12	0	3	2	8	1	4	3	12	2	4	1	0
8:00 AM to 8:15 AM		5	61	3	17	2	5	4	4	0	2	2	12	0	4	2	2
8:15 AM to 8:30 AM		6	75	3	12	0	4	2	5	1	2	1	17	1	4	0	1
8:30 AM to 8:45 AM		15	87	3	35	2	2	6	7	0	3	4	12	0	4	0	4
8:45 AM to 9:00 AM		12	61	1	37	2	1	1	3	0	2	3	11	1	3	2	4
PM PEAK	Direction: Roadway: Movement:	Southbound 18th St				Westbound A St				Northbound 18th St				Eastbound A St			
		Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
4:00 PM to 4:15 PM		2	16	1	4	1	3	1	4	1	6	4	2	0	1	0	6
4:15 PM to 4:30 PM		0	15	1	2	2	4	1	0	2	7	6	7	0	2	0	0
4:30 PM to 4:45 PM		1	17	1	1	1	4	1	0	1	10	0	5	0	3	1	5
4:45 PM to 5:00 PM		0	11	2	8	2	4	0	0	1	5	5	8	0	1	2	3
5:00 PM to 5:15 PM		1	11	1	2	0	7	2	1	0	4	4	8	2	2	0	0
5:15 PM to 5:30 PM		3	9	1	5	3	4	0	2	1	6	2	9	2	6	2	0
5:30 PM to 5:45 PM		2	14	1	7	0	6	1	0	0	5	3	10	2	5	5	0
5:45 PM to 6:00 PM		0	18	2	7	0	6	5	1	2	5	4	6	0	4	2	0
6:00 PM to 6:15 PM		5	14	2	14	1	9	5	5	4	7	2	4	2	2	0	1
6:15 PM to 6:30 PM		1	13	3	6	0	3	0	2	2	6	3	14	0	5	1	0
6:30 PM to 6:45 PM		1	18	5	8	0	5	1	5	1	9	2	11	0	3	1	0
6:45 PM to 7:00 PM		1	16	0	7	2	5	3	0	0	13	1	5	0	4	4	3
PEAK HOURS	Direction: Roadway: Movement:	Southbound 18th St				Westbound A St				Northbound 18th St				Eastbound A St			
		Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
<b>AM INTERSECTION PEAK HOUR</b>																	
7:45 AM to 8:45 AM		33	299	11	76	4	14	14	24	2	11	10	53	3	16	3	7
<b>PM INTERSECTION PEAK HOUR</b>																	
6:00 PM to 7:00 PM		7	63	12	35	1	23	11	13	9	27	11	35	2	14	4	1
<b>AM SYSTEM PEAK HOUR</b>																	
7:45 AM to 8:45 AM		33	299	11	76	4	14	14	24	2	11	10	53	3	16	3	7
<b>PM SYSTEM PEAK HOUR</b>																	
5:15 PM to 6:15 PM		10	55	6	33	4	25	11	8	7	23	11	29	6	17	9	1
PEAK HOUR FACTORS		Southbound 18th St				Westbound A St				Northbound 18th St				Eastbound A St			
		Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
<b>AM PEAK HOUR</b>		0.55	0.86	0.92	N/A	0.50	0.70	0.58	N/A	0.50	0.69	0.63	N/A	0.38	1.00	0.38	N/A
<b>PM PEAK HOUR</b>		0.50	0.76	0.75	N/A	0.33	0.69	0.55	N/A	0.44	0.82	0.69	N/A	0.75	0.71	0.45	N/A
<b>Overall AM PEAK HOUR FACTOR</b>		= 0.83															
<b>Overall PM PEAK HOUR FACTOR</b>		= 0.87															
<b>AM Period Intersection Volume:</b>		171															
<b>PM Period Intersection Volume:</b>		497															

Date of Counts: Wednesday, May 10, 2006  
 AM Weather Conditions: Clear, Mild PM Weather Conditions: Clear, Mild

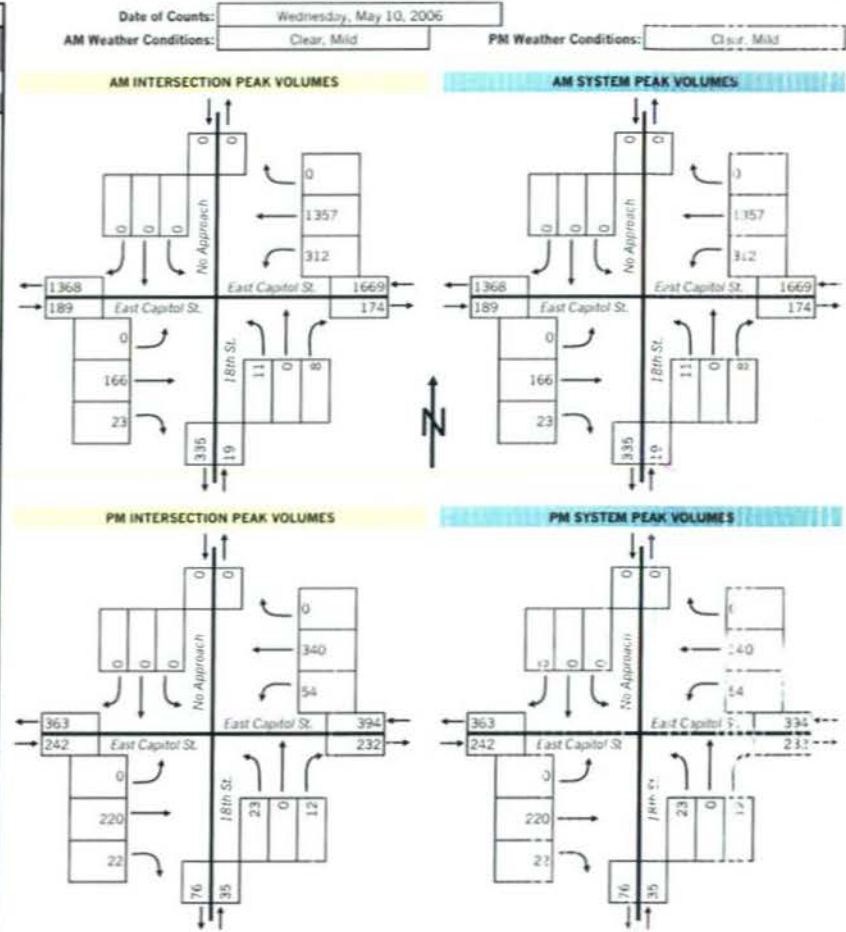




Gorove/Slade Associates

Project Name :	1700 East Capitol Street
Project Number :	1903.007
Location :	DC
Data Source :	Gorove/Slade Associates

Intersection:		18th Street at East Capitol Street															
AM PEAK	Direction: Roadway: Movement:	Southbound				Westbound East Capitol St.				Northbound 18th St.				Eastbound East Capitol St.			
		Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
6:00 AM to 6:15 AM		0	0	0	0	0	170	29	0	1	0	0	0	2	7	0	0
6:15 AM to 6:30 AM		0	0	0	0	0	212	38	0	0	0	2	0	4	13	0	0
6:30 AM to 6:45 AM		0	0	0	0	0	256	42	0	0	0	1	0	2	14	0	0
6:45 AM to 7:00 AM		0	0	0	0	0	286	28	0	1	0	4	0	5	20	0	7
7:00 AM to 7:15 AM		0	0	0	0	0	322	62	1	1	0	3	1	4	18	0	5
7:15 AM to 7:30 AM		0	0	0	5	0	361	52	0	0	0	1	1	4	21	0	8
7:30 AM to 7:45 AM		0	0	0	5	0	378	54	0	1	0	3	1	4	35	0	21
7:45 AM to 8:00 AM		0	0	0	5	0	361	79	0	0	0	3	1	6	35	0	5
8:00 AM to 8:15 AM		0	0	0	15	0	348	67	0	2	0	4	0	7	40	0	8
8:15 AM to 8:30 AM		0	0	0	10	0	311	75	0	2	0	1	2	4	45	0	5
8:30 AM to 8:45 AM		0	0	0	32	0	337	91	0	4	0	3	1	6	46	0	3
8:45 AM to 9:00 AM		0	0	0	25	0	296	68	0	1	0	1	1	0	34	0	2
PM PEAK		Southbound				Westbound East Capitol St.				Northbound 18th St.				Eastbound East Capitol St.			
		Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
4:00 PM to 4:15 PM		0	0	0	6	0	72	14	0	2	1	8	1	2	52	0	4
4:15 PM to 4:30 PM		0	0	0	1	0	84	10	0	2	0	5	0	4	52	0	6
4:30 PM to 4:45 PM		0	0	0	4	0	92	15	0	4	0	8	1	3	60	0	4
4:45 PM to 5:00 PM		0	0	0	2	0	77	9	0	2	0	5	1	5	66	0	12
5:00 PM to 5:15 PM		0	0	0	12	0	67	10	0	3	0	4	0	4	41	0	9
5:15 PM to 5:30 PM		0	0	0	4	0	86	12	0	3	0	8	0	5	57	0	5
5:30 PM to 5:45 PM		0	0	0	12	0	91	12	0	4	0	7	1	4	52	0	7
5:45 PM to 6:00 PM		0	0	0	1	0	84	15	0	2	0	3	2	5	56	0	4
6:00 PM to 6:15 PM		0	0	0	3	0	79	15	0	3	0	5	1	8	55	0	4
6:15 PM to 6:30 PM		0	0	0	7	0	76	12	0	0	0	7	0	5	48	0	3
6:30 PM to 6:45 PM		0	0	0	1	0	64	14	0	6	0	6	1	9	43	0	2
6:45 PM to 7:00 PM		0	0	0	4	0	70	15	0	12	0	8	0	2	39	0	9
PEAK HOURS		Southbound				Westbound East Capitol St.				Northbound 18th St.				Eastbound East Capitol St.			
		Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
<b>AM INTERSECTION PEAK HOUR</b>																	
7:45 AM to 8:45 AM		0	0	0	62	0	1357	312	0	8	0	11	4	23	166	0	21
<b>PM INTERSECTION PEAK HOUR</b>																	
5:15 PM to 6:15 PM		0	0	0	20	0	340	54	0	12	0	23	4	22	220	0	20
<b>AM SYSTEM PEAK HOUR</b>																	
7:45 AM to 8:45 AM		0	0	0	62	0	1357	312	0	8	0	11	4	23	166	0	21
<b>PM SYSTEM PEAK HOUR</b>																	
5:15 PM to 6:15 PM		0	0	0	20	0	340	54	0	12	0	23	4	22	220	0	20
PEAK HOUR FACTORS		Southbound				Westbound East Capitol St.				Northbound 18th St.				Eastbound East Capitol St.			
		Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
<b>AM PEAK HOUR</b>		0.00	0.00	0.00	N/A	0.00	0.94	0.86	N/A	0.50	0.00	0.69	N/A	0.82	0.90	0.00	N/A
<b>PM PEAK HOUR</b>		0.00	0.00	0.00	N/A	0.00	0.93	0.90	N/A	0.75	0.00	0.72	N/A	0.69	0.96	0.00	N/A
<b>Overall AM PEAK HOUR FACTOR</b>		= 0.96								<b>Overall PM PEAK HOUR FACTOR</b> = 0.96							
<b>AM Period Intersection Volume:</b>		4780								<b>PM Period Intersection Volume:</b> 1890							



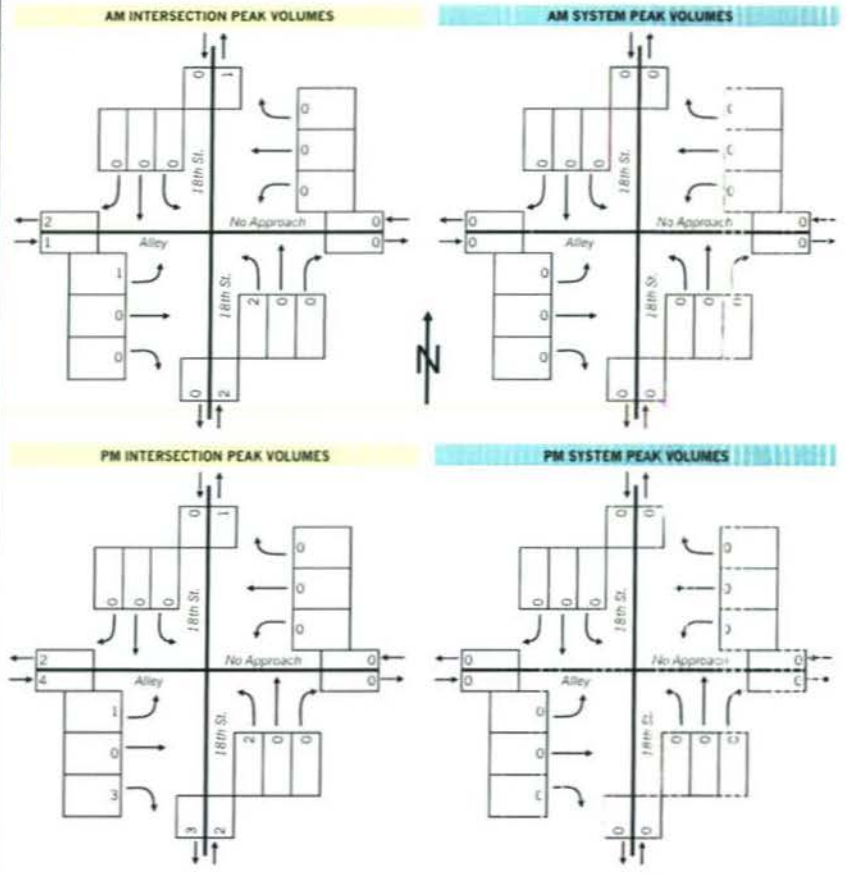


**Gorove/Slade Associates**

Project Name: 1700 East Capitol Street  
 Project Number: 1903.007  
 Location: DC  
 Data Source: Gorove/Slade Associates

Intersection: 18th Street Alley Between East Capitol Street and A Street Southeast 1/2Hr. Spot Count																	
AM PEAK	Direction:	Southbound				Westbound				Northbound				Eastbound			
	Roadway:	18th St.				No Approach				18th St.				Alley			
	Movement:	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
6:00 AM to 6:15 AM																	
6:15 AM to 6:30 AM																	
6:30 AM to 6:45 AM																	
6:45 AM to 7:00 AM		0								1				0			
7:00 AM to 7:15 AM		0								1				0			
7:15 AM to 7:30 AM																	
7:30 AM to 7:45 AM																	
7:45 AM to 8:00 AM																	
8:00 AM to 8:15 AM																	
8:15 AM to 8:30 AM																	
8:30 AM to 8:45 AM																	
8:45 AM to 9:00 AM																	
PM PEAK	Direction:	Southbound				Westbound				Northbound				Eastbound			
	Roadway:	18th St.				No Approach				18th St.				Alley			
	Movement:	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
4:00 PM to 4:15 PM																	
4:15 PM to 4:30 PM																	
4:30 PM to 4:45 PM																	
4:45 PM to 5:00 PM		0								0				1			
5:00 PM to 5:15 PM		0								2				2			
5:15 PM to 5:30 PM																	
5:30 PM to 5:45 PM																	
5:45 PM to 6:00 PM																	
6:00 PM to 6:15 PM																	
6:15 PM to 6:30 PM																	
6:30 PM to 6:45 PM																	
6:45 PM to 7:00 PM																	
PEAK HOURS	Direction:	Southbound				Westbound				Northbound				Eastbound			
Roadway:	18th St.	No Approach				18th St.				Alley							
Movement:	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
<b>AM INTERSECTION PEAK HOUR</b>																	
6:15 AM to 7:15 AM		0	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0
<b>PM INTERSECTION PEAK HOUR</b>																	
4:15 PM to 5:15 PM		0	0	0	0	0	0	0	0	0	0	2	0	3	0	1	0
<b>AM SYSTEM PEAK HOUR</b>																	
7:45 AM to 8:45 AM		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>PM SYSTEM PEAK HOUR</b>																	
5:15 PM to 6:15 PM		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PEAK HOUR FACTORS	Direction:	Southbound				Westbound				Northbound				Eastbound			
Roadway:	18th St.	No Approach				18th St.				Alley							
Movement:	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
<b>AM PEAK HOUR</b>		0.00	0.00	0.00	N/A	0.00	0.00	0.00	N/A	0.00	0.00	0.00	N/A	0.00	0.00	0.00	N/A
<b>PM PEAK HOUR</b>		0.00	0.00	0.00	N/A	0.00	0.00	0.00	N/A	0.00	0.00	0.00	N/A	0.00	0.00	0.00	N/A
<b>Overall AM PEAK HOUR FACTOR</b>		= 0.0000				= 0.0000				= 0.0000							
<b>Overall PM PEAK HOUR FACTOR</b>		= 0.0000				= 0.0000				= 0.0000							
<b>AM Period Intersection Volume:</b>		= 3				= 2				= 3							
<b>PM Period Intersection Volume:</b>		= 3				= 2				= 3							

Date of Counts: Thursday, May 11, 2006  
 AM Weather Conditions: Clear, Mild  
 PM Weather Conditions: Clear, Mild





## **APPENDIX B**

### *LEVEL OF SERVICE DEFINITIONS*



## APPENDIX B: LEVEL OF SERVICE DEFINITIONS

All capacity analyses are based on the procedures specified by the Transportation Research Board, Special Report 209: *Highway Capacity Manual (HCM)*, 2000. Levels of service (LOS) range from A to F. A brief description of each level of service for signalized and unsignalized intersections is provided below.

**Signalized Intersections:** Level of service is based upon the traffic volume present in each lane on the roadway, the capacity of each lane at the intersection and the delay associated with each directional movement. The levels of service for signalized intersections are defined below:

- Level of Service A describes operations with very low average delay per vehicle, i.e., less than 10.0 seconds. This occurs when progression is extremely favorable, and most vehicles arrive during the green phase. Most vehicles do not stop. Short signal cycle lengths may also contribute to low delay.
  - Level of Service B describes operations with average delay in the range of 10.1 to 20.0 seconds per vehicle. This generally occurs with good progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher levels of average delay.
  - Level of Service C describes operations with delay in the range of 20.1 to 35.0 seconds per vehicle. These higher delays may result from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant at this level although many still pass through the intersection without stopping. This is generally considered the lower end of the range of the acceptable level of service in rural areas.
  - Level of Service D describes operations with delay in the range of 35.1 to 55.0 seconds per vehicle. At LOS D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, and/or high traffic volumes as compared to the roadway capacity. Many vehicles are required to stop and the number of vehicles that do not have to stop declines. Individual signal cycle failures, where all waiting vehicles do not clear the intersection during a single green time, are noticeable. This is generally considered the lower end of the range of the acceptable level of service in urban areas.
  - Level of Service E describes operations with delay in the range of 55.1 to 80.0 seconds per vehicle. These higher delay values generally indicate poor progression, long cycle lengths, and high traffic volumes. Individual cycle failures are frequent occurrences. LOS E has been set as the limit of acceptable conditions.
  - Level of Service F describes operations with average delay in excess of 80.0 seconds per vehicle. This is considered to be unacceptable to most drivers. This condition often occurs with over-saturation, i.e., when traffic arrives at a flow rate that exceeds the capacity of the intersection.
-



It may also occur at high volumes with many individual cycle failures. Poor progression and long cycle lengths may also contribute to such delays.

**Unsignalized Intersections:** At an unsignalized intersection, the major street through traffic and right turns are assumed to operate unimpeded and therefore receive no level of service rating. The level of service for the minor street and the major street left turn traffic is dependent on the volume and capacity of the available lanes, and, the number and frequency of acceptable gaps in the major street traffic to make a conflicting turn. The level of service grade is provided for each conflicting movement at an unsignalized intersection and is based on the total average delay experienced by each vehicle. The delay includes the time it takes a vehicle to move from the back of a queue through the intersection.

The unsignalized intersection level of service analysis does not account for variations in driver behavior or the effects of nearby traffic signals. Therefore, the results from this analysis usually indicate worse levels of service than may be experienced in the field. The unsignalized intersection level of service descriptions are provided below:

- Level of Service A. Describes operations where there is very little to no conflicting traffic for a minor side street movement, i.e., an average total delay of less than 10.0 seconds per vehicle.
- Level of Service B. Describes operations with average total delay in the range of 10.1 to 15.0 seconds per vehicle.
- Level of Service C. Describes operations with average total delay in the range of 15.1 to 25.0 second per vehicle.
- Level of Service D. Describes operations with average total delay in the range of 25.1 to 35.0 seconds per vehicle.
- Level of Service E. Describes operations with average total delay in the range of 35.1 to 50.0 seconds per vehicle.
- Level of Service F. Describes operations with average total delay of 50 seconds per vehicle. LOS F exists when there are insufficient gaps of suitable size to allow a side street demand to cross safely through or enter a major street traffic stream. This level of service is generally evident from extremely long total delays experienced by side street traffic and by queuing on the minor approaches. It is important to note that LOS F may not always result in long queues but may result in adjustments to normal driver behavior.





## **APPENDIX C**

### *SCOPING LETTER TO DDOT*

**Cheryl L. Sharp**

---

**From:** Chad A. Baird  
**Sent:** Tuesday, September 26, 2006 9:58 AM  
**To:** 'abdoulaye.bah@dc.gov'  
**Cc:** 'jdapogny@comstockhomebuilding.com'; Cheryl L. Sharp  
**Subject:** 1700 East Capital Scoping Meeting - Traffic Study  
**Attachments:** DC TIS Scoping Agreement092606.pdf

Abdoulaye,

Attached is the scoping document agreement (Draft) for the 1700 East Capital development located along the south side of East Capital Street between 18th Street and 17th Street. Would it be possible for us to set up a scoping meeting latter this week of the beginning part of next week to review the scope of the traffic impact study of this proposed development.

Thanks

Chad Baird  
Director of Engineering  
Gorove/Slade Associates Inc.  
3914 Centreville Road  
Suite 330  
Chantilly, Virginia 20151  
Phone: 703-787-9595  
Fax: 703-787-9905  
Direct: 703-787-9914  
<<DC TIS Scoping Agreement092606.pdf>>

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It has removed 33463 spam emails to date.  
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## DDOT - Gorove/Slade Traffic Impact Study Scoping Form

**Project Name:** 1700 East Capitol Street      **Site Location:** 1700 East Capitol Street (SE)

**Purpose of Study:** Traffic Impact Study (Condominiums)      **Estimated date of Study Completion:** End of October 2006

**Brief Description of Project:** Approximately 120 to 140 Multi Family Dwelling Units with Below Grade Parking

Attendee Name:	Representing:	Phone:	E-Mail:
Chad Baird	Gorove/Slade Associates, Inc.	703-787-9595	cab@goroveslade.com
Cheryl Sharp	Gorove/Slade Associates, Inc.	703-787-9595	cls@goroveslade.com
John Dapogny	Comstock Home Building	703-883-1700	jdapogny@comstockhomebuilding.com
Abdoulaye Bah	DDOT	202-671-0494	abdoulaye.bah@dc.gov
Chris Delfs	Ward 6 Policy Planner		

### Summary of Draft Trip Generation Impact:

**Daily:** 195 IN 195 OUT      **AM:** 6 IN 28 OUT      **PM:** 26 IN 13 OUT

### Attachments:

- DDOT ADT and Classification Maps
- Site location map, including initial traffic distribution thoughts
- Draft Trip Generation Table



DDOT Guideline	Gorove/Slade Comments & Recommendations	Clarifications/Notes
<p><b>1. Scenarios and Planning Horizons</b></p> <p>"Each traffic impact study shall present an analysis of the traffic conditions without and with the proposed project at two planning years horizons: short term and long term... The short-term horizon year is defined as one year after occupancy of the project. If the project is proposed to occur over multiple phases, each phase shall be evaluated one year after phase occupancy. The second planning horizon shall be based on the 20-year planning horizon."</p>	<p>We think that a study of this size should not include a 20-year horizon year.</p> <p>We propose:</p> <ol style="list-style-type: none"> <li>1. Existing</li> <li>2. Background (one year after occupancy)</li> <li>3. Total Future (one year after occupancy)</li> </ol>	
<p><b>2. Peak Hours of Analysis</b></p> <p>None specified, although AM and PM only is implied.</p>	<p>Since this project concerns residential uses, we think that weekday AM and PM peak hours will suffice.</p>	
<p><b>3. Capacity Analyses</b></p> <p>"... peak hour intersection levels of service shall be determined for signalized and un-signalized intersections within the study area based on procedures described in the latest edition of the Highway Capacity Manual (or equivalent approved by DDOT). The existing arterials shall also be analyzed based on a daily volume/capacity ratio analysis where the threshold capacities are defined by arterial designation per the following table. Volume/capacity ratios that exceed 1.00 shall be identified."</p>	<p>We will analyze all intersections in the study area using the Synchro 6.0 software program, with HCM methodology (full detailed worksheets will be included in the appendix).</p> <p>A project of this size will have a negligible impact on arterial level of service, and thus roadway v/c ratios will not be calculated.</p>	
<p><b>4. Study Area</b></p> <p>"At a minimum, the study area shall contain:</p> <ol style="list-style-type: none"> <li>1. Adjacent and boundary streets and/or natural barriers</li> <li>1. Nearest arterial/arterial intersection(s)</li> <li>2. Access roads</li> <li>3. Internal roads</li> <li>4. All major signalized or potentially future signalized intersections, either current or future years, where: <ul style="list-style-type: none"> <li>- the project contributes a 10 percent impact (during either the a.m. or p.m. peak hour) to any approach leg of the intersection where the intersection is operating at an acceptable level of service, or</li> <li>- the project contributes a 5 percent impact (during either the a.m. or p.m. peak hour) to any approach leg of the intersection where the intersection is operating at an unacceptable level of service."</li> </ul> </li> </ol>	<p>Due to the limited trip generation impact of the site, we expect no intersections to fall under category 4. Thus we plan to incorporate (1) all site driveways, (2) the nearest intersection to each site drive, and (3) the closest arterial/arterial intersection to the site.</p>	



DDOT Guideline	Gorove/Slade Thoughts	Clarifications/Notes
<p><b>5. Site Description</b></p> <p>"A brief description of the site shall be provided. This should include, as a minimum, a description of its size, general terrain features, existing zoning and use, and proposed zoning and use. A map shall be included showing build-out conditions of the subject property of the following: the street system, roadway classifications, number of travel lanes, street width, existing and proposed ROW dimensions, and, existing and proposed driveways and accesses (with turning movements)."</p>	<p>We will obtain the latest site plan from the project team and incorporate it into the report. The site will have no internal roadways or intersections to detail, other than the dimensions and turning movements of the site driveways.</p>	
<p><b>6. Trip Generation</b></p> <p>"Trip generation must be calculated from the latest data contained within ITE Trip Generation or other industry publications.... Data limitations, data age, choice of peak hour of adjacent street traffic, choice of independent variable and choice of average rate versus statistical significant modification shall be presented and discussed. In the event that data is not available for a proposed land use, the applicant must conduct a local trip generation study following procedures prescribed in the ITE Trip Generation manual and provide sufficient justification for the proposed generation rate. This rate must be acceptable to DDOT."</p>	<p>We propose Residential trip generation will be based on prior residential trip generation surveys performed by Gorove/Slade on comparable development in the District. The independent variable will be either the number of units or parking spaces, based on the final project program.</p>	
<p><b>7. Background Forecast – Short Term</b></p> <p>"The short term traffic forecast shall be the sum of existing traffic volumes plus cumulative development traffic plus ambient growth. The cumulative development traffic shall be based, in part, on the approved project's a.m. and p.m. peak hour and ADT summary sheets. The short term planning horizon year ambient growth rate traffic forecasts shall be based on:</p> <ul style="list-style-type: none"> <li>- proportion between existing traffic volumes and build-out regional model forecasts</li> <li>- extrapolation from historical traffic counts to current counts, and/or</li> <li>- planning analysis that considers trends in the areas circulation system through either a proportion of extrapolation estimate." </li></ul>	<p>We will incorporate any approved development in the confines of the study area, or within a ½ mile radius of the site, as long as we receive details of these developments in a timely manner.</p> <p>Since this area of the District is constrained, we expect that a 1% growth is taking place. We will check DDOT historical ADT data to double-check this assumption.</p>	

DDOT Guideline	Gorove/Slade Thoughts	Clarifications/Notes
<p><b>8. Background Forecast – Long Term</b></p> <p>“Long term a.m. and p.m. peak hour planning horizon traffic forecasts shall be based on the most recent COG traffic forecasts. Requests for forecast shall comply with current COG protocol. It should be noted that the COG forecasts are based on future year population and employment projections that reflect a regional perspective on growth and development. The applicant and consultant shall investigate those land use assumptions as they apply to their project study area and make forecast adjustments as necessary.”</p>	<p>As stated previously, we do not consider this project significant enough to warrant a 20-year horizon analysis.</p>	
<p><b>9. Background Transportation Improvements</b></p> <p>“The baseline surface transportation network (without the proposed project improvements) assumed for the first planning horizon should reflect existing facilities plus any firmly committed improvements by the District and other developments within the study area. All planned surface transportation facilities within the study area may be included for the baseline assumptions for the long term planning horizon network analysis.”</p>	<p>We will include any transportation improvements noted during this meeting, as long as we receive details of those improvements in a timely manner.</p>	
<p><b>10. Trip Distribution</b></p> <p>“Trip distribution may be based on COG traffic forecasts, market analysis, existing traffic flows, applied census data, and professional judgment.”</p>	<p>We will base our distribution on existing traffic flows and professional judgment.</p>	
<p><b>11. Project Impacts</b></p> <p>“The key elements of the project impact analysis include:</p> <ol style="list-style-type: none"> <li>1. generalized daily traffic volume level of service\</li> <li>2. a peak hour intersection level of service <i>The principal objective of the intersection LOS analysis is to identify whether the traffic from the proposed project when added to the existing plus short and long term planning horizon traffic will result in a significant impact and an unacceptable LOS. Significance is defined as: (a) When the added project traffic causes LOS to exceed the established threshold, (b) When the short term or long term horizon year traffic with the project exceeds the established threshold, and the project traffic causes a 2% increase in the v/c ratio or delay.</i></li> <li>3. the appropriateness of access locations and the need for future traffic signals</li> <li>4. turn lane storage requirements</li> <li>5. sight distance</li> <li>6. appropriateness of acceleration or deceleration lanes”</li> </ol>	<p>As mentioned previously, we do not anticipate performing a roadway v/c ratio, and thus will not be including analysis under category 1.</p> <p>For the intersection LOS analysis, we will assume a threshold of LOS E. We will also list the approach/movement delays where appropriate.</p> <p>We will provide queuing analysis results for all access turn lanes, where appropriate. We do not anticipate the need/desire for a traffic signal.</p> <p>We will perform a sight distance review in the field, but do not plan on incorporating sight triangles onto a CAD drawing to submit with the report, unless specifically requested.</p>	

**1700 EAST CAPITOL STREET**  
Traffic Impact Study Scoping Agreement

DDOT Project Contact: Abdoulaye Bah

Gorove/Slade Project Contact: Chad Baird

Date of Request: \_\_\_\_\_ Date Needed by: \_\_\_\_\_

**Request:**

**DDOT Contact:**

Existing Turning Movement Counts within 1 Year

Intersections: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_

Signal Timings for Intersections within Study Area

\_\_\_\_\_

CAD Drawing of Study Area (ROW, signing, marking, etc.)

\_\_\_\_\_

ADTs from last ten years in Study Area

\_\_\_\_\_

Approved Development Details (preferably TIS)

Developments: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_

Funded Transportation Improvement Details

Improvements/Studies: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_

Crash/Accident Data within Study Area

\_\_\_\_\_

Other: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_





## **APPENDIX D**

### *INTERSECTION CAPACITY ANALYSIS RESULTS – EXISTING CONDITION (2006)*



HCM Signalized Intersection Capacity Analysis  
1: East Capitol Street & 17th Street

1700 East Capital Street  
11/10/2006

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	
Lane Util. Factor		1.00			0.95						0.95	
Fr't		0.98			1.00						0.99	
Flt Protected		1.00			0.98						1.00	
Sat'd. Flow (prot)		1822			3465						3492	
Flt Permitted		1.00			0.76						1.00	
Sat'd. Flow (perm)		1822			2701						3492	
Volume (vph)	0	110	21	578	774	0	0	0	0	55	503	34
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	120	23	628	841	0	0	0	0	60	547	37
RTOR Reduction (vph)	0	7	0	0	0	0	0	0	0	0	4	0
Lane Group Flow (vph)	0	136	0	0	1469	0	0	0	0	0	640	0
Turn Type				Perm						Perm		
Protected Phases		2			6						4	
Permitted Phases				6						4		
Actuated Green, G (s)		55.3			55.3						32.2	
Effective Green, g (s)		55.3			55.3						32.2	
Actuated g/C Ratio		0.58			0.58						0.34	
Clearance Time (s)		4.0			4.0						4.0	
Vehicle Extension (s)		3.0			3.0						3.0	
Lane Grp Cap (vph)		1055			1564						1177	
v/s Ratio Prot		0.07										
v/s Ratio Perm					0.54						0.18	
v/c Ratio		0.13			0.94						0.54	
Uniform Delay, d1		9.1			18.6						25.7	
Progression Factor		1.00			1.00						1.00	
Incremental Delay, d2		0.1			11.2						1.8	
Delay (s)		9.2			29.8						27.5	
Level of Service		A			C						C	
Approach Delay (s)		9.2			29.8			0.0			27.5	
Approach LOS		A			C			A			C	
<b>Intersection Summary</b>												
HCM Average Control Delay		27.8										C
HCM Volume to Capacity ratio		0.79										
Actuated Cycle Length (s)		95.5				Sum of lost time (s)		8.0				
Intersection Capacity Utilization		71.8%				ICU Level of Service		C				
Analysis Period (min)		15										

HCM Unsignalized Intersection Capacity Analysis  
2: Alley Ave. & 17th Street

1700 East Capital Street  
11/10/2006

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔					↔
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	4	0	0	0	2	1096
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	0	0	0	2	1191
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						212
pX, platoon unblocked	0.86					
vC, conflicting volume	600	0				0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	379	0				0
tC, single (s)	6.8	6.9				4.1
tC, 2 stage (s)						
tF (s)	3.5	3.3				2.2
p0 queue free %	99	100				100
cM capacity (veh/h)	514	1084				1622
Direction, Lane #	WB 1	SB 1	SB 2			
Volume Total	4	399	794			
Volume Left	4	2	0			
Volume Right	0	0	0			
cSH	514	1622	1700			
Volume to Capacity	0.01	0.00	0.47			
Queue Length 95th (ft)	1	0	0			
Control Delay (s)	12.1	0.1	0.0			
Lane LOS	B	A				
Approach Delay (s)	12.1	0.0				
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay		0.1				
Intersection Capacity Utilization		40.4%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis  
3: A Street & 17th Street

1700 East Capital Street  
11/10/2006

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔						↕	↕
Sign Control		Stop			Stop			Free			Free	Free
Grade		0%			0%			0%			0%	0%
Volume (veh/h)	0	8	6	28	23	0	0	0	0	13	1058	26
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	9	7	30	25	0	0	0	0	14	1150	28
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)											403	
pX, platoon unblocked	0.87	0.87	0.87	0.87	0.87		0.87					
vC, conflicting volume	1205	1192	589	614	1207	0	1178			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1091	1076	386	415	1093	0	1060			0		
IC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
IC, 2 stage (s)												
IF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	95	99	93	86	100	100			99		
cM capacity (veh/h)	132	189	535	432	185	1084	571			1622		
Direction, Lane #	EB 1	WB 1	SB 1	SB 2								
Volume Total	15	55	589	603								
Volume Left	0	30	14	0								
Volume Right	7	0	0	28								
cSH	261	269	1622	1700								
Volume to Capacity	0.06	0.21	0.01	0.35								
Queue Length 95th (ft)	5	19	1	0								
Control Delay (s)	19.6	21.8	0.3	0.0								
Lane LOS	C	C	A									
Approach Delay (s)	19.6	21.8	0.1									
Approach LOS	C	C										
Intersection Summary												
Average Delay		1.3										
Intersection Capacity Utilization		46.5%		ICU Level of Service		A						
Analysis Period (min)		15										

HCM Unsignalized Intersection Capacity Analysis  
4: East Capitol Street & 18th Street

1700 East Capital Street  
11/10/2006

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	↔
Sign Control	Free			Free	Stop	Stop
Grade	0%			0%	0%	0%
Volume (veh/h)	166	23	312	1357	11	8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	180	25	339	1475	12	9
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage (veh)						
Upstream signal (ft)	497					
pX, platoon unblocked						
vC, conflicting volume			205		1609	193
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			205		1609	193
IC, single (s)			4.1		6.8	6.9
IC, 2 stage (s)						
IF (s)			2.2		3.5	3.3
p0 queue free %			75		83	99
cM capacity (veh/h)			1063		72	816
Direction, Lane #	EB 1	WB 1	WB 2	NB 1		
Volume Total	205	831	983	21		
Volume Left	0	339	0	12		
Volume Right	25	0	0	9		
cSH	1700	1363	1700	116		
Volume to Capacity	0.12	0.25	0.58	0.18		
Queue Length 95th (ft)	0	25	0	15		
Control Delay (s)	0.0	5.2	0.0	42.5		
Lane LOS		A		E		
Approach Delay (s)	0.0	2.4		42.5		
Approach LOS				E		
Intersection Summary						
Average Delay		2.6				
Intersection Capacity Utilization		70.0%		ICU Level of Service		C
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis  
5: Alley Ave. & 18th Street

1700 East Capital Street  
11/10/2006

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			Y	Y	
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	1	2	2	18	335	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	2	2	20	364	1
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	389	365	365			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	389	365	365			
IC, single (s)	6.4	6.2	4.1			
IC, 2 stage (s)						
IF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	614	680	1193			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	3	22	365			
Volume Left	1	2	0			
Volume Right	2	0	1			
cSH	657	1193	1700			
Volume to Capacity	0.00	0.00	0.21			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	10.5	0.8	0.0			
Lane LOS	B	A				
Approach Delay (s)	10.5	0.8	0.0			
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay		0.1				
Intersection Capacity Utilization		27.7%		ICU Level of Service	A	
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis  
6: A Street & 18th Street

1700 East Capital Street  
11/10/2006

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		+			+			+			+	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	3	16	3	14	14	4	10	11	2	11	299	33
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	17	3	15	15	4	11	12	2	12	325	36
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	24	35	25	373								
Volume Left (vph)	3	15	11	12								
Volume Right (vph)	3	4	2	36								
Hadj (s)	-0.02	0.05	0.07	-0.02								
Departure Headway (s)	4.8	4.8	4.5	4.1								
Degree Utilization, x	0.03	0.05	0.03	0.42								
Capacity (veh/h)	684	678	770	875								
Control Delay (s)	7.9	8.1	7.6	10.0								
Approach Delay (s)	7.9	8.1	7.6	10.0								
Approach LOS	A	A	A	A								
<b>Intersection Summary</b>												
Delay				9.6								
HCM Level of Service				A								
Intersection Capacity Utilization			29.4%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis  
1: East Capitol Street & 17th Street

1700 East Capital Street  
11/10/2006

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	
Lane Util. Factor		1.00			0.95						0.95	
Frt		0.98			1.00						0.99	
Flt Protected		1.00			0.98						1.00	
Satd. Flow (prot)		1822			3460						3502	
Flt Permitted		1.00			0.70						1.00	
Satd. Flow (perm)		1822			2482						3502	
Volume (vph)	0	174	34	167	197	0	0	0	0	66	694	34
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	189	37	182	214	0	0	0	0	72	754	37
RTOR Reduction (vph)	0	14	0	0	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	213	0	0	396	0	0	0	0	0	861	0
Turn Type			Perm							Perm		
Protected Phases		2			6						4	
Permitted Phases				6						4		
Actuated Green, G (s)		13.4			13.4						32.2	
Effective Green, g (s)		13.4			13.4						32.2	
Actuated g/C Ratio		0.25			0.25						0.60	
Clearance Time (s)		4.0			4.0						4.0	
Vehicle Extension (s)		3.0			3.0						3.0	
Lane Grp Cap (vph)		456			621						2104	
v/s Ratio Prot		0.12										
v/s Ratio Perm					0.16						0.25	
v/c Ratio		0.47			0.64						0.41	
Uniform Delay, d1		17.1			17.9						5.7	
Progression Factor		1.00			1.00						1.00	
Incremental Delay, d2		0.8			2.2						0.6	
Delay (s)		17.8			20.1						6.3	
Level of Service		B			C						A	
Approach Delay (s)		17.8			20.1			0.0			6.3	
Approach LOS		B			C			A			A	
<b>Intersection Summary</b>												
HCM Average Control Delay		11.7										B
HCM Volume to Capacity ratio		0.48										
Actuated Cycle Length (s)		53.6						8.0				
Intersection Capacity Utilization		53.7%										A
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis  
2: Alley Ave. & 17th Street

1700 East Capital Street  
11/10/2006

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↕	↕	↔	↔
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	2	0	0	0	1	939
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	0	0	0	1	1021
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						212
pX, platoon unblocked	0.89					
vC, conflicting volume	512	0			0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	325	0			0	
IC, single (s)	6.8	6.9			4.1	
IC, 2 stage (s)						
IF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	571	1084			1622	
Direction, Lane #	WB 1	SB 1	SB 2			
Volume Total	2	341	680			
Volume Left	2	1	0			
Volume Right	0	0	0			
cSH	571	1622	1700			
Volume to Capacity	0.00	0.00	0.40			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	11.3	0.0	0.0			
Lane LOS	B	A				
Approach Delay (s)	11.3	0.0				
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay			0.0			
Intersection Capacity Utilization			36.0%		ICU Level of Service	A
Analysis Period (min)			15			



HCM Unsignalized Intersection Capacity Analysis  
3: A Street & 17th Street

1700 East Capital Street  
11/10/2006

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		Stop			Stop			Free			Free	
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	14	13	26	23	0	0	0	0	16	946	11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	15	14	28	25	0	0	0	0	17	1028	12
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)											403	
Upstream signal (ft)												
pX, platoon unblocked	0.91	0.91	0.91	0.91	0.91		0.91					
vC, conflicting volume	1082	1069	520	571	1075	0	1040			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	993	979	377	432	986	0	947			0		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	93	98	93	89	100	100			99		
cM capacity (veh/h)	165	224	566	424	222	1084	657			1622		
Direction, Lane #	EB 1	WB 1	SB 1	SB 2								
Volume Total	29	53	532	526								
Volume Left	0	28	17	0								
Volume Right	14	0	0	12								
cSH	316	297	1622	1700								
Volume to Capacity	0.09	0.18	0.01	0.31								
Queue Length 95th (ft)	8	16	1	0								
Control Delay (s)	17.5	19.7	0.3	0.0								
Lane LOS	C	C	A									
Approach Delay (s)	17.5	19.7	0.2									
Approach LOS	C	C										
Intersection Summary												
Average Delay			1.5									
Intersection Capacity Utilization		42.9%		ICU Level of Service		A						
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
4: East Capitol Street & 18th Street

1700 East Capitol Street  
11/10/2006

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	Free			Free	Stop	
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	220	22	54	340	23	12
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	239	24	59	370	25	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage (veh)						
Upstream signal (ft)	497					
pX, platoon unblocked			0.97		0.97	0.97
vC, conflicting volume			263		553	251
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			238		538	226
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			95		94	98
cM capacity (veh/h)			1282		437	752
Direction, Lane #	EB 1	WB 1	WB 2	NB 1		
Volume Total	263	182	246	38		
Volume Left	0	59	0	25		
Volume Right	24	0	0	13		
cSH	1700	1282	1700	510		
Volume to Capacity	0.15	0.05	0.14	0.07		
Queue Length 95th (ft)	0	4	0	6		
Control Delay (s)	0.0	2.8	0.0	12.6		
Lane LOS		A		B		
Approach Delay (s)	0.0	1.2		12.6		
Approach LOS				B		
Intersection Summary						
Average Delay			1.4			
Intersection Capacity Utilization		37.2%		ICU Level of Service		A
Analysis Period (min)			15			



HCM Unsignalized Intersection Capacity Analysis  
5: Alley Ave. & 18th Street

1700 East Capital Street  
11/10/2006

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			T		
Sign Control	Stop			Free		Free
Grade	0%			0%		0%
Volume (veh/h)	2	6	2	34	73	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	7	2	37	79	3
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	122	81	83			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	122	81	83			
IC, single (s)	6.4	6.2	4.1			
IC, 2 stage (s)						
IF (s)	3.5	3.3	2.2			
p0 queue free %	100	99	100			
cM capacity (veh/h)	872	979	1515			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	9	39	83			
Volume Left	2	2	0			
Volume Right	7	0	3			
cSH	950	1515	1700			
Volume to Capacity	0.01	0.00	0.05			
Queue Length 95th (ft)	1	0	0			
Control Delay (s)	8.8	0.4	0.0			
Lane LOS	A	A				
Approach Delay (s)	8.8	0.4	0.0			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			0.7			
Intersection Capacity Utilization	14.0%		ICU Level of Service	A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
6: A Street & 18th Street

1700 East Capital Street  
11/10/2006

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	+			+			+			+		
Sign Control	Stop			Stop			Stop			Stop		
Grade	0%			0%			0%			0%		
Volume (vph)	9	17	6	11	25	4	11	23	7	6	55	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	18	7	12	27	4	12	25	8	7	60	11
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	35	43	45	77								
Volume Left (vph)	10	12	12	7								
Volume Right (vph)	7	4	8	11								
Hadj (s)	-0.02	0.03	-0.01	-0.03								
Departure Headway (s)	4.2	4.2	4.1	4.1								
Degree Utilization, x	0.04	0.05	0.05	0.09								
Capacity (veh/h)	830	823	841	860								
Control Delay (s)	7.4	7.5	7.4	7.5								
Approach Delay (s)	7.4	7.5	7.4	7.5								
Approach LOS	A	A	A	A								
<b>Intersection Summary</b>												
Delay				7.4								
HCM Level of Service				A								
Intersection Capacity Utilization	14.9%			ICU Level of Service	A							
Analysis Period (min)	15											



**APPENDIX E**

*INTERSECTION CAPACITY ANALYSIS RESULTS - FUTURE CONDITIONS WITHOUT DEVELOPMENT (2009)*



HCM Signalized Intersection Capacity Analysis  
1: East Capitol Street & 17th Street

1700 East Capitol St  
11/10/2006

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	
Lane Util. Factor		1.00			0.95						0.95	
Frt		0.98			1.00						0.99	
Flt Protected		1.00			0.98						1.00	
Satd. Flow (prot)		1822			3465						3492	
Flt Permitted		1.00			0.76						1.00	
Satd. Flow (perm)		1822			2694						3492	
Volume (vph)	0	113	22	596	797	0	0	0	0	57	518	35
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	123	24	648	866	0	0	0	0	62	563	38
RTOR Reduction (vph)	0	7	0	0	0	0	0	0	0	0	4	0
Lane Group Flow (vph)	0	140	0	0	1514	0	0	0	0	0	659	0
Turn Type			Perm		Perm					Perm		
Protected Phases		2			6						4	
Permitted Phases				6						4		
Actuated Green, G (s)		57.6			57.6						32.1	
Effective Green, g (s)		57.6			57.6						32.1	
Actuated g/C Ratio		0.59			0.59						0.33	
Clearance Time (s)		4.0			4.0						4.0	
Vehicle Extension (s)		3.0			3.0						3.0	
Lane Grp Cap (vph)		1074			1588						1147	
v/s Ratio Prot		0.08										
v/s Ratio Perm					0.56						0.19	
v/c Ratio		0.13			0.95						0.57	
Uniform Delay, d1		8.9			18.8						27.1	
Progression Factor		1.00			1.00						1.00	
Incremental Delay, d2		0.1			13.1						2.1	
Delay (s)		9.0			31.9						29.2	
Level of Service		A			C						C	
Approach Delay (s)		9.0			31.9			0.0			29.2	
Approach LOS		A			C			A			C	
<b>Intersection Summary</b>												
HCM Average Control Delay		29.7										C
HCM Volume to Capacity ratio		0.82										
Actuated Cycle Length (s)		97.7						8.0				
Intersection Capacity Utilization		73.7%										D
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis  
2: Alley Ave. & 17th Street

1700 East Capitol St  
11/10/2006

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔					↔
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	4	0	0	0	2	1129
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	0	0	0	2	1227
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						212
pX, platoon unblocked	0.86					
vC, conflicting volume	618	0			0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	385	0			0	
IC, single (s)	6.8	6.9			4.1	
IC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	100			100	
cM capacity (veh/h)	505	1084			1622	
Direction, Lane #	WB 1	SB 1	SB 2			
Volume Total	4	411	818			
Volume Left	4	2	0			
Volume Right	0	0	0			
cSH	505	1622	1700			
Volume to Capacity	0.01	0.00	0.48			
Queue Length 95th (ft)	1	0	0			
Control Delay (s)	12.2	0.1	0.0			
Lane LOS	B	A				
Approach Delay (s)	12.2	0.0				
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay		0.1				
Intersection Capacity Utilization		41.3%			ICU Level of Service	A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis  
3: A Street & 17th Street

1700 East Capitol St  
11/10/2006

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔						↔	↔
Sign Control		Stop			Stop			Free			Free	Free
Grade		0%			0%			0%			0%	0%
Volume (veh/h)	0	8	6	29	24	0	0	0	0	13	1090	27
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	9	7	32	26	0	0	0	0	14	1185	29
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)											403	
pX, platoon unblocked	0.87	0.87	0.87	0.87	0.87		0.87					
vC, conflicting volume	1241	1228	607	632	1242	0	1214			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1123	1108	392	420	1125	0	1093			0		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	95	99	93	85	100	100			99		
cM capacity (veh/h)	122	179	526	423	175	1084	549			1622		
Direction, Lane #	EB 1	WB 1	SB 1	SB 2								
Volume Total	15	58	607	622								
Volume Left	0	32	14	0								
Volume Right	7	0	0	29								
cSH	250	258	1622	1700								
Volume to Capacity	0.06	0.22	0.01	0.37								
Queue Length 95th (ft)	5	21	1	0								
Control Delay (s)	20.4	23.0	0.3	0.0								
Lane LOS	C	C	A									
Approach Delay (s)	20.4	23.0	0.1									
Approach LOS	C	C										
Intersection Summary												
Average Delay			1.4									
Intersection Capacity Utilization			47.6%		ICU Level of Service		A					
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
4: East Capitol Street & 18th Street

1700 East Capitol St  
11/10/2006

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	↔
Sign Control	Free			Free	Stop	Stop
Grade	0%			0%	0%	
Volume (veh/h)	171	24	321	1398	11	8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	186	26	349	1520	12	9
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage (veh)						
Upstream signal (ft)	497					
pX, platoon unblocked						
vC, conflicting volume			212		1657	199
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			212		1657	199
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			74		82	99
cM capacity (veh/h)			1356		66	809
Direction, Lane #	EB 1	WB 1	WB 2	NB 1		
Volume Total	212	855	1013	21		
Volume Left	0	349	0	12		
Volume Right	26	0	0	9		
cSH	1700	1356	1700	107		
Volume to Capacity	0.12	0.26	0.60	0.19		
Queue Length 95th (ft)	0	26	0	17		
Control Delay (s)	0.0	5.4	0.0	46.3		
Lane LOS		A		E		
Approach Delay (s)	0.0	2.5		46.3		
Approach LOS				E		
Intersection Summary						
Average Delay			2.6			
Intersection Capacity Utilization			71.8%		ICU Level of Service	C
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
5: Alley Ave. & 18th Street

1700 East Capitol St  
11/10/2006

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			Y	Y	
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	1	2	2	19	345	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	2	2	21	375	1
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	401	376	376			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	401	376	376			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	604	671	1182			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	3	23	376			
Volume Left	1	2	0			
Volume Right	2	0	1			
cSH	647	1182	1700			
Volume to Capacity	0.01	0.00	0.22			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	10.6	0.8	0.0			
Lane LOS	B	A				
Approach Delay (s)	10.6	0.8	0.0			
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay		0.1				
Intersection Capacity Utilization		28.2%		ICU Level of Service	A	
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis  
6: A Street & 18th Street

1700 East Capitol St  
11/10/2006

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		+			+			+			+	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	3	16	3	14	14	4	10	11	2	11	103	14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	17	3	15	15	4	11	12	2	12	113	17
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	24	35	25	384								
Volume Left (vph)	3	15	11	12								
Volume Right (vph)	3	4	2	37								
Hadj (s)	-0.02	0.05	0.07	-0.02								
Departure Headway (s)	4.8	4.9	4.5	4.1								
Degree Utilization, x	0.03	0.05	0.03	0.43								
Capacity (veh/h)	680	674	768	875								
Control Delay (s)	8.0	8.1	7.6	10.1								
Approach Delay (s)	8.0	8.1	7.6	10.1								
Approach LOS	A	A	A	B								
<b>Intersection Summary</b>												
Delay				9.7								
HCM Level of Service				A								
Intersection Capacity Utilization				29.9%			ICU Level of Service	A				
Analysis Period (min)				15								



HCM Signalized Intersection Capacity Analysis  
1: East Capitol Street & 17th Street

1700 East Capital St  
11/10/2006

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	
Lane Util. Factor		1.00			0.95						0.95	
Frt		0.98			1.00						0.99	
Flt Protected		1.00			0.98						1.00	
Satd. Flow (prot)		1822			3460						3502	
Flt Permitted		1.00			0.70						1.00	
Satd. Flow (perm)		1822			2461						3502	
Volume (vph)	0	179	35	172	203	0	0	0	0	68	715	35
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	195	38	187	221	0	0	0	0	74	777	38
RTOR Reduction (vph)	0	13	0	0	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	220	0	0	408	0	0	0	0	0	887	0
Turn Type			Perm							Perm		
Protected Phases		2			6						4	
Permitted Phases				6						4		
Actuated Green, G (s)		13.9			13.9						32.2	
Effective Green, g (s)		13.9			13.9						32.2	
Actuated g/C Ratio		0.26			0.26						0.60	
Clearance Time (s)		4.0			4.0						4.0	
Vehicle Extension (s)		3.0			3.0						3.0	
Lane Grp Cap (vph)		468			632						2084	
v/s Ratio Prot		0.12										
v/s Ratio Perm					0.17						0.25	
v/c Ratio		0.47			0.65						0.43	
Uniform Delay, d1		17.0			17.9						5.9	
Progression Factor		1.00			1.00						1.00	
Incremental Delay, d2		0.7			2.3						0.6	
Delay (s)		17.7			20.2						6.6	
Level of Service		B			C						A	
Approach Delay (s)		17.7			20.2			0.0			6.6	
Approach LOS		B			C			A			A	

Intersection Summary

HCM Average Control Delay	11.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	54.1	Sum of lost time (s)	8.0
Intersection Capacity Utilization	55.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis  
2: Alley Ave. & 17th Street

1700 East Capital St  
11/10/2006

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↕	↔	↔	↕
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	2	0	0	0	1	967
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	0	0	0	1	1051
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						212
pX, platoon unblocked	0.88					
vC, conflicting volume	528	0			0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	327	0			0	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	564	1084			1622	
Direction, Lane #	WB 1	SB 1	SB 2			
Volume Total	2	351	701			
Volume Left	2	1	0			
Volume Right	0	0	0			
cSH	564	1622	1700			
Volume to Capacity	0.00	0.00	0.41			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	11.4	0.0	0.0			
Lane LOS	B	A				
Approach Delay (s)	11.4	0.0				
Approach LOS	B					

Intersection Summary

Average Delay	0.0		
Intersection Capacity Utilization	36.8%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis  
3: A Street & 17th Street

1700 East Capital St  
11/10/2006

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔						↔	
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	14	13	27	24	0	0	0	0	16	975	11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	15	14	29	26	0	0	0	0	17	1060	12
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)											403	
pX, platoon unblocked	0.90	0.90	0.90	0.90	0.90		0.90					
vC, conflicting volume	1114	1101	536	586	1107	0	1072			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1017	1003	377	433	1010	0	971			0		
IC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
IC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	93	97	93	88	100	100			99		
cM capacity (veh/h)	155	215	560	418	213	1084	637			1622		
Direction, Lane #	EB 1	WB 1	SB 1	SB 2								
Volume Total	29	55	547	542								
Volume Left	0	29	17	0								
Volume Right	14	0	0	12								
cSH	305	288	1622	1700								
Volume to Capacity	0.10	0.19	0.01	0.32								
Queue Length 95th (ft)	8	17	1	0								
Control Delay (s)	18.0	20.5	0.3	0.0								
Lane LOS	C	C	A									
Approach Delay (s)	18.0	20.5	0.2									
Approach LOS	C	C										
Intersection Summary												
Average Delay			1.6									
Intersection Capacity Utilization		43.9%		ICU Level of Service		A						
Analysis Period (min)		15										

HCM Unsignalized Intersection Capacity Analysis  
4: East Capitol Street & 18th Street

1700 East Capital St  
11/10/2006

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	↔
Sign Control	Free			Free	Stop	Stop
Grade	0%			0%	0%	0%
Volume (veh/h)	227	23	56	350	24	12
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	247	25	61	380	26	13
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage (veh)						
Upstream signal (ft)	497					
pX, platoon unblocked			0.96		0.96	0.96
vC, conflicting volume			272		571	259
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			243		554	230
IC, single (s)			4.1		6.8	6.9
IC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			95		94	98
cM capacity (veh/h)			1270		423	743
Direction, Lane #	EB 1	WB 1	WB 2	NB 1		
Volume Total	272	188	254	39		
Volume Left	0	61	0	26		
Volume Right	25	0	0	13		
cSH	1700	1270	1700	494		
Volume to Capacity	0.16	0.05	0.15	0.08		
Queue Length 95th (ft)	0	4	0	6		
Control Delay (s)	0.0	2.9	0.0	12.9		
Lane LOS		A		B		
Approach Delay (s)	0.0	1.2		12.9		
Approach LOS				B		
Intersection Summary						
Average Delay			1.4			
Intersection Capacity Utilization		38.0%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis  
5: Alley Ave. & 18th Street

1700 East Capital St  
11/10/2006

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			Y	Y	
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	2	6	2	35	75	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	7	2	38	82	3
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	126	83	85			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	126	83	85			
IC, single (s)	6.4	6.2	4.1			
IC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	99	100			
cM capacity (veh/h)	868	976	1512			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	9	40	85			
Volume Left	2	2	0			
Volume Right	7	0	3			
cSH	947	1512	1700			
Volume to Capacity	0.01	0.00	0.05			
Queue Length 95th (ft)	1	0	0			
Control Delay (s)	8.8	0.4	0.0			
Lane LOS	A	A				
Approach Delay (s)	8.8	0.4	0.0			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			0.7			
Intersection Capacity Utilization		14.1%		ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
6: A Street & 18th Street

1700 East Capital St  
11/10/2006

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		Y			Y			Y			Y	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	9	18	6	11	26	4	11	24	7	6	57	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	20	7	12	28	4	12	26	8	7	62	11
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	36	45	46	79								
Volume Left (vph)	10	12	12	7								
Volume Right (vph)	7	4	8	11								
Hadj (s)	-0.02	0.03	-0.01	-0.03								
Departure Headway (s)	4.2	4.2	4.1	4.1								
Degree Utilization, x	0.04	0.05	0.05	0.09								
Capacity (veh/h)	827	821	839	858								
Control Delay (s)	7.4	7.5	7.4	7.5								
Approach Delay (s)	7.4	7.5	7.4	7.5								
Approach LOS	A	A	A	A								
<b>Intersection Summary</b>												
Delay				7.4								
HCM Level of Service				A								
Intersection Capacity Utilization			15.0%		ICU Level of Service	A						
Analysis Period (min)				15								



## **APPENDIX F**

### *INTERSECTION CAPACITY ANALYSIS RESULTS - FUTURE CONDITIONS WITH DEVELOPMENT (2009)*



HCM Signalized Intersection Capacity Analysis  
1: East Capitol Street & 17th Street

1700 East Capitol St  
11/10/2006

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	
Lane Util. Factor		1.00			0.95						0.95	
Frt		0.98			1.00						0.99	
Flt Protected		1.00			0.98						1.00	
Satd. Flow (prot)		1822			3465						3492	
Flt Permitted		1.00			0.76						1.00	
Satd. Flow (perm)		1822			2691						3492	
Volume (vph)	0	115	22	596	797	0	0	0	0	59	516	35
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	125	24	648	866	0	0	0	0	64	561	38
RTOR Reduction (vph)	0	7	0	0	0	0	0	0	0	0	4	0
Lane Group Flow (vph)	0	142	0	0	1514	0	0	0	0	0	659	0
Turn Type				Perm						Perm		
Protected Phases		2			6						4	
Permitted Phases				6						4		
Actuated Green, G (s)		57.6			57.6						32.1	
Effective Green, g (s)		57.6			57.6						32.1	
Actuated g/C Ratio		0.59			0.59						0.33	
Clearance Time (s)		4.0			4.0						4.0	
Vehicle Extension (s)		3.0			3.0						3.0	
Lane Grp Cap (vph)		1074			1587						1147	
v/s Ratio Prot		0.08										
v/s Ratio Perm					0.56						0.19	
v/c Ratio		0.13			0.95						0.57	
Uniform Delay, d1		8.9			18.8						27.1	
Progression Factor		1.00			1.00						1.00	
Incremental Delay, d2		0.1			13.2						2.1	
Delay (s)		9.0			32.0						29.2	
Level of Service		A			C						C	
Approach Delay (s)		9.0			32.0		0.0				29.2	
Approach LOS		A			C		A				C	
<b>Intersection Summary</b>												
HCM Average Control Delay		29.8										C
HCM Volume to Capacity ratio		0.82										
Actuated Cycle Length (s)		97.7						8.0				
Intersection Capacity Utilization		73.8%										D
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis  
2: Alley Ave. & 17th Street

1700 East Capitol St  
11/10/2006

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔					↕
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	35	0	0	0	0	1125
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	38	0	0	0	0	1227
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						212
pX, platoon unblocked	0.86					
vC, conflicting volume	614	0				0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	380	0				0
IC, single (s)	6.8	6.9				4.1
IC, 2 stage (s)						
tF (s)	3.5	3.3				2.2
p0 queue free %	93	100				100
cM capacity (veh/h)	509	1084				1622
Direction, Lane #	WB 1	SB 1	SB 2			
Volume Total	38	614	614			
Volume Left	38	0	0			
Volume Right	0	0	0			
cSH	509	1700	1700			
Volume to Capacity	0.07	0.36	0.36			
Queue Length 95th (ft)	6	0	0			
Control Delay (s)	12.6	0.0	0.0			
Lane LOS	B					
Approach Delay (s)	12.6	0.0				
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay		0.4				
Intersection Capacity Utilization		41.2%			ICU Level of Service	B
Analysis Period (min)		15				



HCM Unsignalized Intersection Capacity Analysis  
3: A Street & 17th Street

1700 East Capitol St  
11/10/2006

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔						↔	↔
Sign Control		Stop			Stop			Free			Free	Free
Grade		0%			0%			0%			0%	0%
Volume (veh/h)	0	8	6	29	24	0	0	0	0	17	1105	40
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	9	7	32	26	0	0	0	0	18	1201	43
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)										403		
pX, platoon unblocked	0.87	0.87	0.87	0.87	0.87		0.87					
vC, conflicting volume	1273	1260	622	648	1282	0	1245			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1161	1146	410	440	1171	0	1128			0		
IC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
IC, 2 stage (s)												
IF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	95	99	92	84	100	100			99		
cM capacity (veh/h)	113	170	512	408	164	1084	533			1622		
Direction, Lane #	EB 1	WB 1	SB 1	SB 2								
Volume Total	15	58	619	644								
Volume Left	0	32	18	0								
Volume Right	7	0	0	43								
cSH	238	244	1622	1700								
Volume to Capacity	0.06	0.24	0.01	0.38								
Queue Length 95th (ft)	5	22	1	0								
Control Delay (s)	21.2	24.3	0.3	0.0								
Lane LOS	C	C	A									
Approach Delay (s)	21.2	24.3	0.2									
Approach LOS	C	C										
Intersection Summary												
Average Delay			1.4									
Intersection Capacity Utilization		48.5%		ICU Level of Service		A						
Analysis Period (min)		15										

HCM Unsignalized Intersection Capacity Analysis  
4: East Capitol Street & 18th Street

1700 East Capitol St  
11/10/2006

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	↔
Sign Control	Free			Free	Stop	Stop
Grade	0%			0%	0%	0%
Volume (veh/h)	171	28	322	1398	11	8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	186	30	350	1520	12	9
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage (veh)						
Upstream signal (ft)	497					
pX, platoon unblocked						
vC, conflicting volume			216		1661	201
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			216		1661	201
IC, single (s)			4.1		6.8	6.5
IC, 2 stage (s)						
IF (s)			2.2		3.5	3.3
p0 queue free %			74		82	99
cM capacity (veh/h)			1351		65	806
Direction, Lane #	EB 1	WB 1	WB 2	NB 1		
Volume Total	216	857	1013	21		
Volume Left	0	350	0	12		
Volume Right	30	0	0	9		
cSH	1700	1351	1700	107		
Volume to Capacity	0.13	0.26	0.60	0.19		
Queue Length 95th (ft)	0	26	0	17		
Control Delay (s)	0.0	5.4	0.0	46.7		
Lane LOS		A		E		
Approach Delay (s)	0.0	2.5		46.7		
Approach LOS				E		
Intersection Summary						
Average Delay			2.6			
Intersection Capacity Utilization		72.0%		ICU Level of Service		C
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis  
5: Alley Ave. & 18th Street

1700 East Capitol St  
11/10/2006

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations				+	+	
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	0	0	5	20	345	6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	5	22	375	7
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	411	378	382			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	411	378	382			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	594	668	1177			
Direction, Lane #	NB 1	SB 1				
Volume Total	27	382				
Volume Left	5	0				
Volume Right	0	7				
cSH	1177	1700				
Volume to Capacity	0.00	0.22				
Queue Length 95th (ft)	0	0				
Control Delay (s)	1.6	0.0				
Lane LOS	A					
Approach Delay (s)	1.6	0.0				
Approach LOS						
Intersection Summary						
Average Delay		0.1				
Intersection Capacity Utilization		21.9%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis  
6: A Street & 18th Street

1700 East Capitol St  
11/10/2006

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SEL	SBT	SBR
Lane Configurations		+			+			+				+
Sign Control		Stop			Stop			Stop				Stop
Volume (vph)	5	19	3	14	14	4	10	14	2	11	306	34
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	21	3	15	15	4	11	15	2	12	333	37
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	29	35	28	382								
Volume Left (vph)	5	15	11	12								
Volume Right (vph)	3	4	2	37								
Hadj (s)	0.00	0.05	0.06	-0.02								
Departure Headway (s)	4.8	4.9	4.5	4.1								
Degree Utilization, x	0.04	0.05	0.04	0.43								
Capacity (veh/h)	676	672	765	871								
Control Delay (s)	8.0	8.1	7.7	10.1								
Approach Delay (s)	8.0	8.1	7.7	10.1								
Approach LOS	A	A	A	B								
Intersection Summary												
Delay				9.7								
HCM Level of Service				A								
Intersection Capacity Utilization				29.2%		ICU Level of Service						A
Analysis Period (min)				15								

HCM Signalized Intersection Capacity Analysis  
1: East Capitol Street & 17th Street

1700 East Capital St  
11/10/2006

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	
Lane Util. Factor		1.00			0.95						0.95	
Frt		0.98			1.00						0.99	
Flt Protected		1.00			0.98						1.00	
Satd. Flow (prot)		1823			3460						3502	
Flt Permitted		1.00			0.69						1.00	
Satd. Flow (perm)		1823			2434						3502	
Volume (vph)	0	187	35	172	203	0	0	0	0	70	714	35
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	203	38	187	221	0	0	0	0	76	776	38
RTOR Reduction (vph)	0	13	0	0	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	228	0	0	408	0	0	0	0	0	888	0
Turn Type				Perm						Perm		
Protected Phases		2			6						4	
Permitted Phases				6						4		
Actuated Green, G (s)		13.9			13.9						32.2	
Effective Green, g (s)		13.9			13.9						32.2	
Actuated g/C Ratio		0.26			0.26						0.60	
Clearance Time (s)		4.0			4.0						4.0	
Vehicle Extension (s)		3.0			3.0						3.0	
Lane Grp Cap (vph)		468			625						2084	
v/s Ratio Prot		0.13										
v/s Ratio Perm					c0.17						0.25	
v/c Ratio		0.49			0.65						0.43	
Uniform Delay, d1		17.1			17.9						5.9	
Progression Factor		1.00			1.00						1.00	
Incremental Delay, d2		0.8			2.5						0.6	
Delay (s)		17.9			20.4						6.6	
Level of Service		B			C						A	
Approach Delay (s)		17.9			20.4			0.0			6.6	
Approach LOS		B			C			A			A	
<b>Intersection Summary</b>												
HCM Average Control Delay		12.0			HCM Level of Service						B	
HCM Volume to Capacity ratio		0.49										
Actuated Cycle Length (s)		54.1			Sum of lost time (s)			8.0				
Intersection Capacity Utilization		55.5%			ICU Level of Service			B				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis  
2: Alley Ave. & 17th Street

1700 East Capital St  
11/10/2006

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						↕
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	23	0	0	0	0	967
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	0	0	0	0	1051
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						212
pX, platoon unblocked	0.88					
vC, conflicting volume	526	0				0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	325	0				0
IC, single (s)	6.8	6.9				4.1
IC, 2 stage (s)						
IF (s)	3.5	3.3				2.2
p0 queue free %	96	100				100
cM capacity (veh/h)	567	1084				1622
Direction, Lane #	WB 1	SB 1	SB 2			
Volume Total	25	526	526			
Volume Left	25	0	0			
Volume Right	0	0	0			
cSH	567	1700	1700			
Volume to Capacity	0.04	0.31	0.31			
Queue Length 95th (ft)	3	0	0			
Control Delay (s)	11.6	0.0	0.0			
Lane LOS	B					
Approach Delay (s)	11.6	0.0				
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay		0.3				
Intersection Capacity Utilization		36.7%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis  
3: A Street & 17th Street

1700 East Capital St  
11/10/2006

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔						↔	
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	17	13	27	24	0	0	0	0	19	987	17
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	18	14	29	26	0	0	0	0	21	1073	18
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)											403	
pX, platoon unblocked	0.90	0.90	0.90	0.90	0.90		0.90					
vC, conflicting volume	1136	1123	546	601	1133	0	1091			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1043	1028	388	449	1039	0	993			0		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	91	97	93	87	100	100			99		
cM capacity (veh/h)	148	207	551	400	204	1084	625			1622		
Direction, Lane #	EB 1	WB 1	SB 1	SB 2								
Volume Total	33	55	557	555								
Volume Left	0	29	21	0								
Volume Right	14	0	0	18								
cSH	284	276	1622	1700								
Volume to Capacity	0.11	0.20	0.01	0.33								
Queue Length 95th (ft)	10	18	1	0								
Control Delay (s)	19.3	21.3	0.4	0.0								
Lane LOS	C	C	A									
Approach Delay (s)	19.3	21.3	0.2									
Approach LOS	C	C										
Intersection Summary												
Average Delay		1.7										
Intersection Capacity Utilization		44.5%		ICU Level of Service		A						
Analysis Period (min)		15										

HCM Unsignalized Intersection Capacity Analysis  
4: East Capitol Street & 18th Street

1700 East Capitol St  
11/10/2006

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	227	33	59	350	24	12
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	247	36	64	380	26	13
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage (veh)						
Upstream signal (ft)	497					
pX, platoon unblocked			0.95		0.95	0.95
vC, conflicting volume			283		583	265
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			248		563	229
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			95		94	98
cM capacity (veh/h)			1254		413	738
Direction, Lane #	EB 1	WB 1	WB 2	NB 1		
Volume Total	283	191	254	39		
Volume Left	0	64	0	26		
Volume Right	36	0	0	13		
cSH	1700	1254	1700	484		
Volume to Capacity	0.17	0.05	0.15	0.08		
Queue Length 95th (ft)	0	4	0	7		
Control Delay (s)	0.0	3.0	0.0	13.1		
Lane LOS		A		B		
Approach Delay (s)	0.0	1.3		13.1		
Approach LOS				B		
Intersection Summary						
Average Delay			1.4			
Intersection Capacity Utilization			38.7%		ICU Level of Service	A
Analysis Period (min)			15			



HCM Unsignalized Intersection Capacity Analysis  
5: Alley Ave. & 18th Street

1700 East Capital St  
11/10/2006

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations				↕	↕	
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	0	0	17	37	75	16
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	18	40	82	17
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	167	90	99			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	167	90	99			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	99			
cM capacity (veh/h)	813	968	1494			
Direction, Lane #	NB 1	SB 1				
Volume Total	59	99				
Volume Left	18	0				
Volume Right	0	17				
cSH	1494	1700				
Volume to Capacity	0.01	0.06				
Queue Length 95th (ft)	1	0				
Control Delay (s)	2.4	0.0				
Lane LOS	A					
Approach Delay (s)	2.4	0.0				
Approach LOS						
<b>Intersection Summary</b>						
Average Delay		0.9				
Intersection Capacity Utilization		12.9%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis  
6: A Street & 18th Street

1700 East Capital St  
11/10/2006

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	14	19	6	11	26	4	11	36	7	6	57	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	21	7	12	28	4	12	39	8	7	62	11
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	42	45	59	79								
Volume Left (vph)	15	12	12	7								
Volume Right (vph)	7	4	8	11								
Hadj (s)	0.01	0.03	0.00	-0.03								
Departure Headway (s)	4.3	4.3	4.2	4.1								
Degree Utilization, x	0.05	0.05	0.07	0.09								
Capacity (veh/h)	813	811	833	850								
Control Delay (s)	7.5	7.5	7.5	7.5								
Approach Delay (s)	7.5	7.5	7.5	7.5								
Approach LOS	A	A	A	A								
<b>Intersection Summary</b>												
Delay				7.5								
HCM Level of Service				A								
Intersection Capacity Utilization				15.5%		ICU Level of Service						A
Analysis Period (min)				15								



## APPENDIX

DDOT Guideline	Gorove/Slade Thoughts	Clarifications/Notes
<p><b>12. Special Analysis/Issues</b></p> <p>"This section provides the District with opportunities to request specific focused traffic analyses germane to the proposed development. These could include access control, access spacing, accident/safety concerns, cut through traffic and residential quality of life, truck estimates and pavement design, accident statistics, pedestrian safety, bicycle safety, safe routes to schools, emergency routes, etc."</p>		

Project Scope agreed to by: \_\_\_\_\_

Date: \_\_\_\_\_

