

**Crystal City / Potomac Yard Corridor
Transit Improvements Project**

**Transportation Effects
Technical Memorandum**

December 2006

Transportation Effects

Crystal City/Potomac Yard Corridor Transit Improvements Project

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1.0 INTRODUCTION

This Technical Memorandum documents the results of the potential transportation effects of the Crystal City/Potomac Yard (CCPY) Transit Improvements Project. It consists of the following sections:

- 1.1 Project Description
- 1.2 Project Alignment and Planned Improvements
- 2.0 Transit Operations and Project Transit Service
- 3.0 Traffic Analysis
- 4.0 Pedestrian Effects
- 5.0 Parking and Access Effects

1.1 Project Description

1.1.1 Project Purpose

The purpose of the CCPY Corridor Transit Improvements Project is to advance the proposed transit improvements for the CCPY Corridor into design and construction utilizing federal grants appropriated for these transit improvements. As required by the Federal Transit Administration (FTA), the potential effects on transportation conditions and social, cultural, and natural environments in the corridor will be evaluated and documented. This process will meet the requirements of the National Environmental Policy Act (NEPA) and other federal and state policies.

1.1.2 Background

The CCPY Corridor is a five-mile long corridor that extends from the Braddock Road Metrorail station in the City of Alexandria to the Pentagon in Arlington County. Metrorail Blue and Yellow lines and Jefferson Davis Highway, a segment of heavily-traveled U.S. Route 1, form the transportation backbone of the corridor.

In 2003, the Virginia Department of Rail and Public Transportation (DRPT), Arlington County, and the City of Alexandria completed the CCPY Corridor Transit Alternatives Analysis (AA). In the AA, transit modes, which included bus rapid transit (BRT), light rail transit (LRT), and Metrorail, and alignment options were analyzed. The costs and benefits of each alternative were also assessed.

Following the completion of the AA, DRPT, in collaboration with Arlington County and the City of Alexandria, undertook the CCPY Corridor Interim Transit Improvements Study that formulated implementation strategies targeting the period from 2007 to 2014. As part of the study, an environmental scan and station area planning were conducted. At the conclusion of this study, a high-capacity, branded bus transit service using both mixed traffic operations and exclusive transitways was recommended. This service, while supporting growing transit demand from existing and new developments, would not preclude longer-term transit system improvement options that have been envisioned for the CCPY corridor, including BRT, LRT, and the addition of a Metrorail station.

1.1.4 Environmental Documentation

Both Alexandria and Arlington have secured considerable funding for the design and construction of the planned transit improvements, including several federal grants. In order to utilize the federal grants appropriated for transitways, the project sponsors must undertake environmental analyses to satisfy NEPA. Since the proposed transit improvements are planned largely in existing right-of-way and would require little or no construction, significant environmental effects are not anticipated. Based on consultation with FTA staff, the project sponsors will prepare a Documented Categorical Exclusion as the appropriate NEPA document. The studies will include an Air Quality analysis, a Noise and Vibration analysis, a Traffic analysis, a Historic and Archaeological Analysis, a water resources analysis, and a Phase I ESA. The studies will document the level of potential impact associated with the project and identify any mitigation measures necessary to reduce or eliminate impacts.

There are a number of activities within this project corridor that are either currently being constructed by others or planned to be constructed by others. **Figure 1-1** shows the CCPY planned alignment and areas where construction is underway or planned by others. Construction activities by others include new roadways, bridges, and intersection improvements. Current and proposed projects planned or constructed by others are not evaluated as part of this project, and any potential impacts to known or potential hazardous materials sites are not included in this current study. Evaluations of potential environmental impacts associated with those other improvements are assumed to be part of separate environmental documents being prepared by the agencies sponsoring those improvements.

1.2 Project Alignment and Planned Improvements

The planned alignment for the CCPY Corridor Transit Improvements Project begins at the Braddock Road Metrorail Station and ends near the Pentagon in Arlington County. The alignment passes through 38 intersections. The planned transit alignment, stops, and location of exclusive right-of-way are shown in **Figure 1-1**. The planned CCPY Corridor Alignment has been separated into six segments that are identified from south to north. The segments are described below:

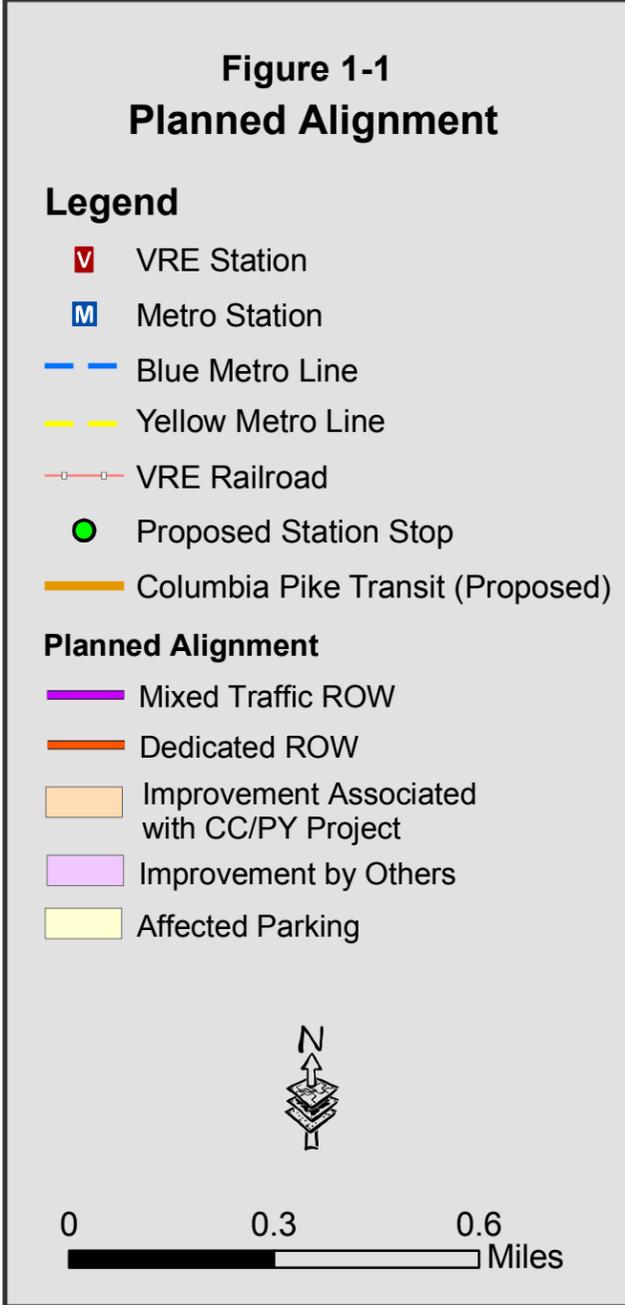
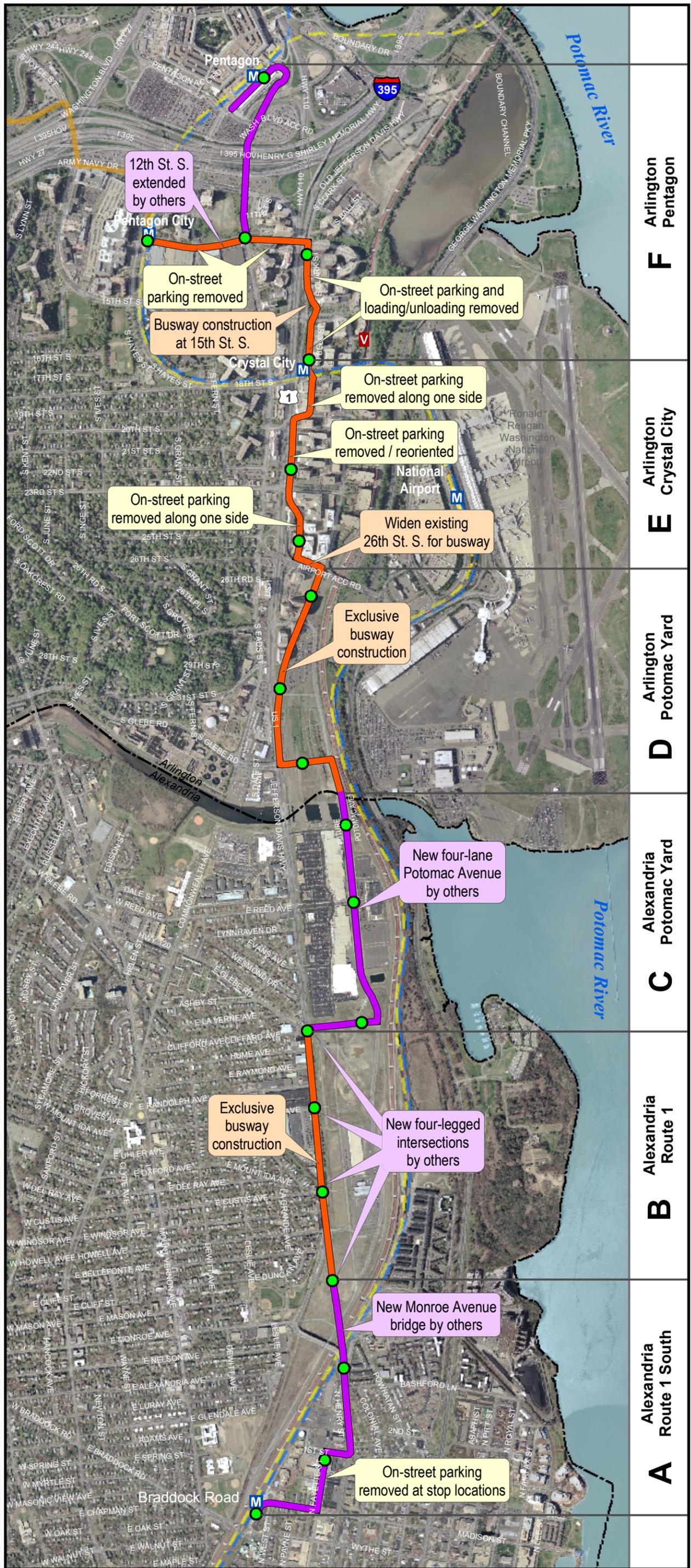
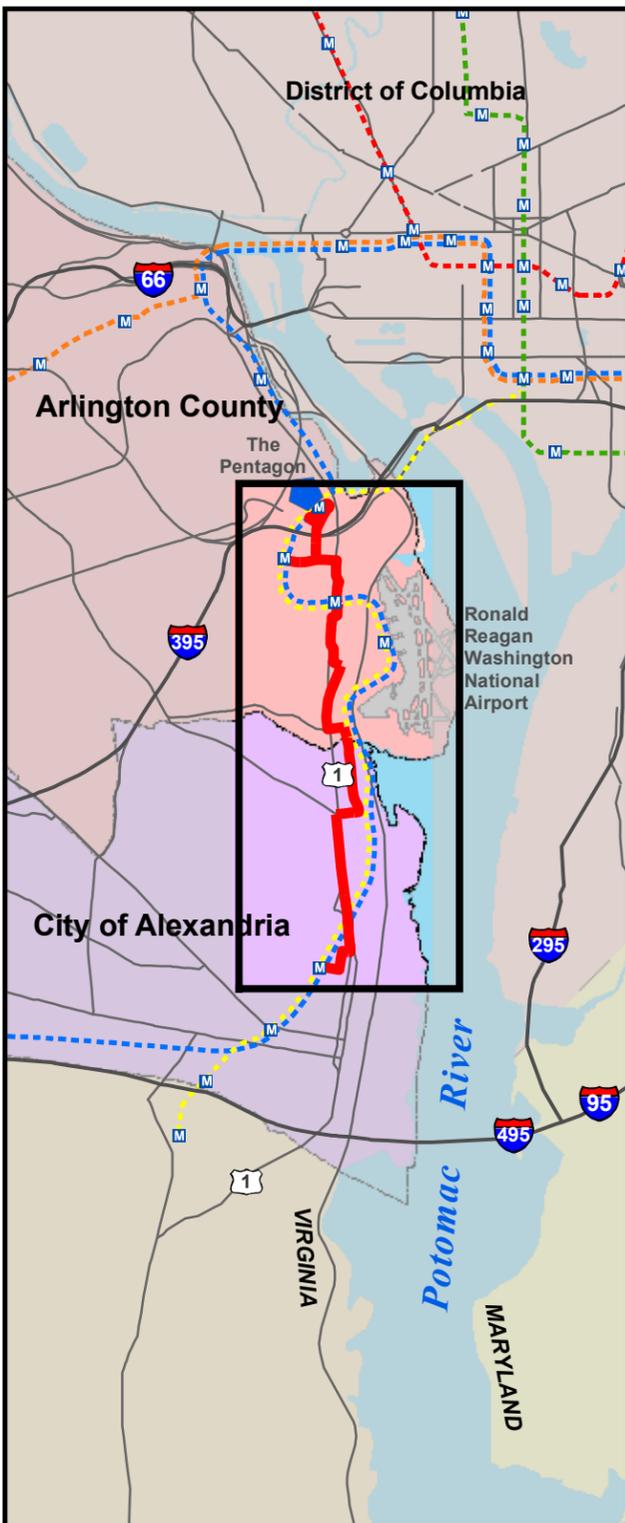
Segment A - Alexandria Route 1 South

Segment A begins at the Braddock Road Metrorail Station and heads east on Madison Street to North Fayette Street. The planned alignment turns north on Fayette Street and then east on 1st Street before turning north again on North Henry Street and crossing the realigned Monroe Avenue Bridge. The planned alignment in Segment A runs entirely in mixed traffic on existing roadway.

Segment B - Alexandria Route 1

Segment B runs north along Route 1 from the realigned Monroe Avenue Bridge to East Glebe Road. The planned alignment in Segment B runs entirely in exclusive transit lanes either in a median busway or along the east and west curbsides of Route 1 to East Glebe Road, where it transitions to mixed traffic.¹

¹ The 2030 analysis is based upon a median alignment in Segment B as the proposed action. The City of Alexandria has not made a definitive decision about the alignment in Segment B; thus, the 2015 analysis examines the effects of both alignments.



Segment C - Alexandria Potomac Yard

Segment C travels east on East Glebe Road from Route 1 through the planned Potomac Yard Town Center to Potomac Avenue. It then turns north along Potomac Avenue to the Alexandria/Arlington line. The planned alignment in Segment C runs entirely in mixed traffic.

Segment D - Arlington Potomac Yard

Segment D begins at the Alexandria/Arlington border running in mixed traffic north on Potomac Avenue. It transitions to exclusive lanes as it turns west on South Glebe Road, running on the northern side of the roadway in right-of-way donated as part of the planned development of Potomac Yard. The alignment turns north on Jefferson Davis Highway and merges with South Crystal Drive, running on the east side of the roadway to the intersection of South Crystal Drive and 26th Street South.

Segment E- Arlington Crystal City

Segment E begins at 26th Street South and South Crystal Drive running west before turning north on South Clark Street to 20th Street South. At 20th Street South, the planned alignment turns east and then north on South Bell Street to the Crystal City Metrorail Station at 18th Street South. This segment runs entirely in exclusive curbside lanes.

Segment F - Arlington Pentagon

Segment F begins at the Crystal City Metrorail Station and travels north on South Bell/South Clark Street before turning west on 12th Street. At South Eads Street, the alignment splits into two branches serving the Pentagon and Pentagon City. The first branch turns north on South Eads Street to the Pentagon Transit Center. The second branch continues west on 12th Street South to the Pentagon City Metrorail Station. The planned alignment in Segment F runs in exclusive curbside lanes until the intersection of 12th Street and South Eads Street, where it transitions to running in mixed traffic.

2.0 TRANSIT OPERATIONS AND PROJECT TRANSIT SERVICE

This section of the memo documents assumptions underlying the analysis of transit operations and effects of the proposed transit service.

2.1 No-Build Scenarios

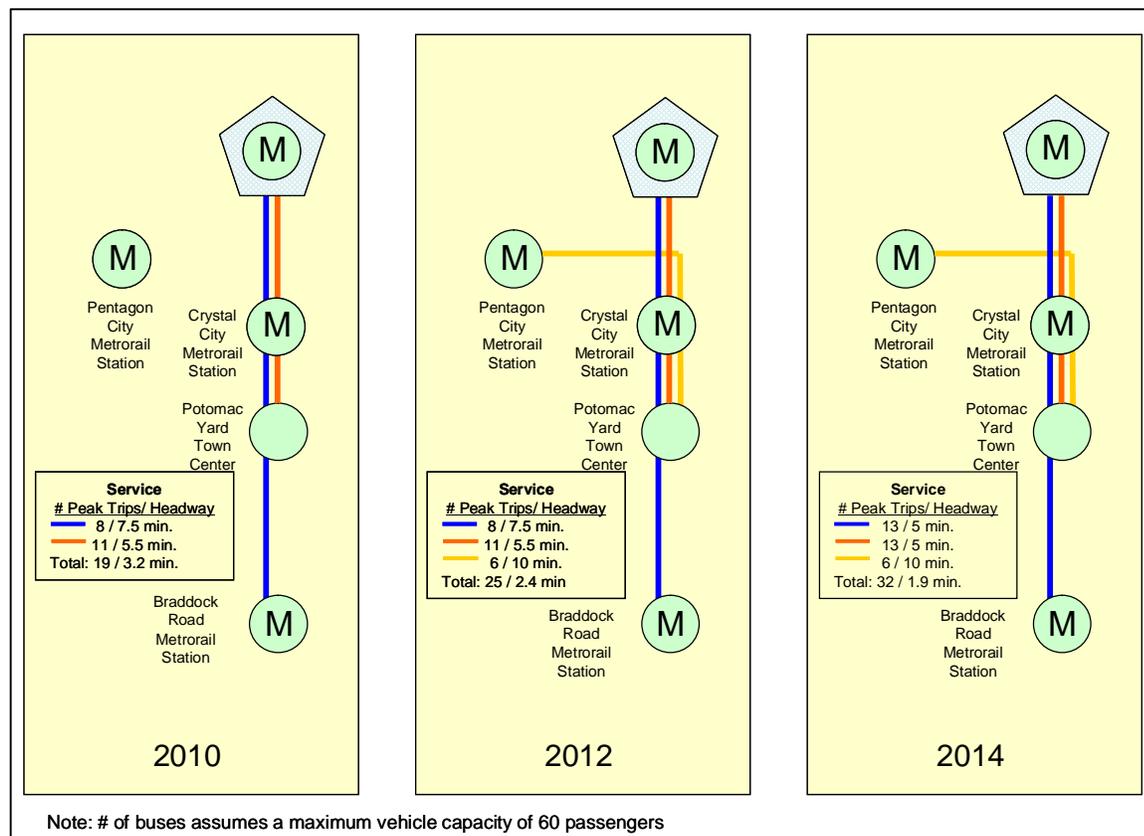
For the transit network, the No-Build model for both 2015 and 2030 will include the existing and planned route structure for Metrobus and DASH service, as shown in Appendix A. The operations plan for the 2015 and 2030 No-Build scenarios matches the levels of transit service assumed for the Build scenarios. In the No-Build case, Metrobus Routes 9E and 9S are the trunk routes operating in mixed traffic along the project corridor. They serve the same destinations as the Build scenarios, with a net service frequency of 32 buses per hour. In the 2015 No-Build scenario, 9S service is extended to the Potomac Yard shopping center via the new Four Mile Run Bridge, and in the 2030 No-Build scenario 9S service is extended to the new Alexandria Town Center and the proposed new Metrorail station.

2.2 Build Scenarios

The operations plan for the 2015 and 2030 Build scenarios is taken from the CC/PY Implementation Strategy, Mid-Term Peak Service Plan. The plan describes three transit lines that would use the busway, producing a net service frequency of 32 buses per hour. The three

lines are configured to satisfy the projected demand for service (see Figure 2-1, below, and refer to Appendix A: Existing and Proposed Bus Routes). The “blue” line extends from Braddock Road Metrorail Station to the Pentagon at 5-minute peak headways, the “red” line extends from future Alexandria Town Center to the Pentagon at 5-minute peak headways, and the “orange” line extends from the future Alexandria Town Center to Pentagon City at 10-minute peak headways.

Figure 2-1: Build Operating Plan



The configuration of the Build transit network is essentially the same as the No-Build with the major exception being that the core transit service has dedicated lanes along much of the alignment with passenger stations and amenities to facilitate use of the service.

The Alternatives Analysis, completed in 2004, included a forecast of travel demand for the proposed transit service. As part of the Implementation Strategy, completed in 2005, this forecast was validated. Due to ongoing economic trends and recently released plans for military base relocations and closures, several changes are expected along the corridor. Some of these projected changes are reflected in the most recent updates to the MWCOG regional forecasts, and ridership projections for the study corridor were validated against the new data.²

As discussed in Appendix B, Assessment of Phase I Operations Plans, ridership estimates that were utilized in the development of the operating plan for the Crystal City/Potomac Yard Transit Implementation Plan were based on model runs conducted during the original corridor

² The projected effects of recent Base Relocation and Closure (BRAC) plans by the federal government were not fully incorporated into the analysis/validation process. First, the analysis is based on the WMCOG Round 7.0 Cooperative Forecast, which did not contain all of the BRAC changes. Second, neither the timing of BRAC plans nor the County's plans for redevelopment of the affected areas were known at the time of this transportation analysis.

Alternatives Analysis. This ridership modeling was based on MWCOG’s Round 6.3 Population and Employment forecasts. Since the completion of the original ridership estimates MWCOG has adopted the new Round 7.0 regional population and employment forecasts. As part of the current analysis, the project team ran three tests to determine whether changes in population, employment, and travel behavior between the two forecast rounds would result in changes to the ridership estimates significant enough to warrant changes in the operating plan. The tests show that changes in projections would effect the previously prepared operating plan within a range of about 10 percent, a range that validates the operating plan.

2.3 Assumed Physical Improvements

The Build scenarios would be accompanied by minor physical changes in the corridor, including busway construction, street paving and resurfacing, upgrades to pedestrian facilities, adjustments to traffic patterns, and additional traffic and pedestrian signals. **Table 2-1** details the improvements by corridor segment. The City of Alexandria is currently considering the option of curbside or median bus lanes along Segment B (approximately 0.7 miles of Route 1) and is working with communities to determine bus lane operations.

Table 2-1: Corridor Improvements

Segment	Pedestrian and Passenger Facilities	Busway/Bus lane Construction	Traffic Patterns and Signals
A	8 ft x 45 ft passenger boarding areas; upgraded sidewalks and crosswalks	None	No changes expected
B	8 ft x 75 ft foot passenger boarding areas; upgraded sidewalks and crosswalks; refuge areas in the median of Route 1	Construction of mountable curb and pavement markings and/or resurfacing to delineate one curb-side bus lane in either direction or a two-lane median busway along the widened Route 1	Option 1, median busway: Extended signal phase at Route 1 and Potomac Avenue and additional signal phase at Route 1 and East Glebe Road to facilitate busway access Option 2, curbside bus lanes: Additional signal phases at each major intersection to reduce right turn conflicts
C	12 ft x 75 ft passenger boarding areas; upgraded sidewalks and crosswalks	None	No changes expected
D	12 ft x 60-90 ft passenger boarding areas, some with signature amenities; upgraded sidewalks and crosswalks	Paving of a two-lane busway that parallels South Glebe Road, Route 1, and Crystal Drive	Extended signal phase at City/County border; additional signal phase at South Glebe Road and Potomac Avenue; additional signal phase at Crystal Drive and 33 rd Street South; additional signal phase at Crystal Drive and Potomac Avenue

Table 2-1 (cont.): Corridor Improvements

Segment	Pedestrian and Passenger Facilities	Busway/Bus lane Construction	Traffic Patterns and Signals
E	12 ft x 60-90 ft passenger boarding areas; upgraded sidewalks and crosswalks; modifications to sidewalk and island configuration at 18 th St South and South Bell/South Clark St	Pavement resurfacing and/or restriping; construction of one new lane for bus use along the south curb line of 26 th Street South between Crystal Dr and South Clark St	Reconfigure 26 th Street South to one general travel lane eastbound, using access road south of 26 th Street as westbound only; additional traffic signal at 26 th Street South and South Clark Street; additional signal phase at 20 th Street South and Route 1; reconfigure 20 th Street South between Crystal Drive and South Clark Street, and South Clark Street between 20 th and 18 th Streets South as one-way; additional pedestrians only phase at 18 th Street South and South Bell/South Clark Street
F	12 ft x 60-90 ft passenger boarding areas; upgraded sidewalks and crosswalks	Pavement resurfacing and/or restriping to delineate bus lanes; construction of a short two-lane busway between 15 th Street South and South Bell Street.	New signal heads at South Bell Street and 15 th Street South; additional signal phase at South Bell Street and 12 th Street South; additional signal phases along 12 th Street South at South Eads, South Fern, and South Hayes Streets

2.4 Transit Effects

Corridor travel times and bus throughput were simulated corridor-wide to develop a general indication as to the performance of the transit improvements. As described below in Section 3, Traffic Modeling, the consultant team developed a simulation model that reflects the planned Build and No-Build transit networks along with projected future traffic levels along the project corridor. In the No-Build case, increasing vehicular traffic would affect the performance of transit service along the entire corridor. In the Build scenarios, transit service will perform better—with reduced travel time for passengers, and thus more overall passenger capacity—because of the segments with dedicated bus lanes. **Table 2-2** shows results for transit performance across the entire corridor. Details on corridor-wide travel times are shown in Appendix E. At the recommendation of City of Alexandria staff, for Segment B the study team simulated both curbside and median bus lanes in the 2015 analysis, and median lanes in the 2030 analysis.

Table 2-2: Corridor-wide Travel Time Results

Measure (compared to No-Build)	2015 (curb*)	2015 (median*)	2030 (median*)
AM Peak Hour			
Average delay time per bus (s)	11% savings	22% savings	5% savings
Travel time for buses (NB)	6% increase	9% savings	9% savings
Travel time for buses (SB)	4% increase	23% savings	18% savings
Total throughput of buses	34% improved	38% improved	33% improved
PM Peak Hour			
Average delay time per bus (s)	12% savings	24% savings	56% savings
Travel time for buses (NB)	8% increase	19% savings	7% savings
Travel time for buses (SB)	30% savings	41% savings	38% savings
Total throughput of buses	32% improved	40% improved	49% improved

*The Build Alternative simulations include the options of curbside bus lanes and median bus lanes on Segment B, located in the City of Alexandria.

Transit Effects by Segment

As described below, the corridor simulation shows that along some study segments, transit travel time will be affected due to provision of exclusive bus lanes. Projected travel times decrease along Segments D and E, increase along Segment B (in the curb-running case), and are comparable to the No Build scenario for Segments A, B (in the median-running case), C, and F. Details on travel times by segment are shown in **Tables 2-3** and **2-4**, and in Appendix E.

- Segment A – Travel time for Segment A is not affected by exclusive busway as buses will travel in the mixed flow of traffic. Travel times will be similar for the No-Build and Build conditions in 2015, and again similar in 2030.
- Segment B – For curbside bus operation under 2015 scenario, Segment B shows an increase in travel time by 2 minutes 11 seconds in the northbound direction and 4 minutes 13 seconds in the southbound direction during the a.m. peak hour. During the p.m. peak hour, Segment B shows increases in travel time by 4 minutes 4 seconds in northbound and 2 minutes 48 seconds in the southbound direction. These increases in travel time are due to provision of exclusive bus phases for curbside operation. The bus phase is engaged after all other phases are complete, leading to accumulated delay time for buses.

In 2015 and 2030, median bus operation shows minor increases in travel time over the No-Build condition in both a.m. and p.m. peaks. In this segment, there is no need for exclusive bus phases because buses are running on the same signal phase as northbound and southbound Route 1 traffic. Additionally, a separate bus phase is provided for northbound right turns at Route 1 and South Glebe Road, which will add additional travel time. Therefore, overall there is slight increase in travel time in northbound direction.

- Segment C – Travel time for Segment C is not affected by exclusive busway as buses will travel in the mixed flow of traffic. Travel times will be similar for the No-Build and Build conditions in 2015, and again similar in 2030.

- Segment D - Due to provision of exclusive busway lanes in Segment D, travel times decrease significantly. In the 2015 scenarios, northbound travel will decrease by 1 minute 22 seconds in the a.m. peak hour and 2 minutes 36 seconds in the p.m. peak hour.

In the 2030 scenario, Segment D shows a decrease in travel time by 1 minute 2 seconds in the a.m. and slight increase in travel time during p.m. peak hour. This segment involves one additional signal phase for buses for northbound left turns at South Glebe Road and Potomac Avenue. Elsewhere along Segment D, the buses will run parallel to Crystal Drive and will therefore have less interference with other signalized intersections.

Table 2-3: 2015 Transit Vehicle Travel Times (in seconds)

Jurisdiction	Segment/Intersection	Direction	AM Peak Hour (seconds)					PM Peak Hour (seconds)					
			A	B	C	Difference	Difference	D	E	F	Difference	Difference	
			2015 No Build	2015 Build Curbside	2015 Build Median	B-A	C-A	2015 No Build	2015 Build Curbside	2015 Build Median	E-D	F-D	
City Of Alexandria	A	Route 1/N. Henry to Future Potomac Ave./Route 1	NB	177	176	176	-1	-1	127	108	108	-19	-19
		Route 1/N. Henry to Future Potomac Ave./Route 1	SB	82	83	83	1	1	82	86	86	4	4
	B	Future Potomac Ave./Route 1 to E. Glebe Road	NB	210	341	218	131	8	192	436	202	244	10
		Future Potomac Ave./Route 1 to E. Glebe Road	SB	200	453	185	253	-15	203	370	211	168	8
	C	Route 1/ E. Glebe Road to County Borderline	NB	133	133	133	0	0	148	149	149	2	2
		Route 1/ E. Glebe Road to County Borderline	SB	125	131	131	7	7	131	125	125	-7	-7
Arlington County	D	County Borderline/S. Glebe Road to S. Clark St./26th St.	NB	304	222	222	-82	-82	392	237	237	-156	-156
	E	S. Clark St./26th St./23rd St. to S. Bell/18th St.	SB	471	222	222	-249	-249	843	272	272	-572	-572
	F	S. Bell St/18th St/15th St/Eads St/12th St/Army Navy Dr.	SB	138	162	162	24	24	194	164	164	-31	-31

Table 2-4: 2030 Transit Vehicle Travel Times (in seconds)

Jurisdiction	Segment/Intersection	Direction	AM Peak Hour (seconds)			PM Peak Hour (seconds)			
			A	B	Difference	C	D	Difference	
			2030 No Build	2030 Build Median	B-A	2030 No Build	2030 Build Median	D-C	
City Of Alexandria	A	Route 1/N. Henry to Future Potomac Ave./Route 1	NB	142	141	-1	256	241	-15
		Route 1/N. Henry to Future Potomac Ave./Route 1	SB	80	77	-3	83	86	3
	B	Future Potomac Ave./Route 1 to E. Glebe Road	NB	272	278	6	262	233	-29
		Future Potomac Ave./Route 1 to E. Glebe Road	SB	179	175	-4	453	242	-211
	C	Route 1/ E. Glebe Road to County Borderline	NB	175	163	-12	184	145	-39
		Route 1/ E. Glebe Road to County Borderline	SB	128	122	-6	167	156	-11
Arlington County	D	County Borderline/S. Glebe Road to S. Clark St./26th St.	NB	221	159	-62	199	215	17
	E	S. Clark St./26th St./23rd St. to S. Bell/18th St.	SB	333	172	-161	654	268	-385
	F	S. Bell St/18th St/15th St/Eads St/12th St/Army Navy Dr.	SB	169	184	15	255	252	-3

- Segment E – Due to provision of exclusive busway lanes in Segment E, travel times decrease significantly. The signal phase for buses at South Clark Street and 23rd Street South will run in parallel with the north-south phase on Route 1 resulting in additional green time for the buses as compared No-Build scenario.

Travel time in the southbound direction will decrease by 4 minutes 9 seconds during the a.m. peak hour, and decrease by 9 minutes 32 seconds in the p.m. peak hour. This is the most congested segment in the 2015 No-Build scenario, mainly during the p.m. peak hour. The southbound approach at South Clark Street and 23rd Street South shows long queues in the 2015 No-Build Condition.

In the 2030 scenario, Segment E shows decrease in travel time by 2 minutes 41 seconds in the a.m. peak hour and 6 minutes 25 seconds in p.m. peak hour.

- Segment F – Future bus routing differs somewhat along this segment between No-Build and Build conditions, thus it is difficult to provide a balanced comparison of transit travel times for Segment F. In general, travel times will be comparable for the Build and No-Build conditions. During the a.m. peak hour, travel times for the Build conditions will be from 15 to 25 seconds longer than for the No-Build conditions; during the p.m. peak hour travel times for the Build conditions will be from 5 to 30 seconds shorter than for the No-Build conditions.

3.0 TRAFFIC ANALYSIS

The traffic analysis for the corridor includes data collection for existing traffic conditions, projections of future conditions, and modeling of traffic operations. Results of the analysis include an assessment of traffic delays and levels of service at 14 key intersections, shown in **Figure 3-1**.

3.1 Existing Conditions

The Study Team conducted an extensive data collection effort to gain an understanding of existing conditions in the study area. In addition to collecting data for the quantitative assessment of existing conditions, the study team conducted field evaluations throughout the study area during peak and off-peak hours to further assist in the assessment of existing conditions. This section of the report summarizes the data collected for the study.

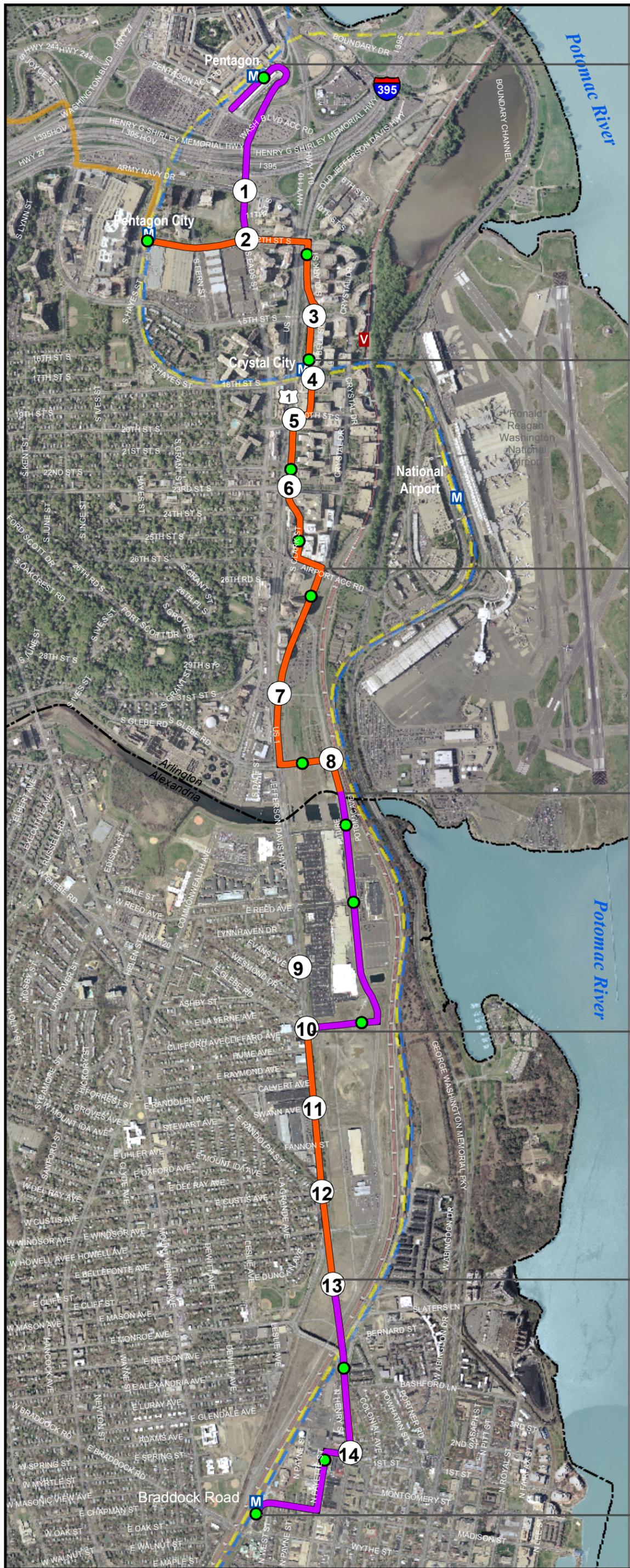
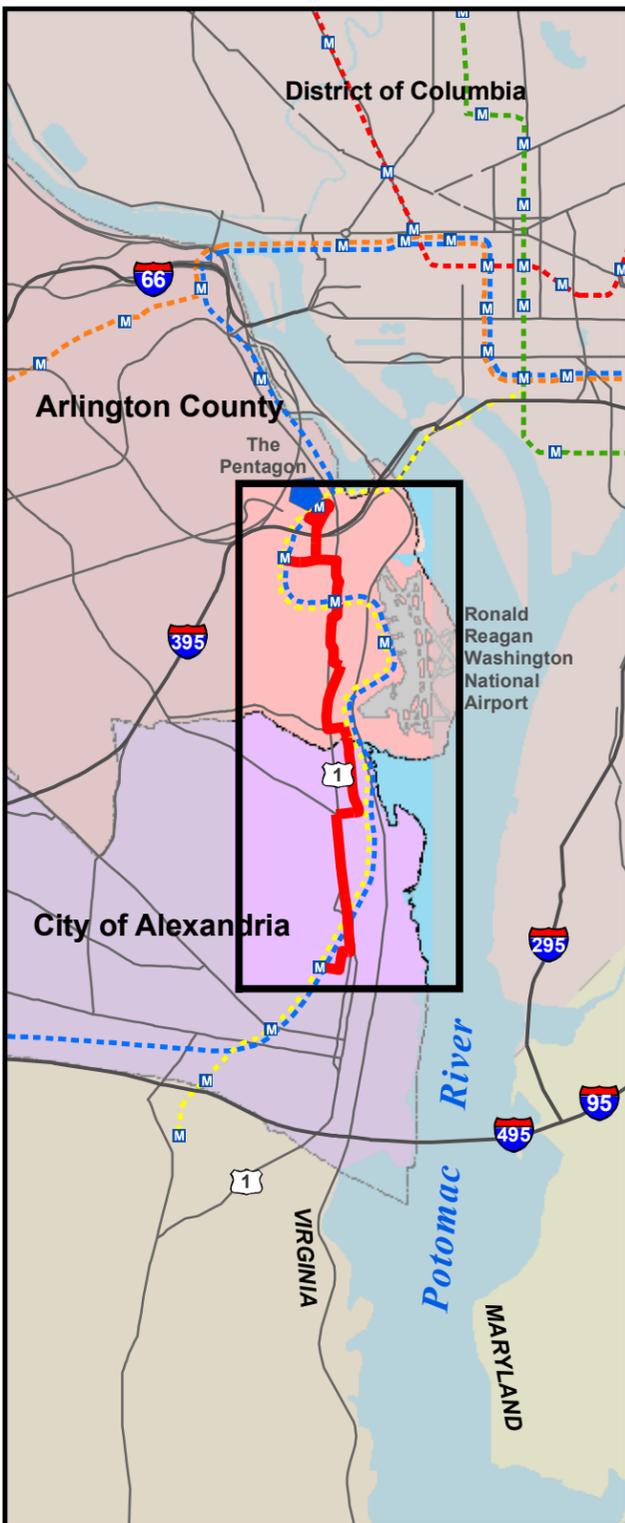
Traffic Volumes

In order to evaluate existing traffic conditions throughout the study area, the study team collected turning movement counts at the following intersections in the City of Alexandria:

1. Route 1 and Evans Lane
2. Route 1 and E. Glebe Road
3. Route 1 and E. Custis Avenue
4. N. Henry Street and 1st Street

Additionally, the study team collected intersection counts at key locations throughout the study area from recent studies conducted by the City of Alexandria and Arlington County. Most of the counts were taken during the months of February, March, and April of 2005 and 2006. No traffic was counted during holiday weeks or while public schools and universities were not in session.

Several of the key intersections will be constructed or reconfigured between the base year and the model year as part of Potomac Yard development. Intersection 7 (Crystal Drive and Route 1 at 31st Street South), intersection 8 (South Glebe Road and Potomac Avenue), and intersection 13 are under construction and not open for traffic at the time of this analysis. Intersection 3 (South Bell Street at 15th Street South), intersection 10 (Route 1 at East Glebe Road), intersection 11 (Route 1 at Swann Avenue), and intersection 12 (Route 1 at East Custis Street) are currently three-legged intersections that are assumed reconfigured as four-legged intersections in the future year analysis.



Arlington Pentagon	F
Arlington Crystal City	E
Arlington Potomac Yard	D
Alexandria Potomac Yard	C
Alexandria Route 1	B
Alexandria Route 1 South	A

**Figure 3-1
Traffic Study Intersections**

Legend

- VRE Station
- Metro Station
- Blue Metro Line
- Yellow Metro Line
- VRE Railroad
- Proposed Station Stop
- Columbia Pike Transit (Proposed)
- Study Intersections

Planned Alignment

- Mixed Traffic ROW
- Dedicated ROW



The turning movement traffic counts on all study intersections were treated as raw volumes. Because of existing public and private parking locations throughout the study area, there were minor discrepancies in the overall balance of traffic volumes. In order to improve the modeling of existing traffic conditions, the study team applied standard traffic engineering techniques to adjust the turning movement volumes at intersections where minor unjustified imbalances were found.

Appendix F presents raw vehicular and pedestrian volumes. Appendix F presents balanced a.m. and p.m. peak hour turning movements at key intersections for existing and future conditions.

Speed and Travel Times

In order to gain an understanding of driving patterns and to gather information needed to develop the traffic model, the study team collected information on speed and travel times on key corridors (May 16 to May 18, 2006).

Study team data collectors drove the Jefferson Davis Highway, Crystal Drive, South Bell Street, and South Clark Street several times in each direction during both a.m. and p.m. peak hours, and recorded the elapsed travel times at predetermined travel points and the distance between the selected travel points. For the travel time runs, the data collectors traveled at the same speeds as most of the vehicles traversing the study area. Appendix C contains detailed travel time information for key roadway segments in the study area during a.m. and p.m. peak hours.

Modeling of Existing Conditions

Simulation modeling is used in transportation engineering as an analysis tool to assess existing conditions and evaluate future alternatives over a specific period of time. The computerized transportation model attempts to simulate traffic conditions along the described roadway links coded into the model. The model parameters can be used to evaluate each intersection, roadway link, and the entire study area. For this analysis, the study team developed simulation models for the existing a.m. and p.m. peak hours in VISSIM. VISSIM is a stochastic microscopic simulation program capable of modeling individual vehicle interactions on complex roadway networks. VISSIM uses inputs such as lane assignments and geometries, intersection turning movement volumes, vehicle speeds, percentages of vehicles by type, and pre-timed and/or actuated signal timing to produce output that contains measures of effectiveness commonly used in the traffic engineering profession, including total delay, stopped delay, and queue lengths. The VISSIM models used in this study cover all roadway segments along the planned transit alignment.

The base existing a.m. and p.m. peak hour models were completed in SYNCHRO traffic software and then entered into the VISSIM model. The study team used current information on corridor travel time and speeds to develop and calibrate the existing conditions models. SYNCHRO was used to assist in the development of a model that accurately replicates signal timings for all study area intersections.

The existing peak hour VISSIM models were simulated five consecutive times with randomly selected seed values. Calibration tables were completed comparing the results from the existing VISSIM simulation models to the measured travel times. As shown in Appendix C, there is some segment by segment variability between simulated and field-observed travel times. For the corridor as a whole, the existing conditions model shows simulated travel times within 20 percent of the travel times observed in the field, which is an acceptable range for simulation of complex urban arterial streets.

Existing Levels of Service

The Consultant used the VISSIM software results to calculate levels of service (LOS) and the delay per vehicle for the intersections in the study area. The LOS evaluation uses a six-letter grade scale (A to F) to rank the overall traffic handling ability of an intersection or a network based on delay per vehicle. Appendix C contains detailed definitions of different levels of service and their associated delays for both signalized and unsignalized intersections. LOS A indicates free-flow traffic operations with minimal delays. LOS F represents failing conditions with long delays.

During the a.m. peak hour and p.m. peak hour, most of the intersections in the study area are operating at LOS D or better except Army Drive and South Eads Street intersection which operates at LOS E during the p.m. peak hour.

3.2 No-Build Scenarios

Once the existing conditions are calibrated, the next step in preparing the simulation is to develop No-Build traffic scenarios for the analysis years. Four important features of the No-Build scenarios are:

- § Operation of traffic signals,
- § Planned geometric changes to existing intersections,
- § Assumed transit network, and
- § Traffic projections.

Traffic signals will be optimized using Synchro software for the future years. Several intersections, particularly in the Alexandria portion of Potomac Yard, will be reconfigured from “T” intersections to 4-legged intersections by 2015, and will be represented as such in the No-Build model. As described above in Section 2.1, the operations plan for the 2015 and 2030 No-Build scenarios matches the levels of transit service assumed for the Build scenarios.

The study team developed projections for traffic growth in the corridor using current MWCOG traffic network assignment information. FTA staff has indicated that for the CE level of NEPA documentation, analysis that focuses on intersection delays and levels of service would be sufficient to measure the impacts of the transit improvements on traffic conditions. It would not be necessary, therefore, to develop a customized traffic assignment model to approximate the potential alternate paths for traffic in the corridor.

Based on the MWCOG traffic network, the project team developed growth factors and applied them to current intersection turning movement counts to approximate 2015 and 2030 conditions. The initial step included determining available trip assignment data relevant to the 14 key intersections under study. This was accomplished by identifying each of the 14 intersections on MWCOG trip assignment maps and determining how the MWCOG network relates nodes to the subject intersections. Links associated with each relevant node were analyzed based on total volumes.

Once the total volume for each node was determined for each analysis year, a rate of growth for that node could be calculated. This was completed for both the AM and PM peak periods. Projections from Wells Associates TIA studies are available for several intersections for 2016, and these have been used in place of the 2015 projections where available. Projections of turning movement volumes are detailed in Appendix D.

3.3 Build Scenarios

Once the No-Build scenario is coded in the simulation model, the Build scenarios are developed. For the purposes of this analysis, the Build scenarios will include the following types of model assumptions:

- § Current alignment plans for the first phase of busway in Arlington;
- § Alternative median-running and curb-running scenarios in new dedicated lanes along Route 1 in Alexandria;
- § Changes to lane configurations and parking/loading locations for street segments along the busway where lanes will be dedicated for transit;
- § Minor geometric changes at the 14 key intersections as a result of the proposed busway; and
- § Adjustments to traffic signals to accommodate the transit alignment.

Simulations of Build scenarios will add bus lanes to No-Build simulations in VISSIM and reflect other physical changes in the corridor as described above in Section 2.3. Comparisons between the Build and the No-Build will focus on the differences resulting from operational changes and roadway reconfigurations.

Even though the Build scenario will improve transit service and thereby increase corridor ridership, the levels of vehicular traffic along the transit route will be assumed equal for the Build as compared to the No-Build scenario. By using the No-Build traffic projections, we are simulating the worst traffic situations and impacts on both transit and traffic operations for the Build scenarios.

In reality, there would be some elasticity in the way drivers would choose routes where the number of lanes has been reduced to accommodate exclusive transit lanes. Furthermore, it is conservative to assume that the No-Build turning movements will be the same as the Build movements: where the Build lane configuration removes travel lanes, the “No-Build equals Build” assumption probably overstates the real volumes at many of the intersections.

The adopted MWCOG travel demand model does not reflect the street network within the study corridor. If the study team coded the entire busway into the model, the reduction in auto traffic volume would be marginal, but it is anticipated that vehicular traffic volumes (excluding buses) over the 5-mile corridor would be reduced slightly as improved bus service would absorb a portion of auto drivers.

3.4 Traffic Effects

Results of the simulation modeling show that there would be minor increases in traffic delay at several intersections in the corridor along with decreases in delay at other intersections due to implementation of the proposed transit service and busway. A few of the intersections studied would be performing at very poor LOS by the analysis years 2015 and 2030, but the proposed action would not degrade performance at these locations.

Tables 3-2 and 3-3 show the projected LOS for each of the 14 intersections studied. Detailed tables that include forecast delay times at each intersection are included as part of Appendix E. It is important to note that signal timings for the entire corridor were optimized separately for the 2015 and 2030 forecast years. While this procedure complicates direct comparisons of delay or LOS at one intersection for 2015 and 2030, it minimizes overall delay for each scenario.

Table 3-2: 2015 Projected Intersection Level of Service¹

Jurisdiction	Segment	Intersection		AM Peak Hour			PM Peak Hour		
				Existing 2005	2015 No Build	2015 Build Curbside/Median ²	Existing 2005	2015 No Build	2015 Build Curbside/Median ²
Arlington County	F	1	Army Drive and S. Eads St.	D	E	E	E	E	E
		2	12th St. and S. Eads St.	A	C	C	A	B	C
		3	S. Bell St. and 15th St. S	A	A	A	A	A	A
	E	4	S. Bell St. and 18th St. S	B	B	C	A	B	C
		5	S. Bell St. and S. Clark St. and 20th St. S	B	B	C	D	D	B/C
		6	S. Clark St. and 23rd St. S	C	E	C	C	E	E
	D	7	33rd St./Crystal Dr. and Jefferson Davis Highway	-	B	D	-	E	E
		8	S. Glebe Rd. and Potomac Ave. (under construction)	-	A	B/C	-	A	B/C
City Of Alexandria	C	9	Route 1 and Evans Lane	A	A	B/A	B	B	C
		10	Route 1 and E. Glebe Rd.	B	B	D	C	C	C
	B	11	Route 1 and Swann Ave.	A	A	B/A	A	A	B/A
		12	Route 1 and E. Custis Ave.	A	A	B/A	A	A	B/A
	A	13	Route 1 and Potomac Ave. (Future Intersection)	-	D	D/E	-	C	B/C
		14	N. Henry St. and 1st St.	A	A	A	A	A	A

¹ The values reported in this table are averages of five model runs.

² 2015 Build Alternative simulations include the options of curbside bus lanes and median bus lanes on Segment B, located in the City of Alexandria. When the LOS results are the same for curbside and median operations, only one value is shown.

Table 3-3: 2030 Projected Intersection Level of Service¹

Jurisdiction	Segment	Intersection		AM Peak Hour			PM Peak Hour		
				Existing 2005	2030 No Build	2030 Build ²	Existing 2005	2030 No Build	2030 Build ²
Arlington County	F	1	Army Drive and S. Eads St.	D	E	E	E	E	E
		2	12th St. and S. Eads St.	A	C	C	A	B	D
		3	S. Bell St. and 15th St. S	A	A	A	A	A	A
	E	4	S. Bell St. and 18th St. S	B	C	C	A	B	C
		5	S. Bell St. and S. Clark St. and 20th St. S	B	C	D	D	E	D
		6	S. Clark St. and 23rd St. S	C	E	D	C	F	F
	D	7	33rd St./Crystal Dr. and Jefferson Davis Highway	-	C	C	-	B	B
		8	S. Glebe Rd. and Potomac Ave. (under construction)	-	B	B	-	B	B
City Of Alexandria	C	9	Route 1 and Evans Lane	A	A	B	B	C	C
		10	Route 1 and E. Glebe Rd.	B	C	D	C	C	D
	B	11	Route 1 and Swann Ave.	A	A	A	A	C	B
		12	Route 1 and E. Custis Ave.	A	B	A	A	B	A
	A	13	Route 1 and Potomac Ave.(Future Intersection)	-	D	D	-	D	D
		14	N. Henry St. and 1st St.	A	A	A	A	A	A

¹ The values reported in this table are averages of 5 model runs.

² 2030 Build Alternative simulations only include median bus lanes on Segment B.

Traffic Effects by Segment

The effects of the planned transit service on vehicular traffic vary somewhat according to location along the study corridor. At intersections (Segments A, C, and D) where buses will transition between mixed traffic and exclusive lanes, additional signal phases for buses contribute to minor increases in traffic delays as compared to the No Build scenario. Traffic delays along Route 1 (Segment B) are not significantly affected by the introduction of exclusive bus lanes, and delays are slightly worse for curbside transit lanes as compared with a median busway. At congested intersections along Segment E exclusive lanes for buses help to channelize automobile flow and reduce traffic delays over the No Build scenario. Already congested conditions at intersections in Segment F will be comparable or slightly worse with the introduction of transit lanes. Specific effects observed through the VISSIM simulation are described below by segment based on intersection LOS results.

- Segment A – At intersections 13 and 14, delay and LOS vary little between the No-Build and Build scenarios. Under the median busway scenario at intersection 13, there would be a minor increase in delays in the 2015 a.m. and p.m. peak periods due to the signal phasing necessary to allow buses to enter and exit the median busway.
- Segment B – Along Route 1 at intersections 11 and 12, delay and LOS vary little between the No-Build and Build scenarios. Delays under the curbside bus lanes

scenario would be slightly greater (and LOS is expected to be slightly worse) than for the median busway for the 2015 a.m. and p.m. peak periods.

- Segment C – At intersections 9 and 10, delay and LOS vary somewhat between the No-Build and Build scenarios. At intersection 10 buses transition to and from dedicated bus lanes on Route 1, requiring additional signal phases for both median busway and curbside bus lanes. In the 2015 a.m. peak period, average vehicle delays increase from 17 seconds under the No-Build to 49 and 43 seconds respectively for the curb-running and median bus lanes. Likewise in the 2030 a.m. peak, delays increase from 23 seconds in the No-Build to 54 seconds in the Build scenario. Delays are less significant in the p.m. peak hour, with no notable change between No-Build and Build in 2015 and a slight increase (from 29 to 38 seconds) in 2030. Intersection 9, which is not directly along the transit corridor, exhibits the same general effects.
- Segment D – At intersections 7 and 8, delay increases slightly (with corresponding downgrading of LOS) between the No-Build and Build scenarios. Intersection 8, which is currently under construction, will be designed to accommodate a signal phase specifically for transit vehicles as they move between Potomac Avenue and the busway along South Glebe Road. Projected 2015 traffic delays would increase from about 5 seconds per vehicle in the No-Build case to about 20 seconds in the Build cases; in 2030 the difference between No-Build and Build delay is insignificant.

At intersection 7 (Route 1/Crystal Drive and 33rd Street South) projected delays are at their highest in the 2015 p.m. peak hour, at about 60 seconds, but the level of delay is essentially the same for No-Build versus Build. In the 2015 a.m. peak, delays increase from 19 seconds for the No-Build case to about 36 seconds for both Build scenarios. Increases in delay between the 2030 No-Build and Build cases are insignificant.

- Segment E – Intersection 6 (South Clark Street and 23rd Street South) operates with about 70 seconds of delay per vehicle in the 2015 a.m. and p.m. peak No-Build cases, but actually improves in the Build cases to about 33 seconds of delay in the a.m. peak and 55 seconds in the p.m. peak period. In the 2030 scenarios there is also improvement from No-Build to Build, but the p.m. peak delays are very high: 172 seconds per vehicle for the No-Build and 127 seconds for the Build.

Intersection 5 shows slight increases in vehicle delay for the Build scenario in the 2015 and 2030 a.m. peak and decreases in delay for the 2015 and 2030 p.m. peak.

Intersection 4 shows slight increases in vehicle delay for the Build scenario in 2015 for both a.m. and p.m. peak hours, and similar slight increases for both peak hours in 2030.

- Segment F – Intersection 3, which will be reconfigured to allow transit vehicles to connect more directly to South Bell Street, shows no significant increases in delay for the Build scenarios.

Intersection 2 shows slight increases in vehicle delay for the Build scenario in 2015 for both a.m. and p.m. peak hours, an insignificant difference between No-Build and Build in the 2030 a.m. peak, and a more pronounced increase (from 13 to 40 seconds) in the 2030 p.m. peak hour. An additional signal phase is required at this intersection to allow buses to make a southbound left turn in the outside lanes from South Eads Street to 12th Street South. Intersection 1 uniformly operates at Level of Service E. For both No-Build and Build scenarios and for both model years, projected delay is 60 to 70 seconds per vehicle.

4.0 PEDESTRIAN EFFECTS

4.1 Existing and No-Build Conditions

Conditions for pedestrians vary widely along the project corridor. In general, streets where existing bus service operates have sidewalks on both sides, and there are crosswalks at existing intersections. Other pedestrian amenities include countdown timers at signalized intersections and high visibility striping at crosswalks.

Many parts of the corridor are experiencing rapid change, with development being constructed or in design along the planned transit alignment. Typically, the development projects include generous sidewalks and landscaped areas that improve the pedestrian environment. Roadway projects that are being planned for the corridor—for example along Route 1 and Potomac Avenue in Alexandria and along Potomac Avenue, Crystal Drive, and 12th Street South in Arlington—will include ample sidewalks, crossings, refuge areas, and landscaping to encourage and better accommodate pedestrian trips.

Effects of the proposed transit improvements on pedestrian circulation are evaluated as part of the modeling exercise. Pedestrian characteristics were studied specifically at 6 of the key intersections:

- Arlington: 18th Street (#4), 23rd Street (#6), and South Glebe Rd./Potomac Ave. (#8)
- Alexandria: East Glebe Rd./Route 1 (#10), Custis Ave. (#12), and 1st St./N. Henry (#14)

4.2 Pedestrian Effects by Segment

Along the transit corridor, particularly near station stops, pedestrian improvements will include restriped crosswalks, adequate sidewalks and ramps, and pedestrian countdown timers at signals. Proposed stops along the busway are larger than typical bus stops, therefore they will provide a safer and more comfortable waiting experience for transit patrons. All of these improvements will lead to an enhanced pedestrian environment where transit passengers and local pedestrian traffic will have improved access to buildings and amenities along the planned transit route.

- Segment A – Here existing conditions are characterized by a pedestrian-scale environment on local streets. Even so, pedestrian counts at First Street and North Henry Street (intersection #14) show that current pedestrian traffic at this intersection is very light. The planned transit service and stop amenities, combined with sidewalk improvements around the stops, will help to make this portion of the corridor more desirable for pedestrians.
- Segment B – Conditions for pedestrians will improve with the planned transit investment. Planned reconstruction of Route 1 (part of a separate project) will include expanded sidewalks and crosswalks. The new configuration will provide for generous pedestrian refuge areas within the median of Route 1, and these refuge areas would be constructed with either a median busway or curb-side bus lanes.

At Custis Avenue and Route 1 (intersection #12), the current light pedestrian activity is mostly along the west sidewalk of Route 1, with very few pedestrians crossing Route 1. With the planned service improvements and a new transit stop near Custis Avenue, pedestrian traffic will likely increase at this location.

Pedestrian safety would likely improve with the planned improvements. The Build scenario includes passenger station stops and facilities which will draw attention to pedestrian activity along Route 1, whereas for the No-Build alternative, transit service

would be comparable in intensity, but would lack the physical facilities to increase comfort and visibility for transit users.

- Segment C – In this segment, roadway reconfiguration and ongoing development will combine to improve pedestrian conditions. The transit project will include sidewalk expansion and ramps near station stops.

At East Glebe Road and Route 1 (intersection #10) the planned transit improvements will include a special signal phase to aid movement of buses to and from the bus lanes.

- Segment D – In this segment, the existing pedestrian pathway along South Glebe Road, Route 1, and Crystal Drive will be relocated to the north and east of the planned busway. At intersections, crosswalks will be improved to provide high visibility pavement markings and pedestrian countdown signals will be installed at signalized intersections. The area (typically about 8 feet wide) between the busway and general travel lanes will serve as a pedestrian refuge area.

At South Glebe Road and Potomac Avenue (intersection #8), bus traffic will require its own signal phase. Pedestrian phases at this intersection will correspond with the through automobile movements; the transit-only green phase will be accompanied by red signals for pedestrians.

- Segment E – Pedestrian conditions along this segment reflect the intensified land uses of central Crystal City. Sidewalks, high-visibility crosswalks, and pedestrian countdown timers exist at most intersections in this segment.

South Clark Street at 23rd Street South (intersection #6) exhibits a complex traffic pattern and moderate pedestrian volumes. A tunnel beneath Route 1 and South Clark Street provides an alternative to the long Route 1 crossing distance. The planned station stop at the north leg of this intersection will include widened sidewalks and improved access to crosswalks and the pedestrian tunnel, improving access and safety for pedestrians.

The planned service is expected to reinforce the importance of the Crystal City Metrorail station as a transfer hub for transit, with the result that pedestrian traffic at South Clark/South Bell Streets and 18th Street South (intersection #4) will likely intensify. For this reason, sidewalks and crosswalks will be adjusted where necessary to facilitate access between bus station stops and the Metrorail station. Traffic signals at this intersection will be adjusted to allow a pedestrians-only phase, allowing pedestrians to cross in all four directions while all traffic stops.

- Segment F – Pedestrian conditions along this segment vary somewhat. South Bell Street reflects the intensified land uses of central Crystal City. Sidewalks, high-visibility crosswalks, and pedestrian countdown timers exist at many intersections in this segment, but there are gaps in the pedestrian infrastructure at South Eads Street, and along 12th Street South. Planned station stops in these areas would include improvements to adjacent sidewalks and street crossings that would increase safety and comfort for transit users and other pedestrians.

5.0 PARKING AND ACCESS EFFECTS

5.1 Existing and No-Build Conditions

The study corridor is marked by urban land uses of commercial and residential character. In general, residents, customers, and employees in the area have automobile access to buildings by means of on- and off-street parking, though the supply of on-street parking is constrained by

traffic patterns, existing bus stops and taxi stands, and fire lane areas. Several buildings along the corridor have loading and unloading areas adjacent to the project alignment. Truck access at these areas affects traffic flow at widely varying intervals.

5.2 Parking and Access Effects by Segment

Effects on parking and access are documented below for each segment of the study corridor.

- Segment A –The only measurable effect along this segment would be displacement of up to 10 on-street parking spaces along North Fayette Street with development of improved bus stops at this location.
- Segment B – While there is no on-street parking along this portion of Route 1, building access would affect or be affected by the planned transit improvements. Curb-side bus lanes could affect access to as many as ten businesses along the west side of Route 1 between Howell Avenue and East Glebe Road. At these locations, design of the bus lanes, lane markings, and mountable lane barriers will ensure continued access to existing driveways. However, depending upon the design solution, the effects of continual access will be noted either in increased delays for traffic along Route 1 or slower travel times for buses. Deliveries may be restricted to off-peak times.

The median busway would have no effect on access to businesses along Route 1, and may in fact improve access by transferring all bus traffic away from the curb areas near the existing access points.

- Segment C – No effects to parking or building access are expected along this segment.
- Segment D – Arlington County has mitigated parking and access effects in this segment through development plans. For example, new buildings in the southern portion of this segment (Potomac Avenue and South Glebe Road) will have off-street parking and off-street access points. Along the northern portion of this segment (Crystal Drive) new on-street parking spaces are part of the reconstructed street cross-section. Access to existing buildings on the west side of Crystal Drive is maintained, and there is a planned access point across the busway at the One Potomac Yard building near 26th Street South that will allow service to the building without long-term interruption of bus traffic.
- Segment E – This portion of the corridor is characterized by several areas of existing on-street parking and several existing loading areas. To provide sufficient width for two bus lanes, one lane for general traffic, and one parking lane, on-street parking will be displaced along the east side of South Clark Street between 26th and 23rd Streets South, as well as along a small portion of the west side of South Clark Street to accommodate a proposed station stop. North of 23rd Street South, the existing end-in parking (about 30 spaces) will be converted to parallel parking (about 15 spaces) to provide sufficient width for two bus lanes and one lane of general traffic. Between 20th Street and 18th Street South, no effects on existing parking are anticipated.

Each of the loading areas along this segment will be maintained as they currently exist. The busway will be delineated by pavement markings, and clearances along the busway will be enforced to restrict parked delivery vehicles to acceptable loading areas. Deliveries may be restricted to off-peak times.

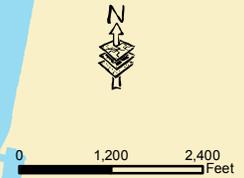
- Segment F – This portion of the corridor is characterized by areas of existing on-street parking, off-street parking access points, and existing loading areas. To provide sufficient width for two bus lanes, and two lanes for general traffic, on-street parking will be displaced along the north and south sides of 12th Street South between South Bell

Street and South Hayes Street. Existing on-street parking along both sides of South Eads Street will also be displaced for approximately one block to the north and south of 12th Street South to accommodate two bus lanes, two lanes for general traffic, and a left turn pocket.

Buses currently use the curb lanes along South Bell Street immediately north of the Crystal City Metrorail station as layover areas. With the planned transit improvements, layover will take place elsewhere, likely to the west along 18th Street South or South Hayes Street. Each of the loading areas along this segment will be maintained as they currently exist. The busway will be delineated by pavement markings, and clearances along the busway will be enforced to restrict parked delivery vehicles to acceptable loading areas. Deliveries may be restricted to off-peak times.

Appendix A
Existing and Proposed Bus Routes

No Build Bus Routes



- VRE Station
 - Metro Station
 - Blue Metro Line
 - Yellow Metro Line
 - VRE Rail Road
- Bus Routes**
- 10A, 10B, 10E
 - 9A, 9E
 - 9S (Extended)
 - 23A, 23C
 - 13A, 13B, 13F, 13G
 - Weekend/Holiday
 - DASH AT 3
 - DASH AT 4
 - DASH AT 3/4 loop
 - DASH AT 10
 - DASH AT 12
 - DASH AT 14
 - PY CIRC

2015 and 2030 Build Bus Routes



Bus Routes to be Included in the 2015 and 2030 No-Build and Build Scenarios

Route	Portions along Build Alignment?	Portion of Alignment Shared	Portion of Corridor Served	Include in Build Condition?	Weekday Headways (am/mid/pm)
9A	YES	Route 1 from Bashford Ln to West Glebe Rd; S. Eads St from 12 th St S. to the Pentagon	North Old Town to the Pentagon via Route 1 and South Eads Street	YES	30/30/30
9E (extended)	YES	Route 1 from Monroe Ave to West Glebe Rd; S. Eads St from 12 th St. S. to the Pentagon	Del Ray to the Pentagon via Route 1 and South Eads Street <u>2015 & 2030</u> : Extend to Braddock Road Metro	NO	5/10/5
9S (extended)	YES	Potomac Avenue from Potomac Yard Shopping Center (or Town Center) to South Glebe Rd; South Glebe Rd from Potomac Ave to Jefferson Davis Hwy; Crystal Drive to 26 th St. S.; S. Bell/S. Clark St. from 12 th St. S. to 26 th St. S.; 12 th St. S. from S. Bell St. to S. Hayes St.; Eads St. from S. 12 th St. to the Pentagon	<u>2015</u> : Potomac Yard Shopping Center to the Crystal City Metrorail Station and north to the Pentagon (5 min. peak) and Pentagon City (10 min. peak) <u>2030</u> : Town Center, Alexandria, to the Crystal City Metrorail Station and north to the Pentagon (5 min. peak) and Pentagon City (10 min. peak)	NO	3/10/3
CC/PY ("Blue" alignment)	YES	Braddock Road Metrorail Station to Pentagon Metrorail Station via Route 1, Potomac Yard, and Crystal City	Braddock Road Metrorail Station to Pentagon Metrorail Station via Route 1, Potomac Yard, and Crystal City	YES (replaces 9E)	5/7/5
CC/PY ("Red" alignment)	YES	Potomac Yard Town Center to Pentagon Metrorail Station via Crystal City	Potomac Yard Town Center to Pentagon Metrorail Station via Crystal City	YES (replaces 9S)	5/--/5
CC/PY ("Orange" alignment)	YES	Potomac Yard Town Center to Pentagon City Metrorail Station via Crystal City	Potomac Yard Town Center to Pentagon City Metrorail Station via Crystal City	YES (replaces 9S)	10/15/10
10A	YES	S. Eads St from 12 th St. S. to the Pentagon	Braddock Road Metrorail Station, Pentagon City, Pentagon	YES	30/30/30
10B	NO		Braddock Road Metrorail Station	YES	30/30/25
10E	YES	S. Eads St from 12 th St. S. to the Pentagon	Del Ray, Pentagon City, Pentagon	YES	10-20/--/5-35
13A	NO		Pentagon, Crystal City/Pentagon City north of 15 th St. S. between S. Eads St. and Jefferson Davis Highway)	YES	10-20/60/20-30
13B	NO		Pentagon, Crystal City/Pentagon City between S. Eads St. and Jefferson Davis Highway	YES	15-30/--/15
13F	NO		Pentagon, Crystal City/Pentagon City between S. Eads St. and Jefferson Davis Highway	YES	No Weekday Service
13G	NO		Pentagon, Crystal City/Pentagon City between S. Eads St. and Jefferson Davis Highway	YES	No Weekday Service

Route	Portions along Build Alignment?	Portion of Alignment Shared	Portion of Corridor Served	Include in Build Condition?	Weekday Headways (am/mid/pm)
23A	NO		Crystal City	YES	30/30/30
23C	NO		Crystal City	YES	One trip per day in each direction
DASH 3	NO		Braddock Road and Pentagon Metrorail stations	YES	20/--/20
DASH 3/4	NO		Braddock Road Metrorail Station	YES	--/60/60
DASH 4	YES	South Route 1 portion of alignment from Slater's Lane	North Old Town, Braddock Road and Pentagon Metrorail stations	YES	20/--/20
DASH 10	NO		Potomac Yard Shopping Center	YES	30/60/30
DASH AT12	YES	East Glebe Rd. crossing Route 1 to Alexandria Town Center and Potomac Yard Shopping Center along Potomac Ave.	Alexandria Town Center and Potomac Yard Shopping Center	YES	15/30/15
DASH AT14	YES	Route 1 between Slaters Ln. and Potomac Ave.; East Glebe Rd. to Potomac Yard Shopping Center via Potomac Ave.	Monroe Ave. Bridge, Main Street, Alexandria Town Center, Potomac Yard Shopping Center	YES	15/30/15
DASH Potomac Yard Circulator	YES	East Glebe Rd. to Potomac Yard Shopping Center and on to South Glebe Rd. via Potomac Ave., then along East Glebe crossing Route 1.	Monroe Ave., Main Street, Alexandria Town Center, Potomac Yard Shopping Center, South Glebe Rd. in Arlington	YES	15/15/15

Appendix B

Transit Operations Plan Validation

Transit Operations Plan Validation

Based on New Round 7.0 Population and Employment Forecasts

Summary of Analyses

Introduction

The ridership estimates that were utilized in the development of the operating plan for the Potomac Yard/Crystal City Transit Implementation Plan were based on model runs completed by HNTB for the original corridor Alternatives Analysis. This ridership modeling was based on MWCOG's Round 6.3 Population and Employment forecasts. Since the completion of the original ridership estimates MWCOG has adopted a new set of regional population and employment forecasts, known as Round 7.0.

As one of the first steps in completing the Documented Categorical Exclusion for the full set of transit improvements within the Potomac Yard/Crystal City corridor, a check of the potential impacts to the Implementation Plan (Phase 1) operating plan resulting from changes in corridor population and employment between Rounds 6.3 and 7.0 was completed.

Three analyses were completed to determine if changes in population and employment between the two Rounds would result in significant changes in the ridership estimates and would thus warrant changes in the operating plan developed as part of the Implementation Plan. If the analyses show that no changes in the operating plan are required, the operating plan completed in the last project phase would remain valid for the impacts analysis completed for the Documented Categorical Exclusion. The three analyses either comparing Rounds 6.3 and 7.0 or utilizing data from trip tables based on the Round 7.0 forecasts are outlined below in Sections 1 through 3.

1. Comparison of Change in Population and Employment between 6.3 and 7.0 (Attachment 1)

This analysis compared population and employment changes between Rounds 6.3 and 7.0 and then used assumptions regarding the percent of the population making trips and mode split to translate population and employment changes into a change in corridor transit trips. This analysis was done for future years 2015 and 2030. **This analysis showed that there was not a significant enough change in trips (based on changes in population and employment) to warrant modification of the operating plan.** A detailed description of the process used in this analysis is included as Attachment 1.

2. Analysis of Round 7.0 Trip Table Productions and Attractions (Attachment 2)

This analysis utilized a total person trip table based on MWCOG Round 7.0 population and employment forecasts to calculate total person trips, production and attraction mode splits, and productions from the project area and attractions into the project area. Specifically, total productions from each traffic analysis zone (TAZ) in the project area to one of four concentric rings around the project area were developed. (The concentric rings outside the project area comprised all of the TAZs within a ring a specific distance from the project area – for instance the first ring incorporates all TAZs between 0 miles from the outer edge of the project area to 2 miles from the edge of the project area. The second ring encompasses all TAZs between 2 and 5 miles from the edge of the project area, the third ring 5-10 miles, and the fourth ring is everything beyond 10 miles from the edge of the project area). A transit mode split for productions from the project area was also calculated and applied to total project area productions in order to calculate project area transit productions. These productions were factored down to peak hour transit trips and the peak hour load at the peak load point and compared to the ridership estimates used to develop the Phase 1 operating plan. This comparison was used to assess whether modifications to the Phase 1 operating plan were required. A similar analysis was completed for attractions. **The analysis showed that there were not significant enough changes in peak hour ridership and loadings at the peak load point to warrant a change in the Phase 1 operating plan.** Detailed descriptions of the process used in both analyses are included as Attachment 2.

3. Analysis of Growth in Trips between Round 6.3 and Round 7.0 Trip Tables (Attachment 3)

This analysis utilized a growth rate in trips between a trip table based on the Round 6.3 population and employment forecasts and a trip table based on the Round 7.0 population and employment forecasts. The growth rate calculated was then applied to the ridership estimates utilized in the Phase 1 analysis, which came from the original corridor Alternatives Analysis, to develop a daily ridership number based on Round 7.0 trips. This daily ridership number was factored down to get the number of passengers on board buses at the peak load point in the peak hour and in the peak direction. The number of trips and headways required to meet this peak hour demand at the peak load point were then calculated and compared to the original service plan developed in Phase 1. **The analysis showed that there were not enough changes in peak hour ridership and loadings at the peak load point to warrant a change in the Phase 1 Operating Plan.** A detailed description of the process used in this analysis is included as Attachment 3.

**Attachment 1
Phase 1 Operations Plan Check
Comparison of Round 6.3 and 7.0 Population and Employment Forecasts**

Analysis Purpose: To determine whether the change in forecasted population and employment between Rounds 6.3 and 7.0 would require modifications to the operations and service plan developed in Phase 1 of the project.

Key Findings: There are changes in population and employment but these changes do not generate enough change in the number of trips to warrant modifications to the service plan developed in Phase 1.

Analysis Process

1. Phase 1 Ridership Numbers – Based on Original Corridor Alternatives Analysis Model Runs:

2015	27,925
2030	32,143

2. Process Step 1: Calculate change in riders based on changes in Population and Employment between Round 6.3 and Round 7.0. In this step, the change in population within project area TAZs (which represent origins in the analysis) was used to determine the additional trips that would result from a change in project area population. The first step was to apply a factor to reflect the percent of the total population change that would actually be making a trip (the factoring assumed that 85% of the population within the project area would actually make a trip on any given day). This change in population was further factored down to reflect transit mode split (mode split was obtained from the Dulles Corridor Travel Demand Forecasting Technical Report). Employment, which represents attractions into the project area, was also factored down based on mode split (also obtained from the Dulles Corridor Travel Demand analysis). The calculations are outlined below:

Project Area Population change (origins) (6.3 vs. 7.0) – Translation to Ridership

<u>Year</u>	<u>Change</u>	<u>Percent Making Trip</u>	<u>Origin Mode Split</u>	<u>Change in Riders</u>
2015	1,522	85%	50%	647
2030	8,006	85%	53%	3,404

Project Area Employment change (6.3 vs. 7.0) – Translation to Ridership

<u>Year</u>	<u>Change</u>	<u>Attraction Mode Split</u>	<u>Change in Riders</u>
2015	-15,810	27%	-4,269
2030	-23,198	32%	-7,423

Total ridership change:

2015	-3,622
2030	-4,021

3. Process Step 2: Calculate New Daily Ridership. New daily ridership was calculated by subtracting the ridership declines developed in step 1 above from the total daily ridership numbers used in the first phase of the project. The results are shown below.

2015	24,303	(27,925 – 3,622)
2030	28,122	(32,143 – 4,021)

4. **Process Step 3: Convert Daily Ridership to Peak Load Point Estimate.** This process step translates the new total daily ridership calculated in the previous steps into a peak load estimate, for use in assessing whether modifications to the phase 1 operations plan are required. The calculation is based on three different factoring steps. The first step is to calculate the percent of total daily ridership that occurs in the peak hour (estimated at 12.6%). The next step is to further factor this peak hour ridership by calculating the percent of peak hour ridership that is traveling in the peak direction (estimated at 60%). The final calculation is a calculation of the total peak direction ridership that is on the vehicle at the peak load point (this was estimated at 90% of peak hour/peak direction ridership). The specific calculations are as follows:

Analysis Year 2015

- Peak hour Ridership (12.6% * 24,303) = **3,062**
- Peak hour/peak direction ridership (60% * 3,062) = **1,837**
- Peak direction peak load point (90% * 1,837) = **1,654** (estimated downward from 1,900 in previous study)

Analysis Year 2030

- Peak hour Ridership (12.6% * 28,122) = **3,543**
- Peak hour/peak direction ridership (60% * 3,062) = **2,126**
- Peak direction peak load point (90% * 1,837) = **1,913** (peak load point was not estimated for 2030 in the original study)

5. **Process Step 4: Demand based Service Plan comparison.** This step compares the original ridership estimates from the Service Implementation Plan (Phase 1) to the new ridership calculations outlined above to determine required changes, if any, in the original operations plan. The analysis is outlined below.

- Phase 1 service plan - # of trips per hour and headways
 - 1,900 (passengers at peak load point during peak hour)/60 (acceptable vehicle loading) = 32 trips in the peak hour
 - Headways = 60 minutes/32 trips = 1.9 minutes
- New 2015 service plan - # of trips per hour and headways
 - 1,654 (passengers at peak load point during peak hour)/ (acceptable vehicle loading) = 28 trips in the peak hour
 - Headways = 60 minutes/28 trips = 2.1 minutes

6. **Analysis Final Result:** No changes in service plan are required based on this analysis.

Attachment 1 - Appendix 1

Calculation of change in Population and Employment Round 6.3 vs. Round 7.0

The tables outlined below show the changes in forecasted population and employment between Rounds 6.3 and 7.0, for the corridor, for the base year of 2005, the full build year of 2015, and the horizon year of 2030. The rate of growth is also shown for three time periods, 2005 to 2015, 2015 to 2030, and 2005 to 2030.

Note that population is projected to be higher and increase faster between years in Round 7.0 than estimated in Round 6.3. Likewise, employment is also projected to increase faster, though overall employment numbers will be lower. These observations are illustrated in the graphs following the tables.

Round 6.3	2005	2015	2030	Rate of Growth			
				05 to 15	15 to 30	05 to 30	
Population	32468	39775	43269	22.5	8.8	33.3	
				Annual	2.3	0.6	1.3
Employment	113075	129716	151217	14.7	16.6	33.7	
				Annual	1.5	1.1	1.3

Round 7.0	2005	2015	2030	Rate of Growth			
				05 to 15	15 to 30	05 to 30	
Population	32060	41297	51275	28.8	24.2	59.9	
				Annual	2.9	1.6	2.4
Employment	88952	113906	128019	28.1	12.4	43.9	
				Annual	2.8	0.8	1.8

Attachment 2

Phase 1 Operations Plan Check Analysis of Round 7.0 Trip Table

Analysis Purpose: Utilize trip data from a trip table generated based on Round 7.0 population and employment forecasts to determine if the Phase 1 operating plan, based on ridership estimates generated using the Round 6.3 forecasts, remains valid.

Key Findings: The analysis of trips from the project area (productions) based on a trip table generated using the 7.0 forecasts shows that there is a small difference in the number of peak hour trips required to meet peak hour demand in 2015, but that the difference is small enough that changes in the operating plan are not warranted.

Analysis Process

1. **Process Step 1:** *Calculate productions from the project area by analysis year and by destination concentric ring.* In this step the Round 7.0 trip table was used to identify trip productions from the project area to each of three concentric rings that are based on distance from the outer edge of the project area. The first ring represents all of the TAZs in a ring from the edge of the project area to 2 miles from the outer edge of the project area. The second ring represents all of the TAZs between 2 and 5 miles from the outer edge of the project area and the third ring represents all of the TAZs between 5 and 10 miles from the outer edge of the project area. Project area productions were identified for the years 2005, 2015, and 2030.

All project steps are shown in Worksheet 1, below.

2. **Process Step 2:** *Calculate the non-auto mode split for productions for each analysis year and each concentric ring.* In addition to total productions from the project area, project area productions by mode were also extracted from the Round 7.0 trip table. With this data, the non-auto mode split was calculated for productions from the project area for each analysis year and concentric ring.
3. **Process Step 3:** *Calculate project area non-auto trip productions based on total trips and non-auto mode split.* In this step the non-auto mode split calculated in the previous step was applied to total project area trip productions in order to calculate non-auto project area productions.
4. **Process Step 4:** *Calculate project area peak hour non-auto productions based on factoring down of total daily non-auto project area productions.* In this step the total daily non-auto productions calculated in the previous steps were factored down to calculate non-auto peak hour productions. This factoring assumed non-auto peak hour productions were 12.6% of total daily non-auto productions.
5. **Process Step 5:** *Calculate percent of non-auto productions that are traveling in the peak direction.* This step accounts for the fact that not all productions within the project area will travel in the peak direction. However, because the majority of major destinations are north of the project area (Pentagon, remainder of Arlington, downtown Washington), which represents the morning peak direction, this factoring assumes that 90% of peak hour non-auto productions travel in the peak direction.
6. **Process Step 6:** *Calculate percent of peak direction trips that are on bus at peak load point.* This step is the final factoring to take into account that not all riders getting on a bus in the peak direction will still be on at the bus at the peak load point (some riders make shorter trips and get off at stops before the bus is at its fullest).

7. **Process Step 7:** Calculate trip requirements and headways. This step calculates the number of trips required to meet demand, based on an acceptable load of 60 passengers per bus.
8. **Process Step 8:** Follow same process for attractions to determine peak load in the non-peak direction. This process is outlined in Worksheet #2 below.
9. **Analysis Final Result:** No changes in service plan are required based on this analysis.

Note: The analysis of productions contained in Worksheet #1 below assumes that all project area productions in the peak direction utilize the new service. An alternative approach is included in Worksheet #3. The analysis approach used in Worksheet #3 is the same as followed in Worksheet #1, except that a further assumption regarding the percent of non-auto project area productions that board the new corridor premium service as opposed to other transit services in the corridor was used. The assumption was that the share of non-auto trips that use the premium service was assumed to be 75% of all non-auto trips. With regard to the comparison to the Phase 1 Operations Plan, the result of this alternative analysis shows that 24 trips (2.45 minute headway) would be required to meet demand at the peak load point in 2015, versus the 32 trips based on the analysis contained in Worksheet 1 and the 32 trips contained in the Phase 1 analysis.

Worksheet 1 – Estimate of Peak Hour Productions				
		2005	2015	2030
Step 1	Total Productions			
	0-2 miles	62,617	72,226	85,753
	2-5 miles	34,372	38,727	44,644
	5-10 miles	13,309	14,374	15,677
Step 2	Productions Mode Split (non-auto)			
	0-2 miles	0.16	0.19	0.21
	2-5 miles	0.09	0.12	0.13
	5-10 miles	0.03	0.05	0.08
Step 3	Total Non-Auto Trips			
	0-2 miles	10,019	13,723	18,008
	2-5 miles	3,093	4,647	5,804
	5-10 miles	399	719	1,254
	Total	13,511	19,089	25,066
Step 4	Peak Hour Estimate (12.6% of total daily)			
	Total	1,702	2,405	3,158
Step 5	Peak Direction (90% of peak hour estimate)			
	Total	1,532	2,165	2,842
Step 6	Peak Load Point (90% of Peak Hour)			
	Total	1,379	1,948	2,558
Step 7	Trip Requirement Estimate			
	Total	23	32	43
	Headway			
Total	2.61	1.85	1.41	

Worksheet 2 - Estimate of Peak Hour Attractions				
		2005	2015	2030
Step 1	Total Attractions			
	0-2 miles	98,051	112,302	128,313
	2-5 miles	106,206	117,015	127,947
	5-10 miles	65,695	72,723	76,602
Step 2	Attractions Mode Split (non-auto)			
	0-2 miles	0.12	0.13	0.14
	2-5 miles	0.17	0.19	0.21
	5-10 miles	0.18	0.2	0.23
Step 3	Total Non-Auto Trips			
	0-2 miles	11,766	14,599	17,964
	2-5 miles	18,055	22,233	26,869
	5-10 miles	11,825	14,545	17,618
	Total	41,646	51,377	62,451
Step 4	Peak Hour Estimate (12.6% of total daily)			
	Total	5,247	6,473	7,869
Step 5	Transfer to Build Service (30% of total attractions)			
	Total	1,574	1,942	2,361
Step 6	Peak Load Point (90% of Peak Hour)			
	Total	1,417	1,748	2,125
Step 7	Trip Requirement Estimate			
	Total	24	29	35
	Headway			
Total	2.54	2.06	1.69	

Worksheet 3 - Alternative Estimate of Peak Hour Productions				
		2005	2015	2030
Step 1	Total Productions			
	0-2 miles	62,617	72,226	85,753
	2-5 miles	34,372	38,727	44,644
	5-10 miles	13,309	14,374	15,677
Step 2	Productions Mode Split (non-auto)			
	0-2 miles	0.16	0.19	0.21
	2-5 miles	0.09	0.12	0.13
	5-10 miles	0.03	0.05	0.08
Step 3	Total Non-Auto Trips			
	0-2 miles	10,019	13,723	18,008
	2-5 miles	3,093	4,647	5,804
	5-10 miles	399	719	1,254
	Total	13,511	19,089	25,066
Step 4	Peak Hour Estimate (12.6% of total daily)			
	Total	1,702	2,405	3,158
Step 5	Percent Utilizing New Service (75%)			
	Total	1,277	1,804	2,369
Step 6	Peak Direction (90% of peak hour estimate)			
	Total	1,149	1,624	2,132
Step 7	Peak Load Point (90% of Peak Hour)			
	Total	1,034	1,461	1,919
Step 8	Trip Requirement Estimate			
	Total	17	24	32
	Headway			
Total	3.48	2.46	1.88	

**Attachment 3
Phase 1 Operations Plan Check
Analysis of Trip Growth Rates between Round 6.3 and 7.0
Trip Tables**

Analysis Purpose: To determine whether the growth rate in project area trips between trip tables based on Round 6.3 to Round 7.0 population and employment forecasts respectively, when applied to the predicted daily ridership utilized in Phase 1, would warrant modifications to the Phase 1 operations and service plan?

Key Finding: No significant changes in service plan are required based on the analysis outlined below.

Analysis Process

1. Available Data:

Total Person Trips, for Round 6.3 and Round 7.0 population and employment forecasts, for each TAZ within the project area. These are trips within the project area, out of the project area, and into the project area. Trips in and out of the project area are between the project area and a series of concentric rings, with each ring representing a distance from the outer edge of the project area (ring 1 represented all TAZs between the outer edge of the project area and 2 miles from the outer edge of the project area; Ring 2 encompasses all TAZs between 2 and 5 miles and ring 3 represents all TAZs between 5 miles and 10 miles. The data was available for the analysis year 2030.

2. Process Step 1: In this step the percent increase in total person trips between Round 6.3 and Round 7.0 was calculated. The percent increase in all total person trips between Round 6.3 and Round 7.0 was 1.5 percent, a slight bump that would not influence the service operation plan. However, more detailed examination revealed that total person trips within the project corridor would increase by 11.8 percent, a more relevant number and one more likely to affect service operations. Therefore this percentage increase

3. Process Step 2: In this step, the calculated growth rate from the previous step was applied to the total daily ridership utilized in the Phase 1 study. This ridership data came from the original Corridor Alternatives Analysis. The calculation is shown below:

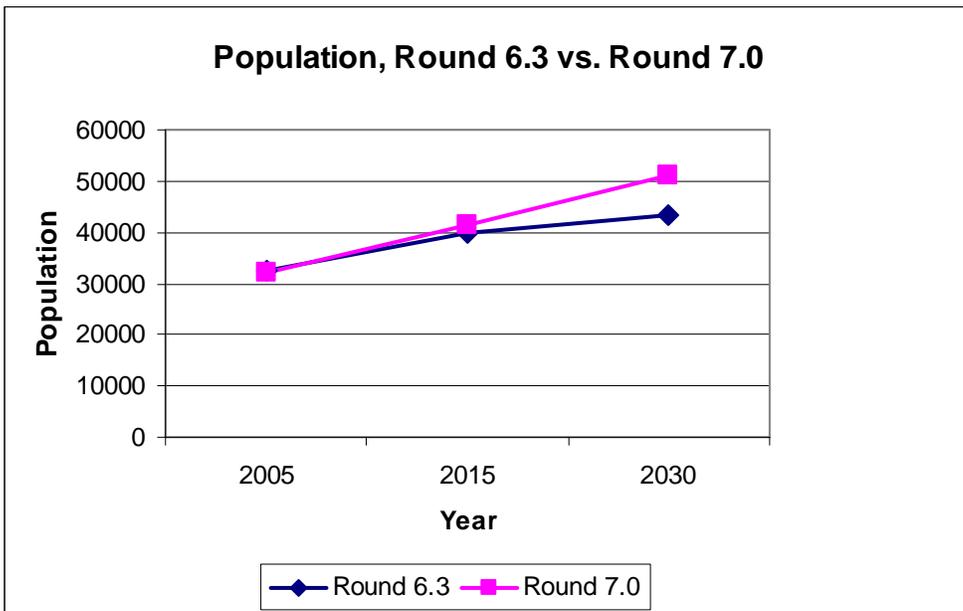
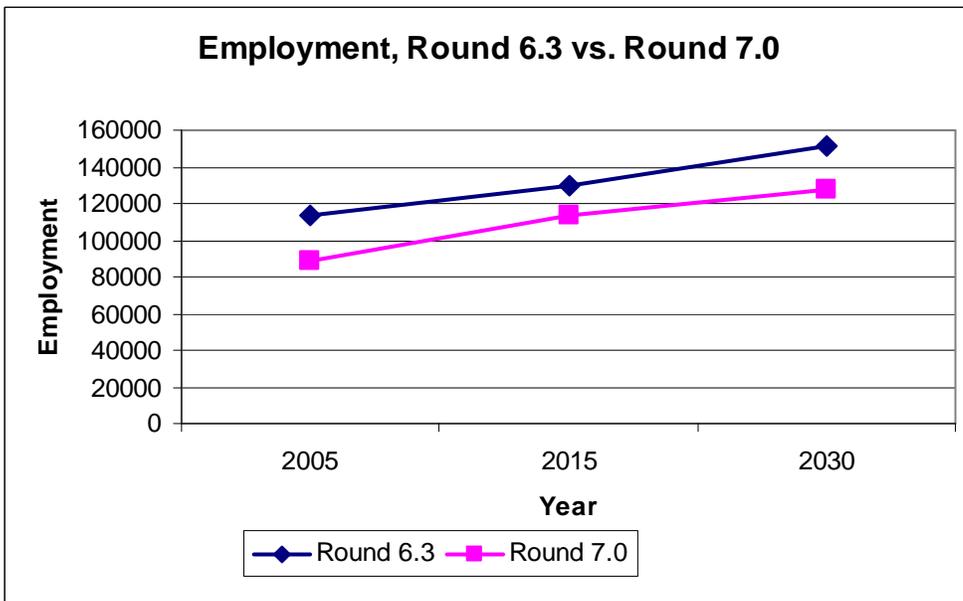
<u>Phase 1 Ridership</u>	<u>Increased by growth rate</u>
2015 27,925	29,572 (5.9% increase – ½ the 2030 11.8% increase – no data for 2015 was available for the Round 6.3 dataset)
2030 32,143	35,936 (11.8% increase)

4. Process Step 3: This step involved converting daily ridership calculated in the previous step into peak hour loadings at the peak load point. The method to calculate the peak load point is based on a series of factors that translates total daily ridership into peak hour ridership and then into loadings at the peak load point. The first step is the calculation of the percent of total daily ridership that occurs in the peak hour (12.6%). In the second step, the percent of this peak hour ridership that is traveling in the peak direction is then calculated (60%). Finally, the last factor, which represents the percent of peak hour, peak direction riders who are on the bus at the peak load point, is applied (90%). The results for 2015 and 2030 are outlined below.

Peak Load Point Volume

2015 2,012
2030 2,445

- 5. **Process Step 4:** In this step the required service levels to meet the demand at the peak load point calculated in the previous step were developed. Based on the peak load point loads for 2015 calculated in this analysis, 33 trips would be required in the peak hour, based on an acceptable load of 60 persons per vehicle. This translates into a headway of 1.8 minutes (in the Phase 1 study, trip requirements and headways were calculated for 2015 only). This compares to 32 required trips at a 1.9 minute headway developed in the Phase 1 analysis for 2015.
- 6. **Final Result:** No changes in the Phase 1 service plan is required based on the analysis contained in this attachment.



Appendix C
Existing Travel Times and Model Calibration

AM Peak Period (7.00 AM - 9.00 AM)

Travel Time Runs- Arlington (SB)

Segment	From	To	Run 1 (sec)	Run 2 (sec)	Run 3 (sec)	Run 4 (sec)	Average (sec)
1	Army Navy Drive and S. Eads St.	S. Eads St & 12th St.	22	59	25	17	31
2	S.Eads St & 12th St	S. Bell St & 15th St.S	104	91	103	119	104
3	S. Bell St. and 15th St. S.	S. Bell St & 18th St.S	95	51	64	39	62
4	S. Bell St. and 18th St. S.	S.Bell St. and S.Clark St. and 20th St.S	110	102	72	104	97
5	S. Bell St. and S. Clark St. and 20th St. S.	S.Clark St. and 23rd St.S	135	123	117	128	126

Travel Time Runs- Alexandria (NB)

Segment	From	To	Run 1 (sec)	Run 2 (sec)	Run 3 (sec)	Run 4 (sec)	Average (sec)
1	Jefferson Davis Hwy & E.Custis Ave	Jefferson Davis Hwy & Swann Ave	25	28	34	23	28
2	Jefferson Davis Hwy & Swann Ave	Jefferson Davis Hwy & E.Glebe Rd	44	43	55	22	41
3	Jefferson Davis Hwy & E.Glebe Rd	Jefferson Davis Hwy & Evans Ln	21	25	30	16	23

Travel Time Runs- Alexandria (SB)

Segment	From	To	Run 1 (sec)	Run 2 (sec)	Run 3 (sec)	Run 4 (sec)	Average (sec)
1	Jefferson Davis Hwy & Evans Lane	Jefferson Davis Hwy & E.Glebe Rd	23	20	37	30	28
2	Jefferson Davis Hwy & E.Glebe Rd	Jefferson Davis Hwy & Swann Ave	28	25	24	28	26
3	Jefferson Davis Hwy & Swann Ave	Jefferson Davis Hwy & E.Custis Ave	25	25	22	27	25

PM Peak Period (4.00 PM - 6.00 PM)

Travel Time Runs- Arlington (SB)

Segment	From	To	Run 1 (sec)	Run 2 (sec)	Run 3 (sec)	Run 4 (sec)	Average (sec)
1	Army Navy Drive and S. Eads St.	S. Eads St & 12th St.	32	19	15	27	23
2	S.Eads St & 12th St	S. Bell St & 15th St.S	95	85	90	91	90
3	S. Bell St. and 15th St. S.	S. Bell St & 18th St.S	30	96	51	53	58
4	S. Bell St. and 18th St. S.	S.Bell St. and S.Clark St. and 20th St.S	117	69	100	55	85
5	S. Bell St. and S. Clark St. and 20th St. S.	S.Clark St. and 23rd St.S	139	126	131	125	130

Travel Time Runs- Alexandria (NB)

Segment	From	To	Run 1 (sec)	Run 2 (sec)	Run 3 (sec)	Run 4 (sec)	Average (sec)
1	Jefferson Davis Hwy & E.Custis Ave	Jefferson Davis Hwy & Swann Ave	29	23	23	22	24
2	Jefferson Davis Hwy & Swann Ave	Jefferson Davis Hwy & E.Glebe Rd	64	26	71	24	46
3	Jefferson Davis Hwy & E.Glebe Rd	Jefferson Davis Hwy & Evans Ln	25	44	19	49	34

Travel Time Runs- Alexandria (SB)

Segemnt	From	To	Run 1 (sec)	Run 2 (sec)	Run 3 (sec)	Run 4 (sec)	Average (sec)
1	Jefferson Davis Hwy & Evans Lane	Jefferson Davis Hwy & E.Glebe Rd	21	75*	36	35	31
2	Jefferson Davis Hwy & E.Glebe Rd	Jefferson Davis Hwy & Swann Ave	23	24	26	24	24
3	Jefferson Davis Hwy & Swann Ave	Jefferson Davis Hwy & E.Custis Ave	24	22	25	22	23

* - Run 2 data for segment 1 is not included in the average.

Calibration of Average AM Peak Travel Time - Existing Condiitions

Arlington Segment (Southbound Only)					
Segment	From	To	Actual Travel Time in Sec.	Average Model Travel Time in Sec.	Model - Actual
1	Army Navy Drive and S. Eads St.	S. Eads St & 12th St.	31	41	10
2	S. Eads St & 12th St.	S. Bell St & 15th St.S	104	99	-5
3	S. Bell St & 15th St.S	S. Bell St & 18th St.S	62	62	0
4	S. Bell St & 18th St.S	S.Bell St. and S.Clark St. and 20th St. S	97	84	-13
5	S.Bell St. and S.Clark St. and 20th St. S	S. Clark St. and 23rd St. S	126	135	9

Alexandria Segment - (Northbound)					
Segment	From	To	Actual Travel Time in Sec.	Average Model Travel Time in Sec.	Model - Actual
1	Jefferson Davis Hwy & E. Custis Ave	Jefferson Davis Hwy & Swann Ave	28	30	2
2	Jefferson Davis Hwy & Swann Ave	Jefferson Davis Hwy & E.Glebe Rd	41	44	3
3	Jefferson Davis Hwy & E.Glebe Rd	Jefferson Davis Hwy & Evans Ln	23	18	-5
Alexandria Segment - (Southbound)					
1	Jefferson Davis Hwy & Evans Lane	Jefferson Davis Hwy & E.Glebe Rd	28	20	-8
2	Jefferson Davis Hwy & E.Glebe Rd	Jefferson Davis Hwy & Swann Ave	26	23	-4
3	Jefferson Davis Hwy & Swann Ave	Jefferson Davis Hwy & E.Custis Ave	25	26	1

Calibration of Average PM Peak Travel Time - Existing Conditions

Arlington Segment (Southbound Only)					
Segment	From	To	Actual Travel Time in Sec.	Average Model Travel Time in Sec.	Model - Actual
1	Army Navy Drive and S. Eads St.	S. Eads St & 12th St.	23	34	11
2	S. Eads St & 12th St.	S. Bell St & 15th St.S	90	93	3
3	S. Bell St & 15th St.S	S. Bell St & 18th St.S	58	46	-12
4	S. Bell St & 18th St.S	S.Bell St. and S.Clark St. and 20th St. S	85	101	16
5	S.Bell St. and S.Clark St. and 20th St. S	S. Clark St. and 23rd St. S	130	128	-2

Alexandria Segment - (Northbound)					
Segment	From	To	Actual Travel Time in Sec.	Average Model Travel Time in Sec.	Model - Actual
1	Jefferson Davis Hwy & E. Custis Ave	Jefferson Davis Hwy & Swann Ave	24	26	2
2	Jefferson Davis Hwy & Swann Ave	Jefferson Davis Hwy & E.Glebe Rd	46	59	13
3	Jefferson Davis Hwy & E.Glebe Rd	Jefferson Davis Hwy & Evans Ln	34	47	13
Alexandria Segment - (Southbound)					
1	Jefferson Davis Hwy & Evans Lane	Jefferson Davis Hwy & E.Glebe Rd	31	33	2
2	Jefferson Davis Hwy & E.Glebe Rd	Jefferson Davis Hwy & Swann Ave	24	25	1
3	Jefferson Davis Hwy & Swann Ave	Jefferson Davis Hwy & E.Custis Ave	23	35	12

Appendix D
Traffic Growth Projection Tables

Trip Table and Network Assignment Outputs For Use in Development of Traffic Growth Figures

Background

The Documented CE must present the effects of proposed transit service on traffic operations within the project corridor.

The traffic analysis focuses on effects at 14 key intersections along the corridor. The major products of the traffic simulation will be estimates of delays and/or levels of service (LOS) at each key intersection for the baseline and “build” scenarios in 2015 and 2030.

For most of the key intersections, current count data is available. At a few of the intersections—specifically those that are scheduled to be reconfigured during the next several years--“data” consists of projected turning movements for 2010.

Methodology

This memo outlines the steps taken to complete two tasks of analyzing the traffic volumes within the project corridor and analyzing the turning movements that occur at intersections along the corridor.

The DMJM Harris ITS group is developing a model of the current traffic conditions in the corridor that will be used mainly for calibration. Once the model accurately reflects current conditions, it may be adjusted to approximate conditions in 2015 and 2030.

The 2005 model makes use of existing turning movement counts and signal timing data, all of which are available at ten of the key intersections. At the four remaining intersections:

- 33rd Street/Crystal Drive/Route 1,
- South Glebe Rd./Potomac Ave.,
- Route1/Swann Ave., and
- Route 1/Potomac Ave.,

all of which are either under construction or to be reconfigured during development of Potomac Yard, projections from traffic impact studies will be used in place of actual counts.

Making use of the network assignment information provided by AECOM Consult, DMJM Harris will adjust the 2010 turning movement projections at these locations to reflect 2005 traffic levels. This will require calculation of 2005 to 2010 growth factors for relevant roadway links and applying them (in reverse) to the 2010 projections.

2015 and 2030 build conditions

Again, using the traffic network assignment information, DMJM Harris will develop growth factors for 2005 to 2010, 2010 to 2020, and 2020 to 2030 for all of the roadway links in the corridor that are adjacent to the key nodes or intersections. In collaboration, the project team will consider the changes in traffic volumes along the links and apply appropriate growth factors to the intersection turning movements to approximate 2015 and 2030 conditions.

The network assignment data is based on the COG regional model, and assumes that a new Metrorail station will be in place by 2020. It is anticipated that the new station will have an appreciable impact upon traffic patterns in the corridor, and special care will be needed in estimating the 2015 traffic volumes. They will likely not be a direct interpolation between 2010 and 2020 projections. The estimated growth in transit trips (based on the trip tables provided by AECOM) in the 2010 to 2020 timeframe is used as a factor in judging the appropriate rate of change in traffic volumes.

Traffic Volumes

This work was completed using the traffic assignment model from the COG. These data were for the year 2005, and projected for the years 2010, 2020, and 2030. The initial step included determining available trip assignment data relevant to the 14 key intersections under study. This was accomplished by identifying each of the 14 intersections on the COG trip assignment maps and determining whether a corresponding node was available at that location. At that point, the links associated with that node could be analyzed based on the total volume. Total volume was used since peak directional activity could not be determined based on trip assignment data.

Once the total volume for each node was determined for each analysis year, a rate of growth for that node could be calculated. This was completed for both the AM and PK peak periods.

Once this effort was completed, it became apparent that using an overall rate of growth for the entire corridor would be disingenuous given the wide range of growth rates predicted due in part to differences in development and differences in travel related to expansion of the Metrorail system. Thus, the intersections along the corridor were split into two groups based on their rates of growth. Interestingly, these closely matched the political jurisdiction separation of the corridor, but not exactly. The two groups are:

- Group A: Intersections 1 to 8
- Group B: Intersections 9 to 14

Group A: the growth rate of this group excluded intersection # 2 which reacted in a manner inconsistent with surrounding roadways. This Group A is based on existing data when available for 2005, but COG for projections. Intersections 1, 3, 4, 5, 6, and 7 are included in this analysis.

The rates of growth differed for the a.m. and p.m. periods. Also, for the 2015 a.m. and p.m. periods, intersection 1 data were not included in the rate of growth calculations given the anomalous projections for the 2015 year received. For the a.m., the rate of growth was determined to be 6% for 2005 to 2015 and 9% for 2005 to 2030; while for the p.m., the rates were 8% for 2005 to 2015 and 10% for 2005 to 2030.

Group B: the growth rate for this group included intersections 12 and 14 as representative nodes which included data for 2005.

The rates of growth differed for the a.m. and p.m. periods. For the a.m., the rate of growth was determined to be 15% for 2005 to 2015 and 17% for 2005 to 2030; while for the p.m., the rates were 13% for 2005 to 2015 and 9% for 2005 to 2030.

The 2015 projected number was determined by taking half the projected rate of growth for 2010 and 2020 for Group A and using the 2010 rate of growth for Group B since most of the development in this area would occur prior to 2015.

Intersection Analysis

The analysis of intersection growth used data from Wells Associates reports which included years 2016 (used for 2015) and 2010 for some intersections located within the study area. Also used were base year 2005 counts and the rates of growth from the traffic volume analysis explained above.

The same groups were continued through the intersection analysis.

For Group A: No data were available for intersections 3 and 4. For intersections 1, 2, 5, and 6, the 2005 turning movement data were factored up using the rates of growth for 2015 and 2030. For intersections 7 and 8, where projections from Wells Associates were available, those turning movements were used and factored down to replicate 2005 data, then factored up to 2030 rate of growth as derived from COG data.

For Group B: Group B projections make use of current traffic counts for 2005 for all but intersection 13. Because of the expected growth in this area and the reconfiguration of intersections, Wells Associates 2016 turning movement projections were used for the 2015 scenario for intersections 10, 11, 12, and 13. To factor these intersections from 2015 to 2030, a yearly growth factor of 1% was applied. (This was considered a prudent compromise between growth in trips for TAZs in Potomac Yard of some 40% and the growth in network assignments which remains flat between 2015 and 2030.) The modest growth factors derived from the COG network were used for intersections 9 and 14 because they are not in the redevelopment areas and are not assumed to be reconfigured in the forecast years. At intersection 13, the Wells Associates 2016 turning movement projections were also factored down by 38% to obtain the 2005 counts. This factor was the result of analyzing the growth rate between 2005 and 2015 at intersections 10, 11 and 12.

Results

This traffic volume and intersection turning movement analysis resulted in a.m. and p.m. peak period growth rate outputs needed for the modeling effort. These growth rate tables are attached below. Shaded areas in the tables indicate figures that have been estimated through this methodology, while the unshaded areas include figures derived from traffic counts or recent studies by others.

AM Peak Hour

Intersection 1	Leg	Turn	Year			Estimates	Estimates
			From Counts Base 2005	From Wells 2010 Proj.	From Wells 2016 Proj.		
Leg 1		Left Turn	46			49	51
		Right Turn	348			369	381
		Through	370			392	405
Leg 2		Left Turn	14			15	16
		Right Turn	14			15	16
		Through	334			354	366
Leg 3		Left Turn	130			138	143
		Right Turn	12			13	14
		Through	198			210	217
Leg 4		Left Turn	384			407	421
		Right Turn	274			290	300
		Through	382			405	419

Intersection 2	Leg	Turn	Year			Estimates	Estimates
			From Counts Base 2005	From Wells 2010 Proj.	From Wells 2016 Proj.		
Leg 1		Left Turn	312			331	342
		Right Turn	0			0	0
		Through	414			439	454
Leg 2		Left Turn	88			94	97
		Right Turn	44			47	49
		Through	0			0	0
Leg 3		Left Turn	0			0	0
		Right Turn	126			134	138
		Through	314			333	344
Leg 4		Left Turn	0			0	0
		Right Turn	0			0	0
		Through	0			0	0

Intersection 3	Leg	Turn	Year			Estimates	Estimates
			From Counts Base 2005	From Wells 2010 Proj.	From Wells 2016 Proj.		
Leg 1		Left Turn	0			0	0
		Right Turn	0			0	0
		Through	0			0	0
Leg 2		Left Turn	32			34	36
		Right Turn	0			0	0
		Through	419			444	459
Leg 3		Left Turn	0			0	0
		Right Turn	0			0	0
		Through	0			0	0
Leg 4		Left Turn	0			0	0
		Right Turn	250			265	274
		Through	564			597	618

Intersection 4	Leg	Turn	Year			Estimates	Estimates
			From Counts Base 2005	From Wells 2010 Proj.	From Wells 2016 Proj.		
Leg 1		Left Turn	204			216	224
		Right Turn	70			75	77
		Through	52			56	57
Leg 2		Left Turn	6			7	7
		Right Turn	0			0	0
		Through	115			122	126
Leg 3		Left Turn	26			28	29
		Right Turn	34			36	38
		Through	0			0	0
Leg 4		Left Turn	0			0	0
		Right Turn	95			101	104
		Through	170			180	187

Intersection 5a S. Bell/20th St.	Leg	Turn	Year			Estimates	Estimates
			Base 2005	2010 Proj.	2016 Proj.		
Leg 1		Left Turn	11			12	13
		Right Turn	44			47	49
		Through	128			136	141
Leg 2		Left Turn	75			80	83
		Right Turn	0			0	0
		Through	113			120	124
Leg 3		Left Turn	0			0	0
		Right Turn	0			0	0
		Through	0			0	0
Leg 4		Left Turn	0			0	0
		Right Turn	8			9	9
		Through	166			176	182

Intersection 5b: Route 1/20th	Leg	Turn	Year			Estimates	Estimates
			Base 2005	2010 Proj.	2016 Proj.		
Leg 1		Left Turn	120			128	132
		Right Turn	0			0	0
		Through	1403			1485	1536
Leg 2		Left Turn	124			132	136
		Right Turn	36			104	108
		Through	0			0	0
Leg 3		Left Turn	0			0	0
		Right Turn	34			36	38
		Through	2170			2297	2375
Leg 4		Left Turn	0			0	0
		Right Turn	0			0	0
		Through	0			0	0

Intersection 6a: S. Clark/23rd	Leg	Turn	Year			Estimates	Estimates
			From Counts Base 2005	From Wells 2010 Proj.	From Wells 2016 Proj.		
Leg 1		Left Turn	44			47	49
		Right Turn	105			112	115
		Through	151			160	166
Leg 2		Left Turn	63			67	69
		Right Turn	0			0	0
		Through	153			162	168
Leg 3		Left Turn	0			0	0
		Right Turn	0			0	0
		Through	0			0	0
Leg 4		Left Turn	0			0	0
		Right Turn	443			469	485
		Through	551			584	603

Intersection 6b: Route 1/23rd	Leg	Turn	Year			Estimates	Estimates
			From Counts Base 2005	From Wells 2010 Proj.	From Wells 2016 Proj.		
Leg 1		Left Turn	554			587	607
		Right Turn	44			47	49
		Through	110			117	121
Leg 2		Left Turn	64			68	71
		Right Turn	60			64	66
		Through	88			94	97
Leg 3		Left Turn	86			172	178
		Right Turn	144			153	200
		Through	1816			314	324
Leg 4		Left Turn	162			172	178
		Right Turn	182			193	200
		Through	296			314	324

Intersection 7a	Leg	Turn	Year			Estimates	Estimates
			From Counts Base 2005	From Wells 2010 Proj.	From Wells 2016 Proj.		
Leg 1		Left Turn	0			0	0
		Right Turn	0			0	0
		Through	0			0	0
Leg 2		Left Turn	0			0	0
		Right Turn	2			2	3
		Through	125		132	132	137
Leg 3		Left Turn	0			0	0
		Right Turn	128		135	135	141
		Through	178		188	188	195
Leg 4		Left Turn	23		24	24	26
		Right Turn	0		0	0	0
		Through	105		111	111	115

Intersection 7b	Leg	Turn	Year			Estimates	Estimates
			From Counts Base 2005	From Wells 2010 Proj.	From Wells 2016 Proj.		
Leg 1		Left Turn	0			0	0
		Right Turn	128		135	135	141
		Through	1306		1382	1382	1430
Leg 2		Left Turn	41		43	43	45
		Right Turn	86		90	90	95
		Through	0		0	0	0
Leg 3		Left Turn	0			0	0
		Right Turn	0			0	0
		Through	2705		2862	2862	2961
Leg 4		Left Turn	0			0	0
		Right Turn	0			0	0
		Through	0			0	0

Intersection 8	Leg	Turn	Year			Estimates	Estimates
			From Counts Base 2005	From Wells 2010 Proj.	From Wells 2016 Proj.		
Leg 1		Left Turn	0			0	0
		Right Turn	99		104	104	109
		Through	252		266	266	276
Leg 2		Left Turn	0			0	0
		Right Turn	0			0	0
		Through	0			0	0
Leg 3		Left Turn	96		101	101	106
		Right Turn	0			0	0
		Through	648		685	685	710
Leg 4		Left Turn	108		114	114	119
		Right Turn	71		75	75	78
		Through	0		0	0	0

AM Peak Hour

Intersection 9		Year			Estimates	
		From Counts Base 2005	From Wells 2010 Proj.	From Wells 2016 Proj.	2015	2030
Leg 1	Left Turn	63	17		73	73
	Right Turn	23	42		27	27
	Through	940	1524		1080	1080
Leg 2	Left Turn	69	14		80	80
	Right Turn	65	12		75	75
	Through	0	2		0	0
Leg 3	Left Turn	11	24		13	13
	Right Turn	137	89		158	158
	Through	1662	2060		1908	1908
Leg 4	Left Turn	23	34		27	27
	Right Turn	0	1		0	0
	Through	20	4		23	23

Intersection 10		Year			Estimates	
		From Counts Base 2005	From Wells 2010 Proj.	From Wells 2016 Proj.	2015	2030
Leg 1	Left Turn	4	180	174	174	201
	Right Turn	36	39	35	35	41
	Through	963	1107	1322	1322	1521
Leg 2	Left Turn	1	11	15	15	18
	Right Turn	5	57	75	75	87
	Through	0	38	27	27	32
Leg 3	Left Turn	158	103	190	190	219
	Right Turn	1	34	37	37	43
	Through	1650	1811	2039	2039	2345
Leg 4	Left Turn	257	180	247	247	285
	Right Turn	188	212	219	219	252
	Through	0	111	65	65	75

Intersection 11		Year			Estimates	
		From Counts Base 2005	From Wells 2010 Proj.	From Wells 2016 Proj.	2015	2030
Leg 1	Left Turn	0	206	80	80	92
	Right Turn	28	35	19	19	22
	Through	1179	1009	1555	1555	1789
Leg 2	Left Turn	0	17	3	3	4
	Right Turn	0	71	32	32	37
	Through	0	0	0	0	0
Leg 3	Left Turn	0	11	9	9	11
	Right Turn	17	49	12	12	14
	Through	1812	694	2210	2210	2542
Leg 4	Left Turn	35	45	59	59	68
	Right Turn	12	8	18	18	21
	Through	0	0	0	0	0

Intersection 12		Year			Estimates	
		From Counts Base 2005	From Wells 2010 Proj.	From Wells 2016 Proj.	2015	2030
Leg 1	Left Turn	0	135	14	14	17
	Right Turn	26	28	21	21	25
	Through	1155	891	1623	1623	1867
Leg 2	Left Turn	0	11	6	6	7
	Right Turn	0	43	36	36	42
	Through	0	7	5	5	6
Leg 3	Left Turn	9	14	7	7	9
	Right Turn	0	33	2	2	3
	Through	1779	1872	2190	2190	2519
Leg 4	Left Turn	41	71	60	60	69
	Right Turn	29	31	35	35	41
	Through	0	22	3	3	4

Intersection 13		Year			Estimates	
		From Counts Base 2005	From Wells 2010 Proj.	From Wells 2016 Proj.	2015	2030
Leg 1	Left Turn	32		42	42	49
	Right Turn	296		392	392	451
	Through	921		1220	1220	1403
Leg 2	Left Turn	605		801	801	922
	Right Turn	275		364	364	419
	Through	0		0	0	0
Leg 3	Left Turn	0		0	0	0
	Right Turn	856		1134	1134	1305
	Through	1286		1704	1704	1960
Leg 4	Left Turn	0		0	0	0
	Right Turn	0		0	0	0
	Through	0		0	0	0

Intersection 14		Year			Estimates	
		From Counts Base 2005	From Wells 2010 Proj.	From Wells 2016 Proj.	2015	2030
Leg 1	Left Turn	0			0	0
	Right Turn	64			74	74
	Through	1498			1720	1720
Leg 2	Left Turn	0			0	0
	Right Turn	0			0	0
	Through	0			0	0
Leg 3	Left Turn	0			0	0
	Right Turn	0			0	0
	Through	1903			2185	2185
Leg 4	Left Turn	66			76	76
	Right Turn	56			65	65
	Through	0			0	0

Route 1 / Hume Ave.		Year			Estimates	
		From Counts Base 2005	From Wells 2010 Proj.	From Wells 2016 Proj.	2015	2030
Leg 1	Left Turn	0			0	0
	Right Turn	11			13	13
	Through	1156			1328	1328
Leg 2	Left Turn	0			0	0
	Right Turn	0			0	0
	Through	0			0	0
Leg 3	Left Turn	10			12	12
	Right Turn	0			0	0
	Through	1837			2109	2109
Leg 4	Left Turn	17			20	20
	Right Turn	23			27	27
	Through	0			0	0

All data from PM Peak traffic assignments

Apply growth factors to total intersection leg volume and then apportion total volumes to different movements through intersection (left, right, through) based on current counts

		Base 2005	Future Year 2010	Growth Base to 2010	Future Year 2020	Growth Future Year 2010 to 2020	Future Year 2015	Growth Future Year 2010 to 2015	Future year 2030	Growth Future Year 2020 to 2030
IN										
Intersection 1	Leg 1 link volume N	0	0	n/a	0	n/a			0	n/a
	leg 2 link volume E	1262	1104	0.87	921	0.83			936	1.02
	Leg 3 link volume S	516	685	1.33	651	0.95			722	1.11
	Leg 4 link volume W	3564	3926	1.10	2948	0.75			3348	1.14
		5342	5715	1.07	4520	0.79			5006	1.11
Intersection 2	Leg 1 link volume	0	0	n/a	0	n/a			0	n/a
	leg 2 link volume	0	0	n/a	0	n/a			0	n/a
	Leg 3 link volume	0	0	n/a	0	n/a			0	n/a
	Leg 4 link volume	0	0	n/a	0	n/a			0	n/a
		0	0	n/a	0	n/a			0	n/a
Intersection 3	Leg 1 link volume	203	224	1.10	226	1.01			240	1.06
	leg 2 link volume	0	0	n/a	0	n/a			0	n/a
	Leg 3 link volume	0	0	n/a	0	n/a			0	n/a
	Leg 4 link volume	0	0	n/a	0	n/a			0	n/a
		203	224	1.10	226	1.01			240	1.06
Intersection 4	Leg 1 link volume	203	224	1.10	226	1.01			240	1.06
	leg 2 link volume	0	0	n/a	0	n/a			0	n/a
	Leg 3 link volume	1528	1898	1.24	1954	1.03			2034	1.04
	Leg 4 link volume	1641	2032	1.24	2066	1.02			2149	1.04
		3372	4154	1.23	4246	1.02			4423	1.04
Intersection 5	Leg 1 link volume	14860	15672	1.05	16338	1.04			16512	1.01
	leg 2 link volume	0	0	n/a	0	n/a			0	n/a
	Leg 3 link volume	14860	15672	1.05	16338	1.04			16512	1.01
	Leg 4 link volume	0	0	n/a	0	n/a			0	n/a
		29720	31344	1.05	32676	1.04			33024	1.01
Intersection 6	Leg 1 link volume	8068	9097	1.13	9563	1.05			10155	1.06
	leg 2 link volume	5261	5526	1.05	5220	0.94			5155	0.99
	Leg 3 link volume	11453	12736	1.11	12852	1.01			13215	1.03
	Leg 4 link volume	2080	2117	1.02	2251	1.06			2399	1.07
		26862	29476	1.10	29886	1.01			30924	1.03
Intersection 7	Leg 1 link volume	14127	14311	1.01	14171	0.99			14230	1.00
	leg 2 link volume	0	0	n/a	0	n/a			0	n/a
	Leg 3 link volume	0	0	n/a	0	n/a			0	n/a
	Leg 4 link volume	0	0	n/a	0	n/a			0	n/a
		14127	14311	1.01	14171	0.99			14230	1.00
Intersection 8	Leg 1 link volume	0	0	n/a	0	n/a			0	n/a
	leg 2 link volume	0	0	n/a	0	n/a			0	n/a
	Leg 3 link volume	0	0	n/a	0	n/a			0	n/a
	Leg 4 link volume	0	0	n/a	0	n/a			0	n/a
		0	0	n/a	0	n/a			0	n/a
Intersection 9	Leg 1 link volume	8145	6918	0.85	6146	0.89			6201	1.01
	leg 2 link volume	0	0	n/a	0	n/a			0	n/a
	Leg 3 link volume	0	0	n/a	0	n/a			0	n/a
	Leg 4 link volume	0	0	n/a	0	n/a			0	n/a
		8145	6918	0.85	6146	0.89			6201	1.01
Intersection 10 ashby	Leg 1 link volume	8145	6918	0.85	6146	0.89			6201	1.01
	leg 2 link volume	10132	10064	0.99	8191	0.81			8293	1.01
	Leg 3 link volume	1876	1951	1.04	1623	0.83			1687	1.04
	Leg 4 link volume	2894	3283	1.13	2320	0.71			2505	1.08
		23047	22216	0.96	18280	0.82			18686	1.02
Intersection 11	Leg 1 link volume	10132	10064	0.99	8191	0.81			8293	1.01
	leg 2 link volume	0	0	n/a	0	n/a			0	n/a
	Leg 3 link volume	0	0	n/a	0	n/a			0	n/a
	Leg 4 link volume	0	0	n/a	0	n/a			0	n/a
		10132	10064	0.99	8191	0.81			8293	1.01
Intersection 12	Leg 1 link volume	10132	10064	0.99	8191	0.81			8293	1.01
	leg 2 link volume	0	3451	n/a	2934	0.85			3434	1.17
	Leg 3 link volume	4023	3854	0.96	2705	0.70			2977	1.10
	Leg 4 link volume	6353	7466	1.18	6670	0.89			6895	1.03
	Leg 5 link volume	1130	1359	1.20	1020	0.75			1266	1.24
		21638	26194	1.21	21520	0.82			22865	1.06
Intersection 13	Leg 1 link volume	6353	7466	1.18	6670	0.89			6895	1.03
	leg 2 link volume	0	0	n/a	0	n/a			0	n/a
	Leg 3 link volume	6353	7466	1.18	6670	0.89			6895	1.03
	Leg 4 link volume	0	0	n/a	0	n/a			0	n/a
		12706	14932	1.18	13340	0.89			13790	1.03
Intersection 14	Leg 1 link volume	9177	9991	1.09	9864	0.99			10081	1.02
	leg 2 link volume	2885	2749	0.95	3165	1.15			3298	1.04
	Leg 3 link volume	11962	12654	1.06	12944	1.02			13352	1.03
	Leg 4 link volume	0	0	n/a	0	n/a			0	n/a
		24024	25394	1.06	25973	1.02			26731	1.03

	Base to 2010			Base to 2020		Base to 2015		Base to 2030	
Group A	79626	85224	1.07	81205	1.09	1.08	87847	1.10	
Group B	45662	51588	1.13	47493	1.04	1.13	49596	1.09	

PM Peak Hour

Intersection	Leg	Turn	Year			Estimates	Estimates	2030
			From Counts Base 2005	From Wells 2010 Proj.	From Wells 2016 Proj.			
Intersection 1	Leg 1	Left Turn	10			11	12	
		Right Turn	166			180	184	
		Through	112			122	124	
	Leg 2	Left Turn	18			20	20	
		Right Turn	340			368	376	
		Through	778			842	859	
	Leg 3	Left Turn	252			273	279	
		Right Turn	12			13	14	
		Through	286			310	316	
	Leg 4	Left Turn	536			580	592	
		Right Turn	246			267	272	
		Through	174			189	192	
Intersection 2	Leg 1	Left Turn	92			100	102	
		Right Turn	0			0	0	
		Through	348			377	384	
	Leg 2	Left Turn	138			150	153	
		Right Turn	132			143	146	
		Through	0			0	0	
	Leg 3	Left Turn	0			0	0	
		Right Turn	80			87	89	
		Through	380			412	420	
	Leg 4	Left Turn	0			0	0	
		Right Turn	0			0	0	
		Through	0			0	0	
Intersection 3	Leg 1	Left Turn	0			0	0	
		Right Turn	0			0	0	
		Through	0			0	0	
	Leg 2	Left Turn	22			24	25	
		Right Turn	0			0	0	
		Through	506			548	559	
	Leg 3	Left Turn	0			0	0	
		Right Turn	0			0	0	
		Through	0			0	0	
	Leg 4	Left Turn	0			0	0	
		Right Turn	200			217	221	
		Through	347			376	383	
Intersection 4	Leg 1	Left Turn	60			65	67	
		Right Turn	124			135	137	
		Through	38			42	42	
	Leg 2	Left Turn	18			20	20	
		Right Turn	286			310	316	
		Through	0			0	0	
	Leg 3	Left Turn	30			33	34	
		Right Turn	26			29	29	
		Through	0			0	0	
	Leg 4	Left Turn	0			0	0	
		Right Turn	42			46	47	
		Through	212			230	234	
Intersection 5a	Leg 1	Left Turn	3			4	4	
		Right Turn	134			145	148	
		Through	139			151	154	
	Leg 2	Left Turn	53			58	59	
		Right Turn	0			0	0	
		Through	321			348	355	
	Leg 3	Left Turn	0			0	0	
		Right Turn	0			0	0	
		Through	0			0	0	
	Leg 4	Left Turn	0			0	0	
		Right Turn	6			7	7	
		Through	114			124	126	
Intersection 5b	Leg 1	Left Turn	0			0	0	
		Right Turn	134			145	148	
		Through	1882			2036	2077	
	Leg 2	Left Turn	53			58	59	
		Right Turn	210			228	232	
		Through	286			310	316	
	Leg 3	Left Turn	0			0	0	
		Right Turn	20			22	23	
		Through	1324			1433	1461	
	Leg 4	Left Turn	0			0	0	
		Right Turn	0			0	0	
		Through	0			0	0	
Intersection 6a	Leg 1	Left Turn	35			38	39	
		Right Turn	195			211	216	
		Through	132			143	146	
	Leg 2	Left Turn	69			75	77	
		Right Turn	0			0	0	
		Through	493			534	544	
	Leg 3	Left Turn	0			0	0	
		Right Turn	0			0	0	
		Through	0			0	0	
	Leg 4	Left Turn	0			0	0	
		Right Turn	120			130	133	
		Through	260			282	287	
Intersection 6b	Leg 1	Left Turn	158			171	175	
		Right Turn	84			91	93	
		Through	1988			2151	2194	
	Leg 2	Left Turn	176			191	195	
		Right Turn	168			182	186	
		Through	290			314	320	
	Leg 3	Left Turn	166			81	82	
		Right Turn	64			275	281	
		Through	1118			171	175	
	Leg 4	Left Turn	74			81	82	
		Right Turn	254			275	281	
		Through	158			171	175	
Intersection 7a	Leg 1	Left Turn	0			0	0	
		Right Turn	0			0	0	
		Through	0			0	0	
	Leg 2	Left Turn	0			0	0	
		Right Turn	7			7	8	
		Through	245		265	265	271	
	Leg 3	Left Turn	0			0	0	
		Right Turn	75		81	81	83	
		Through	114		123	123	126	
	Leg 4	Left Turn	46		49	49	51	
		Right Turn	0		0	0	0	
		Through	72		77	77	80	
Intersection 7b	Leg 1	Left Turn	0			0	0	
		Right Turn	115		124	124	127	
		Through	2352		2544	2544	2595	
	Leg 2	Left Turn	170		183	183	188	
		Right Turn	75		81	81	83	
		Through	0		0	0	0	
	Leg 3	Left Turn	0			0	0	
		Right Turn	2		2	2	3	
		Through	1608		1739	1739	1775	
	Leg 4	Left Turn	0			0	0	
		Right Turn	0			0	0	
		Through	0			0	0	
Intersection 8	Leg 1	Left Turn	0			0	0	
		Right Turn	160		172	172	177	
		Through	476		514	514	526	
	Leg 2	Left Turn	0			0	0	
		Right Turn	0			0	0	
		Through	0			0	0	
	Leg 3	Left Turn	169		182	182	187	
		Right Turn	0		0	0	0	
		Through	277		299	299	306	
	Leg 4	Left Turn	44		47	47	49	
		Right Turn	148		160	160	164	
		Through	0		0	0	0	

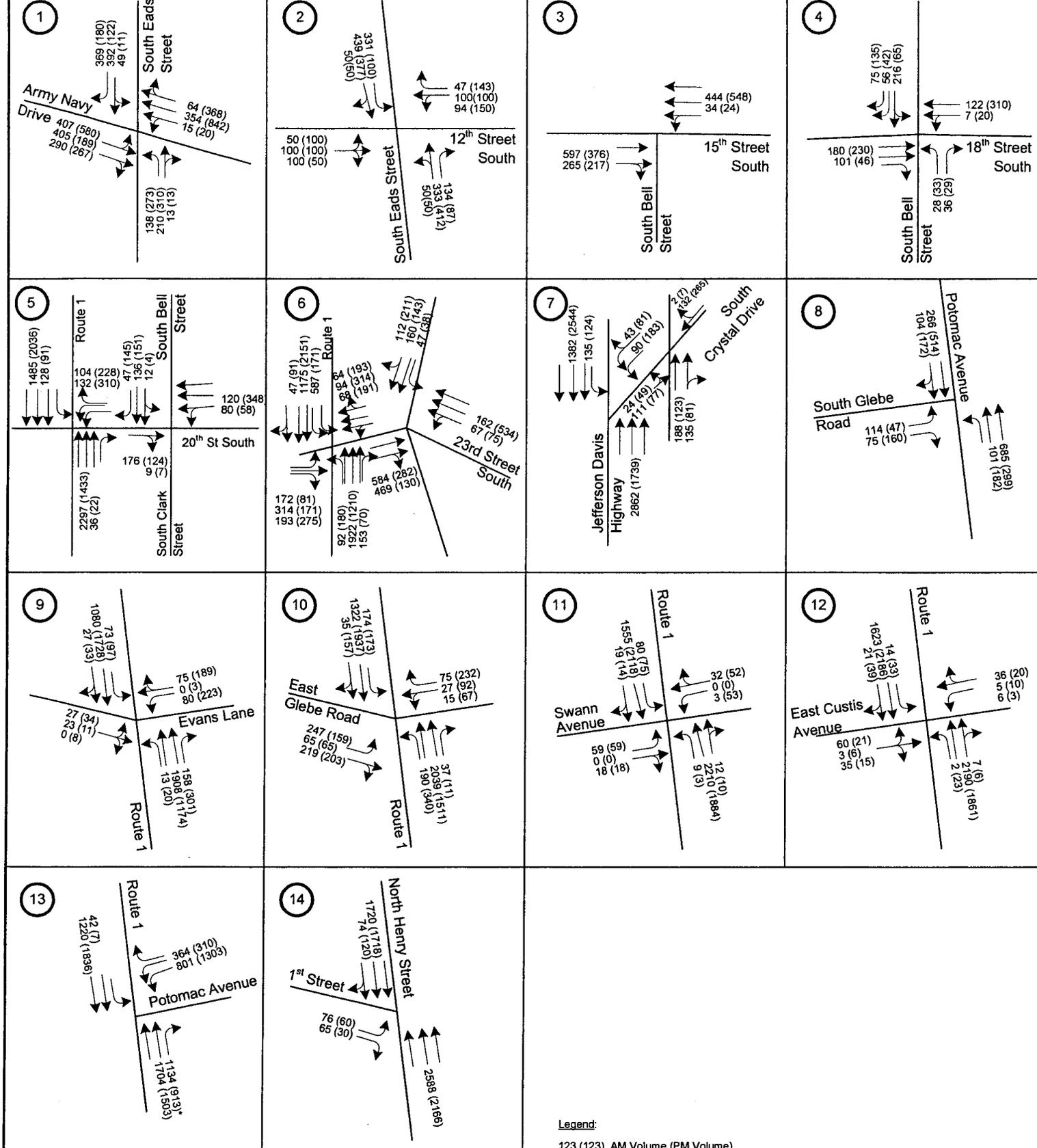
PM Peak Hour

Intersection	Leg	Turn	Year			Estimates	
			From Counts Base 2005	From Wells 2010 Proj.	From Wells 2016 Proj.	2015	2030
Intersection 9	Leg 1	Left Turn	85	42		97	97
		Right Turn	29	67		33	33
		Through	1529	1993		1728	1728
	Leg 2	Left Turn	197	158		223	223
		Right Turn	167	88		189	189
		Through	2	3		3	3
	Leg 3	Left Turn	17	29		20	20
		Right Turn	266	231		301	301
		Through	1039	1368		1174	1174
	Leg 4	Left Turn	30	49		34	34
		Right Turn	7	3		8	8
		Through	9	9		11	11
Intersection 10	Leg 1	Left Turn	6	84	173	173	199
		Right Turn	94	144	157	157	181
		Through	1591	2062	1937	1937	2228
	Leg 2	Left Turn	1	38	67	67	78
		Right Turn	4	196	232	232	267
		Through	2	125	92	92	106
	Leg 3	Left Turn	209	250	340	340	391
		Right Turn	0	16	11	11	13
		Through	1197	1176	1511	1511	1738
	Leg 4	Left Turn	153	125	159	159	183
		Right Turn	159	158	203	203	234
		Through	3	53	65	65	75
Intersection 11	Leg 1	Left Turn	0	111	75	75	87
		Right Turn	12	18	14	14	17
		Through	1646	2044	2118	2118	2436
	Leg 2	Left Turn	0	61	53	53	61
		Right Turn	0	255	52	52	60
		Through	0	0	0	0	0
	Leg 3	Left Turn	6	11	3	3	4
		Right Turn	0	26	10	10	12
		Through	1380	1194	1884	1884	2167
	Leg 4	Left Turn	32	48	59	59	68
		Right Turn	15	14	18	18	21
		Through	0	0	0	0	0
Intersection 12	Leg 1	Left Turn	0	64	33	33	38
		Right Turn	35	57	39	39	45
		Through	1669	2002	2186	2186	2514
	Leg 2	Left Turn	0	38	3	3	4
		Right Turn	0	150	20	20	23
		Through	0	25	10	10	12
	Leg 3	Left Turn	11	27	23	23	27
		Right Turn	0	18	6	6	7
		Through	1329	1161	1861	1861	2141
	Leg 4	Left Turn	24	32	21	21	25
		Right Turn	29	17	15	15	18
		Through	0	11	6	6	7

Intersection	Leg	Turn	Year			Estimates	
			From Counts Base 2005	From Wells 2010 Proj.	From Wells 2016 Proj.	2015	2030
Intersection 13	Leg 1	Left Turn	5		7	7	9
		Right Turn	261		365	365	420
		Through	1311		1836	1836	2112
	Leg 2	Left Turn	931		1303	1303	1499
		Right Turn	222		310	310	357
		Through	0		0	0	0
	Leg 3	Left Turn	0		0	0	0
		Right Turn	652		913	913	1050
		Through	1074		1503	1503	1729
	Leg 4	Left Turn	0		0	0	0
		Right Turn	0		0	0	0
		Through	0		0	0	0

Intersection	Leg	Turn	Year			Estimates	
			From Counts Base 2005	From Wells 2010 Proj.	From Wells 2016 Proj.	2015	2030
Intersection 14	Leg 1	Left Turn	0			0	0
		Right Turn	106			120	120
		Through	1520			1718	1718
	Leg 2	Left Turn	0			0	0
		Right Turn	0			0	0
		Through	0			0	0
	Leg 3	Left Turn	0			0	0
		Right Turn	0			0	0
		Through	1554			1756	1756
	Leg 4	Left Turn	53			60	60
		Right Turn	26			30	30
		Through	0			0	0

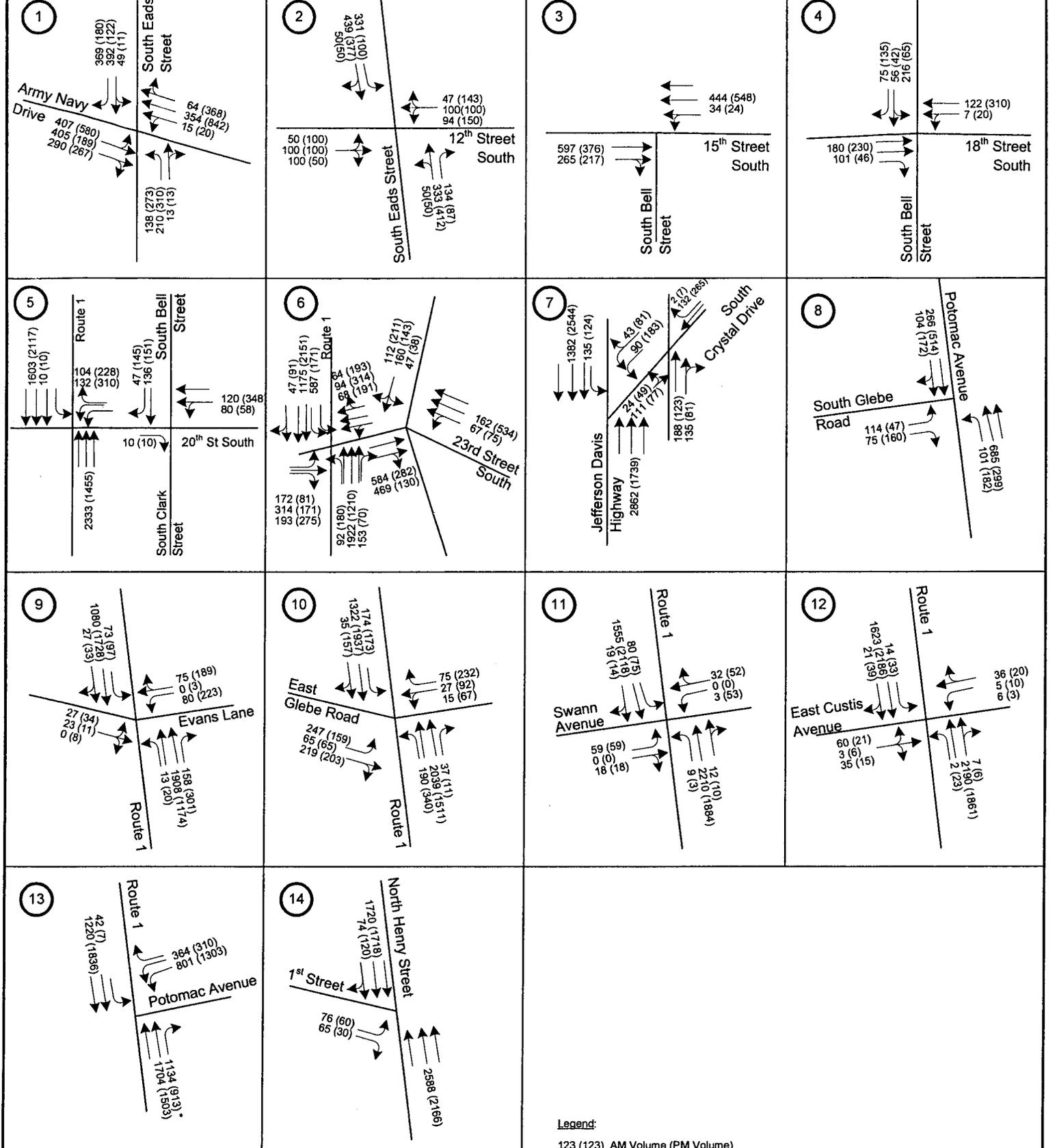
Route 1 / Hume Ave.	Leg	Turn	Year			Estimates	
			From Counts Base 2005	From Wells 2010 Proj.	From Wells 2016 Proj.	2015	2030
Route 1 / Hume Ave.	Leg 1	Left Turn	12			14	14
		Right Turn	0			0	0
		Through	1579			1813	1813
	Leg 2	Left Turn	0			0	0
		Right Turn	0			0	0
		Through	0			0	0
	Leg 3	Left Turn	23			27	27
		Right Turn	0			0	0
		Through	1389			1595	1595
	Leg 4	Left Turn	18			21	21
		Right Turn	14			17	17
		Through	0			0	0



Legend:
 123 (123) AM Volume (PM Volume)
 * Free Right Turn

Figure 2
Future Lane Configurations
And Traffic Volumes – 2015 No Build





Legend:
 123 (123) AM Volume (PM Volume)
 * Free Right Turn

Figure 3

Not to Scale
 September 2006



Crystal City/Potomac Yard Corridor Interim
 Transit Improvements Project

**Future Lane Configurations
 And Traffic Volumes
 2015 Build 1 - Curbside and Build 2 - Median**

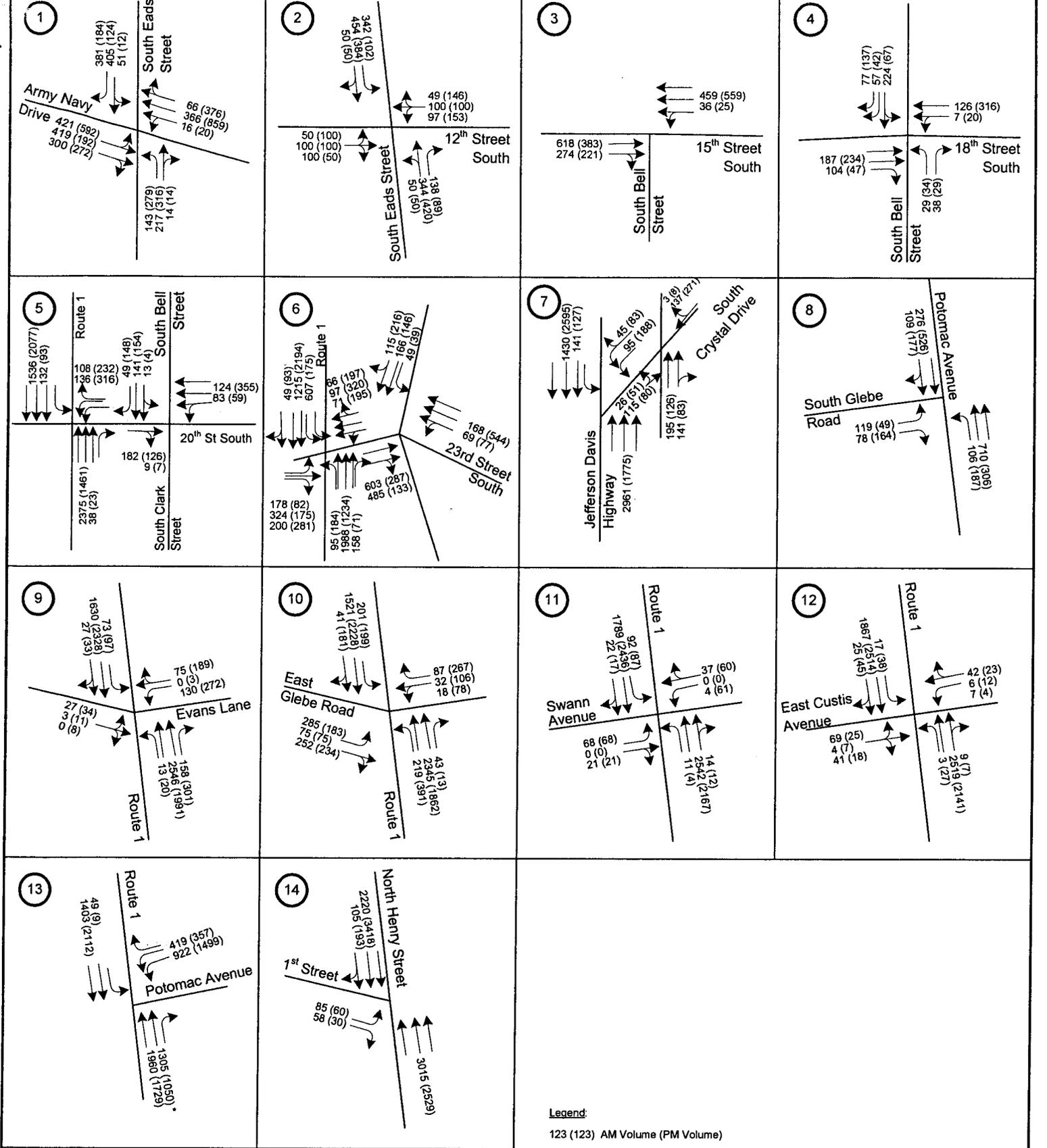


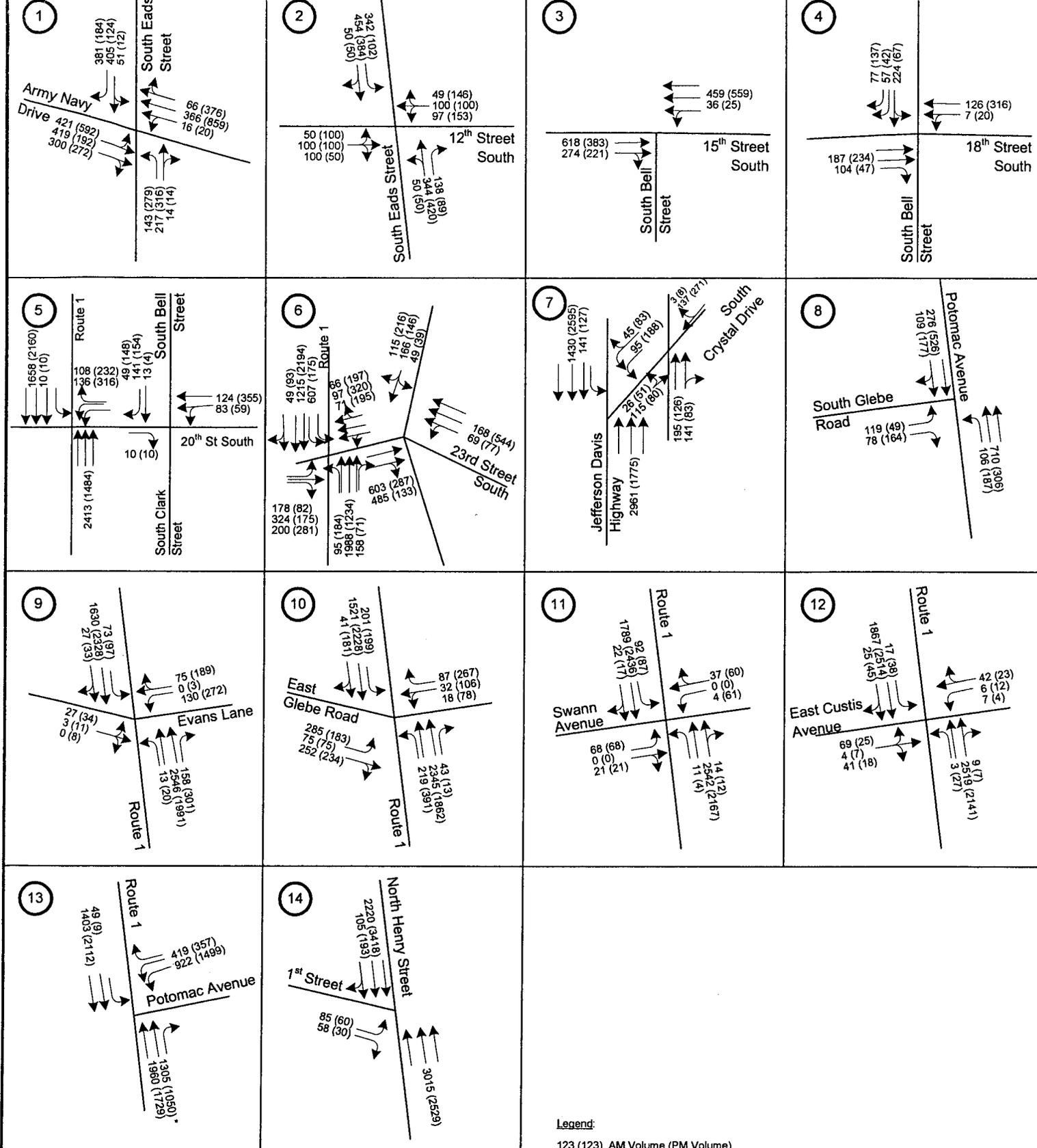
Figure 4

Not to Scale
 September 2006



Crystal City/Potomac Yard Corridor Interim
 Transit Improvements Project

**Future Lane Configurations
 And Traffic Volumes – 2030 No Build**



Legend:
 123 (123) AM Volume (PM Volume)
 * Free Right turn

Figure 5

Not to Scale
 September 2006



Crystal City/Potomac Yard Corridor Interim
 Transit Improvements Project

**Future Lane Configurations
 And Traffic Volumes – 2030 Build**

Appendix E

Simulation Results: Transit Travel Time, Intersection Delay, and LOS

**Total Network Performance for Transit Vehicles
AM Peak Hour**

MOE	Existing	2015 No Build	2015 Build Curbside	2015 Build Median *	2030 No Build	2030 Build
Average delay time per bus (s)	79	307	274	239	265	252
Travel time for buses (NB)		824	871	749	810	741
Travel time for buses (SB)		1016	1051	783	889	730
Total throughput of buses	63	102	137	141	106	141

**Total Network Performance for Transit Vehicles
PM Peak Hour**

MOE	Existing	2015 No Build	2015 Build Curbside	2015 Build Median*	2030 No Build	2030 Build
Average delay time per bus (s)	142	314	277	239	650	287
Travel time for buses (NB)		859	930	696	900	835
Travel time for buses (SB)		1453	1015	856	1611	1005
Total throughput of buses	60	101	133	142	95	141

Travel Time for Transit Buses by Segment (In Seconds) AM Peak Hour

	Segment	Vissim Numbers	Distance Feet	Direction	A	B	C	B-A	C-A	D	E	D-E	
					2015 No Build	2015 Build Curbside	2015 Build Median	2030 No Build	2030 Build Median				
City Of Alexandria - Segment	A	Route 1/N.Henry to Future Potomac Ave/Route 1 (14-13)	1001	2397	NB	177	176	176	-1	-1	142	141	-1
		Route 1/N.Henry to Future Potomac Ave (14-13)	1002	2328	SB	82	83	83	1	1	80	77	-3
	B	Future Potomac Ave./Route 1 to E.Glebe Road (13-10)	1003	3535	NB	210	341	218	131	8	272	278	6
		Future Potomac Ave./Route 1 to E.Glebe Road (13-10)	1004	3477	SB	200	453	185	253	-15	179	175	-4
	C	Route 1/ E.Glebe Road to County Border line	1005	3275	NB	133	133	133	0	0	175	163	-12
		Route 1/ E.Glebe Road to County Border line	1006	3233	SB	125	131	131	7	7	128	122	-6
Arlington County- Segment	D	County border line/S.Glebe Rd to S.Clark St/26 th St.	1007+1008	4004	NB	304	222	222	-82	-82	221	159	-62
	E	S.Clark St/26th St/23rd St to S.Bell/18 th St	1009	2650	SB	471	222	222	-249	-249	333	172	-161
	F	S.Bell St/18th St/15th St/Eads St/12th St/Army Navy Drive	1010+1011	1822	SB	138	162	162	24	24	169	184	15

Note: (1-2-3) = Study intersections as per attached graphics.

Travel Time for Transit Buses by Segment (In Seconds) PM Peak Hour

Segment		Vissim Numbers	Distance Feet	Direction	A	B	C	B-A	C-A	D	E		
					2015 No Build	2015 Build Curbside	2015 Build Median	2030 No Build	2030 Build Median				
City Of Alexandria - Segment	A	Route 1/N.Henry to Future Potomac Ave/Route 1 (14-13)	1001	2397	NB	127	108	108	-19	-19	256	241	-15
		Route 1/N.Henry to Future Potomac Ave (14-13)	1002	2328	SB	82	86	86	4	4	83	86	3
	B	Future Potomac Ave./Route 1 to E.Glebe Road (13-10)	1003	3535	NB	192	436	202	244	10	262	233	-29
		Future Potomac Ave./Route 1 to E.Glebe Road (13-10)	1004	3477	SB	203	370	211	168	8	453	242	-211
	C	Route 1/ E.Glebe Road to County Border line	1005	3275	NB	148	149	149	2	2	184	145	-39
		Route 1/ E.Glebe Road to County Border line	1006	3233	SB	131	125	125	-7	-7	167	156	-11
Arlington County- Segment	D	County border line/S.Glebe Rd to S.Clark St/26 th St.	1007+1008	4004	NB	392	237	237	-156	-156	199	215	17
	E	S.Clark St/26th St/23rd St to S.Bell/18 th St	1009	2650	SB	843	272	272	-572	-572	654	268	-385
	F	S.Bell St/18th St/15th St/Eads St/12th St/Army Navy Drive	1010+1011	1822	SB	194	164	164	-31	-31	255	252	-3

Note: (1-2-3) = Study intersections as per attached graphics.

**2015 Traffic Analysis
Intersection Level of Service and Average Delay
AM Peak Hour**

			Existing 2005		2015 No Build		2015 Build -1(Curbside)		2015 Build -2(Median) ⁴	
			Control Delay ^{1 and 2} (Second/vehicle)	LOS ³	Control Delay ^{1 and 2} (Second/vehicle)	LOS ³	Control Delay ^{1 and 2} (Second/vehicle)	LOS ³	Control Delay ^{1 and 2} (Second/vehicle)	LOS ³
Arlington County	1	Army Drive and S. Eads St.	47.1	D	70.2	E	63.0	E	69.2	E
	2	12th St. and S.Eads St.	6.3	A	23.9	C	27.1	C	28.8	C
	3	S.Bell St. and 15th St. S	2.0	A	2.0	A	9.5	A	9.6	A
	4	S.Bell St. and 18th St. S	15.2	B	17.8	B	27.0	C	27.7	C
	5	S. Bell St. and S.Clark St. and 20th St. S	15.0	B	19.1	B	20.6	C	26.3	C
	6	S.Clark St. and 23rd St.S	26.8	C	70.8	E	33.5	C	33.3	C
	7	33rd St./Crystal Dr. and Jefferson Davis Highway	-	-	19.1	B	36.3	D	36.6	D
	8	S.Glebe Rd. and Potomac Ave.(under construction)	-	-	5.8	A	16.5	B	22.0	C
City Of Alexandria	9	Route 1 and Evans Lane	6.1	A	5.5	A	10.9	B	9.2	A
	10	Route 1 and E.Glebe Rd.	15.8	B	17.4	B	49.3	D	42.8	D
	11	Route 1 and Swann Ave	6.9	A	6.8	A	13.1	B	6.8	A
	12	Route 1 and E.Custis Ave.	3.1	A	9.9	A	13.4	B	5.9	A
	13	Roue 1 and Potomac Ave.(Future Intersection)	-	-	53.7	D	54.4	D	56.9	E
	14	N. Henry St. and 1st St.	3.8	A	5.1	A	4.8	A	3.7	A

Note:

¹ The values reported in this table are of average of 5 runs.

² Control delay is the delay incurred by the control facility. Control delay includes initial deceleration delay, queue move-up time, stopped delay and final acceleration delay.

³ LOS is calculated based on the HCM 2000 methodology.

⁴ 2015 Build Median Alternative includes curbside bus operation in Arlington County and median bus operation along Route-1 intersection (10 -13) in City of Alexandria

**2015 Traffic Analysis
Intersection Level of Service and Average Delay
PM Peak Hour**

			Existing 2005		2015 No Build		2015 Build -1(Curbside)		2015 Build -2(Median) ⁴	
			Control Delay ^{1 and 2} (Second/vehicle)	LOS ³	Control Delay ^{1 and 2} (Second/vehicle)	LOS ³	Control Delay ^{1 and 2} (Second/vehicle)	LOS ³	Control Delay ^{1 and 2} (Second/vehicle)	LOS ³
Arlington County	1	Army Drive and S. Eads St.	64.6	E	61.3	E	69.7	E	68.5	E
	2	12th St. and S.Eads St.	3.7	A	16.8	B	25.7	C	24.7	C
	3	S.Bell St. and 15th St. S	2.0	A	2.0	A	2.2	A	2.5	A
	4	S.Bell St. and 18th St. S	5.9	A	11.6	B	24.7	C	25.0	C
	5	S. Bell St. and S.Clark St. and 20th St. S	41.0	D	48.8	D	17.8	B	22.8	C
	6	S.Clark St. and 23rd St.S	33.0	C	74.0	E	55.4	E	56.2	E
	7	33rd St./Crystal Dr. and Jefferson Davis Highway	-	-	57.1	E	63.8	E	60.0	E
	8	S.Glebe Rd. and Potomac Ave.(under construction)	-	-	2.7	A	18.3	B	23.5	C
City Of Alexandria	9	Route 1 and Evans Lane	15.2	B	19.4	B	26.8	C	23.2	C
	10	Route 1 and E.Glebe Rd.	23.3	C	23.5	C	30.3	C	27.3	C
	11	Route 1 and Swann Ave	2.9	A	6.2	A	16.0	B	4.8	A
	12	Route 1 and E.Custis Ave.	1.8	A	3.7	A	11.7	B	7.1	A
	13	Roue 1 and Potomac Ave.(Future Intersection)	-	-	30.9	C	15.0	B	27.0	C
	14	N. Henry St. and 1st St.	1.8	A	3.3	A	2.9	A	2.8	A

Note:

¹ The values reported in this table are of average of 5 runs.

² Control delay is the delay incurred by the control facility. Control delay includes initial deceleration delay, queue move-up time, stopped delay and final acceleration delay.

³ LOS is calculated based on the HCM 2000 methodology.

⁴ 2015 Build Median Alternative includes curbside operation in Arlington County and median bus operation along Route-1 intersection (10 -13) in City of Alexandria

2030 Traffic Analysis
Intersection Level of Service and Average Delay
AM Peak Hour

		Existing 2005		2030 No Build		2030 Build ⁴		
		Control Delay ^{1 and 2} (Second/vehicle)	LOS ³	Control Delay ^{1 and 2} (Second/vehicle)	LOS ³	Control Delay ^{1 and 2} (Second/vehicle)	LOS ³	
Arlington County	1	Army Drive and S. Eads St.	47.1	D	73.1	E	71.9	E
	2	12th St. and S.Eads St.	6.3	A	29.6	C	30.9	C
	3	S.Bell St. and 15th St. S	2.0	A	2.0	A	3.0	A
	4	S.Bell St. and 18th St. S	15.2	B	24.3	C	29.8	C
	5	S. Bell St. and S.Clark St. and 20th St. S	15.0	B	26.0	C	40.4	D
	6	S.Clark St. and 23rd St.S	26.8	C	64.0	E	50.4	D
	7	33rd St./Crystal Dr. and Jefferson Davis Highway	-	-	21.2	C	24.7	C
	8	S.Glebe Rd. and Potomac Ave.(under construction)	-	-	14.6	B	17.2	B
City Of Alexandria	9	Route 1 and Evans Lane	6.1	A	9.6	A	11.8	B
	10	Route 1 and E.Glebe Rd.	15.8	B	23.0	C	54.2	D
	11	Route 1 and Swann Ave	6.9	A	4.8	A	6.4	A
	12	Route 1 and E.Custis Ave.	3.1	A	10.6	B	7.2	A
	13	Roue 1 and Potomac Ave.(Future Intersection)	-	-	39.7	D	39.5	D
	14	N. Henry St. and 1st St.	3.8	A	4.0	A	4.4	A

Note

¹ The values reported in this table are of average of 5 runs.

² Control delay is the delay incurred by the control facility. Control delay includes initial deceleration delay, queue move-up time, stopped delay and final acceleration delay.

³ LOS is calculated based on the HCM 2000 methodology.

⁴ Build Alternative includes curbside bus operation in Arlington County and median bus operation along Route-1 intersection (10 - 13) in City of Alexandria

2030 Traffic Analysis
Intersection Level of Service and Average Delay
PM Peak Hour

			Existing 2005		2030 No Build		2030 Build ⁴	
			Control Delay ^{1 and 2} (Second/vehicle)	LOS ³	Control Delay ^{1 and 2} (Second/vehicle)	LOS ³	Control Delay ^{1 and 2} (Second/vehicle)	LOS ³
Arlington County	1	Army Drive and S. Eads St.	64.6	E	60.0	E	64.1	E
	2	12th St. and S.Eads St.	3.7	A	12.7	B	40.2	D
	3	S.Bell St. and 15th St. S	2.0	A	2.0	A	5.4	A
	4	S.Bell St. and 18th St. S	5.9	A	12.5	B	21.2	C
	5	S. Bell St. and S.Clark St. and 20th St. S	41.0	D	76.3	E	44.4	D
	6	S.Clark St. and 23rd St.S	33.0	C	171.8	F	126.5	F
	7	33rd St./Crystal Dr. and Jefferson Davis Highway	-	-	14.2	B	18.6	B
	8	S.Glebe Rd. and Potomac Ave.(under construction)	-	-	17.0	B	19.5	B
City Of Alexandria	9	Route 1 and Evans Lane	15.2	B	24.5	C	23.6	C
	10	Route 1 and E.Glebe Rd.	23.3	C	28.8	C	37.6	D
	11	Route 1 and Swann Ave	2.9	A	20.2	C	16.3	B
	12	Route 1 and E.Custis Ave.	1.8	A	15.6	B	8.4	A
	13	Roue 1 and Potomac Ave.(Future Intersection)	-	-	47.3	D	48.2	D
	14	N. Henry St. and 1st St.	1.8	A	3.6	A	4.4	A

Note

¹ The values reported in this table are of average of 5 runs.

² Control delay is the delay incurred by the control facility. Control delay includes initial deceleration delay, queue move-up time, stopped delay and final acceleration delay.

³ LOS is calculated based on the HCM 2000 methodology.

⁴ Build Alternative includes curbside bus operation in Arlington County and median bus operation along Route-1 intersection (10 - 13) in City of Alexandria

Level of Service Definitions for Signalized Intersections

<u>Level of Service</u>	<u>Description</u>
A	<i>Level of Service A</i> describes operations with very low delay, up to 10 sec per vehicle. This level of service occurs when progression is extremely favorable, and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.
B	<i>Level of Service B</i> describes operations with delay greater than 10 and up to 20 sec per vehicle. This level generally occurs with good progression, short cycle lengths, or both. More vehicles stop than for LOS A, causing higher levels of average delay.
C	<i>Level Of Service C</i> describes operations with delay greater than 20 and up to 35 sec per vehicle. These higher delays may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear in this level. The number of vehicles stopping is significant at this level, though many still pass though the intersection without stopping.
D	<i>Level of Service D</i> describes operations with delay greater than 35 and up to 55 sec per vehicle. At level D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, longer cycle lengths, or high volume to capacity (v/c) ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable. This level is considered by many agencies to be the limit of acceptable delay.
E	<i>Level of Service E</i> describes operations with delay greater than 55 and up to 80 sec per vehicle. These high delay values generally indicate poor progression, long cycle lengths, and high v/c ratios. Individual cycle failures are frequent occurrences.
F	<i>Level of Service F</i> describes operations with delay in excess of 80 sec per vehicle. This level, considered to be unacceptable to most drivers, often occurs with over saturation, that is, when arrival flow rates exceed the capacity of the intersection. It may also occur at high v/c ratios below 1.0 with many individual cycle failures. Poor progression and cycle lengths may also be major contributing causes to such delay levels.

LEVEL OF SERVICE UNSIGNALIZED INTERSECTIONS

At unsignalized intersections, the criteria used to evaluate the quality of flow is the measure of the adequacy of the number of acceptable gaps in the thru traffic stream for drivers facing a STOP or YIELD condition. Variables affecting the gaps are the distribution or arrival of vehicles in the thru traffic stream, the width of the highway, trucks, grades and the amount of time it requires to enter the traffic stream from a stop position (critical gap size).

As a result, the following criteria has been established:

Level of Service	Average Control Delay	Status
A	0 – 10	Little or no Delay
B	> 10 – 15	Short Traffic Delays
C	> 15 – 25	Average Delays
D	> 25 – 35	Long Delays
E	> 35 – 50	Very Long Delays
F	> 50	Extremely Long Delays with significant queuing and traffic congestion

Appendix F
Intersection Turning Movement Counts

MCV Associates, Inc.
 4605-C Pinecrest Office Park Drive
 Alexandria, VA 22312
 703-914-4850

File Name : us1 evans In sat
 Site Code : 00000033
 Start Date : 05/13/2006
 Page No : 1

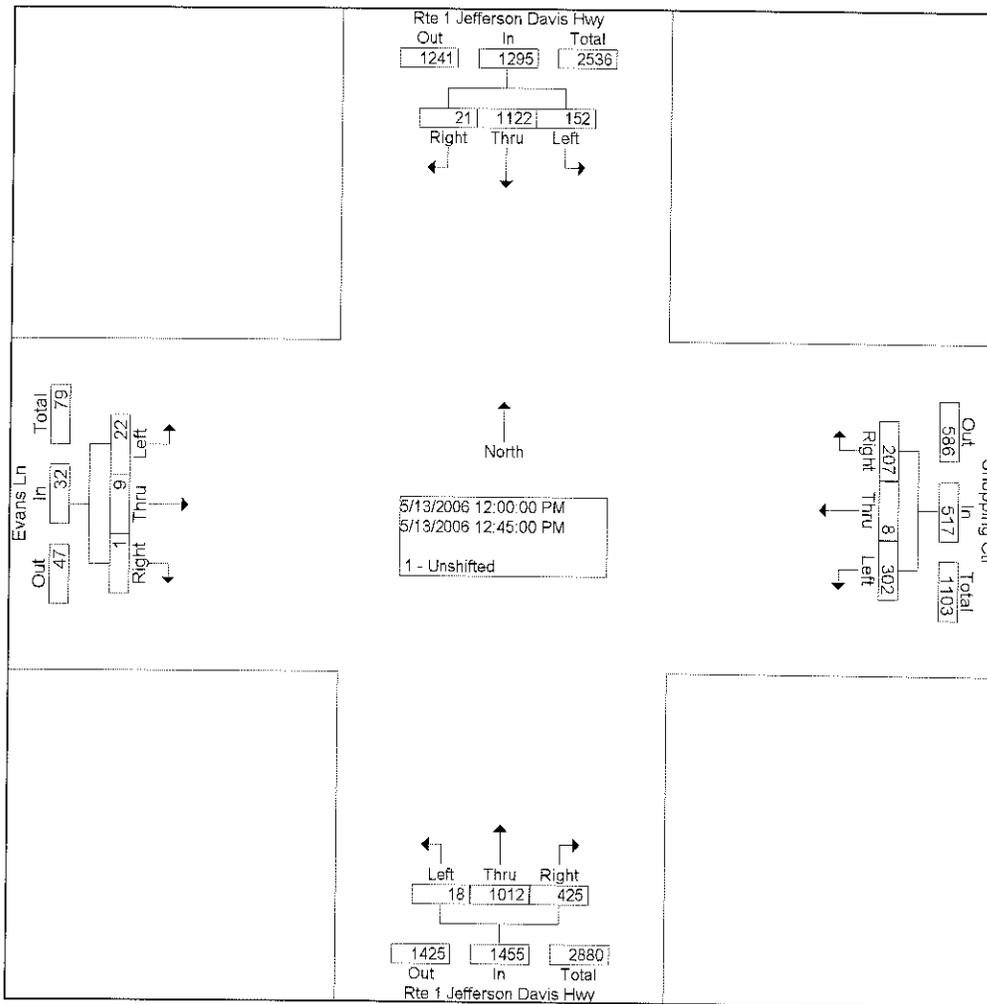
Groups Printed- 1 - Unshifted

Start Time	Rte 1 Jefferson Davis Hwy From North				Shopping Ctr From East				Rte 1 Jefferson Davis Hwy From South				Evans Ln From West				Exclu. Total	Inclu. Total	Int. Total
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds			
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0			
11:00 AM	14	239	12	0	58	0	53	0	7	292	69	0	2	0	4	0	0	750	750
11:15 AM	12	233	2	0	63	2	49	0	1	232	66	0	2	1	0	0	0	663	663
11:30 AM	34	286	2	6	75	1	46	0	4	232	97	0	4	3	4	0	6	788	794
11:45 AM	20	296	6	0	69	2	51	0	3	239	103	0	10	1	0	1	1	800	801
Total	80	1054	22	6	265	5	199	0	15	995	335	0	18	5	8	1	7	3001	3008
12:00 PM	37	245	4	1	64	2	49	1	2	245	118	1	8	2	0	4	7	776	783
12:15 PM	23	306	6	0	80	3	63	3	4	242	99	0	4	1	0	3	6	831	837
12:30 PM	43	279	4	1	74	0	40	0	7	273	110	5	4	4	1	3	9	839	848
12:45 PM	49	292	7	5	84	3	55	0	5	252	98	0	6	2	0	2	7	853	860
Total	152	1122	21	7	302	8	207	4	18	1012	425	6	22	9	1	12	29	3299	3328
Grand Total	232	2176	43	13	567	13	406	4	33	2007	760	6	40	14	9	13	36	6300	6336
Apprch %	9.5	88.8	1.8		57.5	1.3	41.2		1.2	71.7	27.1		63.5	22.2	14.3				
Total %	3.7	34.5	0.7		9.0	0.2	6.4		0.5	31.9	12.1		0.6	0.2	0.1		0.6	99.4	

MCV Associates, Inc.
 4605-C Pinecrest Office Park Drive
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File Name : us1 evans ln sat
 Site Code : 00000033
 Start Date : 05/13/2006
 Page No : 2

Start Time	Rte 1 Jefferson Davis Hwy From North				Shopping Ctr From East				Rte 1 Jefferson Davis Hwy From South				Evans Ln From West				Int. Total			
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total				
Peak Hour From 11:00 AM to 12:45 PM - Peak 1 of 1																				
Intersection	12:00 PM																			
Volume	152	1122	21	1295	302	8	207	517	18	1012	425	1455	22	9	1	32	3299			
Percent	11.7	86.6	1.6		58.4	1.5	40.0		1.2	69.6	29.2		68.8	28.1	3.1					
12:45 Volume	49	292	7	348	84	3	55	142	5	252	98	355	6	2	0	8	853			
Peak Factor	0.967																			
High Int.	12:45 PM																			
Volume	49	292	7	348	80	3	63	146	7	273	110	390	8	2	0	10				
Peak Factor	0.930								0.885								0.800			



MCV Associates, Inc.
 4605-C Pinecrest Office Park Drive
 Alexandria, VA 22312
 703-914-4850

File Name : us1gleberd sat
 Site Code : 00000011
 Start Date : 05/13/2006
 Page No : 1

Groups Printed- 1 - Unshifted

Start Time	Rt1 Jefferson Davis Hwy From North				E Glebe Road From East				Rt1 Jefferson Davis Hwy From South				E Glebe Road From West				Exclu. Total	Inclu. Total	Int. Total
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds			
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0			
11:00 AM	1	242	23	0	0	1	1	0	46	293	0	2	57	6	37	2	4	707	711
11:15 AM	1	327	27	4	0	0	0	0	49	298	1	0	40	1	27	0	4	771	775
11:30 AM	3	318	28	6	0	1	1	0	32	294	3	1	41	0	40	1	8	761	769
11:45 AM	1	356	31	5	1	13	5	2	43	301	0	2	56	2	27	1	10	836	846
Total	6	1243	109	15	1	15	7	2	170	1186	4	5	194	9	131	4	26	3075	3101
12:00 PM	4	298	26	6	0	0	1	0	56	315	1	0	51	0	23	3	9	775	784
12:15 PM	0	362	39	2	0	1	1	3	53	310	1	6	51	0	32	4	15	850	865
12:30 PM	2	323	38	2	0	0	0	0	46	286	0	0	45	1	37	0	2	778	780
12:45 PM	1	324	39	1	0	0	2	2	57	287	0	0	48	0	33	0	3	791	794
Total	7	1307	142	11	0	1	4	5	212	1198	2	6	195	1	125	7	29	3194	3223
Grand Total	13	2550	251	26	1	16	11	7	382	2384	6	11	389	10	256	11	55	6269	6324
Apprch %	0.5	90.6	8.9		3.6	57.1	39.3		13.8	86.0	0.2		59.4	1.5	39.1				
Total %	0.2	40.7	4.0		0.0	0.3	0.2		6.1	38.0	0.1		6.2	0.2	4.1		0.9	99.1	

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File Name : us1gleberd sat
 Site Code : 00000011
 Start Date : 05/13/2006
 Page No : 2

Start Time	Rt1 Jefferson Davis Hwy From North				E Glebe Road From East				Rt1 Jefferson Davis Hwy From South				E Glebe Road From West				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour From 11:00 AM to 12:45 PM - Peak 1 of 1																	
Intersection	11:45 AM																
Volume	7	1339	134	1480	1	14	7	22	198	1212	2	1412	203	3	119	325	3239
Percent	0.5	90.5	9.1		4.5	63.6	31.8		14.0	85.8	0.1		62.5	0.9	36.6		
12:15 Volume	0	362	39	401	0	1	1	2	53	310	1	364	51	0	32	83	850
Peak Factor	0.953																
High Int.	12:15 PM				11:45 AM				12:00 PM				11:45 AM				
Volume	0	362	39	401	1	13	5	19	56	315	1	372	56	2	27	85	
Peak Factor	0.923				0.289				0.949				0.956				

MCV Associates, Inc.
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File Name : US1CustisAveSat
 Site Code : 00000000
 Start Date : 05/20/2006
 Page No : 1

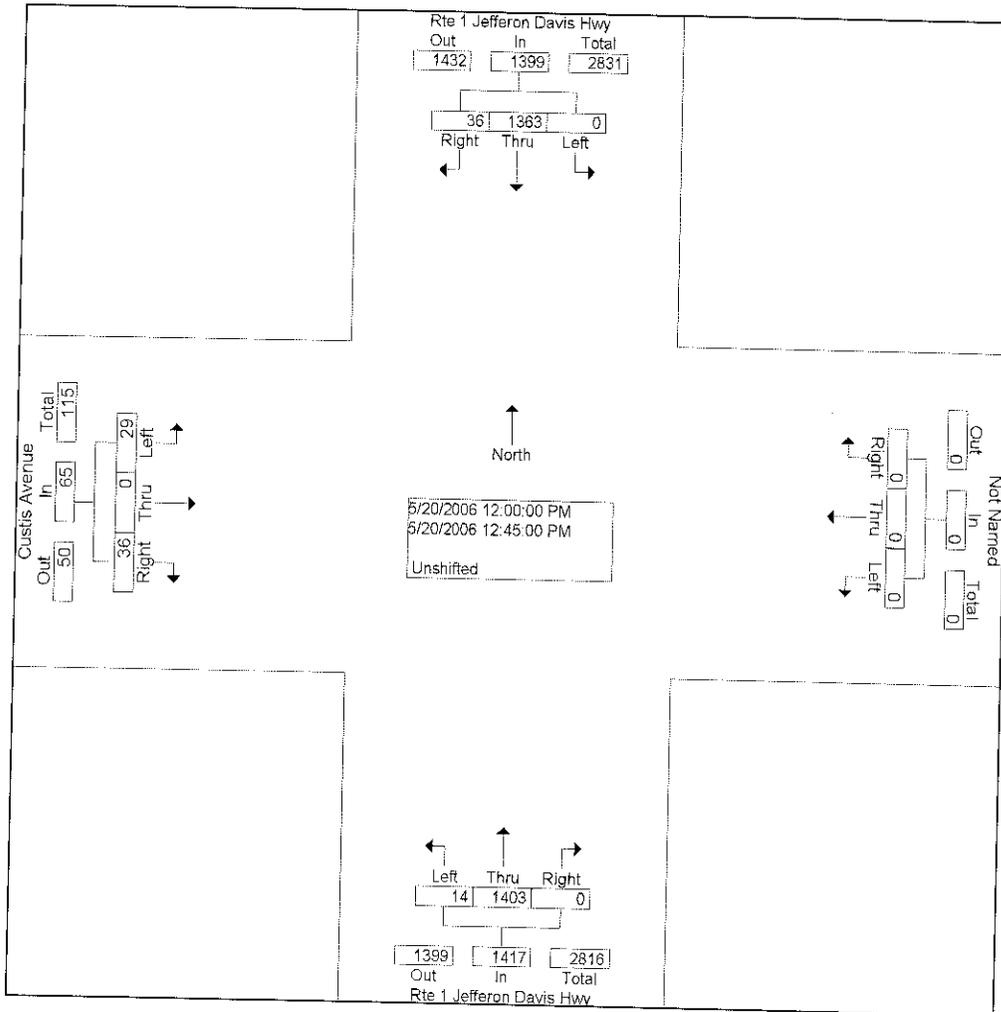
Groups Printed- Unshifted

Start Time	Rte 1 Jefferon Davis Hwy From North				From East				Rte 1 Jefferon Davis Hwy From South				Custis Avenue From West				Exclu. Total	Inclu. Total	Int. Total	
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds				
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0				
11:00 AM	0	302	0	0	0	0	0	0	0	286	0	0	0	0	0	0	0	0	588	588
11:15 AM	0	314	9	0	0	0	0	0	5	272	0	0	6	0	7	2	2	613	615	
11:30 AM	0	320	12	0	0	0	0	0	6	382	0	1	10	0	3	2	3	733	736	
11:45 AM	0	326	12	6	0	0	0	0	1	326	0	1	9	0	10	2	9	684	693	
Total	0	1262	33	6	0	0	0	0	12	1266	0	2	25	0	20	6	14	2618	2632	
12:00 PM	0	322	14	0	0	0	0	0	1	351	0	0	7	0	12	0	0	707	707	
12:15 PM	0	361	7	0	0	0	0	0	4	338	0	0	6	0	10	0	0	726	726	
12:30 PM	0	345	7	1	0	0	0	0	4	349	0	0	10	0	11	0	1	726	727	
12:45 PM	0	335	8	0	0	0	0	0	5	365	0	1	6	0	3	1	2	722	724	
Total	0	1363	36	1	0	0	0	0	14	1403	0	1	29	0	36	1	3	2881	2884	
Grand Total	0	2625	69	7	0	0	0	0	26	2669	0	3	54	0	56	7	17	5499	5516	
Apprch %	0.0	97.4	2.6		0.0	0.0	0.0		1.0	99.0	0.0		49.1	0.0	50.9					
Total %	0.0	47.7	1.3		0.0	0.0	0.0		0.5	48.5	0.0		1.0	0.0	1.0		0.3	99.7		

MCV Associates, Inc.
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File Name : US1CustisAveSat
 Site Code : 00000000
 Start Date : 05/20/2006
 Page No : 2

Start Time	Rte 1 Jefferson Davis Hwy From North				From East				Rte 1 Jefferson Davis Hwy From South				Custis Avenue From West				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour From Intersection	11:00 AM to 12:45 PM - Peak 1 of 1																
Volume	0	1363	36	1399	0	0	0	0	14	1403	0	1417	29	0	36	65	2881
Percent	0.0	97.4	2.6		0.0	0.0	0.0		1.0	99.0	0.0		44.6	0.0	55.4		
12:30 Volume	0	345	7	352	0	0	0	0	4	349	0	353	10	0	11	21	726
Peak Factor	0.950																
High Int.	12:15 PM																
Volume	0	361	7	368	0	0	0	0	5	365	0	370	10	0	11	21	0.992
Peak Factor	0.957																
	10:45:00 AM																
	12:45 PM																
	12:30 PM																
	0.774																



MCV Associates, Inc.
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File Name : henry1stsat
 Site Code : 00000095
 Start Date : 05/13/2006
 Page No : 1

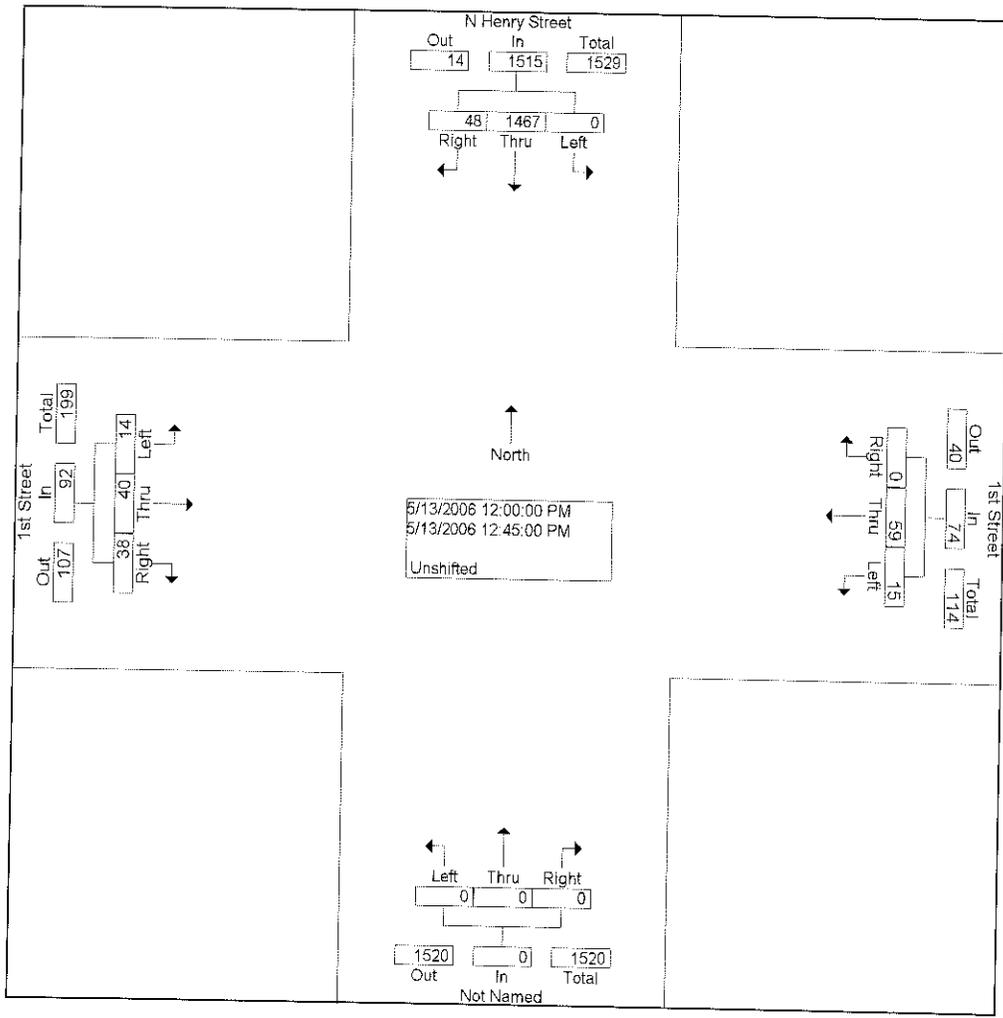
Groups Printed- Unshifted

Start Time	N Henry Street From North				1st Street From East				From South				1st Street From West				Exclu. Total	Inclu. Total	Int. Total	
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds				
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0				
11:00 AM	0	260	8	0	7	8	0	0	0	0	0	0	1	0	10	5	0	1	298	299
11:15 AM	0	341	7	1	3	10	0	0	0	0	0	0	0	1	6	6	1	2	374	376
11:30 AM	0	316	11	0	3	6	0	0	0	0	0	0	0	4	3	3	0	0	346	346
11:45 AM	0	284	13	0	4	7	0	0	0	0	0	0	0	5	2	8	0	0	323	323
Total	0	1201	39	1	17	31	0	0	0	0	0	0	1	10	21	22	1	3	1341	1344
12:00 PM	0	349	10	0	5	12	0	1	0	0	0	0	0	8	3	7	1	2	394	396
12:15 PM	0	379	9	1	4	11	0	0	0	0	0	0	5	3	6	4	0	6	416	422
12:30 PM	0	382	10	1	1	16	0	1	0	0	0	0	5	1	14	19	5	12	443	455
12:45 PM	0	357	19	4	5	20	0	1	0	0	0	0	0	2	17	8	3	8	428	436
Total	0	1467	48	6	15	59	0	3	0	0	0	0	10	14	40	38	9	28	1681	1709
Grand Total	0	2668	87	7	32	90	0	3	0	0	0	11	24	61	60	10		31	3022	3053
Apprch %	0.0	96.8	3.2		26.2	73.8	0.0		0.0	0.0	0.0		16.6	42.1	41.4					
Total %	0.0	88.3	2.9		1.1	3.0	0.0		0.0	0.0	0.0		0.8	2.0	2.0			1.0	99.0	

MCV Associates, Inc.
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 703-914-4850

File Name : henry1stsat
 Site Code : 00000095
 Start Date : 05/13/2006
 Page No : 2

Start Time	N Henry Street From North				1st Street From East				From South				1st Street From West				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour From 11:00 AM to 12:45 PM - Peak 1 of 1																	
Intersection 12:00 PM	0	1467	48	1515	15	59	0	74	0	0	0	0	14	40	38	92	1681
Volume	0.0	96.8	3.2		20.3	79.7	0.0		0.0	0.0	0.0		15.2	43.5	41.3		
Percent	0	382	10	392	1	16	0	17	0	0	0	0	1	14	19	34	443
12:30 Volume																	
Peak Factor																	
High Int. 12:30 PM					12:45 PM				10:45:00 AM				12:30 PM				0.949
Volume	0	382	10	392	5	20	0	25	0	0	0	0	1	14	19	34	
Peak Factor	0.966				0.740								0.676				



MCV Associates, Inc.
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File Name : us1 at evans ln
 Site Code : 00000000
 Start Date : 05/11/2006
 Page No : 1

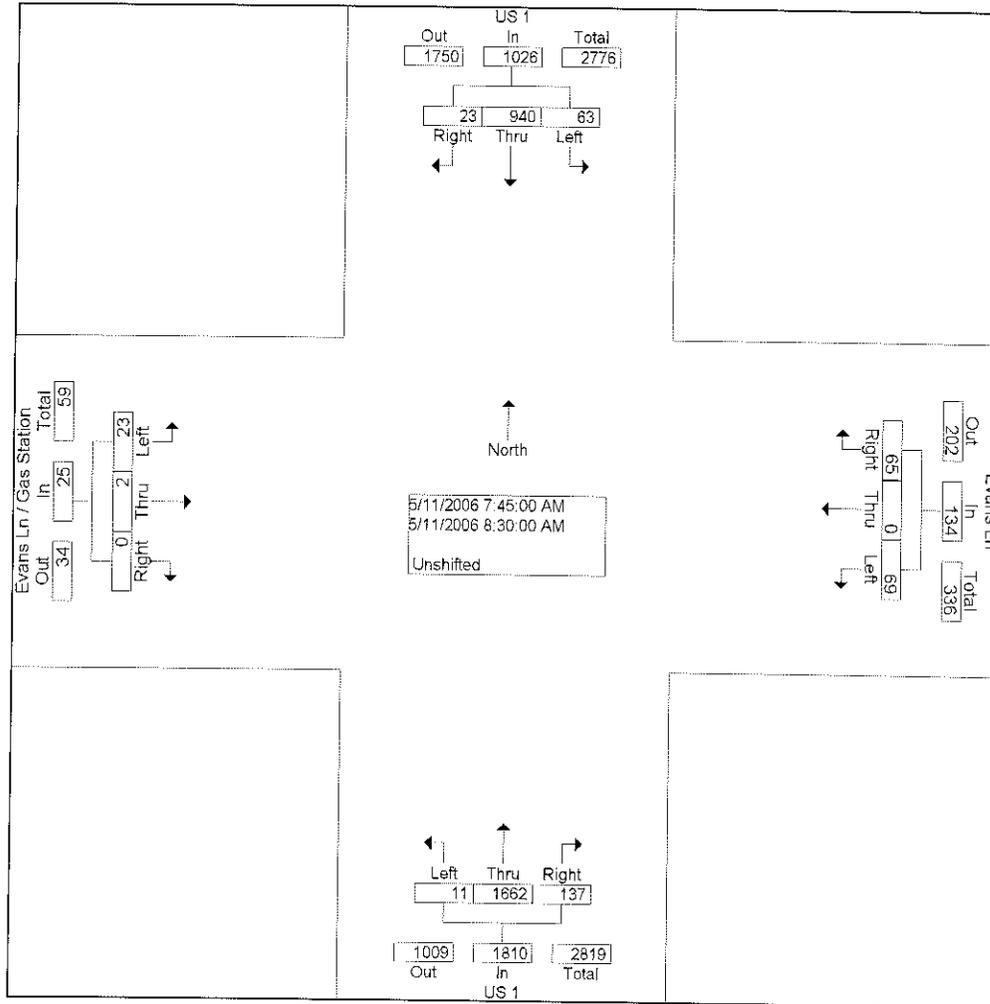
Groups Printed- Unshifted

Start Time	US 1 From North				Evans Ln From East				US 1 From South				Evans Ln / Gas Station From West				Exclu. Total	Inclu. Total	Int. Total
	Left	Thru	Righ t	Ped s	Left	Thru	Righ t	Ped s	Left	Thru	Righ t	Ped s	Left	Thru	Righ t	Ped s			
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0			
07:00 AM	13	159	4	0	7	0	11	0	3	381	23	0	3	2	0	0	0	606	606
07:15 AM	12	192	8	0	10	0	14	0	3	404	28	0	3	2	1	0	0	677	677
07:30 AM	16	193	0	0	17	0	17	0	1	449	24	0	5	0	0	0	0	722	722
07:45 AM	10	219	4	0	15	0	17	0	4	397	34	0	3	1	0	0	0	704	704
Total	51	763	16	0	49	0	59	0	11	1631	109	0	14	5	1	0	0	2709	2709
08:00 AM	20	243	6	0	13	0	18	0	4	426	39	0	8	1	0	0	0	778	778
08:15 AM	16	233	8	0	14	0	13	0	1	423	31	0	7	0	0	0	0	746	746
08:30 AM	17	245	5	0	27	0	17	0	2	416	33	0	5	0	0	0	0	767	767
08:45 AM	17	253	5	0	24	0	25	0	3	318	42	0	4	0	3	0	0	694	694
Total	70	974	24	0	78	0	73	0	10	1583	145	0	24	1	3	0	0	2985	2985
*** BREAK ***																			
04:00 PM	14	331	3	0	53	3	28	0	4	188	51	0	9	3	1	0	0	688	688
04:15 PM	13	349	10	0	31	5	14	0	2	207	28	0	8	1	0	0	0	668	668
04:30 PM	28	357	6	0	38	0	33	0	0	230	57	0	8	0	1	0	0	758	758
04:45 PM	14	347	7	0	51	0	29	0	4	229	48	0	9	1	0	0	0	739	739
Total	69	1384	26	0	173	8	104	0	10	854	184	0	34	5	2	0	0	2853	2853
05:00 PM	21	374	13	0	39	0	46	0	4	245	62	0	9	2	1	0	0	816	816
05:15 PM	27	366	7	0	40	2	23	0	5	267	76	0	9	1	1	0	0	824	824
05:30 PM	15	397	3	0	54	0	54	0	3	282	67	0	5	2	2	0	0	884	884
05:45 PM	22	392	6	0	64	0	44	0	5	245	61	0	7	4	3	0	0	853	853
Total	85	1529	29	0	197	2	167	0	17	1039	266	0	30	9	7	0	0	3377	3377
Grand Total	275	4650	95	0	497	10	403	0	48	5107	704	0	102	20	13	0	0	11924	11924
Apprch %	5.5	92.6	1.9		54.6	1.1	44.3		0.8	87.2	12.0		75.6	14.8	9.6				
Total %	2.3	39.0	0.8		4.2	0.1	3.4		0.4	42.8	5.9		0.9	0.2	0.1		0.0	100.0	

MCV Associates, Inc.
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File Name : us1 at evans ln
 Site Code : 00000000
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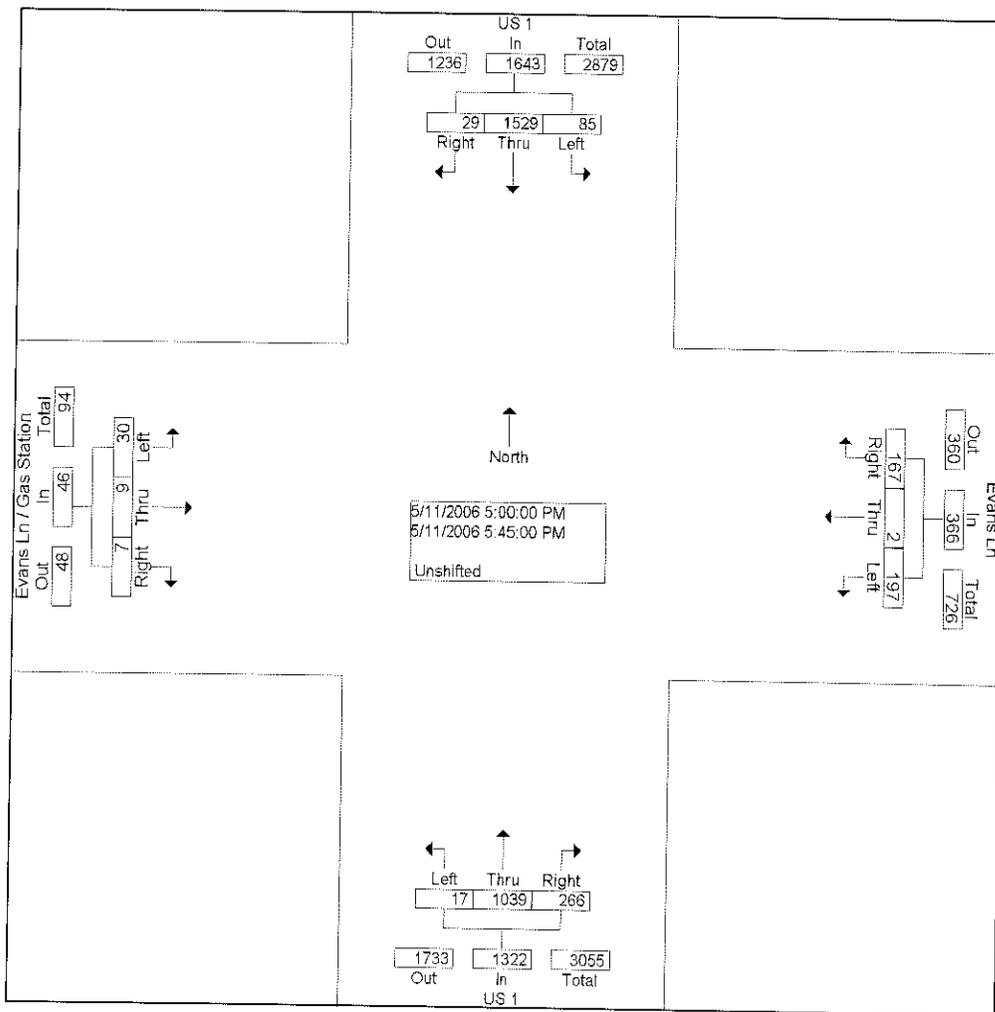
Start Time	US 1 From North				Evans Ln From East				US 1 From South				Evans Ln / Gas Station From West				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Intersection	07:45 AM																
Volume	63	940	23	1026	69	0	65	134	11	1662	137	1810	23	2	0	25	2995
Percent	6.1	91.6	2.2		51.5	0.0	48.5		0.6	91.8	7.6		92.0	8.0	0.0		
08:00	20	243	6	269	13	0	18	31	4	426	39	469	8	1	0	9	778
Peak Factor	0.962																
High Int.	08:00 AM																
Volume	20	243	6	269	27	0	17	44	4	426	39	469	8	1	0	9	778
Peak Factor	0.954				0.761				0.965				0.694				



MCV Associates, Inc.
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File Name : us1 at evans ln
 Site Code : 00000000
 Start Date : 05/11/2006
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Start Time	US 1 From North				Evans Ln From East				US 1 From South				Evans Ln / Gas Station From West				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Intersection 05:00 PM																	
Volume	85	1529	29	1643	197	2	167	366	17	1039	266	1322	30	9	7	46	3377
Percent	5.2	93.1	1.8		53.8	0.5	45.6		1.3	78.6	20.1		65.2	19.6	15.2		
Volume	15	397	3	415	54	0	54	108	3	282	67	352	5	2	2	9	884
Peak Factor																	0.955
High Int. 05:45 PM																	
Volume	22	392	6	420	54	0	54	108	3	282	67	352	7	4	3	14	
Peak Factor																	0.821



Intersection Pedestrians Summary

Date: 5/11/2006

Int: US 1 at Evans Ln

Time	North Leg		South Leg		East Leg		West Leg		Total
	EB	WB	EB	WB	NB	SB	NB	SB	
7:00 - 7:15	3	0	0	0	6	0	0	0	9
7:15 - 7:30	0	0	0	0	4	0	0	0	4
7:30 - 7:45	2	0	0	0	2	0	0	0	4
7:45 - 8:00	1	0	0	0	3	0	0	2	6
8:00 - 8:15	0	0	0	0	0	0	0	1	1
8:15 - 8:30	0	0	0	0	0	0	0	0	0
8:30 - 8:45	1	0	1	0	0	0	0	0	2
8:45 - 9:00	0	0	0	0	0	0	0	0	0
PM									
4:00 - 4:15	1	1	1	0	1	1	0	0	5
4:15 - 4:30	1	0	0	0	0	0	0	3	4
4:30 - 4:45	0	0	0	0	0	1	0	0	1
4:45 - 5:00	0	0	0	0	0	0	0	0	0
5:00 - 5:15	0	0	0	0	0	0	0	0	0
5:15 - 5:30	0	2	0	0	0	0	0	0	2
5:30 - 5:45	0	0	1	0	0	2	0	0	3
5:45 - 6:00	0	0	0	0	0	0	0	0	0
Total	9	3	3	0	16	4	0	6	41

MCV Associates, Inc.
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File Name : us1 at e glebe rd
 Site Code : 00000000
 Start Date : 05/10/2006
 Page No : 1

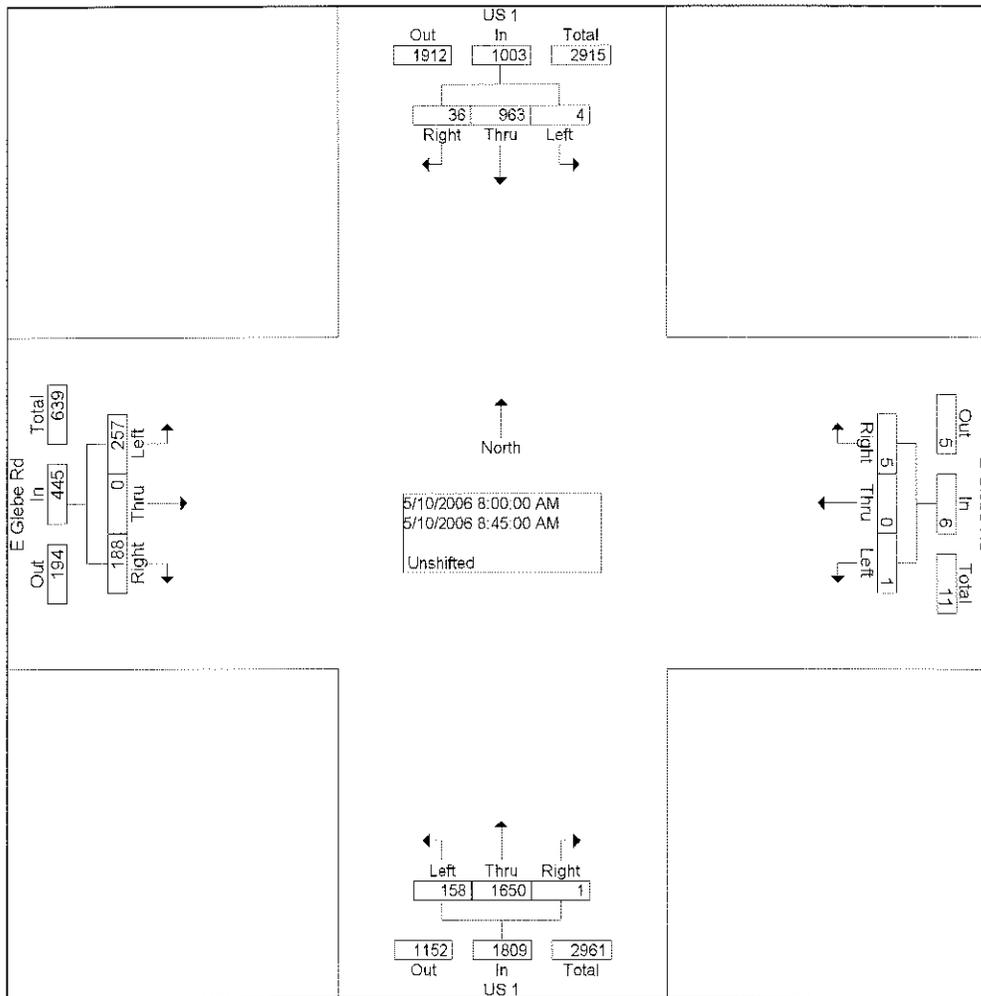
Groups Printed- Unshifted

Start Time	US 1 From North				E Glebe Rd From East				US 1 From South				E Glebe Rd From West				Exclu. Total	Inclu. Total	Int. Total
	Left	Thru	Righ t	Ped s	Left	Thru	Righ t	Ped s	Left	Thru	Righ t	Ped s	Left	Thru	Righ t	Ped s			
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0			
07:00 AM	1	151	12	0	0	0	0	0	38	358	0	0	38	0	28	0	0	626	626
07:15 AM	3	181	6	0	0	0	0	0	42	351	0	0	39	0	26	0	0	648	648
07:30 AM	1	213	8	0	0	0	0	0	39	371	1	0	55	0	51	0	0	739	739
07:45 AM	3	216	8	0	0	1	0	0	42	351	0	0	48	0	36	0	0	705	705
Total	8	761	34	0	0	1	0	0	161	1431	1	0	180	0	141	0	0	2718	2718
08:00 AM	2	197	8	0	0	0	3	0	41	371	1	0	76	0	42	0	0	741	741
08:15 AM	1	245	14	0	1	0	0	0	42	430	0	0	63	0	42	0	0	838	838
08:30 AM	1	239	5	0	0	0	1	0	43	435	0	0	65	0	49	0	0	838	838
08:45 AM	0	282	9	0	0	0	1	0	32	414	0	0	53	0	55	0	0	846	846
Total	4	963	36	0	1	0	5	0	158	1650	1	0	257	0	188	0	0	3263	3263
*** BREAK ***																			
04:00 PM	2	329	19	0	1	0	3	0	50	220	0	0	45	0	34	0	0	703	703
04:15 PM	0	342	6	0	0	0	4	0	42	235	1	0	25	1	34	0	0	690	690
04:30 PM	1	391	28	0	0	1	4	0	48	281	0	0	32	0	26	0	0	812	812
04:45 PM	5	374	17	0	1	0	0	0	40	258	0	0	36	3	51	0	0	785	785
Total	8	1436	70	0	2	1	11	0	180	994	1	0	138	4	145	0	0	2990	2990
05:00 PM	1	385	16	0	0	2	2	0	61	305	0	0	42	1	38	0	0	853	853
05:15 PM	0	405	25	0	1	0	1	0	51	306	0	0	45	1	47	0	0	882	882
05:30 PM	3	388	19	0	0	0	1	0	52	282	0	0	36	1	29	0	0	811	811
05:45 PM	2	413	34	0	0	0	0	0	45	304	0	0	30	0	45	0	0	873	873
Total	6	1591	94	0	1	2	4	0	209	1197	0	0	153	3	159	0	0	3419	3419
Grand Total	26	4751	234	0	4	4	20	0	708	5272	3	0	728	7	633	0	0	12390	12390
Apprch %	0.5	94.8	4.7		14.3	14.3	71.4		11.8	88.1	0.1		53.2	0.5	46.3				
Total %	0.2	38.3	1.9		0.0	0.0	0.2		5.7	42.6	0.0		5.9	0.1	5.1			0.0	100.0

MCV Associates, Inc.
 4605-C Pinecrest Office Park Drive
 Alexandria, VA 22312
 703-914-4850

File Name : us1 at e glebe rd
 Site Code : 00000000
 Start Date : 05/10/2006
 Page No : 2

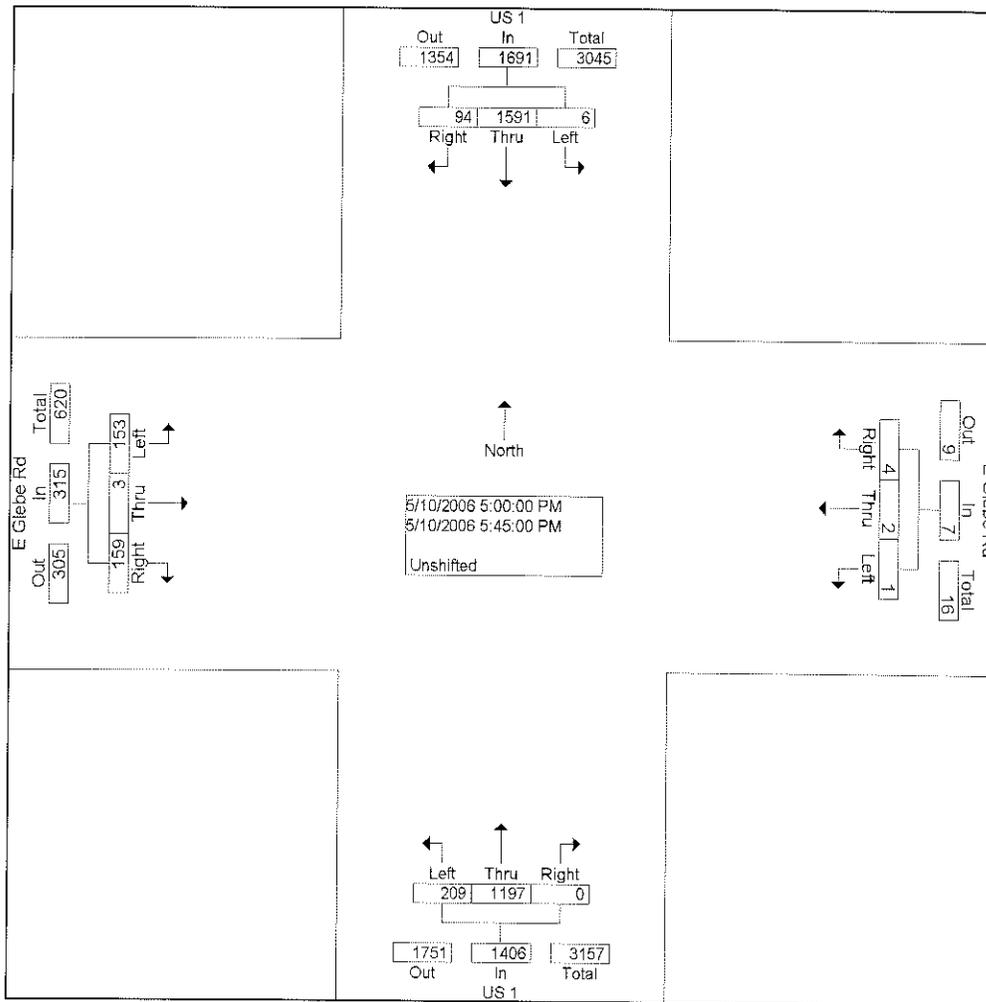
Start Time	US 1 From North				E Glebe Rd From East				US 1 From South				E Glebe Rd From West				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Intersection	08:00 AM																
Volume	4	963	36	1003	1	0	5	6	158	1650	1	1809	257	0	188	445	3263
Percent	0.4	96.0	3.6		16.7	0.0	83.3		8.7	91.2	0.1		57.8	0.0	42.2		
08:45 Volume	0	282	9	291	0	0	1	1	32	414	0	446	53	0	55	108	846
Peak Factor	0.964																
High Int.	08:45 AM				08:00 AM				08:30 AM				08:00 AM				
Volume	0	282	9	291	0	0	3	3	43	435	0	478	76	0	42	118	
Peak Factor	0.862				0.500				0.946				0.943				



MCV Associates, Inc.
 4605-C Pinecrest Office Park Drive
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 703-914-4850

File Name : us1 at e glebe rd
 Site Code : 00000000
 Start Date : 05/10/2006
 Page No : 3

Start Time	US 1 From North				E Glebe Rd From East				US 1 From South				E Glebe Rd From West				Int. Total			
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total				
Peak Hour From 04:00 PM to 05:45 PM - Peak 1 of 1																				
Intersection	05:00 PM																			
Volume	6	1591	94	1691	1	2	4	7	209	1197	0	1406	153	3	159	315	3419			
Percent	0.4	94.1	5.6		14.3	28.6	57.1		14.9	85.1	0.0		48.6	1.0	50.5					
05:15	Volume																			
Volume	0	405	25	430	1	0	1	2	51	306	0	357	45	1	47	93	882			
Peak Factor	0.969																			
High Int.	05:00 PM																			
Volume	2	413	34	449	0	2	2	4	61	305	0	366	45	1	47	93				
Peak Factor	0.942								0.438								0.847			



Intersection Pedestrians Summary

Date: 5/10/2006

Int: US 1 at E Glebe Rd

Time	North Leg		South Leg		East Leg		West Leg	
	EB	WB	EB	WB	NB	SB	NB	SB
7:00 - 7:15	0	0	0	0	0	0	0	2
7:15 - 7:30	0	0	0	0	0	0	0	0
7:30 - 7:45	1	0	0	0	0	0	0	0
7:45 - 8:00	0	0	0	0	0	1	0	0
8:00 - 8:15	0	1	1	0	1	0	0	0
8:15 - 8:30	0	0	0	0	0	0	0	0
8:30 - 8:45	0	0	1	0	0	0	0	0
8:45 - 9:00	1	0	0	0	0	0	0	0
PM								
4:00 - 4:15	0	0	0	1	0	0	0	0
4:15 - 4:30	0	0	0	1	0	0	0	0
4:30 - 4:45	0	2	0	0	0	0	0	0
4:45 - 5:00	1	0	0	0	0	0	0	0
5:00 - 5:15	0	0	0	0	0	0	0	0
5:15 - 5:30	2	1	2	0	0	0	1	0
5:30 - 5:45	2	0	0	0	0	0	0	0
5:45 - 6:00	0	0	0	0	0	0	0	0
Total	7	4	4	2	1	1	1	2

MCV Associates, Inc.
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 703-914-4850

File Name : us1 at custis ave
 Site Code : 00000012
 Start Date : 05/10/2006
 Page No : 1

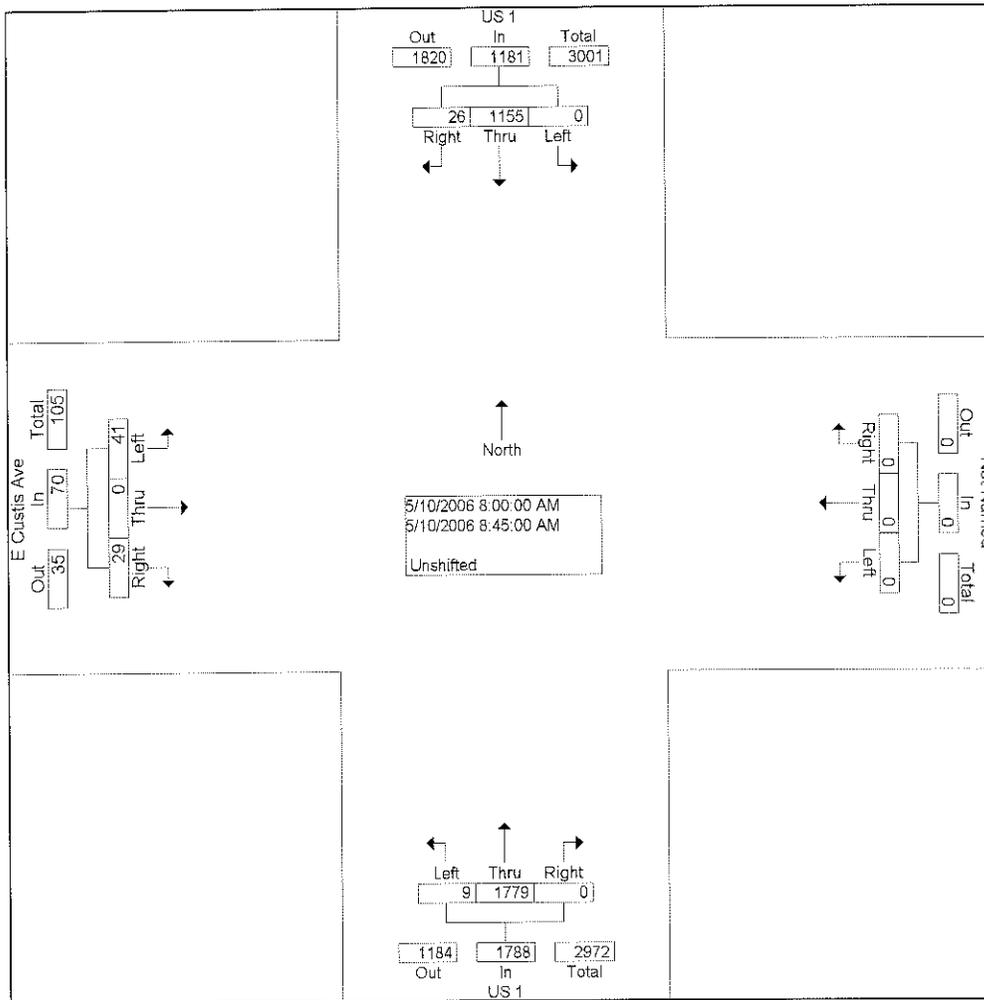
Groups Printed- Unshifted

Start Time	US 1 From North				From East				US 1 From South				E Custis Ave From West				Exclu. Total	Inclu. Total	Int. Total
	Left	Thru	Righ t	Ped s	Left	Thru	Righ t	Ped s	Left	Thru	Righ t	Ped s	Left	Thru	Righ t	Ped s			
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0			
07:00 AM	0	171	3	0	0	0	0	0	1	387	0	0	6	0	5	0	0	573	573
07:15 AM	0	197	4	0	0	0	0	0	1	432	0	0	4	0	6	0	0	644	644
07:30 AM	0	251	4	0	0	0	0	0	3	405	0	0	8	0	8	0	0	679	679
07:45 AM	0	256	7	0	0	0	0	0	1	385	0	0	14	0	5	0	0	668	668
Total	0	875	18	0	0	0	0	0	6	1609	0	0	32	0	24	0	0	2564	2564
08:00 AM	0	253	5	0	0	0	0	0	2	420	0	0	8	0	13	0	0	701	701
08:15 AM	0	285	5	0	0	0	0	0	1	479	0	0	15	0	5	0	0	790	790
08:30 AM	0	292	6	0	0	0	0	0	3	468	0	0	6	0	6	0	0	781	781
08:45 AM	0	325	10	0	0	0	0	0	3	412	0	0	12	0	5	0	0	767	767
Total	0	1155	26	0	0	0	0	0	9	1779	0	0	41	0	29	0	0	3039	3039
*** BREAK ***																			
04:00 PM	0	373	7	0	0	0	0	0	1	271	0	0	6	0	3	0	0	661	661
04:15 PM	0	396	9	0	0	0	0	0	2	274	0	0	4	0	3	0	0	688	688
04:30 PM	0	404	7	0	0	0	0	0	3	303	0	0	2	0	4	0	0	723	723
04:45 PM	0	407	7	0	0	0	0	0	5	302	0	0	3	0	4	0	0	728	728
Total	0	1580	30	0	0	0	0	0	11	1150	0	0	15	0	14	0	0	2800	2800
05:00 PM	0	412	6	0	0	0	0	0	1	332	0	0	7	0	7	0	0	765	765
05:15 PM	0	451	8	0	0	0	0	0	5	335	0	0	5	0	6	0	0	810	810
05:30 PM	0	386	13	0	0	0	0	0	1	327	0	0	6	0	6	0	0	739	739
05:45 PM	0	420	8	0	0	0	0	0	4	335	0	0	6	0	7	0	0	780	780
Total	0	1669	35	0	0	0	0	0	11	1329	0	0	24	0	26	0	0	3094	3094
Grand Total	0	5279	109	0	0	0	0	0	37	5867	0	0	112	0	93	0	0	11497	11497
Apprch %	0.0	98.0	2.0		0.0	0.0	0.0		0.6	99.4	0.0		54.6	0.0	45.4				
Total %	0.0	45.9	0.9		0.0	0.0	0.0		0.3	51.0	0.0		1.0	0.0	0.8			0.0	100.0

MCV Associates, Inc.
 4605-C Pinecrest Office Park Drive
 Alexandria, VA 22312
 703-914-4850

File Name : us1 at custis ave
 Site Code : 00000012
 Start Date : 05/10/2006
 Page No : 2

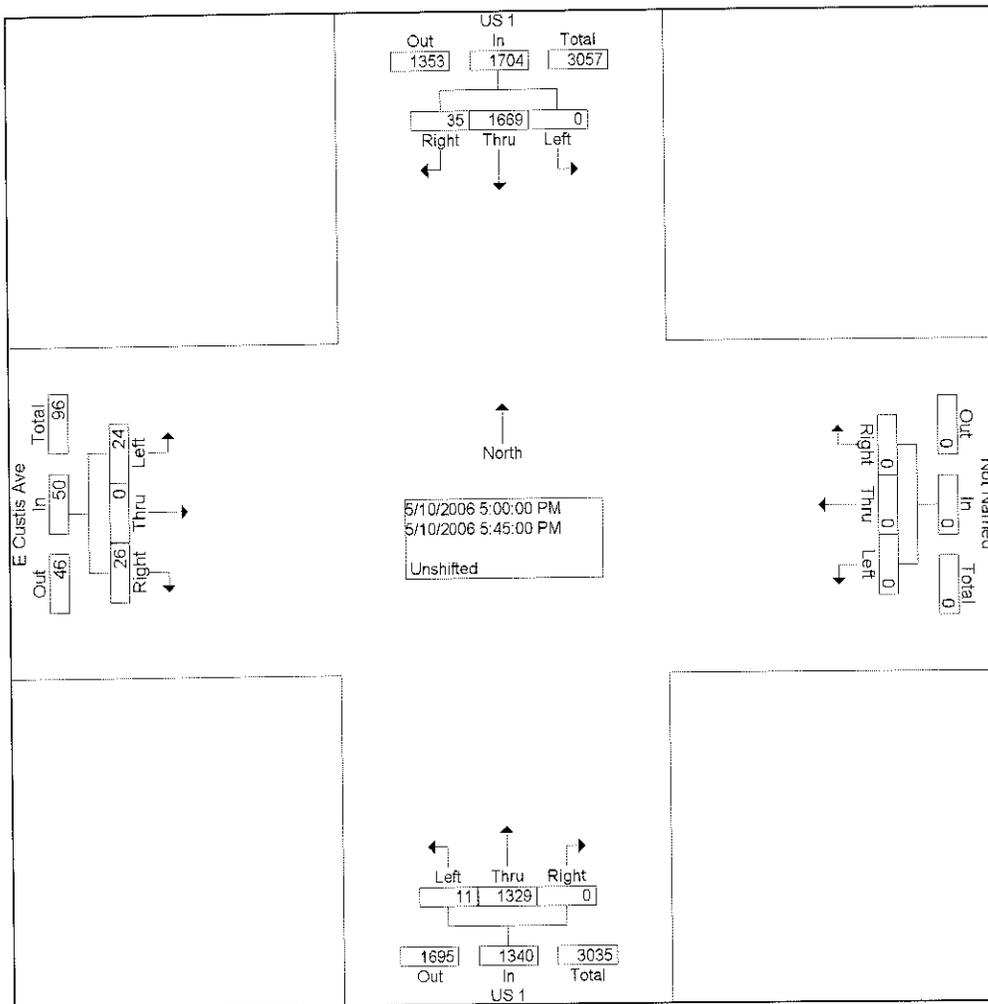
Start Time	US 1 From North				From East				US 1 From South				E Custis Ave From West				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Intersection	08:00 AM																
Volume	0	1155	26	1181	0	0	0	0	9	1779	0	1788	41	0	29	70	3039
Percent	0.0	97.8	2.2		0.0	0.0	0.0		0.5	99.5	0.0		58.6	0.0	41.4		
08:15 Volume	0	285	5	290	0	0	0	0	1	479	0	480	15	0	5	20	790
Peak Factor																	0.962
High Int.	08:45 AM				6:45:00 AM				08:15 AM				08:00 AM				
Volume	0	325	10	335	0	0	0	0	1	479	0	480	8	0	13	21	
Peak Factor	0.881												0.931				0.833



MCV Associates, Inc.
 4605-C Pinecrest Office Park Drive
 Alexandria, VA 22312
 703-914-4850

File Name : us1 at custis ave
 Site Code : 00000012
 Start Date : 05/10/2006
 Page No : 3

Start Time	US 1 From North				From East				US 1 From South				E Custis Ave From West				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Intersection	05:00 PM				0	0	0	0	11	1329	0	1340	24	0	26	50	3094
Volume	0	1669	35	1704	0.0	0.0	0.0	0	0.8	99.2	0.0	48.0	0.0	52.0			
Percent	0.0	97.9	2.1														
05:15 Volume	0	451	8	459	0	0	0	0	5	335	0	340	5	0	6	11	810
Peak Factor									05:15 PM				05:00 PM				0.955
High Int.	05:15 PM								05:15 PM				05:00 PM				
Volume	0	451	8	459	0	0	0	0	5	335	0	340	7	0	7	14	
Peak Factor	0.928								0.985				0.893				



Intersection Pedestrians Summary

Date: 5/10/2006

Int: US 1 at Custis Ave

Time	North Leg		South Leg		East Leg		West Leg		Total
	EB	WB	EB	WB	NB	SB	NB	SB	
7:00 - 7:15	1	0	2	0	0	0	1	4	8
7:15 - 7:30	0	0	0	0	0	0	1	0	1
7:30 - 7:45	0	0	0	0	0	0	1	1	2
7:45 - 8:00	0	0	1	0	0	0	0	2	3
8:00 - 8:15	0	1	0	0	0	0	0	0	1
8:15 - 8:30	0	0	0	0	0	0	0	1	1
8:30 - 8:45	0	0	0	0	0	0	1	2	3
8:45 - 9:00	0	0	0	0	0	0	0	1	1
PM									
4:00 - 4:15	0	0	0	0	0	0	1	0	1
4:15 - 4:30	0	0	0	0	0	0	1	1	2
4:30 - 4:45	0	1	0	0	0	0	2	1	4
4:45 - 5:00	2	0	1	0	0	0	0	0	3
5:00 - 5:15	0	0	0	0	0	0	0	1	1
5:15 - 5:30	0	0	1	0	0	0	2	1	4
5:30 - 5:45	0	0	0	1	0	0	1	1	3
5:45 - 6:00	0	0	0	0	0	0	0	3	3
Total	3	2	5	1	0	0	11	19	41

MCV Associates, Inc.
 4605-C Pinecrest Office Park Drive
 Alexandria, VA 22312
 703-914-4850

File Name : n henry st at 1st st
 Site Code : 00000013
 Start Date : 05/11/2006
 Page No : 1

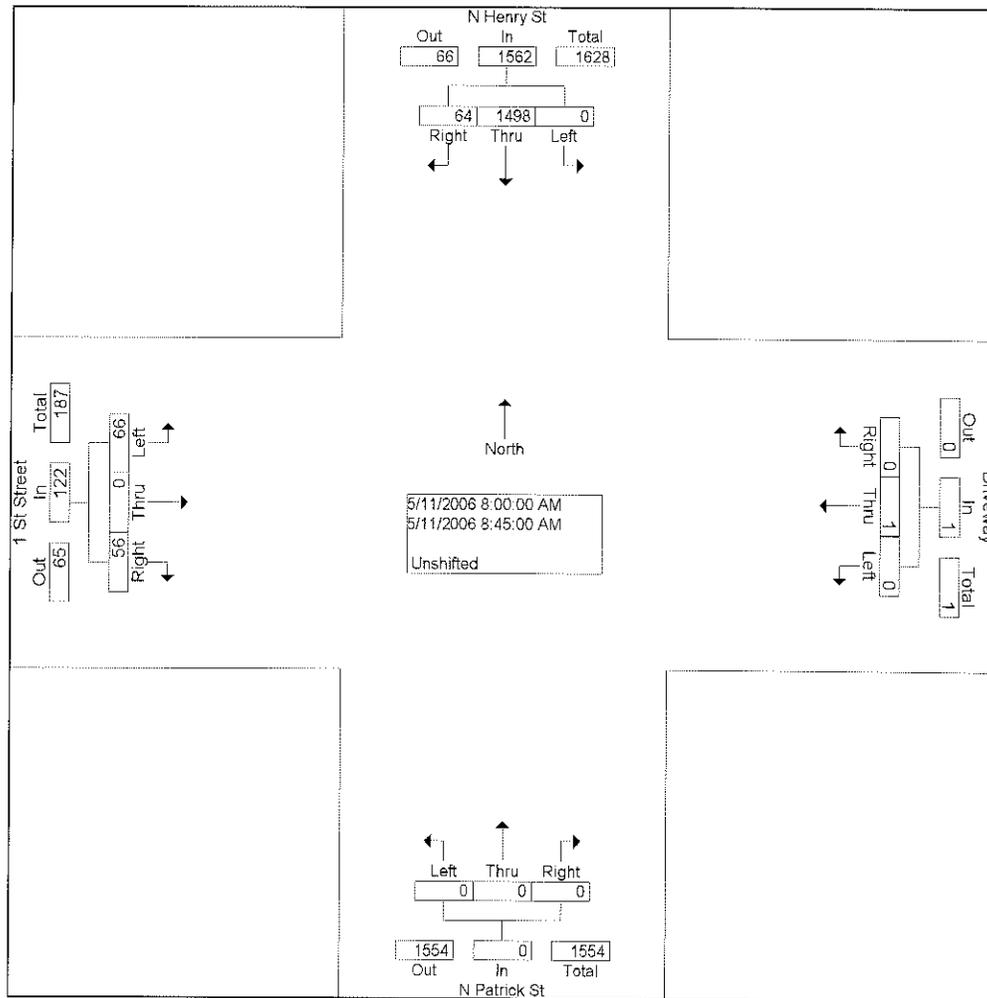
Groups Printed- Unshifted

Start Time	N Henry St From North				Driveway From East				N Patrick St From South				1 St Street From West				Exclu. Total	Inclu. Total	Int. Total
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds			
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0			
07:00 AM	0	229	15	0	0	0	0	0	0	0	0	0	12	0	8	0	0	264	264
07:15 AM	0	241	12	0	0	0	0	0	0	0	0	0	14	0	8	0	0	275	275
07:30 AM	0	310	20	0	0	0	0	0	0	0	0	2	9	0	8	0	2	347	349
07:45 AM	0	283	24	0	0	0	0	0	0	0	0	1	23	0	10	0	1	340	341
Total	0	1063	71	0	0	0	0	0	0	0	0	3	58	0	34	0	3	1226	1229
08:00 AM	0	345	18	0	0	0	0	0	0	0	0	4	23	0	11	0	4	397	401
08:15 AM	0	372	9	0	0	1	0	0	0	0	0	3	18	0	12	0	3	412	415
08:30 AM	0	369	21	0	0	0	0	0	0	0	0	1	10	0	17	0	1	417	418
08:45 AM	0	412	16	0	0	0	0	0	0	0	0	1	15	0	16	0	1	459	460
Total	0	1498	64	0	0	1	0	0	0	0	0	9	66	0	56	0	9	1685	1694
04:00 PM	0	374	19	0	0	0	0	0	0	0	0	2	10	0	7	0	2	410	412
04:15 PM	0	403	26	0	2	0	0	0	0	0	0	0	5	0	11	0	0	447	447
04:30 PM	0	376	15	0	0	0	0	0	0	0	0	3	9	0	8	0	3	408	411
04:45 PM	0	401	19	0	0	0	0	0	0	0	0	4	15	0	5	0	4	440	444
Total	0	1554	79	0	2	0	0	0	0	0	0	9	39	0	31	0	9	1705	1714
05:00 PM	0	334	21	0	0	0	0	0	0	0	0	2	8	0	10	0	2	373	375
05:15 PM	0	395	35	0	0	0	0	0	0	0	0	3	18	0	5	0	3	453	456
05:30 PM	0	375	32	0	0	0	0	0	0	0	1	2	9	0	6	0	2	423	425
05:45 PM	0	416	18	0	1	0	0	0	0	0	0	0	18	0	5	0	0	458	458
Total	0	1520	106	0	1	0	0	0	0	0	1	7	53	0	26	0	7	1707	1714
Grand Total	0	5635	320	0	3	1	0	0	0	0	1	28	216	0	147	0	28	6323	6351
Apprch %	0.0	94.6	5.4		75.0	25.0	0.0		0.0	0.0	100.0		59.5	0.0	40.5				
Total %	0.0	89.1	5.1		0.0	0.0	0.0		0.0	0.0	0.0		3.4	0.0	2.3		0.4	99.6	

MCV Associates, Inc.
 4605-C Pinecrest Office Park Drive
 Alexandria, VA 22312
 703-914-4850

File Name : n henry st at 1st st
 Site Code : 00000013
 Start Date : 05/11/2006
 Page No : 2

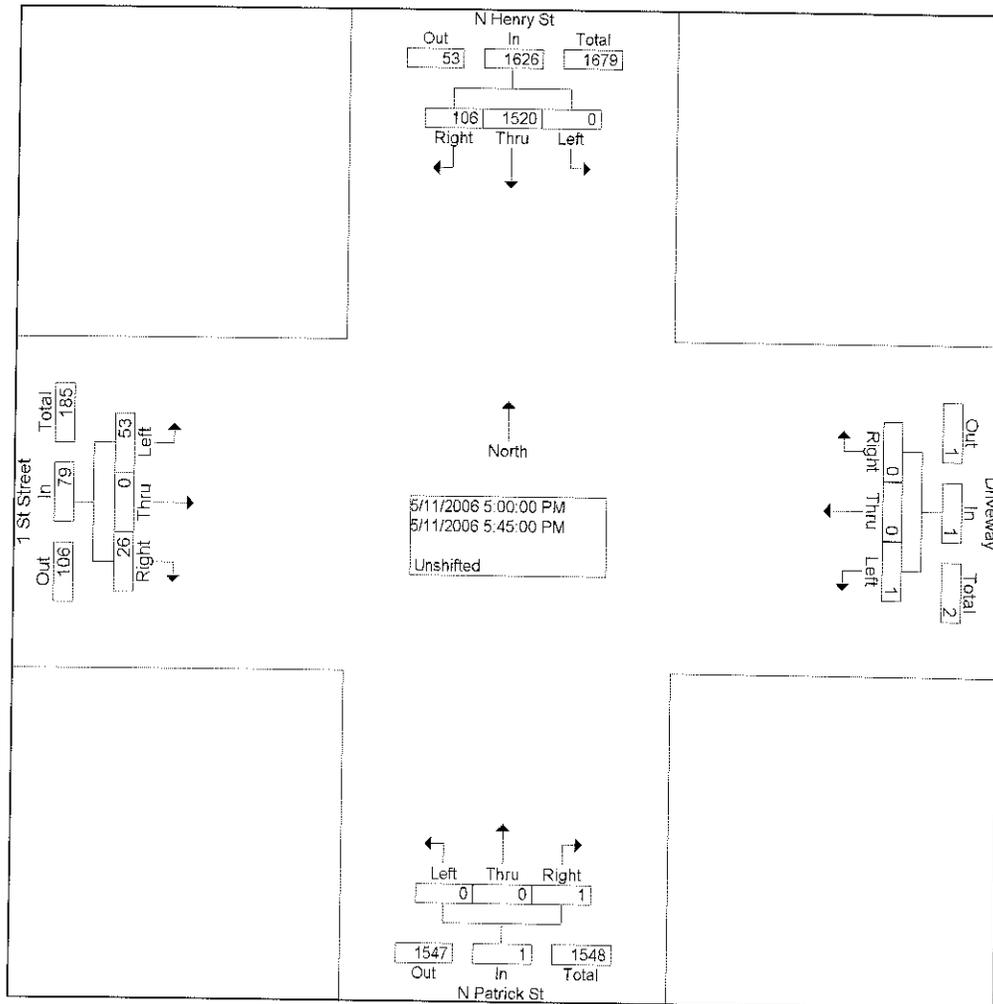
Start Time	N Henry St From North				Driveway From East				N Patrick St From South				1 St Street From West				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour From	07:00 AM to 08:45 AM - Peak 1 of 1																
Intersection	08:00 AM																
Volume	0	1498	64	1562	0	1	0	1	0	0	0	0	66	0	56	122	1685
Percent	0.0	95.9	4.1		0.0	100.0	0.0		0.0	0.0	0.0		54.1	0.0	45.9		
08:45 Volume	0	412	16	428	0	0	0	0	0	0	0	0	15	0	16	31	459
Peak Factor	0.918																
High Int.	08:45 AM																
Volume	0	412	16	428	0	1	0	1	0	0	0	0	23	0	11	34	
Peak Factor	0.250																
				0.912				0.250								0.897	



MCV Associates, Inc.
 4605-C Pinecrest Office Park Drive
 Alexandria, VA 22312
 703-914-4850

File Name : n henry st at 1st st
 Site Code : 00000013
 Start Date : 05/11/2006
 Page No : 3

Start Time	N Henry St From North				Driveway From East				N Patrick St From South				1 St Street From West				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Intersection 05:00 PM																	
Volume	0	1520	106	1626	1	0	0	1	0	0	1	1	53	0	26	79	1707
Percent	0.0	93.5	6.5		100.0	0.0	0.0		0.0	0.0	100.0		67.1	0.0	32.9		
05:45 Volume	0	416	18	434	1	0	0	1	0	0	0	0	18	0	5	23	458
Peak Factor																	
High Int. 05:45 PM																	
Volume	0	416	18	434	1	0	0	1	0	0	1	1	18	0	5	23	0.932
Peak Factor	0.937				0.250				0.250				0.859				



Intersection Pedestrians Summary

Date: 5/11/2006

Int: N Henry St at 1st St

Time	North Leg		South Leg		East Leg		West Leg		Total
	EB	WB	EB	WB	NB	SB	NB	SB	
7:00 - 7:15	0	4	2	2	0	0	1	0	9
7:15 - 7:30	0	4	1	4	0	0	1	0	10
7:30 - 7:45	0	3	1	9	0	0	1	1	15
7:45 - 8:00	2	3	3	1	0	0	0	0	9
8:00 - 8:15	0	4	2	0	0	0	2	4	12
8:15 - 8:30	0	2	6	4	0	0	1	2	15
8:30 - 8:45	0	2	1	5	0	0	0	0	8
8:45 - 9:00	0	0	0	3	0	0	0	0	3
PM									
4:00 - 4:15	0	0	0	0	0	0	0	0	0
4:15 - 4:30	0	0	0	0	0	0	0	0	0
4:30 - 4:45	0	0	0	0	0	0	0	0	0
4:45 - 5:00	0	0	0	0	0	0	0	0	0
5:00 - 5:15	0	0	0	0	0	0	0	0	0
5:15 - 5:30	0	0	0	0	0	0	0	0	0
5:30 - 5:45	0	0	0	0	0	0	0	0	0
5:45 - 6:00	0	0	0	0	0	0	0	0	0
Total	2	22	16	28	0	0	6	7	81

MCV Associates, Inc.
 4605-C Pinecrest Office Park Drive
 Alexandria, VA 22312
 703-914-4850

File Name : nhenry t at1st stpatrick
 Site Code : 00000013
 Start Date : 05/11/2006
 Page No : 1

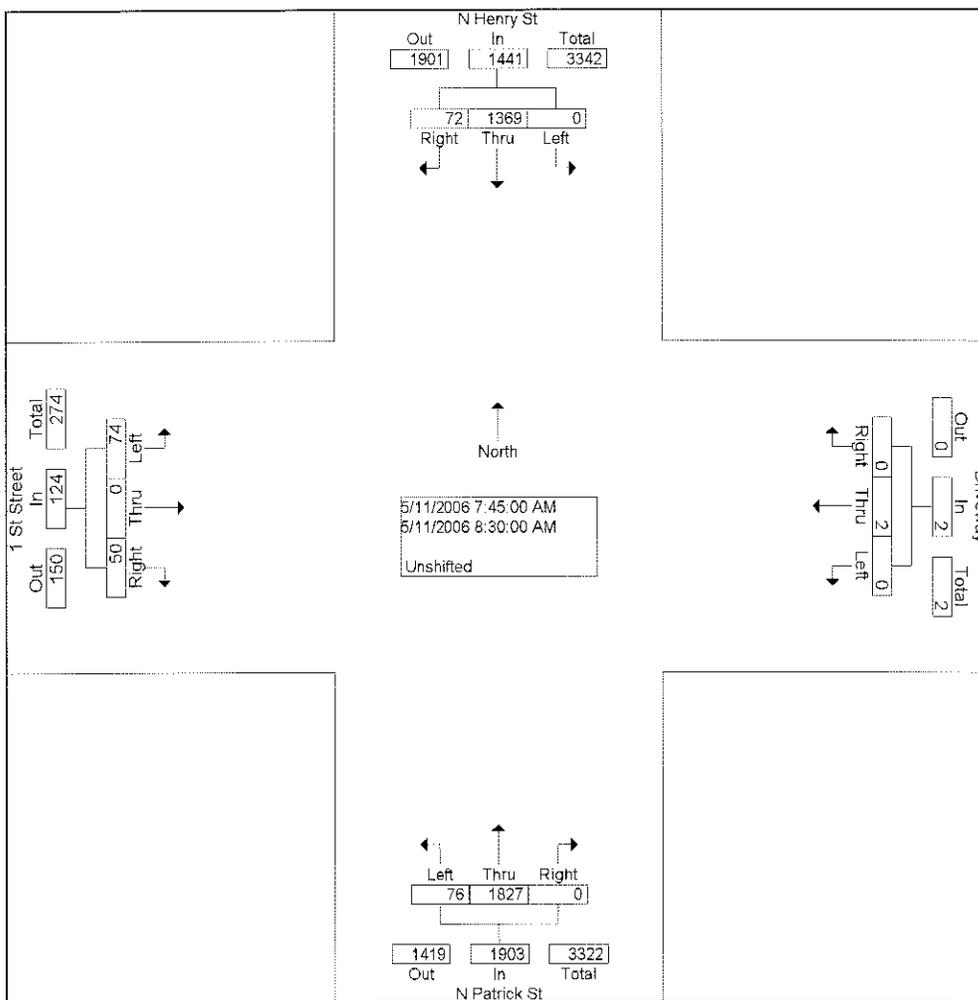
Groups Printed- Unshifted

Start Time	N Henry St From North			Driveway From East			N Patrick St From South			1 St Street From West			Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
07:00 AM	0	229	15	0	0	0	15	492	0	12	0	8	771
07:15 AM	0	241	12	0	0	0	11	531	0	14	0	8	817
07:30 AM	0	310	20	0	0	0	17	470	0	9	0	8	834
07:45 AM	0	283	24	0	1	0	20	474	0	23	0	10	835
Total	0	1063	71	0	1	0	63	1967	0	58	0	34	3257
08:00 AM	0	345	18	0	0	0	17	460	0	23	0	11	874
08:15 AM	0	372	9	0	1	0	20	481	0	18	0	12	913
08:30 AM	0	369	21	0	0	0	19	412	0	10	0	17	848
08:45 AM	0	412	16	0	0	0	13	350	0	15	0	16	822
Total	0	1498	64	0	1	0	69	1703	0	66	0	56	3457
04:00 PM	0	374	19	0	0	0	8	277	0	10	0	7	695
04:15 PM	0	403	26	2	0	0	2	326	0	5	0	11	775
04:30 PM	0	376	15	0	0	0	8	334	0	9	0	8	750
04:45 PM	0	401	19	0	0	0	14	335	0	15	0	5	789
Total	0	1554	79	2	0	0	32	1272	0	39	0	31	3009
05:00 PM	0	334	21	0	0	0	4	367	0	8	0	10	744
05:15 PM	0	395	35	0	0	0	6	401	0	18	0	5	860
05:30 PM	0	375	32	0	0	0	12	395	1	9	0	6	830
05:45 PM	0	416	18	1	0	0	3	366	0	18	0	5	827
Total	0	1520	106	1	0	0	25	1529	1	53	0	26	3261
Grand Total	0	5635	320	3	2	0	189	6471	1	216	0	147	12984
Apprch %	0.0	94.6	5.4	60.0	40.0	0.0	2.8	97.1	0.0	59.5	0.0	40.5	
Total %	0.0	43.4	2.5	0.0	0.0	0.0	1.5	49.8	0.0	1.7	0.0	1.1	

MCV Associates, Inc.
 4605-C Pinecrest Office Park Drive
 Alexandria, VA 22312
 703-914-4850

File Name : nhenry t at1st stpatrick
 Site Code : 00000013
 Start Date : 05/11/2006
 Page No : 2

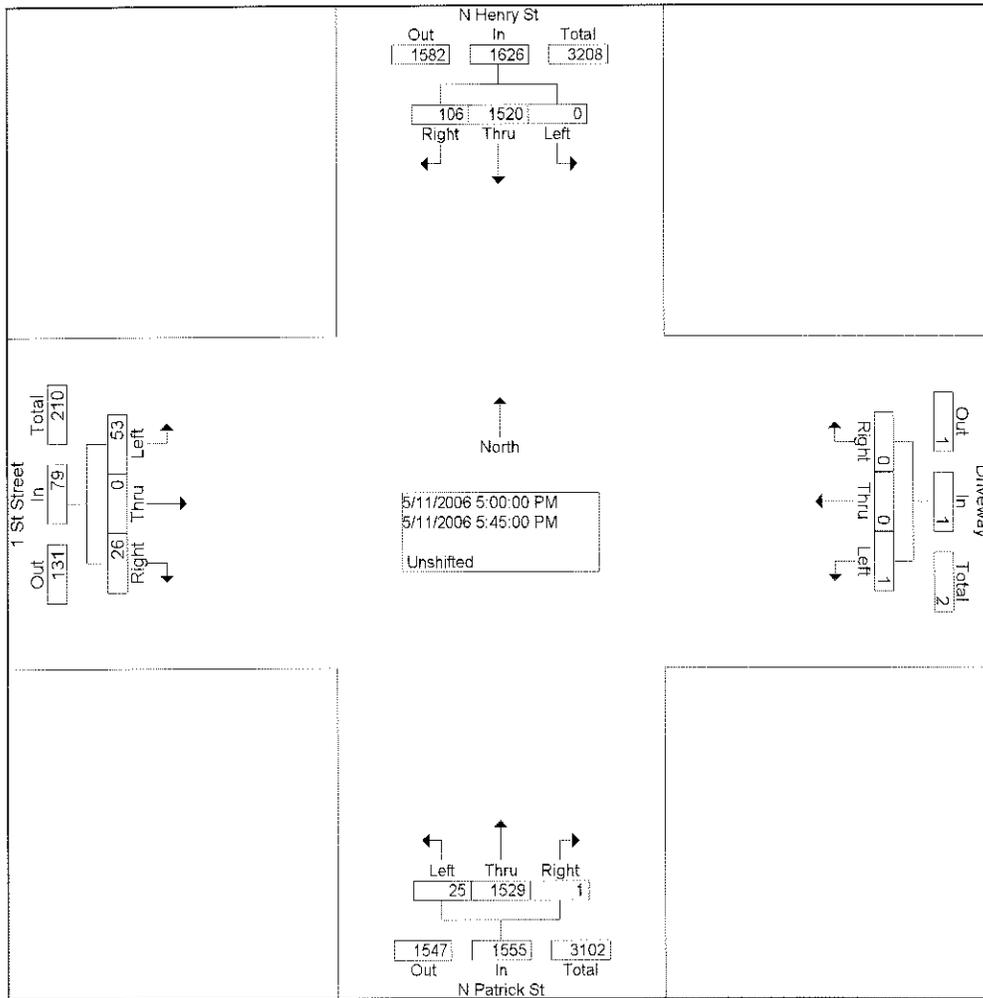
Start Time	N Henry St From North				Driveway From East				N Patrick St From South				1 St Street From West				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Intersection	07:45 AM																
Volume	0	1369	72	1441	0	2	0	2	76	1827	0	1903	74	0	50	124	3470
Percent	0.0	95.0	5.0		0.0	100.0	0.0		4.0	96.0	0.0		59.7	0.0	40.3		
08:15 Volume	0	372	9	381	0	1	0	1	20	481	0	501	18	0	12	30	913
Peak Factor	0.950																
High Int.	08:30 AM				07:45 AM				08:15 AM				08:00 AM				
Volume	0	369	21	390	0	1	0	1	20	481	0	501	23	0	11	34	
Peak Factor	0.924								0.500				0.950				0.912



MCV Associates, Inc.
 4605-C Pinecrest Office Park Drive
 Alexandria, VA 22312
 703-914-4850

File Name : nhenry t at1st stpatrick
 Site Code : 00000013
 Start Date : 05/11/2006
 Page No : 3

Start Time	N Henry St From North				Driveway From East				N Patrick St From South				1 St Street From West				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour From	04:00 PM to 05:45 PM - Peak 1 of 1																
Intersection	05:00 PM																
Volume	0	1520	106	1626	1	0	0	1	25	1529	1	1555	53	0	26	79	3261
Percent	0.0	93.5	6.5		100.0	0.0	0.0		1.6	98.3	0.1		67.1	0.0	32.9		
05:15 Volume	0	395	35	430	0	0	0	0	6	401	0	407	18	0	5	23	860
Peak Factor	0.948																
High Int.	05:45 PM				05:45 PM				05:30 PM				05:15 PM				
Volume	0	416	18	434	1	0	0	1	12	395	1	408	18	0	5	23	
Peak Factor	0.937				0.250				0.953				0.859				



Arlington County Traffic Counts
 Performed By: Daniel Consultants, Inc.

File Name : Final
 Site Code : 00000000
 Start Date : 05/12/2005
 Page No : 1

Groups Printed- 1 - 1 - Unshifted

Start Time	Bell St Southbound					S. 18th St Westbound					Bell St Northbound					S. 18th St Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
07:00 AM	36	6	11	38	91	2	17	0	21	40	3	0	9	16	28	0	51	14	91	156	315
07:15 AM	37	13	15	38	103	3	19	0	20	42	3	0	7	7	17	0	79	28	142	249	411
07:30 AM	37	8	15	42	102	2	31	0	54	87	5	0	4	14	23	0	92	24	148	264	476
07:45 AM	37	13	19	36	105	1	17	0	30	48	8	0	7	25	40	0	76	24	180	280	473
Total	147	40	60	154	401	8	84	0	125	217	19	0	27	62	108	0	298	90	561	949	1675
08:00 AM	54	13	16	28	111	2	18	0	46	66	3	0	6	32	41	0	108	28	196	332	550
08:15 AM	48	12	19	26	105	1	21	0	88	110	7	0	9	20	36	0	99	25	169	293	544
08:30 AM	43	14	16	24	97	2	14	0	96	112	5	0	8	17	30	0	84	24	186	294	533
08:45 AM	38	10	12	25	85	1	10	0	51	62	5	0	5	22	32	0	79	18	173	270	449
Total	183	49	63	103	398	6	63	0	281	350	20	0	28	91	139	0	370	95	724	1189	2076
****break****																					
11:00 AM	13	5	8	25	51	3	34	0	24	61	2	0	4	24	30	0	28	11	32	71	213
11:15 AM	12	5	8	32	57	3	38	0	21	62	2	0	4	29	35	0	25	13	29	67	221
11:30 AM	16	6	7	26	55	4	41	0	25	70	1	0	12	25	38	0	23	10	33	66	229
11:45 AM	14	7	11	50	82	6	31	0	12	49	6	0	3	21	30	0	23	11	41	75	236
Total	55	23	34	133	245	16	144	0	82	242	11	0	23	99	133	0	99	45	135	279	899
12:00 PM	10	6	11	23	50	4	31	0	30	65	7	0	4	40	51	0	22	16	38	76	242
12:15 PM	19	6	10	44	79	1	37	0	26	64	4	0	10	32	46	0	34	11	36	81	270
12:30 PM	19	4	11	50	84	7	38	0	19	64	4	0	3	44	51	0	34	12	47	93	292
12:45 PM	19	4	14	55	92	3	35	0	27	65	4	0	7	40	51	0	44	17	27	88	296
Total	67	20	46	172	305	15	141	0	102	258	19	0	24	156	199	0	134	56	148	338	1100
****break****																					
04:00 PM	9	4	17	31	61	2	84	0	24	110	3	0	4	25	32	0	14	9	71	94	297
04:15 PM	12	4	15	39	70	2	80	0	27	109	2	0	7	29	38	0	13	7	74	94	311
04:30 PM	15	10	30	23	78	6	99	0	21	126	6	0	7	38	51	0	22	16	75	113	368
04:45 PM	15	9	13	28	65	3	73	0	26	102	4	0	6	28	38	0	28	11	64	103	308
Total	51	27	75	121	274	13	336	0	98	447	15	0	24	120	159	0	77	43	284	404	1284
05:00 PM	15	4	31	26	76	3	103	0	24	130	7	0	7	32	46	0	24	11	76	111	363
05:15 PM	12	6	31	40	89	3	90	0	18	111	8	0	6	28	42	0	32	10	80	122	364
05:30 PM	15	5	17	41	78	3	98	0	22	123	6	0	6	24	36	0	17	18	72	107	344
05:45 PM	10	8	21	21	60	4	87	0	26	117	2	0	5	24	31	0	19	15	83	117	325
Total	52	23	100	128	303	13	378	0	90	481	23	0	24	108	155	0	92	54	311	457	1396
06:00 PM	10	1	21	20	52	2	78	0	16	96	4	0	5	22	31	0	24	10	47	81	260
06:15 PM	8	1	11	23	43	1	52	0	14	67	6	0	1	24	31	0	16	13	41	70	211
06:30 PM	4	4	15	10	33	3	51	0	14	68	3	0	2	13	18	0	8	10	45	63	182
06:45 PM	5	8	14	34	61	5	40	0	33	78	6	0	3	12	21	0	22	11	29	62	222
Total	27	14	61	87	189	11	221	0	77	309	19	0	11	71	101	0	70	44	162	276	875
07:00 PM	9	1	6	29	45	0	38	0	15	53	3	0	2	8	13	0	16	11	11	38	149
07:15 PM	7	2	7	28	44	1	34	0	11	46	5	0	2	8	15	0	11	7	18	36	141
Grand Total	598	199	452	955	2204	83	1439	0	881	2403	134	0	165	723	1022	0	1167	445	2354	3966	9595
Apprch %	27.1	9.0	20.5	43.3		3.5	59.9	0.0	36.7		13.1	0.0	16.1	70.7		0.0	29.4	11.2	59.4		
Total %	6.2	2.1	4.7	10.0	23.0	0.9	15.0	0.0	9.2	25.0	1.4	0.0	1.7	7.5	10.7	0.0	12.2	4.6	24.5	41.3	

Arlington County Traffic Counts
 Performed By: Daniel Consultants, Inc.

File Name : final
 Site Code : 00000000
 Start Date : 06/18/2005
 Page No : 1

Groups Printed- Unshifted

Start Time	Clark St Southbound					S. 23rd St Westbound					Clark St Northbound					S. 23rd St Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
11:30 AM	0	7	14	5	26	1	0	0	15	16	0	0	0	0	0	0	0	12	0	12	54
11:45 AM	1	5	22	6	34	0	0	0	11	11	0	0	0	0	0	0	0	15	0	15	60
Total	1	12	36	11	60	1	0	0	26	27	0	0	0	0	0	0	0	27	0	27	114
12:00 PM	0	4	14	14	32	0	0	0	19	19	0	0	0	0	0	0	0	18	0	18	69
12:15 PM	0	6	9	4	19	0	0	0	4	4	0	0	0	0	0	0	0	12	0	12	35
12:30 PM	0	13	15	7	35	3	0	0	10	13	0	0	0	0	0	0	0	14	0	14	62
12:45 PM	1	4	22	11	38	0	0	0	18	18	0	0	0	0	0	0	0	12	0	12	68
Total	1	27	60	36	124	3	0	0	51	54	0	0	0	0	0	0	0	56	0	56	234
01:00 PM	2	14	16	3	35	0	0	0	12	12	0	0	0	0	0	0	0	9	0	9	56
01:15 PM	1	10	16	11	38	1	0	0	4	5	0	0	0	0	0	0	0	12	0	12	55
01:30 PM	0	6	30	8	44	0	0	0	7	7	0	0	0	0	0	0	0	10	0	10	61
01:45 PM	1	9	17	6	33	0	0	0	11	11	0	0	0	0	0	0	0	12	0	12	56
Total	4	39	79	28	150	1	0	0	34	35	0	0	0	0	0	0	0	43	0	43	228
02:00 PM	0	7	19	8	34	6	0	0	4	10	0	0	0	0	0	0	0	14	0	14	58
02:15 PM	1	8	12	4	25	0	0	0	2	2	0	0	0	0	0	0	0	16	0	16	43
02:30 PM	0	6	19	6	31	4	0	0	6	10	0	0	0	0	0	0	0	15	0	15	56
02:45 PM	0	4	10	11	25	0	0	0	21	21	0	0	0	0	0	0	0	18	0	18	64
Total	1	25	60	29	115	10	0	0	33	43	0	0	0	0	0	0	0	63	0	63	221
03:00 PM	1	7	25	9	42	0	0	0	6	6	0	0	0	0	0	0	0	16	0	16	64
03:15 PM	0	7	20	11	38	1	0	0	10	11	0	0	0	0	0	0	0	10	0	10	59
03:30 PM	0	9	19	10	38	0	0	0	10	10	0	0	0	0	0	0	0	17	0	17	65
03:45 PM	0	13	17	5	35	0	0	0	15	15	0	0	0	0	0	0	0	12	0	12	62
Total	1	36	81	35	153	1	0	0	41	42	0	0	0	0	0	0	0	55	0	55	250
04:00 PM	0	3	24	13	40	1	0	0	11	12	0	0	0	0	0	0	0	13	0	13	65
04:15 PM	0	6	17	6	29	0	0	0	6	6	0	0	0	0	0	0	0	15	0	15	50
Grand Total	8	148	357	158	671	17	0	0	202	219	0	0	0	0	0	0	0	272	0	272	1162
Apprch %	1.2	22.1	53.2	23.5		7.8	0.0	0.0	92.2		0.0	0.0	0.0	0.0		0.0	0.0	100.0	0.0		
Total %	0.7	12.7	30.7	13.6	57.7	1.5	0.0	0.0	17.4	18.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23.4	0.0	23.4	

Arlington County Traffic Counts
 Performed By: Daniel Consultants, Inc.

File Name : Final
 Site Code : 00000000
 Start Date : 05/05/2005
 Page No : 1

Groups Printed- 1 - Unshifted

Start Time	Clark St Southbound					S. 12th St Westbound					Clark St Northbound					S. 12th St Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
07:00 AM	5	22	6	0	33	11	46	18	0	75	0	0	0	0	0	18	30	99	0	147	255
07:15 AM	2	16	10	0	28	40	40	19	0	99	0	0	0	0	0	39	13	103	0	155	282
07:30 AM	3	16	12	0	31	18	45	18	0	81	0	0	0	0	0	22	21	75	0	118	230
07:45 AM	1	11	7	0	19	33	45	21	0	99	0	0	0	0	0	28	17	108	0	153	271
Total	11	65	35	0	111	102	176	76	0	354	0	0	0	0	0	107	81	385	0	573	1038
08:00 AM	3	22	4	0	29	31	34	26	0	91	0	0	0	0	0	63	13	111	0	187	307
08:15 AM	2	17	11	0	30	24	31	22	0	77	0	0	0	0	0	84	20	75	0	179	286
08:30 AM	2	17	6	0	25	26	18	27	0	71	0	0	0	0	0	73	10	63	0	146	242
08:45 AM	3	8	10	0	21	34	33	24	1	92	0	0	0	0	0	67	9	67	0	143	256
Total	10	64	31	0	105	115	116	99	1	331	0	0	0	0	0	287	52	316	0	655	1091
****break****																					
11:00 AM	1	9	15	0	25	35	54	14	0	103	0	0	0	0	0	9	11	27	0	47	175
11:15 AM	1	13	19	0	33	24	44	13	0	81	0	0	0	0	0	8	7	28	0	43	157
11:30 AM	2	16	18	0	36	35	42	27	0	104	0	0	0	0	0	11	10	36	0	57	197
11:45 AM	3	11	14	0	28	37	67	22	0	126	0	0	0	0	0	11	10	24	0	45	199
Total	7	49	66	0	122	131	207	76	0	414	0	0	0	0	0	39	38	115	0	192	728
12:00 PM	4	16	18	0	38	32	62	11	0	105	0	0	0	0	0	15	12	19	0	46	189
12:15 PM	0	7	20	0	27	29	58	22	0	109	0	0	0	0	0	13	16	25	0	54	190
12:30 PM	1	5	17	0	23	25	60	13	0	98	0	0	0	0	0	13	12	37	2	64	185
12:45 PM	1	13	11	0	25	24	54	18	0	96	0	0	0	0	0	15	6	30	0	51	172
Total	6	41	66	0	113	110	234	64	0	408	0	0	0	0	0	56	46	111	2	215	736
****break****																					
04:00 PM	0	16	18	0	34	29	176	47	0	252	0	0	0	0	0	9	17	30	0	56	342
04:15 PM	1	15	20	0	36	20	130	42	0	192	0	0	0	0	0	4	9	29	0	42	270
04:30 PM	0	14	35	0	49	30	148	29	0	207	0	0	0	0	0	20	16	29	0	65	321
04:45 PM	0	14	37	0	51	32	136	35	0	203	0	0	0	0	0	10	12	37	0	59	313
Total	1	59	110	0	170	111	590	153	0	854	0	0	0	0	0	43	54	125	0	222	1246
05:00 PM	1	23	35	0	59	27	188	41	1	257	0	0	0	0	0	16	5	38	1	60	376
05:15 PM	0	17	26	0	43	31	139	37	0	207	0	0	0	0	0	15	3	31	0	49	299
05:30 PM	1	16	34	0	51	26	117	35	0	178	0	0	0	0	0	11	5	26	0	42	271
05:45 PM	2	15	25	0	42	19	124	29	0	172	0	0	0	0	0	9	7	22	0	38	252
Total	4	71	120	0	195	103	568	142	1	814	0	0	0	0	0	51	20	117	1	189	1198
06:00 PM	0	12	24	0	36	19	116	41	1	177	0	0	0	0	0	9	9	27	0	45	258
06:15 PM	0	6	15	0	21	19	103	15	0	137	0	0	0	0	0	5	8	32	0	45	203
06:30 PM	1	7	19	0	27	22	71	34	1	128	0	0	0	0	0	3	4	16	0	23	178
06:45 PM	0	10	9	0	19	14	66	13	0	93	0	0	0	0	0	13	4	15	0	32	144
Total	1	35	67	0	103	74	356	103	2	535	0	0	0	0	0	30	25	90	0	145	783
07:00 PM	1	4	15	0	20	14	63	13	0	90	0	0	0	0	0	12	6	10	0	28	138
07:15 PM	3	12	8	0	23	15	51	10	0	76	0	0	0	0	0	3	7	16	0	26	125
Grand Total	44	400	518	0	962	775	2361	736	4	3876	0	0	0	0	0	628	329	1285	3	2245	7083
Apprch %	4.6	41.6	53.8	0.0		20.9	60.9	19.0	0.1		0.0	0.0	0.0	0.0		28.0	14.7	57.2	0.1		
Total %	0.6	5.6	7.3	0.0	13.6	10.9	33.3	10.4	0.1	54.7	0.0	0.0	0.0	0.0	0.0	8.9	4.6	18.1	0.0	31.7	

Arlington County Traffic Counts
 Performed By: Daniel Consultants, Inc.

File Name : final
 Site Code : 00000000
 Start Date : 06/18/2005
 Page No : 1

Groups Printed- Unshifted

Start Time	Clark St Southbound					S. 20th St Westbound					Clark St Northbound					S. 20th St Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
11:30 AM	2	2	6	0	10	8	0	0	0	8	0	0	0	0	0	0	0	3	0	3	21
11:45 AM	1	6	6	3	16	11	0	0	0	11	0	0	0	0	0	0	0	2	0	2	29
Total	3	8	12	3	26	19	0	0	0	19	0	0	0	0	0	0	0	5	0	5	50
12:00 PM	0	7	4	0	11	7	0	0	0	7	0	0	0	0	0	0	0	0	0	0	18
12:15 PM	0	4	6	0	10	6	0	0	0	6	0	0	0	0	0	0	0	0	0	0	16
12:30 PM	2	7	7	3	19	10	0	0	0	10	0	0	0	0	0	0	0	1	0	1	30
12:45 PM	0	6	8	0	14	7	0	0	0	7	0	0	0	0	0	0	0	0	0	0	21
Total	2	24	25	3	54	30	0	0	0	30	0	0	0	0	0	0	0	1	0	1	85
01:00 PM	1	3	3	1	8	20	0	0	0	20	0	0	0	0	0	0	0	2	0	2	30
01:15 PM	0	6	4	5	15	14	0	0	0	14	0	0	0	0	0	0	0	0	0	0	29
01:30 PM	0	3	5	1	9	24	0	0	0	24	0	0	0	0	0	0	0	3	0	3	36
01:45 PM	2	4	6	2	14	15	0	0	0	15	0	0	0	0	0	0	0	0	0	0	29
Total	3	16	18	9	46	73	0	0	0	73	0	0	0	0	0	0	0	5	0	5	124
02:00 PM	2	2	12	2	18	10	0	0	0	10	0	0	0	0	0	0	0	0	0	0	28
02:15 PM	0	8	4	2	14	10	0	0	0	10	0	0	0	0	0	0	0	0	0	0	24
02:30 PM	1	4	5	4	14	7	0	0	0	7	0	0	0	0	0	0	0	0	0	0	21
02:45 PM	1	5	8	5	19	15	0	0	0	15	0	0	0	0	0	0	0	1	0	1	35
Total	4	19	29	13	65	42	0	0	0	42	0	0	0	0	0	0	0	1	0	1	108
03:00 PM	0	4	8	5	17	19	0	0	0	19	0	0	0	0	0	0	0	2	0	2	38
03:15 PM	0	4	10	3	17	13	0	0	0	13	0	0	0	0	0	0	0	0	0	0	30
03:30 PM	2	7	11	2	22	10	0	0	0	10	0	0	0	0	0	0	0	0	0	0	32
03:45 PM	0	3	4	0	7	21	0	0	0	21	0	0	0	0	0	0	0	3	0	3	31
Total	2	18	33	10	63	63	0	0	0	63	0	0	0	0	0	0	0	5	0	5	131
04:00 PM	0	8	2	5	15	13	0	0	0	13	0	0	0	0	0	0	0	2	0	2	30
04:15 PM	1	0	3	2	6	8	0	0	0	8	0	0	0	0	0	0	0	0	0	0	14
Grand Total	15	93	122	45	275	248	0	0	0	248	0	0	0	0	0	0	0	19	0	19	542
Apprch %	5.5	33.8	44.4	16.4		100.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	100.0	0.0		
Total %	2.8	17.2	22.5	8.3	50.7	45.8	0.0	0.0	0.0	45.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.5	0.0	3.5	

Arlington County Traffic Counts
 Performed By: Daniel Consultants, Inc.

File Name : final
 Site Code : 00000000
 Start Date : 05/04/2005
 Page No : 1

Groups Printed- 1 - Unshifted

Start Time	Eads St Southbound					Army Navy Dr Westbound					Eads St Northbound					Army Navy Dr Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
07:00 AM	12	105	95	12	224	1	82	12	1	96	31	25	2	18	76	56	66	73	13	208	604
07:15 AM	11	92	107	29	239	5	85	18	3	111	32	47	1	8	88	63	61	64	5	193	631
07:30 AM	10	93	94	13	210	2	102	11	6	121	33	52	5	14	104	67	93	69	3	232	667
07:45 AM	8	91	52	6	157	1	71	4	5	81	30	22	4	12	68	54	54	44	2	154	460
Total	41	381	348	60	830	9	340	45	15	409	126	146	12	52	336	240	274	250	23	787	2362
08:00 AM	7	80	78	6	171	5	73	20	2	100	35	38	2	12	87	80	79	64	2	225	583
08:15 AM	9	80	71	2	162	0	47	11	0	58	39	28	2	8	77	75	81	51	1	208	505
08:30 AM	3	80	68	4	155	3	41	11	2	57	42	40	4	7	93	102	106	65	4	277	582
08:45 AM	2	33	50	3	88	4	44	8	2	58	20	25	7	5	57	90	85	47	4	226	429
Total	21	273	267	15	576	12	205	50	6	273	136	131	15	32	314	347	351	227	11	936	2099
****break****																					
11:00 AM	5	26	39	5	75	2	64	11	2	79	51	12	4	3	70	61	21	25	2	109	333
11:15 AM	6	30	47	7	90	9	106	15	15	145	53	25	5	11	94	83	28	34	2	147	476
11:30 AM	4	21	43	1	69	6	98	10	0	114	50	14	12	14	90	79	34	48	1	162	435
11:45 AM	4	16	49	3	72	5	98	16	4	123	36	21	6	14	77	78	32	54	1	165	437
Total	19	93	178	16	306	22	366	52	21	461	190	72	27	42	331	301	115	161	6	583	1681
12:00 PM	3	19	43	6	71	8	130	19	8	165	55	25	4	8	92	90	34	41	7	172	500
12:15 PM	1	20	42	1	64	4	101	11	0	116	55	26	2	8	91	83	37	44	0	164	435
12:30 PM	3	14	37	0	54	7	85	13	7	112	52	25	9	12	98	114	43	59	1	217	481
12:45 PM	2	17	41	2	62	5	91	10	4	110	48	29	4	7	88	92	41	51	2	186	446
Total	9	70	163	9	251	24	407	53	19	503	210	105	19	35	369	379	155	195	10	739	1862
****break****																					
04:00 PM	2	19	32	4	57	7	154	61	3	225	42	61	2	6	111	114	48	47	3	212	605
04:15 PM	3	16	35	5	59	8	167	64	4	243	50	67	2	11	130	100	45	52	2	199	631
04:30 PM	3	25	27	12	67	4	184	70	8	266	48	64	3	6	121	125	45	59	2	231	685
04:45 PM	2	27	42	4	75	3	132	55	3	193	54	60	4	4	122	129	33	56	4	222	612
Total	10	87	136	25	258	22	637	250	18	927	194	252	11	27	484	468	171	214	11	864	2533
05:00 PM	2	30	37	5	74	6	173	86	5	270	61	73	2	18	154	135	51	42	4	232	730
05:15 PM	1	26	46	7	80	3	179	84	1	267	65	70	4	11	150	133	36	70	1	240	737
05:30 PM	2	22	45	7	76	1	210	84	2	297	57	63	5	14	139	108	36	53	7	204	716
05:45 PM	2	21	44	1	68	9	164	66	1	240	88	52	9	7	156	118	47	63	3	231	695
Total	7	99	172	20	298	19	726	320	9	1074	271	258	20	50	599	494	170	228	15	907	2878
06:00 PM	2	21	46	3	72	9	199	54	2	264	67	41	4	6	118	130	25	54	3	212	666
06:15 PM	4	20	55	2	81	6	141	32	4	183	71	43	4	8	126	143	22	53	1	219	609
06:30 PM	3	19	40	1	63	3	125	30	0	158	69	35	5	18	127	145	24	37	0	206	554
06:45 PM	0	17	60	2	79	8	147	21	11	187	60	29	3	9	101	109	27	47	10	193	560
Total	9	77	201	8	295	26	612	137	17	792	267	148	16	41	472	527	98	191	14	830	2389
07:00 PM	0	20	28	1	49	4	118	22	1	145	69	28	3	5	105	108	17	41	1	167	466
07:15 PM	6	13	24	8	51	6	87	12	1	106	45	19	4	1	69	87	14	36	0	137	363
Grand Total	122	111	151	162	2914	144	349	941	107	4690	150	115	127	285	3079	295	136	154	91	5950	1663
Apprch %	4.2	38.2	52.1	5.6		3.1	74.6	20.1	2.3		49.0	37.6	4.1	9.3		49.6	22.9	25.9	1.5		
Total %	0.7	6.7	9.1	1.0	17.5	0.9	21.0	5.7	0.6	28.2	9.1	7.0	0.8	1.7	18.5	17.7	8.2	9.3	0.5	35.8	

Arlington County Traffic Counts
 Performed By: Daniel Consultants, Inc.

File Name : combined
 Site Code : 00000000
 Start Date : 03/29/2005
 Page No : 1

Groups Printed- 1 - Unshifted

Start Time	Eads St Southbound					12th St S. Westbound					Eads St Northbound					12th St S. Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
07:00 AM	64	74	0	23	161	21	0	11	5	37	0	56	14	14	84	0	0	0	0	0	282
07:15 AM	75	100	0	20	195	17	0	8	13	38	0	68	15	17	100	0	0	0	0	0	333
07:30 AM	92	102	0	26	220	17	0	8	3	28	0	76	14	16	106	0	0	0	0	0	354
07:45 AM	61	93	0	23	177	25	0	10	7	42	0	74	29	33	136	0	0	0	0	0	355
Total	292	369	0	92	753	80	0	37	28	145	0	274	72	80	426	0	0	0	0	0	1324
08:00 AM	84	104	0	16	204	19	0	12	2	33	0	76	27	25	128	0	0	0	0	0	365
08:15 AM	72	103	0	16	191	14	0	8	8	30	0	81	36	33	150	0	0	0	0	0	371
08:30 AM	72	69	0	16	157	16	0	7	0	23	0	90	25	26	141	0	0	0	0	0	321
08:45 AM	47	56	0	16	119	15	0	13	1	29	0	63	24	13	100	0	0	0	0	0	248
Total	275	332	0	64	671	64	0	40	11	115	0	310	112	97	519	0	0	0	0	0	1305
Break																					
11:00 AM	18	81	0	19	118	23	0	16	6	45	0	48	13	11	72	0	0	0	0	0	235
11:15 AM	23	74	0	13	110	26	0	11	4	41	0	53	15	11	79	0	0	0	0	0	230
11:30 AM	20	88	0	21	129	19	0	9	7	35	0	41	9	15	65	0	0	0	0	0	229
11:45 AM	14	79	0	20	113	21	0	20	4	45	0	48	12	10	70	0	0	0	0	0	228
Total	75	322	0	73	470	89	0	56	21	166	0	190	49	47	286	0	0	0	0	0	922
12:00 PM	27	91	0	17	135	21	0	15	11	47	0	55	11	16	82	0	0	0	0	0	264
12:15 PM	24	83	0	19	126	14	0	16	6	36	0	59	17	14	90	0	0	0	0	0	252
12:30 PM	21	85	0	26	132	28	0	13	5	46	0	62	15	12	89	0	0	0	0	0	267
12:45 PM	22	76	0	15	113	22	0	18	3	43	0	52	13	12	77	0	0	0	0	0	233
Total	94	335	0	77	506	85	0	62	25	172	0	228	56	54	338	0	0	0	0	0	1016
Break																					
04:00 PM	21	99	0	26	146	15	0	23	5	43	0	98	10	18	126	0	0	0	0	0	315
04:15 PM	19	72	0	9	100	22	0	20	3	45	0	69	16	25	110	0	0	0	0	0	255
04:30 PM	16	69	0	19	104	26	0	29	3	58	0	99	19	13	131	0	0	0	0	0	293
04:45 PM	22	87	0	18	127	21	0	31	3	55	0	93	10	22	125	0	0	0	0	0	307
Total	78	327	0	72	477	84	0	103	14	201	0	359	55	78	492	0	0	0	0	0	1170
05:00 PM	24	86	0	21	131	40	0	35	10	85	0	91	7	20	118	0	0	0	0	0	334
05:15 PM	18	90	0	27	135	29	0	31	9	69	0	91	23	18	132	0	0	0	0	0	336
05:30 PM	14	84	0	19	117	34	0	32	8	74	0	99	17	37	153	0	0	0	0	0	344
05:45 PM	11	83	0	22	116	16	0	28	3	47	0	100	16	31	147	0	0	0	0	0	310
Total	67	343	0	89	499	119	0	126	30	275	0	381	63	106	550	0	0	0	0	0	1324
06:00 PM	5	94	0	23	122	34	0	17	11	62	0	93	11	32	136	0	0	0	0	0	320
06:15 PM	14	98	0	16	128	33	0	21	2	56	0	83	17	31	131	0	0	0	0	0	315
06:30 PM	11	79	0	19	109	22	0	19	2	43	0	63	15	19	97	0	0	0	0	0	249
06:45 PM	13	79	0	12	104	21	0	20	2	43	0	67	21	36	124	0	0	0	0	0	271
Total	43	350	0	70	463	110	0	77	17	204	0	306	64	118	488	0	0	0	0	0	1155
07:00 PM	7	73	0	11	91	19	0	11	0	30	0	72	14	32	118	0	0	0	0	0	239
07:15 PM	13	76	0	11	100	16	0	14	3	33	0	73	20	15	108	0	0	0	0	0	241
Grand Total	944	2527	0	559	4030	666	0	526	149	1341	0	2193	505	627	3325	0	0	0	0	0	8696
Apprch %	23.4	62.7	0.0	13.9		49.7	0.0	39.2	11.1		0.0	66.0	15.2	18.9		0.0	0.0	0.0	0.0		
Total %	10.9	29.1	0.0	6.4	46.3	7.7	0.0	6.0	1.7	15.4	0.0	25.2	5.8	7.2	38.2	0.0	0.0	0.0	0.0	0.0	

Arlington County Traffic Counts
 Performed By: Daniel Consultants, Inc.

File Name : Final
 Site Code : 00000000
 Start Date : 06/18/2005
 Page No : 1

Groups Printed- 1 - Unshifted

Start Time	Jefferson Davis Hwy Southbound					S. 20th St Westbound					Jefferson Davis Hwy Northbound					S. 20th St Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
11:30 AM	1	385	2	36	424	4	36	9	6	55	27	320	5	1	353	8	2	35	0	45	877
11:45 AM	6	402	0	0	408	6	85	7	8	106	44	476	1	3	524	21	7	47	4	79	1117
Total	7	787	2	36	832	10	121	16	14	161	71	796	6	4	877	29	9	82	4	124	1994
12:00 PM	6	421	3	0	430	5	47	4	5	61	29	469	2	0	500	12	7	55	0	74	1065
12:15 PM	7	384	2	0	393	8	42	16	0	66	27	462	2	1	492	11	5	49	0	65	1016
12:30 PM	13	401	3	0	417	7	21	1	2	31	33	450	0	4	487	10	2	64	0	76	1011
12:45 PM	5	376	1	0	382	3	49	2	1	55	21	415	2	3	441	5	3	54	1	63	941
Total	31	1582	9	0	1622	23	159	23	8	213	110	1796	6	8	1920	38	17	222	1	278	4033
01:00 PM	4	408	3	0	415	3	25	4	3	35	28	376	2	0	406	12	1	72	4	89	945
01:15 PM	5	401	4	0	410	5	48	1	2	56	27	395	3	0	425	26	1	67	3	97	988
01:30 PM	11	413	6	0	430	3	59	10	6	78	27	449	4	1	481	6	5	66	0	77	1066
01:45 PM	8	455	0	0	463	7	46	1	1	55	22	400	1	0	423	11	0	54	4	69	1010
Total	28	1677	13	0	1718	18	178	16	12	224	104	1620	10	1	1735	55	7	259	11	332	4009
02:00 PM	3	298	0	0	301	7	33	8	2	50	21	393	0	0	414	6	5	64	1	76	841
02:15 PM	11	325	3	0	339	4	37	10	2	53	37	424	4	0	465	16	3	56	0	75	932
02:30 PM	3	310	2	0	315	5	56	2	6	69	40	412	2	0	454	8	4	51	0	63	901
02:45 PM	10	334	12	3	359	9	42	4	2	57	34	483	2	0	519	15	8	55	0	78	1013
Total	27	1267	17	3	1314	25	168	24	12	229	132	1712	8	0	1852	45	20	226	1	292	3687
03:00 PM	4	348	13	0	365	9	44	16	4	73	22	439	3	0	464	16	4	42	0	62	964
03:15 PM	3	386	0	0	389	5	45	10	4	64	24	494	1	1	520	15	3	52	2	72	1045
03:30 PM	9	374	1	0	384	6	32	10	4	52	29	459	1	1	490	16	4	51	0	71	997
03:45 PM	6	336	0	0	342	8	36	12	3	59	34	480	2	0	516	9	1	40	0	50	967
Total	22	1444	14	0	1480	28	157	48	15	248	109	1872	7	2	1990	56	12	185	2	255	3973
04:00 PM	9	425	10	0	444	3	31	7	6	47	24	453	8	5	490	2	0	25	0	27	1008
04:15 PM	6	436	0	0	442	5	16	12	4	37	23	407	1	0	431	7	2	45	2	56	966
Grand Total	130	7618	65	39	7852	112	830	146	71	1159	573	8656	46	20	9295	232	67	1044	21	1364	19670
Apprch %	1.7	97.0	0.8	0.5		9.7	71.6	12.6	6.1		6.2	93.1	0.5	0.2		17.0	4.9	76.5	1.5		
Total %	0.7	38.7	0.3	0.2	39.9	0.6	4.2	0.7	0.4	5.9	2.9	44.0	0.2	0.1	47.3	1.2	0.3	5.3	0.1	6.9	

Arlington County Traffic Counts
 Performed By: Daniel Consultants, Inc.

File Name : Final
 Site Code : 00000000
 Start Date : 06/18/2005
 Page No : 1

Groups Printed- 1 - Unshifted

Start Time	Jefferson Davis Hwy Southbound					S. 23rd St Westbound					Jefferson Davis Hwy Northbound					S. 23rd St Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
11:30 AM	11	379	12	1	403	41	28	14	2	85	50	280	5	1	336	21	19	47	10	97	
11:45 AM	9	364	15	2	390	29	35	10	0	74	44	298	7	0	349	25	24	39	8	96	
Total	20	743	27	3	793	70	63	24	2	159	94	578	12	1	685	46	43	86	18	193	
12:00 PM	22	350	10	1	383	34	48	21	6	109	55	278	5	0	338	16	30	51	7	104	
12:15 PM	10	379	16	1	406	40	19	10	0	69	34	332	4	0	370	35	22	53	11	121	
12:30 PM	7	373	23	1	404	24	20	10	0	54	34	297	10	0	341	27	28	54	13	122	
12:45 PM	13	367	13	1	394	31	31	9	4	75	43	354	3	0	400	28	20	45	11	104	
Total	52	1469	62	4	1587	129	118	50	10	307	166	1261	22	0	1449	106	100	203	42	451	
01:00 PM	6	396	23	1	426	18	19	11	1	49	44	260	4	0	308	27	15	35	9	86	
01:15 PM	4	291	17	4	316	19	13	9	2	43	46	309	13	1	369	25	21	31	5	82	
01:30 PM	10	345	17	0	372	24	28	10	3	65	40	278	3	0	321	27	20	47	0	94	
01:45 PM	19	422	19	1	461	19	23	9	0	51	43	288	7	3	341	24	10	51	3	88	
Total	39	1454	76	6	1575	80	83	39	6	208	173	1135	27	4	1339	103	66	164	17	350	
02:00 PM	16	391	9	0	416	12	19	14	0	45	36	278	2	0	316	26	23	65	1	115	
02:15 PM	15	377	14	2	408	18	21	14	0	53	49	301	2	0	352	30	27	58	25	140	
02:30 PM	18	568	14	3	603	27	34	4	0	65	48	339	4	1	392	32	24	45	1	102	
02:45 PM	19	439	10	3	471	17	23	1	0	41	41	323	8	0	372	41	30	54	11	136	
Total	68	1775	47	8	1898	74	97	33	0	204	174	1241	16	1	1432	129	104	222	38	493	
03:00 PM	14	399	15	1	429	20	26	1	2	49	59	356	2	2	419	26	31	51	0	108	
03:15 PM	17	441	15	0	473	14	17	0	2	33	49	275	1	8	333	40	14	44	2	100	
03:30 PM	23	421	12	1	457	21	25	2	0	48	44	324	5	22	395	30	25	46	2	103	
03:45 PM	14	454	22	7	497	19	33	1	4	57	40	317	4	0	361	24	20	38	6	88	
Total	68	1715	64	9	1856	74	101	4	8	187	192	1272	12	32	1508	120	90	179	10	399	
04:00 PM	19	567	9	0	595	28	43	0	0	71	44	335	2	2	383	28	21	32	0	81	
04:15 PM	31	531	11	0	573	15	25	1	0	41	44	321	4	0	369	21	20	50	3	94	
Grand Total	297	8254	296	30	8877	470	530	151	26	1177	887	6143	95	40	7165	553	444	936	128	2061	
Apprch %	3.3	93.0	3.3	0.3		39.9	45.0	12.8	2.2		12.4	85.7	1.3	0.6		26.8	21.5	45.4	6.2		
Total %	1.5	42.8	1.5	0.2	46.0	2.4	2.7	0.8	0.1	6.1	4.6	31.9	0.5	0.2	37.2	2.9	2.3	4.9	0.7	10.7	

Arlington County Traffic Counts
 Performed By: Daniel Consultants, Inc.

File Name : Final
 Site Code : 00000000
 Start Date : 05/10/2005
 Page No : 1

Groups Printed- 1 - Unshifted

Start Time	Jeff Davis Hwy Southbound					S. Glebe Rd Westbound					Jeff Davis Hwy Northbound					S. Glebe Rd Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
07:00 AM	0	154	24	0	178	0	0	0	0	0	72	326	0	0	398	117	0	53	2	172	748
07:15 AM	0	168	31	0	199	0	0	0	0	0	81	365	0	0	446	134	0	49	2	185	830
07:30 AM	0	164	27	0	191	0	0	1	1	2	75	347	0	0	422	128	10	58	1	197	812
07:45 AM	3	184	30	0	217	0	0	1	1	2	66	431	0	0	497	158	0	72	1	231	947
Total	3	670	112	0	785	0	0	2	2	4	294	1469	0	0	1763	537	10	232	6	785	3337
08:00 AM	0	201	32	1	234	2	0	2	1	5	77	496	0	0	573	188	0	70	3	261	1073
08:15 AM	0	236	20	0	256	0	2	0	2	4	65	481	0	0	546	169	2	74	3	248	1054
08:30 AM	0	244	58	0	302	0	0	0	0	0	71	524	1	0	596	195	0	71	0	266	1164
08:45 AM	2	230	24	1	257	0	0	1	0	1	72	536	1	0	609	200	2	70	1	273	1140
Total	2	911	134	2	1049	2	2	3	3	10	285	2037	2	0	2324	752	4	285	7	1048	4431
****break****																					
11:00 AM	0	233	35	4	272	0	0	0	0	0	70	239	0	0	309	56	1	60	12	129	710
11:15 AM	0	304	52	1	357	0	0	0	0	0	74	230	0	0	304	52	0	87	0	139	800
11:30 AM	0	302	55	0	357	0	0	0	0	0	75	235	0	0	310	70	0	91	5	166	833
11:45 AM	0	314	50	0	364	0	0	0	0	0	74	246	0	0	320	60	0	84	0	144	828
Total	0	1153	192	5	1350	0	0	0	0	0	293	950	0	0	1243	238	1	322	17	578	3171
12:00 PM	0	309	71	0	380	0	0	0	0	0	96	250	0	0	346	78	0	104	0	182	908
12:15 PM	0	336	75	0	411	0	0	0	0	0	102	331	0	0	433	72	0	100	2	174	1018
12:30 PM	0	282	62	0	344	0	0	0	0	0	90	298	0	0	388	87	0	84	5	176	908
12:45 PM	0	358	72	0	430	0	0	0	0	0	87	334	0	0	421	69	0	91	0	160	1011
Total	0	1285	280	0	1565	0	0	0	0	0	375	1213	0	0	1588	306	0	379	7	692	3845
****break****																					
04:00 PM	1	321	110	1	433	0	1	0	3	4	89	253	0	0	342	62	1	84	2	149	928
04:15 PM	1	331	91	2	425	0	1	3	2	6	73	260	1	0	334	53	0	95	3	151	916
04:30 PM	0	308	106	0	414	0	0	0	5	5	131	264	0	0	395	69	1	76	2	148	962
04:45 PM	0	357	112	1	470	0	1	1	2	4	78	283	0	0	361	55	1	93	1	150	985
Total	2	1317	419	4	1742	0	3	4	12	19	371	1060	1	0	1432	239	3	348	8	598	3791
05:00 PM	1	356	104	4	465	1	4	4	3	12	87	245	0	0	332	52	1	123	2	178	987
05:15 PM	0	336	123	2	461	0	0	1	1	2	100	273	0	0	373	72	2	91	2	167	1003
05:30 PM	0	352	90	2	444	0	1	3	0	4	121	270	0	0	391	90	0	136	8	234	1073
05:45 PM	0	418	127	2	547	0	0	2	4	6	96	271	0	0	367	76	0	156	8	240	1160
Total	1	1462	444	10	1917	1	5	10	8	24	404	1059	0	0	1463	290	3	506	20	819	4223
06:00 PM	0	454	86	2	542	0	0	0	0	0	139	278	0	0	417	55	1	175	2	233	1192
06:15 PM	1	477	70	0	548	0	0	0	7	7	107	280	0	1	388	51	0	100	1	152	1095
06:30 PM	2	408	80	2	492	0	0	1	0	1	118	257	0	0	375	96	2	146	2	246	1114
06:45 PM	1	430	83	2	516	0	0	1	1	2	111	266	0	0	377	98	1	156	3	258	1153
Total	4	1769	319	6	2098	0	0	2	8	10	475	1081	0	1	1557	300	4	577	8	889	4554
07:00 PM	2	401	67	2	472	0	0	0	1	1	90	292	0	0	382	104	0	130	2	236	1091
07:15 PM	2	371	61	1	435	0	0	0	0	0	82	231	0	0	313	74	1	139	3	217	965
****break****																					
Grand Total	16	9339	2028	30	11413	3	10	21	34	68	2669	9392	3	1	12065	2840	26	2918	78	5862	29408
Apprch %	0.1	81.8	17.8	0.3		4.4	14.7	30.9	50.0		22.1	77.8	0.0	0.0		48.4	0.4	49.8	1.3		

Total %	0.1	31. ₈	6.9	0.1	38.8		0.0	0.0	0.1	0.1	0.2		9.1	31. ₉	0.0	0.0	41.0		9.7	0.1	9.9	0.3	19.9	
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