

ALBERT V. BRYAN COURTHOUSE
PERIMETER SECURITY IMPROVEMENT PROJECT
Alexandria, VA

TRANSPORTATION IMPACT STUDY
January 2012

PREPARED for the U.S. MARSHALS SERVICE
and the U.S. GENERAL SERVICES ADMINISTRATION

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INTRODUCTION

The following report summarizes the findings of the Transportation Impact Study (TIS) conducted on behalf of the U.S. General Services Administration (GSA) for the Albert V. Bryan (herein A.V. Bryan) Courthouse Perimeter Security Improvements. The A.V. Bryan Courthouse is located at 2100 Jamieson Avenue Alexandria, Virginia. Figures and tables referenced within this document as contained within Appendix A may be obtained through contacting Angela Mar at GSA at (202)205-4668 or angela.mar@gsa.gov.

The A.V. Bryan Courthouse is located within the Eisenhower east section of Alexandria. Key areas generally surrounding the Eisenhower East section of Alexandria include Prince George's County, Maryland (via the Woodrow Wilson Memorial Bridge) to the east, Fairfax County to the south and west and the District of Columbia to the north-east. Figure 1 (see Appendix A) provides a site location map.

The A.V. Bryan Courthouse houses the US Marshals Services (USMS), the U.S. Courts and the U.S. Attorney's Office and is bounded by Jamieson Avenue to the north, Elizabeth Lane to the east and Mill Road to the west.

The purpose of this study is to assess potential transportation impacts associated with the proposed security improvements and identify potential mitigation measures. The security improvements would replace the temporary barriers with permanent security elements that are more in keeping with the urban design landscape of surrounding development within the City of Alexandria. Detailed perimeter security improvements are described in the Future 2013 Build Conditions (with Proposed Security improvements) section of the report. Project completion is expected by 2013. In addition to addressing overall impacts to transportation operations in the area, the study evaluates queuing and addresses potential impacts to transit and pedestrian conditions.

Scope of Study

The study has been prepared in accordance with City of Alexandria guidelines and procedures. Per the request of the City of Alexandria, this study includes an assessment (Level of Service) of Existing (2011), Future No Build (2013) and Future Build (2013) traffic conditions for AM and PM peak hours for the following intersections:

1. Mill Road/ Mandeville Lane Garage Entrance
2. Mill Road/ Jamieson Avenue
3. Jamieson Avenue/ A.V. Bryan Courthouse Garage Entrance
4. Jamieson Avenue/ Courthouse Square (North)
5. Jamieson Avenue/ Dulany Street

6. Ballenger Avenue / Courthouse Square (North)
7. Elizabeth Lane/ A.V. Bryan Courthouse Garage Entrance
8. Elizabeth Lane/ Eisenhower Avenue
9. Eisenhower Avenue/ Mill Road
10. Eisenhower Avenue/ Mill Race Lane
11. Jamieson Avenue/ Courthouse Square South
12. Courthouse Square South/ Elizabeth Lane

Figure 2 (see Appendix A) shows the TIS study area intersections and the surrounding roadway network. This study is based on the following assumptions:

- Proposed Security improvements would be completed by 2013
- There are no foreseen increases in daily activity and/or employee population associated with the A.V. Bryan Courthouse at this time
- There will be no increase in existing parking supply or demand for the A.V. Bryan Courthouse
- The proposed improvements (by the City of Alexandria) to the intersection of Mill Road at Eisenhower Avenue would occur prior to the implementation of the perimeter security improvements in 2013. Proposed improvements to the intersection of Mill Road at Jamieson Avenue would occur concurrently or subsequent to the implementation of the perimeter security improvements in 2013.

Methodology

Data collection efforts including selected observation dates and selected count periods were approved by the City of Alexandria.

Analysis was conducted for three scenarios including Existing Conditions (2011), Future 2013 No-Build and Future 2013 Build with perimeter security improvements. The Highway Capacity Manual 2000 (HCM) methodology was employed through SYNCHRO version 7.0 for all capacity and Level of Service (LOS) analysis.

EXISTING CONDITIONS

Road Accessibility

A.V. Bryan Courthouse is situated in the Eisenhower East section of Alexandria, Virginia. Regional access to the A.V. Bryan Courthouse is provided from the Capital Beltway (Interstate 95/495), Route 1 (Henry and Patrick Streets), Washington Street and Duke Street.

Local access is provided by Eisenhower Avenue, Mill Road and Dulany Street. Jamieson Avenue and Elizabeth Lane provide direct access to the A.V. Bryan Courthouse parking garages which are used by employees only. An illustration of the existing site access is shown in Figure 3 (see Appendix A).

The following section includes a description of the study area roadways. The description includes the Functional Classification of each roadway. Virginia Department of Transportation references the Federal Highway Administration functional classification guidelines. The Federal Highway Administration (FHWA) defines Functional classification *as the process by which streets and highways are grouped into classes or systems according to the character of traffic service that they are intended to provide. Arterials provide the highest level of service at the greatest speed for the longest uninterrupted distance, with some degree of access control. Collector roadways provides a less highly developed level of service at a lower speed for shorter distances by collecting traffic from local roads and connecting them with arterials. Local Streets consist of all roads not defined as arterials or collectors; primarily provides access to land with little or no through movement.*¹

- Eisenhower Avenue is classified as an urban minor arterial by the Virginia Highway Functional Classification System². The roadways transitions from four to six lanes and extends from the Holland Avenue traffic circle (in the east) to the intersection with South Van Dorn Street to the west. Daily traffic through the study area is 14,000³ vehicles per day. Curbside parking is permitted along various sections of the corridor. The speed limit is 25 miles per hour.
- Mill Road is a four to five lane urban collector that borders the A.V. Bryan Courthouse to the west. South of the A.V. Bryan Courthouse, Mill Road provides a direct connection to and from the Eisenhower Avenue I-495 connector ramps. Parking is prohibited along most of the roadway. The speed limit is 25 miles per hour.

¹ Source: FHWA Functional Classification Guidelines

² Source: Virginia Highway Functional Classification, City of Alexandria, 2005 Functional Classification Map

³ Source: 2009 Virginia Department of Transportation Daily Traffic Volume Estimates

- Jamieson Avenue is a two lane local roadway. Curbside parking is prohibited along Jamieson Avenue (along the northern border of the site) for the general public. Law enforcement vehicles are permitted parking (adjacent to the existing Jersey barrier within the right of way) Monday through Friday from 6:00am to 7:00pm. Jamieson Avenue provides access to the Courthouse garage. The speed limit is 25 miles per hour.
- Elizabeth Lane is a local roadway that runs north-south from Courthouse Square to Eisenhower Avenue. The two lane roadway provides access to the A.V. Bryan Courthouse garage and the West public parking garage facility along the east side of the street. Two hour “pay to park” spaces are provided on either side of the street (near Eisenhower Avenue).
- Courthouse Square is a two segment roadway which is separated by the park area fronting the main A.V. Bryan Courthouse entrance. Vehicle access is closed to the public along the westernmost segment of the road, directly in front of the A.V. Bryan Courthouse (Courthouse Square South). The easternmost segment (Courthouse Square North) is open to two-way through traffic and extends north to the intersection with Jamieson Avenue and south to the intersection with Ballenger Avenue.
- Ballenger Avenue is a local east-west Street that runs from the intersection with Holland Avenue to the east to the Elizabeth Lane/ Courthouse Square intersection to the west. Curb parking is permitted along most of the roadway.
- Mandeville Lane provides access to the Hoffman Town Center garage and an adjacent surface parking lot. The parking lot services the Hoffman movie theatre and surrounding office buildings.
- Dulany Street is a north-south four to five lane local roadway. The roadway extends from Duke Street to the north and terminates at the U.S. Patent and Trademark Office. The northbound and southbound sections of the roadway are divided by a median.
- Mill Race Lane is a two-lane local street. The southern approach of the intersection will provide access to several proposed developments in the future.

Figure 4 (see Appendix A) illustrates existing lane configuration and traffic control measures at each study area intersection.

Traffic and Pedestrian Counts with Field Observations

Traffic data (turning movement counts), pedestrian counts, and bicycle counts were conducted during the City’s peak travel periods from 7:00 AM to 9:00 AM (am peak) and from 4:00 PM to 7:00 PM (pm peak) on the following dates:

- Wednesday, May 11, 2011
- Thursday, May 12, 2011
- Thursday, June 2, 2011
- Wednesday, October 26, 2011

- Wednesday, November 2, 2011

Based on data collected during these time periods, the system peak hours were determined to be 7:45 am to 8:45 am and 5:00 pm to 6:00 pm. Peak hour traffic data is shown in Figure 5 (see Appendix A). Security processing and queuing observations were conducted on Thursday, June 2, 2011 during the morning arrival and evening departure period.

Existing Trip Generation, Distribution and Modal Split

A.V. Bryan Courthouse is open weekdays from 8:00 am to 5:00 pm⁴. Employees drive, carpool, use public transit or walk/bike to the A.V. Bryan Courthouse. Employees whom drive to work are provided a key card to access the garage at all times. Existing site vehicle trips (employee trip generation only) captured during the morning (7:00 to 9:00 am) and evening (4:00 to 7:00 pm) peak hours at the A.V. Bryan Courthouse garage entrances are summarized in Table 1 (see Appendix A). Table 1 does not account for visitor trip generation. Visitors are encouraged to take public transit to the site and enter the A.V. Bryan Courthouse through the building's main entrance on Courthouse Square.

As shown in Table 1 (see Appendix A), the A.V. Bryan Courthouse generated a total of 100 am peak hour vehicle trips and 84 pm peak hour vehicle trips. Existing directional distribution is shown in Figure 6 (see Appendix A). This was developed using the inbound/outbound site trips and traffic data collected at study area intersections. Since there are no foreseen increases or decreases in employee population or parking, it is assumed existing and future vehicular trip generation and distribution will remain as under existing conditions.

Security Processing and Queuing Observations

Security processing and queuing was observed at A.V. Bryan Courthouse garage entrances on Jamieson Avenue. Security processing and queuing observations were conducted at Jamieson Avenue garage entrance to determine potential impacts related to proposed perimeter security improvements. During morning observations, a maximum vehicle queue, or sequence of vehicles awaiting their turn to proceed into the garage entrance, was four vehicles. These vehicles approached the A.V. Bryan Courthouse traveling east making a right turn into the driveway. Two vehicles were queued within the A.V. Bryan Courthouse property (one at the access card scanner and one within the Jersey barrier) and the remaining two vehicles were queued on Jamieson Avenue. The four queued vehicles accessing the A.V. Bryan Courthouse created a traffic queue that extended back to Mill Road (12 total vehicles). Queuing occurred between 7:30am and 7:45am and lasted for approximately 40 seconds. Queuing also occurred from 8:00am to 8:45am. The queue lasted 10 to 40 seconds.

⁴ On Friday, the Courthouse is open from 7:45 am to 5:00 pm.

No queuing was observed along Elizabeth Lane.

Capacity Analysis

To assess existing traffic conditions, traffic data and a number of inputs are entered into traffic analysis software and evaluated to provide a Level of Service (LOS) for each intersection. Inputs include parameters such as the number of travel lanes and traffic signal timing. The software outputs a LOS designation. LOS is the measure of the average control (i.e. stop sign or traffic signal) delay experienced by all motorists arriving to an intersection. There are six representative levels of service defined for intersections and they are designated using letters A through F, with LOS A representing the best operating conditions and LOS F representing the worst. Safety of the intersection is not included in the measure used to calculate LOS. Level of Service is defined separately for signalized intersections and unsignalized intersections. For signalized intersections, delay is evaluated for the overall intersection; while at unsignalized intersections delay is analyzed for each movement separately (i.e. northbound, southbound, eastbound or westbound traffic). The threshold for intersection LOS is shown in Table 2 (see Appendix A).

Existing conditions Level of Service (LOS) capacity analyses were conducted for the study area intersections using SYNCHRO 7 software. LOS “D” is acceptable within the City of Alexandria. Table 3 (see Appendix A) shows the LOS result for the study area intersections under existing conditions.

As Table 3 indicates (see Appendix A), all study area intersections operate at acceptable Levels of Service during both the AM and PM peak hours with the exception of the Jamieson Avenue/ Dulany Street intersection during the AM peak hour and the Jamieson Avenue/ Courthouse Square intersection during the PM peak hour. Field observations and analysis results indicate the following:

- Congestion at the Dulany Street/ Jamieson Avenue intersection. The intersection operates at a LOS “E” with an average delay on 70.3 seconds per vehicle. The eastbound lane configuration includes a single left-through-right lane. In the morning peak hour, 348 vehicles make a left turn thereby delaying eastbound through and eastbound right turning traffic. Left turning traffic is not related to the A.V. Bryan Courthouse.
- The minor approach (Courthouse Square) at the Courthouse Square/ Jamieson Avenue intersection only has one lane to accommodate left and right turning traffic. There is also a has a substantial number of pedestrian crossing at this intersection thus the reason for operating conditions at a LOS “E” during PM peak hour.
- Queuing and congestion observed along the southbound approach at Eisenhower Avenue and Mill Road during the pm peak hour. Although the overall intersection operates at a LOS “C”, the southbound approach operates at LOS “D”.

Pedestrians and Bicycles

Pedestrian access to the A.V. Bryan Courthouse is provided via sidewalks along Courthouse Square, Elizabeth Lane and Jamieson Avenue. Sidewalk widths fronting the A.V. Bryan Courthouse are as follows:

- Jamieson Avenue - 14 - foot brick paved with five -foot planter box
- Elizabeth Lane - 16 - foot brick paved with a three -foot planter box
- Courthouse Square - 27 feet

Field observations showed sidewalk widths are adequate to carry existing pedestrian traffic volumes. There is a slight grade change between the sidewalk and the driveway apron crossing Jamieson Avenue garage entrance. At the entrance to the A.V. Bryan Courthouse there is a sign alerting motorists to stop to pedestrians. However, the location of the security booth and the grade of the garage ramp make it difficult for motorist exiting the garage to see pedestrians walking along the sidewalk.

Crosswalks and landings are provided, for crossing Elizabeth, at the intersection of Elizabeth Lane and Courthouse Square. Jersey barriers are stationed on the sidewalk along the west-side of Elizabeth Lane (from the corner of Courthouse Square to the vehicular garage entrance). In addition, there is a pedestrian crosswalk located on Elizabeth Lane mid-block between Courthouse Square and the Guard booth at the Elizabeth Lane employee garage entrance.

Crosswalks and pedestrian signals are provided at all approaches of the intersections of Mill Road with Jamieson Avenue and Eisenhower Avenue. Crosswalks are not provided along an approach at the following study area intersections:

- Eisenhower Avenue/ Elizabeth Lane intersection eastbound approach crossing Eisenhower Avenue
- Dulany Street/ Jamieson Avenue intersection northbound approach crossing Dulany Street

Within the project vicinity, an off-street bikeway is located on Eisenhower Avenue. The bikeway runs east-west from the Eisenhower Avenue Metrorail Station (southwest of the Courthouse) and extends west to the Holmes Run Parkway off-street bikeway. On-street bikeways are designated on Jamieson Avenue (from Mill Road to Holland Lane), on Eisenhower Avenue (from Mill Road to Holland Lane) and on Mill Road (from Jamieson Avenue to Eisenhower Avenue). Figure 7 (see Appendix A) is the Alexandria Bikeway map within proximity of the A.V. Bryan Courthouse.

As shown in Figure 7 (see Appendix A) a future trail is proposed on the Telegraph Road Interchange ramp. The map notes the trail was expected to open in 2010. The trail has not yet opened and status of the bikeway improvement is unknown.

Transit

The study area is well served by a number of transit services including Washington Metropolitan Area Transit Authority (WMATA) Metrorail, Virginia Railway Express, the Alexandria Dash System Bus service and WMATA's Richmond Highway Express (REX).

There are two Metrorail Stations within 0.5 miles of the Courthouse. The Eisenhower Avenue Metrorail Station on WMATA's Yellow Line is located approximately 0.4 miles away. Access from the Eisenhower Metro Station is provided via sidewalks and crosswalks and is a convenient eight minute walk to the A.V. Bryan Courthouse. The King Street Metrorail Station on WMATA's Yellow and Blue Lines is located northeast of the A.V. Bryan Courthouse and is approximately 0.5 miles away. From the King Street Metro Station, the A.V. Bryan Courthouse is a ten minute walk.

The Virginia Railway Express (VRE) and Amtrak Station has a stop within 0.5 miles of the A.V. Bryan Courthouse. The stop is located at 110 Callahan Drive and is approximately a ten minute walk. The Station is adjacent to the King Street Metrorail Station.

WMATA Metrorail stations and the Amtrak Station are illustrated in Figure 8 (see Appendix A).

Bus systems servicing the project study area include the Alexandria Dash (AT7 and AT1) and the Richmond Highway Express. Service extensions are planned for the AT6 line that would extend the route to also provide service along adjacent roadways.

Bus stops near the A.V. Bryan Courthouse are as follows:

- Jamieson Avenue south-side approaching Courthouse Square
- Jamieson Avenue north-side (across from Courthouse Square South)
- Mill Road west-side (just south of intersection with Jamieson Avenue) with bus shelter
- Mill Road east-side (bordering A.V. Bryan Courthouse to the west) with bus shelter

Parking

The garage entrances on Jamieson Avenue and on Elizabeth Lane provide access to separate parking facilities for employees only.

No visitor parking is provided on-site. Curbside parking⁵ around the A.V. Bryan Courthouse is very limited and visitors are strongly encouraged to use public transportation. There are several public parking garages in the area where visitors may also park. The West public parking garage located at 550 Elizabeth Lane provides a total capacity of 1,805 self-park spaces. The Hoffman

⁵ Parking is hourly.

Town Center garage is west of the A.V. Bryan Courthouse and accessible via the Mandeville Lane. This garage provides 2,883 spaces.

Parking garage locations are shown in Figure 8 (see Appendix A).

FUTURE 2013 NO BUILD CONDITIONS (without Perimeter Security Improvements)

The Future 2013 No Build Conditions (without perimeter security improvements) scenario analyzes the future network assuming the proposed project is not built. This scenario is used as a baseline comparison for understanding impacts of no build versus build conditions in the future. The year 2013 is selected since this is the targeted completion date.

A summary of assumptions for future network improvements and regional traffic growth is outlined below.

- Network improvements - The City of Alexandria is planning to modify the Eisenhower Avenue and Mill Road intersection by year 2013. Plans include widening the westbound approach of Eisenhower Avenue to include an additional left turn lane. The existing configuration is illustrated in Figure 4 (see Appendix A).
- Trip distribution and Traffic assignment - Trip distribution is not expected to change from existing 2011 patterns of traffic on the surrounding roadway network and there are no additional traffic assignments (related to the A.V. Bryan Courthouse) assumed for the network
- Land use growth – Roadway traffic, illustrated in Figure 5 (see Appendix A), will increase by 1% percent per year⁶ from the existing traffic in 2011 to 2013 to account for regional growth. Additional land use growth assumptions are outlined in the section below.

Land Use Growth and Planned Projects

Near the A.V. Bryan Courthouse, there are two vacant LCOR buildings which will likely be re-occupied by the year 2013. The location and a summary of the space programming for each building is as follows:

- 2050 Ballenger Avenue- 52,000 square feet of office space and 16,000 square feet ground floor retail

⁶ Growth was applied to through traffic movements on all study area roadways. Courthouse traffic was not increased.

- 1920 Ballenger Avenue - 46,000 square feet of office space and 14,000 square feet ground floor retail

Block O is a residential development planned in the Eisenhower East section of Alexandria, VA. The site situated north of the Eisenhower Avenue/ Holland Avenue traffic circle, and is currently under construction. The development is planned to include 344 residential units.

The above listed projects were included in the Future 2013 No Build analysis assumptions. Potential traffic generation was projected using the Institute of Transportation Engineers' Trip Generation Manual, 8th Edition. This traffic was added to the existing roadway network based on established directional distribution and existing traffic data collected at study area intersections. A 31% reduction was applied to account for non-automobile trip generation.

It is also noted that several other projects are planned within the Eisenhower East area. Expected completion is likely after the 2013 build year thus these projects were not included in the Future 2013 No Build or Future 2013 Build traffic analysis scenario. A summary of the project and proposed development program is listed in the following section.

- Hoffman Blocks 11 and 12 - Located immediately east of Eisenhower Metro Station (on south-side of Eisenhower Avenue), this development will consist of two buildings totaling 1.3 Million square feet to include 1,200 residential units and 67,000 square feet of ground floor retail. Included in the ground floor retail square footage is a 50,000 square feet Harris Teeter Grocery Store.
- Lane Property Blocks 19 and 20 – immediately east of the Hoffman Blocks 11 and 12, this site is planned for 474,000 square feet of residential development and 585,000 square feet of office floor area.
- Block P – located south of the Eisenhower Avenue/ Holland Avenue traffic circle will include approximately 343,000 square feet of office spaces with an additional 30,000 square feet of ground floor retail.

Future 2013 No Build Traffic Projections

Existing traffic volumes, planned land growth and planned projects were used to develop Future 2013 No Build traffic volumes shown in Figure 9 (see Appendix A).

Future 2013 No Build Capacity Analysis

Capacity analyses were conducted for the study area intersections using SYNCHRO 7 software. Future 2013 No Build and Existing level of service and delay is shown in Table 4 (see Appendix A).

As Table 4 indicates (see Appendix A), generally the study area intersections will continue to operate at acceptable Levels of Service during both the AM and PM peak hours for Future 2013 No Build. At intersections 1 (Mill Road and Mandeville Lane) and 5 (Jamieson Avenue/ Dulany Street), traffic signal optimization and additional vehicles on the mainline resulted in a slight improvement in average vehicle delay as compared to existing conditions. The Jamieson Avenue/ Dulany Street intersection will continue to operate at LOS “E”, as under existing conditions, however delay experienced by motorists would decrease from 70.3 to 69.0 (a difference of 1.3 second per vehicle) second per vehicles as a result of signal optimization. The City of Alexandria Department of Transportation and Environmental Services provided information that a signal warrant study had been performed (in accordance with Federal requirements) at the Jamieson Avenue/ Courthouse Square intersection. The study indicated a signal was not warranted at this intersection. However, with the addition of traffic through this intersection due to regional growth and new developments in the vicinity, a signal may be warranted at some point in the future. The installation of a signal would allow the intersection Level of Service to improve from LOS "E" to LOS "B".

LOS declined at the Jamieson Avenue/ Courthouse Square from a “D” to an “E” during the AM peak hour. At Ballenger Avenue/ Courthouse Square intersection operates declined from a LOS “A” to LOS “C” due to the 1% annual growth in traffic and additional traffic associated with the LCOR buildings.

FUTURE 2013 BUILD CONDITIONS (with Perimeter Security Improvements)

Proposed security improvements would be completed by 2013 the targeted build date. The Future Conditions with perimeter security improvements analysis scenario has been examined for the 2013 build year and includes the following primary assumptions:

- The Mill Road/Jamieson Avenue intersection will be improved in accordance with City of Alexandria Department of Transportation and Environmental Services proposed plans as outlined below in the Planned Network Improvements section of this report.
- Security perimeter improvements would be installed to replace current temporary security measures with permanent perimeter elements as outlined in the Proposed Security Perimeter Features section of this report.

- As part of the proposed security improvements the closed section of Courthouse Square South (between Jamieson Avenue and Elizabeth Lane) would be reopened to vehicular traffic. The roadway would be a one-lane, one-way roadway in the southbound direction.

Planned Network Improvements

The City of Alexandria Department of Transportation and Environmental Services has planned to modify the lane configuration and implement intersection improvements at the Mill Road/Jamieson Avenue Intersection and along Jamieson Avenue, west of Courthouse Plaza and east of Mill Road. Proposed plans include modifying the northbound approach to include a shared through-right lane, in place of the existing shared through-left lane, thereby creating a double right turn from northbound Mill Road onto the eastbound approach of Jamieson Avenue. Along the eastbound approach of Jamieson Avenue (near-side), the two right turning lanes would merge into one single eastbound lane. The westbound approach of Jamieson Avenue, east of Mill Road would include an additional through lane increasing the number of lanes on Jamieson from two lanes to three travel lanes. After 7:00 PM, one of the westbound travel lanes (curb-side) will be used for parking. See Figure 10 (Appendix A) for an illustration of the proposed lane configuration changes.

Proposed Security Perimeter Features

The GSA proposes to remove existing temporary security features with permanent perimeter elements. The security improvements would replace the temporary barriers with permanent security elements that are more in keeping with the urban design landscape of this redeveloping area of the City. Proposed security perimeter improvements would be completed by 2013. Key highlights include:

Jamieson Avenue

- Removal of existing jersey barriers, along northern site boundary around Courthouse
- Removal of law enforcement parking adjacent to jersey barriers
- Installation of bollards along all of Jamieson Avenue intermittent with hardened fences
- Installation of a hardened garden fence and curbside planting area
- Jamieson Garage entrance - Installation of retractable bollards; retention of Delta barrier and widened sidewalk

NOTE: The existing jersey barriers on Jamieson Avenue currently allow space for two vehicles to queue back from the current security card reader location without impacting through traffic on Jamieson Avenue. Eliminating the jersey barriers, as proposed in the Perimeter Security Improvements Plan, would eliminate queuing space for one vehicle. Associated impacts are outlined in the Garage Entry Assessment Section of this report.

Elizabeth Lane

- Removal of existing jersey barriers along the sidewalk
- Installation of fixed bollards that spans tree boxes
- Installation of bollards at pedestrian crosswalks between Elizabeth Lane/Courthouse Square
Installation law enforcement vehicle parking zone⁷
- No proposed change in existing travel lane or circulation

Courthouse Square

- Open Courthouse Square South to one-way traffic from Jamieson Avenue to Elizabeth Lane
- Install elevated crosswalk at Courthouse Square South at front of Courthouse
- Install retractable bollards at two location across Courthouse Square South to allow for the temporary closure of the street during times when security levels must be elevated
- Extend sidewalk, install planters, fixed bollards and fence spanning along the front of Courthouse Square

An illustration of the site plan is shown in Figure 11 (see Appendix A).

In summary, the improvements are planned to achieve the following:

- Enhance the pedestrian environment by increasing sidewalk widths, removing jersey barrier along sidewalk along Elizabeth Lane
- Relocate law enforcement vehicle parking (along jersey barrier on Jamieson) to Elizabeth Lane immediately adjacent to the A.V. Bryan Courthouse
- Accommodate the City of Alexandria's proposed plans to increase number of lanes on Jamieson Avenue (three travel lanes during peak periods and two travel lanes with one parking during off peak periods).
- Reduce the available queuing area for vehicle security processing at the Jamieson Avenue garage entrance

⁷ Law enforcement vehicle parking would be relocated from its current location along Jamieson Avenue

Pedestrian Impacts

The proposed security perimeter improvements would enhance the pedestrian environment as follows:

- Improve walkability by increasing sidewalks widths along Jamieson Avenue
- Improve landscaping by implementing curbside planting
- Level grade change between the sidewalk and the driveway apron crossing Jamieson Avenue garage entrance.
- Create a more aesthetically pleasing environment by removing the Jersey barrier along the sidewalk on Elizabeth Lane, along Jamieson Avenue and at the approach to Courthouse Square South (at Jamieson Avenue and at Elizabeth Lane)
- Create a more inviting park area with opening of Courthouse Square south and installation of elevated crosswalk at the front of the Courthouse

Pedestrian circulation at the proposed Courthouse Square South/ Jamieson Avenue intersection would be slightly impacted as a result of widening the sidewalk along Jamieson Avenue. The new curb would not be aligned with the existing curb at the park thus pedestrian traffic would make a slight jog when traveling either east or west along the Southside of Jamieson Avenue. Crosswalks would be in place to guide crossing at this intersection and the installation of ADA compliant curb ramps with detectable warning systems would help to guide individuals with visual disabilities.

Parking Impacts

There would be no loss to public on-street parking as a result of the proposed security perimeter improvements. Along Jamieson Avenue, existing parking spaces support law enforcement personnel only and would be relocated to Elizabeth Lane⁸. Along Elizabeth Lane, a new law enforcement parking zone⁹ would be implemented along the curb where parking is currently prohibited.

The proposed security perimeter project would accommodate the City of Alexandria's proposed plan to increase the number of lanes on Jamieson Avenue to allow for three travel lanes during peak periods and two travel lanes with one parking lane during the off peak period. Thus there would be an increase in off peak parking supply for the local community by providing curb parking between Courthouse Square and Mill Road.

The project would not impact the existing parking supply within the parking garage.

⁸This law enforcement parking area was created with the installation of the temporary security improvements and was not the original intent for Jamieson Avenue.

⁹ The new law enforcement parking zone would accommodate approximately nine vehicles. Jamieson Avenue currently accommodates approximately 12 vehicles thus there would be a loss of three spaces.

Transit Impacts

There are two bus stops along Jamieson Area near the A.V. Bryan Courthouse, one along south-side of Jamieson Avenue approaching the intersection with Courthouse Square and one along the north-side of Jamieson Avenue across from Courthouse Square South. Neither of the bus stops would be impacted by the proposed security perimeter improvements.

Future 2013 Build Traffic Projections

Future Build traffic projections were developed by adjusting the Future No Build scenario traffic conditions to account for slight changes in traffic patterns and circulation associated with the reopening of Courthouse Square South. None of the additional security perimeter changes, as outlined in the Proposed Security Perimeter Features section of this report, are expected to result in any additional traffic. Future Build traffic volumes are shown in Figure 12 (see Appendix A).

Future 2013 Build Capacity Analysis

The Future 2013 Build Level of Service (LOS) capacity analyses were conducted for the study area intersections using SYNCHRO 7 software. As previously noted the Future 2013 Build analysis scenario assumes network improvements (Mill Road/Jamieson Avenue), regional growth (1% per year from 2011 to 2013) and proposed perimeter modifications. Table 5 (see Appendix A) shows a comparison of Future 2013 No Build and Future 2013 Build level of service and delay (in seconds).

As Table 5 indicates (see Appendix A), the majority of the study area intersections will continue to operate at acceptable Levels of Service during both the AM and PM peak hours. As under Future 2013 No Build, the Jamieson Avenue/ Dulany Street intersection will continue to operate at LOS “E” during the AM peak hour under Build conditions.

The following changes are projected to occur from Future 2013 No Build to Future 2013 Build:

- Intersection operations would slightly improve at Mill Road and Jamieson Avenue intersection as a result of the new lane configuration proposed by the City of Alexandria Department of Transportation and Environmental Services (see Figure10, Appendix A).
- Intersection operations would also improve (pm peak hour) at the Jamieson Avenue entrance to the A.V. Bryan Courthouse garage due to the additional travel lane along Jamieson Avenue.
- Intersection operations would slightly improve at Jamieson Avenue and Courthouse Square since there would be reduced turning movement as a result of the opening of Courthouse Square South. It is noted an alternative option was considered with Courthouse Square North becoming one-way towards Jamieson Avenue (instead of the current two-way operation) and signaling this intersection. With this alternative option Courthouse Square

North and South would operate as a one-way pair. This alternative options was however not viable because of potential security related closures of Courthouse Square South.

Generally comparing No Build to Build conditions, results indicate minimal to no change in the LOS or vehicle delay at all study area intersections.

Garage Entry Assessment

In addition to the Level of Service capacity analysis that was conducted at each of the study area intersections, a more comprehensive assessment was conducted at the Jamieson Avenue garage entryway/exit area to better understand the impacts of the proposed security perimeter improvements. Traffic and safety conditions at the garage entry and exit would be affected by the following factors: security operations and processing speed, vehicle storage, sight distance, and gaps in the traffic stream along Jamieson Avenue.

Security Operations and Processing Speed

As part of this assessment existing security operations were observed as the basis for determining future security operations and processing speeds. The processing time for vehicles depends on a number of factors including the speed of the individual security mechanics (such as the delta barrier and garage door). GSA and the US Marshals are currently exploring alternatives to improve security processing rates. Existing processing rates were assumed for the analysis presented in this study.

Queuing Analysis

The maximum queue length along Jamieson Avenue was observed to be approximately 245 feet in length (12 vehicles) during the AM peak hour. This queue extended back to Mill Road and lasted for approximately 40 seconds. It quickly dissipated once vehicles at the Courthouse driveway were cleared to enter. Future queue lengths were projected using Simtraffic 7 simulation software. Simulation parameters were adjusted for the existing scenario to match the existing conditions that were observed in the field. Those same parameters were also used with the corresponding build year volumes and lane configurations to approximate the future build year queue lengths. Table 6 (see Appendix A) shows the results of the simulations.

The 95th percentile queue length is expected to be slightly greater during the AM Build scenario when compared to the AM Existing scenario (200 ft v. 180 ft). This distance is equivalent to a one vehicle length greater queue in the build scenario (10 vehicles v. 9 vehicles). However, the maximum queue length during the build scenario is projected to be 15 feet less than the existing scenario which is equivalent to approximately one less vehicle in the queue on Jamieson Avenue (11 vehicles v. 12 vehicles). This reduction in queue length can be attributed to the additional storage provided by the second travel lane on eastbound Jamieson Avenue exiting the intersection with Mill Road.

The existing jersey barriers on Jamieson Avenue currently allow space for two vehicles to queue back from the current security card reader location without impacting through traffic on Jamieson Avenue. Eliminating the jersey barriers, as proposed in the Perimeter Security Improvements Plan, would eliminate queuing space for one vehicle. Thus, there would be times when a vehicle would be stopped at the garage entry area while a second or third vehicle arrives at the same time. During this time the additional vehicle(s) would have to wait on Jamieson Avenue in either the through-right turn lane or the through left-turn lane. Thus through traffic would have to wait momentarily as the vehicle in front of it is processed through the garage entry. There are potential safety concerns with not having a storage or turn lane on Jamieson Avenue. The situation could be improved with security personnel that help to expedite processing and manage vehicles partially blocking through traffic. Currently the security personnel are not under contract to manage traffic conditions.

Sight Distance

The proposed hardened garden fence and landscaping is proposed to be located on Jamieson Avenue is planned to be lower than 3.5 feet. Consequently sight distance is not expected to be an issue for motorists exiting the garage provided the grade level at the point of exit is not at an incline that would reduce sight line distances.

Gaps in Traffic

There are currently adequate gaps in traffic on Jamieson Avenue to provide access/egress to/from the garage. In the future, increase in traffic due to planned area development will reduce gaps slightly in the eastbound direction. The increase in the number of westbound lanes will improve gaps in traffic in the westbound direction.

RECOMMENDATIONS

Proposed Perimeter Security Impacts and Recommended Mitigation Concept

The following is a summary of recommendations that should be considered in association with the proposed perimeter security improvements:

- Security Processing – Consider leaving the garage door open during peak times if this does not adversely impact security or else consider installing a garage door that would open faster in order to improve security processing rates and thus reduce any potential impacts on Jamieson Avenue.
- Manage Traffic Flow – Use security or traffic personnel to help manage vehicle processing on the premises such that approaching vehicles do not partially block Jamieson Avenue while waiting for the proceeding vehicle to proceed through the garage door.
- Maintain the hardened garden fence and landscaping below 3.5 feet near the garage exit so as not to impede sight distance.

CONCLUSIONS

The traffic impacts due to the upgrades of the perimeter security at the A.V. Bryan Courthouse have been examined for the following conditions:

- Existing Conditions
- 2013 No Build Conditions (with additional proposed development in the area and additional roadway improvements planned by the City of Alexandria)
- 2013 Build Conditions (with the proposed security perimeter improvements including the re-opening of Courthouse Square South)

Existing Conditions

Study area intersections generally reflect adequate level of service in the AM and PM for existing (2011) with the following exceptions:

- Jamieson Avenue/ Dulany Street intersection in the AM (LOS E)
- The minor approach (Courthouse Square) at the Courthouse Square/ Jamieson Avenue intersection only has one lane to accommodate left and right turning traffic. There is also a substantial number of pedestrian crossing at this intersection thus the reason for operating conditions at a LOS “E” during PM peak hour. The City of Alexandria provided information that a signal warrant study had been performed at this intersection and that a signal was not justified at this time. However, with the addition of traffic through this intersection due to one percent annual growth and new development in the vicinity, a signal may be warranted by the year 2013. The implementation of this signal would allow the intersection level of service to improve from LOS "E" to LOS "B".

- Observations indicate queuing and congestions along the southbound approach of Mill Road at the Mill Road /Eisenhower intersection in the PM peak hour. Although the overall intersection operates at a LOS “C”, the southbound approach operates at LOS “D”.

Future No Build Conditions

- The existing operational issues are expected to be improved slightly at the Dulany/Jamieson intersection by optimizing the existing signal timing. Still the intersection would continue to operate at a LOS “E”.
- The existing queuing and congestion observed at the Mill Road/ Eisenhower Avenue intersection is expected to be improved due to roadway improvements planned by the City of Alexandria. Intersection improvements will include the construction of a dual left turn lane on westbound Eisenhower Avenue.
- At Mill Road and Mandeville Lane and at Jamieson Avenue and Dulany Street traffic signal optimization and additional vehicles on the mainline resulted in a slight improved average vehicle delay as compared to existing conditions.
- LOS declined at the Jamieson Avenue/ Courthouse Square from a “D” to an “E” during the AM peak hour.
- At Ballenger Avenue/ Courthouse Square intersection operates declined from a LOS “A” to LOS “C” due to the 1% annual growth in traffic and additional traffic associated with the LCOR buildings.

Future Build Conditions: Perimeter Security Improvements (GSA)

- The two primary elements of the security improvement plan that would impact traffic conditions in some manner include reopening Courthouse Square South to vehicular traffic and perimeter improvements at the Jamieson Avenue garage entry.
- Reopening Courthouse Square South would improve circulation in the immediate vicinity, particularly for the hotel located north of Courthouse Square.
- Traffic and safety conditions at the Jamieson Avenue garage entry and exit would be affected by the following factors: security operations and processing speed, vehicle storage, sight distance, and gaps in the traffic stream along Jamieson Avenue.
- The following recommendations should be considered for improving operations at the Jamieson Avenue garage:
 - The security perimeter improvements will not result in any change to the existing vehicle processing rate. Where possible improve security processing rates to the extent possible without compromising security. Measures could include installing a faster garage door or keeping the garage door open during peak inbound time periods.
 - Maintain the hardened garden fence and landscaping below 3.5 feet near the garage exit so as not to impede sight distance.

- Use security personnel to help manage garage traffic flow so that approaching garage vehicles do not partially impede through traffic. Some through vehicles may attempt to pass garage vehicles that only partially protrude back onto Jamieson Avenue. This could result in unsafe passing movements into the opposing travel lane.
- The City of Alexandria Department of Transportation and Environmental Services is planning intersection improvements (lane restriping) at the Jamieson Avenue/Mill Road intersection. The planned improvements will result in improved traffic conditions in the future even with the planned increase in traffic associated with 2013 No Build Conditions. The intersection improvement project would need to be phased with the security perimeter improvement project in order to maintain satisfactory ingress/egress of the A.V. Bryan Courthouse as well as the traffic flows along Jamieson Avenue.
- The Dulany/Jamieson intersection is projected to continue operating at a LOS “E” as it does in Existing and No Build Conditions. As is the case in No Build Conditions, optimizing the signal timing would improve the Level of Service slightly as compared to Existing Conditions. Traffic conditions at this intersection are not affected by proposed security perimeter improvements.