



MEMORANDUM

TO: Doug Noble
Jeff Jennings
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District Department of Transportation
District Department of Transportation
District Department of Transportation

FROM: Louis J. Slade, P.E.
Leon F. Anderson
Adrienne E. Losh

DATE: January 12, 2007

SUBJECT: Sibley MOB Traffic Analysis based on Peak Hour trips of the Generator

This memorandum was prepared in response to the District Department of Transportation's (DDOT) request for further traffic analyses in conjunction with the proposed Sibley Hospital Medical Office Building (MOB) in Washington DC. In particular, DDOT sought to understand the resulting traffic impacts when the peak hour trips of the generator¹ (the MOB) were added to the peak trips of the surrounding road network. The primary purpose of this memo is therefore to evaluate the traffic impacts of the proposed new development based on the peak hour trips of the generator coinciding with the peak hour of the adjacent street traffic. This is a worst-case analysis intended to verify that the MOB impacts will be acceptable and the design of the Loughboro Road/Dalecarlia Parkway intersection is adequate.

TRAFFIC IMPACT ANALYSIS

To determine the traffic impacts of the MOB (using the peak hour trips of the generator), the future conditions of the transportation network were determined using a composite of the background traffic conditions (future without the MOB) and traffic generated by the MOB expansion. Since background conditions were already evaluated in the previously submitted traffic study (dated: June 8, 2006), the new trips of the MOB (using peak hour trips of the generator) were added to the previously computed background traffic forecast to determine the total future traffic forecast. The number of trips generated by the MOB was based on the rates and equations published by the Institute of Transportation Engineers (ITE), *Trip Generation*, 7th edition. Table 1 shows the trip generation based on the AM Peak Hour and PM Peak Hour of Generator.

¹ The G/SA traffic impact study dated June 8, 2006 used trip generation based on data for the AM Peak Hour and PM Peak Hour of Adjacent Street Traffic, between 7:00 a.m. to 9:00 a.m. and 4:00 p.m. to 6:00 p.m., respectively.

Total future peak hour Levels of Service (including the build-out of the new MOB) were calculated based on future lane use and traffic controls (including any improvements to the network), the total future traffic volumes, and the Highway Capacity Manual (HCM) 2000 methodologies using Synchro, version 6, traffic software. SIMTraffic was used to replicate future conditions (in particular, queuing) on the roadway network surrounding the Sibley Hospital site. Table 2 displays the results of the capacity analysis including the Level of Service and average delay per vehicle in seconds. Table 3 shows the SIMTraffic queuing results.

Tables 2 and 3 show that, using the peak hour trips of the generator, the results of the analysis are generally consistent with the results of the previously submitted study. The capacity analysis shows that the roadway network and the intersections of the study area will continue to operate at overall acceptable conditions. The results of the simulations show that the queuing results are similar to our previous analysis. In particular, the northbound left-turn (into the Hospital) at the Dalecarlia Parkway/Little Falls Road intersection shows a 95th percentile queue of 63 feet – which maintains consistency with earlier findings and renders the 150 foot turning lane provision sufficient.

Table 1 – Trip Generation (Peak Hour of the Generator)

| Land Use | ITE Land Use Code | Size | Trip Generation | | | | | |
|-----------------------------------|-------------------|------------|-----------------|------------|------------|--------------|------------|------------|
| | | | AM Peak Hour | | | PM Peak Hour | | |
| | | | In | Out | Total | In | Out | Total |
| Medical Office Building | 720 | 113,000 SF | 264 | 136 | 400 | 135 | 366 | 501 |
| Alternate Mode/Synergy Reduction | | 10% | (26) | (14) | (40) | (14) | (37) | (50) |
| Total Site Trip Generation | | | 238 | 122 | 360 | 122 | 329 | 451 |

Table 2 – Total Future Levels of Service

| Intersection (Approach) | Future Conditions | | | |
|---|-------------------|------------------|-----------------|------------------|
| | AM Peak Hour | | PM Peak Hour | |
| | Delay (sec/veh) | Level of Service | Delay (sec/veh) | Level of Service |
| Little Falls Road and MacArthur Boulevard | | | | |
| Westbound | 15.7 | C | 15.7 | C |
| Little Falls Road and Dalecarlia Parkway | | | | |
| Eastbound | 24.9 | C | 30.3 | D |
| Dalecarlia Parkway and Loughboro Road | | | | |
| Southbound | 152.4 | F | 43.5 | E |
| Loughboro Road and Main Hospital Entrance | | | | |
| Overall | 8.1 | A | 4.6 | A |
| Eastbound | 10.2 | B | 4.3 | A |
| Westbound | 2.8 | A | 3.7 | A |
| Southbound | 23.8 | C | 11.2 | B |
| Loughboro Road and Renaissance Entrance | | | | |
| Southbound | 16.9 | C | 23.0 | C |
| Loughboro Rd./Norton St. and MacArthur Blvd. | | | | |
| Overall | 63.8 | E | 38.1 | D |
| Eastbound | 17.5 | B | 8.7 | A |
| Westbound | 25.6 | C | 13.5 | B |
| Northbound | 17.4 | B | 29.1 | C |
| Southbound | 124.4 | F | 75.2 | E |
| Loughboro Rd./Norton St. and MacArthur Blvd. | | | | |
| Overall (Imp: Leading Southbound Movement) | 29.8 | C | 25.2 | C |
| Eastbound | 21.3 | C | 18.0 | B |
| Westbound | 33.0 | C | 30.2 | C |
| Northbound | 8.5 | C | 26.3 | C |
| Southbound | 27.7 | C | 19.1 | B |
| MacArthur Boulevard and Grand Oaks Entrance | | | | |
| Southbound | 10.4 | B | 10.1 | B |

Table 3 – Total Future Queuing Levels

| Intersection Approach (Directions Served) | Total Future Queuing Conditions | |
|--|--|--|
| | AM Peak Hour | PM Peak Hour |
| | 95 th Percentile Queue (feet) | 95 th Percentile Queue (feet) |
| Little Falls Road and MacArthur Boulevard | | |
| Westbound | 101 | 110 |
| Northbound (U-Turn) | 61 | 26 |
| Northbound (Through-Right) | 15 ⁽¹⁾ | . |
| Southbound (Left-Through) | 115 | 61 |
| Southbound (Through) | 11 ⁽¹⁾ | . |
| Little Falls Road and Dalecarlia Parkway | | |
| Eastbound (Left) | 84 | 87 |
| Eastbound (Right) | 75 | 62 |
| Northbound (Left) | 65 | 38 |
| Northbound (Through) | 77 ⁽¹⁾ | . |
| Southbound (Through) | 450 ⁽²⁾ | 12 |
| Southbound (Right) | 110 | . |
| Dalecarlia Parkway and Loughboro Road | | |
| Eastbound | 239 | 109 |
| Westbound | 33 | . |
| Southbound (Left) | 302 | 137 |
| Southbound (Right) | 264 | 213 |
| Loughboro Road and Main Hospital Entrance | | |
| Eastbound | 498 | 144 |
| Westbound (Through) | 83 | 67 |
| Westbound (Through-Right) | 117 | 95 |
| Southbound | 134 | 85 |
| Loughboro Road and Grand Oaks Entrance | | |
| Eastbound (Through-Left) | 170 | 52 |
| Southbound | 33 | 49 |
| Loughboro Road and MacArthur Blvd. | | |
| Eastbound | 49 | 38 |
| Westbound (Left) | 206 | 186 |
| Westbound (Left-Through-Right)) | 214 | 220 |
| Northbound (Left-Through) | 199 | 170 |
| Northbound (Through-Right) | 242 | 194 |
| Southbound (Left-Through) | 343 | 178 |
| Southbound (Through-Right) | 281 | 163 |
| Loughboro Road and Grand Oaks Entrance | | |
| Westbound (Right-Out) | 19 | 17 |

Note: (1) This table presents all queues from the simulation analysis. SIMTraffic is sensitive regarding queuing and registers simple vehicle movements such as lane changes and turning as causing potential queues. Therefore, measurable queuing is not expected at these approaches.

Note: (2) A “spillover” queue from Loughboro Road along southbound Dalecarlia Parkway is estimated in this worst-case analysis. “Do not block the Hospital Entrance” signs will be located at Little Falls Road to keep the intersection clear in the rare event that a queue would occur.



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FROM: Louis J. Slade, P.E.
Leon F. Anderson
Adrienne E. Losh

DATE: January 12, 2007

SUBJECT: Sibley MOB – Preliminary Multi-way Stop Analysis

This memorandum details the findings of a preliminary multi-way warrant analysis for the Dalecarlia Parkway/Loughboro Road intersection, Washington D.C.

The Dalecarlia Parkway/Loughboro Road intersection is presently unsignalized with the southbound approach under stop control. The intersection is mostly used by commuter traffic from Maryland to Downtown, Washington D.C., and vice versa.

ANALYSIS

The Manual of Uniform Traffic Control Devices, 2003 Edition (MUTCD) provides guidance for evaluation of the installation of a multi-way stop control. The MUTCD stipulates that the following criteria should be considered for a multi-way stop sign installation:

- A. Where traffic control signals are justified, the multi-way stop is an interim measure that can be installed quickly to control traffic while arrangements are being made for the installation of the traffic control signal.
- B. A crash problem, as indicated by 5 or more reported crashes in a 12-month period that are susceptible to correction by multi-way stop installation. Such crashes include right-and left-turn collisions as well as right-angle collisions.
- C. Minimum volumes:
 1. The vehicular volumes entering the intersection from the major street approaches (total of both approaches) averages at least 300 vehicles per hour for any 8 hours of an average day, and
 2. The combined vehicular, pedestrian, and bicycle volume entering the

intersection from the minor street approaches (total of both approaches) averages at least 200 units per hour for the same 8 hours, with an average delay to the minor street of at least 30 seconds per vehicle during the highest hour, but

3. If the 85th-percentile approach speed of the major street exceeds 65 km/h or exceeds 40 mph, the minimum vehicular volume warrants are 70 percent of the above values.

D. Where no signal criterion is satisfied, but where Criteria B, C.1 and C.2 are all satisfied to 80 percent of the minimum values. Criterion C.3 is excluded from this condition.

Criterion Analysis & Discussion

Since the traffic passing through the Loughboro Road/Dalecarlia Parkway intersection is primarily commuter traffic, the highest four hours of traffic contributes to the six hours of existing turning movement data (AM and PM peak hour counts) collected, this data proves to be sufficient to analyze whether or not this intersection meets the multi-way stop control installation criterion.

Criterion A is not applicable to this intersection. Signal warrant analyses were conducted to determine the need for a traffic signal at the intersection and the need for a traffic signal was not justified.

Criterion B is not satisfied. The intersection does not have a "crash problem," and does not meet the minimum of five (5) crashes over a 12 month period.

Criterion C is not satisfied. The AM and PM hourly volumes (6 hours in total) entering the intersection from the major and minor street approaches were examined. The vehicular volume entering the intersection from the major street approaches averaged above 300 vehicles per hour. The combined vehicular, pedestrian, and bicycle volumes entering the intersection from the minor street approaches averaged above 200 units per hour. Therefore this intersection satisfied C.1 and C.2 of the minimum volume requirements needed for a multi-way stop sign installation. However, the 85th percentile approach speed (40 mph) C.3 was not satisfied for this criterion.

Criterion D is not satisfied. At 80 percent of the minimum values, the minimum threshold for criterion B would be approximately four (4) crashes over a 12 month period. This is not met.

CONCLUSION

Based on the preliminary multi-way Stop analysis, all-way Stop control is not required for the Loughboro Road/Dalecarlia Parkway intersections.



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FROM: Louis J. Slade, P.E.
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DATE: January 15, 2007

SUBJECT: Sibley MOB Diagnostic Space

DDOT requested more information regarding the net new space that would be available at Sibley once the existing diagnostic services were moved to the new Medical Office Building (MOB). This memorandum explains the existing and future use of this space.

Jerry Price, Sibley's Executive Vice President and Chief Operating Office, confirms that the diagnostic facility in the below-grade floor of the new MOB will take existing diagnostic equipment currently located elsewhere on the campus and create a new consolidated facility for this existing use. The below-grade floor of the MOB will house a Surgery Center, Data Center, and a small Imaging Center. The Surgery Center and Data Center are currently located at Hayes Hall. These Centers must be moved as the Hospital has plans to demolish Hayes Hall in order to make room for the new Hospital. Therefore, the space created by moving the Surgery Center and Data Center from Hayes Hall will not be re-used. The imaging activity will be transferred from the Imaging Department of the Hospital to the outpatient setting of the MOB. This will include one of the two Hospital CT scanners along with ultrasound and plain film x-ray. A new use for this space has not been stated.

Therefore, it is not expected that new trips would be generated by a reprogrammed use of the former diagnostic space once the existing equipment is moved to the new MOB.