Appendix

A. FST Peer Review

B. FST Update Peer Review

C. HSH Right Turn Pocket Memo

D. HSH Woodside Access One-way Concept

E. HSH Summer Street Traffic Signal Plan

F. APD/AFD Emergency Services Requirements

G. TAC Draft Traffic Volume Analysis

H. TAC Bicycle and Pedestrian Working Group Priorities

I. TAC Symmes Trip Generation Comparison

J. TAC Symmes Trip Distribution Comparison

FAY, SPOFFORD & THORNDIKE, LLC
Engineers • Planners • Scientists • Landscape Architects • Surveyors

15 Broad Street, Suite 301
Boston, MA 02109
Toll Free 800.835.8666
Tel 617.723.8882
Fax 617.723.9995
www.fstinc.com

September 15, 2004

Mr. Edward Starr, Chairman
Town of Arlington Transportation Advisory Committee
Arlington Redevelopment Board
730 Massachusetts Ave.
Arlington, MA 02476

Subject: Peer Review– Symmes Redevelopment Plan Traffic Impact Study and Mitigation Plan

Dear Mr. Starr:

Fay, Spofford & Thorndike (FST) is pleased to submit this peer review letter to assist the Town of Arlington in evaluating the traffic impacts of the Symmes Redevelopment Project. It is our understanding that the development includes, at full buildout, 255-265 condominium units and a 40,000 square foot medical office building on the existing 18-acre former Symmes Hospital site that is currently accessed via Hospital Road and Woodside Lane.

A senior staff person from FST attended a neighborhood meeting organized by the TAC on September 8, 2004. He also visited the project site and all potentially affected streets/intersections to gain a better understanding of the real and perceived traffic and safety issues. Specifically, this letter addresses the:

- *Symmes Hospital Redevelopment – Transportation Overview* (Howard/Stein-Hudson Associates, Inc., September 2004) – referred to from here on as 'the HSH Study.' HSH also provided:
  - Electronic copies of Build traffic analysis conducted with and without the use of Woodside Lane;
  - An electronic copy of a proposed modifications to the traffic signal plan at the intersection of Summer Street with Brattle Street, soon be reconstructed as part of the Summer Street Improvement Project;
  - An electronic copy of the proposed mitigation plan and its conformance to the recommendations of the Symmes Advisory Committee; and
  - An electronic copy of graphics showing the travel time routes studied.

This peer review was also performed within the following context:

- *Article 8, Town of Arlington* Off Street Parking and Loading Regulations;
- *Town of Arlington Symmes Advisory Committee – Recommendations to Special Town Meeting,* May 5, 2003; and

- *Symmes Hospital – Preliminary Transportation Findings*, VHB, Inc. August 21, 2002.

Executive Summary

It is concluded that the potential site traffic impacts have been adequately and conservatively estimated in the HSH Study. As far as traffic mitigation goes, the Proponent has indicated it is committed to fulfilling the requirements of the Symmes Advisory Committee. While there is room for modifying the mitigation commitments to address neighborhood -- see discussion further on -- by and large, the commitments proposed are reasonable and workable.

Task 1 - Transportation Overview Study

1.1. *Collected Traffic Data:* evaluate the appropriateness of counts with respect to day and time, location, seasonality differences, etc.

Counts were performed in accordance with typical traffic data collection procedures. Traffic data was collected on Tuesdays to Thursdays, typical weekdays for performing traffic counts. Specifically, the data collection dates were March 4, as well as Tuesday and Wednesday May 25 and May 26, 2004. Schools were in session when the counts were performed. According to MassHighway seasonal traffic volume correction factors, traffic volumes recorded during the month of March are 2% higher than average annual traffic, and May volumes are nearly 9% higher than average annual traffic volumes for the types of roadways counted.

As the HSH study did not lower the volumes counted, the 'base case' count data used is conservative, or on the high side. The study area involved 10 intersections and 10 automatic traffic recorder count locations. We believe the study area is large enough to address the traffic impacts anticipated from the site.

1.2. *Crash Histories:* determine if there are any patterns or trends that may be correctable.

FST checked the crash data summary presented in the HSH Study against our own files of MassHighway data. The HSH study indicates, and we concur, that none of the intersections where traffic data was collected have historical crash rates that exceed statewide rates for unsignalized intersections. A review of crash rates indicates that the narrow private streets and closely spaced homes in the area are effective 'traffic calming' measures in and of themselves. However, the measured and observed speeding on Oak Hill Drive, posted at 25 mph and driven at speeds well in excess of 30 mph is a problem. Oak Hill Drive is wider than most of the north/south local streets in the area and serves as a shortcut between Summer and Ridge Streets. Narrowing of Oak Hill Drive and/or 'silent policemen' variable message signs (see below) might be considered. Speeding was also observed on Summer Street, also posted at 25 miles per hour in the study area.

Field observations, consistent with the HSH study traffic operations analyses, indicate that during peak hours motorists can become frustrated making left turns from the unsignalized cross streets of Oak Hill Drive and Grove Street. Limited sight distances at some of the intersections (e.g., Grove Street at Summer Street) in the area should be addressed. Keeping

potential safety enhancements environmentally-friendly will be challenging. In such constrained areas, regular trimming of hedges or vegetation may be a solution. More costly solutions include relocating utility poles or converting to underground utilities at corners where sight lines are problematic.

The proposed Summer Street modifications west of the Symmes development site including the intersection of Summer Street with Brattle Street and Hospital Road are expected to improve both operations and safety.

1.3. Existing Capacity of Intersections: evaluate how well the Level of Service results replicate current conditions, and if the geometric, signal timing, and capacity adjustments are reasonable.

The existing conditions FST observed during the PM peak period appear to be reasonably consistent with the analysis results summarizing existing condition operations. For example, left turns from unsignalized intersections approaching Summer Street were difficult to make during peak hours (e.g., Grove Street approaching Summer Street and Massachusetts Avenue, and Oak Hill Street approaching Summer Street).

A review of the capacity adjustments indicate they are reasonable to consider for mitigation.

1.4. *Trip Generation Calculations*: evaluate the completeness of the results, including any deductions for mode split, etc.

Trip generation calculations summarized in the report and contained in the Technical Appendix were conducted using the ITE Trip Generation 7th Edition, the industry standard for calculating vehicle trip generation. According to the VHB report on traffic impacts of site development options, the option evaluated generates approximately 70% as many trips as the lowest generating of the options.

An independent check of the trip generation calculations indicates they were performed correctly.

We note the HSH analysis was for 275 dwelling units, while the report references 250-265 units. The use of a higher-than-expected number of units makes the base trip generation calculation conservative. Additionally, the HSH Study assumed the average trip generation rates rather than the fitted curve trip generation results. This makes the trip generation figures analyzed more conservative as, in this particular case, the average rate calculation is higher than the fitted curve calculation.

The most conservative approach to trip generation would have been to use the ITE rates directly without any adjustments. Nonetheless, reasonable adjustments (lowering of trip rates) were made for some transit and bike/walk mode use based on a combination of the 1990 and 2000 Journey to work census data information. ITE recommends use of local data to adjust its trip generation rates -- this is an example of a local adjustment. The HSH study that assumed 6-10% non-auto modes from the 2000 census data for the census block in which the Symmes

development site is located. This assumption, given the existing transit service in the area is not unreasonable. Because the MBTA 67 bus route only provides outbound service to the site, the HSH study mitigation section indicates that the Proponent will 'work with the MBTA to modify its existing services to the site'. A commitment to work with the MBTA may not be enough to encourage strong transit use to and from the Symmes site and we recommend this commitment be strengthened.

1.5. *Trip Distribution and Assignment of Trips*: evaluate the assumptions based on US Census Journey-to-Work data and the assignment of trips to roadways and determine if they are reasonable. Assess if appropriate time surveys have been conducted and if their results are reasonable.

Two distribution patterns were assumed; one with access to Woodside Lane and the other without access to Woodside Lane. Within the context of the regional highway system and the available route choices, we conclude the assignments for both options were done reasonably and tend to reflect the distribution patterns of traffic on other streets in the area. However, we conclude some trips should be assigned to Grove Street under Option 1 and Woodside Lane under Option 2 (see attached presentation concerning peer review).

Because the analysis only 'netted out' existing vehicle trips at the Hospital Road intersection with Summer Street, the analysis is conservative at all the other off-site intersections evaluated, as existing trips are double-counted at the other off-site locations.

1.6. *Background Traffic*: evaluate the assumed level of future traffic growth and determine if it is reasonable for both regional growth and local development.

Background traffic was assumed at 0.5% per year, even though historical traffic count data indicates volumes have been declining in recent years. We believe the 0.5% per year is a reasonable estimate of background traffic growth for a fairly stable community like Arlington and consistent with future traffic growth estimates made by the Central Transportation Planning Staff. The historical traffic volume data from 2000-2004 indicates that Summer Street traffic has declined since the year 2000. Traffic volumes within MassHighway District 4, where Arlington is located, generally declined by 2% during 2003.

At a recent meeting with neighbors, it was indicated that a new park will be opening to the west via Summer Street and 20 residential units have been approved for construction. These two developments, while not specifically called out in the study, are not expected to bring background traffic growth beyond the 2.5% assumed in the HSH study over the next 5 years.

1.7. *Future Capacity Analysis of intersections*: evaluate the results and determine if they are reasonable.

The analyses conducted were found to be reasonable for the two optional choices for site access -- Option 1 - retain the Hospital Road and Woodside Lane accesses, or Option 2 - provide only one vehicle access point to and from Hospital Road.

As noted in the attached presentation, the analyses of Grove Street at Summer Street and Massachusetts Avenue and Summer Street at Oak Hill Drive and Cutter Hill Road, could be modified slightly to reflect a slightly different trip assignment than assumed for Grove Street under Options 1 and 2 and Oak Hill Drive under Option 2.

1.8. Pedestrian, Bicycle and Transit: evaluate if the study has adequately considered the pedestrian, bicycle and transit access and circulation.

While the HSH study addresses pedestrian, bicycle, and transit access and circulation, other measures should be taken to ensure the site will adequately address reductions in vehicle traffic. These measures include:

- At the combined intersections of Hospital/Summer/Brattle:
  - Provision of a sidewalk on the entire north side of Summer Street between Brattle and Oak Hill Drive.
  - Provision of an additional cross-walk on the Hospital Road approach to Summer Street (access to MinuteMan Bikeway).
- Provision of a cross-walk from the northwest corner of Brattle Street to the southeast corner of Brattle Street with additional pedestrian signal heads with pushbuttons and a new pedestrian ramp on the corner.

1.9. Mitigations: evaluate the proposed mitigations and determine if they are appropriate to improve deficient conditions, both existing and future conditions caused by the project, and if any additional mitigations are necessary. Re-analyze selected intersections to see if there is a discrepancy. Evaluate the adequacy of data and analysis to determine the reasonableness of the mitigations.

The HSH study indicates either of the two access strategies -- i.e., with and without the Woodside Lane access -- are acceptable to the Proponent. The SAC indicates that no more than 10% of the trips from the site should be using the Woodside Lane access. An examination of the Woodside Lane historical crash data indicates approximately 1 reported crash per year on it. Due to its small volume of 250-580 vehicles per day (the HSH study indicates approximately 252 vehicles per day, while the TAC in an August 2003 report indicates there were 584 vehicles per day. Both studies could have been right, as the volumes were conducted at different locations along Woodside Lane, with the higher volume count at a point where more homes were served than the lower volume count.

While keeping Woodside Lane open to traffic, is a workable option, the poor sight line to the west of the hospital and absence of sidewalks and its steep downgrade does make outbound and inbound traffic problematic. The proposal to allow only inbound traffic from Woodside Lane appears to be difficult to implement. We prefer the Option 2 strategy with the existing

Woodside Lane corridor retained in its current configuration. Woodside Lane should remain available for emergency access and pedestrian/bicycle access to Hospital Road.

Grove Street at its intersection with Summer Street and Massachusetts Avenue likely meet signal warrants today. However, given the spacing between Grove Street and the Brattle/Hospital Road signal, it may be most appropriate to consider sight line improvements and possibly a pedestrian-only activated signal at Grove Street, if it meets warrants for signalization.

The Proponent's proposed sidewalk improvements on the north side Summer Street should be extended to the intersection of Oak Hill Drive, at minimum. Hospital Road should have a sidewalk at least on the east side.

We recommend a free shuttle service be provided between site and the Alewife T Station to reduce vehicle trip making. The service should have at least three stops on Hospital Road -- on both sides of its intersection with Summer Street, in the vicinity of the Medical Office Building and at the top of the hill toward Woodside Lane with minimum 15 minute service during the AM and PM peak periods. Route 67 provides off-peak service.

We do not find any significant problems with the traffic analyses performed. The results of both access options are reasonable, but should be tweaked to reflect the minor change in trip assignments illustrated on the attached display. In either access scenario, the Grove Street and Oak Hill Drive approaches with Summer Street remain congested during peak hours. Both Options 1 and 2 increase peak period queues on Summer Street compared to the No-Build alternative, but queuing in both cases is manageable, as the intersection levels of service at the signalized intersection of Summer Street at Brattle Street/Hospital Road are expected to be acceptable, lower than capacity, during peak periods.

Warrants for a possible pedestrian signal at the Grove Street intersection with Summer Street should be evaluated during the Special Permit phase. This may be the first step in advance of full signalization at this location, if signal warrants are met. Such a signal would enhance pedestrian access between the site and Arlington High School and minimize disruption to traffic on the Summer Street corridor. Its timing should be coordinated with the Brattle/Summer (Hospital Road) and Cutter Hill Road/Summer signals. This could be the first step in potential full signalization of this intersection.

Traffic calming measures should be provided on the Oak Hill Drive corridor to reduce speeding. Such measures should be committed to in concert with neighbors during the Special Permit Review process.

The details of other potential sidewalk enhancements that may be directly related to pedestrian travel patterns developed by this site (i.e., travel patterns to nearby schools) should be provided during the Special Permit review process.

Please feel free to contact me and refer to the attached presentation for illustrations of the peer review process, findings, and recommendations. FST sincerely appreciates the opportunity to provide these services on behalf of the TAC.

Very truly yours,

FAY, SPOFFORD & THORNDIKE

By

Gary L. Hebert, P.E., PTOE
Vice President

PA-915
GLH:gh
Attachment::Peer Review Presentation 9/14/04

FAY, SPOFFORD & THORNDIKE, LLC
Engineers • Planners • Scientists • Landscape Architects • Surveyors

15 Broad Street, Suite 301
Boston, MA 02109
Toll Free 800.835.8666
Tel 617.723.8882
Fax 617.723.9995
www.fstinc.com

February 17, 2005

Mr. Edward Starr
Town of Arlington Transportation Advisory Committee
c/o Mr. Joseph F. Tulimieri
Cambridge Redevelopment Authority
One Cambridge Center
Cambridge, MA 02360

Subject: Status Report - Arlington, MA – Symmes Update Peer Review and Arlington TAC Technical Assistance

Dear Ed:

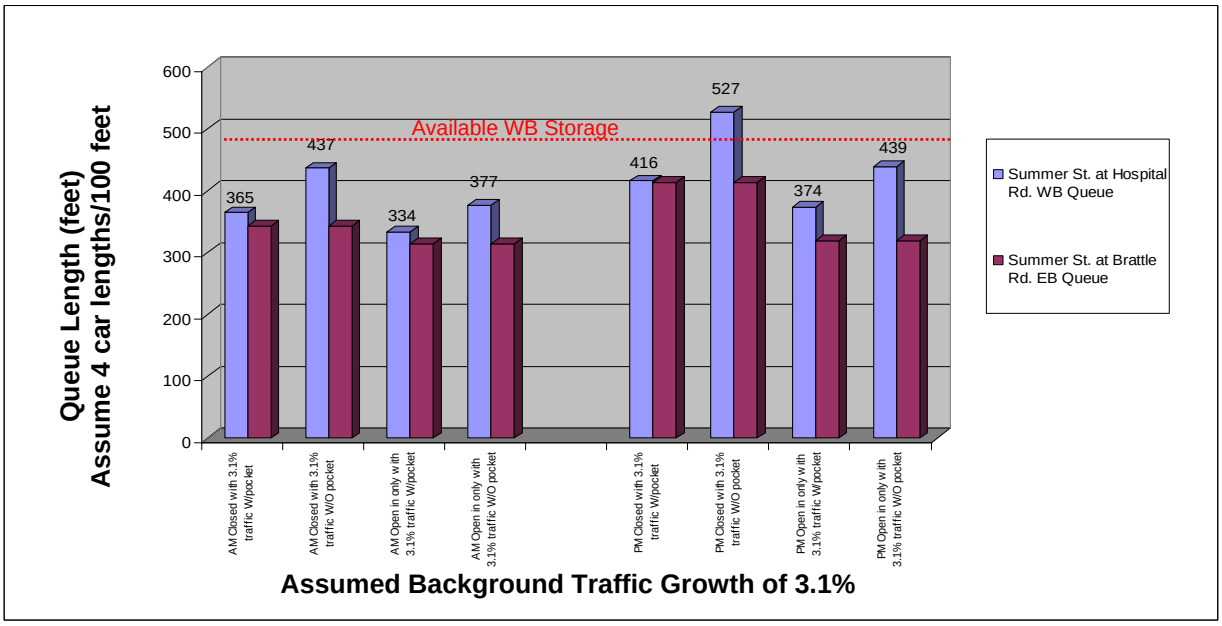
Per our Agreement, this letter is being submitted to address the supplemental Technical Assistance to the TAC in evaluating the Symmes Special Permit traffic mitigation measures.

Task 1 Review the Howard/Stein-Hudson Associates (H/SH) traffic analysis of queuing on Summer Street. Determine whether Grove Street and Oak Hill Drive should be signalized. If so, how and when should this occur?

TAC's request for sensitivity analysis of Summer Street queuing leads us to conclude the following:

Issue 1 - The proposed 200-foot long right turn pocket on the north side of Summer Street approaching Hospital Road:

- The proposed turn pocket has environmental issues (removal of a couple of trees and green space) that may offset its traffic benefits.
- With the assumed Summer Street background growth totaling 3.1% to the design year, it is concluded that the addition of the right turn pocket lane typically reduces the AM and PM peak hour queues on Summer Street by approximately 2-4 car lengths depending on whether Woodside Lane is open or closed.
- With an assumed Summer Street background growth totaling 10% to the design year (also refer to the chart on the next page, it is concluded that the addition of the right turn pocket lane typically reduces the AM and PM peak hour traffic queues on Summer Street by approximately 3-5 car lengths. (refer to charts on the page that follows).



Based on the historical Summer Street traffic volumes, it is not unreasonable to assume that Summer Street may at some point carry traffic volumes similar to those it carried several years ago. Even with a 10% assumed growth in traffic on Summer Street, its traffic can grow approximately another 15-20% during peak hours in the peak flow direction before the corridor becomes saturated.

Conclusion: The right turn pocket is beneficial from a traffic perspective, as it reduces queues toward Grove Street. The question is the trade-off between the green space lost vs. the reduced traffic queues. This is a community value issue. Similarly, with Woodside Lane open one-way to Symmes inbound traffic, the difference in queuing with the right turn pocket is approximately 1-2 car lengths. With Woodside Lane closed to all Symmes traffic, the difference in queuing is 2-3 car lengths without the turn pocket.

Issue 2 – Should Grove Street and Oak Hill Drive be signalized? If so, when?

According to the H/SH studies, the Grove Street intersection already meets signal warrants. A review of the analysis indicates that in order to install an effective traffic signal at this location, a relatively short westbound left turn lane needs to be incorporated on Summer Street into the signal design. Additionally, the Summer Street eastbound approach to Oak Hill Drive has a significant amount of left turns that will block through movements without a short eastbound left only lane on Summer Street. With only approximately 150 feet separating the intersections from stop bar to stop bar, the short left lanes will indeed be very short – i.e., each 50 feet long with a 50 foot transition or, alternatively, a 150 foot long two-way left turn lane. The nice thing about the way the road operates today is that its cross-section is wide enough at 38 feet to allow left turning vehicles to take full advantage of the 150-foot separation and there is still room for most through traffic, except for wider trucks, to bypass on the right.

As the TAC is aware, a traffic signal is usually installed as a last resort, if other measures are not effective. Ostensibly, the benefits of new signal control at either Grove Street or Oak Hill Drive are:

1) It would improve safety for pedestrians crossing Summer Street;
2) It would provide a better opportunity particularly for left turning motorists to exit either Grove Street or Oak Hill Drive (in aggregate from 75-100 vehicles during the AM or PM peak hours) and left turning motorists from Summer Street to cross opposing traffic entering and exiting Grove Street and vice versa for Oak Hill Drive motorists in a similar manner.

However, three primary unintended consequences associated with signalization are:

1) Rear end crashes may increase;
2) Trip diversions may increase (people trying to avoid signals or people trying to take advantage of the signal to increase use of the Oak Hill Drive/Grove Street corridor)

3) Queuing on Summer Street may increase its overall delays, even though the offset intersection will operate a projected LOS A-B.

Perhaps the most critical traffic signal warrant for determining whether Grove Street should have a traffic signal installed sooner rather than later is the crash warrant. While 'reported' crashes do not include all crashes, during the past few years (2001-2003), there were six reported crashes at the intersection of Grove Street with Summer Street and four reported crashes at the intersection of Oak Hill Drive with Summer Street, there were an average of between 3 and 4 crashes annually at the combined intersections. It is noted that a recent Townwide study found that there were, on average, approximately 3 crashes per year at the intersection of Grove Street with Summer Street between 1990 and 2000. Typically, the crash warrant is met when there are 5 or more crashes per year *susceptible to correction through signalization*, so neither intersection meets the crash warrant. Some of the reported crashes were rear-ends, which typically increase following signalization.

Additionally, the Oak Hill Drive intersection with Summer Street clearly does not meet warrants for signalization. Its measured vehicle and pedestrian volumes are too low. However, the intersection had four reported crashes in 2003. This trend needs to be monitored. No crashes were reported at this intersection in 2002 or 2001.

Conclusion: While a signal could be installed at the Grove Street intersection at this time, it is **not** recommended as a high priority due to the unintended consequences cited above. After examining at the traffic patterns, the dynamics of the Oak Hill Drive/Grove Street traffic pattern leads FST to conclude that if signalization occurs only at Grove Street (which probably makes the most since rather than creating an offset signalized intersection with Oak Hill Drive), care must be taken to provide left turn lanes, as discussed above, on both Summer Street approaches to Grove Street and Oak Hill Drive to keep left turning motorists heading to either of the offset intersections from completely blocking the Summer Street eastbound/westbound through traffic.

Task 2 Evaluate the local street designation capacity of Woodside Lane and its projected volumes with and without the one-way inbound access proposal

As discussed at my recent meeting with Ed Starr, the *actual vehicle-carrying capacity* of Woodside Lane is not an appropriate measure of the acceptability of additional traffic to Woodside Lane. At issue is what is the 'functional capacity' of Woodside Lane. By 'functional capacity' what is meant is that Woodside Lane has a 'local' street functional classification. By American Association of State Highway and

Transportation Officials (AASHTO) A Policy on Geometric Design of Streets and Highways (as amended, 2004) a local road is expected to carry less than 25% through traffic. In this case, based on information supplied by the Town of Arlington, there are approximately 75 homes served by Woodside Lane. Refer to the summary below for comparisons of relevant information.

	AM Peak Hour			PM Peak Hour			Average Weekday
Woodside Lane Computations	AM Trips in	AM Trips out	AM Total	PM Trips in	PM Trips 0ut	PM Total	Daily Trips
ITE Trip Generation Estimates*	15	46	62	53	30	83	796
Local Functional Capacity**	19	58	77	66	37	104	994
2004 AM/PM (H/S-H Counts)	20	36	56	29	24	53	600
Local Functional Capacity**	25	45	70	36	30	66	749

Pre-closure Symmes Woodside Lane Volumes	
30	7:00-8:00 AM peak hour
40	4:30-5:30 PM peak hour
239	12-hour measured 6 AM - 6 PM (peak 12 hours)
385	24-hour estimate (FST)

* Assumes 75 Homes

** Local Functional capacity is ITE or counted volume times 1.25.

If one assumes the ITE *Trip Generation* report (2003, as amended) rates apply to the existing approximately 75 homes served by Woodside Lane, the following can be concluded:

- Applying the ITE formula methodology for single family homes along Woodside Lane, it leads one to conclude that a maximum daily flow on Woodside Lane, assuming up to 25% through traffic, would be 982 vehicles per day and 77-102 vehicle trips during peak hours. Given the fluctuation in daily volumes, this would suggest a maximum acceptable volume on Woodside Lane of approximately 1,000 vehicles per day or 100 vehicles per hour during the peak hours at its intersection with Oak Hill Drive. We note that this is well below the street's actual vehicle carrying capacity, but, in our opinion, is a more practical way of looking at the issue of 'How much traffic should Woodside Lane have?'

- Applying the actual 2004 H/SH counts taken during peak hours at the intersection of Woodside Lane at Oak Hill Drive ***would not be appropriate***. The actual volume counted was 33% lower than the ITE rates would suggest might be generated along Woodside Lane if all the traffic were to use it. However, because it was a one-day count and some

Woodside Lane abutters have the option to use Brattle Street or Hospital Drive, the difference is reasonable.

- The Symmes Committee commitment that "***No more than 10% of the non-residential peak hour site traffic shall utilize Woodside Lane.***" Taken at face value, 10% of the non-residential component of the Symmes redevelopment plan would entail 9-13 vehicle trips per hour. However, the identification of the non-residential traffic coming from Symmes would be difficult, if not impossible to achieve. H/SH estimates the residential component of the Symmes redevelopment plan will generate 113-133 vehicle trips per hour. It is doubtful that the Committee assumed it would be ok for the entire residential component to use Woodside Lane. If what was actually meant was 10% of the entire Symmes redevelopment traffic (including its residential component), than the acceptable added impact of Woodside Lane would be 20-26 vehicle trips.

- As a comparison, during traffic count conducted in 1982, Symmes Hospital added approximately 385 vehicle trips per day to the Woodside Lane. During peak hours, the count indicated that 30 vehicle trips occurred during the AM peak hour and 40 vehicle trips during the PM peak hour.

As far as the geometric features of Woodside lane are concerned, the elevation difference between Oak Hill Drive and Hospital Drive is approximately 112 feet. For an approximate 1,200 linear-foot centerline distance, this represents an average grade of 9.3%, with peak grades being nearly 14%. Similarly, at Hospital Road from the crest to Summer Street the elevation difference is approximately 125 feet for an approximately 1,350 linear centerline distance, which also represents an average grade of 9.3% with peak grades also approximately 14%. The design speeds of both Woodside Lane and Hospital Road vary by location. Woodside Lane has more curves than Hospital Road, with the tightest one having approximately a 75-foot centerline radius (just over 15 miles per hour) Hospital Road has approximately a minimum 110-foot centerline radius at its sharpest corner (under 19 miles per hour). Neither road has a typical 30 miles per hour design speed. The big difference between the two roadways will be that Hospital Road is being improved with sidewalks, lighting, etc. There will be a total of 5 curb cuts on Hospital Road, while Woodside Lane has no sidewalks and a total of 23 curb cuts including 21 driveways and two cul-de-sacs between Hospital Road and Oak Hill Drive. The sight distance at the Hospital Road intersection with Woodside Lane is constricted vegetation and by a vertical crest.

From the photos below, it is evident that winter/summer conditions along Woodside Lane differ significantly. On one hand Woodside Lane vegetation sight distance deficiencies (see

left) are reduced during the winter months. However, sight lines at driveways diminish during heavy snow conditions such as those encountered recently.

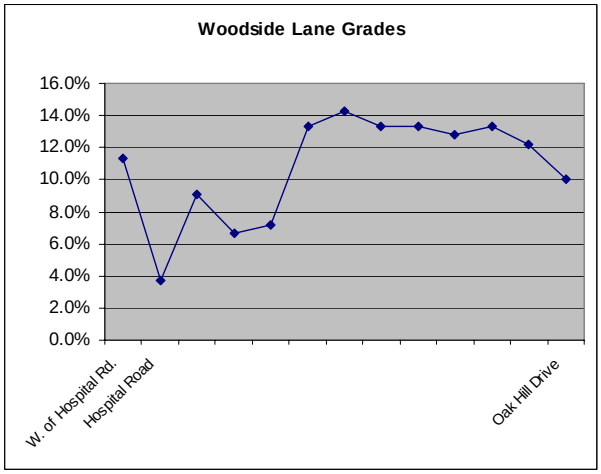
Hospital Road looking west to Woodside Lane

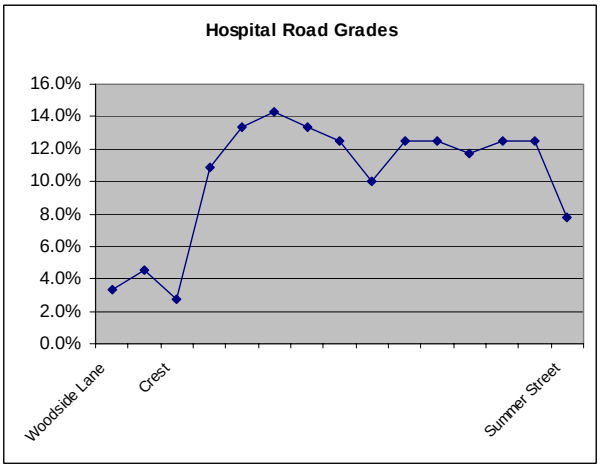
Conclusion: During our initial review, FST recommended that Woodside Lane provide emergency, pedestrian, and bicycle access. We see no reason to change this recommendation in light of its constricted geometric and sight line conditions and its functional capacity. We note that emergency access means that there must not be a locked gate, according to recent Arlington Deputy Fire Chief discussions with the TAC.

Potentially, ***restricting inbound access to less than 40 vehicles per hour during peak hours*** from Woodside Lane is a reasonable option that can be considered for testing if monitoring equipment is installed at the Woodside Lane entrance and the findings are regularly made available to Woodside Lane neighbors.

Woodside Lane looking east at Hospital Road

Further west – similar winter view





Task 3 Explore pedestrian connections mitigation (to neighborhood schools) the potential for a 3-way stop control at the intersection of Oak Hill Drive and Woodside Lane

Elizabeth Carr-Jones provided a map indicating the current sidewalk conditions in the Symmes area. With the exception of a few locations where short lengths of substandard sidewalks exist, there are no sidewalks between the Symmes redevelopment site and the Stratton School via Woodside Lane, Millet Street, and Lansdowne Street to Hemlock and Dickson Avenue. As mentioned above, there are also no sidewalks on Woodside Lane between the site and Oak Hill Drive.

As part of a mitigation strategy, the Proponent should provide a shared sidewalk/bikepath into the site from Woodside Lane. A sidewalk should be provided at minimum on one side of Hospital Drive along its entire length, probably the east side is most appropriate given the location of the high school and Town Center. If technically feasible, it would be preferable to have sidewalks on both sides of Hospital Road. It is important to understand that these sidewalks will not meet ADA minimum grade requirements due to the natural steep grades in the area and may require railings in areas where grades are steeper than 8.6% -- virtually the entire length. A sidewalk should also be provided on the north side of Summer Street between the site and the bikeway crossing of Summer Street. The bikeway crossing of Summer Street should also be addressed with a special pedestrian crossing treatment. The substandard sidewalk on the north side of Summer Street between Oak Hill Drive and the bike crossing should be improved concurrently. On Woodside Lane, consider the provision of a sidewalk on the south side to the east side of Brattle as far as Millet Street, if feasible within the available right-of-way and acceptable to direct abutters.

Conclusion: The data indicates that the volume of traffic approaching Oak Hill Drive will not meet warrants for multi-way stop control at this intersection. Other traffic calming measures should be considered as an alternative to all-way stop control (e.g., a 'mild' non-jarring speed table).

Please contact me should you wish to discuss any aspect of this letter. FST appreciates the opportunity to provide these services on behalf of the TAC.

Very truly yours,

FAY, SPOFFORD & THORNDIKE

By

Gary L. Hebert, P.E., PTOE
Vice President

PA-015A
GLH:gh
Attachments: Synchro Summer at Hospital Road Queue summary sheets

M E M O R A N D U M

To:	**Patrick McMahon, EA Fish** **Jake Upton, EA Fish**	Date: **January 6, 2005**
From:	**James Danila** **Jane Howard**	HSH Project No. **2003156.00**
Subject:	**Westbound Summer St. at Hospital Rd. Right-Turn Pocket**	

Howard/Stein-Hudson Associates (HSH) was asked to perform an analysis of a proposed right-turn pocket on westbound Summer Street at Hospital Road. The purpose of this turning lane would be to provide additional storage space for westbound traffic, reducing the possibility of queues extending to the east and blocking Grove Street. The background conditions used for this analysis set were the same as the conditions used in Task 2.3 in a memorandum prepared by HSH dated December 20, 2004: full build-out traffic from the proposed Symmes Hospital site, a 10% increase over existing conditions in thru traffic along Summer Street, and coordinated traffic signals installed at the Grove Street and Woodside Lane intersections. Analysis was performed for both the Woodside Lane Open and Woodside Lane Closed conditions. For the purpose of this analysis, a 200-foot right-turn pocket along with a standard taper was used; please note that the feasibility of construction of this lane, including alignment, physical limitations, and possible land taking, etc., have not been considered.

A comparison of the results can be seen in **Table 1.**

Table 1. Queue Comparison

50th % Queues (ft.)	Single thru/right lane (ft.)	Thru lane + proposed right-turn pocket (ft.)	Difference (ft.)
Woodside Open, A.M.	266	250	16
Woodside Open, P.M.	530	356	174
Woodside Closed, A.M.	301	275	26
Woodside Closed, P.M.	630	362	268
95th % Queues (ft.)	**Single thru/right lane**	**Thru lane + proposed right-turn pocket**	**Difference**
Woodside Open, A.M.	#796	#718	78
Woodside Open, P.M.	#1061	#934	127
Woodside Closed, A.M.	#829	#713	116
Woodside Closed, P.M.	#1108	#920	188

#: 95th percentile volume exceeds capacity; queue is measured after two cycles and will rarely exceed this length.

HOWARD/STEIN-HUDSON ASSOCIATES, INC.
38 Chauncy Street, 9th Floor • Boston, Massachusetts 02111 • www.hshassoc.com
Phone (617) 482-7080 • Fax (617) 482-7417 • info@hshassoc.com

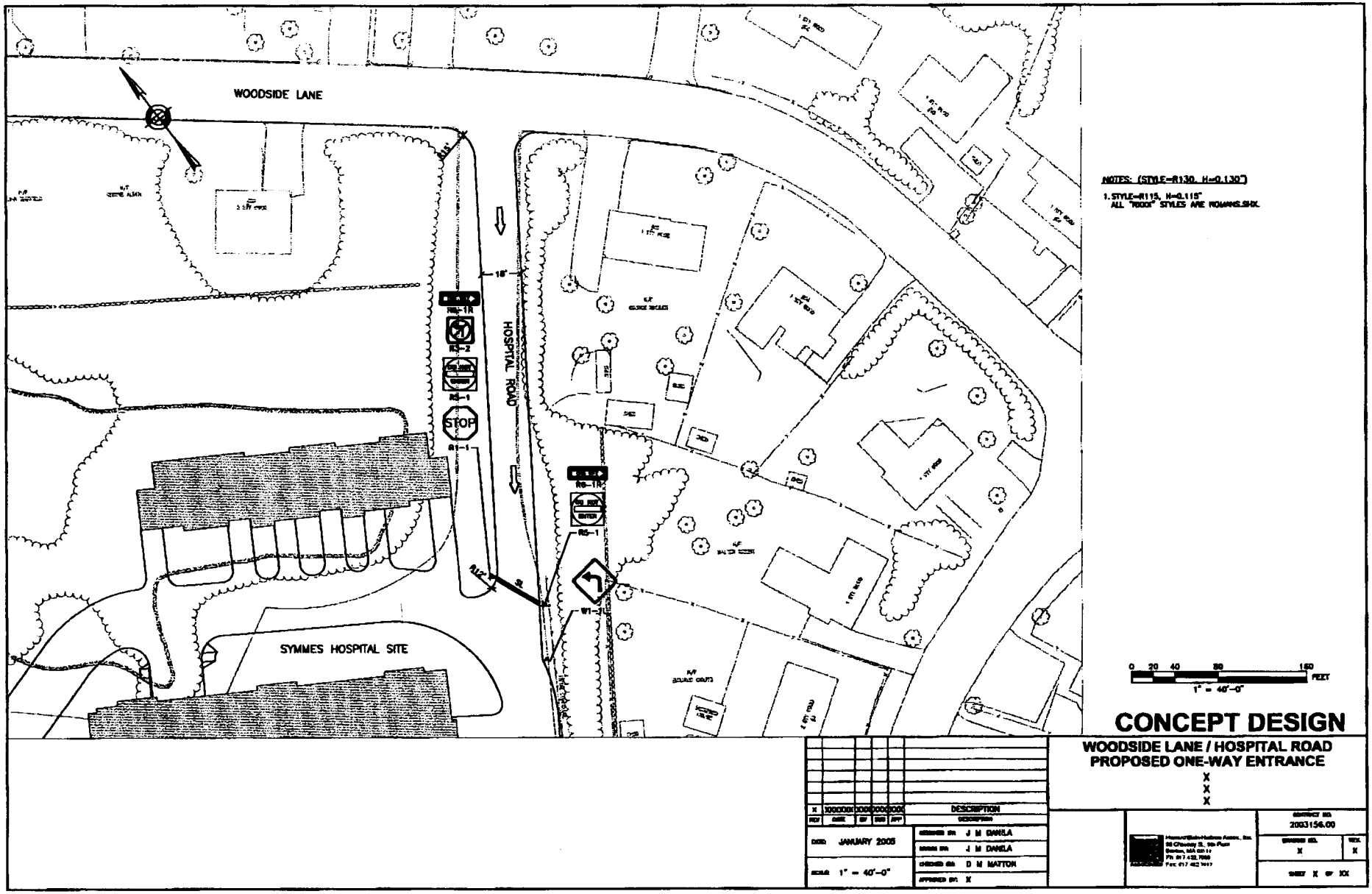
Outside of the difference in 50th percentile queue for the Woodside Lane Closed P.M. condition, the addition of the right-turn pocket decreased the queue lengths along westbound Summer Street by only a small margin. Full Synchro reports can be found in **Appendix A.**

In addition to the actual queue lengths, Synchro can also calculate how often the right-turn pocket will be blocked due to queues in the thru lane. The results of this analysis can be found in **Table 2.**

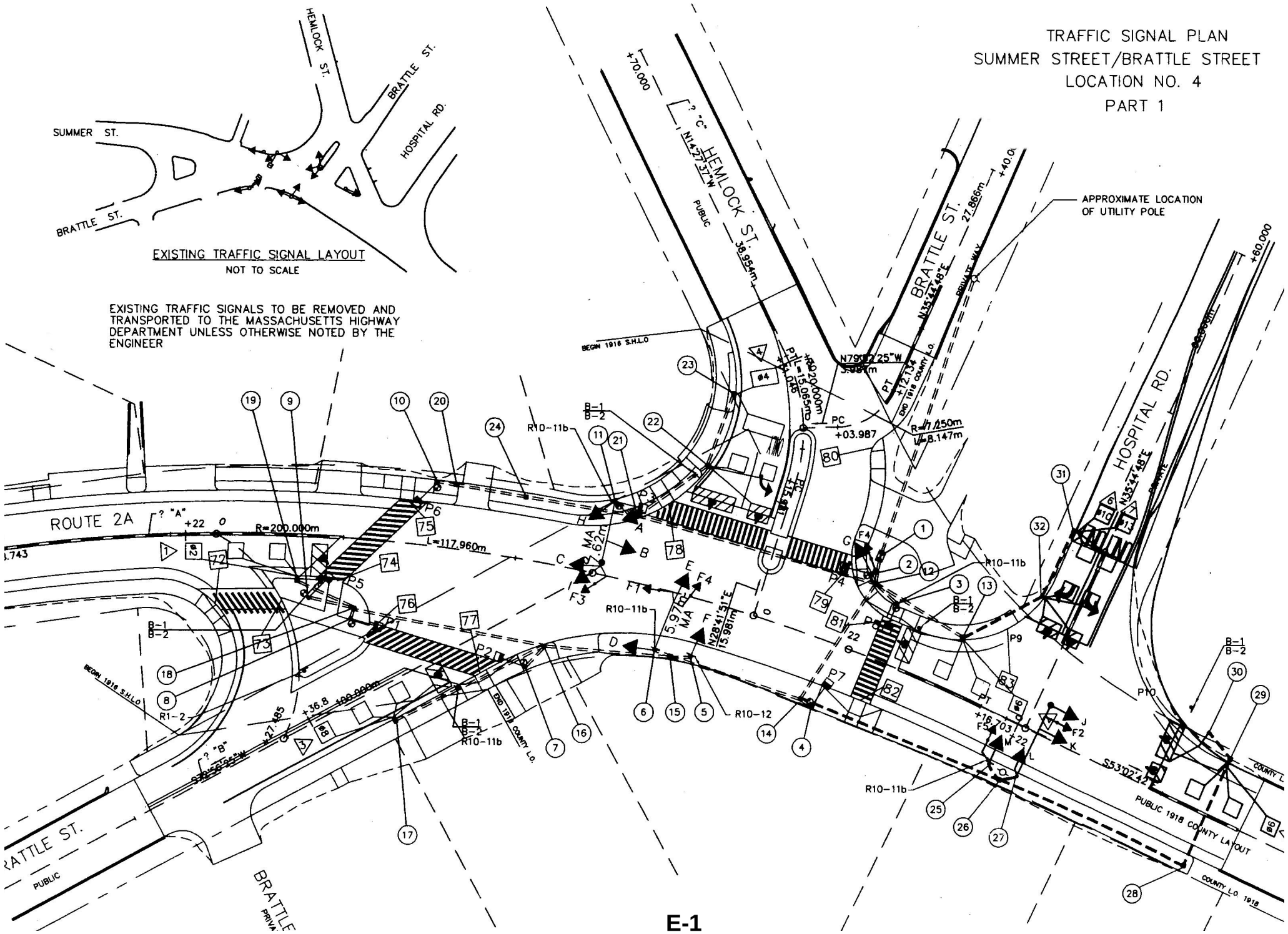
Table 2. Block Time

	50th % Block Time	95th % Block Time
Woodside Open, A.M.	20%	49%
Woodside Open, P.M.	9%	55%
Woodside Closed, A.M.	23%	58%
Woodside Closed, P.M.	25%	63%

As shown in the table, the turn-pocket will be blocked by traffic in the thru lane and not fully utilized between 9-25% of the time during 50th percentile traffic periods and 49-63% of the time during 95th percentile traffic periods.



DRAWING PREPARED BY HOWARD/STEIN-HUDSON ASSOCIATES, INC.


TRAFFIC SIGNAL PLAN
SUMMER STREET/BRATTLE STREET
LOCATION NO. 4
PART 1
HEMLOCK ST.
BRATTLE ST.
HOSPITAL RD.
SUMMER ST.
BRATTLE ST.
EXISTING TRAFFIC SIGNAL LAYOUT
NOT TO SCALE
EXISTING TRAFFIC SIGNALS TO BE REMOVED AND TRANSPORTED TO THE MASSACHUSETTS HIGHWAY DEPARTMENT UNLESS OTHERWISE NOTED BY THE ENGINEER
APPROXIMATE LOCATION OF UTILITY POLE
ROUTE 2A
HEMLOCK ST.
BRATTLE ST.
HOSPITAL RD.
PUBLIC 1918 COUNTY LAYOUT
R=200.000m
L=117.960m
R=20.000m
R=7.250m
R10-11b
R10-12
R1-2
B-1
B-2
PC
PT
PUBLIC
PRIVATE WAY

Conclusions from Meeting with Police and Fire on 2/7/05

Attendees: Department Chief Springer of AFD, Lt. McHugh, Chief of the Traffic Division of APD, Ed Starr, Chair of TAC, and Elisabeth Carr-Jones of the TAC

Topic: Emergency Access Requirements for Symmes Development

1. Fire and Police require two entrances to Symmes for emergency matters.

2. This minimum requirement to meet this is a one-way access **into** the site with a width of 18 feet.
    a. Two way access is also acceptable.
    b. A locked gate will not meet this requirement.

3. This access is to have no speed humps or other items that would delay access.

4. It is required that Hospital Road be a Public Way so that the APD can enforce regulations.
    a. It is preferred that other roadways on the site also be public ways, but the minimum requirement is that adequate fire lanes be designated which will be enforced by APD.

5. Prior to issuing the Special Permit, APD and AFD require a review and approve the plans for the roadways.

6. During construction while the site is not occupied only, a chain that can be cut quickly with a heavy tool can obstruct access.

Traffic Volume Analysis: Woodside Lane / Hospital Road Access

Table 1 shows approximate travel time savings (in minutes) for the back routes (via the access to Woodside Lane). The "off peak" column is based on a simple estimation (based on distance and road type, e.g. Summer Street is faster than Millett) estimation of travel time with minimal (18-second) signal delay. The peak period column considers signal delay as estimated by Howard Stein Hudson. In this table, a negative number (in parentheses) indicates that the shortest time route is via the Hospital Road/Summer Street intersection.

Table 1 Travel Time Savings for Back Routes (minutes)

Corridor	UserGroup	Period	Users per Hour	Off Peak (little signal delay)	Peak Period
To the East	Site Residents	AM Outbound	35	0.5	0.8
To the North	Site Residents	AM Outbound	12	0.5	0.8
To the South	Site Residents	AM Outbound	39	(0.7)	(0.4)
To the West	Site Residents	AM Outbound	27	(1.4)	(1.1)
From the East	Site Visitors	AM Inbound	32	(0.7)	(0.4)
From the North	Site Visitors	AM Inbound	12	0.5	0.8
From the South	Site Visitors	AM Inbound	19	(0.3)	0.0
From the West	Site Visitors	AM Inbound	22	(1.4)	(1.4)
To the East	Area Residents	AM Outbound	19	1.5	1.8
To the North	Area Residents	AM Outbound	6	1.5	1.8
To the South	Area Residents	AM Outbound	21	0.2	(0.2)
To the West	Area Residents	AM Outbound	14	0.2	0.4
From the East	Site Residents	PM Inbound	39	(0.7)	(0.4)
From the North	Site Residents	PM Inbound	13	0.5	0.8
From the South	Site Residents	PM Inbound	43	(0.3)	(0.0)
From the West	Site Residents	PM Inbound	30	(1.4)	(1.4)
To the East	Site Visitors	PM Outbound	52	0.5	0.9
To the North	Site Visitors	PM Outbound	20	0.5	0.9
To the South	Site Visitors	PM Outbound	30	(0.7)	0.1
To the West	Site Visitors	PM Outbound	36	(1.4)	(0.9)
From the East	Area Residents	PM Inbound	14	1.5	1.8
From the North	Area Residents	PM Inbound	5	1.5	1.8
From the South	Area Residents	PM Inbound	15	0.2	1.0
From the West	Area Residents	PM Inbound	10	0.2	0.2

Preliminary Results

Assume logit model for route choice:

Share(Back route) = exp(A + B?T)/(1 + exp(A + B?T)), where

A = Constant for back route: 0 for site and area residents, -2.25 for Summer Street commuters and site visitors/employees. The –2.25 was chosen to produce a 10% back route share for current usage.

B = Coefficient of travel time: -1
?T = Difference in travel time, in minutes.

Current conditions refers to the model applied to current conditions. It does not refer to actual counts.

Table 2 Modeled Volumes (Vehicles per peak hour)

	Period	Current	Open	Closed	OneWay
Approximate Peak Hour Volumes					
Exiting area via Hosp/Summer	AM Peak	13	79	113	133
Exiting area via lower Woodside	AM Peak	38	88	46	34
Exiting area via Brattle/Millett	AM Peak	24	14	24	16
Entering area via Hosp/Summer	AM Peak	26	78	85	77
Entering area via lower Woodside	AM Peak	13	11*	7*	13*
Entering area via Brattle/Millett	AM Peak	11	7*	7*	8*
Exiting area via Hosp/Summer	PM Peak	35	119	138	138
Exiting area via lower Woodside	PM Peak	6	16*	1*	1*
Exiting area via Brattle/Millett	PM Peak	14	11*	8*	6*
Entering area via Hosp/Summer	PM Peak	12	85	125	73
Entering area via lower Woodside	PM Peak	36	69	39	76
Entering area via Brattle/Millett	PM Peak	12	23	14	28
Peak Hour Percentages					
Site Residents using Woodside or Brattle/Millett	Both peaks	N/A	45%	0	22%
Site Visitors using Woodside or Brattle/Millett	Both peaks	10%	11%	0	4%
Area Residents using Hospital	Both peaks	23%	31%	0	20%

* Does not include neighborhood residents entering the area during the AM peak period, or exiting the area during the PM peak period.

It is important to note that during off peak hours, the fraction of travelers using the back routes will be somewhat lower, because there will be less congestion at the Summer/Hospital intersection. Table 3 shows a very rough estimate of DAILY volume using the Woodside lane access (in both directions):

Table 3 Estimated Daily Vehicles Using the Woodside Lane Access

		Access open		Access open one-way inbound	
		Fraction Using	Vehicles	Fraction Using	Vehicles
Site Residents	1494	40%	598	20%	299
Site Visitors	1244	10%	124	4%	50

Symmes Transportation Subcommittee
Bicycle and Pedestrian Working Group Priorities

Summer Street

Supported by Group:

- *Improve safety and driver compliance at Oak Hill Drive crosswalk
- Install sidewalk between Hospital Road and Oak Hill Drive
- Retain crosswalk from NW corner of Brattle to SE corner of Brattle
- Install pedestrian only signal at Grove Street / Oak Hill Drive
- Complete sidewalks from Oak Hill Drive to Cutter Hill Road

Mixed Support by Group:

- Extend redesigned Summer Street roadway width east to Oak Hill
- Restrict parking on south side of Summer from Grove St to Mill St

Not Supported by Group:

- Install full traffic signal at Grove Street / Oak Hill Drive

Hospital Road

Supported by Group:

- *Install sidewalk on Hospital Road, at least on east side
- Install wider sidewalk on Hospital Road to accommodate cyclists
- Add bus stop at medical office building
- Install crosswalk on Hospital Road approach to Summer Street

Mixed Support by Group:

- Install pedestrian path from Hospital Rd to Summer near Grove
- Install bike lanes or wider travel lanes on both sides of roadway

Not Supported by Group:

- Add inbound bus service to top of site

Minuteman Bikeway

Supported by Group:

- *Improve safety of Bikeway crossing at Mill Street
- Install access stairs from Bikeway to Grove Street
- Install ramp on Summer St at access to Bikeway behind High School

Mixed Support by Group:

- Install access stair from Bikeway to High School fields
- Improve Brattle Place roadway for cyclist access (private way)

Woodside Lane

Supported by Group:

- *Install sidewalk on south side of Woodside Lane

Mixed Support by Group:

- Install curb extensions on Woodside at Oak Hill intersection
- Install additional street lights on lower Woodside Lane

Oak Hill Drive

Supported by Group:

- Redesign geometry of Summer/Oak Hill intersection

Mixed Support by Group:

- Install all-way stop with crosswalks at Woodside intersection

Hemlock Street/Stratton School

Supported by Group:

- Install a crosswalk on Hemlock at redesigned NW corner of Brattle St

Mixed Support by Group:

- Install sidewalks on upper Hemlock, Dickson Ave and Mountain Ave

* ranked high priority by everyone voting

Symmes Trip Generation Comparison

Symmes Transportation Subcommittee, Arlington Transportation Advisory Committee
16 September 2004

Symmes Advisory Committee Recommendation

The Symmes Advisory Committee (SAC) determined that the traffic generated by Symmes Hospital in full operation should be considered the upper limit for the traffic generated by any proposed development on the site. From page 8 of the SAC *Recommendations to Special Town Meeting* dated May 5, 2003:

> *REQUIREMENT: Development shall be limited to the total number of peak-hour vehicle trips that were generated when the hospital was in full operation (estimated to be **375** vehicles during the evening peak hour as noted in Appendix I).*

Note: no traffic counts were conducted during the period when the hospital was in full operation.

Vanasse Hangen Brustlin Estimates

Appendix I of the SAC report is the *Symmes Hospital Reuse Alternatives Transportation Assessment* memo from Vanasse Hangen Brustlin (VHB) dated February 13, 2003 and Revised April 17, 2003. From page 1 of the VHB memo:

> *Prior to construction of the 61,500 square foot North Wing in 1984, actual traffic counts indicated that the former hospital with approximately 112,000 square feet and Nurses Building with 25,000 square feet generated 245 vehicle trips during the morning peak hour and **255** vehicle trips during the evening peak hour, rates that are similar to industry standards for hospital uses. Based upon counts conducted in 1982, it is estimated that Symmes Hospital at full-build generated **375** vehicle trips during the evening peak hour.*

From page 8 of the VHB memo:

> *To obtain a more accurate estimate of the amount of traffic generated by Symmes Hospital when in full operation, a trip generation rate based on the counts was determined. Prior to the addition of the North Building, the combined 136,500 square foot campus generated up to **255** vehicle trips per hour, the equivalent of 1.87 trips per 1,000 square feet. Therefore, the full build facility at 200,000 square feet would generate up to **375** vehicle trips per hour. Utilizing ITE rates for a 175,000 square foot hospital (LUC 610) and a 25,000 square foot medical office (LUC 720), it is estimated that the Symmes campus would have generated up to 365 vehicle trips per hour. This estimate, which is very similar to the counts based estimate, validates these findings.*

An earlier VHB memo, *Symmes Hospital Reuse Alternatives Draft Transportation Alternatives,* dated January 8, 2003, estimated the daily traffic for the hospital in full operation to be **4,540** vehicle trips per day. The estimate appears in *Table 4 Trip Generation Comparison* on page 7. As noted below the Table, the calculation was based on ITE Land Use Codes 610 (Hospital) for 175,000 square feet and 720 (Medical-Dental Office Building) for 25,000 square feet.

Howard/Stein-Hudson Projections

On September 13, 2004, Howard/Stein-Hudson (HSH) released the *Symmes Hospital Redevelopment Transportation Overview*. From page 29 of the HSH study:

> *Trip generation data were derived from the Institute of Transportation Engineers (ITE) Trip Generation, 7th edition (2003). Trips were calculated on a per-dwelling-unit basis. The trips are then reallocated to vehicle, transit and walk/bike trips based on the area mode split (described in the next section).*

Page 31 of the HSH study lists the ITE Land Use Codes used for their calculations as LUC 230 (Residential Condominium) and LUC 720 (Medical-Dental Office Building). From page 32 of the HSH study:

> *As shown, the project will generate a total of 1,369 entering and 1,369 exiting vehicle trips each day. These include 85 vehicle trips entering and 113 vehicles exiting during the A.M. peak hour and 125 vehicle trips entering and 138 exiting during the P.M. peak hour.*

From page 33 of the HSH study, *Table 15. Comparison of Vehicle Trips* shows the Total Project Trips to be **263** during the PM peak hour, with an Average Daily Total of **2,738** vehicle trips per day.

Fay, Spofford and Thorndike Review

Gary Hebert of Fay, Spofford and Thorndike (FST) summarized his peer review findings on the HSH study in a letter to the Transportation Advisory Committee and the Arlington Redevelopment Board dated September 15, 2004. The subject of letter is *Peer Review - Symmes Redevelopment Plan Traffic Impact Study and Mitigation Plan*. From section 1.4 on page 3 of the FST letter:

> *An independent check of the trip generation calculations indicates that they were performed correctly.*

Conclusion

The projected peak period traffic volumes for the Symmes redevelopment project will be comparable to those observed in 1982, before the North Wing was built, and are projected to be substantially less than the peak period volume when the hospital was in full operation.

Symmes Trip Distribution Comparison
Symmes Transportation Subcommittee, Arlington Transportation Advisory Committee
18 March 2005

Symmes Advisory Committee Recommendation

The Symmes Advisory Committee (SAC) determined that Summer Street should be the primary access for any proposed development on the Symmes site and that there should be limits on the amount of traffic on Woodside Lane. From page 8 of the SAC Recommendations to Special Town Meeting dated May 5, 2003:

> *REQUIREMENT: Primary access to the site shall be from Summer Street.*
>
> *REQUIREMENT: Woodside Lane shall remain a low-volume local roadway. No proposal should suggest that more than 10 percent of non-residential peak-hour site traffic would utilize Woodside Lane. Proposals suggesting programs to minimize use of Woodside Lane, including the installation of a traffic monitoring program, are encouraged.*

Howard/Stein-Hudson Trip Generation Projections

On page 32 of their *Symmes Hospital Redevelopment Transportation Overview* dated September 13, 2003, Howard/Stein-Hudson (HSH) calculated that the 370,000 square foot residential component of the proposed Symmes development would generate 1,494 vehicle trips per day (55% of the total traffic) and the 40,000 square foot medical component would generate 1,244 vehicle trips per day (45% of the traffic).

Fay, Spofford and Thorndike Trip Generation Review

In page 3 of a letter to the Transportation Advisory Committee and the Arlington Redevelopment Board dated September 15, 2004, Peer Reviewer Gary Hebert of Fay, Spofford and Thorndike (FST) reviewed these calculations and concluded that, "An independent check of the trip generation calculations indicates they were performed correctly."

Howard/Stein-Hudson Trip Distribution Projections

On page 41 of their *Symmes Hospital Redevelopment Transportation Overview* dated September 13, 2003, Howard/Stein-Hudson predicted that 26.2% of the traffic generated by the residential component of the proposed Symmes development (391 vehicle trips) and 33.2% of traffic generated by the medical component (413 vehicle trips) would use the Woodside access if it were to remain open to traffic in both directions. This translates to a total of 804 vehicle trips per day (29% of the total projected trips of the development) predicted to use the Woodside access if it were to remain open in both directions.

Transportation Advisory Committee Trip Distribution Projections

TAC member Scott Smith conducted an independent analysis of the trip distribution for the proposed Symmes development. TAC's analysis predicts that 40% of the projected traffic generated by the residential component of the development (598 vehicle trips) and 10% of the projected traffic generated by the medical component (124 vehicle trips) would use the Woodside access if it were to remain open in both directions. This translates to a total site of or 722 vehicle trips per day (26% of the total traffic generated by the development) predicted to use the Woodside access if it were to remain open in both directions.

TAC's analysis was also used to predict the amount of traffic that would use the Woodside access if it were open in one direction (into the site). The analysis predicts that 20% of the projected traffic generated by the residential component of the development (299 vehicle trips) and 4% of the medical component (50 vehicle trips) would use the Woodside access if it were open in one direction. This translates to 349 vehicle trips per day (13% of the total traffic generated by the development) predicted to use the Woodside access if it were open in one direction.

Estimates of Traffic when the Hospital was in Full Operation

As stated in the *Symmes Trip Generation Comparison*, no traffic counts were conducted when the Hospital was in full operation. In 1982, prior to the construction of the North Wing of the Hospital, 12-hour traffic counts were conducted on Hospital Road at the Summer Street and Woodside Lane accesses. These 6 AM - 6 PM counts measured a total of 1,939 vehicle trips, with 1,700 vehicle trips through the Summer Street access (88% of the total) and 239 vehicle trips through the Woodside access (12% of the total).

Based on the 1982 counts, on page 6 of the February 17, 2005 Status Report FST extrapolated that there were 385 vehicle trips per day using the Woodside access before the construction of the North Wing. The 63,500 square foot North Wing added 32% to the total area of the Hospital (which went from 136,500 to 200,000 square feet). In their *Symmes Hospital Reuse Alternatives Transportation Assessment* memo dated February 13, 2003, Vanasse Hangen Brustlin (VHB) estimated that Hospital in full operation generated 4,540 vehicle trips per day (see TAC document *Symmes Trip Generation Comparison* for information on this estimate).

Based on the available information, two methods can be used to estimate the traffic using the Woodside access when the Hospital was in full operation. If we were to assume a 32% increase in traffic (based on the Hospital area increase) from the extrapolation by FST, 508 vehicles per day would have used the Woodside access. If we were to assume 12% of the VHB estimated total vehicle trips per day generated by the Hospital in full operation (based on the percentage indicated in the 1982 counts), 545 vehicle trips would have used the Woodside access. Based on this, we can estimate that between 500 and 550 vehicle trips per day would have used the Woodside access when the Hospital was in full operation.

Using the VHB estimated total trip generation of 4,540 vehicle trips per day, and an estimated 500 to 550 vehicle trips per day using the Woodside access, we can estimate that between 3,990 and 4,040 vehicle trips per day would have passed through the Summer Street access when the Hospital was in full operation.

Conclusion

Both HSH's prediction of 804 vehicle trips per day and TAC's prediction of 722 vehicle trips per day using the Woodside access if it were open in both directions are substantially more than the 500-550 vehicle trips estimated to have used the Woodside access when the Hospital was in full operation.

TAC's prediction of 349 vehicle trips per day using the Woodside access if it were open in one direction would be substantially less than the 500-550 vehicle trips estimated to have used the Woodside access when the Hospital was in full operation.

Regardless of the Woodside access conditions, the vehicle trips per day using the Summer Street access would be substantially less than the 3,990 and 4,040 vehicle trips estimated to have used the Summer Street access when the Hospital was in full operation.