CONLEY ASSOCIATES

Memorandum

To: Mr. Hans Larsen, Mr. Kien Ho

From: Ms. Jennifer Conley, P.E, AICP, PTOE

CC: Mr. Mark Paris; Mr. Peter Tamm; Mr. Jack O'Neil; Mr. Bob Davis

Date: February 25, 2008

Re: Potential Washington Street Corridor Improvements

Conley Associates, Inc. has submitted a Traffic Impact Study (TIS) dated December 2007, as the Traffic Component of the overall Municipal Systems Impact Analysis, detailing the traffic impact of the redevelopment of 27 Washington Street. In addition to the TIS, Conley Associates, Inc, has submitted three subsequent memorandums dated December 1, 2007, December 20, 2007, and February 21, 2008 detailing the results of our sidewalk survey, summarizing the speed study conducted along Washington Street, and responding to the BETA peer review letter dated February 5, 2008, respectively.

As part of the TIS, the proponent proposed a mitigation package that included the signalization of River Street and the coordination of the signal timings with the existing signalized Concord Street intersection (and the necessary signal equipment upgrades at the existing signal). This signalization plan remains one viable mitigation option to address existing and proposed traffic conditions in the corridor. However, having received input and guidance from BETA, the Town's traffic consultant, and from Town officials, including public safety officials, other potential mitigation and improvement options have been investigated by Conley Associates, Inc. The pros and cons of each of these possible options for Washington Street corridor improvements that have been investigated by Conley Associates, Inc. are discussed in detail and then summarized in bullet point format below. Following this summary, specific recommendations of Conley Associates, Inc. can be found at the end of this memorandum.

Signalization Options

As stated in the TIS, the signalization of River Street would reduce the lengthy queues experienced by motorists approaching Washington Street on River Street. In addition, through the updated and improved signal timings at Concord Street, the coordinated traffic signal system will also reduce the eastbound queue along Washington Street, which is at its longest during the weekday AM peak hour. However, signalizing River Street does not eliminate the existing eastbound queue in the study area. This queue currently blocks several driveways and unsignalized intersections.

At the request of BETA and Town officials, as an alternative to implementing a signal at River Street, the signalization of Glen Road has also been investigated. Although the traffic volumes approaching Washington Street are not as high from Glen Road as they are from River Street, the

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signalization of this intersection would drastically reduce the queues through the study area and would create gaps in the traffic that would allow access and egress from the driveways throughout the study area. Signalization of this intersection, much like the signalization of River Street, would require specific signal timing and coordination with the adjacent signalized intersections of Concord Street and Walnut Street. However, since there are greater distances between the signals, the timing would not need to be as precise to operate properly.

Conley Associates, Inc. investigated the possibility of implementing a traffic signal at Glen Road. Unlike signalizing River Street, the critical peak hour queue would be the westbound weekday PM peak hour. With proper timing of a signal at this intersection, this investigation indicated that it was possible to avoid a westbound standing queue through the study area. Conley Associates, Inc. analyzed the corridor assuming a signal at Glen Road and found the queues could be maintained between the three intersections without creating standing queues through the study area.

Irrespective of the ultimate location of a new signal, complete pedestrian facilities should be included at any future signalization. The facilities should include fully actuated pedestrian signal equipment and crosswalks.

Parking Restrictions

At the request of BETA and Town officials, Conley Associates, Inc. evaluated the possibility of prohibiting parking during the peak hours, through signage and appropriate enforcement, along a certain section of Washington Street. Currently, motorists who parallel park in this corridor cause delays to the through traffic along Washington Street. In order to reduce such delays, parking could be prohibited during the weekday AM peak hour on the south side of Washington Street between the Papa Razzi driveway and River Street. For alternative parking, vehicles which would otherwise park on the street in this location at this time to access the Dunkin' Donuts and other businesses in the area would be able to use the municipal lot on the southwest corner of Washington Street at River Street and appropriate additional signage could assist motorists to identify this alternative. These vehicles would then re-enter the Washington Street traffic flow via River Street, which, through the left turn restriction discussed in the "Turning Restrictions" section and through the roadway geometry improvements discussed in the "Geometric Roadway Improvements" section, would experience reduced queues compared to those that currently exist at this location. Additionally, if desired, during the weekday PM peak hour, parking could be restricted on the north side of Washington Street between River Street and Columbia Street with parking alternatives provided at other locations, including at an improved and expanded parking area upon the Town right of way adjacent to the site, assuming such improvements are approved by the Town.

Based on input from public safety officials, it is not suggested that once free of parked vehicles during these periods, that the parking shoulder space, be used as a second lane of travel as is done along Washington Street in other parts of Wellesley. Merely removing the parallel parking maneuvers will reduce delays and increase vehicular safety. Conley Associates, Inc. strongly recommends that if any such parking restrictions are to be implemented, that this be done in

conjunction with the crosswalk improvements discussed in the "Pedestrian Improvements" section, to ensure adequate pedestrian safety. Without the improvements discussed in that section and appropriate enforcement, the parking lane, with no vehicles in it, might be used, illegally, by motorists traveling through the corridor, which could potentially be hazardous to pedestrians.

Another potential alteration to on street parking in this area could be the implementation of longer on street parking spaces in this location, similar to those implemented in the Linden Square vicinity. Longer on street parking spaces (approximately 25 feet long versus conventional 20 foot long parallel spaces) would be designed to reduce the time it takes for motorists to get into the parking spaces, by allowing vehicles to enter and exit the longer spaces without having to back up and impeding the flow of traffic, thus reducing the delays along Washington Street attributable to this existing parallel parking activity. However, it would be imperative that these spaces be clearly striped in order to ensure motorists only utilize one vehicle per space. Note that this option may result in the elimination of two existing spaces (out of the existing six spaces), due to the incorporation of longer spaces.

Turning Restrictions

Conley Associates, Inc. was asked by BETA and Town officials to evaluate restricting northbound left turns from River Street during the peak hours. The restriction of left turns will reduce conflicts with Washington Street at this location, and therefore, some of the delay experienced by Washington Street vehicles. However, it is likely that the restricted motorists will find new routes to their destinations, increasing traffic on other area streets. It is likely that most of the River Street northbound left turn vehicles would alternatively utilize Walnut Street to access Washington Street.

Accordingly, Conley Associates, Inc. analyzed the corridor assuming the northbound left turn River Street vehicles were diverted to Walnut Street. This evaluation concluded that the existing signal at the Walnut Street intersection is capable of handling the additional traffic without a degradation in LOS (LOS D or better during the peak hours depending on pedestrian activity).

Pedestrian Improvements

At the request of BETA and Town officials, Conley Associates, Inc. has evaluated and found there to be insufficient pedestrian crossings in the study area. Crosswalks are provided across Washington Street to the west of the vicinity at the Glen Road intersection, at the Papa Razzi driveway, and to the east of the vicinity at Grove Street (Newton). An additional crosswalk could be placed on the west side of River Street across Washington Street. The peak hour left turn restrictions discussed previously at River Street would reduce the peak hour pedestrian conflicts to the west of River Street.

In addition to the new crosswalk at River Street, Conley Associates, Inc. investigated the possibility of providing additional safety to the pedestrians crossing Washington Street at the crosswalks. Through the construction of sidewalk bump-outs, the pedestrians will receive two

pertinent advantages, a shorter crossing distance and a grade separated sidewalk to increase pedestrian visibility, specifically due to the on street parking.

The implementation of pedestrian bump-outs at River Street and the Papa Razzi driveway would also eliminate the possibility of motorists utilizing the parking shoulder as a through lane during the peak period parking restrictions discussed previously.

Geometric Improvements

At the request of BETA and Town officials, Conley Associates, Inc. has also investigated several geometric changes and improved pavement striping throughout the Washington Street corridor. These modifications included several alternatives, consisting of a four lane cross section, a three lane cross section with a continuous two-way left-turn lane (TWLTL) in the center, and isolated left turn lanes for high volume driveways. These alternative geometry modifications each have their own pros and cons, but, generally, the addition of lanes within the corridor will increase traffic volume capacity and increase vehicle speeds, while decreasing pedestrian safety and eliminating the possibility of on street parking.

Conley Associates, Inc. investigated the existing lane geometry between River Street and Concord Street. Currently the roadway is approximately 48 feet wide with a double yellow centerline, but lacks lane delineation, or parking space striping. Several options were investigated for this section, including implementing three eastbound lanes (a left turn lane and two through lanes), two striped lanes in each direction, and one through lane in each direction with on street parallel parking on both sides. Of critical concern is the ability of the eastbound lanes to accommodate vehicles turning right from River Street and maximizing the eastbound capacity. Conley Associates, Inc. investigated several options through intersection operations analysis. Although there was a detailed amount of analysis conducted, typically the results were as expected based on capacity restrictions. The results of several of the analysis are discussed in the "Summary" section.

Access Management

The Town asked Conley Associates, Inc. to evaluate how the project might be coordinated with the implementation of access management measures for some of the many driveways throughout the corridor. While a majority of the driveways accessing Washington Street are private and therefore out of the proponent's control, the proponent is committed to implementing certain significant access management measures. In particular, the proponent has proposed the elimination of the existing eastern curb cut into the site, which will improve access management by the reduction in an existing private entrance and egress way on the site. Furthermore, at the request of the Town, the proponent has developed a proposal for the Town-owned right-of-way immediately east of the site, which would commit the proponent to provide public egress through the site and ultimately, the site's remaining curb cut for an expanded public parking area on the right-of-way area (proposed to have a one-way entrance). If the Town approves of this plan, the proponent would be committed to construct these improvements on the Town land and allow vehicles parked in this location to exit the Town land via the site driveway, thereby eliminating another problematic parking egress point. In these important ways, the proponent is participating

directly in access management solutions that utilize the proposed site as part of a combined access point to multiple properties to help improve the conditions along the corridor.

Transportation Demand Management

Conley Associates, Inc. has investigated potential Transportation Demand Management (TDM) measures. In connection with potential TDM measures, the proponent agrees to, in principle: (i) provide a shuttle bus stop on site (or on-street in the location of the site's existing eastern curb cut which is to be closed); (ii) install bike racks on site for use by the public and residents; (iii) promote ride-share programs in common facilities throughout the residences, office and commercial components of the project; (iv) implement a significant new pedestrian connection to adjoining residential area; and (v) work with the Town on any other TDM measures that are proposed by the Town.

Summary

As shown, Conley Associates, Inc. has investigated several transportation improvements for the Washington Street corridor. The following is a list of the pros and cons of each potential improvement.

Signalization of River Street

Pros	Cons
Decreased delay approaching Washington Street	Existing queues on Washington Street in the Study area are not eliminated

Signalization of Glen Road

Pros	Cons
Signalization manages traffic flow eastbound Into the study area. Gaps in traffic utilized by Driveway movements	Weekday AM eastbound queue will block unsignalized intersections not currently affected by the existing queue

Peak Hour Parking Restrictions

Pros	Cons
Elimination of conflicting parallel parking maneuvers	Potential loss of on street parking convenience Potential police enforcement burden

Peak Hour Turning Restrictions

Pros	Cons
Elimination of major conflict point along Washington Street	Potential police enforcement burden Potential traffic displacement to other roadways in the area (however these locations may be better equipped to handle turning movements)

Pedestrian Improvements

Pros	Cons
Increased safety of pedestrians through grade Separated bump-outs	None, however bump-outs will prevent the Possibility of multiple lanes of travel for increased vehicular capacity

Four Lane Cross Section throughout the Corridor

Pros	Cons
Increased traffic volume capacity; decreased Travel times through the corridor	Decrease of pedestrian safety due to higher vehicle speeds and longer crossing distances

Three Lane Cross Section throughout the Corridor

Pros	Cons
Increased traffic volume capacity through removal of blocking maneuvers	Decrease of pedestrian safety. TWLTL not optimal for vehicle safety

Isolated Left Turn Lanes throughout Corridor

Pros	Cons
Increased traffic volume capacity through removal of blocking maneuvers	Decrease of pedestrian safety. Loss of on street parking

Three Eastbound Lanes at Concord Street

Pros	Cons
Increased eastbound capacity through signal	Decreased westbound downstream capacity

Access Management

Pros	Cons
Decreased conflict points	N/A

Transportation Demand Management

Pros	Cons
Decreased of traffic volume through Alternative modes of travel	N/A

Recommendations

Conley Associates, Inc. has evaluated the existing transportation conditions through the Washington Street corridor. The existing corridor's design and operations present difficulties for the existing traffic volumes and pedestrian safety conditions. Conley Associates, Inc.

recommends several improvements to improve these existing deficiencies by increasing the capacity within the corridor through the removal of conflicting movements, while also implementing pedestrian safety measures within the corridor.

While the proposed redevelopment of 27 Washington Street will not add a significant amount of traffic through the corridor (particularly relative to the past use and proposals for the site), traffic from the project will contribute to the existing traffic conditions within the corridor. Therefore, the proponent is committed to assist in the development and implementation of mitigation measures within the corridor to improve traffic and pedestrian safety. The proponent is committed to implement the TDM measures identified within this memorandum and consider any further TDM measures that are proposed by the Town. In addition, upon the Town's determination, the proponent is prepared to develop the signalization of the River Street intersection and to update the signal equipment at Concord Street, as stated in the TIS. In the alternative or in addition, the following are Conley Associates, Inc. recommendations for further corridor improvements discussed from the west to the east.

Signalize Glen Road

As discussed, signalization of this intersection (as an alternative to implementing a traffic signal at River Street) will create gaps in traffic in the study area that can be used to access and egress the many driveways in the area. In addition, this will reduce the eastbound standing queue through the study area.

Install Shuttle Stop to the east of the Proposed Site Driveway

Should the Town develop a shuttle service, the proponent is committed to working with the Town to designate a shuttle stop on the north side of Washington Street. The location of the existing eastern curb cut to the site has been offered as part of the proponent's planned TDM measures for the location of a shuttle stop. This stop could service westbound service so that westbound turning movements off of and on to Washington Street by a shuttle service would be eliminated. A shuttle stop may be possible to be located on site for eastbound service, if desired.

Enhanced Pedestrian Improvements at Papa Razzi Driveway Crosswalk

Install grade separated bump-outs at each end of the existing crosswalk. These bump-outs will shorten the distance traveled by a pedestrian and also supply pedestrians with a location to step out past vehicles parked on street for improved visibility, while still having the safety of a grade separated sidewalk.

Restrict Parking

Parking restrictions should be posted and enforced on the south side of Washington Street between the Papa Razzi driveway and River Street during the weekday AM peak period (6:00 AM to 10:00 AM). In conjunction with the pedestrian bump outs, this will eliminate conflicting parking maneuvers, while eliminating the use of the parking lane as an additional travel lane during this critical period.

Pedestrian Improvements at River Street

On the west side of River Street, install a crosswalk with pedestrian sidewalk bump-outs as described at the Papa Razzi driveway. The two bump-outs will eliminate the use of the parking lane as a travel lane. The new crosswalk will give pedestrians a location to cross Washington Street prior to crossing the river.

River Street to Concord Street

Update and install pavement markings eastbound and westbound between the two intersections. Eastbound should be striped as two lanes between River Street and Concord Street. The second eastbound lane will accommodate right turn movements from River Street, which would be increased due to the restriction of on street parking.

In the westbound direction the roadway should be striped as two through lanes. At the River Street intersection the pavements markings should create a left turn only lane and a through lane. This will shift the existing lane drop away from its current location, adjacent downstream from River Street, directly in front of the 1 Washington Street driveway.

At the Concord Street intersection, in the eastbound direction, there should be a shared through/right turn lane and a shared through/left turn lane. The shared through lanes will maximum the eastbound through volume capacity, while not decreasing the existing westbound capacity. Adding a third lane eastbound would require only one westbound lane. This lane would be fed by two westbound lanes upstream of the signal. The signal will operate with an eastbound advance allowing all eastbound movements to proceed simultaneously.

The signal equipment should be updated, as necessary for coordination with proposed new signalized intersection.

Conclusion

Based upon comments from BETA and the Town, Conley Associates, Inc. has investigated potential improvements throughout the study area along the Washington Street corridor. Conley Associates, Inc. has evaluated additional potential improvements intended to address many of the existing deficiencies of the corridor within the constraints of the area. It should be noted that these improvements cannot completely alleviate the corridor of existing delays and conflict points within the corridor, but rather improve current conditions by minimizing the existing deficiencies, and maximizing the potential of the corridor, in terms of improving traffic and pedestrian safety conditions.

Many of the investigated proposals to the existing deficiencies only exasperated other existing deficiencies (i.e., a four lane cross section would maximize vehicular capacity; however it would further decrease pedestrian safety). Conley Associates, Inc. has attempted to weigh the importance of each of the transportation components against each other when deciding on the recommendations. The recommendations of this memorandum will attempt to decrease the number of vehicular conflicts that are occurring, increase capacity, all while improving pedestrian safety.