



Date: March 15, 2013  
To: Nora Loughnane, Town Planner  
From: Kien Y. Ho, P.E., PTOE  
Greg E. Lucas, P.E., PTOE  
Subject: University Station Peer Review

BETA Project #: 4410

The purpose of this memorandum is to provide review comments for memoranda received from Tetra Tech/VAI in connection with the University Station Development Project, and to identify outstanding framework issues remaining related to traffic.

Documents reviewed included the following:

- Memo – “University Station at Harvard Street”, dated February 12<sup>th</sup>, 2013
- Memo – “University Station – Preliminary Impact Analysis of Full I-95/I-93 Interchange Project on University Avenue”, dated February 19<sup>th</sup>, 2013
- Traffic Simulations for 2022 PM condition, with and without SB crosswalk, submitted electronically on February 20<sup>th</sup>, 2013
- Memo – “University Station – Canton Street/University Avenue”, dated February 20<sup>th</sup>, 2013
- Memo – “University Station – Southbound Crosswalk Impact Analyses”, dated February 21<sup>st</sup>, 2013
- Memo – “University Station – Assessment of Alternative Configurations for the Canton Street/University Avenue Intersection”, dated February 22<sup>nd</sup>, 2013
- Updated TIS Figures 17 through 40, submitted electronically on February 28<sup>th</sup>, 2013

Memoranda were received in response to requests for information submitted by BETA to TetraTech/VAI via email on February 1<sup>st</sup> and February 18<sup>th</sup>, 2013.

**Memo – “University Station at Harvard Street”, dated February 12<sup>th</sup>, 2013**

This memorandum presents updated 2022 Build condition analysis of the University Avenue/Harvard Street intersection. Updated analysis was necessary because the current design of the project has been revised to provide two northbound lanes on University Avenue between Canton Street and Harvard Street, which requires modification of lane assignments at Harvard Street.

1. We concur that the analyses indicate good levels of service for all three peak hours, but caution that the analyses do not consider potential increases in northbound University Avenue traffic created by the full build I-95/I93 interchange or by changes in local travel patterns brought about by modifications to the University Avenue/Canton Street intersection. In addition we note that at such time the I-95 NB off ramp to Dedham Street is implemented, the projected volume of left turns to Harvard Street is such that NB left/thru lane may become a de facto left, which is not consistent with the Planning Board’s goal of two uninterrupted through lanes. It is recommended that the Town consider implementation of a future condition that provides an exclusive left turn lane and

two through lanes northbound at Harvard Street, which will require takings. This may entail specification of requirements in the Development Agreement.

2. Exclusive pedestrian phasing should be provided at this location to match exclusive phasing provided at the other site access intersections along University Avenue and at the University Avenue/Canton Street intersection.
3. The final TIS should incorporate the proposed lane and pedestrian crossing changes.

**Memo – “University Station – Preliminary Impact Analysis of Full I-95/I-93 Interchange Project on University Avenue”, dated February 19<sup>th</sup>, 2013**

This memorandum addresses how the current design of the University Avenue/Canton Street and University Avenue corridor would operate with the full implementation of the proposed I-95/I-93 Interchange Project. This is important to consider because there will be no access from I-95 northbound to University Avenue via I-95/Route 128; all access to University Station, University Avenue and the MBTA station from the south will be via the Dedham Street off-ramp and the University Avenue/Canton Street intersection.

1. The impact of the full build interchange on the University Avenue/Canton Street intersection results in acceptable overall Level of Service (LOS), but shows v/c ratios exceeding 1 and poor LOS for certain individual movements. This is true for both the AM and PM peak hour for the University Avenue SB left, and in the PM peak hour for the University Avenue NB through movement. These individual lane group operations illustrate that additional capacity may be needed at the intersection before the connection from I-95 NB to University Avenue is eliminated, which occurs in conjunction with the full build interchange.
2. Vehicles traveling north on I-95 to Rosemont Road via University Avenue today are redistributed to the Dedham Street off-ramp to University Avenue and Harvard Street after the full build interchange. We concur with this redistribution, and note that it further supports the need for an exclusive left turn lane and two NB through lanes at Harvard Street.
3. University Avenue/Harvard Street is analyzed with an exclusive left turn lane and a single through lane northbound, which is inconsistent with the current design. Two northbound through lanes are required along the entire University Avenue corridor in the current design to promote University Avenue over Canton Street as a preferred route to access I-95/Route 128, a requirement that will become more important in the future once the full build interchange is in place and traffic along University Avenue increases. An update to this sensitivity analysis is not required for this item at this time, however any future analysis of the corridor in a full build interchange condition should incorporate this change.

**Traffic Simulations for 2022 PM condition, with and without SB crosswalk, submitted electronically on February 20<sup>th</sup>, March 8<sup>th</sup> and March 18<sup>th</sup>, 2013**

**Traffic Simulation for 2017 PM condition, with SB crosswalk, submitted electronically on March 18<sup>th</sup>, 2013**

Simulations were requested to facilitate additional review of intersection operations and queuing. Preliminary comments were addressed in revised submissions. The 2017 simulation was also requested and reviewed because through volumes are higher at the northern end of University Avenue in 2017 than they are in 2022 due to the absence of the I-95/Dedham Street off-ramp.

1. Volume exiting the MBTA garage will peak following train arrival times. The revised simulation showed improvement of this driveway operation, but phasing refinements may still be necessary and should be coordinated with MassDOT.
2. Adaptive signal control should be considered along the University Avenue corridor.
3. The simulation shows queuing concerns for the University Avenue NB through movement at Canton Street, which traps right turning vehicles before the beginning of the exclusive right turn lane. It is recommended that this turn lane be extended to the greatest extent practicable. Existing observations at this intersection reveal that right turning vehicles currently use the shoulder to bypass queued through vehicles. Widening in this area to formally establish a right turn lane can likely be accomplished without impacting ROW, existing guardrail or existing wetlands.
4. The Synchro file supporting the simulation shows that University Avenue/Canton Street and University Avenue/Harvard Street are uncoordinated. These locations should be included in the coordinated system along University Avenue to promote continuous flow from Canton and Dedham Streets to I-95/Route 128.
5. The site drive opposite Rosemont Road shows a two lane approach, which does not match the design as conveyed by the proponent. A response from TetraTech stated that this approach should be a shared left/through and a right turn lane, and that the plans will be modified accordingly.
6. The Canton Street/Dedham Street WB right turn to Canton Street has been presented to the Planning Board by the Development team as a free right turn, but is shown under yield condition in the simulation. The simulation and Synchro model should match the design as presented.
7. The Synchro model should be updated based on these comments, with the revised analysis results incorporated into the final TIS. No further review of the simulation is required.

**Memo – “University Station – Canton Street/University Avenue”, dated February 20<sup>th</sup>, 2013**

This memorandum provides a sensitivity analysis for a conservative condition prior to the full build interchange under which all traffic associated with the University Station project arriving from I-95 NB and departing to I-95 SB uses Dedham Street and the University Avenue/Canton Street intersection to access/egress the site.

1. Table 1 provides a comparison between the peak hours with the I-95 site trips and with the full build interchange. Our review indicates that key movements at the Canton Street intersection would reach/slightly exceed max capacity. .

**Memo – “University Station – Southbound Crosswalk Impact Analyses”, dated February 21<sup>st</sup>, 2013**

This memorandum addresses BETA’s request for evaluation of an additional crosswalk across the fourth leg of the intersection at each of the University Avenue site access intersections. This is referred to as the “southbound crosswalk” analysis because it adds a crosswalk across the southbound approach at the Relocated Rosemont Road, North Site Drive and South Site Drive intersections with University Avenue. This requires additional pedestrian clearance time due to the longer crosswalk required.

1. The analysis assumes no change at Harvard Street, since a crosswalk is already provided across the southbound leg. For clarification, our request was for crosswalks across all four legs of each intersection, which would require a new crosswalk across the northbound leg of University Avenue at Harvard Street.
2. Exclusive phasing should be provided for Harvard Street, as noted in comment #2 for the February 12<sup>th</sup> memo above. Revised analysis should be provided for University Avenue/Harvard Street with exclusive pedestrian phasing.
3. The increased pedestrian clearance time has very little impact on delays and queue lengths; therefore, it is recommended that the additional pedestrian crossing across University Avenue be added at all four intersections, pending review of updated analysis for University Avenue/Harvard Street.
4. These operating conditions should be incorporated into the final TIS.

**Memo – “University Station – Assessment of Alternative Configurations for the Canton Street/University Avenue Intersection”, dated February 22<sup>nd</sup>, 2013**

This memorandum provides concept sketches and preliminary analysis for two alternative designs at the University Avenue/Canton Street intersection. Both options require vehicles to stop and turn left if they intend to travel from Dedham Street to Canton Street.

1. We note that previous memoranda support consideration for additional capacity at the University Avenue/Canton Street intersection before the full build I-95/I-93 interchange is implemented.
2. Option 1 should consider aligning the connector road with the north-south roadway that provides connection to both existing and future office uses, thereby creating a T-intersection, with Harvard Street under STOP control. This will provide a natural separation of access for office and retail/grocery uses, and will reduce left and right turns both at Harvard Street and at the University Avenue/Canton Street intersection.
3. We generally agree with the trip redistribution for Option 1. Further refinement can be accomplished based on land use, especially if comment #2 above is implemented. Consideration of redistribution of traffic from Canton Street NB to University Avenue is also appropriate and should be considered in future study of Option 1.

4. Volume redistribution for Option 2 is conservative in that it does not account for any redistribution of I-95/Route 128 destined traffic from Canton Street to University Avenue. Further refinement is necessary at a later stage in conjunction with MassDOT.
5. The preliminary analysis provided for Option 2 will require refinement. Queues in the PM peak hour will exceed the storage provided between the two proposed intersections. The volume redistributions noted under item 4 may help mitigate queuing. These considerations should be included in future study of Option 2
6. Future analysis of these alternatives may also need to consider Full Build Interchange Conditions.

#### **Updated TIS Figures 17 through 40, submitted electronically on February 28<sup>th</sup>, 2013**

These figures were provided at BETA's request to reflect modifications to trip distributions at the University Avenue/Everett Street intersection, as described in the February 19<sup>th</sup> memo. This increases the number of project trips using University Avenue northbound, and decreases the project trips on Everett Street and Canton Street. This is more indicative of expected travel patterns, and we offer no further comments on the figures as provided. These figures should be incorporated into the final TIS.

#### **Outstanding Items**

The following items are outstanding from our review of the November 2012 Traffic Impact Study and supporting documents.

1. A license plate survey should be conducted to determine the existing volume of traffic traveling from I-95 through the Canton Street/Dedham Street or University Avenue corridors. This would identify existing cut-through traffic, and would be helpful in projecting future redistributions. The license plate survey has been discussed with TetraTech and has been on hold due to the lack of sufficient daylight during the afternoon peak period, but should be scheduled after March 10<sup>th</sup>, which marks the beginning of Daylight Savings Time.
2. The TIS assumes that improvements to the "bookend" intersections of Blue Hill Drive/University Avenue and Canton Street/University Avenue will be complete by 2017, and presents a 2017 Build Analysis that applies project trips to these reconstructed intersections. If it is anticipated that an interim condition could occur, an analysis should be presented which includes project trips applied to the geometry at these two intersections or any others where a geometry other than full build might occur.
3. No parking generation or parking demand analysis was included in the TIS. The Proponent should detail the parking requirements of the project, the number of proposed spaces by land use, and any assumptions that are included in the Project.
4. To what extent have the impacts been presented to the surrounding communities such as Norwood and Canton as well as MassDOT? Please provide a copy of any review comments.

#### **Mitigation**

1. The TIS states that a timing and phasing improvements plan will be provided for the intersection of Route 1A at Everett Street in Westwood, but also states that the intersection will continue to operate at LOS F during the weekday peak hours with optimized timings under the 2022 Build conditions. This shows that additional improvements should be considered to add capacity at this intersection. A study should be conducted immediately to determine potential improvements that can be implemented.
  2. Higher than average crash rates show the need for a safety study at the intersection of Nahatan Street and Clapboardtree Street in Westwood. This study should be conducted immediately and should engage Town personnel in a discussion of potential geometric or traffic control improvements.
  3. Since the intersection of Route 1/Everett Street/University Avenue in Norwood is identified as a high crash location, we recommend that a Road Safety Audit be conducted following MassDOT guidelines in addition to timing and phasing adjustments. We note that the TIS states that the intersection will continue to operate at LOS F during all peak hours with optimized timings under the 2022 Build conditions. This shows that additional improvements should be considered to add capacity at this intersection. Efforts should be coordinated with the Town of Norwood and MassDOT, who are advancing a design project at this location.
  4. Please clarify the proponent's involvement in mitigation at Dedham Street/Washington Street and Dedham Street/Elm Street in Canton. Is the proponent funding design only, or design and construction?
  5. TIS states 300 vehicle increase at Route 138/Green Lodge Street in Canton during the Saturday mid-day peak hour, but Figure 34 shows 200. Please clarify. Also Is it the proponents intention to fund construction of any improvements necessary at this location.
  6. Clarify who is responsible for construction of the right turn lane on the Shawmut Road approach to Dedham Street in Canton.
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