

*THE COMMONWEALTH OF MASSACHUSETTS
MASSACHUSETTS DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION
District Four
INTEROFFICE MEMORANDUM*

TO: Marie Rose, P.E., Director of Projects
FROM: Patricia A. Leavenworth, P.E., District Highway Director
DATE: March 25, 2010
SUBJECT: ARLINGTON Mass Ave Reconstruction 604687
DESIGNER: Fay Spofford & Thorndike



Attention: Azad Kidher, Project Manager

Enclosed please find comments from the District Project Section on the 25% submittal for the subject project. Also attached are comments from our Traffic Section.

Comments from our Utilities and Constructability Section (DUCE) are being deferred as a full 25% resubmittal is recommended. Extensive revisions are deemed necessary to the Basic Design Report including a more detailed analysis of traffic data, revised intersection geometrics, and updated Level of Service analyses. The plans submitted are considered incomplete as no critical cross sections nor profiles were included; typical cross sections and traffic management plans also need additional development.

Should you require additional information on this project, please contact Dave Huse PE, at 781 641-8423.

Major Issues

Basic Design Report (BDR)

Traffic data in the Report appears flawed. Observed peak hour turning movements do not correlate well with adjacent machine counts; projected volumes are not always utilized for future LOS analyses; and traffic forecasts are projected for only ten years (twenty year is the norm). In general, turning movement volumes utilized in the LOS analyses need to be better scrutinized. We suggest the Designer compare recent machine counts with historic data to help demonstrate the accuracy of their counting program.

A comparison of Level of Service (LOS) analyses contained in the BDR indicates the proposed travel lane changes would degrade intersection service levels, especially during morning peak hours. The No Build and Build LOS analyses utilize the same future traffic flows which allows assessment of the proposed geometric changes as summarized below:

- Mass Ave at Linwood/Foster St [Signal Location # 1 of 4]
The BDR predicts AM peak hour operations will drop from A to D under build conditions; the Mass Ave southbound queue is expected to increase by 329 feet.
- Mass Ave at Bates/Marion Road [Signal Location # 2 of 4]
There is no signal here now, however, the BDR indicates the proposed new signal would operate at LOS F and cause a southbound queue over 800 feet long. Foster Street [signal # 1] is just 500' from Bates; therefore, the analysis appears to indicate the back up from the new signal would block the Foster St Signal.
- Mass Ave at Lake Street [Signal Location # 3 of 4]
The analyses indicate a slight improvement from LOS F to E, however, the expected northbound average queue exceeds the left turn storage length available; therefore, the cited LOS improvement in the BDR appears invalid.
- Mass Ave at Teel/Thorndike St [Signal Location # 4 of 4]
This signal would continue to be LOS A. which is due to the small side street volumes. The intersection doesn't meet warrants, however, the Town and residents would like it to remain signalized for pedestrian safety; we concur.
- Mass Ave at Mystic Valley Parkway (Rte 16)
The Designer's analysis indicates the intersection is currently operating at LOS E. We contend this intersection is operating well over its capacity during peak hours and believe the analysis of existing conditions should have indicated failed conditions. (LOS F). We suggest signal phasing changes be considered here.

Conclusions in the BDR accurately state that bicycle operations would be enhanced by the proposed modifications; however, other statements do not appear to be supported by the analyses, especially the statements of intersection LOS improvements.

The submittal is considered incomplete as it is missing several components including a Survey Control Plan, Profiles, and the Legend and Abbreviation Sheet. We suggest the data discrepancies in the BDR be resolved and geometrics developed that meet design guidelines. A full 25% resubmitted is recommended, including a revised BDR.

Plan Comments

Title Sheet

The list of applicable Design Documents should include the 2007 Standard Special Provisions and the 2006 Standard Drawings for Development of Tamps

Key Plan

This sheet should be included in the next submittal. In addition to listing the various plan sets that are envisioned for the project, we suggest it also be used to indicate where subsurface investigations were made. Where will subsurface data be presented?

Typical Sections Sheets 2 - 3

Many existing and proposed edges and cross slopes are missing and need to be indicated.

Where Mass Ave sidewalks are being substantially widened, if back of sidewalk elevations are held, and the new sidewalk is sloped towards the gutter or is level, providing adequate curb reveals will be difficult. The existing cement concrete base and limited pavement thickness eliminates many construction options typically used to resolve these types of issues. Full depth pavement reconstruction and excavation of the existing cement concrete base may be necessary along numerous roadway segments.

Pavement notes appear to have two grind and overlay options. Is this the intent?

The typical for Mass Ave from 12+00 to 24+00 may inadvertently promote the use of the bike lanes by cars. The typical shows unallocated space between the parking and bike lanes; in some segments there would be ten feet between the edge of the designated travel lane and the edge of the parking lane. Ten feet is more than adequate for impatient and aggressive drivers to use as an ad hoc travel lane, especially during congested periods. Painted rather than raised medians would further enable this illegal and unsafe practice.

All typicals with "width varies" dimensions need to be augmented with the maximum and minimum values of the dimension.

Construction Plans Sheets 4 - 14

Construction plans shouldn't show paint and landscaping; this obscures existing details.

None of these sheets delineate limits of proposed sidewalk work down the side streets.

We agree with the tactic of relocating hydrants to reinforce parking restrictions; however fire protection parameters are of paramount importance. Have the proposed hydrant relocations been discussed with the City's Fire Department?

Patterns used to designate decorative paving and landscaping obscure existing details; we suggest either lighter patterns be used or indicating this work by more traditional means.

Most existing basins have inlets; to continue this, the new basins should be labeled CBCI.

Do the existing MBTA manholes need to be maintained?

Sheet 1 of 11

Does the existing basin at 13+50 R need to be moved?

Sheet 3 of 11

Address the two existing CBs at Adams Street (21+35 L & 22+20 L)

Sheet 4 of 11

The existing CB at the proposed WCR transition at 26+77 L needs to be moved.

What is the feature labeled FA at 26+71 L?

Is there a proposed land taking from the apartment building at Marion Road?

How wide are the proposed sidewalks at Marion Road?

Are CBs needed at 28+40 R and 30+20 R to prevent puddles caused by the neck downs?

Sheet 5 of 11

Please clarify drainage at Elmhurst Rd, is the double basin off the curb being retained?

Check the drainage at the neck downs for the crosswalk at 32+85

Clarify the dispensation of the existing CB at 36+61 L.

We see no benefits and several problems with the proposed angle parking on Grafton St.

Are basins necessary at 36+05 L or at 37+25 R?

Sheet 6 of 11

Where does the proposed basin at 37+30 outlet?

What is the dispensation of the existing basin at 39+09 L?

Where does the new CB at 39+03 L outlet?

Please check if any basins are needed on the right side between Orvis Rd and Lake St.

Sheet 7 of 11

Where does the proposed CB at 42+56 R outlet?

Sheet 8 of 11

The scaled width of the painted medians does not match the typical section. (5' vs. 6')

Check the drainage at crosswalk neck downs at Marathon and at Trowbridge.

Sheet 9 of 11

If neck downs are warranted for the midblock crossing at 54+15, why aren't they warranted at the relocated crossing at Thorndike?

Check the need for basins at the neck downs.

Sheet 10 of 11

Is the roadway edge being changed at 60+30 R? If it is, address the existing basin there.

The proposed parking bay at 62+50 L scales 20' long but the note says it is 22'.

Check the drainage for the proposed neck down at 62+85 L

Sheet 11 of 11

Revise the median and sidewalks to accommodate the recently advertised Minuteman Bikpath connector (ProjNo 605672). Suggest the median here have an eight inch reveal.

Traffic Signal Control Plans Sheets 15 - 18

These sheets will be reviewed by D4 Traffic; we offer one additional general comment:

The label (TYP) shouldn't be used for parking stalls unless they are all a consistent size. Designating different sizes as typical will lead to confusion.

Traffic Management Plans Sheet 19

The strategy presented is overly simplistic; it assumes no full depth construction, the pavement grind operation is not accounted for, and work in the middle of the roadway appears to be omitted. We expect a more fully developed TMP with the next submittal.

Construction Details Sheet 20

The "Streetscape Rain Garden" and "Streetscape Covered Infiltration Area" lack any dimension, and it is unclear how extensively they would be utilized. More importantly, they do not appear appropriate for this project in their current form.

The "Rain Garden" detail is especially problematic:

- The detail appears to create unprotected drop offs that would pose safety hazards for pedestrians, people in wheel chairs, and vehicles of all types.
- Granite curb adjacent to the traveled way requires full lateral support to prevent damage and misalignment from wheel impacts. It is not practicable to install granite curb with no back support adjacent to the parking lane as shown.
- The "stone reservoirs" adjacent to the sidewalk under the parking lanes in both the details would require excavation of the existing cement concrete base. The reservoirs bottoms would need to be below the frost line, or about five feet down.
- The "porous pavement" over the reservoirs does not appear adequate for wheel loads and will clog and lose permeability with routine snow and ice treatments.

The "Rain Garden" detail appears to inject sidewalk and roof runoff into the Mass Ave pavement structure, thereby promoting frost heaves. This strategy might help meet stormwater management goals, but would likely cause rapid pavement deterioration.

A detail for "decorative paving" is missing (granite block? brick? textured concrete?)

Construction Plans show curb corners at driveways; will this style drive be retained? A driveway detail is recommended.

Survey

We suggest the consultant's plans include survey traverse points and sufficient relational geometry to layout the baseline. The traverse bearings and distances may also be included if they don't confuse or clutter the plans. Traverse points should be labeled with coordinates, elevations, and identification as per the electronic traverse file. These actions would facilitate baseline layout and alignment checks during construction.

Meeting Sign In Sheet

Proj Locn ARLINGTON Meeting Locn D4 Projects
 Proj Name MASS AVE RECON Meeting Date 3/22/10
 Projis No 604687 Meeting Topic Traffic Issues

Name	Affiliation	eMail
<u>Dave Huse</u>	<u>D4</u>	<u>David.Huse@state.ma.us</u>
<u>Azad Kidher</u>	<u>Proj. Management</u>	
<u>DOUGLAS PRZYTIS</u>	<u>FST</u>	<u>DPrzytys@fstinc.com</u>
<u>Bill Reed</u>	<u>FST</u>	<u>wreed@fstinc.com</u>
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<u>John Michalak</u>	<u>FST</u>	<u>JMichalak@fstinc.com</u>
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<u>Carol Kowalski</u>	<u>Planning + Community Dev't Arlington</u>	<u>ckowalski@town.arlington.ma.us</u>

ARLINGTON Massachusetts Ave Reconstruction 604687

Meeting Agenda

Monday, March 22, 2010 10:00 PM in D4

Traffic Volumes

- Manual/ATR count discrepancies
- Recent Manual Count by District
- Projections –why not for 20 years?

Level of Service Analyses (LOS)

- Mass Ave @ Bates/Marion Rd -LOS F w/ signal, 800' queue?
- Mass Ave @ Lake Street – expected queue exceeds left turn storage?
- Mass Ave @ Mystic Valley PW –why no phasing changes?

Basic Design Report Conclusions

- Bicycle operations improved, pedestrian crossings not so much
- Assertion of LOS improvements not supported by analyses.

Typical Sections

- In sidewalk widening areas -back of sw elevations vs. curb reveal
- Impact of existing concrete slab on full depth recon re above.
- V shaped sidewalks?
- Rain Garden details –eliminate “traps”

Mass Ave at Lake Street D4 concept

- Widen Lake Street approach to two lanes
- Add raised median on Mass Ave for pedestrian refuge
- Move SB bus stop to far side
- Change Chandler St to two-way (parking in rear)
- Parking on Mass Ave gains four “legal” spaces compared to exist.

“Concept” Plans at other Major Intersections

- Were any done?
- Display at Public Hearing?

File Copy

THE COMMONWEALTH OF MASSACHUSETTS

INTEROFFICE MEMORANDUM

MHD DISTRICT FOUR

TO: Brian Fallon, DPE

THROUGH: Mike Karas, DTOE

FROM: Emil Vezarov, EIT E.V.

DATE: February 19, 2010

**SUBJECT: Arlington – Massachusetts Avenue Reconstruction - 25% Review
(EWO# P604-687 P11), File No: 604687**

District Traffic Engineering Section has reviewed the 25% plans, Functional Design Report, and Cost Estimate for the subject project and offers the following:

- List of review comments
- Consultant evaluations
- Project documents with comments marked in red

Should you have any question, please contact Emil Vezarov at ext. 8318.

EGV/ev
c-file
encl.

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FDR

- According to the Synchro Analysis it appears that the “Build” condition does not improve the LOS for the most intersections. In some cases the LOS is worse than the “Existing” and “No Build” conditions. While providing bike lanes, the design fails to address other issues such as LOS.
- The difference between the ATR counts during the peak hours and the Turning Movement Counts for the peak hours at several of the intersections is significant. In some cases it is more than 30%. Please explain.
- There are no proposed alternative designs. The consultant should investigate several alternatives and choose one of them to develop at the 25% stage.
- It appears that queues formed at some of the intersections may back up through the adjacent signalized intersection and disturb operations. For example the queue on Mass Avenue SB at Marion Road is almost two times as long as the distance to Linwood Avenue.
- Special attention should be given to the signal at Alewife Brook Parkway. The proposed timing changes not only do not improve the LOS; it is even worse. The Consultant should consider phasing changes as well as the proposed timing changes.
- How are emergency vehicles going to be accommodated?

Plans - General Comments

- There is a concern that the 11’ lane and the 5’ bike lane will be blocked by vehicles turning into driveways and create additional midblock backups.
- The proposed textured median is raising legality concerns for vehicles making left turns into driveways along the corridor. If left turns into driveways are prohibited, are there locations where U-turns can be accommodated?
- The textured median island will also be a significant maintenance burden for the Town.
- The Consultant should coordinate this project with the proposed modifications at the intersection of Mass Avenue with Alewife Brook Parkway by the Alewife Brook Greenway project.
- The proposed CW at the Alewife Brook Parkway intersection leads pedestrians right at the existing mast arm. Also, there are no proposed WCR’s at this location.
- Pavement Marking and Signing Plan is missing.
- TMP is missing.

Traffic Signal Plans

- Signal head “H” for Location 2 cannot be used for the proposed overlap. It should be with 5-section housing or with bi-modal arrow lens.
- Provide signal timings with the next submission.

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Preliminary Estimate

- The items for new proposed traffic signals should be separated from items for traffic signal reconstruction.
- Is there any work proposed at the Alewife Brook Parkway intersection?

All comments are marked on the drawings. Revise the drawing to reflect these comments as necessary.

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Below is our consultant evaluation of the subject project. Design comments have been completed and are under separate cover.

CONSULTANT EVALUATION:

Consultant: FST

25% Traffic Comments Score: 5

General Comments: The plans do not meet the 25% submission requirements.