North Street Reconstruction Project

Intersection of North St. & Bridge St.

“Modifications From Public Input”

July 11, 2007
Traffic & Alternative Studies

• DCAM Has Analyzed Traffic And Alternatives for Six Years:
  – Howard, Stein, Hudson in October 2001 for a Transportation Study.
  – Earth Tech From 2006 to the Present.

• Study Area Bounded By:
  
  St. Peters St. To The East  Boston St. To The West

  Mason St. To The North  Essex St. To The South

• Various Alternatives Were Reviewed And Analysis Performed. Other Reports And Studies Were Utilized With Input From The State And The City.

• Courthouse Project Does Not Add Traffic.
• East Ramps Process 12% AM and 14% PM of the Traffic In This Intersection.
• Removal Of The East Ramps Needs To Be Mitigated In A Safe Manner Without Impacting Current Traffic.
Edwards & Kelcey Alternatives

- 1A  No Improvements, Drivers Must Seek Alternate Route.
- 1B  Minor Roadway Improvements.
- 2A  Slip Ramp With Federal St. Detour.
- 3   Shadow Ramp.
- 4   Signalize Intersection Of North Street With West Ramps.
- 4A  Same as 4 with Federal St. at North St. Thru and Right Only.
- 4B  Same as 4 with Federal St. Left to North St. Allowed.

Conclusion Alternatives 4, 4A, and 4B Offer The Best Overall Solution
Alternative 2B
Alternative 4A

NOTE: SCHEMATIC DRAWING NOT FOR CONSTRUCTION PURPOSES

SALEM STATION
FUTURE COMMUTER RAIL PARKING GARAGE ENTRANCE BY OTHERS (2020 SCENARIO ONLY)

INTERSECTION IMPROVEMENTS BY OTHERS

Legend:

= AREA OF NEW CONSTRUCTION
= TRAFFIC SIGNAL

SCALE: 1" = 0' - 0"
• Central Transportation Planning Staff (CTPS) Study – 2005
• Bridge Street Bypass
• North Street Reconstruction
• Courthouse Site
• Future Bridge Street Reconstruction
• Conservative (Higher) Background Growth Factor
• Other Minor Developments
• Proposed MBTA Garage
Traffic Evaluation
(2006 Existing, 2016 No Build Condition & 2016 Build Condition)

• Study Area
  – 21 Intersections
  – Enlarged Area
  – Existing Traffic is Congested

• Traffic
  – Courthouse Traffic is Off Peak
  – Traffic Congestion is Worst at Peak Hours

• Findings
  – Improvements at 9 Intersections
  – 12 Intersections Not Impacted

East Ramps Process 12% AM and 14% PM of the Traffic In This Intersection.
The 9 Intersections That Improve Bridge St. At:
1. MBTA Parking Lot Driveway (12)
2. Washington St. (63)
3. Ramps (9)

Washington St. At:
4. Federal St. (33)
5. Lynde St. (37)
6. Essex St. (46)

North St. At:
7. Essex St. (4)
8. Federal St. (22)
9. Lynde St. (29)

Improvement Measure
“REDUCED DELAY”
(seconds/vehicle)

“The Time Required To Travel Through The Intersection”

Delay Is Reduced At These 9 Locations By Approximately 30 Seconds On Average *

(#) = Seconds of Reduction in Delay
* = Less with MBTA Garage in Place
Comments Received Fall Into The Following Categories:

1. **Do Nothing, Drivers Must Seek Out Alternate Route**

2. **Redirect Traffic To By Pass The Area**
   - Longer Travel Distance Through Areas With More Existing Congestion.
   - Longer Travel Routes Encourage Cut Through Traffic and Illegal Turns.

3. **Slip Ramp**
   - Provides Less Traffic/Safety Benefits, And Site Limitations Can Not Allow For It.

4. **One Way Reversal, And One Way To Two Way Changes**
   - Ripple Effects On Roadways And Neighborhoods Outside The Study Area.
   - Intersections At Either End May Not Allow NEW Turning Movements.

**SUMMARY:**
The Courthouse Project Does Not Add Traffic. The East Ramps Process 12% AM and 14% PM of the Traffic In This Intersection. Removal Of The East Ramps Needs To Be Mitigated In A Safe Manner Without Impacting Current Traffic Within The Immediate Area Of the East Ramps. The Proposed Intersection Actually Results in Improved Traffic Operations at 9 Other Locations.
Other Comment:

The Aesthetics Of The Intersection.
Modifications From Public Input

WIDENED RAMP (193 S.F.) (4.5 FT MAX.)
OVERLAY EXISTING PAVEMENT
EXISTING PAVEMENT
NEW SIDEWALK
EXISTING SIDEWALK/ISLAND
PROPOSED LANDSCAPED AREA (543 S.F.)
12 PROPOSED TREES
EXIST. LANDSCAPE TO REMAIN
TEXTURED PAVED ISLAND (770 S.F.)
BY OTHERS
TRAFFIC SIGNAL
PEDESTRIAN SIGNAL
ORNAMENTAL STREET LIGHTS

“AFTER”
“Before and After” Plans

“BEFORE”

“AFTER”
Key Modifications #1

Ramp Widening, Sidewalk, Scored Concrete

Ramp Widening Before 287 SF (8.6 FT Max) Southerly.
Ramp Widening After 193 SF (4.5 FT Max) Northerly.

Scored Concrete Before 135 SF, After It Has Been Removed, “0”.

Sidewalk Extended Along North Side Of Ramp.
140 Ft Longer (35 Secs.) Than Pathway
ADA Standards for Walkways

- 5% Grade Desirable, 8.33% Max.
- 15% to 18% Existing
- When Ramp is Widened, 17% to 20%
Textured Paved Islands

Before 824 SF Of Islands Proposed To Be Grey Cement Concrete.
After 770 SF Of Islands Will Be A Paved Textured Surface.
Key Modification #2

Textured Paved Islands

Issues Include Maintenance, Cost, Compatibility.

DCAM Will Work With The City To Select A Suitable Textured Pavement Material.
Key Modifications #3

New Green Space, Ornamental Street Lights, Federal St. Parking Space

543 SF of NEW Green Space.
Ornamental Street Lights Extended On West Ramp.
Resident Requested To Maintain a Parking Space On Federal Street.
Ornamental/Period Type Lighting and Traffic Signals

- Salem Standard Street Lights
- Traffic Signals to Match
Ornamental/Period Type Lighting and Traffic Signals

• Traffic Signals to Match Street Lights
• Photo of Signals Currently Being Installed On North Street
CTPS Pedestrian Count  
Tuesday May 3, 2005  

Counts were performed between 6:15 AM and 8:30 AM.

Heaviest hour was from 7:15 AM to 8:15 AM.

Heaviest 15 minutes was from 8:00 AM to 8:15 AM.

“The most heavily used entrance to the station by pedestrians was at the Bridge Street staircase at Washington Street”

The graphic on Page 85 indicates 46 pedestrians crossed the west ramp and used the pathway to Bridge Street. It also indicates no pedestrian used the east ramps to Bridge Street.

---

DCAM Pedestrian Count  
Thursday June 28, 2007  

Observed pedestrian activity from the Federal Street area crossing Bridge Street. Observation location was on Bridge Street in view of the Ramps and the pathway. Observed pedestrians from 6:30 a.m. to 8:30 a.m. Weather conditions were clear, and approx. 70-80 degrees.

<table>
<thead>
<tr>
<th>East Ramp</th>
<th>Path</th>
<th>West Ramp</th>
</tr>
</thead>
<tbody>
<tr>
<td>6:30 - 6:45 a.m.</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>6:45 - 7:00 a.m.</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>7:00 - 7:15 a.m.</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>7:15 - 7:30 a.m.</td>
<td>0</td>
<td>9</td>
</tr>
<tr>
<td>7:30 - 7:45 a.m.</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>7:45 - 8:00 a.m.</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>8:00 - 8:15 a.m.</td>
<td>0</td>
<td>13</td>
</tr>
<tr>
<td>8:15 - 8:30 a.m.</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>TOTALS</strong></td>
<td>2</td>
<td>40</td>
</tr>
</tbody>
</table>

Pages 83 – 86 of the CTPS Study dated November 2005
Key Modifications #4

NEW Bridge Street Crosswalk at MBTA Driveway

“BEFORE”

“AFTER”
Restricting Left Turns to Federal Street

Reduces Traffic on Federal Street
Actual Federal Street Traffic Must Re-Route.
Still Under Consideration.
Need Input From The City and Fire Chief

2006 - Existing
AM
75 Lefts, 84 Rights
PM
111 Lefts, 196 Rights

2016 - Future (10% Growth Factor)
AM
83 Lefts, 92 Rights
PM
122 Lefts, 216 Rights
<table>
<thead>
<tr>
<th>Issue</th>
<th>Before</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ramp Widening</td>
<td>287 SF Southerly</td>
<td>193 SF Northerly</td>
</tr>
<tr>
<td></td>
<td>8.6 ft at max. point</td>
<td>4.5 ft at max point</td>
</tr>
<tr>
<td>Scored Concrete</td>
<td>135 SF</td>
<td>“0” Removed</td>
</tr>
<tr>
<td>Islands</td>
<td>824 SF Concrete</td>
<td>770 SF Textured</td>
</tr>
<tr>
<td>New Green Space</td>
<td>582 SF</td>
<td>543 SF</td>
</tr>
<tr>
<td>Ornamental Street Lights</td>
<td>North St. Only</td>
<td>North St. &amp; West Ramp</td>
</tr>
<tr>
<td>76 Federal St. On street Parking</td>
<td>2 spaces removed</td>
<td>1 space added back</td>
</tr>
<tr>
<td>Crosswalks</td>
<td>1 Across Bridge St.</td>
<td>2 Across Bridge St.</td>
</tr>
<tr>
<td>Sidewalk Along West Ramp</td>
<td>1 on South Side</td>
<td>1 Added on North Side</td>
</tr>
<tr>
<td>Left turns to Federal St.</td>
<td>Allowed</td>
<td>Can Restrict If Desired</td>
</tr>
</tbody>
</table>
North Street Reconstruction Project

Intersection of North St. & Bridge St.

Modifications from Public Input

July 11, 2007
EXTRA SLIDES
Improved Pedestrian Accommodations

1 Existing Signalized Pedestrian Crossing

3 Proposed Signalized Pedestrian Crossings

Sidewalks, Crosswalks, & Pedestrian Signals

Pedestrian Connection along Judicial Center Site to/from Bridge Street
Traffic Signal – Bridge St. / West Ramps

- Existing Location Is Not Signalized
- New Traffic Signal
- Improved Traffic Flow
- Safer Left Turns
- Improved Pedestrian Accommodation
PUBLIC HEARING MAY 31, 2007

- New Traffic Signals - S
- Signal Coordination
- Improved Traffic Flow
- Geometry Changes
- Improved Safety
- Traffic Calming
- Improved Pedestrian Accommodation
- New Landscaped Areas
- NO Right of Way Needed
Vehicles Before and After: From Bridge St. To North St.

BEFORE

- Un-signalized Intersection
- Conflicts with Parking Lot Traffic
- High Accident Location

AFTER

- Signalized Intersections
- Greater Separation From Parking Lot Traffic
- Less Conflicts, Safer Intersection
Vehicles Before and After: From North St. To Bridge St.

**BEFORE**
- Un-signalized Intersection
- Conflicts with Parking Lot Traffic
- Poor Sight Distance for Left Turns
- High Accident Location

**AFTER**
- Signalized Intersections
- Greater Separation From Parking Lot Traffic
- Improved Sight Distance
- Less Conflicts, Safer Intersection
Pedestrians Before and After: Federal St. To/From Bridge St.

BEFORE

- Non Standard Crossing Of West Ramp
- Steep Walkway, Not ADA Compliant
- 1 Signalized Crossing – “S”

AFTER

- 3 Signalized Crossings – “S”
- All Crossings ADA Compliant
- Access to Bridge St.
**Benefits**

- **Vehicle Travel:**
  - Less Delay
  - Less Unsignalized Locations
  - Improved Safety
  - Improved Sight Distance
  - Signal Coordination
  - Regulated/Reduced Queues

- **Aesthetics:**
  - New Landscaped Areas
  - Period Lighting

- **Pedestrian Travel:**
  - 3 Proposed Signalized Crossings of North Street to Replace the 1 Existing
  - 1 Proposed Signalized Crossing of the West Ramp at Bridge Street. Currently Unsignalized
  - Crossings At Safe Locations
  - ADA Compliant Ramps And Walkways
  - Loop Ramp Walkway Remains
Construction

- Maintain Vehicle and Pedestrian Movements
- Traffic Management Plan (TMP) Is Part of The Project
- Contractor’s Efforts to Date Have Been Good
- North Street Completed July 2008