

North Street Reconstruction Project

Intersection of North St. & Bridge St.

“Modifications From Public Input”

July 11, 2007



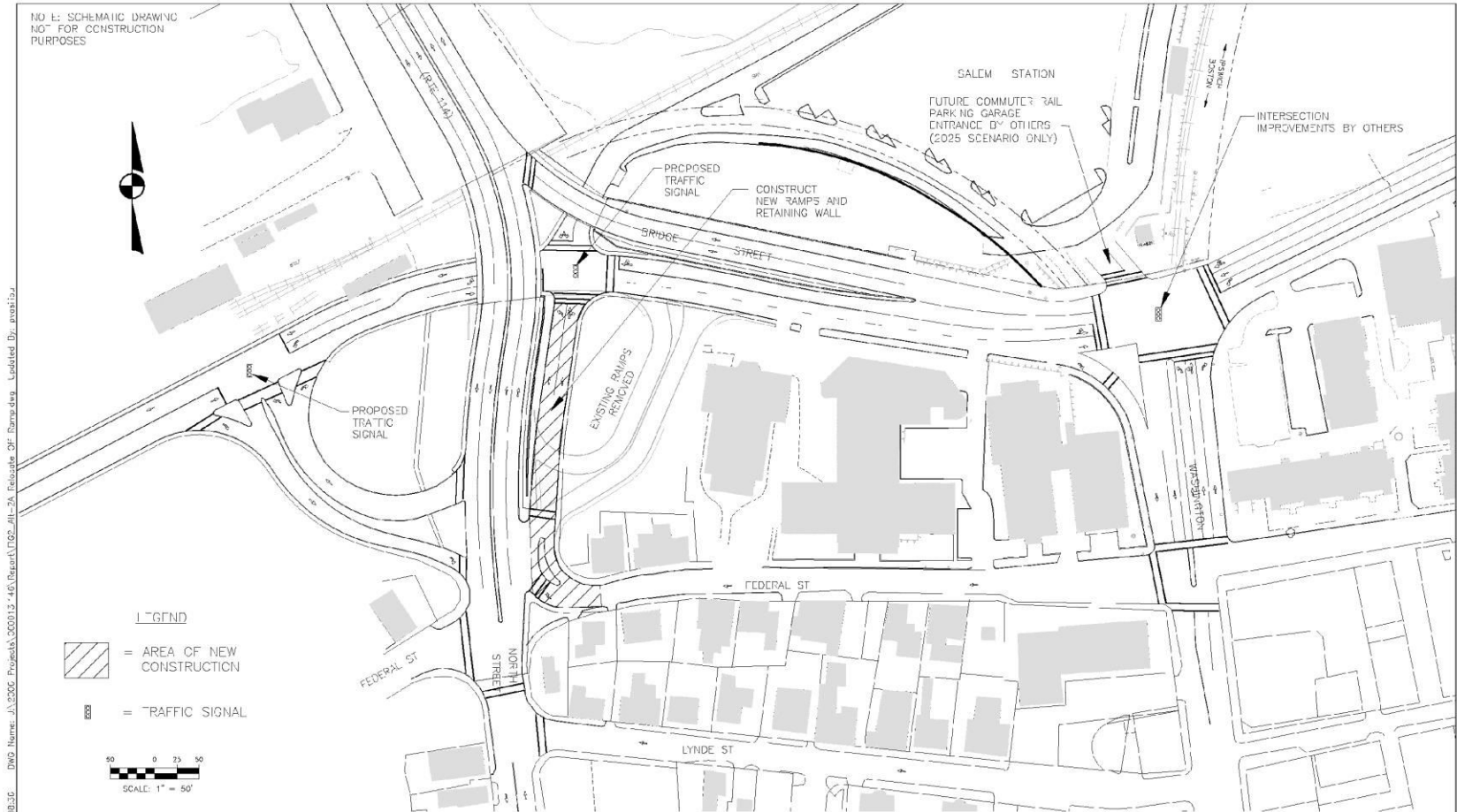
- DCAM Has Analyzed Traffic And Alternatives for Six Years:
 - Howard, Stein, Hudson in October 2001 for a Transportation Study.
 - Edwards & Kelcey From 2002 to 2006.
 - Earth Tech From 2006 to the Present.
- Study Area Bounded By:

<i>St. Peters St. To The East</i>	<i>Boston St. To The West</i>
<i>Mason St. To The North</i>	<i>Essex St. To The South</i>
- 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.
- 2B Slip Ramp With Traffic Signal On North Street.
- 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



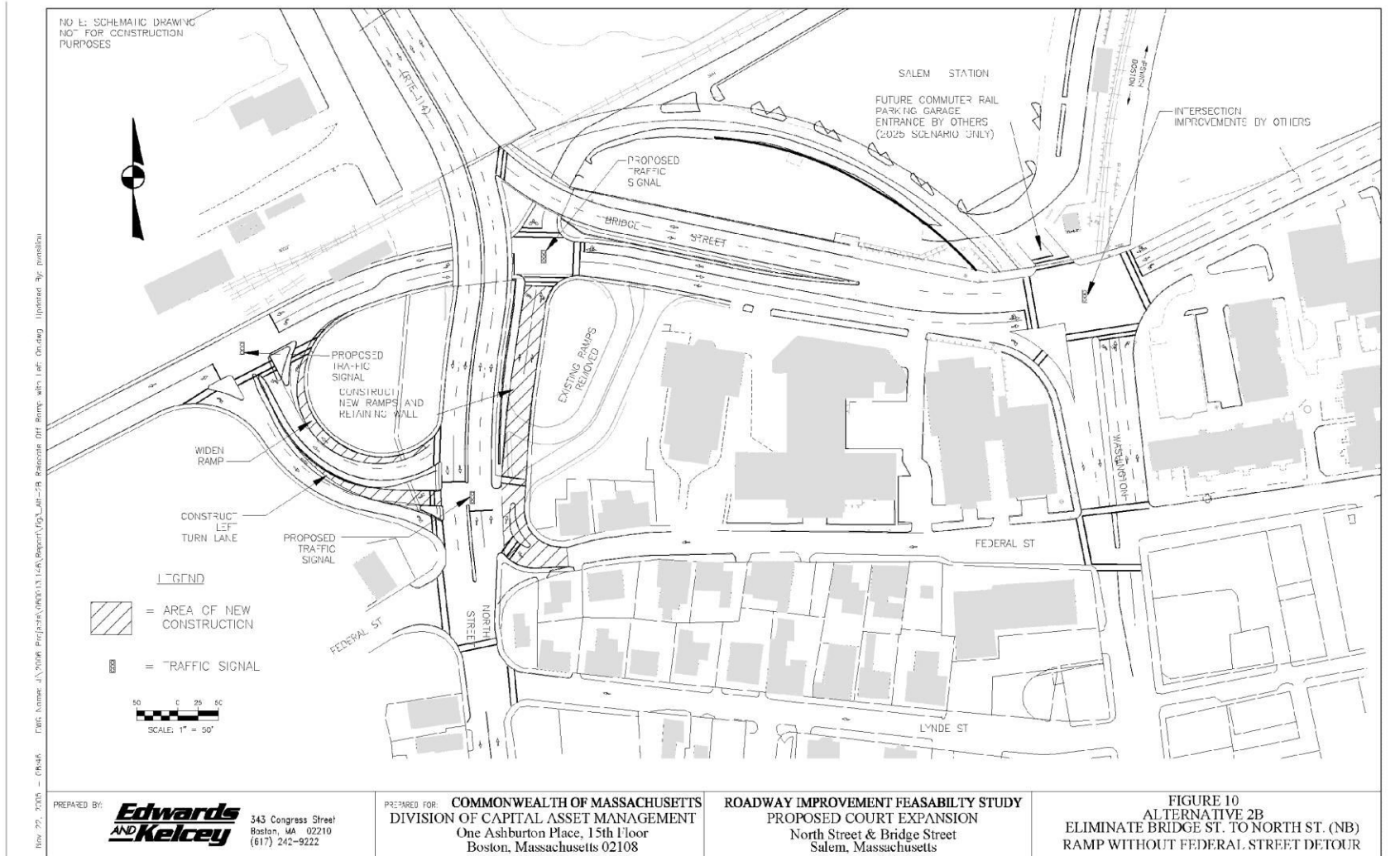
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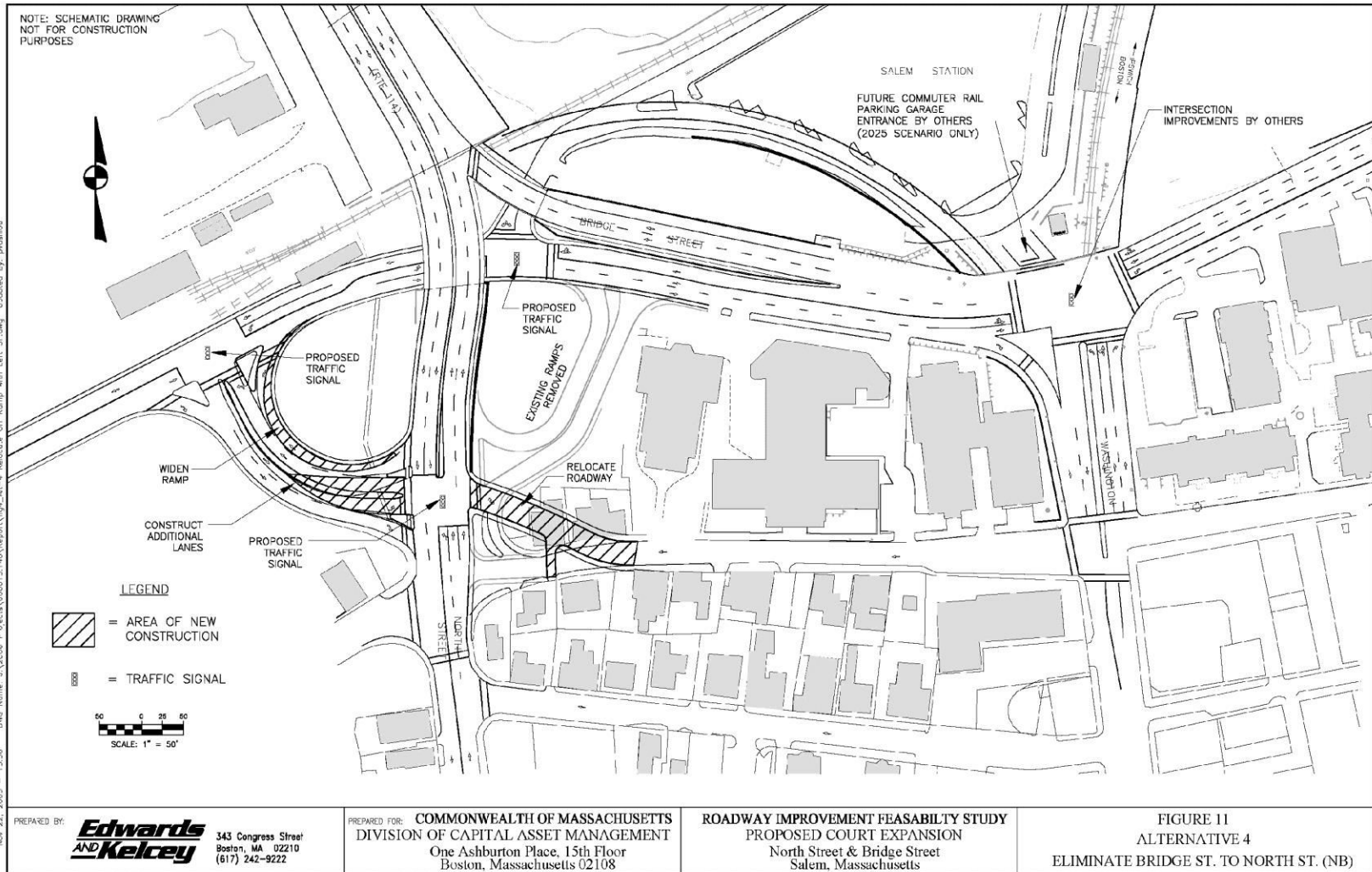
PREPARED BY: **Edwards and Kelcey**
343 Congress Street
Boston, MA 02210
(617) 242-9222

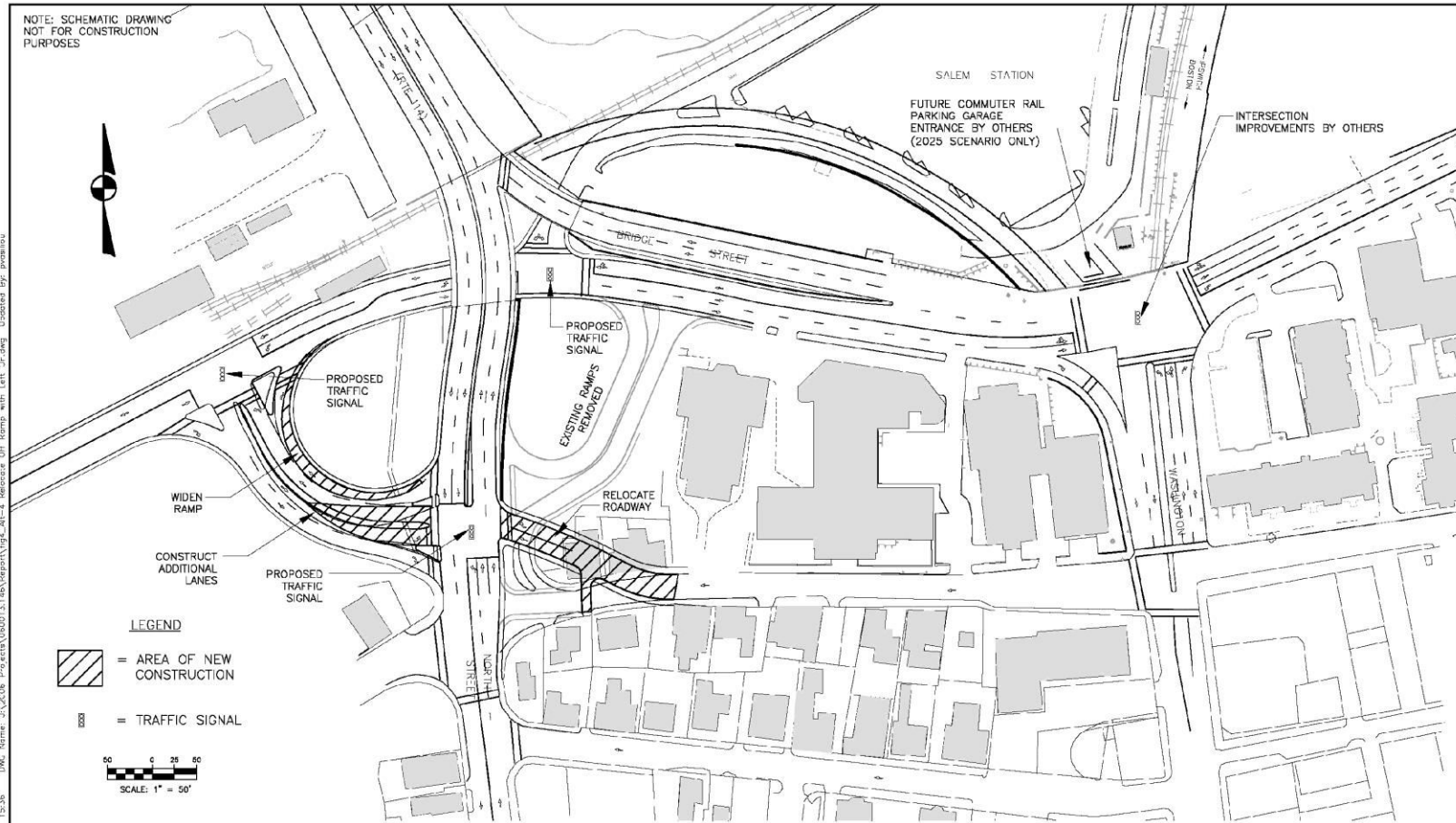
PREPARED FOR: **COMMONWEALTH OF MASSACHUSETTS**
DIVISION OF CAPITAL ASSET MANAGEMENT
One Ashburton Place, 15th Floor
Boston, Massachusetts 02108

ROADWAY IMPROVEMENT FEASIBILITY STUDY
PROPOSED COURT EXPANSION
North Street & Bridge Street
Salem, Massachusetts

FIGURE 9
ALTERNATIVE 2A
ELIMINATE BRIDGE ST. TO NORTH ST. (NB)
SHIFT NORTH STREET







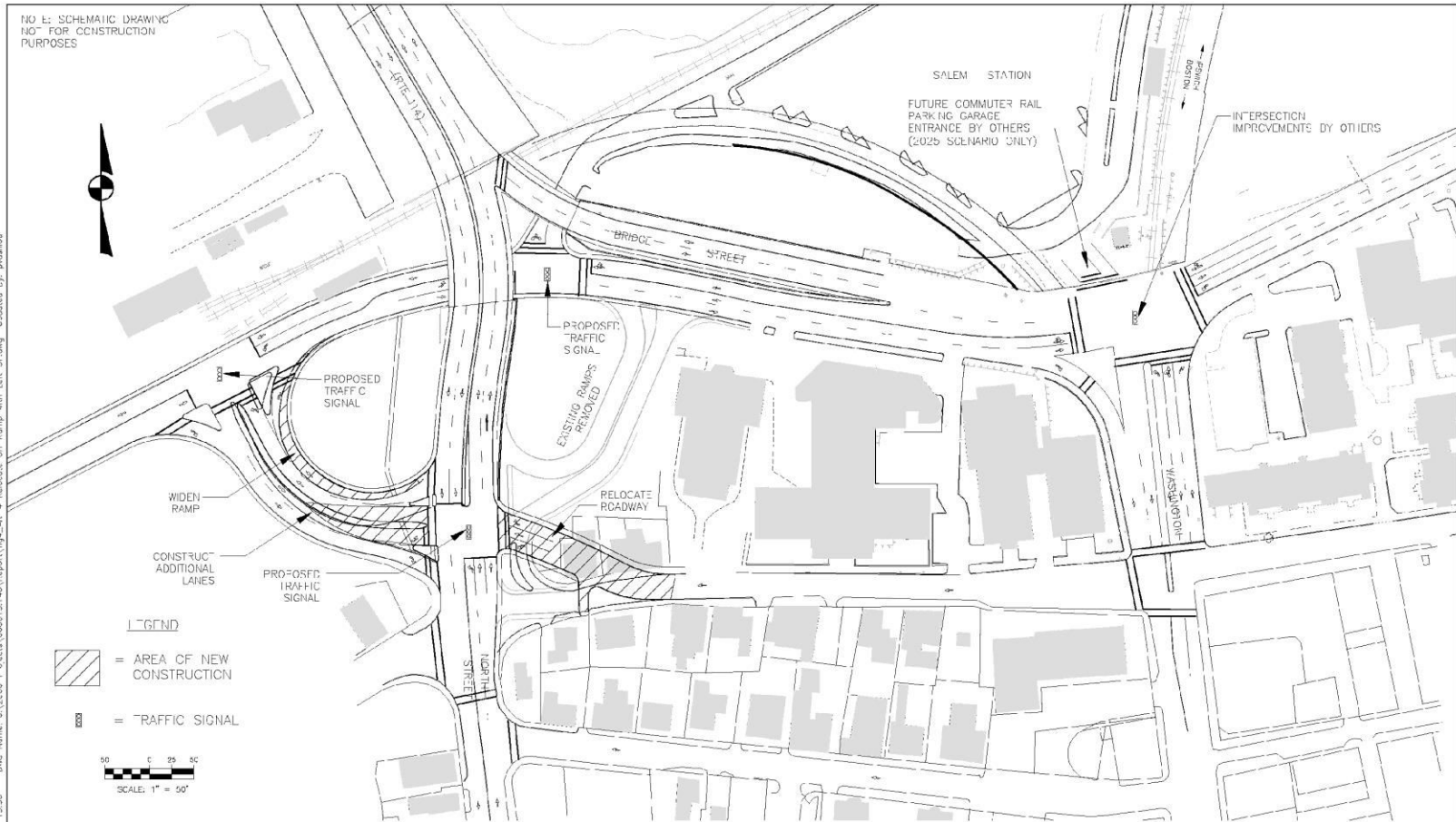
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PREPARED BY: **Edwards and Kelcey**
343 Congress Street
Boston, MA 02210
(617) 242-9222

PREPARED FOR: COMMONWEALTH OF MASSACHUSETTS
DIVISION OF CAPITAL ASSET MANAGEMENT
One Ashburton Place, 15th Floor
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FIGURE 12
ALTERNATIVE 4A
ELIMINATE BRIDGE ST. TO NORTH ST. (NB)



Nov. 22, 2009 - 13:48 UMC Home: \\2008 Projects\00011111\Report\fig_13.dwg Updated by: pmslba

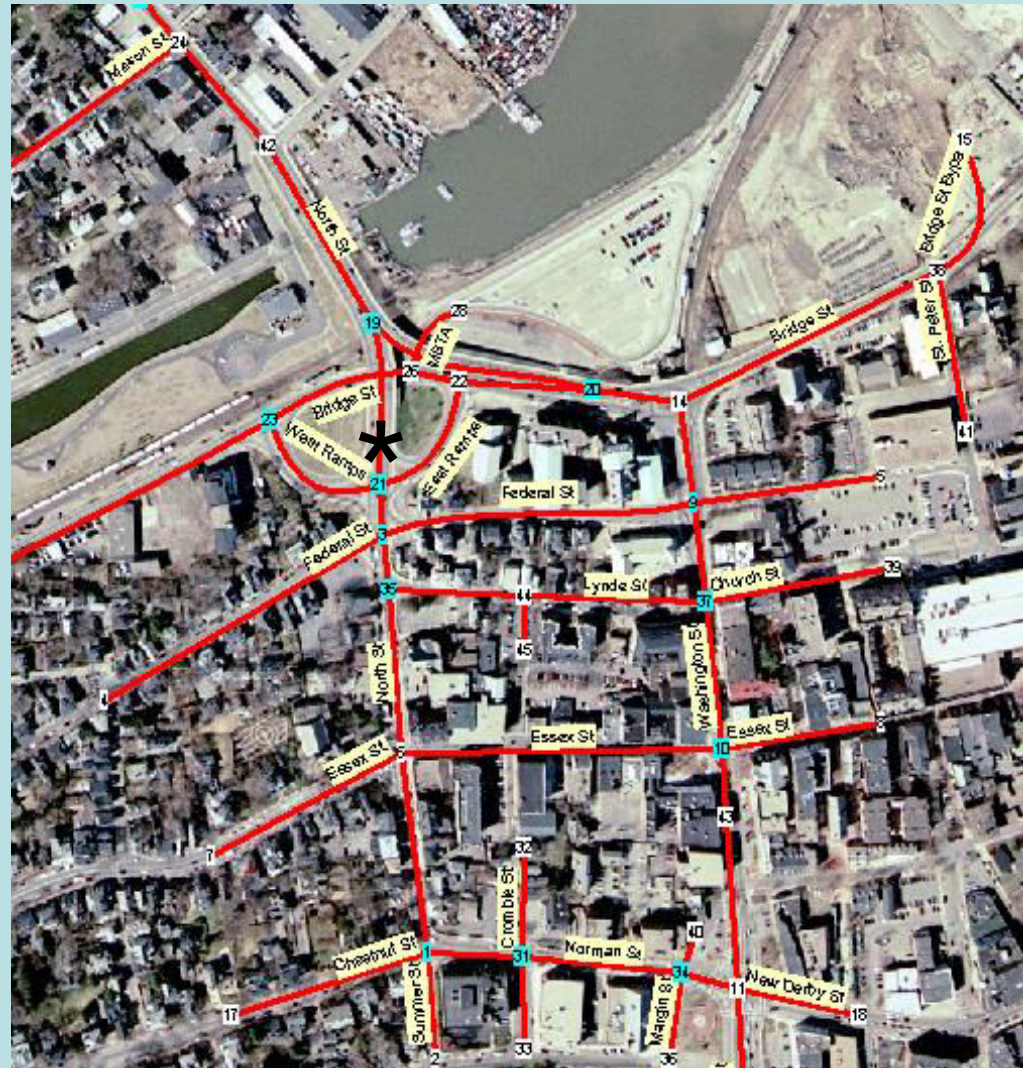
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343 Congress Street
Boston, MA 02210
(617) 242-8222

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One Ashburton Place, 15th Floor
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FIGURE 13
ALTERNATIVE 4B
ELIMINATE BRIDGE ST. TO NORTH ST. (NB)

- 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



• Study Area

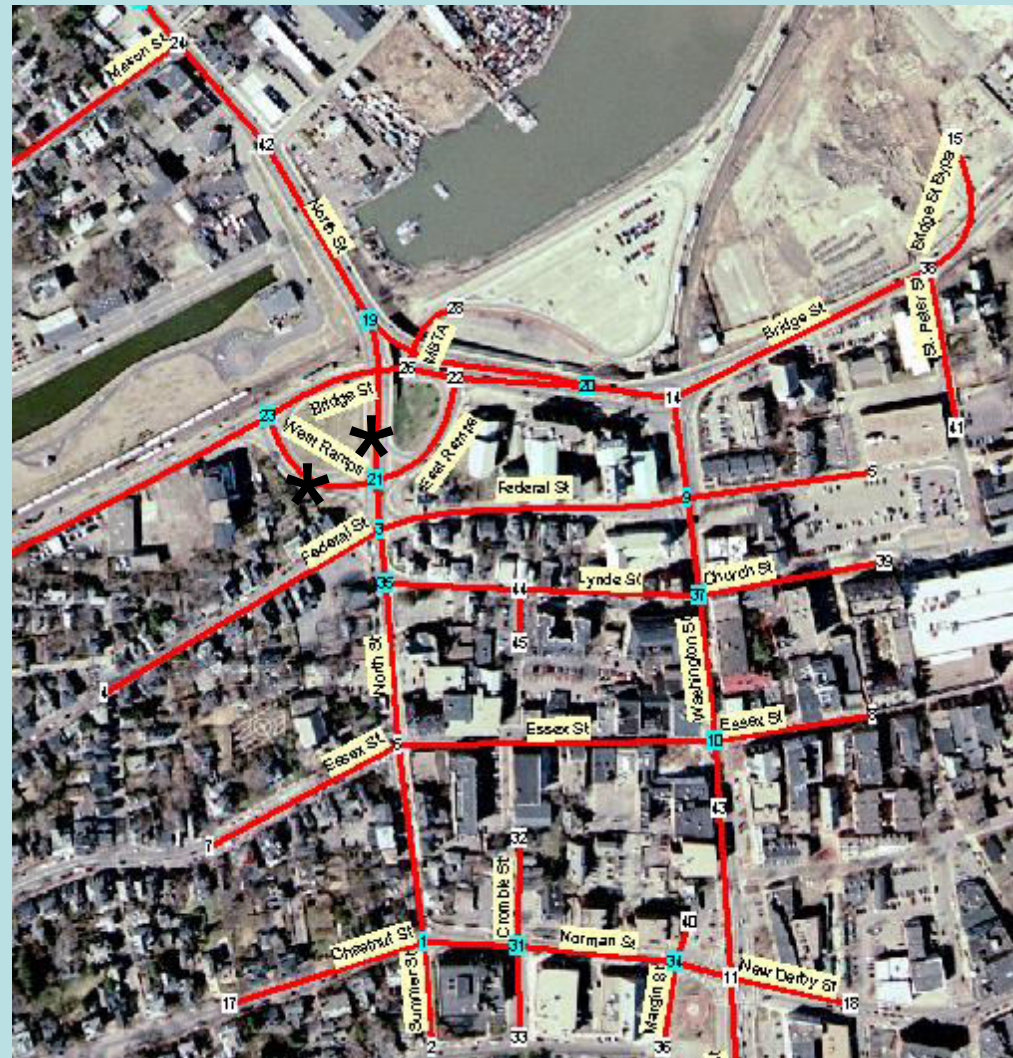
- 21 Intersections
- Enlarged Area
- Existing Traffic is Congested

• 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

- Encourages Cut Through Traffic, Illegal Turns, and Impacts Safety.

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

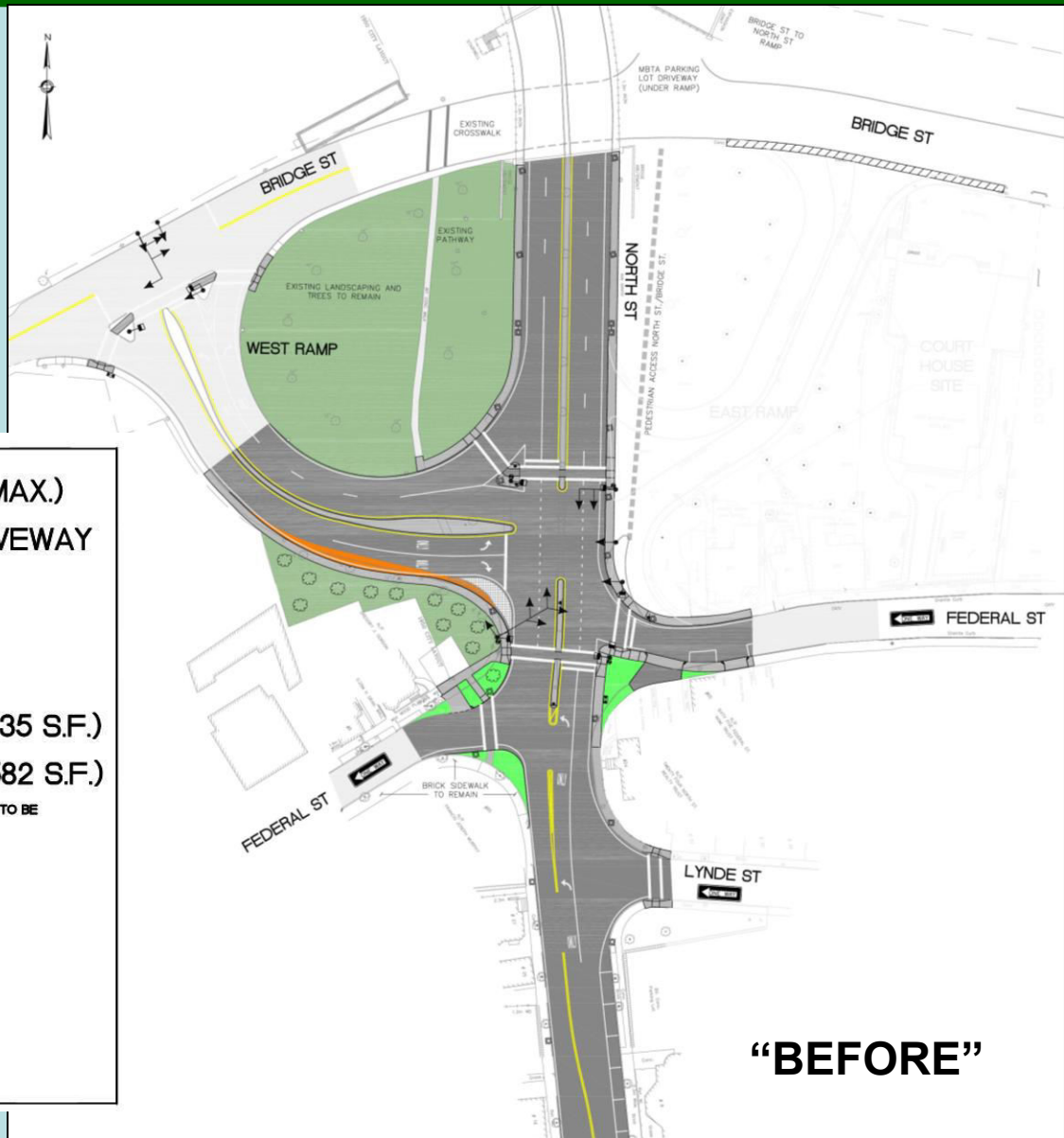
- Ripple Effects On Roadways And Neighborhoods Outside The Study Area.
- Intersections At Either End May Not Allow NEW Turning Movements.
- Loss Of Parking Issues On Roadways Or At Intersections with New Turns.

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:

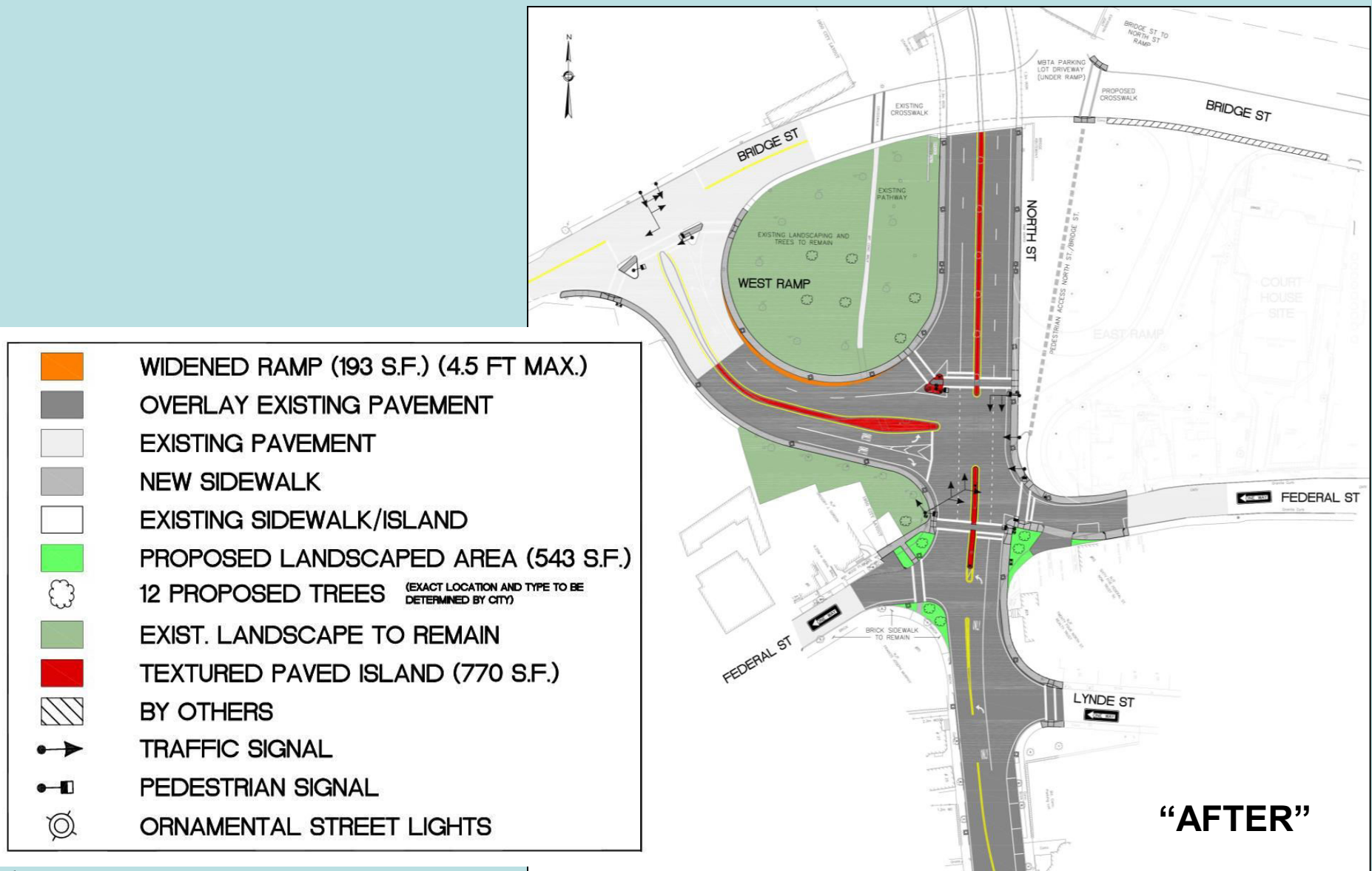
The Aesthetics Of The Intersection.



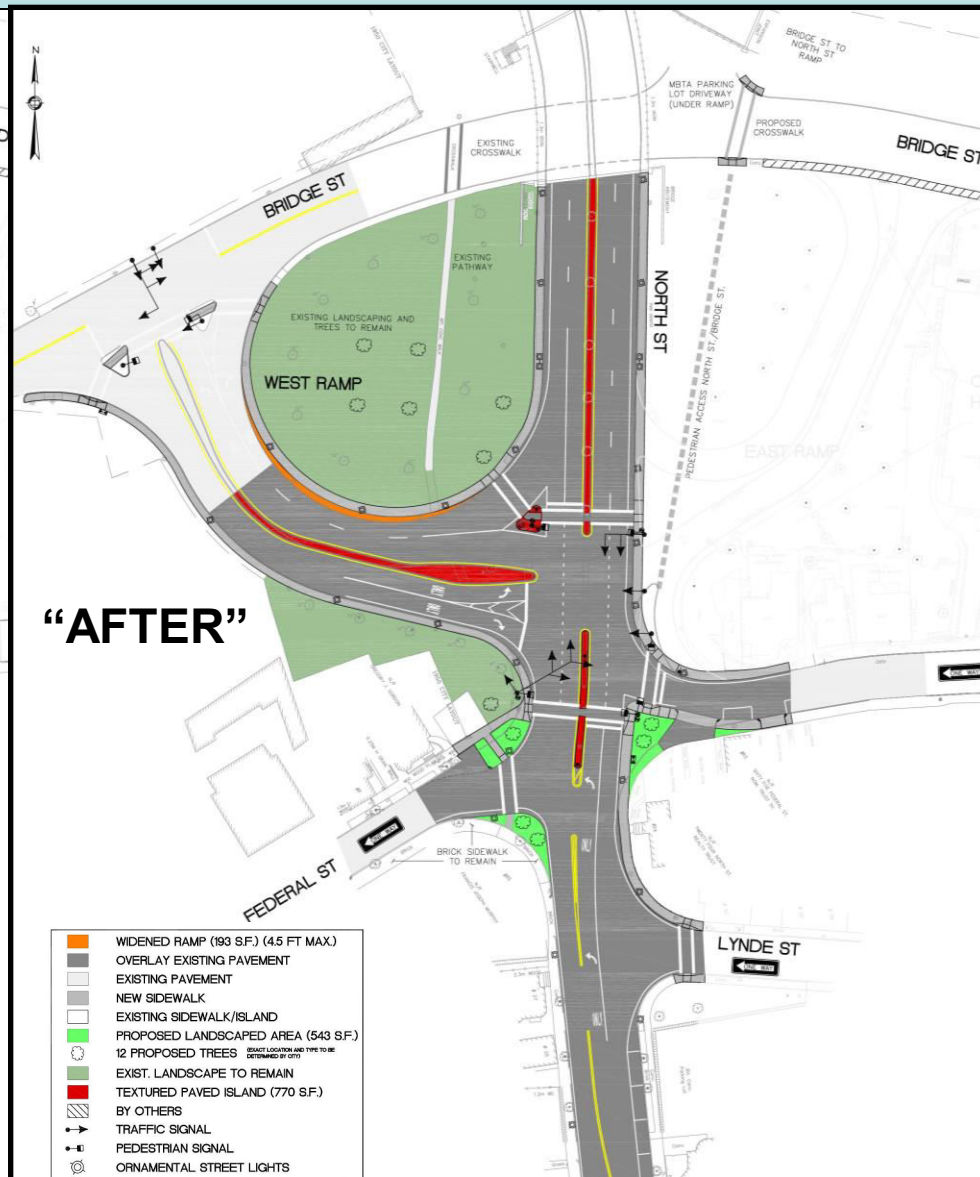
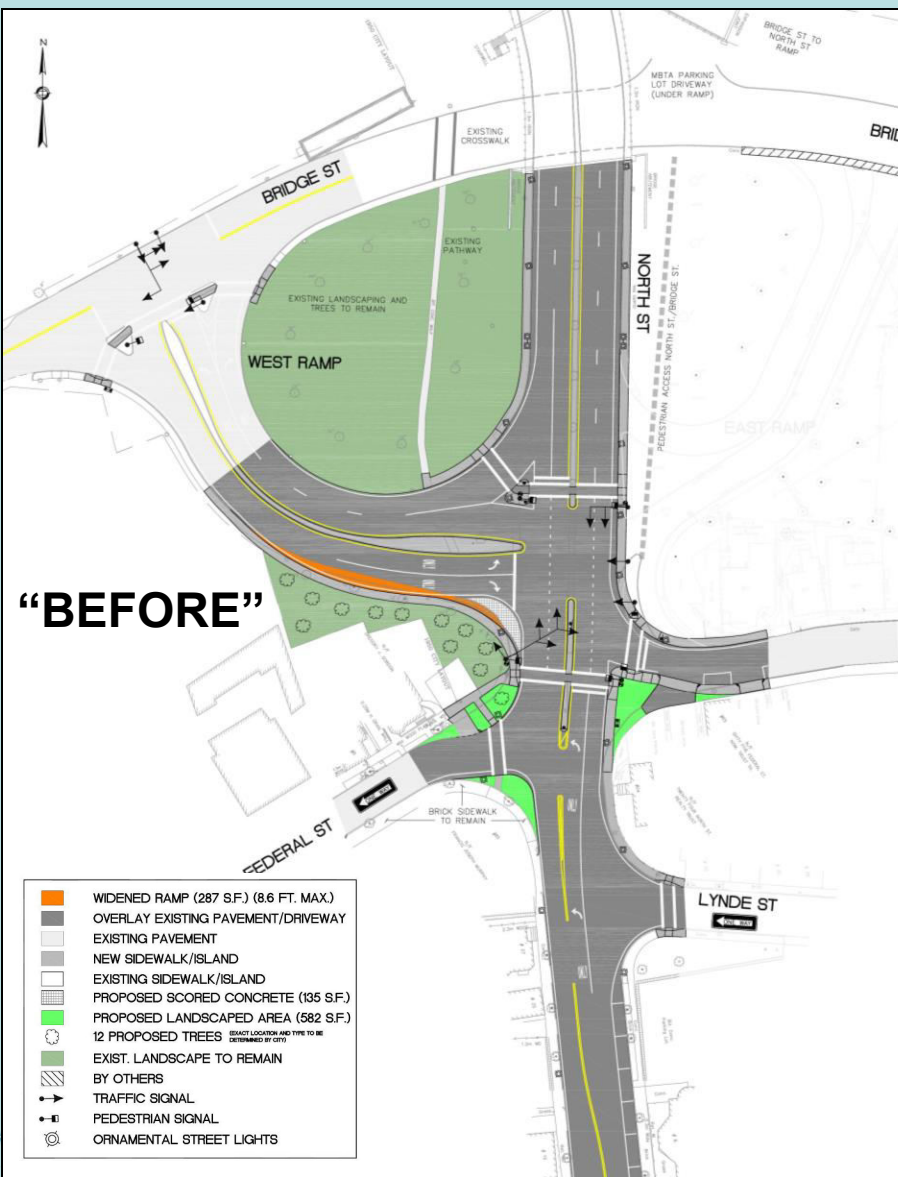
- WIDENED RAMP (287 S.F.) (8.6 FT. MAX.)
- OVERLAY EXISTING PAVEMENT/DRIVEWAY
- EXISTING PAVEMENT
- NEW SIDEWALK/ISLAND
- EXISTING SIDEWALK/ISLAND
- PROPOSED SCORED CONCRETE (135 S.F.)
- PROPOSED LANDSCAPED AREA (582 S.F.)
- 12 PROPOSED TREES (EXACT LOCATION AND TYPE TO BE DETERMINED BY CITY)
- EXIST. LANDSCAPE TO REMAIN
- BY OTHERS
- TRAFFIC SIGNAL
- PEDESTRIAN SIGNAL
- ORNAMENTAL STREET LIGHTS

“BEFORE”

Modifications From Public Input



"Before and After" Plans





Ramp Widening, Sidewalk, Scored Concrete

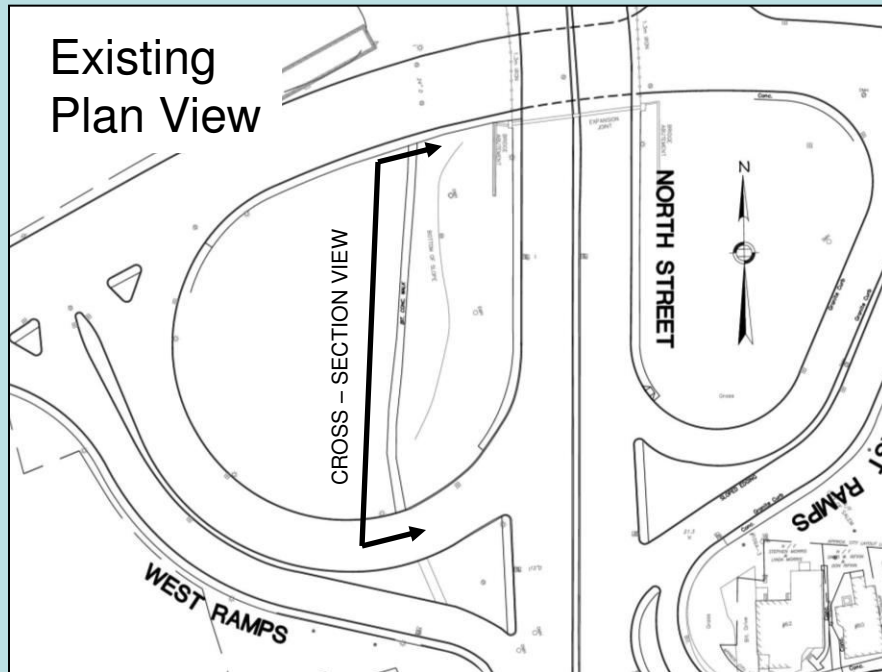
Ramp Widening Before 287 SF (8.6 FT Max) Southerly.

Ramp Widening After 193 SF (4.5 FT Max) Northerly.

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

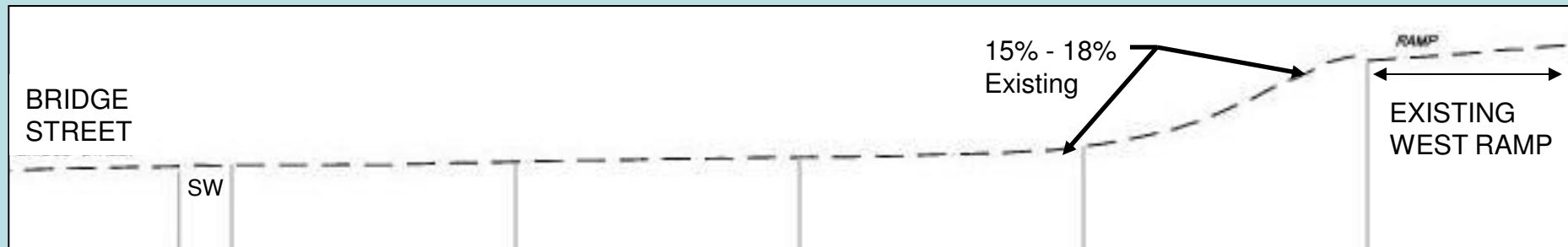
Sidewalk Extended Along North Side Of Ramp.

140 Ft Longer (35 Secs.) Than Pathway

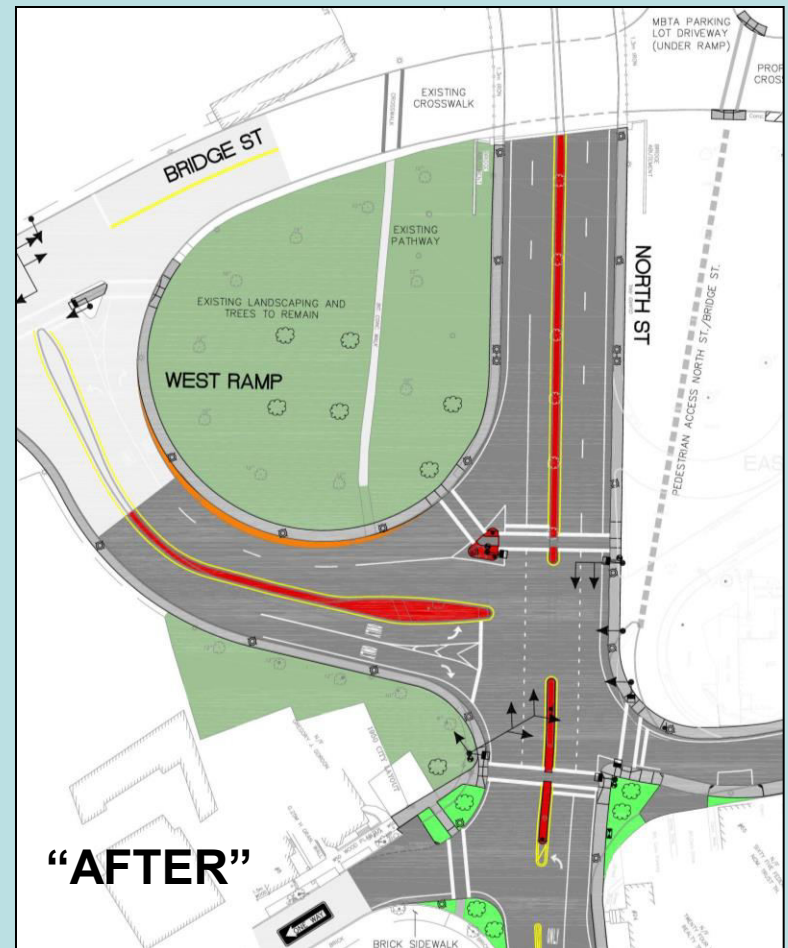


ADA Standards for Walkways

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



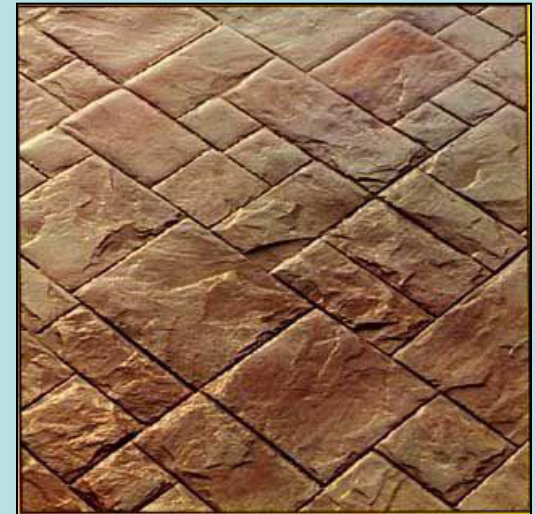
CROSS - SECTION VIEW



Textured Paved Islands

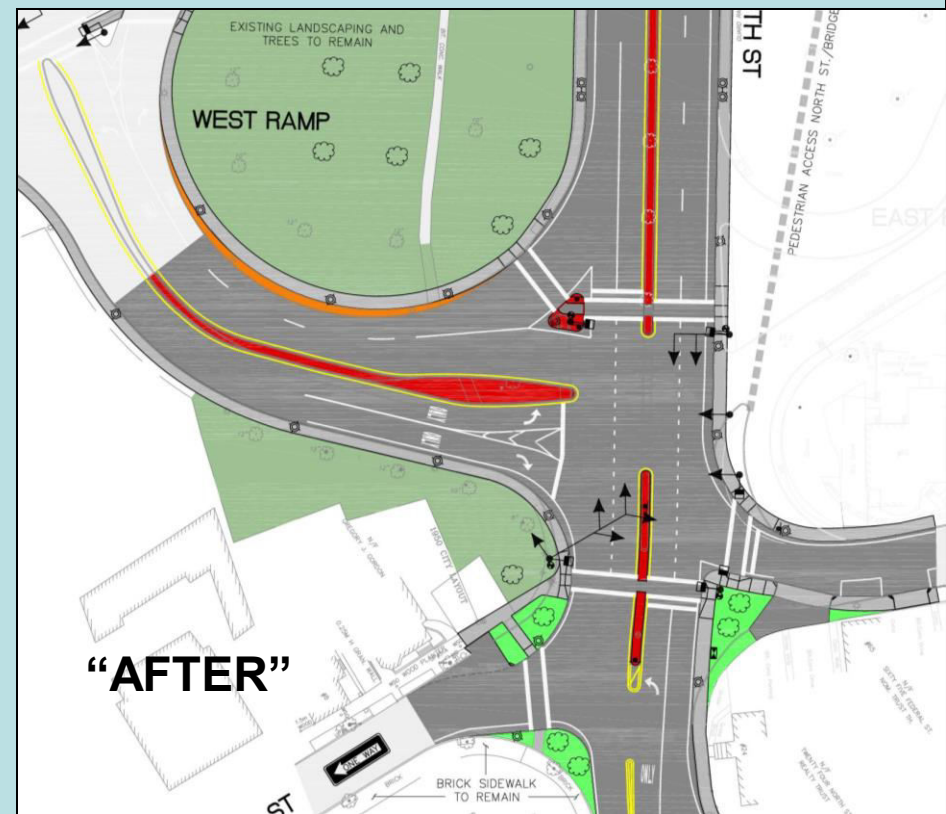
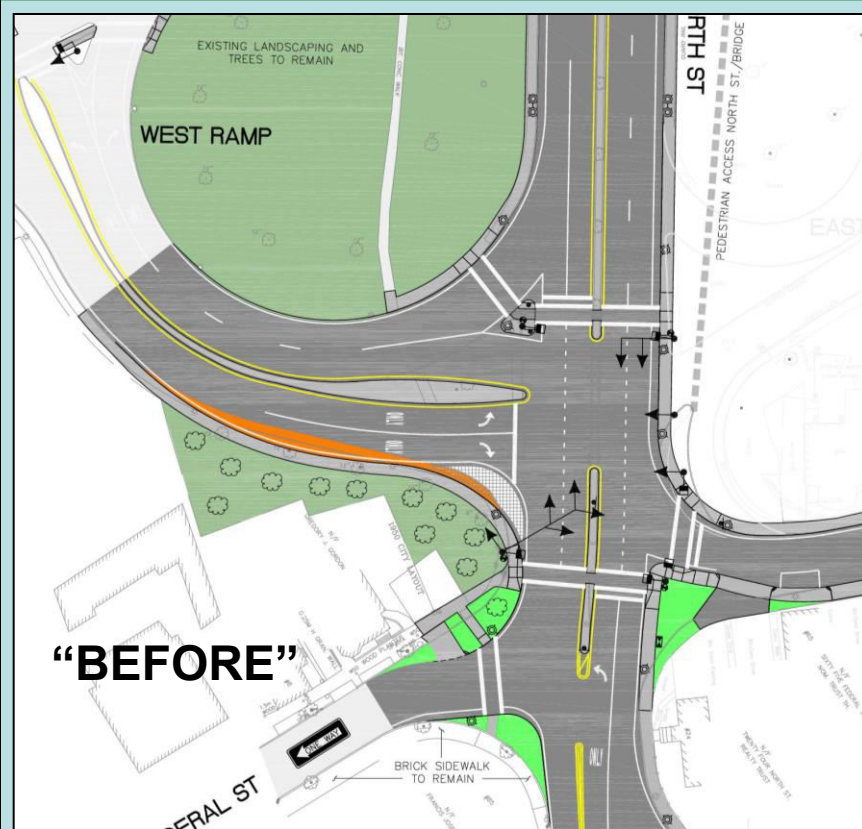
Before 824 SF Of Islands Proposed To Be Grey Cement Concrete.
After 770 SF Of Islands Will Be A Paved Textured Surface.

Textured Paved Islands



Issues Include Maintenance, Cost, Compatibility.

DCAM Will Work With The City To Select A Suitable Textured Pavement Material.



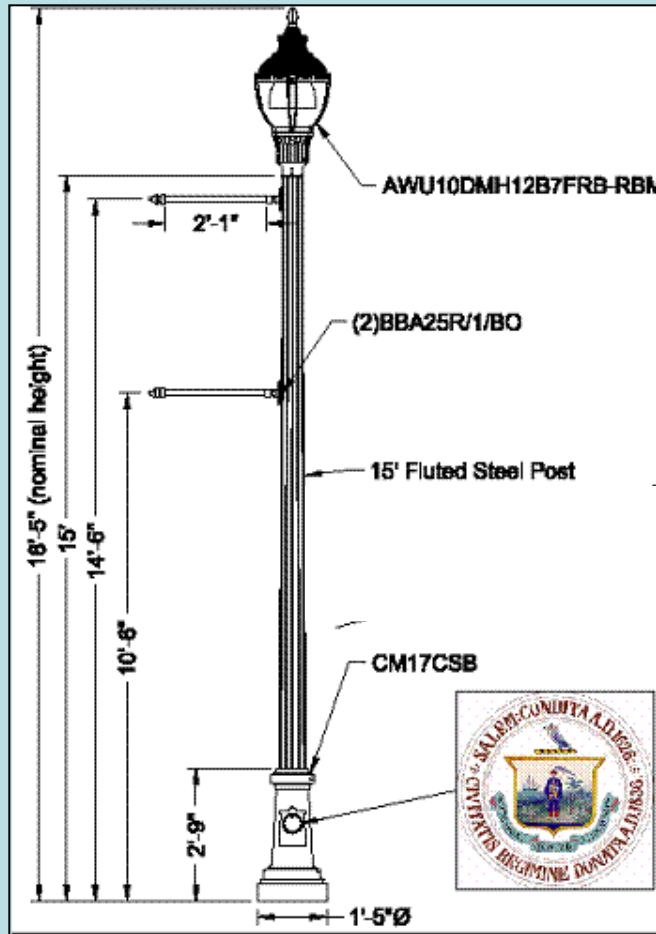
New Green Space, Ornamental Street Lights, Federal St. Parking Space

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.

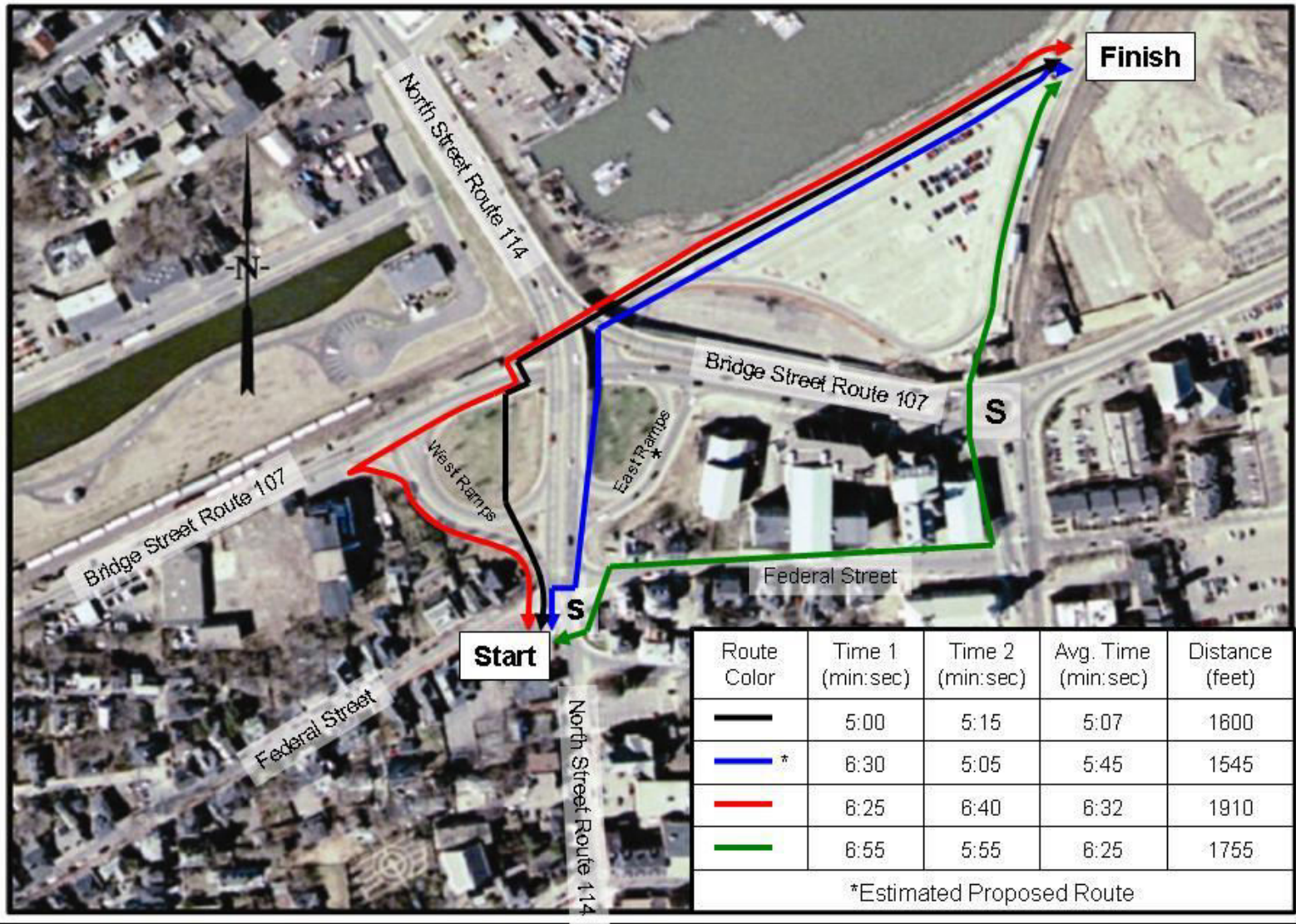
Pages 83 – 86 of the CTPS Study dated November 2005

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.

	<u>East Ramp</u>	<u>Path</u>	<u>West Ramp</u>
6:30 - 6:45 a.m.	0	3	0
6:45 - 7:00 a.m.	1	2	0
7:00 - 7:15 a.m.	0	2	0
7:15 - 7:30 a.m.	0	9	0
7:30 - 7:45 a.m.	1	8	0
7:45 - 8:00 a.m.	0	3	0
8:00 - 8:15 a.m.	0	13	0
8:15 - 8:30 a.m.	0	0	0
TOTALS	2	40	0

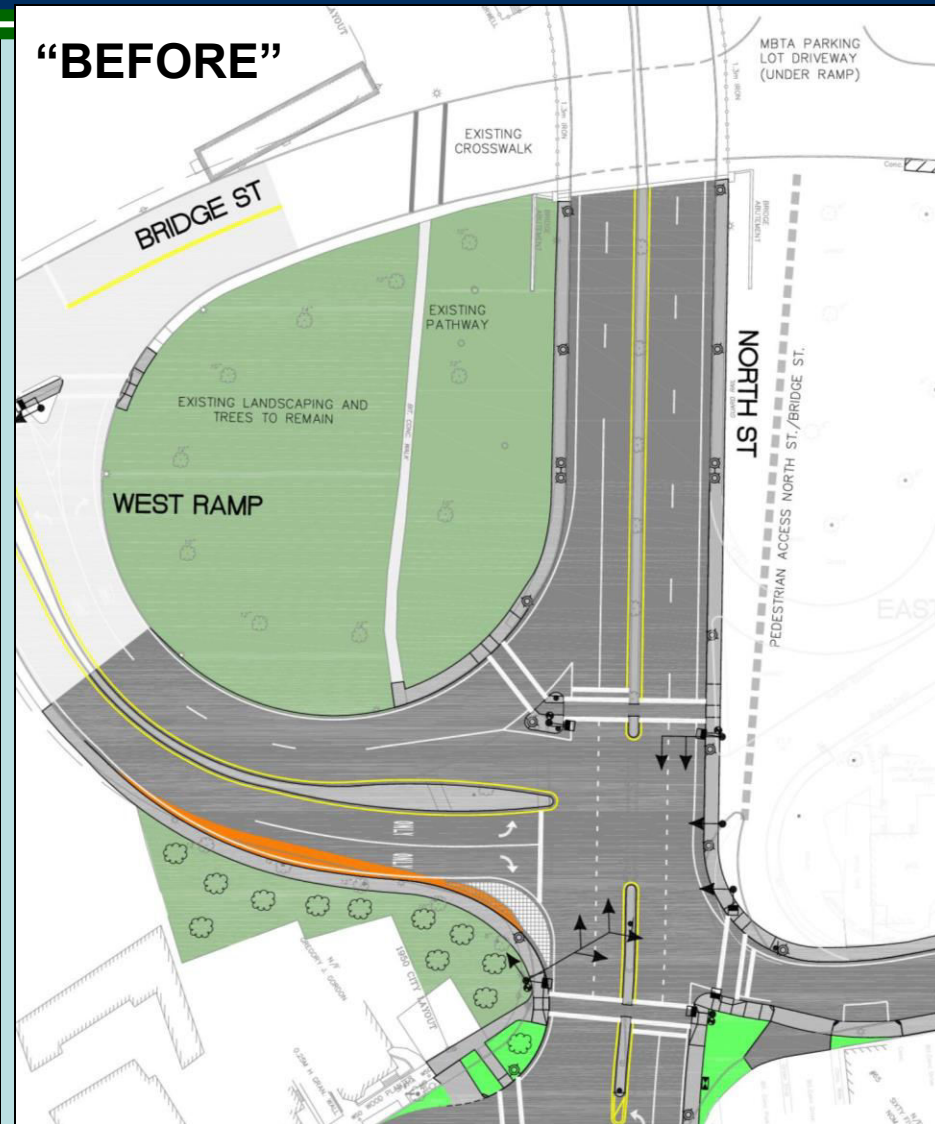
Pedestrian Routes Study



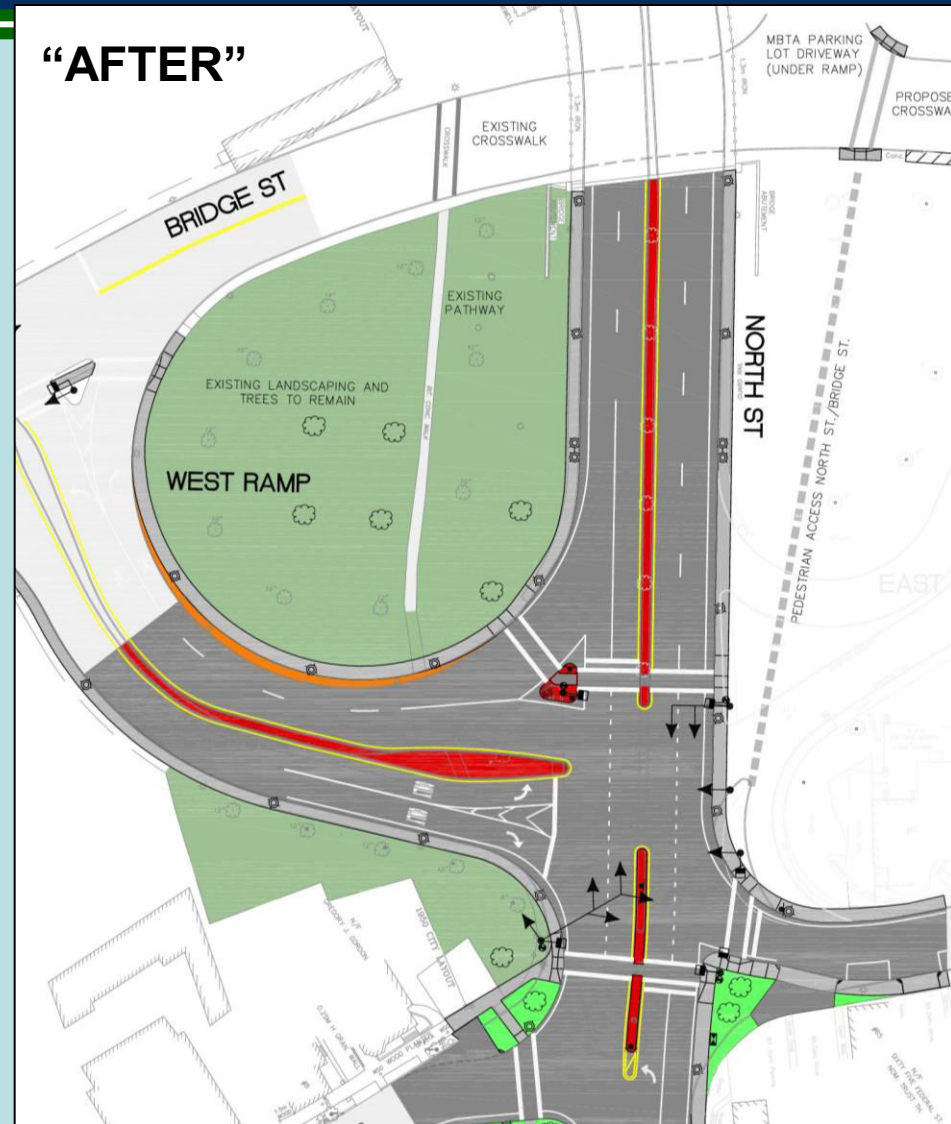
Key Modifications #4



"BEFORE"

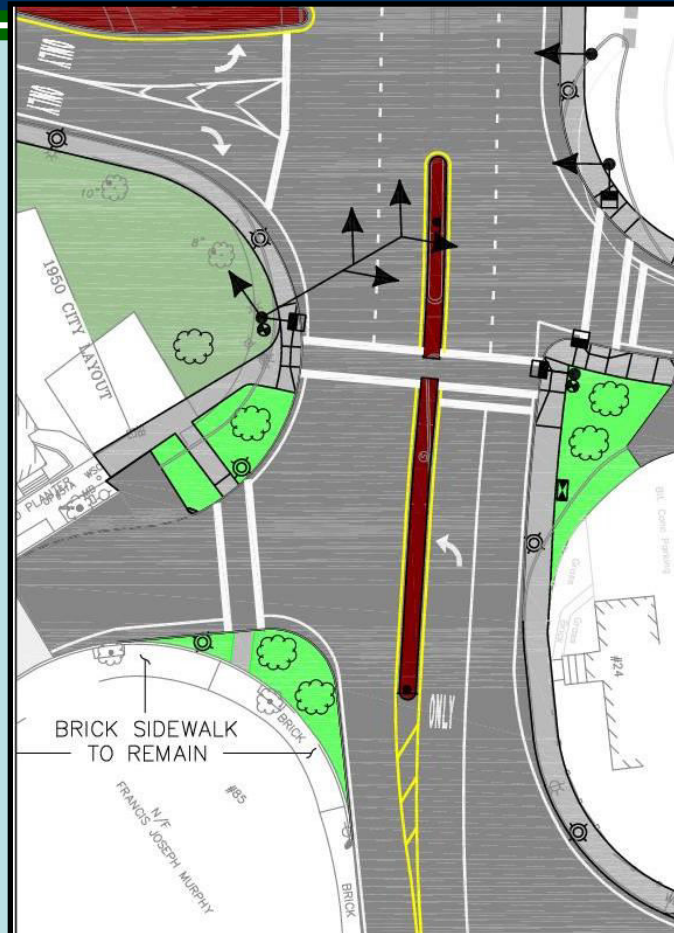
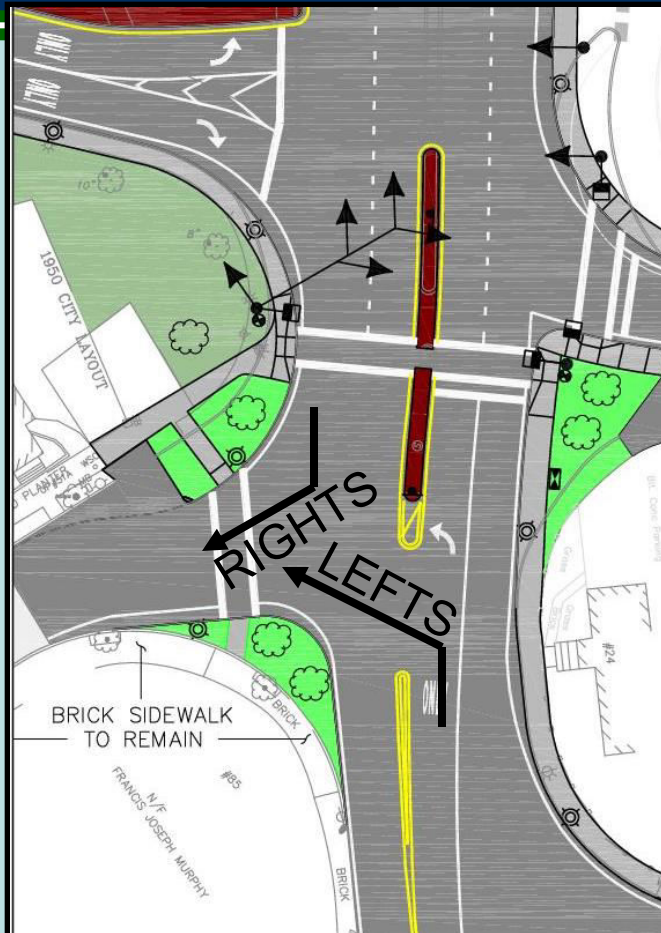


"AFTER"



Left Turns To Federal Street

DCAM



2006 - Existing

AM

75 Lefts, 84 Rights

PM

111 Lefts, 196 Rights

2016 - Future

(10% Growth Factor)

AM

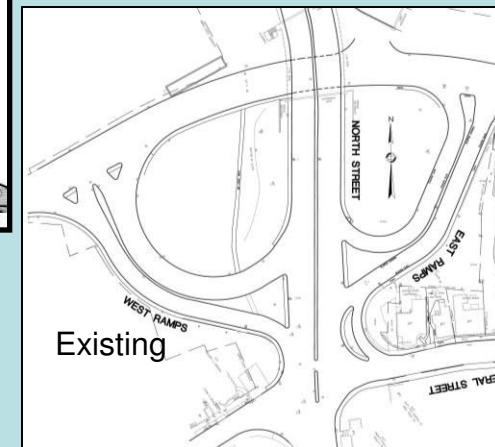
83 Lefts, 92 Rights

PM

122 Lefts, 216 Rights

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



Issue	Before	After
Ramp Widening	287 SF Southerly 8.6 ft at max. point	193 SF Northerly 4.5 ft at max point
Scored Concrete	135 SF	"0" Removed
Islands	824 SF Concrete	770 SF Textured
New Green Space	582 SF	543 SF
Ornamental Street Lights	North St. Only	North St. & West Ramp
76 Federal St. On street Parking	2 spaces removed	1 space added back
Crosswalks	1 Across Bridge St.	2 Across Bridge St.
Sidewalk Along West Ramp	1 on South Side	1 Added on North Side
Left turns to Federal St.	Allowed	Can Restrict If Desired

North Street Reconstruction Project

Intersection of North St. & Bridge St.

Modifications from Public Input

July 11, 2007

EXTRA SLIDES

“Before and After”



“BEFORE”



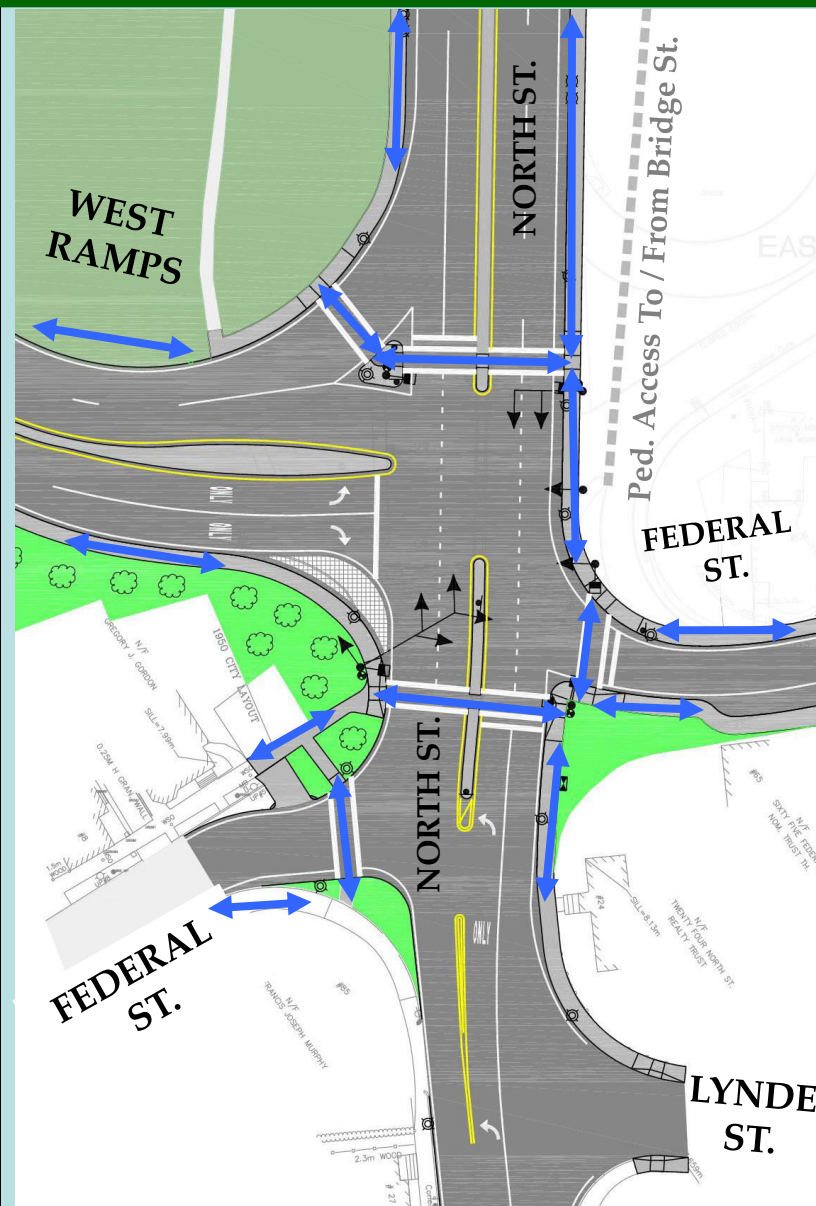
“AFTER”

- WIDENED RAMP (287 S.F.) (8.6 FT. MAX.)
- OVERLAY EXISTING PAVEMENT/DRIVEWAY
- EXISTING PAVEMENT
- NEW SIDEWALK/ISLAND
- EXISTING SIDEWALK/ISLAND
- PROPOSED SCORED CONCRETE (135 S.F.)
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- 12 PROPOSED TREES (EXACT LOCATION AND TYPE TO BE DETERMINED BY CITY)
- EXIST. LANDSCAPE TO REMAIN
- BY OTHERS
- TRAFFIC SIGNAL
- PEDESTRIAN SIGNAL
- ORNAMENTAL STREET LIGHTS

- 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 (EXACT LOCATION AND TYPE TO BE DETERMINED BY CITY)
- EXIST. LANDSCAPE TO REMAIN
- TEXTURED PAVED ISLAND (770 S.F.)
- BY OTHERS
- TRAFFIC SIGNAL
- PEDESTRIAN SIGNAL
- ORNAMENTAL STREET LIGHTS







1 Existing Signalized Pedestrian Crossing

3 Proposed Signalized Pedestrian Crossings

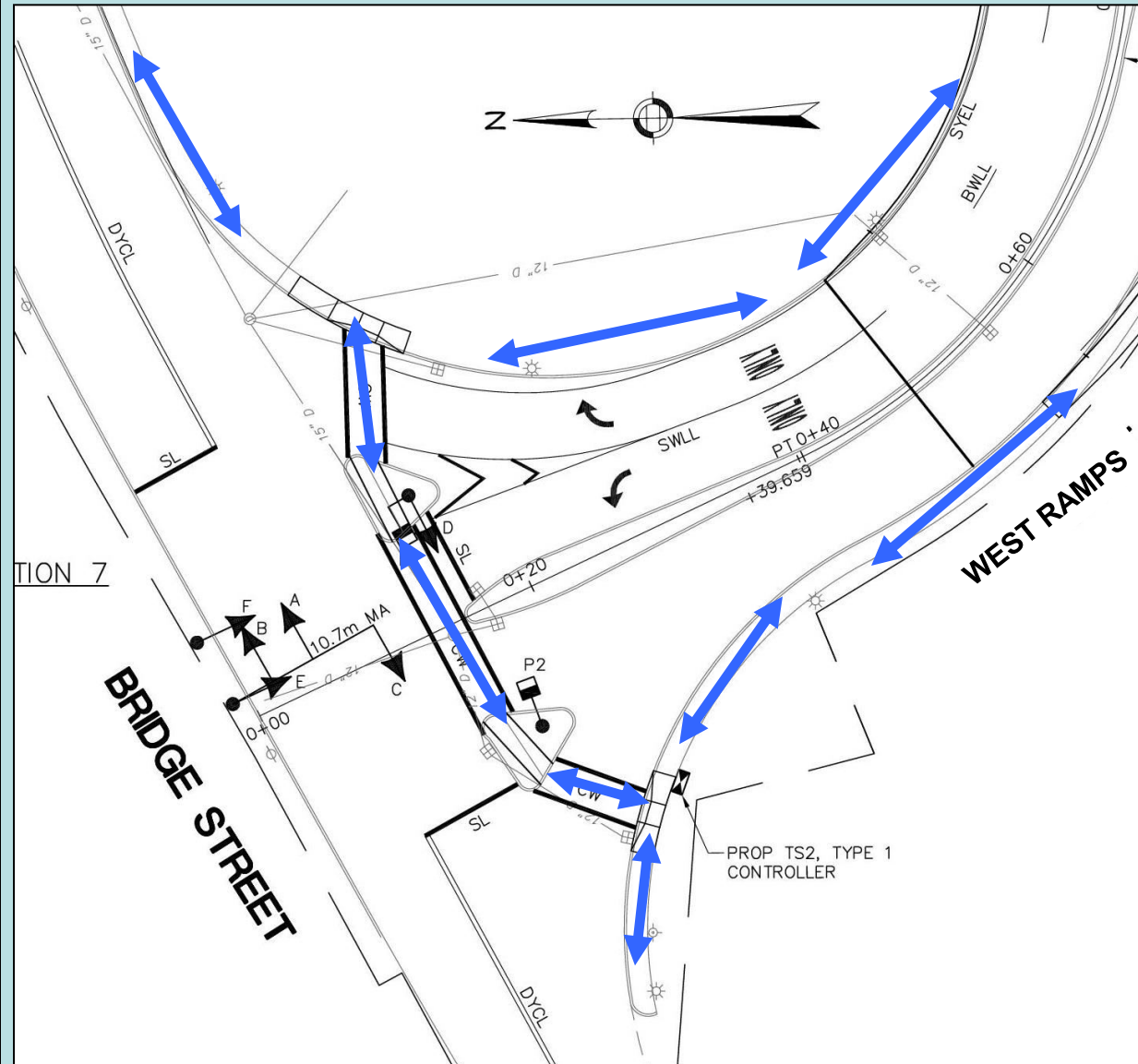


Sidewalks, Crosswalks, & Pedestrian Signals



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

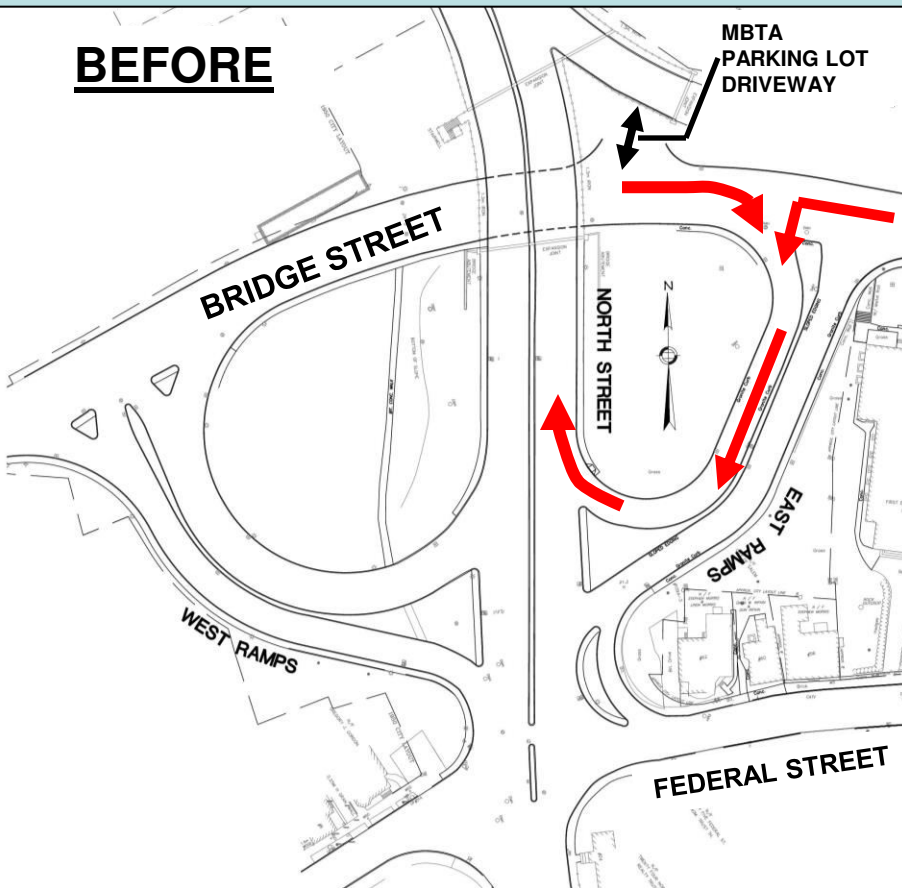
- **New Traffic Signals - S**
- **Signal Coordination**
- **Improved Traffic Flow**
- **Geometry Changes**
- **Improved Safety**
- **Traffic Calming**
- **Improved Pedestrian Accommodation**
- **New Landscaped Areas**
- **NO Right of Way Needed**



Vehicles Before and After: From Bridge St. To North St.

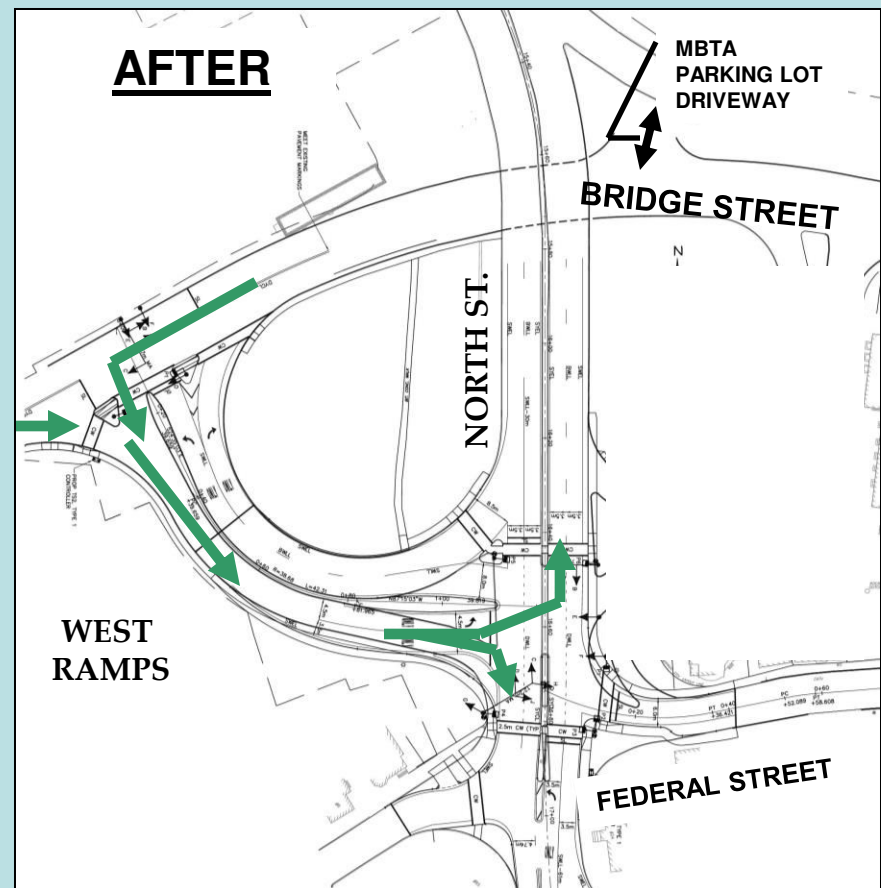


BEFORE



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

AFTER

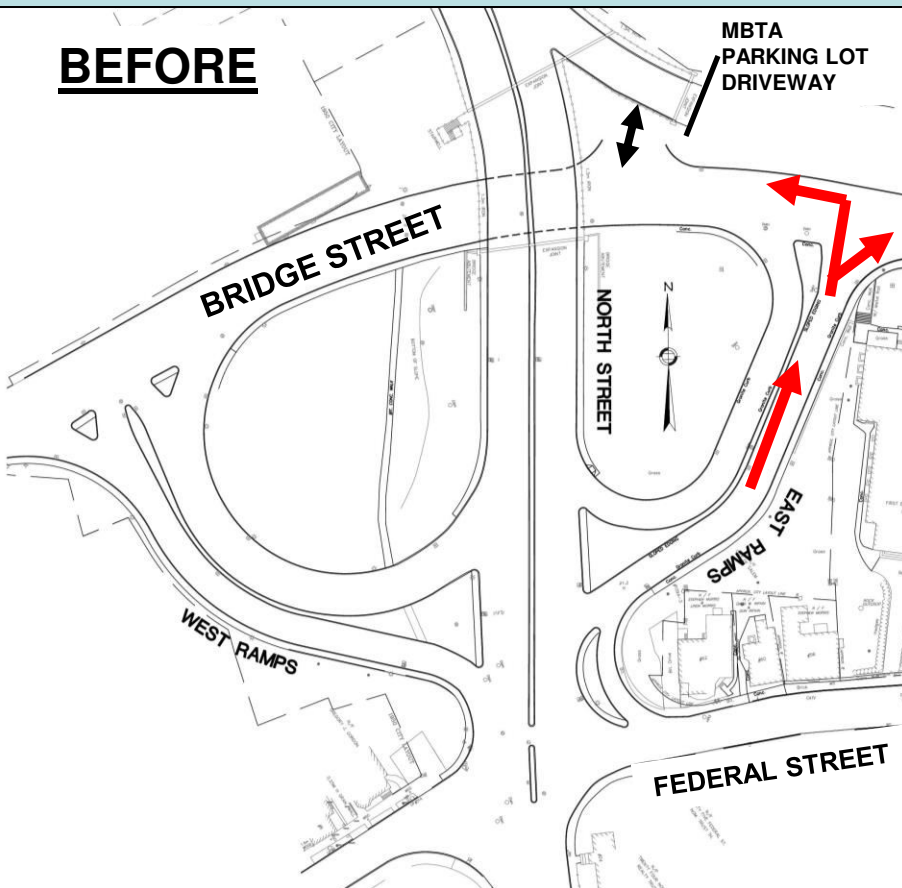


- Signalized Intersections
- Greater Separation From Parking Lot Traffic
- Less Conflicts, Safer Intersection

Vehicles Before and After: From North St. To Bridge St.

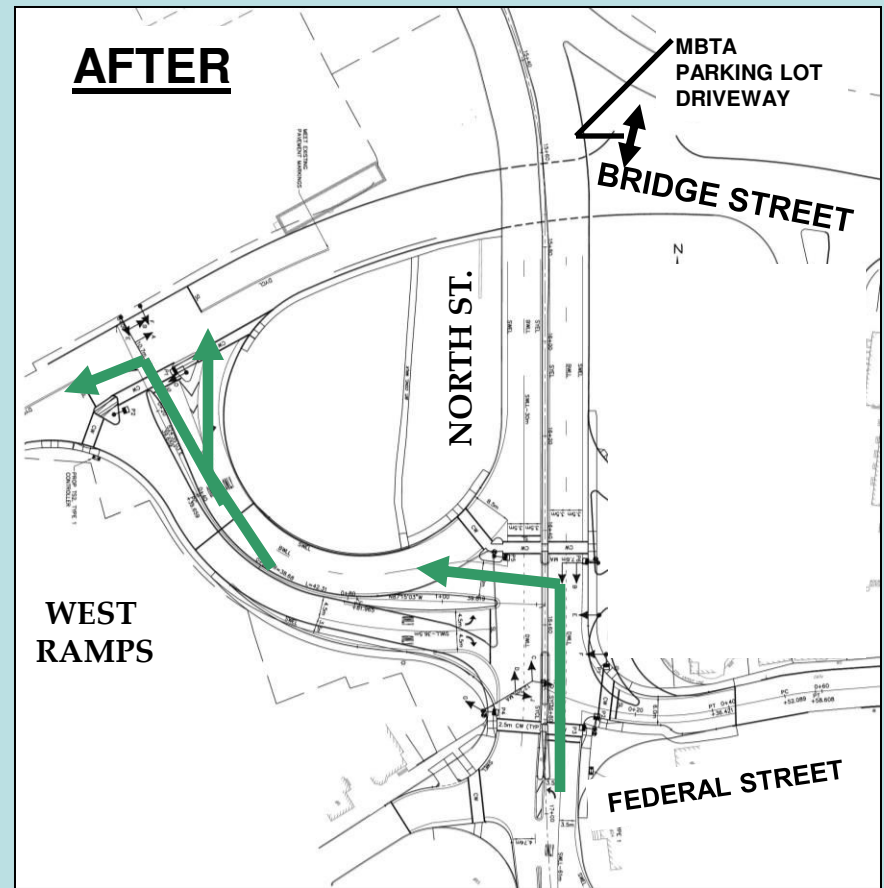


BEFORE



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

AFTER

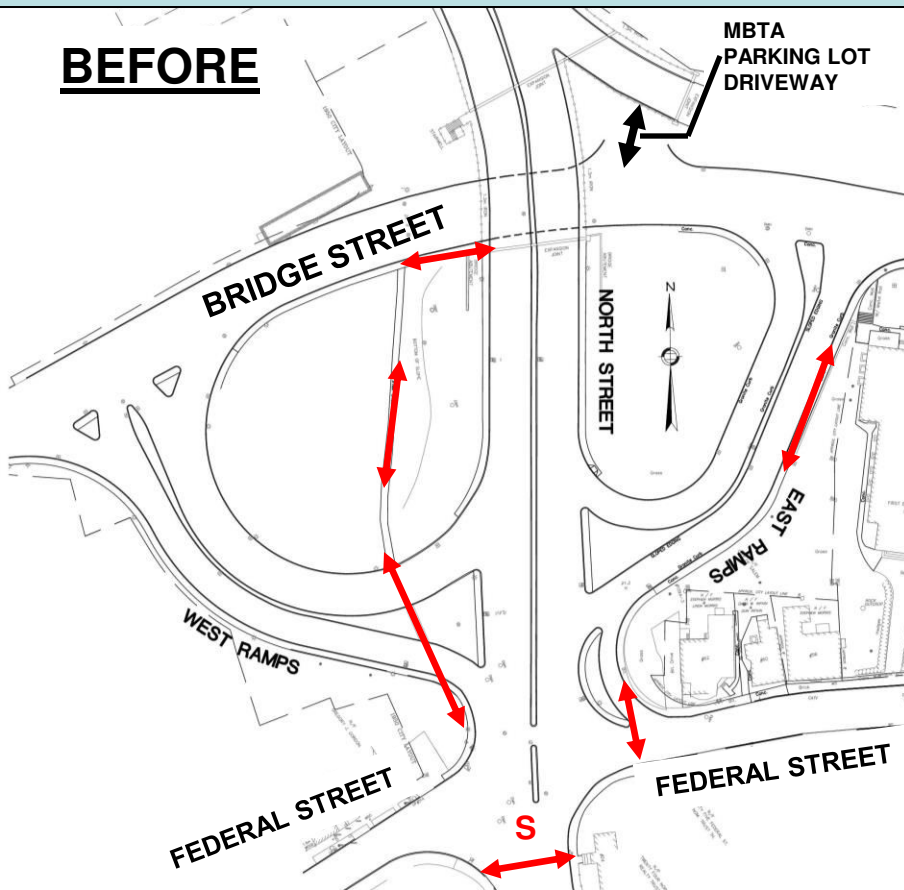


- Signalized Intersections
- Greater Separation From Parking Lot Traffic
- Improved Sight Distance
- Less Conflicts, Safer Intersection

Pedestrians Before and After: Federal St. To/From Bridge St.

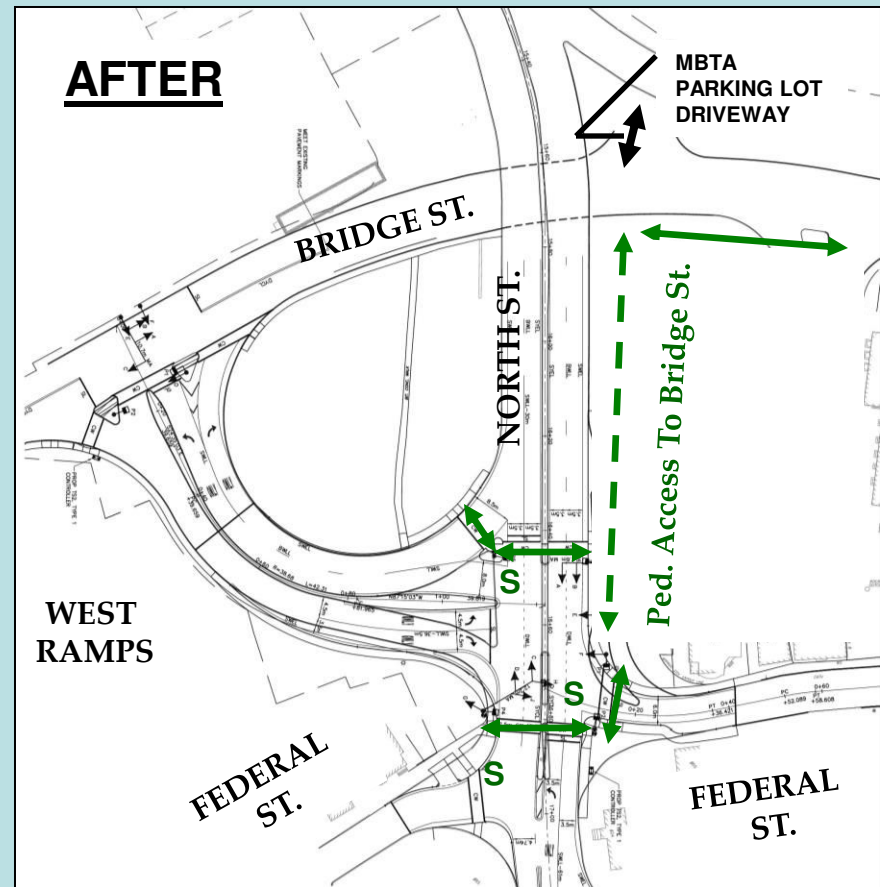


BEFORE



- 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.

- **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

- **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**