

Public 502 Hearing

Middlesex

Project No. 089-2(41)

**Proposed Replacement of
Bridge No. 55 on US Route 2**

Over

**Interstate I-89 and New England
Central Railroad**

Technical Presentation

- Existing Bridge and Site Conditions
- Project Objectives
- Factors Influencing Design
- Alternates Investigated
- Alternate Selected

Project Location



Project Location



West Approach



West Approach



East Approach



East Approach



East Approach



Existing Bridge



Existing Bridge



Existing Bridge



Existing Bridge



Existing Bridge



- **Fiber optic communications line on bridge**

Existing Bridge Condition



- **Deck and deck joints in fair condition and in need of minor repairs.**

Existing Bridge Condition



- **Steel beams in fair condition and in need of minor repairs.**

Existing Bridge Condition



- **Protective paint coating in poor condition and in need of replacement.**

Existing Bridge Condition



- **Abutments and piers in poor condition and in need of replacement.**

Existing Bridge Condition



- **Piers in poor condition and in need of replacement.**

Project Objectives

- Evaluate project constraints & impacts
- Investigate alignment & maintenance of traffic alternates
- Investigate bridge replacement options
- Identify best value solution

Factors Influencing Design

- Existing bridge and site conditions
- Maintenance of traffic during construction
- Alignment
- Environmental impacts
- Right of way impacts
- Utility impacts (including NECR & fiber optic communication lines)
- Maintainability
- Constructability
- Cost

Maintenance of Traffic Schemes

- Road closure and detour – not practically feasible
- Staged construction and alternating one-way traffic – not practically feasible
- Temporary bridge – considered for bridge rehabilitation option
- New alignment with two-way traffic over existing bridge – consider new alignments north & south

Alignment Alternates



- **North** - New parallel alignment located north of the existing bridge

Alignment Alternates



- **South** - New parallel alignment located south of the existing bridge

Bridge Structure Alternatives

- Full matrix of variable structural systems and materials considered.
- Selected bridge alternates that fully address project constraints and best meet project objectives.

Bridge Structure Alternatives

- Existing bridge rehabilitation
- New 3 span steel girder on parallel northerly alignment
- New 3 span steel girder on parallel southerly alignment

Bridge Rehabilitation

Alternative Dismissed:

- Temporary detour bridge adds time and cost
- Increased estimated traffic disruption and construction durations – likely 3 years
- Construction cost estimate \$13.8 M



Common Design Features of New Bridge on Parallel Northerly or Southerly Alignment

- Bridge type
- Maintenance of traffic scheme
- 36' bridge travelway width
- Vertical clearance over I-89 and railroad
- Horizontal clearance to C.L. track
- ROW impacts
 - Abutment within NECR property
- Utility impacts
- Low maintenance

New 3 Span Steel Girder Bridge on Parallel Northerly Alignment

Alternative Dismissed:

- Spans (165' – 160' – 160' = 485')
- Increased west approach embankment height and length
- Environmental impacts
- Additional ROW impacts
- Additional utility impacts
- Increased construction difficulty
- Construction cost estimate \$12.0 M

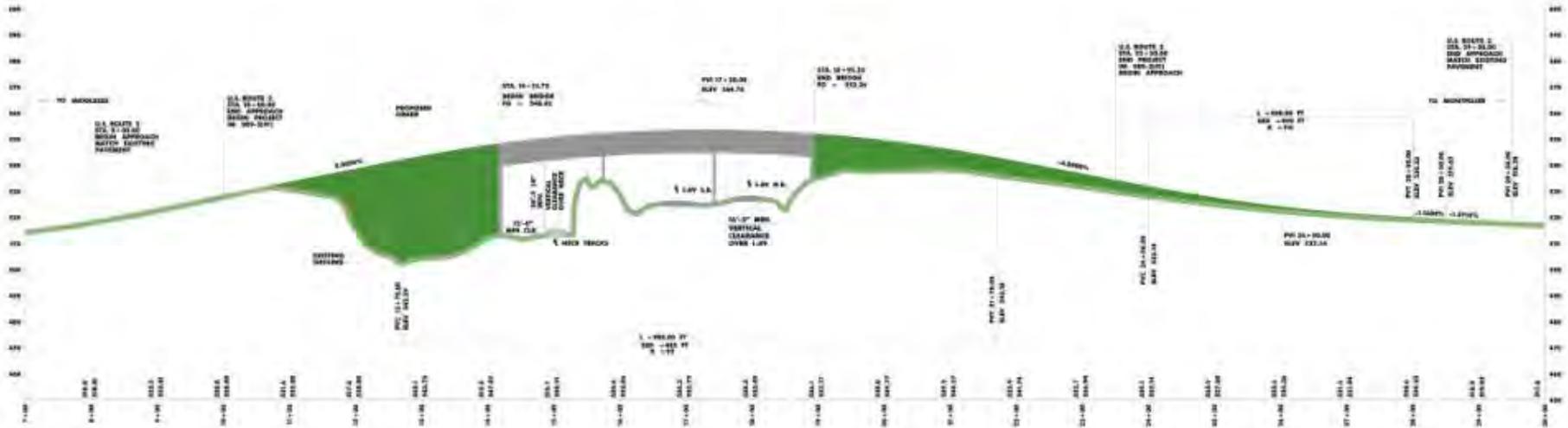
New 3 Span Steel Girder Bridge on Parallel Southerly Alignment

Recommended Alternative:

- Spans (154' – 168' – 151' = 473')
- Reduced environmental impacts
- Additional ROW impacts
- Additional utility impacts
- Construction cost estimate \$9.3 M

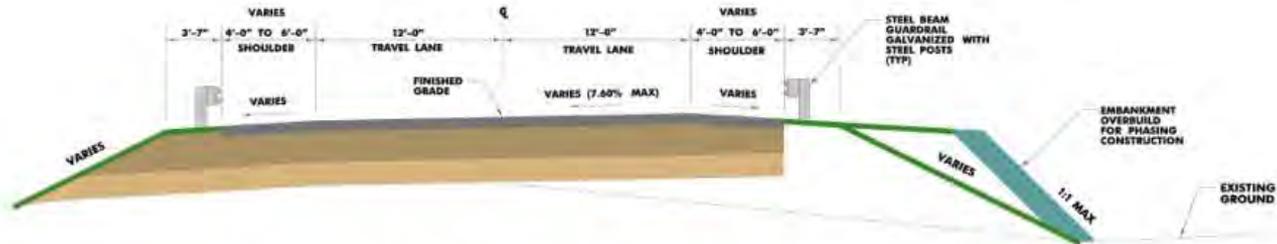
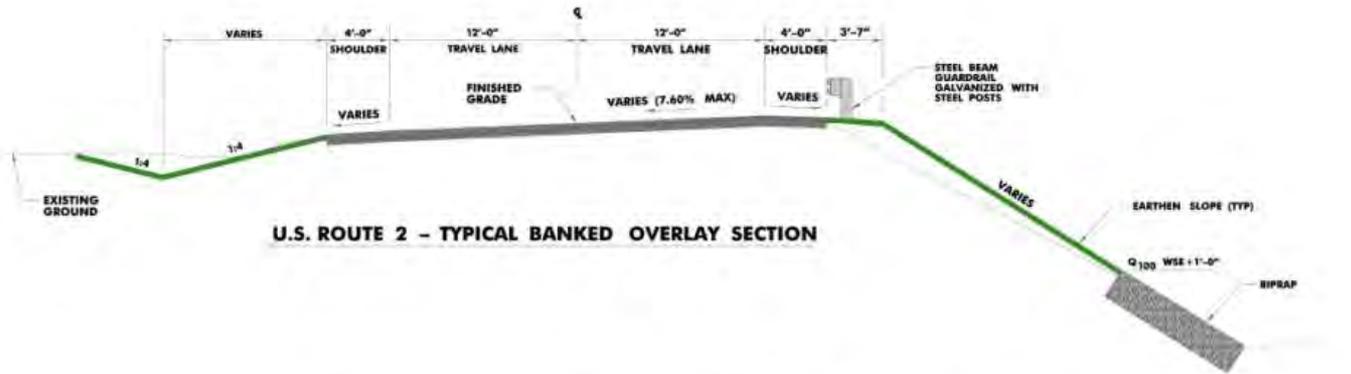
New 3 Span Steel Girder Bridge on Parallel Southerly Alignment (Roadway Profile)

MIDDLESEX IM 089-2(41) PROPOSED PROFILE



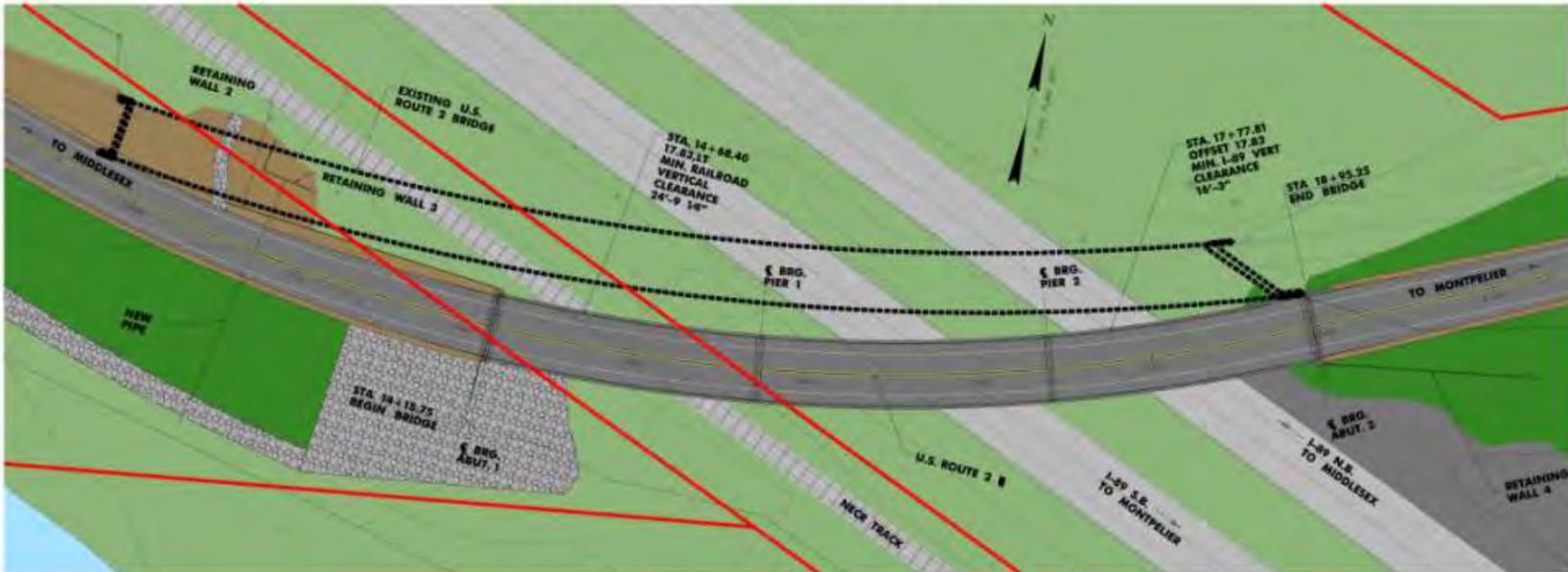
New 3 Span Steel Girder Bridge on Parallel Southerly Alignment (Roadway Section)

MIDDLESEX IM 089-2(41) ROADWAY TYPICAL SECTIONS

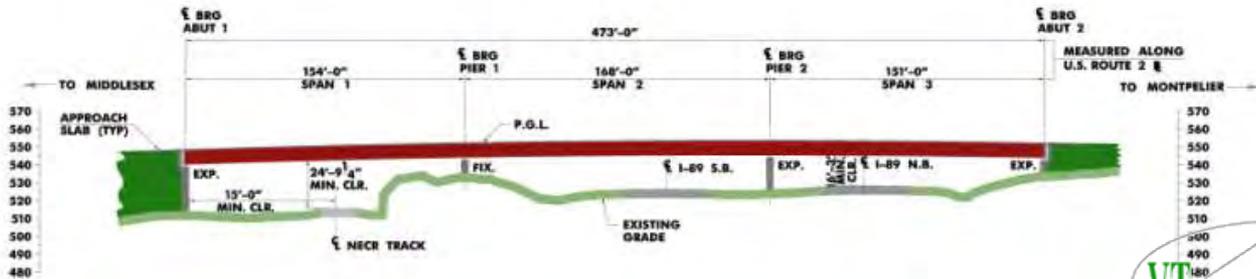


New 3 Span Steel Girder Bridge on Parallel Southerly Alignment (Bridge Plan & Elevation)

MIDDLESEX IM 089-2(41) BRIDGE PLAN AND ELEVATION



PLAN



ELEVATION ALONG U.S. ROUTE 2 BASELINE

