



# District 5: Bridge Bundle, Eight (8) Bridge Deck Replacements at Various Locations

MassDOT's 1<sup>st</sup> Low Bid Design Build

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# Project Overview

| City / Town | Facility Carried | Feature Intersected     | Year Built | Deck Rating | Super. Rating | Sub. Rating | ADT (2023) |
|-------------|------------------|-------------------------|------------|-------------|---------------|-------------|------------|
| Duxbury     | East St          | ST 3 Pilgrim Hwy        | 1962       | 6           | 6             | 6           | 1260       |
| Lakeville   | Pickens St       | ST 140 NB               | 1958       | 5           | 6             | 7           | 1290       |
| Lakeville   | Pickens St       | ST 140 SB               | 1969       | 6           | 6             | 7           |            |
| Mansfield   | George St        | Copeland Dr             | 1954       | 5           | 7             | 5           | 125        |
| Plymouth    | River St         | Hwy Plimoth Patuxet Hwy | 1951       | 5           | 5             | 5           | 810        |
| Plymouth    | Jordan Rd        | St 3 NB Pilgrim Hwy     | 1955       | 5           | 6             | 6           | 1590       |
| Plymouth    | Jordan Rd        | St 3 SB Pilgrim Hwy     | 1955       | 5           | 6             | 6           |            |
| Wareham     | Charge Pond Rd   | St 25                   | 1967       | 5           | 6             | 6           | 1550       |

# Duxbury – East St. over State Route 3



# Plymouth – Jordan Rd over State Route 3



# Plymouth – River Street over Plimouth Patuxet Highway





# Lakeville – Pickens St. over State Route 140



# Wareham – Charge Pond Rd. over State Route 25



# Bridge Deficiencies

- The Bridge decks are in fair condition but are continuing to decline in condition
- Steel superstructure paint system has failed, and the steel is corroding
- Bridge substructures are declining in condition and in need of repair
- Bridge bearings and joints are failing
- Collision damage
- Substandard guardrails and approach barrier



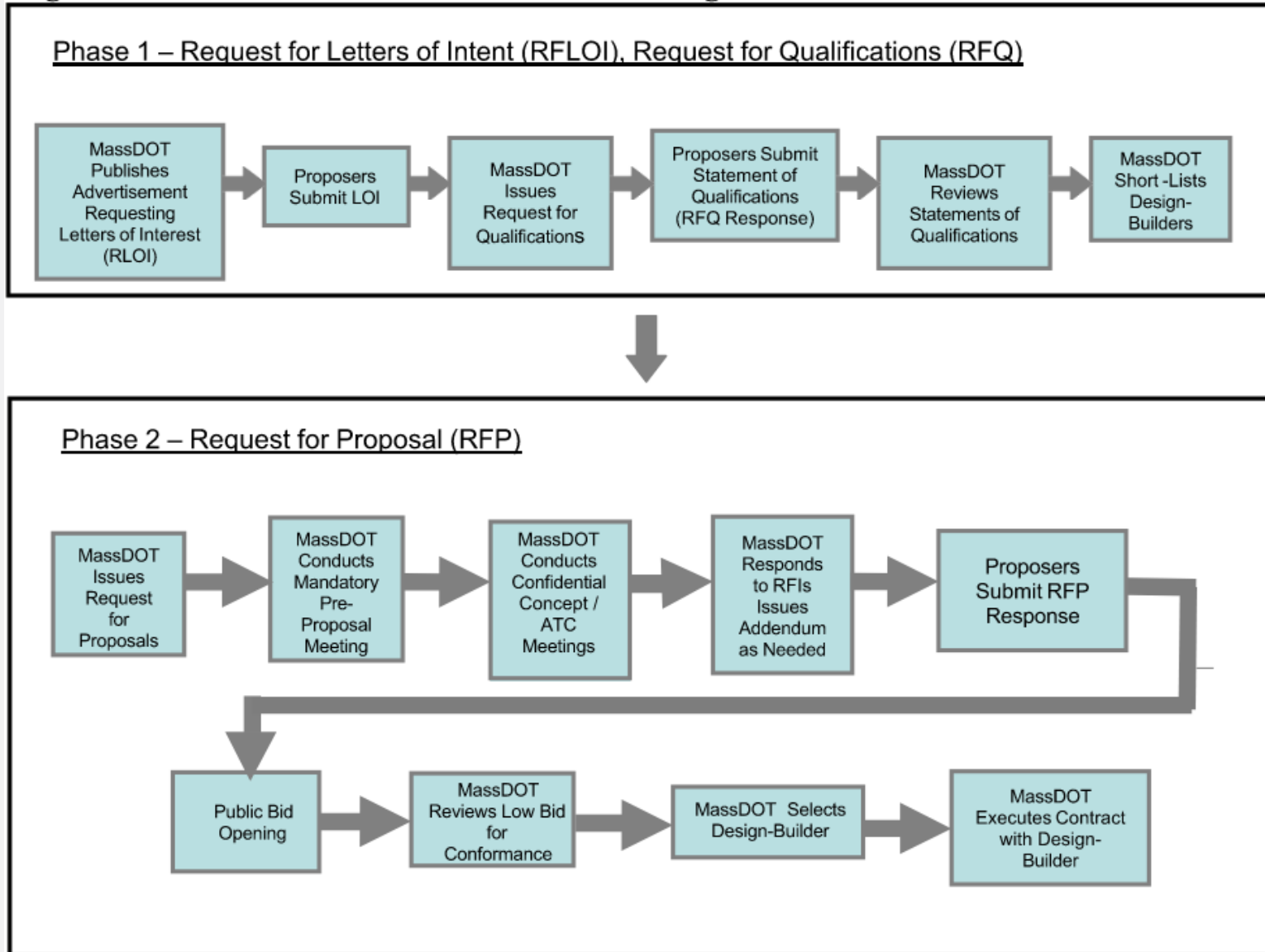
# Project Procurement

- FHWA notified MassDOT about availability of \$50M in redistribution funds in Fall 2022.
- These funds would be available to MassDOT if a contract could be awarded by August 2023.
- Problem: How can MassDOT quickly contract a project that has no initial design?
- Solution: Low Bid Design Build!

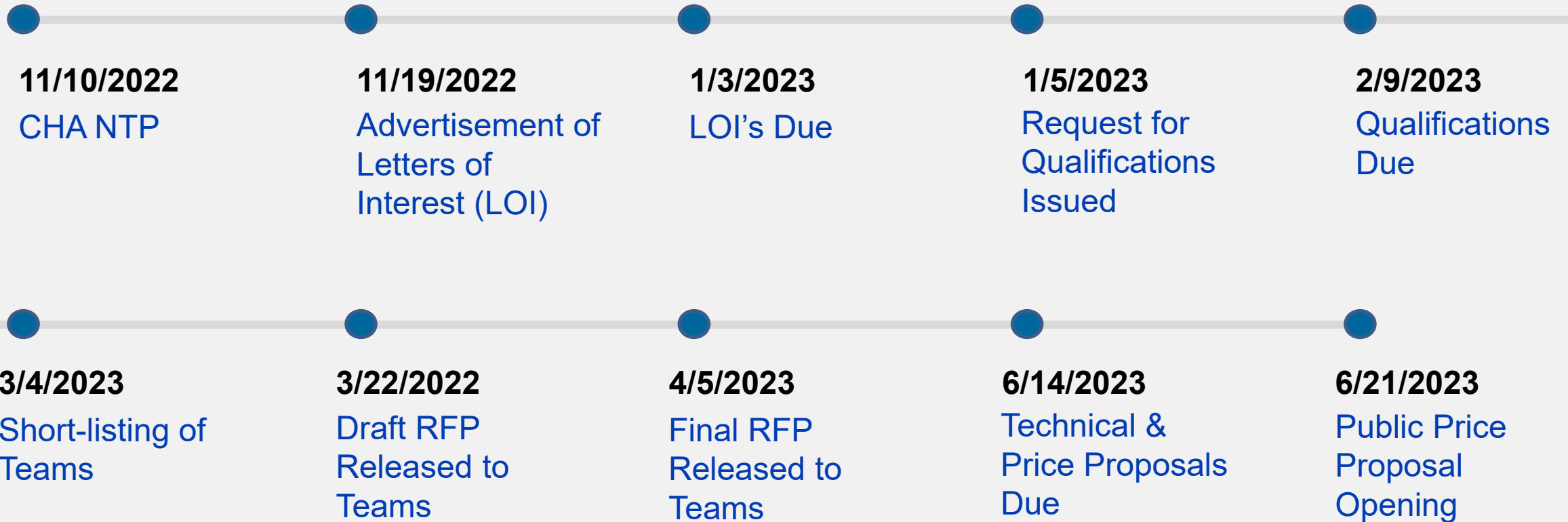
# What is Low Bid Design Build?

- Used on projects where design and construction criteria are clearly defined.
- Significant innovation and alternatives are not being sought.
- Examples:
  - Bridge projects with set span arrangements and beam types
  - Resurfacing projects
- Two-step procurement is required for Massachusetts:
  - Step 1: Shortlisting of DB teams
  - Step 2: Proposal and Bid Price

# Procurement Steps



# Procurement Schedule



# CHA Design for Base Technical Concept

- Topographic survey and confirmation of Right of Way
- Preliminary structural evaluation and confirmation of design loads
- Roadway approach modifications
- Evaluation of construction staging
- Utility coordination
- Preparation of construction cost estimate
- Preparation of construction contract duration
- Assistance with preparation of the bid documents and request for proposals



# Other Project Elements

## General

- Maintain existing vertical and horizontal clearances
- Maintain or add minimum one sidewalk at each bridge location
- Full closure and detour of two locations:
  - Mansfield – George Street
  - Duxbury – East Street Bridge
- Phased construction (two phases) for 4 locations:
  - Wareham – Charge Pond Road
  - Plymouth – River Street
  - Plymouth – Jordan Road
  - Lakeville – Pickens Street



## MBTA/Amtrak

- Work adjacent to electrified MBTA/Amtrak corridor
- Coordination with MBTA and Keolis (Commuter Rail, CSX, and Amtrak)

# Other Project Elements

## Utilities

- Utility relocations proposed for several bridges
  - Design Builder responsible for installing conduits and utility supports
  - Utility companies responsible for relocation of electrical and communications

## Coordination

- Towns of Plymouth, Duxbury, Wareham, Lakeville, and Mansfield
- Amtrak/MBTA for George Street Bridge

## Laydown and Staging Areas

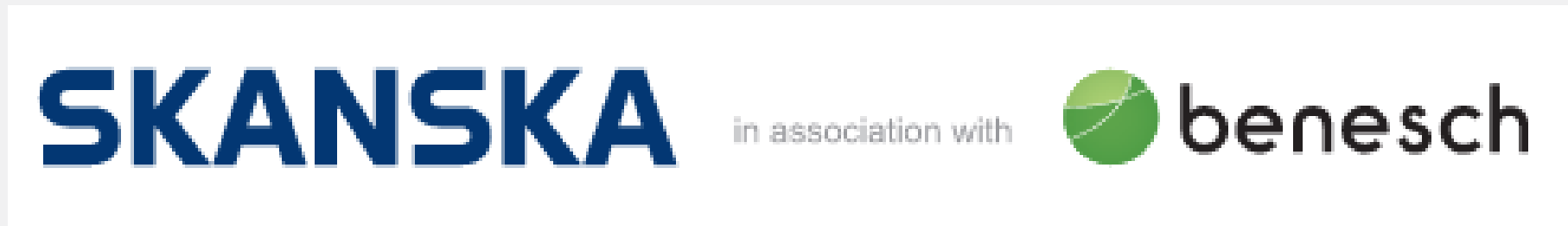
- Design-Builder is responsible for securing their own laydown and staging areas.

## Traffic Management

- Phased construction (4 locations)
- Maintain two travel lanes and pedestrian access at all times on phases construction bridges
- Full closure and detour of two locations



# Shortlisted Teams



# Price Opening and Evaluation of Proposals

|                        |                     |
|------------------------|---------------------|
| <b>Office Estimate</b> | <b>\$29,537,886</b> |
| <b>Skanska/Benesch</b> | <b>\$36,900,000</b> |
| Aetna/VHB              | \$44,277,600        |
| SPS/Gill               | \$44,498,376        |

- MassDOT performed a “Conformance Review” of the technical proposals – i.e. did they provide all of the information requested in the RFP?
- Examples of conformance checks:
  - Did they adequately address approach to Project Management?
  - Did they adequately address approach to Design and Design Management?
  - Did they adequately address approach to Design and Construction Collaboration?

# East St - Duxbury



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# River Street - Plymouth

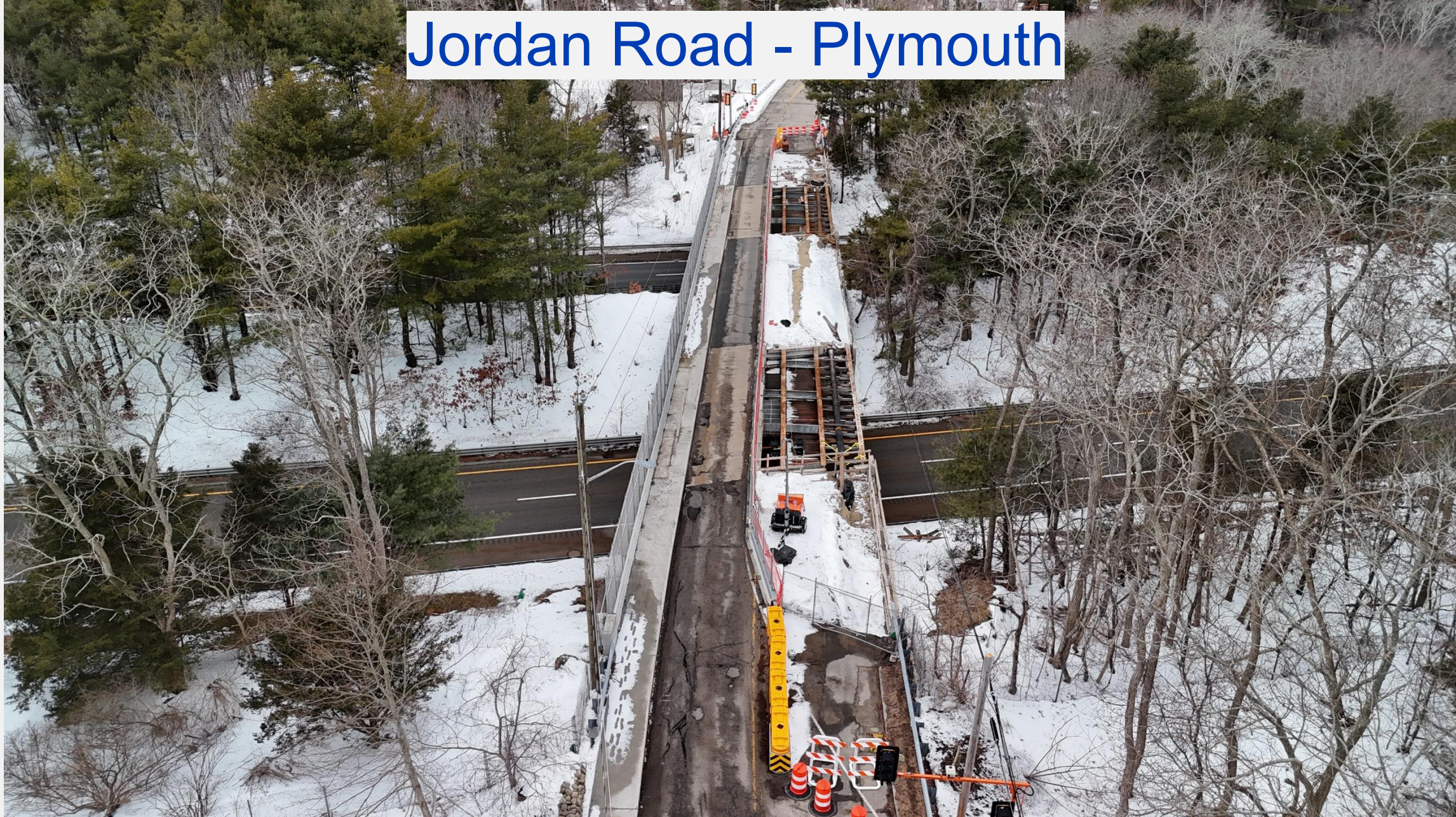


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# George Street - Mansfield



# Jordan Road - Plymouth



# Pickens Street - Lakeville

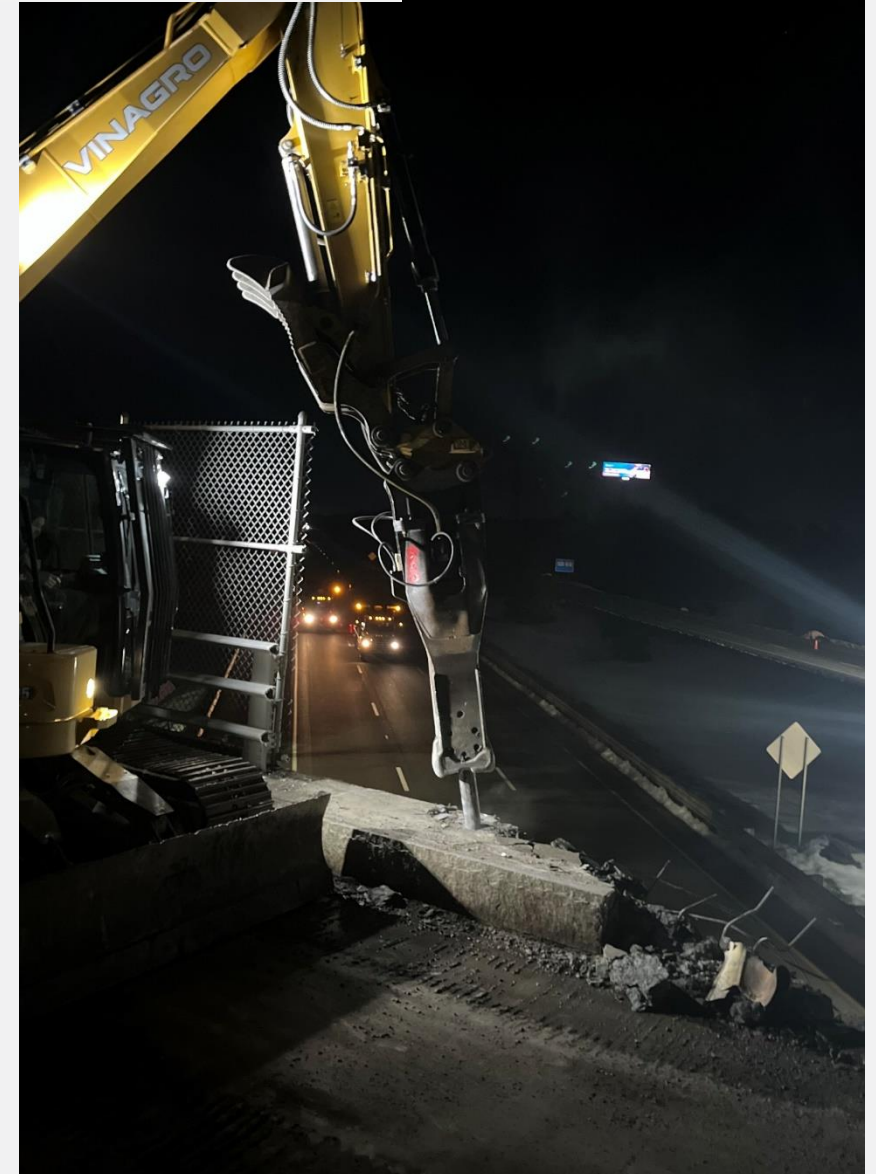


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# Charge Pond Road - Wareham



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# Current LBDB Lessons Learned

- The Alternative Technical Concept (ATC) process was lackluster – but you should still have it! Project examples included:
  - Alternative joints
  - Reusing existing concrete and encasing it in new
  - Use of SIP forms throughout (both steel and see-through types)
  - Partial girder concrete encasement in lieu of steel plate repairs
  - Alternative pavement marking treatments
  - Leaving diaphragms connected at stage lines
- This type of procurement can be ideal for expediting fund obligation
- Don't be too ambitious – allow time for utility coordination and full vetting of constructability prior to releasing bid documents
- Avoid lump sum bid prices and utilize unit costs as preservation/repair scopes can change significantly in the field



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