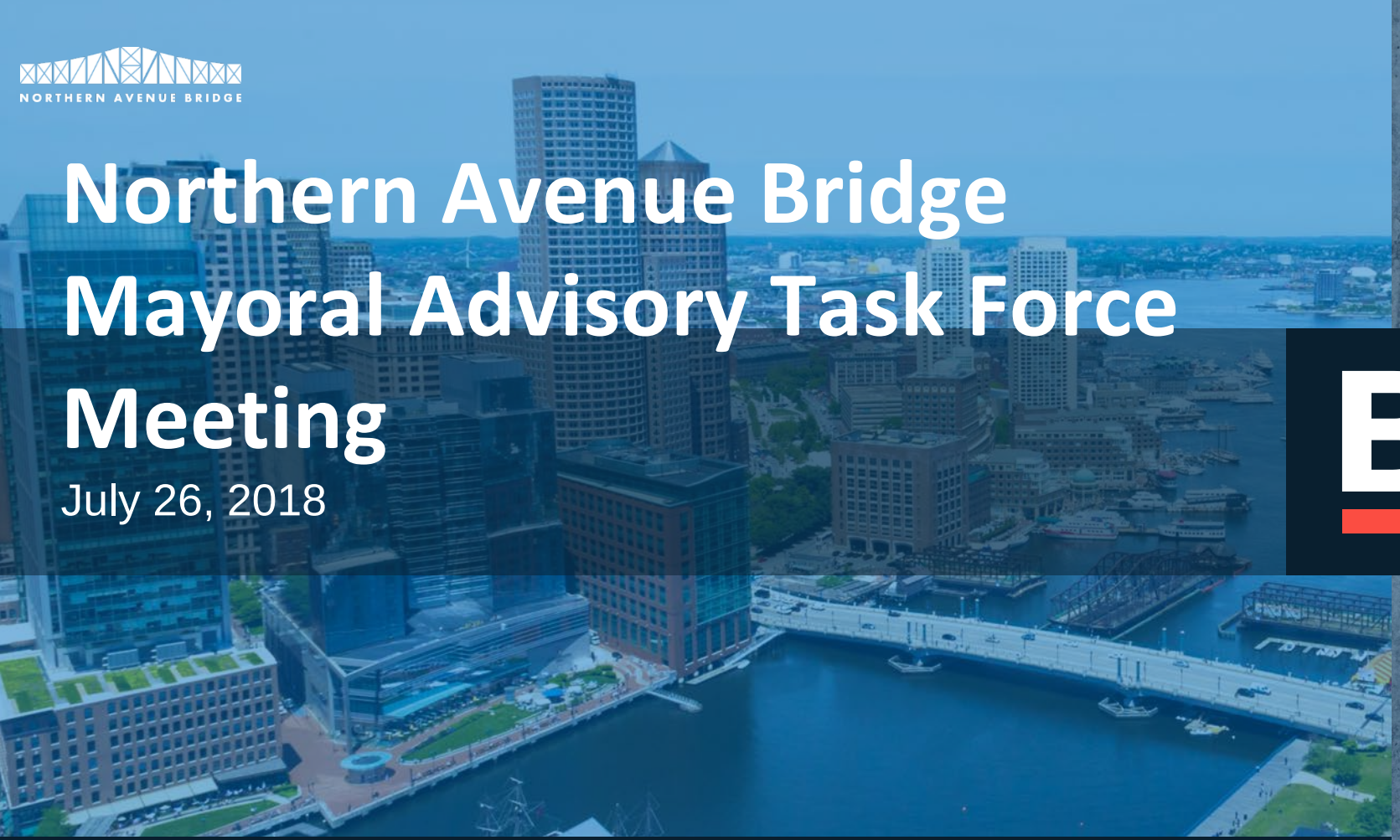
NORTHERN AVENUE BRIDGE

Northern Avenue Bridge Mayoral Advisory Task Force Meeting

July 26, 2018



Mayor Martin J. Walsh

INTRODUCTION + AGENDA

Welcome and Review of Summary Notes from June Meeting

1. Mobility

- Traffic Evaluation Results

2. History – Update on Structural Assessment

- Initial Structural Capacity Assessment)
- Suitability of Use
- Next Steps

3. Place Making – Uses for Programmable Space

- Update on Opportunities

4. Public Outreach

- Community Meetings
- Website

5. Conclusions and Q&A

NORTHERN AVENUE BRIDGE

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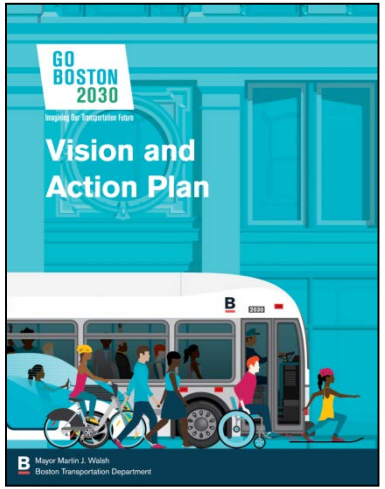
MOBILITY AND TRAFFIC EVALUATION UPDATE

MOBILITY AND TRAFFIC EVALUATION UPDATE

Project Objectives

- ***Improve Mobility***
- Honor the History
- Strengthen Resiliency
- Create a Destination



Purpose of Analysis

- Consider operating concepts to provide greatest mobility benefits on Day 1
- Evaluate concepts that include general traffic on NAB

Parameters

- Day 1 concept should respond to existing plans
- Provide adaptability to respond to future changes
- Analysis is specific to NAB, not a comprehensive Seaport analysis

CONCEPTS ANALYZED

One-Way Westbound Lane / General Traffic

- Shared lane with general traffic and transit vehicles

Two-Way General Traffic

- One westbound shared lane with general traffic and transit vehicles
- One eastbound shared lane with general traffic and transit vehicles

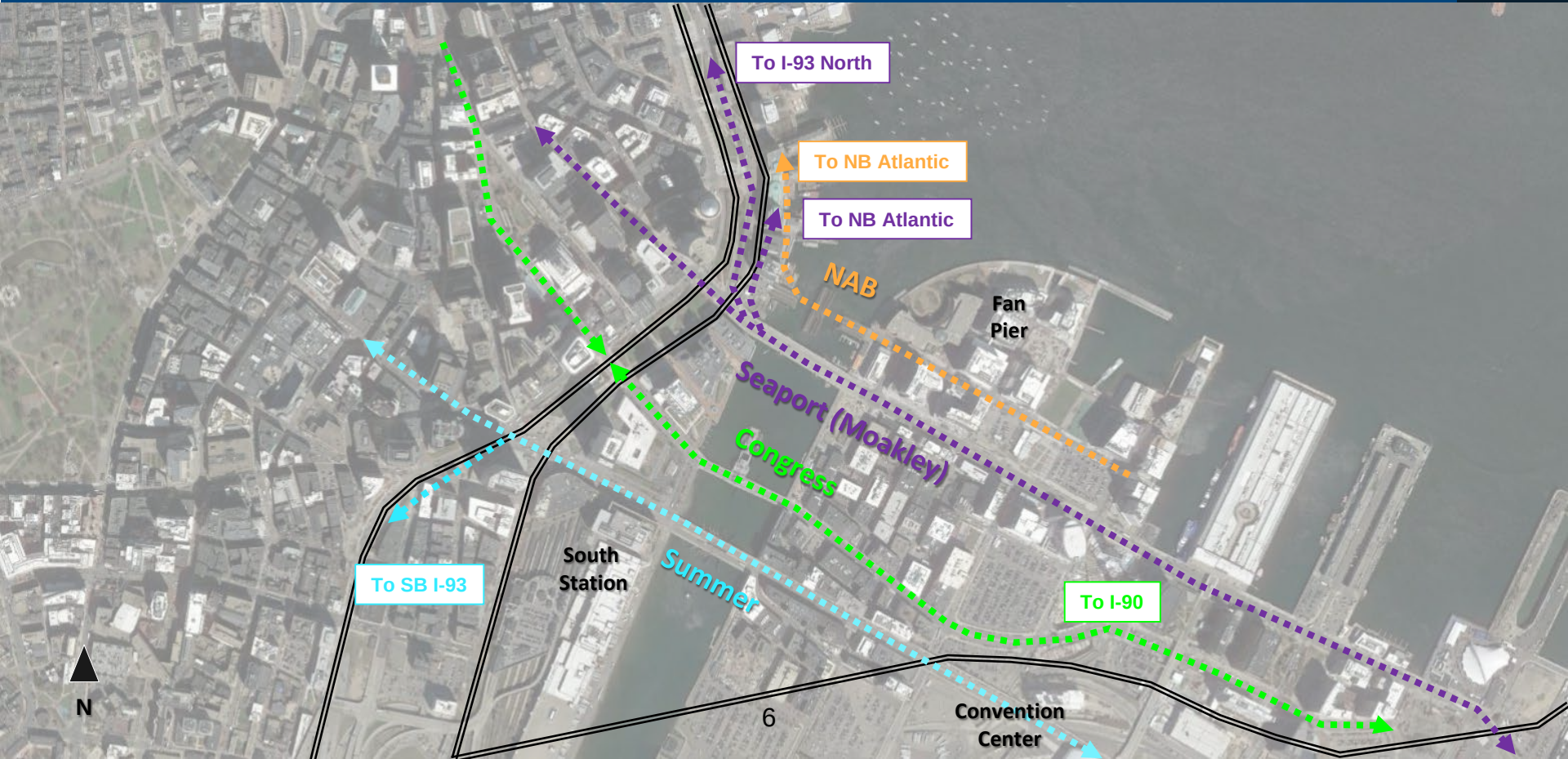
HOV+ Lane / No General Traffic

- One westbound lane dedicated to HOV+ (transit, shuttles, and HOV-3+)
- No use by general traffic

Pedestrian & Bicycle Only / No Vehicles

- Accommodate pedestrians and bicycles
- No vehicles (except emergency)

FORT POINT CHANNEL CROSSINGS



TRAFFIC ANALYSIS METHODOLOGY

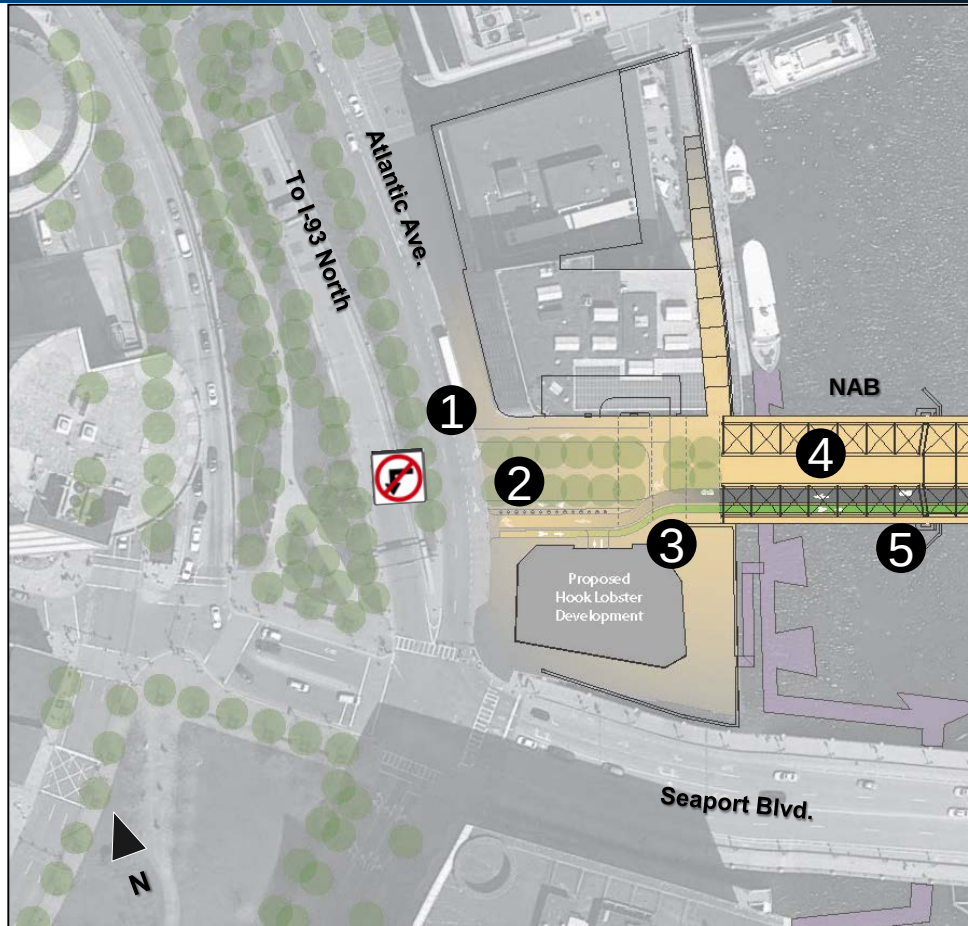
- **Establish baseline conditions** for Moakley & Atlantic Ave with calibrated traffic counts and field observations
- **Develop future year conditions** with adjusted Seaport traffic growth rates (2025 & 2035)
- **Compare concepts for baseline and future year** conditions – does not assume improvements beyond NAB
- **Focused on transportation impacts** – other project goals not considered

Long Queues on WB Seaport Blvd. in PM Peak

Traffic Backups onto I-93 North in PM Peak

TRAFFIC ANALYSIS CONSIDERATIONS

1. Close proximity to Moakley intersection creates signalization challenges
2. Signal not warranted for a single right turn lane
3. Constrained area for merging lanes off bridge
4. Emergency vehicle access must be provided
5. Continuous pedestrian and bicycle access must be provided in all concepts



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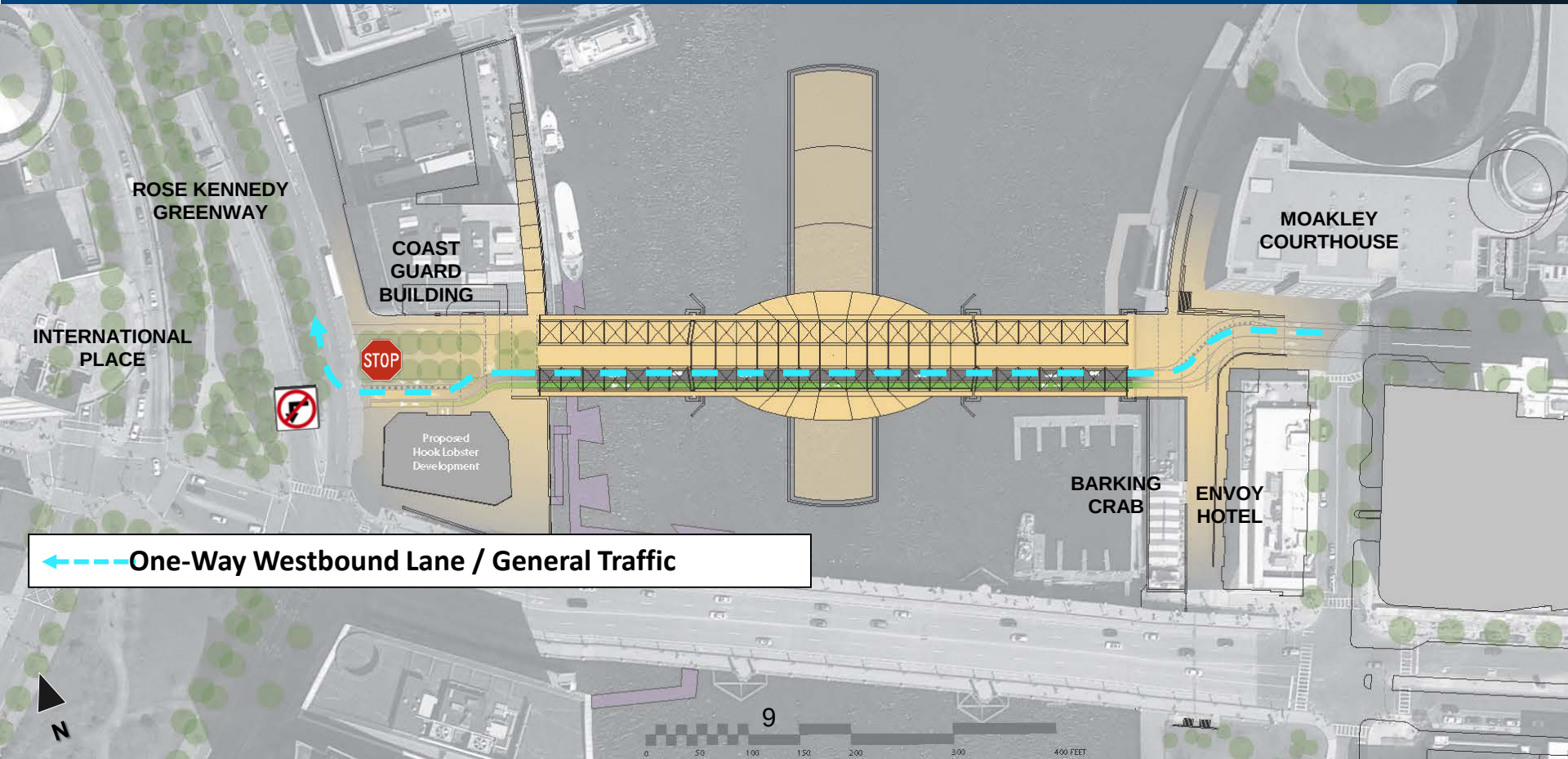
ONE-WAY WESTBOUND LANE / GENERAL TRAFFIC



ONE-WAY WESTBOUND LANE / GENERAL TRAFFIC

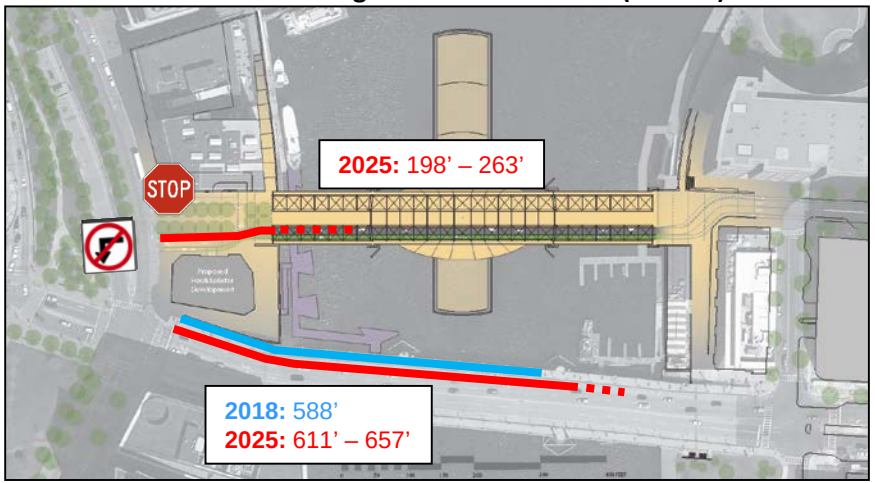
Northern Ave. traffic will experience delay and long queues at stop controlled intersection

- Does not meet warrants for signalization
- Increases delays and unreliability for transit

Provides PM Peak travel time savings for some movements onto Atlantic Ave. from Moakley

- Intersection continues to operate poorly due to I-93 North queues blocking rights onto Atlantic
- Concept does not reduce I-93 North traffic demand

Estimated Queue Lengths for Westbound Rights in PM Peak Hour (5-6 PM) [1]

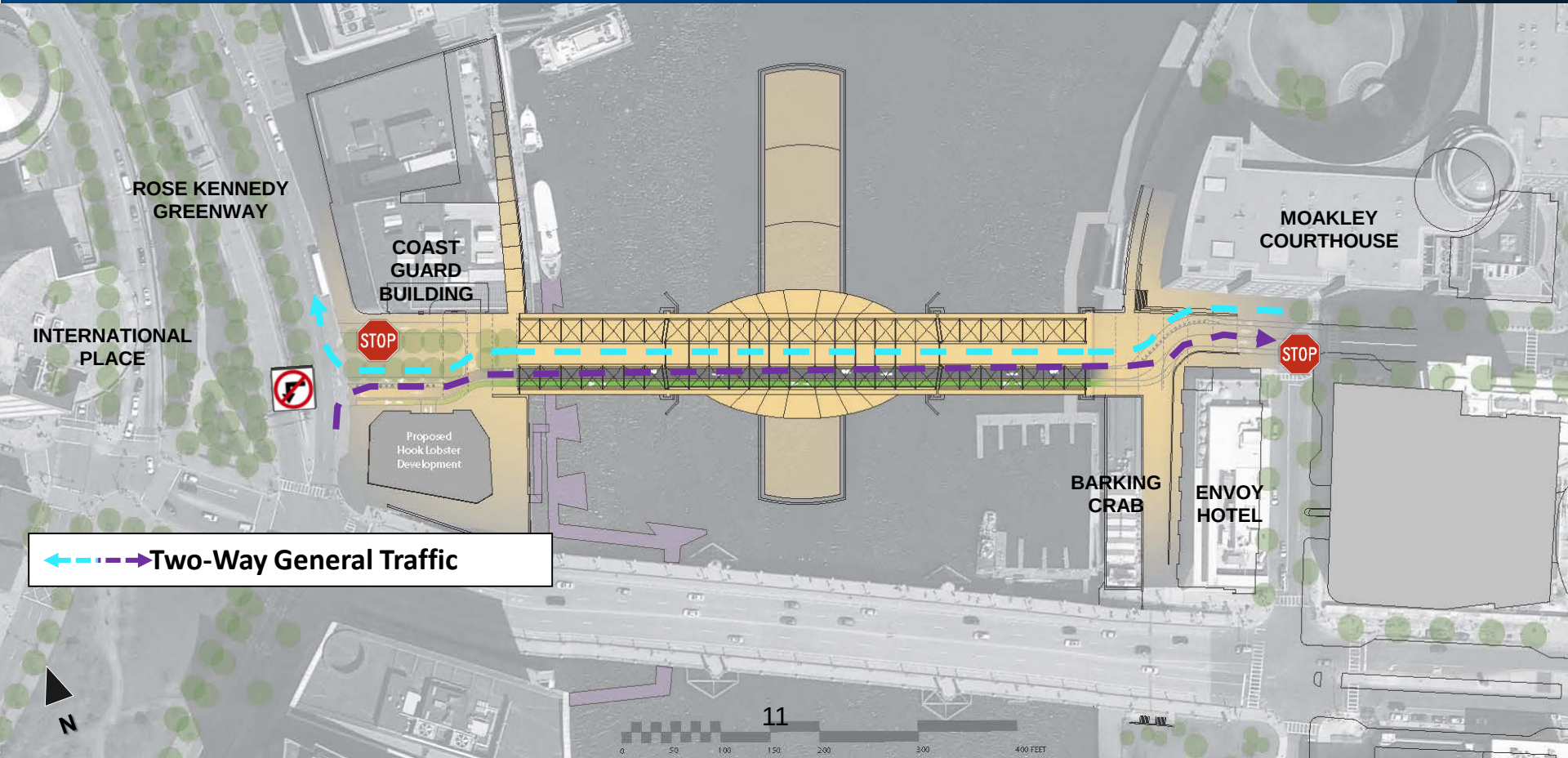


Intersection Operations in PM Peak Hour (5-6 PM)
Overall Level of Service (Moakley WB Right LOS) [2]

Intersection	2018	2025 w/ NAB	2035 w/ NAB
Northern & Atlantic	N/A	F	F
Moakley & Atlantic	F (F)	F (F)	F (F)

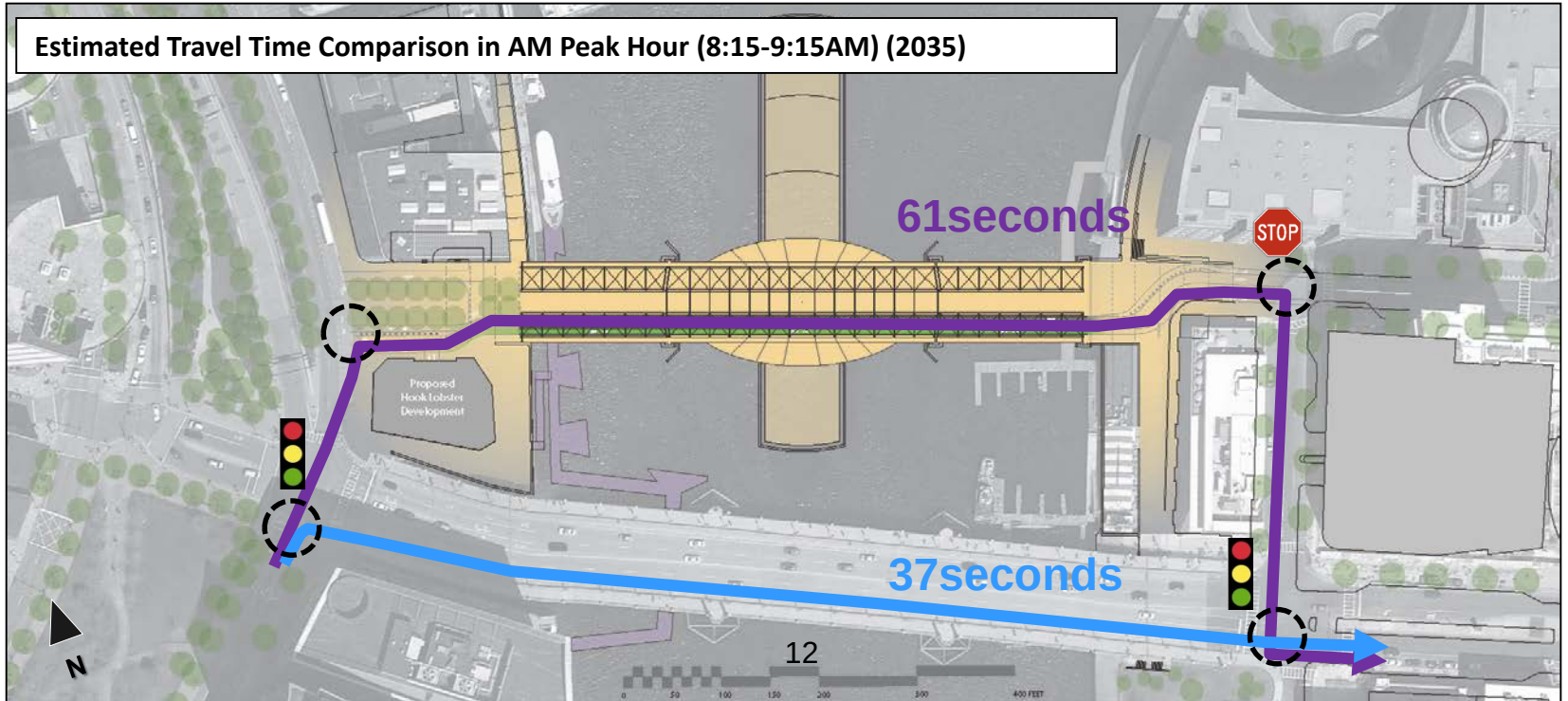
NOTE:
1. 95th percentile volumes exceeds capacity, queue may be longer. Queue length shown is maximum after two cycles.
2. Level of Service is a qualitative measure used to analyze vehicle traffic service at intersections. LOS "F" indicates congested vehicle delays greater than 80 seconds at signalized intersections, and greater than 50 seconds at unsignalized intersections.

TWO-WAY GENERAL TRAFFIC

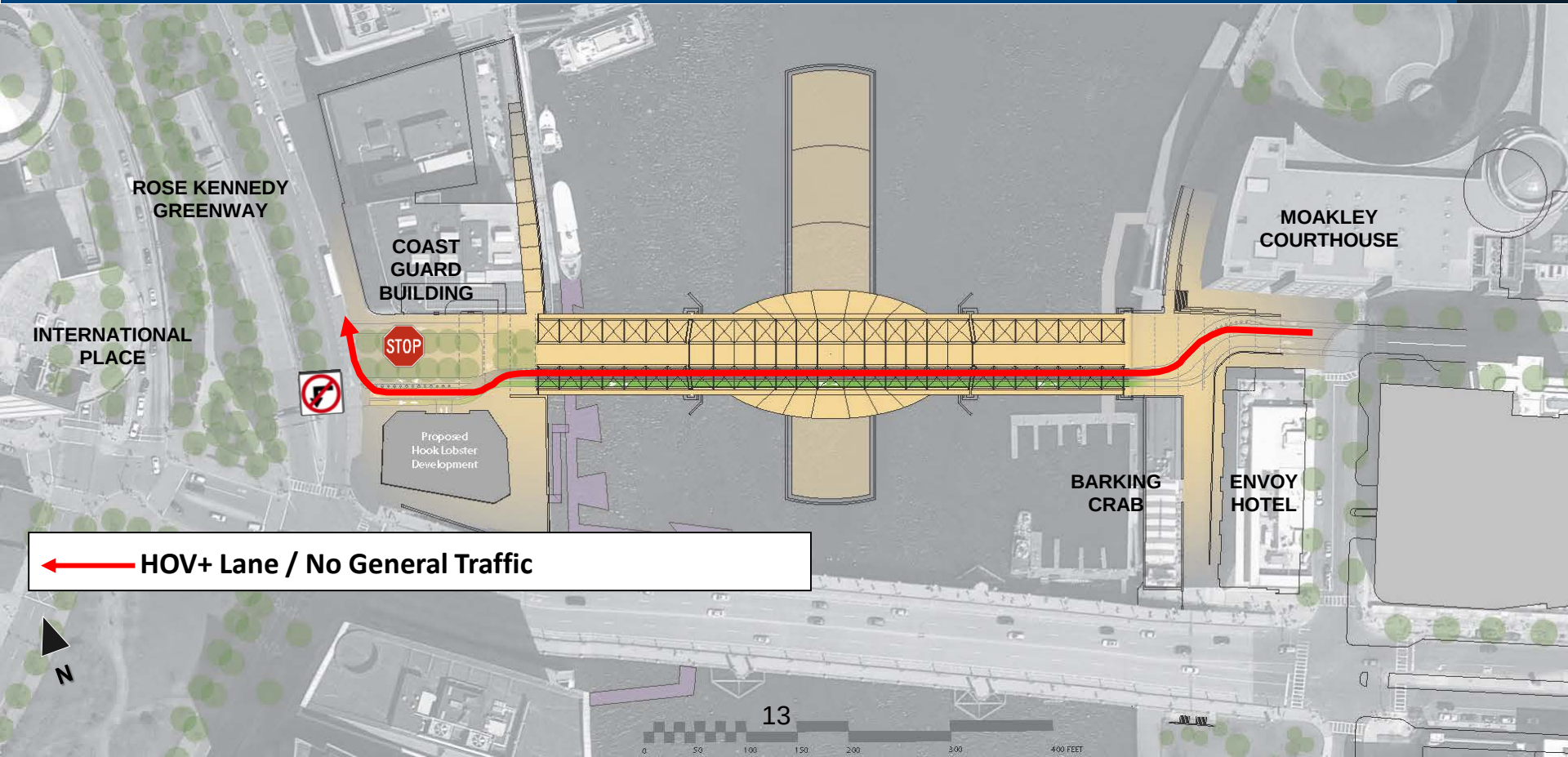


TWO-WAY GENERAL TRAFFIC TRAVEL TIME COMPARISON

- Westbound movements have same impact as in the One-Way Westbound Lane concept
- Because of longer travel time few vehicles would choose NAB for eastbound movements in AM Peak Hour



HOV+ LANE / NO GENERAL TRAFFIC



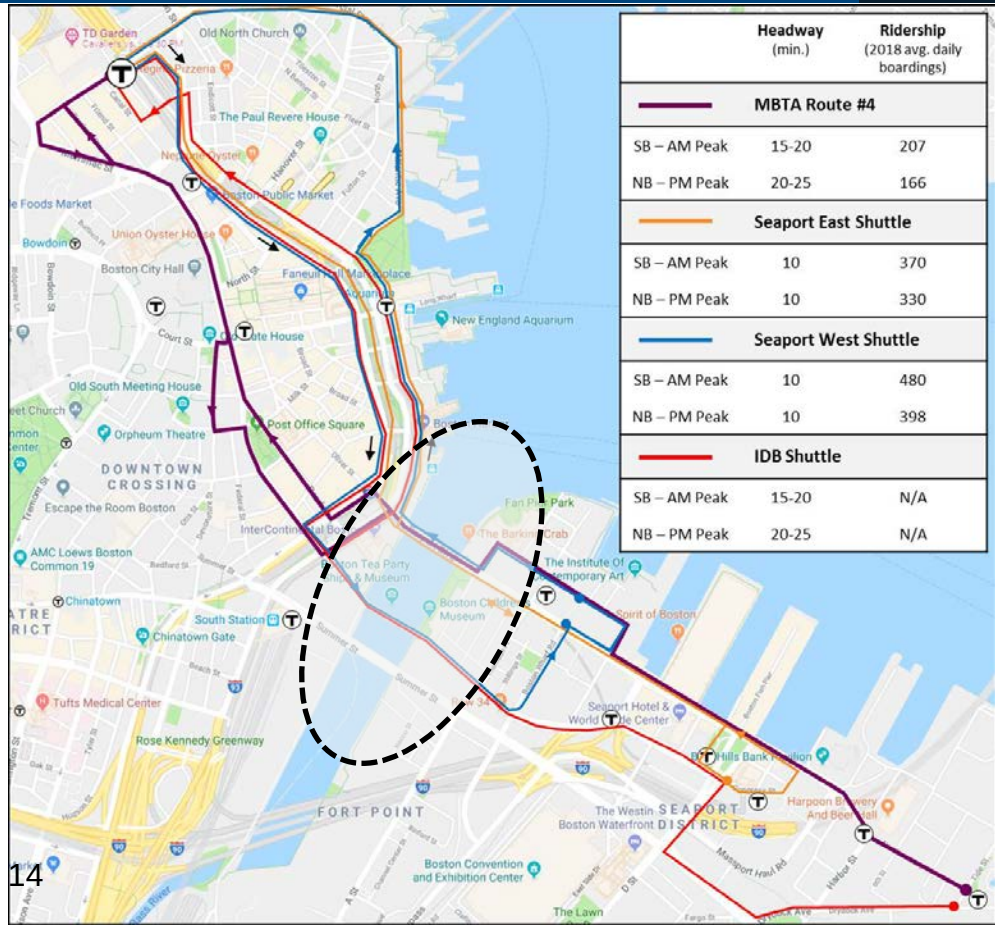
HOV+ LANE / NO GENERAL TRAFFIC SEAPORT ACCESS

Seaport access is constrained and worsening

- Slow, unreliable transit limits use of North Station commuter rail by Seaport employees

Fort Point Channel Crossing is key bottleneck for all modes

- High numbers of transit, shuttle, and other HOV users are impacted by congestion
- Up to 18 northbound transit and shuttle vehicles per hour in PM Peak
- Improving transit travel time and reliability reduces SOV and overall traffic volumes

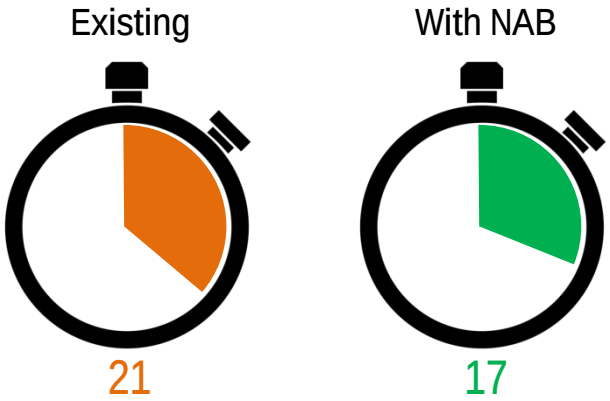


	Headway (min.)	Ridership (2018 avg. daily boardings)
MBTA Route #4		
SB – AM Peak	15-20	207
NB – PM Peak	20-25	166
Seaport East Shuttle		
SB – AM Peak	10	370
NB – PM Peak	10	330
Seaport West Shuttle		
SB – AM Peak	10	480
NB – PM Peak	10	398
IDB Shuttle		
SB – AM Peak	15-20	N/A
NB – PM Peak	20-25	N/A

HOV+ LANE / NO GENERAL TRAFFIC

Travel Time Savings – Seaport-North Station

- Improves transit travel time northbound – PM Peak hours
- Estimated 17-23% improvement in transit travel time with NAB only
- Benefits pedestrians and bicyclists
- No adverse impacts on general traffic operations



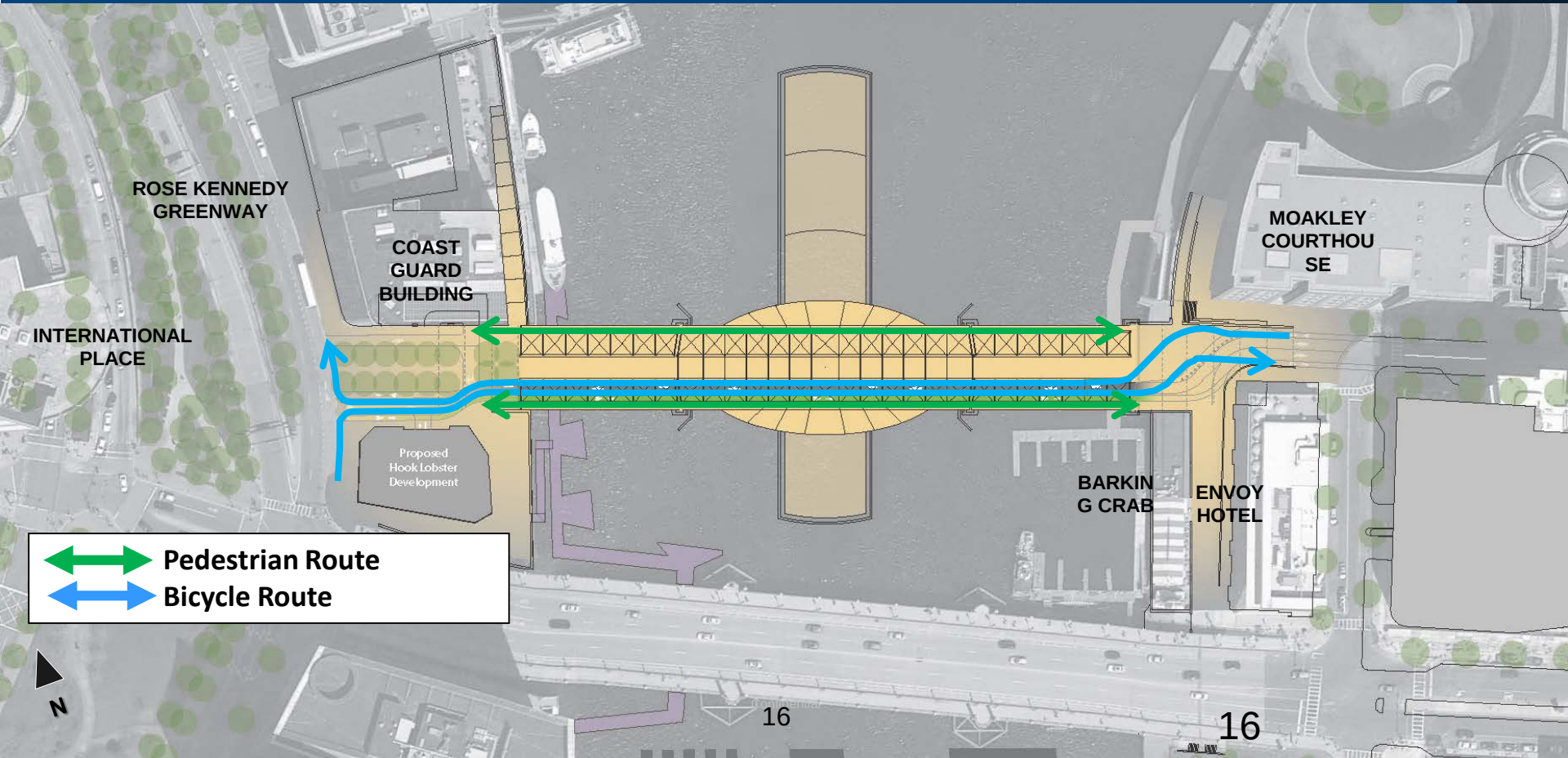
Seaport– North Station
Estimate avg. transit travel time (min.) - 2018

Mode Shift and Traffic Reduction

- North Station Commuter Rail use will increase
- May reduce WB Moakley Bridge traffic heading to I-93 North by up 9-13% in PM Peak Hour and improve overall traffic operations at intersection with shorter queues and less delay

NOTE: Based on analysis of average transit and shuttle transit trip times, and analysis of Travel Survey of South Boston Waterfront Employees (2017)

PEDESTRIAN & BICYCLE ONLY / NO VEHICLES



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PEDESTRIAN & BICYCLE ONLY / NO GENERAL TRAFFIC

Separated Pedestrian & Bicycle Facilities

- Provides key link in walking and biking network between Downtown & Seaport
- Feature of all concepts analyzed

Uninterrupted Mobility

- Fixed span – no bridge openings
- ADA-compliant grade

Mode Shift

- Increase in walking and bicycle mode share
- Limited mode shift compared to HOV+ Lane concept

EVALUATION SUMMARY

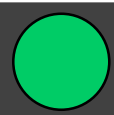
HOV+ Lane / No General Traffic provides most mobility benefit

- Provides capacity to move more people in fewer vehicles consistent with broadest range of mobility goals
- Results in mode shift and reduction in SOV, rather than shifting cars from Moakley to NAB

General Traffic concepts provide limited mobility benefits

- Provides marginal improvements for certain movements north of Atlantic Avenue, but Moakley intersection remains congested as NAB provides no benefit to I-93 North traffic
- Increases transit travel time and reduces reliability compared to HOV+ Lane concept
- Little or no benefit for eastbound movements

EVALUATION SUMMARY

CONCEPT	MOBILITY GOAL					
	Improves Traffic Operations	Promotes Reliable Transit	Enhances Ped/Bike Connectivity	Reduces SOV Traffic	Provides Emergency Vehicle Access	Provides Placemaking Opportunity
One-way Westbound General Traffic						
Two-Way General Traffic						
HOV+ Lane / No General Traffic						
Pedestrian & Bicycle Only						

 Concept Fails to Achieve Goal

 Concept Achieves Aspects of Goal

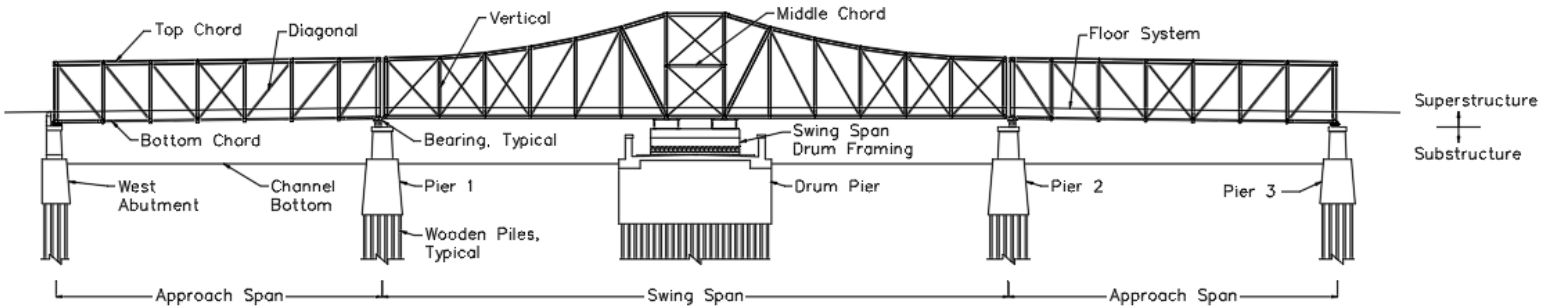
 Concept Achieves Goal

HONORING HISTORY - SUITABILITY OF STRUCTURE ELEMENTS

Evaluate structural elements for suitability:

- **Physical Condition**
- **Proposed Use – structural capacity – *in progress***
- **Substructure Elements – Piers and Abutments- Structural evaluation and testing *in progress***
- **Options being considered affect suitability for use**
- **Risk evaluation of re-use/refurbishment vs. Replacement**
- **75 Year Design Life**

HONORING HISTORY -TRUSS TERMINOLOGY



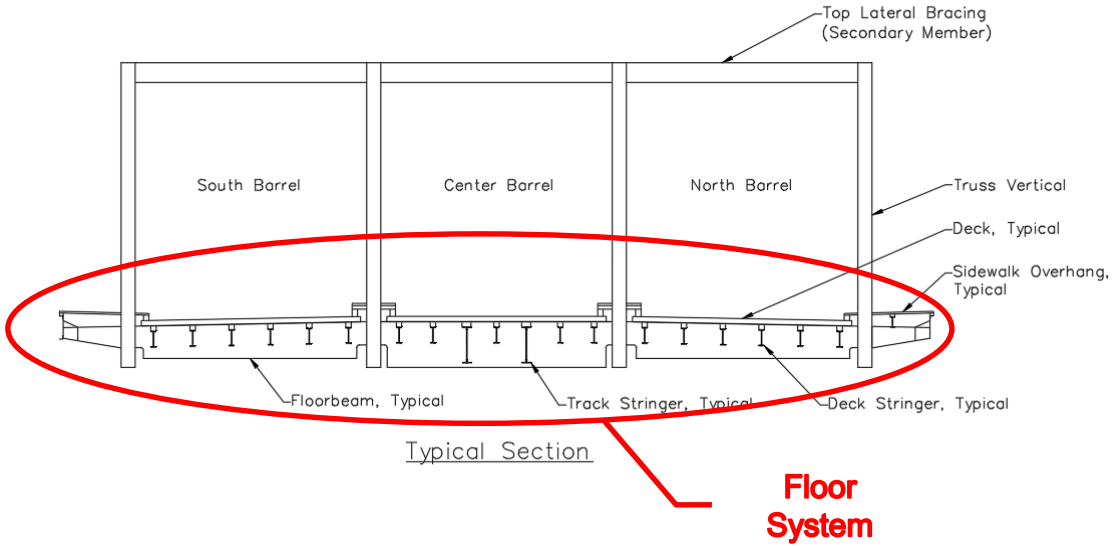
Typical Elevation

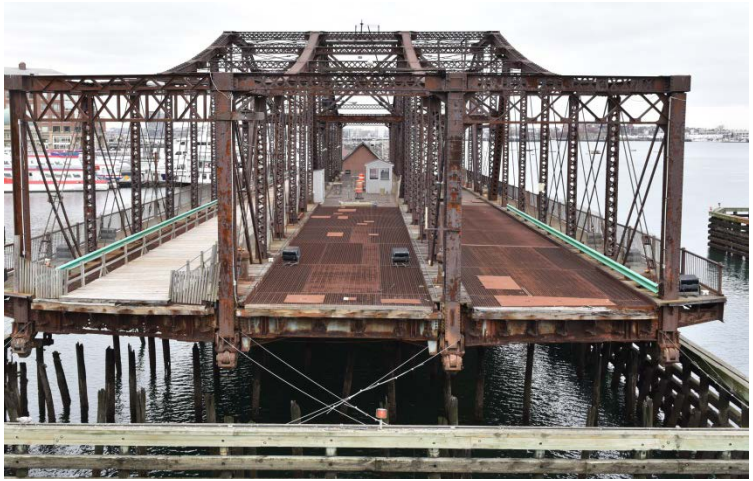
Approach Span

Swing Span

Typical Pier

HONORING HISTORY -TRUSS TERMINOLOGY





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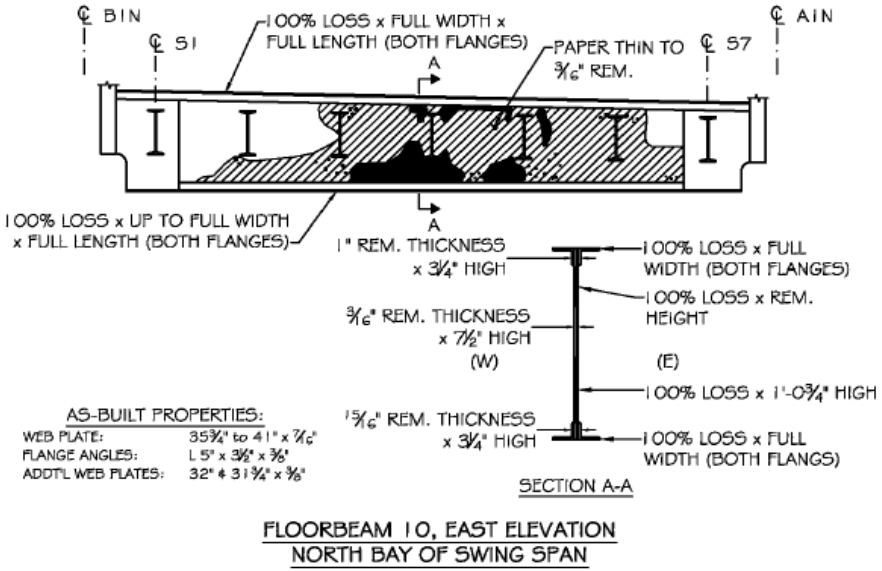
HONORING HISTORY – EXISTING FLOOR SYSTEM CONDITION



FLOORBEAM 10, EAST ELEVATION
NORTH BAY OF SWING SPAN

NORTHERN AVENUE BRIDGE

HONORING HISTORY – EXISTING TRUSS JOINT CONDITION

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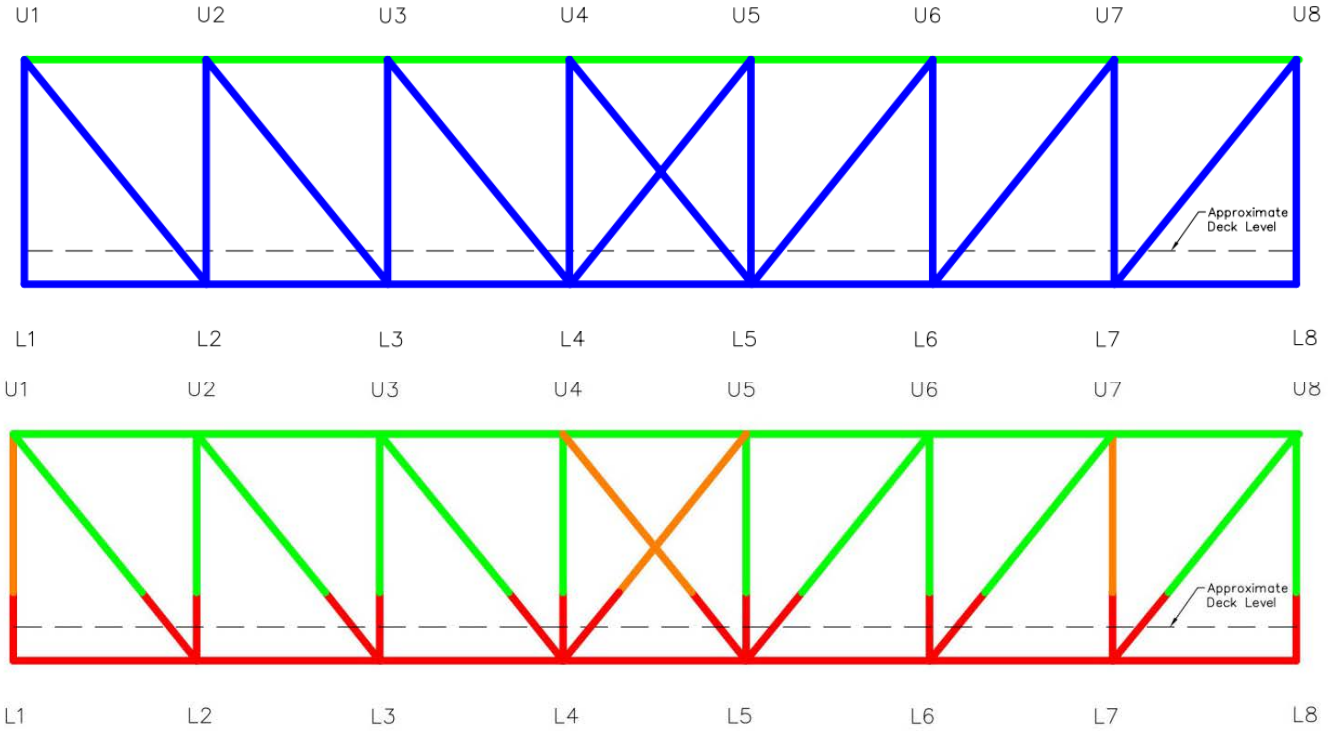
HONORING HISTORY - POTENTIAL RE-USE OF TRUSS MEMBERS



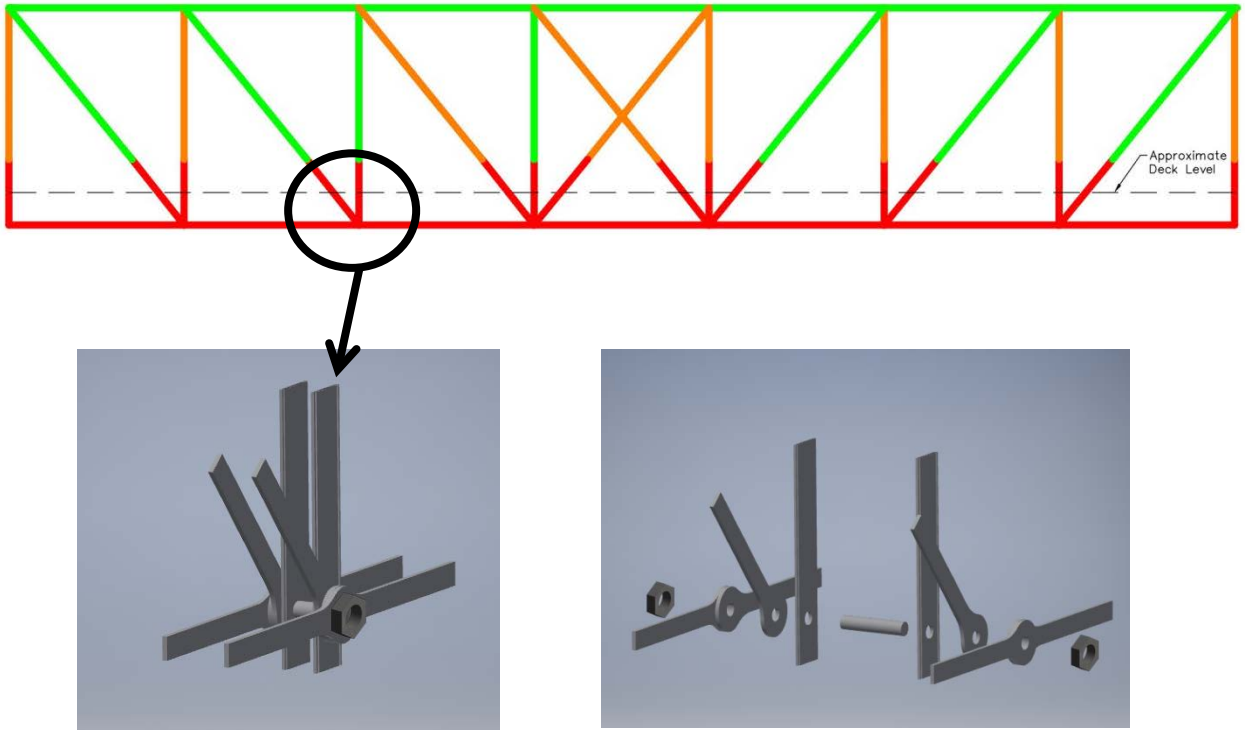
Color coded based on the DEFICIENCY LEVELS:
= Potentially Reusable Members
= Full Member Replacement

NOTE: SECONDARY LATERAL BRACING IS ALSO POTENTIALLY RE-USED (NOT SHOWN)

Potential Re-use Based on Existing Truss Conditions

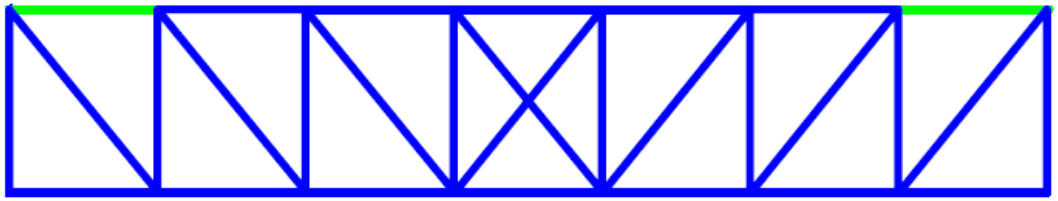
NORTHERN AVENUE BRIDGE

STRUCTURAL ANALYSIS RESULTS

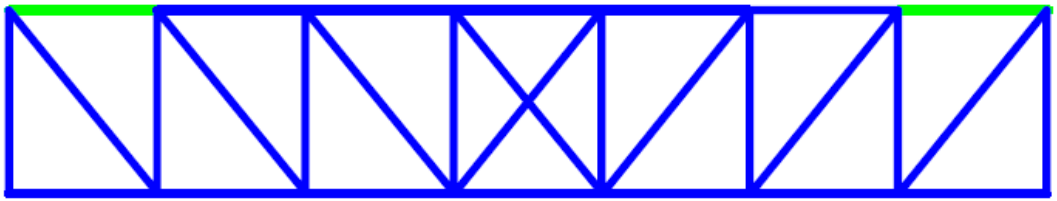


NORTHERN AVENUE BRIDGE

STRUCTURAL ANALYSIS RESULTS



Replaced In–Kind Option
Based on Conditions and Capacity
Replace 93.33% of the Primary Truss Members



Partially Enclosed Option
Based on Conditions and Capacity
Replace 93.33% of the Primary Truss Members

Span 1, Truss A2N
N.T.S.

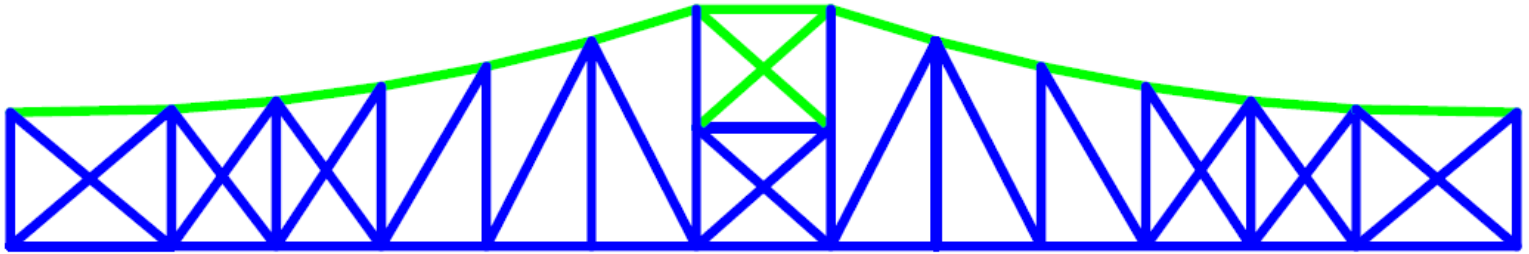
Color coding:

= Potentially Reusable Members

= Full Member Replacement

NORTHERN AVENUE BRIDGE

STRUCTURAL ANALYSIS RESULTS

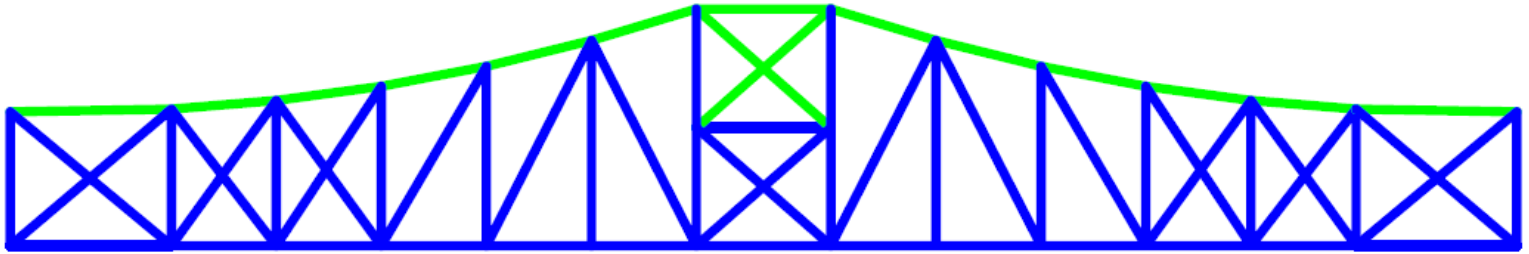


Color coding:

= Potentially Reusable Members

= Full Member Replacement

Replaced In-Kind Option
Based on Conditions and Capacity
Replace 76.56% of the Primary Truss Members



Partially Enclosed Option
Based on Conditions and Capacity
Replace 76.56% of the Primary Truss Members

Swing Span, Truss B1S
N.T.S.

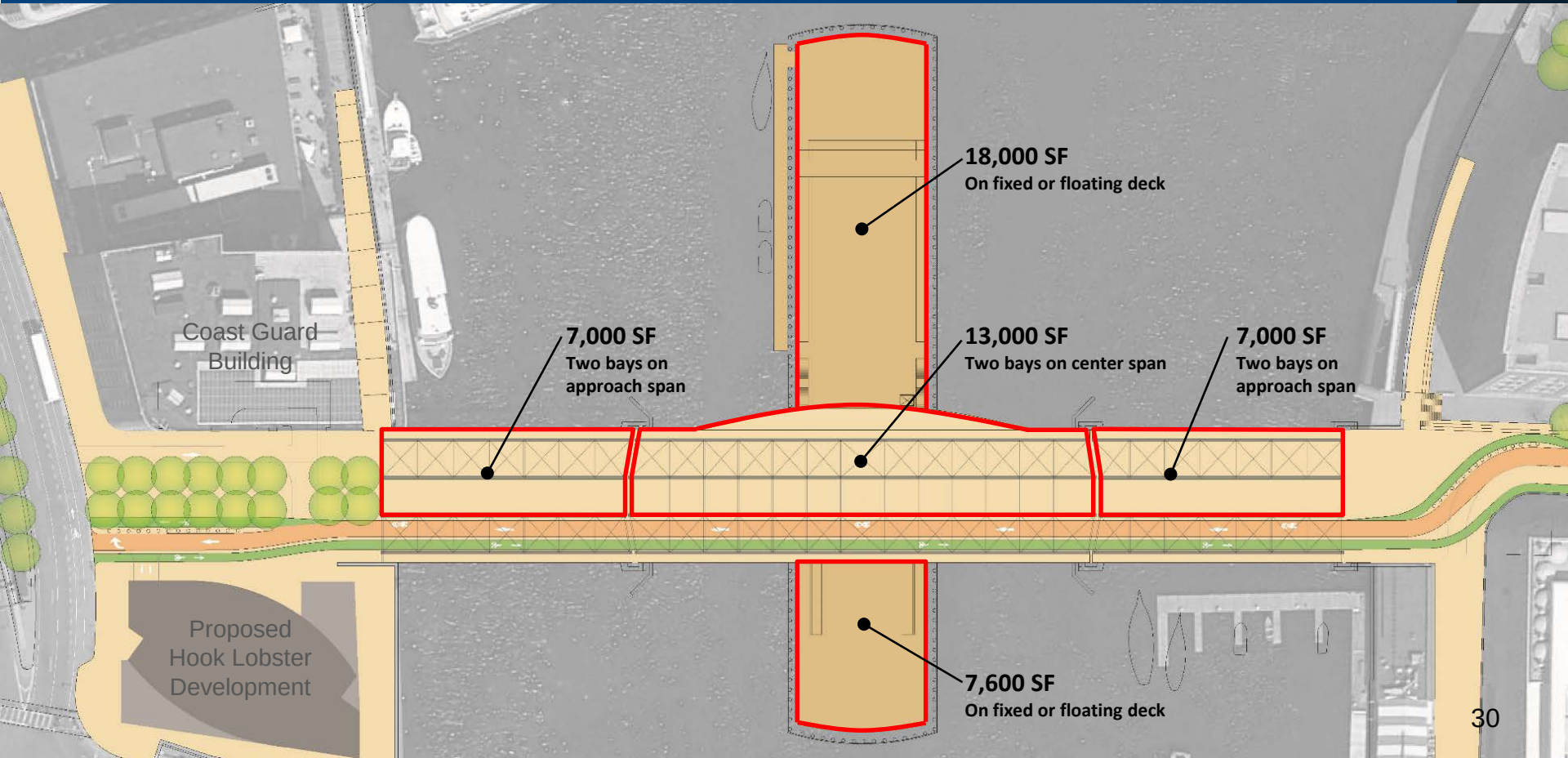
NORTHERN AVENUE BRIDGE

STRUCTURAL ANALYSIS RESULTS SUMMARY

Based on the existing conditions and structural capacity for the bridge as-is or clad:

- Replace 93% of the primary truss members on the approach spans
- Replace 76% of the primary truss members in the swing span
- Replace a total of 86% of the primary truss members across the entire bridge

PROGRAMMABLE SPACE
BRIDGE LEVEL



PLACE MAKING : USES FOR PROGRAMMABLE SPACE

Programmable Space Available

- 11,000 - 27,000 square feet on bridge, depending on bridge layout
- 25,600 square feet on island

Recent neighborhood briefings

- *Wharf District Council 7/17/18*
- *Fort Point Channel Neighborhood Association 7/18/18*
- *U.S. General Services Administration – being scheduled*

Website

- *Site has been live for two weeks*
- *We are receiving comments and suggestions and email sign-ups*
- *Community is Tweeting the meeting information*
- *We are expanding our outreach to cover all demographic groups*

Upcoming Task Force Meetings

MTG	Topics
August 2018	More detailed discussion of programmable space, Project Financing options, Permitting Agency coordination
September 2018	Public Workshops, Public Hearing

Northern Avenue Bridge
City of Boston

Mayor Martin J. Walsh