



# Metropolitan Water Tunnel Program

Working Group  
Meeting No 7

November 7, 2024



# Agenda

- Introductions
- Safety Minute
- Tunnel Program Overview
- Preliminary Design and Environmental Impact Report
- Tunnel Program Look Ahead
- Q&A/Closing
- Break & End of Virtual Meeting
- Shaft Site Figures
- Core Storage Tour



# MWRA Tunnel Program Team

- Kathy Murtagh, Director
- Paul Savard, Director of Design and Construction
- Sean Navin, Director of Intergovernmental Affairs (Working Group **Facilitator**)
- Vivian Chan, Manager of Geotechnical & Tunneling
- Brad Miller, Senior Program Manager – Geology
- Dave Abt, Program Manager, Design
- Gabby Tool, Project Manager, Design
- Kristin MacDougall, Communications Manager for Tunnel Program
- Carmine De Maria, Community Relations Coordinator



# Working Group Members

- Peter Salvatore, Boston
- Jay Hersey, Brookline
- Michael Retzky, Needham
- Louis M. Taverna, Newton
- Michael Chiasson, Waltham
- Dave Cohen, Wellesley
- Thomas E. Cullen Jr., Weston
- Richard Raiche, MWRA Advisory Board
- Martin Pillsbury, MAPC
- Moussa Siri, WSCAC

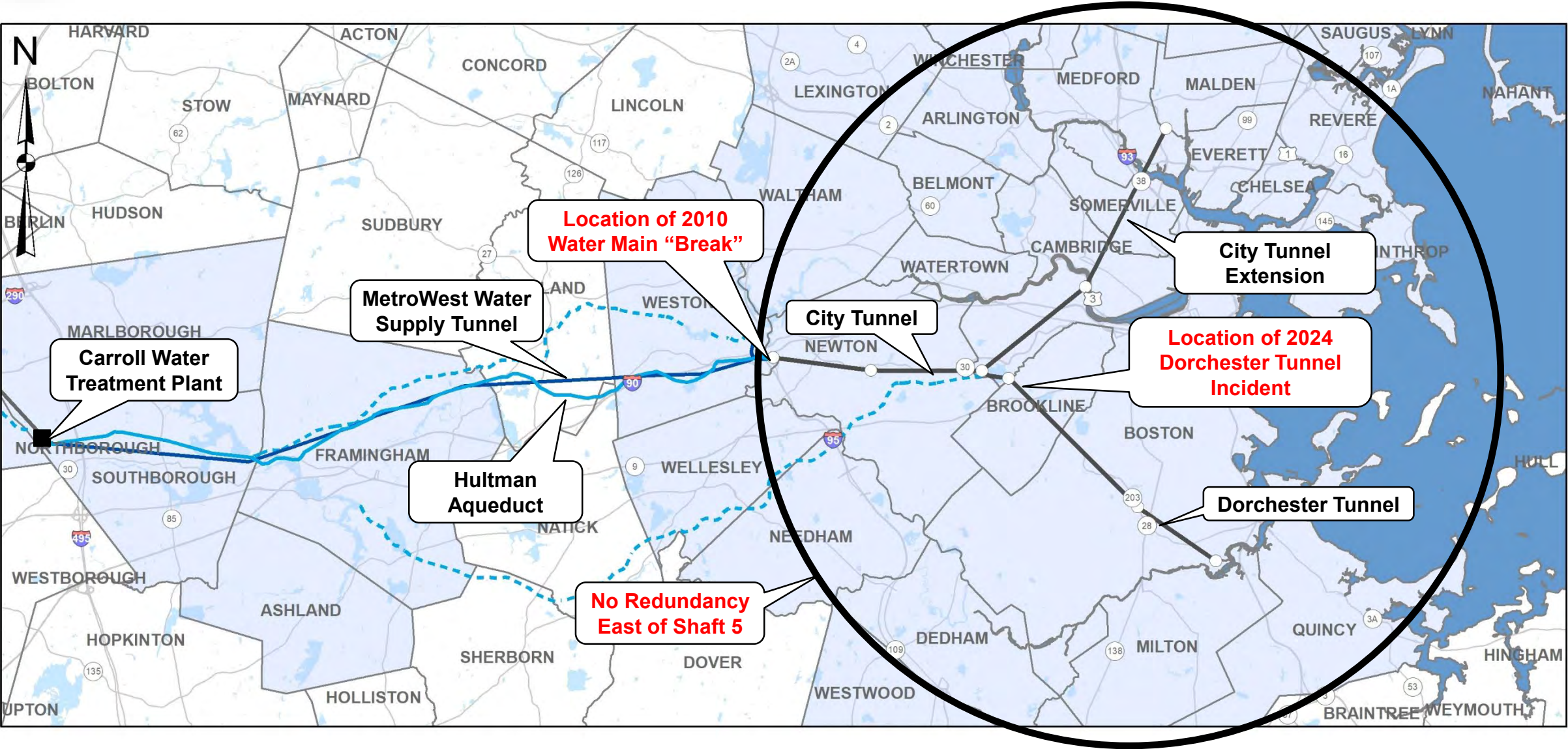




# *Tunnel Program Overview*



# Metropolitan Tunnel System Serves About 60 Percent of Water Demand in Metropolitan Area

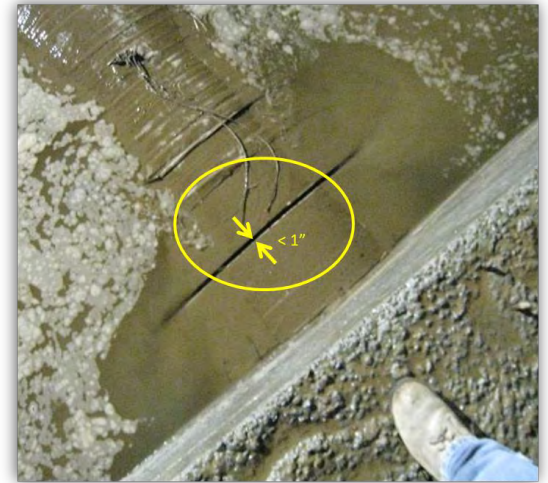






# Metropolitan Water Tunnel Program Purpose

- Our current Metropolitan Tunnel System, servicing the Boston area, is in need of repair
- The tunnels, valves, chambers & pipelines are between 50 – 80 years old



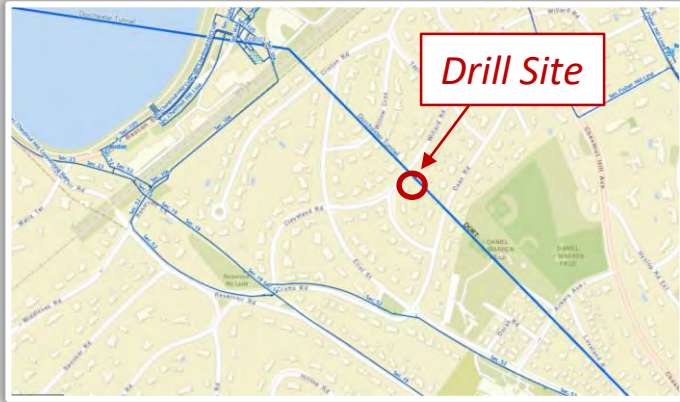
- Currently we cannot maintain our tunnel system east of Shaft 5 in Weston because a shutdown of the entire Metropolitan Tunnel System would be required
- The **Metropolitan Water Tunnel Program** will solve that problem by creating a redundant water tunnel system allowing the old system to be completely taken offline for inspection, maintenance, and repair





# Dorchester Tunnel Drilling Incident

Wednesday October 9<sup>th</sup>, a geothermal contractor drilled into the Dorchester Tunnel



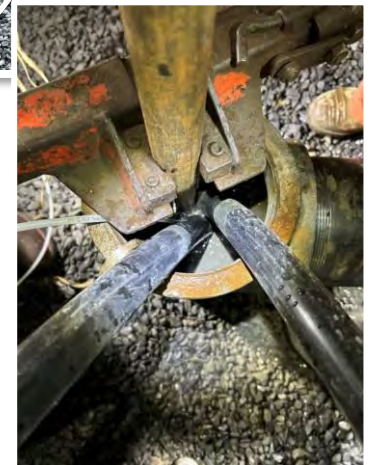
For 120 hrs, the MWRA isolated the Dorchester Tunnel and operated the Chestnut Hill Emergency Pump Station



While a repair (using a down hole packer & cement grout) was used to seal the borehole...in record time!



Averting a wide spread water supply emergency!

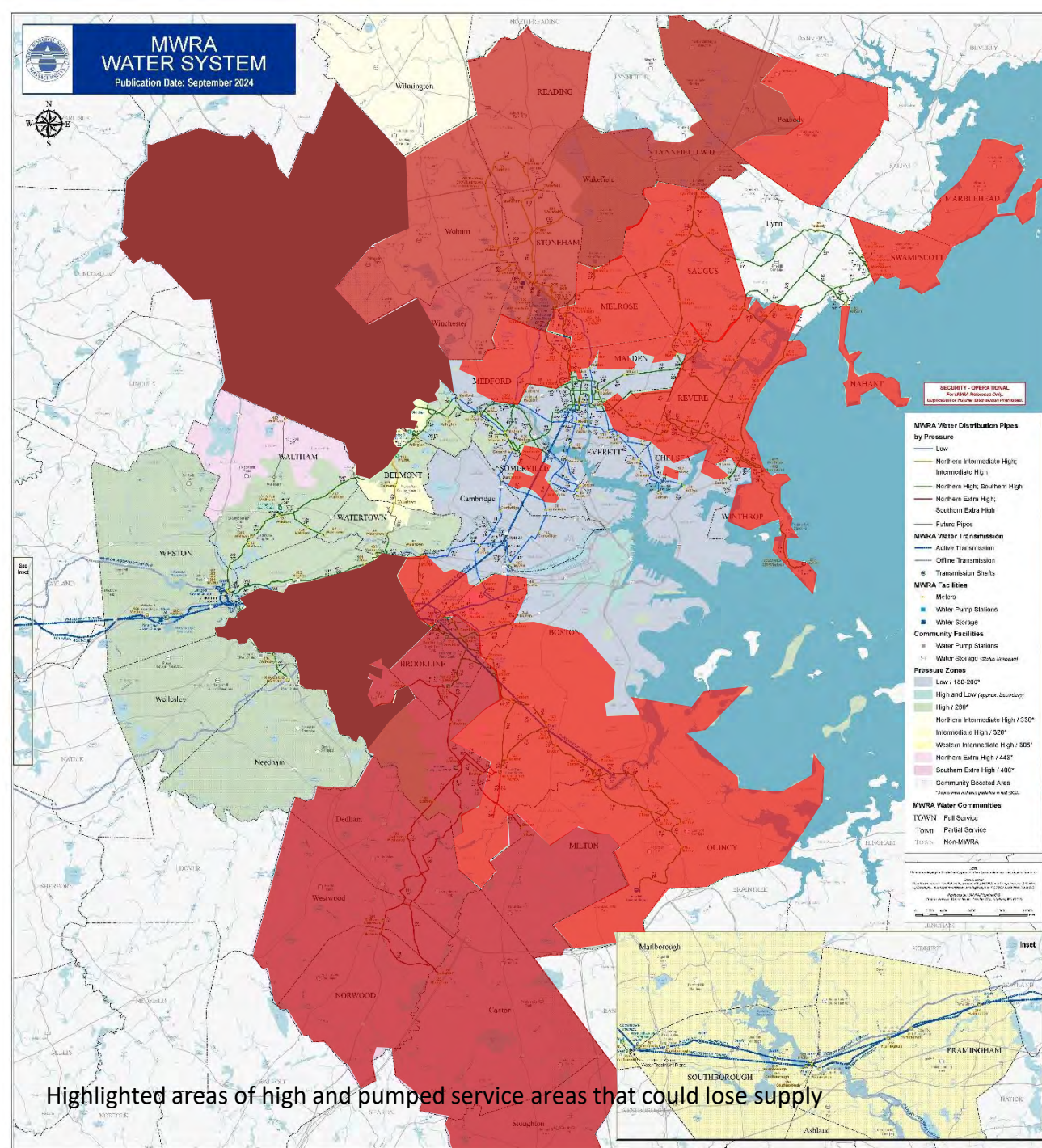






# Wide-Spread Impact

- Sudden shut down of entire Metropolitan Tunnel system
- Loss of supply to high service areas
- Pumped Service Areas lose supply as tanks empty
- Whole system would be on boil order
- Economic Impact for Total Water Loss - One Day:
  - \$360 million (2024)
- Economic Impact for Total Water Loss - Three Days:
  - \$1.1 billion (2024)





# Metropolitan Water Tunnel Program Goals

## Protect Public Health, Provide Sanitation and Fire Protection

- Provide full redundancy for the Metropolitan Tunnel System:
  - Provide normal water service and fire protection when the existing tunnel system is out of service
  - Provide the ability to perform maintenance on existing tunnels year-round
  - Provide uninterrupted service in the event of an emergency shut down
  - Meet high day demand flow with no seasonal restrictions
  - Avoid activation of emergency reservoirs
  - Meet customer expectations for excellent water quality
- Result in no future boil orders!





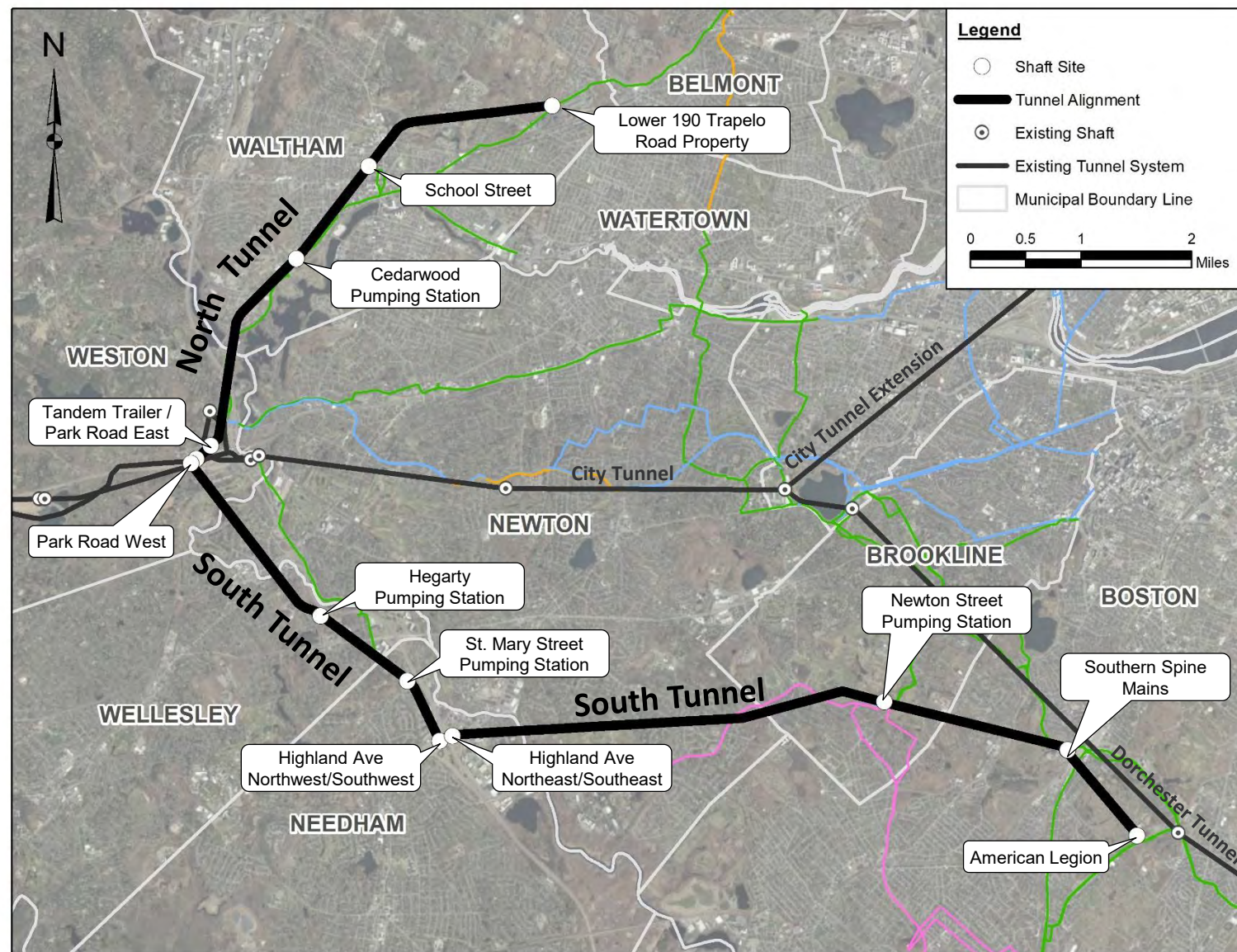
# *Preliminary Design and Environmental Impact Report*





# Metropolitan Water Tunnel Program

- ~15 miles of deep, hard rock, pressure tunnel
- Tunnels will begin in the Weston (I-90/I-95 vicinity)
- North Tunnel - ~5 miles, ends in Waltham
- South Tunnel - ~10 miles, ends in Mattapan near American Legion Hwy
- Six intermediate connections to existing water infrastructure
- Tunnel Construction anticipated between 2028 and 2040





# Preliminary Design & EIR – Performed in Parallel

- Shaft site selection
  - Meet system hydraulic requirements, provide full redundancy
  - Provide sufficient space for temporary construction staging and permanent infrastructure
- Establish tunnel alignment (both horizontal and vertical)
  - Minimize overall tunnel length
  - Avoid geo-hazards when possible
  - Maximize length of unreinforced concrete liner
  - Establish readily constructible tunnel segment lengths
- Avoid, minimize, and mitigate impacts to the environmental and communities to the maximum extent practicable
- Establish construction sequence and packaging
  - Promote good competition by qualified bidders
  - Balance risks
- Advance construction cost estimate and construction schedule



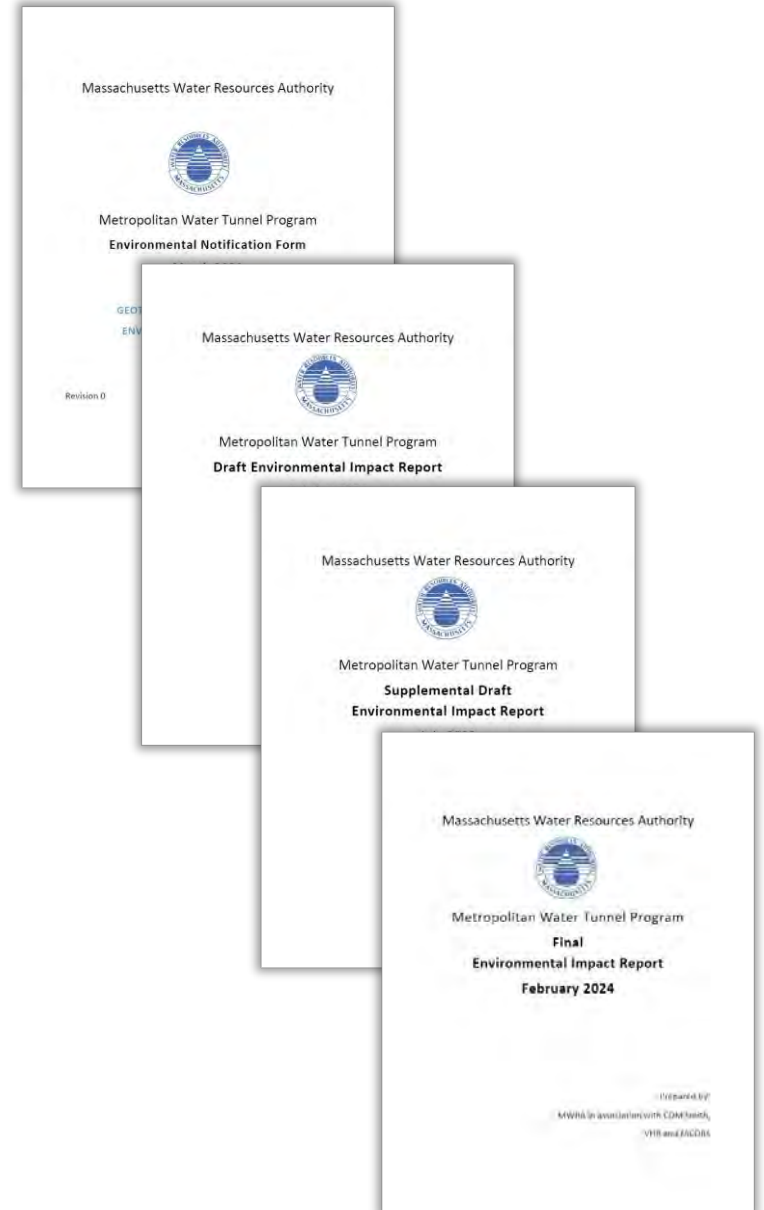
# Environmental Review Documents

## MEPA filings and Environmental Impact Reports:

- Environmental Notification Form (ENF), March 2021
  - Certificate Issued May 2021
- Draft Environmental Impact Report (DEIR), October 2022
  - Certificate Issued December 2022
- Supplemental Draft Environmental Impact Report (SDEIR), July 2023
  - Certificate Issued September 2023
- Final Environmental Impact Report (FEIR), February 2024
  - Certificate Issued April 2024

- These documents are available on our website:

<https://www.mwra.com/mwtp/resources.html#resources>







Maura T. Healey  
GOVERNOR  
Kimberley Driscoll  
LIEUTENANT GOVERNOR  
Rebecca L. Tepper  
SECRETARY

*The Commonwealth of Massachusetts*  
*Executive Office of Energy and Environmental Affairs*  
*100 Cambridge Street, Suite 900*  
*Boston, MA 02114*

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April 1, 2024

**CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS  
ON THE  
FINAL ENVIRONMENTAL IMPACT REPORT**

|                         |   |
|-------------------------|---|
| PROJECT NAME            | : Metropolitan Water Tunnel Program   |
| PROJECT MUNICIPALITY    | : Waltham, Belmont, Watertown, Weston, Newton, Wellesley,<br>Needham, Brookline, Boston, Dedham |
| PROJECT WATERSHED       | : Charles River and Boston Harbor   |
| EEA NUMBER              | : 16355   |
| PROJECT PROPONENT       | : Massachusetts Water Resources Authority (MWRA)  |
| DATE NOTICED IN MONITOR | : February 23, 2024   |

Pursuant to the Massachusetts Environmental Policy Act (MEPA; M.G.L. c. 30, ss. 61-62L) and Section 11.08 of the MEPA regulations (301 CMR 11.00), I have reviewed the Final Environmental Impact Report (FEIR) and hereby determine that it adequately and properly complies with MEPA and its implementing regulations.

Project Description

As described in the FEIR, the Massachusetts Water Resources Authority (MWRA) is proposing to construct two new deep rock water supply tunnels (north and south alignments totaling ±14.6) that will provide redundancy for MWRA's existing Metropolitan Tunnel System, which includes the City Tunnel (constructed in 1950), City Tunnel Extension (constructed in 1963) and Dorchester Tunnel (constructed in 1976). This tunnel system has been in continuous service since construction. While the concrete lined deep rock tunnels have a long design life, some of the associated valves and piping have exceeded their design life and are currently in poor condition. A redundant system is needed to maintain and/or replace some of these valves and piping without interruption to water supply. The project will provide the redundancy to allow for system maintenance and repair, without disrupting service to over 2.5 million water customers. Under current conditions, if the Metropolitan Tunnel System is shut down, water must be supplied from open reservoirs containing nonpotable water, backup aqueducts, and undersized surface mains to distribute the nonpotable water with inadequate pressure. These backup

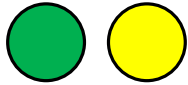






# Shaft Sites

## Construction Shaft Sites



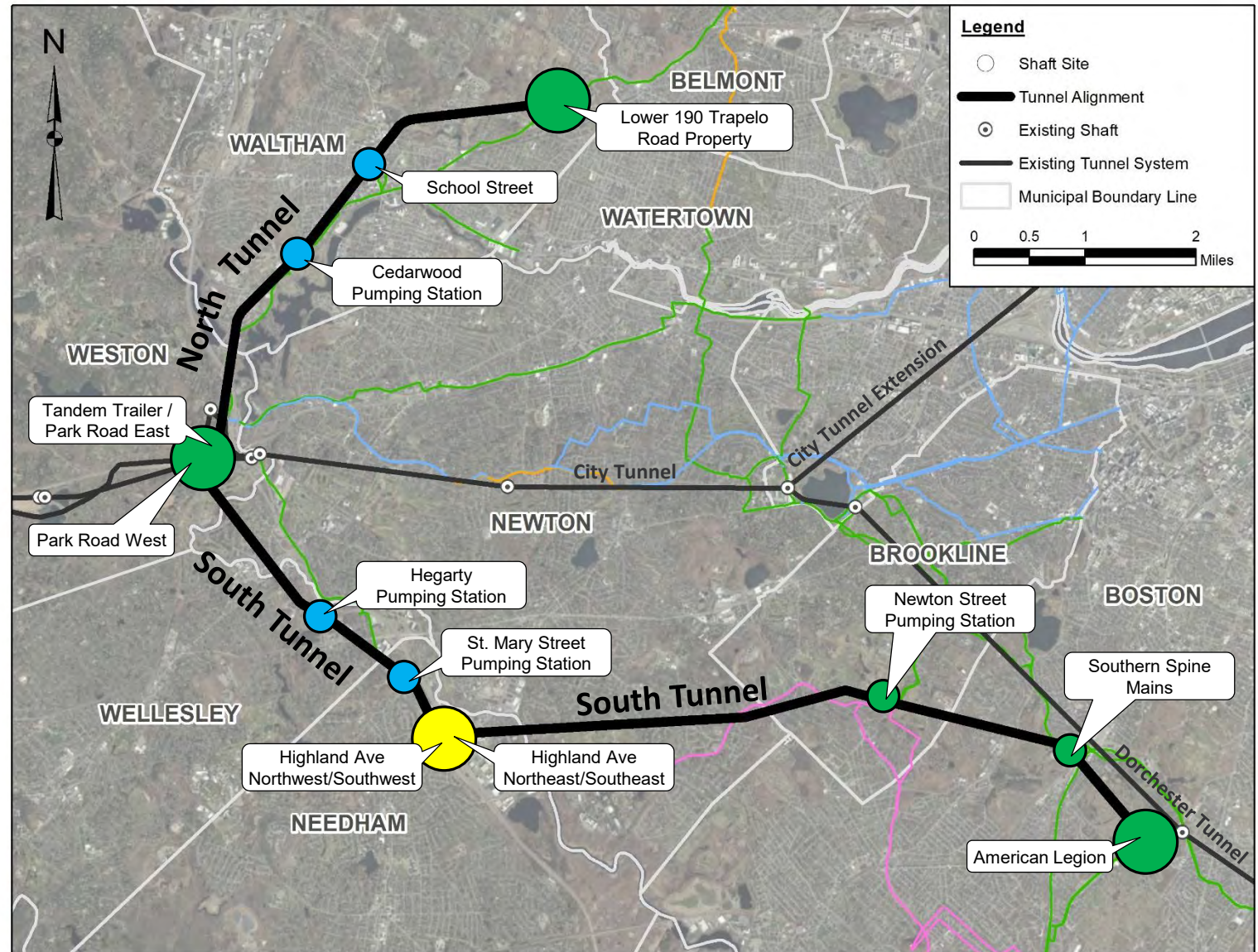
- WASM 3 Connection, Waltham
- I90/I95 Interchange, Weston
- Highland Ave/I95 Interchange, Needham
- American Legion, Mattapan

## Connection Shaft Sites



- Lexington St Pump Station, Waltham
- Cedarwood Pump Station, Waltham
- Hegarty Pump Station, Wellesley
- St. Mary Street Pump Station, Needham
- Newton Street Pump Station, Brookline
- Southern Spine Mains, Boston

- Required Connection (required for system redundancy)
- Secondary Connection (provides local benefit)
- Construction Shaft (South Tunnel Isolation)

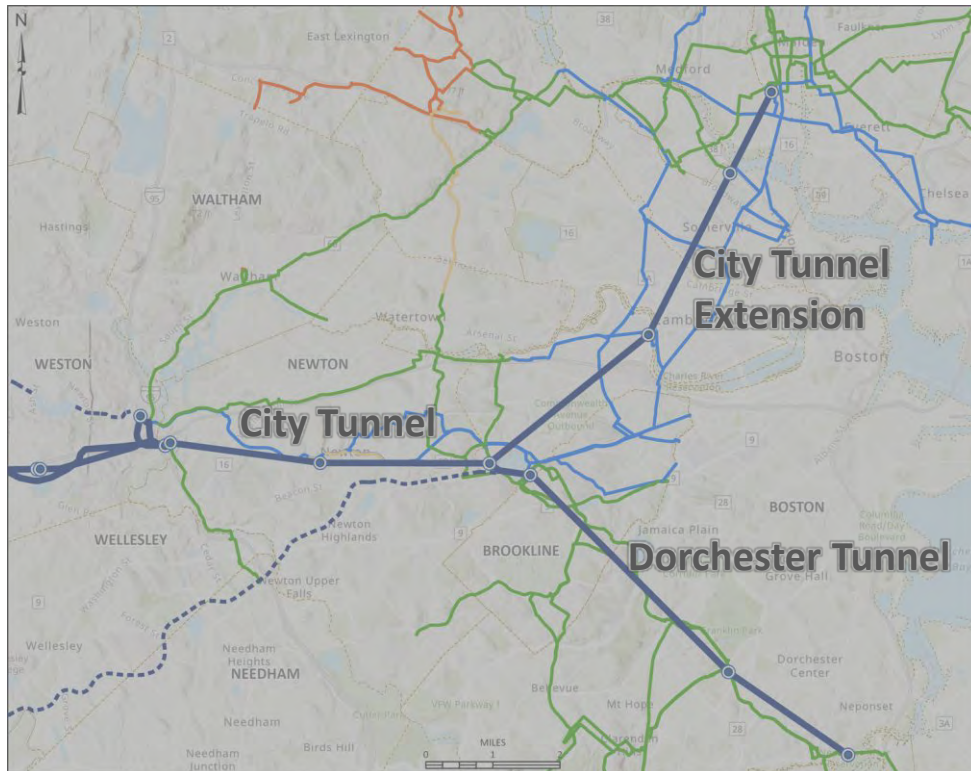




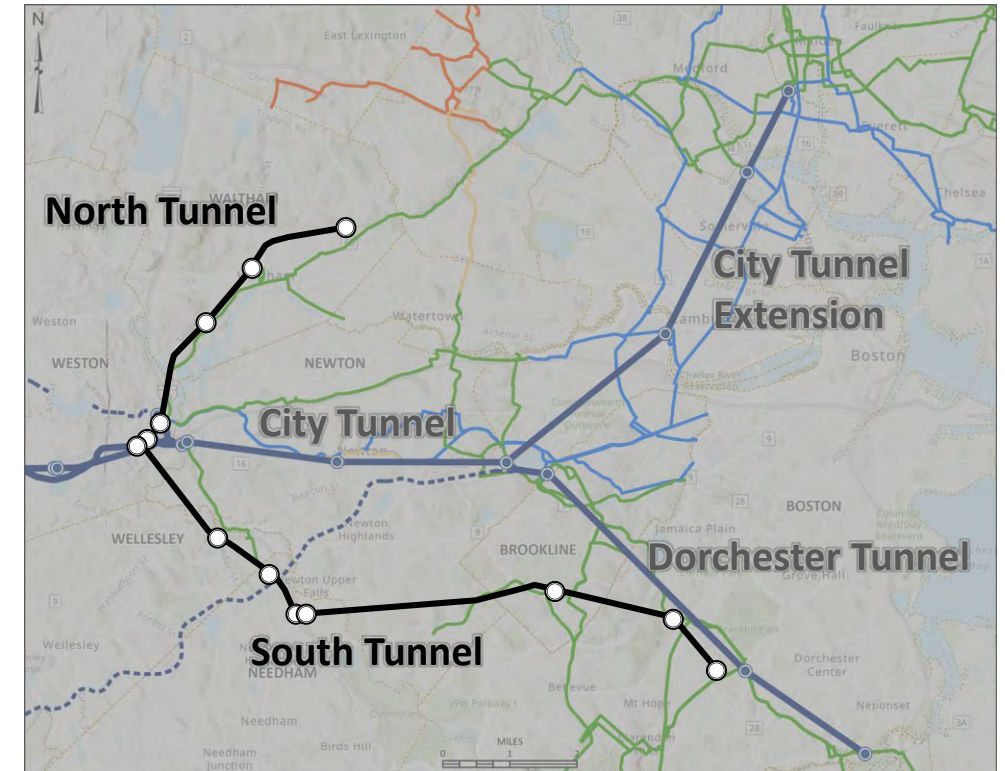
# Program Overview - Purpose

Purpose: To provide redundancy to the Metropolitan Tunnel System.

Today



When Completed



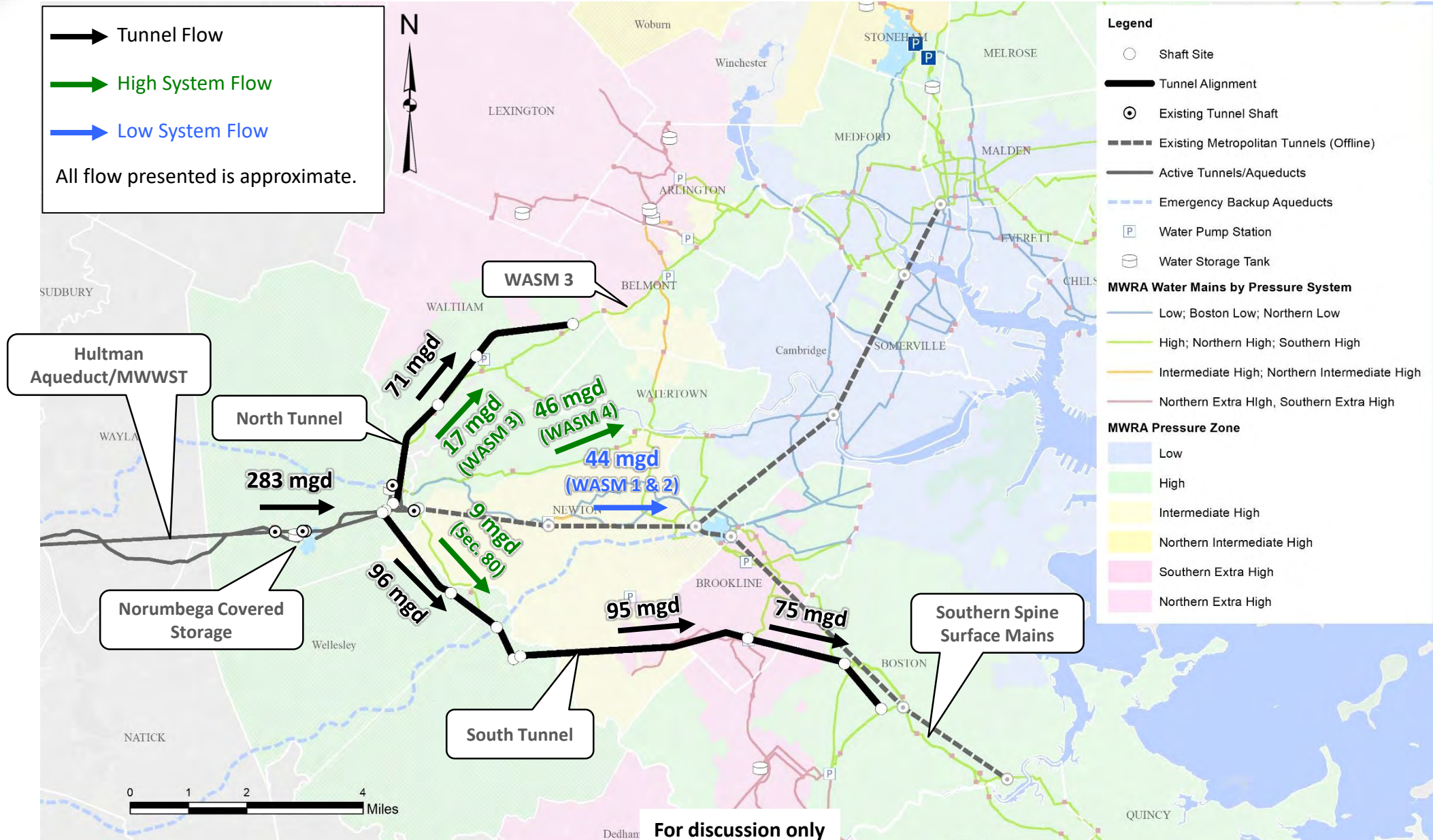
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# New Tunnel System (Existing Tunnel System Offline)

## Projected High Day Demand 283 mgd East of Norumbega (2060)

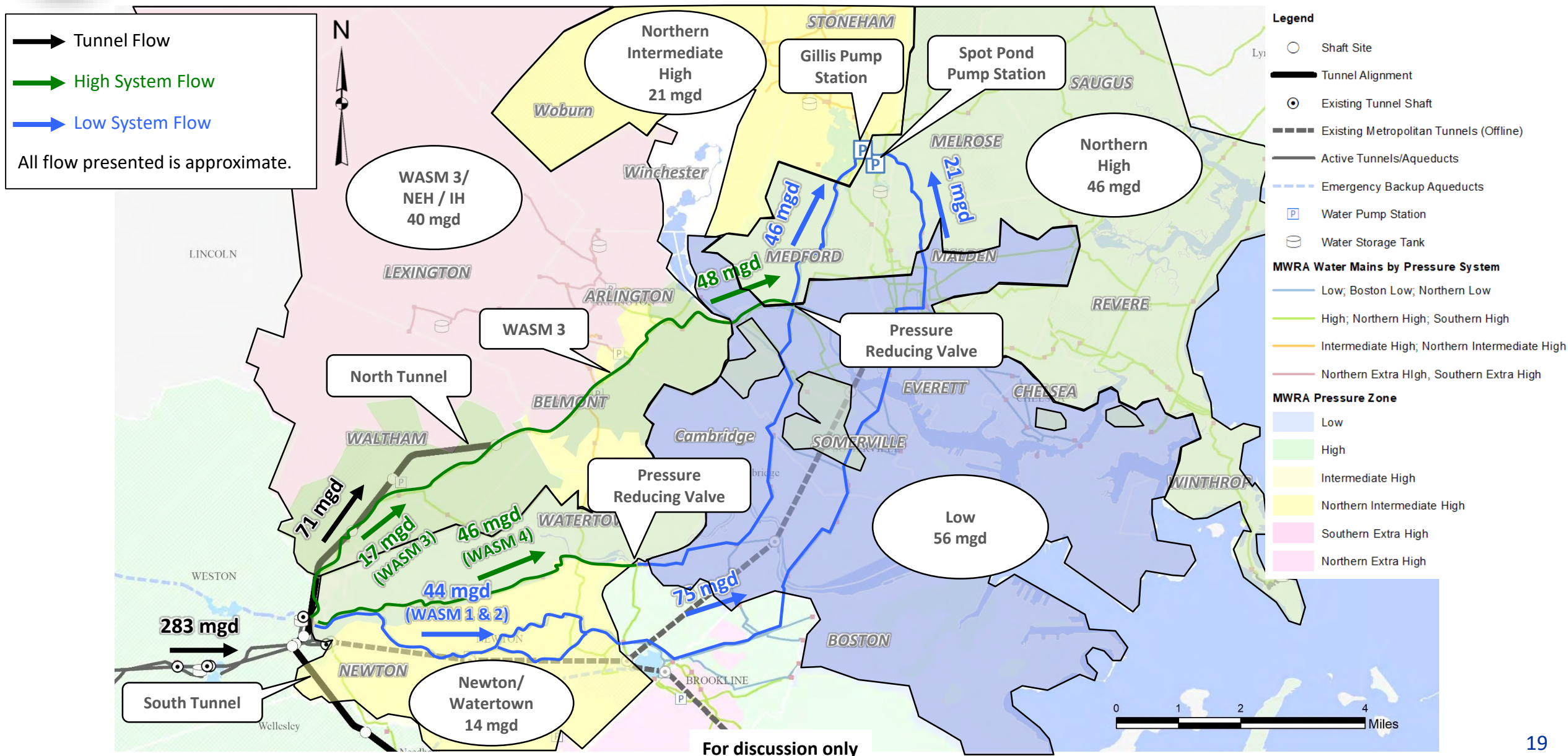






# New Tunnel System (Existing Tunnel System Offline) – North

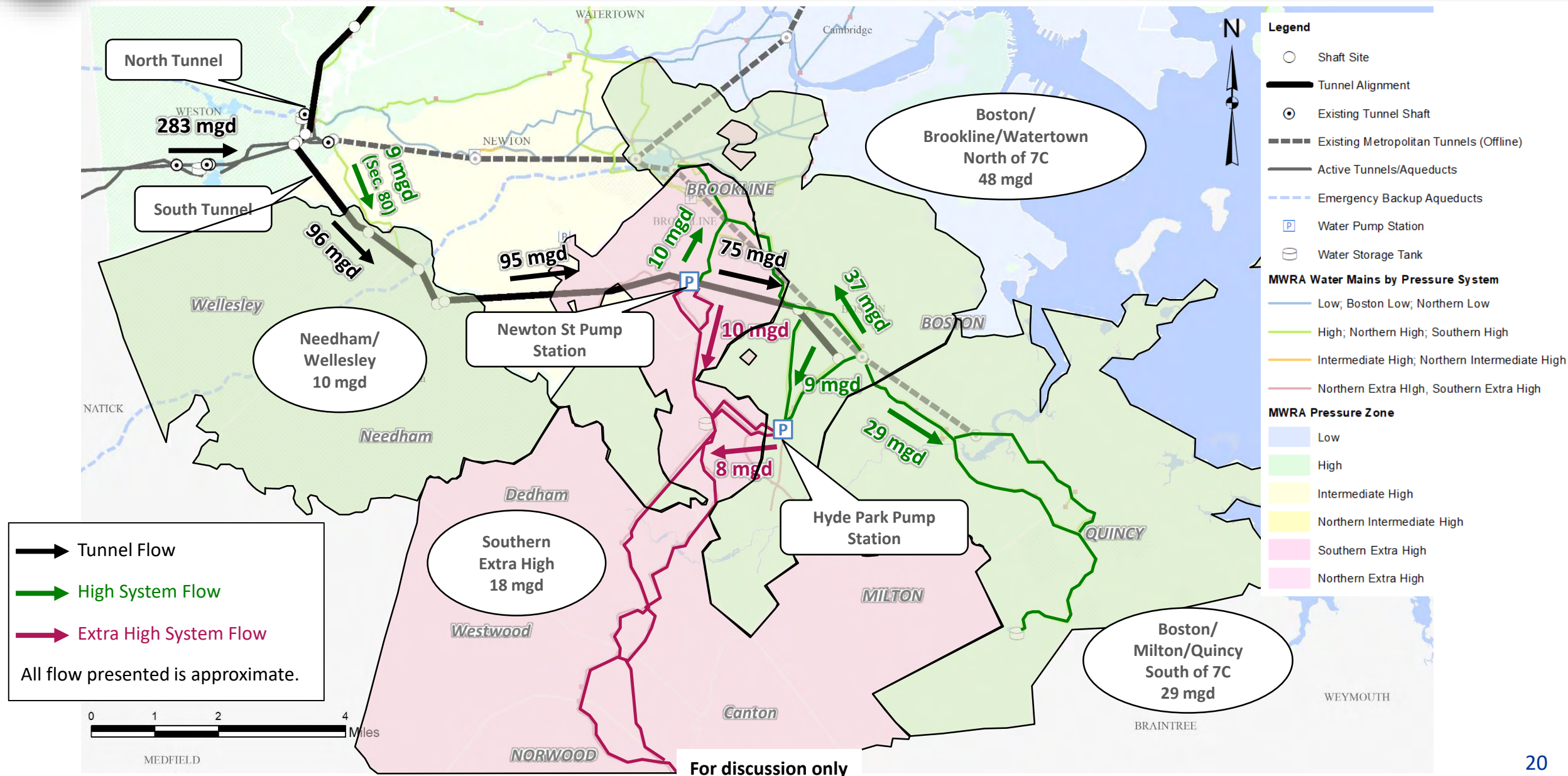
*Projected High Day Demand 283 mgd East of Norumbega (2060)*





# New Tunnel System (Existing Tunnel System Offline) – South

*Projected High Day Demand 283 mgd East of Norumbega (2060)*

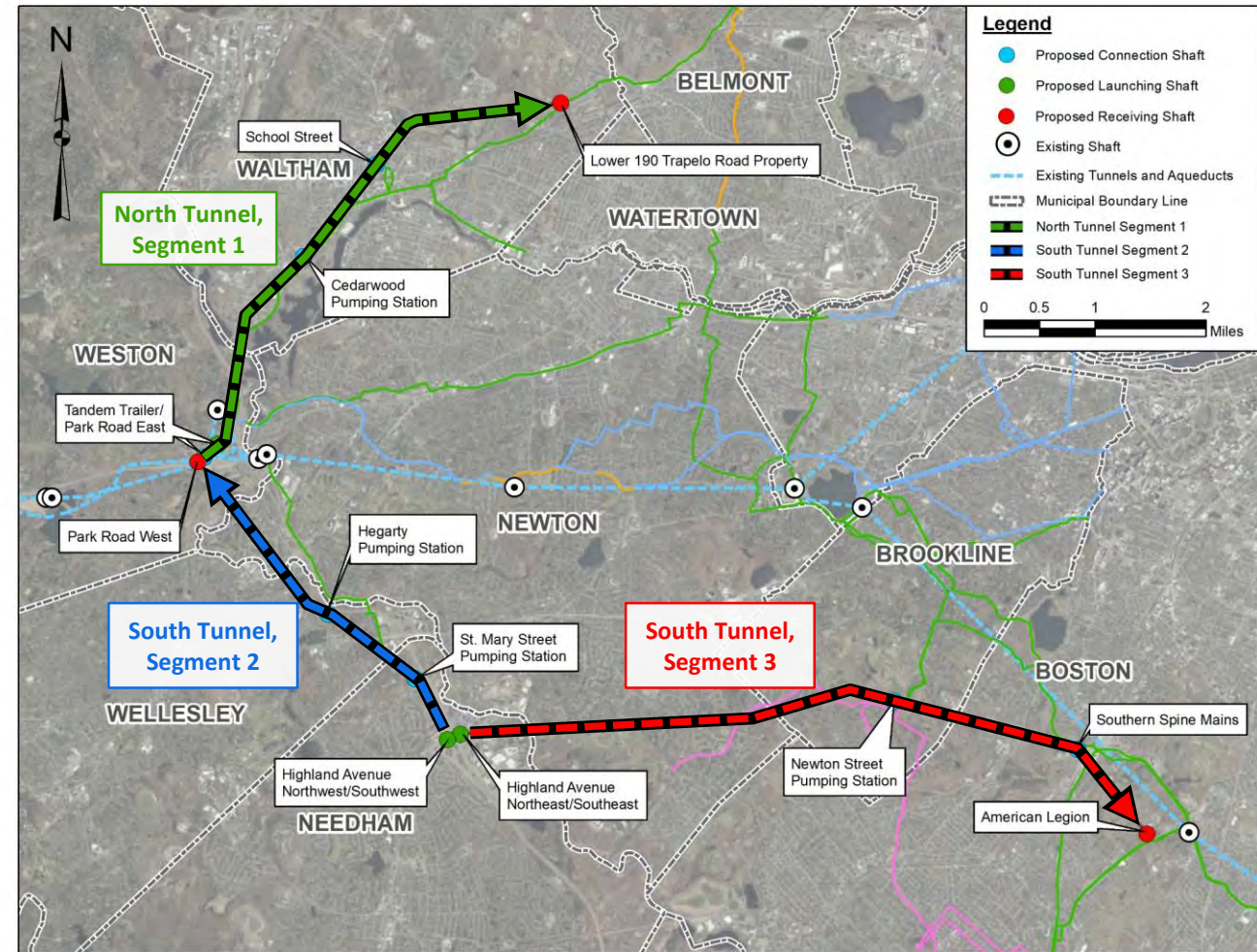






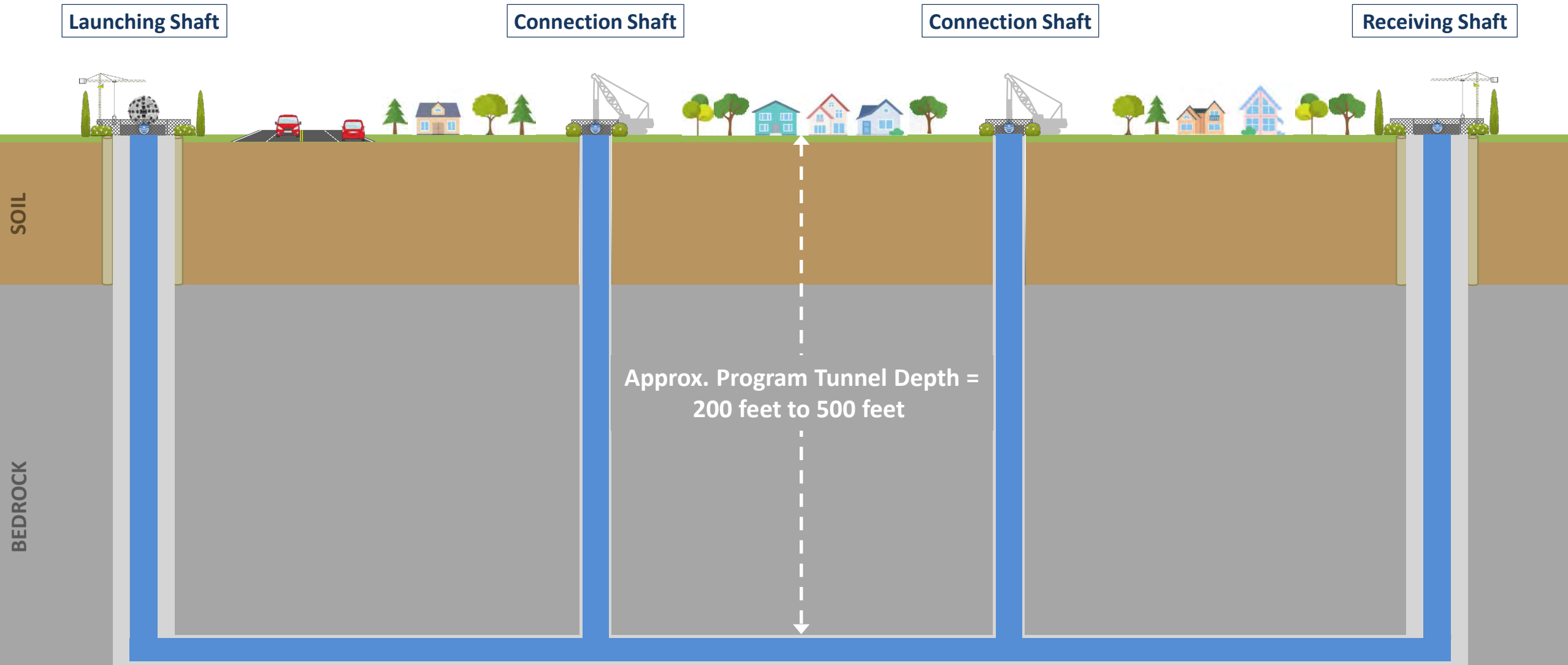
# Tunnel Alignment & Segments

- 15 miles of deep, hard rock, pressure tunnel, 200 to 500 feet deep
- Three tunnel segments (4.8, 3.4 and 6.8 miles long)
- Three launching and three receiving shafts
- Six intermediate connection shafts
- Alignment has been adjusted to avoid known geo-hazards
- Two tunnel construction packages
  - North Tunnel (Segment 1)
  - South Tunnel (Segments 2 & 3)





# Conceptual Construction



NOT TO SCALE  
For discussion only



# Potential Permits and Approvals

## **Municipal**

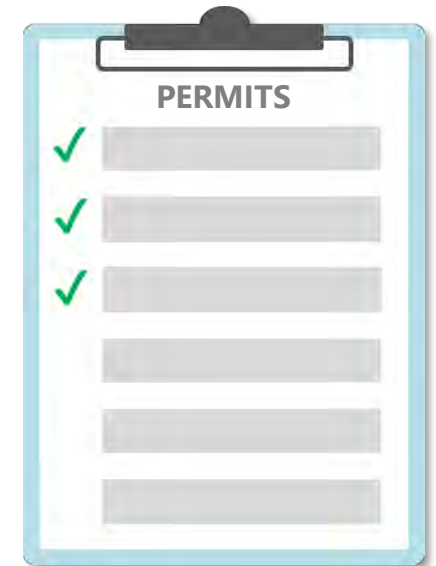
- Wetlands Protection Act Order of Conditions
- Roadway Access Permits/Street Opening Permit
- Hydrant Permit
- Drainage Discharge Permit

## **Commonwealth of Massachusetts**

- Massachusetts Environmental Policy Act (MEPA) Review
- Massachusetts Historical Commission (Massachusetts General Law Ch. 9, Section 26-27C)
- Highway Access/Construction Access Permits
- MBTA Right of Way Access License Agreement
- Natural Heritage Endangered Species Program
- Water Management Act Permit
- Chapter 91 Licenses
- Superseding Order of Conditions, upon appeal
- Section 401 Water Quality Certificate
- Distribution System Modification
- Land disposition/easements
- Article 97 Land Disposition Legislation

## **Federal**

- National Pollutant Discharge Elimination System (NPDES) Construction General Permit (CGP)
- NPDES Dewatering and Remediation General Permit (DRGP), if needed
- Section 404 Department of the Army Permit (General and Preconstruction Notice)



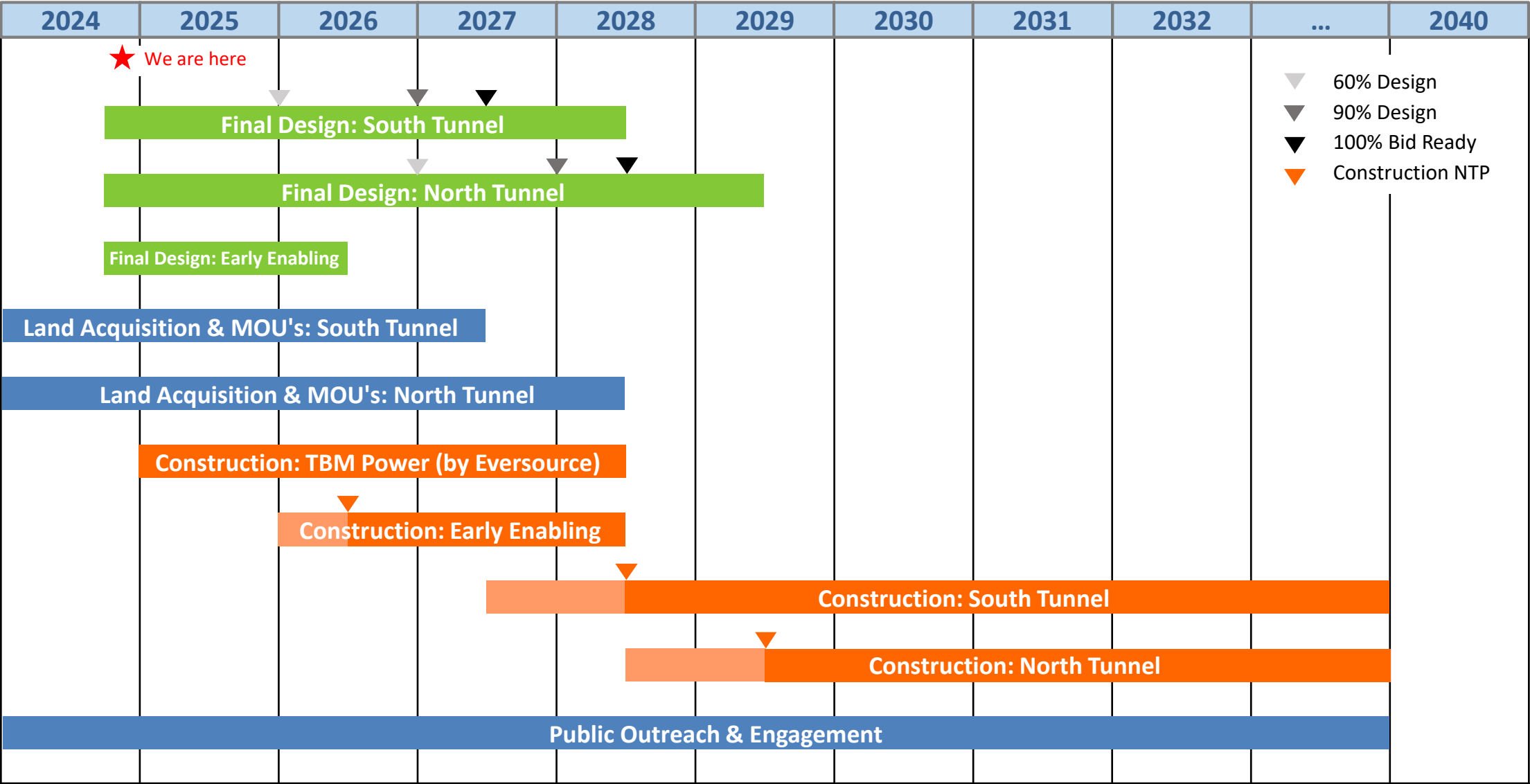




## *Tunnel Program Look Ahead*

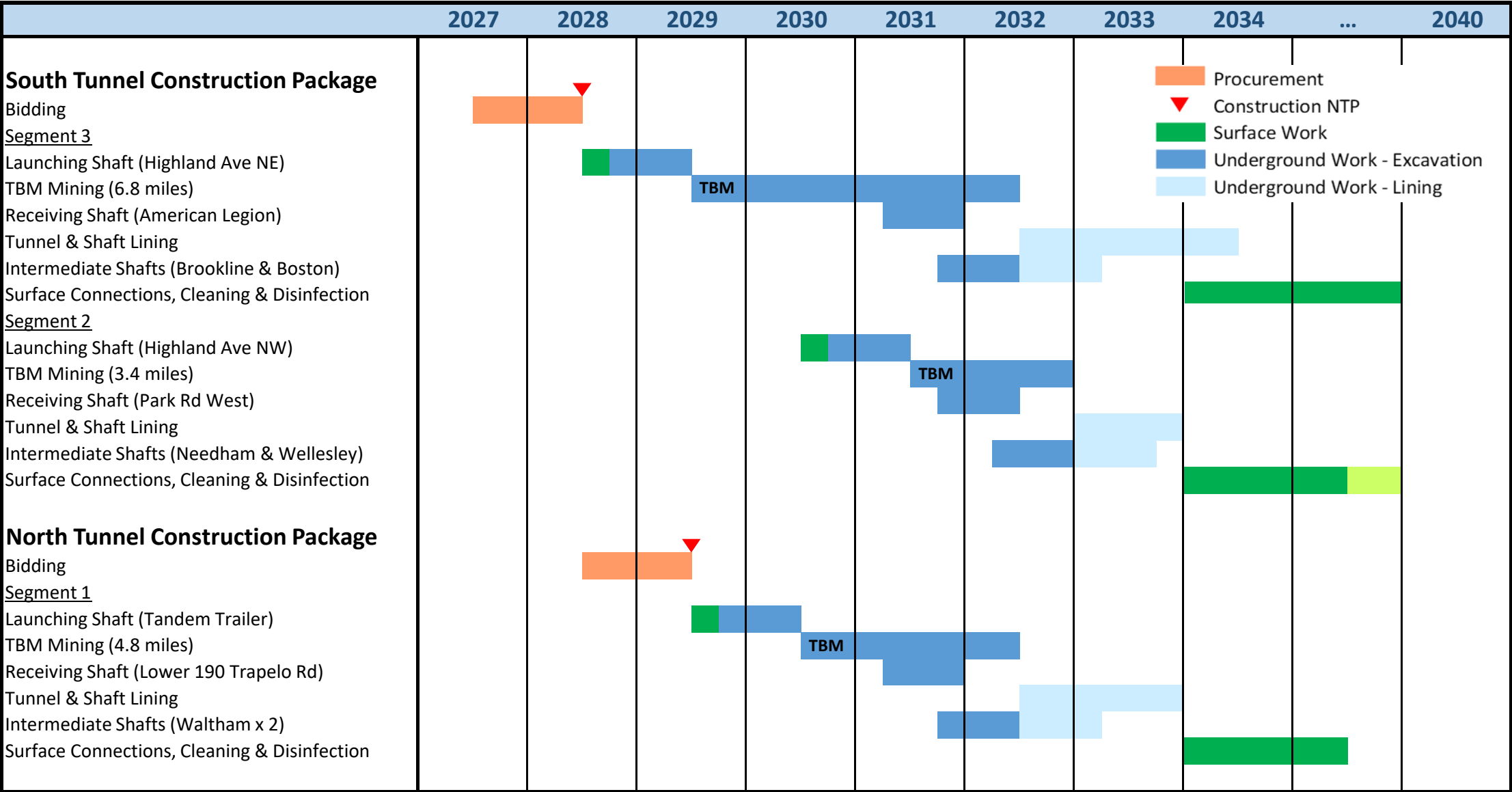


# Tunnel Program - Schedule





# Tunnel System – Conceptual Construction Sequence



Note: Schedule presented here demonstrates only one possible construction schedule. Schedule subject to change.





# Critical Path Tasks

- Geotechnical Investigations (Core Storage Tour)
- Land Acquisitions
- TBM Power Supply
- Community/Stakeholder Agreements (MOU's)



- Tunnel Construction

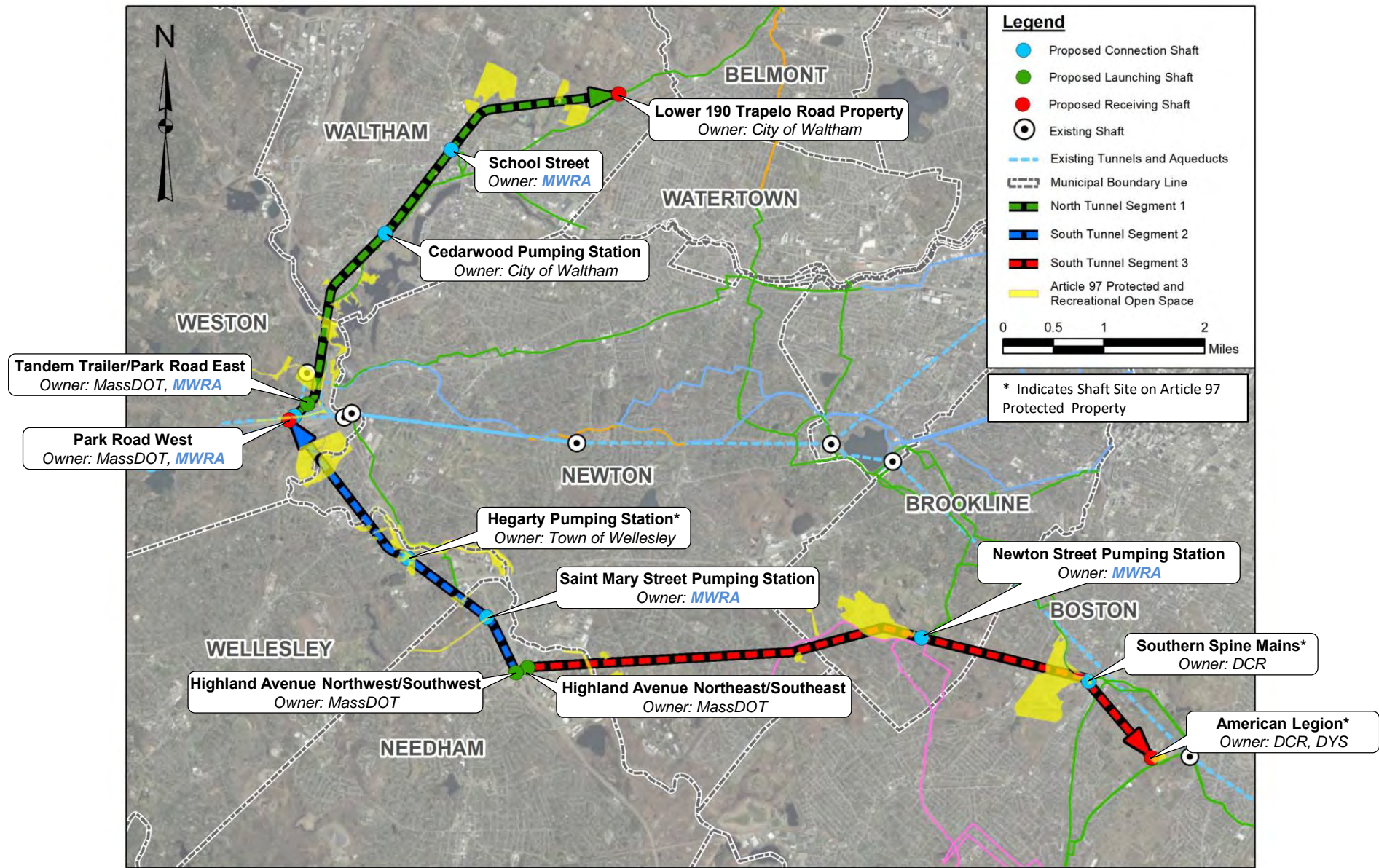


# Land Acquisitions

- 13 shaft sites -
  - Larger temporary staging area and smaller permanent facility footprint
  - MWRA owns 3 shaft sites & has partial control of 2 shaft sites already
- Pipeline easements - ~6,000 ft
- Permanent surface access easements - ~9 sites
- Subterranean easements - ~600 individual properties
- ~3.8 acres of land for permanent facilities will require Article 97 legislation
- Land purchases/easements will be based on appraised value and negotiations
- Own in fee (most sites) or permanent easement
- Land acquisitions will require multiple approvals
- Goal - All land to be acquired prior to tunnel construction bidding (2027-2028)



# Land Acquisitions & Article 97 Properties

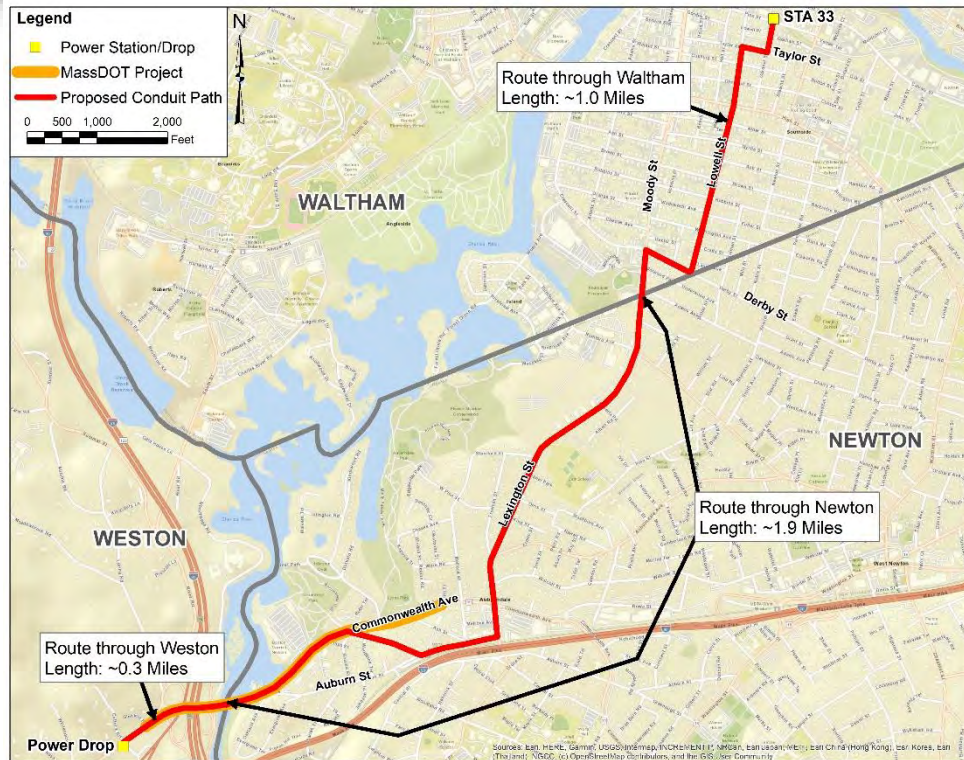


For discussion only





# TBM Power Supply

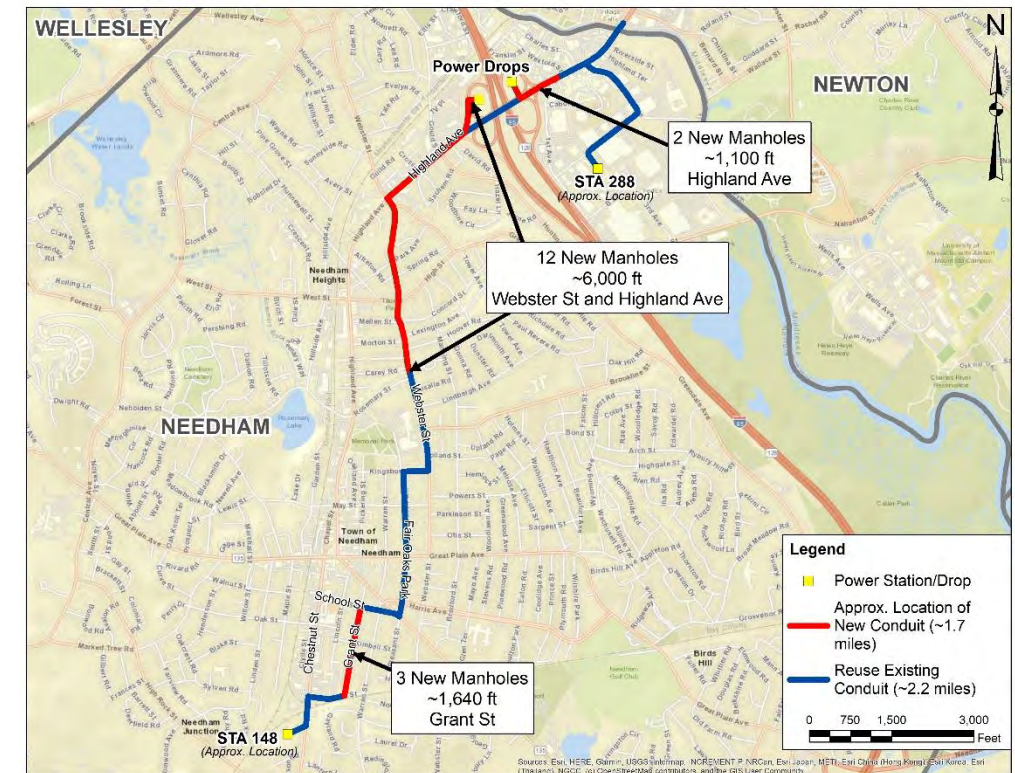


## I90/I95 – Tandem Trailer Launching Shaft Site:

- ~3.2 miles of new duct bank & cable
- Coordinating with ongoing MassDOT project along Route 30
- Through Waltham, Newton & Weston

## Highland Ave Launching Shaft Sites:

- ~1.7 miles of new duct bank & cable
- ~2.2 miles of reused duct bank & cable
- All within Needham



Eversource will design and install all new duct bank & cable

Eversource construction is expected to be complete by tunnel construction bidding (2027 – 2028)

Power supply will remain and provide added resilience to the power grid

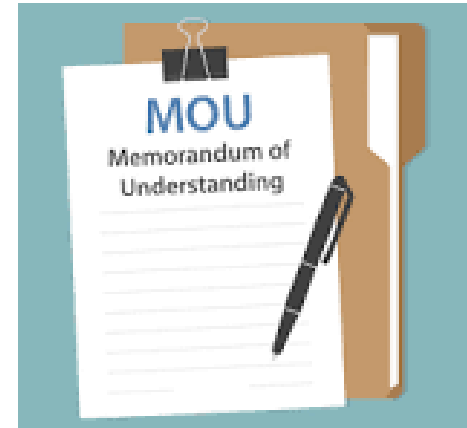
For discussion only



# Community/Stakeholder Agreements (MOU's)

Topics may include:

- Easements & land acquisitions
  - Permitting and local regulations
  - Public safety, emergency response, tunnel rescue services
  - Protection of public/private wells, water supply contingency
  - Work hours, trucking hours and routes
  - Traffic management, signals and signage, lane closures, detours
  - School zone, school bus routes
  - Dust and noise control, blasting and vibration control
  - Wetland protection, restoration, revegetation, replication
  - Monitoring and protection of existing buildings/infrastructure
  - Connections to community water systems
  - Mitigations and final site conditions (fencing, lighting, landscaping, etc.)
  - Public communication, hot line, notices, email lists, complaint & claims process
  - Technical assistance
- 
- Goal - MOUs to be finalized before tunnel construction bidding (2027 – 2028)





# Emergency Response

- Shafts in six (6) communities, tunnel alignment beneath seven (7) communities
- Advance coordination is needed to ensure coordinated emergency response during construction
  - Uniqueness of the underground construction environment and its hazards
  - Anticipated role and responsibilities of the MWRA tunnel contractors and community Emergency Responders
    - Tunnel Contractors to provide all OSHA required tunnel rescue resources (2 teams)
    - Community Emergency Responders assume incident command on the surface and, if needed, support underground for extrication and medical care
  - Training and equipment needed by the community Emergency Responders throughout tunnel construction
- MWRA resources will be provided to ready the community Emergency Responders
- Emergency response coordination needs to be tailored to each communities' capabilities and size
- MWRA is **already working with** your community Emergency Responders to determine what resources are needed
- MOU's between MWRA and each community will include emergency response support







# Community/Stakeholder Agreements (MOU's)

- Expect to execute MOU's with 7 communities (Waltham, Weston, Wellesley, Needham, Newton, Brookline & Boston)
- Expect to have agreements/MOU's (or similar) with DCR, MassDOT, and DYS related to land acquisitions
- All MOU's must be presented to the MWRA Board for approval
- MOU's will also require community/agency approval
- MOU's will become part of the bid documents (binding to the Contractor)
  
- MOU requirements need to be worked into the design (now through ~90% submittal)
- MOU's are on the critical path
  
- Let's start chipping away....



# *Public Information Session*



## **Metropolitan Water Tunnel Program**

### **Public Information Session**

January 30, 2025

6:30pm to 8:00pm

Needham Town Hall - Powers Hall

1471 Highland Avenue

Needham, MA 02492





# How to Contact Us / Where to Find Information

- Contact Us
  - Carmine DeMaria, Community Relations Coordinator
  - 617-305-5725
  - [Carmine.DeMaria@mwra.com](mailto:Carmine.DeMaria@mwra.com)
  - [Tunnels.info@mwra.com](mailto:Tunnels.info@mwra.com)
- <https://www.mwra.com/mwtp/resources.html>
  - Program documents (ENF, DEIR, SDEIR, FEIR)
  - Meeting notices, agendas, presentations, minutes



*Questions ?*



# Metropolitan Water Tunnel Program



Thank you for your  
support!





*Break /  
End of Virtual Meeting*



# *Shaft Site Figures and Core Storage Facility Tour*