



Massachusetts Water Resources Authority

Metropolitan Water Tunnel Program

Town of Weston

Select Board Meeting

January 10, 2023



Topics

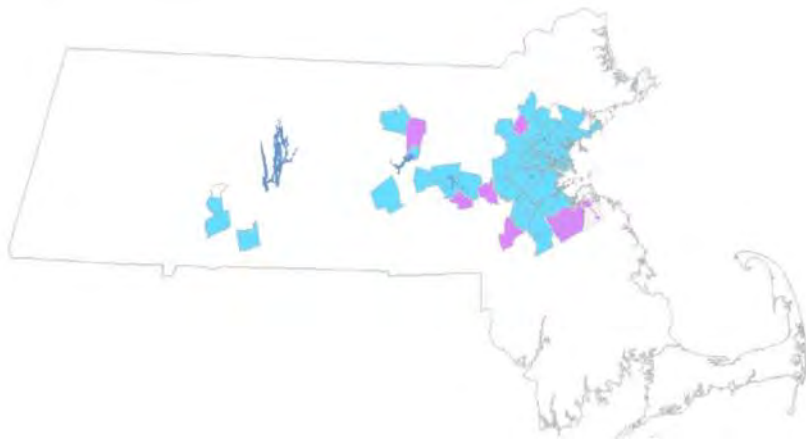
- MWRA
- Metropolitan Water Tunnel Program
- DEIR / Preferred Alternative
- Tunnel Program Schedule
- What Happens at a Shaft Site
- Possible Construction Impacts & Management
- Community & Stakeholder Outreach
- Where to Find Information / How to Contact Us
- Questions?



MWRA - What We Do ...

The MWRA ...

- provides wholesale water and wastewater services to over 3.1 million customers in 61 communities
- delivers an average of 200 million gallons per day to its water customers
- collects and treats an average of 350 million gallons of wastewater per day, with a peak capacity of 1.2 billion gallons



We have ...

- 102 miles of active transmission mains and tunnels (plus 43 miles on standby), including a number of deep rock pressure tunnels
- 284 miles of distribution mains with over 4,700 valves
- 5 years of storage for water supply
- 12 pump stations
- ~ 85% of our water is delivered by gravity

We Must....

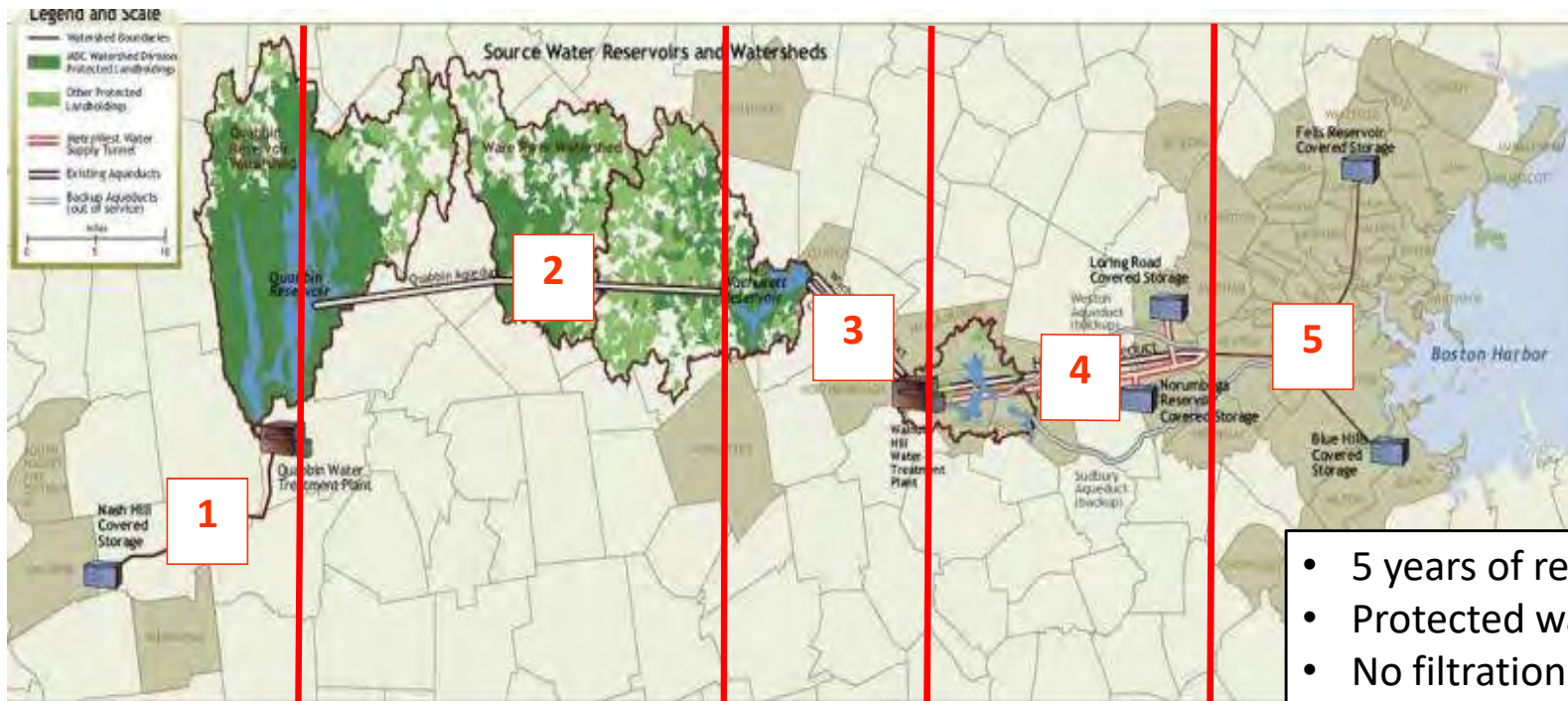
- Deliver water to protect public health, provide sanitation, and fire protection

We Need to....

- Have the ability to swiftly respond to a disruption in service
- Maintain and rehabilitate surface piping, key valves and tunnels on a periodic basis



MWRA Water System



1. Chicopee Valley Aqueduct
2. Quabbin Aqueduct
3. Cosgrove Tunnel / Wachusett Aqueduct
4. MetroWest Tunnel / Hultman Aqueduct
5. Metropolitan Tunnels

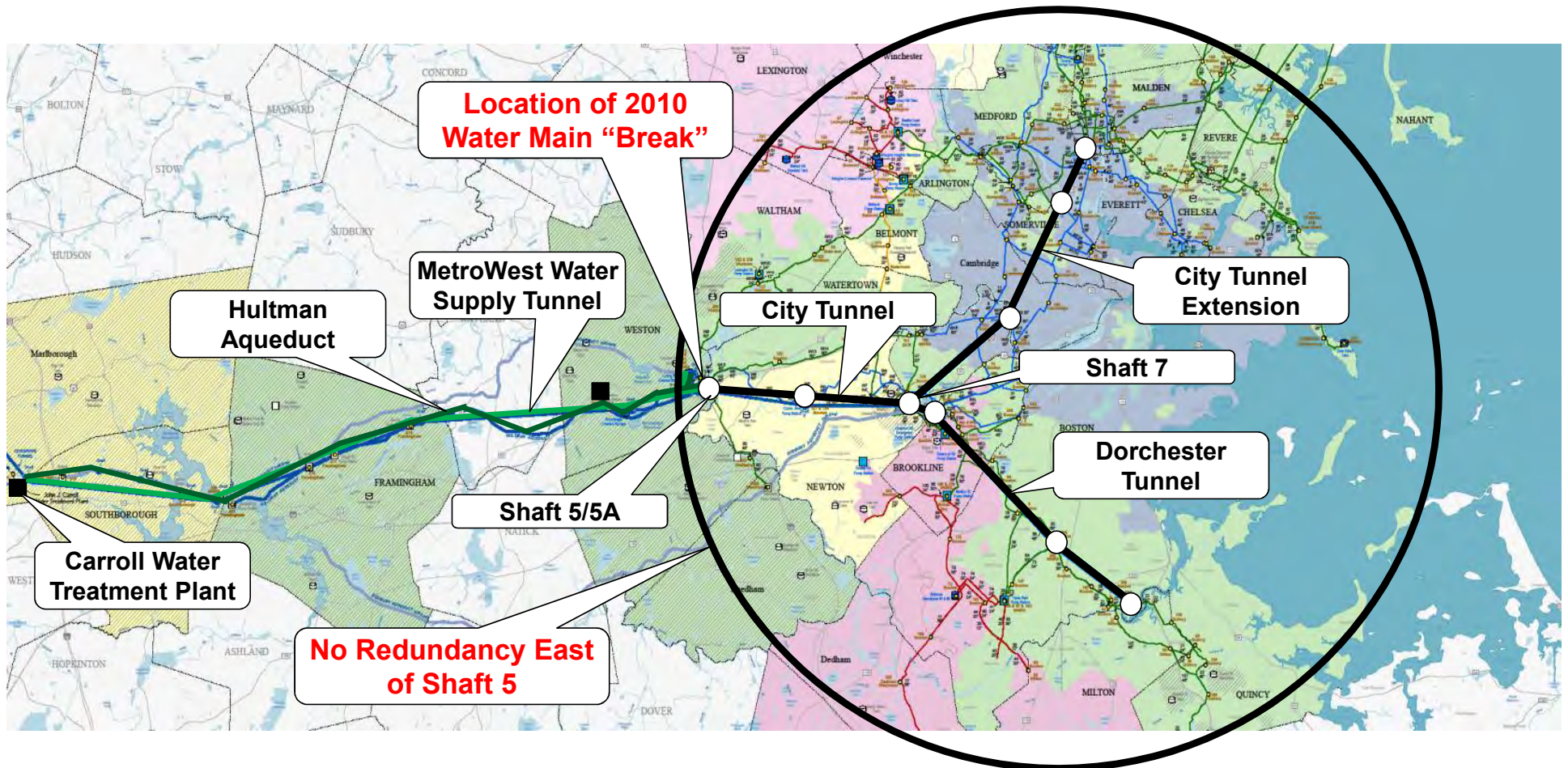
- 2007 Improvements ✓
- Inspection planned ✓
- 2019 Improvements ✓
- 2003/2013 Improvements ✓
- Significant Needs ← Next!

- 5 years of reservoir capacity
- Protected watershed
- No filtration needed
- Gravity fed distribution
- Great taste!

For discussion only



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



For discussion only



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



Metropolitan Water Tunnel Program Goals

Protect Public Health, Provide Sanitation and Fire Protection

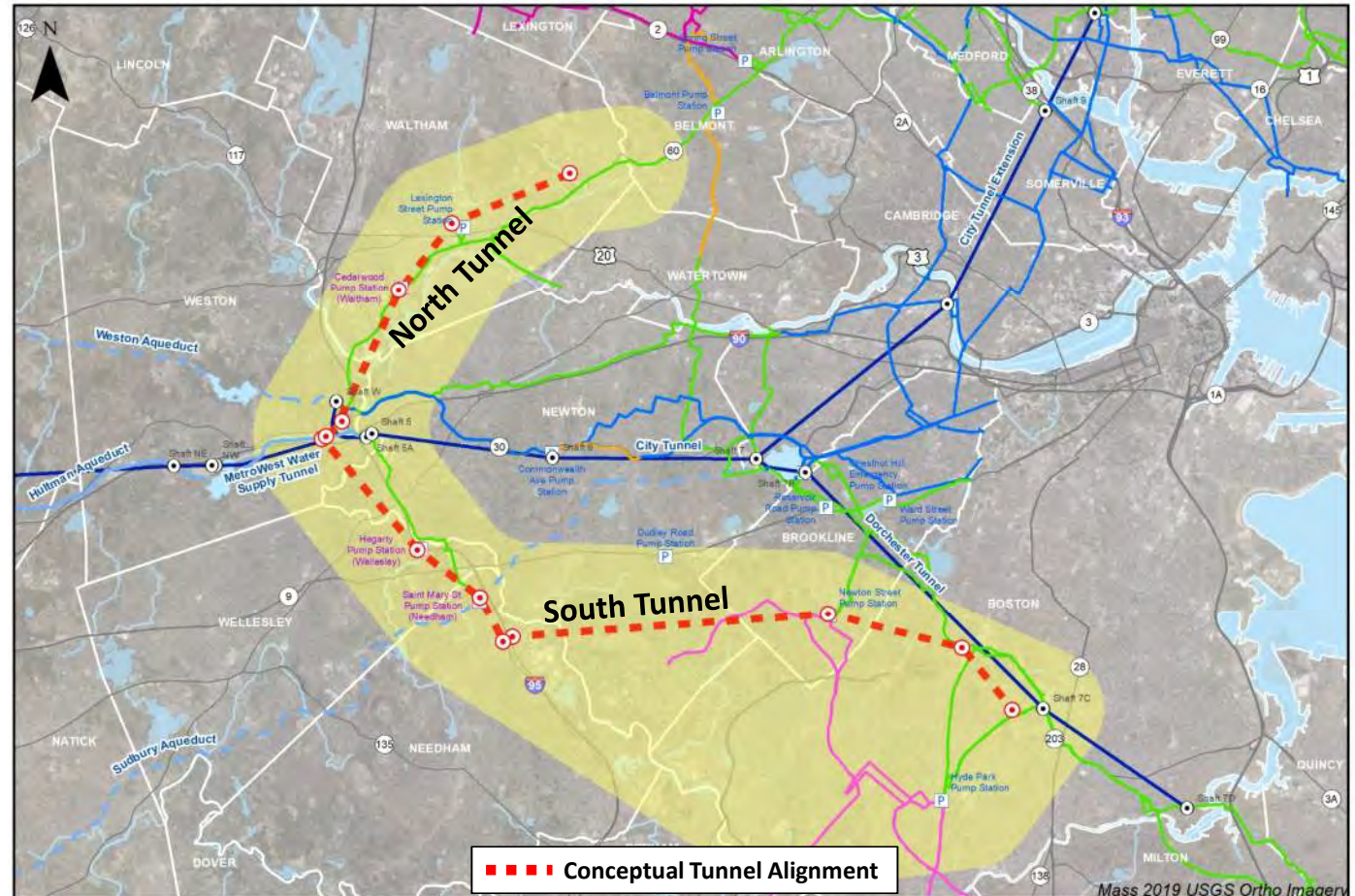
- Provide full redundancy for the Metropolitan Tunnel System:
 - Provide normal water service and fire protection when the existing tunnel system is out of service
 - Provide the ability to perform maintenance on existing tunnels year-round
 - Provide uninterrupted service in the event of an emergency 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!





Metropolitan Water Tunnel Program

- ~14.5 miles of deep, hard rock, pressure tunnel
- Tunnels will begin in the Weston (I-90/I-95 vicinity)
- Northern Tunnel - ~4.5 miles, ends at Waltham/Belmont line
- Southern Tunnel - ~10 miles, ends in Mattapan near American Legion
- Six intermediate connections to existing water infrastructure
- ~8,200 linear ft of tunnel, ~350' deep below Weston
- Construction anticipated between 2027 and 2040



For discussion only



Metropolitan Water Tunnel Program

Construction Shaft Sites

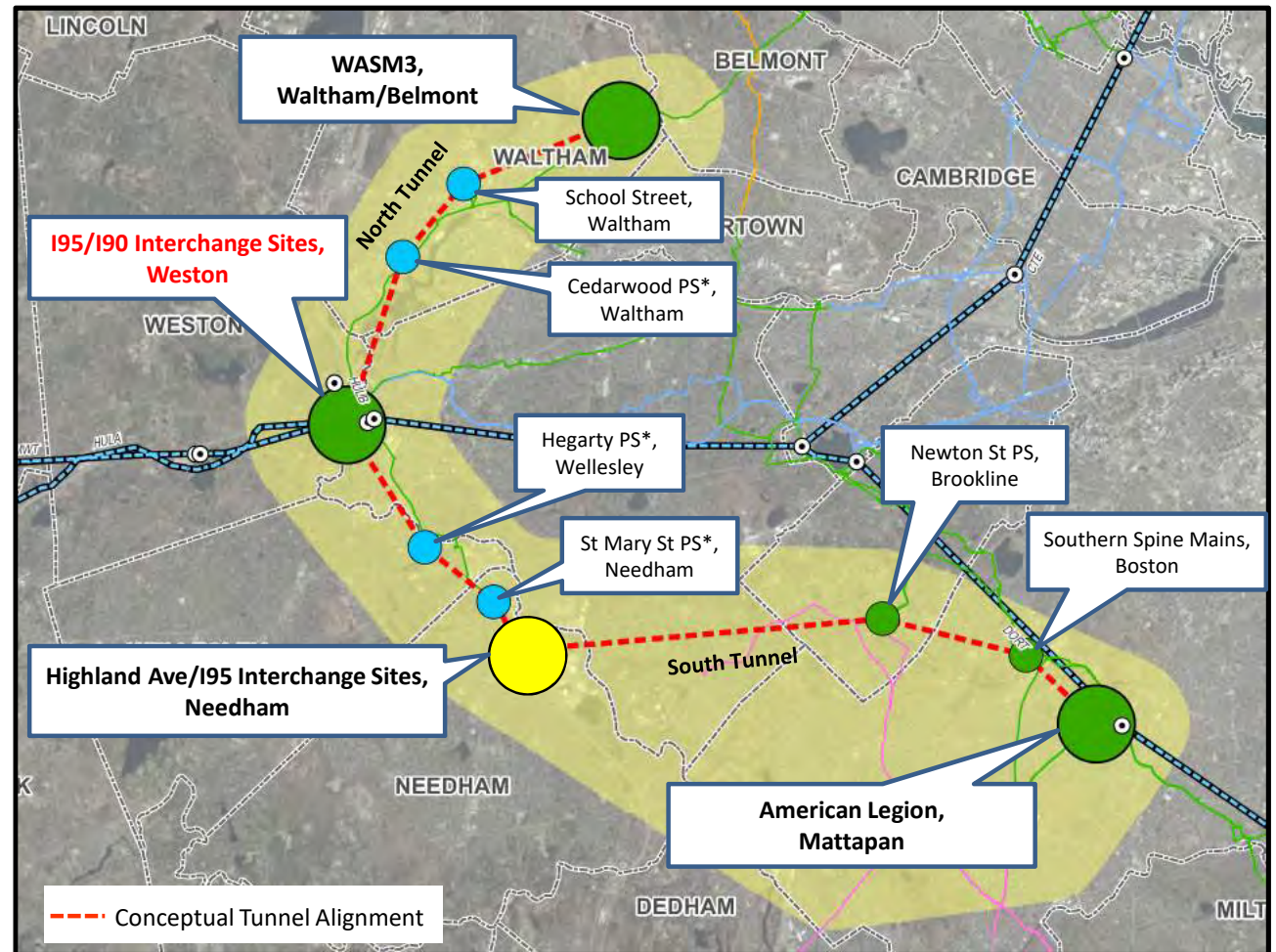
- WASM3, Waltham/Belmont
- **I90/I95 Interchange, Weston**
- Highland Ave/I95 Interchange, Needham
- American Legion, Mattapan

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

Final shaft locations subject to permits and real estate acquisition

- * Non MWRA Pump Station
- Required Connection (required for system redundancy)
- Secondary Connection (provides local benefit)
- Construction Shaft (no connection)



For discussion only



Tunnel Program Schedule

- Overall Program Schedule
 - Preliminary Design is ongoing thru early Jan 2024
 - Currently planning a large geotechnical investigation program to start in 2023
 - Targeting Final Design to start in mid 2024
 - Targeting first tunnel construction contract to bid in 2027
 - Program completion by 2040
- Preliminary Design Status
 - Evaluate tunnel alignment alternatives
 - Geotechnical investigations
 - Environmental Impact Reports
 - Preliminary Design Report
 - Establish contract packages
 - Refine Program cost and schedule

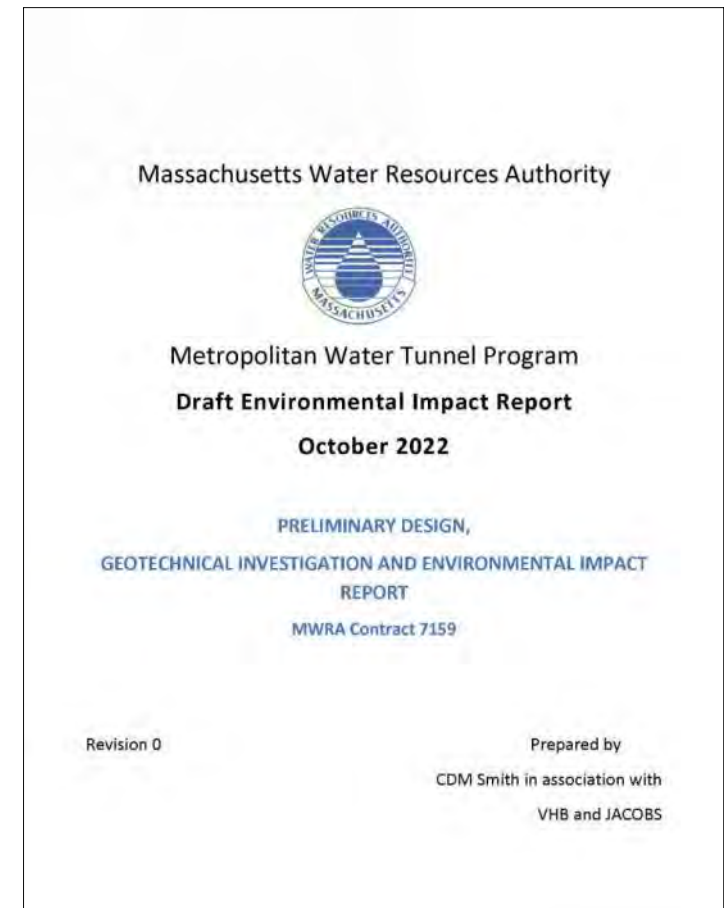
} We are Here





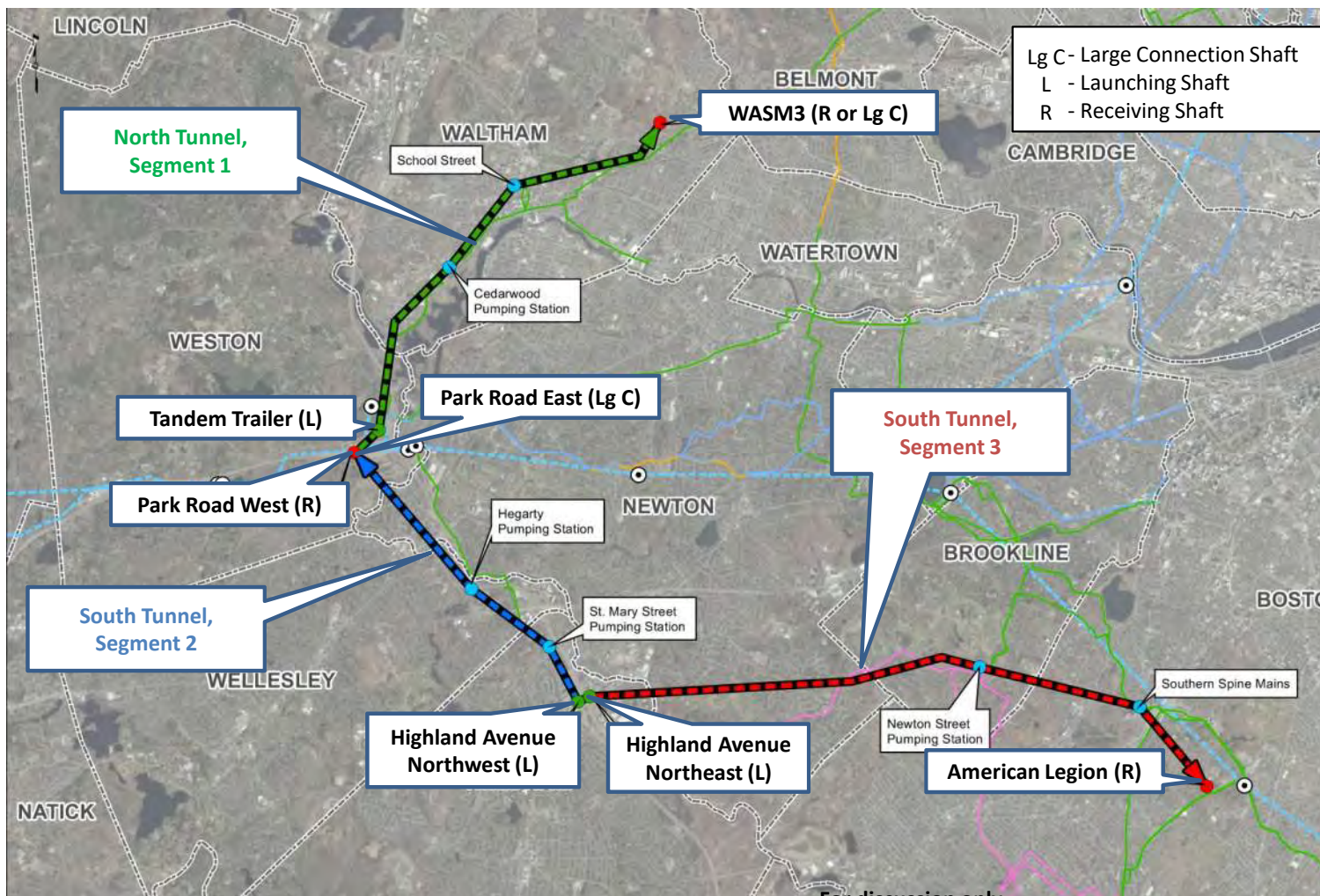
Draft Environmental Impact Report

- Submitted in October 2022
- Public comment period ended on Dec 9, 2022
- Certificate was issued on Dec 16, 2022
- Includes:
 - Alternatives evaluation process and results
 - Preferred Alternative + 2 backups
 - Details of proposed shaft sites (location, limits, purpose, duration, land needs, etc.)
 - Construction impacts at each site (traffic, noise, air quality, vibrations, water supply, wetlands impacts, etc.)
 - Proposed management of impacts (Section 61 Findings)
 - Stakeholder and community outreach
- Supplemental DEIR required
- www.mwra.com/mwtp/resources.html#docs





Preferred Alternative



Preferred Alternative Includes:

- 14.7 miles to deep rock tunnel
- 3 launching shaft sites
- 3 receiving shaft sites
- 1 large connection shaft site
- 6 connection shaft sites
- 3 tunnel segments
 - Segment 1 = tunnel from Weston (Tandem Trailer) ~4.5 miles to Waltham (WASM3)
 - Segment 2 = tunnel from Needham (Highland Ave NW) ~3.4 miles to Weston (Park Road W)
 - Segment 3 = tunnel from Needham (Highland Ave NE) ~6.8 miles to Mattapan (American Legion)
- Tunnel system will operate as 2 tunnels (North Tunnel & South Tunnel)



Coordination with MassDOT

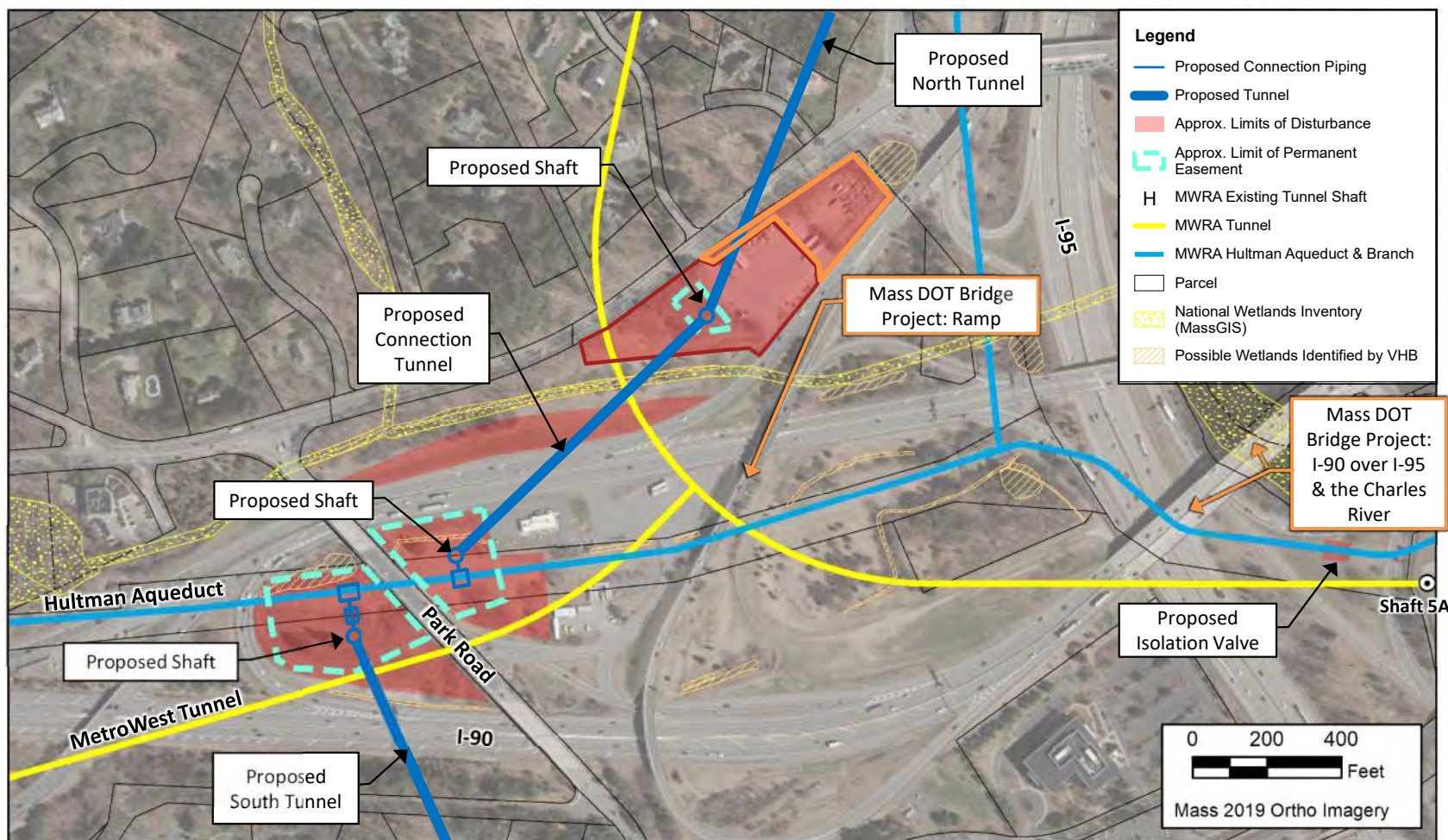
- Shafts and connections in the I-90/I-95 area is essential to achieve the Tunnel Program purpose of redundancy
- MWRA worked closely with MassDOT to review possible shaft sites
- Preferred alternative shaft sites
 - Maintains the Tandem Trailer parking lot capability
 - Allows connection to existing water infrastructure right where we need to
 - No overlapping significant construction projects
 - Route 30 Reconstruction project should be done before Tunnel Program construction starts
 - MassDOT's Newton-Weston bridge replacement project should be complete in 2027
 - Shaft/tunnel construction in Weston will be bid in 2027



I-90 / I-95 Interchange

Site Characteristics:

- Owned by MassDOT and MWRA
- Wetlands Present
- Previously disturbed, portions paved
- MWRA Hultman Aqueduct



For discussion only

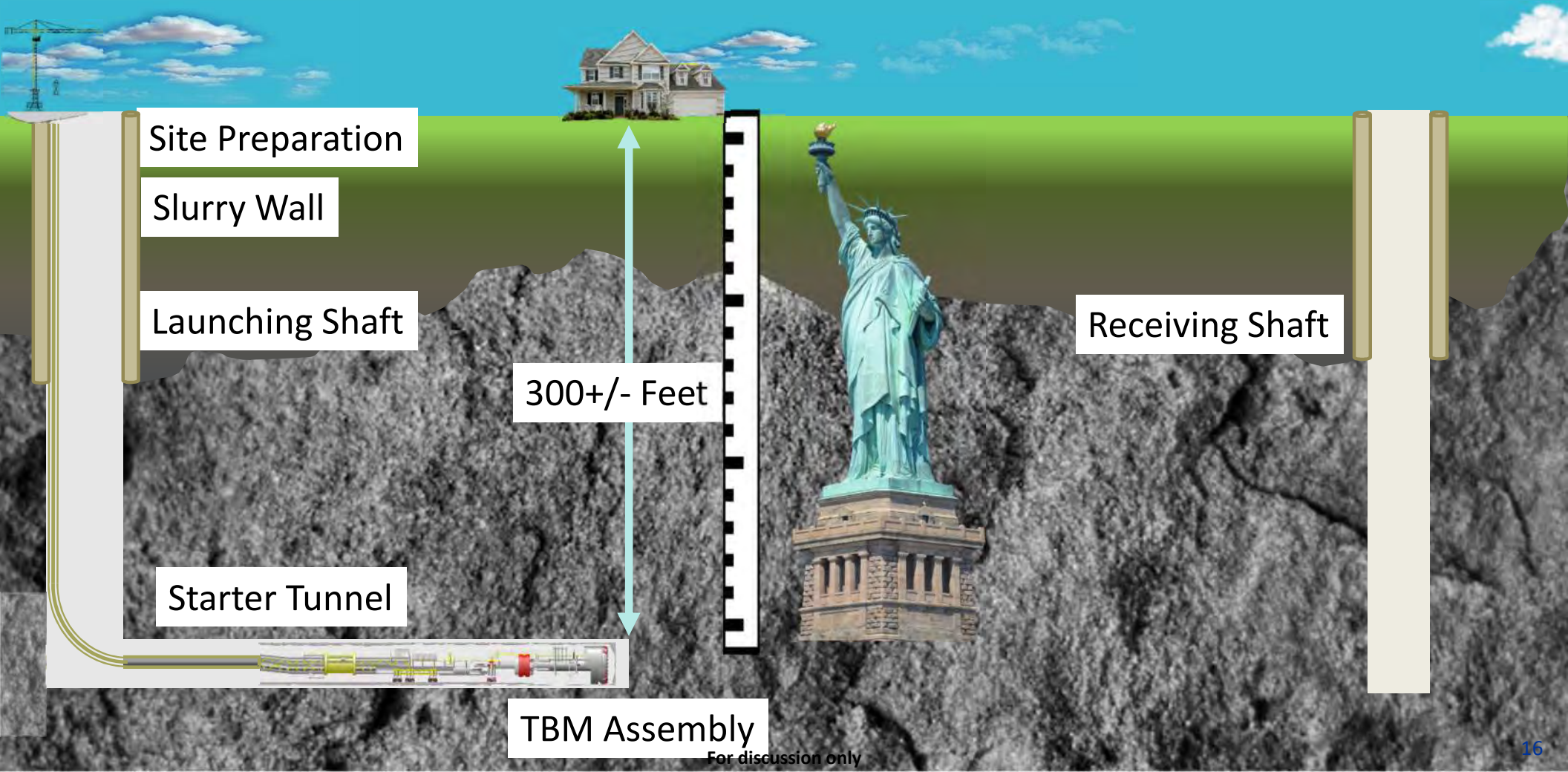


What Happens at a Shaft Site During Construction

- Each shaft site has a specific function during construction
 - TBM launching (L) ← Tandem Trailer
 - TBM receiving (R) ← Park Road West
 - Large connection (Lg C) ← Park Road East
 - Hultman Aqueduct Isolation Valve ← I-95 Ramp
- Activity is dependent on site function and phase of construction
- Most work occurs below ground
- Level of activity at the ground surface will vary to support underground work
- Some utility work will extend outside the shaft site limits
- Most notable above ground activity will be trucking



Tunnel Sequence





Launch Shaft Site



MWWST Shaft 5/5A, Weston – During Construction

Work at Tandem Trailer site will be similar to the work that occurred at Shaft 5/5A in 1999-2003

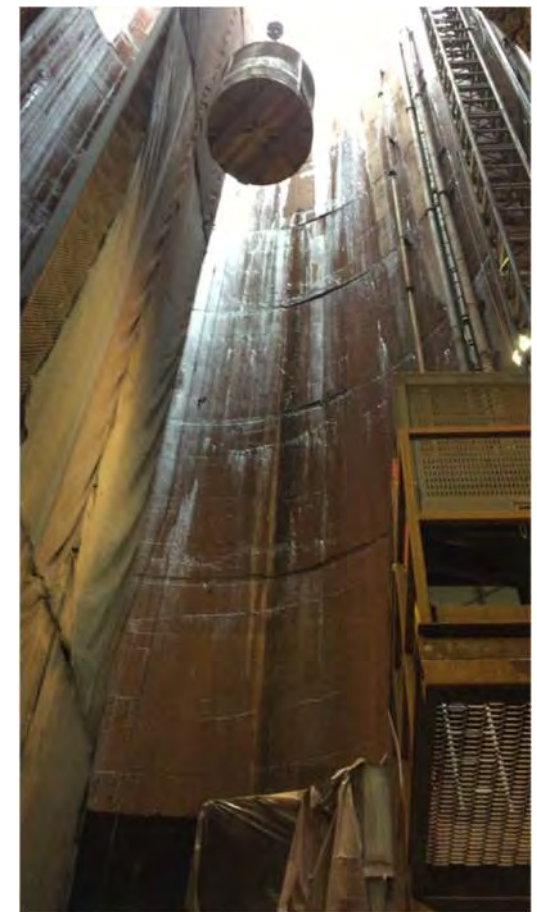


Shaft 5/5A, Weston – Post Construction

For discussion only



Launching / Receiving Construction Shafts



- ~25' – 40' diameter
- ~250' – 350' deep
- Launching shaft is the only access to the tunnel until breakthrough into the receiving shaft

For discussion only



Permanent Infrastructure – Construction Shaft

Infrastructure is mostly below grade

- Top of shaft structure (~2 ft above grade)
- Valve chamber (~2 ft above grade)
- Connection piping (all buried)



MWWST Shaft 5/5A,
Weston



For discussion only



MWWST Shaft E,
Southborough



Potential Construction Impacts & Planned Management

- Construction activity (amount and duration) and potential impacts will vary between shaft sites based on function & phase of construction
- Not all tunnel segments & shaft sites will be active at the same time
- Some sites (i.e., connection shaft sites) will have least and infrequent activity
- Some sites (i.e., launching shaft sites) will have the most activity
- Most construction will be “within the fence line” with little, if any, extending into nearby roads

- Potential impacts include
 - Traffic
 - Water supply
 - Noise and vibrations



Traffic

- Traffic increases will be most noticeable near launching shaft sites at shift change
- Less traffic is expected near receiving shaft site and connection shaft sites
- Access to Tandem Trailer parcel to accommodate shared use will be coordinated with Town and MassDOT
- Conceptual haul routes are shown in the DEIR
 - Shortest route to highway
 - Work with Town & MassDOT to determine the most appropriate route and schedule
- Traffic volumes were estimated and are in the DEIR
 - 3 intersections may benefit from traffic signal timing adjustments
 - River Rd @ South Ave
 - Park Rd @ South Ave
 - I-95 NB off-ramp @ South Ave/Commonwealth Ave
- Haul routes and hauling hours will be set in the construction documents
- Police details and flaggers will be used to keep everyone moving
- Wheel wash and street sweeping will help keep areas clean
- All traffic management will be coordinated with Town & MassDOT, as applicable

Hauling Inspector



Flaggers



Wheel Wash





Water Supply

- Tunnel construction will not impact the existing MWRA water tunnels
- Within 0.5 miles of the current tunnel alignment:
 - 2 municipal water supply wells that are to be abandoned prior to tunnel construction
 - 0 municipal surface water supply
 - 6 domestic wells
 - 12 irrigation wells
 - 2 geothermal wells
- Prior to construction any private wells near the tunnel alignment will be checked and monitored during construction
- During construction groundwater levels along the tunnel alignment will be monitored
- The construction the contractor will limit groundwater inflow into the tunnel
- A water supply contingency plan will be put in place, just in case an adjacent domestic or irrigation well is impacted



Noise & Vibrations

Noise

- Permanent condition will not increase noise levels above existing
- Noise levels during construction will vary by shaft site, function, and construction phase
- Launch shaft site ~ 24/7 once TBM excavation begins
- Receiving & Lg connection shaft sites – Mostly daytime work, some nighttime work
- Isolation valve sites – Day time work, no night work planned
- Noise level criteria will be set & monitored during construction
- Noise mitigation will be implemented/installed where needed

Vibrations

- Construction methods will be adjusted to control vibrations
 - No blasting for connection shaft construction, use drilling methods
 - Rock removal for launch/receiving shafts will be done via controlled blasting
 - Max vibration criteria will be set & vibration monitoring will occur to protect nearby homes/businesses/infrastructure
 - Pre-blast inspections will be offered/encouraged
 - Close coordination with local Fire Department, Emergency Personal, and MassDOT
- Additional details are presented in the DEIR, Chapter 7
 - www.mwra.com/mwtp/resources.html#docs



Community & Stakeholder Outreach

- Met with all 10 communities in the study area
- Established a Working Group with representative from each community – ongoing meetings
- Meetings with key communities in which the tunnel will be constructed:
 - Town Management, Public Works, Public Safety/Fire Dept, Con-Com, etc.
- Met with key stakeholders:
 - EEA, MassDOT, DCR, DPH, DYS, and DCAMM
- Outreach will continue throughout design and construction



Where to Find Information / How to Contact Us

- <https://www.mwra.com/mwtp.html>
 - Program documents (ENF, DEIR, certificates)
 - Meeting notices, agendas, presentations, minutes
 - Fact Sheets (in multiple languages)
- www.weston.org/1806/Metropolitan-Water-Tunnel-Program
- Contact Us
 - Carmine DeMaria, Community Relations Coordinator
 - 617-305-5725
 - Carmine.DeMaria@mwra.com
 - Tunnels.info@mwra.com



Questions/Comments?



Thank you!