



Massachusetts Water Resources Authority

Presentation to the

MWRA Advisory Board

Metropolitan Tunnel Redundancy Program Update

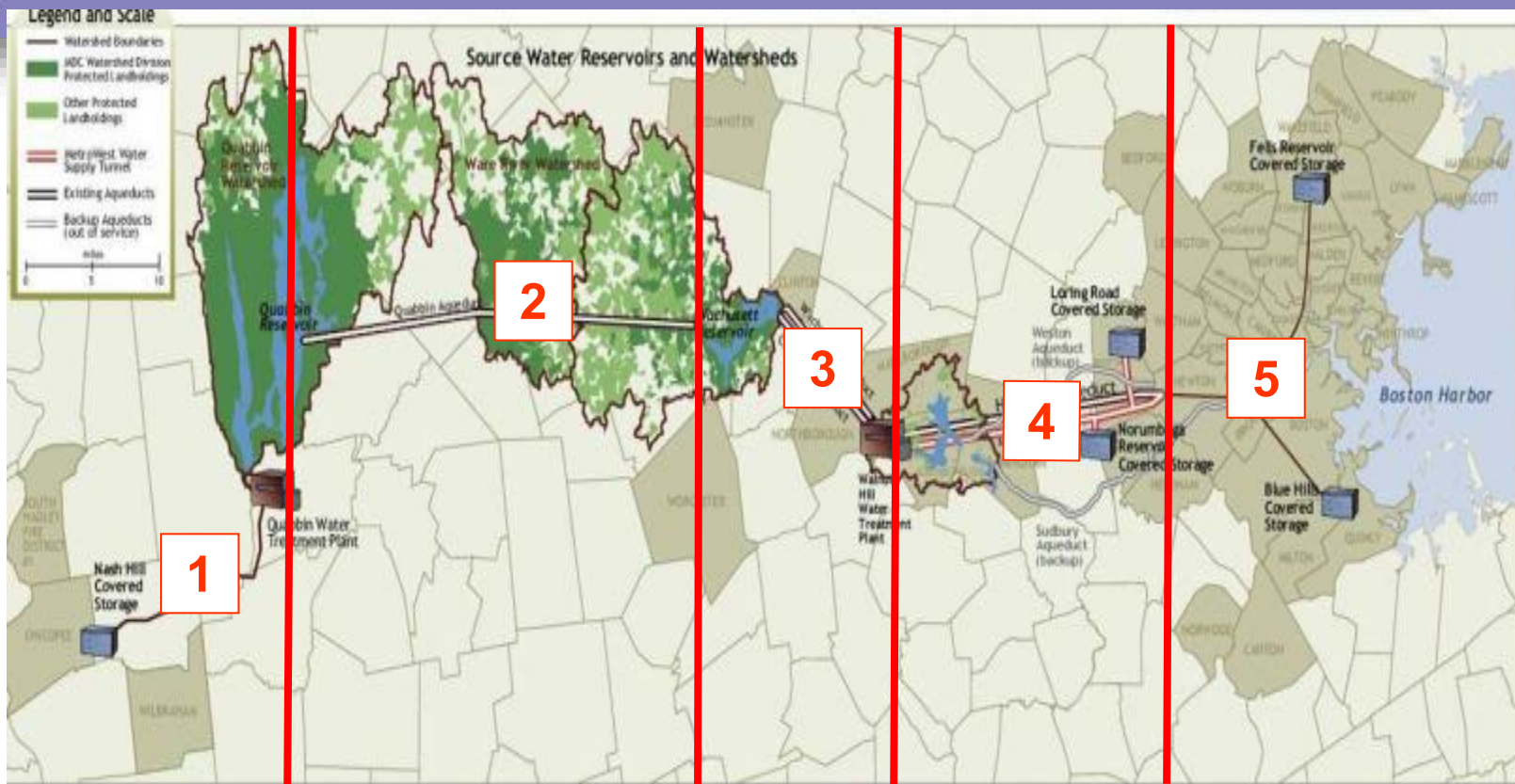
Kathy Murtagh
Director, Tunnel Redundancy

Fred Brandon
Director, Design and Construction

September 20, 2018



MWRA Water Transmission System

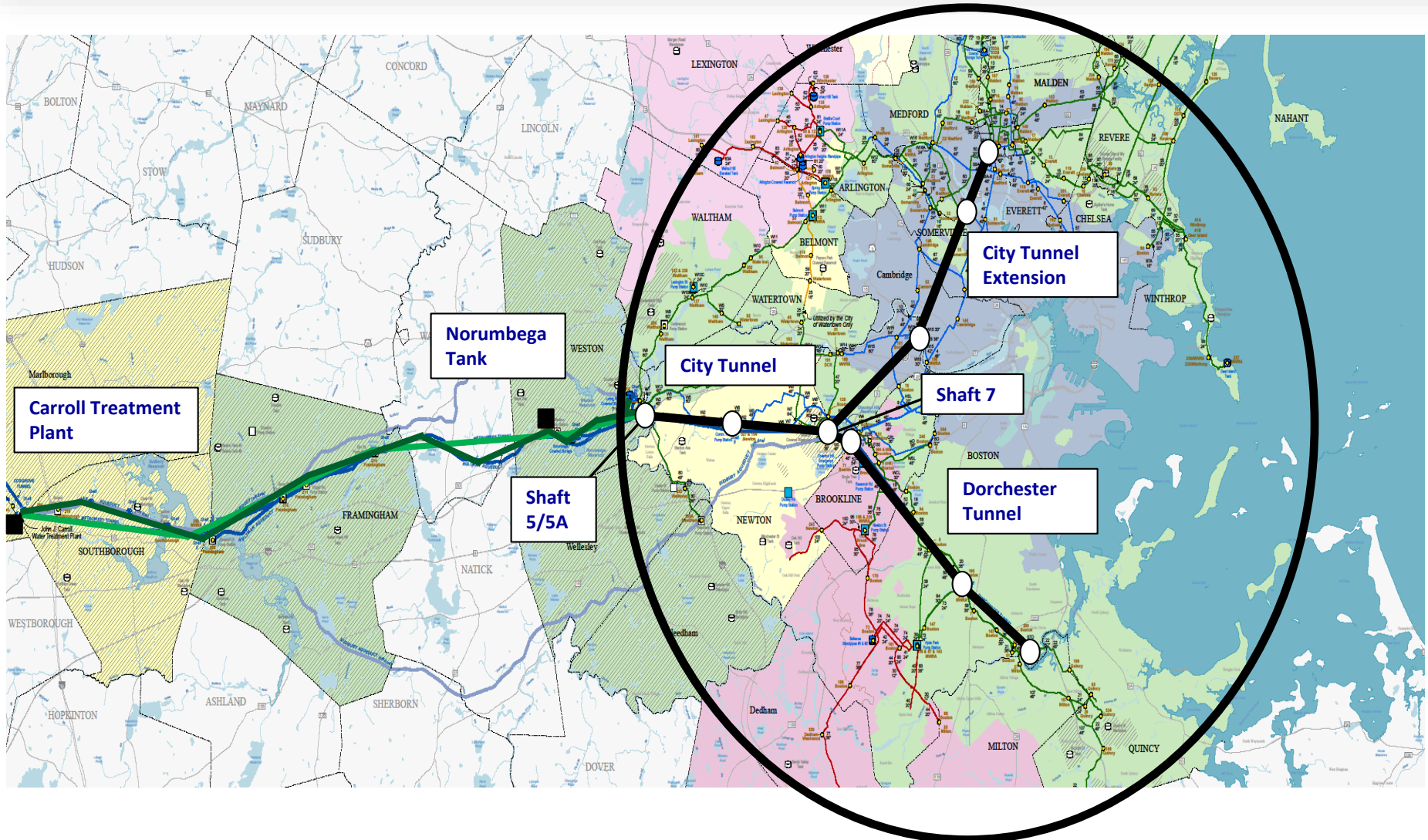


1. Chicopee Valley Aqueduct
2. Quabbin Aqueduct
3. Cosgrove Tunnel / Wachusett Aqueduct
4. MetroWest Tunnel / Hultman Aqueduct
5. Metropolitan Tunnels

- 2007 Improvements
- Inspection planned
- Construction nearing completion
- 2003/2013 Improvements
- Planning underway



Metropolitan Tunnel System





Metropolitan Tunnel System

- The existing Tunnel System consists of:
 - MetroWest Tunnel and Hultman Aqueduct provide redundant supply of treated water from the Carrol WTP to Shaft 5
 - From Shaft 5 to the east, supply is via the Metropolitan Tunnel System; City Tunnel (1950), City Tunnel Ext (1963) and Dorchester Tunnel (1976).
 - These tunnels carry 60% of the total system daily demand with no redundant supply method
 - Existing Metropolitan Tunnel system consists of concrete lined deep rock tunnels with shafts to the surface (Weston/5 & 5A, Chestnut Hill/7 & 7B, Allston/8, Somerville/9, Malden/9A, W. Roxbury/7C, and Dorchester/7D) with valves at/near the surface



Condition of Metropolitan Tunnel System

- Tunnel system:
 - Concrete-lined deep rock tunnels
 - Steel and concrete vertical shafts
 - Surface pipe, valves and appurtenances
- Little maintenance required for tunnels and shafts. Little risk of failure
- Pipe, valves and appurtenances need maintenance, replacement, rehabilitation





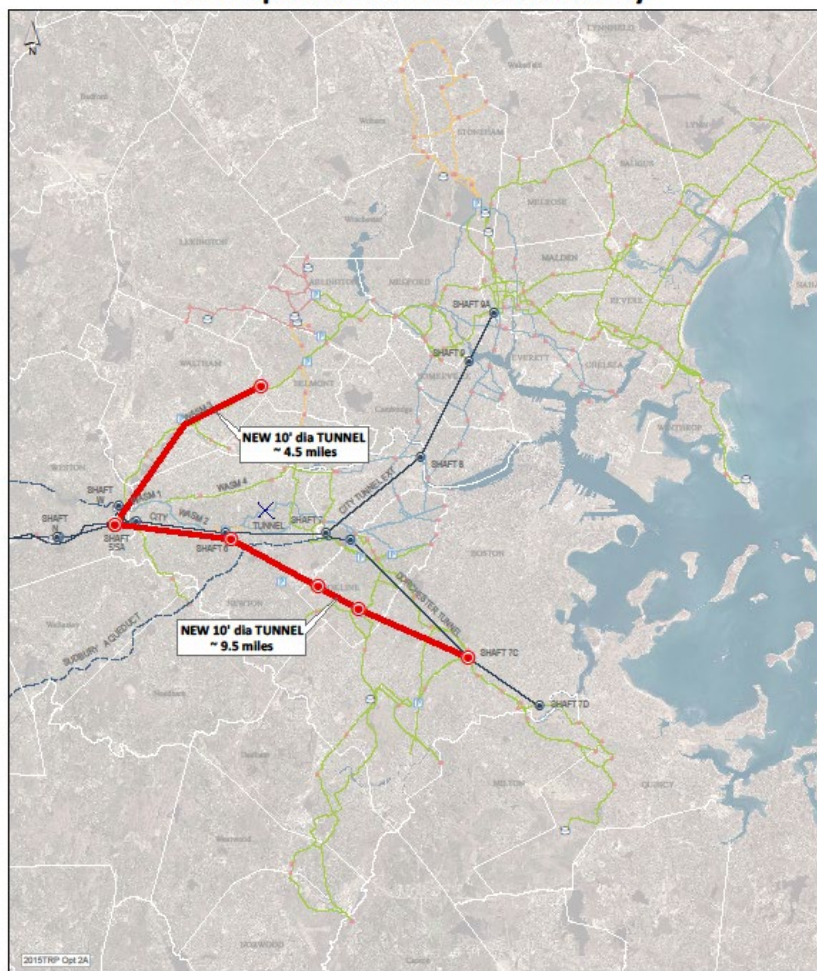
The Need for Redundancy

- Why do we need a redundant tunnel system?
 - Valve reliability for the Metropolitan Tunnels is a concern. Valves haven't been exercised for fear of breaking them in a closed position
 - Many valves have reached the end of their useful life but can't be replaced because shutdown of the City Tunnel would be required
 - Water main break at Shaft 5 in May 2010 put a "sharp point" on the need to operate these valves
 - The Metropolitan Redundancy Tunnel Program will provide much needed redundancy from the Shaft 5 area extending to the north (~WASM3 alignment) and to the south ending at Shaft 7C



The Metropolitan Tunnel Project

Metropolitan Tunnel Redundancy



The Tunnel Project Basics:

- ~ 14 miles of deep rock tunnel
 - ~4.5 mile to the north / WASM3
 - ~9.5 miles to Shaft 7C
- 10' finished diameter pressure tunnel
- Expect it to be 200' – 500' below ground (well into bedrock)
- Mined using Tunnel Boring Machines (TBMs)
- There will be several shafts (# TBD)
- Provides redundancy to the existing Metropolitan Tunnel System (City Tunnel, City Tunnel Extension & Dorchester Tunnel)



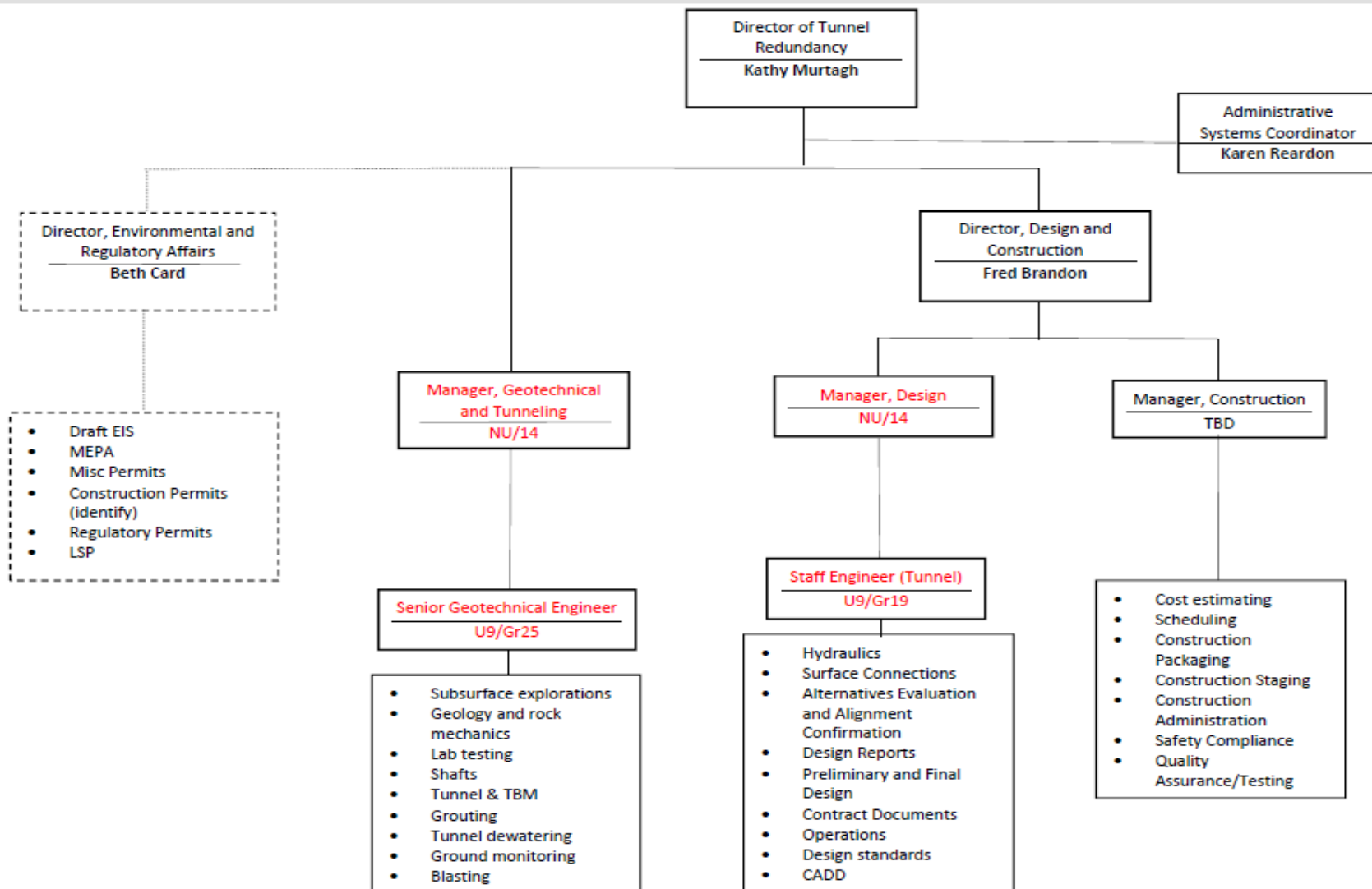
The Metropolitan Tunnel Redundancy Program

Update on Activities-

- Space in Chelsea for the Tunnel Redundancy Department is almost complete; new offices, new workstations, etc.
- Tunnel Redundancy Department staffing:
 - 5 positions were approved by the BOD in July & Sept
 - 1 position filled, Welcome Fred Brandon!!!
 - Hoping to bring remaining positions to BOD in fall/winter
- Have had numerous internal meetings to discuss topics including team structure, consultant WBS, procurement, possible shaft sites, etc.
- Met with several consultants (teams) to give what update we have and to hear their ideas
- Visited MDC Hartford to see the shaft site for the South Hartford Conveyance and Storage Tunnel (CSO, ~4 miles, 18' dia., ~200' deep rock tunnel)
- Met with DC Water who is currently executing several large CSO tunnel projects
- Hope to make a presentation to the BOD soon (October?) with an update



The Metropolitan Tunnel Redundancy Program





The Metropolitan Tunnel Redundancy Program

Questions?

Thank You!