



## **WSCAC Meeting**

Location: Held virtually  
December 8, 2020 – 10:00 am

### **Members in Bold in Attendance:**

#### **Jerry Eves, WSCAC Chair**

Michael Baram

#### **Whitney Beals**

William Copithorne, Town of Arlington

Steven Daunais, Tata & Howard

Andrea Donlon, CT River Conservancy

#### **Bill Fadden, OARS**

Bill Kiley, BWSC

#### **Paul Lauenstein, NepRWA**

#### **Martha Morgan, Nashua River Watershed**

#### **Martin Pillsbury, MAPC**

Janet Rothrock, League of Women Voters

Bruce Spencer

Kurt Tramposch, Wayland Wells

### **Non-Members in Attendance**

Fred Brandon, MWRA

Adriana Cillo, BWSC

Lexi Dewey, WSCAC staff

Andreae Downs, WAC

Steve Estes-Smargiassi, MWRA

Kathy Murtagh, MWRA

Ace Peckham, WSCAC staff

Lexi Dewey opened the meeting, noting that she and Whit Beals presented at the previous week's meeting of the Water Supply Protection Trust (presentation viewable [here](#)). They included two options for green certification (Forest Stewardship Council and Sustainable Forestry Initiative), and are working with SFI to learn more, in case DCR decides to recertify. The Drought Management Task Force is recommending a downgrade from a Level 2 Drought to a Level 1 Drought, in light of the recent rains.

WSCAC staff then requested a vote on the November meeting summary. Whit Beals moved to approve the minutes, Martha seconded the motion, and all approved.

Kathy Murtagh provided a brief introduction to Fred Brandon and the [tunnel program](#), noting that it's still in early stages.

Fred Brandon, the Director of Design and Construction for the MWRA Tunnel Redundancy Department, presented on the latest news about the MWRA Tunnel Redundancy Program (viewable [here](#)). He noted that the last time he spoke to WSCAC about this topic was in May 2019.

Fred began by sharing a map of the current transmission system, pointing out that Section 5, the Metro Boston area, is the focus of the tunnel program. The existing tunnel system is comprised of the City Tunnel, the City Tunnel Extension (to the North) and the Dorchester Tunnel (to the South). There is redundancy from the Wachusett Reservoir all the way to the Shaft 5 area, which is at the start of the City Tunnel.

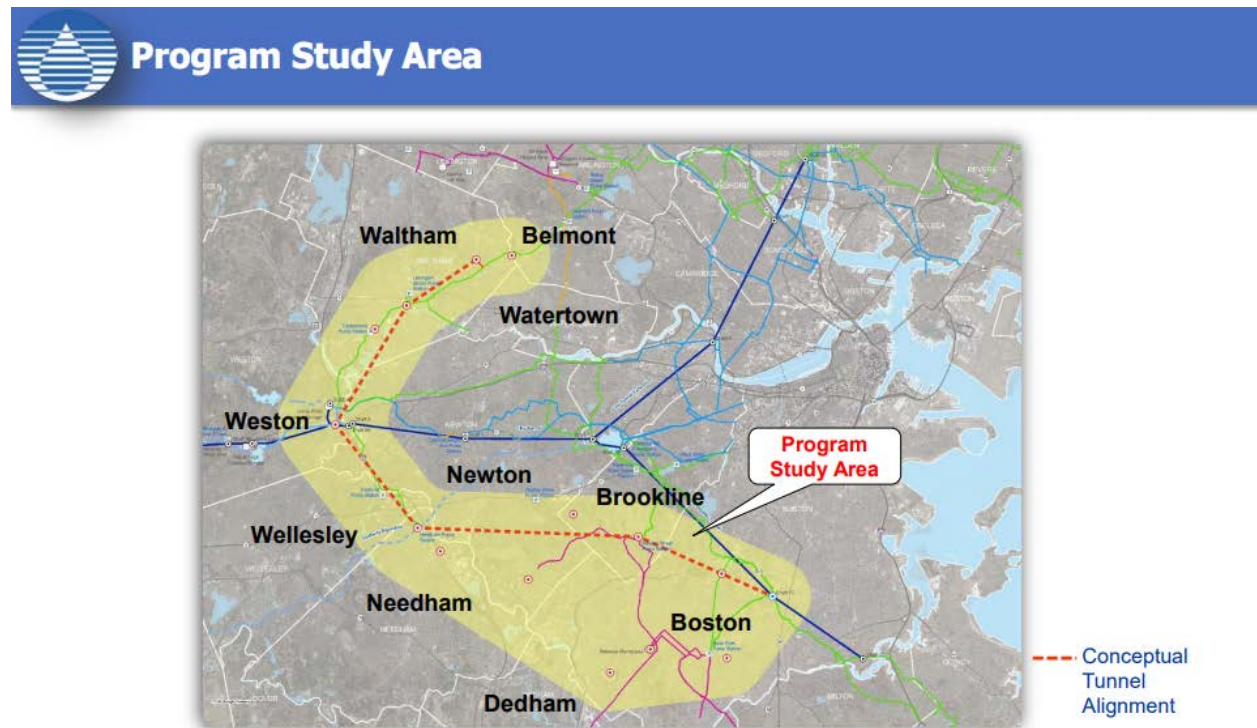
The Metropolitan Tunnel System carries about 60% of the water supply to the Metropolitan Boston area, with the remaining 40% carried through local distribution mains. This means that the MWRA is unable to take the current tunnel system offline for maintenance or repairs without using emergency water supplies (which do not meet water quality standards).

The existing tunnel system is made up of three main components: concrete lined deep rock tunnels, steel and concrete lined vertical shafts, and surface pipe, valves, and appurtenances. The tunnels and shafts are low maintenance and have little risk of failure; however, the pipes, valves, and appurtenances, many of which are over 60 years old, need regular maintenance, rehabilitation, and replacement.

Fred pointed out that many valves have reached the end of their useful lives, but without shutting down the entire tunnel, there's no way to replace them. Even a small break can result in large problems. The May 2010 water main break is a good example. A coupling broke, leaving a 1" gap, which resulted in a 250 mgd (million gallons / day) flow rate. A retrospective look is viewable [here](#).

Redundancy to the water system was first proposed in 1937, and has been studied and discussed since then. The MWRA conducted an alternatives analysis beginning in 2016. They determined that long-distance large diameter pipeline alternatives aren't feasible, but a "two tunnel" concept meets their objective and goals by allowing year-round planned maintenance, and emergency response. The tunnels can be constructed with the majority of the impacts being relegated to the construction process.

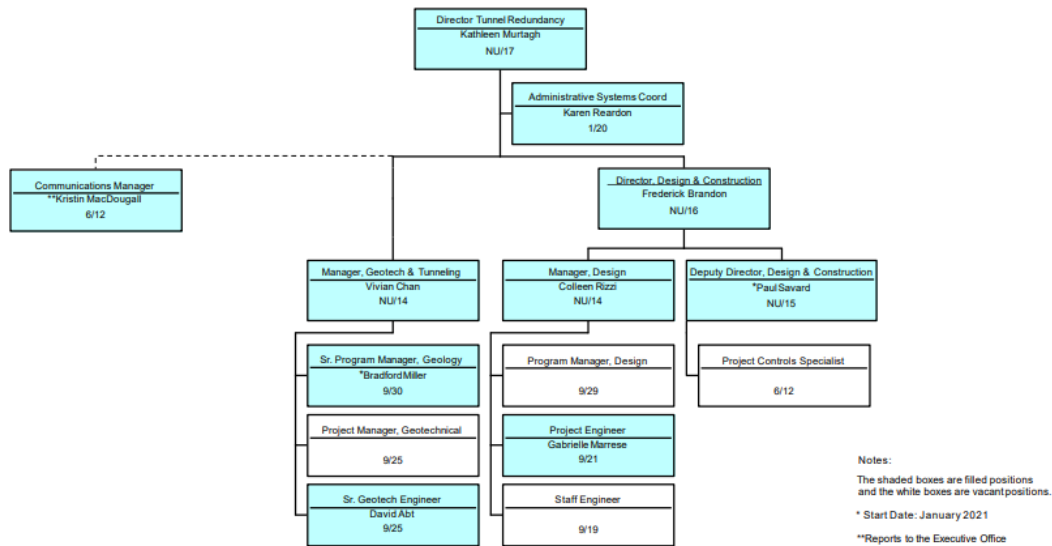
The two tunnels will be 150-500 feet deep, 14 miles long, with a 10 foot diameter. The yellow highlighting in the map below indicates the study area. Construction will begin at Weston, with one tunnel moving north to Belmont and the other moving south to Mattapan, and is expected to take 17-23 years, beginning in 2026 or 2027.



To facilitate this process, the MWRA formed a Tunnel Redundancy Department (similar to the Program Management Department for the Boston Harbor Project). The project is funded by the MWRA's Capital

Improvement Plan. Program Organization is outlined in the image below, with timelines for expected employment date.

## Tunnel Redundancy Department Organization Chart



CDM Smith is the prime consultant in the Preliminary Design Engineering Contract; MWRA is also working with Jacobs Engineering Group, VHB (handling the MEPA process), Green International Affiliates (survey work), CDW (Wetlands assistance), and New England Boring Contractors. Fred noted that the construction process includes about 25 borings along the tunnel alignment, going down about 450 feet deep. The boring process takes about 4 weeks per hole.

Fred shared the slide below which lists the Preliminary Design Key Activities, explaining that they are currently preparing the Environmental Notification Form (ENF) to submit to MEPA in January 2021. The ENF will present the tunnel concept and study area, demonstrating that it's the preferred concept compared to building surface pipelines. The MEPA certificate will provide a scope for the Draft Environmental Impact Report (DEIR), which will include an alternatives analysis for selecting shaft sites and connection locations. MWRA is planning an extensive public engagement period, convening a working group in early 2021. The DEIR will be submitted in Fall 2022. Geotechnical investigations, which include borings and geophysical research, will be ongoing starting early 2021. Mapping and survey work is ongoing now.



## Preliminary Design Key Activities

### Preliminary Design Began in July 2020:

- Duration of 3.5 years
- File Environmental Notification Form (ENF) in early 2021
  - ENF will propose Program Study Area for Tunnel Alignment Alternatives Evaluation
- Evaluation of Alternatives (2021 – 2022) - Select Shaft and Connection Locations
- Extensive Public Engagement – Working Group (early 2021 – 2023)
- Geotechnical Investigations (begin early 2021)
- Mapping and Survey
- Environmental Impact Reports (Fall 2022)
- Preliminary Design (complete by Dec 2023)



The tunnel working group, which is scheduled to start meeting in early 2021, will include representatives from all ten communities affected, to ensure a transparent process for selecting shaft sites. It may eventually divide into two groups, a North and a South branch.

The department is also working with both national and local experts on a review panel, which provides review and advice on risk mitigation, communication, program management, tunnel design and construction. The experts include Richard Fox (who led the Boston Harbor Project), Michael McBride (who worked on the Boston Harbor Project, and led the Integrated Water Supply Improvement Program for the Carroll Water Treatment Plant, MetroWest Tunnel, and the covered storage projects), Erika Moonin (Manager of the Lake Mead Intake No. 3 with the Southern Nevada Water Authority), Gary Brierly (a tunnel boring expert), and Gayln Rippentrop (an experienced tunnel contractor).

Fred noted that the Program Support Services consultant has been assisting the department in preparing program-wide guidelines to be used by staff and consultants. Completed guidelines include a program quality management plan, a geotechnical field manual, and hydraulic analysis, while ongoing activities include a program budget analysis, program schedule development, and project controls.

Fred concluded his presentation by sharing the schedule for the coming years. Preliminary design, underway since July 2020, will take approximately 3.5 years, and final design is expected to run from 2024-2027, with construction beginning in 2026 or 2027. Construction will consist of two or more tunnel construction packages, with each contract lasting approximately five years.

Lexi asked what redundancy work will be done between now and the completion of the tunnel. Fred confirmed that there are a number of interim improvements that are being implemented by the construction and engineering departments, in order to extend the life of the current tunnel. He then mentioned some recent improvements in the City of Newton, which involved a second connection to the Commonwealth Ave pumping station, creating redundancy in Newton's water supply.

Bill Fadden asked about a coupling failure in November in Brookline. Steve Estes-Smargiassi explained that MWRA crews were working on routine maintenance, and a pre-existing crack in an old water main caused the top half of a 48" main to come off. There was damage to the surrounding area, but cleanup is just about completed. Martin Pillsbury commented that he often walks near the area, and the work has been very well done. Steve then commented that there are a lot of areas that are of similar concern along the Metropolitan Tunnel, which is another argument for redundancy.

Martin then commented that he's glad to see Fred in charge of the project, in light of all his experience, and asked if there had been any consideration of expanding the ENF, or extending the comment period during the MEPA process. Fred confirmed that they'll be attaching additional information to the ENF, like a screening report for alternative options to the tunnel, and they will consider extending the comment period. Martin finally pointed out that all the communities in the working group are in the MAPC region, and suggested that he'd be interested in joining or participating on behalf of MAPC.

Paul Lauenstein expressed appreciation for Fred's presentation, and then asked who will be in charge of public outreach, and also how the cost will impact ratepayers, both the final amount and the timing of the expenses. Kathy explained that the outreach will be handled by internal staff, such as Sean Navin and his team. She then confirmed that the financial department has been working on the best methods of paying for the improvements, but noted that the debt service for the Boston Harbor Project is easing, so the MWRA will have more funds available. She offered a rough comparison to the process of paying off one's mortgage and buying a vacation home, where the payments needed would remain roughly the same.

Whit Beals asked about the difference between gravity and pressurized tunnels, and how pressure is provided. Fred responded that the pressure is set by water levels in the source reservoirs. Kathy added that the system is primarily gravity – the water flows downhill, which creates the pressure. Steve said that gravity conduits slope downhill, and the tunnels are pressure pipes, flowing full and under pressure the entire way.

Whit then asked how much land is necessary for the shaft areas, the sections where the public will see the construction. Kathy explained that there are three kinds of shaft sites: the Tunnel Boring Machine (TBM) launching shaft site (needs at least five acres, preferably more), the TBM receiving shaft site (needs about 2 acres), and the connection shaft sites (needs ¼ - ½ acre, possibly even less). These figures all apply to construction, but if there's an additional need for a facility at the location, that will require different calculations. These needs also affect the location of the tunnel – available land, as well as geological conditions and other factors.

Whit commented that this sounds like quite a challenge, and asked about complaints regarding traffic or similar. Kathy responded that there are three major issues associated with the construction: nighttime noise, blasting, and traffic.

Lou Taverna asked where the process is currently regarding narrowing down feasible locations for shaft sites. Kathy said that for the preliminary design, they are working with consultants to determine where to put the first ten borings, watching for potential issues like fault lines, and also pointed out that shaft location will also affect individual communities and contracts.

Kathy then announced that the MWRA has created a [program website](#), and that they'll be presenting at the December MWRA Board of Directors meeting.

Lexi thanked Fred and Kathy for the presentation.

At Lexi's invitation, Steve briefly announced that the MWRA is still in normal operations, and that after the recent rains, the Quabbin levels are elevated to October levels again, Wachusett has returned to May levels, and they are limiting flow from Quabbin to Wachusett Reservoirs at this time.

Lexi said that at the Drought Management Task Force, John Gregoire had announced that transfers from Quabbin to Wachusett were 100 mgd, and Steve explained that they had been, but they stopped transfers this week. Lexi asked if demand is similar to last year, in light of the pandemic, and Steve answered it might be a little higher, but not significantly different, because people are still using water, just in different locations.

Lexi asked if there will be drawdowns of the reservoirs this winter, and Steve said that they hadn't planned for it, but they are revisiting the possibility now, and will have a firmer answer in January. He also noted that lead and copper levels are too high in three communities supplied by the MWRA (Medford, Melrose, and Boston), and so those communities will be sending out notifications to their customers.

Lexi thanked everyone for attending, and wished everyone a happy holiday season.

The meeting was adjourned.

**WSCAC will next meet on January 12, 2021, at 10:00 am via Zoom.**

**Please visit [our website](#) for more information on this meeting.**