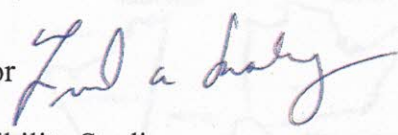


**STAFF SUMMARY**

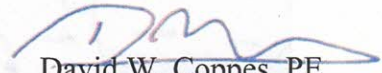
**TO:** Board of Directors  
**FROM:** Frederick A. Laskey, Executive Director  
**DATE:** November 16, 2022  
**SUBJECT:** MWRA Water System Expansion Feasibility Studies



**COMMITTEE:** Water Policy and Oversight

X INFORMATION  
       VOTE

Rebecca Weidman, Director, Env. and Reg. Affairs  
Preparer/Title

  
David W. Coppes, PE  
Chief Operating Officer

**RECOMMENDATION:**

For information only.

**DISCUSSION:**

MWRA recently completed two feasibility studies for expanding MWRA’s water system to the Ipswich River Basin (Beverly, Danvers, Hamilton, Ipswich, Middleton, Lynn, Lynnfield Center Water District, Peabody, Salem, Topsfield, Wenham, Wilmington) and to the South Shore (Abington, Avon, Brockton, Cohasset, Hanover, Hingham, Norwell, Scituate, Rockland, Weymouth, and the Former Naval Air Station). These studies were initiated at the request of the Baker Administration and in a direct legislative appropriation, respectively. The South Shore feasibility study also looked at expanding MWRA’s wastewater system to the South Shore.

A third, ongoing system study is looking at expanding MWRA’s water system to communities in the Metro West area. The Metro West study was initiated following a request by several communities in the Metro West area interested in exploring connection options to MWRA’s water system. The Metro West study currently includes 15 communities (Acton, Bedford, Chelmsford, Concord, Groton, Holliston, Hopkinton, Lincoln, Littleton, Maynard, Natick, Sudbury, Wayland, Wellesley, and Weston).

As a regional supplier of water in Massachusetts, there are opportunities for MWRA to extend water service to communities within the three study areas. MWRA’s high quality source water is a result of our highly protected, forested watersheds. These watersheds act as a buffer against many contaminants, both regulated and unregulated. Additionally, MWRA’s water conservation efforts over the last several decades have resulted in an even more resilient water supply system able to withstand drought conditions and recover following a drought. The “Safe Yield” (i.e., the maximum withdrawal that can be made continuously from a water source or sources during a period of extended drought) for the MWRA system is 300 million gallons per day. From 2016 to 2020, the average daily demand for the entire MWRA system ranged from 192 mgd to 208 mgd. Therefore, in any given year, approximately 100 mgd of additional water supply could be withdrawn from MWRA’s reservoirs while operating within the safe yield of approximately 300 mgd.

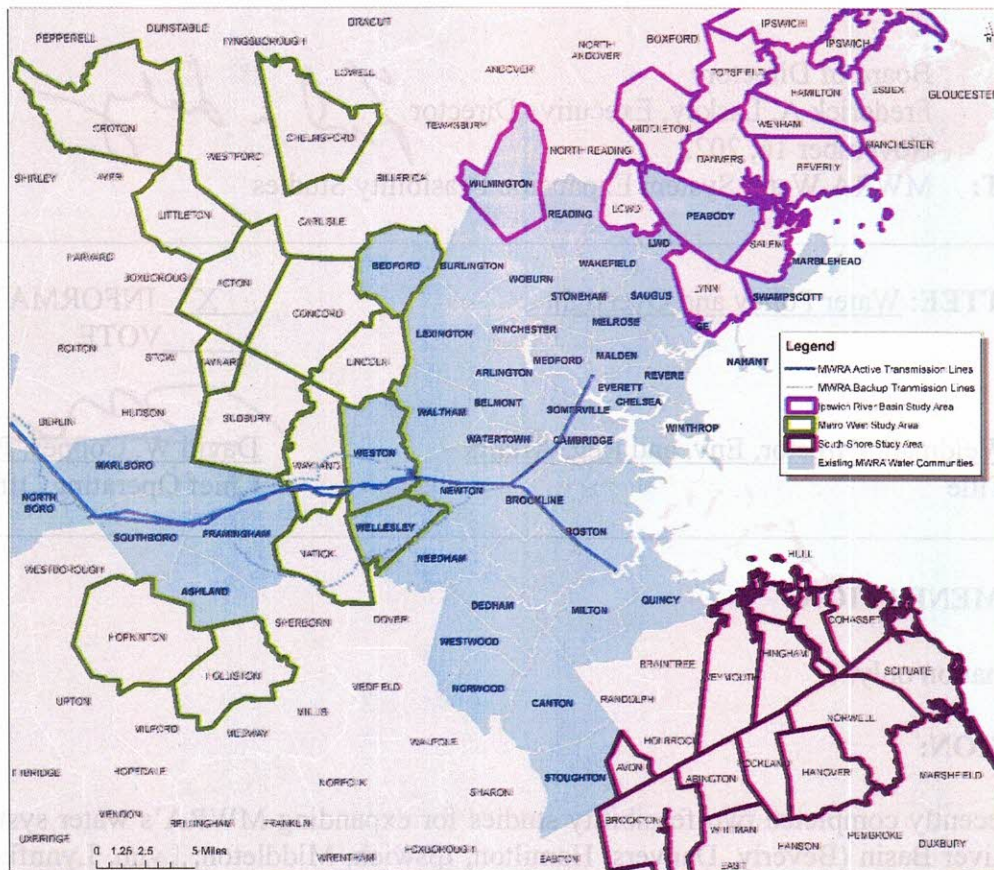


Figure 1. MWRA System Expansion Feasibility Study Areas.

Many cities and towns in the study areas experience challenges meeting current water demands and the growth expectations of their communities. Periodic droughts, water supply capacity limitations, and concerns related to seasonal low flows in local rivers and streams contribute to these challenges. Complicating these issues are emerging drinking water regulations; most recently, the Massachusetts Department of Environmental Protection established drinking water standards for six per- and polyfluoroalkyl substances (PFAS). Water supplies throughout the Commonwealth increasingly require treatment to meet MassDEP’s maximum contaminant limit for these six PFAS compounds. The U.S. Environmental Protection Agency is expected to issue draft National Primary Drinking Water Regulations for two PFAS compounds, PFOA and PFOS in late 2022. If the federal regulations for PFOA and PFOS are lower than MassDEP’s existing PFAS6 maximum contaminant level, treatment will likely be required for even more water supplies.

These studies are intended to review the feasibility of MWRA providing an alternative source of drinking water to the communities included in the studies. Specifically, these studies:

- quantify MWRA’s available water distribution and transmission system capacity to serve study communities in the Ipswich River Basin and South Shore area;
- identify new infrastructure needed to deliver the available capacity to these communities;
- provide planning-level cost estimates for infrastructure needed to serve communities;
- consider the impact on drinking water quality from blending MWRA water with that of communities and highlight the importance for future study prior to any expansion

- community connections; and
- identify other factors that would need further study if system expansion discussions proceed, such as required permits and the time necessary for planning, permitting, design, and construction of required infrastructure.

Conclusions: Ipswich River Basin and South Shore Study Areas

Both studies show that, conceptually, MWRA can provide the full demands to both study areas, 40.5 mgd maximum day demand for the South Shore and 42.1 mgd maximum day demand for the Ipswich River Basin communities. In order to fully supply both study areas, large diameter pipelines would need to be built, extending from MWRA’s existing metropolitan tunnel system. Partial supplies to both study areas could be provided utilizing MWRA’s existing distribution system.

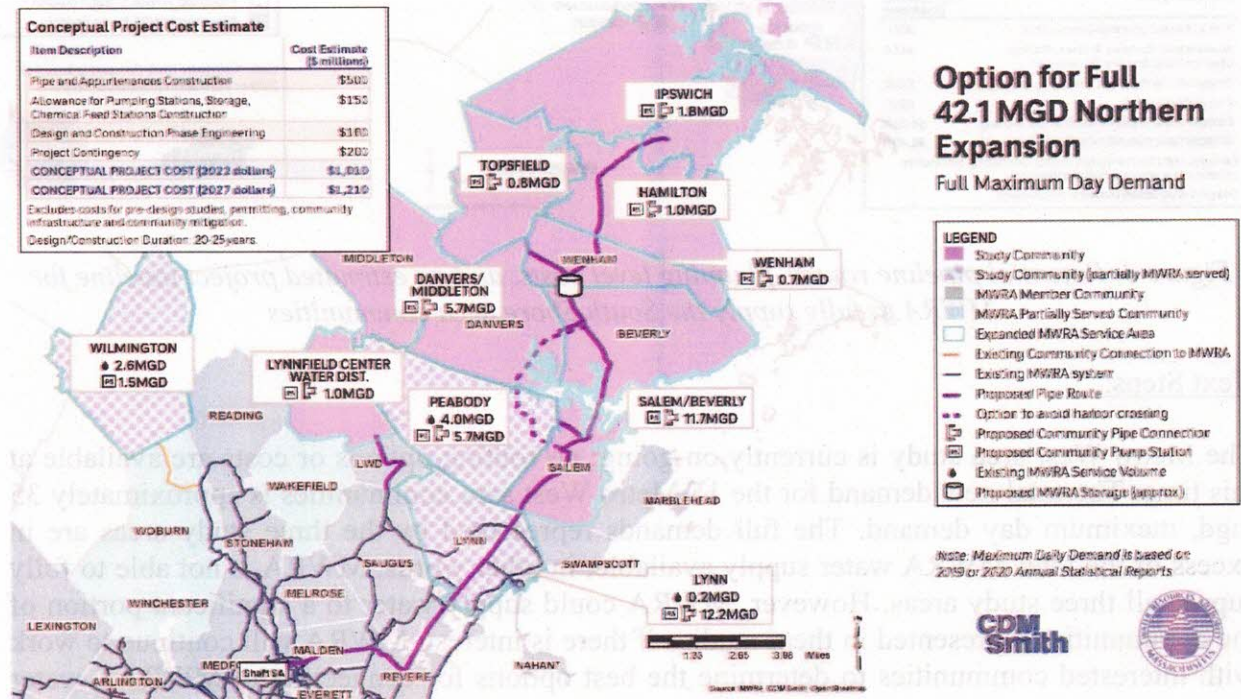


Figure 2. Potential pipeline routes, planning level costs, and an estimated project timeline for MWRA to fully supply the Ipswich River Basin communities

The cost to convey water to the two study areas varies widely depending on the level of service provided; anywhere from \$130 million to well over \$1 billion. Similarly, the time required to implement a system expansion can vary widely depending on the number of communities served and the geography of the communities relative to transmission main length. All system expansion options require extensive pre-design studies, including water quality evaluations, more detailed pipe routing studies and facility siting studies. Permitting and the MWRA admission process will also take time. Once these efforts are complete, the time necessary for design, construction, and startup of the required infrastructure could range from seven to ten years for more limited expansions, to more than 20 years for larger system expansions.

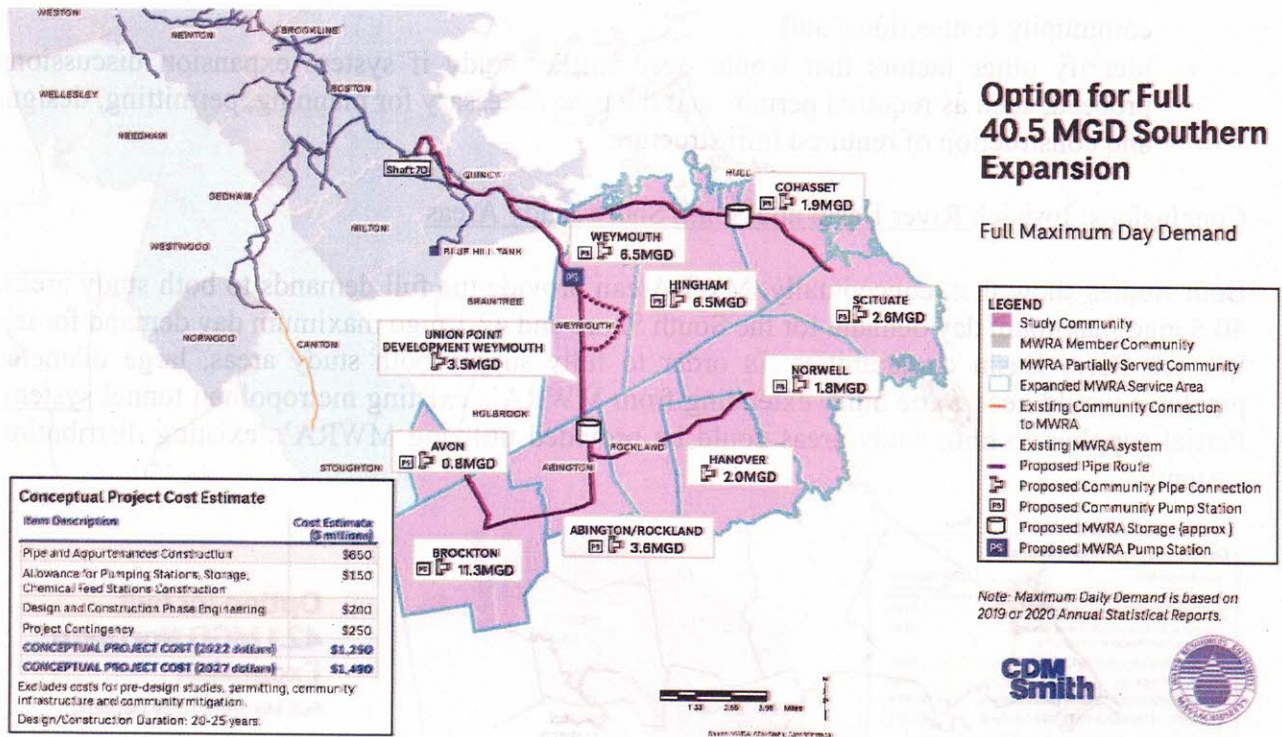


Figure 3. Potential pipeline routes, planning level costs, and an estimated project timeline for MWRA to fully supply the South Shore area communities

**Next Steps:**

The Metro West area study is currently on-going; no routing options or costs are available at this time. The total new demand for the 15 Metro West area communities is approximately 35 mgd, maximum day demand. The full demands represented by the three study areas are in excess of the total MWRA water supply available; in other words, MWRA is not able to fully supply all three study areas. However, MWRA could supply water to a significant portion of the communities represented in these studies if there is interest. MWRA will continue to work with interested communities to determine the best options for connecting to MWRA’s water system. Reports summarizing the findings of the Ipswich River Basin and South Shore area feasibility studies will be posted on MWRA’s website. Additional information regarding the Metro West area study will also be posted once that study has been completed.

**BUDGET/FISCAL IMPACTS:**

The Ipswich River Basin study was funded by the Baker Administration (\$250,000). The South Shore area study was funded through a direct appropriation to MWRA (\$300,000). MWRA has committed to fund the Metro West area study (\$250,000). Additional funding to support future studies or planning projects has not been identified.

A significant investment in infrastructure would be required to provide water to new communities; MWRA may incur some costs associated with regional connections. However, as part of MWRA’s analysis of waiving the Entrance Fee, the sales of just an additional five MGD of water over a period of 25 years based on the FY23 rate revenue requirement would provide approximately \$204.5 million in revenue from new customers, which would reduce the existing communities’ shares of the annual system assessment.