



MWRA Water System Expansion Studies

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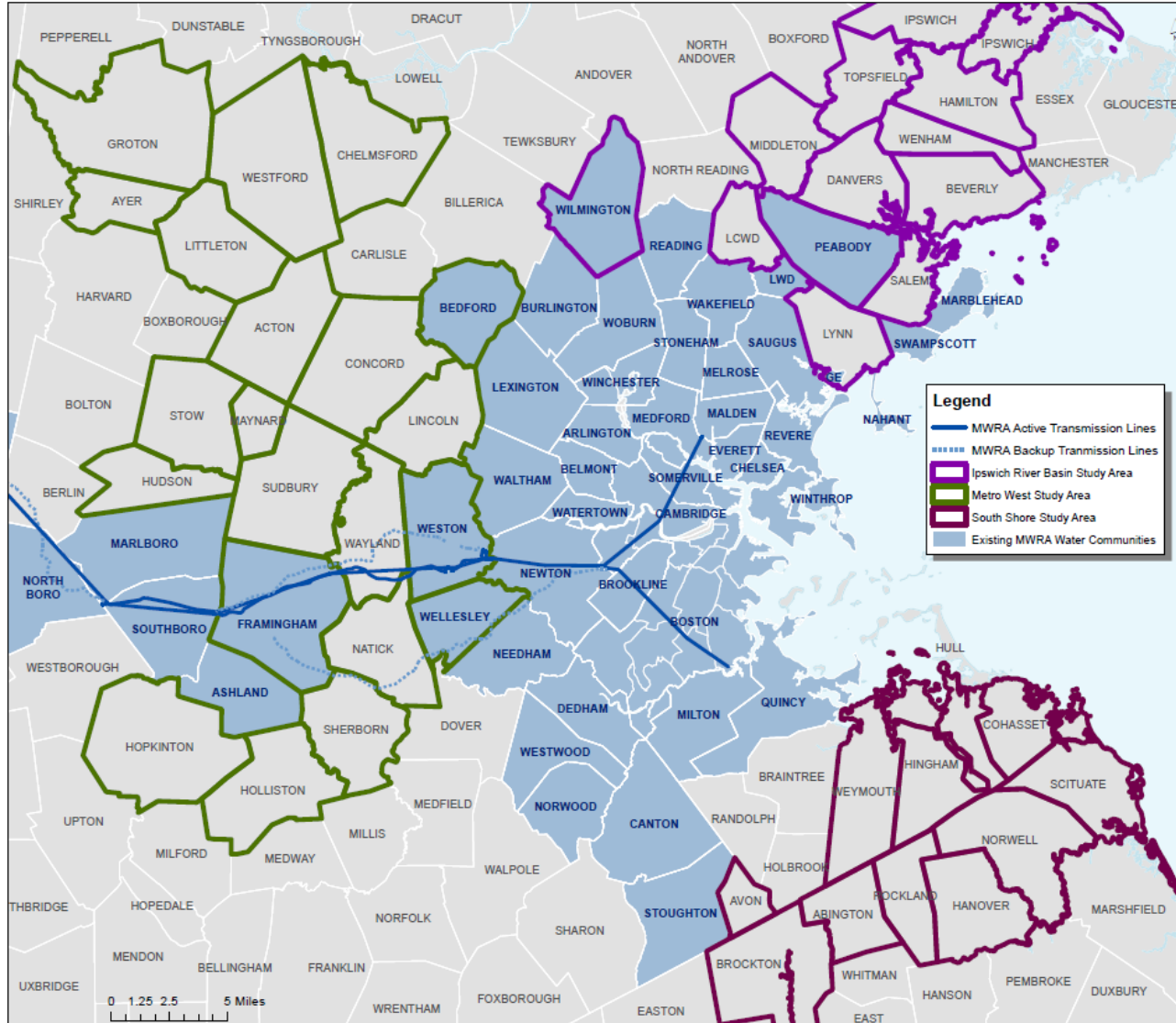


Purpose of Studies and Origins

- 3 completed studies
 - Ipswich River Basin
 - South Shore Communities
 - MetroWest Communities
- Quabbin Reservoir Watershed Communities (upcoming study)
- Status of recent inquiries
- Next Steps



MWRA System Expansion Feasibility Study Areas



- Ipswich River Basin (12 Communities)
- South Shore (10 Communities)
- Metro West (21 Communities)



Purpose of Studies and Origins

- Planning Level Studies
- Question: Is connecting to MWRA's Regional Water System Feasible?
 - Could MWRA transport water to these communities?
 - How would communities connect?
 - How much would a connection cost?
 - How long would it take to make these connections?
- Ipswich River Basin Communities: Requested by the Baker-Polito Administration
- South Shore Communities: Directed by the Legislature
- Metro West Communities: Requested by the Communities
- Additional work would be required for any community to connect to MWRA

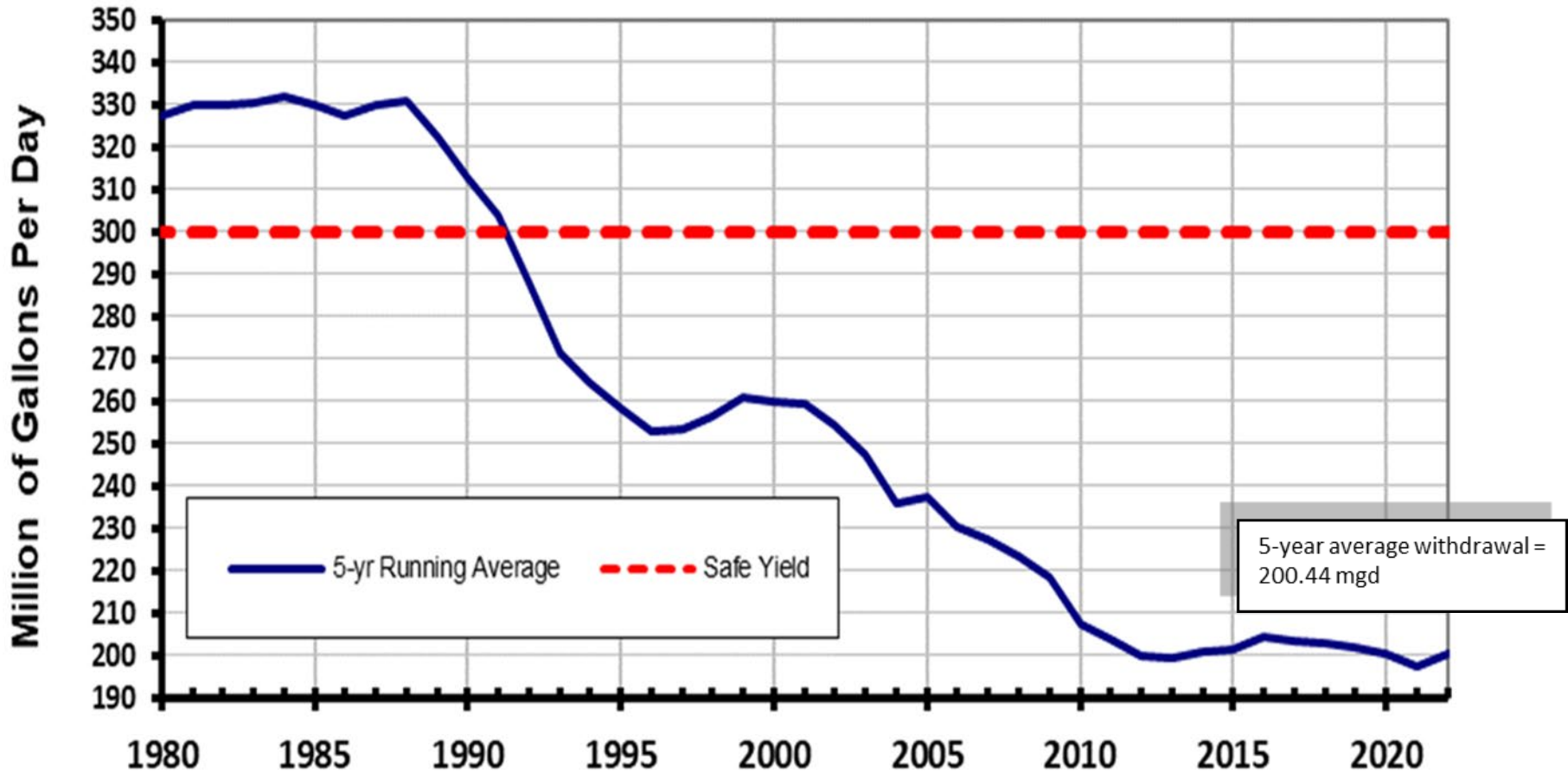


MWRA's Capacity to Provide Additional Water

- Safe Yield = **300 MGD**
 - Amount of water MWRA's source reservoirs, the Quabbin and Wachusett, can safely provide even during periods of extended drought
- Average 5-year reservoir withdrawals (2013-2018) = **203 MGD**
- Conservative growth for increased population and employment = **29 MGD**
- Additional demand from existing partial and emergency users = **17 MGD**
- Conservative Estimate of Future Use = **249 MGD**
- Available supply for new communities = **51 MGD** (average or \approx 76.5 MGD on a maximum demand day)



Reservoir Withdrawals from 1980 to 2022





Study Assumptions, Costs, and Schedules

- **Study Assumptions**

- Communities included in scenarios would be fully-served by MWRA to the greatest extent possible
- Assumed new connection to MWRA's system, limited to no "wheeling" from one system to another
- Pipe sizing based on maximum daily demands (MDD), not average day demands (ADD)

- **Cost and Schedule:**

- Ipswich/South Shore: September 2022 and estimated 2027 dollars
- MetroWest: September 2023 and estimated 2028 dollars
- Conceptual, contingencies added to all line items and total cost
- Infrastructure costs and schedule vary based on size and location/routing



Installation of a 60" MWRA pipeline. Picture taken in Arlington.



Potential MWRA Expansion to Ipswich River Basin

- **Communities Included in Study:**

- Beverly, Danvers, Hamilton, Ipswich, Lynn, Lynnfield Center Water District, Middleton, Peabody, Salem, Topsfield, Wenham, Wilmington

- **Three alternatives considered**

- Alternative #1: Fully serving all Ipswich River Basin Communities
 - ~ 42.5 MGD and ~ 32 miles of pipe
- Alternative #2: Provide water to Peabody and Salem
 - ~ 13.5 MGD and ~ 24 miles of pipe
- Alternative #3: Provide water to Danvers/Middleton, Hamilton, Ipswich, Wenham, Topsfield
 - ~ 12.5 MGD and ~ 4.5 miles of pipe



Potential MWRA Expansion to the South Shore

- **Communities Included in Study:**

- Abington, Avon, Brockton, Cohasset, Hanover, Hingham, Norwell, Rockland, Scituate, and Weymouth
- Former South Weymouth Naval Air Force Station (a.k.a., Union Point Development)

- **Two alternatives considered**

- Alternative #1: Fully serving all South Shore Communities in study area
 - ~ 40.5 MGD and ~ 40 miles of pipe
- Alternative #2: Partial supply to Avon, Brockton, and Weymouth/Formal Naval Air Force Station
 - ~ 17.3 MGD and ~ 20 miles of pipe



Potential MWRA Expansion to MetroWest

- **Communities Included in Study:**

- Acton, Ayer, Bedford, Chelmsford, Concord, Groton, Holliston, Hopkinton, Hudson, Lincoln, Littleton, Maynard, Natick, Sherborn, Stow, Sudbury, Wayland, Wellesley, Westborough, Westford, Weston

- **Considered Multiple Connection Points**

- Two options to supply Communities north of the MetroWest Tunnel and Hultman Aqueduct
- Two pipelines to supply Communities south of the MetroWest Tunnel and Hultman Aqueduct
- A connection for Westborough based on an existing pipeline
- One connection to supply several Communities south of the MetroWest Tunnel and Hultman Aqueduct via wheeling water



Overview of all Projects included in Study

CONCEPTUAL PROJECTS:

Project 1a (and 1b)

Service to Communities North of the MetroWest Water Tunnel

Project 2

Service to Weston, Wellesley, and Natick

Project 3

Service to Holliston

Project 4

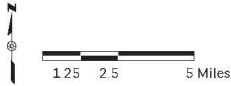
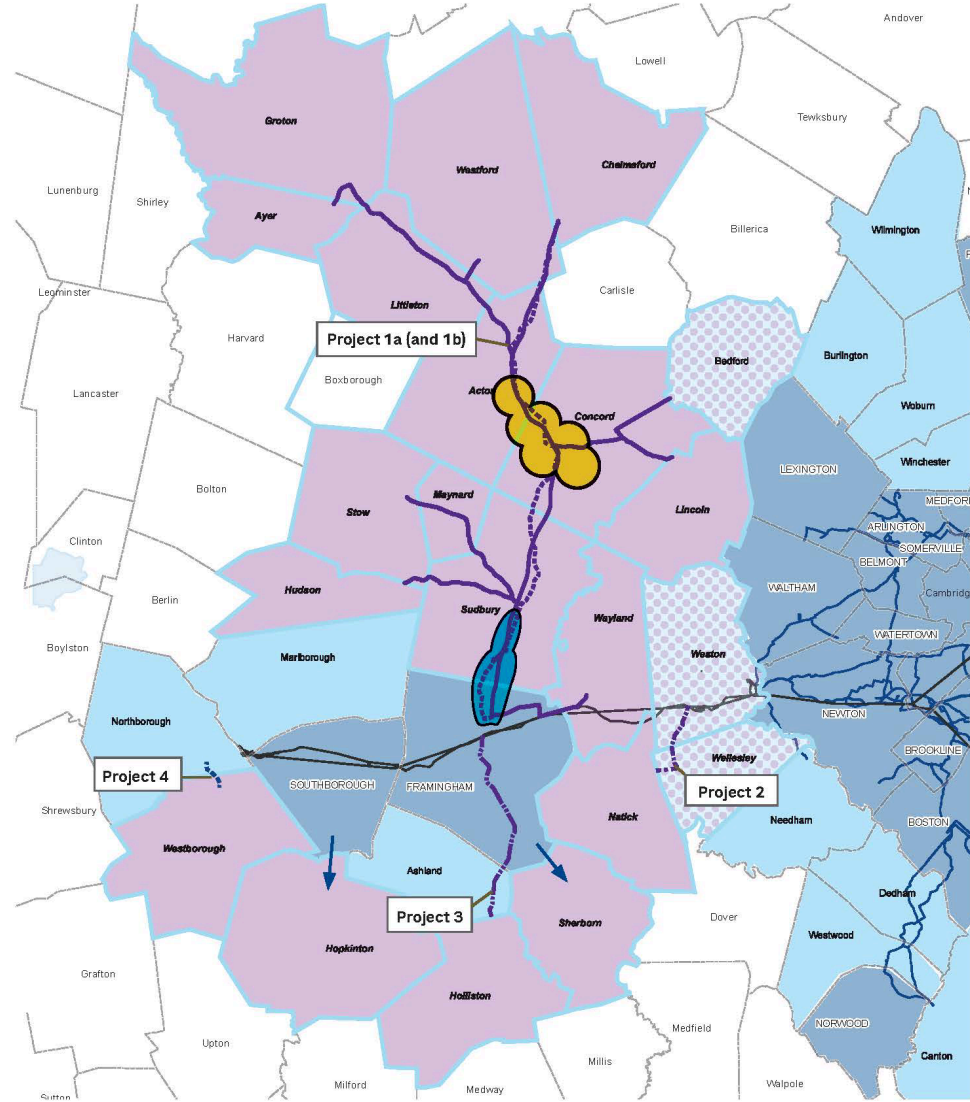
Service to Westborough

Project 5

Wheeling to Hopkinton and Sherborn

LEGEND

- Study Community
- Study Community (MWRA served)
- MWRA Member Community
- MWRA Partially Served Community
- Expanded MWRA Service Area
- Existing MWRA Distribution System
- Existing MWRA Transmission System
- Proposed Pipe Route (Project 1a)
- Proposed Pipe Route (Project 1b)
- Proposed Pipe Route (Project 2)
- Proposed Pipe Route (Project 3)
- Existing Pipe Route (Project 4)
- Represents Wheeling (Project 5)
- Assumed Transmission Main Pumping Station (Location TBD)
- Assumed MWRA Storage (Location TBD)



Source: MWRA, CDM Smith, Open Streetmap





MetroWest Projects 1a and 1b

CONCEPTUAL PROJECTS:

Project 1a
Service to Communities North of the MetroWest Water Tunnel using Rail Trails

Project 1b
Service to Communities North of the MetroWest Water Tunnel using Local Roadways



LEGEND

- Study Community
- Study Community (MWRA served)
- MWRA Member Community
- MWRA Partially Served Community
- Expanded MWRA Service Area
- Existing MWRA Distribution System
- Existing MWRA Transmission System
- Proposed Pipe Route (Project 1a)
- Proposed Pipe Route (Project 1b)
- Assumed Transmission Main Pumping Station (Location TBD)
- Assumed MWRA Storage (Location TBD)
- Proposed Community Pipe Connection with Expected Service Volume
- Proposed Community Pump Station
- Existing MWRA Service Volume

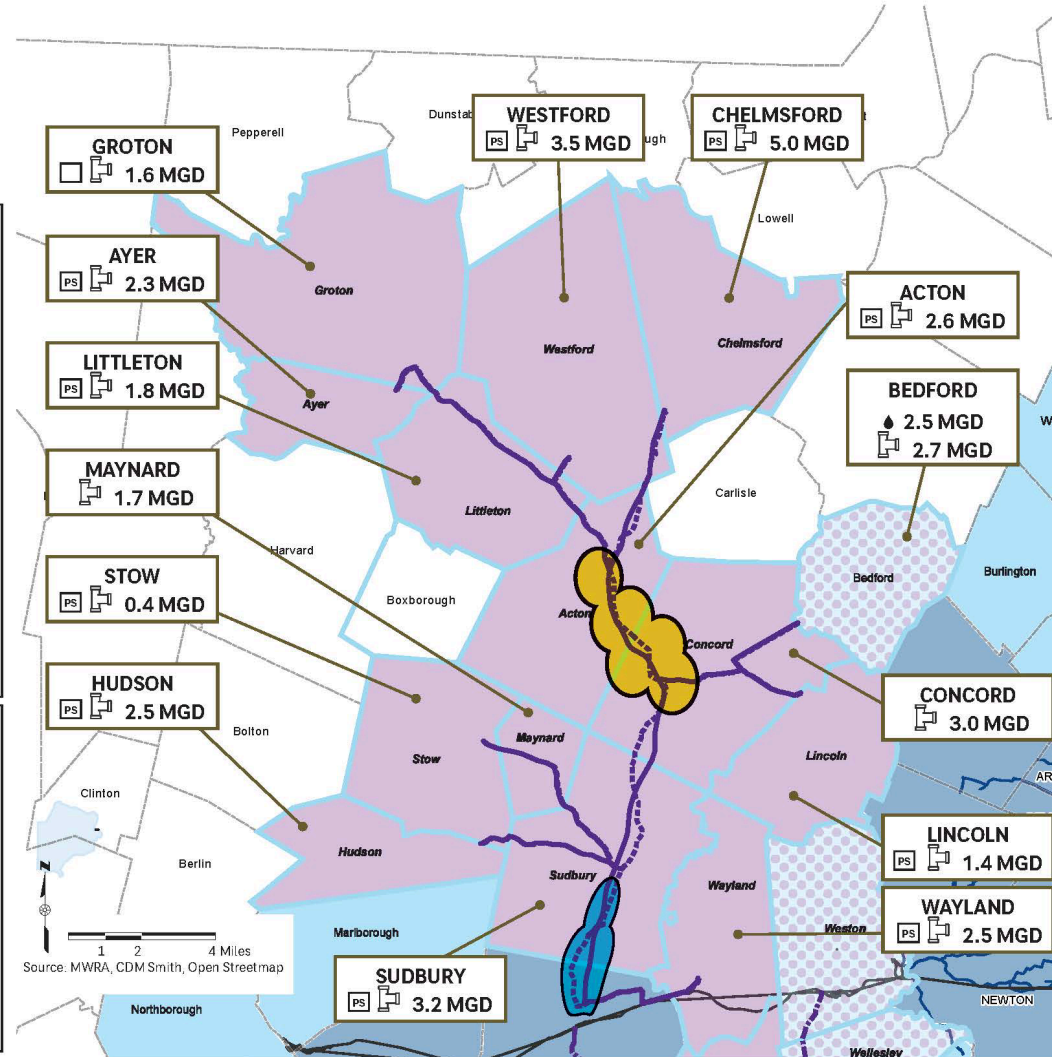
Conceptual Project Cost Estimate

Item Description	Cost Estimate (\$ millions)	
	Project 1a	Project 1b
Pipe and Appurtenances Construction	\$470	\$490
Allowance for Pumping Stations, Storage, Chemical Feed Stations Construction	\$130	\$130
Design and Construction Phase Engineering	\$150	\$160
Project Contingency	\$190	\$200
CONCEPTUAL PROJECT COST (2022 dollars)	\$940	\$980
CONCEPTUAL PROJECT COST (2028 dollars)	\$1,120	\$1,160
<i>Design/Construction Duration</i>	<i>25-30 years</i>	<i>25-30 years</i>

Notes:

- MGD: million gallons per day
- Due to differences in hydraulics between Projects 1a and 1b, it is anticipated that Sudbury will not require its own community pump station for Project 1b.

Excludes costs for pre-design studies, permitting, community infrastructure and community mitigation.





MetroWest Projects 2 through 5

CONCEPTUAL PROJECTS:

- Project 2**
Service to Weston, Wellesley, and Natick
- Project 3**
Service to Holliston
- Project 4**
Service to Westborough
- Project 5**
Wheeling to Hopkinton and Sherborn



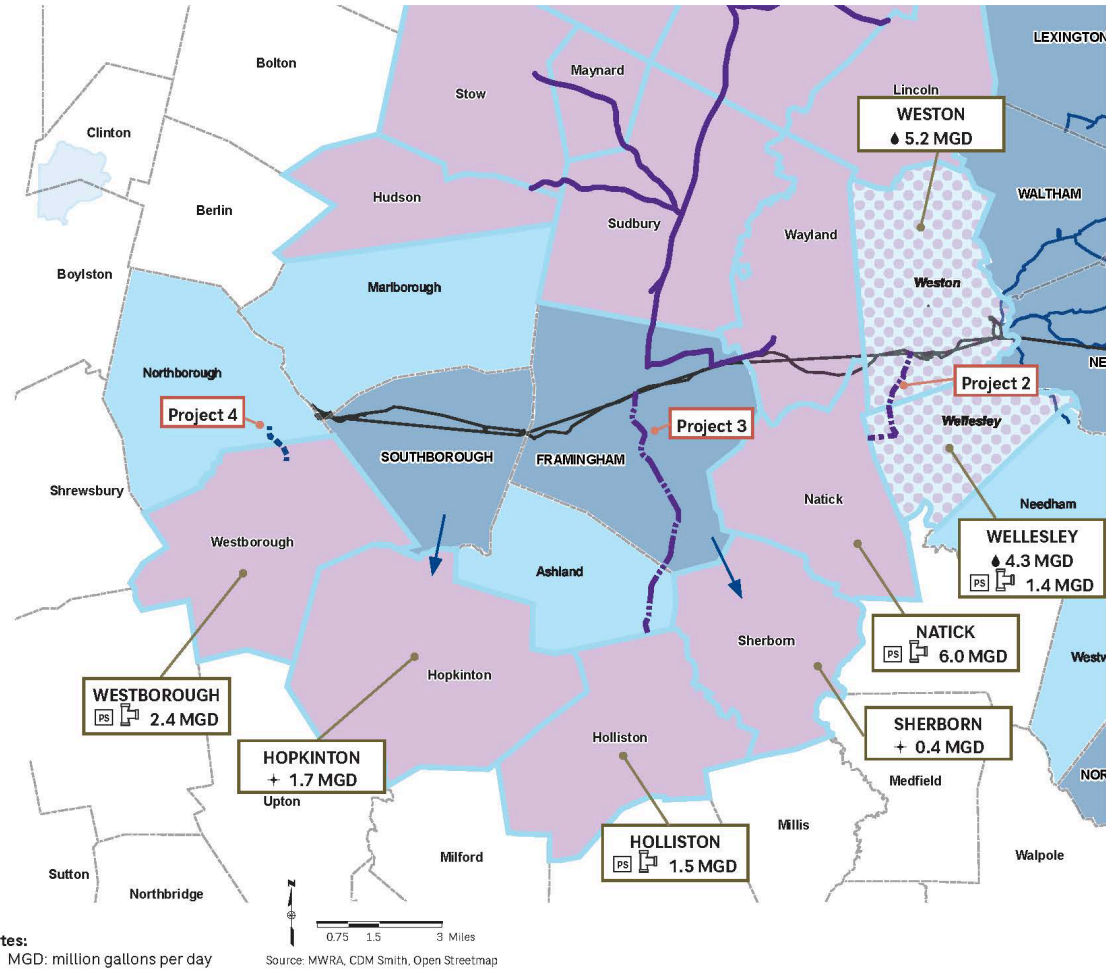
LEGEND

- Study Community
- Study Community (MWRA served)
- MWRA Member Community
- MWRA Partially Served Community
- Expanded MWRA Service Area
- Existing MWRA Distribution System
- Existing MWRA Transmission System
- Proposed Pipe Route (Project 2)
- Proposed Pipe Route (Project 3)
- Existing Pipe Route (Project 4)
- Represents Wheeling (Project 5)
- + Assumed Community Wheeling Service Volume
- Proposed Community Pipe Connection with Expected Service Volume
- PS Proposed Community Pump Station
- Existing MWRA Service Volume

Conceptual Project Cost Estimate

Item Description	Cost Estimate (\$ millions)		
	Project 2	Project 3	Project 4
Pipe and Appurtenances Construction	\$20	\$20	\$1
Allowance for Pumping Stations, Storage, Chemical Feed Stations Construction	\$20	\$10	\$6
Design and Construction Phase Engineering	\$10	\$10	\$2
Project Contingency	\$10	\$10	\$2
CONCEPTUAL PROJECT COST (2022 dollars)	\$60	\$50	\$11
CONCEPTUAL PROJECT COST (2028 dollars)	\$70	\$60	\$13
<i>Design/Construction Duration</i>	<i>5-7 years</i>	<i>5-7 years</i>	<i>4-5 years</i>

Excludes costs for pre-design studies, permitting, community infra-structure and community mitigation. Project 4 assumes no new pipelines.



Notes:
■ MGD: million gallons per day



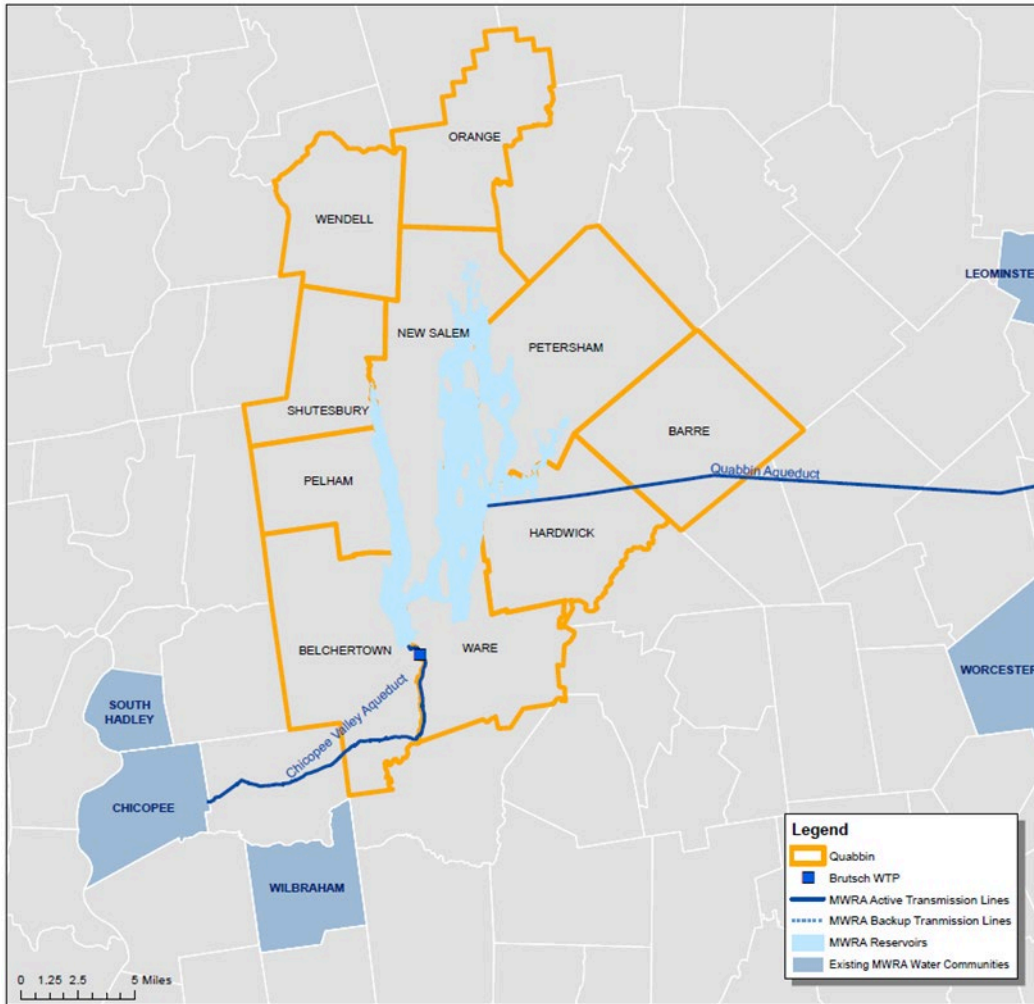
Potential MWRA Expansion to the MetroWest

- **Projects considered**

- Projects 1a/1b: Fully serving 14 MetroWest Communities to the north of Hultman/MWWST
 - ~ 34.2 MGD and ~ 47 miles of pipe
- Project 2: Serving Natick, Wellesley and Weston
 - ~ 7.4 MGD and ~ 2.9 miles of pipe
- Project 3: Serving Holliston
 - ~ 1.5 MGD and ~ 6.5 miles of pipe
- Project 4: Serving Westborough
 - ~ 2.4 MGD through existing connection in Northborough
- Project 5: Wheeling water to Hopkinton and Sherborn



Quabbin Reservoir Watershed Communities – New Study





Status of Recent Inquiries

- Partially Supplied Communities Considering Increasing Supply
 - Wellesley
 - Wilmington
- Communities have Received Approval to Pursue Admission from Governing Body
 - Hopkinton
 - Lynnfield Center Water District (currently undergoing MEPA review)
 - Natick
 - Wayland
- Various Stages in Decision-Making Process
 - Avon
 - Billerica
 - Select South Shore communities (Hingham, Norwell, Hanover, Abington, Rockland, Scituate, Cohasset)
 - Weymouth/Former Naval Air Station
 - North Sherborn Water and Wastewater District (proposed)
 - Select MetroWest Communities
 - Walpole



Study Update and Next Steps

- **Completed Studies**
 - <https://www.mwra.com/02org/html/expansion.html>
- **MWRA's Board of Directors Waived MWRA's Entrance Fee**
 - Up to 20 MGD for new communities seeking admission
 - Must have water quality or quantity issues, or need additional water for economic development
 - Must complete MWRA Admission process by December 31, 2027 (does not require completed connection to MWRA's system)
- **Next Steps:**
 - Working with interested communities
 - Fourth study in the Quabbin Watershed