



***Planning for the Future:
Exploring the Feasibility of Expanding
MWRA's Regional Water System***

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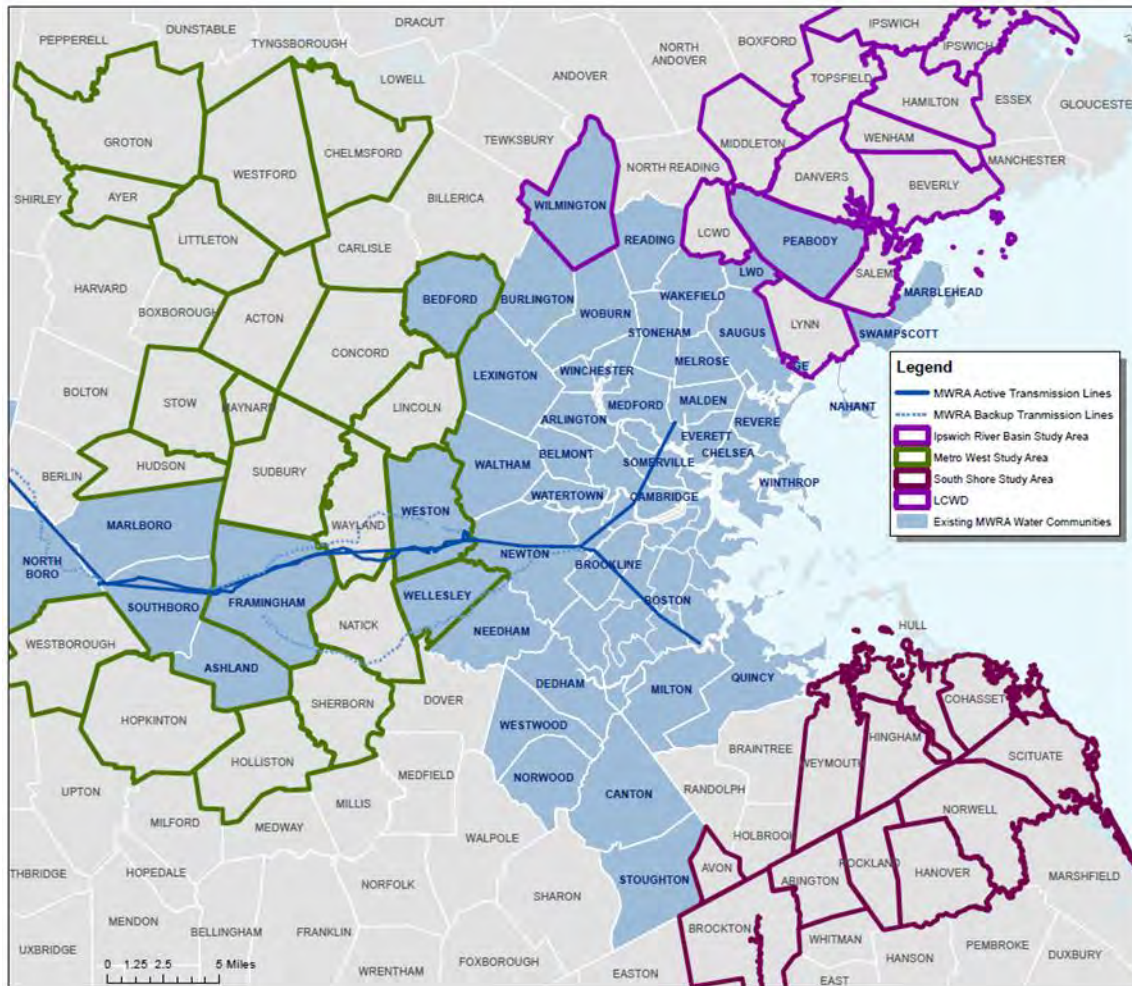
Water Resources Commission

March 9, 2023



Study Areas

- Ipswich River Basin (12 Communities, Demand \approx 42.1 MGD*)
- South Shore (10 Communities, Demand \approx 40.5 MGD)
- Metro West (22 Communities, New Demand \approx 45.3 MGD)



Notes:
*MGD= Million Gallons per Day

Demands are Maximum Daily Demands (MDD)

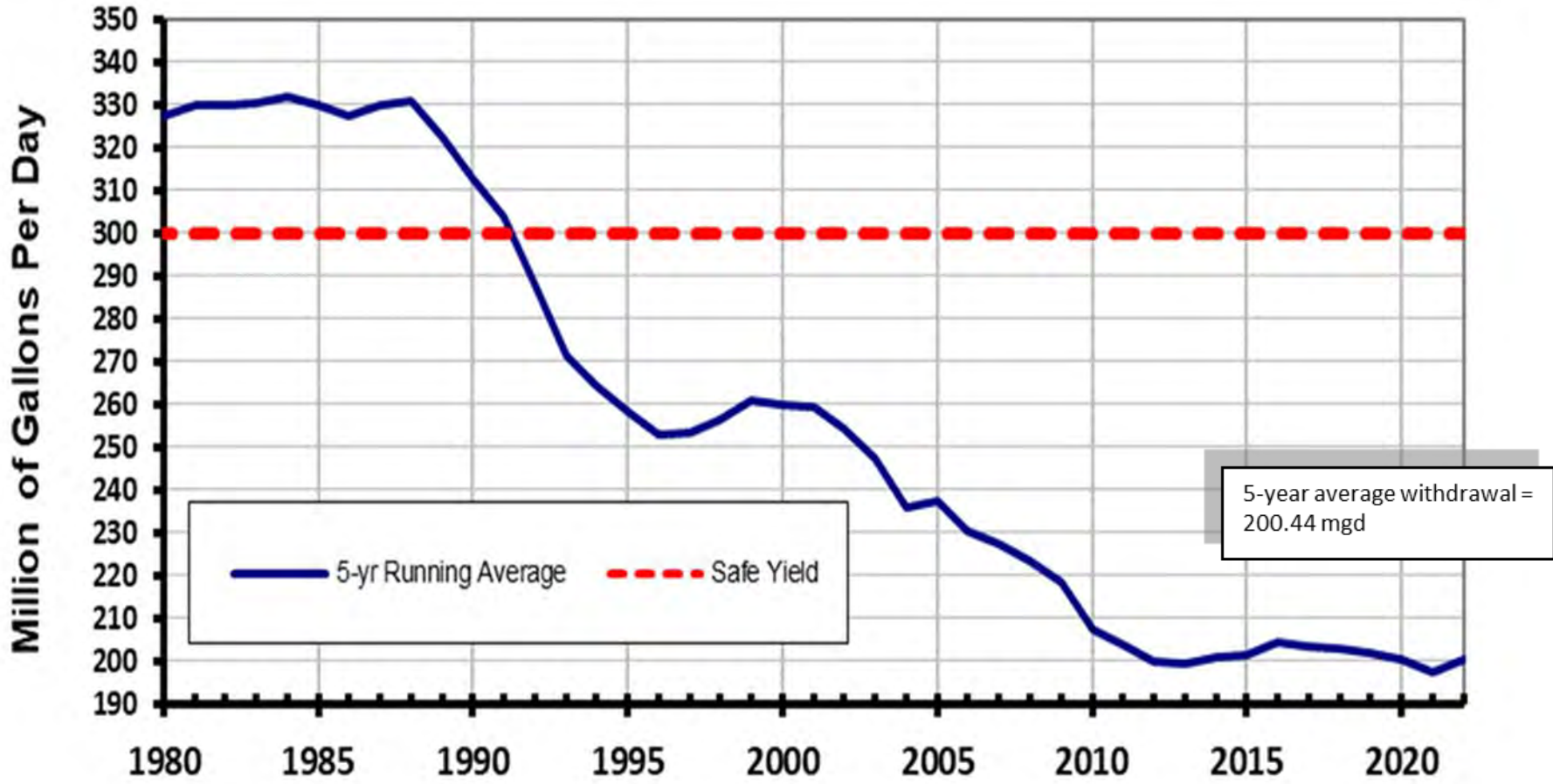


Purpose of Studies and Origins

- 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 Reservoir Withdrawals from 1980 to 2022





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 MDG on a maximum demand day)



Study Assumptions, Costs, and Schedules

- **Study Assumptions (Ipswich and South Shore)**

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

- **Costs:**

- September 2022 and estimated 2027 dollars
- Conceptual, contingencies added to all line items and total cost
- Infrastructure costs vary significantly based on size

- **Schedule:**

- Variable, based on size and location of pipe
- Estimates are included with each option



Example of the installation of a 60 inch MWRA pipeline. Picture taken in Arlington.



- **Communities Included in Study:**

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

- **Three options considered**

- Option #1: Fully serving all Ipswich River Basin Communities
- Based on existing distribution system capacity:
 - Option #2: Provide water to Peabody and Salem
 - Option #3: Provide water to Danvers/Middleton, Hamilton, Ipswich, Wenham, Topsfield

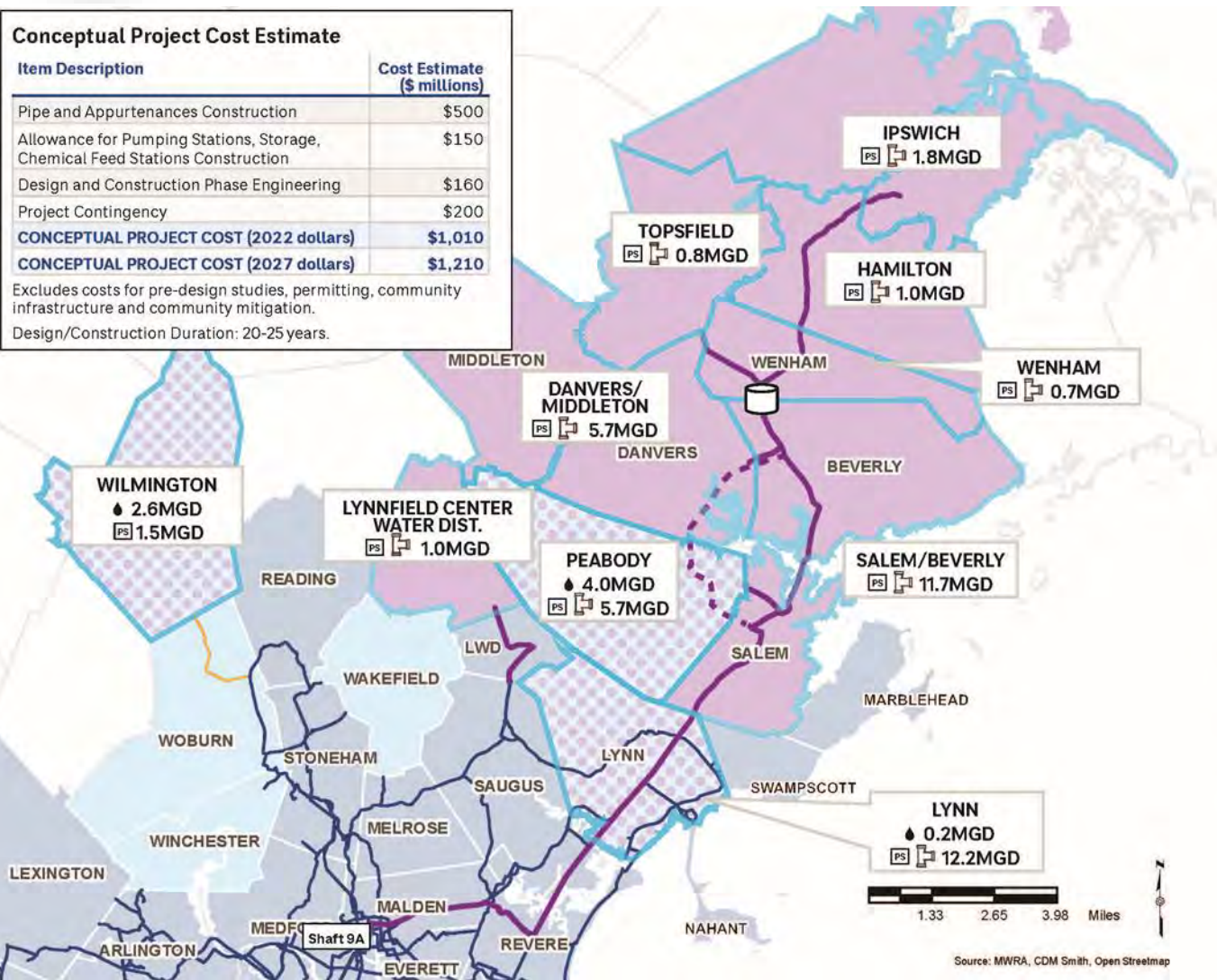


Option #1: Fully Serving the Ipswich River Basin Communities

Conceptual Project Cost Estimate

Item Description	Cost Estimate (\$ millions)
Pipe and Appurtenances Construction	\$500
Allowance for Pumping Stations, Storage, Chemical Feed Stations Construction	\$150
Design and Construction Phase Engineering	\$160
Project Contingency	\$200
CONCEPTUAL PROJECT COST (2022 dollars)	\$1,010
CONCEPTUAL PROJECT COST (2027 dollars)	\$1,210

Excludes costs for pre-design studies, permitting, community infrastructure and community mitigation.
Design/Construction Duration: 20-25 years.



Option for Full 42.1 MGD Northern Expansion

Full Maximum Day Demand

LEGEND

- Study Community
- Study Community (partially MWRA served)
- MWRA Member Community
- MWRA Partially Served Community
- Expanded MWRA Service Area
- Existing Community Connection to MWRA
- Existing MWRA system
- Proposed Pipe Route
- Option to avoid harbor crossing
- Proposed Community Pipe Connection
- Proposed Community Pump Station
- Existing MWRA Service Volume
- Proposed MWRA Storage (approx.)

Note: Maximum Daily Demand is based on 2019 or 2020 Annual Statistical Reports.



Source: MWRA, CDM Smith, Open Streetmap



Option #2: Provide Water to Peabody and Salem

Option for 13.5 MGD Northern Expansion

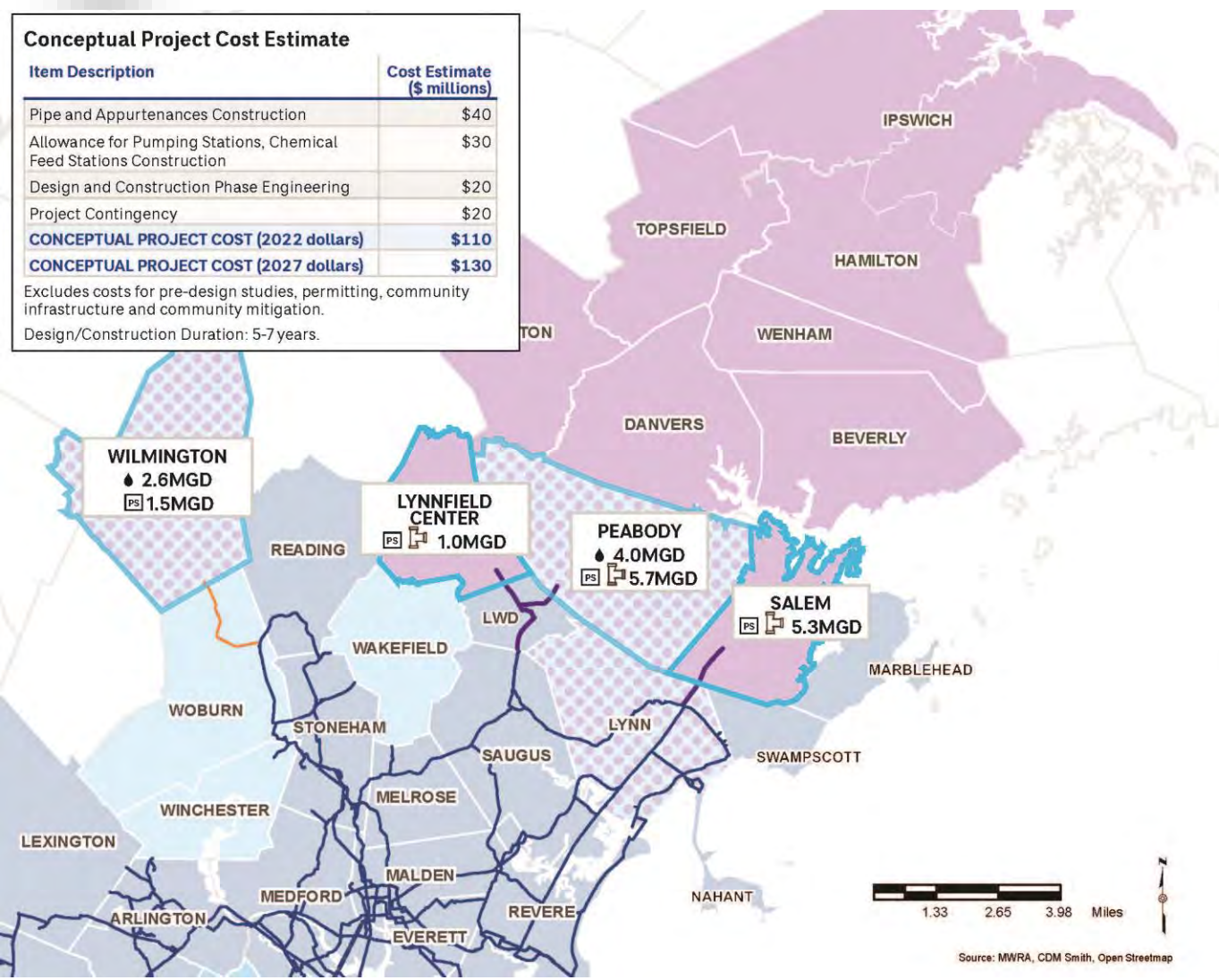
LEGEND

- Study Community
- Study Community (partially MWRA served)
- MWRA Member Community
- MWRA Partially Served Community
- Expanded MWRA Service Area
- Existing Community Connection to MWRA
- Existing MWRA system
- Proposed Pipe Route
- Proposed Community Pipe Connection
- Proposed Community Pump Station
- Existing MWRA Service Volume

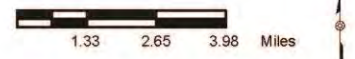
Conceptual Project Cost Estimate

Item Description	Cost Estimate (\$ millions)
Pipe and Appurtenances Construction	\$40
Allowance for Pumping Stations, Chemical Feed Stations Construction	\$30
Design and Construction Phase Engineering	\$20
Project Contingency	\$20
CONCEPTUAL PROJECT COST (2022 dollars)	\$110
CONCEPTUAL PROJECT COST (2027 dollars)	\$130

Excludes costs for pre-design studies, permitting, community infrastructure and community mitigation.
 Design/Construction Duration: 5-7 years.



Note: Maximum Daily Demand is based on 2019 or 2020 Annual Statistical Reports.



Source: MWRA, CDM Smith, Open Streetmap



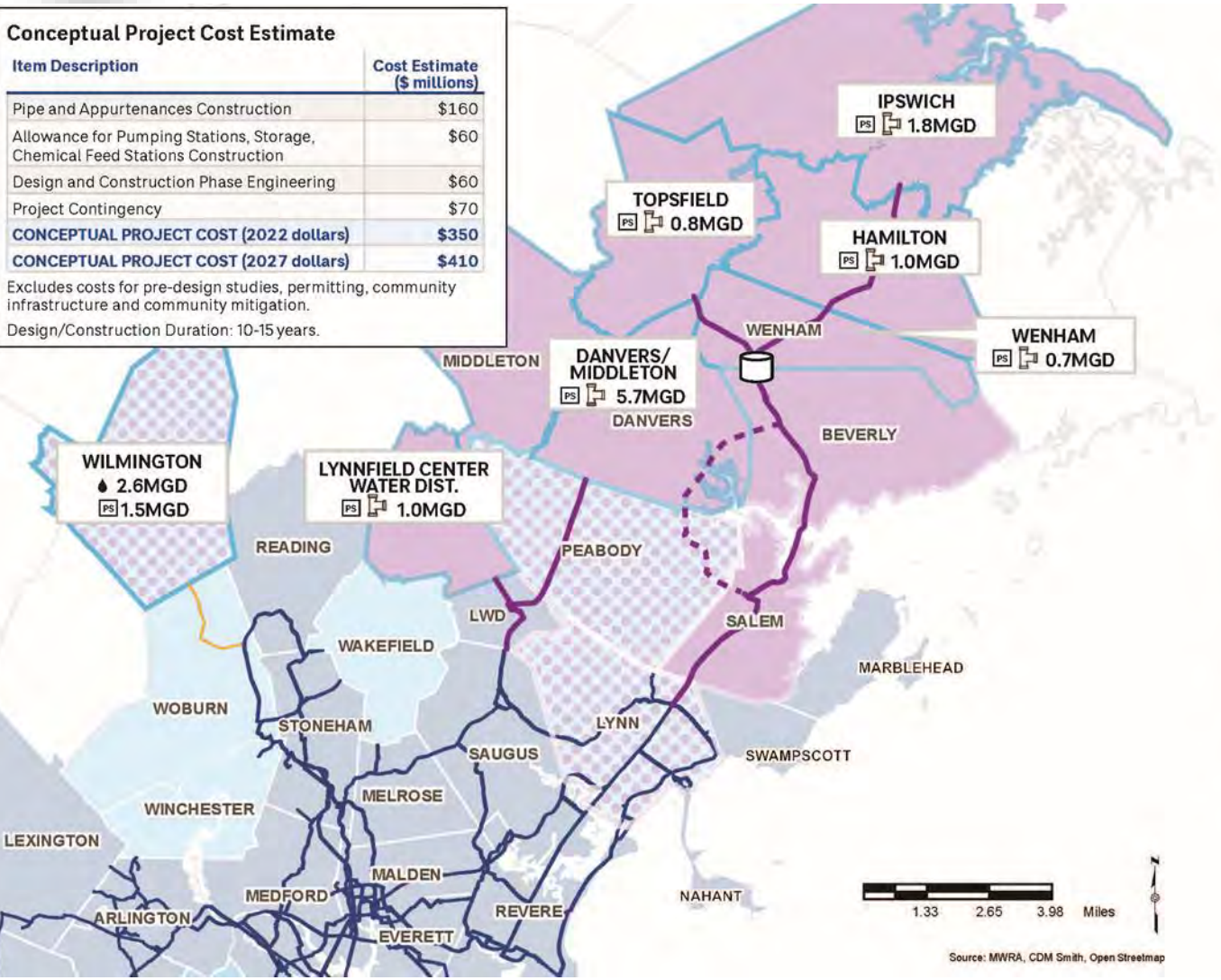
Option #3: Provide water to Danvers/Middleton, Hamilton, Ipswich, Wenham, Topsfield

Option for 12.5 MGD Northern Expansion

Conceptual Project Cost Estimate

Item Description	Cost Estimate (\$ millions)
Pipe and Appurtenances Construction	\$160
Allowance for Pumping Stations, Storage, Chemical Feed Stations Construction	\$60
Design and Construction Phase Engineering	\$60
Project Contingency	\$70
CONCEPTUAL PROJECT COST (2022 dollars)	\$350
CONCEPTUAL PROJECT COST (2027 dollars)	\$410

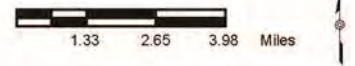
Excludes costs for pre-design studies, permitting, community infrastructure and community mitigation.
 Design/Construction Duration: 10-15 years.



LEGEND

- Study Community
- Study Community (partially MWRA served)
- MWRA Member Community
- MWRA Partially Served Community
- Expanded MWRA Service Area
- Existing Community Connection to MWRA
- Existing MWRA system
- Proposed Pipe Route
- Option to avoid harbor crossing
- Proposed Community Pipe Connection
- Proposed Community Pump Station
- Existing MWRA Service Volume
- Proposed MWRA Storage (approx.)

Note: Maximum Daily Demand is based on 2019 or 2020 Annual Statistical Reports.



Source: MWRA, CDM Smith, Open Streetmap



Potential MWRA Expansion to the South Shore

- **Communities Included in Study:**

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

- **Two options considered**

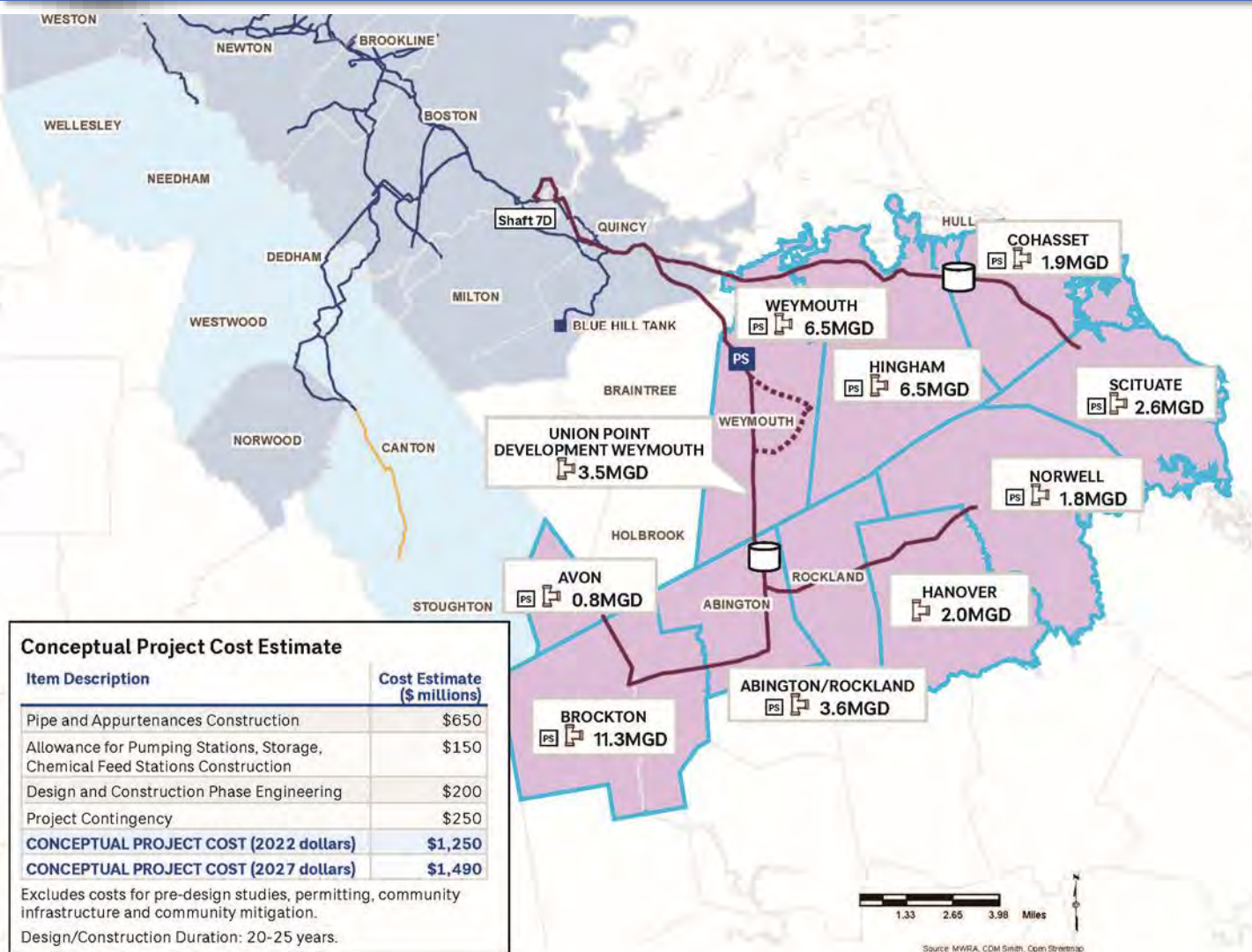
- Option #1: Fully serving all South Shore Communities included in the study
- Based on existing distribution system capacity:
 - Option #2: Partial supply to Avon, Brockton, and Weymouth/Formal Naval Air Force Station



Option #1: Fully Serving the South Shore Communities

Option for Full 40.5 MGD Southern Expansion

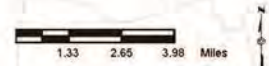
Full Maximum Day Demand



LEGEND

- Study Community
- MWRA Member Community
- MWRA Partially Served Community
- Expanded MWRA Service Area
- Existing Community Connection to MWRA
- Existing MWRA system
- Proposed Pipe Route
- Proposed Community Pipe Connection
- Proposed Community Pump Station
- Proposed MWRA Storage (approx.)
- Proposed MWRA Pump Station

Note: Maximum Daily Demand is based on 2019 or 2020 Annual Statistical Reports.



Source: MWRA, CDM Smith, Open Streetmap

Conceptual Project Cost Estimate

Item Description	Cost Estimate (\$ millions)
Pipe and Appurtenances Construction	\$650
Allowance for Pumping Stations, Storage, Chemical Feed Stations Construction	\$150
Design and Construction Phase Engineering	\$200
Project Contingency	\$250
CONCEPTUAL PROJECT COST (2022 dollars)	\$1,250
CONCEPTUAL PROJECT COST (2027 dollars)	\$1,490

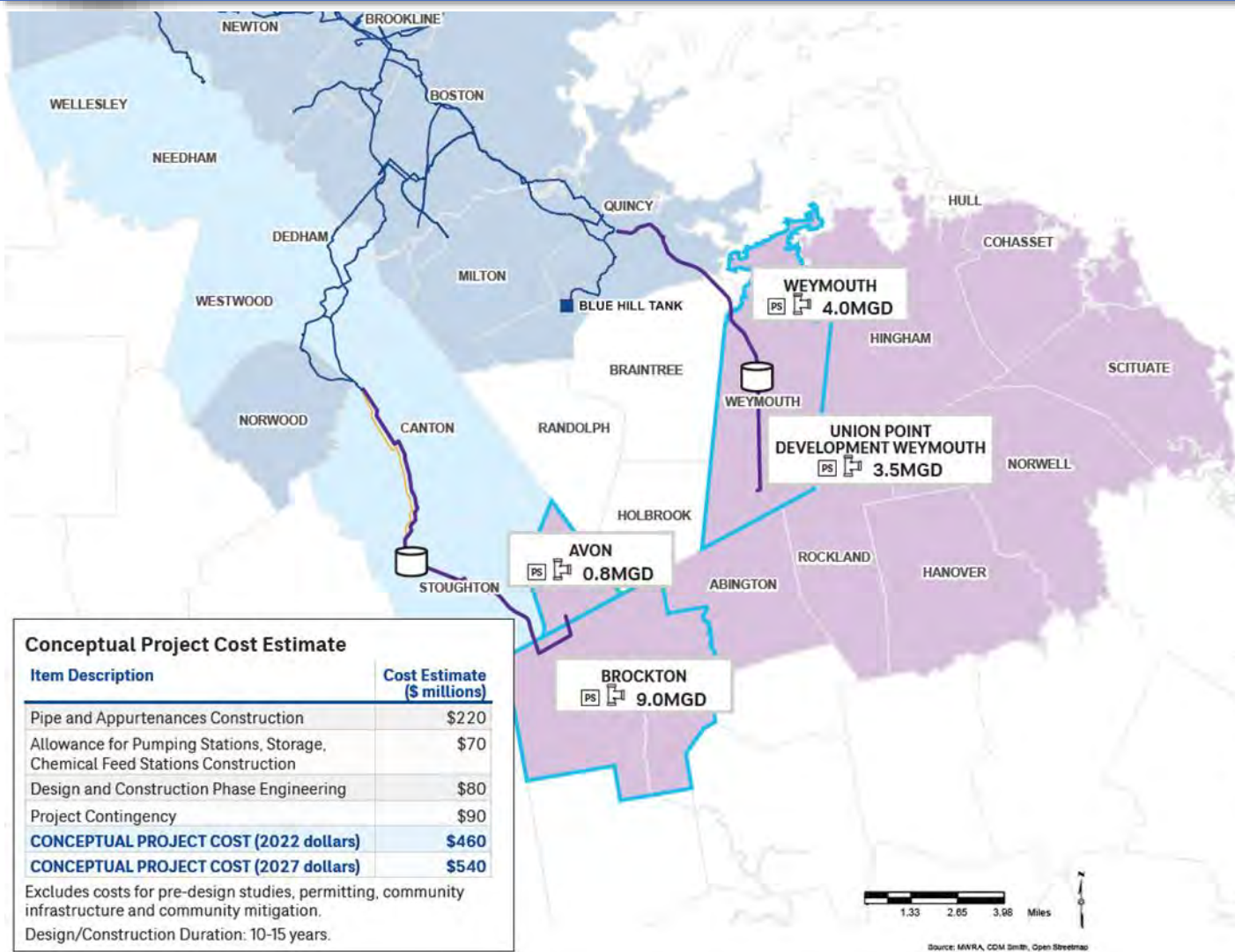
Excludes costs for pre-design studies, permitting, community infrastructure and community mitigation.

Design/Construction Duration: 20-25 years.



Option #2: Partial supply to Avon, Brockton & Weymouth/Former Naval Air Force Station

Option for 17.3 MGD Southern Expansion



LEGEND

- Study Community
- MWRA Member Community
- MWRA Partially Served Community
- Expanded MWRA Service Area
- Existing Community Connection to MWRA
- Existing MWRA system
- Proposed Pipe Route
- Proposed Community Pipe Connection
- PS Proposed Community Pump Station
- Proposed MWRA Storage (approx.)

Conceptual Project Cost Estimate

Item Description	Cost Estimate (\$ millions)
Pipe and Appurtenances Construction	\$220
Allowance for Pumping Stations, Storage, Chemical Feed Stations Construction	\$70
Design and Construction Phase Engineering	\$80
Project Contingency	\$90
CONCEPTUAL PROJECT COST (2022 dollars)	\$460
CONCEPTUAL PROJECT COST (2027 dollars)	\$540

Excludes costs for pre-design studies, permitting, community infrastructure and community mitigation.
Design/Construction Duration: 10-15 years.

Note: Maximum Daily Demand is based on 2019 or 2020 Annual Statistical Reports.



Source: MWRA, CDM Smith, Open StreetMap





Study Update and Next Steps

- **Ipswich River Basin Study: Complete**
- **South Shore Study: Complete**
- **Metro West Study: On-going, completed this spring**
- **<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:**
 - Outreach to Legislators, Communities, and Regional Organizations
 - Funding Opportunities?