



*Metropolitan Tunnel Redundancy
Program Update*

December 16, 2020



Program Update

- Program Staffing
- Preliminary Design, Geotechnical Investigation and Environmental Impact Report
- Community and Stakeholder Outreach
- Expert Review Panel (ERP)
- Other Ongoing Program-Wide Activities

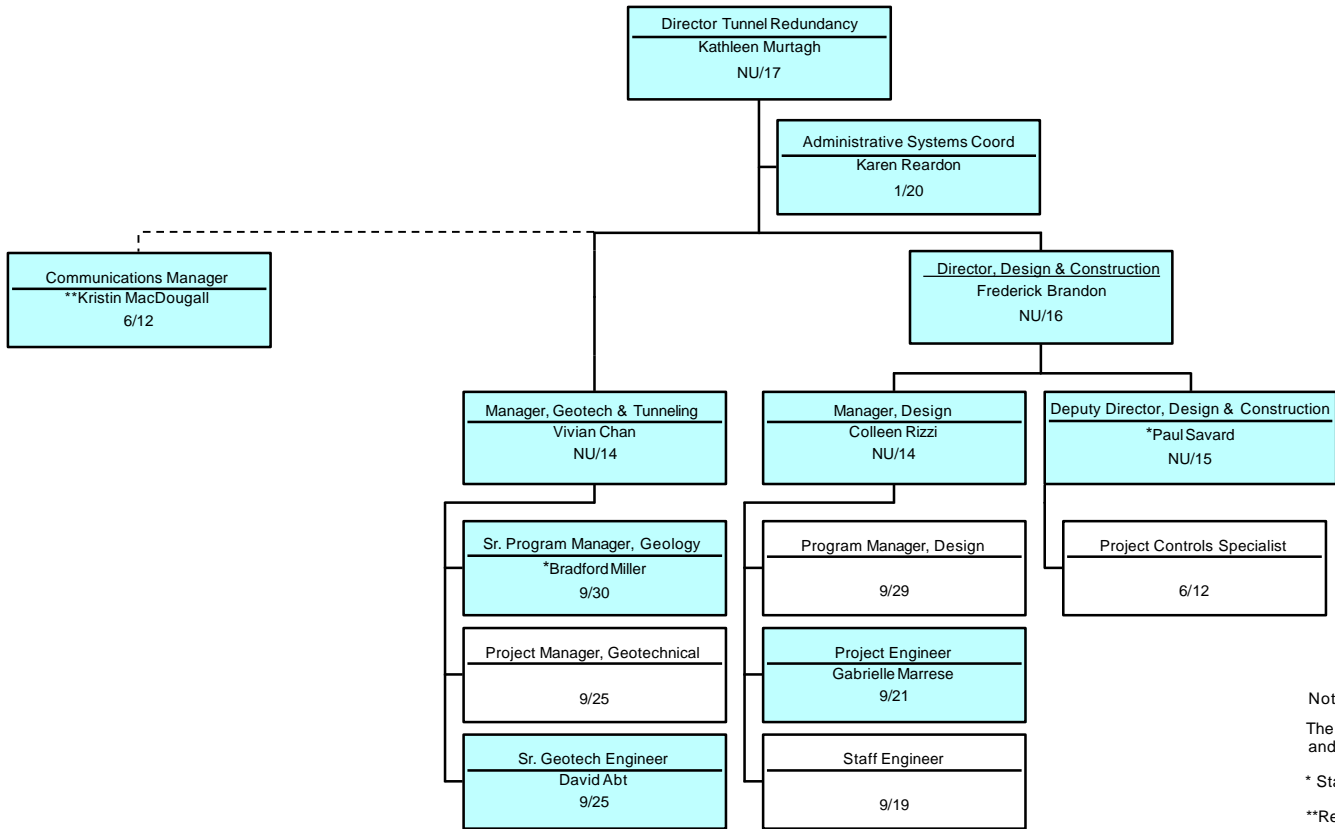


Tunnel Department Staffing Approach

- Build staff capacity to match Program needs
 - Bring expertise and experience necessary to support the Program
 - Plan for the future of the Tunnel Department
 - Grow with the Program
 - Consistent with Expert Review Panel recommendations
 - Approach is consistent with Boston Harbor Project and MetroWest Tunnel
- Tunnel Department staff are assisting with non-tunnel projects where their expertise is helpful



Tunnel Redundancy Department Organization Chart



Notes:
The shaded boxes are filled positions and the white boxes are vacant positions.
* Start Date: January 2021
**Reports to the Executive Office



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)





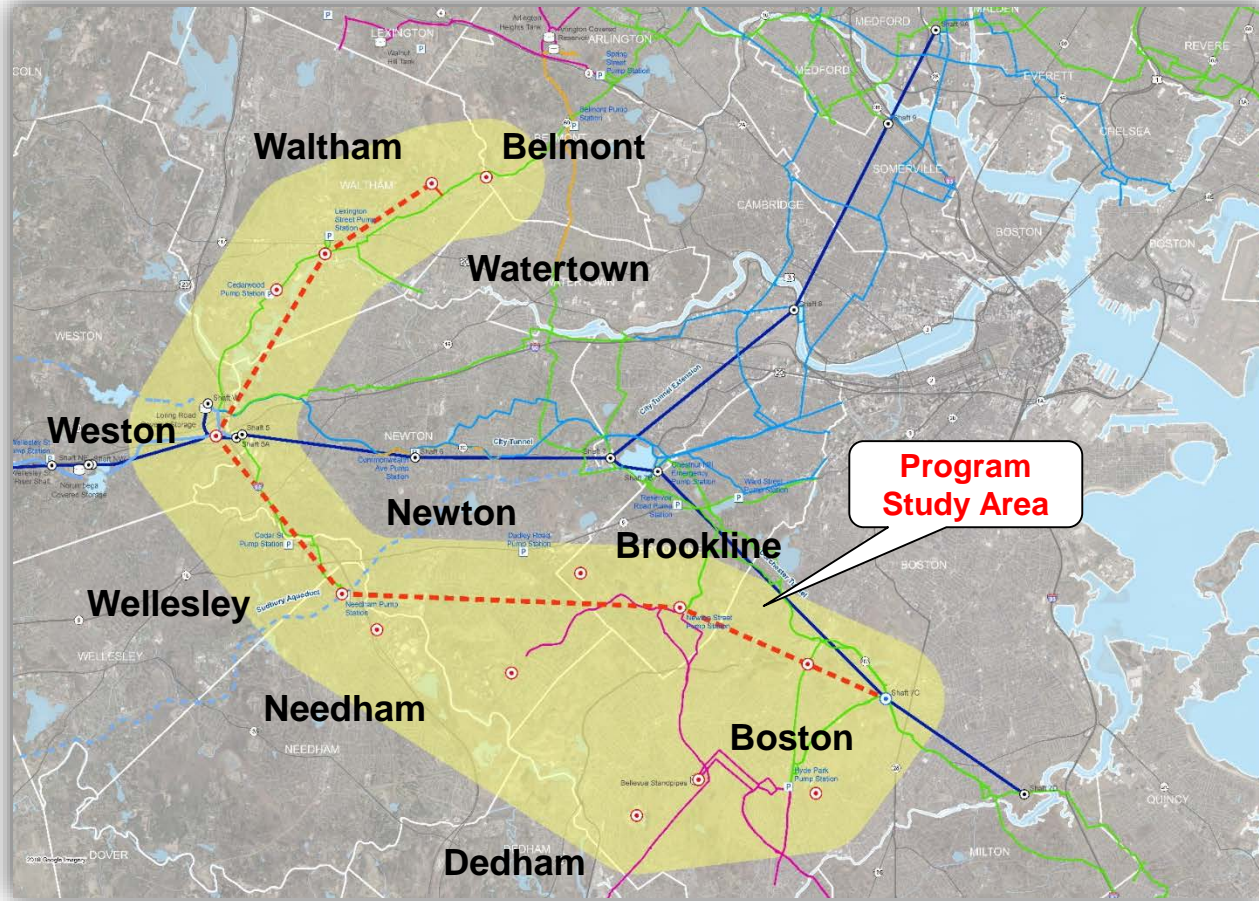
Tunnel Redundancy Program Schedule

- Technical Assistance: 2023
 - Field work – borings, survey, etc.
 - Other “data” collection
- Final Design: begin in 2024
 - Two or more final design contracts
 - Additional geotechnical investigation, survey, State and local permitting
 - Preparation of bid documents
- Construction Manager: begin in 2025
 - Evaluating # of contracts
 - Provides management and inspections of all construction work
 - Experienced with rock tunnel construction
- Construction: begin in 2026 or 2027
 - Two or more tunnel construction packages
 - Each contract lasts 5 years+/-





Program Study Area



--- Conceptual Tunnel Alignment



Tunnel Working Group Concept

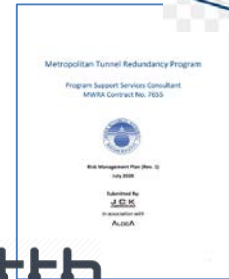
- Includes all 10 communities
 - One (or more) representative from each community
 - Initial Working Group for this Program will consist to 10 to 12 members
- Transparent process for evaluating and selecting shaft sites and tunnel alignments
- First Working Group meeting in early 2021, prior to filing ENF
- Monthly meetings through the evaluation of alternatives (Winter 2021 – Spring 2022)





Expert Review Panel Meetings

- November 2019 – Program Kick-Off
 - Program management, staffing, communications, tunneling and geotechnical challenges, contract practices
- September 2020
 - Risk Management Plan
- September 2020
 - Preliminary Design Work Plan and Schedule
- January 2021
 - Geotechnical Investigation Work Plan (Ph1A)





Other Program Activities

Completed Program-Wide Guidelines and Standards

- Program Risk Management Plan
- Program Quality Management Plan
- Program Delineation Report
- Existing Geotechnical Data Report
- Geotechnical Field Manual
- Geotechnical Data Management Plan
- Hydraulic Analysis
- Program Management Plan
- Document Control Plan
- Style Guide
- Program Web Page

Ongoing Program-Wide Activities

- Expert Review Panel
- Program Guide Specifications
- Program Budget Analysis
- Program Schedule Development
- Project Controls
- Contract Practices
- Community and Stakeholder Outreach
- Industry Outreach



Future Board Updates

Plan to update Board at key milestones through Preliminary Design

- Proposed tunnel alignment and shaft sites (late 2021/early 2022)
- Draft Environmental Impact Report (mid 2022)
- Geotechnical program progress (TBD)
- Preliminary Design (multiple, mid-late 2023)
 - Cost estimate
 - Schedule
 - Contract packaging

Additional updates – topics/dates TBD



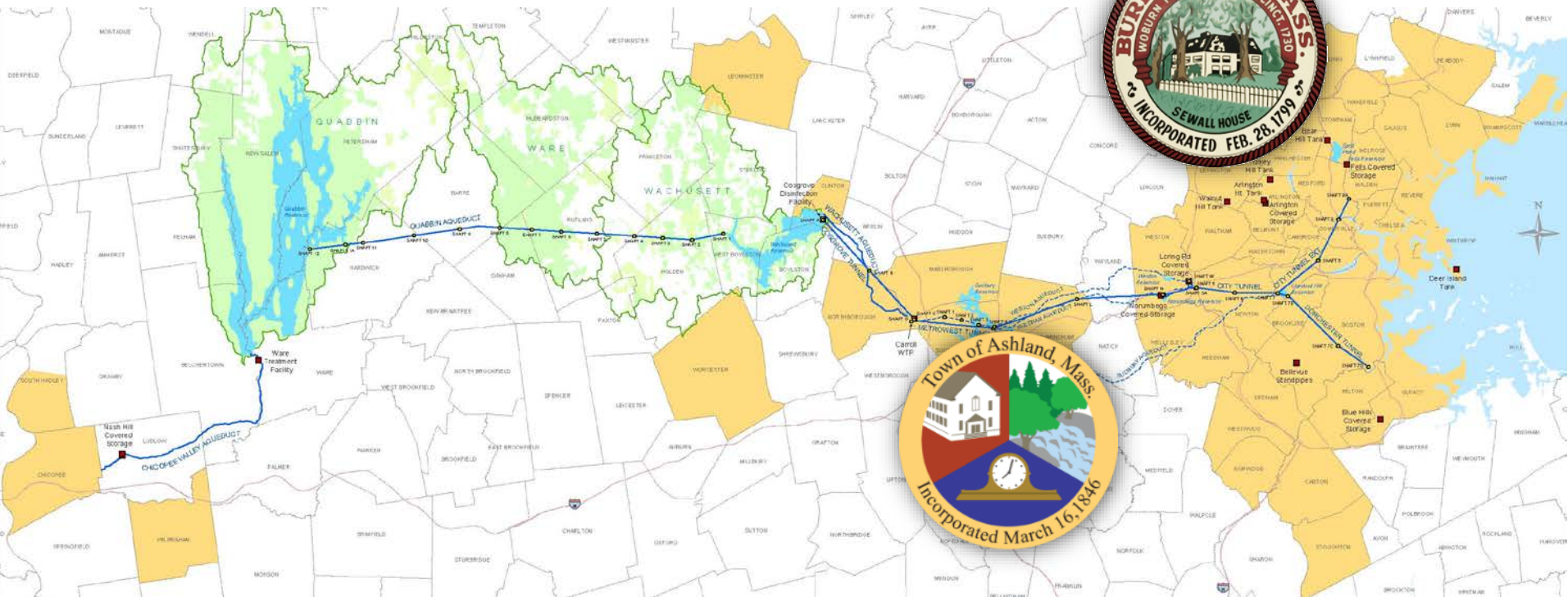


Thank You





Welcome Ashland and Burlington!





*FY22 Proposed
Capital Improvement Program*

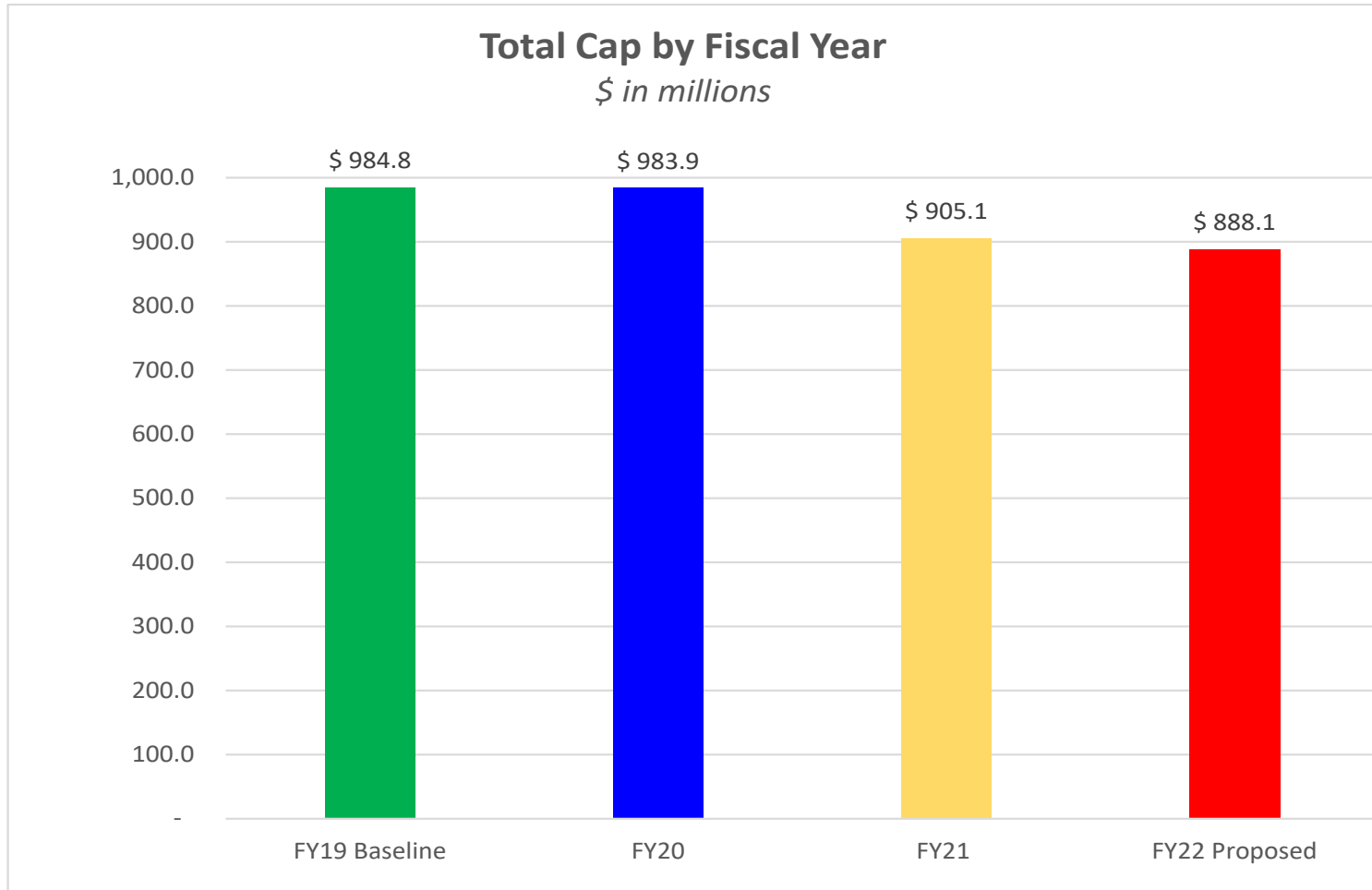
December 16, 2020



- FY22 Proposed CIP complies with the Cap requirements
- Focus on Asset Protection and Long-Term Redundancy
- Metropolitan Tunnel Redundancy



FY22 Proposed CIP - FY19-23 vs. Base-Line Cap

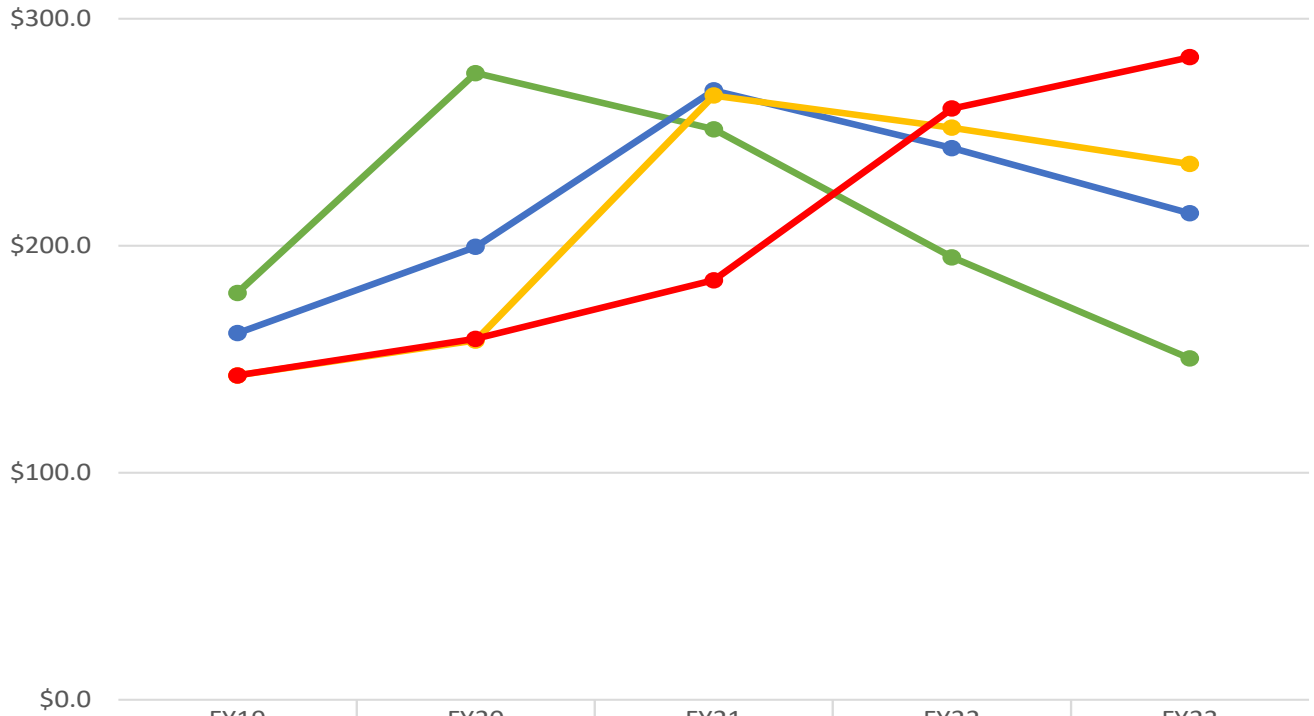




FY22 Proposed CIP – Projected Expenditures

Projected Expenditures by Fiscal Year

\$ in millions

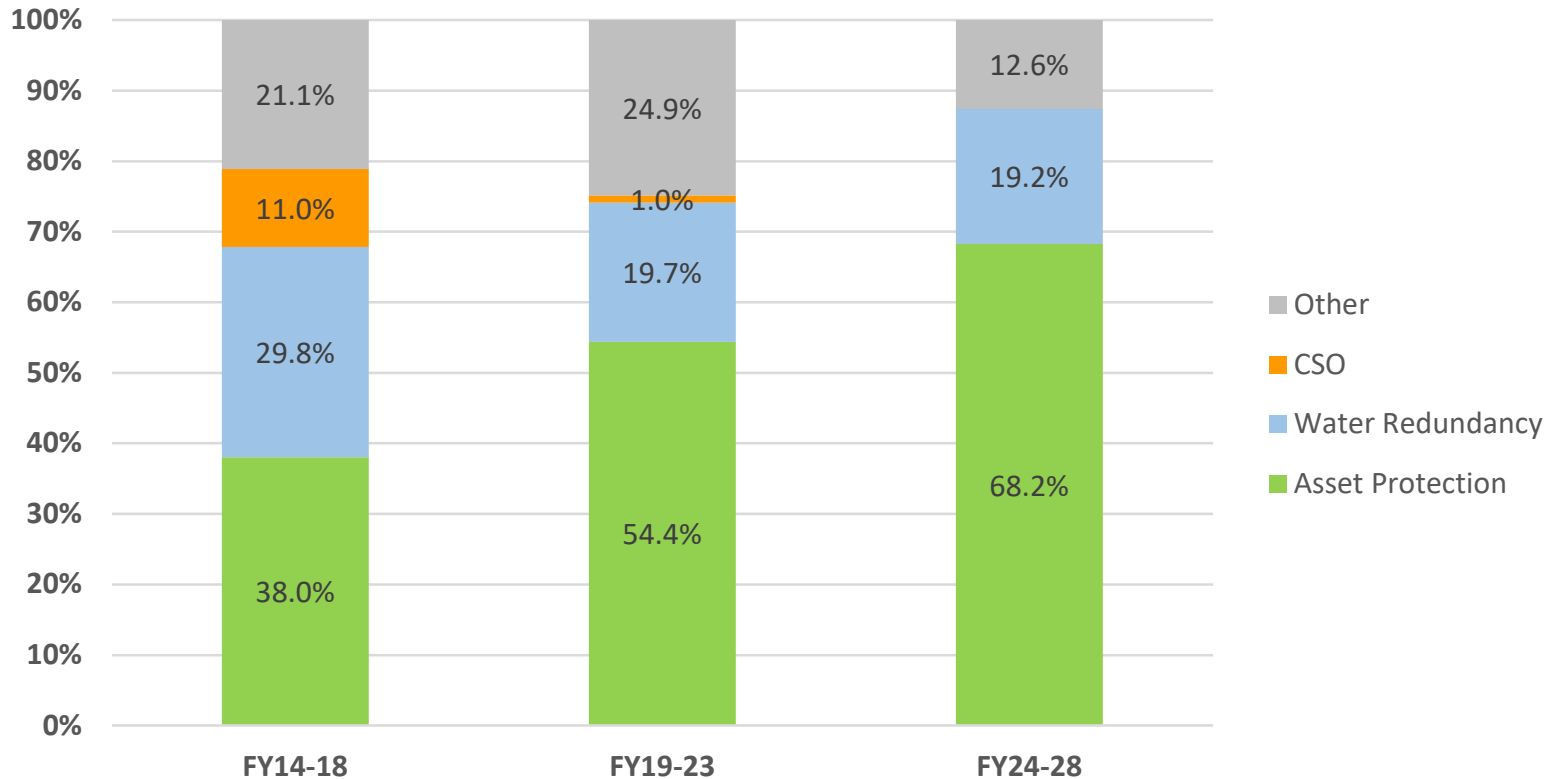


	FY19	FY20	FY21	FY22	FY23
FY19 Baseline	179.2	276.1	251.3	194.9	150.4
FY20	161.5	199.5	268.4	243.0	214.3
FY21	142.9	158.3	266.2	251.9	236.0
FY22 Proposed	142.9	159.0	184.8	260.5	283.0



FY22 Proposed CIP – Asset Protection and Water Redundancy

CIP Spending By Category
% of Total





FY22 Proposed CIP – Top Projects Excluding Loans FY19-23 Cap Period Spending

Project	Subphase	FY19-23 Spending \$s in Millions	% of Total
Deer Island Treatment Plant Asset Protection	Clarifier Rehab Phase 2 - Construction	\$75.3	7.3%
Corrosion & Odor Control	NI Odor Control HVAC Imp Construction Phase 2	\$58.3	5.7%
Facility Asset Protection	Chelsea Creek Upgrades - Construction	\$51.9	5.0%
Facility Asset Protection	Prison Point Rehab - Construction	\$42.5	4.1%
SEH Redundancy & Storage	Redundancy Pipeline Sect 111 - Construction 3	\$20.2	2.0%
NIH Redundancy & Storage	Section 89 & 29 Redundancy Construction Phase	\$19.8	1.9%
Deer Island Treatment Plant Asset Protection	Gravity Thickener Rehab	\$19.6	1.9%
Deer Island Treatment Plant Asset Protection	Fire Alarm System Replacement - Construction	\$15.8	1.5%
Metro Tunnel Redundancy	Prelm Des & MEPA Review	\$14.4	1.4%
SEH Redundancy & Storage	Redundancy Pipeline Sect 111 - Construction 2	\$14.2	1.4%
Top Spending Subphase FY19-23		\$331.9	32.2%
Remaining FY19-23 Spending		\$698.3	67.8%
Total Projected FY19-23 Spending		\$1,030.2	100.0%

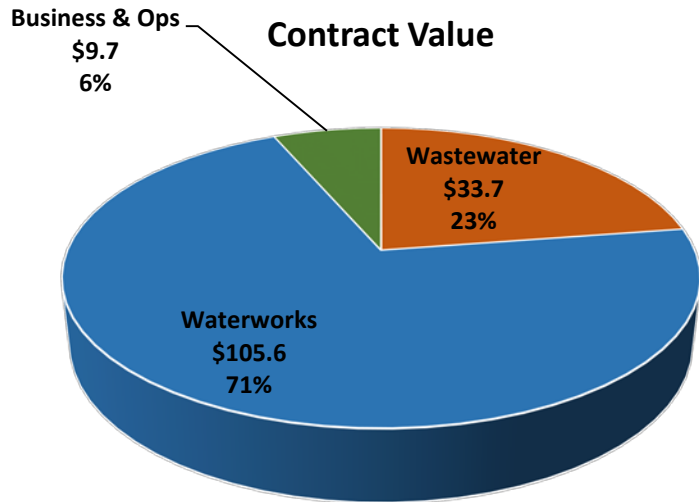


FY22 Proposed CIP – Top Projects Excluding Loans FY22 Spending

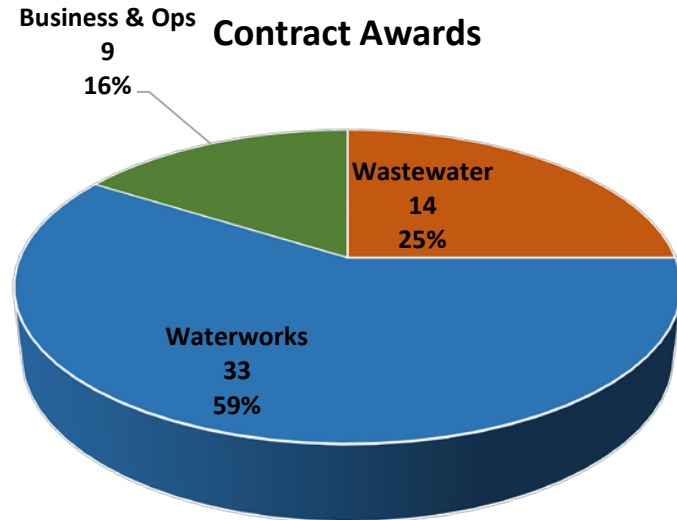
Project	Subphase	FY22 \$s in Millions	% of Total
Corrosion & Odor Control	NI Odor Control HVAC Improvement Construction Phase 2	\$22.9	8.8%
Deer Island Treatment Plant Asset Protection	Clarifier Rehab Phase 2 - Construction	\$21.8	8.4%
Facility Asset Protection	Prison Point Rehab - Construction	\$21.2	8.2%
Deer Island Treatment Plant Asset Protection	Fire Alarm System Replacement - Construction	\$7.8	3.0%
NIH Redundancy & Storage	Section 89 & 29 Replacement - Construction	\$5.8	2.2%
Metro Tunnel Redundancy	Preliminary Des & MEPA Review	\$5.4	2.1%
Metro Redundancy Interim Improvement	WASM 3 CP-1	\$5.2	2.0%
Central Monitoring System	CWTP SCADA Upgrade Construction	\$5.0	1.9%
	Total Contracts > \$5 million	\$95.1	36.5%
	Other Project Spending	\$165.3	63.5%
	Total FY22 Spending	\$260.5	100.0%



FY22 Proposed CIP – Proposed FY22 Contract Awards



\$s in millions



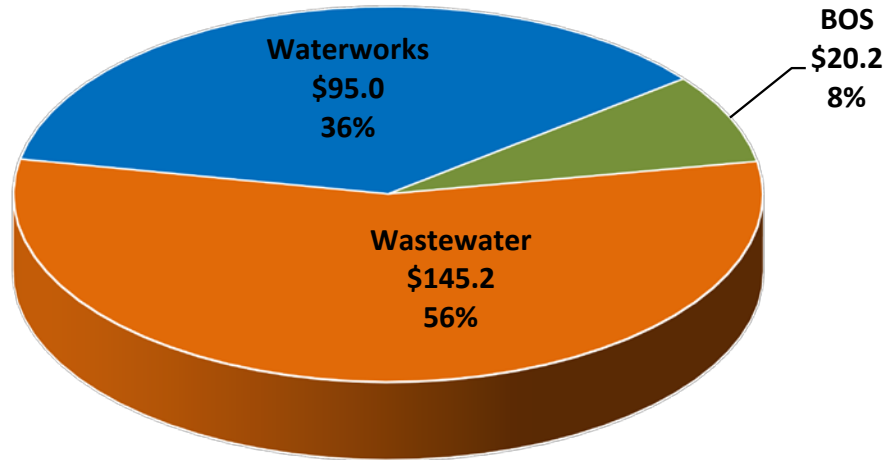
56 contracts projected to be awarded in FY22 for \$149 million.



FY22 Proposed CIP – Proposed FY22 Expenditures

Total Proposed FY22 Expenditures: \$260.5 million

FY22 Spending



\$s in millions



Nut Island Odor Control and HVAC Improvements Construction



FY 22 Budget : \$22.9M
Total Contract: \$58.3M
NTP: February 2020
SC: December 2022



Clarifier Rehabilitation Phase 2 Construction



FY22 Budget: \$21.8M
Total Contract: \$137.2M
NTP: January 2021
SC: May 2025



Prison Point Rehabilitation Construction



FY 22 Budget: \$21.2M

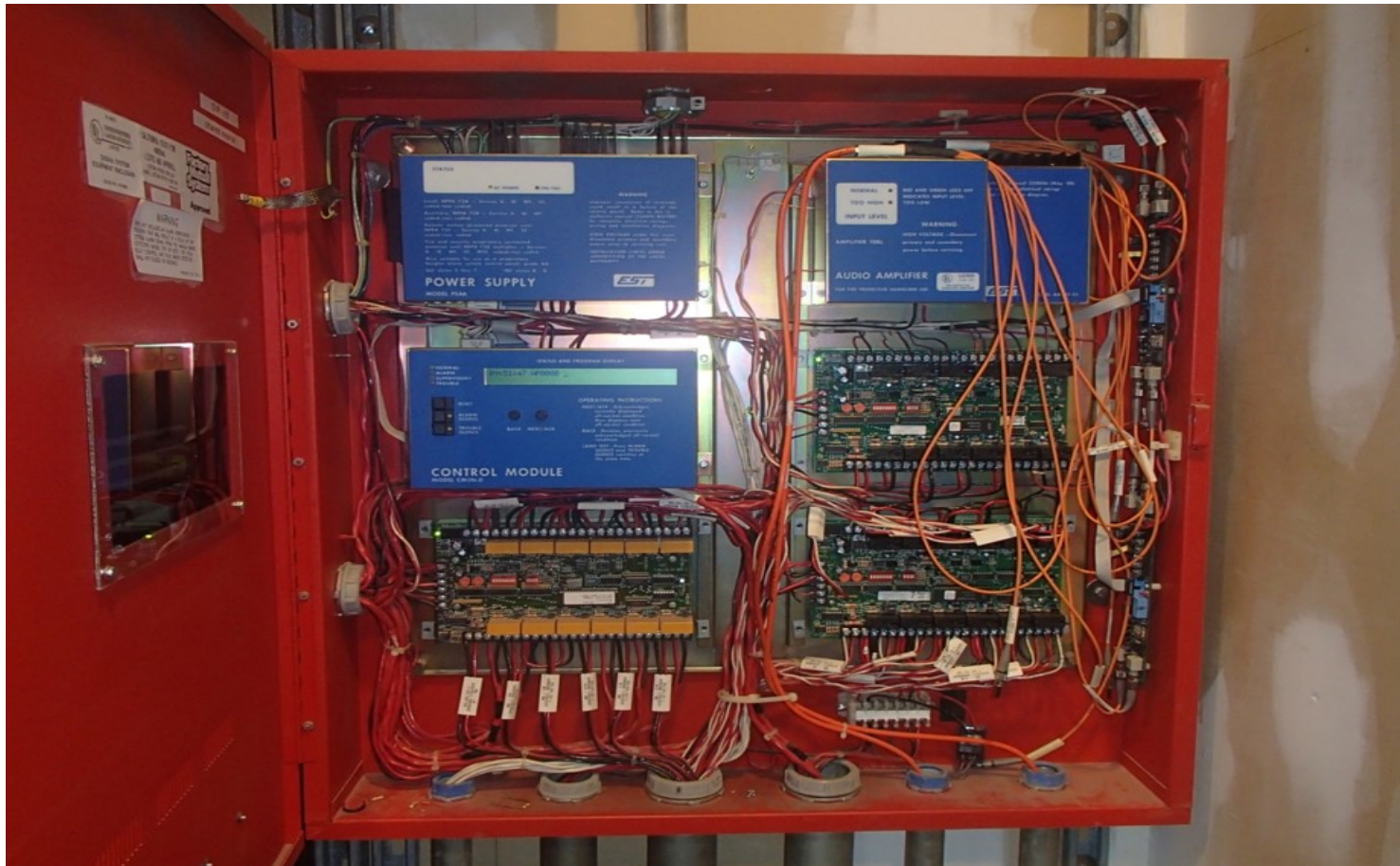
Total Contract: \$42.5M

NTP: March 2021

SC: March 2023



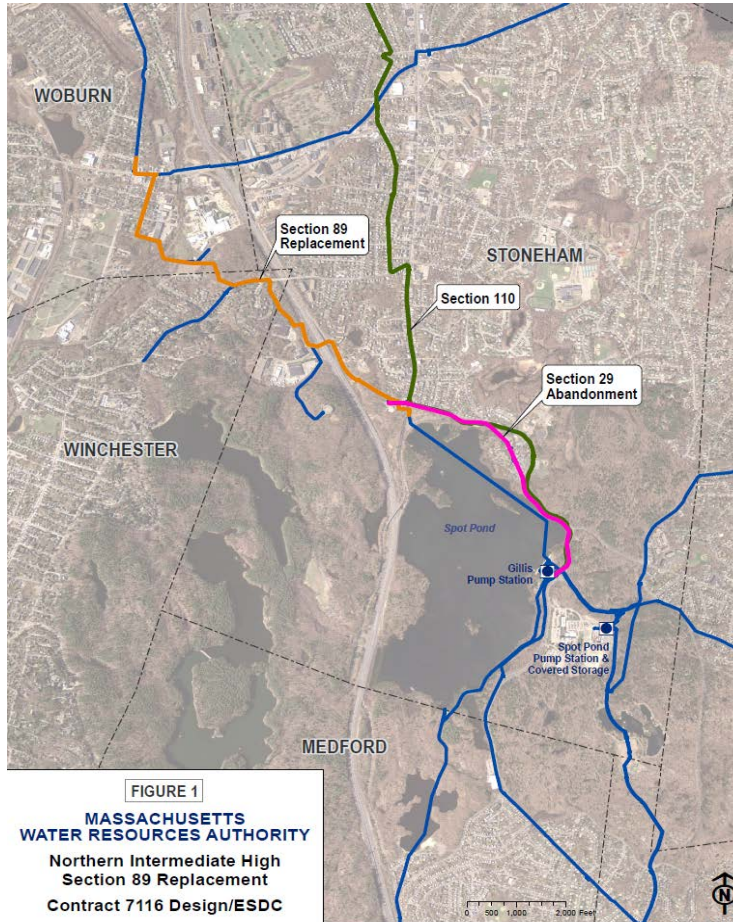
Deer Island Fire Alarm System Replacement Construction



FY22 Budget: \$7.8M
Total Contract: \$28.8M
NTP: June 2021
SC: October 2024



Northern Intermediate High Redundancy Sections 89 and 29



FY 22 Budget: \$5.8M
Total Contract: \$28.9M
NTP: January 2021
SC: December 2025



FY22 Proposed CIP – FY22 Top Spenders – Redundancy

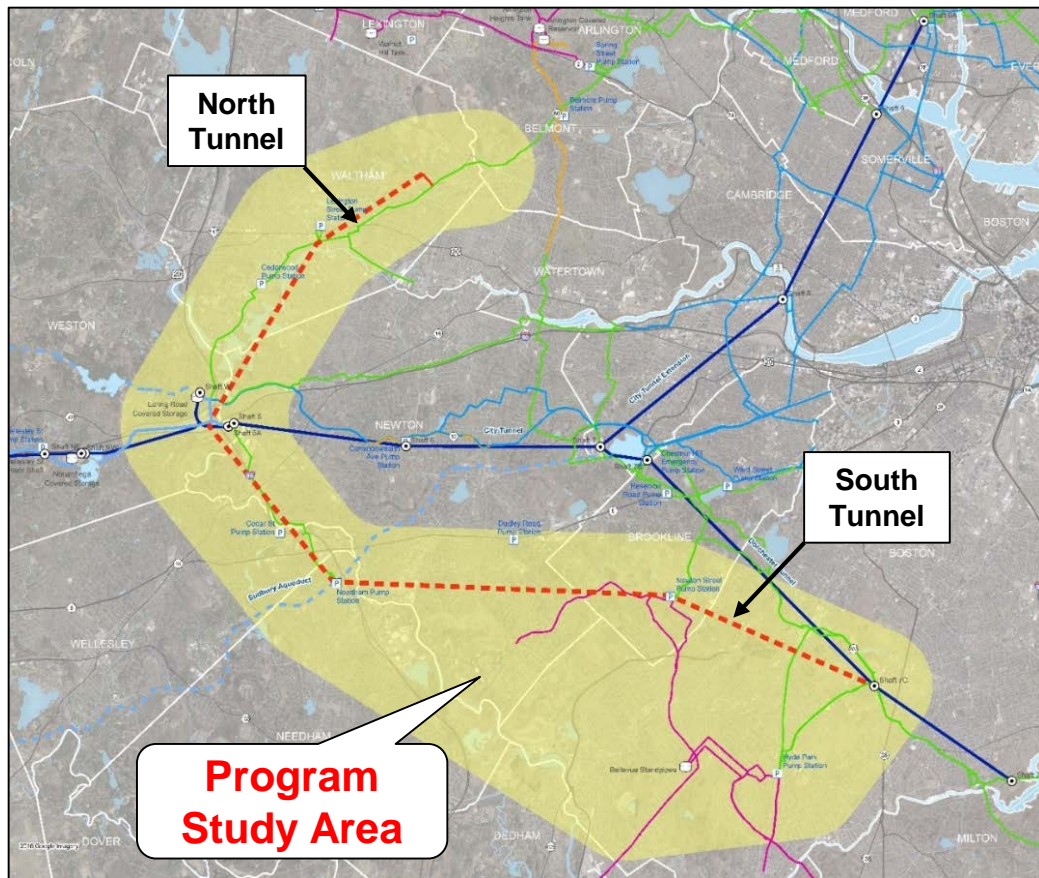
Preliminary Design & MEPA Review

FY22 Budget: \$5.4M

Total Contract: \$15.7M

NTP: July 2020

SC: January 2024





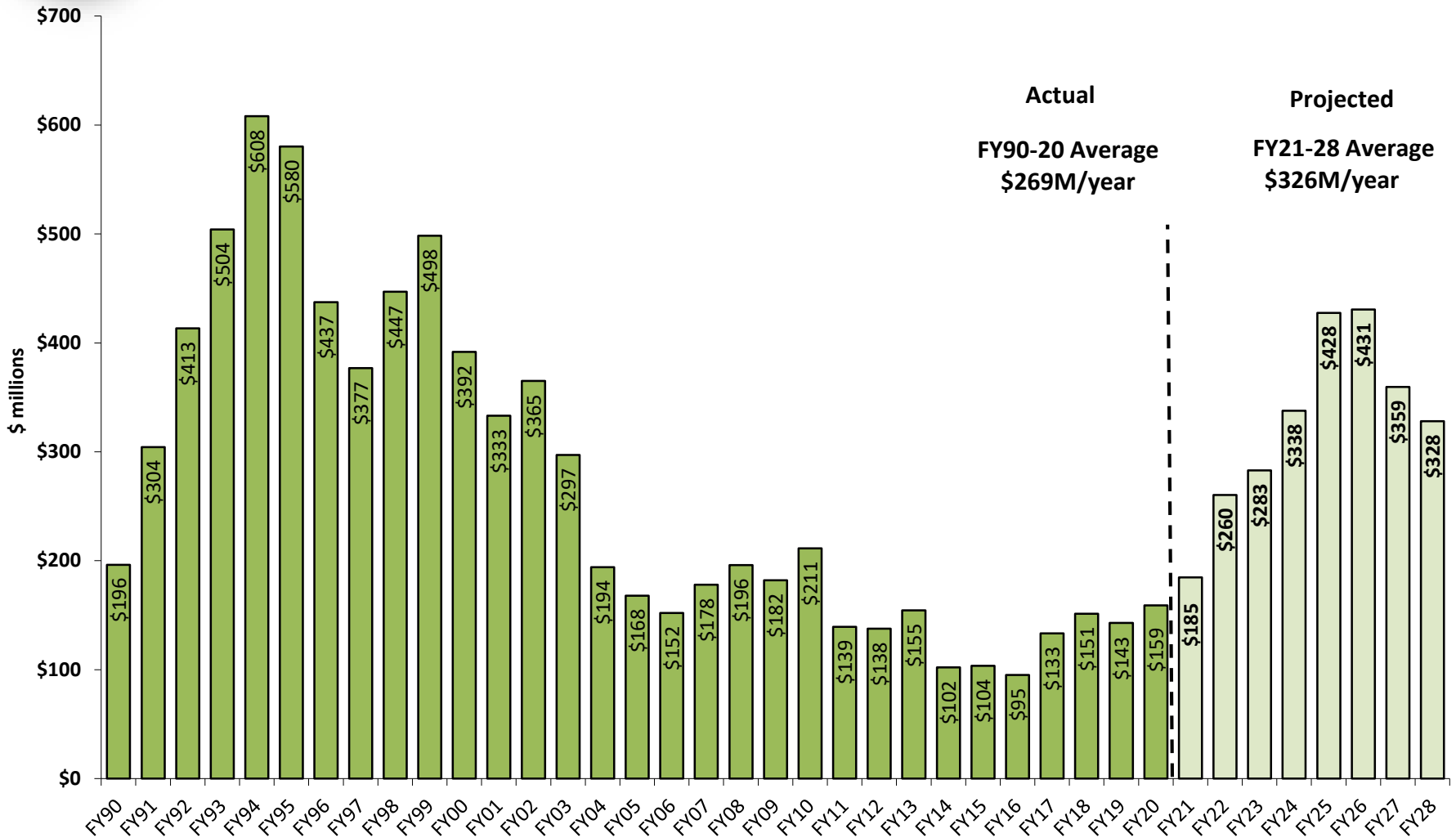
WASM 3 CP-1



FY22 Budget: \$5.2M
Total Contract: \$19.5M
NTP: October 2020
SC: August 2024

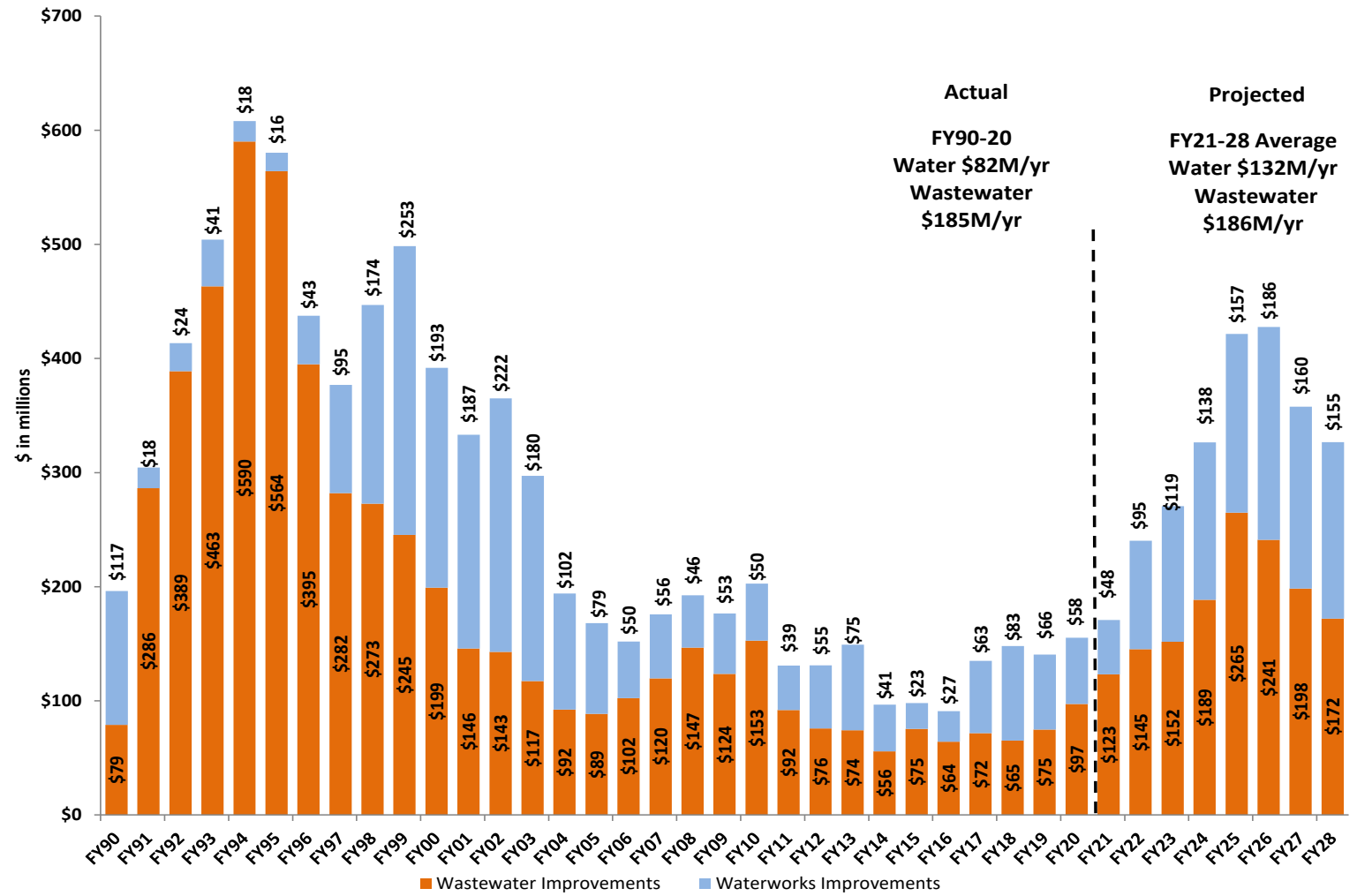


Historic and Projected Capital Improvement Spending



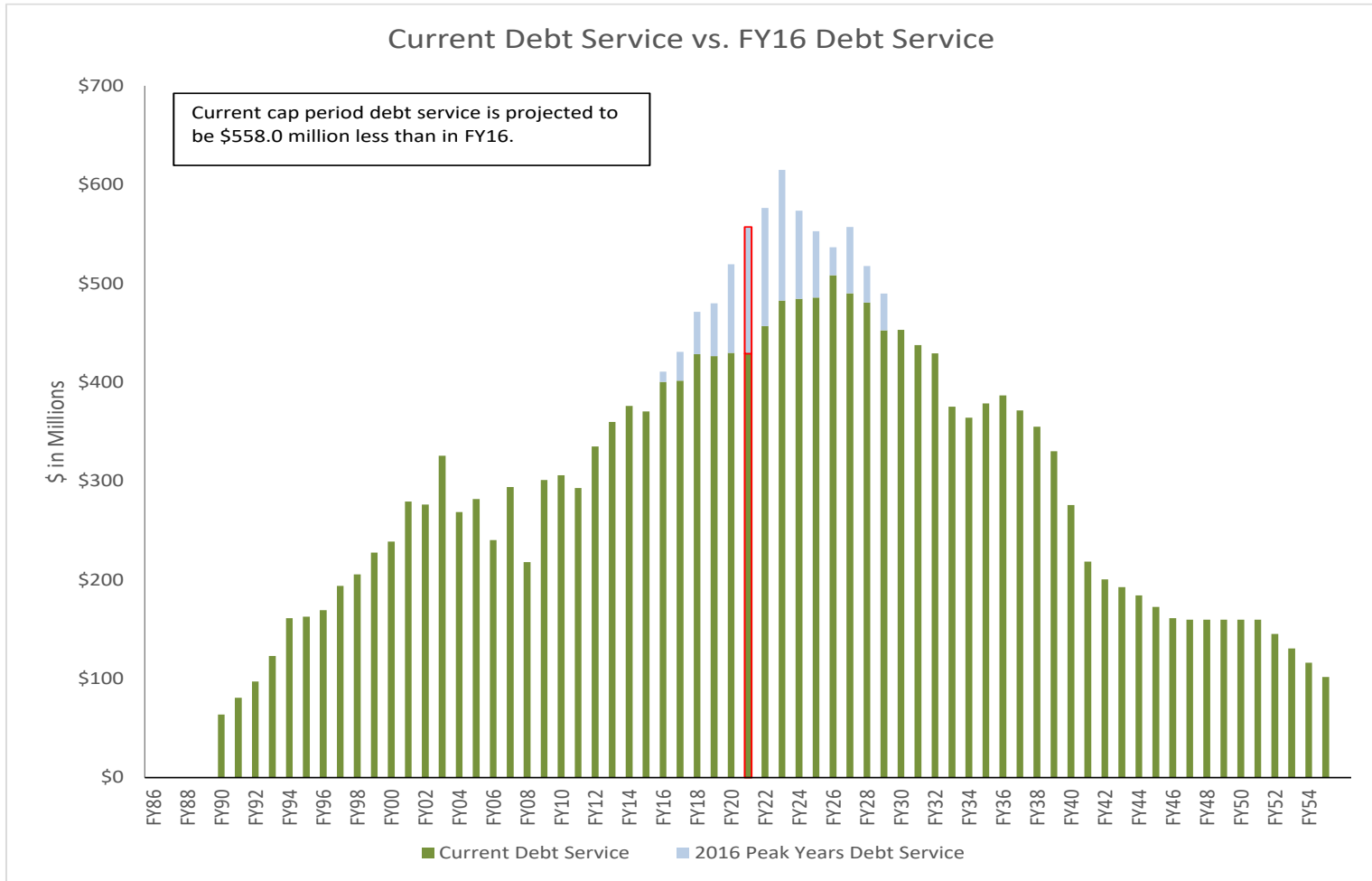


Historic and Projected Capital Improvement Spending by Utility





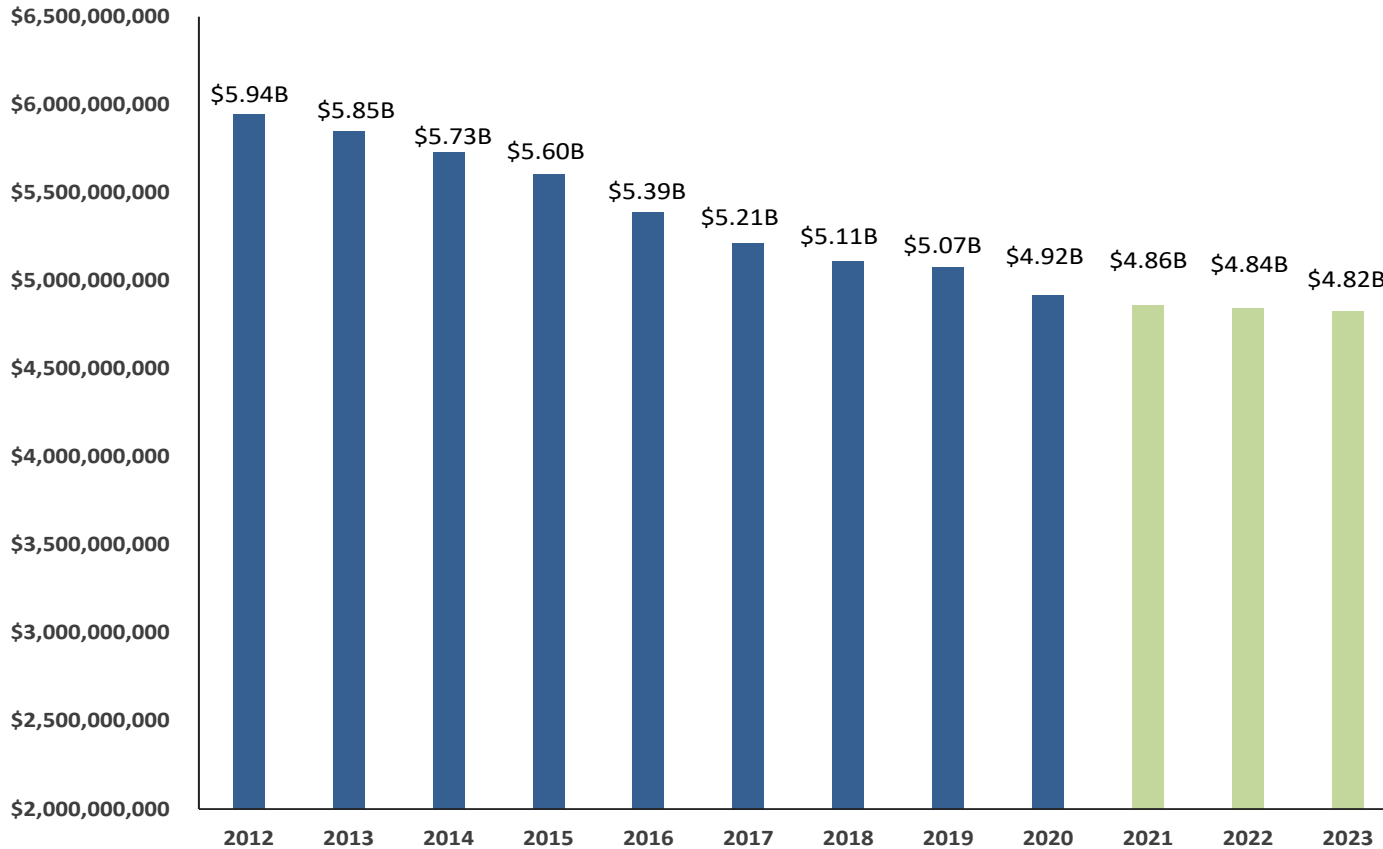
Level of MWRA Indebtedness





Level of MWRA Indebtedness

Outstanding Debt on June 30 by Fiscal Year
FY12-FY23





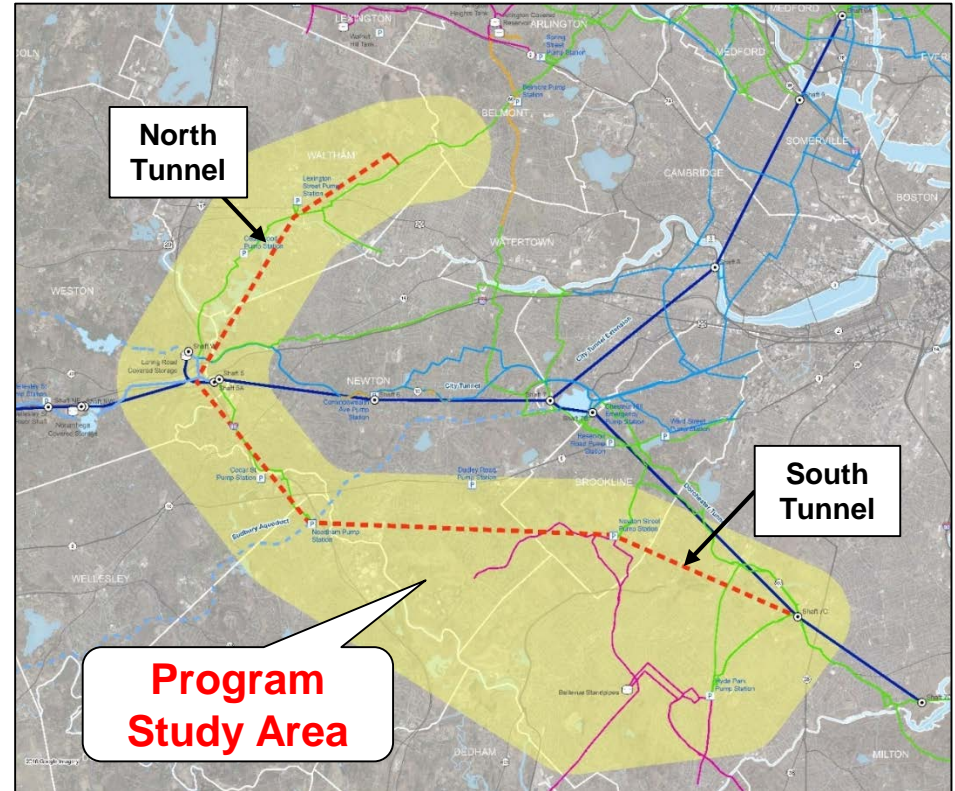
- Lessons learned from Chelsea Headworks Upgrades
- Continue Asset Protection
- Metropolitan Tunnel Redundancy



Metropolitan Tunnel Redundancy Program

FY19-23 Projected Expenditures

Contract Name	Start/ Duration (years)	Contract Budget (millions)	FY19-23 Spending (millions)
Program Support Services Awarded	FY19/9	\$17.5	\$8.1
Preliminary Design/MEPA Review Awarded	FY21/3.5	\$15.7	\$14.4
Technical Assistance Anticipated Award January 2023	FY23/4	\$4.1	\$0.4



--- Conceptual Tunnel Alignment



Next Steps

- Work with the Advisory Board
- Finalize FY22 CIP
- Submit FY22 Final CIP to Board of Directors for approval in June 2020



FY22 Proposed CIP



Thank You!

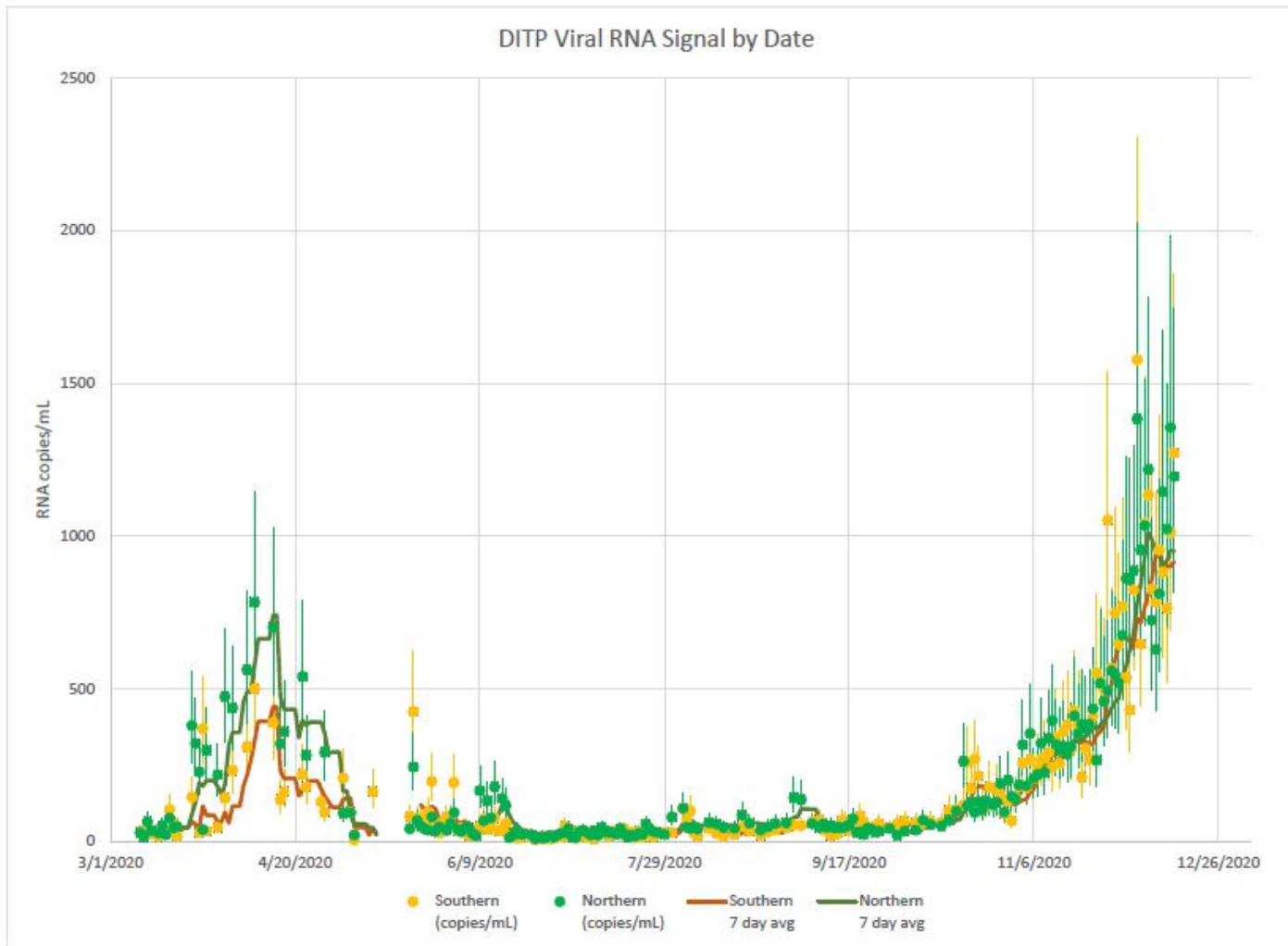


*Wastewater COVID Testing
Biobot Analytics*

December 16, 2020



Current Data from MWRA.COM





OP-420 Selection

Firm	Total Points	Order of Preference* Total Score	Final Ranking
Biobot Analytics, Inc	523	6	1
LuminUltra Technologies, LTD	501	13	2
GoAigua Inc.	449	20	3
CosmosID, Inc.	440	25	4
Geosyntec Consultants	339.5	33	5
120Water	383.5	38	6
CDM Smith Inc.	367.5	42	7
Pennoni Associates, Inc	356	41	8
ALS Group USA, Corp.	294.5	49	9

- Biobot is still the industry leader
- Using an out of state laboratory adds an additional 1 – 2 days to the turnaround time from sampling to results
- Guaranteed comparability to our existing dataset, as well as the data Biobot is generating for DPH and seven other Massachusetts communities



Ward Street and Columbus Park Headworks Upgrade

*Design and Engineering Services
During Construction
Contract 7429*

December 16, 2020



Ward Street and Columbus Park Headworks Upgrade

Major upgrade of both facilities including:

- Screenings and grit collection replacement
- Resurfacing all channels, and influent and effluent shafts
- Odor control and HVAC systems replacements
- SCADA improvements
- Remediation of hazardous building materials (lead and asbestos)
- Building envelope improvements



Ward Street Headworks



Columbus Park Headworks



Major Facility Upgrades



HVAC/Odor control



Climber screen replacements



Grit collection



Scope of Services

Scope of Services includes:

- Design of a new building over channels
- Use 3D Laser Scanning
- Perform destructive investigations to identify hidden conditions
- Document existing conditions and sequencing requirements



Evaluation of New Superstructure



Existing Ward Street Headworks Facility

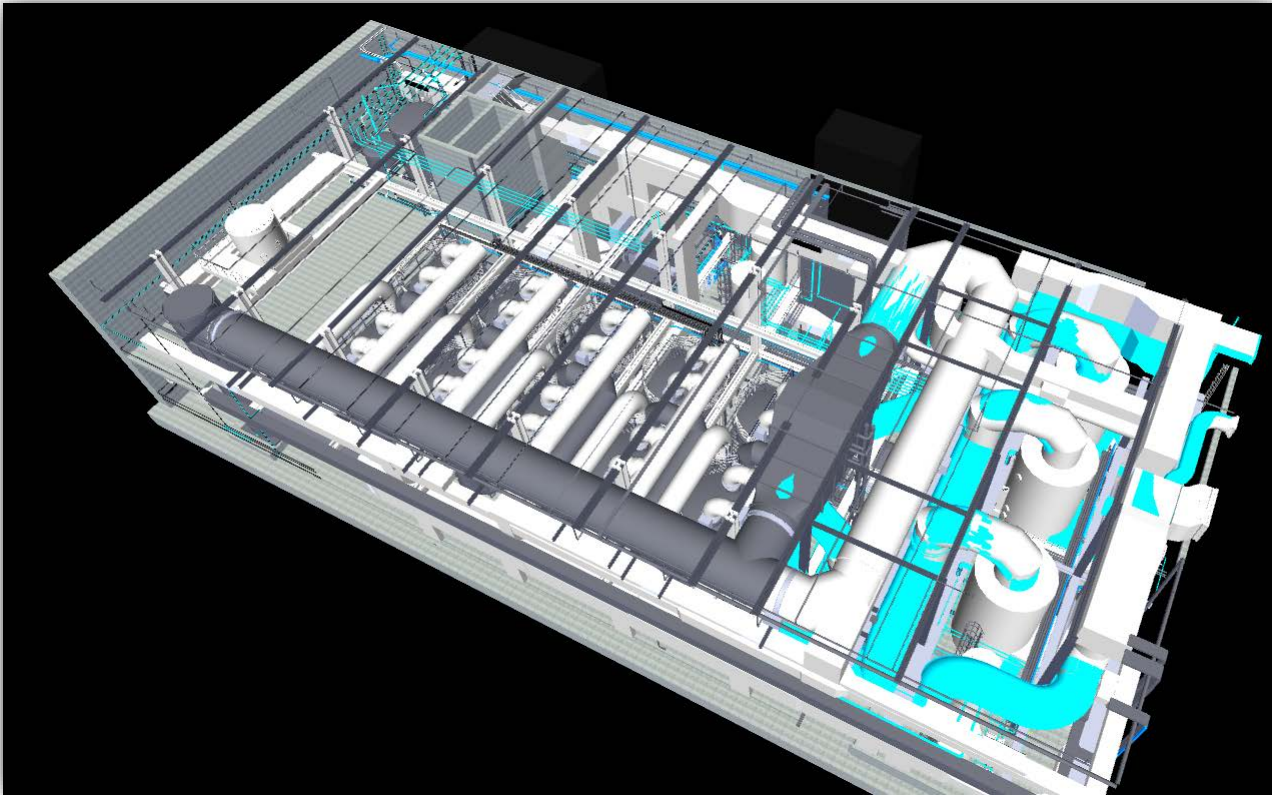


Conceptual Alternative for New Superstructure



3D Laser Scanning

- 3D Laser Scan of Nut Island Odor Control Room





Destructive Investigations

- Expose existing conditions
 - CMU walls – interior and exterior
 - Areas above drop ceilings





Existing Conditions and Sequencing

- Documentation of Existing Conditions
 - 3D Laser scanning
 - Identify each item as active or abandoned
- Sequencing of Equipment Removal/Replacement to Maintain Operations during Rehabilitation





Procurement Process and Project Cost

Proposer	Rank	Cost	Hours
CDM Smith Inc.	1	\$28,896,530	160,866
Arcadis U.S., Inc.	2	\$27,722,135	166,968
<i>Engineer's Estimate</i>		<i>\$24,504,960</i>	<i>144,147</i>

- One step RFQ/P
- Selection Committee recommends award to CDM Smith Inc.

