



Companion document to the 9-24-2026 Advisory Board FY27 Priorities Presentation

Compiled by· Christine Bennett, AB Research & Policy Analyst · September 24, 2026

This note explains how each of the FY27 priorities graphics were built: the question it answers, the data behind it, and the assumptions it rests upon.

Context and the brief

The graphics were developed to test and support the Advisory Board's FY2027 budget and policy priorities. They set MWRA's next capital cycle against two thing it has to be paid for with: long-lived debt service and a workforce that has shrunk since the 1990s. The overall question for the Board is essentially: **can workforce capacity keep pace as the capital workload grows?** The graphics are built to frame that question, not to answer it.

The work followed a five-item brief (*FY27 Priorities Visualization.docx*):

#	Brief item	Question asked	Delivered as
1	Long-range capital spending, historical + projected	What is the long-run shape: an early capital-intensive era, a quieter middle, and a new reinvestment cycle? Does the comparison survive inflation?	Visual 1, nominal and constant FY2026 \$
2	Capital spending + debt service	How does capital spending turn into long-lived debt service? (Timing, not year-for-year causation.)	Visual 2, nominal and constant
3	Long-range actual staffing / FTE	How did workforce levels move across the capital cycle? Test, rather than assume, that staffing was higher in the first capital era, fell as it ended, and has recently begun to rise.	Visual 3, plus an illustrative recovery path (Visual 3a)
4	Current workforce snapshot	What do the freshest FY27 figures say about staffing, vacancies and hiring?	Figures in this note and in the separate <i>MWRA Current Workforce Snapshot — FY27</i>
5	Major capital-program support	Which few programs drive the next spending peak?	Visual 5

The brief set some rules the graphics follow: keep annual data unsmoothed, separate actual from projected, show actual staffing (not budgeted or authorized) in the principal staffing visual, do not project a future staffing requirement, and leave presentation labels to the Prezi layer.

Data used

Every series sits in one workbook, *REVISED_mwra_cip_and_fte.xlsx*, with its source in the last column. The Python scripts that draw each chart read from that workbook and its companion CSVs, so the charts can be regenerated if a figure changes.





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Series	Years	Source document	Workbook sheet / file
CIP spending, actual and forecast	FY90–FY25 actual; FY26–FY38 forecast	FY27 Proposed CIP Staff Summary (14 Jan 2026), p.6 chart	CIP Data Nom & Const
Debt service (capital finance)	FY90–FY26 history; FY27–FY35 projection	MWRA Current Expense Budgets (FY92–FY26 editions); MWRA capital finance projection	DS-Legacy + Forecast; CapFin Projections Data; DS Nom & Const
Positions, FY97–FY02	FY97–FY02	PFY12 “# of Positions” table, held in Advisory Board working papers	PFY12 FTE budget data (I124:O140)
Filled positions	30 June 2003 – 30 June 2013	Final Current Expense Budget books FY04–FY14, “Staffing by Functional Area”	mwra_filled_benchmarks.csv
Actual FTE, fiscal year end	FY12–FY25	ACFR statistical section, “Full-time Equivalent Employees by Function” (FY2021 and FY2025 editions)	mwra_actual_fte_annual.csv
Actual FTE, FY26 year end	FY26	Orange Notebook, FY26 Q4	chart scripts
Monthly staffing, authorized positions, vacancies	Jan 2024 – Jan 2026; Aug 2026	Position Control Registers (PCR)	mwra_staffing_series.csv; vacancy CSVs
Major program budgets	FY26–FY38	FY27 Proposed CIP Expenditure Forecast, “\$5billion components” sheet	CIP Project Timelines folder

The full method for the staffing series, including every cross-check, is in *README_staffing_series.md* in the same folder.



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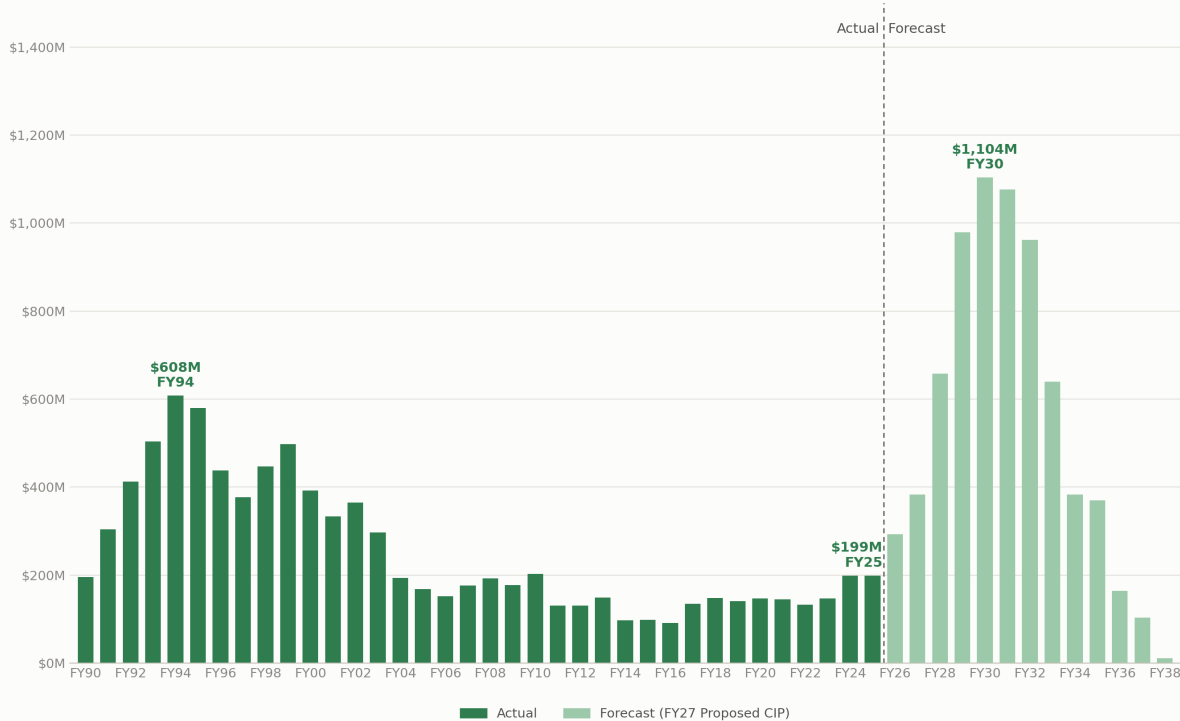


Visual 1 - Long-range capital spending

The chart confirms the three-era shape the brief expected: a Boston Harbor peak in FY94, a long low period bottoming in FY16, and a new peak forecast for FY30. In nominal dollars the coming peak is the larger one; in constant dollars the FY94 peak stays larger.

MWRA capital spending, 1990-2038

Annual CIP spending, \$ millions, nominal dollars



Source: FY27 Proposed CIP Staff Summary (1/14/26), p.6 chart; values recovered from chart geometry, reproducing both labelled peaks within \$0.5M.

Figure 1a. MWRA capital spending, 1990-2038, nominal dollars



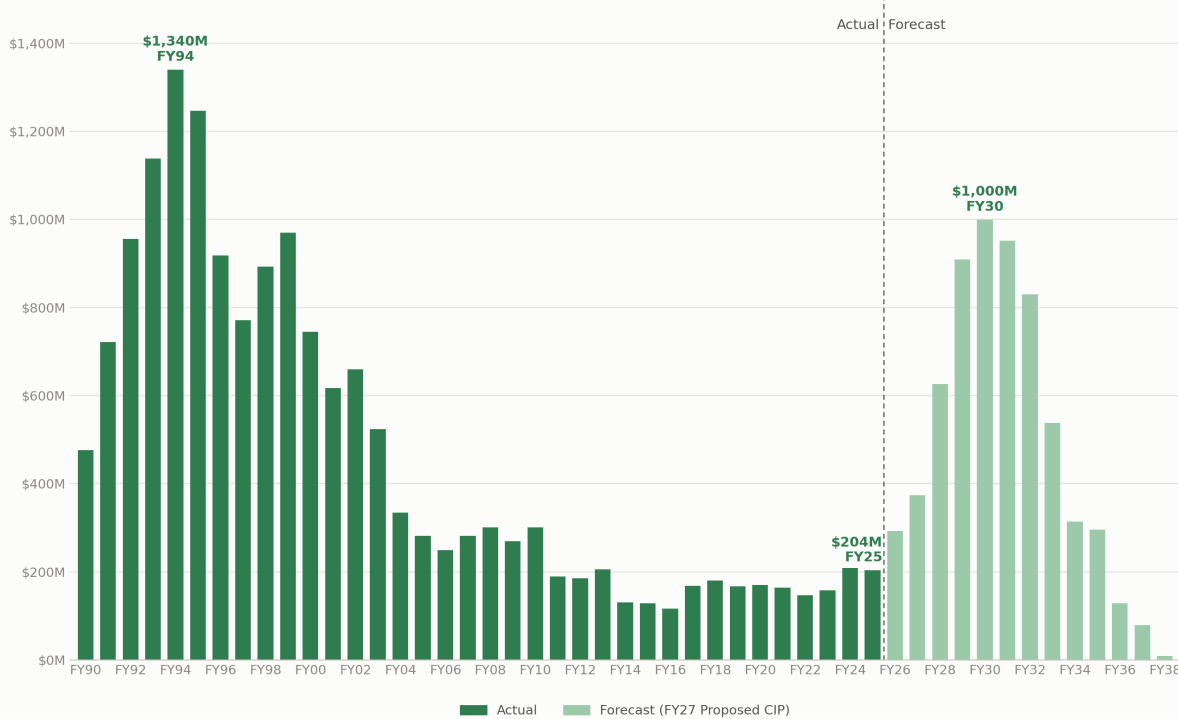


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MWRA capital spending, 1990-2038

Annual CIP spending, \$ millions, constant FY2026 dollars



Source: FY27 Proposed CIP Staff Summary (1/14/26), p.6 chart; values recovered from chart geometry, reproducing both labelled peaks within \$0.5M. Constant dollars deflate at a flat 2.5%/yr (MWRA CIP escalation assumption), base FY2026 — an assumption, not a sourced price index.

Figure 1b. MWRA capital spending, 1990–2038, constant FY2026 dollars

	FY94 peak	FY16 low	FY25	FY30 forecast peak
Nominal	\$608M	\$91M	\$199M	\$1,104M
Constant FY2026 \$	\$1,340M	\$116M	\$204M	\$1,000M

Question asked. What is the long-run shape of MWRA capital spending, and does comparing the early and future investment periods change after inflation?

Data. Annual total CIP spending (water and wastewater combined), FY90–FY25 actual and FY26–FY38 forecast from the FY27 Proposed CIP.

Assumptions.

- Constant dollars use a flat 2.5% a year deflator, MWRA’s own CIP escalation assumption, based to FY2026. This is an assumption, not a published price index; the rate sits in one cell of the workbook so it can be changed.
- The inflation test turns on that rate. At 1.67% a year or below, the FY30 peak would exceed FY94 in constant dollars; above it, FY94 remains the larger.

Data quality. The values were recovered from the geometry of the chart on p.6 of the Staff Summary, not from a data table. They reproduce both labelled peaks to within \$0.5M, so they are a faithful reproduction, but they are not citable as a source.



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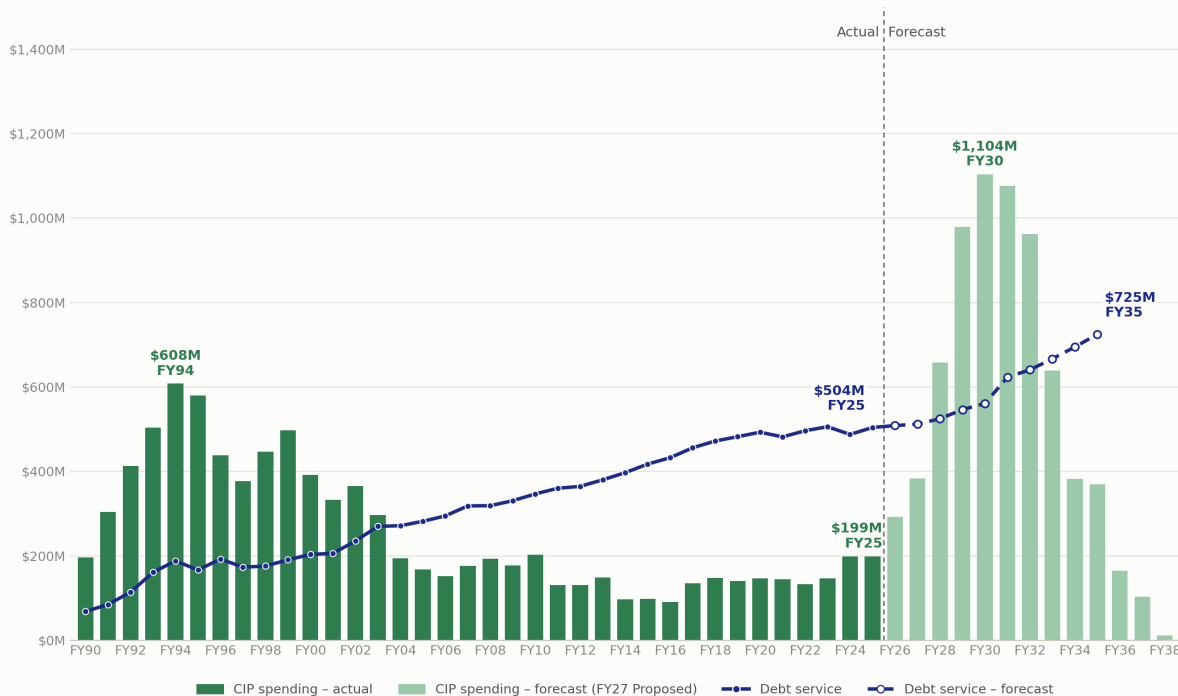
MWRA publishes CIP budget books for FY2019–FY2026, which could replace the recent years; a CIP data table has been requested for the rest.

Visual 2 - Capital spending and debt service

Debt service rose steadily from \$69M in FY90 to \$504M in FY25 while capital spending fell, and it is projected to reach \$725M by FY35 (nominal). The chart shows how the 1990s program became a debt burden that is still carried three decades later. It illustrates timing only; no year's spending produces that same year's debt service.

MWRA capital spending & debt service, 1990–2038

\$ millions, nominal dollars



CIP: FY27 Proposed CIP Staff Summary (1/14/26), p.6 chart; values recovered from chart geometry, reproducing both labelled peaks within \$0.5M.
Debt service: capital finance line of MWRA Current Expense Budgets (FY90-FY13 actual, FY14-FY25 mostly approved budget, FY26 proposed); FY27-FY35 MWRA projection. Includes senior, SRF and variable-rate debt service, current revenue for capital, CP interest, prepayment and the Chelsea lease.

Figure 2a. MWRA capital spending and debt service, 1990–2038, nominal dollars



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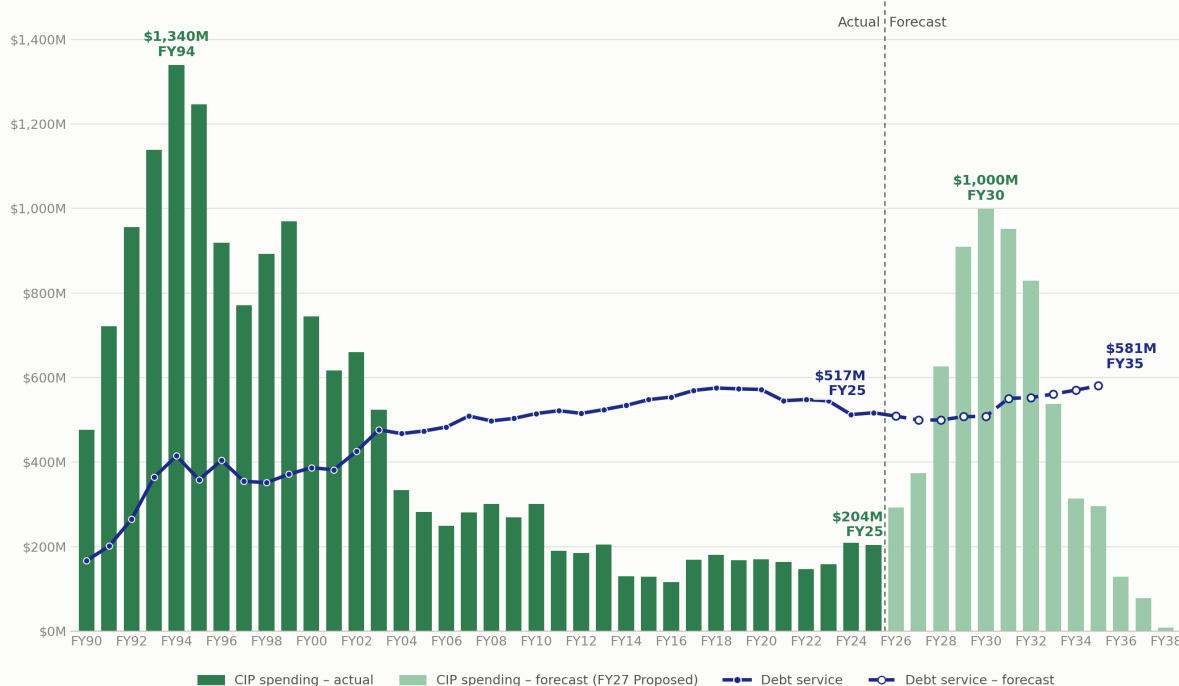


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MWRA capital spending & debt service, 1990-2038

\$ millions, constant FY2026 dollars (both series deflated at 2.5%/yr)



CIP: FY27 Proposed CIP Staff Summary (1/14/26), p.6 chart; values recovered from chart geometry, reproducing both labelled peaks within \$0.5M.
Debt service: capital finance line of MWRA Current Expense Budgets (FY90-FY13 actual, FY14-FY25 mostly approved budget, FY26 proposed); FY27-FY35 MWRA projection.
Includes senior, SRF and variable-rate debt service, current revenue for capital, CP interest, prepayment and the Chelsea lease.
Constant dollars deflate at a flat 2.5%/yr (MWRA CIP escalation assumption), base FY2026 — an assumption, not a sourced price index.

Figure 2b. MWRA capital spending and debt service, 1990-2038, constant FY2026 dollars

Question asked. How does capital spending become long-lived debt service? The brief asked to update the Board's earlier "as of June 30, 2025" chart, which had green debt-service columns under a CIP line. The rebuild reverses that: CIP as columns, debt service as a line.

Data. CIP is the same series as Visual 1, so the two charts match exactly. Debt service is the *Capital Finance* line of the Current Expense Budget: FY90-FY13 actual, FY14-FY25 mostly approved budget (FY20 is actual), FY26 proposed, and FY27-FY35 from MWRA's capital finance projection.

Assumptions.

- The nominal version is the primary one, because debt service is paid in fixed contract dollars. The constant-dollar version deflates both series at the same 2.5% a year; it shows the real burden, not what MWRA will pay. In constant dollars, debt service has been roughly flat at \$470-\$575M since FY03.
- FY26 is \$508.7M, taken from the corrected row of the debt-service worksheet.

Data quality and flags the brief asked for.

- Definition.** "Capital Finance" is broader than bond debt service. It includes senior, SRF and variable-rate debt service, plus about \$22M a year of current revenue for capital, commercial paper interest, debt prepayment and the Chelsea lease. It covers all Authority debt. This is why FY25 reads \$504M here against roughly \$430M on the Board's earlier chart.



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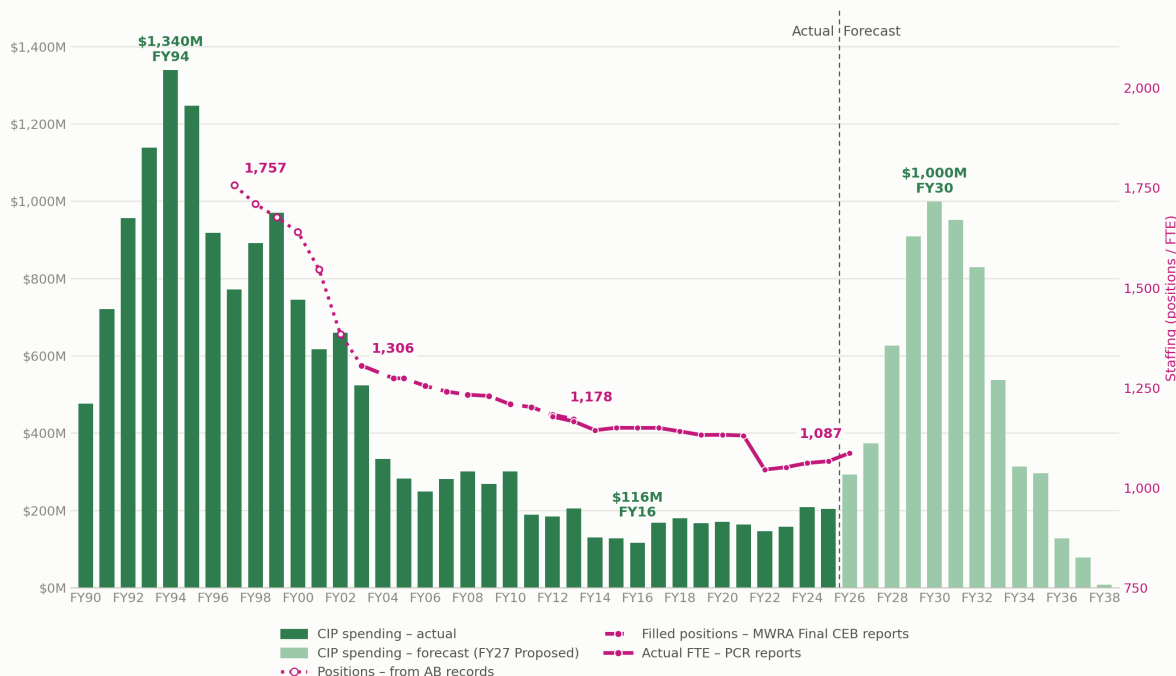
- **MWRA's own documents disagree on "debt service"**. The FY2025 ACFR gives three FY25 figures that answer different questions: cash paid (\$477.8M, p.94), required Bond Resolution deposits (\$440.6M, p.95) and the Note 5 schedule for existing debt (\$434.3M for FY26, p.51).
- **Horizon**. The projection runs to FY35, not the ~FY54 the brief hoped for. Note 5 of the ACFR goes to FY2050 but covers existing debt only; debt on bonds not yet issued appears in no audited statement. A projection including future borrowing has been requested from MWRA.
- **Should the two be plotted together?** On one nominal axis, yes, as a timing picture. Plotting constant-dollar CIP against nominal debt service would not be valid, which is why each version keeps both series on the same basis.

Visual 3 - Capital spending and actual staffing

Staffing fell from about 1,757 in FY97 to 1,087 FTE at the end of FY26, and the capital program is about to climb to its highest level since the 1990s. The recent rise in staffing is real but modest: it is a recovery from the FY22 drop, and FY26 is still 91 below FY12.

MWRA capital spending & staffing, 1990-2038

CIP spending in \$ millions, constant FY2026 dollars (left axis); staffing (right axis, starts at 750)



CIP: FY27 Proposed CIP Staff Summary (1/14/26), p.6 chart; values recovered from chart geometry, reproducing both labelled peaks within \$0.5M.
Staffing: filled positions at 30 June 2003-2013 as stated in MWRA Final Current Expense Budgets FY04-FY14 ('Staffing by Functional Area'); Dec 2004 reading from the FY05 book (no June 2004 figure).
FY97-FY02 from the '# of Positions' table in the PFY12 FTE budget data sheet, treated as actual headcount — an Advisory Board working assumption, not confirmed by MWRA documents.
Actual FTE at 30 June FY12-FY25 from MWRA ACFRs, FY26 from the Orange Notebook FY26 Q4.
Positions and FTE are different measures and are not joined. FTE excludes Tunnel Redundancy staff.
Constant dollars deflate at a flat 2.5%/yr (MWRA CIP escalation assumption), base FY2026 — an assumption, not a sourced price index.

Figure 3. MWRA capital spending and staffing, 1990–2038, constant FY2026 dollars

A nominal-dollar version (*mwra_cip_actuals_v3_nominal.png*) carries the same staffing lines.

Question asked. How did workforce levels move across the capital cycle? The brief asked us to test four claims rather than assume them:



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Claim in the brief	Finding
Staffing was higher around the early capital period	Supported, with a gap. The earliest actual figures are FY97 (1,757) and March 1997 (1,775 filled). Nothing actual exists for FY90–FY96; budgeted positions peaked at 1,907 in FY96.
Staffing declined as the first era ended	Supported. The steepest fall is FY00–FY03, ending at 1,306 filled in June 2003.
Staffing stayed lower in the stable period	Supported. It drifted from 1,306 (2003) to about 1,130 FTE by FY21.
Staffing has recently begun increasing again	Supported, but it is recovery rather than growth. FTE fell 85 in FY22 to 1,045.5, then rose four years running to 1,087 in FY26.

Data. Three measures, drawn as three separate line styles and never joined, because each counts something slightly different:

Line	Years	Measure	Source
Dotted	FY97–FY02	Positions	PFY12 “# of Positions” table in Advisory Board working papers
Dashed	June 2003 – June 2013	Filled positions at 30 June	Final CEB books FY04–FY14
Solid	FY12–FY26	Actual FTE at 30 June, excluding Tunnel Redundancy	ACFRs for FY12–FY25; FY26 Q4 Orange Notebook for FY26

Assumptions.

- **The FY97–FY02 positions are treated as actual headcount.** This is an Advisory Board working assumption, stated on the chart. The evidence for it: the table’s FY03 row (1,305) matches the documented June 2003 filled count (1,306), and its FY97 row (1,757) sits just below the documented March 1997 count (1,775). Nothing from MWRA confirms it, and MWRA has said its records do not reach before FY2008.
- Tunnel Redundancy staff (first appearing in FY18) are excluded from FTE, matching MWRA’s own monthly convention, to avoid an artificial step.
- FY26 uses the fiscal-year-end figure (1,087), the same basis as every other FTE year.

Data quality.

- **The June 2003–June 2013 filled counts are the strongest figures in the set;** each was read from a Final CEB book and its source sentence is recorded. Four carry flags: 2003 is described as “the current staffing level”; 2004 is a December reading (no June figure exists); 2005 repeats 2004 exactly; 2009 says only “in June”.
- **FY12–FY25 FTE chain across two ACFR editions that agree on every division in their six overlapping years, and match the PCR exactly at FY24 and FY25.** The legend reads “PCR reports”; strictly, FY12–FY25 come from the ACFRs.
- **The FY22 drop is explained,** not a data break: pandemic-era attrition plus retirements of the 1985 cohort. FY22 is the only year on record where retirements (82) exceeded hires (65).
- **July 2026 (1,070.8 FTE) was rejected.** It was the first month on MWRA’s new CloudSuite payroll system and is unconfirmed.
- **Gaps:** no actual staffing before FY97, and none for June 2004.



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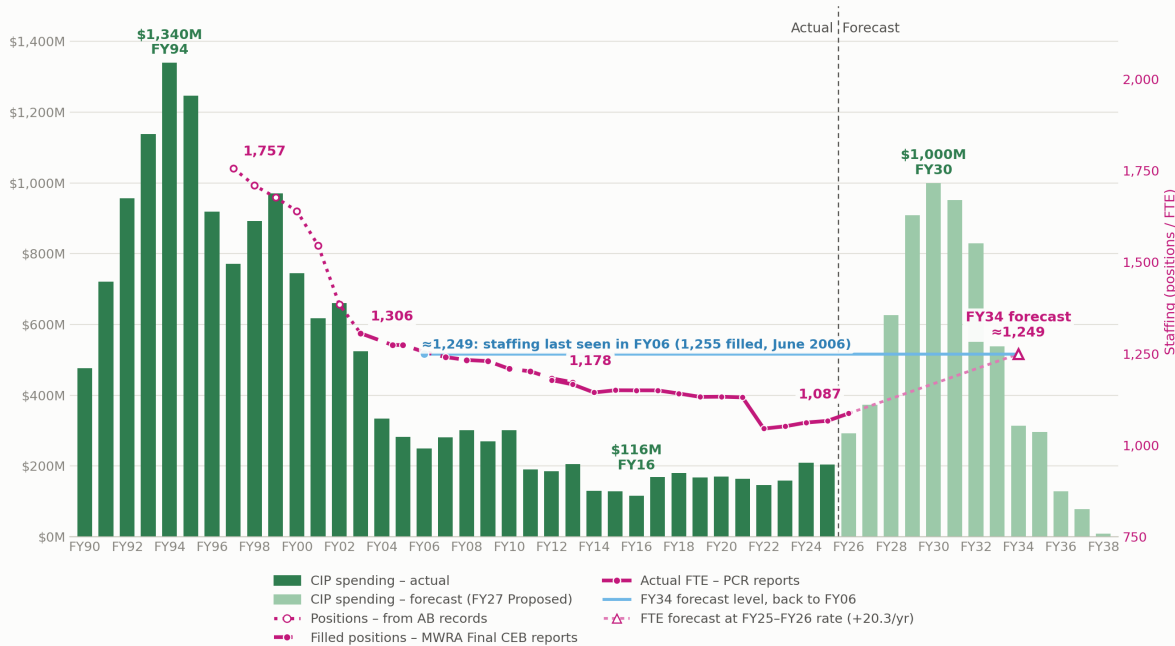


Visual 3a - Illustrative staffing recovery to FY34

If MWRA kept adding staff at its FY26 pace every year, it would reach about 1,249 FTE by FY34, roughly its staffing level of FY06. It would only pass the FY27 budgeted level (1,167.4) in FY30, the year the capital program peaks.

MWRA capital spending & staffing, 1990-2038, with staffing forecast to FY34

CIP spending in \$ millions, constant FY2026 dollars (left axis); staffing (right axis, starts at 750)



CIP: FY27 Proposed CIP Staff Summary (1/14/26), p.6 chart; values recovered from chart geometry, reproducing both labelled peaks within \$0.5M.
Staffing: filled positions at 30 June 2003-2013 as stated in MWRA Final Current Expense Budgets FY04-FY14 ('Staffing by Functional Area'); Dec 2004 reading from the FY05 book (no June 2004 figure).
FY97-FY02 from the 'FTE' table in the FY12 FTE budget data sheet, treated as actual headcount — an Advisory Board working assumption, not confirmed by MWRA documents.
Actual FTE at 30 June FY12-FY25 from MWRA ACFRs, FY26 from the Orange Notebook FY26 Q4.
Positions and FTE are different measures and are not joined. FTE excludes Tunnel Redundancy staff.
Forecast: FY26's 1,087 carried forward at the FY25-FY26 change of +20.3 FTE/yr to FY34. The FY26 gain was about three times the FY23-FY25 average; an illustration, not an MWRA projection.
Constant dollars deflate at a flat 2.5%/yr (MWRA CIP escalation assumption), base FY2026 — an assumption, not a sourced price index.

Figure 3a. MWRA capital spending and staffing with staffing forecast to FY34, constant FY2026 dollars

Question asked. If the FY26 improvement continued, where would staffing be as the capital program peaks? This extends Visual 3; it is not a separate brief item.

Method. FY26's 1,087 FTE is carried forward at the FY25-FY26 change of +20.3 FTE a year to FY34. The light-blue line marks the FY34 level (about 1,249) back to FY06, when 1,255 positions were filled.

FY27	FY28	FY29	FY30	FY31	FY32	FY33	FY34
1,107	1,128	1,148	1,168	1,189	1,209	1,229	1,249

Assumptions and caveats.

- **This is an illustration, not a projection or a staffing target.** The brief asked us not to project a future staffing requirement, and this chart does not; it only extends a recent rate. The chart footnote says so.
- The FY26 gain (+20.3) was about three times the FY23-FY25 average (about +7 a year). At that slower rate, FY34 would be about 1,143.
- The FY06 comparison sets FTE against filled positions, two different measures, so the match is approximate.





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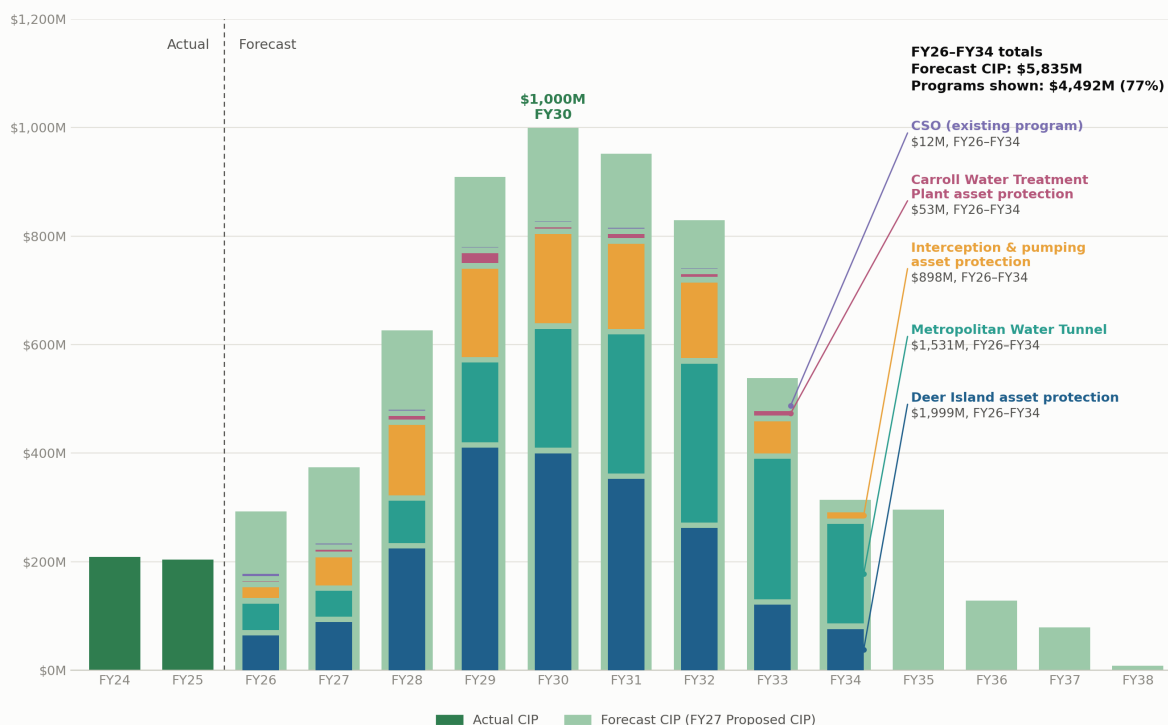
- A fitted trend over FY22–FY26 (+9.8 a year, about 1,161 by FY34) was tried first and replaced by the FY25–FY26 rate.

Visual 5 - Major programs within the forecast

Five programs account for \$4.5B, or 77%, of the \$5.8B forecast CIP for FY26–FY34 (constant FY2026 \$). Deer Island asset protection and the Metropolitan Water Tunnel alone make up \$3.5B, and they drive the FY29–FY32 peak.

MWRA capital spending, FY2024–FY2038

Annual CIP spending, \$ millions, constant FY2026 dollars; major program budgets shown within FY26–FY34 forecast



Source: CIP series from FY27 Proposed CIP Staff Summary (1/14/26), p.6 chart, values recovered from chart geometry. Program budgets from MWRA FY27 Proposed CIP Expenditure Forecast, '\$5billion components' sheet (CSO Long-Term Control Plan excluded); program totals are FY26–FY34 sums. Gaps between program segments are for legibility only. Constant dollars deflate at a flat 2.5%/yr (MWRA CIP escalation assumption), base FY2026.

Figure 5. MWRA capital spending FY2024–FY2038 with major program budgets, constant FY2026 dollars

Program	FY26–FY34, constant FY2026 \$
Deer Island (DITP) asset protection	\$1,999M
Metropolitan Water Tunnel	\$1,531M
Interception & pumping asset protection	\$898M
Carroll Water Treatment Plant asset protection	\$53M
CSO (existing program)	\$12M
Programs shown	\$4,492M (77% of \$5,835M)

Question asked. Which few programs drive the next major spending period, and where do they sit on the capital horizon?

Data. Column heights are the Visual 1 CIP series. Program budgets come from MWRA's FY27 Proposed CIP Expenditure Forecast, "\$5billion components" sheet (in \$000s), deflated at the same 2.5% a year.



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Assumptions and data quality.

- **CSO Long-Term Control Plan is excluded for now.** Adding it would raise the program share.
- Column totals and program budgets come from two different MWRA sources, so they do not reconcile exactly; gaps between program segments are for legibility only.
- Programs are shown through FY34. A version running to FY38 was discussed; its final years are distorted because MWRA's forecast nets negative adjustments into FY38 (programs \$40M against a \$9M column).
- Two further projects were being added to the source workbook; they are not in this version.

Current workforce snapshot (brief item 4)

MWRA ended FY26 with 1,087 FTE against a budget of about 1,167, and in August 2026 had 297 vacancies out of 1,374 authorized positions (21.6%). There is no chart for this item; the figures calibrate how the staffing visuals are read aloud. Full detail is in *MWRA Current Workforce Snapshot — FY27*.

Excluding Tunnel Redundancy	Jan 2026	Aug 2026
Authorized positions	1,315	1,374
Filled	1,076	1,077
FTE	1,084.7	1,074.8
Vacant	239	297
Vacancy rate	18.2%	21.6%

- **The August rise in vacancies is not attrition.** Filled positions held steady; 59 positions were added to the establishment since January.
- **Hiring trajectory.** FY26 had 84 hires against 66 separations (+18), the best net result since at least FY22. Year-end FTE rose 20.3 in FY26, against about +7 a year in FY23–FY25.
- **Budget gap.** Since FY22, actual FTE has run about 100–120 below budget at year end, against a gap of 15–25 in the two decades before.
- **Long vacancies.** Of the 247 positions vacant in January 2026, the median had been open 582 days; 81 had been open more than three years.
- **Hard-to-fill roles.** MWRA publishes no formal list. Its quarterly reports describe long-unfilled positions covered by staff augmentation. The Collins Center compensation study (April 2026) covers only 81 non-union management posts; several senior Tunnel Redundancy and IT security posts in it have been vacant one to six years.

Data quality. August 2026 is the first register on MWRA's new CloudSuite system, which appears to count FTE about 10–12 lower than the old system for the same filled positions. January and August are therefore not fully comparable, and the charts stop at FY26 year end. Two FY27 targets also disagree: 1,167.4 FTE in the Final budget and 1,156.4 in the July 2026 Yellow Notebook.



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Assumptions and data quality across all visuals

Confidence is not uniform across the timeline. Staffing from 2003 forward and all historical debt service were read from documents the Board holds; the capital series and pre-2003 staffing rest on a reconstruction or on Board records.

Series	Read from a document we hold?	Confidence	Main caveat
CIP spending FY90–FY38	No — recovered from a published chart	Good for shape; not citable	Reproduces labelled peaks within \$0.5M
Debt service FY90–FY13	Yes, CEB books	High	Broader “Capital Finance” definition
Debt service FY14–FY26	Yes, CEB books	Medium	Mostly budget, not actual
Debt service FY27–FY35	MWRA projection	Medium	Stops at FY35; source model not yet named
Positions FY97–FY02	No — Board working papers	Low–medium	Treated as actual; unconfirmable at source
Filled positions 2003–2013	Yes, Final CEB books	High	Four readings flagged
Actual FTE FY12–FY26	Yes, ACFRs and Orange Notebook	High	New payroll system from July 2026
Major program budgets	Yes, MWRA workbook	High	CSO LTCP excluded; FY38 netting

Assumptions that apply everywhere.

- **Constant dollars:** a flat 2.5% a year, MWRA’s CIP escalation assumption, based to FY2026, applied identically to every constant-dollar series.
- **Fiscal years:** MWRA’s July–June fiscal year; “FY26” is July 2025 – June 2026.
- **Five staffing measures are never interchanged.** Actual FTE, filled positions, authorized positions, budgeted FTE and the historic “# of Positions” each count something different. The charts keep them as separate lines and never join one to another.
- **Actual, not budget.** The staffing visuals show actual staffing only, as the brief required.



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