BROWN | Swearer Center for Public Service

MEMORANDUM

TO: Budget Review and Revenue Committee, Transition Team of Mayor-elect David Morales

FROM: Wilber Sean V. Anterola, CEDEC, Brown University
Tom Sgouros, Research Associate, Data Science Institute

DATE: November 11, 2026

RE: Required pension contributions compared with projected benefit payments

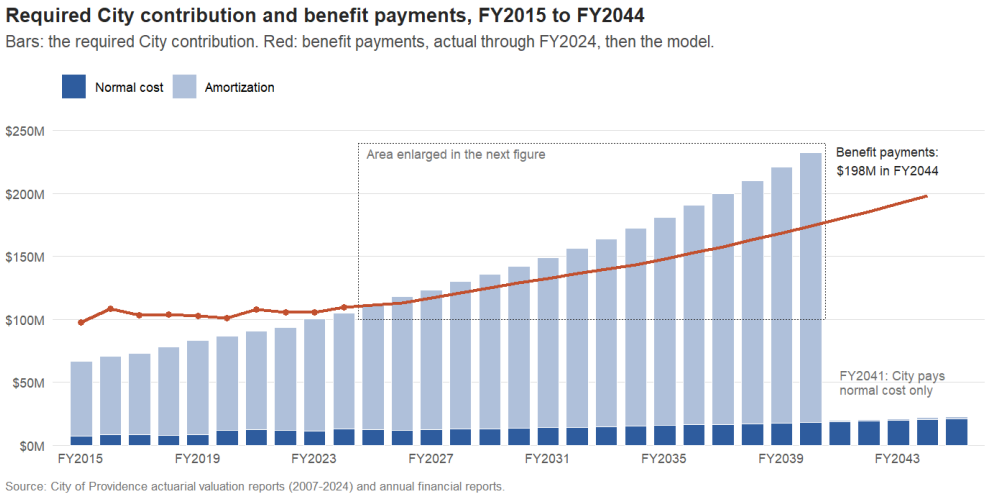

Figure 1: The required City contribution against benefit payments. The dashed box marks the area enlarged in Figure 2.

Synopsis

As of the 2024 actuarial valuation, the Employees' Retirement System of the City of Providence was 28 percent funded, and the City's required contribution is set to more than double by FY2040. Under that valuation, the City must contribute $2.64 billion between FY2025 and FY2040, while benefit payments over the same period are projected at about $2.23 billion.[1] The required payment therefore exceeds benefit payments by $407 million, a margin that widens every year from under $1 million in FY2025 to $58 million in FY2040. The City would be paying $232 million in that final year, or 79 percent of payroll, before the payment falls to $20 million in FY2041. Most of this gap is scheduled repayment of the unfunded liability. The schedule as a whole, however, rests on conditions that the system's record does not support, including a 7 percent annual return against the roughly 5.8 percent the fund has earned. This memo measures that gap and assesses whether the schedule can be carried out as written. The underlying model, built from the ten-year forecasts in the four most recent valuations, is presented in the second half of the memo.

Background

As of the 2024 valuation, the system owed an estimated $1.84 billion in benefits that members had already earned (the accrued liability) and held $514 million in assets, leaving an unfunded liability of $1.32 billion.

[1] Sources: City of Providence actuarial valuation reports (2007 to 2024), annual financial reports, and the 2021 to 2024 experience study. Projections after FY2034 are calculations for this memo and are not actuarial forecasts.

The City's required payment each year, the actuarially determined contribution (ADC), has two parts:

$$\text{ADC}_t = \underbrace{\text{NC}_t}_{\text{normal cost}} + \underbrace{\text{AM}_t}_{\text{amortization}} \tag{1}$$

- **Normal cost** is the City's share of the benefits active employees earn that year, about $12 million to $13 million.
- **Amortization** is the payment toward the unfunded liability, much like a mortgage payment. Board policy is to retire the unfunded liability by June 30, 2040, and the 2024 schedule raises this payment every year until then.

The City currently pays the full ADC, nearly to the dollar. In FY2024, it paid $104.9 million, of which about $13 million was normal cost and about $92 million was amortization.

Contribution Gap

Through FY2024, the City's contribution sat below benefit payments, with employee contributions and investment earnings covering the difference. The two roughly meet in FY2025, at $112.3 million and $111.4 million. Thereafter, the required payment grows 5.0 percent a year against roughly 3.0 percent for benefit payments, which produces the triangle enlarged in Figure 2. The gap reaches $5.1 million in FY2026, $6.5 million in FY2027, $9.2 million in FY2028, $29.3 million in FY2034, and $58.2 million in FY2040 (Table 1). In total it comes to $407 million, with 59 percent falling in the last five years of the schedule. Through FY2034, the benefit line sits below the 2024 report's forecast, and following that forecast instead lowers the total to $354 million, or to $325 million if that forecast is also adjusted for its record (see Limitations). Employee contributions, roughly 9.7 percent of payroll, come on top of these amounts.

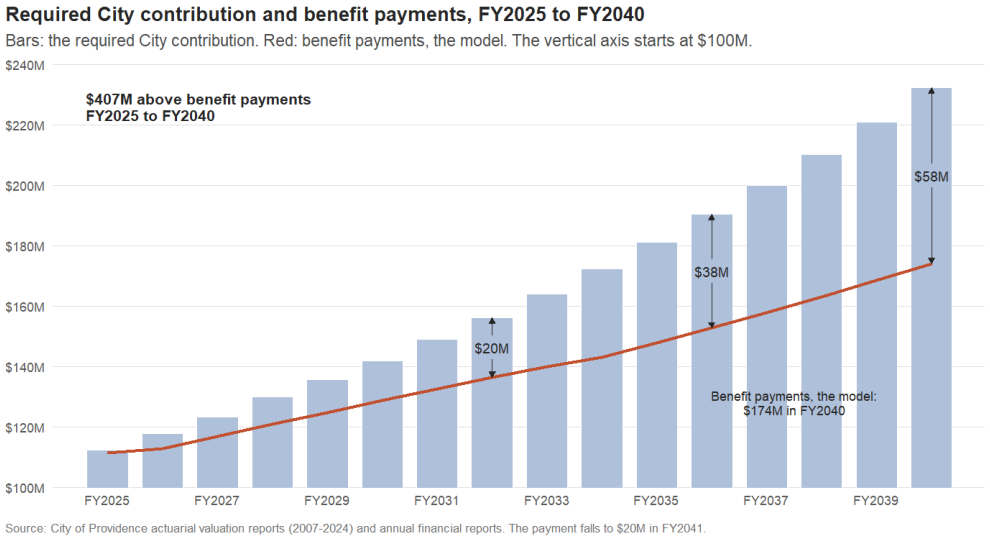

Figure 2: Enlarged view of the area marked in Figure 1. Bars are the required City contribution, and arrows mark the gap in selected years. The vertical axis starts at $100 million, which leaves normal cost out of view. After FY2034, benefits grow 3.3 percent a year, the highest of the three rates in Table 4.

Table 1: The required City contribution against projected benefit payments ($ millions). Gaps and totals are computed before rounding.

Fiscal year	Required payment	Benefits, in model	Gap	Cumulative gap
FY2025	112.3	111.4	0.8	0.8
FY2026	117.8	112.7	5.1	5.9
FY2027	123.2	116.7	6.5	12.4
FY2028	130.0	120.8	9.2	21.7
FY2029	135.7	124.8	10.9	32.6
FY2030	141.9	128.7	13.2	45.8
FY2031	149.0	132.6	16.4	62.2
FY2032	156.1	136.3	19.8	81.9
FY2033	164.0	139.9	24.2	106.1
FY2034	172.4	143.0	29.3	135.4
FY2035	181.1	147.8	33.3	168.8
FY2036	190.3	152.7	37.7	206.4
FY2037	200.0	157.7	42.3	248.7
FY2038	210.2	163.0	47.2	295.9
FY2039	220.9	168.4	52.5	348.5
FY2040	232.2	174.0	58.2	406.7
Total	2,637.2	2,230.4	406.7	

The $407 million is scheduled accumulation in the fund rather than an overestimate of what retirees will receive. Adding the schedule's contributions, less the benefits it implies, to its assets at 7 percent reproduces each year's projected asset value to within $2 million from FY2029 onward. Compounded at 7 percent, the gap is worth $564 million by the start of FY2041, roughly one fifth of the $2.63 billion in assets projected at that date. In effect, the gap reflects how far the City is asked to run ahead of benefit payments in order to retire the debt by 2040 (Diagram 1).

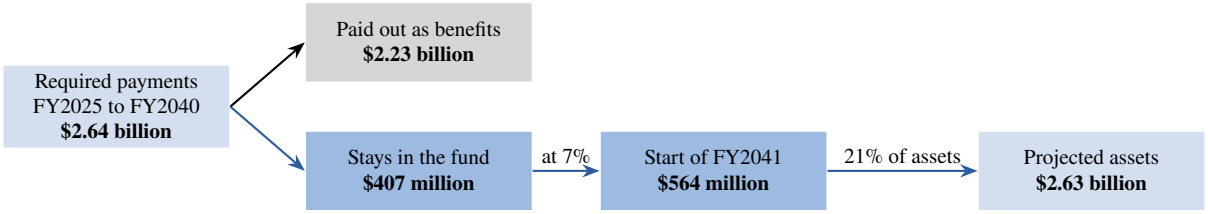

Diagram 1: Required payments against benefit payments in the model, FY2025 to FY2040, before employee contributions and investment earnings.

Through FY2034, the 2024 report's benefit forecast sits $2.3 million to $8.7 million a year above the model. This difference does not change the required payment. Under the liability roll-forward in Equation 10, a dollar of benefits not paid stays in both the liability and the assets, so the unfunded liability falls only when lower payments reflect a smaller obligation rather than a delayed one. The record agrees: first-year forecasts exceeded actual payments by a combined $16.4 million from FY2022 to FY2024, yet the valuations recorded a net liability loss of $21 million over the same years.

Feasibility of the Schedule

The schedule is arithmetically sound, but it depends on conditions that remain largely untested by the system's record (Table 2). The City currently pays the ADC in full, and its contributions have recently grown about 5 percent a year. However, the schedule requires similar growth for fifteen more years while assumed payroll

grows only 3 percent, lifting the payment from 59 to 79 percent of payroll, with 40 percent of the $2.64 billion falling in the final five years. Additionally, the schedule assumes a 7 percent return every year, and assets must grow fivefold by July 2040 after rising only $176 million in the ten years to 2024. The fund, by comparison, has earned about 5.8 percent a year since FY2007. A shortfall of this kind would raise the requirement: as estimated here, a steady 6 percent return lifts the FY2040 payment to $293 million and adds $212 million in total.

Table 2: The system's record against the conditions of the 2024 schedule.

Measure	Record	FY2025 to FY2040
City contribution	$104.9M, the highest to date (FY2024)	→ $232.2M (FY2040)
Share of payroll	58% (FY2024)	59% → 79%
Contribution growth	About 5% a year (recent years)	5.0% a year
Benefit payment growth	0.8% a year (FY2012 to FY2024)	3.0% a year (model)
Investment return	About 5.8% a year (FY2007 to FY2024)	7.0% every year
Fund assets	$338M (2014) → $514M (2024)	→ $2.63B (July 2040)

The end of the schedule warrants equal concern. In FY2041, the payment falls by $212 million, or 91 percent, in a single year, moving from 79 to 7 percent of payroll. At that point, a 7 percent return on projected assets ($184 million) would by itself exceed modeled benefits ($180 million). A path this steep and abrupt is unlikely to be followed as drawn, and press reporting suggests that it has already moved: the *Boston Globe* reported on February 26, 2026 a payment of $224 million a year by 2040, falling to $23.6 million in 2042. Nevertheless, the record does not indicate that the liability itself is overstated. Actuarial experience on the liability side was a net loss of $43 million from FY2021 to FY2024, meaning that costs ran above assumptions overall. The concern lies mainly in the timing and conditions of the schedule.

Projection Method: Part One

Each valuation report forecasts benefit payments for the ten fiscal years following its valuation date. As the reports are a year apart, each forecast window sits one year to the right of the one before it. Here, $B_{r,k}$ denotes the value that report r gives for fiscal year $r + k$, such that $B_{r,0}$ is the actual payment in the report year. Cells sharing the same k fall on a diagonal running down and to the right (Diagram 2).

The projection then moves out one diagonal at a time. Each growth factor is the average, across the four reports, of the step from diagonal $k - 1$ to diagonal k:

$$f_k \;=\; \frac{1}{4} \sum_{r=2021}^{2024} \frac{B_{r,k}}{B_{r,k-1}}, \qquad k = 1, \ldots, 10. \tag{2}$$

Starting from the actual FY2024 payment, the factors are applied in order, with each year built on the one before it:

$$P_{2024+k} \;=\; B_{2024,0} \times f_1 \times f_2 \times \cdots \times f_k. \tag{3}$$

This carries the projection to $143.0 million in FY2034, the final year covered by the 2024 report. Beyond this point no forecasts remain to divide, so growth is held at a constant rate g:

$$P_{2034+t} \;=\; P_{2034}\,(1 + g)^t, \qquad t = 1, \ldots, 20. \tag{4}$$

To select g, a single diagonal is followed across the four reports. For diagonal k, the annual rate over the three years between the 2021 and 2024 reports is

$$g_k \;=\; \left(\frac{B_{2024,k}}{B_{2021,k}} \right)^{1/3} - 1. \tag{5}$$

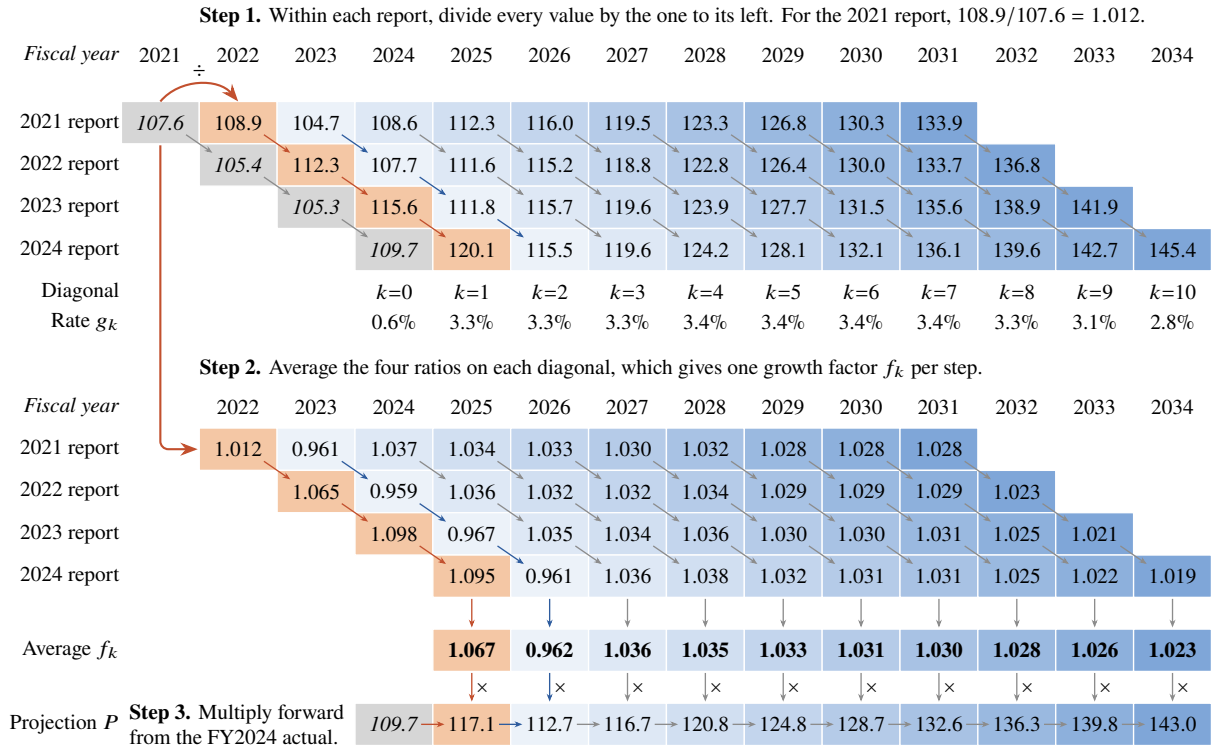

Diagram 2: Construction of part one ($ millions). Gray italic cells are actual payments and orange cells the first forecast year. Blue deepens with each later forecast year.

The first-forecast-year diagonal yields $g_1 = (120.1/108.9)^{1/3} - 1 = 3.3$ percent and a projection of $274.7 million in FY2054.

First-Year Forecast Error

The first-forecast-year diagonal behaves differently from the rest. Each report forecasts a sharp increase in its first year and a decline in its second, on average +6.7 and −3.8 percent. However, actual payments have not followed this pattern. Where the comparison is possible, payments came in 3 to 6 percent below the first-year forecast, while second- and third-year forecasts fell within 2 percent of what was paid (Diagram 3). The first-year margin over the prior year's actual payment also moved from 1.2 percent in the 2021 report to between 6.5 and 9.8 percent in the three reports since. First-year forecasts are, as a result, unreliable. The reports do not explain the pattern, though retirement timing may contribute: the valuations recorded retirement gains of $1.9 to $5.9 million in each of FY2022 to FY2024, indicating that fewer members retired than assumed.

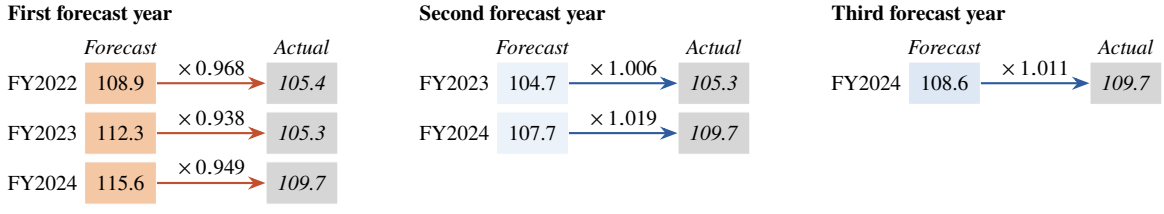

Diagram 3: Forecast and actual payments for the same year ($ millions), with actual divided by forecast on each arrow.

Projection Method: Part Two

Part two sets the first forecast year aside and serves as the model used throughout this memo. It steps directly from each report's actual payment to its second forecast year (Table 3), which bypasses the rise and dip around FY2025:

$$f_{0\to 2} \;=\; \frac{1}{4}\sum_{r=2021}^{2024}\frac{B_{r,2}}{B_{r,0}} \;=\; 1.027. \tag{6}$$

Table 3: The two-year step from each report's actual payment ($ millions).

	Actual, $B_{r,0}$		Second forecast year, $B_{r,2}$		Ratio
2021 report	*107.6*	⟶	104.7	⟶	0.973
2022 report	*105.4*	⟶	107.7	⟶	1.022
2023 report	*105.3*	⟶	111.8	⟶	1.061
2024 report	*109.7*	⟶	115.5	⟶	1.052
Average, $f_{0\to 2}$					**1.027**

From FY2026, the chain continues with f_3 through f_{10} as before. FY2025 itself takes the part-one value, scaled by the average ratio of actual payments to first-year forecasts in Diagram 3:

$$P_{2025} \;=\; B_{2024,0}\, f_1 \times \tfrac{1}{3}(0.968 + 0.938 + 0.949) \;=\; 117.1 \times 0.9517 \;=\; 111.4. \tag{7}$$

After FY2034, growth follows the second-forecast-year diagonal, the closest forecasts that the record supports:

$$g \;=\; g_2 \;=\; \left(\frac{115.5}{104.7}\right)^{1/3} - 1 \;=\; 3.3\%. \tag{8}$$

The two parts agree from FY2026 onward, as the first-year rise and second-year decline offset each other ($f_1 f_2 = 1.067 \times 0.962 = 1.027$), and g_1 and g_2 are nearly equal (Diagram 4). Setting the first year aside thus changes only the FY2025 estimate, by $5.7 million, while removing the bump from the line. Diagram 5 and Figure 3 present the result.

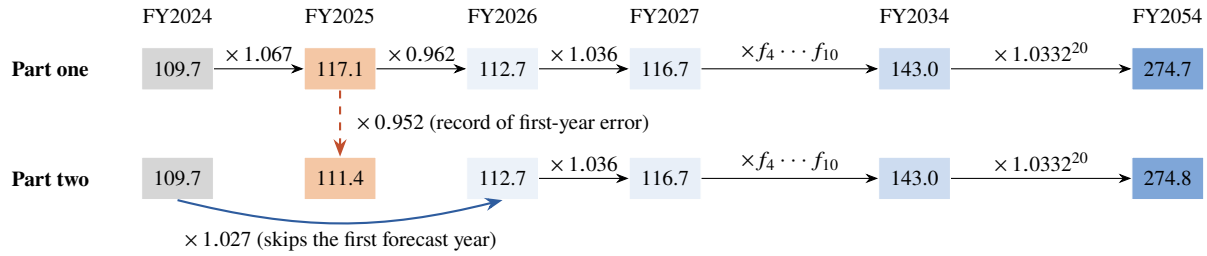

Diagram 4: How each part builds the projection from the FY2024 actual payment ($ millions).

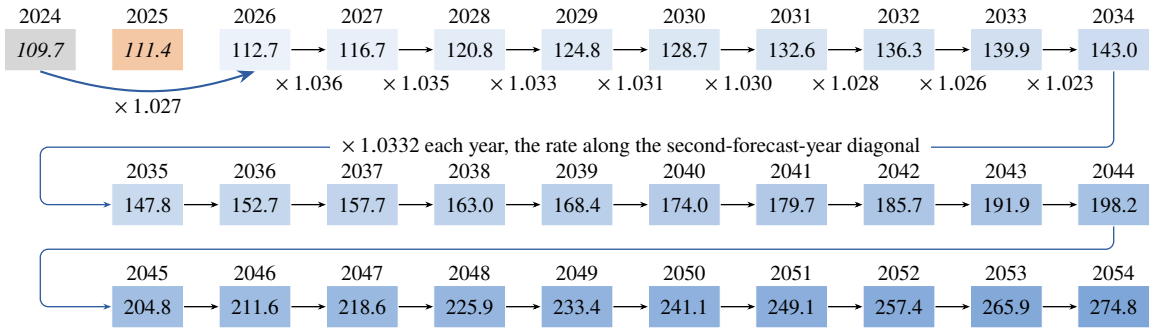

Diagram 5: Part two, FY2024 to FY2054 ($ millions). FY2024 is the actual payment and FY2025 is the adjusted value.

The shaded band in Figure 3 reflects the spread across reports. Through FY2034, its edges apply the lowest and highest single-report growth to the FY2024 payment,

$$B_{2024,0} \min_r \frac{B_{r,k}}{B_{r,0}} \quad \text{and} \quad B_{2024,0} \max_r \frac{B_{r,k}}{B_{r,0}}, \tag{9}$$

and after FY2034 they grow at the slowest and fastest of the year-to-year changes along the second-forecast-year diagonal, 2.9 and 3.8 percent.

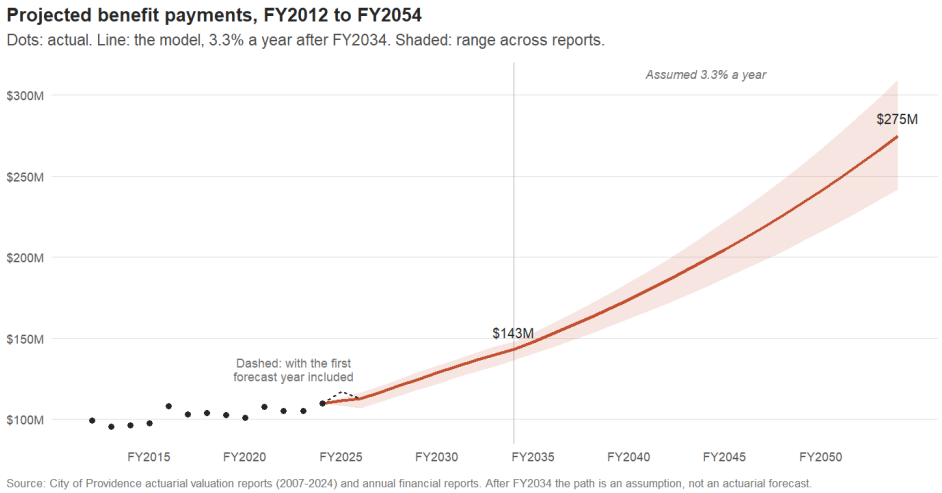

Figure 3: Projected benefit payments under part two. Values after FY2034 are an assumption of this memo, not an actuarial forecast.

Long-Term Growth Range

The 3.3 percent rate sits at the high end of the range, and it marks a step up from the 2.3 percent growth into FY2034. Actual payments grew about 0.6 percent a year from FY2021 to FY2024, and some of the growth along these diagonals reflects new members entering each report. Growth also slows within every report: in the 2024 report it falls from 3.6 percent in the third year to 1.9 percent in the tenth, and the tenth-year rate has declined in each successive report (2.8, 2.3, 2.1, and 1.9 percent). Table 4 applies three rates to the FY2034 estimate of $143 million, with lower rates widening the gap against the required payment.

Table 4: Benefit payments and the gap under three growth rates after FY2034 ($ millions).

Source of growth rate	Rate	FY2044	FY2054	Gap, FY2025 to FY2040
2024 funding schedule (below)	1.4%	164	189	469
Tenth-forecast-year diagonal, g_{10}	2.8%	188	247	425
Second-forecast-year diagonal, g_2	3.3%	198	275	407

Funding Schedule Comparison

The 2024 report also projects the accrued liability through FY2045, assuming continued hiring. Each year, the liability grows with new benefits and 7 percent interest and falls as benefits are paid at mid-year (Diagram 6):



Diagram 6: One year of the liability roll-forward.

$$\text{AAL}_{t+1} = (\text{AAL}_t + \text{NC}_t^{\text{total}})(1.07) - B_t\,(1.07)^{0.5}, \tag{10}$$

where NC^{total} is the City's normal cost plus the employees' share, about 9.7 percent of payroll. As every term other than benefit payments is published, the equation can be solved for them:

$$B_t = \frac{(\text{AAL}_t + \text{NC}_t^{\text{total}})(1.07) - \text{AAL}_{t+1}}{(1.07)^{0.5}}. \tag{11}$$

In FY2034, the result is close to the report's forecast ($144.6 million against $145.4 million). It then grows about 1.4 percent a year, the rate Table 4 applies to the FY2034 figure in the model.

Limitations

The benefit forecasts in the reports cover current members only. As each report adds that year's hires, part of the growth between reports reflects new members rather than higher benefits for the same people. Recent changes are also absent from most of the period: cost-of-living adjustments resumed in January 2023 after a ten-year freeze, and police and fire contribution rates rise to 16 percent by FY2027. Additionally, new assumptions from the 2021 to 2024 experience study take effect with the 2025 valuation, which was not available for this memo; press reporting places the system at 31.4 percent funded under it. The FY2025 estimate rises to $114.3 million if the first-year ratio is applied to the 2024 report's own forecast, and the FY2026 estimate of $112.7 million sits below the $115.5 million forecast even though second-year forecasts have so far run below actual payments. Adjusting both years for this record lowers the total gap to $325 million. Finally, only six forecasts can be compared with actual payments, and each average rests on four reports.

Recommendations

This memo recommends that long-range planning use the annual gap in Table 1, which totals $407 million from FY2025 to FY2040. Additionally, the system's actuary should be asked why first-year forecasts have run above actual payments, and should provide schedules showing how the FY2040 payment and the total cost change under a later payoff date or a level percent of payroll. The 2025 valuation, once available, will add a fifth row to Diagram 2 and allow the gap to be restated against the current schedule.