Dallas Police and Fire Pension System

Review of Subcommittee's Proposed Plan Changes Based on Final January 1, 2016 Results

September 8, 2016

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Key January 1, 2016 Valuation Results

Summary of Key Valuation Results

	2016	2015
Contributions for plan year beginning January 1:		
Recommended contribution (City and employee)	$265,579,195	$205,014,802[1]
Recommended contribution as a percentage of total computation pay	72.72%	53.53%
Actual contributions (City and employee)	--	$140,562,050
Amortization period for determination of recommended contribution	40 years	30 years
Funding elements for plan year beginning January 1:		
Normal cost, including administrative expenses, adjusted for timing	$92,446,291	$98,087,921[2]
Market value of assets	2,680,124,303	3,079,394,897
Actuarial value of assets	2,680,124,303	3,695,273,876
Actuarial accrued liability	5,947,173,998	5,792,216,025
Unfunded actuarial accrued liability (UAAL)	3,267,049,695	2,096,942,149
Funded ratio – Actuarial basis	45.07%	63.80%
Funded ratio – Market basis	45.07%	53.16%
Effective funding period to amortize UAAL	Infinite	Infinite
Demographic data for plan year beginning January 1:		
Number of retired members and beneficiaries	4,230	4,069
Number of vested former members[3]	200	157
Number of active members	5,415	5,487
Total computation pay	$365,210,426	$383,006,330
Average computation pay	67,444	69,803

[1]The 2015 valuation did not include the recommended contribution as a dollar amount. This amount was determined by Segal Consulting based on the rate-of pay information in the prior actuary's report.

[2]Prior valuations did not include an explicit administrative expense assumption.

[3]Excludes terminated participants due a refund of contributions.

The total recommended contribution based on 30-year amortization is $288,633,291, or 79.03% of total computation pay.

Active Groups Defined

- For this presentation current active employees will be grouped as follows:
  - Tier One (T1) – Current active employees hired on or before December 31, 2006.
  - Tier Two (T2) – Current active employees hired on or after January 1, 2007 and on or before March 1, 2011.
  - Tier Three (T3) Current active employees hired after February 28, 2011.

Current Plan Issues

- The statutory contribution rates are not sufficient to amortize the System's unfunded actuarial accrued liability (UAAL) within PRB guidelines. In fact, contributions are less than the interest on the UAAL, and the principal is not being amortized.
  - The System and the City will have to take steps to bring benefits and resources into a balance that amortizes the UAAL over no more than 40 years.
  - 98% of liabilities are for annuitants and Tier 1 active participants.
- There is a sizeable gap between actual and necessary contributions.
  - City contributions are 27.50% of total compensation, including overtime and other non-computation pay. For comparison purposes the City contribution rate is estimated to be 30.53% as a percentage of computation pay.
  - Employee contributions are 8.50% of computation pay if not in DROP, and 4.00% if in DROP. The weighted average of these rates as of the valuation date is 7.08%.
  - The current total contribution rate is 37.61% of computation pay.
- ***With no changes to benefit terms, an additional 35.11% of computation pay is needed to get to a 40-year funding period as of January 1, 2016.***

Current Plan Issues

- Under the current plan of benefits as of January 1, 2016, the System is projected to be insolvent in 15 years if all assumptions are met, including 7.25% annual returns on assets.
- In the near-term, as modifications are made to the asset holdings of the System, it is unlikely that 7.25% returns can be achieved. Staff has advised Segal to assume 5.00% for 2016, 6.00% for 2017, 6.50% for 2018, 7.00% for 2019, and 7.25% thereafter.
  - On this basis, insolvency is anticipated one year earlier, in 2030.
- As noted previously, 98% of plan liability is associated with current annuitants or Tier 1 actives. Therefore, meaningful changes must be focused on these two participant segments.
- For current annuitants, possible changes that could have a significant impact include: COLA changes, DROP interest and DROP payout options.
- For Tier 1 active participants, changes include: COLA, DROP interest, DROP payout, DROP period, accrual rate, final salary determination, contribution changes
- For other active participants, the main impact will be contribution changes.

Summary of Current Plan vs. August 11 Proposed Plan

CURRENT PLAN

- COLA – 4.0% simple on Base Benefit for Tier 1; begins October 1 after DROP entry or retirement; COLA included in DROP
- Employee Contributions – 8.5% for non-DROP active participants and 4.0% for DROP active participants
- DROP (Actives) – 7.0% interest currently (changing to 6.0% October 1, 2016); interest continues throughout DROP; no limit time in DROP
- DROP (Retirees) - 7.0% interest currently (changing to 6.0% October 1, 2016)
- Supplement – Maximum of 3% of total benefit or $75 per month
- Tier 3 Multiplier – 2.0% 1st 20 years, 2.5% next 5 years, 3.0% thereafter (max 90.0%)
- Tiers 1 and 2 Average Computation Pay – 36 consecutive months of highest pay
- Tier 3 Pre-Retirement Death Benefit – Greater of 50.0% of accrued benefit or 25.0% of Average Computation Pay

PROPOSED PLAN

- COLA – CPI-based (max 2.0%), compound with capped base, starting at earlier of age 62 or 3 years after retirement; no COLA in active DROP; Effective January 1, 2017.
- Employee Contributions – Increasing to 9.0%, 10.5%, and 12.0% effective January 1, 2017, October 1, 2017, and October 1, 2018 for all active participants (contributions in the DROP period are returned as described on the next page)
- DROP (Actives) – 3.0% interest payable for first 7 years in DROP, with deposits into the DROP stopping after 10 years; 6-month transition period for anyone in DROP as of 1/1/2017
- DROP (Retirees) – Interest dependent on form of payment
- Supplement – Maximum of 1% of original benefit or $75 per month
- Tier 3 Multiplier – 3.0% for all years, increasing retroactively (max 90.0%)
- Tiers 1 and 2 Average Computation Pay – 60 consecutive months of highest pay, prospectively
- Tier 3 Pre-Retirement Death Benefit – Greater of 50.0% of accrued benefit or benefit based on 20 years, but no less than 30.0% of Average Computation Pay

Subcommittee's Proposed Plan Changes

- CPI-based compound COLA (max 2.0% annual increase) on base benefit for Tier 1 actives and Tier 1 annuitants, base not to exceed $31,668*; COLA removed from active DROP; COLA starts at earlier of age 62 or three years after retirement; COLA change effective January 1, 2017
- Employee contributions increasing to 9.0% effective January 1, 2017, 10.5% effective October 1, 2017, and 12.0% effective October 1, 2018. Effective January 1, 2017, all contributions made from that point on while a DROP participant will be refunded upon retirement. The contributions will be paid out over a 10-year period, without interest.
- Active DROP Participants - Interest lowered to 3% as of January 1, 2017, with interest stopping after 7 years from original DROP entry date, and deposits to DROP account stopping after 10 years from original DROP entry date. A six-month transition period will be implemented.
- For PROP/Retiree DROP participants, and actives assumed to retire under DROP, the DROP account will be paid out under one of the following options:
  - A "liquid" option
  - A 10-year annuity
  - A 20-year annuity

**The maximum Social Security benefit payable for someone who retires at full retirement in 2016 is $31,668 per year. This same amount is used in 2017 for these studies. For purposes of these studies the maximum Social Security benefit is assumed to increase by 2.5% per year after 2017, and the base for each individual is set at COLA commencement as the lesser of this amount and the full benefit accrued. The base for current annuitants is the lesser of $31,668 and the actual benefit at retirement.*

Subcommittee’s Proposed Plan Changes, continued

- Change supplement to the greater of 1% or $75, but no greater than the current supplement the participant has or would earn, with new supplement amount applied to the original base
- Benefit multiplier increased to 3% for Tier 3 participants, retroactive to date of hire
- Average computation pay for Tiers 1 and 2 participants changed to 60 months, prospectively
- Pre-retirement death benefit for Tier 3 participants changed to the same pre-retirement death benefit for Tiers 1 and 2 participants

If DROP balances are withdrawn sooner than assumed as of the January 1, 2016 valuation date, the cost will increase and long-term solvency will be impacted.

Assumptions – September 8 Proposal

Assumptions from the January 1, 2016 valuation were used, unless stated otherwise below:

- The maximum Social Security Normal Retirement benefit for a person retiring at Normal Retirement Age in 2017 is assumed to be $31,668. This amount is assumed to increase at 2.5% annually thereafter.
- Since the long-term inflation assumption is 2.75%, for valuation purposes the COLA increase is assumed to be 2.0% annually.
- Retirement rates are assumed to increase for DROP participants by 15 basis points with the January 1, 2017 and 2018 valuations and 25 basis points with the January 1, 2019 valuation to reflect the increases in employee contribution rates. With the January 1, 2020, the current retirement rates will resume.
- Retirement rates are assumed to increase for non-DROP participants by 15 basis points with the January 1, 2018 valuation and 25 basis points with the January 1, 2019 valuation to reflect the increases in employee contribution rates. With the January 1, 2020, the current retirement rates will resume.
- Active DROP participants with more than 10 years of service as of January 1, 2017 are assumed to retire within the next six months.
- For retiree DROP participants, 10% of DROP balances are assumed to be paid immediately. Of the remaining 90%:
  - 30% is assumed to be paid over seven years and receive1.5% interest; i.e., “liquid option”
  - 50% is assumed to be paid out in a ten-year annuity and receive 3.0% interest
  - 20% is assumed to be paid out in a twenty-year annuity and receive 4.0% interest

Differences Between August 11 and September 8 Proposals

August 11 Proposal

- COLA change assumed to take effect October 1, 2016
- The maximum Social Security Normal Retirement benefit for a person retiring at Normal Retirement Age in 2017 is assumed to be $31,668 x 1.025 = $32,460.
- Employee contribution of 9% assumed to take effect October 1, 2016
- No increases in retirement rates as a result of employee contribution rate changes.

September 8 Proposal

- COLA change assumed to take effect January 1, 2017 for the COLA payable October 1, 2017. This is due to the fact that an election will not take place in time for a change in COLA to be made by October 1, 2016.
- The maximum Social Security Normal Retirement benefit for a person retiring at Normal Retirement Age in 2017 is assumed to be $31,668 (This reflects updated Social Security expectations).
- Employee contribution of 9% assumed to take effect January 1, 2017
- Retirement rates assumed to increase January 1, 2017 (DROP only), January 1, 2018, and January 1, 2019 as a result of the increase in employee contributions.
- An additional 5-year DROP payment annuity option is available for retired participants.

Additional Plan Changes Considered

The following pages compare the January 1, 2016 valuation results with the proposed plan changes.

- Scenario A uses a 27.5% City contribution rate and 8.5%/4.0% member contribution rates.
- Scenarios B, C, D, E, and F use a 28.5% City contribution rate, with a 9.0% contribution rate for expected member contributions effective January 1, 2017; refunds of future DROP contributions include the phase-in of the ultimate member contribution rates.
- The phase-in of the employee contribution rate increases are reflected for cash-flow purposes in the solvency projections.

The six columns on the following page shows the results of the following scenarios:

- **A** – Current Plan
- **B** – August 11 Proposal
- **C** – September 8 Proposal
- **D** – September 8 Proposal, Phasing in to 14% Employee Contribution Rate (9% January 1, 2017, 11% October 1, 2017, 13% October 1, 2018 and 14% October 1, 2019)
- **E** – September 8 Proposal, with DROP Deposits Continuing Without an End Date
- **F** – September 8 Proposal, with All Current Active DROP Participants Allowed 10 Additional Years of Deposits

Assumptions – Additional Plan Changes Considered

Scenarios D, E, and F use the same assumptions as in Scenario C (September 8 Proposal, see assumptions on slide 9) except as follows:

- **Scenario D** - September 8 Proposal, Phasing in to 14% Employee Contribution Rate
  - Retirement rate increased by 25 basis points for all active participants with the January 1, 2020 valuation, with the current rates resuming with the January 1, 2021 valuation.

- **Scenario E** – Retirement rates are the same as the January 1, 2016 valuation

- **Scenario F** - September 8 Proposal, with All Current Active DROP Participants Allowed 10 Additional Years of Deposits
  - All current active DROP participants are assumed to retire after an additional 10 years of DROP deposits, or at age 67, if earlier, per the retirement rates in the January 1, 2016 valuation.

Impact of Subcommittee’s Proposed Plan Changes

	All Results are based on the January 1, 2016 Actuarial Valuation	Plan as of January 1, 2016 A	August 11 Proposal B	September 8 Proposal C	Sept 8 Proposal Phasing in to 14% Employee Contribution Rate D	Sept 8 Proposal with DROP Deposits Continuing Without an End Date E	Sept 8 Proposal with All Current Active DROP Participants Allowed 10 Additional Years of Deposits F
1	Total Normal Cost, without AE, including interest	$82,446,291	$65,786,814	$67,944,263	$69,000,189	$68,553,761	$68,147,560
2	Total Normal Cost as a % of Pay	22.58%	18.01%	18.60%	18.89%	18.77%	18.66%
3	Tier 1 actives not in DROP	$872,603,046	$584,636,943	$614,352,996	$632,519,664	$621,020,382	$614,352,996
4	Tier 1 actives in DROP - annuities	974,423,693	717,501,080	817,790,273	832,708,359	811,305,947	814,236,253
5	Tier 1 actives in DROP - lump sums (includes 1 Old Plan active)	612,504,186	459,443,341	456,165,476	457,998,634	474,419,753	473,629,941
6	Tier 2 actives	85,338,934	79,824,605	80,459,573	81,507,654	81,711,442	80,463,528
7	Tier 3 actives	16,776,897	22,342,757	22,338,400	22,452,500	22,391,976	22,338,400
8	Total active liability: sum (3) - (7)	$2,561,646,756	$1,863,748,726	$1,991,106,718	$2,027,186,811	$2,010,849,500	$2,005,021,118
9	Retirees receiving payments non-DROP liability	$2,101,026,034	$1,871,192,191	$1,891,274,983	$1,891,274,983	$1,891,274,983	$1,891,274,983
10	Retirees receiving payments DROP liabilities	896,155,467	837,492,177	840,869,418	840,869,418	840,869,418	840,869,418
11	Total retiree liability: (9) + (10)	$2,997,181,501	$2,708,684,368	$2,732,144,401	$2,732,144,401	$2,732,144,401	$2,732,144,401
12	Beneficiaries	$278,219,670	$259,468,483	$261,538,397	$261,538,397	$261,538,397	$261,538,397
13	Other liability (Disabilities, Inactive Vesteds)	110,126,070	99,195,897	99,779,881	99,779,880	99,779,880	99,779,881
14	Accrued liability total: (8) + (11) + (12) + (13)	$5,947,173,997	$4,931,097,474	$5,084,569,397	$5,120,649,489	$5,104,312,178	$5,098,483,797
15	Assets	2,680,124,303	2,680,124,303	2,680,124,303	2,680,124,303	2,680,124,303	2,680,124,303
16	Unfunded Liability: (14) - (15)	3,267,049,694	2,250,973,171	2,404,445,094	2,440,525,186	2,424,187,875	2,418,359,494
17	Funded Ratio: (15) / (14)	45.07%	54.35%	52.71%	52.34%	52.51%	52.57%
18	40-year Amortization Payment of Unfunded Liability	$173,132,903	$119,287,295	$127,420,333	$129,332,349	$128,466,575	$128,157,708
19	**Contribution Rate at 40-year level % of pay amortization**	**72.72%**	**53.41%**	**56.23%**	**57.04%**	**56.69%**	**56.49%**
20	Contribution Using a 40-year level % of pay amortization	265,579,195	195,074,109	205,364,597	208,332,538	207,020,336	206,305,268
21	Projected Payroll	$365,210,426	$365,210,426	$365,210,426	$365,210,426	$365,210,426	$365,210,426
22	Expected Contributions in $	137,333,906	148,403,256	148,403,256	148,403,256	148,403,256	148,403,256
23	**Expected Contributions as a % of Pay: (22) / (21)**	**37.60%**	**40.63%**	**40.63%**	**40.63%**	**40.63%**	**40.63%**
24	**Contribution Deficit as a % of Pay: (19) - (23)**	**35.12%**	**12.78%**	**15.60%**	**16.41%**	**16.05%**	**15.85%**
25	Change in Contribution Deficit as a % of Pay	N/A	-22.34%	-19.52%	-18.71%	-19.07%	-19.26%
26	**Percentage of Contribution Deficit Employees Cover**	**N/A**	**63.61%**	**55.58%**	**53.27%**	**54.29%**	**54.85%**
27	**Year of Projected Insolvency, if no additional City contributions**	**2030**	**2046**	**2041**	**2044**	**2040**	**2040**

Summary of Plan Change Impact

Comments on Proposed Plan Changes:

- Total Normal Cost and Actuarial Accrued Liability increases in Scenarios D, E, and F from Scenario C. Please note that these changes do not reflect future cash flows.
- The additional employee contributions generated by Scenario D are beneficial to the long-term solvency projections, but they also increase liability since there are more employee contributions being refunded with interest in the future.
- Scenarios E and F are projected to cause insolvency to occur one year earlier than Scenario C, since the longer DROP deposits continue, the greater the amount that has to be paid out in the future with interest.
- Cash flow projections (without additional City contributions) are shown on slides 19 and 20.

Impact of Proposed Plan Changes on Total Normal Cost

The Normal Cost is the amount of contributions required to fund the benefit allocated to the current year of service. Only active participants have a Normal Cost.

Total Normal Cost as a % of Group's Payroll

	Tier 1 - DROP	Tier 1 - NonDROP	Tier 1 - Total	Tier 2 - DROP	Tier 2 - NonDROP	Tier 2 - Total	Tier 3	Total
A - Current Plan	23.60%	27.64%	**25.78%**	21.58%	18.49%	**18.52%**	**12.78%**	**22.58%**
B - August 11 Proposal	17.64%	19.13%	**18.44%**	17.17%	17.39%	**17.39%**	**16.79%**	**18.01%**
C - September 8 Proposal	18.67%	19.79%	**19.28%**	18.18%	17.53%	**17.53%**	**16.79%**	**18.60%**
D - Sept 8 + 14% Ultimate Employee Contribution Rate	18.89%	20.26%	**19.63%**	18.44%	17.75%	**17.75%**	**16.87%**	**18.89%**
E - Sept 8 + DROP Deposits Continue Without End Date	18.81%	20.00%	**19.45%**	18.22%	17.78%	**17.79%**	**16.82%**	**18.77%**
F - Sept 8 + DROP Deposits Continue for 10 Years	18.85%	19.79%	**19.36%**	18.27%	17.53%	**17.53%**	**16.79%**	**18.66%**

Impact of Proposed Plan Changes on Plan Liability

The chart below shows how the actuarial accrued liability of each group of members changes.

Percentage Change in Actuarial Accrued Liability from January 1, 2016 Actuarial Valuation (Scenario A)

Scenario	Actives											
	Tier 1 - DROP	Tier 1 - NonDROP	Tier 1 - Total	Tier 2 - DROP	Tier 2 - NonDROP	Tier 2 - Total	Tier 3	Total Actives	Retirees	Beneficiaries and Other Inactives	Total Annuitants and Inactives	Total
B - August 11 Proposal	-25.84%	-33.00%	-28.38%	-18.74%	-6.34%	-6.46%	33.18%	**-27.24%**	-9.63%	-7.64%	**-9.40%**	**-17.09%**
C - September 8 Proposal	-19.72%	-29.60%	-23.22%	-12.91%	-5.64%	-5.72%	33.15%	**-22.27%**	-8.84%	-6.96%	**-8.63%**	**-14.50%**
D - Sept 8 + 14% Ultimate Employee Contribution Rate	-18.67%	-27.51%	-21.81%	-11.50%	-4.42%	-4.49%	33.83%	**-20.86%**	-8.84%	-6.96%	**-8.63%**	**-13.90%**
E - Sept 8 + DROP Deposits Continue Without End Date	-18.98%	-28.83%	-22.48%	-12.70%	-4.16%	-4.25%	33.47%	**-21.50%**	-8.84%	-6.96%	**-8.63%**	**-14.17%**
F - Sept 8 + DROP Deposits Continue for 10 Years	-18.85%	-29.60%	-22.66%	-12.45%	-5.64%	-5.71%	33.15%	**-21.73%**	-8.84%	-6.96%	**-8.63%**	**-14.27%**

Impact of Proposed Plan Changes on Plan Liability, contd.

The chart below shows the percentage of the liability change associated with each group of members.

Percentage of Liability Change from January 1, 2016 Actuarial Valuation (Scenario A) Associated with Each Group

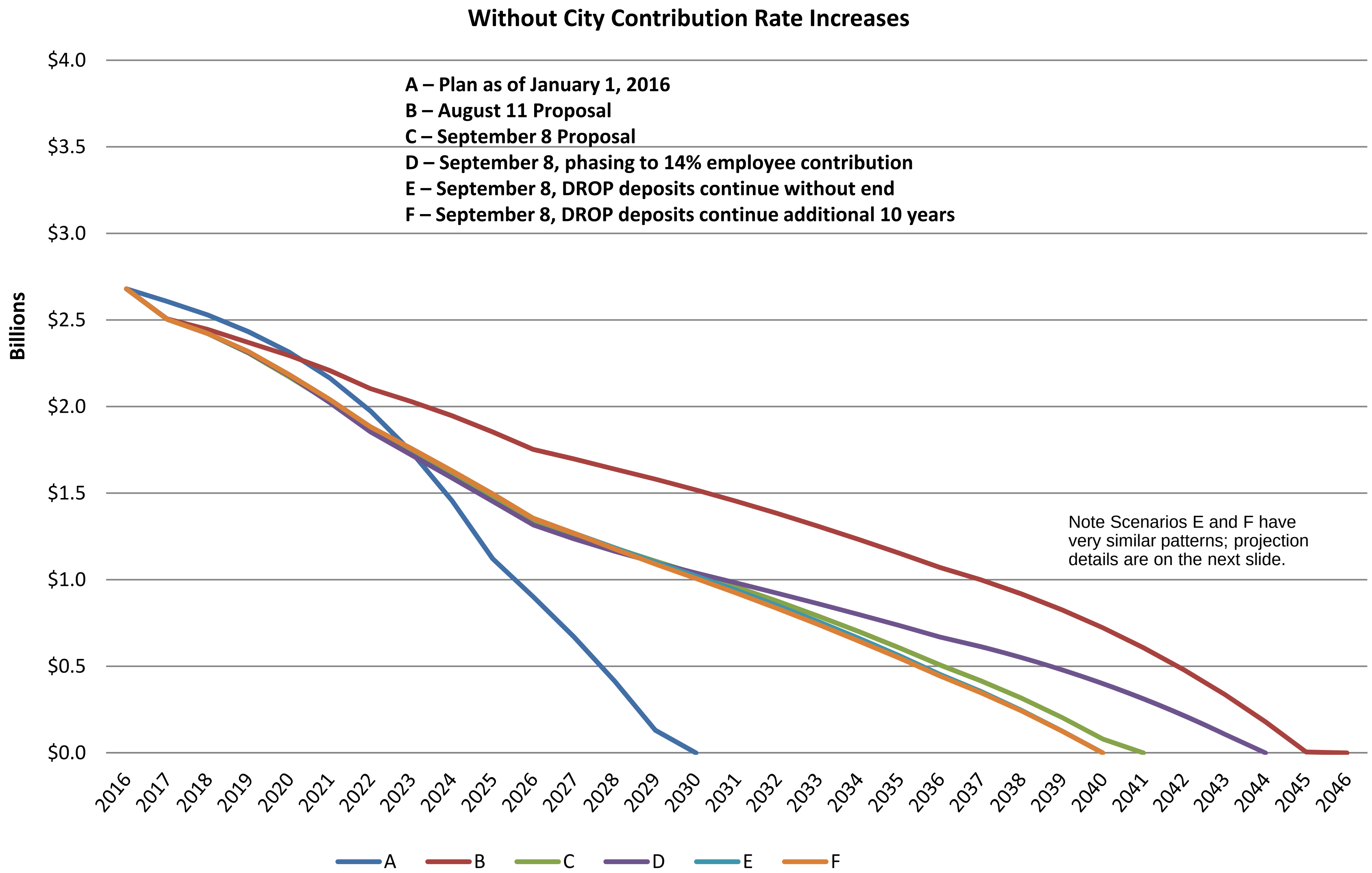
Scenario	Actives	Retirees	Beneficiaries and Other Inactives	Total
B - August 11 Proposal	68.69%	28.39%	2.92%	100.00%
C - September 8 Proposal	66.14%	30.73%	3.13%	100.00%
D - Sept 8 + 14% Ultimate Employee Contribution Rate	64.66%	32.07%	3.27%	100.00%
E - Sept 8 + DROP Deposits Continue Without End Date	65.35%	31.44%	3.21%	100.00%
F - Sept 8 + DROP Deposits Continue for 10 Years	65.59%	31.23%	3.18%	100.00%

Tier 3 Benefit Multiplier Increase

The chart below shows the portion of the Tier 3 participants' Normal Cost that is being paid by the City (line 5), and the portion that would be paid under the four scenarios listed below. Normal Cost rates may change over time as the demographics and pay of participants change.

		Current Plan – Scenario A	September 8 Proposal – Scenario C	September 8 Proposal, Remove Tier 3 Multiplier Increase	Sept 8 Proposal Phasing-in to 14% Employee Contributions – Scenario D	Sept 8 Proposal Phasing-in to 14% Employee Contributions, Remove Tier 3 Multiplier Increase
1	Tier 3 Normal Cost, without AE, including interest	$7,331,042	$9,300,057	$7,026,342	$9,348,553	$7,082,675
2	Tier 3 Payroll	$57,378,992	$57,378,992	$57,378,992	$57,378,992	$57,378,992
3	Tier 3 Normal Cost as a % of Pay	12.78%	16.21%	12.25%	16.29%	12.34%
4	Ultimate Employee Contribution Rate	8.50%	12.00%	12.00%	14.00%	14.00%
5	Excess of Tier 3 Normal Cost over Ultimate Contribuion Rate	4.28%	4.21%	0.25%	2.29%	-1.66%

Projection 1 – Market Value of Assets, Projected as of January 1



Projection 1 – Market Value of Assets, Projected as of January 1

Scenario	A –Plan as of January 1, 2016	B – August 11 Proposal	C – September 8 Proposal	D – September 8, phasing to 14% employee contribution	E – September 8, DROP deposits continue without end	F – September 8, DROP deposits continue additional 10 years
Year						
2016	$2,680,124,303	$2,680,124,303	$2,680,124,303	$2,680,124,303	$2,680,124,303	$2,680,124,303
2017	$2.61 Billion	$2.51 Billion	$2.50 Billion	$2.50 Billion	$2.50 Billion	$2.50 Billion
2018	$2.53 Billion	$2.45 Billion	$2.42 Billion	$2.42 Billion	$2.42 Billion	$2.42 Billion
2019	$2.43 Billion	$2.37 Billion	$2.31 Billion	$2.31 Billion	$2.32 Billion	$2.32 Billion
2020	$2.31 Billion	$2.29 Billion	$2.17 Billion	$2.18 Billion	$2.18 Billion	$2.18 Billion
2021	$2.16 Billion	$2.21 Billion	$2.03 Billion	$2.02 Billion	$2.04 Billion	$2.04 Billion
2022	$1.97 Billion	$2.10 Billion	$1.87 Billion	$1.85 Billion	$1.88 Billion	$1.88 Billion
2023	$1.74 Billion	$2.03 Billion	$1.74 Billion	$1.72 Billion	$1.76 Billion	$1.76 Billion
2024	$1.46 Billion	$1.95 Billion	$1.61 Billion	$1.59 Billion	$1.63 Billion	$1.63 Billion
2025	$1.12 Billion	$1.85 Billion	$1.48 Billion	$1.45 Billion	$1.50 Billion	$1.50 Billion
2026	$901 Million	$1.75 Billion	$1.34 Billion	$1.32 Billion	$1.35 Billion	$1.35 Billion
2027	$671 Million	$1.70 Billion	$1.26 Billion	$1.24 Billion	$1.27 Billion	$1.27 Billion
2028	$414 Million	$1.64 Billion	$1.18 Billion	$1.16 Billion	$1.18 Billion	$1.18 Billion
2029	$131 Million	$1.58 Billion	$1.11 Billion	$1.10 Billion	$1.10 Billion	$1.09 Billion
2030	***Insolvent***	$1.52 Billion	$1.03 Billion	$1.04 Billion	$1.02 Billion	$1.01 Billion
2031		$1.45 Billion	$957 Million	$981 Million	$938 Million	$922 Million
2032		$1.38 Billion	$876 Million	$922 Million	$850 Million	$834 Million
2033		$1.31 Billion	$791 Million	$861 Million	$759 Million	$742 Million
2034		$1.23 Billion	$701 Million	$800 Million	$662 Million	$647 Million
2035		$1.15 Billion	$607 Million	$735 Million	$561 Million	$548 Million
2036		$1.07 Billion	$507 Million	$668 Million	$453 Million	$444 Million
2037		$1.00 Billion	$417 Million	$613 Million	$355 Million	$348 Million
2038		$918 Million	$316 Million	$550 Million	$246 Million	$242 Million
2039		$826 Million	$204 Million	$479 Million	$126 Million	$125 Million
2040		$723 Million	$80 Million	$400 Million	***Insolvent***	***Insolvent***
2041		$607 Million	***Insolvent***	$312 Million		
2042		$479 Million		$215 Million		
2043		$337 Million		$107 Million		
2044		$179 Million		***Insolvent***		
2045		$540 Million				
2046		***Insolvent***				

The amounts shown are projected estimates based on a multitude of assumptions. Actual results may differ significantly.

Summary of Plan Change Impact

Comments on Projection 1:

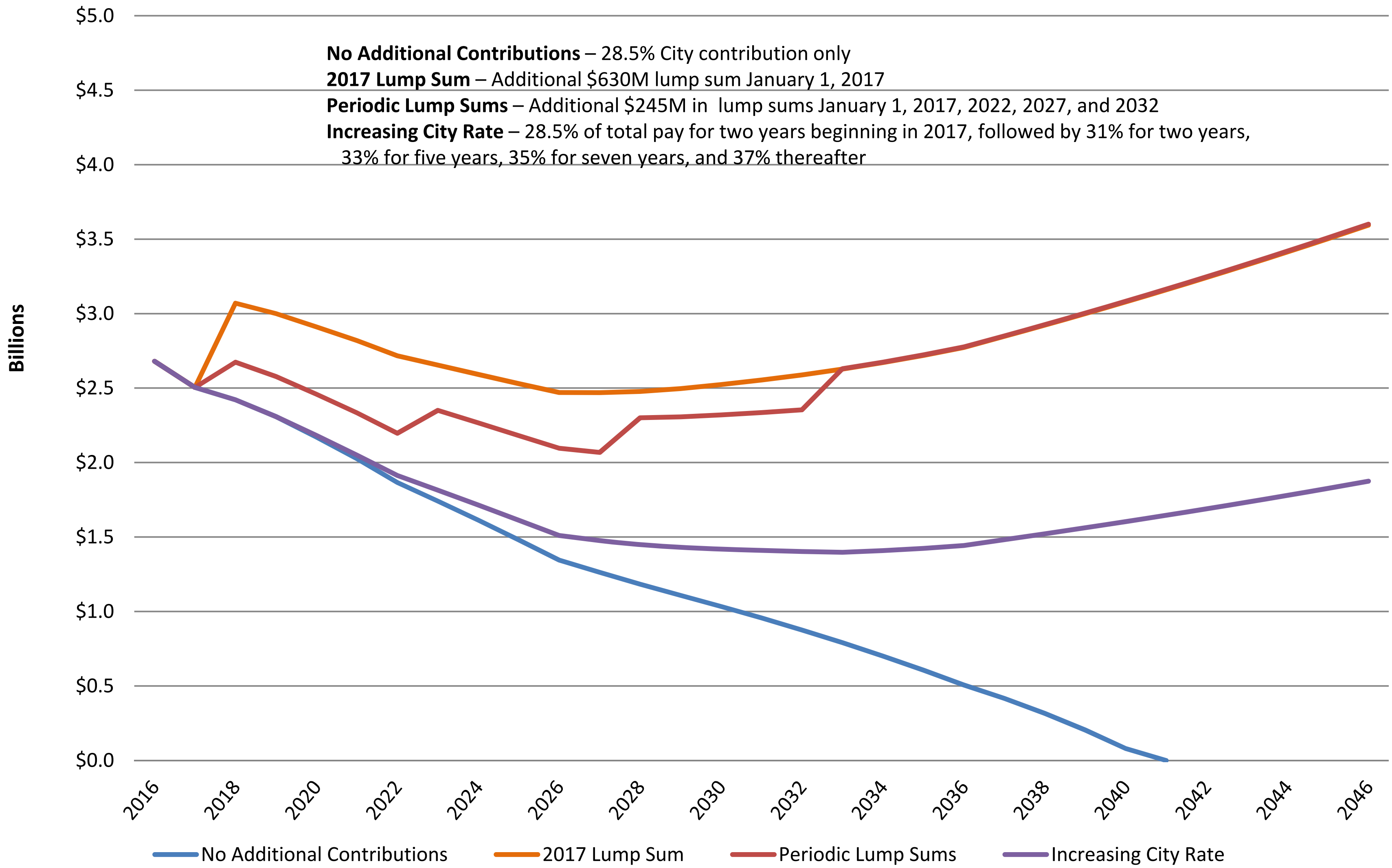
- With no changes to the plan, and the City's current contribution rate of 27.5% of total pay, the System is projected to become insolvent in calendar year 2030.
- Under the September 8th proposed plan, and with the City's contribution rate assumed to increase to 28.5% of total pay as of January 1, 2017, the System is projected to become insolvent in calendar year 2041.
- **Plan changes and employee contribution increases alone are not projected to be enough to keep the System from going insolvent.**

Scenario C Projection - September 8 Proposed Plan Changes

Basis for Projection 2:

- The City's base contribution rate is assumed to be 28.5% of total pay.
- Various scenarios for City contributions:
  - **No Additional Contributions** – No increases in the City's contributions over 28.5% of total pay. Insolvency projected in 2041.
  - **2017 Lump Sum** – Assumes an additional $630 Million City contribution in 2017, in addition to the 28.5% contribution rate
  - **Periodic Lump Sums** – Assumes additional $245 Million City contributions in 2017, 2022, 2027, and 2032, in addition to the 28.5% contribution rate.
  - **Increasing City Rate** – Assumes City's rate increases as follows:
    - 2017 – 2018: 28.5% of total pay
    - 2019 – 2020: 31.0% of total pay
    - 2021 – 2025: 33.0% of total pay
    - 2026 – 2032: 35.0% of total pay
    - 2033 and after: 37.0% of total pay

Projection 2 – Scenario C - September 8 Proposed Plan Changes
Market Value of Assets, Projected as of December 31

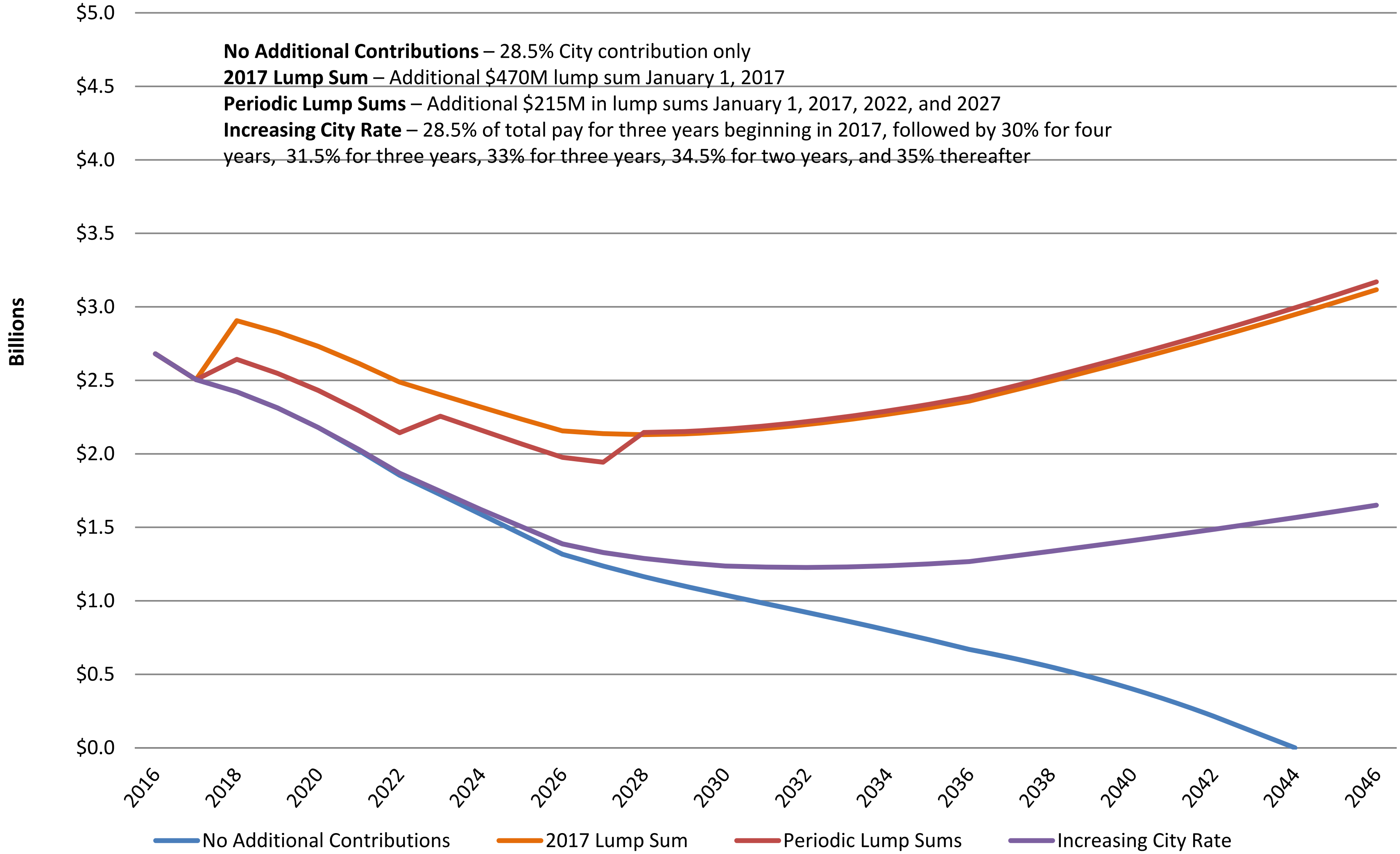


Scenario D Projection - September 8 Proposed Plan Changes, Phasing-in to 14% Employee Contribution Rate

Basis for Projection 3:

- The City's base contribution rate is assumed to be 28.5% of total pay.
- Various scenarios for City contributions:
  - **No Additional Contributions –** No increases in the City's contributions over 28.5% of total pay. Insolvency projected in 2044.
  - **2017 Lump Sum –** Assumes an additional $470 Million City contribution in 2017, in addition to the 28.5% contribution rate
  - **Periodic Lump Sums –** Assumes additional $215 Million City contributions in 2017, 2022, and 2027 in addition to the 28.5% contribution rate.
  - **Increasing City Rate –** Assumes City's rate increases as follows:
    - 2017 – 2019: 28.5% of total pay
    - 2020 – 2023: 30.0% of total pay
    - 2024 – 2026: 31.5% of total pay
    - 2027 – 2029: 33.0% of total pay
    - 2030 – 2031: 34.5% of total pay
    - 2032 and after: 35.0% of total pay

Projection 3 – Scenario D - September 8 Proposed Plan Change, Phase-in to 14% Employee Rate - Market Value of Assets, Projected as of December 31



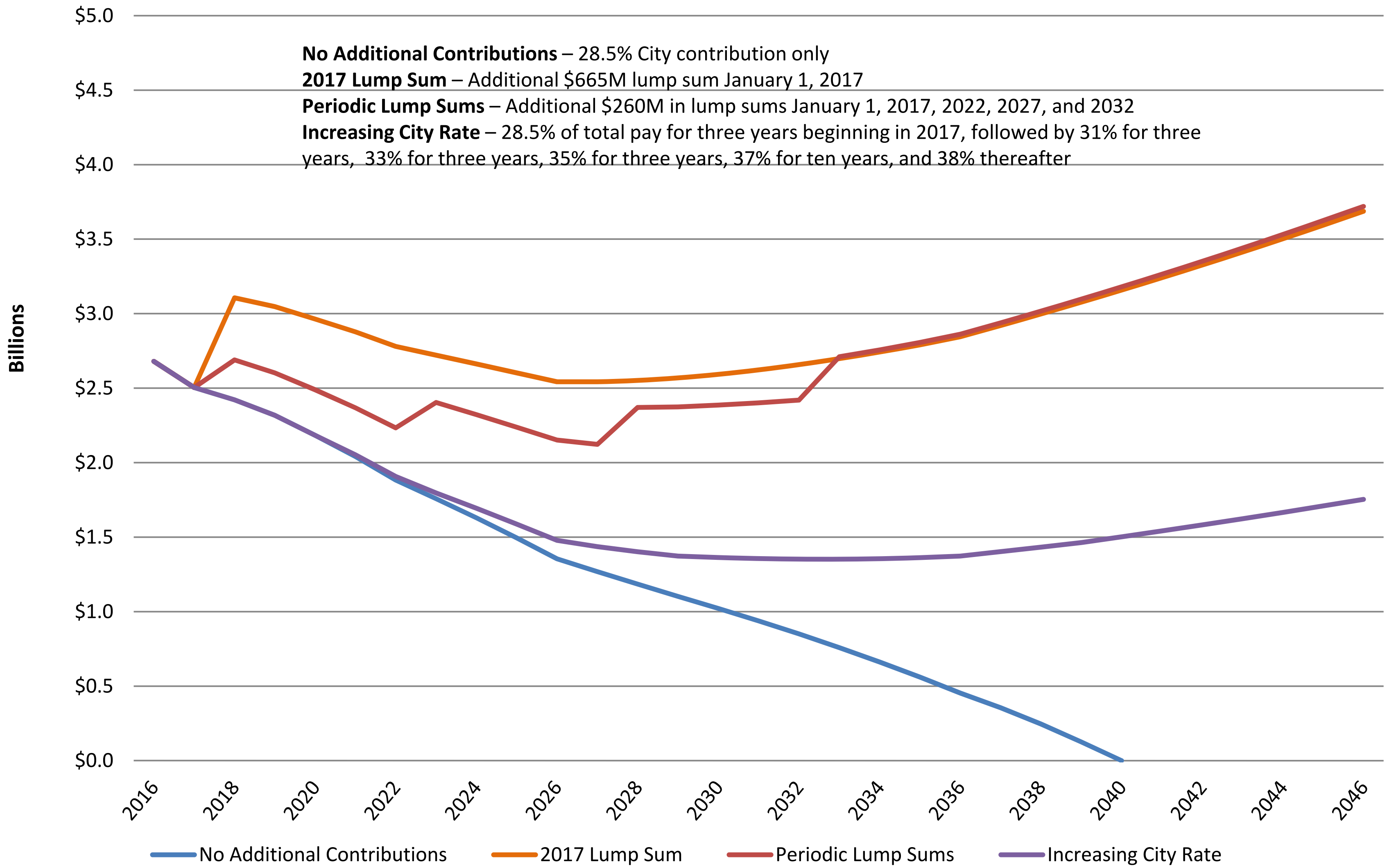
Scenario E Projection - September 8 Proposed Plan Changes, DROP Deposits Continue Without End

Basis for Projection 4:

- The City's base contribution rate is assumed to be 28.5% of total pay.
- Various scenarios for City contributions:
  - **No Additional Contributions –** No increases in the City's contributions over 28.5% of total pay. Insolvency projected in 2040.
  - **2017 Lump Sum –** Assumes an additional $665 Million City contribution in 2017, in addition to the 28.5% contribution rate
  - **Periodic Lump Sums –** Assumes additional $260 Million City contributions in 2017, 2022, 2027, and 2032, in addition to the 28.5% contribution rate.
  - **Increasing City Rate –** Assumes City's rate increases as follows:

– 2017 – 2019:	28.5% of total pay
– 2020 – 2022:	31.0% of total pay
– 2023 – 2025:	33.0% of total pay
– 2026 – 2028:	35.0% of total pay
– 2029 – 2038:	37.0% of total pay
– 2039 and later:	38.0% of total pay

Projection 4 – Scenario E - September 8 Proposed Plan Change, DROP Deposits Continue Without End - Market Value of Assets, Projected as of December 31

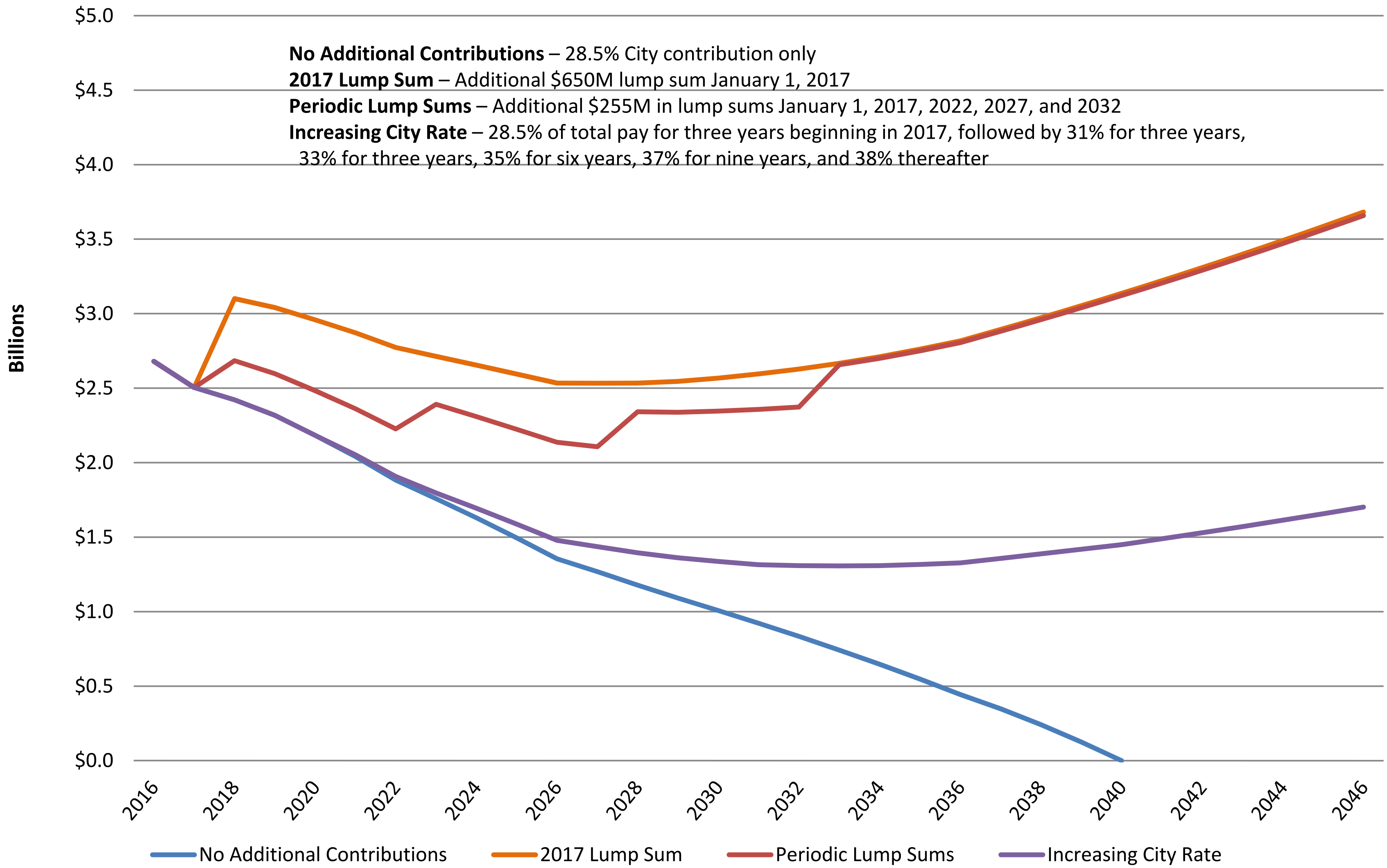


Scenario F Projection - September 8 Proposed Plan Changes, DROP Deposits Continue for an Additional Ten Years

Basis for Projection 5:

- The City's base contribution rate is assumed to be 28.5% of total pay.
- Various scenarios for City contributions:
  - **No Additional Contributions –** No increases in the City's contributions over 28.5% of total pay. Insolvency projected in 2040.
  - **2017 Lump Sum –** Assumes an additional $650 Million City contribution in 2017, in addition to the 28.5% contribution rate
  - **Periodic Lump Sums –** Assumes additional $255 Million City contributions in 2017, 2022, 2027, and 2032, in addition to the 28.5% contribution rate.
  - **Increasing City Rate –** Assumes City's rate increases as follows:
    - 2017 – 2019: 28.5% of total pay
    - 2020 – 2022: 31.0% of total pay
    - 2023 – 2025: 33.0% of total pay
    - 2026 – 2031: 35.0% of total pay
    - 2032 – 2040: 37.0% of total pay
    - 2041 and later: 38.0% of total pay

Projection 5 – Scenario F - September 8 Proposed Plan Change, DROP Deposits Continue Ten Additional Years - Market Value of Assets, Projected as of December 31



Comparison of Additional City Contribution Scenarios

The City contribution scenarios presented are possible options that are projected to keep the Fund solvent. Any number of possible payment options could achieve solvency.

Scenario	Lump Sum in 2017	Periodic Lump Sums	Increasing City Rate Rate (Years)
C – Sept 8 Update	$630M	4 lump sums of $245M	28.5% (2), 31% (2), 33% (5), 35% (7), 37% thereafter
D – Sept 8 Update, Phase-in to 14%	$470M	3 lump sums of $215M	28.5% (3), 30% (4), 31.5% (3), 33% (3), 34.5% (2), 35% thereafter
E – Sept 8 Update, DROP Deposits Continue Without End	$665M	4 lump sums of $260M	28.5% (3), 31% (3), 33% (3), 35% (3), 37% (10), 38% thereafter
F – Sept 8 Update, DROP Deposits Continue 10 Years	$650M	4 lump sums of $255M	28.5% (3), 31% (3), 33% (3), 35% (6), 37% (9), 38% thereafter

If DROP balances are withdrawn sooner or in amounts different than expected, or employee behavioral patterns change in ways not expected, the amounts the City would need to contribute under these scenarios in order to maintain long-term solvency may change.

Additional Assumptions – Solvency Projections

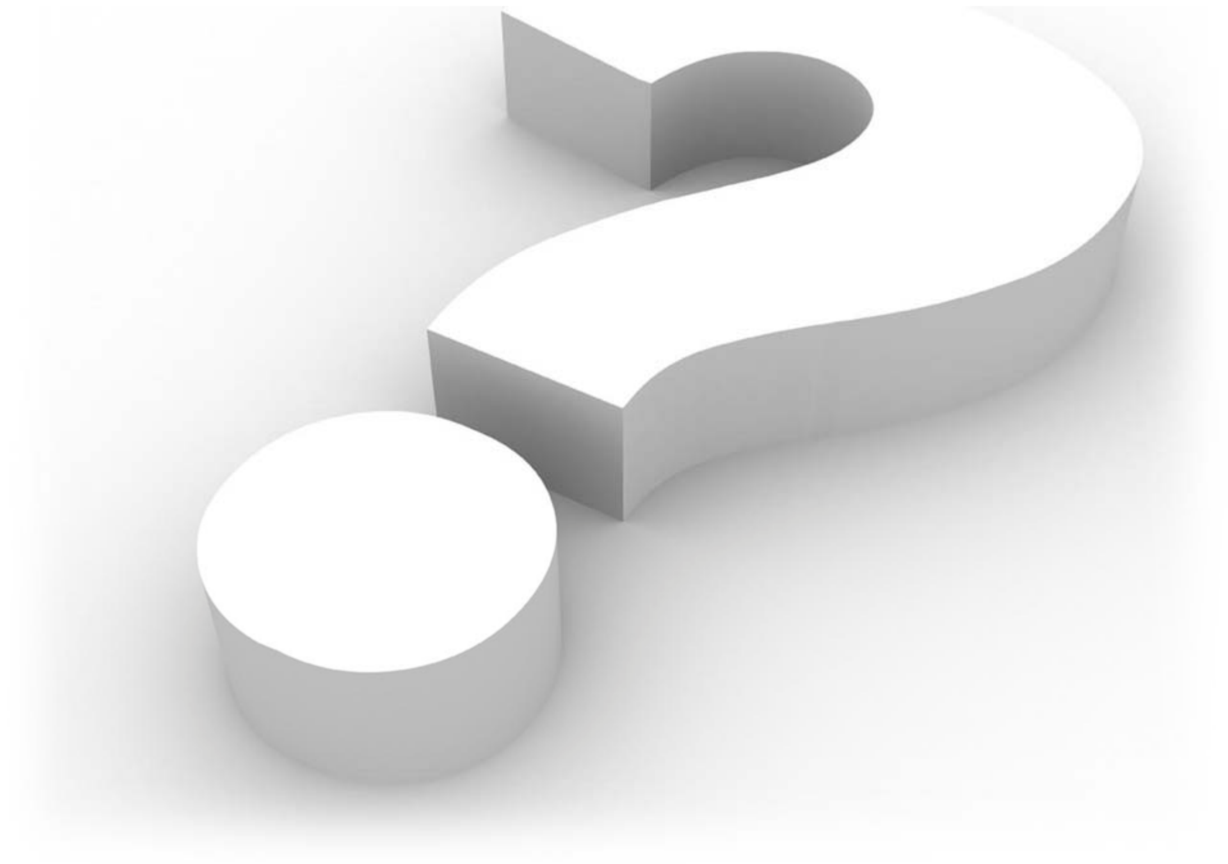
The following additional assumptions were used for the solvency projections:

- The solvency projections were performed in such a way that, after the additional City contributions are fully phased-in, market value assets are projected to continue to increase.
- Market value return of 5% in 2016, 6% in 2017, 6.5% in 2018, 7% in 2019, and 7.25% thereafter
- Total payroll increases by 2.75% per year; total pay is assumed to be 11% greater than pensionable earnings (computation pay)
- Administrative expenses of $10M in 2016, increasing by 2.75% per year for inflation
- Retirement patterns occur according to the assumptions as in the January 1, 2016 valuation with changes as noted earlier under the various scenarios
- Closed-group benefit projections are used through 2036, with benefit payments assumed to be a level percentage of payroll for each year thereafter. The following are the percentages of payroll that benefits are assumed to be starting in 2037:
  - » Scenario B – 64.0%
  - » Scenario C – 60.5%
  - » Scenario D – 59.0%
  - » Scenario E – 61.0%
  - » Scenario F – 60.5%

Caveats and Disclaimers

- The closer the plan gets to insolvency, asset illiquidity may become an issue and earning the assumed return may become more difficult.
- Segal does not practice law and is not in a position to comment on the legality of the proposed benefit changes, nor are we recommending any specific changes. The proposed changes were requested by the Long-Term Financial Stability Subcommittee and the Board of Trustees.
- Actual results may differ significantly from the measurements shown in the attached projections due to such factors as: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the smoothing of investment gains or losses); changes in plan provisions or applicable laws; and the City contributing amounts other than those anticipated.
- ***The results of these projections are not a guarantee of future performance and should be used as a guideline, not an absolute, while making decisions regarding the future of the System. Projections, by their very nature, cannot be guaranteed.***
- The information contained in this presentation was prepared for use by the System and Board of Trustees. Segal is not responsible for representations made regarding the information herein to any third parties. Please note that care should be taken in using the information in this presentation independent of the whole presentation to avoid possible misinterpretation of the results.
- The assumptions used in these projections are the same as those in the January 1, 2016 actuarial valuation, unless stated otherwise. The valuation presumes ongoing plan viability. If no changes are made to plan provisions, the assumptions will need to be updated to reflect projected insolvency and expected changes in participant behavior.

Questions and Discussion



Thank You!

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