

2020 Update: Market Decline Worsens the Outlook for Public Plans

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If markets remain at their current levels until June, most state and local pension plans will end fiscal year 2020 with negative annual investment returns, reduced asset values, lower funded ratios, and higher actuarial costs. Given that the aggregate funded status for public pensions has remained unchanged since the last financial crisis, this outcome represents a serious step backwards in public plans' progress over the past decade. This brief will estimate the immediate impact of the drop in asset values on plan finances for 2020 and take a look at the potential longer-term impact – especially for those plans that were already severely underfunded.

The discussion is organized as follows. The first section estimates that the ratio of assets to liabilities for public plans slipped from 71.0 percent in 2019 to 69.5 percent in 2020. As a result of this drop in the funded ratio, the average actuarially determined contribution is estimated to rise from 18.8 percent to 19.7 percent of payroll. The second section projects plan finances from 2020-2025 and shows that the average funded ratio for public plans will steadily decline; but, even if markets do not fully recover until 2025, most plans will emerge with enough assets to

pay benefits indefinitely. The third section focuses on the worst-funded plans and finds that they will remain solvent over the next five years, but a few are projected to exhaust their assets soon thereafter. The final section concludes that even the worst-funded plans can endure in the shorter term but, in the longer term, all plans will be further behind and some of the worst-off plans may confront the very real possibility of asset depletion.

Public Pensions as of FY 2020

As of mid-April, only half of our sample of roughly 200 major state and local government pension plans had reported their 2019 funded levels. None had reported 2020 levels. To describe the current status of public plans, the analysis relies on a plan-by-plan projection using data provided in the most recently released reports.¹ Based on these projections, the aggregate actuarial funded ratio in 2019 was 71.0 percent – continuing its mostly sideways trajectory over the past decade despite relatively strong investment returns.² However, if the downturn experienced thus far persists until June,

Note to State and Local Governments

Given the fiscal downturns and upswings experienced by state and local governments over the past decade, along with fluctuations in public pension fund asset values, the [Public Plans Database](#) (PPD) has been an invaluable tool in helping track the financial health of retirement plans across the US, along with their impact on government budgets. In 2020, as states and localities work to address the impacts of the global health crisis brought on by COVID-19, this brief provides an early snapshot on where these public plans will be at the end of 2020, along with projections through 2025.

Going into 2020, overall, state and local plans had an aggregate funded ratio of 71.0%, with government actuarially determined pension contributions of 18.8% of payroll. In the wake of the recent market shocks from the current global pandemic, this brief estimates that aggregate reported funded ratios will be 69.5% at the end of fiscal 2020, with contributions making up 19.7% of payrolls. Depending on the speed of the economic recovery, funded ratios could be between 7 and 14 percentage points lower by 2025 and government contribution rates could increase by between 5 and 9 percentage points. Most pension plans in the PPD have the assets to weather the current challenges through 2025 and beyond. But, as state and local leaders deal with a range of budget challenges and public service demands, it will be important to monitor the pension plans that are currently the lowest funded – a few of which, in the absence of major benefit reforms and unprecedented contribution increases, could exhaust their assets soon after 2025.

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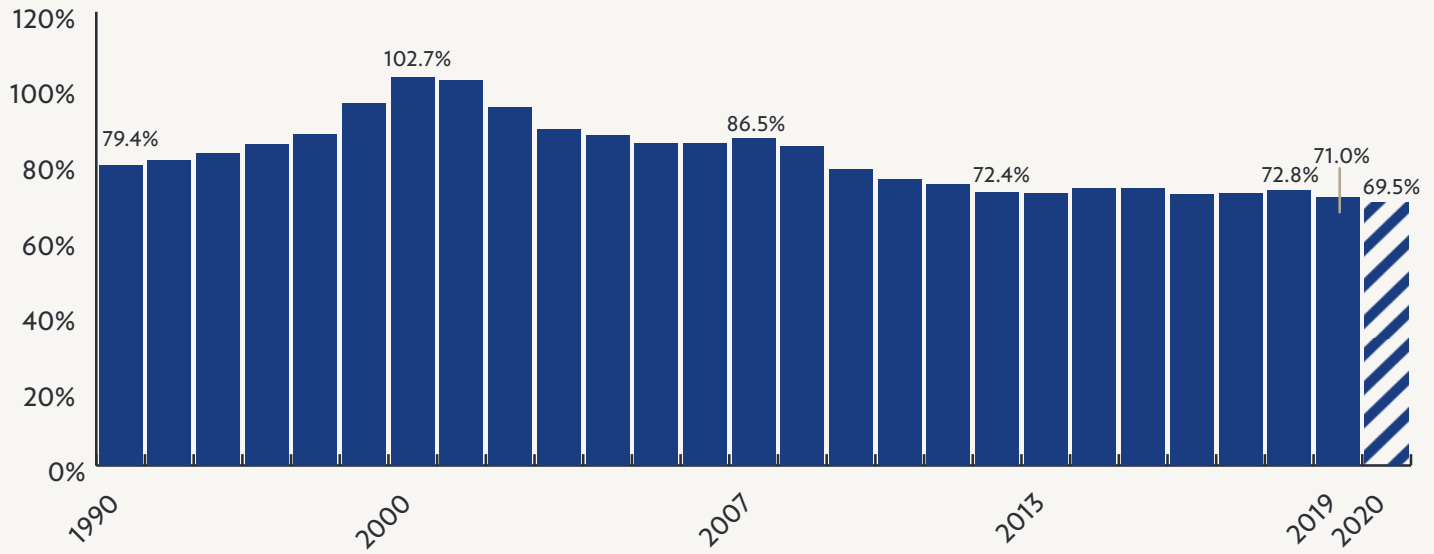
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Figure 1. Funded Ratios for State and Local Pension Plans, FY 1990-2020

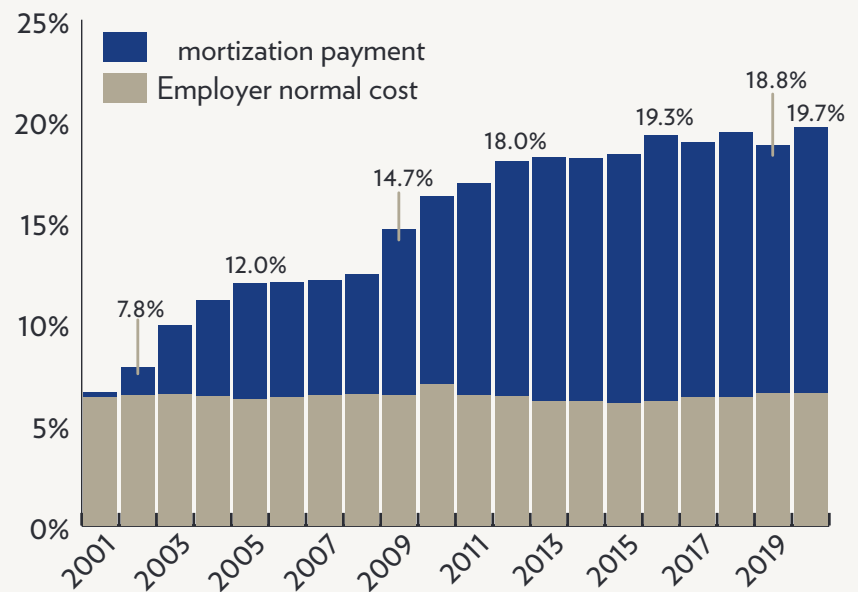


Sources: Authors' estimates based on various plan financial reports; and Public Plans Database (PPD) (2001-2019).

funded levels are estimated to drop to 69.5 percent for 2020 (see Figure 1).³

The decline in funded levels increases the actuarially determined contribution – the payment required to keep the plan on a steady path toward full funding. The actuarial contribution equals the normal cost (the present value of the retirement benefits accrued in a given year) plus a payment to amortize the unfunded liability (the gap between the level of actuarial assets and actuarially accrued liabilities), generally over a period of 25 years. Since 2001, the actuarially determined contribution has increased significantly due primarily to financial downturns that led to lower funded ratios, higher unfunded liabilities, and thereby larger amortization payments (see Figure 2).⁴ However, actuarial contributions had hovered between 18 and 19 percent of payroll from 2012 to 2019. But, with the recent decline in funded levels, the average

Figure 2. Actuarially Determined Contributions for State and Local Pension Plans, 2001-2020



Sources: Authors' estimates based on various plan financial reports; and PPD (2001-2019).

actuarial contribution is expected to rise to 19.7 percent of payroll in 2020.⁵

Historically, some governments have paid less of the actuarially determined contribution immediately following major downturns as they struggle to find additional funds, but they do eventually increase their contributions to meet the actuarial requirements.⁶ Others consistently pay their full actuarial contribution every year. However, pension researchers (and some practitioners) have questioned the adequacy of actuarially determined contributions as they are commonly calculated – highlighting the use of overly optimistic investment return assumptions and relatively lax methods for amortizing the unfunded liability. If plans were to use investment return assumptions that more closely reflect their actual performance since 2001 and use more stringent approaches to amortize unfunded liabilities, the average actuarial contribution in 2020 would rise from 19.7 percent of payroll to 37.6 percent.⁷ The future trajectory of plans' funded status will depend crucially on the ability of governments to meet contributions based on more conservative investment return assumptions and more stringent amortization methods.

Projections for 2021-2025

To understand how plans might fare in the wake of this downturn, the plan-by-plan projections are extended from 2020 to 2025 under two possible market scenarios.⁸ Under the first scenario, markets remain at current levels until June 2021 and then steadily climb to their previous peak by 2023

(and, from that point forward, plans achieve their assumed return – roughly 7.2 percent). Under the second – more pessimistic – scenario, markets remain at current levels until June 2021 but the recovery takes longer with markets steadily climbing to their previous peak by 2025.⁹

Table 1 presents some of the key results from these projections. Under the first scenario, the aggregate funded status of public plans declines to 62.7 percent in 2025 – and the actuarially determined contribution rises to 25.1 percent of pay. But, under the more pessimistic scenario, the funded ratio drops to 55.5 percent and required contributions rise to 29.1 percent of pay. In addition, the average ratio of assets to benefits (a rough measure of trust fund health) drops from 11.6 in 2020 to either 9.4 or 7.9 in 2025 – meaning that public pensions will have on hand assets equal to roughly 8 to 9 years of benefits in 2025. Importantly, plans can sustain asset levels as long as annual investment returns exceed their cash flow. The projections show that cash flows fall from -3.0 percent of assets to either -3.8 or -4.5 percent in 2025. Given these relatively attainable thresholds, no plans are projected to exhaust their trust fund within the next five years.

Historically, some governments have paid less of the actuarially determined contribution immediately following major downturns.

Table 1. Projections of Key Financial Metrics for State and Local Pension Plans, FY 2020 and 2025

Item	Fiscal Year		
	2020	2025	
		Faster recovery	Slower recovery
Funded ratio	69.5%	62.7%	55.5%
Actuarially required contribution rate	19.7%	25.1%	29.1%
Assets to benefits ratio	11.6	9.4	7.9
Ratio of net cash flow to assets	-2.8%	-3.8%	-4.5%
# of plans that have exhausted trust fund assets	0	0	0

Sources: Authors' estimates based on various plan financial reports and PPD (2001-2019).

How Will the Worst-Off Fare?

While all public plans in the sample are projected to endure over the next five years, plans with extremely low funded ratios in 2020 may still face the risk of running out of assets in the foreseeable future if markets are slow to recover. Table 2 presents the projection results for this precarious group under the second scenario of slower market recovery.

In 2020, the average estimated funded ratio for the 20 worst-funded plans in our sample is 38.5 percent.¹⁰ If markets are slow to recover, their average funded ratio will drop to 31.5 percent in 2025. Six plans – Charleston (WV) Fire, Kentucky ERS, Chicago Municipal, Chicago Police, Providence ERS, and New Jersey Teachers – will end up with funded ratios of 25 percent or less.

Given the low funded ratios, the more pressing issue is the extent to which these plans will be able to pay benefits. For this assessment, the key metric is the ratio of assets to benefits. For the 20 worst-funded plans, the average ratio is projected to decline slightly from 5.6 in 2020 to 3.9 in 2025. That figure means that, in 2025, they will have on hand assets equal to roughly four years of benefits. Chicago Municipal and New Jersey Teachers, which have severely negative cash flows, will see their asset-to-benefit ratios deteriorate even more dramatically – ending the period with assets equal to less than two years of benefit payments. Five plans – Charleston Fire, Kentucky ERS, Chicago Police, Providence ERS, and Dallas Police and Fire – will end up with less than three years of benefit payments saved as assets.

And, for plans that do exhaust their assets soon after 2025, the potential pay-go costs are significantly greater than current contributions (see the last column in Table 2). In some cases, the pay-go costs are more than 50 percent higher than current contributions. These sobering statistics highlight the precarious position of the worst-off plans, how plans with extremely negative cash flows face the possibility of exhausting their pension assets soon, and the high cost of pay-go funding if these plans do exhaust their assets.

Table 2. Projections of Key Statistics for State and Local Pension Plans, FY 2020 and 2025

Plan name	Funded Ratio		Assets to benefits		Net cash flow / assets	Pay-go costs / current contributions
	2020	2025	2020	2025		
Average	38.5%	31.5%	5.6	3.9	-2.2%	1.20
Charleston, WV Fire	11.7%	14.8%	2.8	2.8	6.3%	0.85
Kentucky ERS	17.3%	21.2%	2.6	2.5	5.3%	0.88
Chicago Municipal	21.0%	3.6%	3.1	0.4	-14.3%	1.81
Chicago Police	24.1%	19.6%	3.5	2.3	-1.9%	1.07
Providence ERS	27.5%	24.4%	3.3	2.2	-1.5%	1.05
Connecticut SERS	37.5%	32.9%	6.0	4.8	0.6%	0.96
Illinois SERS	38.3%	35.6%	6.4	4.9	-0.2%	1.01
New Jersey Teachers	39.2%	23.2%	4.2	1.6	-8.6%	1.55
Dallas Police and Fire	40.0%	26.2%	4.6	2.5	-6.9%	1.46
Illinois Teachers	40.1%	31.9%	6.8	4.6	-2.6%	1.21
Illinois Universities	41.7%	32.4%	6.5	3.9	-4.0%	1.35
Omaha Police and Fire	44.5%	39.8%	6.4	5.3	-1.2%	1.08
Massachusetts Teachers	45.8%	34.0%	7.2	4.3	-3.3%	1.31
Chicago Teachers	45.9%	24.4%	6.4	3.3	-5.6%	1.56
Kentucky County	47.0%	31.8%	7.9	5.0	-3.4%	1.37
Arizona Public Safety	47.3%	47.3%	8.2	7.7	2.3%	0.84
Indiana Teachers	49.5%	52.9%	6.7	5.6	0.7%	0.96
Philadelphia Municipal	49.7%	58.8%	5.8	5.2	1.3%	0.93
Rhode Island ERS	50.4%	39.4%	6.5	3.6	-5.4%	1.54
Omaha School	50.6%	36.7%	7.9	5.4	-2.8%	1.28

Note: Columns 5 and 6 reflect values as of FY 2020.

Sources: Authors' estimates based on various plan financial reports; and PPD (2001-2019).

Conclusion

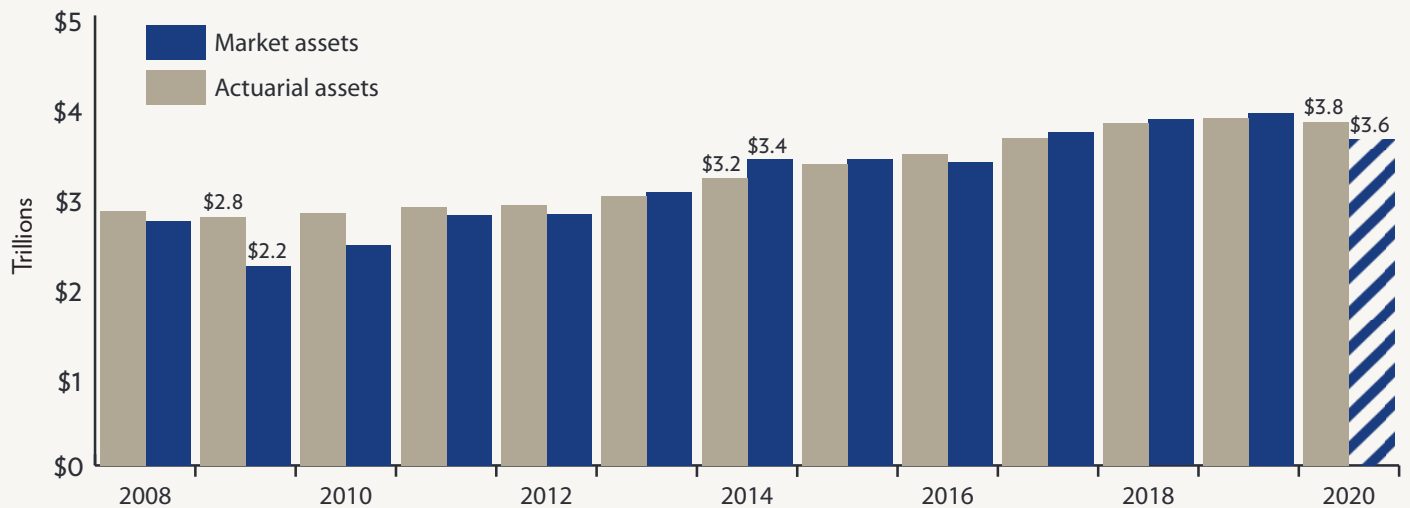
If markets remain at their current levels until June, most public pension plans will conclude fiscal year 2020 with negative annual investment returns, reduced asset values, lower funded ratios, and higher actuarial costs. Given that the aggregate funded status of public plans has remained virtually unchanged since the last financial crisis, this downturn is a serious step backwards in their funding progress. Projections suggest that plan finances will continue to decline in the wake of the downturn, but that – on the whole – plans can endure and will maintain sufficient assets from which to pay benefits. However, some plans with extremely low funded ratios face an increased risk of exhausting their assets and the high cost of pay-go funding if they do.

**Appendix :
Comparing the
Change in Actuarial
Assets to the Change
in Market Assets**

Actuarial asset smoothing limits volatility in the funded status by incrementally recognizing market gains and losses. As a result, actuarial asset values are projected to decline much less than market values in 2020 because of actuarial smoothing (see Figure 1). While this approach reduces the

decline in funded levels in 2020, it will also limit improvements in funded status when markets rebound – as it did in the wake of the 2008-2009 financial crisis – because portions of the 2020 market loss will continue to be recognized in actuarial asset values.

Figure 1. Actuarial vs. Market Value of State and Local Pension Assets, 2008-2020, Trillions of Dollars



Note: 2020 values are authors' estimates.

Sources: Various actuarial valuations and financial reports; and PPD (2001-2019).

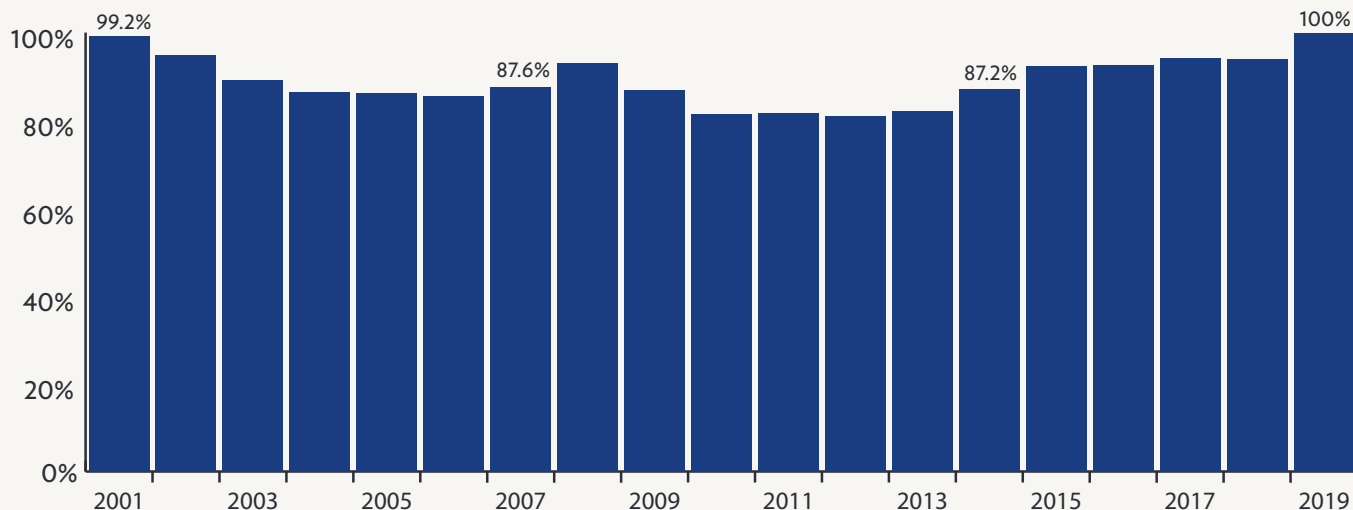
**Appendix B:
Percentage
of Actuarially
Determined
Contribution Paid**

Because financial and economic downturns often coincide, increases in actuarially determined contributions tend to occur during a period when states and localities see a dramatic decline in their revenues.

As a result, governments have historically paid a lower percentage of the actuarial contribution immediately following major downturns as they struggle to find additional funds, but they do eventually increase their payment to meet the actuarial requirements.

Figure B1 shows how the percentage of the actuarial contribution paid fell in the wake of the dot.com crash of the early 2000s and the financial crisis of 2008-2009. As budgets recovered and the funded ratios stabilized as a result of stock market gains, the actuarial contributions also stabilized and the percentage of actuarial contribution paid increased.

Figure B1. Aggregate Percentage of Actuarially Determined Contribution Paid, 2001-2019



Note: 2019 data include roughly half of the plans in the PPD sample, which also represent about half of total plan members in the PPD.

Sources: Various actuarial valuations and financial reports; and PPD (2001-2019).



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End Notes

- 1 Investment performance is based on each plan's asset allocation and the performance of selected indices – Russell 3000 for equities; S&P Composite Bond Index for fixed income; S&P 3-month US Treasury Index for cash; LPX Group Composite Listed Private Equity Index for private equity; HFRI Fund of Funds Composite for hedge funds; S&P World Commodity Index for commodities; and the MSCI US REIT Index for real estate. For cash flows, contributions are expected to grow by 8.5 percent per year in 2019 and 2020, while benefits grow at 6.1 percent – consistent with the average annualized growth rates from 2013-2018. The change in market assets is estimated using the simplified formula: $\text{asset}(t+1) = (\text{asset}(t) * \text{investment return}) + (1/2 * \text{cash flows} * \text{investment return}) + (1/2 * \text{cash flows})$. Actuarial assets are calculated using the smoothing methods reported in each plan's most recent actuarial valuation. Liability growth is based on interest on the prior year's liability plus normal cost net of benefit payments.
- 2 From 2010 to 2019, the return on market assets was about 10 percent for public plans but, due to actuarial smoothing, the return on actuarial assets was only 6.8 percent – below the expected return of 7.6 percent over that period.
- 3 Actuarial smoothing methods mute the impact of annual market performance on the funded status by phasing in market gains and losses over multiple years. See Appendix A for a brief comparison of the change in actuarial assets to the change in market assets.
- 4 While the primary driver behind lower funded ratios and increased unfunded liabilities has been financial downturns, two other factors have played a role. First, most plans have incrementally reduced their assumed investment return, which increases liability values. Second, some plans do not receive the full amount of their actuarially determined contributions from government sponsors, which lowers asset growth.
- 5 The PPD sample includes plans that are covered by Social Security and those that are not. For covered plans, the average contribution rate is estimated to be 17.7 percent of payroll in 2020, while the average rate for non-covered plans is estimated to be 24.9 percent.
- 6 See Appendix B for the percentage of the actuarially determined contribution received by plans from 2001-2019.
- 7 Currently, the majority of plans use an assumed return of just over 7 percent (a decline from the average 8-percent rate plans used in 2001) and backload the amortization of their unfunded liabilities by using a level percent of payroll method. However, the average annualized investment return for public plans from 2001-2020 is closer to 5.5 percent, and the more stringent approach to amortizing unfunded liabilities is to use the level dollar method that pays down a larger portion of unfunded liabilities in earlier years.
- 8 Under both market scenarios, pension contributions follow a pattern similar to what occurred during the 2008-2009 financial crisis when contribution growth slowed for a few years before returning to more historical levels by 2011. Specifically, annual growth in pension contributions was roughly 2.5 percent in 2009 and 2010, and roughly 6.5 percent from 2011 through 2014.
- 9 While investment performance is based on each plan's asset allocation, it is informative to look at the projected performance for equities under each recovery scenario. The faster recovery projects 9.7-percent equity returns from 2021 to 2025, while the slower recovery projects 3.9-percent equity returns.
- 10 The actuarial contributions to bring these plans to full funding over the next 25 years average 50 percent of payrolls – a highly unlikely expectation given the enormous pressure being put on state and local government budgets during the ongoing COVID-19 crisis.

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