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# US Public Pension Landscape Series

Many US states and local governments, though certainly not all, face heightened credit challenges stemming from exposure to pension obligations, resulting in a highly varied and complex landscape. The severity of public pension challenges can differ substantially between, and even within, states.

Unfunded liabilities in many cases have reached historic highs, rising costs increasingly pressure some budgets, and aging demographics leave government finances increasingly susceptible to pension asset volatility. Yet in some cases, low or declining levels of pension risk bolster the credit profile of a given state or local government.

Governments grappling with pension challenges must often navigate legal protections for employee benefits that can limit reform options. However, litigation on a variety of pension reforms continues to work its way through courts across the country, offering the potential for precedent-setting decisions.

*This series provides a state-by-state, in-depth review of the key issues related to pensions facing state and local governments. A list of states covered thus far is below with active links, leading to summaries, Pension Dashboards and opportunities to click through to the full report. An update on Texas is the most recent addition.*

*All ratings in Pension Dashboards were current at the time of publication. For the most up-to-date ratings, please consult Moodys.com.*

**State Listings:**

## California

*California and its local governments face sustained pension cost hikes*

(Published September 2, 2015)

Given the exceptionally strong legal protections provided to public pensions, the State of California (Aa3 stable) and its local governments face limited options to address pension challenges. Savings from recently enacted statewide pension reforms will take years to materialize because they primarily impact new employees. As a result, state and local government contributions to public pension systems such as the California Public Employees' Retirement System (CalPERS, Aa2 stable) and the California State Teachers' Retirement System (CalSTRS, Aa2 stable) will continue to rise materially for at least the next several years.

(Pension Dashboard on following page)

» **Legal framework and reform outcomes: California provides the strongest level of legal protection for public pension benefits**. A series of state Supreme Court decisions have created a strict legal protection framework. Not only are accrued benefits for past service legally protected from impairment, but future benefit accrual formulas may not be weakened once employees are hired. Reform attempts by local governments face additional procedural complications associated with collective bargaining rules.

» **Distribution and control of plans: CalPERS and CalSTRS dominate California's pension landscape, but many large cities and counties have their own local plans**. CalPERS administers hundreds of separately accounted-for pension plans for the state and local governments, while CalSTRS is primarily one pooled multi-employer cost-sharing plan. Many large cities and counties have more localized plans with only one or a handful of government employers.

» **Cost trends: State and local pension costs are broadly rising, although the state's liabilities are not outsized relative to its revenues**. If investment return targets are met, CalPERS projects average government contributions to public safety plans will peak at 40% of payroll in fiscal 2020, up from approximately 32% in fiscal 2015. The costs to address CalSTRS unfunded liabilities after years of contributions below actuarial levels are also scheduled to increase steeply in coming years and will weigh on school district budgets.

» **Plan demographics: Maturing pension plans are leading to greater potential contribution volatility as liabilities and assets rise relative to current government payrolls**. To reduce this risk, CalPERS appears poised to further lower its discount rate over time, and thus increase contribution requirements, all else being equal. The ratio of active employees to benefit recipients is declining for both CalSTRS and CalPERS, although at 1.5, CalSTRS is very close to the national level of 1.6.

## California Pension Dashboard

### Overall State and Local Pension Assessment

MODERATELY PRESSURED

Pension costs are growing materially for CalPERS California and its local governments, while aging demographics drive calls for de-risking.

### Legal Framework

VERY INFLEXIBLE

Through a number of court decisions, California has among the strongest legal protections for public pension benefits. Under the "California Rule," reforms to benefits are limited to future employees only.

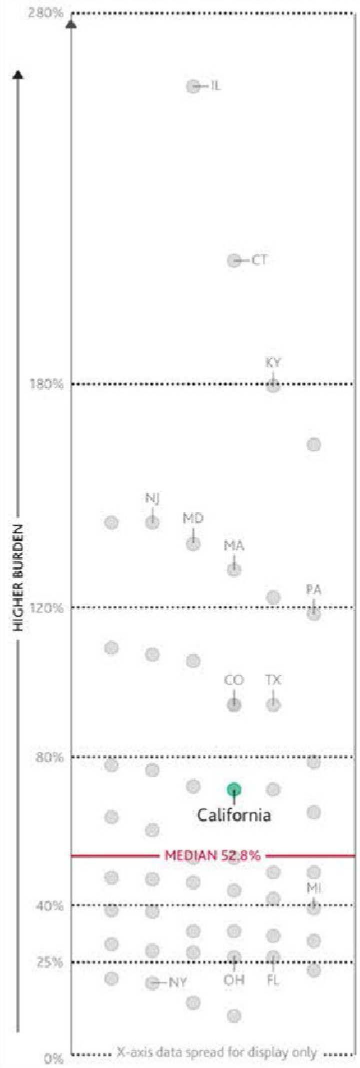
### California (Aa3/stable)

Fiscal 2013

| | | Ranking (#1 IS HIGHEST BURDEN) |
|---|---|---|
| UAAL ($billions) | $101.8 | |
| ANPL ($ billions) | $189.4 | |
| ANPL / Revenues | 92.5% | 17 / 50 |

### Pension Burden: California vs. all US States

Fiscal 2011-2013 three-year average Moody's Adjusted Net Pension Liability (ANPL) / Revenues




### Reform Outcomes

IMPLEMENTED but funding challenges persist

**1947:** In *Kern v. Long Beach*, the state supreme court blocked pension changes to earned pension benefits.

**1955:** In *Allen v. Long Beach*, the state high court ruled that detrimental pension benefit changes must be accompanied by "comparable new advantages."

**1991:** The state supreme court ruling in *Legislature v. Eu* completed the "California Rule" by unequivocally stating prospective pension benefit formula reductions cannot be applied to current employees.

**2013:** The "Public Employee Pension Protection Act" (PEPRA) set lower benefits for future public employees across the state and required eventual sharing of normal costs by all employees.

**2014:** AB 1469 sets a schedule of increases to state, employer and employee contributions to CalSTRS, while contractually guaranteeing 2% COLAs.

### Moody's Key Pension Metrics: Large California Local Governments

Fiscal 2013

| Los Angeles Unified School District (Aa2/STA) | |
|---|---|
| ANPL ($ billions) | $13.6 |
| ANPL / Full Value | 2.8% |
| ANPL / Revenues | 204% |

| Los Angeles Community College District (Aa1/STA) | |
|---|---|
| ANPL ($ billions) | $1.2 |
| ANPL / Full Value | 0.2% |
| ANPL / Revenues | 130% |

| City of Los Angeles (Aa2/STA) | |
|---|---|
| ANPL ($ billions) | $19.3 |
| ANPL / Full Value | 4.6% |
| ANPL / Revenues | 410% |

### Pension Burden of Large California Local Governments Compared to Peers

Largest local governments in Moody's GO Methodology scorecard categories*

Fiscal 2011 – 2013 Reporting


LA CCD = Los Angeles Community College District
LA USD = Los Angeles Unified School District
LA = City of Los Angeles

Note: Fifty largest local governments determined by 2013 gross direct debt outstanding. Categorical placement is shown only, not relative rankings or scoring within categories.

*Sources: Moody's Investor's Service, state and local government comprehensive annual financial reports (CAFRs), pension plan actuarial valuations*

To access full California report, click here.

## Colorado

*Colorado's pension costs and funding gaps still growing despite reform*

(Published March 12, 2015)

Colorado's highest court confirmed substantial pension reforms last year, establishing clear flexibility for material benefit changes such as reductions in cost-of-living adjustments (COLAs). Still, even with successful reform efforts, pension contributions by the State of Colorado (Aa1 stable) and its local governments continue to trail minimum actuarial recommendations, driving up future costs and increasing unfunded liabilities.

(Pension Dashboard on following page)

» **Legal framework and reform outcomes: flexibility established by state Supreme Court**. The state high court ruling in 2014 gives Colorado clear legal authority to change a number of benefit provisions, including COLAs for retirees and highest average salary provisions for employees yet to retire. Legislation signed by the governor in 2014 signals additional state action could materialize.

» **Distribution and control of plans: liabilities concentrated in plans administered by PERA**. While a number of local governments have single-employer plans, most pension liabilities are consolidated under the administration of the statewide Public Employees' Retirement Association (PERA). Some governments, such as the Denver City & County School District 1 (Aa2 stable), have shifted from single-employer plans to centrally administered plans.

» **Cost trends: contribution requirements rising in effort to address increasing unfunded liabilities**. Statutory contribution increases for governments participating in PERA are scheduled to rise through 2018. However, contributions below actuarial requirements continue to defer costs to later years and increase unfunded liabilities.

» **Plan demographics: ratios of actives to retirees track near-to-above national norms**. These ratios for Colorado's largest plans somewhat mitigate the challenges posed by rising unfunded liabilities as the state and local governments have comparatively more time to build plan assets over employee careers. However, this demographic cushion is eroding, with the ratio of actives to retirees decreasing annually over the past decade.

## Colorado Pension Dashboard

### Overall State and Local Pension Assessment

MODERATELY PRESSURED

Funding challenges due to contribution shortfalls are somewhat offset by the state's established flexibility to enact substantial reforms.

### Legal Framework

MODERATELY FLEXIBLE

The state Supreme Court has affirmed that impactful benefit changes such as reductions to retiree COLAs, are legal.

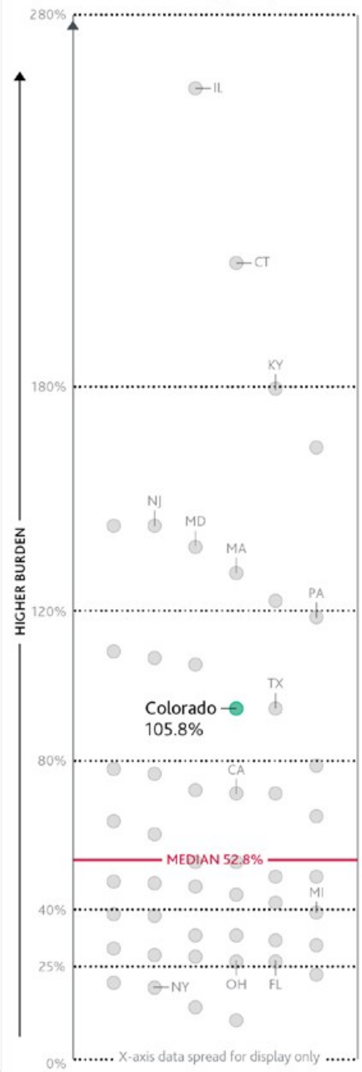
### Colorado (Aa1/STA)

Fiscal 2013

| | | Ranking #1 IS HIGHEST BURDEN |
|---|---|---|
| UAAL ($billions) | $9.7 | |
| ANPL ($ billions) | $17.3 | |
| ANPL / Revenues | 92.6% | 16 / 50 |

### Pension Burden: Colorado vs. all US States

Fiscal 2011-2013 three-year average Moody's Adjusted Net Pension Liability (ANPL) / Revenues




### Reform Outcomes

IMPLEMENTED

but funding challenges persist

**2004:** The state passes SB 04-257, which gives new state employees the choice of a defined contribution plan rather than defined benefit. A schedule of employer contribution increases was also established to address pension underfunding.

**2006:** The state passes SB 06-235, which establishes additional employer contribution increases and increases age and service requirements for new hires, among other various changes.

**2010:** Governor Bill Ritter signs SB 10-001, which among other changes, lowers COLA benefits for retirees.

**2011:** A lower court rules that the SB 10-001 COLA changes were legal.

**2012:** State appellate court reverses lower court ruling on SB 10-001 and remands case to lower court.

**2014:** State Supreme Court overrules appellate decision, confirming legality of SB 10-001 COLA changes.

### Moody's Key Pension Metrics: Large Colorado Local Governments

Fiscal 2012

| City/County of Denver (Aaa/STA) | |
|---|---|
| ANPL ($ billions) | $2.0 |
| ANPL / Full Value | 2.6% |
| ANPL / Revenues | 1.4x |

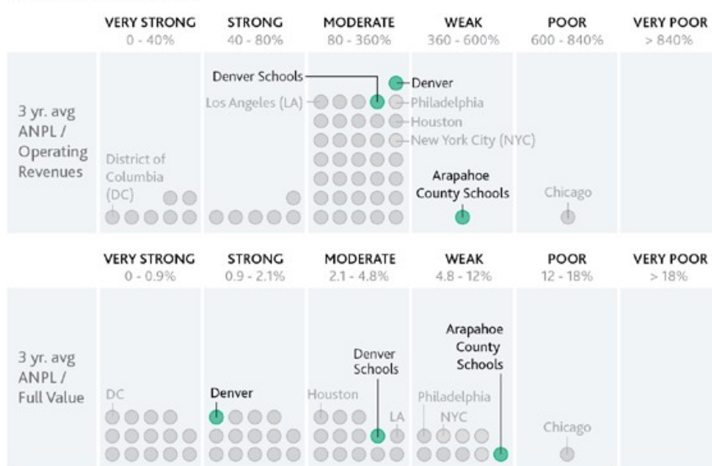
| Denver City & County School District 1 (Aa2/STA) | |
|---|---|
| ANPL ($ billions) | $2.7 |
| ANPL / Full Value | 3.6% |
| ANPL / Revenues | 3.8x |

| Arapahoe County School District 5 (Cherry Creek) (Aa1/STA) | |
|---|---|
| ANPL ($ billions) | $2.5 |
| ANPL / Full Value | 7.3% |
| ANPL / Revenues | 5.4x |

### Pension Burden of Large Colorado Local Governments Compared to Peers

Largest local governments in Moody's GO Methodology scorecard categories*

Fiscal 2010 – 2012 Reporting




Note: Fifty largest local governments determined by 2012 gross direct debt outstanding. Categorical placement is shown only, not relative rankings or scoring within categories.

*Sources: Moody's Investors Service, state and local government comprehensive annual financial reports (CAFRs), pension plan actuarial valuations*

To access full Colorado report, click here.

## Florida

*Florida state and local pensions have leeway to address rising costs*

(Published August 20, 2014)

Pensions are generally not a driver of negative credit pressure for the State of Florida (Aa1 stable) and its local governments, owing partly to the legal flexibility to enact benefit changes prospectively. Costs are rising but in general remain moderate.

(Pension Dashboard on following page)

- **Legal framework and reform outcomes: State and local governments in Florida are permitted to reform retirement benefits and costs prospectively**. This flexibility applies to both current and future employees, and was confirmed by the state Supreme Court in a landmark 2013 split decision. However, state benefit requirements tied to certain revenues complicate reforms for local single-employer plans.
- **Distribution and control of plans: Public pensions in Florida include one large statewide plan – the Florida Retirement System (FRS) – and hundreds of single-employer plans**. Local pensions remain a statewide issue in two major ways:
  - The state provides regulatory oversight of many aspects of local plans, including actuarial contribution adequacy, and mandates minimum benefit levels for some local plans in order to qualify for state revenue sharing.
  - The state Legislature sets employer and employee contribution rates for the FRS, affecting many participating local governments.
- **Cost trends: Pension costs in Florida are rising but generally remain moderate**. In response to growing unfunded liabilities, the state Legislature raised the FRS's contribution rates for participating employers to meet actuarial requirements. However, employer rates remain generally moderate as a result of a cost shift to employees. State statute also calls for funding of actuarially determined contributions for local government plans, a cost that has risen substantially.
- **Plan demographics: The ratio of active employees to retirees in FRS is declining, but aligning with the nation**. The ratios of active employees to retirees in local plans have also declined, but generally remain above national norms.

## Florida Pension Dashboard

### Overall Assessment

MODERATELY PRESSURED

Pensions generally are not driving negative credit pressure for the state and local governments, although costs are rising and there are exceptions.

### Legal Framework

MODERATELY FLEXIBLE

The state supreme court has ruled that prospective benefit changes, even for current employees, are legally allowable.

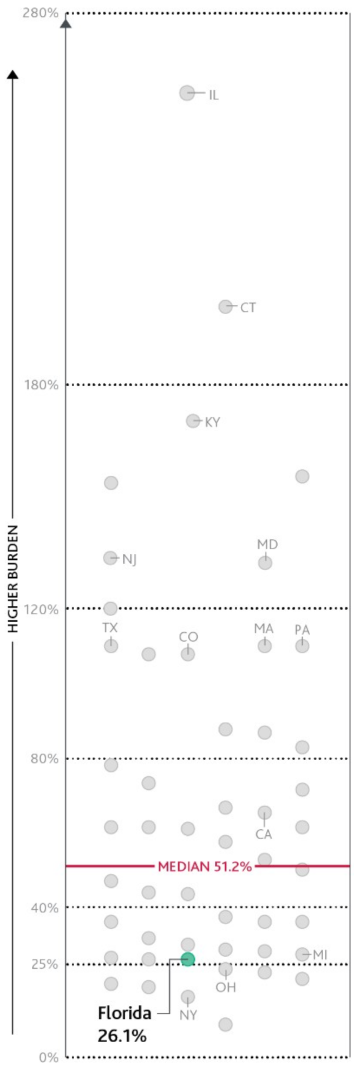
### Florida (Aa1/STA)

Fiscal 2012

| | | Ranking |
|---|---|---|
| UAAL ($billions) | $3.9 | |
| ANPL ($ billions) | $21.8 | |
| ANPL / Revenues | 33.5% | 39 / 50 |

### Pension Burden: Florida vs. all US States

Fiscal 2010-2012 three-year average Moody's Adjusted Net Pension Liability (ANPL) / Revenues




### Reform Outcomes

MIXED

May 2011:
The state increased Florida Retirement System (FRS) employee contributions and lowered benefits for future years of work.

March 2012:
A lower court ruled the changes to FRS benefits violated the state constitution.

January 2013:
The state supreme court overturned the lower court decision, clearly establishing the legality of altering prospective pension benefits for current and future employees.

May 2013:
A proposal to shift all new state employees to a defined contribution plan failed in the state legislature.

August 2014:
The City of Jacksonville's multi-year reform efforts remain stalled.

### Moody's Key Pension Metrics: Large Florida Local Governments

Fiscal 2012

City of Jacksonville (Aa2/STA)

| | |
|---|---|
| ANPL ($ billions) | $3.7 |
| ANPL / Full Value | 4.5% |
| ANPL / Revenues | 3.3 x |

Miami-Dade County School District (Aa3/NEG)

| | |
|---|---|
| ANPL ($ billions) | $4.8 |
| ANPL / Full Value | 1.8% |
| ANPL / Revenues | 1.5 x |

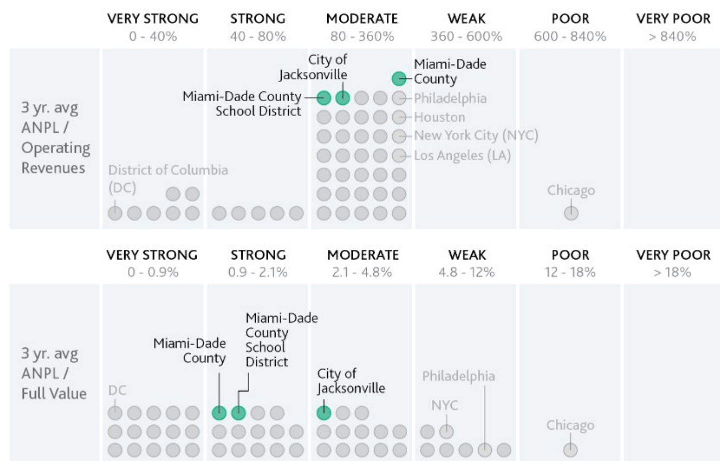
Miami-Dade County (Aa2/NEG)

| | |
|---|---|
| ANPL ($ billions) | $5.0 |
| ANPL / Full Value | 1.9% |
| ANPL / Revenues | 1.7 x |

### Pension Burden of Large Florida Local Governments Compared to Peers

Largest local governments' in Moody's GO Methodology scorecard categories*

Fiscal 2010 – 2012 Reporting




Note: Fifty largest local governments determined by 2012 gross direct debt outstanding. Categorical placement is shown only, not relative rankings or scoring within categories. Philadelphia implemented a new property tax assessment system, raising full value considerably. The impact of this reassessment does not impact 2012 figures, and is not reflected in this exhibit.

*Sources: Moody's Investors Service, Florida Retirement System and issuer comprehensive annual financial reports (CAFRs)*

To access full Florida report, click here.

## Illinois

*Illinois state and local governments face daunting pension challenges*

(Update October 14, 2015)

*In May 2015, the Supreme Court of Illinois ruled that the state's pension reform violated the state constitution. The ruling affirmed that Illinois law provides very strong protections to pension benefits, effectively limiting the state's reform options to future employees only.*

(Published September 4, 2014)

Illinois and many of its local units face among the nation's most daunting pension challenges. The severity of pension problems could ease if 2013 state pension reform legislation is upheld by the Illinois Supreme Court. Even if these and similar local-plan reform laws are allowed, unfunded pension liabilities for both the State of Illinois (Baa3 negative) and some local governments have grown so large that fully paying them down will prove challenging for many years.

(Pension Dashboard on following page)

» **Legal framework and reform outcomes: Illinois' legal pension protections appear to allow little flexibility, but key court decisions loom**. The state constitution includes an explicit – although not legally tested – prohibition against pension benefit reductions. As legal challenges to last year's reforms progress through state courts, judicial decisions will eventually determine whether pension benefit cuts affecting current plan participants (as opposed to future hires) are permissible.

» **Distribution and control of plans: Pension funding and reform are predominantly state-level issues**. The state government (rather than local entities) will be largely responsible for making decisions on these issues for three reasons:

- The state constitutional protections for pension benefits apply to both state and local government pensions;
- The state funds the majority of pension costs for state universities, community college districts and local school districts, except for Chicago Public Schools (B3 review for downgrade);
- State statute dictates pension contribution levels for local government single-employer plans.

» **Cost trends: Previous underfunding contributes to rising pension costs, although new enforcement of minimum contributions will soon take effect for many local plans**. Many local governments contribute at or near actuarial requirements, but like the state, some have consistently fallen short, driving up future costs. Minimum contribution mandates will likely be more strictly enforced for many local plans beginning in 2016.

» **Plan demographics: Shifts toward retirees compound the state's funding challenge**. The ratio of active employees to retirees for the largest Illinois plans continues to decline and is already below national averages.

## Illinois Pension Dashboard

### Overall State and Local Pension Assessment

VERY PRESSURED

We view pensions as a significant source of credit pressure for the state and many local governments.

### Legal Framework

VERY INFLEXIBLE ( but developing )

The Illinois state constitution explicitly protects public pension benefits from impairment. But, the extent of these protections remains legally untested.

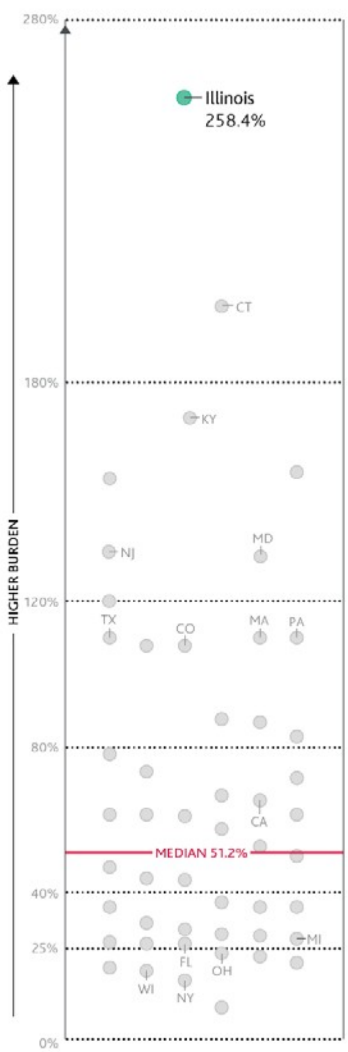
### Illinois (A3/NEG)

Fiscal 2012

| | | Ranking |
|---|---|---|
| UAAL ($billions) | $92.9 | |
| ANPL ($ billions) | $186.8 | |
| ANPL / Revenues | 318.0% | 1 / 50 |

### Pension Burden: Illinois vs. all US States

Fiscal 2010-2012 three-year average Moody's Adjusted Net Pension Liability (ANPL) / Revenues




### Reform Outcomes

UNCERTAIN

December 2013:
State pension reforms passed.

May 2014:
Lower court suspended state reforms until resolution of legal challenges.

June 2014:
Governor signed reform legislation for two of Chicago's four plans.

July 2014:
State supreme court found OPEB benefits provided under state pension systems protected by state constitution. The court expressed views that contrast with one legal rationale for recent pension reform legislation, but has yet to rule directly on the state's pension reforms.

### Moody's Key Pension Metrics: Large Illinois Local Governments

Fiscal 2012

**City of Chicago (Baa1/NEG)**

| | |
|---|---|
| ANPL ($ billions) | $32 |
| ANPL / Full Value | 16.3% |
| ANPL / Revenues | 7.8 x |

**Cook County (A1/NEG)**

| | |
|---|---|
| ANPL ($ billions) | $12.7 |
| ANPL / Full Value | 2.8% |
| ANPL / Revenues | 4.5 x |

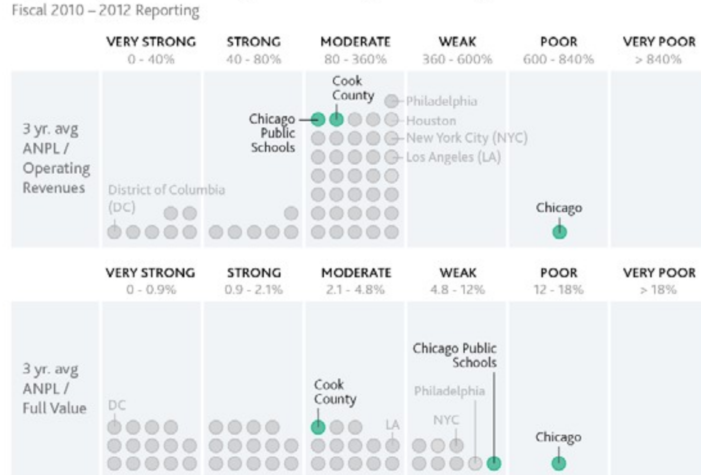
**Chicago Public Schools (Baa1/NEG)**

| | |
|---|---|
| ANPL ($ billions) | $12.1 |
| ANPL / Full Value | 6.2% |
| ANPL / Revenues | 2.1 x |

### Pension Burden of Large Illinois Local Governments Compared to Peers

Largest local governments' in Moody's GO Methodology scorecard categories*

Fiscal 2010 – 2012 Reporting




Note: Fifty largest local governments determined by 2012 gross direct debt outstanding. Categorical placement is shown only, not relative rankings or scoring within categories. Philadelphia implemented a new property tax assessment system, raising full value considerably. The impact of this reassessment does not impact 2012 figures, and is not reflected in this exhibit.

*Sources: Moody's Investors Service, state and local government comprehensive annual financial reports (CAFRs)*

To access full Illinois report, click here.

## New York

*Well-funded pensions still a source of rising budget pressure and investment risk*

(Published June 1, 2016)

New York State (Aa1 stable), and to a lesser degree New York City (Aa2 stable), have kept growth in their reported unfunded pension liabilities largely in check by consistently making meaningful pension contributions compared to reported plan funding needs. However, pension pressure on budgets are rising due to asset volatility and demographics. Furthermore, New York governments have no legal flexibility to reduce benefits, meaning unfunded liabilities must be paid down.

(Pension Dashboard on following page)

» **Cost trends: Pension costs increasingly weigh on budgets, but contribution levels have kept balance sheet liabilities contained**. For example, New York City's pension contributions were equal to 10.4% of revenues in 2015, compared to less than 3% in 2001. With some exceptions associated with a cost-deferral, or "amortization" program, state and local contributions have adhered to actuarial requirements, which exceed our "tread water" benchmark for current year accruals plus interest on outstanding pension debt.

» **Legal framework and reform outcomes: New York's constitution explicitly protects the pension benefits of current employees and retirees from impair**ment. As a result, pension reforms have been limited to additional benefit tiers for new employees hired on or after a particular date.

» **Distribution and control of plans: Contribution requirements are guided by state law**. Three statewide cost-sharing plans cover state employees and those of most local governments. With its five local retirement systems, however, New York City is an exception. Benefits, contributions and assumptions for these plans are ultimately all set by state law, although the city's actuary and pension funds can recommend changes.

» **Plan demographics: Downside asset risk is growing with an increasing proportion of retirees**. In the most pronounced examples, New York City's public safety plans have fewer active employees than retirees. The city already faces much higher contribution requirements for pensions than in past years, and heightened retiree benefit payments increase plan funding risk from volatile investment returns.

## New York Pension Dashboard

### Overall State and Local Pension Assessment

MODERATELY PRESSURED

Increased costs have been absorbed into budgets, but downside asset volatility potential is compounded by strict legal protections for benefits.

### Legal Framework

VERY INFLEXIBLE

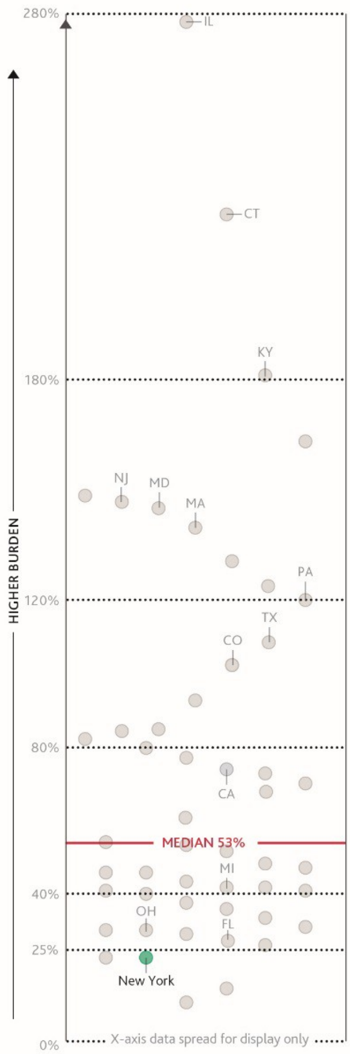
New York's constitution hardens government pension liabilities by strictly limiting reform options to new employees only.

### New York (Aa1 stable)

| Fiscal 2014 | | Ranking #1 IS HIGHEST BURDEN |
|---|---|---|
| GASB UAAL ($ billions) | $19.8 | |
| ANPL ($ billions) | $37.2 | |
| ANPL / Revenues | 28% | 42 / 50 |

### Pension Burden: New York vs. all US States

Fiscal 2012-2014 three-year average Moody's Adjusted Net Pension Liability (ANPL) / Revenues




### Reform Outcomes

IMPLEMENTED but for new employees only.

**1958:** In *Birnbaum v. New York State Teachers' Retirement System*, the state Court of Appeals prohibited a mortality table change from reducing pension benefits, making clear that the benefits in place when public employees are hired may not be impaired.

### Contribution Strength

Government contributions to New York's largest pension funds exceed the "Tread Water" indicator.

| $ in billions | FISCAL 2015 CONTRIBUTIONS | "TREAD WATER" INDICATOR |
|---|---|---|
| NY State & Local | $4.73 | $3.95 |
| NYCERS | $3.16 | $2.63 |
| NYC Police | $2.31 | $1.90 |

### Moody's Key Pension Metrics: Large New York Local Governments

**New York City (Aa2 stable)**
Fiscal 2015 – Single Year

| | |
|---|---|
| ANPL ($ billions) | $102.2 |
| ANPL / Full Value | 11.3% |
| ANPL / Revenues | 132% |

**Nassau County (A2 stable)**
Fiscal 2014 – Single Year

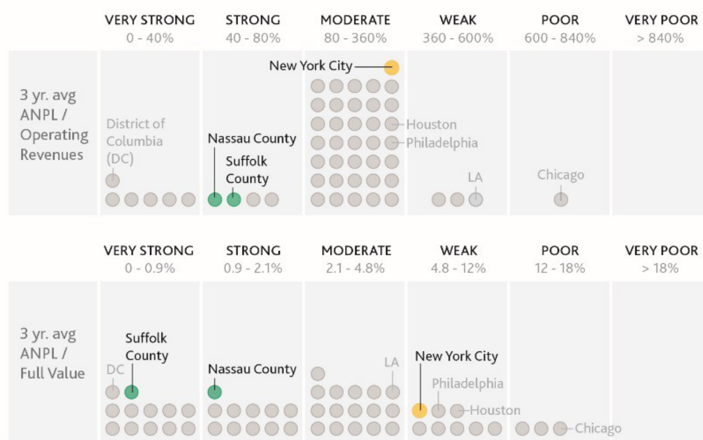
| | |
|---|---|
| ANPL ($ billions) | $3.1 |
| ANPL / Full Value | 1.56% |
| ANPL / Revenues | 115% |

**Suffolk County (A3 negative)**
Fiscal 2014 – Single Year

| | |
|---|---|
| ANPL ($ billions) | $3.0 |
| ANPL / Full Value | 1.18% |
| ANPL / Revenues | 114% |

### Pension Burden of Large New York Local Governments Compared to Peers

Largest local governments in Moody's GO Methodology scorecard categories
Three-Year Average of Fiscal 2011 – 2013




Reflects categorical placement only, not relative standing within categories. Unlike most cities, New York City has no overlapping units of government with additional pension liabilities on the same tax base. Its full value also does not adjust for rent control.

*Sources: Moody's Investors Service, government and pension plan comprehensive annual financial reports (CAFRs)*

To access full New York report, click here.

## Ohio

*Reform flexibility in Ohio lessens pension stress*

(Published September 17, 2014)

Four large plans encompass nearly all public pension liabilities in Ohio (Aa1 stable). Declines in the funded status for these plans have not directly translated to increased budget pressure for the state and its local governments, however. Instead, broad statewide reforms have relied on legal flexibility to reduce benefit levels and increase employee contributions.

(Pension Dashboard on following page)

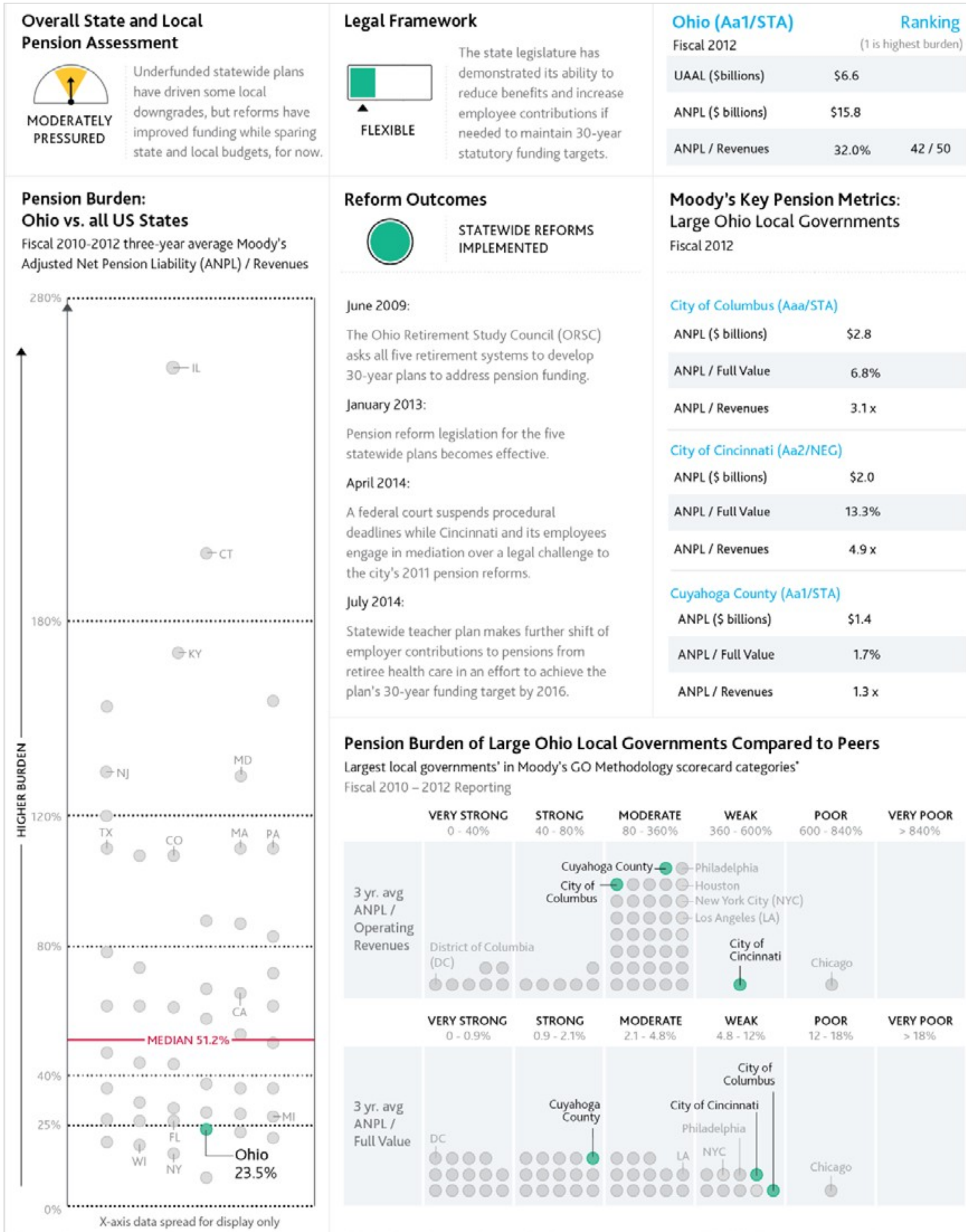
» **Legal framework and reform outcomes: Statewide reforms highlight legal flexibility to lower liabilities**. Following sharp investment declines in 2008 and three of the plans falling outside a statutory 30-year funding target, the state implemented various reforms for each plan in early 2013. Reforms included increased employee contributions and various benefit reductions.

» **Distribution and control of plans: Public pension liabilities are highly concentrated in four state-controlled plans**. In addition to these four, one other state plan and two locally controlled plans also populate Ohio's pension landscape. The state Legislature controls contributions and pension benefits for all statewide plans, which provide benefits for employees of the state and local governments in our database, except for those whose benefits are provided by the Cincinnati Retirement System and the City of Hamilton Metropolitan Pension Plan.

» **Cost trends: State and local contribution requirements have held steady, but haven't consistently kept pace with actuarial costs**. Maintained at constant levels relative to payroll, contribution rates set by the state Legislature have historically been insufficient to meet plan actuarial requirements, particularly for the State Teachers Retirement System of Ohio (STRS) and the Ohio Police & Fire Retirement System (OP&F). The 2013 reforms improved this diverging trend, but additional state action – including an increase to employer contribution rates – could be necessary if plan funding deteriorates further.

» **Plan demographics: Consistent with national trends, Ohio's largest plans have experienced declines in active employees relative to retirees**. The statewide teacher plan, STRS, has fallen well below national norms, with actives only slightly outnumbering benefit recipients.

## Ohio Pension Dashboard




Note: Fifty largest local governments determined by 2012 gross direct debt outstanding. Cuyahoga County and Cincinnati are not among the rated 50 largest local governments, but are shown for comparison. Categorical placement is shown only, not relative rankings or scoring within categories. Philadelphia implemented a new property tax assessment system, raising full value considerably. The impact of this reassessment does not impact 2012 data, and is not reflected in this exhibit showing the city's ANPL relative to full value.

*Sources: Moody's Investors Service, state and local government comprehensive annual financial reports (CAFRs)*

To access full Ohio report, click here.

## Oregon

*Oregon governments have limited options to address rising pension costs*

(Published August 7, 2017)

The State of Oregon (Aa1 stable) and its local governments face steadily rising pension costs to the Oregon Public Employees Retirement System (OPERS). The state's highest court struck down a portion of 2013 reforms, forcing state and local governments to pay down higher unfunded liabilities and limiting future reform options. Government contribution requirements to OPERS also continue to rise because of cost deferrals from “rate collaring,” investment underperformance against targets, and changing actuarial assumptions.

(Pension Dashboard on following page)

» **Cost trends: Contribution requirements will escalate significantly for the next six years.** Already higher than historic levels, contribution rates will rise further due to recent increases in total liabilities and weaker investment earnings than assumptions in 2015 and 2016. Rate collaring limits the pace of contribution increases, deferring some increases to the future. Favorable investment performance in 2017 may help to limit the pace of cost increases, but a decline in OPERS' assumed rate of return to 7.2% will also increase governments' pension cost trajectories.

» **Distribution and control of plans: Government pension exposure is concentrated in OPERS, leaving the state largely in control of funding and reforms.** The City of Portland (Aaa stable) is the primary exception, because of its large single-employer public safety plan, which it funds on a pay-as-you-go basis with a dedicated property tax.

» **Legal framework and reform outcomes: Accrued benefits cannot be impaired, but the state has flexibility to reduce future accruals.** Like many governments nationally, Oregon has created less generous pension tiers for new employees. Its highest court held up its reductions to future benefit accruals for existing employees, which provides greater flexibility than in some states. However, the court overturned changes to cost-of-living adjustments associated with accrued service time, which increased OPERS' unfunded liabilities by $4.7 billion on a reported basis, based on the December 31, 2013 valuation.

» **Asset performance risk: Oregon governments are exposed to budget risk from high expected pension asset volatility.** OPERS' cash outflows for defined-benefit payments exceed the contributions in, making it more difficult to build up assets if returns are volatile. At the same time, roughly 75% of OPERS' investments are allocated to volatile public and private equities and real estate.

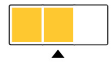
## Oregon Pension Dashboard

### Overall State and Local Pension Assessment

MEDIUM PENSION RISK

Oregon governments face a rising pension cost curve due to overturned reforms and assumption changes, but have legal authority to change benefits prospectively.

### Legal Framework



PROSPECTIVE FLEXIBILITY

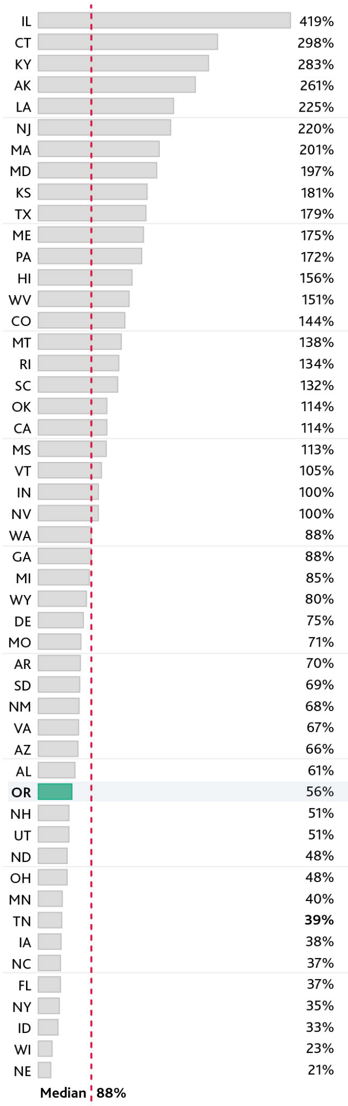
Prospective changes to benefits, including COLAs, are allowable for both future and current employees, but accrued benefits are protected.

### Oregon (Aa1 stable)

| Fiscal 2016 | Fiscal 2015 Rank<br>#1 IS HIGHEST BURDEN |
|---|---|
| GASB NPL ($ billions) | $1.1 |
| ANPL ($ billions) | $7.2 |
| ANPL / Revenues | 42 |

### Pension Burden: Oregon vs. all US States

Fiscal 2013-2015 three-year average Moody's Adjusted Net Pension Liability (ANPL) / Revenues




### Reform Outcomes

IMPLEMENTED but changes to accrued benefits struck down.

**2016:** In *Moro v State of Oregon*, the state's highest court invalidated changes made to benefits earned before the effective date of reforms. The court also applied this view to COLA changes, reversing substantial liability reductions.

### Contribution Strength

Actuarial contributions set by OPERS would generally exceed our "Tread Water" indicator, but the use of additional "rate collars" defers costs and weakens ongoing funding.

| % of Revenues | FISCAL 2016 CONTRIBUTIONS | "TREAD WATER" INDICATOR |
|---|---|---|
| State of Oregon | 1.4% | 1.9% |
| Portland | 14.8% | 22.8% |
| Beaverton School District | 4.4% | 6.3% |

### Moody's Key Pension Metrics: Large Oregon Local Governments

City of Portland (Aaa stable)
Fiscal 2016 - Single Year

| | |
|---|---|
| ANPL ($ billions) | $3.29 |
| ANPL / Full Value | 3.2% |
| ANPL / Revenues | 398% |

Beaverton School District (Aa2 stable)
Fiscal 2016 - Single Year

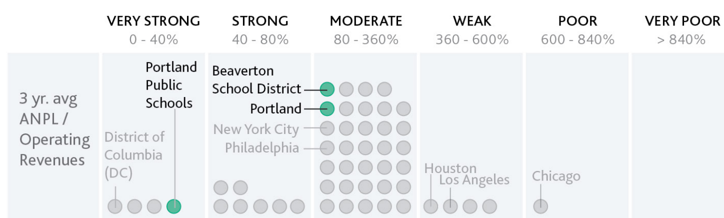
| | |
|---|---|
| ANPL ($ millions) | $744 |
| ANPL / Full Value | 2.0% |
| ANPL / Revenues | 157% |

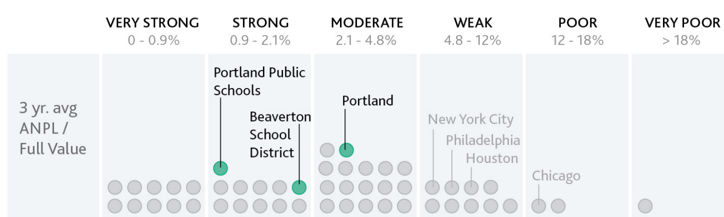
Portland Public Schools (Aa2 stable)
Fiscal 2016 - Single Year

| | |
|---|---|
| ANPL ($ millions) | $109 |
| ANPL / Full Value | 0.12% |
| ANPL / Revenues | 17% |

### Pension Burden of Large Oregon Local Governments Compared to Peers

Largest local government pension exposure in Moody's GO Methodology scorecard categories
Three-Year Average of Fiscal 2013 – 2015




Reflects categorical placement only, not relative standing within categories.

*Sources: State and local government comprehensive annual financial reports (CAFRs) and actuarial valuations, Moody's Investors Service*

To access full Oregon report, click here.

## Pennsylvania

*Limited options for Pennsylvania to avoid accelerating pension costs*

(Published February 4, 2016)

Despite a number of benefit changes for new employees in 2010, Pennsylvania's (Aa3 stable) unfunded pension liabilities continue to grow at a rapid pace. With stringent legal protections on public pension benefits, the commonwealth has little flexibility to reduce accrued liabilities through benefit reforms. As a result, Pennsylvania and many of its local governments face inevitable increases in pension costs.

(Pension Dashboard on following page)

» **Cost trends: Contribution requirements are escalating after years of payment shortfalls by the commonwealth.** Statutory caps have prevented the state's short-term pension contributions from rising dramatically, but in turn helped drive growth in reported unfunded liabilities to $54 billion in 2014, up from $12 billion in 2005. Meanwhile, local plans in Philadelphia (Aa2 negative) and Pittsburgh (A1 stable) also exhibit growing cost and liability trends. Philadelphia's liabilities have steadily grown in part because of shifts to lower investment return assumptions. Pittsburgh has dedicated decades of annual parking revenues to shore up its pensions, but funding metrics continue to weaken because contributions do not cover the annual interest on its reported net liabilities.

» **Legal framework and reform outcomes: Historical state Supreme Court decisions significantly limit pension reform options.** Benefit reductions impacting past and even future accruals by current employees have been deemed legally impermissible. However, the state has a record of lowering benefits for newly hired employees and does retain some flexibility related to cost-of-living adjustments (COLAs).

» **Distribution and control of plans: Pennsylvania mandates minimum funding requirements and provides contribution assistance for local plans.** Pennsylvania leads the nation with more than 3,200 public pension plans. Whether the state may view a reduction in local pension support as a viable option for providing its own budget relief remains unknown.

» **Plan demographics: Growing portion of retirees raises potential for contribution volatility.** Three of the four largest public pension systems in Pennsylvania have fewer active members than retirees and other inactive members. With increasing plan maturity, the commonwealth and its local governments are more susceptible to contribution volatility and funding challenges stemming from negative plan cash flows.

## Pennsylvania Pension Dashboard

### Overall State and Local Pension Assessment


Unfunded pension liabilities have grown substantially over the past decade, and ongoing costs continue to rise.

### Legal Framework

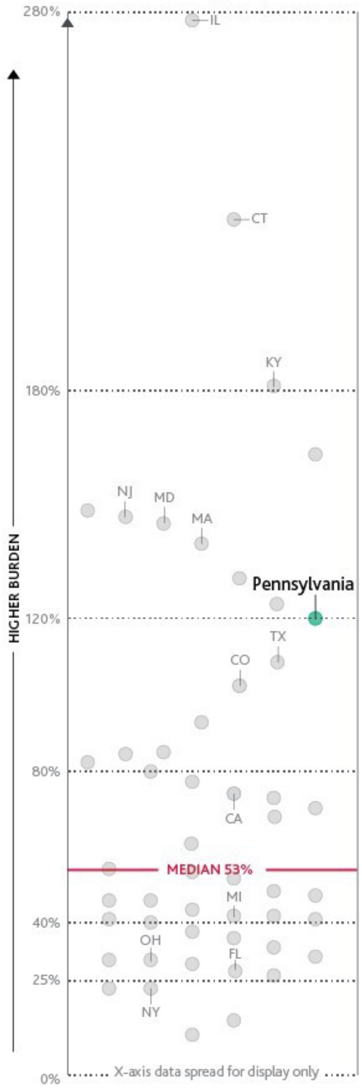

Pennsylvania has among the strongest legal protections for public pension benefits. Reforms are limited to future employees only as a result of several decisions by the Supreme Court of Pennsylvania.

### Pennsylvania (Aa3 negative)

| Fiscal 2014 | | Ranking (#1 IS HIGHEST BURDEN) |
|---|---|---|
| GASB NPL ($ billions) | $54.4 | |
| ANPL ($ billions) | $69.3 | |
| ANPL / Revenues | 117% | 10 / 50 |

### Pension Burden: Pennsylvania vs. all US States

Fiscal 2012-2014 three-year average Moody's Adjusted Net Pension Liability (ANPL) / Revenues




### Reform Outcomes

IMPLEMENTED
but for new employees only. Meanwhile, funding challenges persist.

**1981:** In *McKenna v. State Employees' Retirement Board*, the state's highest court ruled that changes to final average salary and benefit multiplier formulas could not legally be applied to the pensions of judges that had already met vesting requirements. In concurring opinions, other justices noted that under the state constitution, contractual protections for pensions begin when employees are hired.

**1982:** In *Catania v. State Employees' Retirement Board*, State Supreme court justices disagreed over the legal flexibility available to adjust the benefits of current employees in order to maintain the actuarial soundness of its pension plans.

**1984:** In *Association of PA State College v. State System*, the high court disallowed increased contribution requirements of current employees, and announced a preference for the more legally stringent viewpoints from the the various Catania opinions.

### Moody's Key Pension Metrics: Large Pennsylvana Local Governments

Fiscal 2014

**City of Philadelphia (A2/STA)**

| | |
|---|---|
| ANPL ($ billions) | $8.1 |
| ANPL / Full Value | 8.5% |
| ANPL / Revenues | 211% |

**Philadelphia School District (Ba3/NEG)**

| | |
|---|---|
| ANPL ($ billions) | $2.6 |
| ANPL / Full Value | 2.6% |
| ANPL / Revenues | 108% |

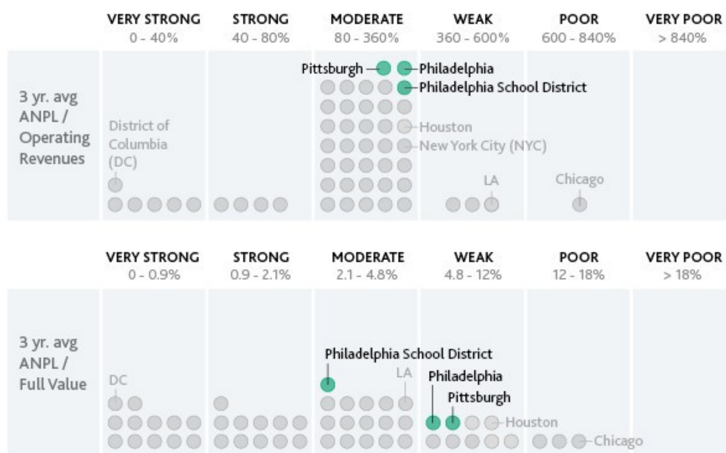
**City of Pittsburgh (A1 POS)**

| | |
|---|---|
| ANPL ($ billions) | $1.3 |
| ANPL / Full Value | 6.3% |
| ANPL / Revenues | 265% |

*Does not consider state assistance for pension costs for Pittsburgh.

### Pension Burden of Large Pennsylvania Local Governments Compared to Peers

Largest local governments in Moody's GO Methodology scorecard categories*
Fiscal 2011 – 2013 Reporting




Notes: Does not reflect state pension support for Pittsburgh. Reflects categorical placement only, not relative standing within categories.

*Sources: State and local government comprehensive annual financial reports (CAFRs) and actuarial valuations, Moody's Investors Service*

To access full Pennsylvania report, click here.

## Tennessee

*Tennessee reduces pension exposure by sharing risk with employees*

(Published December 21, 2016)

The State of Tennessee's (Aaa stable) 2014 pension overhaul shares investment performance risk with employees of the state and many local governments, including local schools. As these changes apply to a greater portion of employees and retirees over time, the state's budgets will grow increasingly insulated from unexpected pension cost hikes. Tennessee still faces risks from potential asset losses associated with its legacy defined benefit pension promises, but this exposure is also below average among the 50 states.

(Pension Dashboard on following page)

» **Distribution and control of plans**: With the exception of some local governments with their own plans, such as the Metropolitan Government of Nashville & Davidson County (Nashville, Aa2 stable), pensions are administered under the Tennessee Consolidated Retirement System (TCRS). This includes many city and county employees, as well as local teachers. Some local governments with their own plans, such as the City of Memphis (Aa2 stable), must increase pension contributions to comply with a state funding mandate after contributing below actuarial requirements for years.

» **Plan demographics and asset performance risk**: The ratio of active employees to retirees in the state's largest pension system is higher than national levels for US public pension plans, a feature that bolsters plan cash flows and reduces the need to sell assets for benefit payments. Tennessee's pension plans take similar investment risk to other plans nationally, but the magnitude of the state's pension assets, and thus the potential downside from investment losses, is below average among the 50 states.

» **Cost trends**: Tennessee's pension costs are at historically high levels relative to payroll, but have stabilized since 2011. Among the largest plans of the 50 states, Tennessee has the seventh lowest "service cost," or cost of current year benefit accruals, relative to its payroll, and the 10th lowest unfunded liability relative to its revenues under our standard pension liability adjustments. Pension costs for large local governments, such as Memphis and Nashville, are similar to large peers in other states.

» **Legal framework and reform outcomes**: Reforms for newly hired employees will limit costs by automatically changing benefits in the event of adverse outcomes, such as poor investment performance. The state has similarly provided local governments with the legal authority to prospectively modify the benefits of current employees, provided they were hired after May 2014.

## Tennessee Pension Dashboard

### Overall State and Local Pension Assessment

LOW PENSION RISK

Reforms to shift asset risk to new employees provide a long-term buffer against unexpected pension cost increases.

### Legal Framework

GROWING FLEXIBILITY

Prospective changes to benefits are allowable for employees hired in 2014 and later.

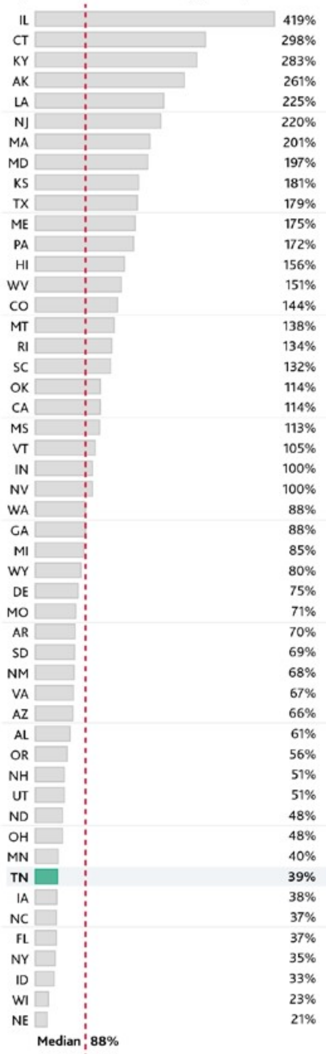
### Tennessee (Aaa stable)

Fiscal 2015

| | | Ranking #1 IS HIGHEST BURDEN |
|---|---|---|
| GASB NPL ($ billions) | $0.7 | |
| ANPL ($ billions) | $6.7 | |
| ANPL / Revenues | 39% | 41 / 50 |

### Pension Burden: Tennessee vs. all US States

Fiscal 2013-2015 three-year average Moody's Adjusted Net Pension Liability (ANPL) / Revenues




### Reform Outcomes

IMPLEMENTED

but for new employees only.

**1981:** In *Blackwell v. Quarterly*, the Tennessee Supreme Court ruled that benefit changes to vested benefits were not permissible, and that "vested benefits" included the right of current employees that had met requirements to continue accruing benefits at the same level.

### Contribution Strength

Contributions by the state and local governments generally exceed the "Tread Water" indicator.

| % of Revenues | FISCAL 2015 CONTRIBUTIONS | "TREAD WATER" INDICATOR |
|---|---|---|
| State of TN | 2.3% | 2.0% |
| Memphis | 5.5% | 6.2% |
| Nashville-Davidson | 7.7% | 4.7% |

### Moody's Key Pension Metrics: Large Tennessee Local Governments

Nashville-Davidson County (Aa2 stable)

Fiscal 2015 – Single Year

| | |
|---|---|
| ANPL ($ billions) | $2.1 |
| ANPL / Full Value | 3.10% |
| ANPL / Revenues | 112% |

City of Memphis (Aa2 stable)

Fiscal 2015 – Single Year

| | |
|---|---|
| ANPL ($ billions) | $1.3 |
| ANPL / Full Value | 3.70% |
| ANPL / Revenues | 167% |

Shelby County (Aa1 stable)

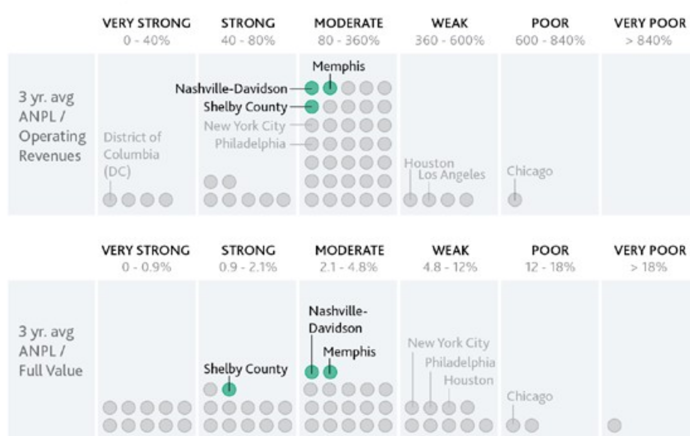
Fiscal 2015 – Single Year

| | |
|---|---|
| ANPL ($ billions) | $1.0 |
| ANPL / Full Value | 1.65% |
| ANPL / Revenues | 104% |

### Pension Burden of Large Tennessee Local Governments Compared to Peers

Largest local government pension exposure in Moody's GO Methodology scorecard categories

Three-Year Average of Fiscal 2013 – 2015




Reflects categorical placement only, not relative standing within categories.

*Sources: State and local government comprehensive annual financial reports (CAFRs) and actuarial valuations, Moody's Investors Service*

To access full Tennessee report, click here.

## Texas

*Pensions weigh on credit quality of some governments, despite reform flexibility*

(Published November 21, 2017)

*This is an update of our first Pension Landscape publication on Texas, published January 20, 2015.*

Growing pension burdens have reduced the credit quality of several large Texas cities in recent years. While unfunded liabilities will remain substantial for the foreseeable future, cities such as Dallas (A1 stable) and Houston (Aa3 stable) have taken advantage of legal flexibility to alter benefits in order to improve their funding trajectories. The State of Texas (Aaa stable), meanwhile, increased its contributions to a constitutional cap, but its reported unfunded liabilities will continue to grow without benefit changes and/or contribution hikes.

(Pension Dashboard on following page)

» **A mix of state and local authority sets benefits and funding provisions.** For example, both state law and local government decisions impact contributions and benefits for the Texas Municipal Retirement System (TMRS) and the Texas County and District Retirement System (TCDRS). Control over large cities' pension systems varies from plan to plan.

» **Substantial flexibility to change pension benefits does not relieve Texas governments from practical and political limitations.** The state has broad legal authority to reduce accrued benefits for its pension plans, and rising unfunded liabilities may signal benefit reforms are on the horizon. Fort Worth's (Aa3 negative) prospective reforms prevailed in a legal challenge but have failed to halt growth in its unfunded liabilities. Houston recently solidified its reforms, including changes to cost-of-living adjustments (COLAs), by agreeing to issue pension bonds.

» **Contributions by the state and many large cities, despite recent increases, remain insufficient to prevent unfunded liability growth.** State and participating governments' contributions to the Employees Retirement System of Texas (TX ERS) and the Teachers' Retirement System of Texas (TX TRS) fall below our "tread water" indicator. After a variety of benefit changes, Dallas will contribute more than ever to its pension systems, but even its higher contributions will not stop unfunded liabilities from growing.

» **Texas is the third most susceptible state to pension investment losses, based on our "budget shock" indicator.** For fiscal 2016, we assigned a 7.8% probability that Texas experiences an investment loss amounting to 25% of its own-source revenues in a given year. Houston's probability of a shock-level investment loss was much higher at 17.5%. Dallas' plan to rebuild assets in its public safety pension system is particularly sensitive to the future investment rate of return and volatility or returns.

## Texas Pension Dashboard

### Overall State and Local Pension Assessment

MEDIUM PENSION RISK

Texas' weak contributions continue to grow unfunded liabilities. But, the state and local governments have broad flexibility to change benefits.

### Legal Framework – State

VERY FLEXIBILE

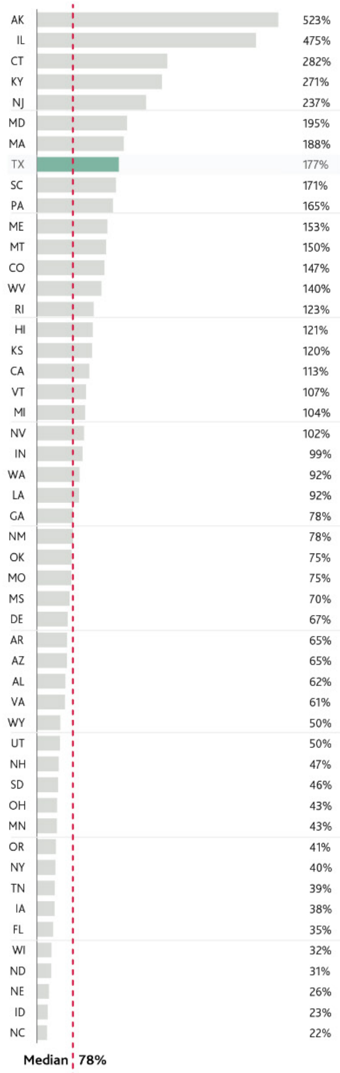
A 1937 state supreme court decision established very broad authority to change public pension benefits.

### Texas (Aaa/STA)

| Fiscal 2016 ($ billions) | Rank 10 / 50 |
|---|---|
| GASB NPL | $38.3 |
| ANPL | $108.6 |
| ANPL / Revenues | 162% |

### Pension Burden: Texas vs. all US States

Fiscal 2014-2016 three-year average Moody's Adjusted Net Pension Liability (ANPL) / Revenues




### Legal Framework – Local

MODERATELY FLEXIBLE

A constitutional protection was added in 2003 for local pensions. Several recent reforms alter prospective benefits and cost-of-living adjustments.

### Contribution Strength

Contributions by the state and certain large cities are below our "tread water" indicator. Other local governments' contributions are stronger.

| % of Revenues | FY 2016 CONTRIBUTIONS | "TREAD WATER" INDICATOR |
|---|---|---|
| State of Texas | 3.9% | 7.1% |
| Dallas | 11.5% | 26.4% |
| Houston | 14.9% | 21.0% |

### Moody's Key Pension Metrics: Large Texas Local Governments

| City of Dallas (A1 stable) Fiscal 2016 - Single Year | |
|---|---|
| ANPL ($ billions) | $8.25 |
| ANPL / Full Value | 8.23% |
| ANPL / Revenues | 609% |

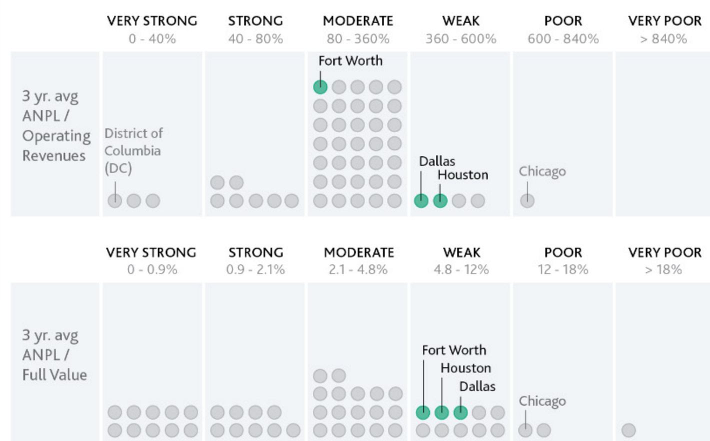
| City of Fort Worth (Aa3 negative) Fiscal 2016 - Single Year | |
|---|---|
| ANPL ($ billions) | $3.19 |
| ANPL / Full Value | 6.40% |
| ANPL / Revenues | 439% |

| City of Houston (Aa3 stable) Fiscal 2016 - Single Year | |
|---|---|
| ANPL ($ billions) | $14.13 |
| ANPL / Full Value | 6.91% |
| ANPL / Revenues | 606% |

### Pension Burden of Large Texas Local Governments Compared to Peers

Largest local government pension exposure in Moody's GO Methodology scorecard categories

Three-Year Average of Fiscal 2013 – 2015




Reflects categorical placement only, not relative standing within categories.

*Source: Moody's Investors Service, based on government and pension plan CAFRs, actuarial valuations*

To access full Texas report, click here.

## Wisconsin

*Wisconsin pensions are well funded and stable*

(Published October 27, 2014)

One well-funded statewide plan, the Wisconsin Retirement System (WRS), encompasses the vast majority of public pension liabilities in Wisconsin (Aa1 stable), although the City of Milwaukee (Aa3 stable) and the County of Milwaukee (Aa2 stable) each have local plans. State reforms have survived legal challenges presented to the state Supreme Court, helping to curtail state and local government pension costs.

(Pension Dashboard on following page)

» **Legal framework and reform outcomes: Wisconsin has broad authority to enact prospective benefit changes**. The state can reduce pension benefits for future work performed by existing and future employees who participate in the WRS. In contrast, both the City and County of Milwaukee have less flexibility, although the county has appealed this issue to the state Supreme Court.

» **Distribution and control of plans: With few exceptions, pension benefits and contributions are determined by the state**. The state's influence is attributable to the concentration of state and local participation in WRS. The only major exceptions to state control are the City and County of Milwaukee pension plans.

» **Cost trends: Pension costs remain relatively stable for WRS, reflecting strong funded status and recent contribution shifts to employees**. The state and participating local governments have consistently met actuarial payment requirements. The system's risk-sharing features, such as the contingent nature of retiree benefit increases, help maintain its strong funded status, in turn keeping costs at bay.

» **Plan demographics: The ratio of active members to retirees for both the WRS and Milwaukee Employees Retirement System (MERS) is declining, with both plans below national norms**. However, the relatively strong as-reported funded status of both plans has largely prevented past service costs from straining current budgets.

## Wisconsin Pension Dashboard

### Overall State and Local Pension Assessment

NOT PRESSURED

The dominant statewide pension plan, WRS, remains well-funded. Pension costs remain stable across the state, aided by reforms and risk-sharing features of WRS.

### Legal Framework

MODERATELY FLEXIBLE

State statue allows for prospective benefit changes, but there is less flexibility for local plans of the City and County of Milwaukee.

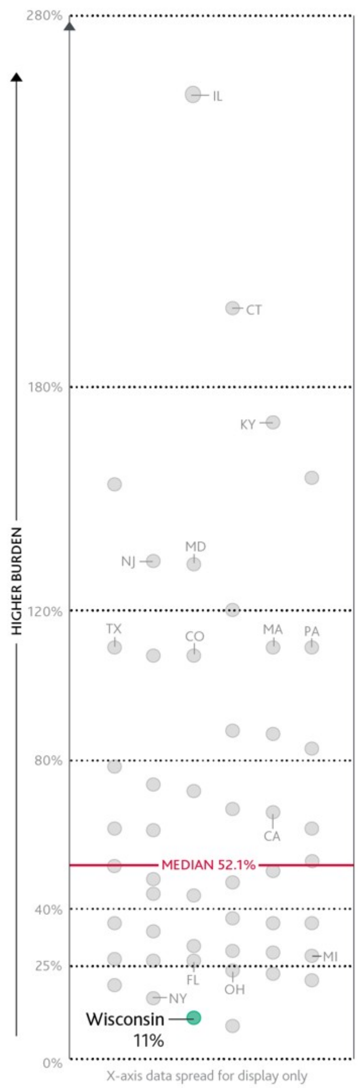
### Wisconsin (Aa2/STA)

Fiscal 2012

| | | Ranking (#1 IS HIGHEST BURDEN) |
|---|---|---|
| UAAL ($billions) | $0.07 | |
| ANPL ($ billions) | $3.8 | |
| ANPL / Revenues | 13.8% | 49 / 50 |

### Pension Burden: Wisconsin vs. all US States

Fiscal 2010-2012 three-year average Moody's Adjusted Net Pension Liability (ANPL) / Revenues




### Reform Outcomes

MIXED
( but developing )

*Statewide reforms implemented for state and most local governments. Milwaukee County appealing loss in appeals court over prospective benefit changes.*

June 2011: State passes "Act 10," broadly changing collective bargaining rules, reducing WRS prospective benefits for certain employees and forbidding "pick-ups" of non-safety employee contributions by public employers.

Aug 2011: Milwaukee County lowers benefit multipliers for future years of service, including employees already hired.

Sept 2012: Lower court rules Act 10 unconstitutional.

Nov 2013: State Court of Appeals rules against Milwaukee County in pension litigation.

July 2014: Wisconsin Supreme Court reverses lower courts, upholds Act 10 in its entirety.

Oct 2014: Wisconsin Supreme Court hearing on Milwaukee County pension benefit changes. No ruling yet issued.

### Moody's Key Pension Metrics: Large Wisconsin Local Governments

Fiscal 2012

**City of Milwaukee (Aa3/STA)**

| | |
|---|---|
| ANPL ($ billions) | $2.0 |
| ANPL / Full Value | 7.0% |
| ANPL / Revenues | 2.2x |

**County of Milwaukee (Aa2/STA)**

| | |
|---|---|
| ANPL ($ billions) | $1.5 |
| ANPL / Full Value | 2.6% |
| ANPL / Revenues | 1.5x |

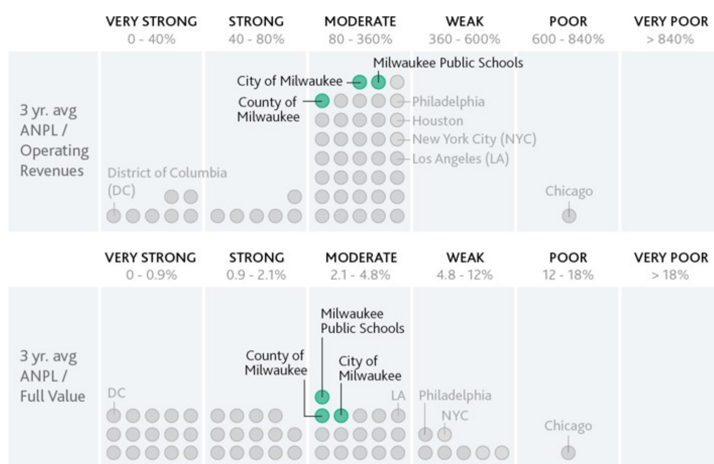
**Milwaukee Public Schools (Aa3/STA)**

| | |
|---|---|
| ANPL ($ billions) | $1.3 |
| ANPL / Full Value | 5.1% |
| ANPL / Revenues | 1.2x |

### Pension Burden of Large Wisconsin Local Governments Compared to Peers

Largest local governments' in Moody's GO Methodology scorecard categories*

Fiscal 2010 – 2012 Reporting




Note: Fifty largest local governments determined by 2012 gross direct debt outstanding. The Wisconsin issuers highlighted are not part of this group, but are shown for comparison. Categorical placement is shown only, not relative rankings or scoring within categories. Philadelphia implemented a new property tax assessment system, raising full value considerrably. The impact of this reassessment does not impact 2012 data, and is not reflected in this exhibit showing the city's ANPL relative to full value.

*Sources: Moody's Investors Service, state and local government comprehensive annual financial reports (CAFRs), pension plan actuarial valuations*

To access full Wisconsin report, click here.

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Report Number: 1054517

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