



# Bayou Blues:

## How Louisiana's Retirement Plan Hurts Teachers and Schools

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### About TeacherPensions.org

Teacherpensions.org provides high-quality information and analysis to help stakeholders—especially teachers and policymakers—understand the teacher pension issue and the trade-offs among various options for reform. We believe there is a need for additional analysis of and communication about teacher pensions—an issue that has not yet gained sufficient traction nationally, despite its seriousness and immediacy. We aim to make the issues around teacher pensions more accessible and relevant to the general public, more compelling to policymakers, and more understandable for current teachers.

Teacherpensions.org focuses on questions affecting public policy choices; it is not personal or institutional investment advice. You should consult a qualified financial professional before making consequential financial decisions.



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### About Bellwether Education Partners

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## Introduction

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The Teachers' Retirement System of Louisiana (TRSL) is one of the most expensive teacher pension plans in the country.<sup>1</sup> Years of irresponsible budgeting practices have left TRSL more than \$11.7 billion in debt, which has led to mounting pension costs and jeopardized the retirement security of thousands of dedicated educators.

State policymakers—not educators—are responsible for the system's large and growing unfunded liabilities, but today's teachers are the ones paying the price for politicians' past mistakes. Districts contribute more than 30 percent of each teacher's salary annually toward the state's pension plan. The vast majority of this contribution goes toward paying down debt, not toward benefits for current workers.

Furthermore, Louisiana's teachers receive benefits that are actually worth far less than the astronomical contributions the state makes on teachers' behalf. The state pension system estimates the average value of teachers' final benefits to be worth only *4 percent* of their salary. Nearly half of all teachers who enter the classroom at age 25 will miss out on even these meager savings. The pension plan delivers benefits through a back-loaded formula that disproportionately rewards the small fraction of teachers who remain on the job for more than 25 years. Just 1 percent of teachers will stay in the classroom long enough to earn the maximum retirement benefit.

What's even more concerning is that Louisiana's pension problems are likely to get worse, which could lead to further consequences for workers and schools. State politicians have promised current and retired teachers \$29.3 billion in retirement benefits that must be paid out over the coming

years, but after years of reckless mismanagement by politicians, the fund only has \$17.5 billion to pay for those benefits. The state has an obligation to make good on its promises, but Louisiana has not balanced the amount it promised teachers against the amount it has saved at any time within the last 25 years.<sup>2</sup>

Participating local school districts are mandated to cover pension costs for public school teachers, and as debt has grown, many communities have been forced to make difficult choices between raising taxes, reducing teachers' salaries and benefits, or making cuts to school-based programs such as art, music, and foreign languages—all of which affect the quality of education in Louisiana. Teachers and students are already experiencing the consequences of rising pension debt. Since 2009, Louisiana school districts have cut their expenditures on instructional programs, textbooks and other school supplies, and special education services.<sup>3</sup>

Although the state has committed to making meaningful improvements to its public school system, without comprehensive pension reform, the debt could undermine any gains. The good news is that it's not too late to fix the problem, and there are solutions that Louisiana legislators could adopt or expand to help improve the financial stability of the pension system and offer all teachers a path to a secure retirement. This brief examines the impact of pension debt on Louisiana's teachers and schools, and provides recommendations for policymakers to ensure Louisiana's students and educators have the resources they need to succeed.

## Louisiana's Pension System Is Very Expensive but Not Very Generous

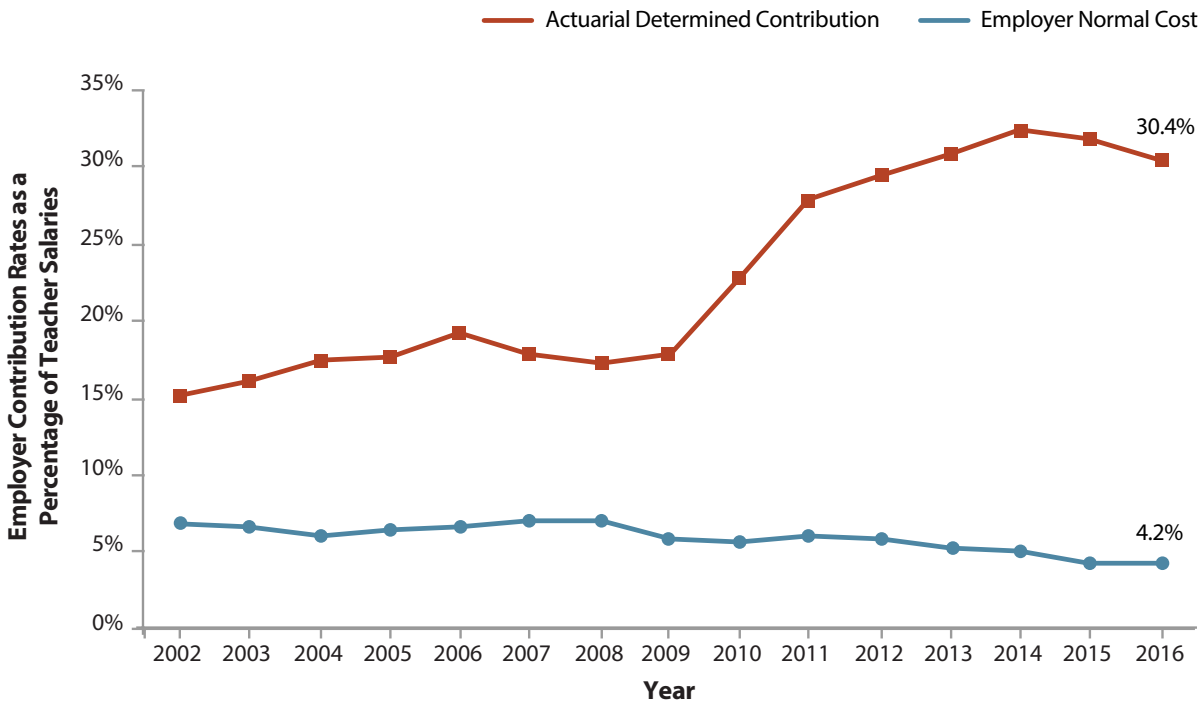
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Louisiana's rising pension costs have left school districts with less money to spend in the classroom, and as a result, they have been forced to scale back funding for other budget priorities. Many school officials have been forced to make tough choices about reducing staffing levels, freezing salaries, and increasing class sizes. These cuts have not only penalized current teachers but have made it difficult for schools to recruit and retain new educators, which will ultimately hurt students and the quality of education in Louisiana.

The state's increasing pension costs today represent more than 11 percent of its General Fund Revenue. The amount needed to pay down the debt and cover benefits for current employees dramatically increased after the Great Recession of 2007 to 2009 (Figure 1). In 2016, this figure was 30.4 percent of each teacher's salary—an increase of more than 11 percentage points in the last decade.<sup>4</sup> For most workers, rising employer contributions would mean better benefits. However, this is not the case for Louisiana teachers because the state's rising pension costs are entirely a function of its debt.

The dramatic increase in debt means that a significant portion of districts' payroll must now be siphoned into the pension fund. Louisiana has the dubious distinction of spending a higher share of teacher compensation on debt costs than all but six other states.<sup>5</sup> In other words, districts are paying exorbitant amounts of money just to keep the pension system afloat.

**Figure 1 Louisiana's Teacher Pension Costs Have Gone Up, While Teacher Benefits Have Gone Down**



Source: Authors' calculations; Teachers' Retirement System of Louisiana comprehensive annual financial reports; Teachers' Retirement System of Louisiana actuarial valuation reports; and Center for Retirement Research at Boston College Public Plans Data.

For every dollar they pay in teacher salaries, schools must pay an additional 30.4 cents into the pension fund—26.2 cents of which go toward paying off debt. To put this concept in more concrete terms, consider the debt costs in the context of the average Louisiana teacher's base salary, which is \$46,733.<sup>6</sup> At that salary, the 26.2 percent debt cost amounts to an additional \$12,244 per teacher that districts must contribute for pension debt alone, on top of what they already spend on salaries and other benefits. If Louisiana had a retirement system that did not accrue debt, or if it had already dealt with its debt in a responsible manner, administrators could choose to do something else with that money, such as raise teachers' salaries.



Instead, the increase in amortization costs—or the cost of paying off debt—has created a challenging situation for school districts, which must try to balance unfunded liabilities and benefits. In addition, normal costs—or the amount of money pension plan managers estimate that districts must contribute now in order to pay for workers' benefits in the future—dropped from about 7 percent in 2008 to about 4 percent in 2016. Thus, the actual value of teachers' pension benefits has decreased, even as school districts' total contributions have grown substantially.

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The average Louisiana teacher receives total retirement benefits that are far worse than what they could receive in other states or in the private sector.

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The high costs of the system belie the fact that the average pension benefit is not very generous. Although the 4 percent contribution rate is comparable to the amount that other states contribute to teachers' retirement savings plans—and to the match some private employers offer to employees who are enrolled in a 401(k) plan—Louisiana's teachers are not enrolled in Social Security. This means that they depend entirely on the state pension plan for their retirement. After accounting for their lack of Social Security, the average

Louisiana teacher receives total retirement benefits that are far worse than what they might receive in other states or in the private sector.

## Louisiana's Pension System Is Unfair to Teachers

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A second problem with the structure of TRSL is that many teachers will leave the system without a path to a secure retirement. Under the state's back-loaded Final Average Salary Defined Benefit (FAS DB) plan, teachers accrue benefits unevenly over the course of their career. Only a minority of workers who spend their entire career in Louisiana public schools actually earn a relatively comfortable retirement. The majority receive significantly lower pension benefits.

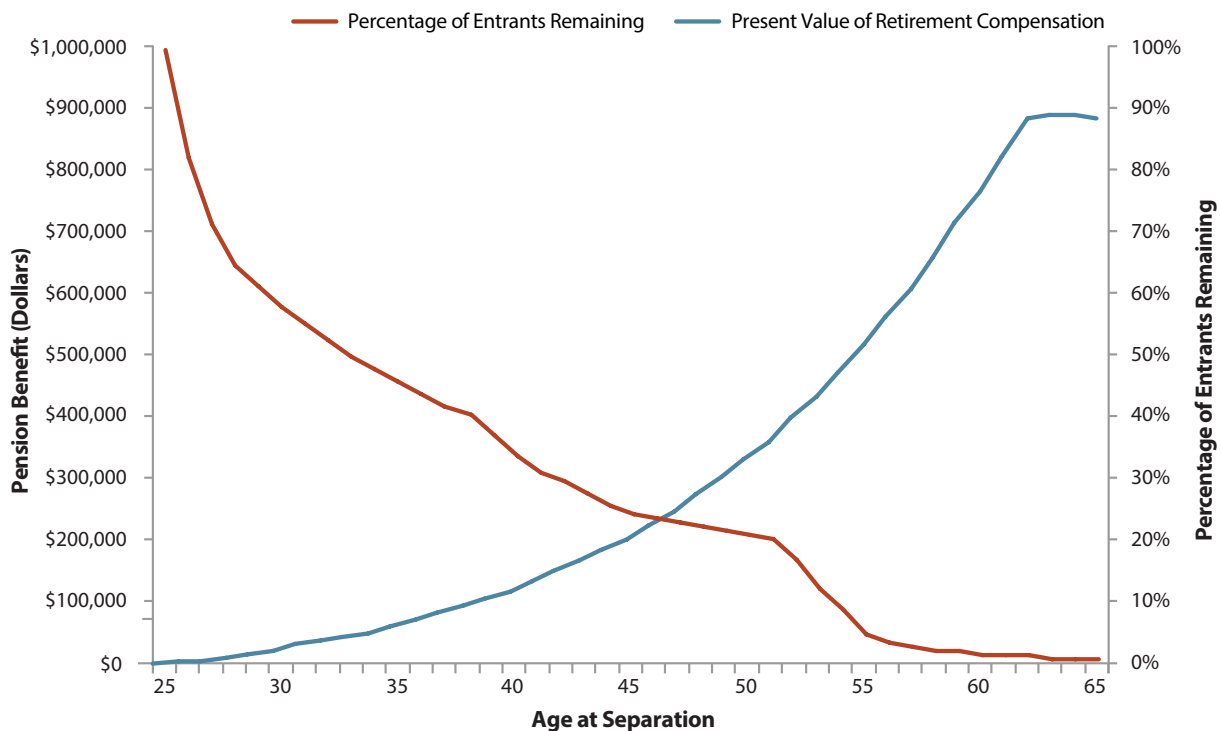
In fact, according to the state's own actuarial estimates, *nearly half of all new teachers will not qualify for a pension at all* because they will change careers or move before meeting the plan's five-year vesting requirements. Although those teachers and their employer will pay into the pension system, the teachers will not receive any of the sizable contribution their employer made on their behalf, nor will they receive any of the interest earned on their own savings. By forfeiting these funds, they will lose out on thousands, or even tens of thousands, of dollars in compensation and will be forced to play catch-up for the rest of their careers.

The pension accrual problem has been further compounded by legislative changes that Louisiana enacted in 2011. The legislature modified benefit calculations in an effort to save money and address "spiking," where workers seek to qualify for larger pensions by increasing their salaries through added overtime or other means at the end of their careers. After the change, benefits were based on the salary a teacher earned during his or her final five years of service rather than the final three years of service, as was the previous case. This change hurts teachers with shorter tenures and lower salaries—many of whom work in urban areas and charter schools. As of 2012, 61 percent of teachers in the charter sector were not vested—40 percentage points higher than

the statewide figure—and only 4 percent had 20 or more years of experience.<sup>7</sup> Thus, the new policy has had a disproportionate impact in high-priority areas where the state has devoted significant resources to improving the quality of education.

This is not just a problem for teachers with short tenure. Because of the way the system is designed, teachers accrue only minimal benefits during their first two decades of service (Figure 2). For example, after 20 years of service, a Louisiana teacher’s total *lifetime* pension wealth, in net present dollars, would be just \$203,000. That amount is only slightly more than the amount he or she would have contributed to the system during his or her career (see the Technical Appendix for our full methodology). So, in addition to the large group of teachers who don’t qualify for a pension at all, another group of mid-career teachers will suffer. **All told, nearly 70 percent of teachers in Louisiana will be net losers from the state’s pension plan.**<sup>8</sup>

**Figure 2 Few Teachers Qualify for Louisiana’s Back-Loaded Pension Benefits**



Source: Authors’ calculations; Teachers’ Retirement System of Louisiana actuarial valuation reports; and the Society of Actuaries RP 2014 Mortality Table. Note: Model is based on a 25-year-old entrant.

There is a common misconception that all public-sector workers earn generous pension benefits, but in reality, teachers in Louisiana must spend *39 consecutive years in the classroom* to earn the maximum retirement value of \$886,000. State data show that just 1 percent of teachers who start teaching at age 25 will remain in the classroom long enough to qualify for an unreduced benefit at age 62. Moreover, after a teacher qualifies for the maximum pension, he or she will actually forfeit benefits each additional year that he or she remains in the classroom. This amounts to an arbitrary penalty that encourages teachers to retire at a certain age regardless of their personal preferences or whether they are still effective educators.

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Perhaps if Louisiana had kept its retirement costs under control, not as many of its teachers would have to take on second jobs while teaching.

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While the 1 percent of teachers who work long enough to qualify for the maximum benefit may earn disproportionately large pensions, they have traded years of lower salaries in exchange for income that is awarded only at the end of their careers. If they had earned higher salaries throughout their tenure, they could have used that money at their discretion. A 2014 report found that 12 percent of Louisiana teachers take on second jobs to supplement their income, and those teachers earn an additional \$7,000 a

year.<sup>9</sup> Perhaps if Louisiana kept its retirement costs under control, it could afford to pay teachers higher base salaries, and fewer teachers would have to take on second jobs. Recent research also suggests that teachers may prefer higher base salaries to more generous retirement policies; pension benefit formulas and contribution rates are decided by state legislators and accountants, not by teachers or their employers.<sup>10</sup>

## There Are Better Options for Louisiana

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In addition to being inequitable, Louisiana's FAS DB plan is also volatile. The plan requires managers to make a number of predictions about demographic and market trends in order to determine the amount of money the government must save now to cover the cost of providing benefits to future retirees. If those predictions are wrong, the cost of providing promised benefits could rise substantially, leaving schools and teachers on the hook to make up the difference.

One way to address this problem would be to implement an alternative plan design that would allow Louisiana to deliver the same level of retirement benefits in a cost-neutral manner. Other types of retirement plans offer benefits based on the value of retirees' individual savings at retirement, which limits contribution volatility and helps ensure that school districts have enough funding to cover their promises to workers. For example, 401(k)-style Defined Contribution (DC) plans are funded through a combination of employee and employer contributions (*i.e.*, employers do not guarantee that retirees will earn a certain level of retirement benefits), plus whatever investment returns plan members earn on their savings. Cities and states have also adopted hybrid plans that combine traditional pensions with a DC component or Cash Balance (CB) plans that guarantee a moderate interest rate on a member's savings.

These alternative plans offer advantages for both employers and employees. First, an alternative retirement plan would stop Louisiana from accruing more debt. Contribution rates for school districts and teachers would not increase unless employers chose to expand benefits for workers, and policymakers would be better able to estimate costs for short- and long-term budgeting purposes. Second, these plans would provide Louisiana's workers with more control over their savings and greater flexibility regardless of where their career paths may take them. Moreover,

workers would accrue benefits evenly over the course of their careers, which would allow governments to provide sufficient benefits to all employees.

Figures 3A and 3B compare Louisiana's existing FAS DB plan to two other retirement plans (see the Technical Appendix for specifics about how each plan was modeled). The graphs show retirement wealth accumulation for 25-year-old teachers over 10- and 40-year periods, respectively. In both graphs, the red lines represent the existing FAS DB plan offered to all teachers hired after 2015.

The grey lines represent a DC plan offered to employees in Louisiana's state university system (called the Optional Retirement Plan, or ORP). The blue lines represent a CB plan that includes the same features as the one proposed by former Governor Bobby Jindal in 2012. That plan passed the state legislature by a simple majority but was subsequently declared unconstitutional on procedural grounds that required a two-thirds majority.

Both the ORP and CB could include annuities that would provide workers with steady, guaranteed payments throughout their retirement years. As shown in Figure 3A, the 55 percent of teachers who teach for 10 or fewer years would be better off under either of the two alternative plans. Although Figure 3B shows a slight advantage under the existing FAS DB plan for teachers who spend 30 to 35 consecutive years in the system, very few Louisiana educators actually reach that threshold.

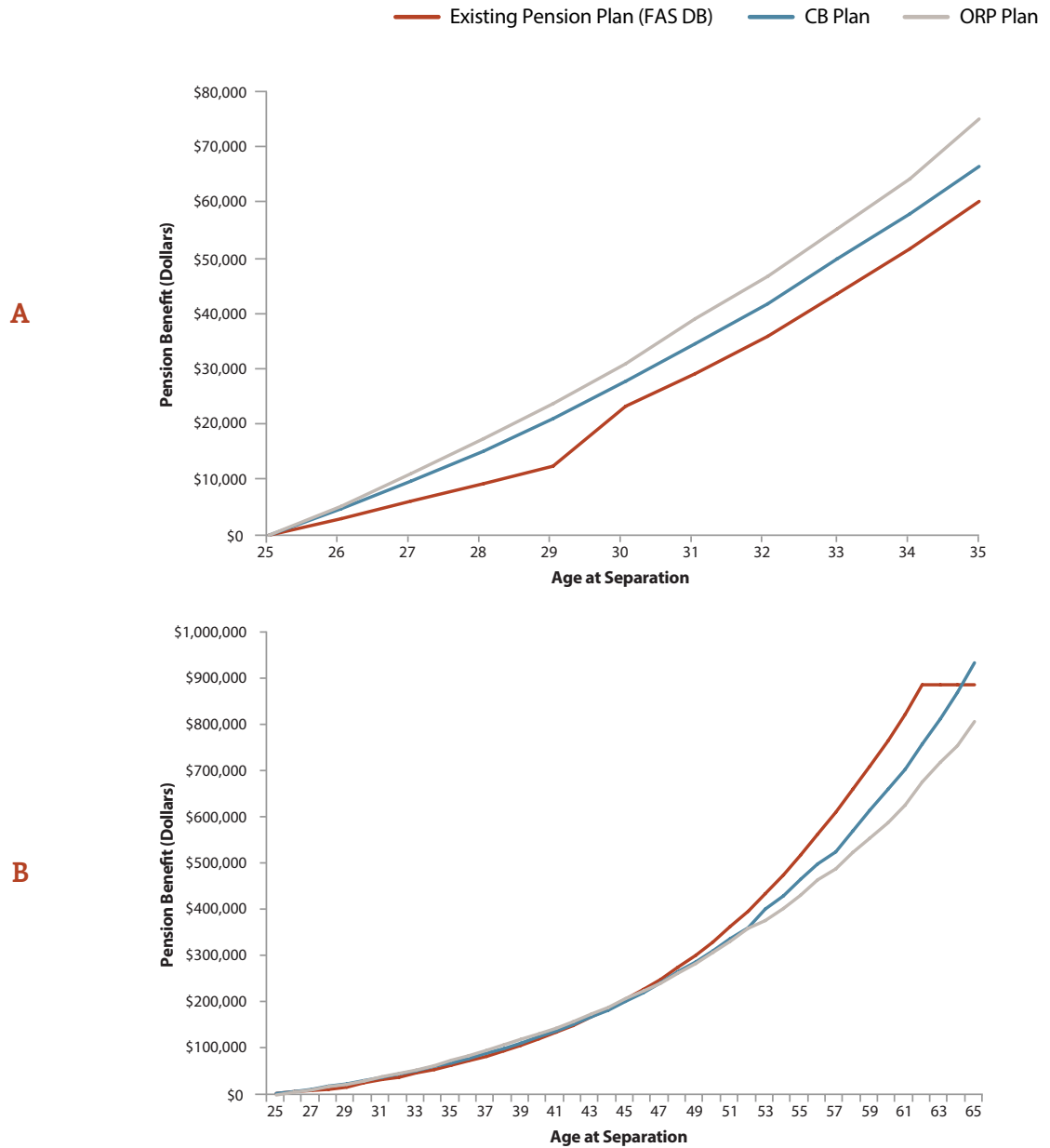
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Louisiana could adopt new, cost-neutral retirement plans that put all teachers on a path to a secure retirement.

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Importantly, both the ORP and CB plans are comparable in cost to the existing FAS DB plan's *normal cost*. However, if debt costs are included, the existing FAS DB plan is nearly three times more expensive than either the ORP plan or the CB plan, meaning that the cost of transitioning to either the ORP or CB plan would be minimal. Notably, Louisiana would not accumulate debt going forward under the ORP or CB plans, and both plans would put all teachers on a path to a secure retirement.

**Figure 3 The Vast Majority of Louisiana's Teachers Would Be Better Off Under Cost-Neutral Alternative Plans**



Source: Authors' calculations; Teachers' Retirement System of Louisiana actuarial valuation reports; Teachers' Retirement System of Louisiana "Optional Retirement Plan (ORP)," Louisiana State Legislature "2012 Regular Session Actuarial Note," and Society of Actuaries RP 2014 Mortality Table.

## Recommendations

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**For the sake of its students, teachers, and schools, Louisiana must take bolder steps to address its pension debt.**

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Louisiana must take bolder actions to address its \$11.7 billion pension debt and improve retirement security for its dedicated public workers. The state's first step should be to mitigate the consequences of the debt for students, teachers, and schools by following the

advice presented by the Society of Actuaries Blue Ribbon Panel.<sup>11</sup> Recommendations include: i) establishing payment schedules using a funding policy with a layered, closed-period amortization not to exceed 20 years, and ii) setting forward-looking investment return assumptions according to market conditions. Although TRSL recently reduced its assumed discount rate from 8 to 7.75 percent,<sup>12</sup> achieving those figures will be more challenging in an environment where interest rates are much lower than they were in the past.<sup>13</sup> Thus, the state should consider lowering its assumption even further to more closely match the present market environment.

Furthermore, the state's pension debt was not caused by students or teachers. Therefore, legislators should not expect schools to bear the full burden. The state should treat its current debt as a legacy cost incurred by years of reckless decisions made by state legislators. It's neither fair nor good practice to ask *future* students to pay for past debts. Currently, school districts are facing what is essentially a 26.2 percent pension tax for every dollar they spend on teachers' salaries, which makes it difficult for districts to increase workers' pay and to recruit and retain effective educators. Given that politicians caused this problem, the state—and not its school districts—should bear the budgetary burden of fixing it.



The state should also consider enrolling all new teachers in Social Security. Although Social Security faces its own set of challenges, enrolling all employees in the program would be another way for Louisiana to ensure that all workers could accumulate sufficient savings regardless of where their career takes them. Incorporating Social Security into workers' compensation packages would also take some of the pressure off the state's retirement system to serve as a standalone retirement benefit.

Finally, Louisiana should address the structural problems with the teacher pension plan. The state could adopt existing models or expand them to make the system more equitable. For example, simply extending the retirement plan already offered to state university employees to public school teachers would significantly improve benefits for Louisiana's K-12 teachers. Similarly, the CB plan approved by the state legislature in 2012 would put all teachers on a path to a secure retirement. Either of these reforms would be better for Louisiana's teachers and would ensure that the state does not take on additional debt going forward.

Although Louisiana's pension challenges are significant, they are not insurmountable. However, it is important that the state take action now to keep the problem from escalating into a full-scale financial crisis. By taking steps to reform its teacher pension plan as well as its funding policy, Louisiana can make meaningful improvements in the quality of education and in the financial health and security of its communities.

## Technical Appendix

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Calculations for benefits and turnover rates in Teachers' Retirement System of Louisiana (TRSL) were generated using benefit parameters for new hires as established in TRSL publications and through a Freedom of Information Act request (outlined in Table 1).<sup>14</sup>

### Current Pension Benefit Model

Louisiana teachers earn retirement benefits through a traditional final average salary defined benefit plan (FAS DB) system. Thus, the present value of a worker's retirement annuity can be calculated at various separation ages using standard actuarial techniques. The methods used in this brief follow McGee and Welch (2016)<sup>15</sup>, using benefit provisions from the state statute (Table 1) as input. Therefore, the model generates pension benefits earned by an example teacher who begins teaching at age 25 at each point in the teacher's career.<sup>16</sup>

### Optimal Retirement Plan

We also model Louisiana's Optimal Retirement Plan (ORP), a Defined Contribution (DC) plan offered to Louisiana's higher education employees.

Equation (1) calculates the total benefits accrued under the ORP plan,  $ORP_{a_s}$  at a given age of separation,  $a_s$ , and adjusted for inflation,  $i$ . This equation is a function of wages,  $W$ ; employer and employee contribution rates,  $CR$ ; cumulative total contributions up to a specified age,  $TC$ ; and the rate of return,  $r_w$  earned on those contributions under the plan's benefit provisions.<sup>17</sup>

$$ORP_{a_s} = \frac{[W_{a-1} * CR] + [TC_{a-1} * (1 + r_w)]}{(1 + i)^{a-e}} \quad (1)$$

$$TC_{a_e} = 0 \quad (1')$$

### Cash Balance Pension Plan

The Cash Balance (CB) plan combines features of both FAS DB and a DC pension plan (*i.e.*, notional individual accounts and a formula for determining benefit at retirement). The employees' accounts are notional in that the plan tracks the value of each employee's account, but all assets are pooled together and professionally managed by the plan fiduciary.

Similar to equation (1), the value of an employee's account in a CB plan is equal to the sum of annual contributions (both employee and employer) and annual interest credits.

In the case of House Bill 61, passed in 2012, the employee's rate of return is 1 percentage point less than the return received by the state's investments; however, employees are guaranteed a minimum return of 0 percent interest.<sup>18</sup> That is, employee accounts can never lose value.

Correspondingly, equation (2) calculates the total benefits accrued under the CB plan,<sup>19</sup>  $CBB_{a_s}$  given age of separation  $a_s$ .

$$CBB_{a_s} = \frac{[W_{a-1} * CR] + [TC_{a-1} * \max_{0 \leq r_w} ((1 + r_w) - 0.01), 1]}{(1 + i)^{a-e}} \quad (2)$$

$$TC_{a_e} = 0 \quad (2')$$

**Table 1** Benefit Calculation Parameters and Economic Assumptions

	TRSL FAS—DB	TRSL—ORP	TRSL—CB
<b>Member Contribution Rate<sup>20</sup></b>	8.0%	7.5%	8.0%
<b>Employer Contribution Rate<sup>21</sup></b>	Based on the actuarial cost method and assumptions.	6.2%	4.0%
<b>Interest on TRSL Member Contribution Accounts<sup>22</sup></b>	4.0%	Annual interest credit is modeled based on a lognormal distribution with a mean equal to the system's assumed rate of return of 7.75%, with a standard deviation of 12%.	Annual interest credit is modeled based on a lognormal distribution with a mean equal to the system's assumed rate of return of 7.75%, with a standard deviation of 12%. The generated rate is reduced by 1%, and the floor is set at 0%.
<b>Vesting<sup>23</sup></b>	5	Immediate vesting	Immediate vesting
<b>Eligibility Thresholds<sup>24</sup></b>	<ul style="list-style-type: none"> <li>• 5 years of service at age 62</li> <li>• 20 years of service at any age (actuarially reduced)</li> </ul>	N/A	N/A
<b>Early Retirement Reduction<sup>25</sup></b>	Reduced by an actuarially determined percentage provided by TRSL.	None	None
<b>Benefit Multiplier<sup>26</sup></b>	2.5%	N/A	N/A
<b>Cost of Living Adjustment<sup>27</sup></b>	Assumed to be 1.5% and limited to first \$60,000 of a retirees' annual benefit.	N/A	N/A
<b>Highest Average Salary<sup>28</sup></b>	5 highest consecutive years of employment	N/A	N/A
<b>Inflation<sup>29</sup></b>	2.5%	2.5%	2.5%

### Cohort Survival Probability

Separation and retirement hazard rates are used to determine the percentage of teachers who leave before reaching different career milestones. The method to calculate this turnover rate follows Aldeman and Welch (2015).<sup>30</sup>

In each Actuarial Valuation Report,<sup>31</sup> TRSL summarizes withdrawal and retirement hazard rates in buckets by age and years of service for its member population. We generated longer-term turnover rates using these annual hazard rates.

To expand the hazard rates provided by TRSL, we assume that the rate holds for each year within the bucket. For example, let  $h_{[a,b]}$  represent the rate from year  $a$  to year  $b$ . If the plan reports a rate,  $x$ , for the range  $a$  to  $b$ , the rate in  $a$  will be  $x$  and the rate in  $b$  will also be  $x$ . To be clear:  $h_{[a,b]} = x$ , and so  $h_a = x$  and  $h_b = x$ .

We then combined the hazard rates. Specifically, for each age/year of service combination, the separation hazard rate is used when the member is *not* eligible ( $e = 0$ ) for retirement, and the retirement hazard rate is used when the member is eligible for retirement ( $e = 1$ ).

$$\text{Total Hazard}_{a, \text{yos}} = h_{a, \text{yos}}^{\text{separation}} \quad \text{if } e = 0 \quad (3)$$

$$\text{Total Hazard}_{a, \text{yos}} = h_{a, \text{yos}}^{\text{retirement}} \quad \text{if } e = 1 \quad (4)$$

Finally, we calculated the survival rate for a cohort with the same entry age, where the initial hazard rate begins at the age of entry,  $a_e$ , and zero years of service. The second value of the hazard rate will be at one plus the entry age and one year of service. The third value of the hazard rate will be at two plus the entry age and two years of service, and so on. The initial survival rate at the age of entry is one. From there on, the survival rate equals the rate in the previous year multiplied by the previous year's total hazard rate subtracted from one. Note that the cohort's years of service are equal to the difference between the cohort's age today,  $a$ , and its entry age. After calculating the survival rate, it is easy to find the turnover rate.

$$\text{Survival Rate}_{ae} = 1 \quad (5)$$

$$\text{Survival Rate}_a = \text{Survival Rate}_{a-1, a > ae} * (1 - \text{Total Hazard}_{a-1}) \quad (6)$$





$$\text{Turnover Rate}_a = 1 - \text{Survival Rate}_a \quad (7)$$

## Endnotes

- <sup>1</sup> As of 2014, only six states had state and local contribution rates higher than Louisiana. See Chad Aldeman, "The Pension Pac-Man: How Pension Debt Eats Away at Teacher Salaries," *Bellwether Education Partners*, May 2016. [http://bellwethereducation.org/sites/default/files/Teacher%20Pension%20Pac-Man\\_Web.pdf](http://bellwethereducation.org/sites/default/files/Teacher%20Pension%20Pac-Man_Web.pdf).
- <sup>2</sup> Recent data comes from Comprehensive Annual Financial Reports and Actuarial Valuations Reports for Teachers' Retirement System of Louisiana. For previous years, we looked at data from "Search: Comparative Retirement Study of Major Public Employee Retirement Systems, 1982–2012," Wisconsin State Legislature, [http://docs.legis.wisconsin.gov/misc/lc/comparative\\_retirement\\_study](http://docs.legis.wisconsin.gov/misc/lc/comparative_retirement_study).
- <sup>3</sup> Authors' calculations using data from Department of Education Louisiana Believes, the Common Core Data, and the Bureau of Labor Statistics.
- <sup>4</sup> Source: Comprehensive Annual Financial Reports and Actuarial Valuations Reports, Teachers' Retirement System of Louisiana, [https://www.trsl.org/main/my\\_trsl/reports](https://www.trsl.org/main/my_trsl/reports).
- <sup>5</sup> Aldeman, "The Pension Pac-Man," [http://bellwethereducation.org/sites/default/files/Teacher%20Pension%20Pac-Man\\_Web.pdf](http://bellwethereducation.org/sites/default/files/Teacher%20Pension%20Pac-Man_Web.pdf).
- <sup>6</sup> "Rankings and Estimates: Rankings of the States 2015 and Estimates of School Statistics 2016," *National Education Association*, March 2016, [http://www.nea.org/assets/docs/2016\\_NEA\\_Rankings\\_And\\_Estimates.pdf](http://www.nea.org/assets/docs/2016_NEA_Rankings_And_Estimates.pdf).
- <sup>7</sup> "National Center for Education Statistics, Schools and Staffing Survey (SASS), Public Teachers Data File 2011–12," *US Department of Education*, <https://nces.ed.gov/surveys/sass/>.
- <sup>8</sup> Chad Aldeman and Richard W. Johnson, "Negative Returns: How State Pensions Shortchange Teachers," *urban.org*, September 2015, <http://www.urban.org/sites/default/files/alfresco/publication-pdfs/2000431-Negative>Returns-How-State-Pensions-Shortchange-Teachers.pdf>.
- <sup>9</sup> Ulrich Boser and Chelsea Straus, "Mid- and Late-Career Teachers Struggle with Paltry Incomes," *Center for American Progress*, July 23, 2014, <https://cdn.americanprogress.org/wp-content/uploads/2014/07/teachersalaries-brief.pdf>.
- <sup>10</sup> See, for example, Maria Donovan Fitzpatrick, "How Much Are Public School Teachers Willing to Pay for Their Retirement Benefits?" (NBER Working Paper No. 20582), October 2014, <http://www.nber.org/papers/w20582>.
- <sup>11</sup> "Report of the Blue Ribbon Panel on Public Pension Plan Funding," *Society of Actuaries*, February 2014, <https://www.soa.org/blueribbonpanel/>.
- <sup>12</sup> The Board of Trustees adopted a discount rate of 7.75 percent effective June 30, 2014. See "2015 Comprehensive Annual Financial Report," *TRSL*, accessed October 9, 2016, [https://www.trsl.org/uploads/File/Annual%20Reports/2015\\_CAFR\\_web.pdf](https://www.trsl.org/uploads/File/Annual%20Reports/2015_CAFR_web.pdf).
- <sup>13</sup> In effect, Louisiana will be betting on markets to yield a return that is almost three times larger than it was in the early 1990s relative to rates earned in the bond market. The current difference between TRSL's expected rate of return and the 20-year Treasury Constant Maturity is around 5.20 percent.
- <sup>14</sup> We used the benefit rules under TRSL's Regular Plan for teachers who were hired on or after July 1, 2015. See "Pocket Guide for new & returning members," *TRSL*, April 2016, [https://www.trsl.org/uploads/File/Brochures/pocketGuide\\_web.pdf](https://www.trsl.org/uploads/File/Brochures/pocketGuide_web.pdf). We received early retirement actuarial reduction factors for FY 2015 from TRSL staff on January 25, 2016, through a Freedom of Information Act (FOIA) request.
- <sup>15</sup> Josh McGee and Michelle H. Welch, "Modeling Pension Benefits," *urban.org*, March 2016, <https://urbanorg.app.box.com/s/2sh31xiv1bxfvsga5z05509deotvlfbg>.
- <sup>16</sup> Salaries for the member profiles are based on the salary schedule of a teacher with a master's degree and highly effective performance pay working in New Orleans Public Schools. See Orleans Parish School Board Salary Scale 2015-2016 Academic Year, at <http://opsb.us/wp-content/uploads/2012/10/2015-16-Salary-Scale.pdf>.
- <sup>17</sup> The rate of return,  $r_w$ , is assumed to be lognormally distributed, where the mean is the natural logarithm of the plan's assumed discount rate and the standard deviation is the natural logarithm of 12 percent. In the current implementation of this model, this equation was run 1,000 times, and the total benefit accrued under the plan is given by the median across all 1,000 iterations.

- <sup>18</sup> See LA State Legislature page for House of Bill No. 61, Regular Session—2012, which provides for a cash balance plan for certain state employees at <https://legiscan.com/LA/text/HB61/2012> and 2012 Regular Session Actuarial Note at <http://www.legis.la.gov/legis/ViewDocument.aspx?d=795726>.
- <sup>19</sup> The rate of return,  $r_w$ , is assumed to be lognormally distributed, where the mean is the natural logarithm of the plan's assumed discount rate and the standard deviation is the natural logarithm of 12 percent. In the current implementation of this model, this equation was run 1,000 times, and the total benefit accrued under the plan is given by the median across all 1,000 iterations.
- <sup>20</sup> Member contribution rates are specified in TRSL publications such as in "Pocket Guide for new & returning members," TRSL, April 2016.
- <sup>21</sup> For FAS DB, employer contributions are determined using the entry age normal actuarial cost method, as required by statute and actuarial assumptions regarding future plan experience. See Teachers' Retirement System of Louisiana June 30, 2016 Actuarial Valuation" TRSL, October 7, 2016. For the ORP, see "Optional Retirement Plan (ORP)," TRSL, accessed October 9, 2016. For CB, see "2012 Regular Session Actuarial Note," Louisiana State Legislature, accessed October 9, 2016.
- <sup>22</sup> See LA State Legislature page for 2012 Regular Session Actuarial Note at <http://www.legis.la.gov/legis/ViewDocument.aspx?d=795726>.
- <sup>23</sup> A worker is vested upon completion of five years of service credit. See "Pocket Guide for new & returning members," TRSL, April 2016.
- <sup>24</sup> Retirement age for the ORP and CB are based on eligibility thresholds defined by TRSL; see *ibid*.
- <sup>25</sup> We received early retirement actuarial reduction factors for FY 2015 from TRSL staff on January 25, 2016, through a Freedom of Information Act (FOIA) request.
- <sup>26</sup> The benefit factor used to calculate the retirement benefit is based on plan membership and date of enrollment. For this model, we used the Regular Plan TRSL membership on or after July 1, 1999. See "Pocket Guide for new & returning members," TRSL, April 2016.
- <sup>27</sup> Permanent benefit increases (PBI) are limited to the lesser of the increase in the CPI-U for the 12-month period ending on the system's valuation date or an amount determined by the system's funded ratio: If funded ratio < 55% yields a 0% of PBI limit, from 55% to <65% is 1.5% of PBI; from 65% to 75% is 2.0%; from 75% to 80% is 2.5%; and 80%+ is 3.0% limit. If the actuarial rate of return for the previous plan year is less than 8.25%, regardless of the discount rate, the increase is limited to the lesser of 2% or the previously described. Beginning July 1, 2015, any increase is limited to the first \$60,000 of a retiree's annual benefit, increased annually by the CPI-U for the 12-month period ending in June. Although this cap is incorporated in the model, the salary schedule used results in a final-average-salary that is less than \$60,000 (adjusted at 2.5% inflation) and so all teachers would receive the full benefit. In addition, benefits are restricted to those retirees who have attained age 60 and have been retired for at least one year. See Teachers' Retirement System of Louisiana June 30, 2016 Actuarial Valuation" TRSL, October 7, 2016.
- <sup>28</sup> The average compensation considered in this model is based on members hired on or after January 1, 2011. See "Pocket Guide for new & returning members," TRSL, April 2016. Salaries for the member profiles are based on the salary schedule of a teacher with a master's degree working in New Orleans Public Schools. See "Orleans Parish School Board Salary Schedule 2012-2013," National Council on Teacher Quality, accessed October 9, 2016, [http://www.nctq.org/docs/New\\_Orleans\\_12-13\\_salary.pdf](http://www.nctq.org/docs/New_Orleans_12-13_salary.pdf).
- <sup>29</sup> Teachers' Retirement System of Louisiana June 30, 2016 Actuarial Valuation" TRSL, October 7, 2016.
- <sup>30</sup> Aldeman, Chad., and Michelle Welch. 2015. "Few Reach the Peaks: How to Fix Colorado's Teacher Pensions." *TeacherPensions.org*; Laura and John Arnold Foundation and Bellwether Education Partners.
- <sup>31</sup> Teachers' Retirement System of Louisiana June 30, 2016 Actuarial Valuation" TRSL, October 7, 2016.

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