Case Study: Los Angeles's Pension Slide, 2003-2013

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Introduction

Public pension plans across the nation are in fiscal distress.[i] Generally underfunded, most now require far greater contributions from governments than initially envisioned. Indeed, high costs associated with retirement benefits contributed to both Stockton's and Vallejo's bankruptcies.[ii] They now pose serious threats to other localities, and the state as well.

Among California's cities, Los Angeles has the largest pension obligation. Regularly facing budget deficits, the city has generated increasing scrutiny for the rising costs associated with contributions to its pension plans. Los Angeles faces a $222 million budget deficit for the current fiscal year and a forecasted $427 million deficit for fiscal year 2014-15.[iii]

Pension costs are a large component of city spending.[iv] In 2012-13, Los Angeles's pension costs are expected to rise to $1.3 billion, or 18% of the city's budgeted expenditures. In 2002-03, just 10 years ago, pension costs were only $157 million, or 3% of total expenditures. In fact, over the last decade, pension costs have grown at an annual average rate of 25%, significantly outpacing growth among all other major areas of the budget.

The city's pension costs are rising principally because over the last decade, Los Angeles's pension funds have performed well below the investment rate those funds assume they will earn. To make up for the failure to earn the expected return, the city has had to make larger and larger annual contributions to these funds in order to fulfill promised obligations to employees and retirees.

In order to have sufficient funding to pay for all benefits earned, Los Angeles *should have* accumulated $41.1 billion in its pension trust funds.[v] Instead, the city only has $31.7 billion in assets, leaving it with a $9.4 billion unfunded liability.[vi] This pension liability is calculated assuming that the pension trust funds will earn a 7.75% average annual rate of return.

Supported by recent investment shortfalls, many have stated that using such a return rate assumption is overly optimistic and that the actual liability is therefore higher than reported in city totals. Moody's Credit Rating Agency has proposed a change to its methodology: it would use a 5.5% investment assumption that is based on recent average yields on high-grade long-term corporate bonds.[vii] Using this assumption for measuring unfunded liabilities would boost Los Angeles's unfunded balance to $25.9 billion, meaning that the city would have to contribute even more to its pension plans.

To reduce pension costs, to date, city officials focused on reducing pension benefits for new employees, but such an approach is insufficient for achieving significant reform. Reducing benefits for new employees and not current employees and retirees has no impact on the existing unfunded liability and still leaves the city with the tab for pension benefits that have already been earned. Absent meaningful reform and/or greatly improved investment performance, pension costs will continue to rise and more and more of the city's budget will be directed to retirement benefits instead of public services.

In this analysis of the Los Angeles pension system, we examine in greater detail the growth of the city's pension expenses, the causes of the growth, and the challenges the city faces in handling its pension problems.

Our findings include the following:

- In 2012-13, Los Angeles's pension costs are expected to rise to $1.3 billion, or 18% of the city's budgeted expenditures. In 2002-03, just 10 years ago, pension costs were only $157 million, or 3% of total expenditures.
- Over the last decade, pension costs have grown at an annual average growth rate of 25% and have outpaced spending growth for every major area of the city's budget.
- In 2012-13, the city of Los Angeles is expected to spend up to 32 cents toward pension benefits for every dollar it spends on total payroll for its

employees. Employees will pay 9 cents for every dollar of payroll.

- From 2003 to 2012, the total official funding ratio of the city's pension plans declined from 99.7% to 77.2%. Correspondingly, the city's officially-reported unfunded liability increased from $87 million to $9.4 billion, more than a 100-fold increase.
- The growth in the unfunded liability and declines in the funding ratio are largely attributable to investment returns falling below the rate pension plans assumed they would earn (on average 7.75% per annum, net of expenses, on a portfolio consisting largely of bonds and equities). Over the last 10 years, LACERS, LAFPP, and LADWP pension trust funds have earned compound annual rates of return of 6.46%, 6.68%, and 5.11%, respectively. Over the last five years, these return rates were 0.68%, 1.06%, and 1.47%, respectively.
- Using Moody's investment return assumption (5.5%), the unfunded liabilities would nearly triple to $25.9 billion.

Background: Los Angeles Pension Plans

Governed by its city charter, Los Angeles maintains three independent pension funds for its employees: Los Angeles Fire and Police Pension System (LAFPPS), Los Angeles City Employee's Retirement System (LACERS), and the Los Angeles Water and Power Employees' Retirement Plan (LADWP) (Table 1). All three plans base an employee's pension benefits on his or her number of years of service, retirement age, and highest 12-month average salary. Employees are promised a set percentage of their highest average salary, according to the formula for their member type and tier (Appendix B). As of June 30, 2012, these three plans together provided retirement benefits for 38,113 retirees and beneficiaries who received an average yearly benefit of $48,218.

Pension benefits paid in the next few decades will largely be based on the benefits earned by the active workforce. Los Angeles's pension plans have a total 47,275 active members. Currently, city employees earn an average salary of $85,621. As of June 30, 2012, the city's three plans had an officially reported total Actuarial Accrued Liability (AAL) of $41 billion, which refers to the amount the city *should have* set

Table 1: Quick Facts – Los Angeles Pension Plans[viii]

Variable[viii]	LACERS	LAFPP	LADWP	Total
Active Membership	24,917	13,396	8,962	47,275
Average Age	48	42	49	46
Years of Service	14	15	18	15
Average Payroll	$73,013	$100,173	$98,922	$85,621
Retirees & Beneficiaries	17,223	12,380	8,510	38,113
Average Yearly Benefit	$39,301	$60,136	$48,929	$48,218
Actuarial Accrued Liability (AAL)	$14,393,958,574	$17,030,833,184	$9,692,602,852	$41,117,394,610
Assets	$9,934,959,310	$14,251,913,532	$7,573,885,754	$31,760,758,596
Unfunded AAL	$4,458,999,264	$2,778,919,652	$2,118,717,098	$9,356,636,014
Funding Ratio	69.0%	83.7%	78.1%	77.2%

aside in its pension funds to fully pay for promised benefits.[ix] This figure is based on the plans' 7.75% discount rate, which the city sets equal to its pension funds' assumed investment rate of return.[x]

To fund these promised benefits, the city has accumulated $31.8 billion in assets, leaving $9.4 billion unfunded. This means that together, Los Angeles's pension plans have a funding ratio of 77%. Among the individual plans themselves, LAFPP currently has the highest funding ratio (83.7%), followed by LADWP (78.1%), and then LACERS (69%). Each plan's goal is to be 100% funded to ensure that it has enough money to pay for the benefits promised.

Growth of the Unfunded Liability

Los Angeles's pension plans have not always been this underfunded. Indeed, in 2003, the pension plans were officially reported as being nearly fully funded, with an aggregate funding ratio of 99.7% and an unfunded liability of only $87 million. Since 2003, however, the funding ratio has fallen to 77%.[xi] The funding ratio declines when the growth in the AAL (total liability) outpaces the growth in the city's assets. Since 2003, the AAL has grown at an annual average rate of 5.7% but the city's assets have only grown by an annual average of 2.8%. The relative lag in asset growth has increased the unfunded liability over ten fold.

Table 2: Change in Funding Status of Los Angeles Pension Plans (2003 v. 2012, in billions, actuarial value of assets)[xii]

Variable	2003	2012	Difference	Growth Rate
AAL	$24.9	$41.1	$16.2	5.7%
Assets	$24.8	$31.8	$7.0	2.8%
UAAL	$0.1	$9.4	$9.3	68.2%
Funding Ratio	99.7%	77.2%	-22.5%	n/a

The city's officially reported liabilities do not fully reflect the actual value of earned pension benefits, but rather, their cost under an investment assumption of a 7.75% average annual return. Therefore, to ensure that enough funds are available for future payments toward all benefits earned, the officially reported liabilities reflect the amount of money required today to be invested in a trust fund that has an average annual return of 7.75%.This means that the liability calculations rely heavily upon the assumptions of investment earnings. This is why so much emphasis is placed on the *actual* rate of return of these trust funds compared to their *expected* rates of return. The funds are *expected* to achieve an average annual rate of return of 7.75%, but this has *actually* not been the case in recent years.

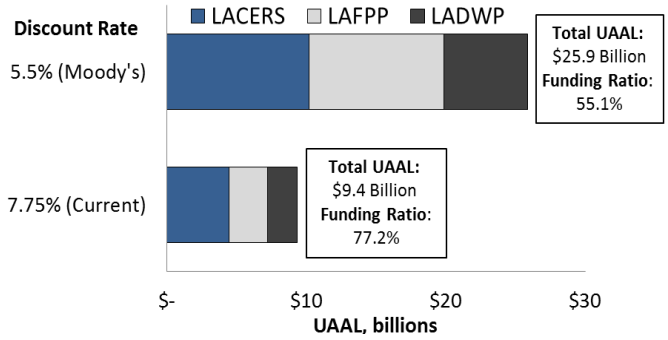
Table 3: Pension Plan Investment Return[xiii]

Plan	Assumed Return Rate	5-year Average	10-Year Average
LACERS	7.75%	0.68%	6.46%
LAFPP	7.75%	1.06%	6.68%
LADWP	7.75%	1.47%	5.11%

Over the last 10 years, LACERS, LAFPP, and LADWP pension trust funds have earned rates of return of 6.46%, 6.68%, and 5.11%, respectively. And over the last five years, these return rates were 0.68%, 1.06%, and 1.47%, respectively. Thus recent investment performance has failed to meet the plan's assumed target. Plan sustainability largely depends on the funds achieving these returns, and if they do not, Los Angeles must spend more on pensions to make up for the investment shortfalls.

In other words, if investment returns are less than assumed, the *actual* unfunded liability for each plan will be much higher than currently reported. Even small changes in the investment rate of return assumption will drastically increase the unfunded liability. Recent experience suggests the plan's assumed rate of return is overly optimistic. Moody's Credit Rating Agency has proposed using a lower risk 5.5% assumed rate of return which is based on recent average yields on high-grade long-term corporate bonds.[xiv] Using this rate, Los Angeles's aggregate unfunded liability nearly triples to $25.9 billion and the funding ratio falls to 55.1% (Figure 4).

Figure 4: Unfunded Liability with Changes in the Discount Rate[xv]

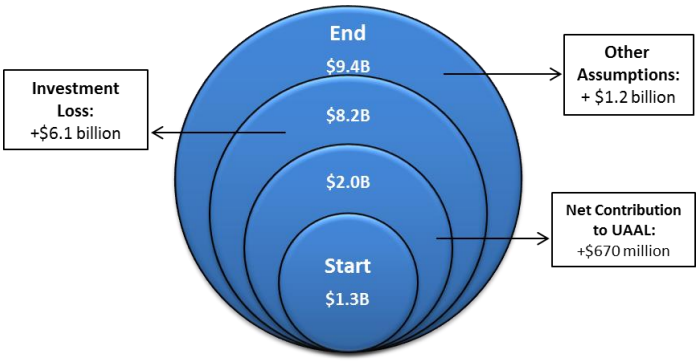


Tracking the sources of growth in the unfunded liability is difficult given the technical nuances contained within the actuarial methodology. The unfunded liability is very much "debt-like" in nature in that 1) contributions are made each year to pay it off, 2) it earns interest for each year it is not paid in full, and 3) additional pension obligations can be taken out (take on more "debt" in the form of additional benefits earned).

In 2004, the aggregate unfunded liability was only $1.3 billion. From 2004 to 2012, approximately $5.8 billion in liability was added due to newly earned pension benefits.[xvi] Additionally, the unfunded liability gained $2.4 billion in interest, which represents the investment earnings it would have earned had it been fully funded in a pension trust fund.[xvii] The city and its employees made contributions to pay down this liability by $7.6 billion.[xviii] Therefore, overall, the net contribution to the unfunded liability was $670 million ($5.8 billion + $2.2 billion - $7.6 billion). Then, had the actuarial assumptions been correct, the unfunded liability would have been only $2 billion in 2012. Instead, the fund's poor investment returns and deviations from the other assumptions increased it by over four fold.

The city assumes that its pension plans will earn a 7.75% average yearly return. However, as we found, actual investment performance did not match this assumption. These investment shortfalls accounted for $6.1 billion in additional unfunded liability. Additionally, deviations from expected payroll increases, retirement ages, cost of living adjustment (COLA) increases, and other assumptions increased the unfunded liability by $1.2 billion. Together, these components equal the 2012 UAAL of $9.4 billion, an $8 billion increase over 2004's UAAL (see Figure 5).

Figure 5: 2004 to 2012-Growth in Unfunded Liability (in billions, not to scale)[xix]



Pension Costs:

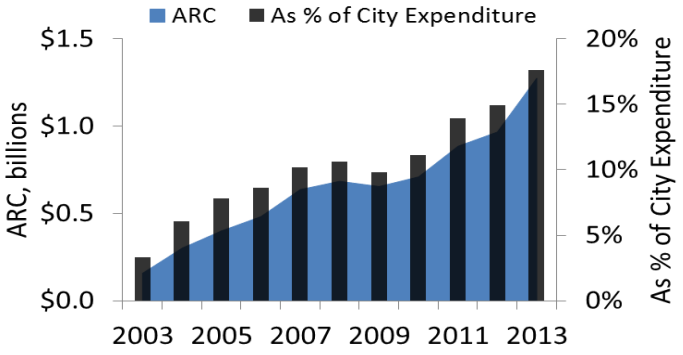
What does growth in unfunded liability mean for the city's budget? Quite simply, growth in the unfunded liability has increased the costs necessary to maintain and fund the city's pension plans.[xx] As the unfunded liability grows, additional payments must be made to offset it or else the plan will not be able to pay for already promised benefits.

Over the past decade, pension costs grew at an average annual rate of 25% from $157 million in 2002-03 to nearly $1 billion in 2011-12. The growth of pension costs has significantly outpaced every major component of the city's expenditures, including general government, which grew at an average annual rate of 3.4%, health and sanitation (6.2%), community development (2.7%), transportation (4.2%), and cultural and recreational service costs (0.6%).[xxi] Consequently, pension costs have taken up increasing portions of the city's budget. In 2002-03, pension costs were equivalent to 3% of the city's expenditures, but in 2011-12, they were nearly 15%. Pension costs are projected to rise yet again, growing to nearly $1.3 billion, or 18%, of 2012-13 budget expenditures (Figure 6).

In all three Los Angeles plans, employees contribute set portions of their payroll to help offset benefits earned by the employees during that given year (Table 7). The city then contributes another set portion of total payroll to help fund the remaining amount. It makes these payments in addition to

making contributions to help pay off the unfunded liability amassed in previous years, which is akin to trying to catch up while running a race from behind.

Figure 6: City Annual Required Contribution 2003-2013[xxii]



City pension costs are expected to comprise nearly 32% of payroll in 2013, up from only 6% in 2003. Comparatively, employee contributions are projected to be 9.2% of payroll. If pension costs continue to rise, the city may seek increased contributions from its employees, which may result in difficult negotiations among the city and the employees' unions. Failure to fully fund pension costs will only hinder the plan's sustainability, but funding it in full will further reduce the resources available for other areas of the city's budget.

Table 7: 2012-2013 Annual Required Contribution (in millions)[xxiii]

Plan	Total Employee Contribution		Total City Contribution	
	Amount	% of Payroll	Amount	% of Payroll
LACERS	$187.2	10.3%	$388.1	21.34%
LAFPP	$127.3	9.5%	$482.1	35.93%
LADWP	$56.5	6.4%	$408.5	46.08%
Total	$371.0	9.17%	$1,278.8	31.59%

Future Outlook:

City Administrative Officer (CAO) Miguel Santana has warned of a "complete devastation of city services, including public safety" if the city cannot reduce other costs or generate higher revenues.[xxiv] The city currently faces a $222 million budget deficit for the current fiscal year and an anticipated $427 million deficit in fiscal year 2014-15.[xxv] The city's pension plans are among the key cost drivers.

Previous attempts at pension reform include former Mayor Richard Riordan's 2012 proposal. For instance, in 2012, former Mayor Richard Riordan proposed that the city switch to 401(k) style plans for new employees. Riordan's plan would have also required existing workers to pay more toward their benefits. However, Riordan withdrew his proposal when it failed to gain political traction and due to concerns that it would actually raise current costs.[xxvi]

In the 2012-13 proposed budget, current Mayor Antonio Villaraigosa offered several proposals for reforming the city's pension system, including increasing the retirement age, capping salary allowances in pension calculations, reducing pension COLAs, and increased cost-sharing between the city and its employees. In late 2012, city council approved increasing the retirement age from 55 to 65 and reducing benefits for new employees in LACERS.[xxvii] However, these changes only affect new employees and will not have any impact on the existing liability.

Most of the proposed changes to the city's pension plans impact new employees rather than active employees and current retirees. Indeed, changes to the benefits provided to new employees still result in savings, but the full extent of these savings won't be realized until decades from now. For example, it is estimated that the approved changes mentioned above would save up to $70 million within five years and as much as $309 million over a decade.[xxviii] These savings equate to only 0.7% and 3.3%, respectively, of the current unfunded liability. Even if changes are made to the pension benefits offered to new employees, the city will continue to incur the growing costs of providing the benefits earned for current employees and retirees over the next few decades as the most recent hires begin to reach retirement age.

To have sufficient funding to pay for all benefits earned, Los Angeles *should have* accumulated $41.1 billion in its pension trust funds. This total will gain interest with each passing year and grow for

each year that additional benefits are earned. If pension fund contributions and investment returns do not keep pace, the plan will be increasingly underfunded.

Continued growth in the unfunded liability will result in increased pension costs. Given recent trends and the forecasted trajectories of the city's financial situation, absorbing these growing costs will be difficult. It appears that merely improved investment performance will not provide a way out. In recent years, the pension funds' investments have significantly underperformed relative to the assumptions and if they continue to do so, pension costs will continue to rise.

Reducing or restructuring already earned benefits is possible, but there are disputes as to the extent to which California's governments can do so within the law.[xxix] Requiring increased contributions from current employees is also possible, but would require support from the city's public employee unions.

Without meaningful reforms that impact the current unfunded liability, pension costs will continue to rise and exert pressure on other budget areas and consume greater portions of the city's expenditures. Looking forward, careful management of the city's retirement benefits will play an essential role in securing a more positive fiscal future and avoiding insolvency.

Appendix A: Pension Plan Primer

A pension generally comprises the majority of a public employee's retirement benefits.[xxx] The primary function of a pension plan is to provide income to employees during their retirement. Typically, public sector pension plans are defined benefit plans, as is the case in Los Angeles. Under a defined benefit plan, the retirement benefit is a established amount guaranteed to be paid to the employee regularly during retirement. Generally, this amount is determined based on the employees' salary and length of service.

For example, the plan might provide a benefit of 2% of the employee's average salary for the final three years of employment for each year of service rendered. Then, an employee with 20 years of service upon retirement would receive 60 percent of his or her final average salary each year for the remainder of his or her lifetime. Often, pension benefits increase with a cost of living adjustment (COLA) because inflation will decrease the value of that benefit if it were to remain constant.

The cost of providing pension benefits in the future is not entirely known. An actuary will project the future pension payments for each member in the plan using the plan's membership data and provisions. These projected payments are based on each individual's compensation and service history, and when that individual will likely retire, quit, become disabled, or die. Each future payment is discounted from the date of that payment to the current date, using actuarial assumptions of the investment return, which we will discuss in further detail later. Actuaries refer to this amount as the Present Value of Future Benefits (PVFB), which represents the present value of all benefits expected to be paid from the plan to current participants.

It is important to note that this figure is a projection and is contingent upon numerous assumptions, including but not limited to projected retirement ages, life expectancies, wage increases, COLA increases, and investment returns. In theory, assuming that the actuarial assumptions are correct, the city could set aside an amount of money equal to the Present Value of Future Benefits into a trust fund and it would cover all payments for all of the plan's participants, including active workers who have not yet finished earning their benefits.

However, accounting principles dictate that the plan recognize only the cost of benefits that employees have already accumulated. While those who have retired have finished accumulating benefits, those who are still in the active workforce have yet to do so. Rather, these individuals continue to accumulate benefits for each year that they work. To adjust for this, actuaries divide the Present Value of Future Benefits into two portions – a portion that has been "earned" and a portion that has "yet to be earned."[xxxi] The Actuarial Accrued Liability (AAL) is the portion of the Present Value of Future Benefits that is attributed to past years of service. This is the liability that is recognized on financial statements and the liability against which assets are measured. The Actuarial Accrued Liability is more accurately defined as the amount of money that *should have* been accumulated to pay for the accumulated benefits of each employee.

Because the AAL is the amount that *should have* been set aside under the actuarial assumptions, it is important to measure how and the extent to which the city has actually accumulated those assets. A plan's funding status is generally reflected by the funding ratio, or portion of the liability funded by assets (assets divided by AAL). A funding ratio of 100% indicates that there are currently enough assets to fund the entire liability (thus matching the AAL). Any funding ratio below 100% indicates that a portion of the liability is unfunded. This unfunded portion, called the Unfunded Actuarial Accrued Liability (UAAL), is the difference between the AAL and the city's assets.

The unearned portion of the Present Value of Future Benefits is the Present Value of Future Normal Costs (PVNC). In other words, it measures the benefits that have not yet been earned, but are projected to be

earned, by active employees. A portion of this total, called the normal cost, is allocated to each fiscal year. This essentially represents the benefits that have been earned in a given year. Thus upon year's end, because it has become a benefit earned, the normal cost is added to the existing AAL. More precisely, the AAL represents the accumulated value of all normal costs from previous years.

In theory, had the normal costs been paid in full each year, every pension plan would be fully funded because benefits earned would always be offset by assets deposited into trust funds. However, for each year that the normal costs are not paid and for each year that the assumptions used to calculate the normal cost understate it, a UAAL develops. When a UAAL exists, amortized payments are made to offset it.[xxxii] The normal cost and amortized cost combine to form the Annual Required Contribution (ARC), which is the estimated annual payment necessary to fully fund the plan.

With a few exceptions, Los Angeles has paid the ARC in full each year. Despite consistently paying the ARC if full, Los Angeles has a growing unfunded liability because the actuary calculates the city's ARC using assumptions that have largely been inaccurate in recent years. This has resulted in a growing unfunded liability.

Table 8: Present Value of Future Benefits[xxxiii]

Plan	AAL "Earned"	PVFNC "Yet to Be Earned"	Total
LACERS	$14.39	$2.74	$17.13
LAFPP	$17.03	$4.09	$21.12
LADWP	$9.69	$1.75	$11.45
Total	$41.12	$8.58	$49.70

Appendix B: Los Angeles City Employee Benefits

All three Los Angeles city pension plans base an employee's annual pension benefit on years of service and the highest 12-month average salary based on years of employment, formula rate, and retirement age (Table 9). They also receive COLA adjustments based on the Consumer Price Index (CPI) with a maximum increase of 3 percent for employees, except Tier 1 members of LAFPPS. For LACERS and Tiers 5 and 6 of LAFPP, annual inflation above 3 percent is stored in a "bank" and can be used for years when inflation is under 3 percent. Members outside of Tier 1 in LAFPPS are eligible for discretionary COLA increases as determined by the LAFPP board.

Table 9: Los Angeles City Employee Benefits (hired before June 30, 2012)[xxxiv]

Member Type	Tier	Age and Service Requirement	Formula	Maximum Benefit as % of Final Average Salary
LACERS (excluding ERIP)	ALL	Age 70 or Age 60 with 10 years of continuous service, or Age 55 with at least 30 years of service	2.16% per year of service	100%
LADWP	ALL	Age 60 with 5 years of service, or Age 55 with 10 years of service in the last 12 years, or any age with 30 years of service	The greater of 2.1% of salary base or $114 per year. For those age 55 or older with 30 or more years of service the factor is 2.3% of salary base.	100%
LAFPP (excluding DROP)	1	20 years of service	40% @ 20 years of Service then + 2% for next 5, then + 1.67% thereafter	66.67%
	2	20 years of service	40% @ 20 years of service, then + 2% for next 5 up to 25, then 55% at 25, then + 3% thereafter	70%
	3	Age 50 and 10 years of service	2% at 20 years of service, then + 3% thereafter	70%
	4	20 years of Service	40% @ 20 years of service, then + 3% thereafter	70%
	5	Age 50 and 20 years of services	50% @ 20 years of service, then + 3% for next 10, then + 4% thereafter	90%
	6	Age 50 and 20 years of service	40% at 20 years of service, then + 3% for next 5, then + 4% for next 5, then + 5% thereafter	90%

[i] Estimates of the nation's pension liability range from $2 to $3 trillion.
[ii] In 2012, we released a report titled "How Stockton Went Bust: A California City's Decade of Policies and the Financial Crisis that Followed", that further explores the roles that post-employment benefits played in the city of Stockton.
URL: http://cacs.org/images/dynamic/articleAttachments/12.pdf
[iii] These values come from Table 1 in the Four-Year Budget Outlook and Update to the Three-Year Plan to fiscal Sustainability submitted by City Administrative Officer Miguel A. Santana on April 6, 2012
URL: http://cao.lacity.org/Reports/CAO%20FOUR-YEAR%20BUDGET%20OUTLOOK%20...%20TO%20FISCAL%20SUSTAINABILITY.pdf
[iv] Throughout the report, pension costs refer to the Annual Require Contribution ARC, regardless of whether or not the city actually paid it in full. Los Angeles has generally paid the ARC in full, however. By design, the ARC reflects the true cost needed to fund the plan under the given assumptions. See Appendix A for more information on the ARC.
[v] Note that "earned" in this case is defined in the actuarial sense, which is subject to the actuarial methodology used. Each method allocates the AAL and Present Value of Normal Costs differently. As of June 2012, all three plans utilize the entry age normal cost method. For simplicity, we do not dive in the details that determine how benefits are recognized as earned aside from the accumulation due to additional years of service. We will use "earned" in this way throughout the report.
[vi] For simplicity, throughout the report, we use the Actuarial Value of Assets.
[vii] Moody's technically uses 5.5% as its discount rate. But because expected investment returns and discount rates are set equal in the actuarial methodology, we employ the "investment return" terminology to avoid confusions stemming from the dual usage of discount rate/investment return. We adopt this approach throughout the report.
[viii] All summary data in this table can be retrieved from the June 30, 2012 Actuarial Valuations performed for each pension plan. These valuations were performed by Segal Group Inc. For simplicity, we rely on the Actuarial Value of Assets (AVA) as opposed to the Market Value of Assets (MVA). Note that the amounts for the total category are a weighted average where applicable.
LACERS 2012 Actuarial Valuation:
URL: http://www.lacers.org/aboutlacers/reports/Actuarial%20Valuations/2010s/2012%20Actuarial%20Valuation%20and%20Review%20of%20Retirement%20and%20Health%20Benefits%20as%20of%20June%2030,%202012.pdf
LAFPP 2012 Actuarial Valuation:
URL: http://www.lafpp.com/LAFPP/documents/financial_reports/2012_actuarial_valuation.pdf
LADWP 2012 Actuarial Valuation:
URL: http://retirement.ladwp.com/image/LADWP%20Retirement%20Plan%207_1_2012%20Actuarial%20Valuation.PDF
[ix] Note that "earned" in this case is defined in the actuarial sense, which is subject to the actuarial methodology used. Each method allocates the AAL and the Present Value of Future Normal Costs differently. As of June 2012, all three plans utilize the entry age normal cost method.
[x] To avoid confusion in the dual usage of discount rate/investment return, we shall use the investment return terminology where applicable.
[xi] Since that time, LADWP experienced the largest decline in funding ratio falling 23.3 percentage points from 101.34% in 2003 to just 78.1% in 2012. Meanwhile the funding ratios of LAFPP and LACERS fell from 104.3% and 91.4% in 2003 to 83.7% and 69.0% in 2012, respectively.
[xii] These summary statistics were obtained from the calculations in the 2003 and 2012 actuarial valuations for each plan. Note that some assumptions used to calculate the AAL have changed since 2003, including the actuarial cost method for the LACERS plan. The aggregate totals reflect the sum of the officially reported values for each plan in that given year. All plans now use the same cost method (entry age normal cost), the same actuarial valuation company (Segal), and also use the same discount rate (7.75%). For simplicity, we use only the Actuarial Value of Assets, the AVA. Using the market value of assets will result in differing funding ratios, but these are more volatile from year to year. Using the AVA also allows for more stability in measuring growth rates and trends. Also, we use the geometric growth in measuring change rate since this is the type of growth rate used to measure average investment performance for each pension plan.
[xiii] These return rates were also obtained from the actuarial valuations for each plan. Note that the average rates of return refer to the geometric rate of return and not an arithmetic rate of return. Additionally, the rates use the market value of investment return as opposed to the actuarial value of investment return. In this way, the true rates of return are reported.
[xiv] More information regarding Moody's adjustments to government reported pension obligations can be found here:
URL: https://www.wellsfargo.com/downloads/pdf/com/retirement-employee-benefits/bpsm/oct12_moodys.pdf
[xv] Estimates of the unfunded liability at different discount rates assume that the average duration of the liability is 16 years. This was the average duration utilized in Joe Nation's report titled "Pension Math: How California's Retirement Spending is Squeezing the State Budget." This figure was obtained through informal discussions with pension officials. Los Angeles's liability most likely has a different, but similar, average duration. Small changes in this assumption will not appreciably change funding ratios. For further information, seek:

URL: http://siepr.stanford.edu/system/files/shared/Nation%20Statewide%20Report%20v081.pdf

[xvi] Note that this actually represents the normal costs that have been allocated to the given years. We use "earned" in the actuarial sense, but refrain from the details that determine this total in the actuarial methodology aside from the accrual due to an additional year's service. For a further description of normal costs and the actuarial methodology, please read Appendix A.

[xvii] Interest in the UAAL corresponds to interest the trust fund would have earned had the entire UAAL been placed into a trust fund, rather than remain unfunded. This essentially represents missed investment opportunities.

[xviii] This reflects the expected contributions for each plan. For simplicity, we do not make this distinction. Any deviations from expectations and assumptions are included in the "other assumptions" category.

[xix] These values were obtained from each plan's actuarial valuations in their development of the unfunded liability. The development of the unfunded liability takes into account only the most current assumptions in the given year. Thus the sum from 2004 and 2012 reflects changes in these variables as they corresponded to the given assumptions in each respective year. Furthermore, the assumptions used in each plan are not necessarily the same. Growth in the unfunded liability due to changes in discount rate, actuarial cost method, and changes in the actuarial company that evaluates the plan are also included the "other assumptions" category.

[xx] When referring to pension costs, we refer to the ARC. Unfunded payments toward the ARC are deferred to future years, and by design, are a better reflection of the true cost of pension plans. While the city has generally paid the ARC in full each year, some exceptions can be seen in LADWP.

[xxi] Historical spending for these budget areas were obtained from the Controller's Preliminary Financial Report for each fiscal year in the "Expenditure Trends" table from FY 2003 to 2012. The 2012 report can be found here:

URL: http://controller.lacity.org/stellent/groups/ElectedOfficials/@CTR_Contributor/documents/Contributor_Web_Content/LACITYP_022340.pdf

[xxii] This chart uses the ARC obtained from each pension plan's actuarial valuation from 2003 to 2012. To be consistent with the figures in the 2012-2013 proposed budget, we used the expenditures and encumbrances for each fiscal year. Figures for historical years were obtained from the Controller's Preliminary Financial Report for each fiscal year. Total expenditures and encumbrances in the 2012-2013 adopted budget were $7.2 billion. Refer to Exhibit A-Summary of Appropriations in the following:

URL: http://controller.lacity.org/stellent/groups/ElectedOfficials/@CTR_Contributor/documents/Contributor_Web_Content/LACITYP_022907.pdf

[xxiii] These values come from the Recommended Contribution formulation in the actuarial valuation for each plan. This is the ARC, which is measured as a set percentage of payroll. The actual ARC will depend on the actual payroll in the current year as well as how it is paid throughout the year (i.e. beginning of the year, biweekly, or end of pay periods). Note that these calculations do not include a phasing in of some new actuarial assumptions.

[xxiv] This quote was obtained from an LA Times article titled, "L.A. budget chief warns of bankruptcy without tax hikes, layoffs." This article can be found here:

URL: http://articles.latimes.com/2012/apr/07/local/la-me-la-insolvency-20120407

[xxv] These values come from Table 1 in the Four-Year Budget Outlook and Update to the Three-Year Plan to fiscal Sustainability submitted by City Administrative Officer Miguel A. Santana on April 6, 2012.

URL: http://cao.lacity.org/Reports/CAO%20FOUR-YEAR%20BUDGET%20OUTLOOK%20...%20TO%20FISCAL%20SUSTAINABILITY.pdf

[xxvi] Mayor Antonio Villaraigosa stated, "Most people concluded, however, that his pension reform proposal went too far and would have cost the city more money than the current system." News coverage of the former Mayor's attempt can be found here:

URL: http://abclocal.go.com/kabc/story?section=news/local/los_angeles&id=8898651

[xxvii] Coverage of city council's approval of some of the proposed changes can be found in the LA Times blog titled, "L.A pension plan would hike retirement age, cut pension benefits." This can be found here:

URL: http://latimesblogs.latimes.com/lanow/2012/09/la-officials-move-ahead-with-plan-for-cutting-employee-pensions.html

[xxviii] Additional information on these changes and their cost saving impacts can be found from the Inter-Departmental Correspondence titled "Pension Reform For New Hires – LACERS (C.F. 10-1250)".

URL: http://cao.lacity.org/Reports/Pension%20Reform%20for%20New%20Hires%20-%20LACERS%20CF%2010-1250-091812.pdf

[xxix] This matter is not entirely settled and may require additional legal precedent in order to determine the extent to which earned pension benefits can be reduced. Some additional information regarding this can be found in the following LA Times article.

URL: http://articles.latimes.com/2011/nov/14/local/la-me-cap-pensions-20111114

[xxx] There are also Other-Post Employment Benefits (OPEB) that are mainly composed of health care.

[xxxi] Note that "earned" in this case is defined in the actuarial sense, which is subject to the actuarial methodology used. Each method allocates the AAL and Present Value of Normal Costs differently. As of June 2012, all three plans utilize the entry age normal cost method. For simplicity, we do not dive in the details that determine how benefits are recognized as earned aside from the accumulation due to additional years of service.

[xxxii] Amortized payments are essentially loan payments, where part is the principal and another part is interest. Making payments according to an amortization schedule will pay off the loan according to the schedule's term.

[xxxiii] These values are shown in an "actuarial accounting" table in each actuarial valuation where the Present Value of Future Benefits must be offset by current assets and expected employee and employer contributions.

[xxxiv] Most benefit provisions can be found in the Summary of Plan Provisions in the actuarial valuations for each plan. For complete benefit provisions, one should consult each plan sponsor. These benefits exclude LACERS retirees who participate in the Early Retirement Incentive Program (ERIP) as well as LAFPP members who participate in the Deferred Retirement Option Plan (DROP).