CITY OF CHICAGO

COUNCIL OFFICE ON FINANCIAL ANALYSIS (COFA)

August 27, 2019

The Honorable Chairman Pat Dowell
Chicago City Council
Committee on Budget and Government Operations
121 N. LaSalle St
Chicago, IL 60602

Chairman Dowell:

Paragraph 2-53-030 (c) of the Chicago Municipal Code states that the Council Office of Financial Analysis (COFA) shall "provide members of the city council with… a summary and analysis of the city's annual audit."

In fulfilment of that requirement, I am hereby transmitting COFA's *Summary and Analysis of the City of Chicago's 2018 Comprehensive Annual Financial Report* (CAFR). Our analysis is divided into three sections which reflect the main issues raised by the report in our view: Debt; Budget vs. Actual Performance of the General Fund; and Pensions. We have also included an Appendix on Demographic and Economic Measures, in order to explain our reasoning in choosing different metrics than the CAFR's authors.

Thank you for the opportunity to do this work. I hope that you and your colleagues find this product useful, and I look forward to answering any questions it may raise for you.

Sincerely,

Jonathan Silverstein
Council Office of Financial Analysis

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Summary and Analysis of the City of Chicago's 2018 Comprehensive Annual Financial Report

Presented by the City of Chicago

Council Office of Financial Analysis

Contents

Acknowledgements

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Alderman Pat Dowell Chairman

The City of Chicago, Department of Finance

The City of Chicago, Office of Budget and Management

Any opinions or analysis expressed in this report are those of the Council Office of Financial Analysis, and are not necessarily those of the parties listed above or anyone else. Any errors or omissions in this report are the sole responsibility of The Council Office of Financial Analysis.

Summary of Findings

Debt

- The City of Chicago ended 2018 with $26.8 billion in long-term debt.
- After adjusting for inflation, the City's debt grew almost 5% between 2017 and 2018, and more than 40% between 2009 and 2018
- TIF bonds are the only category of City debt which has not grown rapidly over the last decade. Sewer debt has risen most rapidly over the decade, and O'Hare Airport was the driver of increasing debt in 2018. Over the ten-year period, debt has grown faster than revenue, while revenue has grown faster than most economic indicators.
- Debt has risen even as capital spending has fallen sharply.
- The City succeeded in lowering interest costs between 2015 and 2018 thanks to the Sales Tax Securitization Corporation (STSC) and improving bond rating outlooks.

General Fund

The City's General Fund (Corporate Fund plus Garbage Collection Fund) spent $115 million more than budgeted on judgements, including $84 million more than budgeted for judgements against the Police Department. This was counterbalanced by the Police Department and twenty-eight other departments spending less than their appropriation from the General Fund.

Pensions

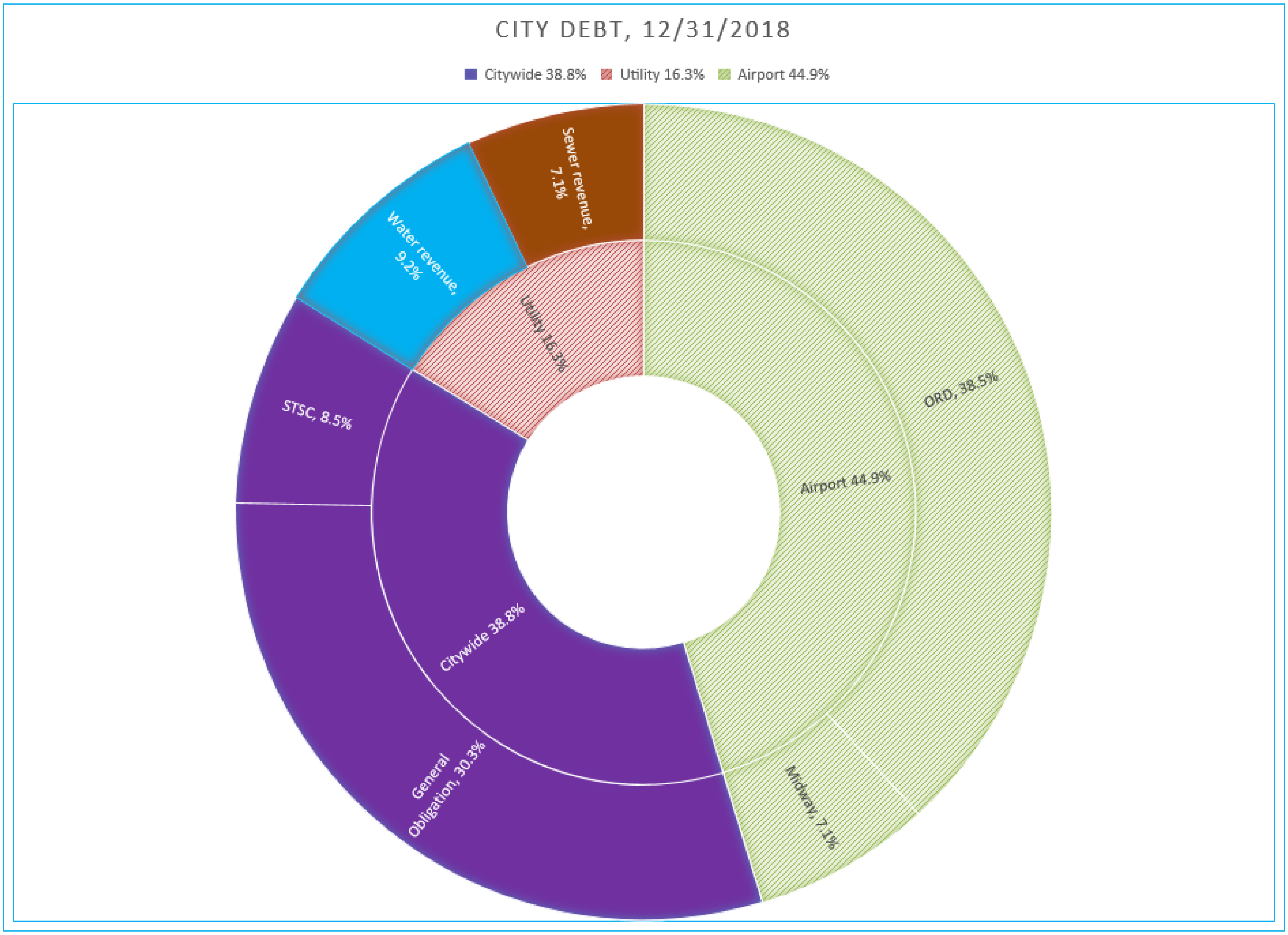
- Although the City contributed a record $1.16 billion to its pension funds in 2018, the funds unfunded liability continued to grow to $29 billion.
- The unfunded liability grew because of negative investment returns; the fact that $1.16 billion, while a record for the City, was well below the Actuarially Determined Contribution; and accounting rule changes.
- Under the "Pension Ramp" set by state law, the City's annual contribution will increase to approximately $1.7 billion in 2021 and $2.25 billion in 2023, and will continue to grow at a modest pace thereafter.
- The problem has been aggravated in recent years by the pension funds' poor investment performance. While 2018 was a terrible year for investors generally, the funds have lagged the market by a small but persistent degree for at least five years.

Throughout this report, all dollar figures from years prior to 2018 have been adjusted for inflation to 2018 levels, unless stated otherwise.[1]

[1] Since CAFRs show status as of December 31 of the report year, we used the December CPI-U for the Chicago Metro for inflation-adjustments. Source: U.S. Bureau of Labor Statistics.

Debt

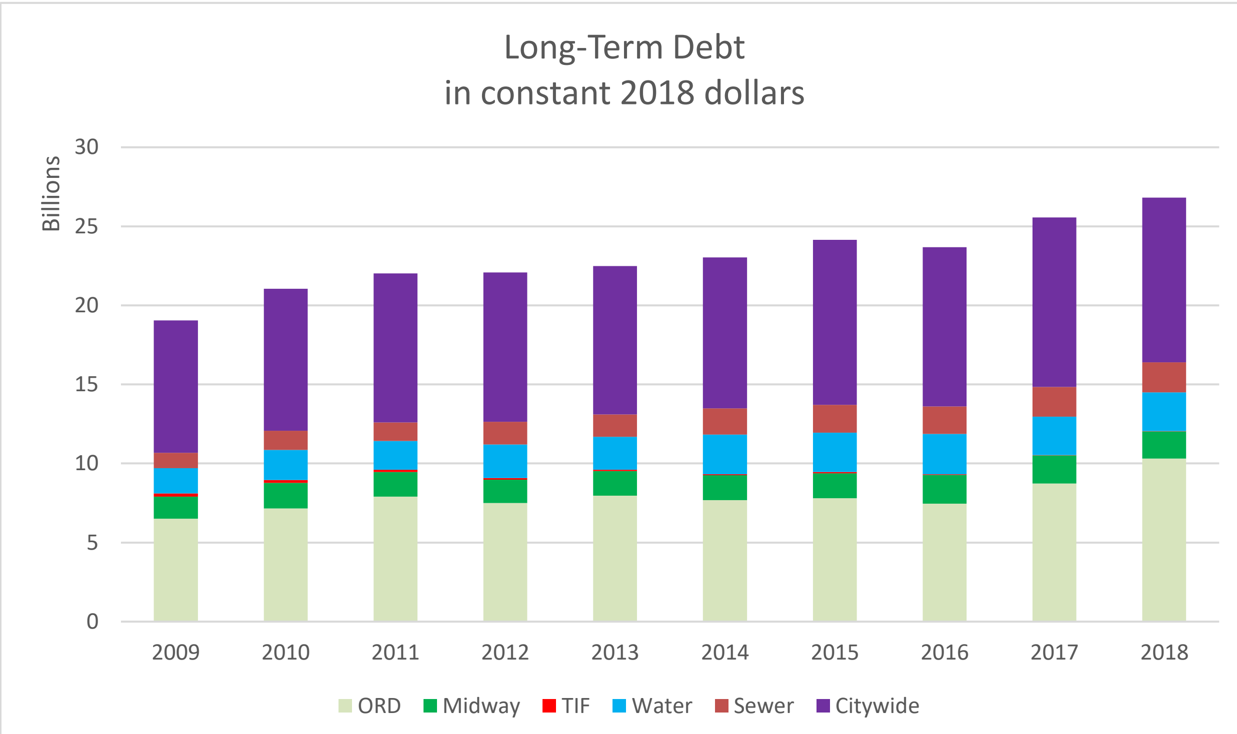
The City of Chicago ended 2018 with a total long-term debt of $26.8 billion. After adjusting for inflation, the City's debt grew 4.9% compared to the prior year, and 40.8% over a ten-year period.[2]

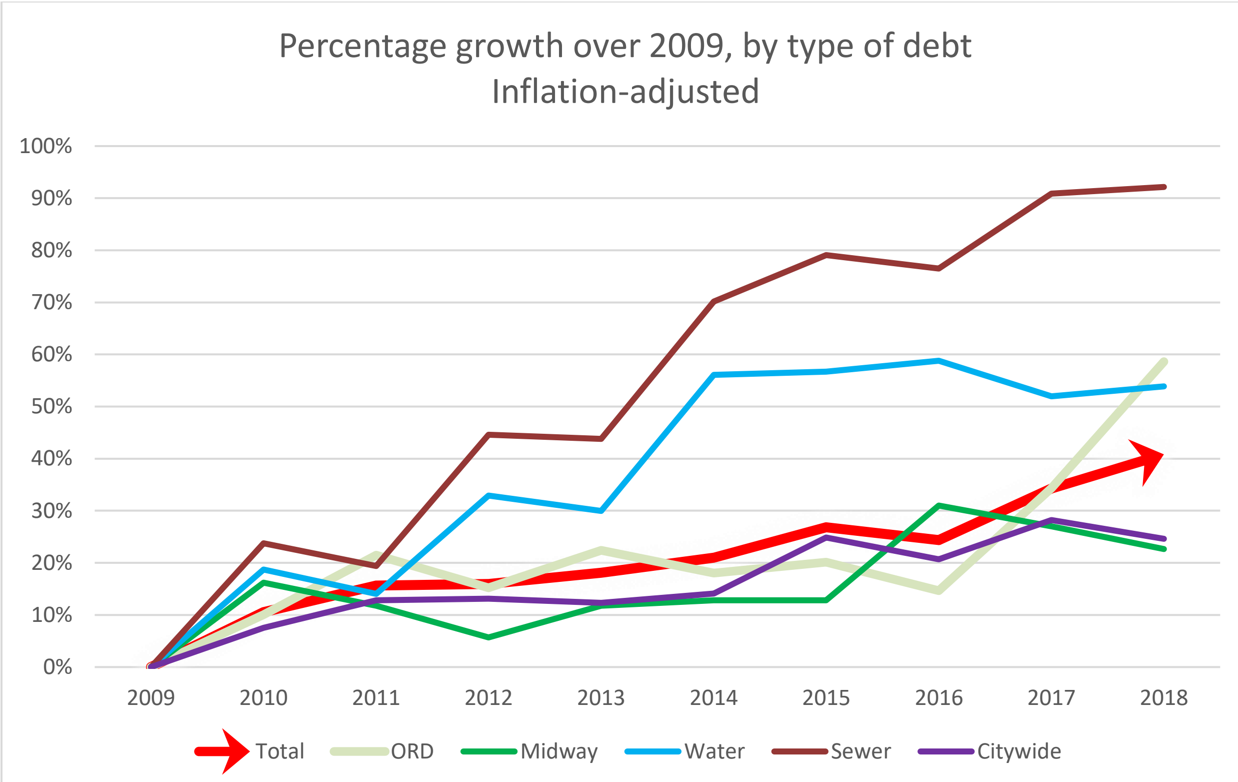


[2] Annual Totals for Total Debt and the breakdowns by type of debt which follow are taken from the Table 21 of the City of Chicago *Comprehensive Financial Analysis for the Year Ended December 31, 2018*, hereafter referred to as 2018 CAFR.

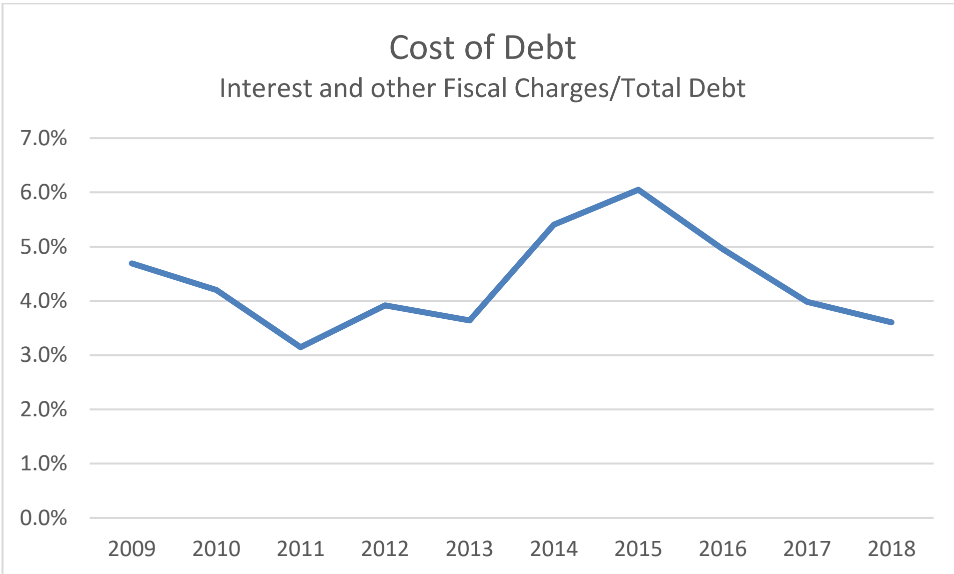
TIF bonds have been excluded from the chart above because they make up less than 1% of the City's total debt.

Every category of long-term debt has grown rapidly over the last decade, except for TIF bonds. While the TIF bonds were always a small portion of the City's total debt (just over 1% in 2009), the outstanding balance on those bonds has been reduced by 90.1% since 2009 as the City has reoriented the role of TIFs in its development strategy. Sewer revenue debt has grown most rapidly (92.2%), followed by O'Hare debt (58.6%) and water revenue debt (53.9%).





Chicago's long-term debt continued to grow during 2018, but that was almost entirely driven by O'Hare airport debt, which grew which climbed 18.1% last year alone. Water and sewer debt, which had grown rapidly over the prior nine years leveled off in 2018. Citywide non-airport/water/sewer debt, which had grown by 28.2% from 2009 to 2017, fell 2.8% from 2017 to 2018. Midway airport debt fell by 3.4%, after climbing 27.0% the prior nine years.



The City's interest costs spiked in 2015, and have dropped significantly since then.[3] The spike was largely due to Moody's Investors Services downgrading Chicago's debt rating to two notches above junk status in February, 2015. Moody's made this decision in response to the State Supreme Court ruling the pension reform law unconstitutional. Moody's action triggered the termination clauses of several of the derivative instruments tied to the City's variable rate bonds, also referred to as swaps.[4]

Since then, investors have responded positively to Illinois and Chicago's actions to put the City's pension funds on a path to actuarial sustainability, and Moody's has improved the City's bond outlook, which has contributed to interest reduction.[5] The other major factor reducing the City's 2018 interest costs was the Sales Tax Securitization Corporation (STSC), which was created by an ordinance passed by the City Council in October 2017. Debt issued by the STSC is paid with revenue from the general sales taxes collected for the City by the Illinois Department of Revenue. The City will continue to receive residual sales tax revenue above debt service requirements. In 2018, the City issued $1.5 billion in STSC debt and used the proceeds to refund higher interest General Obligation bonds, thus achieving $81.2 billion in present value savings.[6]

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[3] Total Debt is taken from 2018 CAFR and 2008 CAFR, Table 21. Since the Total Debt figures reported in CAFR are for December 31, and the Interest and Other Fiscal Charges are from throughout the year, we used the average of the Total Debt from the reporting year and the Total Debt from the prior year as the denominator. That yielded a more accurate approximation of the principal base on which interest was charged.

[4] "Moody's downgrades Chicago's debt rating," *Chicago Tribune*, February 27, 2015

"Chicago Area Governments Bond Ratings Fall Below Investment Grade," *The Civic Federation*, May 22, 2015

[5] "Surprise: Moody's bumps up City Hall, CPS credit outlook," *Crain's Chicago Business*, July 12, 2018

[6] 2018 CAFR, p. 10.

The STSC is analogous to a homeowner taking out a home equity loan to repay higher interest credit cards. The debt is more attractive to lenders because the City's largest and most reliable revenue source has been isolated and dedicated to its service. However, this can only go so far. Total sales tax revenue was $288 million in 2018, a year with a strong local and national economy. The STSC will receive the first $92.4 million of sales tax revenue per year in 2019 and 2020. Annual payments will climb to $130.9 million in 2021, and will stay very close to that figure through 2047.[7] Any additional debt issued by the STSC will likely carry a higher interest rate, with almost half of sales tax revenue spoken for in the short run.

However, additional STSC debt may be attractive to investors if revenue is increased by widening the base of services subject to the tax. In addition, COFA recommends studying the feasibility of forming a similar entity to sell future property tax revenue, since the property tax is the City's other very large, very stable revenue source. The City has already dedicated most of the property tax levy to debt service and pension fund contributions by ordinance. But, ordinances can be reversed, and contracts and/or statutes obliging use of the levy for those purposes could bolster investor confidence.

Debt and Capital Spending

The so-called "Golden Rule of Public Finance" states that *over the economic cycle, the Government will borrow only to invest, and not to fund current spending*.[8] Capital improvements are generally considered the primary form of investment in a local government context. This principle is complicated by the fact that most of a city's capital stock does not generate direct revenue and cannot easily be liquidated for cash (e.g., non-toll roads, streetlights, etc.).

Between 2009 and 2017, Chicago increased its long-term debt by $6.5 billion, while only making $4.2 billion in capital expenditure.[9] The extra $2.3 billion in debt not tied to capital expenditure amounts to $850 per Chicagoan. Also, capital spending dropped steadily and sharply throughout the period. Even without adjusting for inflation it is striking that capital expenditures exceeded $600 million per year in both 2009 and 2010 and fell below $300 million per year in both 2016 and 2017. Adjusting for inflation shows the drop to be even more precipitous. The City's increasing debt was not enough to overcome the end of the Federal Stimulus program, and the State's budget impasse, both of which sharply reduced grants for capital projects.

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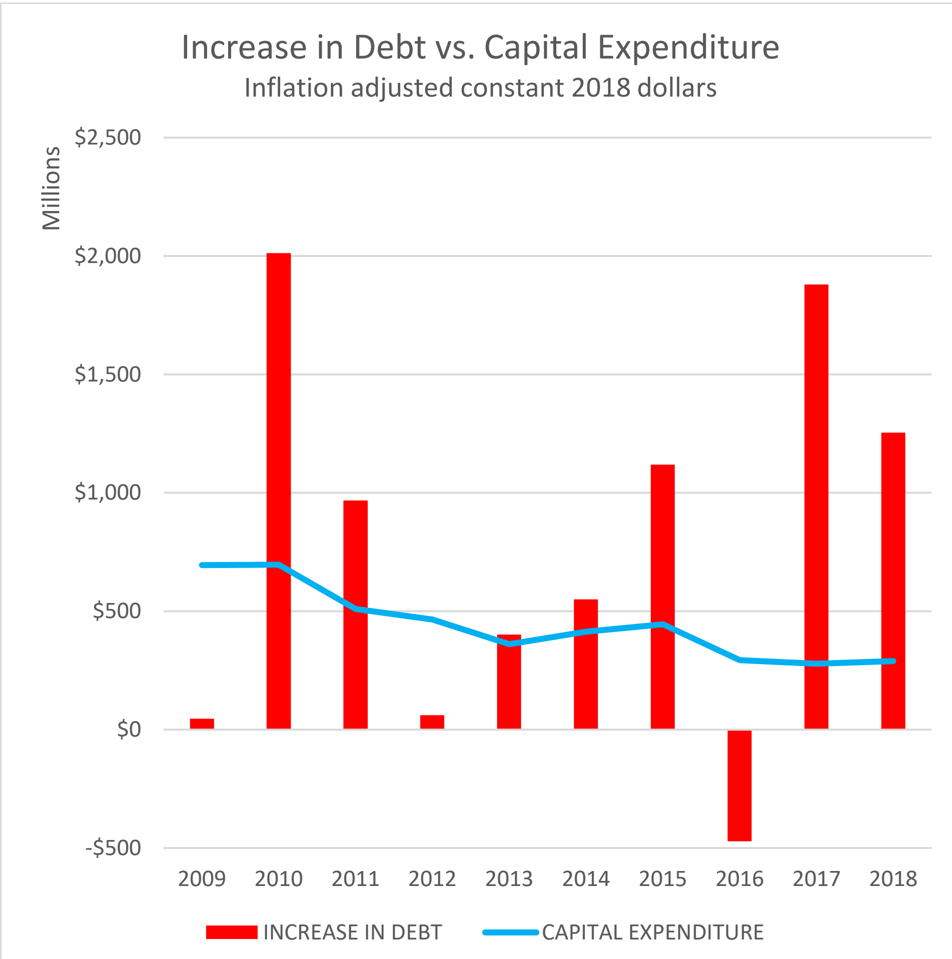
[7] 2018 CAFR, Table 22.

[8] "The Golden Rule of Public Finance and the Composition of Government Expenditures: A Growth and Welfare Analysis," by Max Groneck, *Journal of Economic Policy Reform, Vol. 14, No. 4, pp. 273-294*, December 7, 2011

[9] Capital Expenditure figures are the sum of Capital Expenditure from Special Revenue Funds from Table 7 of the CAFR and from Capital Projects Funds from Table 9 of the CAFR. 2009-2013 data are taken from the 2013 CAFR. 2014-2018 data are taken from the 2018 CAFR. Figures from years prior to 2018 have been adjusted for inflation.

During 2018, the trend was even more one sided, as the City increased its long-term debt by $1.25 billion (adjusted for inflation) while only making $288 million in capital expenditures. However, we believe this trend will reverse sharply over the next few years, because O'Hare made $1.53 billion in net borrowing during 2018 in anticipation of its ORD21 capital program. In addition, Chicago's capital spending will be boosted by the General Assembly's recent passage of the Rebuild Illinois program, which includes $45 billion in capital funding statewide, along with its reappropriation of $15 billion in other statewide capital funding for FY 2020.[10]



The auditors estimate that the total value of the City's capital assets for its governmental and business-type activities amounted to $26.2 billion (net of accumulated depreciation). These capital assets include land, buildings and system improvements, machinery and equipment, roads, highways and bridges, and property, plant and equipment.[11] This compares to an estimated value (net of accumulated depreciation) of $18.2 billion in 2009,[12] which is equivalent to $20.4 billion in 2018 dollars. Please keep in mind that accountants' standard depreciation schedules are no substitute for a thorough evaluation

[10] *Rebuild Illinois: Investing in Infrastructure for a Better Illinois*, Office of Governor J.B. Pritzker, June 28, 2019.
[11] 2018 CAFR, p. 27.
[12] 2009 CAFR, p. 25

of the state of and needs of Chicago's infrastructure, but they are a good general indicator that our capital expenditure is at least outpacing depreciation.

In its June, 2019 report, *"Inquiry Regarding the Status of Tax Increment Financing Reform Panel Recommendations,"* the City of Chicago Office of the Inspector General suggested significant reform for the Capital Improvement Program (CIP) process, to make it a true capital budget, with priorities and criteria clearly stated and choices explicitly made.[13] This would lead to more deliberate choices by the City Council, presumably acting through the Committee on Budget and Governmental Operations.

One of the reasons that debt has increased while capital spending has dropped, is that the City's four Enterprise Funds (O'Hare, Midway, Water and Sewer) began contributing to the pension funds. The Enterprise Funds each made their largest pension contributions in 2015, after having not made any for at least the prior five years, and have been making substantial annual contributions thereafter.[14] By doing so, they have lessened the burden on the Corporate Fund and the property tax levy. But, it reduced the amount those funds could contribute toward capital improvement funds.

The additional debt taken on by O'Hare Airport during 2017 and 2018 will be used for capital expenditure in the coming years. The airport's *2019-2023 Capital Improvement Plan* anticipates using $1.8 billion from Prior Airport Revenue Bond Proceeds for its $2.2 billion in total planned improvements.[15] During the interim, the funds have been held in restricted accounts.[16] Bonds accumulate interest based on the date of issue rather than the date the funds are ultimately used.

[13] *Inquiry Regarding the Status of Tax Increment Financing Reform Panel Recommendations*, City of Chicago, Office of Inspector General, June, 2019, p. 5-6

[14] From the 2018 CAFRs of the respective Enterprise Funds. The O'Hare and Midway figures are listed under Historical Operating Results, while the Water and Sewer figures are listed under Historical Financial Operations. For the Sewer Fund, pension contributions were consolidated under General Fund reimbursements.

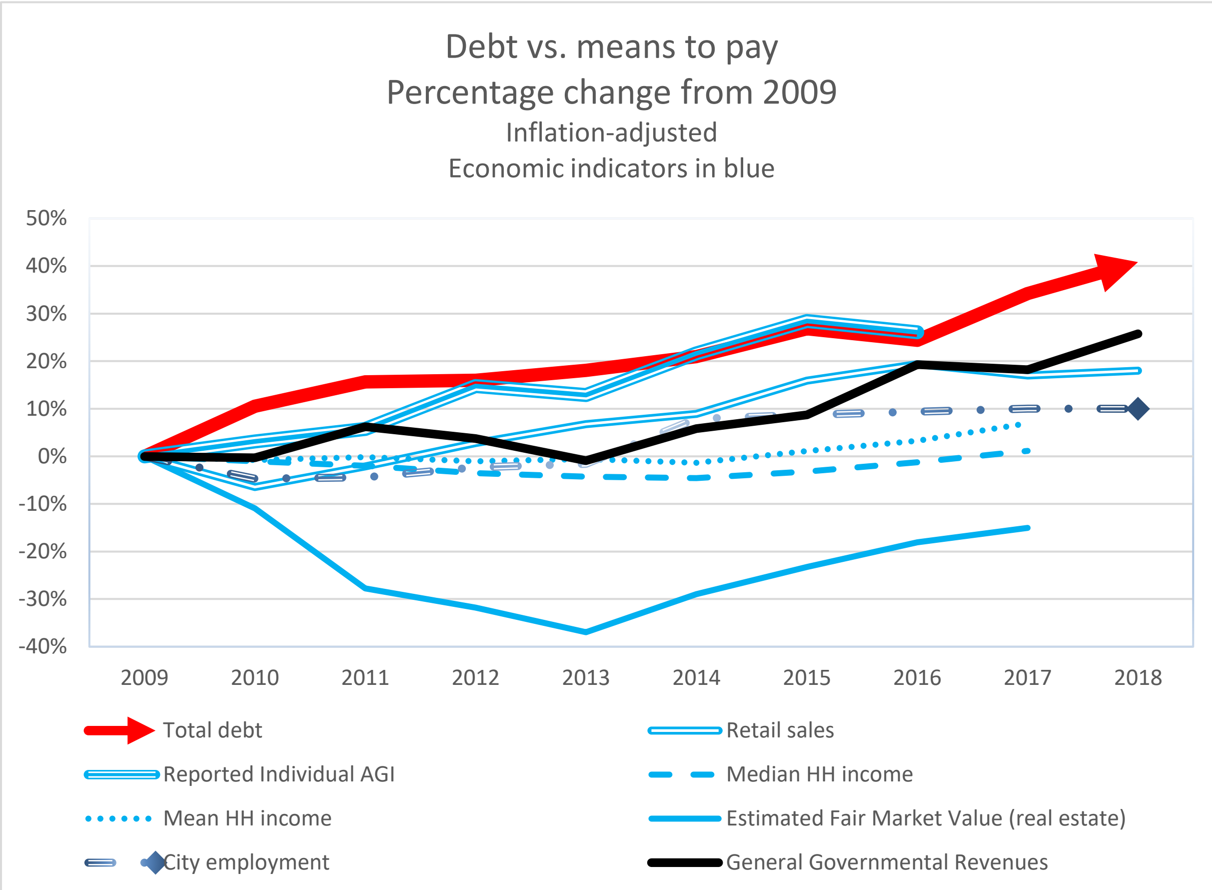
[15] *City of Chicago, Chicago O'Hare International Airport, An Enterprise Fund of the City of Chicago, Comprehensive Annual Financial Report for the years ended December 31, 2018 and 2017*, p. 76

[16] Ibid, pp. 15-16

Economics, Demographics, and Ability to Pay

While repayment of specific debt may be tied to specific revenue streams, there are often opportunities to refinance or transfer resources between funds. From a holistic standpoint, the City's ability to service its debt is limited by its revenue, and in turn its revenue is limited by the size of Chicago's economy.

Over the last ten years, the 40.8% increase in City debt has far outpaced the 25.8% increase in revenues.[17] In turn, revenue has outgrown most economic indicators. Revenue has grown 15.5% since 2013- more than either debt or economic indicators- primarily because the City sharply raised its levy and began annual increases in the utility tax in 2014. However, it will not be possible for revenues to outgrow the economy indefinitely.



The discrepancy between total individual Adjusted Gross Income reported to the Illinois Department of Revenue (which has grown strongly), mean household income (which has grown modestly) and median household income (which has remained flat) is striking.[18] This appears to be the result of rapid growth among a few high earners bringing up the averages, while the median remains the same because half or

[17] Revenue is from the 2018 CAFR, Table 3.

[18] Adjusted Gross Income and number of returns is from the Illinois Department of Revenue*, Income Tax Stratification by Zip Code.*

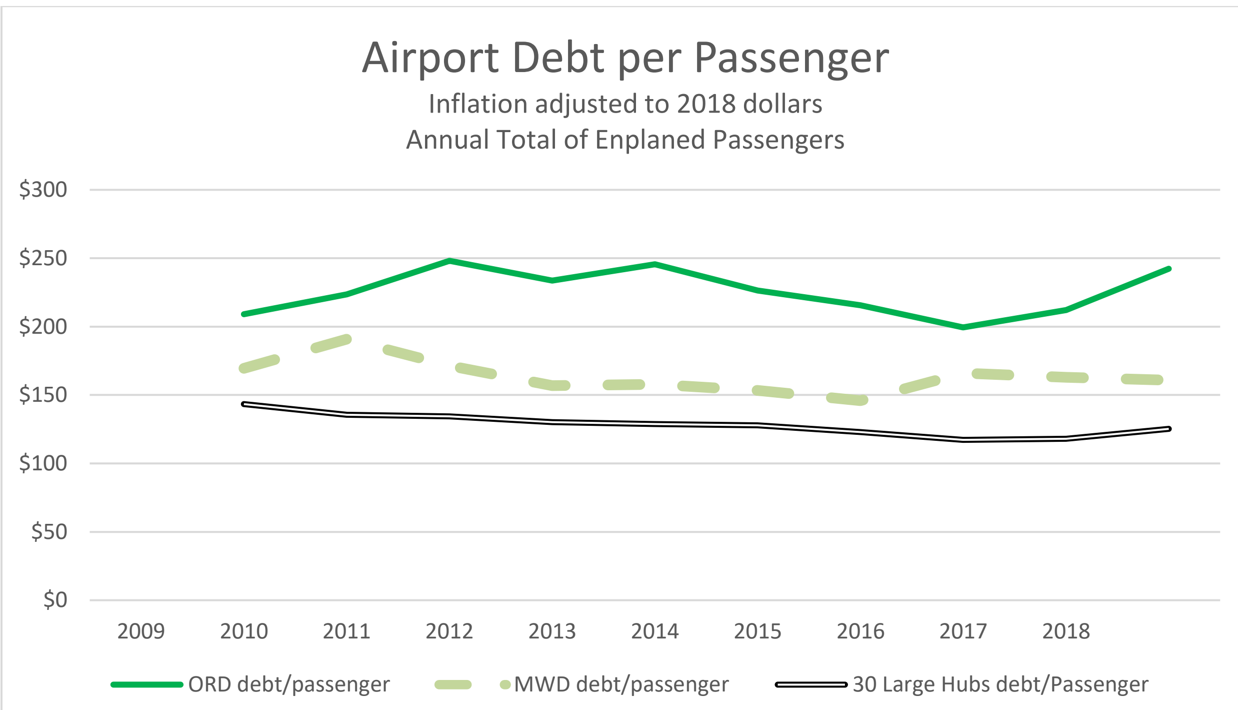
Median Household Income and Mean Household Income are from the U.S. Department of Commerce, Bureau of the Census, *American Community Survey*.

Retail sales are from the Illinois Department of Revenue, *Sales Tax Annual Year Report*.

more of all households were not advancing. One indicator of that bifurcation is the fact that Adjusted Gross Income per individual return grew 24% over ten years (adjusted for inflation) in the ten zip codes which had the highest Gross Income per individual return in 2009, while the ten zip codes with the lowest 2009 AGI/return only grew 3%.[19]

Airport debt

Although airport debt draws from a variety of revenue streams (e.g., Passenger Facility Charges, air carrier takeoff/landing fees, etc.), it is distinct from other types of City debt in the sense that all of the revenue streams draw from a closely interdependent group of stakeholders with their own economy which make up a sub-set of the overall Chicago economy. Unlike other types of capital investments, airport capital investments, if well-designed and planned, can lead directly to increased income for the stakeholders (airlines, contractors, etc.) who must repay the debt. Whether the O'Hare21 capital program and Midway's capital improvements are well-planned and designed is outside the scope of this review, but the airlines have taken a major role in drawing up the plans.



Throughout the last decade, O'Hare and Midway have always carried more debt per passenger than average for the thirty largest hub commercial service airports in the United States. At the end of 2018,

[19] The ten zip codes with the highest AGI/Return in 2009 were: 60604, 60603, 60606, 60611, 60601, 60675, 60602, 60681, 60654 and 60614.
The 10 zip codes with the lowest AGI/Return in 2009 were: 60621, 60636, 60624, 60623, 60644, 60651, 60639, 60632, 60629 and 60620.

the airport debt per passenger was $242 at O'Hare, $161 at Midway,[20] and $125 for all of the thirty largest hubs.[21]

The International Air Transport Association (IATA)[22] and the Federal Aviation Administration (FAA)[23] both project continued strong growth in air travel in the coming decades, including within the United States (although the strongest growth is projected within Asia and the Indian subcontinent). Forecasts are uncertain by definition, and international trade disputes, recessions and energy shortages are believed to pose the largest risks. Whether it meets future traffic forecasts or not, O'Hare is certain to play a significant role in the regional and national economy due to its size and diversity of users. Midway continues to thrive in a more specialize role. According to the airport's own Comprehensive Annual Financial Report,

The airlines using the Airport generally provide low fare, point-to-point origination and destination passenger service. During 2018 and 2017, Southwest Airlines accounted for 92.9% and 92.7%, respectively, of total enplanements at the Airport.[24]

Water/Sewer Debt

Water/Sewer revenue debt essentially draws on the same constituency as Citywide debt: the residents and businesses of the geographic city boundaries. Under its homerule authority, the City has a free hand to raise water and sewer rates as it chooses. The usage is extremely inelastic, meaning that usage does not change much as rates increase. Most residential buildings of one to four units are unmetered, so usage is totally inelastic- usage will not change at all in response to rate increases. Larger residential buildings are metered, but individual units within the buildings are not, so tenants will not reduce their usage as the building's water/sewer bill increases. This makes this form of debt extremely secure, although if rates are increased beyond the willingness/ability to pay, delinquencies may increase or the Mayor/City Council may simply be voted out of office. A significant portion of water revenue is paid by the suburban users, which is a benefit to the City. The City is prohibited by state law from charging a higher rate to suburban ratepayers. If water rates are raised beyond what the suburbs will tolerate, there is the risk of state intervention. Also, to the extent that water/sewer rates become a drag on the local economy, it could hinder the repayment of Citywide debt.

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[20] O'Hare and Midway enplanements are from U.S. Department of Transportation, Bureau of Transportation Statistics, *Annual Airport Ranking*s.

[21] Total debt and enplanements for 30 large commercial hub airports are from the Federal Aviation Administration (FAA) Form 127 Summary Information, https://cats.airports.faa.gov/Reports/reports.cfm

[22] International Air Transport Association, Press Release Number 62, *IATA Forecast Predicts 8.2 billion Air Travelers in 2037,* October 24, 2018

[23] Federal Aviation Administration, *FAA Aerospace Forecast, Fiscal Years 2019-2023*

[24] *City of Chicago, Chicago Midway International Airport, An Enterprise Fund of the City of Chicago, Comprehensive Annual Financial Report, For the Years Ended December 31, 2018 and 2017*, p. 23

Budget vs. Actual Performance of the General Fund

What is referred to as the "General Fund" in the CAFR consists of the Corporate Fund and the Garbage Collection Fund.[25] The latter is included because although it resembles a Special Revenue Fund in some respects, it is not sufficiently segregated from general use to meet the accounting definition of a Special Revenue fund. Since the Corporate fund comprises 98.6% of the combined appropriation for the two funds[26], one could more-or-less consider the CAFR's General Fund synonymous with the Corporate Fund. In any event, this is the area of the budget where the Mayor and City Council exercise widest discretion.

Revenue

The General Fund received $3.77 billion in revenues in 2018, $35 million (0.9%) above budget.[27] The largest factors pushing revenue above budget were the Personal Property Lease tax, whose revenue came in $49 million higher than budgeted (20.0%), and Hotel Tax revenue, which came in $11.3 million above budget (8.9%). Hotel tax revenue is a volatile revenue source, highly subject to fluctuations in the business cycle. Personal Property Lease tax revenue, on the other hand, is likely to stay at this higher plateau, and perhaps even increase. This is because the City has applied the tax to fees for cloud computing software since January, 2016. Cloud computing is increasingly popular among businesses and is expected to become even more so. But, this revenue source is also vulnerable to court challenges or innovative evasion tactics.

[25] City of Chicago Department of Finance, in response to an inquiry from COFA.

[26] Calculation from *2018 Appropriation Ordinance*, p. 3

[27] 2018 CAFR, Schedule A-1. The Schedule shows $3,769,291,000 total General Fund revenues, $83 million below budget. This total includes the category of "Miscellaneous, Other," which was $136 million below budget. COFA has been informed by the Department of Finance that the primary reason for that shortfall was $118 million which the City received from the formation of the STSC. Those funds had been budgeted as Miscellaneous Income in the 2018 budget. The funds were intended to be used to pay down the City's General Obligation debt, for which there was a line item listed under expenditures as "For Transfers to Debt Service" (Schedule A-2, p. 127). However, the City actually received the funds and transferred them to debt service in December 2017. Because the transactions occurred in 2017, it made it appear that the City had a $118 million reduction in revenue and debt repayment in 2018.

In COFA's view, it would not make sense to think of this as a revenue shortfall or an underpayment of debt, given that the transactions occurred as budgeted but a month early. So, for purposes of this analysis, we have subtracted $118 million from the budgeted amount of both Miscellaneous revenue and Finance General expenditure.

Expenditures

General Fund expenditures were $3.739 billion, $4 million (0.1%) above budget.[28] Corporate fund transfers to pension funds and debt service were exactly as budgeted. But, the City spent $154 million on judgements, $115 more than budgeted. That included $103 million for judgements against the Police Department, $84 million more than its appropriation for judgements.

The City counterbalanced its overspending on judgements by spending less than budgeted throughout the government. The Office of the Mayor spent 5.6% more than appropriated and the Department of Animal Care and Control spent 0.6% more than appropriated, but every one of the other twenty-nine departments receiving Corporate funds spent less than appropriated, most of them significantly less (Water Management and Aviation are the only departments which received no Corporate funds in 2018).

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[28] 2018 CAFR, Schedule A-2. See footnote #23 for an explanation of why COFA excluded $118 million from the budgeted amount of Finance General expenditure.

2018 General Fund Expenditures				
	Budget	**Actual**	**Variance**	**% Variance**
Police Dept Judgements	19,844,350	103,480,696	83,636,346	421.5%
Finance General Judgements	15,423,400	48,630,429	33,207,029	215.3%
CFD Judgements	2,702,000	1,527,489	(1,174,511)	-43.5%
Buildings Judgements	300,000	22,000	(278,000)	-92.7%
Sub-Total Judgements	**38,269,750**	**153,660,614**	**115,390,864**	**301.5%**
Office of the Mayor	6,815,378	7,168,806	353,428	5.2%
Animal Care and Control	6,479,324	6,518,592	39,268	0.6%
Streets and Sanitation	209,733,943	206,814,793	(2,919,150)	-1.4%
Police Dept (Other than judgements)	1,492,088,726	1,470,402,348	(21,686,378)	-1.5%
CFD (Other than judgements)	585,092,455	577,232,827	(7,859,628)	-1.3%
2FM	199,378,556	196,175,835	(3,202,721)	-1.6%
City Council	26,561,491	26,006,430	(555,061)	-2.1%
Elections	15,606,377	15,248,774	(357,603)	-2.3%
OBM	3,029,848	2,924,793	(105,055)	-3.5%
OEMC	26,570,409	25,519,108	(1,051,301)	-4.0%
CDOT	57,399,918	55,120,492	(2,279,426)	-4.0%
DFSS	82,036,890	78,440,788	(3,596,102)	-4.4%
DPD	14,445,048	13,755,989	(689,059)	-4.8%
MOPD	1,627,801	1,542,555	(85,246)	-5.2%
Law	29,427,808	27,792,531	(1,635,277)	-5.6%
DoIT	22,815,293	21,497,000	(1,318,293)	-5.8%
City Clerk	4,199,549	3,934,273	(265,276)	-6.3%
IG	5,896,544	5,517,470	(379,074)	-6.4%
DPH	32,916,359	30,777,468	(2,138,891)	-6.5%
DPS	6,841,179	6,365,819	(475,360)	-6.9%
HR	6,723,807	6,250,284	(473,523)	-7.0%
Dept of Finance	68,885,075	63,128,898	(5,756,177)	-8.4%
Ethics	883,803	808,898	(74,905)	-8.5%
License Appeal	186,667	170,662	(16,005)	-8.6%
AH	8,532,654	7,771,625	(761,029)	-8.9%
BACP	18,672,192	16,652,312	(2,019,880)	-10.8%
Buildings (other than judgements)	25,031,242	22,381,773	(2,649,469)	-10.6%
Police Board	473,519	407,130	(66,389)	-14.0%
Treasurer	1,680,906	1,435,254	(245,652)	-14.6%
HR	1,231,493	1,032,963	(198,530)	-16.1%
COPA	13,289,293	10,962,166	(2,327,127)	-17.5%
Sub-Total Departments	**2,974,553,547**	**2,909,758,656**	**(64,794,891)**	**-2.2%**
Finance General- Personnel Services	412,341,387	378,715,997	(33,625,390)	-8.2%
Finance General- Contractural Services	93,132,204	80,673,008	(12,459,196)	-13.4%
Finance General- Corporate Fund transfers to pension funds	101,024,000	101,024,000	0	0.0%
Other Finance General	115,206,012	114,756,480	(449,532)	-0.4%
Sub-Total Finance General	**721,703,603**	**675,169,485**	**(46,534,118)**	**-6.4%**
General Fund Grand Total	**3,734,526,900**	**3,738,588,754**	**4,061,854**	**0.1%**

The Police Department spent $21.7 million (1.5%) less than appropriated for purposes other than judgements, including $18.6 million less than appropriated for personnel services.

Six departments spent less than 91% of their appropriated budget: COPA (spent only 82.5% of budget), HR (83.9%), Office of the Treasurer (85.4%), the Police Board (86%), Buildings (88.4%) BACP (89.2%), and AH (89.9%).

Three of the six departments which spent less than 90% of their appropriation account for much of the City's fine and fee revenue (Buildings, BACP and AH). The Department of Buildings spent the bulk of its contractual services and travel budgets, and almost all of its Personnel budget. Most of its savings came from only spending $921,000 out of $3 million budgeted for Board Up and Demolition of Abandoned Buildings. BACP only spent 91% of its personnel budget, 84% of its contractual services budget, and less than 51% of its travel budget. AH's underspending seemed to be widespread through the department. But, the CAFR does not contain any definitive evidence that those economies actually cost the City fine revenue. In fact, actual revenue from fines and penalties was well above budget ($15.4 million versus $6.4 million),[29] although the CAFR does not break that total down by type or department.

The other departments spending less than 90% of their appropriated budget were COPA, the Police Board, and the City Treasurer.

Altogether, City departments underspent their General Fund appropriations by $65 million. In addition, Finance General spending on personnel services and contractual services were $46 million less than appropriated, but that is merely a reflection of underspending by departments. The line items for personnel services are for health and other fringe benefits for City employees, which are reduced when departments reduce their payrolls. The contractural services line items under Finance General were primarily for information technology development and maintenance, and for other professional and technical services, so underspending there is also reflective of underspending by departments.

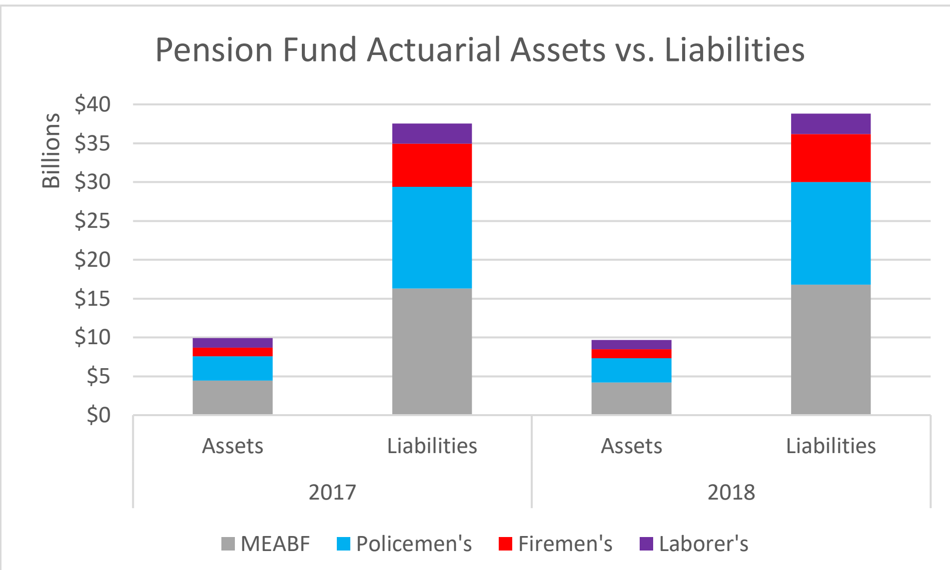
[29] 2018 CAFR, Schedule A-1.

Pensions

Unfunded Liabilities

During 2018, Chicago's four pension funds' combined unfunded liability rose from $27.6 billion to $29.2 billion while their funding ratio sank from 26.5% to 24.9%, and the Actuarially Determined Contribution (ADC) required to make the funds fully funded within thirty years rose from $2.5 billion to $2.6 billion.[30]

In plain English, that means that the funds' actuaries estimate that the funds will have $29 billion less than they need to pay their obligations over the next thirty years, or, in other words, they would only have sufficient assets to pay a quarter of their obligations. There were three primary reasons why the unfunded liability grew by $1.6 billion during 2018. The funds investments performed very badly that year (as did those of the overwhelming majority of investors); the City's contribution was $1.16 billion, which was far less than the ADC, even though it was far more than the City had ever contributed before; and new, more conservative accounting requirements.



[30] Asset, liability and funded ratio data from 2018 CAFR pp. 105-108, ADC data from pp. 109-110

The $2.6 billion Actuarially Determined Contribution (ADC) means the funds could meet their obligations if the City contributes $2.6 billion to the funds every year for the next thirty years. Let's put that number in context:

Actuarially Determined Contribution:	$2.6 billion
2019 contribution (budgeted)	$1.36 billion
2018 contribution[31]	$1.16 billion
Average annual contribution, 2009-2015	$459 million
2019 appropriation for CPD, S&S, CDOT and DWM (combined)[32]	$2.3 billion

Pension Funds' Funded Status by actuarial value
(millions of $)

	December 31, 2017		December 31, 2018	
	Assets	Liabilities	Assets	Liabilities
MEABF	4,456.8	16,282.4	4,195.6	16,808.6
Unfunded liabilities/Funded ratio	(11,825.6)	27.4%	(12,613.0)	25.0%
Policemen's	3104	13,093.9	3145.1	13,214.7
Unfunded liabilities/Funded ratio	(9,989.9)	23.7%	(10,069.6)	23.8%
Firemen's	1,123.4	5,582.4	1,130.4	6,155.9
Unfunded liabilities/Funded ratio	(4,459.0)	20.1%	(5,025.5)	18.4%
Laborer's	1,245.1	2,578.7	1,185.3	2,652.9
Unfunded liabilities/Funded ratio	(1,333.6)	48.3%	(1,467.6)	44.7%
ALL FUNDS	**9,929.3**	**37,537.4**	**9,656.4**	**38,832.1**
Unfunded liabilities/Funded ratio	**(27,608.1)**	**26.5%**	**(29,175.7)**	**24.9%**

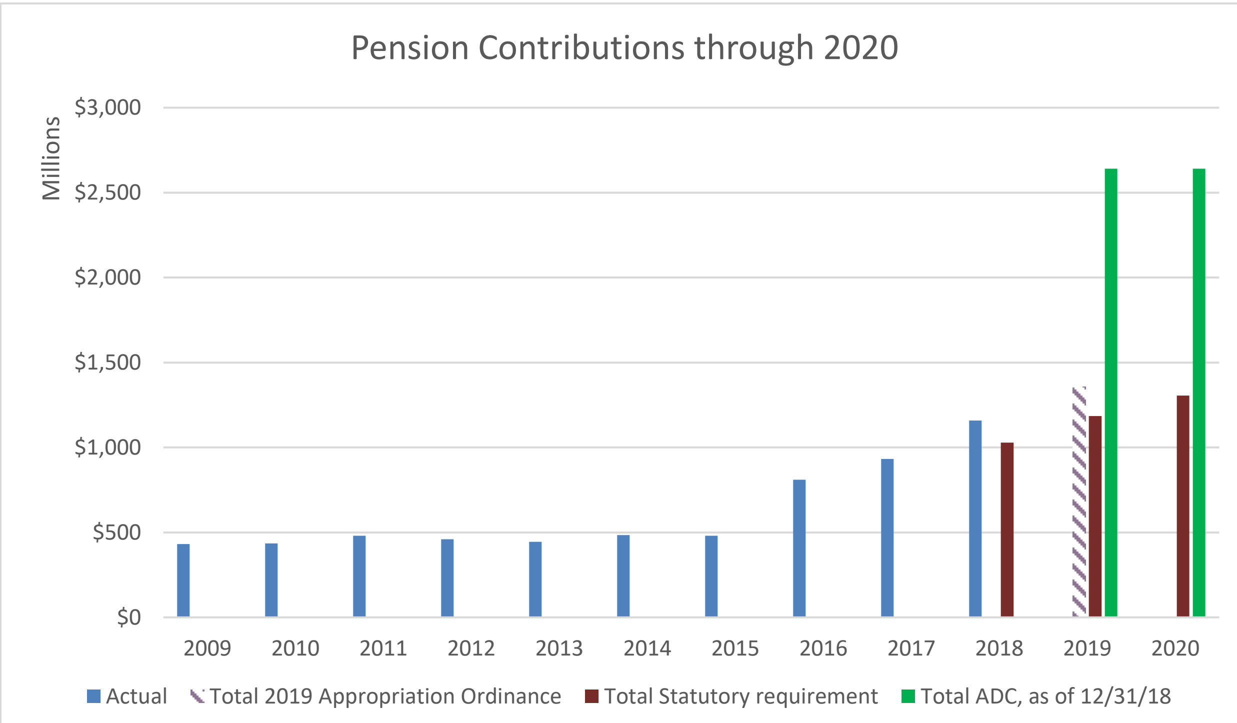
[31] 2009-2018 contributions from CAFR Table 4

[32] 2019 budgeted contribution and departmental appropriations from City of Chicago 2019 Appropriation Ordinance.

The City could make lower contributions in the early years and make up the shortfall in latter years, but at a heavy price. The funds earn compound interest, so a dollar contributed this year is worth far more than a dollar contributed ten years in the future.

Contribution requirements: the "Pension Ramp"

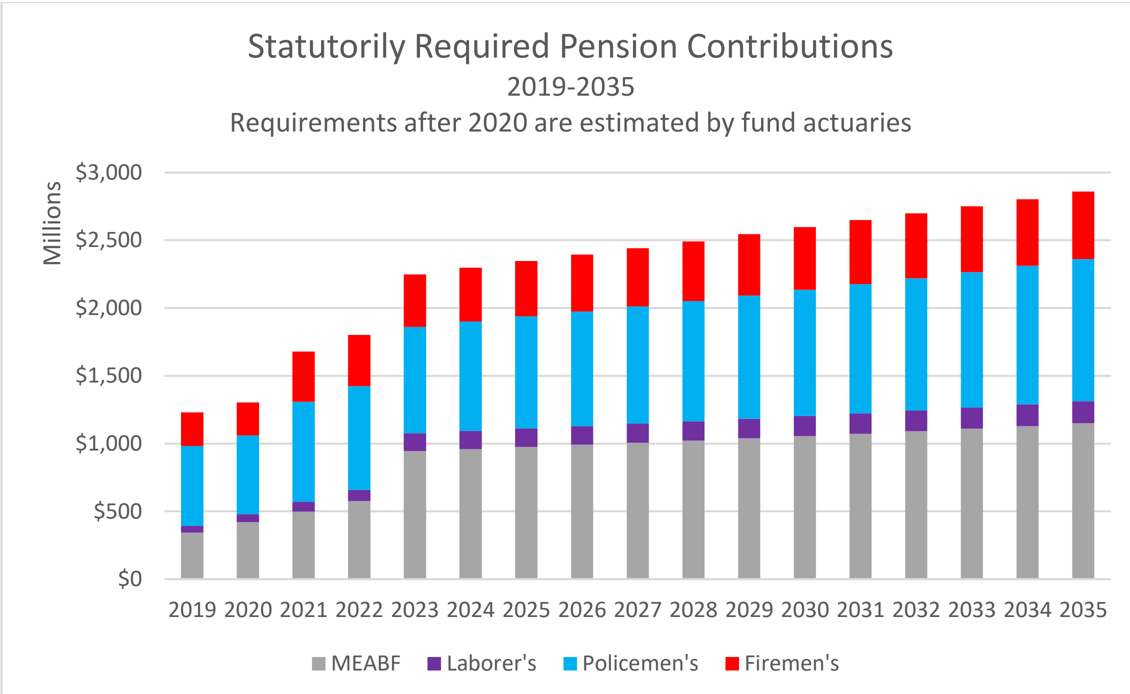
The State of Illinois has passed two laws (PA 99-0506 and PA 100-0023) setting a mandatory time table for the City to make its pension funds solvent. The total required contributions for all four funds are $1.172 billion in 2019 and $1.305 billion in 2020. In 2021, the Policemen's and Firemen's fund contributions switch from a predefined dollar amount to the ADC required each year to make those funds 90% funded by 2055. For the MEABF and Laborer's funds, the City must contribute $571 million in 2021 and $660 million in 2022, before switching to the ADC required to reach 90% funding by 2057.[33]



So, it is impossible to say exactly what the total required contribution will be after 2020. But, we can be certain that the requirements will be much higher when they are determined by the ADC rather than the set amounts. The two statutes require the City to use an ADC large enough to bring the funds up to 90% funded over 35 years, which will be a considerably lower payment than the ADCs cited on page xx of this analysis, which are calculated to bring the funds up to 100% funded over thirty years. Nonetheless, the 35 year/90% funded ADCs will be much larger than the City's current contribution. According the the funds' actuaries estimates, the required contribution will jump from $1.305 billion in 2020 to $1.7 billion

[33] 2018 CAFR, p. 86

in 2021, and to $2.25 billion in 2023. They estimate that the requirement will continue to grow at a moderate annual pace thereafter.[34]



[34] The estimated future statutory contributions are from the *2018 Actuarial Valuation Reports* of the respective funds: Policemen's Annuity and Benefit Fund of Chicago, p. 19; Firemen's Annuity and Benefit Fund of Chicago, p. 18, Laborer's and Retirement Board Employees' Annuity and Benefit Fund of Chicago, p. 23; Municipal Employees' Annuity and Benefit Fund of Chicago, p. 46.
Note that Policemen, Firemen and Laborers attribute contributions to the year before those contributions are counted in the City's expenditures (e.g., the City reports that it is required to contribute $72 million to the Laborers' in 2021, while the Laborers' refer to the same requirement by stating that the City is required to contribute $72 million in 2020). However, the MEABF reports contributions in the same year that the City does.

Investment Performance

The Laborer's fund is the smallest, and by far the least unhealthy of the funds, with a funding ratio of 44.7% (still way short of sound). The Firemen's fund has the lowest funding ratio, but the difference between the Firemen and MEABF and Policemen's is not their actual condition so much as the fact that the Firemen make the most conservative assumptions about their future investment success. The actuarial funding ratios are based on many assumptions about the future. Among the most important is the assumed average investment rate of return on pension fund assets. With its 2018 Actuarial Valuation Report, the Firefighter's fund lowered its assumed rate of return from 7.5% to 6.75%, making it significantly more conservative in that assumption than the other funds.

Assumed Rate of Return[35]

Laborer's	7.25%
Police	7.25%
MEABF	7.0%
Firefighters	6.75%

It is an important difference. Over the course of the 30 year projection, a dollar invested at 7.25% compound interest will become \$8.16, while a dollar invested at 6.75% will only become \$7.10. The four funds currently have a combined \$7.6 billion in investments, which means that if they earn a collective return of 7.25%, they will have almost \$8 billion more in thirty years than if they earn 6.75%.

The funds' investments are managed by Investment Managers who are hired and report to the funds' Boards of Trustees. The Plans are authorized to invest in bonds, notes, and other obligations of the U.S. Government; corporate debentures and obligations; insured mortgage notes and loans; common and preferred stocks; stock options; real estate; and other investment vehicles as set forth in the Illinois Compiled Statutes. The Plans' policies in regard to the allocation of invested assets is established and may be amended by the Board.

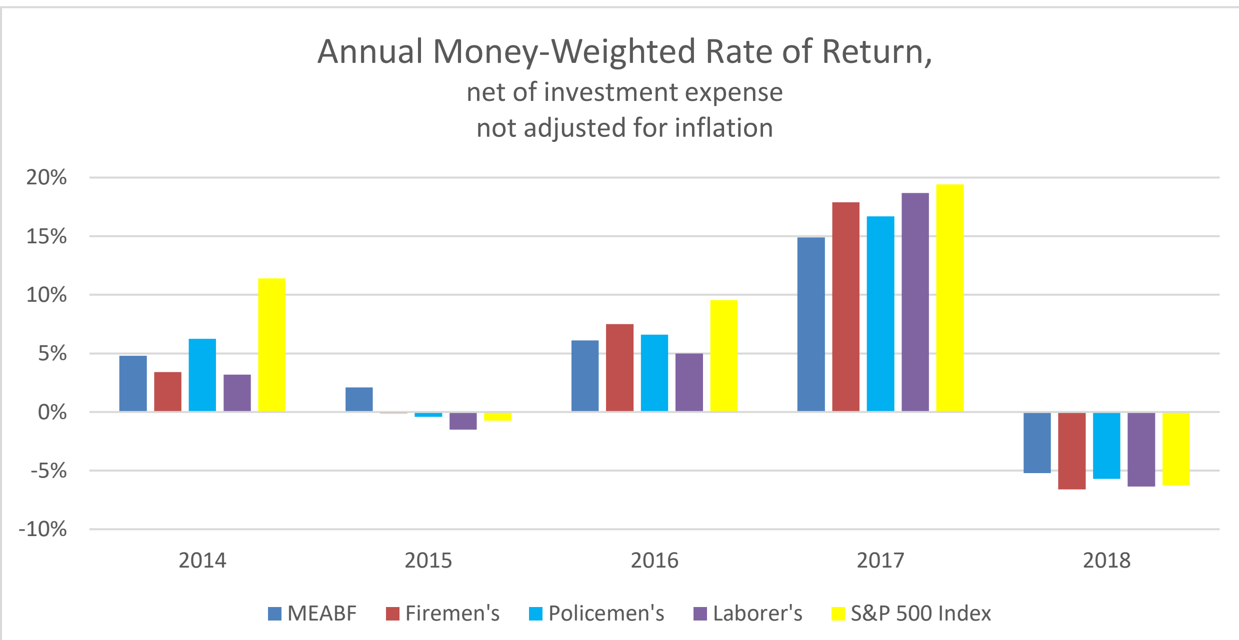
[35] 2018 CAFR, p. 111

Rating their actual investment performance to date is complicated by the fact that there are many ways to compute Rate of Return, so that one risks counting granysmiths against navels. However, the four funds have been required to use a uniform metric since 2014.[36]

Annual Money-Weighted Rate of Return, net of investment expense

	2014	2015	2016	2017	2018
MEABF[37]	4.8%	2.1%	6.1%	14.9%	-5.2%
Firemen's[38]	3.4%	-0.1%	7.5%	17.9%	-6.6%
Policemen's[39]	6.2%	-0.4%	6.6%	16.7%	-5.7%
Laborer's[40]	3.2%	-1.5%	5.0%	18.7%	-6.4%
S&P 500 Index[41]	11.4%	-0.7%	9.5%	19.4%	-6.2%

During that time period, the MEABF and Police funds each underperformed the S&P 500 Index three out of five years. The Firemen's fund underperformed the Index four out of five years, and the Laborer's fund underperformed the Index every single year. The Index outperformed all four funds by a wide margin in both 2014 and 2016. Annual variation is inevitable, but persistent variations, even small ones, become large through compounding.



[36] Annual Money-Weighted Rate of Return, net of investment expense
[37] Municipal Employees' Annuity and Benefit Fund of Chicago, *Financial Report, December 31, 2018 and 2017*, p. 39
[38] Firemen's Annuity and Benefit Fund of Chicago, *Financial Statements, December 31, 2018 and 2017,* p. 33
[39] Policemen's Annuity and Benefit Fund of Chicago, *Financial Statements and Supplementary Information for the Years Ended December 31, 2018 and 2017*, p. 53
[40] Laborer's and Retirement Board Employees' Annuity and Benefit Fund of Chicago, *Financial Statements, December 31, 2018,* p. 53
[41] https://www.macrotrends.net/2526/sp-500-historical-annual-returns

Appendix: Demographic and Economic Measures

One cannot properly evaluate the City's finances without putting them in the context of its tax base. COFA has attempted to do so in the "Economics, Demographics, and Ability to Pay" section of the Debt chapter of this report. The authors of the 2018 CAFR did so within the CAFR's PART III- STATISTICAL SECTION. This appendix explains why COFA chose the measures it did, and how those measures differ from the ones the CAFR's authors selected.

Population and number of households

The 2018 CAFR's Table 26: Population and Income Statistics shows annual figures for population, median age, and number of households. The population figures are used to compute the City's per capita debt in Tables 16 and 19. Although the CAFR uses the annual estimates from the Census Bureau's American Fact Finder for the number of households and median age, for population it uses the number from the 2000 census for 2009, and uses the number from the 2010 census for 2010 through 2018.

This choice results in some peculiar, and we believe unintentionally distorted, results in the per capita debt tables. The census showed that Chicago's population dropped by 7% between 2000 and 2010. But, COFA believes that it is unlikely that 100% of the population decline for the whole decade occurred between 2009 and 2010. In fact, we suspect that Chicago's 2009 population was most likely closer to its 2010 population than to its 2000 population. By using the figures they did, it created the false impression that the City's 2010 per capita debt had grew enormously between 2009 and 2010. Then, the CAFR treated population as a constant for the following nine years. COFA feels that there is no value in including a variable which does not vary in a time series analysis.

COFA considered using the Census Bureau's annual population estimates for this report. However, we decided against it for two reasons. First, the 2009 estimate was 2,850,502, which is still 5.7% higher than the 2010 count. This seems questionable to us, and certainly raises doubts about population estimates between 2001 and 2009, and possibly about all estimates between decennial censuses. Second, according to Census Bureau estimates, the City's population made extremely small fluctuations both up and down between 2010 and 2018. They estimate that the 2018 population was 0.4% higher than the 2010 population. To us, that is not a large enough difference to change an analysis, and may well be within the margin of error. So, we opted to forgo per capita analysis and treat population as a constant.

Similarly, the estimated number of households from the Census Bureau's American Community Survey for 2017 (the most recent available as of this writing) was 1% higher than the 2009 estimate, and 0.2% higher than the 2010 count. So, for the same reasons, we thought it best to treat that number as a constant for the study period.

Economic Measures

It is certainly important to measure the City's finances against changes in the size of the city's economy. Unfortunately, while there is a plethora on state-level and metropolitan area-level economic measures, COFA has not found what it considers a satisfactory mix of measures of the size of the city's economy.

The CAFR's Table 26 includes figures for unemployment rate and per capita income, but the figures it cites are for the whole Chicago-Naperville-Illinois Metropolitan Area, which includes fourteen counties (some of which are in Wisconsin and Indiana). We do not feel that we can assume that figures for the fourteen county area hold true for the city of Chicago. The CAFR's Table 26 also includes a Total Income figure for the city, but it is apparently the result of multiplying the city's population by the fourteen county area's per capita income.

In order to measure changes in personal income among Chicago residents, we believe that the Adjusted Gross Income and number of returns reported to the Illinois Department of Revenue is the most reliable data we have found. However, unfortunately, the most recent data available from that source as of this writing is 2016. So, we decided to also include mean household income and median household income from the Census Bureau's American Community Survey. This brought the figures up to date through 2018. In addition, the discrepancy between the three measures illuminated the degree to which a minority of high-income earners are growing in prosperity, while incomes remain stagnant for half or more of households.

COFA agreed with the authors of the CAFR that total employment in the city is one measure of its economic health, and we used their figures in our analysis. But, while the number of jobs in the city is important, it does not tell us how well the jobs pay, or the financial health (and thus ability to pay taxes) of the employers. We did include changes in retail sales, reported by the Illinois Department of Revenue, as an important measure of the volume of commerce being transacted in the City, but that is only one type of business. The Department of Revenue has informed us that they are unable to break corporate income down by zip code, or other geographic division, as they can for individual income, because a person reports a single address of residence, whereas a company may be conducting business, employing people, and paying local taxes in a variety of locations.

The introductory page to the CAFR's STATISTICAL SECTION (p. 173) implies that the information on the pages that follow regarding the city's Total Market Value (of real estate) relates to the "Revenue Capacity" of the property tax. The CAFR goes on to measure aspects of the City's debt against Total Market Value and EAV in Tables 16, 19 and 21. However, COFA does not believe that the City's capacity to raise revenue through the property tax is related to its EAV. As a homerule body, Chicago can set its levy at any number it choses, whether property values are rising or falling. Property taxpayers are certainly limited in their ability to pay those taxes (whether the taxpayers are homeowners or businesses), but their ability to pay has more to do with their income than changes in their property value (consider the case of a rapidly gentrifying area where a homeowner on a fixed income and a business with tight margins both struggle to pay rising real estate taxes). The City's capacity to raise property tax levies is certainly limited by the willingness of voters to elect Mayors and Aldermen who would do so, but the challenge of persuading voters to support levy increases is the same whether property values rise or fall. That said, COFA has included Total Market Value among its economic measures for two reasons. First, it is one measure of the willingness of people and firms to invest in the city, which makes it useful as one metric among many. Second, Total Market Value and EAV are often cited by bond rating agencies, and their opinions greatly affect the City's ability to borrow, and the price it will pay for doing so.