



**PERSPECTIVES
THAT DRIVE
ENTERPRISE
SUCCESS**



MAY 15, 2018

Enterprise Risk Tolerance Assessment

City of San Jose Retirement Plans

Executive summary

This analysis is designed to assist the retirement boards with an understanding of the financial health of the City, as the sponsor to each pension plan.

This presentation may be considered a framework for both

1. Analyzing the appropriate level of investment risk to assume; and
2. Communicating between the City and the Boards with respect to how the investment program is designed.

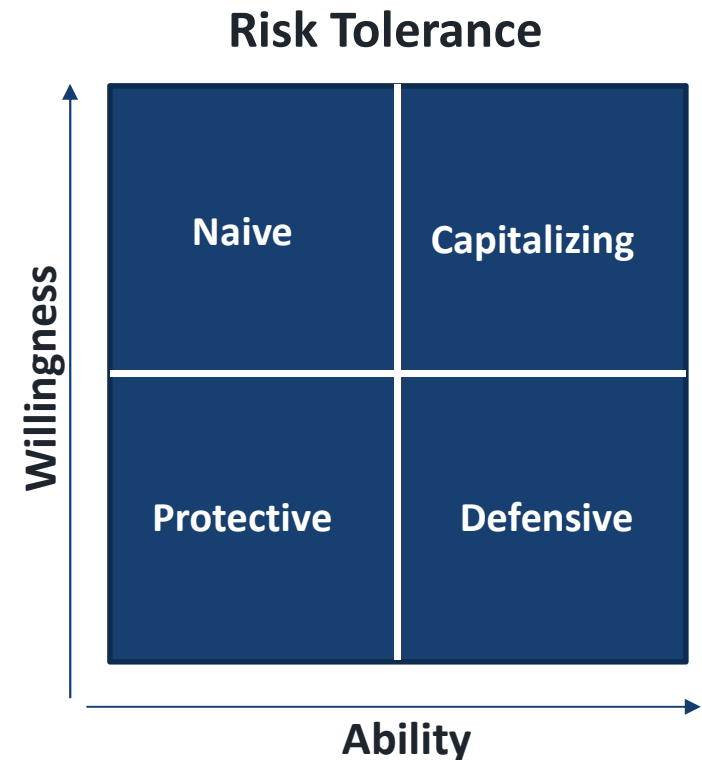
The Police and Fire retirement plan is prepared to accept 12% volatility in its investment program based on the review of the City's financial health, desired investment returns, and financial market forecasts.

The Federated plan will follow a similar analysis but is currently assuming approximately 12% volatility in its investment program.

Fiduciary duties are appropriately recognized such that the Boards' responsibilities are to their respective plan's participants while the City's responsibilities are to its taxpayers.

Enterprise Risk Tolerance in Context

- Properly assessing Enterprise Risk Tolerance has important and practical implications for investment strategy development.
- It involves assessing the Plan's ability and the Board's willingness to accept risk.
- Although the Board's fiduciary duty is to the beneficiaries of the Plans, understanding the City's financial situation impacts its ability to make contributions and cannot be overlooked.
- Similar to the Board's willingness and ability to accept risk, the City itself faces a similar challenge in understanding its willingness and ability to accept risk.



Peer group for comparisons

A peer group has been created to help assess San Jose's financial health relative to other comparable cities.

The peer group has been created using two sub-groups:

- The 4 largest cities in California, excluding San Jose
- 4 other cities outside of California with the following characteristics:
 - High growth
 - Retirement system separate from a state/multi-employer system
 - Comparable population size

As a result, the peer group is as follows:

- Within California: Fresno, Los Angeles, San Diego, San Francisco
- Outside California: Dallas, Denver, San Antonio, Seattle

Credit ratings

- The City of San Jose has been assigned high general credit ratings from all 3 national rating agencies:
 - Moody's Aa1 (2 of 21); stable outlook
 - S&P AA+ (2 of 20); stable outlook
 - Fitch AA+ (2 of 20); stable outlook
- *The ratings continue to reflect the diversity of the local economy anchored by a strong technology presence and sound financial management and prudent budgetary practices.*

City	Moody's	Funded Ratio	Actuarial Value of Assets (\$mm)	Population	Government Revenues (\$mm)	Revenue per Capita
San Jose	Aa1	76% P&F; 54% Fed	\$3,297 P&F / \$2,035 Fed	1,046,000	\$1,526	\$1,459
Dallas	A1	49% P&F; 80% ERS	\$2,158 P&F / \$3,451 ERS	1,270,170	\$1,678	\$1,321
Denver	Aaa	72%	\$2,169	693,060	\$1,954	\$2,820
Fresno	A3	120% P&F; 113% ERS	\$1,355 P&F / \$1,145 ERS	525,832	\$435	\$828
Los Angeles	Aa2	73%	\$13,178	4,041,707	\$7,315	\$1,810
San Antonio	Aaa	88% P&F	\$2,977	1,469,824	\$1,966	\$1,337
San Diego	Aa2	72%	\$6,455	1,406,318	\$1,967	\$1,398
San Francisco	Aa1	85%	\$20,655	870,887	\$5,972	\$6,857
Seattle	Aaa	68%	\$2,564	686,800	\$2,099	\$3,057

Sources: City of San Jose Comprehensive Annual Financial Report 2017; each respective City's CAFR as of the FY End date in the table. Credit rating agencies ratings as of June 30, 2017.

Note: Dallas and Fresno hold outstanding Pension Obligation Bonds of \$257,623,000 and \$131,380,000, respectively.

Calibrating our unique position: Strengths

After discussing which City-level metrics should be included in developing the Plan's risk profile, the Board identified the following strengths & weaknesses that should be considered and communicated with the City.

A review of the Enterprise Risk Tolerance analysis noted the following Strengths:

Consideration	Rationale
Credit ratings	Top 2 rating from each of 3 national rating agencies
Strong balance sheet	Total assets = 1.7 x Total liabilities
Good demographics & trends	0.8% annualized population growth; increasing value of taxable property; declining unemployment rate;
Forecasted General Fund growth in revenues > growth in expenses	-0.8% growth in revenues > -2.5% growth in expenses
History of improving net activity	4.2% CAGR of revenues over past 5 years vs. 2.6% CAGR of expenses over same period
Favorable economic environment	Diversified employment by industry; global tech sector hub; broad domestic economic growth

Calibrating our unique position: Challenges

And the Enterprise Risk Tolerance analysis also noted the following Challenges:

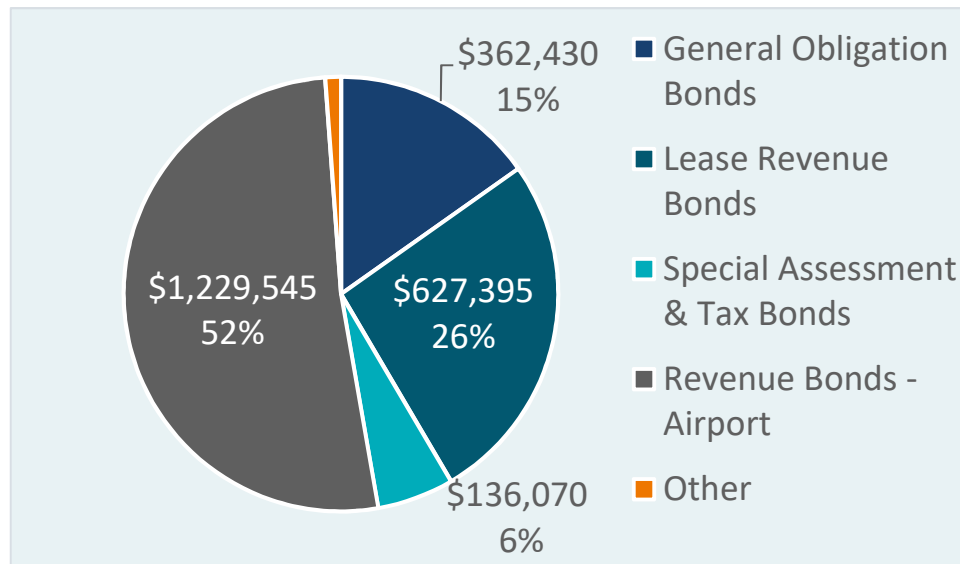
Consideration	Rationale
Funded status	77% for Police & Fire; ~50% for Federated
Interest on UAL	36% of payroll for FYE 2019 vs. normal cost of 38.5%
Growth of contributions	31% of FYE 2020 general fund revenues
City continues to run a deficit	Since 2012, cumulative change in net position = -\$894mm
Relative size of pension obligations	Combined actuarial assumed liabilities have grown from 3.3 to 5.5 x Governmental Revenues
Employees' ability to pay	High cost of living area; Sponsor's responsibility for unfunded liability

Appendix

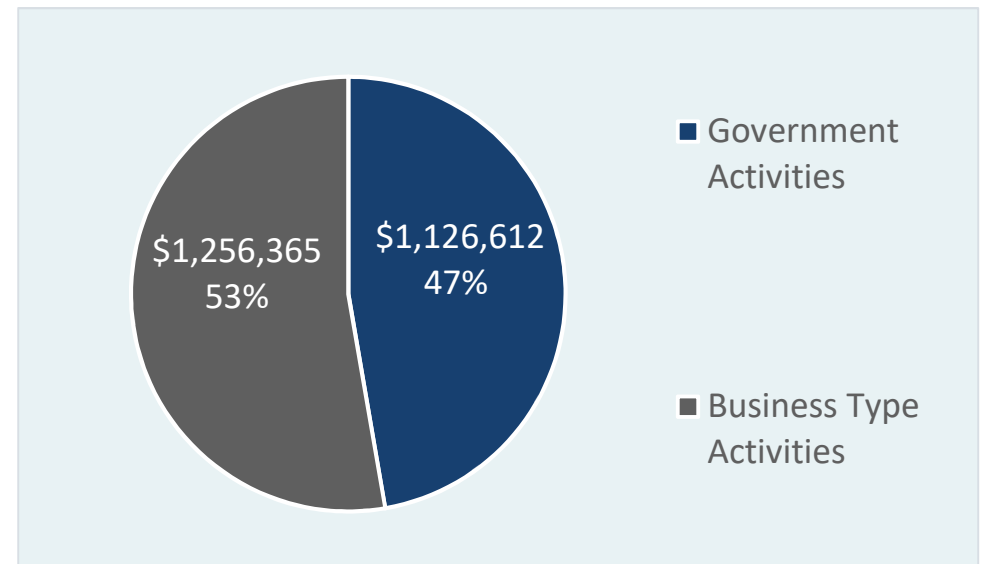
Long-term obligations

- The City's legal general obligation bonded debt limit, per City Charter, is 15% of the value of taxable property (taxable property is also commonly referred to as assessed value) within the City limits.
- With the City's assessed value at \$166.5 billion, the legal debt limit is approximately \$25.0 billion.
- Total general obligation debt outstanding for the City is valued at \$362.4 million, representing 1.4% of the debt limit, well under the legal limit.

LONG-TERM DEBT BY BOND TYPE (IN \$000'S)



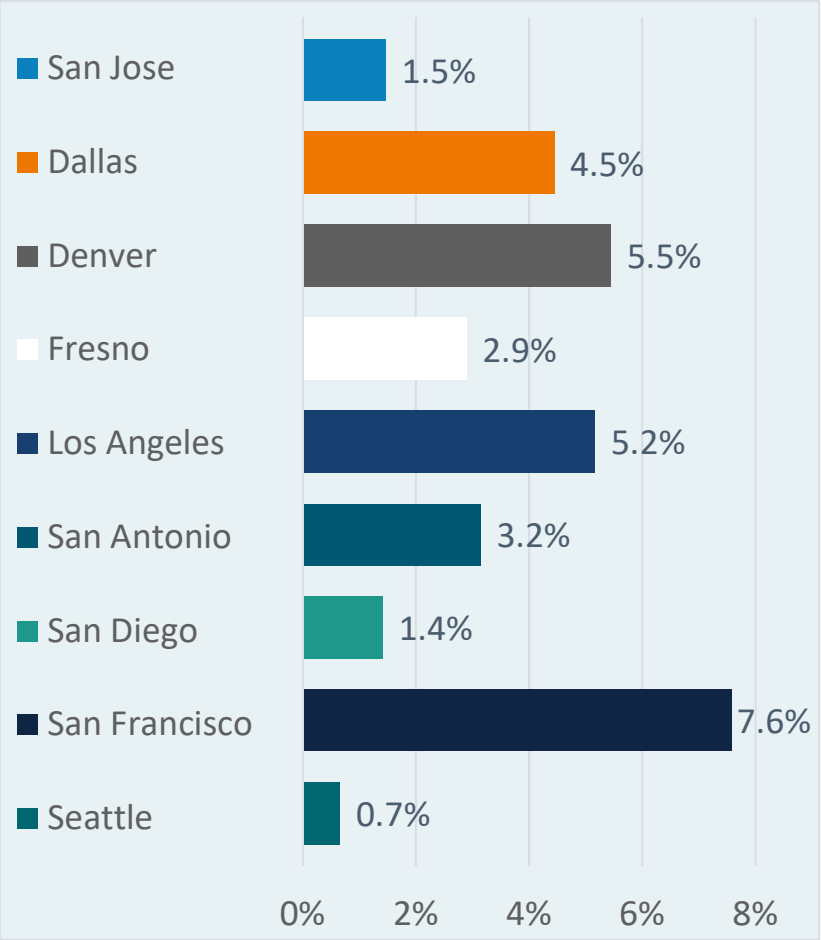
LONG-TERM DEBT BY ACTIVITY TYPE (IN \$000'S)



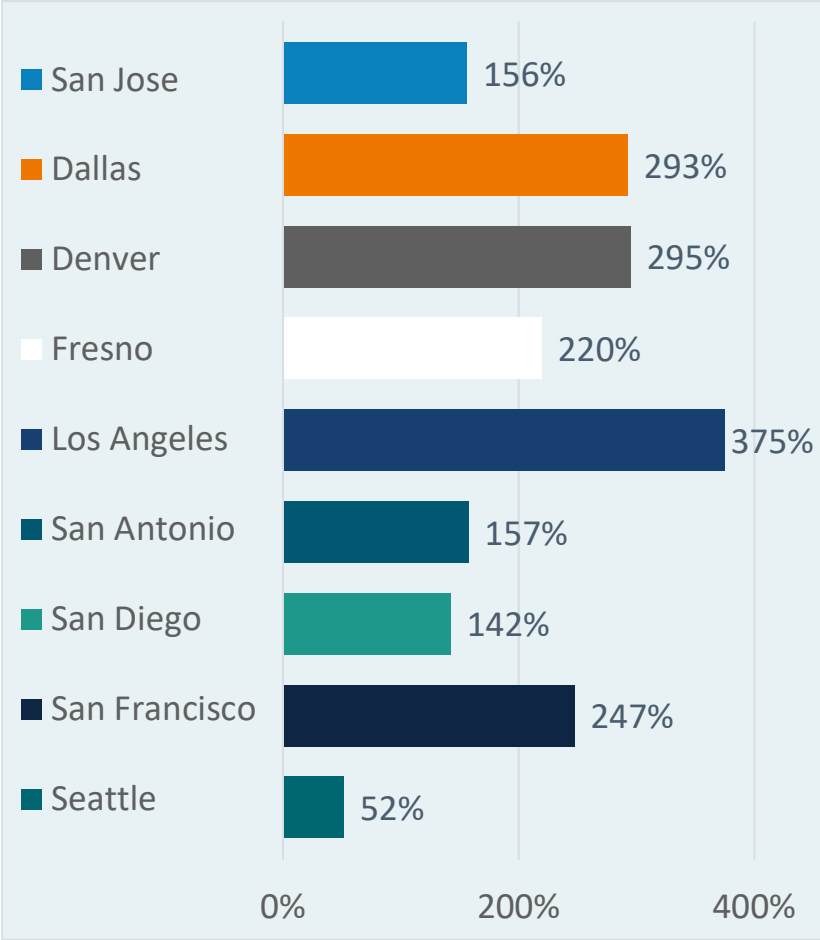
Sources: City of San Jose Comprehensive Annual Financial Report 2017

Outstanding debt

DEBT TO ASSESSED PROPERTY (%)



DEBT TO ANNUAL GOVERNMENT REVENUES (%)



Debt, relative to assessed value of property and governmental revenues, ranks 3rd.

This indicates a reasonable level of leverage.

As of the FY End date for each city noted on page 6.

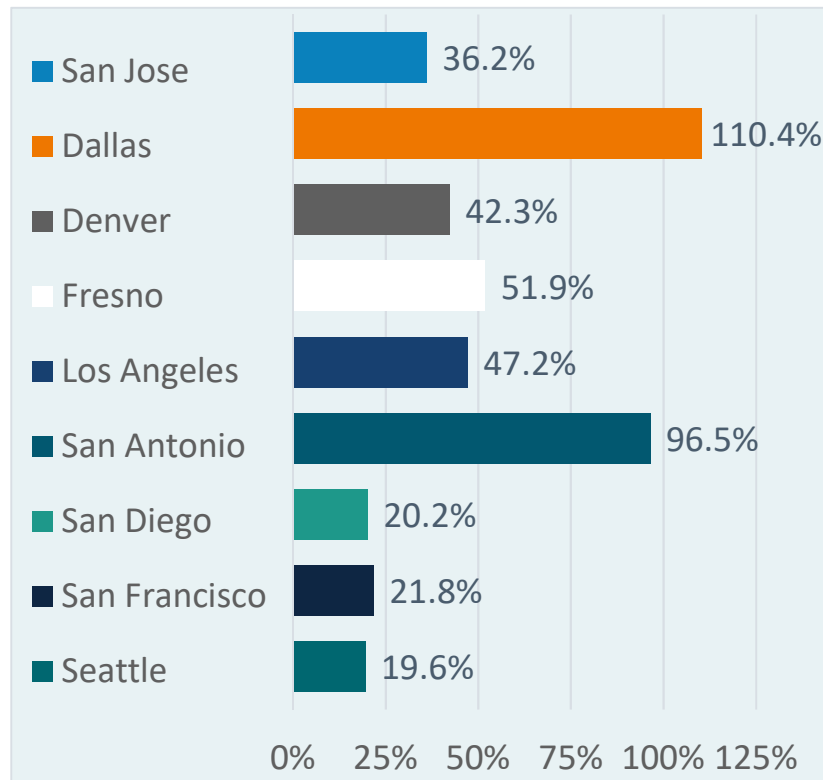
Sources: City of San Jose Comprehensive Annual Financial Report 2017; each respective City's CAFR as of the FY End date noted on page 6.

Debt service

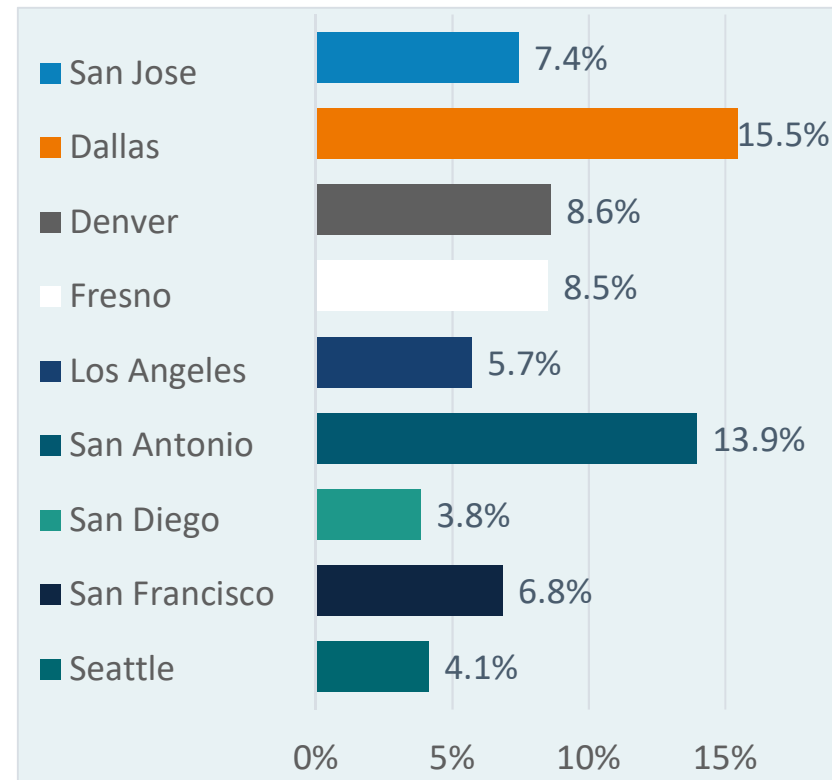
Annual debt service (interest and principal), relative to the general fund balance and governmental revenues, ranks 4th and 5th, respectively.

This indicates servicing debt is not a major financial strain relative to peers.

DEBT SERVICE TO GENERAL FUND BALANCE (%)



DEBT SERVICE TO GOVERNMENTAL REVENUES (%)

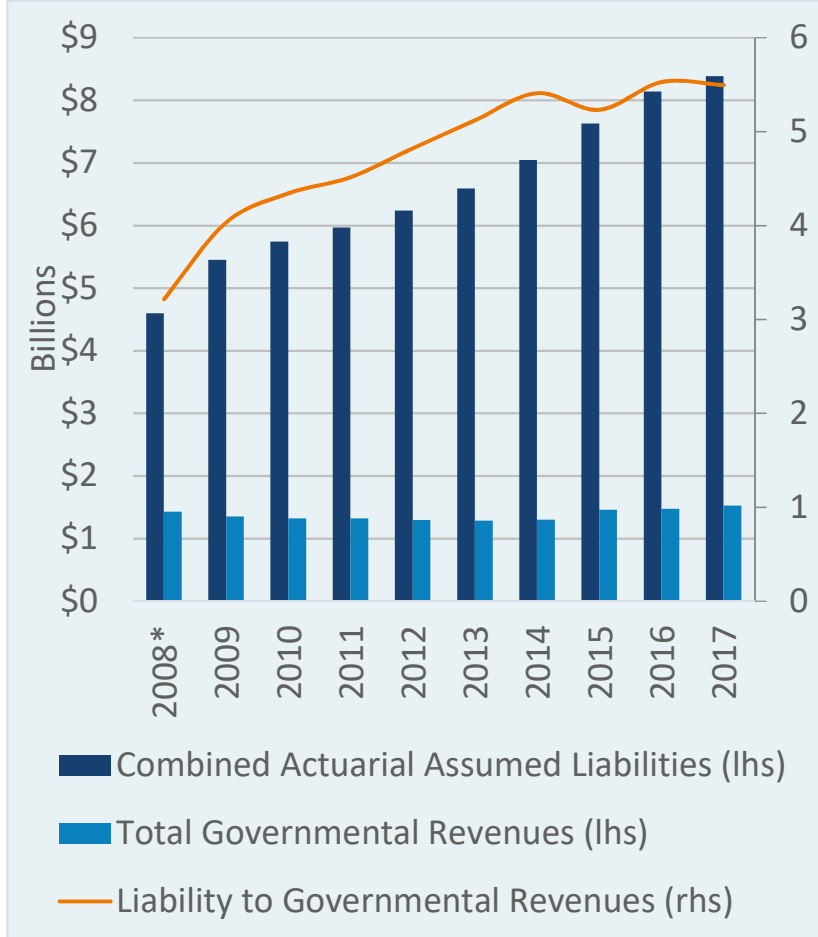


As of the FY End date for each city noted on page 6.

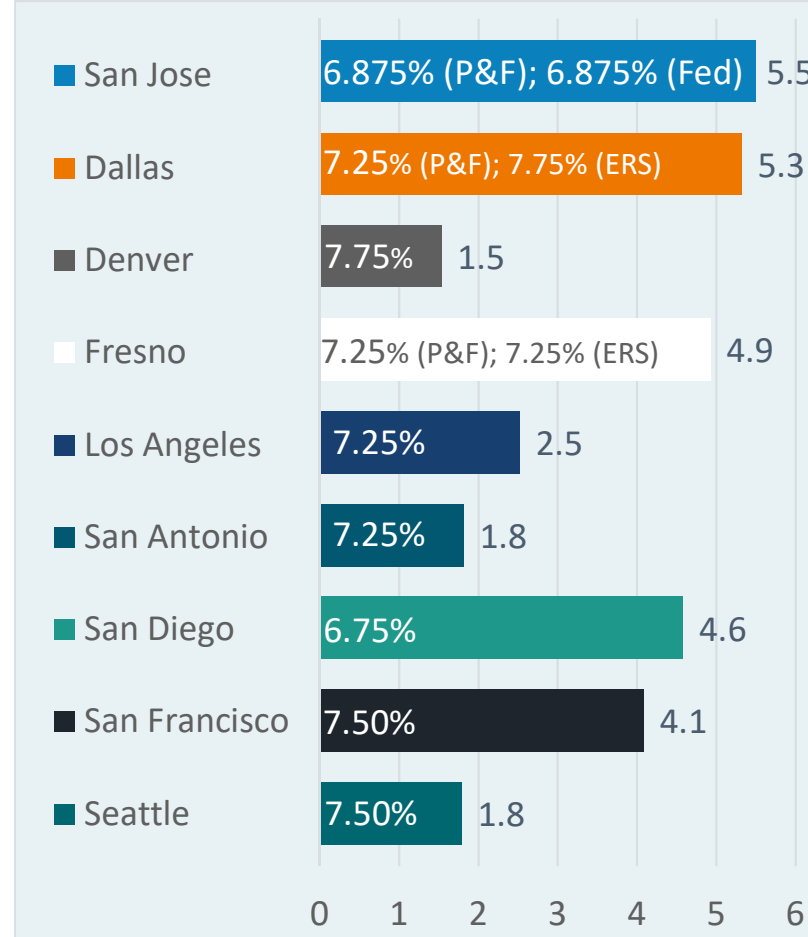
Sources: City of San Jose Comprehensive Annual Financial Report 2017; each respective City's CAFR as of the FY End date noted on page 6.

Liabilities vs. governmental revenue

HISTORICAL TREND



COMPARED TO PEERS



Combined pension liabilities, relative to governmental revenues, ranks among the highest.

Since liability is a function of discount rate, it is important to note that San Jose has the second lowest discount rate.

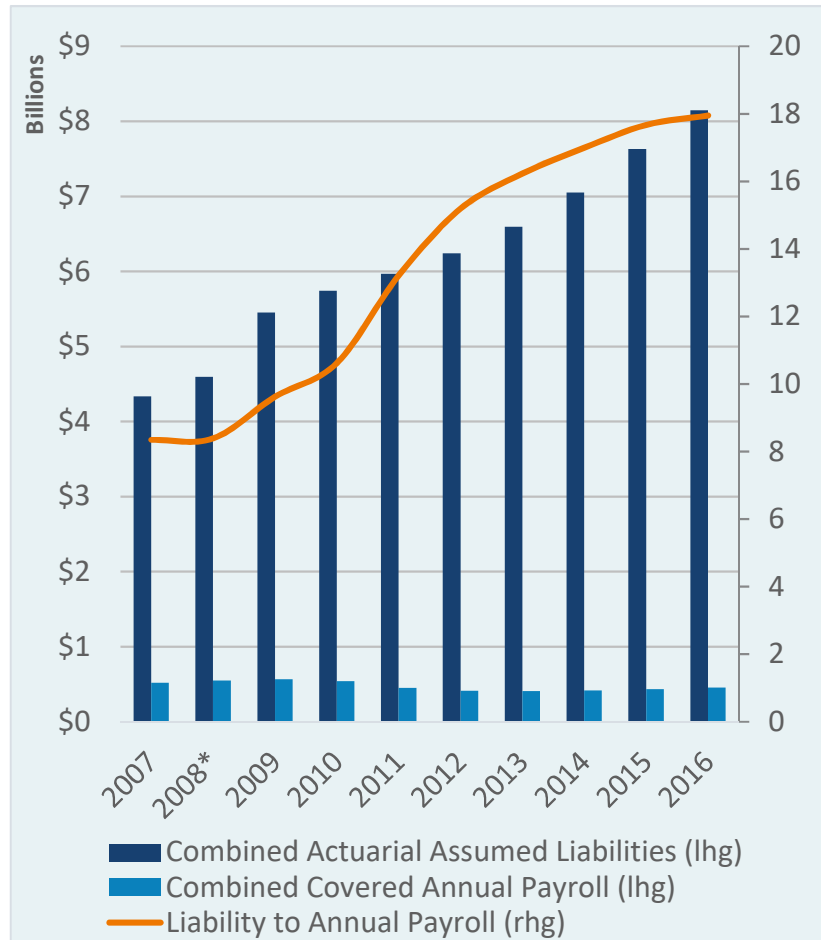
As of the FY End date for each city noted on page 6.

Sources: City of San Jose, Federated Employees', Police & Fire Comprehensive Annual Financial Reports (2017-2008); each respective City's CAFR as of the FY End date noted on page 6.

*2008 actuarial liabilities are estimated as an average of 2007 and 2009 values.

Liabilities vs. annual payroll

HISTORICAL TREND

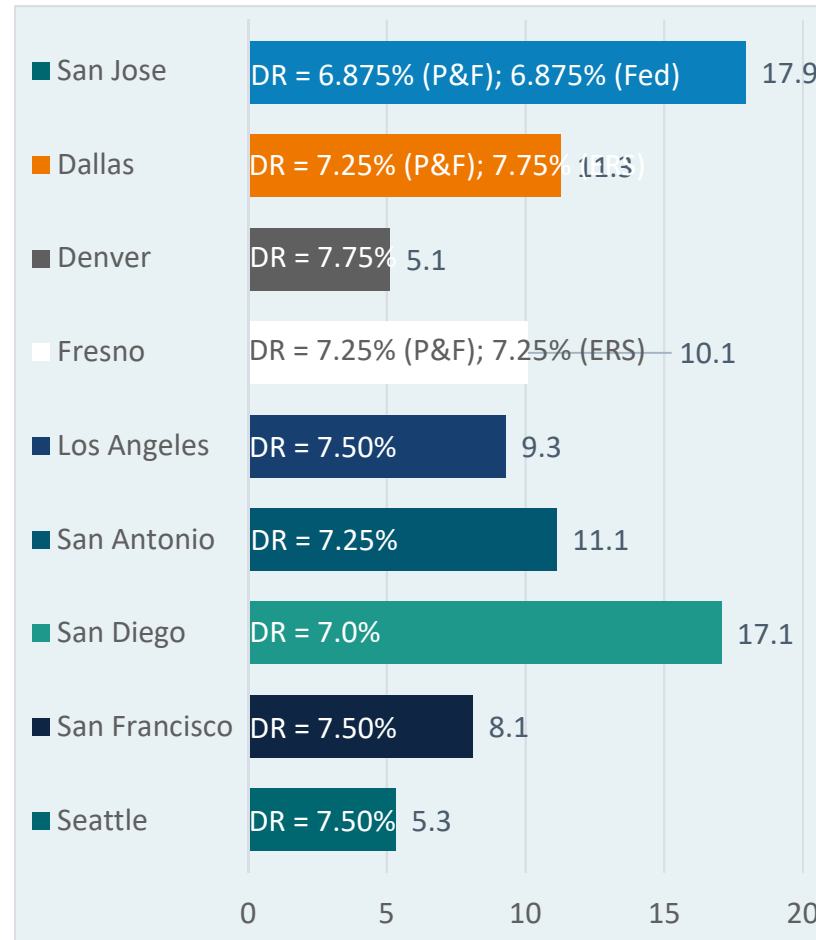


As of the FY End date for each city noted on page 6.

Sources: City of San Jose, Federated Employees', Police & Fire Comprehensive Annual Financial Reports (2016-2008); each respective City's CAFR as of the FY End date noted on page 6.

*Due to lack of 2008 actuarial valuations, liabilities are estimated as an average of 2007 and 2009 values.

COMPARED TO PEERS

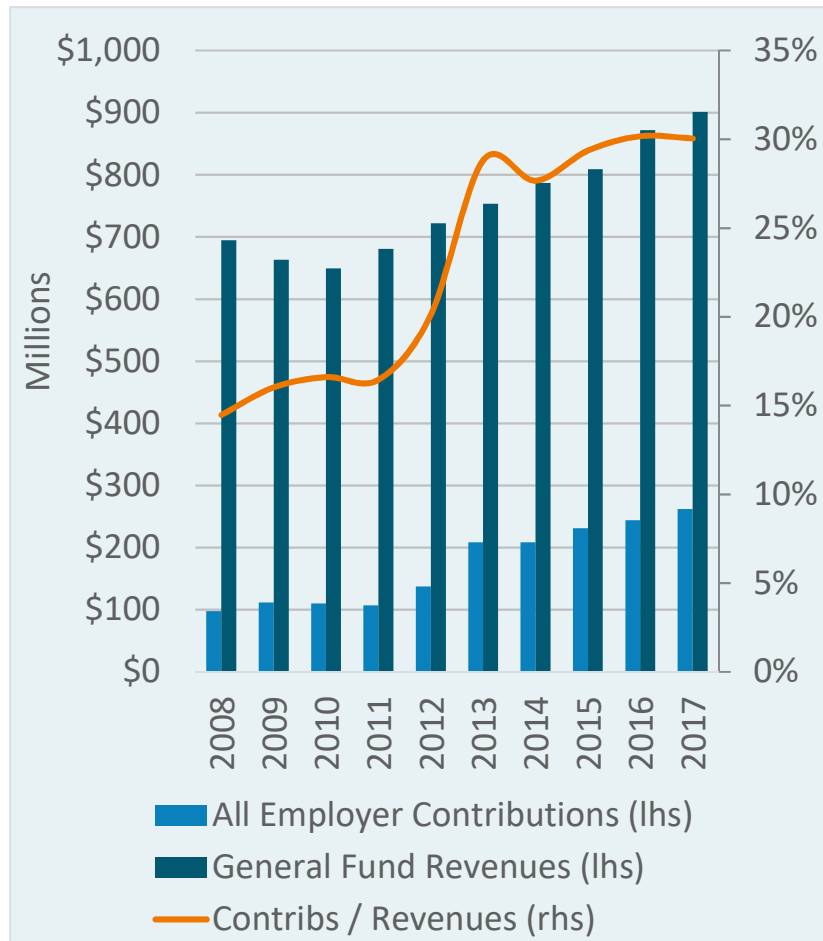


Combined pension liabilities, relative to covered payroll, ranks the highest.

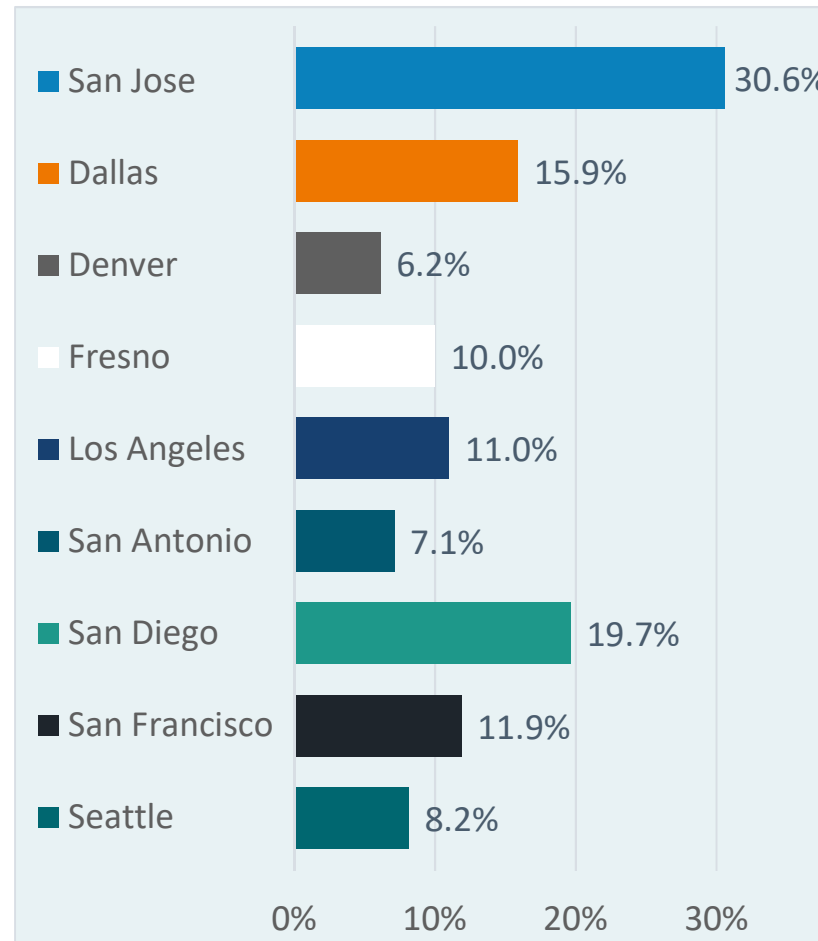
Again, part of this is a function of having the lowest discount rate.

Contributions vs. general fund revenues

HISTORICAL TREND



COMPARED TO PEERS



On both an absolute and as a percentage of general fund revenues, total contributions has trended upwards and ranks the highest.

Contributions have increased as funded status has deteriorated, particularly in the Federated Plan.

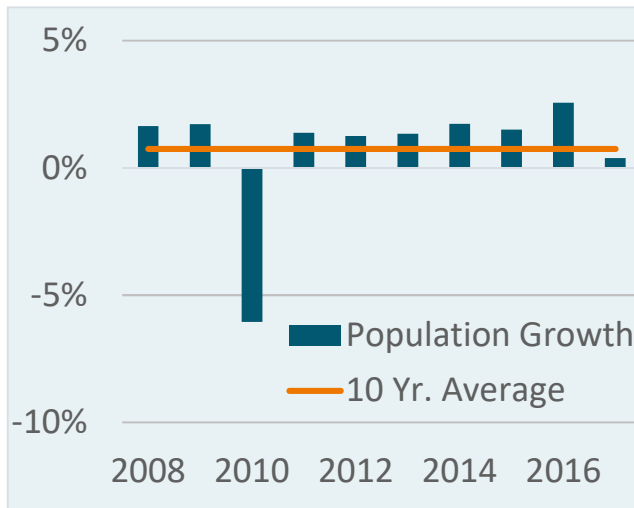
As of the FY End date for each city noted on page 6.

Sources: City of San Jose Comprehensive Annual Financial Reports (2017-2008); each respective City's CAFR as of the FY End date noted on page 6.

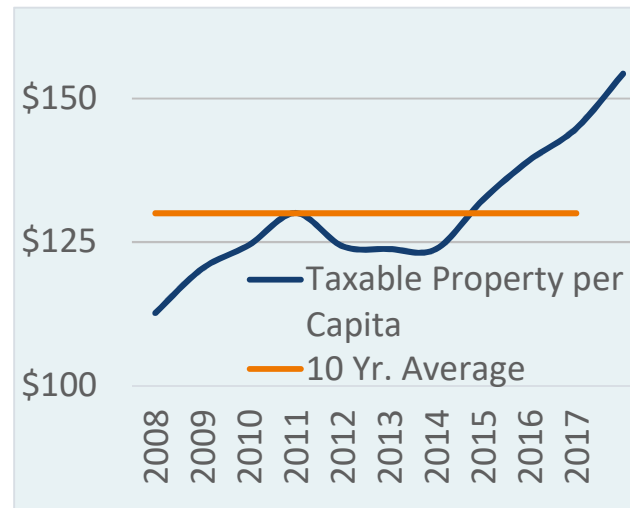
Economic & demographic statistics

- With the exception of 2010, the population growth has been relatively stable over the last 10 years, averaging about 0.7%.
- Taxable property per capita has been trending upwards and is currently at \$154,309, well above its' 10-year average of \$130,000.
- The unemployment rate has improved from the highs between 2010-2011 and is currently at 3.6%, well below its' 10-year average of 7.7%.

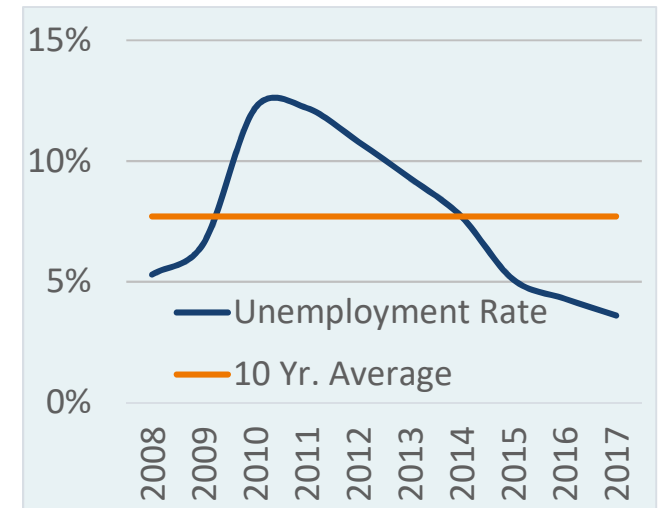
POPULATION GROWTH (%)



TAXABLE PROPERTY



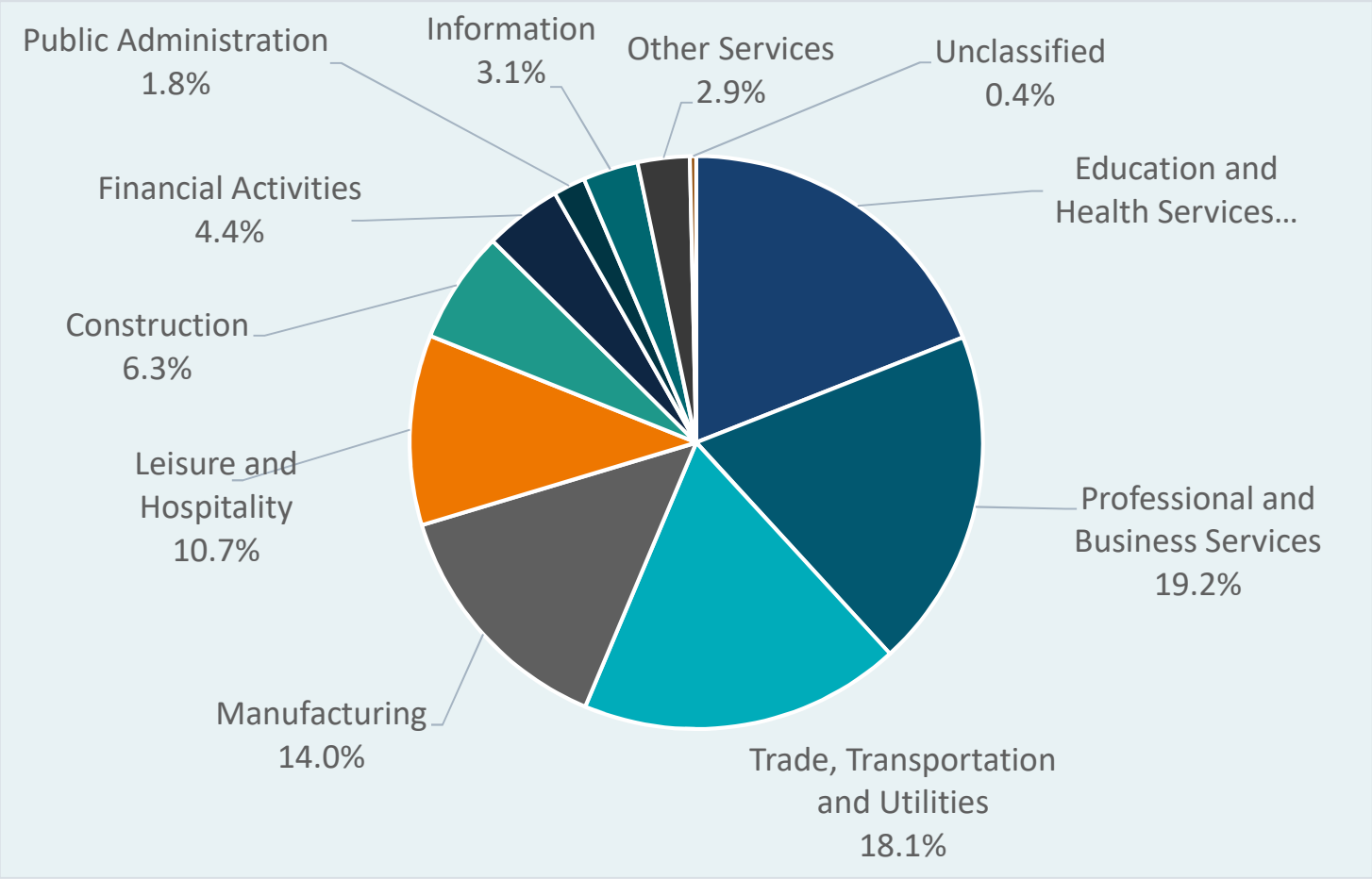
UNEMPLOYMENT RATE (%)



Sources: City of San Jose Comprehensive Annual Financial Reports (2017-2009)

Employment by industry

EMPLOYMENT BY INDUSTRY (%)



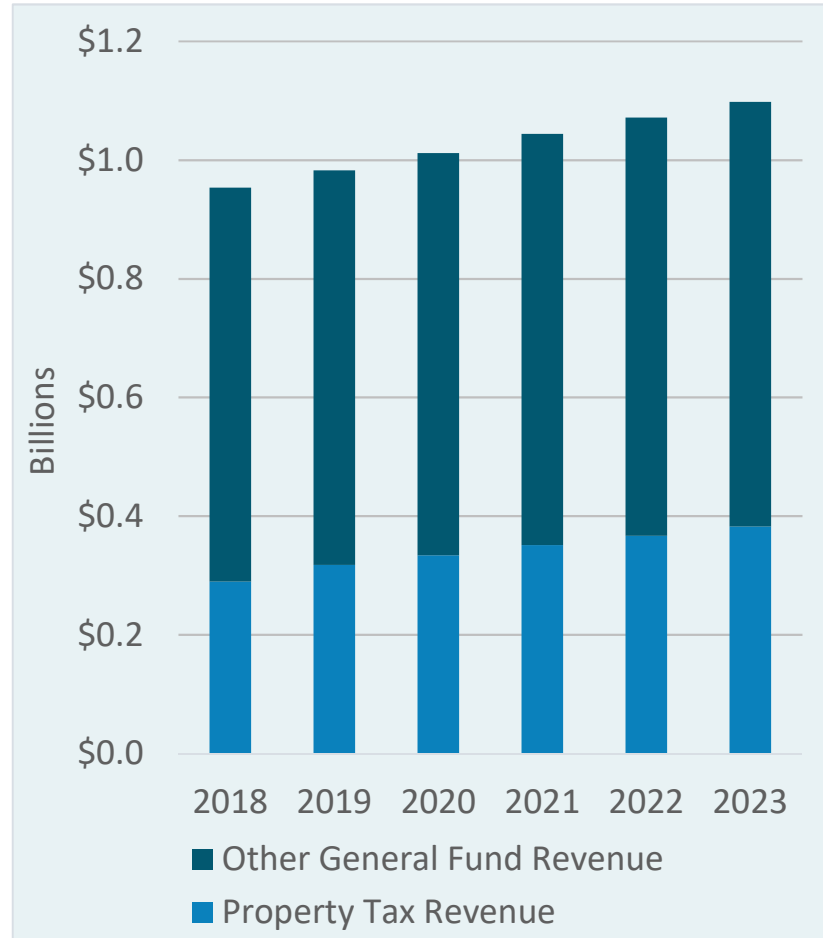
The City of San Jose has a diverse employment base, with the 3 largest sectors each making up over 18% of the base.

Roughly Two-Thirds of the Manufacturing and Professional Services industries are related to the tech sector, accounting for approximately 23% of the total employment.

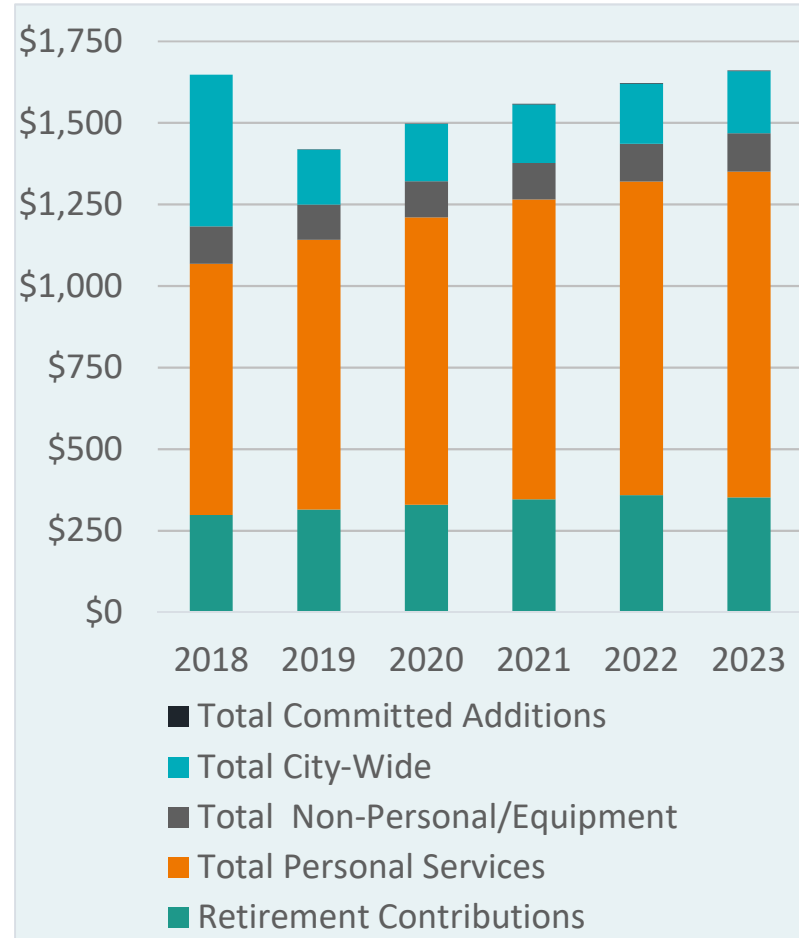
Sources: City of San Jose Comprehensive Annual Financial Report 2016.
 State of CA Employment Department (<https://data.edd.ca.gov/Industry-Information-/Current-Employment-Statistics-CES-San-Jose-Sunnyva/5yee-bw2e>)

Projected general fund financials

GENERAL FUND REVENUES



GENERAL FUND EXPENSES



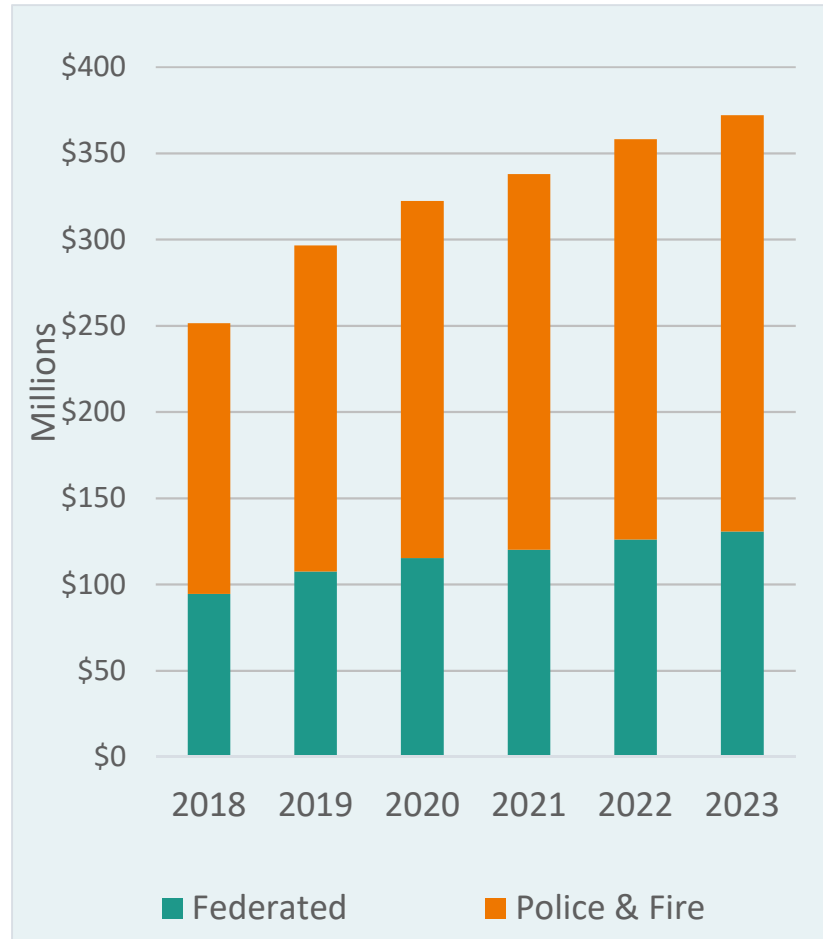
The property tax component of General Fund Revenues are projected to grow at 5.7% annually while the remainder of those revenues are projected to grow at 1.5% annually.

Retirement contributions are projected to grow at 3.2% annually.

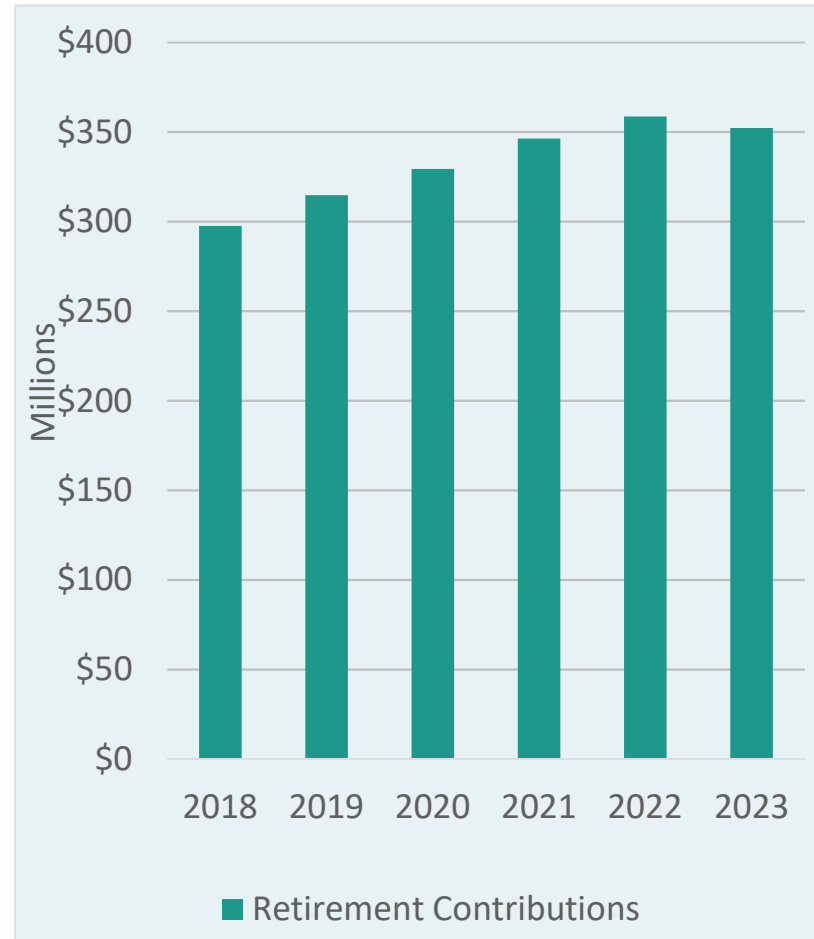
Source: 2018-2019 City Manager's Budget Request & 2019-2023 Five-Year Forecast and Revenue Projections For the General Fund and Capital Improvement Program, Office of the City Manager February 2018

Projected contributions & retirement expenses

CONTRIBUTIONS



GENERAL FUND RETIREMENT EXPENSES



Contributions based on actuarial assumptions have been accounted for in the General Fund projections

Source: 2018-2019 City Manager's Budget Request & 2019-2023 Five-Year Forecast and Revenue Projections For the General Fund and Capital Improvement Program, Office of the City Manager February 2018

San Jose City Statement of Net Position

(in \$000's)

	Fiscal years ending June 30th						CAGRs	
	2012	2013	2014	2015	2016	2017	2-yr	5-yr
Assets								
1. Current and other	2,402,689	2,398,451	2,509,392	2,562,846	2,621,015	2,692,134	2.5%	2.3%
2. Capital	8,756,158	8,329,277	8,003,525	7,730,154	7,591,842	7,501,556	-1.5%	-3.0%
3. Total assets	11,158,847	10,727,728	10,512,917	10,293,000	10,212,857	10,193,690	-0.5%	-1.8%
Deferred outflows of resources								
4. Loss on refundings of debt		2,981	2,535	4,920	4,487	10,591	46.7%	
5. Deferred outflows related to pensions				244,137	527,858	1,050,470	107.4%	
6. Total deferred outflows	-	2,981	2,535	249,057	532,345	1,061,061	106.4%	
7. Total Assets and Deferred Outflows	11,158,847	10,730,709	10,515,452	10,542,057	10,745,202	11,254,751	3.3%	0.2%
Liabilities								
8. Current and other	256,101	254,932	251,269	278,270	267,397	294,349	2.8%	2.8%
9. Long-term	3,493,069	3,512,464	3,498,919	3,398,432	3,330,573	3,263,294	-2.0%	-1.4%
10. Net pension				1,698,658	2,278,227	3,010,977	33.1%	
Total liabilities	3,749,170	3,767,396	3,750,188	5,375,360	5,876,197	6,568,620	10.5%	11.9%
Deferred inflows of resources								
11. Gain on refundings of debt		2,104	1,374	796	373	107	-63.3%	
12. Deferred inflows related to pensions				275,816	341	6,724	-84.4%	
13. Total deferred inflows of resources	-	2,104	1,374	276,612	714	6,831	-84.3%	
14. Total Liabilities and Deferred Inflows	3,749,170	3,769,500	3,751,562	5,651,972	5,876,911	6,575,451	7.9%	11.9%
Net position								
15. Net investment in capital assets	6,210,058	5,829,953	5,548,647	5,336,232	5,244,867	5,205,542	-1.2%	-3.5%
16. Restricted	1,067,870	989,561	1,014,976	1,040,649	1,007,262	1,058,113	0.8%	-0.2%
17. Unrestricted	131,749	141,695	200,267	(1,486,796)	(1,383,838)	(1,584,355)	3.2%	n.m.
18. Total net position	7,409,677	6,961,209	6,763,890	4,890,085	4,868,291	4,679,300	-2.2%	-8.8%
19. Total Assets (7.) / Total Liabilities (14.)	3.0	2.8	2.8	1.9	1.8	1.7		

Source: 2013 – 2017 Comprehensive Annual Financial Reports City of San Jose..

San Jose City Statement of Net Position



Source: 2013 – 2017 Comprehensive Annual Financial Reports City of San Jose..

San Jose City Statement of Activities

(in \$000's)

	Fiscal years ending June 30th						CAGR 5-yr
	2012	2013	2014	2015	2016	2017	
Revenues							
1. Fees, fines, and charges	703,555	769,560	772,915	808,580	869,192	941,865	6.0%
2. Operating grants and contribs	124,499	109,423	105,495	98,733	108,447	88,012	-6.7%
3. Capital grants and contribs	33,648	52,611	44,380	136,126	85,285	76,905	18.0%
4. Property taxes	404,877	329,591	368,233	384,523	404,878	431,138	1.3%
5. Utilities	110,912	111,750	114,486	112,645	113,474	121,046	1.8%
6. Franchise fees	41,709	43,741	45,749	46,909	48,949	49,642	3.5%
7. Transient occupancy tax	22,451	25,258	29,685	36,980	41,125	45,511	15.2%
8. Sales tax shared revenue	154,026	163,751	173,412	180,407	201,797	207,695	6.2%
9. State of CA in-lieu	2,611	524	434	419	410	467	-29.1%
10. Business taxes	41,134	45,140	45,500	47,431	50,864	54,159	5.7%
11. Unrestricted interest	10,512	407	9,641	7,377	14,173	13,017	4.4%
12. Other revenue	21,207	20,678	18,278	19,500	4,417	23,670	2.2%
13. Total revenues	1,671,141	1,672,434	1,728,208	1,879,630	1,943,011	2,053,127	4.2%

Source: 2013 – 2017 Comprehensive Annual Financial Reports City of San Jose..

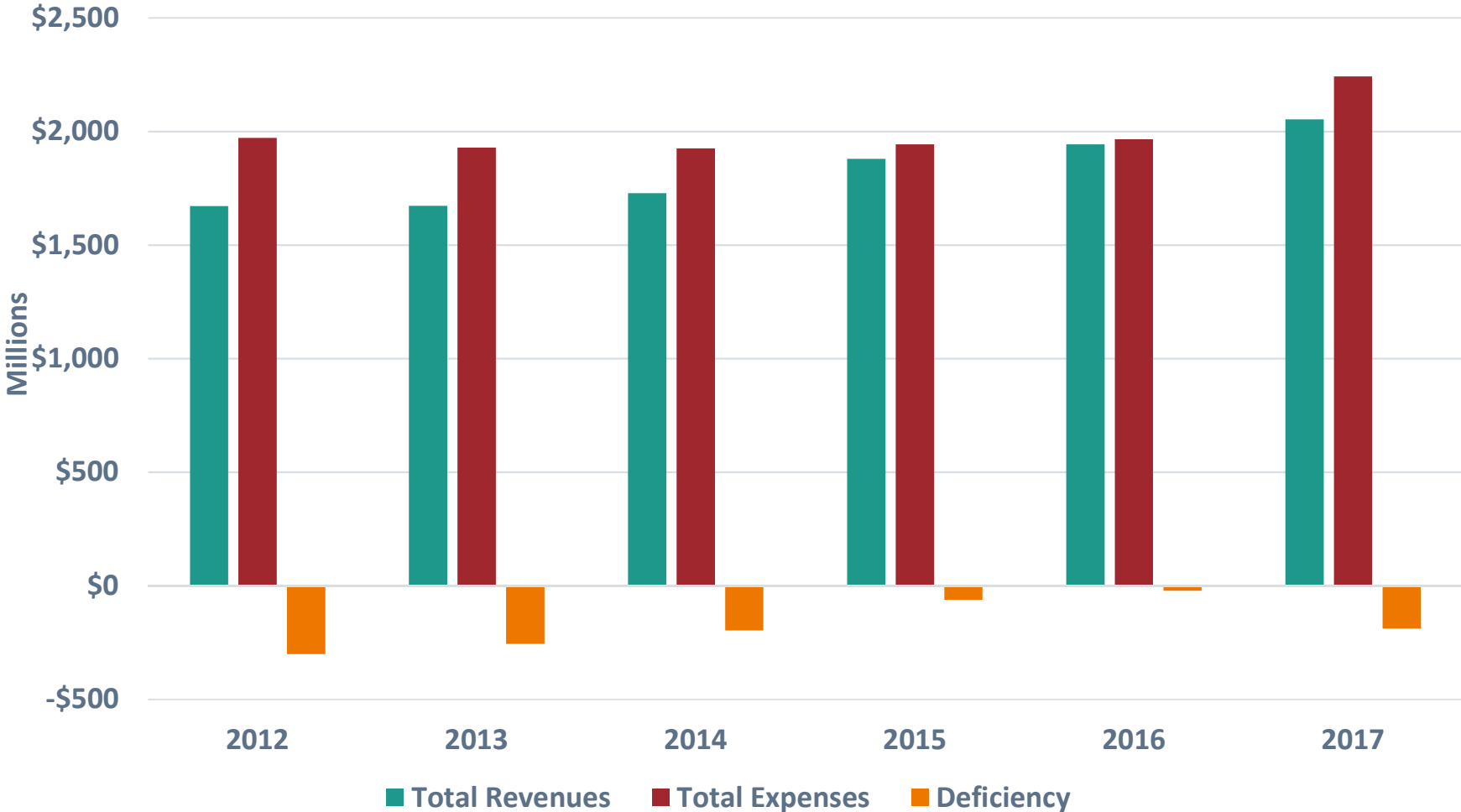
San Jose City Statement of Activities

(in \$000's)

	Fiscal years ending June 30th						CAGR 5-yr
	2012	2013	2014	2015	2016	2017	
Expenses							
14. General government	111,996	133,330	119,299	127,480	122,363	127,090	2.6%
15. Public safety	490,442	489,572	493,544	466,519	555,072	694,557	7.2%
16. Community services	247,518	214,770	207,967	236,840	274,838	310,470	4.6%
17. Sanitation	135,543	160,860	146,058	141,244	145,516	156,299	2.9%
18. Capital maintenance	473,674	475,995	484,260	507,523	395,393	444,867	-1.2%
19. Interest and fiscal charges	123,696	64,467	60,852	60,266	56,768	54,844	-15.0%
20. SJ Int'l Airport	200,380	199,681	199,987	197,786	201,017	204,774	0.4%
21. Wastewater Treatment	149,980	147,994	169,622	158,385	163,985	192,302	5.1%
22. Municipal Water	29,260	31,523	33,187	33,885	36,246	42,647	7.8%
23. Parking	9,290	10,231	10,751	12,714	13,607	14,269	9.0%
24. Total expenses	1,971,779	1,928,423	1,925,527	1,942,642	1,964,805	2,242,118	2.6%
25. Excess (deficiency)	(300,638)	(255,989)	(197,319)	(63,012)	(21,794)	(188,991)	
26. Extraordinary gain (loss)	2,061,851	(167,244)	-	-			
27. Change in net position	1,761,213	(423,233)	(197,319)	(63,012)	(21,794)	(188,991)	
28. Net position BOY, restated	5,648,464	7,384,442	6,961,209	4,953,097	4,890,085	4,868,291	
29. Net position EOY	7,409,677	6,961,209	6,763,890	4,890,085	4,868,291	4,679,300	

Source: 2013 – 2017 Comprehensive Annual Financial Reports City of San Jose..

San Jose City Statement of Activities



Source: 2013 – 2017 Comprehensive Annual Financial Reports City of San Jose..

General Fund Forecast: Revenues

(in \$000's) Category	Forecast	Mod. Budget	Var.	Forecast					5-year
	2017-2018	2017-2018		2018-2019	2019-2020	2020-2021	2021-2022	2022-2023	CAGR
General Revenues									
Property Tax	289,715	288,990	-0.3%	317,600	333,988	350,955	366,713	382,188	5.7%
Sales Tax	228,000	224,000	-1.8%	232,100	238,506	244,969	249,967	253,891	2.5%
Transient Occupancy Tax	18,720	18,720	0.0%	19,600	20,374	21,097	21,638	22,174	3.4%
Franchise Fees	50,620	50,813	0.4%	50,230	51,149	51,932	50,790	49,580	-0.5%
Utility Tax	101,320	101,320	0.0%	102,400	103,700	105,339	107,088	109,197	1.5%
Telephone Line Tax	20,000	20,000	0.0%	20,000	20,040	20,076	20,110	20,142	0.1%
Business Tax	63,000	63,385	0.6%	67,000	67,607	68,147	68,643	69,103	1.7%
Licenses and Permits	52,466	59,670	13.7%	58,530	60,344	62,758	64,955	67,098	2.4%
Fees, Rates, and Charges	42,725	49,432	15.7%	45,779	47,198	49,086	50,804	52,481	1.2%
Fines, Forfeitures and Penalties	14,742	15,336	4.0%	14,283	14,430	14,688	14,740	14,883	-0.6%
Money and Property	5,240	5,705	8.9%	6,779	6,948	7,171	7,379	7,637	6.0%
Revenue from Local Agencies	23,651	23,742	0.4%	10,822	11,199	11,589	11,951	12,307	-12.3%
Revenue from the State	10,410	14,182	36.2%	10,590	10,590	10,590	10,590	10,590	-5.7%
Federal Revenue	1,358	5,662	316.9%						-100.0%
Other Revenue	14,371	183,958	1180.1%	9,298	8,789	8,837	8,900	8,963	-45.4%
Gas Tax	17,300	17,300	0.0%	17,300	16,703	16,489	17,118	17,712	0.5%
Total General Revenues	953,638	1,142,215	19.8%	982,311	1,011,565	1,043,723	1,071,386	1,097,946	-0.8%

2018-2019 City Manager's Budget Request & 2019-2023 Five-Year Forecast and Revenue Projections For the General Fund and Capital Improvement Program, Office of the City Manager February 2018, pg. I-9

General Fund Forecast: Expenses

(in \$000's) Category	Forecast	Mod. Budget	Var.	Forecast					5-year
	2017-2018	2017-2018		2018-2019	2019-2020	2020-2021	2021-2022	2022-2023	CAGR
Personal Services									
Salaries and Other Compensation	467,397	473,466	1%	497,206	520,840	539,070	557,937	577,465	4.1%
Retirement	297,576	301,440	1%	314,761	329,400	346,398	358,718	352,174	3.2%
Health and Other Fringe Benefits	61,487	57,235	-7%	56,755	59,707	62,191	64,916	67,895	3.5%
Total Personal Services	826,460	832,142	1%	868,722	909,947	947,659	981,571	997,534	3.7%
Total Non-Personal/Equipment	107,824	124,020	15%	114,007	115,266	118,732	121,968	122,059	-0.3%
City-Wide									
City-Wide Expenses	87,098	267,545	207%	68,411	72,902	73,705	75,408	77,043	-22.0%
Capital Projects	5,000	46,159	823%	5,580	5,580	5,580	5,580	5,580	-34.5%
Transfers	29,512	32,477	10%	33,239	33,837	34,357	34,683	34,210	1.0%
Earmarked Reserves	11,422	115,665	913%	1,880	1,080	1,080	1,080	1,080	-60.7%
Contingency Reserve	36,000	36,500	1%	36,500	38,000	39,000	40,500	41,000	2.4%
Total City-Wide	169,032	498,345	195%	145,610	151,399	153,722	157,251	158,913	-20.4%
Committed Additions									
New Parks & Recs facilities	257	0	n.m.	216	523	667	725	809	n.m.
New Traffic Infrastructure	55	0	n.m.	22	45	69	82	95	n.m.
Measure P (Parks) Maint. & Operations	121	0	n.m.	381	677	715	755	790	n.m.
Total Committed Additions	433	0	n.m.	619	1,245	1,451	1,562	1,694	n.m.
Total Base Exp. w/ Committed Additions	1,103,749	1,454,507	32%	1,128,958	1,177,857	1,221,564	1,262,352	1,280,200	-2.5%
Revenues less Expenditures	\$ (81,854)	\$ -		\$ (72,937)	\$ (90,388)	\$ (99,727)	\$ (110,668)	\$ (100,246)	

2018-2019 City Manager's Budget Request & 2019-2023 Five-Year Forecast and Revenue Projections For the General Fund and Capital Improvement Program, Office of the City Manager February 2018, pg. I-24

Long-term obligations

	Value (000s)	Allocation %
Government Activities		
General Obligation Bonds	\$362,430	15.2%
HUD Note	\$717	0.0%
Lease Revenue Bonds	\$627,395	26.3%
Special Assessment & Tax Bonds	\$136,070	5.7%
Government Activities	\$1,126,612	47.3%
Business Type Activities		
Revenue Bonds - Airport	\$1,229,545	51.6%
Revenue Bonds - Clean Water Financing Authority	\$20,695	0.9%
State of California - Revolving Fund Loans	\$6,125	0.3%
Business Type Activities	\$1,256,365	52.7%
Total	\$2,382,977	100%

Sources: City of San Jose Comprehensive Annual Financial Report 2017

Actuarial projections: Baseline

FYE	Actuarial	Assets		Funded Ratio		Contributions		Contrib. Rates		Normal Cost	Interest Cost	
	Liability	Market	Actuarial	Market	Actuarial	Member	City	Member	City		Member	City
2018	\$ 4,464	\$ 3,293	\$ 3,440	73.8%	77.1%	\$ 23.9	\$164.2	11.7%	80.6%	37.0%	38.2%	\$ 77.9
2019	4,630	3,491	3,594	75.4%	77.6%	23.9	170.1	11.3%	80.8%	36.3%	36.0%	75.8
2020	4,800	3,699	3,717	77.1%	77.4%	25.1	178.6	11.6%	82.2%	35.5%	33.7%	73.2
2021	4,969	3,918	3,902	78.9%	78.5%	26.5	190.8	11.8%	85.1%	34.8%	31.2%	69.9
2022	5,137	4,152	4,152	80.8%	80.8%	27.9	198.1	12.0%	85.5%	34.1%	28.3%	65.5
2023	5,301	4,395	4,395	82.9%	82.9%	29.4	187.1	12.3%	78.2%	33.3%	25.2%	60.2
2024	5,461	4,629	4,629	84.8%	84.8%	30.9	191.0	12.5%	77.4%	32.6%	22.4%	55.4
2025	5,617	4,867	4,867	86.6%	86.6%	32.4	206.9	12.7%	81.1%	32.0%	19.6%	49.9
2026	5,769	5,123	5,123	88.8%	88.8%	34.0	211.9	12.9%	80.5%	31.5%	16.3%	42.9
2027	5,918	5,389	5,389	91.1%	91.1%	35.5	158.0	13.1%	58.1%	31.0%	12.9%	35.1

Actuarial assumed rate of return = 6.875% for each year

All percentages provided as a percent of estimated payroll

Dollar amounts in millions

Source: Cheiron

Actuarial projections: 25% drawdown

FYE	Actuarial	Assets		Funded Ratio		Contributions		Contrib. Rates		Normal Cost	Interest Cost	
	Liability	Market	Actuarial	Market	Actuarial	Member	City	Member	City			
2018	\$ 4,464	\$ 3,293	\$ 3,440	73.8%	77.1%	\$ 23.9	\$164.2	11.7%	80.6%	37.0%	38.2%	\$ 77.9
2019	4,630	2,446	2,935	52.8%	63.4%	23.9	170.1	11.3%	80.8%	36.3%	69.0%	145.3
2020	4,800	2,582	3,096	53.8%	64.5%	25.2	239.6	11.6%	110.3%	35.5%	67.9%	147.5
2021	4,969	2,788	3,190	56.1%	64.2%	26.6	246.2	11.8%	109.7%	34.8%	64.7%	145.1
2022	5,137	3,001	3,210	58.4%	62.5%	28.0	265.6	12.1%	114.7%	34.1%	61.3%	142.0
2023	5,301	3,235	3,235	61.0%	61.0%	29.6	278.8	12.4%	116.6%	33.3%	57.5%	137.4
2024	5,461	3,483	3,483	63.8%	63.8%	31.1	306.3	12.6%	124.1%	32.6%	53.3%	131.5
2025	5,617	3,762	3,762	67.0%	67.0%	32.7	326.0	12.8%	127.9%	32.0%	48.4%	123.3
2026	5,769	4,066	4,066	70.5%	70.5%	34.2	334.9	13.0%	127.2%	31.5%	43.0%	113.2
2027	5,918	4,387	4,387	74.1%	74.1%	35.8	284.9	13.2%	104.8%	31.0%	37.4%	101.8

Actuarial assumed rate of return = 6.875% for each year after FYE 2018, which is -25%

All percentages provided as a percent of estimated payroll

Dollar amounts in millions

Source: Cheiron

Ability to accept risk

Combining investment program risk with additional modeling from Cheiron, the following table summarizes the extent to which the Plan is willing to accept risk

Metric	Description	Measurement	Risk Limit
Funded Ratio	Expecting the plan's funded ratio to reach 100% over a 15-year period but not to fall below 60% with a high degree of certainty (i.e. >95%)	Actuarial Funded Ratio	60%
Contributions	Plan contributions from the City to fluctuate through time but not to exceed \$335M in any given year	Total plan contributions measured in Dollars	\$335M
Interest Cost	Expecting the interest on the current Unfunded Actuarial Liability to remain below \$150M	Interest Cost measured in Dollars	\$150M

Moody's Credit Ratings

- Aaa** Obligations rated Aaa are judged to be of the highest quality, with minimal credit risk.
-
- Aa** Obligations rated Aa are judged to be of high quality and are subject to very low credit risk.
-
- A** Obligations rated A are considered upper-medium grade and are subject to low credit risk.
-
- Baa** Obligations rated Baa are subject to moderate credit risk. They are considered medium-grade and as such may possess certain speculative characteristics.
-
- Ba** Obligations rated Ba are judged to have speculative elements and are subject to substantial credit risk.
-
- B** Obligations rated B are considered speculative and are subject to high credit risk.
-
- Caa** Obligations rated Caa are judged to be of poor standing and are subject to very high credit risk.
-
- Ca** Obligations rated Ca are highly speculative and are likely in, or very near, default, with some prospect of recovery of principal and interest.
-
- C** Obligations rated C are the lowest rated class of bonds and are typically in default, with little prospect for recovery of principal or interest.

Note: Moody's appends numerical modifiers 1, 2, and 3 to each generic rating classification from Aa through Caa. The modifier 1 indicates that the obligation ranks in the higher end of its generic rating category; the modifier 2 indicates a mid-range ranking; and the modifier 3 indicates a ranking in the lower end of that generic rating category.

Source: Moody's rating Symbols & Definitions

S&P Credit Rating Definitions

Long-Term Issuer Credit Ratings*	
Category	Definition
AAA	An obligor rated 'AAA' has extremely strong capacity to meet its financial commitments. 'AAA' is the highest issuer credit rating assigned by Standard & Poor's.
AA	An obligor rated 'AA' has very strong capacity to meet its financial commitments. It differs from the highest-rated obligors only to a small degree.
A	An obligor rated 'A' has strong capacity to meet its financial commitments but is somewhat more susceptible to the adverse effects of changes in circumstances and economic conditions than obligors in higher-rated categories.
BBB	An obligor rated 'BBB' has adequate capacity to meet its financial commitments. However, adverse economic conditions or changing circumstances are more likely to lead to a weakened capacity of the obligor to meet its financial commitments.
BB; B; CCC; and CC	Obligors rated 'BB', 'B', 'CCC', and 'CC' are regarded as having significant speculative characteristics. 'BB' indicates the least degree of speculation and 'CC' the highest. While such obligors will likely have some quality and protective characteristics, these may be outweighed by large uncertainties or major exposures to adverse conditions.
BB	An obligor rated 'BB' is less vulnerable in the near term than other lower-rated obligors. However, it faces major ongoing uncertainties and exposure to adverse business, financial, or economic conditions which could lead to the obligor's inadequate capacity to meet its financial commitments.
B	An obligor rated 'B' is more vulnerable than the obligors rated 'BB', but the obligor currently has the capacity to meet its financial commitments. Adverse business, financial, or economic conditions will likely impair the obligor's capacity or willingness to meet its financial commitments.
CCC	An obligor rated 'CCC' is currently vulnerable, and is dependent upon favorable business, financial, and economic conditions to meet its financial commitments.
CC	An obligor rated 'CC' is currently highly vulnerable. The 'CC' rating is used when a default has not yet occurred, but Standard & Poor's expects default to be a virtual certainty, regardless of the anticipated time to default.
R	An obligor rated 'R' is under regulatory supervision owing to its financial condition. During the pendency of the regulatory supervision the regulators may have the power to favor one class of obligations over others or pay some obligations and not others.
SD and D	An obligor rated 'SD' (selective default) or 'D' is in default on one or more of its financial obligations including rated and unrated financial obligations but excluding hybrid instruments classified as regulatory capital or in non-payment according to terms. An obligor is considered in default unless Standard & Poor's believes that such payments will be made within five business days of the due date in the absence of a stated grace period, or within the earlier of the stated grace period or 30 calendar days. A 'D' rating is assigned when Standard & Poor's believes that the default will be a general default and that the obligor will fail to pay all or substantially all of its obligations as they come due. An 'SD' rating is assigned when Standard & Poor's believes that the obligor has selectively defaulted on a specific issue or class of obligations but it will continue to meet its payment obligations on other issues or classes of obligations in a timely manner. An obligor's rating is lowered to 'D' or 'SD' if it is conducting a distressed exchange offer.
NR	An issuer designated 'NR' is not rated.

*The ratings from 'AA' to 'CCC' may be modified by the addition of a plus (+) or minus (-) sign to show relative standing within the major rating categories.

Source: Standard and Poor's Ratings Definitions. http://www.standardandpoors.com/en_US/web/guest/article/-/view/sourceId/504352

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