

Monthly Update- Performance & Risk

PUBLIC EMPLOYEES' RETIREMENT FUND (PERF)



April 30, 2017

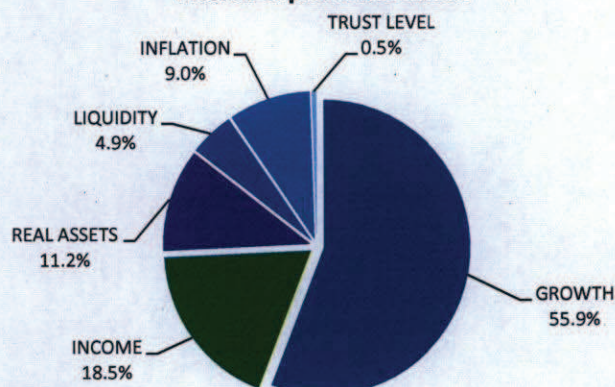
STRATEGIC ASSET ALLOCATION

Investment Belief 6: Strategic asset allocation is the dominant determinant of portfolio risk and return. CalPERS strategic asset allocation process transforms the fund's targeted rate of return to the market exposures that staff will manage. CalPERS will aim to diversify its overall portfolio across distinct risk factors and return drivers.

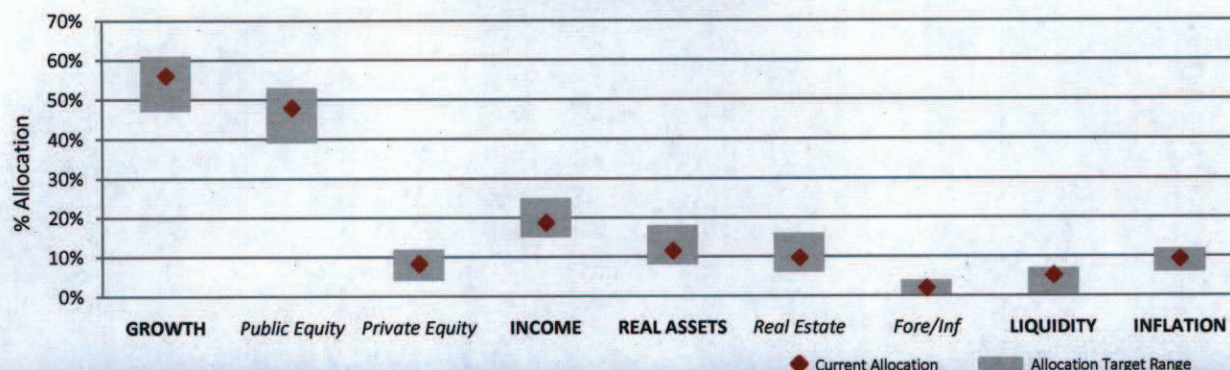
Total Fund Objective

CalPERS' general investment goals are broad in nature. The overall objective of CalPERS' investment program is to provide members and beneficiaries with benefits as required by law. This will be accomplished through a carefully planned and executed long-term investment program that efficiently and effectively allocates and manages the assets of CalPERS. CalPERS' investment policies have been designed to allow CalPERS to achieve a long-term total return. As such, prudent risk-taking is appropriate within the context of overall diversification to meet CalPERS' long-term investment objectives. The assets of CalPERS will be broadly diversified to minimize the effect of short-term losses within any investment program.

Actual Capital Allocation



Strategic Allocation Target Range



ASSET CLASS	Current Allocation (%)	Interim Strategic Target (%) ¹	Variance (%)	Current Allocation (billions)	Interim Strategic Target (billions)	Variance (billions)
AS OF: April 30, 2017						
GROWTH	55.9%	54%	1.9%	\$ 178.1	\$ 172.2	\$ 5.9
PUBLIC EQUITY	47.7%	46%	1.7%	\$ 152.2	\$ 146.7	\$ 5.5
PRIVATE EQUITY	8.1%	8%	0.1%	\$ 25.9	\$ 25.5	\$ 0.4
INCOME	18.5%	20%	(1.5%)	\$ 58.9	\$ 63.8	\$ (4.9)
REAL ASSETS	11.2%	13%	(1.8%)	\$ 35.8	\$ 41.5	\$ (5.6)
REAL ESTATE	9.4%	11%	(1.6%)	\$ 30.1	\$ 35.1	\$ (4.9)
FORESTLAND	0.6%	1%	(0.4%)	\$ 2.0	\$ 3.2	\$ (1.2)
INFRASTRUCTURE	1.2%	1%	0.2%	\$ 3.7	\$ 3.2	\$ 0.5
LIQUIDITY	4.9%	4%	0.9%	\$ 15.7	\$ 12.8	\$ 3.0
INFLATION	9.0%	9%	0.0%	\$ 28.8	\$ 28.7	\$ 0.1
TRUST LEVEL	0.5%	-	0.5%	\$ 1.6	-	\$ 1.6
ARS	0.1%	-	0.1%	\$ 0.3	-	\$ 0.3
MULTI-ASSET CLASS (MAC)	0.4%	-	0.4%	\$ 1.3	-	\$ 1.3
OVERLAY+TRANS+PLAN	0.0%	-	0.0%	\$ 0.0	-	\$ 0.0
TOTAL FUND	100.0%	100%	0.0%	\$ 318.9	\$ 318.9	\$ -

¹ Interim strategic targets adopted by the Investment Committee at the September 2016 Investment Committee meeting.

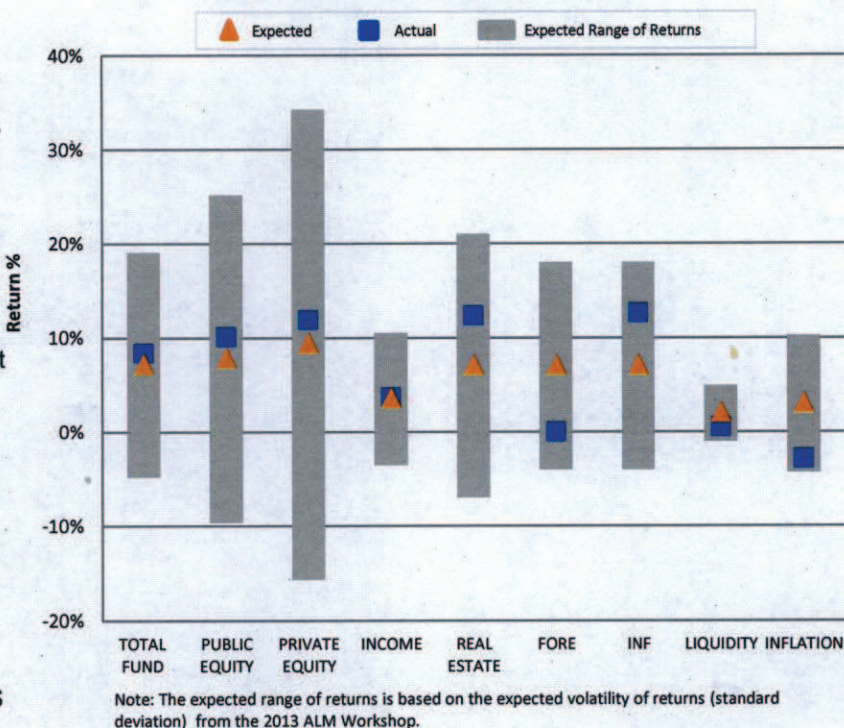
ASSET LIABILITY MANAGEMENT EXPECTATIONS VS. ACTUAL RESULTS

Investment Belief 7: CalPERS will take risk only where we have a strong belief we will be rewarded for it. An expectation of a return premium is required to take risk; CalPERS aims to maximize return for the risk taken.

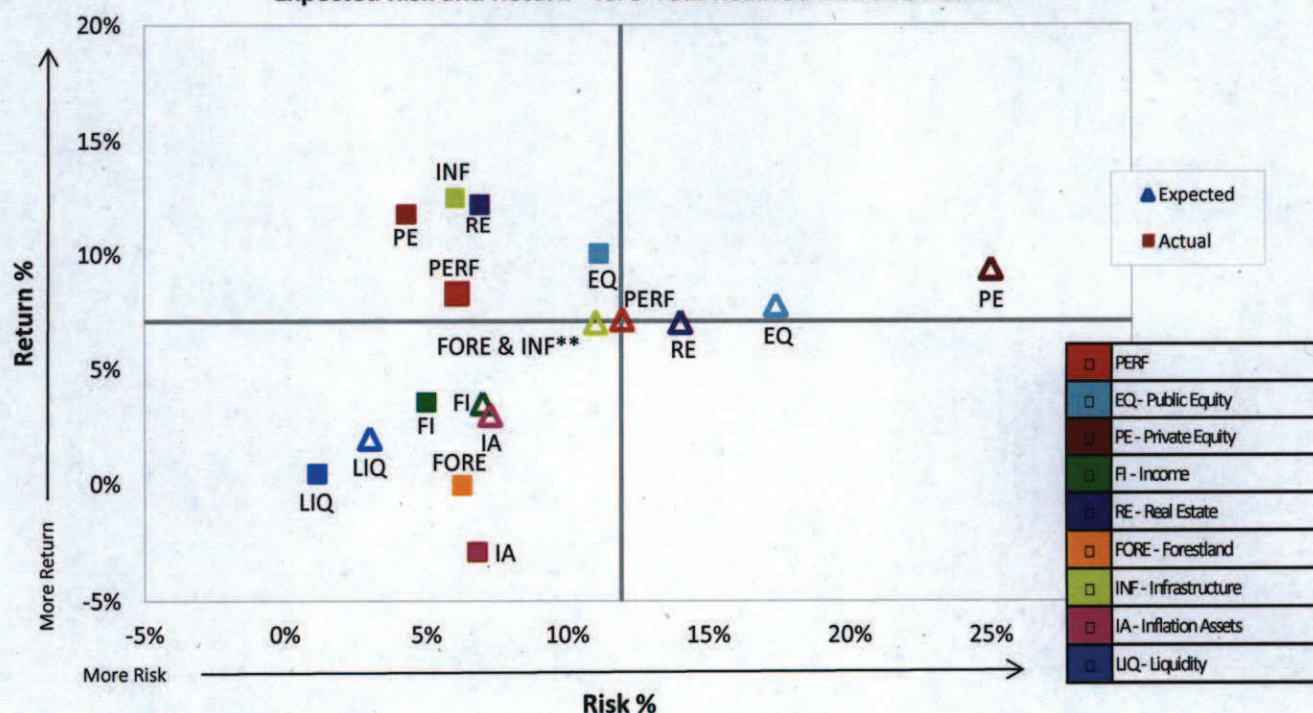
Asset Liability Assumptions

As part of the Strategic Asset Allocation process, a comprehensive strategy analysis shall be completed at least once every four years and will be presented to the Investment Committee (IC) for review and approval of policy target asset class allocations and ranges. Staff may recommend a more frequent analysis of asset class allocations and ranges if expected returns, risks or liability values have substantially changed since the prior analysis. Additionally, the strategy shall be reviewed by staff at the mid-point of the four year cycle or as needed to ensure that all assumptions used in establishing the strategy continue to be reasonable. Staff may also recommend to the IC changes in the policy targets and ranges. The strategy shall reflect analyses that consider the current and expected financial condition of CalPERS including projected CalPERS liabilities. Analyses shall also encompass the expected long-term capital markets outlook, expected inflation, and CalPERS risk tolerance.

Expected Return vs. 5-Year Actual Return



Expected Risk and Return* vs. 5-Year Realized Risk and Return



PERFORMANCE SUMMARY

Investment Belief 5: CalPERS must articulate its investments goals and performance measures and ensure clear accountability for their execution.

ASSET CLASS	FYTD		3-YR		5-YR		10-YR		20-YR	
	Net Return	Excess BPS	Net Return	Excess BPS	Net Return	Excess BPS	Net Return	Excess BPS	Net Return	Excess BPS
AS OF: April 30, 2017										
GROWTH	15.8%	(67)	6.3%	(43)	10.3%	(45)	5.0%	(114)	7.2%	(7)
PUBLIC EQUITY	16.6%	(8)	6.0%	11	10.0%	26	4.3%	(35)	6.8%	12
PRIVATE EQUITY	11.0%	(421)	8.1%	(222)	11.8%	(239)	9.0%	(384)	11.3%	132
INCOME	(1.0%)	108	3.8%	70	3.5%	94	6.2%	72	6.8%	57
REAL ASSETS	5.6%	16	10.8%	64	11.3%	90	(1.0%)	(811)	7.1%	(280)
REAL ESTATE	5.7%	(2)	11.7%	63	12.2%	97	(1.4%)	(938)	6.9%	(345)
FORESTLAND	1.2%	(169)	(2.5%)	(851)	(0.1%)	(714)	N/A	N/A	N/A	N/A
INFRASTRUCTURE	7.7%	236	14.1%	885	12.5%	708	N/A	N/A	N/A	N/A
LIQUIDITY	0.6%	22	0.7%	(24)	0.4%	(25)	1.3%	(15)	2.8%	7
INFLATION	(1.3%)	(76)	(4.8%)	76	(2.9%)	18	N/A	N/A	N/A	N/A
TRUST LEVEL										
TOTAL FUND	9.2%	(2)	5.4%	(10)	8.3%	24	4.3%	(121)	6.9%	(22)

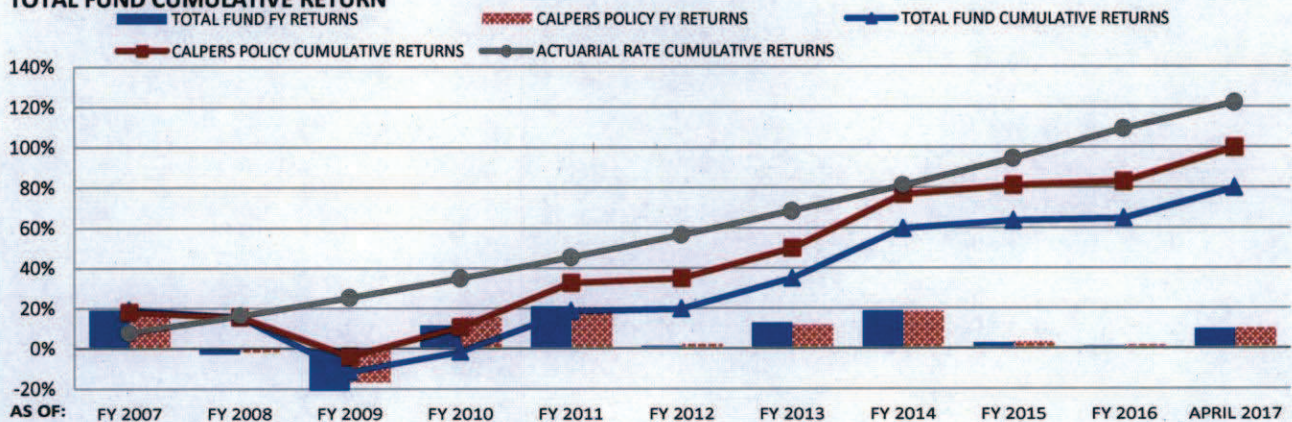
TOTAL FUND SINCE INCEPTION DATE NET RATE OF RETURN (07/01/1988)

8.42%

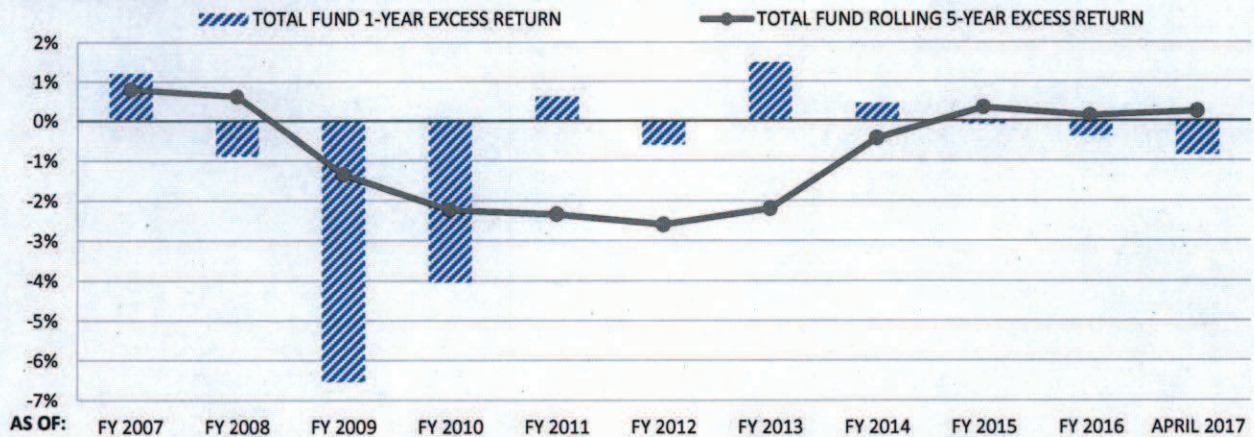
	FYTD		3-YR		5-YR		10-YR		20-YR	
	Net Return	Excess BPS	Net Return	Excess BPS	Net Return	Excess BPS	Net Return	Excess BPS	Net Return	Excess BPS
TOTAL FUND (TF)	9.2%	(2)	5.4%	(10)	8.3%	24	4.3%	(121)	6.9%	(22)
TAP ¹	(1.8%)	-	4.0%	-	-	-	-	-	-	-
TF PLUS TAP	9.2%	-	5.4%	-	8.3%	-	4.3%	-	6.9%	-

¹ Terminated Agency Pool (TAP) funded in July 2013 and exists to provide benefit payments to members who are employees of agencies that have terminated their contract with CalPERS.

TOTAL FUND CUMULATIVE RETURN



TOTAL FUND ROLLING EXCESS RETURN



TOTAL FUND RISK

Investment Belief 9: Risk to CalPERS is multi-faceted and not fully captured through measures such as volatility or tracking error. CalPERS shall develop a broad set of investment and actuarial risk measures and clear processes for managing risk. The path of returns matters, because highly volatile returns can have unexpected impacts on contribution rates and funding status.

Overview

Risk management is central to managing the assets of CalPERS and to achieving the strategic objectives. A framework for risk management is established through the adoption of the Total Fund Investment Policy which includes investment policies for total fund strategic asset allocation, individual asset classes and portfolios with appropriate benchmarks and reasonable risk limits for the implementation of the risk program. The level of risk assumed will be monitored and reported using selected risk metrics as required in the policy.

Risk Measure	3/31/2017	6/30/2016	Explanation of Risk Measures:
Forecast Volatility			
Portfolio	8.6%	10.3%	The total (gross) risk of the Total Fund expressed in the standard deviation (1-yr) of the funds total return distribution, expressed in percent. The forecast expected return of the Total Fund from the most recent interim allocation process is 5.8%. There is two-thirds probability that the Total Fund return over the next year will be between -2.8% and 14.4%, and a 95% probability that the fund will return between -11.4% and 23.1%.
Benchmark	8.2%	10.3%	
Forecast Tracking Error			
Portfolio	0.6%	0.8%	Forecast tracking error is the difference in risk between a managed portfolio and benchmark, measured as the standard deviation (1-yr) of the differential return between the portfolio and an equal investment in the benchmark. There is a two-thirds probability that the Total Fund excess return will fall within 0.6% above or below the policy benchmark return, and 95% probability the return of the Total Fund will fall within 1.2% above or below the policy benchmark return.
Value at Risk (1-year, 95%)¹			
Portfolio	\$24.4 B	\$30.0 B	Value at Risk (VaR) characterizes the potential loss in a portfolio over a given period for a chosen probability level. There is a 1 in 20 chance that the Total Fund will experience a drawdown greater than the specified amount over a 1-year period.
Expected Shortfall (1-year, 95%)¹			
Portfolio	\$35.7 B	\$42.7 B	Expected shortfall measures the magnitude of loss in an event outside of a specified VaR confidence level and mathematically it is the mean of the tail distribution. The expected shortfall of the portfolio over a 1-year horizon and 95% confidence level is the specified amount.

March 31, 2017	Risk and Return Summary						
	Portfolio Risk			Active Risk			5-Year Realized Information Ratio ⁴
	5-Year Realized Gross Return(%) ²	5-Year Realized Volatility (%) ³	1-Year Projected Volatility (%)	5-Year Active Return(%)	5-Year Realized Tracking Error (%) ³	1-Year Projected Tracking Error (%)	
Asset Class							
GROWTH	9.9%	9.1%	12.9%	(0.6%)	2.1%	0.6%	(0.3)
PUBLIC EQUITY	9.5%	11.1%	12.8%	0.3%	0.3%	0.2%	1.1
PRIVATE EQUITY	11.7%	4.3%	15.3%	(3.2%)	7.3%	3.8%	(0.4)
INCOME	3.7%	5.0%	6.3%	0.9%	0.6%	0.3%	1.5
REAL ASSETS	13.4%	6.1%	11.5%	3.0%	6.2%	2.6%	0.5
REAL ESTATE	14.5%	6.9%	12.2%	3.2%	7.1%	2.1%	0.5
FORESTLAND	0.3%	5.3%	16.4%	(6.7%)	4.4%	9.5%	(1.5)
INFRASTRUCTURE	15.2%	5.9%	9.3%	9.8%	5.6%	10.0%	1.8
LIQUIDITY	0.6%	1.1%	0.0%	(0.2%)	0.5%	0.1%	(0.5)
INFLATION	(2.9%)	6.8%	7.5%	0.1%	1.6%	0.5%	0.1
ARS	3.4%	4.2%	5.9%	(1.9%)	4.2%	5.9%	(0.5)
MAC⁵	-	-	8.5%	-	-	8.5%	-
TOTAL FUND	8.2%	6.1%	8.6%	0.3%	1.5%	0.6%	0.2

¹VaR and Expected Shortfall are adjusted to account for the expected return of the Total Fund

²Gross returns include the offsetting impact of management fees incurred by Private Equity fund investments

³Realized Volatility and Tracking Error for private asset classes is computed from quarterly returns

⁴Information ratios for private assets may not be meaningful or comparable to public assets as their returns are based on infrequent valuations

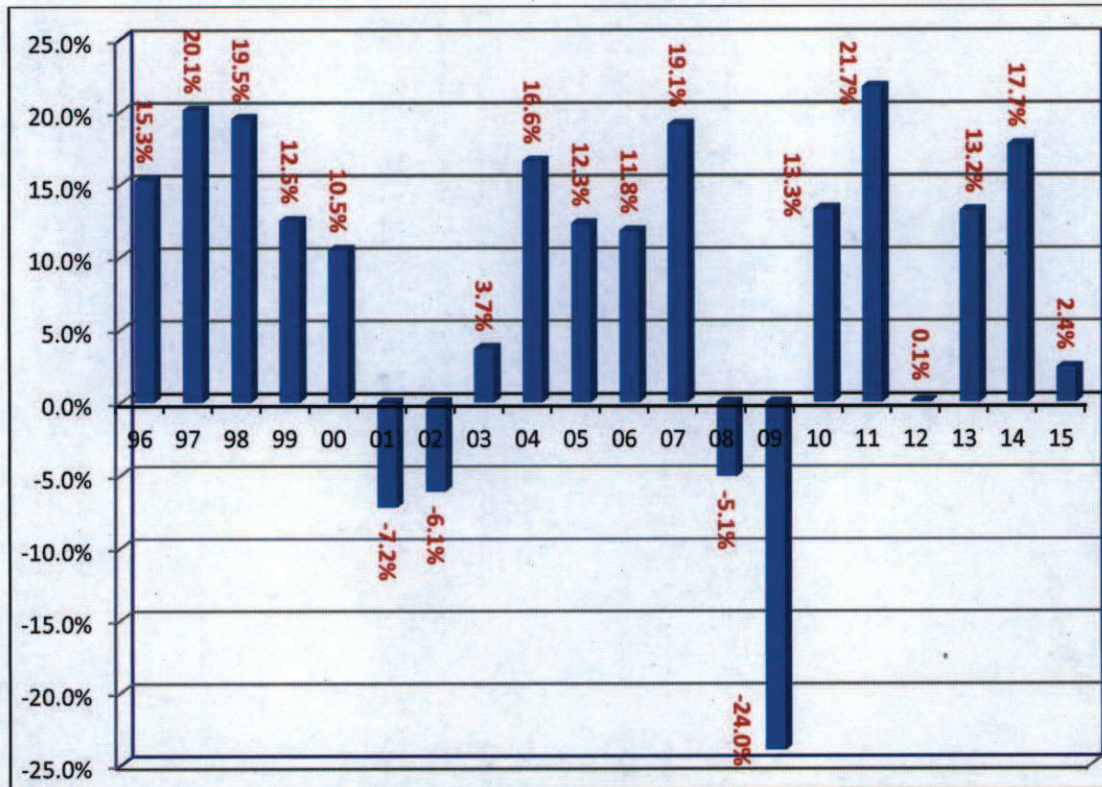
⁵MAC was initially funded in December 2012

Attachment B

CALPERS ACTUARIAL VALUATION - June 30, 2015
MISCELLANEOUS PLAN OF THE CITY OF PASADENA
CalPERS ID: 6556986602


CalPERS History of Investment Returns

The following is a chart with the 20-year historical annual returns of the Public Employees Retirement Fund for each fiscal year ending on June 30. Beginning in 2002, the figures are reported as gross of fees.



The table below shows historical geometric mean annual returns of the Public Employees Retirement Fund for various time periods ending on June 30, 2015, (figures are reported as gross of fees). The geometric mean rate of return is the average rate per period compounded over multiple periods. It should be recognized that in any given year the rate of return is volatile. Although the expected rate of return on the recently adopted new asset allocation is 7.5 percent, the portfolio has an expected volatility of 11.76 percent per year. The volatility is a measure of the risk of the portfolio expressed in the standard deviation of the fund's total return distribution, expressed as a percentage. Consequently, when looking at investment returns, it is more instructive to look at returns over longer time horizons.

History of CalPERS Geometric Mean Rates of Return and Volatilities					
	1 year	5 year	10 year	20 year	30 year
Geometric Return	2.4%	10.7%	6.1%	7.7%	9.1%
Volatility	—	9.4%	14.0%	11.8%	10.5%


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Addressing Traffic Safety in Pasadena

Identification of High Collision Locations
Prioritization of Treatments

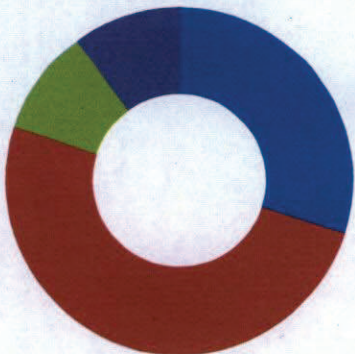
Public Safety Committee May 17, 2017



 **Assessing Safety | Prioritizing Change**

Department of Transportation

- **How Safety Concerns are Identified**



Source	Color
Public Suggestions/Complaints	Dark Blue
Collision Data	Red
Plans/Programs	Green
Best Practices/Research	Dark Blue

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Assessing Safety | Prioritizing Change

Department of Transportation

- **Top 10 High Collision Intersections**
 - > Collision Type / Primary Collision Factor / Severity
- **Safety Performance Measures**
 - > Network Screening Tools / Critical Crash Rate
- **Focused Demographic/Geographic Analysis**
 - > High Risk Groups and Areas are mapped/monitored
 - Pedestrians / Bicyclists / School Zones / Elderly
 - Routes to schools, transit, high pedestrian generators
- **Enforcement Actions**
- **Complete Streets Program / Traffic Investigations**
- **Vision Zero / Best Practices**
 - > Highway Safety Manual/ Crash Reduction Factors

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Assessing Safety | Prioritizing Change

Department of Transportation

- **Countermeasures are identified**
 - > Combination of operations, enforcement, physical change and targeted marketing (education/behavior modification)
- **CIP only includes physical changes \$75,000+**
 - > Prioritized by need
 - > Schedule influenced by available Grant Funding
- **Operations modifications addressed by TMC**
 - > Traffic signal timing and operation
 - > Signs and Pavement Markings

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Assessing Safety | Prioritizing Change

Department of Transportation

- **Enforcement referred to Pasadena Police Dept. daily as staff receives complaints**
 - > PPD deploys speed feedback trailer for speeding
 - > PPD provides selective enforcement of traffic laws
 - > For signalized locations with highest red-light running related crashes, Tattle Tale devices installed to aid the enforcement of red-light running
- **Education/Encouragement Programs developed**
- **Reassess and Reevaluate**
 - > On-going data collection/monitoring

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Top 10 Intersections – Total Collisions

Department of Transportation

- **How does an intersection get on the list**
 - > Generally experiences 8 or more collisions in a year
 - > About twice the average annual number of collisions
- **The list is a filter for pattern identification**
 - > Reviewed monthly by DOT and PPD
 - > Used to focus resources and determine if conditions are favorable for physical remediation, operational modifications or enforcement
- **The list is not static**
- **The list is not the only tool in use**

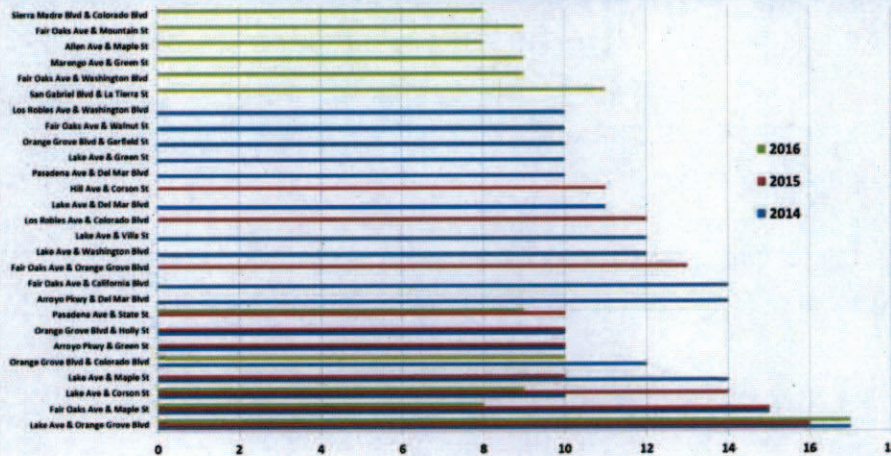
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Top 10 Intersections – Total Collisions

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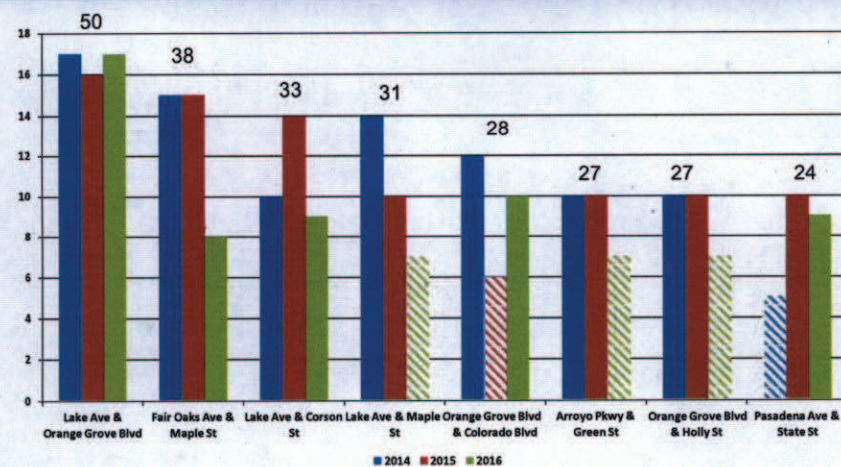
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Intersections in Top 10 – 2 Yrs or More

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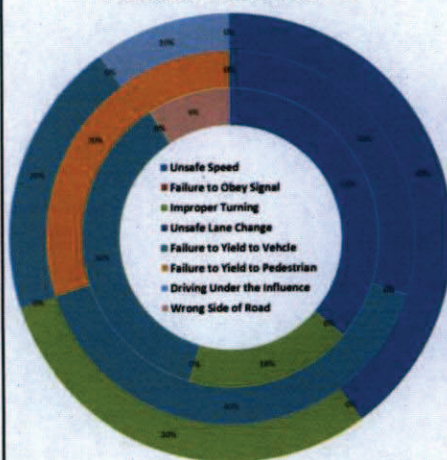
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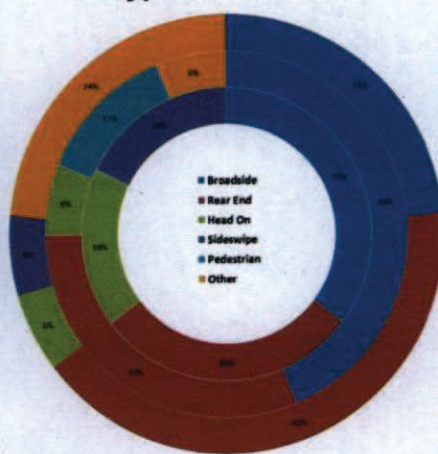
Lake Ave at Orange Grove Blvd

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Primary Collision Factor 2014-2016



Collisions by Type 2014-2016



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Intersections in Top 10 2016

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- **Lake Ave & Orange Grove Blvd**
 - > Project developed to add protected left turn signal phases; requires substantially replacing traffic signal system;
 - > HSIP 80/20 federal funding received in 2017
 - > Currently awaiting Caltrans authorization to proceed with design
 - > PPD providing selected enforcement
- **San Gabriel Blvd & La Tierra St**
 - > Staff is researching potential channelization changes
 - > Tattle tale device is planned to assist with red light running
 - > DOT/PW will develop concept designs and preliminary cost estimates in 2017
 - > PPD providing selected enforcement

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Intersections in Top 10 2016

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- **Orange Grove Blvd & Colorado Blvd**
 - > Caltrans intersection
 - > Project developed to add protected left-turn signal phases for all approaches
 - > HSIP 80/20 federal funding received in 2015
 - > Design completed in 2017/approved by Caltrans
 - > Project under construction with completion in late summer of 2017
- **Lake Ave & Corson St**
 - > Caltrans intersection
 - > Project to alter timing developed and under review by Caltrans
 - > Implementation in 2017
 - > Tattle tale device installed to facilitate red-light running enforcement
 - > PPD providing selected enforcement

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Intersections in Top 10 2016

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- **Pasadena Ave & State St**
 - > Caltrans intersection
 - > Project developed to prohibit turning movements
 - > Encroachment permit submitted in March 2017
 - > Awaiting Caltrans approval; implementation will be completed within 3 weeks after issuance of permit
 - > PPD providing selected enforcement
- **Fair Oaks Ave & Washington Blvd**
 - > Operational enhancements to signal timing
 - > PPD providing selected enforcement
- **Marengo Ave & Green St**
 - > PPD providing selected enforcement

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Intersections in Top 10 2016

Department of Transportation

- **Fair Oaks Ave & Mountain St**
 - > Operational enhancements to signal timing
 - > PPD providing selected enforcement
- **Fair Oaks Ave & Maple St**
 - > Caltrans Intersection
 - > PPD providing selected enforcement
- **Allen Ave & Maple St**
 - > Caltrans Intersection
 - > PPD providing selected enforcement
- **Sierra Madre Blvd & Colorado Blvd**
 - > PPD providing selected enforcement

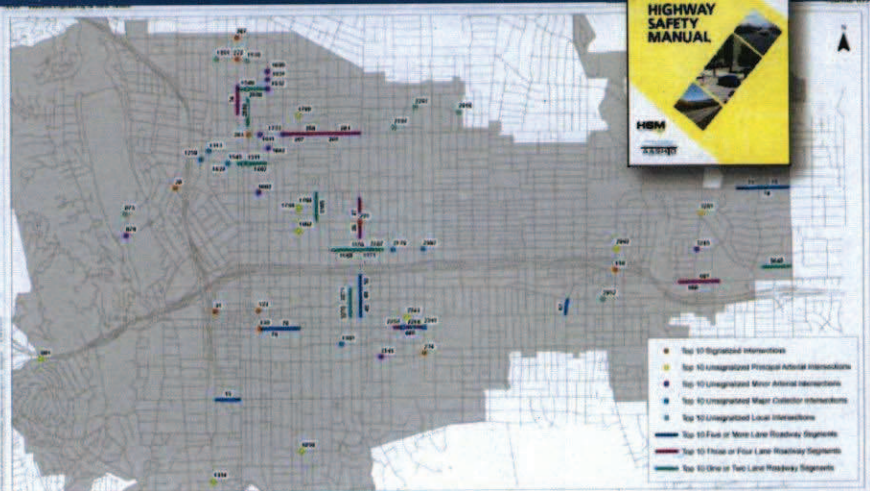
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Network Screening Tools

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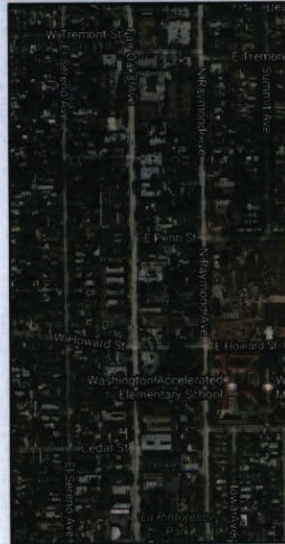




Focused Countermeasures

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Operational
Enhancements
and Capital
Improvements



LINCOLN AVENUE AND MOUNTAIN STREET IMPROVEMENT
CONCEPT DESIGN



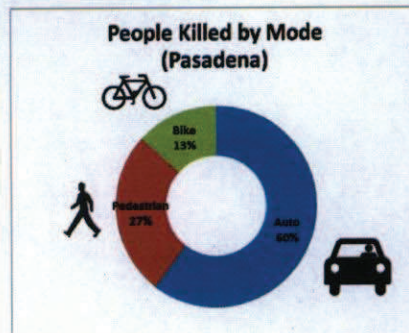
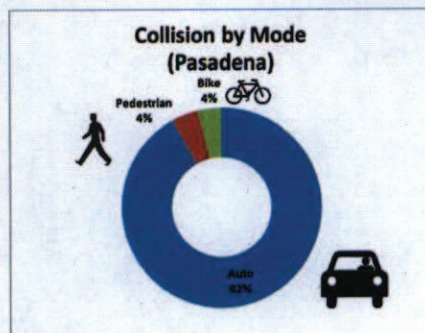
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High Risk Groups / Areas

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- Pedestrian and Bicycle Vulnerability
(10-year Pasadena data 2006-2015)



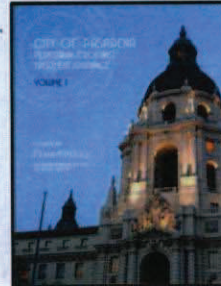
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Pedestrian Safety Projects

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- Conduct site visits, identify countermeasures and prioritize safety enhancements



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Pedestrian Safety Projects

Department of Transportation

- Conduct site visits, identify countermeasures and prioritize safety enhancements



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Pedestrian Safety Projects

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- Pedestrian Safety Projects through Traffic Investigations and Operations



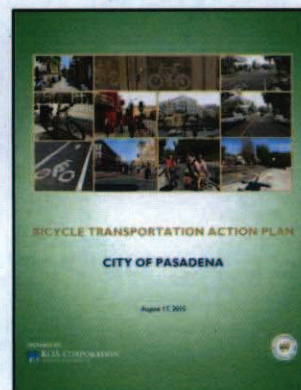
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Bicycle Projects

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- Bicycle Transportation Action Plan



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Bicycle Projects

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- Bicycle Transportation Action Plan



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Speed Management

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HIT BY A VEHICLE
TRAVELING AT:
**20
MPH**
10%
DEATH RISK



HIT BY A VEHICLE
TRAVELING AT:
**30
MPH**
40%
DEATH RISK



HIT BY A VEHICLE
TRAVELING AT:
**40
MPH**
80%
DEATH RISK



Image Source: City of Los Angeles, Vision Zero Fact Sheet, August 2015.

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Assessing Safety | Prioritizing Change

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- Lower Cost vs Higher Cost Improvements
- Identification of funding sources
 - > Many are dependent on safety or mobility grant funding
- Funding dictates scheduling
 - > Type of funding dictates timing of design
 - Engineering dependent upon capital funding
 - > Federal/State/Regional funding sources have different requirements and timelines

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Reassess | Reevaluate

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- Installing automated monitoring via CIP
 - > Network performance, traffic volume, travel times
- On-going effort to develop analytics to further enhance assessment and prioritization
- Continued outreach via Complete Streets
- Ongoing TIs and Development Review
- Ongoing Enforcement and Education
- Coordination with Public Health Department on treating traffic safety as public health item

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Reevaluate | Report

Department of Transportation

- **Periodic Update for Public Safety Committee**
 - > Twice yearly
 - > Report on status of safety assessment
 - > Identification of countermeasures for CIP consideration
- **Incorporate into an Analytics Dashboard**
 - > Developing from monitoring infrastructure
 - > Integration of local and big data streams
 - > Snapshot of assessment and implementation activities

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