



**MICHIGAN OFFICE OF  
RETIREMENT SERVICES**  
*Big Plans. Small Steps.*



# **5-Year Actuarial Experience Study Summary Report**

for the State Police Retirement System,  
a Pension and Other Postemployment Benefit Trust Fund of the State of Michigan  
Oct. 1, 2012, through Sept. 30, 2017

Prepared By  
Office of Retirement Services  
Department of Technology, Management and Budget

# About the Michigan State Police Retirement System

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This report is issued in compliance with the State Police Retirement Act, 1986 Public Act (PA) 182, as amended. The contents come from the 5-Year Actuarial Experience Study covering the period Oct. 1, 2012, through Sept. 30, 2017, and additional analysis performed after Sept. 30, 2017, by the Department of Treasury, Bureau of Investments and the plan actuary. The report includes disclosures on investment assumptions and performance, and a forecast of future expected investment returns. In addition, this report provides a listing of key actuarial assumptions used in measuring the retirement system's liabilities and calculating contributions necessary to provide secure benefits for the membership.

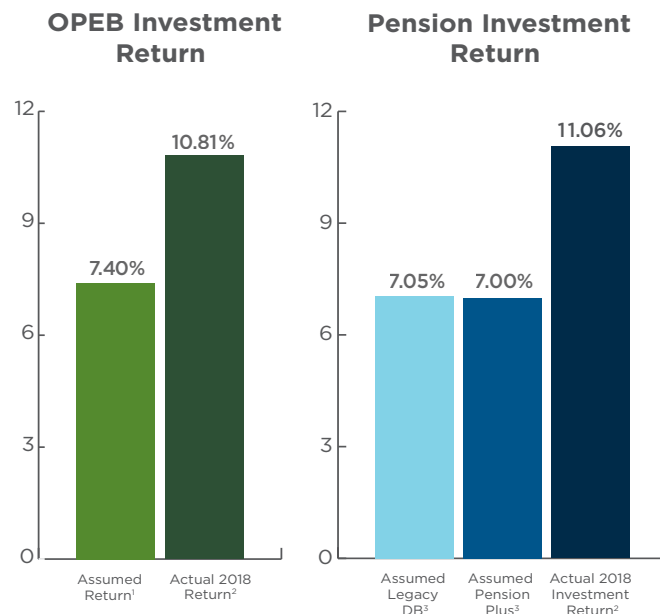
The Michigan State Police Retirement System (SPRS), henceforth referred to as the System, serves 3,117 retirees receiving monthly benefits, and 1,787 active defined benefit plan members. State police pensions are protected by Michigan's Constitution. The System's net assets are held in trust to meet future benefit payments. The state treasurer is the investment fiduciary and custodian of all investments of the System pursuant to state law.

# Assumed and Actual Investment Returns

This section includes the additional investment return disclosures enacted with PA 674 of 2018, which are due by April 1 in the year following an actuarial experience study. The additional disclosures include 15- and 20-year actual investment returns and a forecast of expected investment returns at specified probability levels.

The state treasurer administers all of the System's investments in accordance with the Public Employee Retirement System Investment Act, PA 314 of 1965. The main objective is maximizing the rate of return while meeting the actuarial assumptions through maintaining a diverse portfolio, eliminating unnecessary risks, and investing prudently.

The assumed rate of investment return is a key assumption used by the plan actuary in determining the System's liabilities and employer contribution rates each year. Due to the adoption of the dedicated gains policy by the retirement board and the Department of Technology, Management and Budget (DTMB) director combined with positive investment experience in fiscal year 2018, the assumed rate of return (AROR) was reduced from 7.05 percent to 6.80 percent for the legacy Defined Benefit (DB)



1. SPRS 5-Year Experience Study, Oct. 1, 2012, through Sept. 30, 2017, Page A-7.
2. Department of Treasury, Bureau of Investments report.
3. SPRS 5-Year Experience Study, Oct. 1, 2012, through Sept. 30, 2017, Page A-6.

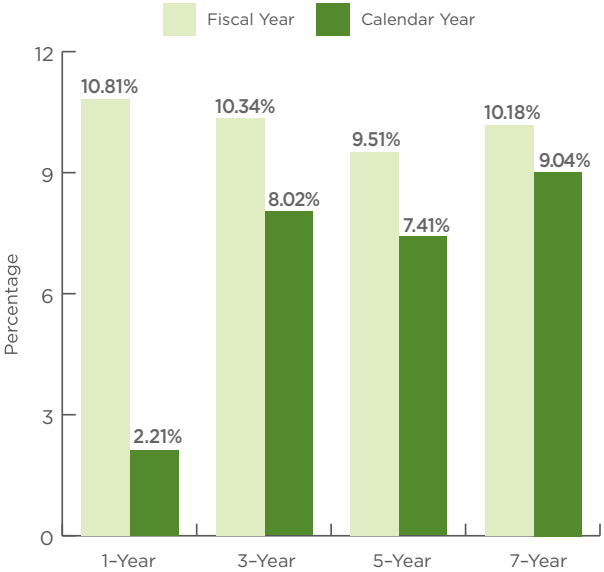
pension plan and the AROR for the Pension Plus plan was reduced from 7.00 percent to 6.85 percent. The actual rate of investment return for the pension plan in fiscal year 2018 was 11.06 percent. The AROR for other postemployment benefits (OPEB) was reduced from 7.40 percent to 7.00 percent by the retirement board and the DTMB director, however, the dedicated gains policy further reduced it to 6.90 percent.

All changes to the AROR are reflected in the Sept. 30, 2018, actuarial valuations, but for comparison with current year investment results, the prior-year assumptions are presented in the chart.

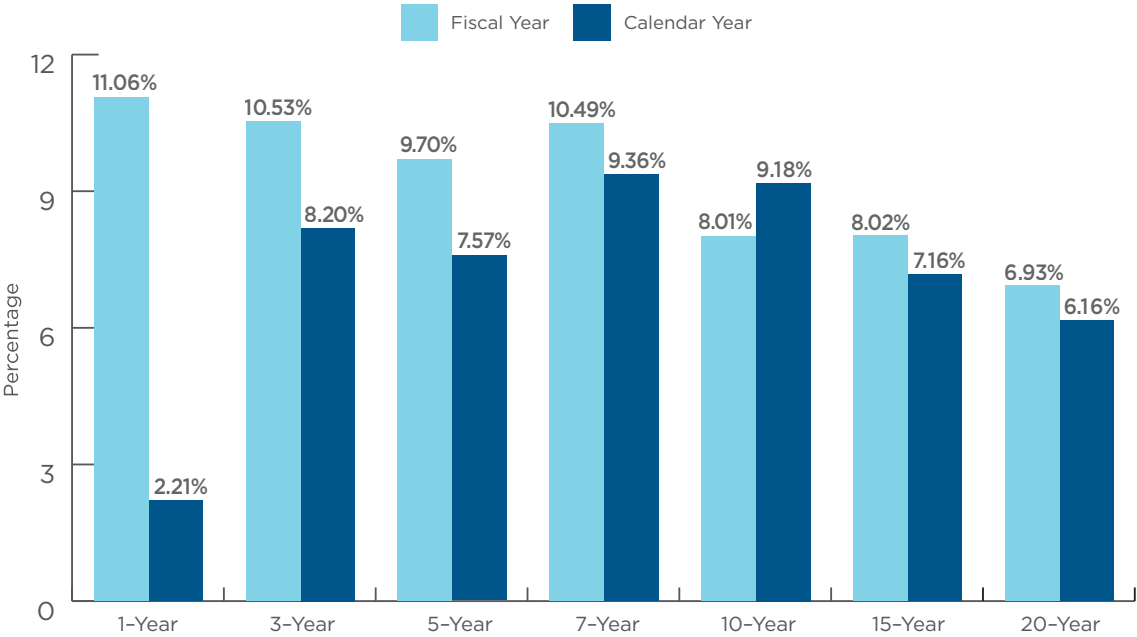
# Historical Investment Returns

Historical investment returns for both pension and OPEB are presented in the following charts. Because the System's OPEB is in the early stages of prefunding, long-term investment results are not available. Over time, as the plan gains more experience, 10-, 15-, and 20-year investment returns will be reported.

**OPEB Historical Investment Returns For 2018<sup>1</sup>**



**Pension Historical Investment Returns For 2018<sup>1</sup>**

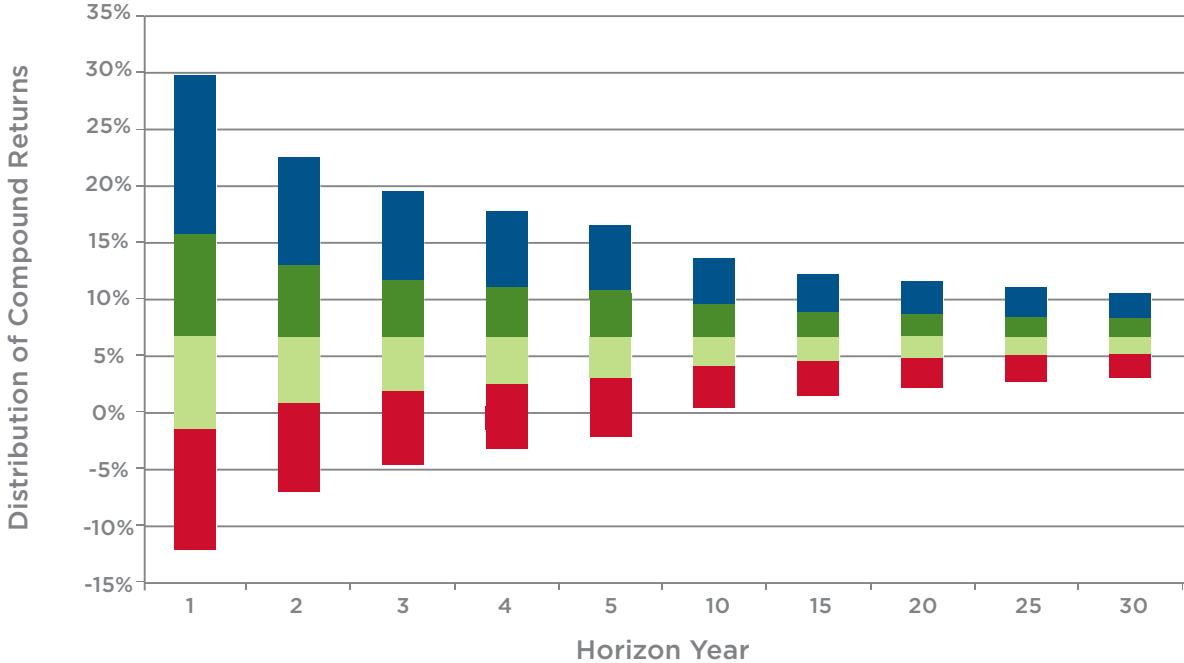


1. Department of Treasury, Bureau of Investments report. These figures are shown net of fees. Information shown in the CAFR is shown gross of fees.

# Forecasted Investment Returns<sup>1</sup>

The distribution of annual returns presented below is based upon the target asset allocation and the capital market assumptions provided by Department of Treasury, Bureau of Investments investment consultant. The results are based upon a price inflation assumption of 2.25 percent.

The expected annual investment return is 7.47 percent. The median of the distribution, that is the return that is expected to be achieved 50 percent of the time, is 6.71 percent.



Percentile	1	2	3	4	5	10	15	20	25	30
<b>95th</b>	29.71%	22.50%	19.44%	17.65%	16.44%	13.51%	12.23%	11.47%	10.96%	10.58%
<b>75th</b>	15.60%	12.93%	11.76%	11.07%	10.60%	9.45%	8.94%	8.64%	8.43%	8.28%
<b>50th</b>	6.71%	6.71%	6.71%	6.71%	6.71%	6.71%	6.71%	6.71%	6.71%	6.71%
<b>25th</b>	-1.49%	0.84%	1.89%	2.53%	2.96%	4.05%	4.53%	4.82%	5.02%	5.16%
<b>5th</b>	-12.21%	-7.04%	-4.66%	-3.21%	-2.21%	0.33%	1.47%	2.16%	2.63%	2.98%
<b>Geometric Average</b>	7.47%	7.09%	6.96%	6.90%	6.86%	6.79%	6.76%	6.75%	6.74%	6.74%

1. SPRS 5-Year Experience Study, Oct. 1, 2012, through Sept. 30, 2017, Page B-6.

# Actuarial Assumptions

Actuarial valuations for both the pension and OPEB plans involve estimates of the value of reported amounts and assumptions about the probability of occurrence of events far into the future. Examples include assumptions about future employment, investment performance, and the healthcare cost trend. A detailed summary on mortality and retirement age assumptions are included.

## Actuarial Assumptions for Fiscal Year Ended Sept. 30, 2018<sup>1</sup>

### Pension and OPEB

Actuarial Cost Method	Entry Age, Normal
Amortization Method	Level Percent of Payroll
Payroll Growth Assumption <sup>2</sup>	2.75% reduced to 0% by Sept. 30, 2024
Amortization Period <sup>3</sup>	Closed Period, 18 years beginning Oct. 1, 2020
Asset Valuation Method	5-Year Smoothed
Wage Inflation Rate	2.75%

### OPEB

Healthcare Cost Trend Rate	8.25% Year 1 graded to 3.00% Year 10
AROR—Closed <sup>4</sup>	6.90%

### Pension—AROR

Legacy DB plan—Closed	6.80%
Pension Plus plan—Open	6.85%

1. Pension and OPEB Actuarial Valuations for the fiscal year ended Sept. 30, 2017.
2. PA 674 of 2018 enacted a gradual phase-in reduction to the payroll growth assumption to 0% in 50 basis point increments beginning with the Sept. 30, 2019, valuations. Once the 0% payroll growth assumption is fully phased-in, the amortization method for both pension and OPEB will be level dollar.
3. PA 674 of 2018 extended the amortization period for the UAAL in the System from 2036 to 2038.
4. The OPEB plan closed to new troopers and sergeants first hired on or after June 10, 2012. These employees participate in the Personal Healthcare Fund and may become eligible for a lump sum payment of \$2,000 into a Health Reimbursement Account upon their first termination from employment (with at least 10 years of service). These employees have the option of enrolling in the System's retiree healthcare at full cost at termination.

# Mortality Assumptions

The mortality tables used in this valuation of the plan are described below:

- Healthy Preretirement:** Retirement Plan (RP)-2014 Male and Female Employee Mortality Tables scaled by 100 percent for both males and females and adjusted for mortality improvements using projection scale Mortality Projection (MP)-2017 from 2006.
- Healthy Postretirement:** RP-2014 Male and Female Healthy Annuitant Mortality Tables scaled by 93 percent for males and 99 percent for females and adjusted for mortality improvements using projection scale MP-2017 from 2006.
- Disabled Retirement:** RP-2014 Male and Female Disabled Annuitant Mortality Tables scaled by 100 percent for both males and females and adjusted for mortality improvements using projection scale MP-2017 from 2006.

Future Life Expectancy (Years) <sup>1</sup>						
Sample Attained	Healthy Preretirement		Healthy Postretirement		Disabled Retirement	
	Men	Women	Men	Women	Men	Women
45	41.38	45.66	39.97	41.98	27.46	32.68
50	36.17	40.46	35.04	36.97	24.23	28.67
55	31.08	35.34	30.26	32.05	21.11	24.86
60	26.16	30.34	25.68	27.30	18.11	21.36
65	21.54	25.45	21.33	22.77	15.28	17.97
70	17.26	20.68	17.22	18.44	12.55	14.59
75	13.30	16.12	13.39	14.41	9.93	11.44
80	9.75	11.82	9.97	10.79	7.56	8.71

1. SPRS GASB Statement Number 67 Report, Sept. 30, 2018, Page 24. Life expectancy in future years is determined by the fully generational MP-2017 projection scale. The sample values shown are for individuals with the indicated attained ages in 2018.

# Retirement Age Assumptions<sup>1</sup>

The rates of retirement used to measure the probability of eligible members retiring during the next year are shown below. These assumptions will first be used for the Sept. 30, 2018, valuation of the System.

A Hybrid plan member is eligible for retirement upon attainment of age 55 and completion of 25 years of service or at age 60 with 10 or more years of service. All other members may retire or enter the Deferred Retirement Option Program (DROP) after accumulating 25 years of credited service, or, may retire upon attaining age 50 with 10 or more years of service. Of those members assumed to retire with 25 or more years of service, (based on the charts below) 70 percent are assumed to elect the DROP and 30 percent are assumed to retire without the DROP.

**In the Age Based chart retirement was reached:**

- at or after age 50 with 10 years of service (Non-Hybrid)
- or after age 55 with 25 years of service (Hybrid)
- or after age 60 with 10 years of service (Hybrid)

**In the Service Based chart retirement was reached:**

- after 25 or more years of service (Non-Hybrid)

Age Based		Service Based	
Age	% Retiring	Years of Service	% Retiring
50	15	25	70
51	20	26	60
52	20	27	35
53	25	28	35
54	30	29	35
55	30	30	35
56	30	31	35
57	30	32	35
58	30	33	35
59	30	34	35
60	40	35	35
61	50	36	35
62	50	37	35
63	50	38	35
64	50	39	35
65 and over	100	40 and over	100

1. SPRS GASB Statement Number 67 Report, Sept. 30, 2018, Page 25.







## **Office of Retirement Services**

Department of Technology, Management and Budget  
Kerrie Vanden Bosch, director

### **Our Purpose**

ORS is an innovative retirement organization driven to empower our customers for a successful today and a secure tomorrow.

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