

**TUCSON SUPPLEMENTAL RETIREMENT SYSTEM
BOARD OF TRUSTEES
Notice of Regular Meeting / Agenda**

DATE: Thursday, April 25, 2019
TIME: 8:30 a.m.
PLACE: Human Resource Conference Room, 3rd floor East
City Hall, 255 West Alameda
Tucson, Arizona 85701

A. Consent Agenda

1. Retirement Ratifications for April 2019
2. March 2019 TSRS Budget Vs. Actual Expenses
3. March 2019 Board Meeting Minutes
4. TSRS March Investment Measurement Service Monthly Review

B. Call to Audience

C. Disability Application*

1. Leon Howell

D. Asset/Liability Model Report

1. Discuss ALM Survey Results ^{Note 1}

E. Administrative Discussions

1. Revision to the Ratification Report
2. 2019 Disability Audit
3. Internal Audit Update – Aaron Williams – City of Tucson Internal Audit

F. Articles & Readings for Board Member Education / Discussion

1. Why the Longest Bull Market Has Failed to Fix the Nation's Public Pensions
2. Why There Is Too Much Emphasis on Recession and the Inverted Yield Curve in 2019
3. Largest DB Plan Sponsors Adjust Policies to Manage Risks

G. Future Agenda Items

1. TSRS Rules and Regulations
2. Consideration to Hire External Legal Counsel
3. Internal Audit Update

H. Adjournment

Please Note: Legal Action may be taken on any agenda item

*Pursuant to A.R.S. 38-431.03(A)(3) and (4): the board may hold an executive session for the purposes of obtaining legal advice from an attorney or attorneys for the Board or to consider its position and instruct its attorney(s) in pending or contemplated litigation. The board may also hold an executive session pursuant to A.R.S. 38-431.03(A)(1) for the discussion or consideration of matters specific to an identified public officer, appointee, or employee or pursuant to A.R.S. 38-431.03(A)(2) for purposes of discussion or consideration of records, information or testimony exempt by law from public inspection.

Note 1 – The results of the survey will be disseminated before or during the meeting.

Service & Disability Retirements, End of Service Entrants for TSRS Board of Trustees Ratification

02/11/19 - 03/10/19 - April 2019

Name of Applicant	Department	Type	Effective Date	Date of Birth	Age	Credited Service	Present Value	Member's Accumulated Contributions	AFC	Option	Pension	
Karen K Sasse	Library	Deferred Retirement	3/12/2019	3/12/1957	62.00	15.9026	114,233.30	58,456.90	2,412.03	Single Life	863.05	
Bradley W Greenslaugh	Water	Deferred Retirement	3/14/2019	3/14/1957	62.00	5.1142	66,572.56	34,620.77	4,560.74	J&S 100	456.51	
Mark A Altamirano	Environmental Services	Deferred Retirement	3/15/2019	3/15/1957	62.00	16.2822	142,013.43	48,142.49	3,055.87	J&S 100	1,041.23	
Elizabeth E Grant	Planning & Development Services	Deferred Retirement	3/22/2019	1/5/1957	62.21	8.0776	92,436.25	29,625.76	3,842.57	Single Life	698.37	
Jeanne M Montague	Police	Normal Retirement	4/3/2019	5/12/1964	54.89	25.7595 **		86,405.37	3,520.08	Single Life	2,040.20	
Daniel A Rasnake	Parks & Recreation	Normal Retirement	4/2/2019	1/10/1967	52.23	28.6633 **		146,391.15	4,128.01	Single Life	2,662.25	
Elaine V Darrell	Public Safety Communications	Normal Retirement	4/5/2019	5/3/1960	58.92	22.9039 **		95,648.17	4,548.23	J&S 50	2,087.73	
Debra M Rosenstiel	Transportation	Deferred Retirement	4/6/2019	4/6/1957	62.00	12.1127	54,971.76	45,396.04	1,523.92	J&S 50	392.39	
Meredith Lambson Jr	Environmental Services	Normal Retirement	4/10/2019	4/10/1957	62.00	14.7421 **		36,736.09	3,117.99	J&S 100	812.98	
									<u>30,709.44</u>		<u>11,054.71</u>	
Source Material: GRS/Payroll					Averages	59.81	16.62	94,045.46	64,602.53	3,412.16		1,228.30
** Present value not available as first payment was made based on an estimate												

Report ID : FIN-COT-BA-0001

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City of Tucson
Budget vs Actual Expenses
Through: March, 2019
For Fiscal Year 2019

Parameter Page

Parameters and Prompts

Fiscal Year	2019
Accounting Period	9
Fund	072
Department	*
Unit	*
Object Code	*

Report Description

The Expenses vs. Actual Report shows expenditures and encumbrances for the selected accounting period and for the selected fiscal year compared against the current expense budget and the unobligated budget balance. The report is sectioned by Department, Fund and Unit and summarized by Object.

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City of Tucson
Budget vs Actual Expenses
Through: March, 2019
For Fiscal Year 2019

Department	Fund	Unit	Object	Current Period Encumbrance	Current Period Expenditure	Current Total Obligations	YTD Encumbrance	YTD Expenditure	YTD Total Obligations	Current Budgeted Amount	Unobligated Budget Balance	Percent
900 - TUCSON SUPPL RETIREMENT SYSTEM	072 - TUCSON SUPP RETIREMENT SYSTEM	9001 - Normal Retiree Benefit	105 - PAYROLL PENSION	0.00	5,682,206.96	5,682,206.96	0.00	50,765,785.81	50,765,785.81	72,000,000	21,234,214.19	29.49 %
Total for 100 - PAYROLL CHGS				0.00	5,682,206.96	5,682,206.96	0.00	50,765,785.81	50,765,785.81	72,000,000	21,234,214.19	29.49 %
Total for Unit 9001 - Normal Retiree Benefit				0.00	5,682,206.96	5,682,206.96	0.00	50,765,785.81	50,765,785.81	72,000,000	21,234,214.19	29.49 %

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City of Tucson
Budget vs Actual Expenses
Through: March, 2019
For Fiscal Year 2019

Department	Fund	Unit	Object	900 - TUCSON SUPPL RETIREMENT SYSTEM	072 - TUCSON SUPP RETIREMENT SYSTEM	9003 - Normal Retiree Beneficiary Benefit	Current Period Encumbrance	Current Period Expenditure	Current Total Obligations	YTD Encumbrance	YTD Expenditure	YTD Total Obligations	Current Budgeted Amount	Unobligated Budget Balance	Percent
			105 - PAYROLL PENSION	0.00	362,257.74	0.00	362,257.74	362,257.74	362,257.74	0.00	3,238,316.65	3,238,316.65	3,900,000	661,683.35	16.97 %
			Total for 100 - PAYROLL CHGS	0.00	362,257.74	0.00	362,257.74	362,257.74	362,257.74	0.00	3,238,316.65	3,238,316.65	3,900,000	661,683.35	16.97 %
			Total for Unit 9003 - Normal Retiree Beneficiary Benefit	0.00	362,257.74	0.00	362,257.74	362,257.74	362,257.74	0.00	3,238,316.65	3,238,316.65	3,900,000	661,683.35	16.97 %

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City of Tucson
Budget vs Actual Expenses
Through: March, 2019
For Fiscal Year 2019

Department	Fund	Unit	900 - TUCSON SUPPL RETIREMENT SYSTEM	072 - TUCSON SUPP RETIREMENT SYSTEM	9020 - Disability Retiree Benefit	Current Period Encumbrance	Current Period Expenditure	YTD Encumbrance	YTD Expenditure	YTD Total Obligations	YTD Total Obligations	Current Budgeted Amount	Unobligated Budget Balance	Percent
			0.00	166,681.68	0.00	166,681.68	0.00	1,498,590.73	1,498,590.73	1,498,590.73	1,498,590.73	2,100,000	601,409.27	28.64 %
105 - PAYROLL PENSION			0.00	166,681.68	0.00	166,681.68	0.00	1,498,590.73	1,498,590.73	1,498,590.73	1,498,590.73	2,100,000	601,409.27	28.64 %
Total for 100 - PAYROLL CHGS														
Total for Unit 9020 - Disability Retiree Benefit			0.00	166,681.68	0.00	166,681.68	0.00	1,498,590.73	1,498,590.73	1,498,590.73	1,498,590.73	2,100,000	601,409.27	28.64 %

**City of Tucson
Budget vs Actual Expenses
Through: March, 2019
For Fiscal Year 2019**

Department	Fund	Unit	Object	900 - TUCSON SUPPL RETIREMENT SYSTEM	072 - TUCSON SUPP RETIREMENT SYSTEM	9021 - Pension Fund Administration	Current Period Encumbrance	Current Period Expenditure	Current Total Obligations	YTD Encumbrance	YTD Expenditure	YTD Total Obligations	Current Budgeted Amount	Unobligated Budget Balance	Percent
101 - SALARIES & WAGES FOR PERMANENT EMPLOYEES				0.00	(156,520.85)		0.00	181,615.84	181,615.84	0.00	181,615.84	181,615.84	276,420	94,804.16	34.30 %
102 - EXTRA TIME				0.00	0.00		0.00	2.17	2.17	0.00	2.17	2.17	0	(2.17)	0.00%
103 - OVERTIME WAGES				0.00	7.21		0.00	132.83	132.83	0.00	132.83	132.83	0	(132.83)	0.00%
105 - PAYROLL PENSION				0.00	0.00		0.00	3,971.22	3,971.22	0.00	3,971.22	3,971.22	0	(3,971.22)	0.00%
108 - DOWNTOWN ALLOWANCE & DISCOUNTED TRANSIT PASSES				0.00	121.17		0.00	842.42	842.42	0.00	842.42	842.42	2,310	1,467.58	63.53 %
113 - TSRS PENSION CONTRIBUTION				0.00	7,241.74		0.00	47,047.75	47,047.75	0.00	47,047.75	47,047.75	76,010	28,962.25	38.10 %
114 - FICA (SOCIAL SECURITY)				0.00	1,911.90		0.00	13,831.02	13,831.02	0.00	13,831.02	13,831.02	20,090	6,258.98	31.15 %
115 - WORKERS COMPENSATION INSURANCE				0.00	162.13		0.00	930.87	930.87	0.00	930.87	930.87	4,500	3,569.13	79.31 %
116 - GROUP PLAN INSURANCE				0.00	3,729.62		0.00	20,313.22	20,313.22	0.00	20,313.22	20,313.22	27,000	6,686.78	24.77 %
117 - STATE UNEMPLOYMENT				0.00	30.34		0.00	209.54	209.54	0.00	209.54	209.54	380	170.46	44.86 %
125 - ONE-TIME DISTRIBUTION				0.00	0.00		0.00	5,250.00	5,250.00	0.00	5,250.00	5,250.00	0	(5,250.00)	0.00%
196 - INTERDEPARTMENTAL LABOR				0.00	8,000.00		0.00	72,000.00	72,000.00	0.00	72,000.00	72,000.00	96,000	24,000.00	25.00 %
Total for 100 - PAYROLL CHGS				0.00	(135,316.74)		0.00	346,146.88	346,146.88	0.00	346,146.88	346,146.88	502,710	156,563.12	31.14 %
202 - TRAVEL				0.00	0.00		0.00	6,613.58	6,613.58	0.00	6,613.58	6,613.58	4,000	(2,613.58)	-65.34 %
204 - TRAINING				0.00	25.00		0.00	3,022.58	3,022.58	0.00	3,022.58	3,022.58	14,000	10,977.42	78.41 %
205 - PARKING SERVICE				0.00	0.00		0.00	327.00	327.00	0.00	327.00	327.00	500	173.00	34.60 %
212 - CONSULTANTS AND SURVEYS				0.00	0.00		0.00	148,137.25	148,137.25	0.00	148,137.25	148,137.25	50,000	(98,137.25)	#####
213 - LEGAL				0.00	0.00		0.00	12,286.50	12,286.50	0.00	12,286.50	12,286.50	50,000	37,713.50	75.43 %

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900 - TUCSON SUPPL RETIREMENT SYSTEM	072 - TUCSON SUPP RETIREMENT SYSTEM	9021 - Pension Fund Administration	215 - AUDITING AND BANK SERVICES	0.00	0.00	0.00	0.00	105,911.43	105,911.43	60,000	(45,911.43)	-76.52 %
			219 - MISCELLANEOUS PROFESSIONAL SERVICES	0.00	0.00	0.00	0.00	95.00	95.00	9,900,000	9,899,905.00	100.00 %
			221 - INSUR-PUBLIC LIABILITY	0.00	32,216.33	32,216.33	0.00	34,082.04	34,082.04	31,000	(3,082.04)	-9.94 %
			232 - R&M MACHINERY & EQUIPMENT	0.00	0.00	0.00	0.00	0.00	0.00	1,200	1,200.00	100.00 %
			234 - COMPUTER HARDWARE MAINTENANCE	0.00	0.00	0.00	0.00	258.35	258.35	0	(258.35)	0.00%
			245 - TELEPHONE	0.00	0.00	0.00	0.00	0.00	0.00	1,200	1,200.00	100.00 %
			252 - RENTS EQUIPMENT	0.00	0.00	0.00	0.00	303.97	303.97	0	(303.97)	0.00%
			260 - COMPUTER SOFTWARE MAINTENANCE AGREEMENTS	0.00	0.00	0.00	0.00	38,000.00	38,000.00	51,000	13,000.00	25.49 %
			263 - PUBLIC RELATIONS	0.00	0.00	0.00	0.00	0.00	0.00	2,560	2,560.00	100.00 %
			264 - INVESTMENT MGT FEES & COMMISSIONS	0.00	0.00	0.00	0.00	1,422,909.96	1,422,909.96	0	(1,422,909.96)	0.00%
			265 - SECURITIES LENDING (STOCK FEES)	0.00	0.00	0.00	0.00	27,838.87	27,838.87	0	(27,838.87)	0.00%
			277 - CARRIED INTEREST EXPENSE	0.00	0.00	0.00	0.00	242,554.81	242,554.81	0	(242,554.81)	0.00%
			284 - MEMBERSHIPS AND SUBSCRIPTIONS	0.00	0.00	0.00	0.00	640.00	640.00	1,500	860.00	57.33 %
			Total for 200 - PROF CHARGES	0.00	32,241.33	32,241.33	0.00	2,042,981.34	2,042,981.34	10,166,960	8,123,978.66	79.91 %
			311 - OFFICE SUPPLIES	0.00	138.52	138.52	0.00	942.37	942.37	9,000	8,057.63	89.53 %
			312 - PRINTING,PHOTOGRAPHY,REPRODUCTION	0.00	24.46	24.46	0.00	7,734.59	7,734.59	9,000	1,265.41	14.06 %
			314 - POSTAGE	0.00	90.97	90.97	0.00	6,443.30	6,443.30	12,000	5,556.70	46.31 %
			317 - COMPUTER SOFTWARE < \$100,000	0.00	0.00	0.00	0.00	71.91	71.91	0	(71.91)	0.00%
			341 - BOOK, PERIODICALS AND RECORDS	0.00	0.00	0.00	0.00	0.00	0.00	250	250.00	100.00 %

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900 - TUCSON SUPPL RETIREMENT SYSTEM	072 - TUCSON SUPP RETIREMENT SYSTEM	9021 - Pension Fund Administration	345 - FURNISHINGS, EQUIPMENT AND TOOLS < \$5,000	0.00	0.00	0.00	0.00	0.00	0.00	1,000	1,000.00	100.00 %
			346 - COMPUTER EQUIPMENT < \$5,000	0.00	0.00	0.00	0.00	1,764.33	1,764.33	1,000	(764.33)	-76.43 %
			359 - NON OFFICE SUPPLIES	0.00	0.00	0.00	0.00	2,537.88	2,537.88	0	(2,537.88)	0.00%
Total for 300 - SUPPLIES				0.00	253.95	253.95	0.00	19,494.38	19,494.38	32,250	12,755.62	39.55 %
Total for Unit 9021 - Pension Fund Administration				0.00	(102,821.46)	(102,821.46)	0.00	2,408,622.60	2,408,622.60	10,701,920	8,293,297.40	77.49 %

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Department	Fund	Unit	Object	900 - TUCSON SUPPL RETIREMENT SYSTEM	072 - TUCSON SUPP RETIREMENT SYSTEM	9022 - Disability Retiree Beneficiary Benefit	Current Period Encumbrance	Current Period Expenditure	Current Total Obligations	YTD Encumbrance	YTD Expenditure	YTD Total Obligations	Current Budgeted Amount	Unobligated Budget Balance	Percent
			105 - PAYROLL PENSION	0.00	34,734.26	0.00	34,734.26	34,734.26	34,734.26	0.00	312,608.34	312,608.34	370,000	57,391.66	15.51 %
Total for 100 - PAYROLL CHGS				0.00	34,734.26	0.00	34,734.26	34,734.26	34,734.26	0.00	312,608.34	312,608.34	370,000	57,391.66	15.51 %
Total for Unit 9022 - Disability Retiree Beneficiary Bene				0.00	34,734.26	0.00	34,734.26	34,734.26	34,734.26	0.00	312,608.34	312,608.34	370,000	57,391.66	15.51 %

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900 - TUCSON SUPPL RETIREMENT SYSTEM	072 - TUCSON SUPP RETIREMENT SYSTEM	9023 - ACTIVE MEMBER REFUNDS-CONTRBS	186 - TSRS REFUNDS	0.00	236,146.55	0.00	1,154,027.51	1,154,027.51	1,154,027.51	2,736,000	1,581,972.49	57.82 %
Total for 100 - PAYROLL CHGS				0.00	236,146.55	0.00	1,154,027.51	1,154,027.51	1,154,027.51	2,736,000	1,581,972.49	57.82 %
Total for Unit 9023 - ACTIVE MEMBER REFUNDS-CON				0.00	236,146.55	0.00	1,154,027.51	1,154,027.51	1,154,027.51	2,736,000	1,581,972.49	57.82 %

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Department	Fund	Unit	Object	900 - TUCSON SUPPL RETIREMENT SYSTEM	072 - TUCSON SUPP RETIREMENT SYSTEM	9025 - INTEREST ON REFUNDS	Current Period Encumbrance	Current Period Expenditure	Current Total Obligations	YTD Encumbrance	YTD Expenditure	YTD Total Obligations	Current Budgeted Amount	Unobligated Budget Balance	Percent
			186 - TSRS REFUNDS	0.00	2,602.44	0.00	2,602.44	2,602.44	2,602.44	0.00	8,332.59	8,332.59	50,000	41,667.41	83.33 %
Total for 100 - PAYROLL CHGS				0.00	2,602.44	0.00	2,602.44	2,602.44	2,602.44	0.00	8,332.59	8,332.59	50,000	41,667.41	83.33 %
Total for Unit 9025 - INTEREST ON REFUNDS				0.00	2,602.44	0.00	2,602.44	2,602.44	2,602.44	0.00	8,332.59	8,332.59	50,000	41,667.41	83.33 %

City of Tucson
Budget vs Actual Expenses
Through: March, 2019
For Fiscal Year 2019

Department	Fund	Unit	900 - TUCSON SUPPL RETIREMENT SYSTEM	072 - TUCSON SUPP RETIREMENT SYSTEM	9026 - DWE SYSTEM BENEFIT PAYMENT	Current Period Encumbrance	Current Period Expenditure	Current Total Obligations	YTD Encumbrance	YTD Expenditure	YTD Total Obligations	Current Budgeted Amount	Unobligated Budget Balance	Percent
			0.00	107,594.45	107,594.45	0.00	107,594.45	107,594.45	0.00	243,225.73	243,225.73	200,000	(43,225.73)	-21.61 %
			0.00	107,594.45	107,594.45	0.00	107,594.45	107,594.45	0.00	243,225.73	243,225.73	200,000	(43,225.73)	-21.61 %
			Total for 100 - PAYROLL CHGS											
			0.00	107,594.45	107,594.45	0.00	107,594.45	107,594.45	0.00	243,225.73	243,225.73	200,000	(43,225.73)	-21.61 %
			Total for Unit 9026 - DWE SYSTEM BENEFIT PAYMENT											

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Department	Fund	Unit	Object	Current Period Encumbrance	Current Period Expenditure	YTD Encumbrance	YTD Expenditure	YTD Total Obligations	YTD Total Obligations	Current Budgeted Amount	Unobligated Budget Balance	Percent
	900 - TUCSON SUPPL RETIREMENT SYSTEM			0.00	20,640.67	0.00	22,779.14	22,779.14	22,779.14	0	(22,779.14)	0.00%
	072 - TUCSON SUPP RETIREMENT SYSTEM			0.00	20,640.67	0.00	22,779.14	22,779.14	22,779.14	0	(22,779.14)	0.00%
	9027 - CREDITABLE SERVICE TRANS(ASRS)			0.00	20,640.67	0.00	22,779.14	22,779.14	22,779.14	0	(22,779.14)	0.00%
	186 - TSRS REFUNDS			0.00	20,640.67	0.00	22,779.14	22,779.14	22,779.14	0	(22,779.14)	0.00%
	Total for 100 - PAYROLL CHGS			0.00	20,640.67	0.00	22,779.14	22,779.14	22,779.14	0	(22,779.14)	0.00%
	Total for Unit 9027 - CREDITABLE SERVICE TRANS(AS			0.00	20,640.67	0.00	22,779.14	22,779.14	22,779.14	0	(22,779.14)	0.00%

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Fund	072 - TUCSON SUPP RETIREMENT SYSTEM	0.00	0.30	0.30	0.00	0.30	0.30	0	(0.30)	0.00%
Unit	9028 - EXCESS SER TRS/CTY CONT(ASRS)	0.00	0.30	0.30	0.00	0.30	0.30	0	(0.30)	0.00%
Object	186 - TSRS REFUNDS	0.00	0.30	0.30	0.00	0.30	0.30	0	(0.30)	0.00%
	Total for 100 - PAYROLL CHGS	0.00	0.30	0.30	0.00	0.30	0.30	0	(0.30)	0.00%
	Total for Unit 9028 - EXCESS SER TRS/CTY CONT(ASR	0.00	0.30	0.30	0.00	0.30	0.30	0	(0.30)	0.00%
	Total for Fund 072 - TUCSON SUPP RETIREMENT SYS	0.00	6,510,043.59	6,510,043.59	0.00	59,652,289.40	59,652,289.40	92,057,920	32,405,630.60	35.20 %
	Total for Department 900 - TUCSON SUPPL RETIREME	0.00	6,510,043.59	6,510,043.59	0.00	59,652,289.40	59,652,289.40	92,057,920	32,405,630.60	35.20 %
	Grand Totals	0.00	6,510,043.59	6,510,043.59	0.00	59,652,289.40	59,652,289.40	92,057,920	32,405,630.60	35.20 %

TUCSON SUPPLEMENTAL RETIREMENT SYSTEM

BOARD OF TRUSTEES

Meeting Minutes

DATE: Thursday, March 28, 2019
TIME: 8:30 a.m.
PLACE: Human Resource Conference Room, 3rd floor East
City Hall, 255 West Alameda
Tucson, Arizona 85701

Members Present: Joyce Garland, Finance Director (Arrived at 9:11 am)
Ana Urquijo, HR Director
Michael Coffey, Elected Representative and Acting Chairman
Jorge Hernández, Elected Representative
Kevin Larson, City Manager Appointee

Staff Present Art Cuaron, Pension & Benefits Administrator
Tina Gamez, Administrative Assistant

Guests Present Catherine Langford, Yoder & Langford – TSRS Legal Counsel (via Telephone)
Dave Deibel, Deputy City Attorney
Pete Saxton, Pension Manager
Paul Erlendson, Callan LLC (via Facetime)
Kim Dudley, HR Deputy Director
Ted Price, GovInvest
Mary Parker, CTRA Representative

Absent/Excused: Mark Rubin, Chairman
James Wysocki, Elected Retiree Representative

Acting Chairman Michael Coffey called the meeting to order at 8:30am

A. Consent Agenda (00:00-01:49)

1. Retirement Ratifications for January 2019
2. Retirement Ratifications for February 2019
3. Retirement Ratifications for March 2019
4. February 2019 TSRS Budget Vs. Actual Expenses
5. February 2019 Board Meeting Minutes
6. TSRS February Investment Measurement Service Monthly Review

Art Cuaron explained that the previous ratification reports were listed on this month's agenda as a result of a lack of a clearly motioned Consent Agenda's in prior months. The intent is to formally adopt the reports. Staff has processed as per the Board's intent and those members listed on the report have received their benefits as scheduled.

A motion to approve the Consent Agenda was made by Kevin Larson, 2nd by Jorge Hernandez, and passed by a vote of 4 to 0 (Mark Rubin and James Wysocki absent/excused).

B. Call to Audience (01:50-01:57)

None heard

C. Asset/Liability Model Report (01:58-55:23)

1. Asset/Liability Education – Callan (via Facetime)

Paul Erlendson presented information to the Board explaining several aspects of the Asset/Liability Study. This included a discussion of the importance of strategic allocation of assets, Paul stated that the allocation of

assets by class would have a highly significant impact on the investment returns, whereas the active manager selection would add or subtract an amount that is less significant. There are several important asset allocation factors for the Board to consider: time horizon of investment, liquidity needs, capital market expectations, and risk tolerance. Paul also noted that the Asset/Liability Study is a prudent investing activity which should be reviewed periodically.

Paul presented information about how Callan estimates future returns, noting that for each asset class there is a range of estimated returns, and this range has a bell curve. The expected return is correlated to the asset class, and Callan uses a method of mean-variance optimization to maximize the return and minimize the risk for any rate of return that can be realistically estimated. The Board requested and Paul Erlendson agreed to submit a written paper with more detailed information on this subject.

Paul discussed the importance of diversification along 2 axes of expected future market performance, one was inflation and the second was growth. The importance is that different asset classes will out-perform each other, depending on the conditions of inflation and growth.

At the conclusion of the presentation, Paul discussed the upcoming plan of action. Callan would submit to the individual members of the Board a questionnaire to understand their level of concern with various factors such as liquidity or funded status. The Board questioned Paul to ensure that this information was going to be used to prepare additional information, and would not be used to poll the Board, nor to remove options from the Board's consideration. Paul assured the Board that the questionnaire would be used to identify themes for discussion and encourage a round table discussion by the entire Board. Further the Board would have complete control over the upcoming discussion and could investigate any and all information prior to making a decision.

Finally, Art Cuaron stated that the tentative plan was to have a discussion about the Asset/Liability model in April, and if reasonable, a draft report could be available for review at the May meeting. However, the timing for upcoming study will depend on the Board and staff will be ready to support the Board's direction.

Presentation given by Paul Erlendson, discussion held. No formal action taken.

D. Administrative Discussions

1. Post Retirement Benefit Increase Policy (55:35-01:21:41)

Art Cuaron briefed the Board that this is a follow up from last month and last November. Art commented that he is seeking direction from the Board on how they would like to proceed with this policy. He has given the Board a few options: 1) Update the policy, 2) Use elements of the PRBI and have Cassie work with Leslie and re-write or, 3) Rescind the policy given the current time line to be reach 100% funded status.

Catherine Langford provided background on how the policy came to be based on her research of prior meeting minutes and documents on this topic. She stated that the most recent updated was in 2009. At that time, the code was re-written and this policy is not a Mayor and Council policy. Authority rests with the Board. The need to get the approval for Mayor and Council was removed when this code was updated. Catherine commented that currently for this year we would need to be funded at 91% to consider a 13th check. That 91% goes up 1% each plan year (June 30th) before it can be considered to give an allotment.

Board discussion ensued and they provided direction to hold a special study session to discuss this as a standalone item in May 2019.

Discussion held, no formal action taken.

2. Investment Policy Statement (01:21:42-01:23:16)

Per direction from the Board at last month's meeting, Art has provided the investment Policy Statement to the Board for review and would like the Board to provide any comments to Cassie and Paul before they begin to update the policy. Art commented that he did not include the correct version of the policy with her corrections from last month. Art would like feedback and revisions from the Board.

Michael Coffey commented they need the correct version and a timeline.

Art will resend the Board the updated policy that was updated by Cassie last month. Art will continue to keep this on the agenda.

Art will provided the updated version to the Board for April's Meeting.

Discussion held, no formal action taken.

3. Internal Cash Liquidation Process (01:23:17-01:42:49)

Art briefed the Board on the Internal Cash Liquidation process and explained to the Board that this topic was being presented in conjunction with the Asset/Liability study. Art has asked Callan to incorporate an allocation to cash as the fund needs \$36 million on an annual basis to meet liquidity needs.

Art commented that this is all informational for the Board and the intent was to inform the Board of the process as a means for further discussion when the asset/liability model is complete.

Discussion held, no formal action taken.

Break: 10:15 AM

Returned: 10:24 AM

4. GovInvest Presentation* (01:42:55-02:20:08)

Presentation and demonstration of software product was made to the Board by GovInvest CEO Ted Price. The Board would like to see options that GRS, which is the current actuarial vendor, is able to provide as a software projection tool. Art will coordinate with GRS to determine what is available.

Discussion held, no formal action taken.

E. Articles & Readings for Board Member Education / Discussion

1. After A Chaotic Week in Brexit Politics, Here's What You Need to Know
2. Atlanta City Pensions Stuck in Lackluster Investment
3. Considerations for Institutional Investors Around Divestment

F. Future Agenda Items

1. TSRS Rules and Regulations
2. Consideration to Hire External Legal Counsel
3. Internal Audit Update

G. Adjournment

Adjourned 10:59 AM

Mark Rubin
Chairman of the Board

Date

Art Cuaron
Pension & Benefits Administrator

Date

March 31, 2019



Tucson Supplemental Retirement System

**Investment Measurement Service
Monthly Review**

Information contained herein includes confidential, trade secret and proprietary information. Neither this Report nor any specific information contained herein is to be used other than by the intended recipient for its intended purpose or disseminated to any other person without Callan's permission. Certain information herein has been compiled by Callan and is based on information provided by a variety of sources believed to be reliable for which Callan has not necessarily verified the accuracy or completeness of or updated. This content may consist of statements of opinion, which are made as of the date they are expressed and are not statements of fact. This content is for informational purposes only and should not be construed as legal or tax advice on any matter. Any decision you make on the basis of this content is your sole responsibility. You should consult with legal and tax advisers before applying any of this information to your particular situation. Past performance is no guarantee of future results. For further information, please see Appendix for Important Information and Disclosures.

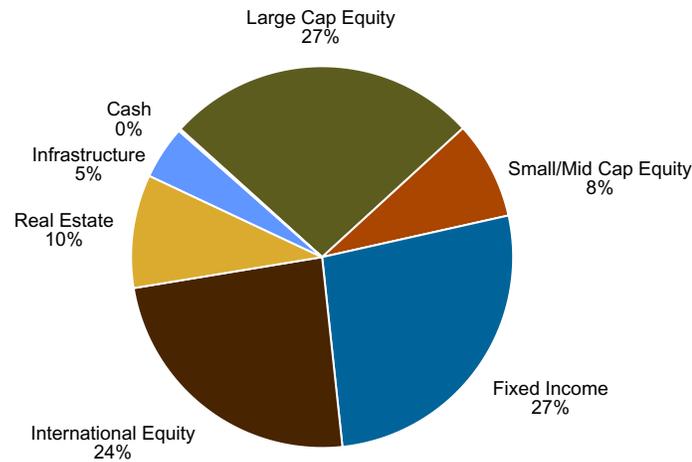
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March 31, 2019

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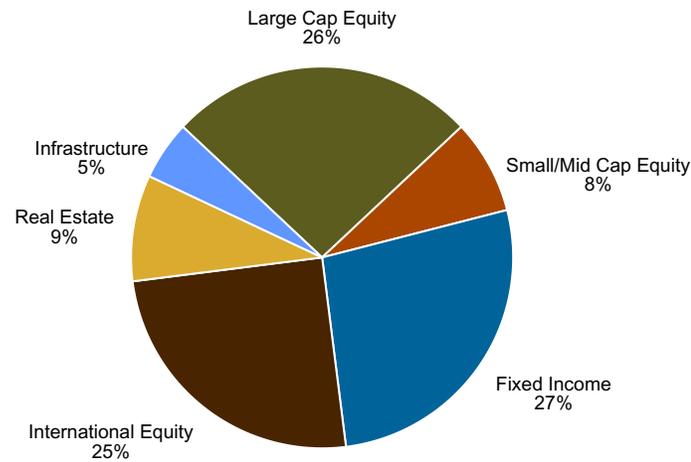
Actual vs Target Asset Allocation

The first chart below shows the Fund's asset allocation as of March 31, 2019. The second chart shows the Fund's target asset allocation as outlined in the investment policy statement.

Actual Asset Allocation



Target Asset Allocation



Asset Class	\$000s Actual	Percent Actual	Percent Target	Percent Difference	\$000s Difference
Large Cap Equity	216,750	26.5%	26.0%	0.5%	4,204
Small/Mid Cap Equity	67,620	8.3%	8.0%	0.3%	2,222
Fixed Income	218,942	26.8%	27.0%	(0.2%)	(1,779)
International Equity	196,703	24.1%	25.0%	(0.9%)	(7,668)
Real Estate	78,720	9.6%	9.0%	0.6%	5,147
Infrastructure	37,149	4.5%	5.0%	(0.5%)	(3,725)
Cash	1,600	0.2%	0.0%	0.2%	1,600
Total	817,485	100.0%	100.0%		

*Current Month Target Performance is calculated using monthly rebalancing.

Investment Manager Asset Allocation

The table below contrasts the distribution of assets across the Fund's investment managers as of March 31, 2019, with the distribution as of February 28, 2019. The change in asset distribution is broken down into the dollar change due to Net New Investment and the dollar change due to Investment Return.

Asset Distribution Across Investment Managers

	March 31, 2019		Net New Inv.	Inv. Return	February 28, 2019	
	Market Value	Weight			Market Value	Weight
Domestic Equity	\$284,370,532	34.79%	\$(4,003,497)	\$3,095,340	\$285,278,689	35.08%
Large Cap Equity	\$216,750,211	26.51%	\$(2,007,165)	\$3,007,769	\$215,749,607	26.53%
Alliance S&P Index	66,510,483	8.14%	(1,007,348)	1,285,783	66,232,048	8.14%
PIMCO StocksPLUS	32,659,714	4.00%	0	684,907	31,974,807	3.93%
BlackRock Russell 1000 Value	58,191,915	7.12%	(1,000,000)	379,095	58,812,820	7.23%
T. Rowe Price Large Cap Growth	59,388,098	7.26%	182	657,983	58,729,933	7.22%
Small/Mid Cap Equity	\$67,620,321	8.27%	\$(1,996,331)	\$87,571	\$69,529,081	8.55%
Champlain Mid Cap	34,171,844	4.18%	(999,500)	324,000	34,847,344	4.28%
Pyramis Small Cap	33,448,477	4.09%	(996,831)	(236,428)	34,681,737	4.26%
International Equity	\$196,702,897	24.06%	\$(132,685)	\$1,484,259	\$195,351,323	24.02%
Causeway International Opps	77,508,038	9.48%	119	(610,617)	78,118,536	9.61%
Aberdeen EAFE Plus	81,017,550	9.91%	(132,804)	1,878,435	79,271,919	9.75%
American Century Non-US SC	38,177,310	4.67%	0	216,442	37,960,868	4.67%
Fixed Income	\$218,941,579	26.78%	\$198	\$3,933,624	\$215,007,757	26.44%
BlackRock U.S. Debt Fund	108,379,621	13.26%	0	2,051,977	106,327,644	13.07%
PIMCO Fixed Income	110,561,958	13.52%	198	1,881,647	108,680,113	13.36%
Real Estate	\$78,720,322	9.63%	\$0	\$(59,960)	\$78,780,282	9.69%
JPM Strategic Property Fund	52,832,388	6.46%	0	(59,960)	52,892,348	6.50%
JPM Income and Growth Fund	25,887,933	3.17%	0	0	25,887,933	3.18%
Infrastructure	\$37,149,091	4.54%	\$0	\$(130,240)	\$37,279,331	4.58%
Macquarie European	9,228,435	1.13%	0	(130,240)	9,358,675	1.15%
SteelRiver Infrastructure	27,920,656	3.42%	0	0	27,920,656	3.43%
Total Cash	\$1,600,366	0.20%	\$(27)	\$3,285	\$1,597,109	0.20%
Cash	1,600,366	0.20%	(27)	3,285	1,597,109	0.20%
Total Fund	\$817,484,788	100.0%	\$(4,136,010)	\$8,326,308	\$813,294,490	100.0%

Investment Manager Returns

The table below details the rates of return for the fund's investment managers over various time periods ended March 31, 2019. Negative returns are shown in red, positive returns in black. Returns for one year or greater are annualized. The first set of returns for each asset class represents the composite returns for all the fund's accounts for that asset class.

Returns for Periods Ended March 31, 2019

	Last Month	Quarter to Date	Last 12 Months	Last 36 Months	Last 60 Months
Gross of Fees					
Domestic Equity	1.09%	14.45%	10.26%	15.56%	11.53%
Total Domestic Equity Target (1)	1.28%	14.19%	8.32%	13.31%	10.24%
Large Cap Equity	1.39%	13.61%	9.88%	15.16%	11.38%
S&P 500 Index	1.94%	13.65%	9.50%	13.51%	10.91%
Alliance S&P Index	1.93%	13.61%	9.50%	13.43%	10.87%
S&P 500 Index	1.94%	13.65%	9.50%	13.51%	10.91%
PIMCO StocksPLUS	2.14%	14.44%	9.22%	13.97%	10.85%
S&P 500 Index	1.94%	13.65%	9.50%	13.51%	10.91%
BlackRock Russell 1000 Value	0.65%	11.97%	5.85%	10.48%	7.81%
Russell 1000 Value Index	0.64%	11.93%	5.67%	10.45%	7.72%
T. Rowe Price Large Cap Growth	1.12%	14.76%	14.71%	22.44%	15.71%
Russell 1000 Growth Index	2.85%	16.10%	12.75%	16.53%	13.50%
Small/Mid Cap Equity	0.15%	17.20%	11.59%	16.90%	12.02%
Russell 2500 Index	(0.82%)	15.82%	4.48%	12.56%	7.79%
Champlain Mid Cap	0.96%	16.89%	16.91%	20.25%	14.54%
Russell MidCap Index	0.86%	16.54%	6.47%	11.82%	8.81%
Pyramis Small Cap	(0.67%)	17.52%	5.81%	13.25%	9.26%
Russell 2000 Index	(2.09%)	14.58%	2.05%	12.92%	7.05%
International Equity	0.78%	11.30%	(7.09%)	8.49%	2.07%
Total International Equity Target (2)	0.54%	10.31%	(4.96%)	7.93%	2.48%
Causeway International Opps	(0.78%)	10.87%	(7.59%)	8.15%	2.33%
MSCI ACWI ex US	0.60%	10.31%	(4.21%)	8.09%	2.57%
Aberdeen EAFE Plus	2.37%	10.77%	(2.88%)	8.21%	1.30%
MSCI ACWI x US (Net)	0.60%	10.31%	(4.21%)	8.09%	2.57%
American Century Non-US SC	0.65%	13.52%	(13.36%)	-	-
MSCI ACWI ex US Small Cap	0.15%	10.26%	(9.48%)	7.01%	3.26%
Fixed Income	1.83%	4.33%	5.25%	4.83%	4.19%
Bimbg Aggregate Index	1.92%	2.94%	4.48%	2.03%	2.74%
BlackRock U.S. Debt Fund	1.93%	2.99%	4.60%	2.13%	2.87%
Bimbg Aggregate Index	1.92%	2.94%	4.48%	2.03%	2.74%
PIMCO Fixed Income	1.73%	5.63%	5.89%	6.85%	5.21%
Custom Index (3)	1.55%	5.10%	4.61%	4.06%	3.99%

(1) The Total Domestic Equity target is currently composed of 76% S&P 500 and 24% Russell 2500 Index.

(2) The Total International Equity Target reflects the MSCI ACWI ex-US (Net Div) through May 2016 and the MSCI ACWI ex-US IMI (Net Div) thereafter.

(3) The PIMCO custom index is composed of 25% Barclays Mortgage, 25% Barclays Credit, 25% Barclays High Yield, and 25% JP Morgan EMBI Global. Previously the index was composed of 70% Barclays Mortgage, 15% Barclays Credit, and 15% Barclays High Yield.

Investment Manager Returns

The table below details the rates of return for the fund's investment managers over various time periods ended March 31, 2019. Negative returns are shown in red, positive returns in black. Returns for one year or greater are annualized. The first set of returns for each asset class represents the composite returns for all the fund's accounts for that asset class.

Returns for Periods Ended March 31, 2019

	Last Month	Quarter to Date	Last 12 Months	Last 36 Months	Last 60 Months
Gross of Fees					
Real Estate	(0.08%)	0.14%	5.13%	6.97%	9.31%
NFI-ODCE Value Weight Gr*	0.58%	1.76%	7.88%	8.09%	10.25%
JPM Strategic Property Fund	(0.11%)	0.20%	5.55%	7.13%	9.40%
JPM Income and Growth Fund**	0.00%	0.00%	4.30%	6.61%	9.21%
NFI-ODCE Value Weight Gr*	0.58%	1.76%	7.88%	8.09%	10.25%
Infrastructure	(0.35%)	(0.40%)	6.85%	14.47%	10.99%
CPI + 4%	0.94%	2.17%	5.77%	6.19%	5.28%
Macquarie European Infrastructure Fund	(1.39%)	(1.59%)	3.79%	26.59%	14.23%
SteelRiver Infrastructure North Amer.**	0.00%	0.00%	7.96%	6.03%	9.79%
CPI + 4%	0.94%	2.17%	5.77%	6.19%	5.28%
Total Fund	1.03%	8.65%	3.83%	10.13%	7.63%
Total Fund Target	1.19%	8.42%	4.01%	8.14%	6.58%

* Current Month Target = 27.0% Blmbg Aggregate, 26.0% S&P 500 Index, 25.0% MSCI ACWI ex US IMI, 9.0% NCREIF NFI-ODCE Val Wt Gr, 8.0% Russell 2500 Index and 5.0% CPI-W+4.0%.

*The NFI-ODCE Value Weight benchmark current quarter return is preliminary.

**SteelRiver Infrastructure and JPM I&G performance reflect prior month's market values as current data is not yet available.

Investment Manager Returns

The table below details the rates of return for the fund's investment managers over various time periods ended March 31, 2019. Negative returns are shown in red, positive returns in black. Returns for one year or greater are annualized. The first set of returns for each asset class represents the composite returns for all the fund's accounts for that asset class.

Returns for Periods Ended March 31, 2019

	Last Month	Quarter to Date	Last 12 Months	Last 36 Months	Last 60 Months
Net of Fees					
Domestic Equity	1.09%	14.44%	10.00%	15.23%	11.22%
Total Domestic Equity Target (1)	1.28%	14.19%	8.32%	13.31%	10.24%
Large Cap Equity	1.39%	13.60%	9.74%	15.01%	11.23%
S&P 500 Index	1.94%	13.65%	9.50%	13.51%	10.91%
Alliance S&P Index	1.93%	13.61%	9.47%	13.39%	10.83%
S&P 500 Index	1.94%	13.65%	9.50%	13.51%	10.91%
PIMCO StocksPLUS	2.14%	14.44%	9.22%	13.97%	10.85%
S&P 500 Index	1.94%	13.65%	9.50%	13.51%	10.91%
BlackRock Russell 1000 Value	0.65%	11.96%	5.82%	10.44%	7.77%
Russell 1000 Value Index	0.64%	11.93%	5.67%	10.45%	7.72%
T. Rowe Price Large Cap Growth	1.12%	14.76%	14.26%	21.92%	15.22%
Russell 1000 Growth Index	2.85%	16.10%	12.75%	16.53%	13.50%
Small/Mid Cap Equity	0.15%	17.20%	10.92%	16.02%	11.18%
Russell 2500 Index	(0.82%)	15.82%	4.48%	12.56%	7.79%
Champlain Mid Cap	0.96%	16.89%	16.17%	19.30%	13.60%
Russell MidCap Index	0.86%	16.54%	6.47%	11.82%	8.81%
Pyramis Small Cap	(0.67%)	17.52%	5.21%	12.43%	8.51%
Russell 2000 Index	(2.09%)	14.58%	2.05%	12.92%	7.05%
International Equity	0.69%	11.21%	(7.41%)	8.03%	1.51%
Total International Equity Target (2)	0.54%	10.31%	(4.96%)	7.93%	2.48%
Causeway International Opps	(0.78%)	10.87%	(7.85%)	7.73%	1.82%
MSCI ACWI ex US	0.60%	10.31%	(4.21%)	8.09%	2.57%
Aberdeen EAFE Plus	2.20%	10.59%	(3.37%)	7.55%	0.60%
MSCI ACWI x US (Net)	0.60%	10.31%	(4.21%)	8.09%	2.57%
American Century Non-US SC	0.57%	13.27%	(14.19%)	-	-
MSCI ACWI ex US Small Cap	0.15%	10.26%	(9.48%)	7.01%	3.26%
Fixed Income	1.83%	4.33%	5.05%	4.56%	3.89%
Bimbg Aggregate Index	1.92%	2.94%	4.48%	2.03%	2.74%
BlackRock U.S. Debt Fund	1.93%	2.99%	4.58%	2.09%	2.82%
Bimbg Aggregate Index	1.92%	2.94%	4.48%	2.03%	2.74%
PIMCO Fixed Income	1.73%	5.63%	5.51%	6.38%	4.72%
Custom Index (3)	1.55%	5.10%	4.61%	4.06%	3.99%

(1) The Total Domestic Equity target is currently composed of 76% S&P 500 and 24% Russell 2500 Index.

(2) The Total International Equity Target reflects the MSCI ACWI ex-US (Net Div) through May 2016 and the MSCI ACWI ex-US IMI (Net Div) thereafter.

(3) The PIMCO custom index is currently composed of 25% Barclays Mortgage, 25% Barclays Credit, 25% Barclays High Yield, and 25% JP Morgan EMBI Global. Prior to 2/1/2012, the custom index was composed of 70% Barclays Mortgage, 15% Barclays Credit, and 15% Barclays High Yield.

Investment Manager Returns

The table below details the rates of return for the fund's investment managers over various time periods ended March 31, 2019. Negative returns are shown in red, positive returns in black. Returns for one year or greater are annualized. The first set of returns for each asset class represents the composite returns for all the fund's accounts for that asset class.

Returns for Periods Ended March 31, 2019

	Last Month	Quarter to Date	Last 12 Months	Last 36 Months	Last 60 Months
Net of Fees					
Real Estate	(0.08%)	0.14%	4.34%	6.00%	8.26%
NFI-ODCE Value Weight Gr*	0.58%	1.76%	7.88%	8.09%	10.25%
JPM Strategic Property Fund	(0.11%)	0.20%	4.77%	6.14%	8.37%
JPM Income and Growth Fund**	0.00%	0.00%	3.48%	5.64%	8.08%
NFI-ODCE Value Weight Gr*	0.58%	1.76%	7.88%	8.09%	10.25%
Infrastructure	(0.35%)	(0.45%)	6.03%	10.13%	8.03%
CPI + 4%	0.94%	2.17%	5.77%	6.19%	5.28%
Macquarie European Infrastructure Fund	(1.39%)	(1.81%)	1.68%	15.94%	8.02%
SteelRiver Infrastructure North Amer.**	0.00%	0.00%	7.63%	5.62%	9.05%
CPI + 4%	0.94%	2.17%	5.77%	6.19%	5.28%
Total Fund	1.01%	8.57%	3.45%	9.47%	7.06%
Total Fund Target	1.19%	8.42%	4.01%	8.14%	6.58%

* Current Month Target = 27.0% Blmbg Aggregate, 26.0% S&P 500 Index, 25.0% MSCI ACWI ex US IMI, 9.0% NCREIF NFI-ODCE Val Wt Gr, 8.0% Russell 2500 Index and 5.0% CPI-W+4.0%.

*The NFI-ODCE Value Weight benchmark current quarter return is preliminary.

**SteelRiver Infrastructure and JPM I&G performance reflect prior month's market values as current data is not yet available.



MEMORANDUM

DATE: April 19, 2019

TO: The Board of Trustees
Tucson Supplemental Retirement System

FROM: Art Cuaron
Pension & Benefits Administrator

SUBJECT: Ratification Report Revision

I am seeking Board direction on the proposal to adopt the attached revision to the ratification report.

As staff continues to evaluate internal operations for improved efficiency, we have made a modification to the ratification report for your review and approval. The new streamlined version will offer the following benefits to the Board, staff and general public:

1. Staff will sign and date the report in order to improve accountability.
2. Remove the department from which a member is retiring, as this information would not cause an application to be denied.
3. Remove the date of birth in order to reduce the exposure of personal information.
4. Remove the actuarial determination of present value since the information is inconsistent, depending on whether the calculation is final or estimated.
5. Remove the member's accumulated contributions in order to reduce the exposure of personal information about a member's finances.

The intent of the new version is to offer enhanced readability without sacrificing the necessary information for the Board to make an informed decision regarding a person's qualifications for retirement. As presented, the new report provides the level of detail required for the Board to approve a member's retirement application.

Should the Board decide to adopt the new format; staff will begin using it with the May Board meeting. I have attached a draft of the April ratification report for your review and comparison to the standard report. Staff looks forward to your review and feedback on the new format.

Attachments: Standard Ratification Report – April
Proposed Ratification Report – April



MEMORANDUM

DATE: April 18, 2019

TO: The Board of Trustees
Tucson Supplemental Retirement System

FROM: Art Cuaron 
Pension & Benefits Administrator

SUBJECT: 2019 Disability Audit

This memo is for informational purposes only. No Board action is required at this time.

TSRS Code 22-39(e) and 22-39(f)(1) requires that retirees collecting a disability benefit must annually submit documentation substantiating their disability payment. The retirement office mailed letters to 31 disability retirees on April 15th requesting earned income information from calendar 2018. Retirees have until May 31st to submit all relevant information.

Staff will review the documentation and the Board will be updated of any issues or concerns during the June meeting.



MEMORANDUM

DATE: April 19, 2019

TO: Tucson Supplemental Retirement System Board of Trustees **FROM:** Aaron Williams, CPA,
Principal Internal Auditor
City of Tucson

SUBJECT: Follow-Up Report - Fraud Prevention Mechanisms in the Pension Division

PURPOSE:

Internal Audit received a request from the Tucson Supplemental Retirement System Board of Trustees (Board) to review the implementation and performance of the Pension Division's management action plan related to Internal Audit's original observations and recommendations as detailed in the original memo and Addendum #1 to the Board dated July 25, 2018 and August 23, 2018, respectively (**Attachment 1**).

OBJECTIVE:

The objective of the review was to determine if the Pension Division's proposed action plans are in place and addressing fraud prevention mechanisms and segregation of duties related to:

- A. Wire/Fund Transfer and Authorization Process
- B. Benefit Payment Process
- C. Member Data Management

CONCLUSIONS:

- 1) The procedures for processing transfers out of the BNY Mellon investment and liquidity accounts were partially updated, but lack adequate controls to mitigate risk to an acceptable level.
- 2) Management discussed the need for a reconciliation process with Accounting, but bank statement reconciliation, including verification of transfers and transactions, is not in place for BNY Mellon investment and liquidity accounts.
- 3) Management has partially implemented their action plan for rollover payments but has not done so for recurring and refund payments.
- 4) Management is reviewing Payment Authorization Packets, but has not established sufficient electronic system verification processes.

SCOPE AND METHODOLOGY:

The scope of the review included the fund transfer, benefit payment, and member data input and maintenance areas. These areas were reviewed to determine if management action plans are in place and addressing the Internal Audit conclusions as described in **Attachment 1**. Samples and tests covered the period of January to April 2019. The objectives of this review were addressed in the following procedures:

- 1) Review wire transfer request memos, payment details and receipt documentation.
- 2) Review client authorization forms and signature cards for BNY Mellon and various investment manager accounts.
- 3) Review member payment calculation, verification and disbursement packets.
- 4) Interviews of BNY Mellon Asset Servicing staff were conducted to gain an understanding of wire transfer process, selected authorization level and disbursement restrictions.
- 5) In order to compare processes to industry standards and best practices, the following publications were reviewed:
 - AICPA Employee Benefit Plan Audit Quality Center's DOL Criminal Enforcement Cases October 2014 – November 2018
 - AICPA Employee Benefit Plan Audit Quality Center's Internal Control Advisory
 - Evaluating Internal Controls - Government Finance Officers Association
- 6) Interviews of City of Tucson staff in the following divisions were conducted to gain an understanding of current business practices:
 - Pension and Benefits
 - Human Resources Operations
 - Enterprise Resource Planning
 - Financial Reporting
 - Accounts Payable
 - Risk Management
 - Treasury

MANAGEMENT RESPONSE AND ACTION PLAN:

A Management Action Plan will be provided within 15 days for each recommendation, beginning on page four (4), and will be included as an addendum to this memo. The Management Action Plans are corrective actions with implementation dates developed by management staff of the Pension Division and Human Resources Department.

BACKGROUND:

TSRS is a single-employer defined benefit plan for the City of Tucson employees. It was established in the City Charter to provide its members with a supplement to the retirement and disability benefits of the social security system. TSRS does not cover commissioned police and fire personnel, and elected officials, who are covered under other plans. TSRS also does not cover appointed officials and staff who elect not to join. Employees are able to participate in TSRS immediately upon beginning employment with the City.

Total plan membership as of June 30, 2018 was 5,888. This was comprised of 3,031 retirees and beneficiaries, 2,455 active participants, 312 inactive members (non-retired, vested members no longer employed) and 90 non-vested members.

Total net position of the plan as of June 30, 2018 was \$823,633,518. For fiscal year 2018, combined employer/employee contributions were \$40,356,944 and retirement benefit payments were \$72,445,792.

OBSERVATIONS AND RECOMMENDATIONS:

- I. **Objective A:** Review the management action plan related to wire transfer and authorization process including segregation of duties and fraud prevention mechanisms.

Conclusion #1: The procedures for processing transfers out of the BNY Mellon investment and liquidity accounts were partially updated, but lack adequate controls to mitigate risk to an acceptable level.

Original Recommendations:

- a) Enact restrictions with BNY Mellon allowing authorized transfers to only deposit into a pre-designated account. This can be accomplished on BNY Mellon's signature card under 'Asset Transfer and Investments – Other Restrictions' section, with the specific restriction being applied to transfers to an outside entity.
- b) After transfer request is sent, Pension Administrative Assistant provides notice of pending deposit to Treasury. Once deposit is processed, Treasury provides receipt copy to Pension. This allows Treasury to track deposit status and Pension to track general ledger classification.

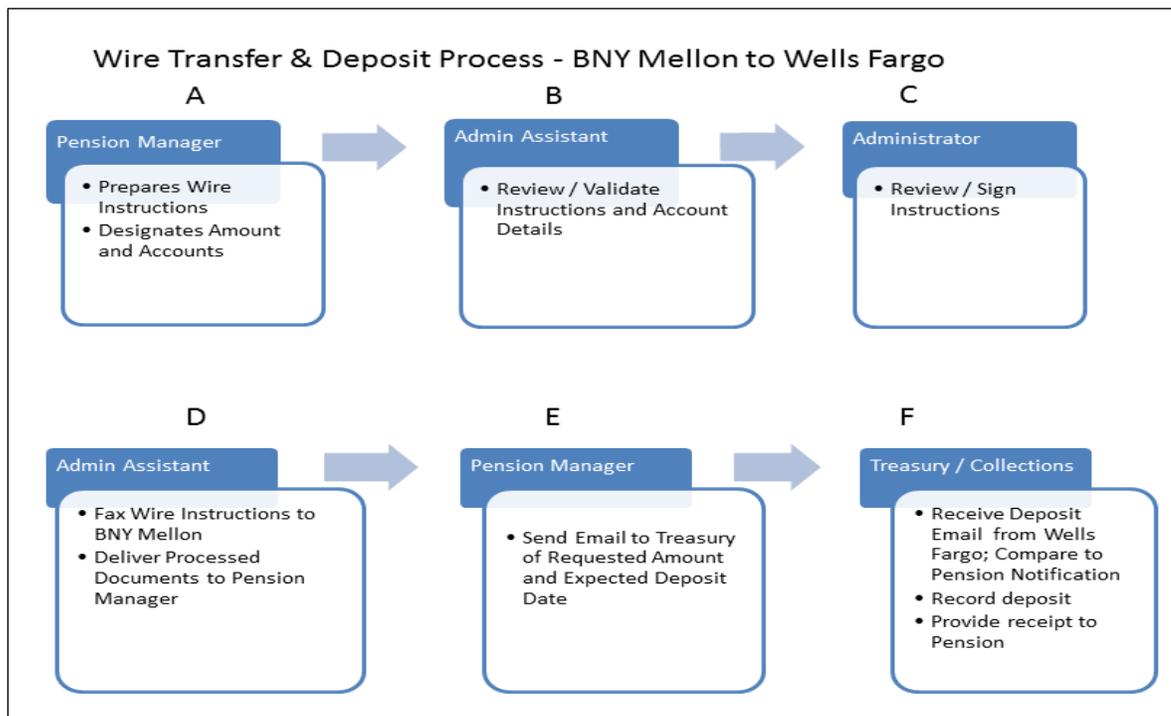
Original Management Response and Action Plan:

TSRS will adopt recommendations A and B as presented above. The implementation of the new process will be complete on or before August 31, 2018.

Observation: Management did not adopt recommendation A due to BNY Mellon's response that any designated account restrictions, once established, could be changed by a single authorized signer under the City's current authorization set up. BNY Mellon does allow for different levels of required authorization depending on transfer/transaction type; online authorization is also available.

Management did update the process related to wire requests to add additional review and notification steps as noted in original recommendation B. This process is displayed in **Figure 1**.

Figure 1 – Current Transfer and Deposit Process

**Recommendations:**

- A. Update BNY Mellon authorization to dual signature in order to ensure a sole individual cannot transfer funds out of the investment and liquidity accounts.
- B. Automate the wire and transfer process through BNY Mellon's online system. Require dual authorization; one initiator, one approver. Utilize enhanced security options and 2-step verification if available from BNY Mellon.

Conclusion #2: Management discussed the need for a reconciliation process with Accounting, but bank statement reconciliation, including verification of transfers and transactions, is not in place for BNY Mellon investment and liquidity accounts.

Original Recommendations:

- a) Monthly reconciliation and review of BNY Mellon statements to the supporting transfer memos should be performed by staff not involved in the transfer and receipt process. BNY Mellon's online system includes detailed transaction reports. These reports include sections related to receipts from other banks and disbursements to other banks which should be utilized in the reconciliation and review process.
- b) Existing quarterly process should be expanded to include a detailed comparison of general ledger transactions to bank account activity in order to identify omitted transactions, transactions in process, errors and reconciling items.

Original Management Response and Action Plan:

On or before August 31, 2018, TSRS will meet with Accounting staff in Business Services to discuss the reconciliation process and the possibility of adopting the recommendations identified above. An update will be provided to the Board and the Internal Audit division based on the discussion with Accounting Services.

Observation: Management has conducted initial discussion with Accounting to convey the need for a bank reconciliation process and that it should be conducted on a timely, recurring basis. The actual form and substance of the reconciliation has not been determined. Recurring bank reconciliation is not currently in place.

Recommendation: Implement the original recommendations. Ensure the adopted process constitutes a proper reconciliation opposed to simply recording bank activity to the ledger.

II. Objective B: Review the management action plan related to the benefit payment process including fraud prevention mechanisms and segregation of duties.

Conclusion #3: Management has partially implemented their action plan for rollover payments but has not done so for recurring and refund payments.

Original Recommendations:

- a) Custody of recurring checks should be removed from the staff responsible for updating payment records. Checks can be held by Payroll Division, to be mailed upon verification performed by Pension Division staff. Pension staff can perform verification against system reports generated with payment batch before providing Payroll with authorization to mail checks.
- b) Modifications and changes to checks should be processed and documented in the main accounting system. Interviews with staff indicated a system change currently being designed to accomplish this through use of payment documents processed directly in the main accounting system that go through a system approval process and a subsequent document to adjust payroll information to reflect the payment. This change is expected to be in place August 2018.

Custody of refund/rollover payments should follow the recommendation for recurring payments.

Original Management Response and Action Plan:

With respect to recommendation A, above, TSRS will meet with Payroll and implement as prescribed above by 8/31/18.

In regard to recommendation B, and as noted above, the City's ERP is undergoing a massive version upgrade. The upgrade will bring enhancements that will enable TSRS to

implement recommendation B above. This will eliminate the current process and provide for enhanced internal controls. The ERP upgrade is expected to go-live beginning August 1st. As of the date of this report, TSRS has had meetings with systems staff to discuss the enhancements and future functionality but testing has not yet begun. Staff will provide an update to the Board and Internal Audit as the time line for testing and go-live become clear.

Observations: Management has made changes to the creation and custody of rollover payments that does address the original concerns of instituting electronic system approvals and segregations of duties. This was accomplished through use of the financial system to establish specific vendors for rollover payments and then processing a General Department Accounting Expense (GAD) payment document through the financial system which goes through a multi-step electronic approval process before final payment occurs. The checks or electronic fund transfer statements produced by this process are printed and mailed by the Accounting Services Division, which is separate from Pension.

The GAD document allows for supporting documentation to be attached to the electronic document. This allows for easier review, research and preservation of why a payment was processed. Pension staff is attaching a summary sheet prepared by Pension staff to the GAD document, keeping the member-signed election form and other supporting documentation in a physical file.

Management has not implemented changes to the custody of printed checks related to recurring payments and refunds mentioned in original recommendation A and B.

Recommendations:

- A. Implement the original recommendations for the custody of recurring and refund payments. The underlying control activity to be established is to remove custody of the checks from the individual(s) that initiated, authorized and recorded the transactions. A specific individual(s) should be assigned custody responsibilities. Physical storage should be a secured location with limited, documented access.
- B. Attach the signed member election form to the electronic supporting documentation on GAD documents. This documents the original request and the reason a payment is needed. The availability of the election form also allows the reviewer to ensure accuracy and completeness of the transaction to the original document. Any sensitive personal information on the election form must be redacted before being scanned into the financial system.

III. Objective C: Review the management action plan related to member data management including fraud prevention mechanisms and segregation of duties.

Conclusion #4: Management is reviewing Payment Authorization Packets, but has not established sufficient electronic system verification processes.

Original Recommendations:

- a) Changes to member information, especially bank account / direct deposit information, should be verified by someone other than the person updating information. Verification should occur before payments are processed. This verification can be automated to provide a documented audit trail of changes to member data and approval of those changes. The existing accounting system allows for the generated documents to go through an electronic approval process before final submission, this tool should be utilized.
- b) The Pension Administrator should utilize the existing review and internal control checklist on a consistent basis. In the event of position vacancies, a suitable backup should be designated to perform verifications.

Original Management Response and Action Plan:

TSRS staff will explore the possibility of adopting recommendation A as described above. A meeting has been requested with Systems and Payroll (7/17) to determine what needs to be done to implement document workflow in HRM/Advantage and how any change to the existing process would impact the timing of the Payroll pension check run. We will also examine how this change would impact the TSRS ability to service our active and retired membership. We anticipate final resolution of the feasibility to implement recommendation A to be complete by August 31, 2018.

With regard to recommendation B, staff will revise the current verification checklist and corresponding procedures to include random periodic verifications of the Payment Authorization Packets including the calculations used to determine payment amounts.

Observations: When Pension updates information in the human resources system many different types of system documents are produced based on the type of information that is input or changed. Some of these documents only impact employee data while some of these documents result in the generation of payments. These documents include: One-Time Payment (OTPAY), One-Time Deduction (OTDED), Net Pay Distribution (NPD), Employee Tax Parameters (TAX), Employee Status Maintenance (ESMT), Department Specific Data (DEPTD), Employee Accounting Data (DEPTA), Miscellaneous Deductions (MISC), and External Adjustments (EADJ). All of these documents are able to utilize an electronic workflow approval process within the human resources system. Of the nine documents listed only one, EADJ, was found to be set up for workflow approval.

A sample of 29 Payment Authorization Packets, selected from January 2019 through March 2019, were found to have 8 verification omissions, all occurring in January 2019. Beginning in February 2019, Pension assigned review responsibilities to specific staff members.

Recommendation: Implement original recommendation A by establishing system workflow for the system documents created by Pension.

ATTACHMENT - 1



MEMORANDUM

DATE: July 25, 2018

TO: Tucson Supplemental Retirement System
Board of Trustees

FROM: 
Joyce Garland,
Chief Financial Officer
Assistant City Manager

SUBJECT: Fraud Prevention Mechanisms in Pension Division

PURPOSE:

Internal Audit received a request from the Tucson Supplemental Retirement System Board of Trustees (Board) to review fraud prevention mechanisms in the Pension Division and note any combination of factors which might indicate deficient internal controls.

OBJECTIVE:

The objective of the review was to determine if fraud prevention mechanisms and segregation of duties are in place for:

- A. Wire/Fund Transfer and Authorization Process
- B. Benefit Payment Process
- C. Member Data Management

CONCLUSIONS:

- 1) The processing of transfers out of the BNY Mellon investment and liquidity accounts lacks review, segregation of duties and adequate controls to mitigate risk to an acceptable level.
- 2) Bank statement reconciliation duties, including verification of transfers and transactions, are not in place for BNY Mellon investment and liquidity accounts.
- 3) The benefit payment process lacks segregation of duties and includes high risk practices.
- 4) Changes to member data lacks segregation of duties and review processes.

SCOPE AND METHODOLOGY:

The scope of the review included the fund transfer, benefit payment and member data input/maintenance areas. Within these areas, control cycles, potential risks and compensating controls were identified; processes were sampled, tested and reviewed to determine if controls are in place and operating as designed. Samples and tests covered October 2016 to June 2018. The objectives of this review were addressed in the following procedures:

- 1) Review wire transfer request memos, payment details and receipt documentation.
- 2) Review client authorization forms and signature cards for BNY Mellon and various investment manager accounts.
- 3) Review of quarterly bank statement transaction recording process.

- 4) Review member payment calculation, verification and disbursement packets.
- 5) Review of payroll transfer and payment process related to the Tucson Supplemental Retirement System (TSRS) member payments.
- 6) Review of City of Tucson – Finance Department documented policy and standard operating procedures related to normal retirement calculations.
- 7) Interviews of BNY Mellon Asset Servicing staff were conducted to gain an understanding of wire transfer process, selected authorization level and disbursement restrictions.
- 8) In order to compare processes to industry standards and best practices, the following publications were reviewed:
 - AICPA Employee Benefit Plan Audit Quality Center’s Internal Control Advisory
 - Evaluating Internal Controls - Government Finance Officers Association
- 9) Interviews of City of Tucson Business Services staff in the following divisions were conducted to gain an understanding of current business practices:
 - Pension and Benefits
 - Human Resources Operations
 - Enterprise Resource Planning
 - Financial Reporting
 - Treasury

MANAGEMENT RESPONSE AND ACTION PLAN:

A Management Action Plan is provided for each recommendation, beginning on page four (4). The Management Action Plans are corrective actions with implementation dates developed by management staff of the Pension Division and Human Resources Department.

BACKGROUND:

TSRS is a single-employer defined benefit plan for the City of Tucson employees. It was established in the City Charter to provide its members with a supplement to the retirement and disability benefits of the social security system. TSRS does not cover commissioned police and fire personnel, and elected officials, who are covered under other plans. TSRS also does not cover appointed officials and staff who elect not to join. Employees are able to participate in TSRS immediately upon beginning employment with the City.

Total membership as of June 30, 2017 was 5,880. This was comprised of 2,974 retirees and beneficiaries, 2,526 active participants, 313 inactive members (non-retired, vested members no longer employed) and 67 non-vested members.

Total net position of the plan as of June 30, 2017 was \$789,942,937. For fiscal year 2017, combined employer/employee contributions were \$39,262,759 and retirement benefit payments were \$71,059,090.

As of the date of this memo, the Pension Division is part of the Human Resources Department, but for the majority of the time period covered in this review, the Pension Division was part of the Finance Department.

OBSERVATIONS AND RECOMMENDATIONS:

- I. **Objective A:** Review fraud prevention mechanisms and segregation of duties related to wire transfer and authorization process.

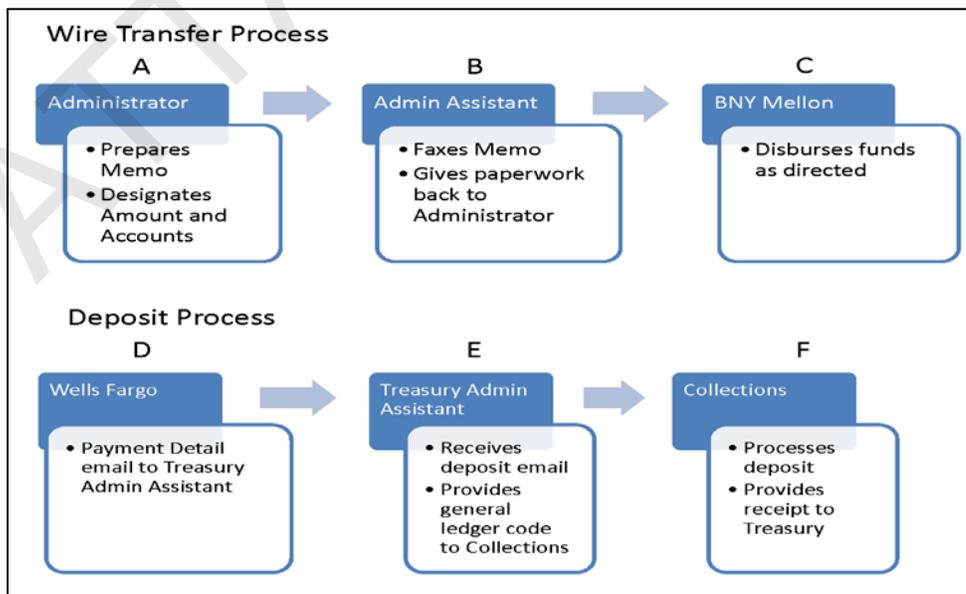
Conclusion #1: The processing of transfers out of the BNY Mellon investment and liquidity accounts lacks review, segregation of duties and adequate controls to mitigate risk to an acceptable level.

Observation: The following current practices heighten the risk of deposits being processed into non-City accounts.

- Single signature authorization of transfers out of BNY Mellon accounts without restrictions on where funds are deposited.
- Transfer requests are not reviewed or approved by anyone other than the requestor.
- Deposit bank information and account numbers are not verified by anyone other than the requestor.
- The only notification to Treasury is from Wells Fargo upon receipt of deposit.

The Pension Administrator prepares a transfer request which is sent to BNY Mellon by the Pension Administrative Assistant. The request and notice of submission are returned to the Pension Administrator. BNY Mellon completes the transfer as directed. The transfer should go from BNY Mellon to Wells Fargo. Wells Fargo sends receipt notice email to the Treasury Administrative Assistant when funds are received. The Treasury Administrative Assistant identifies the deposit using the description provided on the Wells Fargo receipt notice, and then provides the general ledger information to the Collections Division for entry into the accounting system. This process is displayed in **Figure 1**.

Figure 1 – Current Transfer and Deposit Process



Recommendations:

- a) Enact restrictions with BNY Mellon allowing authorized transfers to only deposit into a pre-designated account. This can be accomplished on BNY Mellon's signature card under 'Asset Transfer and Investments – Other Restrictions' section, with the specific restriction being applied to transfers to an outside entity. Adds control to **Figure 1 step C**.
- b) After transfer request is sent, Pension Administrative Assistant provides notice of pending deposit to Treasury. Once deposit is processed, Treasury provides receipt copy to Pension. This allows Treasury to track deposit status and Pension to track general ledger classification. Adds controls to **Figure 1 steps B & E**.

Management Response and Action Plan:

TSRS will adopt recommendations A and B as presented above. The implementation of the new process will be complete on or before August 31, 2018.

Conclusion #2: Bank statement reconciliation, including verification of transfers and transactions, are not in place for BNY Mellon investment and liquidity accounts.

Observation: Detailed bank reconciliations are not being performed. A Financial Operations Senior Financial Accountant records summarized bank transactions into the City's general ledger on a quarterly basis in order to produce quarterly financial statements. The existing process does not include reconciliation processes beyond adjusting general ledger totals to match bank statement ending summary amounts; this method is not sufficient to find errors and omissions. Also, the current process does not include review of material transactions for accuracy/validity.

Recommendations:

- a) Monthly reconciliation and review of BNY Mellon statements to the supporting transfer memos should be performed by staff not involved in the transfer and receipt process. BNY Mellon's online system includes detailed transaction reports. These reports include sections related to receipts from other banks and disbursements to other banks which should be utilized in the reconciliation and review process.
- b) Existing quarterly process should be expanded to include a detailed comparison of general ledger transactions to bank account activity in order to identify omitted transactions, transactions in process, errors and reconciling items.

Management Response and Action Plan:

On or before August 31, 2018, TSRS will meet with Accounting staff in Business Services to discuss the reconciliation process and the possibility of adopting the recommendations identified above. An update will be provided to the Board and the Internal Audit division based on the discussion with Accounting Services.

- II. Objective B:** Review fraud prevention mechanisms and segregation of duties related to the benefit payment process.

Conclusion #3: The benefit payment process lacks segregation of duties and includes high risk practices.

Observations: The same individual that updates member payment records mails the checks generated from those records. Also, check information is modified in a secondary system and used to produce duplicate check numbers with altered payees. Altered checks are disbursed and do not match the payee listed in the system of record.

Benefit payments were analyzed in two main categories; recurring and refund/rollover. Both types of payments are generated through a system batch process.

Recurring benefit payments are generated once a month. Checks are generated by Human Resources – Payroll Division based on system records maintained by Pension Management Analyst. Payroll Division accesses Automated Bank Account Transfer (ABAT) system report to obtain batch total and submits a wire transfer request to Treasury. As changes to employee information or calculated amounts are received, the Pension Management Analyst updates system records and keeps physical file folders of monthly changes. Once checks are printed, Pension Management Analyst takes custody of the checks, verifies items in the monthly change file to printed checks and then mails checks. This process is displayed in **Figure 2**.

Refund/Rollover payments are generated in supplemental payroll runs that occur every other week. Checks are generated by Human Resources – Payroll Division based on system records maintained by Pension Management Analyst. As refund and rollover requests are received by Pension, a Payment Authorization Packet is created.

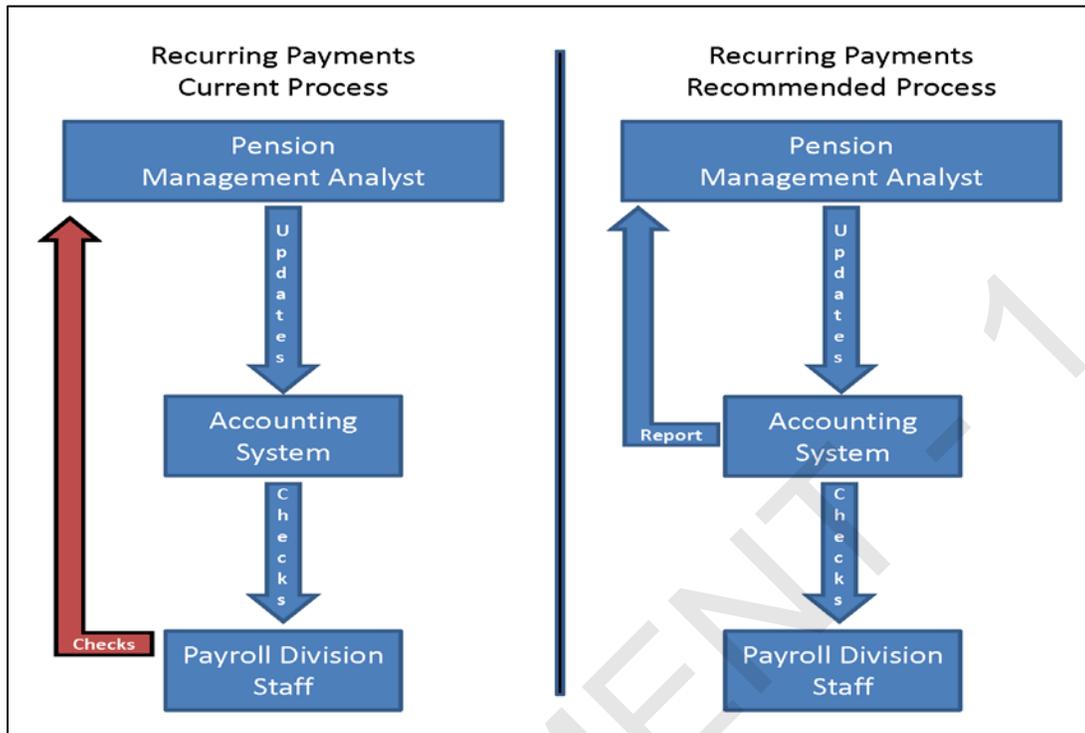
Rollover checks requested to be made payable to a financial institution are initially generated through Payroll as payable to an individual. These checks are then forwarded to Accounting Services Division - Office Assistant, who accesses a secondary system called 'Paybase' to generate a second check with identical check number and amount, but with the payee changed from the individual to the financial institution. Accounting Services then forwards financial institution check to Pension and individual check to Payroll. Payroll attaches individual check to copy of payment request and puts in file.

Pension Management Analyst takes custody of printed refund/rollover checks, verifies information against Payment Authorization Packets, mails checks and files packets.

Recommendations:

- a) Custody of recurring checks should be removed from the staff responsible for updating payment records. Checks can be held by Payroll Division, to be mailed upon verification performed by Pension Division staff. Pension staff can perform verification against system reports generated with payment batch before providing Payroll with authorization to mail checks. This is displayed in **Figure 2**.

Figure 2



- b) Modifications and changes to checks should be processed and documented in the main accounting system. Interviews with staff indicated a system change currently being designed to accomplish this through use of payment documents processed directly in the main accounting system that go through a system approval process and a subsequent document to adjust payroll information to reflect the payment. This change is expected to be in place August 2018.

Custody of refund/rollover payments should follow the recommendation for recurring payments displayed in **Figure 2**.

Management Response and Action Plan:

With respect to recommendation A, above, TSRS will meet with Payroll and implement as prescribed above by 8/31/18.

In regard to recommendation B, and as noted above, the City's ERP is undergoing a massive version upgrade. The upgrade will bring enhancements that will enable TSRS to implement recommendation B above. This will eliminate the current process and provide for enhanced internal controls. The ERP upgrade is expected to go-live beginning August 1st. As of the date of this report, TSRS has had meetings with systems staff to discuss the enhancements and future functionality but testing has not yet begun. Staff will provide an update to the Board and Internal Audit as the time line for testing and go-live become clear.

III. Objective C: Review fraud prevention mechanisms and segregation of duties related to member data management.

Conclusion #4: Changes to member data lacks segregation of duties and review processes.

Observations: A sample of 93 Payment Authorization Packets, selected from October 2016 through March 2018, were found to have 43 verification omissions. Some of these omissions coincided with staff vacancies and new staff appointments.

Changes and updates to member bank account information are entered into the accounting system by the Pension Management Analyst. These updates to the system table generate a document that becomes final submitted upon entry. Upon final submission, member records are changed. These records are picked up during system batch payment processes detailed in section II, above.

Member data and payment calculation documents are compiled by the Pension Management Analyst into Payment Authorization Packets which include a review and internal control checklist as the cover page. The checklist includes an area for the Pension Administrator to verify check amounts to calculations and system inputs.

Recommendations:

- a) Changes to member information, especially bank account / direct deposit information, should be verified by someone other than the person updating information. Verification should occur before payments are processed. This verification can be automated to provide a documented audit trail of changes to member data and approval of those changes. The existing accounting system allows for the generated documents to go through an electronic approval process before final submission, this tool should be utilized.
- b) The Pension Administrator should utilize the existing review and internal control checklist on a consistent basis. In the event of position vacancies, a suitable backup should be designated to perform verifications.

Management Response and Action Plan:

TSRS staff will explore the possibility of adopting recommendation A as described above. A meeting has been requested with Systems and Payroll (7/17) to determine what needs to be done to implement document workflow in HRM/Advantage and how any change to the existing process would impact the timing of the Payroll pension check run. We will also examine how this change would impact the TSRS ability to service our active and retired membership. We anticipate final resolution of the feasibility to implement recommendation A to be complete by August 31, 2018.

With regard to recommendation B, staff will revise the current verification checklist and corresponding procedures to include random periodic verifications of the Payment Authorization Packets including the calculations used to determine payment amounts.



MEMORANDUM

DATE: August 23, 2018

TO: Tucson Supplemental Retirement System
Board of Trustees

FROM: 
Joyce Garland,
Chief Financial Officer
Assistant City Manager

SUBJECT: Addendum #1 to Fraud Prevention Mechanisms in Pension Division
Memorandum dated 7/25/2018

PURPOSE:

Internal Audit received a request from the Tucson Supplemental Retirement System Board of Trustees (Board) to provide process details related to member requests to disburse or ‘rollover’ funds to a financial institution.

CONCLUSIONS:

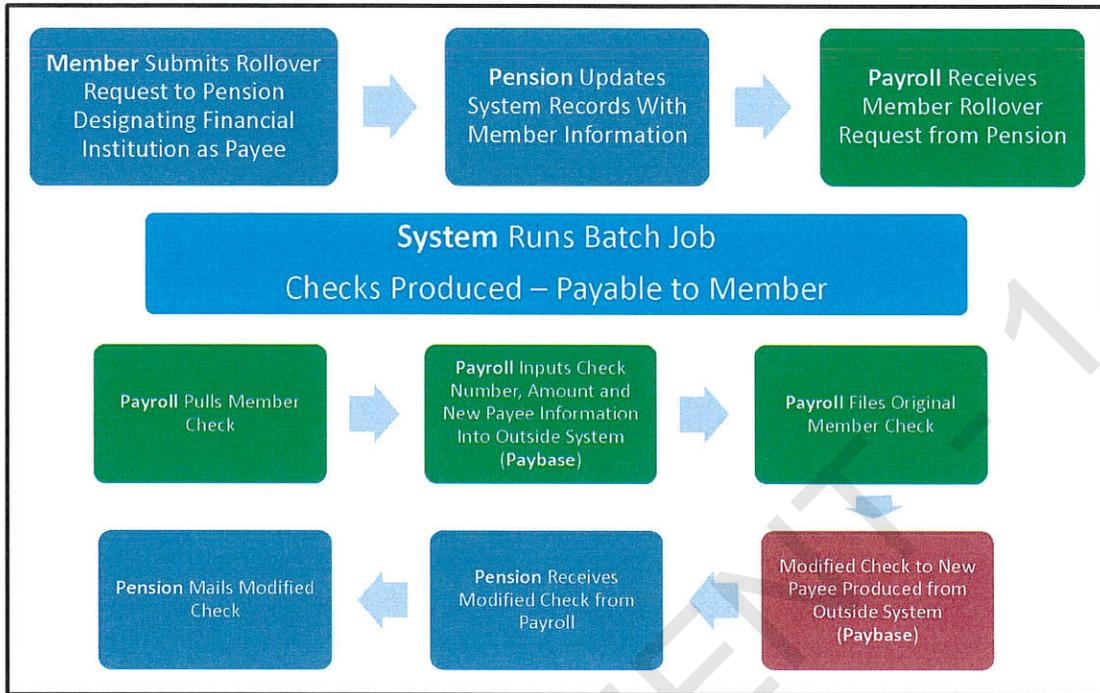
Members submit rollover requests to Pension. Pension creates a Payment Authorization Packet which is forwarded to Human Resources – Payroll Division. Checks are generated by the Payroll Division in supplemental payroll runs that occur every other week.

Rollover checks requested to be made payable to a financial institution are initially generated through Payroll as payable to the individual member. These checks are then forwarded to Accounting Services Division - Office Assistant, who accesses a secondary system called ‘Paybase’ to generate a second check with identical check number and amount, but with the payee changed from the individual member to the financial institution. Accounting Services then forwards financial institution check to Pension and individual member check to Payroll. Payroll attaches individual member check to a copy of the payment request and puts in file.

Pension Management Analyst takes custody of printed rollover checks, verifies information against Payment Authorization Packets, mails checks and files packets.

This process is displayed in **Figure 1**.

Figure 1 – Financial Institution Rollover Process



-LAST ITEM-

ATTACHEMENT

Why the longest US bull market has failed to fix the nation's public pensions

Heather Gillers 6 days ago



© Yoon S. Byun for The Wall Street Journal

Maine's public pension fund earned double-digit returns in six of the past nine years. Yet the Maine Public Employees Retirement System is still \$2.9 billion short of what it needs to afford all future benefits to all retirees.

"If the market is doing better, where's the money?" said one of these retirees, former game warden Daniel Tourtelotte.

The same pressures Maine faces are plaguing public retirement systems around the country. The pressures are coming from a slate of problems, and the longest bull market in U.S. history has failed to solve many of them.

There is a simple reason why pensions are in such rough shape: The amount owed to retirees is accelerating faster than assets on hand to pay those future obligations. Liabilities of major U.S. public pensions are up 64% since 2007 while assets are up 30%, according to the most recent data from Boston College's Center for Retirement Research.

Here is how it got that way:

Public pension funds have to pay benefits—their liabilities. They hold assets, which grow or shrink through a combination of investment gains or losses and contributions from employers and workers. Those assets generally rose faster than liabilities for five decades starting in the 1950s because government was expanding and the number of retirees was smaller.

In the 1980s and 1990s, double-digit stock and bond returns convinced governments they could afford widespread benefit increases.

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But the value of their holdings—their assets—began to fall in the aftermath of the dot-com bust in the 2000s, and the 2008 financial crisis followed soon after. State and local retirement systems lost 28% in 2008 and 2009, according to the Boston College data.

"The first thing you have to do is make up what you lost," said Sandy Matheson, executive director of the Maine Public Employees Retirement System. "And it takes years. And then you have to make up what you didn't earn on what you didn't have. It's a pretty steep climb."

Cities and states set out to ramp up their yearly contributions to public pension funds as a way of

making up for their investment losses.

Some were able to keep up with those payments. But others weren't as they struggled with lower tax revenue and increased demand for government services in the aftermath of the 2008 crisis. New Jersey made less than 15% of its recommended pension payment from 2009 through 2012. It now has a little more than one-third of the cash it needs to pay future benefits—despite robust investment returns in recent years.

State Treasurer Elizabeth Maher Muoio said New Jersey is on “the long road to addressing our unfunded liability after years of neglect.”

“Some of the states allowed themselves to get so underfunded that the higher returns aren't helping them enough,” said Michael Cembalest, chairman of market and investment strategy for the asset-management arm of JPMorgan Chase & Co. and the author of an annual study on the financial health of cities and states.

Related video: How we got to the longest bull market in history

Some states, including New York, Wisconsin, Tennessee and South Dakota managed to keep assets roughly in line with liabilities through funding discipline, benefit cuts, or both.

Many states and cities reduced benefits for new employees after 2008. But deeper cuts often met resistance from judges, unions and angry constituents—even in some of the most indebted states.

The Illinois Supreme Court in 2015 threw out cuts by the legislature that were expected to save tens of billions of dollars. Kentucky's legislature last year declined to approve the governor's proposed cuts to cost-of-living increases for retired teachers after protests brought thousands to the state capitol and forced cancellations of classes in several school districts.

Maine, which has made more progress than many plans in addressing its unfunded liability, did cut cost-of-living increases for both retired and active state workers. They earn a median pension of \$27,000 after 25 or more years' service and don't receive Social Security. But that cut shaved only \$1.6 billion off the fund's unfunded liability, which now stands at \$2.9 billion.

Demographics became another problem as baby boomers aged. The number of pensioners jumped thanks to longer lifespans and a wave of retirees over the past decade, while the number of active workers remained relatively stable.

Maine's fund serves about the same number of active workers that it did in 2008—a little more than 51,000—while the number of retirees has jumped 32% to about 45,000. Many funds are experiencing the same trend.

That pattern contributes to an increasing gap between pension fund inflows and outflows—before the funds earn a dollar on investments. Maine's pension fund paid \$982 million in benefits in 2018, \$394 million more than the contributions it took in. For a plan trying to improve its funding status, that type of gap makes it harder to recover from investment losses.

Many public pension funds have benefited from the 10-year-long bull market. But now many are lowering their predictions of what they can earn in the future. That accounting change makes their liabilities look even larger, portending more strain in the coming decades.

The Maine pension fund, which back in the early 1980s assumed a long-term investment return of 10%, now assumes a rate of 6.75%. If that rate were just 1 percentage point higher—where it was about 10 years ago—the projected \$2.9 billion shortfall, most of which must be paid off over the next decade, would drop by more than half to \$1.1 billion.

The decision to lower the rate was based on discussions with the fund's actuarial and investment consultants and a goal of keeping costs predictable, said Ms. Matheson, the system's executive director. “There's also an element of better safe than sorry.”

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Why There Is Too Much Emphasis on Recession and the Inverted Yield Curve in 2019

By Jon C. Ogg

Get ready, because the recession is coming. The only problem is that the “when that will be” probably is not as soon as many financial media reports might have you scared about. There is a misconception out there after the U.S. Treasury’s yield curve recently inverted, meaning long-term interest rates are lower than some short-term and intermediate-term rates, that means the next recession is around the corner.

Many undecided factors with unknown outcomes are going to have to play themselves out for the next formal recession to arrive. We can argue all day long about the socialist movement in America being economically damaging, or we can argue about the ongoing “soon to be, but as of yet unresolved” trade spat with China or about slower global growth rates and even Brexit for some international watchers at a more granular level. Until some more time plays out, and until the actual result of the outcome is seen, the reality is that it’s just too soon to jump the gun with formal recession timing as being imminent.

The next recession’s timing because of the current yield curve simply isn’t giving the same message as in many past instances. The 2019 inversion has been a “barely inverted” curve. Not all long-term rates went under short-term and intermediate-term ones, and those that did simply did not do it very much. There is also a backdrop in which rates in Europe and Japan are very positive again, which was not really the case in decades past.

The financial media also may have played a role in just how much this inverted yield curve really means in the big picture. The inverted yield curves of years past also came at significantly higher rates than today (I was selling CDs with close to 10% yields about 30 years ago). The St. Louis Fed also gets more specific about when [an inversion really is](#): 10-year rates being negative by greater than 0.25% compared with the one-year Treasury. It also defines negative housing starts in the mix, with a decline of at least 4% for four consecutive months.

Here are some go-to sources that are showing non-recession and warnings alike based on the most recent inversion of the yield curve.

According to a Merrill Lynch [capital markets outlook](#) on April 8, 2019, from the Macro Strategy team:

Yield-curve inversions share both common and distinct features. They always reflect tightening financial conditions and slowing nominal growth. Their recession message, however, depends a lot on the underlying long-term inflation trend. The brief inversion in late March prolonged the expansion, in our view, because it reflected falling inflation pressures.

In late March, Forbes cited expert opinion that the current inversion put the implied [recession risk at 25% to 30%](#) on a 12-month view.

The Cleveland Federal Reserve Bank’s March 28 update did show a higher percentage chance of recession out a year, but that was still just at [32.7%](#).

Goldman Sachs opined in late March that the most recent yield curve inversion is unusual and that it is [not sending the same powerful recession signal](#) it has in the past. Strategists pointed out that it's more usual to see the two-year yield break above the 10-year yield first, and strategists expect stocks to continue to move higher even as the spread between short-term and longer-term yields narrows.

BlackRock, the manager for the massive iShares exchange traded fund family, opined in March that investors have historically viewed the shape of the yield curve as a signal of future economic growth, but [the firm voiced](#): "We do not believe the current yield curve is signaling a recession, but rather that it reflects the Federal Reserve's interest rate hikes and decelerating economic growth."

A Wall Street Journal article in January warned of the yield curve inversion ahead of time and discussed that a true inversion had occurred before the past 5 recessions, but it also warned that the [data sees lower odds](#) than the yield curve.

The [CME FedWatch Tool](#) is also leaning more toward rate cuts in the future, as opposed to more rate hikes, and that means the inverted yield curve is likely to abate then or ahead of time. That FedWatch Tool most recently showed a 30.6% chance of a 25 basis point rate cut (63.7% at flat rates) for the December 2019 FOMC meeting, and the tool showed a 35.0% chance of a 25 basis point rate cut (55.2% flat chance) for the January 2020 FOMC meeting.

A last source of confidence is that Fed Chair Jerome Powell and the Federal Reserve already have given longer-term views for slower growth but no recession. Most important is that the FOMC already has signaled that it is [out of the rate hike business for 2019](#), and that might mean they figured out they were too aggressive in "buying an insurance policy" with excessive rate hikes in 2018.

One more issue to consider, which should need no sourcing, is the level of the S&P 500 Index and the Nasdaq composite index. The S&P 500 was last seen at roughly 2,905, with an all-time and recent high of 2,940.91. The Nasdaq was recently at 7,990, compared with an all-time high and recent high of 8,133.30. Stock markets can hit highs over and over in the late-cycle moves, but if stock indexes tend to discount news for one or two quarters into the future it seems unlikely that the markets are screaming "recession is imminent."

Anyhow, there is a montage of calls around the inverted yield curve. We have tried to show both sides, but the reality is that, from the list of go-to sources that don't just make a living based on headline hype, this most recent inversion is not predicting any massive odds of recession at this time. That can change if the curve gets very inverted and if some yet-unknown outcomes turn south.

By Jon C. Ogg

Largest DB Plan Sponsors Adjust Policies to Manage Risks | PLANSPONSOR

By Rebecca Moore

According to the latest report from Russell Investments about the largest corporate defined benefit (DB) plan sponsors in the United States, they are uniquely situated to set the trends that the rest of the industry often follow.

Based on its analysis of the FYE 2018 annual filings, these corporations continued to make changes to their pension plan policies to take more control of the costs and to better manage their risks.

As for investment policy, the analysis finds over the last several years, the \$20 billion club (the group of 20 publicly listed U.S. corporations with pension liabilities in excess of \$20 billion) has been shifting from the traditional asset-only focus to an asset-liability focus. During 2018, the \$20 billion club shifted asset allocations significantly away from risky assets and into fixed income. On average, equity allocations were down 5% and fixed income allocations were up 5%, which was the highest de-risking movement in the past eight years.

However, Russell Investments says it's worth keeping in mind that most plans will be under exposed to equities because of the very difficult fourth quarter in 2018. This may cause the appearance of a conscious allocation to fixed income; but, in reality, plan sponsors just haven't rebalanced to targets. Still, plan sponsors have sited specific intent to de-risk.

Regarding benefits strategy, the analysis finds that since the Pension Protection Act of 2006 (PPA), large DB plan numbers have been on the decline, both in total count and head count. Almost all \$20 billion club member plans are closed to new entrants, frozen altogether, have offered a lump-sum offer window and/or have made some form of annuity purchase.

As for funding policy, Russell Investments notes that following the implementation of PPA in 2008, which coincided with the global financial crisis, plan sponsors faced rising contribution requirements. However, plan sponsors began to contribute less as the contribution requirements dwindled thanks to multiple rounds of legislation that incorporated pension funding relief. Included in these funding relief initiatives were large increases in the Pension Benefit Guaranty Corporation (PBGC) variable rate premiums. Combining the low contribution rates, PBGC premium increases, and an expected update in prescribed mortality assumptions, led plan sponsors to increase discretionary contributions above their minimum required amounts (in many cases this was zero).

In 2017 and 2018, the \$20 billion club posted record contribution amounts—over \$65 billion over the two years—mostly to take advantage of the [tax deductions that were reduced because of the Tax Cuts and Jobs Act of 2017](#). In most cases, these contributions appear to be accelerations of future contributions as the actual 2018 contributions were higher than expected and now the expected 2019 contributions are at historical lows.

“The low interest rate and return environment persists and sponsors continue to focus on areas within their control, such as benefit, funding and investment policies. By improving plan funded positions and taking steps to minimize portfolio risks, sponsors will help promote stability, reduce surprises and place the sponsors in control of where their DB plans go,” the report concludes.

The full report may be downloaded from [here](#).