

January 30, 2015

#### **CONFIDENTIAL**

Mr. Dave Bergstrom Executive Director Minnesota State Retirement System 60 Empire Drive, Suite 300 St. Paul, MN 55103

Re: Projection of Contributions and Funding Status – Judges Retirement Fund

Dear Dave:

Attached are 30-year projections of estimated funded status, required contributions, and statutory contributions under three asset return scenarios for the Judges Retirement Fund. The estimates are based on participant data, assumptions, methods, and plan provisions as detailed in the Judges Retirement Fund Actuarial Valuation Report for funding purposes as of July 1, 2014.

As required by the State of Minnesota Standards for Actuarial Work, the projections reflect three asset return scenarios. The statutory investment return assumption is a select and ultimate approach with rates of 8.0% for the 5-year period ending June 30, 2017 and 8.5% thereafter. The scenarios assume future investment returns of 1.5% more than the assumed rate, the assumed rate, and 1.5% less than the assumed rate. Note that we believe the 10% rate of return assumption is outside of the range of reasonable expected returns for this plan.

Note that as funding ratios decline, as they are expected to in some of the investment return scenarios shown in this letter, it will be increasingly difficult for the plan to attain the assumed investment return. Each year, a larger proportion of assets is paid out in benefits, and less capital is available to invest.

The estimates are based on the market value of assets with no smoothing of investment gains or losses. In all scenarios, the valuation interest rate used to discount liabilities was the single effective interest rate used in the July 1, 2014 valuation of 8.38%, which produces a similar liability stream as trending to a liability that reflects the expiration of the 5-year select period on June 30, 2017.

Payroll is assumed to increase approximately 3.00% a year over the long-term, consistent with the valuation assumption for total payroll growth.

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The projection is an open group projection; meaning, active members projected to retire or otherwise terminate in the future are replaced with new active members so that the total active membership of the Fund remains at 316 members. The profile of these new members is the same as new members of each Fund hired between July 1, 2010 and July 1, 2013:

- Average age at hire is 50.5;
- Average salary at hire is \$134,800; and
- Approximately 49% female, 51% male.

If actuarial accrued liability exceeds assets, the unfunded actuarial accrued liability is amortized through June 30, 2039 per Minnesota Statute 356.215, Subdivision 11. As directed by MSRS, the statutory amortization date is assumed to be changed to June 30, 2069 once the current period expires in 2039. Per Minnesota Statute 356.215, Subdivision 11 (l), a negative unfunded actuarial accrued liability (i.e., when assets exceed liability) is amortized over a rolling 30-year period.

#### **Post-retirement Benefit Increases**

A very significant assumption affecting the projected estimates is the expectation of annual increases in the benefits being paid to retirees and beneficiaries. If the plan reaches a funding ratio of 70% (based on a 2.0% post-retirement benefit increase assumption) on a market value of assets basis for two consecutive years in the future, post-retirement increases will increase from 1.75% to 2.0%. Similarly, if the plan reaches a funding ratio of 90% (based on a 2.5% post-retirement benefit increase assumption) on a market value of assets basis for two consecutive years in the future, post-retirement increases will increase from 2.0% to 2.5%.

For the actuarial valuation as of July 1, 2014, an actuarial projection was performed to estimate if this plan is expected to attain the threshold required to pay a 2.0% or 2.5% post-retirement benefit increase. The projection indicated that if all assumptions were met, the funded status was not expected to improve and therefore the plan is expected to pay 1.75% post-retirement benefit increases until assets are depleted. This assumption is reflected in our valuation calculations and in the 7.0% and 8.5% ultimate rate of return projection scenarios.

Under the 10% ultimate rate of return scenario, the funded status of the plan is expected to improve. We performed a projection to estimate when the plan is expected to attain the 70% and 90% benefit increase thresholds if future investment returns are 9.5% through June 30, 2017 and 10.0% thereafter. This projection indicated the plan would begin paying a 2.0% benefit increase on January 1, 2029 and would begin paying a 2.5% benefit increase on January 1, 2039 under this investment return scenario. To approximate the recognition of the assumed benefit increase dates, we assumed the accrued liability and normal cost would increase a proportionate amount between 2025 and 2039.

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#### **Comments**

To the best of our knowledge and belief, the calculations were completed in accordance with the requirements of Minnesota Statutes, Section 356.215, and the requirements of the Standards for Actuarial Work established by the Legislative Commission on Pensions and Retirement.

This report should not be relied upon for any purpose other than the purpose described herein. Determinations of the financial results associated with the benefits described in this report in a manner other than the intended purpose may produce significantly different results. GRS is not responsible for the consequences of any unauthorized use.

The valuation was based upon information furnished by Minnesota State Retirement System (MSRS), concerning benefits, financial transactions, plan provisions and active members, terminated members, retirees and beneficiaries.

Actuarial assumptions, including discount rates, mortality tables and others identified in this report, are prescribed by Minnesota Statutes Section 356.215, the Legislative Commission on Pensions and Retirement (LCPR), and the Trustees. These parties are responsible for selecting the plan's funding policy, actuarial valuation methods, asset valuation methods, and assumptions. The policies, methods and assumptions used in this valuation are those that have been so prescribed and are described in the Actuarial Basis of the valuation report. MSRS is solely responsible for communicating to GRS any changes required thereto.

Guidance regarding the selection of economic assumptions for measuring pension obligations is provided by Actuarial Standards of Practice (ASOP) No. 27. A revision of ASOP No. 27, applicable to valuation dates on or after September 30, 2014, will guide assumption setting for future valuations. A recent review of inflation and investment return assumptions for accounting and financial reporting purposes developed a recommended range of 6.99% to 7.92% for the assumed investment return. Additional review and discussion will be required before the next valuation.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the plan's funded status); and changes in plan provisions or applicable law.

#### **Professional Qualifications**

The signing actuaries are independent of the plan sponsor. We are not aware of any relationship that would impair the objectivity of our work.

Bonita J. Wurst and Brian B. Murphy are Members of the American Academy of Actuaries (MAAA) and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein. In addition, Mr. Murphy meets the requirements of "approved actuary" under Minnesota Statutes Section 356.215, Subdivision 1, Paragraph (c).

This report has been prepared by actuaries who have substantial experience valuing public employee retirement systems. To the best of our knowledge and belief the information contained in this report is accurate and fairly presents the actuarial position of the Judges Retirement Fund as of the valuation date and was performed in accordance with the requirements of Minnesota Statutes Section 356.215, and the requirements of the Standards for Actuarial Work established by the LCPR. All calculations have been made in conformity with generally accepted actuarial principles and practices, and with the Actuarial Standards of Practice issued by the Actuarial Standards Board and with applicable statutes.

Sincerely,

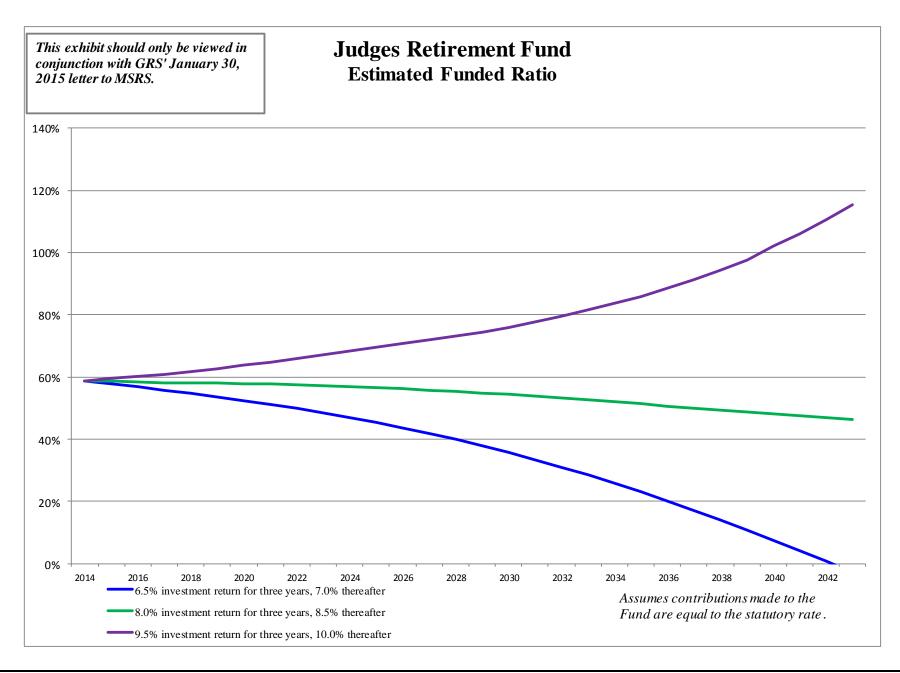
Bonita J. Wurst, ASA, EA, MAAA

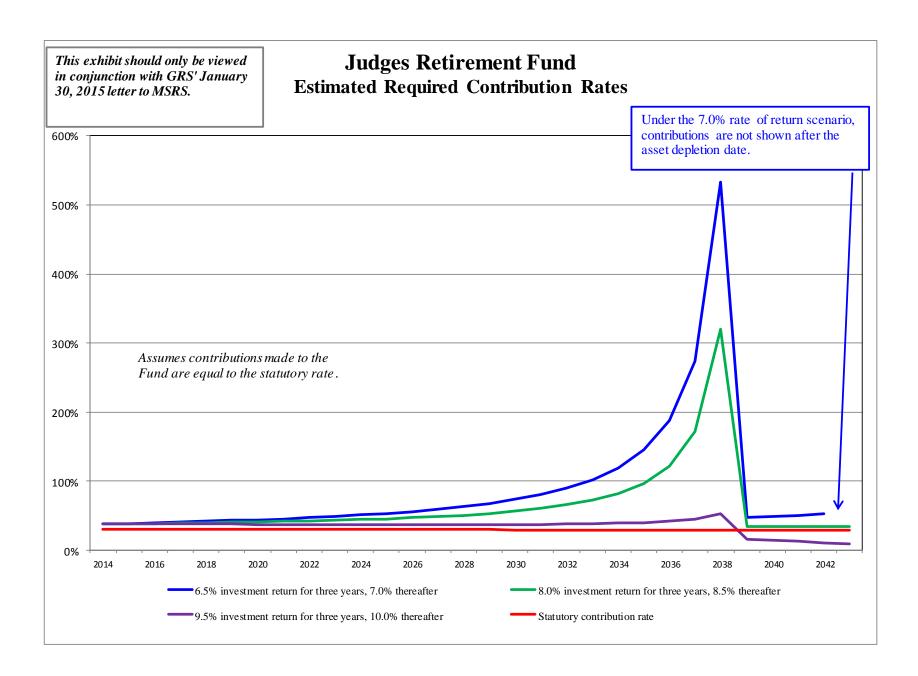
Brian B. Murphy, FSA, EA, MAAA, FCA

Brie B Marks

Bonita J. Wurst

BJW/BBM:bd Enclosures





## Judges Retirement Fund Scenario: 6.5% for Three Years, 7.0% thereafter Fiscal year beginning July 1

\$ in Thousands	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Contributions (% of Payroll)										
Statutory - Chapter 490	31.0%	30.9%	30.8%	30.7%	30.6%	30.5%	30.5%	30.4%	30.3%	30.2%
Required - Chapter 356 (MVA)	38.3%	38.9%	39.9%	40.9%	41.9%	43.1%	44.4%	45.7%	47.2%	49.0%
Sufficiency / (Deficiency)	(7.3)%	(8.0)%	(9.1)%	(10.2)%	(11.3)%	(12.6)%	(13.9)%	(15.3)%	(16.9)%	(18.8)%
Contributions										
Statutory - Chapter 490	13,503	13,866	14,235	14,608	14,997	15,398	15,817	16,255	16,697	17,159
Required - Chapter 356 (MVA)	16,666	17,451	18,421	19,469	20,534	21,731	23,039	24,448	26,036	27,814
Sufficiency / (Deficiency)	(3,163)	(3,585)	(4,186)	(4,861)	(5,537)	(6,333)	(7,222)	(8,193)	(9,339)	(10,655)
Funding Ratios										
Current Assets (MVA)	175,556	178,843	181,695	183,824	186,186	187,821	188,763	189,258	189,248	188,596
Actuarial Accrued Liability (AAL)	298,233	309,019	319,782	330,252	340,509	350,460	360,178	369,939	379,683	389,301
Unfunded AAL	122,677	130,176	138,087	146,428	154,323	162,639	171,415	180,681	190,435	200,705
Funding Ratio	59%	58%	57%	56%	55%	54%	52%	51%	50%	48%
Benefit Payments	21,311	22,301	23,546	24,692	25,941	27,121	28,031	28,990	30,050	31,193

# Judges Retirement Fund Scenario: 6.5% for Three Years, 7.0% thereafter Fiscal year beginning July 1

\$ in Thousands	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Contributions (% of Payroll)										
Statutory - Chapter 490	30.2%	30.1%	30.0%	30.0%	29.9%	29.9%	29.8%	29.8%	29.7%	29.7%
Required - Chapter 356 (MVA)	51.1%	53.5%	56.2%	59.4%	63.3%	67.9%	73.6%	80.7%	89.9%	102.2%
Sufficiency / (Deficiency)	(20.9)%	(23.4)%	(26.2)%	(29.5)%	(33.4)%	(38.0)%	(43.8)%	(50.9)%	(60.2)%	(72.5)%
Contributions										
Statutory - Chapter 490	17,627	18,116	18,625	19,151	19,696	20,255	20,829	21,433	22,048	22,703
Required - Chapter 356 (MVA)	29,851	32,196	34,881	37,973	41,652	46,019	51,414	58,109	66,693	78,101
Sufficiency / (Deficiency)	(12,224)	(14,080)	(16,256)	(18,822)	(21,956)	(25,764)	(30,585)	(36,676)	(44,645)	(55,398)
Funding Ratios										
Current Assets (MVA)	187,189	184,941	181,943	178,204	173,596	168,082	161,520	153,886	145,223	135,542
Actuarial Accrued Liability (AAL)	398,704	407,848	416,862	425,782	434,501	443,026	451,249	459,200	466,963	474,604
Unfunded AAL	211,515	222,907	234,919	247,578	260,905	274,944	289,729	305,314	321,740	339,062
Funding Ratio	47%	45%	44%	42%	40%	38%	36%	34%	31%	29%
Benefit Payments	32,378	33,437	34,456	35,566	36,672	37,868	39,032	40,109	41,120	42,065

# ${\bf Judges~Retirement~Fund}$ Scenario: 6.5% for Three Years, 7.0% thereafter

#### Fiscal year beginning July 1

\$ in Thousands	2034	2035	2036	2037	2038	2039	2040	2041	2042
Contributions (% of Payroll)									
Statutory - Chapter 490	29.7%	29.6%	29.6%	29.6%	29.6%	29.6%	29.5%	29.5%	29.5%
Required - Chapter 356 (MVA)	119.4%	145.2%	188.2%	274.5%	533.1%	48.3%	49.6%	51.0%	52.5%
Sufficiency / (Deficiency)	(89.7)%	(115.5)%	(158.6)%	(244.9)%	(503.5)%	(18.8)%	(20.0)%	(21.5)%	(22.9)%
Contributions									
Statutory - Chapter 490	23,365	24,058	24,771	25,500	26,268	27,047	27,861	28,693	29,551
Required - Chapter 356 (MVA)	94,039	117,848	157,496	236,600	473,551	44,208	46,755	49,541	52,516
Sufficiency / (Deficiency)	(70,674)	(93,790)	(132,725)	(211,100)	(447,283)	(17,161)	(18,894)	(20,848)	(22,965)
<b>Funding Ratios</b>									
Current Assets (MVA)	124,879	113,268	100,641	86,971	72,340	56,769	40,170	22,485	3,784
Actuarial Accrued Liability (AAL)	482,195	489,849	497,548	505,345	513,403	521,809	530,576	539,736	549,468
Unfunded AAL	357,316	376,581	396,907	418,374	441,063	465,040	490,406	517,251	545,684
Funding Ratio	26%	23%	20%	17%	14%	11%	8%	4%	1%
<b>Benefit Payments</b>	42,919	43,805	44,668	45,398	46,080	46,796	47,533	48,146	48,753

Under the 7.0% rate of return scenario, contributions are not shown after expected asset depletion date.

# **Judges Retirement Fund** Scenario: 8.0% for Three Years, 8.5% thereafter

#### Fiscal year beginning July 1

\$ in Thousands	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Contributions (% of Payroll)										
Statutory - Chapter 490	31.0%	30.9%	30.8%	30.7%	30.6%	30.5%	30.5%	30.4%	30.3%	30.2%
Required - Chapter 356 (MVA)	38.3%	38.5%	39.0%	39.6%	40.0%	40.6%	41.2%	41.8%	42.5%	43.4%
Sufficiency / (Deficiency)	(7.3)%	(7.6)%	(8.2)%	(8.8)%	(9.4)%	(10.0)%	(10.7)%	(11.4)%	(12.2)%	(13.2)%
Contributions										
Statutory - Chapter 490	13,503	13,866	14,235	14,608	14,997	15,398	15,817	16,255	16,697	17,159
Required - Chapter 356 (MVA)	16,666	17,262	18,014	18,810	19,586	20,453	21,379	22,350	23,431	24,621
Sufficiency / (Deficiency)	(3,163)	(3,396)	(3,779)	(4,202)	(4,589)	(5,055)	(5,562)	(6,095)	(6,734)	(7,462)
Funding Ratios										
Current Assets (MVA)	175,556	181,418	187,094	192,310	198,074	203,430	208,428	213,334	218,113	222,652
Actuarial Accrued Liability (AAL)	298,233	309,019	319,782	330,252	340,509	350,460	360,178	369,939	379,683	389,301
Unfunded AAL	122,677	127,601	132,688	137,942	142,435	147,030	151,750	156,605	161,570	166,649
Funding Ratio	59%	59%	59%	58%	58%	58%	58%	58%	57%	57%
Benefit Payments	21,311	22,301	23,546	24,692	25,941	27,121	28,031	28,990	30,050	31,193

#### Judges Retirement Fund Scenario: 8.0% for Three Years, 8.5% thereafter

#### Fiscal year beginning July 1

\$ in Thousands	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Contributions (% of Payroll)										
Statutory - Chapter 490	30.2%	30.1%	30.0%	30.0%	29.9%	29.9%	29.8%	29.8%	29.7%	29.7%
Required - Chapter 356 (MVA)	44.4%	45.7%	47.1%	48.8%	50.9%	53.4%	56.6%	60.6%	65.7%	72.6%
Sufficiency / (Deficiency)	(14.3)%	(15.6)%	(17.1)%	(18.9)%	(21.0)%	(23.5)%	(26.8)%	(30.8)%	(36.0)%	(43.0)%
Contributions										
Statutory - Chapter 490	17,627	18,116	18,625	19,151	19,696	20,255	20,829	21,433	22,048	22,703
Required - Chapter 356 (MVA)	25,972	27,512	29,245	31,203	33,514	36,211	39,530	43,594	48,750	55,537
Sufficiency / (Deficiency)	(8,345)	(9,396)	(10,620)	(12,052)	(13,818)	(15,956)	(18,701)	(22,161)	(26,702)	(32,834)
Funding Ratios										
Current Assets (MVA)	226,864	230,685	234,233	237,549	240,535	243,186	245,397	247,177	248,612	249,753
Actuarial Accrued Liability (AAL)	398,704	407,848	416,862	425,782	434,501	443,026	451,249	459,200	466,963	474,604
Unfunded AAL	171,840	177,163	182,629	188,233	193,966	199,840	205,852	212,023	218,351	224,851
Funding Ratio	57%	57%	56%	56%	55%	55%	54%	54%	53%	53%
Benefit Payments	32,378	33,437	34,456	35,566	36,672	37,868	39,032	40,109	41,120	42,065

#### Judges Retirement Fund Scenario: 8.0% for Three Years, 8.5% thereafter

#### Fiscal year beginning July 1

\$ in Thousands	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043
Contributions (% of Payroll)										
Statutory - Chapter 490	29.7%	29.6%	29.6%	29.6%	29.6%	29.6%	29.5%	29.5%	29.5%	29.5%
Required - Chapter 356 (MVA)	82.5%	97.2%	121.9%	171.4%	320.1%	33.9%	34.1%	34.4%	34.7%	35.0%
Sufficiency / (Deficiency)	(52.8)%	(67.5)%	(92.2)%	(141.8)%	(290.6)%	(4.3)%	(4.5)%	(4.9)%	(5.2)%	(5.5)%
Contributions										
Statutory - Chapter 490	23,365	24,058	24,771	25,500	26,268	27,047	27,861	28,693	29,551	30,436
Required - Chapter 356 (MVA)	64,943	78,874	101,950	147,742	284,410	30,977	32,145	33,413	34,716	36,127
Sufficiency / (Deficiency)	(41,578)	(54,816)	(77,179)	(122,242)	(258,142)	(3,930)	(4,284)	(4,720)	(5,165)	(5,691)
Funding Ratios										
Current Assets (MVA)	250,685	251,494	252,166	252,735	253,348	254,099	254,975	256,002	257,341	259,051
Actuarial Accrued Liability (AAL)	482,195	489,849	497,548	505,345	513,403	521,809	530,576	539,736	549,468	559,832
Unfunded AAL	231,510	238,355	245,382	252,610	260,055	267,710	275,601	283,734	292,127	300,781
Funding Ratio	52%	51%	51%	50%	49%	49%	48%	47%	47%	46%
Benefit Payments	42,919	43,805	44,668	45,398	46,080	46,796	47,533	48,146	48,753	49,443

#### **Judges Retirement Fund**

#### Scenario: 9.5% for Three Years, 10.0% thereafter

#### Fiscal year beginning July 1

\$ in Thousands	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Contributions (% of Payroll)										
Statutory - Chapter 490	31.0%	30.9%	30.8%	30.7%	30.6%	30.5%	30.5%	30.4%	30.3%	30.2%
Required - Chapter 356 (MVA)	38.3%	38.1%	38.1%	38.1%	38.0%	37.9%	37.7%	37.5%	37.3%	37.1%
Sufficiency / (Deficiency)	(7.3)%	(7.2)%	(7.3)%	(7.4)%	(7.4)%	(7.3)%	(7.3)%	(7.1)%	(7.0)%	(6.9)%
Contributions										
Statutory - Chapter 490	13,503	13,866	14,235	14,608	14,997	15,398	15,817	16,255	16,697	17,159
Required - Chapter 356 (MVA)	16,666	17,073	17,601	18,131	18,597	19,097	19,594	20,064	20,564	21,067
Sufficiency / (Deficiency)	(3,163)	(3,207)	(3,366)	(3,523)	(3,600)	(3,699)	(3,777)	(3,809)	(3,867)	(3,908)
Funding Ratios										
Current Assets (MVA)	175,556	183,992	192,570	201,043	210,489	219,975	229,590	239,647	250,161	261,076
Actuarial Accrued Liability (AAL)	298,233	309,019	319,782	330,252	340,509	350,460	360,178	369,939	379,683	389,301
Unfunded AAL	122,677	125,027	127,212	129,209	130,020	130,485	130,588	130,292	129,522	128,225
Funding Ratio	59%	60%	60%	61%	62%	63%	64%	65%	66%	67%
Benefit Payments	21,311	22,301	23,546	24,692	25,941	27,121	28,031	28,990	30,050	31,193

#### **Judges Retirement Fund**

#### Scenario: 9.5% for Three Years, 10.0% thereafter

#### Fiscal year beginning July 1

\$ in Thousands	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Contributions (% of Payroll)										
Statutory - Chapter 490	30.2%	30.1%	30.0%	30.0%	29.9%	29.9%	29.8%	29.8%	29.7%	29.7%
Required - Chapter 356 (MVA)	36.9%	36.8%	36.8%	36.9%	37.0%	37.3%	37.5%	37.7%	38.1%	38.6%
Sufficiency / (Deficiency)	(6.7)%	(6.7)%	(6.8)%	(6.9)%	(7.1)%	(7.4)%	(7.6)%	(7.9)%	(8.4)%	(8.9)%
Contributions										
Statutory - Chapter 490	17,627	18,116	18,625	19,151	19,696	20,255	20,829	21,433	22,048	22,703
Required - Chapter 356 (MVA)	21,570	22,135	22,824	23,567	24,385	25,291	26,170	27,154	28,257	29,508
Sufficiency / (Deficiency)	(3,943)	(4,019)	(4,199)	(4,416)	(4,689)	(5,036)	(5,341)	(5,721)	(6,209)	(6,805)
Funding Ratios										
Current Assets (MVA)	272,364	284,026	296,253	309,166	322,752	337,106	352,176	368,038	384,895	402,928
Actuarial Accrued Liability (AAL)	398,704	408,474	419,233	430,275	441,608	453,240	463,146	473,268	483,611	494,181
Unfunded AAL	126,340	124,448	122,980	121,109	118,856	116,134	110,970	105,230	98,716	91,253
Funding Ratio	68%	70%	71%	72%	73%	74%	76%	78%	80%	82%
Benefit Payments	32,378	33,437	34,456	35,566	36,672	37,913	39,165	40,329	41,427	42,457

#### **Judges Retirement Fund**

# Scenario: 9.5% for Three Years, 10.0% thereafter

#### Fiscal year beginning July 1

\$ in Thousands	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043
Contributions (% of Payroll)										
Statutory - Chapter 490	29.7%	29.6%	29.6%	29.6%	29.6%	29.6%	29.5%	29.5%	29.5%	29.5%
Required - Chapter 356 (MVA)	39.3%	40.3%	41.8%	44.7%	52.7%	16.2%	14.3%	12.7%	10.9%	9.0%
Sufficiency / (Deficiency)	(9.6)%	(10.6)%	(12.2)%	(15.1)%	(23.1)%	13.4%	15.2%	16.9%	18.6%	20.5%
Contributions										
Statutory - Chapter 490	23,365	24,058	24,771	25,500	26,268	27,047	27,861	28,693	29,551	30,436
Required - Chapter 356 (MVA)	30,953	32,683	34,953	38,492	46,829	14,793	13,492	12,306	10,891	9,299
Sufficiency / (Deficiency)	(7,588)	(8,625)	(10,182)	(12,992)	(20,561)	12,254	14,369	16,387	18,660	21,137
Funding Ratios										
Current Assets (MVA)	422,367	443,457	466,357	491,294	518,634	548,713	581,662	617,671	657,206	700,660
Actuarial Accrued Liability (AAL)	504,981	516,018	527,296	538,820	550,596	562,630	570,252	581,897	594,118	606,981
Unfunded AAL	82,614	72,561	60,939	47,526	31,962	13,917	(11,410)	(35,774)	(63,088)	(93,679)
Funding Ratio	84%	86%	88%	91%	94%	98%	102%	106%	111%	115%
Benefit Payments	43,394	44,369	45,319	46,131	46,891	47,797	48,831	49,731	50,617	51,579