

## Utah Retirement Systems

## Required Supplementary Information

## Schedule of Changes in the Employers' Net Pension Liability

Year Ended December 31

(in thousands)

	Noncontributory System						Contributory System						Public Safety Systems					
	2018	2017	2016	2015	2014	2013	2018	2017	2016	2015	2014	2013	2018	2017	2016	2015	2014	2013
<b>Total pension liability</b>																		
Service cost	\$ 404,391	403,981	407,690	394,798	407,992	441,320	4,044	4,801	5,673	8,672	9,580	10,997	80,296	78,272	78,843	75,352	76,681	81,736
Interest	1,920,238	1,877,576	1,764,653	1,775,819	1,699,693	1,646,213	87,297	90,124	91,894	95,463	93,819	93,750	280,149	269,818	249,722	248,980	236,803	229,965
Benefit changes	—	—	48,400	—	—	23,123	—	—	(45,057)	—	—	721	—	—	—	—	—	—
Difference between actual and expected experience	32,680	(84,234)	6,408	(188,166)	(204,823)	(208,501)	(17,249)	(24,988)	(13,801)	(15,289)	(22,839)	(20,520)	1,441	(3,041)	9,358	(17,164)	(25,225)	(29,228)
Assumption changes	—	642,187	563,741	—	(157,921)	—	—	22,108	22,909	—	(4,233)	—	—	118,370	110,373	—	(52,410)	—
Benefit payments	(1,320,214)	(1,248,037)	(1,184,317)	(1,123,647)	(1,043,798)	(974,684)	(86,795)	(84,761)	(83,447)	(81,390)	(77,015)	(74,158)	(188,414)	(172,870)	(164,508)	(155,387)	(144,763)	(137,486)
Refunds	(2,766)	(4,635)	(4,366)	(2,496)	(2,204)	(2,454)	(1,471)	(1,613)	(1,700)	(1,215)	(2,433)	(1,922)	(428)	(226)	(183)	(533)	(199)	(467)
<b>Net change in total pension liability</b>	<b>1,034,329</b>	<b>1,586,838</b>	<b>1,602,209</b>	<b>856,308</b>	<b>698,939</b>	<b>925,017</b>	<b>(14,174)</b>	<b>5,671</b>	<b>(23,529)</b>	<b>6,241</b>	<b>(3,121)</b>	<b>8,868</b>	<b>173,044</b>	<b>290,323</b>	<b>283,605</b>	<b>151,248</b>	<b>90,887</b>	<b>144,520</b>
<b>Total pension liability — beginning</b>	<b>28,088,619</b>	<b>26,501,781</b>	<b>24,899,572</b>	<b>24,043,264</b>	<b>23,344,325</b>	<b>22,419,308</b>	<b>1,298,183</b>	<b>1,292,512</b>	<b>1,316,041</b>	<b>1,309,800</b>	<b>1,312,921</b>	<b>1,304,053</b>	<b>4,085,203</b>	<b>3,794,880</b>	<b>3,511,275</b>	<b>3,360,027</b>	<b>3,269,140</b>	<b>3,124,620</b>
<b>Total pension liability — ending (a)</b>	<b>29,122,948</b>	<b>28,088,619</b>	<b>26,501,781</b>	<b>24,899,572</b>	<b>24,043,264</b>	<b>23,344,325</b>	<b>1,284,009</b>	<b>1,298,183</b>	<b>1,292,512</b>	<b>1,316,041</b>	<b>1,309,800</b>	<b>1,312,921</b>	<b>4,258,247</b>	<b>4,085,203</b>	<b>3,794,880</b>	<b>3,511,275</b>	<b>3,360,027</b>	<b>3,269,140</b>
<b>Plan fiduciary net position</b>																		
Contributions — member	14,602	17,285	16,308	17,020	13,587	14,208	2,455	2,675	3,420	4,771	5,461	6,376	895	793	830	905	835	1,258
Contributions — employer	858,444	854,255	831,631	813,449	772,420	710,933	6,027	7,946	8,188	11,719	12,954	12,874	147,101	145,814	147,099	141,024	135,588	128,744
Court fees and fire insurance tax	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Net investment income	(92,207)	2,987,282	1,783,911	366,748	1,419,053	2,588,981	(4,513)	155,949	97,693	21,251	87,577	169,510	(13,134)	421,917	249,027	50,654	194,222	350,563
Benefit payments	(1,320,214)	(1,248,037)	(1,184,317)	(1,123,647)	(1,043,798)	(974,684)	(86,795)	(84,761)	(83,447)	(81,390)	(77,015)	(74,158)	(188,414)	(172,870)	(164,508)	(155,387)	(144,763)	(137,486)
Refunds	(2,766)	(4,635)	(4,366)	(2,496)	(2,204)	(2,454)	(1,471)	(1,613)	(1,700)	(1,215)	(2,433)	(1,922)	(428)	(226)	(183)	(533)	(199)	(467)
Administrative expense	(9,962)	(9,579)	(8,856)	(8,797)	(8,828)	(8,329)	(454)	(457)	(446)	(478)	(494)	(480)	(1,450)	(1,382)	(1,260)	(1,233)	(1,227)	(1,161)
Net transfers with affiliated systems	13,035	(10,187)	(8,005)	33,648	30,467	(42,277)	(26,286)	(1,177)	(1,895)	(41,558)	(38,004)	33,094	6,982	5,926	6,701	4,023	2,746	4,676
<b>Net change in plan fiduciary net position</b>	<b>(539,068)</b>	<b>2,586,384</b>	<b>1,426,306</b>	<b>95,925</b>	<b>1,180,697</b>	<b>2,286,378</b>	<b>(111,037)</b>	<b>78,562</b>	<b>21,813</b>	<b>(86,900)</b>	<b>(11,954)</b>	<b>145,294</b>	<b>(48,448)</b>	<b>399,972</b>	<b>237,706</b>	<b>39,453</b>	<b>187,202</b>	<b>346,127</b>
<b>Plan fiduciary net position — beginning</b>	<b>25,205,127</b>	<b>22,618,743</b>	<b>21,192,437</b>	<b>21,096,512</b>	<b>19,915,815</b>	<b>17,629,437</b>	<b>1,283,466</b>	<b>1,204,904</b>	<b>1,183,091</b>	<b>1,269,991</b>	<b>1,281,945</b>	<b>1,136,651</b>	<b>3,576,517</b>	<b>3,176,545</b>	<b>2,938,839</b>	<b>2,899,386</b>	<b>2,712,184</b>	<b>2,366,057</b>
<b>Plan fiduciary net position — ending (b)</b>	<b>\$ 24,666,059</b>	<b>25,205,127</b>	<b>22,618,743</b>	<b>21,192,437</b>	<b>21,096,512</b>	<b>19,915,815</b>	<b>1,172,429</b>	<b>1,283,466</b>	<b>1,204,904</b>	<b>1,183,091</b>	<b>1,269,991</b>	<b>1,281,945</b>	<b>3,528,069</b>	<b>3,576,517</b>	<b>3,176,545</b>	<b>2,938,839</b>	<b>2,899,386</b>	<b>2,712,184</b>
<b>Net pension liability/(asset) — ending (a-b)</b>	<b>\$ 4,456,889</b>	<b>2,883,492</b>	<b>3,883,038</b>	<b>3,707,135</b>	<b>2,946,752</b>	<b>3,428,510</b>	<b>111,580</b>	<b>14,717</b>	<b>87,608</b>	<b>132,950</b>	<b>39,809</b>	<b>30,976</b>	<b>730,178</b>	<b>508,686</b>	<b>618,335</b>	<b>572,436</b>	<b>460,641</b>	<b>556,956</b>
<b>Plan fiduciary net position as a percentage of the total pension liability</b>	<b>84.7%</b>	<b>89.7%</b>	<b>85.3%</b>	<b>85.1%</b>	<b>87.7%</b>	<b>85.3%</b>	<b>91.3%</b>	<b>98.9%</b>	<b>93.2%</b>	<b>89.9%</b>	<b>97.0%</b>	<b>97.6%</b>	<b>82.9%</b>	<b>87.5%</b>	<b>83.7%</b>	<b>83.7%</b>	<b>86.3%</b>	<b>83.0%</b>
<b>Projected covered payroll</b>	<b>\$ 3,330,548</b>	<b>3,375,321</b>	<b>3,406,567</b>	<b>3,458,286</b>	<b>3,570,912</b>	<b>3,705,771</b>	<b>39,279</b>	<b>45,177</b>	<b>53,615</b>	<b>82,426</b>	<b>90,623</b>	<b>98,023</b>	<b>348,475</b>	<b>350,782</b>	<b>352,407</b>	<b>355,171</b>	<b>360,750</b>	<b>365,998</b>
<b>Net pension liability/(asset) as a percentage of covered payroll</b>	<b>133.8%</b>	<b>85.4%</b>	<b>114.0%</b>	<b>107.2%</b>	<b>82.5%</b>	<b>92.5%</b>	<b>284.1%</b>	<b>32.6%</b>	<b>163.4%</b>	<b>161.3%</b>	<b>43.9%</b>	<b>31.6%</b>	<b>209.5%</b>	<b>145.0%</b>	<b>175.5%</b>	<b>161.2%</b>	<b>127.7%</b>	<b>152.2%</b>

Schedule is intended to show information for 10 years. Additional years will be displayed as they become available.

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## Utah Retirement Systems

## Required Supplementary Information (Continued)

## Schedules of Changes in the Employers' Net Pension Liability (Continued)

Year Ended December 31

	(in thousands)																	
	Firefighter System						Judges System						Utah Governors and Legislators Plan					
	2018	2017	2016	2015	2014	2013	2018	2017	2016	2015	2014	2013	2018	2017	2016	2015	2014	2013
<b>Total pension liability</b>																		
Service cost	\$ 29,378	28,775	28,652	27,182	27,266	29,577	5,682	5,325	5,023	4,794	4,895	4,537	65	68	89	99	106	100
Interest	82,819	80,386	75,334	75,212	71,490	70,259	15,697	14,866	14,064	14,136	13,641	12,924	877	879	851	890	884	860
Benefit changes	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Difference between actual and expected experience	937	(9,216)	(5,525)	(8,259)	(15,077)	(13,083)	7,872	809	1,995	171	2,602	(569)	139	182	167	(105)	307	(233)
Assumption changes	—	31,357	25,572	—	(20,372)	—	—	13,067	2,885	—	(130)	—	—	264	241	—	—	—
Benefit payments	(57,440)	(54,793)	(52,102)	(49,671)	(47,710)	(44,747)	(16,111)	(13,621)	(12,330)	(12,400)	(11,361)	(10,189)	(978)	(973)	(941)	(904)	(909)	(892)
Refunds	(132)	(511)	(466)	(528)	(293)	(106)	—	—	—	—	—	—	—	—	—	—	—	—
<b>Net change in total pension liability</b>	<b>55,562</b>	<b>75,998</b>	<b>71,465</b>	<b>43,936</b>	<b>15,304</b>	<b>41,900</b>	<b>13,140</b>	<b>20,446</b>	<b>11,637</b>	<b>6,701</b>	<b>9,647</b>	<b>6,703</b>	<b>103</b>	<b>420</b>	<b>407</b>	<b>(20)</b>	<b>388</b>	<b>(165)</b>
Total pension liability — beginning	1,205,727	1,129,729	1,058,264	1,014,328	999,024	957,124	231,069	210,623	198,986	192,285	182,638	175,935	13,074	12,654	12,247	12,267	11,879	12,044
<b>Total pension liability — ending (a)</b>	<b>1,261,289</b>	<b>1,205,727</b>	<b>1,129,729</b>	<b>1,058,264</b>	<b>1,014,328</b>	<b>999,024</b>	<b>244,209</b>	<b>231,069</b>	<b>210,623</b>	<b>198,986</b>	<b>192,285</b>	<b>182,638</b>	<b>13,177</b>	<b>13,074</b>	<b>12,654</b>	<b>12,247</b>	<b>12,267</b>	<b>11,879</b>
<b>Plan fiduciary net position</b>																		
Contributions — member	18,305	18,460	18,729	18,175	18,300	18,325	—	—	—	—	317	—	—	—	—	—	—	—
Contributions — employer	7,021	6,715	6,954	6,690	5,514	3,494	8,091	7,563	7,382	6,555	5,627	4,990	392	404	421	421	411	252
Court fees and fire insurance tax	8,747	1,223	10,569	17,218	14,154	11,285	1,518	1,477	1,470	1,653	1,486	1,498	—	—	—	—	—	—
Net investment income	(4,509)	146,736	87,746	17,934	69,070	125,685	(730)	23,435	13,820	2,842	11,068	20,130	(41)	1,353	849	181	717	1,346
Benefit payments	(57,440)	(54,793)	(52,102)	(49,671)	(47,710)	(44,747)	(16,111)	(13,621)	(12,330)	(12,400)	(11,361)	(10,189)	(978)	(973)	(941)	(904)	(909)	(892)
Refunds	(132)	(511)	(466)	(528)	(293)	(106)	—	—	—	—	—	—	—	—	—	—	—	—
Administrative expense	(427)	(408)	(374)	(371)	(370)	(355)	(84)	(79)	(71)	(71)	(71)	(66)	(5)	(5)	(4)	(5)	(5)	(4)
Net transfers with affiliated systems	1,917	1,259	1,611	2,573	3,713	1,302	4,403	4,090	1,600	1,334	1,092	3,186	(51)	89	(12)	(20)	(14)	19
<b>Net change in plan fiduciary net position</b>	<b>(26,518)</b>	<b>118,681</b>	<b>72,667</b>	<b>12,020</b>	<b>62,378</b>	<b>114,883</b>	<b>(2,913)</b>	<b>22,865</b>	<b>11,871</b>	<b>(87)</b>	<b>8,158</b>	<b>19,549</b>	<b>(683)</b>	<b>868</b>	<b>313</b>	<b>(327)</b>	<b>200</b>	<b>721</b>
Plan fiduciary net position — beginning	1,234,407	1,115,726	1,043,059	1,031,039	968,661	853,778	198,483	175,618	163,747	163,834	155,676	136,127	11,220	10,352	10,039	10,366	10,166	9,445
<b>Plan fiduciary net position — ending (b)</b>	<b>\$ 1,207,889</b>	<b>1,234,407</b>	<b>1,115,726</b>	<b>1,043,059</b>	<b>1,031,039</b>	<b>968,661</b>	<b>195,570</b>	<b>198,483</b>	<b>175,618</b>	<b>163,747</b>	<b>163,834</b>	<b>155,676</b>	<b>10,537</b>	<b>11,220</b>	<b>10,352</b>	<b>10,039</b>	<b>10,366</b>	<b>10,166</b>
<b>Net pension liability/(asset) — ending (a-b)</b>	<b>\$ 53,400</b>	<b>(28,680)</b>	<b>14,003</b>	<b>15,205</b>	<b>(16,711)</b>	<b>30,363</b>	<b>48,639</b>	<b>32,586</b>	<b>35,005</b>	<b>35,239</b>	<b>28,451</b>	<b>26,962</b>	<b>2,640</b>	<b>1,854</b>	<b>2,302</b>	<b>2,208</b>	<b>1,901</b>	<b>1,713</b>
<b>Plan fiduciary net position as a percentage of the total pension liability</b>	<b>95.8%</b>	<b>102.4%</b>	<b>98.8%</b>	<b>98.6%</b>	<b>101.6%</b>	<b>97.0%</b>	<b>80.1%</b>	<b>85.9%</b>	<b>83.4%</b>	<b>82.3%</b>	<b>85.2%</b>	<b>85.2%</b>	<b>80.0%</b>	<b>85.8%</b>	<b>81.8%</b>	<b>82.0%</b>	<b>84.5%</b>	<b>85.6%</b>
<b>Projected covered payroll</b>	<b>\$ 113,587</b>	<b>112,953</b>	<b>112,322</b>	<b>111,133</b>	<b>111,305</b>	<b>110,741</b>	<b>18,802</b>	<b>18,661</b>	<b>16,755</b>	<b>15,832</b>	<b>16,072</b>	<b>15,195</b>	<b>639</b>	<b>722</b>	<b>799</b>	<b>943</b>	<b>928</b>	<b>390</b>
<b>Net pension liability/(asset) as a percentage of covered payroll</b>	<b>47.0%</b>	<b>(25.4)%</b>	<b>12.5%</b>	<b>13.7%</b>	<b>(15.0)%</b>	<b>27.4%</b>	<b>258.7%</b>	<b>174.6%</b>	<b>208.9%</b>	<b>222.6%</b>	<b>177.0%</b>	<b>177.4%</b>	<b>413.1%</b>	<b>256.6%</b>	<b>288.1%</b>	<b>234.1%</b>	<b>204.8%</b>	<b>439.2%</b>

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## Utah Retirement Systems

## Required Supplementary Information (Continued)

## Schedules of Changes in the Employers' Net Pension Liability (Concluded)

Year Ended December 31

	(in thousands)																	
	Tier 2 Public Employees System						Tier 2 Public Safety and Firefighter System						Total All Retirement Systems					
	2018	2017	2016	2015	2014	2013	2018	2017	2016	2015	2014	2013	2018	2017	2016	2015	2014	2013
Total pension liability																		
Service cost	\$ 104,736	84,388	69,887	51,005	39,283	29,318	13,998	10,763	8,164	5,466	3,579	2,151	642,590	616,373	604,021	567,368	569,382	599,736
Interest	27,109	19,471	12,608	8,370	4,648	2,351	3,199	2,133	1,274	746	379	159	2,417,385	2,355,253	2,210,400	2,219,616	2,121,357	2,056,481
Benefit changes	—	—	—	—	—	(119)	—	—	—	—	—	(7)	—	—	3,343	—	—	23,718
Difference between actual and expected experience	(1,727)	357	(1,917)	(4,982)	(4,577)	(4,459)	621	(2)	425	220	50	106	24,714	(120,133)	(2,890)	(233,574)	(269,582)	(276,487)
Assumption changes	—	5,786	7,867	—	(1,385)	—	—	1,924	803	—	(127)	—	—	835,063	734,391	—	(236,578)	—
Benefit payments	(692)	(417)	(316)	(333)	—	—	—	(61)	(28)	(30)	—	—	(1,670,644)	(1,575,533)	(1,497,989)	(1,423,762)	(1,325,556)	(1,242,156)
Refunds	—	—	—	—	—	—	—	—	—	—	—	—	(4,797)	(6,985)	(6,715)	(4,772)	(5,129)	(4,949)
Net change in total pension liability	129,426	109,585	88,129	54,060	37,969	27,091	17,818	14,757	10,638	6,402	3,881	2,409	1,409,248	2,104,038	2,044,561	1,124,876	853,894	1,156,343
Total pension liability — beginning	338,035	228,450	140,321	86,261	48,292	21,201	39,023	24,266	13,628	7,226	3,345	936	35,298,933	33,194,895	31,150,334	30,025,458	29,171,564	28,015,221
Total pension liability — ending (a)	467,461	338,035	228,450	140,321	86,261	48,292	56,841	39,023	24,266	13,628	7,226	3,345	36,708,181	35,298,933	33,194,895	31,150,334	30,025,458	29,171,564
Plan fiduciary net position																		
Contributions — member	—	—	—	—	—	—	55	—	—	—	—	—	36,312	39,213	39,287	40,871	38,500	40,167
Contributions — employer	97,680	79,175	63,062	49,645	37,299	25,743	14,295	11,126	8,488	6,221	4,365	2,451	1,139,051	1,112,998	1,073,225	1,035,724	974,178	889,481
Court fees and fire insurance tax	—	—	—	—	—	—	—	—	—	—	—	—	10,265	2,700	12,039	18,871	15,640	12,783
Net investment income	(1,454)	33,249	14,059	1,963	4,320	4,017	(180)	3,989	1,591	199	404	316	(116,768)	3,773,910	2,248,696	461,772	1,786,431	3,260,548
Benefit payments	(692)	(417)	(316)	(333)	—	—	—	(61)	(28)	(30)	—	—	(1,670,644)	(1,575,533)	(1,497,989)	(1,423,762)	(1,325,556)	(1,242,156)
Refunds	—	—	—	—	—	—	—	—	—	—	—	—	(4,797)	(6,985)	(6,715)	(4,772)	(5,129)	(4,949)
Administrative expense	(119)	(82)	(51)	(30)	(16)	(6)	(14)	(9)	(5)	(3)	(1)	—	(12,515)	(12,001)	(11,067)	(10,988)	(11,012)	(10,401)
Net transfers with affiliated systems	—	—	—	3	(2)	3	—	—	—	(3)	2	(3)	—	—	—	—	—	—
Net change in plan fiduciary net position	95,415	111,925	76,754	51,248	41,601	29,757	14,156	15,045	10,046	6,384	4,770	2,764	(619,096)	3,334,302	1,857,476	117,716	1,473,052	2,945,473
Plan fiduciary net position — beginning	329,218	217,293	140,539	89,291	47,690	17,933	40,180	25,135	15,089	8,705	3,935	1,171	31,878,618	28,544,316	26,686,840	26,569,124	25,096,072	22,150,599
Plan fiduciary net position — ending (b)	424,633	329,218	217,293	140,539	89,291	47,690	54,336	40,180	25,135	15,089	8,705	3,935	31,259,522	31,878,618	28,544,316	26,686,840	26,569,124	25,096,072
Net pension liability/(asset) — ending (a-b)	\$ 42,828	8,817	11,157	(218)	(3,030)	602	2,505	(1,157)	(869)	(1,461)	(1,479)	(590)	5,448,659	3,420,315	4,650,579	4,463,494	3,456,334	4,075,492
Plan fiduciary net position as a percentage of the total pension liability	90.8%	97.4%	95.1%	100.2%	103.5%	98.8%	95.6%	103.0%	103.6%	110.7%	120.5%	117.6%	85.2%	90.3%	86.0%	85.7%	88.5%	86.0%
Projected covered payroll	\$ 1,171,543	996,965	822,196	637,560	492,882	353,227	123,439	98,113	74,834	53,276	35,019	20,215	5,146,312	4,998,694	4,839,495	4,714,627	4,678,491	4,669,560
Net pension liability/(asset) as a percentage of covered payroll	3.7%	0.9%	1.4%	(0.0)%	(0.6)%	0.2%	2.0%	(1.2)%	(1.2)%	(2.7)%	(4.2)%	(2.9)%	105.9%	68.4%	96.1%	94.7%	73.9%	87.3%

Schedule is intended to show information for 10 years. Additional years will be displayed as they become available.