



# Actuarial Review of the Self-Insured Workers' Compensation Program

*Outstanding Liabilities as of June 30, 2019  
Forecast for Fiscal Year 2019-20*

***Presented to***

**Municipal Pooling Authority**

June 2019





Friday, June 7, 2019

Ms. Linda M. Cox  
Chief Administrative Officer  
Municipal Pooling Authority  
1911 San Miguel Drive, Suite 100  
Walnut Creek, CA 94596

Re: Actuarial Review of the Self-Insured Workers' Compensation Program

Dear Ms. Cox:

As you requested, we have completed our review of Municipal Pooling Authority's (MPA's) self-insured workers' compensation program. Assuming an SIR of \$500,000 per occurrence, we estimate the ultimate cost of claims and expenses for claims incurred during the 2019-20 program years to be \$7,776,000. This amount includes allocated loss adjustment expenses (ALAE), unallocated loss adjustment expenses (ULAE), and a discount for anticipated investment income. ALAE is the direct cost associated with the defense of individual claims (e.g. legal fees, investigation fees, court charges). ULAE is the cost to administer all claims to final settlement, which may be years into the future (e.g. claims adjusters' salaries, taxes). The discount for investment income is calculated based on the likely payout pattern of MPA's claims, assuming a 2.5% return on investments per year. For budgeting purposes, the expected costs of 2019-20 claims translate to rates of \$2.748 per \$100 of payroll.

In addition, we estimate the program's liability for outstanding claims to be \$30,414,000 as of June 30, 2019, again including ALAE and ULAE, and discounted for anticipated investment income. Given estimated program assets of \$40,957,000 as of June 30, 2019, the program will be funded above the 90% confidence level.

The \$30,414,000 estimate is the minimum liability to be booked by MPA at June 30, 2019 for its workers' compensation program, in accordance with Governmental Accounting Standards Board (GASB) Statement #10. GASB #10 requires MPA to accrue a liability on its financial statements for the ultimate cost of claims and expenses associated with all reported and unreported claims, including ALAE and ULAE. GASB #10 does not prohibit the discounting of losses to recognize investment income.

Our conclusions regarding MPA's liability for unpaid loss and loss adjustment expenses (LAE) at June 30, 2019 are summarized in the table below.

Municipal Pooling Authority  
Self-Insured Workers' Compensation Program  
Estimated Liability for Unpaid Loss and LAE  
at June 30, 2019

	Expected	Marginally Acceptable 70% CL	Recommended Range			Conservative 90% CL
			Low 75% CL	Target 80% CL	High 85% CL	
Loss and ALAE	\$33,632,000	\$36,423,000	\$37,533,000	\$38,811,000	\$40,392,000	\$42,444,000
ULAE	1,766,000	1,913,000	1,971,000	2,039,000	2,121,000	2,228,000
Investment Income Offset	<u>(4,984,000)</u>	<u>(5,398,000)</u>	<u>(5,562,000)</u>	<u>(5,752,000)</u>	<u>(5,986,000)</u>	<u>(6,290,000)</u>
Discounted Loss and LAE	\$30,414,000	\$32,938,000	\$33,942,000	\$35,098,000	\$36,527,000	\$38,382,000
Available Funding	<u>40,957,000</u>	<u>40,957,000</u>	<u>40,957,000</u>	<u>40,957,000</u>	<u>40,957,000</u>	<u>40,957,000</u>
Surplus	\$10,543,000	\$8,019,000	\$7,015,000	\$5,859,000	\$4,430,000	\$2,575,000

GASB #10 does not address an actual funding requirement for the program, but only speaks to the liability to be recorded on MPA's financial statements.

Because actuarial estimates of claims costs are subject to some uncertainty, we recommend that an amount in addition to the discounted expected loss costs be set aside as a risk margin for contingencies. Generally, the amount should be sufficient to fund assets to the 75% to 85% confidence level for primary programs. We consider funding assets to the 70% confidence level to be marginally acceptable and funding assets to the 90% confidence level to be conservative.

Furthermore, the CSAC Excess Insurance Authority standard states that based upon the actuarial recommendations, the member should maintain assets and make funding contributions equal to or exceeding the present value of expected losses and a reasonable margin for contingencies.

The table below shows our funding recommendations for Municipal Pooling Authority for the 2019-20 fiscal year.

Municipal Pooling Authority  
Self-Insured Workers' Compensation Program  
Funding Guidelines for 2019-20  
Self-Insured Retention (SIR) of \$500,000

	Expected	Marginally Acceptable 70% CL	Recommended Range			Conservative 90% CL
			Low 75% CL	Target 80% CL	High 85% CL	
Loss and ALAE	\$8,845,000	\$9,756,000	\$10,119,000	\$10,543,000	\$11,056,000	\$11,728,000
ULAE	0	0	0	0	0	0
Investment Income Offset	<u>(1,069,000)</u>	<u>(1,179,000)</u>	<u>(1,223,000)</u>	<u>(1,274,000)</u>	<u>(1,336,000)</u>	<u>(1,417,000)</u>
Discounted Loss and LAE	\$7,776,000	\$8,577,000	\$8,896,000	\$9,269,000	\$9,720,000	\$10,311,000
Non-claims Related Expenses	<u>4,310,000</u>	<u>4,310,000</u>	<u>4,310,000</u>	<u>4,310,000</u>	<u>4,310,000</u>	<u>4,310,000</u>
Indicated Funding	\$12,086,000	\$12,887,000	\$13,206,000	\$13,579,000	\$14,030,000	\$14,621,000
Rate per \$100 of 2018-19 Payroll	\$4.272	\$4.555	\$4.668	\$4.799	\$4.959	\$5.168

The funding recommendations shown in the table above do not include any recognition of the existing funding margin at June 30, 2019.

Note that while the projected expenses are for the 2019-20 fiscal year, the rate is a percentage of 2018-19 payroll. This is because in practice MPA collects 2019-20 contributions based on member payroll from 2018-19.

The loss projections in this report reflect the estimated impact of benefit legislation contained in AB749, AB227, SB228, SB899, and recent WCAB court decisions based upon information provided by the WCIRB.

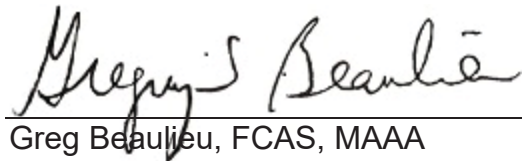
The ultimate impact on loss costs of legislated benefit adjustments are generally difficult to forecast in advance because the changes typically take place over a period of several years following enactment. Furthermore, actuarially derived benefit level evaluations often underestimate actual future cost levels. The shortfalls result from a variety of circumstances, including: increases in utilization levels, unanticipated changes in administrative procedures, and cost shifting among benefit categories. Thus, actual cost increases could differ, perhaps substantially, from the WCIRB's estimates.

The report that follows outlines the scope of our study, its background, and our conclusions, recommendations, and assumptions. Judgments regarding the appropriateness of our conclusions and recommendations should be made only after studying the report in its entirety, including the graphs, attachments, exhibits and appendices. Our report has been developed for MPA's internal use. It is not intended for general circulation.

We appreciate the opportunity to be of service to Municipal Pooling Authority in preparing this report. Please feel free to call Greg Beaulieu at (916) 290-4632 or Becky Richard at (916) 244-1183 with any questions you may have concerning this report.

Sincerely,

Bickmore



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Greg Beaulieu, FCAS, MAAA  
Senior Manager, Property and Casualty Actuarial Services, Bickmore  
Fellow, Casualty Actuarial Society  
Member, American Academy of Actuaries



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## **I. BACKGROUND**

Municipal Pooling Authority began its self-insured workers' compensation program on July 1, 1978. Its current self-insured retention is \$500,000. Claims administration services are provided by MPA's Risk Management Department. Additional background on the program is given in Appendix J.

As of June 30, 2019, MPA is expected to have assets of \$40,957,000 for the program. Additional background on program funding is given in Appendix K.

The purpose of this review is to provide a guide to MPA to determine reasonable funding levels for its self-insurance program according to the funding policy MPA has adopted and to comply with Governmental Accounting Standards Board Statements #10 and #30. The specific objectives of the study are to estimate MPA's liability for outstanding claims as of June 30, 2019, project ultimate loss costs for 2019-20, and provide funding guidelines to meet these liabilities and future costs.

## **II. CONCLUSIONS AND RECOMMENDATIONS**

### **A. LIABILITY FOR OUTSTANDING CLAIMS**

Graph 1 on the following page summarizes our assessment of MPA's funding position as of June 30, 2019. The dark-colored bars indicate our estimates of the program's liability for outstanding claims before recognition of the investment income that can be earned on the assets held before the claim payments come due. The horizontal line across the graph indicates MPA's estimated available assets at June 30, 2019.

Our best estimate of the full value of MPA's liability for outstanding claims within its self-insured retention (SIR) is \$35,398,000 as of June 30, 2019. This amount includes losses, allocated loss adjustment expenses (ALAE), and unallocated loss adjustment expenses (ULAE). ALAE is the direct cost associated with the defense of individual claims (e.g. legal fees, investigation fees, court charges). ULAE is the cost to administer claims to final settlement, which may be years in the future (e.g. claims adjusters' salaries, taxes).

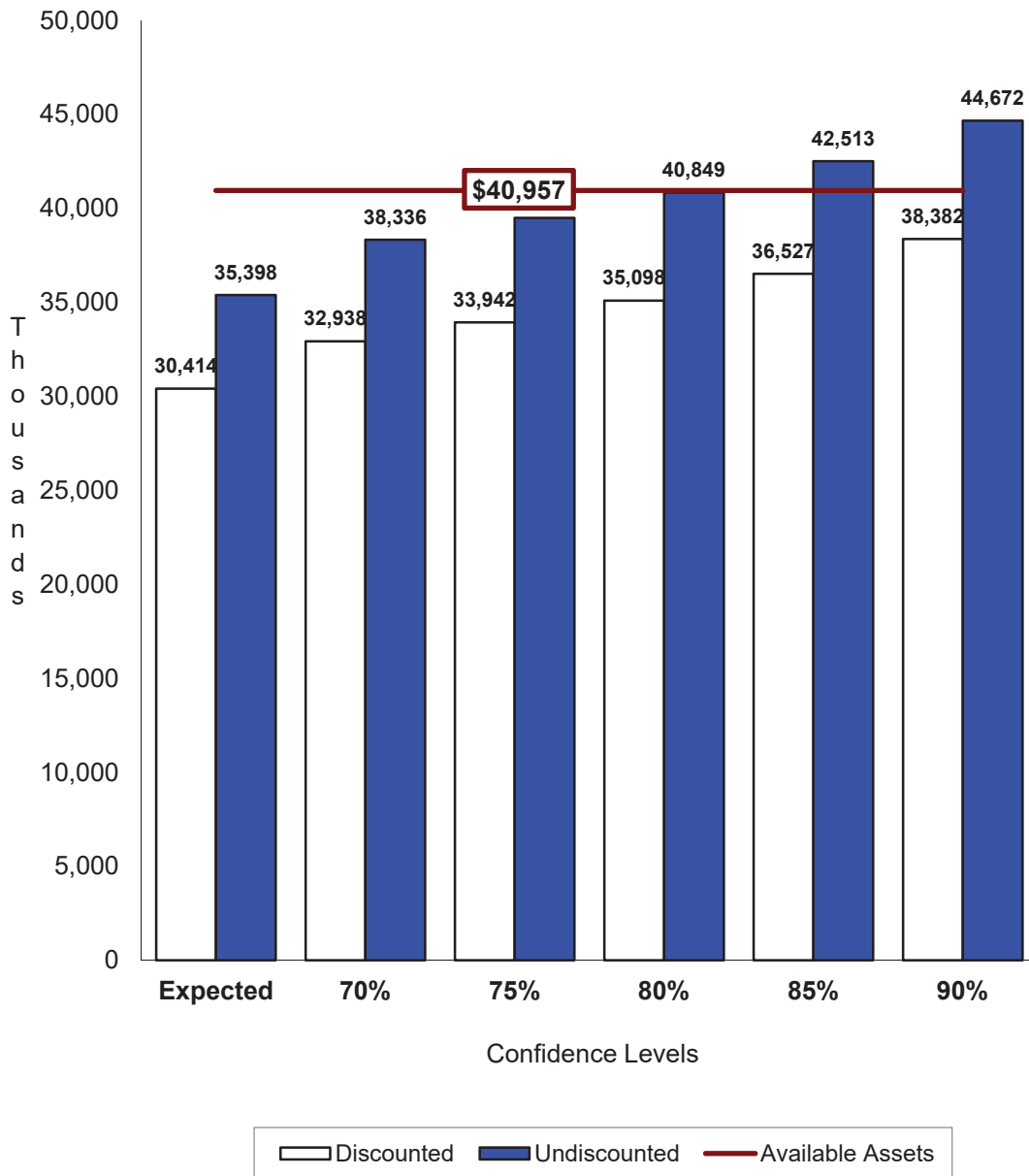
There is some measure of uncertainty associated with our best estimate because of the random nature of much of the process that determines ultimate claims costs. For this reason, we generally recommend that a program such as this include some funding margin for the possibility that actual loss costs will be greater than the best estimate. We generally measure the amount of this margin by thinking in terms of the probability distribution of actual possible results around our best estimate. As the margin grows, the probability that the corresponding funding amount will be sufficient to meet actual claim liabilities increases. We typically refer to this probability as the "confidence level" of funding. Graph 1 shows the liabilities for outstanding claims at several confidence levels that are typically of interest to risk managers in formulating funding policies for self-insurance programs.

The MPA can earn investment income on the assets it holds until claims payments come due. Assuming a long-term average annual return on investments of 2.5%, we estimate the impact of investment income earnings to be about 14.1% if the program is funded within the range indicated in the graphs, resulting in a discounted liability for outstanding claims of \$30,414,000 as of June 30, 2019.

Investment income earnings will be less than this when the program does not maintain sufficient funding, and more when there is excess funding. Thus, thinking in terms of liabilities discounted for investment income can actually mask funding deficiencies and redundancies that might otherwise be obvious. However, the discounted liabilities do represent legitimate funding targets. The light-colored bars on Graph 1 shows our estimates of MPA's discounted liability for outstanding claims.



Municipal Pooling Authority  
 Workers' Compensation  
 Available Assets vs Outstanding Liability (\$000's)  
 at June 30, 2019



The table below displays a breakdown of the program's outstanding loss and LAE liabilities into case reserves and incurred but not reported (IBNR) reserves at June 30, 2019, before recognition of investment income.

Municipal Pooling Authority  
Self-Insured Workers' Compensation Program  
Estimated Liability for Unpaid Loss and LAE at June 30, 2019

Year	Case Reserves	IBNR Reserves	Total Outstanding
Prior	\$875,931	\$144,002	\$1,019,933
1998-99	12,348	23,522	35,870
1999-00	88,151	23,959	112,110
2000-01	194,180	44,119	238,299
2001-02	117,451	33,985	151,436
2002-03	101,790	68,121	169,911
2003-04	191,453	84,260	275,713
2004-05	236,412	91,198	327,610
2005-06	277,593	132,134	409,727
2006-07	162,780	189,319	352,099
2007-08	326,590	275,623	602,213
2008-09	234,834	366,516	601,350
2009-10	541,890	621,219	1,163,109
2010-11	558,794	659,866	1,218,660
2011-12	350,965	681,071	1,032,036
2012-13	210,485	806,454	1,016,939
2013-14	1,121,125	874,403	1,995,528
2014-15	1,677,060	1,059,366	2,736,426
2015-16	944,711	1,811,279	2,755,990
2016-17	2,547,223	1,904,633	4,451,856
2017-18	2,185,649	3,323,098	5,508,747
2018-19	2,034,710	5,421,587	7,456,297
Loss and ALAE	\$14,992,125	\$18,639,734	\$33,631,859
ULAE		1,766,000	1,766,000
Total	\$14,992,125	\$20,405,734	\$35,397,859

## **B. PROGRAM FUNDING: GOALS AND OBJECTIVES**

As self-insurance programs have proliferated among public entities, it has become apparent that there is a large measure of inconsistency in the way in which these programs recognize and account for their claims costs. This is the result of the fact that there have been several different sources of guidance available, none of which has been completely relevant to public entity self-insurance programs.

According to the Governmental Accounting Standards Board (GASB), the most relevant source of guidance on the subject is Financial Accounting Standards Board Statement #60. A liability for unpaid claim costs, including all loss adjustment expenses, should be accrued at the time the self-insured events occur. This liability should include an allowance for incurred but not reported claims. It may be discounted for investment income at an appropriate rate of return, provided the discounting is disclosed. The regulations detailing the way in which this must be done are outlined in GASB's statements #10 and #30. These regulations are required to be applied by MPA.

GASB #10 and #30 do not address asset requirements. They do, however, allow a range of amounts to be recognized for accounting purposes; specifically, GASB #10 and #30 allow recognition of a risk margin for unexpectedly adverse loss experience. Thus, for accounting purposes, it is possible to formulate a funding policy from a range of alternatives. The uncertainty in any estimate of the program's liability for outstanding claims should be taken into consideration in determining funding policy, but it may be offset by recognizing anticipated investment income earnings. This usually means developing a funding program based on discounted claims costs with some risk margin for unexpected adverse loss experience.

The amount of the risk margin should be a question of long-term funding policy. We recommend that the risk margin be determined by thinking in terms of the probability that a given level of assets will prove to be adequate. For example, a reasonable goal might be to maintain assets at the 85% confidence level.

A key factor to consider in determining funding policy is the degree to which stability is required in the level of contributions to the program from year to year. If you elect to maintain assets at a low confidence level, the chances are much greater that future events will prove that additional contributions should have been made for old claims. The additional contributions for old claims may be required at the same time that costs are increasing dramatically on new claims. The burden of funding for increases on past years as well as on current years, may well be prohibitive.

We generally recommend maintaining program assets at the 80% confidence level, after recognition of investment income, with a recommended range of the 75% to 85% confidence levels. We tend to think of the 70% confidence level as marginally acceptable and of the 90% confidence level as conservative. We recommend the 75% to 85% confidence level range because the probabilities are reasonably high that resulting assets will be sufficient to meet claim liabilities, yet the required risk margins are not so large that they will cause most self-insured entities to experience undue financial hardship. In addition, within this range, anticipated investment income generally offsets the required risk margin for the most part, which means that assets are likely sufficient on an undiscounted basis.

We also strongly believe, however, that the confidence level to which any future year is funded should be evaluated in light of the relative certainty of the assumptions underlying the actuarial analysis, MPA's other budgetary constraints, and the relative level of risk it is believed appropriate to assume. This means formulating both short and long-term funding goals, which may be the same in some years, but different in others. In general, we recommend that you fund each year's claims costs in that year. When surpluses or deficits have developed on outstanding liabilities and funding adjustments are necessary, they should be clearly identified as such so that the habit of funding each year's claims costs that year is maintained. We also recommend that you reduce a surplus more slowly than you would accumulate funding to reduce a deficit.

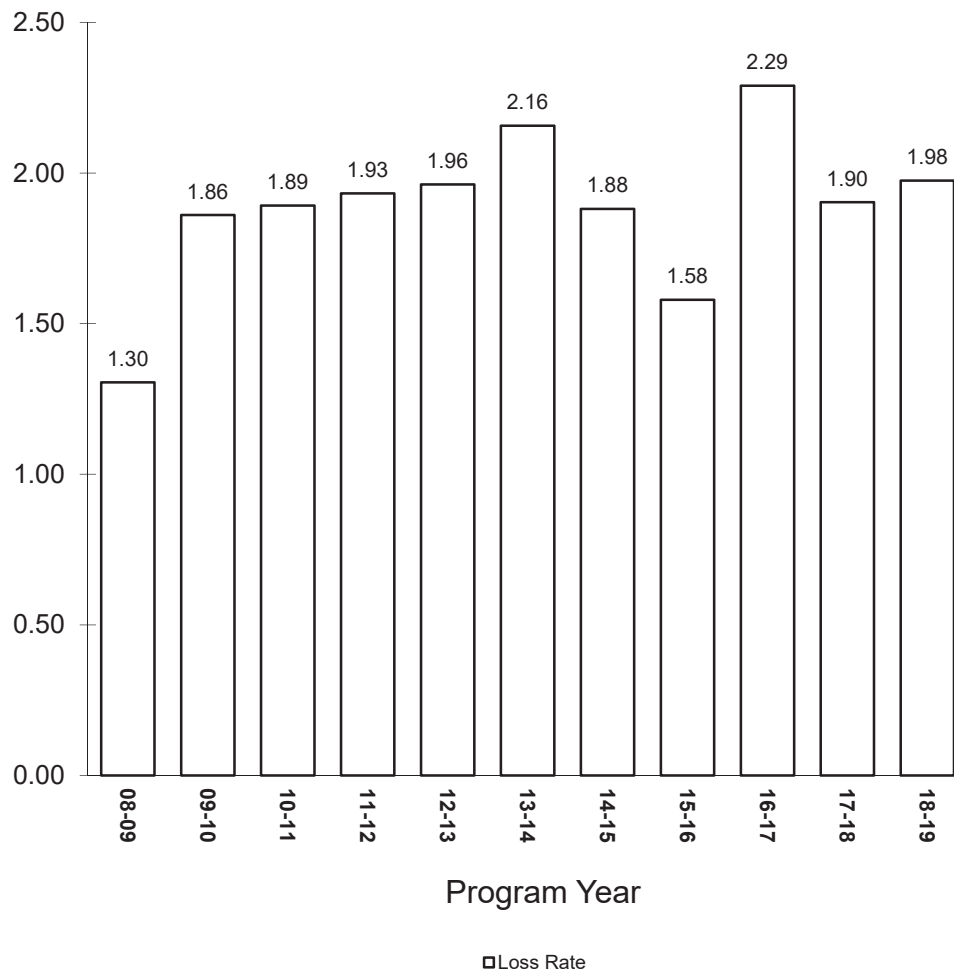
It is estimated that program assets will be \$40,957,000 at June 30, 2019, resulting in the program being funded above the 90% confidence level.

### C. HISTORICAL TRENDS IN THE SELF-INSURANCE PROGRAM

The MPA's loss rate (based on losses limited to \$100,000 per occurrence) varied from a low \$1.30 per \$100 of payroll during the 2008-09 program year to a high of \$2.26 for the 2016-17 program year and has been relatively flat over the latest nine years. Our projected loss rate for 2018-19 of \$1.98 per \$100 of payroll is based on the average of recent years.

Graph 2

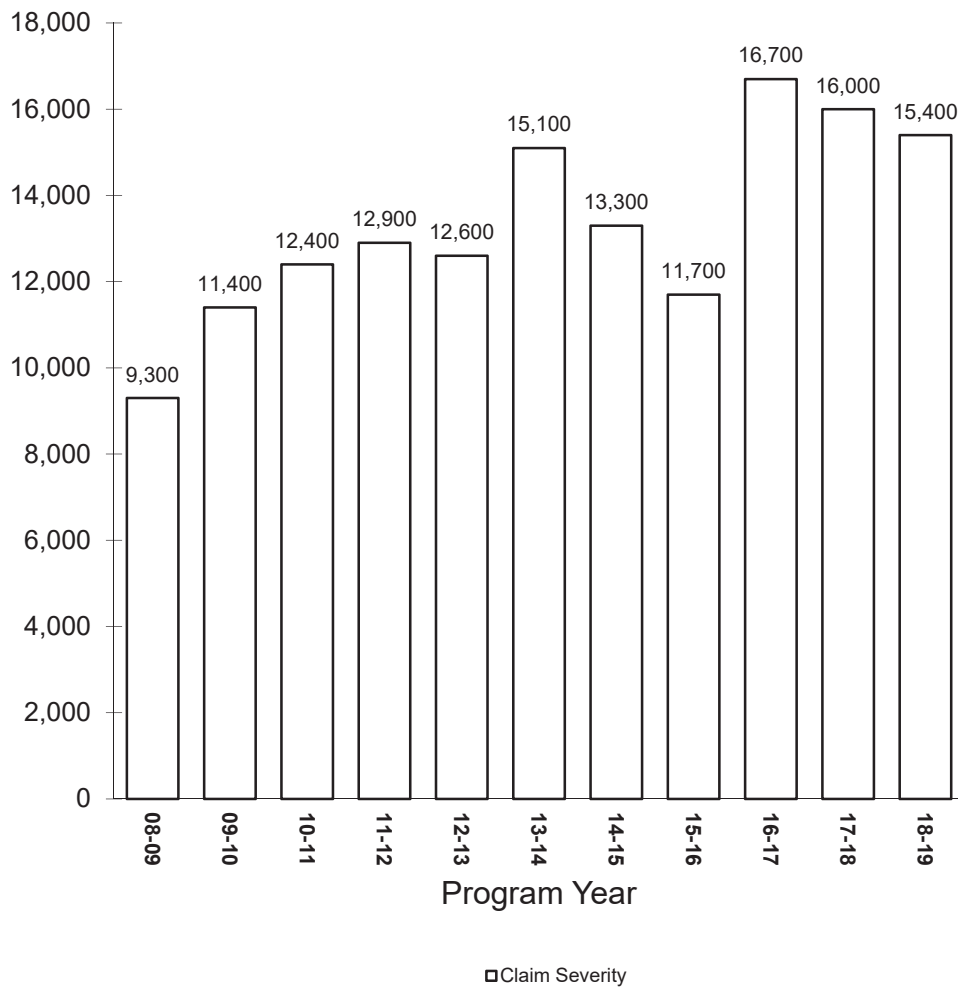
Municipal Pooling Authority  
Workers' Compensation  
Dollars of Loss per  
\$100 of Payroll



The following chart shows that MPA's average claim size, developed to ultimate and limited to \$100,000 per occurrence, has increased significantly during the period shown below. The projected 2018-19 average cost per claim of about \$15,400 is based on the average of the latest five years and the apparent upward trend.

Graph 3

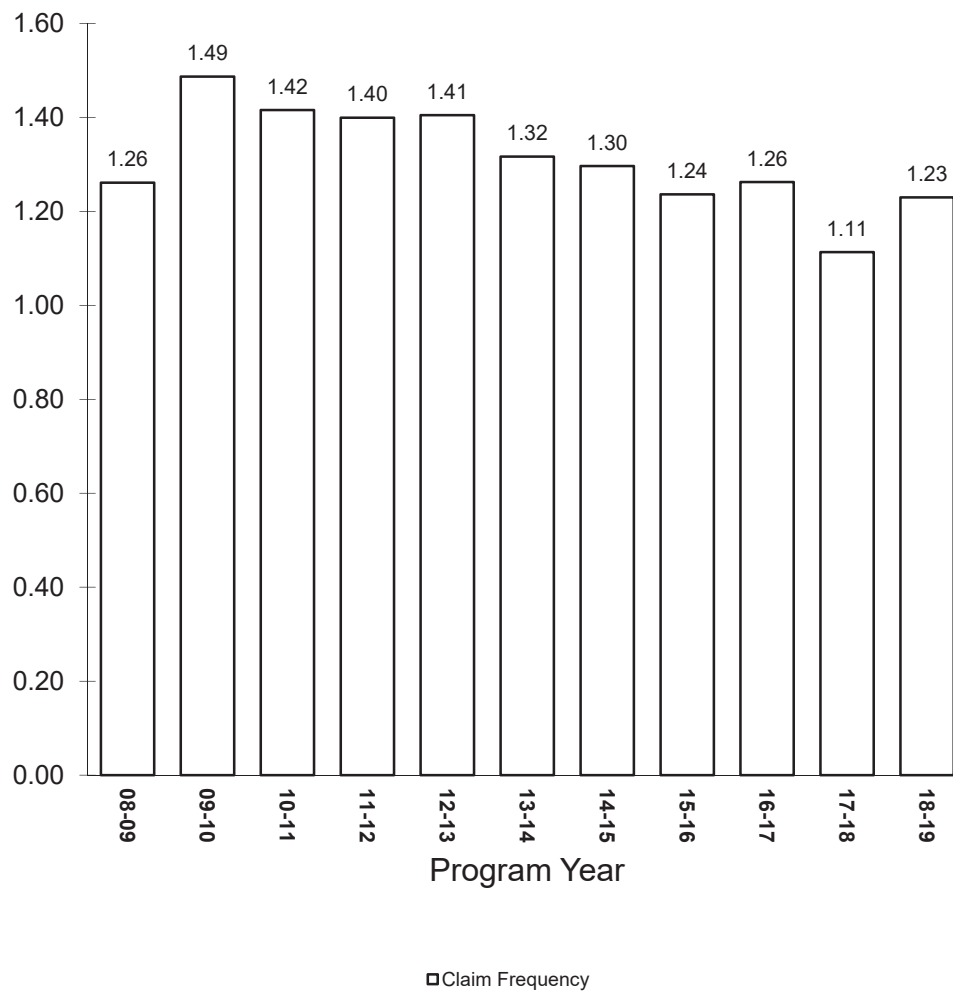
Municipal Pooling Authority  
Workers' Compensation  
Dollars of Loss per Claim



Over the past ten years, MPA's frequency of claims per \$1 million payroll had been generally decreasing overall. From 2008-09 to 2012-13, the program averaged 1.39 claims. The average frequency decreased to 1.25 during the most recent five years and our projection for 2018-19 is 1.23 based on the average of the most recent five years and the downward trend.

Graph 4

Municipal Pooling Authority  
Workers' Compensation  
Number of Claims per  
\$1 Million of Payroll



## D. COMPARISON WITH PREVIOUS RESULTS

The prior report for Municipal Pooling Authority was dated June 7, 2018. In the table below we display actual versus expected development of incurred losses and ALAE by accident year between the January 31, 2018 evaluation date of the prior report and the October 31, 2018 evaluation date of the current report.

### Actual Versus Expected Incurred Loss and ALAE Development

Accident Year	Expected Incurred Development	Actual Incurred Development	Actual Minus Expected
Prior	\$24,000	(\$14,618)	(\$38,618)
1998-99	0	16,447	16,447
1999-00	6,000	(24,590)	(30,590)
2000-01	8,000	0	(8,000)
2001-02	9,000	159	(8,841)
2002-03	18,000	(45,875)	(63,875)
2003-04	23,000	0	(23,000)
2004-05	18,000	27,382	9,382
2005-06	24,000	(17,103)	(41,103)
2006-07	27,000	22,000	(5,000)
2007-08	41,000	27,472	(13,528)
2008-09	54,000	(41,102)	(95,102)
2009-10	93,000	66,887	(26,113)
2010-11	91,000	77,255	(13,745)
2011-12	96,000	(74,406)	(170,406)
2012-13	129,000	(85,375)	(214,375)
2013-14	136,000	110,159	(25,841)
2014-15	191,000	418,558	227,558
2015-16	471,000	132,050	(338,950)
2016-17	882,000	1,234,208	352,208
2017-18	1,930,000	2,312,238	382,238
Total	\$4,271,000	\$4,141,746	(\$129,254)

As shown, actual incurred development was lower than anticipated since the prior report. Based on the assumptions from the prior report, it was expected that incurred losses would increase by \$4,271,000 between the two evaluation dates. However, actual development was approximately \$4,141,746; or about \$129,254 less than expected. Although most accident years have developed lower than expected, this favorable development is partially off-set by adverse development during the 2014-15 through 2017-18 accident years.



In the table below we display actual versus expected development of paid losses and ALAE by accident year between the January 31, 2018 evaluation date of the prior report and the October 31, 2018 evaluation date of the current report.

### Actual Versus Expected Paid Loss and ALAE Development

Accident Year	Expected Paid Development	Actual Paid Development	Actual Minus Expected
Prior	\$0	\$35,299	\$35,299
1998-99	0	114	114
1999-00	15,000	2,451	(12,549)
2000-01	24,000	18,349	(5,651)
2001-02	14,000	1,235	(12,765)
2002-03	23,000	1,953	(21,047)
2003-04	35,000	2,815	(32,185)
2004-05	35,000	47,338	12,338
2005-06	34,000	22,441	(11,559)
2006-07	31,000	31,708	708
2007-08	53,000	35,943	(17,057)
2008-09	58,000	10,123	(47,877)
2009-10	112,000	77,071	(34,929)
2010-11	134,000	40,527	(93,473)
2011-12	141,000	47,632	(93,368)
2012-13	155,000	22,098	(132,902)
2013-14	285,000	269,397	(15,603)
2014-15	399,000	262,701	(136,299)
2015-16	712,000	1,147,845	435,845
2016-17	1,193,000	1,860,474	667,474
2017-18	1,100,000	968,217	(131,783)
Total	\$4,553,000	\$4,905,731	\$352,731

As shown, actual paid development was more than anticipated since the prior report. Based on the assumptions from the prior report, it was expected that paid losses would increase by \$4,553,000 between the two evaluation dates. However, actual development was approximately \$4,905,731; or about \$352,731 more than expected. Similar to the incurred development, most accident years have developed lower than expected, this favorable development is more than off-set by adverse development during the 2015-16 and 2016-17 accident years.

In the table below we display the change in our estimates of the program's ultimate losses and ALAE by accident year since our prior report.

### Change in Ultimate Loss and ALAE

Accident Year	Prior Report	Current Report	Change In Ultimate
Prior	\$27,744,000	\$27,728,000	(\$16,000)
1998-99	3,300,031	3,343,000	42,969
1999-00	3,010,000	2,980,000	(30,000)
2000-01	4,050,000	4,042,000	(8,000)
2001-02	2,455,000	2,448,000	(7,000)
2002-03	3,871,000	3,813,000	(58,000)
2003-04	3,465,000	3,448,000	(17,000)
2004-05	2,841,000	2,856,000	15,000
2005-06	3,310,000	3,276,000	(34,000)
2006-07	3,833,000	3,834,000	1,000
2007-08	4,713,000	4,712,000	(1,000)
2008-09	5,337,000	5,249,000	(88,000)
2009-10	7,533,000	7,525,000	(8,000)
2010-11	6,770,000	6,773,000	3,000
2011-12	6,105,000	5,930,000	(175,000)
2012-13	6,291,000	5,944,000	(347,000)
2013-14	7,544,000	7,517,000	(27,000)
2014-15	7,261,000	7,505,000	244,000
2015-16	6,860,000	6,759,000	(101,000)
2016-17	8,840,000	9,234,000	394,000
2017-18	8,261,000	8,007,000	(254,000)
Total	\$133,394,031	\$132,923,000	(\$471,031)

As shown, overall we have decreased our estimated ultimates by \$471,031 since our prior report. This decrease can be tied to lower than anticipated loss development for most accident years between the two reports as previously discussed.

At the time of the prior report, we estimated the liability for outstanding claims as of June 30, 2018 to be \$29,551,000 at the discounted, expected level. Our current estimate as of June 30, 2019, is \$30,414,000, an increase in our assessment of the MPA's outstanding liabilities, as shown below:

**Outstanding Claim Liabilities for Loss and LAE**

	Prior Report at June 30, 2018	Current Report at June 30, 2019	Change
(A) Case Reserves:	\$14,928,000	\$14,992,000	\$64,000
(B) IBNR Reserves:	17,678,000	18,640,000	962,000
(C) Claims Administration Reserves:	1,712,000	1,766,000	54,000
(D) Total Reserves:	\$34,318,000	\$35,398,000	\$1,080,000
(E) Offset for Investment Income:	(4,767,000)	(4,984,000)	(217,000)
(F) Total Outstanding Claim Liabilities:	\$29,551,000	\$30,414,000	\$863,000

As shown, our estimate of outstanding claims liabilities at the discounted, expected level has increased between June 30, 2018 and June 30, 2019 as reflected in our prior and current reports respectively.

The increase in claim reserves (case and IBNR) is driven primarily by greater than expected claims development in recent years and increases in exposure (payroll). Reserves for future claims administration expenses have increased, resulting in a \$1,080,000 increase in total claim reserves. This increase in reserves leads to a larger offset for investment income. The net change due to the above factors is an overall increase of \$863,000 in our estimate of outstanding claim liabilities for loss and LAE.

At the time of the prior report, available assets were estimated to be \$36,525,000 as of June 30, 2018, which corresponded to the then-estimated discounted liability for outstanding claims between the 85% and 90% confidence levels. Available assets are currently estimated to be \$40,957,000 as of June 30, 2019, which corresponds to the currently estimated liability for outstanding claims above the 90% confidence level. It can be summarized as follows:

	<b>Funding Margin</b>		
	Prior Report at June 30, 2018	Current Report at June 30, 2019	Change
(A) Outstanding Liability at the Discounted Expected Level:	\$29,551,000	\$30,414,000	\$863,000
(B) Estimated Assets At June 30:	36,525,000	40,957,000	4,432,000
(C) Surplus:	\$6,974,000	\$10,543,000	\$3,569,000

As you can see, our estimate of the program's funding margin at the discounted, expected level has increased by \$4,432,000 between June 30, 2018 (as previously estimated) and June 30, 2019 (as currently estimated). This is driven by an increase in the estimated fund assets between the two points, partially offset by an increase in the estimated outstanding liability.

At the time of the prior report, our funding estimate for the 2018-19 year was \$12,823,000 at the discounted, 80% confidence level. That amount included allocated loss adjustment expenses (ALAE) and a discount for anticipated investment income, as well as all other program expenses. Our current estimate for the 2019-20 year is \$13,579,000 at the discounted, 80% confidence level, an increase in the program's expected loss costs, as shown in the table below:

### Comparison of Funding for Loss and LAE

	Prior Report 2018-19 SIR = \$500,000	Current Report 2019-20 SIR = \$500,000	Change
(A) Ultimate Loss and ALAE:	\$8,492,000	\$8,845,000	\$353,000
(B) Offset for Investment Income:	(1,009,000)	(\$1,069,000)	(\$60,000)
(C) Recommended Loss and ALAE Funding:	\$7,483,000	7,776,000	293,000
(D) 80% Risk Margin:	1,437,000	1,493,000	56,000
(E) Non-Claim Related Expenses:	3,903,000	\$4,310,000	\$407,000
(F) Total Funding:	\$12,823,000	13,579,000	756,000
(G) Funding per \$100 of Payroll:	\$4.660	\$4.799	\$0.14

As you can see, our funding recommendations at the discounted, expected level have increased between 2018-19 and 2019-20, as shown in our prior and current reports respectively.

Our estimates of ultimate loss and ALAE have increased by \$353,000. This is driven primarily by greater than expected claims development in recent years and an increase in exposure (payroll). Investment income is expected to be higher, resulting in an overall increase of \$293,000 in our annual funding estimate for loss and ALAE. In addition, other program expenses (claims administration, excess insurance, personnel, etc.) are expected to be higher. The net change due to the above factors is an overall increase of \$756,000 in our annual funding estimate for loss and LAE. On a rate basis, this is a 3% increase.

## **E. DATA PROVIDED FOR THE ANALYSIS**

Overall, the data utilized in preparing this report appears to be accurate.

Comments and issues regarding the data are as follows:

- We have assumed that the program's self-insured retention will remain at \$500,000 per occurrence for 2018-19 and 2019-20 (See Appendix J).
- We estimated the June 30, 2019 asset balance by beginning with the January 31, 2019 asset balance, and adjusting for anticipated revenue and expense between February 1, 2019, and June 20, 2019 (see Appendix K).
- We received loss data evaluated as of October 31, 2018 (See Appendix L). We also utilized the data from the MPA's most recent actuarial study for our assessment of loss development.
- We have assumed that MPA's payroll for 2018-19 will be \$282,928,897 based upon information provided by MPA (See Appendix M).

The data provided for the analysis appears to be reasonable for use in this actuarial valuation of liabilities and projection of loss costs.

### **III. ASSUMPTIONS AND LIMITATIONS**

Any quantitative analysis is developed within a very specific framework of assumptions about conditions in the outside world, and actuarial analysis is no exception. We believe that it is important to review the assumptions we have made in developing the estimates presented in this report. By doing so, we hope you will gain additional perspective on the nature of the uncertainties involved in maintaining a self-insurance program. Our assumptions, and some observations about them, are as follows:

- Our analysis is based on loss experience, exposure data, and other general and specific information provided to us by MPA. We have accepted all of this information without audit.
- We have also made use of loss statistics that have been developed from the information gathered and compiled from other California public entities with self-insured workers' compensation programs.
- We assumed that the future development of incurred and paid losses can be reasonably predicted on the basis of development of such losses in the recent past. We have also assumed that the historical development patterns for the participants of other California public entities with self-insured workers' compensation programs in the aggregate form a reasonable basis of comparison to the patterns from MPA's data.
- We have made use of cost relationships for claims of various sizes derived from the most recent actuarial review of other California public entities with self-insured workers' compensation programs in the aggregate.
- We have assumed that there is a continuing relationship between past and future loss costs.
- It is not possible to predict future claim costs precisely. Most of the cost of workers' compensation claims arise from a small number of incidents involving serious injury. A relatively small number of such claims could generate enough loss dollars to significantly reduce, or even deplete, the self-insurance fund.
- We cannot predict and have not attempted to predict the impact of future law changes and court rulings on claims costs. This is one major reason why we believe our funding recommendations are reasonable now, but should not be extrapolated into the future.
- The changes in cost levels associated with benefit increases and administrative changes typically take place over a period of several years following their enactment, and these changes are very difficult to forecast in advance. We have based our benefit level factors on those produced by the Workers' Compensation Insurance Rating Bureau of California (WCIRB). See Appendix E for a display of the benefit level cost indices by fiscal year.

- We have assumed that the loss rate trend associated with claim costs increases at 3.0% per year. We have assumed that claim severity increases at 3.0% per year, and that claim frequency will remain flat.
- We have assumed that payroll and other inflation-sensitive exposure measures increase 2.5% annually due to inflation.
- We have assumed that assets held for investment will generate an average annual return of 2.5% over the duration of payment of the loss liabilities. It should be noted that actual future investment returns may vary significantly from this assumption, depending upon the prevailing investment market conditions.
- The claims costs we have estimated include indemnity and medical payments, and all loss adjustment expenses. We have included estimates for excess insurance contributions and other expenses associated with the program based upon information provided by MPA.
- Our funding recommendations do not include provisions for catastrophic events not in MPA's history, such as earthquakes, flooding, mass civil disorder, or mass occupational disease.
- Our estimates assume that all excess insurance is valid and collectible. Further, our funding recommendations do not include a provision for losses greater than MPA's excess coverage.
- MPA's assets available for the program are estimated to be \$40,957,000 as of June 30, 2019 for use in this report. This is shown in further detail in Appendix K.



#### **IV. GLOSSARY OF ACTUARIAL TERMS**

**Accident Year** - Year during which the accidents that generate a group of claims occurs, regardless of when the claims are reported, payments are made, or reserves are established.

**Allocated Loss Adjustment Expenses (ALAE)** - Expense incurred in settling claims that can be directly attributed to specific individual claims (e.g., legal fees, investigative fees, court charges, etc.)

**Benefit Level Factor** - Factor used to adjust historical losses to the current level of workers' compensation benefits.

**Case Reserve** - The amount left to be paid on a claim, as estimated by the claims administrator.

**Claim Count Development Factor** - A factor that is applied to the number of claims reported in a particular accident period in order to estimate the number of claims that will ultimately be reported.

**Claim Frequency** - Number of claims per \$1 million of payroll.

**Confidence Level** - An estimated probability that a given level of funding will be adequate to pay actual claims costs. For example, the 85% confidence level refers to an estimate for which there is an 85% chance that the amount will be sufficient to pay loss costs.

**Discount Factor** - A factor to adjust estimated loss costs to reflect anticipated investment income from assets held prior to actual claim payout.

**Expected Losses** - The best estimate of the full, ultimate value of loss costs.

**Incurred but not Reported (IBNR) Losses** - Losses for which the accident has occurred but the claim has not yet been reported. This is the ultimate value of losses, less any amount that has been set up as reported losses by the claims adjuster. It includes both amounts for claims incurred but not yet received by the administrator and loss development on already reported claims.

**Loss Development Factor** - A factor applied to losses for a particular accident period to reflect the fact that reported and paid losses do not reflect final values until all claims are settled (see Section IV).

**Loss Rate** - Ultimate losses per \$100 of payroll.

**Non-Claims Related Expenses** – Program expenses not directly associated with claims settlement and administration, such as excess insurance, safety program expenses, and general overhead. These exclude expenses associated with loss settlements (Indemnity/Medical, BI/PD), legal expenses associated with individual claims (ALAE), and claims administration (ULAE).

**Outstanding Losses** - Losses that have been incurred but not paid. This is the ultimate value of losses less any amount that has been paid.

**Paid Losses** - Losses actually paid on all reported claims.

**Program Losses** - Losses, including ALAE, limited to the SIR for each occurrence.

**Reported Losses** - The total expected value of losses as estimated by the claims administrator. This is the sum of paid losses and case reserves.

**Self-Insured Retention (SIR)** - The level at which an excess insurance policy is triggered to begin payments on a claim. Financially, this is similar to an insurance deductible.

**Severity** - Average claim cost.

**Ultimate Losses** - The value of claim costs at the time when all claims have been settled. This amount must be estimated until all claims are actually settled.

**Unallocated Loss Adjustment Expenses (ULAE)** – Claim settlement expenses that cannot be directly attributed to individual claims (e.g., claims adjusters' salaries, taxes, etc.)

## Municipal Pooling Authority - Workers' Compensation

Funding Guidelines for Outstanding Liabilities at  
June 30, 2019

(A) Estimated Ultimate Losses Incurred through 6/30/19: (From Appendix F)	\$141,168,000
(B) Estimated Paid Losses through 6/30/19: (From Appendix F)	107,536,000
(C) Estimated Liability for Claims Outstanding at 6/30/19: (From Appendix F)	<u>\$33,632,000</u>
(D) Estimated Liability for Outstanding Claims Administration Fees at 6/30/19: (Based on a factor of 5.25% of (C))	1,766,000
(E) Total Outstanding Liability for Claims at 6/30/19: ((C) + (D))	<u>\$35,398,000</u>
(F) Reserve Discount Factor (Based on a Discount Rate of 2.5%.): (Appendix H, Page 1, (H))	0.859
(G) Discounted Outstanding Liability for Claims at 6/30/19: ((E) x (F))	<u>\$30,414,000</u>

	Marginally Acceptable		Recommended		Conservative
Confidence Level of Adequacy:	70%	75%	80%	85%	90%
(H) Confidence Level Factor: (From Appendix I)	1.083	1.116	1.154	1.201	1.262
(I) Margin for Adverse Experience: ((G) x [(H) - 1])	2,524,000	3,528,000	4,684,000	6,113,000	7,968,000
(J) Total Required Assets at 6/30/19: ((G) + (I))	<u>\$32,938,000</u>	<u>\$33,942,000</u>	<u>\$35,098,000</u>	<u>\$36,527,000</u>	<u>\$38,382,000</u>
(K) Estimated Total Assets at 6/30/19: (From Appendix K)	\$40,957,000	\$40,957,000	\$40,957,000	\$40,957,000	\$40,957,000
(L) Indicated Funding Redundancy/ (Deficiency): ((K) - (J))	<u>\$8,019,000</u>	<u>\$7,015,000</u>	<u>\$5,859,000</u>	<u>\$4,430,000</u>	<u>\$2,575,000</u>

Municipal Pooling Authority - Workers' Compensation  
Funding Options for Program Year 2019-2020 (SIR = \$500,000)  
One-Year Funding Plan

	Dollar Amount	Payroll Rate			
(A) Estimated Ultimate Losses Incurred in Accident Year 2019-2020: (From Appendix F)	\$8,845,000	\$3.126			
(B) Estimated Claims Administration Fees Incurred in Accident Year 2019-2020: (Included in Row (I))	0	0.000			
(C) Total Claims Costs Incurred in Accident Year 2019-2020: ((A) + (B))	<u>\$8,845,000</u>	<u>\$3.126</u>			
(D) Loss Discount Factor (Based on a Discount Rate of 2.5%.): (Appendix H, Page 2, (F))	0.879				
(E) Discounted Total Claims Costs Incurred in Accident Year 2019-2020: ((C) x (D))	<u>\$7,776,000</u>	<u>\$2.748</u>			
	<u>Marginally Acceptable</u>		<u>Recommended</u>		<u>Conservative</u>
	70%	75%	80%	85%	90%
(F) Confidence Level Factor: (From Appendix I)	1.103	1.144	1.192	1.250	1.326
(G) Margin for Adverse Experience: ((E) x [(F) - 1])	801,000	1,120,000	1,493,000	1,944,000	2,535,000
(H) Recommended Funding in 2019-2020 for Claims Costs and Other Expenses: ((E) + (G))	<u>\$8,577,000</u>	<u>\$8,896,000</u>	<u>\$9,269,000</u>	<u>\$9,720,000</u>	<u>\$10,311,000</u>
(I) Other Budgeted Program Expenses: (Provided by the Authority)	4,310,000	4,310,000	4,310,000	4,310,000	4,310,000
(J) Recommended Funding in 2019-2020 for Claims Costs, Other Expenses, and Non Claims Related Expenses:	<u>\$12,887,000</u>	<u>\$13,206,000</u>	<u>\$13,579,000</u>	<u>\$14,030,000</u>	<u>\$14,621,000</u>
(K) Rate per \$100 of Payroll: ((K) / \$2,829,289)	\$4.555	\$4.668	\$4.799	\$4.959	\$5.168
(L) Prior Rate at 80% Confidence	\$4.418	\$4.529	\$4.660	\$4.817	\$5.027
(M) Indicated Change in Rate	3.1%	3.1%	3.0%	2.9%	2.8%

Payroll rates are per hundred dollars of 2018-2019 payroll of \$282,928,900.

Municipal Pooling Authority - Workers' Compensation  
Funding Options for Program Year 2019-2020 (SIR = \$500,000)  
One-Year Funding Plan at the 80% Confidence Level

	Dollar Amount	Payroll Rate
(A) Estimated Ultimate Losses Incurred in Accident Year 2019-2020: (From Appendix F)	\$8,845,000	\$3.126
(B) Loss Discount Factor (Based on a Discount Rate of 2.5%): (Appendix H, Page 2, (F))	0.879	
(C) Discounted Total Claims Costs Incurred in Accident Year 2019-2020: ((A) x (B))	\$7,776,000	\$2.748
(D) 80% Confidence Level Factor: (From Appendix I)	1.192	1.192
(E) Margin for Adverse Experience: ((C) x [(D) - 1])	1,493,000	\$0.528
(F) Recommended Funding in 2019-2020 for Claims Costs and Other Expenses ((C) + (E))	\$9,269,000	\$3.276
(G) Other Budgeted Program Expenses: (Provided by the Authority)		
Excess Premium	\$1,673,000	\$0.591
Claims Administration	638,000	0.225
Department Personnel	885,000	0.313
DOC Expense Paid	207,000	0.073
G&A Expense Paid	874,000	0.309
Capital Equipment	33,000	0.012
Total	\$4,310,000	\$1.523
(H) Recommended Funding in 2019-2020 for Claims Costs, Other Expenses, and Non Claims Related Expenses: ((F) + (G))	\$13,579,000	
(I) Rate per \$100 of Payroll: ((H) / \$2,829,289)	\$4.799	
(J) Prior Rate (at 80% Confidence Level)	\$4.660	
(K) Indicated Change in Rate	3.0%	

Payroll rates are per hundred dollars of 2018-2019 payroll of \$282,928,900.

## Municipal Pooling Authority - Workers' Compensation

## IBNR as of 6/30/19 at Expected Claims Level

Accident Year	Estimated Ultimate (A)	Reported as of 10/31/18 (B)	Estimated IBNR as of 10/31/18 (C)	Estimated Percent of IBNR Reported Between 11/1/18 and 6/30/19 (D)	Estimated IBNR Reported (E)	Estimated IBNR as of 6/30/19 (F)
Prior	\$27,728,000	\$27,558,998	\$169,002	15.0%	\$25,000	\$144,002
1998-1999	3,343,000	3,316,478	26,522	12.4%	3,000	23,522
1999-2000	2,980,000	2,950,041	29,959	19.8%	6,000	23,959
2000-2001	4,042,000	3,989,881	52,119	15.2%	8,000	44,119
2001-2002	2,448,000	2,407,015	40,985	17.4%	7,000	33,985
2002-2003	3,813,000	3,726,879	86,121	21.4%	18,000	68,121
2003-2004	3,448,000	3,347,740	100,260	16.3%	16,000	84,260
2004-2005	2,856,000	2,748,802	107,198	14.9%	16,000	91,198
2005-2006	3,276,000	3,122,866	153,134	13.7%	21,000	132,134
2006-2007	3,834,000	3,620,681	213,319	11.3%	24,000	189,319
2007-2008	4,712,000	4,399,377	312,623	11.9%	37,000	275,623
2008-2009	5,249,000	4,837,484	411,516	10.9%	45,000	366,516
2009-2010	7,525,000	6,828,781	696,219	10.8%	75,000	621,219
2010-2011	6,773,000	6,031,134	741,866	11.0%	82,000	659,866
2011-2012	5,930,000	5,165,929	764,071	10.8%	83,000	681,071
2012-2013	5,944,000	5,041,546	902,454	10.6%	96,000	806,454
2013-2014	7,518,000	6,545,597	972,403	10.1%	98,000	874,403
2014-2015	7,505,000	6,285,634	1,219,366	13.1%	160,000	1,059,366
2015-2016	6,758,000	4,670,721	2,087,279	13.2%	276,000	1,811,279
2016-2017	9,234,000	6,708,367	2,525,633	24.6%	621,000	1,904,633
2017-2018	8,007,000	3,503,902	4,503,098	26.2%	1,180,000	3,323,098
2018-2019	8,245,000	693,413	2,055,000	28.2%	2,130,000	5,421,587
Totals	\$141,168,000	\$117,501,266	\$18,170,147		\$5,027,000	\$18,639,734

## Notes:

- (A) From Exhibit 4, Page 1.
- (B) Provided by the Authority. These losses exclude amounts incurred above the Authority's SIR for each year.
- (C) (A) - (B).
- (D) Percentage of incurred but not reported (IBNR) expected to be reported between 11/1/18 and 6/30/19. The percentage is based on the development pattern selected in Appendix A.
- (E) ((A) - (B)) x (D).
- (F) (A) - (B) - (E).

This exhibit shows the calculation of the amount of incurred but not reported losses we expect as of 6/30/19. This amount is dependent on both the strength of the case reserves and the average frequency and severity of the losses incurred.

Municipal Pooling Authority - Workers' Compensation

Estimated Ultimate Program Losses

Accident Year	Reported Loss Development Method (A)	Paid Loss Development Method (B)	Exposure Method Based on Reported Losses (C)	Exposure Method Based on Paid Losses (D)	Frequency-Severity Method (E)	Selected Estimate of Ultimate Losses (F)
Prior	\$27,751,911	\$27,702,066	\$27,748,669	\$27,691,883	\$27,095,155	\$27,728,000
1998-1999	3,343,010	3,475,053	3,340,491	3,450,225	3,002,400	3,343,000
1999-2000	2,979,541	3,039,781	2,984,774	3,065,336	3,473,156	2,980,000
2000-2001	4,041,749	4,060,171	4,035,862	4,024,472	3,537,193	4,042,000
2001-2002	2,447,934	2,475,781	2,451,932	2,487,378	2,642,417	2,448,000
2002-2003	3,812,597	3,976,903	3,818,128	3,990,247	4,147,330	3,813,000
2003-2004	3,448,172	3,501,800	3,453,916	3,517,737	3,659,943	3,448,000
2004-2005	2,856,005	2,835,539	2,845,979	2,803,755	2,557,332	2,856,000
2005-2006	3,275,886	3,251,569	3,270,083	3,235,120	3,131,060	3,276,000
2006-2007	3,834,301	4,022,558	3,836,368	3,998,875	3,852,360	3,834,000
2007-2008	4,711,733	4,817,209	4,699,552	4,774,660	4,547,460	4,712,000
2008-2009	5,248,670	5,571,804	5,181,149	5,367,632	4,404,792	5,249,000
2009-2010	7,525,317	7,784,792	7,422,204	7,510,893	6,379,419	7,525,000
2010-2011	6,772,963	6,975,530	6,687,715	6,754,294	5,969,376	6,773,000
2011-2012	5,930,486	6,413,020	5,953,518	6,336,592	6,104,646	5,930,000
2012-2013	5,943,983	6,818,085	5,960,823	6,591,234	6,049,293	5,944,000
2013-2014	7,959,446	8,027,730	7,713,597	7,525,933	6,511,680	7,518,000
2014-2015	8,001,612	7,428,641	7,772,701	7,237,466	6,962,998	7,505,000
2015-2016	6,338,168	6,978,995	6,530,759	7,022,553	6,926,227	6,758,000
2016-2017	10,686,429	10,474,388	9,472,432	8,572,880	7,613,864	9,234,000
2017-2018	8,076,494	7,384,057	7,937,061	7,745,558	7,255,568	8,007,000
Totals						\$132,923,000
						Projected Losses for the Year 2018-2019 (G)
						\$8,245,000
						Projected Losses for the Year 2019-2020 (H)
						\$8,845,000

Notes:

- (A) From Appendix A, Page 1, Column (G).
- (B) From Appendix B, Page 1, Column (G).
- (C) From Appendix C, Page 1, Column (G).
- (D) From Appendix C, Page 2, Column (G).
- (E) From Appendix D, Page 1, Column (C).
- (F) Selected averages of (A), (B), (C), (D), and (E).
- (G) From Exhibit 5, Page 1, Line (K).
- (H) From Exhibit 5, Page 1, Line (K).

This exhibit summarizes the results of the actuarial methods we have applied to estimate ultimate losses for each year. It is important to apply a number of estimation methods because each one relies on specific assumptions about the claims process that tend to hold generally true, but that may be violated in specific situations. Thus, the more estimation methods that can be applied, the better.

Municipal Pooling Authority - Workers' Compensation  
Estimated Ultimate Limited Losses Capped at \$100,000 per Claim

Accident Year	Reported Loss Development Method (A)	Paid Loss Development Method (B)	Exposure Method Based on Reported Losses (C)	Exposure Method Based on Paid Losses (D)	Frequency-Severity Method (E)	Selected Ultimate Limited Losses (F)
Prior	\$23,240,883	\$23,167,432	\$23,241,714	\$23,171,608	\$23,238,478	\$23,241,000
1998-1999	2,475,571	2,478,659	2,475,698	2,479,178	2,477,160	2,477,000
1999-2000	2,848,456	2,808,031	2,848,634	2,809,788	2,848,185	2,848,000
2000-2001	2,883,120	2,853,404	2,883,351	2,852,680	2,883,155	2,883,000
2001-2002	2,140,430	2,124,924	2,140,632	2,124,685	2,139,950	2,140,000
2002-2003	3,286,689	3,274,432	3,287,168	3,274,606	3,286,932	3,287,000
2003-2004	2,812,244	2,751,927	2,812,800	2,754,759	2,811,951	2,812,000
2004-2005	1,948,973	1,898,148	1,949,519	1,899,382	1,948,860	1,949,000
2005-2006	2,366,551	2,367,979	2,367,488	2,367,989	2,367,080	2,367,000
2006-2007	2,887,523	2,899,167	2,886,138	2,897,371	2,887,920	2,888,000
2007-2008	3,381,286	3,429,475	3,380,114	3,427,720	3,380,860	3,381,000
2008-2009	3,248,461	3,253,281	3,247,897	3,253,328	3,248,016	3,248,000
2009-2010	4,665,509	4,682,906	4,665,823	4,683,530	4,665,857	4,666,000
2010-2011	4,329,382	4,281,227	4,330,749	4,284,178	4,328,964	4,329,000
2011-2012	4,390,167	4,342,052	4,389,517	4,344,845	4,389,990	4,390,000
2012-2013	4,265,279	4,459,815	4,269,659	4,441,957	4,313,949	4,314,000
2013-2014	5,030,261	4,827,949	5,010,071	4,800,526	4,605,296	4,980,000
2014-2015	4,572,271	4,440,998	4,590,799	4,523,099	4,882,487	4,539,000
2015-2016	3,674,038	3,707,798	3,777,553	4,062,959	4,815,602	3,920,000
2016-2017	6,305,033	6,281,597	6,090,216	5,738,880	5,249,144	6,056,000
2017-2018	4,771,565	4,989,478	5,007,162	5,257,940	4,958,544	5,195,000
Totals						\$95,910,000
						Projected Losses for the Year 2018-2019 (G)
						\$5,588,000
						Projected Losses for the Year 2019-2020 (H)
						\$5,944,000

Notes:

- (A) From Appendix A, Page 1, Column (D).
- (B) From Appendix B, Page 1, Column (D).
- (C) Based on results in Appendix C, Page 1.
- (D) Based on results in Appendix C, Page 2.
- (E) Based on results in Appendix D, Page 1.
- (F) Selected averages of (A), (B), (C), (D), and (E).
- (G) From Exhibit 5, Page 1, Line (K) / Line (G).
- (H) From Exhibit 5, Page 1, Line (K) / Line (G).

This exhibit summarizes the results of the actuarial methods we have applied to estimate limited losses for each year. These results are used to select a limited loss rate for future years.



Municipal Pooling Authority - Workers' Compensation

Selection of Projected Limited Loss Rate  
and Projection of Program Losses and ULAE

Accident Year	Ultimate Limited Losses (A)	Trend Factor (B)	Trended Limited Losses (C)	Trended Payroll (\$00) (D)	Trended Limited Loss Rate (E)
1998-1999	2,477,000	1.478	3,661,006	1,411,186	2.594
1999-2000	2,848,000	1.272	3,622,656	1,453,876	2.492
2000-2001	2,883,000	1.168	3,367,344	1,575,494	2.137
2001-2002	2,140,000	1.143	2,446,020	1,648,262	1.484
2002-2003	3,287,000	1.166	3,832,642	2,033,169	1.885
2003-2004	2,812,000	1.400	3,936,800	2,336,473	1.685
2004-2005	1,949,000	1.750	3,410,750	2,396,718	1.423
2005-2006	2,367,000	1.847	4,371,849	2,733,230	1.600
2006-2007	2,888,000	1.706	4,926,928	2,876,440	1.713
2007-2008	3,381,000	1.547	5,230,407	3,130,149	1.671
2008-2009	3,248,000	1.408	4,573,184	3,185,801	1.435
2009-2010	4,666,000	1.259	5,874,494	3,132,497	1.875
2010-2011	4,329,000	1.159	5,017,311	2,789,216	1.799
2011-2012	4,390,000	1.115	4,894,850	2,701,477	1.812
2012-2013	4,314,000	1.111	4,792,854	2,550,769	1.879
2013-2014	4,980,000	1.109	5,522,820	2,613,221	2.113
2014-2015	4,539,000	1.077	4,888,503	2,664,459	1.835
2015-2016	3,920,000	1.071	4,198,320	2,673,871	1.570
2016-2017	6,056,000	1.069	6,473,864	2,779,754	2.329
2017-2018	5,195,000	1.030	5,350,850	2,798,298	1.912
Totals	\$95,910,000		\$141,198,278	50,857,765	\$2.776
13/14-17/18	24,690,000		26,434,357	13,529,603	1.954
14/15-17/18	19,710,000		20,911,537	10,916,382	1.916
				(F) Selected Limited Rate:	\$1.975
				Prior:	\$2.070
Program Year:		2018-2019	2019-2020		
(G) Factor to SIR:		1.475	1.488		
(H) Trend Factor:		1.000	1.030		
(I) Program Rate:		\$2.914	\$3.027		
(J) Trended Payroll (\$00):		2,829,289	2,921,880		
(K) Projected Program Losses:		8,245,000	8,845,000		
(L) Projected ULAE:		0	0		
(M) Projected Loss and ULAE:		\$8,245,000	\$8,845,000		

Notes appear on the next page.

## Municipal Pooling Authority - Workers' Compensation

Selection of Projected Limited Loss Rate  
and Projection of Program Losses and ULAE

## Notes:

- (A) From Exhibit 4, Page 2, Column (F).  
For purposes of projecting future losses, losses are capped at \$100,000 per occurrence.
- (B) #REF!
- (C) (A) x (B).
- (D) From Appendix M, Column (C).
- (E) (C) / (D).
- (F) Selected based on (E).
- (G) Based on a Weibull distribution, a mathematical model of claim sizes.
- (H) #REF!
- (I) (F) x (G) x (H).
- (J) From Appendix M, Column (C).
- (K) (I) x (J).
- (L) Based on an estimated claim closing pattern and the Authority's historical claims administration expenses.
- (M) (K) + (L).

This exhibit shows the calculation of future loss costs based on the past loss rates per \$100 of payroll. The projections will be accurate only to the extent that what has happened in the past is representative of what will happen in the future.

Municipal Pooling Authority - Workers' Compensation

Reported Loss Development

Accident Year (A)	Limited Reported Losses as of 10/31/18 (B)	Reported Loss Development Factor (C)	Ultimate Limited Losses (D)	Program Reported Losses of 10/31/18 (E)	Reported Loss Development Factor (F)	Ultimate Program Losses (G)
Prior	\$23,102,269	1.006	\$23,240,883	\$27,558,998	1.007	\$27,751,911
1998-1999	2,458,362	1.007	2,475,571	3,316,478	1.008	3,343,010
1999-2000	2,825,849	1.008	2,848,456	2,950,041	1.010	2,979,541
2000-2001	2,857,403	1.009	2,883,120	3,989,881	1.013	4,041,749
2001-2002	2,119,238	1.010	2,140,430	2,407,015	1.017	2,447,934
2002-2003	3,247,716	1.012	3,286,689	3,726,879	1.023	3,812,597
2003-2004	2,773,416	1.014	2,812,244	3,347,740	1.030	3,448,172
2004-2005	1,916,394	1.017	1,948,973	2,748,802	1.039	2,856,005
2005-2006	2,320,148	1.020	2,366,551	3,122,866	1.049	3,275,886
2006-2007	2,822,603	1.023	2,887,523	3,620,681	1.059	3,834,301
2007-2008	3,295,600	1.026	3,381,286	4,399,377	1.071	4,711,733
2008-2009	3,156,911	1.029	3,248,461	4,837,484	1.085	5,248,670
2009-2010	4,516,466	1.033	4,665,509	6,828,781	1.102	7,525,317
2010-2011	4,174,910	1.037	4,329,382	6,031,134	1.123	6,772,963
2011-2012	4,205,141	1.044	4,390,167	5,165,929	1.148	5,930,486
2012-2013	4,058,305	1.051	4,265,279	5,041,546	1.179	5,943,983
2013-2014	4,745,529	1.060	5,030,261	6,545,597	1.216	7,959,446
2014-2015	4,269,161	1.071	4,572,271	6,285,634	1.273	8,001,612
2015-2016	3,364,504	1.092	3,674,038	4,670,721	1.357	6,338,168
2016-2017	5,168,060	1.220	6,305,033	6,708,367	1.593	10,686,429
2017-2018	2,828,432	1.687	4,771,565	3,503,902	2.305	8,076,494
Totals	\$90,226,417		\$95,523,692	\$116,807,853		\$134,986,407

Notes:

- (A) Years are 7/1 to 6/30.
- (B) Provided by the Authority. These losses exclude amounts over \$100,000 per occurrence.
- (C) From Appendix A, Page 2. Interpolated to apply to data as of 10/31/18.
- (D) (B) x (C). These estimated losses exclude amounts over \$100,000 per occurrence.
- (E) Losses capped at the Authority's SIR. Amounts are provided by the Authority.
- (F) Derived from factors on Appendix A, Page 4. Interpolated to apply to data as of 10/31/18.
- (G) (E) x (F).

This method tends to understate ultimate losses for the most recent several years because the large losses for those years generally have not yet emerged at the time of our review.

This exhibit shows the calculation of estimated ultimate losses for each year based on paid losses and case reserves as reported by the claims administrator. These losses tend to "develop" or change from period to period as more information becomes available about the cases. This development tends to follow quantifiable patterns over time.

Municipal Pooling Authority - Workers' Compensation  
Reported Loss Development

Limited Losses Reported as of:

Accident Year	12 Months	24 Months	36 Months	48 Months	60 Months	72 Months	84 Months	96 Months	108 Months	120 Months
1997-1998										
1998-1999										2,454,924
1999-2000									2,807,235	2,796,748
2000-2001								2,834,245	2,851,596	2,857,112
2001-2002							2,002,601	2,045,092	2,078,430	2,115,748
2002-2003						3,160,437	3,154,260	3,209,401	3,202,327	3,150,556
2003-2004					2,945,843	2,692,469	2,684,882	2,753,964	2,720,302	2,651,431
2004-2005				1,976,585	1,910,393	1,843,979	1,750,054	1,761,283	1,802,251	1,839,217
2005-2006			2,043,150	2,174,093	2,262,406	2,227,441	2,230,934	2,308,899	2,296,594	2,328,157
2006-2007		2,524,993	2,688,367	2,883,249	2,785,074	2,758,279	2,747,976	2,761,899	2,794,703	2,770,653
2007-2008	2,034,796	2,746,313	3,106,006	3,241,862	3,265,883	3,323,736	3,337,507	3,300,815	3,229,036	3,306,331
2008-2009	1,815,954	2,547,313	3,047,449	3,163,903	3,206,832	3,249,286	3,317,905	3,191,992	3,164,983	3,156,911
2009-2010	2,602,432	4,053,760	4,429,533	4,477,022	4,494,974	4,609,502	4,553,153	4,546,822	4,489,043	
2010-2011	2,177,724	3,372,980	4,085,603	4,032,840	4,121,809	4,146,894	4,092,088	4,123,060		
2011-2012	2,237,306	3,866,321	4,575,307	4,563,313	4,364,372	4,309,630	4,163,291			
2012-2013	2,524,608	3,910,912	4,509,109	4,473,393	4,164,864	4,055,351				
2013-2014	2,243,390	3,662,902	4,672,697	4,745,090	4,707,568					
2014-2015	2,324,025	3,623,639	4,253,968	4,214,180						
2015-2016	2,305,550	3,289,103	3,379,929							
2016-2017	3,232,999	4,843,061								
2017-2018	2,453,613									

Reported Loss Development Factors:

	12-24 Months	24-36 Months	36-48 Months	48-60 Months	60-72 Months	72-84 Months	84-96 Months	96-108 Months	108-120 Months	120-132 Months
1997-1998										
1998-1999										1.001
1999-2000									0.996	0.984
2000-2001								1.006	1.002	0.992
2001-2002							1.021	1.016	1.018	0.980
2002-2003						0.998	1.017	0.998	0.984	0.999
2003-2004					0.914	0.997	1.026	0.988	0.975	1.024
2004-2005				0.967	0.965	0.949	1.006	1.023	1.021	1.029
2005-2006			1.064	1.041	0.985	1.002	1.035	0.995	1.014	0.997
2006-2007		1.065	1.072	0.966	0.990	0.996	1.005	1.012	0.991	1.006
2007-2008	1.350	1.131	1.044	1.007	1.018	1.004	0.989	0.978	1.024	0.985
2008-2009	1.403	1.196	1.038	1.014	1.013	1.021	0.962	0.992	0.997	
2009-2010	1.558	1.093	1.011	1.004	1.025	0.988	0.999	0.987		
2010-2011	1.549	1.211	0.987	1.022	1.006	0.987	1.008			
2011-2012	1.728	1.183	0.997	0.956	0.987	0.966				
2012-2013	1.549	1.153	0.992	0.931	0.974					
2013-2014	1.633	1.276	1.015	0.992						
2014-2015	1.559	1.174	0.991							
2015-2016	1.427	1.028								
2016-2017	1.498									
Average Dollar-weighted Averages	1.525	1.151	1.021	0.990	0.988	0.991	1.007	1.000	1.002	1.000
3-yr	1.495	1.164	1.000	0.960	0.989	0.980	0.992	0.986	1.005	0.996
4-yr	1.526	1.161	0.999	0.974	0.999	0.988	0.991	0.991	1.007	1.002
CSAC Factors	1.470	1.120	1.025	1.015	1.010	1.010	1.009	1.008	1.007	1.006
Prior	1.574	1.188	1.025	1.011	1.009	1.008	1.007	1.005	1.004	1.003
Selected	1.549	1.170	1.024	1.011	1.009	1.008	1.007	1.005	1.004	1.003
Cumulated	1.996	1.289	1.101	1.075	1.063	1.054	1.046	1.039	1.034	1.030

Municipal Pooling Authority - Workers' Compensation  
Reported Loss Development

Limited Losses Reported as of:

Accident Year	132 Months	144 Months	156 Months	168 Months	180 Months	192 Months	204 Months	216 Months	228 Months	240 Months	252 Months
1997-1998	2,450,854	2,444,420	2,461,228	2,462,126	2,462,126	2,464,511	2,470,811	2,509,792	2,523,254	2,524,193	2,524,996
1998-1999	2,458,535	2,463,094	2,457,606	2,465,343	2,482,593	2,479,593	2,444,281	2,441,914	2,441,914	2,458,362	
1999-2000	2,751,231	2,735,208	2,742,099	2,786,722	2,812,481	2,802,460	2,808,659	2,840,427	2,831,335		
2000-2001	2,835,624	2,863,397	2,845,041	2,843,750	2,858,324	2,851,367	2,868,196	2,857,403			
2001-2002	2,073,809	2,095,122	2,100,381	2,100,930	2,087,693	2,119,079	2,119,089				
2002-2003	3,148,384	3,166,634	3,236,611	3,236,611	3,248,679	3,282,179					
2003-2004	2,714,758	2,731,291	2,721,192	2,773,416	2,773,416						
2004-2005	1,892,804	1,894,394	1,894,394	1,904,394							
2005-2006	2,322,143	2,321,752	2,319,874								
2006-2007	2,787,715	2,811,103									
2007-2008	3,257,493										
2008-2009											
2009-2010											
2010-2011											
2011-2012											
2012-2013											
2013-2014											
2014-2015											
2015-2016											
2016-2017											
2017-2018											

	132-144 Months	144-156 Months	156-168 Months	168-180 Months	180-192 Months	192-204 Months	204-216 Months	216-228 Months	228-240 Months	240-252 Months	252-Ult. Months
1997-1998	0.997	1.007	1.000	1.000	1.001	1.003	1.016	1.005	1.000	1.000	
1998-1999	1.002	0.998	1.003	1.007	0.999	0.986	0.999	1.000	1.007		
1999-2000	0.994	1.003	1.016	1.009	0.996	1.002	1.011	0.997			
2000-2001	1.010	0.994	1.000	1.005	0.998	1.006	0.996				
2001-2002	1.010	1.003	1.000	0.994	1.015	1.000					
2002-2003	1.006	1.022	1.000	1.004	1.010						
2003-2004	1.006	0.996	1.019	1.000							
2004-2005	1.001	1.000	1.005								
2005-2006	1.000	0.999									
2006-2007	1.008										
2007-2008											
2008-2009											
2009-2010											
2010-2011											
2011-2012											
2012-2013											
2013-2014											
2014-2015											
2015-2016											
2016-2017											

	132-144 Months	144-156 Months	156-168 Months	168-180 Months	180-192 Months	192-204 Months	204-216 Months	216-228 Months	228-240 Months	240-252 Months	252-Ult. Months
Average Dollar-weighted Averages	1.003	1.002	1.005	1.003	1.003	0.999	1.006	1.001	1.004	1.000	
3-yr	1.004	0.998	1.008	1.000	1.007	1.003	1.002	1.001			
4-yr	1.004	1.006	1.006	1.001	1.004	0.999	1.005				
CSAC Factors	1.005	1.005	1.004	1.003	1.003	1.003	1.003	1.002	1.002	1.002	1.006
Prior	1.003	1.003	1.003	1.003	1.002	1.002	1.002	1.001	1.001	1.001	1.006
Selected	1.003	1.003	1.003	1.003	1.002	1.002	1.002	1.001	1.001	1.001	1.006
Cumulated	1.027	1.024	1.021	1.018	1.015	1.013	1.011	1.009	1.008	1.007	1.006

Municipal Pooling Authority - Workers' Compensation  
Reported between \$100,000 and \$500,000 Loss Development

Accident Year	<u>Losses Reported as of:</u>									
	12 Months	24 Months	36 Months	48 Months	60 Months	72 Months	84 Months	96 Months	108 Months	120 Months
1997-1998										
1998-1999										1,308,116
1999-2000									294,529	294,529
2000-2001								927,263	1,063,094	1,159,090
2001-2002							145,487	145,487	181,082	206,919
2002-2003						594,472	593,028	606,306	580,772	572,235
2003-2004					537,905	514,076	514,076	514,076	514,076	514,076
2004-2005				548,030	581,213	594,237	616,170	614,962	624,736	624,736
2005-2006			59,389	188,429	299,321	364,382	365,895	408,542	541,776	645,776
2006-2007		435,789	633,325	705,295	744,206	754,206	723,665	709,561	728,304	741,540
2007-2008	25,388	67,351	163,151	539,368	597,054	956,707	1,021,285	981,412	879,038	1,137,897
2008-2009	827,313	1,095,576	1,158,127	1,400,442	1,558,114	1,662,530	1,734,469	1,735,902	1,711,000	1,670,569
2009-2010	109,738	958,571	1,846,507	2,104,489	2,106,983	2,027,198	2,153,320	2,164,285	2,179,622	
2010-2011	26,296	147,111	710,579	882,450	984,740	1,517,245	1,711,916	1,844,072		
2011-2012	12,432	301,624	693,432	901,461	978,919	997,234	957,703			
2012-2013	23,515	555,651	1,179,714	1,402,266	1,124,921	983,241				
2013-2014	410,909	740,759	1,445,494	1,686,044	1,800,067					
2014-2015	11,126	500,392	1,099,634	1,881,700						
2015-2016	465,565	1,268,794	1,202,248							
2016-2017	510,404	1,223,535								
2017-2018	512,895									

Reported Loss Development Factors:

	12-24 Months	24-36 Months	36-48 Months	48-60 Months	60-72 Months	72-84 Months	84-96 Months	96-108 Months	108-120 Months	120-132 Months
1997-1998										
1998-1999										1.000
1999-2000									1.000	0.975
2000-2001								1.146	1.090	1.108
2001-2002							1.000	1.245	1.143	0.914
2002-2003						0.998	1.022	0.958	0.985	0.865
2003-2004					0.956	1.000	1.000	1.000	1.000	1.000
2004-2005				1.061	1.022	1.037	0.998	1.016	1.000	1.107
2005-2006			3.173	1.589	1.217	1.004	1.117	1.326	1.192	1.193
2006-2007		1.453	1.114	1.055	1.013	0.960	0.981	1.026	1.018	1.047
2007-2008	2.653	2.422	3.306	1.107	1.602	1.068	0.961	0.896	1.294	0.957
2008-2009	1.324	1.057	1.209	1.113	1.067	1.043	1.001	0.986	0.976	
2009-2010	8.735	1.926	1.140	1.001	0.962	1.062	1.005	1.007		
2010-2011	5.595	4.830	1.242	1.116	1.541	1.128	1.077			
2011-2012	24.263	2.299	1.300	1.086	1.019	0.960				
2012-2013	23.630	2.123	1.189	0.802	0.874					
2013-2014	1.803	1.951	1.166	1.068						
2014-2015	44.975	2.198	1.711							
2015-2016	2.725	0.948								
2016-2017	2.397									

	12-24 Months	24-36 Months	36-48 Months	48-60 Months	60-72 Months	72-84 Months	84-96 Months	96-108 Months	108-120 Months	120-132 Months
Average Dollar-weighted Averages	11.810	2.121	1.655	1.100	1.127	1.026	1.016	1.061	1.070	1.017
3-yr	3.032	1.493	1.334	0.978	1.132	1.062	1.026	0.977	1.070	1.044
4-yr	2.671	1.607	1.329	1.003	1.063	1.057	1.016	0.983	1.087	1.057
CSAC Factors	2.750	1.900	1.380	1.270	1.130	1.100	1.080	1.070	1.055	1.050
Prior	2.750	1.900	1.380	1.270	1.130	1.100	1.080	1.070	1.055	1.050
Selected	2.750	1.900	1.380	1.270	1.130	1.100	1.080	1.070	1.055	1.050
Cumulated	18.101	6.582	3.464	2.510	1.976	1.749	1.590	1.472	1.376	1.304

Municipal Pooling Authority - Workers' Compensation  
 Reported between \$100,000 and \$500,000 Loss Development

Accident Year	Losses Reported as of:										
	132 Months	144 Months	156 Months	168 Months	180 Months	192 Months	204 Months	216 Months	228 Months	240 Months	252 Months
1997-1998	1,177,049	1,141,144	1,240,603	1,197,250	1,184,321	1,339,391	1,358,442	1,346,512	1,346,512	1,346,512	1,346,512
1998-1999	1,308,116	1,308,116	1,308,116	1,308,116	1,308,116	1,308,116	1,308,117	1,308,116	1,308,116	1,308,116	1,308,116
1999-2000	287,171	287,171	287,171	287,171	291,174	213,674	213,674	213,674	124,191		
2000-2001	1,284,376	1,284,376	1,401,238	1,512,460	1,512,460	1,620,209	1,428,676	1,428,676			
2001-2002	189,161	195,282	195,282	287,579	287,579	287,579	287,777				
2002-2003	495,136	495,136	495,136	498,434	508,346	502,075					
2003-2004	514,076	523,685	531,955	574,324	574,324						
2004-2005	691,610	699,021	827,027	829,527							
2005-2006	770,723	762,651	802,717								
2006-2007	776,458	793,078									
2007-2008	1,089,384										
2008-2009											
2009-2010											
2010-2011											
2011-2012											
2012-2013											
2013-2014											
2014-2015											
2015-2016											
2016-2017											
2017-2018											
	132-144 Months	144-156 Months	156-168 Months	168-180 Months	180-192 Months	192-204 Months	204-216 Months	216-228 Months	228-240 Months	240-252 Months	252-Ult. Months
1997-1998	0.969	1.087	0.965	0.989	1.131	1.014	0.991	1.000	1.000	1.000	
1998-1999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000		
1999-2000	1.000	1.000	1.000	1.014	0.734	1.000	1.000	0.581			
2000-2001	1.000	1.091	1.079	1.000	1.071	0.882	1.000				
2001-2002	1.032	1.000	1.473	1.000	1.000	1.001					
2002-2003	1.000	1.000	1.007	1.020	0.988						
2003-2004	1.019	1.016	1.080	1.000							
2004-2005	1.011	1.183	1.003								
2005-2006	0.990	1.053									
2006-2007	1.021										
2007-2008											
2008-2009											
2009-2010											
2010-2011											
2011-2012											
2012-2013											
2013-2014											
2014-2015											
2015-2016											
2016-2017											
	132-144 Months	144-156 Months	156-168 Months	168-180 Months	180-192 Months	192-204 Months	204-216 Months	216-228 Months	228-240 Months	240-252 Months	252-Ult. Months
Average Dollar-weighted Averages	1.004	1.048	1.076	1.003	0.987	0.979	0.998	0.860	1.000	1.000	
3-yr	1.007	1.089	1.026	1.007	1.044	0.910	1.000	0.969			
4-yr	1.009	1.071	1.069	1.003	1.009	0.944	0.997				
CSAC Factors	1.040	1.029	1.030	1.026	1.024	1.020	1.015	1.011	1.008	1.005	1.010
Prior	1.040	1.030	1.030	1.025	1.025	1.020	1.015	1.011	1.008	1.005	1.010
Selected	1.040	1.030	1.030	1.025	1.025	1.020	1.015	1.011	1.008	1.005	1.010
Cumulated	1.242	1.194	1.159	1.125	1.098	1.071	1.050	1.034	1.023	1.015	1.010

Municipal Pooling Authority - Workers' Compensation

Paid Loss Development

Accident Year (A)	Limited Paid Losses as of 10/31/18 (B)	Paid Loss Development Factor (C)	Ultimate Limited Losses (D)	Program Paid Losses of 10/31/18 (E)	Paid Loss Development Factor (F)	Ultimate Program Losses (G)
Prior	\$22,892,719	1.012	\$23,167,432	\$26,662,239	1.039	\$27,702,066
1998-1999	2,442,029	1.015	2,478,659	3,300,145	1.053	3,475,053
1999-2000	2,755,673	1.019	2,808,031	2,856,937	1.064	3,039,781
2000-2001	2,789,251	1.023	2,853,404	3,780,420	1.074	4,060,171
2001-2002	2,069,059	1.027	2,124,924	2,283,931	1.084	2,475,781
2002-2003	3,175,977	1.031	3,274,432	3,625,253	1.097	3,976,903
2003-2004	2,656,300	1.036	2,751,927	3,140,628	1.115	3,501,800
2004-2005	1,823,389	1.041	1,898,148	2,507,108	1.131	2,835,539
2005-2006	2,263,842	1.046	2,367,979	2,837,320	1.146	3,251,569
2006-2007	2,755,862	1.052	2,899,167	3,455,806	1.164	4,022,558
2007-2008	3,238,409	1.059	3,429,475	4,065,155	1.185	4,817,209
2008-2009	3,051,858	1.066	3,253,281	4,600,994	1.211	5,571,804
2009-2010	4,352,143	1.076	4,682,906	6,272,999	1.241	7,784,792
2010-2011	3,942,198	1.086	4,281,227	5,441,131	1.282	6,975,530
2011-2012	3,936,584	1.103	4,342,052	4,785,836	1.340	6,413,020
2012-2013	3,950,235	1.129	4,459,815	4,825,255	1.413	6,818,085
2013-2014	4,122,928	1.171	4,827,949	5,288,360	1.518	8,027,730
2014-2015	3,572,806	1.243	4,440,998	4,450,953	1.669	7,428,641
2015-2016	2,622,205	1.414	3,707,798	3,557,082	1.962	6,978,995
2016-2017	3,341,275	1.880	6,281,597	3,921,523	2.671	10,474,388
2017-2018	1,334,085	3.740	4,989,478	1,369,955	5.390	7,384,057
Totals	\$83,088,827		\$95,320,679	\$103,029,030		\$137,015,472

Notes:

- (A) Years are 7/1 to 6/30.
- (B) Provided by the Authority. These losses exclude amounts over \$100,000 per occurrence.
- (C) From Appendix B, Page 2. Interpolated to apply to data as of 10/31/18.
- (D) (B) x (C). These estimated losses exclude amounts over \$100,000 per occurrence.
- (E) Losses capped at the Authority's SIR. Amounts are provided by the Authority.
- (F) Derived from factors on Appendix B, Page 4. Interpolated to apply to data as of 10/31/18.
- (G) (E) x (F).

This method tends to understate ultimate losses for the most recent several years because the large losses for those years generally have not yet emerged at the time of our review.

This exhibit shows the calculation of estimated ultimate losses for each year based on paid losses as reported by the claims administrator. These losses tend to "develop" or change from period to period as more information becomes available about the cases. This development tends to follow quantifiable patterns over time.



Municipal Pooling Authority - Workers' Compensation  
Paid Loss Development

Accident Year	Limited Losses Paid as of:									
	12 Months	24 Months	36 Months	48 Months	60 Months	72 Months	84 Months	96 Months	108 Months	120 Months
1997-1998										
1998-1999										2,375,676
1999-2000									2,537,628	2,559,571
2000-2001								2,667,919	2,700,731	2,730,248
2001-2002							1,870,263	1,897,477	1,931,289	1,972,137
2002-2003						2,871,087	2,931,497	3,002,705	3,023,192	3,054,369
2003-2004					2,326,110	2,371,968	2,421,783	2,527,567	2,540,161	2,553,320
2004-2005				1,511,599	1,543,162	1,595,159	1,655,814	1,677,073	1,695,912	1,717,531
2005-2006			1,373,909	1,736,683	1,902,352	2,017,147	2,087,363	2,125,077	2,205,025	2,222,784
2006-2007		1,487,074	2,093,465	2,347,655	2,422,118	2,525,706	2,567,027	2,599,702	2,739,799	2,749,494
2007-2008	557,256	1,538,605	2,152,678	2,658,493	2,874,957	2,992,702	3,061,396	3,114,479	3,130,046	3,221,684
2008-2009	636,147	1,616,151	2,150,566	2,520,268	2,750,461	2,855,577	2,958,789	2,993,410	3,029,659	3,050,366
2009-2010	733,213	2,021,035	2,929,847	3,429,600	3,722,672	3,939,986	4,144,551	4,254,971	4,333,805	
2010-2011	717,578	1,851,382	2,847,009	3,258,339	3,446,942	3,666,267	3,848,021	3,925,362		
2011-2012	792,545	2,113,114	3,082,130	3,582,660	3,768,252	3,831,285	3,930,258			
2012-2013	805,718	2,348,117	3,123,194	3,685,449	3,861,213	3,944,479				
2013-2014	679,124	2,064,510	3,020,560	3,695,251	4,094,260					
2014-2015	793,301	1,960,348	3,001,051	3,509,005						
2015-2016	700,558	1,696,714	2,582,458							
2016-2017	1,062,343	2,741,232								
2017-2018	844,123									

Paid Loss Development Factors:

	12-24 Months	24-36 Months	36-48 Months	48-60 Months	60-72 Months	72-84 Months	84-96 Months	96-108 Months	108-120 Months	120-132 Months
1997-1998										
1998-1999										1.003
1999-2000									1.009	1.008
2000-2001								1.012	1.011	1.002
2001-2002							1.015	1.018	1.021	1.007
2002-2003						1.021	1.024	1.007	1.010	1.009
2003-2004					1.020	1.021	1.044	1.005	1.005	1.007
2004-2005				1.021	1.034	1.038	1.013	1.011	1.013	1.021
2005-2006			1.264	1.095	1.060	1.035	1.018	1.038	1.008	1.014
2006-2007		1.408	1.121	1.032	1.043	1.016	1.013	1.054	1.004	1.002
2007-2008	2.761	1.399	1.235	1.081	1.041	1.023	1.017	1.005	1.029	1.002
2008-2009	2.541	1.331	1.172	1.091	1.038	1.036	1.012	1.012	1.007	
2009-2010	2.756	1.450	1.171	1.085	1.058	1.052	1.027	1.019		
2010-2011	2.580	1.538	1.144	1.058	1.064	1.050	1.020			
2011-2012	2.666	1.459	1.162	1.052	1.017	1.026				
2012-2013	2.914	1.330	1.180	1.048	1.022					
2013-2014	3.040	1.463	1.223	1.108						
2014-2015	2.471	1.531	1.169							
2015-2016	2.422	1.522								
2016-2017	2.580									

	12-24 Months	24-36 Months	36-48 Months	48-60 Months	60-72 Months	72-84 Months	84-96 Months	96-108 Months	108-120 Months	120-132 Months
Average Dollar-weighted Averages	2.673	1.443	1.184	1.067	1.040	1.032	1.020	1.018	1.012	1.008
3-yr	2.503	1.504	1.191	1.069	1.033	1.042	1.020	1.013	1.014	1.005
4-yr	2.616	1.453	1.184	1.067	1.039	1.041	1.020	1.021	1.013	1.008
CSAC Factors	2.500	1.400	1.170	1.090	1.050	1.033	1.020	1.015	1.012	1.010
Prior	2.781	1.434	1.177	1.071	1.045	1.025	1.018	1.010	1.009	1.008
Selected	2.748	1.438	1.178	1.070	1.045	1.025	1.018	1.010	1.009	1.008
Cumulated	5.920	2.154	1.498	1.272	1.189	1.138	1.110	1.090	1.079	1.069

Municipal Pooling Authority - Workers' Compensation  
Paid Loss Development

Limited Losses Paid as of:

Accident Year	132 Months	144 Months	156 Months	168 Months	180 Months	192 Months	204 Months	216 Months	228 Months	240 Months	252 Months
1997-1998	2,420,792	2,425,180	2,426,366	2,429,302	2,431,642	2,433,077	2,441,231	2,479,972	2,488,975	2,495,116	2,497,240
1998-1999	2,383,097	2,387,469	2,399,594	2,415,518	2,419,456	2,424,748	2,441,914	2,441,914	2,441,914	2,442,029	
1999-2000	2,579,395	2,590,556	2,601,211	2,708,089	2,719,352	2,729,656	2,731,572	2,745,205	2,755,673		
2000-2001	2,735,479	2,769,470	2,771,681	2,777,286	2,782,711	2,783,907	2,786,168	2,788,000			
2001-2002	1,986,754	2,013,602	2,035,187	2,040,694	2,065,439	2,067,297	2,068,255				
2002-2003	3,082,679	3,091,063	3,104,747	3,105,822	3,116,338	3,175,400					
2003-2004	2,570,920	2,638,576	2,645,119	2,653,021	2,655,486						
2004-2005	1,752,928	1,789,302	1,799,773	1,821,844							
2005-2006	2,253,154	2,255,469	2,262,891								
2006-2007	2,755,514	2,755,607									
2007-2008	3,229,157										
2008-2009											
2009-2010											
2010-2011											
2011-2012											
2012-2013											
2013-2014											
2014-2015											
2015-2016											
2016-2017											
2017-2018											

	132-144 Months	144-156 Months	156-168 Months	168-180 Months	180-192 Months	192-204 Months	204-216 Months	216-228 Months	228-240 Months	240-252 Months	252-Ult. Months
1997-1998	1.002	1.000	1.001	1.001	1.001	1.003	1.016	1.004	1.002	1.001	
1998-1999	1.002	1.005	1.007	1.002	1.002	1.007	1.000	1.000	1.000		
1999-2000	1.004	1.004	1.041	1.004	1.004	1.001	1.005	1.004			
2000-2001	1.012	1.001	1.002	1.002	1.000	1.001	1.001				
2001-2002	1.014	1.011	1.003	1.012	1.001	1.000					
2002-2003	1.003	1.004	1.000	1.003	1.019						
2003-2004	1.026	1.002	1.003	1.001							
2004-2005	1.021	1.006	1.012								
2005-2006	1.001	1.003									
2006-2007	1.000										
2007-2008											
2008-2009											
2009-2010											
2010-2011											
2011-2012											
2012-2013											
2013-2014											
2014-2015											
2015-2016											
2016-2017											

	132-144 Months	144-156 Months	156-168 Months	168-180 Months	180-192 Months	192-204 Months	204-216 Months	216-228 Months	228-240 Months	240-252 Months	252-Ult. Months
Average Dollar-weighted Averages	1.009	1.004	1.009	1.004	1.005	1.002	1.006	1.003	1.001	1.001	
3-yr	1.006	1.004	1.004	1.005	1.008	1.001	1.002	1.003			
4-yr	1.011	1.004	1.004	1.004	1.007	1.002	1.005				
CSAC Factors	1.009	1.008	1.007	1.006	1.005	1.005	1.004	1.004	1.004	1.004	1.013
Prior	1.007	1.006	1.005	1.005	1.005	1.005	1.004	1.004	1.004	1.003	1.013
Selected	1.007	1.006	1.005	1.005	1.005	1.005	1.004	1.004	1.004	1.003	1.013
Cumulated	1.061	1.054	1.048	1.043	1.038	1.033	1.028	1.024	1.020	1.016	1.013

Municipal Pooling Authority - Workers' Compensation  
Paid between \$100,000 and \$500,000 Loss Development

Accident Year	<u>Losses Paid as of:</u>									
	12 Months	24 Months	36 Months	48 Months	60 Months	72 Months	84 Months	96 Months	108 Months	120 Months
1997-1998										
1998-1999										1,253,666
1999-2000									51,255	51,260
2000-2001								556,971	583,624	624,634
2001-2002							106,032	111,773	111,773	157,312
2002-2003						299,906	336,089	404,371	413,487	413,879
2003-2004					474,556	474,720	474,720	474,720	474,720	474,720
2004-2005				172,230	250,899	353,762	427,370	504,834	567,539	618,711
2005-2006			12,940	25,496	103,391	178,873	258,411	270,684	358,310	385,252
2006-2007		117,649	262,264	407,427	454,961	480,459	505,912	514,460	549,294	562,448
2007-2008			20,350	231,443	308,624	480,323	559,482	599,628	632,284	702,777
2008-2009		409,752	520,694	775,648	967,526	1,124,067	1,363,726	1,432,732	1,532,287	1,546,761
2009-2010		75,514	783,857	1,175,394	1,572,595	1,653,273	1,786,930	1,864,737	1,910,876	
2010-2011			131,557	277,293	431,600	796,249	1,295,679	1,496,223		
2011-2012		18,227	242,003	492,976	734,362	837,218	847,126			
2012-2013		61,835	208,508	747,704	794,300	869,731				
2013-2014		349,619	551,822	957,449	1,128,530					
2014-2015		116,525	435,375	845,226						
2015-2016			884,384							
2016-2017	20,698	154,599								
2017-2018										

Paid Loss Development Factors:

	12-24 Months	24-36 Months	36-48 Months	48-60 Months	60-72 Months	72-84 Months	84-96 Months	96-108 Months	108-120 Months	120-132 Months
	1997-1998									
1998-1999										1.000
1999-2000									1.000	1.001
2000-2001								1.048	1.070	1.108
2001-2002							1.054	1.000	1.407	1.093
2002-2003						1.121	1.203	1.023	1.001	1.017
2003-2004					1.000	1.000	1.000	1.000	1.000	1.000
2004-2005				1.457	1.410	1.208	1.181	1.124	1.090	1.012
2005-2006			1.970	4.055	1.730	1.445	1.047	1.324	1.075	1.318
2006-2007		2.229	1.553	1.117	1.056	1.053	1.017	1.068	1.024	1.160
2007-2008			11.373	1.333	1.556	1.165	1.072	1.054	1.111	1.164
2008-2009		1.271	1.490	1.247	1.162	1.213	1.051	1.069	1.009	
2009-2010		10.380	1.500	1.338	1.051	1.081	1.044	1.025		
2010-2011			2.108	1.556	1.845	1.627	1.155			
2011-2012		13.277	2.037	1.490	1.140	1.012				
2012-2013		3.372	3.586	1.062	1.095					
2013-2014		1.578	1.735	1.179						
2014-2015		3.736	1.941							
2015-2016										
2016-2017	7.469									
Average Dollar-weighted Averages	7.469	5.120	2.929	1.583	1.305	1.193	1.082	1.074	1.079	1.087
3-yr			2.133	1.209	1.277	1.196	1.078	1.046	1.036	1.198
4-yr			2.117	1.248	1.177	1.200	1.077	1.048	1.041	1.147
CSAC Factors	4.000	3.100	2.400	1.750	1.500	1.300	1.250	1.175	1.100	1.080
Prior	4.000	3.100	2.400	1.750	1.500	1.300	1.250	1.175	1.100	1.080
Selected	4.000	3.100	2.400	1.750	1.500	1.300	1.250	1.175	1.100	1.080
Cumulated	331.020	82.755	26.695	11.123	6.356	4.237	3.259	2.607	2.219	2.017

Municipal Pooling Authority - Workers' Compensation  
Paid between \$100,000 and \$500,000 Loss Development

Accident Year	Losses Paid as of:										
	132 Months	144 Months	156 Months	168 Months	180 Months	192 Months	204 Months	216 Months	228 Months	240 Months	252 Months
1997-1998	1,035,811	1,055,973	1,061,755	1,068,013	1,137,157	1,145,059	1,160,609	1,179,047	1,204,693	1,243,119	1,261,858
1998-1999	1,254,175	1,283,746	1,294,149	1,308,116	1,308,116	1,308,116	1,308,116	1,308,116	1,308,116	1,308,116	1,308,116
1999-2000	51,312	51,312	51,312	58,525	68,548	79,372	90,911	96,377	99,861		
2000-2001	692,043	740,551	813,551	858,217	877,336	924,697	959,522	987,204			
2001-2002	172,006	184,612	185,887	199,550	214,453	214,674	214,872				
2002-2003	421,025	427,009	433,081	440,088	443,539	448,513					
2003-2004	474,720	484,329	484,329	484,329	484,329						
2004-2005	626,133	634,932	648,198	656,603							
2005-2006	507,599	547,090	562,900								
2006-2007	652,336	675,617									
2007-2008	817,696										
2008-2009											
2009-2010											
2010-2011											
2011-2012											
2012-2013											
2013-2014											
2014-2015											
2015-2016											
2016-2017											
2017-2018											
	132-144 Months	144-156 Months	156-168 Months	168-180 Months	180-192 Months	192-204 Months	204-216 Months	216-228 Months	228-240 Months	240-252 Months	252-Ult. Months
1997-1998	1.019	1.005	1.006	1.065	1.007	1.014	1.016	1.022	1.032	1.015	
1998-1999	1.024	1.008	1.011	1.000	1.000	1.000	1.000	1.000	1.000		
1999-2000	1.000	1.000	1.141	1.171	1.158	1.145	1.060	1.036			
2000-2001	1.070	1.099	1.055	1.022	1.054	1.038	1.029				
2001-2002	1.073	1.007	1.074	1.075	1.001	1.001					
2002-2003	1.014	1.014	1.016	1.008	1.011						
2003-2004	1.020	1.000	1.000	1.000							
2004-2005	1.014	1.021	1.013								
2005-2006	1.078	1.029									
2006-2007	1.036										
2007-2008											
2008-2009											
2009-2010											
2010-2011											
2011-2012											
2012-2013											
2013-2014											
2014-2015											
2015-2016											
2016-2017											
	132-144 Months	144-156 Months	156-168 Months	168-180 Months	180-192 Months	192-204 Months	204-216 Months	216-228 Months	228-240 Months	240-252 Months	252-Ult. Months
Average	1.035	1.020	1.040	1.049	1.039	1.040	1.026	1.019	1.016	1.015	
Dollar-weighted											
Averages											
3-yr	1.040	1.017	1.010	1.016	1.034	1.038	1.014	1.011			
4-yr	1.036	1.017	1.017	1.019	1.040	1.018	1.015				
CSAC											
Factors	1.070	1.055	1.045	1.035	1.035	1.030	1.030	1.030	1.030	1.030	1.275
Prior	1.070	1.055	1.045	1.035	1.035	1.030	1.030	1.030	1.030	1.030	1.275
Selected	1.070	1.055	1.045	1.035	1.035	1.030	1.030	1.030	1.030	1.030	1.275
Cumulated	1.868	1.746	1.655	1.584	1.530	1.478	1.435	1.393	1.352	1.313	1.275

Municipal Pooling Authority - Workers' Compensation

Exposure and Development Method  
Based on Reported Losses

Accident Year	Trended Payroll (\$00) (A)	Reported Losses as of 10/31/18 (B)	Loss Development Factor (C)	Percentage of Losses Yet to Be Reported (D)	Program Rate (E)	Incurred but not Reported (IBNR) (F)	Ultimate Program Losses (G)
1998-1999	1,411,186	3,316,478	1.008	0.008	2.127	24,013	3,340,491
1999-2000	1,453,876	2,950,041	1.010	0.010	2.389	34,733	2,984,774
2000-2001	1,575,494	3,989,881	1.013	0.013	2.245	45,981	4,035,862
2001-2002	1,648,262	2,407,015	1.017	0.017	1.603	44,917	2,451,932
2002-2003	2,033,169	3,726,879	1.023	0.022	2.040	91,249	3,818,128
2003-2004	2,336,473	3,347,740	1.030	0.029	1.567	106,176	3,453,916
2004-2005	2,396,718	2,748,802	1.039	0.038	1.067	97,177	2,845,979
2005-2006	2,733,230	3,122,866	1.049	0.047	1.146	147,217	3,270,083
2006-2007	2,876,440	3,620,681	1.059	0.056	1.339	215,687	3,836,368
2007-2008	3,130,149	4,399,377	1.071	0.066	1.453	300,175	4,699,552
2008-2009	3,185,801	4,837,484	1.085	0.078	1.383	343,665	5,181,149
2009-2010	3,132,497	6,828,781	1.102	0.093	2.037	593,423	7,422,204
2010-2011	2,789,216	6,031,134	1.123	0.110	2.140	656,581	6,687,715
2011-2012	2,701,477	5,165,929	1.148	0.129	2.260	787,589	5,953,518
2012-2013	2,550,769	5,041,546	1.179	0.152	2.371	919,277	5,960,823
2013-2014	2,613,221	6,545,597	1.216	0.178	2.511	1,168,000	7,713,597
2014-2015	2,664,459	6,285,634	1.273	0.214	2.608	1,487,067	7,772,701
2015-2016	2,673,871	4,670,721	1.357	0.263	2.645	1,860,038	6,530,759
2016-2017	2,779,754	6,708,367	1.593	0.372	2.673	2,764,065	9,472,432
2017-2018	2,798,298	3,503,902	2.305	0.566	2.799	4,433,159	7,937,061
Totals	50,857,765	\$116,807,853				\$16,309,860	\$133,117,713

Notes:

- (A) From Appendix M, Column (C).
- (B) Provided by the Authority. These losses exclude amounts incurred above the Authority's SIR for each year.
- (C) From Appendix A, Page 1, Column (F).
- (D)  $1 - 1/(C)$ .
- (E) From Appendix C, Page 3, Column (H).
- (F)  $(A) \times (D) \times (E)$ .
- (G)  $(B) + (F)$ .

This exhibit shows the calculation of ultimate losses based on the assumption that there is an underlying relationship between losses and exposure that changes in regular ways over time. The method relies on the premise that the losses that are currently unreported will cost what this relationship would suggest.

Municipal Pooling Authority - Workers' Compensation

Exposure and Development Method  
Based on Paid Losses

Accident Year	Trended Payroll (\$00) (A)	Paid Losses as of 10/31/18 (B)	Loss Development Factor (C)	Percentage of Losses Yet to Be Paid (D)	Program Rate (E)	Incurred but not Paid (F)	Ultimate Program Losses (G)
1998-1999	1,411,186	3,300,145	1.053	0.050	2.127	150,080	3,450,225
1999-2000	1,453,876	2,856,937	1.064	0.060	2.389	208,399	3,065,336
2000-2001	1,575,494	3,780,420	1.074	0.069	2.245	244,052	4,024,472
2001-2002	1,648,262	2,283,931	1.084	0.077	1.603	203,447	2,487,378
2002-2003	2,033,169	3,625,253	1.097	0.088	2.040	364,994	3,990,247
2003-2004	2,336,473	3,140,628	1.115	0.103	1.567	377,109	3,517,737
2004-2005	2,396,718	2,507,108	1.131	0.116	1.067	296,647	2,803,755
2005-2006	2,733,230	2,837,320	1.146	0.127	1.146	397,800	3,235,120
2006-2007	2,876,440	3,455,806	1.164	0.141	1.339	543,069	3,998,875
2007-2008	3,130,149	4,065,155	1.185	0.156	1.453	709,505	4,774,660
2008-2009	3,185,801	4,600,994	1.211	0.174	1.383	766,638	5,367,632
2009-2010	3,132,497	6,272,999	1.241	0.194	2.037	1,237,894	7,510,893
2010-2011	2,789,216	5,441,131	1.282	0.220	2.140	1,313,163	6,754,294
2011-2012	2,701,477	4,785,836	1.340	0.254	2.260	1,550,756	6,336,592
2012-2013	2,550,769	4,825,255	1.413	0.292	2.371	1,765,979	6,591,234
2013-2014	2,613,221	5,288,360	1.518	0.341	2.511	2,237,573	7,525,933
2014-2015	2,664,459	4,450,953	1.669	0.401	2.608	2,786,513	7,237,466
2015-2016	2,673,871	3,557,082	1.962	0.490	2.645	3,465,471	7,022,553
2016-2017	2,779,754	3,921,523	2.671	0.626	2.673	4,651,357	8,572,880
2017-2018	2,798,298	1,369,955	5.390	0.814	2.799	6,375,603	7,745,558
Totals	50,857,765	\$103,029,030				\$30,675,693	\$133,704,723

Notes:

- (A) From Appendix M, Column (C).
- (B) Provided by the Authority. These losses exclude amounts paid above the Authority's SIR for each year.
- (C) From Appendix B, Page 1, Column (F).
- (D)  $1 - 1/(C)$ .
- (E) From Appendix C, Page 3, Column (H).
- (F)  $(A) \times (D) \times (E)$ .
- (G)  $(B) + (F)$ .

This exhibit shows the calculation of ultimate losses based on the assumption that there is an underlying relationship between losses and exposure that changes in regular ways over time. The method relies on the premise that the losses that are currently unpaid will cost what this relationship would suggest.

Municipal Pooling Authority - Workers' Compensation

Exposure and Development Method

Accident Year	Trended Payroll (\$00) (A)	Ultimate Limited Losses (B)	Trend Factor (C)	Trended Limited Losses (D)	Trended Limited Loss Rate (E)	Limited Loss Rate (F)	Factor to SIR (G)	Program Loss Rate (H)
1998-1999	1,411,186	2,477,000	1.478	3,661,006	2.594	1.755	1.212	2.127
1999-2000	1,453,876	2,848,000	1.272	3,622,656	2.492	1.959	1.219	2.389
2000-2001	1,575,494	2,883,000	1.168	3,367,344	2.137	1.830	1.227	2.245
2001-2002	1,648,262	2,140,000	1.143	2,446,020	1.484	1.298	1.235	1.603
2002-2003	2,033,169	3,287,000	1.166	3,832,642	1.885	1.617	1.262	2.040
2003-2004	2,336,473	2,812,000	1.400	3,936,800	1.685	1.204	1.302	1.567
2004-2005	2,396,718	1,949,000	1.750	3,410,750	1.423	0.813	1.312	1.067
2005-2006	2,733,230	2,367,000	1.847	4,371,849	1.600	0.866	1.323	1.146
2006-2007	2,876,440	2,888,000	1.706	4,926,928	1.713	1.004	1.334	1.339
2007-2008	3,130,149	3,381,000	1.547	5,230,407	1.671	1.080	1.345	1.453
2008-2009	3,185,801	3,248,000	1.408	4,573,184	1.435	1.020	1.356	1.383
2009-2010	3,132,497	4,666,000	1.259	5,874,494	1.875	1.490	1.367	2.037
2010-2011	2,789,216	4,329,000	1.159	5,017,311	1.799	1.552	1.379	2.140
2011-2012	2,701,477	4,390,000	1.115	4,894,850	1.812	1.625	1.391	2.260
2012-2013	2,550,769	4,314,000	1.111	4,792,854	1.879	1.691	1.402	2.371
2013-2014	2,613,221	4,980,000	1.109	5,522,820	2.113	1.776	1.414	2.511
2014-2015	2,664,459	4,539,000	1.077	4,888,503	1.835	1.829	1.426	2.608
2015-2016	2,673,871	3,691,000	1.071	3,953,061	1.478	1.839	1.438	2.645
2016-2017	2,779,754	6,293,000	1.069	6,727,217	2.420	1.843	1.451	2.673
2017-2018	2,798,298	4,881,000	1.030	5,027,430	1.797	1.913	1.463	2.799
Total/Avg	50,857,765	\$95,604,000		\$140,882,952	\$2.770			
13/14-16/17	10,731,305	19,503,000		21,091,601	\$1.965			
13/14-17/18	13,529,603	24,384,000		26,119,031	\$1.931			
				Selected Limited Rate:	\$1.970			
				Prior:	\$2.070			

Notes:

- (A) From Appendix M, Column (C).
- (B) Selected average of results from Appendices A and B.
- (C) #REF!
- (D) (B) x (C).
- (E) (D) / (A).
- (F) Selected Limited Rate / (C). For 2012-2013 and prior (B) / (A).
- (G) Based on a Weibull distribution, a mathematical model of claim sizes.
- (H) (F) x (G).

This exhibit shows the calculation of the underlying historical relationship between losses and exposure that is needed to apply the estimation methods shown on pages 1 and 2 of this Appendix.

## Municipal Pooling Authority - Workers' Compensation

## Frequency and Severity Method

Accident Year	Ultimate Program Severity (A)	Adjusted Ultimate Claims (B)	Ultimate Program Losses (C)
Prior	\$4,405	6,151	\$27,095,155
1998-1999	8,340	360	3,002,400
1999-2000	9,164	379	3,473,156
2000-2001	10,373	341	3,537,193
2001-2002	7,841	337	2,642,417
2002-2003	10,190	407	4,147,330
2003-2004	9,219	397	3,659,943
2004-2005	7,893	324	2,557,332
2005-2006	9,209	340	3,131,060
2006-2007	10,701	360	3,852,360
2007-2008	11,967	380	4,547,460
2008-2009	14,028	314	4,404,792
2009-2010	17,103	373	6,379,419
2010-2011	18,424	324	5,969,376
2011-2012	19,197	318	6,104,646
2012-2013	19,577	309	6,049,293
2013-2014	21,420	304	6,511,680
2014-2015	22,246	313	6,962,998
2015-2016	22,561	307	6,926,227
2016-2017	22,796	334	7,613,864
2017-2018	23,867	304	7,255,568
Total		12,976	\$125,823,669

## Notes:

- (A) From Appendix D, Page 2, Column (H).
- (B) From Appendix D, Page 2, Column (B).
- (C) (A) x (B).

This exhibit shows the calculation of the estimated ultimate losses for each year based on the observed average frequency and severity of claims.



Municipal Pooling Authority - Workers' Compensation

Frequency and Severity Method

Accident Year	Ultimate Limited Losses (A)	Adjusted Ultimate Claims (B)	Ultimate Limited Severity (C)	Trend Factor (D)	Trended Limited Severity (E)	Limited Severity (F)	Factor to SIR (G)	Program Severity (H)
Prior	\$23,241,000	6,151	\$3,778	2.186	\$8,259	\$3,778	1.166	\$4,405
1998-1999	2,477,000	360	6,881	1.478	10,170	6,881	1.212	8,340
1999-2000	2,848,000	379	7,515	1.272	9,559	7,515	1.219	9,164
2000-2001	2,883,000	341	8,455	1.168	9,875	8,455	1.227	10,373
2001-2002	2,140,000	337	6,350	1.143	7,258	6,350	1.235	7,841
2002-2003	3,287,000	407	8,076	1.166	9,417	8,076	1.262	10,190
2003-2004	2,812,000	397	7,083	1.400	9,916	7,083	1.302	9,219
2004-2005	1,949,000	324	6,015	1.750	10,526	6,015	1.312	7,893
2005-2006	2,367,000	340	6,962	1.847	12,859	6,962	1.323	9,209
2006-2007	2,888,000	360	8,022	1.706	13,686	8,022	1.334	10,701
2007-2008	3,381,000	380	8,897	1.547	13,764	8,897	1.345	11,967
2008-2009	3,248,000	314	10,344	1.408	14,564	10,344	1.356	14,028
2009-2010	4,666,000	373	12,509	1.259	15,749	12,509	1.367	17,103
2010-2011	4,329,000	324	13,361	1.159	15,485	13,361	1.379	18,424
2011-2012	4,390,000	318	13,805	1.115	15,393	13,805	1.391	19,197
2012-2013	4,314,000	309	13,961	1.111	15,511	13,961	1.402	19,577
2013-2014	4,980,000	304	16,382	1.109	18,168	15,149	1.414	21,420
2014-2015	4,539,000	313	14,502	1.077	15,619	15,599	1.426	22,246
2015-2016	3,920,000	307	12,769	1.071	13,676	15,686	1.438	22,561
2016-2017	6,056,000	334	18,132	1.069	19,383	15,716	1.451	22,796
2017-2018	5,195,000	304	17,089	1.030	17,602	16,311	1.463	23,867
			Average Limited Severity:		\$13,164			
			Average 13/14-16/17 Limited Severity:		16,712			
			Average 13/14-17/18 Limited Severity:		16,890			
			Selected Limited Severity:		\$16,800			
			Prior:		\$16,100			

Notes:

- (A) Selected average of results from Appendices A, B, and C.
- (B) Appendix D, Page 3, Column (C).
- (C) (A) / (B).
- (D) #REF!
- (E) (C) x (D).
- (F) Selected Limited Severity / (D).
- (G) Based on a Weibull distribution, a mathematical model of claim sizes.
- (H) (F) x (G).

This exhibit shows the calculation of the historical average cost per claim, or severity. The observed average severity is used in the method shown on page 1 of this Appendix.

Municipal Pooling Authority - Workers' Compensation

Frequency and Severity Method  
Projection of Ultimate Claims

Accident Year	Reported Claim Development (A)	Closed Claim Development (B)	Selected Ultimate Claims (C)	Trended Payroll (\$000,000) (D)	Claim Frequency (E)	Trend Factor (F)	Trended Claim Frequency (G)
Prior	6,151	6,156	6,151	137.3	44.786	1.000	44.786
1998-1999	360	361	360	141.1	2.551	1.000	2.551
1999-2000	379	378	379	145.4	2.607	1.000	2.607
2000-2001	341	337	341	157.5	2.164	1.000	2.164
2001-2002	337	339	337	164.8	2.045	1.000	2.045
2002-2003	407	407	407	203.3	2.002	1.000	2.002
2003-2004	397	397	397	233.6	1.699	1.000	1.699
2004-2005	324	322	324	239.7	1.352	1.000	1.352
2005-2006	340	341	340	273.3	1.244	1.000	1.244
2006-2007	360	363	360	287.6	1.252	1.000	1.252
2007-2008	380	383	380	313.0	1.214	1.000	1.214
2008-2009	314	315	314	318.6	0.986	1.000	0.986
2009-2010	373	372	373	313.2	1.191	1.000	1.191
2010-2011	324	325	324	278.9	1.162	1.000	1.162
2011-2012	318	321	318	270.1	1.177	1.000	1.177
2012-2013	309	321	309	255.1	1.211	1.000	1.211
2013-2014	304	302	304	261.3	1.163	1.000	1.163
2014-2015	313	306	313	266.4	1.175	1.000	1.175
2015-2016	307	321	307	267.4	1.148	1.000	1.148
2016-2017	334	323	334	278.0	1.202	1.000	1.202
2017-2018	304	327	304	279.8	1.086	1.000	1.086
Total	12,976	13,017	12,976	5,085.8			2.551
12/13-16/17	1,567	1,573	1,567	1,328.2			1.180
					(H) Selected 2018-2019 Frequency:		1.230
					Prior:		1.310
Program Year:				2018-2019	2019-2020		
(I) Trend Factor:				1.000	1.000		
(J) Selected Frequency:				1.230	1.230		
(K) Est. Payroll (\$000,000):				282.9	292.2		
(L) Ultimate Claims:				348	359		

Notes:

- (A) From Appendix D, Page 4, (C).
- (B) From Appendix D, Page 5, (C).
- (C) Selected from (A) and (B).
- (D) From Appendix M, Column (C) / 10,000.
- (E) (C) / (D).
- (F) #REF!
- (G) (E) x (F).
- (H) The selected frequency of 1.230 is based on (G).
- (I) #REF!
- (J) (H) x (I).
- (K) From Appendix M, Column (C) / 10,000.
- (L) (J) x (K).

This exhibit summarizes the estimated numbers of claims and shows the estimated frequencies per \$1,000,000 of trended payroll.

Municipal Pooling Authority - Workers' Compensation

Frequency and Severity Method  
Reported Claim Count Development

Accident Year	Claims Reported as of 10/31/2018 (A)	Reported Claim Development Factor (B)	Ultimate Claims (C)	Trended Claim Frequency (D)
Prior	6,151	1.000	6,151	44.786
1998-1999	360	1.000	360	2.551
1999-2000	379	1.000	379	2.607
2000-2001	341	1.000	341	2.164
2001-2002	337	1.000	337	2.045
2002-2003	407	1.000	407	2.002
2003-2004	397	1.000	397	1.699
2004-2005	324	1.000	324	1.352
2005-2006	340	1.000	340	1.244
2006-2007	360	1.000	360	1.252
2007-2008	380	1.000	380	1.214
2008-2009	314	1.000	314	0.986
2009-2010	373	1.000	373	1.191
2010-2011	324	1.000	324	1.162
2011-2012	318	1.000	318	1.177
2012-2013	309	1.000	309	1.211
2013-2014	304	1.000	304	1.163
2014-2015	312	1.004	313	1.175
2015-2016	305	1.008	307	1.148
2016-2017	330	1.013	334	1.202
2017-2018	287	1.059	304	1.086
Total	12,952		12,976	2.551

Notes:

- (A) Provided by the Authority.
- (B) From Appendix D, Page 6.
- (C) (A) x (B).
- (D) (C) / [Appendix D, Page 3, (D)] x [Appendix D, Page 3, (F)].

This exhibit shows the calculation of estimated ultimate claims for each year based on reported claims as provided by the Authority. These numbers of claims tend to "develop" or change from period to period as more claims are filed. This development tends to follow quantifiable patterns over time.

Municipal Pooling Authority - Workers' Compensation

Frequency and Severity Method  
Closed Claim Count Development

Accident Year	Claims Closed as of 10/31/2018 (A)	Closed Claim Development Factor (B)	Ultimate Claims (C)	Trended Claim Frequency (D)
Prior	6,125	1.005	6,156	44.823
1998-1999	359	1.006	361	2.558
1999-2000	375	1.007	378	2.600
2000-2001	334	1.009	337	2.139
2001-2002	335	1.011	339	2.057
2002-2003	402	1.013	407	2.002
2003-2004	391	1.015	397	1.699
2004-2005	317	1.017	322	1.344
2005-2006	334	1.021	341	1.248
2006-2007	354	1.025	363	1.262
2007-2008	372	1.029	383	1.224
2008-2009	305	1.033	315	0.989
2009-2010	358	1.038	372	1.188
2010-2011	311	1.045	325	1.165
2011-2012	304	1.055	321	1.188
2012-2013	300	1.071	321	1.258
2013-2014	277	1.092	302	1.156
2014-2015	271	1.129	306	1.148
2015-2016	270	1.188	321	1.201
2016-2017	259	1.249	323	1.162
2017-2018	196	1.666	327	1.169
Total	12,549		13,017	2.559

Notes:

- (A) Provided by the Authority.
- (B) From Appendix D, Page 7.
- (C) (A) x (B).
- (D) (C) / [Appendix D, Page 3, (D)] x [Appendix D, Page 3, (F)].

This exhibit shows the calculation of estimated ultimate claims for each year based on closed claims as provided by the Authority. These numbers of closed claims tend to "develop" or change from period to period as more claims are closed. This development tends to follow quantifiable patterns over time.

Municipal Pooling Authority - Workers' Compensation  
Reported Claim Count Development

Accident Year	Claims Reported as of:												
	12 Months	24 Months	36 Months	48 Months	60 Months	72 Months	84 Months	96 Months	108 Months	120 Months	132 Months	144 Months	156 Months
1997-1998											363	363	363
1998-1999										360	360	360	360
1999-2000									378	378	378	378	378
2000-2001								341	341	341	341	341	341
2001-2002							335	336	336	337	337	337	337
2002-2003						420	420	420	420	420	420	420	420
2003-2004					433	433	433	433	433	433	433	433	433
2004-2005				356	356	358	358	358	358	358	358	358	358
2005-2006			370	371	371	372	372	372	372	372	373	373	373
2006-2007		399	400	400	400	400	400	401	401	401	401	401	
2007-2008	388	406	412	413	416	417	418	418	418	418	418		
2008-2009	324	346	347	349	349	349	349	349	349	349			
2009-2010	386	405	407	408	409	410	409	409	409				
2010-2011	330	346	346	347	347	348	348	348					
2011-2012	308	332	334	336	338	338	338						
2012-2013	321	338	339	341	343	343							
2013-2014	299	322	325	328	329								
2014-2015	302	331	337	341									
2015-2016	306	328	331										
2016-2017	337	357											
2017-2018	298												

Reported Claim Count Development Factors:

	12-24 Months	24-36 Months	36-48 Months	48-60 Months	60-72 Months	72-84 Months	84-96 Months	96-108 Months	108-120 Months	120-132 Months	132-144 Months	144-156 Months	156-168 Months
1997-1998											1.000	1.000	1.000
1998-1999										1.000	1.000	1.000	1.000
1999-2000									1.000	1.000	1.000	1.000	1.000
2000-2001								1.000	1.000	1.000	1.000	1.000	1.000
2001-2002							1.003	1.000	1.003	1.000	1.000	1.000	1.000
2002-2003						1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2003-2004					1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2004-2005				1.000	1.006	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2005-2006			1.003	1.000	1.003	1.000	1.000	1.000	1.000	1.003	1.000	1.000	
2006-2007		1.003	1.000	1.000	1.000	1.000	1.003	1.000	1.000	1.000	1.000		
2007-2008	1.046	1.015	1.002	1.007	1.002	1.002	1.000	1.000	1.000	1.000			
2008-2009	1.068	1.003	1.006	1.000	1.000	1.000	1.000	1.000	1.000				
2009-2010	1.049	1.005	1.002	1.002	1.002	0.998	1.000	1.000					
2010-2011	1.048	1.000	1.003	1.000	1.003	1.000	1.000						
2011-2012	1.078	1.006	1.006	1.006	1.000	1.000							
2012-2013	1.053	1.003	1.006	1.006	1.000								
2013-2014	1.077	1.009	1.009	1.003									
2014-2015	1.096	1.018	1.012										
2015-2016	1.072	1.009											
2016-2017	1.059												
Average Claim-weighted Averages	1.065	1.007	1.005	1.002	1.002	1.000	1.001	1.000	1.000	1.000	1.000	1.000	1.000
3-yr	1.075	1.012	1.009	1.005	1.001	0.999	1.000	1.000	1.000	1.001	1.000	1.000	1.000
4-yr	1.076	1.010	1.008	1.004	1.001	0.999	1.000	1.000	1.000	1.001	1.000	1.000	1.000
CSAC Factors	1.100	1.007	1.004	1.003	1.002	1.001	1.001	1.000	1.000	1.000	1.000	1.000	1.000
Prior	1.065	1.006	1.004	1.003	1.002	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Selected	1.067	1.006	1.004	1.003	1.002	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Cumulated	1.083	1.015	1.009	1.005	1.002	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Municipal Pooling Authority - Workers' Compensation  
Closed Claim Development

Accident Year	Claims Closed as of:												
	12 Months	24 Months	36 Months	48 Months	60 Months	72 Months	84 Months	96 Months	108 Months	120 Months	132 Months	144 Months	156 Months
1997-1998											353	355	356
1998-1999										353	353	353	353
1999-2000									359	363	366	367	368
2000-2001								318	319	321	324	327	330
2001-2002							324	323	324	324	327	328	330
2002-2003						390	398	404	406	411	413	413	414
2003-2004					398	413	415	416	420	425	422	426	427
2004-2005				322	331	336	341	347	346	347	348	351	351
2005-2006			324	338	338	348	354	356	359	361	364	366	367
2006-2007		340	357	359	373	379	385	388	393	395	394	396	
2007-2008	224	337	348	363	380	386	393	396	407	410	410		
2008-2009	189	282	289	304	315	319	324	334	337	340			
2009-2010	178	302	317	340	356	363	376	387	394				
2010-2011	161	263	276	296	311	322	331	336					
2011-2012	164	252	263	284	305	315	325						
2012-2013	185	267	281	301	321	334							
2013-2014	171	252	261	286	300								
2014-2015	164	254	279	298									
2015-2016	123	268	296										
2016-2017	178	283											
2017-2018	164												

Closed Claim Count Development Factors:

	12-24 Months	24-36 Months	36-48 Months	48-60 Months	60-72 Months	72-84 Months	84-96 Months	96-108 Months	108-120 Months	120-132 Months	132-144 Months	144-156 Months	156-168 Months
1997-1998											1.006	1.003	1.003
1998-1999										1.000	1.000	1.000	1.006
1999-2000									1.011	1.008	1.003	1.003	1.011
2000-2001								1.003	1.006	1.009	1.009	1.009	0.997
2001-2002							0.997	1.003	1.000	1.009	1.003	1.006	1.009
2002-2003						1.021	1.015	1.005	1.012	1.005	1.000	1.002	1.000
2003-2004					1.038	1.005	1.002	1.010	1.012	0.993	1.009	1.002	1.000
2004-2005				1.028	1.015	1.015	1.018	0.997	1.003	1.003	1.009	1.000	1.000
2005-2006			1.043	1.000	1.030	1.017	1.006	1.008	1.006	1.008	1.005	1.003	
2006-2007		1.050	1.006	1.039	1.016	1.016	1.008	1.013	1.005	0.997	1.005		
2007-2008	1.504	1.033	1.043	1.047	1.016	1.018	1.008	1.028	1.007	1.000			
2008-2009	1.492	1.025	1.052	1.036	1.013	1.016	1.031	1.009	1.009				
2009-2010	1.697	1.050	1.073	1.047	1.020	1.036	1.029	1.018					
2010-2011	1.634	1.049	1.072	1.051	1.035	1.028	1.015						
2011-2012	1.537	1.044	1.080	1.074	1.033	1.032							
2012-2013	1.443	1.052	1.071	1.066	1.040								
2013-2014	1.474	1.036	1.096	1.049									
2014-2015	1.549	1.098	1.068										
2015-2016	2.179	1.104											
2016-2017	1.590												
Average Claim-weighted Averages	1.610	1.054	1.060	1.044	1.026	1.020	1.013	1.009	1.007	1.003	1.005	1.003	1.003
3-yr	1.731	1.080	1.078	1.063	1.036	1.032	1.025	1.019	1.007	1.002	1.006	1.002	1.000
4-yr	1.662	1.073	1.078	1.060	1.032	1.028	1.020	1.017	1.007	1.002	1.007	1.002	1.002
CSAC Factors	1.600	1.080	1.050	1.030	1.025	1.015	1.010	1.008	1.005	1.004	1.003	1.002	1.001
Prior	1.543	1.045	1.059	1.041	1.019	1.016	1.011	1.006	1.005	1.005	1.004	1.004	1.004
Selected	1.556	1.047	1.059	1.041	1.021	1.017	1.011	1.006	1.005	1.005	1.004	1.004	1.004
Cumulated	1.975	1.269	1.212	1.144	1.099	1.077	1.059	1.047	1.040	1.035	1.030	1.026	1.022

Municipal Pooling Authority - Workers' Compensation

Loss Trend Factors

Accident Year	Benefit Level Factor (A)	Factor to 2018-2019 Loss Rate Level (B)	Factor to 2019-2020 Loss Rate Level (C)	Factor to 2020-2021 Loss Rate Level (D)	Factor to 2021-2022 Loss Rate Level (E)	Factor to 2018-2019 Frequency Level (F)	Factor to 2019-2020 Frequency Level (G)	Factor to 2020-2021 Frequency Level (H)	Factor to 2021-2022 Frequency Level (I)	Factor to 2018-2019 Severity Level (J)
Prior	1.174	2.186	2.252	2.320	2.389	1.000	1.000	1.000	1.000	2.186
1998-1999	0.817	1.478	1.522	1.568	1.615	1.000	1.000	1.000	1.000	1.478
1999-2000	0.725	1.272	1.310	1.349	1.390	1.000	1.000	1.000	1.000	1.272
2000-2001	0.686	1.168	1.204	1.240	1.277	1.000	1.000	1.000	1.000	1.168
2001-2002	0.691	1.143	1.177	1.213	1.249	1.000	1.000	1.000	1.000	1.143
2002-2003	0.726	1.166	1.201	1.238	1.275	1.000	1.000	1.000	1.000	1.166
2003-2004	0.898	1.400	1.442	1.485	1.530	1.000	1.000	1.000	1.000	1.400
2004-2005	1.157	1.750	1.803	1.857	1.913	1.000	1.000	1.000	1.000	1.750
2005-2006	1.257	1.847	1.902	1.960	2.018	1.000	1.000	1.000	1.000	1.847
2006-2007	1.196	1.706	1.757	1.810	1.864	1.000	1.000	1.000	1.000	1.706
2007-2008	1.117	1.547	1.594	1.642	1.691	1.000	1.000	1.000	1.000	1.547
2008-2009	1.047	1.408	1.450	1.494	1.539	1.000	1.000	1.000	1.000	1.408
2009-2010	0.964	1.259	1.297	1.336	1.376	1.000	1.000	1.000	1.000	1.259
2010-2011	0.915	1.159	1.194	1.230	1.267	1.000	1.000	1.000	1.000	1.159
2011-2012	0.906	1.115	1.148	1.183	1.218	1.000	1.000	1.000	1.000	1.115
2012-2013	0.929	1.111	1.144	1.179	1.214	1.000	1.000	1.000	1.000	1.111
2013-2014	0.956	1.109	1.142	1.177	1.212	1.000	1.000	1.000	1.000	1.109
2014-2015	0.956	1.077	1.109	1.143	1.177	1.000	1.000	1.000	1.000	1.077
2015-2016	0.979	1.071	1.103	1.136	1.170	1.000	1.000	1.000	1.000	1.071
2016-2017	1.008	1.069	1.102	1.135	1.169	1.000	1.000	1.000	1.000	1.069
2017-2018	1.000	1.030	1.061	1.093	1.126	1.000	1.000	1.000	1.000	1.030
2018-2019	1.000	1.000	1.030	1.061	1.093	1.000	1.000	1.000	1.000	1.000
2019-2020	1.000	--	1.000	1.030	1.061	--	1.000	1.000	1.000	--
2020-2021	1.000	--	--	1.000	1.030	--	--	1.000	1.000	--
2021-2022	1.000	--	--	--	1.000	--	--	--	1.000	--

Notes:

- (A) Based on WCIRB.
- (B) - (E) (A) adjusted for a 3.0% annual loss rate trend.
- (F) - (I) (A) adjusted for a 0.0% annual frequency trend.
- (J) (A) adjusted for a 3.0% annual severity trend.

This exhibit shows the calculation of the ways in which we expect claims costs to have changed over the past twenty years due to changes in statutory workers' compensation benefit levels and changes in actual claims costs in excess of changes in payroll. Changes in the ways in which claims are filed as a result of greater awareness of workers' compensation benefits are not generally reflected in the statutory benefit level factors shown above, but may be part of the reason for changes in actual claims costs in excess of payroll changes.

Municipal Pooling Authority - Workers' Compensation

Residual Trend Factors

Accident Year	Initial Estimate of Ultimate Limited Losses (A)	Ultimate Reported Claims (B)	BLF (C)	Adjusted Limited Severity (D)	Trended Payroll (\$00) (E)	Ultimate Frequency (F)
Prior	\$23,241,000	6,151	1.174	4,436	1,373,405	44.786
1998-1999	2,477,000	360	0.817	5,624	1,411,186	2.551
1999-2000	2,848,000	379	0.725	5,445	1,453,876	2.607
2000-2001	2,883,000	341	0.686	5,799	1,575,494	2.164
2001-2002	2,140,000	337	0.691	4,388	1,648,262	2.045
2002-2003	3,287,000	407	0.726	5,866	2,033,169	2.002
2003-2004	2,812,000	397	0.898	6,359	2,336,473	1.699
2004-2005	1,949,000	324	1.157	6,957	2,396,718	1.352
2005-2006	2,367,000	340	1.257	8,749	2,733,230	1.244
2006-2007	2,888,000	360	1.196	9,593	2,876,440	1.252
2007-2008	3,381,000	380	1.117	9,939	3,130,149	1.214
2008-2009	3,248,000	314	1.047	10,828	3,185,801	0.986
2009-2010	4,666,000	373	0.964	12,062	3,132,497	1.191
2010-2011	4,329,000	324	0.915	12,224	2,789,216	1.162
2011-2012	4,390,000	318	0.906	12,506	2,701,477	1.177
2012-2013	4,314,000	309	0.929	12,977	2,550,769	1.211
2013-2014	4,980,000	304	0.956	15,660	2,613,221	1.163
2014-2015	4,539,000	313	0.956	13,866	2,664,459	1.175
2015-2016	3,691,000	307	0.979	11,774	2,673,871	1.148
2016-2017	6,293,000	334	1.008	18,984	2,779,754	1.202
2017-2018	4,881,000	304	1.000	16,056	2,798,298	1.086

	<u>Severity Trend Factors</u>	<u>Frequency Trend Factors</u>
Latest 10 x 2017-2018	1.049	1.006
Latest 5 x 2017-2018	1.049	0.997
Prior	1.025	0.990
Default	1.025	0.980
Selected Residual Trend	1.030	1.000

Notes:

- (A) Selected average of results from Appendices A and B.
- (B) Appendix D, Page 3, Column (C).
- (C) Appendix E, Page 1, Page 1.
- (D) (A) x (C) / (B).
- (E) From Appendix M, Column (C).
- (F) (B) / (E) x 10,000.



Municipal Pooling Authority - Workers' Compensation

Payment and Reserve Forecast

<u>Accident Year</u>	<u>As of</u> <u>10/31/2018</u>	<u>Calendar Period</u>	
		<u>11/1/2018</u> <u>to</u> <u>6/30/2019</u>	<u>7/1/2019</u> <u>to</u> <u>6/30/2020</u>
Prior			
Ultimate Loss	\$40,541,000	\$40,541,000	\$40,541,000
Paid in Calendar Period	-	99,680	230,859
Paid to Date	38,883,672	38,983,352	39,214,211
Outstanding Liability	1,657,328	1,557,648	1,326,789
2002-2003			
Ultimate Loss	\$3,813,000	\$3,813,000	\$3,813,000
Paid in Calendar Period	-	17,836	18,180
Paid to Date	3,625,253	3,643,089	3,661,269
Outstanding Liability	187,747	169,911	151,731
2003-2004			
Ultimate Loss	\$3,448,000	\$3,448,000	\$3,448,000
Paid in Calendar Period	-	31,659	37,221
Paid to Date	3,140,628	3,172,287	3,209,508
Outstanding Liability	307,372	275,713	238,492
2004-2005			
Ultimate Loss	\$2,856,000	\$2,856,000	\$2,856,000
Paid in Calendar Period	-	21,282	48,814
Paid to Date	2,507,108	2,528,390	2,577,204
Outstanding Liability	348,892	327,610	278,796
2005-2006			
Ultimate Loss	\$3,276,000	\$3,276,000	\$3,276,000
Paid in Calendar Period	-	28,953	35,237
Paid to Date	2,837,320	2,866,273	2,901,510
Outstanding Liability	438,680	409,727	374,490
2006-2007			
Ultimate Loss	\$3,834,000	\$3,834,000	\$3,834,000
Paid in Calendar Period	-	26,095	32,745
Paid to Date	3,455,806	3,481,901	3,514,646
Outstanding Liability	378,194	352,099	319,354
2007-2008			
Ultimate Loss	\$4,712,000	\$4,712,000	\$4,712,000
Paid in Calendar Period	-	44,632	58,415
Paid to Date	4,065,155	4,109,787	4,168,202
Outstanding Liability	646,845	602,213	543,798

Municipal Pooling Authority - Workers' Compensation

Payment and Reserve Forecast

<u>Accident Year</u>	<u>As of</u> <u>10/31/2018</u>	<u>Calendar Period</u>	
		<u>11/1/2018</u> <u>to</u> <u>6/30/2019</u>	<u>7/1/2019</u> <u>to</u> <u>6/30/2020</u>
2008-2009			
Ultimate Loss	\$5,249,000	\$5,249,000	\$5,249,000
Paid in Calendar Period	-	46,656	61,338
Paid to Date	4,600,994	4,647,650	4,708,988
Outstanding Liability	648,006	601,350	540,012
2009-2010			
Ultimate Loss	\$7,525,000	\$7,525,000	\$7,525,000
Paid in Calendar Period	-	88,892	119,800
Paid to Date	6,272,999	6,361,891	6,481,691
Outstanding Liability	1,252,001	1,163,109	1,043,309
2010-2011			
Ultimate Loss	\$6,773,000	\$6,773,000	\$6,773,000
Paid in Calendar Period	-	113,209	126,741
Paid to Date	5,441,131	5,554,340	5,681,081
Outstanding Liability	1,331,869	1,218,660	1,091,919
2011-2012			
Ultimate Loss	\$5,930,000	\$5,930,000	\$5,930,000
Paid in Calendar Period	-	112,128	124,876
Paid to Date	4,785,836	4,897,964	5,022,840
Outstanding Liability	1,144,164	1,032,036	907,160
2012-2013			
Ultimate Loss	\$5,944,000	\$5,944,000	\$5,944,000
Paid in Calendar Period	-	101,806	140,338
Paid to Date	4,825,255	4,927,061	5,067,399
Outstanding Liability	1,118,745	1,016,939	876,601
2013-2014			
Ultimate Loss	\$7,518,000	\$7,518,000	\$7,518,000
Paid in Calendar Period	-	234,112	259,419
Paid to Date	5,288,360	5,522,472	5,781,891
Outstanding Liability	2,229,640	1,995,528	1,736,109
2014-2015			
Ultimate Loss	\$7,505,000	\$7,505,000	\$7,505,000
Paid in Calendar Period	-	317,621	407,727
Paid to Date	4,450,953	4,768,574	5,176,301
Outstanding Liability	3,054,047	2,736,426	2,328,699

Municipal Pooling Authority - Workers' Compensation

Payment and Reserve Forecast

<u>Accident Year</u>	<u>As of</u> <u>10/31/2018</u>	<u>Calendar Period</u>	
		<u>11/1/2018</u> <u>to</u> <u>6/30/2019</u>	<u>7/1/2019</u> <u>to</u> <u>6/30/2020</u>
<b>2015-2016</b>			
Ultimate Loss	\$6,758,000	\$6,758,000	\$6,758,000
Paid in Calendar Period	-	444,928	410,643
Paid to Date	3,557,082	4,002,010	4,412,653
Outstanding Liability	3,200,918	2,755,990	2,345,347
<b>2016-2017</b>			
Ultimate Loss	\$9,234,000	\$9,234,000	\$9,234,000
Paid in Calendar Period	-	860,621	868,112
Paid to Date	3,921,523	4,782,144	5,650,256
Outstanding Liability	5,312,477	4,451,856	3,583,744
<b>2017-2018</b>			
Ultimate Loss	\$8,007,000	\$8,007,000	\$8,007,000
Paid in Calendar Period	-	1,128,298	1,233,959
Paid to Date	1,369,955	2,498,253	3,732,212
Outstanding Liability	6,637,045	5,508,747	4,274,788
<b>2018-2019</b>			
Ultimate Loss	\$2,748,000	\$8,245,000	\$8,245,000
Paid in Calendar Period	-	666,031	1,752,230
Paid to Date	122,672	788,703	2,540,933
Outstanding Liability	2,625,328	7,456,297	5,704,067
<b>2019-2020</b>			
Ultimate Loss	-	-	\$8,845,000
Paid in Calendar Period	-	-	1,026,020
Paid to Date	-	-	1,026,020
Outstanding Liability	-	-	7,818,980
<b>Totals</b>			
Ultimate Loss	\$135,671,000	\$141,168,000	\$150,013,000
Paid in Calendar Period	-	4,384,439	6,992,674
Paid to Date	103,151,702	107,536,141	114,528,815
Outstanding Liability	32,519,298	33,631,859	35,484,185
Total Outstanding ULAE	0	0	0
Outstanding Liability plus ULAE	32,519,298	33,631,859	35,484,185

Notes appear on the next page.

Municipal Pooling Authority - Workers' Compensation

Payment and Reserve Forecast

Notes to previous page:

- Accident Year is associated with date of loss. Calendar Period is associated with date of transaction. For example, for the losses which occurred during 2016-2017, \$860,621 is expected to be paid between 11/1/18 and 6/30/19, \$4,782,144 will have been paid by 6/30/19, and the reserve for remaining payments on these claims should be \$4,451,856.
- Ultimate Losses for each accident year are from Exhibit 4, Page 1.
- Paid in Calendar Period is a proportion of the Outstanding Liability from the previous calendar period. These proportions are derived from the paid loss development pattern selected in Appendix B. For example,  $\$868,112 = \$4,451,856 \times 19.5\%$ .
- Paid to Date is Paid in Calendar Period plus Paid to Date from previous calendar period. For example,  $\$5,650,256 = \$868,112 + \$4,782,144$ .
- Outstanding Liability is Ultimate Loss minus Paid to Date. For example,  $\$4,451,856 = \$9,234,000 - \$4,782,144$ .

This exhibit shows the calculation of the liability for outstanding claims as of the date of evaluation, the end of the current fiscal year, and the end of the coming fiscal year. It also shows the expected claims payout during the remainder of the current fiscal year and the coming fiscal year. Refer to the Totals at the end of the exhibit for the balance sheet information. The top parts of the exhibit show information for each program year.

## Municipal Pooling Authority - Workers' Compensation

## Short- and Long-Term Liabilities

<u>Liabilities as of 10/31/18:</u>		<u>Expected</u>	<u>Discounted</u>
<u>Current (Short Term)</u>	Loss and ALAE:	\$3,718,408	\$3,672,782
	ULAE:	195,186	192,791
	Short-Term Loss and LAE:	<u>\$3,913,594</u>	<u>\$3,865,573</u>
<u>Non-Current (Long Term)</u>	Loss and ALAE:	\$28,800,890	\$24,261,043
	ULAE:	1,511,814	1,273,509
	Long-Term Loss and LAE:	<u>\$30,312,704</u>	<u>\$25,534,552</u>
<u>Total Liability</u>	Loss and ALAE:	\$32,519,298	\$27,933,825
	ULAE:	1,707,000	1,466,300
	Total Loss and LAE:	<u>\$34,226,298</u>	<u>\$29,400,125</u>
<u>Liabilities as of 6/30/19:</u>			
<u>Current (Short Term)</u>	Loss and ALAE:	\$5,966,654	\$5,893,441
	ULAE:	313,307	309,463
	Short-Term Loss and LAE:	<u>\$6,279,961</u>	<u>\$6,202,904</u>
<u>Non-Current (Long Term)</u>	Loss and ALAE:	\$27,665,205	\$23,003,372
	ULAE:	1,452,693	1,207,901
	Long-Term Loss and LAE:	<u>\$29,117,898</u>	<u>\$24,211,273</u>
<u>Total Liability</u>	Loss and ALAE:	\$33,631,859	\$28,896,813
	ULAE:	1,766,000	1,517,364
	Total Loss and LAE:	<u>\$35,397,859</u>	<u>\$30,414,177</u>

		<u>Discounted with a Margin for Contingencies</u>				
		70%	75%	80%	85%	90%
		<u>Confidence</u>	<u>Confidence</u>	<u>Confidence</u>	<u>Confidence</u>	<u>Confidence</u>
<u>Liabilities as of 10/31/18:</u>						
<u>Current (Short Term)</u>	Loss and ALAE:	\$3,977,623	\$4,098,825	\$4,238,390	\$4,411,011	\$4,635,051
	ULAE:	208,793	215,155	222,481	231,542	243,302
	Short-Term Loss and LAE:	<u>\$4,186,416</u>	<u>\$4,313,980</u>	<u>\$4,460,871</u>	<u>\$4,642,553</u>	<u>\$4,878,353</u>
<u>Non-Current (Long Term)</u>	Loss and ALAE:	\$26,274,709	\$27,075,324	\$27,997,244	\$29,137,513	\$30,617,436
	ULAE:	1,379,210	1,421,236	1,469,629	1,529,484	1,607,169
	Long-Term Loss and LAE:	<u>\$27,653,919</u>	<u>\$28,496,560</u>	<u>\$29,466,873</u>	<u>\$30,666,997</u>	<u>\$32,224,605</u>
<u>Total Liability</u>	Loss and ALAE:	\$30,252,332	\$31,174,149	\$32,235,634	\$33,548,524	\$35,252,487
	ULAE:	1,588,003	1,636,391	1,692,110	1,761,026	1,850,471
	Total Loss and LAE:	<u>\$31,840,335</u>	<u>\$32,810,540</u>	<u>\$33,927,744</u>	<u>\$35,309,550</u>	<u>\$37,102,958</u>
<u>Liabilities as of 6/30/19:</u>						
<u>Current (Short Term)</u>	Loss and ALAE:	\$6,382,597	\$6,577,080	\$6,801,031	\$7,078,023	\$7,437,523
	ULAE:	335,148	345,361	357,120	371,665	390,542
	Short-Term Loss and LAE:	<u>\$6,717,745</u>	<u>\$6,922,441</u>	<u>\$7,158,151</u>	<u>\$7,449,688</u>	<u>\$7,828,065</u>
<u>Non-Current (Long Term)</u>	Loss and ALAE:	\$24,912,651	\$25,671,763	\$26,545,891	\$27,627,049	\$29,030,255
	ULAE:	1,308,158	1,348,018	1,393,918	1,450,690	1,524,371
	Long-Term Loss and LAE:	<u>\$26,220,809</u>	<u>\$27,019,781</u>	<u>\$27,939,809</u>	<u>\$29,077,739</u>	<u>\$30,554,626</u>
<u>Total Liability</u>	Loss and ALAE:	\$31,295,248	\$32,248,843	\$33,346,922	\$34,705,072	\$36,467,778
	ULAE:	1,643,306	1,693,379	1,751,038	1,822,355	1,914,913
	Total Loss and LAE:	<u>\$32,938,554</u>	<u>\$33,942,222</u>	<u>\$35,097,960</u>	<u>\$36,527,427</u>	<u>\$38,382,691</u>

Note: Current (short term) liabilities are the portion of the total estimated liability shown on Appendix F that is expected to be paid out within the coming year. Totals may vary from Exhibit 1, due to rounding.

Municipal Pooling Authority - Workers' Compensation

Discount Factors to be Applied to Overall Reserves

Accident Year	Full Value of Reserve at 10/31/18 (A)	Discount Factor (B)	Discounted Reserve at 10/31/18 (C)	Full Value of Reserve at 6/30/19 (D)	Discount Factor (E)	Discounted Reserve at 6/30/19 (F)
Prior	\$1,065,761	0.988	\$1,052,684	\$1,019,933	0.988	\$1,007,418
1998-1999	42,855	0.973	41,712	35,870	0.988	35,430
1999-2000	123,063	0.953	117,335	112,110	0.966	108,316
2000-2001	261,580	0.936	244,711	238,299	0.947	225,698
2001-2002	164,069	0.919	150,767	151,436	0.930	140,793
2002-2003	187,747	0.904	169,673	169,911	0.914	155,220
2003-2004	307,372	0.890	273,517	275,713	0.899	247,821
2004-2005	348,892	0.877	306,006	327,610	0.885	290,057
2005-2006	438,680	0.865	379,549	409,727	0.873	357,666
2006-2007	378,194	0.855	323,416	352,099	0.861	303,280
2007-2008	646,845	0.847	548,095	602,213	0.852	513,128
2008-2009	648,006	0.841	544,699	601,350	0.845	508,124
2009-2010	1,252,001	0.835	1,045,378	1,163,109	0.838	975,130
2010-2011	1,331,869	0.832	1,108,632	1,218,660	0.833	1,015,461
2011-2012	1,144,164	0.833	952,950	1,032,036	0.832	858,605
2012-2013	1,118,745	0.833	932,135	1,016,939	0.833	847,458
2013-2014	2,229,640	0.835	1,862,049	1,995,528	0.833	1,662,525
2014-2015	3,054,047	0.838	2,558,938	2,736,426	0.836	2,288,029
2015-2016	3,200,918	0.845	2,706,122	2,755,990	0.839	2,311,605
2016-2017	5,312,477	0.857	4,555,435	4,451,856	0.849	3,778,502
2017-2018	6,637,045	0.870	5,775,113	5,508,747	0.862	4,747,800
2018-2019	2,625,328	0.870	2,284,909	7,456,297	0.874	6,518,747
Totals	\$32,519,298		\$27,933,825	\$33,631,859		\$28,896,813

(G) Discount Factor at 10/31/18 for Overall Reserve: 0.859  
(H) Discount Factor at 6/30/19 for Overall Reserve: 0.859

Notes:

- (A) From Appendix F, Outstanding Liability at 10/31/18.
- (B) Based on Appendix H, Page 2, Column (E).
- (C) (A) x (B).
- (D) From Appendix F, Outstanding Liability at 6/30/19.
- (E) Based on Appendix H, Page 2, Column (E).
- (F) (D) x (E).
- (G) Total of (C) / Total of (A).
- (H) Total of (F) / Total of (D).

This exhibit shows the expected impact of anticipated investment income on the liability for outstanding claims at the date of evaluation and the end of the current fiscal year. For example, if the discount factor in item (G) is 0.859, the discounted liability for outstanding claims is 85.9% of the full value.

Municipal Pooling Authority - Workers' Compensation

Calculation of Discount Factors

Payment Year (A)	Payment Pattern (B)	Return on Investment (C)	Discounted* Reserves (D)	Undiscounted Reserves (E)	Discount Factor (F)
22	7.9%	2.5%	0.078	0.079	0.988
21	0.9%	2.5%	0.085	0.088	0.966
20	1.0%	2.5%	0.093	0.098	0.947
19	1.0%	2.5%	0.100	0.108	0.930
18	0.9%	2.5%	0.107	0.117	0.914
17	1.0%	2.5%	0.115	0.127	0.899
16	1.1%	2.5%	0.122	0.138	0.885
15	1.1%	2.5%	0.130	0.149	0.873
14	1.1%	2.5%	0.138	0.160	0.861
13	1.4%	2.5%	0.148	0.174	0.852
12	1.7%	2.5%	0.161	0.191	0.845
11	1.8%	2.5%	0.175	0.209	0.838
10	2.1%	2.5%	0.191	0.230	0.833
9	2.8%	2.5%	0.214	0.258	0.832
8	3.6%	2.5%	0.245	0.294	0.833
7	3.8%	2.5%	0.277	0.332	0.833
6	5.1%	2.5%	0.320	0.383	0.836
5	5.9%	2.5%	0.371	0.442	0.839
4	9.7%	2.5%	0.458	0.539	0.849
3	14.5%	2.5%	0.590	0.684	0.862
2	20.1%	2.5%	0.774	0.885	0.874
1	11.5%	2.5%	0.868	1.000	0.868
(G) Discount Factor for Future Funding:					0.879

Notes:

- (A) This is the year of payment relative to the accident year. For example, year 7 refers to payments made in the seventh year after the inception of the accident year. We assume that payments are made at midyear.
- (B) Percent of ultimate loss paid this year. This payment pattern is based on the paid loss development pattern selected in Appendix B, Page 2.
- (C) Assumed Investment Income Rates.
- (D) Discounted Reserves at the beginning of this year is next year's Discounted Reserves discounted one year plus this year's payments discounted six months. For example, in year 2,  $77.4\% = [59.0\% / 1.025] + [20.1\% / (1.012)]$ .
- (E) Summation of future (B) values. This is the percent of ultimate loss unpaid at the beginning of the year.
- (F) (D) / (E).
- (G) (F) at year 1, with interest accumulated for six months. We assume that the required funding is deposited at the middle of the first year.

This exhibit shows the calculation of the effect of anticipated investment income on future claims costs. Thus, if the discount factor in item (F) is 0.88, on a discounted basis, \$0.88 must be budgeted for every \$1 that will actually be paid on claims that will be incurred in the next fiscal year.

## Municipal Pooling Authority - Workers' Compensation

## Confidence Level Table

Probability	Projected Losses	Outstanding Losses
95%	1.449	1.359
90%	1.326	1.262
85%	1.250	1.201
80%	1.192	1.154
75%	1.144	1.116
70%	1.103	1.083
65%	1.067	1.053
60%	1.033	1.027
55%	1.001	1.002
50%	0.971	0.978
45%	0.942	0.954
40%	0.913	0.931
35%	0.884	0.908
30%	0.854	0.884
25%	0.823	0.859

To read table: For the above retention, there is a 90% chance that final loss settlements will be less than 1.326 times the average expected amount of losses.

This exhibit shows the loads that must be applied to bring estimated losses at the expected level to the various indicated confidence levels.



## Municipal Pooling Authority - Workers' Compensation

## Program History

Policy Year Start Date	Policy Year End Date	Policy Year	Self-Insured Retention	
			Per Occurrence	Aggregate
7/1/1978	6/30/1986	1978-1986	200,000	(none)
7/1/1986	6/30/1988	1986-1988	250,000	(none)
7/1/1988	6/30/1990	1988-1990	300,000	(none)
7/1/1990	6/30/2001	1990-2001	350,000	(none)
7/1/2001	6/30/2002	2001-2002	350,000	(none)
7/1/2002	6/30/2003	2002-2003	400,000	(none)
7/1/2003	6/30/2004	2003-2004	500,000	(none)
7/1/2004	6/30/2005	2004-2005	500,000	(none)
7/1/2005	6/30/2006	2005-2006	500,000	(none)
7/1/2006	6/30/2007	2006-2007	500,000	(none)
7/1/2007	6/30/2008	2007-2008	500,000	(none)
7/1/2008	6/30/2009	2008-2009	500,000	(none)
7/1/2009	6/30/2010	2009-2010	500,000	(none)
7/1/2010	6/30/2011	2010-2011	500,000	(none)
7/1/2011	6/30/2012	2011-2012	500,000	(none)
7/1/2012	6/30/2013	2012-2013	500,000	(none)
7/1/2013	6/30/2014	2013-2014	500,000	(none)
7/1/2014	6/30/2015	2014-2015	500,000	(none)
7/1/2015	6/30/2016	2015-2016	500,000	(none)
7/1/2016	6/30/2017	2016-2017	500,000	(none)
7/1/2017	6/30/2018	2017-2018	500,000	(none)
7/1/2018	6/30/2019	2018-2019	500,000	(none)
7/1/2019	6/30/2020	2019-2020	500,000	(none)
	Third Party Claims Administrator		Begin Date	End Date
	MPA's Risk Management Department		7/1/1978	Current

This exhibit summarizes some of the key facts about the history of the program.

Municipal Pooling Authority - Workers' Compensation

Estimated Total Assets as of 6/30/19

(A) <u>Total Assets as of 1/31/19:</u>		\$44,985,000
(B) <u>Total Income to Fund between 2/1/19 and 6/30/19</u>		
Contributions:		0
Interest:		214,000
Other:		0
Total Income:		<u>\$214,000</u>
(C) <u>Total Payments from Fund between 2/1/19 and 6/30/19</u>		
Loss and ALAE:		2,740,000
Excess Premium	Rate: \$0.6057	714,000
Claims Administration		8,000
Department Personnel		341,000
DOC Expense Paid		88,000
G&A Expense Paid		341,000
Capital Equipment		<u>10,000</u>
Total Payments:		<u>\$4,242,000</u>
(D) <u>Estimated Total Assets as of 6/30/19:</u>		\$40,957,000

Notes:

- (A) Provided by the Authority.
- (B) Provided by the Authority.
- (C) Provided by the Authority. Loss and ALAE paid is estimated in Appendix F.
- (D) (A) + (B) - (C).

Municipal Pooling Authority - Workers' Compensation

Estimated Total Assets as of 6/30/20

(A) <u>Estimated Total Assets as of 6/30/19:</u>		\$40,957,000
(B) <u>Total Income to Fund during 2019-2020</u>		
Contributions:		\$13,579,000
Interest:		259,000
Other:		0
Total Income:		<u>\$13,838,000</u>
(C) <u>Total Payments from Fund during 2019-2020</u>		
Loss and ALAE:		\$6,993,000
Excess Premium	Rate: \$0.5726	\$1,673,000
Claims Administration		637,994
Department Personnel		884,706
DOC Expense Paid		206,856
G&A Expense Paid		873,830
Capital Equipment		<u>33,400</u>
Total Payments:		<u>\$11,302,786</u>
(D) <u>Estimated Total Assets as of 6/30/20:</u>		\$43,492,214

Notes:

- (A) Appendix K, Page 1, Line (D).
- (B) Provided by the Authority.
- (C) Provided by the Authority. Loss and ALAE paid is estimated in Appendix F.
- (D) (A) + (B) - (C).

## Municipal Pooling Authority - Workers' Compensation

## Incurred Losses as of 10/31/18

Accident Year (A)	Unlimited Incurred (B)	Additions to Losses (C)	Subtractions from Losses (D)	Adjusted Incurred (E)	Incurred Over SIR (F)	Incurred Over \$100,000 (G)	Incurred Capped at \$100,000 (H)	Incurred \$100,000 to SIR Layer (I)	Incurred Capped at SIR (J)	Incurred Capped at SIR & Aggregate (K)
Prior	\$29,058,729	\$0	\$0	\$29,058,729	\$1,499,731	\$5,956,461	\$23,102,269	\$4,456,729	\$27,558,998	\$27,558,998
1998-1999	4,867,293	0	0	4,867,293	1,550,815	2,408,931	2,458,362	858,116	3,316,478	3,316,478
1999-2000	2,950,041	0	0	2,950,041	0	124,191	2,825,849	124,191	2,950,041	2,950,041
2000-2001	4,305,855	0	0	4,305,855	315,974	1,448,451	2,857,403	1,132,477	3,989,881	3,989,881
2001-2002	2,407,015	0	0	2,407,015	0	287,777	2,119,238	287,777	2,407,015	2,407,015
2002-2003	3,726,879	0	0	3,726,879	0	479,163	3,247,716	479,163	3,726,879	3,726,879
2003-2004	4,157,598	0	0	4,157,598	809,858	1,384,182	2,773,416	574,325	3,347,740	3,347,740
2004-2005	3,286,922	0	0	3,286,922	538,120	1,370,529	1,916,394	832,409	2,748,802	2,748,802
2005-2006	3,430,178	0	0	3,430,178	307,312	1,110,029	2,320,148	802,718	3,122,866	3,122,866
2006-2007	3,620,681	0	0	3,620,681	0	798,078	2,822,603	798,078	3,620,681	3,620,681
2007-2008	4,399,377	0	0	4,399,377	0	1,103,777	3,295,600	1,103,777	4,399,377	4,399,377
2008-2009	19,961,989	0	0	19,961,989	15,124,505	16,805,077	3,156,911	1,680,572	4,837,484	4,837,484
2009-2010	8,788,335	0	0	8,788,335	1,959,554	4,271,869	4,516,466	2,312,315	6,828,781	6,828,781
2010-2011	6,248,880	0	0	6,248,880	217,745	2,073,970	4,174,910	1,856,225	6,031,134	6,031,134
2011-2012	5,165,929	0	0	5,165,929	0	960,788	4,205,141	960,788	5,165,929	5,165,929
2012-2013	5,041,546	0	0	5,041,546	0	983,241	4,058,305	983,241	5,041,546	5,041,546
2013-2014	6,657,496	0	0	6,657,496	111,900	1,911,967	4,745,529	1,800,067	6,545,597	6,545,597
2014-2015	6,558,382	0	0	6,558,382	272,748	2,289,222	4,269,161	2,016,473	6,285,634	6,285,634
2015-2016	6,318,398	0	0	6,318,398	1,647,676	2,953,894	3,364,504	1,306,218	4,670,721	4,670,721
2016-2017	6,708,367	0	0	6,708,367	0	1,540,307	5,168,060	1,540,307	6,708,367	6,708,367
2017-2018	3,503,902	0	0	3,503,902	0	675,470	2,828,432	675,470	3,503,902	3,503,902
2018-2019	693,413	0	0	693,413	0	0	693,413	0	693,413	693,413
Total	\$141,857,205	\$0	\$0	\$141,857,205	\$24,355,939	\$50,937,375	\$90,919,830	\$26,581,436	\$117,501,265	\$117,501,265

## Notes:

- (A) Years are 7/1 to 6/30.
- (B) Provided by the Authority. Amounts are gross of recoveries and do not include 4850.
- (C) No adjustments were made.
- (D) No adjustments were made.
- (E) (B) + (C) - (D).
- (F) Sum of incurred losses in excess of SIR.
- (G) Sum of incurred losses in excess of \$100,000.
- (H) (E) - (G).
- (I) (G) - (F).
- (J) (E) - (F).
- (K) Minimum of (J) and the aggregate stop loss. See Appendix J.

Municipal Pooling Authority - Workers' Compensation

Paid Losses as of 10/31/18

Accident Year (A)	Unlimited Paid (B)	Additions to Losses (C)	Subtractions from Losses (D)	Adjusted Paid (E)	Paid Over SIR (F)	Paid Over \$100,000 (G)	Paid Capped at \$100,000 (H)	Paid \$100,000 to SIR Layer (I)	Paid Capped at SIR (J)	Paid Capped at SIR & Aggregate (K)
Prior	\$27,904,679	\$0	\$0	\$27,904,679	\$1,242,440	\$5,011,960	\$22,892,719	\$3,769,520	\$26,662,239	\$26,662,239
1998-1999	4,850,961	0	0	4,850,961	1,550,815	2,408,931	2,442,029	858,116	3,300,145	3,300,145
1999-2000	2,856,937	0	0	2,856,937	0	101,264	2,755,673	101,264	2,856,937	2,856,937
2000-2001	3,785,623	0	0	3,785,623	5,203	996,372	2,789,251	991,169	3,780,420	3,780,420
2001-2002	2,283,931	0	0	2,283,931	0	214,872	2,069,059	214,872	2,283,931	2,283,931
2002-2003	3,625,253	0	0	3,625,253	0	449,275	3,175,977	449,275	3,625,253	3,625,253
2003-2004	3,950,486	0	0	3,950,486	809,858	1,294,187	2,656,300	484,329	3,140,628	3,140,628
2004-2005	2,767,485	0	0	2,767,485	260,377	944,096	1,823,389	683,719	2,507,108	2,507,108
2005-2006	2,837,320	0	0	2,837,320	0	573,478	2,263,842	573,478	2,837,320	2,837,320
2006-2007	3,455,806	0	0	3,455,806	0	699,945	2,755,862	699,945	3,455,806	3,455,806
2007-2008	4,065,155	0	0	4,065,155	0	826,746	3,238,409	826,746	4,065,155	4,065,155
2008-2009	8,539,595	0	0	8,539,595	3,938,601	5,487,738	3,051,858	1,549,136	4,600,994	4,600,994
2009-2010	8,201,606	0	0	8,201,606	1,928,607	3,849,462	4,352,143	1,920,856	6,272,999	6,272,999
2010-2011	5,658,876	0	0	5,658,876	217,745	1,716,678	3,942,198	1,498,933	5,441,131	5,441,131
2011-2012	4,785,836	0	0	4,785,836	0	849,253	3,936,584	849,253	4,785,836	4,785,836
2012-2013	4,825,255	0	0	4,825,255	0	875,020	3,950,235	875,020	4,825,255	4,825,255
2013-2014	5,400,260	0	0	5,400,260	111,900	1,277,332	4,122,928	1,165,432	5,288,360	5,288,360
2014-2015	4,723,701	0	0	4,723,701	272,748	1,150,895	3,572,806	878,147	4,450,953	4,450,953
2015-2016	4,813,087	0	0	4,813,087	1,256,005	2,190,882	2,622,205	934,877	3,557,082	3,557,082
2016-2017	3,921,523	0	0	3,921,523	0	580,247	3,341,275	580,247	3,921,523	3,921,523
2017-2018	1,369,955	0	0	1,369,955	0	35,870	1,334,085	35,870	1,369,955	1,369,955
2018-2019	122,672	0	0	122,672	0	0	122,672	0	122,672	122,672
<b>Total</b>	<b>\$114,746,003</b>	<b>\$0</b>	<b>\$0</b>	<b>\$114,746,003</b>	<b>\$11,594,300</b>	<b>\$31,534,504</b>	<b>\$83,211,499</b>	<b>\$19,940,204</b>	<b>\$103,151,703</b>	<b>\$103,151,703</b>

Notes:

- (A) Years are 7/1 to 6/30.
- (B) Provided by the Authority. Amounts are gross of recoveries and do not include 4850.
- (C) No adjustments were made.
- (D) No adjustments were made.
- (E) (B) + (C) - (D).
- (F) Sum of paid losses in excess of SIR.
- (G) Sum of paid losses in excess of \$100,000.
- (H) (E) - (G).
- (I) (G) - (F).
- (J) (E) - (F).
- (K) Minimum of (J) and the aggregate stop loss. See Appendix J.

Municipal Pooling Authority - Workers' Compensation

Case Reserves as of 10/31/18

Accident Year (A)	Unlimited Reserves (B)	Additions to Losses (C)	Subtractions from Losses (D)	Adjusted Reserves (E)	Reserves Over SIR (F)	Reserves Over \$100,000 (G)	Reserves Capped at \$100,000 (H)	Reserves \$100,000 to SIR Layer (I)	Reserves Capped at SIR (J)	Reserves Capped at SIR & Aggregate (K)
Prior	\$1,154,050	\$0	\$0	\$1,154,050	\$257,291	\$944,501	\$209,549	\$687,210	\$896,759	\$896,759
1998-1999	16,333	0	0	16,333	0	0	16,333	0	16,333	16,333
1999-2000	93,104	0	0	93,104	0	22,928	70,176	22,928	93,104	93,104
2000-2001	520,232	0	0	520,232	310,771	452,079	68,153	141,308	209,461	209,461
2001-2002	123,084	0	0	123,084	0	72,905	50,180	72,905	123,084	123,084
2002-2003	101,626	0	0	101,626	0	29,888	71,738	29,888	101,626	101,626
2003-2004	207,112	0	0	207,112	0	89,996	117,116	89,996	207,112	207,112
2004-2005	519,437	0	0	519,437	277,743	426,433	93,004	148,690	241,694	241,694
2005-2006	592,858	0	0	592,858	307,312	536,551	56,307	229,239	285,546	285,546
2006-2007	164,874	0	0	164,874	0	98,134	66,741	98,134	164,874	164,874
2007-2008	334,222	0	0	334,222	0	277,031	57,191	277,031	334,222	334,222
2008-2009	11,422,394	0	0	11,422,394	11,185,904	11,317,340	105,054	131,436	236,490	236,490
2009-2010	586,729	0	0	586,729	30,948	422,407	164,322	391,459	555,782	555,782
2010-2011	590,003	0	0	590,003	0	357,292	232,711	357,292	590,003	590,003
2011-2012	380,093	0	0	380,093	0	111,536	268,557	111,536	380,093	380,093
2012-2013	216,290	0	0	216,290	0	108,221	108,070	108,221	216,290	216,290
2013-2014	1,257,237	0	0	1,257,237	0	634,635	622,602	634,635	1,257,237	1,257,237
2014-2015	1,834,681	0	0	1,834,681	0	1,138,326	696,355	1,138,326	1,834,681	1,834,681
2015-2016	1,505,311	0	0	1,505,311	391,671	763,012	742,299	371,341	1,113,640	1,113,640
2016-2017	2,786,844	0	0	2,786,844	0	960,060	1,826,785	960,060	2,786,844	2,786,844
2017-2018	2,133,947	0	0	2,133,947	0	639,599	1,494,347	639,599	2,133,947	2,133,947
2018-2019	570,741	0	0	570,741	0	0	570,741	0	570,741	570,741
Total	\$27,111,202	\$0	\$0	\$27,111,202	\$12,761,639	\$19,402,871	\$7,708,331	\$6,641,232	\$14,349,563	\$14,349,562

Notes:

- (A) Years are 7/1 to 6/30.
- (B) Appendix L, Page 1, Column (B) - Appendix L, Page 2, Column (B).
- (C) Appendix L, Page 1, Column (C) - Appendix L, Page 2, Column (C).
- (D) Appendix L, Page 1, Column (D) - Appendix L, Page 2, Column (D).
- (E) (B) + (C) - (D).
- (F) Sum of case reserves in excess of SIR.
- (G) Sum of case reserves in excess of \$100,000.
- (H) (E) - (G).
- (I) (G) - (F).
- (J) (E) - (F).
- (K) Minimum of (J) and the aggregate stop loss. See Appendix J.

Municipal Pooling Authority - Workers' Compensation

Claim Counts as of 10/31/18

Accident Year (A)	Reported Claims (B)	Additions to Reported Claims (C)	Subtractions from Reported Claims (D)	Adjusted Reported Claims (E)	Closed Claims (F)	Additions to Closed Claims (G)	Subtractions from Closed Claims (H)	Adjusted Closed Claims (I)	Open Claims (J)	Adjusted Open Claims (K)
Prior	6,151	0	0	6,151	6,125	0	0	6,125	26	26
1998-1999	360	0	0	360	359	0	0	359	1	1
1999-2000	379	0	0	379	375	0	0	375	4	4
2000-2001	341	0	0	341	334	0	0	334	7	7
2001-2002	337	0	0	337	335	0	0	335	2	2
2002-2003	407	0	0	407	402	0	0	402	5	5
2003-2004	397	0	0	397	391	0	0	391	6	6
2004-2005	324	0	0	324	317	0	0	317	7	7
2005-2006	340	0	0	340	334	0	0	334	6	6
2006-2007	360	0	0	360	354	0	0	354	6	6
2007-2008	380	0	0	380	372	0	0	372	8	8
2008-2009	314	0	0	314	305	0	0	305	9	9
2009-2010	373	0	0	373	358	0	0	358	15	15
2010-2011	324	0	0	324	311	0	0	311	13	13
2011-2012	318	0	0	318	304	0	0	304	14	14
2012-2013	309	0	0	309	300	0	0	300	9	9
2013-2014	304	0	0	304	277	0	0	277	27	27
2014-2015	312	0	0	312	271	0	0	271	41	41
2015-2016	305	0	0	305	270	0	0	270	35	35
2016-2017	330	0	0	330	259	0	0	259	71	71
2017-2018	287	0	0	287	196	0	0	196	91	91
2018-2019	103	0	0	103	14	0	0	14	89	89
Total	13,055	0	0	13,055	12,563	0	0	12,563	492	492

Notes:

- (A) Years are 7/1 to 6/30.
- (B) Provided by the Authority.
- (C) No adjustments were made.
- (D) No adjustments were made.
- (E) (B) + (C) - (D).
- (F) Provided by the Authority.
- (G) No adjustments were made.
- (H) No adjustments were made.
- (I) (F) + (G) - (H).
- (J) (B) - (F).
- (K) (E) - (I).

Municipal Pooling Authority - Workers' Compensation

Exposure Measures

Accident Year	Population (A)	Gross Revenue (\$00) (B)	Total Payroll (\$00) (C)	Sheriff's Payroll (\$00) (D)	Number of Police Vehicles (E)	Number of Employees (FTE) (F)	Inflation Trend Factor (G)
1998-1999			861,530				1.638
1999-2000			909,810				1.598
2000-2001			1,010,580				1.559
2001-2002			1,083,670				1.521
2002-2003			1,370,060				1.484
2003-2004			1,613,586				1.448
2004-2005			1,696,191				1.413
2005-2006			1,982,038				1.379
2006-2007			2,138,617				1.345
2007-2008			2,385,784				1.312
2008-2009			2,488,907				1.280
2009-2010			2,508,004				1.249
2010-2011			2,288,118				1.219
2011-2012			2,272,058				1.189
2012-2013			2,198,939				1.160
2013-2014			2,308,499				1.132
2014-2015			2,413,459				1.104
2015-2016			2,482,703				1.077
2016-2017			2,644,866				1.051
2017-2018			2,730,047				1.025
2018-2019			2,829,289				1.000
2019-2020			2,921,880				1.000

Notes: All exposure data provided by the Authority.



Municipal Pooling Authority - Workers' Compensation

Adjusted Exposure Measures

Accident Year	Population (A)	Gross Revenue (\$00) (B)	Trended Payroll (\$00) (C)	Trended Sheriff's Payroll (\$00) (D)	Number of Police Vehicles (E)	Number of Employees (FTE) (F)	Trended Payroll (\$00) (G)
1998-1999			1,411,186				1,411,186
1999-2000			1,453,876				1,453,876
2000-2001			1,575,494				1,575,494
2001-2002			1,648,262				1,648,262
2002-2003			2,033,169				2,033,169
2003-2004			2,336,473				2,336,473
2004-2005			2,396,718				2,396,718
2005-2006			2,733,230				2,733,230
2006-2007			2,876,440				2,876,440
2007-2008			3,130,149				3,130,149
2008-2009			3,185,801				3,185,801
2009-2010			3,132,497				3,132,497
2010-2011			2,789,216				2,789,216
2011-2012			2,701,477				2,701,477
2012-2013			2,550,769				2,550,769
2013-2014			2,613,221				2,613,221
2014-2015			2,664,459				2,664,459
2015-2016			2,673,871				2,673,871
2016-2017			2,779,754				2,779,754
2017-2018			2,798,298				2,798,298
2018-2019			2,829,289				2,829,289
2019-2020			2,921,880				2,921,880
Weight	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	

Notes: Monetary exposures have been adjusted for inflation before calculating the adjusted exposure measures. All exposures from page 1 have been adjusted to a common level. Composite Exposure = (0.0% x Population) + (0.0% x (\$00)) + (100.0% x Payroll (\$00)) + (0.0% x Payroll (\$00)) + (0.0% x Police Vehicles) + (0.0% x (FTE)).