



Actuarial Review of the Self-Insured General Liability Program

*Outstanding Liabilities as of June 30, 2018
Forecast for Fiscal Year 2018-19*

Presented to

Municipal Pooling Authority

June 2018

At the bottom of the page, there are decorative curved lines in shades of blue and yellow-green, mirroring the design at the top.



Thursday, June 07, 2018

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 Liability Program

Dear Ms. Cox:

As you requested, we have completed our review of Municipal Pooling Authority's (MPA's) self-insured liability program. Assuming an SIR of \$1,000,000 per occurrence, we estimate the ultimate cost of claims and expenses for claims incurred during the 2018-19 program year to be \$4,708,000. This amount includes allocated loss adjustment expenses (ALAE) and a discount for anticipated investment income. But excludes 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 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 the MPA's claims, assuming a 2.0% return on investments per year.

In addition, we estimate the program's liability for outstanding claims to be \$14,056,000 as of June 30, 2018, again including ALAE and ULAE, and discounted for anticipated investment income. Given estimated program assets of \$19,932,729 as of June 30, 2018, the program was funded above the 90% confidence level.

The \$14,056,000 estimate is the minimum liability to be booked by MPA at June 30, 2018 for its liability 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, 2018 are summarized in the table below.

Municipal Pooling Authority
Self-Insured Liability Program
Estimated Liability for Unpaid Loss and LAE
at June 30, 2018

	Expected	Marginally Acceptable 70% CL	Recommended Range			Conservative 90% CL
			Low 75% CL	Target 80% CL	High 85% CL	
Loss and ALAE	\$14,134,000	\$15,660,000	\$16,325,000	\$17,116,000	\$18,092,000	\$19,392,000
ULAE	647,000	717,000	747,000	784,000	828,000	888,000
Investment Income Offset	<u>(725,000)</u>	<u>(803,000)</u>	<u>(837,000)</u>	<u>(878,000)</u>	<u>(928,000)</u>	<u>(995,000)</u>
Discounted Loss and LAE	\$14,056,000	\$15,574,000	\$16,235,000	\$17,022,000	\$17,992,000	\$19,285,000
Assets	<u>19,932,729</u>	<u>19,932,729</u>	<u>19,932,729</u>	<u>19,932,729</u>	<u>19,932,729</u>	<u>19,932,729</u>
Surplus	\$5,876,729	\$4,358,729	\$3,697,729	\$2,910,729	\$1,940,729	\$647,729

GASB #10 does not address an actual asset 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.

The table below shows our funding recommendations for Municipal Pooling Authority for the 2018-19 fiscal year.

Municipal Pooling Authority
Self-Insured Liability Program
Loss and LAE Funding Guidelines for 2018-19
Self-Insured Retention (SIR) of \$1,000,000

	Expected	Marginally Acceptable 70% CL	Recommended Range			Conservative 90% CL
			Low 75% CL	Target 80% CL	High 85% CL	
Loss and ALAE	\$4,993,000	\$5,832,000	\$6,231,000	\$6,706,000	\$7,300,000	\$8,094,000
ULAE	0	0	0	0	0	0
Investment Income Offset	<u>(285,000)</u>	<u>(333,000)</u>	<u>(356,000)</u>	<u>(383,000)</u>	<u>(417,000)</u>	<u>(462,000)</u>
Discounted Loss and LAE	\$4,708,000	\$5,499,000	\$5,876,000	\$6,323,000	\$6,883,000	\$7,632,000
Non-Claims Related Expenses	<u>4,838,412</u>	<u>4,838,412</u>	<u>4,838,412</u>	<u>4,838,412</u>	<u>4,838,412</u>	<u>4,838,412</u>
Indicated Funding	\$9,546,412	\$10,337,412	\$10,714,412	\$11,161,412	\$11,721,412	\$12,470,412

The funding recommendations shown in the table above do not include any recognition of the existing funding margin (surplus or deficit) at June 30, 2018.

Municipal Pooling Authority
Self-Insured Liability Program
Loss and LAE Funding Rates Guidelines for 2018-19
Self-Insured Retention (SIR) of \$1,000,000
Discounted at 2.0%

Deductible	Loss &ALAE Deductible to \$1,000,000	Other Expenses	Excess Insurance Premium	Total Funding Rate
\$5,000	\$2.428	\$0.533	\$0.957	\$3.918
\$10,000	2.294	0.533	0.957	3.784
\$25,000	2.033	0.533	0.957	3.523
\$50,000	1.730	0.533	0.957	3.220
\$100,000	1.363	0.533	0.957	2.853

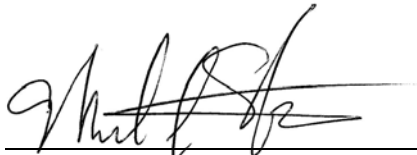
Note that while the projected expenses are for the 2018-19 fiscal year, the rate is a percentage of 2017-18 payroll. This is because in practice MPA collects 2018-19 contributions based on member payroll from 2017-18.

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 Mike Harrington at (916) 244-1162, Becky Richard at (916) 244-1183, or Eric Small at (916) 244-1165 with any questions you may have concerning this report.

Sincerely,

Bickmore



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President, Actuarial Consulting, Bickmore
Fellow, Casualty Actuarial Society
Member, American Academy of Actuaries



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I. BACKGROUND

Municipal Pooling Authority began its self-insured liability program on July 1, 1990. Its current self-insured retention is \$1,000,000. Claims administration services are provided by MPA's Risk Management Department. Additional background on the program is given in Pool - Appendix J.

As of June 30, 2018, MPA is expected to have assets of \$19,932,729 for the program. Additional background on program funding is given in Pool - Exhibit 5.

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, 2018, project ultimate loss costs for 2018-19, 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, 2018. 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 each graph indicates MPA's available assets at June 30th of each year.

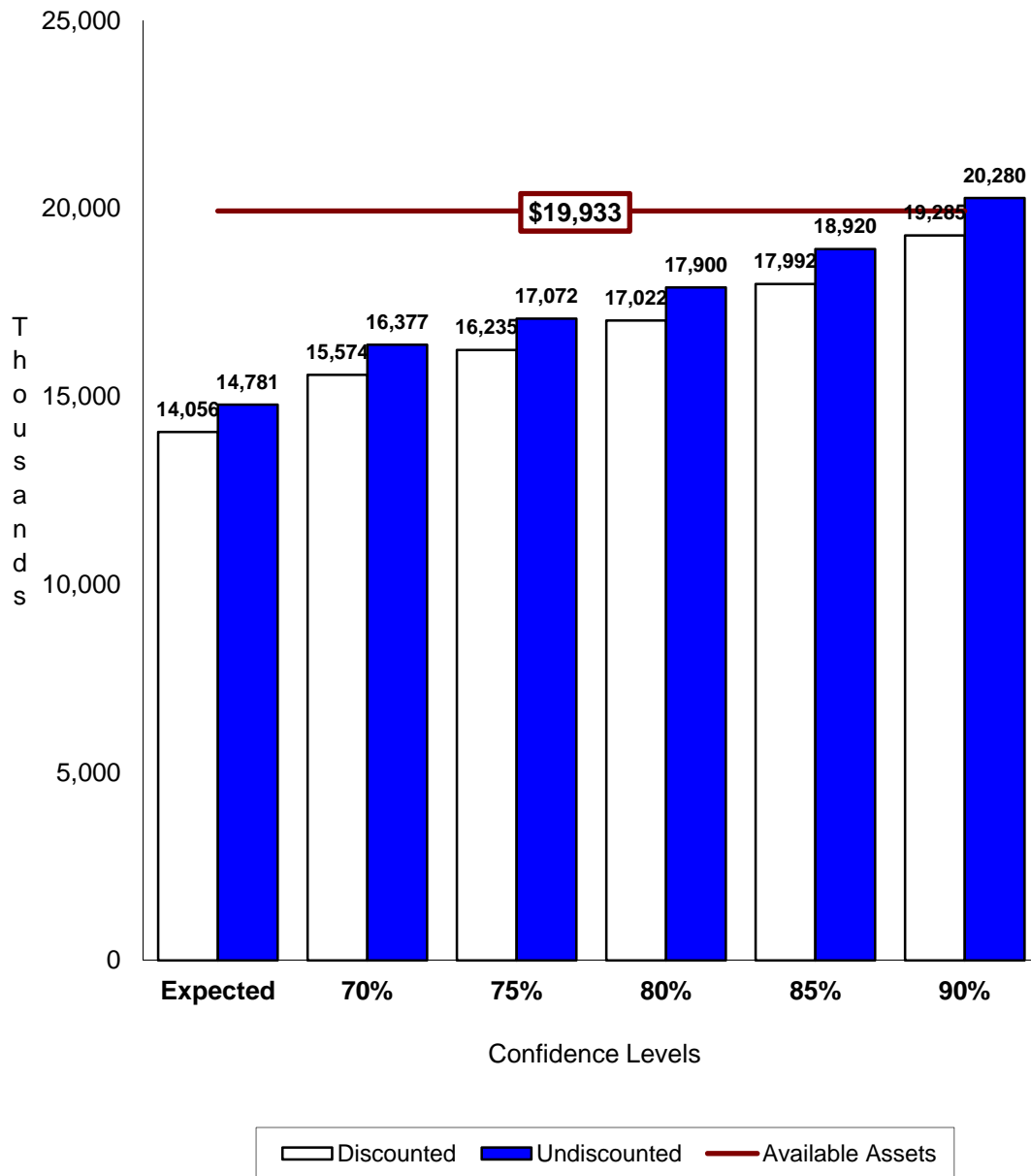
Our best estimate of the full value of MPA's liability for outstanding claims within its self-insured retention (SIR) is \$14,781,000 as of June 30, 2018. This amount includes losses, allocated loss adjustment expenses (ALAE), and unallocated loss adjustment expenses (ULAE). ALAE is the direct cost associated 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.

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 2.0%, we estimate the impact of investment income earnings to be about 4.9% if the program is funded within the range indicated in the graphs, resulting in a discounted liability for outstanding claims of \$14,056,000 as of June 30, 2018.

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
Liability
Available Assets vs Outstanding Liability (\$000's)
at June 30, 2018



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, 2018, before recognition of investment income.

Municipal Pooling Authority
Self-Insured Liability Program
Estimated Liability for Unpaid Loss and LAE at June 30, 2018

Year	Case Reserves	IBNR Reserves	Total Outstanding
Prior	\$0	\$0	\$0
1997-98	0	0	0
1998-99	0	0	0
1999-00	0	0	0
2000-01	0	0	0
2001-02	0	0	0
2002-03	411,027	0	411,027
2003-04	0	0	0
2004-05	0	0	0
2005-06	4,076	0	4,076
2006-07	977	0	977
2007-08	303,847	0	303,847
2008-09	336	0	336
2009-10	293	0	293
2010-11	39,172	13,838	53,010
2011-12	69,815	43,511	113,326
2012-13	133,065	129,301	262,366
2013-14	144,179	240,425	384,604
2014-15	1,232,913	163,161	1,396,074
2015-16	1,930,420	626,279	2,556,699
2016-17	3,081,753	1,055,429	4,137,182
2017-18	856,653	3,653,768	4,510,421
Loss and ALAE	\$8,208,526	\$5,925,712	\$14,134,238
ULAE		647,150	647,150
Total	\$8,208,526	\$6,572,862	\$14,781,388

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 funding 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.

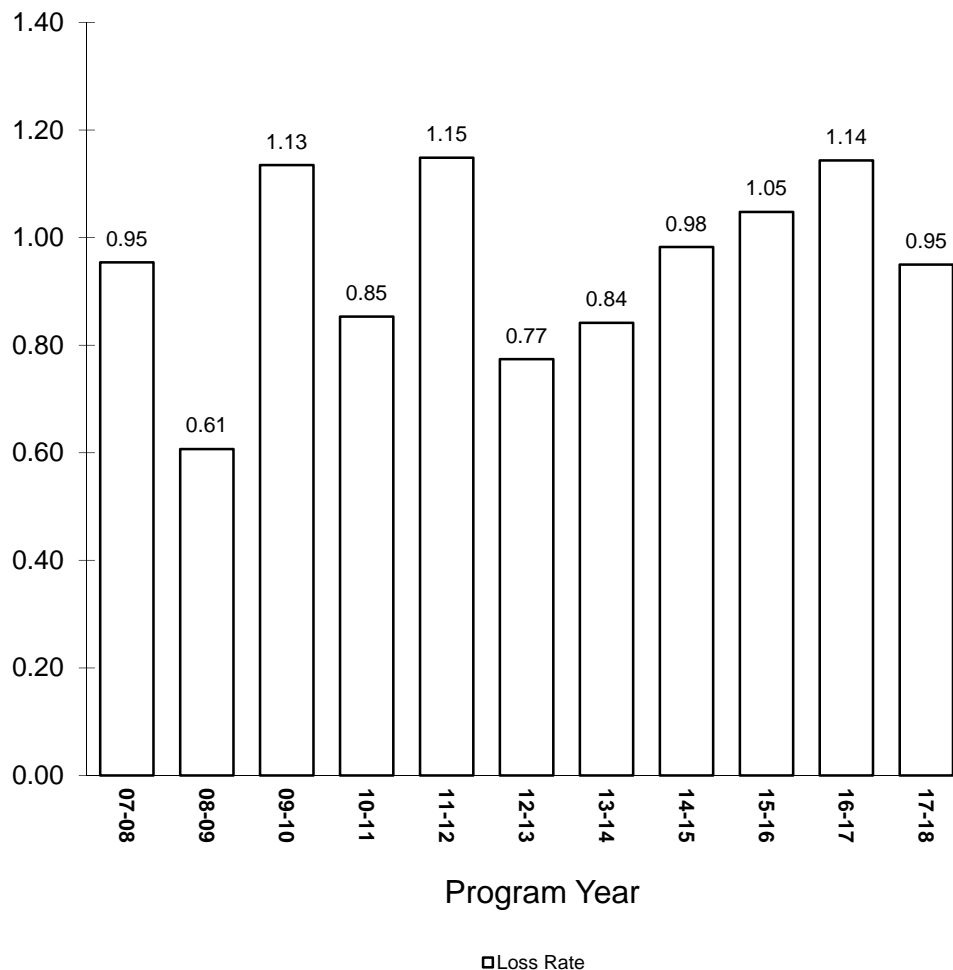
It is estimated that program assets will be \$19,932,729 at June 30, 2018, resulting in the program being funded above the 90% confidence level.

C. HISTORICAL TRENDS IN THE SELF-INSURANCE PROGRAM

MPA's loss rate (based on losses limited to \$100,000 per occurrence) has varied over the 10 year period shown below. The program's loss rate averaged \$0.94 per \$100 of payroll during the period 2007-08 to 2011-12. Since that time, the loss rate averaged \$0.96. Our projected loss rate for 2017-18 of \$0.95 per \$100 of payroll is based on the average of recent years.

Graph 2

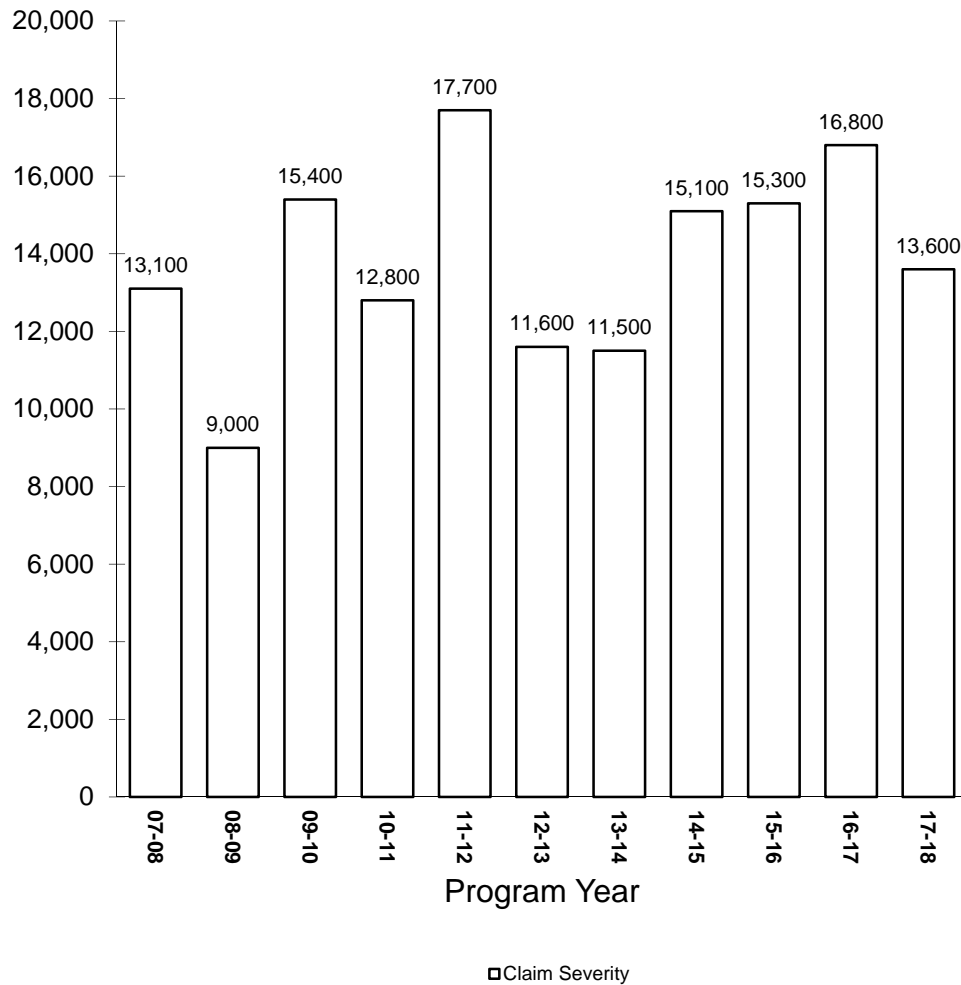
Municipal Pooling Authority
Liability
Dollars of Loss per
\$100 of Payroll



The following chart shows that MPA's average claim size, developed to ultimate and limited to \$100,000 per occurrence, has varied over the last several years, ranging from a low of \$9,000 in 2008-09 to a high of \$17,700 in 2011-12. The projected 2017-18 average cost per claim of \$13,600 based on the average of recent years.

Graph 3

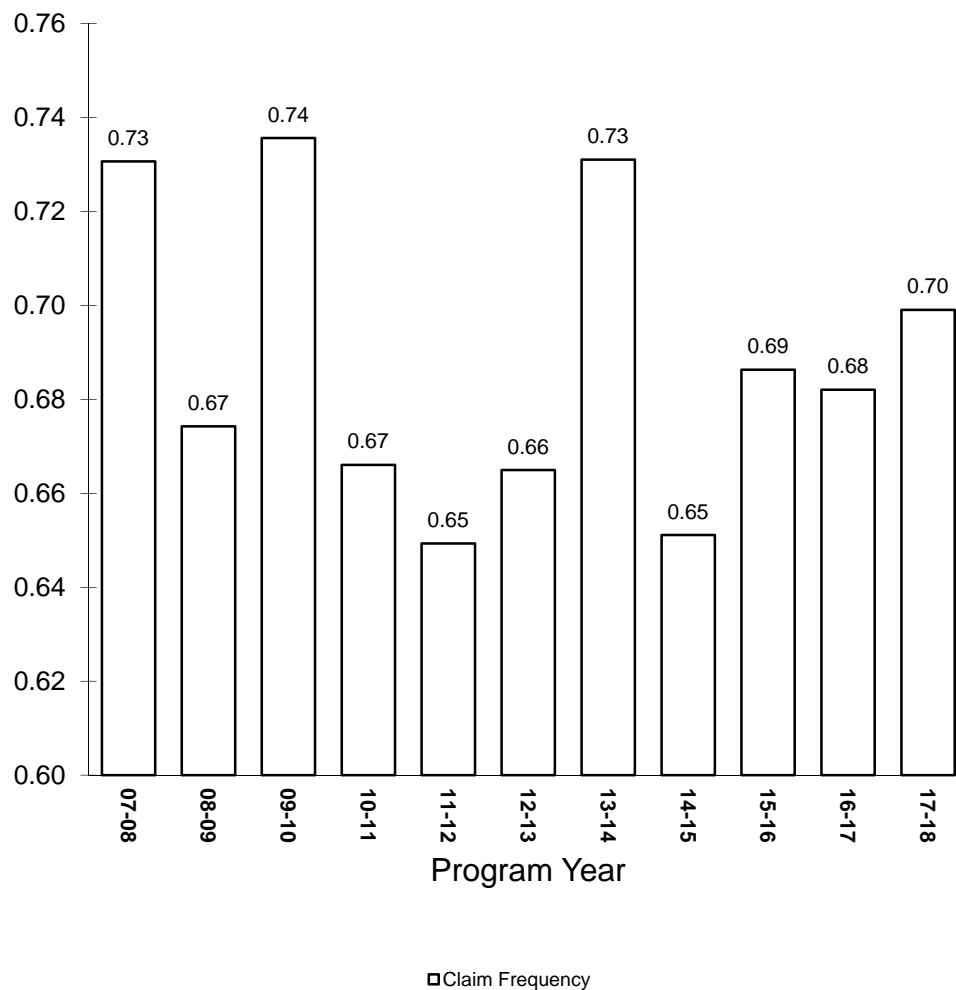
Municipal Pooling Authority
Liability
Dollars of Loss per Claim



The following chart shows that MPA's average number of claims per \$1M of payroll, or frequency. Between 2007-08 and 2013-14, MPA's frequency of claims per \$1 million payroll has averaged 0.69 per \$1M of payroll. Since that time, MPA's frequency has been increasing overall. Our projection for 2017-18 is 0.70 based on the average of the most recent three years.

Graph 4

Municipal Pooling Authority
Liability
Number of Claims per
\$1 Million of Payroll



D. COMPARISON WITH PREVIOUS RESULTS

The prior report for Municipal Pooling Authority was dated July 26, 2017. In the table below we display actual versus expected development of incurred losses and ALAE by accident year between the September 30, 2016 evaluation date of the prior report and the January 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	\$0	\$1,000	\$1,000
1997-98	0	0	0
1998-99	0	0	0
1999-00	0	0	0
2000-01	0	0	0
2001-02	0	(14,449)	(14,449)
2002-03	0	192,500	192,500
2003-04	0	0	0
2004-05	0	0	0
2005-06	0	(234,203)	(234,203)
2006-07	0	0	0
2007-08	1,000	32,557	31,557
2008-09	6,000	0	(6,000)
2009-10	22,000	(56,622)	(78,622)
2010-11	44,000	(492,954)	(536,954)
2011-12	92,000	(152,130)	(244,130)
2012-13	71,000	(456,773)	(527,773)
2013-14	500,000	(18,999)	(518,999)
2014-15	577,000	1,069,940	492,940
2015-16	1,573,000	2,820,276	1,247,276
2016-17	2,858,000	5,916,481	3,058,481
2017-18	337,000	475,595	138,595
Total	\$5,744,000	\$8,606,624	\$2,862,624

As shown, actual incurred development was greater than anticipated since the prior report. Based on the assumptions from the prior report, it was expected that incurred losses would increase by \$5,744,000 between the two evaluation dates. However, actual development was approximately \$8,606,624; or about \$2,862,624 more than expected. Although most accident years are emerging lower than expected, this favorable experience is more than offset by the unfavorable experience during the most recent four years which are emerging much greater than expected.

In the table below we display actual versus expected development of paid losses and ALAE by accident year between the September 30, 2016 evaluation date of the prior report and the January 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	\$12,117	\$12,117
1997-98	0	0	0
1998-99	0	0	0
1999-00	0	0	0
2000-01	0	0	0
2001-02	0	(14,449)	(14,449)
2002-03	99,000	10,138	(88,862)
2003-04	0	0	0
2004-05	0	0	0
2005-06	30,000	(88,760)	(118,760)
2006-07	0	0	0
2007-08	125,000	83,040	(41,960)
2008-09	2,000	0	(2,000)
2009-10	277,000	756,481	479,481
2010-11	215,000	10,122	(204,878)
2011-12	274,000	467,900	193,900
2012-13	456,000	412,366	(43,634)
2013-14	725,000	626,579	(98,421)
2014-15	1,509,000	1,687,899	178,899
2015-16	1,331,000	2,389,341	1,058,341
2016-17	763,000	1,882,600	1,119,600
2017-18	58,000	93,514	35,514
Total	\$5,806,000	\$8,235,374	\$2,429,374

As shown, actual paid development was greater than anticipated since the prior report. Based on the assumptions from the prior report, it was expected that paid losses would increase by \$5,806,000 between the two evaluation dates. However, actual development was approximately \$8,235,374; or about \$2,429,374 more than expected. Although, most accident years are emerging lower than anticipated, this favorable development is more than offset by the unfavorable development for the 2009-10, 2011-12, and the 2014-15 through and 2017-18 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	\$6,443,118	\$6,444,118	\$1,000
1997-98	3,851,532	3,851,532	0
1998-99	4,069,196	4,069,196	0
1999-00	2,495,245	2,495,245	0
2000-01	3,372,352	3,372,352	0
2001-02	2,116,036	2,101,587	(14,449)
2002-03	3,607,000	3,799,059	192,059
2003-04	2,210,245	2,210,245	0
2004-05	3,113,942	3,113,942	0
2005-06	4,963,000	4,729,000	(234,000)
2006-07	5,875,102	5,875,500	398
2007-08	5,657,000	5,689,500	32,500
2008-09	2,668,000	2,662,500	(5,500)
2009-10	7,392,000	7,299,000	(93,000)
2010-11	5,014,000	4,475,000	(539,000)
2011-12	6,466,000	6,207,000	(259,000)
2012-13	4,207,000	3,797,000	(410,000)
2013-14	4,581,000	4,110,000	(471,000)
2014-15	5,279,000	5,496,000	217,000
2015-16	5,470,000	6,477,000	1,007,000
2016-17	6,206,000	7,651,000	1,445,000
2017-18	6,488,000	6,575,000	87,000
Total	\$95,056,768	\$95,925,776	\$869,008

As shown, overall we have increased our estimated ultimate losses by \$869,008 since our prior report. This increase can be tied to greater than anticipated loss development 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, 2017 to be \$13,197,000 at the discounted, expected level. Our current estimate as of June 30, 2018, is \$14,056,000, an increase in our assessment of MPA's outstanding liabilities, as shown below:

Outstanding Claim Liabilities for Loss and LAE

	Prior Report at June 30, 2017	Current Report at June 30, 2018	Change
(A) Case Reserves:	\$7,504,000	\$8,208,000	\$704,000
(B) IBNR Reserves:	5,711,000	5,926,000	215,000
(C) Claims Administration Reserves:	702,000	647,000	(55,000)
(D) Total Reserves:	\$13,917,000	\$14,781,000	\$864,000
(E) Offset for Investment Income:	(720,000)	(725,000)	(5,000)
(F) Total Outstanding Claim Liabilities:	\$13,197,000	\$14,056,000	\$859,000

As shown, our estimate of outstanding claims liabilities at the discounted, expected level has increased between June 30, 2017 and June 30, 2018 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 as previously discussed. Reserves for future claims administration expenses have increased, resulting in an \$864,000 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 \$859,000 in our estimate of outstanding claim liabilities for loss and LAE.

At the time of the prior report, available assets were estimated to be \$18,369,000 as of June 30, 2017, which corresponded to the then-estimated discounted liability for outstanding claims above the 90% confidence level. Available assets are currently estimated to be \$19,932,729 as of June 30, 2018, which again corresponds to the currently estimated liability for outstanding claims above the 90% confidence level. It can be summarized as follows:

Funding Margin

	Prior Report at June 30, 2017	Current Report at June 30, 2018	Change
(A) Outstanding Liability at the Discounted Expected Level:	\$13,197,000	\$14,056,000	\$859,000
(B) Estimated Assets At June 30:	18,369,000	19,932,729	1,563,729
(C) Surplus:	\$5,172,000	\$5,876,729	\$704,729

As you can see, our estimate of the program’s funding margin at the discounted, expected level has increased by \$704,729 between June 30, 2017 (as previously estimated) and June 30, 2018 (as currently estimated). This is driven by an increase in the estimated fund assets between the two points, somewhat offset by an increase in the estimated outstanding liability.

At the time of the prior report, our funding estimate for the 2017-18 year was \$10,305,000 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 2018-19 year is \$11,137,000 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 2017-18 SIR = \$1,000,000	Current Report 2018-19 SIR = \$1,000,000	Change
(A) Ultimate Loss and ALAE:	\$4,772,000	\$4,993,000	\$221,000
(B) Offset for Investment Income:	(272,000)	(285,000)	(13,000)
(C) Recommended Loss and ALAE Funding:	\$4,500,000	\$4,708,000	208,000
(D) 80% Risk Margin:	1,553,000	1,615,000	62,000
(E) CARMA:	2,928,000	3,108,000	180,000
(F) Non-Claim Related Expenses:	1,324,000	1,730,000	406,000
(G) Total Funding:	10,305,000	11,161,000	856,000
(H) Rate:	3.276	3.437	0.161

As you can see, our discounted funding recommendations at the 80% confidence level have increased between 2017-18 and 2018-19, as shown in our prior and current reports respectively.

Our estimates of ultimate loss and ALAE have increased by \$221,000. This is driven primarily by greater than expected loss development and an increase in payroll. Investment income is expected to be higher, resulting in an overall increase of \$208,000 in our annual funding estimate for loss and ALAE. The CARMA premium and other non-claim related expenses have increased, resulting in an overall increase of \$856,000 in our annual funding estimate.

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 \$1,000,000 per occurrence for 2017-18 and 2018-19 (See Pool - Appendix J).
- We estimated the June 30, 2018 asset balance by beginning with the June 30, 2017 asset balance, and adjusting for anticipated revenue and expense for 2017-18 (see Pool - Exhibit 5).
- We received loss data evaluated as of September 30, 2017 and January 31, 2017 (See Pool - Appendix K). We also utilized the data from MPA's most recent actuarial study for our assessment of loss development.
- We have assumed that MPA's payroll for 2017-18 and 2018-19 will be \$324,713,668 and \$324,831,064, respectively, based upon information provided by MPA (See Pool - Appendix L).

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 participating in an excess insurance liability program.
- 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 liability 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 liability 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 costs of liability 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.
- We have assumed that the loss rate trend associated with claim costs increases at 2.0% per year. We have assumed that claim severity increases at 2.0% 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.

- At MPA's instruction, we have assumed that assets held for investment will generate an average annual return of 2.0% 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 CARMA 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 \$19,932,729 as of June 30, 2018 for use in this report. This is shown in further detail in Pool - Exhibit 5.

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 liability 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 - Liability - 100K & SIR Analyses

Funding Guidelines for Outstanding Liabilities at
January 31, 2018

(A) Estimated Ultimate Losses Incurred through 1/31/18: (From Pool - Appendix F)	\$71,717,000
(B) Estimated Paid Losses through 1/31/18: (From Pool - Appendix F)	57,507,000
(C) Estimated Liability for Claims Outstanding at 1/31/18: (From Pool - Appendix F)	<u>\$14,210,000</u>
(D) Estimated Liability for Outstanding Claims Administration Fees at 1/31/18:	650,000
(E) Total Outstanding Liability for Claims at 1/31/18: ((C) + (D))	<u>\$14,860,000</u>
(F) Reserve Discount Factor (Based on a Discount Rate of 2.0%) (Pool - Appendix H, Page 1, (G))	0.950
(G) Discounted Outstanding Liability for Claims at 1/31/18: ((E) x (F))	<u>\$14,118,000</u>

		Marginally Acceptable		Recommended		Conservative
Confidence Level of Adequacy:		70%	75%	80%	85%	90%
(H) Confidence Level Factor: (From Pool - Appendix I)		1.108	1.155	1.211	1.280	1.372
(I) Margin for Adverse Experience: (((G)-(D)) x ((H) - 1))		1,525,000	2,188,000	2,979,000	3,953,000	5,252,000
(J) Total Required Available Funding at 1/31/18:						
Undiscounted ((C) x (H) + (D))		<u>\$16,465,000</u>	<u>\$17,163,000</u>	<u>\$17,995,000</u>	<u>\$19,021,000</u>	<u>\$20,388,000</u>
NPV ((G) + (I))		15,643,000	16,306,000	17,097,000	18,071,000	19,370,000
(K) Estimated Actual Funding at 1/31/18: From Exhibit 6		\$19,932,729	\$19,932,729	\$19,932,729	\$19,932,729	\$19,932,729
(L) Indicated Funding Redundancy/ (Deficiency): ((K)-(J))						
Undiscounted		<u>\$3,467,729</u>	<u>\$2,769,729</u>	<u>\$1,937,729</u>	<u>\$911,729</u>	<u>(\$455,271)</u>
NPV		4,289,729	3,626,729	2,835,729	1,861,729	562,729

Municipal Pooling Authority - Liability - 100K & SIR Analyses

Funding Guidelines for Outstanding Liabilities at
June 30, 2018

(A) Estimated Ultimate Losses Incurred through 6/30/18: (From Pool - Appendix F)	\$73,699,000
(B) Estimated Paid Losses through 6/30/18: (From Pool - Appendix F)	59,565,000
(C) Estimated Liability for Claims Outstanding at 6/30/18: (From Pool - Appendix F)	<u>\$14,134,000</u>
(D) Estimated Liability for Outstanding Claims Administration Fees at 6/30/18:	647,000
(E) Total Outstanding Liability for Claims at 6/30/18: ((C) + (D))	<u>\$14,781,000</u>
(F) Reserve Discount Factor (Based on a Discount Rate of 2.0%) (Pool - Appendix H, Page 1, (H))	0.951
(G) Discounted Outstanding Liability for Claims at 6/30/18: ((E) x (F))	<u>\$14,056,000</u>

Confidence Level of Adequacy:	Marginally Acceptable		Recommended		Conservative
	70%	75%	80%	85%	90%
(H) Confidence Level Factor: (From Pool - Appendix I)	1.108	1.155	1.211	1.280	1.372
(I) Margin for Adverse Experience: (((G)-(D)) x ((H) - 1))	1,518,000	2,179,000	2,966,000	3,936,000	5,229,000
(J) Total Required Available Funding at 6/30/18:					
Undiscounted ((C) x (H) + (D))	<u>\$16,377,000</u>	<u>\$17,072,000</u>	<u>\$17,900,000</u>	<u>\$18,920,000</u>	<u>\$20,280,000</u>
NPV ((G) + (I))	15,574,000	16,235,000	17,022,000	17,992,000	19,285,000
(K) Estimated Actual Funding at 6/30/18: From Exhibit 6	\$19,932,729	\$19,932,729	\$19,932,729	\$19,932,729	\$19,932,729
(L) Indicated Funding Redundancy/ (Deficiency): ((K)-(J))					
Undiscounted	<u>\$3,555,729</u>	<u>\$2,860,729</u>	<u>\$2,032,729</u>	<u>\$1,012,729</u>	<u>(\$347,271)</u>
NPV	4,358,729	3,697,729	2,910,729	1,940,729	647,729

Municipal Pooling Authority - Liability - 100K & SIR Analyses
Funding Options for Program Year 2017-2018 (SIR = \$1,000,000)

	<u>Dollar Amount</u>				
(A) Estimated Ultimate Losses Incurred in Accident Year 2017-2018: (From Pool - Appendix F)	\$4,757,000				
(B) Loss Discount Factor (Based on a Discount Rate of 2.0%.) (Pool - Appendix H, Page 2, (F))	0.943				
(C) Discounted Total Claims Costs Incurred in Accident Year 2017-2018: ((C) x (D))	<u>\$4,486,000</u>				
	<u>Marginally Acceptable</u>	<u>Recommended</u>			<u>Conservative</u>
	70%	75%	80%	85%	90%
(D) Confidence Level Factor: (From Pool - Appendix I)	1.168	1.248	1.343	1.462	1.621
(E) Margin for Adverse Experience: ((C) x [(D) - 1])	754,000	1,113,000	1,539,000	2,073,000	2,786,000
(F) Recommended Funding in 2017-2018 for Claims Costs and Other Expenses ((C) + (E))	<u>\$5,240,000</u>	<u>\$5,599,000</u>	<u>\$6,025,000</u>	<u>\$6,559,000</u>	<u>\$7,272,000</u>
(G) CARMA Expenses (Provided by the Authority)	2,928,000	2,928,000	2,928,000	2,928,000	2,928,000
(H) Administrative Expenses (Provided by the Authority)	1,561,000	1,561,000	1,561,000	1,561,000	1,561,000
(I) Total Recommended Funding in 2017-2018 ((F) + (G))	<u>\$9,729,000</u>	<u>\$10,088,000</u>	<u>\$10,514,000</u>	<u>\$11,048,000</u>	<u>\$11,761,000</u>

Municipal Pooling Authority - Liability - 100K & SIR Analyses
Funding Options for Program Year 2018-2019 (SIR = \$1,000,000)
One-Year Funding Plan

	<u>Dollar Amount</u>				
(A) Estimated Ultimate Losses Incurred in Accident Year 2018-2019: (From Pool - Appendix F)	\$4,993,000				
(B) Loss Discount Factor (Based on a Discount Rate of 2.0%.) (Pool - Appendix H, Page 2, (F))	0.943				
(C) Discounted Total Claims Costs Incurred in Accident Year 2018-2019: ((C) x (D))	<u>\$4,708,000</u>				
	<u>Marginally Acceptable</u>	<u>Recommended</u>			<u>Conservative</u>
	70%	75%	80%	85%	90%
(D) Confidence Level Factor: (From Pool - Appendix I)	1.168	1.248	1.343	1.462	1.621
(E) Margin for Adverse Experience: ((C) x [(D) - 1])	791,000	1,168,000	1,615,000	2,175,000	2,924,000
(F) Recommended Funding in 2018-2019 for Claims Costs and Other Expenses ((C) + (E))	<u>\$5,499,000</u>	<u>\$5,876,000</u>	<u>\$6,323,000</u>	<u>\$6,883,000</u>	<u>\$7,632,000</u>
(G) CARMA Expenses (Provided by the Authority)	3,108,000	3,108,000	3,108,000	3,108,000	3,108,000
(H) Administrative Expenses (Provided by the Authority)	1,730,000	1,730,000	1,730,000	1,730,000	1,730,000
(I) Total Recommended Funding in 2018-2019 ((F) + (G))	<u>\$10,337,000</u>	<u>\$10,714,000</u>	<u>\$11,161,000</u>	<u>\$11,721,000</u>	<u>\$12,470,000</u>

Municipal Pooling Authority - Liability - 100K & SIR Analyses

IBNR as of 6/30/18 at Expected Claims Level

Accident Year	Estimated Ultimate (A)	Reported as of 1/31/18 (B)	Estimated IBNR as of 1/31/18 (C)	Estimated Percent of IBNR Reported Between 2/1/18 and 6/30/18 (D)	Estimated IBNR Reported (E)	Estimated IBNR as of 6/30/18 (F)
Prior	\$4,105,814	\$4,105,814	\$0	100.0%	\$0	\$0
1997-1998	2,512,579	2,512,579	0	100.0%	0	0
1998-1999	2,357,353	2,357,353	(0)	100.0%	0	(0)
1999-2000	1,082,117	1,082,117	(0)	100.0%	0	(0)
2000-2001	2,242,974	2,242,974	(0)	100.0%	0	(0)
2001-2002	1,075,986	1,075,986	(0)	100.0%	0	(0)
2002-2003	2,412,180	2,412,180	(0)	100.0%	0	(0)
2003-2004	1,363,073	1,363,073	0	100.0%	0	0
2004-2005	2,398,527	2,398,527	(0)	100.0%	0	(0)
2005-2006	3,657,000	3,656,775	225	100.0%	225	0
2006-2007	4,657,500	4,656,608	892	100.0%	892	(0)
2007-2008	4,562,500	4,561,844	656	100.0%	656	(0)
2008-2009	1,905,500	1,905,214	286	100.0%	286	0
2009-2010	5,912,000	5,911,721	279	100.0%	279	0
2010-2011	3,596,000	3,578,162	17,838	24.9%	4,000	13,838
2011-2012	4,865,000	4,803,489	61,511	29.8%	18,000	43,511
2012-2013	2,644,000	2,466,699	177,301	26.8%	48,000	129,301
2013-2014	3,052,000	2,737,575	314,425	23.6%	74,000	240,425
2014-2015	3,850,000	3,611,839	238,161	31.7%	75,000	163,161
2015-2016	4,682,000	3,862,721	819,279	23.6%	193,000	626,279
2016-2017	6,008,000	4,550,571	1,457,429	27.6%	402,000	1,055,429
2017-2018	4,757,000	149,232	2,626,000	20.7%	954,000	3,653,768
Totals	\$73,699,103	\$66,003,053	\$5,714,282		\$1,770,338	\$5,925,712

Notes:

- (A) From Pool - Exhibit 3, Page 2.
- (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 2/1/18 and 6/30/18. The percentage is based on the development pattern selected in Pool - 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 6/30/18. 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 - Liability - 100K & SIR Analyses

Accident Year	Reported	Paid	Exposure	Exposure	Frequency-Severity Method (E)	Selected	Losses within the Deductible (G)	Estimate of Ultimate Losses within Aggregate Limit Excluding Deductibles (H)
	Loss Development Method (A)	Loss Development Method (B)	Method Based on Reported Losses (C)	Method Based on Paid Losses (D)		Estimate of Ultimate Losses (F)		
Prior	\$6,444,118	\$6,384,295	\$0	\$0	\$5,703,149	\$6,444,118	\$2,338,304	\$4,105,814
1997-1998	3,851,532	3,851,532	3,851,532	3,851,532	3,069,198	3,851,532	1,338,953	2,512,579
1998-1999	4,069,196	4,069,196	4,069,196	4,069,196	3,860,955	4,069,196	1,711,843	2,357,353
1999-2000	2,495,245	2,497,740	2,495,245	2,498,363	3,117,500	2,495,245	1,413,128	1,082,117
2000-2001	3,372,352	3,379,097	3,372,352	3,377,960	2,804,625	3,372,352	1,129,378	2,242,974
2001-2002	2,101,587	2,107,892	2,101,587	2,109,874	2,761,640	2,101,587	1,025,601	1,075,986
2002-2003	3,799,059	3,302,347	3,799,059	3,303,009	3,420,200	3,799,059	1,386,879	2,412,180
2003-2004	2,210,245	2,227,927	2,210,245	2,230,314	2,508,600	2,210,245	847,172	1,363,073
2004-2005	3,113,942	3,145,081	3,113,942	3,135,718	2,175,551	3,113,942	715,415	2,398,527
2005-2006	4,728,560	4,790,177	4,728,560	4,789,558	4,680,531	4,729,000	1,072,000	3,657,000
2006-2007	5,875,102	5,980,646	5,875,102	5,945,433	3,919,833	5,875,500	1,218,000	4,657,500
2007-2008	5,688,782	5,473,737	5,688,782	5,449,021	4,234,465	5,689,500	1,127,000	4,562,500
2008-2009	2,662,400	2,744,620	2,662,400	2,748,539	2,879,931	2,662,500	757,000	1,905,500
2009-2010	7,298,922	7,621,906	7,298,922	7,522,894	5,366,909	7,299,000	1,387,000	5,912,000
2010-2011	4,474,629	4,712,759	4,472,805	4,668,749	3,997,896	4,475,000	879,000	3,596,000
2011-2012	6,206,863	6,649,386	6,199,368	6,530,207	5,397,847	6,207,000	1,342,000	4,865,000
2012-2013	3,695,876	4,010,707	3,713,871	4,065,242	4,062,240	3,797,000	1,153,000	2,644,000
2013-2014	3,962,395	4,472,335	3,989,888	4,498,613	4,753,620	4,110,000	1,058,000	3,052,000
2014-2015	5,847,062	5,418,490	5,749,014	5,242,623	4,614,960	5,496,000	1,646,000	3,850,000
2015-2016	7,102,870	6,845,009	6,797,160	6,156,199	5,747,997	6,477,000	1,795,000	4,682,000
2016-2017	9,294,828	9,978,366	8,704,117	6,790,062	6,270,709	7,651,000	1,643,000	6,008,000
Totals						\$95,925,776	\$26,983,673	\$68,942,103
						\$6,575,000	\$1,818,000	\$4,757,000
						\$6,812,000	\$1,819,000	\$4,993,000

Notes:

- (A) From Pool - Appendix A, Page 1, Column (G).
- (B) From Pool - Appendix B, Page 1, Column (G).
- (C) From Pool - Appendix C, Page 1, Column (G).
- (D) From Pool - Appendix C, Page 2, Column (G).
- (E) From Pool - Appendix D, Page 1, Column (C).
- (F) Selected averages of (A), (B), (C), (D), and (E).
- (G) From Pool - Exhibit 3, Page 3, Column (H).
- (H) (F) - (G)
- (I) From Pool - Exhibit 9, Page 1, Line (K).
- (J) From Pool - Exhibit 9, 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 - Liability - 100K & SIR Analyses

Estimated Ultimate Limited Losses Within Member Deductible

Accident Year	Paid Losses Within Member Deductible as of 1/31/18 (A)	Case Reserves Within Member Deductible as of 1/31/18 (B)	Incurred Losses Within Member Deductible as of 1/31/18 (C)	Implicit Incurred Loss Development Factor (D)	Deductible (E)	Ratio of Losses Within Deductible to Loss Limited to \$100,000 (F)	Adjustment Incurred Loss Development Factor (G)	Ultimate Losses Within Member Deductible (H)
Prior	\$2,338,304	\$0	\$2,338,304	1.000	Various	0.524	1.000	\$2,338,304
1997-1998	1,338,953	0	1,338,953	1.000	Various	0.640	1.000	1,338,953
1998-1999	1,711,843	0	1,711,843	1.000	Various	0.598	1.000	1,711,843
1999-2000	1,413,128	0	1,413,128	1.000	Various	0.905	1.000	1,413,128
2000-2001	1,129,378	0	1,129,378	1.000	Various	0.713	1.000	1,129,378
2001-2002	1,025,601	0	1,025,601	1.000	Various	0.623	1.000	1,025,601
2002-2003	1,386,879	0	1,386,879	1.000	Various	0.679	1.000	1,386,879
2003-2004	847,172	0	847,172	1.000	Various	0.549	1.000	847,172
2004-2005	715,415	0	715,415	1.000	Various	0.544	1.000	715,415
2005-2006	1,071,785	0	1,071,785	1.000	Various	0.387	1.000	1,072,000
2006-2007	1,218,494	0	1,218,494	1.000	Various	0.534	1.000	1,218,000
2007-2008	1,126,938	0	1,126,938	1.000	Various	0.467	1.000	1,127,000
2008-2009	756,981	206	757,186	1.000	Various	0.470	1.000	757,000
2009-2010	1,375,060	12,141	1,387,201	1.000	Various	0.471	1.000	1,387,000
2010-2011	878,264	376	878,640	1.002	Various	0.409	1.000	879,000
2011-2012	1,292,747	49,173	1,341,920	1.003	Various	0.473	1.000	1,342,000
2012-2013	1,131,674	17,945	1,149,618	1.005	Various	0.620	1.003	1,153,000
2013-2014	965,930	88,261	1,054,191	1.007	Various	0.513	1.004	1,058,000
2014-2015	1,449,245	173,528	1,622,773	1.022	Various	0.654	1.014	1,646,000
2015-2016	1,408,267	335,066	1,743,333	1.050	Various	0.597	1.030	1,795,000
2016-2017	542,154	896,271	1,438,425	1.275	Various	0.518	1.142	1,643,000
Totals	\$25,124,210	\$1,572,966	\$26,697,177					\$26,983,673

Projected Losses within Member Deductible for the Year 2017-2018 (I) \$1,818,000
 Projected Losses within Member Deductible for the Year 2018-2019 (J) \$1,819,000

Notes:

- (A) Provided by the Authority. Amounts are gross of deductibles, net of recoveries. All claims prior to 1994-95 are closed.
- (B) Provided by the Authority. Amounts are gross of deductibles, net of recoveries. All claims prior to 1994-95 are closed.
- (C) Provided by the Authority. Amounts are gross of deductibles, net of recoveries. All claims prior to 1994-95 are closed.
- (D) Based on the reported incurred losses limited to \$100,000 and the selected ultimate limited losses from Pool - Exhibit 3, Page 4.
- (E) Based on individual member deductible per fiscal year and corresponding payroll.
- (F) Based on the ratio of losses to a \$100,000 limit.
- (G) Based on (D) and (F)
- (H) (C) x (G). This amount includes only the portion of loss under the members' deductible.
- (I)-(K) Based on the ratio of loss within member deductible to the ultimate loss. Assumes no deductibles change from 2016-2017.

This exhibit shows the calculation of estimated ultimate losses within the member deductible for each year based on paid losses and case reserves within the members deductible 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.

Municipal Pooling Authority - Liability - 100K & SIR Analyses

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	\$4,464,783	\$4,464,783	\$0	\$0	\$4,464,760	\$4,464,783
1997-1998	2,091,721	2,091,721	2,091,721	2,091,721	2,091,672	2,091,721
1998-1999	2,588,886	2,588,886	2,588,886	2,588,886	2,588,915	2,588,886
1999-2000	2,057,287	2,057,287	2,057,287	2,057,287	2,057,250	2,057,287
2000-2001	1,820,083	1,820,083	1,820,083	1,820,083	1,820,025	1,820,083
2001-2002	1,760,695	1,760,695	1,760,695	1,760,695	1,760,815	1,760,695
2002-2003	2,141,098	2,144,885	2,141,098	2,144,884	2,141,055	2,141,098
2003-2004	1,542,158	1,546,784	1,542,158	1,546,786	1,542,200	1,542,158
2004-2005	1,313,942	1,319,198	1,313,942	1,319,201	1,314,019	1,313,942
2005-2006	2,772,583	2,786,446	2,772,583	2,786,442	2,772,503	2,772,583
2006-2007	2,280,213	2,293,840	2,280,213	2,293,840	2,280,285	2,280,213
2007-2008	2,415,240	2,414,413	2,415,240	2,414,531	2,415,175	2,415,240
2008-2009	1,611,115	1,625,407	1,611,115	1,625,412	1,611,179	1,611,115
2009-2010	2,945,599	2,968,658	2,945,599	2,968,815	2,945,984	2,946,000
2010-2011	2,152,274	2,172,312	2,152,285	2,172,556	2,152,080	2,152,000
2011-2012	2,848,248	2,801,257	2,848,272	2,801,274	2,847,929	2,848,000
2012-2013	1,860,835	1,904,682	1,862,595	1,919,810	2,101,440	1,862,000
2013-2014	2,071,237	2,066,309	2,073,203	2,084,556	2,412,180	2,072,000
2014-2015	2,535,228	2,570,658	2,534,269	2,547,485	2,295,888	2,535,000
2015-2016	3,076,587	3,711,854	3,059,322	3,299,131	2,802,342	3,068,000
2016-2017	3,621,577	3,677,212	3,451,865	3,109,371	2,999,576	3,537,000
Totals						\$49,879,804
			Projected Losses for the Year 2017-2018 (G)			\$3,084,000
			Projected Losses for the Year 2018-2019 (H)			\$3,148,000

Notes:

- (A) From Pool - Appendix A, Page 1, Column (D).
- (B) From Pool - Appendix B, Page 1, Column (D).
- (C) Based on results in Pool - Appendix C, Page 1.
- (D) Based on results in Pool - Appendix C, Page 2.
- (E) Based on results in Pool - Appendix D, Page 1.
- (F) Selected averages of (A), (B), (C), (D), and (E).
- (G) From Pool - Exhibit 9, Page 1, Line (K) / Line (G) .
- (H) From Pool - Exhibit 9, 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 - Liability - 100K & SIR Analyses

Selection of Increased Limits Factors (\$100,000 to \$1,000,000) for 2017-2018 and 2018-2019

Accident Year	Self-Insured Retention (A)	\$100,000 Limited Selected Ultimate Losses (B)	\$1,000,000 Limited Selected Ultimate Losses (C)	Implied Increased Limits Factor (D)	Modeled Increased Limits Factor (E)
Prior	\$1,000,000				1.277
1997-1998	1,000,000	2,091,721	3,851,532	1.841	1.467
1998-1999	1,000,000	2,588,886	4,069,196	1.572	1.491
1999-2000	1,000,000	2,057,287	2,495,245	1.213	1.515
2000-2001	1,000,000	1,820,083	3,372,352	1.853	1.541
2001-2002	1,000,000	1,760,695	2,101,587	1.194	1.568
2002-2003	1,000,000	2,141,098	3,799,059	1.774	1.597
2003-2004	1,000,000	1,542,158	2,210,245	1.433	1.627
2004-2005	1,000,000	1,313,942	3,113,942	2.370	1.656
2005-2006	1,000,000	2,772,583	4,729,000	1.706	1.688
2006-2007	1,000,000	2,280,213	5,875,500	2.577	1.719
2007-2008	1,000,000	2,415,240	5,689,500	2.356	1.753
2008-2009	1,000,000	1,611,115	2,662,500	1.653	1.788
2009-2010	1,000,000	2,946,000	7,299,000	2.478	1.822
2010-2011	1,000,000	2,152,000	4,475,000	2.079	1.858
2011-2012	1,000,000	2,848,000	6,207,000	2.179	1.895
2012-2013	1,000,000	1,862,000	3,797,000	2.039	1.933
2013-2014	1,000,000	2,072,000	4,110,000	1.984	1.971
2014-2015	1,000,000	2,535,000	5,496,000	2.168	2.010
2015-2016	1,000,000	3,068,000	6,477,000	2.111	2.051
2016-2017	1,000,000	3,537,000	7,651,000	2.163	2.091
Total ex Latest 2 Years		38,810,021	75,353,658	1.942	
Total 11/12-16/17		15,922,000	33,738,000	2.119	
All Years		45,415,021	89,481,658	1.970	
		Prior Selected 2016-2017 \$100K-SIR ILF:		2.121	
		(F) Selected 2017-2018 \$100K-SIR ILF:		2.132	
		(G) Selected 2018-2019 \$100K-SIR ILF:		2.164	

Notes:

- (A) Provided by the Authority.
- (B) From Pool - Exhibit 3, Page 4.
- (C) From , .
- (D) (C) / (B).
- (E) From Pool - Appendix C, Page 3.
- (F) - (G) Based on columns (D) and (E) - trended for inflation.

Municipal Pooling Authority - Liability

2018-19 Funding
at 80% Confidence Level

Deductible Amount	Per \$100 of Payroll				Excess of Deductibles to the Program's \$1.0 Million Self-Insured Retention At 80% Confidence Level of Payroll (E)	Present Value Factor at 2.0% Interest (F)	Recommended Unbalanced Funding Per \$100 of Payroll For Losses From In Excess of Deductibles to the Program's \$1.0 Million Self-Insured Retention (G)	Off Balance Factor (H)	Recommended Balanced Funding Per \$100 of Payroll For Losses From In Excess of Deductibles to the Program's \$1.0 Million Self-Insured Retention (I)	Estimated Operating and Administrative Expenses Per \$100 of Payroll (J)	Estimated Excess Insurance Premium Per \$100 of Payroll (K)	Rates Per \$100 of Payroll (L)	2017-18 Payroll (M)	2018-19 Recommended Funding (N)
	Excess of Deductibles to \$100,000 Per Occurrence (A)	Excess of \$100,000 Per Occurrence to the Program's \$1.0 Million Self-Insured Retention (B)	Excess of Deductibles to the Program's \$1.0 Million Self-Insured Retention At Expected Confidence Level (C)	80% Confidence Level Factor (D)										
\$5,000	\$0.785	\$1.128	\$1.913	1.343	\$2.569	0.961	\$2.469	0.983	\$2.428	\$0.533	\$0.957	\$3.918	\$67,125,911	\$2,630,000
10,000	0.686	1.128	1.814	1.343	2.436	0.958	2.333	0.983	2.294	0.533	0.957	3.784	56,816,407	2,150,000
25,000	0.487	1.128	1.615	1.343	2.169	0.954	2.068	0.983	2.033	0.533	0.957	3.523	65,929,367	2,323,000
50,000	0.273	1.128	1.401	1.343	1.882	0.934	1.759	0.983	1.730	0.533	0.957	3.220	57,394,238	1,848,000
100,000	0.000	1.128	1.128	1.343	1.515	0.915	1.386	0.983	1.363	0.533	0.957	2.853	77,447,745	2,210,000
												Total:	\$324,713,668	\$11,161,000

(A) Based on deductible analysis and Pool - Exhibit 3, Page 4.

(B) Based on \$100K & \$1M analyses and Exhibit 6.

(C) (A) + (B)

(D) Based on Pool - Appendix I

(E) (C) x (D)

(F) Based on Pool - Appendix H

(G) (E) x (F)

(H) Off- Balance Factor

(I) (G) x (H)

(J) Includes projected Fiscal Year 2018-19 Administrative Expenses Premium of \$0.533 per \$100 of payroll.

(K) Includes projected Fiscal Year 2018-19 Excess Insurance Premium of \$0.957 per \$100 of payroll. Includes CARMA, but excludes ERMA EPL Premium.

(L) (I) + (J) + (K)

(M) Provided by Authority

(N) (L) x (M)

Municipal Pooling Authority - Liability

Estimated Financial Position of the Liability
Insurance Pool as of June 30, 2018

Liability Insurance

1. Estimated Assets Available to Pay Claims as of June 30, 2017	\$19,337,000
2. Premiums Collected in Fiscal Year 2017-2018 (gross of member rebates and retrospective premiums)	\$11,506,729
3. Estimated Investment Income Earned in Fiscal Year 2017-2018 at 2.0% Interest	\$135,000
4. Other Income (Dividends Received)	-
5. Operating and Administrative Expenses Budgeted for Fiscal Year 2017-2018 (including the excess insurance premium and the premium for coverage of employment practices liability claims)	6,107,000
6. Estimated Pooled Losses Paid in Fiscal Year 2017-2018	4,939,000
7. Estimated Assets Available to Pay Claims as of June 30, 2018 (1)+(2)+(3)+(4)-(5)-(6)	<u>\$19,932,729</u>
8a. Estimated Claim Liability Reserve for Pooled Losses as of June 30, 2018	14,134,000
8b. Estimated Liability for Outstanding Claims Administration Fee as of June 30, 2018	<u>647,000</u>
9. Excess (Deficiency) of the Net Assets of the Liability Insurance Pool in Comparison With the Estimated Claim Liability Reserve as of June 30, 2018. (7)-(8a)-(8b)	5,151,729
10a. Estimated Present Value of the Claim Liability Reserve for Pooled Losses as of June 30, 2018	\$13,441,000
10b. Estimated Present Value of Outstanding Liability for Claims Administration Fee as of June 30, 2018	\$615,000
11. Excess (Deficiency) of Assets Available to Pay Claims in Comparison With the Estimated Present Value of the Claim Liability Reserve as of (7)-(10a)-(10b)	<u>=====</u> \$5,876,729

Municipal Pooling Authority - Liability

Estimated Assets Available to Pay Claims
as of Jun 30, 2017

Liability Insurance

Assets:	
1. Cash and Cash Equivalents as of June 30, 2017	\$8,040,000
2. Investments as of June 30, 2017	-
3. Receivables as of June 30, 2017	
Member Agencies	278,000
Excess Insurance	-
Interest	74,000
Other	600,000
Interprogram Receivables	-
Total	
4. Prepaid Expenses as of June 30, 2017	<u>32,000</u>
5. Total Current Assets as of June 30, 2017	\$9,024,000
6. Member Agencies Receivable as of June 30, 2017	-
7. Interprogram Receivables as of June 30, 2017	-
8. Investments as of June 30, 2017	10,461,000
9. Capital Assets (Net) as of June 30, 2017	<u>30,000</u>
10. Total Noncurrent Assets as of June 30, 2017	\$10,491,000
	=====
11. Total Assets as of June 30, 2017 (5)+(10)	\$19,515,000
Non- Claims Liabilities:	
12. Accounts Payable as of June 30, 2017	-
13. Accrued Vacation & Payroll Payable as of June 30, 2017	41,000
14. Other Payable as of June 30, 2017	107,000
15. Member Dividends Payable as of June 30, 2017	-
16. Capital Assets (Net) as of June 30, 2017	30,000
	=====
17. Total Liabilities as of June 30, 2017	\$178,000
18. Estimated Assets Available to Pay Claims as of June 30, 2017 (11)-(17)	\$19,337,000

Municipal Pooling Authority - Liability

Selected Increased Limit Factors

	Trended Incurred Losses Limited to										
	\$5,000	\$10,000	\$25,000	\$50,000	\$100,000	\$150,000	\$250,000	\$500,000	\$1,000,000	\$2,500,000	Unlimited
2006-2007	590,444	927,551	1,634,781	2,347,816	3,127,949	3,801,065	4,708,834	5,763,342	5,996,957	5,996,957	5,996,957
2007-2008	490,749	787,903	1,374,585	1,854,107	2,528,783	3,120,055	3,680,038	4,930,038	6,766,940	7,304,951	7,304,951
2008-2009	479,270	742,212	1,279,062	1,871,221	2,701,728	3,252,667	4,089,132	5,490,399	6,496,605	6,934,594	6,934,594
2009-2010	423,090	603,635	954,337	1,381,837	1,808,375	2,068,691	2,236,721	2,486,721	2,986,721	3,181,814	3,181,814
2010-2011	564,820	924,014	1,613,700	2,287,631	3,203,935	3,852,471	4,857,815	6,651,648	8,497,286	8,551,851	8,551,851
2011-2012	453,601	683,159	1,143,787	1,666,061	2,312,326	2,788,477	3,514,447	4,309,653	4,974,174	5,122,860	5,122,860
2012-2013	455,246	687,568	1,248,238	1,970,856	3,017,118	3,653,998	4,524,186	5,394,684	6,684,533	6,936,858	6,936,858
2013-2014	417,452	641,239	1,080,706	1,499,483	1,987,793	2,287,793	2,841,480	3,405,926	3,918,480	4,022,560	4,022,560
2014-2015	439,455	657,522	1,082,027	1,556,927	2,143,985	2,569,666	3,038,180	3,538,180	4,091,136	4,173,568	4,173,568
2015-2016	444,745	682,024	1,204,887	1,770,654	2,609,757	3,226,253	4,129,200	5,473,524	6,275,938	6,337,146	6,337,146
2016-2017	549,188	847,760	1,475,884	2,254,361	3,225,035	3,813,408	4,813,408	6,260,135	7,325,945	7,456,443	7,456,443
Total	5,308,059	8,184,586	14,091,996	20,460,954	28,666,784	34,434,544	42,433,442	53,704,250	64,014,715	66,019,601	66,019,601
2006-2007	0.189	0.297	0.523	0.751	1.000	1.215	1.505	1.843	1.917	1.917	1.917
2007-2008	0.194	0.312	0.544	0.733	1.000	1.234	1.455	1.950	2.676	2.889	2.889
2008-2009	0.177	0.275	0.473	0.693	1.000	1.204	1.514	2.032	2.405	2.567	2.567
2009-2010	0.234	0.334	0.528	0.764	1.000	1.144	1.237	1.375	1.652	1.759	1.759
2010-2011	0.176	0.288	0.504	0.714	1.000	1.202	1.516	2.076	2.652	2.669	2.669
2011-2012	0.196	0.295	0.495	0.721	1.000	1.206	1.520	1.864	2.151	2.215	2.215
2012-2013	0.151	0.228	0.414	0.653	1.000	1.211	1.500	1.788	2.216	2.299	2.299
2013-2014	0.210	0.323	0.544	0.754	1.000	1.151	1.429	1.713	1.971	2.024	2.024
2014-2015	0.205	0.307	0.505	0.726	1.000	1.199	1.417	1.650	1.908	1.947	1.947
2015-2016	0.170	0.261	0.462	0.678	1.000	1.236	1.582	2.097	2.405	2.428	2.428
2016-2017	0.170	0.263	0.458	0.699	1.000	1.182	1.493	1.941	2.272	2.312	2.312
Total	0.185	0.286	0.492	0.714	1.000	1.201	1.480	1.873	2.233	2.303	2.303
7-Year Avg	0.180	0.277	0.478	0.703	1.000	1.200	1.498	1.894	2.258	2.303	2.303
5-Year Avg	0.178	0.271	0.469	0.697	1.000	1.198	1.490	1.854	2.179	2.228	2.228
3-Year Avg	0.180	0.274	0.472	0.700	1.000	1.204	1.502	1.914	2.218	2.252	2.252
Prior	0.192	0.295	0.500	0.720	1.000	1.188	1.433	1.750	2.121	2.215	2.223
Selection	0.190	0.292	0.497	0.718	1.000	1.192	1.449	1.762	2.132	2.224	2.231

Municipal Pooling Authority - Liability

Estimated Claim Liability Reserve For Pooled Losses as of

Claims Incurred in Fiscal Year:	Estimated Ultimate Losses Gross of Deductibles and Net of Excess Insurance Recoveries (1)	Estimated Ultimate Losses Within Deductibles (2)	Estimated Ultimate Pooled Losses (1)-(2) (3)	Estimated Ultimate Pooled Losses (4)	Pooled Losses Paid as of 1/31/2018 (5)	Estimated Pooled Losses Unpaid as of 1/31/2018 (3)+(4)-(5) (6)
Prior	\$6,444,118	\$2,338,304	\$4,105,814	\$0	\$4,045,991	\$60,000
1997-1998	3,851,532	1,338,953	2,512,579	0	2,512,579	0
1998-1999	4,069,196	1,711,843	2,357,353	0	2,357,353	0
1999-2000	2,495,245	1,413,128	1,082,117	0	1,082,117	0
2000-2001	3,372,352	1,129,378	2,242,974	0	2,242,974	0
2001-2002	2,101,587	1,025,601	1,075,986	0	1,075,986	0
2002-2003	3,799,059	1,386,879	2,412,180	0	1,899,038	513,000
2003-2004	2,210,245	847,172	1,363,073	0	1,363,073	0
2004-2005	3,113,942	715,415	2,398,527	0	2,398,527	0
2005-2006	4,729,000	1,072,000	3,657,000	0	3,652,255	5,000
2006-2007	5,875,500	1,218,000	4,657,500	0	4,656,404	1,000
2007-2008	5,689,500	1,127,000	4,562,500	0	4,228,969	334,000
2008-2009	2,662,500	757,000	1,905,500	0	1,905,114	0
2009-2010	7,299,000	1,387,000	5,912,000	0	5,911,657	0
2010-2011	4,475,000	879,000	3,596,000	0	3,534,432	62,000
2011-2012	6,207,000	1,342,000	4,865,000	0	4,730,248	135,000
2012-2013	3,797,000	1,153,000	2,644,000	0	2,343,809	300,000
2013-2014	4,110,000	1,058,000	3,052,000	0	2,583,542	468,000
2014-2015	5,496,000	1,646,000	3,850,000	0	2,117,898	1,732,000
2015-2016	6,477,000	1,795,000	4,682,000	0	1,502,026	3,180,000
2016-2017	7,651,000	1,643,000	6,008,000	0	1,343,759	4,664,000
2017-2018	6,575,000	1,818,000	4,757,000	0	19,163	4,738,000
Totals	\$102,500,776	\$28,801,673	\$73,699,103	\$0	\$57,506,914	\$16,192,000

(6) Estimated Pooled Losses Paid From 02/01/18 through 06/30/18 2,058,000

(7) Estimated Claim Liability Reserve as of 06/30/18 \$14,134,000

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Notes: 1. Losses include allocated loss expenses.

2. Fiscal years begin on July 1.

3. Losses on claims closed prior to 1992-93 are generally not included.

Municipal Pooling Authority - Liability

Present Value of the Estimated Claim Liability Reserve for Pooled Losses

Claims Incurred in Fiscal Year:	Estimated Unpaid Losses as of 06/30/18 (000)																				
		2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31	2031-32	2032-33	2033-34	2034-35	2035-36	2036-37	2037-38
Prior	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
1997-1998	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1998-1999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1999-2000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2000-2001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2001-2002	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2002-2003	411	205	206	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2003-2004	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2004-2005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2005-2006	4	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2006-2007	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2007-2008	304	60	60	46	31	46	31	31	0	0	0	0	0	0	0	0	0	0	0	0	0
2008-2009	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2009-2010	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2010-2011	53	17	11	6	4	4	3	2	3	2	2	0	0	0	0	0	0	0	0	0	0
2011-2012	113	35	25	16	10	6	6	4	3	4	3	0	0	0	0	0	0	0	0	0	0
2012-2013	262	84	55	39	25	15	9	9	7	4	7	4	4	0	0	0	0	0	0	0	0
2013-2014	385	120	85	55	39	26	15	9	9	7	4	7	5	5	0	0	0	0	0	0	0
2014-2015	1,396	537	268	190	124	87	57	34	20	20	15	10	15	10	0	0	0	0	0	0	0
2015-2016	2,557	1,033	587	292	207	135	95	62	37	21	21	16	11	16	11	0	0	0	0	0	0
2016-2017	4,137	1,481	1,073	609	304	215	140	99	65	38	22	22	17	11	17	11	11	0	0	0	0
2017-2018	4,510	947	1,276	924	525	262	185	121	85	56	33	19	19	15	10	15	10	10	0	0	0
Total	\$14,134	\$4,521	\$3,646	\$2,179	\$1,268	\$796	\$541	\$370	\$228	\$152	\$107	\$82	\$71	\$57	\$48	\$37	\$21	\$10	\$0	\$0	\$0
Present Value Factors at 2.0% Interest		0.947	0.954	0.954	0.950	0.945	0.944	0.943	0.941	0.939	0.936	0.937	0.941	0.947	0.955	0.963	0.968	0.965	0.971	0.971	0.990
Present Value of Future Payments (1)x(2)		\$4,281	\$3,480	\$2,079	\$1,205	\$752	\$511	\$349	\$214	\$143	\$101	\$77	\$67	\$54	\$46	\$36	\$21	\$10	\$0	\$0	\$0
Total Present Value of the Estimated Reserve (sum of line (3))	\$13,424																				

Notes:

The loss payment pattern is based on the Authority's historical pattern of paying pooled liability insurance losses.

Municipal Pooling Authority - Liability - 100K & SIR Analyses

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)	Composite Exposure (D)	Trended Limited Loss Rate (E)
Prior	\$0	1.516	\$0	0	0.000
1997-1998	2,091,721	1.486	3,108,297	2,172,529	1.431
1998-1999	2,588,886	1.457	3,772,007	2,323,204	1.624
1999-2000	2,057,287	1.428	2,937,806	2,392,909	1.228
2000-2001	1,820,083	1.400	2,548,116	2,596,149	0.981
2001-2002	1,760,695	1.373	2,417,434	2,661,124	0.908
2002-2003	2,141,098	1.346	2,881,918	2,354,318	1.224
2003-2004	1,542,158	1.319	2,034,106	2,668,733	0.762
2004-2005	1,313,942	1.294	1,700,241	2,721,990	0.625
2005-2006	2,772,583	1.268	3,515,635	2,822,609	1.246
2006-2007	2,280,213	1.243	2,834,305	2,984,475	0.950
2007-2008	2,415,240	1.219	2,944,178	3,240,790	0.908
2008-2009	1,611,115	1.195	1,925,282	3,315,825	0.581
2009-2010	2,946,000	1.172	3,452,712	3,164,896	1.091
2010-2011	2,152,000	1.149	2,472,648	2,999,116	0.824
2011-2012	2,848,000	1.126	3,206,848	2,876,266	1.115
2012-2013	1,862,000	1.104	2,055,648	2,723,760	0.755
2013-2014	2,072,000	1.082	2,241,904	2,718,279	0.825
2014-2015	2,535,000	1.061	2,689,635	2,778,823	0.968
2015-2016	3,068,000	1.040	3,190,720	3,078,001	1.037
2016-2017	3,537,000	1.020	3,607,740	3,170,970	1.138
Totals	\$45,415,021		\$55,537,180	55,764,766	\$0.996
12/13-15/16	9,537,000		10,177,907	11,298,863	0.901
12/13-16/17	13,074,000		13,785,647	14,469,833	0.953
			(F) Selected Limited Rate:		\$0.950
			Prior Selected Limited Rate:		\$0.930

Program Year:	2017-2018	2018-2019
(G) Factor to SIR:	2.132	2.164
(H) Trend Factor:	1.000	1.020
(I) Program Rate:	\$2.025	\$2.097
(J) Composite Exposure:	3,247,137	3,248,311
(K) Projected Program Losses:	6,575,000	6,812,000

Notes appear on the next page.

Municipal Pooling Authority - Liability - 100K & SIR Analyses

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

Notes:

- (A) From Pool - Exhibit 3, Page 4, Column (F).
For purposes of projecting future losses, losses are capped at \$100,000 per occurrence.
- (B) From Pool - Appendix E, Column (B).
- (C) (A) x (B).
- (D) From Pool - Appendix L, Page Page 2, Column (G).
- (E) (C) / (D).
- (F) Selected based on (E).
- (G) Based on a Burr distribution, a mathematical model of claim sizes.
- (H) From Pool - Appendix E.
 - (I) (F) x (G) x (H).
- (J) From Pool - Appendix L, Page Page 2, Column (G).
- (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 exposure. 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 - Liability - 100K & SIR Analyses

Reported Loss Development

Accident Year (A)	Limited Reported Losses as of 1/31/18 (B)	Reported Loss Development Factor (C)	Ultimate Limited Losses (D)	Program Reported Losses of 1/31/18 (E)	Reported Loss Development Factor (F)	Ultimate Program Losses (G)
Prior	\$4,464,783	1.000	\$4,464,783	\$6,444,118	1.000	\$6,444,118
1997-1998	2,091,721	1.000	2,091,721	3,851,532	1.000	3,851,532
1998-1999	2,588,886	1.000	2,588,886	4,069,196	1.000	4,069,196
1999-2000	2,057,287	1.000	2,057,287	2,495,245	1.000	2,495,245
2000-2001	1,820,083	1.000	1,820,083	3,372,352	1.000	3,372,352
2001-2002	1,760,695	1.000	1,760,695	2,101,587	1.000	2,101,587
2002-2003	2,141,098	1.000	2,141,098	3,799,059	1.000	3,799,059
2003-2004	1,542,158	1.000	1,542,158	2,210,245	1.000	2,210,245
2004-2005	1,313,942	1.000	1,313,942	3,113,942	1.000	3,113,942
2005-2006	2,772,583	1.000	2,772,583	4,728,560	1.000	4,728,560
2006-2007	2,280,213	1.000	2,280,213	5,875,102	1.000	5,875,102
2007-2008	2,415,240	1.000	2,415,240	5,688,782	1.000	5,688,782
2008-2009	1,611,115	1.000	1,611,115	2,662,400	1.000	2,662,400
2009-2010	2,945,599	1.000	2,945,599	7,298,922	1.000	7,298,922
2010-2011	2,147,978	1.002	2,152,274	4,456,802	1.004	4,474,629
2011-2012	2,839,729	1.003	2,848,248	6,145,409	1.010	6,206,863
2012-2013	1,853,421	1.004	1,860,835	3,616,317	1.022	3,695,876
2013-2014	2,056,839	1.007	2,071,237	3,791,766	1.045	3,962,395
2014-2015	2,480,654	1.022	2,535,228	5,234,612	1.117	5,847,062
2015-2016	2,921,735	1.053	3,076,587	5,606,054	1.267	7,102,870
2016-2017	2,775,155	1.305	3,621,577	5,988,996	1.814	9,294,828
Totals	\$48,880,914		\$49,971,389	\$92,550,998		\$98,295,565

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 Pool - Appendix A, Page 2. Interpolated to apply to data as of 1/31/18.
- (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 Pool - Appendix A, Page 4. Interpolated to apply to data as of 1/31/18.
- (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 - Liability - 100K & SIR Analyses
Reported Loss Development

Accident Year	Limited Losses Reported as of:										
	3 Months	15 Months	27 Months	39 Months	51 Months	63 Months	75 Months	87 Months	99 Months	111 Months	123 Months
1996-1997	170,242	1,766,529	1,976,650	1,852,084	1,705,148	1,704,098	1,735,690	1,684,368	1,684,368	1,683,582	1,683,582
1997-1998	169,078	1,483,452	1,697,868	1,744,090	1,757,353	1,703,500	1,690,716	1,690,716	2,091,435	2,091,435	2,091,435
1998-1999	529,294	2,393,742	2,735,181	2,396,200	2,418,279	2,421,333	2,424,187	2,588,886	2,588,886	2,588,886	2,588,886
1999-2000	294,294	1,992,953	2,392,205	1,992,514	2,008,270	1,952,977	1,974,534	2,016,005	2,066,477	2,066,890	2,071,991
2000-2001	265,206	2,123,030	1,993,309	1,819,047	1,751,137	1,741,747	1,741,747	1,820,083	1,820,083	1,820,083	1,820,083
2001-2002	311,603	1,658,179	1,974,557	1,729,496	1,711,881	1,776,881	1,761,355	1,761,355	1,760,696	1,760,695	1,760,695
2002-2003	309,264	2,175,213	2,755,377	2,013,855	2,048,961	2,050,970	2,049,949	2,049,949	2,049,949	2,049,949	2,149,949
2003-2004	220,107	1,485,260	1,519,014	1,543,247	1,556,078	1,541,307	1,539,283	1,539,282	1,539,282	1,539,282	1,539,282
2004-2005	188,923	1,016,513	1,170,405	1,307,276	1,335,738	1,292,074	1,292,074	1,292,073	1,292,073	1,304,762	1,304,762
2005-2006	246,989	2,074,287	2,910,735	3,046,058	2,945,077	2,775,199	2,779,169	2,773,257	2,773,260	2,772,583	2,772,583
2006-2007	164,943	1,931,880	2,394,480	2,470,190	2,540,276	2,232,651	2,232,651	2,280,213	2,280,214	2,280,213	2,280,213
2007-2008	134,123	1,745,953	2,296,443	2,122,407	2,198,687	2,228,445	2,320,240	2,360,240	2,360,240	2,405,240	2,415,240
2008-2009	163,703	1,059,457	1,425,937	1,605,086	1,653,231	1,641,891	1,646,892	1,666,892	1,611,115	1,611,115	
2009-2010	295,937	1,742,879	3,017,268	3,327,448	3,115,671	2,924,825	2,940,755	2,945,341	2,945,599		
2010-2011	142,201	1,782,520	2,170,413	2,237,016	2,054,881	2,148,787	2,163,783	2,147,602			
2011-2012	238,903	1,770,073	2,703,704	2,642,857	2,672,182	2,704,169	2,822,729				
2012-2013	94,815	1,366,827	1,949,263	2,038,683	1,918,528	1,876,988					
2013-2014	109,986	1,995,919	2,437,225	2,356,313	2,082,429						
2014-2015	159,053	2,035,387	2,246,639	2,496,222							
2015-2016	222,396	1,828,479	3,595,786								
2016-2017	72,515	2,604,620									
2017-2018	150,406										

Amounts Include All Locations Except Richmond
The 2012-13 diagonal is valued as of 10/31/12.
The 2013-14 through 2017-18 diagonal is valued as of 9/30.

Reported Loss Development Factors:

	3-15 Months	15-27 Months	27-39 Months	39-51 Months	51-63 Months	63-75 Months	75-87 Months	87-99 Months	99-111 Months	111-123 Months	123-135 Months
1996-1997	10.377	1.119	0.937	0.921	0.999	1.019	0.970	1.000	1.000	1.000	
1997-1998	8.774	1.145	1.027	1.008	0.969	0.992	1.000	1.237	1.000	1.000	1.000
1998-1999	4.523	1.143	0.876	1.009	1.001	1.001	1.068	1.000	1.000	1.000	1.000
1999-2000	6.772	1.200	0.833	1.008	0.972	1.011	1.021	1.025	1.000	1.002	1.000
2000-2001	8.005	0.939	0.913	0.963	0.995	1.000	1.045	1.000	1.000	1.000	1.000
2001-2002	5.321	1.191	0.876	0.990	1.038	0.991	1.000	1.000	1.000	1.000	1.000
2002-2003	7.034	1.267	0.731	1.017	1.001	1.000	1.000	1.000	1.000	1.049	1.000
2003-2004	6.748	1.023	1.016	1.008	0.991	0.999	1.000	1.000	1.000	1.000	1.065
2004-2005	5.381	1.151	1.117	1.022	0.967	1.000	1.000	1.000	1.010	1.000	1.007
2005-2006	8.398	1.403	1.046	0.967	0.942	1.001	0.998	1.000	1.000	1.000	1.000
2006-2007	11.712	1.239	1.032	1.028	0.879	1.000	1.021	1.000	1.000	1.000	1.000
2007-2008	13.018	1.315	0.924	1.036	1.014	1.041	1.017	1.000	1.019	1.004	
2008-2009	6.472	1.346	1.126	1.030	0.993	1.003	1.012	0.967	1.000		
2009-2010	5.889	1.731	1.103	0.936	0.939	1.005	1.002	1.000			
2010-2011	12.535	1.218	1.031	0.919	1.046	1.007	0.993				
2011-2012	7.409	1.527	0.977	1.011	1.012	1.044					
2012-2013	14.416	1.426	1.046	0.941	0.978						
2013-2014	18.147	1.221	0.967	0.884							
2014-2015	12.797	1.104	1.111								
2015-2016	8.222	1.967									
2016-2017	35.918										
Average	10.375	1.284	0.984	0.983	0.984	1.007	1.010	1.016	1.002	1.005	1.007
Dollar-weighted											
Averages											
3-yr	14.249	1.413	1.039	0.948	1.013	1.019	1.001	0.992	1.007	1.001	1.001
4-yr	15.009	1.415	1.021	0.941	0.989	1.016	1.005	0.994	1.005	1.001	1.014
Industry											
Factors	5.584	1.394	1.028	0.965	0.964	1.000	1.000	1.000	1.000	1.000	1.000
Prior	12.465	1.369	1.036	1.020	1.005	1.001	1.001	1.001	1.001	1.000	1.000
Selected	12.822	1.378	1.036	1.020	1.005	1.001	1.001	1.001	1.001	1.000	1.000
Cumulated	18.836	1.469	1.066	1.029	1.009	1.004	1.003	1.002	1.001	1.000	1.000

Municipal Pooling Authority - Liability - 100K & SIR Analyses
Reported Loss Development

Limited Losses Reported as of:

Accident Year	135 Months	147 Months	159 Months	171 Months	183 Months	195 Months	207 Months	219 Months	231 Months	243 Months	255 Months
1996-1997											
1997-1998	2,091,721	2,091,721	2,091,721	2,091,721	2,091,721	2,091,721	2,091,721	2,091,721			
1998-1999	2,588,886	2,588,886	2,588,886	2,588,886	2,588,886	2,588,886	2,588,886	2,588,886			
1999-2000	2,071,991	2,073,489	2,057,287	2,057,287	2,057,287	2,057,287	2,057,287	2,057,287			
2000-2001	1,820,083	1,820,083	1,820,083	1,820,083	1,820,084	1,820,083	1,820,083	1,820,083			
2001-2002	1,760,695	1,760,695	1,760,695	1,760,695	1,760,695	1,760,695	1,760,695				
2002-2003	2,149,949	2,149,949	2,141,098	2,141,098	2,141,098						
2003-2004	1,639,282	1,542,158	1,542,158	1,542,158							
2004-2005	1,313,942	1,313,942	1,313,942								
2005-2006	2,772,583	2,772,583									
2006-2007	2,280,214										
2007-2008											
2008-2009											
2009-2010											
2010-2011											
2011-2012											
2012-2013											
2013-2014											
2014-2015											
2015-2016											
2016-2017											
2017-2018											

Amounts Include All Locations Except Richmond
The 2012-13 diagonal is valued as of 10/31/12.
The 2013-14 through 2017-18 diagonal is valued as of 9/30.

	135-147 Months	147-159 Months	159-171 Months	171-183 Months	183-195 Months	195-207 Months	207-219 Months	219-231 Months	231-243 Months	243-255 Months	255-Ult. Months
1996-1997											
1997-1998	1.000	1.000	1.000	1.000	1.000	1.000					
1998-1999	1.000	1.000	1.000	1.000	1.000	1.000					
1999-2000	1.001	0.992	1.000	1.000	1.000	1.000					
2000-2001	1.000	1.000	1.000	1.000	1.000	1.000					
2001-2002	1.000	1.000	1.000	1.000	1.000						
2002-2003	1.000	0.996	1.000	1.000							
2003-2004	0.941	1.000	1.000								
2004-2005	1.000	1.000									
2005-2006	1.000										
2006-2007											
2007-2008											
2008-2009											
2009-2010											
2010-2011											
2011-2012											
2012-2013											
2013-2014											
2014-2015											
2015-2016											
2016-2017											
Average Dollar-weighted Averages	0.994	0.999	1.000	1.000	1.000	1.000					
3-yr	0.983	0.998	1.000	1.000	1.000	1.000					
4-yr	0.988	0.999	1.000	1.000	1.000	1.000					
Industry Factors	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Prior	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.000
Selected	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Cumulated	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Municipal Pooling Authority - Liability - 100K & SIR Analyses
 Reported between \$100,000 and \$1,000,000 Loss Development

Accident Year	<u>Losses Reported as of:</u>										
	3 Months	15 Months	27 Months	39 Months	51 Months	63 Months	75 Months	87 Months	99 Months	111 Months	123 Months
1996-1997										446,883	446,883
1997-1998									1,721,945	1,745,817	1,745,817
1998-1999								1,480,310	1,480,310	1,480,310	1,480,310
1999-2000							460,684	460,684	447,620	447,620	447,620
2000-2001						1,630,606	1,630,606	1,552,269	1,552,269	1,552,269	1,552,269
2001-2002					260,876	333,680	373,680	373,680	373,680	393,744	355,342
2002-2003				1,347,188	927,667	1,031,606	998,427	998,427	998,427	998,427	1,141,807
2003-2004			225,624	753,386	700,696	703,320	673,087	668,087	668,087	668,087	668,087
2004-2005		300,000	575,000	900,000	1,185,000	1,281,292	1,447,400	1,778,109	1,799,275	1,800,000	1,800,000
2005-2006		213,359	1,322,004	2,245,154	2,430,884	1,866,893	1,924,857	2,274,857	2,385,301	2,185,301	2,190,180
2006-2007		975,135	1,744,073	2,888,802	3,570,836	3,615,136	3,610,583	3,594,889	3,594,889	3,594,889	3,594,889
2007-2008		142,500	171,414	1,470,476	2,028,873	2,043,546	2,447,953	3,250,985	3,250,985	3,250,985	3,318,985
2008-2009		933,775	933,775	1,002,041	1,091,420	1,051,285	1,051,285	1,051,285	1,051,285	1,051,285	
2009-2010		685,920	1,194,566	2,056,548	2,768,458	2,984,657	3,411,428	4,410,202	4,353,324		
2010-2011		680,673	1,251,956	2,467,395	2,573,921	2,796,885	2,785,974	2,373,824			
2011-2012		7,089	614,161	2,348,916	3,526,354	3,593,370	3,602,679				
2012-2013		85,000	137,002	713,401	2,154,562	1,826,896					
2013-2014		586,675	1,420,772	1,454,452	1,784,928						
2014-2015		282,501	1,918,033	2,806,910							
2015-2016	404,561	957,300	3,204,852								
2016-2017		1,470,145									
2017-2018											

Amounts Include All Locations Except Richmond
 The 2012-13 diagonal is valued as of 10/31/12.
 The 2013-14 through 2017-18 diagonal is valued as of 9/30.

Reported Loss Development Factors:

	3-15 Months	15-27 Months	27-39 Months	39-51 Months	51-63 Months	63-75 Months	75-87 Months	87-99 Months	99-111 Months	111-123 Months	123-135 Months
1996-1997										1.000	
1997-1998									1.014	1.000	1.000
1998-1999								1.000	1.000	1.000	1.000
1999-2000							1.000	0.972	1.000	1.000	1.000
2000-2001						1.000	0.952	1.000	1.000	1.000	1.000
2001-2002					1.279	1.120	1.000	1.000	1.054	0.902	1.000
2002-2003				0.689	1.112	0.968	1.000	1.000	1.000	1.144	1.131
2003-2004			3.339	0.930	1.004	0.957	0.993	1.000	1.000	1.000	1.045
2004-2005		1.917	1.565	1.317	1.081	1.130	1.228	1.012	1.000	1.000	1.000
2005-2006		6.196	1.698	1.083	0.768	1.031	1.182	1.049	0.916	1.002	1.000
2006-2007		1.789	1.656	1.236	1.012	0.999	0.996	1.000	1.000	1.000	1.000
2007-2008		1.203	8.579	1.380	1.007	1.198	1.328	1.000	1.000	1.021	
2008-2009		1.000	1.073	1.089	0.963	1.000	1.000	1.000	1.000		
2009-2010		1.742	1.722	1.346	1.078	1.143	1.293	0.987			
2010-2011		1.839	1.971	1.043	1.087	0.996	0.852				
2011-2012		86.636	3.825	1.501	1.019	1.003					
2012-2013		1.612	5.207	3.020	0.848						
2013-2014		2.422	1.024	1.227							
2014-2015		6.789	1.463								
2015-2016	2.366	3.348									
2016-2017											
Average Dollar-weighted Averages	2.366	9.708	2.760	1.322	1.022	1.045	1.069	1.002	0.999	1.006	1.018
3-yr		3.583	1.431	1.653	0.995	1.045	1.081	0.993	1.000	1.008	1.000
4-yr		3.495	1.791	1.438	1.016	1.041	1.143	0.995	0.981	1.007	1.004
Industry Factors	6.803	2.353	1.344	1.178	1.052	1.027	1.016	1.005	1.003	1.000	1.000
Prior	6.803	2.353	1.344	1.178	1.052	1.027	1.016	1.005	1.003	1.000	1.000
Selected	6.803	2.353	1.344	1.178	1.052	1.027	1.016	1.005	1.003	1.000	1.000
Cumulated	28.062	4.125	1.753	1.304	1.107	1.052	1.024	1.008	1.003	1.000	1.000

Municipal Pooling Authority - Liability - 100K & SIR Analyses
Reported between \$100,000 and \$1,000,000 Loss Development

Accident Year	Losses Reported as of:										
	135 Months	147 Months	159 Months	171 Months	183 Months	195 Months	207 Months	219 Months	231 Months	243 Months	255 Months
1996-1997									446,883	446,883	1,979,334
1997-1998	1,745,817	1,745,817	1,780,817	1,759,811	1,759,811	1,759,811	1,759,811	1,759,811	1,759,811	1,759,811	
1998-1999	1,480,310	1,480,310	1,480,310	1,480,310	1,480,310	1,480,310	1,480,310	1,480,310	1,480,310	1,480,310	
1999-2000	447,620	437,958	437,958	437,958	437,958	437,958	437,958	437,958	437,958		
2000-2001	1,552,269	1,552,269	1,552,269	1,552,269	1,552,269	1,552,269	1,552,269	1,552,269			
2001-2002	355,342	355,342	355,342	355,342	355,342	340,892					
2002-2003	1,291,873	1,363,770	1,363,770	1,465,461	1,657,961						
2003-2004	698,183	668,087	668,087	668,087							
2004-2005	1,800,000	1,800,000	1,800,000								
2005-2006	2,190,180	1,955,977									
2006-2007	3,594,889										
2007-2008											
2008-2009											
2009-2010											
2010-2011											
2011-2012											
2012-2013											
2013-2014											
2014-2015											
2015-2016											
2016-2017											
2017-2018											

Amounts Include All Locations Except Richmond
The 2012-13 diagonal is valued as of 10/31/12.
The 2013-14 through 2017-18 diagonal is valued as of 9/30.

	135-147 Months	147-159 Months	159-171 Months	171-183 Months	183-195 Months	195-207 Months	207-219 Months	219-231 Months	231-243 Months	243-255 Months	255-Ult. Months
1996-1997									1.000	4.429	
1997-1998	1.000	1.020	0.988	1.000	1.000	1.000	1.000	1.000	1.000		
1998-1999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000			
1999-2000	0.978	1.000	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	1.000	1.000	1.000	1.000	0.959						
2002-2003	1.056	1.000	1.075	1.131							
2003-2004	0.957	1.000	1.000								
2004-2005	1.000	1.000									
2005-2006	0.893										
2006-2007											
2007-2008											
2008-2009											
2009-2010											
2010-2011											
2011-2012											
2012-2013											
2013-2014											
2014-2015											
2015-2016											
2016-2017											
Average Dollar-weighted Averages	0.987	1.003	1.009	1.022	0.992	1.000	1.000	1.000	1.000	4.429	
3-yr	0.944	1.000	1.043	1.057	0.994	1.000	1.000				
4-yr	0.968	1.000	1.026	1.051	0.996	1.000					
Industry Factors	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Prior	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.000
Selected	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Cumulated	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Municipal Pooling Authority - Liability - 100K & SIR Analyses

Paid Loss Development

Accident Year (A)	Limited Paid Losses as of 1/31/18 (B)	Paid Loss Development Factor (C)	Ultimate Limited Losses (D)	Program Paid Losses of 1/31/18 (E)	Paid Loss Development Factor (F)	Ultimate Program Losses (G)
Prior	\$4,464,783	1.000	\$4,464,783	\$6,384,295	1.000	\$6,384,295
1997-1998	2,091,721	1.000	2,091,721	3,851,532	1.000	3,851,532
1998-1999	2,588,886	1.000	2,588,886	4,069,196	1.000	4,069,196
1999-2000	2,057,287	1.000	2,057,287	2,495,245	1.001	2,497,740
2000-2001	1,820,083	1.000	1,820,083	3,372,352	1.002	3,379,097
2001-2002	1,760,695	1.000	1,760,695	2,101,587	1.003	2,107,892
2002-2003	2,140,604	1.002	2,144,885	3,285,917	1.005	3,302,347
2003-2004	1,542,158	1.003	1,546,784	2,210,245	1.008	2,227,927
2004-2005	1,313,942	1.004	1,319,198	3,113,942	1.010	3,145,081
2005-2006	2,772,583	1.005	2,786,446	4,724,040	1.014	4,790,177
2006-2007	2,280,159	1.006	2,293,840	5,874,898	1.018	5,980,646
2007-2008	2,397,630	1.007	2,414,413	5,355,907	1.022	5,473,737
2008-2009	1,610,909	1.009	1,625,407	2,662,095	1.031	2,744,620
2009-2010	2,933,457	1.012	2,968,658	7,286,717	1.046	7,621,906
2010-2011	2,138,102	1.016	2,172,312	4,412,696	1.068	4,712,759
2011-2012	2,732,934	1.025	2,801,257	6,022,995	1.104	6,649,386
2012-2013	1,834,954	1.038	1,904,682	3,475,483	1.154	4,010,707
2013-2014	1,918,578	1.077	2,066,309	3,549,472	1.260	4,472,335
2014-2015	2,121,005	1.212	2,570,658	3,567,143	1.519	5,418,490
2015-2016	2,118,638	1.752	3,711,854	2,910,293	2.352	6,845,009
2016-2017	1,024,293	3.590	3,677,212	1,885,913	5.291	9,978,366
Totals	\$45,663,401		\$50,787,370	\$82,611,963		\$99,663,245

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 Pool - Appendix B, Page 2. Interpolated to apply to data as of 1/31/18.
- (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 Pool - Appendix B, Page 4. Interpolated to apply to data as of 1/31/18.
- (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 - Liability - 100K & SIR Analyses

Paid Loss Development

Limited Losses Paid as of:

Accident Year	3 Months	15 Months	27 Months	39 Months	51 Months	63 Months	75 Months	87 Months	99 Months	111 Months	123 Months
1996-1997	34,329	388,880	1,169,152	1,545,211	1,606,045	1,660,935	1,717,701	1,684,368	1,684,368	1,683,582	1,683,582
1997-1998	36,369	544,195	1,066,982	1,443,311	1,653,983	1,685,050	1,678,047	1,679,541	2,090,565	2,091,200	2,091,200
1998-1999	74,732	881,651	1,698,019	2,142,970	2,340,559	2,394,548	2,421,686	2,588,886	2,588,886	2,588,886	2,588,886
1999-2000	63,040	522,319	1,248,203	1,856,586	1,914,759	1,930,952	1,958,533	1,985,027	2,049,475	2,050,069	2,051,491
2000-2001	61,525	517,656	1,038,085	1,437,230	1,699,567	1,741,747	1,741,747	1,820,083	1,820,083	1,820,083	1,820,083
2001-2002	35,892	525,326	1,088,151	1,678,740	1,704,721	1,711,211	1,760,695	1,760,695	1,760,695	1,760,695	1,760,695
2002-2003	56,886	423,517	1,209,671	1,669,493	1,978,800	2,042,565	2,042,449	2,042,449	2,042,449	2,049,949	2,105,300
2003-2004	21,792	507,209	920,162	1,371,999	1,491,288	1,539,282	1,539,282	1,539,282	1,539,282	1,539,282	1,539,282
2004-2005	41,320	344,663	629,114	1,088,778	1,223,314	1,292,073	1,292,073	1,292,073	1,292,073	1,304,762	1,304,762
2005-2006	47,511	735,664	1,792,959	2,516,628	2,737,275	2,759,638	2,771,738	2,771,826	2,773,260	2,772,583	2,772,583
2006-2007	80,775	426,040	1,091,919	1,846,954	2,166,534	2,231,889	2,231,889	2,280,159	2,280,159	2,280,159	2,280,159
2007-2008	36,550	446,730	1,214,293	1,913,002	2,090,917	2,125,363	2,141,570	2,263,998	2,313,733	2,337,148	2,396,947
2008-2009	29,427	428,542	751,266	1,336,912	1,529,368	1,579,306	1,585,563	1,608,569	1,610,909	1,610,909	
2009-2010	111,515	581,807	1,389,045	2,172,952	2,555,279	2,778,915	2,879,606	2,931,982	2,932,938		
2010-2011	23,256	414,841	995,267	1,617,716	1,934,070	2,090,073	2,136,783	2,138,102			
2011-2012	36,595	419,903	1,040,534	2,054,041	2,508,516	2,645,334	2,716,253				
2012-2013	27,342	298,068	725,800	1,323,002	1,684,171	1,831,830					
2013-2014	22,981	547,388	1,283,522	1,761,374	1,905,803						
2014-2015	6,781	356,629	979,244	1,769,926							
2015-2016	24,287	478,043	1,791,821								
2016-2017	3,313	731,409									
2017-2018	1,626										

Amounts Include All Locations Except Richmond
 The 2012-13 diagonal is valued as of 10/31/12.
 The 2013-14 through 2017-18 diagonal is valued as of 9/30.

Paid Loss Development Factors:

	3-15 Months	15-27 Months	27-39 Months	39-51 Months	51-63 Months	63-75 Months	75-87 Months	87-99 Months	99-111 Months	111-123 Months	123-135 Months
1996-1997	11.328	3.006	1.322	1.039	1.034	1.034	0.981	1.000	1.000	1.000	
1997-1998	14.963	1.961	1.353	1.146	1.019	0.996	1.001	1.245	1.000	1.000	1.000
1998-1999	11.798	1.926	1.262	1.092	1.023	1.011	1.069	1.000	1.000	1.000	1.000
1999-2000	8.286	2.390	1.487	1.031	1.008	1.014	1.014	1.032	1.000	1.001	1.000
2000-2001	8.414	2.005	1.385	1.183	1.025	1.000	1.045	1.000	1.000	1.000	1.000
2001-2002	14.636	2.071	1.543	1.015	1.004	1.029	1.000	1.000	1.000	1.000	1.000
2002-2003	7.445	2.856	1.380	1.185	1.032	1.000	1.000	1.000	1.004	1.027	1.013
2003-2004	23.275	1.814	1.491	1.087	1.032	1.000	1.000	1.000	1.000	1.000	1.065
2004-2005	8.341	1.825	1.731	1.124	1.056	1.000	1.000	1.000	1.010	1.000	1.007
2005-2006	15.484	2.437	1.404	1.088	1.008	1.004	1.000	1.001	1.000	1.000	1.000
2006-2007	5.274	2.563	1.691	1.173	1.030	1.000	1.022	1.000	1.000	1.000	1.000
2007-2008	12.222	2.718	1.575	1.093	1.016	1.008	1.057	1.022	1.010	1.026	
2008-2009	14.563	1.753	1.780	1.144	1.033	1.004	1.015	1.001	1.000		
2009-2010	5.217	2.387	1.564	1.176	1.088	1.036	1.018	1.000			
2010-2011	17.838	2.399	1.625	1.196	1.081	1.022	1.001				
2011-2012	11.474	2.478	1.974	1.221	1.055	1.027					
2012-2013	10.901	2.435	1.823	1.273	1.088						
2013-2014	23.819	2.345	1.372	1.082							
2014-2015	52.592	2.746	1.807								
2015-2016	19.683	3.748									
2016-2017	220.769										
Average	24.682	2.393	1.556	1.130	1.037	1.012	1.015	1.022	1.002	1.005	1.009
Dollar-weighted											
Averages											
3-yr	45.551	2.934	1.624	1.187	1.072	1.029	1.012	1.008	1.004	1.008	1.001
4-yr	36.844	2.845	1.715	1.189	1.076	1.025	1.023	1.006	1.003	1.007	1.014
Industry											
Factors	6.365	2.439	1.593	1.198	1.064	1.038	1.018	1.010	1.009	1.008	1.007
Prior	18.926	2.434	1.669	1.164	1.046	1.013	1.011	1.004	1.003	1.002	1.002
Selected	20.056	2.516	1.678	1.169	1.051	1.013	1.012	1.004	1.003	1.002	1.002
Cumulated	108.384	5.404	2.148	1.280	1.095	1.042	1.029	1.017	1.013	1.010	1.008

Municipal Pooling Authority - Liability - 100K & SIR Analyses
Paid Loss Development

Limited Losses Paid as of:

Accident Year	135 Months	147 Months	159 Months	171 Months	183 Months	195 Months	207 Months	219 Months	231 Months	243 Months	255 Months
1996-1997								62,054	1,430,014	1,430,014	4,464,783
1997-1998	2,091,721	2,091,721	2,091,721	2,091,721	2,091,721	2,091,721	2,091,721	2,091,721	2,091,721	2,091,721	
1998-1999	2,588,886	2,588,886	2,588,886	2,588,886	2,588,886	2,588,886	2,588,886	2,588,886	2,588,886		
1999-2000	2,052,135	2,056,966	2,057,287	2,057,287	2,057,287	2,057,287	2,057,287	2,057,287			
2000-2001	1,820,083	1,820,083	1,820,083	1,820,083	1,820,083	1,820,083	1,820,083				
2001-2002	1,760,695	1,760,695	1,760,695	1,760,695	1,760,695	1,760,695					
2002-2003	2,133,151	2,134,723	2,140,604	2,140,604	2,140,604						
2003-2004	1,639,282	1,542,158	1,542,158	1,542,158							
2004-2005	1,313,942	1,313,942	1,313,942								
2005-2006	2,772,583	2,772,583									
2006-2007	2,280,159										
2007-2008											
2008-2009											
2009-2010											
2010-2011											
2011-2012											
2012-2013											
2013-2014											
2014-2015											
2015-2016											
2016-2017											
2017-2018											

Amounts Include All Locations Except Richmond
The 2012-13 diagonal is valued as of 10/31/12.
The 2013-14 through 2017-18 diagonal is valued as of 9/30.

	135-147 Months	147-159 Months	159-171 Months	171-183 Months	183-195 Months	195-207 Months	207-219 Months	219-231 Months	231-243 Months	243-255 Months	255-Ult. Months
1996-1997								23.045	1.000	3.122	
1997-1998	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000		
1998-1999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000			
1999-2000	1.002	1.000	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	1.000	1.000	1.000	1.000	1.000						
2002-2003	1.001	1.003	1.000	1.000							
2003-2004	0.941	1.000	1.000								
2004-2005	1.000	1.000									
2005-2006	1.000										
2006-2007											
2007-2008											
2008-2009											
2009-2010											
2010-2011											
2011-2012											
2012-2013											
2013-2014											
2014-2015											
2015-2016											
2016-2017											
Average Dollar-weighted Averages	0.994	1.000	1.000	1.000	1.000	1.000	1.000	8.348	1.000	3.122	
3-yr	0.983	1.001	1.000	1.000	1.000	1.000	1.000	1.288			
4-yr	0.988	1.001	1.000	1.000	1.000	1.000					
Industry Factors	1.005	1.005	1.004	1.003	1.001	1.001	1.001	1.001	1.001	1.001	1.001
Prior	1.001	1.001	1.001	1.001	1.001	1.001	1.000	1.000	1.000	1.000	0.000
Selected	1.001	1.001	1.001	1.001	1.001	1.001	1.000	1.000	1.000	1.000	1.000
Cumulated	1.006	1.005	1.004	1.003	1.002	1.001	1.000	1.000	1.000	1.000	1.000

Municipal Pooling Authority - Liability - 100K & SIR Analyses
Paid between \$100,000 and \$1,000,000 Loss Development

Accident Year	Losses Paid as of:											
	3 Months	15 Months	27 Months	39 Months	51 Months	63 Months	75 Months	87 Months	99 Months	111 Months	123 Months	
1996-1997											446,883	446,883
1997-1998									1,700,278	1,713,809	1,716,370	
1998-1999								1,480,310	1,480,310	1,480,310	1,480,310	
1999-2000							460,684	460,684	397,620	397,620	397,620	
2000-2001						1,630,606	1,630,606	1,552,269	1,552,269	1,552,269	1,552,269	
2001-2002					235,876	256,134	302,428	314,846	321,368	355,096	355,342	
2002-2003				889,688	920,523	998,119	998,427	998,427	998,427	998,427	998,427	
2003-2004			29,250	115,359	628,669	662,233	668,087	668,087	668,087	668,087	668,087	
2004-2005				900,000	900,000	984,422	1,089,555	1,499,571	1,792,269	1,799,413	1,800,000	
2005-2006		72,583	260,334	977,166	1,748,126	1,805,909	1,857,740	2,068,349	2,376,539	2,178,756	2,180,217	
2006-2007			287,044	1,715,313	2,444,181	3,544,921	3,594,739	3,594,739	3,594,739	3,594,739	3,594,739	
2007-2008			24,275	528,137	1,663,549	1,696,161	1,778,667	2,935,719	2,935,719	2,935,719	2,956,497	
2008-2009		24,699	924,600	965,050	1,049,821	1,051,186	1,051,186	1,051,186	1,051,186	1,051,186		
2009-2010		6,166	751,815	856,719	1,897,915	2,237,403	2,817,995	3,598,254	4,353,261			
2010-2011			18,211	963,898	1,983,645	2,092,425	2,265,791	2,270,752				
2011-2012				289,888	2,473,154	2,909,761	2,957,840					
2012-2013				107,583	1,378,946	1,637,936						
2013-2014			281,864	1,161,519	1,251,563							
2014-2015			900,000	1,181,963								
2015-2016		42,909	300,665									
2016-2017		691,590										
2017-2018												

Amounts Include All Locations Except Richmond
The 2012-13 diagonal is valued as of 10/31/12.
The 2013-14 through 2017-18 diagonal is valued as of 9/30.

Paid Loss Development Factors:

	3-15 Months	15-27 Months	27-39 Months	39-51 Months	51-63 Months	63-75 Months	75-87 Months	87-99 Months	99-111 Months	111-123 Months	123-135 Months
1996-1997										1.000	
1997-1998									1.008	1.001	1.001
1998-1999								1.000	1.000	1.000	1.000
1999-2000							1.000	0.863	1.000	1.000	1.000
2000-2001						1.000	0.952	1.000	1.000	1.000	1.000
2001-2002					1.086	1.181	1.041	1.021	1.105	1.001	1.000
2002-2003				1.035	1.084	1.000	1.000	1.000	1.000	1.000	1.006
2003-2004			3.944	5.450	1.053	1.009	1.000	1.000	1.000	1.000	1.045
2004-2005				1.000	1.094	1.107	1.376	1.195	1.004	1.000	1.000
2005-2006		3.587	3.754	1.789	1.033	1.029	1.113	1.149	0.917	1.001	0.936
2006-2007			5.976	1.425	1.450	1.014	1.000	1.000	1.000	1.000	1.000
2007-2008			21.756	3.150	1.020	1.049	1.651	1.000	1.000	1.000	1.007
2008-2009		37.435	1.044	1.088	1.001	1.000	1.000	1.000	1.000		
2009-2010		121.929	1.140	2.215	1.179	1.259	1.277	1.210			
2010-2011			52.929	2.058	1.055	1.083	1.002				
2011-2012				8.531	1.177	1.017					
2012-2013				12.818	1.188						
2013-2014			4.121	1.078							
2014-2015			1.313								
2015-2016		7.007									
2016-2017											
Average Dollar-weighted Averages											
3-yr				3.274	1.138	1.111	1.128	1.100	1.000	1.003	0.982
4-yr				2.809	1.148	1.097	1.245	1.068	0.980	1.002	0.987
Industry Factors											
Prior	11.179	4.014	2.045	1.416	1.206	1.095	1.073	1.046	1.033	1.021	1.009
Selected	11.179	4.014	2.045	1.416	1.206	1.095	1.073	1.046	1.033	1.021	1.009
Cumulated	212.692	19.026	4.740	2.318	1.637	1.357	1.239	1.155	1.104	1.069	1.047

Municipal Pooling Authority - Liability - 100K & SIR Analyses
Paid between \$100,000 and \$1,000,000 Loss Development

Accident Year	<u>Losses Paid as of:</u>										
	135 Months	147 Months	159 Months	171 Months	183 Months	195 Months	207 Months	219 Months	231 Months	243 Months	255 Months
1996-1997									446,883	446,883	1,919,512
1997-1998	1,718,602	1,724,011	1,768,678	1,759,811	1,759,811	1,759,811	1,759,811	1,759,811	1,759,811	1,759,811	
1998-1999	1,480,310	1,480,310	1,480,310	1,480,310	1,480,310	1,480,310	1,480,310	1,480,310	1,480,310	1,480,310	
1999-2000	397,620	437,958	437,958	437,958	437,958	437,958	437,958	437,958	437,958		
2000-2001	1,552,269	1,552,269	1,552,269	1,552,269	1,552,269	1,552,269	1,552,269	1,552,269			
2001-2002	355,342	355,342	355,342	355,342	355,342	340,892					
2002-2003	1,004,125	1,045,572	1,079,420	1,135,175	1,145,313						
2003-2004	698,183	668,087	668,087	668,087							
2004-2005	1,800,000	1,800,000	1,800,000								
2005-2006	2,040,217	1,951,457									
2006-2007	3,594,739										
2007-2008											
2008-2009											
2009-2010											
2010-2011											
2011-2012											
2012-2013											
2013-2014											
2014-2015											
2015-2016											
2016-2017											
2017-2018											

Amounts Include All Locations Except Richmond
The 2012-13 diagonal is valued as of 10/31/12.
The 2013-14 through 2017-18 diagonal is valued as of 9/30.

	135-147 Months	147-159 Months	159-171 Months	171-183 Months	183-195 Months	195-207 Months	207-219 Months	219-231 Months	231-243 Months	243-255 Months	255-Ult. Months
1996-1997									1.000	4.295	
1997-1998	1.003	1.026	0.995	1.000	1.000	1.000	1.000	1.000	1.000		
1998-1999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000			
1999-2000	1.101	1.000	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	1.000	1.000	1.000	1.000	0.959						
2002-2003	1.041	1.032	1.052	1.009							
2003-2004	0.957	1.000	1.000								
2004-2005	1.000	1.000									
2005-2006	0.956										
2006-2007											
2007-2008											
2008-2009											
2009-2010											
2010-2011											
2011-2012											
2012-2013											
2013-2014											
2014-2015											
2015-2016											
2016-2017											
Average Dollar-weighted Averages	1.006	1.007	1.007	1.002	0.992	1.000	1.000	1.000	1.000	4.295	
3-yr	0.974	1.010	1.027	1.003	0.994	1.000	1.000				
4-yr	0.986	1.009	1.015	1.003	0.996	1.000					
Industry Factors	1.008	1.007	1.005	1.005	1.004	1.003	1.003	1.001	1.001	1.001	1.001
Prior	1.008	1.007	1.005	1.005	1.004	1.003	1.003	1.001	1.001	1.001	0.000
Selected	1.008	1.007	1.005	1.005	1.004	1.003	1.003	1.001	1.001	1.001	1.000
Cumulated	1.038	1.030	1.023	1.018	1.013	1.009	1.006	1.003	1.002	1.001	1.000

Municipal Pooling Authority - Liability - 100K & SIR Analyses

Exposure and Development Method
Based on Reported Losses

Accident Year	Composite Exposure (A)	Reported Losses as of 1/31/18 (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)
Prior	0	\$0	1.000	0.000	0.783	\$0	\$0
1997-1998	2,172,529	3,851,532	1.000	0.000	1.413	0	3,851,532
1998-1999	2,323,204	4,069,196	1.000	0.000	1.661	0	4,069,196
1999-2000	2,392,909	2,495,245	1.000	0.000	1.303	0	2,495,245
2000-2001	2,596,149	3,372,352	1.000	0.000	1.080	0	3,372,352
2001-2002	2,661,124	2,101,587	1.000	0.000	1.038	0	2,101,587
2002-2003	2,354,318	3,799,059	1.000	0.000	1.452	0	3,799,059
2003-2004	2,668,733	2,210,245	1.000	0.000	0.940	0	2,210,245
2004-2005	2,721,990	3,113,942	1.000	0.000	0.800	0	3,113,942
2005-2006	2,822,609	4,728,560	1.000	0.000	1.658	0	4,728,560
2006-2007	2,984,475	5,875,102	1.000	0.000	1.313	0	5,875,102
2007-2008	3,240,790	5,688,782	1.000	0.000	1.306	0	5,688,782
2008-2009	3,315,825	2,662,400	1.000	0.000	0.869	0	2,662,400
2009-2010	3,164,896	7,298,922	1.000	0.000	1.696	0	7,298,922
2010-2011	2,999,116	4,456,802	1.004	0.004	1.334	16,003	4,472,805
2011-2012	2,876,266	6,145,409	1.010	0.010	1.876	53,959	6,199,368
2012-2013	2,723,760	3,616,317	1.022	0.022	1.628	97,554	3,713,871
2013-2014	2,718,279	3,791,766	1.045	0.043	1.695	198,122	3,989,888
2014-2015	2,778,823	5,234,612	1.117	0.105	1.763	514,402	5,749,014
2015-2016	3,078,001	5,606,054	1.267	0.211	1.834	1,191,106	6,797,160
2016-2017	3,170,970	5,988,996	1.814	0.449	1.907	2,715,121	8,704,117
Totals	55,764,766	\$86,106,880				\$4,786,267	\$90,893,147

Notes:

- (A) Provided by the Authority.
- (B) Provided by the Authority. These losses exclude amounts incurred above the Authority's SIR for each year.
- (C) From Pool - Appendix A, Page 1, Column (F).
- (D) $1 - 1/(C)$.
- (E) From Pool - 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 - Liability - 100K & SIR Analyses

Exposure and Development Method
Based on Paid Losses

Accident Year	Composite Exposure (A)	Paid Losses as of 1/31/18 (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)
Prior	0	\$0	1.000	0.000	0.783	\$0	\$0
1997-1998	2,172,529	3,851,532	1.000	0.000	1.413	0	3,851,532
1998-1999	2,323,204	4,069,196	1.000	0.000	1.661	0	4,069,196
1999-2000	2,392,909	2,495,245	1.001	0.001	1.303	3,118	2,498,363
2000-2001	2,596,149	3,372,352	1.002	0.002	1.080	5,608	3,377,960
2001-2002	2,661,124	2,101,587	1.003	0.003	1.038	8,287	2,109,874
2002-2003	2,354,318	3,285,917	1.005	0.005	1.452	17,092	3,303,009
2003-2004	2,668,733	2,210,245	1.008	0.008	0.940	20,069	2,230,314
2004-2005	2,721,990	3,113,942	1.010	0.010	0.800	21,776	3,135,718
2005-2006	2,822,609	4,724,040	1.014	0.014	1.658	65,518	4,789,558
2006-2007	2,984,475	5,874,898	1.018	0.018	1.313	70,535	5,945,433
2007-2008	3,240,790	5,355,907	1.022	0.022	1.306	93,114	5,449,021
2008-2009	3,315,825	2,662,095	1.031	0.030	0.869	86,444	2,748,539
2009-2010	3,164,896	7,286,717	1.046	0.044	1.696	236,177	7,522,894
2010-2011	2,999,116	4,412,696	1.068	0.064	1.334	256,053	4,668,749
2011-2012	2,876,266	6,022,995	1.104	0.094	1.876	507,212	6,530,207
2012-2013	2,723,760	3,475,483	1.154	0.133	1.628	589,759	4,065,242
2013-2014	2,718,279	3,549,472	1.260	0.206	1.695	949,141	4,498,613
2014-2015	2,778,823	3,567,143	1.519	0.342	1.763	1,675,480	5,242,623
2015-2016	3,078,001	2,910,293	2.352	0.575	1.834	3,245,906	6,156,199
2016-2017	3,170,970	1,885,913	5.291	0.811	1.907	4,904,149	6,790,062
Totals	55,764,766	\$76,227,668				\$12,755,438	\$88,983,106

Notes:

- (A) Provided by the Authority.
- (B) Provided by the Authority. These losses exclude amounts paid above the Authority's SIR for each year.
- (C) From Pool - Appendix B, Page 1, Column (F).
- (D) $1 - 1/(C)$.
- (E) From Pool - 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 - Liability - 100K & SIR Analyses

Exposure and Development Method

Accident Year	Composite Exposure (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)
Prior	0	\$0	1.516	\$0		0.613	1.277	0.783
1997-1998	2,172,529	2,091,721	1.486	3,108,297	1.431	0.963	1.467	1.413
1998-1999	2,323,204	2,588,886	1.457	3,772,007	1.624	1.114	1.491	1.661
1999-2000	2,392,909	2,057,287	1.428	2,937,806	1.228	0.860	1.515	1.303
2000-2001	2,596,149	1,820,083	1.400	2,548,116	0.981	0.701	1.541	1.080
2001-2002	2,661,124	1,760,695	1.373	2,417,434	0.908	0.662	1.568	1.038
2002-2003	2,354,318	2,141,098	1.346	2,881,918	1.224	0.909	1.597	1.452
2003-2004	2,668,733	1,542,158	1.319	2,034,106	0.762	0.578	1.627	0.940
2004-2005	2,721,990	1,313,942	1.294	1,700,241	0.625	0.483	1.656	0.800
2005-2006	2,822,609	2,772,583	1.268	3,515,635	1.246	0.982	1.688	1.658
2006-2007	2,984,475	2,280,213	1.243	2,834,305	0.950	0.764	1.719	1.313
2007-2008	3,240,790	2,415,240	1.219	2,944,178	0.908	0.745	1.753	1.306
2008-2009	3,315,825	1,611,115	1.195	1,925,282	0.581	0.486	1.788	0.869
2009-2010	3,164,896	2,946,000	1.172	3,452,712	1.091	0.931	1.822	1.696
2010-2011	2,999,116	2,152,000	1.149	2,472,648	0.824	0.718	1.858	1.334
2011-2012	2,876,266	2,848,000	1.126	3,206,848	1.115	0.990	1.895	1.876
2012-2013	2,723,760	1,861,000	1.104	2,054,544	0.754	0.842	1.933	1.628
2013-2014	2,718,279	2,071,000	1.082	2,240,822	0.824	0.860	1.971	1.695
2014-2015	2,778,823	2,535,000	1.061	2,689,635	0.968	0.877	2.010	1.763
2015-2016	3,078,001	3,077,000	1.040	3,200,080	1.040	0.894	2.051	1.834
2016-2017	3,170,970	3,622,000	1.020	3,694,440	1.165	0.912	2.091	1.907
Total/Avg	55,764,766	\$45,507,021		\$55,631,054	\$0.998			
12/13-15/16	11,298,863	9,544,000		10,185,081	\$0.901			
12/13-16/17	14,469,833	13,166,000		13,879,521	\$0.959			
			Selected Limited Rate:		\$0.930			
			Prior Selected Limited Rate:		\$0.930			

Notes:

- (A) Provided by the Authority.
- (B) Selected average of results from Appendices A and B.
- (C) From Pool - Appendix E, Column (B).
- (D) (B) x (C).
- (E) (D) / (A).
- (F) Selected Limited Rate / (C). For 2011-2012 and prior (B) / (A).
- (G) Based on a Burr 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 - Liability - 100K & SIR Analyses

Frequency and Severity Method

Accident Year	Ultimate Program Severity (A)	Ultimate Claims (B)	Ultimate Program Losses (C)
Prior	\$10,781	529	\$5,703,149
1997-1998	15,501	198	3,069,198
1998-1999	15,759	245	3,860,955
1999-2000	12,470	250	3,117,500
2000-2001	12,465	225	2,804,625
2001-2002	11,272	245	2,761,640
2002-2003	13,960	245	3,420,200
2003-2004	12,543	200	2,508,600
2004-2005	10,717	203	2,175,551
2005-2006	20,439	229	4,680,531
2006-2007	22,923	171	3,919,833
2007-2008	22,889	185	4,234,465
2008-2009	16,089	179	2,879,931
2009-2010	28,099	191	5,366,909
2010-2011	23,797	168	3,997,896
2011-2012	33,527	161	5,397,847
2012-2013	25,389	160	4,062,240
2013-2014	26,409	180	4,753,620
2014-2015	27,470	168	4,614,960
2015-2016	28,597	201	5,747,997
2016-2017	29,719	211	6,270,709
Total		4,544	\$85,348,356

Notes:

- (A) From Pool - Appendix D, Page 2, Column (H).
- (B) From Pool - 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 - Liability - 100K & SIR Analyses

Frequency and Severity Method

Accident Year	Ultimate Limited Losses (A)	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	\$4,464,783	529	\$8,440	1.516	\$12,795	\$8,440	1.277	\$10,781
1997-1998	2,091,721	198	10,564	1.486	15,698	10,564	1.467	15,501
1998-1999	2,588,886	245	10,567	1.457	15,396	10,567	1.491	15,759
1999-2000	2,057,287	250	8,229	1.428	11,751	8,229	1.515	12,470
2000-2001	1,820,083	225	8,089	1.400	11,325	8,089	1.541	12,465
2001-2002	1,760,695	245	7,187	1.373	9,868	7,187	1.568	11,272
2002-2003	2,141,098	245	8,739	1.346	11,763	8,739	1.597	13,960
2003-2004	1,542,158	200	7,711	1.319	10,171	7,711	1.627	12,543
2004-2005	1,313,942	203	6,473	1.294	8,376	6,473	1.656	10,717
2005-2006	2,772,583	229	12,107	1.268	15,352	12,107	1.688	20,439
2006-2007	2,280,213	171	13,335	1.243	16,575	13,335	1.719	22,923
2007-2008	2,415,240	185	13,055	1.219	15,914	13,055	1.753	22,889
2008-2009	1,611,115	179	9,001	1.195	10,756	9,001	1.788	16,089
2009-2010	2,946,000	191	15,424	1.172	18,077	15,424	1.822	28,099
2010-2011	2,152,000	168	12,810	1.149	14,719	12,810	1.858	23,797
2011-2012	2,848,000	161	17,689	1.126	19,918	17,689	1.895	33,527
2012-2013	1,862,000	160	11,638	1.104	12,848	13,134	1.933	25,389
2013-2014	2,072,000	180	11,511	1.082	12,455	13,401	1.971	26,409
2014-2015	2,535,000	168	15,089	1.061	16,009	13,666	2.010	27,470
2015-2016	3,068,000	201	15,264	1.040	15,875	13,942	2.051	28,597
2016-2017	3,409,000	211	16,156	1.020	16,479	14,216	2.091	29,719

Average Limited Severity \$13,910
Average 12/13-15/16 Limited Severity: \$14,297
Average 12/13-16/17 Limited Severity: \$14,733

Selected Limited Severity: \$14,500
Prior Selected Limited Severity: \$14,500

Notes:

- (A) Selected average of results from Appendices A, B, and C.
- (B) Pool - Appendix D, Page 3, Column (C).
- (C) (A) / (B).
- (D) From Pool - Appendix E, Column (J).
- (E) (C) x (D).
- (F) Selected Limited Severity / (D).
- (G) Based on a Burr 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 - Liability - 100K & SIR Analyses

Frequency and Severity Method
Projection of Ultimate Claims

Accident Year	Reported Claim Development (A)	Closed Claim Development (B)	Selected Ultimate Claims (C)	Composite Exposure (10,000s) (D)	Claim Frequency (E)	Trend Factor (F)	Trended Claim Frequency (G)
Prior	529	529	529			1.000	
1997-1998	198	198	198	217.253	0.911	1.000	0.911
1998-1999	245	246	245	232.320	1.055	1.000	1.055
1999-2000	250	251	250	239.291	1.045	1.000	1.045
2000-2001	225	226	225	259.615	0.867	1.000	0.867
2001-2002	245	246	245	266.112	0.921	1.000	0.921
2002-2003	245	246	245	235.432	1.041	1.000	1.041
2003-2004	200	202	200	266.873	0.749	1.000	0.749
2004-2005	203	204	203	272.199	0.746	1.000	0.746
2005-2006	229	230	229	282.261	0.811	1.000	0.811
2006-2007	171	173	171	298.448	0.573	1.000	0.573
2007-2008	185	186	185	324.079	0.571	1.000	0.571
2008-2009	179	181	179	331.583	0.540	1.000	0.540
2009-2010	191	193	191	316.490	0.603	1.000	0.603
2010-2011	168	168	168	299.912	0.560	1.000	0.560
2011-2012	161	160	161	287.627	0.560	1.000	0.560
2012-2013	160	160	160	272.376	0.587	1.000	0.587
2013-2014	180	185	180	271.828	0.662	1.000	0.662
2014-2015	168	165	168	277.882	0.605	1.000	0.605
2015-2016	201	198	201	307.800	0.653	1.000	0.653
2016-2017	211	191	211	317.097	0.665	1.000	0.665
Total	4,544	4,538	4,544	5,576.477			0.720

(H) Selected 2017-2018 Frequency: 0.700
Prior Selected Frequency: 0.715

Program Year:	2017-2018	2018-2019
(I) Trend Factor:	1.000	1.000
(J) Selected Frequency:	0.700	0.700
(K) Composite Exposure:	324.714	324.831
(L) Ultimate Claims:	227	227

Notes:

- (A) From Pool - Appendix D, Page 4, (C).
- (B) From Pool - Appendix D, Page 5, (C).
- (C) Selected from (A) and (B).
- (D) From Pool - Appendix L, Page 2, (G).
- (E) (C) / (D).
- (F) From Pool - Appendix E.
- (G) (E) x (F).
- (H) The selected frequency of 0.700 is based on (G).
- (I) From Pool - Appendix E.
- (J) (H) x (I).
- (K) From Pool - Appendix L, Page 2, (G).
- (L) (J) x (K).

This exhibit summarizes the estimated numbers of claims and shows the estimated frequencies per 10,000 units of Composite Exposure, Pool - Appendix L, Page 2, Item (G).

Municipal Pooling Authority - Liability - 100K & SIR Analyses

Frequency and Severity Method
Reported Claim Count Development

Accident Year	Claims Reported as of 1/31/2018 (A)	Reported Claim Development Factor (B)	Ultimate Claims (C)	Trended Claim Frequency (D)
Prior	529	1.000	529	
1997-1998	198	1.000	198	0.911
1998-1999	245	1.000	245	1.055
1999-2000	250	1.000	250	1.045
2000-2001	225	1.000	225	0.867
2001-2002	245	1.000	245	0.921
2002-2003	245	1.000	245	1.041
2003-2004	200	1.000	200	0.749
2004-2005	203	1.000	203	0.746
2005-2006	229	1.000	229	0.811
2006-2007	171	1.000	171	0.573
2007-2008	185	1.000	185	0.571
2008-2009	179	1.000	179	0.540
2009-2010	191	1.000	191	0.603
2010-2011	168	1.000	168	0.560
2011-2012	161	1.000	161	0.560
2012-2013	160	1.000	160	0.587
2013-2014	180	1.002	180	0.662
2014-2015	168	0.998	168	0.605
2015-2016	206	0.976	201	0.653
2016-2017	266	0.795	211	0.665
Total	4,604		4,544	0.720

Notes:

- (A) Provided by the Authority.
- (B) From Pool - Appendix D, Page 6. Interpolated to apply to data as of 1/31/18.
- (C) (A) x (B).
- (D) (C) / [Pool - Appendix D, Page 3, (D)] x [Pool - 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 - Liability - 100K & SIR Analyses

Frequency and Severity Method
Closed Claim Count Development

Accident Year	Claims Closed as of 1/31/2018 (A)	Closed Claim Development Factor (B)	Ultimate Claims (C)	Trended Claim Frequency (D)
Prior	528	1.001	529	
1997-1998	198	1.002	198	0.911
1998-1999	245	1.003	246	1.059
1999-2000	250	1.004	251	1.049
2000-2001	225	1.005	226	0.871
2001-2002	245	1.006	246	0.924
2002-2003	244	1.007	246	1.045
2003-2004	200	1.008	202	0.757
2004-2005	202	1.009	204	0.749
2005-2006	228	1.010	230	0.815
2006-2007	171	1.011	173	0.580
2007-2008	184	1.012	186	0.574
2008-2009	179	1.013	181	0.546
2009-2010	190	1.014	193	0.610
2010-2011	166	1.015	168	0.560
2011-2012	157	1.018	160	0.556
2012-2013	156	1.028	160	0.587
2013-2014	175	1.056	185	0.681
2014-2015	149	1.110	165	0.594
2015-2016	163	1.216	198	0.643
2016-2017	131	1.456	191	0.602
Total	4,386		4,538	0.719

Notes:

- (A) Provided by the Authority.
- (B) From Pool - Appendix D, Page 7. Interpolated to apply to data as of 1/31/18.
- (C) (A) x (B).
- (D) (C) / [Pool - Appendix D, Page 3, (D)] x [Pool - 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 - Liability - 100K & SIR Analyses
Reported Claim Count Development

Accident Year	Claims Reported as of:													
	3 Months	15 Months	27 Months	39 Months	51 Months	63 Months	75 Months	87 Months	99 Months	111 Months	123 Months	135 Months	147 Months	159 Months
1996-1997	89	303	205	203	202	203	203	203	203	204	204			
1997-1998	99	276	191	190	190	189	189	194	198	198	198	198	198	198
1998-1999	111	313	244	243	244	243	248	245	245	245	245	245	245	245
1999-2000	94	292	249	240	239	244	249	249	249	249	249	249	249	250
2000-2001	116	299	231	229	227	225	225	225	225	225	225	225	225	225
2001-2002	99	309	254	246	246	246	246	246	246	245	245	245	245	245
2002-2003	96	330	250	244	245	244	244	244	244	244	245	245	245	245
2003-2004	82	299	210	202	198	198	198	197	197	197	197	198	200	200
2004-2005	74	286	206	188	188	187	187	186	186	196	196	203	203	203
2005-2006	78	320	229	229	231	228	228	228	229	229	229	229	229	
2006-2007	74	253	168	167	164	164	164	171	172	171	171	172		
2007-2008	92	242	188	183	183	182	185	186	186	185	185			
2008-2009	80	240	188	179	179	179	179	179	179	179				
2009-2010	84	249	191	193	189	190	192	192	191					
2010-2011	78	238	170	165	164	167	167	167						
2011-2012	61	204	166	161	160	160	161							
2012-2013	53	231	167	160	160	161								
2013-2014	55	241	194	180	180									
2014-2015	40	257	194	168										
2015-2016	41	315	213											
2016-2017	46	317												
2017-2018	52													

Amounts Include All Locations Except Richmond
The 2012-13 diagonal is valued as of 10/31/12.
The 2013-14 through 2017-18 diagonal is valued as of 9/30.

Reported Claim Count Development Factors:

	3-15 Months	15-27 Months	27-39 Months	39-51 Months	51-63 Months	63-75 Months	75-87 Months	87-99 Months	99-111 Months	111-123 Months	123-135 Months	135-147 Months	147-159 Months	159-171 Months
1996-1997	3.404	0.677	0.990	0.995	1.005	1.000	1.000	1.000	1.005	1.000				
1997-1998	2.788	0.692	0.995	1.000	0.995	1.000	1.026	1.021	1.000	1.000	1.000	1.000	1.000	1.000
1998-1999	2.820	0.780	0.996	1.004	0.996	1.021	0.988	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1999-2000	3.106	0.853	0.964	0.996	1.021	1.020	1.000	1.000	1.000	1.000	1.000	1.000	1.004	1.000
2000-2001	2.578	0.773	0.991	0.991	0.991	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2001-2002	3.121	0.822	0.969	1.000	1.000	1.000	1.000	1.000	0.996	1.000	1.000	1.000	1.000	1.000
2002-2003	3.438	0.758	0.976	1.004	0.996	1.000	1.000	1.000	1.000	1.004	1.000	1.000	1.000	1.000
2003-2004	3.646	0.702	0.962	0.980	1.000	1.000	0.995	1.000	1.000	1.000	1.005	1.010	1.000	1.000
2004-2005	3.865	0.720	0.913	1.000	0.995	1.000	0.995	1.000	1.054	1.000	1.036	1.000	1.000	
2005-2006	4.103	0.716	1.000	1.009	0.987	1.000	1.000	1.004	1.000	1.000	1.000	1.000		
2006-2007	3.419	0.664	0.994	0.982	1.000	1.000	1.043	1.006	0.994	1.000	1.006			
2007-2008	2.630	0.777	0.973	1.000	0.995	1.016	1.005	1.000	0.995	1.000				
2008-2009	3.000	0.783	0.952	1.000	1.000	1.000	1.000	1.000	1.000					
2009-2010	2.964	0.767	1.010	0.979	1.005	1.011	1.000	0.995						
2010-2011	3.051	0.714	0.971	0.994	1.018	1.000	1.000							
2011-2012	3.344	0.814	0.970	0.994	1.000	1.006								
2012-2013	4.358	0.723	0.958	1.000	1.006									
2013-2014	4.382	0.805	0.928	1.000										
2014-2015	6.425	0.755	0.866											
2015-2016	7.683	0.676												
2016-2017	6.891													
Average	3.858	0.749	0.967	0.996	1.001	1.005	1.003	1.002	1.003	1.000	1.005	1.001	1.001	1.000
Claim-weighted Averages														
3-yr	7.000	0.739	0.915	0.998	1.008	1.006	1.000	0.998	0.996	1.000	1.013	1.003	1.000	1.000
4-yr	6.209	0.736	0.928	0.997	1.007	1.004	1.001	1.000	0.997	1.000	1.011	1.002	1.000	1.000
Industry Factors	5.326	1.198	1.023	1.005	1.005	1.005	1.004	1.003	1.001	1.002	1.000	1.000	1.000	1.000
Prior	4.187	0.758	0.971	0.993	0.999	1.002	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Selected	4.692	0.756	0.970	0.994	1.000	1.002	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Cumulated	3.425	0.730	0.966	0.996	1.002	1.002	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Municipal Pooling Authority - Liability - 100K & SIR Analyses
Closed Claim Count Development

Accident Year	Claims Closed as of:													
	3 Months	15 Months	27 Months	39 Months	51 Months	63 Months	75 Months	87 Months	99 Months	111 Months	123 Months	135 Months	147 Months	159 Months
1996-1997	24	134	169	189	197	202	202	203	203	204	204			
1997-1998	21	132	154	176	181	186	187	193	196	196	196	197	197	197
1998-1999	32	149	196	230	237	239	246	245	245	245	245	245	245	245
1999-2000	29	155	202	229	234	239	245	244	244	244	244	244	245	250
2000-2001	36	150	191	214	223	225	225	225	225	225	225	225	225	225
2001-2002	30	172	203	235	243	243	245	245	244	244	245	245	245	245
2002-2003	31	152	202	228	238	241	243	243	243	244	244	243	243	244
2003-2004	19	158	176	190	193	194	196	197	197	197	197	198	200	200
2004-2005	18	154	177	173	180	185	185	185	185	195	195	202	202	202
2005-2006	19	152	186	206	219	222	225	226	228	228	228	228	228	
2006-2007	22	98	119	133	148	159	161	171	171	171	171	171		
2007-2008	17	124	149	168	172	174	178	182	183	183	183			
2008-2009	19	130	150	165	172	177	177	177	179	179				
2009-2010	17	122	144	160	168	181	184	188	190					
2010-2011	16	113	131	141	155	160	163	165						
2011-2012	16	95	126	143	151	155	157							
2012-2013	11	93	117	134	146	155								
2013-2014	9	118	149	165	174									
2014-2015	6	93	129	145										
2015-2016	9	99	148											
2016-2017	3	111												
2017-2018	3													

Amounts Include All Locations Except Richmond
The 2012-13 diagonal is valued as of 10/31/12.
The 2013-14 through 2017-18 diagonal is valued as of 9/30.

Closed Claim Count Development Factors:

	3-15 Months	15-27 Months	27-39 Months	39-51 Months	51-63 Months	63-75 Months	75-87 Months	87-99 Months	99-111 Months	111-123 Months	123-135 Months	135-147 Months	147-159 Months	159-171 Months
1996-1997	5.583	1.261	1.118	1.042	1.025	1.000	1.005	1.000	1.005	1.000				
1997-1998	6.286	1.167	1.143	1.028	1.028	1.005	1.032	1.016	1.000	1.000	1.005	1.000	1.000	1.005
1998-1999	4.656	1.315	1.173	1.030	1.008	1.029	0.996	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1999-2000	5.345	1.303	1.134	1.022	1.021	1.025	0.996	1.000	1.000	1.000	1.000	1.004	1.020	1.000
2000-2001	4.167	1.273	1.120	1.042	1.009	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2001-2002	5.733	1.180	1.158	1.034	1.000	1.008	1.000	0.996	1.000	1.004	1.000	1.000	1.000	1.000
2002-2003	4.903	1.329	1.129	1.044	1.013	1.008	1.000	1.000	1.004	1.000	0.996	1.000	1.004	1.000
2003-2004	8.316	1.114	1.080	1.016	1.005	1.010	1.005	1.000	1.000	1.000	1.005	1.010	1.000	1.000
2004-2005	8.556	1.149	0.977	1.040	1.028	1.000	1.000	1.000	1.054	1.000	1.036	1.000	1.000	
2005-2006	8.000	1.224	1.108	1.063	1.014	1.014	1.004	1.009	1.000	1.000	1.000	1.000		
2006-2007	4.455	1.214	1.118	1.113	1.074	1.013	1.062	1.000	1.000	1.000	1.000			
2007-2008	7.294	1.202	1.128	1.024	1.012	1.023	1.022	1.005	1.000	1.000				
2008-2009	6.842	1.154	1.100	1.042	1.029	1.000	1.000	1.011	1.000					
2009-2010	7.176	1.180	1.111	1.050	1.077	1.017	1.022	1.011						
2010-2011	7.063	1.159	1.076	1.099	1.032	1.019	1.012							
2011-2012	5.938	1.326	1.135	1.056	1.026	1.013								
2012-2013	8.455	1.258	1.145	1.090	1.062									
2013-2014	13.111	1.263	1.107	1.055										
2014-2015	15.500	1.387	1.124											
2015-2016	11.000	1.495												
2016-2017	37.000													
Average	8.828	1.248	1.115	1.049	1.027	1.012	1.010	1.003	1.005	1.000	1.004	1.002	1.003	1.001
Claim-weighted Averages														
3-yr	16.833	1.374	1.124	1.066	1.040	1.016	1.011	1.009	1.000	1.000	1.012	1.003	1.002	1.000
4-yr	15.593	1.347	1.127	1.074	1.050	1.012	1.014	1.007	1.000	1.000	1.010	1.002	1.001	1.000
Industry Factors	5.740	1.748	1.155	1.058	1.037	1.022	1.014	1.009	1.008	1.006	1.005	1.004	1.002	1.002
Prior	8.879	1.250	1.110	1.060	1.034	1.012	1.005	1.001	1.001	1.001	1.001	1.001	1.001	1.001
Selected	8.866	1.250	1.114	1.061	1.035	1.012	1.005	1.001	1.001	1.001	1.001	1.001	1.001	1.001
Cumulated	13.991	1.578	1.262	1.133	1.068	1.032	1.020	1.015	1.014	1.013	1.012	1.011	1.010	1.009

Municipal Pooling Authority - Liability - 100K & SIR Analyses

Loss Trend Factors

Accident Year	Benefit Level Factor (A)	Factor to 2017-2018 Loss Rate Level (B)	Factor to 2018-2019 Loss Rate Level (C)	Factor to 2019-2020 Loss Rate Level (D)	Factor to 2020-2021 Loss Rate Level (E)	Factor to 2017-2018 Frequency Level (F)	Factor to 2018-2019 Frequency Level (G)	Factor to 2019-2020 Frequency Level (H)	Factor to 2020-2021 Frequency Level (I)	Factor to 2017-2018 Severity Level (J)
Prior	1.000	1.516	1.546	1.577	1.608	1.000	1.000	1.000	1.000	1.516
1997-1998	1.000	1.486	1.516	1.546	1.577	1.000	1.000	1.000	1.000	1.486
1998-1999	1.000	1.457	1.486	1.516	1.546	1.000	1.000	1.000	1.000	1.457
1999-2000	1.000	1.428	1.457	1.486	1.516	1.000	1.000	1.000	1.000	1.428
2000-2001	1.000	1.400	1.428	1.457	1.486	1.000	1.000	1.000	1.000	1.400
2001-2002	1.000	1.373	1.400	1.428	1.457	1.000	1.000	1.000	1.000	1.373
2002-2003	1.000	1.346	1.373	1.400	1.428	1.000	1.000	1.000	1.000	1.346
2003-2004	1.000	1.319	1.346	1.373	1.400	1.000	1.000	1.000	1.000	1.319
2004-2005	1.000	1.294	1.319	1.346	1.373	1.000	1.000	1.000	1.000	1.294
2005-2006	1.000	1.268	1.294	1.319	1.346	1.000	1.000	1.000	1.000	1.268
2006-2007	1.000	1.243	1.268	1.294	1.319	1.000	1.000	1.000	1.000	1.243
2007-2008	1.000	1.219	1.243	1.268	1.294	1.000	1.000	1.000	1.000	1.219
2008-2009	1.000	1.195	1.219	1.243	1.268	1.000	1.000	1.000	1.000	1.195
2009-2010	1.000	1.172	1.195	1.219	1.243	1.000	1.000	1.000	1.000	1.172
2010-2011	1.000	1.149	1.172	1.195	1.219	1.000	1.000	1.000	1.000	1.149
2011-2012	1.000	1.126	1.149	1.172	1.195	1.000	1.000	1.000	1.000	1.126
2012-2013	1.000	1.104	1.126	1.149	1.172	1.000	1.000	1.000	1.000	1.104
2013-2014	1.000	1.082	1.104	1.126	1.149	1.000	1.000	1.000	1.000	1.082
2014-2015	1.000	1.061	1.082	1.104	1.126	1.000	1.000	1.000	1.000	1.061
2015-2016	1.000	1.040	1.061	1.082	1.104	1.000	1.000	1.000	1.000	1.040
2016-2017	1.000	1.020	1.040	1.061	1.082	1.000	1.000	1.000	1.000	1.020
2017-2018	1.000	1.000	1.020	1.040	1.061	1.000	1.000	1.000	1.000	1.000
2018-2019	1.000	--	1.000	1.020	1.040	--	1.000	1.000	1.000	0.980
2019-2020	1.000	--	--	1.000	1.020	--	--	1.000	1.000	--
2020-2021	1.000	--	--	--	1.000	--	--	--	1.000	--

Notes:

- (A) No benefit level adjustment applied.
- (B) - (E) (A) adjusted for a 2.0% annual loss rate trend.
- (F) - (I) (A) adjusted for a 0.0% annual frequency trend.
- (J) (A) adjusted for a 2.0% 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 inflation.

Municipal Pooling Authority - Liability - 100K & SIR Analyses

Payment and Reserve Forecast

<u>Accident Year</u>	<u>As of</u> <u>1/31/2018</u>	<u>Calendar Period</u>	
		<u>2/1/2018</u> <u>to</u> <u>6/30/2018</u>	<u>7/1/2018</u> <u>to</u> <u>6/30/2019</u>
Prior			
Ultimate Loss	\$12,300,837	\$12,300,837	\$12,300,837
Paid in Calendar Period	-	59,823	
Paid to Date	12,241,015	12,300,838	12,300,838
Outstanding Liability	59,822	(1)	(1)
2001-2002			
Ultimate Loss	\$1,075,986	\$1,075,986	\$1,075,986
Paid in Calendar Period	-		
Paid to Date	1,075,986	1,075,986	1,075,986
Outstanding Liability	(0)	(0)	(0)
2002-2003			
Ultimate Loss	\$2,412,180	\$2,412,180	\$2,412,180
Paid in Calendar Period	-	102,115	205,102
Paid to Date	1,899,038	2,001,153	2,206,255
Outstanding Liability	513,142	411,027	205,925
2003-2004			
Ultimate Loss	\$1,363,073	\$1,363,073	\$1,363,073
Paid in Calendar Period	-		
Paid to Date	1,363,073	1,363,073	1,363,073
Outstanding Liability	0	0	0
2004-2005			
Ultimate Loss	\$2,398,527	\$2,398,527	\$2,398,527
Paid in Calendar Period	-		
Paid to Date	2,398,527	2,398,527	2,398,527
Outstanding Liability	(0)	(0)	(0)
2005-2006			
Ultimate Loss	\$3,657,000	\$3,657,000	\$3,657,000
Paid in Calendar Period	-	669	1,011
Paid to Date	3,652,255	3,652,924	3,653,935
Outstanding Liability	4,745	4,076	3,065
2006-2007			
Ultimate Loss	\$4,657,500	\$4,657,500	\$4,657,500
Paid in Calendar Period	-	119	241
Paid to Date	4,656,404	4,656,523	4,656,764
Outstanding Liability	1,096	977	736

Municipal Pooling Authority - Liability - 100K & SIR Analyses

Payment and Reserve Forecast

<u>Accident Year</u>	<u>As of</u> <u>1/31/2018</u>	<u>Calendar Period</u>	
		<u>2/1/2018</u> <u>to</u> <u>6/30/2018</u>	<u>7/1/2018</u> <u>to</u> <u>6/30/2019</u>
2007-2008			
Ultimate Loss	\$4,562,500	\$4,562,500	\$4,562,500
Paid in Calendar Period	-	29,684	59,858
Paid to Date	4,228,969	4,258,653	4,318,511
Outstanding Liability	333,531	303,847	243,989
2008-2009			
Ultimate Loss	\$1,905,500	\$1,905,500	\$1,905,500
Paid in Calendar Period	-	49	86
Paid to Date	1,905,114	1,905,163	1,905,249
Outstanding Liability	386	337	251
2009-2010			
Ultimate Loss	\$5,912,000	\$5,912,000	\$5,912,000
Paid in Calendar Period	-	50	88
Paid to Date	5,911,657	5,911,707	5,911,795
Outstanding Liability	343	293	205
2010-2011			
Ultimate Loss	\$3,596,000	\$3,596,000	\$3,596,000
Paid in Calendar Period	-	8,558	16,698
Paid to Date	3,534,432	3,542,990	3,559,688
Outstanding Liability	61,568	53,010	36,312
2011-2012			
Ultimate Loss	\$4,865,000	\$4,865,000	\$4,865,000
Paid in Calendar Period	-	21,426	34,904
Paid to Date	4,730,248	4,751,674	4,786,578
Outstanding Liability	134,752	113,326	78,422
2012-2013			
Ultimate Loss	\$2,644,000	\$2,644,000	\$2,644,000
Paid in Calendar Period	-	37,824	84,220
Paid to Date	2,343,809	2,381,633	2,465,853
Outstanding Liability	300,191	262,367	178,147
2013-2014			
Ultimate Loss	\$3,052,000	\$3,052,000	\$3,052,000
Paid in Calendar Period	-	83,854	119,996
Paid to Date	2,583,542	2,667,396	2,787,392
Outstanding Liability	468,458	384,604	264,608

Municipal Pooling Authority - Liability - 100K & SIR Analyses

Payment and Reserve Forecast

<u>Accident Year</u>	<u>As of</u> <u>1/31/2018</u>	<u>Calendar Period</u>	
		<u>2/1/2018</u> <u>to</u> <u>6/30/2018</u>	<u>7/1/2018</u> <u>to</u> <u>6/30/2019</u>
2014-2015			
Ultimate Loss	\$3,850,000	\$3,850,000	\$3,850,000
Paid in Calendar Period	-	336,028	537,489
Paid to Date	2,117,898	2,453,926	2,991,415
Outstanding Liability	1,732,102	1,396,074	858,585
2015-2016			
Ultimate Loss	\$4,682,000	\$4,682,000	\$4,682,000
Paid in Calendar Period	-	623,275	1,032,906
Paid to Date	1,502,026	2,125,301	3,158,207
Outstanding Liability	3,179,974	2,556,699	1,523,793
2016-2017			
Ultimate Loss	\$6,008,000	\$6,008,000	\$6,008,000
Paid in Calendar Period	-	527,059	1,481,111
Paid to Date	1,343,759	1,870,818	3,351,929
Outstanding Liability	4,664,241	4,137,182	2,656,071
2017-2018			
Ultimate Loss	\$2,775,000	\$4,757,000	\$4,757,000
Paid in Calendar Period	-	227,416	947,188
Paid to Date	19,163	246,579	1,193,767
Outstanding Liability	2,755,837	4,510,421	3,563,233
2018-2019			
Ultimate Loss	-	-	\$4,993,000
Paid in Calendar Period	-	-	444,377
Paid to Date	-	-	444,377
Outstanding Liability	-	-	4,548,623
Totals			
Ultimate Loss	\$71,717,103	\$73,699,103	\$78,692,103
Paid in Calendar Period	-	2,057,949	4,965,275
Paid to Date	57,506,916	59,564,865	64,530,140
Outstanding Liability	14,210,187	14,134,238	14,161,963
Total Outstanding ULAE	797,000	647,150	715,963
Outstanding Liability plus ULAE	15,007,187	14,781,388	14,877,926

Notes appear on the next page.

Municipal Pooling Authority - Liability - 100K & SIR Analyses

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 2015-2016, \$623,275 is expected to be paid between 2/1/18 and 6/30/18, \$2,125,301 will have been paid by 6/30/18, and the reserve for remaining payments on these claims should be \$2,556,699.
- Ultimate Losses for each accident year are from Pool - Exhibit 3, Page 2.
- 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, $\$1,032,906 = \$2,556,699 \times 40.4\%$.
- Paid to Date is Paid in Calendar Period plus Paid to Date from previous calendar period. For example, $\$3,158,207 = \$1,032,906 + \$2,125,301$.
- Outstanding Liability is Ultimate Loss minus Paid to Date. For example, $\$2,556,699 = \$4,682,000 - \$2,125,301$.

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 - Liability - 100K & SIR Analyses

Short- and Long-Term Liabilities

<u>Liabilities as of 1/31/18:</u>		<u>Expected</u>	<u>Discounted</u>
<u>Current (Short Term)</u>	Loss and ALAE:	\$1,830,533	\$1,812,498
	ULAE:	647,774	641,392
	Short-Term Loss and LAE:	<u>\$2,478,307</u>	<u>\$2,453,890</u>
<u>Non-Current (Long Term)</u>	Loss and ALAE:	\$12,379,654	\$11,688,436
	ULAE:	149,226	115,828
	Long-Term Loss and LAE:	<u>\$12,528,880</u>	<u>\$11,804,264</u>
<u>Total Liability</u>	Loss and ALAE:	\$14,210,187	\$13,500,934
	ULAE:	797,000	757,220
	Total Loss and LAE:	<u>\$15,007,187</u>	<u>\$14,258,154</u>
<u>Liabilities as of 6/30/18:</u>			
<u>Current (Short Term)</u>	Loss and ALAE:	\$4,520,898	\$4,476,356
	ULAE:	227,480	225,239
	Short-Term Loss and LAE:	<u>\$4,748,378</u>	<u>\$4,701,595</u>
<u>Non-Current (Long Term)</u>	Loss and ALAE:	\$9,613,340	\$8,965,025
	ULAE:	419,670	390,188
	Long-Term Loss and LAE:	<u>\$10,033,010</u>	<u>\$9,355,213</u>
<u>Total Liability</u>	Loss and ALAE:	\$14,134,238	\$13,441,381
	ULAE:	647,150	615,427
	Total Loss and LAE:	<u>\$14,781,388</u>	<u>\$14,056,808</u>

		<u>Discounted with a Margin for Contingencies</u>				
		<u>70%</u>	<u>75%</u>	<u>80%</u>	<u>85%</u>	<u>90%</u>
		<u>Confidence</u>	<u>Confidence</u>	<u>Confidence</u>	<u>Confidence</u>	<u>Confidence</u>
<u>Liabilities as of 1/31/18:</u>						
<u>Current (Short Term)</u>	Loss and ALAE:	\$2,008,248	\$2,093,435	\$2,194,935	\$2,319,997	\$2,486,747
	ULAE:	710,662	740,808	776,726	820,982	879,990
	Short-Term Loss and LAE:	<u>\$2,718,910</u>	<u>\$2,834,243</u>	<u>\$2,971,661</u>	<u>\$3,140,979</u>	<u>\$3,366,737</u>
<u>Non-Current (Long Term)</u>	Loss and ALAE:	\$12,950,787	\$13,500,144	\$14,154,696	\$14,961,199	\$16,036,534
	ULAE:	128,338	133,781	140,267	148,259	158,916
	Long-Term Loss and LAE:	<u>\$13,079,125</u>	<u>\$13,633,925</u>	<u>\$14,294,963</u>	<u>\$15,109,458</u>	<u>\$16,195,450</u>
<u>Total Liability</u>	Loss and ALAE:	\$14,959,035	\$15,593,579	\$16,349,631	\$17,281,196	\$18,523,281
	ULAE:	839,000	874,589	916,993	969,241	1,038,906
	Total Loss and LAE:	<u>\$15,798,035</u>	<u>\$16,468,168</u>	<u>\$17,266,624</u>	<u>\$18,250,437</u>	<u>\$19,562,187</u>
<u>Liabilities as of 6/30/18:</u>						
<u>Current (Short Term)</u>	Loss and ALAE:	\$4,959,802	\$5,170,191	\$5,420,867	\$5,729,736	\$6,141,560
	ULAE:	249,565	260,151	272,764	288,306	309,028
	Short-Term Loss and LAE:	<u>\$5,209,367</u>	<u>\$5,430,342</u>	<u>\$5,693,631</u>	<u>\$6,018,042</u>	<u>\$6,450,588</u>
<u>Non-Current (Long Term)</u>	Loss and ALAE:	\$9,933,248	\$10,354,604	\$10,856,645	\$11,475,232	\$12,300,015
	ULAE:	432,328	450,667	472,518	499,440	535,338
	Long-Term Loss and LAE:	<u>\$10,365,576</u>	<u>\$10,805,271</u>	<u>\$11,329,163</u>	<u>\$11,974,672</u>	<u>\$12,835,353</u>
<u>Total Liability</u>	Loss and ALAE:	\$14,893,050	\$15,524,795	\$16,277,512	\$17,204,968	\$18,441,575
	ULAE:	681,893	710,818	745,282	787,746	844,366
	Total Loss and LAE:	<u>\$15,574,943</u>	<u>\$16,235,613</u>	<u>\$17,022,794</u>	<u>\$17,992,714</u>	<u>\$19,285,941</u>

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

Municipal Pooling Authority - Liability - 100K & SIR Analyses

Discount Factors to be Applied to Overall Reserves

Accident Year	Full Value of Reserve at 1/31/18 (A)	Discount Factor (B)	Discounted Reserve at 1/31/18 (C)	Full Value of Reserve at 6/30/18 (D)	Discount Factor (E)	Discounted Reserve at 6/30/18 (F)
Prior	\$59,823	1.000	\$59,823	\$0	1.000	\$0
1997-1998	0	0.996	0	0	1.000	0
1998-1999	(0)	0.982	0	(0)	0.990	0
1999-2000	(0)	0.971	0	(0)	0.971	0
2000-2001	(0)	0.968	0	(0)	0.971	0
2001-2002	(0)	0.966	0	(0)	0.965	0
2002-2003	513,142	0.966	495,510	411,027	0.968	397,813
2003-2004	0	0.959	0	0	0.963	0
2004-2005	(0)	0.952	0	(0)	0.955	0
2005-2006	4,745	0.945	4,483	4,076	0.947	3,861
2006-2007	1,096	0.939	1,029	977	0.941	920
2007-2008	333,531	0.936	312,271	303,847	0.937	284,581
2008-2009	386	0.937	361	337	0.936	315
2009-2010	343	0.940	323	293	0.939	275
2010-2011	61,568	0.942	57,995	53,010	0.941	49,901
2011-2012	134,752	0.943	127,132	113,326	0.943	106,847
2012-2013	300,191	0.945	283,572	262,367	0.944	247,758
2013-2014	468,458	0.947	443,677	384,604	0.945	363,485
2014-2015	1,732,102	0.952	1,648,450	1,396,074	0.950	1,326,154
2015-2016	3,179,974	0.954	3,034,696	2,556,699	0.954	2,439,615
2016-2017	4,664,241	0.951	4,437,205	4,137,182	0.954	3,948,810
2017-2018	2,755,837	0.941	2,594,407	4,510,421	0.947	4,271,046
Totals	\$14,210,187		\$13,500,934	\$14,134,238		\$13,441,381

(G) Discount Factor at 1/31/18 for Overall Reserve: 0.950
(H) Discount Factor at 6/30/18 for Overall Reserve: 0.951

Notes:

- (A) From Pool - Appendix F, Outstanding Liability at 1/31/18.
- (B) Based on Pool - Appendix H, Page 2, Column (E).
- (C) (A) x (B).
- (D) From Pool - Appendix F, Outstanding Liability at 6/30/18.
- (E) Based on Pool - 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 0.950, the discounted liability for outstanding claims is 95.0% of the full value.

Municipal Pooling Authority - Liability - 100K & SIR Analyses

Calculation of Discount Factors

Payment Year (A)	Payment Pattern (B)	Discounted* Reserves (C)	Undiscounted Reserves (D)	Discount Factor (E)
22	0.0%	0.000	0.000	1.000
21	0.1%	0.001	0.001	0.990
20	0.0%	0.001	0.001	0.971
19	0.1%	0.002	0.002	0.971
18	0.1%	0.003	0.003	0.965
17	0.3%	0.006	0.006	0.968
16	0.3%	0.009	0.009	0.963
15	0.3%	0.011	0.012	0.955
14	0.3%	0.014	0.015	0.947
13	0.4%	0.018	0.019	0.941
12	0.5%	0.022	0.023	0.937
11	0.8%	0.029	0.031	0.936
10	1.3%	0.041	0.044	0.939
9	1.9%	0.059	0.063	0.941
8	2.6%	0.084	0.089	0.943
7	3.9%	0.121	0.128	0.944
6	5.5%	0.173	0.183	0.945
5	10.6%	0.275	0.289	0.950
4	18.4%	0.452	0.474	0.954
3	25.2%	0.693	0.726	0.954
2	18.8%	0.865	0.913	0.947
1	8.7%	0.934	1.000	0.934

(F) Discount Factor for Future Funding: 0.943

* Assumed Investment Rate: 2.0%

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 Pool - Appendix B, Page 2.
- (C) 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, $86.5\% = [69.3\% / 1.020] + [18.8\% / (1.010)]$.
- (D) Summation of future (B) values. This is the percent of ultimate loss unpaid at the beginning of the year.
- (E) (C) / (D).
- (F) (E) 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 0.94, on a discounted basis, \$0.94 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 - Liability

Calculation of Discount Factors at the \$5,000 Deductible Level

Payment Year (A)	Payment Pattern (B)	Discounted* Reserves (C)	Undiscounted Reserves (D)	Discount Factor (E)
21	0.0%	0.000	0.000	1.000
20	0.0%	0.000	0.000	1.000
19	0.0%	0.000	0.000	1.000
18	0.0%	0.000	0.000	1.000
17	0.1%	0.001	0.001	0.990
16	0.1%	0.002	0.002	0.980
15	0.1%	0.003	0.003	0.971
14	0.1%	0.004	0.004	0.961
13	0.1%	0.005	0.005	0.952
12	0.1%	0.006	0.006	0.943
11	0.2%	0.007	0.008	0.941
10	0.3%	0.010	0.011	0.941
9	0.3%	0.013	0.014	0.937
8	0.6%	0.018	0.020	0.939
7	1.1%	0.029	0.031	0.946
6	2.1%	0.050	0.052	0.953
5	6.8%	0.116	0.120	0.966
4	17.8%	0.290	0.298	0.973
3	30.7%	0.588	0.605	0.972
2	25.4%	0.828	0.859	0.964
1	14.1%	0.952	1.000	0.952
(F) Discount Factor for Future Funding:				0.961
* Assumed Investment Rate:				2.0%

Municipal Pooling Authority - Liability

Calculation of Discount Factors at the \$10,000 Deductible Level

Payment Year (A)	Payment Pattern (B)	Discounted* Reserves (C)	Undiscounted Reserves (D)	Discount Factor (E)
21	0.0%	0.000	0.000	1.000
20	0.0%	0.000	0.000	1.000
19	0.0%	0.000	0.000	1.000
18	0.0%	0.000	0.000	1.000
17	0.1%	0.001	0.001	0.990
16	0.1%	0.002	0.002	0.980
15	0.1%	0.003	0.003	0.971
14	0.1%	0.004	0.005	0.961
13	0.1%	0.005	0.006	0.952
12	0.1%	0.006	0.007	0.943
11	0.2%	0.009	0.009	0.941
10	0.3%	0.012	0.013	0.941
9	0.3%	0.015	0.016	0.937
8	0.7%	0.021	0.023	0.939
7	1.3%	0.034	0.036	0.946
6	2.4%	0.057	0.060	0.953
5	7.7%	0.132	0.136	0.966
4	19.8%	0.325	0.334	0.972
3	32.2%	0.637	0.656	0.971
2	23.9%	0.861	0.895	0.962
1	10.5%	0.948	1.000	0.948
(F) Discount Factor for Future Funding:				0.958
* Assumed Investment Rate:				2.0%

Municipal Pooling Authority - Liability

Calculation of Discount Factors at the \$25,000 Deductible Level

Payment Year (A)	Payment Pattern (B)	Discounted* Reserves (C)	Undiscounted Reserves (D)	Discount Factor (E)
21	0.0%	0.000	0.000	1.000
20	0.0%	0.000	0.000	1.000
19	0.0%	0.000	0.000	1.000
18	0.0%	0.000	0.000	1.000
17	0.1%	0.001	0.001	0.990
16	0.1%	0.003	0.003	0.980
15	0.1%	0.004	0.004	0.971
14	0.1%	0.005	0.006	0.961
13	0.1%	0.007	0.007	0.952
12	0.1%	0.008	0.008	0.943
11	0.3%	0.010	0.011	0.941
10	0.4%	0.014	0.015	0.941
9	0.4%	0.018	0.019	0.936
8	0.8%	0.026	0.027	0.939
7	1.6%	0.041	0.043	0.946
6	2.9%	0.069	0.072	0.953
5	9.1%	0.158	0.163	0.965
4	22.7%	0.379	0.390	0.972
3	33.7%	0.705	0.727	0.970
2	20.8%	0.898	0.936	0.960
1	6.4%	0.944	1.000	0.944
(F) Discount Factor for Future Funding:				0.954
* Assumed Investment Rate:				2.0%

Municipal Pooling Authority - Liability

Calculation of Discount Factors at the \$50,000 Deductible Level

Payment Year (A)	Payment Pattern (B)	Discounted* Reserves (C)	Undiscounted Reserves (D)	Discount Factor (E)
21	0.0%	0.000	0.000	1.000
20	0.0%	0.000	0.000	1.000
19	0.0%	0.000	0.000	1.000
18	0.0%	0.000	0.000	1.000
17	0.3%	0.003	0.003	0.990
16	0.3%	0.006	0.006	0.980
15	0.3%	0.009	0.010	0.971
14	0.3%	0.012	0.013	0.961
13	0.3%	0.015	0.016	0.952
12	0.3%	0.018	0.019	0.943
11	0.6%	0.024	0.026	0.940
10	0.9%	0.033	0.035	0.940
9	0.9%	0.041	0.044	0.936
8	1.8%	0.059	0.062	0.939
7	3.5%	0.092	0.097	0.945
6	6.2%	0.152	0.160	0.952
5	18.0%	0.327	0.339	0.963
4	34.4%	0.661	0.683	0.967
3	26.8%	0.913	0.951	0.960
2	4.7%	0.942	0.998	0.944
1	0.2%	0.925	1.000	0.925
(F) Discount Factor for Future Funding:				0.934
* Assumed Investment Rate:				2.0%

Municipal Pooling Authority - Liability

Calculation of Discount Factors at the \$100,000 Deductible Level

Payment Year (A)	Payment Pattern (B)	Discounted* Reserves (C)	Undiscounted Reserves (D)	Discount Factor (E)
21	0.0%	0.000	0.000	1.000
20	0.0%	0.000	0.000	1.000
19	0.0%	0.000	0.000	1.000
18	0.0%	0.000	0.000	1.000
17	0.7%	0.007	0.007	0.990
16	0.7%	0.014	0.014	0.980
15	0.7%	0.021	0.021	0.971
14	0.7%	0.027	0.029	0.961
13	0.7%	0.034	0.036	0.952
12	0.7%	0.040	0.042	0.942
11	1.4%	0.053	0.056	0.940
10	2.0%	0.072	0.076	0.940
9	2.0%	0.090	0.096	0.935
8	3.8%	0.125	0.134	0.938
7	7.0%	0.193	0.204	0.944
6	11.8%	0.305	0.322	0.949
5	28.2%	0.578	0.603	0.958
4	32.0%	0.883	0.923	0.957
3	7.6%	0.941	0.999	0.942
2	0.1%	0.924	1.000	0.924
1	0.0%	0.906	1.000	0.906
(F) Discount Factor for Future Funding:				0.915
* Assumed Investment Rate:				2.0%

Municipal Pooling Authority - Liability

Calculation of Discount Factors at the \$250,000 Deductible Level

Payment Year (A)	Payment Pattern (B)	Discounted* Reserves (C)	Undiscounted Reserves (D)	Discount Factor (E)
21	0.0%	0.000	0.000	1.000
20	0.0%	0.000	0.000	1.000
19	0.0%	0.000	0.000	1.000
18	0.0%	0.000	0.000	1.000
17	0.6%	0.006	0.006	0.990
16	0.6%	0.013	0.013	0.980
15	0.6%	0.019	0.019	0.971
14	0.6%	0.025	0.026	0.961
13	0.6%	0.030	0.032	0.952
12	0.6%	0.036	0.038	0.942
11	1.2%	0.047	0.050	0.940
10	1.8%	0.065	0.069	0.940
9	1.8%	0.081	0.086	0.936
8	3.4%	0.113	0.121	0.938
7	6.4%	0.175	0.185	0.944
6	10.9%	0.279	0.294	0.949
5	27.0%	0.540	0.563	0.959
4	33.6%	0.863	0.899	0.959
3	9.8%	0.943	0.998	0.945
2	0.2%	0.927	1.000	0.927
1	0.0%	0.909	1.000	0.909
(F) Discount Factor for Future Funding:				0.918
* Assumed Investment Rate:				2.0%

Municipal Pooling Authority - Liability

Calculation of Discount Factors at the \$500,000 Deductible Level

Payment Year (A)	Payment Pattern (B)	Discounted* Reserves (C)	Undiscounted Reserves (D)	Discount Factor (E)
21	0.0%	0.000	0.000	1.000
20	0.0%	0.000	0.000	1.000
19	0.0%	0.000	0.000	1.000
18	0.0%	0.000	0.000	1.000
17	0.6%	0.006	0.006	0.990
16	0.6%	0.013	0.013	0.980
15	0.6%	0.019	0.019	0.971
14	0.6%	0.025	0.026	0.961
13	0.6%	0.030	0.032	0.952
12	0.6%	0.036	0.038	0.942
11	1.2%	0.047	0.050	0.940
10	1.8%	0.065	0.069	0.940
9	1.8%	0.081	0.086	0.936
8	3.4%	0.113	0.121	0.938
7	6.4%	0.175	0.185	0.944
6	10.9%	0.279	0.294	0.949
5	27.0%	0.540	0.563	0.959
4	33.6%	0.863	0.899	0.959
3	9.8%	0.943	0.998	0.945
2	0.2%	0.927	1.000	0.927
1	0.0%	0.909	1.000	0.909
(F) Discount Factor for Future Funding:				0.918
* Assumed Investment Rate:				2.0%

Municipal Pooling Authority - Liability - 100K & SIR Analyses

Confidence Level Table

Probability	Projected Losses	Outstanding Losses
95%	1.886	1.527
90	1.621	1.372
85	1.462	1.280
80	1.343	1.211
75	1.248	1.155
70	1.168	1.108
65	1.097	1.067
60	1.033	1.029
55	0.975	0.994
50	0.919	0.961
45	0.867	0.930
40	0.815	0.899
35	0.765	0.868
30	0.714	0.837
25	0.662	0.804

To read table: For the above retention, there is a 90% chance that final loss settlements will be less than 1.621 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 - Liability - 100K & SIR Analyses

Program History

Policy Year Start Date	Policy Year End Date	Policy Year	Self-Insured Retention	
			Per Occurrence	Aggregate
7/1/1986	6/30/1997	Prior	1,000,000	(none)
7/1/1997	6/30/1998	1997-1998	1,000,000	(none)
7/1/1998	6/30/1999	1998-1999	1,000,000	(none)
7/1/1999	6/30/2000	1999-2000	1,000,000	(none)
7/1/2000	6/30/2001	2000-2001	1,000,000	(none)
7/1/2001	6/30/2002	2001-2002	1,000,000	(none)
7/1/2002	6/30/2003	2002-2003	1,000,000	(none)
7/1/2003	6/30/2004	2003-2004	1,000,000	(none)
7/1/2004	6/30/2005	2004-2005	1,000,000	(none)
7/1/2005	6/30/2006	2005-2006	1,000,000	(none)
7/1/2006	6/30/2007	2006-2007	1,000,000	(none)
7/1/2007	6/30/2008	2007-2008	1,000,000	(none)
7/1/2008	6/30/2009	2008-2009	1,000,000	(none)
7/1/2009	6/30/2010	2009-2010	1,000,000	(none)
7/1/2010	6/30/2011	2010-2011	1,000,000	(none)
7/1/2011	6/30/2012	2011-2012	1,000,000	(none)
7/1/2012	6/30/2013	2012-2013	1,000,000	(none)
7/1/2013	6/30/2014	2013-2014	1,000,000	(none)
7/1/2014	6/30/2015	2014-2015	1,000,000	(none)
7/1/2015	6/30/2016	2015-2016	1,000,000	(none)
7/1/2016	6/30/2017	2016-2017	1,000,000	(none)
7/1/2017	6/30/2018	2017-2018	1,000,000	(none)
7/1/2018	6/30/2019	2018-2019	1,000,000	(none)

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

Municipal Pooling Authority - Liability - 100K & SIR Analyses

Incurred Losses as of 1/31/18

Accident Year (A)	Unlimited Incurred (B)	Additions to Losses (C)	Additions to 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	\$163,500	\$0	\$6,280,618	\$6,444,118	\$0	\$1,979,334	\$4,464,783	\$1,979,334	\$6,444,118	\$6,444,118
1997-1998	2,851,398	1,000,134	0	3,851,532	0	1,759,811	2,091,721	1,759,811	3,851,532	3,851,532
1998-1999	2,510,333	1,558,863	0	4,069,196	0	1,480,310	2,588,886	1,480,310	4,069,196	4,069,196
1999-2000	1,935,613	559,632	0	2,495,245	0	437,958	2,057,287	437,958	2,495,245	2,495,245
2000-2001	3,056,849	315,503	0	3,372,352	0	1,552,269	1,820,083	1,552,269	3,372,352	3,372,352
2001-2002	1,987,998	113,589	0	2,101,587	0	340,892	1,760,695	340,892	2,101,587	2,101,587
2002-2003	3,700,584	98,476	0	3,799,059	0	1,657,961	2,141,098	1,657,961	3,799,059	3,799,059
2003-2004	2,210,245	0	0	2,210,245	0	668,087	1,542,158	668,087	2,210,245	2,210,245
2004-2005	3,150,494	0	0	3,150,494	36,553	1,836,553	1,313,942	1,800,000	3,113,942	3,113,942
2005-2006	4,728,560	0	0	4,728,560	0	1,955,977	2,772,583	1,955,977	4,728,560	4,728,560
2006-2007	5,875,102	0	0	5,875,102	0	3,594,889	2,280,213	3,594,889	5,875,102	5,875,102
2007-2008	5,688,782	0	0	5,688,782	0	3,273,542	2,415,240	3,273,542	5,688,782	5,688,782
2008-2009	2,662,400	0	0	2,662,400	0	1,051,285	1,611,115	1,051,285	2,662,400	2,662,400
2009-2010	7,298,922	0	0	7,298,922	0	4,353,324	2,945,599	4,353,324	7,298,922	7,298,922
2010-2011	4,456,802	0	0	4,456,802	0	2,308,824	2,147,978	2,308,824	4,456,802	4,456,802
2011-2012	6,145,409	0	0	6,145,409	0	3,305,679	2,839,729	3,305,679	6,145,409	6,145,409
2012-2013	3,616,317	0	0	3,616,317	0	1,762,896	1,853,421	1,762,896	3,616,317	3,616,317
2013-2014	3,791,766	0	0	3,791,766	0	1,734,928	2,056,839	1,734,928	3,791,766	3,791,766
2014-2015	5,234,612	0	0	5,234,612	0	2,753,958	2,480,654	2,753,958	5,234,612	5,234,612
2015-2016	5,606,054	0	0	5,606,054	0	2,684,319	2,921,735	2,684,319	5,606,054	5,606,054
2016-2017	5,988,996	0	0	5,988,996	0	3,213,841	2,775,155	3,213,841	5,988,996	5,988,996
2017-2018	475,595	0	0	475,595	0	0	475,595	0	475,595	475,595
Total	\$83,136,332	\$3,646,196	\$6,280,618	\$93,063,146	\$36,553	\$43,706,637	\$49,356,509	\$43,670,084	\$93,026,593	\$93,026,593

Notes:

- (A) Years are 7/1 to 6/30.
- (B) Provided by the Authority. Amounts are gross of deductibles, net of recoveries. All claims prior to 1994-95 are closed.
- (C) Amounts are for the City of Concord and are valued as of 11/30/07. We assume all claims are closed.
- (D) Claims missing from this year's loss run
- (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 Pool - Appendix J.

Municipal Pooling Authority - Liability - 100K & SIR Analyses

Paid Losses as of 1/31/18

Accident Year (A)	Unlimited Paid (B)	Additions to Losses (C)	Additions to 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	\$103,677	\$0	\$6,280,618	\$6,384,295	\$0	\$1,919,512	\$4,464,783	\$1,919,512	\$6,384,295	\$6,384,295
1997-1998	2,851,398	1,000,134	0	3,851,532	0	1,759,811	2,091,721	1,759,811	3,851,532	3,851,532
1998-1999	2,510,333	1,558,863	0	4,069,196	0	1,480,310	2,588,886	1,480,310	4,069,196	4,069,196
1999-2000	1,935,613	559,632	0	2,495,245	0	437,958	2,057,287	437,958	2,495,245	2,495,245
2000-2001	3,056,849	315,503	0	3,372,352	0	1,552,269	1,820,083	1,552,269	3,372,352	3,372,352
2001-2002	1,987,998	113,589	0	2,101,587	0	340,892	1,760,695	340,892	2,101,587	2,101,587
2002-2003	3,187,441	98,476	0	3,285,917	0	1,145,313	2,140,604	1,145,313	3,285,917	3,285,917
2003-2004	2,210,245	0	0	2,210,245	0	668,087	1,542,158	668,087	2,210,245	2,210,245
2004-2005	3,141,703	0	0	3,141,703	27,761	1,827,761	1,313,942	1,800,000	3,113,942	3,113,942
2005-2006	4,724,040	0	0	4,724,040	0	1,951,457	2,772,583	1,951,457	4,724,040	4,724,040
2006-2007	5,874,898	0	0	5,874,898	0	3,594,739	2,280,159	3,594,739	5,874,898	5,874,898
2007-2008	5,355,907	0	0	5,355,907	0	2,958,277	2,397,630	2,958,277	5,355,907	5,355,907
2008-2009	2,662,095	0	0	2,662,095	0	1,051,186	1,610,909	1,051,186	2,662,095	2,662,095
2009-2010	7,286,717	0	0	7,286,717	0	4,353,261	2,933,457	4,353,261	7,286,717	7,286,717
2010-2011	4,412,696	0	0	4,412,696	0	2,274,593	2,138,102	2,274,593	4,412,696	4,412,696
2011-2012	6,022,995	0	0	6,022,995	0	3,290,061	2,732,934	3,290,061	6,022,995	6,022,995
2012-2013	3,475,483	0	0	3,475,483	0	1,640,529	1,834,954	1,640,529	3,475,483	3,475,483
2013-2014	3,549,472	0	0	3,549,472	0	1,630,895	1,918,578	1,630,895	3,549,472	3,549,472
2014-2015	3,567,143	0	0	3,567,143	0	1,446,138	2,121,005	1,446,138	3,567,143	3,567,143
2015-2016	2,910,293	0	0	2,910,293	0	791,654	2,118,638	791,654	2,910,293	2,910,293
2016-2017	1,885,913	0	0	1,885,913	0	861,620	1,024,293	861,620	1,885,913	1,885,913
2017-2018	93,514	0	0	93,514	0	0	93,514	0	93,514	93,514
Total	\$72,806,424	\$3,646,196	\$6,280,618	\$82,733,237	\$27,761	\$36,976,322	\$45,756,915	\$36,948,561	\$82,705,476	\$82,705,476

Notes:

- (A) Years are 7/1 to 6/30.
- (B) Provided by the Authority. Amounts are gross of deductibles, net of recoveries. All claims prior to 1994-95 are closed.
- (C) Amounts are for the City of Concord and are valued as of 11/30/07. We assume all claims are closed.
- (D) Claims missing from this year's loss run
- (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 Pool - Appendix J.

Municipal Pooling Authority - Liability - 100K & SIR Analyses

Case Reserves as of 1/31/18

Accident Year (A)	Unlimited Reserves (B)	Additions to Losses (C)	Additions to Losses (D)	Adjusted Reserves (E)	Reserves Over SIR (F)	Reserves Over \$100,000 (G)	Reserves Capped at \$100,000 (H)	Reserves to SIR Layer \$100,000 (I)	Reserves Capped at SIR (J)	Reserves Capped at SIR & Aggregate (K)
Prior	\$59,823	\$0	\$0	\$59,823	\$0	\$59,823	\$0	\$59,823	\$59,823	\$59,823
1997-1998	0	0	0	0	0	0	0	0	0	0
1998-1999	0	0	0	0	0	0	0	0	0	0
1999-2000	0	0	0	0	0	0	0	0	0	0
2000-2001	0	0	0	0	0	0	0	0	0	0
2001-2002	0	0	0	0	0	0	0	0	0	0
2002-2003	513,142	0	0	513,142	0	512,648	494	512,648	513,142	513,142
2003-2004	0	0	0	0	0	0	0	0	0	0
2004-2005	8,791	0	0	8,791	8,791	8,791	0	0	0	0
2005-2006	4,520	0	0	4,520	0	4,520	0	4,520	4,520	4,520
2006-2007	204	0	0	204	0	150	54	150	204	204
2007-2008	332,875	0	0	332,875	0	315,265	17,610	315,265	332,875	332,875
2008-2009	305	0	0	305	0	99	206	99	305	305
2009-2010	12,205	0	0	12,205	0	63	12,142	63	12,205	12,205
2010-2011	44,107	0	0	44,107	0	34,231	9,876	34,231	44,107	44,107
2011-2012	122,414	0	0	122,414	0	15,618	106,795	15,618	122,414	122,414
2012-2013	140,834	0	0	140,834	0	122,366	18,467	122,366	140,834	140,834
2013-2014	242,294	0	0	242,294	0	104,033	138,261	104,033	242,294	242,294
2014-2015	1,667,469	0	0	1,667,469	0	1,307,821	359,649	1,307,821	1,667,469	1,667,469
2015-2016	2,695,761	0	0	2,695,761	0	1,892,664	803,097	1,892,664	2,695,761	2,695,761
2016-2017	4,103,084	0	0	4,103,084	0	2,352,222	1,750,862	2,352,222	4,103,084	4,103,084
2017-2018	382,082	0	0	382,082	0	0	382,082	0	382,082	382,082
Total	\$10,329,908	\$0	\$0	\$10,329,908	\$8,791	\$6,730,314	\$3,599,594	\$6,721,523	\$10,321,117	\$10,321,117

Notes:

- (A) Years are 7/1 to 6/30.
- (B) Pool - Appendix K, Page 1, Column (B) - Pool - Appendix K, Page 2, Column (B).
- (C) Pool - Appendix K, Page 1, Column (C) - Pool - Appendix K, Page 2, Column (C).
- (D) Pool - Appendix K, Page 1, Column (D) - Pool - Appendix K, 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 Pool - Appendix J.

Municipal Pooling Authority - Liability - 100K & SIR Analyses

Claim Counts as of 1/31/18

Accident Year (A)	Reported Claims (B)	Additions to Reported Claims (C)	Additions to Reported Claims (D)	Adjusted Reported Claims (E)	Closed Claims (F)	Additions to Closed Claims (G)	Additions to Closed Claims (H)	Adjusted Closed Claims (I)	Open Claims (J)	Adjusted Open Claims (K)
Prior	1	0	528	529	0	0	528	528	1	1
1997-1998	172	26	0	198	172	26	0	198	0	0
1998-1999	205	40	0	245	205	40	0	245	0	0
1999-2000	204	46	0	250	204	46	0	250	0	0
2000-2001	186	39	0	225	186	39	0	225	0	0
2001-2002	216	29	0	245	216	29	0	245	0	0
2002-2003	219	26	0	245	218	26	0	244	1	1
2003-2004	200	0	0	200	200	0	0	200	0	0
2004-2005	203	0	0	203	202	0	0	202	1	1
2005-2006	229	0	0	229	228	0	0	228	1	1
2006-2007	171	0	0	171	171	0	0	171	0	0
2007-2008	185	0	0	185	184	0	0	184	1	1
2008-2009	179	0	0	179	179	0	0	179	0	0
2009-2010	191	0	0	191	190	0	0	190	1	1
2010-2011	168	0	0	168	166	0	0	166	2	2
2011-2012	161	0	0	161	157	0	0	157	4	4
2012-2013	160	0	0	160	156	0	0	156	4	4
2013-2014	180	0	0	180	175	0	0	175	5	5
2014-2015	168	0	0	168	149	0	0	149	19	19
2015-2016	205	0	1	206	163	0	0	163	42	43
2016-2017	266	0	0	266	131	0	0	131	135	135
2017-2018	148	0	0	148	28	0	0	28	120	120
Total	4,017	206	529	4,752	3,680	206	528	4,414	337	338

Notes:

- (A) Years are 7/1 to 6/30.
- (B) Provided by the Authority. Amounts are gross of deductibles, net of recoveries. All claims prior to 1994-95 are closed.
- (C) Amounts are for the City of Concord and are valued as of 11/30/07. We assume all claims are closed.
- (D) Claims missing from this year's loss run
- (E) (B) + (C) + (D).
- (F) Provided by the Authority.
- (G) Amounts are for the City of Concord and are valued as of 11/30/07. We assume all claims are closed.
- (H) Claims missing from this year's loss run
- (I) (F) + (G) + (H).
- (J) (B) - (F).
- (K) (E) - (I).

Municipal Pooling Authority - Liability - 100K & SIR Analyses

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)
Prior							
1997-1998			1,326,330				1.638
1998-1999			1,453,820				1.598
1999-2000			1,534,900				1.559
2000-2001			1,706,870				1.521
2001-2002			1,793,210				1.484
2002-2003			1,625,910				1.448
2003-2004			1,888,700				1.413
2004-2005			1,973,887				1.379
2005-2006			2,098,594				1.345
2006-2007			2,274,752				1.312
2007-2008			2,531,867				1.280
2008-2009			2,654,784				1.249
2009-2010			2,596,305				1.219
2010-2011			2,522,385				1.189
2011-2012			2,479,540				1.160
2012-2013			2,406,148				1.132
2013-2014			2,462,209				1.104
2014-2015			2,580,151				1.077
2015-2016			2,928,640				1.051
2016-2017			3,093,629				1.025
2017-2018			3,247,137				1.000
2018-2019			3,248,311				1.000

Notes: All exposure data provided by the Authority.

Municipal Pooling Authority - Liability - 100K & SIR Analyses

Adjusted Exposure Measures

Accident Year	Population (A)	Gross Revenue (B)	Total Payroll (C)	Sheriff's Payroll (D)	Number of Police Vehicles (E)	Number of Employees (FTE) (F)	Composite Exposure (G)
Prior							
1997-1998			2,172,529				2,172,529
1998-1999			2,323,204				2,323,204
1999-2000			2,392,909				2,392,909
2000-2001			2,596,149				2,596,149
2001-2002			2,661,124				2,661,124
2002-2003			2,354,318				2,354,318
2003-2004			2,668,733				2,668,733
2004-2005			2,721,990				2,721,990
2005-2006			2,822,609				2,822,609
2006-2007			2,984,475				2,984,475
2007-2008			3,240,790				3,240,790
2008-2009			3,315,825				3,315,825
2009-2010			3,164,896				3,164,896
2010-2011			2,999,116				2,999,116
2011-2012			2,876,266				2,876,266
2012-2013			2,723,760				2,723,760
2013-2014			2,718,279				2,718,279
2014-2015			2,778,823				2,778,823
2015-2016			3,078,001				3,078,001
2016-2017			3,170,970				3,170,970
2017-2018			3,247,137				3,247,137
2018-2019			3,248,311				3,248,311
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 Revenue) + (100.0% x Total Payroll) + (0.0% x Sheriff's Payroll) + (0.0% x Police Vehicles) + (0.0% x (FTE)).