



Bickmore

Actuarial

Actuarial Review of the Self-Insured Liability Program

*Outstanding Liabilities as of June 30, 2020
Forecast for Program Year 2020-21*

Presented to
Municipal Pooling Authority

June 16, 2020





Tuesday, June 16, 2020

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 2020-21 program year to be \$6,083,000. 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 \$17,694,000 as of June 30, 2020, including ALAE and ULAE, and discounted for anticipated investment income. Given estimated program assets of \$30,966,000 as of June 30, 2020, the program was funded above the 90% confidence level.

The \$17,694,000 estimate is the minimum liability to be booked by MPA at June 30, 2020 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, 2020 are summarized in the table below.

Municipal Pooling Authority
Self-Insured Liability Program
Estimated Liability for Unpaid Loss and LAE
at June 30, 2020

	Expected	Marginally Acceptable 70% CL	Recommended Range			Conservative 90% CL
			Low 75% CL	Target 80% CL	High 85% CL	
Loss and ALAE	\$17,790,000	\$19,782,000	\$20,619,000	\$21,597,000	\$22,842,000	\$24,532,000
ULAE	870,000	968,000	1,008,000	1,057,000	1,117,000	1,200,000
Investment Income Offset	<u>(966,000)</u>	<u>(1,074,000)</u>	<u>(1,120,000)</u>	<u>(1,173,000)</u>	<u>(1,240,000)</u>	<u>(1,332,000)</u>
Discounted Loss and LAE	\$17,694,000	\$19,676,000	\$20,507,000	\$21,481,000	\$22,719,000	\$24,400,000
Assets	<u>30,966,000</u>	<u>30,966,000</u>	<u>30,966,000</u>	<u>30,966,000</u>	<u>30,966,000</u>	<u>30,966,000</u>
Surplus	\$13,272,000	\$11,290,000	\$10,459,000	\$9,485,000	\$8,247,000	\$6,566,000

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 2020-21 fiscal year.

Municipal Pooling Authority
Self-Insured Liability Program
Loss and LAE Funding Guidelines for 2020-21
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	\$6,447,000	\$7,491,000	\$7,994,000	\$8,581,000	\$9,316,000	\$10,296,000
ULAE	0	0	0	0	0	0
Investment Income Offset	<u>(364,000)</u>	<u>(423,000)</u>	<u>(451,000)</u>	<u>(484,000)</u>	<u>(526,000)</u>	<u>(581,000)</u>
Discounted Loss and LAE	\$6,083,000	\$7,068,000	\$7,543,000	\$8,096,000	\$8,790,000	\$9,715,000
Non-Claims Related Expenses	<u>6,142,000</u>	<u>6,142,000</u>	<u>6,142,000</u>	<u>6,142,000</u>	<u>6,142,000</u>	<u>6,142,000</u>
Indicated Funding	\$12,225,000	\$13,210,000	\$13,685,000	\$14,238,000	\$14,932,000	\$15,857,000

The Non-Claims Related Expenses above include the following:

- CARMA Premium: \$4,231,000
- DOC Expense/Claim Administration: \$276,000
- Department Personnel: \$812,000
- G&A Expense: \$810,000
- Capital Equipment: \$14,000

The funding recommendations shown in the table above do not include any recognition of the anticipated funding margin (surplus or deficit) at June 30, 2020.

Municipal Pooling Authority
Self-Insured Liability Program
Loss and LAE Funding Rates Guidelines for 2020-21
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	\$2.814	\$0.536	\$1.187	\$4.537
\$10,000	2.663	0.536	1.187	4.386
\$25,000	2.363	0.536	1.187	4.086
\$50,000	2.012	0.536	1.187	3.735
\$100,000	1.589	0.536	1.187	3.312

Note that while the projected expenses are for the 2020-21 fiscal year, the rate is a percentage of 2019-20 payroll. This is because in practice MPA collects 2020-21 contributions based on member payroll from 2019-20.

The estimates included in this report do not make any provision for the increased cost of general liability claims as a result of the coronavirus (COVID-19) pandemic.

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 or Becky Richard at (916) 244-1183 with any questions you may have concerning this report.

Sincerely,

Bickmore Actuarial



Mike Harrington, FCAS, MAAA
President and Principal, Bickmore Actuarial
Fellow, Casualty Actuarial Society
Member, American Academy of Actuaries



Becky Richard, ACAS, MAAA
Senior Actuarial Manager, Bickmore Actuarial
Associate, 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, 2020, MPA is expected to have assets of \$30,966,000 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, 2020, project ultimate loss costs for 2020-21, 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, 2020. The dark-colored bars indicate our estimates of the program's liability for outstanding claims before recognition of the investment income that can be earned on the assets held before the claim payments come due. The horizontal line across the graph indicates MPA's available assets at June 30th.

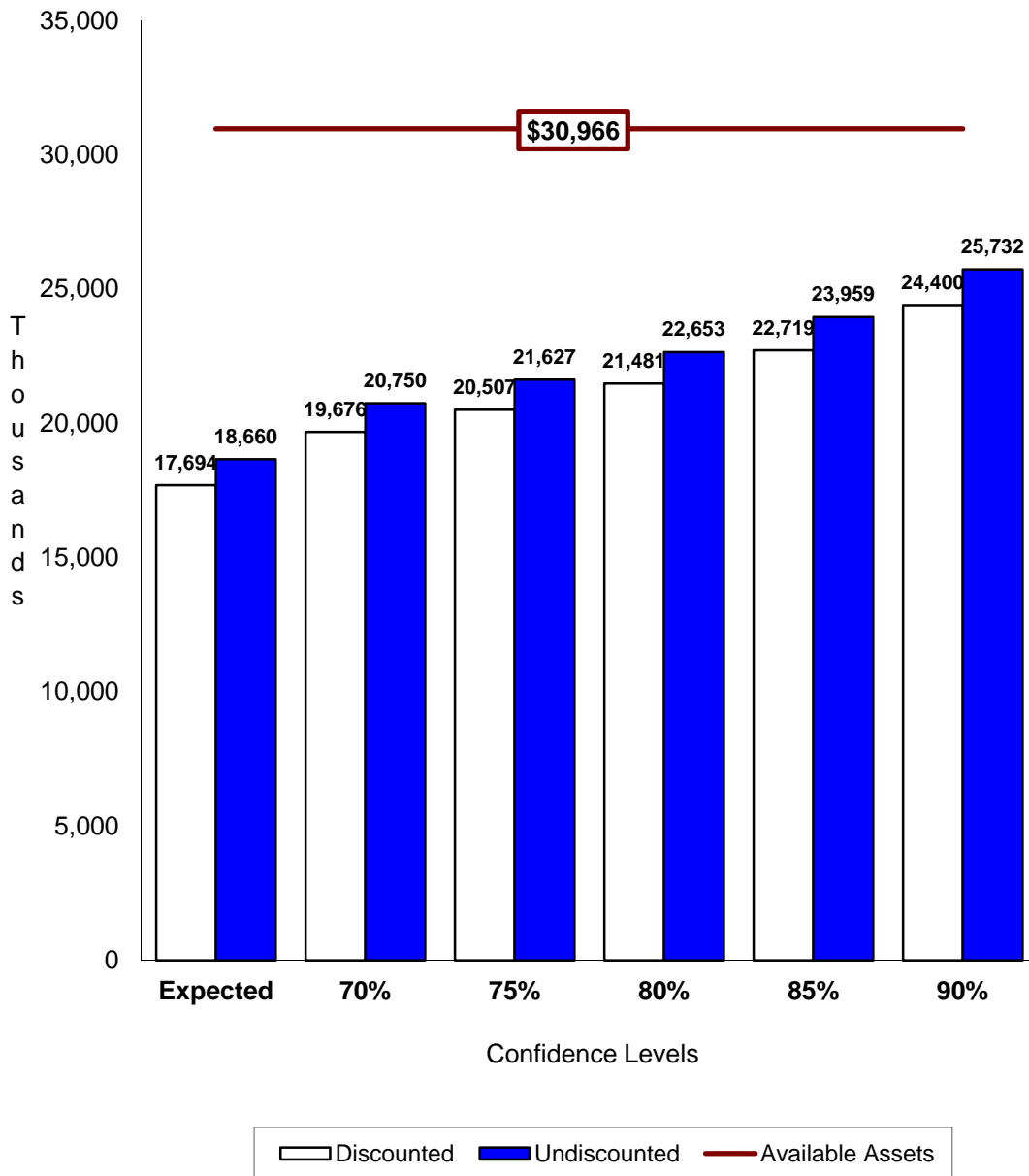
Our best estimate of the full value of MPA's liability for outstanding claims within its self-insured retention (SIR) is \$18,660,000 as of June 30, 2020. This amount includes losses, allocated loss adjustment expenses (ALAE), and unallocated loss adjustment expenses (ULAE). ALAE is the direct cost associated 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 5.2% if the program is funded within the range indicated in the graphs, resulting in a discounted liability for outstanding claims of \$17,694,000 as of June 30, 2020.

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, 2020



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, 2020, before recognition of investment income.

Municipal Pooling Authority
Self-Insured Liability Program
Estimated Liability for Unpaid Loss and LAE at June 30, 2020

Year	Case Reserves	IBNR Reserves	Total Outstanding
Prior	\$0	\$0	\$0
1999-00	0	0	0
2000-01	0	0	0
2001-02	0	0	0
2002-03	8,620	0	8,620
2003-04	0	0	0
2004-05	0	0	0
2005-06	3,706	0	3,706
2006-07	175	0	175
2007-08	266,356	0	266,356
2008-09	2,370	2,600	4,970
2009-10	(2,167)	16,459	14,292
2010-11	18,149	8,997	27,146
2011-12	41,384	25,394	66,778
2012-13	4,659	25,009	29,668
2013-14	5,351	46,868	52,219
2014-15	760,243	79,779	840,022
2015-16	1,497,394	124,595	1,621,989
2016-17	1,920,645	383,414	2,304,059
2017-18	2,029,667	822,554	2,852,221
2018-19	2,507,880	1,813,199	4,321,079
2019-20	1,237,871	4,138,500	5,376,371
Loss and ALAE	\$10,302,303	\$7,487,368	\$17,789,671
ULAE		870,051	870,051
Total	\$10,302,303	\$8,357,419	\$18,659,722

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.

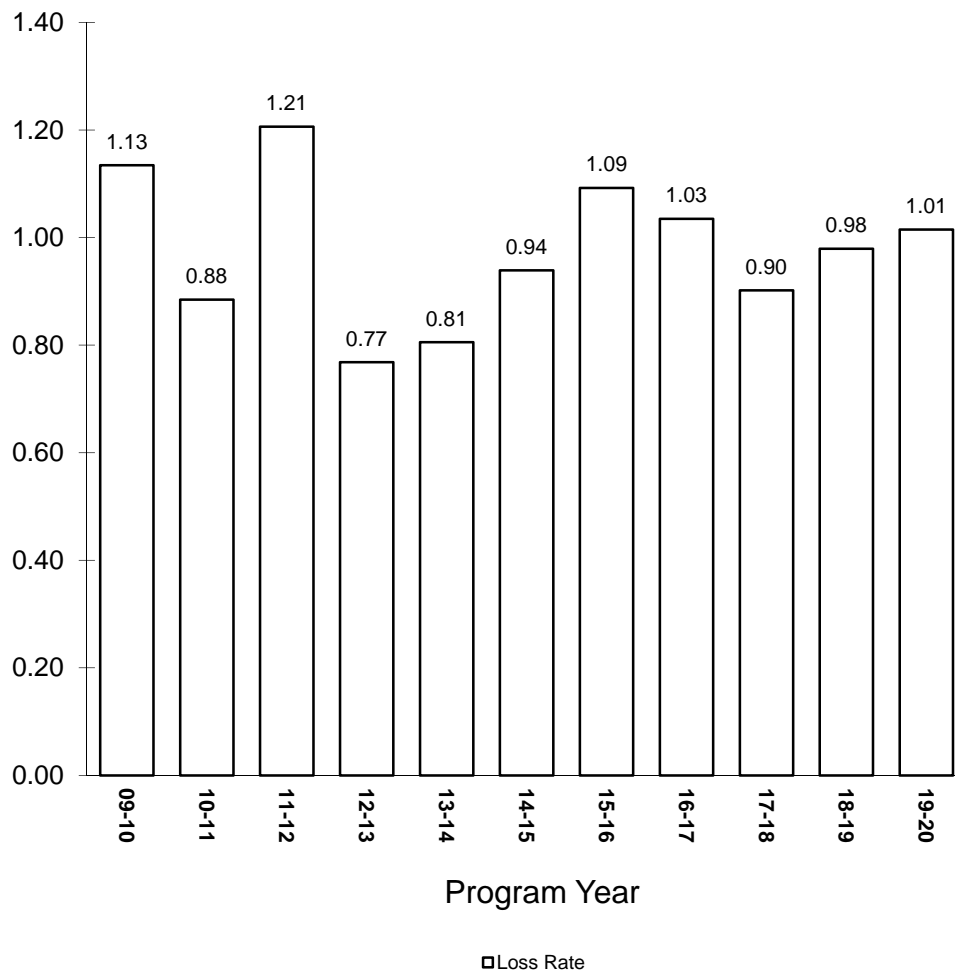
It is estimated that program assets will be \$30,966,000 at June 30, 2020, resulting in the program being funded above the 90% confidence level.

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 \$1.08 per \$100 of payroll during the period 2009-10 to 2012-13. Since that time, the loss rate averaged \$0.93. Our projected loss rate for 2019-20 of \$1.01 per \$100 of payroll is based on the average of recent years.

Graph 2

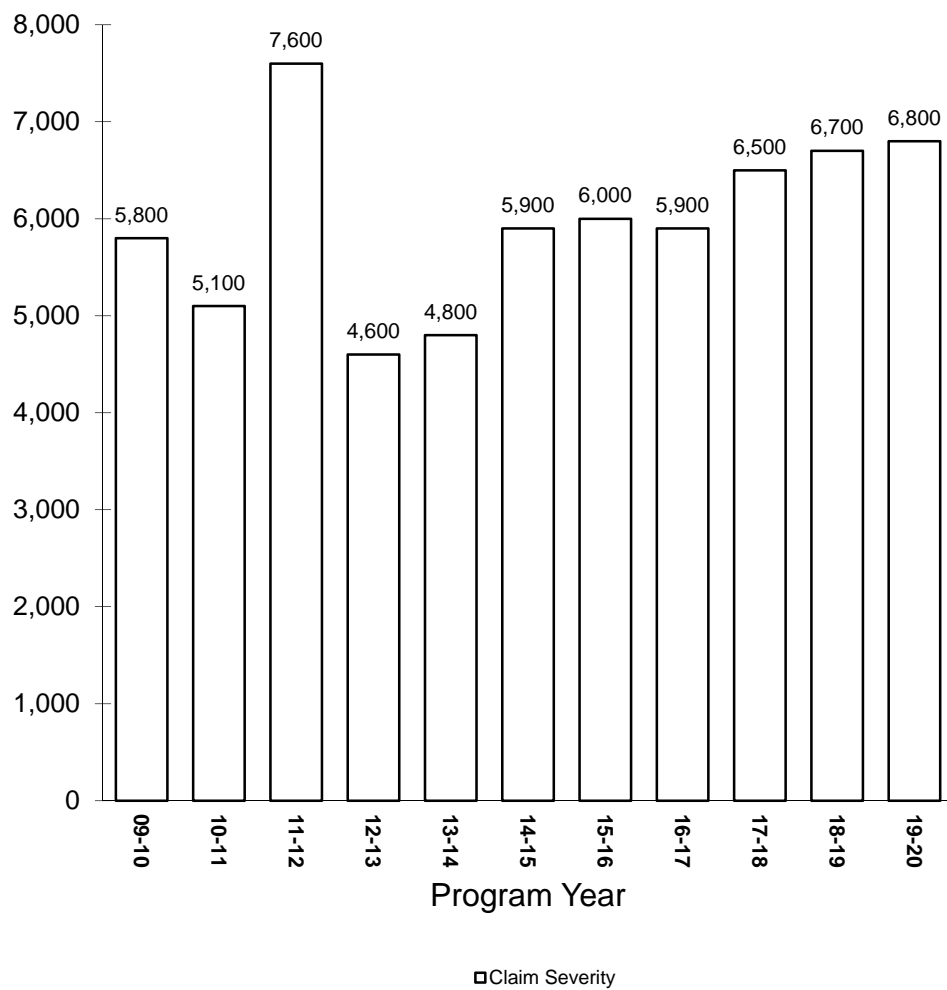
Municipal Pooling Authority
Liability
Dollars of Loss per
\$100 of Payroll



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 \$4,600 in 2012-13 to a high of \$6,700 in 2018-19. The projected 2019-20 average cost per claim of \$6,800 based on the increasing trend in the more recent years.

Graph 3

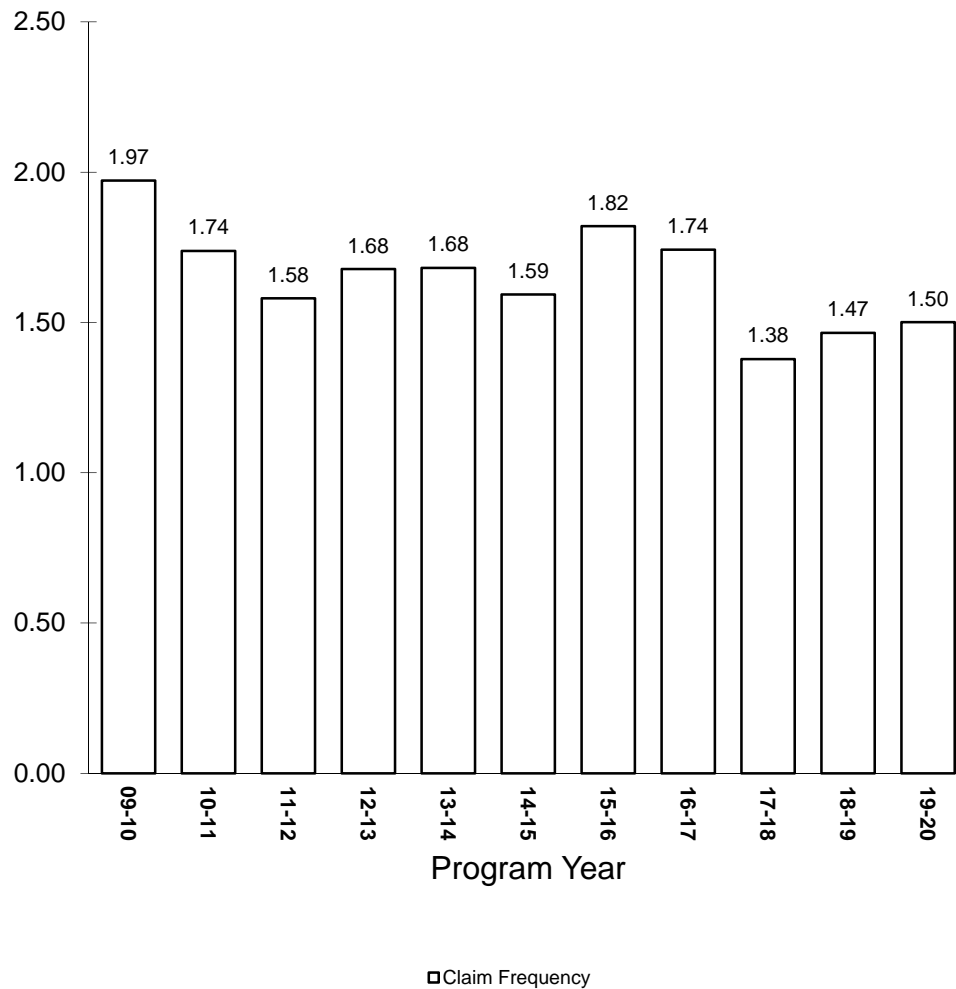
Municipal Pooling Authority
Liability
Dollars of Loss per Claim



The following chart shows that MPA's average number of claims per \$1M of payroll, or frequency. MPA's average frequency has been generally decreasing over the period shown below. Our projection for 2019-20 is 1.50 based on the average of the most recent four 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 June 7, 2019. In the table below we display actual versus expected development of incurred losses and ALAE by accident year between the September 30, 2018 evaluation date of the prior report and the October 31, 2019 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
1998-99	0	0	0
1999-00	0	0	0
2000-01	0	0	0
2001-02	0	0	0
2002-03	0	(211,467)	(211,467)
2003-04	0	0	0
2004-05	0	0	0
2005-06	0	0	0
2006-07	0	0	0
2007-08	0	5	5
2008-09	1,000	0	(1,000)
2009-10	1,000	0	(1,000)
2010-11	9,000	(13,996)	(22,996)
2011-12	18,000	105,556	87,556
2012-13	32,000	1	(31,999)
2013-14	114,000	(17,671)	(131,671)
2014-15	123,000	127,897	4,897
2015-16	346,000	529,734	183,734
2016-17	586,000	710,375	124,375
2017-18	2,476,000	3,079,337	603,337
2018-19	3,090,000	3,881,875	791,875
Total	\$6,796,000	\$8,191,646	\$1,395,646

As shown, actual incurred development was more than anticipated since the prior report. Based on the assumptions from the prior report, it was expected that incurred losses would increase by \$6,796,000 between the two evaluation dates. However, actual development was approximately \$8,192,000; or about \$1,396,000 more than expected. Although accident years 2013-14 and prior are emerging lower than expected, the most recent four years 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, 2018 evaluation date of the prior report and the October 31, 2019 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
1998-99	0	0	0
1999-00	0	0	0
2000-01	0	0	0
2001-02	0	0	0
2002-03	114,000	3,506	(110,494)
2003-04	0	0	0
2004-05	0	0	0
2005-06	1,000	0	(1,000)
2006-07	0	0	0
2007-08	69,000	13,124	(55,876)
2008-09	0	0	0
2009-10	4,000	0	(4,000)
2010-11	17,000	142,334	125,334
2011-12	25,000	107,240	82,240
2012-13	17,000	0	(17,000)
2013-14	69,000	622	(68,378)
2014-15	627,000	524,229	(102,771)
2015-16	1,220,000	577,750	(642,250)
2016-17	2,209,000	1,742,900	(466,100)
2017-18	1,428,000	775,702	(652,298)
2018-19	801,000	528,381	(272,619)
Total	\$6,601,000	\$4,415,788	(\$2,185,212)

As shown, actual paid development was less than anticipated since the prior report. Based on the assumptions from the prior report, it was expected that paid losses would increase by \$6,601,000 between the two evaluation dates. However, actual development was approximately \$4,416,000 or about \$2,185,000 less than expected.

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
1998-99	\$2,510,333	\$2,510,333	\$0
1999-00	1,935,613	1,935,613	0
2000-01	3,056,849	3,056,849	0
2001-02	1,987,998	1,987,998	0
2002-03	3,814,921	3,603,454	(211,467)
2003-04	2,210,245	2,210,245	0
2004-05	3,113,942	3,113,942	0
2005-06	4,728,560	4,728,560	0
2006-07	5,875,102	5,875,102	0
2007-08	5,689,000	5,688,787	(213)
2008-09	2,663,000	2,668,000	5,000
2009-10	7,300,000	7,315,000	15,000
2010-11	4,466,000	4,457,000	(9,000)
2011-12	6,195,000	6,308,000	113,000
2012-13	3,624,000	3,614,000	(10,000)
2013-14	3,835,000	3,675,000	(160,000)
2014-15	6,157,000	6,174,000	17,000
2015-16	6,519,000	6,701,000	182,000
2016-17	7,658,000	7,790,000	132,000
2017-18	5,617,000	5,834,000	217,000
2018-19	6,770,000	7,379,000	609,000
Total	\$95,726,563	\$96,625,883	\$899,320

As shown, overall we have increased our estimated ultimate losses by \$899,000 since our prior report. This increase can be tied to more 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, 2019 to be \$14,151,000 at the discounted, expected level. Our current estimate as of June 30, 2020, is \$17,694,000, 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, 2019	Current Report at June 30, 2020	Change
(A) Case Reserves:	\$7,553,000	\$10,303,000	\$2,750,000
(B) IBNR Reserves:	6,718,000	7,487,000	769,000
(C) Claims Administration Reserves:	620,000	870,000	250,000
(D) Total Reserves:	\$14,891,000	\$18,660,000	\$3,769,000
(E) Offset for Investment Income:	(740,000)	(966,000)	(226,000)
(F) Total Outstanding Claim Liabilities:	\$14,151,000	\$17,694,000	\$3,543,000

As shown, our estimate of outstanding claims liabilities at the discounted, expected level has increased between June 30, 2019 and June 30, 2020 as reflected in our prior and current reports respectively.

The increase in claim reserves (case and IBNR) is driven primarily by increase in case reserves. Reserves for future claims administration expenses have increased, resulting in a \$3,769,000 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 \$3,543,000 in our estimate of outstanding claim liabilities for loss and LAE.

At the time of the prior report, available assets were estimated to be \$23,108,000 as of June 30, 2019, which corresponded to the then-estimated discounted liability for outstanding claims above the 90% confidence level. Available assets are currently estimated to be \$30,966,000 as of June 30, 2020, 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, 2019	Current Report at June 30, 2020	Change
(A) Outstanding Liability at the Discounted Expected Level:	\$14,151,000	\$17,694,000	\$3,543,000
(B) Estimated Assets At June 30:	23,108,000	30,966,000	7,858,000
(C) Surplus:	\$8,957,000	\$13,272,000	\$4,315,000

As you can see, our estimate of the program’s funding margin at the discounted, expected level has increased by \$4,315,000 between June 30, 2019 (as previously estimated) and June 30, 2020 (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 2019-20 year was \$12,467,000 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 2020-21 year is \$14,238,000 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 2019-20 SIR = \$1,000,000	Current Report 2020-21 SIR = \$1,000,000	Change
(A) Ultimate Loss and ALAE:	\$5,416,000	\$6,447,000	\$1,031,000
(B) Offset for Investment Income:	(310,000)	(364,000)	(54,000)
(C) Recommended Loss and ALAE Funding:	\$5,106,000	\$6,083,000	977,000
(D) 80% Risk Margin:	1,736,000	2,013,000	277,000
(E) CARMA:	3,718,000	4,231,000	513,000
(F) Non-Claim Related Expenses:	1,907,000	1,911,000	4,000
(G) Total Funding:	12,467,000	14,238,000	1,771,000
(H) Rate:	3.755	3.995	0.240

As you can see, our discounted funding recommendations at the 80% confidence level have increased between 2019-20 and 2020-21, as shown in our prior and current reports respectively.

Our estimates of ultimate loss and ALAE have increased by \$1,031,000. This is driven primarily by an increase in payroll and an increase in our projected rate. Investment income is expected to be higher, resulting in an overall increase of \$977,000 in our annual funding estimate for loss and ALAE. The CARMA premium and other non-claim related expenses (claims administration, personnel, etc.) for 2020-21 have increased, resulting in an overall increase of \$1,771,000 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 2019-20 and 2020-21 (See Pool - Appendix J).
- We estimated the June 30, 2020 asset balance by beginning with the June 30, 2019 asset balance, and adjusting for anticipated revenue and expense for 2019-20 (see Pool - Exhibit 5).
- We received loss data evaluated as of October 31, 2019 (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 2019-20 will be \$356,434,101 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 3.5% per year. We have assumed that claim severity increases at 3.0% per year, and that claim frequency increases at 0.5% per year.
- 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.

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.)

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
October 31, 2019

(A) Estimated Ultimate Losses Incurred through 10/31/19: (From Pool - Appendix F)	\$72,104,000
(B) Estimated Paid Losses through 10/31/19: (From Pool - Appendix F)	53,960,000
(C) Estimated Liability for Claims Outstanding at 10/31/19: (From Pool - Appendix F)	<u>\$18,144,000</u>
(D) Estimated Liability for Outstanding Claims Administration Fees at 10/31/19:	887,000
(E) Total Outstanding Liability for Claims at 10/31/19: ((C) + (D))	<u>\$19,031,000</u>
(F) Reserve Discount Factor (Based on a Discount Rate of 2.0%) (Pool - Appendix H, Page 1, (G))	0.948
(G) Discounted Outstanding Liability for Claims at 10/31/19: ((E) x (F))	<u>\$18,037,000</u>

		Marginally Acceptable	Recommended			Conservative
Confidence Level of Adequacy:		70%	75%	80%	85%	90%
(H) Confidence Level Factor: (From Pool - Appendix I)		1.112	1.159	1.214	1.284	1.379
(I) Margin for Adverse Experience: (((G)-(D)) x ((H) - 1))		2,020,000	2,868,000	3,860,000	5,123,000	6,836,000
(J) Total Required Available Funding at 10/31/19:						
Undiscounted ((C) x (H) + (D))		<u>\$21,162,000</u>	<u>\$22,057,000</u>	<u>\$23,104,000</u>	<u>\$24,436,000</u>	<u>\$26,244,000</u>
NPV ((G) + (I))		20,057,000	20,905,000	21,897,000	23,160,000	24,873,000
(K) Estimated Actual Funding at 10/31/19: From Exhibit 6		\$30,966,000	\$30,966,000	\$30,966,000	\$30,966,000	\$30,966,000
(L) Indicated Funding Redundancy/ (Deficiency):						
((K)-(J))	Undiscounted	<u>\$9,804,000</u>	<u>\$8,909,000</u>	<u>\$7,862,000</u>	<u>\$6,530,000</u>	<u>\$4,722,000</u>
	NPV	10,909,000	10,061,000	9,069,000	7,806,000	6,093,000

Municipal Pooling Authority - Liability - 100K & SIR Analyses

Funding Guidelines for Outstanding Liabilities at
June 30, 2020

(A) Estimated Ultimate Losses Incurred through 6/30/20: (From Pool - Appendix F)	\$76,013,000
(B) Estimated Paid Losses through 6/30/20: (From Pool - Appendix F)	58,223,000
(C) Estimated Liability for Claims Outstanding at 6/30/20: (From Pool - Appendix F)	<u>\$17,790,000</u>
(D) Estimated Liability for Outstanding Claims Administration Fees at 6/30/20:	870,000
(E) Total Outstanding Liability for Claims at 6/30/20: ((C) + (D))	<u>\$18,660,000</u>
(F) Reserve Discount Factor (Based on a Discount Rate of 2.0%) (Pool - Appendix H, Page 1, (H))	0.948
(G) Discounted Outstanding Liability for Claims at 6/30/20: ((E) x (F))	<u>\$17,694,000</u>

Confidence Level of Adequacy:	<u>Marginally Acceptable</u>	<u>75%</u>	<u>Recommended</u>	<u>85%</u>	<u>Conservative</u>
	70%		80%		90%
(H) Confidence Level Factor: (From Pool - Appendix I)	1.112	1.159	1.214	1.284	1.379
(I) Margin for Adverse Experience: (((G)-(D)) x ((H) - 1))	1,982,000	2,813,000	3,787,000	5,025,000	6,706,000
(J) Total Required Available Funding at 6/30/20:					
Undiscounted ((C) x (H) + (D))	<u>\$20,750,000</u>	<u>\$21,627,000</u>	<u>\$22,653,000</u>	<u>\$23,959,000</u>	<u>\$25,732,000</u>
NPV ((G) + (I))	19,676,000	20,507,000	21,481,000	22,719,000	24,400,000
(K) Estimated Actual Funding at 6/30/20: From Exhibit 6	\$30,966,000	\$30,966,000	\$30,966,000	\$30,966,000	\$30,966,000
(L) Indicated Funding Redundancy/ (Deficiency):					
Undiscounted	<u>\$10,216,000</u>	<u>\$9,339,000</u>	<u>\$8,313,000</u>	<u>\$7,007,000</u>	<u>\$5,234,000</u>
NPV	11,290,000	10,459,000	9,485,000	8,247,000	6,566,000

Municipal Pooling Authority - Liability - 100K & SIR Analyses
Funding Options for Program Year 2019-2020 (SIR = \$1,000,000)

	<u>Dollar Amount</u>				
(A) Estimated Ultimate Losses Incurred in Accident Year 2019-2020: (From Pool - Appendix F)	\$5,863,000				
(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 2019-2020: ((C) x (D))	<u>\$5,532,000</u>				
	<u>Marginally Acceptable</u>	<u>Recommended</u>			<u>Conservative</u>
	70%	75%	80%	85%	90%
(D) Confidence Level Factor: (From Pool - Appendix I)	1.162	1.240	1.331	1.445	1.597
(E) Margin for Adverse Experience: ((C) x [(D) - 1])	896,000	1,328,000	1,831,000	2,462,000	3,303,000
(F) Recommended Funding in 2019-2020 for Claims Costs and Other Expenses ((C) + (E))	<u>\$6,428,000</u>	<u>\$6,860,000</u>	<u>\$7,363,000</u>	<u>\$7,994,000</u>	<u>\$8,835,000</u>
(G) CARMA Expenses (Provided by the Authority)	3,718,000	3,718,000	3,718,000	3,718,000	3,718,000
(H) Administrative Expenses (Provided by the Authority)	1,909,000	1,909,000	1,909,000	1,909,000	1,909,000
(I) Total Recommended Funding in 2019-2020 ((F) + (G))	<u>\$12,055,000</u>	<u>\$12,487,000</u>	<u>\$12,990,000</u>	<u>\$13,621,000</u>	<u>\$14,462,000</u>

Municipal Pooling Authority - Liability - 100K & SIR Analyses
Funding Options for Program Year 2020-2021 (SIR = \$1,000,000)
One-Year Funding Plan

	<u>Dollar Amount</u>				
(A) Estimated Ultimate Losses Incurred in Accident Year 2020-2021: (From Pool - Appendix F)	\$6,447,000				
(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 2020-2021: ((C) x (D))	<u>\$6,083,000</u>				
	<u>Marginally Acceptable</u>	<u>Recommended</u>			<u>Conservative</u>
	70%	75%	80%	85%	90%
(D) Confidence Level Factor: (From Pool - Appendix I)	1.162	1.240	1.331	1.445	1.597
(E) Margin for Adverse Experience: ((C) x [(D) - 1])	985,000	1,460,000	2,013,000	2,707,000	3,632,000
(F) Recommended Funding in 2020-2021 for Claims Costs and Other Expenses ((C) + (E))	<u>\$7,068,000</u>	<u>\$7,543,000</u>	<u>\$8,096,000</u>	<u>\$8,790,000</u>	<u>\$9,715,000</u>
(G) CARMA Expenses (Provided by the Authority)	4,231,000	4,231,000	4,231,000	4,231,000	4,231,000
(H) Administrative Expenses (Provided by the Authority)	1,911,000	1,911,000	1,911,000	1,911,000	1,911,000
(I) Total Recommended Funding in 2020-2021 ((F) + (G))	<u>\$13,210,000</u>	<u>\$13,685,000</u>	<u>\$14,238,000</u>	<u>\$14,932,000</u>	<u>\$15,857,000</u>

Municipal Pooling Authority - Liability - 100K & SIR Analyses

IBNR as of 6/30/20 at Expected Claims Level

Accident Year	Estimated Ultimate (A)	Reported as of 10/31/19 (B)	Estimated IBNR as of 10/31/19 (C)	Estimated Percent of IBNR Reported Between 11/1/19 and 6/30/20 (D)	Estimated IBNR Reported (E)	Estimated IBNR as of 6/30/20 (F)
1998-1999	\$1,373,136	\$1,373,136	\$0	100.0%	\$0	\$0
1999-2000	1,034,249	1,034,249	(0)	100.0%	0	(0)
2000-2001	2,164,131	2,164,131	0	100.0%	0	0
2001-2002	1,053,868	1,053,868	0	100.0%	0	0
2002-2003	1,985,264	1,985,264	0	100.0%	0	0
2003-2004	1,294,611	1,294,611	(0)	100.0%	0	(0)
2004-2005	2,370,149	2,370,149	(0)	100.0%	0	(0)
2005-2006	3,590,940	3,590,940	(0)	100.0%	0	(0)
2006-2007	4,639,142	4,639,142	0	100.0%	0	0
2007-2008	4,547,107	4,547,107	0	0.0%	0	0
2008-2009	1,811,342	1,805,742	5,600	50.0%	3,000	2,600
2009-2010	5,831,000	5,814,541	16,459	0.0%	0	16,459
2010-2011	3,569,000	3,555,003	13,997	33.3%	5,000	8,997
2011-2012	4,912,000	4,874,606	37,394	33.2%	12,000	25,394
2012-2013	2,468,000	2,431,991	36,009	29.8%	11,000	25,009
2013-2014	2,627,000	2,562,132	64,868	27.4%	18,000	46,868
2014-2015	4,511,000	4,400,221	110,779	28.4%	31,000	79,779
2015-2016	4,757,000	4,587,405	169,595	26.7%	45,000	124,595
2016-2017	5,990,000	5,409,586	580,414	33.9%	197,000	383,414
2017-2018	4,223,000	2,957,446	1,265,554	35.0%	443,000	822,554
2018-2019	5,398,000	2,434,801	2,963,199	38.8%	1,150,000	1,813,199
2019-2020	5,863,000	26,500	1,928,000	29.1%	1,698,000	4,138,500
Totals	\$76,012,939	\$64,912,571	\$7,191,868		\$3,613,000	\$7,487,368

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 11/1/19 and 6/30/20. 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 6/30/20. 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

Estimated Ultimate Limited Losses Within Member Deductible

Accident Year	Paid Losses Within Member Deductible as of 10/31/19 (A)	Case Reserves Within Member Deductible as of 10/31/19 (B)	Incurred Losses Within Member Deductible as of 10/31/19 (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)
1998-1999	\$1,137,197	\$0	\$1,137,197	1.000	Various	0.589	1.000	\$1,137,197
1999-2000	901,364	0	901,364	1.000	Various	0.572	1.000	901,364
2000-2001	892,718	0	892,718	1.000	Various	0.593	1.000	892,718
2001-2002	934,130	0	934,130	1.000	Various	0.559	1.000	934,130
2002-2003	1,617,696	494	1,618,190	1.000	Various	0.701	1.000	1,618,190
2003-2004	915,634	0	915,634	1.000	Various	0.567	1.000	915,634
2004-2005	743,793	0	743,793	1.000	Various	0.565	1.000	743,793
2005-2006	1,137,620	0	1,137,620	1.000	Various	0.399	1.000	1,137,620
2006-2007	1,235,960	0	1,235,960	1.000	Various	0.541	1.000	1,235,960
2007-2008	1,141,668	12	1,141,680	1.000	Various	0.464	1.000	1,141,680
2008-2009	856,452	206	856,658	1.000	Various	0.521	1.000	856,658
2009-2010	1,473,004	11,377	1,484,381	1.000	Various	0.482	1.000	1,484,000
2010-2011	1,019,240	(131,437)	887,803	1.000	Various	0.389	1.000	888,000
2011-2012	1,395,557	0	1,395,557	1.001	Various	0.477	1.000	1,396,000
2012-2013	1,145,867	1	1,145,868	1.003	Various	0.624	1.000	1,146,000
2013-2014	1,046,228	1,313	1,047,541	1.005	Various	0.525	1.000	1,048,000
2014-2015	1,623,469	30,875	1,654,343	1.008	Various	0.680	1.005	1,663,000
2015-2016	1,685,891	246,104	1,931,995	1.011	Various	0.567	1.006	1,944,000
2016-2017	1,510,737	269,730	1,780,467	1.022	Various	0.496	1.011	1,800,000
2017-2018	821,816	755,966	1,577,782	1.039	Various	0.543	1.021	1,611,000
2018-2019	509,371	1,132,308	1,641,679	1.326	Various	0.635	1.207	1,981,000
Totals	\$23,745,410	\$2,316,949	\$26,062,360					\$26,475,944

Projected Losses within Member Deductible for the Year 2019-2020 (I) \$1,925,000
 Projected Losses within Member Deductible for the Year 2020-2021 (J) \$1,982,000

Notes:

- (A) Provided by the Authority. Amounts are gross of deductibles, net of recoveries.
- (B) Provided by the Authority. Amounts are gross of deductibles, net of recoveries.
- (C) Provided by the Authority. Amounts are gross of deductibles, net of recoveries.
- (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 2018-2019.

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)
1998-1999	\$1,930,023	\$1,930,023	\$0	\$0	\$1,929,978	\$1,930,023
1999-2000	1,497,656	1,497,656			1,497,496	1,497,656
2000-2001	1,504,580	1,504,580			1,504,734	1,504,580
2001-2002	1,647,105	1,647,105			1,647,124	1,647,105
2002-2003	2,042,623	2,042,128			2,042,496	2,042,623
2003-2004	1,542,158	1,542,158	1,542,158	1,542,158	1,542,191	1,542,158
2004-2005	1,313,942	1,316,570	1,313,942	1,316,572	1,313,850	1,313,942
2005-2006	2,772,583	2,780,901	2,772,583	2,780,901	2,772,484	2,772,583
2006-2007	2,280,213	2,289,280	2,280,213	2,289,281	2,280,060	2,280,213
2007-2008	2,415,240	2,423,949	2,415,240	2,423,962	2,415,294	2,415,240
2008-2009	1,611,115	1,620,574	1,611,115	1,620,585	1,610,988	1,611,115
2009-2010	2,945,599	2,957,695	2,945,599	2,957,776	2,945,536	2,945,599
2010-2011	2,147,978	2,159,483	2,147,978	2,159,577	2,147,980	2,147,978
2011-2012	2,907,769	2,935,879	2,907,771	2,935,991	2,908,173	2,908,000
2012-2013	1,841,104	1,866,270	1,841,119	1,866,363	1,841,160	1,841,000
2013-2014	1,983,379	2,031,364	1,983,422	2,029,681	1,983,060	1,983,000
2014-2015	2,423,146	2,502,628	2,423,566	2,500,008	5,354,508	2,423,000
2015-2016	3,206,039	2,999,654	3,201,876	2,982,670	7,160,940	3,204,000
2016-2017	3,226,271	3,407,004	3,223,433	3,324,818	7,501,545	3,225,000
2017-2018	2,886,472	2,164,574	2,896,697	2,637,352	6,290,544	2,892,000
2018-2019	3,767,363	2,818,106	3,659,237	3,303,837	7,432,620	3,393,000
Totals						\$47,519,815
			Projected Losses for the Year 2019-2020 (G)			\$3,617,000
			Projected Losses for the Year 2020-2021 (H)			\$3,857,000

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 2019-2020 and 2020-2021

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)
1998-1999	\$1,000,000				1.454
1999-2000	1,000,000	1,497,656	1,935,613	1.292	1.476
2000-2001	1,000,000	1,504,580	3,056,849	2.032	1.501
2001-2002	1,000,000	1,647,105	1,987,998	1.207	1.525
2002-2003	1,000,000	2,042,623	3,603,454	1.764	1.551
2003-2004	1,000,000	1,542,158	2,210,245	1.433	1.579
2004-2005	1,000,000	1,313,942	3,113,942	2.370	1.609
2005-2006	1,000,000	2,772,583	4,728,560	1.705	1.639
2006-2007	1,000,000	2,280,213	5,875,102	2.577	1.668
2007-2008	1,000,000	2,415,240	5,688,787	2.355	1.701
2008-2009	1,000,000	1,611,115	2,668,000	1.656	1.733
2009-2010	1,000,000	2,945,599	7,315,000	2.483	1.768
2010-2011	1,000,000	2,147,978	4,457,000	2.075	1.803
2011-2012	1,000,000	2,908,000	6,308,000	2.169	1.838
2012-2013	1,000,000	1,841,000	3,614,000	1.963	1.874
2013-2014	1,000,000	1,983,000	3,675,000	1.853	1.913
2014-2015	1,000,000	2,423,000	6,174,000	2.548	1.951
2015-2016	1,000,000	3,204,000	6,701,000	2.091	1.989
2016-2017	1,000,000	3,225,000	7,790,000	2.416	2.030
2017-2018	1,000,000	2,892,000	5,834,000	2.017	2.071
2018-2019	1,000,000	3,393,000	7,379,000	2.175	2.112
Total ex Latest 2 Years		39,304,792	80,902,550	2.058	
Total 13/14-18/19		17,120,000	37,553,000	2.194	
All Years		45,589,792	94,115,550	2.064	
		Prior Selected 2018-2019 \$100K-SIR ILF:		2.146	
		(F) Selected 2019-2020 \$100K-SIR ILF:		2.153	
		(G) Selected 2020-2021 \$100K-SIR ILF:		2.185	

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

2020-21 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)	2019-20 Payroll (M)	2020-21 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	\$0.876	\$1.283	\$2.159	1.331	\$2.874	0.961	\$2.761	1.019	\$2.814	\$0.536	\$1.187	\$4.537	\$74,424,344	\$3,377,000
10,000	0.767	1.283	2.050	1.331	2.729	0.958	2.613	1.019	2.663	0.536	1.187	4.386	63,096,413	2,767,000
25,000	0.545	1.283	1.828	1.331	2.433	0.953	2.319	1.019	2.363	0.536	1.187	4.086	74,436,719	3,041,000
50,000	0.306	1.283	1.589	1.331	2.115	0.933	1.974	1.019	2.012	0.536	1.187	3.735	63,485,212	2,371,000
100,000	0.000	1.283	1.283	1.331	1.708	0.913	1.559	1.019	1.589	0.536	1.187	3.312	80,991,413	2,682,000
												Total:	\$356,434,101	\$14,238,000

(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 2020-21 Administrative Expenses Premium of \$0.536 per \$100 of payroll.

(K) Includes projected Fiscal Year 2020-21 Excess Insurance Premium of \$1.187 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, 2020

Liability Insurance

1. Estimated Assets Available to Pay Claims as of June 30, 2019	\$27,207,000
2. Premiums Collected in Fiscal Year 2019-2020 (gross of member rebates and retrospective premiums)	\$14,119,000
3. Estimated Investment Income Earned in Fiscal Year 2019-2020 at 2.0% Interest	\$1,130,000
4. Other Income (Reserves)	18,000
5. Operating and Administrative Expenses Estimated for between 7/1/19 and 6/30/20 (including the excess insurance premium and claims)	7,235,000
6. Estimated Pooled Losses Paid in Fiscal Year 2019-2020	\$4,273,000
7. Estimated Assets Available to Pay Claims as of June 30, 2020 (1)+(2)+(3)+(4)-(5)-(6)	\$30,966,000
8a. Estimated Claim Liability Reserve for Pooled Losses as of June 30, 2020	17,790,000
8b. Estimated Liability for Outstanding Claims Administration Fee as of June 30, 2020	870,000
9. Excess (Deficiency) of the Net Assets of the Liability Insurance Pool in Comparison With the Estimated Claim Liability Reserve as of June 30, 2020. (7)-(8a)-(8b)	12,306,000
10a. Estimated Present Value of the Claim Liability Reserve for Pooled Losses as of June 30, 2020	\$16,869,000
10b. Estimated Present Value of Outstanding Liability for Claims Administration Fee as of June 30, 2020	\$825,000
11. Excess (Deficiency) of Assets Available to Pay Claims in Comparison With the Estimated Present Value of the Claim Liability Reserve as of June 30, 2020 (7)-(10a)-(10b)	\$13,272,000

Municipal Pooling Authority - Liability

Estimated Assets Available to Pay Claims
as of June 30, 2019

Liability Insurance

Assets:

1. Cash and Cash Equivalents as of June 30, 2019	\$605,000
2. Investments as of June 30, 2019	-
3. Receivables as of June 30, 2019	
Member Agencies	350,000
Excess Insurance	-
Interest	168,000
Other	565,000
Interprogram Receivables	-
Total	
4. Prepaid Expenses as of June 30, 2019	<u>37,000</u>
5. Total Current Assets as of June 30, 2019	\$1,725,000
6. Member Agencies Receivable as of June 30, 2019	-
7. Interprogram Receivables as of June 30, 2019	449,000
8. Investments as of June 30, 2019	25,123,000
9. Capital Assets (Net) as of June 30, 2019	<u>23,000</u>
10. Total Noncurrent Assets as of June 30, 2019	\$25,595,000
11. Total Assets as of June 30, 2019 (5)+(10)	<u>=\$27,320,000</u>
Non- Claims Liabilities:	
12. Accounts Payable as of June 30, 2019	-
13. Accrued Vacation & Payroll Payable as of June 30, 2019	25,000
14. Other Payable as of June 30, 2019	65,000
15. Member Dividends Payable as of June 30, 2019	-
16. Capital Assets (Net) as of June 30, 2019	23,000
17. Total Liabilities as of June 30, 2019	<u>=\$113,000</u>
18. Estimated Assets Available to Pay Claims as of June 30, 2019 (11)-(17)	\$27,207,000

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
2008-2009	527,243	753,176	1,130,398	1,571,676	2,070,204	2,323,819	2,551,177	2,801,177	3,301,177	3,685,425	3,685,425
2009-2010	653,878	1,063,833	1,838,138	2,627,052	3,611,492	4,341,990	5,492,378	7,479,110	9,676,285	9,810,310	9,810,310
2010-2011	497,775	764,995	1,276,735	1,879,925	2,648,512	3,139,898	3,818,457	4,724,095	5,478,914	5,783,687	5,783,687
2011-2012	511,911	763,106	1,335,621	2,092,538	3,226,885	4,020,044	5,058,770	6,044,974	7,417,858	7,950,348	7,950,348
2012-2013	465,112	705,224	1,147,434	1,579,555	2,119,731	2,419,731	2,997,447	3,599,747	4,170,698	4,400,571	4,400,571
2013-2014	490,062	737,129	1,201,699	1,691,568	2,231,403	2,579,915	3,024,879	3,528,409	4,116,416	4,310,469	4,310,469
2014-2015	503,611	774,456	1,311,682	1,876,812	2,632,786	3,223,580	4,065,599	5,312,089	6,812,089	7,327,027	7,327,027
2015-2016	646,337	991,791	1,677,391	2,529,079	3,671,201	4,470,559	5,661,843	7,200,378	8,135,331	8,135,331	8,135,331
2016-2017	640,809	1,009,246	1,789,672	2,682,349	3,897,005	4,667,001	5,928,978	7,208,708	8,342,664	9,141,406	9,141,406
2017-2018	572,746	859,982	1,465,062	2,240,863	3,284,284	4,144,592	5,294,516	6,667,372	6,814,158	6,814,158	6,814,158
2018-2019	768,099	1,248,712	2,236,945	3,300,772	4,540,537	5,128,857	5,900,452	6,819,645	7,819,645	9,710,053	9,792,229
Total	6,277,582	9,671,650	16,410,778	24,072,189	33,934,040	40,459,986	49,794,495	61,385,705	72,085,235	77,068,784	77,150,960
2008-2009	0.255	0.364	0.546	0.759	1.000	1.123	1.232	1.353	1.595	1.780	1.780
2009-2010	0.181	0.295	0.509	0.727	1.000	1.202	1.521	2.071	2.679	2.716	2.716
2010-2011	0.188	0.289	0.482	0.710	1.000	1.186	1.442	1.784	2.069	2.184	2.184
2011-2012	0.159	0.236	0.414	0.648	1.000	1.246	1.568	1.873	2.299	2.464	2.464
2012-2013	0.219	0.333	0.541	0.745	1.000	1.142	1.414	1.698	1.968	2.076	2.076
2013-2014	0.220	0.330	0.539	0.758	1.000	1.156	1.356	1.581	1.845	1.932	1.932
2014-2015	0.191	0.294	0.498	0.713	1.000	1.224	1.544	2.018	2.587	2.783	2.783
2015-2016	0.176	0.270	0.457	0.689	1.000	1.218	1.542	1.961	2.216	2.216	2.216
2016-2017	0.164	0.259	0.459	0.688	1.000	1.198	1.521	1.850	2.141	2.346	2.346
2017-2018	0.174	0.262	0.446	0.682	1.000	1.262	1.612	2.030	2.075	2.075	2.075
2018-2019	0.169	0.275	0.493	0.727	1.000	1.130	1.300	1.502	1.722	2.139	2.157
Total	0.185	0.285	0.484	0.709	1.000	1.192	1.467	1.809	2.124	2.271	2.274
7-Year Avg	0.183	0.283	0.484	0.711	1.000	1.190	1.469	1.803	2.065	2.227	2.231
5-Year Avg	0.174	0.271	0.470	0.701	1.000	1.200	1.490	1.842	2.104	2.282	2.286
3-Year Avg	0.169	0.266	0.469	0.702	1.000	1.189	1.461	1.766	1.960	2.190	2.197
Prior	0.188	0.289	0.495	0.717	1.000	1.195	1.460	1.773	2.146	2.239	2.246
Selection	0.190	0.291	0.496	0.717	1.000	1.196	1.467	1.782	2.153	2.252	2.258

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 10/31/2019 (5)	Estimated Pooled Losses Unpaid as of 10/31/2019 (3)+(4)-(5) (6)
1998-1999	\$2,510,333	\$1,137,197	\$1,373,136	\$0	\$1,373,136	\$0
1999-2000	1,935,613	901,364	1,034,249	0	1,034,249	0
2000-2001	3,056,849	892,718	2,164,131	0	2,164,131	0
2001-2002	1,987,998	934,130	1,053,868	0	1,053,868	0
2002-2003	3,603,454	1,618,190	1,985,264	0	1,972,341	13,000
2003-2004	2,210,245	915,634	1,294,611	0	1,294,611	0
2004-2005	3,113,942	743,793	2,370,149	0	2,370,149	0
2005-2006	4,728,560	1,137,620	3,590,940	0	3,586,420	5,000
2006-2007	5,875,102	1,235,960	4,639,142	0	4,638,938	0
2007-2008	5,688,787	1,141,680	4,547,107	0	4,228,499	319,000
2008-2009	2,668,000	856,658	1,811,342	0	1,805,643	6,000
2009-2010	7,315,000	1,484,000	5,831,000	0	5,814,477	17,000
2010-2011	4,457,000	888,000	3,569,000	0	3,536,950	32,000
2011-2012	6,308,000	1,396,000	4,912,000	0	4,830,464	82,000
2012-2013	3,614,000	1,146,000	2,468,000	0	2,430,682	37,000
2013-2014	3,675,000	1,048,000	2,627,000	0	2,562,132	65,000
2014-2015	6,174,000	1,663,000	4,511,000	0	3,504,984	1,006,000
2015-2016	6,701,000	1,944,000	4,757,000	0	2,625,608	2,131,000
2016-2017	7,790,000	1,800,000	5,990,000	0	2,776,529	3,213,000
2017-2018	5,834,000	1,611,000	4,223,000	0	299,725	3,923,000
2018-2019	7,379,000	1,981,000	5,398,000	0	56,741	5,341,000
2019-2020	7,788,000	1,925,000	5,863,000	0	0	5,863,000
Totals	\$104,413,883	\$28,400,944	\$76,012,939	\$0	\$53,960,277	\$22,053,000

(6) Estimated Pooled Losses Paid From 11/01/19 through 06/30/20

4,263,000

(7) Estimated Claim Liability Reserve as of 06/30/20

\$17,790,000

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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 06/30/20 (000)	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	2038-39	2039-40
Prior	\$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	9	9	0	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	2	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2006-2007	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2007-2008	266	53	53	71	36	18	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2008-2009	5	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
2009-2010	14	3	3	2	2	2	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
2010-2011	27	6	4	4	3	3	3	2	1	2	0	0	0	0	0	0	0	0	0	0	0
2011-2012	67	17	11	8	8	5	5	6	3	2	3	0	0	0	0	0	0	0	0	0	0
2012-2013	30	8	5	3	2	2	2	2	2	1	1	1	0	0	0	0	0	0	0	0	0
2013-2014	52	16	10	7	4	3	3	2	2	3	1	1	1	0	0	0	0	0	0	0	0
2014-2015	840	231	181	121	76	49	36	36	22	22	29	15	7	15	0	0	0	0	0	0	0
2015-2016	1,622	482	314	246	164	103	67	48	49	30	30	40	20	10	20	0	0	0	0	0	0
2016-2017	2,304	896	418	272	213	143	90	58	42	42	26	26	35	17	9	18	0	0	0	0	0
2017-2018	2,852	1,192	646	301	196	154	103	65	42	30	30	19	19	25	13	6	13	0	0	0	0
2018-2019	4,321	1,551	1,158	627	293	190	149	100	63	41	29	30	18	18	24	12	6	12	0	0	0
2019-2020	5,376	1,220	1,492	1,114	603	281	183	143	96	60	39	28	28	17	17	23	12	6	12	0	0
Total	\$17,790	\$5,686	\$4,296	\$2,777	\$1,602	\$954	\$677	\$463	\$322	\$232	\$189	\$158	\$128	\$103	\$83	\$59	\$30	\$18	\$12	\$0	\$0
Present Value Factors at 2.0% Interest		0.947	0.954	0.953	0.946	0.938	0.937	0.936	0.933	0.930	0.930	0.933	0.940	0.946	0.951	0.956	0.962	0.963	0.965	0.971	0.971
Present Value of Future Payments (1)x(2)		\$5,387	\$4,098	\$2,646	\$1,516	\$895	\$634	\$433	\$301	\$216	\$175	\$148	\$121	\$97	\$79	\$57	\$29	\$17	\$11	\$0	\$0
Total Present Value of the Estimated Reserve (sum of line (3))		\$16,861																			

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)
1998-1999	\$0	2.066	\$0	0	0.000
1999-2000	0	1.996	0	0	0.000
2000-2001	0	1.928	0	0	0.000
2001-2002	0	1.862	0	0	0.000
2002-2003	0	1.799	0	0	0.000
2003-2004	1,542,158	1.738	2,680,271	2,802,831	0.956
2004-2005	1,313,942	1.679	2,206,109	2,858,188	0.772
2005-2006	2,772,583	1.622	4,497,130	2,965,313	1.517
2006-2007	2,280,213	1.567	3,573,094	3,136,883	1.139
2007-2008	2,415,240	1.514	3,656,673	3,405,361	1.074
2008-2009	1,611,115	1.462	2,355,450	3,483,077	0.676
2009-2010	2,945,599	1.413	4,162,131	3,323,270	1.252
2010-2011	2,147,978	1.365	2,931,990	3,033,147	0.967
2011-2012	2,908,000	1.318	3,832,744	2,939,154	1.304
2012-2013	1,841,000	1.274	2,345,434	2,849,089	0.823
2013-2014	1,983,000	1.230	2,439,090	2,856,162	0.854
2014-2015	2,423,000	1.189	2,880,947	2,920,742	0.986
2015-2016	3,204,000	1.148	3,678,192	3,238,879	1.136
2016-2017	3,225,000	1.109	3,576,525	3,356,803	1.065
2017-2018	2,892,000	1.072	3,100,224	3,370,672	0.920
2018-2019	3,393,000	1.035	3,511,755	3,547,038	0.990
Totals	\$38,897,828		\$51,427,759	50,086,609	\$1.027
13/14-17/18	13,727,000		15,674,978	15,743,258	0.996
14/15-18/19	15,137,000		16,747,643	16,434,134	1.019
			(F) Selected Limited Rate:		\$1.015
			Prior Selected Limited Rate:		\$0.950
Program Year:		2019-2020	2020-2021		
(G) Factor to SIR:		2.153	2.185		
(H) Trend Factor:		1.000	1.035		
(I) Program Rate:		\$2.185	\$2.296		
(J) Composite Exposure:		3,564,341	3,671,271		
(K) Projected Program Losses:		7,788,000	8,429,000		

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) $(A) \times (B)$.
- (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) $(F) \times (G) \times (H)$.
- (J) From Pool - Appendix L, Page Page 2, Column (G).
- (K) $(I) \times (J)$.
- (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 10/31/19 (B)	Reported Loss Development Factor (C)	Ultimate Limited Losses (D)	Program Reported Losses of 10/31/19 (E)	Reported Loss Development Factor (F)	Ultimate Program Losses (G)
1998-1999	\$1,930,023	1.000	\$1,930,023	\$2,510,333	1.000	\$2,510,333
1999-2000	1,497,656	1.000	1,497,656	1,935,613	1.000	1,935,613
2000-2001	1,504,580	1.000	1,504,580	3,056,849	1.000	3,056,849
2001-2002	1,647,105	1.000	1,647,105	1,987,998	1.000	1,987,998
2002-2003	2,042,623	1.000	2,042,623	3,603,454	1.000	3,603,454
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	1.001	5,880,977
2007-2008	2,415,240	1.000	2,415,240	5,688,787	1.001	5,694,476
2008-2009	1,611,115	1.000	1,611,115	2,662,400	1.002	2,667,725
2009-2010	2,945,599	1.000	2,945,599	7,298,922	1.002	7,313,520
2010-2011	2,147,978	1.000	2,147,978	4,442,806	1.003	4,456,134
2011-2012	2,904,864	1.001	2,907,769	6,270,163	1.006	6,307,784
2012-2013	1,835,597	1.003	1,841,104	3,577,859	1.010	3,613,638
2013-2014	1,973,511	1.005	1,983,379	3,609,673	1.018	3,674,647
2014-2015	2,403,915	1.008	2,423,146	6,054,564	1.031	6,242,255
2015-2016	3,168,023	1.012	3,206,039	6,519,400	1.054	6,871,448
2016-2017	3,156,821	1.022	3,226,271	7,190,053	1.118	8,038,479
2017-2018	2,783,483	1.037	2,886,472	4,535,228	1.284	5,823,233
2018-2019	2,559,350	1.472	3,767,363	4,076,480	2.120	8,158,138
Totals	\$46,436,379		\$47,892,358	\$90,948,431		\$97,889,448

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.
- (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.
- (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	<u>Limited Losses Reported as of:</u>										
	4 Months	16 Months	28 Months	40 Months	52 Months	64 Months	76 Months	88 Months	100 Months	112 Months	124 Months
1998-1999											
1999-2000											
2000-2001											
2001-2002											
2002-2003											
2003-2004											
2004-2005											
2005-2006											2,772,583
2006-2007										2,280,214	2,280,214
2007-2008									2,360,240	2,405,240	2,415,240
2008-2009								1,656,225	1,611,115	1,611,115	1,611,115
2009-2010							2,940,755	2,945,600	2,945,599	2,945,599	2,945,599
2010-2011						2,148,359	2,173,209	2,147,602	2,147,978	2,147,978	
2011-2012					2,674,052	2,717,169	2,839,729	2,859,864	2,904,864		
2012-2013				2,001,105	1,886,515	1,876,987	1,835,596	1,835,597			
2013-2014			2,455,873	2,339,518	2,082,429	1,986,183	1,973,511				
2014-2015		1,995,030	2,337,429	2,552,766	2,451,708	2,403,915					
2015-2016	308,729	1,949,019	3,355,993	3,041,612	3,168,023						
2016-2017	150,161	2,749,251	3,001,707	3,156,821							
2017-2018	261,029	1,506,036	2,783,483								
2018-2019	320,000	2,559,350									
2019-2020	202,821										

Amounts Do Not Include Richmond or Concord.

Reported Loss Development Factors:

	4-16 Months	16-28 Months	28-40 Months	40-52 Months	52-64 Months	64-76 Months	76-88 Months	88-100 Months	100-112 Months	112-124 Months	124-136 Months
1998-1999											
1999-2000											
2000-2001											
2001-2002											
2002-2003											
2003-2004											
2004-2005											
2005-2006											1.000
2006-2007										1.000	1.000
2007-2008									1.019	1.004	1.000
2008-2009								0.973	1.000	1.000	1.000
2009-2010							1.002	1.000	1.000	1.000	
2010-2011						1.012	0.988	1.000	1.000		
2011-2012					1.016	1.045	1.007	1.016			
2012-2013				0.943	0.995	0.978	1.000				
2013-2014			0.953	0.890	0.954	0.994					
2014-2015		1.172	1.092	0.960	0.981						
2015-2016	6.313	1.722	1.092	1.042							
2016-2017	18.309	1.092	1.052								
2017-2018	5.770	1.848									
2018-2019	7.998										
Average Dollar-weighted Averages	4-16 Months	16-28 Months	28-40 Months	40-52 Months	52-64 Months	64-76 Months	76-88 Months	88-100 Months	100-112 Months	112-124 Months	124-136 Months
Average	9.598	1.459	1.001	0.959	0.987	1.007	0.999	0.997	1.005	1.001	1.000
3-yr	9.320	1.473	1.006	0.971	0.976	1.010	0.999	1.006	1.000	1.001	1.000
4-yr	8.427	1.400	0.995	0.965	0.988	1.011	1.000	1.000	1.005	1.001	1.000
Industry Factors	4-16 Months	16-28 Months	28-40 Months	40-52 Months	52-64 Months	64-76 Months	76-88 Months	88-100 Months	100-112 Months	112-124 Months	124-136 Months
Prior	4.304	1.380	1.028	0.980	0.984	0.996	1.001	1.001	1.000	1.000	1.000
Selected	6.667	1.329	1.019	1.018	1.005	1.001	1.001	1.002	1.001	1.000	1.000
Cumulated	9.320	1.420	1.015	1.010	1.004	1.003	1.002	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	136 Months	148 Months	160 Months	172 Months	184 Months	196 Months	208 Months	220 Months	232 Months	244 Months	256 Months
1998-1999							1,930,023	1,930,023	1,930,023	1,930,023	1,930,023
1999-2000						1,497,656	1,497,656	1,497,656	1,497,656	1,497,656	1,497,656
2000-2001					1,504,581	1,504,580	1,504,580	1,504,580	1,504,580	1,504,580	
2001-2002				1,647,105	1,647,105	1,647,105	1,647,105	1,647,105	1,647,105		
2002-2003			2,042,623	2,042,623	2,042,623	2,042,623	2,042,623				
2003-2004		1,542,158	1,542,158	1,542,158	1,542,158	1,542,158					
2004-2005	1,313,942	1,313,942	1,313,942	1,313,942	1,313,942						
2005-2006	2,772,583	2,772,583	2,772,583	2,772,583							
2006-2007	2,280,214	2,280,213	2,280,213								
2007-2008	2,415,240	2,415,240									
2008-2009	1,611,115										
2009-2010											
2010-2011											
2011-2012											
2012-2013											
2013-2014											
2014-2015											
2015-2016											
2016-2017											
2017-2018	Amounts Do Not Include Richmond or Concord.										
2018-2019											
2019-2020											

	136-148 Months	148-160 Months	160-172 Months	172-184 Months	184-196 Months	196-208 Months	208-220 Months	220-232 Months	232-244 Months	244-256 Months	256-Ult. Months
1998-1999							1.000	1.000	1.000	1.000	
1999-2000						1.000	1.000	1.000	1.000		
2000-2001					1.000	1.000	1.000	1.000			
2001-2002				1.000	1.000	1.000	1.000				
2002-2003			1.000	1.000	1.000	1.000					
2003-2004		1.000	1.000	1.000	1.000						
2004-2005	1.000	1.000	1.000	1.000							
2005-2006	1.000	1.000	1.000								
2006-2007	1.000	1.000									
2007-2008	1.000										
2008-2009											
2009-2010											
2010-2011											
2011-2012											
2012-2013											
2013-2014											
2014-2015											
2015-2016											
2016-2017											
2017-2018											
2018-2019											

	136-148 Months	148-160 Months	160-172 Months	172-184 Months	184-196 Months	196-208 Months	208-220 Months	220-232 Months	232-244 Months	244-256 Months	256-Ult. Months
Average	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Dollar-weighted											
Averages											
3-yr	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000			
4-yr	1.000	1.000	1.000	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	1.000
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>										
	4 Months	16 Months	28 Months	40 Months	52 Months	64 Months	76 Months	88 Months	100 Months	112 Months	124 Months
1998-1999											
1999-2000											
2000-2001											
2001-2002											
2002-2003											
2003-2004											
2004-2005											
2005-2006											2,190,180
2006-2007										3,594,889	3,594,889
2007-2008									3,250,985	3,250,985	3,318,985
2008-2009								1,051,285	1,051,285	1,051,285	1,051,285
2009-2010							3,522,310	4,410,202	4,353,324	4,353,324	4,353,324
2010-2011						2,796,885	2,373,824	2,373,824	2,308,824	2,294,827	
2011-2012					3,425,671	3,603,115	3,605,679	3,298,297	3,365,298		
2012-2013				938,951	2,161,681	1,826,896	1,742,262	1,742,262			
2013-2014			1,421,633	1,535,352	1,784,928	1,641,161	1,636,161				
2014-2015		1,107,501	1,992,383	2,836,910	3,474,960	3,650,649					
2015-2016	404,341	1,208,208	2,963,252	2,949,966	3,351,378						
2016-2017		1,827,731	3,771,363	4,033,232							
2017-2018		127,900	1,751,745								
2018-2019		1,517,130									
2019-2020											

Amounts Do Not Include Richmond or Concord.

Reported Loss Development Factors:

	4-16 Months	16-28 Months	28-40 Months	40-52 Months	52-64 Months	64-76 Months	76-88 Months	88-100 Months	100-112 Months	112-124 Months	124-136 Months
1998-1999											
1999-2000											
2000-2001											
2001-2002											
2002-2003											
2003-2004											
2004-2005											
2005-2006											1.000
2006-2007										1.000	1.000
2007-2008									1.000	1.021	0.986
2008-2009								1.000	1.000	1.000	1.000
2009-2010							1.252	0.987	1.000	1.000	
2010-2011						0.849	1.000	0.973	0.994		
2011-2012					1.052	1.001	0.915	1.020			
2012-2013				2.302	0.845	0.954	1.000				
2013-2014			1.080	1.163	0.919	0.997					
2014-2015		1.799	1.424	1.225	1.051						
2015-2016	2.988	2.453	0.996	1.136							
2016-2017		2.063	1.069								
2017-2018		13.696									
2018-2019											
Average Dollar-weighted Averages	2.988	5.003	1.142	1.457	0.967	0.950	1.042	0.995	0.999	1.005	0.997
3-yr		2.682	1.125	1.176	0.959	0.988	0.960	0.995	0.998	1.008	0.994
4-yr		2.453	1.119	1.304	0.988	0.948	1.052	0.995	0.999	1.006	0.996
Industry Factors	5.491	2.127	1.341	1.151	1.059	1.032	1.020	1.007	1.005	1.002	1.001
Prior	6.133	1.582	1.143	1.085	1.026	1.014	1.007	1.005	1.000	1.000	1.000
Selected	5.491	2.127	1.341	1.118	1.043	1.023	1.013	1.006	1.005	1.002	1.001
Cumulated	19.284	3.512	1.651	1.231	1.101	1.056	1.032	1.018	1.012	1.007	1.005

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

Losses Reported as of:

Accident Year	136 Months	148 Months	160 Months	172 Months	184 Months	196 Months	208 Months	220 Months	232 Months	244 Months	256 Months
1998-1999							580,310	580,310	580,310	580,310	580,310
1999-2000						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		
2001-2002				355,342	355,342	340,892	340,892	340,892			
2002-2003			1,363,770	1,465,461	1,657,961	1,772,299	1,560,831				
2003-2004		668,087	668,087	668,087	668,087	668,087					
2004-2005	1,800,000	1,800,000	1,800,000	1,800,000	1,800,000						
2005-2006	2,190,180	1,955,977	1,955,977	1,955,977							
2006-2007	3,594,889	3,594,889	3,594,889								
2007-2008	3,273,542	3,273,547									
2008-2009	1,051,285										
2009-2010											
2010-2011											
2011-2012											
2012-2013											
2013-2014											
2014-2015											
2015-2016											
2016-2017											
2017-2018	Amounts Do Not Include Richmond or Concord.										
2018-2019											
2019-2020											

	136-148 Months	148-160 Months	160-172 Months	172-184 Months	184-196 Months	196-208 Months	208-220 Months	220-232 Months	232-244 Months	244-256 Months	256-Ult. Months
1998-1999							1.000	1.000	1.000	1.000	
1999-2000						1.000	1.000	1.000	1.000		
2000-2001					1.000	1.000	1.000	1.000			
2001-2002				1.000	0.959	1.000	1.000				
2002-2003			1.075	1.131	1.069	0.881					
2003-2004		1.000	1.000	1.000	1.000						
2004-2005	1.000	1.000	1.000	1.000							
2005-2006	0.893	1.000	1.000								
2006-2007	1.000	1.000									
2007-2008	1.000										
2008-2009											
2009-2010											
2010-2011											
2011-2012											
2012-2013											
2013-2014											
2014-2015											
2015-2016											
2016-2017											
2017-2018											
2018-2019											

	136-148 Months	148-160 Months	160-172 Months	172-184 Months	184-196 Months	196-208 Months	208-220 Months	220-232 Months	232-244 Months	244-256 Months	256-Ult. Months
Average Dollar-weighted Averages	0.973	1.000	1.019	1.033	1.007	0.970	1.000	1.000	1.000	1.000	
3-yr	0.974	1.000	1.000	1.049	1.037	0.942	1.000	1.000			
4-yr	0.978	1.000	1.018	1.045	1.024	0.948	1.000				
Industry Factors	1.001	1.001	1.001	1.001	1.000	1.000	1.001	1.000	1.000	1.001	1.000
Prior	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
Selected	1.001	1.001	1.001	1.001	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Cumulated	1.004	1.003	1.002	1.001	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 10/31/19 (B)	Paid Loss Development Factor (C)	Ultimate Limited Losses (D)	Program Paid Losses of 10/31/19 (E)	Paid Loss Development Factor (F)	Ultimate Program Losses (G)
1998-1999	\$1,930,023	1.000	\$1,930,023	\$2,510,333	1.000	\$2,510,333
1999-2000	1,497,656	1.000	1,497,656	1,935,613	1.001	1,937,549
2000-2001	1,504,580	1.000	1,504,580	3,056,849	1.001	3,059,906
2001-2002	1,647,105	1.000	1,647,105	1,987,998	1.002	1,991,974
2002-2003	2,042,128	1.000	2,042,128	3,590,037	1.003	3,600,807
2003-2004	1,542,158	1.000	1,542,158	2,210,245	1.004	2,219,086
2004-2005	1,313,942	1.002	1,316,570	3,113,942	1.008	3,138,854
2005-2006	2,772,583	1.003	2,780,901	4,724,040	1.011	4,776,004
2006-2007	2,280,159	1.004	2,289,280	5,874,898	1.014	5,957,147
2007-2008	2,411,890	1.005	2,423,949	5,370,167	1.018	5,466,830
2008-2009	1,610,909	1.006	1,620,574	2,662,095	1.023	2,723,323
2009-2010	2,934,221	1.008	2,957,695	7,287,481	1.029	7,498,818
2010-2011	2,138,102	1.010	2,159,483	4,556,190	1.038	4,729,325
2011-2012	2,898,202	1.013	2,935,879	6,226,021	1.053	6,556,000
2012-2013	1,835,074	1.017	1,866,270	3,576,549	1.078	3,855,520
2013-2014	1,972,198	1.030	2,031,364	3,608,360	1.113	4,016,105
2014-2015	2,401,754	1.042	2,502,628	5,128,453	1.156	5,928,492
2015-2016	2,734,416	1.097	2,999,654	4,311,499	1.267	5,462,669
2016-2017	2,661,722	1.280	3,407,004	4,287,266	1.578	6,765,306
2017-2018	1,121,541	1.930	2,164,574	1,121,541	2.638	2,958,625
2018-2019	566,112	4.978	2,818,106	566,112	7.681	4,348,306
Totals	\$41,816,475		\$46,437,581	\$77,705,689		\$89,500,979

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.
- (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.
- (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

Accident Year	<u>Limited Losses Paid as of:</u>										
	4 Months	16 Months	28 Months	40 Months	52 Months	64 Months	76 Months	88 Months	100 Months	112 Months	124 Months
1998-1999											
1999-2000											
2000-2001											
2001-2002											
2002-2003											
2003-2004											
2004-2005											
2005-2006											2,772,583
2006-2007										2,280,159	2,280,159
2007-2008									2,313,825	2,338,929	2,396,947
2008-2009								1,610,258	1,610,909	1,610,909	1,610,909
2009-2010							2,883,000	2,932,241	2,932,998	2,934,221	2,934,221
2010-2011						2,091,919	2,136,878	2,138,102	2,138,102	2,138,102	
2011-2012					2,616,633	2,647,687	2,717,284	2,828,292	2,898,202		
2012-2013				1,348,315	1,698,074	1,833,247	1,835,074	1,835,074			
2013-2014			1,356,867	1,790,096	1,909,501	1,971,577	1,972,198				
2014-2015		455,286	1,061,224	1,851,830	2,252,542	2,401,754					
2015-2016	36,617	506,061	1,929,630	2,531,665	2,734,416						
2016-2017	11,981	760,929	1,733,717	2,661,722							
2017-2018	11,030	394,537	1,121,541								
2018-2019	61,655	566,112									
2019-2020	43,881										

Amounts Do Not Include Richmond or Concord.

Paid Loss Development Factors:

	4-16 Months	16-28 Months	28-40 Months	40-52 Months	52-64 Months	64-76 Months	76-88 Months	88-100 Months	100-112 Months	112-124 Months	124-136 Months
1998-1999											
1999-2000											
2000-2001											
2001-2002											
2002-2003											
2003-2004											
2004-2005											
2005-2006											1.000
2006-2007										1.000	1.000
2007-2008									1.011	1.025	1.001
2008-2009								1.000	1.000	1.000	1.000
2009-2010							1.017	1.000	1.000	1.000	
2010-2011						1.021	1.001	1.000	1.000		
2011-2012					1.012	1.026	1.041	1.025			
2012-2013				1.259	1.080	1.001	1.000				
2013-2014			1.319	1.067	1.033	1.000					
2014-2015		2.331	1.745	1.216	1.066						
2015-2016	13.820	3.813	1.312	1.080							
2016-2017	63.510	2.278	1.535								
2017-2018	35.770	2.843									
2018-2019	9.182										
Average Dollar-weighted Averages	30.571	2.816	1.478	1.156	1.048	1.012	1.015	1.006	1.003	1.006	1.000
3-yr	20.334	2.880	1.491	1.117	1.059	1.011	1.017	1.009	1.000	1.008	1.000
4-yr	18.367	2.762	1.453	1.143	1.045	1.014	1.017	1.008	1.003	1.006	1.000
Industry Factors	5.419	2.343	1.538	1.178	1.058	1.031	1.018	1.010	1.009	1.008	1.007
Prior	9.245	2.382	1.588	1.165	1.049	1.012	1.013	1.004	1.003	1.002	1.002
Selected	20.334	2.580	1.508	1.167	1.053	1.012	1.013	1.004	1.003	1.002	1.002
Cumulated	101.221	4.978	1.930	1.280	1.097	1.042	1.030	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	136 Months	148 Months	160 Months	172 Months	184 Months	196 Months	208 Months	220 Months	232 Months	244 Months	256 Months
1998-1999							1,930,023	1,930,023	1,930,023	1,930,023	1,930,023
1999-2000						1,497,656	1,497,656	1,497,656	1,497,656	1,497,656	1,497,656
2000-2001					1,504,580	1,504,580	1,504,580	1,504,580	1,504,580	1,504,580	
2001-2002				1,647,105	1,647,105	1,647,105	1,647,105	1,647,105	1,647,105		
2002-2003			2,042,128	2,042,128	2,042,128	2,042,128	2,042,128				
2003-2004		1,542,158	1,542,158	1,542,158	1,542,158	1,542,158					
2004-2005	1,313,942	1,313,942	1,313,942	1,313,942	1,313,942						
2005-2006	2,772,583	2,772,583	2,772,583	2,772,583							
2006-2007	2,280,159	2,280,159	2,280,159								
2007-2008	2,398,767	2,411,890									
2008-2009	1,610,909										
2009-2010											
2010-2011											
2011-2012											
2012-2013											
2013-2014											
2014-2015											
2015-2016											
2016-2017											
2017-2018	Amounts Do Not Include Richmond or Concord.										
2018-2019											
2019-2020											

	136-148 Months	148-160 Months	160-172 Months	172-184 Months	184-196 Months	196-208 Months	208-220 Months	220-232 Months	232-244 Months	244-256 Months	256-Ult. Months
1998-1999							1.000	1.000	1.000	1.000	
1999-2000						1.000	1.000	1.000	1.000		
2000-2001					1.000	1.000	1.000	1.000			
2001-2002				1.000	1.000	1.000	1.000				
2002-2003			1.000	1.000	1.000	1.000					
2003-2004		1.000	1.000	1.000	1.000						
2004-2005	1.000	1.000	1.000	1.000							
2005-2006	1.000	1.000	1.000								
2006-2007	1.000	1.000									
2007-2008	1.005										
2008-2009											
2009-2010											
2010-2011											
2011-2012											
2012-2013											
2013-2014											
2014-2015											
2015-2016											
2016-2017											
2017-2018											
2018-2019											

	136-148 Months	148-160 Months	160-172 Months	172-184 Months	184-196 Months	196-208 Months	208-220 Months	220-232 Months	232-244 Months	244-256 Months	256-Ult. Months
Average Dollar-weighted Averages	1.001	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
3-yr	1.002	1.000	1.000	1.000	1.000	1.000	1.000	1.000			
4-yr	1.001	1.000	1.000	1.000	1.000	1.000	1.000				
Industry Factors	1.006	1.005	1.004	1.003	1.002	1.001	1.001	1.001	1.001	1.001	1.001
Prior	1.001	1.001	1.001	1.001	1.002	1.000	1.000	1.000	1.000	1.000	1.000
Selected	1.001	1.001	1.001	1.001	1.002	1.000	1.000	1.000	1.000	1.000	1.000
Cumulated	1.006	1.005	1.004	1.003	1.002	1.000	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	<u>Losses Paid as of:</u>										
	4 Months	16 Months	28 Months	40 Months	52 Months	64 Months	76 Months	88 Months	100 Months	112 Months	124 Months
1998-1999											
1999-2000											
2000-2001											
2001-2002											
2002-2003											
2003-2004											
2004-2005											
2005-2006											2,180,217
2006-2007										3,594,739	3,594,739
2007-2008									2,935,719	2,935,719	2,956,497
2008-2009								1,051,186	1,051,186	1,051,186	1,051,186
2009-2010							3,167,880	3,598,374	4,353,261	4,353,261	4,353,261
2010-2011						2,093,047	2,269,132	2,272,388	2,275,753	2,418,088	
2011-2012					2,534,742	2,910,036	2,970,076	3,294,335	3,327,818		
2012-2013				107,583	1,419,593	1,637,936	1,741,475	1,741,475			
2013-2014			282,156	1,161,519	1,259,146	1,636,161	1,636,161				
2014-2015			900,000	1,184,563	2,358,831	2,726,699					
2015-2016		89,331	345,367	1,268,104	1,577,083						
2016-2017		751,274	954,162	1,625,544							
2017-2018											
2018-2019											
2019-2020											

Amounts Do Not Include Richmond or Concord.

Paid Loss Development Factors:

	4-16 Months	16-28 Months	28-40 Months	40-52 Months	52-64 Months	64-76 Months	76-88 Months	88-100 Months	100-112 Months	112-124 Months	124-136 Months
1998-1999											
1999-2000											
2000-2001											
2001-2002											
2002-2003											
2003-2004											
2004-2005											
2005-2006											0.936
2006-2007										1.000	1.000
2007-2008									1.000	1.007	1.001
2008-2009								1.000	1.000	1.000	1.000
2009-2010							1.136	1.210	1.000	1.000	
2010-2011						1.084	1.001	1.001	1.063		
2011-2012					1.148	1.021	1.109	1.010			
2012-2013				13.195	1.154	1.063	1.000				
2013-2014			4.117	1.084	1.299	1.000					
2014-2015			1.316	1.991	1.156						
2015-2016		3.866	3.672	1.244							
2016-2017		1.270	1.704								
2017-2018											
2018-2019											
Average Dollar-weighted Averages											
3-yr			1.854	1.437	1.191	1.026	1.047	1.086	1.019	1.002	1.000
4-yr			2.111	1.777	1.177	1.041	1.075	1.077	1.013	1.002	0.986
Industry Factors											
Prior	31.277	4.804	2.219	1.462	1.192	1.090	1.071	1.048	1.027	1.018	1.010
Selected	8.771	2.684	1.716	1.253	1.110	1.048	1.038	1.023	1.016	1.010	1.005
Cumulated	20.024	3.744	1.967	1.358	1.151	1.069	1.055	1.048	1.027	1.018	1.010
	300.722	15.018	4.011	2.039	1.502	1.305	1.221	1.158	1.105	1.076	1.057

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>										
	136 Months	148 Months	160 Months	172 Months	184 Months	196 Months	208 Months	220 Months	232 Months	244 Months	256 Months
1998-1999							580,310	580,310	580,310	580,310	580,310
1999-2000						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		
2001-2002				355,342	355,342	340,892	340,892	340,892			
2002-2003			1,080,645	1,135,175	1,146,053	1,545,951	1,547,909				
2003-2004		668,087	668,087	668,087	668,087	668,087					
2004-2005	1,800,000	1,800,000	1,800,000	1,800,000	1,800,000						
2005-2006	2,040,217	1,951,457	1,951,457	1,951,457							
2006-2007	3,594,739	3,594,739	3,594,739								
2007-2008	2,958,277	2,958,277									
2008-2009	1,051,186										
2009-2010											
2010-2011											
2011-2012											
2012-2013											
2013-2014											
2014-2015											
2015-2016											
2016-2017											
2017-2018	Amounts Do Not Include Richmond or Concord.										
2018-2019											
2019-2020											

	136-148 Months	148-160 Months	160-172 Months	172-184 Months	184-196 Months	196-208 Months	208-220 Months	220-232 Months	232-244 Months	244-256 Months	256-Ult. Months
1998-1999							1.000	1.000	1.000	1.000	
1999-2000						1.000	1.000	1.000	1.000		
2000-2001					1.000	1.000	1.000	1.000			
2001-2002				1.000	0.959	1.000	1.000				
2002-2003			1.050	1.010	1.349	1.001					
2003-2004		1.000	1.000	1.000	1.000						
2004-2005	1.000	1.000	1.000	1.000							
2005-2006	0.956	1.000	1.000								
2006-2007	1.000	1.000									
2007-2008	1.000										
2008-2009											
2009-2010											
2010-2011											
2011-2012											
2012-2013											
2013-2014											
2014-2015											
2015-2016											
2016-2017											
2017-2018											
2018-2019											

	136-148 Months	148-160 Months	160-172 Months	172-184 Months	184-196 Months	196-208 Months	208-220 Months	220-232 Months	232-244 Months	244-256 Months	256-Ult. Months
Average Dollar-weighted Averages	0.989	1.000	1.013	1.003	1.077	1.000	1.000	1.000	1.000	1.000	
3-yr	0.990	1.000	1.000	1.003	1.178	1.001	1.000	1.000			
4-yr	0.991	1.000	1.010	1.003	1.104	1.001	1.000				
Industry Factors	1.009	1.008	1.007	1.006	1.005	1.004	1.003	1.002	1.001	1.001	1.003
Prior	1.004	1.004	1.002	1.003	1.002	1.002	1.001	1.001	1.000	1.001	
Selected	1.009	1.008	1.007	1.006	1.005	1.004	1.003	1.002	1.001	1.001	1.001
Cumulated	1.047	1.038	1.030	1.023	1.017	1.012	1.008	1.005	1.003	1.002	1.001

Municipal Pooling Authority - Liability - 100K & SIR Analyses

Exposure and Development Method
Based on Reported Losses

Accident Year	Composite Exposure (A)	Reported Losses as of 10/31/19 (B)	Loss Development Factor (C)	Percentage of Losses Yet to Be Reported (D)	Program Rate (E)	Incurred but not Reported (IBNR) (F)	Ultimate Program Losses (G)
1998-1999	0	\$0	1.000	0.000	0.704	\$0	\$0
1999-2000	0		1.000	0.000	0.740	0	
2000-2001	0		1.000	0.000	0.779	0	
2001-2002	0		1.000	0.000	0.819	0	
2002-2003	0		1.000	0.000	0.863	0	
2003-2004	2,802,831	2,210,245	1.000	0.000	0.869	0	2,210,245
2004-2005	2,858,188	3,113,942	1.000	0.000	0.740	0	3,113,942
2005-2006	2,965,313	4,728,560	1.000	0.000	1.532	0	4,728,560
2006-2007	3,136,883	5,875,102	1.001	0.001	1.213	3,805	5,878,907
2007-2008	3,405,361	5,688,787	1.001	0.001	1.206	4,107	5,692,894
2008-2009	3,483,077	2,662,400	1.002	0.002	0.802	5,587	2,667,987
2009-2010	3,323,270	7,298,922	1.002	0.002	1.566	10,408	7,309,330
2010-2011	3,033,147	4,442,806	1.003	0.003	1.276	11,611	4,454,417
2011-2012	2,939,154	6,270,163	1.006	0.006	1.817	32,043	6,302,206
2012-2013	2,849,089	3,577,859	1.010	0.010	1.211	34,502	3,612,361
2013-2014	2,856,162	3,609,673	1.018	0.018	1.327	68,222	3,677,895
2014-2015	2,920,742	6,054,564	1.031	0.030	1.641	143,788	6,198,352
2015-2016	3,238,879	6,519,400	1.054	0.051	1.733	286,262	6,805,662
2016-2017	3,356,803	7,190,053	1.118	0.106	1.831	651,508	7,841,561
2017-2018	3,370,672	4,535,228	1.284	0.221	1.933	1,439,927	5,975,155
2018-2019	3,547,038	4,076,480	2.120	0.528	2.040	3,820,586	7,897,066
Totals	50,086,609	\$77,854,184				\$6,512,356	\$84,366,540

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 10/31/19 (B)	Loss Development Factor (C)	Percentage of Losses Yet to Be Paid (D)	Program Rate (E)	Incurred but not Paid (F)	Ultimate Program Losses (G)
1998-1999	0	\$0	1.000	0.000	0.704	\$0	\$0
1999-2000	0		1.001	0.001	0.740	0	
2000-2001	0		1.001	0.001	0.779	0	
2001-2002	0		1.002	0.002	0.819	0	
2002-2003	0		1.003	0.003	0.863	0	
2003-2004	2,802,831	2,210,245	1.004	0.004	0.869	9,743	2,219,988
2004-2005	2,858,188	3,113,942	1.008	0.008	0.740	16,920	3,130,862
2005-2006	2,965,313	4,724,040	1.011	0.011	1.532	49,971	4,774,011
2006-2007	3,136,883	5,874,898	1.014	0.014	1.213	53,271	5,928,169
2007-2008	3,405,361	5,370,167	1.018	0.018	1.206	73,924	5,444,091
2008-2009	3,483,077	2,662,095	1.023	0.022	0.802	61,455	2,723,550
2009-2010	3,323,270	7,287,481	1.029	0.028	1.566	145,719	7,433,200
2010-2011	3,033,147	4,556,190	1.038	0.037	1.276	143,201	4,699,391
2011-2012	2,939,154	6,226,021	1.053	0.050	1.817	267,022	6,493,043
2012-2013	2,849,089	3,576,549	1.078	0.072	1.211	248,418	3,824,967
2013-2014	2,856,162	3,608,360	1.113	0.102	1.327	386,593	3,994,953
2014-2015	2,920,742	5,128,453	1.156	0.135	1.641	647,047	5,775,500
2015-2016	3,238,879	4,311,499	1.267	0.211	1.733	1,184,338	5,495,837
2016-2017	3,356,803	4,287,266	1.578	0.366	1.831	2,249,548	6,536,814
2017-2018	3,370,672	1,121,541	2.638	0.621	1.933	4,046,131	5,167,672
2018-2019	3,547,038	566,112	7.681	0.870	2.040	6,295,283	6,861,395
Totals	50,086,609	\$64,624,859				\$15,878,584	\$80,503,443

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)
1998-1999	0	\$0	2.066	\$0		0.484	1.454	0.704
1999-2000	0		1.996			0.501	1.476	0.740
2000-2001	0		1.928			0.519	1.501	0.779
2001-2002	0		1.862			0.537	1.525	0.819
2002-2003	0		1.799			0.556	1.551	0.863
2003-2004	2,802,831	1,542,158	1.738	2,680,271	0.956	0.550	1.579	0.869
2004-2005	2,858,188	1,313,942	1.679	2,206,109	0.772	0.460	1.609	0.740
2005-2006	2,965,313	2,772,583	1.622	4,497,130	1.517	0.935	1.639	1.532
2006-2007	3,136,883	2,280,213	1.567	3,573,094	1.139	0.727	1.668	1.213
2007-2008	3,405,361	2,415,240	1.514	3,656,673	1.074	0.709	1.701	1.206
2008-2009	3,483,077	1,611,115	1.462	2,355,450	0.676	0.463	1.733	0.802
2009-2010	3,323,270	2,945,599	1.413	4,162,131	1.252	0.886	1.768	1.566
2010-2011	3,033,147	2,147,978	1.365	2,931,990	0.967	0.708	1.803	1.276
2011-2012	2,939,154	2,908,000	1.318	3,832,744	1.304	0.989	1.838	1.817
2012-2013	2,849,089	1,841,000	1.274	2,345,434	0.823	0.646	1.874	1.211
2013-2014	2,856,162	1,983,000	1.230	2,439,090	0.854	0.694	1.913	1.327
2014-2015	2,920,742	2,423,000	1.189	2,880,947	0.986	0.841	1.951	1.641
2015-2016	3,238,879	3,206,000	1.148	3,680,488	1.136	0.871	1.989	1.733
2016-2017	3,356,803	3,226,000	1.109	3,577,634	1.066	0.902	2.030	1.831
2017-2018	3,370,672	2,886,000	1.072	3,093,792	0.918	0.933	2.071	1.933
2018-2019	3,547,038	3,055,000	1.035	3,161,925	0.891	0.966	2.112	2.040
Total/Avg	50,086,609	\$38,556,828		\$51,074,902	\$1.020			
13/14-17/18	15,743,258	13,724,000		15,671,951	\$0.995			
14/15-18/19	16,434,134	14,796,000		16,394,786	\$0.998			

Selected Limited Rate: \$1.000
Prior Selected Limited Rate: \$0.935

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 2013-2014 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)
1998-1999	\$5,225	537	\$2,805,825
1999-2000	4,568	484	2,210,912
2000-2001	4,888	462	2,258,256
2001-2002	4,936	509	2,512,424
2002-2003	5,501	576	3,168,576
2003-2004	4,901	497	2,435,797
2004-2005	3,709	570	2,114,130
2005-2006	7,943	572	4,543,396
2006-2007	7,177	530	3,803,810
2007-2008	7,873	522	4,109,706
2008-2009	6,245	447	2,791,515
2009-2010	10,170	512	5,207,040
2010-2011	9,176	422	3,872,272
2011-2012	14,026	381	5,343,906
2012-2013	8,584	402	3,450,768
2013-2014	9,162	414	3,793,068
2014-2015	25,418	411	10,446,798
2015-2016	26,678	534	14,246,052
2016-2017	28,038	543	15,224,634
2017-2018	29,481	442	13,030,602
2018-2019	30,956	507	15,694,692
Total		10,274	\$123,064,179

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)
1998-1999	\$1,930,023	537	\$3,594	1.860	\$6,685	\$3,594	1.454	\$5,225
1999-2000	1,497,656	484	3,094	1.806	5,588	3,094	1.476	4,568
2000-2001	1,504,580	462	3,257	1.754	5,713	3,257	1.501	4,888
2001-2002	1,647,105	509	3,236	1.702	5,508	3,236	1.525	4,936
2002-2003	2,042,623	576	3,546	1.653	5,862	3,546	1.551	5,501
2003-2004	1,542,158	497	3,103	1.605	4,980	3,103	1.579	4,901
2004-2005	1,313,942	570	2,305	1.558	3,591	2,305	1.609	3,709
2005-2006	2,772,583	572	4,847	1.513	7,334	4,847	1.639	7,943
2006-2007	2,280,213	530	4,302	1.469	6,320	4,302	1.668	7,177
2007-2008	2,415,240	522	4,627	1.426	6,598	4,627	1.701	7,873
2008-2009	1,611,115	447	3,604	1.384	4,988	3,604	1.733	6,245
2009-2010	2,945,599	512	5,753	1.344	7,732	5,753	1.768	10,170
2010-2011	2,147,978	422	5,090	1.305	6,642	5,090	1.803	9,176
2011-2012	2,908,000	381	7,633	1.267	9,671	7,633	1.838	14,026
2012-2013	1,841,000	402	4,580	1.230	5,633	4,580	1.874	8,584
2013-2014	1,983,000	414	4,790	1.194	5,719	4,790	1.913	9,162
2014-2015	2,423,000	411	5,895	1.159	6,832	13,028	1.951	25,418
2015-2016	3,204,000	534	6,000	1.126	6,756	13,410	1.989	26,678
2016-2017	3,225,000	543	5,939	1.093	6,491	13,815	2.030	28,038
2017-2018	2,892,000	442	6,543	1.061	6,942	14,232	2.071	29,481
2018-2019	3,393,000	507	6,692	1.030	6,893	14,660	2.112	30,956

Average Limited Severity: \$6,308
Average 14/15-17/18 Limited Severity: \$6,755
Average 14/15-18/19 Limited Severity: \$6,783

Selected Limited Severity: \$6,800
Prior Selected Limited Severity: \$15,100

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)
1998-1999	537	538	537			1.110	
1999-2000	484	485	484			1.105	
2000-2001	462	463	462			1.099	
2001-2002	509	511	509			1.094	
2002-2003	576	574	576			1.088	
2003-2004	497	500	497	280.283	1.773	1.083	1.920
2004-2005	570	574	570	285.819	1.994	1.078	2.150
2005-2006	572	576	572	296.531	1.929	1.072	2.068
2006-2007	530	535	530	313.688	1.690	1.067	1.803
2007-2008	522	515	522	340.536	1.533	1.062	1.628
2008-2009	447	453	447	348.308	1.283	1.056	1.355
2009-2010	512	520	512	332.327	1.541	1.051	1.620
2010-2011	422	428	422	303.315	1.391	1.046	1.455
2011-2012	381	390	381	293.915	1.296	1.041	1.349
2012-2013	402	415	402	284.909	1.411	1.036	1.462
2013-2014	414	431	414	285.616	1.449	1.030	1.492
2014-2015	411	421	411	292.074	1.407	1.025	1.442
2015-2016	534	547	534	323.888	1.649	1.020	1.682
2016-2017	543	564	543	335.680	1.618	1.015	1.642
2017-2018	442	469	442	337.067	1.311	1.010	1.324
2018-2019	507	530	507	354.704	1.429	1.005	1.436
Total	10,274	10,439	10,274	5,008.661			1.607

(H) Selected 2019-2020 Frequency: 1.500
Prior Selected Frequency: 0.650

Program Year:	2019-2020	2020-2021
(I) Trend Factor:	1.000	1.005
(J) Selected Frequency:	1.500	1.508
(K) Composite Exposure:	356.434	367.127
(L) Ultimate Claims:	535	554

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 1.500 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 10/31/2019 (A)	Reported Claim Development Factor (B)	Ultimate Claims (C)	Trended Claim Frequency (D)
1998-1999	537	1.000	537	
1999-2000	484	1.000	484	
2000-2001	462	1.000	462	
2001-2002	509	1.000	509	
2002-2003	576	1.000	576	
2003-2004	497	1.000	497	1.920
2004-2005	570	1.000	570	2.150
2005-2006	572	1.000	572	2.068
2006-2007	530	1.000	530	1.803
2007-2008	522	1.000	522	1.628
2008-2009	447	1.000	447	1.355
2009-2010	512	1.000	512	1.619
2010-2011	422	1.000	422	1.455
2011-2012	381	1.000	381	1.349
2012-2013	402	1.001	402	1.462
2013-2014	414	1.001	414	1.493
2014-2015	411	1.001	411	1.442
2015-2016	532	1.003	534	1.682
2016-2017	539	1.008	543	1.642
2017-2018	434	1.018	442	1.324
2018-2019	457	1.110	507	1.437
Total	10,210		10,274	1.607

Notes:

- (A) Provided by the Authority.
- (B) From Pool - Appendix D, Page 6.
- (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 10/31/2019 (A)	Closed Claim Development Factor (B)	Ultimate Claims (C)	Trended Claim Frequency (D)
1998-1999	537	1.001	538	
1999-2000	484	1.002	485	
2000-2001	462	1.003	463	
2001-2002	509	1.004	511	
2002-2003	571	1.005	574	
2003-2004	497	1.006	500	1.932
2004-2005	570	1.007	574	2.165
2005-2006	571	1.008	576	2.082
2006-2007	530	1.009	535	1.820
2007-2008	509	1.011	515	1.606
2008-2009	447	1.014	453	1.373
2009-2010	511	1.018	520	1.645
2010-2011	418	1.023	428	1.476
2011-2012	379	1.029	390	1.381
2012-2013	401	1.036	415	1.509
2013-2014	413	1.044	431	1.554
2014-2015	401	1.050	421	1.477
2015-2016	512	1.068	547	1.723
2016-2017	508	1.111	564	1.705
2017-2018	382	1.227	469	1.405
2018-2019	261	2.029	530	1.502
Total	9,873		10,439	1.640

Notes:

- (A) Provided by the Authority.
- (B) From Pool - Appendix D, Page 7.
- (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:													
	4 Months	16 Months	28 Months	40 Months	52 Months	64 Months	76 Months	88 Months	100 Months	112 Months	124 Months	136 Months	148 Months	160 Months
1998-1999														
1999-2000														
2000-2001														
2001-2002														
2002-2003														574
2003-2004													497	497
2004-2005												570	570	570
2005-2006											572	572	572	572
2006-2007										530	530	530	530	530
2007-2008									516	516	516	516	522	
2008-2009								447	447	447	447	447		
2009-2010							512	512	512	512	512			
2010-2011						422	422	422	422	422				
2011-2012					380	380	380	380	381					
2012-2013				396	400	402	402	402						
2013-2014			410	414	414	414	414							
2014-2015		372	406	409	409	411								
2015-2016	87	477	524	528	532									
2016-2017	79	492	532	539										
2017-2018	80	398	434											
2018-2019	95	457												
2019-2020	100													

Amounts Do Not Include Richmond or Concord.

Reported Claim Count Development Factors:

	4-16	16-28	28-40	40-52	52-64	64-76	76-88	88-100	100-112	112-124	124-136	136-148	148-160	160-172
	Months	Months	Months	Months	Months	Months	Months	Months	Months	Months	Months	Months	Months	Months
1998-1999														
1999-2000														
2000-2001														
2001-2002														
2002-2003														1.003
2003-2004													1.000	1.000
2004-2005												1.000	1.000	1.000
2005-2006											1.000	1.000	1.000	1.000
2006-2007										1.000	1.000	1.000	1.000	
2007-2008									1.000	1.000	1.000	1.012		
2008-2009								1.000	1.000	1.000	1.000			
2009-2010							1.000	1.000	1.000	1.000				
2010-2011						1.000	1.000	1.000	1.000					
2011-2012					1.000	1.000	1.000	1.003						
2012-2013				1.010	1.005	1.000	1.000							
2013-2014			1.010	1.000	1.000	1.000								
2014-2015		1.091	1.007	1.000	1.005									
2015-2016	5.483	1.099	1.008	1.008										
2016-2017	6.228	1.081	1.013											
2017-2018	4.975	1.090												
2018-2019	4.811													
Average	5.374	1.090	1.010	1.005	1.003	1.000	1.000	1.001	1.000	1.000	1.000	1.003	1.000	1.001
Claim-weighted Averages														
3-yr	5.303	1.090	1.010	1.003	1.003	1.000	1.000	1.001	1.000	1.000	1.000	1.004	1.000	1.000
4-yr	5.349	1.090	1.010	1.005	1.002	1.000	1.000	1.001	1.000	1.000	1.000	1.003	1.000	1.001
Industry Factors	3.989	1.183	1.022	1.007	1.006	1.004	1.004	1.003	1.002	1.001	1.001	1.000	1.001	1.000
Prior	3.739	0.767	0.972	0.995	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Selected	5.349	1.090	1.010	1.005	1.002	1.000	1.000	1.001	1.000	1.000	1.000	1.000	1.000	1.000
Cumulated	5.937	1.110	1.018	1.008	1.003	1.001	1.001	1.001	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:													
	4 Months	16 Months	28 Months	40 Months	52 Months	64 Months	76 Months	88 Months	100 Months	112 Months	124 Months	136 Months	148 Months	160 Months
1998-1999														
1999-2000														
2000-2001														
2001-2002														
2002-2003														570
2003-2004													497	497
2004-2005												569	569	569
2005-2006											571	571	571	571
2006-2007										529	529	529	530	530
2007-2008									506	507	507	508	509	
2008-2009								446	447	447	447	447		
2009-2010							502	508	511	511	511			
2010-2011						408	411	412	412	418				
2011-2012					367	370	372	378	379					
2012-2013				371	387	397	401	401						
2013-2014			363	392	405	413	413							
2014-2015		207	333	377	396	401								
2015-2016	24	259	451	494	512									
2016-2017	11	278	456	508										
2017-2018	14	237	382											
2018-2019	15	261												
2019-2020	19													

Amounts Do Not Include Richmond or Concord.

Closed Claim Count Development Factors:

	4-16 Months	16-28 Months	28-40 Months	40-52 Months	52-64 Months	64-76 Months	76-88 Months	88-100 Months	100-112 Months	112-124 Months	124-136 Months	136-148 Months	148-160 Months	160-172 Months
1998-1999														
1999-2000														
2000-2001														
2001-2002														
2002-2003														1.002
2003-2004													1.000	1.000
2004-2005												1.000	1.000	1.002
2005-2006											1.000	1.000	1.000	1.000
2006-2007										1.000	1.000	1.002	1.000	
2007-2008									1.002	1.000	1.002	1.002		
2008-2009								1.002	1.000	1.000	1.000			
2009-2010							1.012	1.006	1.000	1.000				
2010-2011						1.007	1.002	1.000	1.015					
2011-2012					1.008	1.005	1.016	1.003						
2012-2013				1.043	1.026	1.010	1.000							
2013-2014			1.080	1.033	1.020	1.000								
2014-2015		1.609	1.132	1.050	1.013									
2015-2016	10.792	1.741	1.095	1.036										
2016-2017	25.273	1.640	1.114											
2017-2018	16.929	1.612												
2018-2019	17.400													
Average	17.599	1.651	1.105	1.041	1.017	1.006	1.008	1.003	1.004	1.000	1.001	1.001	1.000	1.001
Claim-weighted Averages														
3-yr	19.400	1.665	1.112	1.040	1.019	1.005	1.006	1.003	1.004	1.000	1.001	1.001	1.000	1.001
4-yr	16.172	1.653	1.105	1.040	1.017	1.006	1.008	1.003	1.004	1.000	1.000	1.001	1.000	1.001
Industry Factors	4.675	1.692	1.138	1.056	1.034	1.024	1.017	1.014	1.012	1.010	1.008	1.007	1.005	1.003
Prior	5.595	1.237	1.114	1.062	1.000	1.012	1.005	1.001	1.001	1.001	1.001	1.001	1.001	1.001
Selected	16.172	1.653	1.105	1.040	1.017	1.006	1.008	1.007	1.006	1.005	1.004	1.003	1.002	1.001
Cumulated	32.813	2.029	1.227	1.111	1.068	1.050	1.044	1.036	1.029	1.023	1.018	1.014	1.011	1.009

Municipal Pooling Authority - Liability - 100K & SIR Analyses

Loss Trend Factors

Accident Year	Benefit Level Factor (A)	Factor to 2019-2020 Loss Rate Level (B)	Factor to 2020-2021 Loss Rate Level (C)	Factor to 2021-2022 Loss Rate Level (D)	Factor to 2022-2023 Loss Rate Level (E)	Factor to 2019-2020 Frequency Level (F)	Factor to 2020-2021 Frequency Level (G)	Factor to 2021-2022 Frequency Level (H)	Factor to 2022-2023 Frequency Level (I)	Factor to 2019-2020 Severity Level (J)
1998-1999	1.000	2.066	2.138	2.213	2.291	1.110	1.116	1.122	1.127	1.860
1999-2000	1.000	1.996	2.066	2.138	2.213	1.105	1.110	1.116	1.122	1.806
2000-2001	1.000	1.928	1.996	2.066	2.138	1.099	1.105	1.110	1.116	1.754
2001-2002	1.000	1.862	1.928	1.996	2.066	1.094	1.099	1.105	1.110	1.702
2002-2003	1.000	1.799	1.862	1.928	1.996	1.088	1.094	1.099	1.105	1.653
2003-2004	1.000	1.738	1.799	1.862	1.928	1.083	1.088	1.094	1.099	1.605
2004-2005	1.000	1.679	1.738	1.799	1.862	1.078	1.083	1.088	1.094	1.558
2005-2006	1.000	1.622	1.679	1.738	1.799	1.072	1.078	1.083	1.088	1.513
2006-2007	1.000	1.567	1.622	1.679	1.738	1.067	1.072	1.078	1.083	1.469
2007-2008	1.000	1.514	1.567	1.622	1.679	1.062	1.067	1.072	1.078	1.426
2008-2009	1.000	1.462	1.514	1.567	1.622	1.056	1.062	1.067	1.072	1.384
2009-2010	1.000	1.413	1.462	1.514	1.567	1.051	1.056	1.062	1.067	1.344
2010-2011	1.000	1.365	1.413	1.462	1.514	1.046	1.051	1.056	1.062	1.305
2011-2012	1.000	1.318	1.365	1.413	1.462	1.041	1.046	1.051	1.056	1.267
2012-2013	1.000	1.274	1.318	1.365	1.413	1.036	1.041	1.046	1.051	1.230
2013-2014	1.000	1.230	1.274	1.318	1.365	1.030	1.036	1.041	1.046	1.194
2014-2015	1.000	1.189	1.230	1.274	1.318	1.025	1.030	1.036	1.041	1.159
2015-2016	1.000	1.148	1.189	1.230	1.274	1.020	1.025	1.030	1.036	1.126
2016-2017	1.000	1.109	1.148	1.189	1.230	1.015	1.020	1.025	1.030	1.093
2017-2018	1.000	1.072	1.109	1.148	1.189	1.010	1.015	1.020	1.025	1.061
2018-2019	1.000	1.035	1.072	1.109	1.148	1.005	1.010	1.015	1.020	1.030
2019-2020	1.000	1.000	1.035	1.072	1.109	1.000	1.005	1.010	1.015	1.000
2020-2021	1.000	--	1.000	1.035	1.072	--	1.000	1.005	1.010	0.971
2021-2022	1.000	--	--	1.000	1.035	--	--	1.000	1.005	--
2022-2023	1.000	--	--	--	1.000	--	--	--	1.000	--

Notes:

- (A) No benefit level adjustment applied.
- (B) - (E) (A) adjusted for a 3.5% annual loss rate trend.
- (F) - (I) (A) adjusted for a 0.5% annual frequency trend.
- (J) (A) adjusted for a 3.0% annual severity trend.

This exhibit shows the calculation of the ways in which we expect claims costs to have changed over the past twenty years due to changes in inflation.

Municipal Pooling Authority - Liability - 100K & SIR Analyses

Payment and Reserve Forecast

<u>Accident Year</u>	<u>As of</u> <u>10/31/2019</u>	<u>Calendar Period</u>	
		<u>11/1/2019</u> <u>to</u> <u>6/30/2020</u>	<u>7/1/2020</u> <u>to</u> <u>6/30/2021</u>
Prior			
Ultimate Loss	\$7,610,648	\$7,610,648	\$7,610,648
Paid in Calendar Period	-	4,303	4,310
Paid to Date	7,597,725	7,602,028	7,606,338
Outstanding Liability	12,923	8,620	4,310
2003-2004			
Ultimate Loss	\$1,294,611	\$1,294,611	\$1,294,611
Paid in Calendar Period	-		
Paid to Date	1,294,611	1,294,611	1,294,611
Outstanding Liability	(0)	(0)	(0)
2004-2005			
Ultimate Loss	\$2,370,149	\$2,370,149	\$2,370,149
Paid in Calendar Period	-		
Paid to Date	2,370,149	2,370,149	2,370,149
Outstanding Liability	(0)	(0)	(0)
2005-2006			
Ultimate Loss	\$3,590,940	\$3,590,940	\$3,590,940
Paid in Calendar Period	-	814	1,638
Paid to Date	3,586,420	3,587,234	3,588,872
Outstanding Liability	4,520	3,706	2,068
2006-2007			
Ultimate Loss	\$4,639,142	\$4,639,142	\$4,639,142
Paid in Calendar Period	-	29	43
Paid to Date	4,638,938	4,638,967	4,639,010
Outstanding Liability	204	175	132
2007-2008			
Ultimate Loss	\$4,547,107	\$4,547,107	\$4,547,107
Paid in Calendar Period	-	52,252	52,739
Paid to Date	4,228,499	4,280,751	4,333,490
Outstanding Liability	318,608	266,356	213,617
2008-2009			
Ultimate Loss	\$1,811,342	\$1,811,342	\$1,811,342
Paid in Calendar Period	-	729	1,223
Paid to Date	1,805,643	1,806,372	1,807,595
Outstanding Liability	5,699	4,970	3,747

Municipal Pooling Authority - Liability - 100K & SIR Analyses

Payment and Reserve Forecast

<u>Accident Year</u>	<u>As of</u> <u>10/31/2019</u>	<u>Calendar Period</u>	
		<u>11/1/2019</u> <u>to</u> <u>6/30/2020</u>	<u>7/1/2020</u> <u>to</u> <u>6/30/2021</u>
2009-2010			
Ultimate Loss	\$5,831,000	\$5,831,000	\$5,831,000
Paid in Calendar Period	-	2,231	2,801
Paid to Date	5,814,477	5,816,708	5,819,509
Outstanding Liability	16,523	14,292	11,491
2010-2011			
Ultimate Loss	\$3,569,000	\$3,569,000	\$3,569,000
Paid in Calendar Period	-	4,904	5,782
Paid to Date	3,536,950	3,541,854	3,547,636
Outstanding Liability	32,050	27,146	21,364
2011-2012			
Ultimate Loss	\$4,912,000	\$4,912,000	\$4,912,000
Paid in Calendar Period	-	14,758	16,561
Paid to Date	4,830,464	4,845,222	4,861,783
Outstanding Liability	81,536	66,778	50,217
2012-2013			
Ultimate Loss	\$2,468,000	\$2,468,000	\$2,468,000
Paid in Calendar Period	-	7,650	8,396
Paid to Date	2,430,682	2,438,332	2,446,728
Outstanding Liability	37,318	29,668	21,272
2013-2014			
Ultimate Loss	\$2,627,000	\$2,627,000	\$2,627,000
Paid in Calendar Period	-	12,649	15,509
Paid to Date	2,562,132	2,574,781	2,590,290
Outstanding Liability	64,868	52,219	36,710
2014-2015			
Ultimate Loss	\$4,511,000	\$4,511,000	\$4,511,000
Paid in Calendar Period	-	165,993	231,006
Paid to Date	3,504,984	3,670,977	3,901,983
Outstanding Liability	1,006,016	840,023	609,017
2015-2016			
Ultimate Loss	\$4,757,000	\$4,757,000	\$4,757,000
Paid in Calendar Period	-	509,403	481,731
Paid to Date	2,625,608	3,135,011	3,616,742
Outstanding Liability	2,131,392	1,621,989	1,140,258

Municipal Pooling Authority - Liability - 100K & SIR Analyses

Payment and Reserve Forecast

<u>Accident Year</u>	<u>As of</u> <u>10/31/2019</u>	<u>Calendar Period</u>	
		<u>11/1/2019</u> <u>to</u> <u>6/30/2020</u>	<u>7/1/2020</u> <u>to</u> <u>6/30/2021</u>
2016-2017			
Ultimate Loss	\$5,990,000	\$5,990,000	\$5,990,000
Paid in Calendar Period	-	909,412	896,279
Paid to Date	2,776,529	3,685,941	4,582,220
Outstanding Liability	3,213,471	2,304,059	1,407,780
2017-2018			
Ultimate Loss	\$4,223,000	\$4,223,000	\$4,223,000
Paid in Calendar Period	-	1,071,054	1,192,228
Paid to Date	299,725	1,370,779	2,563,007
Outstanding Liability	3,923,275	2,852,221	1,659,993
2018-2019			
Ultimate Loss	\$5,398,000	\$5,398,000	\$5,398,000
Paid in Calendar Period	-	1,020,180	1,551,267
Paid to Date	56,741	1,076,921	2,628,188
Outstanding Liability	5,341,259	4,321,079	2,769,812
2019-2020			
Ultimate Loss	\$1,954,000	\$5,863,000	\$5,863,000
Paid in Calendar Period	-	486,629	1,220,436
Paid to Date	0	486,629	1,707,065
Outstanding Liability	1,954,000	5,376,371	4,155,935
2020-2021			
Ultimate Loss	-	-	\$6,447,000
Paid in Calendar Period	-	-	573,783
Paid to Date	-	-	573,783
Outstanding Liability	-	-	5,873,217
Totals			
Ultimate Loss	\$72,103,939	\$76,012,939	\$82,459,939
Paid in Calendar Period	-	4,262,990	6,255,732
Paid to Date	53,960,279	58,223,269	64,479,001
Outstanding Liability	18,143,660	17,789,670	17,980,938
Total Outstanding ULAE	740,000	870,051	1,037,415
Outstanding Liability plus ULAE	18,883,660	18,659,721	19,018,353

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 2017-2018, \$1,071,054 is expected to be paid between 11/1/19 and 6/30/20, \$1,370,779 will have been paid by 6/30/20, and the reserve for remaining payments on these claims should be \$2,852,221.
- 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, \$1,192,228 = \$2,852,221 x 41.8%.
- Paid to Date is Paid in Calendar Period plus Paid to Date from previous calendar period. For example, \$2,563,007 = \$1,192,228 + \$1,370,779.
- Outstanding Liability is Ultimate Loss minus Paid to Date. For example, \$2,852,221 = \$4,223,000 - \$1,370,779.

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 10/31/19:</u>		<u>Expected</u>	<u>Discounted</u>
<u>Current (Short Term)</u>	Loss and ALAE:	\$3,776,361	\$3,739,155
	ULAE:	218,400	216,248
	Short-Term Loss and LAE:	<u>\$3,994,761</u>	<u>\$3,955,403</u>
<u>Non-Current (Long Term)</u>	Loss and ALAE:	\$14,367,299	\$13,456,792
	ULAE:	521,600	485,099
	Long-Term Loss and LAE:	<u>\$14,888,899</u>	<u>\$13,941,891</u>
<u>Total Liability</u>	Loss and ALAE:	\$18,143,660	\$17,195,947
	ULAE:	740,000	701,347
	Total Loss and LAE:	<u>\$18,883,660</u>	<u>\$17,897,294</u>

<u>Liabilities as of 6/30/20:</u>			
<u>Current (Short Term)</u>	Loss and ALAE:	\$5,681,949	\$5,625,968
	ULAE:	282,895	280,108
	Short-Term Loss and LAE:	<u>\$5,964,844</u>	<u>\$5,906,076</u>
<u>Non-Current (Long Term)</u>	Loss and ALAE:	\$12,107,721	\$11,242,371
	ULAE:	587,156	544,883
	Long-Term Loss and LAE:	<u>\$12,694,877</u>	<u>\$11,787,254</u>
<u>Total Liability</u>	Loss and ALAE:	\$17,789,670	\$16,868,339
	ULAE:	870,051	824,991
	Total Loss and LAE:	<u>\$18,659,721</u>	<u>\$17,693,330</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 10/31/19:</u>						
<u>Current (Short Term)</u>	Loss and ALAE:	\$4,157,940	\$4,333,681	\$4,539,334	\$4,801,075	\$5,156,295
	ULAE:	240,468	250,631	262,525	277,662	298,206
	Short-Term Loss and LAE:	<u>\$4,398,408</u>	<u>\$4,584,312</u>	<u>\$4,801,859</u>	<u>\$5,078,737</u>	<u>\$5,454,501</u>
<u>Non-Current (Long Term)</u>	Loss and ALAE:	\$14,963,953	\$15,596,422	\$16,336,546	\$17,278,521	\$18,556,916
	ULAE:	539,430	562,230	588,910	622,867	668,951
	Long-Term Loss and LAE:	<u>\$15,503,383</u>	<u>\$16,158,652</u>	<u>\$16,925,456</u>	<u>\$17,901,388</u>	<u>\$19,225,867</u>
<u>Total Liability</u>	Loss and ALAE:	\$19,121,893	\$19,930,103	\$20,875,880	\$22,079,596	\$23,713,211
	ULAE:	779,898	812,861	851,435	900,529	967,157
	Total Loss and LAE:	<u>\$19,901,791</u>	<u>\$20,742,964</u>	<u>\$21,727,315</u>	<u>\$22,980,125</u>	<u>\$24,680,368</u>
<u>Liabilities as of 6/30/20:</u>						
<u>Current (Short Term)</u>	Loss and ALAE:	\$6,256,076	\$6,520,497	\$6,829,925	\$7,223,743	\$7,758,210
	ULAE:	311,480	324,645	340,051	359,659	386,269
	Short-Term Loss and LAE:	<u>\$6,567,556</u>	<u>\$6,845,142</u>	<u>\$7,169,976</u>	<u>\$7,583,402</u>	<u>\$8,144,479</u>
<u>Non-Current (Long Term)</u>	Loss and ALAE:	\$12,501,517	\$13,029,908	\$13,648,239	\$14,435,204	\$15,503,229
	ULAE:	605,910	631,519	661,488	699,630	751,394
	Long-Term Loss and LAE:	<u>\$13,107,427</u>	<u>\$13,661,427</u>	<u>\$14,309,727</u>	<u>\$15,134,834</u>	<u>\$16,254,623</u>
<u>Total Liability</u>	Loss and ALAE:	\$18,757,593	\$19,550,405	\$20,478,164	\$21,658,947	\$23,261,439
	ULAE:	917,390	956,164	1,001,539	1,059,289	1,137,663
	Total Loss and LAE:	<u>\$19,674,983</u>	<u>\$20,506,569</u>	<u>\$21,479,703</u>	<u>\$22,718,236</u>	<u>\$24,399,102</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 10/31/19 (A)	Discount Factor (B)	Discounted Reserve at 10/31/19 (C)	Full Value of Reserve at 6/30/20 (D)	Discount Factor (E)	Discounted Reserve at 6/30/20 (F)
1998-1999	\$0	0.990	\$0	\$0	0.990	\$0
1999-2000	(0)	0.977	0	(0)	0.990	0
2000-2001	0	0.971	0	0	0.971	0
2001-2002	0	0.967	0	0	0.971	0
2002-2003	12,923	0.964	12,455	8,620	0.965	8,315
2003-2004	(0)	0.962	0	(0)	0.963	0
2004-2005	(0)	0.958	0	(0)	0.962	0
2005-2006	4,520	0.952	4,305	3,706	0.956	3,541
2006-2007	204	0.948	194	175	0.951	167
2007-2008	318,608	0.942	300,209	266,356	0.946	252,104
2008-2009	5,699	0.935	5,330	4,970	0.940	4,672
2009-2010	16,523	0.931	15,382	14,292	0.933	13,332
2010-2011	32,050	0.930	29,804	27,146	0.930	25,245
2011-2012	81,536	0.932	75,989	66,778	0.930	62,096
2012-2013	37,318	0.935	34,901	29,668	0.933	27,681
2013-2014	64,868	0.937	60,749	52,219	0.936	48,895
2014-2015	1,006,016	0.938	943,383	840,023	0.937	786,752
2015-2016	2,131,392	0.944	2,011,069	1,621,989	0.938	1,521,944
2016-2017	3,213,471	0.951	3,055,110	2,304,059	0.946	2,180,002
2017-2018	3,923,275	0.954	3,741,196	2,852,221	0.953	2,718,159
2018-2019	5,341,259	0.950	5,071,874	4,321,079	0.954	4,121,815
2019-2020	1,954,000	0.939	1,833,997	5,376,371	0.947	5,093,619
Totals	\$18,143,660		\$17,195,947	\$17,789,670		\$16,868,339

(G) Discount Factor at 10/31/19 for Overall Reserve: 0.948
(H) Discount Factor at 6/30/20 for Overall Reserve: 0.948

Notes:

- (A) From Pool - Appendix F, Outstanding Liability at 10/31/19.
- (B) Based on Pool - Appendix H, Page 2, Column (E).
- (C) (A) x (B).
- (D) From Pool - Appendix F, Outstanding Liability at 6/30/20.
- (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 0.948, the discounted liability for outstanding claims is 94.8% 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	0.1%	0.001	0.001	0.990
21	0.0%	0.001	0.001	0.971
20	0.1%	0.002	0.002	0.971
19	0.1%	0.003	0.003	0.965
18	0.2%	0.005	0.005	0.963
17	0.3%	0.008	0.008	0.962
16	0.3%	0.010	0.011	0.956
15	0.4%	0.014	0.015	0.951
14	0.5%	0.019	0.020	0.946
13	0.5%	0.023	0.024	0.940
12	0.5%	0.027	0.029	0.933
11	0.7%	0.034	0.037	0.930
10	1.1%	0.044	0.048	0.930
9	1.8%	0.061	0.065	0.933
8	2.6%	0.086	0.092	0.936
7	3.2%	0.116	0.124	0.937
6	4.8%	0.161	0.171	0.938
5	10.2%	0.259	0.274	0.946
4	18.7%	0.439	0.461	0.953
3	24.9%	0.677	0.710	0.954
2	20.3%	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, $86.5\% = [67.7\% / 1.020] + [20.3\% / (1.010)]$.
- (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	0.0%	0.000	0.000	1.000
16	0.2%	0.002	0.002	0.990
15	0.1%	0.003	0.003	0.977
14	0.1%	0.004	0.004	0.966
13	0.1%	0.005	0.005	0.956
12	0.2%	0.007	0.007	0.952
11	0.2%	0.008	0.009	0.946
10	0.2%	0.010	0.011	0.939
9	0.3%	0.013	0.014	0.935
8	0.7%	0.019	0.021	0.941
7	1.2%	0.031	0.033	0.948
6	2.4%	0.054	0.057	0.955
5	7.5%	0.128	0.132	0.967
4	17.5%	0.298	0.307	0.972
3	28.1%	0.570	0.588	0.971
2	27.5%	0.832	0.863	0.964
1	13.7%	0.951	1.000	0.951
(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	0.0%	0.000	0.000	1.000
16	0.2%	0.002	0.002	0.990
15	0.1%	0.003	0.003	0.977
14	0.1%	0.004	0.005	0.966
13	0.1%	0.005	0.006	0.956
12	0.2%	0.008	0.008	0.952
11	0.2%	0.010	0.010	0.946
10	0.2%	0.012	0.013	0.939
9	0.3%	0.015	0.016	0.935
8	0.8%	0.022	0.024	0.941
7	1.4%	0.036	0.038	0.948
6	2.7%	0.062	0.065	0.955
5	8.5%	0.145	0.150	0.967
4	19.3%	0.334	0.344	0.972
3	29.5%	0.620	0.639	0.970
2	25.9%	0.864	0.898	0.962
1	10.2%	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	0.0%	0.000	0.000	1.000
16	0.3%	0.003	0.003	0.990
15	0.1%	0.004	0.004	0.977
14	0.1%	0.005	0.006	0.966
13	0.1%	0.007	0.007	0.956
12	0.3%	0.009	0.010	0.952
11	0.3%	0.012	0.012	0.946
10	0.3%	0.014	0.015	0.939
9	0.4%	0.018	0.019	0.935
8	0.9%	0.027	0.029	0.941
7	1.7%	0.043	0.046	0.948
6	3.3%	0.075	0.078	0.954
5	10.1%	0.174	0.180	0.966
4	22.1%	0.389	0.401	0.971
3	31.0%	0.688	0.711	0.969
2	22.7%	0.900	0.938	0.959
1	6.2%	0.944	1.000	0.944
(F) Discount Factor for Future Funding:				0.953
* 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	0.0%	0.000	0.000	1.000
16	0.6%	0.006	0.006	0.990
15	0.3%	0.009	0.010	0.977
14	0.3%	0.012	0.013	0.966
13	0.3%	0.015	0.016	0.956
12	0.6%	0.021	0.022	0.952
11	0.6%	0.027	0.029	0.946
10	0.6%	0.033	0.035	0.938
9	0.9%	0.041	0.044	0.935
8	2.1%	0.061	0.065	0.940
7	3.8%	0.097	0.103	0.947
6	7.0%	0.164	0.173	0.953
5	19.6%	0.355	0.369	0.964
4	32.7%	0.672	0.696	0.966
3	24.8%	0.905	0.944	0.959
2	5.5%	0.941	0.998	0.943
1	0.2%	0.924	1.000	0.924
(F) Discount Factor for Future Funding:				0.933
* 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	0.0%	0.000	0.000	1.000
16	1.4%	0.014	0.014	0.990
15	0.7%	0.021	0.021	0.977
14	0.7%	0.028	0.029	0.966
13	0.7%	0.034	0.036	0.955
12	1.4%	0.047	0.049	0.952
11	1.4%	0.059	0.063	0.945
10	1.3%	0.072	0.076	0.938
9	2.0%	0.090	0.096	0.934
8	4.4%	0.131	0.140	0.939
7	7.5%	0.203	0.215	0.945
6	12.9%	0.327	0.345	0.950
5	29.7%	0.615	0.642	0.959
4	28.8%	0.888	0.930	0.956
3	6.9%	0.939	0.998	0.940
2	0.2%	0.922	1.000	0.922
1	0.0%	0.904	1.000	0.904
(F) Discount Factor for Future Funding:				0.913
* 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	0.0%	0.000	0.000	1.000
16	1.3%	0.013	0.013	0.990
15	0.6%	0.019	0.019	0.977
14	0.6%	0.025	0.026	0.966
13	0.6%	0.030	0.032	0.956
12	1.2%	0.042	0.044	0.952
11	1.2%	0.053	0.057	0.945
10	1.2%	0.064	0.069	0.938
9	1.8%	0.081	0.086	0.934
8	4.0%	0.119	0.126	0.939
7	6.9%	0.185	0.195	0.945
6	12.0%	0.300	0.315	0.951
5	28.6%	0.577	0.601	0.960
4	30.6%	0.869	0.907	0.958
3	8.9%	0.940	0.997	0.943
2	0.3%	0.925	1.000	0.925
1	0.0%	0.907	1.000	0.907
(F) Discount Factor for Future Funding:				0.916
* 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	0.0%	0.000	0.000	1.000
16	1.3%	0.013	0.013	0.990
15	0.6%	0.019	0.019	0.977
14	0.6%	0.025	0.026	0.966
13	0.6%	0.030	0.032	0.956
12	1.2%	0.042	0.044	0.952
11	1.2%	0.053	0.057	0.945
10	1.2%	0.064	0.069	0.938
9	1.8%	0.081	0.086	0.934
8	4.0%	0.119	0.126	0.939
7	6.9%	0.185	0.195	0.945
6	12.0%	0.300	0.315	0.951
5	28.6%	0.577	0.601	0.960
4	30.6%	0.869	0.907	0.958
3	8.9%	0.940	0.997	0.943
2	0.3%	0.925	1.000	0.925
1	0.0%	0.907	1.000	0.907
(F) Discount Factor for Future Funding:				0.916
* Assumed Investment Rate:				2.0%

Municipal Pooling Authority - Liability - 100K & SIR Analyses

Confidence Level Table

Probability	Projected Losses	Outstanding Losses
95%	1.850	1.549
90	1.597	1.379
85	1.445	1.284
80	1.331	1.214
75	1.240	1.159
70	1.162	1.112
65	1.094	1.071
60	1.032	1.034
55	0.976	1.000
50	0.922	0.968
45	0.871	0.937
40	0.821	0.907
35	0.772	0.877
30	0.723	0.847
25	0.672	0.815

To read table: For the above retention, there is a 90% chance that final loss settlements will be less than 1.597 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
7/1/1998	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)
7/1/2019	6/30/2020	2019-2020	1,000,000	(none)
7/1/2020	6/30/2021	2020-2021	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 10/31/19

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)
1998-1999	\$2,510,333	0	0	\$2,510,333	\$0	\$580,310	\$1,930,023	\$580,310	\$2,510,333	\$2,510,333
1999-2000	1,935,613	0	0	1,935,613	0	437,958	1,497,656	437,958	1,935,613	1,935,613
2000-2001	3,056,849	0	0	3,056,849	0	1,552,269	1,504,580	1,552,269	3,056,849	3,056,849
2001-2002	1,987,998	0	0	1,987,998	0	340,892	1,647,105	340,892	1,987,998	1,987,998
2002-2003	3,603,454	0	0	3,603,454	0	1,560,831	2,042,623	1,560,831	3,603,454	3,603,454
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	3,125,614	0	0	3,125,614	11,672	1,811,672	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	5,688,787	0	0	5,688,787	0	3,273,547	2,415,240	3,273,547	5,688,787	5,688,787
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	4,442,806	0	0	4,442,806	0	2,294,827	2,147,978	2,294,827	4,442,806	4,442,806
2011-2012	6,270,163	0	0	6,270,163	0	3,365,298	2,904,864	3,365,298	6,270,163	6,270,163
2012-2013	3,577,859	0	0	3,577,859	0	1,742,262	1,835,597	1,742,262	3,577,859	3,577,859
2013-2014	3,609,673	0	0	3,609,673	0	1,636,161	1,973,511	1,636,161	3,609,673	3,609,673
2014-2015	6,054,564	0	0	6,054,564	0	3,650,649	2,403,915	3,650,649	6,054,564	6,054,564
2015-2016	6,519,400	0	0	6,519,400	0	3,351,378	3,168,023	3,351,378	6,519,400	6,519,400
2016-2017	7,190,053	0	0	7,190,053	0	4,033,232	3,156,821	4,033,232	7,190,053	7,190,053
2017-2018	4,535,228	0	0	4,535,228	0	1,751,745	2,783,483	1,751,745	4,535,228	4,535,228
2018-2019	4,076,480	0	0	4,076,480	0	1,517,130	2,559,350	1,517,130	4,076,480	4,076,480
2019-2020	202,821	0	0	202,821	0	0	202,821	0	202,821	202,821
Total	\$91,162,923	\$0	\$0	\$91,162,923	\$11,672	\$44,523,724	\$46,639,199	\$44,512,051	\$91,151,251	\$91,151,251

Notes:

- (A) Years are 7/1 to 6/30.
- (B) Provided by the Authority. Amounts are gross of deductibles, net of recoveries.
- (C)
- (D)
- (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 10/31/19

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)
1998-1999	2,510,333	0	0	\$2,510,333	\$0	\$580,310	\$1,930,023	\$580,310	\$2,510,333	\$2,510,333
1999-2000	1,935,613	0	0	1,935,613	0	437,958	1,497,656	437,958	1,935,613	1,935,613
2000-2001	3,056,849	0	0	3,056,849	0	1,552,269	1,504,580	1,552,269	3,056,849	3,056,849
2001-2002	1,987,998	0	0	1,987,998	0	340,892	1,647,105	340,892	1,987,998	1,987,998
2002-2003	3,590,037	0	0	3,590,037	0	1,547,909	2,042,128	1,547,909	3,590,037	3,590,037
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	3,125,614	0	0	3,125,614	11,672	1,811,672	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	5,370,167	0	0	5,370,167	0	2,958,277	2,411,890	2,958,277	5,370,167	5,370,167
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	7,287,481	0	0	7,287,481	0	4,353,261	2,934,221	4,353,261	7,287,481	7,287,481
2010-2011	4,556,190	0	0	4,556,190	0	2,418,088	2,138,102	2,418,088	4,556,190	4,556,190
2011-2012	6,226,021	0	0	6,226,021	0	3,327,818	2,898,202	3,327,818	6,226,021	6,226,021
2012-2013	3,576,549	0	0	3,576,549	0	1,741,475	1,835,074	1,741,475	3,576,549	3,576,549
2013-2014	3,608,360	0	0	3,608,360	0	1,636,161	1,972,198	1,636,161	3,608,360	3,608,360
2014-2015	5,128,453	0	0	5,128,453	0	2,726,699	2,401,754	2,726,699	5,128,453	5,128,453
2015-2016	4,311,499	0	0	4,311,499	0	1,577,083	2,734,416	1,577,083	4,311,499	4,311,499
2016-2017	4,287,266	0	0	4,287,266	0	1,625,544	2,661,722	1,625,544	4,287,266	4,287,266
2017-2018	1,121,541	0	0	1,121,541	0	0	1,121,541	0	1,121,541	1,121,541
2018-2019	566,112	0	0	566,112	0	0	566,112	0	566,112	566,112
2019-2020	43,881	0	0	43,881	0	0	43,881	0	43,881	43,881
Total	\$77,761,242	\$0	\$0	\$77,761,242	\$11,672	\$35,900,884	\$41,860,357	\$35,889,212	\$77,749,569	\$77,749,569

Notes:

- (A) Years are 7/1 to 6/30.
- (B) Provided by the Authority. Amounts are gross of deductibles, net of recoveries.
- (C)
- (D)
- (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 10/31/19

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 \$100,000 to SIR Layer (I)	Reserves Capped at SIR (J)	Reserves Capped at SIR & Aggregate (K)
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	13,417	0	0	13,417	0	12,922	494	12,922	13,417	13,417
2003-2004	0	0	0	0	0	0	0	0	0	0
2004-2005	0	0	0	0	0	0	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	318,620	0	0	318,620	0	315,270	3,350	315,270	318,620	318,620
2008-2009	305	0	0	305	0	99	206	99	305	305
2009-2010	11,441	0	0	11,441	0	63	11,378	63	11,441	11,441
2010-2011	-113,385	0	0	-113,385	0	-123,261	9,876	-123,261	-113,385	-113,385
2011-2012	44,142	0	0	44,142	0	37,480	6,662	37,480	44,142	44,142
2012-2013	1,310	0	0	1,310	0	787	524	787	1,310	1,310
2013-2014	1,313	0	0	1,313	0	0	1,313	0	1,313	1,313
2014-2015	926,111	0	0	926,111	0	923,950	2,161	923,950	926,111	926,111
2015-2016	2,207,901	0	0	2,207,901	0	1,774,295	433,606	1,774,295	2,207,901	2,207,901
2016-2017	2,902,786	0	0	2,902,786	0	2,407,688	495,099	2,407,688	2,902,786	2,902,786
2017-2018	3,413,688	0	0	3,413,688	0	1,751,745	1,661,943	1,751,745	3,413,688	3,413,688
2018-2019	3,510,368	0	0	3,510,368	0	1,517,130	1,993,238	1,517,130	3,510,368	3,510,368
2019-2020	158,940	0	0	158,940	0	0	158,940	0	158,940	158,940
Total	\$13,401,681	\$0	\$0	\$13,401,681	\$0	\$8,622,839	\$4,778,842	\$8,622,839	\$13,401,681	\$13,401,681

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 10/31/19

Accident Year (A)	Reported Claims (B)	Additions to Reported Claims (C)	Subtractions to Reported Claims (D)	Adjusted Reported Claims (E)	Closed Claims (F)	Additions to Closed Claims (G)	Subtractions to Closed Claims (H)	Adjusted Closed Claims (I)	Open Claims (J)	Adjusted Open Claims (K)
1998-1999	537	0	0	537	537	0	0	537	0	0
1999-2000	484	0	0	484	484	0	0	484	0	0
2000-2001	462	0	0	462	462	0	0	462	0	0
2001-2002	509	0	0	509	509	0	0	509	0	0
2002-2003	576	0	0	576	571	0	0	571	5	5
2003-2004	497	0	0	497	497	0	0	497	0	0
2004-2005	570	0	0	570	570	0	0	570	0	0
2005-2006	572	0	0	572	571	0	0	571	1	1
2006-2007	530	0	0	530	530	0	0	530	0	0
2007-2008	522	0	0	522	509	0	0	509	13	13
2008-2009	447	0	0	447	447	0	0	447	0	0
2009-2010	512	0	0	512	511	0	0	511	1	1
2010-2011	422	0	0	422	418	0	0	418	4	4
2011-2012	381	0	0	381	379	0	0	379	2	2
2012-2013	402	0	0	402	401	0	0	401	1	1
2013-2014	414	0	0	414	413	0	0	413	1	1
2014-2015	411	0	0	411	401	0	0	401	10	10
2015-2016	532	0	0	532	512	0	0	512	20	20
2016-2017	539	0	0	539	508	0	0	508	31	31
2017-2018	434	0	0	434	382	0	0	382	52	52
2018-2019	457	0	0	457	261	0	0	261	196	196
2019-2020	100	0	0	100	19	0	0	19	81	81
Total	10,310	0	0	10,310	9,892	0	0	9,892	418	418

Notes:

- (A) Years are 7/1 to 6/30.
- (B) Provided by the Authority. Amounts are gross of deductibles, net of recoveries.
- (C)
- (D)
- (E) (B) + (C) + (D).
- (F) Provided by the Authority.
- (G)
- (H)
- (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)
1998-1999							
1999-2000							
2000-2001							
2001-2002							
2002-2003							
2003-2004			1,888,700				1.484
2004-2005			1,973,887				1.448
2005-2006			2,098,594				1.413
2006-2007			2,274,752				1.379
2007-2008			2,531,867				1.345
2008-2009			2,654,784				1.312
2009-2010			2,596,305				1.280
2010-2011			2,428,460				1.249
2011-2012			2,411,119				1.219
2012-2013			2,396,206				1.189
2013-2014			2,462,209				1.160
2014-2015			2,580,161				1.132
2015-2016			2,933,767				1.104
2016-2017			3,116,809				1.077
2017-2018			3,207,109				1.051
2018-2019			3,460,525				1.025
2019-2020			3,564,341				1.000
2020-2021			3,671,271				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)
1998-1999							
1999-2000							
2000-2001							
2001-2002							
2002-2003							
2003-2004			2,802,831				2,802,831
2004-2005			2,858,188				2,858,188
2005-2006			2,965,313				2,965,313
2006-2007			3,136,883				3,136,883
2007-2008			3,405,361				3,405,361
2008-2009			3,483,077				3,483,077
2009-2010			3,323,270				3,323,270
2010-2011			3,033,147				3,033,147
2011-2012			2,939,154				2,939,154
2012-2013			2,849,089				2,849,089
2013-2014			2,856,162				2,856,162
2014-2015			2,920,742				2,920,742
2015-2016			3,238,879				3,238,879
2016-2017			3,356,803				3,356,803
2017-2018			3,370,672				3,370,672
2018-2019			3,547,038				3,547,038
2019-2020			3,564,341				3,564,341
2020-2021			3,671,271				3,671,271
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)).