

# **Monterey Bay Area Self Insurance Authority**

**An Actuarial Review of the  
Liability Self-Insurance Program**

**BAY ACTUARIAL CONSULTANTS  
Moraga, California  
March 15, 2017**

# Bay Actuarial Consultants

March 15, 2017

Mr. Conor Boughey  
Vice President  
Alliant Insurance Services  
100 Pine Street, 11th Floor  
San Francisco, CA 94111

Dear Mr. Boughey:

We are pleased to present Bay Actuarial's Actuarial Review of the Monterey Bay Area Self Insurance Authority's General and Auto Liability self-insurance program. We appreciate the opportunity to serve the Authority.

If you have any questions, please call me at (925) 377-5269.

Respectfully,

BAY ACTUARIAL CONSULTANTS



Jack Joyce, FCAS, MAAA  
Principal

# Monterey Bay Area Self Insurance Authority

## An Actuarial Review of the Liability Self-Insurance Program

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# **Monterey Bay Area Self Insurance Authority**

## **An Actuarial Review of the Liability Self-Insurance Program**

### **Introduction**

# Monterey Bay Area Self Insurance Authority

## An Actuarial Review of the Liability Self-Insurance Program

### Introduction

#### Background & Purpose

The Monterey Bay Area Self Insurance Authority (“MBASIA”) self-insures its general and auto liability claims. The Authority has asked Bay Actuarial Consultants to provide an actuarial report on its liability self-insurance program. The specific topics covered in this report include the following:

- 1) **Projected 2017-18 Loss Rate.** A projection of the losses expected to be incurred during 2017-18, expressed in terms of a rate of loss per \$100 of payroll.
- 2) **Unpaid Losses.** We projected the Authority’s liability for unpaid losses as of June 30, 2017.
- 3) **Discounting.** We have also discounted the projected 2017-18 losses and the liabilities to present value, assuming a 1.0% interest rate. The discounted estimates take into account the time value of money as general and auto liability costs discharge over an extended timeframe.
- 4) **Variability of Estimates.** We have included an analysis of items (1) and (2) above, in terms of “probability levels.”
- 5) **Short-Term versus Long-Term.** We have broken out the liabilities into their short-term and long-term components.

## **Conditions & Limitations**

We prepared this report for the Authority's internal use. The Authority may provide a copy to its financial auditors. Bay Actuarial does not authorize any other use. In particular, those interested in providing insurance to the Authority must perform their own actuarial analysis and may not rely upon our work.

Risk Management Services and Alliant Insurance Services provided the loss, payroll, and excess insurance information. We did not audit this data and are not responsible for its accuracy. In any actuarial analysis the accuracy and relevance of the conclusions and the reasonableness of the recommendations depend upon the accuracy and relevance of the underlying data.

The term "losses" refers to all costs that can be associated with a specific claim. These include loss payments, attorney's fees, and other expenses linked to a specific claim.

The actuarial projections in this report are uncertain estimates. Uncertainty is inherent and unavoidable because many of the events that will determine future claims costs have not yet taken place. These events include, but are not limited to, future legislation that may affect the tort liability system, changes in the rate of inflation, and the outcomes of current and future litigation and settlement negotiations. Our projections are based upon the Authority's historical experience. We did not anticipate any extraordinary changes in the various factors that might affect the future cost of claims. We used actuarial methods that should produce reasonable results given current information. There is no guarantee, express or implied, that losses will develop as projected in this report.

## **Organization of the Report**

We divided the remainder of this report into seven sections: the *Management Summary*, the *Technical Approach* section, the *Summary Exhibits*, the *Fiscal Year End Exhibits*, the *Loss Projection Exhibits*, the *Future Loss Exhibits*, and the *Discounting Exhibits*.

The *Management Summary* gives an overview of the results of our analysis. The *Technical Approach* section explains and discusses the assumptions and details underlying our calculations. The *Exhibits* document the actual calculations used in developing our results.

# **Monterey Bay Area Self Insurance Authority**

## **An Actuarial Review of the Liability Self-Insurance Program**

### **Management Summary**

# Monterey Bay Area Self Insurance Authority

## An Actuarial Review of the Liability Self-Insurance Program

### Management Summary

#### Projected 2017-18 Losses and Loss Rates

Tables I and II shows the projected 2017-18 losses and loss rates at various probability levels, discounted and undiscounted. The rates in Table I are gross of the \$10,000 per loss deductible, while those in Table II are net of that deductible. We discounted the rates at 1.0% interest. The items in Tables I and II do not include claims handling fees (“ULAE”), administrative costs, or the cost of excess insurance coverage. The losses have been calculated assuming that CARMA will cover any general and auto liability losses that exceed \$1,000,000, and that the Employment Risk Management Authority (“ERMA”) will cover any EPL losses that exceed \$500,000.

Tables I and II show actuarial central estimates, plus estimates at various probability levels. The probability level rates correspond to the estimated probabilities that the indicated rate will be adequate. For example, we estimate that there is a 70% probability that the actual 2017-18 discounted loss rate, gross of deductibles (Table I) will be less than **\$3.01**.

Table V on page 11 shows factors to adjust these rates for interest rates other than 1.0%.

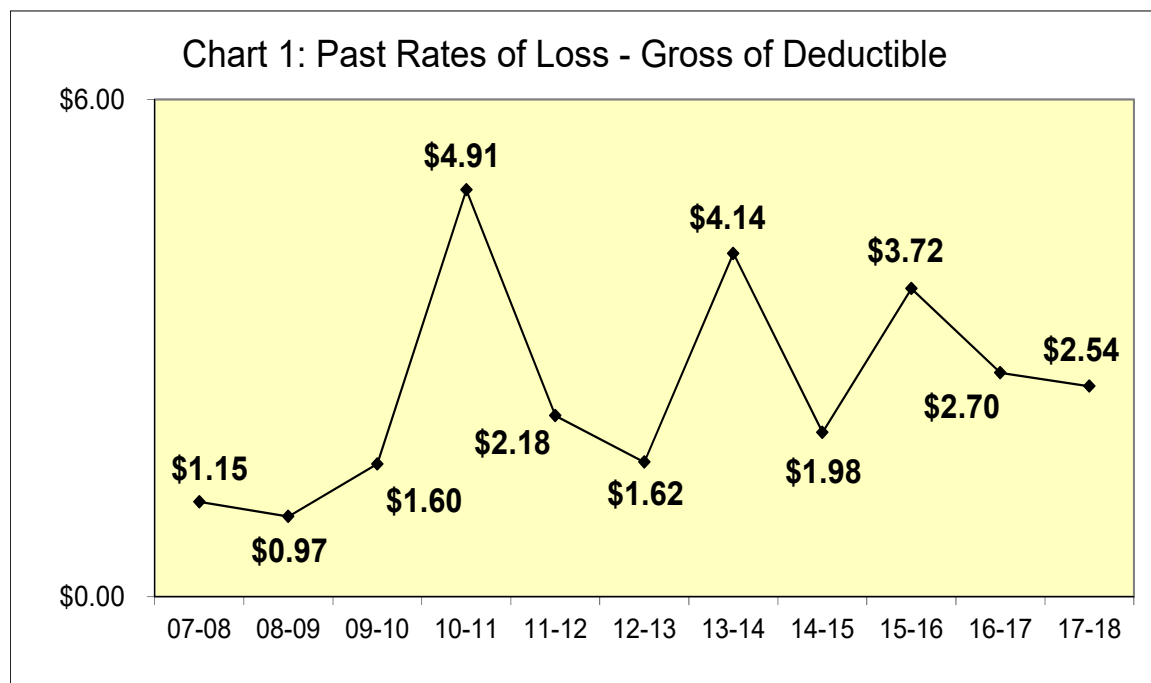
<b>Table I: Projected 2017-18 Losses and Loss Rates</b>				
<b>\$1M SIR (\$500K EPL SIR), Gross of \$10K Deductible, 1.0% Interest Rate</b>				
Probability <u>Level</u>	Undiscounted <u>Losses</u>	Discounted <u>Losses</u>	Undiscounted <u>Loss Rate</u>	Discounted <u>Loss Rate</u>
<b>Central Estimate</b>	<b>\$1,285,526</b>	<b>\$1,254,673</b>	<b>\$2.54</b>	<b>\$2.48</b>
70%	1,560,439	1,522,989	3.08	3.01
80%	1,880,028	1,834,907	3.72	3.63
90%	2,388,898	2,331,564	4.72	4.61
<b>2016-17 C.E.</b>	<b>\$1,190,386</b>	<b>\$1,159,436</b>	<b>\$2.54</b>	<b>\$2.47</b>
% Change from 16-17	+8.0%	+8.2%	+0.0%	+0.4%

<b>Table II: Projected 2017-18 Losses and Loss Rates</b>				
<b>\$1M SIR (\$500K EPL SIR), NET of \$10K Deductible, 1.0% Interest Rate</b>				
<u>Probability Level</u>	<u>Undiscounted Losses</u>	<u>Discounted Losses</u>	<u>Undiscounted Loss Rate</u>	<u>Discounted Loss Rate</u>
<b>Central Estimate</b>	<b>\$1,138,079</b>	<b>\$1,110,765</b>	<b>\$2.25</b>	<b>\$2.20</b>
70%	1,381,460	1,348,305	2.73	2.66
80%	1,664,392	1,624,447	3.29	3.21
90%	2,114,896	2,064,138	4.18	4.08
<b>2016-17 C.E.</b>	<b>\$1,047,011</b>	<b>\$1,018,741</b>	<b>\$2.23</b>	<b>\$2.17</b>
% Change from 16-17	+8.7%	+9.0%	+0.9%	+1.4%

The \$10,000 deductible rates in Table II are about 11% lower than the Table I rates.

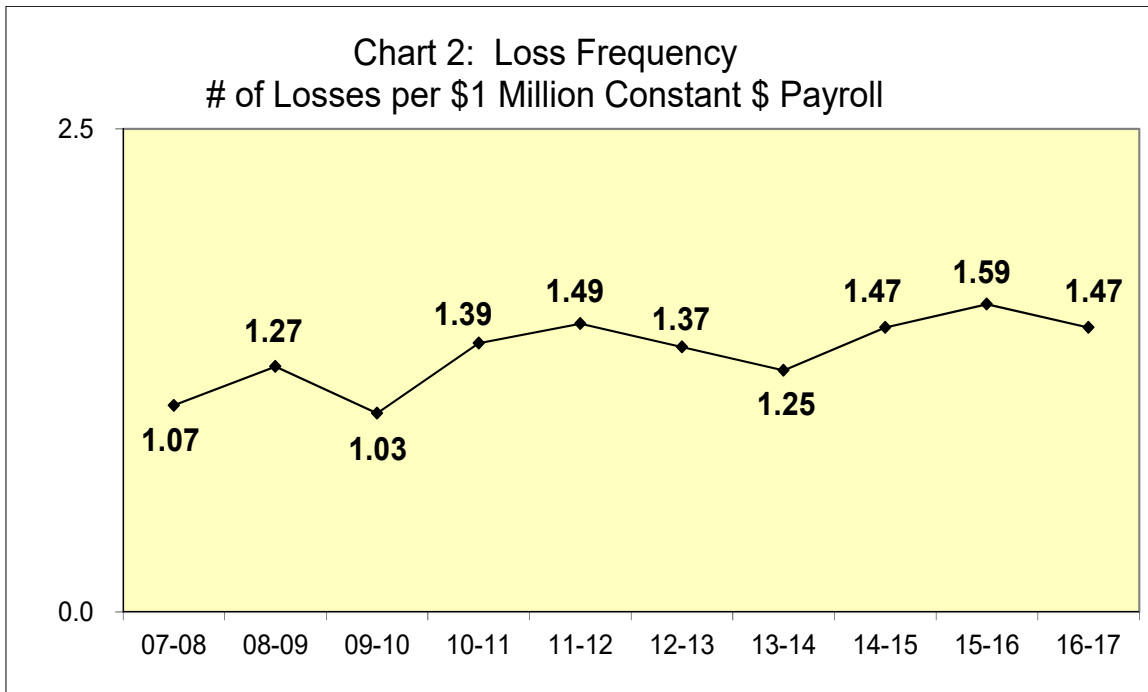
### The Authority's Past Rates of Loss

Chart 1 shows the Authority's estimated past rates of loss. The rate is equal to the estimated total losses for the year divided by the total insured payroll measured in hundreds of dollars. These rates are not discounted. The rate of **\$2.54** projected for 2017-18 in Chart 1 matches the undiscounted central estimate rate in Table I.



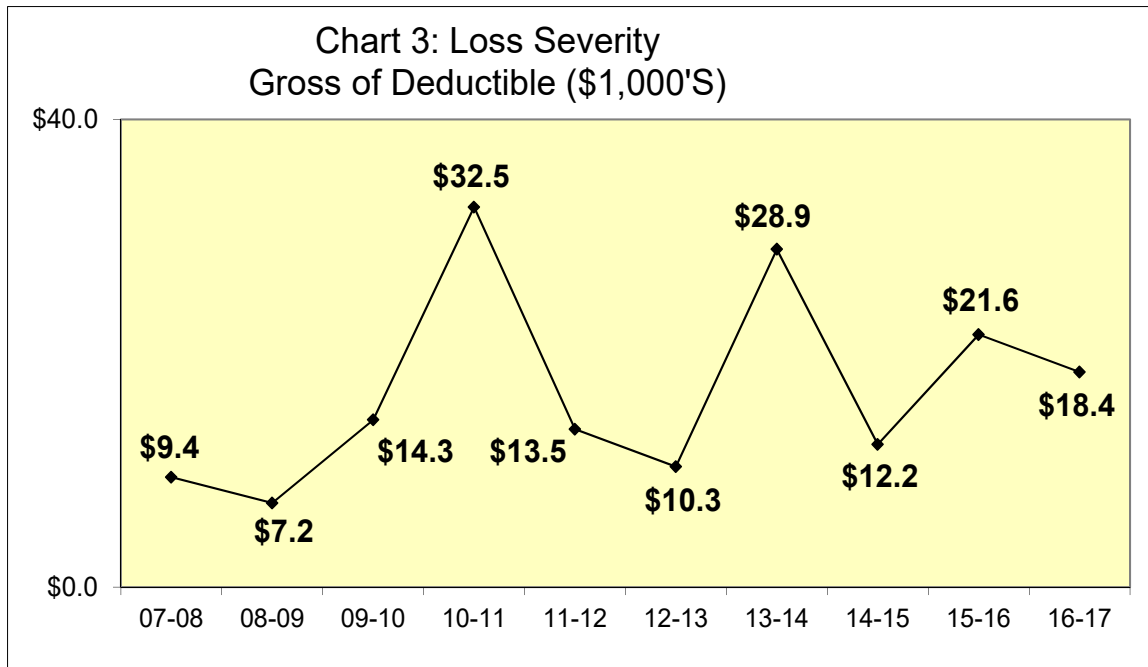
### Loss Frequency

Loss “frequency” is the number of losses divided by 2016-17 payroll. Chart 2 shows historical loss frequency by program year.



### Average Loss Amount

The average loss amount is the estimated ultimate losses divided by the number of losses. Chart 3 shows the estimated average cost per loss.



### Liability for Unpaid Losses – 6/30/17

We project that the Authority's liability for unpaid losses, undiscounted, will be **\$2,654,000** on June 30, 2017, or **\$2,623,000** if discounted at 1.0% interest. Table III shows the actuarial central estimate plus various probability levels. The estimates in Table III are net of the \$10,000 deductible that the members pay on each loss.

<b>Table III: Projected Liability for Unpaid Losses As of June 30, 2017 – Net of Deductibles</b>		
Probability <u>Level</u>	Undiscounted <u>Losses</u>	Discounted <u>at 1.0%</u>
50%	2,521,944	2,491,681
<b>Central Estimate</b>	<b>\$2,654,106</b>	<b>\$2,622,822</b>
60%	2,734,319	2,701,507
70%	2,999,786	2,963,789
80%	3,344,895	3,304,756
90%	3,849,283	3,803,092

Table IV shows the projected liability gross of deductibles.

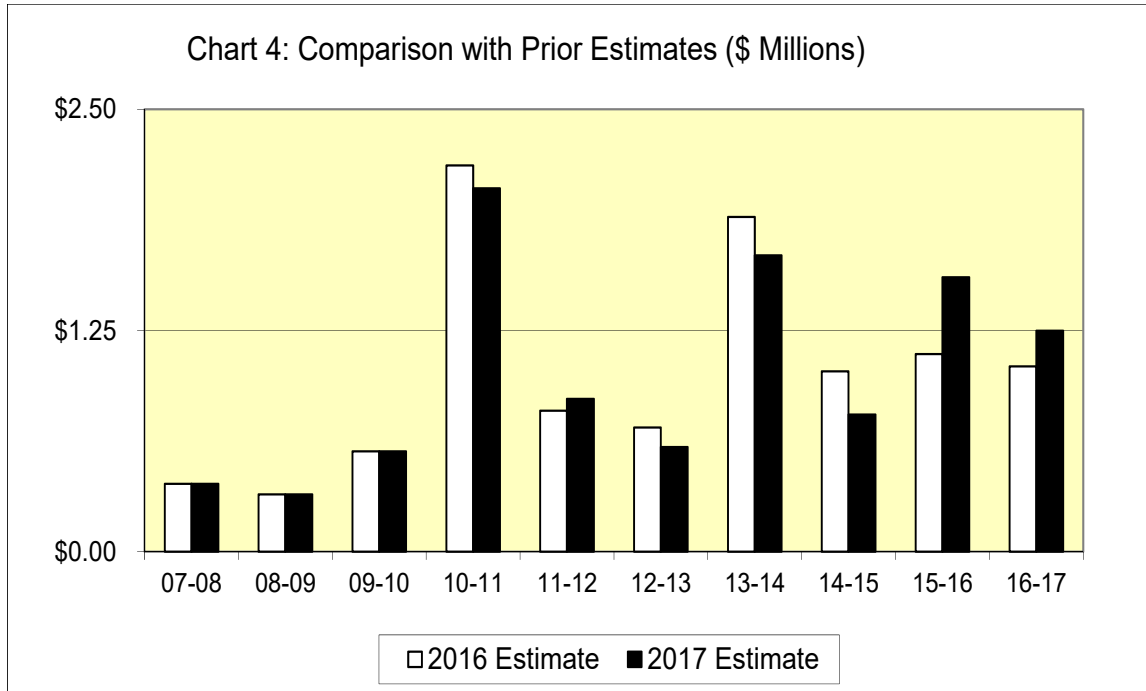
<b>Table IV: Projected Liability for Unpaid Losses As of June 30, 2017 – Gross of Deductibles</b>		
Probability <u>Level</u>	Undiscounted <u>Losses</u>	Discounted <u>at 1.0%</u>
50%	2,627,441	2,595,352
<b>Central Estimate</b>	<b>\$2,765,131</b>	<b>\$2,731,949</b>
60%	2,848,700	2,813,908
70%	3,125,272	3,087,103
80%	3,484,817	3,442,257
90%	4,010,305	3,961,327

### ULAE Liability

We estimate the liability for unpaid unallocated loss adjustment expenses ("ULAE") will be \$162,000 on June 30, 2017. See page 20.

## Comparison with 2016 Estimates

Chart 4 compares the prior estimates of the net losses by program year with the new estimates.



The overall reduction in the estimates for all years through 2015-16 was \$201,000.

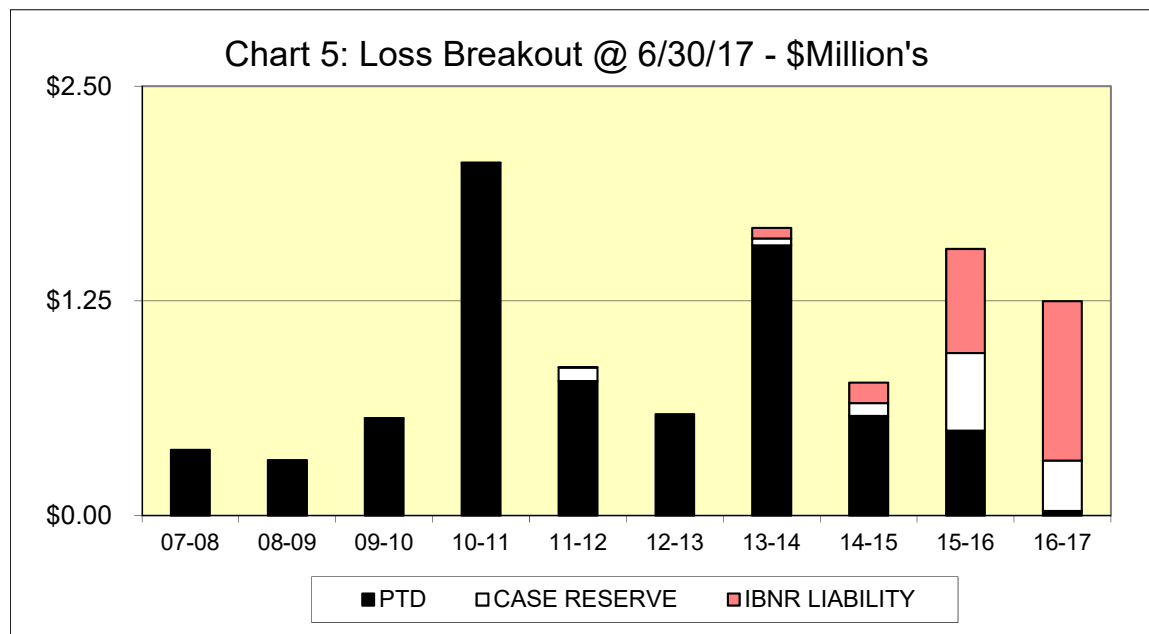
## Reconciliation of 12/31/15 & 12/31/16 Estimates

These estimates are based on analysis of the 12/31/16 data. Last year we used 12/31/15 data and estimated a net liability of \$2,896,000 on that date. Claims expenditures were \$1,179,000 during 2016. We reduced the loss estimates for 12/31/15 and prior by \$419,000 in this report. We estimate the losses incurred during 2016 at \$1,400,000.

Therefore starting with last year's 12/31/15 liability estimate, subtracting the claims payments and the change in the estimates and then adding the 2016 losses produces \$2,698,000 as the indicated liability on 12/31/16. This matched the direct calculation shown on page 23.

## Loss Breakout as of 6/30/17

In Table III we projected that the Authority's 6/30/17 liability, net of deductibles, would be **\$2,654,000**. This comprises **\$938,000** in case reserves for known claims and an IBNR liability of **\$1,716,000**. Chart 5 breaks out the projected total program year losses into their components: losses paid, case reserves, and IBNR liability. The details are on page 22. There is \$1.83 of IBNR liability for every \$1.00 of case reserves. Total IBNR is up 17% from last year while case reserves are down 27%.



## Short-Term Liability

Short-term liabilities are those expected to be discharged within twelve months. The total projected 6/30/17 liability of **\$2,654,000** comprises **\$1,269,000** of short-term and **\$1,385,000** of long-term liabilities.

## Interest Rates

The discounted liabilities and rates in this report were discounted at 1.0% interest. Here are the adjustments to make for different interest rate assumptions:

Interest Rate	0.0%	1.0%	1.06%	1.44%	1.5%
Gross Rates	+2.5%	+0.0%	-0.1%	-1.0%	-1.1%
Net Rates	+2.5%	+0.0%	-0.2%	-1.1%	-1.2%
Liabilities	+1.2%	+0.0%	0.0%	-0.5%	-0.6%

The Table includes columns for 1.06% and 1.44% interest rates. Those are the “risk-free buy-and-hold” interest rates. We obtained them by calculating the overall yield on a hypothetical portfolio of US Treasuries selected to mature to match the future claims expenditures. The portfolio that matches the payments on the 2017-18 losses yields 1.44% and the portfolio matching the 6/30/17 liability expenditures yields 1.06%.

# **Monterey Bay Area Self Insurance Authority**

## **An Actuarial Review of the Liability Self-Insurance Program**

### **Technical Approach**

# Monterey Bay Area Self Insurance Authority

## An Actuarial Review of the Liability Self-Insurance Program

### Technical Approach

This section describes the actuarial calculations.

#### **Exhibits**

##### ***Summary Exhibits***

These exhibits summarize the analysis and conclusions. Summary Exhibit 1 shows the projected liabilities for unpaid losses as of June 30, 2017. Summary Exhibit 2 shows our projected rate for the 2017-18 program year, which runs from July 1, 2017 to June 30, 2017. Summary Exhibit 3 shows the projected unpaid losses as of June 30, 2017 by program year on both discounted and non-discounted bases.

##### ***Fiscal Year End Exhibits***

These exhibits show the calculation of the projected unpaid losses as of June 30, 2017.

##### ***Loss Projection Exhibits***

These exhibits show the various actuarial projection methods and summarize the results for each program year.

We used five different actuarial methods:

- 1) Reported loss projection method;
- 2) Paid loss projection method;
- 3) IBNR to Case Reserves Ratio method;
- 4) Bornhuetter-Ferguson method using reported losses; and
- 5) Frequency times Severity method.

Loss Projection Exhibit 1 summarizes the results of these methods.

***Limited Loss Exhibits - \$250,000 Limit***

These exhibits show the estimated ultimate losses limited to \$250,000 per loss. We use this limited loss analysis to calculate the projected 2017-18 loss rate.

***Future Loss Exhibits***

These exhibits show the projection of the expected rate for 2017-18.

***Discounting Exhibits***

These exhibits show the discounting of the remaining unpaid losses and the projected future loss rate. They also include the Program Information Exhibit.

***Deductibles Exhibits***

These exhibits show the estimation of the losses that fall under the \$10,000 deductible.

***Claims Data***

We included development triangles for reported losses, paid losses, and number of claims reported, plus a Program Information Exhibit.

**Monterey Bay Area Self Insurance Authority**

**Actuarial Analysis of the  
General and Auto Liability Program**

**Summary Exhibits**

Monterey Bay Area Self Insurance Authority  
General and Auto Liability Program

Unpaid Losses as of 6/30/17  
**Losses Limited to SIR, NET of \$10K Deductible**

	<u>06/30/17</u>
(1) Projected Unpaid Losses:	\$2,654,106
(2) Discounted Value of Unpaid Losses: (Assuming 1.0% Interest Rate)	\$2,622,822

**Probability Levels for 6/30/17 Liabilities**

Probability Level <u>(3)</u>	Probability Factor <u>(4)</u>	Discounted * Liability <u>(5)</u>
50%	0.95	2,491,681
<b>Central Estimate</b>	<b>1.00</b>	<b>\$2,622,822</b>
60%	1.03	2,701,507
70%	1.13	2,963,789
80%	1.26	3,304,756
90%	1.45	3,803,092

\* Multiply by 1.012 to obtain undiscounted values.

Notes:

- (1) Page 19, Column (1).
- (2) Page 19, Column (2).
- (3) Estimated probability that funding will be adequate.
- (4) Estimated by BAC.
- (5) (2) x (4).

Monterey Bay Area Self Insurance Authority  
General and Auto Liability Program

Projected Loss Funding Rate for 2017-18  
**Losses Limited to \$1,000,000, NET of \$10K Deductible**

(1) Discounted Loss Rate:  
(as of July 1, 2017, 1.0% interest rate)

Loss Rates  
\$2.20

<u>Probability Levels</u>		
Probability Level (2)	Probability Factor (3)	Discounted * Rate (4)
50%	0.87	1.91
<b>Central Estimate</b>	<b>1.00</b>	<b>\$2.20</b>
60%	1.02	2.24
70%	1.21	2.66
80%	1.46	3.21
90%	1.86	4.09

\* Multiply by 1.025 to obtain undiscounted values.

Notes:

- (1) [Page 52, Column ] x [Page 58, Column (4)],  
adjusted for \$10,000 deductible.
- (2) Estimated probability that funding will be adequate.
- (3) Estimated by BAC.
- (4) (1) x (3).

Monterey Bay Area Self Insurance Authority  
General and Auto Liability Program

Projected Unpaid Losses as of June 30, 2017  
**Losses Limited to SIR, NET of \$10K Deductible**

Program Year	Undiscounted Value: Claims Liabilities as of 6/30/17 <u>(1)</u>	Discounted (1.0% Interest) Claims Liabilities as of 6/30/17 <u>(2)</u>	Estimated Ultimate Losses <u>(3)</u>
2007-08	\$0	\$0	\$382,509
2008-09	0	0	323,426
2009-10	0	0	566,348
2010-11	0	0	2,053,309
2011-12	81,200	80,797	863,528
2012-13	0	0	590,087
2013-14	99,676	98,935	1,673,945
2014-15	194,174	192,644	773,907
2015-16	1,057,463	1,047,254	1,551,612
2016-17	1,221,592	1,203,192	1,248,789
Total	\$2,654,106	\$2,622,822	\$10,027,458

## Notes:

- (1) Page 22, Column (6).
- (2) Page 56, Column (3).
- (3) Page 22, Column (1).

Monterey Bay Area Self Insurance Authority  
General and Auto Liability Program

ULAE Projections and Calculation of Unpaid ULAE

(1) Selected ULAE Ratio: **8.7%**

	<u>Case Reserves with Development</u>	<u>"True" IBNR</u>	<u>Total</u>
(2) ULAE Ratio:	4.3%	8.7%	
(3) Estimated Unpaid Losses as of 12/31/16:	\$1,905,289	\$917,277	\$2,822,566
(4) Estimated Unpaid ULAE as of 12/31/16:	\$81,927	\$79,603	\$161,530
(5) Discounted Unpaid ULAE as of 12/31/16: ( 1.0% interest rate)			\$159,592

We project that the 6/30/17 ULAE liability  
will equal the 12/31/16 ULAE liability.

Notes:

- (1) Estimated by BAC.
- (2) "50-50 Rule."
- (3) Page 29, assuming 50% of IBNR is  
development on known claims.
- (4) (2) x [(3)].
- (5) (4) x [Page 56, Item ].

**Monterey Bay Area Self Insurance Authority**

**Actuarial Analysis of the  
General and Auto Liability Program**

**Fiscal Year End Exhibits**

Monterey Bay Area Self Insurance Authority  
General and Auto Liability Program

Projected Unpaid Losses as of June 30, 2017  
**Losses Limited to SIR, NET of \$10K Deductible**

Program Year	Estimated Ultimate Losses (1)	Projected Losses Paid as of 6/30/17 (2)	Projected Case Reserves 6/30/17 (3)	Projected Losses Reported as of 6/30/17 (4)	Projected IBNR as of 6/30/17 (5)	Projected Unpaid Losses as of 6/30/17 (6)
2007-08	\$382,509	\$382,509	\$0	\$382,509	\$0	\$0
2008-09	323,426	323,426	0	323,426	0	0
2009-10	566,348	566,348	0	566,348	0	0
2010-11	2,053,309	2,053,309	1	2,053,310	0	0
2011-12	863,528	782,328	79,118	861,446	2,082	81,200
2012-13	590,087	590,087	0	590,087	0	0
2013-14	1,673,945	1,574,269	38,666	1,612,935	61,010	99,676
2014-15	773,907	579,732	74,813	654,546	119,361	194,174
2015-16	1,551,612	494,149	452,480	946,628	604,983	1,057,463
2016-17	1,248,789	27,197	292,656	319,853	928,936	1,221,592
Total	\$10,027,458	\$7,373,353	\$937,734	\$8,311,087	\$1,716,372	\$2,654,106

## Notes:

(1) through (6) Page 24 entries minus Page 27 entries.

Monterey Bay Area Self Insurance Authority  
General and Auto Liability Program

Estimated Unpaid Losses as of December 31, 2016  
**Losses Limited to SIR, NET of \$10K Deductible**

Program Year	Estimated Ultimate Losses (1)	Losses Paid as of 12/31/16 (2)	Case Reserves 12/31/16 (3)	Losses Reported as of 12/31/16 (4)	Estimated IBNR as of 12/31/16 (5)	Estimated Unpaid Losses as of 12/31/16 (6)
2007-08	\$382,509	\$382,509	\$0	\$382,509	\$0	\$0
2008-09	323,426	323,426	0	323,426	0	0
2009-10	566,348	566,348	0	566,348	0	0
2010-11	2,053,309	2,053,309	0	2,053,309	0	0
2011-12	863,528	768,381	90,979	859,360	4,168	95,147
2012-13	590,087	590,087	0	590,087	0	0
2013-14	1,673,945	1,563,920	23,443	1,587,363	86,582	110,025
2014-15	773,907	407,851	162,953	570,804	203,103	366,056
2015-16	1,551,612	49,630	649,932	699,561	852,050	1,501,982
2016-17	624,394	0	0	0	624,394	624,394
Total	\$9,403,064	\$6,705,460	\$927,306	\$7,632,766	\$1,770,298	\$2,697,604

## Notes:

(1) through (6) Page 26 entries minus Page 29 entries.

Monterey Bay Area Self Insurance Authority  
General and Auto Liability Program

Projected Unpaid Losses as of June 30, 2017  
Losses Limited to SIR, Gross of \$10K Deductible

Program Year	Estimated Ultimate Losses (1)	Projected Losses Paid as of 6/30/17 (2)	Projected Case Reserves 6/30/17 (3)	Projected Losses Reported as of 6/30/17 (4)	Projected IBNR as of 6/30/17 (5)	Projected Unpaid Losses as of 6/30/17 (6)
2007-08	\$500,365	\$500,365	\$0	\$500,365	\$0	\$0
2008-09	455,371	455,371	0	455,371	0	0
2009-10	728,936	728,936	0	728,936	0	0
2010-11	2,240,499	2,240,499	1	2,240,499	0	0
2011-12	1,000,000	915,872	82,046	997,918	2,082	84,128
2012-13	703,418	703,418	0	703,418	0	0
2013-14	1,790,000	1,689,927	38,994	1,728,921	61,079	100,073
2014-15	890,000	687,208	82,320	769,528	120,472	202,792
2015-16	1,710,000	611,598	477,801	1,089,398	620,602	1,098,402
2016-17	1,340,000	60,264	308,269	368,533	971,467	1,279,736
Total	\$11,358,589	\$8,593,458	\$989,431	\$9,582,889	\$1,775,700	\$2,765,131

## Notes:

- (1) Page 31, Column (6).
- (2) Page 25, Column (3).
- (3) (4) - (2).
- (4) Page 25, Column (6).
- (5) (1) - (4).
- (6) (3) + (5).

Monterey Bay Area Self Insurance Authority  
General and Auto Liability Program

Projected Paid and Reported Losses between 1/1/17 and 6/30/17  
Losses Limited to SIR, Gross of \$10K Deductible

Program Year	Losses Paid as of 12/31/16 (1)	Projected Losses Paid 1/1/17 - 6/30/17 (2)	Projected Losses Paid as of 6/30/17 (3)	Losses Reported as of 12/31/16 (4)	Projected Losses Reported 1/1/17 - 6/30/17 (5)	Projected Losses Reported as of 6/30/17 (6)
2007-08	\$500,365	\$0	\$500,365	\$500,365	\$0	\$500,365
2008-09	455,371	0	455,371	455,371	0	455,371
2009-10	728,936	0	728,936	728,936	0	728,936
2010-11	2,240,499	0	2,240,499	2,240,499	1	2,240,499
2011-12	898,996	16,876	915,872	995,832	2,086	997,918
2012-13	703,418	0	703,418	703,418	0	703,418
2013-14	1,679,292	10,635	1,689,927	1,703,280	25,641	1,728,921
2014-15	509,954	177,254	687,208	684,806	84,722	769,528
2015-16	141,722	469,876	611,598	828,446	260,952	1,089,398
2016-17	7,470	52,794	60,264	13,082	355,451	368,533
<b>Total</b>	<b>\$7,866,022</b>	<b>\$727,436</b>	<b>\$8,593,458</b>	<b>\$8,854,034</b>	<b>\$728,854</b>	<b>\$9,582,889</b>

## Notes:

- (1) Page 33, Column (1).
- (2) Projected by BAC.
- (3) (1) + (2).
- (4) Page 32, Column (1).
- (5) Projected by BAC.
- (6) (4) + (5).

Monterey Bay Area Self Insurance Authority  
General and Auto Liability Program

Estimated Unpaid Losses as of December 31, 2016  
Losses Limited to SIR, Gross of \$10K Deductible

Program Year	Estimated Ultimate Losses (1)	Losses Paid as of 12/31/16 (2)	Case Reserves 12/31/16 (3)	Losses Reported as of 12/31/16 (4)	Estimated IBNR as of 12/31/16 (5)	Estimated Unpaid Losses as of 12/31/16 (6)
2007-08	\$500,365	\$500,365	\$0	\$500,365	\$0	\$0
2008-09	455,371	455,371	0	455,371	0	0
2009-10	728,936	728,936	0	728,936	0	0
2010-11	2,240,499	2,240,499	0	2,240,499	0	0
2011-12	1,000,000	898,996	96,836	995,832	4,168	101,004
2012-13	703,418	703,418	0	703,418	0	0
2013-14	1,790,000	1,679,292	23,988	1,703,280	86,720	110,708
2014-15	890,000	509,954	174,852	684,806	205,194	380,046
2015-16	1,710,000	141,722	686,724	828,446	881,554	1,568,278
2016-17	670,000	7,470	5,612	13,082	656,918	662,530
Total	\$10,688,589	\$7,866,022	\$988,012	\$8,854,034	\$1,834,555	\$2,822,567

## Notes:

- (1) Page 31, Column (6).  
2016-17 entry adjusted for incomplete year through 12/31/16.
- (2) Page 33, Column (1).
- (3) (4) - (2).
- (4) Page 32, Column (1).
- (5) (1) - (4).
- (6) (1) - (2).

Monterey Bay Area Self Insurance Authority  
General and Auto Liability Program

Projected Unpaid Deductibles as of June 30, 2017  
Losses Limited to \$10K Deductible

Program Year	Estimated Ultimate Deductibles (1)	Projected Ded Paid as of 6/30/17 (2)	Projected Case Reserves 6/30/17 (3)	Projected Ded Reported as of 6/30/17 (4)	Projected Deductible IBNR as of 6/30/17 (5)	Projected Deductible Losses as of 6/30/17 (6)
2007-08	\$117,856	\$117,856	\$0	\$117,856	\$0	\$0
2008-09	131,945	131,945	0	131,945	0	0
2009-10	162,588	162,588	0	162,588	0	0
2010-11	187,190	187,190	0	187,190	0	0
2011-12	136,472	133,544	2,928	136,472	0	2,928
2012-13	113,331	113,331	0	113,331	0	0
2013-14	116,055	115,659	328	115,986	69	397
2014-15	116,093	107,475	7,507	114,982	1,111	8,618
2015-16	158,388	117,449	25,321	142,770	15,618	40,939
2016-17	91,211	33,067	15,614	48,681	42,530	58,144
Total	\$1,331,131	\$1,220,105	\$51,697	\$1,271,802	\$59,328	\$111,025

## Notes:

- (1) Page 60, Column (3).
- (2) Page 28, Column (3).
- (3) (4) - (2).
- (4) Page 28, Column (6).
- (5) (1) - (4).
- (6) (3) + (5).

Monterey Bay Area Self Insurance Authority  
General and Auto Liability Program

Projected Paid and Reported Deductibles between 1/1/17 and 6/30/17  
Losses Limited to \$10K Deductible

Program Year	Ded Paid as of 12/31/16 (1)	Projected Losses Paid 1/1/17 - 6/30/17 (2)	Projected Losses Paid as of 6/30/17 (3)	Losses Reported as of 12/31/16 (4)	Projected Losses Reported 1/1/17 - 6/30/17 (5)	Projected Losses Reported as of 6/30/17 (6)
2007-08	\$117,856	\$0	\$117,856	\$117,856	\$0	\$117,856
2008-09	131,945	0	131,945	131,945	0	131,945
2009-10	162,588	0	162,588	162,588	0	162,588
2010-11	187,190	0	187,190	187,190	0	187,190
2011-12	130,614	2,929	133,544	136,472	0	136,472
2012-13	113,331	0	113,331	113,331	0	113,331
2013-14	115,372	286	115,659	115,917	69	115,986
2014-15	102,103	5,372	107,475	114,002	980	114,982
2015-16	92,092	25,357	117,449	128,885	13,885	142,770
2016-17	7,470	25,597	33,067	13,082	35,599	48,681
Total	\$1,160,562	\$59,543	\$1,220,105	\$1,221,269	\$50,534	\$1,271,802

## Notes:

- (1) Page 29, Column (2).
- (2) Projected by BAC.
- (3) (1) + (2).
- (4) Page 29, Column (4).
- (5) Projected by BAC.
- (6) (4) + (5).

Monterey Bay Area Self Insurance Authority  
General and Auto Liability Program

Estimated Unpaid Deductibles as of December 31, 2016  
Losses Limited to \$10K Deductible

Program Year	Estimated Ultimate Deductibles (1)	Ded Paid as of 12/31/16 (2)	Case Reserves 12/31/16 (3)	Ded Reported as of 12/31/16 (4)	Estimated Deductible IBNR as of 12/31/16 (5)	Estimated Deductible Losses as of 12/31/16 (6)
2007-08	\$117,856	\$117,856	\$0	\$117,856	\$0	\$0
2008-09	131,945	131,945	0	131,945	0	0
2009-10	162,588	162,588	0	162,588	0	0
2010-11	187,190	187,190	0	187,190	0	0
2011-12	136,472	130,614	5,857	136,472	0	5,857
2012-13	113,331	113,331	0	113,331	0	0
2013-14	116,055	115,372	545	115,917	139	683
2014-15	116,093	102,103	11,899	114,002	2,091	13,990
2015-16	158,388	92,092	36,793	128,885	29,504	66,296
2016-17	45,606	7,470	5,612	13,082	32,523	38,136
Total	\$1,285,525	\$1,160,562	\$60,706	\$1,221,269	\$64,257	\$124,963

## Notes:

- (1) Page 60, Column (3).  
2016-17 adjusted for partial year through 12/31/16.
- (2) Provided by Risk Management Services.
- (3) (4) - (2).
- (4) Page 61, Column (1).
- (5) (1) - (4).
- (6) (1) - (2).

**Monterey Bay Area Self Insurance Authority**

**Actuarial Analysis of the  
General and Auto Liability Program**

**Loss Projection Exhibits**

Monterey Bay Area Self Insurance Authority  
General and Auto Liability Program

Selected Ultimate Losses  
Losses Limited to SIR, Gross of \$10K Deductible

Program Year	Reported Projection (1)	Paid Projection (2)	IBNR to Case Reserves Ratio (3)	B-F Method Using Reported (4)	Frequency Times Severity (5)	Selected Ultimate Losses (6)
2007-08	\$500,365	\$500,365	\$500,365	\$500,365	\$800,651	\$500,365
2008-09	455,371	455,371	455,371	455,371	977,413	455,371
2009-10	728,936	729,348	728,936	728,936	812,603	728,936
2010-11	2,240,499	2,240,790	2,240,499	2,240,499	1,129,088	2,240,499
2011-12	1,002,438	918,305	1,039,989	1,003,622	1,243,600	1,000,000
2012-13	719,369	729,371	703,418	728,574	1,173,622	703,418
2013-14	1,803,770	2,035,655	1,714,482	1,769,022	1,098,959	1,790,000
2014-15	900,033	1,189,169	810,699	972,985	1,328,872	890,000
2015-16	1,765,722	1,177,305	1,873,640	1,486,270	1,476,923	1,710,000
2016-17	1,159,984	2,022,395	744,711	1,270,999	1,401,600	1,340,000
Total	\$11,276,487	\$11,998,074	\$10,812,109	\$11,156,642	\$11,443,331	\$11,358,589

## Notes:

- (1) Page 32, Column (3).
- (2) Page 33, Column (3).
- (3) Page 34, Column (6).
- (4) Page 35, Column (6).
- (5) Page 39, Column (4).
- (6) Selected on the basis of (1) - (5).

Monterey Bay Area Self Insurance Authority  
General and Auto Liability Program

Reported Loss Development  
Losses Limited to SIR, Gross of \$10K Deductible

Program Year	Cumulative Reported Losses as of 12/31/16 <u>(1)</u>	Reported Development Factor as of 12/31/16 <u>(2)</u>	Projected Ultimate Losses <u>(3)</u>
2007-08	\$500,365	1.000	\$500,365
2008-09	455,371	1.000	455,371
2009-10	728,936	1.000	728,936
2010-11	2,240,499	1.000	2,240,499
2011-12	995,832	1.007	1,002,438
2012-13	703,418	1.023	719,369
2013-14	1,703,280	1.059	1,803,770
2014-15	684,806	1.314	900,033
2015-16	828,446	2.131	1,765,722
2016-17	13,082	88.670	1,159,984
Total	\$8,854,034		\$11,276,487

## Notes:

- (1) Provided by Risk Management Services.
- (2) Page 64.
- (3) (1) x (2), rounded.

Monterey Bay Area Self Insurance Authority  
General and Auto Liability Program

Paid Loss Projection  
Losses Limited to SIR, Gross of \$10K Deductible

Program Year	Cumulative Paid Losses as of 12/31/16 <u>(1)</u>	Paid Development Factor as of 12/31/16 <u>(2)</u>	Projected Ultimate Losses <u>(3)</u>
2007-08	\$500,365	1.000	\$500,365
2008-09	455,371	1.000	455,371
2009-10	728,936	1.001	729,348
2010-11	2,240,499	1.000	2,240,790
2011-12	898,996	1.021	918,305
2012-13	703,418	1.037	729,371
2013-14	1,679,292	1.212	2,035,655
2014-15	509,954	2.332	1,189,169
2015-16	141,722	8.307	1,177,305
2016-17	7,470	270.737	2,022,395
Total	\$7,866,022		\$11,998,074

## Notes:

- (1) Provided by Risk Management Services.
- (2) Page 65.
- (3) (1) x (2), rounded.

Monterey Bay Area Self Insurance Authority  
General and Auto Liability Program

IBNR to Case Reserves Ratio Method  
Losses Limited to SIR, Gross of \$10K Deductible

Program Year	Reported Development Factor as of 12/31/16 (1)	Paid Development Factor as of 12/31/16 (2)	IBNR to Case Reserves Ratio (3)	Case Reserves 12/31/16 (4)	Estimated IBNR as of 12/31/16 (5)	Estimated Ultimate Losses (6)
2007-08	1.000	1.000	0.000	\$0	\$0	\$500,365
2008-09	1.000	1.000	0.000	0	0	455,371
2009-10	1.000	1.001	0.000	0	0	728,936
2010-11	1.000	1.000	0.000	0	0	2,240,499
2011-12	1.007	1.021	0.456	96,836	44,157	1,039,989
2012-13	1.023	1.037	1.654	0	0	703,418
2013-14	1.059	1.212	0.467	23,988	11,202	1,714,482
2014-15	1.314	2.332	0.720	174,852	125,893	810,699
2015-16	2.131	8.307	1.522	686,724	1,045,194	1,873,640
2016-17	88.670	270.737	130.367	5,612	731,629	744,711
Total				\$988,012	\$1,958,075	\$10,812,109

## Notes:

- (1) Page 32, Column (2).
- (2) Page 33, Column (2).
- (3)  $[(1) - 1.000] \times (2) / [(2) - (1)]$ .
- (4) Page 32, Column (1) - Page 33, Column (1).
- (5) (3) x (4), rounded.
- (6) (5) + Page 32, Column (1).

Monterey Bay Area Self Insurance Authority  
General and Auto Liability Program

Bornhuetter-Ferguson Using Reported Losses  
Losses Limited to SIR, Gross of \$10K Deductible

Program Year	<i>A Priori</i> Ultimate Losses (1)	Cumulative Reported Loss Development Factors (2)	Percentage of Losses Not Yet Reported (3)	Expected Unreported Losses (4)	Losses Reported as of 12/31/16 (5)	Estimated Ultimate Losses (6)
2007-08	\$1,000,992	1.000	0.0%	\$0	\$500,365	\$500,365
2008-09	1,027,702	1.000	0.0%	0	455,371	455,371
2009-10	1,055,684	1.000	0.0%	0	728,936	728,936
2010-11	1,083,666	1.000	0.0%	0	2,240,499	2,240,499
2011-12	1,112,920	1.007	0.7%	7,790	995,832	1,003,622
2012-13	1,143,446	1.023	2.2%	25,156	703,418	728,574
2013-14	1,173,972	1.059	5.6%	65,742	1,703,280	1,769,022
2014-15	1,205,769	1.314	23.9%	288,179	684,806	972,985
2015-16	1,238,839	2.131	53.1%	657,824	828,446	1,486,270
2016-17	1,271,908	88.670	98.9%	1,257,917	13,082	1,270,999
	\$11,314,898			\$2,302,608	\$8,854,034	\$11,156,642

## Notes:

- (1) Page 36, Column (3).
- (2) Page 32, Column (2).
- (3)  $100\% - [1.000 / (2)]$ .
- (4)  $(1) \times (3)$ .
- (5) Page 32, Column (1).
- (6)  $(4) + (5)$ .

Monterey Bay Area Self Insurance Authority  
General and Auto Liability Program

*A Priori* Losses for Bornhuetter-Ferguson  
Losses Limited to SIR, Gross of \$10K Deductible

Program Year	<i>A Priori</i> 2016-17 Loss (1)	Factor to Remove Trend (2)	<i>A Priori</i> Ultimate Losses (3)
2007-08	\$1,271,908	0.787	\$1,000,992
2008-09	1,271,908	0.808	1,027,702
2009-10	1,271,908	0.830	1,055,684
2010-11	1,271,908	0.852	1,083,666
2011-12	1,271,908	0.875	1,112,920
2012-13	1,271,908	0.899	1,143,446
2013-14	1,271,908	0.923	1,173,972
2014-15	1,271,908	0.948	1,205,769
2015-16	1,271,908	0.974	1,238,839
2016-17	1,271,908	1.000	1,271,908
Total			\$11,314,898

## Notes:

- (1) Page 37, Average of Column (3).
- (2)  $1.000 / [\text{Page 37, Column (2)}]$ .
- (3)  $(1) \times (2)$ .

Monterey Bay Area Self Insurance Authority  
General and Auto Liability Program

*A Priori* Loss Rate for Bornhuetter-Ferguson Method  
At \$1M SIR, Gross of \$10K Deductible

Program Year	<i>A Priori</i> Ultimate Losses (1)	Estimated Pure Premium Trend (2)	Constant Dollar Ultimate Losses (3)
2007-08	\$500,365	1.271	\$635,947
2008-09	455,371	1.238	563,546
2009-10	728,936	1.205	878,381
2010-11	2,240,499	1.173	2,628,859
2011-12	995,832	1.142	1,137,728
2012-13	703,418	1.112	782,520
2013-14	1,911,891	1.083	2,070,973
2014-15	1,004,253	1.055	1,059,215
2015-16	1,645,578	1.027	1,690,009
2016-17	1,372,751	1.000	1,372,751
Average			\$1,281,993
07/08-15/16			\$1,271,908
		(4) A Priori 2016-17 Losses:	\$1,271,908

## Notes:

- (1) Page 38, Column (3).
- (2) Estimated by BAC.
- (3) (1) x (2).
- (4) Average of (3) excluding 2016-17.

Monterey Bay Area Self Insurance Authority  
General and Auto Liability Program

*A Priori* Ultimate losses  
Losses Limited to SIR, Gross of \$10K Deductible

Program Year	Reported Loss Projection (1)	Paid Loss Projection (2)	<i>A Priori</i> Selection (3)
2007-08	\$500,365	\$500,365	\$500,365
2008-09	455,371	455,371	455,371
2009-10	728,936	729,348	728,936
2010-11	2,240,499	2,240,790	2,240,499
2011-12	1,002,438	918,305	995,832
2012-13	719,369	729,371	703,418
2013-14	1,803,770	2,035,655	1,911,891
2014-15	900,033	1,189,169	1,004,253
2015-16	1,765,722	1,177,305	1,645,578
2016-17	1,159,984	2,022,395	1,372,751
Total	\$11,276,487	\$11,998,074	\$11,558,894

## Notes:

- (1) Page 32, Column (3).
- (2) Page 33, Column (3).
- (3) Selected on the basis of (1) and (2).

Monterey Bay Area Self Insurance Authority  
General and Auto Liability Program

Frequency Times Severity Method  
Losses Limited to SIR, Gross of \$10K Deductible

Program Year	Selected Claim Severity (1)	Factor to Remove Trend (2)	Selected Ultimate Claims (3)	Estimated Ultimate Losses (4)
2007-08	\$19,200	0.787	53	\$800,651
2008-09	19,200	0.808	63	977,413
2009-10	19,200	0.830	51	812,603
2010-11	19,200	0.852	69	1,129,088
2011-12	19,200	0.875	74	1,243,600
2012-13	19,200	0.899	68	1,173,622
2013-14	19,200	0.923	62	1,098,959
2014-15	19,200	0.948	73	1,328,872
2015-16	19,200	0.974	79	1,476,923
2016-17	19,200	1.000	73	1,401,600
Total				\$11,443,331

## Notes:

- (1) Page 40, Item (5).
- (2) 1.000 / [Page 40, Column (2)].
- (3) Page 41, Column (3).
- (4) (1) x (2) x (3).

Monterey Bay Area Self Insurance Authority  
General and Auto Liability Program

Calculation of Expected Claim Severity  
Frequency Times Severity Method  
At \$1M SIR, Gross of \$10K Deductible

Program Year	<i>A Priori</i> Ultimate Losses (1)	Estimated Severity Trend (2)	Selected Claim Count (3)	Trended Claim Severity (4)
2007-08	\$500,365	1.271	53	\$11,999
2008-09	455,371	1.238	63	8,945
2009-10	728,936	1.205	51	17,223
2010-11	2,240,499	1.173	69	38,099
2011-12	995,832	1.142	74	15,375
2012-13	703,418	1.112	68	11,508
2013-14	1,911,891	1.083	62	33,403
2014-15	1,004,253	1.055	73	14,510
2015-16	1,645,578	1.027	79	21,393
2016-17	1,372,751	1.000	73	18,805
Total	\$11,558,894		665	\$19,126
07/08-15/16	\$10,186,143		592	\$19,162
			(5) Selected Severity:	\$19,200

## Notes:

- (1) Page 38, Column (3).
- (2) Estimated by BAC.
- (3) Page 41, Column (3).
- (4) (1) x (2) / (3).
- (5) Selected on the basis of (4).

Monterey Bay Area Self Insurance Authority  
General and Auto Liability Program

Selected Claim Counts

Program Year	Reported Claim Count Projection (1)	Bornhuetter- Ferguson Method (2)	Selected Claim Count (3)
2007-08	53		53
2008-09	63		63
2009-10	51		51
2010-11	69		69
2011-12	74		74
2012-13	68		68
2013-14	62		62
2014-15	73		73
2015-16	79		79
2016-17	91	73	73
Total	683		665

Notes:

- (1) Page 42, Column (3).
- (2) Page 43, Column (6).
- (3) Selected on the basis of (1) and (2).

Monterey Bay Area Self Insurance Authority  
General and Auto Liability Program

Projection of Ultimate Claim Counts  
Projection of Reported Claims

Program Year	Total Claims Reported 12/31/16 <u>(1)</u>	Development Factors as of 12/31/16 <u>(2)</u>	Projected Ultimate Claims <u>(3)</u>
2007-08	53	1.000	53
2008-09	63	1.000	63
2009-10	51	1.000	51
2010-11	69	1.000	69
2011-12	74	1.000	74
2012-13	68	1.000	68
2013-14	62	1.000	62
2014-15	73	1.000	73
2015-16	77	1.026	79
2016-17	26	3.485	91
Average			68
07/08-15/16 Average			66

## Notes:

- (1) Provided by Risk Management Services.
- (2) Page 64.
- (3) (1) x (2), rounded.

Monterey Bay Area Self Insurance Authority  
General and Auto Liability Program

Projection of Ultimate Claim Counts  
Bornhuetter-Ferguson Method

Program Year	A Priori Claim Count (1)	Claim Development Factor (2)	Estimated Percentage of Claims Unreported (3)	Estimated Unreported Claims (4)	Reported Claims as of 12/31/16 (5)	Projected Ultimate Claims (6)
2016-17	66	3.485	71.3%	47	26	73

Notes:

- (1) Page 42, Column (3), average 2007-08 to 2015-16.
- (2) Page 42, Column (2).
- (3)  $100\% - [ 1.000 / (2) ]$ .
- (4)  $(1) \times (3)$ .
- (5) Page 42, Column (1).
- (6)  $(4) + (5)$ .

**Monterey Bay Area Self Insurance Authority**

**Actuarial Analysis of the  
General and Auto Liability Program**

**Limited Loss Analysis  
Losses Limited to \$250,000 per Loss**

Monterey Bay Area Self Insurance Authority  
General and Auto Liability Program

Selected Ultimate Losses  
Losses Limited to \$250,000, Gross of \$10K Deductible

Program Year	Reported Projection (1)	Paid Projection (2)	IBNR to Case Reserves Ratio (3)	B-F Method Using Reported (4)	B-F Method Using Paid (5)	Selected Ultimate Losses (6)
2007-08	\$500,365	\$500,365	\$500,365	\$500,365	\$500,365	\$500,365
2008-09	455,371	455,371	455,371	455,371	455,371	455,371
2009-10	698,626	698,777	698,626	698,626	698,626	698,626
2010-11	1,216,990	1,217,062	1,216,990	1,216,990	1,216,990	1,216,990
2011-12	693,092	603,377	693,092	693,092	602,705	693,000
2012-13	632,250	644,110	631,610	632,155	641,971	631,610
2013-14	957,838	1,055,980	954,264	955,996	994,479	960,000
2014-15	544,283	781,004	537,129	544,464	663,646	540,000
2015-16	1,234,246	904,992	1,267,785	1,002,667	596,691	1,170,000
2016-17	801,109	1,408,172	513,791	542,134	542,437	540,000
Total	\$7,734,170	\$8,269,210	\$7,469,023	\$7,241,860	\$6,913,281	\$7,405,962

Notes:

- (1) Page 46, Column (3).
- (2) Page 47, Column (3).
- (3) Page 48, Column (6).
- (4) Page 49, Column (6).
- (5) Page 50, Column (6).
- (6) Selected on the basis of (1) - (5).

Monterey Bay Area Self Insurance Authority  
General and Auto Liability Program

Reported Loss Development  
Losses Limited to \$250,000, Gross of \$10K Deductible

Program Year	Cumulative Reported Losses as of 12/31/16 <u>(1)</u>	Reported Development Factor as of 12/31/16 <u>(2)</u>	Projected Ultimate Losses <u>(3)</u>
2007-08	\$500,365	1.000	\$500,365
2008-09	455,371	1.000	455,371
2009-10	698,626	1.000	698,626
2010-11	1,216,990	1.000	1,216,990
2011-12	693,092	1.000	693,092
2012-13	631,610	1.001	632,250
2013-14	953,280	1.005	957,838
2014-15	529,306	1.028	544,283
2015-16	822,946	1.500	1,234,246
2016-17	13,082	61.237	801,109
Total	\$6,514,668		\$7,734,170

Notes:

- (1) Provided by Risk Management Services.
- (2) Estimated by BAC.
- (3) (1) x (2), rounded.

Monterey Bay Area Self Insurance Authority  
General and Auto Liability Program

Paid Loss Development  
Losses Limited to \$250,000, Gross of \$10K Deductible

Program Year	Cumulative Paid Losses as of 12/31/16 (1)	Paid Development Factor as of 12/31/16 (2)	Projected Ultimate Losses (3)
2007-08	\$500,365	1.000	\$500,365
2008-09	455,371	1.000	455,371
2009-10	698,626	1.000	698,777
2010-11	1,216,990	1.000	1,217,062
2011-12	597,235	1.010	603,377
2012-13	631,610	1.020	644,110
2013-14	929,292	1.136	1,055,980
2014-15	398,916	1.958	781,004
2015-16	141,722	6.386	904,992
2016-17	7,470	188.511	1,408,172
Total	\$5,577,597		\$8,269,210

Notes:

- (1) Provided by Risk Management Services.
- (2) Estimated by BAC.
- (3) (1) x (2), rounded.

Monterey Bay Area Self Insurance Authority  
General and Auto Liability Program

IBNR to Case Reserves Ratio Method  
Losses Limited to \$250,000, Gross of \$10K Deductible

Program Year	Reported LDF (1)	Paid LDF (2)	IBNR to Case Reserves Ratio (3)	Case Reserves as of 12/31/16 (4)	Estimated IBNR as of as of 12/31/16 (5)	Estimated Ultimate Losses (6)
2007-08	1.000	1.000	0.000	\$0	\$0	\$500,365
2008-09	1.000	1.000	0.000	0	0	455,371
2009-10	1.000	1.000	0.000	0	0	698,626
2010-11	1.000	1.000	0.000	0	0	1,216,990
2011-12	1.000	1.010	0.000	95,857	0	693,092
2012-13	1.001	1.020	0.055	0	0	631,610
2013-14	1.005	1.136	0.041	23,988	984	954,264
2014-15	1.028	1.958	0.060	130,390	7,823	537,129
2015-16	1.500	6.386	0.653	681,224	444,839	1,267,785
2016-17	61.237	188.511	89.220	5,612	500,709	513,791
Total				\$937,072	\$954,355	\$7,469,023

Notes:

- (1) Page 46, Column (2).
- (2) Page 47, Column (2).
- (3)  $[(1) - 1.000] \times (2) / [(2) - (1)]$ .
- (4) Page 46, Column (1) - Page 47, Column (1).
- (5) (3) x (4), rounded.
- (6) (5) + Page 46, Column (1).

Monterey Bay Area Self Insurance Authority  
General and Auto Liability Program

Bornhuetter-Ferguson Using Reported Losses  
Losses Limited to \$250,000, Gross of \$10K Deductible

Program Year	<i>A Priori</i> Ultimate Losses (1)	Cumulative Reported Loss Development Factors (2)	Percentage of Losses Not Yet Reported (3)	Expected Unreported Losses (4)	Losses Reported as of 12/31/16 (5)	Estimated Ultimate Losses (6)
2007-08	\$555,006	1.000	0.0%	\$0	\$500,365	\$500,365
2008-09	552,896	1.000	0.0%	0	455,371	455,371
2009-10	551,086	1.000	0.0%	0	698,626	698,626
2010-11	548,895	1.000	0.0%	0	1,216,990	1,216,990
2011-12	546,975	1.000	0.0%	0	693,092	693,092
2012-13	545,290	1.001	0.1%	545	631,610	632,155
2013-14	543,224	1.005	0.5%	2,716	953,280	955,996
2014-15	541,370	1.028	2.8%	15,158	529,306	544,464
2015-16	539,702	1.500	33.3%	179,721	822,946	1,002,667
2016-17	537,655	61.237	98.4%	529,052	13,082	542,134
Total	\$5,462,099			\$727,192	\$6,514,668	\$7,241,860

Notes:

- (1) Page 31, Column (6), adjusted for \$250K limit.
- (2) Page 46, Column (2).
- (3)  $100\% - [ 1.000 / (2) ]$ .
- (4)  $(1) \times (3)$ .
- (5) Page 46, Column (1).
- (6)  $(4) + (5)$ .

Monterey Bay Area Self Insurance Authority  
General and Auto Liability Program

Bornhuetter-Ferguson Using Paid Losses  
Losses Limited to \$250,000, Gross of \$10K Deductible

Program Year	<i>A Priori</i> Ultimate Losses (1)	Cumulative Paid Loss Development Factors (2)	Percentage of Losses Not Yet Paid (3)	Expected Unpaid Losses (4)	Losses Paid as of 12/31/16 (5)	Estimated Ultimate Losses (6)
2007-08	\$555,006	1.000	0.0%	\$0	\$500,365	\$500,365
2008-09	552,896	1.000	0.0%	0	455,371	455,371
2009-10	551,086	1.000	0.0%	0	698,626	698,626
2010-11	548,895	1.000	0.0%	0	1,216,990	1,216,990
2011-12	546,975	1.010	1.0%	5,470	597,235	602,705
2012-13	545,290	1.020	1.9%	10,361	631,610	641,971
2013-14	543,224	1.136	12.0%	65,187	929,292	994,479
2014-15	541,370	1.958	48.9%	264,730	398,916	663,646
2015-16	539,702	6.386	84.3%	454,969	141,722	596,691
2016-17	537,655	188.511	99.5%	534,967	7,470	542,437
Total	\$5,462,099			\$1,335,684	\$5,577,597	\$6,913,281

Notes:

- (1) Page 49, Column (1).
- (2) Page 47, Column (2).
- (3)  $100\% - [1.000 / (2)]$ .
- (4)  $(1) \times (3)$ .
- (5) Page 47, Column (1).
- (6)  $(4) + (5)$ .

**Monterey Bay Area Self Insurance Authority**

**Actuarial Analysis of the  
General and Auto Liability Program**

**Future Loss Exhibits**

Monterey Bay Area Self Insurance Authority  
General and Auto Liability Program

Projected \$1M Loss Rate for 2017-18  
**All Gross of \$10K Deductible**

Based on \$250K Limit Analysis

Program Year	250K Limit Loss Rate (1)	Factor for \$1M SIR (2)	Projected \$1M SIR Loss Rate (3)
2017-18	\$1.62	1.673	\$2.71

Based on \$1M Limit Analysis

Program Year	1M Limit Loss Rate (4)	Factor for \$1M SIR (5)	Projected \$1M SIR Loss Rate (6)
2017-18	\$2.54	1.000	\$2.54

Program Year	Selected 2017-18 \$1M SIR Loss Rate (7)	Projected 2017-18 Payroll (\$00's) (8)	Projected Ultimate Losses (9)
2017-18	<b>\$2.54</b>	\$505,999	\$1,285,526

Notes:

- (1) Page 53, Item (5).
- (2) Estimated by BAC.
- (3) (1) x (2), rounded.
- (4) Page 54, Item (5).
- (5) Estimated by BAC.
- (6) (4) x (5), rounded.
- (7) Selected by BAC.
- (8) Page 67, Column (2).
- (9) (7) x (8), rounded.

Monterey Bay Area Self Insurance Authority  
General and Auto Liability Program

Projected Future Loss Rate  
Losses Limited to \$250,000, Gross of \$10K Deductible

Program Year	Estimated Ultimate Losses (1)	Trend Factor (2)	Losses Trended to 2017-18 (3)
2007-08	\$500,365	1.138	\$569,353
2008-09	455,371	1.123	511,506
2009-10	698,626	1.109	774,676
2010-11	1,216,990	1.095	1,332,150
2011-12	693,000	1.081	748,842
2012-13	631,610	1.067	673,746
2013-14	960,000	1.053	1,010,902
2014-15	540,000	1.040	561,335
2015-16	1,170,000	1.026	1,200,618
2016-17	540,000	1.013	547,020
Average 07-08 through 15-16:			\$820,347
(4) Projected 2017-18 Payroll (\$00's):			\$505,999
(5) Projected 2017-18 \$250K Limit Rate:			\$1.62

Notes:

- (1) Page 45, Column (6).
- (2) Estimated by BAC.
- (3) (1) x (2).
- (4) Page 67, Column (2).
- (5) Average (3) / (4).

Monterey Bay Area Self Insurance Authority  
General and Auto Liability Program

Projected Future Loss Rate  
Losses Limited to \$1,000,000, Gross of \$10K Deductible

Program Year	Estimated Ultimate Losses (1)	Trend Factor (2)	Losses Trended to 2017-18 (3)
2007-08	\$500,365	1.305	\$653,118
2008-09	455,371	1.271	578,761
2009-10	728,936	1.238	902,096
2010-11	2,240,499	1.205	2,699,839
2011-12	1,000,000	1.173	1,173,337
2012-13	703,418	1.142	803,648
2013-14	1,790,000	1.112	1,991,291
2014-15	890,000	1.083	964,054
2015-16	1,710,000	1.055	1,803,587
2016-17	1,340,000	1.027	1,376,180

Average 07-08 through 15-16: \$1,285,526

(4) Projected 2017-18 Payroll (\$00's): \$505,999

(5) Projected 2017-18 \$1M Limit Rate: \$2.54

Notes:

- (1) Page 31, Column (6).
- (2) Estimated by BAC.
- (3) (1) x (2).
- (4) Page 67, Column (2).
- (5) (3) / (4).

**Monterey Bay Area Self Insurance Authority**

**Actuarial Analysis of the  
General and Auto Liability Program**

**Discounting Exhibits**

Monterey Bay Area Self Insurance Authority  
General and Auto Liability Program

Discounted Value of Unpaid Losses as of June 30, 2017  
Assuming a 1.0% Interest Rate

Losses Limited to SIR, NET of \$10K Deductible

Program Year	Projected Unpaid Losses (1)	Discount Factor (2)	Discounted Unpaid Losses (3)
2007-08	\$0	1.000	\$0
2008-09	0	1.000	0
2009-10	0	1.000	0
2010-11	0	1.000	0
2011-12	81,200	0.995	80,797
2012-13	0	0.990	0
2013-14	99,676	0.993	98,935
2014-15	194,174	0.992	192,644
2015-16	1,057,463	0.990	1,047,254
2016-17	1,221,592	0.985	1,203,192
Total	\$2,654,106		\$2,622,822

(4) Indicated Discount Factor: 0.988

Notes:

- (1) Page 22, Column (6).
- (2) (3) / (1).
- (3) Based upon a 1.0% interest rate.
- (4) [ Sum of Column (3) ] / [ Sum of Column (1) ].

Monterey Bay Area Self Insurance Authority  
General and Auto Liability Program

Discounted Value of 2017-18 Losses as of July 1, 2017  
Assuming a 1.0% Interest Rate

Losses Limited to \$1M SIR, Gross of \$10K Deductible

Program Year	Projected Loss Payments (1)	Discounted Value Factor (2)	Discounted Value of Payments (3)
2017-18	\$57,814	0.995	\$57,527
2018-19	401,966	0.985	396,011
2019-20	532,830	0.975	519,739
2020-21	221,046	0.966	213,480
2021-22	46,159	0.956	44,138
2022-23	12,855	0.947	12,171
2023-24	12,855	0.937	12,050
2024-25	0	0.928	0
2025-26	0	0.919	0
2026-27	0	0.910	0
2027-28	0	0.901	0
Total	\$1,285,526		\$1,255,116

(4) Indicated Discount Factor: 0.976

Notes:

- (1) Based upon the observed payment pattern.
- (2) Based upon a 1.0% interest rate.
- (3) (1) x (2).
- (4) [ Sum of Column (3) ] / [ Sum of Column (1) ].

Monterey Bay Area Self Insurance Authority  
General and Auto Liability Program

Discounted Value of 2017-18 Losses as of July 1, 2017  
Assuming a 1.0% Interest Rate

Losses Limited to \$1M SIR, NET of \$10K Deductible

Program Year	Projected Loss Payments (1)	Discount Factor (2)	Discounted Value of Payments (3)
2017-18	\$24,786	0.995	\$24,663
2018-19	337,663	0.985	332,661
2019-20	490,084	0.975	478,043
2020-21	217,778	0.966	210,324
2021-22	56,387	0.956	53,918
2022-23	5,690	0.947	5,387
2023-24	5,690	0.937	5,334
2024-25	0	0.928	0
2025-26	0	0.919	0
2026-27	0	0.910	0
2027-28	0	0.901	0
Total	\$1,138,079		\$1,110,330

(4) Indicated Discount Factor: 0.976

Notes:

- (1) Based upon the observed payment pattern.
- (2) Based upon a 1.0% interest rate.
- (3) (1) x (2).
- (4) [ Sum of Column (3) ] / [ Sum of Column (1) ].

## **Monterey Bay Area Self Insurance Authority**

### **Actuarial Analysis of the General and Auto Liability Program**

#### **Deductibles**

Monterey Bay Area Self Insurance Authority  
General and Auto Liability Program

Selected Ultimate Deductible Losses  
Losses Limited to \$10,000 Deductible

Program Year	Reported Projection (1)	B-F Method Using Reported (2)	Selected Ultimate Losses (3)
2007-08	\$117,856	\$117,856	\$117,856
2008-09	131,945	131,945	131,945
2009-10	162,588	162,588	162,588
2010-11	187,190	187,190	187,190
2011-12	136,475	136,472	136,472
2012-13	113,389	113,429	113,331
2013-14	116,046	116,065	116,055
2014-15	116,457	115,729	116,093
2015-16	156,696	160,081	158,388
2016-17	452,511	91,211	91,211
Total	\$1,691,153	\$1,332,567	\$1,331,131

Notes:

- (1) Page 61, Column (3).
- (2) Page 62, Column (6).
- (3) Selected on the basis of (1) - (2).

Monterey Bay Area Self Insurance Authority  
General and Auto Liability Program

Reported Loss Development  
Deductible Losses Limited to \$10,000

Program Year	Cumulative Reported Losses as of 12/31/16 (1)	Reported Development Factor as of 12/31/16 (2)	Projected Ultimate Losses (3)
2007-08	\$117,856	1.000	\$117,856
2008-09	131,945	1.000	131,945
2009-10	162,588	1.000	162,588
2010-11	187,190	1.000	187,190
2011-12	136,472	1.000	136,475
2012-13	113,331	1.001	113,389
2013-14	115,917	1.001	116,046
2014-15	114,002	1.022	116,457
2015-16	128,885	1.216	156,696
2016-17	13,082	34.590	452,511
Total	\$1,221,269		\$1,691,153

Notes:

- (1) Provided by Risk Management Services.
- (2) Estimated by BAC.
- (3) (1) x (2), rounded.

Monterey Bay Area Self Insurance Authority  
General and Auto Liability Program

Bornhuetter-Ferguson Using Reported Losses  
Deductible Losses Limited to \$10,000

Program Year	<i>A Priori</i> Ultimate Losses (1)	Cumulative Reported Loss Development Factors (2)	Percentage of Losses Not Yet Reported (3)	Expected Unreported Losses (4)	Limited Losses Reported as of 12/31/16 (5)	Estimated Ultimate Deductible Losses (6)
2007-08	\$82,255	1.000	0.0%	\$0	\$117,856	\$117,856
2008-09	74,045	1.000	0.0%	0	131,945	131,945
2009-10	112,366	1.000	0.0%	0	162,588	162,588
2010-11	193,614	1.000	0.0%	0	187,190	187,190
2011-12	109,054	1.000	0.0%	0	136,472	136,472
2012-13	98,314	1.001	0.1%	98	113,331	113,429
2013-14	147,807	1.001	0.1%	148	115,917	116,065
2014-15	82,239	1.022	2.1%	1,727	114,002	115,729
2015-16	176,249	1.216	17.7%	31,196	128,885	160,081
2016-17	80,462	34.590	97.1%	78,129	13,082	91,211
Total	\$1,156,405			\$111,298	\$1,221,269	\$1,332,567

Notes:

- (1) Page 45, Column (6), adjusted for \$10K limit.
- (2) Page 61, Column (2).
- (3)  $100\% - [1.000 / (2)]$ .
- (4)  $(1) \times (3)$ .
- (5) Page 61, Column (1).
- (6)  $(4) + (5)$ .

**Monterey Bay Area Self Insurance Authority**

**Actuarial Analysis of the  
General and Auto Liability Program**

**Claims Data Exhibits**

Monterey Bay Area Self Insurance Authority  
General and Auto Liability Program

Cumulative Reported Losses (\$000's) - Limited to \$1M per Loss - Includes ALAE - 12/31/16

Program	<u>Months of Development</u>										
	<u>6</u>	<u>18</u>	<u>30</u>	<u>42</u>	<u>54</u>	<u>66</u>	<u>78</u>	<u>90</u>	<u>102</u>	<u>114</u>	<u>126</u>
2006					618	557	557	557	557	557	557
2007				451	424	401	401	401	401	401	401
2008			662	617	500	500	500	500	500	500	500
2009		541	307	355	405	452	455	454	455		
2010	151	569	1,025	1,082	721	729	729	729			
2011	76	819	2,507	2,500	2,304	2,334	2,240				
2012	19	278	593	856	896	996					
2013	55	343	454	777	703						
2014	7	1,443	1,714	2,384							
2015	13	534	685								
2016	55	828									
2017	13										
	<u>6 - 18</u>	<u>18 - 30</u>	<u>30 - 42</u>	<u>42 - 54</u>	<u>54 - 66</u>	<u>66 - 78</u>	<u>78 - 90</u>	<u>90 - 102</u>	<u>102 - 114</u>	<u>114 - 126</u>	<u>126 - Ult.</u>
VOL AVG	12.785	1.609	1.180	0.897	1.017	0.982	0.999	1.001	1.000	1.000	
AVG	41.602	1.622	1.241	0.919	1.014	0.995	0.999	1.001	1.000	1.000	
REFERENCE	3.515	1.496	1.092	1.036	1.017	1.007	1.000	1.000	1.000	1.000	1.000
SELECT	41.602	1.622	1.241	1.036	1.016	1.007	1.000	1.000	1.000	1.000	1.000
CUMULATIVE	88.670	2.131	1.314	1.059	1.023	1.007	1.000	1.000	1.000	1.000	1.000

Monterey Bay Area Self Insurance Authority  
General and Auto Liability Program

Cumulative Paid Losses (\$000's) - Limited to \$1M per Loss - Includes ALAE - 12/31/16

Program	<u>Months of Development</u>										
	<u>6</u>	<u>18</u>	<u>30</u>	<u>42</u>	<u>54</u>	<u>66</u>	<u>78</u>	<u>90</u>	<u>102</u>	<u>114</u>	<u>126</u>
2006					565	557	557	557	557	557	557
2007				386	406	401	401	401	401	401	401
2008			337	497	500	500	500	500	500	500	500
2009		151	255	274	306	372	455	454	455		
2010	15	122	524	727	721	729	729	729			
2011	5	194	646	1,932	2,200	2,221	2,240				
2012	13	113	177	387	897	899					
2013	3	124	373	702	703						
2014	4	478	935	2,311							
2015	10	56	510								
2016	13	142									
2017	7										
	<u>6 - 18</u>	<u>18 - 30</u>	<u>30 - 42</u>	<u>42 - 54</u>	<u>54 - 66</u>	<u>66 - 78</u>	<u>78 - 90</u>	<u>90 - 102</u>	<u>102 - 114</u>	<u>114 - 126</u>	<u>126 - Ult.</u>
VOL AVG	19.291	2.761	2.104	1.169	1.015	1.021	1.000	1.001	1.000	1.000	
AVG	32.591	3.562	1.924	1.232	1.030	1.039	1.000	1.001	1.000	1.000	
REFERENCE	9.585	2.802	1.515	1.172	1.037	1.040	1.036	1.019	1.004	1.000	1.000
SELECT	32.591	3.562	1.924	1.169	1.015	1.021	1.000	1.001	1.000	1.000	1.000
CUMULATIVE	270.737	8.307	2.332	1.212	1.037	1.021	1.000	1.001	1.000	1.000	1.000

Monterey Bay Area Self Insurance Authority  
General and Auto Liability Program

Cumulative # of Reported Losses - 12/31/16

Program	<u>Months of Development</u>									
	<u>6</u>	<u>18</u>	<u>30</u>	<u>42</u>	<u>54</u>	<u>66</u>	<u>78</u>	<u>90</u>	<u>102</u>	<u>114</u>
2006					41	40	40	40	39	38
2007				56	56	56	56	49	49	49
2008			57	55	55	55	54	52	49	53
2009		56	61	62	62	61	60	57	63	
2010	17	46	49	52	51	52	51	51		
2011	21	65	65	65	65	61	69			
2012	22	75	72	72	67	74				
2013	17	62	66	63	68					
2014	14	58	57	62						
2015	19	64	73							
2016	20	77								
2017	26									
	<u>6 - 18</u>	<u>18 - 30</u>	<u>30 - 42</u>	<u>42 - 54</u>	<u>54 - 66</u>	<u>66 - 78</u>	<u>78 - 90</u>	<u>90 - 102</u>	<u>102 - 114</u>	<u>114 - Ult.</u>
ALLYR VOL	3.438	1.040	1.009	0.998	1.005	1.015	0.954	1.010	1.022	0.000
ALL YR AVG	3.460	1.043	1.012	0.999	1.003	1.015	0.947	1.016	1.041	1.000
SELECT	3.395	1.027	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
CUMULATIVE	3.485	1.026	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Monterey Bay Area Self Insurance Authority  
General and Auto Liability Program

Program Information  
Program Years run July 1 to June 30

Program Year	Self-Insured Retention (SIR) (1)	Payroll (\$00's) (2)	Exposure Index (3)	Deductible (4)
2007-08	\$1,000,000	\$437,000	1.000	\$10,000
2008-09	1,000,000	470,000	1.000	10,000
2009-10	1,000,000	455,000	1.000	10,000
2010-11	1,000,000	456,468	1.000	10,000
2011-12	1,000,000	457,935	1.000	10,000
2012-13	1,000,000	433,156	1.000	10,000
2013-14	1,000,000	432,210	1.000	10,000
2014-15	1,000,000	448,768	1.000	10,000
2015-16	1,000,000	460,085	1.000	10,000
2016-17	1,000,000	496,077	1.000	10,000
2017-18	?	505,999	1.000	10,000

## Notes:

- (1) Provided by MBASIA.  
EPL SIR is \$500,000 claims made starting 2011-12.
- (2) Provided by MBASIA.
- (4) Provided by MBASIA.  
Deductible assumed to apply to combined loss & ALAE.  
(Unconfirmed).