



# COMMONWEALTH AUTOMOBILE REINSURERS

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RALPH A. IANNACO  
PRESIDENT

October 31, 2008

Honorable Nonnie S. Burnes  
Commissioner of Insurance  
Massachusetts Division of Insurance  
One South Station  
Boston, MA 02110

RE: Private Passenger Residual Market Rate Filing for Policies Effective April 1, 2009 and Later

Dear Commissioner Burnes:

Commonwealth Automobile Reinsurers (CAR), as administrator of the residual market for motor vehicle insurance written in the Commonwealth of Massachusetts, and pursuant to G.L. c. 175, § 113H, G.L. c. 175, § 113A, and 211 CMR 79.00, herewith files its rates for policies written through the Massachusetts Automobile Insurance Plan (MAIP) with effective dates on and after April 1, 2009.

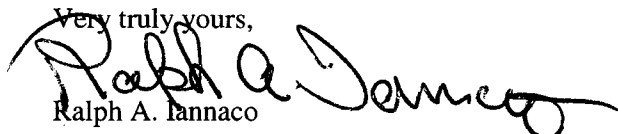
The estimated overall rate increase proposed in this filing is 11.6%. In compliance with the requirements outlined in the regulatory Bulletin 2008-09, the following issues should be noted, with additional information provided in Section 100K:

- With the elimination of the passive restraint discount, the current average rates for coverage A-2 identified in Exhibit 2 of Bulletin 2008-09 have been adjusted downward. The proposed base rates then apply a uniform change of +10% for each class and territory.
- The proposed rates for coverage B comply with the provision to limit the premium change for the basic coverage package to +10% of up to 4 SDIP points, and the required change to the application of SDIP factors to coverage B.

General Laws c. 175, § 113H provides that these rates will be charged to consumers only in circumstances where these rates do not "exceed the premiums charges, which would be used by each risk's Servicing Carrier for that risk if such risk were written on a voluntary basis."

CAR is prepared to discuss the issues addressed in this filing as you may request.

Very truly yours,



Ralph A. Iannaco  
President

Enclosures

cc: Docket Clerk – Division of Insurance  
Mr. Kevin Beagan – State Rating Bureau  
Honorable Martha Coakley – Attorney General

*Commonwealth Automobile Reinsurers*  
**Massachusetts Private Passenger Automobile**  
**Filing for 4/1/2009 Rates**

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002

# *Commonwealth Automobile Reinsurers*

**Filing for Residual Market Rates  
Effective 4/1/2009**

**Introduction**

## Massachusetts Private Passenger Automobile

### Introduction

This filing, representing the rate level recommendation for the private passenger automobile insurance residual market, is submitted pursuant to 211 CMR 79.00 with a proposed effective date of 4/1/2009. The indicated rate level developed in this filing represents the analysis of the combined involuntary experience of all companies servicing the residual market through CAR. The rates, subject to G.L. Ch. 175, sec. 113H, are applicable to risks assigned through the Massachusetts Automobile Insurance Plan (MAIP).

The attached Form 110/100 summarizes the overall +11.6% proposed rate level change for the Massachusetts private passenger automobile insurance residual market.<sup>1</sup> The indicated average rate for 4/1/2009 relies on the experience for the total residual market business and the expected expense to write and service that business. The proposed base rate level changes conform to the requirements of DOI Bulletin 2008-09 issued on August 22, 2008, including the new application of SDIP to optional BI. Changes are also proposed for the following rating factors:

- model year/symbol relativities (100M)
- increased limits (101)
- deductible relativities (100M)

The current merit rating plan and policy discounts are unchanged with this filing, except for the passive restraint discount. With more than 95% of vehicles eligible for the passive restraint discount and lack of justification for the long-standing 25% discount, there is little value in continuing to offer this discount. Proposed rates for the coverages affected (PIP, MedPay, U-1, and U-2) are properly adjusted to reflected the removal of the discount (see 100K and 100L).

In 2007 the residual market accounted for over \$250 million of premium, just over 6.5% of the total market, for roughly 180,000 vehicles. Absent any empirical results

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<sup>1</sup> The MAIP became effective on 4/1/2008 on a transitional basis. It will be fully implemented beginning with policies effective 4/1/2009. Data for risks written under MAIP is not yet available; this filing relies on the historical experience for risks written in the facility market as representative of expected MAIP business.



to indicate otherwise, the underlying assumption in this filing is that the composition of the residual market under the MAIP will essentially be the same as recent history. The final rates in this filing, which incorporate the requirements set forth in DOI Bulletin 2008-09, results in an overall inadequate rate level. The inadequacy will be accounted for by each company in the rates established for the voluntary market.

***Commonwealth Automobile Reinsurers***

**Filing for Residual Market Rates  
Effective 4/1/2009**

**Summary of Statewide Rate Change by Coverage**

**Massachusetts Private Passenger Automobile  
Summary of 4/1/2009 CAR Manual Rate Changes**

Coverage	2007		2008		4/1/2009		Proposed	
	Earned Exposures	Average Manual Rates	Average Manual Rates	Indicated Average Manual Rates	Indicated Change	Proposed Average Manual Rates	Proposed Change	
A-1, 20/40	179,384.3	386.28	534.49	38.4%	424.74	10.0%	10.0%	
A-2, PIP	177,279.4	116.05	190.62	64.3%	127.66	10.0%	10.0%	
B, 20/40	175,956.6	49.19	92.20	87.4%	48.79	-0.8%	-0.8%	
B, Excess	64,570.3	169.05	297.18	75.8%	224.55	32.8%	32.8%	
PDL, Basic	179,384.3	392.48	483.13	23.1%	431.41	9.9%	9.9%	
PDL, Excess	173,914.8	109.03	143.77	31.9%	128.38	17.7%	17.7%	
Collision 500	94,815.3	594.43	870.72	46.5%	630.61	6.1%	6.1%	
Ltd Coll 500	2,939.2	25.42	73.75	190.1%	50.45	98.5%	98.5%	
Med Pmts Basic	55,472.9	23.79	47.55	99.9%	47.88	101.3%	101.3%	
Comp 500	110,000.0	128.19	198.01	54.5%	139.14	8.5%	8.5%	
U-1, 20/40	179,384.3	11.15	38.58	246.0%	20.52	84.0%	84.0%	
U-2, Total	179,384.3	7.47	7.78	4.1%	7.79	4.3%	4.3%	
U-1, Excess	51,189.5	4.54	13.62	200.0%	7.24	59.5%	59.5%	
Subs Trans	61,479.7	83.29	111.34	33.7%	111.70	34.1%	34.1%	
<b>AVERAGE MANUAL RATE</b>		<b>1557.29</b>	<b>2228.77</b>	<b>43.1%</b>	<b>1738.39</b>	<b>11.6%</b>	<b>11.6%</b>	
Bodily Injury Coverages		637.34	985.23	54.6%	724.77	13.7%	13.7%	
Property Damage Coverages		919.95	1243.53	35.2%	1013.62	10.2%	10.2%	
Compulsory Coverages		904.60	1244.58	37.6%	1002.83	10.9%	10.9%	
Annual Statement Liability		1135.53	1607.75	41.6%	1280.65	12.8%	12.8%	
Annual Statement Phys Dam		421.76	621.02	47.2%	457.75	8.5%	8.5%	
<b>Combined Ratios:</b>								
		Bodily Injury Coverages		98.9%		134.4%		
		Property Damage Coverages		97.7%		119.8%		
		All Coverages		98.2%		125.9%		

**Notes:** Assumed Average Excess Limits Factors:  
 Current Average Rates (100J) 0.3882  
 Indicated & Proposed Average Rates (101) 0.4742

B PDL U-1  
 0.3882 0.2778 0.4071  
 0.4742 0.2976 0.3530

<sup>1</sup> Proposed average manual rates (basic limit & standard deductible) estimated from proposed manual base rates (100K, 100L calculated in accordance with DOI Bulletin 2008-09) and estimated average rating factors. Ltd. Collision = 8% x Collision.



**Massachusetts Private Passenger Automobile**

4/1/2009 CAR

Form 100

**Summary of Indicated Rate Components by Coverage**

	<u>A-1</u>	<u>A-2</u>	<u>B Basic</u>	<u>PDL</u>	<u>Coll</u>	<u>Ltd Coll</u>	<u>Med Pay</u>	<u>Comp</u>	<u>U-1</u>
1) 2007 Loss Pure Premium (100A)	385.04	206.30	67.14	304.14	607.83	75.56	19.28	130.58	28.14
2) Loss Development Factor (100B)	0.9355	0.6275	0.9355	1.0117	0.9161	0.5970	1.3469	1.0177	0.9081
3) Pure Premium Trend Factor (100CD)	1.0000	0.9843	1.0000	1.0673	1.1693	1.1693	1.2618	0.9889	1.0000
4) Claim Adj Expense Factor (100E)	1.1500	1.1500	1.1500	1.1500	1.2000	1.2000	1.1500	1.2000	1.1500
5) Indicated Loss Pure Premium (1) x (2) x (3) x (4)	414.24	146.53	72.23	377.67	781.33	63.30	37.68	157.70	29.39
6) Company Expense Pure Premium									
A) 2007 Experience Pure Prem (100F)	29.80	11.73	4.43	24.46	47.93	3.15	1.90	14.72	2.62
B) Company Expense Trend Factor (100G)	1.092	1.092	1.092	1.092	1.092	1.092	1.092	1.092	1.092
C) Company Expense Pure Prem (6A) x (6B)	32.54	12.81	4.84	26.71	52.34	3.44	2.07	16.07	2.86
7) Commission Expense Ratio	13.00%	13.00%	13.00%	13.00%	13.00%	13.00%	13.00%	13.00%	13.00%
8) Premium Tax	2.30%	2.30%	2.30%	2.30%	2.30%	2.30%	2.30%	2.30%	2.30%
9) U/W Profit Provision (100H)	1.11%	1.11%	1.11%	1.00%	3.70%	3.70%	1.11%	3.70%	1.11%
10) Average Indicated Actuarial Premium (5) + (6C)) / (1-((7)+(8)+(9)))	534.49	190.62	92.20	483.13	1029.22	82.40	47.55	214.53	38.58
11) Drift Reduction Factor (100I)	1.000	1.000	1.000	1.000	0.846	0.895	1.000	0.923	1.000
12) Average Indicated Actuarial Rate (10) x (11)	534.49	190.62	92.20	483.13	870.72	73.75	47.55	198.01	38.58

*Commonwealth Automobile Reinsurers*

**Filing for Residual Market Rates  
Effective 4/1/2009**

**Loss Provisions: 100A, 100B, 100C/CD/D**

**Massachusetts Private Passenger Automobile****Loss Component of Rates****Introduction**

The following discussion details the calculation of the 2009 projected pure premiums which provide for expected losses in the 4/1/2009 residual market rates.

The 2009 projected pure premium is calculated by deriving loss pure premiums using the most recent available experience data, developing the loss pure premiums to their ultimate values, and trending the pure premiums to account for expected changes losses between the experience period and the policy effective period.

## Loss Pure Premiums

Reported loss pure premiums are developed in Section 100 A. Resulting pure premiums appear in Form 100, Line 1. All loss pure premiums are based upon losses and exposures from the residual market segment. Included in the discussion of loss pure premium calculations are the following exhibits:

<u>Section</u>	<u>Description</u>
100 A-1	Development of reported loss pure premiums based on 2007 residual market experience.
100 A-2	Calculation of catastrophe loading for comprehensive.

Relevant considerations for each of the coverages and adjustments are detailed in the following paragraphs.

### **Liability Loss Pure Premiums**

Liability losses are reported on an incurred basis including direct defense and cost containment expense. Liability losses are limited to basic limits of 20/40. The 2007 accident year loss pure premiums in the following Section 100 A-1 are calculated as the ratio of first report (15 months) losses divided by calendar year 2007 earned exposures.

Because direct defense and cost containment expense are reported on a total limits basis, it is necessary to assign them to basic limits and excess limits layers for coverages A-1 and B Basic. The relevant calculation has been performed in Section 101 A-3 (Increased Limits Factors), with the resulting value applicable to 20/40 limits displayed on 100 A-1, Line 4.

The basic limits loss development and loss trend factors also use basic limits of 20/40.

### **Physical Damage Loss Pure Premiums**

Physical damage losses are reported on a paid basis excluding loss adjustment expense and are adjusted to a \$500 deductible basis. The 2007 accident year loss pure premiums in the following Section 100 A-1 are calculated as the ratio of first report (15 months) losses divided by 2007 calendar year earned exposures.

Because of the small number of purchasers of deductibles higher than \$500 and the difficulty in adjusting higher deductibles to a common \$500 basis, the experience of those buyers has not been included in the calculation of physical damage pure premiums. This exclusion is considered when setting deductible relativities for deductibles higher than \$500.

### **Catastrophes**

Section 100 A-2 provides the details for the calculation of the adjustment for the effects of catastrophes for the comprehensive coverage. This method adjusts the comprehensive loss pure premium (at \$500) by removing the excess losses (Exhibit 2, page 1) and loading an average excess loss factor based on the last 20 years of catastrophe experience in Massachusetts (Exhibit 1, page 1). This calculation has been performed using total industry data.

Pages 2-4 of Exhibit 2 provide the most recent 12 months experience by type of loss.



## Loss Development

Accident year histories for losses, claims, frequencies, and severities are displayed in Section 100 B. Losses, claims and exposures used in the calculations are for the residual market segment.

Exhibit 1 provides the accident year detail and development for each coverage. Specific considerations by coverage are described below.

### Liability Coverages

Age-to-ultimate factors for the liability and first party injury liability coverages are based on ten years (120 months) of development history. Development is estimated at 20/40 basic limits of coverage for bodily injury (A-1, B) and uninsured motorists (U-1), \$5,000 for property damage liability (PDL), \$5,000 for medical payments (D), and at the full coverage option for PIP (A-2). Liability losses are evaluated on an incurred basis and include direct defense and cost containment expense.

Age-to-age development factors for the A-1/B, PIP, and U-1 coverage are based on a 3 year, equally weighted, average of the five most recent development factors – excluding the single highest and lowest factors during the experience period. Factors for the PDL and medical payments coverages are based on an average of the latest 3 development factors.

### Physical Damage Coverages

Physical damage coverages include collision, comprehensive, and limited collision. The loss development for each of these coverages is based on accident year experience through five years (60 months) on a \$500 deductible basis<sup>1</sup>. These losses exclude direct defense and cost containment expense.

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<sup>1</sup> The accident year loss experience for comprehensive in these exhibits includes catastrophe loss and claim experience. Further, comprehensive claims coding is handled as follows:

- All glass claims are given a count of 1.0.
- Claims with multiple types of loss, other than glass, are assigned to just one type of loss code. The type of loss that is coded is based on the following priority system:
  - (1) theft
  - (2) fire
  - (3) malicious mischief & vandalism
  - (4) windstorm, etc.
  - (5) flood and rising water
  - (6) all other

Age-to-age development factors for the physical damage coverages are based on a 3 year, equally weighted, average of the five most recent development factors – excluding the single highest and lowest factors during the experience period.

## Loss Trending Methods

The following discussion provides the details underlying the loss trend methods used to adjust the losses from the latest 2007 accident year experience period to the levels expected during the 2009 policy period for the residual market for the various coverages. Data has been analyzed for the residual market, and at times complemented with voluntary market data, in order to best represent the trends and issues affecting Massachusetts private passenger automobile losses and claims.

Section	Description
100 CD-1	Residual Market Historical Loss Statistics
100 CD-2	Average Accident Date Calculation
100 CD-3	Comprehensive Losses by Type of Loss
100 CD-4	Residual Market Claims Ratios by Territory
100 CD-5	Frequency Changes by Territory
100 CD-6	Regression Statistics Calculations
100 CD-7	Comprehensive Coverage Trend Support

### **General Description of the Method**

Selected trend factors are calculated as the ratio of the policy period 2009Q2-2010Q1 projected pure premium to the 2007 accident year developed pure premium. Trend factors are determined separately for each coverage, and are based on residual market historical pure premiums that have been developed to ultimate using the loss development factors derived in section 100 B.

### **Calculation of the Projected Average Effective Date**

Section 100 CD-2 displays the calculation of the projected average effective date, from which the average accident date and the loss trend period are derived. These calculations are based upon the assumption that residual market rates will become effective on 4/1/2009 and they will remain in effect over a 12 month period (with 12 month policies) through 3/31/2010; that is, they will cover all initial ratings and all re-ratings of all policies that have inception dates from 4/1/2009 through 3/31/2010. Thus, they will provide coverage for some accidents occurring as early as 4/1/2009 and some as

late as 3/31/2011. The calculations displayed in Section 100 CD-2 detail the calculation of the projected average effective date for this period.

The average date of writing for the policy period 2009Q2-2010Q1 has been estimated by assuming 2009Q2-2010Q1 monthly residual market exposure distributions are similar to 2007 residual market exposure distributions. The policy period monthly exposures are then used to weight index values for each month in order to determine the average date of writing for the policy period.

### **Discussion of Injury Coverage Issues**

#### **Community Insurance Fraud Initiative**

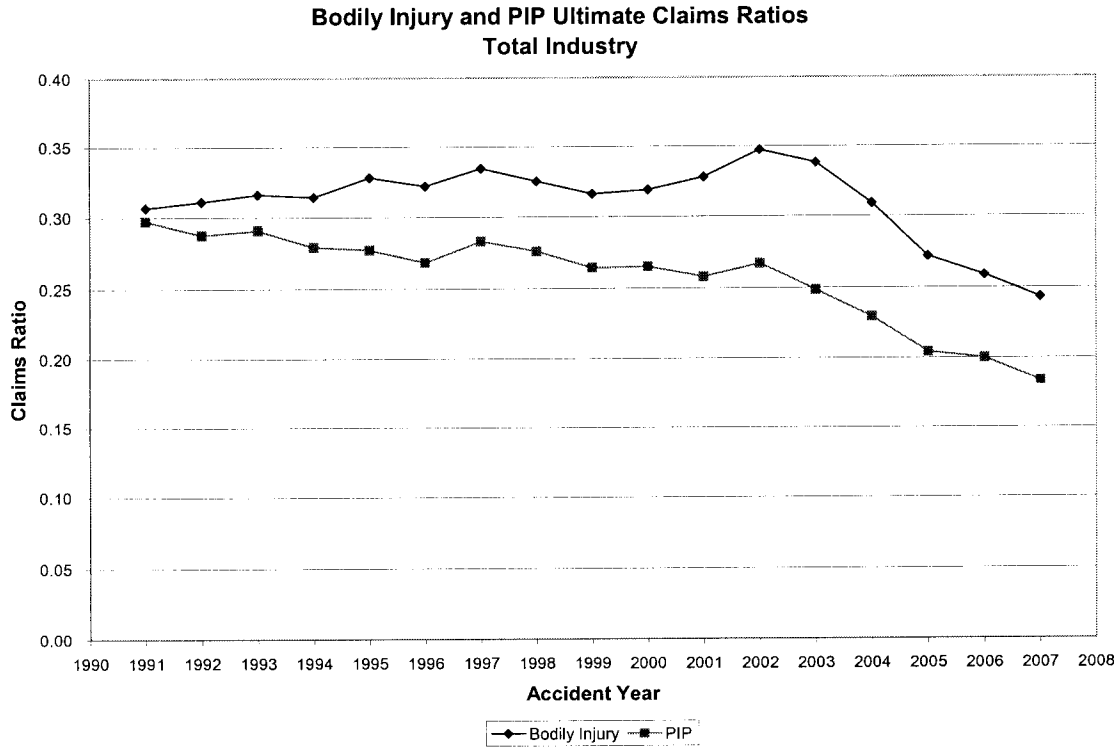
One factor that has had significant impact on losses in recent years is the work of the Insurance Fraud Bureau and, in particular, its Community Insurance Fraud Initiative (CIFI) task force program which was first introduced in late 2003. The impact on both loss frequencies and severities, though not directly measurable, is readily apparent via inspection of historic loss and claim statistics. Indirect analysis of proxy variables can be used in order to estimate the impact of these task forces on losses, and this is useful when trying to answer the important trend-related question: *How much more (if at all) will future losses be significantly affected by the CIFI task forces?*

The CIFI programs were designed to target those individuals or professional practitioners who organize claims, thus eliminating the vehicle for opportunistic claims and creating a deterrent for such behavior in claimants. One statistic used to measure levels of opportunistic claiming is the injury claims to accident ratio.<sup>2</sup> The BI and PIP coverage graph below shows that this industry statistic has generally behaved in a stable manner throughout the 1990's until the introduction of the first CIFI programs in 2003-2004. Improvements to the claims ratios are reflected in the downturn of the curves since 2003 as opportunistic claims were eliminated and deterred. Industry claims ratios are at historic lows and improvements continue to be seen through 2007, even though claims frequency decreases have significantly moderated for the BI and PIP coverages at both the

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<sup>2</sup> This ratio is one of the criteria used to determine which towns should be targeted with CIFI program resources.

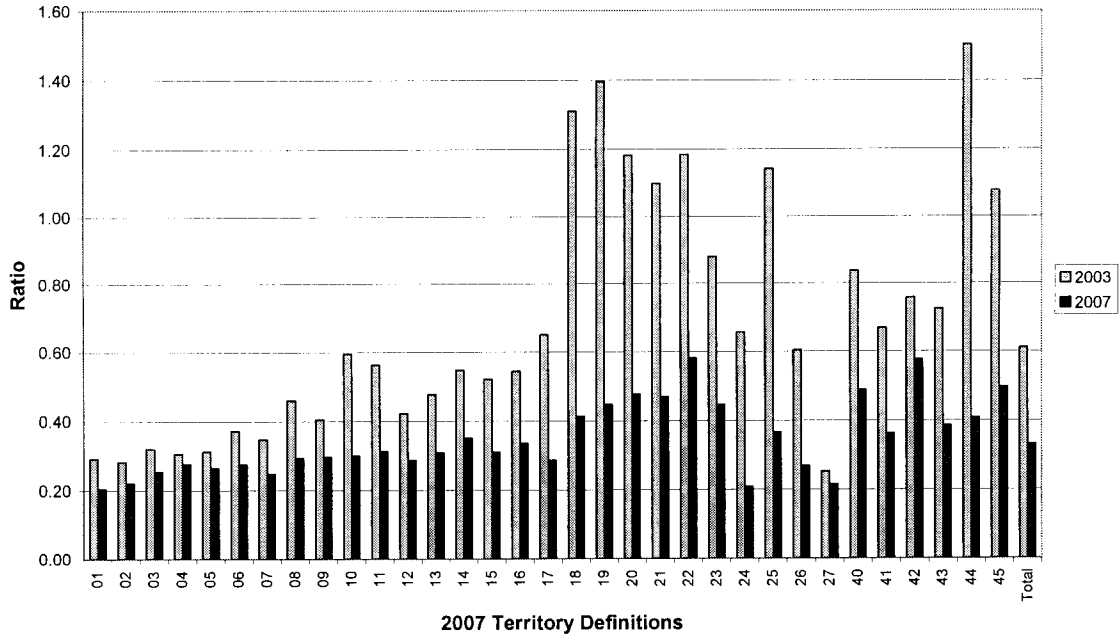
industry and residual market levels. It is expected that once the CIFI programs achieve a maximum level of deterrence, a stable pattern of year-to-year claims ratios will once again be reached.



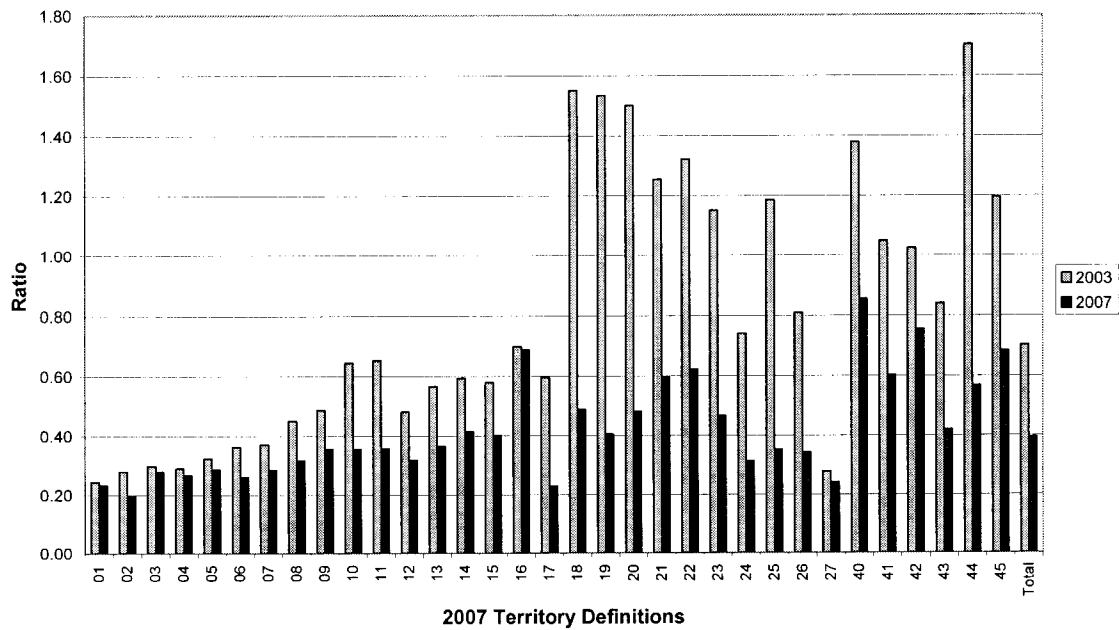
Digging further into the industry claims ratio data provides more insight. CIFI task forces were introduced to target the towns or regions where opportunistic claiming behavior was most severe. Focusing now on the residual market segment and calculating claims ratios by territory illustrates the differences in claims ratios between these regions. The graphs below show BI and PIP claims ratios by territory for 2003 (the last “pre-CIFI” year) and for 2007 (the most recent “post-CIFI” accident year)<sup>3</sup>.

<sup>3</sup> Tables of claims ratios by territory are included in Section 100 CD-4.

**A-1/B to PDL Claims Ratios  
(Pre vs. Post CIFI Introduction)  
Residual Market**



**PIP to PDL Claims Ratios  
(Pre vs. Post CIFI Introduction)  
Residual Market**



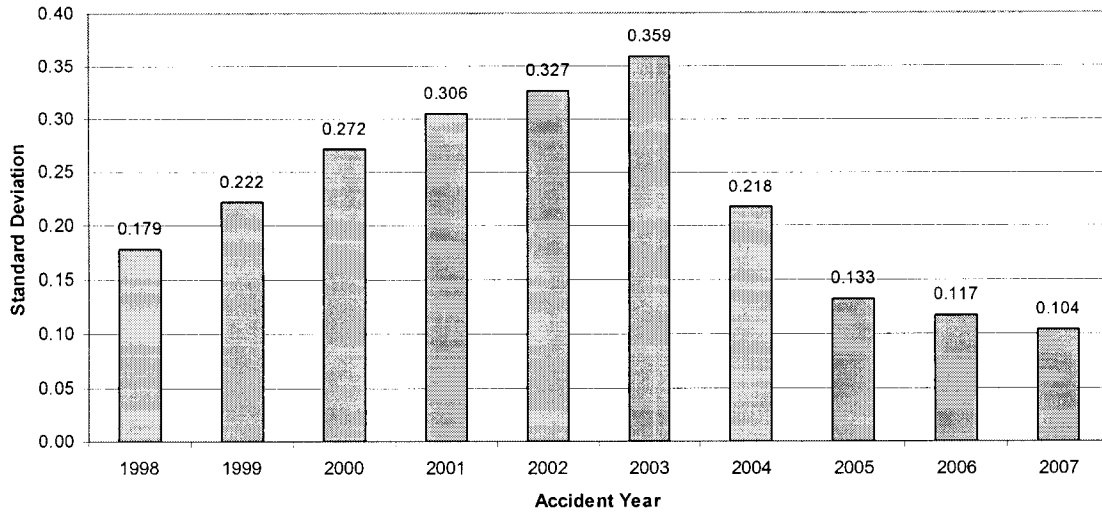
Some observations based on the above:

- In 2003, prior to the introduction of the CIFI task forces, significant variation existed in claims ratios between territories, as can be seen by the varying heights in the graph bars. The highest BI to PDL ratio (in territory 44) was 5.9 times higher than the lowest ratio (territory 27); the highest PIP to PDL ratio (territory 44) was 7.0 times higher than the lowest ratio (territory 1)
- In 2007, after the introduction of the CIFI task forces, the territories with the highest claims ratios experienced the most improvement and their ratios have become much more uniform across the territories. The highest BI to PDL ratio (territory 22) is only 2.8 times the lowest ratio (territory 1); the highest PIP to PDL ratio (territory 40) is only 4.3 times the lowest ratio (territory 2) This indicates that the CIFI task forces have been effective in deterring opportunistic claiming behavior in territories where it was most pronounced. It is not known whether a perfectly uniform distribution across territories is a reasonable expectation for the long term; there may be factors other than opportunistic claiming behavior that make it reasonable to expect higher claims ratios in the typically urban, higher-rated territories.

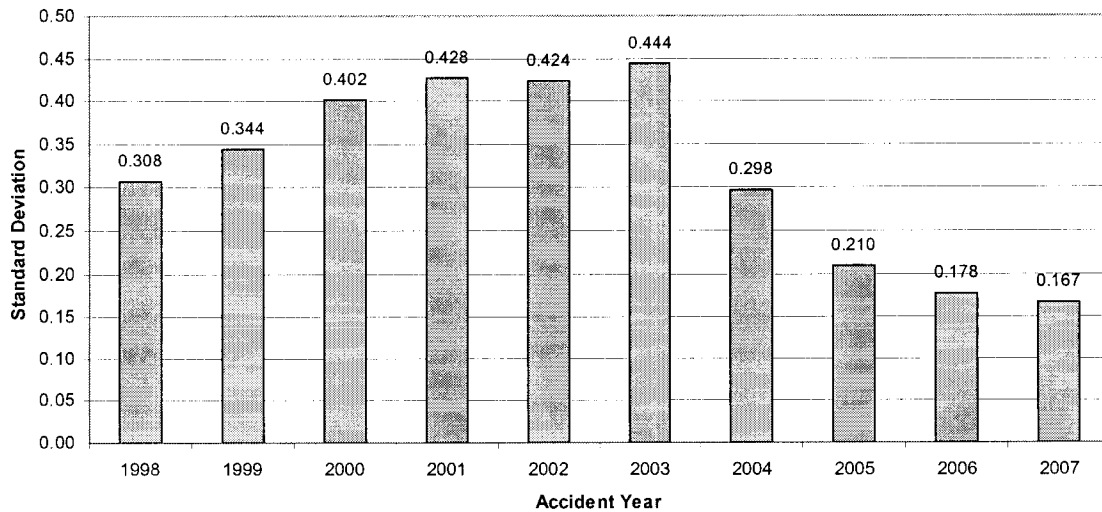
To date, claims ratio improvements have been significant and have occurred to varying degrees across territories in the residual market. Additional statistics can help to determine how much longer and how much more loss savings can be expected from CIFI-related improvements.

Standard Deviation Statistics: The standard deviations of the claims ratios can be calculated across territories and used as a measure of year-to-year improvement. The charts below show improvement occurring rapidly between 2003-2005, and continuing but slowing down significantly in 2006-2007, for both the BI and PIP coverages in the residual market. Referring again to the claims ratio graphs above, these results can be directly observed in the 2003 bars that show large differences from territory to territory (i.e. high variability) and much smaller differences in the 2007 bars after the implementation of CIFI task force programs.

**Standard Deviation of Bodily Injury Claims Ratios @ 15 Months  
Residual Market**



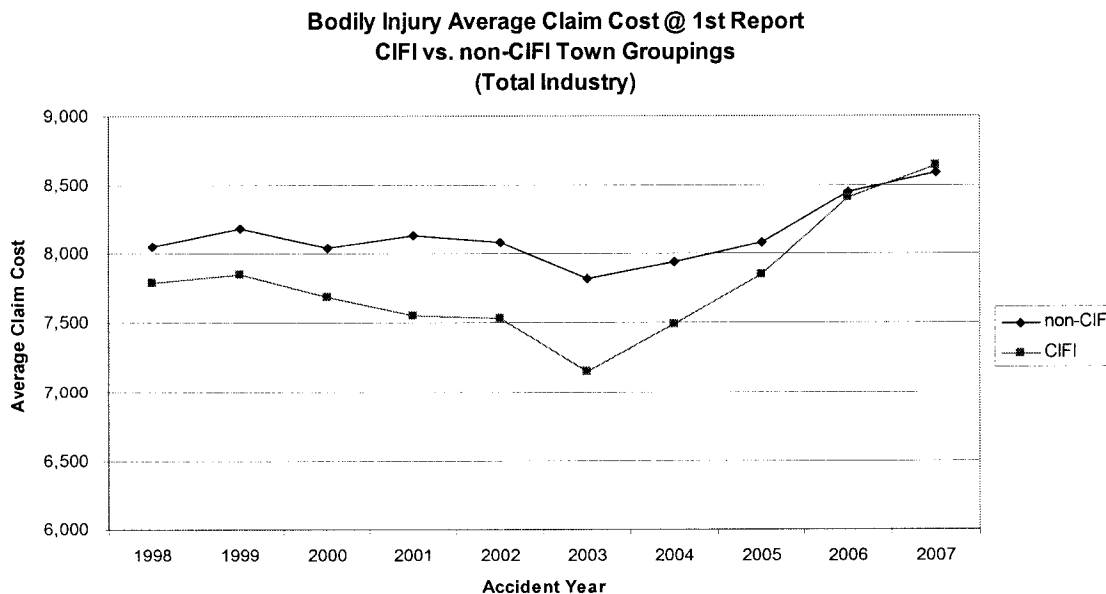
**Standard Deviation of PIP Claims Ratios @ 15 Months  
Residual Market**



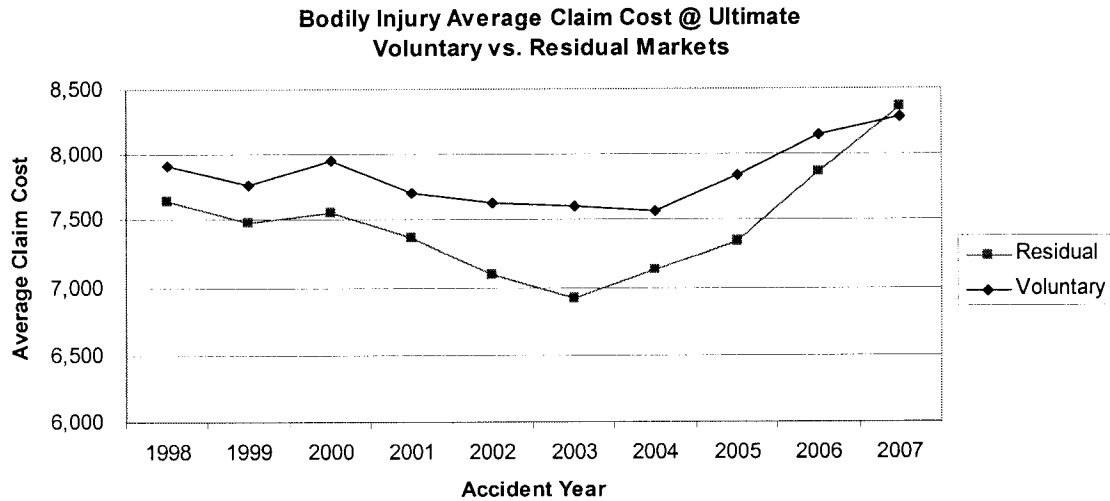
Claims Severities: Opportunistic injury claims tend to be of a soft tissue or strain-and-sprain nature, having a severity lower than non sprain-and-sprain claims. Historically, as more sprain-and-strain type claims were eliminated and deterred by CIFI task forces, fewer smaller claims remained and the overall size-of-claim



distribution shifted upwards, resulting in increased severities. Groups with more of these strain-and-sprain claims had lower severities initially and higher subsequent severity growth as a larger proportion of these claims were removed and deterred. The graphs below display these claim characteristics using bodily injury claims severities grouped in two ways: the first graph shows industry data grouped into CIFI vs. non-CIFI towns, and the second graph shows voluntary vs. residual market data groups. Both graphs tell the same story: coincident with the introduction of the first CIFI program in 2003, the average severity of each group began increasing, with the greater increases resulting in the groups having the larger proportion of opportunistic claims (the CIFI and the residual groups)<sup>4</sup>. By 2006-2007 the average severities for each of these groups have become virtually equal, indicating that the CIFI/non-CIFI and voluntary/residual claims distributions have become more homogeneous in terms of size-of-claim distribution.

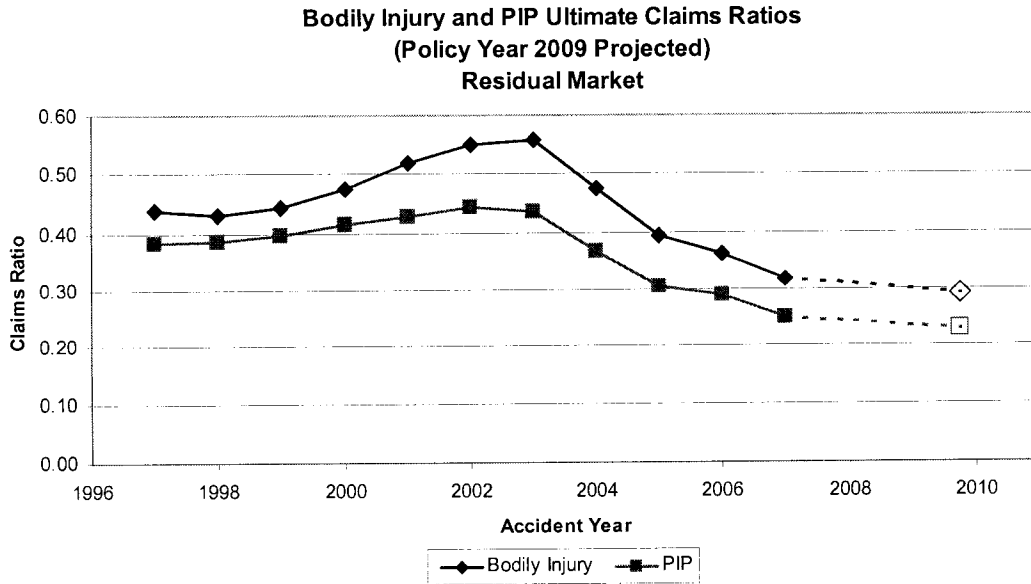


<sup>4</sup> It is intuitive that the CIFI and residual market groups would have more opportunistic claims and this is also borne out in the data, where CIFI towns/territories have higher claims ratios than non-CIFI, as does the residual market in comparison to the voluntary market.



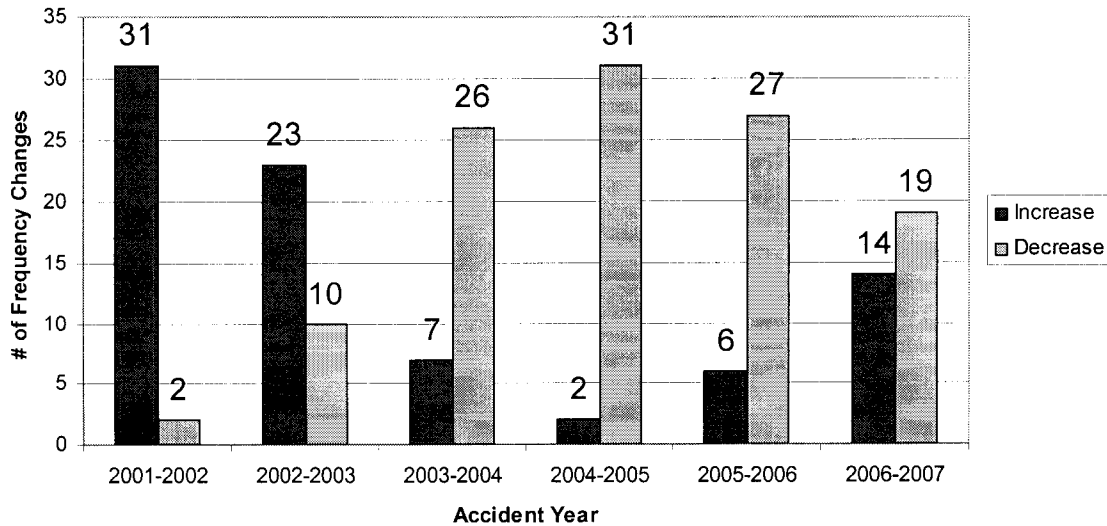
The above statistics all indicate that improvements due to the CIFI program were most significant during 2004 and 2005 but have since slowed, resulting in nearly homogenous loss severity distributions and historic low claims ratios during 2006-2007. As to the size and duration of further claims improvements, it is expected that there will be some further improvements to losses due to the CIFI programs during the trend period, but that these improvements will be moderated from the improvements of the recent past.

Specifically, the proposed trend selections (discussed below) anticipate further CIFI-related improvement to bodily injury and PIP claims ratios (frequencies) of -3.0% per year. The graph below shows historic claims ratios for the residual market along with the expected ratios underlying the trend calculations for policy year 2009. These assumptions are based on judgment.

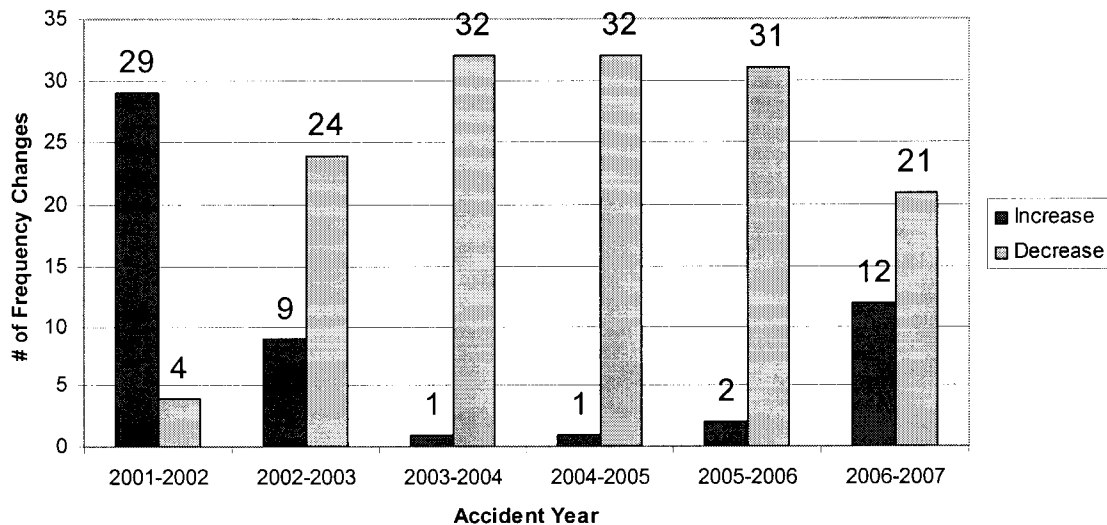


Claims Frequencies: Aside from anticipated improvements to claiming behavior discussed above, there are many other factors that can influence bodily injury claims frequencies. Specifically identifying and isolating causes in order to predict their effects is a difficult, if not impossible, task. However, direct observation of recent frequency data makes it possible to develop reasonable predictions for short-term frequency expectations. The graphs below show the number of frequency increases and decreases (across territories) occurring during accident years 2002-2007 for the bodily injury and PIP coverages.

**BI Frequency Changes Across Territories (@ 1st Report)  
Residual Market**



**PIP Frequency Changes Across Territories (@ 1st Report)  
Residual Market**



The now familiar pattern of claims improvement beginning in 2003 is clear in both of these graphs, as the frequency changes turn from a majority of increases across territories in 2002, to nearly statewide decreases by 2004. During 2007, however, a more balanced mixture of increasing and decreasing frequency changes appears across the state. This has occurred during a time of continued

improvements to bodily injury and PIP claims ratios, indicating that there are unidentified factors beginning to exert upward pressure on injury claims frequencies. Given the current information, on a statewide basis a neutral impact on frequencies is anticipated due to non-CIFI related factors during the trend period, and no further adjustments are made to claims frequency expectations<sup>5</sup>.

### **Property Damage Liability Results**

As indicated in the previous discussion of claims ratios, PDL claims levels are correlated with bodily injury and PIP claims. Therefore, given a stable claims ratio, as PDL claims increase (decrease) there is an expected increase (decrease) in bodily injury and PIP claims.

Section 100 CD-5 displays 2003-2007 total industry frequency changes by territory, with separate graphs for each accident year and for each of the bodily injury, PIP and PDL coverages. Fifteen graphs are displayed side by side by coverage, and top to bottom by accident year. Some observations based on these exhibits:

- The 2002-2003 frequency changes which occurred prior to the introduction of the CIFI program generally appear uniform or randomly increasing and decreasing across the territories.
- With the introduction of CIFI task forces in 2004 and subsequently, the largest bodily injury and PIP changes are clustered in the high rated territories (on the right side of each graph) which tend to be the CIFI territories. During 2004 Lawrence (territory 44, the 3<sup>rd</sup> to last bar on each graph) showed the most significant frequency decreases in excess of -60% for bodily injury and PIP; the Boston territories also showed significant improvement, as did territory 11 which contains Lawrence's neighboring town of Methuen. The significance of the

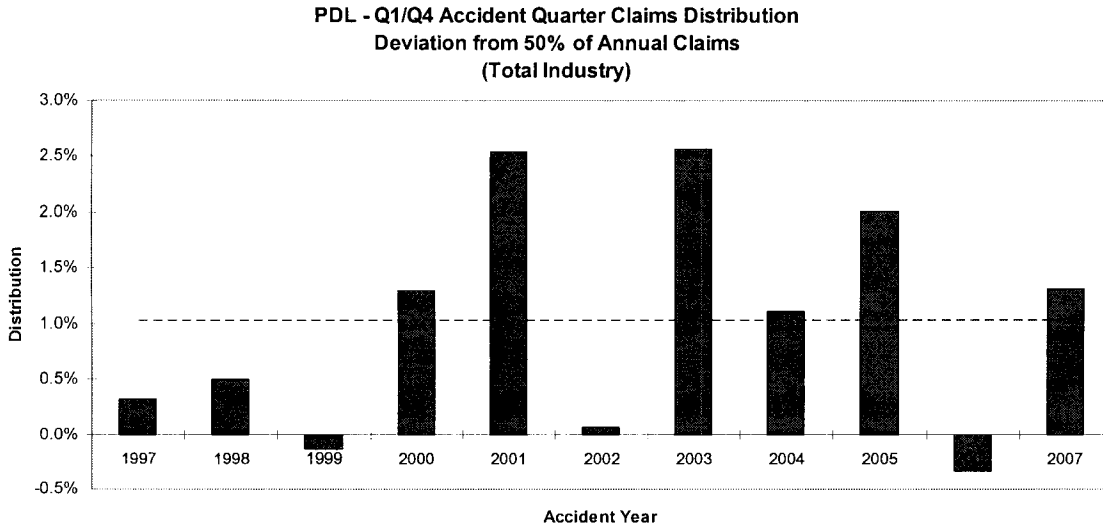
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<sup>5</sup> The rising price of gasoline has likely had some influence on consumer driving habits, and may thus exert some downward pressure on injury claims frequencies – this influence may quickly be reversed if gas prices moderate. However, consumers' vehicle preferences are also changing toward light-weight and more fuel efficient cars which have been shown to provide less protection to their occupants during accidents. This shift in fleet characteristics will exert upward pressure on injury claim severities, and will be longer lasting, as vehicle choices are not as quickly changed as driving habits. Given the opposing, indirect, influences of gas prices on claims, a neutral impact for this factor has been assumed in the trend calculations.

differences in the changes between the territories makes the impact of the CIFI programs on certain territories readily apparent.

- The 2004 PDL frequency changes also showed the largest decrease in the Lawrence territory, though the -18% change was not nearly as significant as the -60% changes in the bodily injury and PIP coverages.
- Large frequency improvements in the higher rate territories persisted during 2005 for bodily injury and PIP, but did not do so for PDL where the changes were small and rather random across territories. This indicates that there may have been some small CIFI-related improvement achieved in the PDL coverage during 2004 but that it likely did not persist into 2005 as it did in the other coverages.
- During 2006 there appears to have been a uniform frequency decrease of about -10% across all territories for all three coverages. In addition to those uniform decreases, the bodily injury and PIP coverages also continued to show additional marginal decreases in the higher rated territories. The uniformity of the decreases, particularly in the PDL coverage, indicates that there were additional factors acting upon claims during 2006. Further analysis (discussed below) indicates that this was due to fewer than normal winter quarter, or seasonal, claims. The drop in winter-related accidents correspondingly resulted in fewer injury claims.
- 2007 PDL frequencies show a small and relatively uniform increase across territories, as claims return from below-expected claims levels in 2006. The bodily injury and PIP coverages show some improvements in the higher rated territories, though results are beginning to vary on a statewide basis, with minimal decreases and even increases in some territories.

The uniformity of the PDL frequency decreases across all territories indicates that non-CIFI related factors were acting to reduce claims in 2006 (and increase them in 2007) on a statewide basis. A likely factor affecting PDL losses in 2006 was good weather (or lack of bad weather). The cyclical nature of weather related claims makes this a type of loss about which general levels of influence can be estimated. To verify that this was the case the following data was reviewed:



The above graph uses quarterly PDL claims, grouping the winter quarters (Q1 and Q4) of each accident year together to determine what percent of annual claims came from claims arising in the winter quarters. If more than half of an accident year's claims were attributable to winter claims a positive bar shows the % in excess of 50%; if winter claims represent less than half a negative % is shown. The dotted line represents the average. The results show that in most years winter claims percentages typically exceeded non-winter claims. Only two of the past ten years showed fewer claims percentages in the winter quarters, and accident year 2006 clearly had the lowest percent of winter quarter claims in the last ten years. The 2007 winter quarters show claims at about the average level over the past 10 years.

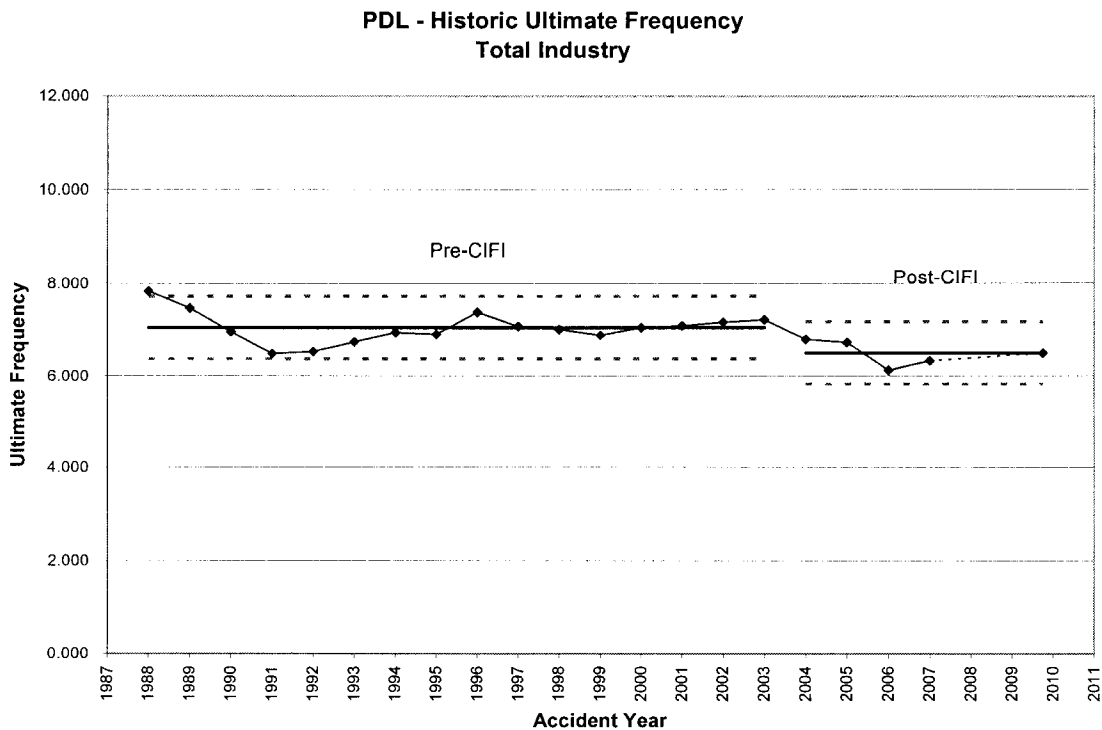
The following conclusions are drawn from all of the data reviewed thus far:

- During 2004 PDL claims experienced a small frequency reduction, likely benefiting from the CIFI programs. CIFI influences did not persist into subsequent accident years as they did in the bodily injury and PIP coverages. This indicates that a small one-time downward adjustment to long-term frequency expectations for PDL may be appropriate.
- The 2006 PDL frequency decrease occurs as a result of the reporting of fewer than normal expected claims during the winter quarters; therefore this decrease

represents natural random variation, is not representative of a long term change in frequency expectations, and should not be considered indicative of a trend.

- In terms of weather-related claims, the 2007 accident year looks to be about average.

Below is a graph of historical industry ultimate claims frequencies for the PDL coverage with pre- and post-CIFI accident years highlighted. During the pre-CIFI years PDL frequencies tended to move around a flat line, indicating that a long-term average of historical frequencies would be a reasonable estimate for future expectations. The introduction of CIFI programs in 2004 likely had a small one-time effect on the long term expectation. A reasonable approach to reflect long-term PDL frequency expectations *and* incorporate CIFI-related improvements is to use the average of the PDL frequencies reported during the post-CIFI period. This results in an expected PDL frequency that is shifted down from past long-term expectations but is higher than the 2006 reported frequency and almost equal to the 2007 reported frequency; this is consistent with the results of the winter quarter claims analysis discussed above.





**Residual Market Trend Selections**

For all trend selections, historic reported frequency, severity and pure premium results for the residual market segment was primarily relied upon, with consideration given to issues observed at the industry or voluntary market level, where appropriate. Exhibit 100 CD-1 displays the historic frequency, severity and pure premium statistics for the residual market segment. Exhibits 100 CD-6 and 100 CD-7 show residual and voluntary regression calculations, some of which are relied upon in the trend factor selection discussion, below.

- **Property Damage Liability (PDL)** The actual data for the residual market segment was reviewed, consideration was given to the trend issues discussed above, and long-term frequency expectations were selected to be equal to the average of the 2004-2007 post-CIFI PDL frequencies.

Over the long term, residual market severities have increased in a fairly steady manner; regressions are generally reliable for trend projections in such cases. The 2009 PDL severity expectation was estimated based upon a regression through the 2004-2007 data points.

Combining the frequency and severity trend components gives a 2009 policy year expected pure premium of \$328.43 and a corresponding trend factor of 1.0673.

- **Bodily Injury (A-1/B) and PIP** The residual market segment, like the industry, showed significant improvements to claims frequencies in the BI and PIP coverages during 2004-2007.

The analysis of trend issues shows that when selecting trends for the bodily injury and PIP coverages it is appropriate to consider both the impact of continuing improvements due to CIFI activity and any other factors affecting claims frequencies and severities. Overall frequency expectations for bodily injury and PIP are made up of the combination of expected frequency decreases due to continuing CIFI improvements, which the AIB has estimated at -3.0% per year for both coverages, and expected frequency changes due to other factors which the AIB has estimated at 0.0% (discussed above).

The residual market bodily injury severities show increases in recent years, exceeding the increases seen in the voluntary market; however the severities themselves have become about equal in 2007. As expected CIFI-related improvements moderate in the upcoming years and fewer low severity claims are eliminated from claims distributions, growth in average severities can be expected to be tempered as well. In consideration of this expectation, it is assumed that residual market severities will behave more like those recently observed in the voluntary market. Selected annual severity trends are +3.0% for bodily injury and +2.5% for PIP.

The combined the frequency and severity trend components result in policy year 2009 expected pure premiums of \$422.04 for A-1/B and \$127.31 for PIP, and the corresponding trend factors are 1.0000 and 0.9843, respectively<sup>6</sup>.

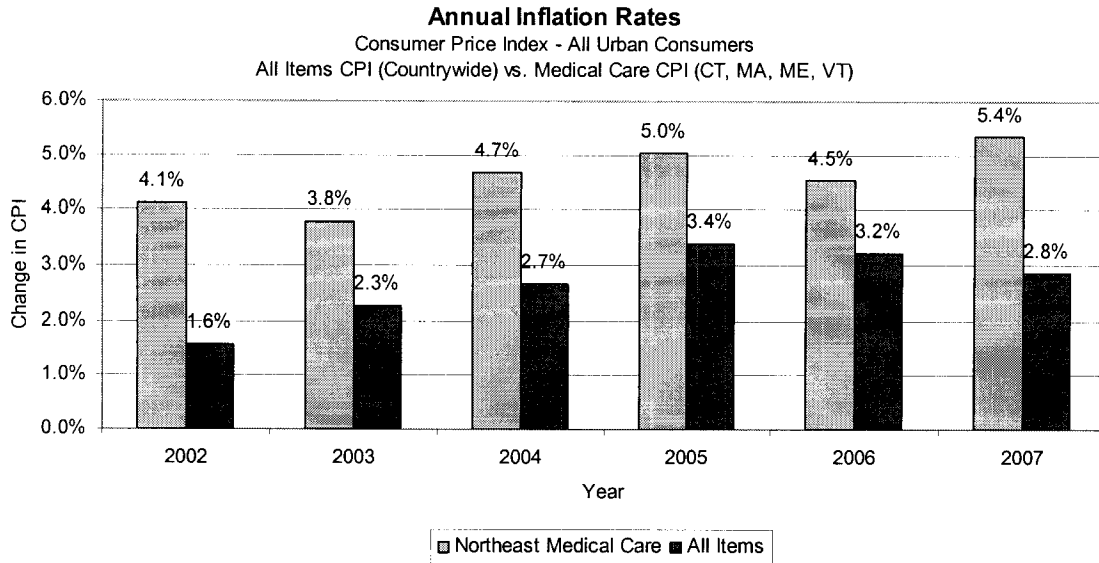
- **Medical Payments** Residual market medical payments frequencies reached a turning point in 2005 after a period of general decline; they have increased by approximately +7.0% during 2006 and 2007. Severities have steadily increased over the long term and have been fairly predictable using regression methods.

The graph below shows that medical costs, as measured by the Bureau of Labor Statistics, are increasing at a rate in excess of 5.0%, which continues to outstrip the overall inflation rate. The AIB has estimated the medical payments severity trend to be +2.3% per year based on 2004-2007 regression results<sup>7</sup>.

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<sup>6</sup> It was assumed that the +3.0% expected severity and -3.0% expected frequency net to an annual trend of 0.0%, for trending purposes.

<sup>7</sup> See Section 100 CD-6, Exhibit 4.



On May 12, 2008, the Massachusetts Supreme Judicial Court (SJC) issued a decision indicating that health insurance carriers may defer coverage of medical costs in excess of \$2000 in instances where the claimant has a motor vehicle insurance policy that provides coverage for MedPay and where the health coverage policy contains a clause stating that coverage is secondary to other coverage for health care services. As this has historically been an unresolved issue of contention between health and auto insurers, the recent SJC decision will likely result in upward pressure on medical payments claims frequencies in the near future. While the AIB has not made an explicit adjustment for this issue, it has selected the most conservative frequency regression (2005-2007) in order to contemplate future claims increases<sup>8</sup>. The resulting annualized pure premium trend is +8.8%, which is comparable to the two most recent observed changes of +8.6% and +9.9%.

The policy year 2009 expected pure premium for medical payments is \$32.76, and the corresponding trend factor is 1.2618.

- **Uninsured Motorists.** The frequency and severity results for the U-1 coverage in the residual market generally follow the pattern of the bodily injury (coverage A-1/B) results, with substantial frequency decreases since 2004 that moderated in

<sup>8</sup> See Section 100 CD-6, Exhibit 4.

2006-2007, and severity increases reflecting the changing size of loss distribution since the implementation of the CIFI programs. The AIB has derived the U-1 trends using logic similar to that used for the bodily injury coverage, assuming a judgmental -3.0% per year frequency reduction and basing the projected severity on voluntary market regression results, selecting +3.0% per year<sup>9</sup>. Given these results the AIB has selected a trend factor of unity to represent pure premium expectations for policy year 2008.

The combined frequency and severity trend components result in a policy year 2009 expected pure premium of \$25.56 for U-1 and a corresponding trend factor of 1.0000<sup>10</sup>.

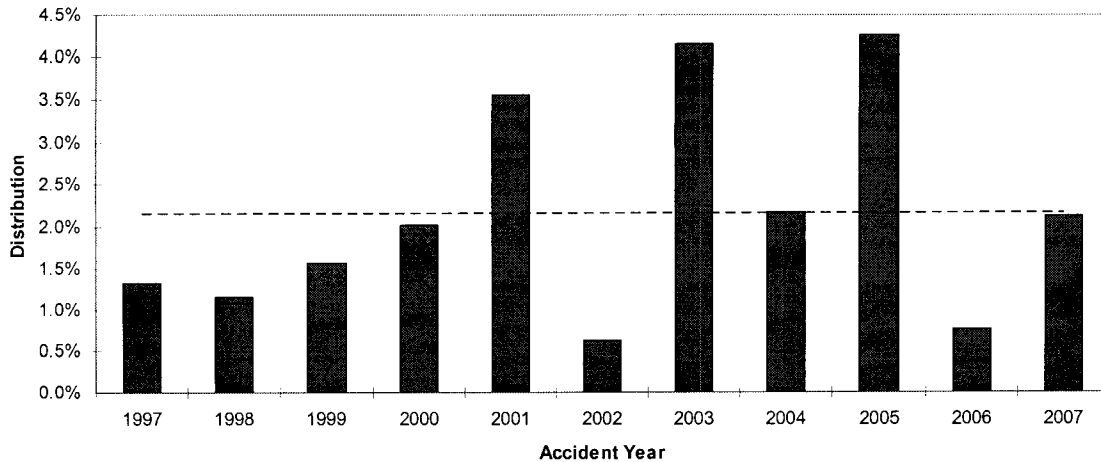
- **Collision** Given the nature of this coverage, the issues surrounding and factors acting upon collision are similar to those of the PDL coverage. With respect to loss and claim statistics:
  - Both collision and PDL severities tend to increase with time.
  - Where frequencies have tended to be stable/flat for PDL, they have increased over the long term for collision. However, collision frequencies have decreased since 2004, similar to PDL.
  - As with the PDL coverage, the 2004 frequency decrease appears to be (at least partially) due to CIFI-related improvements.
  - Collision data compiled in terms of “winter quarters”, as was done for the PDL coverage, also shows that the 2006 accident year frequency was likely lower than would be expected due to a lack of the usual level of winter weather claims, and should therefore not be considered indicative of a decreasing trend.

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<sup>9</sup> Based on calculations from Section 100 CD-6, Exhibit 8.

<sup>10</sup> It was assumed that the +3.0% expected severity and -3.0% expected frequency net to an annual trend of 0.0%, for trending purposes.

**Collision - Q1/Q4 Accident Quarter Claims Distribution**  
**Deviation from 50% of Annual Claims**  
**(Total Industry)**



Given these similarities, the same methodology as was used for the PDL coverage was applied to derive the collision trend factor: a “post-CIFI” four year average was used for expected frequency, and a regression through the 2004-2007 data points was used for expected severity<sup>11</sup>. The resulting 2009 expected pure premium is \$651.11 and the corresponding trend factor is 1.1693.

- **Comprehensive (OTC)** Though the comprehensive coverage is a physical damage coverage akin to PDL and collision, its loss and claim results are more subject to the random variation associated with the nature of the types of risk for which the coverage provides protection. The individual frequency and severity components are difficult to predict for the coverage as a whole, but these statistics can be more meaningful when analyzed at the type of loss level.

Comprehensive glass claims make up almost 40% of total OTC losses, and theft claims another 20%, and the statistics for these types of loss tell a rational story given their individual historical contexts, making predictions based on data for these individual types of loss more intuitive and reliable. Therefore the AIB has subdivided the OTC residual market data into three credible subgroups representing claims relating to glass, theft, and the remaining “Other” category. Trends were analyzed for each category and then the total ultimate projected pure

<sup>11</sup> See Exhibit 100 CD-6, Exhibit 6.

premium for the OTC coverage was selected by adding together the results for the three categories.

Frequency and severity assumptions were made for each type of loss category as follows<sup>12</sup>:

#### Glass

- *Frequency*: Glass frequencies have alternated between large increases and decreases for the past several years. A short term average (2004-2007) was used to reflect an average expectation and to be responsive to any recent overall trend in the frequency level.
- *Severity*: After several years of decline, glass severities appear to have plateaued in 2007; accordingly a severity trend factor of unity was selected.

#### Theft

- *Frequency*: Theft frequencies have been decreasing steadily and rapidly for many years. The current rate of decrease cannot be sustained (without assuming that *all claims* would soon be eliminated) so a projected theft frequency reflecting continuing, but moderating, decreases was judgmentally selected.
- *Severity*: Theft severities have been fairly stable over the past four years, so an average of the 2004-2007 average claim costs was selected as the projected theft severity.

#### “Other” Types of Loss

- *Frequency*: Frequencies for the “Other” category of losses appear to have plateaued in 2007; accordingly a trend factor of unity was selected.
- *Severity*: Given the random nature of the claims in this category, a long-term average is the most reasonable method to develop an expected average severity; an average of the 1998-2007 average claims costs was selected as the projected “Other” severity.

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<sup>12</sup> Details of the frequency and severity selections by type of loss are found in Exhibit 100 CD-7.

Combining the above results gives a 2009 projected pure premium of \$130.12 and a corresponding trend factor of 0.9889 for the comprehensive coverage, as a whole.

**Massachusetts Private Passenger Automobile  
Determination of Loss Pure Premiums  
Accident Year 2007 Data  
Facility Market**

	A-1, 20/40	A-2, PIP (Full Covg.)	B, Basic	PDL, Basic	Collision (up to \$500 Ded.)	Ltd. Collision (up to \$500 Ded.)	D, Medical	Comp. (up to \$500 Ded.)	U-1, Uninsured, 20/40
1. 2007 Calendar Year Earned Exposures	179,384.3	177,279.4	175,956.6	179,384.3	94,815.3	2,939.2	55,472.9	110,000.0	179,384.3
2. 2007 Accident Year Incurred/Paid Losses	66,973,788	33,718,146	11,419,004	54,162,882	57,631,133	222,100	1,055,448	14,250,706	4,804,365
3. 2007 Accident Year Total Limits Incurred DCCE	3,041,049	2,855,242	571,520	395,872	-	-	13,844	-	244,035
4. Basic DCCE Proportion	0.689	-	0.689	-	-	-	-	-	-
5. DCCE assigned to basic layer (3)*(4)	2,095,801	-	393,875	-	-	-	-	-	-
6. 2007 Incurred (Paid) Claims	8,184	11,298	1,321	28,603	19,498	137	283	20,029	601
7. 2007 Pure Premium ((2)+(3))/(1), A-1 & B: ((2)+(5))/(1)	385.04	206.30	67.14	304.14	607.83	75.56	19.28	129.55	28.14
8. Factor to Remove Excess Experience Current Year	-	-	-	-	-	-	-	0.9978	-
9. Excess Loading Factor	-	-	-	-	-	-	-	1.010	-
10. Pure Premium Adjusted For Excess (7) x (8) x (9)	385.04	206.30	67.14	304.14	607.83	75.56	19.28	130.58	28.14



**Massachusetts Private Passenger Automobile  
Calculation of Catastrophe Loading Factor for  
2007 Industry Comprehensive Losses on a \$500 Deductible Basis  
At First Report**

(A) <u>Year</u>	(B) Massachusetts Catastrophe <u>Losses</u>	(C) CPI All Items <u>(U)</u>	(D) Losses Adjusted to 2007 Level
1988	\$ 0	118.3	\$ 0
1989	\$ 0	124.0	\$ 0
1990	\$ 0	130.7	\$ 0
1991	\$ 7,185,817	136.2	\$ 10,939,219
1992	\$ 825,900	140.3	\$ 1,220,554
1993	\$ 274,795	144.5	\$ 394,301
1994	\$ 278,001	148.2	\$ 388,943
1995	\$ 186,919	152.4	\$ 254,306
1996	\$ 5,019,840	156.9	\$ 6,633,675
1997	\$ 690,892	160.5	\$ 892,529
1998	\$ 5,486,555	163.0	\$ 6,979,099
1999	\$ 2,999,909	166.6	\$ 3,733,536
2000	\$ 460,977	172.2	\$ 555,051
2001	\$ 0	177.1	\$ 0
2002	\$ 0	179.9	\$ 0
2003	\$ 114,142	184.0	\$ 128,622
2004	\$ 0	188.9	\$ 0
2005	\$ 2,044,597	195.3	\$ 2,170,665
2006	\$ 987,424	201.6	\$ 1,015,548
2007	\$ 388,587	207.3	\$ 388,587
Totals	\$ 26,944,354		\$ 35,694,636
(E) 2007 Non-Excess Comprehensive Losses (Exhibit 2, Page 1)			\$176,216,140
(F) 2007 Catastrophe Loading Factor {{Sum (D)/20}/(E)}+1			1.010

**Massachusetts Private Passenger Automobile  
Determination of Excess and Non-Excess Experience  
2007 Industry Comprehensive Losses on a \$500 Deductible Basis  
At First Report**

	<u>Reported Claims</u>	<u>Non-Excess Claims</u>	<u>Reported Losses</u>	<u>Non-Excess Losses</u>
Type of Loss 01	1,273	1,273	6,735,188	6,735,188
Type of Loss 02	5,033	5,033	17,378,276	17,378,276
Type of Loss 03	277,050	277,050	97,468,409	97,468,409
Type of Loss 05	14,585	14,585	20,334,807	20,334,807
Type of Loss 06	1,338	1,203	3,205,782	2,882,329
Type of Loss 07	422	410	2,290,540	2,225,406
Type of Loss 09	14,534	14,534	29,191,725	29,191,725
<b>Total</b>	<b>314,235</b>	<b>314,088</b>	<b>176,604,727</b>	<b>176,216,140</b>

	<u>Claims</u>	<u>Losses</u>
A) Total Reported Comprehensive Experience Percent of Total	314,235 100.00%	176,604,727 100.00%
B) Non-Excess Comprehensive Experience Percent of Total	314,088 99.95%	176,216,140 99.78%
C) Excess Comprehensive Experience Percent of Total	147 0.05%	388,587 0.22%

I. It was determined that claims were affected by catastrophes if both

- A. ISO catastrophe(s) were reported during the month and
- B. Reported claims during the month were greater than three (3) times the average number of claims for the month without catastrophes.

II. Reported claims affected by catastrophes were limited to three (3) times the average number of claims for the month without ISO reported catastrophes.

Average reported flood claims (Type of Loss 07) were seasonally adjusted.

III. Reported losses were adjusted to recognize the effects of catastrophes by multiplying the adjusted number of claims times the average cost per claim.

**Massachusetts Private Passenger Automobile  
Determination of Excess and Non-Excess Experience  
2007 Industry Comprehensive Losses on a \$500 Deductible Basis  
At First Report**

<u>Month</u>	<u>Claims</u>	<u>% of Avg. Claims**</u>	<u>Non-Excess Claims</u>	<u>Losses</u>	<u>Avg. Loss Per Case</u>	<u>Non-Excess Losses</u>
<b>TYPE OF LOSS 01-FIRE</b>						
January	110	104%	110	543,257	4,939	581,988
February	109	103%	109	599,870	5,503	576,697
March	120	113%	120	633,562	5,280	634,896
April*	110	104%	110	579,659	5,270	581,988
May	138	130%	138	727,041	5,268	730,130
June	100	94%	100	461,223	4,612	529,080
July	99	93%	99	511,510	5,167	523,789
August	102	96%	102	504,450	4,946	539,662
September	78	74%	78	434,343	5,569	412,682
October	72	68%	72	412,804	5,733	380,938
November	102	96%	102	561,492	5,505	539,662
December	133	125%	133	765,977	5,759	703,676
Total	1,273		1,273	6,735,188	5,291	6,735,188
Average	106		106	561,266		561,266
Average excluding Catastrophe Months	106					
<b>TYPE OF LOSS 02-THEFT</b>						
January	514	123%	514	1,524,415	2,966	1,774,773
February	377	90%	377	1,234,013	3,273	1,301,731
March	448	107%	448	1,506,090	3,362	1,546,884
April*	422	101%	422	1,484,935	3,519	1,457,110
May	430	103%	430	1,497,745	3,483	1,484,733
June	415	99%	415	1,506,579	3,630	1,432,940
July	443	106%	443	1,493,178	3,371	1,529,620
August	408	97%	408	1,580,449	3,874	1,408,769
September	374	89%	374	1,404,532	3,755	1,291,372
October	420	100%	420	1,513,034	3,602	1,450,204
November	419	100%	419	1,507,777	3,599	1,446,751
December	363	87%	363	1,125,529	3,101	1,253,390
Total	5,033		5,033	17,378,276	3,453	17,378,276
Average	419		419	1,448,190		1,448,190
Average excluding Catastrophe Months	419					
<b>TYPE OF LOSS 03-GLASS</b>						
January	19,140	84%	19,140	6,780,198	354	6,733,605
February	23,945	105%	23,945	8,461,025	353	8,424,043
March	28,943	127%	28,943	10,207,842	353	10,182,379
April*	25,784	113%	25,784	9,124,103	354	9,071,018
May	26,060	114%	26,060	9,248,449	355	9,168,117
June	23,808	104%	23,808	8,452,341	355	8,375,845
July	23,304	102%	23,304	8,133,158	349	8,198,534
August	22,560	99%	22,560	7,879,123	349	7,936,789
September	19,012	83%	19,012	6,651,701	350	6,688,574
October	18,251	80%	18,251	6,342,572	348	6,420,848
November	16,586	73%	16,586	5,765,087	348	5,835,088
December	29,657	130%	29,657	10,422,810	351	10,433,570
Total	277,050		277,050	97,468,409	352	97,468,409
Average	23,088		23,088	8,122,367		8,122,367
Average excluding Catastrophe Months	22,842					

\* Catastrophe month as reported by ISO.

\*\* Equals percentage of the average claims calculated excluding catastrophe months.

**Massachusetts Private Passenger Automobile  
Determination of Excess and Non-Excess Experience  
2007 Industry Comprehensive Losses on a \$500 Deductible Basis  
At First Report**

<u>Month</u>	<u>Claims</u>	<u>% of Avg. Claims**</u>	<u>Non-Excess Claims</u>	<u>Losses</u>	<u>Avg. Loss Per Case</u>	<u>Non-Excess Losses</u>
<b>TYPE OF LOSS 05-MALICIOUS MISCHIEF &amp; VANDALISM</b>						
January	976	81%	976	1,307,492	1,340	1,360,766
February	832	69%	832	1,121,691	1,348	1,159,997
March	1,142	94%	1,142	1,468,431	1,286	1,592,208
April*	1,252	103%	1,252	1,740,698	1,390	1,745,573
May	1,305	108%	1,305	1,835,157	1,406	1,819,467
June	1,391	115%	1,391	1,928,267	1,386	1,939,370
July	1,461	121%	1,461	2,155,341	1,475	2,036,966
August	1,477	122%	1,477	2,133,458	1,444	2,059,274
September	1,407	116%	1,407	2,069,525	1,471	1,961,678
October	1,371	113%	1,371	1,877,099	1,369	1,911,486
November	1,122	93%	1,122	1,627,933	1,451	1,564,323
December	849	70%	849	1,069,715	1,260	1,183,699
Total	14,585		14,585	20,334,807	1,394	20,334,807
Average	1,215		1,215	1,694,567		1,694,567
Average excluding Catastrophe Months	1,212					
<b>TYPE OF LOSS 06-WINDSTORM,ETC.</b>						
January	27	31%	27	48,753	1,806	64,691
February	53	62%	53	113,895	2,149	126,985
March	100	116%	100	215,030	2,150	239,595
April*	393	457%	258	1,111,216	2,828	618,155
May	40	47%	40	74,497	1,862	95,838
June	110	128%	110	207,789	1,889	263,555
July	101	117%	101	269,716	2,670	241,991
August	133	155%	133	309,448	2,327	318,661
September	32	37%	32	81,517	2,547	76,670
October	91	106%	91	214,038	2,352	218,032
November	172	200%	172	382,671	2,225	412,104
December	86	100%	86	177,212	2,061	206,052
Total	1,338		1,203	3,205,782	2,396	2,882,329
Average	112		100	267,149		240,194
Average excluding Catastrophe Months	86					

\* Catastrophe month as reported by ISO.

\*\* Equals percentage of the average claims calculated excluding catastrophe months.

**Massachusetts Private Passenger Automobile  
Determination of Excess and Non-Excess Experience  
2007 Industry Comprehensive Losses on a \$500 Deductible Basis  
At First Report**

<u>Month</u>	<u>S</u> <u>A</u> <u>F</u>	<u>Claims</u>	<u>% of Avg.</u> <u>Claims**</u>	<u>Non-Excess</u> <u>Claims</u>	<u>Losses</u>	<u>Avg. Loss</u> <u>Per Case</u>	<u>Non-Excess</u> <u>Losses</u>
<b>TYPE OF LOSS 07-FLOOD &amp; RISING WATER</b>							
January	1	5	21%	5	23,077	4,615	27,139
February	1	26	108%	26	104,901	4,035	141,123
March	1	47	196%	47	203,589	4,332	255,108
April*	2	156	650%	144	1,101,672	7,062	781,606
May	2	20	83%	20	118,688	5,934	108,556
June	3	20	83%	20	104,957	5,248	108,556
July	3	63	263%	63	254,192	4,035	341,953
August	3	9	38%	9	69,205	7,689	48,850
September	3	15	63%	15	63,707	4,247	81,417
October	2	22	92%	22	86,440	3,929	119,412
November	2	33	138%	33	112,903	3,421	179,118
December	1	6	25%	6	47,209	7,868	32,567
Total		422		410	2,290,540	5,428	2,225,406
Average		35		34	190,878		185,451
Average excluding Catastrophe Months		24					
<b>TYPE OF LOSS 09-ALL OTHER</b>							
January		869	72%	869	1,661,606	1,912	1,745,398
February		1,426	118%	1,426	2,267,601	1,590	2,864,139
March		1,292	107%	1,292	2,139,420	1,656	2,594,999
April*		1,260	104%	1,260	2,566,098	2,037	2,530,726
May		1,054	87%	1,054	2,050,932	1,946	2,116,972
June		1,190	99%	1,190	2,653,912	2,230	2,390,130
July		1,075	89%	1,075	2,173,677	2,022	2,159,151
August		991	82%	991	1,883,692	1,901	1,990,436
September		844	70%	844	1,577,360	1,869	1,695,185
October		1,256	104%	1,256	2,805,298	2,234	2,522,692
November		1,742	144%	1,742	4,317,859	2,479	3,498,829
December		1,535	127%	1,535	3,094,270	2,016	3,083,067
Total		14,534		14,534	29,191,725	2,009	29,191,725
Average		1,211		1,211	2,432,644		2,432,644
Average excluding Catastrophe Months		1,207					

\* Catastrophe month as reported by ISO.

\*\* Equals percentage of the average claims calculated excluding catastrophe months.

**Massachusetts Private Passenger Automobile  
A-1 and B 20,000/40,000 Dollar Limits  
Selected Loss Development Factors  
Residual Market**

		<u>Reported Losses</u>								
<u>Data Type</u>		2007	2006	2005	2004	2003	2002	2001	2000	1999
<u>Incurring</u>		82,005,361	89,387,449	122,728,208	153,057,777	198,256,810	209,366,191	194,105,209	195,521,643	180,188,108
	<u>Method</u>									
	5-Yr Ex Hi/Lo	15 to Ult 0.9355	24 to Ult 1.0027	36 to Ult 1.0080	48 to Ult 1.0013	60 to Ult 0.9993	72 to Ult 1.0001	84 to Ult 1.0004	96 to Ult 1.0007	108 to Ult 1.0005
<u>Development Factors (to Ultimate)</u>										
	<u>Method</u>									
	5-Yr Ex Hi/Lo	15 to Ult 76,716,015	24 to Ult 89,628,795	36 to Ult 123,710,034	48 to Ult 153,256,752	60 to Ult 198,118,030	72 to Ult 209,387,128	84 to Ult 194,182,851	96 to Ult 195,658,508	108 to Ult 180,278,202
<u>Projected Ultimate Losses</u>										
<u>Data Type</u>										
<u>Incurring</u>		427.66	432.77	475.68	591.11	712.37	711.32	646.90	587.77	510.82
	<u>Method</u>									
	5-Yr Ex Hi/Lo	15 to Ult 427.66	24 to Ult 432.77	36 to Ult 475.68	48 to Ult 591.11	60 to Ult 712.37	72 to Ult 711.32	84 to Ult 646.90	96 to Ult 587.77	108 to Ult 510.82

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**Massachusetts Private Passenger Automobile  
A-1 and B 20,000/40,000 Dollar Limits  
Residual Market**

Part 1.A: Development of Reported Incurred Losses

<u>Calendar/ Accident Year</u>	<u>First Report</u>	<u>Second Report</u>	<u>Third Report</u>	<u>Fourth Report</u>	<u>Fifth Report</u>	<u>Calendar/ Accident Year</u>	<u>First Report</u>	<u>Second Report</u>	<u>Third Report</u>	<u>Fourth Report</u>	<u>Fifth Report</u>	<u>Calendar/ Accident Year</u>	<u>First Report</u>	<u>Second Report</u>	<u>Third Report</u>	<u>Fourth Report</u>	<u>Fifth Report</u>	<u>Calendar/ Accident Year</u>	<u>Earned Exposures</u>
1996	218,107,956	202,219,164	194,679,499	194,534,144	194,204,585	1996	24,958	25,101	25,006	25,035	24,972	1996	394,297						
1997	209,298,113	192,858,392	189,214,797	189,015,150	188,026,065	1997	24,601	24,692	24,638	24,703	24,524	1997	358,093						
1998	193,127,493	187,074,449	184,093,440	181,377,881	181,572,947	1998	24,098	24,158	24,194	23,935	23,830	1998	355,505						
1999	200,311,111	189,753,181	178,565,593	180,133,262	180,605,177	1999	25,269	25,443	24,243	24,252	24,186	1999	352,916						
2000	193,528,773	190,950,745	192,346,274	194,902,470	195,525,707	2000	25,393	25,966	25,840	25,974	25,951	2000	332,884						
2001	194,097,135	190,952,619	191,361,731	193,829,665	193,964,921	2001	25,934	26,268	26,312	26,522	26,442	2001	300,175						
2002	223,768,000	209,296,903	208,919,770	209,507,623	209,932,891	2002	30,190	29,718	29,664	29,682	29,623	2002	294,364						
2003	212,130,463	198,295,037	197,134,893	197,993,180	198,256,810	2003	30,487	29,123	28,835	28,792	28,709	2003	278,112						
2004	167,712,854	155,792,601	153,151,355	153,057,777		2004	22,786	22,056	21,722	21,606		2004	259,268						
2005	131,532,608	123,737,790	122,728,208			2005	17,501	17,079	16,921			2005	260,072						
2006	97,234,456	89,387,449				2006	11,735	11,536				2006	207,105						
2007	82,005,361					2007	9,505					2007	179,384						

Part 1.B: Development of Reported Claims

Part 1.D: Average Claim Cost (1A/1B)

<u>Calendar/ Accident Year</u>	<u>First Report</u>	<u>Second Report</u>	<u>Third Report</u>	<u>Fourth Report</u>	<u>Fifth Report</u>	<u>Calendar/ Accident Year</u>	<u>First Report</u>	<u>Second Report</u>	<u>Third Report</u>	<u>Fourth Report</u>	<u>Fifth Report</u>	<u>Calendar/ Accident Year</u>	<u>First Report</u>	<u>Second Report</u>	<u>Third Report</u>	<u>Fourth Report</u>	<u>Fifth Report</u>
1996	8,739	8,056	7,785	7,770	7,777	1996	6,330	6,366	6,342	6,349	6,333	1996	6,333				
1997	8,508	7,811	7,680	7,652	7,667	1997	6,870	6,895	6,880	6,898	6,849	1997	6,849				
1998	8,014	7,744	7,609	7,578	7,620	1998	6,779	6,795	6,806	6,733	6,703	1998	6,703				
1999	7,927	7,458	7,366	7,428	7,467	1999	7,160	7,209	6,869	6,872	6,853	1999	6,853				
2000	7,621	7,354	7,444	7,504	7,534	2000	7,628	7,800	7,762	7,803	7,796	2000	7,796				
2001	7,484	7,269	7,273	7,308	7,335	2001	8,640	8,751	8,766	8,836	8,809	2001	8,809				
2002	7,412	7,043	7,043	7,058	7,087	2002	10,256	10,096	10,077	10,083	10,063	2002	10,063				
2003	6,958	6,809	6,837	6,877	6,906	2003	10,962	10,472	10,368	10,353	10,323	2003	10,323				
2004	7,360	7,064	7,051	7,084		2004	8,789	8,507	8,378	8,333		2004	8,333				
2005	7,516	7,245	7,253			2005	6,729	6,567	6,506			2005	6,506				
2006	8,286	7,749				2006	5,666	5,570				2006	5,570				
2007	8,628					2007	5,299					2007	5,299				

Part 1.E: Claim Frequency (1B)/(1C) x 100

<u>Calendar/ Accident Year</u>	<u>First Report</u>	<u>Second Report</u>	<u>Third Report</u>	<u>Fourth Report</u>	<u>Fifth Report</u>	<u>Calendar/ Accident Year</u>	<u>First Report</u>	<u>Second Report</u>	<u>Third Report</u>	<u>Fourth Report</u>	<u>Fifth Report</u>
1996	6,330	6,366	6,342	6,349	6,333	1996	6,330	6,366	6,342	6,349	6,333
1997	6,870	6,895	6,880	6,898	6,849	1997	6,870	6,895	6,880	6,898	6,849
1998	6,779	6,795	6,806	6,733	6,703	1998	6,779	6,795	6,806	6,733	6,703
1999	7,160	7,209	6,869	6,872	6,853	1999	7,160	7,209	6,869	6,872	6,853
2000	7,628	7,800	7,762	7,803	7,796	2000	7,628	7,800	7,762	7,803	7,796
2001	8,640	8,751	8,766	8,836	8,809	2001	8,640	8,751	8,766	8,836	8,809
2002	10,256	10,096	10,077	10,083	10,063	2002	10,256	10,096	10,077	10,083	10,063
2003	10,962	10,472	10,368	10,353	10,323	2003	10,962	10,472	10,368	10,353	10,323
2004	8,789	8,507	8,378	8,333		2004	8,789	8,507	8,378	8,333	
2005	6,729	6,567	6,506			2005	6,729	6,567	6,506		
2006	5,666	5,570				2006	5,666	5,570			
2007	5,299					2007	5,299				





**Massachusetts Private Passenger Automobile  
 A-1 and B 20,000/40,000 Dollar Limits  
 Residual Market**

Statistical Plan Data - Incurred Losses by Accident Year and Year of Report

<u>Calendar/ Accident Year</u>	<u>Sixth Report</u>	<u>Seventh Report</u>	<u>Eighth Report</u>	<u>Ninth Report</u>	<u>Tenth Report</u>
1996	192,905,700	192,550,438	192,456,646	192,370,384	192,397,525
1997	187,707,582	187,715,604	187,685,684	187,658,611	187,681,498
1998	181,531,662	181,331,758	181,279,939	181,325,940	181,539,045
1999	180,134,642	180,032,587	180,132,957	180,188,108	
2000	195,581,766	195,633,196	195,521,643		
2001	194,174,317	194,105,209			
2002	209,366,191				

Statistical Plan Data - Incurred Claims by Accident Year and Year of Report

<u>Calendar/ Accident Year</u>	<u>Sixth Report</u>	<u>Seventh Report</u>	<u>Eighth Report</u>	<u>Ninth Report</u>	<u>Tenth Report</u>
1996	24,888	24,855	24,827	24,817	24,817
1997	24,473	24,433	24,421	24,423	24,419
1998	23,791	23,772	23,754	23,744	23,743
1999	24,128	24,116	24,111	24,110	
2000	25,943	25,921	25,907		
2001	26,404	26,369			
2002	29,570				

**Massachusetts Private Passenger Automobile  
 A-1 and B 20,000/40,000 Dollar Limits  
 Loss Development Factors (Incurred)  
 Residual Market**

<u>Accident Year</u>	<u>First to</u>	<u>Second to</u>	<u>Third to</u>	<u>Fourth to</u>	<u>Fifth to</u>	<u>Sixth to</u>	<u>Seventh to</u>	<u>Eighth to</u>	<u>Ninth to</u>	<u>Tenth</u>
	<u>Second</u>	<u>Third</u>	<u>Fourth</u>	<u>Fifth</u>	<u>Sixth</u>	<u>Seventh</u>	<u>Eighth</u>	<u>Ninth</u>	<u>Tenth</u>	
1996	0.9272	0.9627	0.9993	0.9983	0.9933	0.9982	0.9995	0.9996	1.0001	1.0001
1997	0.9215	0.9811	0.9989	0.9948	0.9983	1.0000	0.9998	0.9999	1.0001	1.0001
1998	0.9687	0.9841	0.9852	1.0011	0.9998	0.9989	0.9997	1.0003	1.0003	1.0012
1999	0.9473	0.9410	1.0088	1.0026	0.9974	0.9994	1.0006	1.0003	1.0003	1.0003
2000	0.9867	1.0073	1.0133	1.0032	1.0003	1.0003	0.9994	1.0003	1.0003	1.0003
2001	0.9838	1.0021	1.0129	1.0007	1.0011	0.9996				
2002	0.9353	0.9982	1.0028	1.0020	0.9973					
2003	0.9348	0.9941	1.0044	1.0013						
2004	0.9289	0.9830	0.9994							
2005	0.9407	0.9918								
2006	0.9193									
5-Yr Ex Hi/Lo	0.9330	0.9947	1.0067	1.0020	0.9992	0.9997	0.9997	1.0002	1.0005	1.0005
Factors to Ultimate	0.9355	1.0027	1.0080	1.0013	0.9993	1.0001	1.0004	1.0007	1.0005	1.0005

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**Massachusetts Private Passenger Automobile  
 A-1 and B 20,000/40,000 Dollar Limits  
 Claim Development Factors (Incurred)  
 Residual Market**

Accident Year	First to	Second to	Third to	Fourth to	Fifth to	Sixth to	Seventh to	Eighth to	Ninth to
	Second	Third	Fourth	Fifth	Sixth	Seventh	Eighth	Ninth	Tenth
1996	1.0057	0.9962	1.0012	0.9975	0.9966	0.9987	0.9989	0.9996	1.0000
1997	1.0037	0.9978	1.0026	0.9928	0.9979	0.9984	0.9995	1.0001	0.9998
1998	1.0025	1.0015	0.9893	0.9956	0.9984	0.9992	0.9992	0.9996	1.0000
1999	1.0069	0.9528	1.0004	0.9973	0.9976	0.9995	0.9998	1.0000	
2000	1.0226	0.9951	1.0052	0.9991	0.9997	0.9992	0.9995		
2001	1.0129	1.0017	1.0080	0.9970	0.9986	0.9987			
2002	0.9844	0.9982	1.0006	0.9980	0.9982				
2003	0.9553	0.9901	0.9985	0.9971					
2004	0.9680	0.9849	0.9947						
2005	0.9759	0.9907							
2006	0.9830								
5-Yr Ex Hi/Lo	0.9756	0.9930	1.0014	0.9975	0.9984	0.9990	0.9994	0.9999	0.9999
Factors to Ultimate	0.9644	0.9885	0.9955	0.9941	0.9966	0.9982	0.9992	0.9998	0.9999





**Massachusetts Private Passenger Automobile  
A-2 (Full Coverage), PIP and Paid Subrogation Combined  
Residual Market**

Part 1A: Development of Reported Incurred Losses

Calendar/ Accident Year	First Report	Second Report	Third Report	Fourth Report	Fifth Report
1996	85,488,590	67,906,383	57,021,728	53,598,531	53,325,549
1997	86,599,323	68,564,775	57,611,814	54,425,937	54,250,853
1998	88,721,148	69,923,235	59,443,657	56,692,177	56,335,141
1999	92,809,299	75,236,762	64,179,001	60,947,217	60,975,128
2000	104,835,826	84,044,703	70,017,055	66,564,277	66,198,231
2001	109,693,155	83,582,286	69,665,656	65,728,684	66,624,277
2002	123,876,781	90,516,628	76,985,689	74,721,678	75,324,723
2003	114,573,393	84,609,716	74,371,551	73,648,076	73,938,153
2004	84,386,969	61,734,510	54,562,986	53,260,081	
2005	63,274,724	46,676,421	42,587,586		
2006	44,984,535	35,511,859			
2007	36,573,388				

Part 1B: Development of Reported Claims

Calendar/ Accident Year	First Report	Second Report	Third Report	Fourth Report	Fifth Report	Calendar/ Accident Year	Earned Exposures
1996	31,341	24,729	21,936	20,939	20,902	1996	382,296
1997	31,392	24,761	21,945	21,207	21,250	1997	348,244
1998	31,293	24,591	21,926	21,114	21,106	1998	347,479
1999	32,044	25,291	21,864	21,129	21,280	1999	347,072
2000	33,785	26,420	23,031	22,216	22,266	2000	328,280
2001	33,660	25,512	22,280	21,445	21,564	2001	296,512
2002	38,046	27,687	24,105	23,606	23,671	2002	291,073
2003	35,157	25,412	22,650	22,164	22,149	2003	275,199
2004	26,247	18,913	16,847	16,499		2004	255,810
2005	19,552	14,430	13,187			2005	256,584
2006	13,743	10,507				2006	204,570
2007	11,298					2007	177,432

Part 1C: Earned Exposures

Part 1D: Average Claim Cost (1A/1B)

Calendar/ Accident Year	First Report	Second Report	Third Report	Fourth Report	Fifth Report
1996	2,728	2,746	2,599	2,560	2,551
1997	2,759	2,769	2,625	2,566	2,553
1998	2,835	2,843	2,711	2,685	2,669
1999	2,896	2,975	2,935	2,885	2,865
2000	3,103	3,181	3,040	2,996	2,973
2001	3,259	3,276	3,127	3,065	3,090
2002	3,256	3,269	3,194	3,165	3,182
2003	3,259	3,330	3,284	3,323	3,338
2004	3,215	3,264	3,239	3,228	
2005	3,236	3,235	3,230		
2006	3,273	3,380			
2007	3,237				

Part 1E: Claim Frequency (1B)/(1C) x 100

Calendar/ Accident Year	First Report	Second Report	Third Report	Fourth Report	Fifth Report
1996	8.198	6.469	5.738	5.477	5.467
1997	9.014	7.110	6.302	6.090	6.102
1998	9.006	7.077	6.310	6.076	6.074
1999	9.233	7.287	6.300	6.088	6.131
2000	10.292	8.048	7.016	6.767	6.783
2001	11.352	8.604	7.514	7.232	7.273
2002	13.071	9.512	8.281	8.110	8.132
2003	12.775	9.234	8.230	8.054	8.048
2004	10.260	7.393	6.586	6.450	
2005	7.620	5.624	5.139		
2006	6.718	5.136			
2007	6.368				

**Massachusetts Private Passenger Automobile  
 A-2 (Full Coverage), PIP and Paid Subrogation Combined  
 Residual Market**

Statistical Plan Data - Incurred Losses by Accident Year and Year of Report

<u>Calendar/ Accident Year</u>	<u>Sixth Report</u>	<u>Seventh Report</u>	<u>Eighth Report</u>	<u>Ninth Report</u>	<u>Tenth Report</u>
1996	53,215,035	53,200,737	53,214,137	53,180,677	53,158,658
1997	54,251,312	54,276,253	54,268,958	54,297,123	54,321,697
1998	56,356,133	56,408,071	56,409,639	56,538,310	56,557,687
1999	60,974,347	61,266,549	61,829,978	62,051,756	
2000	66,539,853	67,577,654	67,891,159		
2001	67,416,227	67,541,940			
2002	75,592,883				

Statistical Plan Data - Incurred Claims by Accident Year and Year of Report

<u>Calendar/ Accident Year</u>	<u>Sixth Report</u>	<u>Seventh Report</u>	<u>Eighth Report</u>	<u>Ninth Report</u>	<u>Tenth Report</u>
1996	21,023	21,067	21,083	21,074	21,076
1997	21,264	21,314	21,313	21,312	21,322
1998	21,152	21,173	21,178	21,213	21,219
1999	21,320	21,419	21,569	21,562	
2000	22,439	22,614	22,631		
2001	21,757	21,763			
2002	23,713				

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**Massachusetts Private Passenger Automobile  
 A-2 (Full Coverage), PIP and Paid Subrogation Combined  
 Loss Development Factors (Incurred)  
 Residual Market**

Accident Year	First to	Second to	Third to	Fourth to	Fifth to	Sixth to	Seventh to	Eighth to	Ninth to
	Second	Third	Fourth	Fifth	Sixth	Seventh	Eighth	Ninth	Tenth
1996	0.7943	0.8397	0.9400	0.9949	0.9979	0.9997	1.0003	0.9994	0.9996
1997	0.7917	0.8403	0.9447	0.9968	1.0000	1.0005	0.9999	1.0005	1.0005
1998	0.7881	0.8501	0.9537	0.9937	1.0004	1.0009	1.0000	1.0023	1.0003
1999	0.8107	0.8530	0.9496	1.0005	1.0000	1.0048	1.0092	1.0036	
2000	0.8017	0.8331	0.9507	0.9945	1.0052	1.0156	1.0046		
2001	0.7620	0.8335	0.9435	1.0136	1.0119				
2002	0.7307	0.8505	0.9706	1.0081	1.0036				
2003	0.7385	0.8790	0.9903	1.0039					
2004	0.7316	0.8838	0.9761						
2005	0.7377	0.9124							
2006	0.7894								
5 yr ex Hi/Lo	0.7359	0.8711	0.9658	1.0042	1.0031	1.0025	1.0016	1.0021	1.0001
Factors to Ultimate	0.6275	0.8527	0.9789	1.0136	1.0094	1.0063	1.0038	1.0022	1.0001

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**Massachusetts Private Passenger Automobile  
 A-2 (Full Coverage), PIP and Paid Subrogation Combined  
 Claim Development Factors (Incurred)  
 Residual Market**

Accident Year	First to	Second to	Third to	Fourth to	Fifth to	Sixth to	Seventh to	Eighth to	Ninth to
	Second	Third	Fourth	Fifth	Sixth	Seventh	Eighth	Ninth	Tenth
1996	0.7890	0.8871	0.9545	0.9982	1.0058	1.0021	1.0008	0.9996	1.0001
1997	0.7888	0.8863	0.9664	1.0020	1.0007	1.0024	1.0000	1.0000	1.0005
1998	0.7858	0.8916	0.9630	0.9996	1.0022	1.0010	1.0002	1.0017	1.0003
1999	0.7893	0.8645	0.9664	1.0071	1.0019	1.0046	1.0070	0.9997	
2000	0.7820	0.8717	0.9646	1.0023	1.0078	1.0078	1.0008		
2001	0.7579	0.8733	0.9625	1.0055	1.0090	1.0003			
2002	0.7277	0.8706	0.9793	1.0028	1.0018				
2003	0.7228	0.8913	0.9785	0.9993					
2004	0.7206	0.8908	0.9793						
2005	0.7380	0.9139							
2006	0.7645								
5 yr ex Hi/Lo	0.7295	0.8851	0.9741	1.0035	1.0040	1.0027	1.0006	1.0005	1.0003
Factors to Ultimate	0.6363	0.8723	0.9855	1.0117	1.0081	1.0041	1.0014	1.0008	1.0003

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**Massachusetts Private Passenger Automobile  
PDL, Basic (\$5,000) Limits  
Selected Loss Development Factors  
Residual Market**

		<u>Reported Losses</u>								
<u>Data Type</u>	<u>Method</u>	<u>2007</u>	<u>2006</u>	<u>2005</u>	<u>2004</u>	<u>2003</u>	<u>2002</u>	<u>2001</u>	<u>2000</u>	<u>1999</u>
Incurred		54,558,754	59,641,266	78,665,639	82,468,597	93,608,566	98,069,616	91,325,328	93,802,253	88,651,314
		<u>1.0117</u>	<u>1.0051</u>	<u>0.9991</u>	<u>1.0008</u>	<u>1.0001</u>	<u>1.0000</u>	<u>1.0000</u>	<u>1.0000</u>	<u>1.0000</u>
		<u>15 to Ult</u>	<u>24 to Ult</u>	<u>36 to Ult</u>	<u>48 to Ult</u>	<u>60 to Ult</u>	<u>72 to Ult</u>	<u>84 to Ult</u>	<u>96 to Ult</u>	<u>108 to Ult</u>
Incurred	3 Year	1.0117	1.0051	0.9991	1.0008	1.0001	1.0000	1.0000	1.0000	1.0000
<u>Development Factors (to Ultimate)</u>										
<u>Projected Ultimate Losses</u>										
		55,197,091	59,945,436	78,594,840	82,534,572	93,617,927	98,069,616	91,325,328	93,802,253	88,651,314
		<u>1.0117</u>	<u>1.0051</u>	<u>0.9991</u>	<u>1.0008</u>	<u>1.0001</u>	<u>1.0000</u>	<u>1.0000</u>	<u>1.0000</u>	<u>1.0000</u>
		<u>15 to Ult</u>	<u>24 to Ult</u>	<u>36 to Ult</u>	<u>48 to Ult</u>	<u>60 to Ult</u>	<u>72 to Ult</u>	<u>84 to Ult</u>	<u>96 to Ult</u>	<u>108 to Ult</u>
Incurred	3 Year	1.0117	1.0051	0.9991	1.0008	1.0001	1.0000	1.0000	1.0000	1.0000
<u>Projected Ultimate Pure Premiums</u>										
		307.70	289.44	302.20	318.34	336.62	333.16	304.24	281.79	251.20
		<u>1.0117</u>	<u>1.0051</u>	<u>0.9991</u>	<u>1.0008</u>	<u>1.0001</u>	<u>1.0000</u>	<u>1.0000</u>	<u>1.0000</u>	<u>1.0000</u>
		<u>15 to Ult</u>	<u>24 to Ult</u>	<u>36 to Ult</u>	<u>48 to Ult</u>	<u>60 to Ult</u>	<u>72 to Ult</u>	<u>84 to Ult</u>	<u>96 to Ult</u>	<u>108 to Ult</u>
Incurred	3 Year	1.0117	1.0051	0.9991	1.0008	1.0001	1.0000	1.0000	1.0000	1.0000

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**Massachusetts Private Passenger Automobile  
PDL, Basic (\$5,000) Limits  
Selected Claim Development Factors  
Residual Market**

		<u>Reported Claims</u>								
<u>Data Type</u>		<u>2007</u>	<u>2006</u>	<u>2005</u>	<u>2004</u>	<u>2003</u>	<u>2002</u>	<u>2001</u>	<u>2000</u>	<u>1999</u>
<u>Incurred</u>		28,603	31,484	42,794	45,230	51,255	53,671	50,837	54,654	54,369
		<u>Development Factors (to Ultimate)</u>								
<u>Data Type</u>	<u>Method</u>	<u>15 to Ult</u>	<u>24 to Ult</u>	<u>36 to Ult</u>	<u>48 to Ult</u>	<u>60 to Ult</u>	<u>72 to Ult</u>	<u>84 to Ult</u>	<u>96 to Ult</u>	<u>108 to Ult</u>
<u>Incurred</u>	<u>3 Year</u>	1.0055	1.0008	0.9975	0.9999	1.0000	1.0000	1.0000	1.0000	1.0000
		<u>Projected Ultimate Claims</u>								
<u>Data Type</u>	<u>Method</u>	<u>15 to Ult</u>	<u>24 to Ult</u>	<u>36 to Ult</u>	<u>48 to Ult</u>	<u>60 to Ult</u>	<u>72 to Ult</u>	<u>84 to Ult</u>	<u>96 to Ult</u>	<u>108 to Ult</u>
<u>Incurred</u>	<u>3 Year</u>	28,760	31,509	42,687	45,225	51,255	53,671	50,837	54,654	54,369

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**Massachusetts Private Passenger Automobile  
PDL, Basic (\$5,000) Limits  
Residual Market**

Part 1A: Development of Reported Incurred Losses

Calendar/ Accident Year	Part 1B: Development of Reported Claims					Part 1C: Earned Exposures					
	First Report	Second Report	Third Report	Fourth Report	Fifth Report	Calendar/ Accident Year	Second Report	Third Report	Fourth Report	Fifth Report	Earned Exposures
1996	87,256,948	90,402,750	91,438,581	91,722,818	91,747,931	1996	59,878	61,720	61,120	61,120	394,297
1997	81,730,899	84,196,708	85,362,816	85,642,134	85,597,503	1997	54,201	55,491	55,603	55,578	358,093
1998	83,677,014	86,166,180	86,946,834	87,132,742	87,170,160	1998	54,153	55,095	55,122	55,141	355,505
1999	85,038,733	87,224,473	88,006,321	88,629,693	88,666,907	1999	53,232	54,172	54,391	54,400	352,916
2000	87,407,422	90,444,213	92,835,873	93,719,537	93,786,932	2000	51,940	54,270	54,643	54,649	332,884
2001	85,063,565	88,193,682	90,459,405	91,224,130	91,346,895	2001	48,570	49,667	50,840	50,848	300,175
2002	93,260,361	95,212,548	97,467,672	97,962,405	98,048,110	2002	52,168	52,569	53,669	53,668	294,364
2003	90,323,580	93,217,134	93,861,395	93,623,153	93,608,566	2003	50,032	51,302	51,283	51,255	278,112
2004	81,760,044	82,614,926	83,109,680	82,468,597		2004	44,932	45,365	45,230		259,268
2005	77,827,970	78,256,133	78,665,639			2005	42,512	42,660			260,072
2006	59,428,468	59,641,266				2006	31,451				207,105
2007	54,558,754					2007	28,603				179,384

Part 1D: Average Claim Cost (1A/1B)

Calendar/ Accident Year	Part 1E: Claim Frequency (1B)/(1C) x 100				
	First Report	Second Report	Third Report	Fourth Report	Fifth Report
1996	1,457	1,474	1,482	1,501	1,501
1997	1,508	1,529	1,538	1,540	1,540
1998	1,545	1,571	1,578	1,581	1,581
1999	1,598	1,617	1,625	1,629	1,630
2000	1,683	1,696	1,711	1,715	1,716
2001	1,751	1,776	1,790	1,794	1,796
2002	1,788	1,811	1,822	1,825	1,827
2003	1,805	1,817	1,824	1,826	1,826
2004	1,820	1,821	1,825	1,823	
2005	1,831	1,834	1,838		
2006	1,890	1,894			
2007	1,907				

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**Massachusetts Private Passenger Automobile  
 PDL, Basic (\$5,000) Limits  
 Residual Market**

Statistical Plan Data - Incurred Losses by Accident Year and Year of Report

<u>Calendar/ Accident Year</u>	<u>Sixth Report</u>	<u>Seventh Report</u>	<u>Eighth Report</u>	<u>Ninth Report</u>	<u>Tenth Report</u>
1996	91,774,135	91,779,233	91,750,531	91,749,078	91,737,982
1997	85,598,233	85,585,942	85,581,035	85,578,309	85,579,963
1998	87,184,706	87,176,064	87,175,522	87,173,393	87,171,577
1999	88,650,891	88,662,994	88,651,336	88,651,314	
2000	93,795,768	93,801,538	93,802,253		
2001	91,334,956	91,325,328			
2002	98,069,616				

Statistical Plan Data - Incurred Claims by Accident Year and Year of Report

<u>Calendar/ Accident Year</u>	<u>Sixth Report</u>	<u>Seventh Report</u>	<u>Eighth Report</u>	<u>Ninth Report</u>	<u>Tenth Report</u>
1996	61,126	61,129	61,123	61,123	61,122
1997	55,575	55,573	55,571	55,570	55,569
1998	55,140	55,132	55,132	55,131	55,130
1999	54,370	54,374	54,370	54,369	
2000	54,650	54,653	54,654		
2001	50,840	50,837			
2002	53,671				

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**Massachusetts Private Passenger Automobile  
 PDL, Basic (\$5,000) Limits  
 Loss Development Factors (Incurred)  
 Residual Market**

Accident Year	First to	Second to	Third to	Fourth to	Fifth to	Sixth to	Seventh to	Eighth to	Ninth to
	Second	Third	Fourth	Fifth	Sixth	Seventh	Eighth	Ninth	Tenth
1996	1.0361	1.0115	1.0031	1.0003	1.0003	1.0001	0.9997	1.0000	0.9999
1997	1.0302	1.0138	1.0033	0.9995	1.0000	0.9999	0.9999	1.0000	1.0000
1998	1.0297	1.0091	1.0021	1.0004	1.0002	0.9999	1.0000	1.0000	1.0000
1999	1.0257	1.0090	1.0071	1.0004	0.9998	1.0001	0.9999	1.0000	
2000	1.0347	1.0264	1.0095	1.0007	1.0001	1.0001	1.0000		
2001	1.0368	1.0257	1.0085	1.0013	0.9999	0.9999			
2002	1.0209	1.0237	1.0051	1.0009	1.0002				
2003	1.0320	1.0069	0.9975	0.9998					
2004	1.0105	1.0060	0.9923						
2005	1.0055	1.0052							
2006	1.0036								
3 Year Weighted Average	1.0065	1.0060	0.9983	1.0007	1.0001	1.0000	1.0000	1.0000	1.0000
Factors to Ultimate	1.0117	1.0051	0.9991	1.0008	1.0001	1.0000	1.0000	1.0000	1.0000

**Massachusetts Private Passenger Automobile  
 PDL, Basic (\$5,000) Limits  
 Claim Development Factors (Incurred)  
 Residual Market**

Accident Year	First to	Second to	Third to	Fourth to	Fifth to	Sixth to	Seventh to	Eighth to	Ninth to
	Second	Third	Fourth	Fifth	Sixth	Seventh	Eighth	Ninth	Tenth
1996	1.0241	1.0065	0.9903	1.0000	1.0001	1.0000	0.9999	1.0000	1.0000
1997	1.0161	1.0076	1.0020	0.9996	0.9999	1.0000	1.0000	1.0000	1.0000
1998	1.0129	1.0044	1.0005	1.0003	1.0000	0.9999	1.0000	1.0000	1.0000
1999	1.0136	1.0040	1.0040	1.0002	0.9994	1.0001	0.9999	1.0000	1.0000
2000	1.0270	1.0174	1.0069	1.0001	1.0000	1.0001	1.0000		
2001	1.0226	1.0175	1.0060	1.0002	0.9998	0.9999			
2002	1.0077	1.0178	1.0030	1.0000	1.0001				
2003	1.0254	1.0030	0.9966	0.9995					
2004	1.0096	1.0039	0.9932						
2005	1.0035	1.0031							
2006	1.0010								
3 Year Weighted Average	1.0047	1.0033	0.9976	0.9999	1.0000	1.0000	1.0000	1.0000	1.0000
Factors to Ultimate	1.0055	1.0008	0.9975	0.9999	1.0000	1.0000	1.0000	1.0000	1.0000

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**Massachusetts Private Passenger Automobile  
D, Medical Payments \$5,000 Limit  
Selected Loss Development Factors  
Residual Market**

		<u>Reported Losses</u>								
<u>Data Type</u>		2007	2006	2005	2004	2003	2002	2001	2000	1999
Incurring		1,069,292	1,353,676	1,551,103	1,589,848	1,668,863	1,679,603	1,789,217	2,172,186	2,081,542
	<u>Method</u>									
	3 Year	<u>15 to Ult</u> 1.3469	<u>24 to Ult</u> 1.0750	<u>36 to Ult</u> 1.0279	<u>48 to Ult</u> 1.0130	<u>60 to Ult</u> 1.0094	<u>72 to Ult</u> 1.0042	<u>84 to Ult</u> 1.0020	<u>96 to Ult</u> 1.0013	<u>108 to Ult</u> 1.0010
	<u>Method</u>									
	3 Year	<u>15 to Ult</u> 1.440,229	<u>24 to Ult</u> 1,455,202	<u>36 to Ult</u> 1,594,379	<u>48 to Ult</u> 1,610,516	<u>60 to Ult</u> 1,684,550	<u>72 to Ult</u> 1,686,657	<u>84 to Ult</u> 1,792,795	<u>96 to Ult</u> 2,175,010	<u>108 to Ult</u> 2,083,624
	<u>Method</u>									
	3 Year	<u>15 to Ult</u> 25.96	<u>24 to Ult</u> 23.63	<u>36 to Ult</u> 21.75	<u>48 to Ult</u> 24.02	<u>60 to Ult</u> 25.04	<u>72 to Ult</u> 24.03	<u>84 to Ult</u> 25.94	<u>96 to Ult</u> 28.97	<u>108 to Ult</u> 25.78

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**Massachusetts Private Passenger Automobile  
 D, Medical Payments \$5,000 Limit  
 Selected Claim Development Factors  
 Residual Market**

		<u>Reported Claims</u>								
<u>Data Type</u>		<u>2007</u>	<u>2006</u>	<u>2005</u>	<u>2004</u>	<u>2003</u>	<u>2002</u>	<u>2001</u>	<u>2000</u>	<u>1999</u>
Incurring		283	381	450	486	513	531	631	778	747
	<u>Method</u>									
	3 Year	<u>15 to Ult</u>	<u>24 to Ult</u>	<u>36 to Ult</u>	<u>48 to Ult</u>	<u>60 to Ult</u>	<u>72 to Ult</u>	<u>84 to Ult</u>	<u>96 to Ult</u>	<u>108 to Ult</u>
		1.4466	1.1072	1.0389	1.0134	1.0086	1.0028	1.0000	1.0000	1.0000
	<u>Method</u>									
	3 Year	<u>15 to Ult</u>	<u>24 to Ult</u>	<u>36 to Ult</u>	<u>48 to Ult</u>	<u>60 to Ult</u>	<u>72 to Ult</u>	<u>84 to Ult</u>	<u>96 to Ult</u>	<u>108 to Ult</u>
		409	422	468	493	517	532	631	778	747

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**Massachusetts Private Passenger Automobile  
D, Medical Payments \$5,000 Limit  
Residual Market**

Part 1A: Development of Reported Incurred Losses

<u>Calendar/ Accident Year</u>	<u>First Report</u>	<u>Second Report</u>	<u>Third Report</u>	<u>Fourth Report</u>	<u>Fifth Report</u>	<u>Calendar/ Accident Year</u>	<u>First Report</u>	<u>Second Report</u>	<u>Third Report</u>	<u>Fourth Report</u>	<u>Fifth Report</u>	<u>Calendar/ Accident Year</u>	<u>Earned Exposures</u>
1996	2,571,203	2,760,666	2,796,781	2,800,360	2,804,354	1996	887	1,091	1,130	1,137	1,139	1996	99,787
1997	2,285,261	2,516,326	2,570,989	2,565,414	2,567,392	1997	830	977	1,022	1,033	1,034	1997	86,050
1998	1,829,498	2,078,564	2,109,041	2,125,971	2,142,978	1998	645	771	804	810	815	1998	82,995
1999	1,821,324	2,023,022	2,041,305	2,078,234	2,074,608	1999	583	703	733	748	747	1999	80,834
2000	1,899,257	2,104,457	2,111,877	2,161,485	2,162,344	2000	617	736	760	768	770	2000	75,072
2001	1,520,961	1,743,278	1,746,690	1,781,953	1,776,540	2001	479	592	620	629	627	2001	69,121
2002	1,361,365	1,596,688	1,643,525	1,649,330	1,664,278	2002	399	487	515	521	527	2002	70,186
2003	1,263,039	1,534,462	1,611,340	1,661,340	1,668,863	2003	350	456	487	510	513	2003	67,270
2004	1,218,504	1,520,400	1,574,619	1,589,848		2004	346	453	478	486		2004	67,063
2005	1,193,838	1,474,982	1,551,103			2005	329	419	450			2005	73,297
2006	1,061,278	1,353,676				2006	285	381				2006	61,584
2007	1,069,292					2007	283					2007	55,473

Part 1B: Development of Reported Claims

Part 1D: Average Claim Cost (1A/1B)

<u>Calendar/ Accident Year</u>	<u>First Report</u>	<u>Second Report</u>	<u>Third Report</u>	<u>Fourth Report</u>	<u>Fifth Report</u>	<u>Calendar/ Accident Year</u>	<u>First Report</u>	<u>Second Report</u>	<u>Third Report</u>	<u>Fourth Report</u>	<u>Fifth Report</u>
1996	2,899	2,530	2,475	2,463	2,462	1996	0.889	1.093	1.132	1.139	1.141
1997	2,753	2,576	2,516	2,483	2,483	1997	0.965	1.135	1.188	1.200	1.202
1998	2,836	2,696	2,623	2,625	2,629	1998	0.777	0.929	0.969	0.976	0.982
1999	3,124	2,878	2,785	2,778	2,777	1999	0.721	0.870	0.907	0.925	0.924
2000	3,078	2,859	2,779	2,814	2,808	2000	0.822	0.980	1.012	1.023	1.026
2001	3,175	2,945	2,817	2,833	2,833	2001	0.693	0.856	0.897	0.910	0.907
2002	3,412	3,279	3,191	3,166	3,158	2002	0.568	0.694	0.734	0.742	0.751
2003	3,609	3,365	3,309	3,258	3,253	2003	0.520	0.678	0.724	0.758	0.763
2004	3,522	3,356	3,294	3,271		2004	0.516	0.675	0.713	0.725	
2005	3,629	3,520	3,447			2005	0.449	0.572	0.614		
2006	3,724	3,553				2006	0.463	0.619			
2007	3,778					2007	0.510				

Part 1E: Claim Frequency (1B)/(1C) x 100

<u>Calendar/ Accident Year</u>	<u>First Report</u>	<u>Second Report</u>	<u>Third Report</u>	<u>Fourth Report</u>	<u>Fifth Report</u>
1996	0.889	1.093	1.132	1.139	1.141
1997	0.965	1.135	1.188	1.200	1.202
1998	0.777	0.929	0.969	0.976	0.982
1999	0.721	0.870	0.907	0.925	0.924
2000	0.822	0.980	1.012	1.023	1.026
2001	0.693	0.856	0.897	0.910	0.907
2002	0.568	0.694	0.734	0.742	0.751
2003	0.520	0.678	0.724	0.758	0.763
2004	0.516	0.675	0.713	0.725	
2005	0.449	0.572	0.614		
2006	0.463	0.619			
2007	0.510				



**Massachusetts Private Passenger Automobile  
 D, Medical Payments \$5,000 Limit  
 Residual Market**

Statistical Plan Data - Incurred Losses by Accident Year and Year of Report

<u>Calendar/ Accident Year</u>	<u>Sixth Report</u>	<u>Seventh Report</u>	<u>Eighth Report</u>	<u>Ninth Report</u>	<u>Tenth Report</u>
1996	2,812,916	2,814,503	2,814,503	2,814,503	2,814,503
1997	2,576,249	2,579,921	2,576,090	2,578,737	2,586,739
1998	2,137,084	2,147,687	2,147,687	2,147,687	2,147,687
1999	2,074,869	2,080,768	2,081,542	2,081,542	
2000	2,165,465	2,168,440	2,172,186		
2001	1,785,017	1,789,217			
2002	1,679,603				

Statistical Plan Data - Incurred Claims by Accident Year and Year of Report

<u>Calendar/ Accident Year</u>	<u>Sixth Report</u>	<u>Seventh Report</u>	<u>Eighth Report</u>	<u>Ninth Report</u>	<u>Tenth Report</u>
1996	1,141	1,142	1,142	1,142	1,142
1997	1,038	1,040	1,039	1,039	1,039
1998	817	819	819	819	819
1999	746	747	747	747	
2000	775	778	778		
2001	629	631			
2002	531				

**Massachusetts Private Passenger Automobile  
 D, Medical Payments \$5,000 Limit  
 Loss Development Factors (Incurred)  
 Residual Market**

<u>Accident Year</u>	<u>First to</u>	<u>Second to</u>	<u>Third to</u>	<u>Fourth to</u>	<u>Fifth to</u>	<u>Sixth to</u>	<u>Seventh to</u>	<u>Eighth to</u>	<u>Ninth to</u>
	<u>Second</u>	<u>Third</u>	<u>Fourth</u>	<u>Fifth</u>	<u>Sixth</u>	<u>Seventh</u>	<u>Eighth</u>	<u>Ninth</u>	<u>Tenth</u>
1996	1.0737	1.0131	1.0013	1.0014	1.0031	1.0006	1.0000	1.0000	1.0000
1997	1.1011	1.0217	0.9978	1.0008	1.0034	1.0014	0.9985	1.0010	1.0031
1998	1.1361	1.0147	1.0080	1.0080	0.9972	1.0050	1.0000	1.0000	1.0000
1999	1.1107	1.0090	1.0181	0.9983	1.0001	1.0028	1.0004	1.0000	1.0000
2000	1.1080	1.0035	1.0235	1.0004	1.0014	1.0014	1.0017		
2001	1.1462	1.0020	1.0202	0.9970	1.0048	1.0024			
2002	1.1729	1.0293	1.0035	1.0091	1.0092				
2003	1.2149	1.0501	1.0310	1.0045					
2004	1.2478	1.0357	1.0097						
2005	1.2355	1.0516							
2006	1.2755								
3 Year Weighted Average	1.2529	1.0458	1.0147	1.0035	1.0051	1.0022	1.0007	1.0003	1.0010
Factors to Ultimate	1.3469	1.0750	1.0279	1.0130	1.0094	1.0042	1.0020	1.0013	1.0010

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**Massachusetts Private Passenger Automobile  
 D, Medical Payments \$5,000 Limit  
 Claim Development Factors (Incurred)  
 Residual Market**

<u>Accident Year</u>	<u>First to</u>	<u>Second to</u>	<u>Third to</u>	<u>Fourth to</u>	<u>Fifth to</u>	<u>Sixth to</u>	<u>Seventh to</u>	<u>Eighth to</u>	<u>Ninth to</u>
	<u>Second</u>	<u>Third</u>	<u>Fourth</u>	<u>Fifth</u>	<u>Sixth</u>	<u>Seventh</u>	<u>Eighth</u>	<u>Ninth</u>	<u>Tenth</u>
1996	1.2300	1.0357	1.0062	1.0018	1.0018	1.0009	1.0000	1.0000	1.0000
1997	1.1771	1.0461	1.0108	1.0010	1.0039	1.0019	0.9990	1.0000	1.0000
1998	1.1953	1.0428	1.0075	1.0062	1.0025	1.0024	1.0000	1.0000	1.0000
1999	1.2058	1.0427	1.0205	0.9987	0.9987	1.0013	1.0000	1.0000	1.0000
2000	1.1929	1.0326	1.0105	1.0026	1.0065	1.0039	1.0000		
2001	1.2359	1.0473	1.0145	0.9968	1.0032	1.0032			
2002	1.2206	1.0575	1.0117	1.0115	1.0076				
2003	1.3029	1.0680	1.0472	1.0059					
2004	1.3092	1.0552	1.0167						
2005	1.2736	1.0740							
2006	1.3368								

3 Year Weighted Average Factors to Ultimate 1.3065 1.0657 1.0252 1.0047 1.0058 1.0028 1.0000 1.0000 1.0000 1.0000

004

**Massachusetts Private Passenger Automobile  
 Collision (\$500 Deductible Basis)  
 Selected Loss Development Factors  
 Residual Market**

	<u>Reported Losses</u>			
<u>Data Type</u>	<u>2007</u>	<u>2006</u>	<u>2005</u>	<u>2004</u>
Paid	57,631,133	59,404,549	77,022,418	85,184,835
	<u>Development Factors (to Ultimate)</u>			
<u>Data Type</u>	<u>15 to Ult</u>	<u>24 to Ult</u>	<u>36 to Ult</u>	<u>48 to Ult</u>
Paid	0.9161	0.9725	0.9913	0.9980
	<u>Projected Ultimate Losses</u>			
<u>Data Type</u>	<u>15 to Ult</u>	<u>24 to Ult</u>	<u>36 to Ult</u>	<u>48 to Ult</u>
Paid	52,795,881	57,770,924	76,352,323	85,014,465
	<u>Projected Ultimate Pure Premiums</u>			
<u>Data Type</u>	<u>15 to Ult</u>	<u>24 to Ult</u>	<u>36 to Ult</u>	<u>48 to Ult</u>
Paid	556.83	525.55	552.39	620.02

035

**Massachusetts Private Passenger Automobile  
 Collision (\$500 Deductible Basis)  
 Selected Claim Development Factors  
 Residual Market**

		<u>Reported Claims</u>			
<u>Data Type</u>		2007	2006	2005	2004
Paid		19,498	20,278	28,545	31,958

		<u>Development Factors (to Ultimate)</u>	
<u>Data Type</u>	<u>Method</u>	<u>15 to Ult</u>	<u>24 to Ult</u>
Paid	5 Yr ex Hi/Lo	0.9272	0.9762
			<u>36 to Ult</u>
			0.9925
			<u>48 to Ult</u>
			0.9986

		<u>Projected Ultimate Claims</u>	
<u>Data Type</u>	<u>Method</u>	<u>15 to Ult</u>	<u>24 to Ult</u>
Paid	5 Yr ex Hi/Lo	18,079	19,795
			<u>36 to Ult</u>
			28,331
			<u>48 to Ult</u>
			31,913

000

**Massachusetts Private Passenger Automobile  
Collision (\$500 Deductible Basis)  
Residual Market**

Part IA: Development of Reported Paid Losses

<u>Calendar/ Accident Year</u>	<u>First Report</u>	<u>Second Report</u>	<u>Third Report</u>	<u>Fourth Report</u>	<u>Fifth Report</u>	<u>Calendar/ Accident Year</u>	<u>First Report</u>	<u>Second Report</u>	<u>Third Report</u>	<u>Fourth Report</u>	<u>Fifth Report</u>	<u>Calendar/ Accident Year</u>	<u>Earned Exposures</u>
1998	101,006,037	93,205,000	90,745,614	90,110,496	90,001,370	1998	42,564	39,484	38,580	38,395	38,367	1998	203,541
1999	108,520,760	100,818,140	98,144,216	97,236,912	97,005,075	1999	44,314	41,375	40,513	40,216	40,150	1999	204,687
2000	123,376,018	115,351,477	111,504,445	110,090,640	109,837,341	2000	48,128	44,775	43,384	42,935	42,853	2000	193,692
2001	124,859,571	116,434,585	112,934,732	111,871,863	111,576,820	2001	46,658	43,496	42,346	41,970	41,912	2001	178,850
2002	129,014,586	120,430,017	117,526,672	116,732,169	116,575,322	2002	46,999	43,980	43,055	42,807	42,772	2002	174,842
2003	119,317,045	112,401,353	110,380,696	109,957,731	109,873,905	2003	44,740	42,305	41,666	41,521	41,472	2003	156,997
2004	92,348,781	86,717,045	85,430,498	85,184,835		2004	34,217	32,460	32,031	31,958		2004	137,116
2005	82,356,039	77,832,970	77,022,418			2005	30,074	28,775	28,545			2005	138,221
2006	62,860,543	59,404,549				2006	21,234	20,278				2006	109,925
2007	57,631,133					2007	19,498					2007	94,815

Part IB: Development of Reported Claims

Part ID: Average Claim Cost (1A/1B)

<u>Calendar/ Accident Year</u>	<u>First Report</u>	<u>Second Report</u>	<u>Third Report</u>	<u>Fourth Report</u>	<u>Fifth Report</u>
1998	2,373	2,361	2,352	2,347	2,346
1999	2,449	2,437	2,423	2,418	2,416
2000	2,563	2,576	2,570	2,564	2,563
2001	2,676	2,677	2,667	2,666	2,662
2002	2,745	2,738	2,730	2,727	2,726
2003	2,667	2,657	2,649	2,648	2,649
2004	2,699	2,672	2,667	2,666	
2005	2,738	2,705	2,698		
2006	2,960	2,930			
2007	2,956				

Part IE: Claim Frequency (1B)/(1C) x 100

<u>Calendar/ Accident Year</u>	<u>First Report</u>	<u>Second Report</u>	<u>Third Report</u>	<u>Fourth Report</u>	<u>Fifth Report</u>
1998	20,912	19,399	18,954	18,864	18,850
1999	21,650	20,214	19,793	19,648	19,615
2000	24,848	23,117	22,399	22,167	22,124
2001	26,088	24,320	23,677	23,467	23,434
2002	26,881	25,154	24,625	24,483	24,463
2003	28,497	26,946	26,539	26,447	26,416
2004	24,955	23,673	23,360	23,307	
2005	21,758	20,818	20,652		
2006	19,317	18,447			
2007	20,564				

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**Massachusetts Private Passenger Automobile  
 Collision (\$500 Deductible Basis)  
 Loss Development Factors  
 Residual Market**

<u>Accident Year</u>	<u>First to</u>		<u>Second to</u>		<u>Third to</u>		<u>Fourth to</u>	
	<u>Second</u>		<u>Third</u>		<u>Fourth</u>		<u>Fifth</u>	
1996	0.9228		0.9736		0.9930		0.9988	
1997	0.9290		0.9735		0.9908		0.9976	
2000	0.9350		0.9666		0.9873		0.9977	
2001	0.9325		0.9699		0.9906		0.9974	
2002	0.9335		0.9759		0.9932		0.9987	
2003	0.9420		0.9820		0.9962		0.9992	
2004	0.9390		0.9852		0.9971			
2005	0.9451		0.9896					
2006	0.9450							
5-Yr Ex Hi/Lo	0.9420		0.9810		0.9933		0.9980	
Factors to Ultimate	0.9161		0.9725		0.9913		0.9980	

008

**Massachusetts Private Passenger Automobile  
 Collision (\$500 Deductible Basis)  
 Claim Development Factors  
 Residual Market**

<u>Accident Year</u>	<u>First to Second</u>	<u>Second to Third</u>	<u>Third to Fourth</u>	<u>Fourth to Fifth</u>
1996	0.9276	0.9771	0.9952	0.9993
1997	0.9337	0.9792	0.9927	0.9984
2000	0.9303	0.9689	0.9897	0.9981
2001	0.9322	0.9736	0.9911	0.9986
2002	0.9358	0.9790	0.9942	0.9992
2003	0.9456	0.9849	0.9965	0.9988
2004	0.9487	0.9868	0.9977	
2005	0.9568	0.9920		
2006	0.9550			
5-Yr Ex Hi/Lo	0.9498	0.9836	0.9939	0.9986
Factors to Ultimate	0.9272	0.9762	0.9925	0.9986

**Massachusetts Private Passenger Automobile  
 Limited Collision (\$500 Deductible Basis)  
 Selected Loss Development Factors  
 Residual Market**

		<u>Reported Losses</u>			
<u>Data Type</u>	<u>Method</u>	<u>2007</u>	<u>2006</u>	<u>2005</u>	<u>2004</u>
Paid		222,100	107,459	164,136	168,002
		<u>Development Factors (to Ultimate)</u>			
<u>Data Type</u>	<u>Method</u>	<u>15 to Ult</u>	<u>24 to Ult</u>	<u>36 to Ult</u>	<u>48 to Ult</u>
Paid	5 Yr ex Hi/Lo	0.5970	0.8663	0.9669	0.9950
		<u>Projected Ultimate Losses</u>			
<u>Data Type</u>	<u>Method</u>	<u>15 to Ult</u>	<u>24 to Ult</u>	<u>36 to Ult</u>	<u>48 to Ult</u>
Paid	5 Yr ex Hi/Lo	132,594	93,092	158,703	167,162
		<u>Projected Ultimate Pure Premiums</u>			
<u>Data Type</u>	<u>Method</u>	<u>15 to Ult</u>	<u>24 to Ult</u>	<u>36 to Ult</u>	<u>48 to Ult</u>
Paid		45.11	27.79	35.82	35.30

**Massachusetts Private Passenger Automobile  
 Limited Collision (\$500 Deductible Basis)  
 Selected Claim Development Factors  
 Residual Market**

		<u>Reported Claims</u>			
<u>Data Type</u>		<u>2007</u>	<u>2006</u>	<u>2005</u>	<u>2004</u>
Paid		137	104	152	157

		<u>Development Factors (to Ultimate)</u>	
<u>Data Type</u>	<u>Method</u>	<u>15 to Ult</u>	<u>24 to Ult</u>
Paid	5 Yr ex Hi/Lo	0.6904	0.9012
		<u>36 to Ult</u>	<u>48 to Ult</u>
		0.9751	1.0000

		<u>Projected Ultimate Claims</u>	
<u>Data Type</u>	<u>Method</u>	<u>15 to Ult</u>	<u>24 to Ult</u>
Paid	5 Yr ex Hi/Lo	95	94
		<u>36 to Ult</u>	<u>48 to Ult</u>
		148	157

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**Massachusetts Private Passenger Automobile  
Limited Collision (\$500 Deductible Basis)  
Residual Market**

Part 1A: Development of Reported Paid Losses

<u>Calendar/ Accident Year</u>	<u>First Report</u>	<u>Second Report</u>	<u>Third Report</u>	<u>Fourth Report</u>	<u>Fifth Report</u>	<u>Calendar/ Accident Year</u>	<u>First Report</u>	<u>Second Report</u>	<u>Third Report</u>	<u>Fourth Report</u>	<u>Fifth Report</u>	<u>Calendar/ Accident/ Year</u>	<u>Earned Exposures</u>
1998	397,701	261,090	228,596	200,563	197,254	1998	310	235	204	189	188	1998	6,517
1999	497,762	330,324	277,462	255,978	253,404	1999	407	307	259	249	249	1999	6,475
2000	653,307	475,771	390,460	354,642	348,908	2000	507	380	323	300	298	2000	6,430
2001	628,825	462,404	379,816	368,927	367,663	2001	447	329	275	267	267	2001	5,925
2002	614,686	430,966	365,329	354,078	353,813	2002	435	336	299	291	292	2002	5,597
2003	444,266	327,179	291,437	287,891	287,438	2003	354	273	254	251	251	2003	5,042
2004	265,669	181,506	172,333	168,002		2004	221	168	160	157		2004	4,735
2005	247,578	169,098	164,136			2005	206	158	152			2005	4,430
2006	188,742	107,459				2006	147	104				2006	3,350
2007	222,100					2007	137					2007	2,939

Part 1B: Development of Reported Claims

Part 1D: Average Claim Cost (1A/1B)

<u>Calendar/ Accident Year</u>	<u>First Report</u>	<u>Second Report</u>	<u>Third Report</u>	<u>Fourth Report</u>	<u>Fifth Report</u>	<u>Calendar/ Accident Year</u>	<u>First Report</u>	<u>Second Report</u>	<u>Third Report</u>	<u>Fourth Report</u>	<u>Fifth Report</u>	<u>Calendar/ Accident/ Year</u>	<u>Earned Exposures</u>
1998	1,283	1,111	1,121	1,061	1,049	1998	4,757	3,606	3,130	2,900	2,885	1998	6,517
1999	1,223	1,076	1,071	1,028	1,018	1999	6,286	4,741	4,000	3,846	3,846	1999	6,475
2000	1,289	1,252	1,209	1,182	1,171	2000	7,885	5,910	5,023	4,666	4,635	2000	6,430
2001	1,407	1,405	1,381	1,382	1,377	2001	7,545	5,553	4,642	4,507	4,507	2001	5,925
2002	1,413	1,283	1,222	1,217	1,212	2002	7,772	6,003	5,342	5,199	5,217	2002	5,597
2003	1,255	1,198	1,147	1,147	1,145	2003	7,022	5,415	5,038	4,979	4,979	2003	5,042
2004	1,202	1,080	1,077	1,070		2004	4,667	3,548	3,379	3,316		2004	4,735
2005	1,202	1,070	1,080			2005	4,650	3,566	3,431			2005	4,430
2006	1,284	1,033				2006	4,388	3,104				2006	3,350
2007	1,621					2007	4,661					2007	2,939

Part 1E: Claim Frequency (1B)/(1C) x 100

072

**Massachusetts Private Passenger Automobile  
 Limited Collision (\$500 Deductible Basis)  
 Loss Development Factors  
 Residual Market**

<u>Accident Year</u>	<u>First to</u>	<u>Second to</u>	<u>Third to</u>	<u>Fourth to</u>
	<u>Second</u>	<u>Third</u>	<u>Fourth</u>	<u>Fifth</u>
1996	0.6565	0.8755	0.8774	0.9835
1997	0.6636	0.8400	0.9226	0.9899
2000	0.7283	0.8207	0.9083	0.9838
2001	0.7353	0.8214	0.9713	0.9966
2002	0.7011	0.8477	0.9692	0.9993
2003	0.7364	0.8908	0.9878	0.9984
2004	0.6832	0.9495	0.9749	
2005	0.6830			
2006	0.5693			
5-Yr Ex Hi/Lo	0.6891	0.8960	0.9718	0.9950
Factors to Ultimate	0.5970	0.8663	0.9669	0.9950

073

**Massachusetts Private Passenger Automobile  
 Limited Collision (\$500 Deductible Basis)  
 Claim Development Factors  
 Residual Market**

<u>Accident Year</u>	<u>First to</u>		<u>Second to</u>		<u>Third to</u>		<u>Fourth to</u>	
	<u>Second</u>	<u>Third</u>	<u>Fourth</u>	<u>Fifth</u>	<u>Fourth</u>	<u>Fifth</u>	<u>Fourth</u>	<u>Fifth</u>
1996	0.7581	0.8681	0.9265	0.9947	0.9265	0.9947	0.9947	0.9947
1997	0.7543	0.8436	0.9614	1.0000	0.9614	1.0000	1.0000	1.0000
2000	0.7495	0.8500	0.9288	0.9933	0.9288	0.9933	0.9933	0.9933
2001	0.7360	0.8359	0.9709	1.0000	0.9709	1.0000	1.0000	1.0000
2002	0.7724	0.8899	0.9732	1.0034	0.9732	1.0034	1.0034	1.0034
2003	0.7712	0.9304	0.9882	1.0000	0.9882	1.0000	1.0000	1.0000
2004	0.7602	0.9524	0.9813		0.9813			
2005	0.7670	0.9620						
2006	0.7075							
5-Yr Ex Hi/Lo	0.7661	0.9242	0.9751	1.0000	0.9751	1.0000	1.0000	1.0000
Factors to Ultimate	0.6904	0.9012	0.9751	1.0000	0.9751	1.0000	1.0000	1.0000

**Massachusetts Private Passenger Automobile  
 Comprehensive (\$500 Deductible Basis)  
 Selected Loss Development Factors  
 Residual Market**

		<u>Reported Losses</u>			
<u>Data Type</u>		2007	2006	2005	2004
Paid		14,250,706	18,695,302	26,493,688	29,323,656

		<u>Development Factors (to Ultimate)</u>			
<u>Method</u>		15 to Ult	24 to Ult	36 to Ult	48 to Ult
5 Yr ex Hi/Lo		1.0177	1.0054	1.0013	1.0005

		<u>Projected Ultimate Losses</u>			
<u>Method</u>		15 to Ult	24 to Ult	36 to Ult	48 to Ult
5 Yr ex Hi/Lo		14,502,943	18,796,257	26,528,130	29,338,318

		<u>Projected Ultimate Pure Premiums</u>			
<u>Method</u>		15 to Ult	24 to Ult	36 to Ult	48 to Ult
		131.84	148.65	167.78	180.83

075



**Massachusetts Private Passenger Automobile  
 Comprehensive (\$500 Deductible Basis)  
 Selected Claim Development Factors  
 Residual Market**

		<u>Reported Claims</u>			
<u>Data Type</u>		<u>2007</u>	<u>2006</u>	<u>2005</u>	<u>2004</u>
Paid		20,029	23,299	35,303	35,580

Development Factors (to Ultimate)

<u>Data Type</u>	<u>Method</u>	<u>15 to Ult</u>	<u>24 to Ult</u>	<u>36 to Ult</u>	<u>48 to Ult</u>
Paid	5 Yr ex Hi/Lo	1.0090	1.0019	1.0002	1.0000

Projected Ultimate Claims

<u>Data Type</u>	<u>Method</u>	<u>15 to Ult</u>	<u>24 to Ult</u>	<u>36 to Ult</u>	<u>48 to Ult</u>
Paid	5 Yr ex Hi/Lo	20,209	23,343	35,310	35,580

075

**Massachusetts Private Passenger Automobile  
Comprehensive (\$500 Deductible Basis)  
Residual Market**

Part 1A: Development of Reported Paid Losses					Part 1B: Development of Reported Claims					Part 1C: Earned Exposures				
<u>Calendar/ Accident Year</u>	<u>First Report</u>	<u>Second Report</u>	<u>Third Report</u>	<u>Fourth Report</u>	<u>Fifth Report</u>	<u>Calendar/ Accident Year</u>	<u>First Report</u>	<u>Second Report</u>	<u>Third Report</u>	<u>Fourth Report</u>	<u>Fifth Report</u>	<u>Calendar/ Accident Year</u>	<u>Year</u>	<u>Earned Exposures</u>
1998	49,598,629	50,072,420	50,182,529	50,201,614	50,261,777	1998	47,232	47,684	47,741	47,752	47,770	1998	1998	226,775
1999	49,481,548	49,731,000	49,963,075	49,989,606	50,039,405	1999	47,655	48,187	48,278	48,290	48,301	1999	1999	227,758
2000	50,844,730	52,036,900	52,109,933	52,137,846	52,151,118	2000	45,668	46,562	46,609	46,612	46,613	2000	2000	216,124
2001	55,399,617	56,227,818	56,509,575	56,592,995	56,663,346	2001	49,227	49,858	50,007	50,022	50,025	2001	2001	198,967
2002	45,754,869	46,927,345	47,441,557	47,487,861	47,488,558	2002	44,474	45,057	45,398	45,407	45,405	2002	2002	193,125
2003	41,780,425	42,344,904	42,423,872	42,456,240	42,466,006	2003	44,604	45,013	45,064	45,086	45,083	2003	2003	180,300
2004	28,897,944	29,229,173	29,317,197	29,323,656		2004	35,304	35,555	35,584	35,580		2004	2004	162,244
2005	26,075,036	26,382,953	26,493,688			2005	35,097	35,271	35,303			2005	2005	158,116
2006	18,552,313	18,695,302				2006	23,414	23,299				2006	2006	126,448
2007	14,250,706					2007	20,029					2007	2007	110,000

Part 1D: Average Claim Cost (1A/1B)

<u>Calendar/ Accident Year</u>	<u>First Report</u>	<u>Second Report</u>	<u>Third Report</u>	<u>Fourth Report</u>	<u>Fifth Report</u>
1998	1,050	1,050	1,051	1,051	1,052
1999	1,038	1,032	1,035	1,035	1,036
2000	1,113	1,118	1,118	1,119	1,119
2001	1,125	1,128	1,130	1,131	1,133
2002	1,029	1,042	1,045	1,046	1,046
2003	937	941	941	942	942
2004	819	822	824	824	
2005	743	748	750		
2006	792	802			
2007	712				

Part 1E: Claim Frequency (1B)/(1C) x 100

<u>Calendar/ Accident Year</u>	<u>First Report</u>	<u>Second Report</u>	<u>Third Report</u>	<u>Fourth Report</u>	<u>Fifth Report</u>
1998	20.828	21.027	21.052	21.057	21.065
1999	20.924	21.157	21.197	21.202	21.207
2000	21.130	21.544	21.566	21.567	21.568
2001	24.741	25.058	25.133	25.141	25.142
2002	23.029	23.331	23.507	23.512	23.511
2003	24.739	24.966	24.994	25.006	25.004
2004	21.760	21.914	21.932	21.930	
2005	22.197	22.307	22.327		
2006	18.517	18.426			
2007	18.208				

077

**Massachusetts Private Passenger Automobile  
 Comprehensive (\$500 Deductible Basis)  
 Loss Development Factors  
 Residual Market**

<u>Accident Year</u>	<u>First to Second</u>	<u>Second to Third</u>	<u>Third to Fourth</u>	<u>Fourth to Fifth</u>
1996	1.0096	1.0022	1.0004	1.0012
1997	1.0050	1.0047	1.0005	1.0010
2000	1.0234	1.0014	1.0005	1.0003
2001	1.0149	1.0050	1.0015	1.0012
2002	1.0256	1.0110	1.0010	1.0000
2003	1.0135	1.0019	1.0008	1.0002
2004	1.0115	1.0030	1.0002	
2005	1.0118	1.0042		
2006	1.0077			

5-Yr Ex Hi/Lo  
 Factors to Ultimate

1.0123	1.0041	1.0008	1.0005
1.0177	1.0054	1.0013	1.0005

078

**Massachusetts Private Passenger Automobile  
 Comprehensive (\$500 Deductible Basis)  
 Claim Development Factors  
 Residual Market**

<u>Accident Year</u>	<u>First to</u>	<u>Second to</u>	<u>Third to</u>	<u>Fourth to</u>
	<u>Second</u>	<u>Third</u>	<u>Fourth</u>	<u>Fifth</u>
1996	1.0096	1.0012	1.0002	1.0004
1997	1.0112	1.0019	1.0002	1.0002
2000	1.0196	1.0010	1.0001	1.0000
2001	1.0128	1.0030	1.0003	1.0001
2002	1.0131	1.0076	1.0002	1.0000
2003	1.0092	1.0011	1.0005	0.9999
2004	1.0071	1.0008	0.9999	
2005	1.0050	1.0009		
2006	0.9951			
5-Yr Ex Hi/Lo	1.0071	1.0017	1.0002	1.0000
Factors to Ultimate	1.0090	1.0019	1.0002	1.0000

079





**Massachusetts Private Passenger Automobile  
U-1 at 20,000/40,000  
Residual Market**

Part 1A: Development of Reported Incurred Losses

<u>Calendar/ Accident Year</u>	<u>First Report</u>	<u>Second Report</u>	<u>Third Report</u>	<u>Fourth Report</u>	<u>Fifth Report</u>	<u>Calendar/ Accident Year</u>	<u>First Report</u>	<u>Second Report</u>	<u>Third Report</u>	<u>Fourth Report</u>	<u>Fifth Report</u>	<u>Calendar/ Accident Year</u>	<u>Earned Exposures</u>
1996	23,492,229	21,165,425	18,859,874	18,600,035	18,412,387	1996	2,479	2,746	2,668	2,680	2,669	1996	394,297
1997	21,467,016	19,617,349	18,490,978	18,064,410	17,902,981	1997	2,482	2,741	2,691	2,660	2,650	1997	358,093
1998	20,417,077	19,514,390	18,926,135	18,280,933	18,283,159	1998	2,479	2,677	2,693	2,655	2,652	1998	355,505
1999	20,016,075	21,911,033	20,744,653	20,715,530	20,535,868	1999	2,507	2,996	2,972	2,967	2,953	1999	352,916
2000	21,510,209	23,280,300	22,872,369	22,741,886	22,642,189	2000	2,812	3,374	3,380	3,379	3,364	2000	332,884
2001	18,456,722	18,709,563	17,824,916	17,817,047	17,590,436	2001	2,566	2,891	2,855	2,866	2,839	2001	300,175
2002	19,415,039	18,679,931	17,763,825	17,486,794	17,224,913	2002	2,520	2,889	2,878	2,866	2,840	2002	294,364
2003	16,273,181	16,633,455	16,002,127	15,654,430	15,635,995	2003	2,383	2,675	2,619	2,610	2,610	2003	278,112
2004	12,034,548	11,359,758	10,882,557	10,707,437		2004	1,725	1,818	1,799	1,770		2004	259,268
2005	8,934,644	8,633,070	8,369,963			2005	1,186	1,314	1,300			2005	260,072
2006	6,971,466	6,936,383				2006	826	915				2006	207,105
2007	5,048,400					2007	601					2007	179,384

Part 1B: Development of Reported Claims

Part 1C: Earned Exposures

Part 1D: Average Claim Cost (I/A/IB)

<u>Calendar/ Accident Year</u>	<u>First Report</u>	<u>Second Report</u>	<u>Third Report</u>	<u>Fourth Report</u>	<u>Fifth Report</u>
1996	9,476	7,708	7,069	6,940	6,899
1997	8,649	7,157	6,871	6,791	6,756
1998	8,236	7,290	7,028	6,885	6,894
1999	7,984	7,313	6,980	6,982	6,954
2000	7,649	6,900	6,767	6,730	6,731
2001	7,193	6,472	6,243	6,196	6,196
2002	7,704	6,466	6,172	6,101	6,065
2003	6,829	6,218	6,110	5,998	5,991
2004	6,977	6,248	6,049	6,049	
2005	7,533	6,570	6,438		
2006	8,440	7,581			
2007	8,400				

Part 1E: Claim Frequency (1B)/(1C) x.100

<u>Calendar/ Accident Year</u>	<u>First Report</u>	<u>Second Report</u>	<u>Third Report</u>	<u>Fourth Report</u>	<u>Fifth Report</u>
1996	0.629	0.696	0.677	0.680	0.677
1997	0.693	0.765	0.751	0.743	0.740
1998	0.697	0.753	0.758	0.747	0.746
1999	0.710	0.849	0.842	0.841	0.837
2000	0.845	1.014	1.015	1.015	1.011
2001	0.855	0.963	0.951	0.955	0.946
2002	0.856	0.981	0.978	0.974	0.965
2003	0.857	0.962	0.942	0.938	0.938
2004	0.665	0.701	0.694	0.683	
2005	0.456	0.505	0.500		
2006	0.399	0.442			
2007	0.335				

003

**Massachusetts Private Passenger Automobile  
 U-1 at 20,000/40,000  
 Residual Market**

Statistical Plan Data - Incurred Losses by Accident Year and Year of Report

<u>Calendar/ Accident Year</u>	<u>Sixth Report</u>	<u>Seventh Report</u>	<u>Eighth Report</u>	<u>Ninth Report</u>	<u>Tenth Report</u>
1996	18,434,027	18,359,582	18,375,489	18,370,752	18,371,621
1997	17,825,701	17,887,515	17,870,223	17,816,937	17,810,327
1998	18,229,989	18,273,896	18,275,483	18,259,228	18,267,382
1999	20,402,677	20,376,253	20,407,282	20,378,013	
2000	22,491,856	22,446,484	22,418,788		
2001	17,512,268	17,516,408			
2002	17,221,420				

Statistical Plan Data - Incurred Claims by Accident Year and Year of Report

<u>Calendar/ Accident Year</u>	<u>Sixth Report</u>	<u>Seventh Report</u>	<u>Eighth Report</u>	<u>Ninth Report</u>	<u>Tenth Report</u>
1996	2,667	2,664	2,665	2,666	2,666
1997	2,644	2,644	2,642	2,639	2,639
1998	2,647	2,649	2,648	2,648	2,648
1999	2,943	2,944	2,942	2,940	
2000	3,349	3,346	3,346		
2001	2,832	2,831			
2002	2,837				

003



**Massachusetts Private Passenger Automobile  
 U-1 at 20,000/40,000  
 Loss Development Factors (Incurred)  
 Residual Market**

Accident Year	<u>First to</u>	<u>Second to</u>	<u>Third to</u>	<u>Fourth to</u>	<u>Fifth to</u>	<u>Sixth to</u>	<u>Seventh to</u>	<u>Eighth to</u>	<u>Ninth to</u>
	Second	Third	Fourth	Fifth	Sixth	Seventh	Eighth	Ninth	Tenth
1996	0.9010	0.8911	0.9862	0.9899	1.0012	0.9960	1.0009	0.9997	1.0000
1997	0.9138	0.9426	0.9769	0.9911	0.9957	1.0035	0.9990	0.9970	0.9996
1998	0.9558	0.9699	0.9659	1.0001	0.9971	1.0024	1.0001	0.9991	1.0004
1999	1.0947	0.9468	0.9986	0.9913	0.9935	0.9987	1.0015	0.9986	
2000	1.0823	0.9825	0.9943	0.9956	0.9934	0.9980	0.9988		
2001	1.0137	0.9527	0.9996	0.9873	0.9956	1.0002			
2002	0.9621	0.9510	0.9844	0.9850	0.9998				
2003	1.0221	0.9620	0.9783	0.9988					
2004	0.9439	0.9580	0.9839						
2005	0.9662	0.9695							
2006	0.9950								
5 yr ex Hi/Lo	0.9744	0.9576	0.9875	0.9914	0.9954	1.0004	1.0000	0.9982	1.0000
Factors to Ultimate	0.9081	0.9319	0.9732	0.9855	0.9940	0.9986	0.9982	0.9982	1.0000

031

**Massachusetts Private Passenger Automobile  
 U-1 at 20,000/40,000  
 Claim Development Factors (Incurred)  
 Residual Market**

<u>Accident Year</u>	<u>First to Second</u>	<u>Second to Third</u>	<u>Third to Fourth</u>	<u>Fourth to Fifth</u>	<u>Fifth to Sixth</u>	<u>Sixth to Seventh</u>	<u>Seventh to Eighth</u>	<u>Eighth to Ninth</u>	<u>Ninth to Tenth</u>
1996	1.1077	0.9716	1.0045	0.9959	0.9993	0.9989	1.0004	1.0004	1.0000
1997	1.1044	0.9818	0.9885	0.9962	0.9977	1.0000	0.9992	0.9989	1.0000
1998	1.0799	1.0060	0.9859	0.9989	0.9981	1.0008	0.9996	1.0000	1.0000
1999	1.1951	0.9920	0.9983	0.9953	0.9966	1.0003	0.9993	0.9993	
2000	1.1999	1.0018	0.9997	0.9956	0.9955	0.9991	1.0000		
2001	1.1267	0.9875	1.0039	0.9906	0.9975	0.9996			
2002	1.1464	0.9962	0.9958	0.9909	0.9989				
2003	1.1225	0.9791	0.9966	1.0000					
2004	1.0539	0.9895	0.9839						
2005	1.1079	0.9893							
2006	1.1077								
5 yr ex Hi/Lo	1.1127	0.9888	0.9974	0.9939	0.9974	1.0000	0.9996	0.9994	1.0000
Factors to Ultimate	1.0868	0.9767	0.9878	0.9904	0.9964	0.9990	0.9990	0.9994	1.0000

035

**Massachusetts Private Passenger Automobile  
Construction of Frequency, Severity and Pure Premium Trends  
Coverages A-1 and B with \$20,000/\$40,000 Limits  
Residual Market**

<u>Accident Year</u>	<u>Earned Exposures</u>	<u>Incurred Losses at Latest Report</u>	<u>Adjustments</u>	<u>Non-Excess Loss Factor</u>	<u>Development Factor</u>	<u>Incurred Losses Developed to 10th Report</u>
1999	352,916	\$180,188,108		1.0	1.0005	\$180,278,202
2000	332,884	\$195,521,643		1.0	1.0007	\$195,658,508
2001	300,175	\$194,105,209		1.0	1.0004	\$194,182,851
2002	294,364	\$209,366,191		1.0	1.0001	\$209,387,128
2003	278,112	\$198,256,810		1.0	0.9993	\$198,118,030
2004	259,268	\$153,057,777		1.0	1.0013	\$153,256,752
2005	260,072	\$122,728,208		1.0	1.0080	\$123,710,034
2006	207,105	\$89,387,449		1.0	1.0027	\$89,628,795
2007	179,384	\$82,005,361		1.0	0.9355	\$76,716,015

<u>Accident Year</u>	<u>Earned Exposures</u>	<u>Incurred Claims at Latest Report</u>	<u>Non-Excess Claim Factor</u>	<u>Development Factor</u>	<u>Incurred Claims Developed to 10th Report</u>
1999	352,916	24,110	1.0	0.9999	24,108
2000	332,884	25,907	1.0	0.9998	25,902
2001	300,175	26,369	1.0	0.9993	26,351
2002	294,364	29,570	1.0	0.9984	29,523
2003	278,112	28,709	1.0	0.9972	28,629
2004	259,268	21,606	1.0	0.9946	21,489
2005	260,072	16,921	1.0	0.9925	16,794
2006	207,105	11,536	1.0	0.9812	11,319
2007	179,384	9,505	1.0	0.9573	9,099

<u>Accident Year</u>	<u>Average Frequency</u>	<u>Change from Previous Year</u>	<u>Average Claim Cost</u>	<u>Change from Previous Year</u>	<u>Average Pure Premium</u>	<u>Change from Previous Year</u>
1999	6.831		\$7,478		\$510.82	
2000	7.781	13.91%	\$7,554	1.01%	\$587.77	15.06%
2001	8.778	12.82%	\$7,369	-2.44%	\$646.90	10.06%
2002	10.029	14.25%	\$7,092	-3.76%	\$711.32	9.96%
2003	10.294	2.64%	\$6,920	-2.43%	\$712.37	0.15%
2004	8.288	-19.48%	\$7,132	3.06%	\$591.11	-17.02%
2005	6.457	-22.09%	\$7,366	3.29%	\$475.68	-19.53%
2006	5.465	-15.36%	\$7,918	7.49%	\$432.77	-9.02%
2007	5.072	-7.19%	\$8,431	6.48%	\$427.66	-1.18%

\$427.66 Selected 03/29/10 Pure Premium  
1.0000 Selected Trend Factor

Source: 4/1/2008 MAIP Filing Section 100B

**Massachusetts Private Passenger Automobile  
Construction of Frequency, Severity and Pure Premium Trends  
Coverage A-2, PIP  
Residual Market**

<u>Accident Year</u>	<u>Earned Exposures</u>	<u>Incurred Losses at Latest Report</u>	<u>Adjustments</u>	<u>Non-Excess Loss Factor</u>	<u>Development Factor</u>	<u>Incurred Losses Developed to 10th Report</u>
1999	347,072	\$62,051,756		1.0	1.0001	\$62,057,961
2000	328,280	\$67,891,159		1.0	1.0022	\$68,040,520
2001	296,512	\$67,541,940		1.0	1.0038	\$67,798,599
2002	291,073	\$75,592,883		1.0	1.0063	\$76,069,118
2003	275,199	\$73,938,153		1.0	1.0094	\$74,633,172
2004	255,810	\$53,260,081		1.0	1.0136	\$53,984,418
2005	256,584	\$42,587,586		1.0	0.9789	\$41,688,988
2006	204,570	\$35,511,859		1.0	0.8527	\$30,280,962
2007	177,432	\$36,573,388		1.0	0.6275	\$22,949,801

<u>Accident Year</u>	<u>Earned Exposures</u>	<u>Incurred Claims at Latest Report</u>	<u>Non-Excess Claim Factor</u>	<u>Development Factor</u>	<u>Incurred Claims Developed to 10th Report</u>
1999	347,072	21,562	1.0	1.0003	21,568
2000	328,280	22,631	1.0	1.0008	22,649
2001	296,512	21,763	1.0	1.0014	21,793
2002	291,073	23,713	1.0	1.0041	23,810
2003	275,199	22,149	1.0	1.0081	22,328
2004	255,810	16,499	1.0	1.0117	16,692
2005	256,584	13,187	1.0	0.9855	12,996
2006	204,570	10,507	1.0	0.8723	9,165
2007	177,432	11,298	1.0	0.6363	7,189

<u>Accident Year</u>	<u>Average Frequency</u>	<u>Change from Previous Year</u>	<u>Average Claim Cost</u>	<u>Change from Previous Year</u>	<u>Average Pure Premium</u>	<u>Change from Previous Year</u>
1999	6.214		\$2,877		\$178.80	
2000	6.899	11.02%	\$3,004	4.41%	\$207.26	15.92%
2001	7.350	6.53%	\$3,111	3.56%	\$228.65	10.32%
2002	8.180	11.30%	\$3,195	2.70%	\$261.34	14.30%
2003	8.114	-0.81%	\$3,343	4.62%	\$271.20	3.77%
2004	6.525	-19.58%	\$3,234	-3.24%	\$211.03	-22.18%
2005	5.065	-22.38%	\$3,208	-0.81%	\$162.48	-23.01%
2006	4.480	-11.54%	\$3,304	2.99%	\$148.02	-8.90%
2007	4.052	-9.57%	\$3,192	-3.37%	\$129.34	-12.62%

\$127.31 Selected 03/29/10 Pure Premium  
0.9843 Selected Trend Factor

Source: 4/1/2008 MAIP Filing Section 100B

**Massachusetts Private Passenger Automobile  
Construction of Frequency, Severity and Pure Premium Trends  
Coverage Property Damage Liability  
Residual Market**

<u>Accident Year</u>	<u>Earned Exposures</u>	<u>Incurred Losses at Latest Report</u>	<u>Adjustments</u>	<u>Non-Excess Loss Factor</u>	<u>Development Factor</u>	<u>Incurred Losses Developed to 10th Report</u>
1999	352,916	\$88,651,314		1.0	1.0000	\$88,651,314
2000	332,884	\$93,802,253		1.0	1.0000	\$93,802,253
2001	300,175	\$91,325,328		1.0	1.0000	\$91,325,328
2002	294,364	\$98,069,616		1.0	1.0000	\$98,069,616
2003	278,112	\$93,608,566		1.0	1.0001	\$93,617,927
2004	259,268	\$82,468,597		1.0	1.0008	\$82,534,572
2005	260,072	\$78,665,639		1.0	0.9991	\$78,594,840
2006	207,105	\$59,641,266		1.0	1.0051	\$59,945,436
2007	179,384	\$54,558,754		1.0	1.0117	\$55,197,091

<u>Accident Year</u>	<u>Earned Exposures</u>	<u>Incurred Claims at Latest Report</u>	<u>Non-Excess Claim Factor</u>	<u>Development Factor</u>	<u>Incurred Claims Developed to 10th Report</u>
1999	352,916	54,369	1.0	1.0000	54,369
2000	332,884	54,654	1.0	1.0000	54,654
2001	300,175	50,837	1.0	1.0000	50,837
2002	294,364	53,671	1.0	1.0000	53,671
2003	278,112	51,255	1.0	1.0000	51,255
2004	259,268	45,230	1.0	0.9999	45,225
2005	260,072	42,794	1.0	0.9975	42,687
2006	207,105	31,484	1.0	1.0008	31,509
2007	179,384	28,603	1.0	1.0055	28,760

<u>Accident Year</u>	<u>Average Frequency</u>	<u>Change from Previous Year</u>	<u>Average Claim Cost</u>	<u>Change from Previous Year</u>	<u>Average Pure Premium</u>	<u>Change from Previous Year</u>
1999	15.406		\$1,631		\$251.20	
2000	16.418	6.57%	\$1,716	5.26%	\$281.79	12.18%
2001	16.936	3.15%	\$1,796	4.67%	\$304.24	7.97%
2002	18.233	7.66%	\$1,827	1.71%	\$333.16	9.50%
2003	18.430	1.08%	\$1,827	-0.04%	\$336.62	1.04%
2004	17.444	-5.35%	\$1,825	-0.09%	\$318.34	-5.43%
2005	16.414	-5.90%	\$1,841	0.89%	\$302.20	-5.07%
2006	15.214	-7.31%	\$1,902	3.33%	\$289.44	-4.22%
2007	16.033	5.38%	\$1,919	0.88%	\$307.70	6.31%

\$328.43 Selected 03/29/10 Pure Premium  
1.0673 Selected Trend Factor

Source: 4/1/2008 MAIP Filing Section 100B

**Massachusetts Private Passenger Automobile  
Construction of Frequency, Severity and Pure Premium Trends  
Coverage Medical Payments  
Residual Market**

<u>Accident Year</u>	<u>Earned Exposures</u>	<u>Incurred Losses at Latest Report</u>	<u>Adjustments</u>	<u>Non-Excess Loss Factor</u>	<u>Development Factor</u>	<u>Incurred Losses Developed to 10th Report</u>
1999	80,834	\$2,081,542		1.0	1.0010	\$2,083,624
2000	75,072	\$2,172,186		1.0	1.0013	\$2,175,010
2001	69,121	\$1,789,217		1.0	1.0020	\$1,792,795
2002	70,186	\$1,679,603		1.0	1.0042	\$1,686,657
2003	67,270	\$1,668,863		1.0	1.0094	\$1,684,550
2004	67,063	\$1,589,848		1.0	1.0130	\$1,610,516
2005	73,297	\$1,551,103		1.0	1.0279	\$1,594,379
2006	61,584	\$1,353,676		1.0	1.0750	\$1,455,202
2007	55,473	\$1,069,292		1.0	1.3469	\$1,440,229

<u>Accident Year</u>	<u>Earned Exposures</u>	<u>Incurred Claims at Latest Report</u>	<u>Non-Excess Claim Factor</u>	<u>Development Factor</u>	<u>Incurred Claims Developed to 10th Report</u>
1999	80,834	747	1.0	1.0000	747
2000	75,072	778	1.0	1.0000	778
2001	69,121	631	1.0	1.0000	631
2002	70,186	531	1.0	1.0028	532
2003	67,270	513	1.0	1.0086	517
2004	67,063	486	1.0	1.0134	493
2005	73,297	450	1.0	1.0389	468
2006	61,584	381	1.0	1.1072	422
2007	55,473	283	1.0	1.4466	409

<u>Accident Year</u>	<u>Average Frequency</u>	<u>Change from Previous Year</u>	<u>Average Claim Cost</u>	<u>Change from Previous Year</u>	<u>Average Pure Premium</u>	<u>Change from Previous Year</u>
1999	0.924		\$2,789		\$25.78	
2000	1.036	12.14%	\$2,796	0.23%	\$28.97	12.40%
2001	0.913	-11.91%	\$2,841	1.63%	\$25.94	-10.48%
2002	0.759	-16.89%	\$3,168	11.49%	\$24.03	-7.35%
2003	0.769	1.38%	\$3,256	2.78%	\$25.04	4.20%
2004	0.734	-4.52%	\$3,270	0.44%	\$24.02	-4.10%
2005	0.638	-13.15%	\$3,410	4.29%	\$21.75	-9.42%
2006	0.685	7.39%	\$3,450	1.15%	\$23.63	8.63%
2007	0.738	7.74%	\$3,518	1.98%	\$25.96	9.87%

\$32.76 Selected 03/29/10 Pure Premium  
1.2618 Selected Trend Factor

Source: 4/1/2008 MAIP Filing Section 100B

**Massachusetts Private Passenger Automobile  
Construction of Frequency, Severity and Pure Premium Trends  
Coverage Collision, \$500 Deductible  
Residual Market**

<u>Accident Year</u>	<u>Earned Exposures</u>	<u>Paid Losses at Latest Report</u>	<u>Adjustments</u>	<u>Non-Excess Loss Factor</u>	<u>Development Factor</u>	<u>Paid Losses Developed to 10th Report</u>
1999	204,687	\$97,005,075		1.0	1.0000	\$97,005,075
2000	193,692	\$109,837,341		1.0	1.0000	\$109,837,341
2001	178,850	\$111,576,820		1.0	1.0000	\$111,576,820
2002	174,842	\$116,575,322		1.0	1.0000	\$116,575,322
2003	156,997	\$109,873,905		1.0	1.0000	\$109,873,905
2004	137,116	\$85,184,835		1.0	0.9980	\$85,014,465
2005	138,221	\$77,022,418		1.0	0.9913	\$76,352,323
2006	109,925	\$59,404,549		1.0	0.9725	\$57,770,924
2007	94,815	\$57,631,133		1.0	0.9161	\$52,795,881

<u>Accident Year</u>	<u>Earned Exposures</u>	<u>Paid Claims at Latest Report</u>	<u>Non-Excess Claim Factor</u>	<u>Development Factor</u>	<u>Paid Claims Developed to 10th Report</u>
1999	204,687	40,150	1.0	1.0000	40,150
2000	193,692	42,853	1.0	1.0000	42,853
2001	178,850	41,912	1.0	1.0000	41,912
2002	174,842	42,772	1.0	1.0000	42,772
2003	156,997	41,472	1.0	1.0000	41,472
2004	137,116	31,958	1.0	0.9986	31,913
2005	138,221	28,545	1.0	0.9925	28,331
2006	109,925	20,278	1.0	0.9762	19,795
2007	94,815	19,498	1.0	0.9272	18,079

<u>Accident Year</u>	<u>Average Frequency</u>	<u>Change from Previous Year</u>	<u>Average Claim Cost</u>	<u>Change from Previous Year</u>	<u>Average Pure Premium</u>	<u>Change from Previous Year</u>
1999	19.615		\$2,416		\$473.92	
2000	22.124	12.79%	\$2,563	6.09%	\$567.07	19.66%
2001	23.434	5.92%	\$2,662	3.86%	\$623.86	10.01%
2002	24.463	4.39%	\$2,726	2.38%	\$666.75	6.87%
2003	26.416	7.98%	\$2,649	-2.79%	\$699.85	4.96%
2004	23.275	-11.89%	\$2,664	0.55%	\$620.02	-11.41%
2005	20.497	-11.93%	\$2,695	1.17%	\$552.39	-10.91%
2006	18.008	-12.14%	\$2,918	8.29%	\$525.55	-4.86%
2007	19.067	5.88%	\$2,920	0.07%	\$556.83	5.95%

\$651.11 Selected 03/29/10 Pure Premium  
1.1693 Selected Trend Factor

Source: 4/1/2008 MAIP Filing Section 100B

**Massachusetts Private Passenger Automobile  
Construction of Frequency, Severity and Pure Premium Trends  
Coverage Limited Collision, \$500 Deductible  
Residual Market**

<u>Accident Year</u>	<u>Earned Exposures</u>	<u>Paid Losses at Latest Report</u>	<u>Adjustments</u>	<u>Non-Excess Loss Factor</u>	<u>Development Factor</u>	<u>Paid Losses Developed to 10th Report</u>
1999	6,475	\$253,404		1.0	1.0000	\$253,404
2000	6,430	\$348,908		1.0	1.0000	\$348,908
2001	5,925	\$367,663		1.0	1.0000	\$367,663
2002	5,597	\$353,813		1.0	1.0000	\$353,813
2003	5,042	\$287,438		1.0	1.0000	\$287,438
2004	4,735	\$168,002		1.0	0.9950	\$167,162
2005	4,430	\$164,136		1.0	0.9669	\$158,703
2006	3,350	\$107,459		1.0	0.8663	\$93,092
2007	2,939	\$222,100		1.0	0.5970	\$132,594

<u>Accident Year</u>	<u>Earned Exposures</u>	<u>Paid Claims at Latest Report</u>	<u>Non-Excess Claim Factor</u>	<u>Development Factor</u>	<u>Paid Claims Developed to 10th Report</u>
1999	6,475	249	1.0	1.0000	249
2000	6,430	298	1.0	1.0000	298
2001	5,925	267	1.0	1.0000	267
2002	5,597	292	1.0	1.0000	292
2003	5,042	251	1.0	1.0000	251
2004	4,735	157	1.0	1.0000	157
2005	4,430	152	1.0	0.9751	148
2006	3,350	104	1.0	0.9012	94
2007	2,939	137	1.0	0.6904	95

<u>Accident Year</u>	<u>Average Frequency</u>	<u>Change from Previous Year</u>	<u>Average Claim Cost</u>	<u>Change from Previous Year</u>	<u>Average Pure Premium</u>	<u>Change from Previous Year</u>
1999	3.846		\$1,018		\$39.14	
2000	4.635	20.52%	\$1,171	15.05%	\$54.26	38.65%
2001	4.507	-2.76%	\$1,377	17.61%	\$62.06	14.36%
2002	5.217	15.76%	\$1,212	-12.01%	\$63.21	1.86%
2003	4.979	-4.57%	\$1,145	-5.49%	\$57.01	-9.81%
2004	3.316	-33.40%	\$1,065	-7.02%	\$35.30	-38.08%
2005	3.345	0.90%	\$1,071	0.57%	\$35.82	1.47%
2006	2.798	-16.38%	\$993	-7.24%	\$27.79	-22.43%
2007	3.218	15.03%	\$1,402	41.14%	\$45.11	62.34%

Source: 4/1/2008 MAIP Filing Section 100B



**Massachusetts Private Passenger Automobile  
Construction of Frequency, Severity and Pure Premium Trends  
Coverage Comprehensive, \$500 Deductible  
Residual Market**

<u>Accident Year</u>	<u>Earned Exposures</u>	<u>Paid Losses at Latest Report</u>	<u>Adjustments</u>	<u>Non-Excess Loss Factor</u>	<u>Development Factor</u>	<u>Paid Losses Developed to 10th Report</u>
1999	227,758	\$50,039,405		0.987	1.0000	\$49,388,893
2000	216,124	\$52,151,118		0.998	1.0000	\$52,046,816
2001	198,967	\$56,663,346		1.000	1.0000	\$56,663,346
2002	193,125	\$47,488,558		1.000	1.0000	\$47,488,558
2003	180,300	\$42,466,006		1.000	1.0000	\$42,466,006
2004	162,244	\$29,323,656		1.000	1.0005	\$29,338,318
2005	158,116	\$26,493,688		0.991	1.0013	\$26,289,377
2006	126,448	\$18,695,302		0.995	1.0054	\$18,696,272
2007	110,000	\$14,250,706		0.998	1.0177	\$14,473,938

<u>Accident Year</u>	<u>Earned Exposures</u>	<u>Paid Claims at Latest Report</u>	<u>Non-Excess Claim Factor</u>	<u>Development Factor</u>	<u>Paid Claims Developed to 10th Report</u>
1999	227,758	48,301	0.996	1.0000	48,108
2000	216,124	46,613	0.999	1.0000	46,566
2001	198,967	50,025	1.000	1.0000	50,025
2002	193,125	45,405	1.000	1.0000	45,405
2003	180,300	45,083	1.000	1.0000	45,083
2004	162,244	35,580	1.000	1.0000	35,580
2005	158,116	35,303	0.999	1.0002	35,275
2006	126,448	23,299	0.999	1.0019	23,329
2007	110,000	20,029	1.000	1.0090	20,200

<u>Accident Year</u>	<u>Average Frequency</u>	<u>Change from Previous Year</u>	<u>Average Claim Cost</u>	<u>Change from Previous Year</u>	<u>Average Pure Premium</u>	<u>Change from Previous Year</u>
1999	21.122		\$1,027		\$216.85	
2000	21.546	2.01%	\$1,118	8.87%	\$240.82	11.05%
2001	25.142	16.69%	\$1,133	1.34%	\$284.79	18.26%
2002	23.511	-6.49%	\$1,046	-7.66%	\$245.90	-13.66%
2003	25.004	6.35%	\$942	-9.94%	\$235.53	-4.22%
2004	21.930	-12.30%	\$825	-12.46%	\$180.83	-23.22%
2005	22.309	1.73%	\$745	-9.62%	\$166.27	-8.05%
2006	18.449	-17.30%	\$801	7.53%	\$147.86	-11.07%
2007	18.363	-0.47%	\$717	-10.59%	\$131.58	-11.01%

\$130.12 Selected 03/29/10 Pure Premium  
0.9889 Selected Trend Factor

Source: 4/1/2008 MAIP Filing Section 100B

**Massachusetts Private Passenger Automobile  
Construction of Frequency, Severity and Pure Premium Trends  
Coverage U-1 with \$20,000/\$40,000 Limits  
Residual Market**

<u>Accident Year</u>	<u>Earned Exposures</u>	<u>Incurred Losses at Latest Report</u>	<u>Adjustments</u>	<u>Non-Excess Loss Factor</u>	<u>Development Factor</u>	<u>Incurred Losses Developed to 10th Report</u>
1999	352,916	\$20,378,013		1.0	1.0000	\$20,378,013
2000	332,884	\$22,418,788		1.0	0.9982	\$22,378,434
2001	300,175	\$17,516,408		1.0	0.9982	\$17,484,878
2002	294,364	\$17,221,420		1.0	0.9986	\$17,197,310
2003	278,112	\$15,635,995		1.0	0.9940	\$15,542,179
2004	259,268	\$10,707,437		1.0	0.9855	\$10,552,179
2005	260,072	\$8,369,963		1.0	0.9732	\$8,145,648
2006	207,105	\$6,936,383		1.0	0.9319	\$6,464,015
2007	179,384	\$5,048,400		1.0	0.9081	\$4,584,452

<u>Accident Year</u>	<u>Earned Exposures</u>	<u>Incurred Claims at Latest Report</u>	<u>Non-Excess Claim Factor</u>	<u>Development Factor</u>	<u>Incurred Claims Developed to 10th Report</u>
1999	352,916	2,940	1.0	1.0000	2,940
2000	332,884	3,346	1.0	0.9994	3,344
2001	300,175	2,831	1.0	0.9990	2,828
2002	294,364	2,837	1.0	0.9990	2,834
2003	278,112	2,610	1.0	0.9964	2,601
2004	259,268	1,770	1.0	0.9904	1,753
2005	260,072	1,300	1.0	0.9878	1,284
2006	207,105	915	1.0	0.9767	894
2007	179,384	601	1.0	1.0868	653

<u>Accident Year</u>	<u>Average Frequency</u>	<u>Change from Previous Year</u>	<u>Average Claim Cost</u>	<u>Change from Previous Year</u>	<u>Average Pure Premium</u>	<u>Change from Previous Year</u>
1999	0.833		\$6,931		\$57.74	
2000	1.005	20.59%	\$6,692	-3.45%	\$67.23	16.43%
2001	0.942	-6.21%	\$6,182	-7.62%	\$58.25	-13.35%
2002	0.963	2.19%	\$6,068	-1.85%	\$58.42	0.30%
2003	0.935	-2.88%	\$5,976	-1.51%	\$55.88	-4.34%
2004	0.676	-27.69%	\$6,019	0.72%	\$40.70	-27.17%
2005	0.494	-26.97%	\$6,343	5.38%	\$31.32	-23.04%
2006	0.432	-12.61%	\$7,233	14.03%	\$31.21	-0.35%
2007	0.364	-15.62%	\$7,019	-2.96%	\$25.56	-18.12%

\$25.56 Selected 03/29/10 Pure Premium  
1.0000 Selected Trend Factor

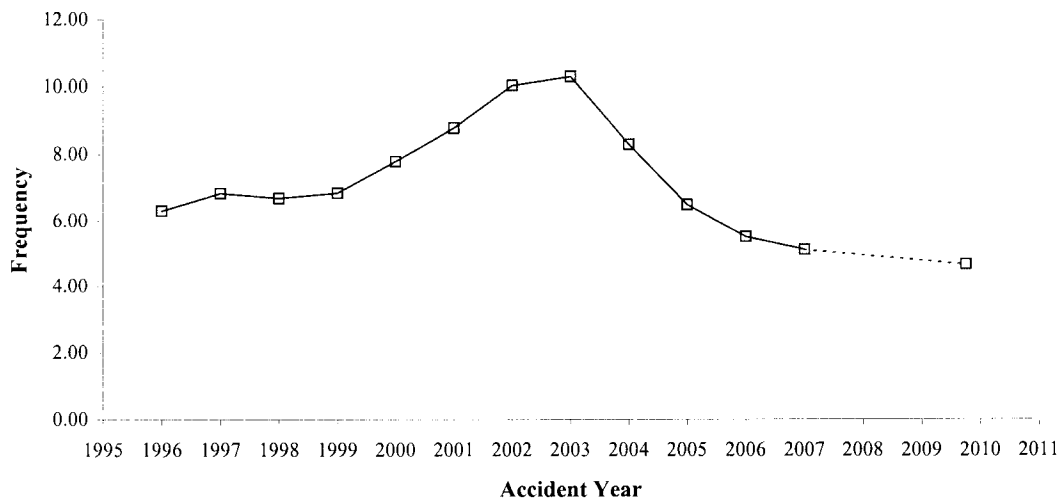
Source: 4/1/2008 MAIP Filing Section 100B

034

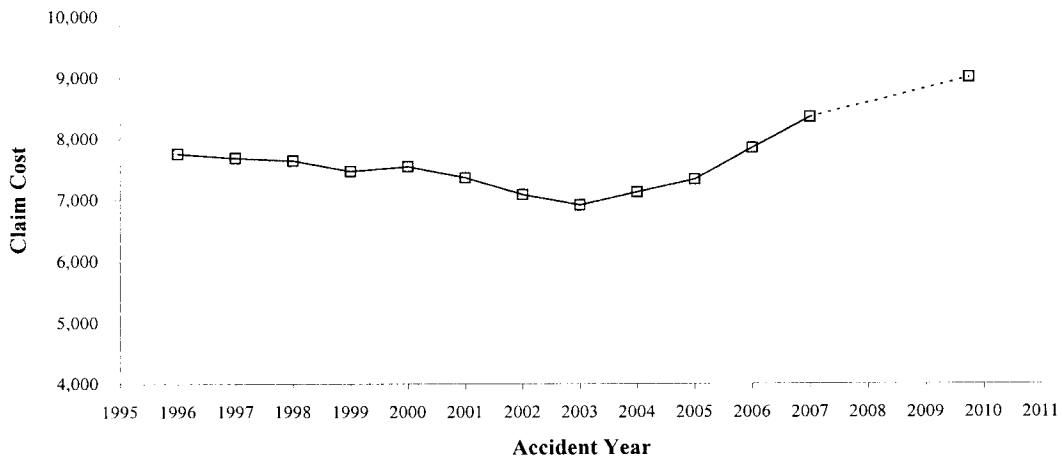
**Massachusetts Private Passenger Automobile  
 A-1/B Bodily Injury (Basic) - Residual Market  
 Ultimate Pure Premium**



**Ultimate Frequency**

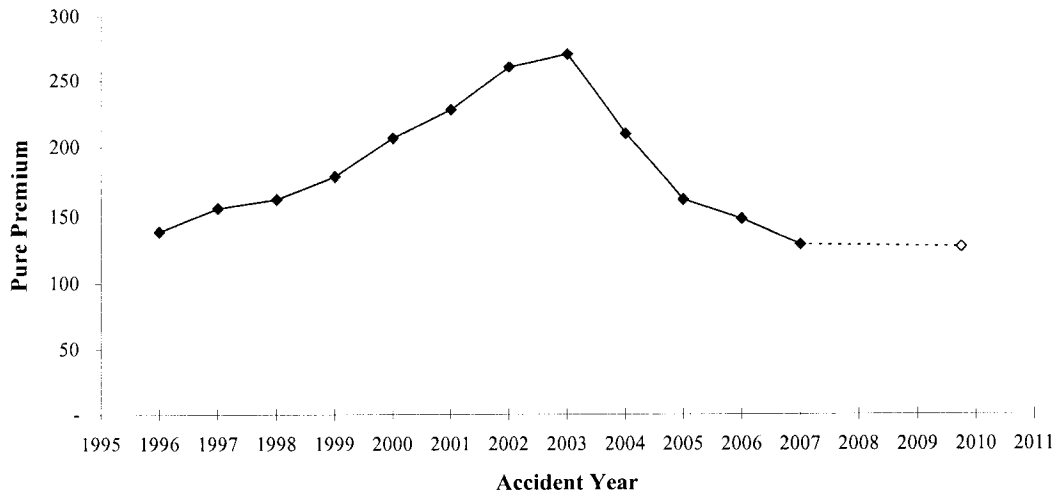


**Ultimate Average Claim Cost**

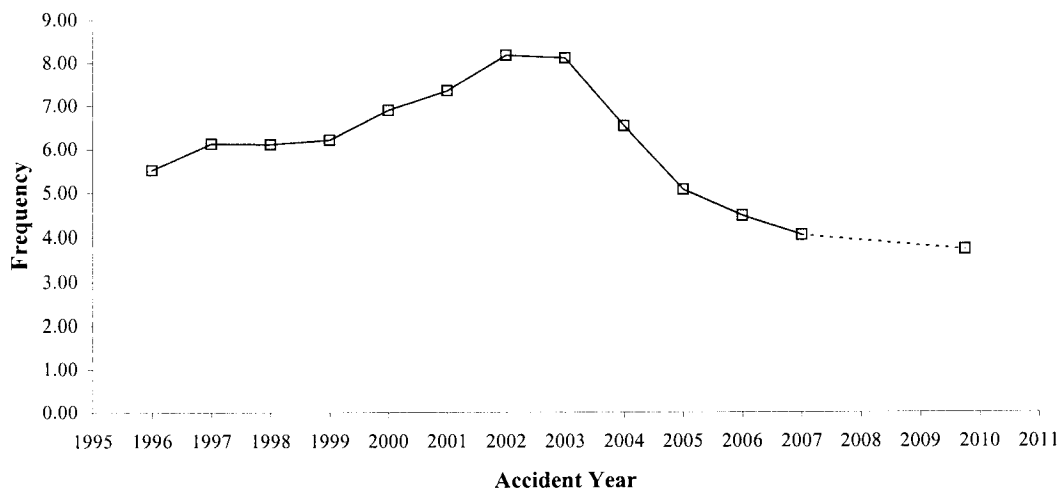


035

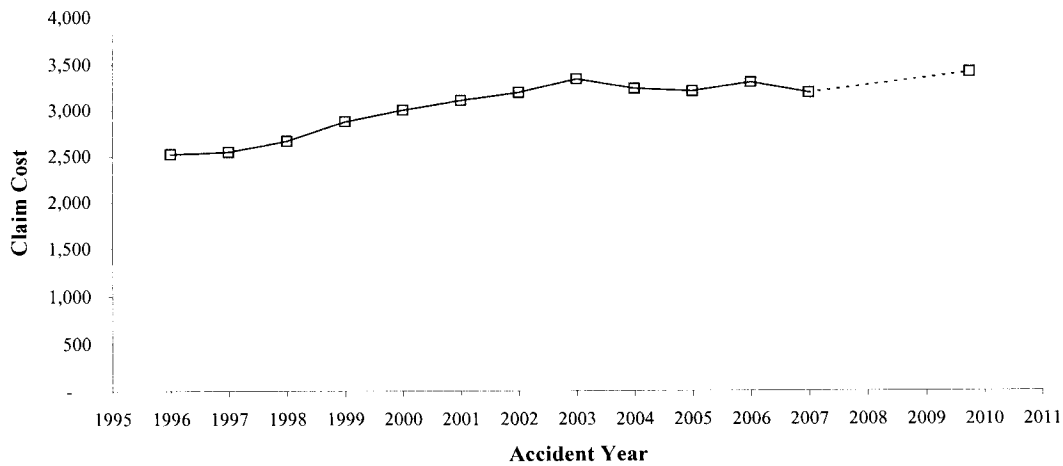
### Massachusetts Private Passenger Automobile Personal Injury Protection - Residual Market Ultimate Pure Premium



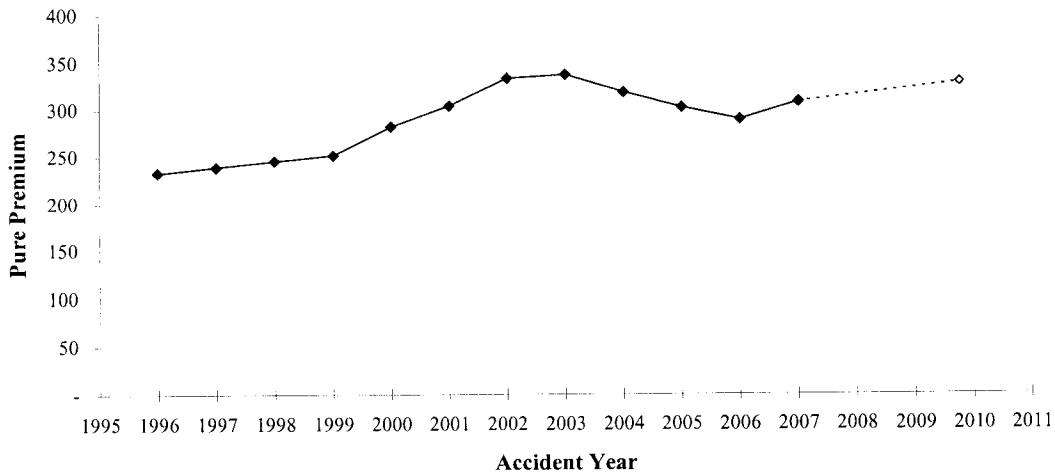
### Ultimate Frequency



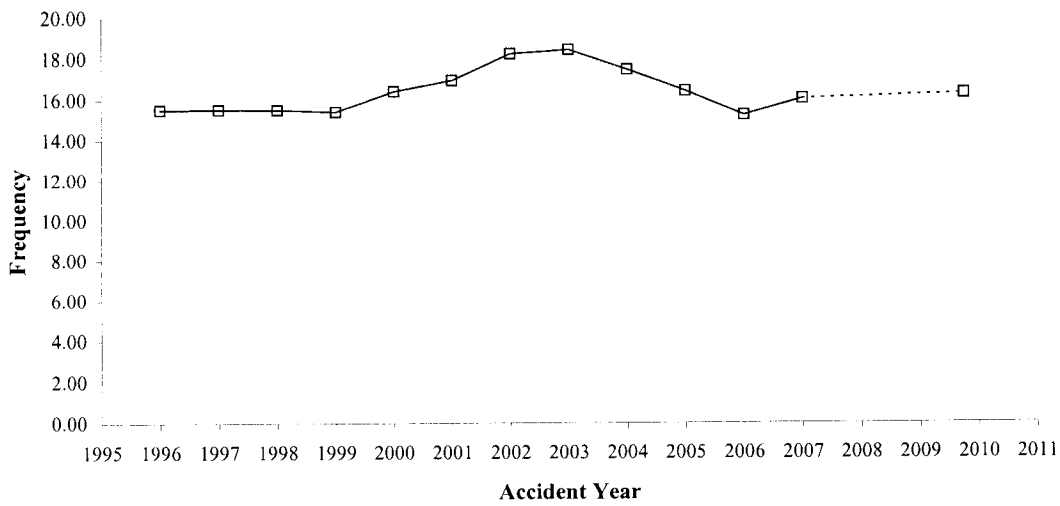
### Ultimate Average Claim Cost



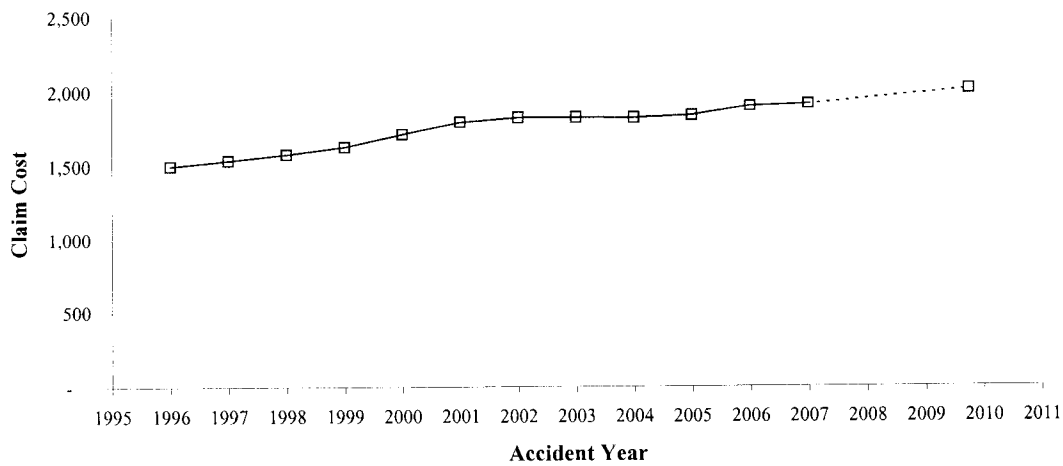
**Massachusetts Private Passenger Automobile  
Property Damage Liability (Basic) - Residual Market  
Ultimate Pure Premium**



**Ultimate Frequency**

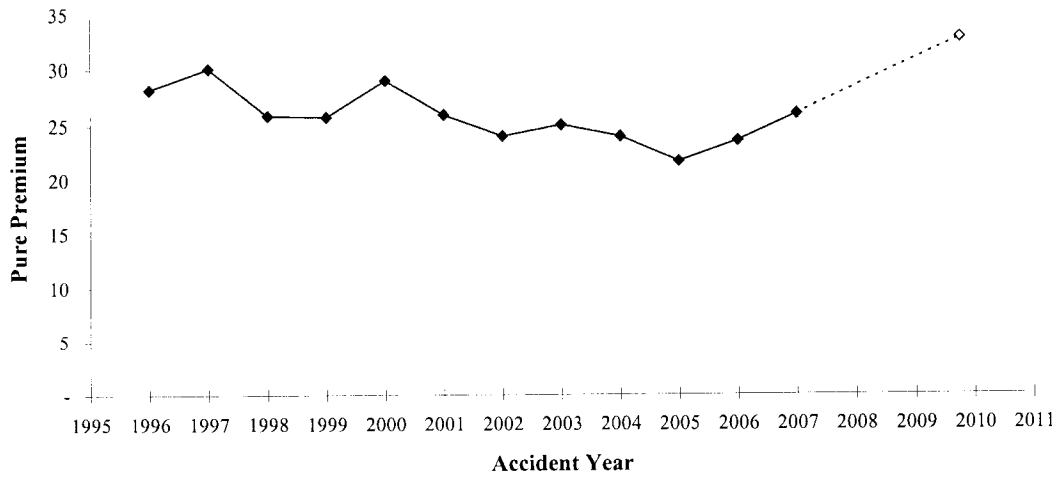


**Ultimate Average Claim Cost**



637

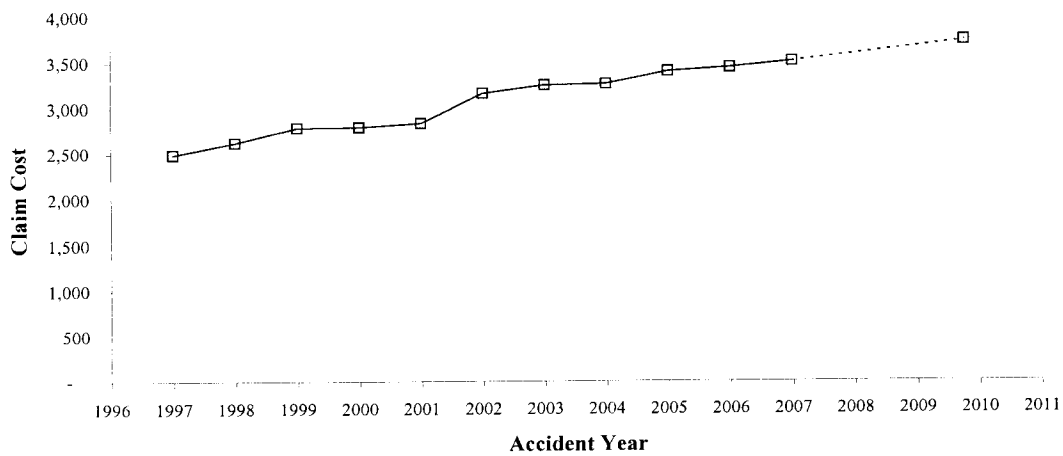
### Massachusetts Private Passenger Automobile Medical Payments (Basic) - Residual Market Ultimate Pure Premium



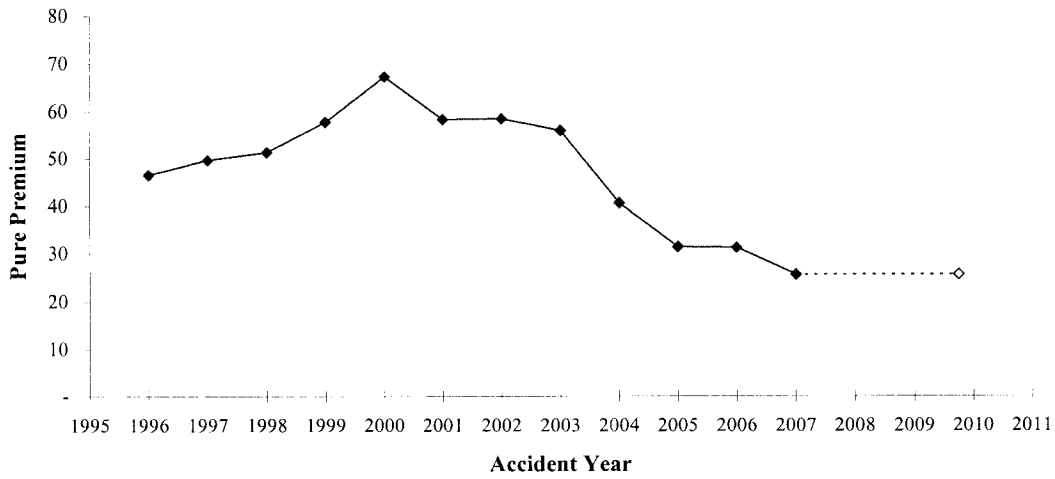
### Ultimate Frequency



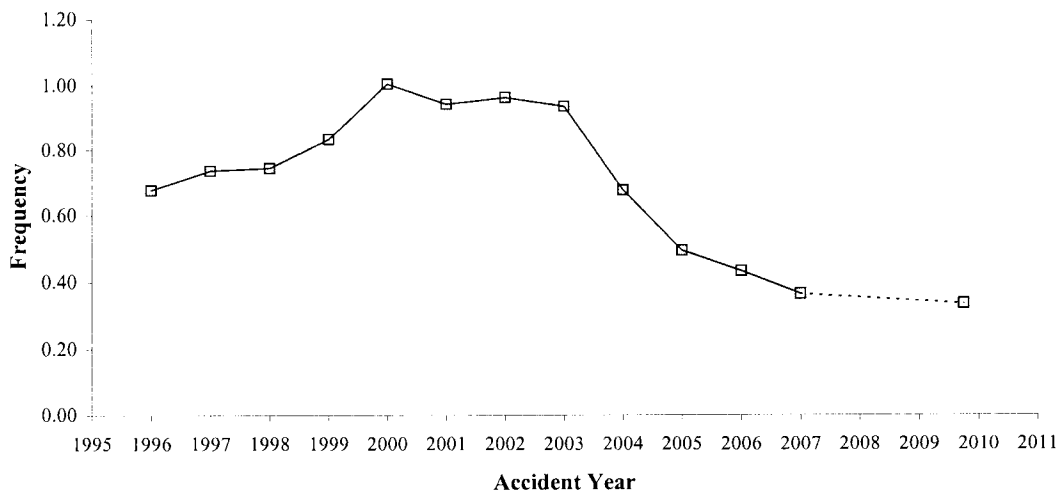
### Ultimate Average Claim Cost



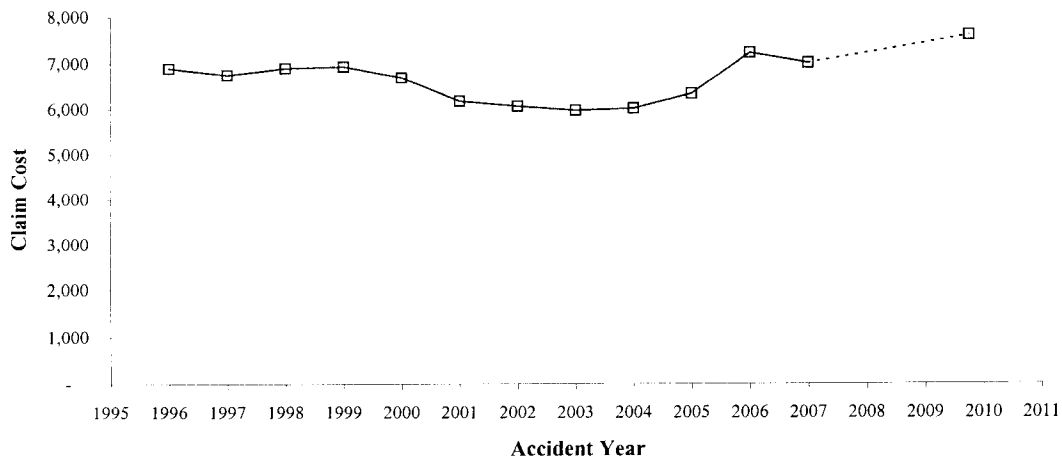
### Massachusetts Private Passenger Automobile Uninsured Motorists Liability (Basic) - Residual Market Ultimate Pure Premium



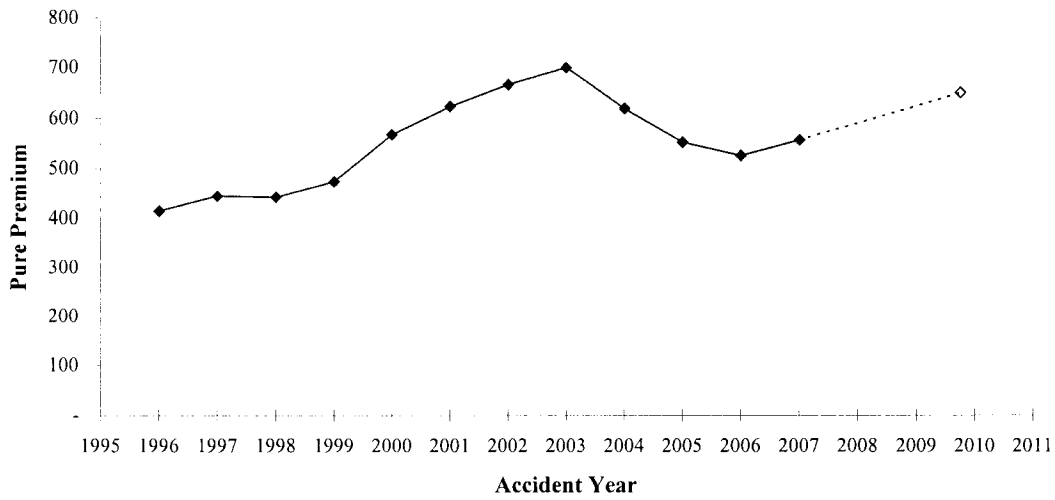
### Ultimate Frequency



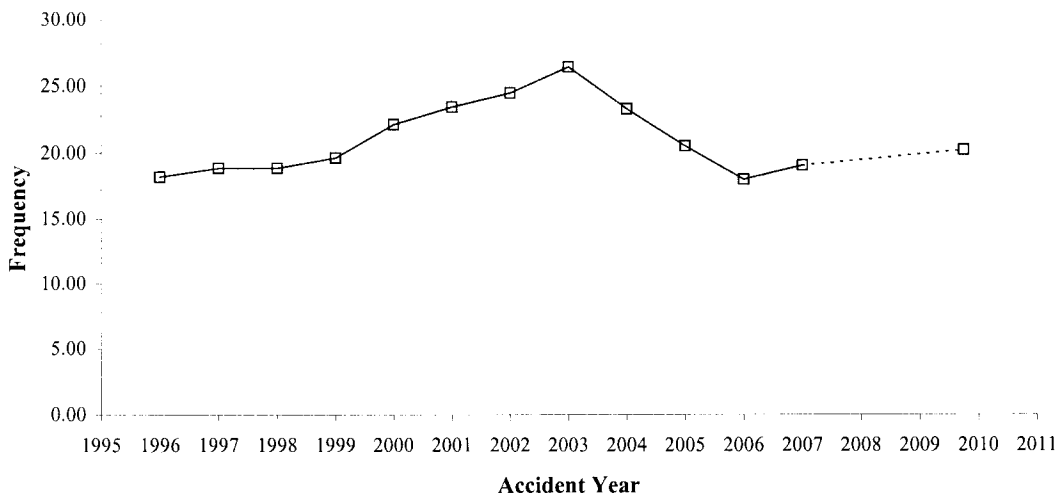
### Ultimate Average Claim Cost



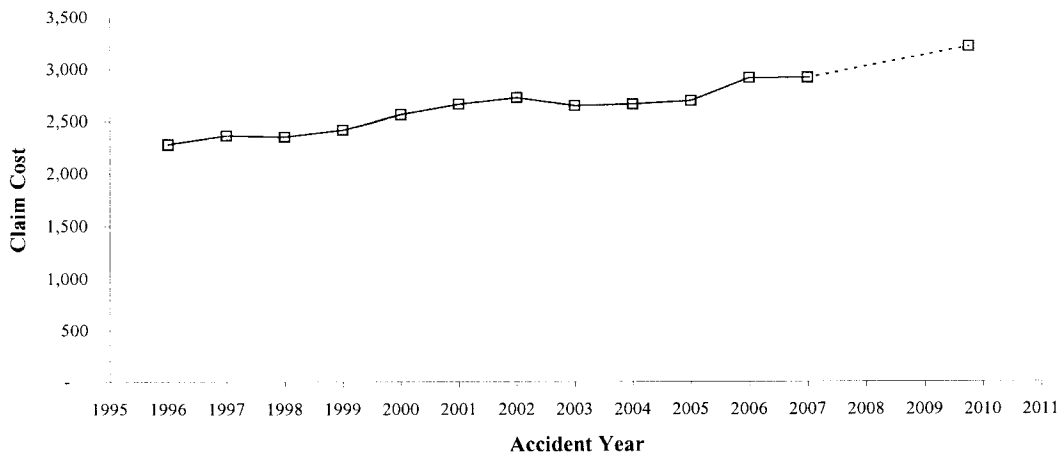
**Massachusetts Private Passenger Automobile  
Collision (\$500 Deductible) - Residual Market  
Ultimate Pure Premium**



**Ultimate Frequency**

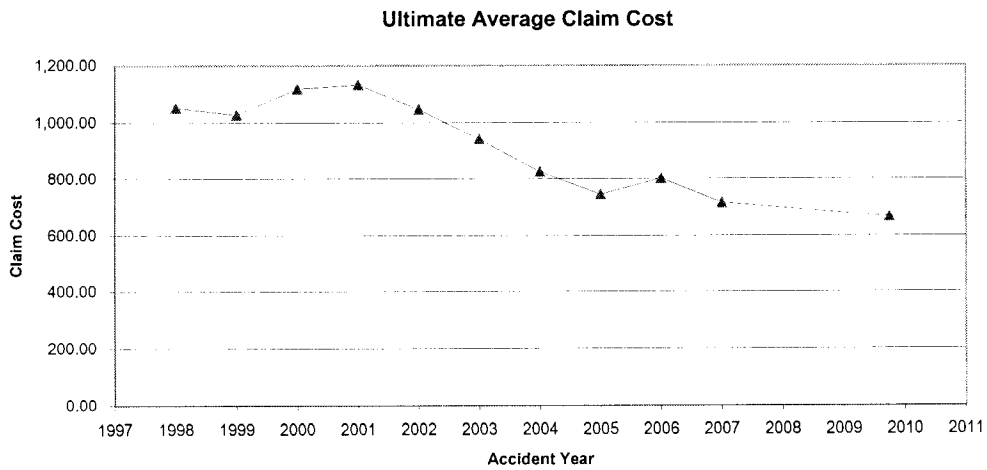
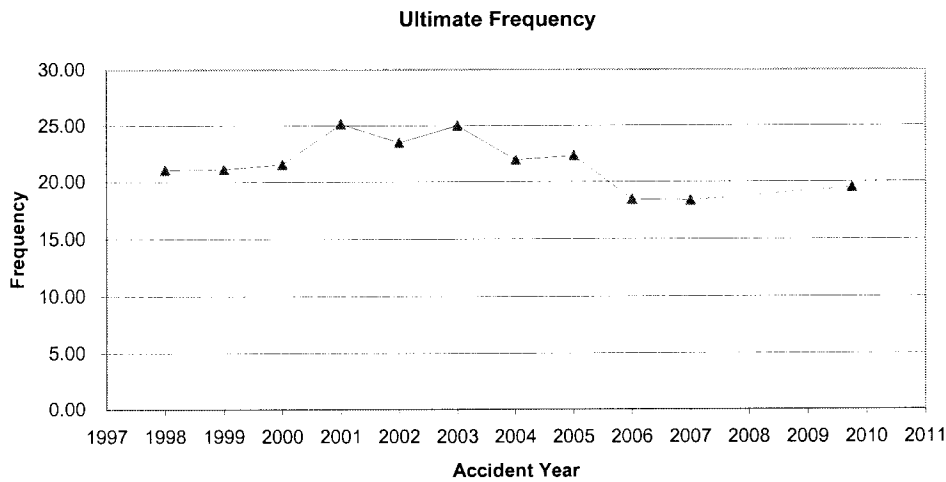
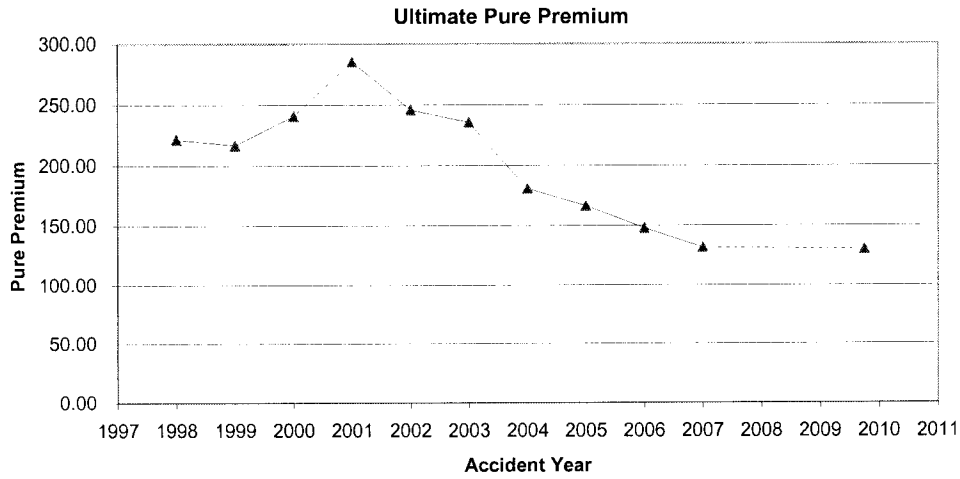


**Ultimate Average Claim Cost**



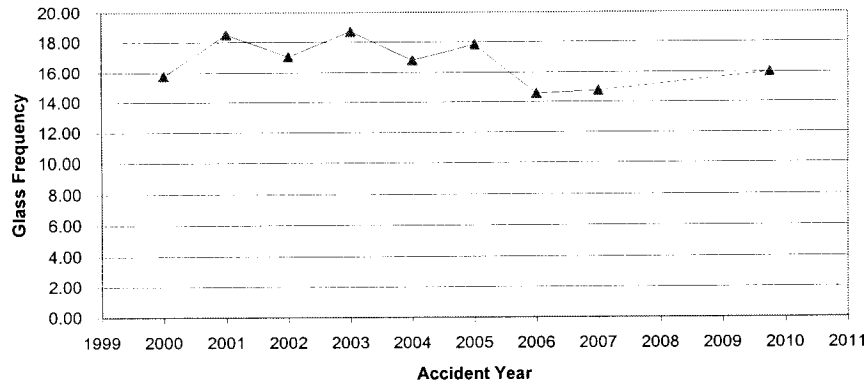


**Massachusetts Private Passenger Automobile  
Comprehensive (\$500 Deductible) - Residual Market  
All Types of Loss**

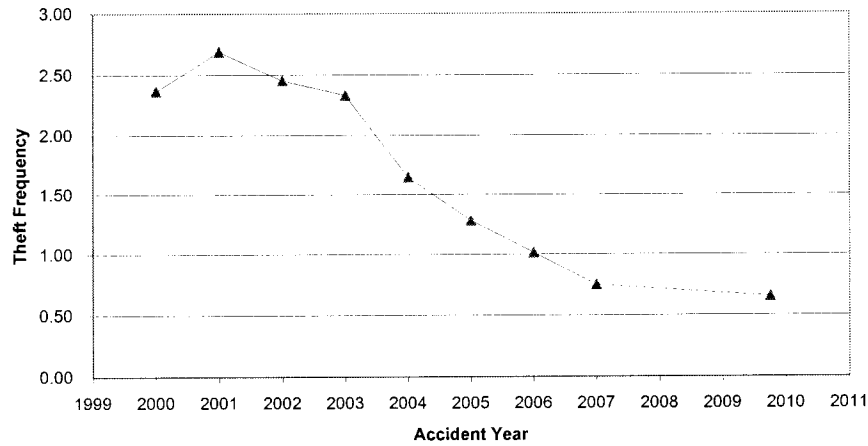


**Massachusetts Private Passenger Automobile  
Comprehensive (\$500 Deductible) - Residual Market**

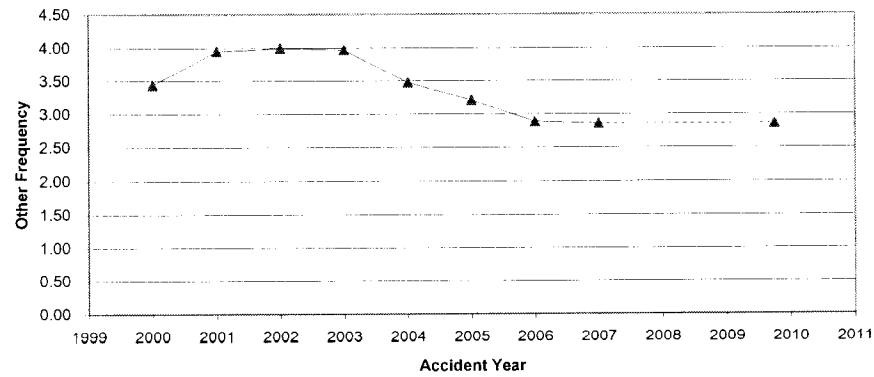
**Glass Frequency @ Ultimate**



**Theft Frequency @ Ultimate**

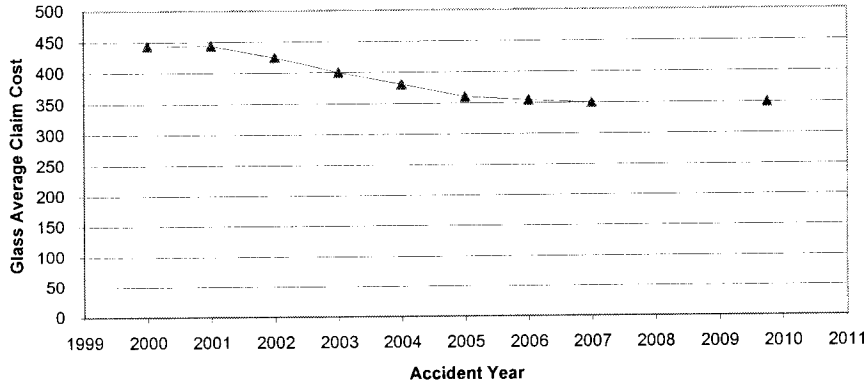


**"Other" Frequency @ Ultimate**

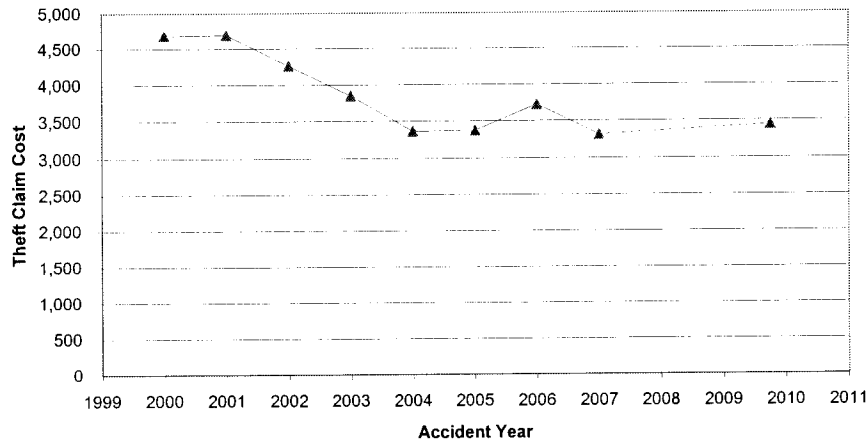


**Massachusetts Private Passenger Automobile  
Comprehensive (\$500 Deductible) - Residual Market**

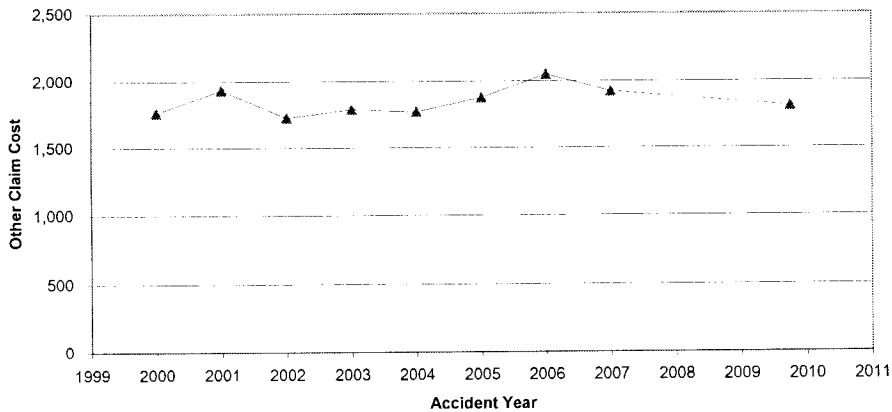
**Glass - Ultimate Average Claim Cost**



**Theft - Ultimate Average Claim Cost**

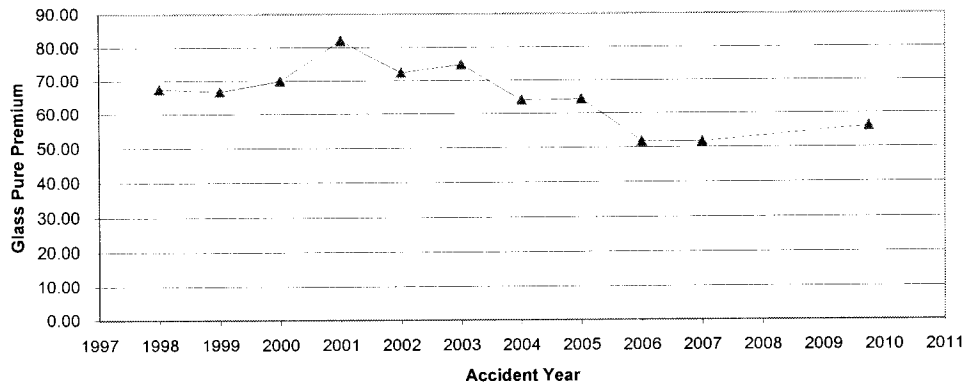


**"Other" - Ultimate Average Claim Cost**

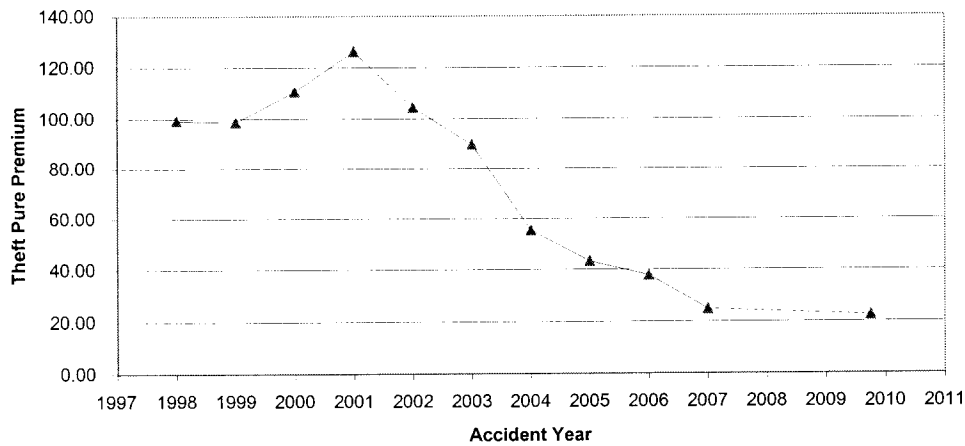


**Massachusetts Private Passenger Automobile  
Comprehensive (\$500 Deductible) - Residual Market**

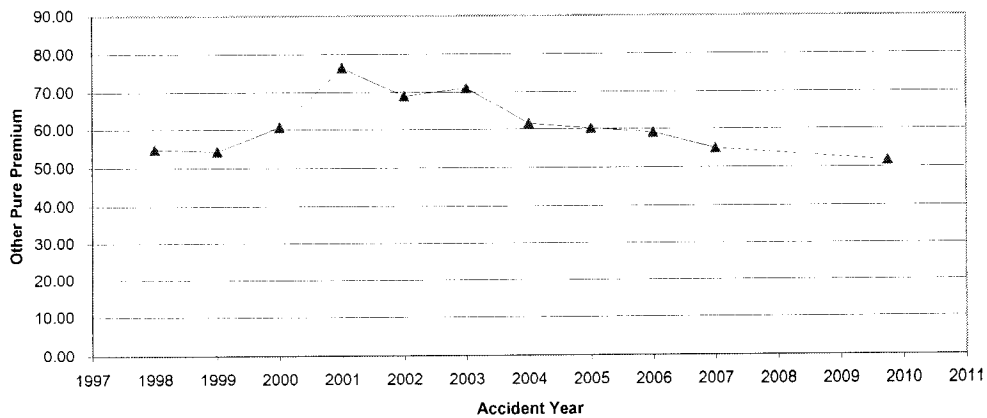
**Glass - Ultimate Pure Premium**



**Theft - Ultimate Pure Premium**



**"Other" - Ultimate Pure Premium**



**Massachusetts Private Passenger Automobile  
Calculation of Projected Average Effective Date  
Residual Market**

Month	Written Exposures			
	2004	2005	2006	2007
January	23,891	28,419	18,371	16,592
February	19,978	24,621	15,701	13,457
March	23,481	24,322	17,810	13,186
April	21,671	21,356	15,849	14,087
May	21,066	20,913	16,624	14,933
June	22,199	21,258	16,905	14,785
July	23,910	19,234	16,232	15,053
August	25,575	21,198	17,810	16,754
September	25,622	20,089	17,578	15,789
October	24,788	19,403	17,840	16,390
November	22,485	17,961	16,565	15,111
December	18,326	14,778	12,674	11,507

Month	Written Exposures *		
	2008	2009	2010
January	16,592	16,592	16,592
February	13,457	13,457	13,457
March	13,186	13,186	13,186
April	14,087	14,087	14,087
May	14,933	14,933	14,933
June	14,785	14,785	14,785
July	15,053	15,053	15,053
August	16,754	16,754	16,754
September	15,789	15,789	15,789
October	16,390	16,390	16,390
November	15,111	15,111	15,111
December	11,507	11,507	11,507

\* 2007 Monthly Exposures used for 2008, 2009 and 2010

**Massachusetts Private Passenger Automobile  
Calculation of Average Effective Date for 2007 Rates  
Residual Market**

Month	Written Exposures *	Avg. Date of Writing	Index
April	14,087	15-Apr-07	0.5
May	14,933	15-May-07	1.5
June	14,785	15-Jun-07	2.5
July	15,053	15-Jul-07	3.5
August	16,754	15-Aug-07	4.5
September	15,789	15-Sep-07	5.5
October	16,390	15-Oct-07	6.5
November	15,111	15-Nov-07	7.5
December	11,507	15-Dec-07	8.5
January	16,592	15-Jan-08	9.5
February	13,457	15-Feb-08	10.5
March	13,186	15-Mar-08	11.5
Total	177,643		5.91 **

Average Effective Date: 5.91 or September 29, 2009

Average Accident Date: 11.91 or March 29, 2010

Average Experience Date: July 1, 2007

Loss Trend Period (in years): 2.75

\* 2007 Monthly Exposures used for 2008 and 2009

\*\*  $\text{Sum of } [( \text{Monthly Exposures} ) \times ( \text{Index} )] / \text{Sum of } ( \text{Monthly Exposures} )$

**Massachusetts Private Passenger Automobile  
Comprehensive Loss Data, by Accident Year and Type of Loss  
Adjusted to \$500 Deductible Basis Except for Glass  
As of First Report  
Residual Market**

A	B	C	D	E	F	G	H	I	J	K	L
Type of Loss	Acc. Year	Loss Dollars	% Total Comp Loss Dollars	Earned Exposures	Pure Premium C/E	Annual	Claim Count	Claim	Annual	Average Claim Cost (C/H)	Annual
						Change in Pure Premium		Frequency /100 Exp. H/E x 100	Change in Claim Frequency		Change in Avg Claim Cost
(1) Fire	1998	\$1,777,982	3.58%	226,775.4	\$7.84	N/A	474	0.2090	N/A	\$3,751	N/A
	1999	\$2,065,098	4.17%	227,757.6	\$9.07	15.69%	465	0.2042	-2.30%	\$4,441	18.40%
	2000	\$1,826,187	3.59%	216,124.3	\$8.45	-6.84%	402	0.1860	-8.91%	\$4,543	2.30%
	2001	\$1,742,229	3.14%	199,165.1	\$8.75	3.55%	364	0.1828	-1.72%	\$4,786	5.35%
	2002	\$1,584,880	3.46%	193,125.0	\$8.21	-6.17%	325	0.1683	-7.93%	\$4,877	1.90%
	2003	\$1,644,103	3.94%	180,299.0	\$9.12	11.08%	319	0.1769	5.11%	\$5,154	5.68%
	2004	\$1,269,567	4.39%	162,244.0	\$7.83	-14.14%	241	0.1485	-16.05%	\$5,268	2.21%
	2005	\$1,043,547	4.00%	158,117.0	\$6.60	-15.71%	202	0.1278	-13.94%	\$5,166	-1.94%
	2006	\$693,197	3.74%	126,448.0	\$5.48	-16.97%	141	0.1115	-12.75%	\$4,916	-4.84%
2007	\$677,621	4.75%	110,000.0	\$6.16	12.41%	153	0.1391	24.75%	\$4,429	-9.91%	
(2) Theft	1998	\$22,061,102	44.48%	226,775.4	\$97.28	N/A	5,329	2.3499	N/A	\$4,140	N/A
	1999	\$22,090,803	44.64%	227,757.6	\$96.99	-0.30%	5,055	2.2195	-5.55%	\$4,370	5.56%
	2000	\$23,124,790	45.48%	216,124.3	\$107.00	10.32%	4,955	2.2927	3.30%	\$4,667	6.80%
	2001	\$24,311,771	43.88%	199,165.1	\$122.07	14.08%	5,183	2.6024	13.51%	\$4,691	0.51%
	2002	\$19,036,045	41.60%	193,125.0	\$98.57	-19.25%	4,501	2.3306	-10.44%	\$4,229	-9.85%
	2003	\$15,661,913	37.49%	180,299.0	\$86.87	-11.87%	4,050	2.2463	-3.62%	\$3,867	-8.56%
	2004	\$8,624,204	29.84%	162,244.0	\$53.16	-38.81%	2,601	1.6031	-28.63%	\$3,316	-14.25%
	2005	\$6,467,104	24.80%	158,117.0	\$40.90	-23.06%	1,963	1.2415	-22.56%	\$3,295	-0.63%
	2006	\$4,567,348	24.62%	126,448.0	\$36.12	-11.69%	1,242	0.9822	-20.89%	\$3,677	11.59%
2007	\$2,607,070	18.29%	110,000.0	\$23.70	-34.39%	795	0.7227	-26.42%	\$3,279	-10.82%	
(3) Glass	1998	\$15,144,850	30.53%	226,775.4	\$66.78	N/A	34,462	15.1965	N/A	\$439	N/A
	1999	\$15,012,713	30.34%	227,757.6	\$65.92	-1.29%	35,016	15.3742	1.17%	\$429	-2.28%
	2000	\$14,761,677	29.03%	216,124.3	\$68.30	3.61%	33,328	15.4208	0.30%	\$443	3.26%
	2001	\$16,098,059	29.06%	199,165.1	\$80.83	18.35%	36,244	18.1980	18.01%	\$444	0.23%
	2002	\$13,718,361	29.98%	193,125.0	\$71.03	-12.12%	32,353	16.7524	-7.94%	\$424	-4.50%
	2003	\$13,370,706	32.00%	180,299.0	\$74.16	4.41%	33,444	18.5492	10.73%	\$400	-5.66%
	2004	\$10,310,194	35.68%	162,244.0	\$63.55	-14.31%	27,092	16.6983	-9.98%	\$381	-4.75%
	2005	\$10,100,474	38.74%	158,117.0	\$63.88	0.52%	28,079	17.7584	6.35%	\$360	-5.51%
	2006	\$6,572,814	35.43%	126,448.0	\$51.98	-18.63%	18,547	14.6677	-17.40%	\$354	-1.67%
2007	\$5,634,043	39.54%	110,000.0	\$51.22	-1.46%	16,109	14.6445	-0.16%	\$350	-1.13%	
Other Perils Subtotal (5,6,7,9)	1998	\$10,614,695	21.40%	226,775.4	\$46.81	N/A	6,967	3.0722	N/A	\$1,524	N/A
	1999	\$10,312,934	20.84%	227,757.6	\$45.28	-3.27%	7,119	3.1257	1.74%	\$1,449	-4.92%
	2000	\$11,132,076	21.89%	216,124.3	\$51.51	13.76%	6,983	3.2310	3.37%	\$1,594	10.01%
	2001	\$13,247,558	23.91%	199,165.1	\$66.52	29.14%	7,436	3.7336	15.56%	\$1,782	11.79%
	2002	\$11,415,583	24.95%	193,125.0	\$59.11	-11.14%	7,295	3.7773	1.17%	\$1,565	-12.18%
	2003	\$11,103,703	26.58%	180,299.0	\$61.58	4.18%	6,791	3.7665	-0.29%	\$1,635	4.47%
	2004	\$8,693,979	30.09%	162,244.0	\$53.59	-12.97%	5,370	3.3098	-12.13%	\$1,619	-0.98%
	2005	\$8,463,911	32.46%	158,117.0	\$53.53	-0.11%	4,853	3.0692	-7.27%	\$1,744	7.72%
	2006	\$6,718,954	36.22%	126,448.0	\$53.14	-0.73%	3,484	2.7553	-10.23%	\$1,929	10.61%
2007	\$5,331,972	37.42%	110,000.0	\$48.47	-8.79%	2,972	2.7018	-1.94%	\$1,794	-7.00%	
Total	1998	\$49,598,629	100.00%	226,775.4	\$218.71	N/A	47,232	20.8277	N/A	\$1,050	N/A
	1999	\$49,481,548	100.00%	227,757.6	\$217.26	-0.66%	47,655	20.9236	0.46%	\$1,038	-1.14%
	2000	\$50,844,730	100.00%	216,124.3	\$235.26	8.29%	45,668	21.1304	0.99%	\$1,113	7.23%
	2001	\$55,399,617	100.00%	199,165.1	\$278.16	18.24%	49,227	24.7167	16.97%	\$1,125	1.08%
	2002	\$45,754,869	100.00%	193,125.0	\$236.92	-14.83%	44,474	23.0286	-6.83%	\$1,029	-8.53%
	2003	\$41,780,425	100.00%	180,299.0	\$231.73	-2.19%	44,604	24.7389	7.43%	\$937	-8.94%
	2004	\$28,897,944	100.00%	162,244.0	\$178.11	-23.14%	35,304	21.7598	-12.04%	\$819	-12.59%
	2005	\$26,075,036	100.00%	158,117.0	\$164.91	-7.41%	35,097	22.1969	2.01%	\$741	-9.28%
	2006	\$18,552,313	100.00%	126,448.0	\$146.72	-11.03%	23,414	18.5167	-16.58%	\$792	6.59%
2007	\$14,250,706	100.00%	110,000.0	\$129.55	-11.70%	20,029	18.2082	-1.67%	\$712	-10.10%	

**Massachusetts Private Passenger Automobile  
Comprehensive Loss Data, by Accident Year and Type of Loss  
Adjusted to \$500 Deductible Basis Except for Glass  
As of First Report  
Residual Market**

A	B	C	D	E	F	G	H	I	J	K	L
Type of Loss	Acc. Year	Loss Dollars	% Total Comp Loss Dollars	Earned Exposures	Pure Premium C/E	Annual	Claim Count	Claim	Annual	Average Claim Cost (C/H)	Annual
						Change in Pure Premium		Frequency /100 Exp. H/E x 100	Change in Claim Frequency		Change in Avg Claim Cost
(5)	1998	\$6,056,801	12.21%	226,775.4	\$26.71	N/A	4,992	2.2013	N/A	\$1,213	N/A
Malicious	1999	\$6,211,703	12.55%	227,757.6	\$27.27	2.10%	4,810	2.1119	-4.06%	\$1,291	6.43%
Mischief &	2000	\$7,455,422	14.66%	216,124.3	\$34.50	26.51%	4,974	2.3015	8.98%	\$1,499	16.11%
Vandalism	2001	\$8,137,344	14.69%	199,165.1	\$40.86	18.43%	5,198	2.6099	13.40%	\$1,565	4.40%
	2002	\$7,855,742	17.17%	193,125.0	\$40.68	-0.44%	5,361	2.7759	6.36%	\$1,465	-6.39%
	2003	\$7,300,748	17.47%	180,299.0	\$40.49	-0.47%	4,900	2.7177	-2.10%	\$1,490	1.71%
	2004	\$5,424,456	18.77%	162,244.0	\$33.43	-17.44%	3,767	2.3218	-14.57%	\$1,440	-3.36%
	2005	\$4,274,087	16.39%	158,117.0	\$27.03	-19.14%	3,031	1.9169	-17.44%	\$1,410	-2.08%
	2006	\$3,411,614	18.39%	126,448.0	\$26.98	-0.18%	2,155	1.7043	-11.09%	\$1,583	12.27%
	2007	\$3,360,931	23.58%	110,000.0	\$30.55	13.23%	2,072	1.8836	10.52%	\$1,622	2.46%
(6)	1998	\$460,852	0.93%	226,775.4	\$2.03	N/A	152	0.0670	N/A	\$3,032	N/A
Windstorm	1999	\$621,596	1.26%	227,757.6	\$2.73	34.48%	308	0.1352	101.79%	\$2,018	-33.44%
Etc.	2000	\$255,591	0.50%	216,124.3	\$1.18	-56.78%	115	0.0532	-60.65%	\$2,223	10.16%
	2001	\$318,340	0.57%	199,165.1	\$1.60	35.59%	105	0.0527	-0.94%	\$3,032	36.39%
	2002	\$248,134	0.54%	193,125.0	\$1.28	-20.00%	100	0.0518	-1.71%	\$2,481	-18.17%
	2003	\$158,725	0.38%	180,299.0	\$0.88	-31.25%	84	0.0466	-10.04%	\$1,890	-23.82%
	2004	\$213,876	0.74%	162,244.0	\$1.32	50.00%	91	0.0561	20.39%	\$2,350	24.34%
	2005	\$343,097	1.32%	158,117.0	\$2.17	64.39%	118	0.0746	32.98%	\$2,908	23.74%
	2006	\$350,089	1.89%	126,448.0	\$2.77	27.65%	107	0.0846	13.40%	\$3,272	12.52%
	2007	\$159,550	1.12%	110,000.0	\$1.45	-47.65%	73	0.0664	-21.51%	\$2,186	-33.19%
(7)	1998	\$1,290,578	2.60%	226,775.4	\$5.69	N/A	288	0.1270	N/A	\$4,481	N/A
Flood and	1999	\$447,089	0.90%	227,757.6	\$1.96	-65.55%	90	0.0395	-68.90%	\$4,968	10.87%
Rising	2000	\$327,925	0.64%	216,124.3	\$1.52	-22.45%	69	0.0319	-19.24%	\$4,753	-4.33%
Water	2001	\$1,289,944	2.33%	199,165.1	\$6.48	326.32%	270	0.1356	325.08%	\$4,778	0.53%
	2002	\$224,697	0.49%	193,125.0	\$1.16	-82.10%	40	0.0207	-84.73%	\$5,617	17.56%
	2003	\$362,359	0.87%	180,299.0	\$2.01	73.28%	79	0.0438	111.59%	\$4,587	-18.34%
	2004	\$366,359	1.27%	162,244.0	\$2.26	12.44%	90	0.0555	26.71%	\$4,071	-11.25%
	2005	\$988,897	3.79%	158,117.0	\$6.25	176.55%	208	0.1315	136.94%	\$4,754	16.78%
	2006	\$681,325	3.67%	126,448.0	\$5.39	-13.76%	136	0.1076	-18.17%	\$5,010	5.38%
	2007	\$194,011	1.36%	110,000.0	\$1.76	-67.35%	41	0.0373	-65.33%	\$4,732	-5.55%
(9)	1998	\$2,806,464	5.66%	226,775.4	\$12.38	N/A	1,535	0.6769	N/A	\$1,828	N/A
All Other	1999	\$3,032,546	6.13%	227,757.6	\$13.31	7.51%	1,911	0.8390	23.95%	\$1,587	-13.18%
	2000	\$3,093,138	6.08%	216,124.3	\$14.31	7.51%	1,825	0.8444	0.64%	\$1,695	6.81%
	2001	\$3,501,930	6.32%	199,165.1	\$17.58	22.85%	1,863	0.9354	10.78%	\$1,880	10.91%
	2002	\$3,087,010	6.75%	193,125.0	\$15.98	-9.10%	1,794	0.9289	-0.69%	\$1,721	-8.46%
	2003	\$3,281,871	7.86%	180,299.0	\$18.20	13.89%	1,728	0.9584	3.18%	\$1,899	10.34%
	2004	\$2,689,288	9.31%	162,244.0	\$16.58	-8.90%	1,422	0.8765	-8.55%	\$1,891	-0.42%
	2005	\$2,857,830	10.96%	158,117.0	\$18.07	8.99%	1,496	0.9461	7.94%	\$1,910	1.00%
	2006	\$2,275,926	12.27%	126,448.0	\$18.00	-0.39%	1,086	0.8589	-9.22%	\$2,096	9.74%
	2007	\$1,617,480	11.35%	110,000.0	\$14.70	-18.33%	786	0.7145	-16.81%	\$2,058	-1.81%
Sub-Total (5,6,7,9)	1998	\$10,614,695	21.40%	226,775.4	\$46.81	N/A	6,967	3.0722	N/A	\$1,524	N/A
	1999	\$10,312,934	20.84%	227,757.6	\$45.28	-3.27%	7,119	3.1257	1.74%	\$1,449	-4.92%
	2000	\$11,132,076	21.89%	216,124.3	\$51.51	13.76%	6,983	3.2310	3.37%	\$1,594	10.01%
	2001	\$13,247,558	23.91%	199,165.1	\$66.52	29.14%	7,436	3.7336	15.56%	\$1,782	11.79%
	2002	\$11,415,583	24.95%	193,125.0	\$59.11	-11.14%	7,295	3.7773	1.17%	\$1,565	-12.18%
	2003	\$11,103,703	26.58%	180,299.0	\$61.58	4.18%	6,791	3.7665	-0.29%	\$1,635	4.47%
	2004	\$8,693,979	30.09%	162,244.0	\$53.59	-12.97%	5,370	3.3098	-12.13%	\$1,619	-0.98%
	2005	\$8,463,911	32.46%	158,117.0	\$53.53	-0.11%	4,853	3.0692	-7.27%	\$1,744	7.72%
	2006	\$6,718,954	36.22%	126,448.0	\$53.14	-0.73%	3,484	2.7553	-10.23%	\$1,929	10.61%
	2007	\$5,331,972	37.42%	110,000.0	\$48.47	-8.79%	2,972	2.7018	-1.94%	\$1,794	-7.00%



**Massachusetts Private Passenger Automobile  
Comprehensive Loss Data, by Accident Year and Type of Loss  
Adjusted to \$500 Deductible Basis Except for Glass  
As of First Report - Excluding Excess Experience  
Residual Market**

A	B	C	D	E	F	G	H	I	J	K	L
Type of Loss	Acc. Year	Loss Dollars	% Total Comp Loss Dollars	Earned Exposures	Pure Premium C/E	Annual	Claim Count	Claim	Annual	Average Claim Cost (C/H)	Annual
						Change in Pure Premium		Frequency /100 Exp. H/E x 100	Change in Claim Frequency		Change in Avg Claim Cost
(1) Fire	1998	\$1,777,982	3.66%	226,775.4	\$7.84	N/A	474	0.2090	N/A	\$3,751	N/A
	1999	\$2,065,098	4.23%	227,757.6	\$9.07	15.69%	465	0.2042	-2.30%	\$4,441	18.40%
	2000	\$1,826,187	3.60%	216,124.3	\$8.45	-6.84%	402	0.1860	-8.91%	\$4,543	2.30%
	2001	\$1,742,229	3.14%	199,165.1	\$8.75	3.55%	364	0.1828	-1.72%	\$4,786	5.35%
	2002	\$1,584,880	3.46%	193,125.0	\$8.21	-6.17%	325	0.1683	-7.93%	\$4,877	1.90%
	2003	\$1,644,103	3.94%	180,299.0	\$9.12	11.08%	319	0.1769	5.11%	\$5,154	5.68%
	2004	\$1,269,567	4.39%	162,244.0	\$7.83	-14.14%	241	0.1485	-16.05%	\$5,268	2.21%
	2005	\$1,043,547	4.05%	158,117.0	\$6.60	-15.71%	202	0.1278	-13.94%	\$5,166	-1.94%
	2006	\$693,197	3.75%	126,448.0	\$5.48	-16.97%	141	0.1115	-12.75%	\$4,916	-4.84%
2007	\$677,621	4.76%	110,000.0	\$6.16	12.41%	153	0.1391	24.75%	\$4,429	-9.91%	
(2) Theft	1998	\$22,061,102	45.47%	226,775.4	\$97.28	N/A	5,329	2.3499	N/A	\$4,140	N/A
	1999	\$22,090,803	45.26%	227,757.6	\$96.99	-0.30%	5,055	2.2195	-5.55%	\$4,370	5.56%
	2000	\$23,124,790	45.54%	216,124.3	\$107.00	10.32%	4,955	2.2927	3.30%	\$4,667	6.80%
	2001	\$24,311,771	43.88%	199,165.1	\$122.07	14.08%	5,183	2.6024	13.51%	\$4,691	0.51%
	2002	\$19,036,045	41.60%	193,125.0	\$98.57	-19.25%	4,501	2.3306	-10.44%	\$4,229	-9.85%
	2003	\$15,661,913	37.49%	180,299.0	\$86.87	-11.87%	4,050	2.2463	-3.62%	\$3,867	-8.56%
	2004	\$8,624,204	29.84%	162,244.0	\$53.16	-38.81%	2,601	1.6031	-28.63%	\$3,316	-14.25%
	2005	\$6,467,104	25.13%	158,117.0	\$40.90	-23.06%	1,963	1.2415	-22.56%	\$3,295	-0.63%
	2006	\$4,567,348	24.69%	126,448.0	\$36.12	-11.69%	1,242	0.9822	-20.89%	\$3,677	11.59%
2007	\$2,607,070	18.31%	110,000.0	\$23.70	-34.39%	795	0.7227	-26.42%	\$3,279	-10.82%	
(3) Glass	1998	\$15,144,850	31.22%	226,775.4	\$66.78	N/A	34,462	15.1965	N/A	\$439	N/A
	1999	\$15,012,713	30.76%	227,757.6	\$65.92	-1.29%	35,016	15.3742	1.17%	\$429	-2.28%
	2000	\$14,761,677	29.07%	216,124.3	\$68.30	3.61%	33,328	15.4208	0.30%	\$443	3.26%
	2001	\$16,098,059	29.06%	199,165.1	\$80.83	18.35%	36,244	18.1980	18.01%	\$444	0.23%
	2002	\$13,718,361	29.98%	193,125.0	\$71.03	-12.12%	32,353	16.7524	-7.94%	\$424	-4.50%
	2003	\$13,370,706	32.00%	180,299.0	\$74.16	4.41%	33,444	18.5492	10.73%	\$400	-5.66%
	2004	\$10,310,194	35.68%	162,244.0	\$63.55	-14.31%	27,092	16.6983	-9.98%	\$381	-4.75%
	2005	\$10,100,474	39.24%	158,117.0	\$63.88	0.52%	28,079	17.7584	6.35%	\$360	-5.51%
	2006	\$6,572,814	35.53%	126,448.0	\$51.98	-18.63%	18,547	14.6677	-17.40%	\$354	-1.67%
2007	\$5,634,043	39.57%	110,000.0	\$51.22	-1.46%	16,109	14.6445	-0.16%	\$350	-1.13%	
Other Perils Subtotal (5,6,7,9)	1998	\$9,532,980	19.65%	226,775.4	\$42.04	N/A	6,702	2.9553	N/A	\$1,422	N/A
	1999	\$9,643,220	19.76%	227,757.6	\$42.34	0.71%	6,869	3.0159	2.05%	\$1,404	-1.27%
	2000	\$11,061,640	21.79%	216,124.3	\$51.18	20.88%	6,957	3.2190	6.73%	\$1,590	13.25%
	2001	\$13,247,558	23.91%	199,165.1	\$66.52	29.97%	7,436	3.7336	15.99%	\$1,782	12.08%
	2002	\$11,415,583	24.95%	193,125.0	\$59.11	-11.14%	7,295	3.7773	1.17%	\$1,565	-12.18%
	2003	\$11,103,703	26.58%	180,299.0	\$61.58	4.18%	6,791	3.7665	-0.29%	\$1,635	4.47%
	2004	\$8,693,979	30.09%	162,244.0	\$53.59	-12.97%	5,370	3.3098	-12.13%	\$1,619	-0.98%
	2005	\$8,126,040	31.57%	158,117.0	\$51.39	-4.11%	4,773	3.0187	-8.80%	\$1,703	5.19%
	2006	\$6,663,847	36.03%	126,448.0	\$52.70	2.55%	3,473	2.7466	-9.01%	\$1,919	12.68%
2007	\$5,321,044	37.37%	110,000.0	\$48.37	-8.22%	2,967	2.6973	-1.79%	\$1,793	-6.57%	
Total	1998	\$48,516,914	100.00%	226,775.4	\$213.94	N/A	46,967	20.7108	N/A	\$1,033	N/A
	1999	\$48,811,834	100.00%	227,757.6	\$214.31	0.17%	47,405	20.8138	0.50%	\$1,030	-0.29%
	2000	\$50,774,294	100.00%	216,124.3	\$234.93	9.62%	45,642	21.1184	1.46%	\$1,112	7.96%
	2001	\$55,399,617	100.00%	199,165.1	\$278.16	18.40%	49,227	24.7167	17.04%	\$1,125	1.17%
	2002	\$45,754,869	100.00%	193,125.0	\$236.92	-14.83%	44,474	23.0286	-6.83%	\$1,029	-8.53%
	2003	\$41,780,425	100.00%	180,299.0	\$231.73	-2.19%	44,604	24.7389	7.43%	\$937	-8.94%
	2004	\$28,897,944	100.00%	162,244.0	\$178.11	-23.14%	35,304	21.7598	-12.04%	\$819	-12.59%
	2005	\$25,737,165	100.00%	158,117.0	\$162.77	-8.61%	35,017	22.1463	1.78%	\$735	-10.26%
	2006	\$18,497,206	100.00%	126,448.0	\$146.28	-10.13%	23,403	18.5080	-16.43%	\$790	7.48%
2007	\$14,239,778	100.00%	110,000.0	\$129.45	-11.51%	20,024	18.2036	-1.64%	\$711	-10.00%	

**Massachusetts Private Passenger Automobile  
Comprehensive Loss Data, by Accident Year and Type of Loss  
Adjusted to \$500 Deductible Basis Except for Glass  
As of First Report - Excluding Excess Experience  
Residual Market**

A	B	C	D	E	F	G	H	I	J	K	L
Type of Loss	Acc. Year	Loss Dollars	% Total	Earned	Pure	Annual	Claim	Claim	Annual	Average	Annual
			Comp Loss			Change in					
			Dollars	Exposures	Premium	Premium	Count	/100 Exp.	Frequency	(C/H)	Avg Claim
					C/E			H/E x 100			Cost
(5)	1998	\$6,056,801	12.48%	226,775.4	\$26.71	N/A	4,992	2.2013	N/A	\$1,213	N/A
Malicious	1999	\$6,211,703	12.73%	227,757.6	\$27.27	2.10%	4,810	2.1119	-4.06%	\$1,291	6.43%
Mischief &	2000	\$7,455,422	14.68%	216,124.3	\$34.50	26.51%	4,974	2.3015	8.98%	\$1,499	16.11%
Vandalism	2001	\$8,137,344	14.69%	199,165.1	\$40.86	18.43%	5,198	2.6099	13.40%	\$1,565	4.40%
	2002	\$7,855,742	17.17%	193,125.0	\$40.68	-0.44%	5,361	2.7759	6.36%	\$1,465	-6.39%
	2003	\$7,300,748	17.47%	180,299.0	\$40.49	-0.47%	4,900	2.7177	-2.10%	\$1,490	1.71%
	2004	\$5,424,456	18.77%	162,244.0	\$33.43	-17.44%	3,767	2.3218	-14.57%	\$1,440	-3.36%
	2005	\$4,274,087	16.61%	158,117.0	\$27.03	-19.14%	3,031	1.9169	-17.44%	\$1,410	-2.08%
	2006	\$3,411,614	18.44%	126,448.0	\$26.98	-0.18%	2,155	1.7043	-11.09%	\$1,583	12.27%
	2007	\$3,360,931	23.60%	110,000.0	\$30.55	13.23%	2,072	1.8836	10.52%	\$1,622	2.46%
(6)	1998	\$239,522	0.49%	226,775.4	\$1.06	N/A	79	0.0348	N/A	\$3,032	N/A
Windstorm	1999	\$230,071	0.47%	227,757.6	\$1.01	-4.72%	114	0.0501	43.97%	\$2,018	-33.44%
Etc.	2000	\$208,918	0.41%	216,124.3	\$0.97	-3.96%	94	0.0435	-13.17%	\$2,223	10.16%
	2001	\$318,340	0.57%	199,165.1	\$1.60	64.95%	105	0.0527	21.15%	\$3,032	36.39%
	2002	\$248,134	0.54%	193,125.0	\$1.28	-20.00%	100	0.0518	-1.71%	\$2,481	-18.17%
	2003	\$158,725	0.38%	180,299.0	\$0.88	-31.25%	84	0.0466	-10.04%	\$1,890	-23.82%
	2004	\$213,876	0.74%	162,244.0	\$1.32	50.00%	91	0.0561	20.39%	\$2,350	24.34%
	2005	\$276,222	1.07%	158,117.0	\$1.75	32.58%	95	0.0601	7.13%	\$2,908	23.74%
	2006	\$350,089	1.89%	126,448.0	\$2.77	58.29%	107	0.0846	40.77%	\$3,272	12.52%
	2007	\$148,622	1.04%	110,000.0	\$1.35	-51.26%	68	0.0618	-26.95%	\$2,186	-33.19%
(7)	1998	\$430,193	0.89%	226,775.4	\$1.90	N/A	96	0.0423	N/A	\$4,481	N/A
Flood and	1999	\$168,900	0.35%	227,757.6	\$0.74	-61.05%	34	0.0149	-64.78%	\$4,968	10.87%
Rising	2000	\$304,162	0.60%	216,124.3	\$1.41	90.54%	64	0.0296	98.66%	\$4,753	-4.33%
Water	2001	\$1,289,944	2.33%	199,165.1	\$6.48	359.57%	270	0.1356	358.11%	\$4,778	0.53%
	2002	\$224,697	0.49%	193,125.0	\$1.16	-82.10%	40	0.0207	-84.73%	\$5,617	17.56%
	2003	\$362,359	0.87%	180,299.0	\$2.01	73.28%	79	0.0438	111.59%	\$4,587	-18.34%
	2004	\$366,359	1.27%	162,244.0	\$2.26	12.44%	90	0.0555	26.71%	\$4,071	-11.25%
	2005	\$717,901	2.79%	158,117.0	\$4.54	100.88%	151	0.0955	72.07%	\$4,754	16.78%
	2006	\$626,218	3.39%	126,448.0	\$4.95	9.03%	125	0.0989	3.56%	\$5,010	5.38%
	2007	\$194,011	1.36%	110,000.0	\$1.76	-64.44%	41	0.0373	-62.29%	\$4,732	-5.55%
(9)	1998	\$2,806,464	5.78%	226,775.4	\$12.38	N/A	1,535	0.6769	N/A	\$1,828	N/A
All Other	1999	\$3,032,546	6.21%	227,757.6	\$13.31	7.51%	1,911	0.8390	23.95%	\$1,587	-13.18%
	2000	\$3,093,138	6.09%	216,124.3	\$14.31	7.51%	1,825	0.8444	0.64%	\$1,695	6.81%
	2001	\$3,501,930	6.32%	199,165.1	\$17.58	22.85%	1,863	0.9354	10.78%	\$1,880	10.91%
	2002	\$3,087,010	6.75%	193,125.0	\$15.98	-9.10%	1,794	0.9289	-0.69%	\$1,721	-8.46%
	2003	\$3,281,871	7.86%	180,299.0	\$18.20	13.89%	1,728	0.9584	3.18%	\$1,899	10.34%
	2004	\$2,689,288	9.31%	162,244.0	\$16.58	-8.90%	1,422	0.8765	-8.55%	\$1,891	-0.42%
	2005	\$2,857,830	11.10%	158,117.0	\$18.07	8.99%	1,496	0.9461	7.94%	\$1,910	1.00%
	2006	\$2,275,926	12.30%	126,448.0	\$18.00	-0.39%	1,086	0.8589	-9.22%	\$2,096	9.74%
	2007	\$1,617,480	11.36%	110,000.0	\$14.70	-18.33%	786	0.7145	-16.81%	\$2,058	-1.81%
Sub-Total	1998	\$9,532,980	19.65%	226,775.4	\$42.04	N/A	6,702	2.9553	N/A	\$1,422	N/A
(5,6,7,9)	1999	\$9,643,220	19.76%	227,757.6	\$42.34	0.71%	6,869	3.0159	2.05%	\$1,404	-1.27%
	2000	\$11,061,640	21.79%	216,124.3	\$51.18	20.88%	6,957	3.2190	6.73%	\$1,590	13.25%
	2001	\$13,247,558	23.91%	199,165.1	\$66.52	29.97%	7,436	3.7336	15.99%	\$1,782	12.08%
	2002	\$11,415,583	24.95%	193,125.0	\$59.11	-11.14%	7,295	3.7773	1.17%	\$1,565	-12.18%
	2003	\$11,103,703	26.58%	180,299.0	\$61.58	4.18%	6,791	3.7665	-0.29%	\$1,635	4.47%
	2004	\$8,693,979	30.09%	162,244.0	\$53.59	-12.97%	5,370	3.3098	-12.13%	\$1,619	-0.98%
	2005	\$8,126,040	31.57%	158,117.0	\$51.39	-4.11%	4,773	3.0187	-8.80%	\$1,703	5.19%
	2006	\$6,663,847	36.03%	126,448.0	\$52.70	2.55%	3,473	2.7466	-9.01%	\$1,919	12.68%
	2007	\$5,321,044	37.37%	110,000.0	\$48.37	-8.22%	2,967	2.6973	-1.79%	\$1,793	-6.57%

**Massachusetts Private Passenger Automobile  
Claims Ratios by Territory @ 15 Months  
Residual Market**

**Bodily Injury (A-1/B)**

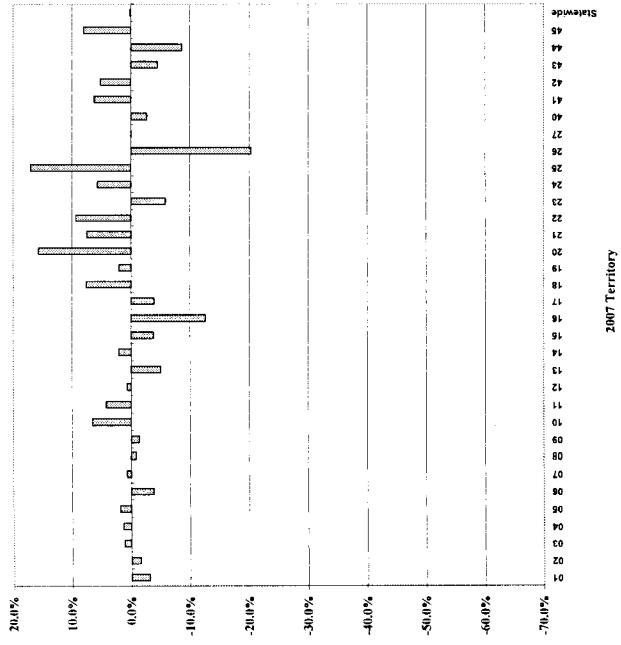
<u>Territory</u>	<u>1998</u>	<u>1999</u>	<u>2000</u>	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>
01	0.247	0.269	0.286	0.250	0.259	0.293	0.235	0.218	0.231	0.205
02	0.298	0.291	0.250	0.275	0.264	0.283	0.324	0.295	0.257	0.220
03	0.314	0.297	0.307	0.308	0.331	0.321	0.303	0.299	0.248	0.254
04	0.304	0.285	0.297	0.306	0.313	0.307	0.326	0.334	0.288	0.276
05	0.312	0.314	0.317	0.307	0.329	0.313	0.326	0.266	0.296	0.264
06	0.341	0.329	0.306	0.333	0.330	0.373	0.297	0.337	0.268	0.275
07	0.307	0.323	0.293	0.334	0.363	0.348	0.340	0.322	0.305	0.248
08	0.401	0.342	0.352	0.357	0.409	0.459	0.401	0.333	0.289	0.294
09	0.364	0.397	0.365	0.398	0.370	0.405	0.442	0.347	0.333	0.296
10	0.421	0.459	0.505	0.601	0.582	0.594	0.363	0.402	0.355	0.301
11	0.471	0.476	0.387	0.448	0.429	0.562	0.501	0.360	0.391	0.313
12	0.391	0.397	0.386	0.373	0.443	0.422	0.434	0.356	0.332	0.287
13	0.392	0.398	0.385	0.392	0.457	0.477	0.422	0.367	0.335	0.310
14	0.433	0.448	0.435	0.460	0.470	0.547	0.508	0.400	0.370	0.352
15	0.417	0.424	0.456	0.413	0.457	0.521	0.455	0.427	0.337	0.312
16	0.505	0.549	0.661	0.514	0.601	0.544	0.688	0.486	0.323	0.335
17	0.300	0.462	0.431	0.660	0.694	0.649	0.477	0.297	0.331	0.287
18	0.703	0.748	0.907	1.011	1.116	1.311	0.859	0.508	0.563	0.413
19	0.733	0.863	1.253	1.334	1.278	1.396	0.924	0.586	0.500	0.447
20	0.720	0.884	0.915	0.940	0.934	1.182	0.931	0.585	0.465	0.477
21	0.739	0.848	0.880	0.994	0.987	1.099	0.863	0.624	0.570	0.469
22	0.761	0.995	0.928	1.018	1.157	1.184	0.939	0.711	0.562	0.580
23	0.633	0.708	0.665	0.840	0.820	0.880	0.703	0.534	0.424	0.446
24	0.327	0.414	0.366	0.364	0.459	0.655	0.496	0.384	0.312	0.209
25	0.603	0.733	0.842	0.850	0.927	1.141	0.740	0.435	0.350	0.366
26	0.517	0.477	0.514	0.580	0.644	0.603	0.564	0.406	0.424	0.269
27	0.249	0.304	0.230	0.227	0.301	0.253	0.302	0.235	0.232	0.215
40	0.721	0.663	0.733	0.745	0.857	0.837	0.774	0.618	0.594	0.489
41	0.532	0.516	0.511	0.573	0.604	0.668	0.591	0.514	0.429	0.363
42	0.734	0.702	0.706	0.734	0.773	0.757	0.703	0.592	0.641	0.575
43	0.670	0.552	0.656	0.747	0.692	0.725	0.589	0.474	0.381	0.386
44	0.743	1.017	1.146	1.302	1.527	1.503	0.441	0.427	0.482	0.408
45	0.738	0.778	0.740	0.839	0.994	1.079	0.898	0.711	0.605	0.496
<b>Total</b>	<b>0.445</b>	<b>0.475</b>	<b>0.489</b>	<b>0.534</b>	<b>0.579</b>	<b>0.609</b>	<b>0.507</b>	<b>0.412</b>	<b>0.373</b>	<b>0.332</b>
Standard Deviation	0.179	0.222	0.272	0.306	0.327	0.359	0.218	0.133	0.117	0.104

**Massachusetts Private Passenger Automobile  
Claims Ratios by Territory @ 15 Months  
Residual Market**

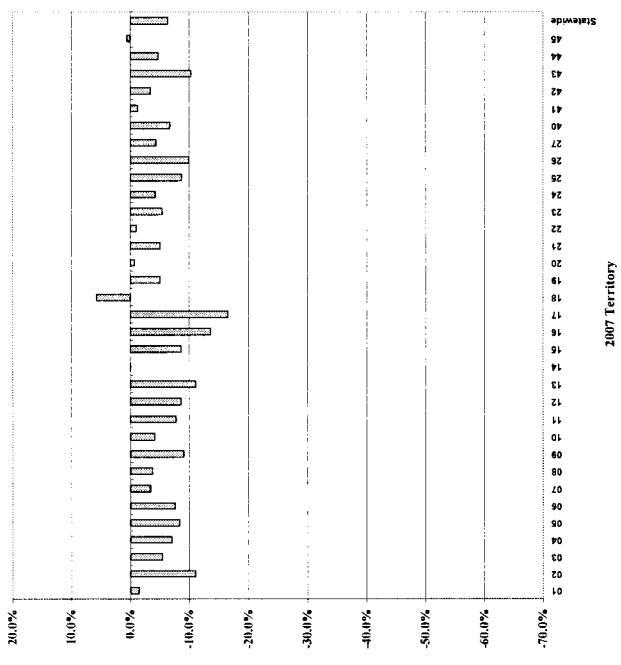
**Personal Injury Protection**

<u>Territory</u>	<u>1998</u>	<u>1999</u>	<u>2000</u>	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>
01	0.278	0.293	0.267	0.288	0.299	0.245	0.244	0.230	0.259	0.234
02	0.294	0.304	0.312	0.296	0.320	0.280	0.273	0.241	0.251	0.196
03	0.332	0.327	0.328	0.341	0.352	0.299	0.304	0.284	0.250	0.280
04	0.334	0.312	0.307	0.324	0.327	0.291	0.286	0.304	0.286	0.267
05	0.358	0.346	0.362	0.341	0.384	0.325	0.318	0.269	0.270	0.287
06	0.386	0.378	0.342	0.369	0.412	0.364	0.347	0.334	0.332	0.261
07	0.389	0.353	0.385	0.372	0.394	0.373	0.322	0.308	0.317	0.285
08	0.412	0.422	0.445	0.405	0.469	0.451	0.377	0.318	0.308	0.317
09	0.463	0.438	0.466	0.442	0.436	0.489	0.457	0.338	0.352	0.357
10	0.603	0.532	0.629	0.743	0.735	0.645	0.469	0.362	0.339	0.357
11	0.544	0.587	0.538	0.584	0.614	0.654	0.603	0.501	0.450	0.359
12	0.488	0.483	0.479	0.488	0.523	0.482	0.439	0.359	0.360	0.319
13	0.479	0.459	0.500	0.544	0.635	0.567	0.485	0.414	0.449	0.366
14	0.600	0.600	0.586	0.585	0.549	0.593	0.578	0.464	0.461	0.416
15	0.590	0.482	0.580	0.488	0.585	0.580	0.514	0.450	0.374	0.403
16	0.771	0.733	0.863	0.810	0.727	0.698	0.699	0.558	0.487	0.688
17	0.419	0.357	0.590	0.750	0.719	0.596	0.483	0.367	0.406	0.228
18	1.042	1.027	1.323	1.425	1.247	1.552	1.106	0.689	0.591	0.490
19	0.942	1.359	1.574	1.599	1.455	1.535	0.885	0.547	0.556	0.405
20	0.994	1.315	1.272	1.331	1.334	1.501	1.082	0.730	0.579	0.482
21	1.072	1.190	1.207	1.375	1.380	1.255	0.982	0.729	0.633	0.597
22	1.057	1.173	1.106	1.465	1.415	1.322	1.094	0.777	0.703	0.623
23	0.700	0.963	0.901	1.024	1.257	1.152	0.879	0.615	0.578	0.468
24	0.400	0.524	0.474	0.457	0.620	0.742	0.527	0.321	0.387	0.313
25	0.797	1.064	1.354	1.106	1.342	1.186	0.776	0.669	0.503	0.354
26	0.678	0.700	0.780	0.845	0.747	0.809	0.598	0.463	0.424	0.344
27	0.273	0.309	0.291	0.276	0.318	0.278	0.295	0.218	0.237	0.241
40	1.231	0.928	1.275	1.136	1.314	1.379	1.174	1.000	0.889	0.856
41	0.925	0.887	0.964	0.923	1.025	1.052	0.935	0.704	0.583	0.602
42	1.055	1.033	1.080	1.118	1.150	1.029	1.078	0.931	0.903	0.755
43	0.922	0.842	0.902	1.007	0.830	0.841	0.768	0.550	0.465	0.421
44	1.323	1.272	1.540	1.646	1.739	1.704	0.627	0.595	0.544	0.569
45	0.942	0.933	1.047	1.086	1.163	1.196	1.065	0.774	0.783	0.684
<b>Total</b>	<b>0.578</b>	<b>0.602</b>	<b>0.650</b>	<b>0.693</b>	<b>0.729</b>	<b>0.703</b>	<b>0.584</b>	<b>0.460</b>	<b>0.437</b>	<b>0.395</b>
Standard Deviation	0.308	0.344	0.402	0.428	0.424	0.444	0.298	0.210	0.178	0.167

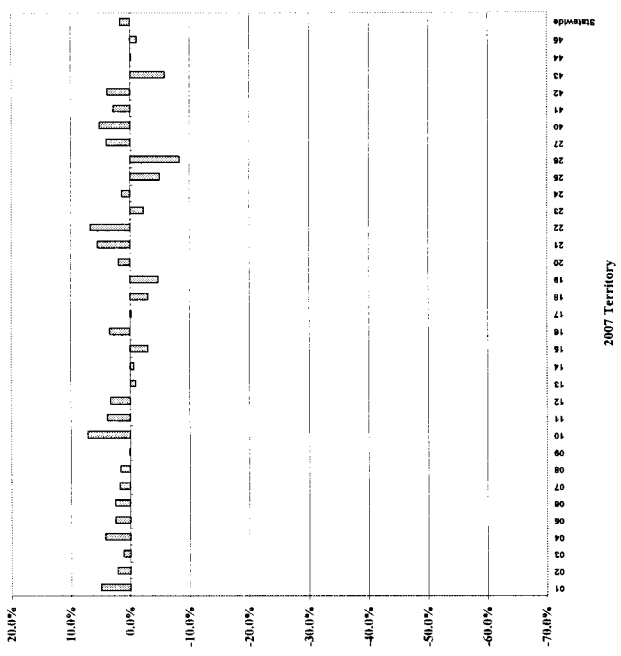
2002-2003 BI FREQUENCY % CHANGES @ 15 MONTHS - INDUSTRY



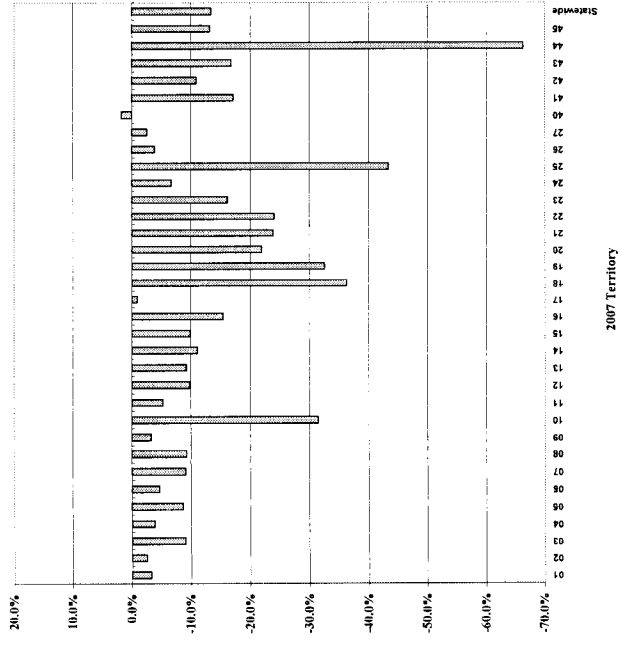
2002-2003 PIP FREQUENCY % CHANGES @ 15 MONTHS - INDUSTRY



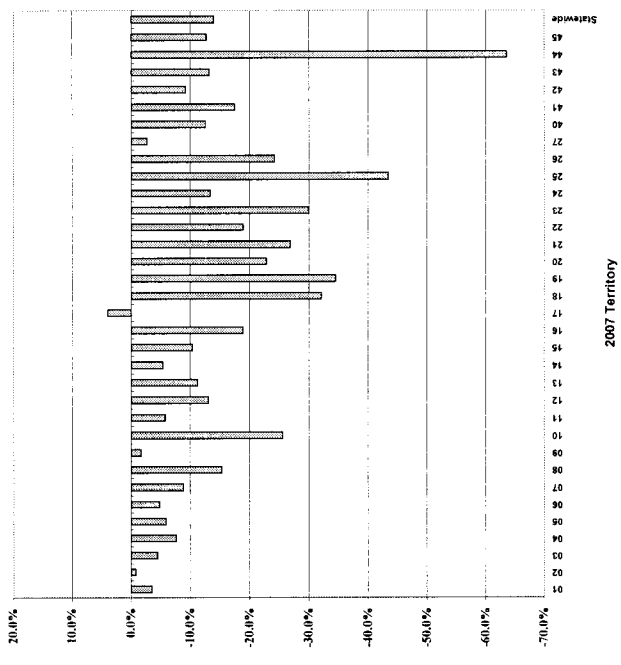
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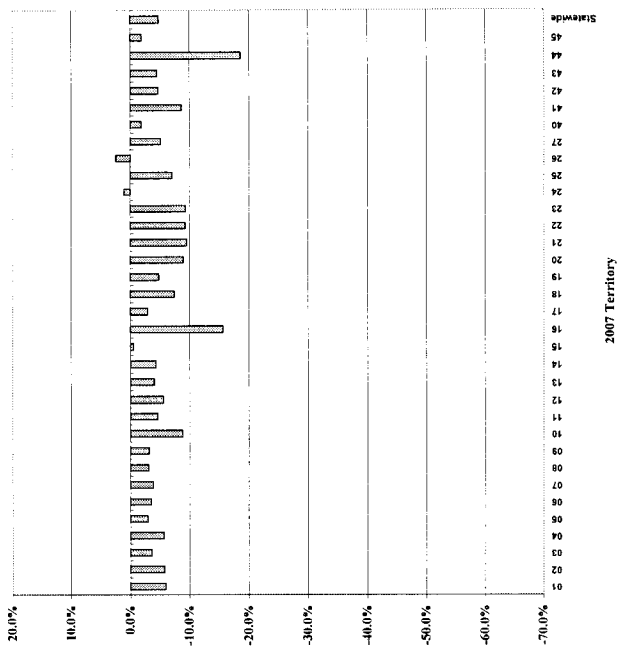
2003-2004 BI FREQUENCY % CHANGES @ 15 MONTHS - INDUSTRY



2003-2004 PIP FREQUENCY % CHANGES @ 15 MONTHS - INDUSTRY

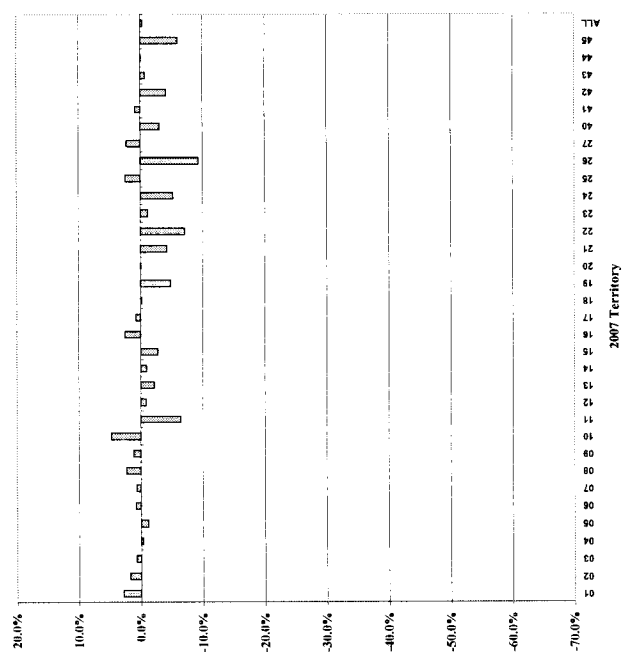


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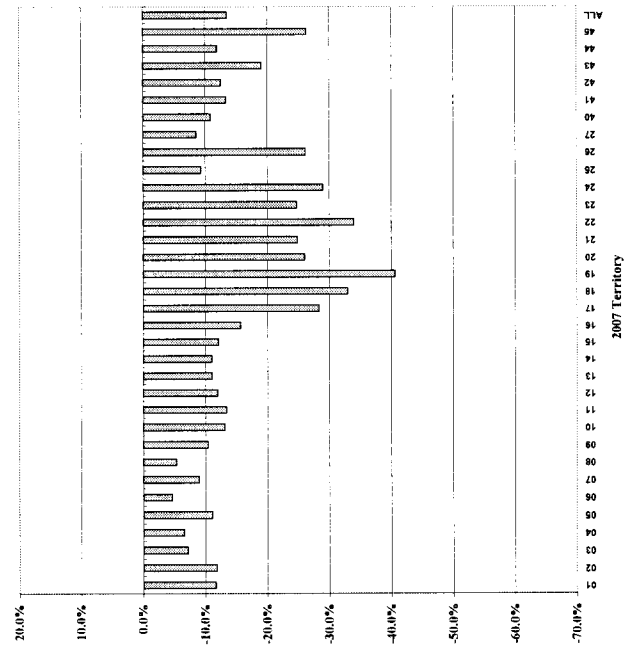


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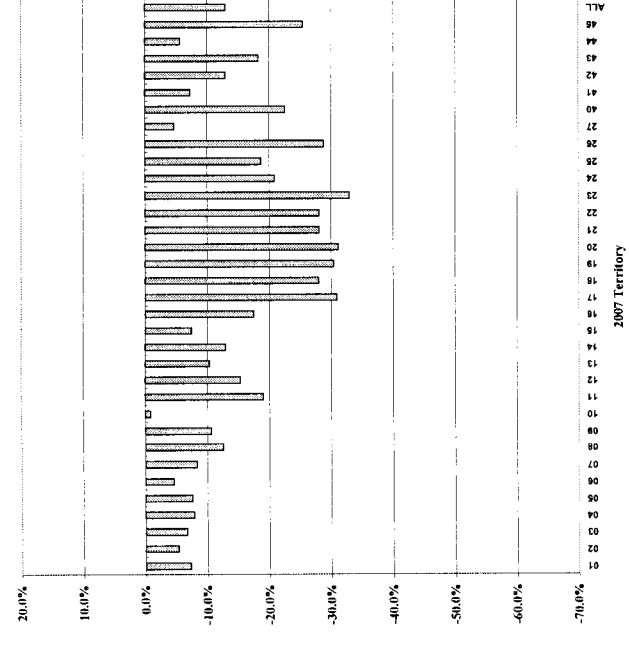
2004-2005 PDL FREQUENCY % CHANGES @ 15 MONTHS - INDUSTRY



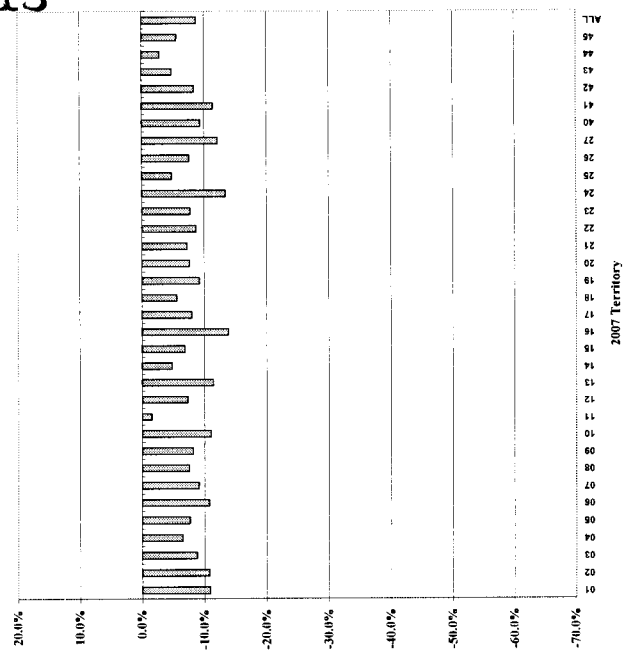
2004-2005 PIP FREQUENCY % CHANGES @ 15 MONTHS - INDUSTRY



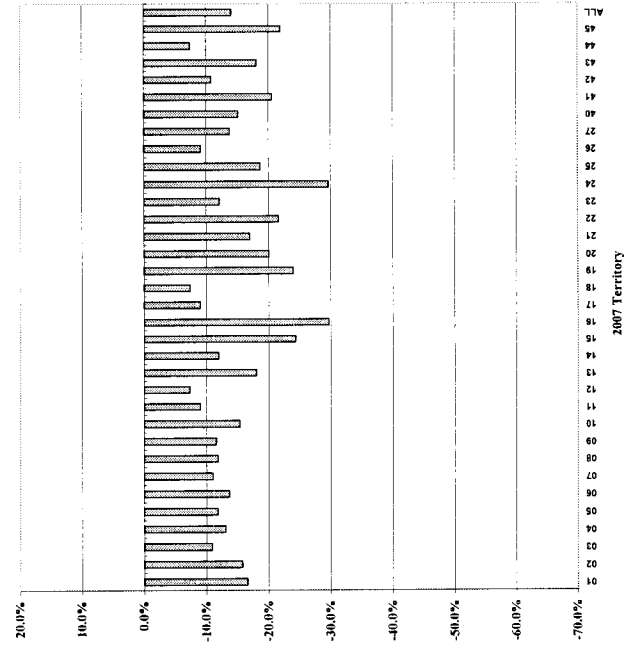
2004-2005 BI FREQUENCY % CHANGES @ 15 MONTHS - INDUSTRY



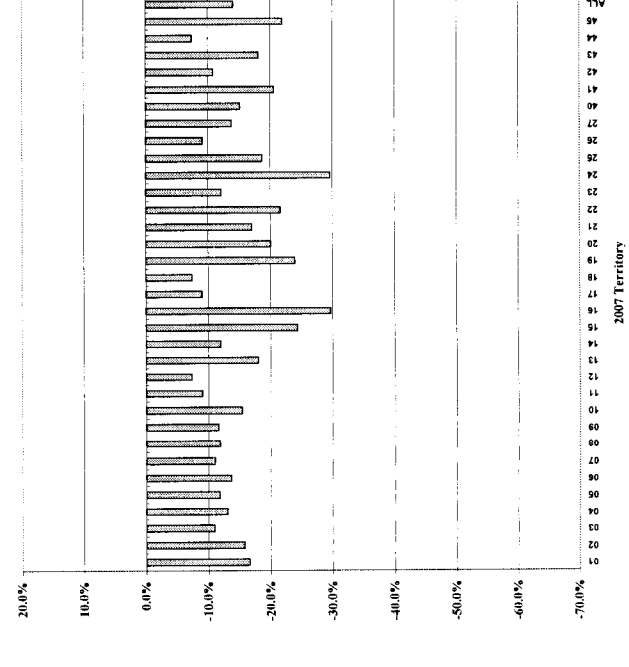
2005-2006 PDL FREQUENCY % CHANGES @ 15 MONTHS - INDUSTRY



2005-2006 BI FREQUENCY % CHANGES @ 15 MONTHS - INDUSTRY

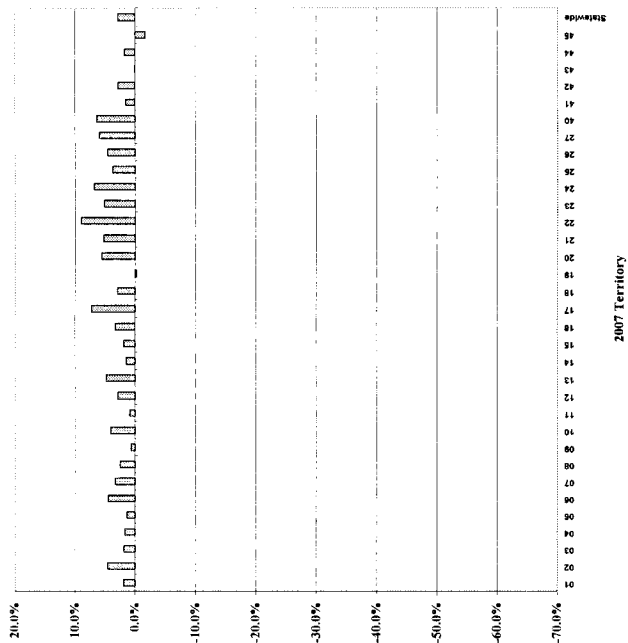


2005-2006 BI FREQUENCY % CHANGES @ 15 MONTHS - INDUSTRY

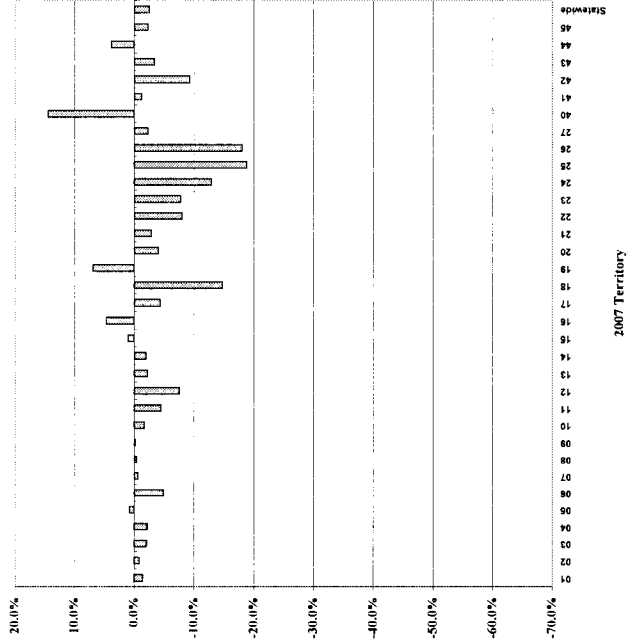




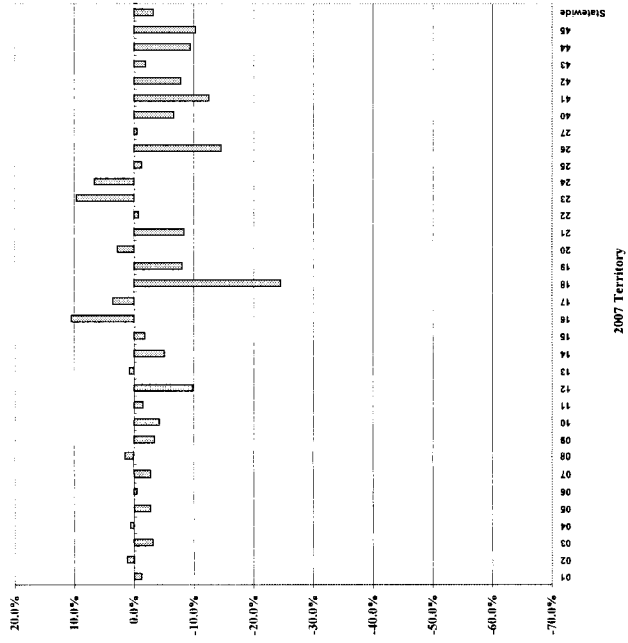
2006-2007 PDL FREQUENCY % CHANGES @ 15 MONTHS - INDUSTRY



2006-2007 PIP FREQUENCY % CHANGES @ 15 MONTHS - INDUSTRY



2006-2007 BI FREQUENCY % CHANGES @ 15 MONTHS - INDUSTRY



Massachusetts Private Passenger Automobile  
Regression Statistic Calculations for Voluntary and Residual Market Data

Bodily Injury (A-1/B)

	Residual Market			Voluntary Market		
	Ultimate Frequency	Ultimate Severity	Ultimate Pure Premium	Ultimate Frequency	Ultimate Severity	Ultimate Pure Premium
1998	6.679	7,646	510.65	1.804	7,911	142.74
1999	6.831	7,478	510.82	1.694	7,769	131.58
2000	7.781	7,554	587.77	1.718	7,949	136.61
2001	8.778	7,370	646.90	1.786	7,708	137.65
2002	10.027	7,094	711.32	1.884	7,626	143.65
2003	10.288	6,924	712.37	1.852	7,603	140.81
2004	8.284	7,135	591.11	1.670	7,566	126.38
2005	6.477	7,344	475.68	1.508	7,844	118.31
2006	5.506	7,860	432.77	1.373	8,155	111.93
2007	5.111	8,368	427.66	1.375	8,291	113.99

Linear Regression Calculations - Residual Market

Accident Year	Fitted Frequency				Fitted Severity			
	3 Point	4 Point	5 Point	6 Point	3 Point	4 Point	5 Point	6 Point
2002				10.525				6,784
2003			9.760	9.361			6,804	7,052
2004		7.918	8.446	8.197		7,045	7,165	7,320
2005	6.381	6.869	7.133	7.034	7,345	7,466	7,526	7,588
2006	5.698	5.820	5.820	5.870	7,857	7,888	7,888	7,857
2007	5.015	4.771	4.507	4.706	8,369	8,309	8,249	8,125
Projected	3.136	1.885	0.895	1.505	9,778	9,468	9,242	8,862
r-square	0.94	0.92	0.94	0.93	1.00	0.97	0.95	0.83
Annualized Change*	-12.0%	-16.5%	-18.4%	-15.3%	6.5%	5.5%	4.8%	3.6%

Linear Regression Calculations - Voluntary Market

Accident Year	Fitted Frequency				Fitted Severity			
	3 Point	4 Point	5 Point	6 Point	3 Point	4 Point	5 Point	6 Point
2002				1.906				7,472
2003			1.806	1.788			7,499	7,622
2004		1.635	1.681	1.669		7,591	7,695	7,772
2005	1.485	1.533	1.556	1.551	7,873	7,840	7,892	7,923
2006	1.419	1.430	1.430	1.433	8,096	8,088	8,088	8,073
2007	1.352	1.328	1.305	1.314	8,320	8,337	8,284	8,223
Projected	1.168	1.047	0.961	0.989	8,935	9,020	8,825	8,636
r-square	0.74	0.88	0.93	0.95	0.95	0.98	0.92	0.82
Annualized Change*	-4.7%	-6.9%	-8.0%	-7.4%	2.8%	3.1%	2.5%	1.9%

\* The annualized rate of change is calculated as the projected value over the average of the fitted values.



**Massachusetts Private Passenger Automobile  
Regression Statistic Calculations for Voluntary and Residual Market Data**

**Personal Injury Protection (PIP)**

	Residual Market			Voluntary Market		
	Ultimate Frequency	Ultimate Severity	Ultimate Pure Premium	Ultimate Frequency	Ultimate Severity	Ultimate Pure Premium
1998	6.107	2,665	162.77	1.472	2,256	33.20
1999	6.214	2,877	178.80	1.348	2,353	31.72
2000	6.899	3,004	207.26	1.372	2,405	33.00
2001	7.349	3,111	228.65	1.353	2,484	33.60
2002	8.179	3,195	261.34	1.399	2,569	35.95
2003	8.112	3,343	271.20	1.310	2,681	35.13
2004	6.524	3,235	211.03	1.209	2,720	32.88
2005	5.064	3,209	162.48	1.113	2,818	31.36
2006	4.479	3,305	148.02	1.044	2,916	30.44
2007	4.051	3,193	129.34	1.027	2,931	30.10

Linear Regression Calculations - Residual Market

Accident Year	Fitted Frequency				Fitted Severity			
	3 Point	4 Point	5 Point	6 Point	3 Point	4 Point	5 Point	6 Point
2002				8.425				3,257
2003			7.679	7.482			3,303	3,253
2004		6.230	6.663	6.540		3,240	3,280	3,249
2005	5.038	5.430	5.646	5.597	3,243	3,237	3,257	3,244
2006	4.531	4.629	4.629	4.654	3,235	3,234	3,234	3,240
2007	4.025	3.829	3.613	3.711	3,228	3,231	3,211	3,236
Projected	2.632	1.628	0.817	1.118	3,206	3,223	3,147	3,224
r-square	0.99	0.92	0.93	0.95	0.02	0.01	0.32	0.02
Annualized Change*	-11.2%	-15.9%	-18.0%	-15.5%	-0.2%	-0.1%	-0.7%	-0.1%

Linear Regression Calculations - Voluntary Market

Accident Year	Fitted Frequency				Fitted Severity			
	3 Point	4 Point	5 Point	6 Point	3 Point	4 Point	5 Point	6 Point
2002				1.381				2,586
2003			1.287	1.302			2,674	2,661
2004		1.190	1.214	1.223		2,736	2,744	2,735
2005	1.104	1.129	1.141	1.144	2,832	2,810	2,813	2,810
2006	1.061	1.067	1.067	1.066	2,888	2,883	2,883	2,885
2007	1.018	1.006	0.994	0.987	2,945	2,956	2,953	2,959
Projected	0.900	0.837	0.793	0.770	3,100	3,157	3,144	3,165
r-square	0.89	0.92	0.95	0.97	0.85	0.93	0.96	0.97
Annualized Change*	-4.1%	-5.6%	-6.4%	-6.7%	2.0%	2.6%	2.5%	2.7%

\* The annualized rate of change is calculated as the projected value over the average of the fitted values.



**Massachusetts Private Passenger Automobile  
Regression Statistic Calculations for Voluntary and Residual Market Data**

**Property Damage Liability (PDL)**

	Residual Market			Voluntary Market		
	Ultimate Frequency	Ultimate Severity	Ultimate Pure Premium	Ultimate Frequency	Ultimate Severity	Ultimate Pure Premium
1998	15.508	1,581	245.21	6.090	1,521	92.61
1999	15.406	1,631	251.20	5.997	1,561	93.64
2000	16.418	1,716	281.79	6.149	1,647	101.31
2001	16.934	1,797	304.24	6.264	1,703	106.66
2002	18.233	1,827	333.16	6.276	1,733	108.73
2003	18.428	1,827	336.62	6.376	1,750	111.60
2004	17.442	1,825	318.34	6.054	1,755	106.24
2005	16.412	1,841	302.20	6.052	1,789	108.27
2006	15.214	1,902	289.44	5.624	1,845	103.77
2007	16.033	1,919	307.70	5.874	1,869	109.79

Linear Regression Calculations - Residual Market

Accident Year	Fitted Frequency				Fitted Severity			
	3 Point	4 Point	5 Point	6 Point	3 Point	4 Point	5 Point	6 Point
2002				18.508				1,807
2003			18.109	17.889			1,811	1,827
2004		17.089	17.407	17.270		1,821	1,837	1,847
2005	16.076	16.546	16.706	16.651	1,849	1,855	1,863	1,867
2006	15.886	16.004	16.004	16.031	1,888	1,889	1,889	1,887
2007	15.697	15.461	15.302	15.412	1,927	1,924	1,915	1,907
Projected	15.175	13.970	13.372	13.710	2,034	2,018	1,988	1,963
r-square	0.10	0.57	0.79	0.82	0.90	0.94	0.87	0.79
Annualized Change*	-1.2%	-3.3%	-4.2%	-3.7%	2.1%	1.8%	1.4%	1.1%

Linear Regression Calculations - Voluntary Market

Accident Year	Fitted Frequency				Fitted Severity			
	3 Point	4 Point	5 Point	6 Point	3 Point	4 Point	5 Point	6 Point
2002				6.348				1,719
2003			6.283	6.226			1,736	1,747
2004		6.047	6.139	6.104		1,755	1,769	1,776
2005	5.939	5.950	5.996	5.982	1,794	1,795	1,802	1,804
2006	5.850	5.853	5.853	5.860	1,834	1,834	1,834	1,833
2007	5.761	5.756	5.709	5.738	1,875	1,874	1,867	1,862
Projected	5.515	5.489	5.315	5.402	1,985	1,984	1,957	1,940
r-square	0.17	0.38	0.68	0.70	0.95	0.98	0.94	0.93
Annualized Change*	-1.5%	-1.6%	-2.4%	-2.0%	2.2%	2.2%	1.8%	1.6%

\* The annualized rate of change is calculated as the projected value over the average of the fitted values.

**Massachusetts Private Passenger Automobile  
Regression Statistic Calculations for Voluntary and Residual Market Data**

**Medical Payments (MedPay)**

	Residual Market			Voluntary Market		
	Ultimate Frequency	Ultimate Severity	Ultimate Pure Premium	Ultimate Frequency	Ultimate Severity	Ultimate Pure Premium
1998	0.987	2,622	25.88	0.333	2,906	9.69
1999	0.924	2,789	25.78	0.305	2,871	8.74
2000	1.036	2,796	28.97	0.295	3,012	8.88
2001	0.913	2,841	25.94	0.280	2,984	8.35
2002	0.759	3,168	24.03	0.255	3,204	8.17
2003	0.769	3,256	25.04	0.220	3,338	7.34
2004	0.734	3,270	24.02	0.221	3,410	7.55
2005	0.638	3,410	21.75	0.224	3,491	7.83
2006	0.685	3,450	23.63	0.233	3,503	8.18
2007	0.738	3,518	25.96	0.236	3,503	8.26

Linear Regression Calculations - Residual Market

Accident Year	Fitted Frequency				Fitted Severity			
	3 Point	4 Point	5 Point	6 Point	3 Point	4 Point	5 Point	6 Point
2002				0.753				3,168
2003			0.735	0.740			3,240	3,239
2004		0.690	0.724	0.727		3,295	3,310	3,310
2005	0.637	0.696	0.713	0.714	3,406	3,373	3,381	3,381
2006	0.687	0.702	0.702	0.701	3,459	3,451	3,451	3,451
2007	0.737	0.707	0.691	0.688	3,513	3,529	3,522	3,522
Projected	0.875	0.723	0.660	0.653	3,661	3,745	3,715	3,716
r-square	1.00	0.02	0.12	0.24	0.98	0.93	0.95	0.97
Annualized Change*	7.3%	0.8%	-1.6%	-1.8%	1.6%	2.3%	2.1%	2.1%

Linear Regression Calculations - Voluntary Market

Accident Year	Fitted Frequency				Fitted Severity			
	3 Point	4 Point	5 Point	6 Point	3 Point	4 Point	5 Point	6 Point
2002				0.235				3,260
2003			0.218	0.234			3,364	3,319
2004		0.221	0.223	0.232		3,433	3,407	3,379
2005	0.226	0.226	0.227	0.231	3,493	3,462	3,449	3,438
2006	0.231	0.231	0.231	0.229	3,499	3,491	3,491	3,497
2007	0.237	0.236	0.236	0.228	3,505	3,520	3,534	3,556
Projected	0.252	0.251	0.248	0.224	3,521	3,600	3,650	3,719
r-square	0.90	0.94	0.92	0.05	0.71	0.70	0.83	0.86
Annualized Change*	2.4%	2.3%	1.9%	-0.6%	0.2%	0.8%	1.2%	1.7%

\* The annualized rate of change is calculated as the projected value over the average of the fitted values.

Massachusetts Private Passenger Automobile  
Regression Statistic Calculations for Voluntary and Residual Market Data

Uninsured Motorists (U-1)

	Residual Market			Voluntary Market		
	Ultimate Frequency	Ultimate Severity	Ultimate Pure Premium	Ultimate Frequency	Ultimate Severity	Ultimate Pure Premium
1998	0.745	6,899	51.38	0.096	9,306	8.93
1999	0.833	6,931	57.74	0.102	9,393	9.55
2000	1.005	6,692	67.23	0.109	8,922	9.72
2001	0.942	6,182	58.25	0.091	8,280	7.56
2002	0.963	6,068	58.42	0.094	8,109	7.64
2003	0.935	5,976	55.88	0.086	8,051	6.90
2004	0.676	6,019	40.70	0.072	8,504	6.12
2005	0.494	6,343	31.32	0.061	8,597	5.26
2006	0.432	7,233	31.21	0.057	8,818	5.00
2007	0.364	7,018	25.56	0.055	9,312	5.08

Linear Regression Calculations - Residual Market

Accident Year	Fitted Frequency				Fitted Severity			
	3 Point	4 Point	5 Point	6 Point	3 Point	4 Point	5 Point	6 Point
2002				0.979				5,811
2003			0.857	0.845			5,858	6,064
2004		0.641	0.719	0.711		6,071	6,188	6,317
2005	0.495	0.541	0.580	0.577	6,527	6,459	6,518	6,569
2006	0.430	0.441	0.441	0.443	6,865	6,848	6,848	6,822
2007	0.365	0.342	0.303	0.309	7,202	7,236	7,178	7,075
Projected	0.187	0.067	(0.079)	(0.059)	8,130	8,305	8,085	7,770
r-square	1.00	0.92	0.91	0.94	0.53	0.78	0.82	0.74
Annualized Change*	-15.1%	-20.3%	-23.9%	-20.8%	4.9%	5.8%	5.1%	3.9%

Linear Regression Calculations - Voluntary Market

Accident Year	Fitted Frequency				Fitted Severity			
	3 Point	4 Point	5 Point	6 Point	3 Point	4 Point	5 Point	6 Point
2002				0.092				7,964
2003			0.082	0.083			8,089	8,205
2004		0.070	0.074	0.075		8,411	8,373	8,445
2005	0.061	0.064	0.066	0.066	8,551	8,675	8,656	8,685
2006	0.057	0.058	0.058	0.058	8,909	8,940	8,940	8,926
2007	0.054	0.053	0.050	0.050	9,267	9,205	9,224	9,166
Projected	0.045	0.037	0.029	0.026	10,250	9,933	10,004	9,827
r-square	0.96	0.89	0.90	0.94	0.95	0.89	0.95	0.92
Annualized Change*	-5.7%	-9.3%	-11.8%	-12.0%	4.0%	3.0%	3.3%	2.8%

\* The annualized rate of change is calculated as the projected value over the average of the fitted values.

**Massachusetts Private Passenger Automobile  
Regression Statistic Calculations for Voluntary and Residual Market Data**

**Collision**

	Residual Market			Voluntary Market		
	Ultimate Frequency	Ultimate Severity	Ultimate Pure Premium	Ultimate Frequency	Ultimate Severity	Ultimate Pure Premium
1998	18,850	2,346	442.18	6,538	2,193	143.41
1999	19,615	2,416	473.92	6,741	2,257	152.17
2000	22,124	2,563	567.07	7,298	2,392	174.56
2001	23,434	2,662	623.86	7,385	2,460	181.66
2002	24,463	2,726	666.75	7,278	2,528	183.99
2003	26,416	2,649	699.85	7,658	2,487	190.47
2004	23,275	2,664	620.02	7,049	2,584	182.14
2005	20,499	2,695	552.39	6,992	2,629	183.84
2006	18,008	2,918	525.55	6,175	2,746	169.56
2007	19,067	2,920	556.83	6,628	2,729	180.89

Linear Regression Calculations - Residual Market

Accident Year	Fitted Frequency				Fitted Severity			
	3 Point	4 Point	5 Point	6 Point	3 Point	4 Point	5 Point	6 Point
2002				25.882				2,633
2003			25.446	24.311			2,610	2,684
2004		22.479	23.449	22.740		2,650	2,690	2,736
2005	19.907	20.968	21.453	21.169	2,732	2,750	2,769	2,788
2006	19.191	19.456	19.456	19.598	2,845	2,849	2,849	2,840
2007	18.475	17.945	17.460	18.028	2,957	2,948	2,929	2,891
Projected	16.507	13.789	11.970	13.708	3,268	3,221	3,148	3,034
r-square	0.33	0.73	0.86	0.80	0.76	0.85	0.83	0.60
Annualized Change*	-3.7%	-7.5%	-9.3%	-7.2%	4.0%	3.5%	2.9%	1.9%

Linear Regression Calculations - Voluntary Market

Accident Year	Fitted Frequency				Fitted Severity			
	3 Point	4 Point	5 Point	6 Point	3 Point	4 Point	5 Point	6 Point
2002				7.517				2,487
2003			7.487	7.296			2,506	2,539
2004		7.023	7.194	7.074		2,589	2,570	2,591
2005	6.780	6.815	6.901	6.853	2,651	2,644	2,635	2,643
2006	6.599	6.607	6.607	6.631	2,701	2,700	2,700	2,695
2007	6.417	6.399	6.314	6.410	2,751	2,755	2,764	2,748
Projected	5.917	5.827	5.507	5.801	2,888	2,907	2,942	2,891
r-square	0.20	0.44	0.71	0.65	0.63	0.83	0.91	0.86
Annualized Change*	-2.8%	-3.1%	-4.3%	-3.2%	1.8%	2.1%	2.4%	2.0%

\* The annualized rate of change is calculated as the projected value over the average of the fitted values.

**Massachusetts Private Passenger Automobile  
Comprehensive Trend Support by Type of Loss  
Residual Market Data**

**Claim Statistics**

OTC Frequencies @ Ultimate					Frequency Changes			
	<u>Glass</u>	<u>Theft</u>	<u>Other</u>	<u>Total*</u>	<u>Glass</u>	<u>Theft</u>	<u>Other</u>	<u>Total</u>
1998	15.36	2.40	3.30	21.06				
1999	15.58	2.27	3.36	21.12	1.4%	-5.6%	1.7%	0.3%
2000	15.77	2.37	3.44	21.55	1.2%	4.2%	2.3%	2.0%
2001	18.50	2.69	3.95	25.14	17.3%	13.7%	15.0%	16.7%
2002	17.06	2.45	4.00	23.51	-7.8%	-8.9%	1.2%	-6.5%
2003	18.70	2.33	3.97	25.00	9.6%	-4.9%	-0.6%	6.4%
2004	16.81	1.64	3.48	21.93	-10.1%	-29.5%	-12.5%	-12.3%
2005	17.84	1.28	3.21	22.31	6.1%	-22.0%	-7.7%	1.7%
2006	14.56	1.01	2.88	18.45	-18.4%	-20.9%	-10.1%	-17.3%
2007	14.75	0.75	2.86	18.36	1.3%	-26.3%	-0.9%	-0.5%
Selected 2009.75	15.99	0.65	2.86	19.50	3.0%	-5.0%	0.0%	2.2% (annualized)

Selection Basis: 2004-2007 average judgement unity

OTC Severities @ Ultimate					Severity Changes			
	<u>Glass</u>	<u>Theft</u>	<u>Other</u>	<u>Total*</u>	<u>Glass</u>	<u>Theft</u>	<u>Other</u>	<u>Total</u>
1998	440	4,127	1,661	1,052				
1999	428	4,342	1,620	1,027	-2.6%	5.2%	-2.5%	-2.4%
2000	444	4,683	1,763	1,118	3.6%	7.8%	8.8%	8.9%
2001	444	4,691	1,935	1,133	0.0%	0.2%	9.8%	1.3%
2002	425	4,261	1,726	1,046	-4.3%	-9.2%	-10.8%	-7.7%
2003	400	3,848	1,788	942	-5.8%	-9.7%	3.6%	-9.9%
2004	381	3,361	1,771	825	-4.8%	-12.7%	-1.0%	-12.5%
2005	360	3,372	1,875	745	-5.4%	0.3%	5.9%	-9.6%
2006	355	3,722	2,049	801	-1.6%	10.4%	9.3%	7.5%
2007	350	3,313	1,923	717	-1.3%	-11.0%	-6.1%	-10.6%
Selected 2009.75	350	3,442	1,811	667	0.0%	1.4%	-2.2%	-2.6% (annualized)

Selection Basis: unity 2004-2007 average 1998-2007 average

	<u>Glass</u>	<u>Theft</u>	<u>Other</u>	<u>Total</u>
2007 E. Exposures	110,000	110,000	110,000	
Forecast Frequencies	15.99	0.65	2.86	
Implied Forecast Claims	17,590	715	3,145	21,450
Forecast Severities	350	3,442	1,811	
Implied Forecast Losses	6,156,915	2,461,040	5,695,749	14,313,704

Forecast Claims = (Forecast Frequency) x (2007 E. Exposures)

Forecast Losses = (Forecast Severity) x (2007 E. Exposures)

OTC Pure Premiums @ Ultimate					Pure Premium Changes			
	<u>Glass</u>	<u>Theft</u>	<u>Other</u>	<u>Total*</u>	<u>Glass</u>	<u>Theft</u>	<u>Other</u>	<u>Total</u>
1998	67.53	99.24	54.86	221.64				
1999	66.72	98.59	54.40	216.85	-1.2%	-0.7%	-0.8%	-2.2%
2000	69.95	110.77	60.58	240.82	4.8%	12.4%	11.4%	11.1%
2001	82.11	126.22	76.46	284.79	17.4%	13.9%	26.2%	18.3%
2002	72.44	104.47	68.99	245.90	-11.8%	-17.2%	-9.8%	-13.7%
2003	74.81	89.68	71.04	235.53	3.3%	-14.2%	3.0%	-4.2%
2004	64.00	55.25	61.55	180.83	-14.5%	-38.4%	-13.4%	-23.2%
2005	64.28	43.21	60.19	166.27	0.4%	-21.8%	-2.2%	-8.1%
2006	51.65	37.75	59.10	147.86	-19.6%	-12.6%	-1.8%	-11.1%
2007	51.63	24.77	55.00	131.58	0.0%	-34.4%	-6.9%	-11.0%
2009.75	55.97	22.37	51.78	130.12	3.0%	-3.6%	-2.2%	-0.4% (annualized)

Overall Trend Factor: 0.9889

\* Historic total claim statistics are developed in Section 100 CD-1; policy year 2009 total projected claim statistics are based on the combined type of loss trend selections.

**Massachusetts Private Passenger Automobile  
Comprehensive Trend Support by Type of Loss  
Residual Market Data**

**Loss Development**

Type of Loss	Accident Year	Paid Losses							Ultimate Paid Losses	Age-to-Age Loss Development Factors			
		15 Months	24 Months	36 Months	48 Months	60 Months	15-24	24-36		36-48	48-60		
Glass	1996	15,144,078	15,273,288	15,263,145	15,260,320	15,259,892	15,259,892	15,259,892	1996	1.0086	0.9993	0.9998	1.0000
	1997	14,102,028	14,222,637	14,233,987	14,235,032	14,234,982	14,234,982	14,234,982	1997	1.0096	1.0008	1.0001	1.0000
	1998	15,144,850	15,290,744	15,306,326	15,308,343	15,313,991	15,313,991	15,313,991	1998	1.0100	1.0019	1.0002	1.0001
	1999	15,012,713	15,162,828	15,191,539	15,194,057	15,195,324	15,195,324	15,195,324	1999	1.0226	1.0013	1.0002	1.0000
	2000	14,761,677	15,094,822	15,114,514	15,118,102	15,117,969	15,117,969	15,117,969	2000	1.0118	1.0029	1.0000	1.0001
	2001	16,098,059	16,288,071	16,335,088	16,335,843	16,336,939	16,336,939	16,336,939	2001	1.0073	1.0002	1.0000	1.0000
	2002	13,718,361	13,886,406	13,987,562	13,989,868	13,989,849	13,989,849	13,989,849	2002	1.0077	1.0008	1.0003	1.0000
	2003	13,370,706	13,473,247	13,484,092	13,487,650	13,487,904	13,487,904	13,487,904	2003	1.0059	1.0011	1.0000	1.0000
	2004	10,310,194	10,371,499	10,382,723	10,382,723	10,382,723	10,382,723	10,382,723	2004	1.0059	1.0011	1.0000	1.0000
	2005	10,100,474	10,151,268	10,162,242				10,163,936	2005	1.0059	1.0011	1.0000	1.0000
	2006	6,572,814	6,519,321					6,531,492	2006	0.9919			
2007	5,634,043						5,679,558	2007					
									ldf (5 ex hi/lo)	1.0062	1.0017	1.0001	1.0000
									uldf	1.0081	1.0019	1.0002	1.0000
Theft	1996	23,732,739	24,096,720	24,147,810	24,158,065	24,195,196	24,195,196	24,195,196	1996	1.0153	1.0021	1.0004	1.0015
	1997	22,465,075	22,670,451	22,723,459	22,747,156	22,748,958	22,748,958	22,748,958	1997	1.0091	1.0023	1.0010	1.0001
	1998	22,061,102	22,368,921	22,433,043	22,447,718	22,505,949	22,505,949	22,505,949	1998	1.0140	1.0029	1.0007	1.0026
	1999	22,090,803	22,207,624	22,387,227	22,409,176	22,454,219	22,454,219	22,454,219	1999	1.0053	1.0081	1.0010	1.0020
	2000	23,124,790	23,833,006	23,901,073	23,927,088	23,940,492	23,940,492	23,940,492	2000	1.0306	1.0029	1.0011	1.0006
	2001	24,311,771	24,790,551	24,944,823	25,037,858	25,112,641	25,112,641	25,112,641	2001	1.0197	1.0062	1.0037	1.0030
	2002	19,036,045	19,815,552	20,137,491	20,171,354	20,175,866	20,175,866	20,175,866	2002	1.0409	1.0162	1.0017	1.0002
	2003	15,661,913	16,038,584	16,123,393	16,182,521	16,170,020	16,170,020	16,170,020	2003	1.0241	1.0053	1.0037	0.9992
	2004	8,624,204	8,855,485	8,940,910	8,954,842	8,963,200	8,963,200	8,963,200	2004	1.0268	1.0096	1.0016	1.0016
	2005	6,467,104	6,691,413	6,809,566				6,831,825	2005	1.0347	1.0177		
	2006	4,567,348	4,707,115					4,772,875	2006	1.0306			
2007	2,607,070						2,724,647	2007					
									ldf (5 ex hi/lo)	1.0307	1.0107	1.0023	1.0009
									uldf	1.0451	1.0140	1.0033	1.0009
Other	1996	11,614,917	11,519,680	11,488,064	11,473,155	11,467,366	11,467,366	11,467,366	1996	0.9918	0.9973	0.9987	0.9995
	1997	9,899,957	9,993,010	9,996,051	9,989,804	9,986,903	9,986,903	9,986,903	1997	1.0094	1.0003	0.9994	0.9997
	1998	12,392,677	12,412,755	12,443,160	12,445,553	12,441,837	12,441,837	12,441,837	1998	1.0016	1.0024	1.0002	0.9997
	1999	12,378,032	12,360,548	12,384,309	12,386,373	12,389,862	12,389,862	12,389,862	1999	0.9986	1.0019	1.0002	1.0003
	2000	12,958,263	13,109,072	13,094,346	13,092,656	13,092,657	13,092,657	13,092,657	2000	1.0116	0.9989	0.9999	1.0000
	2001	14,989,787	15,149,196	15,229,664	15,219,294	15,213,766	15,213,766	15,213,766	2001	1.0106	1.0053	0.9993	0.9996
	2002	13,000,463	13,225,387	13,316,504	13,326,639	13,322,843	13,322,843	13,322,843	2002	1.0173	1.0069	1.0008	0.9997
	2003	12,747,806	12,833,073	12,816,387	12,786,069	12,808,082	12,808,082	12,808,082	2003	1.0067	0.9987	0.9976	1.0017
	2004	9,963,546	10,002,189	9,993,564	9,986,091	9,986,091	9,986,091	9,986,091	2004	1.0039	0.9991	0.9993	0.9997
	2005	9,507,458	9,540,272	9,521,880				9,517,119	2005	1.0035	0.9981		
	2006	7,412,151	7,468,866					7,472,846	2006	1.0077			
2007	6,009,593						6,049,473	2007					
									ldf (5 ex hi/lo)	1.0061	1.0010	0.9995	1.0000
									uldf	1.0066	1.0005	0.9995	1.0000

**Massachusetts Private Passenger Automobile  
Comprehensive Trend Support by Type of Loss  
Residual Market Data**

**Claim Development**

Type of Loss	Accident Year	Paid Claims							Ultimate Paid Claims	Age-to-Age Claim Development Factors			
		15 Months	24 Months	36 Months	48 Months	60 Months	60 Months	15-24		24-36	36-48	48-60	
Glass	1996	38,067	38,365	38,334	38,329	38,330	38,330	38,330	1996	1.0078	0.9992	0.9999	1.0000
	1997	34,728	35,008	35,040	35,047	35,046	35,046	35,046	1997	1.0081	1.0009	1.0002	1.0000
	1998	34,462	34,773	34,808	34,814	34,825	34,825	34,825	1998	1.0090	1.0010	1.0002	1.0003
	1999	35,016	35,397	35,468	35,475	35,481	35,481	35,481	1999	1.0109	1.0020	1.0002	1.0002
	2000	33,328	34,033	34,070	34,077	34,074	34,074	34,074	2000	1.0212	1.0011	1.0002	0.9999
	2001	36,244	36,694	36,804	36,808	36,809	36,809	36,809	2001	1.0124	1.0030	1.0001	1.0000
	2002	32,353	32,734	32,944	32,950	32,949	32,949	32,949	2002	1.0118	1.0064	1.0002	1.0000
	2003	33,444	33,662	33,706	33,717	33,718	33,718	33,718	2003	1.0071	1.0007	1.0003	1.0000
	2004	27,092	27,248	27,274	27,274	27,274	27,274	27,274	2004	1.0058	1.0010	1.0000	1.0000
	2005	28,079	28,183	28,204	28,204	28,209	28,209	28,209	2005	1.0037	1.0007	1.0000	1.0000
	2006	18,547	18,381			18,413	18,413	18,413	2006	0.9910			
	2007	16,109				16,226	16,226	16,226					
									cdf (5 ex hi/lo) ucdf	1.0055	1.0016	1.0002	1.0000
										1.0073	1.0017	1.0002	1.0000
Theft	1996	5,915	5,998	6,006	6,007	6,003	6,003	6,003	1996	1.0140	1.0013	1.0002	0.9993
	1997	5,504	5,577	5,585	5,591	5,591	5,591	5,591	1997	1.0133	1.0014	1.0011	1.0000
	1998	5,329	5,428	5,445	5,449	5,453	5,453	5,453	1998	1.0186	1.0031	1.0007	1.0007
	1999	5,055	5,157	5,166	5,167	5,171	5,171	5,171	1999	1.0202	1.0017	1.0002	1.0008
	2000	4,955	5,096	5,106	5,110	5,112	5,112	5,112	2000	1.0285	1.0020	1.0008	1.0004
	2001	5,183	5,313	5,341	5,350	5,353	5,353	5,353	2001	1.0251	1.0053	1.0017	1.0006
	2002	4,501	4,644	4,730	4,735	4,735	4,735	4,735	2002	1.0318	1.0185	1.0011	1.0000
	2003	4,050	4,173	4,196	4,206	4,202	4,202	4,202	2003	1.0304	1.0055	1.0024	0.9990
	2004	2,601	2,667	2,670	2,666	2,667	2,667	2,667	2004	1.0254	1.0011	0.9985	
	2005	1,963	2,010	2,023	2,023	2,026	2,026	2,026	2005	1.0239	1.0065		
	2006	1,242	1,273			1,282	1,282	1,282	2006	1.0250			
	2007	795				822	822	822					
									cdf (5 ex hi/lo) ucdf	1.0269	1.0058	1.0012	1.0003
										1.0344	1.0073	1.0015	1.0003
Other	1996	7,250	7,296	7,295	7,292	7,292	7,292	7,292	1996	1.0063	0.9999	0.9996	1.0000
	1997	6,779	6,809	6,811	6,809	6,809	6,809	6,809	1997	1.0044	1.0003	0.9997	1.0000
	1998	7,441	7,483	7,488	7,489	7,492	7,492	7,492	1998	1.0056	1.0007	1.0001	1.0004
	1999	7,584	7,633	7,644	7,648	7,649	7,649	7,649	1999	1.0065	1.0014	1.0005	1.0001
	2000	7,385	7,433	7,433	7,425	7,427	7,427	7,427	2000	1.0065	1.0000	0.9989	1.0003
	2001	7,800	7,851	7,862	7,864	7,863	7,863	7,863	2001	1.0065	1.0014	1.0003	0.9999
	2002	7,620	7,679	7,724	7,722	7,721	7,721	7,721	2002	1.0077	1.0059	1.0003	0.9999
	2003	7,110	7,158	7,162	7,163	7,163	7,163	7,163	2003	1.0068	1.0006	0.9997	1.0000
	2004	5,611	5,640	5,640	5,640	5,640	5,640	5,640	2004	1.0052	1.0000	1.0000	1.0000
	2005	5,055	5,078	5,076	5,076	5,076	5,076	5,076	2005	1.0045	0.9996		
	2006	3,625	3,645			3,647	3,647	3,647	2006	1.0055			
	2007	3,125				3,145	3,145	3,145					
									cdf (5 ex hi/lo) ucdf	1.0058	1.0007	0.9999	1.0000
										1.0064	1.0006	0.9999	1.0000



*Commonwealth Automobile Reinsurers*

**Filing for Residual Market Rates  
Effective 4/1/2009**

**Expense Provisions: 100E, 100F, 100G**

**Massachusetts Private Passenger Automobile****Expense Provisions****Claim Adjustment, Company Expense, Agent Commission**

This section explains the derivation of the expense provisions needed to cover the expected costs for writing and servicing residual market private passenger automobile insurance policies (other than the cost of losses paid to or on behalf of policyholders). These expenses are divided into three categories:

- Claim Adjustment Expense (defense cost and containment expense (DCCE) and adjusting and other expense (AOE))
- Other Company Expense (acquisition expenses, including agent commissions; general expenses; miscellaneous taxes, licenses, and fees)
- Premium Tax

Estimates for these expenses are derived primarily from financial statement data that are reported by line of business but not necessarily by state or market (voluntary or ceded). Expenses for Massachusetts are estimated from countrywide data where state detail is not available. Total market results are appropriate to use in this filing since the expense of servicing a policy is basically the same regardless of whether it is written voluntarily or through the residual market. Premium tax is a uniform variable expense of 2.3% of premium.

Expenses are estimated from the financial statement data for a sample set of companies that write private passenger automobile insurance in Massachusetts. Companies with direct written premiums of at least \$5 million were selected as a representative sample; for 2007, this comprises over 99% of the market. The experience for these companies is used to derive appropriate ratios that can be applied to facility market data to produce reasonable estimates of the required expense rate components as explained below.

Since this filing is estimating costs for writing policies for an assumed policy year period of 4/1/2009 through 3/31/2010, the non-variable company expenses need to further reflect expected inflationary effects on the costs of items in the base expenses. A

trend factor is derived that brings the base expense pure premium to the level expected for this assumed policy year period.

### **Claim Adjustment Expense**

Expenses for adjusting and settling claims are reflected in rates by applying a factor (CAEF) to the expected loss pure premium.

Since the liability (BI and PDL) loss pure premium provisions include DCCE, the CAEF adjustment accounts only for AOE. Physical damage loss pure premiums do not include any claim adjustment expense so the CAEF accounts for both DCCE and AOE.

The three latest years of experience for each line of business is summarized on 100E for the sample set of companies. Claim adjustment expense factors were selected for liability (BI and PDL combined) and physical damage using judgment based on the results shown.

### **Other Company Expenses**

Company expenses are generally reflected in rates as a fixed cost per exposure. Non-commission company expenses include operating costs such as those for issuing and servicing policies; advertising and other selling expenses (except for agent commissions); and other miscellaneous taxes, licenses, and fees.

Historical expense data are compiled for liability and physical damage separately for the sample set of companies weighted by each company's share of the residual market (100F-2, pages 2-4) in terms of expense ratios to premium. These are used to select company expense ratios that, when applied to the total premium in the residual market (adjusted to represent pure private passenger only), produce the expense dollars appropriate to support the facility exposures underlying this filing (100F-2, page 1). The estimated expenses are then allocated to coverage in direct proportion to the total loss pure premiums underlying current rates (100F-1). The loss pure premiums are adjusted so that the average company expense pure premium per compulsory exposure remains constant with respect to changes in anticipated optional coverage purchases. This is achieved by estimating the purchasing pattern for the exposures to be written using these rates (100F-3).

Private passenger automobile insurance companies operate under one of two general structures that reflects the primary marketing channel used: an agency system in

which insurers use independent agents for developing and servicing the portfolio of customers or a non-agency system which markets and services insurance products directly to consumers.<sup>1</sup> The difference in company structure affects company expense results primarily in selling expenses (other acquisition and agent commission combined) that are primarily agent commissions for agency companies and primarily other acquisition for non-agency companies.<sup>2</sup>

Since this filing includes a separate provision for agent commission, the estimate for other acquisition expense is based on results for agency companies only. The resulting combined selling expense is assumed to be a reasonable estimate of total acquisition expense for non-agency companies. Other company expenses are not generally affected by the choice of distribution channel and can reasonably be estimated from both agency and non-agency companies combined. The selected expense ratios shown on 100F-2, page 1 produce company expenses that, when combined with the agent commission provision, are appropriate for a company writing private passenger residual market automobile insurance in Massachusetts.

Agent commission expense in this filing is based on the last commission rate set by the Commissioner of Insurance under fix-and-establish regulation of private passenger automobile insurance rates. In compliance with G.L. c. 175, section 162E, that requires commissions not be changed for the first four years of competitive rating as that set in the last fix-and-establish Decision (rates effective 4/1/07 through 3/31/08), this filing includes a commission rate of 13.0%.

### **Company Expense Trend**

The base other company expense pure premium represents the average cost incurred in company operations during the experience period defined by the latest financial statement from which the data was compiled. An expense trend factor is needed to adjust the actual expense level from that experience period for expected trends to the policy period assumed in this filing.

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<sup>1</sup> Non-agency companies may also use agents that write exclusively for the company that may or may not be paid on a commission basis. The commission, if paid, may also differ from the standard commission paid to independent agents in Massachusetts.

<sup>2</sup> The Exclusive Representative Producer (ERP) is an independent agent that is assigned to write private passenger automobile insurance through one company but is paid agent commission as other independent agents in Massachusetts. Non-agency companies are assigned ERPs and incur the standard commission expense in addition to the other selling expenses attributable to the non-agency company structure.

The expense trend factor is a composite of external trends for the items represented in other company expenses as summarized on 100G. The external trends are derived using wage and price index data compiled and published by the U.S. Bureau of Labor Statistics. The specific insurance company expense items with the selected corresponding trend series and the proportion that each represents for personal lines insurers are detailed in 100G-2 and the trend factor calculations for each series are summarized in 100G-3. Trend factors are estimated using linear regression on 24 months of data for all but postage which relies on 48 months of data to smooth out the effect of postage rate changes over time.

The trend factor applicable to the base company expense provision first adjusts the actual index for the experience period of the base company expenses for the underlying trend and then adjusts for the expected trend from the experience period to the average expense date implied from the assumed effective date of this filing.

#### **Guaranty Fund**

The net assessment or refund to the automobile insurance market is determined annually by Guaranty Fund Management Services (GFMS). This is reported in financial statements under the category of taxes, licenses, and fees and is thereby included in other company expenses.

Since the actual assessment of the GFMS is not determined until late October, the amount reported in financial statements is included in miscellaneous taxes, licenses, and fees instead of removing historical values and separately loading in the current assessment. Over time the cost of the Guaranty Fund will be properly accounted for in rates but may lag due to timing of assessments, financial statements, and rate filings.

**Massachusetts Private Passenger Automobile  
Calculation of Claim Adjustment Expense Factors  
Total Market**

<b>Industry:</b>		<u>2005</u>		<u>2006</u>		<u>2007</u>
BI	1. Incurred Losses	\$ 826,385,615	\$	752,621,854	\$	1,371,209,891
	2. Direct Defense & Cost Containment Expenses	\$ 94,877,857	\$	74,280,951	\$	76,136,578
	3. Adjusting and Other Expenses	\$ 158,020,016	\$	144,074,341	\$	218,106,498
	4. Claim Adjustment Expense Factor	1.1715		1.1742		1.1507
	= 1 + (3)/[(1)+(2)]					
PDL	1. Incurred Losses	\$ 618,473,834	\$	544,445,714		
	2. Direct Defense & Cost Containment Expenses	\$ 8,059,020	\$	356,558		
	3. Adjusting and Other Expenses	\$ 83,545,634	\$	92,295,705		
	4. Claim Adjustment Expense Factor	1.1333		1.1694		
	= 1 + (3)/[(1)+(2)]					
PhyD	1. Incurred Losses	\$ 954,710,306	\$	851,222,344	\$	872,209,410
	2. Direct Defense & Cost Containment Expenses	\$ 12,294,908	\$	10,154,904	\$	10,834,761
	3. Adjusting and Other Expenses	\$ 165,851,878	\$	165,831,973	\$	159,673,034
	4. Claim Adjustment Expense Factor	1.1866		1.2067		1.1955
	= 1 + [(2)+(3)]/(1)					
<b>Selected Claim Adjustment Expense Factor</b>		<u>BI</u>		<u>PDL</u>		<u>PhyD</u>
		1.1500		1.1500		1.2000

Note: 2005 and 2006 data is from the Massachusetts Automobile Expense Calls compiled for prior year rate filings.

2007 is based on Annual Statement (IEE) data for companies with at least \$5 million in 2007 written premium;

BI & PDL split is not available.

**Massachusetts Private Passenger Automobile  
Calculation of Expense Pure Premium by Coverage  
Facility Market**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	<u>Projected</u>	<u>Estimated</u>	<u>Current Loss</u>	<u>Total</u>	<u>2007</u>	<u>2007</u>	<u>2007</u>	<u>2007</u>	<u>2007</u>
	<u>Percent</u>	<u>Coverage</u>	<u>Pure</u>	<u>Collectible Pure</u>	<u>Total Company</u>	<u>Company</u>	<u>Proposed</u>	<u>Basic Limit</u>	<u>Company</u>
	<u>Purchasing</u>	<u>Purchasing</u>	<u>Premium</u>	<u>Premium</u>	<u>Expenses</u>	<u>Expense</u>	<u>Average</u>	<u>Company</u>	<u>Expense</u>
<u>Coverage</u>	<u>Optional</u>	<u>Pattern</u>		<u>(current)</u>		<u>Pure</u>	<u>Increased</u>	<u>Pure</u>	<u>Premium</u>
	<u>Coverage</u>			<u>(2) x (3)</u>		<u>Premium</u>	<u>Limits Factor</u>		<u>(7) / (8)</u>
						<u>Ratio</u>			
						<u>(5) / (4)</u>	<u>(3) x (6)</u>		
<b>Liability</b>									
A-1 , Basic	1.0000	179,384.4	429.40	\$88,558,491		\$35.25	1.1829	\$29.80	
A-2 PIP	1.0000	179,384.4	164.23	\$29,460,300		\$11.73		\$11.73	
B, Basic	0.9809	175,956.7	63.86	\$12,918,742		\$5.24	1.1829	\$4.43	
PDL, Basic	1.0000	179,384.4	347.69	\$79,203,594		\$31.53	1.2890	\$24.46	
D, Med Pay	0.3509	62,946.0	26.65	\$1,677,511		\$1.90		\$1.90	
U-1 , Basic	1.0000	179,384.4	36.14	\$7,311,708		\$2.91	1.1108	\$2.62	
Total		179,384.4		\$219,130,346	\$15,645,391	7.14%	\$87.23		\$73.62
<b>Physical Damage</b>									
Collision	0.5950	106,733.7		\$68,670,339				\$47.93	
Limited Colli:	0.0161	2,888.1		\$122,137				\$3.15	
Comprehensi	0.6750	121,084.5		\$23,922,659				\$14.72	
Total		121,084.5		\$92,715,136	\$6,909,930	7.45%			\$57.05

Sources: (1) 100F-4 Page 1  
(2) (1) x 2007 Compulsory Earned Exposures (179,384.4)  
(3) 4/1/2008 MAIP Filing Form 100 Line 5 and 100J  
(5) 100 F-2  
(8) 101A, 101B, and 101C

**Massachusetts Private Passenger Automobile  
Determination of 2007 Company Expenses  
Facility Market**

	<u>Liability</u>	<u>Phys Dam</u>
(1) <u>Other Acquisition and General Expenses</u>		
(a) 2007 Fac PP Auto Earned Premium	\$193,175,775	\$86,522,275
(b) 2007 Private Passenger Company Expense Ratio	8.00%	8.10%
(c) Fac PP Company Expenses (1a) x (1b)	\$15,454,062	\$7,008,304
(d) Adjustment to remove expenses for Misc. Coverages (A2/(A1+A2))	1.000	0.952
(e) Fac PP Company Expenses excl. misc. covg. (1c) x (1d)	\$15,454,062	\$6,669,889
 (2) <u>Misc. Taxes, Licenses and Fees</u>		
(a) 2007 Pure PP Auto % of Vol PP Earned Premium (A1/A)	99.0%	92.5%
(b) 2007 Pure Fac PP Auto Earned Premium (1a) x (2a)	\$191,328,998	\$80,013,735
(c) 2007 Total Auto Company Expense Ratio	0.10%	0.30%
(d) Fac PP Company Expenses (2b) x (2c)	\$191,329	\$240,041
 (3) <u>Fac Private Passenger Company Expense</u> (1e) + (2d)	 \$15,645,391	 \$6,909,930

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A. Determination of Fac. Market Private Passenger Written Premium Split

	<u>Liability</u>	<u>Phys Dam</u>
A1. Pure Fac Private Passenger WP (excl. misc. covgs)	\$186,151,741	\$77,554,110
A2. Misc. Coverages Fac Written Premium	\$0	\$3,934,919
A3. Misc. Class Types Fac Written Premium	\$122,384	\$177,705
A4. Motorcycle Fac Written Premium	\$1,674,420	\$2,195,843
 A. Total Fac Written Premium (incl. moto/misc. cl) sum of A1, A2, A3, A4	 \$187,948,545	 \$83,862,577





**Massachusetts Private Passenger Automobile  
Historical Company Expense Ratios  
Agency Companies**

**Liability**

	<u>Calendar Year</u>	<u>Direct Earned Premium</u>	<u>Direct Written Premium</u>	<u>Other Acquisition<sup>1</sup></u>	<u>General<sup>1</sup></u>	<u>Misc. Taxes, Licenses &amp; Fees<sup>2</sup></u>	<u>Total Company Expense</u>	<u>Commission Ratio</u>
Facility	2005	238,290,000	230,396,501	2.98%	3.56%	0.18%	6.71%	15.49%
	2006	179,595,723	170,600,194	3.12%	3.97%	0.22%	7.31%	17.83%
	2007	148,055,855	143,353,484	3.80%	4.26%	0.16%	8.23%	17.42%
Total Market	2005	2,252,059,933	2,288,675,871	2.97%	3.22%	0.15%	6.35%	16.17%
	2006	2,203,556,208	2,143,388,507	3.17%	3.66%	0.14%	6.98%	18.05%
	2007	2,057,540,417	2,015,250,343	3.80%	4.13%	0.14%	8.07%	17.58%

**Physical Damage**

		<u>Direct Earned Premium</u>	<u>Direct Written Premium</u>	<u>Other Acquisition<sup>1</sup></u>	<u>General<sup>1</sup></u>	<u>Misc. Taxes, Licenses &amp; Fees<sup>2</sup></u>	<u>Total Company Expense</u>	<u>Commission Ratio</u>
Facility	2005	100,923,121	92,358,044	2.92%	3.73%	0.16%	6.80%	14.54%
	2006	75,973,348	70,761,371	3.28%	4.36%	0.21%	7.85%	16.31%
	2007	64,380,859	62,279,477	3.93%	4.57%	0.36%	8.87%	17.53%
Total Market	2005	1,273,711,785	1,243,711,681	2.87%	3.08%	0.16%	6.11%	15.36%
	2006	1,216,026,394	1,199,606,121	3.21%	3.69%	0.26%	7.16%	16.91%
	2007	1,099,172,791	1,081,057,754	3.90%	4.22%	0.34%	8.46%	18.08%

Expense ratios estimated using representative sample companies; selection criteria is at least \$5 million in direct written premium for 2007.

(1) - Facility market company expense ratio = countrywide company expense ratio by company weighted by MA facility EP  
Total market company expense ratio = countrywide company expense ratio by company weighted by MA direct EP

(2) - Facility market misc TLF = MA Statutory Page 14 TLF less MA premium tax (2.3%) by company weighted by MA facility EP  
Total market misc TLF = MA Statutory Page 14 total TLF less MA premium tax (2.3%) by company weighted by MA direct EP

**Massachusetts Private Passenger Automobile  
Historical Company Expense Ratios  
Non-Agency Companies**

**Liability**

	<u>Calendar Year</u>	<u>Direct Earned Premium</u>	<u>Direct Written Premium</u>	<u>Other Acquisition<sup>1</sup></u>	<u>General<sup>1</sup></u>	<u>Misc. Taxes, Licenses &amp; Fees<sup>2</sup></u>	<u>Total Company Expense</u>	<u>Commission Ratio</u>
Facility	2005	67,830,758	75,123,270	11.12%	3.69%	-0.06%	14.75%	5.03%
	2006	57,802,542	50,177,256	12.71%	4.62%	-0.14%	17.19%	5.30%
	2007	43,035,374	42,771,613	14.35%	5.02%	0.04%	19.41%	4.83%
Total Market	2005	639,712,425	650,815,681	9.90%	2.63%	-0.05%	12.48%	4.79%
	2006	613,277,617	582,864,850	11.05%	3.42%	-0.05%	14.42%	4.91%
	2007	558,844,156	547,224,696	13.66%	4.24%	0.08%	17.99%	4.66%

**Physical Damage**

		<u>Direct Earned Premium</u>	<u>Direct Written Premium</u>	<u>Other Acquisition<sup>1</sup></u>	<u>General<sup>1</sup></u>	<u>Misc. Taxes, Licenses &amp; Fees<sup>2</sup></u>	<u>Total Company Expense</u>	<u>Commission Ratio</u>
Facility	2005	26,977,195	28,386,196	12.71%	3.92%	-0.08%	16.56%	4.29%
	2006	23,812,222	21,001,446	14.95%	5.26%	-0.17%	20.04%	4.70%
	2007	19,301,646	19,209,832	14.57%	5.22%	0.23%	20.02%	4.52%
Total Market	2005	375,573,151	367,134,917	11.67%	2.96%	-0.06%	14.57%	4.26%
	2006	352,789,062	342,071,330	13.14%	3.99%	-0.05%	17.08%	4.57%
	2007	314,009,849	309,761,512	13.74%	4.37%	0.27%	18.38%	4.51%

Expense ratios estimated using representative sample companies; selection criteria is at least \$5 million in direct written premium for 2007.

(1) - Facility market company expense ratio = countrywide company expense ratio by company weighted by MA facility EP  
Total market company expense ratio = countrywide company expense ratio by company weighted by MA direct EP

(2) - Facility market misc TLF = MA Statutory Page 14 TLF less MA premium tax (2.3%) by company weighted by MA facility EP  
Total market misc TLF = MA Statutory Page 14 total TLF less MA premium tax (2.3%) by company weighted by MA direct EP

**Massachusetts Private Passenger Automobile  
Historical Company Expense Ratios  
All Companies**

**Liability**

	<u>Calendar Year</u>	<u>Direct Earned Premium</u>	<u>Direct Written Premium</u>	<u>Other Acquisition</u>	<u>General</u>	<u>Misc. Taxes, Licenses &amp; Fee</u>	<u>Total Company Expense</u>	<u>Commission Ratio</u>
Facility	2005	306,120,758	305,519,771	4.78%	3.59%	0.12%	8.49%	12.92%
	2006	237,398,265	220,777,450	5.45%	4.13%	0.13%	9.72%	14.98%
	2007	191,091,229	186,125,097	6.17%	4.43%	0.14%	10.74%	14.53%
Total Market	2005	2,891,772,358	2,939,491,552	4.50%	3.09%	0.11%	7.70%	13.65%
	2006	2,816,833,825	2,726,253,357	4.88%	3.61%	0.10%	8.60%	15.24%
	2007	2,616,384,573	2,562,475,039	5.91%	4.16%	0.12%	10.19%	14.82%

**Physical Damage**

		<u>Direct Earned Premium</u>	<u>Direct Written Premium</u>	<u>Other Acquisition</u>	<u>General</u>	<u>Misc. Taxes, Licenses &amp; Fee</u>	<u>Total Company Expense</u>	<u>Commission Ratio</u>
Facility	2005	127,900,316	120,744,240	4.98%	3.77%	0.11%	8.86%	12.13%
	2006	99,785,570	91,762,817	6.07%	4.57%	0.12%	10.76%	13.65%
	2007	83,682,505	81,489,309	6.39%	4.72%	0.33%	11.44%	14.47%
Total Market	2005	1,649,284,936	1,610,846,598	4.87%	3.05%	0.11%	8.04%	12.83%
	2006	1,568,815,456	1,541,677,451	5.44%	3.76%	0.19%	9.39%	14.17%
	2007	1,413,182,640	1,390,819,266	6.08%	4.26%	0.32%	10.66%	15.06%

Expense ratios derived from agency & non-agency expense ratios shown on pages 2 & 3;  
company expenses weighted using EP and commissions weighted using WP.

**Massachusetts Private Passenger Automobile  
Optional Coverage Exposures as a Percentage of Compulsory Exposures  
Facility Market**

Year	Collision		Comprehensive		Limited Collision		Medical Payments	
	% of Compulsory	% Ann. Chg	% of Compulsory	% Ann. Chg	% of Compulsory	% Ann. Chg	% of Compulsory	% Ann. Chg
2001	0.6135		0.6833		0.0193		0.2317	
2002	0.5924	-3.4%	0.6632	-2.9%	0.0189	-2.1%	0.2373	2.4%
2003	0.5796	-2.2%	0.6490	-2.1%	0.0183	-3.2%	0.2433	2.5%
2004	0.5526	-4.7%	0.6249	-3.7%	0.0178	-2.7%	0.2662	9.4%
2005	0.5580	1.0%	0.6332	1.3%	0.0166	-6.7%	0.2852	7.1%
2006	0.5611	0.6%	0.6379	0.7%	0.0161	-3.0%	0.2993	4.9%
2007	0.5744	2.4%	0.6562	2.9%	0.0161	0.0%	0.3169	5.9%
<u>2 Year Chgs</u>								
2003/2001		-5.5%		-5.0%		-5.2%		5.0%
2004/2002		-6.7%		-5.8%		-5.8%		12.2%
2005/2003		-3.7%		-2.4%		-9.3%		17.2%
2006/2004		1.5%		2.1%		-9.6%		12.4%
2007/2005		2.9%		3.6%		-3.0%		11.1%
Projected								
2008	0.5850		0.6650		0.0161		0.3339	
2009	0.5950		0.6750		0.0161		0.3509	

**Massachusetts Private Passenger Automobile  
Compulsory & Optional Coverage Written Exposures  
Facility Market**

<u>Year</u>	<u>Compulsory (PDL)</u>	<u>Collision</u>	<u>Limited Collision</u>	<u>Medical Payments</u>	<u>Comprehensive</u>
2001	306,916	188,305	5,924	71,107	209,703
2002	304,288	180,264	5,760	72,199	201,800
2003	282,568	163,784	5,175	68,755	183,396
2004	272,991	150,855	4,872	72,660	170,598
2005	253,551	141,493	4,200	72,303	160,554
2006	199,954	112,185	3,211	59,847	127,558
2007	177,635	102,029	2,856	56,287	116,563

Percent Purchasing Coverage

<u>Year</u>	<u>Collision</u>	<u>Limited Collision</u>	<u>Medical Payments</u>	<u>Comprehensive</u>
2001	0.6135	0.0193	0.2317	0.6833
2002	0.5924	0.0189	0.2373	0.6632
2003	0.5796	0.0183	0.2433	0.6490
2004	0.5526	0.0178	0.2662	0.6249
2005	0.5580	0.0166	0.2852	0.6332
2006	0.5611	0.0161	0.2993	0.6379
2007	0.5744	0.0161	0.3169	0.6562

Physical damage includes all deductibles; Comprehensive excludes Towing and Labor, Substitute Transportation and Cellular Telephones.

**Massachusetts Private Passenger Automobile  
Calculation of Expense Trends  
Facility Market**

<u>Index</u>	<u>Weights</u>	<u>Expense Trend Factor</u> (7/1/07 - 01/21/10)
Average Weekly Earnings - (Direct Property & Casualty Insurance Companies)	0.711	1.089
Food Away From Home	0.016	1.102
Private Transportation	0.016	1.279
Telephone	0.044	1.054
Office and Store Machines and Equipment	0.144	1.088
Paper	0.025	1.149
Postage	0.044	1.089
Weighted Average	1.000	1.092

**Massachusetts Private Passenger Automobile  
Calculation of Expense Component Trends for Expense Trend Factor  
Facility Market**

	<u>Average Weekly Earnings (Direct Property &amp; Casualty Insurance)</u>	<u>Food Away From Home</u>	<u>Private Trans.</u>	<u>Phone</u>	<u>Postage</u>	<u>Office and Store Machines and Equipment</u>	<u>Paper</u>
(1) Latest Data Period	7/08	7/08	7/08	7/08	7/08	7/08	7/08
(2) Average Value for 2007	939.4	206.4	181.5	98.4	206.8	114.7	169.3
(3) Actual Index Value for (1)	966.4	213.7	203.8	99.9	214.2	119.7	182.0
(4) Fitted Index Value for (1)	973.8	215.1	201.1	100.5	213.7	118.6	179.5
(5) Fitted Index Value for January 21, 2010	1,031.3	229.0	229.0	104.3	224.6	123.6	191.9
(6) Trend Factor July 1, 2007 to January 21, 2010 [ (5) / (4) ] x [ (3) / (2) ]	1.089	1.102	1.279	1.054	1.089	1.088	1.149

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**Massachusetts Private Passenger Automobile  
Average Expense Date Calculation - Company Expense  
Facility Market**

<u>Quarter</u>	<u>Distribution</u>	<u>Months</u>	<u>Weighted Average</u>
0	0.200	-1.5	-0.30
1	0.300	1.5	0.45
2	0.200	4.5	0.90
3	0.150	7.5	1.13
4	0.150	10.5	1.58
Total	1.000		3.76

Average Effective Date = 5.91 months (after 4/1) or September 29, 2009

Average Expense Date = 5.91 + 3.76 = 9.67 months (after 4/1) or January 21, 2010



**Massachusetts Private Passenger Automobile  
Determination of Weights Applicable to Expense Trend Indices**

<u>Expense Item</u>	<u>Weight</u>	<u>Relative Weight of Specified Items</u>	<u>Trend Source</u>	<u>Weight for Expense Trend Factor</u>
Salaries	0.340	0.5270	Average Weekly Earnings - Direct Property & Casualty	0.527
Employee Relations	0.093	0.1840	Average Weekly Earnings - Direct Property & Casualty	0.184
Payroll Taxes	0.026			
Travel and Travel Items	0.020	0.0310	CPI - Food Away from Home	0.016
			CPI - Private Transportation	0.016
Equipment	0.093	0.1440	PPI - Office & Store Machine & Equipment	0.144
Printing and Stationary	0.016	0.0250	PPI - Paper	0.025
Postage and Telephone	0.057	0.0880	CPI - Postage	0.044
			CPI - Telephone	0.044
Total of Above	0.645	1.00		
			Total	1.000
Managers and Agents	0.053			
Advertising	0.107			
Boards and Bureaus	0.011			
Survey and U/W Reports	0.042			
Insurance	0.005			
Rent and Rent Items	0.041			
Other Taxes	0.021			
Miscellaneous	0.076			
Total	1.00			

Expense Item Weight: 100G-2, page 2

**Massachusetts Private Passenger Automobile  
Components of Company Expenses  
Facility Market**

	<u>Private Passenger Automobile and Homeowners Predominating</u>	<u>Private Passenger Automobile Predominating</u>	<u>% Distribution</u>
Net Written Premiums	\$119,943,082	\$76,164,206	
Managers and Agents	0.39	0.96	5.29%
Advertising	0.93	1.81	10.69%
Boards and Bureaus	0.18	0.10	1.10%
Surveys and Reports	0.55	0.52	4.20%
Salaries	4.89	3.82	33.97%
Employee Relations	1.43	0.94	9.29%
Payroll Taxes	0.37	0.29	2.60%
Insurance	0.08	0.04	0.50%
Travel and Travel Items	0.33	0.18	2.00%
Rent and Rent Items	0.54	0.51	4.10%
Equipment	1.29	1.11	9.29%
Printing and Stationary	0.24	0.16	1.60%
Postage and Telephone	0.68	0.77	5.69%
Other Taxes	0.27	0.26	2.10%
Miscellaneous	1.16	0.82	7.59%
<b>Total</b>	<b>13.33</b>	<b>12.29</b>	<b>100.0%</b>

Source : Best's Aggregates and Averages 2007, pages 684, 690 in  
Underwriting Expenses Incurred For Property-Casualty Companies Section  
(Best's no longer displays Physical Damage data)

% Distribution = Average Expense Relative to Total

**Massachusetts Private Passenger Automobile  
Parameters of Expense Trend Model**

	Ordinary Least Squares - 24 Month		
	<u>Slope</u>	<u>Intercept</u>	<u>R-Square</u>
Average Weekly Earnings - DPC*	2.8538	905.2819	0.7849
Food Away From Home	0.6890	198.6000	0.9944
Private Transportation	1.3864	167.8326	0.7065
Telephone	0.1855	96.0815	0.9099
Postage **	0.5411	187.7684	0.9040
Office and Store Equipment	0.2488	112.6236	0.6137
Paper	0.6125	164.8351	0.6447

\* Direct Property and Casualty Insurance Companies is the definition for the industry under the new NAIC system used by the BLS.

\*\* OLS last 48 months

**Massachusetts Private Passenger Automobile  
Consumer Price Indices**

<u>Month</u>	<u>Year</u>	<u>Average Weekly Earnings Direct Property &amp; Casualty Insurers Unadjusted</u>	<u>Food Away from Home</u>	<u>Telephone Services</u>	<u>Private Transportation</u>	<u>Office and Store Machines and Equipment</u>	<u>Paper</u>
January	2006	923.4	196.4	95.3	172.2	114.6	163.5
February	2006	881.6	197.0	95.4	172.0	114.6	164.2
March	2006	886.6	197.4	95.2	173.8	114.4	165.2
April	2006	922.0	197.8	95.6	181.2	114.6	165.7
May	2006	890.1	198.4	95.3	184.9	114.8	166.3
June	2006	884.7	198.9	95.5	184.2	114.8	167.1
July	2006	919.6	199.4	95.7	186.1	114.9	167.7
August	2006	896.2	199.9	96.0	185.8	114.9	168.4
September	2006	906.4	200.2	96.2	177.1	115.0	170.1
October	2006	932.4	200.8	96.9	170.7	115.3	170.5
November	2006	912.0	201.4	96.7	169.9	114.1	169.5
December	2006	916.8	202.0	96.9	171.7	114.1	170.0
January	2007	920.0	202.9	97.0	170.3	112.9	170.0
February	2007	918.7	203.7	97.2	170.6	113.1	169.3
March	2007	923.3	203.8	97.6	176.7	113.2	168.6
April	2007	953.3	204.5	97.7	182.2	113.6	168.3
May	2007	936.8	205.0	98.6	187.6	115.0	167.1
June	2007	934.0	205.7	98.6	186.4	115.1	167.3
July	2007	957.2	206.7	98.7	184.7	115.2	167.7
August	2007	932.8	207.5	99.0	181.2	115.3	168.3
September	2007	956.4	208.6	99.0	181.5	115.5	169.2
October	2007	937.1	209.0	99.1	181.7	115.5	169.8
November	2007	938.9	209.5	98.9	188.0	115.6	172.8
December	2007	964.7	209.9	98.9	187.2	115.8	172.7
January	2008	946.9	210.8	99.0	188.1	115.9	175.4
February	2008	953.7	211.5	98.9	187.8	116.2	177.1
March	2008	969.0	212.2	99.1	192.7	116.5	178.4
April	2008	955.7	212.8	99.6	196.6	117.5	179.8
May	2008	966.4	213.7	99.9	203.8	119.7	182.0
June	2008	986.1	214.9	100.7	210.4	121.1	182.8
July	2008	968.1	216.2	101.4	211.2	121.5	184.7

**Massachusetts Private Passenger Automobile  
 Consumer Price Index for Postage**

<u>Year</u>	<u>Month</u>											
	<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>
2001	169.2	171.2	171.2	171.2	171.2	171.2	173.4	173.4	173.4	173.4	173.4	173.4
2002	173.4	173.4	173.4	173.4	173.4	173.4	191.7	191.7	191.7	191.7	191.7	191.7
2003	191.7	191.7	191.7	191.7	191.7	191.7	191.7	191.7	191.7	191.7	191.7	191.7
2004	191.7	191.7	191.7	191.7	191.7	191.7	191.7	191.7	191.7	191.7	191.7	191.7
2005	191.7	191.7	191.7	191.7	191.7	191.7	191.7	191.7	191.7	191.7	191.7	191.7
2006	201.9	201.9	201.9	201.9	201.9	201.9	201.9	201.9	201.9	201.9	201.9	201.9
2007	201.9	201.9	201.9	201.9	206.6	209.7	209.7	209.7	209.7	209.7	209.7	209.7
2008	209.7	209.7	209.7	209.7	214.2	216.2	216.2	216.2	209.7	209.7	209.7	209.7

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*Commonwealth Automobile Reinsurers*

**Filing for Residual Market Rates  
Effective 4/1/2009**

**Underwriting Profit Component: 100H**

**Massachusetts Private Passenger Automobile  
Underwriting Profit Introduction and Summary**

The underwriting profit provision has been derived using an Internal Rate of Return (IRR) Model using a construct representing the cash flows expected from writing private passenger automobile insurance. The indicated profit provisions for policies effective 4/1/2009 are:

Bodily Injury Liability	+1.11%
Property Damage Liability	+1.00%
Physical Damage	+3.70%
Overall (41/32/27)	+1.77%

The application of the IRR model is produced in 100H-1 with corresponding explanation and documentation. The parametric input values are calculated and explained in the remaining sections.

## Massachusetts Private Passenger Automobile

### Internal Rate of Return Profit Model

The profit provisions in the rates must be set so that insurers have an opportunity to earn a fair and reasonable rate of return on their invested capital.<sup>1</sup> Consistent with this objective, an internal rate of return (IRR) model is used to establish the profit provisions underlying the indicated rate need for the residual market.

#### A. IRR Models

##### A1. General Consideration

The use of an IRR model is a standard well-established valuation method of corporate finance<sup>2</sup>. It is used to evaluate and compare alternative capital investments and their expected returns to shareholders over time. The IRR profit model recommended in this filing uses the basic principles of constructing multi-period IRR models, adapted to the specific application of insurance. In the insurance application, the capital investment is the shareholder commitment of debt and equity capital that is needed to secure all future obligations of the insurance policy. The return on this investment is derived from the return of surplus as the policy obligations are fulfilled, combined with after-tax income generated by the underwriting and investment operations.

In theory, the IRR is intended to generate rates at a level such that insurers are exactly indifferent between writing the policy and not writing the policy (after consideration of all risks involved). That is the meaning of “fair” as used above. A profit provision greater than the one at this indifference point would provide insurers additional incentive to write insurance policies, but be unfair to policyholders. Conversely, a profit provision less than that produced at the indifference point would cause insurers to invest their equity capital in other states or in non-insurance businesses rather than write insurance policies at rates insufficient to compensate for the risks involved.

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<sup>1</sup> Boston Gas Co. v. Department of Pub. Utils., 368 Mass 780, 789-790 (1975); Federal Power Commission v. Hope Natural Gas Co., 320 US 591 (1944)



**A2. The Massachusetts Private Passenger Automobile IRR Model**

The IRR model used in this filing was developed by the AIB and has been the basis for establishing the underwriting profit provision in Massachusetts automobile ratemaking for many years. It uses a single policy approach that allows for simple and straightforward quantification of the cash flows related to the underwriting and investment functions of an insurance operation. The underwriting operation is represented by the insurance policy transactions in the form of expected revenues from premium, finance charges (if any) and subrogation recoveries, and expected costs for losses, expenses and underwriting income tax. The investment operation creates income by investing the assets (policyholder funds plus investor funds) that are held by the company to fund future liabilities and support the insurance operation. After accounting for future obligations on the policy, the underwriting and investment operations combine to create a cash flow stream to and from the surplus account, including the return of surplus when it is no longer needed to back the outstanding liabilities on the policy. The inputs and results of applying the IRR for the Advisory Filing are detailed here.

Underwriting profit provisions are determined separately for the bodily injury (BI) coverages combined, property damage liability (PDL), and the physical damage (PhsD) coverages combined. These distinctions recognize the significant timing differences between premium collection and loss payout among the coverages<sup>3</sup>. The general formulas and parameters of the IRR are summarized in 100H-1, and the resulting profit provisions and calculations are displayed in 100H-1A, 100H-1B and 100H-1C, for BI, PDL and PhsD, respectively.

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<sup>2</sup> Brealey, Richard A. and Myers, Stewart C., Principles of Corporate Finance, 6<sup>th</sup> edition, Irwin McGraw-Hill, 2000.

<sup>3</sup> The approximate amount of time that premium is held prior to paying claims is 1.7, 0.8, and 0.5 years for BI, PDL, and PhsD, respectively based on Under 1% company cash flows. See 100H-4, exhibit 3.

### **A3. The IRR Components - Summary**

An explanation of the IRR is provided by section corresponding to the exhibits for each coverage (100H-1A, 100H-1B, and 100H-1C). The model is applied in the same manner for each coverage. In general, cash flows are developed on a quarterly basis and follow the expected cash transactions resulting from a policy issued at the beginning of quarter 1. While the cash flows to and from the policyholder may occur throughout a quarter, the valuation of policyholder and shareholder account balances are at the end of the quarter.

The application of the IRR model specifies the underwriting profit provision that produces underwriting and investment cash flows that result in a surplus flow that has a net present value equal to zero using the target cost of capital as the discount rate (IRR). The policyholder flows are those premium, loss and expense flows related to the underwriting function and which underlie the policyholder account in the model. These flows also contribute to the derivation of investment income earnings, the underwriting and investment income taxes, and ultimately the available underwriting income flow to shareholders. The net surplus flow is the flow to and from the insurance operation. It amounts to the investment from, and returns to, shareholders after accounting for all income, payments of liabilities and required levels of the policyholder and surplus accounts.

The major components and assumptions of the IRR model include:

1. **Policyholder Account**: This account is required to be funded at a minimum level<sup>4</sup> equal to the risk-free discounted value of expected future loss and expense payments net of future premium income at the beginning of each quarter subsequent to the effective date of the policy.
2. **Surplus Account**: This account is required to be funded at a constant ratio, reserves to surplus ratio or leverage<sup>5</sup>, to the reserves at the end of each quarter beginning with the effective date of the policy. This implementation of the IRR

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<sup>4</sup> The policyholder account is also required to retain any expected risk premium for outstanding liabilities.

<sup>5</sup> See Section 100H-6.

model assumes a nominal reserves to surplus input value for the surplus requirement. Other relationships of reserves to surplus can be implemented in the model to match the source input parameter.

3. Investment Income: Investment income is earned at a constant pre-tax rate, net of investment expenses, each quarter on the policyholder and surplus accounts and is subject to an investment tax liability at the end of each quarter<sup>6</sup>.
4. Shareholder Flow: Investments are provided by shareholders to fund the required levels of policyholder and surplus accounts. Any funds in excess of those requirements are returns to the shareholders. These inflows and outflows constitute the net surplus flow for IRR valuation.

#### **A4. The IRR Components - Details**

For each of the three coverages, exhibit 1 summarizes the results of the IRR model based on the specific coverage parameters and cash flows. The final weights for losses and expenses develop the nominal components that total to the assumed base of \$1,000 and the premium is the nominal base adjusted by the underwriting profit provision ( $\$1,000 \div (1 - UW \text{ profit})$ ).

##### **A4.1. Nominal Policy Flows**

The nominal cash flows for the policy are displayed on exhibit 2. Premium is assumed to be paid in full at policy inception. The total loss and expense costs for the policy are set to \$1,000 with the company expense provisions based on the loss/expense weights anticipated in this filing (100H-2, exhibit 2) and a variable expense provision of 15.3% (commission rate of 13.0% and a premium tax of 2.3%). Specifically, an iterative process solves for the appropriate component amounts that meet these two constraints. The weight for the loss provision is assigned to the net loss flow.

Loss payment patterns based on historical experience for the residual market are developed in 100H-3. Unlike BI and PDL coverages for which the net loss flows are always positive (i.e. net outflow to the policyholder), the physical

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<sup>6</sup> See Section 100H-7.

damage net loss flows are not uniformly positive due to the significant timing effect of salvage and subrogation recoveries. For physical damage coverages, expected gross loss payments to the policyholder exceed the expected net loss payments (after salvage and subrogation are recovered) by about 50%. The separate flows are used only for determining the appropriate surplus commitment for PhsD; net losses are used in the final determination of the underwriting profit provision and, ultimately, in the final average rate. As discussed in further detail later in this section, the separation of the subrogation recovery flows from gross loss payments to policyholders properly accounts for the distinct timing impact on the surplus flow.

#### **A4.2. Underwriting Income Tax**

The Federal tax for underwriting income is derived from the annual policy cash flows compiled on exhibit 3. Based on the current tax code, revenues for underwriting income include earned premium plus finance charge income, if any, and deductions include expenses and incurred losses. The deduction for incurred loss reflects the annual amount of paid losses plus the change in outstanding losses (column 4) that are discounted for tax purposes. The discount factors for reserves are based on the latest (2002) IRS payment patterns and the latest five year average Federal interest rate for discounting (see 100H-7, exhibits 6 and 7). The paid and outstanding losses for PhsD are net of actual and expected subrogation recoveries, respectively, as required by the IRS tax code.

The underwriting income for the single policy upon which this model is based properly has no explicit unearned premium reserve,<sup>7</sup> however, an amount for expected growth in the Massachusetts market is reflected in the revenue offset tax adjustment (column 7). This value estimates the additional tax not otherwise produced by the model for the 80% limit on the deduction for change in unearned premium reserves (100H-7, exhibit 5). The final underwriting income tax

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<sup>7</sup> The policyholder account calculation proxies the sum of the unearned premium and loss reserves by including all outstanding liabilities at the end of each quarter.

(column 8) is based on a 35% underwriting tax rate applied to underwriting income plus the revenue offset.

#### **A4.3. Intermediate Flows**

Exhibit 4 displays several accumulations of cash flows that are based on the quarterly policy cash flows from exhibit 2, most of which are self-explanatory, and that are used to calculate the final policyholder and surplus account flows. The values that are used to establish supporting surplus (column 3) are based on nominal outstanding losses and expenses from exhibit 2. The discounted values (column 4) are produced using the net present value of gross outstanding losses as of the end of the quarter derived using the pre-tax risk-free spot yield rate by quarter excluding investment expenses (100H-4, exhibit 1). The concept of the underwriting risk flow (column 6) is developed from the gross loss and expense flow. Although premium may not be paid in full at policy inception because of financing, the underwriting risk of the policy exposure begins at policy inception and exists for several years as long as there are outstanding losses. The underwriting risk flow is derived from the premium amount distributed according to policy obligations (column 1). As a result, this flow represents the proportion of risk in the premium dollars for which the obligations underlying the premium have been resolved.

#### **A4.4. Policyholder Cash Flow**

A policyholder account is established to identify the cash income and outgo related specifically to the insurance transaction. The insurance transaction encompasses all cash flows related to the insurance policy contract as distinguished from the investment of assets held for the policyholders benefit or the surplus flow to and from investors. The policyholder account is debited with revenues paid (premium, finance charge income, if any, subrogation and salvage) and credited with loss and expense costs of the insurance operation including underwriting income tax. The quarterly cash flows to and from the policyholder are compiled on exhibit 5 including a cumulative total of the net flows.

The cumulative account balance derived each quarter is preliminary at this stage. The prior quarter final policyholder account balance (see exhibit 7) is updated with the current quarter net policyholder cash flow. The balance is preliminary subject to the later adjustment for investment income and underwriting flow to shareholders.

#### **A4.5. Investment Income**

As developed in the next section on underwriting and surplus flow, assets (the combined policyholder and invested surplus accounts) are available at the end of each quarter to be invested until needed to pay policy obligations or until returned to shareholders. The investment income earned is derived from invested assets held at the beginning of the quarter adjusted by the net effect of the current quarter underwriting cash flow. The net effect of the quarterly underwriting flow reflects the timing of the policyholder cash flows during the quarter (see 100H-1, exhibit 1). If the underwriting cash flow during a quarter is positive, the otherwise earned investment income is increased; if the flow is negative, investment income is reduced since some assets are used to pay policyholder costs during the quarter. Income is earned at the portfolio rate (100H-7, exhibit 1) that is adjusted to a quarterly return.

Tax on investment income (100H-7) is assumed to be paid at the end of the quarter. After-tax investment income is used to either balance the policyholder account or is released to shareholders as a return on investment (see exhibit 7).

#### **A4.6. Underwriting and Surplus Flow**

Any underwriting income to be distributed to shareholders is available from the policyholder account only when the account is adequately funded to cover remaining insurance obligations. Consistent with the basic principle of recognizing the time value of money when the premium is paid in advance of the loss payouts, a minimum funding level is established for the policyholder account, exhibit 7, column (1), calculated as the net present value of the remaining underwriting flows (premiums, losses and expenses, underwriting taxes)

discounted by after-tax quarterly spot yields (100H-4, exhibit 1 adjusted by the investment tax rate in 100H-7, exhibit 1). This explicitly gives the policyholder the benefit of the after-tax risk-free return on the premium that is paid in before losses are expected to be paid out.

Any difference between the required account balance and the preliminary account balance (exhibit 5, column 6) is made up by adjusting the preliminary policyholder account balance. If the otherwise available funds for the insurance transaction are inadequate to cover future obligations, the difference is first made up by retaining available investment income for the benefit of the policyholder (column 3a). If available investment income is insufficient to achieve the required balance, a cash deficiency exists for the balance (column 3b). The cash deficiency is funded by shareholders as additional surplus in the quarter<sup>8</sup>.

If the preliminary account exceeds the minimum required, funds are available to release as underwriting income to shareholders (column 3c).

Recognizing the risk that remains in outstanding insurance liabilities, any excess funds are released in proportion to the level of underwriting risk resolved based on the underwriting risk flow (exhibit 4). Once adjusted, the final policyholder account balance contains amounts that, together with risk-free earnings on the balance, are expected to be sufficient to cover outstanding insurance obligations that remain.

The surplus account separately identifies the funds that are supplied by shareholders to back the insurance operation. The surplus account is derived using a leverage measure based on total nominal reserves (100H-6). The total reserves reflect the outstanding losses and expenses (see exhibit 4, column 3). This approach results in release of surplus as liabilities are paid over the life of the policy cash flows.

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<sup>8</sup> A cash deficiency can occur because of (1) delayed premium payments due to financing premiums and (2) inadequate premium levels for the payment of expected losses and expenses and (3) gross payments on PhsD far in excess of premiums received (this occurs when gross loss payments and subrogation recoveries are separate cash flows). The AIB recommended parameters produce a cash deficiency only for (3) on PhsD coverage.

The leverage ratio for physical damage is additionally modified by the gross-to-net ratio of ultimate losses to properly adjust the relative magnitude of surplus when gross outstanding losses (i.e. not reduced for expected salvage/subrogation recoveries) are used for setting surplus each quarter. The rationale for this approach is to adjust for using liabilities in the model that are gross of future recoveries while the leverage ratio is based on net liabilities. Using gross losses as the basis for surplus recognizes that the purpose of surplus is to protect against adverse events that affect the company's obligation to the policyholder. That obligation is represented by the gross loss cash flow. The delayed recovery of subrogation is an element of the timing of the surplus flow to the extent that the subrogation recoveries represent a portion of the return on the surplus investment that occurs after the surplus obligation to policyholders is complete. The adjusted leverage ratio produces the proper amount of surplus for physical damage relative to net reserves as follows:

$$\text{PhsDSurplus } i = \text{Gross Outstanding Losses } i \times \frac{\text{Net Losses}}{\text{Gross Losses}} \times \frac{\text{Surplus}}{\text{Net Losses}} \text{ for each quarter } i$$

The final balances for the policyholder and adjusted surplus accounts combine to make up the invested assets supporting the policy which in turn produce the investment income in subsequent quarters.

#### **A4.7. Investor Cash Flow**

The surplus commitment is combined with the underwriting and investment flows to create the net cash flow to investors shown on exhibit 8. Surplus is initially committed by shareholders when the policy is written and is gradually returned to shareholders as the insurance obligations are resolved. After-tax investment income on assets flows directly to shareholders subject to limitation by the underwriting flow. The underwriting flow results from the adjustment to the policyholder account determined on exhibit 7 (-(column 3a + column 3c)). If investment income is retained in the policyholder account, there is a reduction from the otherwise available flow to shareholders. Alternatively, if policyholder account funds are available to be released, the underwriting flow is



positive and increases the net surplus flow = columns (2) + (3) + (4) + (5). Any cash deficiency needed to adequately fund the policyholder account (exhibit 7, column 3b) is additional surplus that is later returned through the underwriting flow. These elements combine to produce the net surplus flow by quarter (column 6). Quarter zero of the surplus flow is the initial surplus contribution and the net flow reflects any corresponding underwriting cash deficiency and investment flows; subsequent quarter flows are the returns of surplus (column 2) plus quarterly underwriting and investment flows, inclusive of the return of any cash deficiency contributions.

The fair premium that will produce an expected IRR equal to the target cost of capital (100H-5) is the premium that creates a net surplus flow having a net present value equal to zero when discounted at that target cost of capital. That premium is determined in the IRR model by solving for the underwriting profit provision that (1) has the present value of the net surplus flow equal to zero and (2) has the commission and premium tax weight equal to 15.3%<sup>9</sup>.

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<sup>9</sup> Practically, this premium is determined by using Solver in the AIB Excel spreadsheet implementation of the IRR Model.

## **Massachusetts Private Passenger Automobile**

### **Internal Rate of Return – Input Parameters**

The IRR model application presented in 100H-1 relies on various input parameters in order to produce the cash flows estimated by the model. The calculation of these parameters are attached and explained below.

#### **100H-2: Expense/Loss Ratios**

In order to determine the combined loss and expense cash flows, it is necessary to weight the flows for the individual loss and expense components. Exhibit 1 of this section displays the initial set of flows and weights, all relative to an assumed premium of \$1,000. Weights for the various flow components (premium, premium taxes, commissions, other expenses, and losses) are based on the indicated levels in this filing as shown in Exhibit 2.

The weights used in these pages are “initial” solely because the ratio of commission and premium taxes to premium is dependent on the premium charged, which is dependent on the underwriting profit provision. The net present value of the surplus flows is, in turn, dependent on the policy cash flows. Final weights are based on the iterative solution for the profit provision and the loss weight, retaining the relative expense weight and a commission and premium tax of 15.3% of premium, that produces surplus flows that have a net present value equal to zero when discounted by the target cost of capital. The final weights are displayed in Exhibit 1 of 100H-1A, 100H-1B, and 100H-1C.

#### **100H-3: Policyholder Cash Flows**

The premium, loss, and expense flow inputs to the IRR model are developed in this section. The final nominal flows are displayed in Exhibit 2 of 100H-1A, 100H-1B, and 100H-1C.

##### **A. Premium Flows**

The proposed IRR implementation assumes that the required policyholder’s premium is paid in full at the inception date of the policy. For example, see 100H-2, Exhibit 1, page 1,

column (1). This formulation assumes that premium financing plans are services additional to the pure underwriting of a single policy.

### **B. Loss Flow Patterns**

Loss flow patterns are developed separately using residual market data for all bodily injury coverages combined, property damage liability (PDL), and physical damage coverages. The underlying data for these flows are displayed in 100H-3, Exhibit 1.

The historical BI paid loss data developed through ten years for each accident year is used in order to estimate BI payment patterns. The selected loss flow pattern is based on three year averages for all payment quarters normalized to sum to one.

For both the PDL and physical damage coverages, loss development patterns are evaluated through 5th report (60 months) for accident year 2006. For PDL, net paid loss patterns are used. For physical damage, net paid loss patterns are derived from the separate gross loss payment and salvage and subrogation recovery patterns. The cash flow patterns for the gross paid losses and the salvage/subrogation recoveries are derived using the same methodology as has been used for net paid losses.

### **C. Expense Flows**

Insurance underwriting expenses are reflected in the IRR model in two components: commissions and other underwriting expenses.

The commission expense flows reflect commissions as a fully prepaid expense at policy inception. This pattern reflects the actual payment practices of companies writing Massachusetts private passenger automobile insurance.

Other underwriting expenses are assumed to be paid out over five quarters (the quarter prior to policy inception, and the four quarters for which the policy is in effect) in the following proportions: 20%, 30%, 20%, 15%, and 15%. This flow is based on a historical survey previously adopted for Massachusetts automobile ratemaking.

### **D. Tax Flows**

The underwriting profit tax flow pattern is based on current tax law. This flow assumes the quarterly tax liability of underwriting income to be one quarter of the annual whole, payable

at the end of each of the four quarters of the period for which the tax obligation is derived (100H-1A, B, C, Exhibit 3).

Premium taxes are assumed to be paid one quarter after the policy is written.

#### **100H-4: Calculation of Risk-Free Rate**

The spot yield curve represents the risk-free returns that are used for discounting the loss and expense cash flows that underlie the required policyholder account quarterly levels.<sup>1</sup>

In addition, the spot yield curve will be used to estimate risk-free yield rates, when appropriate, in estimating the insurer expected return on invested assets<sup>2</sup> as employed in the IRR Model. This section develops the values for the spot yield curve and the investment expense ratio suitable to a Massachusetts insurer's investment operation.

#### **Twelve Month Average**

A recent history of the spot yield curves is shown graphically in 100H-4, Exhibit 5. For this filing the spot yield curve is determined using Treasury Strips as published by the Wall Street Journal for the 12 month period of October 2007 – September 2008. While it may be *theoretically* appropriate to use a shorter averaging process, one day, three months or six months, the use of a latest twelve month average of Treasury yields has the following benefits:

- (1) It lessens the fluctuations, while reflecting substantive changes from year to year.  
(See Exhibit 5 this section).
- (2) It is simple and based on indisputable historic Treasury rates.
- (3) It is responsive to the Supreme Judicial Court's criticism of the use of a single day's rate and
- (4) It is consistent with the way changes in (historic) loss costs are incorporated into ratemaking.

#### **Investment Expense**

Investment expense is reflected in the final yield curve as a downward adjusted spot yield curve as shown on 100H-4, Exhibit 1. The adjusted yield curve is the basis for the discount

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<sup>1</sup> See 100H-1 for the overview of the IRR model and the mechanics of the policyholder account.

<sup>2</sup> See 100H-7.

factors that are used to derive the present value of cash flows in the IRR model (see 100H-1). An adjustment of 0.42% is made to the risk-free interest rate for investment and interest expenses only (rather than all investment deductions) based upon those reported by private passenger auto predominating insurers. The investment expense adjustment has been selected to be the average of the 2005-2007 investment and interest expense ratios to add stability to the parameter estimation process.

### **100H-5: Derivation of Cost of Capital**

The cost of capital estimate is based on estimation procedures that have a long history of use by companies and regulators alike throughout the United States.<sup>3</sup>

The target cost of capital is 9.57%, composed of an average cost of equity capital (10.96%), produced by averaging DCF Growth models (12.07%) and the simple CAPM (9.84%) for private passenger auto insurers using Value Line data<sup>4</sup>, and an after-tax cost of debt (4.00%).

The remainder of this section will cover:

- A. Definitions and Standards
- B. Methodologies and Data
- C. Cost of Equity Capital Calculation
- D. Adjustments to the Equity Cost of Capital

#### **A. Definitions and Standards**

The *Cost of Capital* (COC) for an investment is the expected rate of return prevailing in capital markets for alternative investments of equivalent risk.<sup>5</sup> The Cost of Capital is also known as the “Opportunity Cost of Capital” or “The Required Rate of Return”. The Cost of Capital is the expected market return that is required to attract capital to the investment.<sup>6</sup> Application of COC in any context involves four key concepts.

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<sup>3</sup> The DCF growth models and CAPM models for COC estimation have been in common use for thirty years or more in the United States.

<sup>4</sup> The Value Line Survey includes 25 property and casualty insurance companies through 2008Q2. SAFECO Corporation is removed in 2008Q3 due to its acquisition by Liberty Mutual.

<sup>5</sup> See Kolbe, A. Lawrence, James A. Read, Jr. and George R. Hall, 1986, The Cost of Capital, Estimating the Rate of Return for Public Utilities, MIT Press, Cambridge, Chapter 2.

<sup>6</sup> Pratt, Shannon, 1998, Cost of Capital, Estimation and Applications, Wiley & Sons, New York, Chapter 1.

- 1) Expectation – COC is a prospective or forward-looking concept similar to the remainder of insurance ratemaking involving projections of future costs. COC should also be the probabilistic mean, or expectation, of the possible return outcomes for the investment.<sup>7</sup>
- 2) Opportunity Cost – COC is that rate of return expected from the range of possible alternative investments, not just insurance investments, with equivalent risk, the so-called next best alternative use of the capital.
- 3) Market Rates – COC is a market-valued rate of return, assuming a well-functioning (liquid) trading market at all levels of investment risk.
- 4) Risk-Based – COC should be the same for all investments of “equivalent” risk. The key here, of course, is a risk measure and the nature of equivalence.<sup>8</sup>

The conceptual COC has acquired practical constraints through well-known court decisions.

In the United States, the Supreme Court in Federal Power Commission v. Hope Natural Gas Company<sup>9</sup> set the current standard for cost of capital in regulated industries:

[T]he return to the equity owner should be commensurate with the returns on investments in other enterprises having corresponding risks. That return, moreover, should be sufficient to assure confidence in the financial integrity of the enterprise, so as to maintain its credit and to attract capital.

The court’s language in Hope is the legal underpinning of the four economic concepts outlined above for COC.

In Massachusetts, the Supreme Judicial Court in Boston Gas Company v. Department of Public Utilities<sup>10</sup> confirmed the constitutional right to a fair and reasonable return on investments under regulation and in Fitchburg Gas & Electric Light Company v. Department of Public Utilities,<sup>11</sup> affirmed the Hope standard to define “fair and reasonable”:

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<sup>7</sup> See Kolbe, A. Lawrence, William B. Tye, and Steward C. Myers, 1993, Regulatory Risk: Economic Principles and Applications to Natural Gas Pipelines and Other Industries, Kluwer Academic Press, Boston, p. 43.

<sup>8</sup> Neither risk nor equivalence are well-settled theoretical concepts in insurance pricing. Practical interpretations dominate estimation techniques that are used in the real world.

<sup>9</sup> Federal Power Commission v. Hope Natural Gas Company, 320 U.S. 591, 603 (1944).

<sup>10</sup> Boston Gas Company v. Department of Public Utilities, 368 Mass 780, 789-790 (1975).

<sup>11</sup> Fitchburg Gas & Electric Light Company v. Department of Public Utilities, 371 Mass 881, 884 (1977)

A return is fair and reasonable if it covers utility operating expenses, debt service, and dividends, if it compensates investors for the risks of investment, and if it is sufficient to attract capital and assure confidence in the enterprise's financial integrity.

Both of these legal standards provide the basis for the implementation methodologies and data commonly used to estimate COC elsewhere and adopted for use in prior Massachusetts rate filings.

## **B. Methodologies**

The most widely used methods to estimate the cost of capital for IRR models, are the DCF Growth model, also known as the Gordon Growth model, and the simple one-factor CAPM models. These two methods have been used in past auto rate cases.

### **B1. DCF Growth Models**

Briefly, the DCF Growth models are based upon the simple proposition that the current price  $P_0$  is equal to the present value of all future dividends discounted at a single rate, the cost of capital. If the future dividends are assumed to grow at some average growth rate  $g$  from the next (expected) dividend  $D_1$ , then

$$P_0 = D_1 / (\text{COC} - g) \quad (1)$$

or

$$\text{COC} = (D_1 / P_0) + g \quad (1a)$$

Equation (1a) is the one in most common use. The growth rate  $g$  is routinely estimated through historical dividend and earnings growth rates combined with analysts forecasts of those growth rates for the near future (5 years). A third DCF Growth model, the "Plowback" Model based upon the movement in book value earnings and retention rates for those earnings is included in the DCF estimates.<sup>12</sup>

### **B2. Capital Asset Pricing Model (CAPM)**

Briefly, the simple CAPM models are based on the proposition that any equity return over a fixed time horizon,  $r_A$ , can be described by two factors: the risk-free return over that horizon,  $r_f$ , and some proportion, the equity beta ( $\beta$ ), of the expected return on

the market  $E(r_m)$  excess of the risk-free rate.<sup>13</sup> Here the COC is equated with the expected return:

$$\text{COC} = E(r_A) = r_f + \beta (E(r_m) - r_f) \quad (2)$$

where

$$\beta = \text{COV}(r_A, r_m) / \text{VAR}(r_m) \quad (2a)$$

In practice, a long term average of realized excess returns ( $r_m - r_f$ ) is used in conjunction with an investment information source such as Value Line for the *expected* proportion  $\beta$  to estimate required returns in a future period, the horizon. Multiple horizons are commonly used with CAPM estimations of COC applicable to multi-year cash flows. Three horizons are used in estimated the COC using CAPM: short (one quarter), intermediate (5 years) and intermediate (ten years). The use of the longer horizons reflect (1) the extension of IRR cash flows beyond the one-year policy exposure period and (2) the fact that insurance is assumed to be an ongoing business extending over multiple years through renewals.

The simple CAPM is used to estimate the private passenger auto COC by means of the Value Line expected betas, not historic raw betas, along with the full Ibbotson series of equity risk premia.

### **B3. Data Sources and Timing**

Two widely used sources are used for financial information pertinent to the use of the DCF growth model and CAPM to estimate a cost of capital.

Value Line (VL) produces four quarterly reports containing both historical and forecast financial data on a company-by-company basis. The property-casualty industry is represented now by about 25 companies at each report, stock companies that are typically assumed to be representative of the industry generally. These are the major traded companies followed by the VL analysts and their data sources. The key estimates

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<sup>12</sup> Brealey and Myers, 2000, Principles of Corporate Finance, Boston, Irwin McGraw Hill, p. 68.

<sup>13</sup> See Morningstar SBBI 2007 Valuation Yearbook, pp. 57-61 for a description of the basic CAPM and the modification for firm size.



from VL are the equity beta, the debt/equity ratio, and the historical and projected growth rates for the DCF models.

Morningstar SBBI is likewise acknowledged as the leading source of detailed historical capital market data. The publication of their annual yearbooks provide historical data on stock and bond returns as well as the principles of how to use that data in COC estimates.

The average of DCF and CAPM estimates from the latest four quarterly VL data reports are used in the final estimates of COC. The use of a single report issue subjects the ratemaking process to unnecessary variability and possible seasonality (e.g. always using the June reports).

### **C. Cost of Equity Capital Calculation**

Exhibit 1 summarizes the calculations underlying the choice of equity COC of 10.96%, a debt COC of 6.16%, and the use of 80/20 weighting of equity and debt. Exhibit 2 provides the underlying DCF growth rates and COC by company, and their averages, for the four Value Line issues. The VL companies COC are weighted by the 2007 PPA written premium to proxy the COC for writing PPA. Exhibit 3 shows the simple CAPM average VL equity beta of about 0.97 and the COC averaged over three horizons of 9.84%.<sup>14</sup> Exhibit 3 uses market risk premiums (MRP) of 8.48%, 7.51% and 7.40%, reflecting an equal weighting of three horizon COC averages. The historical equity risk premiums are shown in 100H-5, Exhibit 4, page 3. Spot yields (100H-4, Exhibit 5 page 1) corresponding to the durations of the intermediate bonds are used as the CAPM risk-free rates for the two intermediate horizon MRPs.

### **D. Adjustments to the Equity Cost of Capital**

An adjustment is made to the 10.96% return on equity capital to reflect the use of debt in capitalization<sup>15</sup>.

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<sup>14</sup> The usual three time horizons are short (one month/one quarter), intermediate (5 years) and long (20 years). In view of the fact that PPA cash flows extend only for ten years, the "long" horizon has been replaced by a longer "intermediate" horizon at 10 years.

<sup>15</sup> Another adjustment that has been widely studied is for firm size. Historical data consistently shows a difference in the estimated CAPM beta relative to firm size (capitalization). No adjustment for the size of Massachusetts automobile insurers relative to the market is proposed in this filing.

The notion of weighted cost of equity and debts for capitalization of a parent or holding company is a well-established methodology in utility ratemaking.<sup>16</sup> Utilities are typically levered equity investments, levered by roughly 50 percent debt. Insurers, on the other hand, typically do not add debt to their financial structure because they are already a levered investment where the insurance policies are the (contingent) debt at levels of 60 percent more of the firms' assets.

Exhibit 1 shows a calculation of a cost of equity at 10.96% and an after-tax cost of debt of 4.00%. This results in a COC of 9.57%, using 6.16% for the cost of debt, 20.0% debt financing, and a tax rate of 35%. Exhibit 5 shows the current VL companies average about 16.4% long-term debt at the holding company level. Exhibit 5 shows that the current median debt rate is 6.16% for the Value Line companies for the four quarters of data. A debt/equity ratio of 20/80 is judgmentally selected and used in Exhibit 1, page 1 for a weighted COC of 9.57%.

#### **100H-6: Calculation of Leverage Ratio**

The IRR model calculates the tax liabilities that result from investment income on assets. In the model, at any given quarter, supporting assets are generally defined as the total premium flow received through the quarter, that has not yet been paid out as loss or expense, plus the surplus commitment for the policy.<sup>17</sup> The assets that are held to support the writing of an insurance policy include the surplus that provides a cushion to protect the policyholder in the event of adverse loss experience. The surplus commitment, both in amount and timing, is interpreted as the stockholder investment in the insurance transaction. This dual role for the surplus, generating a portion of the investment income tax liabilities<sup>18</sup> and serving as the shareholder's investment, is incorporated in the IRR. The ultimate purpose of the IRR model is to equate the expected total (investment and underwriting income) return on invested surplus with an externally established target cost of capital. This history uses a leverage ratio of reserves to surplus of 1.50.

Exhibit 1 shows the calculation of a five-year average leverage ratio of 1.52 based upon the annual statement surplus and reserves for all Private Passenger Automobile Predominating

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<sup>16</sup> Kolbe, et. al, op. cit, pp. 16-19 and Brealey and Myers, op. cit, pp. 484-488, and 543-551.

<sup>17</sup> See 100H-1 for the detailed definitions of the policyholder and surplus accounts in the IRR model.

<sup>18</sup> The tax liability is the only frictional cost of capital currently included within the IRR model (see Introduction and 100H-5).

insurers. These are the same companies represented in the calculation of asset returns, investment expense and Federal investment tax rates in 100H-7. This leverage ratio is also consistent with the choice of countrywide data for use in the other principal IRR parameters. A leverage ratio of 1.50 is used for purposes of the IRR model.

#### **100H-7: Asset Returns and Federal Taxes**

The use of the IRR to evaluate a fair underwriting profit provision requires that expected returns to the typical insurer investment portfolio be estimated for 2009. The expected asset returns should be based on actual asset holdings (bonds, stocks, real estate, etc.), fair estimates of expected returns in 2009, and actual tax rates applicable to those asset returns and should be reasonably consistent with the other parametric choices. The asset returns so estimated are used in the IRR (1) to credit investment returns to the surplus held to back the promise to pay all liabilities arising from the insurance transaction and (2) to credit investment returns to the policyholder's cash flow of premiums received by the insurer prior to payment of those liabilities.

#### **Asset Distribution**

The filing uses the investment portfolio distribution of the Private Passenger Automobile Insurance Predominating companies. This choice allows for relative consistency between the net after-tax after-expense investment returns and the choice of cost of capital, leverage and investment expenses.

#### **Bond Yields**

The correct method of assigning current yields to long bonds held over time by insurers is to first categorize them as the NAIC does into maturity categories by current time to maturity. This is axiomatic. There can be no difference in current yields in an efficient market like that for Treasuries between a five year Treasury issued now and a twenty year Treasury issued fifteen years ago. The selection reflects real world bond pricing and return to estimating current yields that match the bond maturities as grouped by the NAIC and by economic parity.

#### **Capital Gains Tax Rate**

The following is used to calculate the effective tax value of the capital gain deferral:

1. Let  $n$  be the number of years of capital gain deferral for the average Massachusetts insurer (1.4 years).<sup>19</sup>
2. Assume all capital gains are deferred by  $n$  years (gains and losses are offset in earlier years).
3. Let  $r$  be the spot yield risk-free rate for  $n$  years (2.54% for 1.5 years).
4. The effective capital gains tax is equal to:  
$$\text{CG Tax Rate} = 34\% / (1 + r)^n$$

Currently, that CG Tax Rate would be 33% and Exhibit 1 shows the effect on the after-tax portfolio rate of return.

### **Investment Portfolio Asset Returns**

Property casualty insurers have invested assets consisting primarily of bonds and stocks with other asset types, such as mortgages and real estate, constituting a small portion of the portfolio. The predominance of bonds and stocks is based upon the general notion that bonds, being safer investments with more reliable income, serve as the liquid investment of reserves while stocks, being riskier with much less reliable but higher expected returns, serve as the liquid investment of shareholder supplied funds.<sup>20</sup>

### **Invested Assets**

100H-7, Exhibit 1 displays the calculation of an average current portfolio rate of return of 5.48%, a post-investment expense rate of return of 5.06%, and a post-expense, post-tax rate of return of 3.61%, using an estimated 28.69% investment income tax rate. Exhibit 2 displays the underlying asset distributions by type.

### **Expected Return on Assets**

The appropriate return for 2009 for each major asset type is consistent with the recommended twelve month trailing historical risk-free spot yield estimation (100H-4). Bond yields are estimated using twelve month trailing averages of ValuBond rates. Exhibit 100H-7, Exhibit 3 shows the historical ValuBond data and averages, along with Financial Paper rates

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<sup>19</sup> The estimate deferral rate of 1.4 years was estimated in the AIB Stock Turnover study 2004 filed as Appendix A in the 2007 AIB Filing on underwriting profit.

from the Federal Reserve Statistical Release H-15 as proxies for short rates. Common stock returns are estimated at 10.93% by CAPM using the average of three month, five year and ten year risk free yields, market risk premiums of 8.48%, 7.51% and 7.40% (see 100H-5) and a beta of 1.00. The common stock dividend rate of 1.63% is the ten year average from Morningstar 2008 Yearbook. Preferred stock yields are taken from current Mergent Bond Records. Mortgage loan rates are selected to be equal to the long corporate bond rate. Real estate returns are estimated as beta=0.25 securities. The remaining assets are assumed to be beta one asset returns with a tax rate equal to the rest of the portfolio.

### **Federal Taxes**

The inclusion of cash flows for federal income taxes in the IRR Model requires three sets of tax-related parameters: asset income tax rates, reserve discounting factors for the underwriting income tax calculations, and a revenue offset tax factor.

Tax rates for each asset type are shown in Exhibit 1, page 1.

Current tax law measures underwriting gain/ (loss) using discounted losses. The discount factor and payout rate used for determining the federal income tax flow are described and calculated in 100H-7, Exhibits 6 and 7.<sup>21</sup> The federal tax rate applicable to underwriting gain/ (loss) is 35%. The calculation of, the revenue offset tax factor for changes in the unearned premium reserve, is outlined in Exhibit 5.

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<sup>20</sup> Kulp, C.A. and John W. Hall (1968), Casualty Insurance, 4<sup>th</sup> Edition, Ronald Press, New York, pp. 981-983 is a classic reference, while Marshall, David H. et. al. (1997), Accounting and Finance for Insurance Professionals, AICPCU, Malvern, PA is a more modern view.

<sup>21</sup>The IRS determination of payout rate is revised every five years. The 2008 revisions to the loss payment patterns per IRS Rev. Proc. 2008-10 (IRS Bulletin 2008-3) are reflected in 100H-7, Exhibit 6.

**Massachusetts Private Passenger Automobile  
Internal Rate of Return Model  
Summary of Underwriting Profit  
Facility Market**

	IRR Model
Bodily Injury Liability	1.11%
Property Damage Liability	1.00%
Physical Damage	3.70%
Overall <sup>(1)</sup>	1.77%

**Parameters**

Cost of Capital (IRR) (100H-5)	9.57%
a) Cost of Equity	10.96%
b) Cost of Debt (after-tax)	4.00%
c) Equity/Debt Weights	80.00/20.00
Investment Income (net of investment expense)	
a) Risk-free 1 year spot yield (100H-4)	2.10%
b) Asset return (pre-tax) (100H-7)	5.06%
Income Taxes (100H-7)	
a) Underwriting Income	35.00%
b) Investment Income	28.69%
c) Federal AFR for Loss Reserves	4.06%
Reserves/Surplus Ratio (100H-6) <sup>(2)</sup>	1.50
Finance Charge (100H-8)	0.00%
Cash Flows (100H-3)	
Losses - Estimated from AY payment patterns valued through 12/31/07	
Premium - Paid at policy inception	
Expense - survey	

(1) Weighted by current average rates:

Bodily Injury Liability	41%
Property Damage Liability	32%
Physical Damage	27%

(2) For physical damage, R/S ratio is adjusted by gross to net losses (1.41)  
to account for application to gross reserves

**Massachusetts Private Passenger Automobile  
Internal Rate of Return Model<sup>1</sup>  
Single Policy Formulation**

**Basic Principle**

*Internal Rate of Return:* the discount rate that makes the net present value (NPV) of a capital investment and the future returns on that investment equal to zero.<sup>2</sup>

**Single Policy Formulation for Massachusetts**

The underwriting profit provision is established so that, when loss and expense provisions are balanced to produce 2.3% premium tax, net surplus flows resulting from underwriting and investment operations produce NPV=0 at the target cost of capital (IRR).

**Surplus Flow**

Surplus ( $S_0$ ) is committed at policy inception (end of quarter 0/beginning of quarter 1) and is retained to support outstanding policy liabilities, i.e. losses and expenses remaining to be paid ( $R_i$ ).

$$S_i = R_i \times (S_0/R_0) = (R_i/R_0) \times S_0, \text{ quarter } i = 0,1,2,\dots$$

Net surplus cash flow is generated from an initial investment ( $S_0$ ), investment income ( $I$ ) plus the net cash flow from underwriting ( $UW$ ), and satisfies:

$$S_{i-1} - S_i + I_i + UW_i, \text{ quarter } i = 0,1,2,\dots$$

**Underwriting Flow**

The *Policyholder Account* (PH) is developed from the funds for the insurance transaction:

<u>Revenue</u>	<u>Expense</u>
premium (P)	loss payment (L)
finance charge (FC)	company expense (E)
subrogation (SUB)	commission & premium tax ( $CT^p$ )
	underwriting income tax ( $T^u$ )

The preliminary policyholder account balance accumulates from the quarterly cash flows:

$$PH_i = PH_{i-1}^F + [P_i + FC_i + SUB_i - L_i - E_i - CT_i^p - T_i^u], \text{ quarter } i = 0,1,2,\dots$$

A minimum level of funding is established for the policyholder account balance equal to the NPV of the remaining underwriting flows discounted by quarterly spot yields. The final policyholder account balance ( $PH_i^F$ ) may include an adjustment to the preliminary  $PH_i$ :

<u>if <math>PH_i &lt; \text{minimum } PH_i</math></u>	<u>if <math>PH_i &gt; \text{minimum } PH_i</math></u>
<ul style="list-style-type: none"> <li>• retain <math>I_i</math></li> <li>• create cash deficiency, if necessary</li> </ul>	<ul style="list-style-type: none"> <li>• release portion of excess to shareholders</li> </ul>

Any available excess ( $PH_i - \text{minimum } PH_i$ ) is released in proportion to the level of risk resolved ( $UW \text{ risk}_i / UW \text{ risk}_{\text{total}}$ ).

**Investment Income**

*Investment Income* ( $I$ ) is derived from investing assets at the portfolio rate ( $r_A$ , adjusted to a quarterly return  $r_A^q$ ). Investment income is generated from prior quarter end invested assets ( $IA = \text{policyholder} + \text{invested surplus accounts}$ ) adjusted by the inflow and outgo from current quarter policyholder flows.

$$I_i = IA_{i-1} \times r_A^q + P_i \times [(1 + r_A^q)^{\% \text{ qtr. held}} - 1] - C_i \times r_A^q - (L_i - SUB_i + E_i) \times [(1 + r_A^q)^{1/2} - 1], \text{ quarter } i = 1,2,\dots$$

The above calculation of investment returns reflects the expected timing of the policyholder cash flows:

- premium ( $P_i$ ) is invested from the day in the quarter it is received (% qtr held);
- commissions ( $C_i$ ), paid at policy inception, reduce income from the beginning of the quarter;
- losses ( $L_i$ ), net of subrogation, and company expenses ( $E_i$ ) reduce investment income from, on average, mid-quarter.

Premium and underwriting income tax is assumed paid at the end of the quarter. Investment taxes are paid at the end of each quarter as they accrue; i.e. with the receipt of the investment income.

<sup>1</sup> The AIB electronic implementation of the Massachusetts CDM IRR Underwriting Profit model, © AIB 2004, has been developed by Richard A. Derrig and Kim A. Barber of AIB and is proprietary, and copywritten by, the Automobile Insurers Bureau of Massachusetts.

<sup>2</sup> For example, Brealey, Richard A. and Myers, Stewart C., Principles of Corporate Finance, 6<sup>th</sup> edition, Irwin McGraw-Hill, 2000, chapter 5.

**Massachusetts Private Passenger Automobile  
Internal Rate of Return Model  
Summary  
Bodily Injury Coverages**

Final Weights:	<u>Nominal</u>	<u>Percentage of Premium</u>
(1) Loss and ALAE	\$732.04	72.39%
(2) Commission Expense	\$131.45	13.00%
(3) Company Expense	\$113.25	11.20%
(4) Premium Tax	\$23.26	2.30%
Subtotal	\$1,000.00	98.89%
(5) Underwriting Profit	\$11.18	1.11%
(6) Premium	\$1,011.18	100.00%

Underwriting Profit Provision	1.11%
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Parameters

Investment Income Return (pre-tax)	5.06%
Investment Income Tax Rate	28.69%
Underwriting Income Tax Rate	35.00%
Reserves-to Surplus Ratio	1.50
Finance Charge Income	0.00%

Internal Rate of Return	9.57%
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**Massachusetts Private Passenger Automobile  
Internal Rate of Return Model  
Policy Flows  
Bodily Injury Coverages**

<b>Qtr</b>	<b>Premium</b>	<b>Prem.</b>		<b>Other Expense</b>	<b>Paid Loss</b>		<b>Net</b>
		<b>Tax</b>	<b>Commission</b>		<b>Gross</b>	<b>Recovery</b>	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
0	1,011.18	0.00	0.00	22.65	0.00	0.00	0.00
1	0.00	23.26	131.45	33.97	8.75	0.00	8.75
2	0.00	0.00	0.00	22.65	51.63	0.00	51.63
3	0.00	0.00	0.00	16.99	83.90	0.00	83.90
4	0.00	0.00	0.00	16.99	104.03	0.00	104.03
5	0.00	0.00	0.00	0.00	114.40	0.00	114.40
6	0.00	0.00	0.00	0.00	85.08	0.00	85.08
7	0.00	0.00	0.00	0.00	58.36	0.00	58.36
8	0.00	0.00	0.00	0.00	45.41	0.00	45.41
9	0.00	0.00	0.00	0.00	30.94	0.00	30.94
10	0.00	0.00	0.00	0.00	25.98	0.00	25.98
11	0.00	0.00	0.00	0.00	19.58	0.00	19.58
12	0.00	0.00	0.00	0.00	16.86	0.00	16.86
13	0.00	0.00	0.00	0.00	15.08	0.00	15.08
14	0.00	0.00	0.00	0.00	13.07	0.00	13.07
15	0.00	0.00	0.00	0.00	10.16	0.00	10.16
16	0.00	0.00	0.00	0.00	8.93	0.00	8.93
17	0.00	0.00	0.00	0.00	6.90	0.00	6.90
18	0.00	0.00	0.00	0.00	5.57	0.00	5.57
19	0.00	0.00	0.00	0.00	5.02	0.00	5.02
20	0.00	0.00	0.00	0.00	4.09	0.00	4.09
21	0.00	0.00	0.00	0.00	3.44	0.00	3.44
22	0.00	0.00	0.00	0.00	2.77	0.00	2.77
23	0.00	0.00	0.00	0.00	2.39	0.00	2.39
24	0.00	0.00	0.00	0.00	1.69	0.00	1.69
25	0.00	0.00	0.00	0.00	1.37	0.00	1.37
26	0.00	0.00	0.00	0.00	1.68	0.00	1.68
27	0.00	0.00	0.00	0.00	0.99	0.00	0.99
28	0.00	0.00	0.00	0.00	0.57	0.00	0.57
29	0.00	0.00	0.00	0.00	0.29	0.00	0.29
30	0.00	0.00	0.00	0.00	0.72	0.00	0.72
31	0.00	0.00	0.00	0.00	0.41	0.00	0.41
32	0.00	0.00	0.00	0.00	0.61	0.00	0.61
33	0.00	0.00	0.00	0.00	0.18	0.00	0.18
34	0.00	0.00	0.00	0.00	0.23	0.00	0.23
35	0.00	0.00	0.00	0.00	0.21	0.00	0.21
36	0.00	0.00	0.00	0.00	0.23	0.00	0.23
37	0.00	0.00	0.00	0.00	0.07	0.00	0.07
38	0.00	0.00	0.00	0.00	0.27	0.00	0.27
39	0.00	0.00	0.00	0.00	0.09	0.00	0.09
40	0.00	0.00	0.00	0.00	0.09	0.00	0.09
<b>Totals</b>	1,011.18	23.26	131.45	113.25	732.04	0.00	732.04

Weights for premium, commission, other expense and loss are chosen to preserve loss to expense ratios in the proposed rates.

**Massachusetts Private Passenger Automobile  
Internal Rate of Return Model  
Underwriting Taxes  
Bodily Injury Coverages**

<u>Year</u>	<u>Premium Written</u> (1)	<u>Expense</u> (2)	<u>Paid Loss</u> (3)	<u>Outstanding Loss</u> (4)	<u>Reserve Discount Factor</u> (5)	<u>UW Income</u> (6)	<u>Revenue Offset</u> (7)	<u>Final UW Tax</u> (8)
0	0.00	22.65	0.00	0.00	0.0000	-22.65	0.00	-7.93
1	1,011.18	245.31	248.31	483.73	0.9419	61.93	0.20	21.75
2	0.00	0.00	303.25	180.48	0.9393	-17.15	0.00	-6.00
3	0.00	0.00	93.36	87.12	0.9409	-5.81	0.00	-2.03
4	0.00	0.00	47.24	39.88	0.9379	-2.67	0.00	-0.94
5	0.00	0.00	21.58	18.30	0.9305	-1.20	0.00	-0.42
6	0.00	0.00	10.28	8.02	0.9259	-0.68	0.00	-0.24
7	0.00	0.00	4.61	3.41	0.9245	-0.34	0.00	-0.12
8	0.00	0.00	2.04	1.37	0.9224	-0.15	0.00	-0.05
9	0.00	0.00	0.85	0.52	0.9311	-0.07	0.00	-0.02
10	0.00	0.00	0.52	0.00	0.9489	-0.04	0.00	-0.01
<b>Totals</b>	1,011.18	267.96	732.04			11.18	0.20	3.98

**Massachusetts Private Passenger Automobile  
Internal Rate of Return Model  
Intermediate Flows  
Bodily Injury Coverages**

<b>Qtr</b>	<b>Cumulative Gross Loss &amp; Expense Payment</b>	<b>Cumulative Loss Recovered</b>	<b>Gross Loss &amp; Expense Outstanding</b>	<b>Disc'd Loss &amp; Gross Exp. Outstanding</b>	<b>Cumulative Premium Received</b>	<b>Underwriting Risk Flow</b>
	(1)	(2)	(3)	(4)	(5)	(6)
0	22.65	0.00	977.35	946.00	1,011.18	22.90
1	220.09	0.00	779.91	753.08	1,011.18	222.55
2	294.37	0.00	705.63	683.18	1,011.18	297.66
3	395.25	0.00	604.75	586.27	1,011.18	399.67
4	516.27	0.00	483.73	468.67	1,011.18	522.04
5	630.67	0.00	369.33	357.02	1,011.18	637.72
6	715.75	0.00	284.25	274.09	1,011.18	723.75
7	774.11	0.00	225.89	217.43	1,011.18	782.76
8	819.52	0.00	180.48	173.40	1,011.18	828.68
9	850.46	0.00	149.54	143.60	1,011.18	859.96
10	876.44	0.00	123.56	118.57	1,011.18	886.24
11	896.02	0.00	103.98	99.81	1,011.18	906.04
12	912.88	0.00	87.12	83.64	1,011.18	923.08
13	927.96	0.00	72.04	69.15	1,011.18	938.33
14	941.03	0.00	58.97	56.56	1,011.18	951.55
15	951.19	0.00	48.81	46.81	1,011.18	961.82
16	960.12	0.00	39.88	38.23	1,011.18	970.85
17	967.02	0.00	32.98	31.61	1,011.18	977.83
18	972.59	0.00	27.41	26.28	1,011.18	983.46
19	977.61	0.00	22.39	21.46	1,011.18	988.54
20	981.70	0.00	18.30	17.55	1,011.18	992.67
21	985.14	0.00	14.86	14.24	1,011.18	996.15
22	987.90	0.00	12.10	11.59	1,011.18	998.95
23	990.29	0.00	9.71	9.30	1,011.18	1,001.36
24	991.98	0.00	8.02	7.69	1,011.18	1,003.07
25	993.35	0.00	6.65	6.38	1,011.18	1,004.46
26	995.03	0.00	4.97	4.75	1,011.18	1,006.15
27	996.02	0.00	3.98	3.80	1,011.18	1,007.16
28	996.59	0.00	3.41	3.27	1,011.18	1,007.73
29	996.88	0.00	3.12	3.01	1,011.18	1,008.02
30	997.60	0.00	2.40	2.31	1,011.18	1,008.76
31	998.01	0.00	1.99	1.92	1,011.18	1,009.17
32	998.63	0.00	1.37	1.33	1,011.18	1,009.79
33	998.81	0.00	1.19	1.15	1,011.18	1,009.98
34	999.04	0.00	0.96	0.94	1,011.18	1,010.21
35	999.25	0.00	0.75	0.73	1,011.18	1,010.42
36	999.48	0.00	0.52	0.51	1,011.18	1,010.65
37	999.55	0.00	0.45	0.45	1,011.18	1,010.72
38	999.82	0.00	0.18	0.18	1,011.18	1,011.00
39	999.91	0.00	0.09	0.09	1,011.18	1,011.09
40	1,000.00	0.00	0.00	0.00	1,011.18	1,011.18

**Massachusetts Private Passenger Automobile  
Internal Rate of Return Model  
Policyholder Cash Flows  
Bodily Injury Coverages**

<u>Qtr</u>	Premium & Finance Charge <u>Received</u> (1)	Gross Loss & Expense <u>Payment</u> (2)	Salvage/ Subrogation <u>Recovery</u> (3)	Quarterly <u>UW Tax</u> (4)	Quarterly Policyholder Account <u>Flow</u> (5)	Preliminary Policyholder Account <u>Balance</u> (6)
0	1,011.18	22.65	0.00	-7.93	996.46	996.46
1	0.00	197.44	0.00	5.44	-202.87	792.97
2	0.00	74.28	0.00	5.44	-79.72	708.16
3	0.00	100.89	0.00	5.44	-106.33	597.36
4	0.00	121.02	0.00	5.44	-126.45	467.66
5	0.00	114.40	0.00	-1.50	-112.90	353.27
6	0.00	85.08	0.00	-1.50	-83.57	269.94
7	0.00	58.36	0.00	-1.50	-56.86	214.36
8	0.00	45.41	0.00	-1.50	-43.91	171.48
9	0.00	30.94	0.00	-0.51	-30.43	141.87
10	0.00	25.98	0.00	-0.51	-25.47	117.09
11	0.00	19.58	0.00	-0.51	-19.07	98.60
12	0.00	16.86	0.00	-0.51	-16.35	82.74
13	0.00	15.08	0.00	-0.23	-14.85	68.32
14	0.00	13.07	0.00	-0.23	-12.84	55.84
15	0.00	10.16	0.00	-0.23	-9.92	46.22
16	0.00	8.93	0.00	-0.23	-8.69	37.77
17	0.00	6.90	0.00	-0.11	-6.80	31.19
18	0.00	5.57	0.00	-0.11	-5.47	25.90
19	0.00	5.02	0.00	-0.11	-4.91	21.13
20	0.00	4.09	0.00	-0.11	-3.98	17.28
21	0.00	3.44	0.00	-0.06	-3.38	14.00
22	0.00	2.77	0.00	-0.06	-2.71	11.38
23	0.00	2.39	0.00	-0.06	-2.33	9.13
24	0.00	1.69	0.00	-0.06	-1.63	7.55
25	0.00	1.37	0.00	-0.03	-1.34	6.26
26	0.00	1.68	0.00	-0.03	-1.65	4.65
27	0.00	0.99	0.00	-0.03	-0.96	3.72
28	0.00	0.57	0.00	-0.03	-0.54	3.21
29	0.00	0.29	0.00	-0.01	-0.28	2.95
30	0.00	0.72	0.00	-0.01	-0.71	2.26
31	0.00	0.41	0.00	-0.01	-0.40	1.88
32	0.00	0.61	0.00	-0.01	-0.60	1.30
33	0.00	0.18	0.00	-0.01	-0.18	1.13
34	0.00	0.23	0.00	-0.01	-0.22	0.92
35	0.00	0.21	0.00	-0.01	-0.21	0.72
36	0.00	0.23	0.00	-0.01	-0.22	0.50
37	0.00	0.07	0.00	0.00	-0.06	0.44
38	0.00	0.27	0.00	0.00	-0.27	0.17
39	0.00	0.09	0.00	0.00	-0.09	0.09
40	0.00	0.09	0.00	0.00	-0.09	0.00
<b>Totals</b>	1,011.18	1,000.00	0.00			

**Massachusetts Private Passenger Automobile  
Internal Rate of Return Model  
Investment Income  
Bodily Injury Coverages**

<b>Qtr</b>	<b>Investment Income derived from</b>		<b>Investment</b>	<b>Investment</b>	<b>After-tax Investment Income</b>
	<b>Current UW Flow</b>	<b>Prior Qtr. Assets</b>	<b>Income Total</b>	<b>Income Tax</b>	
	<b>(1)</b>	<b>(2)</b>	<b>(3)</b>	<b>(4)</b>	<b>(5)</b>
0	-0.14		-0.14	-0.04	-0.10
1	-1.90	20.46	18.56	5.32	13.23
2	-0.46	16.24	15.78	4.53	11.25
3	-0.62	14.58	13.95	4.00	9.95
4	-0.75	12.38	11.63	3.34	8.30
5	-0.71	9.79	9.08	2.61	6.48
6	-0.53	7.45	6.92	1.99	4.93
7	-0.36	5.72	5.36	1.54	3.82
8	-0.28	4.54	4.26	1.22	3.04
9	-0.19	3.63	3.44	0.99	2.45
10	-0.16	3.01	2.85	0.82	2.03
11	-0.12	2.48	2.36	0.68	1.68
12	-0.10	2.09	1.99	0.57	1.42
13	-0.09	1.75	1.66	0.48	1.18
14	-0.08	1.45	1.37	0.39	0.98
15	-0.06	1.19	1.12	0.32	0.80
16	-0.06	0.98	0.93	0.27	0.66
17	-0.04	0.80	0.76	0.22	0.54
18	-0.03	0.66	0.63	0.18	0.45
19	-0.03	0.55	0.52	0.15	0.37
20	-0.03	0.45	0.42	0.12	0.30
21	-0.02	0.37	0.35	0.10	0.25
22	-0.02	0.30	0.28	0.08	0.20
23	-0.01	0.24	0.23	0.07	0.16
24	-0.01	0.19	0.18	0.05	0.13
25	-0.01	0.16	0.15	0.04	0.11
26	-0.01	0.13	0.12	0.04	0.09
27	-0.01	0.10	0.09	0.03	0.07
28	0.00	0.08	0.08	0.02	0.05
29	0.00	0.07	0.07	0.02	0.05
30	0.00	0.06	0.06	0.02	0.04
31	0.00	0.05	0.05	0.01	0.03
32	0.00	0.04	0.04	0.01	0.03
33	0.00	0.03	0.03	0.01	0.02
34	0.00	0.02	0.02	0.01	0.02
35	0.00	0.02	0.02	0.01	0.01
36	0.00	0.02	0.01	0.00	0.01
37	0.00	0.01	0.01	0.00	0.01
38	0.00	0.01	0.01	0.00	0.01
39	0.00	0.00	0.00	0.00	0.00
40	0.00	0.00	0.00	0.00	0.00

**Massachusetts Private Passenger Automobile  
Internal Rate of Return Model  
Underwriting and Surplus Flow  
Bodily Injury Coverages**

Qtr	Required	Preliminary	Adjustment to Policyholder Account			Final	Surplus	Invested
	Policyholder	Account	Investment	Cash	UW Flow	Policyholder		
	Account	Excess/ (Deficiency)	Income	Deficiency	Released to	Account	Account	Assets
	Balance	(2)	Retained	(3b)	Shareholders	Balance	(5)	(6)
	(1)		(3a)		(3c)	(4)		
0	969.40	27.06	0.00	0.00	-0.61	995.84	651.57	1,647.41
1	769.83	23.14	0.00	0.00	-5.09	787.88	519.94	1,307.82
2	692.95	15.21	0.00	0.00	-4.48	703.69	470.42	1,174.11
3	589.14	8.22	0.00	0.00	-3.25	594.11	403.16	997.27
4	464.77	2.88	0.00	0.00	-1.49	466.17	322.49	788.65
5	353.52	-0.25	0.25	0.00	0.00	353.52	246.22	599.74
6	271.23	-1.28	1.28	0.00	0.00	271.23	189.50	460.73
7	215.38	-1.02	1.02	0.00	0.00	215.38	150.59	365.98
8	172.31	-0.83	0.83	0.00	0.00	172.31	120.32	292.63
9	142.56	-0.69	0.69	0.00	0.00	142.56	99.70	242.26
10	117.67	-0.58	0.58	0.00	0.00	117.67	82.37	200.04
11	99.09	-0.49	0.49	0.00	0.00	99.09	69.32	168.41
12	83.16	-0.42	0.42	0.00	0.00	83.16	58.08	141.25
13	68.68	-0.36	0.36	0.00	0.00	68.68	48.03	116.71
14	56.14	-0.30	0.30	0.00	0.00	56.14	39.31	95.45
15	46.47	-0.25	0.25	0.00	0.00	46.47	32.54	79.01
16	37.99	-0.21	0.21	0.00	0.00	37.99	26.59	64.58
17	31.36	-0.18	0.18	0.00	0.00	31.36	21.99	53.35
18	26.05	-0.15	0.15	0.00	0.00	26.05	18.27	44.32
19	21.26	-0.13	0.13	0.00	0.00	21.26	14.93	36.19
20	17.38	-0.10	0.10	0.00	0.00	17.38	12.20	29.59
21	14.09	-0.09	0.09	0.00	0.00	14.09	9.91	24.00
22	11.45	-0.07	0.07	0.00	0.00	11.45	8.06	19.52
23	9.18	-0.06	0.06	0.00	0.00	9.18	6.47	15.66
24	7.60	-0.05	0.05	0.00	0.00	7.60	5.35	12.95
25	6.30	-0.04	0.04	0.00	0.00	6.30	4.43	10.73
26	4.68	-0.03	0.03	0.00	0.00	4.68	3.31	8.00
27	3.75	-0.03	0.03	0.00	0.00	3.75	2.65	6.40
28	3.23	-0.02	0.02	0.00	0.00	3.23	2.27	5.51
29	2.97	-0.02	0.02	0.00	0.00	2.97	2.08	5.05
30	2.28	-0.02	0.02	0.00	0.00	2.28	1.60	3.88
31	1.90	-0.01	0.01	0.00	0.00	1.90	1.32	3.22
32	1.31	-0.01	0.01	0.00	0.00	1.31	0.92	2.22
33	1.14	-0.01	0.01	0.00	0.00	1.14	0.79	1.93
34	0.92	-0.01	0.01	0.00	0.00	0.92	0.64	1.56
35	0.72	-0.01	0.01	0.00	0.00	0.72	0.50	1.22
36	0.50	0.00	0.00	0.00	0.00	0.50	0.35	0.85
37	0.44	0.00	0.00	0.00	0.00	0.44	0.30	0.75
38	0.17	0.00	0.00	0.00	0.00	0.17	0.12	0.29
39	0.09	0.00	0.00	0.00	0.00	0.09	0.06	0.15
40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

**4/1/2009 Massachusetts Private Passenger Automobile  
Internal Rate of Return Model  
Investor Cash Flow  
Bodily Injury Coverages**

<u>Qtr</u>	<u>Surplus</u> (1)	<u>Surplus</u> <u>Flow</u> (2)	<u>Cash</u> <u>Deficiency</u> <u>Flow</u> (3)	<u>Underwriting</u> <u>Flow to</u> <u>Shareholders</u> (4)	<u>After-tax</u> <u>Investment</u> <u>Income</u> (5)	<u>Net</u> <u>Surplus</u> <u>Flow</u> (6)
						0.00
<b>0</b>	651.57	-651.57	0.00	0.61	-0.10	-651.05
<b>1</b>	519.94	131.63	0.00	5.09	13.23	149.95
<b>2</b>	470.42	49.52	0.00	4.48	11.25	65.25
<b>3</b>	403.16	67.26	0.00	3.25	9.95	80.46
<b>4</b>	322.49	80.68	0.00	1.49	8.30	90.46
<b>5</b>	246.22	76.27	0.00	-0.25	6.48	82.50
<b>6</b>	189.50	56.72	0.00	-1.28	4.93	60.37
<b>7</b>	150.59	38.91	0.00	-1.02	3.82	41.71
<b>8</b>	120.32	30.27	0.00	-0.83	3.04	32.48
<b>9</b>	99.70	20.63	0.00	-0.69	2.45	22.39
<b>10</b>	82.37	17.32	0.00	-0.58	2.03	18.77
<b>11</b>	69.32	13.05	0.00	-0.49	1.68	14.24
<b>12</b>	58.08	11.24	0.00	-0.42	1.42	12.23
<b>13</b>	48.03	10.05	0.00	-0.36	1.18	10.88
<b>14</b>	39.31	8.72	0.00	-0.30	0.98	9.39
<b>15</b>	32.54	6.77	0.00	-0.25	0.80	7.32
<b>16</b>	26.59	5.95	0.00	-0.21	0.66	6.40
<b>17</b>	21.99	4.60	0.00	-0.18	0.54	4.97
<b>18</b>	18.27	3.71	0.00	-0.15	0.45	4.01
<b>19</b>	14.93	3.35	0.00	-0.13	0.37	3.59
<b>20</b>	12.20	2.72	0.00	-0.10	0.30	2.92
<b>21</b>	9.91	2.29	0.00	-0.09	0.25	2.45
<b>22</b>	8.06	1.84	0.00	-0.07	0.20	1.97
<b>23</b>	6.47	1.59	0.00	-0.06	0.16	1.69
<b>24</b>	5.35	1.13	0.00	-0.05	0.13	1.21
<b>25</b>	4.43	0.92	0.00	-0.04	0.11	0.98
<b>26</b>	3.31	1.12	0.00	-0.03	0.09	1.17
<b>27</b>	2.65	0.66	0.00	-0.03	0.07	0.70
<b>28</b>	2.27	0.38	0.00	-0.02	0.05	0.41
<b>29</b>	2.08	0.19	0.00	-0.02	0.05	0.22
<b>30</b>	1.60	0.48	0.00	-0.02	0.04	0.51
<b>31</b>	1.32	0.27	0.00	-0.01	0.03	0.29
<b>32</b>	0.92	0.41	0.00	-0.01	0.03	0.42
<b>33</b>	0.79	0.12	0.00	-0.01	0.02	0.13
<b>34</b>	0.64	0.15	0.00	-0.01	0.02	0.16
<b>35</b>	0.50	0.14	0.00	-0.01	0.01	0.15
<b>36</b>	0.35	0.15	0.00	0.00	0.01	0.16
<b>37</b>	0.30	0.05	0.00	0.00	0.01	0.05
<b>38</b>	0.12	0.18	0.00	0.00	0.01	0.19
<b>39</b>	0.06	0.06	0.00	0.00	0.00	0.06
<b>40</b>	0.00	0.06	0.00	0.00	0.00	0.06

NPV @ 9.57% IRR

**Massachusetts Private Passenger Automobile  
Internal Rate of Return Model  
Summary  
Property Damage Coverages**

Final Weights:	<u>Nominal</u>	<u>Percentage of Premium</u>
(1) Loss and ALAE	\$738.13	73.08%
(2) Commission Expense	\$131.31	13.00%
(3) Company Expense	\$107.32	10.63%
(4) Premium Tax	\$23.23	2.30%
Subtotal	\$1,000.00	99.00%
(5) Underwriting Profit	\$10.09	1.00%
(6) Premium	\$1,010.08	100.00%

Underwriting Profit Provision	1.00%
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Parameters

Investment Income Return (pre-tax)	5.06%
Investment Income Tax Rate	28.69%
Underwriting Income Tax Rate	35.00%
Reserves-to Surplus Ratio	1.50
Finance Charge Income	0.00%

Internal Rate of Return	9.57%
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**Massachusetts Private Passenger Automobile  
Internal Rate of Return Model  
Policy Flows  
Property Damage Coverages**

<u>Qtr</u>	<u>Premium</u> (1)	<u>Prem.</u>		<u>Other</u> <u>Expense</u> (4)	<u>Paid Loss</u>		<u>Net</u> (7)
		<u>Tax</u> (2)	<u>Commission</u> (3)		<u>Gross</u> (5)	<u>Salv/Subro</u> <u>Recovery</u> (6)	
0	1,010.08	0.00	0.00	21.46	0.00	0.00	0.00
1	0.00	23.23	131.31	32.20	65.62	0.00	65.62
2	0.00	0.00	0.00	21.46	137.05	0.00	137.05
3	0.00	0.00	0.00	16.10	151.65	0.00	151.65
4	0.00	0.00	0.00	16.10	158.82	0.00	158.82
5	0.00	0.00	0.00	0.00	122.34	0.00	122.34
6	0.00	0.00	0.00	0.00	45.06	0.00	45.06
7	0.00	0.00	0.00	0.00	22.74	0.00	22.74
8	0.00	0.00	0.00	0.00	10.49	0.00	10.49
9	0.00	0.00	0.00	0.00	7.31	0.00	7.31
10	0.00	0.00	0.00	0.00	6.05	0.00	6.05
11	0.00	0.00	0.00	0.00	3.05	0.00	3.05
12	0.00	0.00	0.00	0.00	2.19	0.00	2.19
13	0.00	0.00	0.00	0.00	1.38	0.00	1.38
14	0.00	0.00	0.00	0.00	1.29	0.00	1.29
15	0.00	0.00	0.00	0.00	0.86	0.00	0.86
16	0.00	0.00	0.00	0.00	0.66	0.00	0.66
17	0.00	0.00	0.00	0.00	0.73	0.00	0.73
18	0.00	0.00	0.00	0.00	0.29	0.00	0.29
19	0.00	0.00	0.00	0.00	0.39	0.00	0.39
20	0.00	0.00	0.00	0.00	0.15	0.00	0.15
<b>Totals</b>	1,010.08	23.23	131.31	107.32	738.13	0.00	738.13

Weights for premium, commission, other expense and loss are chosen to preserve loss to expense ratios in the proposed rates.

**Massachusetts Private Passenger Automobile  
Internal Rate of Return Model  
Underwriting Taxes  
Property Damage Coverages**

<u>Year</u>	<u>Premium Written</u> (1)	<u>Expense</u> (2)	<u>Paid Loss</u> (3)	<u>Outstanding Loss</u> (4)	<u>Reserve Discount Factor</u> (5)	<u>UW Income</u> (6)	<u>Revenue Offset</u> (7)	<u>Final UW Tax</u> (8)
0	0.00	21.46	0.00	0.00	0.0000	-21.46	0.00	-7.51
1	1,010.08	240.40	513.15	224.98	0.9419	44.62	0.20	15.69
2	0.00	0.00	200.63	24.35	0.9393	-11.59	0.00	-4.06
3	0.00	0.00	18.60	5.76	0.9409	-1.14	0.00	-0.40
4	0.00	0.00	4.19	1.56	0.9379	-0.24	0.00	-0.09
5	0.00	0.00	1.56	0.00	0.9305	-0.10	0.00	-0.03
6	0.00	0.00	0.00	0.00	0.9259	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.9245	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.9224	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.9311	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.9489	0.00	0.00	0.00
<b>Totals</b>	1,010.08	261.87	738.13			10.08	0.20	3.60

**Massachusetts Private Passenger Automobile  
Internal Rate of Return Model  
Intermediate Flows  
Property Damage Coverages**

<u>Qtr</u>	Cumulative Gross Loss & Expense Payment (1)	Cumulative Loss Recovered (2)	Gross Loss & Expense Outstanding (3)	Disc'd Loss & Gross Exp. Outstanding (4)	Cumulative Premium Received (5)	Underwriting Risk Flow (6)
0	21.46	0.00	978.54	963.21	1,010.08	21.68
1	273.83	0.00	726.17	715.15	1,010.08	276.59
2	432.34	0.00	567.66	560.37	1,010.08	436.70
3	600.09	0.00	399.91	395.49	1,010.08	606.15
4	775.02	0.00	224.98	222.47	1,010.08	782.83
5	897.36	0.00	102.64	101.17	1,010.08	906.41
6	942.42	0.00	57.58	56.62	1,010.08	951.92
7	965.16	0.00	34.84	34.18	1,010.08	974.89
8	975.65	0.00	24.35	23.89	1,010.08	985.49
9	982.96	0.00	17.04	16.72	1,010.08	992.87
10	989.00	0.00	11.00	10.77	1,010.08	998.98
11	992.05	0.00	7.95	7.79	1,010.08	1,002.05
12	994.24	0.00	5.76	5.64	1,010.08	1,004.27
13	995.62	0.00	4.38	4.30	1,010.08	1,005.66
14	996.92	0.00	3.08	3.03	1,010.08	1,006.97
15	997.78	0.00	2.22	2.19	1,010.08	1,007.84
16	998.44	0.00	1.56	1.54	1,010.08	1,008.51
17	999.17	0.00	0.83	0.82	1,010.08	1,009.24
18	999.46	0.00	0.54	0.53	1,010.08	1,009.54
19	999.85	0.00	0.15	0.15	1,010.08	1,009.94
20	1,000.00	0.00	0.00	0.00	1,010.08	1,010.08

**Massachusetts Private Passenger Automobile  
Internal Rate of Return Model  
Policyholder Cash Flows  
Property Damage Coverages**

<u>Qtr</u>	Premium & Finance Charge <u>Received</u> (1)	Loss & Expense Payment (2)	Salvage/ Subrogation Recovery (3)	Quarterly UW Tax (4)	Quarterly Policyholder Account Flow (5)	Preliminary Policyholder Account Balance (6)
0	1,010.08	21.46	0.00	-7.51	996.13	996.13
1	0.00	252.36	0.00	3.92	-256.28	739.49
2	0.00	158.52	0.00	3.92	-162.44	573.51
3	0.00	167.75	0.00	3.92	-171.67	398.80
4	0.00	174.92	0.00	3.92	-178.84	218.65
5	0.00	122.34	0.00	-1.01	-121.33	97.62
6	0.00	45.06	0.00	-1.01	-44.05	54.17
7	0.00	22.74	0.00	-1.01	-21.72	32.75
8	0.00	10.49	0.00	-1.01	-9.48	23.44
9	0.00	7.31	0.00	-0.10	-7.21	16.35
10	0.00	6.05	0.00	-0.10	-5.95	10.48
11	0.00	3.05	0.00	-0.10	-2.95	7.59
12	0.00	2.19	0.00	-0.10	-2.09	5.54
13	0.00	1.38	0.00	-0.02	-1.36	4.21
14	0.00	1.29	0.00	-0.02	-1.27	2.96
15	0.00	0.86	0.00	-0.02	-0.84	2.13
16	0.00	0.66	0.00	-0.02	-0.64	1.51
17	0.00	0.73	0.00	-0.01	-0.72	0.79
18	0.00	0.29	0.00	-0.01	-0.29	0.51
19	0.00	0.39	0.00	-0.01	-0.38	0.14
20	0.00	0.15	0.00	-0.01	-0.14	0.00
<b>Totals</b>	1,010.08	1,000.00	0.00			

**Massachusetts Private Passenger Automobile  
Internal Rate of Return Model  
Investment Income  
Property Damage Coverages**

<u>Qtr</u>	<u>Investment Income derived from</u>		<u>Investment Income Total</u>	<u>Investment Income Tax</u>	<u>After-tax Investment Income</u>
	<u>Current UW Flow</u> (1)	<u>Prior Qtr. Assets</u> (2)			
0	-0.13		-0.13	-0.04	-0.09
1	-2.24	20.46	18.23	5.23	13.00
2	-0.98	15.15	14.17	4.06	10.10
3	-1.04	11.78	10.74	3.08	7.66
4	-1.08	8.25	7.16	2.06	5.11
5	-0.76	4.58	3.82	1.10	2.73
6	-0.28	2.07	1.79	0.51	1.28
7	-0.14	1.15	1.01	0.29	0.72
8	-0.06	0.70	0.63	0.18	0.45
9	-0.05	0.49	0.45	0.13	0.32
10	-0.04	0.35	0.31	0.09	0.22
11	-0.02	0.22	0.20	0.06	0.14
12	-0.01	0.16	0.15	0.04	0.10
13	-0.01	0.12	0.11	0.03	0.08
14	-0.01	0.09	0.08	0.02	0.06
15	-0.01	0.06	0.06	0.02	0.04
16	0.00	0.05	0.04	0.01	0.03
17	0.00	0.03	0.03	0.01	0.02
18	0.00	0.02	0.01	0.00	0.01
19	0.00	0.01	0.01	0.00	0.01
20	0.00	0.00	0.00	0.00	0.00

**Massachusetts Private Passenger Automobile  
Internal Rate of Return Model  
Underwriting and Surplus Flow  
Property Damage Coverages**

<u>Qtr</u>	Required	Preliminary	Adjustment to Policyholder Account			Final	Surplus	Invested
	Policyholder		Account	Investment	Cash			
	<u>Account</u>	<u>Excess/</u>	<u>Income</u>	<u>Cash</u>	<u>Released to</u>	<u>Account</u>	<u>Account</u>	<u>Assets</u>
	<u>Balance</u>	<u>(Deficiency)</u>	<u>Retained</u>	<u>Deficiency</u>	<u>Shareholders</u>	<u>Balance</u>	<u>Account</u>	<u>Assets</u>
	(1)	(2)	(3a)	(3b)	(3c)	(4)	(5)	(6)
0	979.70	16.43	0.00	0.00	-0.35	995.78	652.36	1,648.14
1	726.53	12.97	0.00	0.00	-3.55	735.94	484.11	1,220.06
2	566.49	7.01	0.00	0.00	-3.03	570.47	378.44	948.91
3	396.63	2.18	0.00	0.00	-1.31	397.50	266.60	664.10
4	218.95	-0.29	0.29	0.00	0.00	218.95	149.99	368.94
5	98.22	-0.60	0.60	0.00	0.00	98.22	68.43	166.65
6	54.47	-0.30	0.30	0.00	0.00	54.47	38.39	92.86
7	32.92	-0.17	0.17	0.00	0.00	32.92	23.23	56.15
8	23.56	-0.11	0.11	0.00	0.00	23.56	16.23	39.79
9	16.43	-0.08	0.08	0.00	0.00	16.43	11.36	27.80
10	10.54	-0.06	0.06	0.00	0.00	10.54	7.33	17.87
11	7.63	-0.04	0.04	0.00	0.00	7.63	5.30	12.93
12	5.57	-0.03	0.03	0.00	0.00	5.57	3.84	9.40
13	4.23	-0.02	0.02	0.00	0.00	4.23	2.92	7.15
14	2.97	-0.02	0.02	0.00	0.00	2.97	2.05	5.03
15	2.15	-0.01	0.01	0.00	0.00	2.15	1.48	3.62
16	1.52	-0.01	0.01	0.00	0.00	1.52	1.04	2.56
17	0.80	-0.01	0.01	0.00	0.00	0.80	0.55	1.35
18	0.52	0.00	0.00	0.00	0.00	0.52	0.36	0.87
19	0.14	0.00	0.00	0.00	0.00	0.14	0.10	0.23
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

**Massachusetts Private Passenger Automobile  
Internal Rate of Return Model  
Investor Cash Flow  
Property Damage Coverages**

<u>Qtr</u>	<u>Surplus</u> (1)	<u>Surplus</u> <u>Flow</u> (2)	<u>Cash</u> <u>Deficiency</u> <u>Flow</u> (3)	<u>Underwriting</u> <u>Flow to</u> <u>Shareholders</u> (4)	<u>After-tax</u> <u>Investment</u> <u>Income</u> (5)	<u>Net</u> <u>Surplus</u> <u>Flow</u> (6)
						0.00
						NPV @ 9.57% IRR
<b>0</b>	652.36	-652.36	0.00	0.35	-0.09	-652.10
<b>1</b>	484.11	168.24	0.00	3.55	13.00	184.79
<b>2</b>	378.44	105.68	0.00	3.03	10.10	118.81
<b>3</b>	266.60	111.83	0.00	1.31	7.66	120.80
<b>4</b>	149.99	116.61	0.00	-0.29	5.11	121.43
<b>5</b>	68.43	81.56	0.00	-0.60	2.73	83.68
<b>6</b>	38.39	30.04	0.00	-0.30	1.28	31.02
<b>7</b>	23.23	15.16	0.00	-0.17	0.72	15.71
<b>8</b>	16.23	6.99	0.00	-0.11	0.45	7.33
<b>9</b>	11.36	4.87	0.00	-0.08	0.32	5.11
<b>10</b>	7.33	4.03	0.00	-0.06	0.22	4.19
<b>11</b>	5.30	2.03	0.00	-0.04	0.14	2.14
<b>12</b>	3.84	1.46	0.00	-0.03	0.10	1.54
<b>13</b>	2.92	0.92	0.00	-0.02	0.08	0.97
<b>14</b>	2.05	0.86	0.00	-0.02	0.06	0.90
<b>15</b>	1.48	0.58	0.00	-0.01	0.04	0.60
<b>16</b>	1.04	0.44	0.00	-0.01	0.03	0.46
<b>17</b>	0.55	0.49	0.00	-0.01	0.02	0.50
<b>18</b>	0.36	0.20	0.00	0.00	0.01	0.20
<b>19</b>	0.10	0.26	0.00	0.00	0.01	0.26
<b>20</b>	0.00	0.10	0.00	0.00	0.00	0.10

**Massachusetts Private Passenger Automobile  
Internal Rate of Return Model  
Summary  
Physical Damage Coverages**

Final Weights:	<u>Nominal</u>	<u>Percentage of Premium</u>
(1) Loss and ALAE	\$717.19	69.06%
(2) Commission Expense	\$135.00	13.00%
(3) Company Expense	\$123.93	11.93%
(4) Premium Tax	\$23.88	2.30%
Subtotal	\$1,000.00	96.30%
(5) Underwriting Profit	\$38.44	3.70%
(6) Premium	\$1,038.44	100.00%

Underwriting Profit Provision	3.70%
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Parameters

Investment Income Return (pre-tax)	5.06%
Investment Income Tax Rate	28.69%
Underwriting Income Tax Rate	35.00%
Reserves-to Surplus Ratio (Gross)	2.11
Finance Charge Income	0.00%

Internal Rate of Return	9.57%
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**Massachusetts Private Passenger Automobile  
Internal Rate of Return Model  
Policy Flows  
Physical Damage Coverages**

<u>Qtr</u>	<u>Premium</u> (1)	<u>Prem.</u>		<u>Other</u> <u>Expense</u> (4)	<u>Paid Loss</u>		<u>Net</u> (7)
		<u>Tax</u> (2)	<u>Commission</u> (3)		<u>Gross</u> (5)	<u>Recovery</u> (6)	
0	1,038.44	0.00	0.00	24.79	0.00	0.00	0.00
1	0.00	23.88	135.00	37.18	197.53	-15.27	182.26
2	0.00	0.00	0.00	24.79	240.76	-47.67	193.09
3	0.00	0.00	0.00	18.59	239.07	-54.09	184.98
4	0.00	0.00	0.00	18.59	236.34	-62.95	173.39
5	0.00	0.00	0.00	0.00	80.46	-56.26	24.20
6	0.00	0.00	0.00	0.00	7.33	-23.62	-16.28
7	0.00	0.00	0.00	0.00	1.72	-11.28	-9.57
8	0.00	0.00	0.00	0.00	2.53	-7.64	-5.11
9	0.00	0.00	0.00	0.00	0.91	-4.71	-3.81
10	0.00	0.00	0.00	0.00	0.81	-2.21	-1.41
11	0.00	0.00	0.00	0.00	0.40	-1.71	-1.31
12	0.00	0.00	0.00	0.00	0.30	-1.15	-0.85
13	0.00	0.00	0.00	0.00	0.20	-1.24	-1.04
14	0.00	0.00	0.00	0.00	0.10	-0.64	-0.54
15	0.00	0.00	0.00	0.00	0.20	-0.52	-0.32
16	0.00	0.00	0.00	0.00	0.30	-0.38	-0.08
17	0.00	0.00	0.00	0.00	0.30	-0.44	-0.13
18	0.00	0.00	0.00	0.00	0.10	-0.20	-0.10
19	0.00	0.00	0.00	0.00	0.00	-0.17	-0.17
20	0.00	0.00	0.00	0.00	0.10	-0.12	-0.02
<b>Totals</b>	1,038.44	23.88	135.00	123.93	1,009.47	-292.28	717.19

Weights for premium, commission, other expense and loss are chosen to preserve loss to expense ratios in the proposed rates.

**Massachusetts Private Passenger Automobile  
Internal Rate of Return Model  
Underwriting Taxes  
Physical Damage Coverages**

<u>Year</u>	<u>Premium Written</u> (1)	<u>Expense</u> (2)	<u>Paid Loss</u> (3)	<u>Outstanding Loss</u> (4)	<u>Reserve Discount Factor</u> (5)	<u>UW Income</u> (6)	<u>Revenue Offset</u> (7)	<u>Final UW Tax</u> (8)
0	0.00	24.79	0.00	0.00	0.0000	-24.79	0.00	-8.68
1	1,038.44	258.03	733.72	-16.52	0.9786	62.87	0.21	22.08
2	0.00	0.00	-6.75	-9.77	0.9612	-0.03	0.00	-0.01
3	0.00	0.00	-7.37	-2.40	0.9803	0.33	0.00	0.12
4	0.00	0.00	-1.97	-0.43	0.9803	0.04	0.00	0.01
5	0.00	0.00	-0.43	0.00	0.9803	0.01	0.00	0.00
6	0.00	0.00	0.00	0.00	0.0000	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.0000	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.0000	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.0000	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.0000	0.00	0.00	0.00
<b>Totals</b>	1,038.44	282.81	717.19			38.44	0.21	13.53

**Massachusetts Private Passenger Automobile  
Internal Rate of Return Model  
Intermediate Flows  
Physical Damage Coverages**

<u>Qtr</u>	Cumulative	Cumulative	Gross Loss	Disc'd Loss	Cumulative	Underwriting
	Gross Loss & Expense Payment	Loss Recovered	& Expense Outstanding	& Gross Exp. Outstanding	Premium Received	Risk Flow
	(1)	(2)	(3)	(4)	(5)	(6)
0	24.79	0.00	1,267.49	1,252.95	1,038.44	19.92
1	418.37	-15.27	873.91	864.88	1,038.44	336.19
2	683.92	-62.94	608.36	603.60	1,038.44	549.58
3	941.57	-117.03	350.70	348.77	1,038.44	756.62
4	1,196.51	-179.98	95.77	95.17	1,038.44	961.48
5	1,276.97	-236.24	15.31	15.06	1,038.44	1,026.13
6	1,284.30	-259.86	7.98	7.80	1,038.44	1,032.03
7	1,286.02	-271.14	6.26	6.13	1,038.44	1,033.41
8	1,288.55	-278.78	3.73	3.63	1,038.44	1,035.44
9	1,289.46	-283.49	2.82	2.75	1,038.44	1,036.17
10	1,290.26	-285.70	2.02	1.96	1,038.44	1,036.82
11	1,290.67	-287.42	1.61	1.57	1,038.44	1,037.14
12	1,290.97	-288.57	1.31	1.28	1,038.44	1,037.39
13	1,291.17	-289.81	1.11	1.09	1,038.44	1,037.55
14	1,291.27	-290.44	1.01	0.99	1,038.44	1,037.63
15	1,291.47	-290.97	0.81	0.80	1,038.44	1,037.79
16	1,291.77	-291.34	0.50	0.50	1,038.44	1,038.03
17	1,292.08	-291.78	0.20	0.20	1,038.44	1,038.28
18	1,292.18	-291.99	0.10	0.10	1,038.44	1,038.36
19	1,292.18	-292.16	0.10	0.10	1,038.44	1,038.36
20	1,292.28	-292.28	0.00	0.00	1,038.44	1,038.44

**Massachusetts Private Passenger Automobile  
Internal Rate of Return Model  
Policyholder Cash Flows  
Physical Damage Coverages**

<u>Qtr</u>	Premium & Finance Charge <u>Received</u> (1)	Loss & Expense <u>Payment</u> (2)	Salvage/ Subrogation <u>Recovery</u> (3)	Quarterly <u>UW Tax</u> (4)	Quarterly Policyholder Account <u>Flow</u> (5)	Preliminary Policyholder Account <u>Balance</u> (6)
0	1,038.44	24.79	0.00	-8.68	1,022.33	1,022.33
1	0.00	393.59	-15.27	5.52	-383.84	896.16
2	0.00	265.54	-47.67	5.52	-223.39	669.09
3	0.00	257.66	-54.09	5.52	-209.09	432.17
4	0.00	254.93	-62.95	5.52	-197.50	178.54
5	0.00	80.46	-56.26	0.00	-24.20	77.48
6	0.00	7.33	-23.62	0.00	16.28	32.30
7	0.00	1.72	-11.28	0.00	9.57	17.72
8	0.00	2.53	-7.64	0.00	5.11	11.47
9	0.00	0.91	-4.71	0.03	3.78	7.60
10	0.00	0.81	-2.21	0.03	1.38	4.27
11	0.00	0.40	-1.71	0.03	1.28	3.34
12	0.00	0.30	-1.15	0.03	0.82	2.45
13	0.00	0.20	-1.24	0.00	1.04	2.34
14	0.00	0.10	-0.64	0.00	0.53	1.64
15	0.00	0.20	-0.52	0.00	0.32	1.33
16	0.00	0.30	-0.38	0.00	0.07	0.88
17	0.00	0.30	-0.44	0.00	0.13	0.64
18	0.00	0.10	-0.20	0.00	0.10	0.31
19	0.00	0.00	-0.17	0.00	0.17	0.28
20	0.00	0.10	-0.12	0.00	0.02	0.12
<b>Totals</b>	1,038.44	1,292.28	-292.28			

**Massachusetts Private Passenger Automobile  
Internal Rate of Return Model  
Investment Income  
Physical Damage Coverages**

<b>Qtr</b>	<u>Investment Income derived from</u>		<u>Investment</u>	<u>Investment</u>	<u>After-tax</u>
	<u>Current</u>	<u>Prior</u>	<u>Income</u>	<u>Income</u>	<u>Investment</u>
	<u>UW Flow</u>	<u>Qtr. Assets</u>	<u>Total</u>	<u>Tax</u>	<u>Income</u>
	(1)	(2)	(3)	(4)	(5)
0	-0.15		-0.15	-0.04	-0.11
1	-3.03	23.35	20.31	5.83	14.49
2	-1.35	16.22	14.87	4.27	10.61
3	-1.26	11.54	10.28	2.95	7.33
4	-1.19	6.73	5.54	1.59	3.95
5	-0.15	1.83	1.68	0.48	1.20
6	0.10	0.29	0.39	0.11	0.28
7	0.06	0.15	0.21	0.06	0.15
8	0.03	0.12	0.15	0.04	0.11
9	0.02	0.07	0.09	0.03	0.07
10	0.01	0.05	0.06	0.02	0.04
11	0.01	0.04	0.05	0.01	0.03
12	0.01	0.03	0.04	0.01	0.02
13	0.01	0.02	0.03	0.01	0.02
14	0.00	0.02	0.02	0.01	0.02
15	0.00	0.02	0.02	0.01	0.01
16	0.00	0.01	0.02	0.00	0.01
17	0.00	0.01	0.01	0.00	0.01
18	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00

**Massachusetts Private Passenger Automobile  
Internal Rate of Return Model  
Underwriting and Surplus Flow  
Physical Damage Coverages**

<u>Qtr</u>	Required	Preliminary	<u>Adjustment to Policyholder Account</u>			Final	Surplus	Invested
	Policyholder		Account	Investment	Cash			
	<u>Account</u>	<u>Excess/</u>	<u>Income</u>	<u>Cash</u>	<u>Released to</u>	<u>Account</u>		
	<u>Balance</u>	<u>(Deficiency)</u>	<u>Retained</u>	<u>Deficiency</u>	<u>Shareholders</u>	<u>Balance</u>	<u>Account</u>	<u>Assets</u>
	(1)	(2)	(3a)	(3b)	(3c)	(4)	(5)	(6)
0	1,280.00	-257.67	-0.11	257.78	0.00	1,280.00	600.34	1,880.34
1	884.80	11.37	0.00	0.00	-3.68	892.48	413.92	1,306.40
2	616.51	52.58	0.00	0.00	-27.83	641.26	288.15	929.41
3	355.14	77.04	0.00	0.00	-56.13	376.04	166.11	542.15
4	95.53	83.01	0.00	0.00	-76.86	101.68	45.36	147.04
5	15.28	62.20	0.00	0.00	-61.46	16.02	7.25	23.27
6	8.00	24.31	0.00	0.00	-24.16	8.15	3.78	11.93
7	6.31	11.40	0.00	0.00	-11.35	6.37	2.97	9.33
8	3.80	7.67	0.00	0.00	-7.65	3.82	1.77	5.59
9	2.88	4.72	0.00	0.00	-4.71	2.89	1.34	4.23
10	2.06	2.21	0.00	0.00	-2.21	2.06	0.96	3.02
11	1.63	1.71	0.00	0.00	-1.71	1.63	0.76	2.40
12	1.31	1.15	0.00	0.00	-1.14	1.31	0.62	1.93
13	1.11	1.24	0.00	0.00	-1.24	1.11	0.53	1.63
14	1.01	0.63	0.00	0.00	-0.63	1.01	0.48	1.49
15	0.81	0.52	0.00	0.00	-0.52	0.81	0.38	1.19
16	0.50	0.38	0.00	0.00	-0.38	0.50	0.24	0.74
17	0.20	0.44	0.00	0.00	-0.44	0.20	0.10	0.30
18	0.10	0.20	0.00	0.00	-0.20	0.10	0.05	0.15
19	0.10	0.17	0.00	0.00	-0.17	0.10	0.05	0.15
20	0.00	0.12	0.00	0.00	-0.12	0.00	0.00	0.00

**4/1/2009 Massachusetts Private Passenger Automobile  
 Internal Rate of Return Model  
 Investor Cash Flow  
 Physical Damage Coverages**

<u>Qtr</u>	<u>Surplus</u> (1)	<u>Surplus</u> <u>Flow</u> (2)	<u>Cash</u> <u>Deficiency</u> <u>Flow</u> (3)	<u>Underwriting</u> <u>Flow to</u> <u>Shareholders</u> (4)	<u>After-tax</u> <u>Investment</u> <u>Income</u> (5)	<u>Net</u> <u>Surplus</u> <u>Flow</u> (6)
						0.00
<b>0</b>	600.34	-600.34	-257.78	0.11	-0.11	-858.12
<b>1</b>	413.92	186.42	0.00	3.68	14.49	204.58
<b>2</b>	288.15	125.77	0.00	27.83	10.61	164.21
<b>3</b>	166.11	122.04	0.00	56.13	7.33	185.50
<b>4</b>	45.36	120.75	0.00	76.86	3.95	201.56
<b>5</b>	7.25	38.11	0.00	61.46	1.20	100.77
<b>6</b>	3.78	3.47	0.00	24.16	0.28	27.91
<b>7</b>	2.97	0.81	0.00	11.35	0.15	12.31
<b>8</b>	1.77	1.20	0.00	7.65	0.11	8.96
<b>9</b>	1.34	0.43	0.00	4.71	0.07	5.20
<b>10</b>	0.96	0.38	0.00	2.21	0.04	2.63
<b>11</b>	0.76	0.19	0.00	1.71	0.03	1.93
<b>12</b>	0.62	0.14	0.00	1.14	0.02	1.31
<b>13</b>	0.53	0.10	0.00	1.24	0.02	1.35
<b>14</b>	0.48	0.05	0.00	0.63	0.02	0.70
<b>15</b>	0.38	0.10	0.00	0.52	0.01	0.63
<b>16</b>	0.24	0.14	0.00	0.38	0.01	0.53
<b>17</b>	0.10	0.14	0.00	0.44	0.01	0.59
<b>18</b>	0.05	0.05	0.00	0.20	0.00	0.25
<b>19</b>	0.05	0.00	0.00	0.17	0.00	0.18
<b>20</b>	0.00	0.05	0.00	0.12	0.00	0.17

NPV @ 9.57% IRR

**Massachusetts Private Passenger Automobile  
Internal Rate of Return Profit Model  
Formula and Reference Documentation**

<b>Exhibit 1 Summary</b>	Sources: Final Weights - Exhibit 2, Columns (2), (3), (4), (7) Totals Premium - Exhibit 2, Column (1) Total
<b>Exhibit 2 Policy Flows</b>	Sources: Final Weight retains initial relative loss/expense weights from 100H-2 Premium & Loss Cash Flows by Quarter - 100H-3  Formulas: Nominal Cash Flows (Cols (1) - (7))= Final weight x Cash flow by qtr
<b>Exhibit 3 Underwriting Income Tax</b>	Sources: Earned premium - Exhibit 2, Column (1) total Expense & Loss quarterly cash flows - Exhibit 2, Column (2), (3), (4), (7) Reserve discount factors - 100H-7, Exhibit 6 Revenue offset factor - 100H-7, Exhibit 5  Formulas: Col (1) = Earned premium where Earned premium = Written premium + Change in Unearned Premium and Change in Unearned Premium = 0 Col (2) = Exhibit 2, annual sum [ (2) + (3) + (4) ] Col (3) = Exhibit 2, annual sum (7) Col (4) = (3) total - (3) cumulative through qtr Col (6) = (1) - (2) - (3) - [ {(4) qtr x (5) qtr} - {(4) (qtr -1) x (5) (qtr -1)} ] Col (7) = Written Premium x Revenue Offset Factor Col (8) = 0.35 x ( (6) + (7) )
<b>Exhibit 4 Intermediate Flows</b>	Formulas: Col (1) = Exhibit 2, (2) + (3)+ (4) + (5) cumulative Col (2) = Exhibit 2, (6) cumulative Col (3) = Exhibit 2, (2)+(3) + (4) + (5) {total - cumulative} Col (4) = Exhibit 2, (2) + (3) + (4) + {total - cumulative} + NPV of outstanding gross losses (Exhibit 2, (5)) at end of quarter discounted from qtr mid-point using quarterly pre-tax spot yields for maturity corresponding to original timing of flow Col (5) = Exhibit 2, (1) cumulative x ( 1 + Finance charge % ) Col (6) = (5) total x [ (1) qtr / (1) total ]
<b>Exhibit 5 Policyholder Cash Flows</b>	Sources: Expense & Loss quarterly cash flows - Exhibit 2, Column (2), (3), (4), (5), (6)  Formulas: Col (1) = Exhibit 2, (1) Col (2) = Exhibit 2, (2) + (3) + (4) + (5) Col (3) = Exhibit 2, (6) Col (4) = Exhibit 3, (8) annual values distributed by quarter Col (5) = (1) - (2) - (3) - (4) Col (6) = (5) + Exhibit 7, (4) (qtr - 1)



**Massachusetts Private Passenger Automobile  
Internal Rate of Return Profit Model  
Formula and Reference Documentation**

**Exhibit 6  
Investment Income**

Sources:

Premium payment day (D) - 100H-3  
Investment return ( $r_A$ ) - 100H-7  
Investment tax rate ( $t_A$ ) - 100H-7

Formulas:

$r_A^q = (1 + r_A)^{1/4} - 1$   
qtr % = % of qtr from premium payment =  $(90 - D) / 90$   
Col (1) = [ Exhibit 5, (1) x  $\{ (1 + r_A^q)^{qtr\%} - 1 \}$  ] - [ Exhibit 2, (3) x  $r_A^q$  ]  
- [ {Exhibit 2, (4) + (5) + (6) } x  $\{ (1 + r_A^q)^{0.5} - 1 \}$  ]  
Col (2) = Exhibit 7, (6) (qtr - 1) x  $r_A^q$   
Col (3) = (1) + (2)  
Col (4) = (3) x  $t_A$   
Col (5) = (3) - (4)

**Exhibit 7  
Underwriting and  
Surplus Flow**

Sources:

Spot Yields - 100H-4  
Reserves-to-Surplus Ratio (R/S) - 100H-6

Formulas:

Col (1) = NPV valued at end of qtr of remaining cash flows (outgo - income) where Premium (Exhibit 2, (1)) and Gross Loss & Expense (Exhibit 2, (2) + (3) + (4) + (5)) discounted from qtr mid-point and UW Income Tax (Exhibit 5, (4)) discounted from qtr end using quarterly after-tax spot yields (net of investment expense) for maturity corresponding to original timing of cash flow  
Col (2) = Exhibit 5, (6) - (1)  
Col (3a) (if (2) < 0) = minimum of either absolute value (2) or Exhibit 6, (5); otherwise 0  
Col (3b) (if (2) < 0 and (2) + (3a) < 0) = absolute value (2) - (3a); otherwise 0  
Col (3c) (if (2) > 0) = - (2) x [ Exhibit 4, (6) qtr / Exhibit 4, (6) total ]; otherwise 0  
Col (4) = (3a) + (3b) + (3c) + Exhibit 5, (6)  
Col (5) = Exhibit 4, (3) / [ (R/S) x { Exhibit 2, (5) total / Exhibit 2, (7) total } ]  
Col (6) = (4) + (5)

**Exhibit 8  
Investor Cash Flow**

Sources:

IRR - 100H-5

Formulas:

Col (1) = Exhibit 7, (5)  
Col (2) = (1) (qtr - 1) - (1) qtr  
Col (3) = Exhibit 7, - (3b)  
Col (4) = Exhibit 7, - [ (3a) + (3c) ]  
Col (5) = Exhibit 6, (5)  
Col (6) = (2) + (3) + (4) + (5)  
NPV (6) at discount rate = IRR is valued at end qtr 0 (beginning qtr 1)

**Massachusetts Private Passenger Automobile  
Cash Flows-Bodily Injury Coverages  
Premiums, Expenses and Losses  
Facility Market**

**Initial Relative Loss and Expense Weights**

Quarter	(1) Premium	(2) Premium Taxes	(3) Commissions	(4) Other Expenses	(5) =(2)+(3)+(4) Total Expenses	(6) Losses	(7) =(5)+(6) Total Losses And Expenses	(8) =(1)-(7) Net Flows
0	1000.000	0.000	0.000	22.695	22.695	0.000	22.695	977.305
1	0.000	23.000	130.000	34.043	187.043	8.771	195.814	-195.814
2	0.000	0.000	0.000	22.695	22.695	51.733	74.428	-74.428
3	0.000	0.000	0.000	17.021	17.021	84.072	101.094	-101.094
4	0.000	0.000	0.000	17.021	17.021	104.240	121.262	-121.262
5	0.000	0.000	0.000	0.000	0.000	114.631	114.631	-114.631
6	0.000	0.000	0.000	0.000	0.000	85.247	85.247	-85.247
7	0.000	0.000	0.000	4.000	4.000	58.480	58.480	-58.480
8	0.000	0.000	0.000	0.000	0.000	45.500	45.500	-45.500
9	0.000	0.000	0.000	0.000	0.000	31.003	31.003	-31.003
10	0.000	0.000	0.000	0.000	0.000	26.035	26.035	-26.035
11	0.000	0.000	0.000	0.000	0.000	19.619	19.619	-19.619
12	0.000	0.000	0.000	0.000	0.000	16.892	16.892	-16.892
13	0.000	0.000	0.000	0.000	0.000	15.110	15.110	-15.110
14	0.000	0.000	0.000	0.000	0.000	13.101	13.101	-13.101
15	0.000	0.000	0.000	0.000	0.000	10.178	10.178	-10.178
16	0.000	0.000	0.000	0.000	0.000	8.946	8.946	-8.946
17	0.000	0.000	0.000	0.000	0.000	6.919	6.919	-6.919
18	0.000	0.000	0.000	0.000	0.000	5.584	5.584	-5.584
19	0.000	0.000	0.000	0.000	0.000	5.029	5.029	-5.029
20	0.000	0.000	0.000	0.000	0.000	4.094	4.094	-4.094
21	0.000	0.000	0.000	0.000	0.000	3.448	3.448	-3.448
22	0.000	0.000	0.000	0.000	0.000	2.772	2.772	-2.772
23	0.000	0.000	0.000	0.000	0.000	2.391	2.391	-2.391
24	0.000	0.000	0.000	0.000	0.000	1.694	1.694	-1.694
25	0.000	0.000	0.000	0.000	0.000	1.375	1.375	-1.375
26	0.000	0.000	0.000	0.000	0.000	1.681	1.681	-1.681
27	0.000	0.000	0.000	0.000	0.000	0.993	0.993	-0.993
28	0.000	0.000	0.000	0.000	0.000	0.568	0.568	-0.568
29	0.000	0.000	0.000	0.000	0.000	0.292	0.292	-0.292
30	0.000	0.000	0.000	0.000	0.000	0.725	0.725	-0.725
31	0.000	0.000	0.000	0.000	0.000	0.412	0.412	-0.412
32	0.000	0.000	0.000	0.000	0.000	0.614	0.614	-0.614
33	0.000	0.000	0.000	0.000	0.000	0.184	0.184	-0.184
34	0.000	0.000	0.000	0.000	0.000	0.227	0.227	-0.227
35	0.000	0.000	0.000	0.000	0.000	0.213	0.213	-0.213
36	0.000	0.000	0.000	0.000	0.000	0.227	0.227	-0.227
37	0.000	0.000	0.000	0.000	0.000	0.068	0.068	-0.068
38	0.000	0.000	0.000	0.000	0.000	0.275	0.275	-0.275
39	0.000	0.000	0.000	0.000	0.000	0.089	0.089	-0.089
40	0.000	0.000	0.000	0.000	0.000	0.091	0.091	-0.091
Total	1000.000	23.000	130.000	113.476	266.476	733.524	1000.00	0.00

Weights for premiums, commissions, other expenses and losses are chosen to preserve proposed loss to expense ratios.

Weight for premium tax is 0.023000  
Weight for commission is 0.130000  
Weight for other expense is 0.113476  
Weight for loss is 0.733524

**Massachusetts Private Passenger Automobile  
Cash Flows-Property Damage Liability Coverages  
Premiums, Expenses and Losses  
Facility Market**

**Initial Relative Loss and Expense Weights**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
					=(2)+(3)+(4)		=(5)+(6)	=(1)-(7)
<u>Quarter</u>	<u>Premium</u>	<u>Premium Taxes</u>	<u>Commissions</u>	<u>Other Expenses</u>	<u>Total Expenses</u>	<u>Losses</u>	<u>Total Losses And Expenses</u>	<u>Net Flows</u>
0	1000.000	0.000	0.000	21.504	21.504	0.000	21.504	978.496
1	0.000	23.000	130.000	32.256	185.256	65.743	250.999	-250.999
2	0.000	0.000	0.000	21.504	21.504	137.301	158.805	-158.805
3	0.000	0.000	0.000	16.128	16.128	151.928	168.056	-168.056
4	0.000	0.000	0.000	16.128	16.128	159.112	175.240	-175.240
5	0.000	0.000	0.000	0.000	0.000	122.564	122.564	-122.564
6	0.000	0.000	0.000	0.000	0.000	45.144	45.144	-45.144
7	0.000	0.000	0.000	0.000	0.000	22.780	22.780	-22.780
8	0.000	0.000	0.000	0.000	0.000	10.509	10.509	-10.509
9	0.000	0.000	0.000	0.000	0.000	7.320	7.320	-7.320
10	0.000	0.000	0.000	0.000	0.000	6.059	6.059	-6.059
11	0.000	0.000	0.000	0.000	0.000	3.053	3.053	-3.053
12	0.000	0.000	0.000	0.000	0.000	2.198	2.198	-2.198
13	0.000	0.000	0.000	0.000	0.000	1.381	1.381	-1.381
14	0.000	0.000	0.000	0.000	0.000	1.297	1.297	-1.297
15	0.000	0.000	0.000	0.000	0.000	0.864	0.864	-0.864
16	0.000	0.000	0.000	0.000	0.000	0.660	0.660	-0.660
17	0.000	0.000	0.000	0.000	0.000	0.732	0.732	-0.732
18	0.000	0.000	0.000	0.000	0.000	0.295	0.295	-0.295
19	0.000	0.000	0.000	0.000	0.000	0.390	0.390	-0.390
20	0.000	0.000	0.000	0.000	0.000	0.146	0.146	-0.146
Total	1000.000	23.000	130.000	107.520	260.520	739.480	1000.00	0.000

Weights for premiums, commissions, other expenses and losses are chosen to preserve proposed loss to expense ratios.

Weight for premium tax is	0.023000
Weight for commission is	0.130000
Weight for other expense is	0.107520
Weight for loss is	0.739480

**Massachusetts Private Passenger Automobile  
Cash Flows-Physical Damage Coverages  
Premiums, Expenses and Losses  
Facility Market**

**Initial Relative Loss and Expense Weights**

	(1)	(2)	(3)	(4)	(5) =(2)+(3)+(4)	(6)	(7)	(8) =(1)-(7)
<u>Quarter</u>	<u>Premium</u>	<u>Premium Taxes</u>	<u>Commissions</u>	<u>Other Expenses</u>	<u>Total Expenses</u>	<u>Losses</u>	<u>Total Losses And Expenses</u>	<u>Net Flows</u>
0	1000.000	0.000	0.000	24.959	24.959	0.000	24.959	975.041
1	0.000	23.000	130.000	37.439	190.439	183.531	373.970	-373.970
2	0.000	0.000	0.000	24.959	24.959	194.436	219.395	-219.395
3	0.000	0.000	0.000	18.720	18.720	186.272	204.992	-204.992
4	0.000	0.000	0.000	18.720	18.720	174.606	193.326	-193.326
5	0.000	0.000	0.000	0.000	0.000	24.369	24.369	-24.369
6	0.000	0.000	0.000	0.000	0.000	-16.397	-16.397	16.397
7	0.000	0.000	0.000	0.000	0.000	-9.633	-9.633	9.633
8	0.000	0.000	0.000	0.000	0.000	-5.141	-5.141	5.141
9	0.000	0.000	0.000	0.000	0.000	-3.833	-3.833	3.833
10	0.000	0.000	0.000	0.000	0.000	-1.416	-1.416	1.416
11	0.000	0.000	0.000	0.000	0.000	-1.320	-1.320	1.320
12	0.000	0.000	0.000	0.000	0.000	-0.853	-0.853	0.853
13	0.000	0.000	0.000	0.000	0.000	-1.046	-1.046	1.046
14	0.000	0.000	0.000	0.000	0.000	-0.540	-0.540	0.540
15	0.000	0.000	0.000	0.000	0.000	-0.324	-0.324	0.324
16	0.000	0.000	0.000	0.000	0.000	-0.076	-0.076	0.076
17	0.000	0.000	0.000	0.000	0.000	-0.135	-0.135	0.135
18	0.000	0.000	0.000	0.000	0.000	-0.104	-0.104	0.104
19	0.000	0.000	0.000	0.000	0.000	-0.176	-0.176	0.176
20	0.000	0.000	0.000	0.000	0.000	-0.016	-0.016	0.016
Total	1000.000	23.000	130.000	124.797	277.797	722.205	1000.00	0.00

Weights for premiums, commissions, other expenses and losses are chosen to preserve proposed loss to expense ratios.

Weight for premium tax is	0.023000
Weight for commission is	0.130000
Weight for other expense is	0.124797
Weight for loss is	0.722203

**Massachusetts Private Passenger Automobile  
Calculation of Expected Expense to Loss Ratio  
Facility Market**

<u>Coverage</u>	(1) 2007 Earned Exposures	(2) Loss PP incl LAE	(3) (2) x U.F. Unallocated Loss Adjustment	(4) (2) -.5 x (3) Loss Pure Prem. After Trans.	(5) Company Expense Pure Premium	(6) (5) + .5 x (3) Expense Pure Prem. After Trans.
A-1	179,384.2	\$414.24	\$54.03	\$387.23	\$32.54	\$59.56
A-2	177,279.4	\$146.53	\$19.11	\$136.98	\$12.81	\$22.37
B, 20/40	175,956.6	\$72.23	\$9.42	\$67.52	\$4.84	\$9.55
B, Excess	64,570.2	\$230.68	\$30.09	\$215.64	\$17.73	\$32.77
D	55,472.9	\$37.68	\$4.91	\$35.23	\$2.07	\$4.53
U-1	179,384.2	\$29.39	\$3.83	\$27.48	\$2.86	\$4.78
U-1, Excess	51,189.4	\$10.37	\$1.35	\$9.70	\$1.01	\$1.68
PDL, Basic	179,384.2	\$377.67	\$49.26	\$353.04	\$26.71	\$51.34
PDL, Excess	173,914.7	\$112.39	\$14.66	\$105.06	\$7.95	\$15.28
Collision	94,815.3	\$781.33	\$130.22	\$716.22	\$52.34	\$117.45
Limited Collision	2,939.3	\$63.30	\$10.55	\$58.03	\$3.44	\$8.72
Comprehensive	110,000.0	\$157.70	\$26.28	\$144.56	\$16.07	\$29.21
Subs. Trans.	61,479.7	\$81.85	\$13.64	\$75.03	\$8.34	\$15.16
		(7) Expenses x Exposures	(8) Losses x Exposures	(9) Ratio: Expenses to Losses		
Bodily Injury Coverages		\$19,640,964	\$126,931,528	0.1547		
Property Damage Liability		\$11,867,003	\$81,601,287	0.1454		
Physical Damage Coverages		\$15,306,815	\$88,593,575	0.1728		

Source: Form 110/100

(3) Unallocated loss adjustment expense portion of loss pure premiums is obtained by multiplying appropriate factors by coverage:

BI 0.1304

PDL 0.1304

PhyD 0.1667

(2) and (5) for Excess Limits are calculated as Basic Pure Premium x Avg.IL where Avg IL is

BI 0.4742

U-1 0.3530

PDL 0.2976

Exclusive of Premium Tax



**Massachusetts Private Passenger Automobile  
Calculation of Cumulative Paid Loss Development Factors  
Bodily Injury Liability - Net  
Facility Market**

**Incremental Paid Losses by Quarter**

	<u>21</u>	<u>22</u>	<u>23</u>	<u>24</u>	<u>25</u>	<u>26</u>	<u>27</u>	<u>28</u>	<u>29</u>	<u>30</u>	<u>31</u>	<u>32</u>	<u>33</u>	<u>34</u>	<u>35</u>	<u>36</u>	<u>37</u>	<u>38</u>	<u>39</u>	<u>40</u>
1994																				
1995																				
1996																				
1997																				
1998																				
1999																				
2000																				
2001																				
2002																				
2003																				
2004																				
2005																				
2006																				

**Cumulative Paid Losses by Quarter**

	<u>21</u>	<u>22</u>	<u>23</u>	<u>24</u>	<u>25</u>	<u>26</u>	<u>27</u>	<u>28</u>	<u>29</u>	<u>30</u>	<u>31</u>	<u>32</u>	<u>33</u>	<u>34</u>	<u>35</u>	<u>36</u>	<u>37</u>	<u>38</u>	<u>39</u>	<u>40</u>
1994																				
1995																				
1996																				
1997																				
1998																				
1999																				
2000																				
2001																				
2002																				
2003																				
2004																				
2005																				
2006																				

**Cumulative Loss Development Factors by Quarter**

	<u>21 to 22</u>	<u>22 to 23</u>	<u>23 to 24</u>	<u>24 to 25</u>	<u>25 to 26</u>	<u>26 to 27</u>	<u>27 to 28</u>	<u>28 to 29</u>	<u>29 to 30</u>	<u>30 to 31</u>	<u>31 to 32</u>	<u>32 to 33</u>	<u>33 to 34</u>	<u>34 to 35</u>	<u>35 to 36</u>	<u>36 to 37</u>	<u>37 to 38</u>	<u>38 to 39</u>	<u>39 to 40</u>	
1994																				
1995																				
1996																				
1997																				
1998																				
1999																				
2000																				
2001																				
2002																				
2003																				
2004																				
2005																				
2006																				

\* LDF's calculated from the average of the two most recent years of data.

Massachusetts Private Passenger Automobile  
Net Paid Losses  
Bodily Injury  
Facility Market

Quarter	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	SELECTED FLOW
1			0.8798%	0.7574%	0.7475%	0.8255%	0.8856%	0.6287%	0.7758%	0.7170%	1.1360%	1.1474%	1.2760%	1.1957%
2	4.8042%		4.9382%	5.0179%	4.9382%	5.1197%	5.3721%	4.9720%	5.1009%	6.2608%	6.5696%	6.8537%	7.5710%	7.0527%
3	9.0633%		9.3875%	9.6251%	9.3875%	9.2619%	9.4698%	9.5959%	9.7156%	11.6250%	11.7837%	11.8699%	11.4614%	11.4614%
4	12.4688%		13.6340%	12.7765%	13.6340%	13.1203%	13.6691%	14.7782%	14.2337%	15.4666%	14.1089%	14.4704%	13.7232%	14.2109%
5	14.9885%		14.9477%	14.2528%	14.9477%	15.7913%	15.6066%	16.8211%	16.1174%	16.0597%	15.2836%	15.5079%	15.7275%	15.6274%
6	13.1624%		13.2518%	12.7624%	13.2518%	13.4856%	13.7845%	13.6620%	14.1957%	12.5884%	12.0564%	11.3602%	11.1780%	11.6216%
7	9.4774%		9.0435%	9.1273%	9.0435%	9.0296%	9.0610%	9.1144%	9.2452%	8.4688%	8.2407%	7.3284%	8.1630%	7.9725%
8	7.2466%		7.7171%	7.7171%	7.6439%	7.0539%	7.0355%	6.5985%	6.5862%	6.1799%	6.1611%	6.2365%	6.0672%	6.2030%
9	4.9949%		5.0341%	4.9695%	5.0341%	4.8221%	4.8105%	4.3509%	4.2819%	3.8044%	4.1819%	4.5952%	4.2266%	4.2266%
10	3.8234%		3.9745%	3.9745%	4.2161%	3.7888%	3.4166%	3.6269%	3.1382%	3.2197%	3.2737%	4.0721%	3.5493%	3.5493%
11	2.9488%		3.1596%	3.1596%	2.5101%	2.8886%	2.4782%	2.3421%	2.3433%	2.3003%	2.6246%	3.0367%	2.6746%	2.6746%
12	2.8430%		2.7789%	2.7789%	2.5437%	2.5476%	2.3956%	2.2846%	1.9969%	2.2175%	2.3317%	2.3058%	2.3028%	2.3028%
13	2.0957%		2.6088%	2.6088%	2.0337%	2.2543%	1.8040%	2.0746%	1.8541%	1.8833%	2.3943%	2.3058%	2.3028%	2.0599%
14	2.2768%		1.9181%	1.9181%	1.9177%	1.7611%	1.6699%	1.6643%	1.7127%	1.7748%	1.8290%	1.7748%	1.7860%	1.7860%
15	1.4198%		1.1499%	1.1499%	1.3611%	1.3644%	1.5106%	1.1351%	1.5129%	1.2826%	1.3352%	1.2826%	1.3876%	1.3876%
16	1.5288%		1.3163%	1.3163%	1.2946%	1.1945%	1.4445%	0.9983%	1.3631%	1.0940%	1.1733%	1.0940%	1.2196%	1.2196%
17	1.2453%		0.9899%	0.9899%	0.9409%	0.8906%	0.8648%	0.9681%	0.9353%	0.9043%	0.9043%	0.9043%	0.9432%	0.9432%
18	1.0351%		0.9182%	0.9182%	0.8180%	0.9474%	0.7212%	0.7463%	0.9137%	0.6060%	0.6060%	0.6060%	0.7612%	0.7612%
19	0.7006%		0.5802%	0.5802%	0.5802%	0.5939%	0.6051%	0.5747%	0.9729%	0.4932%	0.4932%	0.4932%	0.6856%	0.6856%
20	0.6239%		0.7432%	0.7432%	0.7432%	0.6879%	0.5403%	0.6792%	0.5402%	0.4420%	0.4420%	0.4420%	0.5581%	0.5581%
21	0.6757%		0.6878%	0.6878%	0.4544%	0.6508%	0.4583%	0.4034%	0.5376%	0.4420%	0.4420%	0.4420%	0.4700%	0.4700%
22	0.4777%		0.3939%	0.3939%	0.3939%	0.3421%	0.4217%	0.4415%	0.2619%	0.2619%	0.2619%	0.2619%	0.3779%	0.3779%
23	0.2527%		0.3004%	0.3004%	0.2464%	0.3159%	0.3649%	0.3820%	0.2232%	0.2232%	0.2232%	0.2232%	0.3259%	0.3259%
24	0.2132%		0.1915%	0.1915%	0.2612%	0.2069%	0.2280%	0.2788%	0.1807%	0.1807%	0.1807%	0.1807%	0.2309%	0.2309%
25	0.1323%		0.2072%	0.2072%	0.2234%	0.1137%	0.2453%	0.1992%	0.1992%	0.1992%	0.1992%	0.1992%	0.1875%	0.1875%
26	0.0916%		0.1105%	0.1105%	0.1005%	0.1388%	0.3638%	0.1798%	0.1798%	0.1798%	0.1798%	0.1798%	0.1354%	0.1354%
27	0.1360%		0.1567%	0.1567%	0.1655%	0.1506%	0.1747%	0.0778%	0.0778%	0.0778%	0.0778%	0.0778%	0.0774%	0.0774%
28	0.1729%		0.0547%	0.0547%	0.0815%	0.0681%	0.0888%	0.0788%	0.0788%	0.0788%	0.0788%	0.0788%	0.0989%	0.0989%
29	0.0376%		0.0832%	0.0832%	0.0762%	-0.0056%	0.0478%	0.0478%	0.0478%	0.0478%	0.0478%	0.0478%	0.0561%	0.0561%
30	0.0350%		0.0307%	0.0307%	0.0489%	0.1737%	0.0717%	0.0717%	0.0717%	0.0717%	0.0717%	0.0717%	0.0837%	0.0837%
31	0.0628%		0.0290%	0.0290%	0.0125%	0.1076%	0.0468%	0.1132%	0.1132%	0.1132%	0.1132%	0.1132%	0.0251%	0.0251%
32	0.0237%		0.0060%	0.0060%	0.0440%	0.0919%	0.0411%	0.0411%	0.0411%	0.0411%	0.0411%	0.0411%	0.0310%	0.0310%
33	0.0248%		0.0073%	0.0073%	0.0263%	0.0411%	0.0411%	0.0411%	0.0411%	0.0411%	0.0411%	0.0411%	0.0291%	0.0291%
34	0.0137%		0.0349%	0.0349%	0.0268%	0.0307%	0.0307%	0.0307%	0.0307%	0.0307%	0.0307%	0.0307%	0.0310%	0.0310%
35	0.0020%		0.0446%	0.0446%	0.0114%	0.0306%	0.0606%	0.0606%	0.0606%	0.0606%	0.0606%	0.0606%	0.0093%	0.0093%
36	0.0075%		0.0274%	0.0274%	0.0606%	0.0043%	0.0043%	0.0043%	0.0043%	0.0043%	0.0043%	0.0043%	0.0375%	0.0375%
37	0.0157%		0.0092%	0.0092%	0.0029%	0.0029%	0.0029%	0.0029%	0.0029%	0.0029%	0.0029%	0.0029%	0.0122%	0.0122%
38	0.0012%		-0.0028%	-0.0028%	0.1132%	0.0009%	0.0009%	0.0009%	0.0009%	0.0009%	0.0009%	0.0009%	0.0122%	0.0122%
39	0.0009%		0.0045%	0.0045%	0.0309%	0.0309%	0.0309%	0.0309%	0.0309%	0.0309%	0.0309%	0.0309%	0.0122%	0.0122%
40	-0.0040%		0.0090%	0.0090%	0.0319%	0.0319%	0.0319%	0.0319%	0.0319%	0.0319%	0.0319%	0.0319%	0.0124%	0.0124%
	0.00%	0.00%	100.00%	100.00%	100.00%	99.89%	99.77%	99.45%	98.74%	97.39%	94.48%	88.10%	74.85%	100.00%

Note: Selected flow is based on three year averages for all quarters with total normalized to 100%.

Source: 100H-3, Exhibit 2, Page 1&2. Paid by Quarter/Ultimate as a Percent.





**Massachusetts Private Passenger Automobile  
Calculation of Cumulative Paid Loss Development Factors  
Physical Damage - Salvage and Subrogation  
Facility Market**

AY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1997	-1,027,696	-6,786,701	-10,705,720	-12,486,493	-11,852,183	-6,560,306	-4,268,918	-2,656,983	-1,923,387	-1,406,687	-899,406	-868,377	-534,946	-487,958	-325,728	-126,835	-101,070	-77,452	-51,355	-35,615
1998	-1,951,794	-8,597,945	-10,602,904	-12,409,358	-11,827,393	-7,413,152	-3,775,162	-2,914,350	-1,810,988	-1,495,427	-873,663	-739,539	-401,682	-401,507	-190,016	-119,461	-67,872	-33,977	-47,018	-47,759
1999	-2,021,616	-9,260,526	-11,641,247	-12,668,437	-11,260,252	-6,532,278	-3,040,199	-1,830,186	-1,163,423	-908,054	-497,757	-396,229	-313,117	-179,312	-119,856	-94,932	-124,848	-58,246	-26,254	-8,296
2000	-2,095,680	-8,027,762	-9,496,407	-10,523,221	-9,358,320	-4,732,910	-2,423,306	-1,710,366	-1,041,584	-424,312	-353,629	-218,205	-170,630	-75,137	-85,080	-51,476	-76,182	-35,605	-30,540	-20,372
2001	-1,830,509	-8,170,081	-9,547,820	-9,878,792	-9,680,734	-4,156,046	-1,875,478	-1,022,287	-564,383	-323,959	-228,095	-174,016	-204,044	-104,844	-85,970	-62,201	-71,864	-33,587	-28,809	-19,217
2002	-1,941,010	-6,059,198	-6,875,275	-8,001,488	-7,150,687	-3,001,827	-1,434,182	-970,992	-598,846	-281,061	-217,887	-146,130	-157,718	-81,040	-66,451	-48,079	-55,548	-25,961	-22,268	-14,854

**Cumulative Salvage and Subrogation by Quarter**

AY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1997	-1,027,696	-7,814,397	-18,520,117	-31,006,610	-42,838,793	-49,419,099	-53,688,017	-56,345,000	-58,268,387	-59,675,074	-60,574,480	-61,442,857	-61,977,803	-62,465,761	-62,791,489	-62,918,324	-63,019,394	-63,096,846	-63,148,201	-63,183,816
1998	-1,951,794	-10,549,739	-21,132,643	-33,562,001	-45,389,394	-52,802,546	-56,577,708	-59,492,058	-61,303,046	-62,798,478	-63,672,136	-64,411,675	-64,813,357	-65,214,864	-65,404,880	-65,524,341	-65,592,213	-65,626,190	-65,673,208	-65,720,967
1999	-2,021,616	-11,282,142	-22,933,389	-35,591,826	-46,852,078	-53,384,356	-56,424,555	-58,254,741	-59,418,164	-60,326,218	-60,823,975	-61,220,204	-61,533,321	-61,712,633	-61,832,489	-61,927,341	-62,052,269	-62,110,515	-62,136,769	-62,145,065
2000	-2,095,680	-10,123,442	-19,619,849	-30,143,070	-39,501,390	-44,234,300	-46,657,606	-48,367,972	-49,409,556	-49,833,868	-50,187,497	-50,405,702	-50,576,332	-50,651,469	-50,736,549	-50,738,025	-50,864,207	-50,899,812	-50,930,352	-50,950,724
2001	-1,830,509	-10,000,590	-19,548,410	-29,427,202	-39,107,936	-43,263,982	-45,139,460	-46,101,747	-46,726,130	-47,050,089	-47,278,184	-47,452,200	-47,656,244	-47,761,088	-47,847,058	-47,909,259	-47,981,123	-48,014,710	-48,043,519	-48,062,736
2002	-1,941,010	-8,000,208	-14,875,483	-22,876,971	-30,027,658	-33,029,485	-34,463,667	-35,434,659	-36,033,505	-36,314,566	-36,532,453	-36,678,583	-36,836,301	-36,917,341	-36,983,792	-37,031,871	-37,087,419	-37,113,380	-37,135,648	-37,150,502

**Loss Development Factors by Quarter**

QTR	1 to 2	2 to 3	3 to 4	4 to 5	5 to 6	6 to 7	7 to 8	8 to 9	9 to 10	10 to 11	11 to 12	12 to 13	13 to 14	14 to 15	15 to 16	16 to 17	17 to 18	18 to 19	19 to 20
1997	7.6038	2.3700	1.6742	1.3822	1.1531	1.0864	1.0495	1.0341	1.0241	1.0151	1.0143	1.0087	1.0079	1.0052	1.0020	1.0016	1.0012	1.0008	1.0006
1998	5.4051	2.0050	1.5867	1.3524	1.1633	1.0715	1.0515	1.0304	1.0244	1.0139	1.0116	1.0062	1.0062	1.0029	1.0018	1.0010	1.0005	1.0007	1.0007
1999	5.5808	2.0318	1.5526	1.3164	1.1394	1.0569	1.0324	1.0200	1.0153	1.0083	1.0065	1.0051	1.0029	1.0019	1.0015	1.0020	1.0009	1.0004	1.0001
2000	4.8306	1.9381	1.5364	1.3105	1.1198	1.0548	1.0367	1.0215	1.0086	1.0071	1.0043	1.0034	1.0015	1.0017	1.0010	1.0015	1.0007	1.0006	1.0001
2001	5.4633	1.9547	1.5054	1.3290	1.1063	1.0433	1.0226	1.0122	1.0069	1.0048	1.0037	1.0043	1.0022	1.0018	1.0013	1.0015	1.0007	1.0006	1.0004
2002	4.1217	1.8594	1.5379	1.3126	1.1000	1.0434	1.0282	1.0169	1.0078	1.0060	1.0040	1.0043	1.0022	1.0018	1.0013	1.0015	1.0007	1.0006	1.0004
2-Year Avg.*	4.7925	1.9071	1.5217	1.3208	1.1032	1.0434	1.0254	1.0169	1.0078	1.0060	1.0040	1.0043	1.0022	1.0018	1.0013	1.0015	1.0007	1.0006	1.0004

**S/S Flow**

AY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1997	-0.5311%	-3.5072%	-5.5325%	-6.4527%	-6.1249%	-3.3902%	-2.2061%	-1.3731%	-0.9940%	-0.7269%	-0.4648%	-0.4488%	-0.2764%	-0.2522%	-0.1683%	-0.0655%	-0.0522%	-0.0400%	-0.0265%	
1998	-1.0309%	-4.5414%	-5.6004%	-6.5545%	-6.2471%	-3.9186%	-1.9940%	-1.5393%	-0.9566%	-0.7899%	-0.4615%	-0.3906%	-0.2122%	-0.2121%	-0.1004%	-0.0631%	-0.0358%	-0.0179%	-0.0248%	
1999	-1.1497%	-5.2665%	-6.6205%	-7.2047%	-6.4038%	-3.7150%	-1.7290%	-1.0408%	-0.6616%	-0.5164%	-0.2831%	-0.2235%	-0.1781%	-0.1020%	-0.0682%	-0.0540%	-0.0710%	-0.0331%	-0.0149%	
2000	-1.5744%	-6.0311%	-7.1344%	-7.9059%	-6.0311%	-3.5577%	-1.8206%	-1.2850%	-0.7825%	-0.3183%	-0.2657%	-0.1639%	-0.1282%	-0.0564%	-0.0369%	-0.0387%	-0.0572%	-0.0267%	-0.0229%	
2001	-1.5107%	-6.7428%	-7.8798%	-8.1530%	-7.9895%	-3.4300%	-1.5478%	-0.8437%	-0.4658%	-0.2674%	-0.1882%	-0.1436%	-0.1684%	-0.0865%	-0.0710%	-0.0513%	-0.0593%	-0.0277%	-0.0153%	
2002	-2.1292%	-6.6468%	-7.5410%	-8.7775%	-7.8442%	-3.2929%	-1.5733%	-1.0652%	-0.6569%	-0.3083%	-0.2390%	-0.1603%	-0.1730%	-0.0889%	-0.0729%	-0.0527%	-0.0609%	-0.0285%	-0.0163%	

\* LDFs calculated from the average of the two most recent years of data.

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**Massachusetts Private Passenger Automobile  
Calculation of Cumulative Paid Loss Development Factors  
Physical Damage - Gross  
Facility Market**

AY	Incremental Paid Losses by Quarter																				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
1997																					
1998																					
1999																					
2000																					
2001	41,561,924	58,537,574	63,957,249	63,165,730	24,869,135	2,104,251	1,080,787	331,985	369,887	180,384	189,448	161,360	92,385	57,700	-13,197	34,954	38,971	3,271	-816	-31,922	
2002	42,101,553	58,317,228	59,522,813	63,570,516	25,285,620	2,892,794	808,671	519,185	1,668,981	66,557	67,757	69,934	25,640	90,264	18,146	1,254	35,143	-14,512	-15,855	14,172	
2003	44,167,740	59,567,399	56,061,801	54,108,825	20,296,807	2,016,931	636,902	294,332	204,541	147,284	46,491	77,690	75,870	27,274	39,208	60,097	109,522	54,298	-11,804	658	
2004	35,472,801	44,491,640	42,186,596	42,542,411	16,655,130	1,566,394	327,519	192,333	160,188	167,572	52,420	41,485	25,536	-2,481	34,098	51,509	55,190	18,402	0	18,404	
2005	32,526,464	41,333,996	40,402,883	38,669,539	14,006,573	1,211,563	333,334	146,648	145,073	117,294	75,212	44,083	33,802	16,904	33,812	50,729	50,744	16,920	0	16,921	
2006	25,107,074	30,601,679	30,387,312	30,040,969	10,226,658	932,153	218,310	322,031	115,053	102,361	51,221	38,431	25,629	12,817	25,636	38,462	58,474	12,828	0	12,830	

Cumulative Paid Losses by Quarter

AY	Cumulative Paid Losses by Quarter																				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
1997																					
1998																					
1999																					
2000																					
2001	41,561,924	100,099,678	164,056,927	227,222,657	252,091,792	254,196,043	255,276,830	255,608,815	255,978,702	256,159,086	256,348,534	256,509,894	256,602,279	256,659,979	256,646,782	256,681,736	256,720,707	256,723,978	256,723,162	256,691,240	
2002	42,101,553	100,418,781	159,941,594	223,512,110	248,797,730	251,690,524	252,499,195	253,018,380	254,687,361	254,753,918	254,821,675	254,891,609	254,917,249	255,007,513	255,025,659	255,026,913	255,062,056	255,047,544	255,031,689	255,045,861	
2003	44,167,740	103,735,139	159,796,940	215,905,765	234,202,572	236,219,503	236,856,405	237,150,737	237,355,278	237,502,562	237,549,083	237,626,743	237,703,613	237,729,887	237,769,095	237,829,192	237,938,714	237,993,012	237,981,208	237,981,866	
2004	35,472,801	79,964,441	122,151,037	164,693,448	181,348,578	182,914,972	183,242,491	183,434,824	183,595,012	183,762,584	183,815,004	183,856,489	183,882,025	183,879,594	183,913,642	183,965,151	184,020,341	184,038,743	184,038,743	184,057,146	
2005	32,526,464	73,860,460	114,263,343	152,932,882	166,939,455	168,151,018	168,484,352	168,631,000	168,776,073	168,899,367	168,966,579	169,010,662	169,044,464	169,061,369	169,095,181	169,145,909	169,196,653	169,213,573	169,213,573	169,230,494	
2006	25,107,074	55,708,753	86,096,065	116,137,034	126,363,692	127,295,845	127,514,155	127,836,186	127,951,239	128,053,600	128,104,821	128,143,252	128,168,881	128,181,698	128,207,334	128,245,797	128,284,270	128,297,099	128,297,099	128,309,928	

Loss Development Factors by Quarter

QTR	Loss Development Factors by Quarter																				
	1 to 2	2 to 3	3 to 4	4 to 5	5 to 6	6 to 7	7 to 8	8 to 9	9 to 10	10 to 11	11 to 12	12 to 13	13 to 14	14 to 15	15 to 16	16 to 17	17 to 18	18 to 19	19 to 20	20	
1997																					
1998																					
1999																					
2000																					
2001	2.4084	1.6389	1.3850	1.1094	1.0083	1.0043	1.0013	1.0014	1.0007	1.0007	1.0006	1.0004	1.0002	0.9999	1.0001	1.0002	1.0000	1.0000	0.9999	1.0001	
2002	2.3852	1.5927	1.3975	1.1131	1.0116	1.0032	1.0021	1.0066	1.0003	1.0003	1.0003	1.0001	1.0004	1.0001	1.0000	1.0001	0.9999	0.9999	1.0001	1.0001	
2003	2.3487	1.5404	1.3386	1.0949	1.0086	1.0027	1.0012	1.0009	1.0006	1.0002	1.0003	1.0003	1.0001	1.0002	1.0003	1.0005	1.0002	1.0000	1.0000	1.0000	
2004	2.2542	1.5276	1.3483	1.1011	1.0086	1.0018	1.0010	1.0009	1.0009	1.0003	1.0002	1.0001	1.0001	1.0000	1.0003	1.0003	1.0001	1.0000	1.0001	1.0001	
2005	2.2708	1.5470	1.3384	1.0916	1.0073	1.0020	1.0009	1.0009	1.0007	1.0004	1.0003	1.0002	1.0001	1.0002	1.0003	1.0003	1.0001	1.0000	1.0001	1.0001	
2006	2.2188	1.5455	1.3489	1.0881	1.0074	1.0017	1.0025	1.0009	1.0008	1.0004	1.0003	1.0002	1.0001	1.0002	1.0003	1.0003	1.0001	1.0000	1.0001	1.0001	
2-Year Avg.*	2.2448	1.5463	1.3437	1.0899	1.0074	1.0019	1.0017	1.0009	1.0008	1.0004	1.0003	1.0002	1.0001	1.0002	1.0003	1.0003	1.0001	1.0000	1.0001	1.0001	

Gross Loss Flow

AY	Gross Loss Flow																				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
1997																					
1998																					
1999																					
2000																					
2001	21,4782%	30,2509%	33,0516%	32,6425%	12,8518%	1,0874%	0,5585%	0,1716%	0,1911%	0,0932%	0,0979%	0,0834%	0,0477%	0,0298%	-0,0068%	0,0181%	0,0201%	0,0017%	-0,0004%	-0,0165%	
2002	22,2377%	30,8027%	31,4395%	33,5775%	13,5280%	1,5280%	0,4271%	0,2742%	0,8815%	0,0352%	0,0358%	0,0369%	0,0135%	0,0477%	0,0096%	0,0007%	0,0186%	-0,0077%	-0,0004%	0,0075%	
2003	25,1186%	33,8765%	31,8829%	30,7722%	11,5430%	1,1470%	0,3622%	0,1674%	0,1163%	0,0838%	0,0264%	0,0442%	0,0431%	0,0155%	0,0223%	0,0342%	0,0623%	0,0309%	-0,0007%	0,0004%	
2004	26,6500%	33,4256%	31,6939%	31,9612%	12,5126%	1,1768%	0,2461%	0,1445%	0,1203%	0,0934%	0,0312%	0,0192%	0,0192%	-0,0019%	0,0256%	0,0387%	0,0415%	0,0138%	0,0000%	0,0138%	
2005	26,8442%	34,1130%	33,3446%	31,9141%	11,5597%	0,9999%	0,2751%	0,1210%	0,1197%	0,0968%	0,0364%	0,0342%	0,0279%	-0,0140%	0,0279%	0,0419%	0,0419%	0,0140%	0,0000%	0,0140%	
2006	27,5419%	33,5694%	33,3343%	32,9543%	11,2184%	1,0226%	0,2395%	0,3553%	0,1262%	0,1123%	0,0562%	0,0422%	0,0281%	0,0141%	0,0281%	0,0422%	0,0422%	0,0141%	0,0000%	0,0141%	

\* LDF's calculated from the average of the two most recent years of data.

**Massachusetts Private Passenger Automobile  
Analysis of Spot Yield Curve  
Components of Term Structure**

(1)	(2)	(3)
<u>Year</u>	<u>WSJ Treasury Strip Oct 2007-Sep 2008</u>	<u>Adjusted WSJ Treasury Strip *</u>
0.25	2.29%	1.87%
0.50	2.42%	2.00%
0.75	2.50%	2.08%
1.00	2.52%	2.10%
1.25	2.52%	2.10%
1.50	2.54%	2.12%
1.75	2.56%	2.14%
2.00	2.60%	2.18%
2.25	2.64%	2.22%
2.50	2.69%	2.27%
2.75	2.72%	2.30%
3.00	2.78%	2.36%
3.25	2.80%	2.38%
3.50	2.87%	2.45%
3.75	2.96%	2.54%
4.00	2.93%	2.51%
4.25	3.01%	2.59%
4.50	3.10%	2.68%
4.75	3.16%	2.74%
5.00	3.24%	2.82%
5.25	3.29%	2.87%
5.50	3.34%	2.92%
5.75	3.37%	2.95%
6.00	3.41%	2.99%
6.25	3.47%	3.05%
6.50	3.54%	3.12%
6.75	3.58%	3.16%
7.00	3.65%	3.23%
7.25	3.72%	3.30%
7.50	3.77%	3.35%
7.75	3.83%	3.41%
8.00	3.89%	3.47%
8.25	3.94%	3.52%
8.50	3.99%	3.57%
8.75	4.02%	3.60%
9.00	4.06%	3.64%
9.25	4.08%	3.66%
9.50	4.11%	3.69%
9.75	4.16%	3.74%
10.00	4.21%	3.79%

\* Column (2) - 0.42% Massachusetts investment and interest expense (Exhibit 4).

**Massachusetts Private Passenger Automobile  
Compilation of Treasury Strips - Wall Street Journal**

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Exhibit 2

Page 1

<b>OCTOBER 2007</b>		<b>NOVEMBER 2007</b>		<b>DECEMBER 2007</b>	
FROM WSJ ON TUESDAY, OCTOBER 2, 2007		FROM WSJ ON FRIDAY, NOVEMBER 2, 2007		FROM WSJ ON TUESDAY, DECEMBER 4, 2007	
Nov-07	3.665	Nov-07	3.325	Feb-08	2.910
Feb-08	3.945	Feb-08	3.700	May-08	3.110
May-08	4.120	May-08	3.920	Aug-08	3.103
Aug-08	4.073	Aug-08	3.883	Nov-08	3.073
Nov-08	4.057	Nov-08	3.847	Feb-09	2.907
Feb-09	3.997	Feb-09	3.797	May-09	2.860
May-09	3.985	May-09	3.740	Aug-09	2.925
Aug-09	3.993	Aug-09	3.745	Nov-09	2.905
Nov-09	4.003	Nov-09	3.750	Feb-10	2.883
Feb-10	4.017	Feb-10	3.760	May-10	2.910
May-10	4.030	May-10	3.805	Aug-10	2.950
Aug-10	4.037	Aug-10	3.803	Nov-10	2.945
Nov-10	4.045	Nov-10	3.825	Feb-11	3.050
Feb-11	4.050	Feb-11	3.830	May-11	2.940
May-11	3.890	May-11	3.690	Aug-11	3.120
Aug-11	4.080	Aug-11	3.865	Nov-11	3.190
Nov-11	3.710	Nov-11	3.990	Feb-12	2.740
Feb-12	4.160	Feb-12	3.510	May-12	3.235
May-12	3.940	May-12	3.960	Aug-12	3.000
Aug-12	4.190	Aug-12	3.720	Nov-12	3.240
Nov-12	4.215	Nov-12	3.960	Feb-13	3.270
Feb-13	4.235	Feb-13	4.000	May-13	3.350
May-13	4.280	May-13	4.020	Aug-13	3.410
Aug-13	4.275	Aug-13	4.060	Nov-13	3.420
Nov-13	4.330	Nov-13	4.060	Feb-14	3.470
Feb-14	4.345	Feb-14	4.110	May-14	3.565
May-14	4.385	May-14	4.140	Aug-14	3.625
Aug-14	4.395	Aug-14	4.180	Nov-14	3.670
Nov-14	4.430	Nov-14	4.195	Feb-15	3.725
Feb-15	4.490	Feb-15	4.230	May-15	3.837
May-15	4.495	May-15	4.280	Aug-15	3.860
Aug-15	4.527	Aug-15	4.300	Nov-15	3.873
Nov-15	4.557	Nov-15	4.323	Feb-16	3.927
Feb-16	4.553	Feb-16	4.357	May-16	3.943
May-16	4.607	May-16	4.363	Aug-16	3.990
Aug-16	4.605	Aug-16	4.420	Nov-16	3.995
Nov-16	4.647	Nov-16	4.405	Feb-17	4.027
Feb-17	4.630	Feb-17	4.435	May-17	4.025
May-17	4.675	May-17	4.480	Aug-17	4.060
Aug-17	4.697	Aug-17	4.470	Nov-17	4.083
Nov-17	4.760	Nov-17	4.540	Feb-18	4.150
Feb-18	N/A	Feb-18	N/A	May-18	N/A
May-18	N/A	May-18	N/A	Aug-18	N/A
Aug-18	N/A	Aug-18	N/A	Nov-18	N/A
Nov-18	N/A	Nov-18	N/A	Feb-19	N/A
Feb-19	N/A	Feb-19	N/A	May-19	N/A
May-19	N/A	May-19	N/A	Aug-19	N/A
Aug-19	N/A	Aug-19	N/A	Nov-19	N/A
Nov-19	N/A	Nov-19	N/A	Feb-20	N/A
Feb-20	N/A	Feb-20	N/A	May-20	N/A
May-20	N/A	May-20	N/A	Aug-20	N/A
Aug-20	N/A	Aug-20	N/A	Nov-20	N/A
Nov-20	N/A	Nov-20	N/A	Feb-21	N/A
Feb-21	N/A	Feb-21	N/A	May-21	N/A
May-21	N/A	May-21	N/A	Aug-21	N/A
Aug-21	N/A	Aug-21	N/A	Nov-21	N/A
Nov-21	N/A	Nov-21	N/A	Feb-22	N/A
Feb-22	N/A	Feb-22	N/A	May-22	N/A

**Massachusetts Private Passenger Automobile  
Compilation of Treasury Strips - Wall Street Journal**

<b>JANUARY 2008</b>		<b>FEBRUARY 2008</b>		<b>MARCH 2008</b>	
FROM WSJ ON WEDNESDAY, JANUARY 2, 2008		FROM WSJ ON MONDAY, 'FEBRUARY 4, 2008		FROM WSJ ON TUESDAY, MARCH 4, 2008	
Feb-08	2.985	Feb-08	1.490	May-08	1.737
May-08	3.230	May-08	2.050	Aug-08	1.673
Aug-08	3.133	Aug-08	2.017	Nov-08	1.673
Nov-08	3.337	Nov-08	2.087	Feb-09	1.580
Feb-09	3.040	Feb-09	2.013	May-09	1.475
May-09	2.995	May-09	2.000	Aug-09	1.523
Aug-09	3.077	Aug-09	2.047	Nov-09	1.543
Nov-09	3.033	Nov-09	2.023	Feb-10	1.587
Feb-10	3.037	Feb-10	2.043	May-10	1.655
May-10	3.075	May-10	2.085	Aug-10	1.703
Aug-10	3.073	Aug-10	2.103	Nov-10	1.750
Nov-10	3.075	Nov-10	2.130	Feb-11	1.895
Feb-11	3.145	Feb-11	2.280	May-11	1.850
May-11	3.030	May-11	2.270	Aug-11	2.055
Aug-11	3.230	Aug-11	2.435	Nov-11	2.165
Nov-11	3.320	Nov-11	2.530	Feb-12	1.790
Feb-12	2.880	Feb-12	2.130	May-12	2.240
May-12	3.345	May-12	2.580	Aug-12	2.140
Aug-12	3.140	Aug-12	2.420	Nov-12	2.400
Nov-12	3.380	Nov-12	2.685	Feb-13	2.465
Feb-13	3.435	Feb-13	2.720	May-13	2.535
May-13	3.480	May-13	2.785	Aug-13	2.610
Aug-13	3.535	Aug-13	2.850	Nov-13	2.655
Nov-13	3.565	Nov-13	2.890	Feb-14	2.725
Feb-14	3.600	Feb-14	2.955	May-14	2.890
May-14	3.680	May-14	3.075	Aug-14	2.970
Aug-14	3.730	Aug-14	3.160	Nov-14	3.020
Nov-14	3.760	Nov-14	3.200	Feb-15	3.105
Feb-15	3.825	Feb-15	3.275	May-15	3.240
May-15	3.907	May-15	3.383	Aug-15	3.280
Aug-15	3.940	Aug-15	3.420	Nov-15	3.347
Nov-15	3.967	Nov-15	3.480	Feb-16	3.447
Feb-16	4.033	Feb-16	3.563	May-16	3.493
May-16	4.070	May-16	3.597	Aug-16	3.570
Aug-16	4.120	Aug-16	3.667	Nov-16	3.580
Nov-16	4.115	Nov-16	3.670	Feb-17	3.650
Feb-17	4.163	Feb-17	3.727	May-17	3.705
May-17	4.160	May-17	3.745	Aug-17	3.760
Aug-17	4.190	Aug-17	3.790	Nov-17	3.810
Nov-17	4.223	Nov-17	3.827	Feb-18	3.780
Feb-18	4.195	Feb-18	3.795	May-18	3.795
May-18	N/A	May-18	N/A	Aug-18	N/A
Aug-18	N/A	Aug-18	N/A	Nov-18	N/A
Nov-18	N/A	Nov-18	N/A	Feb-19	N/A
Feb-19	N/A	Feb-19	N/A	May-19	N/A
May-19	N/A	May-19	N/A	Aug-19	N/A
Aug-19	N/A	Aug-19	N/A	Nov-19	N/A
Nov-19	N/A	Nov-19	N/A	Feb-20	N/A
Feb-20	N/A	Feb-20	N/A	May-20	N/A
May-20	N/A	May-20	N/A	Aug-20	N/A
Aug-20	N/A	Aug-20	N/A	Nov-20	N/A
Nov-20	N/A	Nov-20	N/A	Feb-21	N/A
Feb-21	N/A	Feb-21	N/A	May-21	N/A
May-21	N/A	May-21	N/A	Aug-21	N/A
Aug-21	N/A	Aug-21	N/A	Nov-21	N/A
Nov-21	N/A	Nov-21	N/A	Feb-22	N/A
Feb-22	N/A	Feb-22	N/A	May-22	N/A
May-22	N/A	May-22	N/A	Aug-22	N/A

**Massachusetts Private Passenger Automobile  
Compilation of Treasury Strips - Wall Street Journal**

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Exhibit 2

Page 3

<b>APRIL 2008</b>		<b>MAY 2008</b>		<b>JUNE 2008</b>	
FROM WSJ ON WEDNESDAY, APRIL 2, 2008		FROM WSJ ON FRIDAY, MAY 2, 2008		FROM WSJ ON TUESDAY, JUNE 3, 2008	
May-08	1.060	May-08	0.947	Aug-08	1.750
Aug-08	1.507	Aug-08	1.593	Nov-08	1.920
Nov-08	1.543	Nov-08	1.717	Feb-09	1.977
Feb-09	1.757	Feb-09	2.100	May-09	2.065
May-09	1.755	May-09	2.105	Aug-09	2.267
Aug-09	1.780	Aug-09	2.140	Nov-09	2.417
Nov-09	1.817	Nov-09	2.203	Feb-10	2.390
Feb-10	1.817	Feb-10	2.177	May-10	2.470
May-10	1.860	May-10	2.220	Aug-10	2.580
Aug-10	1.890	Aug-10	2.240	Nov-10	2.605
Nov-10	1.930	Nov-10	2.280	Feb-11	2.700
Feb-11	2.040	Feb-11	2.350	May-11	2.690
May-11	2.070	May-11	2.370	Aug-11	2.900
Aug-11	2.235	Aug-11	2.540	Nov-11	2.700
Nov-11	2.350	Nov-11	2.340	Feb-12	3.090
Feb-12	2.040	Feb-12	2.725	May-12	3.020
May-12	2.435	May-12	2.690	Aug-12	3.170
Aug-12	2.410	Aug-12	2.885	Nov-12	3.220
Nov-12	2.600	Nov-12	2.920	Feb-13	3.310
Feb-13	2.635	Feb-13	3.035	May-13	3.345
May-13	2.740	May-13	3.080	Aug-13	3.380
Aug-13	2.795	Aug-13	3.105	Nov-13	3.450
Nov-13	2.815	Nov-13	3.145	Feb-14	3.485
Feb-14	2.850	Feb-14	3.120	May-14	3.515
May-14	2.875	May-14	3.195	Aug-14	3.570
Aug-14	2.930	Aug-14	3.255	Nov-14	3.595
Nov-14	2.990	Nov-14	3.320	Feb-15	3.683
Feb-15	3.050	Feb-15	3.400	May-15	3.740
May-15	3.183	May-15	3.445	Aug-15	3.820
Aug-15	3.215	Aug-15	3.490	Nov-15	3.867
Nov-15	3.280	Nov-15	3.573	Feb-16	3.877
Feb-16	3.360	Feb-16	3.637	May-16	4.007
May-16	3.430	May-16	3.767	Aug-16	4.000
Aug-16	3.560	Aug-16	3.800	Nov-16	4.130
Nov-16	3.590	Nov-16	3.893	Feb-17	4.110
Feb-17	3.693	Feb-17	3.935	May-17	4.145
May-17	3.745	May-17	3.985	Aug-17	4.203
Aug-17	3.800	Aug-17	4.050	Nov-17	4.180
Nov-17	3.877	Nov-17	4.020	Feb-18	4.285
Feb-18	3.845	Feb-18	4.030	May-18	4.340
May-18	3.850	May-18	4.250	Aug-18	4.420
Aug-18	N/A	Aug-18	N/A	Nov-18	N/A
Nov-18	N/A	Nov-18	N/A	Feb-19	N/A
Feb-19	N/A	Feb-19	N/A	May-19	N/A
May-19	N/A	May-19	N/A	Aug-19	N/A
Aug-19	N/A	Aug-19	N/A	Nov-19	N/A
Nov-19	N/A	Nov-19	N/A	Feb-20	N/A
Feb-20	N/A	Feb-20	N/A	May-20	N/A
May-20	N/A	May-20	N/A	Aug-20	N/A
Aug-20	N/A	Aug-20	N/A	Nov-20	N/A
Nov-20	N/A	Nov-20	N/A	Feb-21	N/A
Feb-21	N/A	Feb-21	N/A	May-21	N/A
May-21	N/A	May-21	N/A	Aug-21	N/A
Aug-21	N/A	Aug-21	N/A	Nov-21	N/A
Nov-21	N/A	Nov-21	N/A	Feb-22	N/A
Feb-22	N/A	Feb-22	N/A	May-22	N/A
May-22	N/A	May-22	N/A	Aug-22	N/A
Aug-22	N/A	Aug-22	N/A	Nov-22	N/A

**Massachusetts Private Passenger Automobile  
Compilation of Treasury Strips - Wall Street Journal**

100H-4

Exhibit 2

Page 4

<b>JULY 2008</b>		<b>AUGUST 2008</b>		<b>SEPTEMBER 2008</b>	
FROM WSJ ON WEDNESDAY, JULY 2, 2008		FROM WSJ ON MONDAY, AUGUST 4, 2008		FROM WSJ ON TUESDAY, SEPTEMBER 2, 2008	
Aug-08	1.620	Aug-08	0.890	Nov-08	1.630
Nov-08	1.993	Nov-08	1.680	Feb-09	1.830
Feb-09	2.183	Feb-09	1.893	May-09	1.890
May-09	2.285	May-09	1.985	Aug-09	2.017
Aug-09	2.430	Aug-09	2.230	Nov-09	2.063
Nov-09	2.480	Nov-09	2.307	Feb-10	2.013
Feb-10	2.463	Feb-10	2.277	May-10	2.060
May-10	2.545	May-10	2.345	Aug-10	2.177
Aug-10	2.643	Aug-10	2.467	Nov-10	2.225
Nov-10	2.695	Nov-10	2.535	Feb-11	2.350
Feb-11	2.795	Feb-11	2.650	May-11	2.370
May-11	2.770	May-11	2.660	Aug-11	2.475
Aug-11	2.905	Aug-11	2.785	Nov-11	2.350
Nov-11	2.740	Nov-11	2.600	Feb-12	2.720
Feb-12	3.140	Feb-12	2.975	May-12	2.670
May-12	3.070	May-12	2.930	Aug-12	2.800
Aug-12	3.220	Aug-12	3.085	Nov-12	2.850
Nov-12	3.250	Nov-12	3.110	Feb-13	2.945
Feb-13	3.345	Feb-13	3.210	May-13	2.995
May-13	3.375	May-13	3.255	Aug-13	3.020
Aug-13	3.395	Aug-13	3.265	Nov-13	3.075
Nov-13	3.460	Nov-13	3.325	Feb-14	3.105
Feb-14	3.500	Feb-14	3.360	May-14	3.135
May-14	3.525	May-14	3.395	Aug-14	3.190
Aug-14	3.565	Aug-14	3.445	Nov-14	3.220
Nov-14	3.635	Nov-14	3.475	Feb-15	3.300
Feb-15	3.693	Feb-15	3.567	May-15	3.310
May-15	3.735	May-15	3.595	Aug-15	3.393
Aug-15	3.803	Aug-15	3.667	Nov-15	3.480
Nov-15	3.863	Nov-15	3.740	Feb-16	3.527
Feb-16	3.873	Feb-16	3.780	May-16	3.660
May-16	3.963	May-16	3.907	Aug-16	3.685
Aug-16	4.005	Aug-16	3.940	Nov-16	3.773
Nov-16	4.090	Nov-16	4.020	Feb-17	3.800
Feb-17	4.120	Feb-17	4.055	May-17	3.850
May-17	4.160	May-17	4.100	Aug-17	3.920
Aug-17	4.237	Aug-17	4.170	Nov-17	3.890
Nov-17	4.200	Nov-17	4.145	Feb-18	3.900
Feb-18	4.185	Feb-18	4.140	May-18	4.075
May-18	4.345	May-18	4.300	Aug-18	4.150
Aug-18	4.420	Aug-18	4.380	Nov-18	4.170
Nov-18	N/A	Nov-18	N/A	Feb-19	N/A
Feb-19	N/A	Feb-19	N/A	May-19	N/A
May-19	N/A	May-19	N/A	Aug-19	N/A
Aug-19	N/A	Aug-19	N/A	Nov-19	N/A
Nov-19	N/A	Nov-19	N/A	Feb-20	N/A
Feb-20	N/A	Feb-20	N/A	May-20	N/A
May-20	N/A	May-20	N/A	Aug-20	N/A
Aug-20	N/A	Aug-20	N/A	Nov-20	N/A
Nov-20	N/A	Nov-20	N/A	Feb-21	N/A
Feb-21	N/A	Feb-21	N/A	May-21	N/A
May-21	N/A	May-21	N/A	Aug-21	N/A
Aug-21	N/A	Aug-21	N/A	Nov-21	N/A
Nov-21	N/A	Nov-21	N/A	Feb-22	N/A
Feb-22	N/A	Feb-22	N/A	May-22	N/A
May-22	N/A	May-22	N/A	Aug-22	N/A
Aug-22	N/A	Aug-22	N/A	Nov-22	N/A
Nov-22	N/A	Nov-22	N/A	Feb-23	N/A



**Massachusetts Private Passenger Automobile Compilation of Treasury Strips  
- Wall Street Journal**

**Summary for 12 months October 2007 - September 2008**

<u>Maturity (months)</u>	<u>Average Yield</u>
3	2.287
6	2.416
9	2.502
12	2.522
15	2.521
18	2.536
21	2.555
24	2.598
27	2.639
30	2.688
33	2.724
36	2.783
39	2.798
42	2.874
45	2.963
48	2.925
51	3.010
54	3.098
57	3.160
60	3.240
63	3.289
66	3.335
69	3.366
72	3.410
75	3.473
78	3.535
81	3.583
84	3.646
87	3.716
90	3.766
93	3.825
96	3.885
99	3.937
102	3.986
105	4.020
108	4.063
111	4.084
114	4.108
117	4.162
120	4.214

Source:

Average Yield is from Exhibit 2, Pages 1-4, holding months of maturity constant (interpolated where needed).

**Massachusetts Private Passenger Automobile  
Weighted Averages of Net Cash Flow Matched  
Risk-Free Yield Curves**

**Risk-free Securities**

<u>Maturity</u>	<u>Yield</u>	<u>BI Weights</u>	<u>PDL Weights</u>	<u>Phys Dam Weights</u>
6 Mo.	2.00%	.5 x 120	.5 x 305	.5 x 218
1 Yr.	2.10%	1 x 228	1 x 83	
2 Yr.	2.18%	2 x 80	2 x 12	
3 Yr.	2.36%	3 x 51	3 x 4	
5 Yr.	2.82%	5 x 19	5 x 0	
7 Yr.	3.23%	7 x 3		
10 Yr.	3.79%	10 x 1		
Weighted Average Yields		2.31%	2.06%	2.00%
Weighted Average Duration		1.45	0.67	0.50

Notes: 1. Risk-Free yields from Yield Curve, 100H4, Exhibit 1.

2. Weights chosen to correspond to net cash flow pattern. See 100H4, Exhibit 3, page 2.

**Massachusetts Private Passenger Automobile  
Calculation of Weights for Treasury Bill Maturity Periods**

<u>Bodily Injury Liability</u>				<u>Property Damage Liability</u>				<u>Physical Damage</u>			
<u>Quarter</u>	<u>Net Cash Flow</u>	<u>Maturity Period</u>	<u>Sum for Mat. Period</u>	<u>Quarter</u>	<u>Net Cash Flow</u>	<u>Maturity Period</u>	<u>Sum for Mat. Period</u>	<u>Quarter</u>	<u>Net Cash Flow</u>	<u>Maturity Period</u>	<u>Sum for Mat. Period</u>
1	-159.331			1	-242.375			1	-354.996		
2	- 82.897			2	-165.818			2	-234.397		
3	-111.346			3	-174.796			3	-219.491		
4	-132.658			4	-182.051	1/2 yr.		4	-208.468	1/2 yr.	
5	-119.584	1/2 yr.	119.584	5	-122.772	1/2 yr.	304.823	5	-26.807	1/2 yr.	
6	- 88.534	1 yr.		6	-44.580	1 yr.		6	17.388	1/2 yr.	217.887
7	- 60.249	1 yr.		7	-21.993	1 yr.		7	10.340		
8	- 46.533	1 yr.		8	-9.600	1 yr.		8	8.312		
9	- 32.213	1 yr.	227.529	9	-7.290	1 yr.	83.464	9	3.992		
10	- 26.963	2 yr.		10	-6.016	2 yr.		10	1.456		
11	- 20.183	2 yr.		11	-2.981	2 yr.		11	1.356		
12	- 17.301	2 yr.		12	-2.118	2 yr.		12	0.865		
13	- 15.709	2 yr.	80.155	13	-1.372	2 yr.	12.487	13	1.094		
14	- 13.586	3 yr.		14	-1.288	3 yr.		14	0.563		
15	- 10.498	3 yr.		15	-0.851	3 yr.		15	0.336		
16	- 09.196	3 yr.		16	-0.644	3 yr.		16	0.077		
17	- 07.196	3 yr.		17	-0.731	3 yr.		17	0.141		
18	- 05.785	3 yr.		18	-0.290	3 yr.		18	0.108		
19	- 05.199	3 yr.	51.460	19	-0.386	3 yr.	4.189	19	0.185		
20	- 04.211	5 yr.		20	-0.139	5 yr.		20	0.016		
21	- 03.584	5 yr.		Totals	0.000	5 yr.	0.139	Totals	0.000		
22	- 02.870	5 yr.									
23	- 02.467	5 yr.									
24	- 01.731	5 yr.									
25	- 01.426	5 yr.									
26	- 01.749	5 yr.									
27	- 01.022	5 yr.	19.059								
28	- 00.572	7 yr.									
29	- 00.294	7 yr.									
30	- 00.752	7 yr.									
31	- 00.420	7 yr.									
32	- 00.634	7 yr.									
33	- 00.188	7 yr.									
34	- 00.234	7 yr.									
35	- 00.219	7 yr.	3.314								
36	- 00.234	10 yr.									
37	- 00.068	10 yr.									
38	- 00.287	10 yr.									
39	- 00.091	10 yr.									
40	- 00.092	10 yr.									
Totals	00.000	10 yr.	0.773								

Note: Net Cash Flow is Quarterly Policyholder Account Flow, Section II, 100H-1 Exhibits 2, 3, 4 (page 5).

**Massachusetts Private Passenger Automobile  
Deductions from Investment Income (Countrywide)  
Private Passenger Automobile Predominating Companies**

**Underwriting and Investment Exhibit  
Part 1 - Interest, Dividends and Real Estate Income**

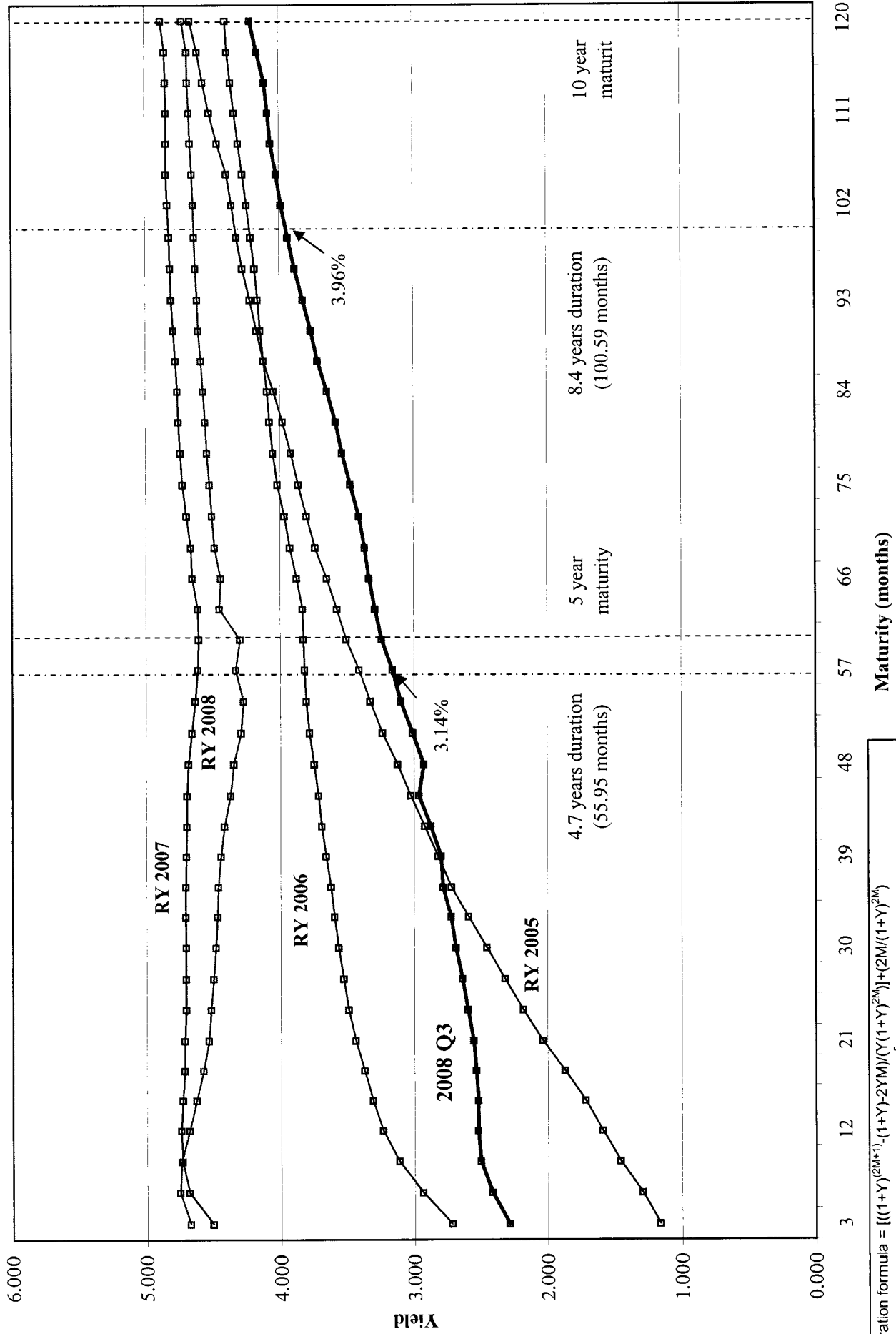
	<u>1998</u>	<u>1999</u>	<u>2000</u>	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>
<u>Investment Income (AS, page 12)</u>										
Line 10 Total earned during the year	516,944	530,041	555,122	576,160	538,437	1,437,267	1,549,083	1,699,597	1,942,619	2,057,560
<u>Deductions</u>										
Line 11+12 Total Investment Expenses Incurred	24,057	27,825	29,177	31,317	34,246	104,275	121,644	143,370	156,168	179,466
Line 13 Interest Expense	710	1,005	1,047	1,332	891	3,675	4,859	7,449	13,059	27,189
Line 14 Depreciation on Real Estate	3,879	4,336	5,925	7,913	8,650	25,511	29,082	32,618	35,602	38,864
Line 15 <u>Aggregate Write-ins</u>	<u>36</u>	<u>6</u>	<u>3</u>	<u>0</u>	<u>195</u>	<u>1,515</u>	<u>2,855</u>	<u>2,748</u>	<u>2,725</u>	<u>1,168</u>
Total (for lines 11 - 15)	28,682	33,172	36,152	40,562	43,982	134,976	158,440	186,187	207,555	246,687

**Assets**

	<u>1998</u>	<u>1999</u>	<u>2000</u>	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>3-yr. avg.</u>
<u>Invested Assets (AS, page 15)</u>											
Line 10 Subtotals, Cash and Invested Assets	8,559,727	8,674,397	8,923,283	9,319,328	9,957,863	34,510,711	38,297,389	41,588,110	43,531,529	41,572,936	
Investment Expense / Invested Assets	0.28%	0.32%	0.33%	0.34%	0.34%	0.30%	0.32%	0.34%	0.36%	0.43%	0.378%
Interest Expense / Invested Assets	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.02%	0.03%	0.07%	0.038%
Deductions / Invested Assets	0.34%	0.38%	0.41%	0.44%	0.44%	0.39%	0.41%	0.45%	0.48%	0.59%	0.506%

Source: Highline Annual Statement data

Comparison of Spot Yield Curves



Duration formula =  $\frac{Y}{(1+Y)^2} \frac{1 - (1+Y)^{-2M}}{Y} + \frac{Y}{(1+Y)^2} \frac{1 - (1+Y)^{-2M}}{Y} + \frac{2M}{(1+Y)^2}$   
 Y is the semi-annual coupon yield =  $\frac{(1+Y)^{2M} - 1}{Y}$ . Duration is formula duration/2.  
 (See Chua, J., "A Closed Form for Calculating Bond Durations", Financial Analyst Journal, May/June 1984).

### Comparison of Spot Yield Curves

RY 2005 11/03-10/04		RY 2006 11/04-10/05		RY 2007 11/05-10/06		RY 2008 11/06-10/07		2008 Q3 10/07-09/08	
Maturity (months)	Average	Maturity (months)	Average	Maturity (months)	Average	Maturity (months)	Average	Maturity (months)	Average
3	1.161	3	2.718	3	4.506	3	4.674	3	2.287
6	1.292	6	2.936	6	4.683	6	4.754	6	2.416
9	1.457	9	3.114	9	4.735	9	4.741	9	2.502
12	1.590	12	3.235	12	4.743	12	4.681	12	2.522
15	1.716	15	3.310	15	4.731	15	4.628	15	2.521
18	1.871	18	3.373	18	4.717	18	4.577	18	2.536
21	2.037	21	3.439	21	4.716	21	4.537	21	2.555
24	2.184	24	3.492	24	4.706	24	4.520	24	2.598
27	2.321	27	3.529	27	4.706	27	4.500	27	2.639
30	2.456	30	3.567	30	4.706	30	4.484	30	2.688
33	2.593	33	3.597	33	4.709	33	4.472	33	2.724
36	2.721	36	3.623	36	4.707	36	4.464	36	2.783
39	2.819	39	3.660	39	4.702	39	4.444	39	2.798
42	2.921	42	3.692	42	4.699	42	4.418	42	2.874
45	3.023	45	3.715	45	4.697	45	4.373	45	2.963
48	3.123	48	3.748	48	4.685	48	4.348	48	2.925
51	3.235	51	3.782	51	4.659	51	4.293	51	3.010
54	3.327	54	3.806	54	4.634	54	4.274	54	3.098
57	3.410	57	3.819	57	4.614	57	4.333	57	3.160
60	3.506	60	3.827	60	4.608	60	4.300	60	3.240
63	3.576	63	3.832	63	4.614	63	4.452	63	3.289
66	3.650	66	3.877	66	4.655	66	4.443	66	3.335
69	3.738	69	3.926	69	4.665	69	4.488	69	3.366
72	3.801	72	3.967	72	4.697	72	4.508	72	3.410
75	3.862	75	4.018	75	4.726	75	4.524	75	3.473
78	3.917	78	4.050	78	4.742	78	4.543	78	3.535
81	3.979	81	4.076	81	4.755	81	4.555	81	3.583
84	4.045	84	4.094	84	4.762	84	4.571	84	3.646
87	4.119	87	4.119	87	4.775	87	4.586	87	3.716
90	4.170	90	4.143	90	4.791	90	4.605	90	3.766
93	4.220	93	4.162	93	4.806	93	4.614	93	3.825
96	4.275	96	4.184	96	4.813	96	4.625	96	3.885
99	4.320	99	4.213	99	4.820	99	4.634	99	3.937
102	4.354	102	4.242	102	4.833	102	4.641	102	3.986
105	4.391	105	4.273	105	4.843	105	4.650	105	4.020
108	4.461	108	4.304	108	4.840	108	4.663	108	4.063
111	4.519	111	4.333	111	4.840	111	4.669	111	4.084
114	4.566	114	4.358	114	4.844	114	4.680	114	4.108
117	4.606	117	4.384	117	4.850	117	4.684	117	4.162
120	4.660	120	4.398	120	4.878	120	4.720	120	4.214

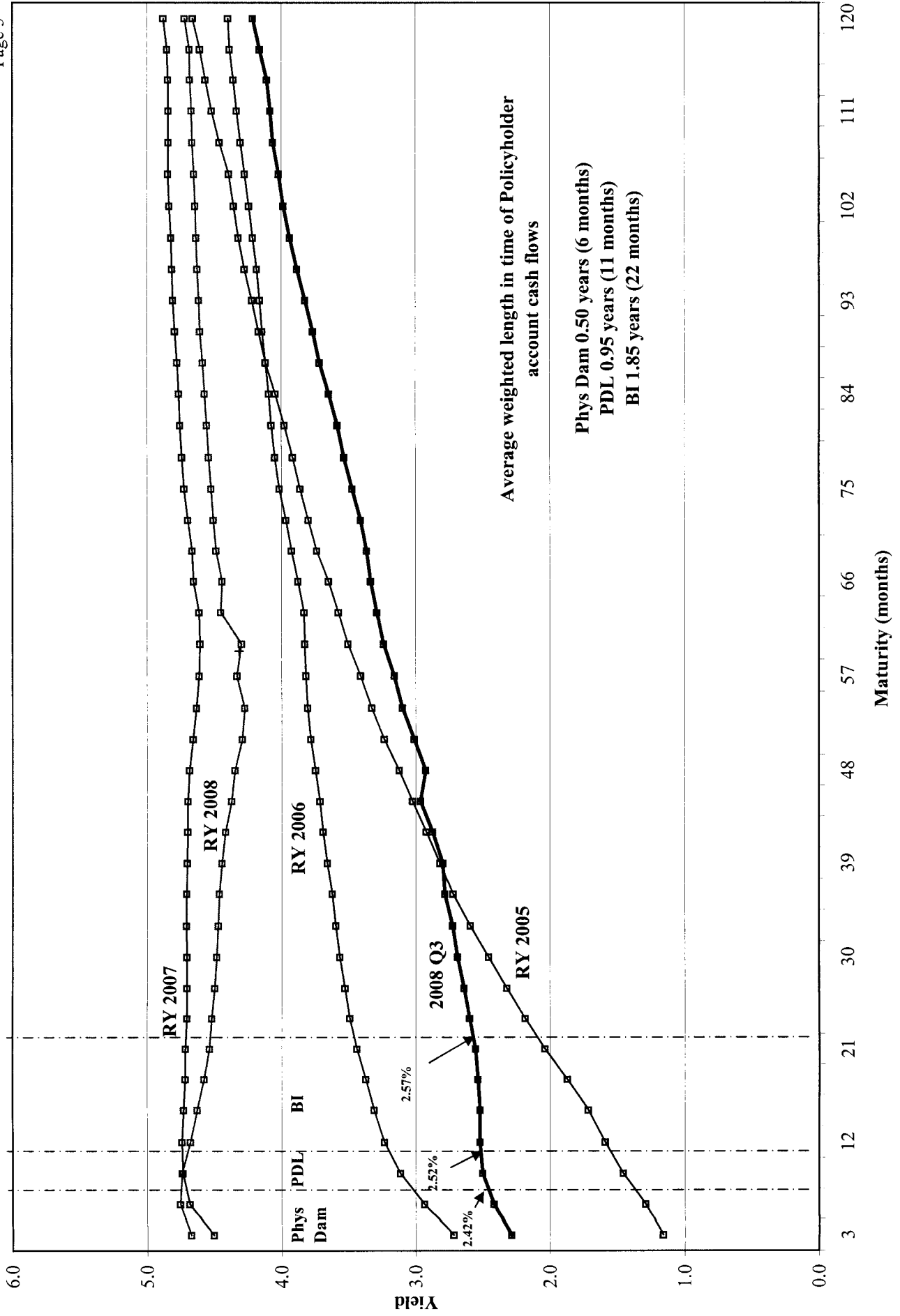
recision spot yield curves.







### Comparison of Spot Yield Curves and Duration of Lines



**Massachusetts Private Passenger Automobile  
Value Line Property and Casualty Insurance Companies  
Weighted Cost of Capital - Value Line Data Four Quarters**

	Percent	Cost	
Equity	80.00%	10.96%	1/
Debt	20.00%	4.00%	2/
Weighted Average Cost of Capital		9.57%	

1/ Average of COC rates for DCF and CAPM, as shown on Cost of Capital, Exhibit 1, Page 2.

2/ Cost of long-term debt only of 6.16%, as shown on Cost of Capital, Exhibit 1, Page 3, adjusted for 35% tax rate.

**Massachusetts Private Passenger Automobile  
Value Line Property and Casualty Insurance Companies  
Cost of Capital Estimates - Value Line Data Four Quarters**

	Dividend Growth DCF Model 1/	CAPM 2/
4th Quarter 2007	12.67%	9.92%
1st Quarter 2008	11.93%	9.77%
2nd Quarter 2008	11.51%	9.76%
3rd Quarter 2008	12.17%	9.91%
Four Quarter Summary	12.07%	9.84%
<b>Total Average</b>	<b>10.96%</b>	

1/ DCF weighted Cost Rates for each quarter, as shown on Cost of Capital, Exhibit 2.

2/ CAPM weighted Cost Rates for each quarter, as shown on Cost of Capital, Exhibit 3.

**Massachusetts Private Passenger Automobile  
Value Line Property and Casualty Insurance Companies  
Debt Estimates - Value Line Data Four Quarters**

	Long Term Debt Weight 1/	Cost of Debt 2/
4th Quarter 2007	15.58%	6.31%
1st Quarter 2008	17.12%	6.23%
2nd Quarter 2008	15.68%	6.06%
3rd Quarter 2008	17.33%	6.05%
Four Quarter Summary	16.43%	6.16%
Selected	16.43%	6.16%

1/ Median Long Term Debt Weight for each quarter, as shown on Cost of Capital, Exhibit 5.

2/ Median Cost of Debt for each quarter, as shown on Cost of Capital, Exhibit 5.

**Massachusetts Private Passenger Automobile  
Value Line Property and Casualty Insurance Companies  
Discounted Cash Flow Analysis using Alternative Data and Methodologies**

Company	Div'd Yield	DPS Growth			EPS Growth 2/			Plowback Growth Rate 3/			Average of All Growth Rates	DCF Cost Rates All Cos.
		Past 10 Yrs 1/	5-Yr Est	Average	Past 10 Yrs	5-Yr Est	Average	Past 10 Yrs	5-Yr Est	Average		
Alleghany Corp	0.0%	NMF	NMF	NMF	NMF	25.0%	25.0%	6.5%	8.5%	7.5%	16.24%	16.24%
Ace Limited	1.9%	18.0%	7.5%	12.8%	15.0%	10.5%	12.8%	9.4%	8.5%	9.0%	11.48%	13.38%
Allstate Corp	2.9%	12.5%	8.0%	10.3%	11.0%	9.0%	10.0%	11.5%	13.5%	12.5%	10.91%	13.81%
American Financial Group, Inc.	1.4%	-6.0%	6.5%	0.3%	-1.0%	12.5%	5.8%	5.9%	11.5%	8.7%	4.90%	6.30%
American International Group, Inc	1.4%	20.0%	18.0%	19.0%	13.5%	11.0%	12.3%	12.5%	13.0%	12.8%	14.67%	16.07%
W.R. Berkley Corp	0.6%	8.0%	17.0%	12.5%	22.5%	9.0%	15.8%	10.1%	11.0%	10.6%	13.54%	13.54%
Berkshire Hathaway Inc.	0.0%	NMF	6.0%	6.0%	10.5%	4.0%	7.3%	7.3%	9.0%	8.2%	7.14%	9.34%
The Chubb Corporation	2.2%	6.0%	6.0%	8.8%	10.0%	1.5%	5.8%	3.3%	3.5%	3.4%	5.96%	9.66%
Cincinnati Financial Corp	3.7%	11.5%	NMF	NMF	-3.5%	15.0%	5.8%	5.1%	7.5%	6.3%	6.02%	7.72%
CNA Financial	1.7%	NMF	NMF	NMF	8.5%	3.5%	6.0%	13.5%	10.0%	11.8%	9.84%	13.34%
Eric Indemnity	3.5%	13.5%	10.0%	11.8%	8.5%	3.5%	6.0%	13.5%	10.0%	11.8%	9.84%	13.34%
Hanover Insurance Group	0.9%	6.5%	22.0%	14.3%	-0.5%	13.5%	6.5%	6.9%	7.0%	7.0%	9.24%	10.14%
The Hartford Financial Services Group	2.2%	NMF	15.0%	15.0%	18.0%	8.5%	13.3%	9.8%	7.5%	8.6%	12.30%	14.50%
HCC Insurance Holding, Inc	1.5%	NMF	14.0%	14.0%	13.0%	11.5%	12.3%	11.2%	10.0%	10.6%	12.28%	13.78%
Market Corporation	0.0%	NMF	NMF	NMF	15.0%	11.5%	13.8%	8.2%	11.5%	9.8%	11.79%	11.79%
Mercury General Corp.	4.0%	15.5%	4.5%	10.0%	10.5%	11.0%	10.8%	9.1%	8.0%	8.6%	9.77%	13.77%
Old Republic International Corp.	4.5%	14.0%	10.0%	12.0%	9.5%	1.5%	5.5%	9.4%	5.0%	7.2%	8.23%	12.73%
PMI Group	1.4%	14.0%	12.0%	13.0%	11.5%	7.5%	9.5%	14.5%	10.0%	12.2%	11.58%	12.98%
The Progressive Corp. of Ohio	1.1%	5.0%	NMF	5.0%	20.5%	1.0%	10.8%	17.8%	21.0%	19.4%	11.72%	12.82%
RLI	1.6%	11.5%	12.0%	11.8%	22.0%	7.5%	14.8%	8.9%	10.0%	9.4%	11.98%	13.58%
SAFECO Corporation	2.9%	-1.0%	11.5%	5.3%	5.5%	5.5%	5.5%	5.9%	9.0%	7.5%	6.07%	8.97%
Selective Insurance Group	2.2%	3.5%	6.0%	4.8%	9.5%	6.5%	8.0%	6.9%	10.0%	8.4%	7.06%	9.26%
The Travelers Co.	2.2%	2.0%	5.0%	3.5%	2.5%	12.0%	7.3%	6.6%	9.0%	7.8%	6.18%	8.38%
Unitrin, Inc.	4.0%	6.0%	2.5%	4.3%	6.5%	4.0%	5.3%	2.4%	5.0%	3.7%	4.40%	8.40%
XL Capital Ltd.	2.6%	9.5%	-1.5%	4.0%	-7.0%	NMF	-7.0%	7.2%	11.0%	9.1%	2.03%	4.63%
Average	2.0%	8.9%	9.6%	9.4%	10.3%	8.8%	9.5%	8.6%	9.5%	9.1%	9.45%	11.47%
Weighted Average 4/												12.67%

1/ NMF - since company does not currently pay dividends, dividend growth on both a historic and prospective basis has no meaningful value.

2/ NMF - calculations omitted by ValueLine

3/ As reported in Value Line as "Retained to Com Eq." Value Line references to NMF are treated as zero values, since the NMF results from negative EPS or EPS less than DPS and effectively means that earnings retention is negative. Years with missing data are not included in average calculations

4/ Average Weighted by 2006 Company Private Passenger Auto Written Premium (Cost of Capital, Ex 4, Pg 1)

Sources: Value Line Investment Survey, November 24, 2007 and December 22, 2007.

**Massachusetts Private Passenger Automobile  
Value Line Property and Casualty Insurance Companies  
Discounted Cash Flow Analysis using Alternative Data and Methodologies**

Company	DPS Growth			EPS Growth 2/			Plowback Growth Rate 3/			Average of All Growth Rates	DCF Cost Rates All cos.
	Past 10 Yrs 1/	5-Yr Est	Average	Past 10 Yrs	5-Yr Est	Average	Past 10 Yrs	5-Yr Est	Average		
Alleghany Corp	0.0%	NMF	NMF	NMF	25.0%	25.0%	NMF	7.8%	7.5%	7.7%	16.33%
Ace Limited	2.0%	16.5%	11.8%	11.0%	7.0%	9.0%	11.0%	10.7%	9.0%	9.9%	10.20%
Allstate Corp	3.4%	12.0%	10.0%	-1.0%	9.0%	10.0%	11.0%	11.4%	12.0%	11.7%	10.57%
American Financial Group, Inc.	1.9%	-6.0%	0.3%	13.5%	12.5%	5.8%	7.0%	7.0%	11.5%	9.2%	6.98%
American International Group, Inc	1.7%	20.0%	19.0%	13.5%	11.0%	12.3%	13.5%	12.5%	13.0%	12.8%	14.67%
W.R. Berkley Corp	0.7%	8.0%	11.8%	22.5%	8.5%	15.5%	NMF	13.7%	11.0%	12.4%	13.20%
Berkshire Hathaway Inc.	1.5%	NMF	NMF	NMF	NMF	NMF	NMF	7.1%	8.0%	7.5%	9.07%
The Chubb Corporation	2.3%	6.0%	6.0%	10.5%	4.5%	7.5%	10.5%	9.7%	8.5%	9.1%	9.84%
Cincinnati Financial Corp	4.0%	11.5%	8.8%	10.0%	1.5%	5.8%	8.8%	3.8%	4.0%	3.9%	6.14%
CNA Financial	2.3%	NMF	NMF	-3.5%	13.0%	4.8%	-3.5%	6.1%	7.5%	6.8%	10.14%
Eric Indemnity	3.4%	15.0%	12.5%	8.5%	3.5%	6.0%	8.5%	13.0%	9.5%	11.2%	8.07%
Hanover Insurance Group	1.0%	6.5%	13.3%	-0.5%	13.0%	6.3%	13.0%	7.8%	8.0%	7.9%	13.31%
The Hartford Financial Services Group	2.9%	NMF	15.0%	18.0%	8.0%	13.0%	18.0%	10.9%	13.5%	12.2%	10.13%
HCC Insurance Holding, Inc	1.9%	NMF	13.0%	13.0%	9.5%	11.3%	13.0%	11.2%	9.5%	10.4%	16.29%
Market Corporation	0.0%	NMF	NMF	15.0%	12.5%	13.8%	15.0%	10.2%	10.0%	10.1%	13.44%
Mercury General Corp.	5.2%	15.5%	10.0%	10.5%	5.5%	8.0%	10.5%	8.2%	8.0%	8.1%	11.92%
Old Republic International Corp.	5.1%	14.0%	11.3%	9.5%	0.5%	5.0%	9.5%	8.4%	5.0%	6.7%	13.90%
PMI Group	3.4%	14.0%	12.8%	11.5%	NMF	11.5%	11.5%	14.3%	4.0%	9.1%	12.76%
The Progressive Corp. of Ohio	0.9%	0.5%	0.5%	18.0%	1.0%	9.5%	18.0%	18.4%	18.0%	18.2%	14.53%
RLI	1.7%	11.5%	11.3%	22.0%	8.0%	15.0%	22.0%	9.5%	9.0%	9.3%	10.31%
SAFECO Corporation	3.5%	-1.0%	4.8%	5.5%	4.5%	5.0%	5.5%	8.5%	7.5%	8.0%	13.54%
Selective Insurance Group	2.1%	3.5%	4.8%	9.5%	6.5%	8.0%	9.5%	6.8%	10.5%	9.1%	9.41%
The Travelers Co.	2.4%	2.0%	3.5%	2.5%	10.0%	6.3%	2.5%	7.3%	9.0%	8.1%	9.24%
Unitrin, Inc.	5.1%	6.0%	4.3%	6.5%	4.0%	5.3%	6.5%	3.4%	6.0%	4.7%	8.56%
XL Capital Ltd.	4.5%	9.5%	4.3%	-7.0%	NMF	-7.0%	-7.0%	8.0%	12.5%	10.3%	9.84%
Average	2.5%	8.7%	9.0%	9.4%	8.1%	8.8%	9.4%	9.4%	9.3%	9.4%	11.63%
Weighted Average 4/											11.93%

1/ NMF - since company does not currently pay dividends, dividend growth on both a historic and prospective basis has no meaningful value.

2/ NMF - calculations omitted by ValueLine

3/ As reported in Value Line as "Retained to Com Eq." Value Line references to NMF are treated as zero values, since the NMF results from negative EPS or EPS less than DPS and effectively means that earnings retention is negative. Years with missing data are not included in average calculations

4/ Average Weighted by 2006 Company Private Passenger Auto Written Premium (Cost of Capital, Ex 4, Pg 1)

Sources: Value Line Investment Survey, December 22, 2007 and March 21, 2008.

**Massachusetts Private Passenger Automobile  
Value Line Property and Casualty Insurance Companies  
Discounted Cash Flow Analysis using Alternative Data and Methodologies**

Company	Div'd Yield	DPS Growth			EPS Growth 2/			Plowback Growth Rate 3/ Past 10			Average of All Growth Rates	DCF Cost Rates All cos.
		Past 10 Yrs 1/	5-Yr Est	Average	Past 10 Yrs	5-Yr Est	Average	Yrs	5-Yr Est	Average		
Alleghany Corp	0.0%	NMF	25.0%	25.0%	NMF	NMF	NMF	7.8%	8.5%	8.2%	16.58%	16.58%
Ace Limited	1.9%	11.0%	7.0%	9.0%	16.5%	7.0%	11.8%	10.7%	9.0%	9.9%	10.20%	12.10%
Allstate Corp	3.3%	11.0%	9.0%	10.0%	12.0%	8.0%	10.0%	11.4%	10.0%	10.7%	10.23%	13.53%
American Financial Group, Inc.	1.7%	NMF	12.5%	12.5%	-6.0%	6.5%	0.3%	7.0%	12.0%	9.5%	7.42%	9.12%
American International Group, Inc	2.2%	11.0%	9.5%	10.3%	22.0%	17.0%	19.5%	12.0%	12.0%	12.0%	13.91%	16.11%
W.R. Berkley Corp	0.9%	21.5%	7.0%	14.3%	8.0%	11.5%	9.8%	13.9%	16.0%	15.0%	12.99%	13.89%
Berkshire Hathaway Inc.	0.0%	NMF	NMF	NMF	NMF	NMF	NMF	7.1%	11.0%	9.0%	9.03%	9.03%
The Chubb Corporation	2.5%	11.0%	2.0%	6.5%	6.5%	8.0%	7.3%	9.7%	8.0%	8.9%	7.54%	10.04%
Cincinnati Financial Corp	4.7%	9.0%	0.5%	4.8%	11.5%	5.5%	8.5%	3.8%	3.9%	3.9%	10.42%	10.42%
CNA Financial	2.0%	-3.5%	10.5%	3.5%	NMF	43.0%	43.0%	6.1%	8.0%	7.0%	17.84%	19.84%
Eric Indemnity	3.7%	8.5%	3.5%	6.0%	15.0%	10.0%	12.5%	13.0%	9.0%	11.0%	9.83%	13.53%
Hanover Insurance Group	1.0%	1.0%	11.0%	6.0%	9.0%	9.0%	10.8%	7.8%	8.0%	7.9%	8.22%	9.22%
The Hartford Financial Services Group	3.1%	16.5%	5.0%	10.8%	12.0%	8.5%	10.3%	11.0%	15.0%	13.0%	11.33%	14.43%
HCC Insurance Holding, Inc	1.9%	14.0%	7.0%	10.5%	24.0%	11.0%	17.5%	11.2%	10.0%	10.6%	12.87%	14.77%
Market Corporation	0.0%	14.5%	12.5%	13.5%	NMF	NMF	NMF	10.2%	7.5%	8.8%	11.17%	11.17%
Mercury General Corp.	4.4%	6.5%	5.5%	6.0%	14.5%	4.5%	9.5%	8.2%	7.5%	7.8%	7.78%	12.18%
Old Republic International Corp.	4.7%	5.5%	2.5%	4.0%	14.0%	7.5%	10.8%	8.4%	5.0%	6.7%	7.16%	11.86%
PMI Group	1.2%	NMF	NMF	NMF	14.0%	Nil	14.0%	14.3%	4.0%	9.1%	11.57%	12.77%
The Progressive Corp. of Ohio	0.7%	18.0%	1.0%	9.5%	0.5%	NMF	0.5%	18.4%	18.0%	18.2%	9.41%	10.11%
RLI	1.9%	17.0%	3.5%	10.3%	13.5%	10.3%	12.0%	9.8%	8.5%	9.1%	10.46%	12.36%
SAFECO Corporation	2.4%	6.0%	3.0%	4.5%	0.5%	9.0%	4.8%	8.7%	7.5%	8.1%	5.78%	8.18%
Selective Insurance Group	2.4%	8.5%	6.5%	7.5%	4.5%	6.0%	5.3%	6.9%	9.5%	8.2%	6.98%	9.38%
The Travelers Co.	2.5%	2.5%	10.0%	6.3%	2.0%	5.0%	3.5%	7.3%	9.0%	8.1%	5.96%	8.46%
Unitrin, Inc.	4.9%	5.5%	0.5%	3.0%	5.0%	1.5%	3.3%	3.2%	3.5%	3.3%	3.20%	8.10%
XL Capital Ltd.	4.5%	-7.0%	22.0%	7.5%	5.5%	NMF	5.5%	8.0%	11.5%	9.7%	7.58%	12.08%
Average	2.3%	9.0%	7.7%	8.7%	9.7%	10.1%	10.5%	9.4%	9.3%	9.4%	9.63%	11.97%
Weighted Average 4/												11.51%

1/ NMF - since company does not currently pay dividends, dividend growth on both a historic and prospective basis has no meaningful value.

2/ NMF - calculations omitted by ValueLine

3/ As reported in Value Line as "Retained to Com Eq." Value Line references to NMF are treated as zero values, since the NMF results from negative EPS or EPS less than DPS and effectively means that earnings retention is negative. Years with missing data are not included in average calculations

4/ Average Weighted by 2006 Company Private Passenger Auto Written Premium (Cost of Capital, Ex 4, Pg 1)

Sources: Value Line Investment Survey, May 23, 2008 and June 20, 2008.

**Massachusetts Private Passenger Automobile  
Value Line Property and Casualty Insurance Companies  
Discounted Cash Flow Analysis using Alternative Data and Methodologies**

Company	DPS Growth			EPS Growth 2/			Plowback Growth Rate 3/			Average of		DCF Cost Rates All cos.
	Past 10 Yrs 1/	5-Yr Est	Average	Past 10 Yrs	5-Yr Est	Average	Past 10 Yrs	5-Yr Est	Average	Plowback Growth Rate	DCF Cost Rates	
Alleghany Corp	0.0%	11.0%	11.0%	NMF	NMF	NMF	NMF	7.8%	8.5%	8.2%	9.58%	9.58%
Ace Limited	2.3%	11.0%	9.0%	11.0%	7.0%	11.8%	11.8%	10.7%	12.5%	11.6%	10.78%	13.08%
Allstate Corp	3.6%	11.0%	10.0%	12.0%	8.0%	10.0%	10.0%	11.4%	11.5%	11.4%	10.48%	14.08%
American Financial Group, Inc.	1.7%	12.5%	12.5%	-6.0%	6.5%	0.3%	0.3%	7.0%	12.0%	9.5%	7.42%	9.12%
American International Group, Inc.	3.9%	11.0%	8.5%	22.0%	11.0%	16.5%	16.5%	12.0%	11.0%	11.5%	12.16%	16.06%
W.R. Berkley Corp	1.0%	21.5%	14.3%	8.0%	7.0%	14.3%	14.3%	13.9%	8.0%	11.0%	11.65%	12.65%
Berkshire Hathaway Inc.	0.0%	24.0%	16.0%	NMF	NMF	NMF	NMF	7.1%	9.0%	8.0%	12.01%	12.01%
The Chubb Corporation	2.8%	11.0%	6.5%	6.5%	8.0%	7.3%	7.3%	9.7%	3.5%	6.6%	6.79%	9.59%
Cincinnati Financial Corp	5.3%	9.0%	4.0%	11.5%	5.5%	8.5%	8.5%	3.8%	8.0%	5.9%	6.14%	11.44%
CNA Financial	2.1%	-5.0%	2.8%	NMF	NMF	NMF	NMF	6.1%	11.0%	8.5%	5.64%	7.74%
Erre Indemnity	4.1%	8.5%	6.3%	15.0%	9.0%	12.0%	12.0%	13.0%	8.5%	10.7%	9.66%	13.76%
Hanover Insurance Group	1.0%	11.0%	6.0%	9.0%	12.5%	10.8%	10.8%	7.8%	7.5%	7.7%	8.14%	9.14%
The Hartford Financial Services Group	3.3%	16.5%	10.3%	12.0%	7.0%	9.5%	9.5%	11.0%	10.0%	10.5%	10.08%	13.38%
HCC Insurance Holding, Inc	1.7%	14.0%	10.3%	10.3%	11.0%	17.5%	17.5%	11.2%	11.5%	11.4%	13.03%	14.73%
Markel Corporation	0.0%	14.5%	13.5%	NMF	NMF	NMF	NMF	10.2%	8.0%	9.1%	11.29%	11.29%
Mercury General Corp.	4.4%	6.5%	6.0%	14.5%	4.5%	9.5%	9.5%	8.2%	6.0%	7.1%	7.53%	11.93%
Old Republic International Corp.	5.8%	5.5%	4.0%	2.5%	7.5%	10.8%	10.8%	10.0%	10.0%	9.2%	7.99%	13.79%
PMI Group	1.5%	NMF	NMF	14.0%	NMF	14.0%	14.0%	14.3%	16.5%	15.4%	14.70%	16.20%
The Progressive Corp. of Ohio	0.8%	18.0%	9.5%	0.5%	NMF	0.5%	0.5%	18.4%	10.0%	14.2%	8.07%	8.87%
RLJ	1.8%	17.0%	10.3%	13.5%	3.5%	10.3%	10.3%	13.5%	9.0%	9.4%	10.55%	12.35%
Selective Insurance Group	2.2%	8.5%	7.5%	4.5%	6.0%	5.3%	5.3%	6.9%	11.0%	8.9%	7.23%	9.43%
The Travelers Co.	2.8%	5.0%	5.0%	1.5%	5.0%	3.3%	3.3%	7.4%	9.0%	8.2%	5.48%	8.28%
Unitrin, Inc.	8.1%	5.5%	5.0%	5.0%	4.5%	3.0%	3.0%	3.2%	3.5%	3.3%	3.86%	11.96%
XL Capital Ltd.	4.0%	-7.0%	7.5%	5.5%	NMF	5.5%	5.5%	8.0%	6.0%	7.0%	6.66%	10.66%
<b>Average</b>	<b>2.7%</b>	<b>9.9%</b>	<b>8.5%</b>	<b>10.2%</b>	<b>7.8%</b>	<b>8.9%</b>	<b>8.9%</b>	<b>9.5%</b>	<b>9.2%</b>	<b>9.3%</b>	<b>9.04%</b>	<b>11.71%</b>
<b>Weighted Average 4/</b>												<b>12.17%</b>

1/ NMF - since company does not currently pay dividends, dividend growth on both a historic and prospective basis has no meaningful value.

2/ NMF - calculations omitted by ValueLine

3/ As reported in Value Line as "Retained to Com Eq." Value Line references to NMF are treated as zero values, since the NMF results from negative EPS or EPS less than DPS and effectively means that earnings retention is negative. Years with missing data are not included in average calculations

4/ Average Weighted by 2006 Company Private Passenger Auto Written Premium (Cost of Capital, Ex 4, Pg 1)

Sources: Value Line Investment Survey, August 22, 2008 and September 19, 2008.



**Massachusetts Private Passenger Automobile  
Value Line Property and Casualty Companies  
Capital Asset Pricing Model**

Company	Beta		U.S. Treasury Yields 1/			Market Risk Premiums			CAPM Cost Rates			Avg All Cos
	Value Line	3-month	5-Year	10-Year	Short-Term	5-Year	10-Year	Short-Term	5-Year	10-Year		
Alleghany Corp	0.65	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	7.80%	8.02%	8.77%	8.20%	
Ace Limited	1.25	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	12.89%	12.53%	13.21%	12.88%	
Allstate Corp	0.95	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	10.35%	10.28%	10.99%	10.54%	
American Financial Group, Inc.	1.00	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	10.77%	10.65%	11.36%	10.93%	
American International Group, Inc	1.15	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	12.04%	11.78%	12.47%	12.10%	
W.R. Berkley Corp	1.00	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	10.77%	10.65%	11.36%	10.93%	
Berkshire Hathaway Inc.	0.55	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	6.95%	7.27%	8.03%	7.42%	
The Chubb Corporation	1.05	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	11.19%	11.03%	11.73%	11.32%	
Cincinnati Financial Corp	0.85	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	9.50%	9.53%	10.25%	9.76%	
CNA Financial	0.90	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	9.92%	9.90%	10.62%	10.15%	
Erie Indemnity	0.65	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	7.80%	8.02%	8.77%	8.20%	
Hanover Insurance Group	1.30	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	13.31%	12.91%	13.58%	13.27%	
The Hartford Financial Services Group	1.30	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	13.31%	12.91%	13.58%	13.27%	
HCC Insurance Holding, Inc	0.85	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	9.50%	9.53%	10.25%	9.76%	
Market Corporation	0.80	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	9.07%	9.15%	9.88%	9.37%	
Mercury General Corp.	0.85	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	9.50%	9.53%	10.25%	9.76%	
Old Republic International Corp.	0.95	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	10.35%	10.28%	10.99%	10.54%	
PMI Group	1.30	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	13.31%	12.91%	13.58%	13.27%	
The Progressive Corp. of Ohio	0.80	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	9.07%	9.15%	9.88%	9.37%	
RLI	0.80	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	9.07%	9.15%	9.88%	9.37%	
SAFECO Corporation	0.80	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	9.07%	9.15%	9.88%	9.37%	
Selective Insurance Group	0.95	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	10.35%	10.28%	10.99%	10.54%	
The Travelers Co.	1.00	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	10.77%	10.65%	11.36%	10.93%	
Unitrin, Inc.	1.10	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	11.62%	11.41%	12.10%	11.71%	
XL Capital Ltd.	1.05	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	11.19%	11.03%	11.73%	11.32%	
Average	0.95										<b>10.57%</b>	
Weighted Average 2/											<b>9.92%</b>	

1/ U.S. Treasury securities with 3-month, 5-year, and 10-year maturities from Wall Street Journal U.S. Treasury Strips

2/ Average Weighted by 2007 Company Private Passenger Auto Written Premium (Cost of Capital, Ex 4, Pg 1)

**Massachusetts Private Passenger Automobile  
Value Line Property and Casualty Companies  
Capital Asset Pricing Model**

Company	Beta Value Line	U.S. Treasury Yields 1/			Market Risk Premiums			CAPM Cost Rates			
		3-month	5-Year	10-Year	Short-Term	5-Year	10-Year	Short-Term	5-Year	10-Year	Avg All Cos
Alleghany Corp	0.70	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	8.22%	8.40%	9.14%	8.59%
Ace Limited	1.20	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	12.47%	12.16%	12.84%	12.49%
Allstate Corp	0.90	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	9.92%	9.90%	10.62%	10.15%
American Financial Group, Inc.	1.00	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	10.77%	10.65%	11.36%	10.93%
American International Group, Inc	1.15	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	12.04%	11.78%	12.47%	12.10%
W.R. Berkley Corp	1.00	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	10.77%	10.65%	11.36%	10.93%
Berkshire Hathaway Inc.	0.55	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	6.95%	7.27%	8.03%	7.42%
The Chubb Corporation	1.00	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	10.77%	10.65%	11.36%	10.93%
Cincinnati Financial Corp	0.90	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	9.92%	9.90%	10.62%	10.15%
CNA Financial	0.95	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	10.35%	10.28%	10.99%	10.54%
Erie Indemnity	0.65	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	7.80%	8.02%	8.77%	8.20%
Hanover Insurance Group	1.25	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	12.89%	12.53%	13.21%	12.88%
The Hartford Financial Services Group	1.20	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	12.47%	12.16%	12.84%	12.49%
HCC Insurance Holding, Inc	0.85	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	9.50%	9.53%	10.25%	9.76%
Market Corporation	0.80	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	9.07%	9.15%	9.88%	9.37%
Mercury General Corp.	0.85	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	9.50%	9.53%	10.25%	9.76%
Old Republic International Corp.	1.00	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	10.77%	10.65%	11.36%	10.93%
PMI Group	1.55	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	15.44%	14.79%	15.43%	15.22%
The Progressive Corp. of Ohio	0.80	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	9.07%	9.15%	9.88%	9.37%
RLI	0.85	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	9.50%	9.53%	10.25%	9.76%
SAFECO Corporation	0.80	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	9.07%	9.15%	9.88%	9.37%
Selective Insurance Group	0.95	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	10.35%	10.28%	10.99%	10.54%
The Travelers Co.	1.00	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	10.77%	10.65%	11.36%	10.93%
Unitrin, Inc.	1.15	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	12.04%	11.78%	12.47%	12.10%
XL Capital Ltd.	1.20	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	12.47%	12.16%	12.84%	12.49%
Average	0.97										<b>10.69%</b>
Weighted Average 2/											<b>9.77%</b>

1/ U.S. Treasury securities with 3-month, 5-year, and 10-year maturities from Wall Street Journal U.S. Treasury Strips

2/ Average Weighted by 2007 Company Private Passenger Auto Written Premium (Cost of Capital, Ex 4, Pg 1)

**Massachusetts Private Passenger Automobile  
Value Line Property and Casualty Companies  
Capital Asset Pricing Model**

Company	Beta Value Line	U.S. Treasury Yields 1/			Market Risk Premiums			CAPM Cost Rates			Avg All Cos
		3-month	5-Year	10-Year	Short-Term	5-Year	10-Year	Short-Term	5-Year	10-Year	
Alleghany Corp	0.70	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	8.22%	8.40%	9.14%	8.59%
Ace Limited	1.05	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	11.19%	11.03%	11.73%	11.32%
Allstate Corp	0.90	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	9.92%	9.90%	10.62%	10.15%
American International Group, Inc.	1.00	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	10.77%	10.65%	11.36%	10.93%
American International Group, Inc	1.15	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	12.04%	11.78%	12.47%	12.10%
W.R. Berkley Corp	0.95	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	10.35%	10.28%	10.99%	10.54%
Berkshire Hathaway Inc.	0.55	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	6.95%	7.27%	8.03%	7.42%
The Chubb Corporation	0.90	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	9.92%	9.90%	10.62%	10.15%
Cincinnati Financial Corp	0.85	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	9.50%	9.53%	10.25%	9.76%
CNA Financial	0.95	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	10.35%	10.28%	10.99%	10.54%
Erie Indemnity	0.65	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	7.80%	8.02%	8.77%	8.20%
Hanover Insurance Group	1.15	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	12.04%	11.78%	12.47%	12.10%
The Hartford Financial Services Group	1.20	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	12.47%	12.16%	12.84%	12.49%
HCC Insurance Holding, Inc	0.80	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	9.07%	9.15%	9.88%	9.37%
Markel Corporation	0.80	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	9.07%	9.15%	9.88%	9.37%
Mercury General Corp.	0.85	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	9.50%	9.53%	10.25%	9.76%
Old Republic International Corp.	1.00	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	10.77%	10.65%	11.36%	10.93%
PMI Group	1.70	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	16.71%	15.92%	16.54%	16.39%
The Progressive Corp. of Ohio	0.80	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	9.07%	9.15%	9.88%	9.37%
RLI	0.80	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	9.07%	9.15%	9.88%	9.37%
SAFECO Corporation	0.80	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	9.07%	9.15%	9.88%	9.37%
Selective Insurance Group	0.95	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	10.35%	10.28%	10.99%	10.54%
The Travelers Co.	1.00	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	10.77%	10.65%	11.36%	10.93%
Unitrin, Inc.	1.20	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	12.47%	12.16%	12.84%	12.49%
XL Capital Ltd.	1.20	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	12.47%	12.16%	12.84%	12.49%
<b>Average</b>	<b>0.96</b>										<b>10.58%</b>
<b>Weighted Average 2/</b>											<b>9.76%</b>

1/ U.S. Treasury securities with 3-month, 5-year, and 10-year maturities from Wall Street Journal U.S. Treasury Strips

2/ Average Weighted by 2007 Company Private Passenger Auto Written Premium (Cost of Capital, Ex 4, Pg 1)

**Massachusetts Private Passenger Automobile  
Value Line Property and Casualty Companies  
Capital Asset Pricing Model**

Company	Beta Value Line	U.S. Treasury Yields 1/			Market Risk Premiums			CAPM Cost Rates			
		3-month	5-Year	10-Year	Short-Term	5-Year	10-Year	Short-Term	5-Year	10-Year	Avg All Cos
Alleghany Corp	0.70	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	8.22%	8.40%	9.14%	8.59%
Ace Limited	1.10	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	11.62%	11.41%	12.10%	11.71%
Allstate Corp	0.90	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	9.92%	9.90%	10.62%	10.15%
American Financial Group, Inc.	1.00	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	10.77%	10.65%	11.36%	10.93%
American International Group, Inc	1.10	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	11.62%	11.41%	12.10%	11.71%
W.R. Berkley Corp	1.00	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	10.77%	10.65%	11.36%	10.93%
Berkshire Hathaway Inc.	0.60	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	7.38%	7.65%	8.40%	7.81%
The Chubb Corporation	0.95	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	10.35%	10.28%	10.99%	10.54%
Cincinnati Financial Corp	1.00	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	10.77%	10.65%	11.36%	10.93%
CNA Financial	1.05	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	11.19%	11.03%	11.73%	11.32%
Erie Indermity	0.70	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	8.22%	8.40%	9.14%	8.59%
Hanover Insurance Group	1.15	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	12.04%	11.78%	12.47%	12.10%
The Hartford Financial Services Group	1.15	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	12.04%	11.78%	12.47%	12.10%
HCC Insurance Holding, Inc	0.90	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	9.92%	9.90%	10.62%	10.15%
Markel Corporation	0.95	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	10.35%	10.28%	10.99%	10.54%
Mercury General Corp.	0.90	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	9.92%	9.90%	10.62%	10.15%
Old Republic International Corp.	1.15	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	12.04%	11.78%	12.47%	12.10%
PMI Group	2.15	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	20.52%	19.30%	19.87%	19.90%
The Progressive Corp. of Ohio	0.85	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	9.50%	9.53%	10.25%	9.76%
RLI	0.90	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	9.92%	9.90%	10.62%	10.15%
Selective Insurance Group	1.00	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	10.77%	10.65%	11.36%	10.93%
The Travelers Co.	1.00	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	10.77%	10.65%	11.36%	10.93%
Unitrin, Inc.	1.20	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	12.47%	12.16%	12.84%	12.49%
XL Capital Ltd.	1.40	2.29%	3.14%	3.96%	8.48%	7.51%	7.40%	14.16%	13.66%	14.32%	14.05%
Average	1.03										11.19%
Weighted Average 2/											9.91%

1/ U.S. Treasury securities with 3-month, 5-year, and 10-year maturities from Wall Street Journal U.S. Treasury Strips

2/ Average Weighted by 2007 Company Private Passenger Auto Written Premium (Cost of Capital, Ex 4, Pg 1)

**Massachusetts Private Passenger Automobile  
Calculation of Market Risk Premium (MRP)**

Year	Income Returns						Common Stocks Income Return		
	Stocks	Government Securities			Risk Premiums				
		Short-Term	Inter-term	Long-Term	Short-Term	Inter-term		Long-Term	
1926	11.62%	3.27%	3.78%	3.73%	8.35%	7.84%	7.89%	5.41%	
1927	37.49%	3.12%	3.49%	3.41%	34.37%	34.00%	34.08%	5.71%	
1928	43.61%	3.56%	3.64%	3.22%	40.05%	39.97%	40.39%	4.81%	
1929	-8.42%	4.75%	4.07%	3.47%	-13.17%	-12.49%	-11.89%	3.98%	
1930	-24.90%	2.41%	3.30%	3.32%	-27.31%	-28.20%	-28.22%	4.57%	
1931	-43.34%	1.07%	3.16%	3.33%	-44.41%	-46.50%	-46.67%	5.35%	
1932	-8.19%	0.96%	3.63%	3.69%	-9.15%	-11.82%	-11.88%	6.16%	
1933	53.99%	0.30%	2.83%	3.12%	53.69%	51.16%	50.87%	6.39%	
1934	-1.44%	0.16%	2.93%	3.18%	-1.60%	-4.37%	-4.62%	4.46%	
1935	47.67%	0.17%	2.02%	2.81%	47.50%	45.65%	44.86%	4.95%	
1936	33.92%	0.18%	1.44%	2.77%	33.74%	32.48%	31.15%	5.36%	
1937	-35.03%	0.31%	1.48%	2.66%	-35.34%	-36.51%	-37.69%	4.66%	
1938	31.12%	-0.02%	1.82%	2.64%	31.14%	29.30%	28.48%	4.83%	
1939	-0.41%	0.02%	1.31%	2.40%	-0.43%	-1.72%	-2.81%	4.69%	
1940	-9.78%	0.00%	0.90%	2.23%	-9.78%	-10.68%	-12.01%	5.36%	
1941	-11.59%	0.06%	0.67%	1.94%	-11.65%	-12.26%	-13.53%	6.71%	
1942	20.34%	0.27%	0.76%	2.46%	20.07%	19.58%	17.88%	6.79%	
1943	25.90%	0.35%	1.56%	2.44%	25.55%	24.34%	23.46%	6.24%	
1944	19.75%	0.33%	1.44%	2.46%	19.42%	18.31%	17.29%	5.48%	
1945	36.44%	0.33%	1.19%	2.34%	36.11%	35.25%	34.10%	4.97%	
1946	-8.07%	0.35%	1.08%	2.04%	-8.42%	-9.15%	-10.11%	4.09%	
1947	5.71%	0.50%	1.21%	2.13%	5.21%	4.50%	3.58%	5.49%	
1948	5.50%	0.81%	1.56%	2.40%	4.69%	3.94%	3.10%	6.09%	
1949	18.79%	1.10%	1.36%	2.25%	17.69%	17.43%	16.54%	7.50%	
1950	31.71%	1.20%	1.39%	2.12%	30.51%	30.32%	29.59%	8.77%	
1951	24.02%	1.49%	1.98%	2.38%	22.53%	22.04%	21.64%	6.91%	
1952	18.37%	1.66%	2.19%	2.66%	16.71%	16.18%	15.71%	5.93%	
1953	-0.99%	1.82%	2.55%	2.84%	-2.81%	-3.54%	-3.83%	5.46%	
1954	52.62%	0.86%	1.60%	2.79%	51.76%	51.02%	49.83%	6.21%	
1955	31.56%	1.57%	2.45%	2.75%	29.99%	29.11%	28.81%	4.56%	
1956	6.56%	2.46%	3.05%	2.99%	4.10%	3.51%	3.57%	3.83%	
1957	-10.78%	3.14%	3.59%	3.44%	-13.92%	-14.37%	-14.22%	3.84%	
1958	43.36%	1.54%	2.93%	3.27%	41.82%	40.43%	40.09%	4.38%	
1959	11.96%	2.95%	4.18%	4.01%	9.01%	7.78%	7.95%	3.31%	
1960	0.47%	2.66%	4.15%	4.26%	-2.19%	-3.68%	-3.79%	3.26%	
1961	26.89%	2.13%	3.54%	3.83%	24.76%	23.35%	23.06%	3.48%	
1962	-8.73%	2.73%	3.73%	4.00%	-11.46%	-12.46%	-12.73%	2.98%	
1963	22.80%	3.12%	3.71%	3.89%	19.68%	19.09%	18.91%	3.61%	
1964	16.48%	3.54%	4.00%	4.15%	12.94%	12.48%	12.33%	3.33%	
1965	12.45%	3.93%	4.15%	4.19%	8.52%	8.30%	8.26%	3.21%	
1966	-10.06%	4.76%	4.93%	4.49%	-14.82%	-14.99%	-14.55%	3.11%	
1967	23.98%	4.21%	4.88%	4.59%	19.77%	19.10%	19.39%	3.64%	
1968	11.06%	5.21%	5.49%	5.50%	5.85%	5.57%	5.56%	3.18%	
1969	-8.50%	6.58%	6.65%	5.95%	-15.08%	-15.15%	-14.45%	3.04%	
1970	4.01%	6.52%	7.49%	6.74%	-2.51%	-3.48%	-2.73%	3.41%	
1971	14.31%	4.39%	5.75%	6.32%	9.92%	8.56%	7.99%	3.33%	
1972	18.98%	3.84%	5.75%	5.87%	15.14%	13.23%	13.11%	3.09%	
1973	-14.66%	6.93%	6.58%	6.51%	-21.59%	-21.24%	-21.17%	2.86%	
1974	-26.47%	8.00%	7.24%	7.27%	-34.47%	-33.71%	-33.74%	3.69%	
1975	37.20%	5.80%	7.35%	7.99%	31.40%	29.85%	29.21%	5.37%	
1976	23.84%	5.08%	7.10%	7.89%	18.76%	16.74%	15.95%	4.38%	
1977	-7.18%	5.12%	6.49%	7.14%	-12.30%	-13.67%	-14.32%	4.31%	
1978	6.56%	7.18%	7.83%	7.90%	-0.62%	-1.27%	-1.34%	5.33%	
1979	18.44%	10.38%	9.04%	8.86%	8.06%	9.40%	9.58%	5.71%	
1980	32.42%	11.24%	10.55%	9.97%	21.18%	21.87%	22.45%	5.73%	
1981	-4.91%	14.71%	12.97%	11.55%	-19.62%	-17.88%	-16.46%	4.89%	
1982	21.41%	10.54%	12.81%	13.50%	10.87%	8.60%	7.91%	5.50%	
1983	22.51%	8.80%	10.35%	10.38%	13.71%	12.16%	12.13%	5.00%	
1984	6.27%	9.85%	11.68%	11.74%	-3.58%	-5.41%	-5.47%	4.56%	
1985	32.16%	7.72%	10.29%	11.25%	24.44%	21.87%	20.91%	5.10%	
1986	18.47%	6.16%	7.72%	8.98%	12.31%	10.75%	9.49%	3.74%	
1987	5.23%	5.47%	7.47%	7.92%	-0.24%	-2.24%	-2.69%	3.64%	
1988	16.81%	6.35%	8.24%	8.97%	10.46%	8.57%	7.84%	4.17%	
1989	31.49%	8.37%	8.46%	8.81%	23.12%	23.03%	22.68%	3.85%	
1990	-3.17%	7.81%	8.15%	8.19%	-10.98%	-11.32%	-11.36%	3.36%	
1991	30.55%	5.60%	7.43%	8.22%	24.95%	23.12%	22.33%	3.82%	
1992	7.67%	3.51%	6.27%	7.26%	4.16%	1.40%	0.41%	3.03%	
1993	9.99%	2.90%	5.53%	7.17%	7.09%	4.46%	2.82%	2.83%	
1994	1.31%	3.90%	6.07%	6.59%	-2.59%	-4.76%	-5.28%	2.82%	
1995	37.43%	5.60%	6.69%	7.60%	31.83%	30.74%	29.83%	2.91%	
1996	23.07%	5.21%	5.82%	6.18%	17.86%	17.25%	16.89%	2.54%	
1997	33.36%	5.26%	6.14%	6.64%	28.10%	27.22%	26.72%	2.11%	
1998	28.58%	4.86%	5.29%	5.83%	23.72%	23.29%	22.75%	1.68%	
1999	21.04%	4.68%	5.30%	5.57%	16.36%	15.74%	15.47%	1.36%	
2000	-9.11%	5.89%	6.19%	6.50%	-15.00%	-15.30%	-15.61%	1.10%	
2001	-11.88%	3.83%	4.27%	5.53%	-15.71%	-16.15%	-17.41%	1.18%	
2002	-22.10%	1.65%	3.98%	5.59%	-23.75%	-26.08%	-27.69%	1.39%	
2003	28.70%	1.02%	2.85%	4.80%	27.68%	25.85%	23.90%	2.00%	
2004	10.87%	1.20%	3.28%	5.02%	9.67%	7.59%	5.85%	1.75%	
2005	4.91%	2.98%	3.92%	4.69%	1.93%	0.99%	0.22%	1.84%	
2006	15.80%	4.80%	4.54%	4.68%	11.00%	11.26%	11.12%	2.01%	
2007	5.49%	4.66%	4.44%	4.86%	0.83%	1.05%	0.63%	1.96%	
Arithmetic Averages: 1926-2007	12.26%	3.78%	4.75%	5.21%	8.48%	7.51%	7.05%	10-year Interpolated 7.40%	4.19%

Source: Morningstar SBB, 2008 Yearbook.

**Massachusetts Private Passenger Automobile  
Value Line Property and Casualty Insurance Companies  
Capital Structure Ratios**

Company	Total Debt	L-T Debt	Common Equity	Total Debt Ratio	L-T Debt Ratio	Common Equity Ratio	Interest Expense	Cost of L-T Debt
Allstate Corp	\$5,640.0	\$5,640.0	\$32,667.4	14.7%	14.7%	85.3%		
W.R. Berkley Corp	\$1,363.8	\$1,363.8	\$5,952.7	18.6%	18.6%	81.4%	\$88.0	6.45%
The Chubb Corporation	\$4,135.0	\$4,135.0	\$22,094.0	15.8%	15.8%	84.2%	\$250.0	6.05%
Cincinnati Financial Corp	\$860.0	\$860.0	\$6,824.9	11.2%	11.2%	88.8%	\$52.0	6.05%
CNA Financial	\$2,157.0	\$2,007.0	\$9,507.8	18.5%	17.2%	81.5%	\$125.0	6.23%
Hanover Insurance Group	\$514.0	\$514.0	\$2,313.3	18.2%	18.2%	81.8%	\$42.0	8.17%
The Hartford Financial Services Group	\$4,492.0	\$3,670.0	\$30,632.2	12.8%	10.4%	87.2%	\$250.0	6.81%
Mercury General Corp.	\$131.0	\$131.0	\$2,813.3	4.4%	4.4%	95.6%	\$8.4	6.41%
Old Republic International Corp.	\$93.8	\$93.8	\$3,615.9	2.5%	2.5%	97.5%	\$6.0	6.40%
PMI Group	\$496.6	\$496.6	\$1,314.3	27.4%	27.4%	72.6%	\$17.0	3.42%
The Progressive Corp. of Ohio	\$2,173.1	\$2,173.1	\$13,965.2	13.5%	13.5%	86.5%	\$40.0	1.84%
Selective Insurance Group	\$332.7	\$332.7	\$1,348.1	19.8%	19.8%	80.2%	\$19.8	5.95%
Unitrin, Inc.	\$560.1	\$560.1	\$3,077.3	15.4%	15.4%	84.6%	\$36.1	6.45%
XL Capital Ltd.	\$2,866.4	\$2,866.4	\$10,422.6	21.6%	21.6%	78.4%		
Average				15.3%	15.1%	84.7%		5.85%
Median				15.58%	15.58%	84.42%		6.31%

Companies with incomplete information are not shown

Source: Value Line Investment Survey, November 24, 2007 and December 22, 2007.

**Massachusetts Private Passenger Automobile  
Value Line Property and Casualty Insurance Companies  
Capital Structure Ratios**

Company	Total Debt	L-T Debt	Common Equity	Total Debt Ratio	L-T Debt Ratio	Common Equity Ratio	Interest Expense	Cost of L-T Debt
Alleghany Corp	\$5.0	\$5.0	\$2,871.2	0.2%	0.2%	99.8%	\$0.2	4.00%
Allstate Corp	\$5,640.0	\$5,640.0	\$27,311.1	17.1%	17.1%	82.9%		
W.R. Berkley Corp	\$1,363.8	\$1,363.8	\$5,134.9	21.0%	21.0%	79.0%	\$88.0	6.45%
The Chubb Corporation	\$3,460.0	\$3,460.0	\$19,133.4	15.3%	15.3%	84.7%	\$210.0	6.07%
Cincinnati Financial Corp	\$860.0	\$860.0	\$6,425.9	11.8%	11.8%	88.2%	\$52.0	6.05%
CNA Financial	\$2,157.0	\$2,007.0	\$7,023.4	23.5%	21.9%	76.5%	\$125.0	6.23%
Hanover Insurance Group	\$514.0	\$514.0	\$2,224.3	18.8%	18.8%	81.2%	\$42.0	8.17%
The Hartford Financial Services Group	\$4,492.0	\$3,670.0	\$22,878.4	16.4%	13.4%	83.6%	\$250.0	6.81%
Mercury General Corp.	\$138.6	\$138.6	\$2,456.8	5.3%	5.3%	94.7%	\$10.0	7.22%
Old Republic International Corp.	\$64.1	\$64.1	\$3,097.5	2.0%	2.0%	98.0%	\$4.0	6.24%
PMI Group	\$496.6	\$496.6	\$506.3	49.5%	49.5%	50.5%	\$17.0	3.42%
The Progressive Corp. of Ohio	\$2,173.9	\$2,173.9	\$11,917.1	15.4%	15.4%	84.6%	\$108.6	5.00%
Selective Insurance Group	\$294.9	\$294.9	\$1,358.3	17.8%	17.8%	82.2%	\$23.8	8.07%
Unitrin, Inc.	\$560.1	\$560.1	\$2,462.3	18.5%	18.5%	81.5%	\$33.6	6.00%
XL Capital Ltd.	\$2,868.7	\$2,868.7	\$6,006.2	32.3%	32.3%	67.7%		
Average				17.7%	17.4%	82.3%		6.1%
Median				17.12%	17.12%	82.88%		6.23%

Companies with incomplete information are not shown

Source: Value Line Investment Survey, December 22, 2007 and March 21, 2008.

**Massachusetts Private Passenger Automobile  
Value Line Property and Casualty Insurance Companies  
Capital Structure Ratios**

Company	Total Debt	L-T Debt	Common Equity	Total Debt Ratio	L-T Debt Ratio	Common Equity Ratio	Interest Expense	Cost of L-T Debt
Alleghany Corp	\$5.0	\$5.0	\$3,117.9	0.2%	0.2%	99.8%	\$0.2	4.00%
Ace Limited	\$3,455.0	\$2,114.0	\$20,049.1	14.7%	9.0%	85.3%	\$100.0	4.73%
Allstate Corp	\$5,640.0	\$5,640.0	\$28,257.0	16.6%	16.6%	83.4%		
W.R. Berkley Corp	\$1,359.7	\$1,359.7	\$4,796.5	22.1%	22.1%	77.9%	\$88.0	6.47%
The Chubb Corporation	\$3,460.0	\$3,460.0	\$20,058.8	14.7%	14.7%	85.3%	\$210.0	6.07%
Cincinnati Financial Corp	\$860.0	\$860.0	\$5,529.5	13.5%	13.5%	86.5%	\$52.0	6.05%
CNA Financial	\$2,007.0	\$1,807.0	\$8,205.3	19.7%	17.7%	80.3%	\$110.0	6.09%
Hanover Insurance Group	\$511.9	\$511.9	\$2,336.2	18.0%	18.0%	82.0%	\$40.0	7.81%
The Hartford Financial Services Group	\$4,982.0	\$3,618.0	\$21,556.8	18.8%	13.6%	81.2%	\$185.0	5.11%
Mercury General Corp.	\$160.1	\$160.1	\$2,856.9	5.3%	5.3%	94.7%	\$11.5	7.18%
Old Republic International Corp.	\$66.9	\$66.9	\$3,341.8	2.0%	2.0%	98.0%	\$4.0	5.98%
PMI Group	\$414.4	\$369.4	\$350.4	54.2%	48.3%	45.8%	\$25.0	6.77%
The Progressive Corp. of Ohio	\$2,174.3	\$2,174.3	\$13,617.6	13.8%	13.8%	86.2%	\$108.6	4.99%
Selective Insurance Group	\$286.2	\$286.2	\$1,191.0	19.4%	19.4%	80.6%	\$23.0	8.04%
Unitrin, Inc.	\$560.3	\$560.3	\$2,479.8	18.4%	18.4%	81.6%	\$33.6	6.00%
XL Capital Ltd.	\$2,869.0	\$2,869.0	\$5,949.3	32.5%	32.5%	67.5%		
Average				17.7%	16.6%	82.3%		6.09%
Median				17.31%	15.68%	82.69%		6.06%

Companies with incomplete information are not shown

Source: Value Line Investment Survey, May 23, 2008 and June 20, 2008.



**Massachusetts Private Passenger Automobile  
Value Line Property and Casualty Insurance Companies  
Capital Structure Ratios**

Company	Total Debt	L-T Debt	Common Equity	Total Debt Ratio	L-T Debt Ratio	Common Equity Ratio	Interest Expense	Cost of L-T Debt
Allegheny Corp	\$5.0	\$5.0	\$2,779.7	0.2%	0.2%	99.8%	\$0.2	4.00%
Ace Limited	\$4,058.0	\$3,008.0	\$17,104.8	19.2%	14.2%	80.8%	\$140.0	4.65%
Allstate Corp	\$5,640.0	\$5,640.0	\$25,442.0	18.1%	18.1%	81.9%		
W.R. Berkley Corp	\$1,271.1	\$1,271.1	\$4,212.3	23.2%	23.2%	76.8%	\$82.0	6.45%
The Chubb Corporation	\$4,435.0	\$4,435.0	\$18,084.4	19.7%	19.7%	80.3%	\$270.0	6.09%
Cincinnati Financial Corp	\$860.0	\$860.0	\$4,956.8	14.8%	14.8%	85.2%	\$52.0	6.05%
CNA Financial	\$2,007.0	\$1,807.0	\$7,633.6	20.8%	18.7%	79.2%	\$110.0	6.09%
Hanover Insurance Group	\$511.9	\$511.9	\$2,449.6	17.3%	17.3%	82.7%	\$40.0	7.81%
The Hartford Financial Services Group	\$5,971.0	\$4,618.0	\$20,244.2	22.8%	17.6%	77.2%	\$185.0	4.01%
Mercury General Corp.	\$154.1	\$154.1	\$2,869.5	5.1%	5.1%	94.9%	\$11.0	7.14%
Old Republic International Corp.	\$66.3	\$66.3	\$2,701.1	2.4%	2.4%	97.6%	\$4.0	6.03%
The Progressive Corp. of Ohio	\$2,174.7	\$2,174.7	\$12,080.4	15.3%	15.3%	84.7%	\$108.6	4.99%
Selective Insurance Group	\$273.9	\$273.9	\$1,306.7	17.3%	17.3%	82.7%	\$21.0	7.67%
Unitrin, Inc.	\$633.4	\$633.4	\$1,499.8	29.7%	29.7%	70.3%	\$33.6	5.30%
XL Capital Ltd.	\$2,869.0	\$2,869.0	\$3,380.3	45.9%	45.9%	54.1%		
Average				18.1%	17.3%	81.9%		5.87%
Median				18.15%	17.33%	81.85%		6.05%

Companies with incomplete information are not shown

Source: Value Line Investment Survey, August 22, 2008 and September 19, 2008.

## Reserves to Surplus Ratio - Countrywide

### Private Passenger Automobile Predominating

(Amount in 000's)

(1) Year	(2) Invested Assets	(3) Losses	(4) LAE	(5) UPR	(6) Surplus	(7) Reserves to Surplus [(3) + (4) + (5)] / (6)
2003	52,915,225	15,315,540	3,274,413	15,009,539	22,781,097	1.47
2004	54,040,349	16,487,708	3,559,331	13,874,022	21,414,730	1.58
2005	57,123,268	17,704,847	3,986,597	15,036,880	24,378,217	1.51
2006	57,808,555	17,867,363	4,059,211	14,925,308	24,785,573	1.49
2007	57,339,037	18,606,939	4,215,365	14,597,216	24,363,711	1.54
AVG	55,845,287	17,196,479	3,818,983	14,688,593	23,544,666	1.52

Source: Best's Aggregates and Averages

**Massachusetts Private Passenger Automobile  
Countrywide Property and Casualty Industry  
Asset Return Rate  
Private Passenger Predominating**

(1) <u>Categories</u>	(2) <u>Assets</u>	(3) <u>Expected Return on Assets</u>	(4) <u>Expected Pre-Tax Income</u>	(5) <u>Income Taxes Rate</u>	(6) <u>Income Taxes Amount</u>	(7) <u>After-Tax Income Amount</u>	(8) <u>After-Tax Income Rate</u>
US Government Bonds	109	3.06%	\$3.34	35.0%	\$1.17	\$2.17	1.99%
Short	22	2.29%	\$0.51	35.0%	\$0.18	\$0.33	1.49%
Intermediate	74	3.14%	\$2.32	35.0%	\$0.81	\$1.51	2.04%
Long	13	3.96%	\$0.51	35.0%	\$0.18	\$0.33	2.57%
Other Taxable Bonds	295	5.43%	\$16.01	35.0%	\$5.60	\$10.41	3.53%
Short	30	3.19%	\$0.97	35.0%	\$0.34	\$0.63	2.07%
Intermediate	148	5.46%	\$8.07	35.0%	\$2.82	\$5.24	3.55%
Long	117	5.98%	\$6.97	35.0%	\$2.44	\$4.53	3.88%
Tax Exempt Bonds	165	3.49%	\$5.75	5.3%	\$0.30	\$5.44	3.30%
Short	12	1.49%	\$0.17	5.3%	\$0.01	\$0.16	1.41%
Intermediate	128	3.52%	\$4.51	5.3%	\$0.24	\$4.27	3.33%
Long	25	4.26%	\$1.06	5.3%	\$0.06	\$1.01	4.03%
Stocks	235	10.29%		29.0%			
Common	205	10.93%	\$22.35	30.2%	\$6.75	\$15.60	7.63%
Dividends	205	1.63%		14.2%			
Capital Gain	205	9.30%		33.0%			
Preferred	30	6.01%	\$1.82	14.2%	\$0.26	\$1.57	5.16%
Dividends	30			14.2%			
Mortgage Loans	0	5.98%	\$0.02	35.0%	\$0.01	\$0.01	3.88%
Real Estate	22	5.08%	\$1.10	35.0%	\$0.39	\$0.72	3.30%
Cash	170	2.29%	\$3.88	35.0%	\$1.36	\$2.52	1.49%
Other	5	10.93%	\$0.54	28.7%	\$0.16	\$0.39	7.80%
Total Before Expense	1,000	5.48%	\$54.81		\$15.99	\$38.82	3.88%
Investment Expense	1,000	0.42%	\$4.16	35.00%	\$1.46	\$2.71	0.27%
Total After Expense	1,000	5.06%	\$50.65	28.69%	\$14.53	\$36.12	3.61%

**Massachusetts Private Passenger Automobile  
Notes on Calculation of Return on Countrywide Assets  
Private Passenger Predominating**

- (1) Categories of investments. Source: Annual Statement
- (2) Dollars of assets in each category per \$1000 in the portfolio for Industry Aggregate. (Exhibit 2, page 1).  
Taxable bonds split into government and other taxable bonds using Exhibit 2 page 3 data with state, territories and possession bonds plus one-half special revenue bonds in tax-exempt category.
- (3) Expected rate of return for assets by category
- | <u>Description</u>  | <u>Expected Return</u> | <u>Basis</u>                                                                                                                 |
|---------------------|------------------------|------------------------------------------------------------------------------------------------------------------------------|
| US Government Bonds |                        |                                                                                                                              |
| Short               | 2.29%                  | 3-month spot yield per Wall Street Journal.                                                                                  |
| Intermediate        | 3.14%                  | 4.7 year spot rate (100H-4, ex. 5)                                                                                           |
| Long                | 3.96%                  | 8.4 year spot rate (100H-4, ex. 5)                                                                                           |
| Other Taxable Bonds |                        |                                                                                                                              |
| Short               | 3.19%                  | Yield on financial paper per Federal Reserve Statistical Release H. 15. (519)                                                |
| Intermediate        | 5.46%                  | Average yield on 5-year & 10-year corporate A and AA rated bonds for Nov 2007-Oct 2008, per ValuBond.                        |
| Long                | 5.98%                  | Average yield on 10 & 20-year corporate A and AA rated bonds for Nov 2007-Oct 2008, per ValuBond.                            |
| Tax Exempt Bonds    |                        |                                                                                                                              |
| Short               | 1.49%                  | 3-month spot yield, per Wall Street Journal, times 1 minus tax rate(i.e. 65%)                                                |
| Intermediate        | 3.52%                  | Average yield on 5-year & 10-year municipal A and AA rated bonds for Nov 2007-Oct 2008, per ValuBond.                        |
| Long                | 4.26%                  | Average yield on 10 & 20-year municipal A and AA rated bonds for Nov 2007-Oct 2008, per ValuBond.                            |
| Common Stock        | 10.93%                 | Three-horizon CAPM, with beta of 1.00. Ten-year average dividend yield of 1.63% is from pg. 237 in Ibbotson's 2008 Yearbook. |
| Preferred Stock     | 6.01%                  | Yield on a-rated preferred stock per Mergent Bond Record.                                                                    |
| Mortgage Bonds      | 5.98%                  | Same as yield on long-term corporate bonds.                                                                                  |
| Real Estate         | 5.08%                  | Three-horizon CAPM, with beta of 0.25.                                                                                       |
| Cash & Short-Term   | 2.29%                  | Same as yield on short-term US Treasury bills.                                                                               |
| Other               | 10.93%                 | Same as yield on common stock.                                                                                               |
- (4) Expected pre-tax income = average annual return expected on the asset category  
(4) = (2) x (3)
- (5) Tax rate on investment income for each category  
US Government Bonds and Other Taxable Bonds: marginal federal tax rate = 35%  
Tax exempt Bonds: tax rate = [ { .15 x .35 x 1.00 } ] = 5.3%  
Tax rate for dividends and capital gains is 14.2% and 34.0% respectively (100H-7, Ex. 4)  
Tax rate for other assets = weighted average of tax rate for all other categories of investment = 28.8%
- (6) Taxes on the expected income by category  
(6) = (4) x (5)
- (7) After-tax income by category  
(4) - (6)
- (8) Expected post-tax return on assets  
Expected ROA \* (1-tax rate)

**Massachusetts Private Passenger Automobile  
Summary of 2007 Private Passenger Predominating Asset Distribution**

**Bond Distribution by Category and Maturity used in ROA**

Asset Distribution	Total	Tot. Port. Shr.
Bonds	56.87%	
Preferred	3.03%	10.89%
Common	20.45%	2.22%
Mortgage	0.03%	7.39%
Collateral	0.00%	1.28%
Real Estate	2.17%	29.49%
Cash & Short Term Investments	16.95%	3.04%
Other Investments	0.50%	14.77%
Total	100.00%	11.67%
		16.48%
		1.17%
		12.82%
		2.50%
		56.87%

**Bond Distribution**

TIME	GOVT'S	ST., TERR., POSSES	SPEC. REV.	PUB. UTILS.	INDUST/ MISC.	OTHER BONDS	TOTALS
<1	3.90%	1.21%	1.69%	0.08%	4.43%	0.00%	11.30%
1 to 5	8.30%	8.16%	7.54%	0.02%	12.86%	0.00%	36.88%
5 to 10	4.70%	8.17%	4.89%	0.01%	6.88%	0.00%	24.64%
10 to 20	2.08%	1.92%	2.06%	4.43%	0.79%	0.00%	11.27%
>20	0.18%	0.80%	1.31%	12.86%	0.76%	0.00%	15.91%
TOTAL	19.16%	20.25%	17.47%	17.40%	25.72%	0.00%	100.00%
TOT. PORT. SHR.	10.89%	11.51%	9.94%	9.90%	14.63%	0.00%	56.87%

Source: Highline Annual Statement data

**Massachusetts Private Passenger Automobile  
2007 Private Passenger Predominating Asset Distribution**

<b>Asset Distribution</b> <sup>3</sup>	<b><u>12/31/07</u></b>	<b><u>Share</u></b>
Bonds	32,598,811	56.87%
Preferred Stock	1,739,562	3.03%
Common Stock	11,724,072	20.45%
Mortgage Loans	15,527	0.03%
Collateral Loans	-	0.00%
Real Estate <sup>1</sup>	1,245,204	2.17%
Cash <sup>2</sup>	9,717,773	16.95%
Other Invested Assets	284,982	0.50%
<b>Total</b>	<b>57,325,931</b>	<b>100.00%</b>

Source: Best's Aggregates & Averages Property Casualty, 2008 Edition, page 335, PPA Predominating Composite & Highline Annual Statement data

Notes:

<sup>1</sup> Real Estate is sum of Real Estate Investment, Offices, and Sales.

<sup>2</sup> Cash imputed as cash and short-term investment (p. 2) less short-term investment, where short-term investment equals total bonds (p. 25) less total bonds (p. 2).

<sup>3</sup> Total excludes Receivables for securities and Aggregate write-ins for invested assets.

**Massachusetts Private Passenger Automobile  
Return on Assets' Sources  
2007 Private Passenger Predominating Bond Distribution by Maturity**

	Years					Total Curr Year	Percent
	<1	1 to 5	5 to 10	10 to 20	>20		
U.S. Governments	1,517,080	3,212,119	1,720,349	814,939	71,816	7,336,303	18.69%
All Other Governments	13,023	46,567	125,627	-	-	185,217	0.47%
States, Territories, etc.	297,535	2,013,770	1,481,328	425,710	31,619	4,249,962	10.83%
Political Subdivisions of States, Territories, etc.	176,598	1,188,884	1,725,205	327,043	280,542	3,698,272	9.42%
Special Revenue	661,727	2,958,541	1,918,065	806,791	513,709	6,858,833	17.47%
Public Utilities	31,191	8,100	3,391	1,739,177	5,049,956	6,831,816	17.40%
Industrial & Misc.	1,739,177	5,049,956	2,700,313	311,299	297,090	10,097,835	25.72%
Credit Tenant Loans	-	-	-	-	-	-	0.00%
Parent, Subsidiaries, and Affiliates	-	-	-	-	-	-	0.00%
Total Bonds Current Year	4,436,332	14,477,938	9,674,276	4,424,959	6,244,733	39,258,238	100.00%
Percent	11.30%	36.88%	24.64%	11.27%	15.91%	100.00%	

Source: Highline Annual Statement data

Time	States, Territories, etc.					Other Bonds	Totals
	Government	Public Utilities	Industrial/Misc.	Special Revenue	Public Utilities		
<1	3.90%	0.08%	4.43%	1.69%	0.08%	0.00%	11.30%
1 to 5	8.30%	0.02%	12.86%	7.54%	0.02%	0.00%	36.88%
5 to 10	4.70%	0.01%	6.88%	4.89%	0.01%	0.00%	24.64%
10 to 20	2.08%	4.43%	0.79%	2.06%	4.43%	0.00%	11.27%
>20	0.18%	12.86%	0.76%	1.31%	12.86%	0.00%	15.91%
Total Curr Year	19.16%	17.40%	25.72%	17.47%	17.40%	0.00%	100.00%

Total Portfolio Share Normalized for Total US PC Industry Bond Portfolio\*  
Total Portfolio Share 10.89% 11.51%

\*Source: 100H-7 Exhibit 2, page 2.

**Massachusetts Private Passenger Automobile**  
**Return on Assets' Sources**

**Financial Paper Rates**

Oct-07	4.91%
Nov-07	4.75%
Dec-07	4.76%
Jan-08	3.70%
Feb-08	3.03%
Mar-08	2.70%
Apr-08	2.72%
May-08	2.61%
Jun-08	2.70%
Jul-08	2.72%
Aug-08	2.76%
Sep-08	2.91%
12 mo avg	3.36%

Note: Monthly yields of financial paper with ninety-day maturity from Federal Reserve H-15 historical data.



Massachusetts Private Passenger Automobile

Asset Yields

	Nov-07	Dec-07	Jan-08	Feb-08	Mar-08	Apr-08	May-08	Jun-08	Jul-08	Aug-08	Sep-08	Oct-08	12 mo avg
	Fri 11/02/2007, Data as of 11/02/2007	Sat 12/01/2007, Data as of 12/01/2007	Wed 01/02/2008, Data as of 01/02/2008	Fri 02/01/2008, Data as of 02/01/2008	Mon 03/03/2008, Data as of 03/03/2008	Wed 04/02/2008, Data as of 04/02/2008	Sat 05/03/2008, Data as of 05/03/2008	Sun 06/01/2008, Data as of 06/01/2008	Wed 07/02/2008, Data as of 07/02/2008	Fri 08/01/2008, Data as of 08/01/2008	Wed 09/03/2008, Data as of 09/03/2008	Thu 10/02/2008, Data as of 10/02/2008	Noc 07 thru Oct 08
<b>Corporate Bonds</b>													
5 Year	5.14%	4.65%	4.80%	4.21%	4.15%	4.65%	4.89%	5.14%	5.51%	5.62%	5.56%	6.98%	5.11%
10 Year	5.70%	5.36%	5.55%	5.20%	5.54%	5.77%	5.64%	5.87%	6.16%	6.15%	5.87%	6.99%	5.81%
20 Year	6.02%	5.93%	5.94%	5.83%	6.28%	6.20%	6.31%	6.34%	6.43%	6.10%	5.97%	6.38%	6.14%
<b>Municipal Bonds</b>													
5 Year	3.52%	3.41%	3.42%	2.90%	3.52%	3.36%	3.25%	3.19%	3.28%	3.18%	2.86%	3.27%	3.26%
10 Year	3.88%	3.75%	3.95%	3.55%	3.97%	3.81%	3.75%	3.65%	3.90%	3.76%	3.57%	3.90%	3.78%
20 Year	4.50%	4.52%	4.68%	4.50%	5.08%	4.87%	4.73%	4.48%	4.83%	5.09%	4.71%	4.97%	4.74%

244

Source: ValuBond AA and A rated Corporate and Municipal Bonds  
Data reflects first business day of the month (corresponds to spot yield data)  
N/A for not yet available, 12 month average includes July value for August-October.

**Massachusetts Private Passenger Automobile  
Calculation of Alpha - The Revenue Offset Tax Factor\***

$$\begin{aligned} \text{alpha} &= .20 \times (\text{UPR}(09) - (\text{UPR}(08) / (1+g))) \\ &= \text{factor for revenue offset for 2009 assessment of 20\% in the change in the unearned premium reserve} \\ &= .20 \times (0.464 - 0.463/1.000) (\text{Liability}) \\ &\quad .20 \times (0.464 - 0.463/1.000) (\text{Physical Damage}) \\ &\quad \text{UPR}(2009) = 0.464 \quad [100H-3, \text{Exhibit 5, Page 2}] \\ &\quad \text{UPR}(2008) = 0.463 \quad [100H-3, \text{Exhibit 5, Page 2}] \\ &\quad g(\text{Liability}) = 1.000 \quad [100H-3, \text{Exhibit 5, Page 7}] \\ &\quad g(\text{Phys. Dam.}) = 1.000 \quad [100H-3, \text{Exhibit 5, Page 7}] \\ &= \quad 0.000200 \text{ Liability} \\ &\quad 0.000200 \text{ Physical Damage} \end{aligned}$$

*\* For details on the method of calculation see MARB filing for 1988 rates, Underwriting Profit Filing, Section XII-2 p. 10-16*

**Massachusetts Private Passenger Automobile  
Calculation of Unearned Premium Reserve**

(1)	(2)	(3)	(4)	(5)
<u>Policy Year (X)</u>	PDL Exposures Written in Year (X)	PDL Exposures Written in (X) <u>Earned in Year (X+1)</u>	Average Effective Dates <u>(months after Jan. 1)</u>	Average Effective Date
1993	3,394,397.8	1,339,201.7	4.73	May 22, 1993
1994	3,444,040.7	1,387,180.0	4.83	May 25, 1994
1995	3,502,411.6	1,429,768.7	4.90	May 27, 1995
1996	3,616,067.6	1,474,185.4	4.89	May 27, 1996
1997	3,688,149.3	1,531,683.8	4.98	May 30, 1997
1998	3,782,898.2	1,597,530.8	5.07	June 2, 1998
1999	3,870,125.3	1,657,079.9	5.14	June 4, 1999
2000	3,936,666.2	1,723,202.5	5.25	June 8, 2000
2001	4,009,873.3	1,766,438.3	5.29	June 9, 2001
2002	4,071,630.1	1,803,846.6	5.32	June 9, 2002
2003	4,083,024.3	1,829,016.6	5.38	June 11, 2003
2004	4,084,732.7	1,841,453.7	5.41	June 12, 2004
2005	4,076,406.2	1,848,396.6	5.44	June 13, 2005
2006	4,072,708.1	1,854,834.7	5.47	June 14, 2006
2007	4,086,014.3	1,871,116.6	5.50	June 15, 2007
2009E			5.55	June 17, 2009
2010E			5.57	June 17, 2010

$$\text{UPR}(i) = \text{Col. (4)} / 12$$

$$\text{UPR}(08) = 0.463$$

$$\text{UPR}(09) = 0.464$$

Notes: Exposures are from 4/1/2008 CAR Transition Rate Filing  
Average effective date in Col. (4) is calculated as 12 x Col. (3)/Col. (2)

**Massachusetts Private Passenger Automobile  
Calculation of Projected Average Accident Date**

Staggered Policy Method

<u>Policy Year (X)</u>	<u>Estimated Proportion of Policies Effective on January 1 *</u>	<u>Ratio to Prior Year</u>
1995	0.184	
1996	0.185	1.006
1997	0.169	0.917
1998	0.155	0.917
1999	0.144	0.924
2000	0.125	0.867
2001	0.119	0.955
2002	0.114	0.958
2003	0.104	0.913
2004	0.098	0.945
2005	0.093	0.947
2006	0.089	0.957
2007	0.084	0.944

Number of Years of Data	Assumed Ratio in the Future	Estimated 2008 Proportion **	Estimated 2008 Effective Date***
3	0.949	0.076	5.55
4	0.948	0.076	5.55
5	0.941	0.075	5.55

Number of Years of Data	Assumed Ratio in the Future	Estimated 2009 Proportion **	Estimated 2009 Effective Date***
3	0.949	0.072	5.57
4	0.948	0.072	5.57
5	0.941	0.070	5.58

Selected Average Effective Date for 2008 is 5.55 or June 16, 2008

Selected Average Effective Date for 2009 is 5.57 or June 17, 2009

\* 1-(Average Effective Date Divided by 6)

\*\* (Proportion for Latest Year) x ( Assumed Ratio in the Future)^2 for 2008  
(Proportion for Latest Year) x( Assumed Ratio in the Future)^3 for 2009

\*\*\* (1-Estimated Future Proportion ) x 6

**Massachusetts Private Passenger Automobile  
Premium Growth Rate**

Year	Liability				Physical Damage			
	Earned Premium (000s)	% Change Prior Yr.	Written Premium (000s)	% Change Prior Yr.	Earned Premium (000s)	% Change Prior Yr.	Written Premium (000s)	% Change Prior Yr.
1986	\$961,386		\$999,530		\$808,556		\$854,265	
1987	\$1,138,715	18.4%	\$1,240,909	24.1%	\$917,080	13.4%	\$975,290	14.2%
1988	\$1,467,882	28.9%	\$1,581,973	27.5%	\$1,109,804	21.0%	\$1,180,050	21.0%
1989	\$1,443,437	-1.7%	\$1,439,218	-9.0%	\$1,044,072	-5.9%	\$1,021,932	-13.4%
1990	\$1,556,535	7.8%	\$1,641,975	14.1%	\$962,859	-7.8%	\$934,993	-8.5%
1991	\$1,699,100	9.2%	\$1,764,845	7.5%	\$906,739	-5.8%	\$900,407	-3.7%
1992	\$1,885,223	11.0%	\$1,972,558	11.8%	\$862,281	-4.9%	\$842,666	-6.4%
1993	\$2,050,080	8.7%	\$2,143,606	8.7%	\$820,268	-4.9%	\$822,650	-2.4%
1994	\$2,221,208	8.3%	\$2,305,587	7.6%	\$757,258	-7.7%	\$720,222	-12.5%
1995	\$2,277,007	2.5%	\$2,212,291	-4.0%	\$832,465	9.9%	\$897,908	24.7%
1996	\$2,026,294	-11.0%	\$1,982,854	-10.4%	\$839,033	0.8%	\$833,781	-7.1%
1997	\$1,949,360	-3.8%	\$1,942,702	-2.0%	\$830,569	-1.0%	\$836,117	0.3%
1998	\$1,933,765	-0.8%	\$1,941,444	-0.1%	\$922,673	11.1%	\$997,506	19.3%
1999	\$1,983,413	2.6%	\$2,035,953	4.9%	\$1,125,900	22.0%	\$1,248,296	25.1%
2000	\$2,174,485	9.6%	\$2,335,228	14.7%	\$1,309,680	16.3%	\$1,385,692	11.0%
2001	\$2,329,596	7.1%	\$2,343,172	0.3%	\$1,391,844	6.3%	\$1,407,303	1.6%
2002	\$2,438,430	4.7%	\$2,525,685	7.8%	\$1,448,064	4.0%	\$1,484,953	5.5%
2003	\$2,610,857	7.1%	\$2,705,332	7.1%	\$1,542,727	6.5%	\$1,597,161	7.6%
2004	\$2,778,183	6.4%	\$2,855,063	5.5%	\$1,653,311	7.2%	\$1,706,089	6.8%
2005	\$2,891,752	4.1%	\$2,939,491	3.0%	\$1,649,371	-0.2%	\$1,610,845	-5.6%
2006	\$2,816,834	-2.6%	\$2,726,254	-7.3%	\$1,569,214	-4.9%	\$1,542,064	-4.3%
2007	\$2,655,216	-5.7%	\$2,541,576	-6.8%	\$1,527,027	-2.7%	\$1,491,633	-3.3%
Arithmetic Average								
Latest 20 Years		4.6%		4.0%		3.0%		2.8%
Latest 15 Years		2.5%		1.9%		4.2%		4.4%
Latest 10 Years		3.3%		2.9%		6.6%		6.4%
Latest 5 Years		1.9%		0.3%		1.2%		0.2%
Geometric Average								
Latest 20 Years		4.3%		3.6%		2.6%		2.1%
Latest 15 Years		2.3%		1.7%		3.9%		3.9%
Latest 10 Years		3.1%		2.7%		6.3%		6.0%
Latest 5 Years		1.7%		0.1%		1.1%		0.1%
Selected				0.0%				0.0%

Source: Bests' Executive Data Service for the State of Massachusetts

**Massachusetts Private Passenger Automobile  
Calculation of Countrywide Liability Discount Reserve Factors**

<u>Year</u>	<u>Annual Liab. Loss Flow</u>	<u>Cumulative Paid Losses</u>	<u>% Paid in Year Y+1 Reserve Flow</u>
1	42.6108	42.6108	28.9719
2	28.9719	71.5827	13.1120
3	13.1120	84.6947	7.6610
4	7.6610	92.3557	3.8812
5	3.8812	96.2369	1.6907
6	1.6907	97.9276	0.8444
7	0.8444	98.7720	0.4973
8	0.4973	99.2693	0.2361
9	0.2361	99.5054	0.1387
10	0.1387	99.6441	0.1387
11	0.1387	99.7828	0.1387
12	0.1387	99.9215	0.0785
13	0.0785	100.0000	
14			
Total	100.0000		57.3892

Source: 2008-3 Internal Revenue Bulletin, p. 291 & 297

**Massachusetts Private Passenger Automobile  
Calculation of Countrywide Liability Discount Reserve Factors**

<u>Year</u>	<u>Reserve Flow</u>	<u>Interest Factors</u>	<u>Discounted Reserve Flow</u>
1	28.9719	0.9803	28.4017
2	13.1120	0.9421	12.3530
3	7.6610	0.9054	6.9362
4	3.8812	0.8701	3.3771
5	1.6907	0.8362	1.4138
6	0.8444	0.8036	0.6786
7	0.4973	0.7723	0.3841
8	0.2361	0.7422	0.1752
9	0.1387	0.7133	0.0989
10	0.1387	0.6855	0.0951
11	0.1387	0.6587	0.0914
12	0.0785	0.6331	0.0497
13	0.0000		
14			
Total	57.3892		54.0546

Total Discounted Reserve/Total Reserve=

0.9419

<u>Year</u>	<u>Reserve Flow</u>	<u>Interest Factors</u>	<u>Discounted Reserve Flow</u>
1	13.1120	0.9803	12.8539
2	7.6610	0.9421	7.2175
3	3.8812	0.9054	3.5140
4	1.6907	0.8701	1.4711
5	0.8444	0.8362	0.7061
6	0.4973	0.8036	0.3996
7	0.2361	0.7723	0.1823
8	0.1387	0.7422	0.1029
9	0.1387	0.7133	0.0989
10	0.1387	0.6855	0.0951
11	0.0785	0.6587	0.0517
12	0.0000	0.6331	0.0000
13			
Total	28.4173		26.6933

Total Discounted Reserve/Total Reserve=

0.9393

The average mid-term AFR used in these calculations is:

4.06%
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**Massachusetts Private Passenger Automobile  
Calculation of Countrywide Liability Discount Reserve Factors**

<u>Year</u>	<u>Reserve Flow</u>	<u>Interest Factors</u>	<u>Discounted Reserve Flow</u>
1	7.6610	0.9803	7.5102
2	3.8812	0.9421	3.6565
3	1.6907	0.9054	1.5307
4	0.8444	0.8701	0.7347
5	0.4973	0.8362	0.4158
6	0.2361	0.8036	0.1897
7	0.1387	0.7723	0.1071
8	0.1387	0.7422	0.1029
9	0.1387	0.7133	0.0989
10	0.0785	0.6855	0.0538
11	0.0000	0.6587	0.0000
12			
Total	15.3053		14.4006

Total Discounted Reserve/Total Reserve=

0.9409

<u>Year</u>	<u>Reserve Flow</u>	<u>Interest Factors</u>	<u>Discounted Reserve Flow</u>
1	3.8812	0.9803	3.8048
2	1.6907	0.9421	1.5928
3	0.8444	0.9054	0.7645
4	0.4973	0.8701	0.4327
5	0.2361	0.8362	0.1974
6	0.1387	0.8036	0.1115
7	0.1387	0.7723	0.1071
8	0.1387	0.7422	0.1029
9	0.0785	0.7133	0.0560
10	0.0000	0.6855	0.0000
11			
Total	7.6443		7.1698

Total Discounted Reserve/Total Reserve=

0.9379

The average mid-term AFR used in these calculations is:

4.06%
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**Massachusetts Private Passenger Automobile  
Calculation of Countrywide Liability Discount Reserve Factors**

<u>Year</u>	<u>Reserve Flow</u>	<u>Interest Factors</u>	<u>Discounted Reserve Flow</u>
1	1.6907	0.9803	1.6574
2	0.8444	0.9421	0.7955
3	0.4973	0.9054	0.4503
4	0.2361	0.8701	0.2054
5	0.1387	0.8362	0.1160
6	0.1387	0.8036	0.1115
7	0.1387	0.7723	0.1071
8	0.0785	0.7422	0.0583
9	0.0000	0.7133	0.0000
10			
Total	3.7631		3.5014

Total Discounted Reserve/Total Reserve= 0.9305

<u>Year</u>	<u>Reserve Flow</u>	<u>Interest Factors</u>	<u>Discounted Reserve Flow</u>
1	0.8444	0.9803	0.8278
2	0.4973	0.9421	0.4685
3	0.2361	0.9054	0.2138
4	0.1387	0.8701	0.1207
5	0.1387	0.8362	0.1160
6	0.1387	0.8036	0.1115
7	0.0785	0.7723	0.0606
8	0.0000	0.7422	0.0000
9			
Total	2.0724		1.9188

Total Discounted Reserve/Total Reserve= 0.9259

<u>Year</u>	<u>Reserve Flow</u>	<u>Interest Factors</u>	<u>Discounted Reserve Flow</u>
1	0.4973	0.9803	0.4875
2	0.2361	0.9421	0.2224
3	0.1387	0.9054	0.1256
4	0.1387	0.8701	0.1207
5	0.1387	0.8362	0.1160
6	0.0785	0.8036	0.0631
7	0.0000	0.7723	0.0000
8			
Total	1.228		1.1353

Total Discounted Reserve/Total Reserve= 0.9245

The average mid-term AFR used in these calculations is:

4.06%

**Massachusetts Private Passenger Automobile  
Calculation of Countrywide Liability Discount Reserve Factors**

<u>Year</u>	<u>Reserve Flow</u>	<u>Interest Factors</u>	<u>Discounted Reserve Flow</u>
1	0.2361	0.9803	0.2315
2	0.1387	0.9421	0.1307
3	0.1387	0.9054	0.1256
4	0.1387	0.8701	0.1207
5	0.0785	0.8362	0.0656
6	0.0000	0.8036	0.0000
7			
Total	0.7307		0.6740

Total Discounted Reserve/Total Reserve= 0.9224

<u>Year</u>	<u>Reserve Flow</u>	<u>Interest Factors</u>	<u>Discounted Reserve Flow</u>
1	0.1387	0.9803	0.1360
2	0.1387	0.9421	0.1307
3	0.1387	0.9054	0.1256
4	0.0785	0.8701	0.0683
5	0.0000	0.8362	0.0000
6			
Total	0.4946		0.4605

Total Discounted Reserve/Total Reserve= 0.9311

<u>Year</u>	<u>Reserve Flow</u>	<u>Interest Factors</u>	<u>Discounted Reserve Flow</u>
1	0.1387	0.9803	0.1360
2	0.1387	0.9421	0.1307
3	0.0785	0.9054	0.0711
4	0.0000	0.8701	0.0000
5			
Total	0.3559		0.3377

Total Discounted Reserve/Total Reserve= 0.9489

The average mid-term AFR used in these calculations is:

4.06%

**Massachusetts Private Passenger Automobile  
Calculation of Countrywide Liability Discount Reserve Factors**

<u>Year</u>	<u>Reserve Flow</u>	<u>Interest Factors</u>	<u>Discounted Reserve Flow</u>
1	0.1387	0.9803	0.1360
2	0.0785	0.9421	0.0740
3	0.0000	0.9054	0.0000
4			
Total	0.2172		0.2099
Total Discounted Reserve/Total Reserve=			<u>0.9665</u>

<u>Year</u>	<u>Reserve Flow</u>	<u>Interest Factors</u>	<u>Discounted Reserve Flow</u>
1	0.0785	0.9803	0.0770
2	0.0000	0.9421	0.0000
3			
Total	0.0785		0.0770
Total Discounted Reserve/Total Reserve=			<u>0.9803</u>

<u>Year</u>	<u>Reserve Flow</u>	<u>Interest Factors</u>	<u>Discounted Reserve Flow</u>
1	0.0000	0.9803	0.0000
2			
Total	0.0000		0.0000
Total Discounted Reserve/Total Reserve=			<u>                    </u>

The average mid-term AFR used in these calculations is:

4.06%
-------

**Massachusetts Private Passenger Automobile  
Calculation of Countrywide Physical Damage Discount Reserve Factors**

<u>Year</u>	<u>Annual Phys D. Loss Flow</u>	<u>Outstanding</u>	<u>Reserve Flow for Tax</u>	<u>Interest Factors</u>	<u>Discounted Reserve Flow</u>
1	89.4096	10.5904	10.2752	0.9803	10.0730
2	10.2752	0.3152	0.1576	0.9421	0.1485
3	0.1576	0.1576	0.1576	0.9054	0.1427
4	0.1576	0.0000			
5	0.0000				
Total	100.0000		10.5904		10.3641
					Total Discounted Reserve/Total Reserve= <u>0.9786</u>

<u>Year</u>		<u>Reserve Flow</u>	<u>Interest Factors</u>	<u>Discounted Reserve Flow</u>
1		0.1576	0.9803	0.1545
2		0.1576	0.9421	0.1485
Total		0.3152		0.3030
				Total Discounted Reserve/Total Reserve= <u>0.9612</u>

<u>Year</u>		<u>Reserve Flow</u>	<u>Interest Factors</u>	<u>Discounted Reserve Flow</u>
1		0.1576	0.9803	0.1545
Total		0.1576		0.1545
				Total Discounted Reserve/Total Reserve= <u>0.9803</u>

The average mid-term AFR used in these calculations is:

4.06%
-------

**Massachusetts Private Passenger Automobile  
Calculation of Interest Rate for Reserve Discount Factors**

<u>Month</u>	<u>Midterm AFR</u>	
January 2003	3.43%	
February 2003	3.27%	
March 2003	3.24%	
April 2003	2.96%	
May 2003	3.17%	
June 2003	3.06%	
July 2003	2.55%	
August 2003	2.70%	
September 2003	3.43%	
October 2003	3.65%	
November 2003	3.32%	
December 2003	3.55%	
		12 Month Average <input type="text" value="3.19%"/>
January 2004	3.52%	
February 2004	3.44%	
March 2004	3.34%	
April 2004	3.15%	
May 2004	3.16%	
June 2004	3.89%	
July 2004	4.11%	
August 2004	4.00%	
September 2004	3.84%	
October 2004	3.62%	
November 2004	3.55%	
December 2004	3.56%	
		24 Month Average <input type="text" value="3.40%"/>

## Sources:

4/1/2008 CAR Transition Rate Filing, 100H-7, Exhibit 7

**Massachusetts Private Passenger Automobile  
Calculation of Interest Rate for Reserve Discount Factors**

<u>Month</u>	<u>Midterm AFR</u>	
January 2005	3.76%	
February 2005	3.83%	
March 2005	3.83%	
April 2005	4.09%	
May 2005	4.28%	
June 2005	4.01%	
July 2005	3.86%	
August 2005	3.92%	
September 2005	4.19%	
October 2005	4.08%	
November 2005	4.23%	
December 2005	4.52%	
		36 Month Average <input type="text" value="3.61%"/>
January 2006	4.48%	
February 2006	4.40%	
March 2006	4.51%	
April 2006	4.72%	
May 2006	4.84%	
June 2006	5.06%	
July 2006	5.05%	
August 2006	5.21%	
September 2006	5.01%	
October 2006	4.82%	
November 2006	4.69%	
December 2006	4.73%	
		48 Month Average <input type="text" value="3.91%"/>
January 2007	4.58%	
February 2007	4.69%	
March 2007	4.86%	
April 2007	4.61%	
May 2007	4.62%	
June 2007	4.64%	
July 2007	4.95%	
August 2007	5.09%	
September 2007	4.79%	
October 2007	4.35%	
November 2007	4.39%	
December 2007	4.13%	
		60 Month Average <input type="text" value="4.06%"/>

*Commonwealth Automobile Reinsurers*

**Filing for Residual Market Rates  
Effective 4/1/2009**

**Model Year/Symbol Drift: 100I**

**Massachusetts Private Passenger Automobile****Model Year/Symbol Drift Factors**

Because of inflation and the ongoing turnover of vehicles in the insured population, the average value of insured vehicles (and their corresponding premium & losses) tends to rise over time, even if base rates do not change. Thus, when a set of model year symbol relativities is balanced on the set of exposures underlying the next year's rates, the actual average relativity in the year for which rates are being set will generally be greater than one. In order for rates to produce the correct overall expected premium, the effect of this shift towards a higher average relativity needs to be considered when calculating the rates for the three physical damage coverages (collision, limited collision, and comprehensive).

**General Description of Method**

The effect of model year/symbol drift for 4/1/2009 CAR rates has been calculated as follows:

1. Proposed policy year 2009 model year/symbol rate relativities (flattened to account for the effect of fixed expenses) are averaged over calendar year 2007 written exposures for the facility market segment by model year and symbol.
2. Proposed policy year 2009 model year/symbol rate relativities are again averaged over calendar year 2005 written exposures for the residual market segment by model year and symbol.
3. The ratio of (2)/(1) is used to estimate the 2009 average rate level from the average premium level.

This method assumes that the annualized shift in mix of model year/symbol exposures between experience year 2007 and policy year beginning 4/1/2009 will be the same as the annualized shift in exposure mix that occurred between calendar years 2005 and 2007.

The implied model year/symbol rate reduction factors to be applied to CAR rates effective 4/1/2009 are displayed in Section 100I, Exhibit 1.



**Massachusetts Private Passenger Automobile  
Summary of Estimated Model Year / Symbol Drift Factors  
Facility Market**

	(A)	(B)	(C)
	2005 Average Model Year/Symbol <u>Relativity*</u>	2007 Average Model Year/Symbol <u>Relativity**</u>	Implied Rate Reduction <u>Factor (A)/(B)***</u>
Collision	0.8613	1.0000	0.8458
Limited Collision	0.6012	0.6635	0.8953
Comprehensive	0.9307	1.0000	0.9226

\* From Section 100 I, Exhibit 3

\*\* From Section 100 I, Exhibit 2

\*\*\*  $(C) = [(A)/(B)] ^ (2.243/2)$  ;

where the 2.243 symbol drift period is derived in Section 100 I, Exhibit 4

Massachusetts Private Passenger - Automobile  
Calculation of Average Model Year/Symbol Relativities  
Facility Market

Calendar Year 2007 Written Exposures - \$500 Deductible Collision Coverages

Symbol	Model Year													1989 & Prior	1997-1990	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Total
	2009	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997-1990															
1			1.8	1.4	0.0	0.2	2.8	1.1	1.0	1.7	1.0	0.8	0.0	6.1	0.0	2.0	21.2											
2		0.0	0.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.7	0.0	0.2	49.9											
3		0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.1	0.0	5.8	153.7											
4		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.2	0.0	8.8	664.3											
5		0.9	2.2	1.8	0.1	7.2	9.3	19.1	31.2	40.1	171.5	73.7	171.5	59.5	17.2	6.9	962.5											
6		4.8	71.3	25.7	59.8	2.1	63.7	58.2	92.3	25.5	333.8	278.2	659.5	710.8	17.2	1.8	1,864.8											
7		47.6	252.1	36.4	128.9	36.4	143.5	145.2	153.3	256.5	99.2	165.1	710.8	1,194.0	81.2	5.1	2,293.9											
8		57.3	182.2	159.9	301.2	293.8	535.7	680.4	729.9	614.4	437.3	532.9	1,681.0	6.8	56.8	6,794.5												
10		81.2	599.1	22.2	293.8	327.8	535.7	680.4	729.9	614.4	437.3	532.9	1,681.0	6.8	56.8	6,794.5												
11		46.5	280.8	406.1	601.2	766.4	875.8	658.2	631.4	649.3	558.3	232.6	1,018.9	232.6	31.2	6,756.7												
12		66.0	531.9	574.1	969.2	1,143.1	1,210.2	1,435.6	1,445.5	1,445.5	1,030.6	996.8	1,084.9	28.9	10,936.9													
13		103.2	770.0	653.4	1,168.8	897.4	1,112.7	1,231.7	853.8	970.4	632.1	468.8	912.1	27.3	9,801.7													
14		258.7	1,215.2	1,190.2	739.9	831.2	853.1	869.2	974.0	929.0	690.2	497.9	944.1	22.0	9,950.8													
15		156.5	624.0	581.0	1,168.8	831.2	1,048.9	1,058.1	1,152.1	609.4	522.1	459.6	677.3	16.3	8,963.3													
16		75.9	501.7	576.3	836.7	976.2	954.5	772.8	547.0	653.9	582.4	440.0	621.7	16.2	7,535.3													
17		107.1	320.1	556.4	721.2	716.6	720.4	556.4	576.9	426.7	472.4	248.3	646.5	23.7	6,092.7													
18		74.8	199.1	573.6	266.6	498.0	491.8	416.7	618.1	638.4	374.8	269.2	475.9	12.3	4,899.3													
19		45.4	179.3	280.4	132.4	381.2	197.9	345.9	451.9	360.6	164.7	255.2	316.4	2.2	3,133.5													
20		39.2	200.1	170.8	181.6	164.1	202.9	285.8	212.2	301.6	361.5	127.7	207.4	8.9	2,423.8													
21		30.6	206.0	116.7	67.8	78.1	104.3	138.7	197.2	206.5	119.4	43.6	207.5	8.2	1,326.6													
22		16.1	55.2	77.0	51.8	117.8	106.8	49.8	66.9	154.1	107.4	104.3	106.9	0.0	1,002.8													
23		14.2	42.3	34.7	46.8	63.6	23.1	35.9	102.1	39.2	47.8	64.5	104.3	0.0	621.1													
24		7.2	23.8	24.8	26.4	37.4	30.8	29.0	19.2	15.1	41.7	15.6	86.3	0.0	357.3													
25		1.8	21.9	18.5	8.1	23.2	9.3	14.8	30.5	26.2	12.1	4.7	34.5	0.0	205.6													
26		4.3	6.2	19.8	10.3	10.8	13.6	19.7	27.3	22.9	10.0	15.5	53.7	0.0	214.1													
27		5.4	31.8	34.3	19.1	9.5	21.1	15.7	6.1	2.9	5.8	2.8	45.1	0.0	190.6													
Average		1,246.5	6,279.6	6,327.9	7,483.9	8,616.3	9,439.9	9,323.4	8,784.2	8,940.6	7,229.8	5,601.8	12,930.7	409.1	5,877.7	10,090.0	92,594.0											

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Proposed Flattened Model Year/Symbol Relativities Balanced to 2007 Written Exposures \* - Collision Coverages

Symbol	Model Year													1989 & Prior	1997-1990	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Average
	2009	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997-1990															
1	0.7370	0.6900	0.6450	0.6040	0.5660	0.5310	0.4980	0.4670	0.4380	0.4120	0.3870	0.3270	0.3460	0.0950	0.4204													
2	0.8830	0.7800	0.7290	0.6830	0.6390	0.5990	0.5620	0.5270	0.4930	0.4630	0.4350	0.3650	0.3460	0.1110	0.3545													
3	0.8880	0.8300	0.7760	0.7260	0.6800	0.6360	0.5970	0.5590	0.5240	0.4910	0.4610	0.3870	0.3870	0.1320	0.3667													
4	0.9440	0.8830	0.8260	0.7730	0.7230	0.6760	0.6340	0.5940	0.5560	0.5220	0.4900	0.4110	0.4110	0.1590	0.4004													
5	1.0060	0.9400	0.8790	0.8220	0.7690	0.7200	0.6730	0.6310	0.5910	0.5540	0.5190	0.4360	0.4360	0.2220	0.5197													
6	1.0710	1.0010	0.9360	0.8750	0.8180	0.7650	0.7160	0.6710	0.6280	0.5880	0.5510	0.4610	0.4610	0.2630	0.6229													
7	1.1420	1.0670	0.9970	0.9310	0.8710	0.8150	0.7620	0.7130	0.6680	0.6250	0.5850	0.4900	0.4900	0.3130	0.6660													
8	1.2160	1.1360	1.0610	0.9920	0.9270	0.8670	0.8110	0.7590	0.7090	0.6640	0.6220	0.5200	0.5200	0.3690	0.7105													
10	1.2960	1.2100	1.1300	1.0560	0.9870	0.9230	0.8630	0.8070	0.7550	0.7070	0.6610	0.5520	0.5520	0.4420	0.7991													
11	1.3810	1.2890	1.2040	1.1250	1.0520	0.9820	0.9180	0.8580	0.8030	0.7510	0.7030	0.5860	0.5860	0.4420	0.8469													
12	1.4720	1.3750	1.2840	1.1980	1.1200	1.0460	0.9780	0.9140	0.8540	0.7990	0.7480	0.6230	0.6230	0.4916	0.9416													
13	1.5700	1.4660	1.3680	1.2770	1.1930	1.1140	1.0410	0.9730	0.9090	0.8510	0.7960	0.6620	0.6620	0.5110	1.0280													
14	1.6740	1.5620	1.4580	1.3610	1.2710	1.1870	1.1090	1.0360	0.9690	0.9060	0.8470	0.7040	0.7040	0.5390	1.0742													
16	1.7850	1.6660	1.5550	1.4510	1.3550	1.2660	1.1810	1.1040	1.0320	0.9640	0.9010	0.7480	0.7480	0.5810	1.1414													
17	1.9030	1.7770	1.6580	1.5470	1.4440	1.3480	1.2590	1.1760	1.0990	1.0270	0.9600	0.7970	0.7970	0.6110	1.2177													
18	2.0560	1.9190	1.7910	1.6710	1.5590	1.4560	1.3600	1.2700	1.1870	1.1090	1.0360	0.8560	0.8560	0.6510	1.2765													
19	2.1890	2.0430	1.9070	1.7790	1.6600	1.5500	1.4480	1.3520	1.2640	1.1810	1.1040	0.9080	0.9080	0.7000	1.3498													
20	2.3790	2.2210	2.0730	1.9340	1.8050	1.6850	1.5740	1.4700	1.3740	1.2810	1.2000	0.9830	0.9830	0.7510	1.4385													
21	2.5700	2.3980	2.2380	2.0890	1.9490	1.8260	1.7000	1.5870	1.4840	1.3860	1.2950	1.0570	1.0570	0.8000	1.5286													
22	2.7600	2.5760	2.4040	2.2430	2.0940	1.9550	1.8260	1.7050	1.5930	1.4890	1.3910	1.1320	1.1320	0.8400	1.6206													
23	2.9500	2.7540	2.5700	2.3980	2.2380	2.0920	1.9520	1.8220	1.7030	1.5920	1.4870	1.2070	1.2070	0.9000	1.7165													
24	3.1360	3.0200	2.8190	2.6300	2.4500	2.2920	2.1400	1.9990	1.8680	1.7460	1.6310	1.3190	1.3190	0.9600	1.8199													
25	3.3210	3.2870	3.0670	2.8620	2.6710	2.4940	2.3290	2.1750	2.0330	1.9000	1.7750	1.4310	1.4310	1.0000	1.9266													
26	3.5070	3.5530	3.3160	3.0940	2.8880	2.6960	2.5180	2.3510	2.1980	2.0540	1.9190	1.5420	1.5420	1.0400	2.0327													
27	4.0930	3.8190	3.5650	3.3260	3.1040	2.8990	2.7070	2.5280	2.3630	2.2080	2.0630	1.6540	1.6540	1.0800	2.1687													
Average	1.5822	1.4258	1.2847	1.1748	1.0699	0.9985	0.9382	0.8777	0.8114	0.7617	0.7028	0.5617	0.5617	0.4539	0.7090													

\* From the 2009 MAIP Filing, Section 100M

Massachusetts Private Passenger Automobile  
Calculation of Average Model Year/Symbol Relativities  
Facility, Market

Calendar Year 2007 Written Exposures - \$500 Deductible Limited Collision Coverages

Symbol	2009	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997-1999	1989 & Prior	Total
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.5
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30.9
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	74.7
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	136.9
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	149.4
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	152.9
8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	250.6
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	316.8
11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	241.6
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	313.5
13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	203.4
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	218.8
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	159.3
16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	154.8
17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	127.8
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	66.3
19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	102.0
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	66.3
21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	41.6
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	29.0
23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17.1
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.7
25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.9
26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.3
27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0
<b>Totals</b>	<b>0.3</b>	<b>5.0</b>	<b>8.7</b>	<b>17.8</b>	<b>14.7</b>	<b>33.1</b>	<b>65.5</b>	<b>137.2</b>	<b>203.9</b>	<b>284.0</b>	<b>333.1</b>	<b>1,636.5</b>	<b>79.9</b>	<b>2,820.0</b>	

Proposed Flattened Model-Year/Symbol Relativities Balanced to 2007 Written Exposures \* - Limited Collision Coverages

Symbol	2009	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997-1999	1989 & Prior	Average
1	0.7370	0.6900	0.6450	0.6040	0.5660	0.5310	0.4980	0.4670	0.4380	0.4120	0.3870	0.3270	0.3270	0.0950	0.0000
2	0.7830	0.7330	0.6860	0.6420	0.6010	0.5630	0.5280	0.4950	0.4650	0.4370	0.4100	0.3460	0.3460	0.1110	0.3460
3	0.8340	0.7800	0.7290	0.6830	0.6390	0.5990	0.5620	0.5270	0.4930	0.4630	0.4350	0.3650	0.3650	0.1320	0.3650
4	0.8880	0.8300	0.7760	0.7260	0.6800	0.6360	0.5970	0.5590	0.5240	0.4910	0.4610	0.3870	0.3870	0.1390	0.3917
5	0.9440	0.8850	0.8260	0.7730	0.7230	0.6760	0.6340	0.5940	0.5560	0.5220	0.4900	0.4110	0.4110	0.1890	0.4211
6	1.0060	0.9400	0.8790	0.8220	0.7690	0.7200	0.6730	0.6310	0.5910	0.5540	0.5190	0.4360	0.4360	0.2220	0.4462
7	1.0710	1.0010	0.9360	0.8750	0.8180	0.7650	0.7160	0.6710	0.6280	0.5880	0.5510	0.4610	0.4610	0.2630	0.4718
8	1.1420	1.0670	0.9970	0.9310	0.8710	0.8150	0.7620	0.7130	0.6680	0.6250	0.5850	0.4900	0.4900	0.3130	0.5125
10	1.2160	1.1360	1.0610	0.9920	0.9270	0.8670	0.8110	0.7590	0.7090	0.6640	0.6220	0.5200	0.5200	0.3690	0.5458
11	1.2960	1.2100	1.1300	1.0560	0.9870	0.9230	0.8630	0.8070	0.7550	0.7070	0.6610	0.5520	0.5520	0.4420	0.5905
12	1.3810	1.2890	1.2040	1.1250	1.0520	0.9820	0.9180	0.8580	0.8030	0.7510	0.7030	0.5860	0.5860	0.4520	0.6540
13	1.4720	1.3750	1.2840	1.1980	1.1200	1.0460	0.9780	0.9140	0.8540	0.7990	0.7480	0.6230	0.6230	0.6230	0.6911
14	1.5700	1.4660	1.3680	1.2770	1.1930	1.1140	1.0410	0.9730	0.9090	0.8510	0.7960	0.6620	0.6620	0.7410	0.7463
15	1.6740	1.5620	1.4580	1.3610	1.2710	1.1870	1.1090	1.0360	0.9660	0.9060	0.8470	0.7040	0.7040	0.8800	0.7954
16	1.7850	1.6660	1.5550	1.4510	1.3550	1.2660	1.1810	1.1040	1.0320	0.9640	0.9010	0.7480	0.7480	1.0480	0.8521
17	1.9030	1.7770	1.6580	1.5470	1.4440	1.3480	1.2590	1.1760	1.0990	1.0270	0.9600	0.7970	0.7970	1.2510	0.9130
18	2.0360	1.9190	1.7910	1.6710	1.5590	1.4560	1.3600	1.2700	1.1870	1.0990	1.0360	0.8560	0.8560	0.0000	0.9392
19	2.1890	2.0430	1.9070	1.7790	1.6660	1.5500	1.4480	1.3520	1.2640	1.1810	1.1040	0.9080	0.9080	0.0000	1.0315
20	2.3790	2.2210	2.0730	1.9340	1.8050	1.6850	1.5740	1.4700	1.3740	1.2840	1.2000	0.9830	0.9830	0.0000	1.1530
21	2.5700	2.3980	2.2380	2.0890	1.9490	1.8200	1.7000	1.5870	1.4840	1.3860	1.2950	1.0570	1.0570	0.0000	1.1731
22	2.7600	2.5760	2.4040	2.2430	2.0940	1.9550	1.8260	1.7050	1.5910	1.4890	1.3910	1.1320	1.1320	0.0000	1.2524
23	2.9500	2.7540	2.5700	2.3980	2.2380	2.0900	1.9520	1.8220	1.7030	1.5920	1.4870	1.2070	1.2070	0.0000	1.3417
24	3.2360	3.0200	2.8190	2.6300	2.4550	2.2920	2.1400	1.9990	1.8680	1.7460	1.6310	1.3190	1.3190	0.0000	1.4718
25	3.5210	3.2870	3.0670	2.8620	2.6710	2.4940	2.3290	2.1750	2.0330	1.9000	1.7750	1.4310	1.4310	0.0000	1.6889
26	3.8070	3.5530	3.3160	3.0940	2.8880	2.6960	2.5180	2.3510	2.1980	2.0540	1.9190	1.5420	1.5420	0.0000	1.5420
27	4.0930	3.8190	3.5650	3.3260	3.1040	2.8990	2.7070	2.5280	2.3630	2.2080	2.0630	1.6540	1.6540	0.0000	1.6540
<b>Average</b>	<b>2.2210</b>	<b>2.2210</b>	<b>1.6200</b>	<b>1.3814</b>	<b>1.2514</b>	<b>1.0833</b>	<b>1.0254</b>	<b>0.9308</b>	<b>0.8991</b>	<b>0.8271</b>	<b>0.7869</b>	<b>0.6314</b>	<b>0.5836</b>	<b>0.4516</b>	<b>0.6635</b>

\* From the 2009 MAIP Filing, Section 100M

Massachusetts Private Passenger Automobile  
 Calculation of Average Model Year/Symbol Relativities  
 Facility Market

Calendar Year 2007 Written Exposures - \$500 Deductible Comprehensive Coverages

Symbol	2009	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997-1999	1989 & Prior	Total
1	1.8	1.3	0.0	1.4	0.0	0.2	2.8	1.1	1.0	1.7	1.0	1.8	15.0	3.8	32.9
2	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	101.6	0.2	104.8
3	0.0	0.0	0.0	0.4	0.0	0.0	0.0	5.7	0.0	0.0	10.7	21.3	267.4	9.8	315.3
4	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	-0.6	1.8	151.0	707.6	18.9	1,055.2
5	1.9	2.2	1.8	9.3	1.8	7.2	9.3	18.1	33.5	45.9	214.1	102.2	1,104.1	17.6	1,558.0
6	4.8	4.8	73.5	25.7	59.8	24.0	66.1	61.2	106.1	196.8	402.8	348.4	1,173.5	35.7	3,076.8
7	49.2	263.4	37.4	135.8	186.7	127.7	146.5	163.5	168.4	299.0	129.5	221.3	1,251.7	81.4	3,476.4
8	84.8	612.8	230.6	298.8	335.2	449.4	557.6	503.5	597.0	828.8	345.4	241.9	2,028.5	193.1	6,472.5
10	11.0	48.5	296.8	417.8	629.3	788.3	923.1	707.0	696.7	696.4	546.5	679.2	2,610.8	168.3	8,345.6
11	70.2	545.4	598.9	1,004.3	1,004.3	942.6	1,266.1	1,505.3	818.1	1,278.8	1,199.5	1,236.5	1,721.9	104.2	8,097.7
13	108.2	688.7	1,212.7	1,212.7	1,212.7	942.6	1,266.1	1,505.3	818.1	1,278.8	1,199.5	1,236.5	1,721.9	68.2	12,506.6
14	276.5	1,257.7	1,257.7	769.4	883.6	818.1	912.4	931.4	1,063.1	1,057.1	764.2	595.2	1,414.1	56.9	11,108.9
15	168.5	659.6	611.0	883.6	611.0	1,086.0	1,306.8	1,157.3	1,267.5	1,038.2	805.8	612.1	1,413.4	51.4	11,211.2
16	79.4	79.4	544.7	879.5	1,041.1	1,016.3	834.1	608.6	608.6	702.6	605.0	593.3	1,045.6	28.4	10,137.2
17	116.4	344.9	344.9	591.9	775.2	776.8	768.2	605.7	626.8	765.5	660.8	543.7	964.1	25.4	8,586.4
18	76.2	211.2	608.9	281.8	532.0	452.2	452.2	452.2	452.2	452.2	359.9	306.3	963.9	38.9	6,949.1
19	50.5	196.8	297.3	173.7	397.5	211.8	380.0	380.0	380.0	382.2	202.6	304.2	440.5	9.0	3,551.7
20	41.4	178.3	193.0	200.9	177.0	224.4	305.4	305.4	305.4	338.2	413.2	143.8	292.9	9.5	2,745.8
21	34.9	233.2	123.2	73.3	84.2	109.8	142.9	142.9	208.1	238.7	137.0	56.8	277.5	16.1	1,735.1
22	18.7	61.4	89.7	57.7	132.0	117.2	55.8	39.2	111.5	47.8	120.8	112.0	150.4	0.0	1,175.1
23	13.8	49.0	36.3	56.1	69.3	69.3	26.8	32.2	52.8	52.8	76.0	138.1	138.1	0.0	716.7
24	8.0	27.5	31.8	33.4	41.4	41.4	34.6	31.3	33.7	19.1	49.6	21.6	118.7	0.0	436.2
25	2.2	23.9	20.5	11.3	23.0	23.0	11.3	13.9	14.6	29.2	14.6	7.7	47.9	0.0	238.5
26	5.2	6.2	22.8	10.8	15.1	14.6	14.6	20.7	31.1	26.1	19.8	9.4	67.3	0.0	249.1
27	6.6	46.1	31.2	24.2	14.0	14.0	25.1	17.0	7.1	5.8	9.8	2.8	50.4	0.0	240.1
Totals	1,327.1	6,634.5	6,709.3	7,885.3	9,098.4	10,001.5	10,004.5	9,585.0	10,176.3	8,550.6	7,054.2	20,828.7	956.1	108,812	108,812

Proposed Flattened Model-Year/Symbol Relativities Balanced to 2007 Written Exposures \* - Comprehensive Coverages

Symbol	2009	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997-1999	1989 & Prior	Average
1	0.5650	0.5530	0.5400	0.5280	0.5160	0.5040	0.4920	0.4820	0.4710	0.4600	0.4500	0.4420	0.4220	0.1020	0.4142
2	0.6000	0.5860	0.5730	0.5600	0.5470	0.5340	0.5220	0.5110	0.4990	0.4880	0.4770	0.4670	0.4470	0.1260	0.4488
3	0.6370	0.6230	0.6080	0.5940	0.5800	0.5670	0.5540	0.5410	0.5290	0.5170	0.5060	0.4940	0.4740	0.1520	0.4664
4	0.7200	0.7030	0.6860	0.6710	0.6550	0.6390	0.6250	0.6100	0.5960	0.5820	0.5680	0.5520	0.5320	0.1810	0.5020
5	0.7660	0.7470	0.7300	0.7120	0.6960	0.6800	0.6650	0.6490	0.6330	0.6180	0.6040	0.5880	0.5680	0.2180	0.5389
6	0.8150	0.7950	0.7770	0.7580	0.7400	0.7220	0.7060	0.6890	0.6720	0.6570	0.6420	0.6260	0.6000	0.2590	0.5888
7	0.8670	0.8460	0.8270	0.8060	0.7870	0.7680	0.7500	0.7320	0.7150	0.6980	0.6820	0.6670	0.6370	0.3180	0.6450
8	0.9230	0.9010	0.8790	0.8580	0.8380	0.8170	0.7980	0.7800	0.7610	0.7430	0.7250	0.7070	0.6770	0.3820	0.6921
10	0.9830	0.9590	0.9360	0.9140	0.8920	0.8700	0.8500	0.8290	0.8090	0.7900	0.7710	0.7520	0.7220	0.4610	0.7399
11	1.0480	1.0230	0.9980	0.9730	0.9500	0.9270	0.9050	0.8830	0.8620	0.8410	0.8210	0.8010	0.7700	0.5540	0.8080
12	1.1170	1.0900	1.0640	1.0370	1.0120	0.9870	0.9630	0.9400	0.9170	0.8950	0.8740	0.8530	0.8220	0.6740	0.8645
13	1.1910	1.1620	1.1340	1.1060	1.0780	1.0530	1.0270	1.0020	0.9770	0.9520	0.9270	0.9020	0.8760	0.8150	0.9366
14	1.2700	1.2390	1.2090	1.1790	1.1490	1.1220	1.0940	1.0670	1.0420	1.0160	0.9910	0.9670	0.9410	0.8880	1.0070
15	1.3550	1.3220	1.2890	1.2570	1.2260	1.1960	1.1660	1.1370	1.1100	1.0830	1.0560	1.0300	1.0030	1.1920	1.0684
16	1.4470	1.4110	1.3760	1.3410	1.3080	1.2760	1.2440	1.2130	1.1840	1.1540	1.1260	1.0980	1.0700	1.4460	1.1377
17	1.5460	1.5030	1.4600	1.4180	1.3780	1.3380	1.3000	1.2630	1.2280	1.1940	1.1610	1.1290	1.0980	1.7500	1.2155
18	1.6640	1.6220	1.5820	1.5430	1.5040	1.4670	1.4310	1.3950	1.3610	1.3270	1.2940	1.2620	1.2300	2.0000	1.2920
19	1.8080	1.7630	1.7190	1.6770	1.6350	1.5950	1.5540	1.5160	1.4800	1.4430	1.4070	1.3710	1.3360	2.5000	1.3751
20	1.9530	1.9040	1.8570	1.8110	1.7660	1.7220	1.6790	1.6380	1.5980	1.5580	1.5190	1.4810	1.4450	3.0000	1.4947
21	2.1080	2.0450	1.9950	1.9450	1.8970	1.8500	1.8030	1.7590	1.7160	1.6730	1.6320	1.5910	1.5500	3.5000	1.6138
22	2.2820	2.1980	2.1320	2.0790	2.0280	1.9780	1.9280	1.8800	1.8350	1.7900	1.7450	1.7020	1.6580	4.0000	1.7286
23	2.4590	2.3580	2.3380	2.2800	2.2240	2.1690	2.1140	2.0620	2.0120	1.9620	1.9130	1.8640	1.8160	4.5000	1.8366
24	2.6760	2.5600	2.5450	2.4820	2.4200	2.3600	2.3010	2.2440	2.1900	2.1350	2.0820	2.0300	1.9780	5.0000	2.0146
25	2.8930	2.8210	2.7510	2.6830	2.6160	2.5520	2.4870	2.4260	2.3670	2.3080	2.2510	2.1960	2.1420	5.5000	2.2177
26	3.1100	3.0330	2.9570	2.8840	2.8130	2.7430	2.6740	2.6080	2.5450	2.4810	2.4200	2.3530	2.2930	6.0000	2.3436
27	3.1100	3.0330	2.9570	2.8840	2.8130	2.7430	2.6740	2.6080	2.5450	2.4810	2.4200	2.3530	2.2930	6.0000	2.6667
Average	1.2604	1.2604	1.1923	1.2165	1.1231	1.1148	1.0586	1.0291	1.0291	0.9844	0.9449	0.8633	0.7971	0.5597	1.0000

\* From the 2009 NAIP Filing - Section 100M

Massachusetts Private Passenger - Automobile  
Calculation of Average Model Year/Symbol Relativities  
Facility Market

Calendar Year 2005 Written Exposures - \$500 Deductible Collision Coverages

Symbol	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997	1996	1995-1990	1989 & Prior	Total
1	3.3	3.8	1.0	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.6	0.2	18.3	2.9	34
2	3.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.0	8.0	150.8	3.0	167
3	2.2	1.2	0.0	0.4	1.2	1.0	0.4	0.4	3.0	60.2	34.0	49.4	358.2	16.0	353
4	1.3	0.0	0.8	0.0	0.0	0.0	2.5	2.5	257.8	257.8	95.7	159.7	764.8	10.2	1,580
5	2.2	3.1	8.8	19.0	25.9	82.9	97.4	333.1	201.2	201.2	289.1	527.4	941.1	17.2	2,428
6	7.9	96.8	32.8	32.8	65.2	79.2	325.5	602.6	565.2	565.2	330.6	287.2	941.1	38.3	3,745
7	20.0	162.2	147.0	172.8	285.3	371.5	478.3	478.3	434.2	434.2	218.0	218.0	1,127.2	60.2	3,943
8	38.2	449.9	73.5	73.5	817.3	625.3	940.2	1,335.8	567.6	406.2	520.7	746.4	2,020.2	203.8	9,395
9	45.0	334.5	398.6	1,164.4	868.4	868.4	1,164.4	882.2	1,076.1	1,472.8	981.9	1,736.0	200.4	10,783	10,234
10	107.8	676.5	917.7	924.8	1,236.6	1,122.7	1,236.6	1,122.7	509.5	509.5	749.9	1,314.7	112.2	10,234	10,234
11	102.6	1,272.2	1,221.1	1,831.5	1,278.9	1,945.5	1,953.7	1,953.7	1,050.9	2,151.2	355.1	1,249.8	72.2	15,838	15,838
12	219.5	1,455.5	1,045.0	1,649.4	1,426.1	1,649.4	1,649.4	1,649.4	992.7	1,180.2	1,004.5	444.0	67.4	13,134	13,134
13	103.5	861.9	994.9	1,020.8	1,227.5	1,518.8	1,594.9	1,594.9	802.7	1,050.1	802.7	622.8	743.7	65.5	11,917
14	113.1	1,118.4	1,300.6	1,438.8	1,438.8	1,423.5	1,423.5	1,423.5	1,014.5	674.8	333.8	642.1	37.1	11,794	11,794
15	95.0	993.4	1,288.5	1,035.9	1,069.3	892.1	1,162.7	1,053.9	844.2	844.2	568.2	341.3	648.0	28.3	10,021
16	88.3	716.3	736.4	736.4	736.4	736.4	736.4	736.4	591.6	591.6	442.6	591.4	37.8	5,981	5,981
17	311.8	449.1	449.1	449.1	449.1	449.1	449.1	449.1	478.9	478.9	352.7	442.6	25.6	3,979	3,979
18	214.8	344.2	200.8	458.2	630.3	522.0	289.8	470.4	308.8	115.7	332.8	18.8	306.9	12.7	3,007
19	56.1	202.8	189.7	278.4	208.8	278.4	278.4	278.4	213.9	213.9	171.7	47.8	314.3	12.1	1,831
20	30.8	84.2	93.2	144.2	144.2	144.2	144.2	144.2	102.8	149.3	40.0	40.0	12.1	0.0	1,278
21	22.6	68.8	130.4	106.9	70.2	112.0	247.9	138.4	138.4	138.4	47.2	48.2	128.8	0.0	807
22	18.1	77.6	52.8	27.9	39.8	118.2	71.8	86.8	130.4	32.6	28.6	23.8	122.2	0.0	495
23	22.3	44.5	46.7	25.8	43.3	13.0	23.3	33.3	43.3	16.2	28.9	15.6	34.9	0.0	248
24	5.8	11.2	12.8	19.9	20.4	27.0	34.7	28.5	20.8	12.2	29.8	27.4	24.1	0.0	171
25	7.5	15.0	11.8	16.4	16.4	16.4	16.4	16.4	9.8	5.8	6.0	4.8	42.6	0.0	252
26	6.2	19.2	11.7	13.0	14.4	5.2	14.4	5.2	5.8	5.8	4.8	4.8	42.6	0.0	171
27	1.523	9.218	10.258	12.323	12.323	12.323	13.591	15.156	13.304	11.749	10.900	7.001	15.763	1.042	131,412
Totals	1,273	9,218	10,258	12,323	12,323	12,323	13,591	15,156	13,304	11,749	10,900	7,001	15,763	1,042	131,412

Proposed Flattened Model-Year/Symbol Relativities Balanced to 2007 Written Exposures \* - Collision Coverages

Symbol	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997	1996	1995-1990	1989 & Prior	Average
1	0.6450	0.6040	0.5660	0.5310	0.4980	0.4670	0.4380	0.4120	0.3870	0.3270	0.3270	0.3270	0.3270	0.0950	0.3847
2	0.6860	0.6420	0.6010	0.5630	0.5280	0.4950	0.4650	0.4370	0.4100	0.3460	0.3460	0.3460	0.3460	0.1110	0.3486
3	0.7290	0.6830	0.6390	0.5990	0.5620	0.5270	0.4910	0.4630	0.4350	0.3630	0.3630	0.3630	0.3630	0.1320	0.3693
4	0.7760	0.7260	0.6800	0.6360	0.5970	0.5590	0.5240	0.4910	0.4610	0.3870	0.3870	0.3870	0.3870	0.1590	0.3984
5	0.8260	0.7730	0.7230	0.6760	0.6340	0.5940	0.5560	0.5220	0.4900	0.4110	0.4110	0.4110	0.4110	0.1890	0.4351
6	0.8790	0.8220	0.7690	0.7200	0.6730	0.6310	0.5910	0.5540	0.5190	0.4360	0.4360	0.4360	0.4360	0.2220	0.4847
7	0.9360	0.8730	0.8180	0.7650	0.7160	0.6710	0.6280	0.5880	0.5510	0.4610	0.4610	0.4610	0.4610	0.2630	0.5423
8	0.9970	0.9310	0.8710	0.8150	0.7620	0.7130	0.6680	0.6250	0.5850	0.4900	0.4900	0.4900	0.4900	0.3130	0.6125
9	1.0610	0.9920	0.9270	0.8670	0.8110	0.7590	0.7090	0.6640	0.6220	0.5200	0.5200	0.5200	0.5200	0.3690	0.6233
10	1.1300	1.0560	0.9870	0.9230	0.8630	0.8070	0.7550	0.7070	0.6610	0.5520	0.5520	0.5520	0.5520	0.4420	0.7218
11	1.2040	1.1250	1.0520	0.9820	0.9180	0.8580	0.8030	0.7510	0.7030	0.5860	0.5860	0.5860	0.5860	0.4718	0.7692
12	1.2840	1.1980	1.1200	1.0460	0.9780	0.9140	0.8540	0.7990	0.7480	0.6230	0.6230	0.6230	0.6230	0.5120	0.8486
13	1.3680	1.2770	1.1930	1.1140	1.0410	0.9730	0.9090	0.8510	0.7960	0.6620	0.6620	0.6620	0.6620	0.5410	0.8999
14	1.4580	1.3610	1.2710	1.1870	1.1090	1.0360	0.9660	0.9010	0.8400	0.7040	0.7040	0.7040	0.7040	0.5880	0.9760
15	1.5550	1.4510	1.3550	1.2660	1.1810	1.1040	1.0320	0.9640	0.9010	0.7480	0.7480	0.7480	0.7480	0.6400	1.0715
16	1.6580	1.5470	1.4440	1.3480	1.2590	1.1760	1.0990	1.0270	0.9600	0.7970	0.7970	0.7970	0.7970	0.7000	1.1820
17	1.7910	1.6710	1.5590	1.4560	1.3600	1.2700	1.1870	1.1090	1.0360	0.8560	0.8560	0.8560	0.8560	0.7600	1.3200
18	1.9070	1.7790	1.6600	1.5500	1.4480	1.3520	1.2640	1.1810	1.1040	0.9080	0.9080	0.9080	0.9080	0.8100	1.5005
19	2.0730	1.9340	1.8050	1.6850	1.5740	1.4700	1.3740	1.2840	1.2080	0.9830	0.9830	0.9830	0.9830	0.8800	1.7663
20	2.2380	2.0890	1.9490	1.8200	1.7000	1.5870	1.4840	1.3860	1.2950	1.0570	1.0570	1.0570	1.0570	0.9500	2.1346
21	2.4040	2.2430	2.0940	1.9550	1.8260	1.7050	1.5930	1.4890	1.3910	1.1320	1.1320	1.1320	1.1320	1.0200	2.5146
22	2.5700	2.3980	2.2380	2.0900	1.9520	1.8230	1.6930	1.5740	1.4610	1.1700	1.1700	1.1700	1.1700	1.0500	2.9000
23	2.8190	2.6300	2.4550	2.2920	2.1400	1.9990	1.8680	1.7460	1.6310	1.3190	1.3190	1.3190	1.3190	1.1900	3.2910
24	3.0670	2.8620	2.6710	2.4940	2.3290	2.1750	2.0330	1.9000	1.7750	1.4310	1.4310	1.4310	1.4310	1.3000	3.6833
25	3.3160	3.0940	2.8880	2.6960	2.5180	2.3510	2.1980	2.0540	1.9190	1.5420	1.5420	1.5420	1.5420	1.4100	4.0800
26	3.5650	3.3260	3.1040	2.8990	2.7070	2.5280	2.3630	2.2080	2.0630	1.6540	1.6540	1.6540	1.6540	1.5200	4.4811
Average	1.4244	1.2309	1.1577	1.0527	0.9866	0.9414	0.8634	0.7961	0.7546	0.6420	0.6087	0.5956	0.5956	0.5189	0.8613

\* From the 2009 MAIP Filing, Section 100M

Massachusetts Private Passenger Automobile  
Calculation of Average Model Year/ Symbol Relativities  
Faculty Market

Calendar Year 2005 Written Exposures - \$500 Deductible Limited Collision Coverages

Symbol	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997	1996	1995-1990	1989 & Prior	Total
1	0.6450	0.6040	0.5660	0.5310	0.4980	0.4670	0.4380	0.4120	0.3870	0.3270	0.00	0.00	0.00	0.00	4.0
2	0.6860	0.6420	0.6010	0.5630	0.5280	0.4950	0.4650	0.4370	0.4100	0.3460	0.00	0.00	22.1	0.0	23.5
3	0.7290	0.6830	0.6390	0.5990	0.5620	0.5270	0.4930	0.4630	0.4350	0.3650	1.0	1.0	64.0	0.0	67.8
4	0.7760	0.7260	0.6800	0.6360	0.5970	0.5590	0.5240	0.4910	0.4610	0.3870	1.0	1.0	166.0	0.0	171.0
5	0.8260	0.7750	0.7230	0.6760	0.6340	0.5940	0.5560	0.5220	0.4900	0.4110	3.5	3.5	49.3	2.0	57.1
6	0.8790	0.8220	0.7690	0.7200	0.6730	0.6310	0.5910	0.5540	0.5190	0.4360	7.8	7.8	106.0	6.0	113.8
7	0.9360	0.8750	0.8180	0.7650	0.7160	0.6710	0.6280	0.5880	0.5510	0.4610	15.9	15.9	167.0	7.1	174.1
8	0.9970	0.9310	0.8710	0.8150	0.7620	0.7130	0.6680	0.6250	0.5850	0.4900	32.4	32.4	352.0	19.2	371.2
9	1.0610	0.9920	0.9270	0.8670	0.8110	0.7590	0.7090	0.6640	0.6220	0.5200	60.0	60.0	615.0	33.3	648.3
10	1.1300	1.0560	0.9870	0.9230	0.8630	0.8070	0.7550	0.7070	0.6610	0.5520	106.0	106.0	1071.0	51.4	1122.4
11	1.2040	1.1250	1.0520	0.9820	0.9180	0.8580	0.8030	0.7510	0.7030	0.5860	200.0	200.0	1973.0	17.7	2000.7
12	1.2840	1.1980	1.1200	1.0460	0.9780	0.9140	0.8540	0.7990	0.7480	0.6230	382.0	382.0	1696.0	19.6	1895.6
13	1.3680	1.2770	1.1930	1.1140	1.0410	0.9730	0.9090	0.8510	0.7960	0.6620	610.0	610.0	3906.0	10.5	4011.5
14	1.4580	1.3610	1.2710	1.1870	1.1090	1.0360	0.9690	0.9060	0.8470	0.7040	938.0	938.0	5839.0	6.1	6015.1
15	1.5550	1.4510	1.3550	1.2660	1.1810	1.1040	1.0320	0.9640	0.9010	0.7480	1329.0	1329.0	8311.0	12.7	8513.7
16	1.6580	1.5470	1.4440	1.3480	1.2590	1.1760	1.0990	1.0270	0.9600	0.7970	1919.0	1919.0	11971.0	19.2	12200.2
17	1.7910	1.6710	1.5590	1.4560	1.3600	1.2700	1.1870	1.1090	1.0360	0.8560	2732.0	2732.0	16701.0	67.6	17378.6
18	1.9070	1.7900	1.6600	1.5500	1.4480	1.3520	1.2640	1.1810	1.1040	0.9080	3833.0	3833.0	22911.0	51.4	23426.4
19	2.0730	1.9340	1.8050	1.6850	1.5740	1.4700	1.3740	1.2840	1.2000	0.9830	5187.0	5187.0	30693.0	17.7	30870.7
20	2.2380	2.0890	1.9490	1.8200	1.7000	1.5870	1.4840	1.3860	1.2950	1.0570	7061.0	7061.0	41966.0	19.6	42162.6
21	2.4040	2.2430	2.0940	1.9550	1.8260	1.7050	1.5920	1.4890	1.3910	1.1320	9509.0	9509.0	55846.0	10.5	56806.5
22	2.5700	2.3980	2.2380	2.0900	1.9520	1.8220	1.7030	1.5920	1.4870	1.2070	12649.0	12649.0	75039.0	6.1	75715.1
23	2.8190	2.6300	2.4550	2.2920	2.1400	1.9990	1.8680	1.7460	1.6310	1.3190	17269.0	17269.0	103190.0	12.7	103412.7
24	3.0670	2.8620	2.6710	2.4940	2.3290	2.1750	2.0330	1.9000	1.7750	1.4310	23319.0	23319.0	139431.0	19.2	139623.2
25	3.3160	3.0940	2.8880	2.6960	2.5180	2.3510	2.1980	2.0540	1.9190	1.5420	31429.0	31429.0	185420.0	51.4	185931.4
26	3.5650	3.3260	3.1040	2.8990	2.7070	2.5280	2.3630	2.2080	2.0630	1.6540	42244.0	42244.0	251540.0	17.7	251717.7
27	3.8140	3.5550	3.3040	3.0790	2.8770	2.6860	2.5040	2.3310	2.1660	1.7540	56664.0	56664.0	336040.0	42.2	336462.2
Average	0.0000	0.0000	1.3550	1.1201	1.0052	0.9352	0.9020	0.8373	0.7505	0.6244	0.6080	0.5775	0.5571	0.4569	0.6012
Totals	0.0	0.6	0.6	9.3	19.5	49.9	75.5	176.0	226.3	337.5	457.1	466.3	2,118.0	238.8	4,174.8

Proposed Flattened Model-Year/Symbol Relativities Balanced to 2007 Written Exposures - Limited Collision Coverages

Symbol	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997	1996	1995-1990	1989 & Prior	Average
1	0.6450	0.6040	0.5660	0.5310	0.4980	0.4670	0.4380	0.4120	0.3870	0.3270	0.00	0.00	0.3270	0.0950	0.3270
2	0.6860	0.6420	0.6010	0.5630	0.5280	0.4950	0.4650	0.4370	0.4100	0.3460	0.3460	0.3460	0.3460	0.1110	0.3460
3	0.7290	0.6830	0.6390	0.5990	0.5620	0.5270	0.4930	0.4630	0.4350	0.3650	0.3650	0.3650	0.3650	0.1320	0.3650
4	0.7760	0.7260	0.6800	0.6360	0.5970	0.5590	0.5240	0.4910	0.4610	0.3870	0.3870	0.3870	0.3870	0.1590	0.3870
5	0.8260	0.7750	0.7230	0.6760	0.6340	0.5940	0.5560	0.5220	0.4900	0.4110	0.4110	0.4110	0.4110	0.1890	0.4110
6	0.8790	0.8220	0.7690	0.7200	0.6730	0.6310	0.5910	0.5540	0.5190	0.4360	0.4360	0.4360	0.4360	0.2220	0.4360
7	0.9360	0.8750	0.8180	0.7650	0.7160	0.6710	0.6280	0.5880	0.5510	0.4610	0.4610	0.4610	0.4610	0.2630	0.4610
8	0.9970	0.9310	0.8710	0.8150	0.7620	0.7130	0.6680	0.6250	0.5850	0.4900	0.4900	0.4900	0.4900	0.3130	0.4900
9	1.0610	0.9920	0.9270	0.8670	0.8110	0.7590	0.7090	0.6640	0.6220	0.5200	0.5200	0.5200	0.5200	0.3690	0.5200
10	1.1300	1.0560	0.9870	0.9230	0.8630	0.8070	0.7550	0.7070	0.6610	0.5520	0.5520	0.5520	0.5520	0.4420	0.5520
11	1.2040	1.1250	1.0520	0.9820	0.9180	0.8580	0.8030	0.7510	0.7030	0.5860	0.5860	0.5860	0.5860	0.5220	0.5860
12	1.2840	1.1980	1.1200	1.0460	0.9780	0.9140	0.8540	0.7990	0.7480	0.6230	0.6230	0.6230	0.6230	0.6310	0.6230
13	1.3680	1.2770	1.1930	1.1140	1.0410	0.9730	0.9090	0.8510	0.7960	0.6620	0.6620	0.6620	0.6620	0.7410	0.6620
14	1.4580	1.3610	1.2710	1.1870	1.1090	1.0360	0.9690	0.9060	0.8470	0.7040	0.7040	0.7040	0.7040	0.8800	0.7040
15	1.5550	1.4510	1.3550	1.2660	1.1810	1.1040	1.0320	0.9640	0.9010	0.7480	0.7480	0.7480	0.7480	1.0480	0.7480
16	1.6580	1.5470	1.4440	1.3480	1.2590	1.1760	1.0990	1.0270	0.9600	0.7970	0.7970	0.7970	0.7970	1.2510	0.7970
17	1.7910	1.6710	1.5590	1.4560	1.3600	1.2700	1.1870	1.1090	1.0360	0.8560	0.8560	0.8560	0.8560	0.0000	0.8560
18	1.9070	1.7900	1.6600	1.5500	1.4480	1.3520	1.2640	1.1810	1.1040	0.9080	0.9080	0.9080	0.9080	0.0000	0.9080
19	2.0730	1.9340	1.8050	1.6850	1.5740	1.4700	1.3740	1.2840	1.2000	0.9830	0.9830	0.9830	0.9830	0.0000	0.9830
20	2.2380	2.0890	1.9490	1.8200	1.7000	1.5870	1.4840	1.3860	1.2950	1.0570	1.0570	1.0570	1.0570	0.0000	1.0570
21	2.4040	2.2430	2.0940	1.9550	1.8260	1.7050	1.5920	1.4890	1.3910	1.1320	1.1320	1.1320	1.1320	0.0000	1.1320
22	2.5700	2.3980	2.2380	2.0900	1.9520	1.8220	1.7030	1.5920	1.4870	1.2070	1.2070	1.2070	1.2070	0.0000	1.2070
23	2.8190	2.6300	2.4550	2.2920	2.1400	1.9990	1.8680	1.7460	1.6310	1.3190	1.3190	1.3190	1.3190	0.0000	1.3190
24	3.0670	2.8620	2.6710	2.4940	2.3290	2.1750	2.0330	1.9000	1.7750	1.4310	1.4310	1.4310	1.4310	0.0000	1.4310
25	3.3160	3.0940	2.8880	2.6960	2.5180	2.3510	2.1980	2.0540	1.9190	1.5420	1.5420	1.5420	1.5420	0.0000	1.5420
26	3.5650	3.3260	3.1040	2.8990	2.7070	2.5280	2.3630	2.2080	2.0630	1.6540	1.6540	1.6540	1.6540	0.0000	1.6540
27	3.8140	3.5550	3.3040	3.0790	2.8770	2.6860	2.5040	2.3310	2.1660	1.7540	1.7540	1.7540	1.7540	0.0000	1.7540
Average	0.0000	0.0000	1.3550	1.1201	1.0052	0.9352	0.9020	0.8373	0.7505	0.6244	0.6080	0.5775	0.5571	0.4569	0.6012

\* From the 2009 MAIP Filing - Section 100M

Massachusetts Private Passenger Automobile  
 Calculation of Average Model Year/Symbol Relativities  
 Facility Market

Calendar Year 2005 Written Exposures - \$500 Deductible Comprehensive Coverages

Symbol	Model Year	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997	1996	1995-1990	1989 & Prior	Total
1	0.5400	3.3	3.8	1.0	1.0	0.0	0.0	0.0	1.2	1.0	0.0	0.6	0.2	29.8	5.8	51.0
2	0.5730	3.0	1.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0	233.7	3.1	253.8
3	0.6080	1.0	2.2	2.2	2.2	1.0	8.8	6.4	1.0	28.2	65.0	42.5	63.9	644.4	12.6	872.2
4	0.6460	1.3	6.0	0.8	0.8	0.0	0.0	0.0	1.0	315.0	297.7	119.5	213.3	1,216.2	28.1	2,192.9
5	0.6860	2.2	3.1	8.8	3.1	19.3	27.5	85.9	107.5	368.2	226.2	374.0	721.3	1,416.4	32.3	3,392.7
6	0.7120	7.9	96.8	32.8	67.0	67.0	82.8	183.6	343.3	678.5	656.8	661.8	374.1	1,632.3	72.1	4,889.8
7	0.7400	20.8	167.3	150.0	177.6	294.8	294.8	408.4	521.6	247.4	408.4	524.3	320.1	1,863.1	171.1	5,098.5
8	0.7700	38.4	461.7	343.4	413.2	898.8	898.8	978.4	1,433.4	619.9	463.6	627.9	937.5	3,037.6	483.1	11,303.3
9	0.8000	46.1	704.0	943.5	1,064.8	1,064.8	1,257.1	1,437.4	2,080.3	1,337.4	1,245.7	1,716.2	1,215.8	2,703.3	459.8	12,934.1
10	0.8300	106.8	1,290.8	1,257.1	1,400.3	1,400.3	1,884.0	2,337.4	2,980.3	2,136.2	2,463.9	607.2	937.2	2,035.2	277.1	11,979.8
11	0.8600	225.8	1,516.6	1,083.4	1,244.7	1,244.7	1,713.5	1,493.0	1,790.2	1,302.2	1,129.5	1,210.7	579.1	1,193.4	191.0	17,857.2
12	0.8900	108.9	890.8	1,056.2	1,068.5	1,068.5	1,295.2	1,599.2	2,098.5	1,423.3	1,129.5	925.1	579.1	1,136.4	150.7	14,632.8
13	0.9200	101.3	1,161.5	1,333.9	1,347.9	1,347.9	1,492.9	1,900.2	2,525.2	1,833.6	1,336.4	925.1	579.1	1,136.4	130.8	13,279.4
14	0.9500	91.3	761.0	796.1	781.1	781.1	868.8	966.7	1,131.5	983.6	1,136.4	925.1	398.9	947.7	74.6	11,103.3
15	0.9800	82.9	359.8	584.7	543.8	543.8	618.1	730.7	922.2	788.8	653.8	669.8	522.5	952.8	52.9	6,667.7
16	1.0100	80.6	228.7	378.2	216.1	216.1	261.8	333.3	444.5	314.1	314.1	314.1	314.1	314.1	31.4	6,597.7
17	1.0400	60.2	220.2	189.5	237.9	237.9	301.2	345.8	521.1	582.9	467.9	467.9	467.9	467.9	46.7	4,438.2
18	1.0700	31.8	92.9	100.8	87.3	87.3	158.8	300.8	311.6	240.8	110.7	170.9	48.0	394.9	18.4	2,068.7
19	1.1000	23.9	78.1	146.0	120.6	120.6	79.0	115.6	275.0	151.9	172.2	52.4	55.8	171.8	0.0	1,442.3
20	1.1300	19.9	88.2	56.9	28.4	28.4	45.2	128.4	74.2	92.8	145.0	40.8	32.5	154.3	0.0	906.6
21	1.1600	24.9	47.8	55.1	30.2	30.2	30.2	30.2	28.7	53.8	56.2	73.3	28.4	111.1	0.0	573.0
22	1.1900	6.2	14.6	16.4	25.6	25.6	21.4	31.8	39.3	20.8	18.0	18.7	35.3	42.0	0.0	290.1
23	1.2200	7.5	19.7	14.3	13.8	13.8	19.6	31.6	31.9	14.6	14.6	65.6	32.3	31.0	0.0	315.6
24	1.2500	7.2	22.9	16.7	16.2	16.2	16.0	16.6	6.2	12.0	7.0	7.0	5.9	46.3	0.0	178.8
25	1.2800	1.332.9	9,599.5	10,731.8	11,285.0	12,907.7	14,384.6	16,327.4	14,538.4	14,538.4	13,306.8	11,914.0	8,853.4	24,272.8	2,319.0	151,753.3

Proposed Flattened Model-Year/Symbol Relativities Balanced to 2007 Written Exposures \* - Comprehensive Coverages

Symbol	Model Year	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997	1996	1995-1990	1989 & Prior	Average
1	0.5400	0.5280	0.5600	0.5160	0.5040	0.4930	0.4820	0.4710	0.4600	0.4500	0.4420	0.4220	0.4220	0.4220	0.4084	0.4084
2	0.5730	0.5940	0.5600	0.5470	0.5340	0.5220	0.5110	0.4990	0.4880	0.4770	0.4470	0.4470	0.4470	0.4470	0.4470	0.4451
3	0.6080	0.6310	0.6160	0.6020	0.5890	0.5760	0.5630	0.5500	0.5370	0.5260	0.5020	0.5020	0.5020	0.5020	0.4719	0.4719
4	0.6460	0.6710	0.6550	0.6390	0.6260	0.6130	0.6000	0.5870	0.5740	0.5610	0.5320	0.5320	0.5320	0.5320	0.5029	0.5029
5	0.6860	0.7120	0.6960	0.6800	0.6670	0.6540	0.6410	0.6280	0.6150	0.6020	0.5730	0.5730	0.5730	0.5730	0.5379	0.5379
6	0.7120	0.7380	0.7400	0.7220	0.7060	0.6900	0.6740	0.6580	0.6420	0.6260	0.6000	0.6000	0.6000	0.6000	0.5785	0.5785
7	0.7400	0.8060	0.7870	0.7680	0.7500	0.7320	0.7150	0.6980	0.6810	0.6640	0.6370	0.6370	0.6370	0.6370	0.6193	0.6193
8	0.8270	0.8580	0.8380	0.8170	0.7980	0.7790	0.7600	0.7410	0.7220	0.7030	0.6760	0.6760	0.6760	0.6760	0.6522	0.6522
9	0.9360	0.9140	0.8920	0.8710	0.8500	0.8290	0.8080	0.7870	0.7660	0.7450	0.7180	0.7180	0.7180	0.7180	0.6900	0.6900
10	0.9980	0.9730	0.9500	0.9270	0.9050	0.8830	0.8610	0.8390	0.8170	0.7950	0.7680	0.7680	0.7680	0.7680	0.7389	0.7389
11	1.0640	1.0370	1.0120	0.9870	0.9630	0.9400	0.9170	0.8950	0.8730	0.8510	0.8240	0.8240	0.8240	0.8240	0.7940	0.7940
12	1.1340	1.1060	1.0780	1.0530	1.0270	1.0020	0.9770	0.9540	0.9310	0.9080	0.8870	0.8870	0.8870	0.8870	0.8570	0.8570
13	1.2090	1.1790	1.1490	1.1220	1.0940	1.0670	1.0420	1.0180	0.9950	0.9720	0.9500	0.9230	0.9230	0.9230	0.8930	0.8930
14	1.2890	1.2570	1.2260	1.1960	1.1660	1.1370	1.1100	1.0830	1.0560	1.0300	0.9830	0.9830	0.9830	0.9830	0.9460	0.9460
15	1.3760	1.3410	1.3080	1.2760	1.2440	1.2130	1.1840	1.1560	1.1290	1.1030	1.0480	1.0480	1.0480	1.0480	1.0160	1.0160
16	1.4860	1.4490	1.4130	1.3780	1.3430	1.3100	1.2780	1.2460	1.2160	1.1860	1.1320	1.1320	1.1320	1.1320	1.1000	1.1000
17	1.5820	1.5430	1.5040	1.4670	1.4300	1.3950	1.3610	1.3270	1.2940	1.2620	1.2050	1.2050	1.2050	1.2050	1.1730	1.1730
18	1.6770	1.6350	1.5950	1.5540	1.5140	1.4750	1.4360	1.3970	1.3580	1.3200	1.2600	1.2600	1.2600	1.2600	1.2280	1.2280
19	1.8570	1.8110	1.7660	1.7220	1.6790	1.6380	1.5980	1.5580	1.5190	1.4800	1.4150	1.4150	1.4150	1.4150	1.3830	1.3830
20	1.9850	1.9450	1.8970	1.8500	1.8030	1.7580	1.7130	1.6680	1.6230	1.5780	1.5100	1.5100	1.5100	1.5100	1.4770	1.4770
21	2.1320	2.0790	2.0280	1.9780	1.9280	1.8800	1.8300	1.7800	1.7300	1.6800	1.6240	1.6240	1.6240	1.6240	1.5900	1.5900
22	2.3380	2.2800	2.2240	2.1690	2.1140	2.0620	2.0120	1.9620	1.9130	1.8630	1.7820	1.7820	1.7820	1.7820	1.7480	1.7480
23	2.4450	2.4280	2.4000	2.3660	2.3300	2.2940	2.2500	2.2100	2.1700	2.1300	2.0460	2.0460	2.0460	2.0460	2.0110	2.0110
24	2.5110	2.6830	2.6160	2.5450	2.4870	2.4260	2.3670	2.3080	2.2510	2.1960	2.0960	2.0960	2.0960	2.0960	2.0610	2.0610
25	2.6300	2.8840	2.8130	2.7430	2.6740	2.6080	2.5450	2.4810	2.4200	2.3620	2.2530	2.2530	2.2530	2.2530	2.2170	2.2170
26	2.8570	3.2590	3.1810	3.1030	3.0260	2.9500	2.8750	2.8000	2.7260	2.6520	2.5350	2.5350	2.5350	2.5350	2.5000	2.5000
27	3.0500	3.5800	3.5000	3.4200	3.3400	3.2600	3.1800	3.1000	3.0200	2.9400	2.8200	2.8200	2.8200	2.8200	2.7850	2.7850
Totals		1,332.9	9,599.5	10,731.8	11,285.0	12,907.7	14,384.6	16,327.4	14,538.4	14,538.4	13,306.8	11,914.0	8,853.4	24,272.8	2,319.0	151,753.3

\* From the 2009 MAIP Filing Section 100M1

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*Commonwealth Automobile Reinsurers*

**Filing for Residual Market Rates  
Effective 4/1/2009**

**Current Average Rates: 100J**



**Massachusetts Private Passenger Automobile****Current Average Rates**

Current average rates for policy year 2008 have been re-calculated on the basis of the most recent available facility market exposure distribution (calendar year 2007 written exposures).

Page 1 of Exhibit 1 summarizes the current average rate calculation for each coverage. The calculation of current average rates involves updating the 2008 average base rates, discount factors, and SDIP factors to reflect the 2007 written exposure and written premium distributions for the facility market segment. The supporting exhibits in this section are summarized below:

<b><u>Section</u></b>	<b><u>Description</u></b>
100J, Exhibit 1	Average excess factors calculation
100J, Exhibit 2	Average base rate calculation for coverages rated by territory/class
100J, Exhibit 3	Average SDIP factors for coverages subject to SDIP
100J, Exhibit 4	Average offset factors for senior citizen discounts, passive restraint discount, annual mileage discount, public transportation discount, multi-car discount, and anti-theft discount/surcharges

The senior citizen discount of 25% applies to all coverages. Because the average base rates calculated for coverages in Exhibit 2 reflect class distribution (seniors are class 15), further adjustment by the offset factor is unnecessary. However, the average offset factor for senior citizens calculated in Exhibit 4 is applied to medical payments, un/underinsured motorists, and substitute transportation, since rates for these coverages do not reflect class distribution.

The passive restraint discount of 25% applies to the PIP (A-2), medical payments, and un/underinsured motorists coverage.

The annual mileage discount applies to all coverages except for substitute transportation and comprehensive. The anti-theft discount applies to comprehensive coverage only.

Public transportation discounts of 10% are available on property damage and collision coverages.

The multi-car discount of 5% is applicable to the following coverages: Bodily Injury (A-1 and B), PIP (A-2), Property Damage, Collision, Limited Collision and Comprehensive.

SDIP factors are calculated for the A-1, A-2, PDL and Collision Coverages.

**Massachusetts Private Passenger Automobile  
Determination of Current Average Rates Effective 4/1/2008, Adjusted to 2007 Written Exposure Base  
Facility Market**

(A) Coverage	(B) 2008 Average Manual Rates	(C) 2008 Average Base Rates	(E) Discount Factors for:							(I) SDIP Effect Offset	(J) 2008 Average Rates	(K) Average Model Year Symbol Relativity Factor	(L) 2008 Average Rates Adj. for Age/Symbol Rel
			(D) Annual Mileage or Anti Theft	(F) Passive Restraint	(G) Senior Citizen	(H) Public Transit	(I) Multi-Car	(J) Passive Restraint	(K) Senior Citizen				
A-1, 20/40 Limits	\$378.74	\$296.26	0.997	1.000	1.000	1.000	1.000	1.000	1.325	\$386.28	1.0000	\$386.28	
A-2	\$114.22	\$116.52	0.997	0.987	0.761	1.000	1.000	1.000	1.330	\$116.05	1.0000	\$116.05	
B, 20/40 Limits	\$ 48.79	\$ 49.99	0.997	0.987	1.000	1.000	1.000	1.000	1.000	\$ 49.19	1.0000	\$ 49.19	
B, Excess Limits	\$161.52	\$134.41	0.997	0.987	1.000	1.000	1.000	1.000	1.330	\$169.05	1.0000	\$169.05	
PDL, Basic Limits	\$384.08	\$300.79	0.997	0.987	1.000	1.000	0.997	1.000	1.330	\$392.48	1.0000	\$392.48	
PDL, Excess Limits	\$106.54	\$ 83.56	0.997	0.986	1.000	1.000	0.997	1.000	1.373	\$109.03	1.0000	\$109.03	
Collision, \$500 Deductible	\$558.70	\$425.89	0.997	0.990	1.000	1.000	0.997	1.000	1.000	\$573.11	1.0372	\$594.43	
Lmt. Collision, \$500 Deductible	\$ 24.71	\$ 35.22	0.997	0.990	1.000	1.000	1.000	1.000	1.000	\$ 34.76	0.7313	\$ 25.42	
Medical Payments, \$5000 Limit	\$ 23.94	\$ 32.00	0.997	1.000	0.761	0.980	1.000	1.000	1.000	\$ 23.79	1.0000	\$ 23.79	
Comprehensive, \$500 Deductible	\$129.04	\$145.08	0.884	0.985	1.000	1.000	1.000	1.000	1.000	\$126.33	1.0147	\$128.19	
U-1, 20/40 Limits	\$ 11.55	\$ 15.00	0.997	1.000	0.761	0.980	1.000	1.000	1.000	\$ 11.15	1.0000	\$ 11.15	
U-2, Total Limits	\$ 5.79	\$ 10.04	0.997	1.000	0.761	0.980	1.000	1.000	1.000	\$ 7.47	1.0000	\$ 7.47	
U-1, Excess Limits	\$ 4.63	\$ 6.11	0.997	1.000	0.761	0.980	1.000	1.000	1.000	\$ 4.54	1.0000	\$ 4.54	
Substitute Transportation	\$ 83.07	\$ 84.99	1.000	1.000	1.000	0.980	1.000	1.000	1.000	\$ 83.29	1.0000	\$ 83.29	

**NOTES :**

- Column (B) All values for basic limits come from the 4/1/2008 Form 110.
- Column (B) & (C) Excess limit factors (shown below) are calculated on pages 3, 4, and 5.
- Column (C) Medical Payments, Sub. Tran. and U-1 basic limit coverages from the current MAIP rates Exhibit 100L effective 4/1/2008
- Column (D) (E) (F) (G)(H)&(I) See Memorandum text.
- Column (J) (C)x(D)x(E)x(F)x(G)x(H)x(I)
- Column (K) From Section 100I, Exhibit 2.
- Column (L) (J)x(K)

Coverage: B  
Average Excess Limit Factor: 0.3882

PDL: U-1  
0.2778

**Massachusetts Private Passenger Automobile  
 Determination of Coverage U-2 Total Limits Average Rates  
 Facility Market**

(A) <u>Limits</u>	(B) <u>2007 U-2 Written Exposures</u>	(C) <u>Expected* Percent of Exposures At This Limit</u>	(D) <u>2008 Manual Rate**</u>	(E) <u>Product of (C) X (D)</u>
20/40	119,564.7	68.63%	\$ 0.00	0.0000
20/50	3,531.8	2.03%	\$ 1.00	0.0203
25/50	10,033.7	5.95%	\$ 3.00	0.1785
25/60	1,110.8	0.64%	\$ 4.00	0.0256
30/70	202.5	0.12%	\$ 8.00	0.0096
35/80	2,026.2	1.16%	\$ 12.00	0.1392
50/100	15,512.3	8.95%	\$ 21.00	1.8795
100/300	18,209.2	10.45%	\$ 47.00	4.9115
250/500	3,464.2	1.99%	\$131.00	2.6069
500/500	138.2	0.08%	\$333.00	0.2664
500/1000	0.0	0.00%	\$348.00	0.0000
1000/1000	2.0	0.00%	\$385.00	0.0000
All Other	421.6	0.00%		0.0000
Totals	174,217.2	100.00%		10.0375

"Total Limit" Average Rate = 10.04

\* Assumes 80% of "All Other" exposures will be assigned to the 25/50 limit,  
 and 20% will be assigned to the 50/100 limit.

\*\* From the current MAIP rates effective 4/1/2008

**Massachusetts Private Passenger Automobile  
 Determination of Coverage B Excess Limit Factors  
 Facility Market**

(A) <u>Limits</u>	(B) 2007 <u>Coverage B Written Exposures</u>	(C) <u>Expected* Percent of Exposures At This Limit</u>	(D) 2008 <u>Inc. Limit Factor**</u>	(E) <u>Product of (C) X (D)</u>
20\40	109,141.9	61.43%	1.000	0.6143
20\50	3,491.0	1.96%	1.010	0.0198
25\50	9,970.8	6.02%	1.050	0.0632
25\60	939.2	0.53%	1.060	0.0056
30\70	213.2	0.12%	1.110	0.0013
35\80	2,079.2	1.17%	1.160	0.0136
50\100	16,666.0	9.48%	1.270	0.1204
100\300	26,186.1	14.74%	1.500	0.2211
250\500	7,634.3	4.30%	1.940	0.0834
500\500	418.2	0.24%	2.860	0.0069
500\1000	6.0	0.00%	2.910	0.0000
1000\1000	3.0	0.00%	3.210	0.0000
All Other	913.0	0.00%		0.0000
Totals	177,661.9	100.00%		

Weighted Average Excess Limit Factor\*\*\* = 0.3882

\* Assumes 80% of "All Other" exposures will be assigned to the 25/50 limit, and 20% will be assigned to the 50/100 limit.  
 \*\* From the current MAIP rates effective 4/1/2008  
 \*\*\*  $\{(E) - (E@20/40)\} \div \{(C) - (C@20/40)\}$

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**Massachusetts Private Passenger Automobile  
 Determination of Coverage U-1 Excess Limit Factors  
 Facility Market**

(A) <u>Limits</u>	(B) <u>2007 U-1 Written Exposures</u>	(C) <u>Expected* Percent of Exposures At This Limit</u>	(D) <u>2008 Manual Rate**</u>	(E) <u>Product of (C) X (D)</u>
20\40	121,938.5	68.61%	\$ 14.00	9.6054
20\50	3,590.2	2.02%	\$ 15.00	0.3030
25\50	10,111.7	5.89%	\$ 16.00	0.9424
25\60	1,098.2	0.62%	\$ 17.00	0.1054
30\70	204.0	0.11%	\$ 18.00	0.0198
35\80	2,061.7	1.16%	\$ 18.00	0.2088
50\100	15,613.3	8.84%	\$ 19.00	1.6796
100\300	18,797.5	10.58%	\$ 22.00	2.3276
250\500	3,703.0	2.08%	\$ 27.00	0.5616
500\500	140.2	0.08%	\$ 42.00	0.0336
500\1000	0.0	0.00%	\$ 40.00	0.0000
1000\1000	2.0	0.00%	\$ 44.00	0.0000
All Other	453.8	0.00%		0.0000
Totals	177,714.1	100.00%		

(F) "Excess Limit" Average Rate = \$19.70  
 (G) Average Excess Limit Factor\*\*\* = 0.4071

\* Assumes 80% of "All Other" exposures will be assigned to the 25/50 limit, and 20% will be assigned to the 50/100 limit.

\*\* From the current MAIP rates effective 4/1/2008

\*\*\* (G) = (F) ÷ (D@20/40) - 1

**Massachusetts Private Passenger Automobile  
 Determination of Property Damage Liability Excess Limits Factor  
 Facility Market**

(A) <u>Limits</u>	(B) <u>2007 PDL Written Exposures</u>	(C) <u>Expected* Percent of Exposures At Limit</u>	(D) <u>2008 Increased Limit Factor**</u>	(E) <u>Product of (C) X (D)</u>
5,000	5,094.6	2.87%	1.000	0.028700
10,000	600.7	0.34%	1.204	0.004094
15,000	51.7	0.03%	1.220	0.000366
25,000	6,761.8	5.00%	1.242	0.062100
35,000	233.8	0.13%	1.254	0.001630
50,000	8,417.2	5.04%	1.265	0.063756
100,000	148,479.1	83.59%	1.280	1.069952
250,000	5,341.2	3.01%	1.309	0.039401
500,000	1.2	0.00%	1.329	0.000000
750,000	0.0	0.00%	1.338	0.000000
1,000,000	0.6	0.00%	1.348	0.000000
All Other	2,653.2	0.00%		0.000000
Totals	177,635.1	100.00%		

Weighted Average Excess Limit Factor\*\*\* = 0.2778

\* Assumes 80% of "All Other" exposures will be assigned to the \$25,000 limit, and 20% will be assigned to the \$50,000 limit.

\*\* From the current MAIP rates effective 4/1/2008

\*\*\*  $\frac{(E) - (E@5000)}{(C) - (C@5000)}$

**Massachusetts Private Passenger Automobile  
Calculation of 2008 Manual Rates, Averaged Over 2008 Territory Configurations  
2007 Written Exposures for Liability Coverages  
Facility Market**

Territory	Class 10	Class 15	Class 17	Class 18	Class 20	Class 21	Class 25	Class 26	Class 30	Totals
1	1,561.8	291.9	465.1	48.8	89.2	12.9	547.0	219.3	45.3	3,281.3
2	2,279.2	499.9	542.6	75.2	129.5	24.2	676.2	317.6	57.7	4,602.1
3	5,588.5	947.0	1,463.3	142.4	291.9	43.2	1,572.8	604.7	121.4	10,775.2
4	3,713.4	817.0	968.8	92.5	163.1	26.9	1,100.3	435.9	77.1	7,395.0
5	7,138.2	1,054.9	1,903.3	204.6	426.1	72.7	1,952.2	604.8	197.2	13,554.0
6	5,603.9	966.6	1,316.6	135.8	265.3	64.8	1,417.8	497.2	110.5	10,378.5
7	6,704.9	1,014.0	1,524.9	165.8	368.7	61.3	1,289.2	461.1	129.6	11,719.5
8	4,663.0	641.3	938.1	82.4	253.9	46.2	782.5	288.6	81.6	7,777.6
9	5,443.5	531.4	1,190.2	111.5	335.2	42.8	833.8	263.8	80.8	8,833.0
10	2,369.8	289.2	553.3	49.9	130.8	35.4	398.2	133.2	41.1	4,000.9
11	2,023.2	313.0	336.1	50.2	112.7	30.2	163.3	85.8	34.5	3,149.0
12	6,442.9	700.2	1,211.7	128.3	307.8	67.5	584.7	230.4	111.8	9,785.3
13	8,682.8	1,300.2	1,762.1	133.0	705.8	87.7	953.6	358.7	80.8	14,064.7
14	4,066.5	336.2	656.8	67.0	234.8	55.0	162.8	89.2	73.4	5,741.7
15	1,389.6	220.0	232.2	24.5	87.8	16.2	83.4	49.4	23.8	2,126.9
16	669.4	76.5	176.3	8.1	68.8	8.4	29.8	14.4	15.5	1,067.2
17	446.1	82.2	71.6	4.4	16.3	3.1	50.3	28.1	9.7	711.8
18	997.7	126.8	231.1	25.9	116.5	18.5	49.1	14.8	17.0	1,597.4
19	855.2	110.2	136.4	14.2	111.2	12.2	30.0	7.6	14.7	1,291.7
20	1,178.1	144.8	298.0	19.1	159.6	15.8	81.2	29.2	5.1	1,930.9
21	3,629.2	647.8	811.0	77.2	658.0	56.8	200.3	57.0	32.1	6,169.4
22	1,076.8	150.4	248.4	20.5	218.7	20.1	68.3	8.0	13.6	1,824.8
23	1,571.9	139.6	230.8	23.4	151.4	14.2	40.1	20.0	22.3	2,213.7
24	871.8	125.5	138.5	20.0	74.9	13.6	20.2	12.6	11.9	1,289.0
25	675.9	47.8	67.2	13.1	43.3	7.4	30.6	8.0	15.4	908.7
26	1,092.8	120.8	241.1	14.8	161.0	10.2	35.4	15.2	8.3	1,699.6
27	2,964.9	617.7	868.1	110.8	166.1	29.4	950.2	392.6	102.3	6,202.1
40	1,536.6	121.8	359.6	14.9	182.0	27.5	92.4	24.4	8.2	2,367.4
41	3,637.5	159.8	760.9	50.8	339.4	45.2	217.8	83.8	8.5	5,303.7
42	5,520.0	586.2	1,239.0	56.1	718.2	41.5	371.9	76.8	24.8	8,634.5
43	4,039.9	340.3	651.3	49.9	339.8	54.1	256.0	73.6	41.6	5,846.5
44	1,503.2	96.1	356.7	32.9	307.2	24.7	76.6	29.2	10.3	2,436.9
45	6,228.1	518.2	1,008.6	84.8	562.4	57.7	370.0	69.6	62.6	8,962.0
<b>Totals</b>	<b>106,166.3</b>	<b>14,135.3</b>	<b>22,959.7</b>	<b>2,152.8</b>	<b>8,297.4</b>	<b>1,147.4</b>	<b>15,488.0</b>	<b>5,604.6</b>	<b>1,690.5</b>	<b>177,642.0</b>

**2008 Manual Rates\* for Coverage A-1**

Territory	Class 10	Class 15**	Class 17	Class 18	Class 20	Class 21	Class 25	Class 26	Class 30	Weighted Average
1	122	92	220	138	411	217	371	195	119	\$187.99
2	133	99	240	154	447	245	403	221	129	\$197.38
3	140	105	252	166	485	263	437	237	136	\$211.07
4	151	113	279	172	538	305	484	274	145	\$229.66
5	154	115	278	194	565	326	509	293	153	\$240.14
6	167	125	309	191	606	373	546	336	163	\$253.75
7	171	128	298	211	644	380	580	341	165	\$251.96
8	182	136	331	218	677	408	609	367	177	\$263.83
9	208	156	355	248	701	426	630	383	202	\$289.96
10	210	157	416	277	746	491	671	442	213	\$309.14
11	204	153	452	274	734	494	660	444	231	\$278.75
12	226	169	431	299	735	530	661	477	220	\$298.20
13	256	192	469	322	736	534	662	480	250	\$336.42
14	287	215	491	361	724	551	651	496	279	\$340.85
15	341	255	547	378	722	595	650	536	327	\$389.17
16	286	214	558	494	706	576	636	519	294	\$369.74
17	218	163	421	265	717	425	645	382	219	\$281.35
18	222	166	550	301	736	530	662	477	252	\$323.55
19	270	202	538	358	703	538	634	484	300	\$343.33
20	250	187	549	337	729	553	657	498	276	\$355.29
21	306	229	553	458	708	582	638	524	425	\$391.12
22	301	225	553	446	710	572	639	515	411	\$397.08
23	230	172	510	356	717	528	646	475	233	\$301.86
24	232	174	455	294	721	474	648	427	235	\$290.70
25	230	172	515	309	723	545	650	491	251	\$292.02
26	283	212	559	395	705	581	635	523	273	\$369.27
27	106	79	201	118	369	184	332	165	109	\$162.64
40	265	198	498	328	729	520	657	469	279	\$353.43
41	275	206	495	362	734	550	660	495	283	\$356.33
42	339	254	547	391	726	594	653	535	344	\$412.11
43	304	228	539	382	724	594	652	535	328	\$371.83
44	275	206	568	499	717	583	646	525	279	\$391.71
45	315	236	529	377	725	591	652	531	327	\$378.28
<b>Wtd. Avg.</b>	<b>\$225.35</b>	<b>\$158.19</b>	<b>\$396.30</b>	<b>\$262.51</b>	<b>\$679.33</b>	<b>\$471.47</b>	<b>\$542.04</b>	<b>\$336.98</b>	<b>\$202.39</b>	<b>\$296.26</b>

\* From the current MAIP rates, Section 100K, Exhibit 17, effective 4/1/2008

\*\* Class 15 is truncated at 75% of Class 10's manual rate.



**Massachusetts Private Passenger Automobile  
Calculation of 2008 Manual Rates, Averaged Over 2008 Territory Configurations  
2007 Written Exposures for Liability Coverages  
Facility Market**

Territory	Class 10	Class 15	Class 17	Class 18	Class 20	Class 21	Class 25	Class 26	Class 30	Totals
1	1,561.8	291.9	465.1	48.8	89.2	12.9	547.0	219.3	45.3	3,281.3
2	2,279.2	499.9	542.6	75.2	129.5	24.2	676.2	317.6	57.7	4,602.1
3	5,588.5	947.0	1,463.3	142.4	291.9	43.2	1,572.8	604.7	121.4	10,775.2
4	3,713.4	817.0	968.8	92.5	163.1	26.9	1,100.3	435.9	77.1	7,395.0
5	7,138.2	1,054.9	1,903.3	204.6	426.1	72.7	1,952.2	604.8	197.2	13,554.0
6	5,603.9	966.6	1,316.6	135.8	265.3	64.8	1,417.8	497.2	110.5	10,378.5
7	6,704.9	1,014.0	1,524.9	165.8	368.7	61.3	1,289.2	461.1	129.6	11,719.5
8	4,663.0	641.3	938.1	82.4	253.9	46.2	782.5	288.6	81.6	7,777.6
9	5,443.5	531.4	1,190.2	111.5	335.2	42.8	833.8	263.8	80.8	8,833.0
10	2,369.8	289.2	553.3	49.9	130.8	35.4	398.2	133.2	41.1	4,000.9
11	2,023.2	313.0	336.1	50.2	112.7	30.2	163.3	85.8	34.5	3,149.0
12	6,442.9	700.2	1,211.7	128.3	307.8	67.5	584.7	230.4	111.8	9,785.3
13	8,682.8	1,300.2	1,762.1	133.0	705.8	87.7	953.6	358.7	80.8	14,064.7
14	4,066.5	336.2	656.8	67.0	234.8	55.0	162.8	89.2	73.4	5,741.7
15	1,389.6	220.0	232.2	24.5	87.8	16.2	83.4	49.4	23.8	2,126.9
16	669.4	76.5	176.3	8.1	68.8	8.4	29.8	14.4	15.5	1,067.2
17	446.1	82.2	71.6	4.4	16.3	3.1	50.3	28.1	9.7	711.8
18	997.7	126.8	231.1	25.9	116.5	18.5	49.1	14.8	17.0	1,597.4
19	855.2	110.2	136.4	14.2	111.2	12.2	30.0	7.6	14.7	1,291.7
20	1,178.1	144.8	298.0	19.1	159.6	15.8	81.2	29.2	5.1	1,930.9
21	3,629.2	647.8	811.0	77.2	658.0	56.8	200.3	57.0	32.1	6,169.4
22	1,076.8	150.4	248.4	20.5	218.7	20.1	68.3	8.0	13.6	1,824.8
23	1,571.9	139.6	230.8	23.4	151.4	14.2	40.1	20.0	22.3	2,213.7
24	871.8	125.5	138.5	20.0	74.9	13.6	20.2	12.6	11.9	1,289.0
25	675.9	47.8	67.2	13.1	43.3	7.4	30.6	8.0	15.4	908.7
26	1,092.8	120.8	241.1	14.8	161.0	10.2	35.4	15.2	8.3	1,699.6
27	2,964.9	617.7	868.1	110.8	166.1	29.4	950.2	392.6	102.3	6,202.1
40	1,536.6	121.8	359.6	14.9	182.0	27.5	92.4	24.4	8.2	2,367.4
41	3,637.5	159.8	760.9	50.8	339.4	45.2	217.8	83.8	8.5	5,303.7
42	5,520.0	586.2	1,239.0	56.1	718.2	41.5	371.9	76.8	24.8	8,634.5
43	4,039.9	340.3	651.3	49.9	339.8	54.1	256.0	73.6	41.6	5,846.5
44	1,503.2	96.1	356.7	32.9	307.2	24.7	76.6	29.2	10.3	2,436.9
45	6,228.1	518.2	1,008.6	84.8	562.4	57.7	370.0	69.6	62.6	8,962.0
Totals	106,166.3	14,135.3	22,959.7	2,152.8	8,297.4	1,147.4	15,488.0	5,604.6	1,690.5	177,642.0

**2008 Manual Rates\* for Coverage A-2**

Territory	Class 10	Class 15**	Class 17	Class 18	Class 20	Class 21	Class 25	Class 26	Class 30	Weighted Average
1	51	38	87	57	161	89	144	80	51	\$75.62
2	54	40	95	63	174	98	156	88	53	\$78.39
3	59	44	98	67	188	105	169	94	57	\$84.76
4	62	46	109	69	208	120	187	108	61	\$91.21
5	64	48	108	77	219	128	197	116	64	\$95.82
6	68	51	120	77	234	146	210	131	67	\$100.27
7	69	51	116	84	249	149	223	133	67	\$99.29
8	74	55	128	87	261	160	234	143	72	\$104.34
9	85	63	136	98	270	166	243	150	81	\$114.94
10	86	64	160	109	282	190	253	172	85	\$121.73
11	84	63	174	108	277	191	250	173	91	\$110.94
12	90	67	166	117	277	206	250	185	87	\$116.56
13	102	76	185	125	277	207	250	186	99	\$131.81
14	114	85	195	140	273	213	246	193	110	\$134.24
15	132	99	215	146	273	230	245	207	124	\$150.46
16	114	85	219	190	266	222	240	200	117	\$145.22
17	88	66	162	105	276	166	249	149	88	\$111.44
18	89	66	210	118	278	206	250	185	101	\$126.25
19	108	81	211	140	265	208	239	187	119	\$135.02
20	99	74	217	131	275	215	248	193	113	\$138.87
21	121	90	217	180	267	224	241	202	168	\$152.51
22	119	89	217	177	268	221	241	199	163	\$154.75
23	90	67	202	139	271	205	243	184	92	\$117.50
24	94	70	175	116	272	184	244	166	94	\$115.06
25	92	69	202	121	273	211	245	189	103	\$115.13
26	112	84	219	153	266	224	240	202	109	\$144.26
27	44	33	79	48	144	75	130	67	47	\$65.38
40	107	80	196	128	275	201	248	182	110	\$139.56
41	108	81	196	141	277	212	250	191	111	\$138.98
42	133	99	215	152	274	229	246	207	133	\$160.30
43	119	89	211	149	274	230	246	207	128	\$144.53
44	109	81	222	193	271	226	244	202	111	\$152.54
45	123	92	208	146	274	228	246	206	128	\$146.90
Wtd. Avg.	\$90.22	\$63.32	\$154.87	\$103.45	\$258.00	\$183.22	\$207.75	\$132.01	\$81.58	\$116.52

\* From the current MAIP rates, Section 100K, Exhibit 17, effective 4/1/2008  
 \*\* Class 15 is truncated at 75% of Class 10's manual rate.

**Massachusetts Private Passenger Automobile  
Calculation of 2008 Manual Rates, Averaged Over 2008 Territory Configurations  
2007 Written Exposures for Liability Coverages  
Facility Market**

Territory	Class 10	Class 15	Class 17	Class 18	Class 20	Class 21	Class 25	Class 26	Class 30	Totals
1	1,561.8	291.9	465.1	48.8	89.2	12.9	547.0	219.3	45.3	3,281.3
2	2,279.2	499.9	542.6	75.2	129.5	24.2	676.2	317.6	57.7	4,602.1
3	5,588.5	947.0	1,463.3	142.4	291.9	43.2	1,572.8	604.7	121.4	10,775.2
4	3,713.4	817.0	968.8	92.5	163.1	26.9	1,100.3	435.9	77.1	7,395.0
5	7,138.2	1,054.9	1,903.3	204.6	426.1	72.7	1,952.2	604.8	197.2	13,554.0
6	5,603.9	966.6	1,316.6	135.8	265.3	64.8	1,417.8	497.2	110.5	10,378.5
7	6,704.9	1,014.0	1,524.9	165.8	368.7	61.3	1,289.2	461.1	129.6	11,719.5
8	4,663.0	641.3	938.1	82.4	253.9	46.2	782.5	288.6	81.6	7,777.6
9	5,443.5	531.4	1,190.2	111.5	335.2	42.8	833.8	263.8	80.8	8,833.0
10	2,369.8	289.2	553.3	49.9	130.8	35.4	398.2	133.2	41.1	4,000.9
11	2,023.2	313.0	336.1	50.2	112.7	30.2	163.3	85.8	34.5	3,149.0
12	6,442.9	700.2	1,211.7	128.3	307.8	67.5	584.7	230.4	111.8	9,785.3
13	8,682.8	1,300.2	1,762.1	133.0	705.8	87.7	953.6	358.7	80.8	14,064.7
14	4,066.5	336.2	656.8	67.0	234.8	55.0	162.8	89.2	73.4	5,741.7
15	1,389.6	220.0	232.2	24.5	87.8	16.2	83.4	49.4	23.8	2,126.9
16	669.4	76.5	176.3	8.1	68.8	8.4	29.8	14.4	15.5	1,067.2
17	446.1	82.2	71.6	4.4	16.3	3.1	50.3	28.1	9.7	711.8
18	997.7	126.8	231.1	25.9	116.5	18.5	49.1	14.8	17.0	1,597.4
19	855.2	110.2	136.4	14.2	111.2	12.2	30.0	7.6	14.7	1,291.7
20	1,178.1	144.8	298.0	19.1	159.6	15.8	81.2	29.2	5.1	1,930.9
21	3,629.2	647.8	811.0	77.2	658.0	56.8	200.3	57.0	32.1	6,169.4
22	1,076.8	150.4	248.4	20.5	218.7	20.1	68.3	8.0	13.6	1,824.8
23	1,571.9	139.6	230.8	23.4	151.4	14.2	40.1	20.0	22.3	2,213.7
24	871.8	125.5	138.5	20.0	74.9	13.6	20.2	12.6	11.9	1,289.0
25	675.9	47.8	67.2	13.1	43.3	7.4	30.6	8.0	15.4	908.7
26	1,092.8	120.8	241.1	14.8	161.0	10.2	35.4	15.2	8.3	1,699.6
27	2,964.9	617.7	868.1	110.8	166.1	29.4	950.2	392.6	102.3	6,202.1
40	1,536.6	121.8	359.6	14.9	182.0	27.5	92.4	24.4	8.2	2,367.4
41	3,637.5	159.8	760.9	50.8	339.4	45.2	217.8	83.8	8.5	5,303.7
42	5,520.0	586.2	1,239.0	56.1	718.2	41.5	371.9	76.8	24.8	8,634.5
43	4,039.9	340.3	651.3	49.9	339.8	54.1	256.0	73.6	41.6	5,846.5
44	1,503.2	96.1	356.7	32.9	307.2	24.7	76.6	29.2	10.3	2,436.9
45	6,228.1	518.2	1,008.6	84.8	562.4	57.7	370.0	69.6	62.6	8,962.0
<b>Totals</b>	<b>106,166.3</b>	<b>14,135.3</b>	<b>22,959.7</b>	<b>2,152.8</b>	<b>8,297.4</b>	<b>1,147.4</b>	<b>15,488.0</b>	<b>5,604.6</b>	<b>1,690.5</b>	<b>177,642.0</b>

**2008 Manual Rates\* for Coverage B**

Territory	Class 10	Class 15**	Class 17	Class 18	Class 20	Class 21	Class 25	Class 26	Class 30	Weighted Average
1	20	15	40	25	68	36	62	33	20	\$31.70
2	21	15	43	28	74	41	67	36	21	\$32.45
3	22	16	45	30	80	44	73	40	22	\$34.82
4	24	18	51	31	89	51	80	45	24	\$38.06
5	24	18	51	34	95	54	85	48	26	\$39.75
6	26	19	56	34	101	62	90	55	28	\$41.55
7	28	21	54	37	107	63	96	56	28	\$42.16
8	29	21	59	39	112	67	101	61	30	\$43.44
9	34	25	64	44	116	70	105	63	33	\$48.47
10	34	25	70	50	118	79	107	72	34	\$50.20
11	35	26	78	47	116	80	105	73	40	\$46.94
12	37	27	76	53	117	87	105	78	41	\$49.26
13	42	31	85	57	117	88	105	79	42	\$55.78
14	47	35	90	63	114	90	103	80	46	\$56.64
15	58	43	98	67	114	98	103	88	57	\$65.99
16	64	48	95	80	110	95	99	85	66	\$72.59
17	36	27	72	45	118	69	106	62	36	\$46.63
18	44	33	96	53	114	87	103	78	51	\$58.60
19	50	37	95	61	111	88	100	79	57	\$60.79
20	50	37	98	61	114	89	103	80	57	\$64.85
21	67	50	96	81	112	96	101	86	83	\$75.63
22	66	49	96	81	111	95	100	85	80	\$76.02
23	36	27	95	61	111	86	100	77	39	\$48.86
24	37	27	76	50	111	76	100	68	40	\$46.45
25	43	32	96	55	114	89	102	80	46	\$52.63
26	52	39	95	66	111	95	100	85	52	\$64.44
27	19	14	36	21	62	31	55	28	19	\$28.21
40	42	31	88	57	114	86	103	77	44	\$57.31
41	44	33	90	63	116	90	103	80	46	\$58.44
42	55	41	98	67	114	97	102	87	58	\$67.72
43	52	39	97	67	113	97	102	87	57	\$63.01
44	57	42	96	81	111	95	100	85	66	\$71.36
45	53	39	98	67	116	97	103	87	57	\$63.98
<b>Wtd. Avg.</b>	<b>\$38.11</b>	<b>\$26.52</b>	<b>\$70.97</b>	<b>\$46.22</b>	<b>\$108.55</b>	<b>\$77.46</b>	<b>\$88.52</b>	<b>\$55.44</b>	<b>\$35.17</b>	<b>\$49.99</b>

\* From the current MAIP rates, Section 100K, Exhibit 17, effective 4/1/2008  
\*\* Class 15 is truncated at 75% of Class 10's manual rate.

**Massachusetts Private Passenger Automobile  
Calculation of 2008 Manual Rates, Averaged Over 2008 Territory Configurations  
2007 Written Exposures for Liability Coverages  
Facility Market**

Territory	Class 10	Class 15	Class 17	Class 18	Class 20	Class 21	Class 25	Class 26	Class 30	Totals
1	1,561.8	291.9	465.1	48.8	89.2	12.9	547.0	219.3	45.3	3,281.3
2	2,279.2	499.9	542.6	75.2	129.5	24.2	676.2	317.6	57.7	4,602.1
3	5,588.5	947.0	1,463.3	142.4	291.9	43.2	1,572.8	604.7	121.4	10,775.2
4	3,713.4	817.0	968.8	92.5	163.1	26.9	1,100.3	435.9	77.1	7,395.0
5	7,138.2	1,054.9	1,903.3	204.6	426.1	72.7	1,952.2	604.8	197.2	13,554.0
6	5,603.9	966.6	1,316.6	135.8	265.3	64.8	1,417.8	497.2	110.5	10,378.5
7	6,704.9	1,014.0	1,524.9	165.8	368.7	61.3	1,289.2	461.1	129.6	11,719.5
8	4,663.0	641.3	938.1	82.4	253.9	46.2	782.5	288.6	81.6	7,777.6
9	5,443.5	531.4	1,190.2	111.5	335.2	42.8	833.8	263.8	80.8	8,833.0
10	2,369.8	289.2	553.3	49.9	130.8	35.4	398.2	133.2	41.1	4,000.9
11	2,023.2	313.0	336.1	50.2	112.7	30.2	163.3	85.8	34.5	3,149.0
12	6,442.9	700.2	1,211.7	128.3	307.8	67.5	584.7	230.4	111.8	9,785.3
13	8,682.8	1,300.2	1,762.1	133.0	705.8	87.7	953.6	358.7	80.8	14,064.7
14	4,066.5	336.2	656.8	67.0	234.8	55.0	162.8	89.2	73.4	5,741.7
15	1,389.6	220.0	232.2	24.5	87.8	16.2	83.4	49.4	23.8	2,126.9
16	669.4	76.5	176.3	8.1	68.8	8.4	29.8	14.4	15.5	1,067.2
17	446.1	82.2	71.6	4.4	16.3	3.1	50.3	28.1	9.7	711.8
18	997.7	126.8	231.1	25.9	116.5	18.5	49.1	14.8	17.0	1,597.4
19	855.2	110.2	136.4	14.2	111.2	12.2	30.0	7.6	14.7	1,291.7
20	1,178.1	144.8	298.0	19.1	159.6	15.8	81.2	29.2	5.1	1,930.9
21	3,629.2	647.8	811.0	77.2	658.0	56.8	200.3	57.0	32.1	6,169.4
22	1,076.8	150.4	248.4	20.5	218.7	20.1	68.3	8.0	13.6	1,824.8
23	1,571.9	139.6	230.8	23.4	151.4	14.2	40.1	20.0	22.3	2,213.7
24	871.8	125.5	138.5	20.0	74.9	13.6	20.2	12.6	11.9	1,289.0
25	675.9	47.8	67.2	13.1	43.3	7.4	30.6	8.0	15.4	908.7
26	1,092.8	120.8	241.1	14.8	161.0	10.2	35.4	15.2	8.3	1,699.6
27	2,964.9	617.7	868.1	110.8	166.1	29.4	950.2	392.6	102.3	6,202.1
40	1,536.6	121.8	359.6	14.9	182.0	27.5	92.4	24.4	8.2	2,367.4
41	3,637.5	159.8	760.9	50.8	339.4	45.2	217.8	83.8	8.5	5,303.7
42	5,520.0	586.2	1,239.0	56.1	718.2	41.5	371.9	76.8	24.8	8,634.5
43	4,039.9	340.3	651.3	49.9	339.8	54.1	256.0	73.6	41.6	5,846.5
44	1,503.2	96.1	356.7	32.9	307.2	24.7	76.6	29.2	10.3	2,436.9
45	6,228.1	518.2	1,008.6	84.8	562.4	57.7	370.0	69.6	62.6	8,962.0
Totals	106,166.3	14,135.3	22,959.7	2,152.8	8,297.4	1,147.4	15,488.0	5,604.6	1,690.5	177,642.0

**2008 Manual Rates\* for PDL Coverage**

Territory	Class 10	Class 15**	Class 17	Class 18	Class 20	Class 21	Class 25	Class 26	Class 30	Weighted Average
1	156	117	279	198	550	341	495	307	164	\$248.74
2	169	126	294	204	593	365	534	329	173	\$257.32
3	173	129	301	217	616	369	554	331	184	\$264.49
4	184	138	314	220	660	395	594	355	201	\$278.93
5	184	138	317	219	681	419	613	377	206	\$287.23
6	195	146	323	232	685	433	617	391	209	\$288.36
7	200	150	327	245	705	462	635	416	218	\$286.64
8	202	151	347	252	728	463	656	417	228	\$288.46
9	209	156	354	250	741	465	668	419	216	\$296.96
10	211	158	359	252	747	469	672	421	217	\$300.89
11	208	156	381	257	740	466	667	419	219	\$273.26
12	231	173	388	275	758	499	682	450	235	\$297.44
13	241	180	387	274	757	499	682	450	241	\$316.70
14	252	189	419	290	760	516	684	464	259	\$306.79
15	270	202	461	308	772	558	695	502	275	\$329.28
16	237	177	453	305	756	501	680	451	244	\$319.79
17	218	163	419	261	757	441	681	397	218	\$285.23
18	239	179	471	290	774	502	697	452	235	\$326.70
19	249	186	464	298	751	484	677	436	241	\$323.25
20	231	173	462	281	769	490	692	441	243	\$331.98
21	272	204	509	327	757	548	681	493	273	\$366.30
22	344	258	543	405	755	589	680	530	337	\$429.98
23	208	156	474	305	768	508	691	458	228	\$284.91
24	253	189	474	304	771	487	694	438	248	\$312.55
25	240	180	514	301	773	539	696	485	254	\$303.57
26	287	215	526	372	755	575	679	517	284	\$372.79
27	151	113	266	178	520	303	469	272	151	\$230.78
40	223	167	417	276	757	476	681	429	257	\$314.03
41	227	170	406	286	757	506	681	455	240	\$310.09
42	228	171	438	311	777	550	700	495	270	\$324.84
43	262	196	450	309	776	558	697	502	266	\$334.21
44	208	156	442	300	756	501	680	450	215	\$331.26
45	266	199	451	304	776	554	699	498	271	\$336.88
Wtd. Avg.	\$219.19	\$159.66	\$375.04	\$255.40	\$734.91	\$480.09	\$616.84	\$387.64	\$218.82	\$300.79

\* From the current MAIP rates, Section 100K, Exhibit 17, effective 4/1/2008  
 \*\* Class 15 is truncated at 75% of Class 10's manual rate.

**Massachusetts Private Passenger Automobile  
Calculation of 2008 Manual Rates, Averaged Over 2008 Territory Configurations  
2007 Written Exposures for Collision Coverage  
Facility Market**

Territory	Class 10	Class 15	Class 17	Class 18	Class 20	Class 21	Class 25	Class 26	Class 30	Totals
1	964.4	206.9	242.9	33.0	26.6	10.2	164.0	162.2	32.2	1,842.4
2	1,400.8	351.8	266.5	54.5	41.0	19.9	228.9	241.3	40.2	2,644.9
3	3,254.8	701.7	744.8	105.7	95.8	24.4	497.0	418.4	66.5	5,909.1
4	2,277.6	611.6	469.5	70.9	47.8	14.1	336.0	308.9	53.4	4,189.8
5	4,140.5	780.2	901.0	125.6	133.2	40.4	608.2	406.2	129.0	7,264.3
6	3,467.7	742.2	654.3	104.2	96.3	39.8	413.2	357.4	68.9	5,944.0
7	3,859.9	731.4	763.0	98.3	111.6	43.9	403.7	315.8	76.1	6,403.7
8	2,769.9	495.9	447.0	57.1	84.3	29.9	246.8	192.5	44.8	4,368.2
9	2,944.7	380.8	526.5	78.0	101.7	24.0	244.2	185.5	47.1	4,532.5
10	1,289.2	208.2	232.8	35.4	43.8	11.6	109.9	86.7	26.2	2,043.8
11	1,254.2	212.8	159.1	35.2	42.3	19.1	56.8	56.5	21.2	1,857.2
12	3,919.2	538.9	594.0	86.5	106.1	42.3	229.6	165.0	66.3	5,747.9
13	4,785.8	859.9	813.8	90.8	259.8	52.2	370.2	245.9	49.4	7,527.8
14	2,468.8	241.5	333.8	47.9	83.8	33.4	59.6	67.5	33.8	3,370.1
15	804.9	155.2	116.0	16.2	26.0	10.0	33.4	29.6	11.1	1,202.4
16	387.7	41.9	70.8	8.1	16.7	4.9	9.9	8.4	7.1	555.5
17	289.6	71.8	32.1	3.4	4.3	2.0	15.0	19.8	2.7	440.7
18	530.9	83.9	101.6	15.8	34.1	9.4	13.2	10.1	8.3	807.3
19	459.2	60.8	51.4	13.0	25.3	3.5	12.5	5.1	2.0	632.8
20	647.8	97.6	131.2	6.4	52.5	11.6	23.0	21.6	3.6	995.3
21	1,892.9	381.9	320.5	46.7	213.7	30.2	73.5	39.5	15.8	3,014.7
22	499.4	65.4	97.4	8.9	61.2	9.2	19.2	6.8	8.8	776.3
23	945.0	91.3	105.2	14.1	49.1	6.8	16.2	13.0	14.4	1,255.1
24	475.6	92.2	55.0	11.2	21.0	8.8	9.3	7.5	4.0	684.6
25	388.0	29.7	28.1	8.1	10.8	3.9	8.0	3.0	9.2	488.8
26	542.9	59.0	86.9	9.8	47.7	6.0	11.4	10.2	2.4	776.3
27	1,733.0	425.0	427.7	74.0	60.8	16.8	340.6	278.2	55.1	3,411.2
40	609.9	55.3	112.6	4.8	34.4	11.3	19.8	9.4	4.5	862.0
41	1,726.8	77.3	301.8	37.8	117.2	25.2	74.6	47.1	2.2	2,410.0
42	2,140.0	309.5	321.2	36.4	132.8	21.8	78.9	47.0	14.2	3,101.8
43	1,833.2	203.5	271.4	29.8	90.2	30.0	66.5	44.4	21.8	2,590.8
44	676.2	43.2	111.1	15.5	42.9	12.3	24.0	16.2	1.8	943.2
45	3,312.9	307.6	468.6	50.5	219.7	41.2	134.8	50.2	19.2	4,604.7
Totals	58,693.4	9,715.9	10,359.6	1,433.6	2,534.5	670.1	4,951.9	3,876.9	963.3	93,199.2

**2008 Manual Rates\* for Collision Coverage**

Territory	Class 10	Class 15**	Class 17	Class 18	Class 20	Class 21	Class 25	Class 26	Class 30	Weighted Average
1	235	176	518	312	947	524	852	471	234	\$354.62
2	245	183	525	314	989	513	890	462	244	\$355.54
3	249	186	550	335	1007	541	906	488	248	\$366.66
4	260	195	572	340	1040	577	936	519	259	\$370.09
5	263	197	576	349	1055	605	949	545	262	\$385.83
6	280	210	615	370	1087	641	979	577	278	\$391.63
7	296	222	630	399	1084	670	975	604	290	\$403.15
8	303	227	623	417	1082	668	974	601	300	\$397.15
9	303	227	622	396	1076	670	969	603	300	\$402.69
10	295	221	637	398	1080	689	972	620	298	\$397.49
11	319	239	712	435	1051	698	946	628	318	\$394.83
12	354	265	732	456	1056	765	949	687	353	\$435.55
13	356	267	664	485	1064	771	957	694	352	\$448.57
14	395	296	735	528	1039	806	935	725	392	\$459.69
15	472	354	771	569	1036	843	933	758	461	\$521.95
16	417	312	748	515	1010	717	909	646	401	\$485.20
17	333	249	702	438	1067	665	961	599	332	\$388.99
18	406	304	777	517	1041	780	937	702	397	\$487.73
19	421	315	790	589	1010	813	909	731	419	\$482.09
20	451	338	789	572	1026	809	923	729	437	\$536.64
21	469	351	803	657	1019	920	917	828	564	\$552.10
22	520	390	795	675	1009	889	908	800	700	\$602.34
23	359	269	796	633	1038	841	935	757	404	\$433.41
24	393	294	765	556	1036	785	933	706	391	\$447.74
25	414	310	807	610	1053	844	947	760	435	\$462.31
26	488	366	804	667	1010	877	909	789	535	\$561.72
27	224	168	494	287	917	485	825	437	223	\$343.24
40	361	270	695	493	1048	754	943	679	368	\$448.97
41	336	252	715	517	1056	791	951	712	350	\$449.78
42	389	291	766	589	1049	844	944	760	379	\$471.76
43	418	313	761	569	1034	847	930	762	408	\$492.79
44	380	285	765	501	1036	717	933	646	365	\$475.83
45	435	326	751	573	1038	843	934	759	424	\$511.91
Wtd. Avg.	\$335.25	\$240.84	\$653.50	\$430.62	\$1,042.32	\$726.91	\$935.07	\$575.19	\$310.33	\$425.89

\* From the current MAIP rates, Section 100K, Exhibit 17, effective 4/1/2008  
\*\* Class 15 is truncated at 75% of Class 10's manual rate.

**Massachusetts Private Passenger Automobile  
Calculation of 2008 Manual Rates, Averaged Over 2008 Territory Configurations  
2007 Written Exposures for Limited Collision Coverage  
Facility Market**

Territory	Class 10	Class 15	Class 17	Class 18	Class 20	Class 21	Class 25	Class 26	Class 30	Totals
1	4.2	6.5	2.2	0.0	0.0	0.0	10.5	2.4	0.0	25.8
2	8.7	9.8	7.3	0.1	1.0	0.0	21.9	2.0	0.0	50.8
3	25.7	8.8	11.2	0.8	4.8	0.0	33.6	4.8	0.1	89.8
4	12.0	6.0	11.5	1.3	1.2	0.0	30.0	1.7	0.0	63.7
5	35.1	10.6	22.4	1.5	4.2	2.0	63.5	7.0	0.0	146.3
6	37.6	10.0	13.7	0.0	3.7	0.5	60.8	3.2	1.0	130.5
7	39.2	9.9	20.5	0.3	2.8	0.8	55.8	1.0	1.0	131.3
8	32.7	5.0	19.0	1.0	9.2	1.0	25.2	1.3	1.1	95.5
9	35.8	6.0	17.7	0.0	2.0	0.0	36.2	3.2	0.0	100.9
10	34.8	1.9	21.1	0.0	4.1	3.0	26.6	4.4	0.2	96.1
11	16.6	3.5	8.4	0.9	2.2	0.1	10.2	1.1	0.0	43.0
12	82.6	10.4	28.6	1.0	3.7	2.8	22.2	3.4	0.0	154.7
13	50.0	33.6	19.8	1.7	7.5	1.6	24.2	5.8	0.0	144.2
14	55.8	3.5	14.8	3.7	6.1	1.0	7.3	2.1	1.0	95.3
15	29.2	7.8	5.4	0.7	1.2	0.0	4.0	1.5	1.9	51.7
16	26.3	8.2	13.2	0.0	2.6	0.0	5.0	0.0	1.0	56.3
17	5.1	1.2	2.1	0.0	0.0	0.0	1.8	0.0	1.0	11.2
18	48.7	5.1	17.5	0.9	11.7	1.4	2.7	0.0	1.0	89.0
19	48.0	6.0	10.9	0.1	7.6	1.0	2.7	0.0	0.0	76.3
20	44.3	6.2	16.4	0.8	18.4	1.0	10.7	2.2	0.0	100.0
21	188.6	26.2	50.8	3.3	33.1	6.1	20.1	1.7	0.0	329.9
22	69.6	11.9	22.0	4.2	14.2	3.5	7.0	0.0	0.1	132.5
23	55.8	5.1	8.2	1.3	9.6	1.0	2.4	0.7	0.0	84.1
24	9.8	3.7	1.1	0.0	3.2	0.0	1.2	0.0	0.0	19.0
25	28.1	1.0	2.1	0.8	1.7	1.1	1.9	0.0	0.0	36.7
26	31.8	5.9	12.2	0.1	15.4	0.1	2.1	2.0	0.0	69.6
27	17.8	5.7	4.4	0.0	1.2	0.0	23.6	0.0	0.0	52.7
40	1.0	0.0	2.7	0.0	0.0	0.0	0.0	0.0	0.0	3.7
41	17.9	0.0	0.7	0.0	0.4	0.1	2.0	1.5	0.0	22.6
42	9.4	7.0	2.7	0.0	2.3	0.0	6.0	0.0	0.0	27.4
43	35.8	18.0	11.2	0.8	8.5	1.0	3.1	2.0	0.0	80.4
44	39.8	6.8	11.0	1.9	3.8	2.3	0.6	1.8	0.0	68.0
45	103.2	13.2	17.6	1.0	10.8	0.6	15.7	0.0	2.0	164.1
<b>Totals</b>	<b>1,281.0</b>	<b>264.5</b>	<b>430.4</b>	<b>28.2</b>	<b>198.2</b>	<b>32.0</b>	<b>540.6</b>	<b>56.8</b>	<b>11.4</b>	<b>2,843.1</b>

**2008 Manual Rates\* for Limited Collision Coverage**

Territory	Class 10	Class 15**	Class 17	Class 18	Class 20	Class 21	Class 25	Class 26	Class 30	Weighted Average
1	14	10	31	19	57	31	51	28	14	\$30.80
2	15	11	32	19	59	31	53	28	15	\$34.44
3	15	11	33	20	60	32	54	29	15	\$34.64
4	16	12	34	20	62	35	56	31	16	\$39.06
5	16	12	35	21	63	36	57	33	16	\$38.90
6	17	12	37	22	65	38	59	35	17	\$40.17
7	18	13	38	24	65	40	59	36	17	\$39.45
8	18	13	37	25	65	40	58	36	18	\$37.15
9	18	13	37	24	65	40	58	36	18	\$36.89
10	18	13	38	24	65	41	58	37	18	\$36.96
11	19	14	43	26	63	42	57	38	19	\$35.23
12	21	15	44	27	63	46	57	41	21	\$31.95
13	21	15	40	29	64	46	57	42	21	\$31.71
14	24	18	44	32	62	48	56	44	24	\$32.77
15	28	21	46	34	62	51	56	45	28	\$32.35
16	25	18	45	31	61	43	55	39	24	\$32.98
17	20	15	42	26	64	40	58	36	20	\$29.70
18	24	18	47	31	62	47	56	42	24	\$34.58
19	25	18	47	35	61	49	55	44	25	\$32.57
20	27	20	47	34	62	49	55	44	26	\$39.93
21	28	21	48	39	61	55	55	50	34	\$36.20
22	31	23	48	41	61	53	54	48	42	\$38.44
23	22	16	48	38	62	50	56	45	24	\$30.48
24	24	18	46	33	62	47	56	42	23	\$32.53
25	25	18	48	37	63	51	57	46	26	\$30.58
26	29	21	48	40	61	53	55	47	32	\$40.08
27	13	9	30	17	55	29	50	26	13	\$31.51
40	22	16	42	30	63	45	57	41	22	\$36.59
41	20	15	43	31	63	47	57	43	21	\$26.39
42	23	17	46	35	63	51	57	46	23	\$34.54
43	25	18	46	34	62	51	56	46	24	\$32.40
44	23	17	46	30	62	43	56	39	22	\$29.89
45	26	19	45	34	62	51	56	46	25	\$32.84
<b>Wtd. Avg.</b>	<b>\$23.39</b>	<b>\$16.20</b>	<b>\$42.35</b>	<b>\$32.28</b>	<b>\$62.01</b>	<b>\$47.56</b>	<b>\$56.51</b>	<b>\$37.63</b>	<b>\$22.66</b>	<b>\$35.22</b>

\* Limited Collision Rates assumed to be 6% of Collision Rates.  
\*\* Class 15 is truncated at 75% of Class 10's manual rate.

**Massachusetts Private Passenger Automobile  
Calculation of 2008 Manual Rates, Averaged Over 2008 Territory Configurations  
2007 Written Exposures for Comprehensive Coverages  
Facility Market**

Territory	Class 10	Class 15	Class 17	Class 18	Class 20	Class 21	Class 25	Class 26	Class 30	Totals
1	1,075.1	235.2	306.2	35.8	38.8	12.3	307.9	176.8	34.2	2,222.3
2	1,572.6	391.1	329.8	58.3	54.8	18.9	391.4	266.2	42.6	3,125.7
3	3,614.6	773.8	893.5	116.3	125.7	24.0	865.2	459.2	79.0	6,951.3
4	2,461.8	677.2	593.1	76.1	67.6	18.3	610.1	358.7	57.0	4,919.9
5	4,558.8	847.8	1,103.5	145.1	178.8	46.8	1,091.2	458.8	140.3	8,571.1
6	3,800.9	799.5	818.7	111.4	139.9	46.5	796.6	396.0	79.9	6,989.4
7	4,261.5	795.0	947.2	112.3	161.2	44.8	759.9	353.5	85.4	7,520.8
8	3,055.0	529.1	560.5	61.4	117.4	33.2	434.6	221.2	50.9	5,063.3
9	3,274.3	425.1	655.3	85.2	148.2	26.9	452.2	198.0	51.2	5,316.4
10	1,526.0	232.2	329.9	41.5	65.0	20.8	226.0	104.1	28.6	2,574.1
11	1,340.5	229.2	197.2	38.8	56.8	21.3	86.9	65.8	22.7	2,059.2
12	4,290.8	586.7	742.9	93.3	142.3	49.1	319.8	178.5	76.9	6,480.3
13	5,283.8	970.4	970.2	99.2	310.5	62.9	526.4	277.6	54.7	8,555.7
14	2,637.4	259.5	383.3	54.1	100.8	36.0	77.7	71.3	36.3	3,656.4
15	890.1	175.3	134.2	18.9	34.0	9.0	46.0	34.3	16.0	1,357.8
16	438.0	50.7	93.8	8.1	23.5	4.9	15.9	9.4	7.0	651.3
17	307.5	73.9	37.7	3.4	6.6	2.0	23.9	21.8	4.7	481.5
18	615.0	92.3	133.2	16.8	52.2	11.7	20.4	11.1	10.3	963.0
19	538.5	66.5	69.5	12.2	42.9	4.5	15.8	6.6	4.2	760.7
20	720.9	106.7	159.9	10.2	79.2	12.7	36.2	23.8	2.6	1,152.2
21	2,170.4	426.8	406.7	51.8	267.9	35.2	109.2	43.8	19.9	3,531.7
22	586.2	79.5	127.1	13.3	79.0	12.7	31.9	7.8	10.0	947.5
23	1,069.1	101.7	128.4	17.2	71.2	8.9	22.8	14.7	14.4	1,448.4
24	548.0	92.2	64.2	13.2	38.7	9.4	12.9	8.5	4.0	791.1
25	424.6	34.7	36.2	9.8	17.3	5.0	13.9	3.0	12.2	556.7
26	644.8	70.5	120.6	8.2	65.3	5.4	14.6	12.2	3.7	945.3
27	1,943.2	464.8	545.0	85.8	76.9	19.2	572.1	323.0	64.4	4,094.4
40	812.7	68.8	171.8	7.8	68.8	15.1	50.0	14.7	4.9	1,214.6
41	1,902.9	85.2	368.8	40.4	141.2	28.2	102.8	58.5	3.2	2,731.2
42	2,536.1	354.2	475.2	44.7	232.9	27.3	151.3	53.9	15.2	3,890.8
43	2,042.6	235.2	334.1	32.9	122.7	35.6	94.0	50.6	23.2	2,970.9
44	864.0	59.2	171.5	22.8	96.0	14.7	37.3	20.6	2.1	1,288.2
45	3,584.4	339.5	543.2	53.5	262.5	44.0	186.8	54.9	23.8	5,092.6
<b>Totals</b>	<b>65,392.1</b>	<b>10,729.5</b>	<b>12,952.4</b>	<b>1,599.8</b>	<b>3,486.6</b>	<b>767.3</b>	<b>8,503.7</b>	<b>4,358.9</b>	<b>1,085.5</b>	<b>108,875.8</b>

**2008 Manual Rates\* for Comprehensive Coverages**

Territory	Class 10	Class 15**	Class 17	Class 18	Class 20	Class 21	Class 25	Class 26	Class 30	Weighted Average
1	99	74	99	99	99	99	99	99	99	\$96.35
2	101	75	101	101	101	101	101	101	101	\$97.75
3	105	78	105	105	105	105	105	105	105	\$101.99
4	103	77	103	103	103	103	103	103	103	\$99.42
5	107	80	107	107	107	107	107	107	107	\$104.33
6	111	83	111	111	111	111	111	111	111	\$107.80
7	115	86	115	115	115	115	115	115	115	\$111.93
8	119	89	119	119	119	119	119	119	119	\$115.87
9	117	87	117	117	117	117	117	117	117	\$114.60
10	125	93	125	125	125	125	125	125	125	\$122.11
11	134	100	134	134	134	134	134	134	134	\$130.22
12	138	103	138	138	138	138	138	138	138	\$134.83
13	155	116	155	155	155	155	155	155	155	\$150.58
14	162	121	162	162	162	162	162	162	162	\$159.09
15	200	150	200	200	200	200	200	200	200	\$193.54
16	324	243	324	324	324	324	324	324	324	\$317.69
17	115	86	115	115	115	115	115	115	115	\$110.55
18	235	176	235	235	235	235	235	235	235	\$229.35
19	258	193	258	258	258	258	258	258	258	\$252.32
20	234	175	234	234	234	234	234	234	234	\$228.54
21	318	238	318	318	318	318	318	318	318	\$308.33
22	359	269	359	359	359	359	359	359	359	\$351.45
23	216	162	216	216	216	216	216	216	216	\$212.21
24	162	121	162	162	162	162	162	162	162	\$157.22
25	245	183	245	245	245	245	245	245	245	\$241.14
26	292	219	292	292	292	292	292	292	292	\$286.56
27	94	70	94	94	94	94	94	94	94	\$91.28
40	148	111	148	148	148	148	148	148	148	\$145.90
41	150	112	150	150	150	150	150	150	150	\$148.81
42	182	136	182	182	182	182	182	182	182	\$177.81
43	191	143	191	191	191	191	191	191	191	\$187.20
44	312	234	312	312	312	312	312	312	312	\$308.42
45	201	150	201	201	201	201	201	201	201	\$197.60
<b>Wtd. Avg.</b>	<b>\$152.98</b>	<b>\$107.76</b>	<b>\$147.68</b>	<b>\$144.21</b>	<b>\$176.84</b>	<b>\$161.25</b>	<b>\$125.32</b>	<b>\$123.86</b>	<b>\$135.38</b>	<b>\$145.08</b>

\* From the current MAIP rates, Section 100K, Exhibit 17, effective 4/1/2008  
\*\* Class 15 is truncated at 75% of Class 10's manual rate.

**Massachusetts Private Passenger Automobile  
Calculation of the Average SDIP Factor for Liability Coverages  
2007 Written Premium\* for Coverage A-1  
Facility Market**

Territory	Class 10	Class 15	Class 17	Class 18	Class 20	Class 21	Class 25	Class 26	Class 30	Totals
1	190,540	26,709	102,322	6,734	36,661	2,799	202,937	42,764	5,391	616,857
2	303,134	49,490	130,224	11,581	57,887	5,929	272,509	70,190	7,443	908,387
3	782,390	99,435	368,752	23,638	141,572	11,362	687,314	143,314	16,510	2,274,287
4	560,723	92,321	270,295	15,910	87,748	8,205	532,545	119,437	11,180	1,698,364
5	1,099,283	121,314	529,117	39,692	240,747	23,700	993,670	177,206	30,172	3,254,901
6	935,851	120,825	406,829	25,938	160,772	24,170	774,119	167,059	18,012	2,633,575
7	1,146,538	129,792	454,420	34,984	237,443	23,294	747,736	157,235	21,384	2,952,826
8	848,666	87,217	310,511	17,963	171,890	18,850	476,543	105,916	14,443	2,051,999
9	1,132,248	82,898	422,521	27,652	234,975	18,233	525,294	101,035	16,322	2,561,178
10	497,658	45,404	230,173	13,822	97,577	17,381	267,192	58,874	8,754	1,236,835
11	412,733	47,889	151,917	13,755	82,722	14,919	107,778	38,095	7,970	877,778
12	1,456,095	118,334	522,243	38,362	226,233	35,775	386,487	109,901	24,596	2,918,026
13	2,222,797	249,638	826,425	42,826	519,469	46,832	631,283	172,176	20,200	4,731,646
14	1,167,086	72,283	322,489	24,187	169,995	30,305	105,983	44,243	20,479	1,957,050
15	473,854	56,100	127,013	9,261	63,392	9,639	54,210	26,478	7,783	827,730
16	191,448	16,371	98,375	4,001	48,573	4,838	18,953	7,474	4,557	394,590
17	97,250	13,399	30,144	1,166	11,687	1,318	32,444	10,734	2,124	200,266
18	221,489	21,049	127,105	7,796	85,744	9,805	32,504	7,060	4,284	516,836
19	230,904	22,260	73,383	5,084	78,174	6,564	19,020	3,678	4,410	443,477
20	294,525	27,078	163,602	6,437	116,348	8,737	53,348	14,542	1,408	686,025
21	1,110,535	148,346	448,483	35,358	465,864	33,058	127,791	29,868	13,643	2,412,946
22	324,117	33,840	137,365	9,143	155,277	11,497	43,644	4,120	5,590	724,593
23	361,537	24,011	117,708	8,330	108,554	7,498	25,905	9,500	5,196	668,239
24	202,258	21,837	63,018	5,880	54,003	6,446	13,090	5,380	2,797	374,709
25	155,457	8,222	34,608	4,048	31,306	4,033	19,890	3,928	3,865	265,357
26	309,262	25,610	134,775	5,846	113,505	5,926	22,479	7,950	2,266	627,619
27	314,279	48,798	174,488	13,074	61,291	5,410	315,466	64,779	11,151	1,008,736
40	407,199	24,116	179,081	4,887	132,678	14,300	60,707	11,444	2,288	836,700
41	1,000,313	32,919	376,646	18,390	249,120	24,860	143,748	41,481	2,406	1,889,883
42	1,871,280	148,895	677,733	21,935	521,413	24,651	242,851	41,088	8,531	3,558,377
43	1,228,130	77,588	351,051	19,062	246,015	32,135	166,912	39,376	13,645	2,173,914
44	413,380	19,797	202,606	16,417	220,262	14,400	49,484	15,330	2,874	954,550
45	1,961,852	122,295	533,549	31,970	407,740	34,101	241,240	36,958	20,470	3,390,175
Totals	23,924,811	2,236,080	9,098,971	565,129	5,636,637	540,970	8,395,076	1,888,613	342,144	52,628,431

**2008 Liability SDIP Factors\*\***

Territory	Class 10	Class 15	Class 17	Class 18	Class 20	Class 21	Class 25	Class 26	Class 30	Weighted Average
1	1.808	1.808	1.563	1.550	1.124	1.078	1.124	1.078	2.106	1.448
2	1.734	1.734	1.516	1.420	1.107	1.072	1.107	1.072	2.100	1.418
3	1.752	1.752	1.519	1.544	1.119	1.088	1.119	1.088	1.988	1.438
4	1.668	1.668	1.501	1.471	1.110	1.087	1.110	1.087	1.922	1.394
5	1.675	1.675	1.467	1.516	1.106	1.086	1.106	1.086	1.823	1.388
6	1.622	1.622	1.459	1.454	1.105	1.078	1.105	1.078	1.721	1.373
7	1.623	1.623	1.416	1.465	1.095	1.088	1.095	1.088	1.801	1.382
8	1.559	1.559	1.381	1.486	1.099	1.091	1.099	1.091	1.725	1.359
9	1.525	1.525	1.346	1.492	1.085	1.069	1.085	1.069	1.915	1.346
10	1.538	1.538	1.345	1.376	1.104	1.095	1.104	1.095	1.649	1.346
11	1.485	1.485	1.313	1.398	1.094	1.078	1.094	1.078	1.619	1.346
12	1.515	1.515	1.305	1.379	1.100	1.078	1.100	1.078	1.861	1.370
13	1.442	1.442	1.317	1.422	1.098	1.085	1.098	1.085	1.718	1.321
14	1.427	1.427	1.293	1.325	1.104	1.084	1.104	1.084	1.475	1.346
15	1.412	1.412	1.299	1.312	1.120	1.084	1.120	1.084	1.538	1.339
16	1.408	1.408	1.281	1.138	1.079	1.081	1.079	1.081	1.446	1.308
17	1.519	1.519	1.359	1.593	1.057	1.090	1.057	1.090	1.613	1.369
18	1.357	1.357	1.223	1.223	1.078	1.050	1.078	1.050	1.923	1.253
19	1.341	1.341	1.240	1.386	1.076	1.049	1.076	1.049	1.459	1.261
20	1.400	1.400	1.228	1.147	1.072	1.098	1.072	1.098	1.507	1.265
21	1.425	1.425	1.275	1.269	1.084	1.079	1.084	1.079	1.484	1.302
22	1.349	1.349	1.288	1.331	1.072	1.075	1.072	1.075	1.203	1.254
23	1.426	1.426	1.235	1.212	1.070	1.040	1.070	1.040	1.752	1.311
24	1.506	1.506	1.232	1.323	1.059	1.108	1.059	1.108	2.041	1.368
25	1.495	1.495	1.326	1.249	1.063	1.048	1.063	1.048	1.871	1.378
26	1.365	1.365	1.254	1.420	1.098	1.112	1.098	1.112	1.840	1.280
27	1.797	1.797	1.547	1.578	1.118	1.085	1.118	1.085	2.133	1.451
40	1.283	1.283	1.202	1.196	1.074	1.097	1.074	1.097	1.129	1.211
41	1.342	1.342	1.236	1.263	1.077	1.056	1.077	1.056	1.804	1.256
42	1.251	1.251	1.192	1.199	1.063	1.075	1.063	1.075	1.482	1.196
43	1.323	1.323	1.273	1.292	1.079	1.073	1.079	1.073	1.577	1.262
44	1.308	1.308	1.201	1.232	1.060	1.086	1.060	1.086	1.238	1.207
45	1.266	1.266	1.247	1.268	1.083	1.087	1.083	1.087	1.446	1.225
Wtd. Avg.	1.460	1.494	1.331	1.380	1.087	1.080	1.100	1.082	1.724	1.325

\* Derived from Exhibit 2, (written exposures \* manual rate).

\*\* From Section 100K, Exhibit 5.

**Massachusetts Private Passenger Automobile  
Calculation of the Average SDIP Factor for Liability Coverages  
2007 Written Premium\* for Coverage A-2  
Facility Market**

Territory	Class 10	Class 15	Class 17	Class 18	Class 20	Class 21	Class 25	Class 26	Class 30	Totals
1	79,652	11,092	40,464	2,782	14,361	1,148	78,768	17,544	2,310	248,121
2	123,077	19,996	51,547	4,738	22,533	2,372	105,487	27,949	3,058	360,757
3	329,722	41,668	143,403	9,541	54,877	4,536	265,803	56,842	6,920	913,312
4	230,231	37,582	105,599	6,383	33,925	3,228	205,756	47,077	4,703	674,484
5	456,845	50,635	205,556	15,754	93,316	9,306	384,583	70,157	12,621	1,298,773
6	381,065	49,297	157,992	10,457	62,080	9,461	297,738	65,133	7,404	1,040,627
7	462,638	51,714	176,888	13,927	91,806	9,134	287,492	61,326	8,683	1,163,608
8	345,062	35,272	120,077	7,169	66,268	7,392	183,105	41,270	5,875	811,490
9	462,698	33,478	161,867	10,927	90,504	7,105	202,613	39,570	6,545	1,015,307
10	203,803	18,509	88,528	5,439	36,886	6,726	100,745	22,910	3,494	487,040
11	169,949	19,719	58,481	5,422	31,218	5,768	40,825	14,843	3,140	349,365
12	579,861	46,913	201,142	15,011	85,261	13,905	146,175	42,624	9,727	1,140,619
13	885,646	98,815	325,989	16,625	195,507	18,154	238,400	66,718	7,999	1,853,853
14	463,581	28,577	128,076	9,380	64,100	11,715	40,049	17,216	8,074	770,768
15	183,427	21,780	49,923	3,577	23,969	3,726	20,433	10,226	2,951	320,012
16	76,312	6,503	38,610	1,539	18,301	1,865	7,152	2,880	1,814	154,976
17	39,257	5,425	11,599	462	4,499	515	12,525	4,187	854	79,323
18	88,795	8,369	48,531	3,056	32,387	3,811	12,275	2,738	1,717	201,679
19	92,362	8,926	28,780	1,988	29,468	2,538	7,170	1,421	1,749	174,402
20	116,632	10,715	64,666	2,502	43,890	3,397	20,138	5,636	576	268,152
21	439,133	58,302	175,987	13,896	175,686	12,723	48,272	11,514	5,393	940,906
22	128,139	13,386	53,903	3,629	58,612	4,442	16,460	1,592	2,217	282,380
23	141,471	9,353	46,622	3,253	41,029	2,911	9,744	3,680	2,052	260,115
24	81,949	8,785	24,238	2,320	20,373	2,502	4,929	2,092	1,119	148,307
25	62,183	3,298	13,574	1,585	11,821	1,561	7,497	1,512	1,586	104,617
26	122,394	10,147	52,801	2,264	42,826	2,285	8,496	3,070	905	245,188
27	130,456	20,384	68,580	5,318	23,918	2,205	123,526	26,304	4,808	405,499
40	164,416	9,744	70,482	1,907	50,050	5,528	22,915	4,441	902	330,385
41	392,850	12,944	149,136	7,163	94,014	9,582	54,450	16,006	944	737,089
42	734,160	58,034	266,385	8,527	196,787	9,504	91,487	15,898	3,298	1,384,080
43	480,748	30,287	137,424	7,435	93,105	12,443	62,976	15,235	5,325	844,978
44	163,849	7,784	79,187	6,350	83,251	5,582	18,690	5,898	1,143	371,734
45	766,056	47,674	209,789	12,381	154,098	13,156	91,020	14,338	8,013	1,316,525
Totals	9,578,419	895,107	3,555,826	222,707	2,140,726	210,226	3,217,694	739,847	137,919	20,698,471

**2008 Liability SDIP Factors\*\***

Territory	Class 10	Class 15	Class 17	Class 18	Class 20	Class 21	Class 25	Class 26	Class 30	Weighted Average
1	1.808	1.808	1.563	1.550	1.124	1.078	1.124	1.078	2.106	1.456
2	1.734	1.734	1.516	1.420	1.107	1.072	1.107	1.072	2.100	1.424
3	1.752	1.752	1.519	1.544	1.119	1.088	1.119	1.088	1.988	1.448
4	1.668	1.668	1.501	1.471	1.110	1.087	1.110	1.087	1.922	1.400
5	1.675	1.675	1.467	1.516	1.106	1.086	1.106	1.086	1.823	1.396
6	1.622	1.622	1.459	1.454	1.105	1.078	1.105	1.078	1.721	1.379
7	1.623	1.623	1.416	1.465	1.095	1.088	1.095	1.088	1.801	1.386
8	1.559	1.559	1.381	1.486	1.099	1.091	1.099	1.091	1.725	1.364
9	1.525	1.525	1.346	1.492	1.085	1.069	1.085	1.069	1.915	1.351
10	1.538	1.538	1.345	1.376	1.104	1.095	1.104	1.095	1.649	1.352
11	1.485	1.485	1.313	1.398	1.094	1.078	1.094	1.078	1.619	1.351
12	1.515	1.515	1.305	1.379	1.100	1.078	1.100	1.078	1.861	1.373
13	1.442	1.442	1.317	1.422	1.098	1.085	1.098	1.085	1.718	1.324
14	1.427	1.427	1.293	1.325	1.104	1.084	1.104	1.084	1.475	1.347
15	1.412	1.412	1.299	1.312	1.120	1.084	1.120	1.084	1.538	1.340
16	1.408	1.408	1.281	1.138	1.079	1.081	1.079	1.081	1.446	1.310
17	1.519	1.519	1.359	1.593	1.057	1.090	1.057	1.090	1.613	1.372
18	1.357	1.357	1.223	1.223	1.078	1.050	1.078	1.050	1.923	1.256
19	1.341	1.341	1.240	1.386	1.076	1.049	1.076	1.049	1.459	1.264
20	1.400	1.400	1.228	1.147	1.072	1.098	1.072	1.098	1.507	1.268
21	1.425	1.425	1.275	1.269	1.084	1.079	1.084	1.079	1.484	1.305
22	1.349	1.349	1.288	1.331	1.072	1.075	1.072	1.075	1.203	1.256
23	1.426	1.426	1.235	1.212	1.070	1.040	1.070	1.040	1.752	1.312
24	1.506	1.506	1.232	1.323	1.059	1.108	1.059	1.108	2.041	1.374
25	1.495	1.495	1.326	1.249	1.063	1.048	1.063	1.048	1.871	1.382
26	1.365	1.365	1.254	1.420	1.098	1.112	1.098	1.112	1.840	1.282
27	1.797	1.797	1.547	1.578	1.118	1.085	1.118	1.085	2.133	1.459
40	1.283	1.283	1.202	1.196	1.074	1.097	1.074	1.097	1.129	1.213
41	1.342	1.342	1.236	1.263	1.077	1.056	1.077	1.056	1.804	1.257
42	1.251	1.251	1.192	1.199	1.063	1.075	1.063	1.075	1.482	1.197
43	1.323	1.323	1.273	1.292	1.079	1.073	1.079	1.073	1.577	1.263
44	1.308	1.308	1.201	1.232	1.060	1.086	1.060	1.086	1.238	1.209
45	1.266	1.266	1.247	1.268	1.083	1.087	1.083	1.087	1.446	1.226
Wtd. Avg.	1.463	1.497	1.331	1.382	1.087	1.080	1.100	1.082	1.729	1.330

\* Derived from Exhibit 2, (written exposures \* manual rate).  
\*\* From Section 100K, Exhibit 5.



**Massachusetts Private Passenger Automobile  
Calculation of the Average SDIP Factor for Liability Coverages  
2007 Written Premium\* for PDL Coverage  
Facility Market**

Territory	Class 10	Class 15	Class 17	Class 18	Class 20	Class 21	Class 25	Class 26	Class 30	Totals
1	243,641	34,152	129,763	9,662	49,060	4,399	270,765	67,325	7,429	816,196
2	385,185	62,987	159,524	15,341	76,794	8,833	361,091	104,490	9,982	1,184,227
3	966,811	122,163	440,453	30,901	179,810	15,941	871,331	200,156	22,338	2,849,904
4	683,266	112,746	304,203	20,350	107,646	10,626	653,578	154,745	15,497	2,062,657
5	1,313,429	145,576	603,346	44,807	290,174	30,461	1,196,699	228,010	40,623	3,893,125
6	1,092,761	141,124	425,262	31,506	181,731	28,058	874,783	194,405	23,095	2,992,725
7	1,340,980	152,100	498,642	40,621	259,934	28,321	818,642	191,818	28,253	3,359,311
8	941,926	96,836	325,521	20,765	184,839	21,391	513,320	120,346	18,605	2,243,549
9	1,137,692	82,898	421,331	27,875	248,383	19,902	556,978	110,532	17,453	2,623,044
10	500,028	45,694	198,635	12,575	97,708	16,603	267,590	56,077	8,919	1,203,829
11	420,826	48,828	128,054	12,901	83,398	14,073	108,921	35,950	7,556	860,507
12	1,488,310	121,135	470,140	35,283	233,312	33,683	398,765	103,680	26,273	2,910,581
13	2,092,555	234,036	681,933	36,442	534,291	43,762	650,355	161,415	19,473	4,454,262
14	1,024,758	63,542	275,199	19,430	178,448	28,380	111,355	41,389	19,011	1,761,512
15	375,192	44,440	107,044	7,546	67,782	9,040	57,963	24,799	6,545	700,351
16	158,648	13,541	79,864	2,471	52,013	4,208	20,264	6,494	3,782	341,285
17	97,250	13,399	30,000	1,148	12,339	1,367	34,254	11,156	2,115	203,028
18	238,450	22,697	108,848	7,511	90,171	9,287	34,223	6,690	3,995	521,872
19	212,945	20,497	63,290	4,232	83,511	5,905	20,310	3,314	3,543	417,547
20	272,141	25,050	137,676	5,367	122,732	7,742	56,190	12,877	1,239	641,014
21	987,142	132,151	412,799	25,244	498,106	31,126	136,404	28,101	8,763	2,259,836
22	370,419	38,803	134,881	8,303	165,119	11,839	46,444	4,240	4,583	784,631
23	326,955	21,778	109,399	7,137	116,275	7,214	27,709	9,160	5,084	630,711
24	220,565	23,720	65,649	6,080	57,748	6,623	14,019	5,519	2,951	402,874
25	162,216	8,604	34,541	3,943	33,471	3,989	21,298	3,880	3,912	275,854
26	313,634	25,972	126,819	5,506	121,555	5,865	24,037	7,858	2,357	633,603
27	447,700	69,800	230,915	19,722	86,372	8,908	445,644	106,787	15,447	1,431,295
40	342,662	20,341	149,953	4,112	137,774	13,090	62,924	10,468	2,107	743,431
41	825,713	27,166	308,925	14,529	256,926	22,871	148,322	38,129	2,040	1,644,621
42	1,258,560	100,240	542,682	17,447	558,041	22,825	260,330	38,016	6,696	2,804,837
43	1,058,454	66,699	293,085	15,419	263,685	30,188	178,432	36,947	11,066	1,953,975
44	312,666	14,992	157,661	9,870	232,243	12,375	52,088	13,140	2,215	807,250
45	1,656,675	103,122	454,879	25,779	436,422	31,966	258,630	34,661	16,965	3,019,099
Totals	23,270,155	2,256,829	8,610,916	549,825	6,097,813	550,861	9,553,658	2,172,574	369,912	53,432,543

**2008 Liability SDIP Factors\*\***

Territory	Class 10	Class 15	Class 17	Class 18	Class 20	Class 21	Class 25	Class 26	Class 30	Weighted Average
1	1.808	1.808	1.563	1.550	1.124	1.078	1.124	1.078	2.106	1.437
2	1.734	1.734	1.516	1.420	1.107	1.072	1.107	1.072	2.100	1.408
3	1.752	1.752	1.519	1.544	1.119	1.088	1.119	1.088	1.988	1.432
4	1.668	1.668	1.501	1.471	1.110	1.087	1.110	1.087	1.922	1.391
5	1.675	1.675	1.467	1.516	1.106	1.086	1.106	1.086	1.823	1.386
6	1.622	1.622	1.459	1.454	1.105	1.078	1.105	1.078	1.721	1.375
7	1.623	1.623	1.416	1.465	1.095	1.088	1.095	1.088	1.801	1.387
8	1.559	1.559	1.381	1.486	1.099	1.091	1.099	1.091	1.725	1.361
9	1.525	1.525	1.346	1.492	1.085	1.069	1.085	1.069	1.915	1.341
10	1.538	1.538	1.345	1.376	1.104	1.095	1.104	1.095	1.649	1.347
11	1.485	1.485	1.313	1.398	1.094	1.078	1.094	1.078	1.619	1.348
12	1.515	1.515	1.305	1.379	1.100	1.078	1.100	1.078	1.861	1.372
13	1.442	1.442	1.317	1.422	1.098	1.085	1.098	1.085	1.718	1.316
14	1.427	1.427	1.293	1.325	1.104	1.084	1.104	1.084	1.475	1.339
15	1.412	1.412	1.299	1.312	1.120	1.084	1.120	1.084	1.538	1.327
16	1.408	1.408	1.281	1.138	1.079	1.081	1.079	1.081	1.446	1.297
17	1.519	1.519	1.359	1.593	1.057	1.090	1.057	1.090	1.613	1.364
18	1.357	1.357	1.223	1.223	1.078	1.050	1.078	1.050	1.923	1.256
19	1.341	1.341	1.240	1.386	1.076	1.049	1.076	1.049	1.459	1.255
20	1.400	1.400	1.228	1.147	1.072	1.098	1.072	1.098	1.507	1.260
21	1.425	1.425	1.275	1.269	1.084	1.079	1.084	1.079	1.484	1.291
22	1.349	1.349	1.288	1.331	1.072	1.075	1.072	1.075	1.203	1.257
23	1.426	1.426	1.235	1.212	1.070	1.040	1.070	1.040	1.752	1.302
24	1.506	1.506	1.232	1.323	1.059	1.108	1.059	1.108	2.041	1.371
25	1.495	1.495	1.326	1.249	1.063	1.048	1.063	1.048	1.871	1.377
26	1.365	1.365	1.254	1.420	1.098	1.112	1.098	1.112	1.840	1.278
27	1.797	1.797	1.547	1.578	1.118	1.085	1.118	1.085	2.133	1.447
40	1.283	1.283	1.202	1.196	1.074	1.097	1.074	1.097	1.129	1.203
41	1.342	1.342	1.236	1.263	1.077	1.056	1.077	1.056	1.804	1.246
42	1.251	1.251	1.192	1.199	1.063	1.075	1.063	1.075	1.482	1.181
43	1.323	1.323	1.273	1.292	1.079	1.073	1.079	1.073	1.577	1.253
44	1.308	1.308	1.201	1.232	1.060	1.086	1.060	1.086	1.238	1.192
45	1.266	1.266	1.247	1.268	1.083	1.087	1.083	1.087	1.446	1.218
Wtd. Avg	1.484	1.519	1.345	1.400	1.088	1.080	1.100	1.083	1.759	1.330

\* Derived from Exhibit 2, (written exposures \* manual rate).

\*\* From Section 100K, Exhibit 5

**Massachusetts Private Passenger Automobile  
Calculation of the Average SDIP Factor for Collision  
2007 Written Premium\* for Collision Coverage  
Facility Market**

Territory	Class 10	Class 15	Class 17	Class 18	Class 20	Class 21	Class 25	Class 26	Class 30	Totals
1	226,634	36,414	125,822	10,296	25,190	5,345	139,728	76,396	7,535	653,360
2	343,196	64,379	139,913	17,113	40,549	10,209	203,721	111,481	9,809	940,370
3	810,445	130,516	409,640	35,410	96,471	13,200	450,282	204,179	16,492	2,166,635
4	592,176	119,262	268,554	24,106	49,712	8,136	314,496	160,319	13,831	1,550,592
5	1,088,952	153,699	518,976	43,834	140,526	24,442	577,182	221,379	33,798	2,802,788
6	970,956	155,862	402,395	38,554	104,678	25,512	404,523	206,220	19,154	2,327,854
7	1,142,530	162,371	480,690	39,222	120,974	29,413	393,608	190,743	22,069	2,581,620
8	839,280	112,569	278,481	23,811	91,213	19,973	240,383	115,693	13,440	1,734,843
9	892,244	86,442	327,483	30,888	109,429	16,080	236,630	111,857	14,130	1,825,183
10	380,314	46,012	148,294	14,089	47,304	7,992	106,823	53,754	7,808	812,390
11	400,090	50,859	113,279	15,312	44,457	13,332	53,733	35,482	6,742	733,286
12	1,387,397	142,809	434,808	39,444	112,042	32,360	217,890	113,355	23,404	2,503,509
13	1,703,745	229,593	540,363	44,038	276,427	40,246	354,281	170,655	17,389	3,376,737
14	975,176	71,484	245,343	25,291	87,068	26,920	55,726	48,938	13,250	1,549,196
15	379,913	54,941	89,436	8,928	26,936	8,430	31,162	22,437	5,117	627,590
16	161,671	13,073	52,958	4,172	16,867	3,513	8,999	5,426	2,847	269,526
17	96,437	17,878	22,534	1,489	4,588	1,330	14,415	11,860	896	171,427
18	215,545	25,506	78,943	8,169	35,498	7,332	12,368	7,090	3,295	393,746
19	193,323	19,152	40,606	7,657	25,553	2,846	11,363	3,728	838	305,066
20	292,158	32,989	103,517	3,661	53,865	9,384	21,229	15,746	1,573	534,122
21	887,770	134,047	257,362	30,682	217,760	27,784	67,400	32,706	8,911	1,664,422
22	259,688	25,506	77,433	6,008	61,751	8,179	17,434	5,440	6,160	467,599
23	339,255	24,560	83,739	8,925	50,966	5,719	15,147	9,841	5,818	543,970
24	186,911	27,107	42,075	6,227	21,756	6,908	8,677	5,295	1,564	306,520
25	160,632	9,207	22,677	4,941	11,372	3,292	7,576	2,280	4,002	225,979
26	264,935	21,594	69,868	6,537	48,177	5,262	10,363	8,048	1,284	436,068
27	388,192	71,400	211,284	21,238	55,754	8,148	280,995	121,573	12,287	1,170,871
40	220,174	14,931	78,257	2,366	36,051	8,520	18,671	6,383	1,656	387,009
41	580,205	19,480	215,787	19,543	123,763	19,933	70,945	33,535	770	1,083,961
42	832,460	90,065	246,039	21,440	139,307	18,399	74,482	35,720	5,382	1,463,294
43	766,278	63,696	206,535	16,956	93,267	25,410	61,845	33,833	8,894	1,276,714
44	256,956	12,312	84,992	7,766	44,444	8,819	22,392	10,465	657	448,803
45	1,441,112	100,278	351,919	28,937	228,049	34,732	125,903	38,102	8,141	2,357,173
Totals	19,676,750	2,339,993	6,770,002	617,340	2,641,764	487,100	4,630,372	2,229,959	298,943	39,692,223

**2008 SDIP Factors\*\* for Collision Coverage**

Territory	Class 10	Class 15	Class 17	Class 18	Class 20	Class 21	Class 25	Class 26	Class 30	Weighted Totals
1	1.843	1.843	1.584	1.593	1.126	1.104	1.126	1.104	2.296	1.521
2	1.747	1.747	1.509	1.443	1.128	1.086	1.128	1.086	2.322	1.466
3	1.738	1.738	1.517	1.587	1.140	1.103	1.140	1.103	2.190	1.483
4	1.682	1.682	1.470	1.493	1.145	1.096	1.145	1.096	1.977	1.455
5	1.689	1.689	1.483	1.531	1.108	1.103	1.108	1.103	1.915	1.451
6	1.633	1.633	1.458	1.472	1.138	1.101	1.138	1.101	1.737	1.440
7	1.631	1.631	1.421	1.491	1.111	1.114	1.111	1.114	2.132	1.446
8	1.561	1.561	1.382	1.658	1.104	1.101	1.104	1.101	1.450	1.409
9	1.553	1.553	1.347	1.551	1.097	1.070	1.097	1.070	1.769	1.397
10	1.515	1.515	1.304	1.441	1.107	1.125	1.107	1.125	1.661	1.370
11	1.447	1.447	1.273	1.501	1.070	1.086	1.070	1.086	1.423	1.347
12	1.488	1.488	1.303	1.387	1.114	1.076	1.114	1.076	2.097	1.387
13	1.475	1.475	1.310	1.439	1.103	1.100	1.103	1.100	1.578	1.356
14	1.407	1.407	1.280	1.378	1.086	1.095	1.086	1.095	1.306	1.341
15	1.412	1.412	1.279	1.391	1.096	1.067	1.096	1.067	1.241	1.345
16	1.363	1.363	1.218	1.138	1.075	1.084	1.075	1.084	1.505	1.296
17	1.504	1.504	1.354	1.546	1.026	1.127	1.026	1.127	1.431	1.402
18	1.363	1.363	1.202	1.244	1.041	1.057	1.041	1.057	1.811	1.282
19	1.350	1.350	1.217	1.406	1.046	1.051	1.046	1.051	1.190	1.290
20	1.369	1.369	1.168	1.216	1.064	1.077	1.064	1.077	1.586	1.273
21	1.376	1.376	1.251	1.237	1.080	1.092	1.080	1.092	1.526	1.294
22	1.318	1.318	1.337	1.256	1.091	1.084	1.091	1.084	1.124	1.273
23	1.433	1.433	1.226	1.166	1.087	1.038	1.087	1.038	1.430	1.343
24	1.445	1.445	1.210	1.343	1.139	1.139	1.139	1.139	1.450	1.368
25	1.421	1.421	1.324	1.260	1.070	1.107	1.070	1.107	1.382	1.370
26	1.334	1.334	1.224	1.337	1.109	1.197	1.109	1.197	1.563	1.283
27	1.799	1.799	1.532	1.530	1.145	1.094	1.145	1.094	2.453	1.487
40	1.314	1.314	1.207	1.190	1.075	1.124	1.075	1.124	1.255	1.250
41	1.353	1.353	1.214	1.266	1.076	1.055	1.076	1.055	0.976	1.259
42	1.274	1.274	1.212	1.248	1.107	1.104	1.107	1.104	1.683	1.234
43	1.355	1.355	1.277	1.267	1.071	1.063	1.071	1.063	1.299	1.293
44	1.312	1.312	1.211	1.255	1.069	1.093	1.069	1.093	1.080	1.246
45	1.263	1.263	1.233	1.289	1.094	1.094	1.094	1.094	1.684	1.230
Wtd. Avg.	1.489	1.526	1.354	1.424	1.099	1.092	1.115	1.096	1.798	1.373

\* Derived from Exhibit 2, (written exposures \* manual rate).

\*\* From Section 100K, Exhibit 5.

**Massachusetts Private Passenger Automobile  
Determination of Average Discount Factors  
Facility Market**

**Senior Citizen Discount for Med. Pay, U-1, & U-2**

(A)	(B)	(C)	(D)	(E)
<u>Class</u>	<u>2007 Written Liability Exposures*</u>	<u>Percent of Exposures At This Limit</u>	<u>Senior Citizen Discount</u>	<u>Weighted Discount (B) X (D)</u>
Class 10	106,166.3	59.76%	0.0%	0.0
Class 15	14,135.3	7.96%	25.0%	3,533.8
Class 17	22,959.7	12.92%	0.0%	0.0
Class 18	2,152.8	1.21%	0.0%	0.0
Class 20	8,297.4	4.67%	0.0%	0.0
Class 21	1,147.4	0.65%	0.0%	0.0
Class 25	15,488.0	8.72%	0.0%	0.0
Class 26	5,604.6	3.15%	0.0%	0.0
Class 30	1,690.5	0.95%	0.0%	0.0
Total / Average	177,642.0	100.00%	2.0%	3,533.8

Offset Factor = 100% - 2% = 98%

\*In Car-Years, from Section 100J, Exhibit 2.

**Massachusetts Private Passenger Automobile  
Determination of Average Discount Factors  
Facility Market**

<b>Annual Mileage Discount *</b>				
(A) Expected VMT <u>Codes 2,3&amp;4</u>	(B) 2007 Written <u>Exposures</u>	(C) Percent of Exposures <u>At This Limit</u>	(D) Annual Mileage <u>Discount</u>	(E) Weighted Discount <u>(B) X (D)</u>
0	22	0.01%	10.0%	2.2
100-1000	456	0.26%	10.0%	45.6
1100-2000	539	0.30%	10.0%	53.9
2100-2500	270	0.15%	10.0%	27.0
2600-3000	409	0.23%	10.0%	40.9
3100-4000	686	0.39%	10.0%	68.6
4100-5000	1,371	0.77%	10.0%	137.1
5100-6000	584	0.33%	5.0%	29.2
6100-6500	263	0.15%	5.0%	13.1
6600-7000	356	0.20%	5.0%	17.8
7100-7500	379	0.21%	5.0%	19.0
7600-8000	0	0.00%	0.0%	0.0
8100-8500	0	0.00%	0.0%	0.0
8600-10000	0	0.00%	0.0%	0.0
10100-12500	0	0.00%	0.0%	0.0
12600-15000	0	0.00%	0.0%	0.0
Over 15000	0	0.00%	0.0%	0.0
Subtotal	5,335			
All Other Codes	172,308	97.00%	0.0%	0.0
Total / Average	177,642	100.00%	0.3%	454.4

Offset Factor = 100% - 0.3% = 99.7%

\* Not applicable to Comprehensive or Substitute Transportation coverages.

**Massachusetts Private Passenger Automobile  
Determination of Average Discount Factors  
Facility Market**

**Public Transportation Discount for PDL Coverage**

(A)	(B)	(C)	(D)	(E)	(F)	(G)
<u>Class</u>	<u>2007 Written Liability Exposures*</u>	<u>Percent of Exposures</u>	<u>Public Transportation Discount</u>	<u>Utilization</u>	<u>Overall Discount (D) x (E)</u>	<u>Weighted Discount (B) x (F)</u>
Class 10	106,166.3	59.76%	10.0%	3.6%	0.36%	382.2
Class 15	14,135.3	7.96%	10.0%	3.6%	0.36%	50.9
Class 17	22,959.7	12.92%	10.0%	2.1%	0.21%	48.2
Class 18	2,152.8	1.21%	10.0%	2.1%	0.21%	4.5
Class 20	8,297.4	4.67%	10.0%	2.1%	0.21%	17.4
Class 21	1,147.4	0.65%	10.0%	2.1%	0.21%	2.4
Class 25	15,488.0	8.72%	10.0%	2.1%	0.21%	32.5
Class 26	5,604.6	3.15%	10.0%	2.1%	0.21%	11.8
Class 30	1,690.5	0.95%	0.0%	0.0%	0.00%	0.0
Tot/Avg	177,642.0	100.00%			0.31%	549.9
Offset Factor = 100% - 0.3% =					99.7%	

\*In Car-Years, from Section 100J, Exhibit 2.

**Massachusetts Private Passenger Automobile  
Determination of Average Discount Factors  
Facility Market**

**Public Transportation Discount for Collision Coverage**

(A)	(B)	(C)	(D)	(E)	(F)	(G)
<u>Class</u>	<u>2007 Written Collision Exposures*</u>	<u>Percent of Exposures</u>	<u>Public Transportation Discount</u>	<u>Utilization</u>	<u>Overall Discount (D) x (E)</u>	<u>Weighted Discount (B) x (F)</u>
Class 10	58,693.4	62.98%	10.0%	3.6%	0.36%	211.3
Class 15	9,715.9	10.42%	10.0%	3.6%	0.36%	35.0
Class 17	10,359.6	11.12%	10.0%	2.1%	0.21%	21.8
Class 18	1,433.6	1.54%	10.0%	2.1%	0.21%	3.0
Class 20	2,534.5	2.72%	10.0%	2.1%	0.21%	5.3
Class 21	670.1	0.72%	10.0%	2.1%	0.21%	1.4
Class 25	4,951.9	5.31%	10.0%	2.1%	0.21%	10.4
Class 26	3,876.9	4.16%	10.0%	2.1%	0.21%	8.1
Class 30	963.3	1.03%	0.0%	0.0%	0.00%	0.0
Tot/Avg	93,199.2	100.00%			0.32%	296.3
					Offset Factor = 100% - 0.3% =	99.7%

\*In Car-Years, from Section 100J, Exhibit 2.

**Massachusetts Private Passenger Automobile  
Calculation of Multi-Car Average Discount Factors  
Facility Market**

**Bodily Injury**

	<u>Multi Car Code</u>	<u>2007 Written Exposure</u>	<u>Proportion of Total</u>	<u>Average Manual Rate*</u>	<u>Multi-Car Discount</u>	<u>Multi-Car Discount Factor</u>
Class 10	1 & 4	36,236.2	0.3409	263.46	5.0%	
	A/O	70,068.3	0.6591			
	Total	106,304.5	1.0000			
Class 15	1 & 4	4,110.9	0.2908	184.71	5.0%	
	A/O	10,025.2	0.7092			
	Total	14,136.1	1.0000			
Class 17	1 & 4	3,790.9	0.1649	467.27	5.0%	
	A/O	19,194.7	0.8351			
	Total	22,985.6	1.0000			
Class 18	1 & 4	964.1	0.4467	308.73	5.0%	
	A/O	1,194.0	0.5533			
	Total	2,158.1	1.0000			
Class 20	1 & 4	1,348.2	0.1623	787.88	5.0%	
	A/O	6,956.2	0.8377			
	Total	8,304.4	1.0000			
Class 21	1 & 4	382.4	0.3330	548.93	5.0%	
	A/O	765.9	0.6670			
	Total	1,148.3	1.0000			
Class 25	1 & 4	2,137.5	0.1380	630.56	5.0%	
	A/O	13,356.6	0.8620			
	Total	15,494.1	1.0000			
Class 26	1 & 4	2,446.0	0.4367	392.42	5.0%	
	A/O	3,154.9	0.5633			
	Total	5,600.9	1.0000			
Class 30	1 & 4	756.6	0.4477	237.56	5.0%	
	A/O	933.4	0.5523			
	Total	1,690.0	1.0000			
All Classes		177,822.0		346.25	\$4.54	0.987

\* From Section 100J, Exhibit 2.  
BI manual rate includes A-1 and B

**Massachusetts Private Passenger Automobile  
Calculation of Multi-Car Average Discount Factors  
Facility Market**

**PIP**

	<u>Multi Car Code</u>	<u>2007 Written Exposure</u>	<u>Proportion of Total</u>	<u>Average Manual Rate*</u>	<u>Multi-Car Discount</u>	<u>Multi-Car Discount Factor</u>
Class 10	1 & 4	36,194.3	0.3410	90.22	5.0%	
	A/O	69,955.6	0.6590			
	Total	106,149.9	1.0000			
Class 15	1 & 4	4,112.2	0.2909	63.32	5.0%	
	A/O	10,024.8	0.7091			
	Total	14,137.0	1.0000			
Class 17	1 & 4	3,768.4	0.1644	154.87	5.0%	
	A/O	19,157.2	0.8356			
	Total	22,925.6	1.0000			
Class 18	1 & 4	955.8	0.4453	103.45	5.0%	
	A/O	1,190.8	0.5547			
	Total	2,146.6	1.0000			
Class 20	1 & 4	1,346.1	0.1624	258.00	5.0%	
	A/O	6,944.0	0.8376			
	Total	8,290.1	1.0000			
Class 21	1 & 4	377.8	0.3325	183.22	5.0%	
	A/O	758.3	0.6675			
	Total	1,136.1	1.0000			
Class 25	1 & 4	2,133.2	0.1378	207.75	5.0%	
	A/O	13,346.2	0.8622			
	Total	15,479.4	1.0000			
Class 26	1 & 4	2,439.2	0.4359	132.01	5.0%	
	A/O	3,156.4	0.5641			
	Total	5,595.6	1.0000			
Class 30	1 & 4	753.2	0.4463	81.58	5.0%	
	A/O	934.3	0.5537			
	Total	1,687.5	1.0000			
All Classes		177,547.8		116.52	\$1.54	0.987

\* From Section 100J, Exhibit 2.



**Massachusetts Private Passenger Automobile  
Calculation of Multi-Car Average Discount Factors  
Facility Market**

**Property Damage Liability**

	<u>Multi Car Code</u>	<u>2007 Written Exposure</u>	<u>Proportion of Total</u>	<u>Average Manual Rate*</u>	<u>Multi-Car Discount</u>	<u>Multi-Car Discount Factor</u>
Class 10	1 & 4	36,219.4	0.3412	219.19	5.0%	
	A/O	69,948.2	0.6588			
	Total	106,167.6	1.0000			
Class 15	1 & 4	4,109.2	0.2907	159.66	5.0%	
	A/O	10,027.2	0.7093			
	Total	14,136.4	1.0000			
Class 17	1 & 4	3,790.8	0.1651	375.04	5.0%	
	A/O	19,168.0	0.8349			
	Total	22,958.8	1.0000			
Class 18	1 & 4	963.1	0.4474	255.40	5.0%	
	A/O	1,189.8	0.5526			
	Total	2,152.9	1.0000			
Class 20	1 & 4	1,346.9	0.1624	734.91	5.0%	
	A/O	6,947.8	0.8376			
	Total	8,294.7	1.0000			
Class 21	1 & 4	382.4	0.3336	480.09	5.0%	
	A/O	764.0	0.6664			
	Total	1,146.4	1.0000			
Class 25	1 & 4	2,136.7	0.1380	616.84	5.0%	
	A/O	13,350.6	0.8620			
	Total	15,487.3	1.0000			
Class 26	1 & 4	2,446.3	0.4365	387.64	5.0%	
	A/O	3,158.0	0.5635			
	Total	5,604.3	1.0000			
Class 30	1 & 4	757.8	0.4483	218.82	5.0%	
	A/O	932.7	0.5517			
	Total	1,690.5	1.0000			
All Classes		177,638.9		300.79	\$3.90	0.987

\* From Section 100J, Exhibit 2.

**Massachusetts Private Passenger Automobile  
Calculation of Multi-Car Average Discount Factors  
Facility Market**

**Collision**

	<u>Multi Car Code</u>	<u>2007 Written Exposure</u>	<u>Proportion of Total</u>	<u>Average Manual Rate*</u>	<u>Multi-Car Discount</u>	<u>Multi-Car Discount Factor</u>
Class 10	1 & 4	19,395.0	0.3304	335.25	5.0%	
	A/O	39,299.3	0.6696			
	Total	58,694.3	1.0000			
Class 15	1 & 4	2,611.6	0.2688	240.84	5.0%	
	A/O	7,104.5	0.7312			
	Total	9,716.1	1.0000			
Class 17	1 & 4	1,464.4	0.1413	653.50	5.0%	
	A/O	8,897.1	0.8587			
	Total	10,361.5	1.0000			
Class 18	1 & 4	602.7	0.4204	430.62	5.0%	
	A/O	830.9	0.5796			
	Total	1,433.6	1.0000			
Class 20	1 & 4	378.4	0.1494	1042.32	5.0%	
	A/O	2,154.0	0.8506			
	Total	2,532.4	1.0000			
Class 21	1 & 4	222.3	0.3322	726.91	5.0%	
	A/O	446.9	0.6678			
	Total	669.2	1.0000			
Class 25	1 & 4	948.0	0.1914	935.07	5.0%	
	A/O	4,004.1	0.8086			
	Total	4,952.1	1.0000			
Class 26	1 & 4	1,750.0	0.4514	575.19	5.0%	
	A/O	2,126.6	0.5486			
	Total	3,876.6	1.0000			
Class 30	1 & 4	414.4	0.4302	310.33	5.0%	
	A/O	548.8	0.5698			
	Total	963.2	1.0000			
All Classes		93,199.0		\$425.89	\$5.86	0.986

\* From Section 100J, Exhibit 2.

**Massachusetts Private Passenger Automobile  
Calculation of Multi-Car Average Discount Factors  
Facility Market**

**Limited Collision**

	<u>Multi Car Code</u>	<u>2007 Written Exposure</u>	<u>Proportion of Total</u>	<u>Average Manual Rate*</u>	<u>Multi-Car Discount</u>	<u>Multi-Car Discount Factor</u>
Class 10	1 & 4	394.9	0.3080	23.39	5.0%	
	A/O	887.3	0.6920			
	Total	1,282.2	1.0000			
Class 15	1 & 4	73.4	0.2775	16.20	5.0%	
	A/O	191.1	0.7225			
	Total	264.5	1.0000			
Class 17	1 & 4	72.5	0.1681	42.35	5.0%	
	A/O	358.8	0.8319			
	Total	431.3	1.0000			
Class 18	1 & 4	7.8	0.2786	32.28	5.0%	
	A/O	20.2	0.7214			
	Total	28.0	1.0000			
Class 20	1 & 4	27.5	0.1388	62.01	5.0%	
	A/O	170.6	0.8612			
	Total	198.1	1.0000			
Class 21	1 & 4	10.8	0.3375	47.56	5.0%	
	A/O	21.2	0.6625			
	Total	32.0	1.0000			
Class 25	1 & 4	50.2	0.0929	56.51	5.0%	
	A/O	490.4	0.9071			
	Total	540.6	1.0000			
Class 26	1 & 4	18.2	0.3199	37.63	5.0%	
	A/O	38.7	0.6801			
	Total	56.9	1.0000			
Class 30	1 & 4	3.2	0.2807	22.66	5.0%	
	A/O	8.2	0.7193			
	Total	11.4	1.0000			
All Classes		2,845.0		\$35.22	\$0.34	0.990

\* From Section 100J, Exhibit 2.

**Massachusetts Private Passenger Automobile  
Calculation of Multi-Car Average Discount Factors  
Facility Market**

**Comprehensive**

	<b>Multi Car Code</b>	<b>2007 Written Exposure</b>	<b>Proportion of Total</b>	<b>Average Manual Rate*</b>	<b>Multi-Car Discount</b>	<b>Multi-Car Discount Factor</b>
Class 10	1 & 4	21,699.1	0.3318	152.98	5.0%	
	A/O	43,693.7	0.6682			
	Total	65,392.8	1.0000			
Class 15	1 & 4	2,944.0	0.2744	107.76	5.0%	
	A/O	7,785.4	0.7256			
	Total	10,729.4	1.0000			
Class 17	1 & 4	1,877.9	0.1450	147.68	5.0%	
	A/O	11,074.7	0.8550			
	Total	12,952.6	1.0000			
Class 18	1 & 4	675.2	0.4220	144.21	5.0%	
	A/O	924.8	0.5780			
	Total	1,600.0	1.0000			
Class 20	1 & 4	500.5	0.1435	176.84	5.0%	
	A/O	2,986.3	0.8565			
	Total	3,486.8	1.0000			
Class 21	1 & 4	252.6	0.3292	161.25	5.0%	
	A/O	514.8	0.6708			
	Total	767.4	1.0000			
Class 25	1 & 4	1,317.2	0.1549	125.32	5.0%	
	A/O	7,186.7	0.8451			
	Total	8,503.9	1.0000			
Class 26	1 & 4	1,951.4	0.4477	123.86	5.0%	
	A/O	2,407.1	0.5523			
	Total	4,358.5	1.0000			
Class 30	1 & 4	462.1	0.4256	135.38	5.0%	
	A/O	623.6	0.5744			
	Total	1,085.7	1.0000			
All Classes		108,877.1		\$145.08	\$2.12	0.985

\* From Section 100J, Exhibit 2.

**Massachusetts Private Passenger Automobile  
Determination of Anti-Theft Average Discount Factors  
Facility Market**

<b>(A)</b> <b>Anti-Theft</b> <b>Category</b>	<b>(B)</b> <b>2007 Written</b> <b>Premium</b>	<b>(C)</b> <b>Estimated</b> <b>Premium</b> <b>Without Discount</b>	<b>(D)</b> <b>Anti-Theft</b> <b>Discount</b>	<b>(E)</b> <b>Discount</b> <b>Factor</b>
0	\$ 6,631,426	\$ 6,631,426	0%	1.000
1	\$ 228,923	\$ 240,972	5%	0.950
2	\$ 631,827	\$ 743,326	15%	0.850
3/4	\$ 6,525,513	\$ 8,156,891	20%	0.800
5	\$ 16,673	\$ 22,231	25%	0.750
6	\$ 17,093	\$ 24,419	30%	0.700
7	\$ 349,461	\$ 537,632	35%	0.650
8	\$ 4,068	\$ 5,424	25%	0.750
9	\$ 786	\$ 1,092	28%	0.720
A	\$ 1,246	\$ 1,832	32%	0.680
B	\$ 4,282	\$ 6,691	36%	0.640
Totals	\$ 14,411,298	\$ 16,371,935		0.880
<b>(F)</b> <b>High Theft</b> <b>Category</b>	<b>(G)</b> <b>2007 Written</b> <b>Premium</b>	<b>(H)</b> <b>Estimated</b> <b>Premium</b> <b>Without Surcharge</b>	<b>(I)</b> <b>High Theft</b> <b>Surcharge*</b>	<b>(J)</b> <b>Surcharge</b> <b>Factor</b>
1	147,259	\$ 99,734	47.7%	1.477
<b>(K)</b> <b>Total</b> <b>Written Premium</b>	<b>(L)</b> <b>Total Premium</b> <b>Without</b> <b>Discount / Surcharge</b>	<b>(M)</b> <b>Average</b> <b>Discount Factor</b>		
\$ 14,558,557	\$ 16,471,669	0.884		

(C) = (B)/(E)

(H) = (G)/(J)

(M) = (K)/(L)

\* This is the estimated High Theft Surcharge (50%) combined with any applicable Anti-Theft Discount

**Massachusetts Private Passenger Automobile  
Substitute Transportation Average Manual Rate Calculation  
Facility Market**

(A)	(B)	(C)	(D)
<u>Limit</u>	<u>2008 Manual Rate</u>	<u>Est.2007 Earned Exposures*</u>	<u>(D)=(B)*(C)</u>
\$15/day	\$22.00	5,357	\$117,854
\$30/day	\$91.00	56,123	\$5,107,193
		Weighted Average	\$84.99

\*From 100X, Exhibit 1, Pages 2-3

**Massachusetts Private Passenger Automobile  
Estimate of Passive Restraint Off-Balance  
Facility Market**

<u>Calendar Year</u>	<u>% Exposures * w/Passive Restraint Discount</u>	<u>Est'd Average Rating Factor For Calendar Year</u>
2002	79.9%	
2003	84.7%	
2004	88.3%	
2005	91.2%	
2006	93.2%	
2007	94.5%	
<b>2008.252</b>	<b>95.7%</b>	<b>0.761</b>

\* 2008 & 2009 Exposures estimated using judgment based on multiple forecasts.

Regression results:

	<u>% w/Discount 2002 - 2007</u>	<u>% w/Discount 2004 - 2007</u>
Estimated		
Annual Change	2.90%	2.06%
R-square	95.6%	97.1%

*Commonwealth Automobile Reinsurers*

**Filing for Residual Market Rates  
Effective 4/1/2009**

**Manual Rates: 100K, 100L**



## Massachusetts Private Passenger Automobile

### Manual Base Rates

The calculation of manual base rates is explained in this section, including rates that do not vary by class and territory. The proposed manual base rates for A-1, A-2, B, PDL, Collision, and Comprehensive reflect selected rate changes that are uniform by class and territory in accordance with Bulletin 2008-09. In general, rates for these coverages are increased by 10%, significantly less than the indicated rate need. The calculation, including necessary adjustments for changes to rating factors, are explained below.

Average rates by coverage that reflect the expected effect of other rating factors, such as discounts and merit rating adjustments, are estimated in order to quantify the proposed rate level effect on Form 110.

Rates for MedPay, U-1, U-2, and Substitute Transportation do not vary by class/territory. Manual rates are produced on a statewide basis as shown on 100L.

#### Class/Territory Manual Rates

Proposed manual base rates by class and territory reflect a uniform change from current (4/1/2008) manual base rates of no more than +10%, in accordance with Bulletin 2008-09. Current and proposed manual base rates for A-1, A-2, B, PDL, Collision, and Comprehensive are displayed in Exhibits 2 and 3, respectively. The percent change from current rates, including the statewide average which is based on 2007 written exposures (Exhibit 1), are shown on Exhibit 4.<sup>1</sup> For A-1, PDL, Collision, and Comprehensive, the proposed base rates are derived from current base rates increased by +10%. The calculations for A-2 and B additionally reflect adjustments necessary to properly account for other rating factor changes.

The proposed base rates for A-2 are balanced for the elimination of the passive restraint discount. Current base rates are first adjusted to the estimated average discount level (Exhibit 2, page 2a) and then increased uniformly by +10% (results shown on Exhibit 3, page 2). Before accounting for the adjustment to current base rates, the statewide average manual base rate change is -16.2% (\$97.63 [Exhibit 3, p. 2] compared

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<sup>1</sup> Percentage changes derived by dividing the proposed base rate (rounded to the nearest whole dollar) by the current (whole dollar) base rate deviate from the applied percentage due to rounding.

to \$116.52 [Exhibit 2, p. 2]). When compared to *adjusted* current rates (Exhibit 2, p. 2a), the manual base rate change that underlies the estimated rate level change is +10.1% (\$97.63 [Exhibit 3, p. 2] compared to \$88.70 [Exhibit 2, p. 2a]).

The proposed base rates for B comply with the provisions of Bulletin 2008-09 that limit the premium change for the basic coverage package (A-1, B, A-2, PDL) to +10% for up to 4 SDIP points and require changes to be uniform by class and territory. The basic coverage package premiums using current rates are shown on Exhibit 7a for SDIP levels of up to 4 points. The 4 point premiums for the basic coverage package (which experience the largest increase from applying SDIP rating to coverage B) are increased uniformly by 10% and coverage B proposed base rates are then derived by removing the previously determined proposed rates for A-1, A-2, and PDL. The resulting proposed statewide average manual rate for coverage B (Exhibit 3, page 3) is +7.3% greater than current (\$37.77 [Exhibit 3, p. 3] compared to \$35.17 [Exhibit 2, p. 3]) prior to reflecting the on-balance adjustment for the effect of including SDIP. Using current rates that are adjusted for the expected level of SDIP (Exhibit 2, page 3a), the average manual rate change that underlies the estimated rate level change is -1.9% (\$37.77 [Exhibit 3, p. 3] compared to \$38.50 [Exhibit 2, p. 3a]).

Exhibit 7b and 7c show the proposed premiums for the basic coverage package and the percentage change from current premiums, respectively. Although the derived coverage B manual base rates are not a uniform percentage change from current manual base rates by class and territory (Exhibit 4, page 3), the basic coverage package premium change is uniform and does not exceed +10% for up to 4 SDIP points.

### **Proposed Average Rates**

The proposed manual base rates are shown in Exhibit 4. The proposed base rates are combined with expected average rating factors (Exhibit 5) to determine the proposed average rates by coverage (Exhibit 6) that are used to produce the proposed rate level change shown on Form 110.

### **Rates Not Varying by Class or Territory**

Manual rates for coverages that do not vary by class or territory are calculated on 100L from the indicated average rates shown on Form 110. Off-balances for the discounts applicable to these coverages are applied to adjust the average rate to the

manual base rate level<sup>2</sup>. The off-balance factors are derived from the residual market exposure distribution for each discount.

The manual base rate for U-1 is selected from the current manual base rate adjusted for the elimination of the passive restraint discount ( $\$15 \times 0.761 = \$11.23$ ). A base rate of \$21 complies with Bulletin 2008-09 that limits the base rate increase for U-1 to \$10.

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<sup>2</sup> The passive restraint discount is proposed to be eliminated and is not included as an off-balance for MedPay, U-1 and U-2 manual rates.

<b><u>Exhibit</u></b>	<b><u>Contents</u></b>
1	2007 Calendar Year Written Exposures
2	Current (4/1/2008) Manual Base Rates
3	Proposed Manual Base Rates
4	Proposed Manual Base Rate Change
5	Average Rating Factors
6	Proposed Average Rates
7	Basic Coverage Package (A-1, A-2, B, PDL) – Premiums and Percent Change (SDIP 4 points and less)

**Massachusetts Private Passenger Automobile  
2007 Written Exposures  
Facility Market**

**Liability**

Territory	Class									
	10	15	17	18	20	21	25	26	30	
1	1,561.8	291.9	465.1	48.8	89.2	12.9	547.0	219.3	45.3	
2	2,279.2	499.9	542.6	75.2	129.5	24.2	676.2	317.6	57.7	
3	5,588.5	947.0	1,463.3	142.4	291.9	43.2	1,572.8	604.7	121.4	
4	3,713.4	817.0	968.8	92.5	163.1	26.9	1,100.3	435.9	77.1	
5	7,138.2	1,054.9	1,903.3	204.6	426.1	72.7	1,952.2	604.8	197.2	
6	5,603.9	966.6	1,316.6	135.8	265.3	64.8	1,417.8	497.2	110.5	
7	6,704.9	1,014.0	1,524.9	165.8	368.7	61.3	1,289.2	461.1	129.6	
8	4,663.0	641.3	938.1	82.4	253.9	46.2	782.5	288.6	81.6	
9	5,443.5	531.4	1,190.2	111.5	335.2	42.8	833.8	263.8	80.8	
10	2,369.8	289.2	553.3	49.9	130.8	35.4	398.2	133.2	41.1	
11	2,023.2	313.0	336.1	50.2	112.7	30.2	163.3	85.8	34.5	
12	6,442.9	700.2	1,211.7	128.3	307.8	67.5	584.7	230.4	111.8	
13	8,682.8	1,300.2	1,762.1	133.0	705.8	87.7	953.6	358.7	80.8	
14	4,066.5	336.2	656.8	67.0	234.8	55.0	162.8	89.2	73.4	
15	1,389.6	220.0	232.2	24.5	87.8	16.2	83.4	49.4	23.8	
16	669.4	76.5	176.3	8.1	68.8	8.4	29.8	14.4	15.5	
17	446.1	82.2	71.6	4.4	16.3	3.1	50.3	28.1	9.7	
18	997.7	126.8	231.1	25.9	116.5	18.5	49.1	14.8	17.0	
19	855.2	110.2	136.4	14.2	111.2	12.2	30.0	7.6	14.7	
20	1,178.1	144.8	298.0	19.1	159.6	15.8	81.2	29.2	5.1	
21	3,629.2	647.8	811.0	77.2	658.0	56.8	200.3	57.0	32.1	
22	1,076.8	150.4	248.4	20.5	218.7	20.1	68.3	8.0	13.6	
23	1,571.9	139.6	230.8	23.4	151.4	14.2	40.1	20.0	22.3	
24	871.8	125.5	138.5	20.0	74.9	13.6	20.2	12.6	11.9	
25	675.9	47.8	67.2	13.1	43.3	7.4	30.6	8.0	15.4	
26	1,092.8	120.8	241.1	14.8	161.0	10.2	35.4	15.2	8.3	
27	2,964.9	617.7	868.1	110.8	166.1	29.4	950.2	392.6	102.3	
40	1,536.6	121.8	359.6	14.9	182.0	27.5	92.4	24.4	8.2	
41	3,637.5	159.8	760.9	50.8	339.4	45.2	217.8	83.8	8.5	
42	5,520.0	586.2	1,239.0	56.1	718.2	41.5	371.9	76.8	24.8	
43	4,039.9	340.3	651.3	49.9	339.8	54.1	256.0	73.6	41.6	
44	1,503.2	96.1	356.7	32.9	307.2	24.7	76.6	29.2	10.3	
45	6,228.1	518.2	1,008.6	84.8	562.4	57.7	370.0	69.6	62.6	
<b>Total</b>										
<b>Class Total</b>	106,166.3	14,135.3	22,959.7	2,152.8	8,297.4	1,147.4	15,488.0	5,604.6	1,690.5	177,642.0

	10-15	20-25	21-26
<b>Class Group</b>	120,301.6	23,785.4	6,752.0

**Massachusetts Private Passenger Automobile  
2007 Written Exposures  
Facility Market**

**Collision**

Territory	Class								
	10	15	17	18	20	21	25	26	30
1	964.4	206.9	242.9	33.0	26.6	10.2	164.0	162.2	32.2
2	1,400.8	351.8	266.5	54.5	41.0	19.9	228.9	241.3	40.2
3	3,254.8	701.7	744.8	105.7	95.8	24.4	497.0	418.4	66.5
4	2,277.6	611.6	469.5	70.9	47.8	14.1	336.0	308.9	53.4
5	4,140.5	780.2	901.0	125.6	133.2	40.4	608.2	406.2	129.0
6	3,467.7	742.2	654.3	104.2	96.3	39.8	413.2	357.4	68.9
7	3,859.9	731.4	763.0	98.3	111.6	43.9	403.7	315.8	76.1
8	2,769.9	495.9	447.0	57.1	84.3	29.9	246.8	192.5	44.8
9	2,944.7	380.8	526.5	78.0	101.7	24.0	244.2	185.5	47.1
10	1,289.2	208.2	232.8	35.4	43.8	11.6	109.9	86.7	26.2
11	1,254.2	212.8	159.1	35.2	42.3	19.1	56.8	56.5	21.2
12	3,919.2	538.9	594.0	86.5	106.1	42.3	229.6	165.0	66.3
13	4,785.8	859.9	813.8	90.8	259.8	52.2	370.2	245.9	49.4
14	2,468.8	241.5	333.8	47.9	83.8	33.4	59.6	67.5	33.8
15	804.9	155.2	116.0	16.2	26.0	10.0	33.4	29.6	11.1
16	387.7	41.9	70.8	8.1	16.7	4.9	9.9	8.4	7.1
17	289.6	71.8	32.1	3.4	4.3	2.0	15.0	19.8	2.7
18	530.9	83.9	101.6	15.8	34.1	9.4	13.2	10.1	8.3
19	459.2	60.8	51.4	13.0	25.3	3.5	12.5	5.1	2.0
20	647.8	97.6	131.2	6.4	52.5	11.6	23.0	21.6	3.6
21	1,892.9	381.9	320.5	46.7	213.7	30.2	73.5	39.5	15.8
22	499.4	65.4	97.4	8.9	61.2	9.2	19.2	6.8	8.8
23	945.0	91.3	105.2	14.1	49.1	6.8	16.2	13.0	14.4
24	475.6	92.2	55.0	11.2	21.0	8.8	9.3	7.5	4.0
25	388.0	29.7	28.1	8.1	10.8	3.9	8.0	3.0	9.2
26	542.9	59.0	86.9	9.8	47.7	6.0	11.4	10.2	2.4
27	1,733.0	425.0	427.7	74.0	60.8	16.8	340.6	278.2	55.1
40	609.9	55.3	112.6	4.8	34.4	11.3	19.8	9.4	4.5
41	1,726.8	77.3	301.8	37.8	117.2	25.2	74.6	47.1	2.2
42	2,140.0	309.5	321.2	36.4	132.8	21.8	78.9	47.0	14.2
43	1,833.2	203.5	271.4	29.8	90.2	30.0	66.5	44.4	21.8
44	676.2	43.2	111.1	15.5	42.9	12.3	24.0	16.2	1.8
45	3,312.9	307.6	468.6	50.5	219.7	41.2	134.8	50.2	19.2

Total

Class Total	58,693.4	9,715.9	10,359.6	1,433.6	2,534.5	670.1	4,951.9	3,876.9	963.3	93,199.2
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Class Group	10-15	52938.60
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Class Group	20-25	4108.60	21-26	3331.95
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**Massachusetts Private Passenger Automobile  
2007 Written Exposures  
Facility Market  
Comprehensive**

Territory	All except Class 15	Class 15	
1	1,987.1	235.2	
2	2,734.6	391.1	
3	6,177.5	773.8	
4	4,242.7	677.2	
5	7,723.3	847.8	
6	6,189.9	799.5	
7	6,725.8	795.0	
8	4,534.2	529.1	
9	4,891.3	425.1	
10	2,341.9	232.2	
11	1,830.0	229.2	
12	5,893.6	586.7	
13	7,585.3	970.4	
14	3,396.9	259.5	
15	1,182.5	175.3	
16	600.6	50.7	
17	407.6	73.9	
18	870.7	92.3	
19	694.2	66.5	
20	1,045.5	106.7	
21	3,104.9	426.8	
22	868.0	79.5	
23	1,346.7	101.7	
24	698.9	92.2	
25	522.0	34.7	
26	874.8	70.5	
27	3,629.6	464.8	
40	1,145.8	68.8	
41	2,646.0	85.2	
42	3,536.6	354.2	
43	2,735.7	235.2	
44	1,229.0	59.2	
45	4,753.1	339.5	
<b>Class Total</b>	<b>98,146.3</b>	<b>10,729.5</b>	<b>Total</b>
			<b>108,875.8</b>

**Massachusetts Private Passenger Automobile  
Current Manual Base Rates (eff. 4/01/2008)  
Facility Market**

A-1

Territory	Class									
	10	15	17	18	20	21	25	26	30	
1	122	91	220	138	411	217	371	195	119	
2	133	99	240	154	447	245	403	221	129	
3	140	105	252	166	485	263	437	237	136	
4	151	113	279	172	538	305	484	274	145	
5	154	115	278	194	565	326	509	293	153	
6	167	125	309	191	606	373	546	336	163	
7	171	128	298	211	644	380	580	341	165	
8	182	136	331	218	677	408	609	367	177	
9	208	156	355	248	701	426	630	383	202	
10	210	157	416	277	746	491	671	442	213	
11	204	153	452	274	734	494	660	444	231	
12	226	169	431	299	735	530	661	477	220	
13	256	192	469	322	736	534	662	480	250	
14	287	215	491	361	724	551	651	496	279	
15	341	255	547	378	722	595	650	536	327	
16	286	214	558	494	706	576	636	519	294	
17	218	163	421	265	717	425	645	382	219	
18	222	166	550	301	736	530	662	477	252	
19	270	202	538	358	703	538	634	484	300	
20	250	187	549	337	729	553	657	498	276	
21	306	229	553	458	708	582	638	524	425	
22	301	225	553	446	710	572	639	515	411	
23	230	172	510	356	717	528	646	475	233	
24	232	174	455	294	721	474	648	427	235	
25	230	172	515	309	723	545	650	491	251	
26	283	212	559	395	705	581	635	523	273	
27	106	79	201	118	369	184	332	165	109	
40	265	198	498	328	729	520	657	469	279	
41	275	206	495	362	734	550	660	495	283	
42	339	254	547	391	726	594	653	535	344	
43	304	228	539	382	724	594	652	535	328	
44	275	206	568	499	717	583	646	525	279	
45	315	236	529	377	725	591	652	531	327	
Total										
Class Total	225.35	158.18	396.30	262.51	679.33	471.47	542.04	336.98	202.39	296.26
	10-15			20-25		21-26				
Class Group	217.46			589.93		359.83				



**Massachusetts Private Passenger Automobile  
Current Manual Base Rates (eff. 4/01/2008)  
Facility Market**

A-2

Territory	Class									
	10	15	17	18	20	21	25	26	30	
1	51	38	87	57	161	89	144	80	51	
2	54	40	95	63	174	98	156	88	53	
3	59	44	98	67	188	105	169	94	57	
4	62	46	109	69	208	120	187	108	61	
5	64	48	108	77	219	128	197	116	64	
6	68	51	120	77	234	146	210	131	67	
7	69	51	116	84	249	149	223	133	67	
8	74	55	128	87	261	160	234	143	72	
9	85	63	136	98	270	166	243	150	81	
10	86	64	160	109	282	190	253	172	85	
11	84	63	174	108	277	191	250	173	91	
12	90	67	166	117	277	206	250	185	87	
13	102	76	185	125	277	207	250	186	99	
14	114	85	195	140	273	213	246	193	110	
15	132	99	215	146	273	230	245	207	124	
16	114	85	219	190	266	222	240	200	117	
17	88	66	162	105	276	166	249	149	88	
18	89	66	210	118	278	206	250	185	101	
19	108	81	211	140	265	208	239	187	119	
20	99	74	217	131	275	215	248	193	113	
21	121	90	217	180	267	224	241	202	168	
22	119	89	217	177	268	221	241	199	163	
23	90	67	202	139	271	205	243	184	92	
24	94	70	175	116	272	184	244	166	94	
25	92	69	202	121	273	211	245	189	103	
26	112	84	219	153	266	224	240	202	109	
27	44	33	79	48	144	75	130	67	47	
40	107	80	196	128	275	201	248	182	110	
41	108	81	196	141	277	212	250	191	111	
42	133	99	215	152	274	229	246	207	133	
43	119	89	211	149	274	230	246	207	128	
44	109	81	222	193	271	226	244	202	111	
45	123	92	208	146	274	228	246	206	128	
<b>Total</b>										
<b>Class Total</b>	90.22	63.32	154.87	103.45	258.00	183.22	207.75	132.01	81.58	116.52

Class Group	10-15	87.06
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Class Group	20-25	225.28	21-26	140.71
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**Massachusetts Private Passenger Automobile  
Current Manual Base Rates (eff. 4/01/2008)  
Facility Market**

**A-2 - Adjusted to Base Rate w/o Passive Restraint  
(current manual base rate x 0.761 avg. discount factor)**

Territory	Class								
	10	15	17	18	20	21	25	26	30
1	39	29	66	43	123	68	110	61	39
2	41	30	72	48	132	75	119	67	40
3	45	33	75	51	143	80	129	72	43
4	47	35	83	53	158	91	142	82	46
5	49	36	82	59	167	97	150	88	49
6	52	39	91	59	178	111	160	100	51
7	53	39	88	64	189	113	170	101	51
8	56	42	97	66	199	122	178	109	55
9	65	48	103	75	205	126	185	114	62
10	65	48	122	83	215	145	193	131	65
11	64	48	132	82	211	145	190	132	69
12	68	51	126	89	211	157	190	141	66
13	78	58	141	95	211	158	190	142	75
14	87	65	148	107	208	162	187	147	84
15	100	75	164	111	208	175	186	158	94
16	87	65	167	145	202	169	183	152	89
17	67	50	123	80	210	126	189	113	67
18	68	51	160	90	212	157	190	141	77
19	82	61	161	107	202	158	182	142	91
20	75	56	165	100	209	164	189	147	86
21	92	69	165	137	203	170	183	154	128
22	91	68	165	135	204	168	183	151	124
23	68	51	154	106	206	156	185	140	70
24	72	54	133	88	207	140	186	126	72
25	70	52	154	92	208	161	186	144	78
26	85	63	167	116	202	170	183	154	83
27	33	24	60	37	110	57	99	51	36
40	81	60	149	97	209	153	189	139	84
41	82	61	149	107	211	161	190	145	84
42	101	75	164	116	209	174	187	158	101
43	91	68	161	113	209	175	187	158	97
44	83	62	169	147	206	172	186	154	84
45	94	70	158	111	209	174	187	157	97

Total

Class Total	68.72	48.10	117.79	78.85	196.43	139.41	158.16	100.55	62.07	88.70
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	10-15
Class Group	66.30

	20-25	21-26
	171.51	107.15

**Massachusetts Private Passenger Automobile  
Current Manual Base Rates (eff. 4/01/2008)  
Facility Market**

**B**

Territory	Class								
	10	15	17	18	20	21	25	26	30
1	20	15	40	25	68	36	62	33	20
2	21	15	43	28	74	41	67	36	21
3	22	16	45	30	80	44	73	40	22
4	24	18	51	31	89	51	80	45	24
5	24	18	51	34	95	54	85	48	26
6	26	19	56	34	101	62	90	55	28
7	28	21	54	37	107	63	96	56	28
8	29	21	59	39	112	67	101	61	30
9	34	25	64	44	116	70	105	63	33
10	34	25	70	50	118	79	107	72	34
11	35	26	78	47	116	80	105	73	40
12	37	27	76	53	117	87	105	78	41
13	42	31	85	57	117	88	105	79	42
14	47	35	90	63	114	90	103	80	46
15	58	43	98	67	114	98	103	88	57
16	64	48	95	80	110	95	99	85	66
17	36	27	72	45	118	69	106	62	36
18	44	33	96	53	114	87	103	78	51
19	50	37	95	61	111	88	100	79	57
20	50	37	98	61	114	89	103	80	57
21	67	50	96	81	112	96	101	86	83
22	66	49	96	81	111	95	100	85	80
23	36	27	95	61	111	86	100	77	39
24	37	27	76	50	111	76	100	68	40
25	43	32	96	55	114	89	102	80	46
26	52	39	95	66	111	95	100	85	52
27	19	14	36	21	62	31	55	28	19
40	42	31	88	57	114	86	103	77	44
41	44	33	90	63	116	90	103	80	46
42	55	41	98	67	114	97	102	87	58
43	52	39	97	67	113	97	102	87	57
44	57	42	96	81	111	95	100	85	66
45	53	39	98	67	116	97	103	87	57

										Total
Class Total	38.11	26.52	70.97	46.22	108.55	77.46	88.52	55.44	35.17	49.99

	10-15	20-25	21-26
Class Group	36.75	95.51	59.18

**Massachusetts Private Passenger Automobile  
Current Manual Base Rates (eff. 4/01/2008)  
Facility Market**

**B - Adjusted to Base SDIP Level  
(current manual base rate / avg. SDIP factor (Exh. 5, p.1))**

Territory	Class								
	10	15	17	18	20	21	25	26	30
1	11	8	26	16	61	33	55	31	9
2	12	9	28	20	67	38	61	34	10
3	13	9	30	19	72	40	65	37	11
4	14	10	34	21	80	47	72	41	12
5	14	10	35	22	86	50	77	44	14
6	16	12	38	23	91	57	81	51	16
7	17	12	38	25	98	58	88	51	16
8	19	14	43	26	102	61	92	56	17
9	22	16	48	29	107	66	97	59	17
10	22	16	52	36	107	72	97	66	21
11	24	18	59	34	106	74	96	68	25
12	24	18	58	38	106	81	95	72	22
13	29	21	65	40	107	81	96	73	24
14	33	24	70	48	103	83	93	74	31
15	41	30	75	51	102	90	92	81	37
16	45	33	74	70	102	88	92	79	46
17	24	18	53	28	112	63	100	57	22
18	32	24	79	43	106	83	96	74	27
19	37	27	77	44	103	84	93	75	39
20	36	27	80	53	106	81	96	73	38
21	47	35	75	64	103	89	93	80	56
22	49	36	75	61	104	88	93	79	67
23	25	18	77	50	104	83	93	74	22
24	25	18	62	38	105	69	94	61	20
25	29	21	72	44	107	85	96	76	25
26	38	28	76	46	101	85	91	76	28
27	11	8	23	13	55	29	49	26	9
40	33	24	73	48	106	78	96	70	39
41	33	24	73	50	108	85	96	76	26
42	44	33	82	56	107	90	96	81	39
43	39	29	76	52	105	90	95	81	36
44	44	33	80	66	105	87	94	78	53
45	42	31	79	53	107	89	95	80	39

Class Total	26.40	17.79	53.68	33.52	99.88	71.62	80.52	51.23	20.71	Total	38.50
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Class Group	10-15	25.39
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Class Group	20-25	87.27	21-26	54.69
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**Massachusetts Private Passenger Automobile  
Current Manual Base Rates (eff. 4/01/2008)  
Facility Market**

**PDL**

Territory	Class								
	10	15	17	18	20	21	25	26	30
1	156	117	279	198	550	341	495	307	164
2	169	126	294	204	593	365	534	329	173
3	173	129	301	217	616	369	554	331	184
4	184	138	314	220	660	395	594	355	201
5	184	138	317	219	681	419	613	377	206
6	195	146	323	232	685	433	617	391	209
7	200	150	327	245	705	462	635	416	218
8	202	151	347	252	728	463	656	417	228
9	209	156	354	250	741	465	668	419	216
10	211	158	359	252	747	469	672	421	217
11	208	156	381	257	740	466	667	419	219
12	231	173	388	275	758	499	682	450	235
13	241	180	387	274	757	499	682	450	241
14	252	189	419	290	760	516	684	464	259
15	270	202	461	308	772	558	695	502	275
16	237	177	453	305	756	501	680	451	244
17	218	163	419	261	757	441	681	397	218
18	239	179	471	290	774	502	697	452	235
19	249	186	464	298	751	484	677	436	241
20	231	173	462	281	769	490	692	441	243
21	272	204	509	327	757	548	681	493	273
22	344	258	543	405	755	589	680	530	337
23	208	156	474	305	768	508	691	458	228
24	253	189	474	304	771	487	694	438	248
25	240	180	514	301	773	539	696	485	254
26	287	215	526	372	755	575	679	517	284
27	151	113	266	178	520	303	469	272	151
40	223	167	417	276	757	476	681	429	257
41	227	170	406	286	757	506	681	455	240
42	228	171	438	311	777	550	700	495	270
43	262	196	450	309	776	558	697	502	266
44	208	156	442	300	756	501	680	450	215
45	266	199	451	304	776	554	699	498	271

Total

Class Total	219.19	159.66	375.04	255.40	734.91	480.09	616.84	387.64	218.82	300.79
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Class Group	10-15	212.20
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Class Group	20-25	658.03	21-26	403.35
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**Massachusetts Private Passenger Automobile  
Current Manual Base Rates (eff. 4/01/2008)  
Facility Market**

**Collision**

Territory	Class								
	10	15	17	18	20	21	25	26	30
1	235	176	518	312	947	524	852	471	234
2	245	183	525	314	989	513	890	462	244
3	249	186	550	335	1007	541	906	488	248
4	260	195	572	340	1040	577	936	519	259
5	263	197	576	349	1055	605	949	545	262
6	280	210	615	370	1087	641	979	577	278
7	296	222	630	399	1084	670	975	604	290
8	303	227	623	417	1082	668	974	601	300
9	303	227	622	396	1076	670	969	603	300
10	295	221	637	398	1080	689	972	620	298
11	319	239	712	435	1051	698	946	628	318
12	354	265	732	456	1056	765	949	687	353
13	356	267	664	485	1064	771	957	694	352
14	395	296	735	528	1039	806	935	725	392
15	472	354	771	569	1036	843	933	758	461
16	417	312	748	515	1010	717	909	646	401
17	333	249	702	438	1067	665	961	599	332
18	406	304	777	517	1041	780	937	702	397
19	421	315	790	589	1010	813	909	731	419
20	451	338	789	572	1026	809	923	729	437
21	469	351	803	657	1019	920	917	828	564
22	520	390	795	675	1009	889	908	800	700
23	359	269	796	633	1038	841	935	757	404
24	393	294	765	556	1036	785	933	706	391
25	414	310	807	610	1053	844	947	760	435
26	488	366	804	667	1010	877	909	789	535
27	224	168	494	287	917	485	825	437	223
40	361	270	695	493	1048	754	943	679	368
41	336	252	715	517	1056	791	951	712	350
42	389	291	766	589	1049	844	944	760	379
43	418	313	761	569	1034	847	930	762	408
44	380	285	765	501	1036	717	933	646	365
45	435	326	751	573	1038	843	934	759	424

Total

Class Total	335.25	240.84	653.50	430.62	1042.32	726.91	935.07	575.19	310.33	425.89
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Class Group	10-15	321.84
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Class Group	20-25	971.38	21-26	597.55
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**Massachusetts Private Passenger Automobile  
 Current Manual Base Rates (eff. 4/01/2008)  
 Facility Market  
 Comprehensive**

Territory	All except Class 15	Class 15	
1	99	74	
2	101	75	
3	105	78	
4	103	77	
5	107	80	
6	111	83	
7	115	86	
8	119	89	
9	117	87	
10	125	93	
11	134	100	
12	138	103	
13	155	116	
14	162	121	
15	200	150	
16	324	243	
17	115	86	
18	235	176	
19	258	193	
20	234	175	
21	318	238	
22	359	269	
23	216	162	
24	162	121	
25	245	183	
26	292	219	
27	94	70	
40	148	111	
41	150	112	
42	182	136	
43	191	143	
44	312	234	
45	201	150	
<b>Class Total</b>	<b>149.17</b>	<b>107.76</b>	<b>Total 145.08</b>

**Massachusetts Private Passenger Automobile  
Proposed Manual Base Rates  
Facility Market**

**A-1**

Territory	Class								
	10	15	17	18	20	21	25	26	30
1	134	100	242	152	452	239	408	215	131
2	146	109	264	169	492	270	443	243	142
3	154	115	277	183	534	289	481	261	150
4	166	124	307	189	592	336	532	301	160
5	169	126	306	213	622	359	560	322	168
6	184	138	340	210	667	410	601	370	179
7	188	141	328	232	708	418	638	375	182
8	200	150	364	240	745	449	670	404	195
9	229	171	391	273	771	469	693	421	222
10	231	173	458	305	821	540	738	486	234
11	224	168	497	301	807	543	726	488	254
12	249	186	474	329	809	583	727	525	242
13	282	211	516	354	810	587	728	528	275
14	316	237	540	397	796	606	716	546	307
15	375	281	602	416	794	655	715	590	360
16	315	236	614	543	777	634	700	571	323
17	240	180	463	292	789	468	710	420	241
18	244	183	605	331	810	583	728	525	277
19	297	222	592	394	773	592	697	532	330
20	275	206	604	371	802	608	723	548	304
21	337	252	608	504	779	640	702	576	468
22	331	248	608	491	781	629	703	567	452
23	253	189	561	392	789	581	711	523	256
24	255	191	501	323	793	521	713	470	259
25	253	189	567	340	795	600	715	540	276
26	311	233	615	435	776	639	699	575	300
27	117	87	221	130	406	202	365	182	120
40	292	219	548	361	802	572	723	516	307
41	303	227	545	398	807	605	726	545	311
42	373	279	602	430	799	653	718	589	378
43	334	250	593	420	796	653	717	589	361
44	303	227	625	549	789	641	711	578	307
45	347	260	582	415	798	650	717	584	360

Total

Class Total	247.99	173.98	436.03	288.76	747.44	518.56	596.25	370.75	222.69	325.97
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10-15	
Class Group	239.29

20-25	21-26
648.99	395.87



**Massachusetts Private Passenger Automobile  
Proposed Manual Base Rates  
Facility Market**

A-2

Territory	Class								
	10	15	17	18	20	21	25	26	30
1	43	32	73	47	135	75	121	67	43
2	45	33	79	53	145	83	131	74	44
3	50	37	83	56	157	88	142	79	47
4	52	39	91	58	174	100	156	90	51
5	54	40	90	65	184	107	165	97	54
6	57	42	100	65	196	122	176	110	56
7	58	43	97	70	208	124	187	111	56
8	62	46	107	73	219	134	196	120	61
9	72	54	113	83	226	139	204	125	68
10	72	54	134	91	237	160	212	144	72
11	70	52	145	90	232	160	209	145	76
12	75	56	139	98	232	173	209	155	73
13	86	64	155	105	232	174	209	156	83
14	96	72	163	118	229	178	206	162	92
15	110	82	180	122	229	193	205	174	103
16	96	72	184	160	222	186	201	167	98
17	74	55	135	88	231	139	208	124	74
18	75	56	176	99	233	173	209	155	85
19	90	67	177	118	222	174	200	156	100
20	83	62	182	110	230	180	208	162	95
21	101	75	182	151	223	187	201	169	141
22	100	75	182	149	224	185	201	166	136
23	75	56	169	117	227	172	204	154	77
24	79	59	146	97	228	154	205	139	79
25	77	57	169	101	229	177	205	158	86
26	94	70	184	128	222	187	201	169	91
27	36	27	66	41	121	63	109	56	40
40	89	66	164	107	230	168	208	153	92
41	90	67	164	118	232	177	209	160	92
42	111	83	180	128	230	191	206	174	111
43	100	75	177	124	230	193	206	174	107
44	91	68	186	162	227	189	205	169	92
45	103	77	174	122	230	191	206	173	107

Total

Class Total	75.65	53.04	129.60	86.83	216.11	153.41	174.04	110.57	68.37	97.63
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Class Group	10-15	72.99
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Class Group	20-25	188.72	21-26	117.85
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**Massachusetts Private Passenger Automobile  
Proposed Manual Base Rates  
Facility Market**

**B**

Territory	Class									
	10	15	17	18	20	21	25	26	30	
1	14	10	34	22	54	31	49	28	14	
2	15	11	37	25	60	33	54	30	14	
3	16	12	38	25	64	38	58	34	16	
4	17	12	44	27	71	42	64	38	16	
5	17	12	42	29	74	45	67	41	18	
6	17	12	48	29	78	52	70	47	20	
7	19	14	45	31	85	53	77	48	18	
8	20	15	50	33	89	57	80	51	20	
9	23	17	55	37	92	60	83	54	23	
10	23	17	59	43	95	69	86	62	23	
11	25	18	67	40	94	70	85	63	27	
12	25	18	65	45	94	73	85	66	28	
13	28	21	72	48	94	75	85	68	29	
14	33	24	76	53	95	77	86	69	32	
15	41	30	83	56	93	83	84	75	39	
16	43	32	80	67	91	82	82	74	46	
17	24	18	61	38	94	59	85	53	24	
18	30	22	81	45	96	76	86	68	34	
19	34	25	81	51	94	78	85	70	39	
20	34	25	83	51	93	77	84	69	39	
21	46	34	81	68	93	85	84	77	58	
22	46	34	82	67	93	84	84	76	56	
23	25	18	81	50	92	73	83	66	28	
24	26	19	65	43	94	65	85	59	27	
25	30	22	82	47	93	78	84	70	32	
26	35	26	80	55	92	82	83	74	37	
27	13	9	30	17	48	26	43	23	13	
40	28	21	74	47	94	75	85	68	31	
41	29	21	75	54	95	75	86	68	33	
42	38	28	83	56	93	83	84	75	40	
43	36	27	82	57	93	84	84	76	38	
44	39	29	82	68	92	83	83	75	45	
45	36	27	82	58	94	85	85	77	39	
<b>Total</b>										
<b>Class Total</b>	26.11	18.04	60.00	39.12	88.11	66.38	70.85	47.34	24.16	37.72

	10-15
<b>Class Group</b>	25.16

	20-25	21-26
	76.87	50.58

**Massachusetts Private Passenger Automobile  
Proposed Manual Base Rates  
Facility Market**

**PDL**

Territory	Class								
	10	15	17	18	20	21	25	26	30
1	172	129	307	218	605	375	545	338	180
2	186	139	323	224	652	402	587	362	190
3	190	142	331	239	678	406	609	364	202
4	202	151	345	242	726	435	653	391	221
5	202	151	349	241	749	461	674	415	227
6	215	161	355	255	754	476	679	430	230
7	220	165	360	270	776	508	699	458	240
8	222	166	382	277	801	509	722	459	251
9	230	172	389	275	815	512	735	461	238
10	232	174	395	277	822	516	739	463	239
11	229	171	419	283	814	513	734	461	241
12	254	190	427	303	834	549	750	495	259
13	265	198	426	301	833	549	750	495	265
14	277	207	461	319	836	568	752	510	285
15	297	222	507	339	849	614	765	552	303
16	261	195	498	336	832	551	748	496	268
17	240	180	461	287	833	485	749	437	240
18	263	197	518	319	851	552	767	497	259
19	274	205	510	328	826	532	745	480	265
20	254	190	508	309	846	539	761	485	267
21	299	224	560	360	833	603	749	542	300
22	378	283	597	446	831	648	748	583	371
23	229	171	521	336	845	559	760	504	251
24	278	208	521	334	848	536	763	482	273
25	264	198	565	331	850	593	766	534	279
26	316	237	579	409	831	633	747	569	312
27	166	124	293	196	572	333	516	299	166
40	245	183	459	304	833	524	749	472	283
41	250	187	447	315	833	557	749	501	264
42	251	188	482	342	855	605	770	545	297
43	288	216	495	340	854	614	767	552	293
44	229	171	486	330	832	551	748	495	237
45	293	219	496	334	854	609	769	548	298

Total

Class Total	241.09	175.50	412.60	281.01	808.63	528.18	678.51	426.52	240.79	330.87
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Class Group	10-15	233.38
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Class Group	20-25	723.90	21-26	443.80
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**Massachusetts Private Passenger Automobile  
Proposed Manual Base Rates  
Facility Market**

**Collision**

Territory	Class								
	10	15	17	18	20	21	25	26	30
1	259	194	570	343	1042	576	937	518	257
2	270	202	578	345	1088	564	979	508	268
3	274	205	605	369	1108	595	997	537	273
4	286	214	629	374	1144	635	1030	571	285
5	289	216	634	384	1161	666	1044	600	288
6	308	231	677	407	1196	705	1077	635	306
7	326	244	693	439	1192	737	1073	664	319
8	333	249	685	459	1190	735	1071	661	330
9	333	249	684	436	1184	737	1066	663	330
10	325	243	701	438	1188	758	1069	682	328
11	351	263	783	479	1156	768	1041	691	350
12	389	291	805	502	1162	842	1044	756	388
13	392	294	730	534	1170	848	1053	763	387
14	435	326	809	581	1143	887	1029	798	431
15	519	389	848	626	1140	927	1026	834	507
16	459	344	823	567	1111	789	1000	711	441
17	366	274	772	482	1174	732	1057	659	365
18	447	335	855	569	1145	858	1031	772	437
19	463	347	869	648	1111	894	1000	804	461
20	496	372	868	629	1129	890	1015	802	481
21	516	387	883	723	1121	1012	1009	911	620
22	572	429	875	743	1110	978	999	880	770
23	395	296	876	696	1142	925	1029	833	444
24	432	324	842	612	1140	864	1026	777	430
25	455	341	888	671	1158	928	1042	836	479
26	537	402	884	734	1111	965	1000	868	589
27	246	184	543	316	1009	534	908	481	245
40	397	297	765	542	1153	829	1037	747	405
41	370	277	787	569	1162	870	1046	783	385
42	428	321	843	648	1154	928	1038	836	417
43	460	345	837	626	1137	932	1023	838	449
44	418	313	842	551	1140	789	1026	711	402
45	479	359	826	630	1142	927	1027	835	466

Total

Class Total	368.85	264.89	718.90	473.87	1146.65	799.66	1028.73	632.78	341.29	468.54
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Class Group	10-15	354.08
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Class Group	20-25	1068.65	21-26	657.37
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**Massachusetts Private Passenger Automobile  
Proposed Manual Base Rates  
Facility Market  
Comprehensive**

Territory	All except Class 15	Class 15	
1	109	81	
2	111	83	
3	116	87	
4	113	84	
5	118	88	
6	122	91	
7	127	95	
8	131	98	
9	129	96	
10	138	103	
11	147	110	
12	152	114	
13	171	128	
14	178	133	
15	220	165	
16	356	267	
17	127	95	
18	259	194	
19	284	213	
20	257	192	
21	350	262	
22	395	296	
23	238	178	
24	178	133	
25	270	202	
26	321	240	
27	103	77	
40	163	122	
41	165	123	
42	200	150	
43	210	157	
44	343	257	
45	221	165	
<b>Class Total</b>	<b>164.20</b>	<b>118.70</b>	<b>Total 159.72</b>

**Massachusetts Private Passenger Automobile  
Proposed Manual Base Rate Change  
Facility Market**

A-1

Territory	Class								
	10	15	17	18	20	21	25	26	30
1	9.8%	9.9%	10.0%	10.1%	10.0%	10.1%	10.0%	10.3%	10.1%
2	9.8%	10.1%	10.0%	9.7%	10.1%	10.2%	9.9%	10.0%	10.1%
3	10.0%	9.5%	9.9%	10.2%	10.1%	9.9%	10.1%	10.1%	10.3%
4	9.9%	9.7%	10.0%	9.9%	10.0%	10.2%	9.9%	9.9%	10.3%
5	9.7%	9.6%	10.1%	9.8%	10.1%	10.1%	10.0%	9.9%	9.8%
6	10.2%	10.4%	10.0%	9.9%	10.1%	9.9%	10.1%	10.1%	9.8%
7	9.9%	10.2%	10.1%	10.0%	9.9%	10.0%	10.0%	10.0%	10.3%
8	9.9%	10.3%	10.0%	10.1%	10.0%	10.0%	10.0%	10.1%	10.2%
9	10.1%	9.6%	10.1%	10.1%	10.0%	10.1%	10.0%	9.9%	9.9%
10	10.0%	10.2%	10.1%	10.1%	10.1%	10.0%	10.0%	10.0%	9.9%
11	9.8%	9.8%	10.0%	9.9%	9.9%	9.9%	10.0%	9.9%	10.0%
12	10.2%	10.1%	10.0%	10.0%	10.1%	10.0%	10.0%	10.1%	10.0%
13	10.2%	9.9%	10.0%	9.9%	10.1%	9.9%	10.0%	10.0%	10.0%
14	10.1%	10.2%	10.0%	10.0%	9.9%	10.0%	10.0%	10.1%	10.0%
15	10.0%	10.2%	10.1%	10.1%	10.0%	10.1%	10.0%	10.1%	10.1%
16	10.1%	10.3%	10.0%	9.9%	10.1%	10.1%	10.1%	10.0%	9.9%
17	10.1%	10.4%	10.0%	10.2%	10.0%	10.1%	10.1%	9.9%	10.0%
18	9.9%	10.2%	10.0%	10.0%	10.1%	10.0%	10.0%	10.1%	9.9%
19	10.0%	9.9%	10.0%	10.1%	10.0%	10.0%	9.9%	9.9%	10.0%
20	10.0%	10.2%	10.0%	10.1%	10.0%	9.9%	10.0%	10.0%	10.1%
21	10.1%	10.0%	9.9%	10.0%	10.0%	10.0%	10.0%	9.9%	10.1%
22	10.0%	10.2%	9.9%	10.1%	10.0%	10.0%	10.0%	10.1%	10.0%
23	10.0%	9.9%	10.0%	10.1%	10.0%	10.0%	10.1%	10.1%	9.9%
24	9.9%	9.8%	10.1%	9.9%	10.0%	9.9%	10.0%	10.1%	10.2%
25	10.0%	9.9%	10.1%	10.0%	10.0%	10.1%	10.0%	10.0%	10.0%
26	9.9%	9.9%	10.0%	10.1%	10.1%	10.0%	10.1%	9.9%	9.9%
27	10.4%	10.1%	10.0%	10.2%	10.0%	9.8%	9.9%	10.3%	10.1%
40	10.2%	10.6%	10.0%	10.1%	10.0%	10.0%	10.0%	10.0%	10.0%
41	10.2%	10.2%	10.1%	9.9%	9.9%	10.0%	10.0%	10.1%	9.9%
42	10.0%	9.8%	10.1%	10.0%	10.1%	9.9%	10.0%	10.1%	9.9%
43	9.9%	9.6%	10.0%	9.9%	9.9%	9.9%	10.0%	10.1%	10.1%
44	10.2%	10.2%	10.0%	10.0%	10.0%	9.9%	10.1%	10.1%	10.0%
45	10.2%	10.2%	10.0%	10.1%	10.1%	10.0%	10.0%	10.0%	10.1%

Total

Class Total	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
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	10-15
Class Group	10.0%

	20-25	21-26
	10.0%	10.0%

**Massachusetts Private Passenger Automobile  
Proposed Manual Base Rate Change  
Facility Market**

**A-2**

(relative to current base rates adjusted for removal of passive restraint discount)

Territory	Class								
	10	15	17	18	20	21	25	26	30
1	10.3%	10.3%	10.6%	9.3%	9.8%	10.3%	10.0%	9.8%	10.3%
2	9.8%	10.0%	9.7%	10.4%	9.8%	10.7%	10.1%	10.4%	10.0%
3	11.1%	12.1%	10.7%	9.8%	9.8%	10.0%	10.1%	9.7%	9.3%
4	10.6%	11.4%	9.6%	9.4%	10.1%	9.9%	9.9%	9.8%	10.9%
5	10.2%	11.1%	9.8%	10.2%	10.2%	10.3%	10.0%	10.2%	10.2%
6	9.6%	7.7%	9.9%	10.2%	10.1%	9.9%	10.0%	10.0%	9.8%
7	9.4%	10.3%	10.2%	9.4%	10.1%	9.7%	10.0%	9.9%	9.8%
8	10.7%	9.5%	10.3%	10.6%	10.1%	9.8%	10.1%	10.1%	10.9%
9	10.8%	12.5%	9.7%	10.7%	10.2%	10.3%	10.3%	9.6%	9.7%
10	10.8%	12.5%	9.8%	9.6%	10.2%	10.3%	9.8%	9.9%	10.8%
11	9.4%	8.3%	9.8%	9.8%	10.0%	10.3%	10.0%	9.8%	10.1%
12	10.3%	9.8%	10.3%	10.1%	10.0%	10.2%	10.0%	9.9%	10.6%
13	10.3%	10.3%	9.9%	10.5%	10.0%	10.1%	10.0%	9.9%	10.7%
14	10.3%	10.8%	10.1%	10.3%	10.1%	9.9%	10.2%	10.2%	9.5%
15	10.0%	9.3%	9.8%	9.9%	10.1%	10.3%	10.2%	10.1%	9.6%
16	10.3%	10.8%	10.2%	10.3%	9.9%	10.1%	9.8%	9.9%	10.1%
17	10.4%	10.0%	9.8%	10.0%	10.0%	10.3%	10.1%	9.7%	10.4%
18	10.3%	9.8%	10.0%	10.0%	9.9%	10.2%	10.0%	9.9%	10.4%
19	9.8%	9.8%	9.9%	10.3%	9.9%	10.1%	9.9%	9.9%	9.9%
20	10.7%	10.7%	10.3%	10.0%	10.0%	9.8%	10.1%	10.2%	10.5%
21	9.8%	8.7%	10.3%	10.2%	9.9%	10.0%	9.8%	9.7%	10.2%
22	9.9%	10.3%	10.3%	10.4%	9.8%	10.1%	9.8%	9.9%	9.7%
23	10.3%	9.8%	9.7%	10.4%	10.2%	10.3%	10.3%	10.0%	10.0%
24	9.7%	9.3%	9.8%	10.2%	10.1%	10.0%	10.2%	10.3%	9.7%
25	10.0%	9.6%	9.7%	9.8%	10.1%	9.9%	10.2%	9.7%	10.3%
26	10.6%	11.1%	10.2%	10.3%	9.9%	10.0%	9.8%	9.7%	9.6%
27	9.1%	12.5%	10.0%	10.8%	10.0%	10.5%	10.1%	9.8%	11.1%
40	9.9%	10.0%	10.1%	10.3%	10.0%	9.8%	10.1%	10.1%	9.5%
41	9.8%	9.8%	10.1%	10.3%	10.0%	9.9%	10.0%	10.3%	9.5%
42	9.9%	10.7%	9.8%	10.3%	10.0%	9.8%	10.2%	10.1%	9.9%
43	9.9%	10.3%	9.9%	9.7%	10.0%	10.3%	10.2%	10.1%	10.3%
44	9.6%	9.7%	10.1%	10.2%	10.2%	9.9%	10.2%	9.7%	9.5%
45	9.6%	10.0%	10.1%	9.9%	10.0%	9.8%	10.2%	10.2%	10.3%

Total

Class Total	10.1%	10.3%	10.0%	10.1%	10.0%	10.0%	10.0%	10.0%	10.1%	10.1%
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	10-15
Class Group	10.1%

	20-25	21-26
	10.0%	10.0%

**Massachusetts Private Passenger Automobile  
Proposed Manual Base Rate Change  
Facility Market**

**B**

(relative to current base rates adjusted to base SDIP level)

Territory	Class									
	10	15	17	18	20	21	25	26	30	
1	27.3%	25.0%	30.8%	37.5%	-11.5%	-6.1%	-10.9%	-9.7%	55.6%	
2	25.0%	22.2%	32.1%	25.0%	-10.4%	-13.2%	-11.5%	-11.8%	40.0%	
3	23.1%	33.3%	26.7%	31.6%	-11.1%	-5.0%	-10.8%	-8.1%	45.5%	
4	21.4%	20.0%	29.4%	28.6%	-11.3%	-10.6%	-11.1%	-7.3%	33.3%	
5	21.4%	20.0%	20.0%	31.8%	-14.0%	-10.0%	-13.0%	-6.8%	28.6%	
6	6.3%	0.0%	26.3%	26.1%	-14.3%	-8.8%	-13.6%	-7.8%	25.0%	
7	11.8%	16.7%	18.4%	24.0%	-13.3%	-8.6%	-12.5%	-5.9%	12.5%	
8	5.3%	7.1%	16.3%	26.9%	-12.7%	-6.6%	-13.0%	-8.9%	17.6%	
9	4.5%	6.3%	14.6%	27.6%	-14.0%	-9.1%	-14.4%	-8.5%	35.3%	
10	4.5%	6.3%	13.5%	19.4%	-11.2%	-4.2%	-11.3%	-6.1%	9.5%	
11	4.2%	0.0%	13.6%	17.6%	-11.3%	-5.4%	-11.5%	-7.4%	8.0%	
12	4.2%	0.0%	12.1%	18.4%	-11.3%	-9.9%	-10.5%	-8.3%	27.3%	
13	-3.4%	0.0%	10.8%	20.0%	-12.1%	-7.4%	-11.5%	-6.8%	20.8%	
14	0.0%	0.0%	8.6%	10.4%	-7.8%	-7.2%	-7.5%	-6.8%	3.2%	
15	0.0%	0.0%	10.7%	9.8%	-8.8%	-7.8%	-8.7%	-7.4%	5.4%	
16	-4.4%	-3.0%	8.1%	-4.3%	-10.8%	-6.8%	-10.9%	-6.3%	0.0%	
17	0.0%	0.0%	15.1%	35.7%	-16.1%	-6.3%	-15.0%	-7.0%	9.1%	
18	-6.3%	-8.3%	2.5%	4.7%	-9.4%	-8.4%	-10.4%	-8.1%	25.9%	
19	-8.1%	-7.4%	5.2%	15.9%	-8.7%	-7.1%	-8.6%	-6.7%	0.0%	
20	-5.6%	-7.4%	3.8%	-3.8%	-12.3%	-4.9%	-12.5%	-5.5%	2.6%	
21	-2.1%	-2.9%	8.0%	6.3%	-9.7%	-4.5%	-9.7%	-3.8%	3.6%	
22	-6.1%	-5.6%	9.3%	9.8%	-10.6%	-4.5%	-9.7%	-3.8%	-16.4%	
23	0.0%	0.0%	5.2%	0.0%	-11.5%	-12.0%	-10.8%	-10.8%	27.3%	
24	4.0%	5.6%	4.8%	13.2%	-10.5%	-5.8%	-9.6%	-3.3%	35.0%	
25	3.4%	4.8%	13.9%	6.8%	-13.1%	-8.2%	-12.5%	-7.9%	28.0%	
26	-7.9%	-7.1%	5.3%	19.6%	-8.9%	-3.5%	-8.8%	-2.6%	32.1%	
27	18.2%	12.5%	30.4%	30.8%	-12.7%	-10.3%	-12.2%	-11.5%	44.4%	
40	-15.2%	-12.5%	1.4%	-2.1%	-11.3%	-3.8%	-11.5%	-2.9%	-20.5%	
41	-12.1%	-12.5%	2.7%	8.0%	-12.0%	-11.8%	-10.4%	-10.5%	26.9%	
42	-13.6%	-15.2%	1.2%	0.0%	-13.1%	-7.8%	-12.5%	-7.4%	2.6%	
43	-7.7%	-6.9%	7.9%	9.6%	-11.4%	-6.7%	-11.6%	-6.2%	5.6%	
44	-11.4%	-12.1%	2.5%	3.0%	-12.4%	-4.6%	-11.7%	-3.8%	-15.1%	
45	-14.3%	-12.9%	3.8%	9.4%	-12.1%	-4.5%	-10.5%	-3.8%	0.0%	
<b>Total</b>										
<b>Class Total</b>	-1.1%	1.4%	11.8%	16.7%	-11.8%	-7.3%	-12.0%	-7.6%	16.7%	-2.0%

Class Group	10-15	-0.9%
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Class Group	20-25	-11.9%	21-26	-7.5%
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**Massachusetts Private Passenger Automobile  
Proposed Manual Base Rate Change  
Facility Market**

**PDL**

Territory	Class								
	10	15	17	18	20	21	25	26	30
1	10.3%	10.3%	10.0%	10.1%	10.0%	10.0%	10.1%	10.1%	9.8%
2	10.1%	10.3%	9.9%	9.8%	9.9%	10.1%	9.9%	10.0%	9.8%
3	9.8%	10.1%	10.0%	10.1%	10.1%	10.0%	9.9%	10.0%	9.8%
4	9.8%	9.4%	9.9%	10.0%	10.0%	10.1%	9.9%	10.1%	10.0%
5	9.8%	9.4%	10.1%	10.0%	10.0%	10.0%	10.0%	10.1%	10.2%
6	10.3%	10.3%	9.9%	9.9%	10.1%	9.9%	10.0%	10.0%	10.0%
7	10.0%	10.0%	10.1%	10.2%	10.1%	10.0%	10.1%	10.1%	10.1%
8	9.9%	9.9%	10.1%	9.9%	10.0%	9.9%	10.1%	10.1%	10.1%
9	10.0%	10.3%	9.9%	10.0%	10.0%	10.1%	10.0%	10.0%	10.2%
10	10.0%	10.1%	10.0%	9.9%	10.0%	10.0%	10.0%	10.0%	10.1%
11	10.1%	9.6%	10.0%	10.1%	10.0%	10.1%	10.0%	10.0%	10.0%
12	10.0%	9.8%	10.1%	10.2%	10.0%	10.0%	10.0%	10.0%	10.2%
13	10.0%	10.0%	10.1%	9.9%	10.0%	10.0%	10.0%	10.0%	10.0%
14	9.9%	9.5%	10.0%	10.0%	10.0%	10.1%	9.9%	9.9%	10.0%
15	10.0%	9.9%	10.0%	10.1%	10.0%	10.0%	10.1%	10.0%	10.2%
16	10.1%	10.2%	9.9%	10.2%	10.1%	10.0%	10.0%	10.0%	9.8%
17	10.1%	10.4%	10.0%	10.0%	10.0%	10.0%	10.0%	10.1%	10.1%
18	10.0%	10.1%	10.0%	10.0%	9.9%	10.0%	10.0%	10.0%	10.2%
19	10.0%	10.2%	9.9%	10.1%	10.0%	9.9%	10.0%	10.1%	10.0%
20	10.0%	9.8%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	9.9%
21	9.9%	9.8%	10.0%	10.1%	10.0%	10.0%	10.0%	9.9%	9.9%
22	9.9%	9.7%	9.9%	10.1%	10.1%	10.0%	10.0%	10.0%	10.1%
23	10.1%	9.6%	9.9%	10.2%	10.0%	10.0%	10.0%	10.0%	10.1%
24	9.9%	10.1%	9.9%	9.9%	10.0%	10.1%	9.9%	10.0%	10.1%
25	10.0%	10.0%	9.9%	10.0%	10.0%	10.0%	10.1%	10.1%	9.8%
26	10.1%	10.2%	10.1%	9.9%	10.1%	10.1%	10.0%	10.1%	9.9%
27	9.9%	9.7%	10.2%	10.1%	10.0%	9.9%	10.0%	9.9%	9.9%
40	9.9%	9.6%	10.1%	10.1%	10.0%	10.1%	10.0%	10.0%	10.1%
41	10.1%	10.0%	10.1%	10.1%	10.0%	10.1%	10.0%	10.1%	10.0%
42	10.1%	9.9%	10.0%	10.0%	10.0%	10.0%	10.0%	10.1%	10.0%
43	9.9%	10.2%	10.0%	10.0%	10.1%	10.0%	10.0%	10.0%	10.2%
44	10.1%	9.6%	10.0%	10.0%	10.1%	10.0%	10.0%	10.0%	10.2%
45	10.2%	10.1%	10.0%	9.9%	10.1%	9.9%	10.0%	10.0%	10.0%

Total

Class Total	10.0%	9.9%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
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Class Group	10-15	10.0%
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Class Group	20-25	10.0%	21-26	10.0%
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**Massachusetts Private Passenger Automobile  
Proposed Manual Base Rate Change  
Facility Market**

**Collision**

Territory	Class								
	10	15	17	18	20	21	25	26	30
1	10.2%	10.2%	10.0%	9.9%	10.0%	9.9%	10.0%	10.0%	9.8%
2	10.2%	10.4%	10.1%	9.9%	10.0%	9.9%	10.0%	10.0%	9.8%
3	10.0%	10.2%	10.0%	10.1%	10.0%	10.0%	10.0%	10.0%	10.1%
4	10.0%	9.7%	10.0%	10.0%	10.0%	10.1%	10.0%	10.0%	10.0%
5	9.9%	9.6%	10.1%	10.0%	10.0%	10.1%	10.0%	10.1%	9.9%
6	10.0%	10.0%	10.1%	10.0%	10.0%	10.0%	10.0%	10.1%	10.1%
7	10.1%	9.9%	10.0%	10.0%	10.0%	10.0%	10.1%	9.9%	10.0%
8	9.9%	9.7%	10.0%	10.1%	10.0%	10.0%	10.0%	10.0%	10.0%
9	9.9%	9.7%	10.0%	10.1%	10.0%	10.0%	10.0%	10.0%	10.0%
10	10.2%	10.0%	10.0%	10.1%	10.0%	10.0%	10.0%	10.0%	10.1%
11	10.0%	10.0%	10.0%	10.1%	10.0%	10.0%	10.0%	10.0%	10.1%
12	9.9%	9.8%	10.0%	10.1%	10.0%	10.1%	10.0%	10.0%	9.9%
13	10.1%	10.1%	9.9%	10.1%	10.0%	10.0%	10.0%	9.9%	9.9%
14	10.1%	10.1%	10.1%	10.0%	10.0%	10.0%	10.1%	10.1%	9.9%
15	10.0%	9.9%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
16	10.1%	10.3%	10.0%	10.1%	10.0%	10.0%	10.0%	10.1%	10.0%
17	9.9%	10.0%	10.0%	10.0%	10.0%	10.1%	10.0%	10.0%	9.9%
18	10.1%	10.2%	10.0%	10.1%	10.0%	10.0%	10.0%	10.0%	10.1%
19	10.0%	10.2%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
20	10.0%	10.1%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.1%
21	10.0%	10.3%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	9.9%
22	10.0%	10.0%	10.1%	10.1%	10.0%	10.0%	10.0%	10.0%	10.0%
23	10.0%	10.0%	10.1%	10.0%	10.0%	10.0%	10.1%	10.0%	9.9%
24	9.9%	10.2%	10.1%	10.1%	10.0%	10.1%	10.0%	10.1%	10.0%
25	9.9%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.1%
26	10.0%	9.8%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.1%
27	9.8%	9.5%	9.9%	10.1%	10.0%	10.1%	10.1%	10.1%	9.9%
40	10.0%	10.0%	10.1%	9.9%	10.0%	9.9%	10.0%	10.0%	10.1%
41	10.1%	9.9%	10.1%	10.1%	10.0%	10.0%	10.0%	10.0%	10.0%
42	10.0%	10.3%	10.1%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
43	10.0%	10.2%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
44	10.0%	9.8%	10.1%	10.0%	10.0%	10.0%	10.0%	10.1%	10.1%
45	10.1%	10.1%	10.0%	9.9%	10.0%	10.0%	10.0%	10.0%	9.9%

Total

Class Total	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
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10-15	
Class Group	10.0%

20-25		21-26	
10.0%	10.0%	10.0%	10.0%

**Massachusetts Private Passenger Automobile  
 Proposed Manual Base Rate Change  
 Facility Market  
 Comprehensive**

Territory	All except Class 15	Class 15	
1	10.1%	9.5%	
2	9.9%	10.7%	
3	10.5%	11.5%	
4	9.7%	9.1%	
5	10.3%	10.0%	
6	9.9%	9.6%	
7	10.4%	10.5%	
8	10.1%	10.1%	
9	10.3%	10.3%	
10	10.4%	10.8%	
11	9.7%	10.0%	
12	10.1%	10.7%	
13	10.3%	10.3%	
14	9.9%	9.9%	
15	10.0%	10.0%	
16	9.9%	9.9%	
17	10.4%	10.5%	
18	10.2%	10.2%	
19	10.1%	10.4%	
20	9.8%	9.7%	
21	10.1%	10.1%	
22	10.0%	10.0%	
23	10.2%	9.9%	
24	9.9%	9.9%	
25	10.2%	10.4%	
26	9.9%	9.6%	
27	9.6%	10.0%	
40	10.1%	9.9%	
41	10.0%	9.8%	
42	9.9%	10.3%	
43	9.9%	9.8%	
44	9.9%	9.8%	
45	10.0%	10.0%	
<b>Class Total</b>	<b>10.1%</b>	<b>10.2%</b>	<b>Total 10.1%</b>

**Massachusetts Private Passenger Automobile  
Average Rating Factors  
Facility Market**

**Average SDIP Factors - Liability**

Territory	Class					
	10-15	17	18	20-25	21-26	30
1	1.8083	1.5628	1.5498	1.1236	1.0775	2.1056
2	1.7341	1.5161	1.4201	1.1069	1.0720	2.0997
3	1.7521	1.5192	1.5441	1.1185	1.0875	1.9883
4	1.6684	1.5007	1.4708	1.1096	1.0866	1.9220
5	1.6753	1.4668	1.5157	1.1055	1.0862	1.8232
6	1.6223	1.4587	1.4544	1.1045	1.0783	1.7211
7	1.6226	1.4160	1.4647	1.0946	1.0879	1.8011
8	1.5586	1.3814	1.4857	1.0991	1.0907	1.7247
9	1.5247	1.3462	1.4919	1.0847	1.0687	1.9154
10	1.5380	1.3448	1.3761	1.1035	1.0950	1.6493
11	1.4846	1.3128	1.3983	1.0938	1.0779	1.6186
12	1.5150	1.3051	1.3786	1.0998	1.0781	1.8610
13	1.4420	1.3167	1.4224	1.0982	1.0852	1.7182
14	1.4266	1.2932	1.3245	1.1044	1.0839	1.4754
15	1.4115	1.2990	1.3124	1.1198	1.0843	1.5377
16	1.4080	1.2809	1.1379	1.0794	1.0809	1.4455
17	1.5190	1.3587	1.5930	1.0566	1.0899	1.6126
18	1.3569	1.2228	1.2228	1.0782	1.0495	1.9229
19	1.3414	1.2401	1.3855	1.0759	1.0489	1.4592
20	1.3996	1.2284	1.1471	1.0715	1.0979	1.5070
21	1.4254	1.2750	1.2690	1.0835	1.0786	1.4838
22	1.3487	1.2884	1.3307	1.0715	1.0750	1.2029
23	1.4262	1.2346	1.2115	1.0698	1.0402	1.7516
24	1.5061	1.2322	1.3229	1.0591	1.1084	2.0412
25	1.4948	1.3256	1.2485	1.0628	1.0484	1.8710
26	1.3651	1.2538	1.4204	1.0980	1.1115	1.8401
27	1.7973	1.5474	1.5777	1.1181	1.0853	2.1328
40	1.2826	1.2017	1.1964	1.0738	1.0969	1.1286
41	1.3415	1.2364	1.2627	1.0770	1.0555	1.8036
42	1.2508	1.1923	1.1989	1.0626	1.0753	1.4817
43	1.3234	1.2728	1.2921	1.0789	1.0728	1.5768
44	1.3079	1.2008	1.2315	1.0604	1.0864	1.2376
45	1.2655	1.2473	1.2677	1.0832	1.0870	1.4459

**Massachusetts Private Passenger Automobile  
Average Rating Factors  
Facility Market**

**Average SDIP Factors - Collision**

Territory	Class					
	10-15	17	18	20-25	21-26	30
1	1.8431	1.5838	1.5927	1.1259	1.1041	2.2955
2	1.7472	1.5089	1.4434	1.1282	1.0858	2.3217
3	1.7376	1.5167	1.5872	1.1398	1.1031	2.1898
4	1.6818	1.4703	1.4927	1.1451	1.0963	1.9765
5	1.6888	1.4825	1.5313	1.1075	1.1033	1.9152
6	1.6327	1.4580	1.4719	1.1376	1.1010	1.7369
7	1.6307	1.4205	1.4908	1.1106	1.1139	2.1324
8	1.5609	1.3817	1.6575	1.1038	1.1007	1.4504
9	1.5527	1.3467	1.5512	1.0968	1.0696	1.7691
10	1.5151	1.3035	1.4405	1.1066	1.1254	1.6614
11	1.4468	1.2730	1.5013	1.0703	1.0861	1.4227
12	1.4876	1.3030	1.3870	1.1140	1.0764	2.0971
13	1.4748	1.3095	1.4388	1.1029	1.0995	1.5779
14	1.4065	1.2800	1.3775	1.0857	1.0946	1.3056
15	1.4124	1.2787	1.3907	1.0956	1.0665	1.2407
16	1.3633	1.2181	1.1379	1.0750	1.0840	1.5049
17	1.5043	1.3538	1.5455	1.0264	1.1273	1.4312
18	1.3625	1.2016	1.2443	1.0408	1.0566	1.8108
19	1.3504	1.2169	1.4056	1.0456	1.0514	1.1900
20	1.3694	1.1675	1.2156	1.0640	1.0771	1.5861
21	1.3757	1.2506	1.2372	1.0801	1.0918	1.5258
22	1.3184	1.3365	1.2562	1.0910	1.0836	1.1235
23	1.4329	1.2259	1.1660	1.0871	1.0375	1.4302
24	1.4449	1.2096	1.3432	1.1391	1.1390	1.4500
25	1.4210	1.3238	1.2599	1.0702	1.1072	1.3822
26	1.3340	1.2237	1.3371	1.1089	1.1968	1.5625
27	1.7994	1.5315	1.5299	1.1445	1.0939	2.4532
40	1.3136	1.2068	1.1899	1.0753	1.1235	1.2552
41	1.3525	1.2140	1.2655	1.0755	1.0547	0.9759
42	1.2744	1.2122	1.2481	1.1067	1.1041	1.6830
43	1.3554	1.2774	1.2671	1.0714	1.0633	1.2994
44	1.3123	1.2110	1.2553	1.0690	1.0934	1.0800
45	1.2628	1.2325	1.2889	1.0939	1.0939	1.6838

**Massachusetts Private Passenger Automobile  
Average Rating Factors  
Facility Market**

**Discounts**

Discount	Applicability	Avg. Factor			
Annual Mileage Discount 5%/10% varies by mileage	A-1, A-2, B, PDL, Coll All classes.	0.997			
Passive Restraint Discount 25%	A-2 All classes.	N/A (discount eliminated)			
Multi-Car Discount 5%	A-1, A-2, B, PDL		Coll		
	Class 10	0.9829		Class 10	0.9835
	Class 15	0.9855		Class 15	0.9866
	Class 17	0.9917		Class 17	0.9929
	Class 18	0.9776		Class 18	0.979
	Class 20	0.9919		Class 20	0.9925
	Class 21	0.9833		Class 21	0.9834
	Class 25	0.9931		Class 25	0.9904
	Class 26	0.9782		Class 26	0.9774
	Class 30	0.9776		Class 30	0.9785
	Comp				
	All except Class 15	0.9854			
	Class 15	0.9863			
Anti-theft Device Discount varies by device	Comp All classes.	0.884			
Public Transit Discount 10% max of \$75 per year	PDL, Coll				
	Classes 10, 15 A/O except Class 30	0.9964 0.9979			

Note: Senior citizen discount (25%) and driver training discount (10%) are reflected in manual base rates as classes 15 and 25/26, respectively; average discount varies by territory based on exposures.

**Massachusetts Private Passenger Automobile  
Proposed Average Rates  
Facility Market**

A-1

Territory	Class									
	10	15	17	18	20	21	25	26	30	
1	237.45	177.67	373.93	229.60	502.24	252.46	453.90	225.93	268.85	
2	248.10	185.72	395.74	233.92	538.56	283.75	485.51	254.05	290.60	
3	264.41	197.97	416.07	275.41	590.66	308.11	532.68	276.82	290.69	
4	271.40	203.27	455.52	270.94	649.61	357.92	584.48	318.98	299.73	
5	277.45	207.40	443.78	314.67	680.01	382.28	612.96	341.11	298.54	
6	292.52	219.97	490.37	297.69	728.54	433.42	657.25	389.10	300.27	
7	298.93	224.79	459.21	331.20	766.39	445.81	691.46	397.87	319.50	
8	305.47	229.71	497.16	347.54	809.76	480.10	729.12	429.74	327.80	
9	342.16	256.17	520.43	396.97	827.04	491.37	744.27	438.79	414.45	
10	348.16	261.43	608.97	409.08	895.94	579.68	806.34	519.01	376.16	
11	325.88	245.06	645.11	410.23	872.92	573.80	786.25	513.00	400.71	
12	369.67	276.87	611.64	442.07	879.88	616.18	791.66	552.00	438.95	
13	398.49	298.95	671.76	490.77	879.69	624.50	791.59	558.81	460.54	
14	441.77	332.20	690.45	512.51	869.37	643.94	782.94	577.17	441.47	
15	518.70	389.71	773.18	532.13	879.27	696.26	792.75	623.91	539.55	
16	434.63	326.49	777.61	602.23	829.40	671.82	748.12	601.93	455.07	
17	357.25	268.65	621.99	453.37	824.42	500.05	742.77	446.44	378.79	
18	324.45	243.98	731.45	394.49	863.67	599.84	777.18	537.36	519.15	
19	390.41	292.59	725.86	532.06	822.46	608.75	742.49	544.21	469.34	
20	377.17	283.28	733.59	414.79	849.83	654.41	767.04	586.77	446.52	
21	470.73	352.93	766.46	623.37	834.70	676.74	753.10	605.91	676.83	
22	437.47	328.64	774.51	636.82	827.57	662.89	745.82	594.45	529.94	
23	353.59	264.85	684.80	462.88	834.72	592.48	753.11	530.57	437.05	
24	376.36	282.64	610.37	416.47	830.56	566.13	747.68	508.06	515.28	
25	370.60	277.59	743.14	413.74	835.57	616.68	752.39	552.13	503.31	
26	416.03	312.52	762.39	602.22	842.61	696.29	759.92	623.30	538.05	
27	206.07	153.64	338.12	199.91	448.92	214.92	404.07	192.64	249.45	
40	367.01	275.99	651.11	420.96	851.65	615.10	768.69	552.00	337.70	
41	398.33	299.20	666.24	489.82	859.51	626.03	774.18	561.02	546.71	
42	457.19	342.88	709.67	502.47	839.61	688.37	755.41	617.69	545.89	
43	433.15	325.07	746.26	528.93	849.29	686.77	765.93	616.25	554.80	
44	388.35	291.71	742.04	658.97	827.39	682.70	746.50	612.41	370.32	
45	430.32	323.29	717.74	512.77	854.82	692.67	768.98	619.11	507.34	
Total										
Class Total	354.71	255.36	573.78	388.50	803.46	549.12	648.95	391.33	374.29	424.74
Class Group	10-15	20-25	21-26							
	343.04	702.85	418.14							

Proposed Manual Base Rate (Exh. 3) x Average Rating Factors applicable to coverage (see Exh. 5).

**Massachusetts Private Passenger Automobile  
Proposed Average Rates  
Facility Market**

A-2

Territory	Class																				
	10	15	17	18	20	21	25	26	30												
1	76.20	56.86	112.80	71.00	150.01	79.22	134.61	70.41	88.25												
2	76.47	56.23	118.42	73.36	158.72	87.23	143.57	77.37	90.05												
3	85.85	63.70	124.67	84.28	173.66	93.82	157.26	83.79	91.08												
4	85.02	63.93	135.02	83.15	190.93	106.52	171.39	95.38	95.54												
5	88.65	65.84	130.52	96.02	201.16	113.94	180.61	102.76	95.96												
6	90.62	66.95	144.23	92.14	214.08	128.97	192.47	115.68	93.94												
7	92.22	68.55	135.80	99.93	225.16	132.25	202.67	117.77	98.31												
8	94.70	70.44	146.14	105.71	238.04	143.28	213.30	127.65	102.54												
9	107.58	80.90	150.41	120.69	242.43	145.63	219.09	130.28	126.95												
10	108.52	81.60	178.17	122.05	258.63	171.76	231.63	153.78	115.74												
11	101.84	75.85	188.21	122.66	250.95	169.08	226.35	152.43	119.90												
12	111.35	83.36	179.36	131.68	252.33	182.85	227.59	162.97	132.41												
13	121.53	90.68	201.79	145.57	251.96	185.11	227.26	165.10	139.00												
14	134.21	100.92	208.41	152.33	250.11	189.14	225.26	171.25	132.30												
15	152.15	113.72	231.18	156.06	253.59	205.16	227.29	184.00	154.37												
16	132.46	99.61	233.03	177.45	236.97	197.10	214.82	176.05	138.07												
17	110.15	82.09	181.36	136.63	241.37	148.52	217.60	131.80	116.31												
18	99.73	74.66	212.79	117.99	248.44	178.00	223.12	158.65	159.31												
19	118.31	88.30	217.02	159.35	236.20	178.92	213.05	159.58	142.22												
20	113.84	85.26	221.05	122.98	243.72	193.74	220.67	173.46	139.54												
21	141.08	105.04	229.43	186.76	238.94	197.73	215.63	177.77	203.92												
22	132.17	99.39	231.84	193.25	237.36	194.97	213.24	174.04	159.45												
23	104.82	78.47	206.29	138.15	240.15	175.40	216.08	156.23	131.46												
24	116.60	87.31	177.87	125.07	238.80	167.34	214.97	150.26	157.17												
25	112.79	83.72	221.50	122.90	240.69	181.92	215.72	161.55	156.83												
26	125.75	93.89	228.10	177.21	241.06	203.77	218.52	183.20	163.21												
27	63.41	47.68	100.98	63.05	133.79	67.03	120.67	59.27	83.15												
40	111.86	83.17	194.86	124.77	244.24	180.66	221.14	163.67	101.20												
41	118.31	88.31	200.48	145.22	247.10	183.15	222.87	164.70	161.73												
42	136.06	102.00	212.19	149.57	241.69	201.35	216.73	182.47	160.30												
43	129.69	97.52	222.75	156.16	245.40	202.98	220.06	182.05	164.44												
44	116.63	87.38	220.83	194.45	238.04	201.29	215.23	179.06	110.97												
45	127.73	95.74	214.58	150.74	246.38	203.54	220.93	183.40	150.79												
Total																					
Class Total	108.42	78.00	170.50	116.94	232.33	162.46	189.44	116.71	115.22	127.66											
<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;"></td> <td style="width: 33%; text-align: center;">10-15</td> <td style="width: 33%;"></td> <td style="width: 33%; text-align: center;">20-25</td> <td style="width: 33%; text-align: center;">21-26</td> <td style="width: 33%;"></td> </tr> <tr> <td>Class Group</td> <td>104.85</td> <td></td> <td>204.40</td> <td>124.48</td> <td></td> </tr> </table>											10-15		20-25	21-26		Class Group	104.85		204.40	124.48	
	10-15		20-25	21-26																	
Class Group	104.85		204.40	124.48																	

Proposed Manual Base Rate (Exh. 3) x Average Rating Factors applicable to coverage (see Exh. 5).



**Massachusetts Private Passenger Automobile  
Proposed Average Rates  
Facility Market**

**B**

Territory	Class									
	10	15	17	18	20	21	25	26	30	
1	24.81	17.77	52.54	33.23	60.00	32.75	54.51	29.42	28.73	
2	25.49	18.74	55.46	34.60	65.68	34.68	59.18	31.36	28.65	
3	27.47	20.66	57.08	37.62	70.79	40.51	64.23	36.06	31.01	
4	27.79	19.67	65.29	38.71	77.91	44.74	70.31	40.27	29.97	
5	27.91	19.75	60.91	42.84	80.90	47.92	73.34	43.43	31.99	
6	27.03	19.13	69.23	41.11	85.20	54.97	76.55	49.43	33.55	
7	30.21	22.32	63.00	44.26	92.01	56.53	83.45	50.93	31.60	
8	30.55	22.97	68.29	47.79	96.74	60.95	87.06	54.25	33.62	
9	34.37	25.47	73.21	53.80	98.69	62.86	89.14	56.28	42.94	
10	34.66	25.69	78.45	57.67	103.67	74.07	93.96	66.21	36.97	
11	36.37	26.26	86.97	54.52	101.68	73.97	92.05	66.23	42.60	
12	37.12	26.79	83.88	60.47	102.24	77.15	92.56	69.39	50.79	
13	39.57	29.75	93.73	66.55	102.09	79.79	92.42	71.97	48.57	
14	46.13	33.64	97.18	68.42	103.76	81.82	94.04	72.94	46.02	
15	56.71	41.61	106.60	71.63	102.99	88.23	93.13	79.31	58.45	
16	59.33	44.27	101.32	74.31	97.14	86.89	87.64	78.01	64.81	
17	35.73	26.86	81.95	59.00	98.22	63.04	88.92	56.34	37.72	
18	39.89	29.33	97.93	53.63	102.36	78.19	91.81	69.60	63.72	
19	44.69	32.95	99.32	68.87	100.01	80.21	90.55	71.61	55.47	
20	46.63	34.38	100.81	57.02	98.55	82.88	89.12	73.88	57.28	
21	64.25	47.62	102.11	84.11	99.65	89.88	90.11	81.00	83.88	
22	60.80	45.06	104.46	86.90	98.55	88.53	89.12	79.68	65.66	
23	34.94	25.22	98.88	59.04	97.33	74.44	87.92	66.96	47.80	
24	38.37	28.12	79.19	55.44	98.45	70.63	89.13	63.78	53.72	
25	43.94	32.31	107.47	57.19	97.75	80.17	88.39	71.57	58.36	
26	46.82	34.87	99.17	76.14	99.90	89.35	90.23	80.22	66.36	
27	22.90	15.89	45.90	26.14	53.07	27.66	47.60	24.34	27.02	
40	35.19	26.46	87.92	54.81	99.82	80.65	90.37	72.74	34.10	
41	38.12	27.68	91.68	66.46	101.18	77.61	91.71	70.00	58.01	
42	46.58	34.41	97.85	65.44	97.73	87.50	88.38	78.65	57.77	
43	46.69	35.11	103.19	71.78	99.23	88.34	89.73	79.52	58.40	
44	49.99	37.27	97.36	81.62	96.48	88.40	87.14	79.46	54.28	
45	44.64	33.57	101.13	71.66	100.69	90.58	91.16	81.63	54.96	
<b>Total</b>										
<b>Class Total</b>	37.27	26.38	78.99	52.68	94.72	70.29	77.12	49.97	40.47	48.79

	10-15
<b>Class Group</b>	35.99

	20-25	21-26
	83.26	53.42

Proposed Manual Base Rate (Exh. 3) x Average Rating Factors applicable to coverage (see Exh. 5).

**Massachusetts Private Passenger Automobile  
Proposed Average Rates  
Facility Market**

**PDL**

Territory	Class									
	10	15	17	18	20	21	25	26	30	
1	303.69	228.37	473.37	328.61	670.84	395.29	605.04	354.44	369.41	
2	314.94	235.98	483.16	309.39	712.21	421.59	641.98	377.67	388.84	
3	325.05	243.58	496.14	358.94	748.37	431.94	673.02	385.25	391.46	
4	329.07	246.64	510.83	346.19	794.97	462.41	715.90	413.48	414.00	
5	330.43	247.66	505.08	355.28	817.13	489.87	736.20	438.70	403.38	
6	340.57	255.71	510.92	360.72	821.84	502.13	740.99	451.25	385.82	
7	348.56	262.11	502.95	384.64	838.24	540.66	755.98	484.91	421.31	
8	337.85	253.30	520.65	400.27	868.80	543.11	784.06	487.22	421.93	
9	342.41	256.74	516.68	399.04	872.40	535.30	787.72	479.48	444.32	
10	348.40	261.99	524.10	370.74	895.15	552.75	805.73	493.41	384.20	
11	331.96	248.54	542.72	384.88	878.64	540.96	793.25	483.60	380.20	
12	375.74	281.81	549.84	406.28	905.17	579.03	814.99	519.37	469.79	
13	373.12	279.52	553.43	416.42	902.77	582.84	813.80	522.79	443.79	
14	385.85	289.11	588.21	410.95	911.14	602.29	820.58	537.98	409.84	
15	409.33	306.77	649.80	432.72	938.21	651.31	846.40	582.50	454.12	
16	358.82	268.80	629.37	371.87	886.25	582.65	797.74	521.77	377.58	
17	355.96	267.68	618.00	444.67	868.57	517.13	781.93	463.53	377.22	
18	348.45	261.70	624.95	379.39	905.48	566.75	817.09	507.63	485.41	
19	358.88	269.21	624.01	442.00	877.00	545.90	791.96	489.99	376.89	
20	347.12	260.34	615.70	344.75	894.57	578.92	805.66	518.22	392.18	
21	416.15	312.59	704.47	444.33	890.68	636.28	801.84	568.94	433.86	
22	497.79	373.67	758.91	577.24	878.71	681.48	791.90	609.94	434.97	
23	318.90	238.76	634.64	395.92	892.09	568.85	803.33	510.22	428.51	
24	408.82	306.69	633.40	429.75	886.30	581.21	798.43	519.94	543.13	
25	385.32	289.76	738.96	401.94	891.50	608.20	804.37	544.85	508.79	
26	421.20	316.74	716.26	565.04	900.44	688.31	810.40	615.50	559.57	
27	291.32	218.19	447.33	300.76	631.14	353.56	570.04	315.81	345.08	
40	306.83	229.79	544.22	353.75	882.71	562.30	794.66	503.87	311.30	
41	327.47	245.59	545.29	386.86	885.34	575.15	797.03	514.64	464.09	
42	306.55	230.21	567.02	398.80	896.57	636.43	808.42	570.34	428.92	
43	372.15	279.85	621.62	427.29	909.26	644.40	817.62	576.33	450.30	
44	292.45	218.96	575.80	395.27	870.65	585.61	783.69	523.37	285.88	
45	362.05	271.33	610.40	411.82	912.89	647.61	823.02	579.72	419.96	
<b>Total</b>										
<b>Class Total</b>	349.20	260.94	547.51	382.75	867.81	558.28	737.54	449.34	412.87	431.41

10-15	
<b>Class Group</b>	338.83

20-25	21-26
782.98	467.85

Proposed Manual Base Rate (Exh. 3) x Average Rating Factors applicable to coverage (see Exh. 5).

**Massachusetts Private Passenger Automobile****Proposed Average Rates****Facility Market****Collision**

Territory	Class								
	10	15	17	18	20	21	25	26	30
1	466.39	350.45	891.79	532.10	1158.46	622.22	1042.35	556.15	575.53
2	460.90	345.91	861.54	485.03	1212.07	599.16	1091.30	536.37	607.01
3	465.16	349.12	906.45	570.46	1247.04	642.16	1122.79	576.03	583.21
4	469.94	352.74	913.58	543.76	1293.55	681.11	1165.35	608.72	549.54
5	476.85	357.52	928.48	572.74	1269.66	718.92	1142.40	643.72	538.10
6	491.32	369.65	975.07	583.50	1343.49	759.43	1210.54	679.85	518.50
7	519.39	389.97	972.44	637.45	1307.21	803.20	1177.42	719.23	663.61
8	507.83	380.93	934.96	741.02	1297.03	791.53	1168.03	707.50	466.94
9	505.17	378.93	909.94	658.75	1282.31	771.26	1155.21	689.59	569.54
10	481.09	360.84	902.64	614.54	1298.13	834.62	1168.81	746.36	531.62
11	496.16	372.94	984.64	700.44	1221.73	816.10	1100.86	729.80	485.78
12	565.38	424.28	1036.16	678.18	1278.22	886.74	1149.11	791.32	793.79
13	564.84	424.96	944.31	748.35	1274.19	912.23	1147.47	815.78	595.73
14	597.77	449.39	1022.93	779.53	1225.37	949.93	1103.83	849.40	548.96
15	716.19	538.49	1071.15	847.95	1233.30	967.28	1110.64	864.93	613.66
16	611.37	459.64	990.31	628.42	1179.33	836.79	1062.14	749.47	647.44
17	537.92	403.98	1032.43	725.57	1189.86	807.35	1071.93	722.40	509.62
18	595.04	447.35	1014.88	689.61	1176.75	886.97	1060.23	793.20	771.98
19	610.87	459.26	1044.63	887.16	1147.08	919.64	1033.10	822.01	535.18
20	663.61	499.28	1001.07	744.74	1186.17	937.90	1067.05	840.01	744.27
21	693.55	521.80	1090.85	871.25	1195.59	1081.03	1076.79	967.20	922.88
22	736.79	554.34	1155.22	909.10	1195.81	1036.86	1076.88	927.27	843.96
23	552.99	415.70	1060.83	790.45	1225.88	938.95	1105.25	840.40	619.49
24	609.85	458.83	1006.10	800.68	1282.27	962.83	1154.74	860.60	608.26
25	631.70	474.92	1161.24	823.42	1223.73	1005.28	1101.81	900.09	645.90
26	699.90	525.60	1068.60	955.93	1216.52	1129.96	1095.64	1010.17	897.82
27	432.48	324.50	821.49	470.89	1140.30	571.52	1026.78	511.65	586.35
40	509.51	382.38	911.98	628.17	1224.25	911.26	1101.75	816.11	495.93
41	488.92	367.19	943.80	701.36	1234.04	897.76	1111.52	803.05	366.54
42	532.91	400.94	1009.46	787.75	1261.10	1002.46	1135.02	897.57	684.66
43	609.16	458.31	1056.19	772.59	1202.89	969.58	1082.94	866.47	569.17
44	535.94	402.58	1007.27	673.70	1203.36	844.05	1083.68	755.97	423.55
45	590.98	444.32	1005.67	790.91	1233.55	992.13	1110.00	888.22	765.48

Total

Class Total	536.52	396.21	961.35	657.21	1244.37	854.59	1133.50	674.66	598.59	630.61
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Class Group	10-15	516.59
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Class Group	20-25	1171.03	21-26	701.18
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Proposed Manual Base Rate (Exh. 3) x Average Rating Factors applicable to coverage (see Exh. 5).

**Massachusetts Private Passenger Automobile  
Proposed Average Rates  
Facility Market  
Comprehensive**

Territory	All except Class 15	Class 15	
1	94.95	70.62	
2	96.69	72.37	
3	101.05	75.85	
4	98.43	73.24	
5	102.79	76.73	
6	106.27	79.34	
7	110.63	82.83	
8	114.11	85.45	
9	112.37	83.70	
10	120.21	89.80	
11	128.05	95.91	
12	132.41	99.40	
13	148.96	111.60	
14	155.05	115.96	
15	191.64	143.86	
16	310.11	232.79	
17	110.63	82.83	
18	225.61	169.15	
19	247.39	185.71	
20	223.87	167.40	
21	304.88	228.43	
22	344.08	258.08	
23	207.32	155.20	
24	155.05	115.96	
25	235.20	176.12	
26	279.62	209.25	
27	89.72	67.14	
40	141.99	106.37	
41	143.73	107.24	
42	174.22	130.78	
43	182.93	136.89	
44	298.79	224.08	
45	192.51	143.86	
<b>Class Total</b>	<b>143.04</b>	<b>103.50</b>	<b>Total</b> <b>139.14</b>

Proposed Manual Base Rate (Exh. 3) x Average Rating Factors applicable to coverage (see Exh. 5).

**Massachusetts Private Passenger Automobile  
Current Liability Base Premiums (eff. 4/01/2008)  
Facility Market**

**20/40 A-1/B; \$5,000 PDL; Full A-2  
SDIP: Excellent Driver Plus**

Territory	Class								
	10	15	17	18	20	21	25	26	30
1	283	212	---	---	---	---	---	---	287
2	306	227	---	---	---	---	---	---	305
3	319	238	---	---	---	---	---	---	323
4	341	255	---	---	---	---	---	---	349
5	345	258	---	---	---	---	---	---	365
6	370	276	---	---	---	---	---	---	379
7	380	284	---	---	---	---	---	---	388
8	394	294	---	---	---	---	---	---	412
9	434	324	---	---	---	---	---	---	431
10	437	326	---	---	---	---	---	---	445
11	430	322	---	---	---	---	---	---	471
12	473	353	---	---	---	---	---	---	473
13	519	388	---	---	---	---	---	---	512
14	567	424	---	---	---	---	---	---	562
15	648	485	---	---	---	---	---	---	635
16	570	426	---	---	---	---	---	---	586
17	453	339	---	---	---	---	---	---	454
18	483	362	---	---	---	---	---	---	519
19	549	410	---	---	---	---	---	---	582
20	511	382	---	---	---	---	---	---	559
21	623	467	---	---	---	---	---	---	769
22	677	506	---	---	---	---	---	---	804
23	456	342	---	---	---	---	---	---	480
24	499	373	---	---	---	---	---	---	501
25	491	367	---	---	---	---	---	---	530
26	596	446	---	---	---	---	---	---	583
27	260	193	---	---	---	---	---	---	265
40	514	384	---	---	---	---	---	---	559
41	529	396	---	---	---	---	---	---	550
42	609	456	---	---	---	---	---	---	651
43	597	447	---	---	---	---	---	---	631
44	527	394	---	---	---	---	---	---	546
45	613	458	---	---	---	---	---	---	634

Total

Class Total	464.07	330.24	---	---	---	---	---	---	436.28	307.77
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10-15

Class Group	448.35
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**Massachusetts Private Passenger Automobile  
Current Liability Base Premiums (eff. 4/01/2008)  
Facility Market**

**20/40 A-1/B; \$5,000 PDL; Full A-2  
SDIP: Excellent Driver**

Territory	Class								
	10	15	17	18	20	21	25	26	30
1	315	235	565	377	---	---	---	---	319
2	340	252	607	406	---	---	---	---	339
3	355	264	629	434	---	---	---	---	360
4	379	284	680	445	---	---	---	---	389
5	384	287	681	473	---	---	---	---	405
6	411	307	728	482	---	---	---	---	421
7	422	316	717	521	---	---	---	---	432
8	438	327	780	537	---	---	---	---	458
9	482	360	819	577	---	---	---	---	479
10	486	363	904	619	---	---	---	---	494
11	478	358	975	617	---	---	---	---	523
12	525	392	955	670	---	---	---	---	526
13	577	431	1012	700	---	---	---	---	568
14	629	471	1074	768	---	---	---	---	624
15	719	538	1188	808	---	---	---	---	704
16	631	472	1191	958	---	---	---	---	649
17	504	377	968	609	---	---	---	---	505
18	536	401	1194	686	---	---	---	---	576
19	609	455	1177	771	---	---	---	---	645
20	567	424	1192	729	---	---	---	---	620
21	690	517	1237	938	---	---	---	---	851
22	750	561	1269	998	---	---	---	---	891
23	507	379	1153	774	---	---	---	---	533
24	555	415	1064	688	---	---	---	---	556
25	545	408	1196	708	---	---	---	---	588
26	661	495	1259	887	---	---	---	---	647
27	289	215	526	331	---	---	---	---	294
40	571	426	1078	709	---	---	---	---	621
41	587	439	1067	765	---	---	---	---	611
42	676	506	1167	828	---	---	---	---	723
43	663	497	1167	815	---	---	---	---	700
44	583	436	1192	961	---	---	---	---	604
45	681	509	1156	804	---	---	---	---	703
<b>Class Total</b>	<b>515.39</b>	<b>366.84</b>	<b>897.90</b>	<b>601.31</b>	<b>---</b>	<b>---</b>	<b>---</b>	<b>---</b>	<b>484.57</b>

10-15

Class Group	497.94
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**Massachusetts Private Passenger Automobile  
Current Liability Base Premiums (eff. 4/01/2008)**

**Facility Market**

**20/40 A-1/B; \$5,000 PDL; Full A-2**

**SDIP: 0 points**

Territory	Class								
	10	15	17	18	20	21	25	26	30
1	337	252	605	404	1152	662	1038	596	342
2	364	270	649	434	1246	726	1123	653	363
3	380	283	673	464	1324	756	1193	680	385
4	406	304	727	476	1445	842	1300	756	416
5	411	307	728	506	1508	896	1357	806	434
6	440	329	779	516	1570	979	1413	882	451
7	452	338	767	557	1645	1018	1481	914	462
8	469	350	834	575	1716	1060	1544	954	490
9	516	385	876	617	1763	1087	1588	979	513
10	520	388	967	662	1826	1184	1643	1066	529
11	511	383	1043	660	1801	1185	1622	1068	559
12	562	420	1021	716	1821	1273	1638	1146	562
13	617	461	1082	748	1821	1279	1639	1151	608
14	673	504	1148	821	1806	1319	1625	1187	668
15	769	575	1270	864	1816	1426	1634	1284	753
16	674	504	1273	1024	1774	1341	1598	1207	693
17	539	403	1035	651	1802	1061	1621	954	540
18	573	429	1277	734	1836	1276	1652	1148	615
19	651	486	1258	824	1767	1268	1593	1141	689
20	606	453	1274	779	1821	1296	1641	1166	662
21	737	552	1323	1003	1780	1396	1603	1257	909
22	802	600	1357	1067	1780	1424	1602	1281	952
23	542	406	1233	828	1802	1278	1622	1150	570
24	594	444	1138	736	1810	1177	1628	1059	595
25	583	436	1279	757	1818	1334	1634	1200	629
26	707	529	1347	949	1773	1421	1597	1279	692
27	309	230	563	354	1061	575	955	516	315
40	611	456	1152	758	1809	1235	1630	1114	664
41	628	470	1140	818	1818	1307	1634	1175	653
42	723	541	1247	885	1826	1415	1642	1275	773
43	709	531	1247	871	1822	1424	1638	1282	748
44	623	466	1275	1027	1790	1351	1612	1214	644
45	728	544	1236	859	1826	1416	1641	1273	752

Class Total	525.14	400.71	928.12	752.09	1698.51	995.75	1391.56	947.15	559.80
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	10-15
Class Group	448.12

	20-25	21-26
	1443.72	990.97

**Massachusetts Private Passenger Automobile  
Current Liability Base Premiums (eff. 4/01/2008)**

**Facility Market**

**20/40 A-1/B; \$5,000 PDL; Full A-2**

**SDIP: 1 points**

Territory	Class								
	10	15	17	18	20	21	25	26	30
1	385	288	647	432	1233	709	1111	638	390
2	415	308	694	464	1334	777	1202	699	414
3	434	323	720	497	1417	809	1277	728	439
4	463	347	778	509	1547	901	1392	809	475
5	469	350	779	541	1614	959	1452	863	495
6	502	376	833	552	1680	1048	1512	944	514
7	516	386	820	596	1760	1090	1585	978	527
8	535	399	892	615	1836	1134	1652	1021	559
9	588	439	937	660	1887	1163	1699	1048	585
10	593	442	1034	708	1954	1267	1758	1141	603
11	582	437	1115	706	1927	1268	1736	1143	637
12	641	479	1092	766	1949	1362	1753	1226	640
13	703	526	1157	800	1949	1368	1754	1231	693
14	767	574	1227	878	1933	1411	1739	1270	761
15	876	655	1358	924	1944	1526	1749	1374	857
16	766	572	1361	1095	1899	1434	1710	1291	787
17	614	459	1107	696	1928	1135	1735	1021	616
18	652	488	1366	785	1965	1365	1768	1228	700
19	741	553	1345	881	1891	1357	1705	1221	784
20	689	515	1362	833	1949	1387	1756	1247	753
21	838	627	1415	1072	1905	1494	1716	1345	1033
22	912	683	1452	1141	1905	1524	1715	1371	1083
23	618	463	1318	886	1929	1367	1736	1230	650
24	678	507	1218	787	1937	1260	1743	1133	678
25	664	497	1368	810	1946	1427	1749	1284	716
26	805	603	1441	1015	1898	1520	1709	1369	788
27	353	262	603	379	1136	616	1023	553	359
40	696	520	1232	811	1936	1321	1745	1192	757
41	716	536	1219	875	1946	1398	1749	1257	744
42	823	616	1333	946	1954	1514	1758	1364	880
43	808	605	1333	931	1950	1524	1753	1372	852
44	708	530	1363	1098	1916	1445	1725	1299	731
45	829	620	1321	918	1954	1515	1756	1362	856

Class Total	598.56	456.78	992.58	804.24	1817.80	1065.62	1489.34	1013.63	637.77
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	10-15
Class Group	510.81

	20-25	21-26
	1545.16	1060.50



**Massachusetts Private Passenger Automobile  
Current Liability Base Premiums (eff. 4/01/2008)  
Facility Market**

**20/40 A-1/B; \$5,000 PDL; Full A-2  
SDIP: 2 points**

Territory	Class								
	10	15	17	18	20	21	25	26	30
1	432	323	690	461	1315	756	1184	680	439
2	467	347	740	495	1422	829	1281	746	466
3	487	363	767	529	1511	863	1361	776	494
4	521	390	828	543	1648	961	1483	863	534
5	527	394	830	577	1720	1022	1548	920	556
6	564	422	887	588	1790	1117	1611	1006	578
7	579	433	874	635	1876	1161	1689	1043	592
8	601	449	950	655	1957	1209	1760	1088	628
9	661	493	998	703	2010	1240	1810	1116	657
10	666	497	1102	754	2082	1350	1873	1215	678
11	654	490	1188	752	2054	1351	1850	1217	715
12	720	538	1163	815	2077	1451	1868	1306	718
13	790	590	1232	852	2077	1458	1869	1312	778
14	861	645	1307	935	2060	1503	1853	1353	855
15	982	735	1446	984	2071	1625	1864	1463	962
16	857	641	1450	1166	2024	1528	1823	1375	881
17	690	516	1179	742	2055	1210	1848	1088	691
18	732	548	1454	836	2094	1454	1884	1309	784
19	831	621	1432	938	2015	1445	1817	1300	879
20	773	578	1450	887	2077	1477	1872	1329	844
21	938	703	1507	1141	2030	1591	1828	1433	1157
22	1023	765	1546	1215	2030	1623	1827	1460	1214
23	694	520	1404	943	2056	1457	1850	1311	729
24	761	569	1297	839	2065	1342	1857	1208	762
25	745	557	1456	862	2074	1521	1864	1368	804
26	904	676	1535	1081	2022	1620	1822	1458	884
27	396	295	642	404	1211	657	1090	589	404
40	782	584	1312	863	2063	1407	1859	1270	850
41	803	601	1298	931	2073	1490	1864	1339	835
42	923	691	1419	1008	2083	1613	1873	1453	988
43	906	679	1420	992	2078	1623	1868	1461	955
44	793	593	1452	1169	2042	1539	1839	1383	817
45	931	696	1407	978	2083	1614	1872	1451	961

Class Total	672.00	512.86	1057.21	856.54	1937.24	1135.77	1587.07	1080.13	716.05
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	10-15
Class Group	573.50

	20-25	21-26
	1646.58	1130.29

**Massachusetts Private Passenger Automobile  
Current Liability Base Premiums (eff. 4/01/2008)**

**Facility Market**

**20/40 A-1/B; \$5,000 PDL; Full A-2**

**SDIP: 3 points**

Territory	Class								
	10	15	17	18	20	21	25	26	30
1	480	359	732	489	1396	803	1258	723	487
2	518	385	785	525	1510	880	1361	792	517
3	541	403	814	562	1604	916	1445	824	548
4	578	433	879	576	1750	1020	1575	916	592
5	585	437	880	612	1826	1085	1643	977	618
6	626	469	942	624	1901	1185	1711	1068	641
7	643	481	927	674	1991	1233	1793	1107	657
8	667	498	1008	696	2077	1283	1869	1155	697
9	733	547	1059	746	2134	1316	1922	1185	729
10	739	551	1169	800	2210	1433	1989	1290	752
11	725	544	1260	798	2180	1434	1963	1292	793
12	798	597	1234	865	2204	1540	1983	1386	796
13	876	655	1306	903	2204	1547	1984	1392	863
14	955	715	1386	992	2187	1596	1967	1436	948
15	1089	814	1534	1043	2199	1725	1978	1553	1066
16	949	709	1538	1236	2148	1621	1935	1459	975
17	765	572	1252	787	2181	1284	1962	1155	767
18	811	607	1543	887	2223	1544	2001	1389	869
19	921	688	1520	996	2140	1534	1929	1380	973
20	856	640	1539	941	2205	1568	1987	1410	934
21	1039	778	1599	1210	2155	1689	1941	1520	1281
22	1133	848	1641	1289	2156	1723	1940	1550	1344
23	770	577	1489	1001	2182	1546	1964	1391	809
24	845	632	1377	890	2192	1425	1972	1282	845
25	826	618	1545	915	2201	1614	1979	1452	891
26	1002	750	1629	1148	2147	1719	1934	1548	980
27	440	327	682	429	1286	697	1158	626	448
40	867	647	1391	916	2190	1494	1974	1347	943
41	891	667	1376	988	2201	1581	1978	1421	926
42	1024	766	1506	1069	2211	1712	1989	1542	1095
43	1005	752	1506	1052	2207	1723	1984	1551	1059
44	878	657	1540	1240	2168	1634	1952	1468	904
45	1032	771	1492	1037	2211	1713	1987	1540	1065

Class Total	745.41	568.83	1121.60	908.65	2056.50	1205.51	1685.14	1146.61	794.03
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	10-15
Class Group	636.12

	20-25	21-26
	1748.25	1199.71

**Massachusetts Private Passenger Automobile  
Current Liability Base Premiums (eff. 4/01/2008)**

**Facility Market**

**20/40 A-1/B; \$5,000 PDL; Full A-2**

**SDIP: 4 points**

Territory	Class								
	10	15	17	18	20	21	25	26	30
1	527	394	775	518	1477	850	1331	765	535
2	570	423	831	556	1598	932	1440	838	568
3	595	443	861	594	1697	970	1529	872	603
4	635	476	930	610	1852	1079	1666	969	651
5	643	480	931	648	1932	1149	1739	1033	679
6	688	515	996	661	2011	1254	1810	1130	705
7	706	528	981	713	2106	1305	1897	1171	722
8	733	547	1067	736	2197	1358	1977	1222	766
9	805	601	1120	789	2257	1392	2033	1254	801
10	812	606	1236	846	2338	1516	2104	1364	826
11	797	597	1333	844	2307	1517	2077	1367	870
12	877	656	1305	915	2332	1629	2098	1466	875
13	962	719	1381	955	2332	1636	2099	1473	948
14	1049	785	1465	1048	2314	1688	2082	1519	1041
15	1196	894	1622	1103	2327	1824	2093	1643	1171
16	1040	778	1626	1307	2273	1715	2048	1544	1069
17	841	629	1324	833	2307	1359	2076	1222	842
18	890	667	1631	938	2353	1633	2117	1469	953
19	1012	755	1607	1053	2264	1622	2041	1460	1068
20	940	703	1627	994	2333	1658	2102	1492	1025
21	1139	853	1691	1280	2280	1786	2054	1608	1405
22	1244	931	1735	1363	2281	1823	2053	1640	1475
23	846	633	1574	1058	2309	1636	2079	1472	889
24	928	694	1457	942	2320	1507	2086	1356	928
25	907	678	1634	968	2329	1708	2094	1536	979
26	1100	823	1723	1214	2272	1819	2046	1637	1076
27	483	360	721	454	1361	738	1225	662	493
40	952	711	1471	968	2318	1580	2088	1425	1036
41	978	732	1455	1045	2329	1672	2093	1504	1017
42	1124	841	1592	1130	2340	1810	2104	1631	1202
43	1103	826	1592	1112	2335	1822	2099	1641	1163
44	963	720	1629	1311	2294	1728	2066	1553	991
45	1133	847	1577	1097	2339	1812	2102	1629	1169

Class Total	818.69	624.69	1186.20	960.96	2175.87	1275.65	1782.89	1212.97	872.20
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	10-15	20-25	21-26
Class Group	698.62	1849.67	1269.48

**Massachusetts Private Passenger Automobile  
Proposed Liability Base Premiums  
Facility Market**

**20/40 A-1/B; \$5,000 PDL; Full A-2  
SDIP: Excellent Driver Plus**

Territory	Class								
	10	15	17	18	20	21	25	26	30
1	301	225	---	---	---	---	---	---	305
2	325	242	---	---	---	---	---	---	324
3	340	254	---	---	---	---	---	---	344
4	363	271	---	---	---	---	---	---	372
5	367	273	---	---	---	---	---	---	388
6	393	293	---	---	---	---	---	---	403
7	403	301	---	---	---	---	---	---	412
8	418	313	---	---	---	---	---	---	437
9	460	344	---	---	---	---	---	---	457
10	463	347	---	---	---	---	---	---	471
11	455	339	---	---	---	---	---	---	496
12	500	374	---	---	---	---	---	---	500
13	549	410	---	---	---	---	---	---	541
14	599	448	---	---	---	---	---	---	594
15	683	510	---	---	---	---	---	---	668
16	593	444	---	---	---	---	---	---	610
17	480	359	---	---	---	---	---	---	481
18	508	380	---	---	---	---	---	---	544
19	577	431	---	---	---	---	---	---	609
20	536	401	---	---	---	---	---	---	585
21	650	486	---	---	---	---	---	---	803
22	710	531	---	---	---	---	---	---	842
23	483	360	---	---	---	---	---	---	508
24	530	396	---	---	---	---	---	---	530
25	518	387	---	---	---	---	---	---	559
26	627	470	---	---	---	---	---	---	614
27	276	205	---	---	---	---	---	---	281
40	543	406	---	---	---	---	---	---	592
41	558	417	---	---	---	---	---	---	581
42	642	480	---	---	---	---	---	---	686
43	629	471	---	---	---	---	---	---	663
44	549	411	---	---	---	---	---	---	565
45	647	484	---	---	---	---	---	---	667
<b>Class Total</b>	490.48	349.10	---	---	---	---	---	---	461.48

10-15

Class Group	473.87
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**Massachusetts Private Passenger Automobile  
Proposed Liability Base Premiums  
Facility Market**

**20/40 A-1/B; \$5,000 PDL; Full A-2  
SDIP: Excellent Driver**

Territory	Class								
	10	15	17	18	20	21	25	26	30
1	338	252	610	408	---	---	---	---	342
2	365	272	654	438	---	---	---	---	363
3	381	285	678	468	---	---	---	---	386
4	406	303	732	480	---	---	---	---	417
5	411	306	732	510	---	---	---	---	434
6	440	328	784	520	---	---	---	---	451
7	451	338	772	561	---	---	---	---	461
8	469	351	840	579	---	---	---	---	490
9	515	385	882	621	---	---	---	---	512
10	519	389	973	666	---	---	---	---	528
11	510	380	1049	664	---	---	---	---	556
12	561	419	1028	721	---	---	---	---	560
13	615	459	1087	751	---	---	---	---	606
14	671	502	1153	825	---	---	---	---	666
15	765	572	1276	868	---	---	---	---	749
16	665	498	1280	1029	---	---	---	---	684
17	538	403	1042	656	---	---	---	---	538
18	569	426	1283	738	---	---	---	---	609
19	646	483	1265	829	---	---	---	---	683
20	601	449	1281	782	---	---	---	---	656
21	728	544	1331	1007	---	---	---	---	899
22	795	595	1366	1072	---	---	---	---	944
23	541	404	1239	832	---	---	---	---	569
24	593	444	1147	741	---	---	---	---	593
25	580	433	1286	762	---	---	---	---	626
26	703	526	1356	955	---	---	---	---	688
27	309	230	567	357	---	---	---	---	315
40	608	455	1158	762	---	---	---	---	663
41	625	467	1145	823	---	---	---	---	651
42	719	538	1253	889	---	---	---	---	768
43	705	528	1253	875	---	---	---	---	743
44	616	460	1282	1031	---	---	---	---	633
45	724	542	1241	864	---	---	---	---	748

Class Total	549.45	391.18	965.66	647.03	---	---	---	---	517.00
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10-15

Class Group	530.85
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**Massachusetts Private Passenger Automobile  
Proposed Liability Base Premiums  
Facility Market**

**20/40 A-1/B; \$5,000 PDL; Full A-2  
SDIP: 0 points**

Territory	Class								
	10	15	17	18	20	21	25	26	30
1	363	271	656	439	1246	720	1123	648	368
2	392	292	703	471	1349	788	1215	709	390
3	410	306	729	503	1433	821	1290	738	415
4	437	326	787	516	1563	913	1405	820	448
5	442	329	787	548	1629	972	1466	875	467
6	473	353	843	559	1695	1060	1526	957	485
7	485	363	830	603	1777	1103	1601	992	496
8	504	377	903	623	1854	1149	1668	1034	527
9	554	414	948	668	1904	1180	1715	1061	551
10	558	418	1046	716	1975	1285	1775	1155	568
11	548	409	1128	714	1947	1286	1754	1157	598
12	603	450	1105	775	1969	1378	1771	1241	602
13	661	494	1169	808	1969	1385	1772	1247	652
14	722	540	1240	887	1956	1429	1760	1287	716
15	823	615	1372	933	1965	1545	1769	1391	805
16	715	535	1376	1106	1922	1453	1731	1308	735
17	578	433	1120	705	1947	1151	1752	1034	579
18	612	458	1380	794	1990	1384	1790	1245	655
19	695	519	1360	891	1915	1376	1727	1238	734
20	646	483	1377	841	1971	1404	1776	1264	705
21	783	585	1431	1083	1928	1515	1736	1364	967
22	855	640	1469	1153	1929	1546	1736	1392	1015
23	582	434	1332	895	1953	1385	1758	1247	612
24	638	477	1233	797	1963	1276	1766	1150	638
25	624	466	1383	819	1967	1448	1770	1302	673
26	756	566	1458	1027	1921	1541	1730	1387	740
27	332	247	610	384	1147	624	1033	560	339
40	654	489	1245	819	1959	1339	1765	1209	713
41	672	502	1231	885	1967	1414	1770	1274	700
42	773	578	1347	956	1977	1532	1778	1383	826
43	758	568	1347	941	1973	1544	1774	1391	799
44	662	495	1379	1109	1940	1464	1747	1317	681
45	779	583	1334	929	1976	1535	1777	1382	804

Class Total	562.93	429.32	1003.79	813.19	1837.47	1079.60	1504.50	1027.31	599.84
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	10-15
Class Group	480.23

	20-25	21-26
	1561.08	1074.45

**Massachusetts Private Passenger Automobile  
Proposed Liability Base Premiums  
Facility Market**

**20/40 A-1/B; \$5,000 PDL; Full A-2  
SDIP: 1 points**

Territory	Class								
	10	15	17	18	20	21	25	26	30
1	417	312	705	472	1339	774	1207	697	423
2	451	336	756	506	1450	847	1306	762	449
3	472	352	784	541	1540	883	1387	793	477
4	503	375	846	555	1680	981	1510	882	515
5	508	378	846	589	1751	1045	1576	941	537
6	544	406	906	601	1822	1140	1640	1029	558
7	558	417	892	648	1910	1186	1721	1066	570
8	580	434	971	670	1993	1235	1793	1112	606
9	637	476	1019	718	2047	1269	1844	1141	634
10	642	481	1124	770	2123	1381	1908	1242	653
11	630	470	1213	768	2093	1382	1886	1244	688
12	693	518	1188	833	2117	1481	1904	1334	692
13	760	568	1257	869	2117	1489	1905	1341	750
14	830	621	1333	954	2103	1536	1892	1384	823
15	946	707	1475	1003	2112	1661	1902	1495	926
16	822	615	1479	1189	2066	1562	1861	1406	845
17	665	498	1204	758	2093	1237	1883	1112	666
18	704	527	1484	854	2139	1488	1924	1338	753
19	799	597	1462	958	2059	1479	1857	1331	844
20	743	555	1480	904	2119	1509	1909	1359	811
21	900	673	1538	1164	2073	1629	1866	1466	1112
22	983	736	1579	1239	2074	1662	1866	1496	1167
23	669	499	1432	962	2099	1489	1890	1341	704
24	734	549	1325	857	2110	1372	1898	1236	734
25	718	536	1487	880	2115	1557	1903	1400	774
26	869	651	1567	1104	2065	1657	1860	1491	851
27	382	284	656	413	1233	671	1110	602	390
40	752	562	1338	880	2106	1439	1897	1300	820
41	773	577	1323	951	2115	1520	1903	1370	805
42	889	665	1448	1028	2125	1647	1911	1487	950
43	872	653	1448	1012	2121	1660	1907	1495	919
44	761	569	1482	1192	2086	1574	1878	1416	783
45	896	670	1434	999	2124	1650	1910	1486	925

Class Total	647.39	493.70	1079.08	874.25	1975.30	1160.68	1617.26	1104.49	689.83
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Class Group	10-15	552.26
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Class Group	20-25	1678.10	21-26	1155.15
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**Massachusetts Private Passenger Automobile  
Proposed Liability Base Premiums  
Facility Market**

**20/40 A-1/B; \$5,000 PDL; Full A-2  
SDIP: 2 points**

Territory	Class								
	10	15	17	18	20	21	25	26	30
1	472	352	754	505	1433	828	1291	745	478
2	510	380	808	542	1551	906	1397	815	507
3	533	398	838	578	1648	944	1484	849	540
4	568	424	905	593	1797	1050	1616	943	582
5	575	428	905	630	1873	1118	1686	1006	607
6	615	459	969	643	1949	1219	1755	1101	631
7	631	472	955	693	2044	1268	1841	1141	645
8	655	490	1038	716	2132	1321	1918	1189	685
9	720	538	1090	768	2190	1357	1972	1220	716
10	725	543	1203	823	2271	1478	2041	1328	738
11	712	532	1297	821	2239	1479	2017	1331	777
12	784	585	1271	891	2264	1585	2037	1427	783
13	859	642	1344	929	2264	1593	2038	1434	848
14	939	702	1426	1020	2249	1643	2024	1480	931
15	1070	800	1578	1073	2260	1777	2034	1600	1047
16	930	696	1582	1272	2210	1671	1991	1504	956
17	751	563	1288	811	2239	1324	2015	1189	753
18	796	595	1587	913	2289	1592	2059	1432	852
19	904	675	1564	1025	2202	1582	1986	1424	954
20	840	628	1584	967	2267	1615	2042	1454	917
21	1018	761	1646	1245	2217	1742	1996	1569	1257
22	1112	832	1689	1326	2218	1778	1996	1601	1320
23	757	564	1532	1029	2246	1593	2022	1434	796
24	829	620	1418	917	2257	1467	2031	1323	829
25	811	606	1590	942	2262	1665	2036	1497	875
26	983	736	1677	1181	2209	1772	1990	1595	962
27	432	321	702	442	1319	718	1188	644	441
40	850	636	1432	942	2253	1540	2030	1390	927
41	874	653	1416	1018	2262	1626	2036	1465	910
42	1005	751	1549	1099	2274	1762	2045	1590	1074
43	985	738	1549	1082	2269	1776	2040	1600	1039
44	861	644	1586	1275	2231	1684	2009	1515	885
45	1013	758	1534	1068	2272	1765	2044	1589	1045
<b>Class Total</b>	731.89	558.17	1154.33	934.98	2112.98	1241.56	1730.24	1181.41	779.90

	10-15
<b>Class Group</b>	624.37

	20-25	21-26
	1795.28	1235.64



**Massachusetts Private Passenger Automobile  
Proposed Liability Base Premiums  
Facility Market**

**20/40 A-1/B; \$5,000 PDL; Full A-2  
SDIP: 3 points**

Territory	Class								
	10	15	17	18	20	21	25	26	30
1	526	393	804	538	1526	882	1376	794	534
2	568	423	861	577	1653	965	1488	869	566
3	595	444	893	616	1755	1006	1580	904	602
4	634	473	964	632	1915	1118	1721	1005	650
5	641	477	964	671	1996	1191	1796	1072	677
6	686	512	1033	685	2076	1299	1869	1172	703
7	703	526	1017	739	2177	1351	1961	1215	719
8	731	547	1106	763	2271	1408	2043	1267	764
9	803	600	1161	818	2332	1446	2101	1300	799
10	809	606	1281	877	2419	1574	2174	1415	824
11	795	593	1382	875	2385	1575	2149	1417	867
12	874	653	1354	949	2412	1688	2169	1520	873
13	958	716	1432	990	2412	1697	2171	1528	945
14	1047	783	1519	1087	2396	1751	2156	1577	1038
15	1193	892	1681	1143	2407	1893	2167	1704	1167
16	1037	776	1686	1355	2354	1780	2120	1602	1066
17	838	628	1372	864	2385	1410	2146	1267	840
18	887	664	1691	973	2438	1695	2193	1525	950
19	1008	753	1666	1091	2346	1686	2116	1517	1064
20	937	700	1687	1030	2414	1720	2176	1548	1022
21	1135	848	1753	1327	2362	1856	2127	1671	1402
22	1240	928	1800	1412	2363	1894	2127	1705	1472
23	844	629	1632	1096	2392	1697	2154	1528	887
24	925	692	1510	976	2405	1563	2163	1409	925
25	905	676	1694	1003	2410	1774	2168	1595	976
26	1096	821	1786	1258	2353	1888	2119	1699	1073
27	481	358	747	470	1405	764	1265	686	492
40	948	709	1525	1003	2400	1640	2162	1481	1034
41	974	728	1508	1084	2410	1732	2168	1561	1015
42	1121	838	1650	1171	2422	1877	2178	1694	1198
43	1099	824	1650	1153	2417	1891	2173	1704	1159
44	960	718	1689	1359	2377	1793	2140	1613	987
45	1130	845	1634	1138	2421	1880	2177	1693	1166

Class Total	816.21	622.51	1229.66	996.16	2250.93	1322.61	1842.89	1258.53	869.79
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	10-15
Class Group	696.32

	20-25	21-26
	1912.23	1316.30

**Massachusetts Private Passenger Automobile  
Proposed Liability Base Premiums  
Facility Market**

**20/40 A-1/B; \$5,000 PDL; Full A-2  
SDIP: 4 points**

Territory	Class								
	10	15	17	18	20	21	25	26	30
1	581	434	853	571	1620	936	1460	842	589
2	627	467	914	612	1754	1024	1580	922	624
3	656	490	948	654	1863	1067	1677	959	664
4	699	522	1023	671	2032	1187	1827	1066	717
5	707	526	1023	712	2118	1264	1906	1138	747
6	757	565	1096	727	2204	1378	1984	1244	776
7	776	581	1079	784	2310	1434	2081	1290	794
8	806	603	1174	810	2410	1494	2168	1344	843
9	886	662	1232	868	2475	1534	2230	1379	882
10	893	669	1360	931	2568	1671	2308	1502	909
11	877	654	1466	928	2531	1672	2280	1504	957
12	965	720	1437	1008	2560	1791	2302	1613	963
13	1058	790	1520	1050	2560	1801	2304	1621	1043
14	1155	864	1612	1153	2543	1858	2288	1673	1146
15	1317	984	1784	1213	2555	2009	2300	1808	1288
16	1144	856	1789	1438	2499	1889	2250	1700	1176
17	925	693	1456	917	2531	1496	2278	1344	926
18	979	733	1794	1032	2587	1799	2327	1619	1048
19	1112	830	1768	1158	2490	1789	2245	1609	1174
20	1034	773	1790	1093	2562	1825	2309	1643	1128
21	1253	936	1860	1408	2506	1970	2257	1773	1547
22	1368	1024	1910	1499	2508	2010	2257	1810	1624
23	931	694	1732	1164	2539	1801	2285	1621	979
24	1021	763	1603	1036	2552	1659	2296	1495	1021
25	998	746	1798	1065	2557	1882	2301	1693	1077
26	1210	906	1895	1335	2497	2003	2249	1803	1184
27	531	395	793	499	1491	811	1343	728	542
40	1046	782	1619	1065	2547	1741	2295	1572	1141
41	1075	803	1600	1151	2557	1838	2301	1656	1120
42	1237	925	1751	1243	2570	1992	2311	1798	1322
43	1213	909	1751	1223	2565	2007	2306	1808	1278
44	1059	792	1793	1442	2522	1903	2271	1712	1090
45	1246	933	1734	1208	2569	1996	2310	1797	1286

Class Total	900.69	686.90	1304.96	1057.19	2388.82	1403.56	1955.96	1335.51	959.74
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	10-15
Class Group	768.37

	20-25	21-26
	2029.52	1396.86

**Massachusetts Private Passenger Automobile  
Percent Change by SDIP Level  
Facility Market**

**20/40 A-1/B; \$5,000 PDL; Full A-2  
SDIP: Excellent Driver Plus**

Territory	Class								
	10	15	17	18	20	21	25	26	30
1	6.4%	6.1%	---	---	---	---	---	---	6.3%
2	6.2%	6.6%	---	---	---	---	---	---	6.2%
3	6.6%	6.7%	---	---	---	---	---	---	6.5%
4	6.5%	6.3%	---	---	---	---	---	---	6.6%
5	6.4%	5.8%	---	---	---	---	---	---	6.3%
6	6.2%	6.2%	---	---	---	---	---	---	6.3%
7	6.1%	6.0%	---	---	---	---	---	---	6.2%
8	6.1%	6.5%	---	---	---	---	---	---	6.1%
9	6.0%	6.2%	---	---	---	---	---	---	6.0%
10	5.9%	6.4%	---	---	---	---	---	---	5.8%
11	5.8%	5.3%	---	---	---	---	---	---	5.3%
12	5.7%	5.9%	---	---	---	---	---	---	5.7%
13	5.8%	5.7%	---	---	---	---	---	---	5.7%
14	5.6%	5.7%	---	---	---	---	---	---	5.7%
15	5.4%	5.2%	---	---	---	---	---	---	5.2%
16	4.0%	4.2%	---	---	---	---	---	---	4.1%
17	6.0%	5.9%	---	---	---	---	---	---	5.9%
18	5.2%	5.0%	---	---	---	---	---	---	4.8%
19	5.1%	5.1%	---	---	---	---	---	---	4.6%
20	4.9%	5.0%	---	---	---	---	---	---	4.7%
21	4.3%	4.1%	---	---	---	---	---	---	4.4%
22	4.9%	4.9%	---	---	---	---	---	---	4.7%
23	5.9%	5.3%	---	---	---	---	---	---	5.8%
24	6.2%	6.2%	---	---	---	---	---	---	5.8%
25	5.5%	5.4%	---	---	---	---	---	---	5.5%
26	5.2%	5.4%	---	---	---	---	---	---	5.3%
27	6.2%	6.2%	---	---	---	---	---	---	6.0%
40	5.6%	5.7%	---	---	---	---	---	---	5.9%
41	5.5%	5.3%	---	---	---	---	---	---	5.6%
42	5.4%	5.3%	---	---	---	---	---	---	5.4%
43	5.4%	5.4%	---	---	---	---	---	---	5.1%
44	4.2%	4.3%	---	---	---	---	---	---	3.5%
45	5.5%	5.7%	---	---	---	---	---	---	5.2%
<b>Class Total</b>	5.7%	5.7%	---	---	---	---	---	---	5.8%

10-15	
Class Group	5.7%

**max chg: 6.7%**

**Massachusetts Private Passenger Automobile  
Percent Change by SDIP Level  
Facility Market**

**20/40 A-1/B; \$5,000 PDL; Full A-2  
SDIP: Excellent Driver**

Territory	Class								
	10	15	17	18	20	21	25	26	30
1	7.3%	7.2%	8.0%	8.2%	---	---	---	---	7.2%
2	7.4%	7.9%	7.7%	7.9%	---	---	---	---	7.1%
3	7.3%	8.0%	7.8%	7.8%	---	---	---	---	7.2%
4	7.1%	6.7%	7.6%	7.9%	---	---	---	---	7.2%
5	7.0%	6.6%	7.5%	7.8%	---	---	---	---	7.2%
6	7.1%	6.8%	7.7%	7.9%	---	---	---	---	7.1%
7	6.9%	7.0%	7.7%	7.7%	---	---	---	---	6.7%
8	7.1%	7.3%	7.7%	7.8%	---	---	---	---	7.0%
9	6.8%	6.9%	7.7%	7.6%	---	---	---	---	6.9%
10	6.8%	7.2%	7.6%	7.6%	---	---	---	---	6.9%
11	6.7%	6.1%	7.6%	7.6%	---	---	---	---	6.3%
12	6.9%	6.9%	7.6%	7.6%	---	---	---	---	6.5%
13	6.6%	6.5%	7.4%	7.3%	---	---	---	---	6.7%
14	6.7%	6.6%	7.4%	7.4%	---	---	---	---	6.7%
15	6.4%	6.3%	7.4%	7.4%	---	---	---	---	6.4%
16	5.4%	5.5%	7.5%	7.4%	---	---	---	---	5.4%
17	6.7%	6.9%	7.6%	7.7%	---	---	---	---	6.5%
18	6.2%	6.2%	7.5%	7.6%	---	---	---	---	5.7%
19	6.1%	6.2%	7.5%	7.5%	---	---	---	---	5.9%
20	6.0%	5.9%	7.5%	7.3%	---	---	---	---	5.8%
21	5.5%	5.2%	7.6%	7.4%	---	---	---	---	5.6%
22	6.0%	6.1%	7.6%	7.4%	---	---	---	---	5.9%
23	6.7%	6.6%	7.5%	7.5%	---	---	---	---	6.8%
24	6.8%	7.0%	7.8%	7.7%	---	---	---	---	6.7%
25	6.4%	6.1%	7.5%	7.6%	---	---	---	---	6.5%
26	6.4%	6.3%	7.7%	7.7%	---	---	---	---	6.3%
27	6.9%	7.0%	7.8%	7.9%	---	---	---	---	7.1%
40	6.5%	6.8%	7.4%	7.5%	---	---	---	---	6.8%
41	6.5%	6.4%	7.3%	7.6%	---	---	---	---	6.5%
42	6.4%	6.3%	7.4%	7.4%	---	---	---	---	6.2%
43	6.3%	6.2%	7.4%	7.4%	---	---	---	---	6.1%
44	5.7%	5.5%	7.6%	7.3%	---	---	---	---	4.8%
45	6.3%	6.5%	7.4%	7.5%	---	---	---	---	6.4%
<b>Class Total</b>	6.6%	6.6%	7.5%	7.6%	---	---	---	---	6.7%

10-15

Class Group	6.6%
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*max chg:* 8.2%

**Massachusetts Private Passenger Automobile  
Percent Change by SDIP Level  
Facility Market**

**20/40 A-1/B; \$5,000 PDL; Full A-2  
SDIP: 0 points**

Territory	Class								
	10	15	17	18	20	21	25	26	30
1	7.7%	7.5%	8.4%	8.7%	8.2%	8.8%	8.2%	8.7%	7.6%
2	7.7%	8.1%	8.3%	8.5%	8.3%	8.5%	8.2%	8.6%	7.4%
3	7.9%	8.1%	8.3%	8.4%	8.2%	8.6%	8.1%	8.5%	7.8%
4	7.6%	7.2%	8.3%	8.4%	8.2%	8.4%	8.1%	8.5%	7.7%
5	7.5%	7.2%	8.1%	8.3%	8.0%	8.5%	8.0%	8.6%	7.6%
6	7.5%	7.3%	8.2%	8.3%	8.0%	8.3%	8.0%	8.5%	7.5%
7	7.3%	7.4%	8.2%	8.3%	8.0%	8.3%	8.1%	8.5%	7.4%
8	7.5%	7.7%	8.3%	8.3%	8.0%	8.4%	8.0%	8.4%	7.6%
9	7.4%	7.5%	8.2%	8.3%	8.0%	8.6%	8.0%	8.4%	7.4%
10	7.3%	7.7%	8.2%	8.2%	8.2%	8.5%	8.0%	8.3%	7.4%
11	7.2%	6.8%	8.1%	8.2%	8.1%	8.5%	8.1%	8.3%	7.0%
12	7.3%	7.1%	8.2%	8.2%	8.1%	8.2%	8.1%	8.3%	7.1%
13	7.1%	7.2%	8.0%	8.0%	8.1%	8.3%	8.1%	8.3%	7.2%
14	7.3%	7.1%	8.0%	8.0%	8.3%	8.3%	8.3%	8.4%	7.2%
15	7.0%	7.0%	8.0%	8.0%	8.2%	8.3%	8.3%	8.3%	6.9%
16	6.1%	6.2%	8.1%	8.0%	8.3%	8.4%	8.3%	8.4%	6.1%
17	7.2%	7.4%	8.2%	8.3%	8.0%	8.5%	8.1%	8.4%	7.2%
18	6.8%	6.8%	8.1%	8.2%	8.4%	8.5%	8.4%	8.4%	6.5%
19	6.8%	6.8%	8.1%	8.1%	8.4%	8.5%	8.4%	8.5%	6.5%
20	6.6%	6.6%	8.1%	8.0%	8.2%	8.3%	8.2%	8.4%	6.5%
21	6.2%	6.0%	8.2%	8.0%	8.3%	8.5%	8.3%	8.5%	6.4%
22	6.6%	6.7%	8.3%	8.1%	8.4%	8.6%	8.4%	8.7%	6.6%
23	7.4%	6.9%	8.0%	8.1%	8.4%	8.4%	8.4%	8.4%	7.4%
24	7.4%	7.4%	8.3%	8.3%	8.5%	8.4%	8.5%	8.6%	7.2%
25	7.0%	6.9%	8.1%	8.2%	8.2%	8.5%	8.3%	8.5%	7.0%
26	6.9%	7.0%	8.2%	8.2%	8.3%	8.4%	8.3%	8.4%	6.9%
27	7.4%	7.4%	8.3%	8.5%	8.1%	8.5%	8.2%	8.5%	7.6%
40	7.0%	7.2%	8.1%	8.0%	8.3%	8.4%	8.3%	8.5%	7.4%
41	7.0%	6.8%	8.0%	8.2%	8.2%	8.2%	8.3%	8.4%	7.2%
42	6.9%	6.8%	8.0%	8.0%	8.3%	8.3%	8.3%	8.5%	6.9%
43	6.9%	7.0%	8.0%	8.0%	8.3%	8.4%	8.3%	8.5%	6.8%
44	6.3%	6.2%	8.2%	8.0%	8.4%	8.4%	8.4%	8.5%	5.7%
45	7.0%	7.2%	7.9%	8.1%	8.2%	8.4%	8.3%	8.6%	6.9%

Class Total	7.2%	7.1%	8.2%	8.1%	8.2%	8.4%	8.1%	8.5%	7.2%
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Class Group	10-15	20-25	21-26	<i>max chg:</i>	8.8%
	7.2%	8.1%	8.4%		

**Massachusetts Private Passenger Automobile  
Percent Change by SDIP Level  
Facility Market**

**20/40 A-1/B; \$5,000 PDL; Full A-2  
SDIP: 1 points**

Territory	Class								
	10	15	17	18	20	21	25	26	30
1	8.3%	8.3%	9.0%	9.3%	8.6%	9.2%	8.6%	9.2%	8.5%
2	8.7%	9.1%	8.9%	9.1%	8.7%	9.0%	8.7%	9.0%	8.5%
3	8.8%	9.0%	8.9%	8.9%	8.7%	9.1%	8.6%	8.9%	8.7%
4	8.6%	8.1%	8.7%	9.0%	8.6%	8.9%	8.5%	9.0%	8.4%
5	8.3%	8.0%	8.6%	8.9%	8.5%	9.0%	8.5%	9.0%	8.5%
6	8.4%	8.0%	8.8%	8.9%	8.5%	8.8%	8.5%	9.0%	8.6%
7	8.1%	8.0%	8.8%	8.7%	8.5%	8.8%	8.6%	9.0%	8.2%
8	8.4%	8.8%	8.9%	8.9%	8.6%	8.9%	8.5%	8.9%	8.4%
9	8.3%	8.4%	8.8%	8.8%	8.5%	9.1%	8.5%	8.9%	8.4%
10	8.3%	8.8%	8.7%	8.8%	8.6%	9.0%	8.5%	8.9%	8.3%
11	8.2%	7.6%	8.8%	8.8%	8.6%	9.0%	8.6%	8.8%	8.0%
12	8.1%	8.1%	8.8%	8.7%	8.6%	8.7%	8.6%	8.8%	8.1%
13	8.1%	8.0%	8.6%	8.6%	8.6%	8.8%	8.6%	8.9%	8.2%
14	8.2%	8.2%	8.6%	8.7%	8.8%	8.9%	8.8%	9.0%	8.1%
15	8.0%	7.9%	8.6%	8.5%	8.6%	8.8%	8.7%	8.8%	8.1%
16	7.3%	7.5%	8.7%	8.6%	8.8%	8.9%	8.8%	8.9%	7.4%
17	8.3%	8.5%	8.8%	8.9%	8.6%	9.0%	8.5%	8.9%	8.1%
18	8.0%	8.0%	8.6%	8.8%	8.9%	9.0%	8.8%	9.0%	7.6%
19	7.8%	8.0%	8.7%	8.7%	8.9%	9.0%	8.9%	9.0%	7.7%
20	7.8%	7.8%	8.7%	8.5%	8.7%	8.8%	8.7%	9.0%	7.7%
21	7.4%	7.3%	8.7%	8.6%	8.8%	9.0%	8.7%	9.0%	7.6%
22	7.8%	7.8%	8.7%	8.6%	8.9%	9.1%	8.8%	9.1%	7.8%
23	8.3%	7.8%	8.6%	8.6%	8.8%	8.9%	8.9%	9.0%	8.3%
24	8.3%	8.3%	8.8%	8.9%	8.9%	8.9%	8.9%	9.1%	8.3%
25	8.1%	7.8%	8.7%	8.6%	8.7%	9.1%	8.8%	9.0%	8.1%
26	8.0%	8.0%	8.7%	8.8%	8.8%	9.0%	8.8%	8.9%	8.0%
27	8.2%	8.4%	8.8%	9.0%	8.5%	8.9%	8.5%	8.9%	8.6%
40	8.0%	8.1%	8.6%	8.5%	8.8%	8.9%	8.7%	9.1%	8.3%
41	8.0%	7.6%	8.5%	8.7%	8.7%	8.7%	8.8%	9.0%	8.2%
42	8.0%	8.0%	8.6%	8.7%	8.8%	8.8%	8.7%	9.0%	8.0%
43	7.9%	7.9%	8.6%	8.7%	8.8%	8.9%	8.8%	9.0%	7.9%
44	7.5%	7.4%	8.7%	8.6%	8.9%	8.9%	8.9%	9.0%	7.1%
45	8.1%	8.1%	8.6%	8.8%	8.7%	8.9%	8.8%	9.1%	8.1%
<b>Class Total</b>	8.2%	8.1%	8.7%	8.7%	8.7%	8.9%	8.6%	9.0%	8.2%

	10-15
<b>Class Group</b>	8.1%

	20-25	21-26
	8.6%	8.9%

**max chg: 9.3%**

**Massachusetts Private Passenger Automobile  
Percent Change by SDIP Level  
Facility Market**

**20/40 A-1/B; \$5,000 PDL; Full A-2  
SDIP: 2 points**

Territory	Class								
	10	15	17	18	20	21	25	26	30
1	9.3%	9.0%	9.3%	9.5%	9.0%	9.5%	9.0%	9.6%	8.9%
2	9.2%	9.5%	9.2%	9.5%	9.1%	9.3%	9.1%	9.2%	8.8%
3	9.4%	9.6%	9.3%	9.3%	9.1%	9.4%	9.0%	9.4%	9.3%
4	9.0%	8.7%	9.3%	9.2%	9.0%	9.3%	9.0%	9.3%	9.0%
5	9.1%	8.6%	9.0%	9.2%	8.9%	9.4%	8.9%	9.3%	9.2%
6	9.0%	8.8%	9.2%	9.4%	8.9%	9.1%	8.9%	9.4%	9.2%
7	9.0%	9.0%	9.3%	9.1%	9.0%	9.2%	9.0%	9.4%	9.0%
8	9.0%	9.1%	9.3%	9.3%	8.9%	9.3%	9.0%	9.3%	9.1%
9	8.9%	9.1%	9.2%	9.2%	9.0%	9.4%	9.0%	9.3%	9.0%
10	8.9%	9.3%	9.2%	9.2%	9.1%	9.5%	9.0%	9.3%	8.8%
11	8.9%	8.6%	9.2%	9.2%	9.0%	9.5%	9.0%	9.4%	8.7%
12	8.9%	8.7%	9.3%	9.3%	9.0%	9.2%	9.0%	9.3%	9.1%
13	8.7%	8.8%	9.1%	9.0%	9.0%	9.3%	9.0%	9.3%	9.0%
14	9.1%	8.8%	9.1%	9.1%	9.2%	9.3%	9.2%	9.4%	8.9%
15	9.0%	8.8%	9.1%	9.0%	9.1%	9.4%	9.1%	9.4%	8.8%
16	8.5%	8.6%	9.1%	9.1%	9.2%	9.4%	9.2%	9.4%	8.5%
17	8.8%	9.1%	9.2%	9.3%	9.0%	9.4%	9.0%	9.3%	9.0%
18	8.7%	8.6%	9.1%	9.2%	9.3%	9.5%	9.3%	9.4%	8.7%
19	8.8%	8.7%	9.2%	9.3%	9.3%	9.5%	9.3%	9.5%	8.5%
20	8.7%	8.7%	9.2%	9.0%	9.1%	9.3%	9.1%	9.4%	8.6%
21	8.5%	8.3%	9.2%	9.1%	9.2%	9.5%	9.2%	9.5%	8.6%
22	8.7%	8.8%	9.2%	9.1%	9.3%	9.6%	9.3%	9.7%	8.7%
23	9.1%	8.5%	9.1%	9.1%	9.2%	9.3%	9.3%	9.4%	9.2%
24	8.9%	9.0%	9.3%	9.3%	9.3%	9.3%	9.4%	9.5%	8.8%
25	8.9%	8.8%	9.2%	9.3%	9.1%	9.5%	9.2%	9.4%	8.8%
26	8.7%	8.9%	9.3%	9.3%	9.2%	9.4%	9.2%	9.4%	8.8%
27	9.1%	8.8%	9.3%	9.4%	8.9%	9.3%	9.0%	9.3%	9.2%
40	8.7%	8.9%	9.1%	9.2%	9.2%	9.5%	9.2%	9.4%	9.1%
41	8.8%	8.7%	9.1%	9.3%	9.1%	9.1%	9.2%	9.4%	9.0%
42	8.9%	8.7%	9.2%	9.0%	9.2%	9.2%	9.2%	9.4%	8.7%
43	8.7%	8.7%	9.1%	9.1%	9.2%	9.4%	9.2%	9.5%	8.8%
44	8.6%	8.6%	9.2%	9.1%	9.3%	9.4%	9.2%	9.5%	8.3%
45	8.8%	8.9%	9.0%	9.2%	9.1%	9.4%	9.2%	9.5%	8.7%
<b>Class Total</b>	8.9%	8.8%	9.2%	9.2%	9.1%	9.3%	9.0%	9.4%	8.9%

Class Group	10-15	20-25	21-26	<i>max chg:</i>	9.7%
	8.9%	9.0%	9.3%		

**Massachusetts Private Passenger Automobile  
Percent Change by SDIP Level  
Facility Market**

**20/40 A-1/B; \$5,000 PDL; Full A-2  
SDIP: 3 points**

Territory	Class								
	10	15	17	18	20	21	25	26	30
1	9.6%	9.5%	9.8%	10.0%	9.3%	9.8%	9.4%	9.8%	9.7%
2	9.7%	9.9%	9.7%	9.9%	9.5%	9.7%	9.3%	9.7%	9.5%
3	10.0%	10.2%	9.7%	9.6%	9.4%	9.8%	9.3%	9.7%	9.9%
4	9.7%	9.2%	9.7%	9.7%	9.4%	9.6%	9.3%	9.7%	9.8%
5	9.6%	9.2%	9.5%	9.6%	9.3%	9.8%	9.3%	9.7%	9.5%
6	9.6%	9.2%	9.7%	9.8%	9.2%	9.6%	9.2%	9.7%	9.7%
7	9.3%	9.4%	9.7%	9.6%	9.3%	9.6%	9.4%	9.8%	9.4%
8	9.6%	9.8%	9.7%	9.6%	9.3%	9.7%	9.3%	9.7%	9.6%
9	9.5%	9.7%	9.6%	9.7%	9.3%	9.9%	9.3%	9.7%	9.6%
10	9.5%	10.0%	9.6%	9.6%	9.5%	9.8%	9.3%	9.7%	9.6%
11	9.7%	9.0%	9.7%	9.6%	9.4%	9.8%	9.5%	9.7%	9.3%
12	9.5%	9.4%	9.7%	9.7%	9.4%	9.6%	9.4%	9.7%	9.7%
13	9.4%	9.3%	9.6%	9.6%	9.4%	9.7%	9.4%	9.8%	9.5%
14	9.6%	9.5%	9.6%	9.6%	9.6%	9.7%	9.6%	9.8%	9.5%
15	9.6%	9.6%	9.6%	9.6%	9.5%	9.7%	9.6%	9.7%	9.5%
16	9.3%	9.4%	9.6%	9.6%	9.6%	9.8%	9.6%	9.8%	9.3%
17	9.5%	9.8%	9.6%	9.8%	9.4%	9.8%	9.4%	9.7%	9.5%
18	9.4%	9.4%	9.6%	9.7%	9.7%	9.8%	9.6%	9.8%	9.3%
19	9.4%	9.4%	9.6%	9.5%	9.6%	9.9%	9.7%	9.9%	9.4%
20	9.5%	9.4%	9.6%	9.5%	9.5%	9.7%	9.5%	9.8%	9.4%
21	9.2%	9.0%	9.6%	9.7%	9.6%	9.9%	9.6%	9.9%	9.4%
22	9.4%	9.4%	9.7%	9.5%	9.6%	9.9%	9.6%	10.0%	9.5%
23	9.6%	9.0%	9.6%	9.5%	9.6%	9.8%	9.7%	9.8%	9.6%
24	9.5%	9.5%	9.7%	9.7%	9.7%	9.7%	9.7%	9.9%	9.5%
25	9.6%	9.4%	9.6%	9.6%	9.5%	9.9%	9.6%	9.8%	9.5%
26	9.4%	9.5%	9.6%	9.6%	9.6%	9.8%	9.6%	9.8%	9.5%
27	9.3%	9.5%	9.5%	9.6%	9.3%	9.6%	9.2%	9.6%	9.8%
40	9.3%	9.6%	9.6%	9.5%	9.6%	9.8%	9.5%	9.9%	9.7%
41	9.3%	9.1%	9.6%	9.7%	9.5%	9.6%	9.6%	9.9%	9.6%
42	9.5%	9.4%	9.6%	9.5%	9.5%	9.6%	9.5%	9.9%	9.4%
43	9.4%	9.6%	9.6%	9.6%	9.5%	9.8%	9.5%	9.9%	9.4%
44	9.3%	9.3%	9.7%	9.6%	9.6%	9.7%	9.6%	9.9%	9.2%
45	9.5%	9.6%	9.5%	9.7%	9.5%	9.7%	9.6%	9.9%	9.5%

Class Total	9.5%	9.4%	9.6%	9.6%	9.5%	9.7%	9.4%	9.8%	9.5%
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	10-15
Class Group	9.5%

	20-25	21-26
	9.4%	9.7%

*max chg: 10.2%*



**Massachusetts Private Passenger Automobile  
Percent Change by SDIP Level  
Facility Market**

**20/40 A-1/B; \$5,000 PDL; Full A-2  
SDIP: 4 points**

Territory	Class								
	10	15	17	18	20	21	25	26	30
1	10.2%	10.2%	10.1%	10.2%	9.7%	10.1%	9.7%	10.1%	10.1%
2	10.0%	10.4%	10.0%	10.1%	9.8%	9.9%	9.7%	10.0%	9.9%
3	10.3%	10.6%	10.1%	10.1%	9.8%	10.0%	9.7%	10.0%	10.1%
4	10.1%	9.7%	10.0%	10.0%	9.7%	10.0%	9.7%	10.0%	10.1%
5	10.0%	9.6%	9.9%	9.9%	9.6%	10.0%	9.6%	10.2%	10.0%
6	10.0%	9.7%	10.0%	10.0%	9.6%	9.9%	9.6%	10.1%	10.1%
7	9.9%	10.0%	10.0%	10.0%	9.7%	9.9%	9.7%	10.2%	10.0%
8	10.0%	10.2%	10.0%	10.1%	9.7%	10.0%	9.7%	10.0%	10.1%
9	10.1%	10.1%	10.0%	10.0%	9.7%	10.2%	9.7%	10.0%	10.1%
10	10.0%	10.4%	10.0%	10.0%	9.8%	10.2%	9.7%	10.1%	10.0%
11	10.0%	9.5%	10.0%	10.0%	9.7%	10.2%	9.8%	10.0%	10.0%
12	10.0%	9.8%	10.1%	10.2%	9.8%	9.9%	9.7%	10.0%	10.1%
13	10.0%	9.9%	10.1%	9.9%	9.8%	10.1%	9.8%	10.0%	10.0%
14	10.1%	10.1%	10.0%	10.0%	9.9%	10.1%	9.9%	10.1%	10.1%
15	10.1%	10.1%	10.0%	10.0%	9.8%	10.1%	9.9%	10.0%	10.0%
16	10.0%	10.0%	10.0%	10.0%	9.9%	10.1%	9.9%	10.1%	10.0%
17	10.0%	10.2%	10.0%	10.1%	9.7%	10.1%	9.7%	10.0%	10.0%
18	10.0%	9.9%	10.0%	10.0%	9.9%	10.2%	9.9%	10.2%	10.0%
19	9.9%	9.9%	10.0%	10.0%	10.0%	10.3%	10.0%	10.2%	9.9%
20	10.0%	10.0%	10.0%	10.0%	9.8%	10.1%	9.8%	10.1%	10.0%
21	10.0%	9.7%	10.0%	10.0%	9.9%	10.3%	9.9%	10.3%	10.1%
22	10.0%	10.0%	10.1%	10.0%	10.0%	10.3%	9.9%	10.4%	10.1%
23	10.0%	9.6%	10.0%	10.0%	10.0%	10.1%	9.9%	10.1%	10.1%
24	10.0%	9.9%	10.0%	10.0%	10.0%	10.1%	10.1%	10.3%	10.0%
25	10.0%	10.0%	10.0%	10.0%	9.8%	10.2%	9.9%	10.2%	10.0%
26	10.0%	10.1%	10.0%	10.0%	9.9%	10.1%	9.9%	10.1%	10.0%
27	9.9%	9.7%	10.0%	9.9%	9.6%	9.9%	9.6%	10.0%	9.9%
40	9.9%	10.0%	10.1%	10.0%	9.9%	10.2%	9.9%	10.3%	10.1%
41	9.9%	9.7%	10.0%	10.1%	9.8%	9.9%	9.9%	10.1%	10.1%
42	10.1%	10.0%	10.0%	10.0%	9.8%	10.1%	9.8%	10.2%	10.0%
43	10.0%	10.0%	10.0%	10.0%	9.9%	10.2%	9.9%	10.2%	9.9%
44	10.0%	10.0%	10.1%	10.0%	9.9%	10.1%	9.9%	10.2%	10.0%
45	10.0%	10.2%	10.0%	10.1%	9.8%	10.2%	9.9%	10.3%	10.0%
<b>Class Total</b>	10.0%	10.0%	10.0%	10.0%	9.8%	10.0%	9.7%	10.1%	10.0%

	10-15
<b>Class Group</b>	10.0%

	20-25	21-26
	9.7%	10.0%

**max chg: 10.6%**

**Massachusetts Private Passenger Automobile Insurance  
Determination of Rates Not Varying by Class or Territory**

Basic Limits Rates	Subs. Trans.		Med.	U-1	U-2
	<u>\$15/day</u>	<u>\$30/day</u>	<u>Pay.</u>	<u>20/40</u>	<u>20/40</u>
1) Indicated Average Rate (Form 110, 100X)	29.38	119.17	47.55	40.47	0.00
2) Off-Balance: Senior Citizen *	0.980	0.980	0.980	0.980	0.980
3) Off-Balance: Annual Mileage *	1.000	1.000	0.997	0.997	0.997
4) Off-Balance: Passive Restraint *	1.000	1.000	1.000	1.000	1.000
5) Indicated Manual Rate (1) / [(2) x (3) x (4)]	29.980	121.602	48.666	41.420	0.000
6) Selected Manual Rate (Rounded)	\$30	\$122	\$49	\$21	\$0
7) Collectible Average Rate (6) x (2) x (3) x (4)	29.40	119.56	47.88	20.52	0.00

\* Sections 100J, 100K

**Increased Limits Rates**

Limit	Med. Pay.	Limit	U-1 ILF	Manual U-1 Rate	Avg. U-2 Rate	Manual U-2 Rate
10,000	64	20/50	1.020	22	0.38	0
15,000	83	25/50	1.057	23	2.37	2
20,000	88	25/60	1.077	24	2.86	3
25,000	98	35/80		25		9
50,000	113	50/100	1.280	27	14.53	15
100,000	134	100/100		30		35
		100/200		31		36
		100/300	1.474	32	35.93	37
		200/400		38		101
		250/500	1.884	40	119.08	122
		250/1000		41		130
		300/500		45		166
		500/500		58	284.22	291
		500/1000	2.826	59	290.31	297

Based on implied  
4/1/2007 ILFs

U-1 ILF's per 101C, Page 1; U-2 average rates per 101C-4.  
Some rates interpolated; "\*" rates adjusted to maintain \$1 difference

*Commonwealth Automobile Reinsurers*

**Filing for Residual Market Rates  
Effective 4/1/2009**

**Model Year/Symbol Relativities: 100M**

**Massachusetts Private Passenger Automobile****Model Year/Symbol Relativities**

The policy year 2009 model-year/symbol relativities for collision and comprehensive are calculated as follows:

- 1) Calculate the accident year 2005-2007 relativities using total industry data.
- 2) Regress the logarithms of the calculated relativities against model year and symbol to determine appropriate relationships between them.
- 3) Using the above relationships, calculate the indicated un-flattened model year/symbol relativities. Note that up to this point, total industry data is used for all calculations.
- 4) Balance the indicated un-flattened relativities on 2007 written exposures using facility market exposures from all available model years.
- 5) Flatten the balanced relativities to reflect expenses not varying by model year or symbol.
- 6) Re-balance the flattened relativities on 2007 written exposures using facility market exposures from all available model years.

The attached exhibits display the various calculations as follows:

<u>Section</u>	<u>Description</u>
100M, Exhibit 1	Calculation of Collision Relativities
100M, Exhibit 2	Calculation of Comprehensive Relativities
100M, Exhibit 3	Determination of Flattening Parameters
100M, Exhibit 4	Determination of Symbol 9 Relativities

Manual advisory rates for the limited collision coverage are determined as a fraction (8%) of the corresponding rates for the collision coverage.

Advisory rates for the 1989 and prior model year vehicles are calculated by application of symbol factors in Rule 20 times the earliest model year category. Thirteen model years are calculated (1998-2010) in Exhibits 1-2.

**Massachusetts Private Passenger Automobile  
 Calculation of Model Year/Symbol Relativities  
 Indicated Flattened Model Year /Symbol Relativities (Rounded )-Collision**

**Balanced on 2007 Facility Market Written Exposures**

Symbol	Model Year													1989& prior	Weighted Average
	2010	2009	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998-1990		
1	0.787	0.737	0.690	0.645	0.604	0.566	0.531	0.498	0.467	0.438	0.412	0.387	0.327	0.095	0.420
2	0.837	0.783	0.733	0.686	0.642	0.601	0.563	0.528	0.495	0.465	0.436	0.410	0.345	0.111	0.354
3	0.891	0.834	0.780	0.729	0.683	0.639	0.599	0.562	0.527	0.493	0.463	0.435	0.365	0.132	0.367
4	0.949	0.888	0.830	0.776	0.726	0.680	0.636	0.597	0.559	0.524	0.491	0.461	0.387	0.159	0.400
5	1.011	0.944	0.883	0.826	0.773	0.723	0.676	0.634	0.594	0.556	0.522	0.490	0.411	0.189	0.443
6	1.076	1.006	0.940	0.879	0.822	0.769	0.720	0.673	0.631	0.591	0.554	0.519	0.436	0.222	0.520
7	1.146	1.071	1.001	0.936	0.875	0.818	0.765	0.716	0.671	0.628	0.588	0.551	0.461	0.263	0.623
8	1.222	1.142	1.067	0.997	0.931	0.871	0.815	0.762	0.713	0.668	0.625	0.585	0.490	0.313	0.666
10	1.302	1.216	1.136	1.061	0.992	0.927	0.867	0.811	0.759	0.709	0.664	0.622	0.520	0.369	0.710
11	1.388	1.296	1.210	1.130	1.056	0.987	0.923	0.863	0.807	0.755	0.707	0.661	0.552	0.442	0.799
12	1.480	1.381	1.289	1.204	1.125	1.052	0.982	0.918	0.858	0.803	0.751	0.703	0.586	0.522	0.847
13	1.578	1.472	1.375	1.284	1.198	1.120	1.046	0.978	0.914	0.854	0.799	0.748	0.623	0.623	0.942
14	1.682	1.570	1.466	1.368	1.277	1.193	1.114	1.041	0.973	0.909	0.851	0.796	0.662	0.741	1.028
15	1.794	1.674	1.562	1.458	1.361	1.271	1.187	1.109	1.036	0.969	0.906	0.847	0.704	0.880	1.074
16	1.913	1.785	1.666	1.555	1.451	1.355	1.266	1.181	1.104	1.032	0.964	0.901	0.748	1.048	1.141
17	2.041	1.904	1.777	1.658	1.547	1.444	1.348	1.259	1.176	1.099	1.027	0.960	0.797	1.218	1.218
18	2.204	2.056	1.919	1.791	1.671	1.559	1.456	1.360	1.270	1.187	1.109	1.036	0.856	1.277	1.277
19	2.347	2.189	2.043	1.907	1.779	1.660	1.550	1.448	1.352	1.264	1.181	1.104	0.908	1.350	1.350
20	2.551	2.379	2.221	2.073	1.934	1.805	1.685	1.574	1.470	1.374	1.284	1.200	0.983	1.458	1.458
21	2.755	2.570	2.398	2.238	2.089	1.949	1.820	1.700	1.587	1.484	1.386	1.295	1.057	1.607	1.607
22	2.959	2.760	2.576	2.404	2.243	2.094	1.955	1.826	1.705	1.593	1.489	1.391	1.132	1.673	1.673
23	3.164	2.951	2.754	2.570	2.398	2.238	2.090	1.952	1.822	1.703	1.592	1.487	1.207	1.760	1.760
24	3.470	3.236	3.020	2.819	2.630	2.455	2.292	2.140	1.999	1.868	1.746	1.631	1.319	1.940	1.940
25	3.776	3.522	3.287	3.067	2.862	2.671	2.494	2.329	2.175	2.033	1.900	1.775	1.431	2.183	2.183
26	4.082	3.807	3.553	3.316	3.094	2.888	2.696	2.518	2.351	2.198	2.054	1.919	1.542	2.193	2.193
27	4.388	4.093	3.820	3.565	3.326	3.104	2.899	2.707	2.528	2.363	2.208	2.063	1.654	2.690	2.690
Weighted Average	N/A	N/A	1.582	1.426	1.397	1.235	1.175	1.070	0.998	0.958	0.878	0.811	0.635	0.454	1.000

Massachusetts Private Passenger Automobile  
Calculation of Model Year/Symbol Relativities

Indicated Flattened Model Year /Symbol Relativities (Unrounded) \* - Collision Coverages

Symbol	Model Year													1998-1990	1989 & prior	Weighted Average
	2010	2009	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998-1990			
1	0.788	0.738	0.691	0.646	0.605	0.567	0.532	0.499	0.468	0.439	0.412	0.388	0.327	0.0948	0.421	
2	0.839	0.785	0.734	0.687	0.643	0.602	0.564	0.529	0.496	0.466	0.437	0.411	0.346	0.1107	0.355	
3	0.893	0.835	0.781	0.730	0.684	0.640	0.599	0.562	0.527	0.494	0.464	0.435	0.366	0.1317	0.368	
4	0.951	0.889	0.831	0.777	0.728	0.681	0.637	0.598	0.560	0.524	0.492	0.462	0.388	0.1590	0.401	
5	1.012	0.946	0.884	0.827	0.774	0.724	0.677	0.635	0.595	0.557	0.523	0.490	0.412	0.1893	0.443	
6	1.078	1.008	0.941	0.880	0.823	0.770	0.721	0.674	0.632	0.592	0.555	0.520	0.436	0.2225	0.520	
7	1.148	1.073	1.003	0.937	0.877	0.820	0.767	0.717	0.672	0.629	0.589	0.552	0.462	0.2632	0.624	
8	1.224	1.143	1.068	0.998	0.933	0.872	0.816	0.763	0.714	0.669	0.626	0.586	0.490	0.3138	0.667	
10	1.304	1.218	1.138	1.063	0.993	0.929	0.868	0.812	0.760	0.711	0.665	0.623	0.521	0.3697	0.712	
11	1.390	1.298	1.212	1.132	1.058	0.989	0.924	0.864	0.808	0.756	0.708	0.662	0.553	0.4423	0.800	
12	1.482	1.383	1.291	1.206	1.127	1.053	0.984	0.919	0.860	0.804	0.752	0.704	0.587	0.5225	0.848	
13	1.580	1.475	1.377	1.286	1.200	1.121	1.047	0.979	0.916	0.856	0.801	0.749	0.624	0.6241	0.943	
14	1.684	1.572	1.468	1.370	1.279	1.195	1.116	1.043	0.974	0.911	0.852	0.797	0.663	0.7426	1.030	
15	1.796	1.677	1.565	1.460	1.364	1.273	1.189	1.111	1.038	0.971	0.907	0.848	0.705	0.8810	1.076	
16	1.916	1.788	1.668	1.557	1.454	1.357	1.268	1.183	1.105	1.033	0.966	0.902	0.749	1.0492	1.143	
17	2.044	1.906	1.779	1.661	1.550	1.446	1.350	1.261	1.177	1.101	1.028	0.961	0.798	1.2526	1.219	
18**	2.208	2.059	1.922	1.793	1.674	1.562	1.458	1.362	1.272	1.189	1.111	1.038	0.858		1.279	
19	2.351	2.192	2.046	1.910	1.782	1.663	1.553	1.450	1.354	1.266	1.183	1.105	0.910		1.352	
20	2.555	2.383	2.224	2.076	1.937	1.808	1.688	1.576	1.472	1.376	1.286	1.201	0.985		1.461	
21	2.760	2.574	2.402	2.242	2.092	1.952	1.823	1.702	1.590	1.486	1.388	1.297	1.059		1.610	
22	2.964	2.764	2.580	2.408	2.247	2.097	1.958	1.828	1.707	1.596	1.491	1.394	1.134		1.675	
23	3.168	2.955	2.758	2.574	2.402	2.241	2.093	1.955	1.825	1.706	1.594	1.490	1.209		1.763	
24	3.475	3.241	3.025	2.823	2.634	2.458	2.295	2.144	2.002	1.871	1.748	1.634	1.321		1.943	
25	3.782	3.527	3.292	3.072	2.867	2.675	2.498	2.333	2.178	2.036	1.903	1.778	1.433		2.186	
26	4.088	3.813	3.559	3.321	3.099	2.892	2.700	2.522	2.355	2.201	2.057	1.922	1.545		2.196	
27	4.395	4.099	3.825	3.570	3.332	3.109	2.903	2.711	2.532	2.366	2.211	2.066	1.657		2.694	
Weighted Average	N/A	N/A	1.584	1.428	1.399	1.237	1.177	1.072	1.000	0.960	0.879	0.813	0.635	0.455	1.002	

\* Relativity = [ Indicated Model Year Symbol Relativity \* Variable Component ] + Flat Component

Variable Component is 0.949

Flat Component is 0.051

\*\* Symbol 18 and Higher vehicles apply rating factors by Rule 22 B.

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**Massachusetts Private Passenger Automobile  
 Calculation of Model Year/Symbol Relativities  
 Indicated Un-flattened Model Year /Symbol Relativities (Rounded )-Collision**

**Balanced on 2007 Facility Market Written Exposures**

Symbol	Model Year											1989 & Prior	Weighted Average			
	2010	2009	2008	2007	2006	2005	2004	2003	2002	2001	2000			1999	1998-1990	
1	0.777	0.724	0.674	0.627	0.584	0.544	0.507	0.472	0.439	0.409	0.381	0.355	0.291	0.084	0.426	
2	0.830	0.773	0.720	0.670	0.624	0.581	0.541	0.504	0.469	0.437	0.407	0.379	0.311	0.100	0.321	
3	0.887	0.826	0.769	0.716	0.667	0.621	0.578	0.539	0.502	0.467	0.435	0.405	0.332	0.120	0.343	
4	0.948	0.883	0.822	0.765	0.713	0.664	0.618	0.576	0.536	0.499	0.465	0.433	0.355	0.146	0.373	
5	1.013	0.943	0.878	0.818	0.762	0.709	0.660	0.615	0.573	0.533	0.497	0.463	0.380	0.175	0.415	
6	1.082	1.008	0.938	0.874	0.814	0.758	0.706	0.657	0.612	0.570	0.531	0.494	0.406	0.207	0.497	
7	1.156	1.077	1.003	0.934	0.870	0.810	0.754	0.702	0.654	0.609	0.567	0.528	0.433	0.247	0.609	
8	1.236	1.151	1.072	0.998	0.929	0.865	0.806	0.750	0.699	0.651	0.606	0.564	0.463	0.296	0.655	
9	1.320	1.230	1.145	1.066	0.993	0.925	0.861	0.802	0.747	0.695	0.647	0.603	0.495	0.351	0.699	
10	1.411	1.314	1.223	1.139	1.061	0.988	0.920	0.857	0.798	0.743	0.692	0.644	0.529	0.423	0.791	
11	1.508	1.404	1.307	1.217	1.134	1.056	0.983	0.915	0.852	0.794	0.739	0.688	0.565	0.503	0.841	
12	1.611	1.500	1.397	1.301	1.211	1.128	1.050	0.978	0.911	0.848	0.790	0.736	0.604	0.604	0.941	
13	1.721	1.603	1.493	1.390	1.294	1.205	1.122	1.045	0.973	0.906	0.844	0.786	0.645	0.722	1.032	
14	1.839	1.713	1.595	1.485	1.383	1.288	1.199	1.117	1.040	0.969	0.902	0.840	0.689	0.861	1.080	
15	1.965	1.830	1.704	1.587	1.478	1.376	1.282	1.193	1.111	1.035	0.964	0.897	0.736	1.031	1.151	
16	2.100	1.955	1.821	1.696	1.579	1.470	1.369	1.275	1.187	1.106	1.030	0.959	0.787	1.231	1.231	
17	2.268	2.112	1.967	1.831	1.705	1.588	1.479	1.377	1.282	1.194	1.112	1.036	0.850	1.293	1.293	
18	2.415	2.249	2.094	1.950	1.816	1.691	1.575	1.466	1.366	1.272	1.184	1.103	0.905	1.365	1.365	
19	2.625	2.444	2.276	2.120	1.974	1.838	1.712	1.594	1.484	1.382	1.287	1.199	0.984	1.479	1.479	
20	2.835	2.640	2.458	2.289	2.132	1.985	1.849	1.721	1.603	1.493	1.390	1.295	1.062	1.636	1.636	
21	3.045	2.835	2.640	2.459	2.290	2.132	1.986	1.849	1.722	1.603	1.493	1.390	1.141	1.692	1.692	
22	3.255	3.031	2.823	2.628	2.448	2.279	2.122	1.977	1.841	1.714	1.596	1.486	1.220	1.783	1.783	
23	3.570	3.324	3.096	2.883	2.684	2.500	2.328	2.168	2.019	1.880	1.751	1.630	1.338	1.967	1.967	
24	3.885	3.618	3.369	3.137	2.921	2.720	2.533	2.359	2.197	2.046	1.905	1.774	1.456	2.213	2.213	
25	4.200	3.911	3.642	3.391	3.158	2.941	2.739	2.550	2.375	2.212	2.059	1.918	1.574	2.224	2.224	
26	4.515	4.204	3.915	3.646	3.395	3.162	2.944	2.742	2.553	2.377	2.214	2.062	1.692	2.739	2.739	
27																
Weighted Average	N/A	N/A	1.613	1.448	1.418	1.248	1.184	1.074	0.998	0.955	0.870	0.800	0.616	0.438	1.000	

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Massachusetts Private Passenger Automobile  
 Calculation of Model Year/Symbol Relativities  
 Total Industry

Indicated Un-flattened Model Year /Symbol Relativities (Unrounded) - Collision Coverages

Symbol	Model Year													1989 & Prior	Weighted Average
	2010	2009	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998-1990		
1	0.4823	0.4492	0.4183	0.3895	0.3627	0.3378	0.3145	0.2929	0.2727	0.2540	0.2365	0.2203	0.1807	0.0524	0.2642
2	0.5154	0.4799	0.4469	0.4162	0.3876	0.3609	0.3361	0.3130	0.2914	0.2714	0.2527	0.2353	0.1931	0.0618	0.1994
3	0.5507	0.5128	0.4776	0.4447	0.4141	0.3856	0.3591	0.3344	0.3114	0.2900	0.2701	0.2515	0.2063	0.0743	0.2134
4	0.5884	0.5480	0.5103	0.4752	0.4425	0.4121	0.3837	0.3573	0.3328	0.3099	0.2886	0.2687	0.2205	0.0904	0.2314
5	0.6288	0.5855	0.5452	0.5077	0.4728	0.4403	0.4100	0.3818	0.3556	0.3311	0.3083	0.2871	0.2356	0.1084	0.2575
6	0.6719	0.6256	0.5826	0.5425	0.5052	0.4705	0.4381	0.4080	0.3799	0.3538	0.3295	0.3068	0.2517	0.1284	0.3087
7	0.7179	0.6685	0.6225	0.5797	0.5399	0.5027	0.4681	0.4359	0.4060	0.3780	0.3520	0.3278	0.2690	0.1533	0.3783
8	0.7671	0.7143	0.6652	0.6195	0.5769	0.5372	0.5002	0.4658	0.4338	0.4040	0.3762	0.3503	0.2874	0.1840	0.4066
10	0.8197	0.7633	0.7108	0.6619	0.6164	0.5740	0.5345	0.4977	0.4635	0.4316	0.4019	0.3743	0.3071	0.2181	0.4340
11	0.8758	0.8156	0.7595	0.7073	0.6586	0.6133	0.5711	0.5319	0.4953	0.4612	0.4295	0.4000	0.3282	0.2625	0.4912
12	0.9359	0.8715	0.8116	0.7557	0.7038	0.6554	0.6103	0.5683	0.5292	0.4928	0.4589	0.4274	0.3507	0.3121	0.5222
13	1.0000	0.9312	0.8672	0.8075	0.7520	0.7003	0.6521	0.6073	0.5655	0.5266	0.4904	0.4567	0.3747	0.3747	0.5842
14	1.0685	0.9950	0.9266	0.8629	0.8035	0.7483	0.6968	0.6489	0.6042	0.5627	0.5240	0.4879	0.4004	0.4484	0.6406
15	1.1418	1.0632	0.9901	0.9220	0.8586	0.7995	0.7445	0.6933	0.6457	0.6012	0.5599	0.5214	0.4278	0.5348	0.6707
16	1.2200	1.1361	1.0580	0.9852	0.9174	0.8543	0.7956	0.7409	0.6899	0.6425	0.5983	0.5571	0.4571	0.6400	0.7146
17	1.3036	1.2140	1.1305	1.0527	0.9803	0.9129	0.8501	0.7916	0.7372	0.6865	0.6393	0.5953	0.4885	0.7669	0.7643
18	1.4079	1.3111	1.2209	1.1369	1.0587	0.9859	0.9181	0.8550	0.7962	0.7414	0.6904	0.6429	0.5275	0.8028	0.8028
19	1.4992	1.3960	1.3000	1.2106	1.1274	1.0498	0.9776	0.9104	0.8478	0.7895	0.7352	0.6846	0.5617	0.8476	0.8476
20	1.6295	1.5174	1.4131	1.3159	1.2254	1.1411	1.0626	0.9895	0.9215	0.8581	0.7991	0.7441	0.6106	0.9184	0.9184
21	1.7599	1.6388	1.5261	1.4212	1.3234	1.2324	1.1476	1.0687	0.9952	0.9267	0.8630	0.8037	0.6594	1.0155	1.0155
22	1.8902	1.7602	1.6392	1.5264	1.4214	1.3237	1.2326	1.1479	1.0689	0.9954	0.9269	0.8632	0.7083	1.0505	1.0505
23	2.0206	1.8816	1.7522	1.6317	1.5195	1.4150	1.3176	1.2270	1.1426	1.0640	0.9909	0.9227	0.7571	1.1067	1.1067
24	2.2161	2.0637	1.9218	1.7896	1.6665	1.5519	1.4452	1.3458	1.2532	1.1670	1.0867	1.0120	0.8304	1.2208	1.2208
25	2.4117	2.2458	2.0914	1.9475	1.8136	1.6888	1.5727	1.4645	1.3638	1.2700	1.1826	1.1013	0.9037	1.3736	1.3736
26	2.6072	2.4279	2.2609	2.1054	1.9606	1.8258	1.7002	1.5833	1.4744	1.3730	1.2785	1.1906	0.9769	1.3807	1.3807
27	2.8028	2.6100	2.4305	2.2633	2.1077	1.9627	1.8277	1.7020	1.5849	1.4759	1.3744	1.2799	1.0502	1.7002	1.7002
Weighted Average	N/A	N/A	1.0013	0.8992	0.8804	0.7746	0.7352	0.6667	0.6198	0.5929	0.5401	0.4968	0.3823	0.2719	0.6208



Massachusetts Private Passenger Automobile  
 Calculation of Model Year/Symbol Relativities

2007 Facility Market Written Exposures \* - \$ 500 Deductible Other Than Collision Coverages

Symbol	Model Year											1989 & prior	Totals
	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998-90		
1	1.8	1.3	1.4	0.0	0.2	2.8	1.1	1.0	1.7	1.0	6.9	2.0	21.2
2	0.0	0.0	0.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	47.7	0.2	49.9
3	0.0	0.0	0.4	0.0	0.0	0.0	5.7	0.0	0.0	8.1	133.7	5.8	153.7
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	147.8	507.7	8.8	664.3
5	0.9	2.2	1.8	0.1	7.2	9.3	19.1	31.2	40.1	171.5	672.2	6.9	962.5
6	4.8	71.3	25.7	59.8	23.1	63.7	58.2	92.3	177.2	333.8	937.7	17.2	1,864.8
7	47.6	252.1	36.4	128.9	122.3	143.5	145.2	153.3	256.5	99.2	875.9	33.0	2,293.9
8	57.3	182.2	159.9	301.2	435.1	529.8	479.7	533.7	708.0	297.8	1,390.9	81.2	5,156.8
10	81.2	599.1	224.2	293.8	327.8	535.7	680.4	729.9	614.4	437.3	2,213.9	56.8	6,794.5
11	46.5	280.8	406.1	601.2	766.4	875.8	658.2	631.4	649.3	558.3	1,251.5	31.2	6,756.7
12	66.0	531.9	574.1	969.2	1,143.1	1,210.2	1,435.6	756.1	1,145.5	1,030.6	2,045.7	28.9	10,936.9
13	103.2	770.0	653.4	1,168.8	897.4	1,112.7	1,231.7	853.8	970.4	632.1	1,380.9	27.3	9,801.7
14	258.7	1,215.2	1,190.2	739.9	767.3	853.1	869.2	974.0	929.0	690.2	1,442.0	22.0	9,950.8
15	156.5	624.0	581.0	831.2	1,048.9	1,226.8	1,058.1	1,152.1	609.4	522.1	1,136.9	16.3	8,963.3
16	75.9	501.7	576.3	836.7	976.2	954.5	772.8	547.0	653.9	582.4	1,061.7	16.2	7,555.3
17	107.1	320.1	556.4	721.2	716.6	720.4	556.4	576.9	426.7	472.4	894.8	23.7	6,092.7
18	74.8	199.1	573.6	266.6	498.0	491.8	416.7	618.1	628.4	374.8	745.1	12.3	4,899.3
19	45.4	179.3	280.4	152.4	381.2	197.9	345.9	451.9	360.6	164.7	571.6	2.2	3,133.5
20	39.2	160.1	170.8	181.6	164.1	202.9	285.8	212.2	301.6	361.5	335.1	8.9	2,423.8
21	30.6	208.0	116.7	67.8	78.1	104.3	138.7	197.2	206.5	119.4	251.1	8.2	1,526.6
22	16.1	55.2	77.0	51.8	117.8	106.8	49.8	66.9	154.1	107.4	199.9	0.0	1,002.8
23	14.2	42.3	34.7	46.8	63.6	23.1	35.9	102.1	39.2	47.8	171.4	0.0	621.1
24	7.2	23.8	24.8	26.4	37.4	30.8	29.0	19.2	15.1	41.7	101.9	0.0	357.3
25	1.8	21.9	18.5	8.1	23.2	9.3	14.8	30.5	26.2	12.1	39.2	0.0	205.6
26	4.3	6.2	19.8	10.3	10.8	13.6	19.7	27.3	22.9	10.0	69.2	0.0	214.1
27	5.4	31.8	24.3	19.1	9.5	21.1	15.7	6.1	3.9	5.8	47.9	0.0	190.6
Totals	1,246.5	6,279.6	6,327.9	7,483.9	8,616.3	9,439.9	9,323.4	8,764.2	8,940.6	7,229.8	18,532.5	409.1	92,593.7

\* Exposures are in Car-Years

**Massachusetts Private Passenger Automobile  
Calculation of Model Year/Symbol Relativities  
Total Industry**

Calendar Years 2005-2007 Earned Exposures\* - \$500 Deductible Collision Coverages

Symbol	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997&Pr	Totals
1	6.7	61.2	87.8	91.6	57.0	55.5	48.9	35.2	32.6	26.2	27.4	15.8	565.9
2	1.7	12.8	22.2	19.1	13.5	11.2	12.1	9.0	20.6	9.9	8.0	8.9	149.0
3	1.2	18.7	24.6	36.9	26.0	37.9	56.1	14.3	34.0	1,034.6	2,036.8	1,102.4	4,928.5
4	5.8	41.0	29.3	48.8	17.7	24.4	22.9	17.1	56.8	14,346.9	11,553.9	4,081.4	30,246.0
5	15.5	59.0	81.8	65.2	440.9	976.1	1,603.4	3,289.8	4,736.0	20,678.7	9,247.2	14,524.9	55,718.5
6	28.6	1,112.9	2,056.3	5,450.1	2,115.5	5,427.5	6,536.2	7,857.2	22,069.0	46,821.0	33,961.1	30,221.5	163,656.9
7	144.7	4,065.7	2,476.6	9,148.9	11,150.4	17,743.1	20,059.6	19,079.6	28,820.0	12,527.5	22,820.0	24,890.4	172,737.2
8	341.5	3,761.0	12,611.6	36,401.0	49,683.7	57,092.2	49,901.9	60,353.0	78,986.1	36,292.1	26,814.5	30,384.3	442,622.9
9	696.8	16,961.4	19,367.9	37,852.9	39,104.8	56,298.4	65,302.5	74,694.7	67,145.3	48,857.6	58,315.4	68,232.2	552,829.9
10	455.7	7,867.2	27,432.2	56,752.4	89,209.5	97,616.0	77,641.4	70,372.6	67,103.3	59,646.8	74,113.8	33,009.8	614,610.7
11	648.9	15,189.9	44,601.6	93,926.5	123,614.1	124,961.6	138,799.2	80,645.6	120,696.4	111,619.9	114,995.7	51,560.4	1,021,259.8
12	749.2	20,250.3	45,987.0	101,884.2	93,680.3	102,931.3	109,623.5	84,711.1	95,473.2	66,298.8	57,066.6	46,900.5	825,556.0
13	1,694.6	27,822.1	56,846.5	76,957.9	80,995.9	86,037.0	80,564.9	85,222.1	89,367.1	73,843.1	50,606.8	39,421.4	753,379.4
14	1,195.6	19,713.7	42,105.0	87,683.1	117,047.9	107,700.6	95,471.9	107,521.1	56,049.4	43,442.3	45,413.3	26,453.4	749,797.3
15	588.9	11,492.9	32,107.6	69,879.2	95,922.1	80,108.9	65,088.3	48,583.5	61,308.0	44,828.7	34,148.4	24,813.8	568,870.3
16	645.7	8,827.5	34,429.6	61,088.5	66,083.7	56,302.1	48,874.6	53,384.2	29,662.2	39,311.5	22,013.1	22,417.6	443,040.3
Totals	7,221.1	137,257.3	320,267.6	637,286.3	769,253.0	793,323.8	766,112.4	693,790.1	721,390.7	619,585.6	516,442.0	418,038.7	6,401,968.6

Accident Year 2005-2007 Observed Relativities - \$ 500 Deductible Collision Coverages

Symbol	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997&Pr	Average
1	0.0000	3.2635	5.9132	4.5067	1.8831	2.2492	2.5626	0.5864	0.3920	0.6131	0.0000	0.2280	2.7392
2	0.0190	0.0000	0.0000	0.1686	1.3112	0.7488	0.0000	0.0000	0.6300	0.0000	0.6338	0.1702	0.3282
3	0.0000	2.6997	4.3497	6.6691	0.2206	2.6628	0.8342	2.3583	0.7129	0.6145	0.4712	0.2509	0.5452
4	0.0000	3.4204	2.6206	3.6915	3.8773	3.5644	1.2657	5.5428	0.6259	0.5841	0.5053	0.3274	0.5354
5	3.5654	2.3350	1.6612	0.6626	1.0738	0.8134	0.7488	0.6887	0.6191	0.5049	0.3498	0.5049	0.5211
6	3.4386	1.6794	1.0130	0.9346	1.0529	0.9115	0.7539	0.8008	0.6702	0.6056	0.5151	0.3932	0.6127
7	1.3038	1.7531	0.9795	1.3406	1.0712	0.8218	0.8238	0.7005	0.7113	0.6828	0.5699	0.4296	0.7886
8	2.1623	1.8881	1.1011	1.1011	1.0003	1.0404	0.8761	0.8491	0.7827	0.7178	0.6518	0.5019	0.8862
9	1.8262	1.3108	0.9656	0.8436	0.9253	0.8819	0.9469	0.9220	0.7771	0.7019	0.6226	0.5477	0.8155
10	1.5308	1.4165	1.0428	1.0981	0.9644	0.9255	0.8849	0.9255	0.8818	0.7235	0.5454	0.5378	0.8755
11	2.1615	1.1741	1.0109	1.0547	1.0107	0.9996	0.9782	0.9794	0.8818	0.8209	0.7471	0.5924	0.9273
12	1.4859	1.2584	1.2669	1.2625	1.0443	1.0550	1.0708	0.9387	0.9154	0.8132	0.7511	0.7007	0.1000
13	1.5802	1.3519	1.2650	1.1346	1.1331	1.1325	1.0260	1.0869	0.9655	0.8832	0.8463	0.7668	1.0521
14	1.8201	1.3019	1.2632	1.1756	1.1433	1.1678	1.2272	1.0656	1.0502	1.0508	0.7359	0.7507	1.1101
15	2.1928	1.5244	1.3042	1.3042	1.2334	1.1658	1.1843	1.1843	1.1428	1.0818	0.9989	0.7328	1.1900
16	2.5907	1.3306	1.4005	1.3154	1.4319	1.3587	1.2800	1.0873	1.1704	1.0853	0.8962	0.8464	1.2296
Average	1.8535	1.3541	1.2184	1.1642	1.093	1.0742	1.0594	0.9780	0.9042	0.8164	0.7156	0.5988	0.9828

Accident Year Formula Relativities - \$ 500 Deductible Collision

Symbol	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998*	1997&Pr	Average
1	0.4823	0.4492	0.4183	0.3895	0.3627	0.3378	0.3145	0.2929	0.2727	0.2540	0.2084	0.2084	0.3503
2	0.5154	0.4799	0.4469	0.4162	0.3876	0.3609	0.3361	0.3130	0.2914	0.2714	0.2227	0.2227	0.3591
3	0.5507	0.5128	0.4776	0.4447	0.4141	0.3856	0.3591	0.3344	0.3114	0.2900	0.2380	0.2380	0.2694
4	0.5884	0.5480	0.5103	0.4752	0.4425	0.4121	0.3837	0.3573	0.3328	0.3099	0.2543	0.2543	0.2822
5	0.6288	0.5855	0.5452	0.5077	0.4728	0.4403	0.4100	0.3818	0.3556	0.3293	0.2717	0.2717	0.3170
6	0.6719	0.6256	0.5825	0.5425	0.5052	0.4705	0.4381	0.4080	0.3799	0.3553	0.2903	0.2903	0.3553
7	0.7179	0.6685	0.6225	0.5797	0.5399	0.5027	0.4681	0.4359	0.4060	0.3780	0.3102	0.3102	0.4254
8	0.7671	0.7143	0.6652	0.6195	0.5769	0.5372	0.5002	0.4658	0.4338	0.4040	0.3315	0.3315	0.4839
9	0.8197	0.7633	0.7108	0.6619	0.6164	0.5740	0.5345	0.4977	0.4635	0.4316	0.3542	0.3542	0.5026
10	0.8758	0.8156	0.7595	0.7073	0.6586	0.6133	0.5711	0.5319	0.4953	0.4612	0.3784	0.3784	0.5725
11	0.9359	0.8715	0.8116	0.7557	0.7038	0.6554	0.6103	0.5683	0.5292	0.4928	0.4044	0.4044	0.5941
12	1.0000	0.9312	0.8672	0.8075	0.7520	0.7003	0.6521	0.6073	0.5655	0.5266	0.4321	0.4321	0.6554
13	1.0685	0.9950	0.9266	0.8629	0.8035	0.7483	0.6968	0.6489	0.6042	0.5627	0.4617	0.4617	0.7026
14	1.1418	1.0632	0.9901	0.9220	0.8586	0.7995	0.7445	0.6933	0.6457	0.6012	0.4933	0.4933	0.7667
15	1.2200	1.1361	1.0580	0.9852	0.9174	0.8543	0.7956	0.7409	0.6899	0.6425	0.5272	0.5272	0.8139
16	1.3036	1.2140	1.1305	1.0527	0.9803	0.9129	0.8501	0.7916	0.7372	0.6863	0.5633	0.5633	0.8772
Average	1.0339	0.9477	0.9029	0.8313	0.7731	0.7048	0.6504	0.6039	0.5442	0.4996	0.4069	0.3984	0.6417

Notes:  
1.074 Average Effect of Moving from Model Year [n] to Model Year [n+1] and is applied to symbol 13 experience.  
1.069 Average Effect of Moving from Model Year [n] to Symbol [n+1] and is applied to each symbol for model years 1996 & later.  
\* Uses average model year for 1998 and prior vehicles.



Massachusetts Private Passenger Automobile  
 Calculation of Model Year/Symbol Relativities  
 Total Industry

Regression of Model Year /Symbol Relativities on Symbol for Collision Coverages : For Model Years 1990 and Later

Symbol	X Order	$\frac{Y}{\text{Ln(Relativities)}}$	Observed	W	WX	W <sup>2</sup>	W(X-X <sub>mean</sub> ) <sup>2</sup>	WY	W(X-X <sub>mean</sub> )(Y-Y <sub>mean</sub> )	Predicted Relativity EXP (aX+b)	Weighted Prediction Error
1	1	0.3534	1,188.3	0.01%	0.0001	0.0187	0.0001	0.0001	-0.0006	0.4592	0.0000
2	2	-1.7284	3,197.6	0.04%	0.0008	0.0418	-0.0007	-0.0007	0.0069	0.4907	-0.0009
3	3	-1.0927	17,177.4	0.21%	0.0064	0.1830	-0.0023	-0.0023	0.0209	0.5243	-0.0034
4	4	-0.8752	70,390.9	0.87%	0.0348	0.5973	-0.0076	-0.0076	0.0609	0.5602	-0.0125
5	5	-0.8297	110,527.1	1.37%	0.0683	0.7251	-0.0113	-0.0113	0.0796	0.5986	-0.0195
6	6	-0.5645	204,814.8	2.53%	0.1518	1.0002	-0.0143	-0.0143	0.0850	0.6396	-0.0305
7	7	-0.3629	213,603.2	2.64%	0.1847	0.7377	-0.0096	-0.0096	0.0464	0.6835	-0.0276
8	8	-0.2057	544,968.5	6.73%	0.5387	1.2374	-0.0139	-0.0139	0.0507	0.7303	-0.0630
10	9	-0.2543	649,991.5	8.03%	0.7228	0.8676	-0.0204	-0.0204	0.0592	0.7804	-0.0831
11	10	-0.1733	684,824.4	8.46%	0.8461	0.4425	-0.0147	-0.0147	0.0277	0.8338	-0.0852
12	11	-0.0950	1,078,850.7	13.33%	1.4663	0.2207	-0.0127	-0.0127	0.0111	0.8910	-0.1314
13	12	-0.0053	868,510.3	10.73%	1.2877	0.0088	-0.0006	-0.0006	-0.0008	0.9520	-0.1027
14	13	0.0347	802,551.3	9.92%	1.2891	0.0504	0.0034	0.0034	0.0046	1.0173	-0.0974
15	14	0.0906	783,066.8	9.68%	1.3545	0.2840	0.0088	0.0088	0.0200	1.0870	-0.0964
16	15	0.1536	600,357.6	7.42%	1.1127	0.5461	0.0114	0.0114	0.0370	1.1615	-0.0748
17	16	0.1857	474,694.2	5.87%	0.9384	0.8087	0.0109	0.0109	0.0470	1.2411	-0.0619
18	17	0.2680	333,699.9	4.12%	0.7009	0.9159	0.0111	0.0111	0.0579	1.3262	-0.0436
19	18	0.3166	212,674.3	2.63%	0.4730	0.8577	0.0083	0.0083	0.0521	1.4170	-0.0289
20	19	0.3346	174,466.0	2.16%	0.4096	0.9715	0.0072	0.0072	0.0528	1.5141	-0.0254
21	20	0.4616	98,082.2	1.21%	0.2424	0.7210	0.0056	0.0056	0.0460	1.6179	-0.0140
22	21	0.4875	66,456.0	0.82%	0.1724	0.6234	0.0040	0.0040	0.0370	1.7288	-0.0102
23	22	0.5262	39,386.4	0.49%	0.1071	0.4591	0.0026	0.0026	0.0263	1.8473	-0.0064
24	23	0.4645	25,468.3	0.31%	0.0724	0.3612	0.0015	0.0015	0.0167	1.9739	-0.0047
25	24	0.6669	14,345.8	0.18%	0.0425	0.2432	0.0012	0.0012	0.0145	2.1091	-0.0026
26	25	0.7075	12,304.4	0.15%	0.0380	0.2457	0.0011	0.0011	0.0143	2.2537	-0.0024
27	26	0.8601	7,832.9	0.10%	0.0252	0.1820	0.0008	0.0008	0.0118	2.4081	-0.0015
A/O											
Totals	351	-0.2755	8,093,430.8	100.00%	12.2868	13.3507			0.8850	0.0663 =a	-1.0302
Means	12							-0.0301		-0.8446 =b	

**Massachusetts Private Passenger Automobile  
Calculation of Average Model Year/Symbol Relativities  
Total Industry**

**Collision Coverage: Symbol Factors for 1989 and Prior Model Year Vehicles**

<b>Symbol</b>	<b>Factor</b>
1	0.29
2	0.32
3	0.36
4	0.41
5	0.46
6	0.51
7	0.57
8	0.64
10	0.71
11	0.80
12	0.89
13	1.00
14	1.12
15	1.25
16	1.40
17	1.57

Private Passenger Rating Manual, Rule 20

**Massachusetts Private Passenger Automobile  
 Calculation of Average Model Year/Symbol Relativities  
 Total Industry**

**Accident Year 2005-2007 Observed Relativities - \$ 500 Deductible Collision Coverages**

Symbol	Model Year											1997 & Prior	Totals
	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998		
1	0.0000	3.2635	5.9132	4.5067	1.8831	2.2492	2.5626	0.5864	0.3920	0.6131	0.0000	0.2280	1.4239
2	0.0190	0.0000	0.0000	0.1686	1.3112	0.7488	0.0000	0.0000	0.6300	0.0000	0.6338	0.1702	0.1776
3	0.0000	2.6997	4.3497	0.6691	0.2206	2.6628	0.8342	2.3583	0.7129	0.6145	0.4712	0.2509	0.3353
4	0.0000	3.4204	2.6206	3.6915	3.8773	0.5644	1.2657	5.5428	0.6259	0.5841	0.5053	0.3274	0.4168
5	3.5654	2.3350	1.6612	0.6626	1.0738	0.8134	0.7488	0.6887	0.6191	0.5440	0.5049	0.3498	0.4362
6	3.4386	1.6794	1.0150	0.9346	1.1529	0.9115	0.7539	0.8008	0.6702	0.6056	0.5151	0.3932	0.5686
7	1.3038	1.7531	0.9795	1.3406	1.0712	0.8218	0.8238	0.7005	0.7113	0.6828	0.5699	0.4296	0.6957
8	2.1623	1.8881	1.1660	1.1011	1.1003	1.0404	0.8761	0.8491	0.7827	0.7178	0.6518	0.5019	0.8141
10	1.8262	1.3108	0.9656	0.8436	0.9253	0.8819	0.9469	0.9220	0.7771	0.7019	0.6226	0.5477	0.7755
11	1.5308	1.4165	1.0428	1.0981	0.9644	0.9255	0.8849	0.8236	0.8397	0.7235	0.5454	0.5378	0.8409
12	2.1615	1.1741	1.1109	1.0547	1.0107	0.9996	0.9782	0.9794	0.8818	0.8209	0.7471	0.5924	0.9094
13	1.4859	1.2584	1.2669	1.2625	1.0443	1.0550	1.0708	0.9387	0.9154	0.8132	0.7511	0.7007	0.9947
14	1.5802	1.3519	1.2650	1.1346	1.1331	1.1325	1.0260	1.0869	0.9655	0.8832	0.8463	0.7668	1.0353
15	1.8201	1.3019	1.2632	1.1756	1.1433	1.1678	1.2272	1.0656	1.0502	1.0308	0.7359	0.7507	1.0948
16	2.1928	1.5244	1.4072	1.3042	1.2334	1.2356	1.1843	1.1655	1.1428	1.0818	0.9989	0.7328	1.1661
17	2.5907	1.3306	1.3005	1.3154	1.4319	1.3587	1.2800	1.0873	1.1704	1.0453	0.8962	0.8464	1.2041
18	2.1854	1.3770	1.3907	1.2983	1.4800	1.5686	1.4004	1.3366	1.1858	1.2846	1.2797	0.8914	1.3074
19	2.1738	1.4103	1.4136	1.3214	1.3939	1.4254	1.4050	1.6433	1.5563	1.1160	1.0622	1.0583	1.3725
20	1.3491	1.6285	1.5374	1.5583	1.4187	1.5089	1.5878	1.3235	1.2657	1.2003	1.5762	1.2441	1.3974
21	1.9970	1.7802	1.4619	1.6894	1.5660	1.6828	1.3503	1.6948	1.7629	1.5338	1.9866	1.3802	1.5866
22	2.2093	1.8193	1.7840	2.0647	1.5781	1.7044	1.6833	1.3733	1.4466	1.8226	1.5037	1.5524	1.6282
23	0.5838	1.7440	1.6307	1.8574	1.8701	1.5314	1.6187	1.9461	1.9176	1.5784	1.5818	1.3797	1.6925
24	1.2978	1.5656	1.2550	2.0554	1.6835	1.5675	1.7196	1.2038	1.6974	1.4742	1.8414	1.4609	1.5912
25	0.6264	2.3425	1.9995	2.2819	2.9299	2.0866	2.2322	1.1576	2.6598	2.0897	1.6377	1.5863	1.9481
26	3.9610	3.6949	3.2828	4.1071	1.2831	2.0437	4.2925	2.6318	2.4129	1.4168	1.4225	1.1309	2.0289
27	14.2067	3.3179	3.8822	1.9906	2.6467	1.8667	2.4392	1.2428	1.9631	2.2040	1.2346	1.9425	2.3634
Totals**	1.9142	1.3988	1.2704	1.2050	1.1592	1.1222	1.0921	1.0563	0.9757	0.8792	0.7818	0.6208	1.0000

\* This data is used to calculate symbol relativities; see Exhibit 1, Page 8.

\*\* This data is used to calculate model year relativities; see Exhibit 1, Page 7.

**Massachusetts Private Passenger Automobile  
 Calculation of Model Year/Symbol Relativities  
 Indicated Flattened Model Year /Symbol Relativities (Rounded) - Other Than Collision**

Balanced on 2007 Facility Market Written Exposures

Symbol	Model Year											1989 & Prior	Weighted Average		
	2010	2009	2008	2007	2006	2005	2004	2003	2002	2001	2000			1999	1998 - 1990
1	0.578	0.565	0.553	0.540	0.528	0.516	0.504	0.493	0.482	0.471	0.460	0.450	0.422	0.102	0.414
2	0.614	0.600	0.586	0.573	0.560	0.547	0.534	0.522	0.511	0.499	0.488	0.477	0.447	0.126	0.449
3	0.652	0.637	0.623	0.608	0.594	0.580	0.567	0.554	0.541	0.529	0.518	0.506	0.474	0.152	0.466
4	0.694	0.677	0.661	0.646	0.631	0.616	0.602	0.589	0.575	0.562	0.549	0.536	0.502	0.181	0.502
5	0.737	0.720	0.703	0.686	0.671	0.655	0.639	0.625	0.610	0.596	0.582	0.569	0.532	0.218	0.539
6	0.784	0.766	0.747	0.730	0.712	0.696	0.680	0.663	0.649	0.633	0.618	0.604	0.565	0.259	0.589
7	0.835	0.815	0.795	0.777	0.758	0.740	0.722	0.706	0.689	0.672	0.657	0.642	0.600	0.318	0.645
8	0.888	0.867	0.846	0.827	0.806	0.787	0.768	0.750	0.732	0.715	0.698	0.682	0.637	0.382	0.692
10	0.947	0.923	0.901	0.879	0.858	0.838	0.817	0.798	0.780	0.761	0.743	0.725	0.677	0.461	0.740
11	1.008	0.983	0.959	0.936	0.914	0.892	0.871	0.850	0.829	0.809	0.790	0.771	0.720	0.554	0.808
12	1.075	1.048	1.023	0.998	0.973	0.950	0.927	0.905	0.883	0.862	0.841	0.821	0.766	0.674	0.864
13	1.146	1.117	1.090	1.064	1.037	1.012	0.987	0.963	0.940	0.917	0.895	0.874	0.815	0.815	0.937
14	1.221	1.191	1.162	1.134	1.106	1.078	1.053	1.027	1.002	0.977	0.954	0.931	0.867	0.988	1.007
15	1.303	1.270	1.239	1.209	1.179	1.149	1.122	1.094	1.067	1.042	1.016	0.991	0.923	1.192	1.068
16	1.390	1.355	1.322	1.289	1.257	1.226	1.196	1.166	1.137	1.110	1.083	1.056	0.983	1.446	1.138
17	1.483	1.447	1.411	1.376	1.341	1.308	1.276	1.244	1.213	1.184	1.154	1.125	1.048	1.750	1.215
18	1.602	1.562	1.523	1.486	1.449	1.413	1.378	1.343	1.310	1.278	1.246	1.216	1.132	1.292	1.292
19	1.706	1.664	1.622	1.582	1.543	1.504	1.467	1.430	1.395	1.361	1.327	1.294	1.205	1.375	1.375
20	1.854	1.808	1.763	1.719	1.677	1.635	1.595	1.554	1.516	1.480	1.443	1.407	1.310	1.495	1.495
21	2.003	1.953	1.904	1.857	1.811	1.766	1.722	1.679	1.638	1.598	1.558	1.519	1.415	1.614	1.614
22	2.151	2.098	2.045	1.995	1.945	1.897	1.850	1.803	1.759	1.716	1.673	1.632	1.520	1.729	1.729
23	2.299	2.242	2.186	2.132	2.079	2.028	1.978	1.928	1.880	1.835	1.789	1.745	1.624	1.837	1.837
24	2.522	2.459	2.398	2.338	2.280	2.224	2.169	2.114	2.062	2.012	1.962	1.913	1.782	2.015	2.015
25	2.744	2.676	2.610	2.545	2.482	2.420	2.360	2.301	2.244	2.190	2.135	2.082	1.939	2.218	2.218
26	2.967	2.893	2.821	2.751	2.683	2.616	2.552	2.487	2.426	2.367	2.308	2.251	2.096	2.344	2.344
27	3.189	3.110	3.033	2.957	2.884	2.813	2.743	2.674	2.608	2.545	2.481	2.420	2.253	2.667	2.667
Weighted Average	N/A	N/A	1.260	1.192	1.216	1.123	1.115	1.059	1.029	1.029	0.984	0.945	0.814	0.560	1.000

**Massachusetts Private Passenger Automobile  
 Calculation of Model Year/Symbol Relativities**

**Indicated Flattened Model Year/Symbol Relativities (Unrounded) \* - Other Than Collision Coverages**

Symbol	Model Year													1989 & Prior	Weighted Average
	2010	2009	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998-1990		
1	0.580	0.567	0.554	0.541	0.529	0.517	0.505	0.494	0.483	0.473	0.462	0.451	0.424	0.102	0.416
2	0.616	0.601	0.587	0.574	0.561	0.549	0.536	0.524	0.512	0.500	0.489	0.478	0.449	0.126	0.450
3	0.654	0.639	0.624	0.610	0.596	0.582	0.569	0.556	0.543	0.531	0.519	0.507	0.475	0.152	0.468
4	0.696	0.679	0.663	0.648	0.633	0.618	0.604	0.590	0.576	0.563	0.550	0.537	0.503	0.181	0.503
5	0.739	0.722	0.705	0.688	0.673	0.657	0.641	0.626	0.611	0.598	0.584	0.571	0.534	0.219	0.541
6	0.786	0.768	0.749	0.732	0.714	0.697	0.682	0.665	0.650	0.635	0.620	0.606	0.566	0.260	0.590
7	0.837	0.817	0.797	0.779	0.760	0.742	0.724	0.708	0.691	0.674	0.659	0.644	0.601	0.319	0.647
8	0.891	0.870	0.848	0.829	0.808	0.789	0.771	0.752	0.734	0.717	0.700	0.684	0.638	0.383	0.694
10	0.949	0.926	0.904	0.882	0.860	0.840	0.820	0.800	0.782	0.763	0.745	0.727	0.679	0.462	0.742
11	1.011	0.986	0.962	0.939	0.917	0.895	0.873	0.852	0.832	0.811	0.792	0.773	0.722	0.556	0.810
12	1.078	1.051	1.026	1.001	0.976	0.953	0.930	0.907	0.885	0.864	0.844	0.823	0.768	0.676	0.867
13	1.149	1.120	1.093	1.067	1.040	1.015	0.990	0.966	0.943	0.920	0.897	0.876	0.817	0.817	0.939
14	1.225	1.194	1.166	1.137	1.109	1.081	1.056	1.030	1.005	0.980	0.957	0.933	0.870	0.991	1.010
15	1.306	1.274	1.242	1.212	1.182	1.153	1.125	1.097	1.070	1.044	1.019	0.994	0.926	1.195	1.071
16	1.394	1.359	1.326	1.292	1.261	1.229	1.199	1.169	1.141	1.113	1.086	1.059	0.986	1.450	1.141
17	1.488	1.451	1.414	1.379	1.345	1.312	1.279	1.247	1.216	1.187	1.157	1.129	1.051	1.755	1.219
18**	1.607	1.567	1.528	1.490	1.453	1.417	1.382	1.347	1.314	1.282	1.250	1.219	1.135		1.296
19	1.711	1.668	1.627	1.586	1.547	1.509	1.471	1.434	1.399	1.365	1.331	1.298	1.209		1.379
20	1.859	1.813	1.768	1.724	1.681	1.640	1.599	1.559	1.521	1.484	1.447	1.411	1.314		1.499
21	2.008	1.958	1.910	1.862	1.816	1.771	1.727	1.683	1.642	1.602	1.562	1.524	1.419		1.618
22	2.157	2.103	2.051	2.000	1.950	1.902	1.855	1.808	1.764	1.721	1.678	1.636	1.524		1.733
23	2.306	2.248	2.192	2.138	2.085	2.033	1.983	1.933	1.886	1.840	1.794	1.749	1.629		1.842
24	2.529	2.466	2.405	2.345	2.287	2.230	2.175	2.120	2.068	2.018	1.967	1.919	1.787		2.020
25	2.752	2.684	2.617	2.552	2.488	2.427	2.367	2.307	2.250	2.196	2.141	2.088	1.944		2.224
26	2.975	2.901	2.829	2.759	2.690	2.624	2.559	2.494	2.433	2.374	2.315	2.257	2.102		2.350
27	3.198	3.119	3.041	2.966	2.892	2.820	2.751	2.681	2.615	2.552	2.488	2.426	2.259		2.674
Weighted Average	N/A	N/A	1.264	1.195	1.220	1.126	1.118	1.061	1.032	1.032	0.987	0.947	0.816	0.561	1.003

\* Relativity = [ Indicated Model Year Symbol Relativity \* Variable Component ] + Flat Component

Variable Component is 0.925

Flat Component is 0.075

\*\* Symbol 18 and Higher vehicles apply rating factors by Rule 22 B



**Massachusetts Private Passenger Automobile  
 Calculation of Model Year/Symbol Relativities  
 Indicated Un-flattened Model Year /Symbol Relativities (Rounded) - Other Than Collision**

Balanced on 2007 Facility Market Written Exposures

Symbol	Model Year												1989 & Prior	Weighted Average	
	2010	2009	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999			1998 -1990
1	0.546	0.532	0.518	0.504	0.491	0.478	0.465	0.453	0.441	0.430	0.418	0.407	0.377	0.090	0.412
2	0.585	0.569	0.554	0.540	0.526	0.512	0.498	0.485	0.473	0.460	0.448	0.436	0.404	0.113	0.407
3	0.626	0.610	0.594	0.578	0.563	0.548	0.534	0.520	0.506	0.493	0.480	0.467	0.433	0.138	0.436
4	0.671	0.653	0.636	0.619	0.603	0.587	0.572	0.557	0.542	0.528	0.514	0.500	0.463	0.167	0.469
5	0.718	0.699	0.681	0.663	0.646	0.629	0.612	0.596	0.580	0.565	0.550	0.536	0.496	0.203	0.507
6	0.769	0.749	0.729	0.710	0.691	0.673	0.656	0.638	0.622	0.605	0.589	0.574	0.531	0.244	0.562
7	0.824	0.802	0.781	0.761	0.741	0.721	0.702	0.684	0.666	0.648	0.631	0.615	0.569	0.302	0.628
8	0.882	0.859	0.836	0.815	0.793	0.772	0.752	0.732	0.713	0.694	0.676	0.658	0.609	0.366	0.679
10	0.945	0.920	0.896	0.872	0.849	0.827	0.805	0.784	0.764	0.744	0.724	0.705	0.653	0.444	0.727
11	1.012	0.985	0.959	0.934	0.910	0.886	0.863	0.840	0.818	0.796	0.775	0.755	0.699	0.538	0.798
12	1.084	1.055	1.028	1.001	0.974	0.949	0.924	0.900	0.876	0.853	0.831	0.809	0.749	0.659	0.857
13	1.161	1.130	1.101	1.072	1.043	1.016	0.989	0.963	0.938	0.913	0.889	0.866	0.802	0.802	0.935
14	1.243	1.210	1.179	1.148	1.118	1.088	1.060	1.032	1.005	0.978	0.953	0.928	0.859	0.979	1.011
15	1.331	1.296	1.262	1.229	1.197	1.165	1.135	1.105	1.076	1.048	1.020	0.993	0.920	1.186	1.077
16	1.426	1.388	1.352	1.316	1.282	1.248	1.215	1.183	1.152	1.122	1.093	1.064	0.985	1.448	1.151
17	1.527	1.487	1.448	1.410	1.373	1.337	1.302	1.267	1.234	1.202	1.170	1.139	1.055	1.762	1.233
18	1.649	1.606	1.564	1.523	1.483	1.444	1.406	1.369	1.333	1.298	1.264	1.231	1.139	1.318	1.318
19	1.756	1.710	1.665	1.621	1.579	1.537	1.497	1.458	1.419	1.382	1.346	1.310	1.213	1.401	1.401
20	1.909	1.859	1.810	1.762	1.716	1.671	1.627	1.584	1.543	1.502	1.463	1.424	1.319	1.525	1.525
21	2.061	2.007	1.955	1.903	1.853	1.805	1.757	1.711	1.666	1.622	1.580	1.538	1.424	1.656	1.656
22	2.214	2.156	2.099	2.044	1.991	1.938	1.887	1.838	1.790	1.743	1.697	1.652	1.530	1.756	1.756
23	2.367	2.305	2.244	2.185	2.128	2.072	2.018	1.965	1.913	1.863	1.814	1.766	1.635	1.865	1.865
24	2.596	2.528	2.461	2.397	2.334	2.272	2.213	2.155	2.098	2.043	1.989	1.937	1.793	2.046	2.046
25	2.825	2.751	2.679	2.608	2.540	2.473	2.408	2.345	2.283	2.223	2.165	2.108	1.951	2.254	2.254
26	3.054	2.974	2.896	2.820	2.746	2.674	2.603	2.535	2.468	2.404	2.340	2.279	2.110	2.378	2.378
27	3.283	3.197	3.113	3.031	2.952	2.874	2.799	2.725	2.654	2.584	2.516	2.450	2.268	2.717	2.717
Weighted Average	N/A	N/A	1.2810	1.2072	1.2336	1.1339	1.1241	1.0640	1.0319	1.0306	0.9824	0.9398	0.7983	0.5471	1.000

Massachusetts Private Passenger Automobile  
Calculation of Model Year/Symbol Relativities  
Total Industry

Indicated Un-flattened Model Year /Symbol Relativities (Unrounded) - Other Than Collision Coverages

Symbol	Model Year													1989 & Prior	Weighted Averages
	2010	2009	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998-1990		
1	0.4703	0.4580	0.4459	0.4342	0.4228	0.4117	0.4009	0.3904	0.3801	0.3701	0.3604	0.3509	0.3249	0.3554	
2	0.5037	0.4905	0.4776	0.4650	0.4528	0.4409	0.4294	0.4181	0.4071	0.3964	0.3860	0.3759	0.3479	0.3502	
3	0.5394	0.5253	0.5115	0.4980	0.4850	0.4722	0.4598	0.4478	0.4360	0.4245	0.4134	0.4025	0.3726	0.3750	
4	0.5777	0.5626	0.5478	0.5334	0.5194	0.5058	0.4925	0.4795	0.4669	0.4547	0.4427	0.4311	0.3991	0.4046	
5	0.6187	0.6025	0.5867	0.5713	0.5563	0.5417	0.5274	0.5136	0.5001	0.4870	0.4742	0.4617	0.4274	0.4373	
6	0.6627	0.6453	0.6283	0.6118	0.5958	0.5801	0.5649	0.5500	0.5356	0.5215	0.5078	0.4945	0.4578	0.4844	
7	0.7097	0.6911	0.6729	0.6553	0.6380	0.6213	0.6050	0.5891	0.5736	0.5585	0.5439	0.5296	0.4903	0.5407	
8	0.7601	0.7401	0.7207	0.7018	0.6833	0.6654	0.6479	0.6309	0.6143	0.5982	0.5825	0.5672	0.5251	0.5856	
10	0.8140	0.7927	0.7719	0.7516	0.7318	0.7126	0.6939	0.6757	0.6579	0.6407	0.6238	0.6075	0.5623	0.6284	
11	0.8718	0.8489	0.8266	0.8049	0.7838	0.7632	0.7432	0.7237	0.7046	0.6861	0.6681	0.6506	0.6022	0.6878	
12	0.9337	0.9092	0.8853	0.8621	0.8394	0.8174	0.7959	0.7750	0.7547	0.7348	0.7155	0.6968	0.6450	0.7383	
13	1.0000	0.9737	0.9482	0.9233	0.8990	0.8754	0.8524	0.8300	0.8082	0.7870	0.7663	0.7462	0.6908	0.8055	
14	1.0710	1.0429	1.0155	0.9888	0.9628	0.9376	0.9129	0.8890	0.8656	0.8429	0.8207	0.7992	0.7398	0.8705	
15	1.1470	1.1169	1.0876	1.0590	1.0312	1.0041	0.9777	0.9521	0.9271	0.9027	0.8790	0.8559	0.7923	0.9277	
16	1.2284	1.1962	1.1648	1.1342	1.1044	1.0754	1.0471	1.0196	0.9929	0.9668	0.9414	0.9167	0.8486	0.9921	
17	1.3156	1.2811	1.2474	1.2147	1.1828	1.1517	1.1215	1.0920	1.0633	1.0354	1.0082	0.9817	0.9088	1.0625	
18	1.4209	1.3836	1.3472	1.3119	1.2774	1.2439	1.2112	1.1794	1.1484	1.1183	1.0889	1.0603	0.9815	1.1354	
19	1.5130	1.4732	1.4346	1.3969	1.3602	1.3245	1.2897	1.2558	1.2228	1.1907	1.1595	1.1290	1.0451	1.2073	
20	1.6445	1.6014	1.5593	1.5184	1.4785	1.4396	1.4018	1.3650	1.3292	1.2943	1.2603	1.2272	1.1360	1.3136	
21	1.7761	1.7295	1.6840	1.6398	1.5968	1.5548	1.5140	1.4742	1.4355	1.3978	1.3611	1.3254	1.2269	1.4270	
22	1.9077	1.8576	1.8088	1.7613	1.7150	1.6700	1.6261	1.5834	1.5418	1.5014	1.4619	1.4235	1.3178	1.5132	
23	2.0392	1.9857	1.9335	1.8828	1.8333	1.7852	1.7383	1.6926	1.6482	1.6049	1.5628	1.5217	1.4087	1.6069	
24	2.2366	2.1778	2.1206	2.0650	2.0107	1.9579	1.9065	1.8564	1.8077	1.7602	1.7140	1.6690	1.5450	1.7627	
25	2.4339	2.3700	2.3078	2.2472	2.1881	2.1307	2.0747	2.0202	1.9672	1.9155	1.8652	1.8162	1.6813	1.9419	
26	2.6313	2.5622	2.4949	2.4294	2.3656	2.3034	2.2429	2.1840	2.1267	2.0708	2.0165	1.9635	1.8176	2.0491	
27	2.8286	2.7543	2.6820	2.6116	2.5430	2.4762	2.4112	2.3478	2.2862	2.2262	2.1677	2.1108	1.9540	2.3404	
Weighted Average	N/A	N/A	1.1035	1.0400	1.0627	0.9770	0.9685	0.9168	0.8890	0.8880	0.8464	0.8097	0.6877	0.8616	
														0.4713	

073

Massachusetts Private Passenger Automobile  
Calculation of Model Year/Symbol Relativities

2007 Facility Market Written Exposures \* - \$ 500 Deductible Other Than Collision Coverages

Symbol	Model Year										1989 & prior	Totals	
	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999			1998-90
1	1.8	1.3	1.4	0.0	0.2	2.8	1.1	1.0	1.7	1.0	16.8	3.8	32.9
2	0.0	0.0	0.0	1.0	1.0	0.0	1.0	0.0	0.0	0.0	101.6	0.2	104.8
3	0.0	0.0	0.4	0.0	0.0	0.0	5.7	0.0	0.0	10.7	288.7	9.8	315.3
4	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	-0.6	178.1	858.6	18.9	1,055.2
5	1.9	2.2	1.8	0.1	7.2	9.3	18.1	33.5	45.9	214.1	1,206.3	17.6	1,558.0
6	4.8	73.5	25.7	59.8	24.0	66.1	61.2	106.1	196.8	402.8	1,521.9	35.7	2,578.4
7	49.2	263.4	37.4	135.8	127.7	146.5	163.5	168.4	299.0	129.5	1,475.0	81.4	3,076.8
8	59.4	186.7	167.9	313.3	449.4	557.6	503.5	597.0	828.8	345.4	2,270.4	193.1	6,472.5
10	84.8	612.8	230.6	298.8	335.2	559.6	730.8	791.2	696.4	546.5	3,290.6	168.3	8,345.6
11	48.5	296.8	417.8	629.3	788.3	922.1	707.0	696.7	749.2	679.2	2,058.6	104.2	8,097.7
12	70.2	545.4	598.9	1,004.3	1,193.0	1,266.1	1,505.3	818.1	1,278.8	1,199.9	2,958.4	68.2	12,506.6
13	108.2	809.9	688.7	1,212.7	942.6	1,165.1	1,320.4	925.2	1,105.7	764.2	2,009.3	56.9	11,108.9
14	276.5	1,259.7	1,257.7	769.4	818.1	912.4	931.4	1,063.1	1,038.2	805.8	2,027.5	51.4	11,211.2
15	168.5	659.6	611.0	883.6	1,108.0	1,306.8	1,157.3	1,267.5	702.6	605.0	1,638.9	28.4	10,137.2
16	79.4	544.7	623.2	879.5	1,041.1	1,016.3	834.1	608.6	765.5	660.8	1,507.8	25.4	8,586.4
17	116.4	344.9	591.9	775.2	776.8	768.2	605.7	626.8	474.2	559.9	1,270.2	38.9	6,949.1
18	76.2	211.2	608.9	281.8	532.3	527.0	452.2	674.5	710.8	437.9	1,053.9	19.3	5,586.0
19	50.5	196.8	297.3	173.7	397.5	211.8	380.0	498.6	389.2	202.6	744.7	9.0	3,551.7
20	41.4	178.3	193.0	200.9	177.0	224.4	305.4	227.8	338.2	413.2	436.7	9.5	2,745.8
21	34.9	233.2	123.2	73.3	84.2	109.8	142.9	208.1	238.7	137.0	334.3	16.1	1,735.7
22	18.7	61.4	89.7	57.7	132.0	117.2	55.8	70.2	189.2	120.8	262.4	0.0	1,175.1
23	13.8	49.0	36.3	56.1	69.3	26.8	39.2	111.5	47.8	52.8	214.1	0.0	716.7
24	8.0	27.5	31.8	33.4	41.4	34.6	31.3	19.2	19.1	49.6	140.3	0.0	436.2
25	2.2	23.9	20.5	10.6	23.0	11.3	13.9	33.7	29.2	14.6	55.6	0.0	238.5
26	5.2	6.2	22.8	10.8	15.1	14.6	20.7	31.1	26.1	9.4	87.1	0.0	249.1
27	6.6	46.1	31.2	24.2	14.0	25.1	17.0	7.1	5.8	9.8	53.2	0.0	240.1
Totals	1,327.1	6,634.5	6,709.3	7,885.3	9,098.4	10,001.5	10,004.5	9,585.0	10,176.3	8,550.6	27,882.9	956.1	108,811.5

\* Exposures are in Car-Years

Massachusetts Private Passenger Automobile  
Calculation of Model Year/Symbol Relativities  
Total Industry

Calendar Years 2005-2007 Earned Exposures - \$500 Deductible Other Than Collision Coverages

Symbol	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997&Pr	Totals
1	7.4	63.4	94.6	96.3	57.8	58.7	56.0	41.9	64.2	28.8	39.2	964.5	1,372.8
2	2.0	13.3	23.9	19.1	16.8	12.1	18.9	15.5	21.8	10.7	7.2	4,306.3	4,467.6
3	1.2	19.9	27.4	41.9	37.0	42.9	57.1	16.7	35.6	1,158.3	2,323.0	18,352.5	22,628.3
4	5.6	40.8	29.8	48.9	27.0	27.0	22.9	20.6	58.8	15,879.5	13,199.3	59,302.9	88,659.1
5	16.1	59.6	82.9	67.4	453.1	1,019.1	1,655.8	3,497.0	5,078.7	22,415.9	10,382.9	89,933.1	134,661.6
6	30.3	1,161.0	2,095.0	5,529.6	2,153.5	5,553.8	8,277.9	8,277.9	30,494.2	50,791.0	38,189.5	90,391.3	234,358.7
7	150.0	4,191.1	2,546.0	9,375.7	11,498.2	18,239.4	20,812.1	19,880.4	30,424.2	13,851.4	25,777.1	83,683.4	240,499.5
8	350.6	3,870.9	12,971.5	37,436.0	51,245.8	58,842.0	63,051.6	51,877.9	83,984.7	39,168.9	30,114.4	166,144.2	598,768.5
9	1,768.0	29,001.4	80,370.8	122,799.5	112,907.1	100,673.2	114,135.5	60,448.9	47,429.2	50,714.9	72,452.6	839,059.1	1,319,221.1
10	472.5	8,175.1	28,345.1	58,645.7	92,175.6	101,117.3	80,718.3	73,921.2	71,522.4	65,154.3	32,076.9	129,457.0	741,781.4
11	300.3	15,792.1	46,349.3	96,924.8	127,867.4	129,365.9	144,200.2	84,568.0	128,087.1	120,894.7	127,612.9	134,360.7	1,156,697.4
12	778.8	21,044.4	47,637.4	105,558.3	97,449.5	107,084.2	114,489.7	89,379.3	102,213.9	72,854.8	63,793.6	108,931.0	931,214.9
13	1,247.4	29,001.4	59,182.4	80,370.8	84,499.6	89,769.0	90,854.9	89,864.0	95,531.4	80,239.4	56,567.2	103,924.0	861,572.1
14	1,247.4	29,001.4	59,182.4	80,370.8	84,499.6	89,769.0	90,854.9	89,864.0	95,531.4	80,239.4	56,567.2	103,924.0	861,572.1
15	1,247.4	29,001.4	59,182.4	80,370.8	84,499.6	89,769.0	90,854.9	89,864.0	95,531.4	80,239.4	56,567.2	103,924.0	861,572.1
16	623.3	12,060.0	33,577.1	72,796.3	100,260.2	84,134.7	68,682.8	51,836.4	65,976.0	48,337.3	37,951.0	69,008.0	645,243.1
17	683.1	9,288.7	36,266.3	64,270.7	69,795.7	59,410.7	51,727.0	56,727.6	31,851.6	42,696.9	24,629.4	65,170.3	512,520.8
Totals	7,534.1	142,966.0	333,266.3	661,790.6	800,607.7	825,777.7	800,631.5	733,609.3	769,899.6	673,879.4	578,462.7	1,399,202.1	7,727,627.0

Accident Year 2005-2007 Observed Relativities - \$ 500 Deductible Other Than Collision Coverages

Symbol	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997&Pr	Average
1	0.0000	1.3413	4.5932	1.9062	1.8806	3.7437	0.4525	0.4871	0.5120	2.3625	0.0000	0.6372	1.1435
2	0.0000	0.0000	0.2936	1.5099	0.0000	0.9380	0.0000	0.7363	1.0096	0.4651	0.6563	0.7020	0.6968
3	0.0000	1.8878	2.2700	4.0413	3.9905	3.7817	0.6338	2.3793	0.6844	0.6337	0.6271	0.6271	0.6498
4	0.0000	0.7711	0.5347	1.5282	1.1754	0.7431	0.8823	0.5190	0.7254	0.6384	0.6868	0.5138	0.5630
5	0.0000	0.5937	0.8467	3.1719	0.6948	0.7198	0.9384	0.8657	0.7182	0.6532	0.6314	0.5764	0.6136
6	0.9419	1.1178	0.6236	0.6027	1.0212	0.8930	0.6981	0.6691	0.6284	0.5769	0.5958	0.5995	0.6159
7	0.3175	0.8769	0.9428	0.9208	0.9075	0.6645	0.6138	0.5405	0.7066	0.7624	0.6683	0.6668	0.6979
8	3.3946	1.0636	0.9604	0.8297	0.8919	0.7873	0.7028	0.6881	0.7181	0.7225	0.7420	0.7357	0.7577
9	0.6483	0.8776	0.8250	0.8652	0.8672	0.8181	0.8157	0.7609	0.7357	0.7859	0.7859	0.7639	0.7894
10	1.1635	0.8544	0.8004	0.8524	0.8319	0.7981	0.7232	0.7773	0.8611	0.8993	0.8068	0.8021	0.8133
11	1.0661	1.0201	0.7808	0.7507	0.8082	0.8387	0.9371	0.8769	0.8691	0.7888	0.7687	0.9131	0.8424
12	0.9075	0.8957	0.9978	0.9729	1.0661	0.9920	0.9217	0.8926	0.9044	0.9504	0.8594	0.9634	0.9522
13	0.9075	0.9909	0.9735	1.0012	1.0551	0.9749	1.0348	1.0050	0.9044	0.9680	0.8872	1.0241	0.9995
14	0.9720	0.9652	1.1672	1.0598	1.0944	1.0668	1.1156	0.9847	1.0703	1.1477	0.9749	1.0800	1.0678
15	1.5896	1.1542	1.1354	1.0420	1.1509	1.2145	1.1341	1.0445	1.1662	1.3026	1.1116	1.1046	1.1419
16	1.6211	1.0859	1.1543	1.2663	1.3868	1.3342	1.3319	1.1608	1.6817	1.0980	1.1478	1.1569	1.2670
17	1.1176	0.9872	0.9857	0.9639	1.0161	0.9651	0.9532	0.8949	0.9233	0.8910	0.8288	0.8236	0.9174
Average	1.1176	0.9872	0.9857	0.9639	1.0161	0.9651	0.9532	0.8949	0.9233	0.8910	0.8288	0.8236	0.9174

Accident Year Formula Relativities - \$ 500 Deductible Other Than Collision

Symbol	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998*	1997&Pr	Average
1	0.4703	0.4580	0.4459	0.4342	0.4228	0.4117	0.4009	0.3904	0.3801	0.3701	0.3426	0.3426	0.3706
2	0.5037	0.4905	0.4776	0.4650	0.4528	0.4409	0.4294	0.4181	0.4071	0.3964	0.3670	0.3670	0.3696
3	0.5394	0.5253	0.5115	0.4980	0.4850	0.4722	0.4598	0.4478	0.4360	0.4245	0.3930	0.3930	0.3972
4	0.5777	0.5626	0.5478	0.5334	0.5194	0.5058	0.4925	0.4795	0.4669	0.4547	0.4209	0.4209	0.4273
5	0.6187	0.6025	0.5867	0.5713	0.5563	0.5417	0.5274	0.5136	0.5001	0.4870	0.4508	0.4508	0.4625
6	0.6627	0.6453	0.6283	0.6118	0.5958	0.5801	0.5649	0.5500	0.5356	0.5215	0.4828	0.4828	0.4977
7	0.7097	0.6911	0.6729	0.6553	0.6380	0.6213	0.6050	0.5891	0.5736	0.5585	0.5171	0.5171	0.5641
8	0.7601	0.7401	0.7207	0.7018	0.6833	0.6654	0.6479	0.6309	0.6143	0.5982	0.5538	0.5538	0.6177
9	0.8140	0.7927	0.7719	0.7516	0.7318	0.7126	0.6939	0.6757	0.6579	0.6407	0.5931	0.5931	0.6581
10	0.8718	0.8489	0.8266	0.8049	0.7838	0.7632	0.7432	0.7237	0.7046	0.6861	0.6352	0.6352	0.7261
11	0.9337	0.9092	0.8853	0.8621	0.8394	0.8174	0.7959	0.7750	0.7547	0.7348	0.6803	0.6803	0.7752
12	1.0000	0.9737	0.9482	0.9233	0.8990	0.8754	0.8524	0.8300	0.8082	0.7870	0.7285	0.7285	0.8406
13	1.0710	1.0429	1.0155	0.9888	0.9628	0.9376	0.9129	0.8890	0.8656	0.8429	0.7803	0.7803	0.9002
14	1.1470	1.1169	1.0876	1.0590	1.0312	1.0041	0.9777	0.9521	0.9271	0.9027	0.8357	0.8357	0.9752
15	1.2284	1.1962	1.1648	1.1342	1.1044	1.0754	1.0471	1.0196	0.9929	0.9668	0.8950	0.8950	1.0396
16	1.3156	1.2811	1.2474	1.2147	1.1828	1.1517	1.1215	1.0920	1.0633	1.0354	0.9585	0.9585	1.1145
17	1.0365	0.9929	0.9899	0.9528	0.9267	0.8927	0.8515	0.8280	0.7778	0.7457	0.6845	0.6845	0.8101
Average	1.0365	0.9929	0.9899	0.9528	0.9267	0.8927	0.8515	0.8280	0.7778	0.7457	0.6845	0.6845	0.8101

Notes:  
1.0270 Average Effect of moving from Model-Year [n] to Model Year [n+1] and is applied to symbol 13 experience.  
1.0710 Average Effect of moving from Symbol [n] to Symbol [n+1] and is applied to each symbol for model years 1996 & later.  
\* Uses average model year for 1998 and prior vehicles

Massachusetts Private Passenger Automobile  
 Calculation of Average Model Year/Symbol Relativities  
 Total Industry

Regression of Model Year /Symbol Relativities on Model Year for Other Than Collision Coverages: For All Symbols by Model Year

Model Year	X Order	Y Observed Ln(Relativities)	Earned Exposures	W Weight	WX Weighted X	W(X-X <sub>mean</sub> ) <sup>2</sup>	WY Weighted Y	W(X-X <sub>mean</sub> )(Y-Y <sub>mean</sub> )	Predicted Relativity EXP (aX+b)	Observed Relativity
2008	1	0.2053	9,710.4	0.11%	0.0011	0.0563	0.0002	-0.0016	1.1433	1.2279
2007	2	0.0629	171,654.1	1.95%	0.0389	0.7356	0.0012	-0.0078	1.1217	1.0649
2006	3	0.0839	411,502.4	4.67%	0.1400	1.2364	0.0039	-0.0207	1.1005	1.0875
2005	4	0.0307	752,472.7	8.53%	0.3413	1.4679	0.0026	-0.0117	1.0797	1.0312
2004	5	0.0802	919,265.8	10.42%	0.5212	1.9328	0.0084	-0.0271	1.0594	1.0835
2003	6	0.0437	918,314.3	10.41%	0.6247	4.803	0.0046	-0.0103	1.0394	1.0447
2002	7	0.0239	909,799.6	10.32%	0.7221	0.1359	0.0025	-0.0031	1.0197	1.0242
2001	8	0.0196	871,986.0	9.89%	0.7910	0.0022	0.0019	-0.0003	1.0005	1.0198
2000	9	0.0151	901,586.7	10.22%	0.9200	0.0742	0.0015	0.0015	0.9816	1.0152
1999	10	-0.0142	769,969.2	8.73%	0.8730	0.2995	-0.0012	-0.0019	0.9631	0.9859
1998	11	-0.0920	644,965.0	7.31%	0.8044	0.5949	-0.0067	-0.0187	0.9449	0.9121
1997 & Prior	13.6	-0.1216	1,538,327.6	17.44%	2.3701	5.1628	-0.0212	-0.1132	0.8994	0.8855
Totals	80	0.3376	8,819,553.8	100.00%	8.1478	11.2788	-0.0023	-0.2149	-0.0191 =a	
Means	8							0.1530 =b		

Summation of Comparable Model Year Statistics, Relative to Accident Year

	Acc. Yr. X Model Yr. X+1	Acc. Yr. X Model Yr. X	Acc. Yr. X Model Yr. X-1	Acc. Yr. X Model Yr. X-2	Acc. Yr. X Model Yr. X-3	Acc. Yr. X Model Yr. X-4	Acc. Yr. X Model Yr. X-5	Acc. Yr. X Model Yr. X-6	Acc. Yr. X Model Yr. X-7	Acc. Yr. X Model Yr. X-8	Acc. Yr. X Model Yr. X-9	Acc. Yr. X Model Yr. X-10 and Prior	Total/Average
Exposures	32,329.2	839,907.9	839,907.9	911,758.2	920,486.0	915,463.5	911,369.1	859,321.7	777,611.4	653,054.5	521,276.3	994,355.8	8,819,553.8
Losses at 15 months	\$2,396,710	\$60,481,748	\$61,556,180	\$61,420,119	\$60,475,501	\$59,508,863	\$59,508,863	\$54,972,160	\$47,267,566	\$38,099,377	\$28,764,566	\$52,758,638	\$561,459,983
Loss Pure Premium	\$74.13	\$72.01	\$67.51	\$66.73	\$66.06	\$65.30	\$65.30	\$63.97	\$60.79	\$58.34	\$55.18	\$53.06	\$63.66
Relativity	1.1645	1.0988	1.1312	1.0605	1.0481	1.0377	1.0257	1.0049	0.9548	0.9164	0.8668	0.8335	1.0000

Regression of Model-Year /Symbol Relativities for Other Than Collision Coverages: For All Symbols by Relative Car Age

Model Year	X Order	Y Observed Ln(Relativities)	Earned Exposures	W Weight	WX Weighted X	W(X-X <sub>mean</sub> ) <sup>2</sup>	WY Weighted Y	W(X-X <sub>mean</sub> )(Y-Y <sub>mean</sub> )	Predicted Relativity EXP (aX+b)	Observed Relativity
X+1	1	0.1523	32,329.2	0.37%	0.0037	0.1398	0.0006	-0.0035	1.1737	1.1645
X	2	0.0942	482,620.2	5.47%	0.1094	1.4660	0.0052	-0.0279	1.1429	1.0988
X-1	3	0.1232	839,907.9	9.52%	0.2857	1.6607	0.0117	-0.0507	1.1129	1.1312
X-2	4	0.0588	911,758.2	10.34%	0.4135	1.0427	0.0061	-0.0207	1.0837	1.0605
X-3	5	0.0470	920,486.0	10.44%	0.5218	0.4941	0.0049	-0.0116	1.0552	1.0481
X-4	6	0.0370	915,463.5	10.38%	0.6228	0.1435	0.0038	-0.0050	1.0275	1.0377
X-5	7	0.0254	911,369.1	10.33%	0.7233	0.0032	0.0026	-0.0005	1.0005	1.0257
X-6	8	0.0049	859,321.7	9.74%	0.7795	0.0662	0.0005	0.0007	0.9742	1.0049
X-7	9	-0.0462	777,611.4	8.82%	0.7935	0.2934	-0.0041	-0.0068	0.9487	0.9548
X-8	10	-0.0873	653,054.5	7.40%	0.7405	0.5905	-0.0065	-0.0174	0.9237	0.9164
X-9	11	-0.1429	521,276.3	5.91%	0.6502	0.8643	-0.0084	-0.0314	0.8995	0.8668
X-10	13.6	-0.1822	994,355.8	11.27%	1.5320	4.6360	-0.0205	-0.1287	0.8396	0.8335
Totals	80	0.0841	8,819,553.8	100.00%	7.1759	11.4005	-0.0042	-0.3034	-0.0266 =a	
Means	7							0.1868 =b		

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Massachusetts Private Passenger Automobile  
 Calculation of Average Model Year/Symbol Relativities  
 Total Industry

Regression of Model Year/Symbol Relativities on Symbol for Other Than Collision Coverages : For Model Years 1990 and Later

Symbol	X_Order	Y Observed Ln(Relativities)	Earned Exposures	W Weight	WX Weighted X	W(X-X <sub>mean</sub> ) <sup>2</sup>	WY Weighted Y	W(X-X <sub>mean</sub> )(Y-Y <sub>mean</sub> )	Predicted Relativity EXP (aX+b)	Weighted Prediction Error
1	1	0.1341	1,572.8	0.02%	0.0002	0.0226	0.0000	-0.0003	0.4458	-0.0001
2	2	-0.3612	4,467.6	0.05%	0.0010	0.0533	-0.0002	0.0017	0.4775	-0.0004
3	3	-0.4310	22,628.3	0.26%	0.0077	0.2199	-0.0011	0.0094	0.5114	-0.0024
4	4	-0.5744	88,659.1	1.01%	0.0402	0.6854	-0.0058	0.0447	0.5477	-0.0113
5	5	-0.4884	134,661.6	1.53%	0.0763	0.8042	-0.0075	0.0501	0.5865	-0.0164
6	6	-0.4846	234,358.7	2.66%	0.1594	1.0404	-0.0129	0.0746	0.6282	-0.0296
7	7	-0.3597	240,499.5	2.73%	0.1909	0.7537	-0.0098	0.0464	0.6728	-0.0282
8	8	-0.2775	598,768.5	6.79%	0.5431	1.2305	-0.0188	0.0699	0.7205	-0.0678
10	9	-0.2365	713,922.1	8.09%	0.7285	0.8589	-0.0191	0.0529	0.7717	-0.0816
11	10	-0.2066	741,781.4	8.41%	0.8411	0.4286	-0.0174	0.0324	0.8265	-0.0869
12	11	-0.1715	1,156,697.4	13.12%	1.4427	0.2073	-0.0225	0.0224	0.8851	-0.1386
13	12	-0.0490	931,214.9	10.56%	1.2670	0.0070	-0.0052	0.0004	0.9480	-0.1053
14	13	-0.0005	861,572.1	9.77%	1.2700	0.0539	0.0000	0.0026	1.0152	-0.0992
15	14	0.0656	839,059.1	9.51%	1.3319	0.2889	0.0062	0.0168	1.0873	-0.0972
16	15	0.1327	645,243.1	7.32%	1.0974	0.5503	0.0097	0.0338	1.1645	-0.0755
17	16	0.2366	512,520.8	5.81%	0.9298	0.8140	0.0138	0.0593	1.2472	-0.0587
18	17	0.2854	363,304.9	4.12%	0.7003	0.9266	0.0118	0.0628	1.3357	-0.0433
19	18	0.3713	232,729.5	2.64%	0.4750	0.8702	0.0098	0.0617	1.4305	-0.0279
20	19	0.3984	192,662.5	2.18%	0.4151	0.9931	0.0087	0.0640	1.5321	-0.0248
21	20	0.6035	109,947.4	1.25%	0.2493	0.7473	0.0075	0.0617	1.6408	-0.0129
22	21	0.6609	75,532.8	0.86%	0.1798	0.6546	0.0057	0.0522	1.7573	-0.0094
23	22	0.8334	45,552.2	0.52%	0.1136	0.4903	0.0043	0.0437	1.8820	-0.0054
24	23	0.7909	30,215.7	0.34%	0.0788	0.3954	0.0027	0.0304	2.0156	-0.0042
25	24	0.8585	17,118.0	0.19%	0.0466	0.2676	0.0017	0.0204	2.1587	-0.0025
26	25	0.8694	15,021.6	0.17%	0.0426	0.2766	0.0015	0.0196	2.3119	-0.0025
27	26	1.0341	9,842.2	0.11%	0.0290	0.2108	0.0012	0.0164	2.4761	-0.0016
A/O										
Totals	351	3.6338	8,819,553.8	100.00%	12.2573	13.8514		0.9499	0.0686 =a	-1.0336
Means	12						-0.0358		-0.8764 =b	

**2009 Massachusetts Private Passenger Automobile  
Calculation of Average Model Year/Symbol Relativities  
Total Industry**

**Other than Collision Coverage: Symbol Factors for 1989 and Prior Model Year Vehicles**

<b>Symbol</b>	<b>Factor</b>
1	0.24
2	0.28
3	0.32
4	0.36
5	0.41
6	0.46
7	0.53
8	0.60
10	0.68
11	0.77
12	0.88
13	1.00
14	1.14
15	1.29
16	1.47
17	1.67

Private Passenger Rating Manual, Rule 20

Massachusetts Private Passenger Automobile  
Calculation of Average Model Year/Symbol Relativities  
Total Industry

Accident Year 2005-2007 Observed Relativities - \$ 500 Deductible Other Than Collision Coverages

Symbol	Model Year											1997 & Prior	Totals
	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998		
1	0.0000	1.3413	4.5932	1.9062	1.8806	3.7437	0.4525	0.4871	0.5120	2.5625	0.0000	0.6372	1.1435
2	0.0000	0.0000	0.2936	1.5099	0.0000	0.9380	0.0000	0.7363	1.0096	0.4651	0.6563	0.7020	0.6968
3	0.0000	1.8878	2.2700	4.0413	3.9905	3.7817	0.6338	2.3793	0.6844	0.6337	0.6271	0.6271	0.6498
4	0.0000	0.7711	0.5347	1.5282	1.1754	0.7431	0.8823	0.5190	0.7254	0.6384	0.6868	0.5138	0.5630
5	0.0000	0.5937	0.8467	3.1719	0.6948	0.7198	0.9384	0.8657	0.7182	0.6532	0.6314	0.5764	0.6136
6	0.9419	1.1178	0.6236	0.6027	1.0212	0.8930	0.6981	0.6691	0.6284	0.5769	0.5958	0.5995	0.6159
7	0.3175	1.3160	0.8769	0.9428	0.9075	0.6645	0.6138	0.5405	0.7066	0.7624	0.6683	0.6668	0.6979
8	3.3946	1.0636	0.9604	0.8297	0.8919	0.7873	0.7028	0.6881	0.7181	0.7225	0.7420	0.7357	0.7577
10	0.6483	0.8776	0.8250	0.8652	0.8672	0.8181	0.8157	0.7609	0.7357	0.7841	0.7859	0.7639	0.7894
11	1.1635	0.8544	0.8004	0.8524	0.8319	0.7981	0.7232	0.7773	0.8611	0.8993	0.8068	0.8021	0.8133
12	1.0661	1.0201	0.7808	0.7507	0.8082	0.8387	0.9371	0.8769	0.8691	0.7888	0.7687	0.9131	0.8424
13	0.9075	0.8957	0.9978	0.9729	1.0661	0.9920	0.9217	0.8926	0.9044	0.9504	0.8594	0.9634	0.9522
14	0.7910	0.9909	0.9735	1.0012	1.0551	0.9749	1.0348	1.0050	1.0226	0.9680	0.8872	1.0241	0.9995
15	0.9720	0.9652	1.1672	1.0598	1.0944	1.0668	1.1156	0.9847	1.0703	1.1477	0.9749	1.0800	1.0678
16	1.5896	1.1542	1.1354	1.0420	1.1509	1.2145	1.1341	1.0445	1.1662	1.3026	1.1116	1.1046	1.1419
17	1.6211	1.0859	1.1543	1.2663	1.3868	1.3342	1.3319	1.1608	1.6817	1.0980	1.1478	1.1569	1.2670
18	0.8068	1.1123	1.2510	1.2844	1.3033	1.5692	1.3483	1.2570	1.1993	1.5445	1.3768	1.3226	1.3303
19	0.9890	1.2773	1.5421	1.2974	1.3545	1.4455	1.7003	1.6487	1.3300	1.2856	1.4338	1.3287	1.4496
20	1.4886	1.3248	1.4220	1.4959	1.6601	1.9278	1.3786	1.4670	1.3547	1.3481	2.0583	1.3822	1.4895
21	1.3322	1.2720	1.6970	1.5192	1.5468	1.9278	1.6440	1.4670	2.1237	2.0944	2.3106	1.6702	1.8284
22	1.2116	3.4179	1.7024	2.6034	1.7673	2.2316	1.1714	2.2608	1.7836	2.5397	1.5932	1.4453	1.9366
23	2.2961	1.5976	2.5452	1.7652	3.0461	2.9572	3.0341	2.3327	2.5923	2.7049	1.9849	1.7355	2.3010
24	0.6463	1.9352	2.1064	2.6796	2.2991	2.0702	1.7217	3.0303	2.8332	1.8337	1.7813	2.2802	2.2053
25	20.0523	2.7189	2.3126	1.9255	2.1073	1.9337	1.4550	1.6300	5.5786	2.4778	2.5708	2.0267	2.3596
26	0.0000	4.0817	2.9835	1.8014	2.3827	1.9341	2.3739	5.2560	5.3509	1.4416	1.3971	1.5202	2.3854
27	1.4586	0.5020	1.3056	3.6716	1.3360	2.0114	3.3227	5.8669	3.6896	2.4099	5.3510	4.0236	2.8124
Totals**	1.2279	1.0649	1.0875	1.0312	1.0835	1.0447	1.0242	1.0198	1.0152	0.9859	0.9121	0.8855	1.0000

\* This data is used to calculate symbol relativities; see Exhibit 2, Page 8.

\*\* This data is used to calculate model year relativities; see Exhibit 2, Page 7.



**Massachusetts Private Passenger Automobile  
Evaluation of Symbol 9 Relativities  
Total Industry**

	<u>Collision Coverages</u>	<u>Comprehensive Coverages</u>
(A) 2007 Symbol 9 Earned Premiums	\$1,509,533	\$903,066
(B) 2007 'Total' Other than Symbol 9 Earned Premiums	\$979,330,679	\$342,853,162
(C) Ratio [ (A) / (B) ]	0.0015	0.0026
(D) 2007 Symbol 9 Losses	\$841,246	\$426,361
(E) 2007 'Subtotal' Other Than Symbol 9 Losses	\$597,917,646	\$176,516,544
(F) Ratio [ (D) / (E) ]	0.0014	0.0024
(G) Indicated Change in Symbol 9 Relativity from 2007 [ (F) / (C) - 1.0 ]	-7.0%	-8.0%
(H) 2007 Symbol 9 Relativity	0.60	0.90
(I) Indicated 2009 Symbol 9 Relativity [ (G) x (H) ]	0.56	0.83
(J) 2008 (Current) Symbol 9 Relativity	0.55	0.95
(K) Selected 2009 Symbol 9 Relativity	0.55	0.85

**Massachusetts Private Passenger Automobile  
 Adjustment of Model Year Symbol Relativities to Simulate Flat Expenses  
 Facility Market**

	<u>Collision</u>	<u>Other Than Collision</u>
A) Capped Average Actuarial Premium (Form 110)	1028.71	214.70
B) Flat (Non-Variable) Pure Premium (Form 100)	52.34	16.07
C) Variable Pure Premium = (A) - (B)	976.37	198.63
<b><u>Relative Magnitude of Pure Premium Components</u></b>		
D) Variable Component = (C) / (A)	0.949	0.925
E) Flat Component = 1.000 - (D)	0.051	0.075

Adjusted Model Year /Symbol Relativities  
 = [([Indicated Model Year Symbol Relativities ]\* (Variable Component )] + (Flat Component)

*Commonwealth Automobile Reinsurers*

**Filing for Residual Market Rates  
Effective 4/1/2009**

**Other : 100X  
(Substitute Transportation, Stated Amount)**

**Massachusetts Private Passenger Automobile****Other Coverage****Substitute Transportation**

Rates for substitute transportation coverage are developed in Exhibit 1. Actual experience is available and sufficient for determining appropriate rates for the \$15/day and \$30/day limits but because of the relatively recent introduction of the \$45/day and \$100/day limits, experience is still quite sparse and not sufficiently reliable for setting rates for the higher limits. The rates for \$45/day and \$100/day limits are unchanged from current (4/1/2008) for this filing.

Loss pure premium experience for the facility market and for the total industry is detailed in Exhibit 1, pages 2 and 3. Since statistical reporting does not require exposures to be reported, earned exposures are estimated from earned premium using the estimated average rate. The selected loss pure premiums are then adjusted for expenses and profit to produce the indicated average rate on Exhibit 1, page 1.

**Massachusetts Private Passenger Automobile  
Substitute Transportation Coverage  
Facility Market**

**\$15/Day Limit**

Selected Pure Premium	\$18.00
Claim Adjustment Expense Factor (Comprehensive)	1.2000
Loss and Loss Adjustment Expense Pure Premium	\$21.60
Company Expense Provision (Comp: Form 100 Line 6D/Line 10)	7.49%
Commission Exp. Provision (Comp: Form 100 Line 7A)	13.00%
Premium Tax Provision	2.30%
Underwriting Profit Provision (Comp)	3.70%
Total Expense, Premium Tax, and Profit Provision	26.49%
Indicated Rate (Pure Premium/(1-Expense Provision))	\$29.38

Selected Rate	\$29.38
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**\$30/Day Limit**

Selected Pure Premium	\$73.00
Claim Adjustment Expense Factor (Comprehensive)	1.2000
Loss and Loss Adjustment Expense Pure Premium	\$87.60
Company Expense Provision (Comp: Form 100 Line 6D/Line 10)	7.49%
Commission Exp. Provision (Comp: Form 100 Line 7A)	13.00%
Premium Tax Provision	2.30%
Underwriting Profit Provision (Comp)	3.70%
Total Expense, Premium Tax, and Profit Provision	26.49%
Indicated Rate (Pure Premium/(1-Expense Provision))	\$119.17

Selected Rate	\$119.17
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**Massachusetts Private Passenger Automobile  
Review of Substitute Transportation Coverage - \$15/Day Limit**

	(1)	(2)	(3)	(4)
	Cal/Acc	Earned	Est'd Earned	Pure
	<u>Year</u>	<u>Premium</u>	<u>Exposure</u>	<u>Premium</u>
Facility				<u>(3)/(2)</u>
	2001	344,808	17,542.7	
	2002	272,203	14,793.6	\$18.93
	2003	179,393	11,311.0	\$20.95
	2004	131,591	9,535.6	\$19.50
	2005	96,871	7,526.9	\$21.61
	2006	77,286	6,177.9	\$16.97
	2007	64,712	5,357.0	\$16.97
Industry	2001	8,459,684	439,008.0	\$9.12
	2002	7,745,587	430,071.5	\$8.31
	2003	6,092,955	393,601.7	\$10.42
	2004	6,027,937	444,210.5	\$7.44
	2005	5,878,374	462,864.1	\$6.66
	2006	4,793,236	388,116.3	\$6.34
	2007	4,375,182	367,662.4	\$6.10

(2) Estimated Earned Exposure = (1) / Estimated Average Rate

Estimated Average Rate:	Total Market	Facility
2001	\$19.27	\$19.66
2002	\$18.01	\$18.40
2003	\$15.48	\$15.86
2004	\$13.57	\$13.80
2005	\$12.70	\$12.87
2006	\$12.35	\$12.51
2007	\$11.90	\$12.08

**Massachusetts Private Passenger Automobile  
Review of Substitute Transportation Coverage - \$30/Day Limit**

		(1)	(3)	(3)	(4)
	Cal/Acc	Earned	Est'd Earned	Loss	Pure
	<u>Year</u>	<u>Premium</u>	<u>Exposure</u>	<u>Amount</u>	<u>(3)/(2)</u>
Facility	2001	7,208,747	92,272.5		
	2002	6,871,766	91,331.3	11,115,847	\$121.71
	2003	6,592,150	88,473.4	10,250,485	\$115.86
	2004	5,996,530	80,826.7	7,367,028	\$91.15
	2005	5,539,010	75,628.2	6,199,721	\$81.98
	2006	4,409,323	63,608.2	4,548,195	\$71.50
	2007	3,581,188	56,122.7	4,169,349	\$74.29
	Industry	2001	50,079,680	650,639.0	34,528,841
2002		52,578,932	722,833.8	34,056,179	\$47.11
2003		54,744,764	745,841.5	40,080,761	\$53.74
2004		64,456,516	877,556.4	33,119,034	\$37.74
2005		72,234,804	1,000,897.9	32,246,854	\$32.22
2006		63,842,703	936,247.3	28,553,323	\$30.50
2007		63,124,119	1,007,889.5	31,685,353	\$31.44

(2) Estimated Earned Exposure = (1) / Estimated Average Rate

Estimated Average Rate:	Total Market	Facility
2001	\$76.97	\$78.12
2002	\$72.74	\$75.24
2003	\$73.40	\$74.51
2004	\$73.45	\$74.19
2005	\$72.17	\$73.24
2006	\$68.19	\$69.32
2007	\$62.63	\$63.81

**Massachusetts Private Passenger Automobile****Stated Amount Rates**

Exhibits 4 and 5 of Section 100X display the comprehensive and specified peril stated amount rates. Also shown (below and in Exhibits 2 and 3) is documentation of the procedures used to calculate the stated amount rates from the base rates derived in Section 100K.

**Comprehensive Stated Amount**

The following factors are required:

- a) Private passenger class 10 base rates by territory for comprehensive (Section 100K, Exhibit 6, Page 6);
- b) Private passenger comprehensive symbol factor for the latest model year shown (2010) in the rate pages for each symbol (displayed in Exhibit 2);
- c) Median symbol value (displayed in Exhibit 3).

The comprehensive stated amount rate per \$100 is calculated as:

$$[(a) \times (b) \times (100)] / (c) \quad (\text{rounded to the nearest cents})$$

**Fire Stated Amount**

The following factors are required:

- a) Ten percent of the statewide average comprehensive base rate, exclusive of class 15 =  
 $0.10 \times \$142.57 = \$14.26$
- b) Private passenger comprehensive factor for the latest model year shown (2010) in the rate pages for each symbol (displayed in Exhibit 2);
- c) Median symbol value (displayed in Exhibit 3).

The fire stated amount rate per \$100 is calculated as:

$$[(a) \times (b) \times (100)] / (c) \quad (\text{rounded to the nearest cents})$$



**Theft Stated Amount**

The following factors are required:

- a) Comprehensive stated amount rates from (1), which vary by territory and vehicle symbol, before rounding;
- b) Fire stated amount rates from (2), before rounding.

The theft stated amount rate per \$100 is calculated as:

$$[0.70 \times (a)] - (b) \quad (\text{rounded to the nearest cents})$$

**Tables of Values Used to Calculate 2009 Stated Amount Rates**

<u>Symbol</u>	<u>Private Passenger Comprehensive Model Year 2010 Factor by Symbol</u>	<u>Median Symbol Value</u>
1	0.578	3,250
2	0.614	7,250
3	0.652	8,500
4	0.694	9,500
5	0.737	10,625
6	0.784	11,875
7	0.835	13,125
8	0.888	14,375
10	0.947	15,625
11	1.008	16,875
12	1.075	18,125
13	1.146	19,375
14	1.221	21,000
15	1.303	23,000
16	1.390	25,000
17	1.483	27,000

**Stated Amount Rating Procedure for  
Collision and Limited Collision**

1. Determine the Actual Cash Value premium for the latest model year shown in the rate pages for the vehicle symbol and deductible in the appropriate territory and class and divide by the Stated Amount Divisor shown below. Round the result to the nearest cent.
  
2. Apply the above rate to each \$100 of insured value to determine the stated amount premium. This results in a stated amount premium applicable to those insureds at the base rate (zero point/zero credit level) of the 4/1/2009 Safe Driver Insurance Plan.

**Stated Amount Divisors**

<u>Symbol</u>	<u>Divisors</u>	<u>Symbol</u>	<u>Divisors</u>
1	32.50	10	156.25
2	72.50	11	168.75
3	85.00	12	181.25
4	95.00	13	193.75
5	106.25	14	210.00
6	118.75	15	230.00
7	131.25	16	250.00
8	143.75	17	270.00

## MASSACHUSETTS PRIVATE PASSENGER AUTOMOBILE

## STATED AMOUNT COMPREHENSIVE \$500 DEDUCTIBLE RATES

Symbol Territory	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>10</u>	<u>11</u>	<u>12</u>	<u>13</u>	<u>14</u>	<u>15</u>	<u>16</u>	<u>17</u>
1	1.69	0.80	0.73	0.69	0.66	0.63	0.60	0.59	0.58	0.57	0.56	0.56	0.55	0.54	0.53	0.52
2	1.72	0.82	0.74	0.71	0.67	0.64	0.62	0.60	0.59	0.58	0.57	0.57	0.56	0.55	0.54	0.53
3	1.80	0.86	0.78	0.74	0.70	0.67	0.64	0.62	0.61	0.60	0.60	0.60	0.59	0.57	0.56	0.56
4	1.75	0.83	0.76	0.72	0.68	0.65	0.63	0.61	0.60	0.59	0.58	0.58	0.57	0.56	0.55	0.54
5	1.83	0.87	0.79	0.75	0.71	0.68	0.65	0.63	0.62	0.61	0.61	0.61	0.60	0.58	0.57	0.56
6	1.89	0.90	0.82	0.78	0.74	0.70	0.68	0.66	0.64	0.63	0.63	0.63	0.62	0.60	0.59	0.58
7	1.97	0.94	0.85	0.81	0.77	0.73	0.70	0.68	0.67	0.66	0.66	0.65	0.64	0.63	0.62	0.61
8	2.03	0.97	0.88	0.83	0.79	0.75	0.73	0.70	0.69	0.68	0.68	0.67	0.66	0.65	0.63	0.63
9	2.00	0.95	0.86	0.82	0.78	0.74	0.71	0.69	0.68	0.67	0.67	0.66	0.65	0.64	0.62	0.62
10	2.14	1.02	0.92	0.88	0.83	0.79	0.76	0.74	0.73	0.72	0.71	0.71	0.70	0.68	0.67	0.66
11	2.28	1.08	0.98	0.94	0.89	0.85	0.81	0.79	0.78	0.76	0.76	0.76	0.74	0.73	0.71	0.70
12	2.35	1.12	1.02	0.97	0.92	0.87	0.84	0.82	0.80	0.79	0.79	0.78	0.77	0.75	0.74	0.73
13	2.65	1.26	1.14	1.09	1.03	0.98	0.95	0.92	0.90	0.89	0.88	0.88	0.87	0.84	0.83	0.82
14	2.76	1.31	1.19	1.13	1.08	1.02	0.99	0.96	0.94	0.93	0.92	0.92	0.90	0.88	0.86	0.85
15	3.41	1.62	1.47	1.40	1.33	1.27	1.22	1.18	1.16	1.14	1.14	1.13	1.11	1.09	1.07	1.05
16	5.52	2.63	2.38	2.27	2.15	2.05	1.97	1.92	1.88	1.85	1.84	1.83	1.80	1.76	1.72	1.70
17	1.97	0.94	0.85	0.81	0.77	0.73	0.70	0.68	0.67	0.66	0.66	0.65	0.64	0.63	0.62	0.61
18	4.01	1.91	1.73	1.65	1.56	1.49	1.44	1.39	1.37	1.35	1.34	1.33	1.31	1.28	1.25	1.24
19	4.40	2.10	1.90	1.81	1.72	1.63	1.57	1.53	1.50	1.48	1.47	1.46	1.44	1.40	1.38	1.36
20	3.98	1.90	1.72	1.64	1.55	1.48	1.42	1.38	1.36	1.34	1.33	1.32	1.30	1.27	1.24	1.23
21	5.42	2.58	2.34	2.23	2.11	2.01	1.94	1.88	1.85	1.82	1.81	1.80	1.77	1.73	1.70	1.67
22	6.12	2.91	2.64	2.51	2.39	2.27	2.19	2.13	2.09	2.06	2.04	2.04	2.00	1.95	1.91	1.89
23	3.69	1.76	1.59	1.51	1.44	1.37	1.32	1.28	1.26	1.24	1.23	1.23	1.21	1.17	1.15	1.14
24	2.76	1.31	1.19	1.13	1.08	1.02	0.99	0.96	0.94	0.93	0.92	0.92	0.90	0.88	0.86	0.85
25	4.18	1.99	1.80	1.72	1.63	1.55	1.50	1.45	1.43	1.40	1.39	1.39	1.37	1.33	1.31	1.29
26	4.97	2.37	2.14	2.04	1.94	1.85	1.78	1.73	1.69	1.67	1.66	1.65	1.63	1.58	1.55	1.54
27	1.60	0.76	0.69	0.66	0.62	0.59	0.57	0.55	0.54	0.54	0.53	0.53	0.52	0.51	0.50	0.49
40	2.53	1.20	1.09	1.04	0.98	0.94	0.90	0.88	0.86	0.85	0.84	0.84	0.83	0.80	0.79	0.78
41	2.56	1.22	1.10	1.05	1.00	0.95	0.91	0.89	0.87	0.86	0.85	0.85	0.84	0.81	0.80	0.79
42	3.10	1.48	1.34	1.27	1.21	1.15	1.11	1.08	1.06	1.04	1.03	1.03	1.01	0.99	0.97	0.96
43	3.25	1.55	1.40	1.34	1.27	1.21	1.16	1.13	1.11	1.09	1.08	1.08	1.06	1.04	1.02	1.00
44	5.31	2.53	2.29	2.18	2.07	1.97	1.90	1.85	1.81	1.78	1.77	1.77	1.74	1.69	1.66	1.64
45	3.42	1.63	1.48	1.41	1.34	1.27	1.22	1.19	1.17	1.15	1.14	1.14	1.12	1.09	1.07	1.06

## STATED AMOUNT FIRE \$500 DEDUCTIBLE RATES

1-27,40-45	0.25	0.12	0.11	0.10	0.10	0.09	0.09	0.09	0.09	0.09	0.08	0.08	0.08	0.08	0.08	0.08
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## MASSACHUSETTS PRIVATE PASSENGER AUTOMOBILE

## STATED AMOUNT THEFT \$500 DEDUCTIBLE RATES

Symbol Territory	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>10</u>	<u>11</u>	<u>12</u>	<u>13</u>	<u>14</u>	<u>15</u>	<u>16</u>	<u>17</u>
1	0.93	0.44	0.40	0.38	0.36	0.34	0.33	0.32	0.32	0.31	0.31	0.31	0.30	0.30	0.29	0.29
2	0.95	0.45	0.41	0.39	0.37	0.35	0.34	0.33	0.32	0.32	0.32	0.32	0.31	0.30	0.30	0.29
3	1.00	0.48	0.43	0.41	0.39	0.37	0.36	0.35	0.34	0.34	0.33	0.33	0.33	0.32	0.31	0.31
4	0.97	0.46	0.42	0.40	0.38	0.36	0.35	0.34	0.33	0.33	0.32	0.32	0.32	0.31	0.30	0.30
5	1.03	0.49	0.44	0.42	0.40	0.38	0.37	0.36	0.35	0.34	0.34	0.34	0.34	0.33	0.32	0.32
6	1.07	0.51	0.46	0.44	0.42	0.40	0.38	0.37	0.36	0.36	0.36	0.36	0.35	0.34	0.33	0.33
7	1.12	0.54	0.48	0.46	0.44	0.42	0.40	0.39	0.38	0.38	0.37	0.37	0.37	0.36	0.35	0.35
8	1.17	0.56	0.50	0.48	0.46	0.43	0.42	0.41	0.40	0.39	0.39	0.39	0.38	0.37	0.36	0.36
9	1.15	0.55	0.49	0.47	0.45	0.43	0.41	0.40	0.39	0.38	0.38	0.38	0.37	0.36	0.36	0.35
10	1.24	0.59	0.54	0.51	0.48	0.46	0.44	0.43	0.42	0.42	0.41	0.41	0.41	0.40	0.39	0.38
11	1.34	0.64	0.58	0.55	0.52	0.50	0.48	0.47	0.46	0.45	0.45	0.45	0.44	0.43	0.42	0.41
12	1.39	0.66	0.60	0.57	0.54	0.52	0.50	0.48	0.48	0.47	0.47	0.46	0.46	0.44	0.44	0.43
13	1.60	0.76	0.69	0.66	0.62	0.59	0.57	0.56	0.55	0.54	0.53	0.53	0.52	0.51	0.50	0.49
14	1.68	0.80	0.72	0.69	0.65	0.62	0.60	0.58	0.57	0.56	0.56	0.56	0.55	0.53	0.52	0.52
15	2.13	1.02	0.92	0.88	0.83	0.79	0.76	0.74	0.73	0.72	0.71	0.71	0.70	0.68	0.67	0.66
16	3.61	1.72	1.56	1.48	1.41	1.34	1.29	1.25	1.23	1.21	1.20	1.20	1.18	1.15	1.13	1.11
17	1.12	0.54	0.48	0.46	0.44	0.42	0.40	0.39	0.38	0.38	0.37	0.37	0.37	0.36	0.35	0.35
18	2.56	1.22	1.10	1.05	1.00	0.95	0.91	0.89	0.87	0.86	0.85	0.85	0.84	0.81	0.80	0.79
19	2.83	1.35	1.22	1.16	1.10	1.05	1.01	0.98	0.96	0.95	0.94	0.94	0.92	0.90	0.88	0.87
20	2.53	1.21	1.09	1.04	0.99	0.94	0.91	0.88	0.86	0.85	0.84	0.84	0.83	0.81	0.79	0.78
21	3.54	1.69	1.53	1.45	1.38	1.31	1.27	1.23	1.21	1.19	1.18	1.18	1.16	1.13	1.11	1.09
22	4.03	1.92	1.74	1.66	1.57	1.50	1.44	1.40	1.37	1.35	1.34	1.34	1.32	1.28	1.26	1.24
23	2.33	1.11	1.00	0.96	0.91	0.86	0.83	0.81	0.79	0.78	0.78	0.77	0.76	0.74	0.73	0.72
24	1.68	0.80	0.72	0.69	0.65	0.62	0.60	0.58	0.57	0.56	0.56	0.56	0.55	0.53	0.52	0.52
25	2.67	1.27	1.15	1.10	1.04	0.99	0.96	0.93	0.91	0.90	0.89	0.89	0.87	0.85	0.84	0.83
26	3.23	1.54	1.39	1.33	1.26	1.20	1.15	1.12	1.10	1.08	1.08	1.07	1.06	1.03	1.01	1.00
27	0.86	0.41	0.37	0.35	0.34	0.32	0.31	0.30	0.29	0.29	0.29	0.29	0.28	0.28	0.27	0.27
40	1.51	0.72	0.65	0.62	0.59	0.56	0.54	0.53	0.52	0.51	0.50	0.50	0.49	0.48	0.47	0.47
41	1.54	0.73	0.66	0.63	0.60	0.57	0.55	0.53	0.52	0.52	0.51	0.51	0.50	0.49	0.48	0.47
42	1.92	0.91	0.83	0.79	0.75	0.71	0.69	0.67	0.65	0.64	0.64	0.64	0.63	0.61	0.60	0.59
43	2.02	0.96	0.87	0.83	0.79	0.75	0.72	0.70	0.69	0.68	0.67	0.67	0.66	0.64	0.63	0.63
44	3.47	1.65	1.49	1.42	1.35	1.29	1.24	1.20	1.18	1.16	1.16	1.15	1.13	1.10	1.08	1.07
45	2.14	1.02	0.92	0.88	0.84	0.80	0.77	0.74	0.73	0.72	0.71	0.71	0.70	0.68	0.67	0.66

Stated amount C.A.C. with M.M.&V. \$500 deductible  
15% of the stated amount comprehensive rate.

Additional charges to reduce deductible from \$500  
same as actual cash value charges.

For higher deductibles, refer to Rule 16 of the rate manual.

*Commonwealth Automobile Reinsurers*

**Filing for Residual Market Rates  
Effective 4/1/2009**

**Increased Limits Factors: 101**

## Massachusetts Private Passenger Automobile

### Liability Increased Limits

Increased limits experience for the total Massachusetts private passenger automobile insurance market is used to develop indicated increased limits factors for liability coverages. The general approach uses total limits loss experience segmented into loss layers in order to measure the additional cost of losses for higher limits relative to the expected basic limits cost. Adjustments are made for loss development and to incorporate defense cost and containment expense (DCCE) in the final experience ILFs which are then used in deriving indicated ILFs. The specific calculations for each coverage are explained below.

#### Bodily Injury

The indicated BI increased limits factors and the average overall ILF for the residual market is shown on 101A. The indicated ILFs are based on historical industry experience ILFs shown on 101A-1, page 1 that are derived using the formula outlined on 101A-1, pages 6-7. For BI, total and basic limits loss experience is segmented by limit purchased to directly estimate the cost of increased limits relative to 20/40 basic limits. The ratio of total limits to basic limits losses at 5<sup>th</sup> report for each limit<sup>1</sup>, shown and developed on 101 A-2, is the starting point for the derivation of ILFs. This ratio is then modified for excess limit development and DCCE as shown on 101A-1, page 3.

Indicated ILFs are estimated as the average of the most recent three years of experience ILFs (101A-1, page 1). This selection recognizes that results for the latest three years reflect changes in relative costs consistent with a shift in the BI claim distribution that underlies the recent reductions in basic limits loss experience. The effect of CIFI efforts that have contributed to a reduction in claim build-up and fraud is primarily limited to the basic limit layer while the expected costs of major accident claims that penetrate the increased limit layers are generally unaffected. The result is that BI ILFs increase as the cost of basic limits claims decreases. The

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<sup>1</sup> The experience for 20/50, 25/50, and 25/60 limits are combined since the volume of each separate limit is generally low and less credible than when grouped. The selected ILFs by limit are set so that the selected average of the group is reproduced with 20/50 set judgmentally at 1.01 and the ILF for 25/60 set at +0.01 from the otherwise determined 25/50 ILF.

use of the latest three years' indicated ILFs is responsive to these changing conditions and the level of basic limits loss pure premiums.

### **Property Damage & Uninsured Motorists**

Indicated PDL and U-1 increased limits factors and average overall ILFs for the residual market are shown on 101B and 101C, respectively. Indicated ILFs rely on industry historical experience as shown in 101B-1 and 101C-1. The methodology used for calculating the increased limits loss experience is similar for PDL and U-1: loss data is compiled by layering losses corresponding to selected coverage limit levels; an adjustment is made for the effect of differences between the basic layer of losses produced by claim layering compared to basic limits losses; DCCE is assigned to the first loss layer; and experience pure premiums reflecting expected loss development are accumulated by limit. Pure premiums for each limit are compared to the basic limit pure premiums to derive experience ILFs. Specific calculations for PDL and U-1 are further described below.

For PDL, the adjustment for the per-occurrence limit is made by assigning the difference between the \$5,000 loss layer and actual \$5,000 basic limits losses to the \$10,000 loss layer. A market mix adjustment factor is also applied to reflect the fact that higher PDL limits are generally purchased more by lower-rated classes and territories which would understate the pure premiums in those layers relative to the basic limit layer. The indicated PDL ILFs for recognize that PDL pure premiums by layer generally increase over time but at different rates. Reflecting the measurable trends by limit is more responsive to changes in PDL excess limit experience over time than relying solely on the experience ILFs. The experience pure premiums and resulting ILFs are displayed with the projected pure premiums and indicated ILFs on 101B, page 2.

For U-1, the adjustment for loss layering spreads the difference in the basic limit layer to the four excess layers in 40/30/20/10 proportions. Since U-1 rates will not vary by class and territory, there is no adjustment needed for market mix differences between layers. The historical pure premiums and resulting ILFs are shown on 101C, page 2. Similar to the analysis for BI discussed previously, the average of the latest three years is the basis for the indicated U-1 ILFs.



Because loss layering does not separate the per-occurrence effect of the split U-1 limits, the \$20,000 ILF is the combined result for 20/40 and 20/50. The 20/50 ILF is set so that when combined with the 20/40 ILF (defined as 1.000 by definition) the weighted average reproduces the \$20,000 experience ILF. In a similar manner, 25/50 and 25/60 ILFs are derived from the \$25,000 ILF and 250/500 and 500/1000 are derived from the "> \$100,000" indicated ILF.

### **Underinsured Motorists**

Underinsured motorists rates by limit are calculated in 101D using a formula methodology based on the estimated size of the underinsured market and the relative cost of BI losses at each limit. These measures are based on total market results since all risks are exposed to the same distribution of BI limits purchased by the driving population in Massachusetts. The BI basic limits loss pure premium to which the resulting ratio of underinsured losses to BI is applied is also a total market estimate.

### **Miscellaneous Increased Limits**

Increased limits factors for all miscellaneous limits are displayed in 100E. The proposed factors for the most common BI and PDL limits that are derived in 101A and 101B are used to interpolate ILFs for all other limits.

U-1 and U-2 rates for the most common limits are displayed in 100L. Increased limit rates for U-1 are derived from the proposed basic limit manual rate and the proposed ILFs shown in 101C. Rates for all other limits displayed in 100E are derived by interpolation.

**Massachusetts Private Passenger Automobile  
Summary of Bodily Injury Increased Limits Factors  
Facility Market**

		(1)	(2)	(3)	(4)
	% of		Dist. of		
<u>Limit</u>	<u>Expo's at</u>	<u>Indicated</u>	<u>Excess</u>	<u>Proposed</u>	<u>Product</u>
	<u>Limit</u>	<u>ILF's</u>	<u>Limits</u>	<u>ILF's</u>	<u>(3)x(4)</u>
20/40	61.43%	1.0000	---	---	---
20/50	1.96%	1.0100	5.08%	1.01	0.0513
25/50	6.02%	1.0600	15.61%	1.06	0.1654
25/60	0.53%	1.0700	1.37%	1.07	0.0147
30/70	0.12%		0.31%	1.13	0.0035
35/80	1.17%		3.03%	1.18	0.0358
50/100	9.48%	1.3002	24.58%	1.30	0.3195
100/300	14.74%	1.6006	38.22%	1.60	0.6115
250/500	4.30%	2.2526	11.15%	2.25	0.2508
500/500	0.24%		0.62%	3.33	0.0207
500/1000	0.01%	3.3789	0.03%	3.38	0.0009
Totals	100.00%		100.00%		1.4742

Average Selected Increased Limits Factor (20/40 Basis): 1.4742  
Average Selected ILF including Basic Limits: 1.1829

Indicated ILFs shown on 101A-1, page 1.  
Proposed ILFs for all limits shown in 101E.

**Massachusetts Private Passenger Automobile  
Bodily Injury Increased Limits Factors**

<u>Limits</u>	<u>Accident Year Historical Factors</u>						<u>Selected 2009 **</u>
	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>	
\$ 20,000/ \$ 40,000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
\$ 20,000/ \$ 50,000			Included in \$25,000/\$50,000 data				
\$ 25,000/ \$ 50,000	1.0456	1.0482	1.0530	1.0600	1.0572	1.0561	1.0578
\$ 25,000/ \$ 60,000			Included in \$25,000/\$50,000 data				
\$ 50,000/\$100,000	1.2410	1.2564	1.2690	1.2848	1.3186	1.2972	1.3002
\$100,000/\$300,000	1.4832	1.4679	1.5198	1.5801	1.6057	1.6161	1.6006
\$250,000/\$500,000	1.8811	1.9650	2.0288	2.2032	2.2867	2.2678	2.2526
Average *	1.3528	1.3624	1.3937	1.4459	1.4728	1.4707	1.4631

\* Based on 2007 Written Exposures.

\*\* Policy year 2009 based on latest three year average ILF.

**Massachusetts Private Passenger Automobile  
Bodily Injury Increased Limit Factors**

**Calculated Increased Limit Factors**

<u>Limits</u>	<u>Accident Year</u>					
	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>
\$ 20,000/ \$ 40,000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
\$ 20,000/ \$ 50,000	Included in \$25,000/\$50,000 data					
\$ 25,000/ \$ 50,000	1.0456	1.0482	1.0530	1.0600	1.0572	1.0561
\$ 25,000/ \$ 60,000	Included in \$25,000/\$50,000 data					
\$ 50,000/\$100,000	1.2410	1.2564	1.2690	1.2848	1.3186	1.2972
\$100,000/\$300,000	1.4832	1.4679	1.5198	1.5801	1.6057	1.6161
\$250,000/\$500,000	1.8811	1.9650	2.0288	2.2032	2.2867	2.2678

Source: Formula - see 101A-1, page 6; Input values - see 101A-1, page 3

**Massachusetts Private Passenger Automobile  
Bodily Injury Increased Limit Factors**

**Ratio of Total Limit Losses to Basic Limit Losses for All Companies at Fifth Report**

<u>Limits</u>	<u>Accident Year</u>					
	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>
\$ 20,000/ \$ 40,000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
\$ 20,000/ \$ 50,000		Included in \$25,000/\$50,000 data				
\$ 25,000/ \$ 50,000	1.0463	1.0491	1.0543	1.0619	1.0589	1.0577
\$ 25,000/ \$ 60,000		Included in \$25,000/\$50,000 data				
\$ 20/\$40 Group *	1.0056	1.0061	1.0074	1.0089	1.0089	1.0089
\$ 50,000/\$100,000	1.2459	1.2627	1.2763	1.2936	1.3303	1.3070
\$100,000/\$300,000	1.4971	1.4805	1.5368	1.6024	1.6302	1.6415
\$250,000/\$500,000	1.9138	2.0049	2.0742	2.2637	2.3545	2.3339

<u>Limits</u>	<u>LD FE</u>	<u>[R(x,y) - 1] x LD FE</u>					
\$ 20,000/ \$ 40,000	0.9578	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
\$ 20,000/ \$ 50,000	0.9578	Included in \$25,000/\$50,000 data					
\$ 25,000/ \$ 50,000	0.9578	0.0444	0.0471	0.0520	0.0593	0.0564	0.0553
\$ 25,000/ \$ 60,000	0.9578	Included in \$25,000/\$50,000 data					
\$ 20/\$40 Group *	0.9578	0.0053	0.0058	0.0071	0.0085	0.0085	0.0085
\$ 50,000/\$100,000	0.9578	0.2356	0.2516	0.2647	0.2812	0.3163	0.2940
\$100,000/\$300,000	0.9578	0.4761	0.4602	0.5142	0.5769	0.6036	0.6144
\$250,000/\$500,000	0.9578	0.8752	0.9625	1.0289	1.2104	1.2973	1.2776

<u>Limits</u>	<u>LD FB</u>	<u>DCCER</u>	<u>LD FB x DCCER</u>
\$ 20,000/ \$ 40,000	0.9993	0.0414	0.0414
\$ 20,000/ \$ 50,000	0.9993		
\$ 25,000/ \$ 50,000	0.9993	0.0445	0.0445
\$ 25,000/ \$ 60,000	0.9993		
\$ 20/\$40 Group *	0.9993	0.0419	0.0419
\$ 50,000/\$100,000	0.9993	0.0566	0.0566
\$100,000/\$300,000	0.9993	0.0681	0.0681
\$250,000/\$500,000	0.9993	0.0832	0.0831

Source :

Losses: 101A-1 pages 4 and 5

LD FE: 101A-6

LD FB: 100B

DCCER: 101A-3

\* Note: \$20,000 / \$40,000 Group DCCER is a weighted average of 20/40, 20/50, 25/50, and 25/60.  
\$25,000 / \$50,000 DCCER is a weighted average of 20/50, 25/50, and 25/60.

**Massachusetts Private Passenger Automobile  
Bodily Injury Increased Limit Factors**

**Basic and Total Limits Losses by Limit**

Total Limit Losses Developed to Fifth Report for All Companies  
Accident Year

<u>Limits</u>	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>
\$ 20,000/ \$ 40,000	366,025,143	364,940,191	291,460,157	229,312,363	186,125,635	169,559,696
\$ 20,000/ \$ 50,000	6,562,320	6,460,460	5,590,951	4,889,190	4,608,886	5,039,762
\$ 25,000/ \$ 50,000	34,869,745	36,473,228	33,409,443	28,479,996	24,995,511	23,060,492
\$ 25,000/ \$ 60,000	2,908,782	3,538,910	2,907,705	2,748,779	2,531,225	2,507,118
\$ 20/\$40 Group	415,570,467	417,150,787	338,222,758	270,646,269	222,222,356	204,487,474
\$ 50,000/\$100,000	67,037,731	83,531,838	78,287,251	77,503,366	76,394,381	74,767,996
\$100,000/\$300,000	205,256,348	211,390,023	202,230,833	190,832,044	180,639,644	191,300,627
\$250,000/\$500,000	70,403,451	86,655,439	83,967,016	87,925,776	88,231,408	93,764,253

Basic Limit Losses Developed to Fifth Report for All Companies  
Accident Year

<u>Limits</u>	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>
\$ 20,000/ \$ 40,000	366,025,143	364,940,191	291,460,157	229,312,363	186,125,635	169,559,696
\$ 20,000/ \$ 50,000	6,562,320	6,460,460	5,592,481	4,877,598	4,568,319	4,927,207
\$ 25,000/ \$ 50,000	33,078,953	34,524,156	31,474,434	26,609,198	23,436,669	21,655,392
\$ 25,000/ \$ 60,000	2,736,345	3,311,253	2,681,257	2,526,510	2,343,636	2,353,935
\$ 20/\$40 Group	413,272,562	414,639,499	335,743,914	268,264,502	220,266,223	202,679,983
\$ 50,000/\$100,000	53,805,052	66,154,590	61,337,152	59,913,969	57,426,976	57,206,044
\$100,000/\$300,000	137,101,674	142,787,160	131,589,040	119,094,553	110,810,061	116,543,326
\$250,000/\$500,000	36,787,897	43,221,299	40,481,459	38,841,316	37,473,617	40,174,731

Source: 101A-2 pages 1-8

Note: \$20,000/\$40,000 Group includes data for 20/40, 20/50, 25/50, 25/60, 30/70 and 35/80.

**Massachusetts Private Passenger Automobile  
Bodily Injury Increased Limit Factors**

**Basic and Total Limits Pure Premiums by Limit**

	Earned Exposures					
	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>
20/40	1,250,736.5	1,214,300.2	1,174,147.6	1,135,885.7	1,086,283.6	1,035,350.7
20/50+ *	275,272.9	266,202.0	258,589.1	251,765.3	244,052.3	234,054.5
50/100	471,555.1	486,656.2	500,385.1	511,656.5	518,396.2	525,299.4
100/300	1,396,851.6	1,409,585.2	1,418,180.3	1,431,252.7	1,450,395.0	1,483,747.9
250/500	482,911.2	514,794.9	544,241.8	567,597.6	588,470.9	616,125.8

	Basic Limits Pure Premium					
	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>
20/40	292.65	300.54	248.23	201.88	171.34	163.77
20/50+ *	153.95	166.40	153.71	135.10	124.35	123.63
50/100	114.10	135.94	122.58	117.10	110.78	108.90
100/300	98.15	101.30	92.79	83.21	76.40	78.55
250/500	76.18	83.96	74.38	68.43	63.68	65.21

	Total Limits Pure Premium					
	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>
20/40	292.65	300.54	248.23	201.88	171.34	163.77
20/50+ *	161.08	174.58	162.06	143.46	131.68	130.77
50/100	142.16	171.64	156.45	151.48	147.37	142.33
100/300	146.94	149.97	142.60	133.33	124.55	128.93
250/500	145.79	168.33	154.28	154.91	149.93	152.18

\* 20/50+ represents 20/40 Group excluding 20/40

Notes:

Basic limits pure premium = Basic limits losses (from 101 A-1 page 4) / Earned exposures.

Total limits pure premium = Total limits losses (from 101 A-1 page 4) / Earned exposures.

## Massachusetts Private Passenger Automobile

### Formula for Increased Limit Factors

#### I. Bodily Injury Liability

For limits x/y let

LL(x) = Losses limited to x and developed to 5th report. These losses are displayed in Exhibit 101A-2, pages 1-8. Losses are broken down into basic losses (losses limited to 20/40) and total losses (losses limited to the indicated policy limit).

Losses(x,y) = Losses at total limits for limit x/y.

R(x,y) = Ratio of losses at limit x/y to losses at limit 20/40.

$$= \frac{\text{Losses}(x, y)}{\text{Losses}(20, 40)}$$

These ratios (reflecting the effects of development to 5th report) are displayed in Exhibit 101A-1, page 3.

These ratios are then adjusted to include defense and cost containment expenses and are developed from 5th report to ultimate.

Let LDFB = 5th to ultimate loss development factor for basic limit losses (including defense and cost containment expense)

LDFE = 5th to ultimate loss development factor for excess (losses excess of 20/40 limit) losses (excluding defense and cost containment expenses).

DCCE(x) = Defense and cost containment expense for insured purchasing limit x

DCCER(x) = Ratio of defense and cost containment expense to basic limit losses

$$= \frac{\text{DCCE}(x)}{\text{Losses}(20, 40)}$$



Then, increased limit factor (x,y) =

$$\frac{\text{Losses}(20,40) \times \text{LDFB} + [\text{Losses}(x,y)\text{Losses}(20,40)] \times \text{LDFE} + \text{DCCE}(x) \times \text{LDFB}}{\text{LDFB} \times [\text{DCCE}(20) + \text{Losses}(20,40)]}$$

Then, if the numerator and denominator of the above formula are divided by Losses(20,40), the following formula results:

$$\frac{\text{LDFB} + \left( \frac{\text{Losses}(x,y)}{\text{Losses}(20,40)} \right) \times \text{LDFE} + \text{DCCER}(x) \times \text{LDFB}}{\text{LDFB} \times [\text{DCCER}(20) + 1]}$$

$$= \frac{\text{LDFB} + [\text{R}(x,y) + 1] \times \text{LDFE} + \text{DCCER}(x) \times \text{LDFB}}{\text{LDFB} \times [\text{DCCER}(20) + 1]}$$

This formula is used to calculate the BI increased limit factors shown in Exhibit 101A-1, page 2.

## II. Property Damage Liability/Uninsured Motorists

The procedure for calculating increased limit factors for these coverages follows the procedure used for bodily injury except that losses are broken down by layer of loss only; bodily injury losses are broken down by layer of loss and by policy limit.

**Massachusetts Private Passenger Automobile  
Bodily Injury Increased Limit Factors**

**Loss Development from First to Fifth Report  
Basic Limit Losses for Insureds Purchasing 20/40 Group - Industry**

<u>Accident</u> <u>Year</u>	<u>First Report</u>	<u>Second Report</u>	<u>Third Report</u>	<u>Fourth Report</u>	<u>Fifth Report</u>
1998	433,691,150	406,812,346	400,859,427	398,360,996	393,484,755
1999	399,389,728	395,540,445	390,678,419	382,902,351	380,517,226
2000	403,108,461	389,335,789	365,373,130	365,289,695	363,234,449
2001	395,627,828	392,533,989	396,099,508	396,302,019	394,496,325
2002	420,850,219	415,598,380	415,643,245	416,620,254	413,272,562
2003	465,227,223	441,570,304	438,595,147	436,375,361	414,639,499
2004	447,019,390	422,787,324	418,837,644	346,414,357	335,743,914
2005	380,334,653	357,223,596	297,695,645	276,790,348	268,264,502
2006	321,667,251	259,913,547	244,431,503	227,266,613	220,266,223
2007	263,539,892	239,161,832	224,915,887	209,121,456	202,679,983

<u>Accident</u> <u>Year</u>	<u>Loss Development Factors</u>			
	<u>First to</u> <u>Second</u>	<u>Second to</u> <u>Third</u>	<u>Third to</u> <u>Fourth</u>	<u>Fourth to</u> <u>Fifth</u>
1998	0.9380	0.9854	0.9938	0.9878
1999	0.9904	0.9877	0.9801	0.9938
2000	0.9658	0.9385	0.9998	0.9944
2001	0.9922	1.0091	1.0005	0.9954
2002	0.9875	1.0001	1.0024	0.9920
2003	0.9491	0.9933	0.9949	0.9502
2004	0.9458	0.9907	0.8271	
2005	0.9392	0.8334		
2006	0.8080			
<b>Weighted</b> <b>Average</b>	0.9075	0.9404	0.9298	0.9692
<b>Cumulative</b> <b>Factors to Fifth</b> <b>Report</b>	0.7691	0.8475	0.9011	0.9692
<b>First to Fifth</b> <b>Factor</b>	0.7691			

The above losses are the sum of losses for limits 20/40, 20/50, 25/50, 25/60, 30/70, and 35/80.  
Weights for Weighted Average from 101A-2, page 9  
Source: 101 A-2 Loss by Layer Exhibits

**Massachusetts Private Passenger Automobile  
Bodily Injury Increased Limit Factors**

**Loss Development from First to Fifth Report  
Basic Limit Losses for Insureds Purchasing 20/40 Group - Industry**

<u>Accident</u>	<u>Year</u>	<u>First Report</u>	<u>Second Report</u>	<u>Third Report</u>	<u>Fourth Report</u>	<u>Fifth Report</u>
	1998	433,691,150	406,812,346	400,859,427	398,360,996	393,484,755
	1999	399,389,728	395,540,445	390,678,419	382,902,351	380,517,226
	2000	403,108,461	389,335,789	365,373,130	365,289,695	363,234,449
	2001	395,627,828	392,533,989	396,099,508	396,302,019	394,496,325
	2002	420,850,219	415,598,380	415,643,245	416,620,254	413,272,562
	2003	465,227,223	441,570,304	438,595,147	436,375,361	414,639,499
	2004	447,019,390	422,787,324	418,837,644	346,414,357	335,743,914
	2005	380,334,653	357,223,596	297,695,645	276,790,348	268,264,502
	2006	321,667,251	259,913,547	244,431,503	227,266,613	220,266,223
	2007	263,539,892	239,161,832	224,915,887	209,121,456	202,679,983

<u>Accident</u>	<u>Loss Development Factors</u>				
	<u>Year</u>	<u>First to Second</u>	<u>Second to Third</u>	<u>Third to Fourth</u>	<u>Fourth to Fifth</u>
	1998	0.9380	0.9854	0.9938	0.9878
	1999	0.9904	0.9877	0.9801	0.9938
	2000	0.9658	0.9385	0.9998	0.9944
	2001	0.9922	1.0091	1.0005	0.9954
	2002	0.9875	1.0001	1.0024	0.9920
	2003	0.9491	0.9933	0.9949	0.9502
	2004	0.9458	0.9907	0.8271	
	2005	0.9392	0.8334		
	2006	0.8080			
	Weighted Average	0.9075	0.9404	0.9298	0.9692
	Cumulative Factors to Fifth Report	0.7691	0.8475	0.9011	0.9692
	First to Fifth Factor	0.7691			

The above losses are the sum of losses for limits 20/40, 20/50, 25/50, 25/60, 30/70, and 35/80.  
Weights for Weighted Average from 101A-2, page 9  
Source: 101 A-2 Loss by Layer Exhibits

**Massachusetts Private Passenger Automobile  
Bodily Injury Increased Limit Factors**

**Loss Development from First to Fifth Report  
Basic Limit Losses for Insureds Purchasing 20/40 Group excl. 20/40 - Industry**

<u>Accident Year</u>	<u>First Report</u>	<u>Second Report</u>	<u>Third Report</u>	<u>Fourth Report</u>	<u>Fifth Report</u>
1998	54,022,898	51,467,056	50,631,541	50,576,975	49,970,873
1999	48,360,392	46,677,780	46,882,957	46,031,496	45,666,597
2000	47,202,231	45,850,941	43,371,973	43,867,676	43,396,472
2001	45,228,064	44,870,902	45,593,989	45,657,444	45,605,626
2002	47,947,055	47,507,958	47,751,612	47,608,475	47,247,419
2003	55,626,508	54,021,241	53,519,795	53,117,607	49,699,308
2004	52,511,786	50,608,860	50,377,770	46,023,420	44,250,448
2005	49,648,890	47,419,328	42,289,601	40,687,826	39,120,398
2006	44,864,507	38,727,765	37,236,867	35,826,471	34,446,319
2007	40,457,164	37,837,404	36,380,783	35,002,812	33,654,389

<u>Accident Year</u>	<u>Loss Development Factors</u>			
	<u>First to Second</u>	<u>Second to Third</u>	<u>Third to Fourth</u>	<u>Fourth to Fifth</u>
1998	0.9527	0.9838	0.9989	0.9880
1999	0.9652	1.0044	0.9818	0.9921
2000	0.9714	0.9459	1.0114	0.9893
2001	0.9921	1.0161	1.0014	0.9989
2002	0.9908	1.0051	0.9970	0.9924
2003	0.9711	0.9907	0.9925	0.9356
2004	0.9638	0.9954	0.9136	
2005	0.9551	0.8918		
2006	0.8632			
Weighted Average	0.9352	0.9615	0.9621	0.9615
Cumulative Factors to Fifth Report	0.8319	0.8894	0.9251	0.9615
First to Fifth Factor	0.8319			

Weights for Weighted Average from 101A-2, page 9

Source: 101 A-2 Loss by Layer Exhibits

**Massachusetts Private Passenger Automobile  
Bodily Injury Increased Limit Factors**

**Loss Development from First to Fifth Report  
Basic Limit Losses for Insureds Purchasing 20/40 Limits - Industry**

<u>Accident</u>					
<u>Year</u>	<u>First Report</u>	<u>Second Report</u>	<u>Third Report</u>	<u>Fourth Report</u>	<u>Fifth Report</u>
1998	379,668,252	355,345,290	350,227,886	347,784,021	343,513,882
1999	351,029,336	348,862,665	343,795,462	336,870,855	334,850,629
2000	355,906,230	343,484,848	322,001,157	321,422,019	319,837,977
2001	350,399,764	347,663,087	350,505,519	350,644,575	348,890,699
2002	372,903,164	368,090,422	367,891,633	369,011,779	366,025,143
2003	409,600,715	387,549,063	385,075,352	383,257,754	364,940,191
2004	394,507,604	372,178,464	368,459,874	300,390,937	291,460,157
2005	330,685,763	309,804,268	255,406,044	236,338,840	229,312,363
2006	276,802,744	221,185,782	207,305,056	191,828,806	186,125,635
2007	223,082,728	201,499,346	188,854,062	174,755,261	169,559,696

<u>Accident</u>	<u>Loss Development Factors</u>			
	<u>First to</u>	<u>Second to</u>	<u>Third to</u>	<u>Fourth to</u>
<u>Year</u>	<u>Second</u>	<u>Third</u>	<u>Fourth</u>	<u>Fifth</u>
1998	0.9359	0.9856	0.9930	0.9877
1999	0.9938	0.9855	0.9799	0.9940
2000	0.9651	0.9375	0.9982	0.9951
2001	0.9922	1.0082	1.0004	0.9950
2002	0.9871	0.9995	1.0030	0.9919
2003	0.9462	0.9936	0.9953	0.9522
2004	0.9434	0.9900	0.8153	
2005	0.9369	0.8244		
2006	0.7991			
<b>Weighted</b>				
<b>Average</b>	0.9032	0.9372	0.9253	0.9703
<b>Cumulative</b>				
<b>Factors to Fifth</b>				
<b>Report</b>	0.7601	0.8415	0.8978	0.9703
<b>First to Fifth</b>				
<b>Factor</b>	0.7601			

Weights for Weighted Average from 101A-2, page 9  
Source: 101 A-2 Loss by Layer Exhibits

**Massachusetts Private Passenger Automobile  
Bodily Injury Increased Limit Factors**

**Loss Development from First to Fifth Report  
Basic Limit Losses for Insureds Purchasing 20/50 Limits - Industry**

<u>Accident</u> <u>Year</u>	<u>First Report</u>	<u>Second Report</u>	<u>Third Report</u>	<u>Fourth Report</u>	<u>Fifth Report</u>
1998	6,026,702	5,767,022	5,583,996	5,528,140	5,448,621
1999	5,784,757	5,958,467	6,140,431	5,949,754	5,935,350
2000	6,009,014	6,205,515	5,916,639	6,059,404	6,027,668
2001	6,074,229	6,036,437	6,138,829	6,247,547	6,234,716
2002	6,282,168	6,448,602	6,555,143	6,608,199	6,562,320
2003	7,066,070	6,772,110	6,715,168	6,630,978	6,460,460
2004	7,125,690	6,699,687	6,497,357	5,816,554	5,592,481
2005	6,446,795	6,086,503	5,272,740	5,073,028	4,877,598
2006	5,727,438	5,136,130	4,938,405	4,751,356	4,568,319
2007	5,923,174	5,539,625	5,326,367	5,124,624	4,927,207

<u>Accident</u> <u>Year</u>	<u>Loss Development Factors</u>			
	<u>First to</u> <u>Second</u>	<u>Second to</u> <u>Third</u>	<u>Third to</u> <u>Fourth</u>	<u>Fourth to</u> <u>Fifth</u>
1998	0.9569	0.9683	0.9900	0.9856
1999	1.0300	1.0305	0.9689	0.9976
2000	1.0327	0.9534	1.0241	0.9948
2001	0.9938	1.0170	1.0177	0.9979
2002	1.0265	1.0165	1.0081	0.9931
2003	0.9584	0.9916	0.9875	0.9743
2004	0.9402	0.9698	0.8952	
2005	0.9441	0.8663		
2006	0.8968			
Selected Average	0.9352	0.9615	0.9621	0.9615
Cumulative Factors to Fifth Report	0.8319	0.8894	0.9251	0.9615
First to Fifth Factor	0.8319			

Selected Average from 20/40 Group excluding 20/40 Limit (101A-2, page 1a)

Source: 101 A-2 Loss by Layer Exhibits

**Massachusetts Private Passenger Automobile  
Bodily Injury Increased Limit Factors**

**Loss Development from First to Fifth Report  
Basic Limit Losses for Insureds Purchasing 25/50 Limits - Industry**

<u>Accident</u>	<u>Year</u>	<u>First Report</u>	<u>Second Report</u>	<u>Third Report</u>	<u>Fourth Report</u>	<u>Fifth Report</u>
	1998	38,254,620	36,672,783	36,180,314	36,227,404	35,818,504
	1999	34,506,310	32,752,146	32,756,137	32,125,446	31,921,835
	2000	33,734,169	32,348,755	30,713,053	30,822,445	30,415,351
	2001	31,730,905	31,456,524	31,964,546	31,918,530	31,793,217
	2002	34,246,902	33,509,885	33,424,113	33,345,420	33,078,953
	2003	39,222,606	38,276,937	37,908,241	37,844,860	34,524,156
	2004	36,345,819	35,008,877	34,985,284	32,735,513	31,474,434
	2005	35,247,957	33,627,476	28,764,850	27,675,343	26,609,198
	2006	30,637,493	26,349,690	25,335,310	24,375,701	23,436,669
	2007	26,032,733	24,347,012	23,409,728	22,523,053	21,655,392

<u>Accident</u>	<u>Loss Development Factors</u>			
	<u>First to</u> <u>Second</u>	<u>Second to</u> <u>Third</u>	<u>Third to</u> <u>Fourth</u>	<u>Fourth to</u> <u>Fifth</u>
<u>Year</u>				
1998	0.9586	0.9866	1.0013	0.9887
1999	0.9492	1.0001	0.9807	0.9937
2000	0.9589	0.9494	1.0036	0.9868
2001	0.9914	1.0161	0.9986	0.9961
2002	0.9785	0.9974	0.9976	0.9920
2003	0.9759	0.9904	0.9983	0.9123
2004	0.9632	0.9993	0.9357	
2005	0.9540	0.8554		
2006	0.8600			
Selected Average	0.9352	0.9615	0.9621	0.9615
Cumulative Factors to Fifth Report	0.8319	0.8894	0.9251	0.9615
First to Fifth Factor	0.8319			

Selected Average from 20/40 Group excluding 20/40 Limit (101A-2, page 1a)  
Source: 101 A-2 Loss by Layer Exhibits

**Massachusetts Private Passenger Automobile  
Bodily Injury Increased Limit Factors**

**Loss Development from First to Fifth Report  
Basic Limit Losses for Insureds Purchasing 25/60 Limits - Industry**

<u>Accident</u> <u>Year</u>	<u>First Report</u>	<u>Second Report</u>	<u>Third Report</u>	<u>Fourth Report</u>	<u>Fifth Report</u>
1998	4,780,044	4,400,315	4,441,242	4,401,012	4,337,150
1999	3,602,064	3,928,559	3,971,370	3,963,369	3,881,157
2000	2,980,132	2,930,890	2,797,532	2,930,402	2,958,030
2001	2,572,081	2,599,486	2,649,869	2,639,959	2,674,822
2002	2,553,244	2,667,727	2,711,518	2,776,440	2,736,345
2003	3,778,409	3,777,558	3,812,669	3,681,607	3,311,253
2004	3,444,659	3,355,421	3,385,497	2,788,686	2,681,257
2005	2,860,368	2,840,210	2,731,186	2,627,739	2,526,510
2006	2,634,265	2,634,934	2,533,497	2,437,538	2,343,636
2007	2,829,751	2,646,514	2,544,631	2,448,250	2,353,935

<u>Accident</u> <u>Year</u>	<u>Loss Development Factors</u>			
	<u>First to</u> <u>Second</u>	<u>Second to</u> <u>Third</u>	<u>Third to</u> <u>Fourth</u>	<u>Fourth to</u> <u>Fifth</u>
1998	0.9206	1.0093	0.9909	0.9855
1999	1.0906	1.0109	0.9980	0.9793
2000	0.9835	0.9545	1.0475	1.0094
2001	1.0107	1.0194	0.9963	1.0132
2002	1.0448	1.0164	1.0239	0.9856
2003	0.9998	1.0093	0.9656	0.8994
2004	0.9741	1.0090	0.8237	
2005	0.9930	0.9616		
2006	1.0003			
Selected Average	0.9352	0.9615	0.9621	0.9615
Cumulative Factors to Fifth Report	0.8319	0.8894	0.9251	0.9615
First to Fifth Factor	0.8319			

Selected Average from 20/40 Group excluding 20/40 Limit (101A-2, page 1a)

Source: 101 A-2 Loss by Layer Exhibits



**Massachusetts Private Passenger Automobile  
Bodily Injury Increased Limit Factors**

**Loss Development from First to Fifth Report  
Basic Limit Losses for Insureds Purchasing 30/70 & 35/80 Limits - Industry**

<u>Accident</u> <u>Year</u>	<u>First Report</u>	<u>Second Report</u>	<u>Third Report</u>	<u>Fourth Report</u>	<u>Fifth Report</u>
1998	4,961,532	4,626,936	4,425,989	4,420,419	4,366,598
1999	4,467,261	4,038,608	4,015,019	3,992,927	3,928,255
2000	4,478,916	4,365,781	3,944,749	4,055,425	3,995,423
2001	4,850,849	4,778,455	4,840,745	4,851,408	4,902,871
2002	4,864,741	4,881,744	5,060,838	4,878,416	4,869,801
2003	5,559,423	5,194,636	5,083,717	4,960,162	5,403,439
2004	5,595,618	5,544,875	5,509,632	4,682,667	4,502,275
2005	5,093,770	4,865,139	5,520,825	5,311,716	5,107,092
2006	5,865,311	4,607,011	4,429,656	4,261,876	4,097,695
2007	5,671,506	5,304,254	5,100,057	4,906,885	4,717,856

<u>Accident</u> <u>Year</u>	<u>Loss Development Factors</u>			
	<u>First to</u> <u>Second</u>	<u>Second to</u> <u>Third</u>	<u>Third to</u> <u>Fourth</u>	<u>Fourth to</u> <u>Fifth</u>
1998	0.9326	0.9566	0.9987	0.9878
1999	0.9040	0.9942	0.9945	0.9838
2000	0.9747	0.9036	1.0281	0.9852
2001	0.9851	1.0130	1.0022	1.0106
2002	1.0035	1.0367	0.9640	0.9982
2003	0.9344	0.9786	0.9757	1.0894
2004	0.9909	0.9936	0.8499	
2005	0.9551	1.1348		
2006	0.7855			
Selected Average	0.9352	0.9615	0.9621	0.9615
Cumulative Factors to Fifth Report	0.8319	0.8894	0.9251	0.9615
First to Fifth Factor	0.8319			

Selected Average from 20/40 Group excluding 20/40 Limit (101A-2, page 1a)  
Source: 101 A-2 Loss by Layer Exhibits

**Massachusetts Private Passenger Automobile  
Bodily Injury Increased Limit Factors**

**Loss Development from First to Fifth Report  
Basic Limit Losses for Insureds Purchasing 50/100 Limits - Industry**

<u>Accident</u>	<u>Year</u>	<u>First Report</u>	<u>Second Report</u>	<u>Third Report</u>	<u>Fourth Report</u>	<u>Fifth Report</u>
	1998	62,036,278	57,743,144	57,833,705	57,673,899	56,675,541
	1999	55,123,583	55,367,638	54,958,691	54,251,255	53,739,608
	2000	54,574,844	53,181,080	50,546,000	51,249,384	50,672,157
	2001	52,607,265	52,495,306	53,571,352	53,658,811	52,963,631
	2002	54,438,828	53,855,092	54,436,421	54,277,949	53,805,052
	2003	68,226,855	65,323,586	64,448,859	64,568,564	66,154,590
	2004	70,460,061	67,892,101	67,270,759	60,764,574	61,337,152
	2005	66,196,832	62,630,020	61,753,512	59,354,677	59,913,969
	2006	66,266,112	59,690,044	59,190,161	56,890,900	57,426,976
	2007	63,120,514	59,460,406	58,962,446	56,672,030	57,206,044

<u>Accident</u>	<u>Loss Development Factors</u>				
	<u>Year</u>	<u>First to Second</u>	<u>Second to Third</u>	<u>Third to Fourth</u>	<u>Fourth to Fifth</u>
	1998	0.9308	1.0016	0.9972	0.9827
	1999	1.0044	0.9926	0.9871	0.9906
	2000	0.9745	0.9505	1.0139	0.9887
	2001	0.9979	1.0205	1.0016	0.9870
	2002	0.9893	1.0108	0.9971	0.9913
	2003	0.9574	0.9866	1.0019	1.0246
	2004	0.9636	0.9908	0.9033	
	2005	0.9461	0.9860		
	2006	0.9008			
	Selected Average	0.9420	0.9916	0.9612	1.0094
	Cumulative Factors to Fifth Report	0.9063	0.9621	0.9702	1.0094
	First to Fifth Factor	0.9063			

Weights for Weighted Average from 101A-2, page 9  
Source: 101 A-2 Loss by Layer Exhibits

**Massachusetts Private Passenger Automobile  
Bodily Injury Increased Limit Factors**

**Loss Development from First to Fifth Report  
Basic Limit Losses for Insureds Purchasing 100/300 Limits - Industry**

<u>Accident</u>	<u>Year</u>	<u>First Report</u>	<u>Second Report</u>	<u>Third Report</u>	<u>Fourth Report</u>	<u>Fifth Report</u>
	1998	138,305,313	130,311,026	129,231,176	128,796,337	126,291,050
	1999	133,063,486	136,025,726	136,195,577	134,181,415	133,210,528
	2000	137,024,924	133,480,190	128,410,007	128,746,566	127,550,609
	2001	133,320,784	134,160,577	136,519,072	137,015,511	135,952,657
	2002	137,576,344	137,691,877	138,970,040	138,442,274	137,101,674
	2003	151,776,701	148,258,734	147,419,808	146,074,559	142,787,160
	2004	147,225,140	145,113,040	145,912,212	133,819,975	131,589,040
	2005	142,942,153	137,827,415	125,793,433	121,113,659	119,094,553
	2006	134,686,203	120,321,699	117,042,952	112,688,713	110,810,061
	2007	132,816,423	126,547,092	123,098,704	118,519,179	116,543,326

<u>Accident</u>	<u>Loss Development Factors</u>				
	<u>Year</u>	<u>First to Second</u>	<u>Second to Third</u>	<u>Third to Fourth</u>	<u>Fourth to Fifth</u>
	1998	0.9422	0.9917	0.9966	0.9805
	1999	1.0223	1.0012	0.9852	0.9928
	2000	0.9741	0.9620	1.0026	0.9907
	2001	1.0063	1.0176	1.0036	0.9922
	2002	1.0008	1.0093	0.9962	0.9903
	2003	0.9768	0.9943	0.9909	0.9775
	2004	0.9857	1.0055	0.9171	
	2005	0.9642	0.9127		
	2006	0.8933			
	Selected Average	0.9528	0.9728	0.9628	0.9833
	Cumulative Factors to Fifth Report	0.8775	0.9209	0.9467	0.9833
	First to Fifth Factor	0.8775			

Weights for Weighted Average from 101A-2, page 9  
Source: 101 A-2 Loss by Layer Exhibits

**Massachusetts Private Passenger Automobile  
Bodily Injury Increased Limit Factors**

**Loss Development from First to Fifth Report  
Basic Limit Losses for Insureds Purchasing 250/500 Limits - Industry**

<u>Accident</u>	<u>Year</u>	<u>First Report</u>	<u>Second Report</u>	<u>Third Report</u>	<u>Fourth Report</u>	<u>Fifth Report</u>
	1998	33,170,402	31,184,244	30,955,788	30,411,595	29,847,006
	1999	33,521,805	34,296,735	34,062,638	33,689,834	33,346,757
	2000	36,533,617	34,966,531	34,312,611	34,760,386	34,455,280
	2001	36,470,812	35,599,790	36,787,434	37,081,224	36,406,621
	2002	37,201,631	37,276,510	37,239,500	37,263,947	36,787,897
	2003	44,606,777	42,686,829	42,427,313	42,269,137	43,221,299
	2004	45,048,102	44,356,731	44,704,934	40,221,463	40,481,459
	2005	42,109,300	41,250,216	40,249,419	38,591,855	38,841,316
	2006	41,924,116	39,122,120	38,832,136	37,232,939	37,473,617
	2007	43,439,652	41,942,059	41,631,174	39,916,705	40,174,731

<u>Accident</u>	<u>Loss Development Factors</u>				
	<u>Year</u>	<u>First to Second</u>	<u>Second to Third</u>	<u>Third to Fourth</u>	<u>Fourth to Fifth</u>
	1998	0.9401	0.9927	0.9824	0.9814
	1999	1.0231	0.9932	0.9891	0.9898
	2000	0.9571	0.9813	1.0130	0.9912
	2001	0.9761	1.0334	1.0080	0.9818
	2002	1.0020	0.9990	1.0007	0.9872
	2003	0.9570	0.9939	0.9963	1.0225
	2004	0.9847	1.0079	0.8997	
	2005	0.9796	0.9757		
	2006	0.9332			
	Selected Average	0.9655	0.9926	0.9588	1.0065
	Cumulative Factors to Fifth Report	0.9248	0.9579	0.9650	1.0065
	First to Fifth Factor	0.9248			

Weights for Weighted Average from 101A-2, page 9  
Source: 101 A-2 Loss by Layer Exhibits

**Massachusetts Private Passenger Automobile  
Bodily Injury Increased Limit Factors**

**Loss Development from First to Fifth Report  
Total Limit Losses for Insureds Purchasing 20/40 Group - Industry**

<u>Accident</u>	<u>Year</u>	<u>First Report</u>	<u>Second Report</u>	<u>Third Report</u>	<u>Fourth Report</u>	<u>Fifth Report</u>
	1998	435,523,759	409,346,481	403,795,651	401,299,830	396,336,548
	1999	399,296,192	397,816,809	393,181,553	385,331,355	382,961,893
	2000	404,696,543	391,378,657	367,541,147	367,561,440	365,491,253
	2001	397,020,440	394,504,216	398,367,209	398,608,665	396,855,966
	2002	422,369,854	417,639,317	417,972,851	418,955,031	415,570,467
	2003	466,933,439	443,993,216	441,279,276	439,069,064	417,150,787
	2004	448,641,045	424,972,873	421,334,442	349,000,628	338,222,758
	2005	382,021,687	359,611,326	300,198,027	279,270,734	270,646,269
	2006	323,217,024	261,835,646	246,486,726	229,303,736	222,222,356
	2007	264,966,047	240,939,349	226,815,380	211,003,711	204,487,474

<u>Accident</u>	<u>Loss Development Factors</u>				
	<u>Year</u>	<u>First to Second</u>	<u>Second to Third</u>	<u>Third to Fourth</u>	<u>Fourth to Fifth</u>
	1998	0.9399	0.9864	0.9938	0.9876
	1999	0.9963	0.9883	0.9800	0.9939
	2000	0.9671	0.9391	1.0001	0.9944
	2001	0.9937	1.0098	1.0006	0.9956
	2002	0.9888	1.0008	1.0023	0.9919
	2003	0.9509	0.9939	0.9950	0.9501
	2004	0.9472	0.9914	0.8283	
	2005	0.9413	0.8348		
	2006	0.8101			
	Weighted Average	0.9093	0.9414	0.9303	0.9691
	Cumulative Factors to Fifth Report	0.7717	0.8487	0.9016	0.9691
	First to Fifth Factor	0.7717			

The above losses are the sum of losses for limits 20/40, 20/50, 25/50, 25/60, 30/70, and 35/80.

Weights for Weighted Average from 101A-2, page 9

Source: 101 A-2 Loss by Layer Exhibits

**Massachusetts Private Passenger Automobile  
Bodily Injury Increased Limit Factors**

**Loss Development from First to Fifth Report  
Total Limit Losses for Insureds Purchasing 20/40 Group excl. 20/40 - Industry**

<u>Accident Year</u>	<u>First Report</u>	<u>Second Report</u>	<u>Third Report</u>	<u>Fourth Report</u>	<u>Fifth Report</u>
1998	55,855,507	54,001,191	53,567,765	53,515,809	52,822,666
1999	48,266,856	48,954,144	49,386,091	48,460,500	48,111,264
2000	48,790,313	47,893,809	45,539,990	46,139,421	45,653,276
2001	46,620,676	46,841,129	47,861,690	47,964,090	47,965,267
2002	49,466,690	49,548,895	50,081,218	49,943,252	49,545,324
2003	57,332,724	56,444,153	56,203,924	55,811,310	52,210,596
2004	54,133,441	52,794,409	52,874,568	48,609,691	46,724,296
2005	51,335,924	49,807,058	44,791,983	43,209,669	41,533,722
2006	46,414,280	40,649,864	39,338,565	37,948,897	36,476,996
2007	41,883,319	39,713,361	38,432,272	37,074,620	35,636,629

<u>Accident Year</u>	<u>Loss Development Factors</u>			
	<u>First to Second</u>	<u>Second to Third</u>	<u>Third to Fourth</u>	<u>Fourth to Fifth</u>
1998	0.9668	0.9920	0.9990	0.9870
1999	1.0142	1.0088	0.9813	0.9928
2000	0.9816	0.9509	1.0132	0.9895
2001	1.0047	1.0218	1.0021	1.0000
2002	1.0017	1.0107	0.9972	0.9920
2003	0.9845	0.9957	0.9930	0.9355
2004	0.9753	1.0015	0.9193	
2005	0.9702	0.8993		
2006	0.8758			
Weighted Average	0.9482	0.9677	0.9647	0.9612
Cumulative Factors to Fifth Report	0.8509	0.8973	0.9273	0.9612
First to Fifth Factor	0.8509			

Weights for Weighted Average from 101A-2, page 9  
Source: 101 A-2 Loss by Layer Exhibits

**Massachusetts Private Passenger Automobile  
Bodily Injury Increased Limit Factors**

**Loss Development from First to Fifth Report  
Total Limit Losses for Insureds Purchasing 20/40 Limits - Industry**

<u>Accident</u> <u>Year</u>	<u>First Report</u>	<u>Second Report</u>	<u>Third Report</u>	<u>Fourth Report</u>	<u>Fifth Report</u>
1998	379,668,252	355,345,290	350,227,886	347,784,021	343,513,882
1999	351,029,336	348,862,665	343,795,462	336,870,855	334,850,629
2000	355,906,230	343,484,848	322,001,157	321,422,019	319,837,977
2001	350,399,764	347,663,087	350,505,519	350,644,575	348,890,699
2002	372,903,164	368,090,422	367,891,633	369,011,779	366,025,143
2003	409,600,715	387,549,063	385,075,352	383,257,754	364,940,191
2004	394,507,604	372,178,464	368,459,874	300,390,937	291,460,157
2005	330,685,763	309,804,268	255,406,044	236,338,840	229,312,363
2006	276,802,744	221,185,782	207,305,056	191,828,806	186,125,635
2007	223,082,728	201,499,346	188,854,062	174,755,261	169,559,696

<u>Accident</u> <u>Year</u>	<u>Loss Development Factors</u>			
	<u>First to</u> <u>Second</u>	<u>Second to</u> <u>Third</u>	<u>Third to</u> <u>Fourth</u>	<u>Fourth to</u> <u>Fifth</u>
1998	0.9359	0.9856	0.9930	0.9877
1999	0.9938	0.9855	0.9799	0.9940
2000	0.9651	0.9375	0.9982	0.9951
2001	0.9922	1.0082	1.0004	0.9950
2002	0.9871	0.9995	1.0030	0.9919
2003	0.9462	0.9936	0.9953	0.9522
2004	0.9434	0.9900	0.8153	
2005	0.9369	0.8244		
2006	0.7991			
Weighted Average	0.9032	0.9372	0.9253	0.9703
Cumulative Factors to Fifth Report	0.7601	0.8415	0.8978	0.9703
First to Fifth Factor	0.7601			

Weights for Weighted Average from 101A-2, page 9  
Source: 101 A-2 Loss by Layer Exhibits

**Massachusetts Private Passenger Automobile  
Bodily Injury Increased Limit Factors**

**Loss Development from First to Fifth Report  
Total Limit Losses for Insureds Purchasing 20/50 Limits - Industry**

<u>Accident</u> <u>Year</u>	<u>First Report</u>	<u>Second Report</u>	<u>Third Report</u>	<u>Fourth Report</u>	<u>Fifth Report</u>
1998	6,026,702	5,767,022	5,583,996	5,528,140	5,448,621
1999	5,784,757	5,958,467	6,140,431	5,949,754	5,935,350
2000	6,009,014	6,205,515	5,916,639	6,059,404	6,027,668
2001	6,074,229	6,036,437	6,138,829	6,247,547	6,234,716
2002	6,282,168	6,448,602	6,555,143	6,608,199	6,562,320
2003	7,066,070	6,772,110	6,715,168	6,630,978	6,460,460
2004	7,125,690	6,699,687	6,497,357	5,816,554	5,590,951
2005	6,446,795	6,086,503	5,272,740	5,086,476	4,889,190
2006	5,727,438	5,136,130	4,970,447	4,794,862	4,608,886
2007	5,923,174	5,616,297	5,435,124	5,243,124	5,039,762

<u>Accident</u> <u>Year</u>	<u>Loss Development Factors</u>			
	<u>First to</u> <u>Second</u>	<u>Second to</u> <u>Third</u>	<u>Third to</u> <u>Fourth</u>	<u>Fourth to</u> <u>Fifth</u>
1998	0.9569	0.9683	0.9900	0.9856
1999	1.0300	1.0305	0.9689	0.9976
2000	1.0327	0.9534	1.0241	0.9948
2001	0.9938	1.0170	1.0177	0.9979
2002	1.0265	1.0165	1.0081	0.9931
2003	0.9584	0.9916	0.9875	0.9743
2004	0.9402	0.9698	0.8952	
2005	0.9441	0.8663		
2006	0.8968			
Selected Average	0.9482	0.9677	0.9647	0.9612
Cumulative Factors to Fifth Report	0.8509	0.8973	0.9273	0.9612
First to Fifth Factor	0.8509			

Selected Average from 20/40 Group excluding 20/40 Limit (101A-2, page 5a)  
Source: 101 A-2 Loss by Layer Exhibits



**Massachusetts Private Passenger Automobile  
Bodily Injury Increased Limit Factors**

**Loss Development from First to Fifth Report  
Total Limit Losses for Insureds Purchasing 25/50 Limits - Industry**

<u>Accident</u> <u>Year</u>	<u>First Report</u>	<u>Second Report</u>	<u>Third Report</u>	<u>Fourth Report</u>	<u>Fifth Report</u>
1998	39,700,645	38,658,760	38,526,671	38,593,465	38,085,813
1999	34,115,329	34,552,141	34,719,219	34,058,761	33,880,703
2000	35,001,107	33,984,967	32,445,652	32,617,121	32,187,194
2001	32,863,823	33,061,188	33,762,972	33,709,699	33,621,278
2002	35,483,327	35,148,700	35,267,242	35,168,362	34,869,745
2003	40,585,463	40,216,180	40,027,327	39,981,160	36,473,228
2004	37,598,874	36,715,624	36,940,576	34,757,564	33,409,443
2005	36,556,006	35,490,391	30,714,211	29,629,206	28,479,996
2006	31,816,236	27,854,928	26,956,373	26,004,117	24,995,511
2007	27,102,731	25,698,549	24,869,555	23,991,018	23,060,492

<u>Accident</u> <u>Year</u>	<u>Loss Development Factors</u>			
	<u>First to</u> <u>Second</u>	<u>Second to</u> <u>Third</u>	<u>Third to</u> <u>Fourth</u>	<u>Fourth to</u> <u>Fifth</u>
1998	0.9738	0.9966	1.0017	0.9868
1999	1.0128	1.0048	0.9810	0.9948
2000	0.9710	0.9547	1.0053	0.9868
2001	1.0060	1.0212	0.9984	0.9974
2002	0.9906	1.0034	0.9972	0.9915
2003	0.9909	0.9953	0.9988	0.9123
2004	0.9765	1.0061	0.9409	
2005	0.9708	0.8654		
2006	0.8755			
Selected Average	0.9482	0.9677	0.9647	0.9612
Cumulative Factors to Fifth Report	0.8509	0.8973	0.9273	0.9612
First to Fifth Factor	0.8509			

Selected Average from 20/40 Group excluding 20/40 Limit (101A-2, page 5a)

Source: 101 A-2 Loss by Layer Exhibits

**Massachusetts Private Passenger Automobile  
Bodily Injury Increased Limit Factors**

**Loss Development from First to Fifth Report  
Total Limit Losses for Insureds Purchasing 25/60 Limits - Industry**

<u>Accident</u> <u>Year</u>	<u>First Report</u>	<u>Second Report</u>	<u>Third Report</u>	<u>Fourth Report</u>	<u>Fifth Report</u>
1998	4,935,096	4,642,205	4,721,217	4,646,267	4,586,616
1999	3,740,555	4,195,682	4,251,442	4,208,425	4,116,213
2000	3,092,720	3,098,912	2,985,372	3,140,808	3,178,172
2001	2,654,686	2,720,970	2,791,266	2,800,439	2,840,302
2002	2,639,758	2,820,890	2,868,931	2,958,599	2,908,782
2003	3,928,609	3,999,453	4,071,554	3,922,556	3,538,910
2004	3,622,059	3,564,730	3,624,612	3,025,035	2,907,705
2005	3,002,433	3,057,732	2,964,417	2,859,697	2,748,779
2006	2,805,103	2,820,790	2,729,796	2,633,364	2,531,225
2007	2,946,587	2,793,925	2,703,798	2,608,284	2,507,118

<u>Accident</u> <u>Year</u>	<u>Loss Development Factors</u>			
	<u>First to</u> <u>Second</u>	<u>Second to</u> <u>Third</u>	<u>Third to</u> <u>Fourth</u>	<u>Fourth to</u> <u>Fifth</u>
1998	0.9407	1.0170	0.9841	0.9872
1999	1.1217	1.0133	0.9899	0.9781
2000	1.0020	0.9634	1.0521	1.0119
2001	1.0250	1.0258	1.0033	1.0142
2002	1.0686	1.0170	1.0313	0.9832
2003	1.0180	1.0180	0.9634	0.9022
2004	0.9842	1.0168	0.8346	
2005	1.0184	0.9695		
2006	1.0056			
Selected Average	0.9482	0.9677	0.9647	0.9612
Cumulative Factors to Fifth Report	0.8509	0.8973	0.9273	0.9612
First to Fifth Factor	0.8509			

Selected Average from 20/40 Group excluding 20/40 Limit (101A-2, page 5a)  
Source: 101 A-2 Loss by Layer Exhibits

**Massachusetts Private Passenger Automobile  
Bodily Injury Increased Limit Factors**

**Loss Development from First to Fifth Report  
Total Limit Losses for Insureds Purchasing 30/70 & 35/80 Limits - Industry**

<u>Accident Year</u>	<u>First Report</u>	<u>Second Report</u>	<u>Third Report</u>	<u>Fourth Report</u>	<u>Fifth Report</u>
1998	5,193,064	4,933,204	4,735,881	4,747,937	4,701,616
1999	4,626,215	4,247,854	4,274,999	4,243,560	4,178,998
2000	4,687,472	4,604,415	4,192,327	4,322,088	4,260,242
2001	5,027,938	5,022,534	5,168,623	5,206,405	5,268,971
2002	5,061,437	5,130,703	5,389,902	5,208,092	5,204,477
2003	5,752,582	5,456,410	5,389,875	5,276,616	5,737,998
2004	5,786,818	5,814,368	5,812,023	5,010,538	4,816,197
2005	5,330,690	5,172,432	5,840,615	5,634,290	5,415,757
2006	6,065,503	4,838,016	4,681,949	4,516,556	4,341,375
2007	5,910,827	5,604,589	5,423,794	5,232,194	5,029,256

<u>Accident Year</u>	<u>Loss Development Factors</u>			
	<u>First to Second</u>	<u>Second to Third</u>	<u>Third to Fourth</u>	<u>Fourth to Fifth</u>
1998	0.9500	0.9600	1.0025	0.9902
1999	0.9182	1.0064	0.9926	0.9848
2000	0.9823	0.9105	1.0310	0.9857
2001	0.9989	1.0291	1.0073	1.0120
2002	1.0137	1.0505	0.9663	0.9993
2003	0.9485	0.9878	0.9790	1.0874
2004	1.0048	0.9996	0.8621	
2005	0.9703	1.1292		
2006	0.7976			
Selected Average	0.9482	0.9677	0.9647	0.9612
Cumulative Factors to Fifth Report	0.8509	0.8973	0.9273	0.9612
First to Fifth Factor	0.8509			

Selected Average from 20/40 Group excluding 20/40 Limit (101A-2, page 5a)

Source: 101 A-2 Loss by Layer Exhibits

**Massachusetts Private Passenger Automobile  
Bodily Injury Increased Limit Factors**

**Loss Development from First to Fifth Report  
Total Limit Losses for Insureds Purchasing 50/100 Limits - Industry**

<u>Accident</u> <u>Year</u>	<u>First Report</u>	<u>Second Report</u>	<u>Third Report</u>	<u>Fourth Report</u>	<u>Fifth Report</u>
1998	72,926,306	71,825,358	73,938,181	74,265,904	72,735,083
1999	64,971,220	68,633,012	69,690,134	68,616,004	68,075,687
2000	63,618,220	65,492,837	64,160,941	65,593,952	64,830,661
2001	61,281,356	64,487,638	67,354,657	67,968,717	67,072,602
2002	62,660,516	64,837,858	67,389,744	67,544,343	67,037,731
2003	79,528,711	80,516,389	81,771,940	82,161,651	83,531,838
2004	81,426,522	82,444,562	84,478,922	77,845,392	78,287,251
2005	77,387,924	77,281,292	79,384,728	77,065,931	77,503,366
2006	77,726,119	76,269,036	78,248,823	75,963,205	76,394,381
2007	74,506,006	74,645,319	76,582,958	74,345,999	74,767,996

<u>Accident</u> <u>Year</u>	<u>Loss Development Factors</u>			
	<u>First to</u> <u>Second</u>	<u>Second to</u> <u>Third</u>	<u>Third to</u> <u>Fourth</u>	<u>Fourth to</u> <u>Fifth</u>
1998	0.9849	1.0294	1.0044	0.9794
1999	1.0564	1.0154	0.9846	0.9921
2000	1.0295	0.9797	1.0223	0.9884
2001	1.0523	1.0445	1.0091	0.9868
2002	1.0347	1.0394	1.0023	0.9925
2003	1.0124	1.0156	1.0048	1.0167
2004	1.0125	1.0247	0.9215	
2005	0.9986	1.0272		
2006	0.9813			
Weighted Average	1.0019	1.0260	0.9708	1.0057
Cumulative Factors to Fifth Report	1.0035	1.0016	0.9763	1.0057
First to Fifth Factor	1.0035			

Weights for Weighted Average from 101A-2, page 9  
Source: 101 A-2 Loss by Layer Exhibits

**Massachusetts Private Passenger Automobile  
Bodily Injury Increased Limit Factors**

**Loss Development from First to Fifth Report  
Total Limit Losses for Insureds Purchasing 100/300 Limits - Industry**

<u>Accident</u> <u>Year</u>	<u>First Report</u>	<u>Second Report</u>	<u>Third Report</u>	<u>Fourth Report</u>	<u>Fifth Report</u>
1998	178,324,234	182,725,710	190,278,770	191,136,506	185,740,911
1999	175,891,533	195,925,752	202,048,883	200,855,657	199,043,319
2000	178,909,109	188,334,030	189,520,892	192,413,010	191,098,024
2001	174,024,809	190,143,535	199,771,192	205,268,616	203,254,120
2002	182,218,946	197,273,887	207,170,824	207,432,400	205,256,348
2003	197,407,730	210,668,446	217,983,319	218,309,335	211,390,023
2004	189,983,375	203,695,135	213,524,328	206,789,911	202,230,833
2005	190,280,942	203,190,994	197,460,347	195,134,149	190,832,044
2006	180,003,611	183,229,275	186,913,928	184,711,972	180,639,644
2007	183,907,810	194,043,092	197,945,205	195,613,295	191,300,627

<u>Accident</u> <u>Year</u>	<u>Loss Development Factors</u>			
	<u>First to</u> <u>Second</u>	<u>Second to</u> <u>Third</u>	<u>Third to</u> <u>Fourth</u>	<u>Fourth to</u> <u>Fifth</u>
1998	1.0247	1.0413	1.0045	0.9718
1999	1.1139	1.0313	0.9941	0.9910
2000	1.0527	1.0063	1.0153	0.9932
2001	1.0926	1.0506	1.0275	0.9902
2002	1.0826	1.0502	1.0013	0.9895
2003	1.0672	1.0347	1.0015	0.9683
2004	1.0722	1.0483	0.9685	
2005	1.0678	0.9718		
2006	1.0179			
Weighted Average	1.0551	1.0201	0.9882	0.9780
Cumulative Factors to Fifth Report	1.0402	0.9859	0.9664	0.9780
First to Fifth Factor	1.0402			

Weights for Weighted Average from 101A-2, page 9  
Source: 101 A-2 Loss by Layer Exhibits

**Massachusetts Private Passenger Automobile  
Bodily Injury Increased Limit Factors**

**Loss Development from First to Fifth Report  
Total Limit Losses for Insureds Purchasing 250/500 Limits - Industry**

<u>Accident</u>	<u>Year</u>	<u>First Report</u>	<u>Second Report</u>	<u>Third Report</u>	<u>Fourth Report</u>	<u>Fifth Report</u>
	1998	54,438,112	57,814,172	60,378,976	60,658,381	59,577,802
	1999	52,588,925	59,658,746	62,814,320	62,840,913	61,540,560
	2000	55,784,161	60,794,586	63,068,513	64,223,204	63,778,413
	2001	56,571,910	62,048,954	68,099,116	69,495,265	67,370,723
	2002	59,907,473	66,768,688	70,311,038	71,128,928	70,403,451
	2003	68,735,486	74,925,439	77,322,107	79,693,285	86,655,439
	2004	74,539,057	81,636,544	88,776,966	80,507,492	83,967,016
	2005	69,304,554	76,073,154	86,371,027	84,303,147	87,925,776
	2006	72,271,338	79,855,262	86,671,254	84,596,186	88,231,408
	2007	77,154,916	84,862,853	92,106,265	89,901,073	93,764,253

<u>Accident</u>	<u>Loss Development Factors</u>				
	<u>Year</u>	<u>First to Second</u>	<u>Second to Third</u>	<u>Third to Fourth</u>	<u>Fourth to Fifth</u>
	1998	1.0620	1.0444	1.0046	0.9822
	1999	1.1344	1.0529	1.0004	0.9793
	2000	1.0898	1.0374	1.0183	0.9931
	2001	1.0968	1.0975	1.0205	0.9694
	2002	1.1145	1.0531	1.0116	0.9898
	2003	1.0901	1.0320	1.0307	1.0874
	2004	1.0952	1.0875	0.9069	
	2005	1.0977	1.1354		
	2006	1.1049			
Weighted	Average	1.0999	1.0854	0.9761	1.0430
Cumulative	Factors to Fifth				
Report		1.2153	1.1049	1.0180	1.0430
First to Fifth	Factor	1.2153			

Weights for Weighted Average from 101A-2, page 9  
Source: 101 A-2 Loss by Layer Exhibits

**Massachusetts Private Passenger Automobile  
Bodily Injury Increased Limit Factors**

**Calculation of Increased Limits Development Factors  
Selected Weights for Loss Development**

<u>Accident Year</u>	<u>First to Second</u>	<u>Second to Third</u>	<u>Third to Fourth</u>	<u>Fourth to Fifth</u>
2002	0.100	0.167	0.267	0.455
2003	0.150	0.222	0.333	0.545
2004	0.200	0.278	0.400	
2005	0.250	0.333		
2006	0.300			
Total	1.000	1.000	1.000	1.000

**Massachusetts Private Passenger Automobile  
Bodily Injury Increased Limit Factors**

**Defense and Cost Containment Expense vs. Basic Limits Losses**

<u>Per Person Policy Limit X</u>	<u>Basic Limits Losses \$20 K</u>	<u>Defense and Cost Containment Expense</u>	<u>Observed Ratio</u>	<u>Fitted Ratio</u>	<u>Selected Ratio</u>
\$20,000	\$229,005,902	\$10,154,849	0.0443	0.0414	0.0414
\$25,000	\$34,533,990	\$1,596,483	0.0462	0.0451	0.0451
\$50,000	\$63,120,514	\$3,184,912	0.0505	0.0566	0.0566
\$100,000	\$132,816,423	\$9,042,805	0.0681	0.0681	0.0681
\$250,000	\$43,439,652	\$3,708,628	0.0854	0.0832	0.0832

Regression Line is  $0.0166 \ln X + -0.1225$



**Massachusetts Private Passenger Automobile  
Bodily Injury Increased Limits Factors**

**Reallocation by Layer of Defense and Cost Containment Expense**

(1)	(2)	(3)	(4)	(5)
<u>Per Person Policy Limit X</u>	<u>Selected Ratio</u>	<u>Difference in Ratios</u>	<u>Cumulative Exposures</u>	<u>Percent of Total DCCE</u>
\$20,000	0.0414	0.0414	4,008,594.2	68.9%
\$25,000	0.0451	0.0037	2,948,391.7	4.5%
\$50,000	0.0566	0.0115	2,643,919.8	12.6%
\$100,000	0.0681	0.0115	2,103,002.9	10.0%
\$250,000	0.0832	0.0151	619,255.0	3.9%
Total				100.0%

Source: (2) 101A-3 page 1

(4) Adjusted Exposures 101A-5

(5) [ Col. (3) x Col. (4) ] / sum [ Col. (3) x Col. (4) ]

**Massachusetts Private Passenger Automobile  
Bodily Injury Increased Limit Factors  
Adjustment of Bodily Injury Written Exposures  
Facility Market**

<u>Limit</u>	<u>Cal. Year 2007</u>		<u>Adjusted Exposures</u>	<u>% Distribution</u>
	<u>BI Written Exposures</u>	<u>Adjustments*</u>		
20/40	109,141.9		109,141.9	61.43%
20/50	3,491.0		3,491.0	1.96%
25/50	9,970.8	1,067.4	11,038.2	6.21%
25/60	939.2	2,292.4	3,231.6	1.82%
30/70	213.2			
35/80	2,079.2			
50/100	16,666.0	266.8	16,932.8	9.53%
100/300	26,186.1		26,186.1	14.74%
250/500	7,634.3		7,634.3	4.30%
500/1,000	6.0		6.0	0.00%
All Other	1,334.2			
Total	177,661.9	3,626.6	177,661.9	100.00%

\* 80% of All Other assigned to 25/50 limit and 20% assigned to 50/100 limit  
30/70 & 35/80 limit assigned to 25/60 limit.

**Massachusetts Private Passenger Automobile  
Bodily Injury Increased Limit Factors**

**Loss Development - Industry  
Over \$20,000/\$40,000**

<u>Accident</u>	<u>Year</u>	<u>Fifth Report</u>	<u>Sixth Report</u>	<u>Seventh Report</u>	<u>Eighth Report</u>	<u>Ninth Report</u>	<u>Tenth Report</u>
	1996	118,988,341	114,202,107	113,739,935	113,502,358	113,309,648	113,120,254
	1997	118,709,176	116,154,070	115,714,657	115,396,761	115,000,848	114,772,550
	1998	120,573,144	117,840,995	115,821,351	115,060,618	114,927,144	114,431,688
	1999	120,826,403	118,471,567	116,846,559	116,394,070	116,337,146	
	2000	125,652,709	131,710,973	130,561,643	130,007,330		
	2001	128,097,294	124,995,273	123,928,150			
	2002	141,580,511	137,627,904				
	2003	146,716,154					

<u>Accident</u>	<u>Loss Development Factors</u>				
	<u>Fifth to</u>	<u>Sixth to</u>	<u>Seventh to</u>	<u>Eighth to</u>	<u>Ninth to</u>
<u>Year</u>	<u>Sixth</u>	<u>Seventh</u>	<u>Eighth</u>	<u>Ninth</u>	<u>Tenth</u>
1996	0.9598	0.9960	0.9979	0.9983	0.9983
1997	0.9785	0.9962	0.9973	0.9966	0.9980
1998	0.9773	0.9829	0.9934	0.9988	0.9957
1999	0.9805	0.9863	0.9961	0.9995	
2000	1.0482	0.9913	0.9958		
2001	0.9758	0.9915			
2002	0.9721				
Two Year Average	0.9739	0.9914	0.9959	0.9992	0.9969
Cumulative Factors to Tenth	0.9578	0.9834	0.9920	0.9960	0.9969
Fifth to Tenth Factor	0.9578				

**Massachusetts Private Passenger Automobile  
Summary of Property Damage Liability Increased Limits Factors  
Facility Market**

	(1)	(2)	(3)	(4)	(5)	
		Dist of				
	% of	Expo's	Excess	Product	Proposed	Product
<u>Limit</u>	<u>Expo's at</u>	<u>Indicated</u>	<u>Excess</u>	<u>(1)x(2)</u>	<u>ILF's</u>	<u>(4)x(2)</u>
	<u>Limit</u>	<u>ILF's</u>	<u>Limits</u>			
5000	2.87%	1.0000	---	---	---	---
10000	0.34%	1.2193	0.35%	0.0043	1.240	0.0043
15000	0.03%	1.2633	0.03%	0.0004	1.254	0.0004
25000	5.00%	1.2856	5.15%	0.0662	1.268	0.0653
35000	0.13%	1.2914	0.13%	0.0017	1.279	0.0017
50000	5.04%	1.2947	5.19%	0.0672	1.290	0.0669
>50000	86.59%	1.2988	89.15%	1.1579	1.300	1.1589
Totals	100.00%			1.2976		1.2976

Average Selected Increased Limits Factor: 1.2976  
Average Selected ILF including Basic Limits: 1.2890

Indicated ILFs shown on 101B, page 2.  
Proposed ILFs for all limits shown in 101E.

**Massachusetts Private Passenger Automobile****PDL Increased Limit Factors**

<u>Limit</u>	<u>Accident Year Experience Factors</u>						<u>Projected</u>
	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2009 **</u>
\$5,000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
\$10,000	1.1727	1.1722	1.1733	1.1820	1.1960	1.2013	1.2193
\$15,000	1.2067	1.2063	1.2072	1.2192	1.2366	1.2401	1.2633
\$25,000	1.2216	1.2212	1.2243	1.2373	1.2565	1.2580	1.2856
\$35,000	1.2247	1.2244	1.2287	1.2415	1.2614	1.2624	1.2914
\$50,000	1.2266	1.2260	1.2314	1.2443	1.2643	1.2646	1.2947
> \$50,000	1.2281	1.2278	1.2341	1.2473	1.2672	1.2673	1.2988
Average *	1.2276	1.2273	1.2335	1.2466	1.2665	1.2667	1.2980

\* Based on 2007 Written Exposures

\*\* Policy year 2009 based on projected pure premium for each limit relative to projected \$5,000 pure premium.  
(see page 2a)

## Massachusetts Private Passenger Automobile

### PDL Pure Premiums by Layer

Limit	Accident Year Experience Pure Premiums						Projected 2009 **
	2002	2003	2004	2005	2006	2007	
\$5,000	\$125.34	\$127.28	\$120.04	\$120.83	\$113.64	\$118.26	\$109.57
\$10,000	\$146.98	\$149.20	\$140.84	\$142.82	\$135.91	\$142.06	\$133.59
\$15,000	\$151.25	\$153.54	\$144.91	\$147.31	\$140.53	\$146.65	\$138.42
\$25,000	\$153.11	\$155.43	\$146.97	\$149.50	\$142.79	\$148.77	\$140.86
\$35,000	\$153.51	\$155.84	\$147.49	\$150.01	\$143.34	\$149.29	\$141.50
\$50,000	\$153.74	\$156.05	\$147.82	\$150.35	\$143.67	\$149.55	\$141.86
> \$50,000	\$153.93	\$156.27	\$148.14	\$150.71	\$144.01	\$149.87	\$142.31
Average *	\$153.87	\$156.21	\$148.07	\$150.63	\$143.93	\$149.80	\$142.22

\* Based on 2007 Written Exposures

\*\* Policy Year 2009 projected from linear regression of accident year 2002 - 2007 pure premium

**Massachusetts Private Passenger Automobile  
Calculation of Accident Year 2007 PDL Increased Limit Factors**

(1) Increased Limit	\$5,000	\$10,000	\$15,000	\$25,000	\$35,000	\$50,000	> \$50,000
(2) Incurred Loss by Layer	\$485,076,204	\$60,758,602	\$15,176,532	\$7,025,141	\$1,648,016	\$829,045	\$903,635
(3) Earned Exposures by Limit	43,320.5	14,581.9	1,607.4	152,936.9	15,739.1	255,354.9	3,525,053.7
(4) Cumulative Earned Exposures for at least the limit	4,008,594.4	3,965,273.9	3,950,692.0	3,949,084.6	3,796,147.7	3,780,408.6	3,525,053.7
(5) Adjustment to Losses by Layer (E), (F)	(\$19,053,664)	\$19,053,664					
(6) Adjusted Layer of Loss (2) + (5)	\$466,022,540	\$79,812,266	\$15,176,532	\$7,025,141	\$1,648,016	\$829,045	\$903,635
(7) Defense and Cost Containment Expense by Layer (C)	\$2,538,292						
(8) Loss Development Factor by Layer	1.0117	1.1823	1.1823	1.1823	1.1823	1.1823	1.1823
(9) Market Mix Adjustment Factor by Layer	1.00	1.00	1.01	1.01	1.02	1.02	1.06
(10) Developed Losses by Layer [ (6) x (8) ]	\$471,475,004	\$94,364,708	\$17,943,721	\$8,306,059	\$1,948,504	\$980,208	\$1,068,398
(11) Developed Expenses by Layer [ (7) x (8 Basic) ]	\$2,567,990	\$0	\$0	\$0	\$0	\$0	\$0
(12) Pure Premium by Layer [ (10)+(11) ] x (9)/(4)	\$118,26	\$23,80	\$4,59	\$2,12	\$0,52	\$0,26	\$0,32
(13) Cumulative Pure Premium by Layer	\$118,26	\$142,06	\$146,65	\$148,77	\$149,29	\$149,55	\$149,87
(14) Indicated Increased Limits Factor [(12) / (12 Basic)]		1.2013	1.2401	1.2580	1.2624	1.2646	1.2673
(15) Exp.Distribution of Buyers of Inc. Limits		0.37%	0.04%	3.86%	0.40%	6.44%	88.90%

(16) Avg. Indicated Increased Limits Factor ex. Basic Limits 1.2665

Calculation of Adjustment to Losses by Layer

- A) PDL and DCCE Basic Limit Losses (100B) \$468,560,832
- B) Basic Limit Loss from Losses by Layer (2) \$485,076,204
- C) Basic Limits DCCE \$2,538,292
- D) Basic Limits Loss and DCCE by Layer (B) +(C) \$487,614,496
- E) Adjustment to Basic Limit Losses (A) - (D) (\$19,053,664)
- F) Adjustment to Increased Limit Losses (D) - (A) \$19,053,664

**Massachusetts Private Passenger Automobile  
Calculation of Accident Year 2006 PDL Increased Limit Factors**

(1) Increased Limit	<u>\$5,000</u>	<u>\$10,000</u>	<u>\$15,000</u>	<u>\$25,000</u>	<u>\$35,000</u>	<u>\$50,000</u>	> <u>\$50,000</u>
(2) Incurred Loss by Layer	\$469,943,438	\$66,055,669	\$17,566,394	\$8,580,170	\$1,994,626	\$1,169,981	\$1,096,458
(3) Earned Exposures by Limit	45,546.9	17,318.0	1,895.6	153,231.2	18,339.1	272,103.3	3,491,066.1
(4) Cumulative Earned Exposures for at least the limit	3,999,500.2	3,953,953.3	3,936,635.3	3,934,739.7	3,781,508.5	3,763,169.4	3,491,066.1
(5) Adjustment to Losses by Layer (E), (F)	(\$19,793,661)	\$19,793,661					
(6) Adjusted Layer of Loss (2) + (5)	\$450,149,777	\$85,849,330	\$17,566,394	\$8,580,170	\$1,994,626	\$1,169,981	\$1,096,458
(7) Defense and Cost Containment Expense by Layer (C)	\$2,050,828						
(8) Loss Development Factor by Layer	1.0051	1.0257	1.0257	1.0257	1.0257	1.0257	1.0257
(9) Market Mix Adjustment Factor by Layer	1.00	1.00	1.01	1.01	1.02	1.02	1.06
(10) Developed Losses by Layer [ (6) x (8) ]	\$452,445,541	\$88,059,003	\$18,018,535	\$8,801,015	\$2,045,966	\$1,200,095	\$1,124,680
(11) Developed Expenses by Layer [ (7) x (8 Basic) ]	\$2,061,287	\$0	\$0	\$0	\$0	\$0	\$0
(12) Pure Premium by Layer [ (10)+(11) ] x (9)/(4)	\$113.64	\$22.27	\$4.62	\$2.26	\$0.55	\$0.33	\$0.34
(13) Cumulative Pure Premium by Layer	\$113.64	\$135.91	\$140.53	\$142.79	\$143.34	\$143.67	\$144.01
(14) Indicated Increased Limits Factor [(12) / (12 Basic)]		1.1960	1.2366	1.2565	1.2614	1.2643	1.2672
(15) Exp. Distribution of Buyers of Inc. Limits		0.44%	0.05%	3.88%	0.46%	6.88%	88.29%

(16) Avg. Indicated Increased Limits Factor ex. Basic Limits 1.2663

Calculation of Adjustment to Losses by Layer

A) PDL and DCCE Basic Limit Losses (100B)	\$452,200,605
B) Basic Limit Loss from Losses by Layer (2)	\$469,943,438
C) Basic Limits DCCE	\$2,050,828
D) Basic Limits Loss and DCCE by Layer (B) +(C)	\$471,994,266
E) Adjustment to Basic Limit Losses (A) - (D)	(\$19,793,661)
F) Adjustment to Increased Limit Losses (D) - (A)	\$19,793,661

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**Massachusetts Private Passenger Automobile  
Calculation of Accident Year 2005 PDL Increased Limit Factors**

	<u>\$5,000</u>	<u>\$10,000</u>	<u>\$15,000</u>	<u>\$25,000</u>	<u>\$35,000</u>	<u>\$50,000</u>	<u>&gt; \$50,000</u>
(1) Increased Limit							
(2) Incurred Loss by Layer	\$502,043,837	\$66,902,370	\$17,473,549	\$8,499,543	\$1,894,953	\$1,231,921	\$1,173,197
(3) Earned Exposures by Limit	47,486.3	19,935.4	2,219.2	169,404.3	21,305.6	298,292.8	3,445,650.3
(4) Cumulative Earned Exposures for at least the limit	4,004,293.9	3,956,807.6	3,936,872.2	3,934,653.0	3,765,248.7	3,743,943.1	3,445,650.3
(5) Adjustment to Losses by Layer (E), (F)	(\$19,955,644)	\$19,955,644					
(6) Adjusted Layer of Loss (2) + (5)	\$482,088,193	\$86,858,014	\$17,473,549	\$8,499,543	\$1,894,953	\$1,231,921	\$1,173,197
(7) Defense and Cost Containment Expense by Layer (C)	\$2,204,401						
(8) Loss Development Factor by Layer	0.9991	1.0016	1.0016	1.0016	1.0016	1.0016	1.0016
(9) Market Mix Adjustment Factor by Layer	1.00	1.00	1.01	1.01	1.02	1.02	1.06
(10) Developed Losses by Layer [ (6) x (8) ]	\$481,654,314	\$86,997,386	\$17,501,587	\$8,513,181	\$1,897,994	\$1,233,898	\$1,175,080
(11) Developed Expenses by Layer [ (7) x (8 Basic) ]	\$2,202,417	\$0	\$0	\$0	\$0	\$0	\$0
(12) Pure Premium by Layer [ (10)+(11) ] x (9)/(4)	\$120.83	\$21.99	\$4.49	\$2.19	\$0.51	\$0.34	\$0.36
(13) Cumulative Pure Premium by Layer	\$120.83	\$142.82	\$147.31	\$149.50	\$150.01	\$150.35	\$150.71
(14) Indicated Increased Limits Factor [(12) / (12 Basic)]		1.1820	1.2192	1.2373	1.2415	1.2443	1.2473
(15) Exp. Distribution of Buyers of Inc. Limits		0.50%	0.06%	4.28%	0.54%	7.54%	87.08%

(16) Avg. Indicated Increased Limits Factor ex. Basic Limits 1.2463

Calculation of Adjustment to Losses by Layer

A) PDL and DCCE Basic Limit Losses (100B)	\$484,292,594
B) Basic Limit Loss from Losses by Layer (2)	\$502,043,837
C) Basic Limits DCCE	\$2,204,401
D) Basic Limits Loss and DCCE by Layer (B) +(C)	\$504,248,238
E) Adjustment to Basic Limit Losses (A) - (D)	(\$19,955,644)
F) Adjustment to Increased Limit Losses (D) - (A)	\$19,955,644

**Massachusetts Private Passenger Automobile  
Calculation of Accident Year 2004 PDL Increased Limit Factors**

(1) Increased Limit	<u>\$5,000</u>	<u>\$10,000</u>	<u>\$15,000</u>	<u>\$25,000</u>	<u>\$35,000</u>	<u>\$50,000</u>	> <u>\$50,000</u>
(2) Incurred Loss by Layer	\$495,901,499	\$63,074,165	\$15,836,892	\$7,991,289	\$1,891,525	\$1,186,441	\$1,022,797
(3) Earned Exposures by Limit	45,761.1	22,851.4	2,590.2	183,416.7	24,766.4	328,238.4	3,389,460.5
(4) Cumulative Earned Exposures for at least the limit	3,997,084.7	3,951,323.6	3,928,472.2	3,925,882.0	3,742,465.3	3,717,698.9	3,389,460.5
(5) Adjustment to Losses by Layer (E), (F)	(\$19,160,319)	\$19,160,319					
(6) Adjusted Layer of Loss (2) + (5)	\$476,741,180	\$82,234,484	\$15,836,892	\$7,991,289	\$1,891,525	\$1,186,441	\$1,022,797
(7) Defense and Cost Containment Expense by Layer (C)	\$2,668,205						
(8) Loss Development Factor by Layer	1.0008	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997
(9) Market Mix Adjustment Factor by Layer	1.00	1.00	1.01	1.01	1.02	1.02	1.06
(10) Developed Losses by Layer [ (6) x (8) ]	\$477,122,573	\$82,206,266	\$15,831,458	\$7,988,547	\$1,890,876	\$1,186,034	\$1,022,446
(11) Developed Expenses by Layer [ (7) x (8 Basic) ]	\$2,670,340	\$0	\$0	\$0	\$0	\$0	\$0
(12) Pure Premium by Layer [ (10)+(11) ] x (9)/(4)	\$120.04	\$20.80	\$4.07	\$2.06	\$0.52	\$0.33	\$0.32
(13) Cumulative Pure Premium by Layer	\$120.04	\$140.84	\$144.91	\$146.97	\$147.49	\$147.82	\$148.14
(14) Indicated Increased Limits Factor [(12) / (12 Basic)]		1.1733	1.2072	1.2243	1.2287	1.2314	1.2341
(15) Exp. Distribution of Buyers of Inc. Limits		0.58%	0.07%	4.64%	0.63%	8.31%	85.78%

(16) Avg. Indicated Increased Limits Factor ex. Basic Limits 1.2330

Calculation of Adjustment to Losses by Layer

A) PDL and DCCE Basic Limit Losses (100B)	\$479,409,385
B) Basic Limit Loss from Losses by Layer (2)	\$495,901,499
C) Basic Limits DCCE	\$2,668,205
D) Basic Limits Loss and DCCE by Layer (B) +(C)	\$498,569,704
E) Adjustment to Basic Limit Losses (A) - (D)	(\$19,160,319)
F) Adjustment to Increased Limit Losses (D) - (A)	\$19,160,319

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**Massachusetts Private Passenger Automobile  
Calculation of Accident Year 2003 PDL Increased Limit Factors**

(1) Increased Limit	<u>\$5,000</u>	<u>\$10,000</u>	<u>\$15,000</u>	<u>\$25,000</u>	<u>\$35,000</u>	<u>\$50,000</u>	<u>&gt; \$50,000</u>
(2) Incurred Loss by Layer	\$524,039,247	\$67,175,374	\$16,835,772	\$7,327,979	\$1,503,796	\$768,812	\$697,204
(3) Earned Exposures by Limit	45,413.7	26,908.4	3,104.6	209,491.2	28,866.1	364,229.9	3,314,040.0
(4) Cumulative Earned Exposures for at least the limit	3,992,053.9	3,946,640.2	3,919,731.8	3,916,627.2	3,707,136.0	3,678,269.9	3,314,040.0
(5) Adjustment to Losses by Layer (E), (F)	(\$19,342,907)	\$19,342,907					
(6) Adjusted Layer of Loss (2) + (5)	\$504,696,340	\$86,518,281	\$16,835,772	\$7,327,979	\$1,503,796	\$768,812	\$697,204
(7) Defense and Cost Containment Expense by Layer (C)	\$3,358,061						
(8) Loss Development Factor by Layer	1.0001	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998
(9) Market Mix Adjustment Factor by Layer	1.00	1.00	1.01	1.01	1.02	1.02	1.06
(10) Developed Losses by Layer [ (6) x (8) ]	\$504,746,810	\$86,499,622	\$16,832,141	\$7,326,399	\$1,503,472	\$768,646	\$697,054
(11) Developed Expenses by Layer [ (7) x (8) Basic ]	\$3,358,397	\$0	\$0	\$0	\$0	\$0	\$0
(12) Pure Premium by Layer [ (10)+(11) ] x (9)/(4)	\$127.28	\$21.92	\$4.34	\$1.89	\$0.41	\$0.21	\$0.22
(13) Cumulative Pure Premium by Layer	\$127.28	\$149.20	\$153.54	\$155.43	\$155.84	\$156.05	\$156.27
(14) Indicated Increased Limits Factor [(12) / (12 Basic)]		1.1722	1.2063	1.2212	1.2244	1.2260	1.2278
(15) Exp. Distribution of Buyers of Inc. Limits		0.68%	0.08%	5.31%	0.73%	9.23%	83.97%

(16) Avg. Indicated Increased Limits Factor ex. Basic Limits 1.2268

Calculation of Adjustment to Losses by Layer

A) PDL and DCCE Basic Limit Losses (100B)	\$508,054,401
B) Basic Limit Loss from Losses by Layer (2)	\$524,039,247
C) Basic Limits DCCE	\$3,358,061
D) Basic Limits Loss and DCCE by Layer (B) +(C)	\$527,397,308
E) Adjustment to Basic Limit Losses (A) - (D)	(\$19,342,907)
F) Adjustment to Increased Limit Losses (D) - (A)	\$19,342,907

**Massachusetts Private Passenger Automobile  
Calculation of Accident Year 2002 PDL Increased Limit Factors**

(1) Increased Limit	\$5,000	\$10,000	\$15,000	\$25,000	\$35,000	\$50,000	> \$50,000
(2) Incurred Loss by Layer	\$513,147,510	\$66,162,433	\$16,479,289	\$7,173,745	\$1,450,935	\$804,443	\$565,115
(3) Earned Exposures by Limit	48,238.7	32,634.1	3,698.8	234,494.9	34,008.6	403,161.2	3,219,291.6
(4) Cumulative Earned Exposures for at least the limit	3,975,527.9	3,927,289.2	3,894,655.1	3,890,956.3	3,656,461.4	3,622,452.8	3,219,291.6
(5) Adjustment to Losses by Layer (E), (F)	(\$18,845,727)	\$18,845,727					
(6) Adjusted Layer of Loss (2) + (5)	\$494,301,783	\$85,008,160	\$16,479,289	\$7,173,745	\$1,450,935	\$804,443	\$565,115
(7) Defense and Cost Containment Expense by Layer (C)	\$3,960,762						
(8) Loss Development Factor by Layer	1.0001	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998
(9) Market Mix Adjustment Factor by Layer	1.00	1.00	1.01	1.01	1.02	1.02	1.06
(10) Developed Losses by Layer [ (6) x (8) ]	\$494,351,213	\$84,989,827	\$16,475,735	\$7,172,198	\$1,450,622	\$804,270	\$564,993
(11) Developed Expenses by Layer [ (7) x (8 Basic) ]	\$3,961,158	\$0	\$0	\$0	\$0	\$0	\$0
(12) Pure Premium by Layer [ (10)+(11) ] x (9)/(4)	\$125.34	\$21.64	\$4.27	\$1.86	\$0.40	\$0.23	\$0.19
(13) Cumulative Pure Premium by Layer	\$125.34	\$146.98	\$151.25	\$153.11	\$153.51	\$153.74	\$153.93
(14) Indicated Increased Limits Factor [ (12) / (12 Basic) ]		1.1727	1.2067	1.2216	1.2247	1.2266	1.2281
(15) Exp. Distribution of Buyers of Inc. Limits		0.83%	0.09%	5.97%	0.87%	10.27%	81.97%

(16) Avg. Indicated Increased Limits Factor ex. Basic Limits 1.2270

Calculation of Adjustment to Losses by Layer

A) PDL and DCCE Basic Limit Losses (100B)	\$498,262,545
B) Basic Limit Loss from Losses by Layer (2)	\$513,147,510
C) Basic Limits DCCE	\$3,960,762
D) Basic Limits Loss and DCCE by Layer (B) +(C)	\$517,108,272
E) Adjustment to Basic Limit Losses (A) - (D)	(\$18,845,727)
F) Adjustment to Increased Limit Losses (D) - (A)	\$18,845,727

**Massachusetts Private Passenger Automobile****Property Damage Liability Increased Limits****Loss Development****Over \$5,000**

<u>Accident</u> <u>Year</u>	<u>First Report</u>	<u>Second Report</u>	<u>Third Report</u>	<u>Fourth Report</u>	<u>Fifth Report</u>
1998	53,383,260	63,343,433	65,631,656	66,143,839	66,186,570
1999	58,012,124	69,086,489	71,822,768	72,714,579	72,692,966
2000	68,557,097	84,804,588	90,595,780	91,855,231	91,947,231
2001	82,915,458	98,455,045	103,280,496	104,535,827	104,449,331
2002	89,064,584	106,799,374	111,066,696	111,529,689	111,481,687
2003	94,957,877	111,086,950	113,754,785	113,638,949	113,651,844
2004	94,254,038	107,506,723	109,846,761	110,163,428	
2005	100,692,459	115,049,111	117,131,177		
2006	101,536,820	116,256,959			
2007	105,394,635				

<u>Accident</u> <u>Year</u>	<u>Loss Development Factors</u>			
	<u>First to</u> <u>Second</u>	<u>Second to</u> <u>Third</u>	<u>Third to</u> <u>Fourth</u>	<u>Fourth to</u> <u>Fifth</u>
1998	1.1866	1.0361	1.0078	1.0006
1999	1.1909	1.0396	1.0124	0.9997
2000	1.2370	1.0683	1.0139	1.0010
2001	1.1874	1.0490	1.0122	0.9992
2002	1.1991	1.0400	1.0042	0.9996
2003	1.1699	1.0240	0.9990	1.0001
2004	1.1406	1.0218	1.0029	
2005	1.1426	1.0181		
2006	1.1450			
Weighted Average*	1.1527	1.0241	1.0019	0.9999
Cumulative Factors to Tenth Report	1.1823	1.0257	1.0016	0.9997
First to Fifth Factor	1.1826			

\* Weights for Weighted Average from 101B-2, page 3

**Massachusetts Private Passenger Automobile**  
**Property Damage Liability Increased Limit Factors**  
**Loss Development**  
**Over \$5,000**

<u>Accident</u> <u>Year</u>	<u>Fifth Report</u>	<u>Sixth Report</u>	<u>Seventh Report</u>	<u>Eighth Report</u>	<u>Ninth Report</u>	<u>Tenth Report</u>
1996	51,520,411	51,549,650	51,539,896	51,519,195	51,483,722	51,477,967
1997	58,439,471	58,426,386	58,399,898	58,411,270	58,413,358	58,414,363
1998	66,186,570	66,168,745	66,192,085	66,244,868	66,244,047	66,228,008
1999	72,692,966	72,676,094	72,711,709	72,695,410	72,705,170	
2000	91,947,231	91,954,686	91,964,932	91,953,465		
2001	104,449,331	104,471,342	104,489,987			
2002	111,481,687	111,428,174				
2003	113,651,844					

<u>Accident</u> <u>Year</u>	<u>Loss Development Factors</u>				
	<u>Fifth to</u> <u>Sixth</u>	<u>Sixth to</u> <u>Seventh</u>	<u>Seventh to</u> <u>Eighth</u>	<u>Eighth to</u> <u>Ninth</u>	<u>Ninth to</u> <u>Tenth</u>
1996	1.0006	0.9998	0.9996	0.9993	0.9999
1997	0.9998	0.9995	1.0002	1.0000	1.0000
1998	0.9997	1.0004	1.0008	1.0000	0.9998
1999	0.9998	1.0005	0.9998	1.0001	
2000	1.0001	1.0001	0.9999		
2001	1.0002	1.0002			
2002	0.9995				
Two Year Average	0.9999	1.0001	0.9998	1.0001	0.9999
Cumulative Factors to Tenth	0.9998	0.9999	0.9998	0.9999	0.9999
Fifth to Tenth Factor	0.9998				

**Massachusetts Private Passenger Automobile  
Calculation of Increased Limits Development Factors**

**Selected Weights for Loss Development**

<u>Accident Year</u>	<u>First to Second</u>	<u>Second to Third</u>	<u>Third to Fourth</u>	<u>Fourth to Fifth</u>
2002	0.100	0.167	0.267	0.455
2003	0.150	0.222	0.333	0.545
2004	0.200	0.278	0.400	
2005	0.250	0.333		
2006	0.300			
Total	1.000	1.000	1.000	1.000

**Massachusetts Private Passenger Automobile  
Property Damage Liability Calendar Year 2007 Written Exposures  
Facility Market**

<u>Limit</u>	Written Exposures in Car Year Months	Adjusted Written Exposures*	% Distribution	Dist of Exposures at Excess Limits
\$5,000	5,094.6	5,094.6	2.87%	
\$10,000	600.7	600.7	0.34%	0.35%
\$15,000	51.7	51.7	0.03%	0.03%
\$25,000	6,761.8	8,884.4	5.00%	3.98%
\$35,000	233.8	233.8	0.13%	0.14%
\$50,000	8,417.2	8,947.8	5.04%	4.95%
> \$ 50,000	153,822.1	153,822.1	86.59%	90.54%
All Other	2,653.2	0.0		
Total	177,635.1	177,635.1	100.00%	100.00%

\* 80% of All Other assigned to \$25,000 limit and 20% assigned to \$50,000 limit.



**Massachusetts Private Passenger Automobile  
Summary of U-1 Increased Limits Factors  
Facility Market**

	(1)	(2)	(3)	(4)	
		Dist of			
	% of	Expo's	Excess	Proposed	
<u>Limit</u>	<u>Expo's at</u>	<u>Indicated</u>	<u>Limits</u>	<u>ILF's</u>	
	<u>Limit</u>	<u>ILF's</u>		<u>ILF's</u>	
				<u>Product</u>	
				<u>(3)x(4)</u>	
20/40	68.62%	1.0000	---	---	---
20/50	2.02%	1.0200	6.44%	1.048	0.0674
25/50	5.89%	1.0573	18.78%	1.095	0.2057
25/60	0.62%	1.0773	1.97%	1.143	0.0225
30/70	0.12%		0.37%	1.190	0.0044
35/80	1.16%		3.70%	1.190	0.0440
50/100	8.84%	1.2798	28.16%	1.286	0.3620
100/300	10.58%	1.4745	33.70%	1.524	0.5135
250/500	2.08%	1.8844	6.64%	1.905	0.1265
500/500	0.08%	2.7817	0.25%	2.762	0.0070
500/1000	0.00%	2.8266	0.00%	2.810	0.0001
Totals	100.00%		100.00%		1.3530

Average Selected Increased Limits Factor (20/40 Basis): 1.3530  
Average Selected ILF including Basic Limits: 1.1108

Indicated ILFs shown on 101C, page 2.  
Proposed ILFs derived from proposed rates in 100L:  
 $ILF(\text{limit}) = \text{rate}(\text{limit}) / \text{rate}(20/40)$   
Proposed rates for all limits shown in 101E.

**Massachusetts Private Passenger Automobile****U-1 Increased Limit Factors**

Limit	Accident Year Experience Factors						Projected
	2002	2003	2004	2005	2006	2007	2009 **
\$20,000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
\$25,000	1.0367	1.0465	1.0514	1.0552	1.0558	1.0728	1.0613
\$50,000	1.1572	1.2004	1.2285	1.2587	1.2562	1.3246	1.2798
\$100,000	1.2751	1.3408	1.3971	1.4869	1.4105	1.5261	1.4745
> \$100,000	1.4358	1.4898	1.8947	1.9288	1.5534	2.1847	1.8889
Average *	1.1245	1.1518	1.1968	1.2268	1.1826	1.2641	1.2245

\* Based on 2007 Written Exposures

\*\* Policy year 2009 based on latest three year average ILF.

**Massachusetts Private Passenger Automobile****U-1 Pure Premiums by Layer**

<u>Limit</u>	<u>Accident Year Experience Pure Premiums</u>					
	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>
\$20,000	\$11.45	\$10.33	\$8.36	\$6.88	\$6.09	\$5.36
\$25,000	\$11.87	\$10.81	\$8.79	\$7.26	\$6.43	\$5.75
\$50,000	\$13.25	\$12.40	\$10.27	\$8.66	\$7.65	\$7.10
\$100,000	\$14.60	\$13.85	\$11.68	\$10.23	\$8.59	\$8.18
> \$100,000	\$16.44	\$15.39	\$15.84	\$13.27	\$9.46	\$11.71
Average *	\$12.88	\$11.90	\$10.01	\$8.44	\$7.20	\$6.78

\* Based on 2007 Written Exposures

**Massachusetts Private Passenger Automobile  
Calculation of Accident Year 2007 Coverage U - 1 Increased Limit Factors**

(1) Increased Limit	\$20,000	\$25,000	\$50,000	\$100,000	> \$100,000
(2) Incurred Loss by Layer	\$22,392,823	\$557,009	\$1,669,065	\$932,061	\$600,000
(3) Earned Exposures by Limit	1,838,422.0	352,516.1	546,851.8	1,021,679.2	249,125.2
(4) Cumulative Earned Exposures for at least the limit	4,008,594.3	2,170,172.3	1,817,656.2	1,270,804.4	249,125.2
(5) Adjustment to Losses by Layer (E), (F)	(\$50,000)	\$20,000	\$15,000	\$10,000	\$5,000
(6) Adjusted Layer of Loss (2) + (5)	\$22,342,823	\$577,009	\$1,684,065	\$942,061	\$605,000
(7) Defense and Cost Containment Expense by Layer (C)	\$1,322,194				
(8) Loss Development Factor by Layer	0.9081	1.4541	1.4541	1.4541	1.4541
(9) Market Mix Adjustment Factor by Layer	1.00	1.00	1.00	1.00	1.00
(10) Developed Losses by Layer [ (6) x (8) ]	\$20,289,518	\$839,038	\$2,448,826	\$1,369,866	\$879,740
(11) Developed Expenses by Layer [ (7) x (8 Basic) ]	\$1,200,684	\$0	\$0	\$0	\$0
(12) Pure Premium by Layer [ (10) + (11) ] x (9)/(4)	\$5.36	\$0.39	\$1.35	\$1.08	\$3.53
(13) Cumulative Pure Premium by Layer	\$5.36	\$5.75	\$7.10	\$8.18	\$11.71
(14) Indicated Increased Limits Factor [(13)/(13 Basic)]	1.0000	1.0728	1.3246	1.5261	2.1847
(15) Exp. Distribution of Buyers of Inc. Lims.		16.24%	25.20%	47.08%	11.48%

(16) Avg. Indicated Increased Limits Factor ex. Basic Lims 1.4773

Calculation of Adjustment to Losses by Layer

A) U-1 and DCCE Basic Limit Losses (100B)	\$23,665,017
B) Basic Limit Loss from Losses by Layer (2)	\$22,392,823
C) Basic Limits DCCE	\$1,322,194
D) Basic Limits Loss and DCCE (B) +(C)	\$23,715,017
E) Adjustment to Basic Limit Losses (A) - (D)	(\$50,000)
F) Adjustment to Increased Limit Losses (D) - (A)	\$50,000

Loss & DCCE valued at 15 months

**Massachusetts Private Passenger Automobile  
Calculation of Accident Year 2006 Coverage U - 1 Increased Limit Factors**

(1) Increased Limit	<u>\$20,000</u>	<u>\$25,000</u>	<u>\$50,000</u>	<u>\$100,000</u>	<u>&gt; \$100,000</u>
(2) Incurred Loss by Layer	\$24,627,637	\$618,661	\$1,880,671	\$1,001,309	\$175,000
(3) Earned Exposures by Limit	1,929,882.5	359,694.1	524,147.6	960,151.6	225,624.6
(4) Cumulative Earned Exposures for at least the limit	3,999,500.4	2,069,617.9	1,709,923.8	1,185,776.2	225,624.6
(5) Adjustment to Losses by Layer (E), (F)	(\$36,000)	\$14,400	\$10,800	\$7,200	\$3,600
(6) Adjusted Layer of Loss (2) + (5)	\$24,591,637	\$633,061	\$1,891,471	\$1,008,509	\$178,600
(7) Defense and Cost Containment Expense by Layer (C)	\$1,566,482				
(8) Loss Development Factor by Layer	0.9319	1.1003	1.1003	1.1003	1.1003
(9) Market Mix Adjustment Factor by Layer	1.00	1.00	1.00	1.00	1.00
(10) Developed Losses by Layer [ (6) x (8) ]	\$22,916,947	\$696,561	\$2,081,196	\$1,109,668	\$196,515
(11) Developed Expenses by Layer [ (7) x (8 Basic) ]	\$1,459,805	\$0	\$0	\$0	\$0
(12) Pure Premium by Layer [ (10) + (11) ] x (9)/(4)	\$6.09	\$0.34	\$1.22	\$0.94	\$0.87
(13) Cumulative Pure Premium by Layer	\$6.09	\$6.43	\$7.65	\$8.59	\$9.46
(14) Indicated Increased Limits Factor [(13)/(13 Basic)]	1.0000	1.0558	1.2562	1.4105	1.5534
(15) Exp. Distribution of Buyers of Inc. Lims.		17.38%	25.33%	46.39%	10.90%

(16) Avg. Indicated Increased Limits Factor ex. Basic Lims 1.3253

Calculation of Adjustment to Losses by Layer

A) U-1 and DCCE Basic Limit Losses (100B)	\$26,158,119
B) Basic Limit Loss from Losses by Layer (2)	\$24,627,637
C) Basic Limits DCCE	\$1,566,482
D) Basic Limits Loss and DCCE (B) +(C)	\$26,194,119
E) Adjustment to Basic Limit Losses (A) - (D)	(\$36,000)
F) Adjustment to Increased Limit Losses (D) - (A)	\$36,000

Loss & DCCE valued at 24 months

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**Massachusetts Private Passenger Automobile  
Calculation of Accident Year 2005 Coverage U - 1 Increased Limit Factors**

	<u>\$20,000</u>	<u>\$25,000</u>	<u>\$50,000</u>	<u>\$100,000</u>	<u>&gt; \$100,000</u>
(1) Increased Limit					
(2) Incurred Loss by Layer	\$26,652,319	\$752,614	\$2,281,684	\$1,765,788	\$634,000
(3) Earned Exposures by Limit	2,017,547.6	362,315.6	502,173.1	914,325.8	207,932.0
(4) Cumulative Earned Exposures for at least the limit	4,004,294.1	1,986,746.5	1,624,430.9	1,122,257.8	207,932.0
(5) Adjustment to Losses by Layer (E), (F)	(\$1,201)	\$480	\$360	\$240	\$120
(6) Adjusted Layer of Loss (2) + (5)	\$26,651,118	\$753,094	\$2,282,044	\$1,766,028	\$634,120
(7) Defense and Cost Containment Expense by Layer (C)					
(8) Loss Development Factor by Layer	0.9732	0.9980	0.9980	0.9980	0.9980
(9) Market Mix Adjustment Factor by Layer	1.00	1.00	1.00	1.00	1.00
(10) Developed Losses by Layer [ (6) x (8) ]	\$25,936,868	\$751,611	\$2,277,550	\$1,762,550	\$632,871
(11) Developed Expenses by Layer [ (7) x (8 Basic) ]	\$1,612,002	\$0	\$0	\$0	\$0
(12) Pure Premium by Layer [ (10) + (11) ] x (9)/(4)	\$6.88	\$0.38	\$1.40	\$1.57	\$3.04
(13) Cumulative Pure Premium by Layer	\$6.88	\$7.26	\$8.66	\$10.23	\$13.27
(14) Indicated Increased Limits Factor [(13)/(13 Basic)]	1.0000	1.0552	1.2587	1.4869	1.9288
(15) Exp. Distribution of Buyers of Inc. Lims.		18.24%	25.28%	46.02%	10.47%

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(16) Avg. Indicated Increased Limits Factor ex. Basic Lims 1.3968

Calculation of Adjustment to Losses by Layer

A) U-1 and DCCE Basic Limit Losses (100B)	\$28,307,511
B) Basic Limit Loss from Losses by Layer (2)	\$26,652,319
C) Basic Limits DCCE	\$1,656,393
D) Basic Limits Loss and DCCE (B) +(C)	\$28,308,712
E) Adjustment to Basic Limit Losses (A) - (D)	(\$1,201)
F) Adjustment to Increased Limit Losses (D) - (A)	\$1,201

Loss & DCCE valued at 36 months

**Massachusetts Private Passenger Automobile  
Calculation of Accident Year 2004 Coverage U - 1 Increased Limit Factors**

(1) Increased Limit	\$20,000	\$25,000	\$50,000	\$100,000	> \$100,000
(2) Incurred Loss by Layer	\$31,659,155	\$822,657	\$2,319,722	\$1,529,404	\$807,027
(3) Earned Exposures by Limit	2,085,061.9	363,958.2	479,923.0	876,562.1	191,579.4
(4) Cumulative Earned Exposures for at least the limit	3,997,084.6	1,912,022.7	1,548,064.5	1,068,141.5	191,579.4
(5) Adjustment to Losses by Layer (E), (F)	(\$15,000)	\$6,000	\$4,500	\$3,000	\$1,500
(6) Adjusted Layer of Loss (2) + (5)	\$31,644,155	\$828,657	\$2,324,222	\$1,532,404	\$808,527
(7) Defense and Cost Containment Expense by Layer (C)	\$2,276,025				
(8) Loss Development Factor by Layer	0.9855	0.9858	0.9858	0.9858	0.9858
(9) Market Mix Adjustment Factor by Layer	1.00	1.00	1.00	1.00	1.00
(10) Developed Losses by Layer [ (6) x (8) ]	\$31,185,315	\$816,851	\$2,291,109	\$1,510,572	\$797,008
(11) Developed Expenses by Layer [ (7) x (8 Basic) ]	\$2,243,023	\$0	\$0	\$0	\$0
(12) Pure Premium by Layer [ (10) + (11) ] x (9)/(4)	\$8.36	\$0.43	\$1.48	\$1.41	\$4.16
(13) Cumulative Pure Premium by Layer	\$8.36	\$8.79	\$10.27	\$11.68	\$15.84
(14) Indicated Increased Limits Factor [(13)/(13 Basic)]	1.0000	1.0514	1.2285	1.3971	1.8947
(15) Exp. Distribution of Buyers of Inc. Lims.		19.04%	25.10%	45.84%	10.02%

(16) Avg. Indicated Increased Limits Factor ex. Basic Lims 1.3389

Calculation of Adjustment to Losses by Layer

A) U-1 and DCCE Basic Limit Losses (100B)	\$33,920,180
B) Basic Limit Loss from Losses by Layer (2)	\$31,659,155
C) Basic Limits DCCE	\$2,276,025
D) Basic Limits Loss and DCCE (B) +(C)	\$33,935,180
E) Adjustment to Basic Limit Losses (A) - (D)	(\$15,000)
F) Adjustment to Increased Limit Losses (D) - (A)	\$15,000

Loss & DCCE valued at 48 months





**Massachusetts Private Passenger Automobile  
Calculation of Accident Year 2002 Coverage U - 1 Increased Limit Factors**

(1) Increased Limit	\$20,000	\$25,000	\$50,000	\$100,000	> \$100,000
(2) Incurred Loss by Layer	\$43,287,955	\$715,850	\$1,849,109	\$1,243,199	\$280,000
(3) Earned Exposures by Limit	2,226,722.1	375,556.6	427,799.8	789,090.1	156,359.4
(4) Cumulative Earned Exposures for at least the limit	3,975,528.0	1,748,805.9	1,373,249.3	945,449.5	156,359.4
(5) Adjustment to Losses by Layer (E), (F)	(\$14,000)	\$5,600	\$4,200	\$2,800	\$1,400
(6) Adjusted Layer of Loss (2) + (5)	\$43,273,955	\$721,450	\$1,853,309	\$1,245,999	\$281,400
(7) Defense and Cost Containment Expense by Layer (C)	\$2,508,711				
(8) Loss Development Factor by Layer	0.9940	1.0247	1.0247	1.0247	1.0247
(9) Market Mix Adjustment Factor by Layer	1.00	1.00	1.00	1.00	1.00
(10) Developed Losses by Layer [ (6) x (8) ]	\$43,014,311	\$739,279	\$1,899,109	\$1,276,791	\$288,354
(11) Developed Expenses by Layer [ (7) x (8 Basic) ]	\$2,493,659	\$0	\$0	\$0	\$0
(12) Pure Premium by Layer [ (10) + (11) ] x (9)/(4)	\$11.45	\$0.42	\$1.38	\$1.35	\$1.84
(13) Cumulative Pure Premium by Layer	\$11.45	\$11.87	\$13.25	\$14.60	\$16.44
(14) Indicated Increased Limits Factor [(13)/(13 Basic)]	1.0000	1.0367	1.1572	1.2751	1.4358
(15) Exp. Distribution of Buyers of Inc. Lims.		21.48%	24.46%	45.12%	8.94%

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(16) Avg. Indicated Increased Limits Factor ex. Basic Limits 1.2094

Calculation of Adjustment to Losses by Layer

- A) U-1 and DCCE Basic Limit Losses (100B) \$45,782,666
- B) Basic Limit Loss from Losses by Layer (2) \$43,287,955
- C) Basic Limits DCCE \$2,508,711
- D) Basic Limits Loss and DCCE (B) +(C) \$45,796,666
- E) Adjustment to Basic Limit Losses (A) - (D) (\$14,000)
- F) Adjustment to Increased Limit Losses (D) - (A) \$14,000

Loss & DCCE valued at 60 months

**Massachusetts Private Passenger Automobile****U-1 Increased Limits  
Loss Development  
Over \$20,000/\$40,000**

<u>Accident</u> <u>Year</u>	<u>First Report</u>	<u>Second Report</u>	<u>Third Report</u>	<u>Fourth Report</u>	<u>Fifth Report</u>
1998	2,100,879	2,754,593	3,234,318	3,411,535	3,625,242
1999	1,905,846	3,004,319	3,641,854	4,158,369	4,115,597
2000	3,797,471	4,845,227	5,756,445	6,163,175	5,883,944
2001	2,310,038	2,999,173	3,541,230	3,350,482	3,238,060
2002	2,924,243	3,977,808	3,866,688	4,101,990	4,102,158
2003	3,350,377	4,573,556	5,253,708	5,182,741	4,821,009
2004	3,373,075	4,667,546	5,484,140	5,493,810	
2005	3,792,775	5,048,804	5,435,287		
2006	2,999,541	3,711,641			
2007	3,808,135				

<u>Accident</u> <u>Year</u>	<u>Loss Development Factors</u>			
	<u>First to</u> <u>Second</u>	<u>Second to</u> <u>Third</u>	<u>Third to</u> <u>Fourth</u>	<u>Fourth to</u> <u>Fifth</u>
1998	1.3112	1.1742	1.0548	1.0626
1999	1.5764	1.2122	1.1418	0.9897
2000	1.2759	1.1881	1.0707	0.9547
2001	1.2983	1.1807	0.9461	0.9664
2002	1.3603	0.9721	1.0609	1.0000
2003	1.3651	1.1487	0.9865	0.9302
2004	1.3838	1.1750	1.0018	
2005	1.3312	1.0765		
2006	1.2374			
Weighted Average*	1.3216	1.1025	1.0125	0.9620
Cumulative Factors to Tenth Report	1.4541	1.1003	0.9980	0.9858
First to Fifth Factor	1.4190			

\* Weights for Weighted Average from 101C-2 , page 3

**Massachusetts Private Passenger Automobile****U-1 Increased Limits  
Loss Development  
Over \$20,000/\$40,000**

<u>Accident</u>	<u>Year</u>	<u>Fifth Report</u>	<u>Sixth Report</u>	<u>Seventh Report</u>	<u>Eighth Report</u>	<u>Ninth Report</u>	<u>Tenth Report</u>
	1996	3,751,969	3,785,136	3,525,941	3,529,942	3,438,164	3,459,773
	1997	4,736,257	4,586,425	4,607,622	4,661,826	4,659,524	4,701,986
	1998	3,625,242	3,653,999	3,536,582	3,551,582	3,587,155	3,579,888
	1999	4,115,597	4,171,812	4,358,581	4,453,676	4,454,837	
	2000	5,883,944	5,812,648	5,897,317	5,921,054		
	2001	3,238,060	3,426,909	3,336,692			
	2002	4,102,158	3,935,497				
	2003	4,821,009					

<u>Accident</u>	<u>Loss Development Factors</u>				
	<u>Fifth to</u> <u>Sixth</u>	<u>Sixth to</u> <u>Seventh</u>	<u>Seventh to</u> <u>Eighth</u>	<u>Eighth to</u> <u>Ninth</u>	<u>Ninth to</u> <u>Tenth</u>
1996	1.0088	0.9315	1.0011	0.9740	1.0063
1997	0.9684	1.0046	1.0118	0.9995	1.0091
1998	1.0079	0.9679	1.0042	1.0100	0.9980
1999	1.0137	1.0448	1.0218	1.0003	
2000	0.9879	1.0146	1.0040		
2001	1.0583	0.9737			
2002	0.9594				
Two Year Average*	1.0088	0.9941	1.0129	1.0051	1.0035
Cumulative Factors to Tenth	1.0247	1.0157	1.0217	1.0087	1.0035
Fifth to Tenth Factor	1.0247				

**Massachusetts Private Passenger Automobile  
Calculation of Increased Limits Development Factors**

**Selected Weights for Loss Development**

<u>Accident</u> <u>Year</u>	<u>First to</u> <u>Second</u>	<u>Second to</u> <u>Third</u>	<u>Third to</u> <u>Fourth</u>	<u>Fourth to</u> <u>Fifth</u>
2002	0.100	0.167	0.267	0.455
2003	0.150	0.222	0.333	0.545
2004	0.200	0.278	0.400	
2005	0.250	0.333		
2006	0.300			
Total	1.000	1.000	1.000	1.000

**Massachusetts Private Passenger Automobile  
U-1 Calendar Year 2007 Earned Exposures  
Total Industry**

<u>Limit</u>	Earned Exposures	Adjustments*	Adjusted Earned Exposures	% Distribution
20/40	1,807,914.7		1,807,914.7	45.10%
20/50	30,507.3		30,507.3	0.76%
25/50	254,870.4	26,856.0	281,726.4	7.03%
25/60	35,163.7	35,626.0	70,789.7	1.77%
30/70	35,626.0			
50/100	540,137.8	6,714.0	546,851.8	13.64%
100/300	1,021,679.2		1,021,679.2	25.49%
250/500	248,075.6		248,075.6	6.19%
500/1,000	1,049.6		1,049.6	0.03%
All Other	33,570.0			
Total	4,008,594.3		4,008,594.3	100.00%

\* 80% of All Other assigned to 25/50 limit and 20% assigned to 50/100 limit.  
30/70 limit assigned to 25/60 limit,  
35/80 limit included in 30/70 limit and assigned to 25/60 limit.

**Massachusetts Private Passenger Automobile  
U-1 Calendar Year 2007 Written Exposures  
Facility Market**

<u>Limit</u>	Written Exposures	Adjustments*	Adjusted Written Exposures	% Distribution
20/40	121,938.5		121,938.5	68.61%
20/50	3,590.2		3,590.2	2.02%
25/50	10,111.7	476.8	10,588.5	5.96%
25/60	1,098.2	2,265.7	3,363.9	1.89%
30/70	204.0			
35/80	2,061.7			
50/100	15,613.3	119.2	15,732.5	8.85%
100/300	18,797.5		18,797.5	10.58%
250/500	3,703.0		3,703.0	2.08%
500/1,000	0.0		0.0	0.00%
All Other	596.0			
Total	177,714.1	2,861.7	177,714.1	100.00%

\* 80% of All Other assigned to 25/50 limit and 20% assigned to 50/100 limit,  
30/70 + 35/80 limit assigned to 25/60 limit.

**Massachusetts Private Passenger Automobile  
Calculation of U-2 Rates  
Total Market**

	(1)	(2)	(3)	(4)	(5)	(6)	
	Statewide % of BI Expo's at Limit <sup>1</sup>	BI ILF's	% of Pop. that is Under- Insured	Diff in ILF's	Product (2)x(3)	Ratio of U-2 PPre to BI Basic PPrem (Cumul. sum (4))	U-2 Pure Premium (5) x BI PPre <sup>2</sup>
20/40	25.49%	1.000	0.00%	0.000	0.00%	0.00%	0.00
20/50	0.62%	1.010	25.49%	0.010	0.25%	0.25%	0.37
25/50	5.94%	1.060	26.11%	0.050	1.31%	1.56%	2.29
25/60	1.30%	1.070	32.05%	0.010	0.32%	1.88%	2.76
50/100	13.51%	1.300	33.35%	0.230	7.67%	9.55%	14.03
100/300	37.23%	1.600	46.86%	0.300	14.06%	23.61%	34.70
250/500	15.49%	2.250	84.09%	0.650	54.66%	78.27%	115.02
500/500	0.32%	3.330	99.58%	1.080	107.55%	185.82%	273.08
500/1000	0.10%	3.380	99.90%	0.050	4.99%	190.81%	280.41
Totals	100.00%						

	(7)	(8)	(9)
Limit	% of U-2 Exposures at Limit <sup>3</sup>	Proposed Avg. Rate <sup>4</sup>	Product (7)x(8)
20/40	69.24%	0.00	0.00
20/50	1.99%	0.38	0.01
25/50	5.84%	2.37	0.14
25/60	0.63%	2.86	0.02
30/70	0.11%	5.86	0.01
35/80	1.14%	8.79	0.10
50/100	8.78%	14.53	1.28
100/300	10.25%	35.93	3.68
250/500	1.95%	119.08	2.32
500/500	0.08%	282.72	0.23
500/1000	0.00%	290.31	0.00
Totals	100.01%		7.78

U-2 Indicated Average Rate = 7.78

<sup>1</sup> Total Market

<sup>2</sup> Estimate of total market BI basic limits pure premium including LAE: 146.96

<sup>3</sup> Facility Market

<sup>4</sup> Column (6) / (1 - prem tax - UW profit) (Form 100);  
proposed manual rates derived in 100L; proposed manual rates for all limits shown in 101E.







**Massachusetts Private Passenger Automobile  
Coverage U Rates by Limit**  
**Applicable to Coverage U-2 (Underinsured Motorists) Rates for Vehicles Other Than Motorcycles**  
**Rated in the Private Passenger Automobile Manual**

**Facility Market (Limits Expressed in Thousands)**

	LIMIT PER PERSON															
	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	40	0	2	6	8	11										
	45	0	2	6	9	11										
	50	0	2	6	9	11	14									
	60	0	3	6	9	11	15									
	70	0	3	6	9	11	15									
	80	0	3	6	9	11	15									
	100	0	3	7	9	11	15	35								
	150	0	4	7	10	12	16	36	70							
	200	1	4	7	10	12	16	36	71	97						
	250	1	4	7	10	12	16	37	72	98	118					
	300	1	4	7	10	12	17	37	73	99	119	159				
	350	1	5	8	10	12	17	38	74	99	119	161				
	400						17	38	74	100	120	162	233			
	500						17	39	75	101	121	165	235	290		
	600						18	40	76	102	123	167	238	292	303	
	700						18	41	77	103	125	169	240	293	304	311
	800						18	41	77	103	126	171	241	294	304	311
	900						18	42	78	104	128	172	243	295	304	311
	1000						18	42	78	104	129	173	244	296	304	311
	1250						19	43	79	105	132	176	247	297	305	312
	1500						19	44	80	106	134	178	249	297	305	312
	1750						19	45	81	107	136	180	251	297	306	313
	2000						19	45	82	107	137	182	252	298	306	313
	2500						20	46	83	108	140	185	255	298	307	314
	3000						47	83	109	142	187	257	299	307	314	314
	4000						49	85	110	146	190	261	299	308	315	315
	5000						50	86	111	149	193	264	300	308	315	315
	7500						51	87	113	154	198	269	301	309	316	316
	10000						53	89	114	157	202	272	301	310	317	317

Additional Increased Limit Rates    Limit    Rate  
45/45    13  
750/750    314

**Massachusetts Private Passenger Automobile  
Increased Limits Factors for Property Damage Liability**

**Facility Market**

Applicable to PDL Rates for All Vehicles Rated in the Private Passenger Manual

<u>Limit</u> (\$000's)	Increased Limit <u>Factor</u>
5	1.000
10	1.240
15	1.254
20	1.262
25	1.268
30	1.274
35	1.279
40	1.283
45	1.287
50	1.290
75	1.296
80	1.297
100	1.300
150	1.308
200	1.316
250	1.319
300	1.323
400	1.329
500	1.333
750	1.339
1,000	1.345
2,000	1.355
2,500	1.358
5,000	1.371
10,000	1.383

*Commonwealth Automobile Reinsurers*

**Filing for Residual Market Rates  
Effective 4/1/2009**

**Deductible Relativities: 102**

## Massachusetts Private Passenger Automobile Deductible Relativities

The methodology to price deductibles for higher or lower than the standard deductible comprises three general components. First, indicated deductible loss relativities are calculated from size-of-claim distributions for a constant claim population under varying deductibles. Second, these indicated loss relativities are adjusted based on a review of the loss experience of the buyers of different deductibles. Third, the adjusted loss relativities are converted to deductible rate relativities. The method is described in more detail below.

### Indicated Loss Relativities

The calculation of indicated loss relativities requires the following steps:

- a. 2009 deductibles being priced must be 'detrended' to 2007 cost levels to produce appropriate entry points to 2007 size-of-claim distributions.
- b. Two approximations are required to extract from the size-of-claim distributions the losses corresponding to the entry points determined in (a):
  1. Linear interpolation is employed between the entry points displayed in the size-of-claim distribution. Note that the appropriate entry points are functions of both the detrended deductible and the deductible underlying a particular subset of losses. For example, the appropriate entry point for losses on \$300 deductible policies when the detrended deductible is \$500 equals \$200 (assuming no waiver of deductible; if a waiver applies, the appropriate entry point would be \$500).
  2. Where the detrended deductible is slightly below the actual deductible for particular coverage codes, total losses are estimated by adding the difference between the detrended deductible and the actual deductible to each claim that appears in the size-of-claim distribution. This procedure understates losses slightly, since it ignores claims just below the actual deductible.

- c. For A-2, only named insured or named insured and members of insured household losses are reduced by deductibles. Other losses are included on a first dollar basis.
- d. Direct defense and cost containment expense is included in the calculation of A-2 deductibles. It is assumed that allocated loss expense is proportional to the dollar loss of the claim. Those expenses associated with losses from claims below the deductible are eliminated; no expenses are eliminated on claims above the deductible.
- e. For comprehensive, glass losses are on a \$0 deductible basis and thus are treated separately from other losses. Claim cost trends are also different for glass losses than for other comprehensive losses.

### **Adjustment for Varying Loss Experience**

The use of size-of-claim distributions to establish deductible relativities implicitly assumes that purchasers of different deductibles would produce similar claims experience but for the imposition of the different deductibles. But purchasers of different deductibles have markedly different claims experience, even when placed on a standard deductible basis. Exhibit 6A column (F) displays loss pure premiums, on a uniform \$500 deductible basis, for the different groups of buyers; the next column calculates relativities of these pure premiums to the average for all buyers. A component of the observed variation in loss pure premiums is attributable to differences in class and territory distributions and typical vehicle characteristics between the buyers of different deductibles. The effect of this component is calculated in Exhibit 6B and used in Exhibit 6A, column (H).

The remaining variation (Exhibit 6A, column (I)) provides indicated adjustments to traditional deductible prices to reflect population characteristics not captured by other rating variables.

The selected adjustments to traditional relativity calculations are displayed in Exhibit 6A, column (J). The selected adjustments are based on the indicated adjustments and the following considerations:

- a. Since the adjustments are intended to reflect the extent to which certain segments of the insured population have claims experience better than or worse than average, the exposure-weighted average adjustment must be unity.
- b. For collision, a uniform adjustment is selected for the "waiver" and "no waiver" options within each deductible.
- c. The adjustment factors are selected to be monotonically declining with increasing deductibles.
- d. Limited collision adjustments are set equal to collision adjustments.
- e. Adjustments for \$2000 deductible are set equal to adjustments for \$1000 deductible. The adjustment for \$0 deductible limited collision is judgmentally set equal to one.

The selected adjustments are applied to the traditionally-calculated loss pure premium deductible relativities in Exhibit 2A, line 3; Exhibit 3A, line 3; and Exhibit 4A, line 3; with adjusted relativities displayed on line 4 of the same exhibits. These adjusted relativities are then renormalized to a \$500 base.

#### **Conversion to Deductible Rate Relativities**

The AIB advisory rate structure assumes that the company expenses associated with a policy do not vary with the deductible purchased. Therefore, the final deductible relativity is calculated by applying the loss pure premium relativity to the loss portion of the CAR rate, adding the corresponding flat provision for company expenses, and loading the result for variable expense components. This manner of loading expenses specifically assumes that the commission percentage for the different deductibles is the same as that for the standard deductible of \$500.

#### **Miscellaneous Deductible Charges**

Finally, collision waiver of deductible charges and limited collision buyback charges are expressed as flat dollar amounts. Collision and comprehensive buyback relativities are expressed as percentages of class-territory base rates. The final deductible rate relativities, waiver of deductible charges, and buyback charges are displayed on both the Summary Exhibit and on Exhibits 1, 2A, 3A, and 4A.

**Massachusetts Private Passenger Automobile  
Calculation of " Deductible " Discounts**

**Total Industry  
PIP**

	\$100	\$250	\$500	\$1,000	\$2,000	\$4,000	\$8,000
(1) Deductible							
(2) Detrended Deductible = [(1) / 0.9843] from Exhibit 5	\$102	\$254	\$508	\$1,016	\$2,032	\$4,064	\$8,128
(3) Losses Eliminated by Detrended Deductibles Named Insured (Type of Claimant 1) Members of Household (Type of Claimant 2)	\$3,827,003 \$1,225,639	\$9,358,071 \$2,987,392	\$18,277,637 \$5,783,880	\$34,851,205 \$10,870,724	\$63,152,850 \$19,224,271	\$87,555,641 \$25,786,480	\$106,811,306 \$30,636,254
(4) Dollars on Claims Eliminated Entirely by Detrended Deductibles Named Insured Members of Household	\$50,627 \$18,111	\$263,595 \$107,656	\$988,453 \$399,248	\$3,594,709 \$1,410,388	\$31,799,106 \$11,088,175	\$56,004,057 \$17,355,312	\$105,751,146 \$30,503,262
(5) Ratio of ALAE to Losses Named Insured Members of Household	6,527,109 1,817,169	107,303,625 30,656,597	Ratio 0.061 0.059				
(6) Estimated ALAE Eliminated by Detrended Deductible = (4) x (5) Named Insured Members of Household	\$3,088 \$1,069	\$16,079 \$6,352	\$60,296 \$23,556	\$219,277 \$83,213	\$1,939,745 \$654,202	\$3,416,247 \$1,023,963	\$6,450,820 \$1,799,692
(7) Estimated Loss and ALAE Eliminated by Detrended Deductible = (3) + (6) Named Insured Members of Household Named Insured and Members of Household	\$3,830,091 \$1,226,708 \$5,056,799	\$9,374,150 \$2,993,744 \$12,367,894	\$18,337,933 \$5,807,436 \$24,145,369	\$35,070,482 \$10,953,937 \$46,024,419	\$65,092,595 \$19,878,473 \$84,971,068	\$90,971,888 \$26,810,443 \$117,782,331	\$113,262,126 \$32,435,946 \$145,698,072
(8) Total Loss and ALAE All Claimants - Total Loss Amount All Claimants - Total ALAE Amount All Claimants - Total Loss and ALAE Amount	197,778,938 12,048,722 209,827,660						
(9) Loss Elimination Ratio = (7) / (8) Named Insured Named Insured and Members of Household	0.018 0.024	0.045 0.059	0.087 0.115	0.167 0.219	0.310 0.405	0.434 0.561	0.540 0.694
(10) Rate Components from Exhibit 7 A) Losses B) Fixed Expenses C) Variable Expenses	0.77 0.07 0.16						
(11) Deductible Discount = [(9) x (10A)] / [ 1.00 - (10C) ] Named Insured Named Insured and Members of Household	0.02 0.02	0.04 0.05	0.08 0.11	0.15 0.20	0.28 0.37	0.40 0.51	0.50 0.64
(12) Selected Discount Named Insured Named Insured and Members of Household	0.02 0.02	0.04 0.05	0.08 0.11	0.15 0.20	0.28 0.37	0.40 0.51	0.50 0.64





**Massachusetts Private Passenger Automobile**  
**Calculation of Selected "Deductible" Relativities and "Waiver of Deductible" Charges**  
**Total Industry**  
**COLLISION**

(1)	Deductible	<b>\$300</b>	<b>\$500</b>	<b>\$1,000</b>	<b>\$2,000</b>
(2)	Relativities of \$500 Deductible Losses Indicated by Size-of-Claim Distributions (From Exhibit 2B)	1.074	1.000	0.860	0.654
(3)	Adjustment for Historical Results of Buyers at Deductible (From Exhibit 6A)	1.070	1.023	0.790	0.790
(4)	Adjusted Relativities to \$500 Deductible Losses = (2) x (3)	1.149	1.023	0.679	0.517
(5)	Adjusted Relativities to \$500 Deductible Losses Normalized to \$500 Base = (4)/ \$500 Deductible (4)	1.123	1.000	0.664	0.505
(6)	Rate Components (From Exhibit 7)				
	A) Losses	0.76			
	B) Fixed Expenses	0.05			
	C) Variable Expenses	0.19			
	D) Average Premium	\$1,029.86			
	E) Symbol Drift Factor (Form 100)	0.842			
(7)	Deductible Relativities to Final "\$500 Deductible " Premiums = [ {(5) x (6A) } + (6B) ] / [1.0 - (6C) ]	1.115	1.000	0.685	0.536
(8)	Deductible Buyback Charges Applicable to Class-Territory Base Rates = [(7) -1.0]/(6E)	0.14			
<i>Waiver of Deductible Calculations</i>					
(9)	Waiver of Deductible Relativities to Losses at Deductible (From Exhibit 2C)	0.023	0.037	0.075	0.153
(10)	Waiver of Deductible Relativities to \$500 Deductible Losses = (5) x (9)	0.026	0.037	0.050	0.077
(11)	Indicated Waiver of Deductible Charges = [(6D) x (10) x (6A)] / [1.0 - (6C)]	\$25	\$36	\$48	\$74
(12)	Selected Waiver of Deductible Charges	\$25	\$36	\$48	\$74

**Massachusetts Private Passenger Automobile  
Calculation of Selected "Deductible" Relativities and "Waiver of Deductible" Charges  
Total Industry  
COLLISION**

(1) Deductible		<b>\$300</b>	<b>\$500</b>	<b>\$1,000</b>	<b>\$2,000</b>
(2) Detrended Deductible * = [ (1) / 1.1693 ] from Exhibit 5		\$257	\$428	\$855	\$1,710
(3) Losses in Excess of Detrended Deductible					
Coverage **					
15 \$300 deductible policies, with waiver	\$90,662,741	\$84,443,651	\$71,040,346	\$52,596,285	
16 \$500 deductible policies, with waiver		\$522,153,396	\$450,619,513	\$344,244,306	
76 \$300 deductible policies, without waiver	\$1,367,799	\$1,283,034	\$1,094,794	\$830,776	
77 \$500 deductible policies, without waiver		\$5,792,469	\$4,987,597	\$3,797,460	
(4) Losses in Excess of Detrended Deductible from (3)					
Coverage					
15,76	\$92,030,540	\$85,726,685	\$72,135,140	\$53,427,061	
15,16,76,77		\$613,672,550	\$527,742,250	\$401,468,827	
(5) Relativities to \$500 Deductible Losses = (4) / \$500 Deductible (4)					
Coverage					
15,76	1.074	1.000	0.841	0.623	
15,16,76,77		1.000	0.860	0.654	

\* 2009 deductible must be adjusted to 2007 cost levels in order to produce appropriate entry points to the 2009 size of claim distributions.

\*\* Losses below the minimum reported deductible are estimated using:  
( Number of Claims ) x [ ( Actual Deductible ) - ( Detrended Deductible ) ]

**Massachusetts Private Passenger Automobile  
Calculation of Selected "Deductible" Relativities and "Waiver of Deductible" Charges  
Total Industry  
COLLISION**

(1) Deductible			\$0	\$300	\$500	\$1,000	\$2,000
(2) Detrended Deductible * = [ (1) / 1.1693 ] from Exhibit 5				\$257	\$428	\$855	\$1,710
(3) Losses in Excess of Detrended Deductible							
Coverage **	Type of Loss						
15	11***	\$300 ded. policies, w/ waiver - ded. applied		\$74,409,747	\$69,424,326	\$58,487,213	\$43,207,965
	12	\$300 ded. policies, w/ waiver - ded. not applied	\$18,378,825	\$16,252,994	\$15,019,325	\$12,553,133	\$9,388,320
16	11****	\$500 ded. policies, w/ waiver - ded. applied			\$429,764,224	\$372,349,762	\$284,620,571
	12	\$500 ded. policies, w/ waiver - ded. not applied	\$111,392,004		\$92,389,172	\$78,269,751	\$59,623,735
(4) Losses in Excess of Detrended Deductible from (3)							
Coverage							
15				\$90,662,741	\$84,443,651	\$71,040,346	\$52,596,285
15,16					\$606,597,047	\$521,659,859	\$396,840,591
(5) Losses Eliminated if Deductible <i>Had Been</i> Applied: [(3) at \$0 deductible minus (3) at selected deductible]							
Coverage	Type of Loss						
15	12			\$2,125,831	\$3,359,500	\$5,825,692	\$8,990,505
15,16	12				\$22,362,332	\$38,947,945	\$60,758,774
(6) Factor for Waiver of Deductible , Related to Losses at Selected Deductible = (5)/(4)							
Coverage							
15				0.023	0.040	0.082	0.171
15,16					0.037	0.075	0.153

\* 2009 deductible must be adjusted to 2007 cost levels in order to produce appropriate entry points to the 2009 size of claim distributions.

\*\* Losses below the minimum reported deductible are estimated using:  
( Number of Claims ) x [ ( Actual Deductible ) - ( Detrended Deductible ) ]

\*\*\* Column G at Detrended Deductible - 300 (Type of Loss is " Other Than 12 " )

\*\*\*\* Column G at Detrended Deductible - 500 (Type of Loss is " Other Than 12 " )

**Massachusetts Private Passenger Automobile**  
**Calculation of Selected "Deductible" Relativities and "Waiver of Deductible" Charges**  
**Total Industry**  
**LIMITED COLLISION**

(1)	Deductible	\$0	\$300	\$500	\$1,000	\$2,000
(2)	Relativities of \$500 Deductible Losses Indicated by Size-of-Claim Distributions	1.408	1.149	1.000	0.726	0.429
(3)	Adjustment for Historical Results of Buyers at Deductible (From Exhibit 6A Collision)	1.000	1.070	1.023	0.790	0.790
(4)	Adjusted Relativities to \$500 Deductible Losses = (2) x (3)	1.408	1.229	1.023	0.574	0.339
(5)	Adjusted Relativities to \$500 Deductible Losses Normalized to \$500 Base = (4) / \$500 Deductible (4)	1.376	1.201	1.000	0.561	0.331
(6)	Rate Components (From Exhibit 7)					
	A) Losses	0.77				
	B) Fixed Expenses	0.04				
	C) Variable Expenses	0.19				
	D) Average Premium	\$82.45				
(7)	Deductible Relativities to Final "\$500 Deductible" Premiums on a \$500 Deductible Basis = [(5) x (6A) + (6B)] / [1.0 - (6C)]	1.357	1.191	1.000	0.583	0.364
(8)	Flat Buyback Charges Applicable to Class-Territory Base Rates = [(7) - 1.0] x (6D) x [\$500 Deductible (7)]	\$29	\$16	\$0	N/A	N/A

**Massachusetts Private Passenger Automobile  
Calculation of Selected "Deductible" Relativities and "Waiver of Deductible" Charges  
Total Industry  
LIMITED COLLISION**

(1) Deductible		<b>\$0</b>	<b>\$300</b>	<b>\$500</b>	<b>\$1,000</b>	<b>\$2,000</b>
(2) Detrended Deductible* = [ (1) / 1.1693 ] (From Exhibit 5)			\$257	\$428	\$855	\$1,710
(3) Losses (Excluding Glass) in Excess of Detrended Deductible						
Coverage						
40	\$1,180,285	\$963,063	\$838,225	\$605,660	\$357,008	
45**		\$14,536	\$12,460	\$8,752	\$4,602	
42**			\$53,998	\$42,318	\$26,561	
40,45,42	\$1,180,285	\$977,599	\$904,683	\$656,730	\$388,171	
(4) Relativities to \$500 Deductible Losses = (3) / \$500 Deductible (3)						
Coverage						
40	1.408					
40,45		1.149	1.000	0.722	0.425	
40,45,42			1.000	0.726	0.429	

\* 2009 deductible must be adjusted to 2007 cost levels in order to produce appropriate entry points to the 2009 size of claim distributions.

\*\* Losses below the minimum reported deductible are estimated using:  
( Number of Claims ) x [ ( Actual Deductible ) - ( Detrended Deductible ) ]

**Massachusetts Private Passenger Automobile**  
**Calculation of Selected "Deductible" Relativities and "Waiver of Deductible" Charges**  
**Total Industry**  
**COMPREHENSIVE**

	<b>\$300</b>	<b>\$500</b>	<b>\$1,000</b>	<b>\$2,000</b>
(1) Deductible				
(2) Relativities of \$500 Deductible Losses Indicated by Size-of-Claim Distributions (From Exhibit 4B)	1.051	1.000	0.907	0.794
(3) Adjustment for Historical Results of Buyers at Deductible (From Exhibit 6A)	1.010	1.050	0.600	0.600
(4) Adjusted Relativities to \$ 500 Deductible Losses = (2) x (3)	1.062	1.050	0.544	0.476
(5) Adjusted Relativities to \$500 Deductible Losses Normalized to \$500 Base = (4) / \$500 Deductible (4)	1.011	1.000	0.518	0.453
(6) Rate Components (From Exhibit 7)				
A) Losses	0.73			
B) Fixed Expenses	0.07			
C) Variable Expenses	0.20			
D) Symbol Drift Factor	0.923			
(7) Deductible Relativities to Final "\$500 Deductible" Premiums on a \$500 Deductible Basis = [ {(5) x (6A) } + (6B) ] / [ 1.0 - (6C) ]	1.010	1.000	0.560	0.501
(8) Deductible Buyback Charges Applicable to Class-Territory Base Rates = [(7) - 1.0] / (6D)	0.01	N/A	N/A	N/A

**Massachusetts Private Passenger Automobile**  
**Calculation of Selected "Deductible" Relativities and "Waiver of Deductible" Charges**  
**Total Industry**  
**COMPREHENSIVE**

(1)	Deductible	\$300	\$500	\$1,000	\$2,000	Glass
(2)	Detrended Deductible* = [ (1) / 0.989 ] (From Exhibit 5)	\$303	\$506	\$1,011	\$2,022	N/A
(3)	Losses (Excluding Glass) in Excess of Detrended Deductible					
	Coverages					
	35, 134, 135, 234, 334, 434, 534 - \$300 deductible, not glass**	\$25,911,601	\$23,344,179	\$18,222,334	\$12,051,710	\$26,645,191
	37, 136, 137, 236, 336, 436, 536 - \$500 deductible, not glass**		\$55,557,740	\$44,344,291	\$30,458,812	\$70,761,218
(4)	Claim Cost Trend (from Exhibit 5)	0.989	0.989	0.989	0.989	0.989
(5)	Trended Losses in Excess of Deductible = (3) x (4)					
	Coverages					
	35, 134, 135, 234, 334, 434, 534	\$25,626,573	\$23,087,393	\$18,021,888	\$11,919,141	\$26,352,094
	37, 136, 137, 236, 336, 436, 536		\$54,946,605	\$43,856,504	\$30,123,765	\$69,982,845
(6)	Total Losses (Including Glass) in Excess of Deductible = (5) + Glass (5)					
	Coverages					
	35, 134, 135, 234, 334, 434, 534	\$51,978,667	\$49,439,487	\$44,373,982	\$38,271,235	
	ALL		\$174,368,937	\$158,213,331	\$138,377,845	
(7)	Relativities to \$500 Deductible Losses = (6) / \$500 Deductible (6)					
	Coverages					
	35, 134, 135, 234, 334, 434, 534	1.051	1.000	0.898	0.774	
	ALL		1.000	0.907	0.794	

\* 2009 deductible must be adjusted to 2007 cost levels in order to produce appropriate entry points to the 2009 size of claim distributions.

\*\* Losses below the minimum reported deductible are estimated using:  
 ( Number of Claims ) x [ ( Actual Deductible ) - ( Detrended Deductible ) ]

**Massachusetts Private Passenger Automobile  
Claim Cost Trend Factors for Deductible Coverages  
Facility Market**

<u>Coverage</u>	<u>Trend Factor</u>	<u>Source</u>
A-2, PIP	0.9843	4/1/09 CAR Filing
Collision	1.1693	4/1/09 CAR Filing
Limited Collision	1.1693	4/1/09 CAR Filing
Comprehensive Coverages		
Other Than Glass	0.9889	4/1/09 CAR Filing
Glass Only	0.9889	4/1/09 CAR Filing



**Massachusetts Private Passenger Automobile  
Analysis of Experience of Buyers of Various Deductibles  
Total Industry**

COLLISION	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)
	Collision Coverage Deductible		2007 Earned Exposures	2007 Accident Year Losses on a \$500 Deductible Basis	\$500 Deductible Pure Premium (D)/(C)	Indicated \$500 Deductible Pure Premium Relativity	Distributional Variations Captured by Other Rating Variables (Exhibit 6B)	Rate Adjustment Produced by Traditional Methodologies (F)/(G)	Selected
Coverage Code	Amount	Waiver?							
15	\$300	Yes	404,512.0	\$81,948,508	\$202.59	0.968	0.908	1.066	1.070
16	\$500	Yes	2,394,431.8	\$509,254,447	\$212.68	1.016	0.993	1.023	1.023
17	\$1,000	Yes	338,831.3	\$64,772,315	\$191.16	0.913	1.150	0.794	0.790
12	\$2,000	Yes	9,811.3	\$1,054,893	\$107.52	0.514	1.188	0.433	0.790 *
76	\$300	No	3,982.6	\$1,242,793	\$312.06	1.490	0.894	1.667	1.070
77	\$500	No	19,348.6	\$5,632,099	\$291.09	1.390	0.985	1.411	1.023
78	\$1,000	No	4,115.3	\$923,947	\$224.52	1.072	1.091	0.983	0.790
72	\$2,000	No	330.2	\$32,687	\$98.99	0.473	1.128	0.419	0.790 *
Total Collision			3,175,363.1	\$664,861,689	\$209.38				1.003

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COMPREHENSIVE	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)
	Comprehensive Coverage Deductible		2007 Earned Exposures	2007 Accident Year Losses on a \$500 Deductible Basis	\$500 Deductible Pure Premium (D)/(C)	Indicated \$500 Deductible Pure Premium Relativity	Distributional Variations Captured by Other Rating Variables (Exhibit 6B)	Rate Adjustment Produced by Traditional Methodologies (F)/(G)	Selected
Coverage Code	Amount	Waiver?							
35,135,234,334,434,434	\$300	n/a	920,755.6	49,996,737	\$54.30	1.009	0.996	1.013	1.010
37,137,236,336,436,536	\$500	n/a	2,231,368.1	126,142,780	\$56.53	1.050	0.998	1.052	1.050
39,139,238,338,438,538	\$1,000	n/a	266,553.2	8,504,978	\$31.91	0.593	1.038	0.571	0.600
23,123,222,322,422,522	\$2,000	n/a	32,586.4	1,110,605	\$34.08	0.633	0.956	0.662	0.600 *
Total Comprehensive			3,451,263.3	\$185,755,100	\$53.82				1.000

\* Same as \$1,000 Deductible



**Massachusetts Private Passenger Automobile  
Rate Components for Deductible Calculations  
Facility Market**

	<u>PIP, A-2</u>	<u>Collision</u>	<u>Limited Collision</u>	<u>Comprehensive</u>
A) Loss Portion of Rate (Loss Pure Premium From Form 100)	\$146.53	\$781.33	\$63.30	\$157.70
B) Fixed Expense Portion of Rate (Company Expense Premium From Form 100)	\$12.81	\$52.34	\$3.44	\$16.07
C) Average Premium Before Reduction for Symbol Drift (From Form 100)	\$190.78	\$1,029.86	\$82.45	\$214.66
D) Loss Component of Rate = (A) / (C)	0.77	0.76	0.77	0.73
E) Fixed Expense Component of Rate = (B) / (C)	0.07	0.05	0.04	0.07
F) Variable Expense Component of Rate = 1 - [(D) + (E)]	0.16	0.19	0.19	0.20
G) Symbol Drift Factor ( From Form 100)	1.000	0.842	0.895	0.923

**Massachusetts Private Passenger Automobile**

**Glass Deductible Calculation**

**Total Industry**

**COMPREHENSIVE, FIRE & THEFT and CAC**

(A)	(B)	(C)	(D)	(E) = (B)+(C)	(F) = (B) + (D)	(G) = (F)/(E)
	<u>Comprehensive</u> \$500	<u>Glass</u> \$0	<u>Glass</u> \$100	<u>Comp. \$500 &amp; Glass \$0</u>	<u>Comp. \$500 &amp; Glass \$100</u>	<u>Savings Due to the \$100 Glass Ded.</u>
(1) Deductible						
(2) Claim Cost Trend from Exhibit 5	0.989	0.989	0.989			
(3) Detrended Deductible = (1)/(2)	\$506	\$0	\$101			
(4) Losses in Excess of Detrended Deductible						
<u>Coverages</u>						
35, 134, 135, 234, 334, 434, 534 - \$300 deductible	\$23,344,179	\$26,645,191	\$19,062,862	\$49,989,370	\$42,407,041	84.8%
37, 136, 137, 236, 336, 436, 536 - \$500 deductible	\$55,557,740	\$70,761,218	\$50,710,502	\$126,318,958	\$106,268,242	84.1%
ALL	\$78,901,919	\$97,406,409	\$69,773,364	\$176,308,328	\$148,675,283	84.3%

(5) Rate Components (From Exhibit 4A)

A) Losses	0.73
B) Fixed Expenses	0.07
C) Variable Expenses	0.20

(6) Deductible Relativities to Final

"\$500 Deductible" Premiums	<u>Coverages</u>	<u>Indicated Relativity</u>
= [ (4) x (5A) ] + (5B) ] / [ 1.0 - (5C) ]	35, 234, 434	86.1%
	37, 236, 436	85.5%
	35, 37, 234, 236, 434, 436	85.7%

(7) Selected Relativity for \$100 Glass Deductible

(Equal to Decision 2007 value.)	86.0%
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\* 2009 deductibles must be adjusted to 2007 cost levels in order to produce appropriate entry points to the 2007 size-of-claim distributions.