



C-57: Wheels – Commercial Auto is Getting Personal

CAS Annual Meeting, November 11, 2019
Honolulu, Hawaii

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Concurrent Session C-57: Wheels – Commercial Auto is Getting Personal



- This session will provide an update to the Commercial Auto industry experience, most recently presented at CAre and last years CLRS sessions: ***“the Wheels series”***
- Although there has been significant rate improvements in the past few years, recent results have still been rather challenging
- This session will give a brief history starting in 2010, including an analysis of recent trends, lengthening LDFs, emergence issues, and pressures on ILFs with an updated view through 2019
- A comparison of commercial and personal auto trends, and drivers, will be explored
- An underwriter / commercial auto product manager who has lived through the wheels ups and downs over the last decade will give also their experience from a ground level perspective, including an investigation into what’s driving the recent results including societal measures, juries, etc.
- An overview of the largest claims affecting umbrella, as well as the road ahead will be explored

C-57: Wheels Commercial Auto is Getting Personal

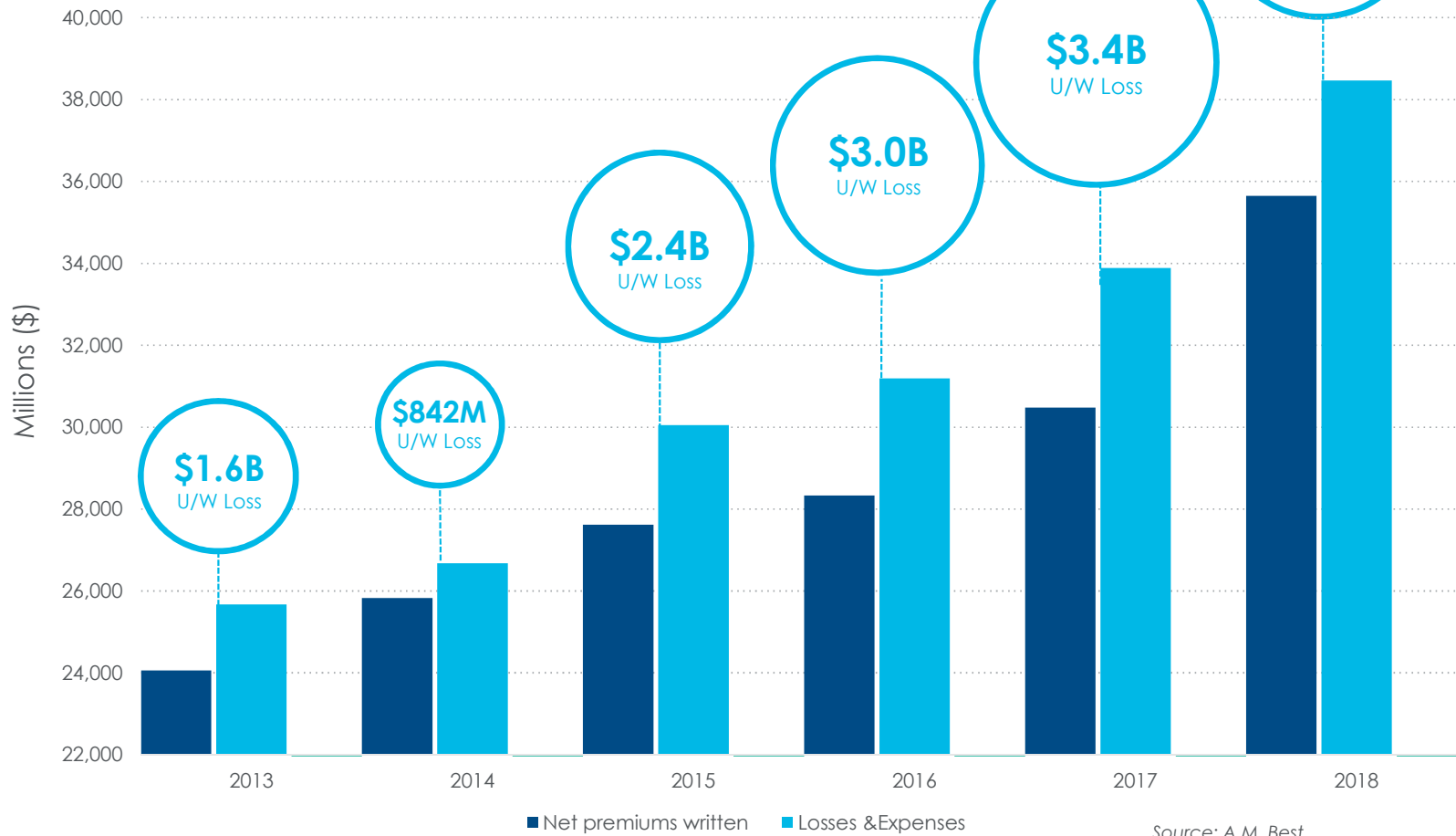


- **Introduction – John 5 mins**
 - Overall industry results through 12/31/2018
- **Commercial Auto Update – John 20 mins**
 - Recap of industry experience from 2010 to 2018, view at 2019
 - Review trends, LDFs, loss ratios, segments, ground-up vs excess, competitive underwriting cycle, rate changes, emergence lags, ILF pressures
 - Review of personal auto vs. commercial auto trends and results
 - Claim drivers / trends
- **An underwriting managers perspective – Jen 20 mins**
 - State of the market for commercial and personal auto, including societal factors, jury impact, etc.
 - What is impact on portfolio loss ratios, reserving?
 - What is potential underwriting response? Rating factors and benefits? Umbrella component?
 - What's next with future auto trends for actuaries and other professionals?
- **Q&A 5 mins**
 - Wrap-up thoughts and personal touch





Losses versus premiums – Commercial Auto



Update of Commercial Auto Views from 2010 - 2018



Commercial Auto – View at 2010



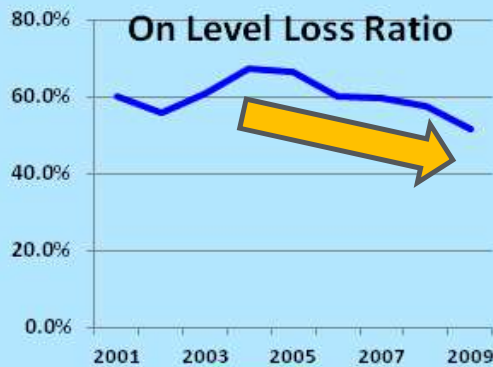
Holistic view at 2010:

- On level loss ratios going down since 2004
- Frequencies steadily reducing from early 2000s
- Severities overall recently flat
- Relatively quick LDF duration
 - avg GU reported loss = 1.2 yrs
 - avg paid = 2.4 yrs
- Moderate reductions in rates since 2005
- Mostly BI claims – but their trends ok as well
- The interconnected on-level line graphs show what various IELRs would be at current rate levels (useful for residual trend analysis)
- Overall, the current on-level loss ratio compared to long term is 8 pts better (60.0% long-term vs. 51.9% current)

ISO Size-of-Loss Matrix

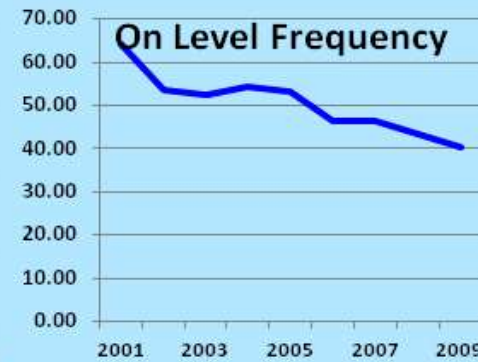
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Market Segment: Commercial Auto
Trucks Tractors and Trailers - All Companies
All Causes of Loss
Unlimited xs 0



Illustrative

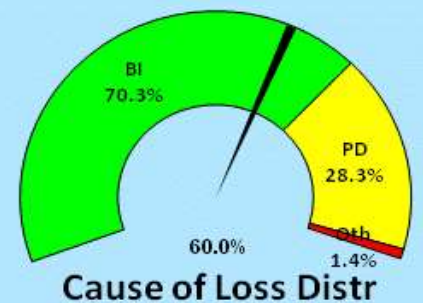
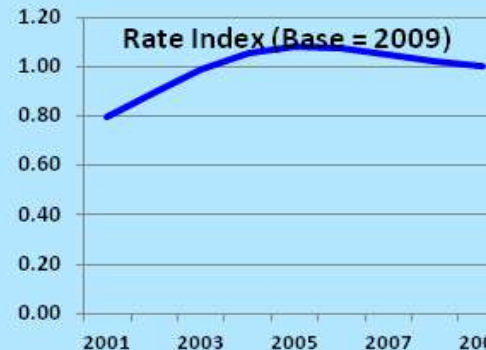
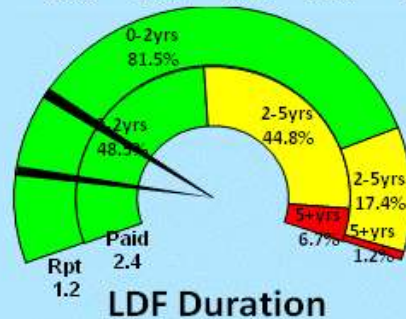
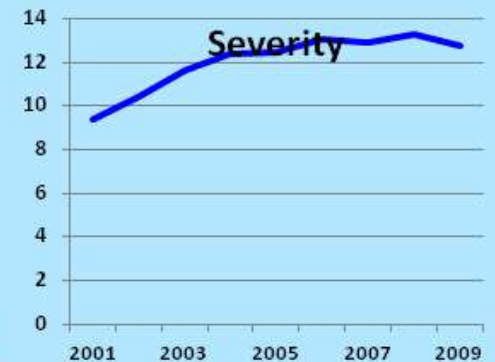
Est All Yr/Curr Yr LR: 60.0% / 51.9%
7 Year Severity Trend: 1.60%
All Year Trend: 3.69%
Avg Rep / Pay Duration: 1.2 / 2.4 Years



Loss Ratio Analytics: View At 2010 - TTT

SOLM 2017 v0.4.2

Total Premium 12/2009: 36,899,761,019
Total Incurred Loss & Alae: 31,174,002,891
Total Occurrences: 3,129,183
Total Exposure (Power Units): 260,470,867



Note: Loss development factors and durations use 5-year VWA and 3% detrending.
Rate changes from MarketWatch - Trucks Tractors and Trailers - Liability - 12/31/2016

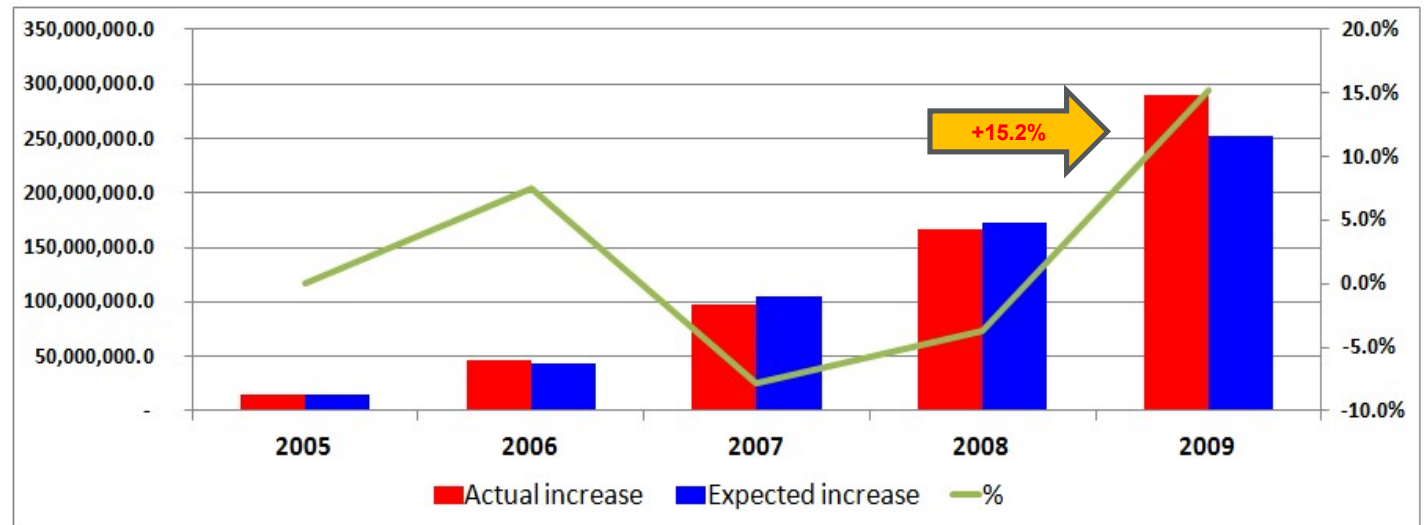
Commercial Auto – View at 2010



TTT Actual vs. Expected (ERLI Warning) – Excess Layer 900x100k *Illustrative*

Check to see if any early warning development signs in various layers and components.

Overall ok, except AY 2009 indicates a bit of a blip up – 252M expected, but 290M actual, or 15.2% adverse development.



AY	Actual n-6	Actual n-5	5-Yr ATA	Expected n-5	AY	Actual increase	Expected increase	Actual - Expected	%
2005	1,097,265,890	1,112,068,639	1.0135	1,112,059,126	2005	14,802,749.0	14,793,235.6	9,513.4	0.1%
2006	1,066,637,325	1,112,815,458	1.0403	1,109,570,434	2006	46,178,133.0	42,933,109.1	3,245,023.9	7.6%
2007	991,509,745	1,088,630,104	1.1063	1,096,882,077	2007	97,120,359.0	105,372,332.4	(8,251,973.4)	-7.8%
2008	722,271,219	888,533,303	1.2391	894,986,382	2008	166,262,084.0	172,715,163.5	(6,453,079.5)	-3.7%
2009	334,768,535	624,898,496	1.7525	586,678,587	2009	290,129,961.0	251,910,051.5	38,219,909.5	15.2%
2010		372,698,496			2010				
Sum x2010	12,419,753,463	13,029,933,029		13,010,201,530	Sum x2015	610,179,566	590,448,067	19,731,499	3.3%
1996-1999	3,028,045,461	3,027,332,760		3,027,933,529	2001-2004	(712,701)	(111,932)	(600,769)	-536.7%
2000-2004	5,179,255,288	5,175,654,269		5,182,091,395	2005-2009	(3,601,019)	2,836,107	(6,437,126)	-227.0%
2005-2009	4,212,452,714	4,826,946,000		4,800,176,606	2010-2014	614,493,286	587,723,892	26,769,394	4.6%

Commercial Auto – View at 2014



Due to frequencies and severities both ticking up since 2009, and rate levels not reacting until 2013, overall 2013 TTT IELR went from 51.9% to 62.8%

ISO Size-of-Loss Matrix

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Market Segment: Commercial Auto
Trucks Tractors and Trailers - All Companies
All Causes of Loss
Unlimited xs 0

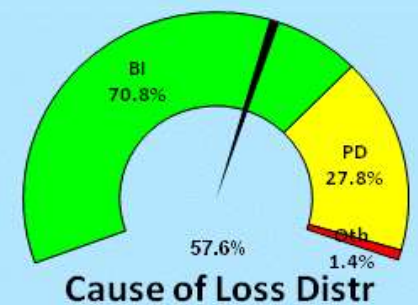
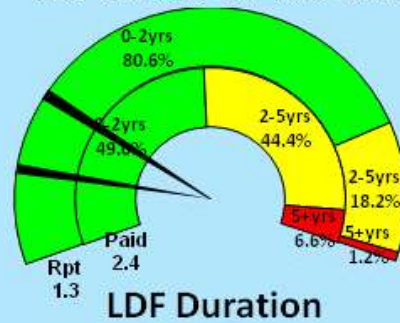
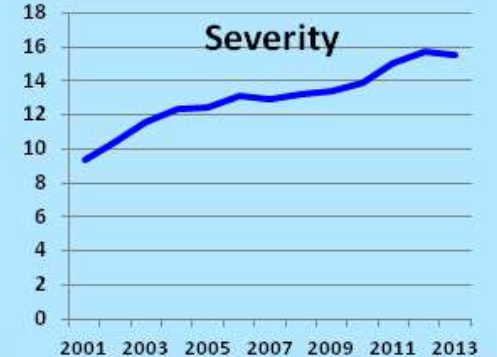
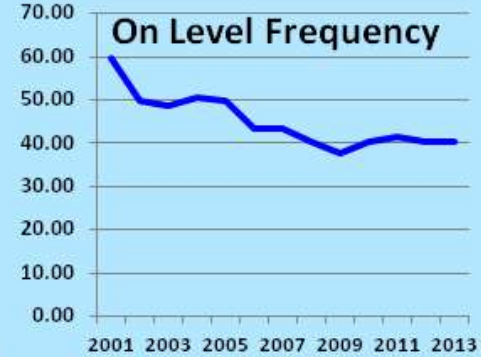
Illustrative

Est All Yr/Curr Yr LR: 57.6% / 62.8%
7 Year Severity Trend: 3.67%
All Year Trend: 3.66%
Avg Rep / Pay Duration: 1.3 / 2.4 Years

Loss Ratio Analytics: View At 2014 - TTT

CSL17 2017 v0.4.2

Total Premium 12/2013: 52,517,171,135
Total Incurred Loss & Alae: 41,012,115,025
Total Occurrences: 3,797,565
Total Exposure (Power Units): 389,863,143



Note: Loss development factors and durations use 5-year VWA and 3% detrending.
Rate changes from MarketWatch - Trucks Tractors and Trailers - Liability - 12/31/2016

Commercial Auto – View at 2016

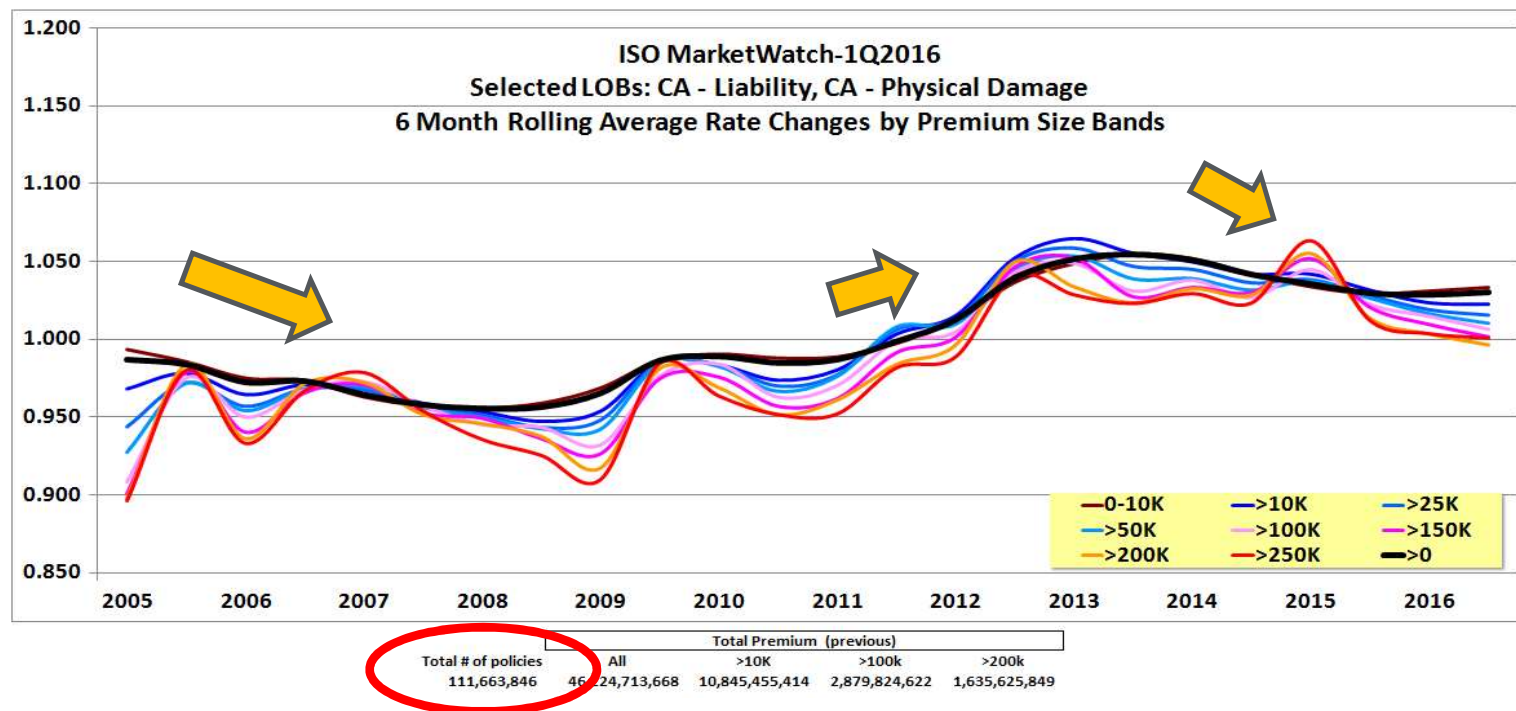


Incremental Rate Changes Through 3/31/2016 - Liability & Physical Damage

Rates reducing from 2005 to 2011, and importantly didn't go positive until 2012 even though loss trends changed direction 3 years earlier.

Larger policies, in general have larger rate reductions, and back to flat early 2016.

Illustrative



Source: ISO MarketWatch – released 6/15/2016; further details in Commercial Actuarial Panel – December 2016

Commercial Auto – View at 2016

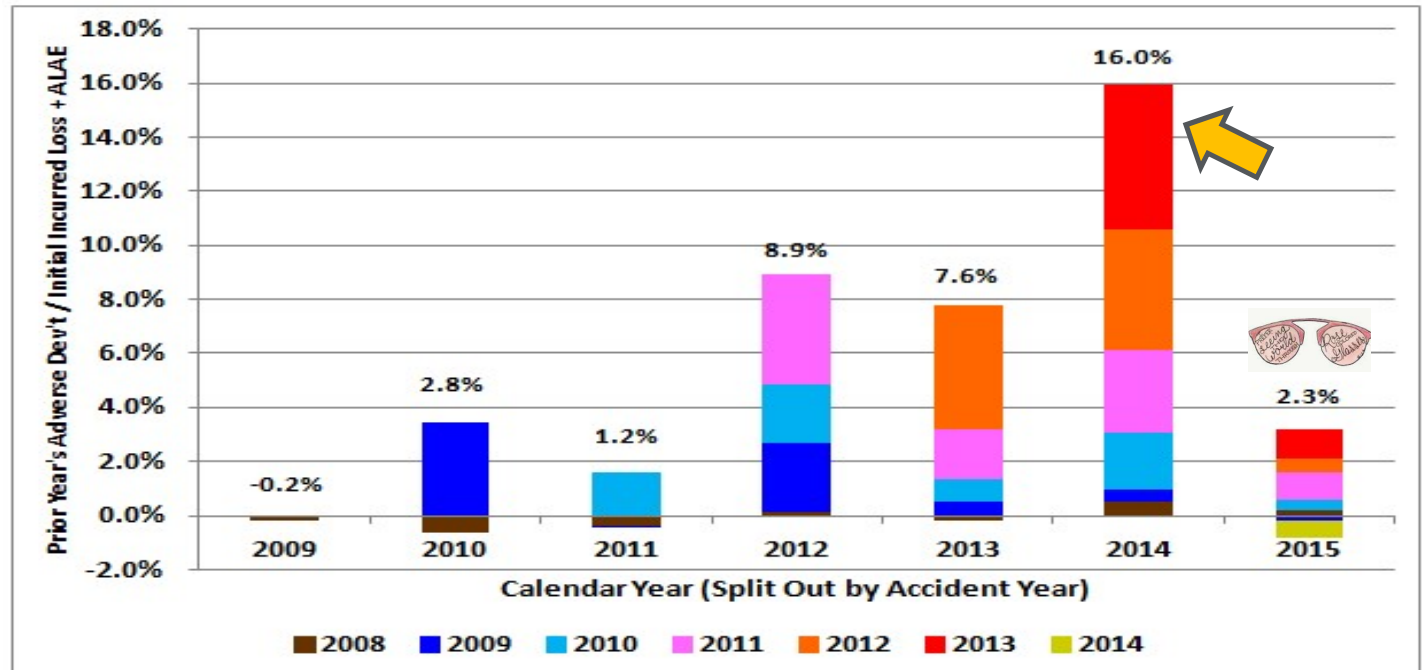


Illustrative

Commercial Auto – TTT - ERLI Warning through 2015 – Calendar Year

Each calendar year since 2010 had adverse development due to lengthening loss development factors. Calendar year 2014 being by far the most adverse, with all accident years contributing.

First look at 2015 appears to be not as adverse as prior years.



Source: ISO SOLM 2016 v1 - losses developed to ultimate using 5-year VWA (refresh each year); premiums developed to ultimate using Earned Premium triangle
 ISO MarketWatch for Rate changes - Auto Commercial Liability - through 12/31/2015 (adjusted policy year to accident year using 6 mo policy term assumption)
 CY adverse development for AYS 2009-2014: approximately 40% in CY2014 (about 20% each in CY2013 and CY2012)

Commercial Auto – View at 2017



The IELR for 2016 has moved to 73.0%, up from 51.9% at 2009. Rebounded frequency, heightened severity trends, lengthening development factors, coupled with rates that were still going down through 2012 account for the over 20 point increase.

ISO Size-of-Loss Matrix

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Market Segment: Commercial Auto
Trucks Tractors and Trailers - All Companies
All Causes of Loss
Unlimited xs 0

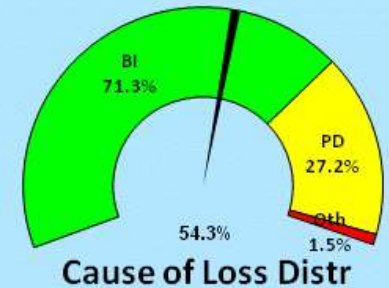
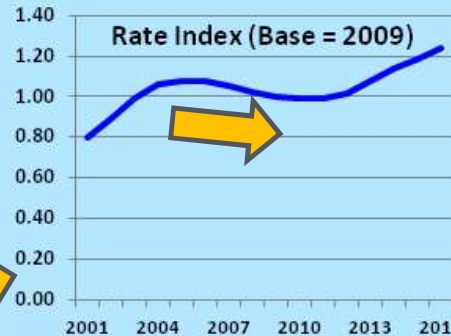
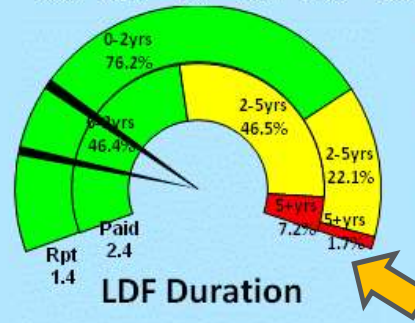
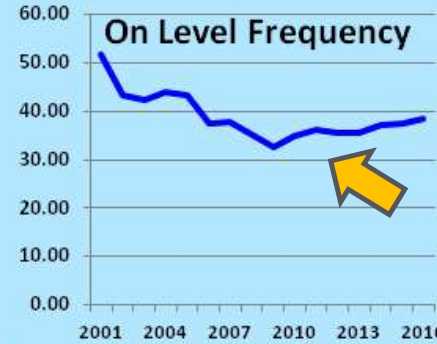
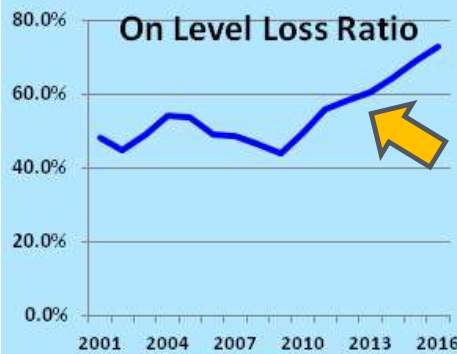
Illustrative

Est All Yr/Curr Yr LR: 54.3% / 73.0%
7 Year Severity Trend: 4.50%
All Year Trend: 4.18%
Avg Rep / Pay Duration: 1.4 / 2.4 Years

Loss Ratio Analytics: View At 2017 - TTT

SOLM 2017 v0.4.2

Total Premium 12/2016: 66,691,448,966
Total Incurred Loss & Alae: 50,729,706,680
Total Occurrences: 4,356,050
Total Exposure (Power Units): 492,788,066



Note: Loss development factors and durations use 5-year VWA and 3% detrending.
Rate changes from MarketWatch - Trucks Tractors and Trailers - Liability - 12/31/2016

Source: SOLM 2017v1 pre-release

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Commercial Auto View at 2019



Commercial Auto – View at 2019



There has been a steady decline in on-level results since 2009.

Overall loss ratios ticked up again in 2018 due to continued higher average severity trends (1.6% 7-year trend 2009 to now 5.9%), lengthening tail and continued adverse actual vs. expected losses. The recent improvement in rates is not enough to totally reverse the higher loss levels.

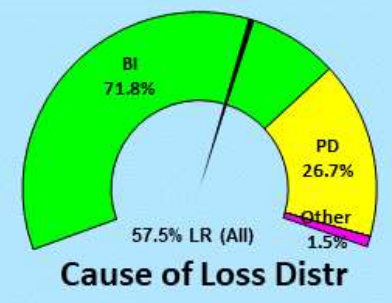
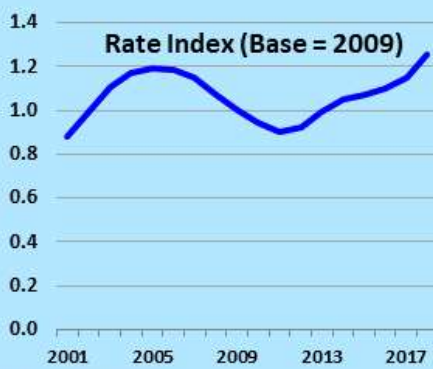
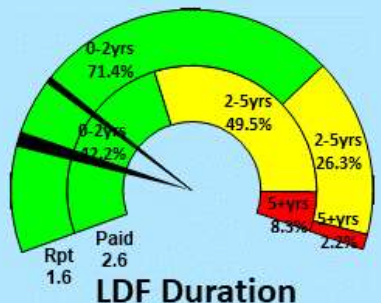
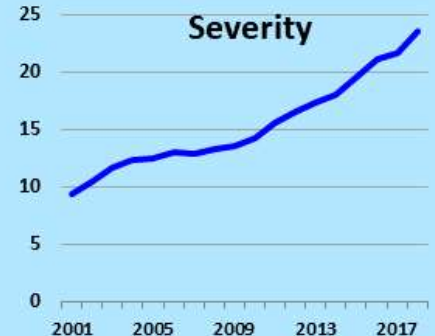
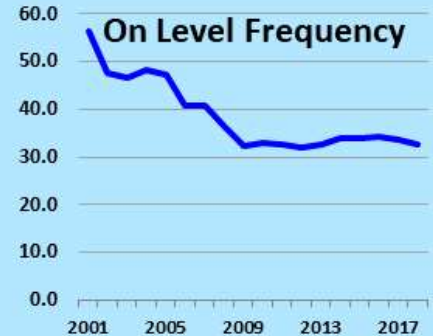
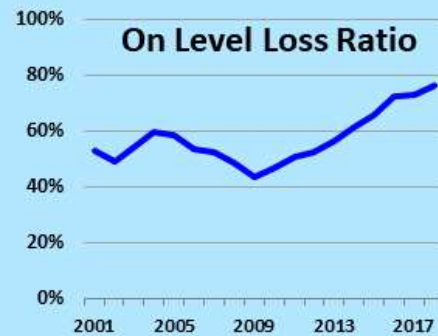
The current TTT loss ratio of 76.7%, is 19.2 points worse than longer term on-level average of 57.5%.

ISO Size-of-Loss Matrix

© Insurance Services Office, Inc., 2019
 Market Segment: Commercial Auto
 Trucks Tractors and Trailers
 All Companies - All Hazard Groups
 All Causes of Loss
 Unlimited xs 0 Countrywide

Loss Ratio Analytics: View at 2019 - TTT

Illustrative
 Est All Yr/Curr Yr LR: 57.5% / 76.7%
 7 Year Severity Trend: 5.87%
 All Year Trend: 4.80%
 Avg Rep / Pay Duration: Rpt 1.6 / Paid 2.6 Years
 Total Premium 12/2018: 77,083,835,931
 Total Incurred \$ Indemnity+Alae (Prorata): 58,610,498,786
 Total Occurrences: 4,718,129



Note: Loss development factors and durations use 3-year VWA and 3% detrending
 Rate Changes from MarketWatch - Trucks, Tractors and Trailers - Liability - New and Renewal Policies - 12/31/2018

Source: SOLM 2019v1 pre-release (using expanded MarketWatch method 3-new and renewal including impacts from ILFs)

Commercial Auto – View at 2019

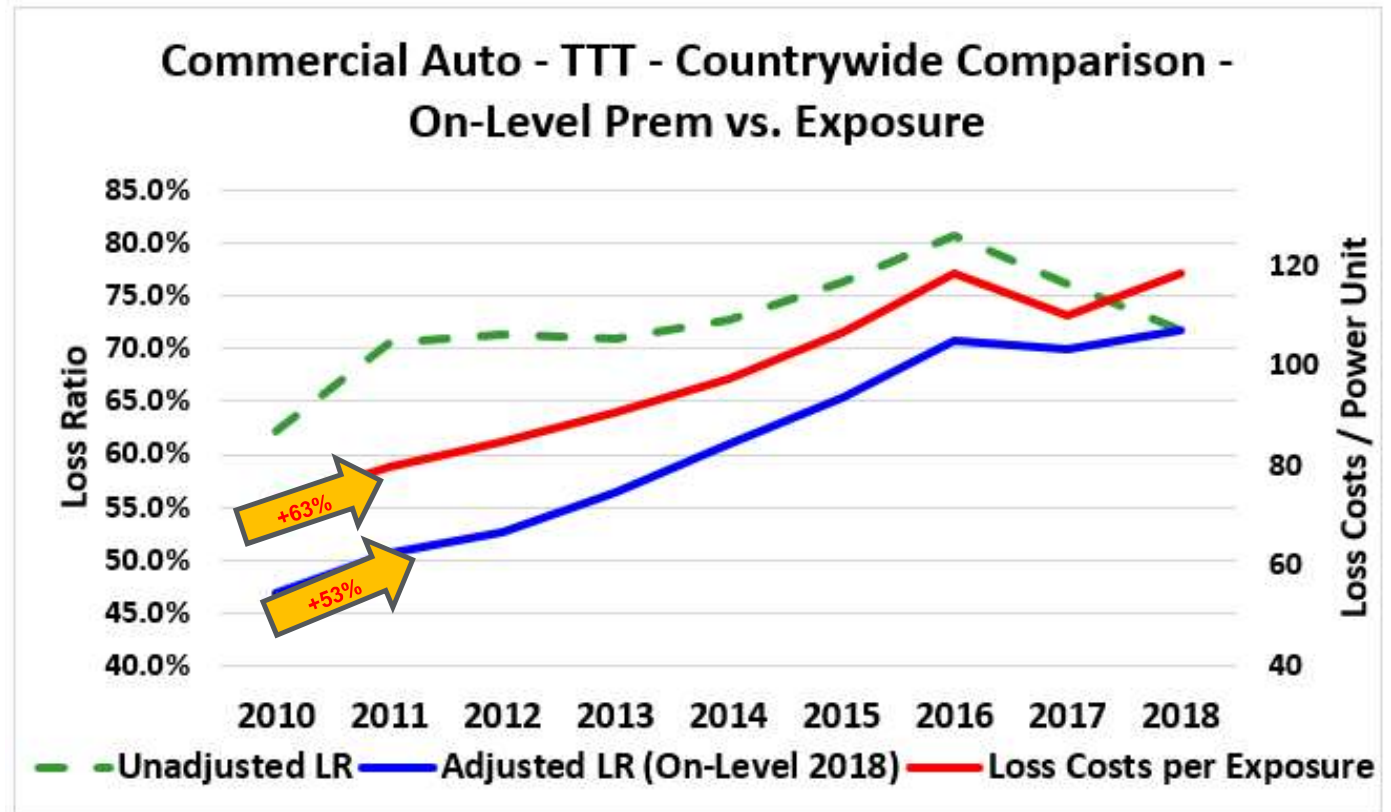


Commercial Auto Trend – TTT – Comparison On-level premium vs. Power Units

Illustrative

Overall increase in cost per on-level premium up by 63% per power unit, and up by 53% per on-level premium.

Small deterioration in 2018 due to continuing lengthening tails and adverse development.



Source: SOLM 2019v1 pre-release; losses developed using 7-yr VWA; uses ISO MarketWatch 12/31/2018 rate changes – CA-TTT Liability; power units in months

Commercial Auto – View at 2019



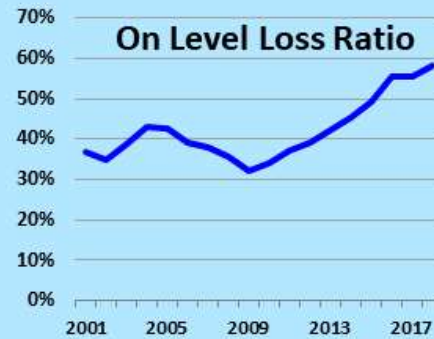
Bodily injury is a somewhat larger portion of total (71.8% vs. 70.3% in 2009), and longer average reported loss and payment duration.

BI shows higher frequency trends but lower severity trends than total and PD.

ISO Size-of-Loss Matrix

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Market Segment: Commercial Auto
Trucks Tractors and Trailers
All Companies - All Hazard Groups
Bodily Injury
Unlimited xs 0 Countrywide



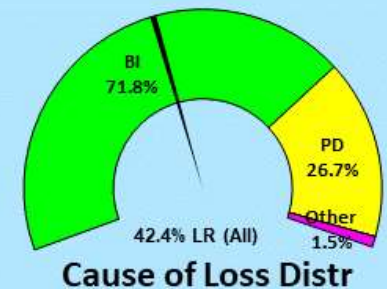
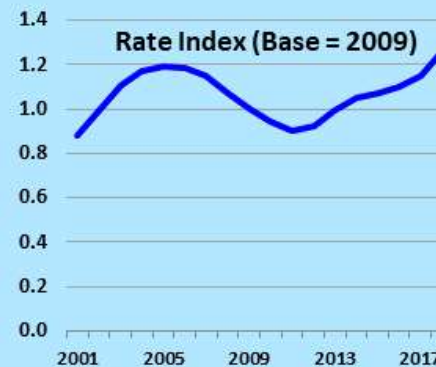
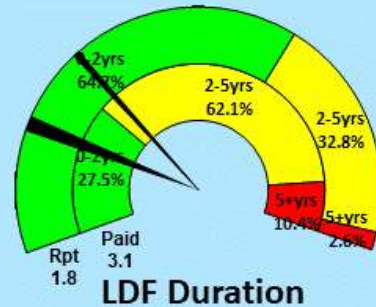
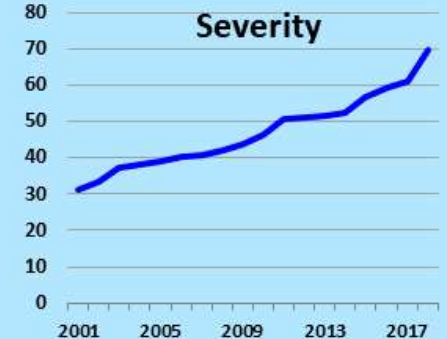
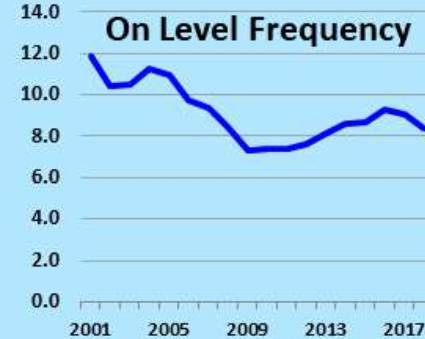
Loss Ratio Analytics: View at 2019 - TTT BI

Illustrative

SOLM 2019 v0.2

Est All Yr/Curr Yr LR: 42.4% / 58.3%
7 Year Severity Trend: 4.31%
All Year Trend: 4.07%
Avg Rep / Pay Duration: Rpt 1.8 / Paid 3.1
Years

Total Premium 12/2018: 77,083,835,931
Total Incurred \$ Indemnity+Alae (Prorata): 42,081,798,487
Total Occurrences: 1,091,989



Note: Loss development factors and durations use 3-year VWA and 3% detrending
Rate Changes from MarketWatch - Trucks, Tractors and Trailers - Liability - New and Renewal Policies - 12/31/2018

Source: SOLM 2019v1 pre-release using on-level premium as base

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Commercial Auto – View at 2019



PD excess of 25k shows somewhat lower frequency trends but somewhat higher overall average severity trends, rising from 21k in 2008 to 40k in 2017 (90% increase)

ISO Size-of-Loss Matrix

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Market Segment: Commercial Auto
Trucks Tractors and Trailers
All Companies - All Hazard Groups
Property Damage
Unlimited xs 25,000 Countrywide

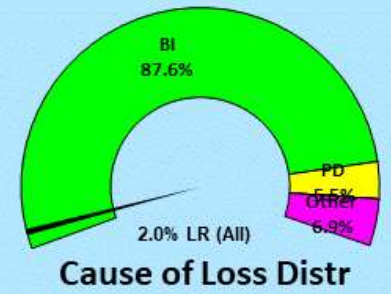
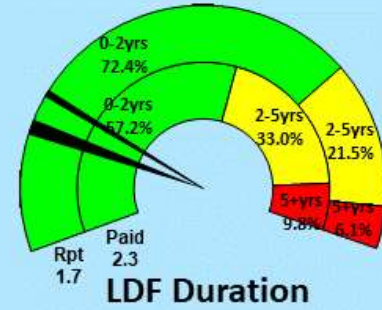
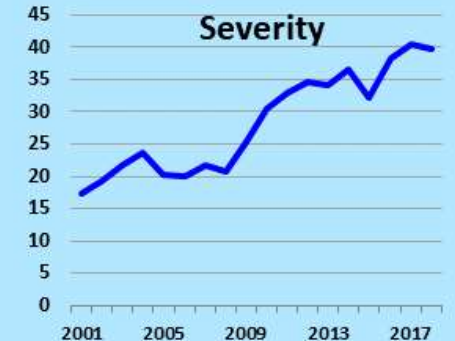
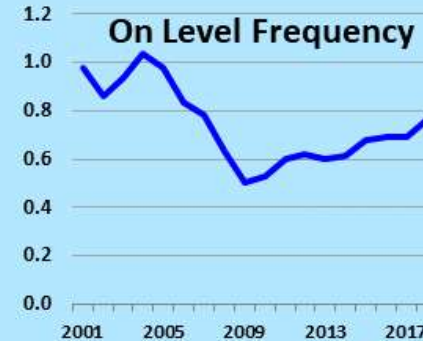
Illustrative

Est All Yr/Curr Yr LR: 2.0% / 3.0%
7 Year Severity Trend: 2.78%
All Year Trend: 5.06%
Avg Rep / Pay Duration: Rpt 1.7 / Paid 2.3
Years

Loss Ratio Analytic - PD Excess of 25k

SOLM 2019 v0.2

Total Premium 12/2018: 77,083,835,931
Total Incurred \$ Indemnity+Alae (Prorata): 1,988,125,946
Total Occurrences: 84,286



Note: Loss development factors and durations use 3-year VWA and 3% detrending
Rate Changes from MarketWatch - Trucks, Tractors and Trailers - Liability - New and Renewal Policies - 12/31/2018

Source: SOLM 2019v1 pre-release using on-level premium as base

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Commercial Auto – View at 2019



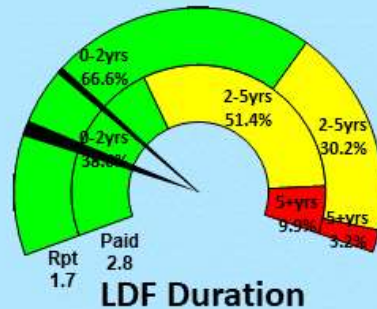
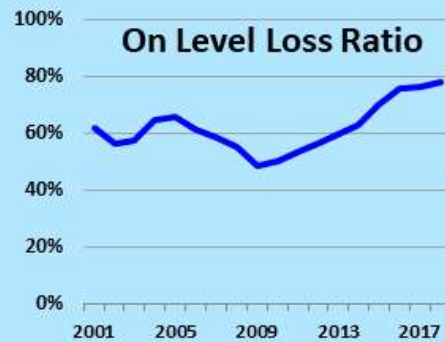
For all of Commercial Auto (TTT is about half of the 8 CAU markets out of 47 total commercial markets we analyze), the current loss ratio is 78.3%, vs. long-term on-level average of 62.2%.

Recent somewhat higher overall severity trends (5.6% vs. 4.3% accounting for some of the difference).

ISO Size-of-Loss Matrix

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Market Segment: Commercial Auto
 Total Commercial Auto Liability
 All Companies - All Hazard Groups
 All Causes of Loss
 Unlimited xs 0 Countrywide

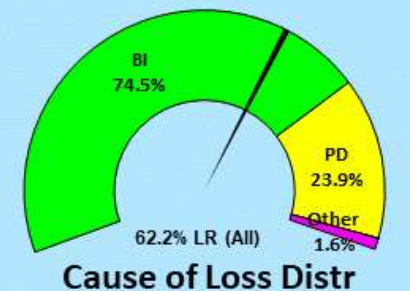
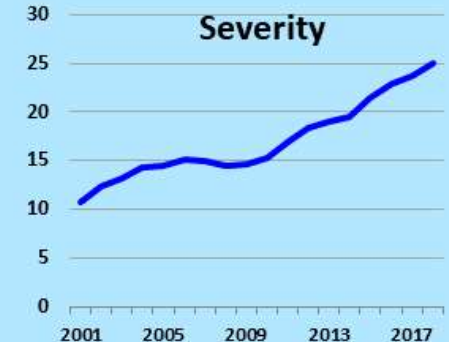
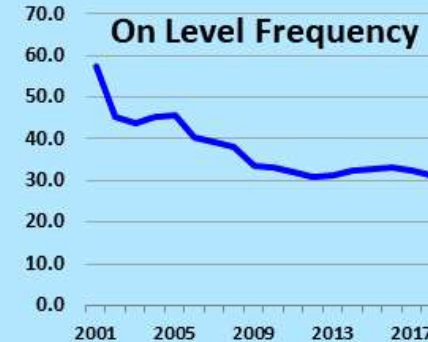


Loss Ratio Analytics: View at 2019 - All CAU

SOLM 2019 v0.2

Est All Yr/Curr Yr LR: 62.2% / 78.3%
 7 Year Severity Trend: 5.59%
 All Year Trend: 4.28%
 Avg Rep / Pay Duration: Rpt 1.7 / Paid 2.8 Years

Total Premium 12/2018: 156,248,734,636
 Total Incurred \$ Indemnity+Alae (Prorata): 116,774,857,965
 Total Occurrences: 8,366,671



Note: Loss development factors and durations use 3-year VWA and 3% detrending
 Rate Changes from MarketWatch - Trucks, Tractors and Trailers - Liability - New and Renewal Policies - 12/31/2018

Source: SOLM 2019v1 pre-release using on-level premium as base

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Commercial Auto – View at 2019

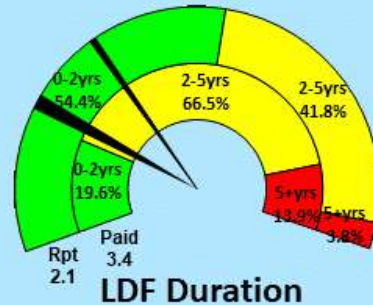
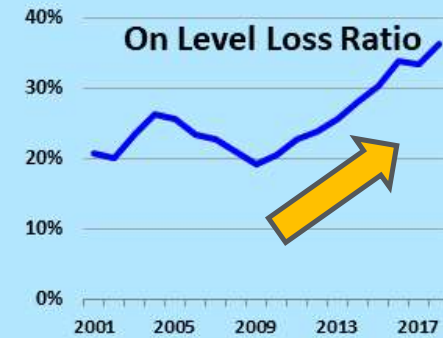


Continued significant pressure on increased limits factors for layer 4.9M xs of 100k, going from low 20% in 2009 to above 35% currently, driven by higher frequency and steady severity trend.

ISO Size-of-Loss Matrix

© Insurance Services Office, Inc., 2019

Market Segment: Commercial Auto
Trucks Tractors and Trailers
All Companies - All Hazard Groups
All Causes of Loss
4,900,000 xs 100,000 Countrywide

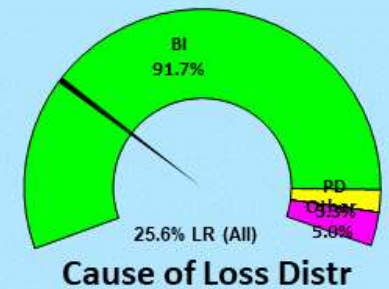
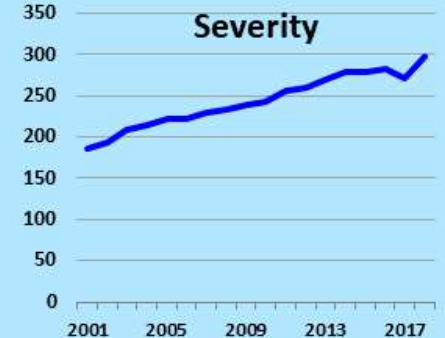
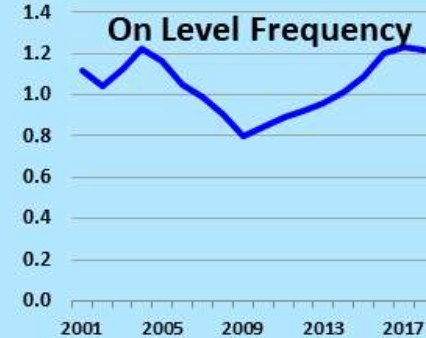


Loss Ratio Analytics: View at 2019 **TTT Excess**

SOLM 2019 v0.2

Est All Yr/Curr Yr LR: 25.6% / 36.3%
7 Year Severity Trend: 1.68%
All Year Trend: 2.49%
Avg Rep / Pay Duration: Rpt 2.1 / Paid 3.4 Years

Total Premium 12/2018: 77,083,835,931
Total Incurred \$ Indemnity+Alae (Prorata): 24,449,095,128
Total Occurrences: 110,969



Note: Loss development factors and durations use 3-year VWA and 3% detrending
Rate Changes from MarketWatch - Trucks, Tractors and Trailers - Liability - New and Renewal Policies - 12/31/2018

Source: SOLM 2019v1 pre-release using on-level premium as base

SERVE | ADD VALUE | INNOVATE

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Commercial Auto – View at 2019



Continuing Reported Lengthening Loss Development – 4.9M vs 100k

Illustrative

LDF Factors continue to lengthen in 2018, but a little reduced from 2017. All views at 2018 use 3-year averages – if use more recent or trend LDFs, indications would be higher.

Incurred \$ Indemnity+Alae (Prorata) Triangle

	12	24	36	48	60	72	84	96	108
AY 1997	366,271,909	629,259,713	773,865,934	866,648,011	936,800,687	968,369,262	974,701,562	977,431,450	978,621,158
AY 1998	375,354,366	636,637,520	804,314,841	934,657,849	986,336,086	1,007,993,894	1,017,451,625	1,018,677,715	1,020,692,657
AY 1999	382,086,421	650,791,328	876,836,459	1,013,540,855	1,063,679,090	1,089,741,134	1,101,707,233	1,106,121,564	1,107,005,960
AY 2000	384,090,934	694,924,486	927,390,950	1,063,681,468	1,129,598,828	1,144,832,828	1,146,667,597	1,153,557,895	1,153,278,350
AY 2001	376,491,010	669,582,765	891,592,233	1,048,999,886	1,087,254,625	1,096,062,840	1,102,186,160	1,104,970,928	1,102,823,818
AY 2002	384,387,866	673,917,695	875,373,707	970,076,282	997,124,393	1,022,631,079	1,026,986,046	1,028,554,177	1,028,597,897
AY 2003	415,623,273	723,503,548	907,994,887	1,034,112,564	1,074,303,699	1,093,818,177	1,096,480,717	1,095,317,565	1,098,265,531
AY 2004	455,593,140	786,690,773	980,695,177	1,085,326,318	1,136,075,387	1,156,759,387	1,159,294,204	1,162,875,129	1,165,006,856
AY 2005	464,620,762	790,789,101	976,101,567	1,096,675,366	1,141,596,584	1,165,315,917	1,175,241,854	1,178,780,056	1,179,408,655
AY 2006	454,875,727	785,205,740	991,201,649	1,094,043,187	1,147,973,822	1,166,006,174	1,172,234,323	1,174,864,556	1,177,526,351
AY 2007	464,391,060	785,382,389	981,301,778	1,092,746,044	1,143,956,359	1,167,873,066	1,175,399,269	1,175,956,208	1,178,927,190
AY 2008	431,490,202	714,509,258	893,011,485	996,392,925	1,039,881,463	1,057,479,705	1,067,520,984	1,070,579,626	1,070,456,918
AY 2009	323,876,450	609,296,213	772,878,835	890,726,876	937,732,714	958,937,493	961,773,794	970,627,150	974,143,438
AY 2010	357,736,004	643,776,496	842,080,312	952,478,642	1,022,986,960	1,044,946,761	1,058,527,118	1,068,499,468	1,070,530,932
AY 2011	407,872,355	754,233,242	968,743,573	1,119,846,576	1,192,455,976	1,227,671,711	1,240,185,950	1,240,002,330	
AY 2012	401,185,064	764,491,867	1,014,161,145	1,156,719,841	1,251,437,219	1,276,458,076	1,283,604,801		
AY 2013	422,604,578	809,603,603	1,062,304,770	1,273,591,289	1,378,897,215	1,406,032,269			
AY 2014	465,068,242	825,406,535	1,165,767,453	1,395,065,452	1,510,052,010				
AY 2015	480,974,014	957,940,977	1,292,650,775	1,555,195,568					
AY 2016	520,855,028	1,052,268,424	1,467,815,439						
AY 2017	516,963,559	1,028,496,445							
AY 2018	533,179,358								
15,2016,2017,2018:	18,651,685,350	19,991,009,783	21,693,642,350	23,466,872,149	25,339,333,392				

	24/12	36/24	48/36	60/48	72/60	84/72	96/84	108/96	120/108
AY 1997	1.718	1.230	1.120	1.081	1.034	1.007	1.003	1.001	1.001
AY 1998	1.696	1.263	1.162	1.055	1.022	1.009	1.001	1.002	1.001
AY 1999	1.703	1.347	1.156	1.049	1.025	1.011	1.004	1.001	1.000
AY 2000	1.809	1.335	1.147	1.062	1.013	1.002	1.006	1.000	0.999
AY 2001	1.778	1.332	1.177	1.036	1.008	1.006	1.003	0.998	1.000
AY 2002	1.753	1.299	1.108	1.028	1.026	1.004	1.002	1.000	0.999
AY 2003	1.741	1.255	1.139	1.039	1.018	1.002	0.999	1.003	1.001
AY 2004	1.727	1.247	1.107	1.047	1.018	1.002	1.003	1.002	1.000
AY 2005	1.702	1.234	1.124	1.041	1.021	1.009	1.003	1.001	1.001
AY 2006	1.726	1.262	1.104	1.049	1.016	1.005	1.002	1.002	0.998
AY 2007	1.691	1.249	1.114	1.047	1.021	1.006	1.000	1.003	1.001
AY 2008	1.656	1.250	1.116	1.044	1.017	1.009	1.003	1.000	1.003
AY 2009	1.881	1.268	1.152	1.053	1.023	1.003	1.009	1.004	1.002
AY 2010	1.800	1.308	1.131	1.074	1.021	1.013	1.009	1.002	
AY 2011	1.849	1.284	1.156	1.065	1.030	1.010	1.000		
AY 2012	1.906	1.327	1.141	1.082	1.020	1.006			
AY 2013	1.916	1.312	1.199	1.083	1.020				
AY 2014	1.775	1.412	1.197	1.082					
AY 2015	1.992	1.349	1.203						
AY 2016	2.020	1.395							
AY 2017	1.989								



Commercial Auto – View at 2019

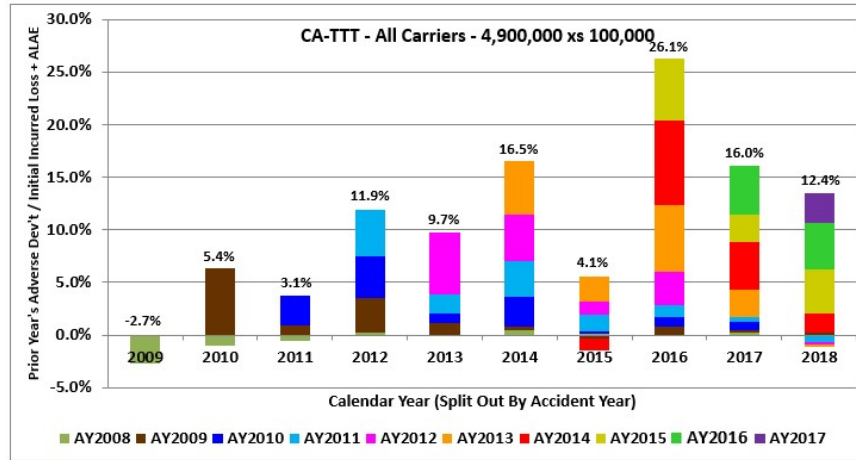


TTT – Reserve Run-off Test @12/31/2018 – 4.9M xs 100k

Illustrative

Comparing to initial selected excess losses at 12 months using a mechanical 7-year average, produces deterioration over 10% for accident years 2009 to 2015.

All subsequent years continue the same pattern of deterioration.



ISO SOLM 2019 v0.2 - Development Triangle and Analysis
Ex-ante Reserving Analysis Runoff Tests (through 12/31/2018)

Market Analysis: CA-TTT - All Carriers
Assumptions: Incurred \$ Indemnity+Alae (Included); 4,900,000 xs 100,000; 7 yr VWA (100% wt); 3.0% detrended threshold

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SOLM 2019 v0.2

Select Metric here:	Ultimate Est. INCURRED @12 mos	Adverse (Fav) Dev't	AY	CY2018	CY2017	CY2016	CY2015	CY2014	CY2013	CY2012	CY2011	CY2010	CY2009	CY2008	CY2007	CY2006	CY2005	CY2004	CY2003	CY2002	CY2001
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
% Adv (Fav)	914,672,523	55,004,345	2000	(149,526)	(12,969)	(32,937)	(268,198)	428,556	751,064	(607,756)	802,375	(1,248,338)	(1,738,864)	(1,800,048)	3,788,037	(8,528,913)	(14,752,487)	933,219	363,731	27,287,245	33,790,214
	1,030,520,535	19,423,691	2001	204,987	44,811	(353,667)	883,153	(257,936)	427,423	(1,056,698)	(838,452)	13,492	(3,136,207)	(1,578,861)	(1,578,861)	(16,157,672)	(26,084,853)	26,631,971	24,387,872	17,476,075	
	1,096,950,177	(61,799,427)	2002	29,377	(98,759)	313,757	487,981	910,625	1,060,439	286,885	(1,443,291)	(275,238)	(1,900,535)	(2,526,976)	5,706,522	(27,315,471)	(39,148,853)	(2,453,974)	4,568,099		
	1,187,871,265	(64,905,451)	2003	(116,164)	157,291	(216,500)	(864,367)	(691,995)	(1,003,319)	619,789	2,655,488	(4,539,423)	(4,261,782)	(2,806,325)	(12,971,455)	(5,818,594)	(33,973,135)	(1,074,359)			
	1,312,665,287	(90,975,121)	2004	354,180	739,903	208,821	206,039	(2,131,805)	(714,802)	1,408,631	716,088	(4,123,857)	(2,482,540)	(3,015,372)	(36,926,814)	(37,827,231)	(7,386,359)				
	1,313,629,072	(82,919,355)	2005	(397,442)	83,960	(800,944)	261,390	720,368	(231,440)	573,299	3,365,394	2,723,306	(4,767,989)	(17,515,421)	(48,218,206)	(19,315,629)					
	1,276,368,489	(58,142,154)	2006	(616,380)	145,709	392,731	(1,997,987)	2,030,150	(614,421)	314,577	(2,961,498)	6,469,934	(32,136,502)	(21,497,773)	(7,670,694)						
	1,296,167,825	(52,158,111)	2007	(1,362,517)	211,376	1,258,824	2,079,641	(2,401,203)	2,514,893	4,415,721	3,761,524	(14,779,587)	(22,584,477)	(25,272,307)							
	1,169,694,858	(43,279,772)	2008	(1,412,994)	3,029,016	(1,371,196)	1,236,736	4,752,053	(1,263,954)	2,367,386	(7,188,410)	(11,820,489)	(31,599,920)								
	851,722,167	111,698,428	2009	1,735,191	2,130,288	7,171,242	(2,463,517)	3,017,390	9,350,505	28,494,379	7,704,480	54,558,469									
	934,214,652	116,007,280	2010	20,484	7,117,893	7,962,160	2,541,704	27,196,581	8,512,767	36,248,920	26,406,771										
	1,055,367,249	129,521,817	2011	(5,321,642)	4,135,007	12,042,194	16,400,437	39,057,929	19,655,255	47,553,038											
	1,060,400,343	152,610,021	2012	(3,121,749)	(1,503,602)	33,443,153	13,511,654	47,816,787	62,461,791												
	1,144,654,195	186,117,036	2013	(1,987,974)	29,711,290	73,296,020	27,524,627	57,493,073													
	1,307,956,545	173,239,388	2014	24,590,126	60,368,674	104,304,556	(15,824,168)														
	1,379,052,998	174,653,885	2015	57,482,468	35,873,479	81,297,326															
	1,605,890,677	146,562,758	2016	71,540,558	75,122,200																
	1,666,424,210	46,137,114	2017	46,137,114																	

Minimum	Maximum	Actual vs Expected Development: AY x CY
-3.7%	-1.3%	16 Favorable development
-0.1%	0.1%	40 Somewhat favorable
0.1%	2.7%	54 Within +0.1% of original estimate
2.7%	8.0%	40 Somewhat adverse
		21 Adverse development

Sources: Using pre-release SOLM 2019 v2 – mechanical selections of VWA (100% 7-year)

Commercial Auto – View at 2019

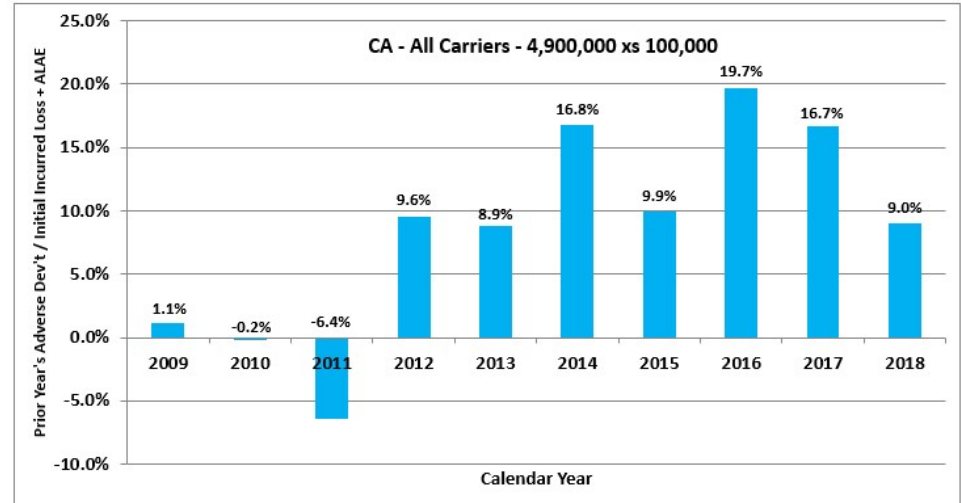


All CAu – Reserve Run-off Test @12/31/2018 – # xs 100k

Illustrative

Comparing to initial selected excess loss frequencies at 12 months using a mechanical 7-year average, produces deterioration over 10% for accident years 2011 to 2015.

All years from 2009 have large loss deterioration



ISO SOLM 2019 v0.2 - Development Triangle and Analysis
Ex-ante Reserving Analysis Runoff Tests (through 12/31/2018)

Market Analysis: CA - All Carriers
Assumptions: Incurred # Occurrence Indemnity; 4,900,000 xs 100,000; 7 yr VWA (100% wt); 3.0% detrended threshold

Select Metric here:			CY2018	CY2017	CY2016	CY2015	CY2014	CY2013	CY2012	CY2011	CY2010	CY2009	CY2008	CY2007	CY2006	CY2005	CY2004	CY2003	CY2002	CY2001
% Adv. (Fav)	Ultimate Est. INCURRED @12 mos	Adverse (Fav) Dev't	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
3.9%	6,348	250	2000																	
1.2%	12,861	158	2001	1																
-4.4%	12,445	(553)	2002	2	1	4														
-2.9%	11,580	(331)	2003	(0)	2	0														
-5.6%	12,343	(697)	2004	4	2	(1)														
-6.6%	12,545	(830)	2005	1	(3)	2														
-7.3%	12,570	(914)	2006	5	1	5														
-4.1%	11,891	(489)	2007	11	2	3														
-3.5%	10,035	(349)	2008	3	(4)	6														
2.9%	8,140	235	2009	(3)	16	11														
5.4%	8,251	447	2010	3	17	52														
14.9%	7,918	1,181	2011	(4)	21	72	144													
12.8%	8,228	1,054	2012	(18)	14	132	153	446												
15.0%	8,407	1,265	2013	6	165	391	289	414												
14.6%	8,811	1,290	2014	84	400	564	242													
13.9%	9,581	1,336	2015	223	602	511														
5.4%	11,257	609	2016	259	349															
3.5%	11,562	404	2017	404																

Minimum	Maximum	Actual vs Expected Development: AY x CY	
-4.2%	-1.5%	15	Favorable development
-1.5%	-0.4%	31	Somewhat favorable
-0.4%	0.4%	73	Within +/-0.4% of original estimate
0.4%	2.5%	34	Somewhat adverse
2.5%	7.2%	18	Adverse development

Sources: Using pre-release SOLM 2019 v2 – mechanical selections of VWA (100% 7-year)

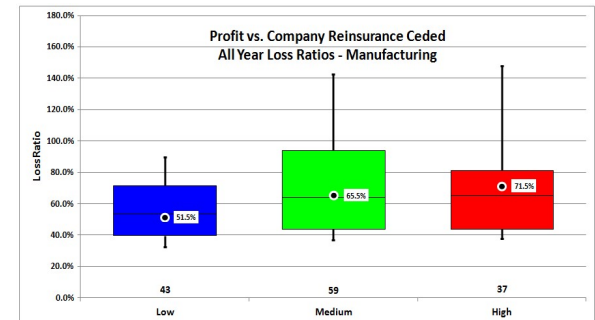
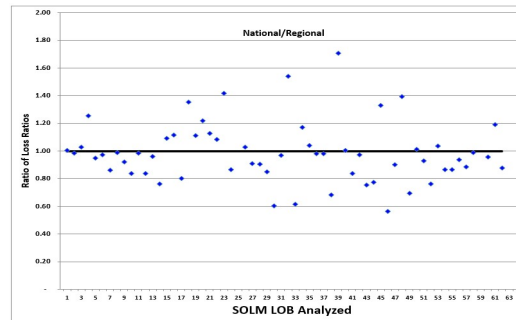
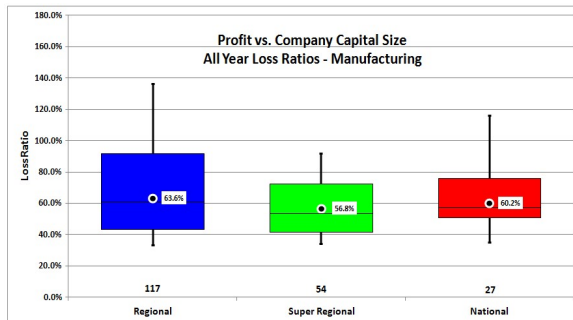
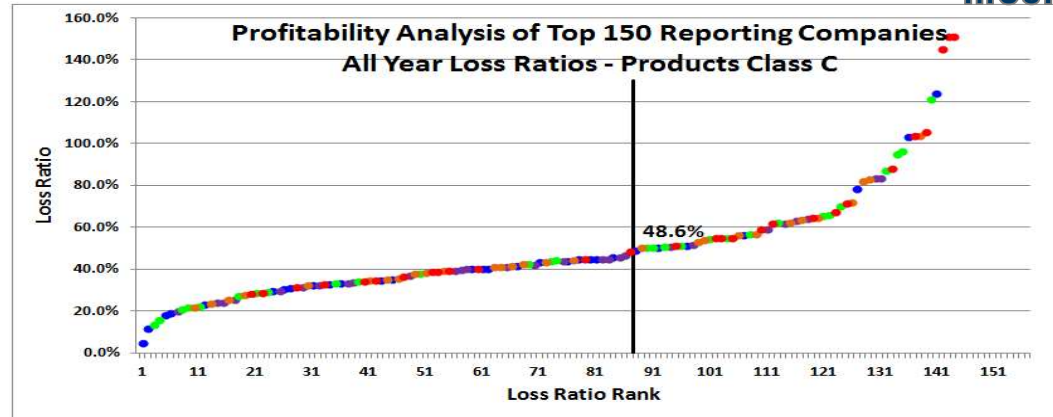
Underwriting Cycle Analysis – Initial Investigation



Illustrative

Research done over the last few years was centered around investigating why company results were so dramatically different from each other. Like the LDF patterns, we found companies had strikingly different results.

We investigated things like how correlated are capital size and reinsurance ceded to results. We did find there was some impact of each, but not overwhelming.



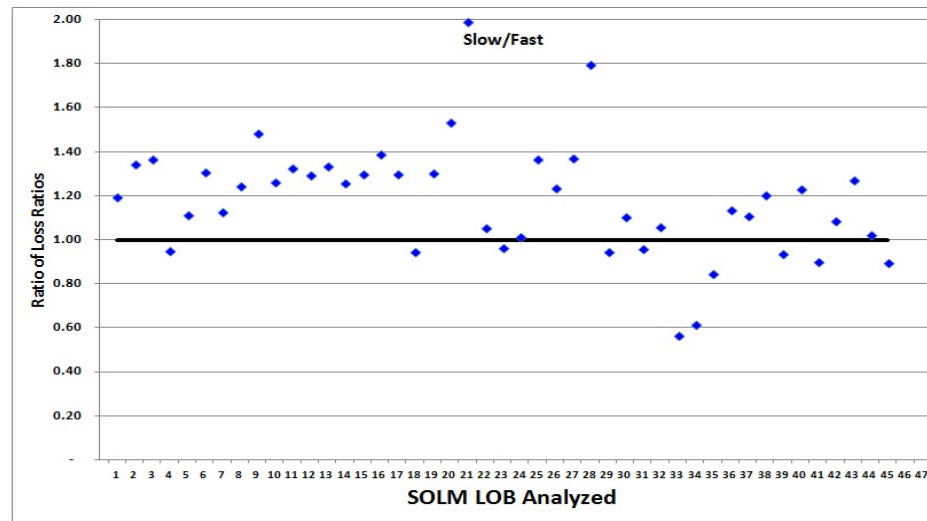
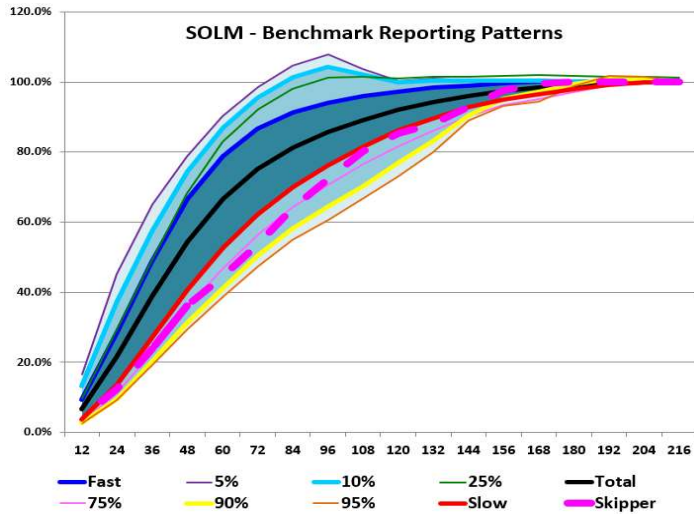
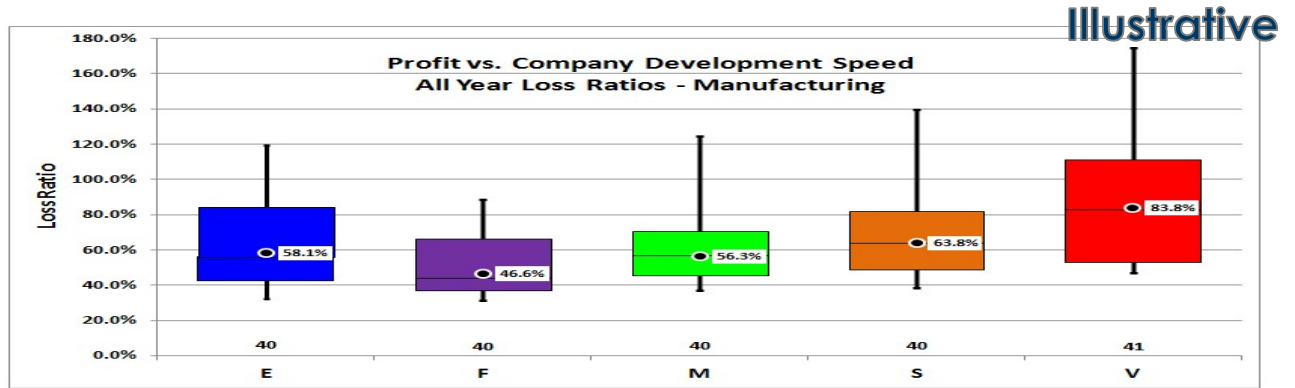
Note: Total loss ratios (2001-2016) use 20 year loss triangles and all-year LDFs; each individual company uses credibility weighted all-year industry factors, split between Fast and Slow for apriori

Source: Verisk Monday Webinar – 10/1/2018 – John Buchanan, Marni Wasserman (recorded)

Underwriting Cycle Analysis – Further Investigation Profit / LDF Speed



However when investigating LDF Speed and Profitability, we found a significant correlation. Companies that don't recognize the are longer than industry LDFs, very strongly have much worse ultimate loss ratios. Almost every one of the 44 markets we analyzed (besides short-tail property lines) experienced this important connection.



Note: See Verisk Monday Webinar on link between LDF Speed and Profitability (9/11/2017 – J. Buchanan and M. Wasserman)



We are investigating “why” profit is often strongly correlated to loss development speed. We have a few competitive marketplace hypotheses:

- The first is that **faster reporting companies** may get an **earlier more accurate reading** of results, and be able to reprice their business more quickly when circumstances change
- The second is that **slower companies**, especially those that **don't know they are slow**, may have a **downward bias** in establishing lower loss development **parameters** for their models
- Especially in a highly competitive environment, **slower LDF companies** may for example **assume** that losses are **fully reported by 8 years** rather than the full length of the pattern at 20+ years
- These companies may ultimately have higher loss ratios when the losses do indeed emerge against **lower charged premiums**
- There may also be an additional pricing component for longer tailed companies to factor in additional investment income. But this may be mitigated by lower interest rates and payment patterns that don't vary as much as the reporting patterns

ISO Size-of-Loss Matrix

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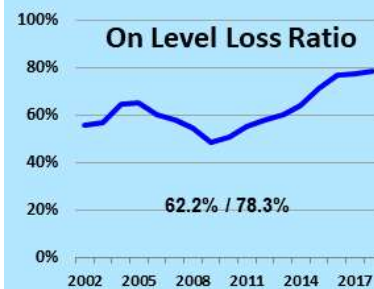
Market Segment: Commercial Auto Liability
 Total Commercial Auto Liability
 All Companies - All Hazard Groups
 All Causes of Loss
 Unlimited xs 0 Countrywide

Est All Yr/Curr Yr LR: 62.2% / 78.3%
 7 Year Severity Trend: 5.59%
 All Year Trend: 4.28%
 Avg Duration: Rpt 1.7 / Paid 2.8 Years

Fast/Slow Loss Ratio Analytics

SOLM 2019 v2

Total Premium 12/2018: 156,248,734,636
 Total Incurred \$ Indemnity+Alae (Prorata): 116,774,857,965
 Total Occurrences: 8,366,671
 VWA 3yr/all 100%/0%



Underwriting Cycle Analysis - Impact of Wrong Signals – Emergence Lag / Rate Changes



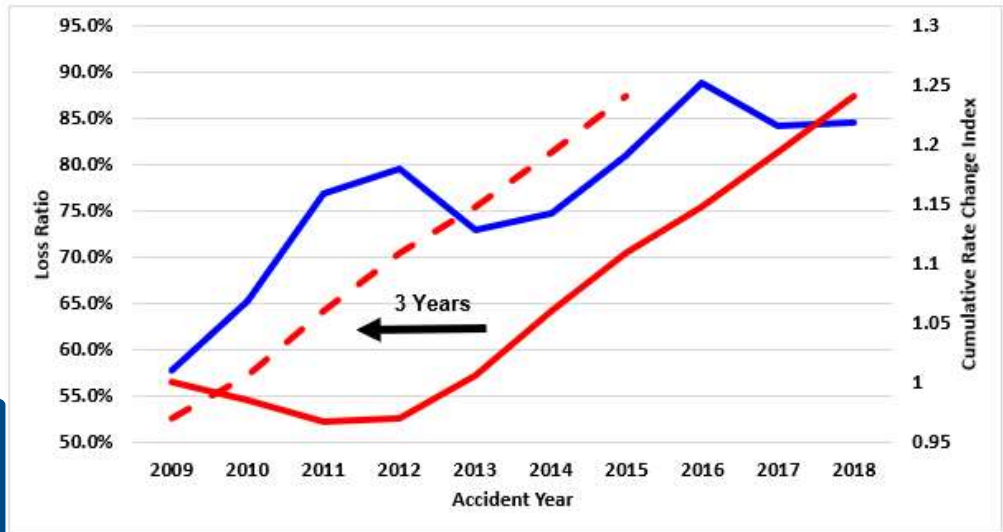
Illustrative

Emergence Lag Analysis

Market #2 - State Group Y - All Carriers

Incurred \$ Indemnity+Alae (Prorata); Unlimited xs 0; 7 yr VWA (100% wt); 3.0% detrended threshold

Nominal							
Year	CY	AY @2017	CY vs. AY Difference	Breakeven	Apparent Market	Actual Market	Incremental Rate Change
2001	77.3%	83.0%	5.7%	72.7%	Transitional	Soft	
2002	86.4%	74.1%	-12.3%	72.7%	Soft	Transitional	14.29%
2003	66.8%	66.2%	-0.7%	72.7%	Hard	Hard	10.57%
2004	71.5%	66.2%	-5.3%	72.7%	Transitional	Hard	8.09%
2005	85.1%	70.8%	5.7%	72.7%	Hard	Transitional	4.30%
2006	61.2%	63.1%	1.9%	72.7%	Hard	Hard	3.55%
2007	65.4%	54.5%	-10.9%	72.7%	Hard	Hard	0.48%
2008	61.7%	56.0%	-5.8%	72.7%	Hard	Hard	-3.13%
2009	41.8%	57.8%	16.0%	72.7%	Hard	Hard	-2.34%
2010	59.7%	65.3%	5.7%	72.7%	Hard	Hard	-1.54%
2011	69.1%	76.8%	7.8%	72.7%	Transitional	Transitional	-1.81%
2012	78.8%	79.6%	0.7%	72.7%	Soft	Soft	0.30%
2013	73.4%	72.9%	-0.5%	72.7%	Transitional	Transitional	3.74%
2014	67.9%	74.8%	7.0%	72.7%	Transitional	Transitional	5.41%
2015	74.5%	80.9%	6.5%	72.7%	Transitional	Soft	4.62%
2016	96.7%	88.9%	-7.8%	72.7%	Soft	Soft	3.51%
2017	83.8%	84.3%	0.5%	72.7%	Soft	Soft	3.97%
2018	92.3%	84.5%	-7.8%	72.7%	Soft	Soft	3.95%



Note: Breakeven as illustration is all year AY Loss Ratio for this grouping
 Soft and hard Market determined as whether loss ratio is within 5% of breakeven
 Row colors determined as whether CY and AY loss ratios differ by more than 5%

Underwriting Cycle Analysis - Impact of Wrong Signals – Emergence Lag / Rate Changes



Illustrative

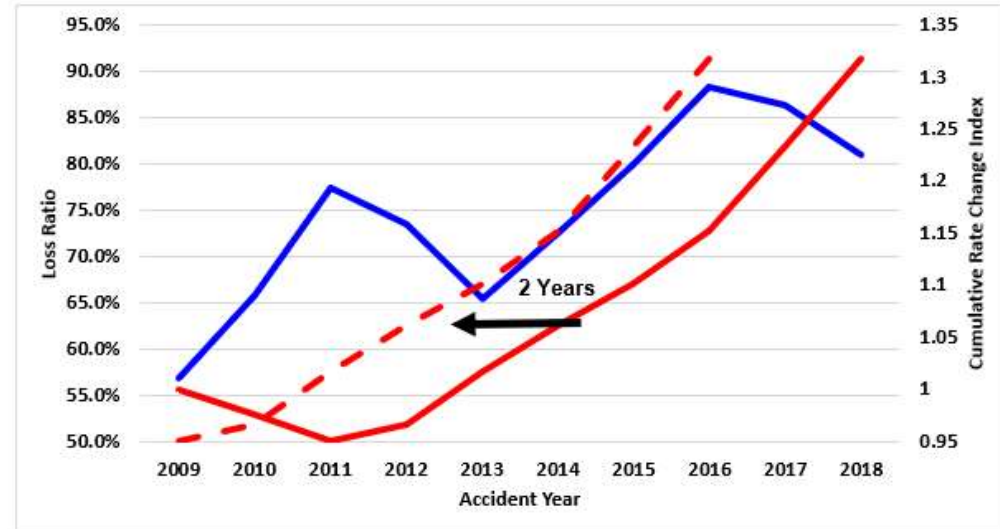
Emergence Lag Analysis

Market #2 - State Group Y - Faster Carriers

Incurred \$ Indemnity+Alae (Prorata); Unlimited xs 0; 7 yr VWA (100% wt); 3.0% detrended threshold

Nominal							
Year	CY	AY @2017	CY vs. AY Difference	Breakeven	Apparent Market	Actual Market	Incremental Rate Change
2001	76.1%	82.4%	6.3%	69.2%	Soft	Soft	
2002	76.8%	66.8%	-10.0%	69.2%	Soft	Transitional	14.29%
2003	56.7%	58.8%	2.1%	69.2%	Hard	Hard	11.75%
2004	59.2%	60.7%	-1.5%	69.2%	Hard	Hard	10.90%
2005	64.6%	62.4%	-2.2%	69.2%	Transitional	Hard	8.14%
2006	50.3%	58.8%	8.5%	69.2%	Hard	Hard	5.63%
2007	64.6%	54.2%	-10.4%	69.2%	Transitional	Hard	1.85%
2008	65.4%	58.2%	-7.2%	69.2%	Transitional	Hard	-1.73%
2009	42.2%	56.8%	14.6%	69.2%	Hard	Hard	-1.97%
2010	62.4%	65.8%	3.4%	69.2%	Hard	Transitional	-2.35%
2011	81.2%	77.5%	-3.8%	69.2%	Soft	Soft	-2.61%
2012	81.1%	73.5%	-7.6%	69.2%	Soft	Transitional	1.59%
2013	70.3%	65.3%	-4.8%	69.2%	Transitional	Transitional	5.31%
2014	59.6%	72.6%	13.0%	69.2%	Hard	Transitional	4.44%
2015	64.6%	79.9%	15.2%	69.2%	Transitional	Soft	3.71%
2016	95.8%	88.3%	-7.5%	69.2%	Soft	Soft	5.51%
2017	85.9%	86.3%	0.5%	69.2%	Soft	Soft	7.06%
2018	91.0%	80.9%	-10.1%	69.2%	Soft	Soft	6.85%

Note: Breakeven as illustration is all year AY Loss Ratio for this grouping
 Soft and hard Market determined as whether loss ratio is within 5% of breakeven
 Row colors determined as whether CY and AY loss ratios differ by more than 5%



Underwriting Cycle Analysis - Impact of Wrong Signals – Emergence Lag / Rate Changes



Illustrative

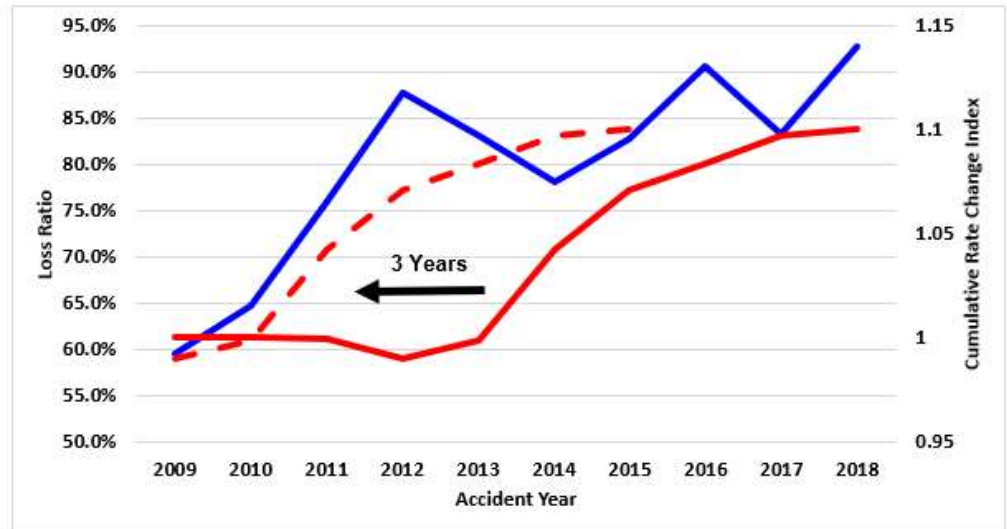
Emergence Lag Analysis

Market #2 - State Group Y - Slower Carriers

Incurred \$ Indemnity+Alae (Prorata); Unlimited xs 0; 7 yr VWA (100% wt); 3.0% detrended threshold

Nominal							
Year	CY	AY @2017	CY vs. AY Difference	Breakeven	Apparent Market	Actual Market	Incremental Rate Change
2001	77.6%	83.7%	6.1%	78.3%	Transitional	Soft	
2002	98.4%	83.3%	-15.1%	78.3%	Soft	Soft	14.29%
2003	80.4%	77.3%	-3.2%	78.3%	Transitional	Transitional	11.88%
2004	88.4%	75.8%	-12.7%	78.3%	Soft	Transitional	5.50%
2005	64.1%	86.6%	22.5%	78.3%	Hard	Soft	-3.07%
2006	81.9%	70.1%	-11.9%	78.3%	Transitional	Hard	-2.22%
2007	64.1%	55.2%	-8.9%	78.3%	Hard	Hard	-3.02%
2008	52.5%	51.9%	-0.6%	78.3%	Hard	Hard	-5.70%
2009	44.6%	59.5%	14.9%	78.3%	Hard	Hard	-3.07%
2010	57.2%	64.7%	7.4%	78.3%	Hard	Hard	0.01%
2011	53.0%	76.0%	22.9%	78.3%	Hard	Transitional	-0.02%
2012	78.6%	87.7%	9.1%	78.3%	Transitional	Soft	-1.01%
2013	79.6%	83.1%	3.5%	78.3%	Transitional	Transitional	0.87%
2014	81.2%	78.1%	-3.0%	78.3%	Transitional	Transitional	4.45%
2015	87.8%	82.7%	-5.0%	78.3%	Soft	Transitional	2.73%
2016	99.7%	90.7%	-9.0%	78.3%	Soft	Soft	1.20%
2017	80.6%	83.3%	2.7%	78.3%	Transitional	Soft	1.24%
2018	96.7%	92.8%	-3.9%	78.3%	Soft	Soft	0.26%

Note: Breakeven as illustration is all year AY Loss Ratio for this grouping
 Soft and hard Market determined as whether loss ratio is within 5% of breakeven
 Row colors determined as whether CY and AY loss ratios differ by more than 5%





Commercial Auto – State Group X

Expected Loss 900x100 based on AS Circular ILF

Illustrative

Policy Limit (\$,000)	State Group Basic Limit Loss Weight	Limited Average Severity	Indicated Increased Limit Factor
100	0.0148	18,529	1.00
250	0.0010	28,100	1.52
300	0.0153	30,374	1.64
400	0.0003	34,152	1.84
500	0.0294	37,169	2.01
750	0.0011	42,582	2.30
1,000	0.8664	46,214	2.49
1,500	0.0001	50,983	2.75
2,000	0.0590	54,160	2.92
2,500	0.0000	56,517	3.05
3,000	0.0022	58,372	3.15
5,000	0.0104	63,237	3.41
7,500	0.0000	66,793	3.60
10,000	0.0000	69,157	3.73



Policy Limit	300k	1M	5M
100	1,000	1,000	1,000
250	1,517	1,517	1,517
300	1,639	1,639	1,639
400	1,843	1,843	1,843
500	2,006	2,006	2,006
750	2,298	2,298	2,298
1000	2,494	2,494	2,494
1500	2,752	2,752	2,752
2000	2,923	2,923	2,923
2500	3,050	3,050	3,050
3000	3,150	3,150	3,150
5000	3,413	3,413	3,413
7500	3,605	3,605	3,605
10000	3,732	3,732	3,732
900x100 Expected Loss %	39.0%	59.9%	43.8%
Loss Weight	7.5%	85.0%	7.5%

Weighted Expected Loss %
57.1%

Note: Weights provided in the circular can be used to combine expected loss percentages from state groups and classes.



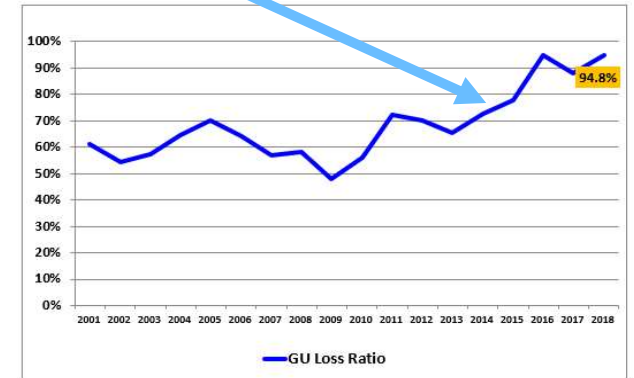
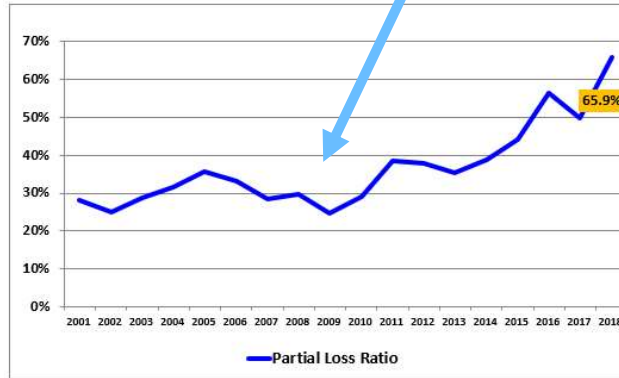
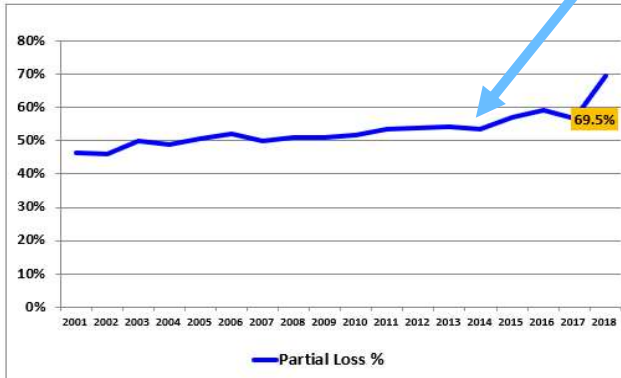
Underwriting Cycle Analysis – Bringing in ILF Component

Commercial Auto – State Group X

900 x 100 – Partial Loss Ratio (3% detrended)

Illustrative

AY	Ultimate \$ Indemnity	Partial Loss %	YTY Change	Ultimate Prem	Ultimate Ground-Up \$ Indemnity	Partial Loss Ratio	GU Loss Ratio
2001	54,066,864	46.3%		191,059,192	116,686,784	28.3%	61.1%
2002	45,225,137	45.9%	-11.66%	180,793,117	98,552,188	25.0%	54.5%
2003	50,944,082	50.0%	14.80%	177,408,839	101,956,361	28.7%	57.5%
2004	53,816,571	49.0%	10.80%	169,451,394	109,826,867	31.8%	64.8%
2005	61,515,440	50.8%	12.26%	172,332,265	121,097,403	35.7%	70.3%
2006	62,046,318	51.9%	-7.00%	186,688,815	119,556,003	33.2%	64.0%
2007	56,211,517	50.0%	-14.16%	197,579,830	112,369,319	28.5%	56.9%
2008	58,378,117	51.1%	4.56%	196,128,588	114,311,987	29.8%	58.3%
2009	48,242,594	51.0%	-17.45%	196,359,288	94,609,471	24.6%	48.2%
2010	58,029,818	51.8%	17.89%	200,404,513	112,019,813	29.0%	55.9%
2011	77,515,141	53.4%	33.10%	201,014,022	145,206,125	38.6%	72.2%
2012	79,780,656	53.9%	-2.07%	210,893,915	148,086,826	37.8%	70.2%
2013	84,573,196	54.2%	-6.08%	238,248,803	156,156,005	35.5%	65.5%
2014	94,174,505	53.3%	9.30%	242,577,817	176,581,133	38.8%	72.8%
2015	113,736,427	56.9%	14.18%	256,866,545	199,772,422	44.3%	77.8%
2016	145,974,211	59.4%	27.09%	259,204,703	245,943,395	56.3%	94.9%
2017	119,487,257	56.8%	-11.19%	238,984,685	210,337,036	50.0%	88.0%
2018	152,038,223	69.5%	31.80%	230,626,271	218,673,743	65.9%	94.8%
Total/Average	1,415,747,670	54.4%	9.27%	3,746,622,604	2,601,744,954	37.8%	69.4%
Trend 7 year		58.3%	7.93%			47.08%	80.81%
Trend - all year			4.20%				



Note: premiums are on-leveled to 12/31/2018 using ISO MWDB Method 2 (new and renewal) indications

additional adjustments for historical changes in deductibles, limits and other exposure adjustments would be required for a full comparison to AS Circular ILF results

Personal Auto View at 2019



Personal Auto – View at 2019



ISO Size-of-Loss Matrix

© Insurance Services Office, Inc., 2019

Market Segment: Personal Auto
 Personal Auto Liability
 All Companies - All Hazard Groups
 All Causes of Loss
 Unlimited xs 0 Countrywide

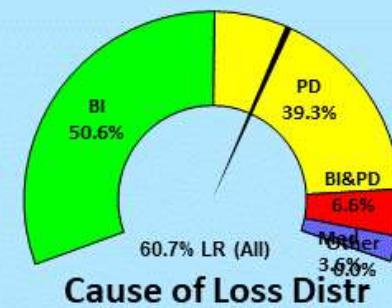
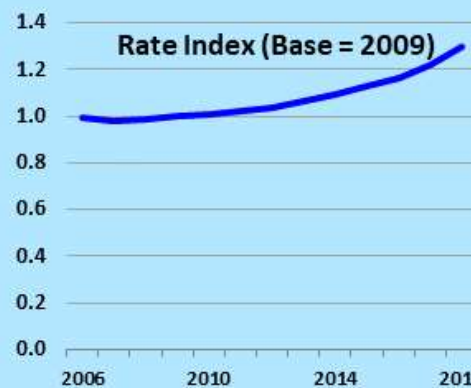
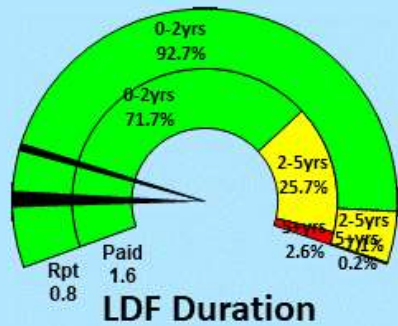
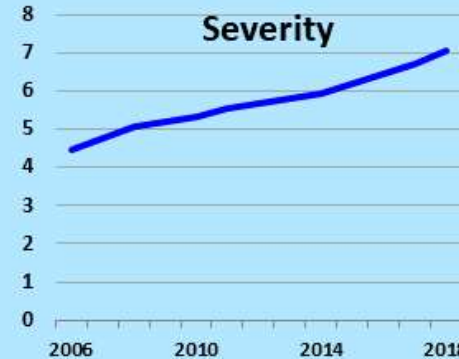
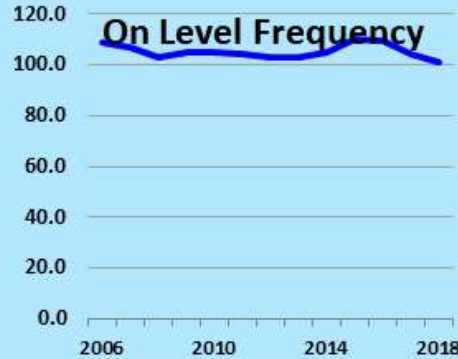
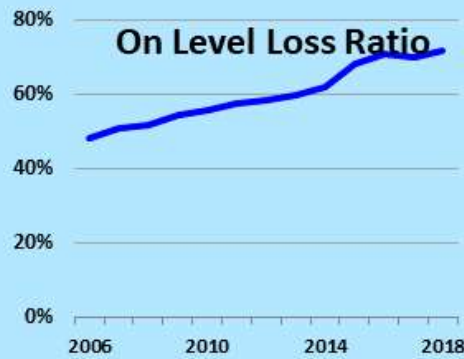
Illustrative

Est All Yr/Curr Yr LR: 60.7% / 71.6%
 7 Year Severity Trend: 4.40%
 All Year Trend: 3.44%
 Avg Duration: Rpt 0.8 / Paid 1.6 Years

Loss Ratio Analytics

SOLM 2019 v2

Total Premium 12/2018: 291,488,314,603
 Total Incurred \$ Indemnity+Alae (Prorata): 204,365,504,953
 Total Occurrences: 36,552,405
 VWA 7yr/all 100%/0%



Personal Auto – View at 2019



ISO Size-of-Loss Matrix

© Insurance Services Office, Inc., 2019

Market Segment: Personal Auto
 Personal Auto Liability
 All Companies - All Hazard Groups
 All Causes of Loss
 Unlimited xs 0 Countrywide

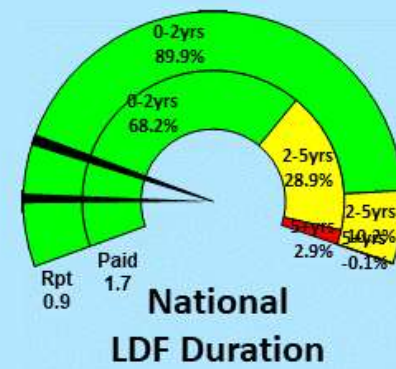
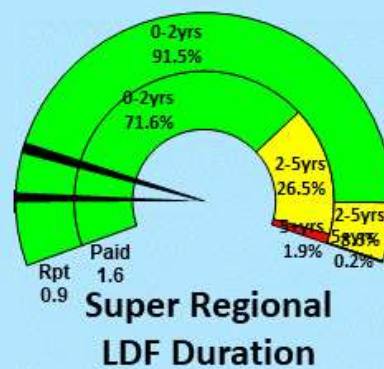
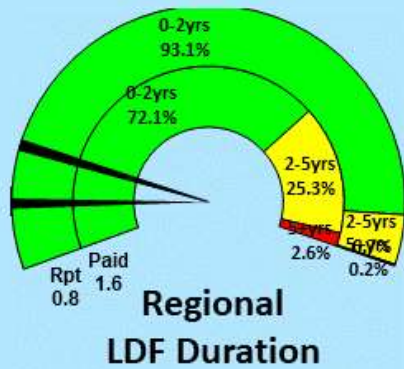
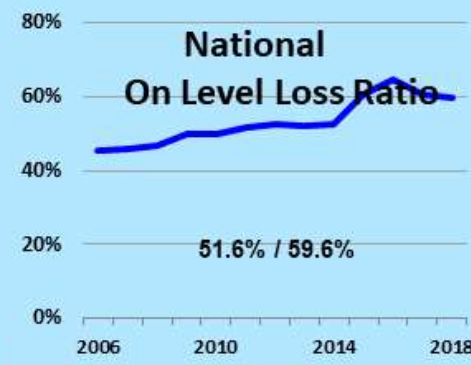
Illustrative

Est All Yr/Curr Yr LR: 60.7% / 71.6%
 7 Year Severity Trend: 4.40%
 All Year Trend: 3.44%
 Avg Duration: Rpt 0.8 / Paid 1.6 Years

Regional Loss Ratio Analytics

SOLM 2019 v2

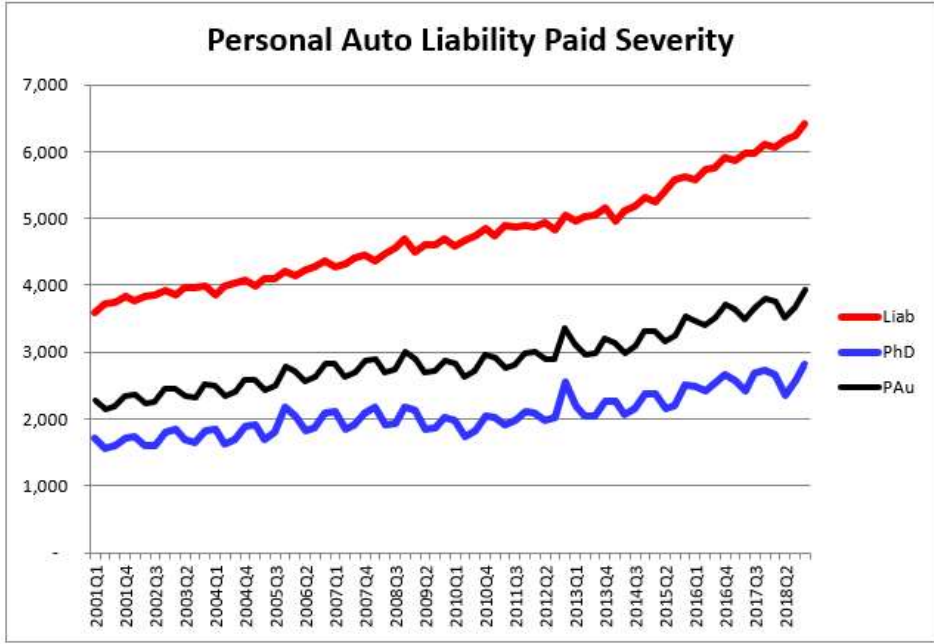
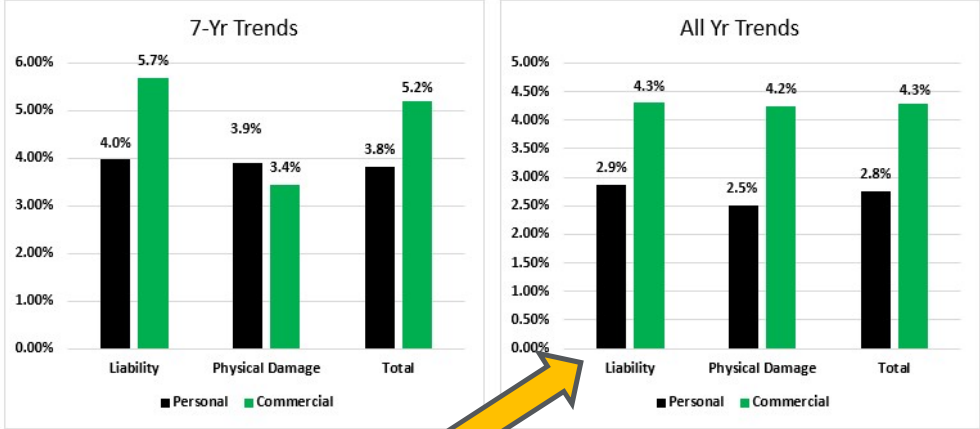
Total Premium 12/2018: 291,488,314,603
 Total Incurred \$ Indemnity+Alae (Prorata): 204,365,504,953
 Total Occurrences: 36,552,405
 VWA 7yr/all 100%/0%



Personal vs. Commercial Auto – View at 2019



Personal Auto Paid Severity trends tend to be lower than that of Commercial Auto.

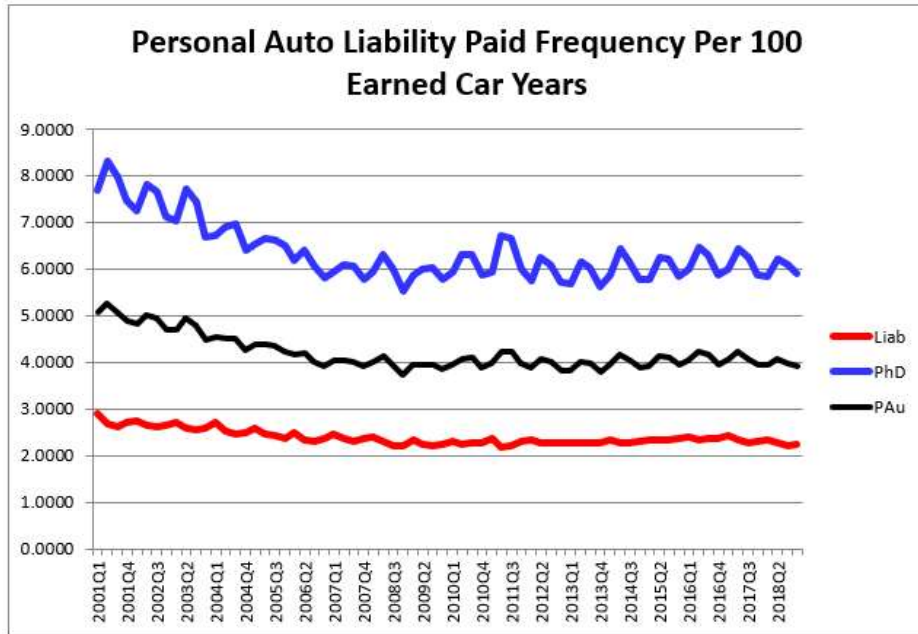
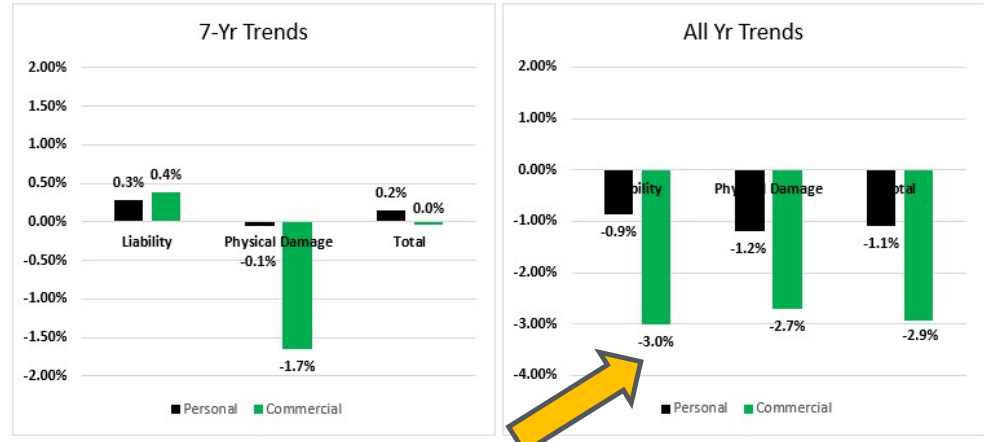


		7 Yr	All Yr
Liability	Personal	3.79%	2.87%
	Commercial	5.69%	4.30%
Physical Damage	Personal	3.91%	2.51%
	Commercial	3.44%	4.24%
Total	Personal	3.83%	2.76%
	Commercial	5.21%	4.29%

Personal vs. Commercial Auto – View at 2019



Personal Auto Paid Frequency trends tend to be higher than that of Commercial Auto, but both sets are relatively flat or negative.

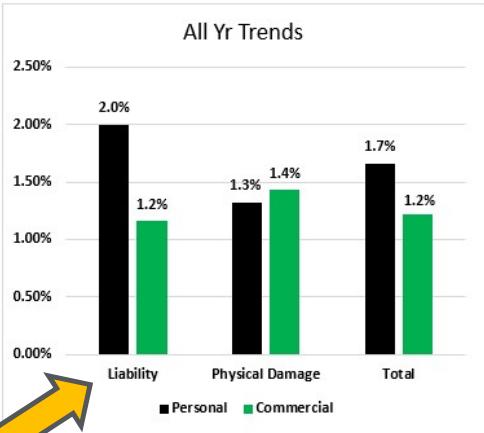
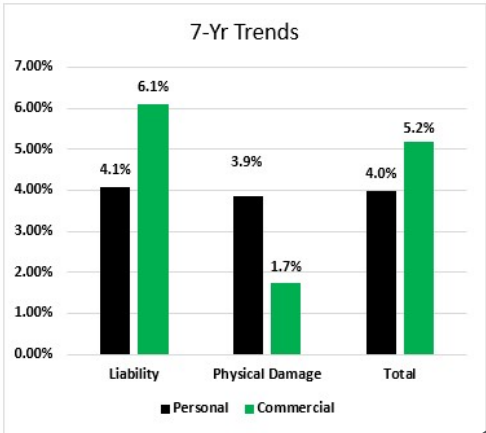
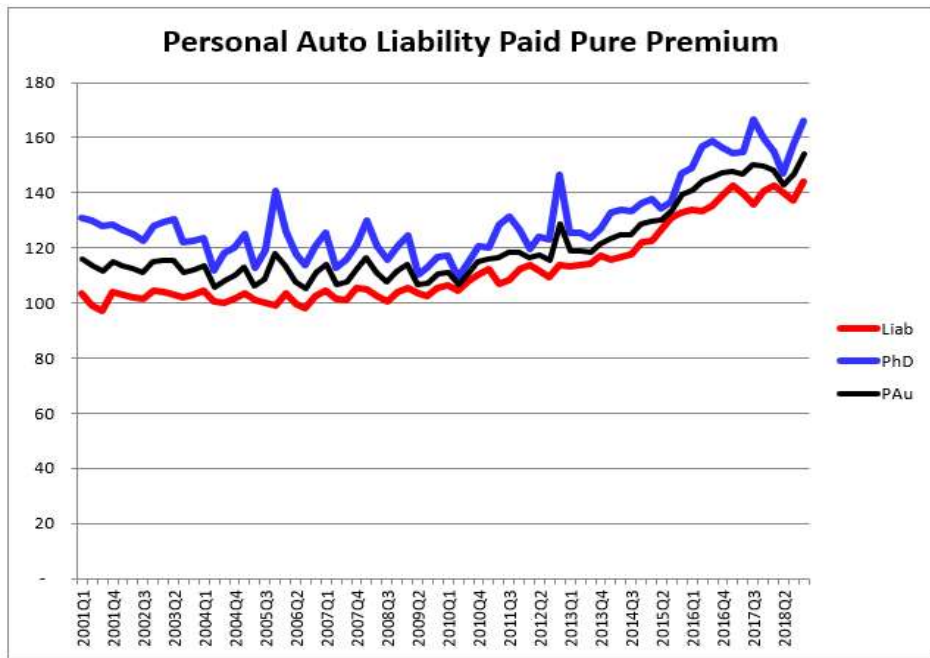


		7 Yr	All Yr
Liability	Personal	0.29%	-0.87%
	Commercial	0.39%	-3.01%
Physical Damage	Personal	-0.06%	-1.20%
	Commercial	-1.65%	-2.70%
Total	Personal	0.15%	-1.10%
	Commercial	-0.04%	-2.94%

Personal vs. Commercial Auto – View at 2019



Personal Auto Pure Premium trends tend to be lower than Commercial Auto in the more recent years, but somewhat higher over all years.



		7 Yr	All Yr
Liability	Personal	4.08%	2.00%
	Commercial	6.10%	1.16%
Physical Damage	Personal	3.85%	1.32%
	Commercial	1.73%	1.43%
Total	Personal	3.98%	1.66%
	Commercial	5.17%	1.22%

Underwriting Cycle Analysis - Impact of Wrong Signals – Emergence Lag / Rate Changes

Personal Auto



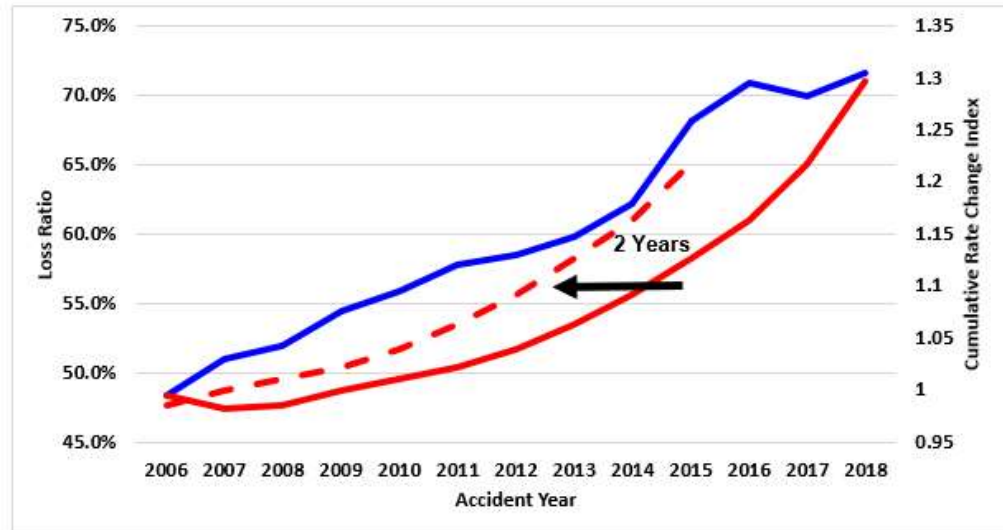
Illustrative

Emergence Lag Analysis

Market #3 - All States - All Carriers

Incurred \$ Indemnity+Alae (Prorata); Unlimited xs 0; 7 yr VWA (100% wt); 3.0% detrended threshold

(1)	(5)	(8)	(9)	(10)	(11)	(12)	(13)
		Nominal					
Year	CY	AY @2017	CY vs. AY Difference	Breakeven	Apparent Market	Actual Market	Incremental Rate Change
2006	50.6%	48.4%	-2.2%	60.7%	Hard	Hard	-23.33%
2007	71.1%	51.0%	-20.1%	60.7%	Soft	Transitional	-1.31%
2008	73.3%	52.0%	-21.3%	60.7%	Soft	Transitional	0.34%
2009	73.3%	54.4%	-18.9%	60.7%	Soft	Transitional	1.48%
2010	72.7%	55.9%	-16.8%	60.7%	Soft	Transitional	1.12%
2011	72.1%	57.8%	-14.3%	60.7%	Soft	Transitional	1.04%
2012	72.1%	58.5%	-13.6%	60.7%	Soft	Transitional	1.71%
2013	72.0%	59.8%	-12.2%	60.7%	Soft	Transitional	2.40%
2014	73.2%	62.2%	-11.0%	60.7%	Soft	Transitional	2.66%
2015	78.4%	68.2%	-10.2%	60.7%	Soft	Transitional	3.22%
2016	79.3%	71.0%	-8.4%	60.7%	Soft	Soft	3.20%
2017	76.2%	70.0%	-6.2%	60.7%	Soft	Transitional	4.68%
2018	72.9%	71.6%	-1.3%	60.7%	Soft	Soft	6.55%



Note: Breakeven as illustration is all year AY Loss Ratio for this grouping
 Soft and hard Market determined as whether loss ratio is within 10% of breakeven
 Row colors determined as whether CY and AY loss ratios differ by more than 5%

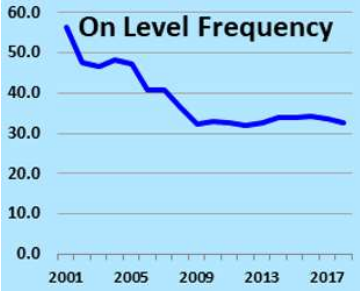
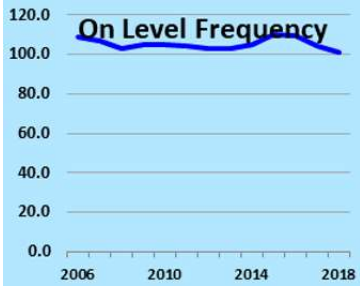
Personal vs. Commercial Auto Emerging Issues Comparison



Assessing various drivers of personal and commercial, with concentration on distracted driving and autonomous vehicles in the future

Illustrative Incremental Impacts	STANDARD CASUALTY											
	Personal Auto - Total						Commercial Auto - Total					
	2H 1990s	1H 2000s	2H 2000s	1H 2010s	2015-2019	FUTURE	2H 1990s	1H 2000s	2H 2000s	1H 2010s	2015-2019	FUTURE
Cell Phone Usage (Talking)			M	M	M	L			✓	✓	✓	L
Cell Phone Usage (Texting, Emailing, Browsing)				M	H	H			✓	✓	✓	H
In-Vehicle Systems (Radio, Heat/AC, GPS)	L			M	H	H		✓	✓	✓	✓	H
Other Distracted Driving (Passengers, Eating, Drowsy ...)	L			L	L	L		✓	✓	✓	✓	H
Autonomous Vehicles						M						H

Historical Perspective	Illustrative Incremental Impacts	STANDARD CASUALTY											
		Personal Auto - Total						Commercial Auto - Total					
		2H 1990s	1H 2000s	2H 2000s	1H 2010s	2015-2019	FUTURE	2H 1990s	1H 2000s	2H 2000s	1H 2010s	2015-2019	FUTURE
	Seat Belt Laws	M					✓	✓	✓	✓	✓	✓	✓
	Seat Belt Usage		L	L			✓	✓	✓	✓	✓	✓	✓
	Airbags Laws/Technology	L	M	M	L	L	✓	✓	✓	✓	✓	✓	✓
	Automobile Design (Crash Tech)	L	L	L	M	M	✓	✓	✓	✓	✓	✓	✓
	Auto Performance						✓	✓	✓	✓	✓	✓	✓
	Roadway Design	L	L	L	L	L	✓	✓	✓	✓	✓	✓	✓
	Electronic Stability Control						✓	✓	✓	✓	✓	✓	✓
	Bumper Height		✓	✓	✓	L							
	Graduated Licensing (Teenagers)		M	L	L	L	✓	✓	✓	✓	✓	✓	✓
	Cell Phone Usage (Talking)			M	M	M	L		✓	✓	✓	✓	L
	Cell Phone Usage (Texting, Emailing, Browsing)							✓	✓	✓	✓	✓	H
	In-Vehicle Systems (Radio, Heat/AC, GPS)	L			M	H	H	✓	✓	✓	✓	✓	H
	Other Distracted Driving (Passengers, Eating, Drowsy ...)	L			L	L	L	✓	✓	✓	✓	✓	H
	Autonomous Vehicles						M						H
	Miles Driven (Price of Gasoline)			L	L	L	✓	✓	✓	✓	✓	✓	✓
	Driving Under the Influence						✓	✓	✓	✓	✓	✓	✓
	Electronic Traffic Surveillance					M	✓						
	Telematics					L	✓				✓	✓	✓
	Ride Sharing						✓				✓	✓	✓
	Economy (Unemployment)	✓	L	M	L	L	✓	✓	✓	✓	✓	✓	✓
	Changing Demographics (Shift to urban)						✓	✓	✓	✓	✓	✓	✓
	Tort Reform	✓	✓	✓	✓	✓	✓				✓	✓	✓
	Propensity to sue				L	L					✓	✓	✓
	Fraud					L							
	Climate Change			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓



Impact Color Keys:
Positive (Lower Frequency) (Low / Medium / High)
Negative (Higher Frequency) (Low / Medium / High)
No Impact/Unknown
Blank = N/A
✓ = Some impact expected (TBD)

Getting Personal – Grandfathers, Insurance, and Distracted Driving



Live to Enjoy Another Drive

Windshield or Dashboard sticker application and usage:

- 1) If applying to windshield (easier) select area out of normal vision. If applying to dashboard, avoid cushy surfaces. Above radio or vents is good.
- 2) Remove waxy paper from one side of sticker, exposing sticky letters.
- 3) Work from one end of strip of letters to the other, carefully pressing each letter onto surface. May take a few minutes - don't rush it. May end up reversing side you start from. Make sure to dot your "Ts"!
- 4) Glance at occasionally while driving to resist the urge to pick up your cell phone and text message!!
- 5) Live to Enjoy Another Drive

www.LiveToEnjoyAnotherDrive.com



Live to Enjoy Another Drive

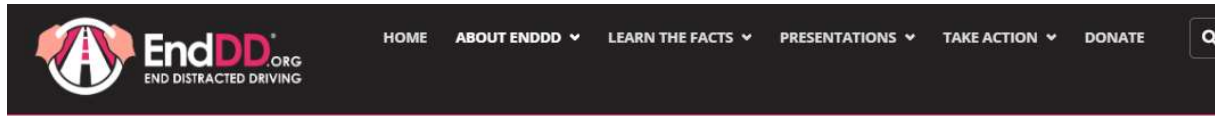


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EndDD.org



Distracted Driving – More Info



EndDD.org is end distracted driving organization founded in 2009. A project of the **Casey Feldman Memorial Foundation**, EndDD.org was founded by Casey's parents, Joel Feldman and Dianne Anderson.

Twenty-one year- old Casey Feldman was struck and killed by a distracted driver in July, 2009 in Ocean City, NJ. She was crossing the street in a crosswalk during daylight hours at an intersection governed by 4-way stop signs. She was ¾ of the way across the street, yet the driver claimed that he never saw her. He was distracted and was looking away from the road and reaching for an object.



Casey Feldman (April 6, 1988-July 17, 2009)

The Problem –

- 37,461 lives were lost on U.S. roads in 2016, an increase of 5.6% from 2015 (data not yet available for 2017) NHTSA
- 10% of fatal crashes and 15% of injury crashes in 2015 were distraction-affected. NHTSA . (The NSC estimates that cell phone related crashes alone accounted for 27% of 2015 car crashes – let alone other distractions)
- In 2015, there were 3,477 people killed and an estimated additional 391,000 injured in crashes involving distracted drivers NHTSA
- The fatal crash rate for teens is 3 times greater than for drivers age 20 and over (IHS), with driver distraction responsible for more than 58% of teen crashes AAA Foundation

EndDD's mission – to save lives from distracted driving through advocacy, education and action

EndDD has –

- Created science-based distracted driving presentations, when there were none
- Amassed a **network of 500 speakers**, the largest in the country
- Given **talks to over 375,000 students nationwide**, all without cost to schools
- Created a bystander intervention program to teach teens how to effectively speak up when driven distracted by others
- Provided educational materials for free, including safe driving agreements, quizzes and surveys
- Developed video public service announcements. [View our most recent PSAs.](#)
- Sponsored **teen distracted driving video and meme contests.**
- Designed presentations for parents to help them model distraction-free driving for their children

Schedule a presentation for your school, business, place of worship or community organization.

Donate to help us continue our mission and to expand our work.



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John Buchanan, FCAS, MAAA, is a principal in charge of ISO's Excess and Reinsurance Division. He has over 30 years of experience as a front-line pricing actuary and consultant in the US, London, and other international reinsurance marketplaces.

In John's career, he has conceptualized, developed and implemented extensive benchmarking and modeling services for various reinsurers, excess carriers, and industry groups. He has pioneered extensive work to extend information gathered in mature benchmarking markets, and applying the information to International markets making use of local and customized knowledge. He was a frontline sign-off actuary for many domestic and international lines of business. While a consultant, he was the main contact for the Reinsurance Association of America and the Reinsurance Research Council of Canada as well as working extensively with the London and European reinsurance market through the Casualty Actuaries in Reinsurance in London. He also formed and chaired the multi-discipline joint IFoA-CAS International Pricing Research Working Party. The resulting paper, *"Analyzing the Disconnect Between the Reinsurance Submission and Global Underwriter's Needs - Property Per Risk"*, won the prestigious 2016 IFoA UK Brian Hey and the 2019 CAS US Hachemeister awards.

John's professional accomplishments also include being heavily involved with many international meteorological groups including NOAA, UK-Met, GLOBE, ACRE, and was chairperson of the CAS Climate Change Student Outreach subcommittee. He is on the CARE committee responsible for many of the annual CARE conference educational tracks, and previously at the CAS Ratemaking Seminar. He has been a moderator and panelist at dozens of industry seminars on the topic of domestic and international reinsurance pricing, the underwriting cycle, international benchmarking, etc.

Prior to joining Verisk, John was a Senior Vice President at Platinum Underwriters (previously St. Paul Reinsurance), a Principal at Tillinghast (now Towers Watson), and a Senior Consultant at KPMG, Peat Marwick. He has also competed and won many medals and trophies as an amateur in the Global Salsa Championships, and is determined to write the book "The Mathematician's Guide to Salsa Dancing". He has also written and directed a few sponsored films entitled *"Franklin Climate Change"* and *"Cuba People to People"* with the latter selected to run at various film festivals and described in September 2018 CAS actuarial review article.

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