



C-30: Wheels – Commercial Auto is Getting Personal

CARe Seminar, June 4, 2019
Bermuda

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Concurrent Session C-30: Wheels – Commercial Auto is Getting Personal



- This session will provide an update to the Commercial Auto industry experience, most recently presented at last year's CARE and CLRS sessions.
- Although there has been significant rate improvements in the past few years, recent results have still been rather challenging.
- This session will investigate why, including an analysis of lengthening LDFs. Additional claim drivers and litigation trends will be reviewed, including a diagnosis of the past and potential remedies for the future from a product manager's perspective.
- A comparison of commercial and personal auto trends, and drivers, will also be explored.
- An underwriter / commercial auto product manager who has lived through the wheels ups and downs over the last decade will give their experience from a ground level perspective, including measures to help underwriters improve their insights in this continually challenging line of business.

C-30: Wheels Commercial Auto is Getting Personal



- **Introduction – Elliot 5 mins**
 - Overall industry results through 12/31/2018
- **Commercial Auto Update – Marni 25 mins**
 - Review of industry experience from 2010 to 2018, view at 2019
 - Review frequency and severity trends, lengthening loss development, profit vs LDF speed, IELRs – ground-up and excess, market segment review, rate changes, umbrella
 - Review of personal auto vs. commercial auto trends
 - Claim drivers / trends
- **An underwriting managers perspective – Jen 25 mins**
 - State of the market including environmental 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?
- **A product manager perspective – Elliot 10 mins**
 - Common underwriting challenges and trends to improve profitability
 - Focus on data and improved risk verification and selection
- **Further discussion and Q&A - Panel 10 mins**

Swiss Re Verisk

Wheels – Commercial Auto is Getting Personal

Speakers:
Elliot Burn, Verisk/ISO
Marni Wasserman, Verisk/ISO
Jennifer Stevens, Swiss Re

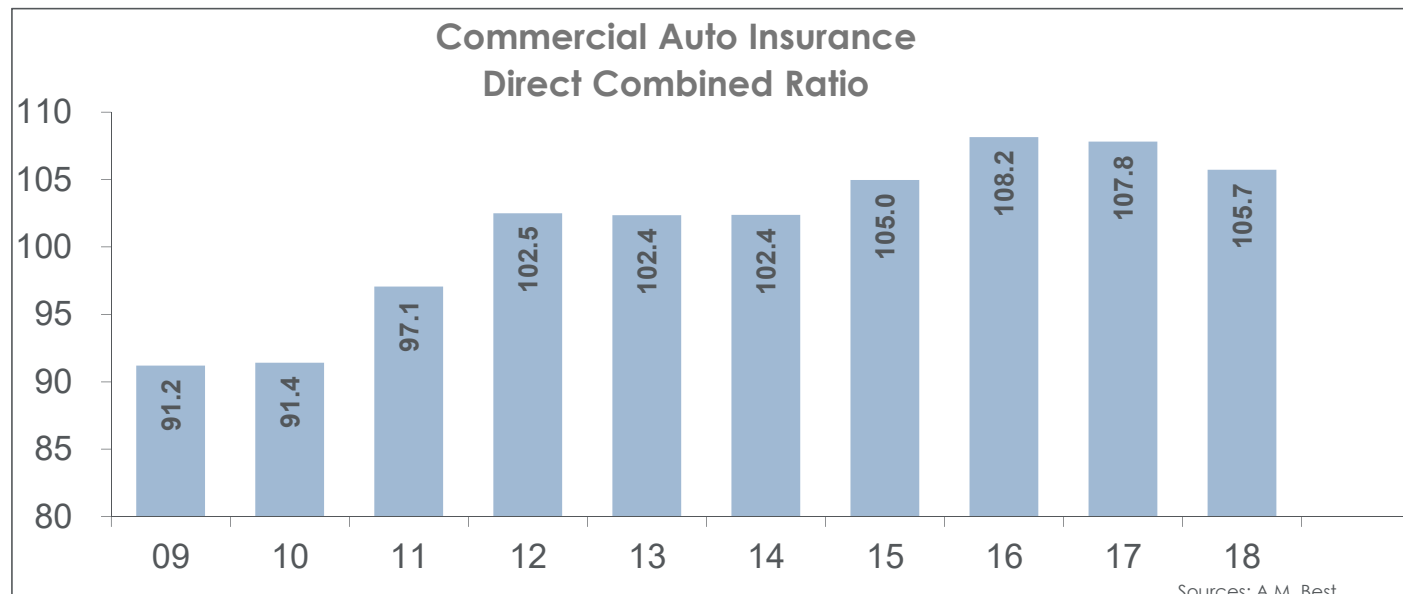
2019 CAS Seminar on Reinsurance

8:00 a.m. – 9:15 a.m.
June 4th, 2019
Room: Morning Glory



Commercial Auto Insurance is tough business!

- **105.7** Combined ratio in 2018 (AMB), **>102** since 2012
- Pricing challenges present hurdles to profitability
- Lack of risk insight and data accuracy impact underwriting and rating





Trends driving higher losses



More than **16 million** commercial vehicles are on the road today



Miles driven were **up 6.5%** between February 2015 and February 2016



The need for as many as **50,000 drivers** is producing a glut of inexperienced drivers



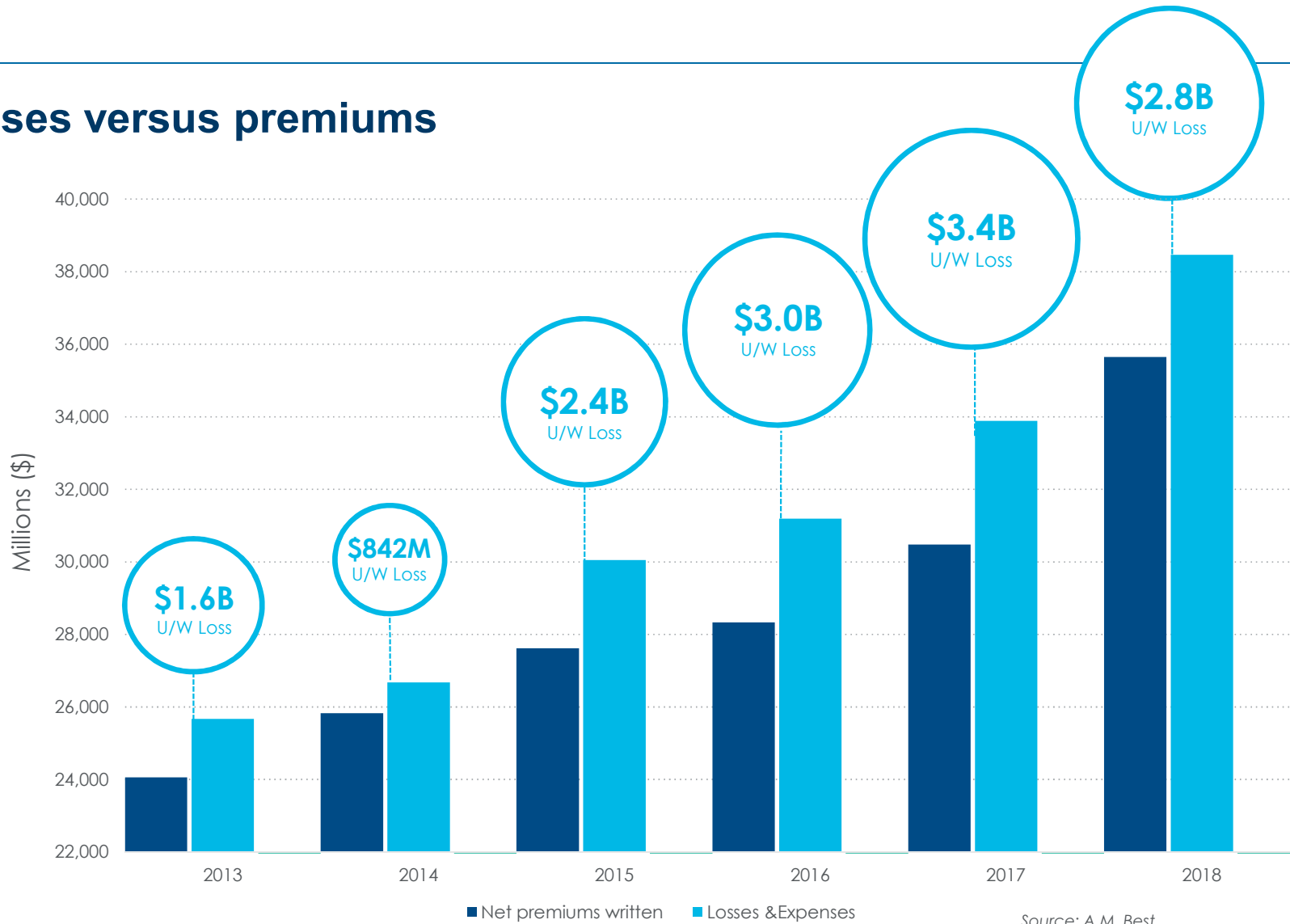
27% of crashes involved drivers distracted by mobile devices



Loss severity per claim was up **over 30%** between 2012 and 2018



Losses versus premiums



Update of Commercial Auto Views from 2010 - 2018



Commercial Auto – View at 2010



Frequency

Analysis Method: Premium (MW rate change)
 Apriori Trend = 0.03
 INCURRED

AY	Ultimate OCCURRENCE	Freq per 1M UOP	YTY Change	Ultimate Prem
2001	287,739	54.8940		5,241,730,845
2002	233,162	45.8150	-16.54%	5,089,250,680
2003	212,072	44.7750	-2.27%	4,736,394,774
2004	205,497	46.4050	3.64%	4,428,370,494
2005	207,560	45.4080	-2.15%	4,571,045,142
2006	197,104	39.1880	-13.70%	5,029,644,311
2007	200,826	39.3190	0.33%	5,107,664,575
2008	177,153	36.6460	-6.80%	4,834,202,298
2009	159,060	34.2520	-6.53%	4,643,800,894
Total/Average	3,139,584	71.8735	-2.84%	43,682,104,012
Trend 7 year			-5.07%	
Trend - all year			-4.98%	

-37.6%

Looking back at Trend at 2010:

- Frequencies steadily reducing from early 2000s
- Recent severities overall flat

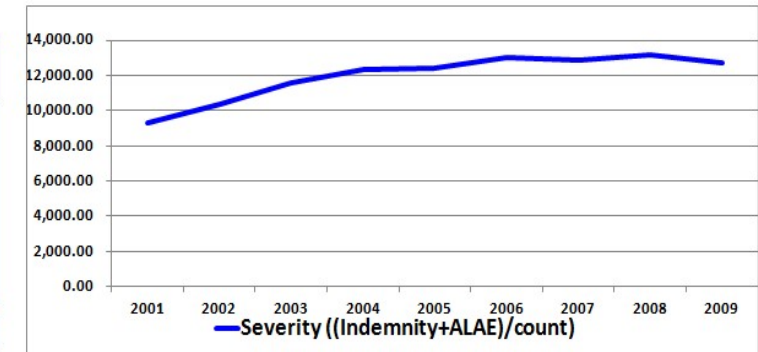
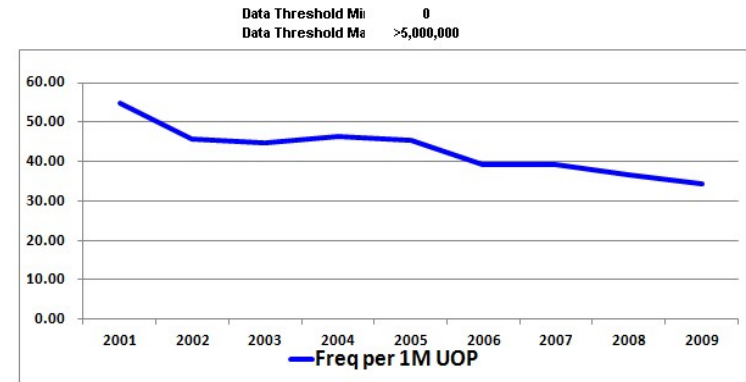
Severity

Analysis Method: Premium (MW rate change)
 Apriori Trend = 0.03
 INCURRED

AY	Ultimate Severity ((Indemnity+ALAE)/count)	Severity ((Indemnity+ALAE)/count)	YTY Change	Ultimate Prem
2001	9,334	9,334	9.11%	5,241,730,845
2002	10,383	10,383	11.24%	5,089,250,680
2003	11,585	11,585	11.58%	4,736,394,774
2004	12,336	12,336	6.48%	4,428,370,494
2005	12,406	12,406	0.57%	4,571,045,142
2006	12,988	12,988	4.69%	5,029,644,311
2007	12,832	12,832	-1.20%	5,107,664,575
2008	13,190	13,190	2.79%	4,834,202,298
2009	12,725	12,725	-3.53%	4,643,800,894
Total/Average	140,980	140,980	3.62%	43,682,104,012
Trend 7 year			1.60%	
Trend - all year			3.69%	



Illustrative



Source: ISO Slides from CAS Casualty Loss Reserve Seminar – September 12, 2017 (LOB-3 Wheels Down – J. Buchanan)

Commercial Auto – View at 2010



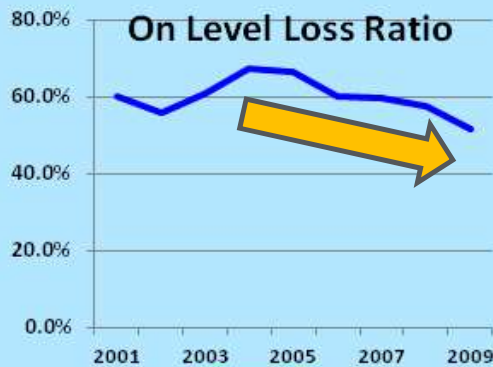
Holistic view at 2010:

- 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

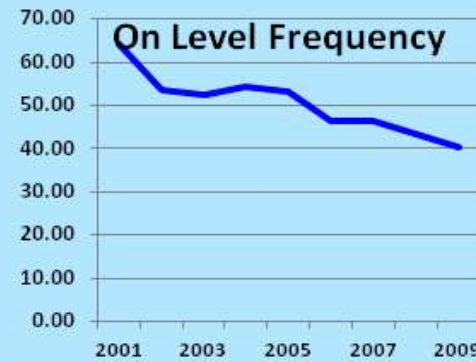
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Market Segment: Commercial Auto
Trucks Tractors and Trailers - All Companies
All Causes of Loss
Unlimited xs 0



Illustrative

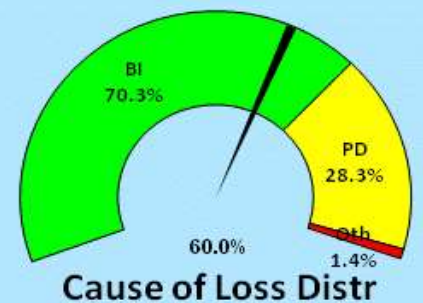
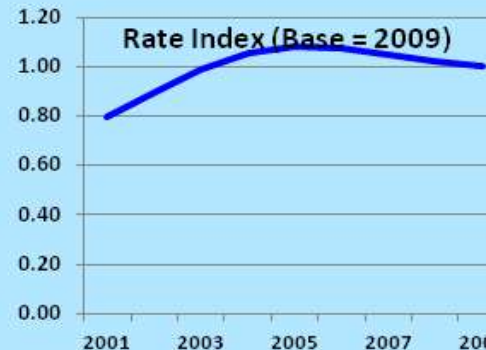
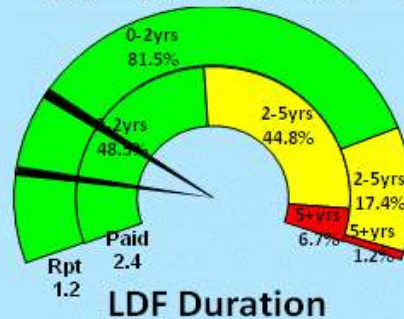
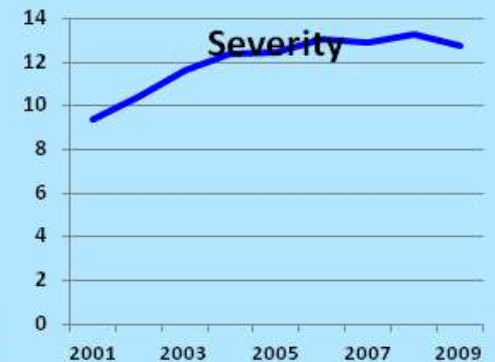
Est All Yr/Curr Yr LR: 60.0% / 51.9%
7 Year Severity Trend: 1.60%
All Year Trend: 3.69%
Avg Rep / Pay Duration: 1.2 / 2.4 Years



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

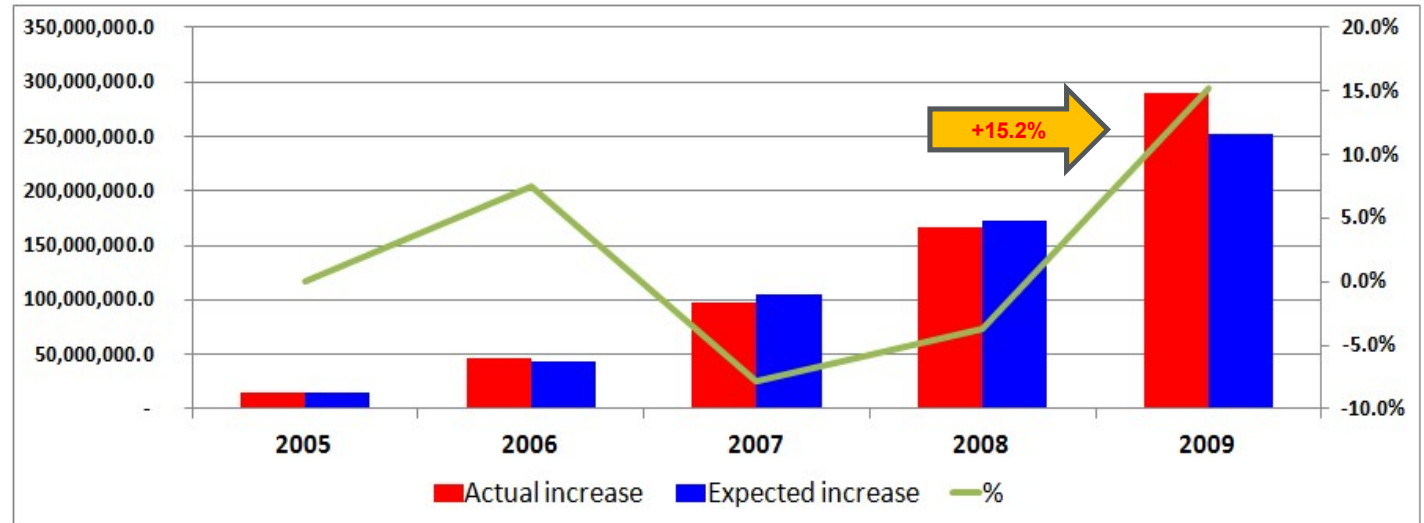
Commercial Auto – View at 2010



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, overall 2013 TTT IELR went from 51.9% to 62.8%

ISO Size-of-Loss Matrix

© Insurance Services Office, Inc., 2017

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

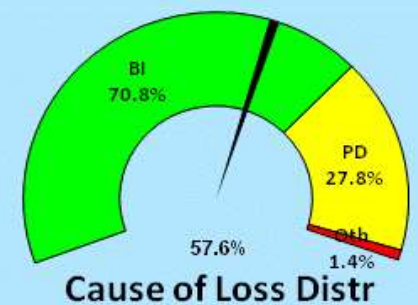
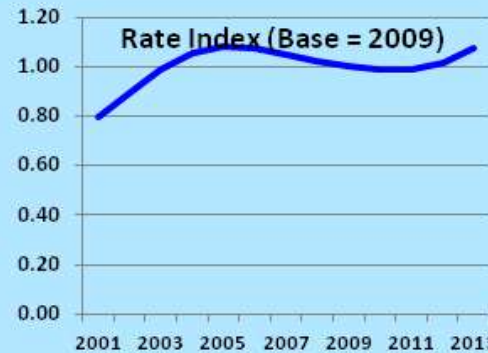
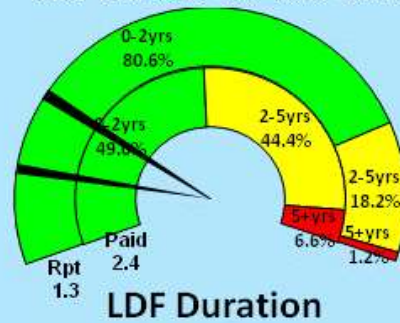
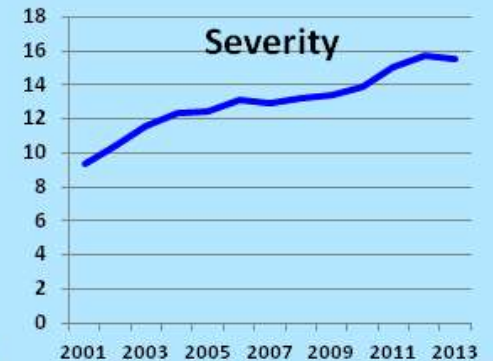
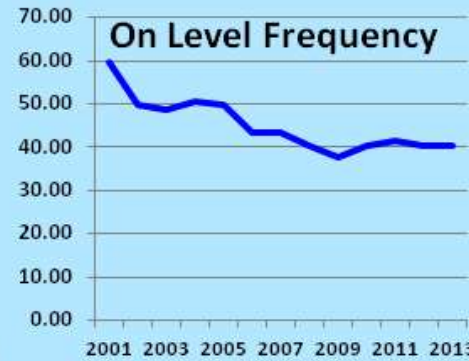
Illustrative

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



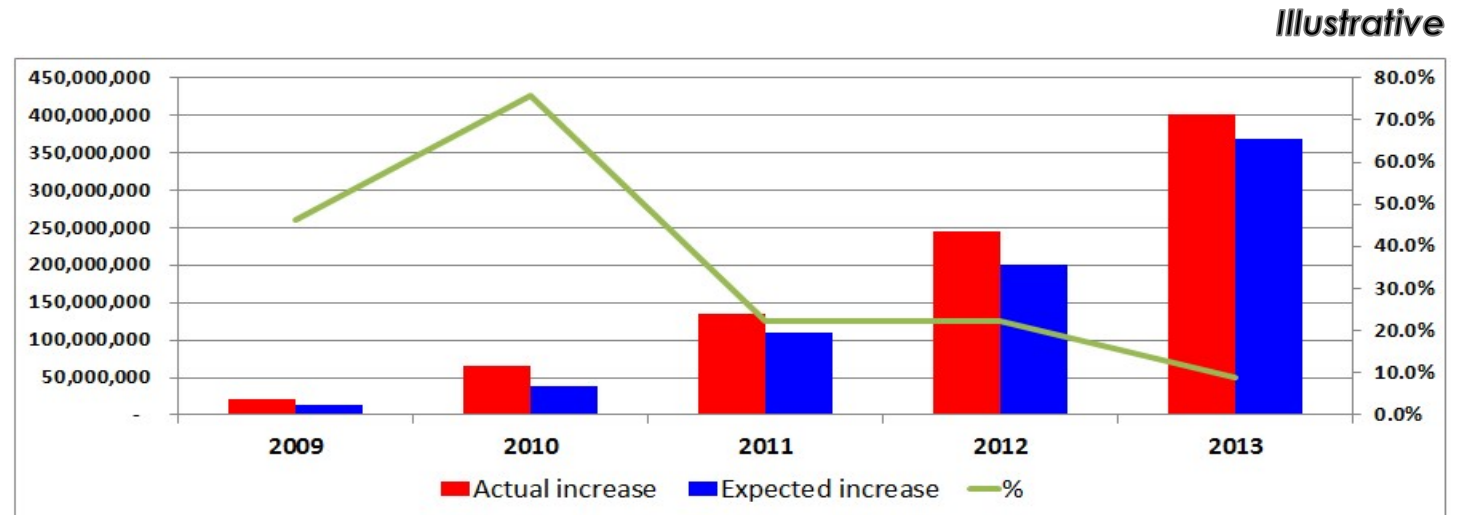
Note: Loss development factors and durations use 5-year VWA and 3% detrending.
Rate changes from MarketWatch - Trucks Tractors and Trailers - Liability - 12/31/2016

Commercial Auto – View at 2014



Commercial Auto – CAu (3 markets) - ERLI Warning – Excess Layer 900x100k

Each calendar year since 2009 had significant adverse development due to lengthening loss development tail.



SOLM Release 2016 (v4.2) - Development Triangle and Analysis ERLI Warning

AY	CY=2014				AY	Actual increase	Expected	Actual - Expected	%
	Actual n-3	Actual n-2	5-Yr ATA	Expected n-2					
2009	927,792,337	948,489,796	1.015	941,937,861	2009	20,697,459	14,145,524	6,551,935	46.3%
2010	969,391,676	1,035,440,722	1.039	1,006,993,685	2010	66,049,046	37,602,009	28,447,037	75.7%
2011	990,401,529	1,125,681,334	1.112	1,100,985,153	2011	135,279,805	110,583,624	24,696,181	22.3%
2012	796,632,607	1,042,053,515	1.252	997,232,576	2012	245,420,908	200,599,969	44,820,939	22.3%
2013	448,845,946	849,647,219	1.820	817,040,649	2013	400,801,273	368,194,703	32,606,570	8.9%
Sum x2014	14,820,297,316	15,698,714,934		15,555,987,734	Sum x2014	878,417,618	735,690,418	142,727,200	16.4%
1999-2002	4,175,976,527	4,176,860,812		4,176,055,046	1999-2002	884,285	78,519	805,766	1026.2%
2003-2007	5,484,115,606	5,486,515,086		5,485,827,797	2003-2007	2,399,480	1,712,191	687,289	40.1%
2008-2012	4,711,359,237	5,185,691,817		5,077,064,243	2008-2012	474,332,580	365,705,006	108,627,574	29.7%

Commercial Auto – View at 2016

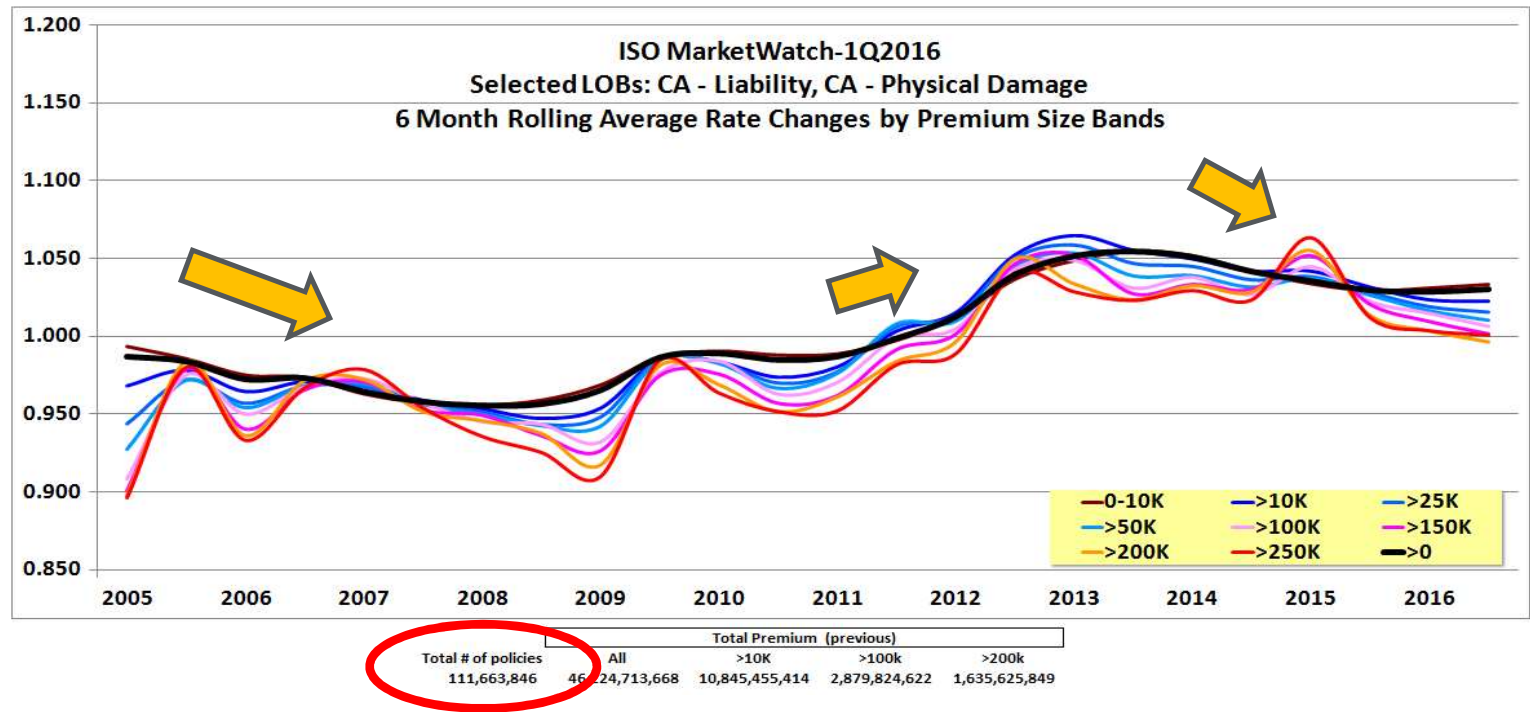


Incremental Rate Changes Through 3/31/2016 - Liability & Physical Damage

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

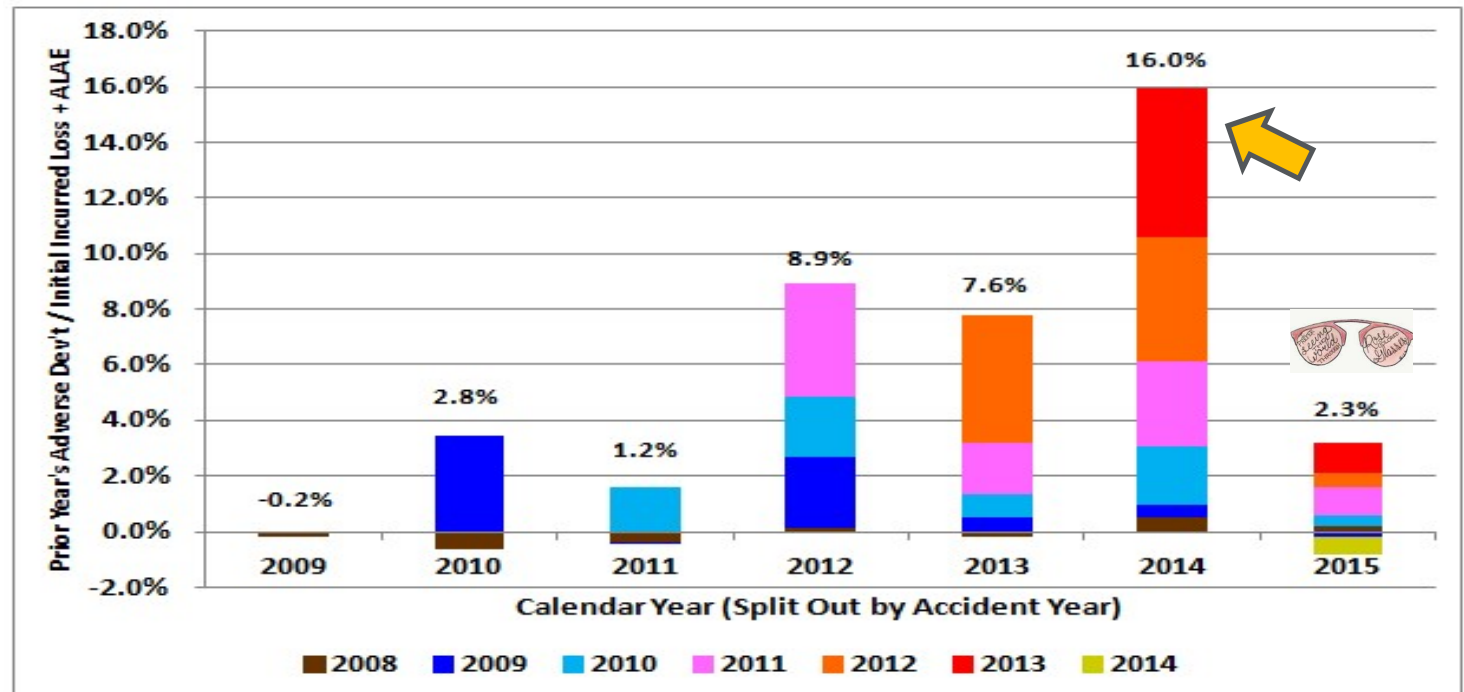
Commercial Auto – View at 2016



Illustrative

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

Each calendar year since 2010 had adverse development due to lengthening loss development tail. 2014 being by far the most adverse, with all years contributing besides first look at 2015.



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, and 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

© Insurance Services Office, Inc., 2017

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

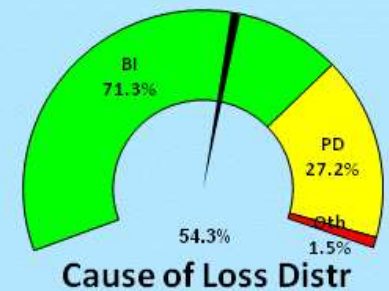
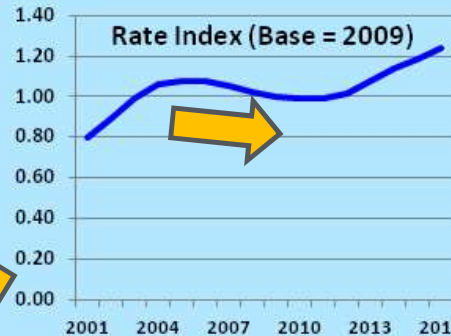
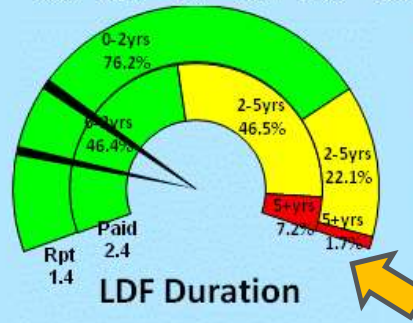
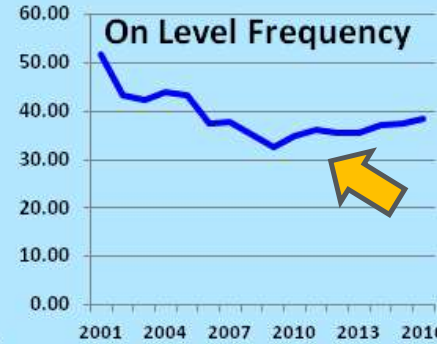
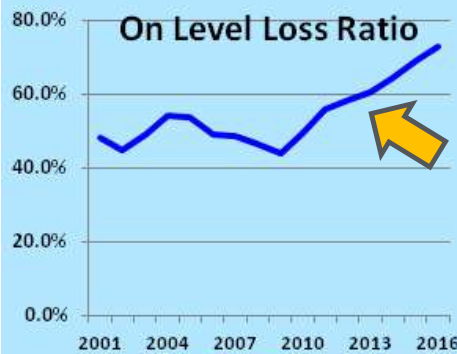
Illustrative

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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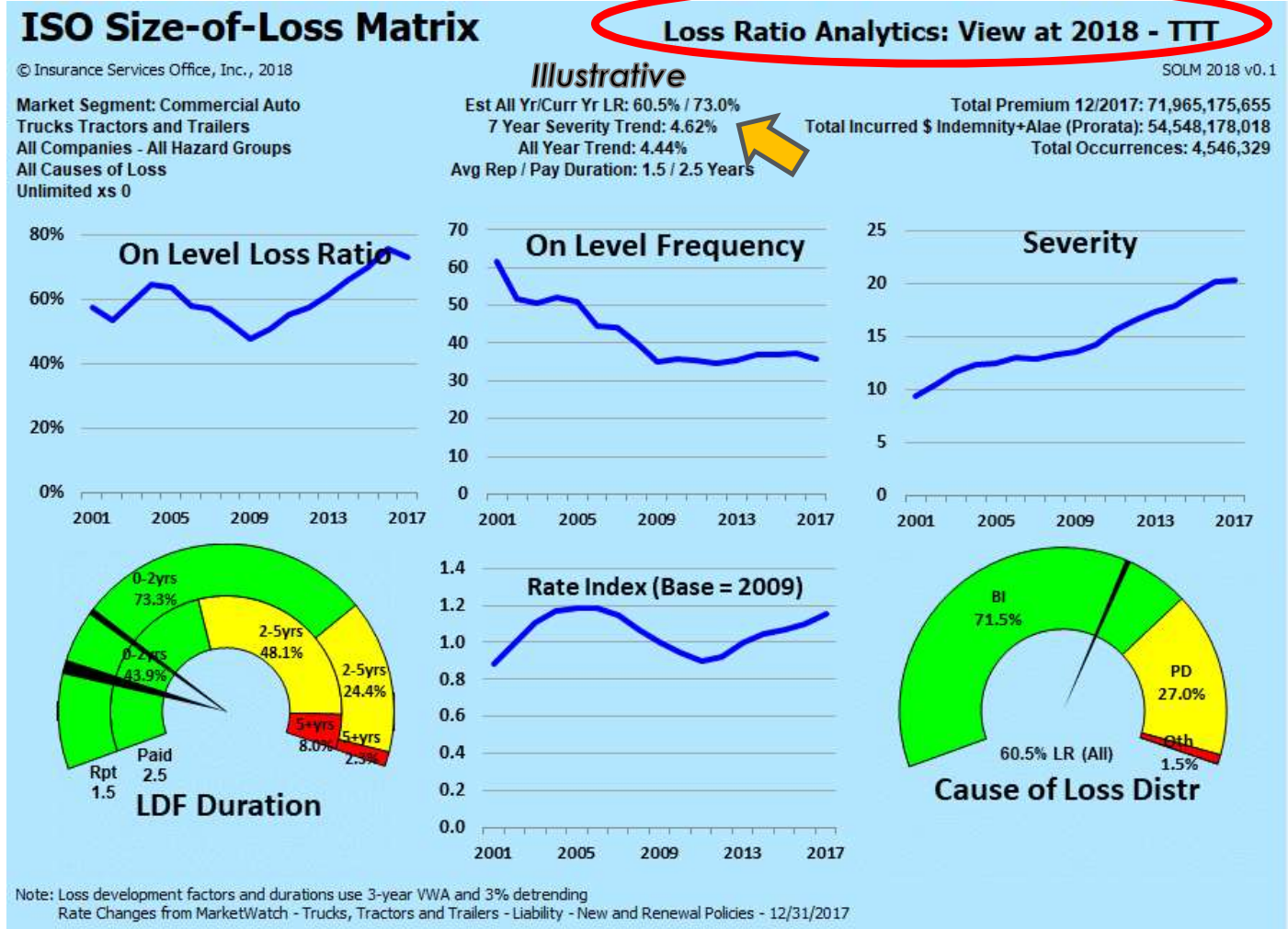
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Commercial Auto – View at 2018



Overall loss ratios deteriorated a bit for 2016 and prior due to further lengthening tail and adverse loss development. 2017 improved a bit due to continued rate activity, and lessened loss trends.

The current TTT loss ratio of 73.0%, is 12.5 points worse than longer term on-level average of 60.5%.



Source: SOLM 2018v1 pre-release (using expanded MarketWatch method 3-new and renewal including impacts from ILFs)

Commercial Auto View at 2019



Commercial Auto – View at 2019



Overall loss ratios ticked up again in 2018 due to continued higher average severity levels, lengthening tail and continued adverse development in actual vs. expected losses. The recent improvement in rates is not enough to totally reverse the higher loss levels. There has been a steady decline in these on-level results since 2009.

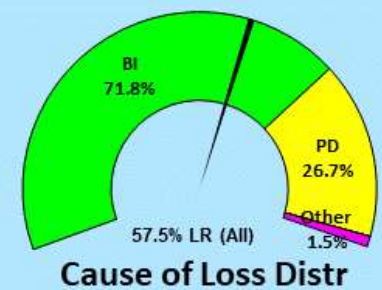
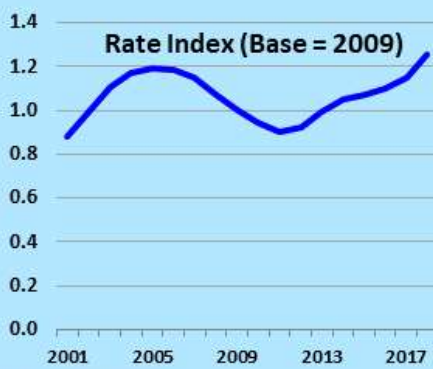
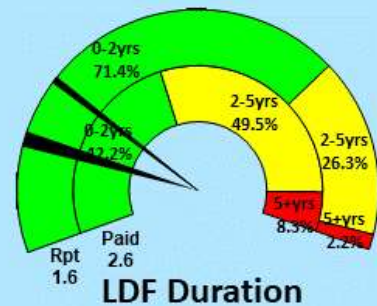
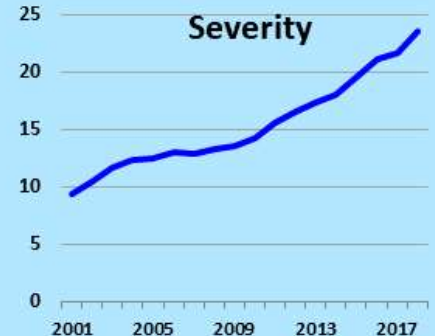
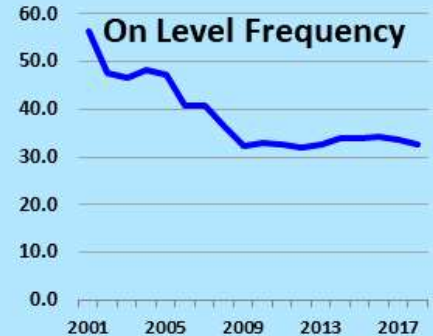
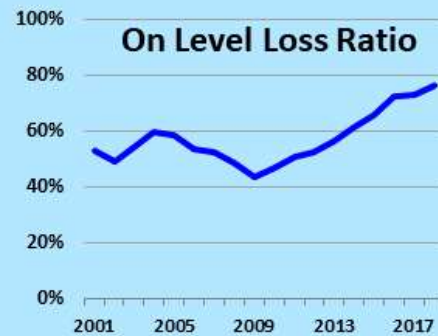
The current TTT loss ratio of 76.7%, is 19.2 points worse than longer term on-level average of 57.5%.

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
 SOLM 2019 v0.2



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



Results using power units as base vs. on-level premium produce similar indications.

Continued adverse development in calendar year 2018 across all years, with slight improvement to 2017.

ISO Size-of-Loss Matrix

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

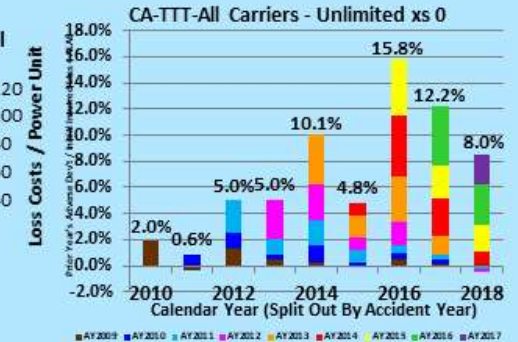
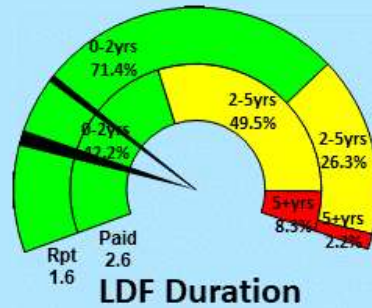
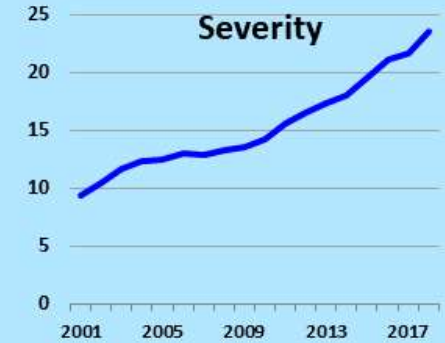
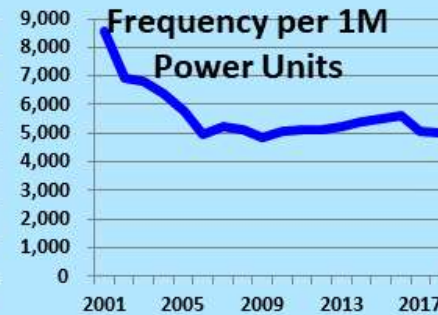
Loss Cost Analytics: View at 2019 - TTT

Illustrative

SOLM 2019 v0.2

Est All Yr/Curr Yr LC: 85 / 119
7 Year Severity Trend: 5.87%
All Year Trend: 4.80%
Avg 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
Total Exposure (Power Units): 36,513,373



Note: All triangles use 3-year VWA (3.0% detrended)
Loss Costs per Total Losses / Power Units, Power Units are in months (multiply LC * 12 for annual cost)

Source: SOLM 2019v1 pre-release

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Commercial Auto – View at 2019

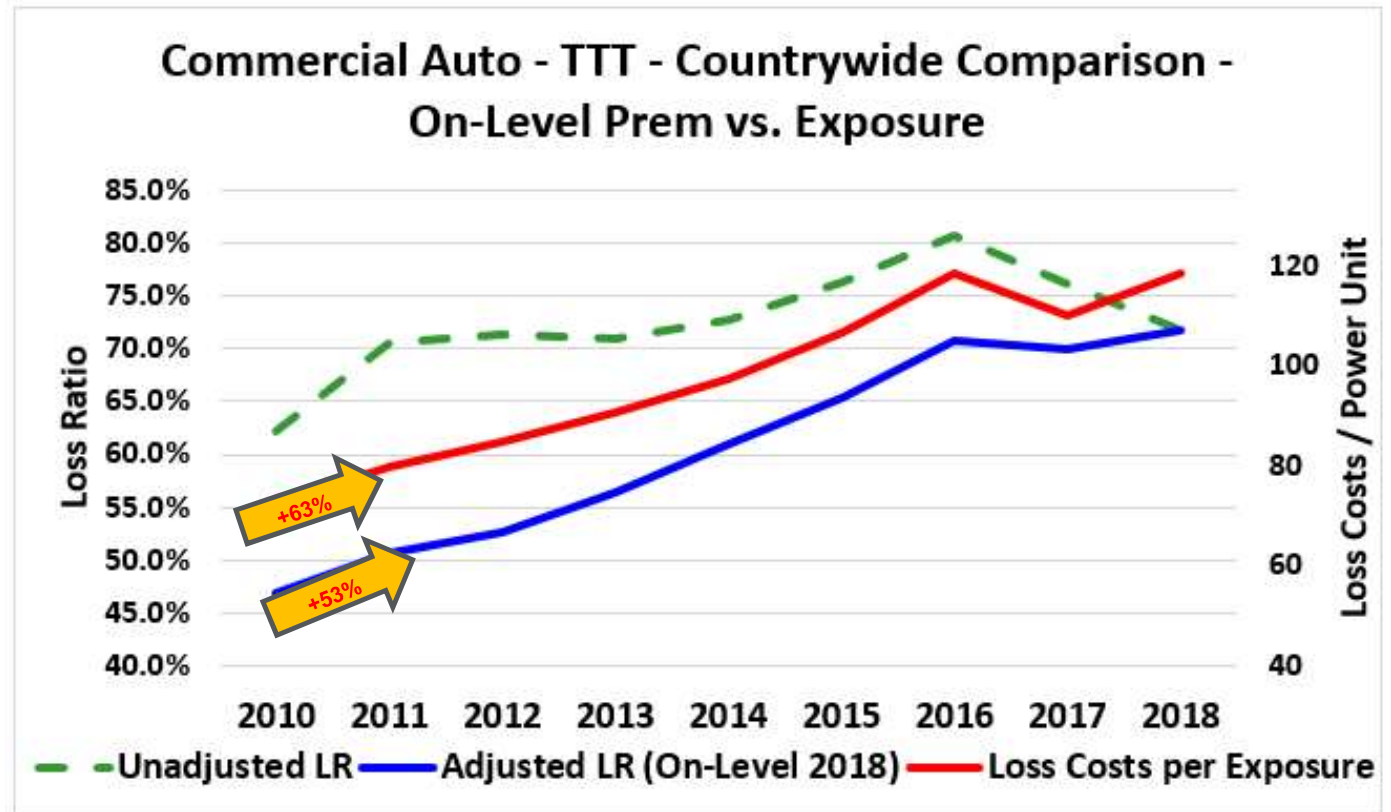


Commercial Auto Trend – TTT – Comparison On-level premium vs. Power Units

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



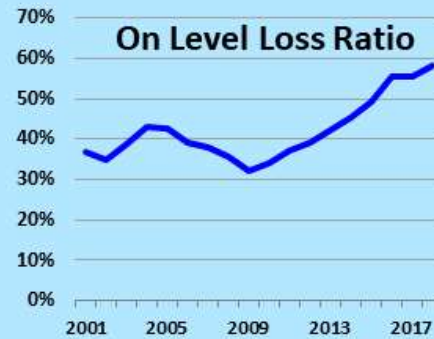
Bodily injury is a somewhat larger portion of total (71.8% vs. 70.3% in 2009), and longer average reported loss and payment duration.

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

ISO Size-of-Loss Matrix

© Insurance Services Office, Inc., 2019

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



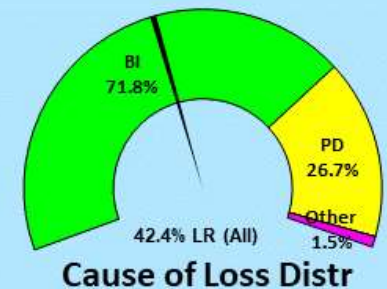
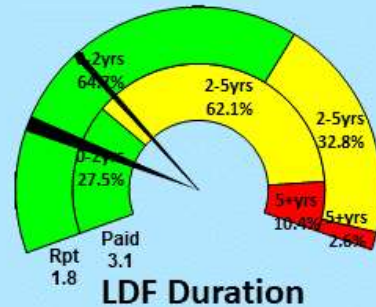
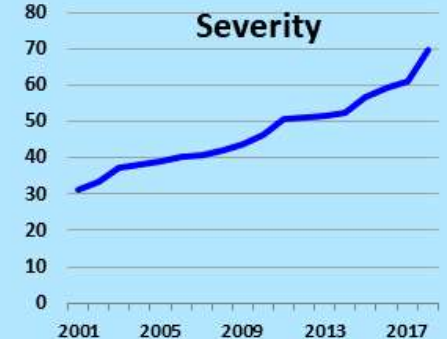
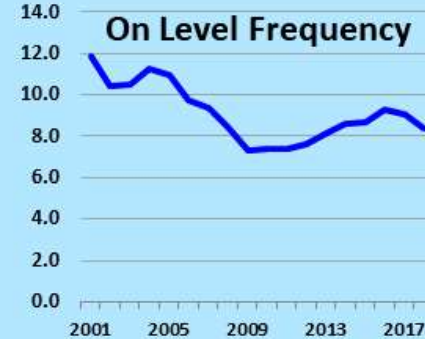
Loss Ratio Analytics: View at 2019 - TTT BI

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

© Insurance Services Office, Inc., 2019

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

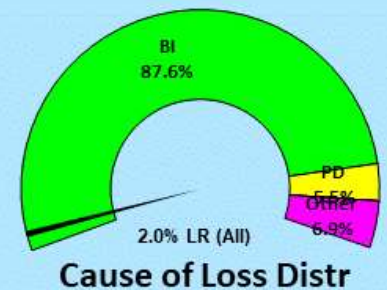
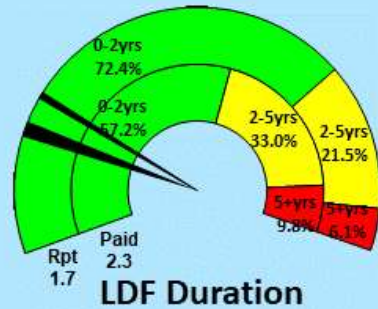
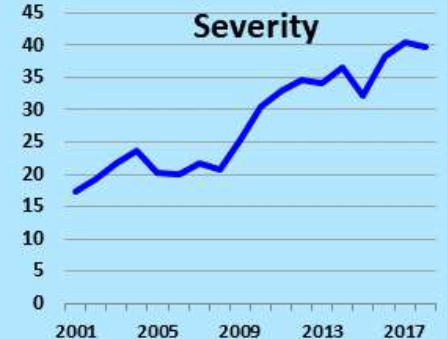
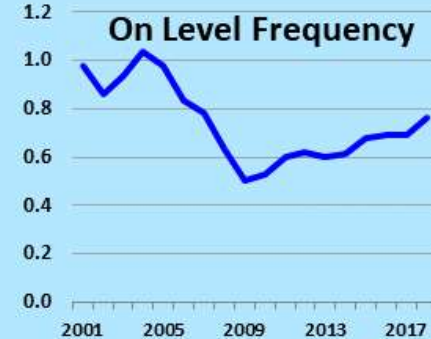
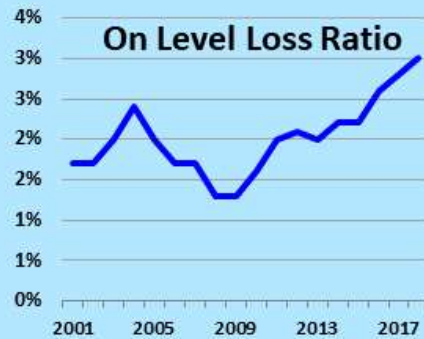
Illustrative

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



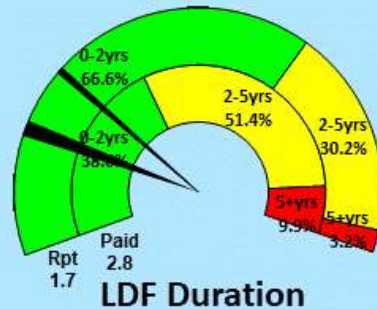
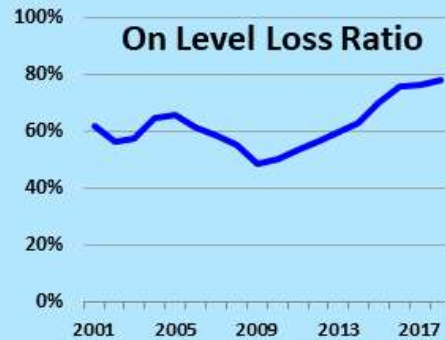
For all of Commercial Auto (TTT is about half of the 8 CAU markets out of 47 total commercial markets we analyze), the current loss ratio is 78.3%, vs. long-term on-level average of 62.2%.

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

ISO Size-of-Loss Matrix

© Insurance Services Office, Inc., 2019

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

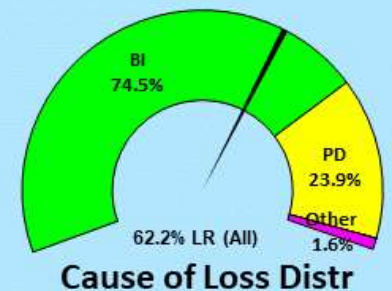
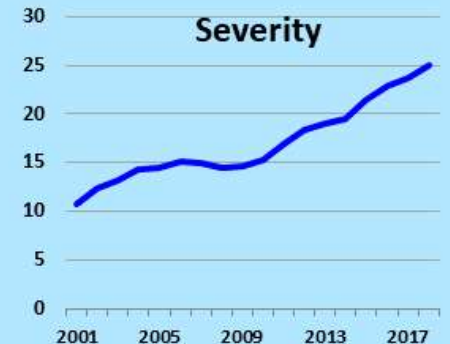
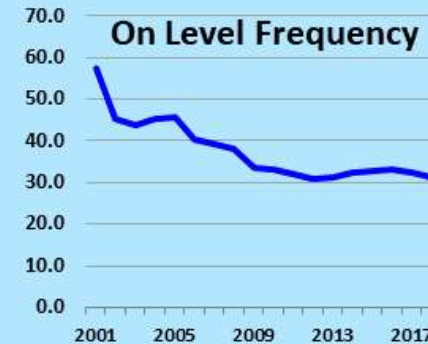


Loss Ratio Analytics: View at 2019 - All CAU

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

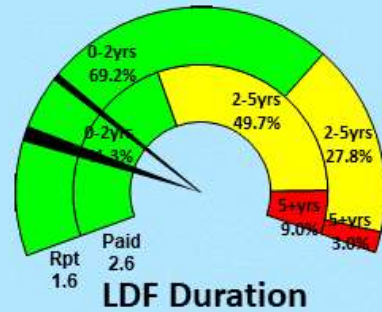
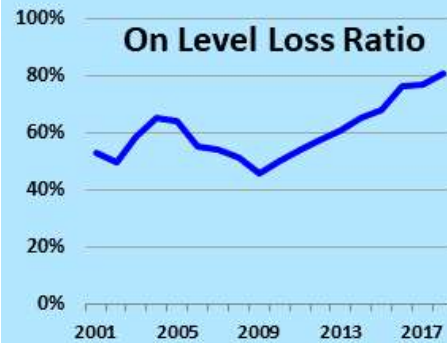


Regional carriers somewhat worse overall experience at 81.0% for TTT, and 20 points worse than long-term on-level average 61%. Significant variations between regional, and all, carriers exist.

ISO Size-of-Loss Matrix

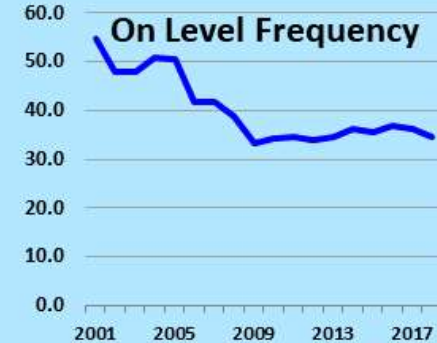
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Market Segment: Commercial Auto
Trucks Tractors and Trailers
Regional Companies - All Hazard Groups
All Causes of Loss
Unlimited xs 0 Countrywide



Illustrative

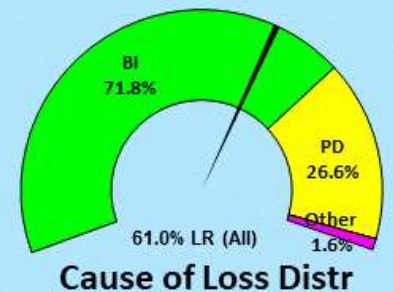
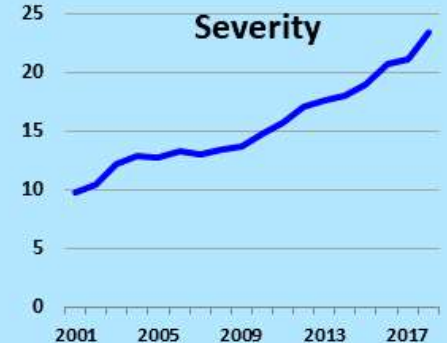
Est All Yr/Curr Yr LR: 61.0% / 81.0%
7 Year Severity Trend: 5.27%
All Year Trend: 4.51%
Avg Rep / Pay Duration: Rpt 1.6 / Paid 2.6
Years



Loss Ratio Analytics - Regional Carriers

SOLM 2019 v0.2

Total Premium 12/2018: 37,531,473,125
Total Incurred \$ Indemnity+Alae (Prorata): 30,701,193,974
Total Occurrences: 2,455,283
Total Exposure (Power Units): 36,513,373



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

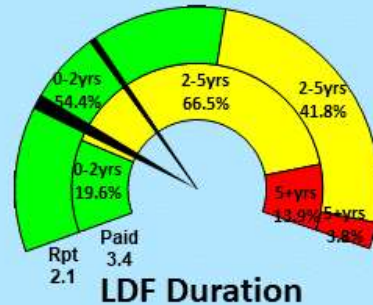
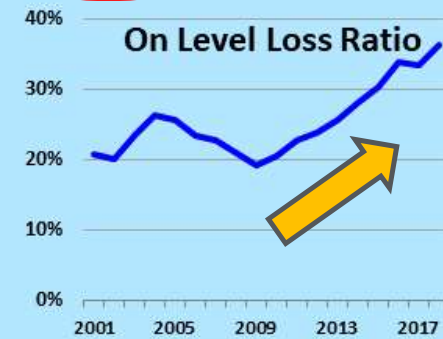


Continued significant pressure on increased limits factors for layer 4.9M xs of 100k, going from low 20% in 2009 to above 35% currently, driven by higher frequency and steady severity trend.

ISO Size-of-Loss Matrix

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



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

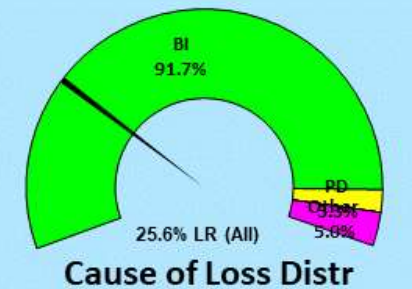
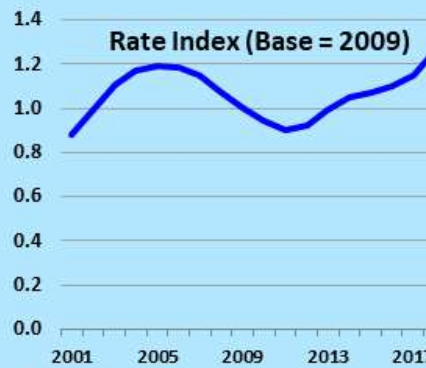
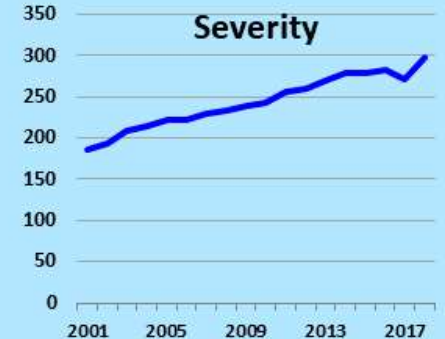
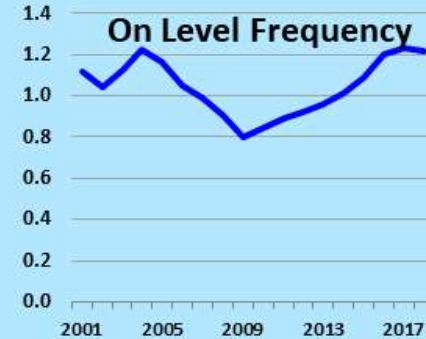
Loss Ratio Analytics: View at 2019 **TTT Excess**

SOLM 2019 v0.2

Illustrative

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



Source: SOLM 2019v1 pre-release using on-level premium as base
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Commercial Auto – View at 2019



Regional carriers have worse experience than super-regional or national carriers, with losses less than 100k providing much of the difference.

Faster developing companies having better experience than slower companies.

ISO Size-of-Loss Matrix

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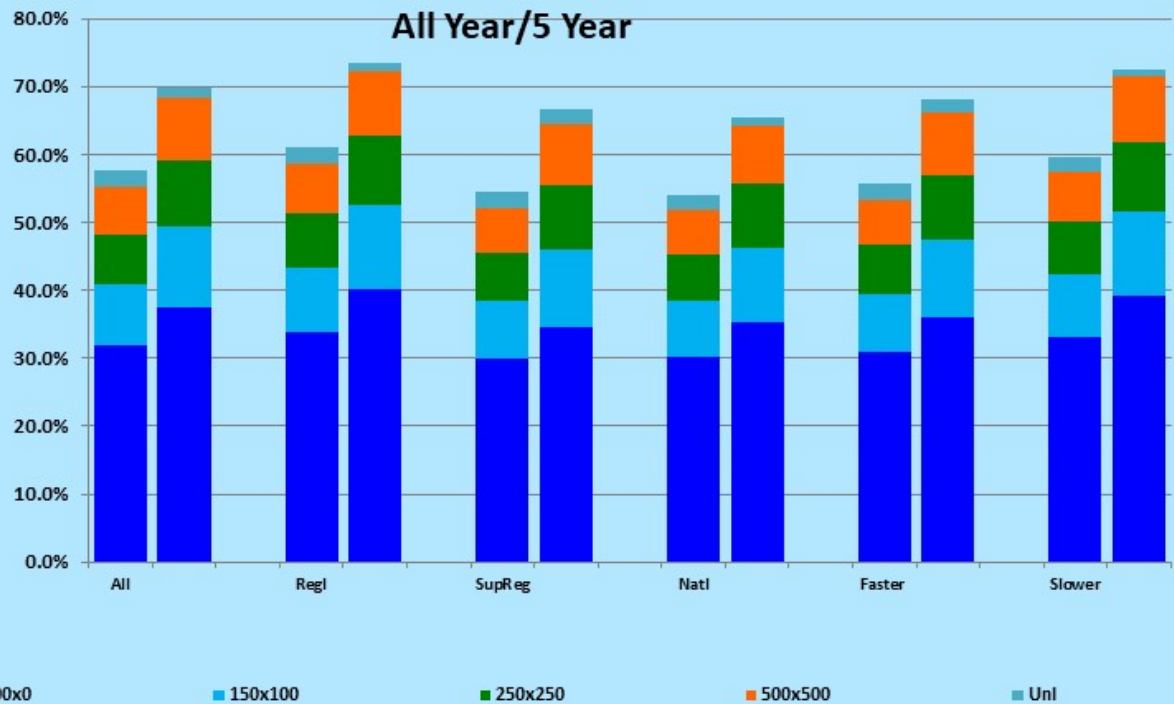
Market Segment: Commercial Auto
Trucks Tractors and Trailers
All Companies - All Hazard Groups
All Causes of Loss
Unlimited xs 0 Countrywide

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

Excess Loss Ratio Analytics

SOLM 2019 v0.2

Total Premium 12/2018: 77,083,835,931
Total Incurred \$ Indemnity+Alae (Prorata): 58,610,498,786
Total Occurrences: 4,718,129
Total Exposure (Power Units): 36,513,373



Source: SOLM 2019 v1 pre release using top 40 National Companies (market cap > \$1B); regional is <250M market cap)

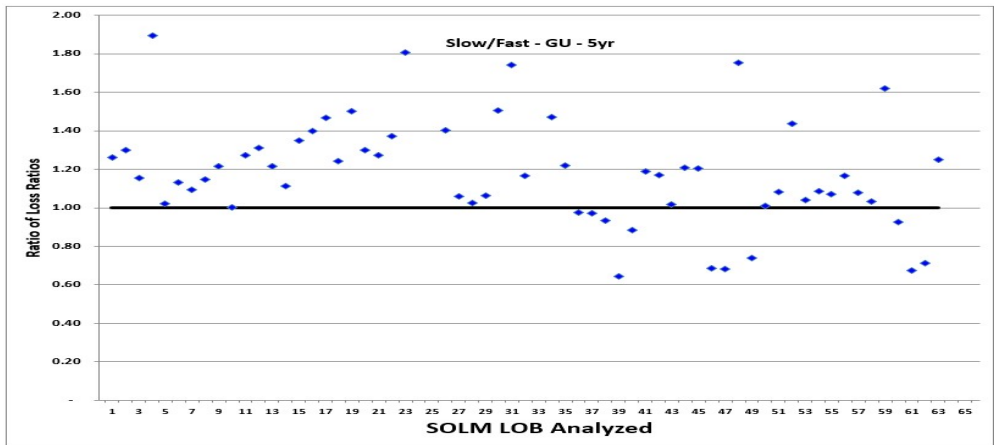
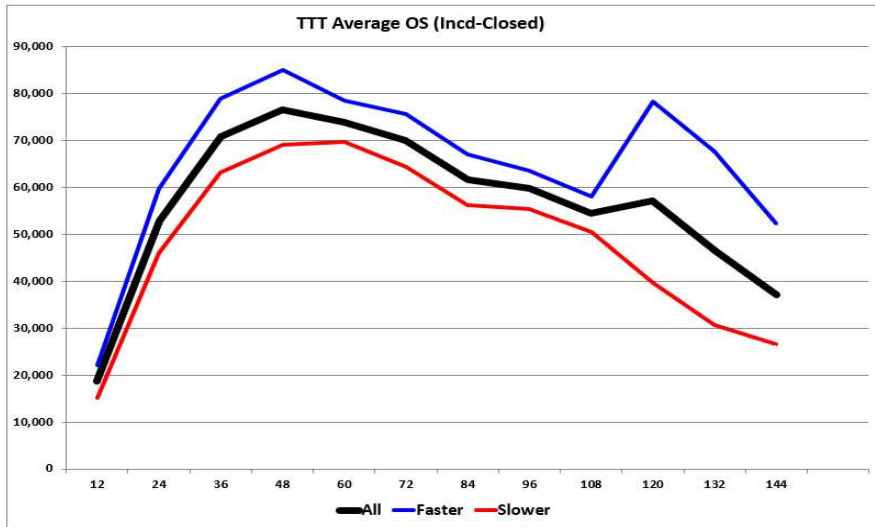
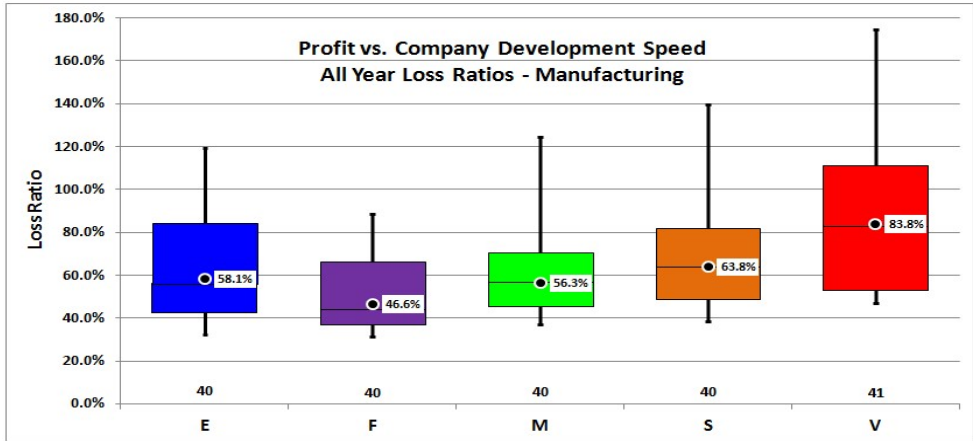
Commercial Auto – View at 2019



Is There a Connection between Profitability and LDF Speed? Illustrative

Faster and slower companies generally have significantly different average case reserves at comparable maturities, with faster companies putting up reserves much faster.

We have shown a very significant link between faster reporting companies and better overall results in the 54 markets we analyze on a macro basis.



Source: Verisk Monday Webinar – 9/11/2017 (updated 2019) – John Buchanan, Marni Wasserman (recorded)
<http://webinars.verisk.com/line-of-insurance/profitability-company-loss-development-speed/>

Commercial Auto Component of Umbrella – View at 2019



Continued significant increase in loss ratios (2.4% to 11.4%) driven by large increase in frequency per \$1M of premium since 2009 (.02 to .06). Frequency increase likely due to increased primary losses piercing umbrella attachment points.

ISO Size-of-Loss Matrix

Loss Ratio Analytics: View at 2019 **UXS CA**

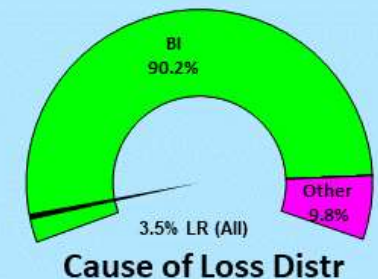
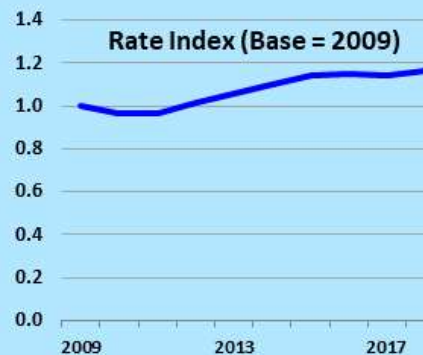
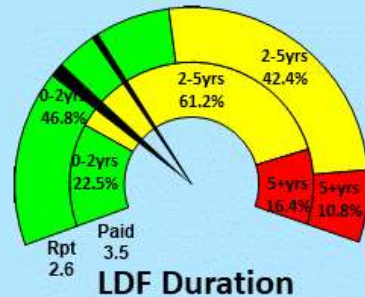
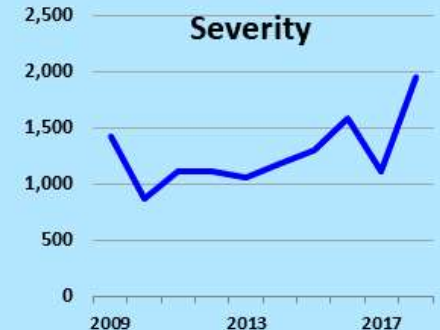
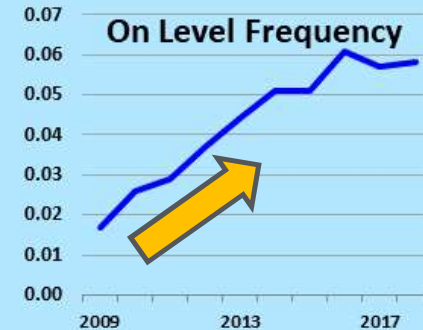
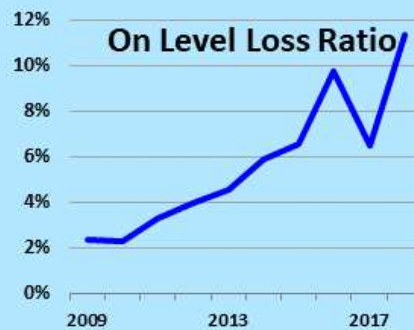
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SOLM 2019 v0.2

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

Est All Yr/Curr Yr LR: 3.5% / 11.4%
 7 Year Severity Trend: 6.23%
 All Year Trend: 4.22%
 Avg Rep / Pay Duration: Rpt 2.6 / Paid 3.5
 Years

Total Premium 12/2018: 99,820,000,000
 Total Incurred \$ Indemnity+Alae (Prorata): 2,548,973,156
 Total Occurrences: 2,278



Note: Loss development factors and durations use 3-year VWA and 3% detrending
 Rate changes from MarketWatch - Umbrella and Excess - New and Renewal Policies - 12/31/2018

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

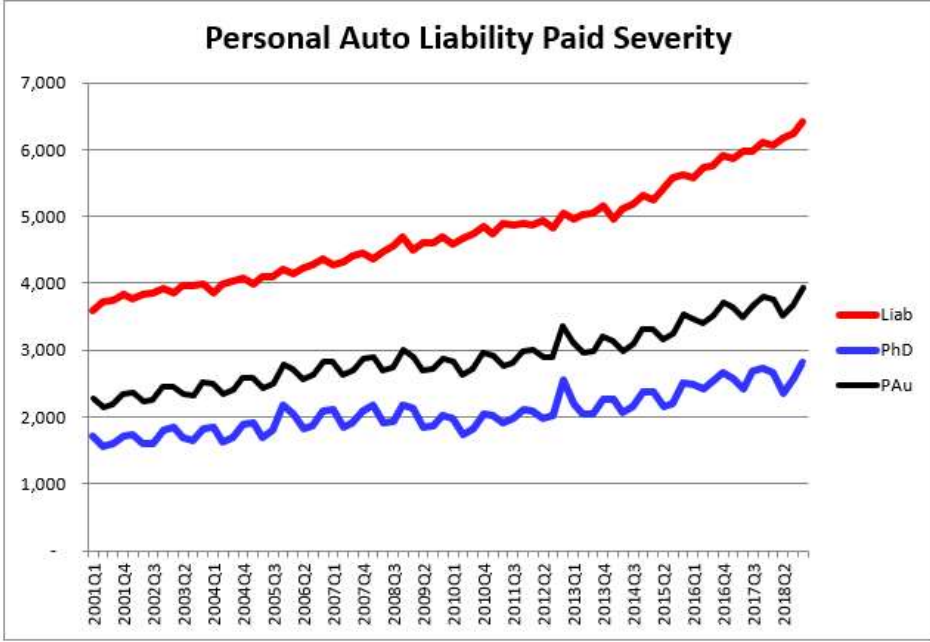
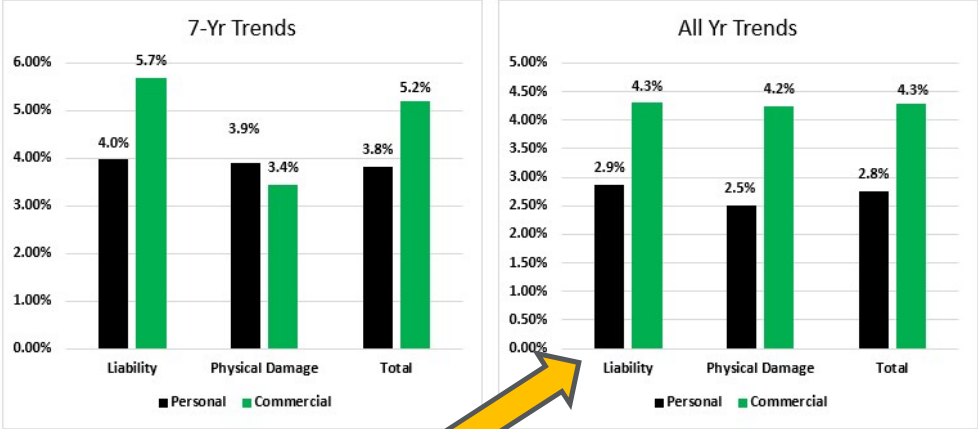
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Personal vs. Commercial Auto – View at 2019



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

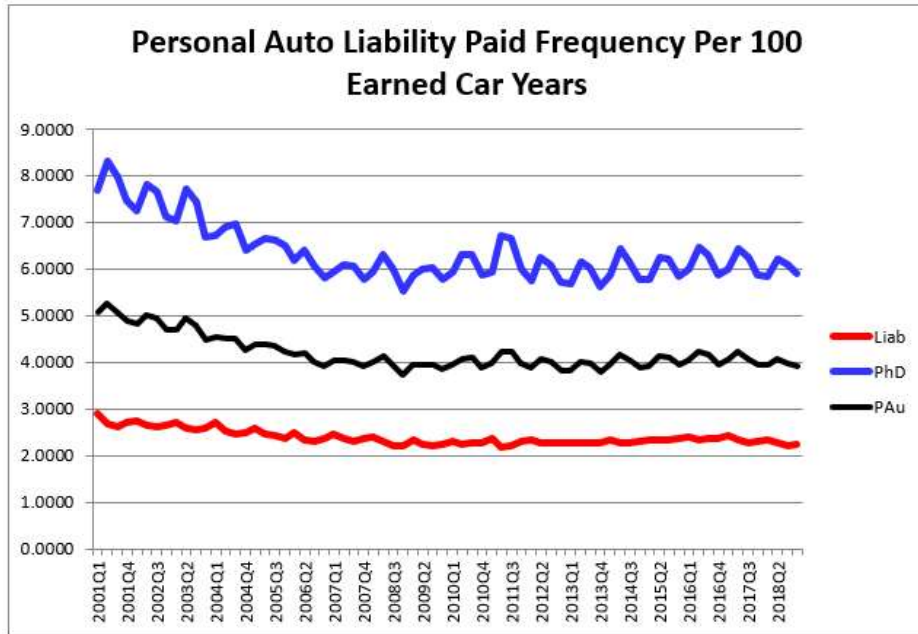
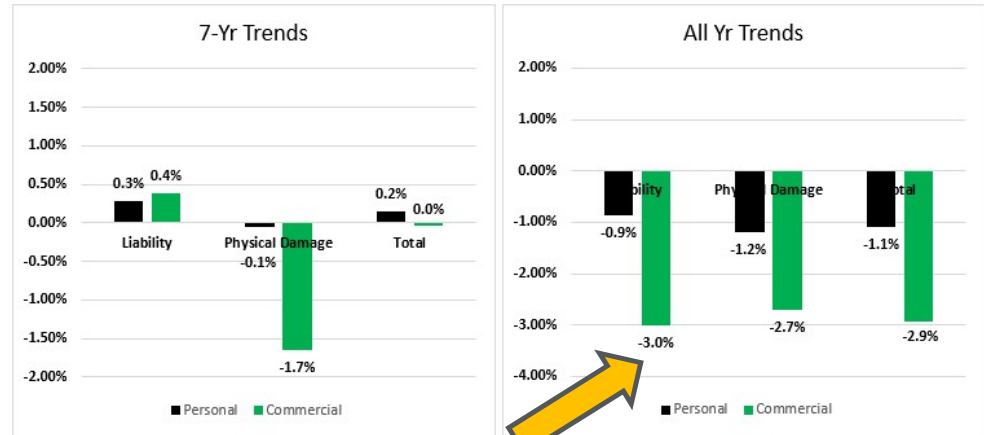


		7 Yr	All Yr
Liability	Personal	3.79%	2.87%
	Commercial	5.69%	4.30%
Physical Damage	Personal	3.91%	2.51%
	Commercial	3.44%	4.24%
Total	Personal	3.83%	2.76%
	Commercial	5.21%	4.29%

Personal vs. Commercial Auto – View at 2019



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

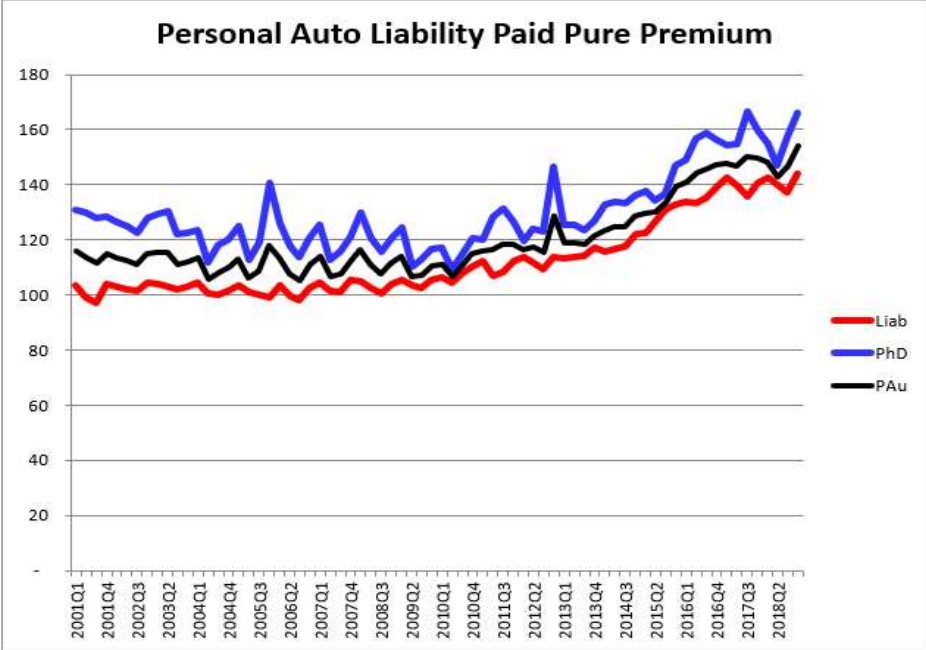
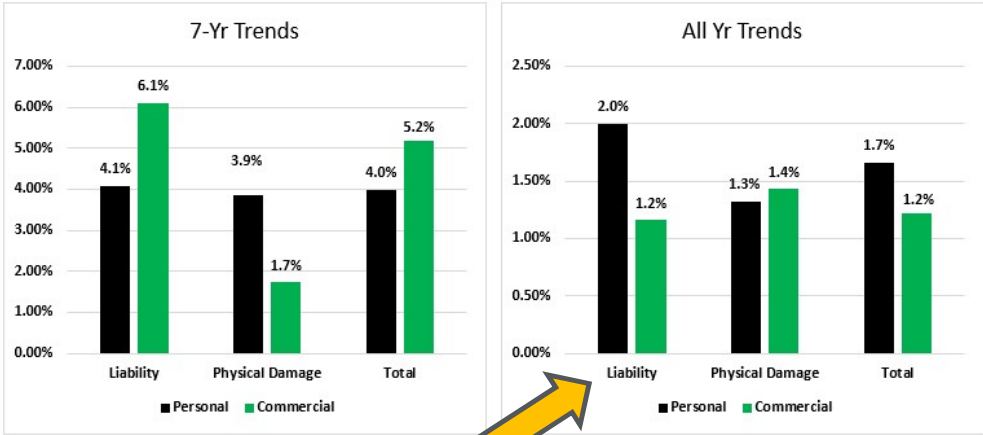


		7 Yr	All Yr
Liability	Personal	0.29%	-0.87%
	Commercial	0.39%	-3.01%
Physical Damage	Personal	-0.06%	-1.20%
	Commercial	-1.65%	-2.70%
Total	Personal	0.15%	-1.10%
	Commercial	-0.04%	-2.94%

Personal vs. Commercial Auto – View at 2019



Personal Auto Pure Premium trends tend to be lower than in the more recent years than that of Commercial Auto, but 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%

Personal vs. Commercial Auto Emerging Issues Comparison



Illustrative

ISSUE/TOPIC	STANDARD CASUALTY											
	PAu - Total						CAu - Total					
	2H 1990s	1H 2000s	2H 2000s	1H 2010s	2015-18	FUTURE	2H 1990s	1H 2000s	2H 2000s	1H 2010s	2015-18	FUTURE
Seat Belt Laws	M					✓	✓	✓	✓	✓	✓	✓
Seat Belt Usage		L	L			✓						
Airbags Laws/Technology	L	M	M	L	L		✓	✓	✓	✓	✓	
Automobile Design (Crash Avoidance Tech)	L	L	L	M	M	✓	✓	✓	✓	✓	✓	✓
Auto Performance		L	L	L	L							
Roadway Design	L	L	L				✓	✓	✓	✓	✓	
Electronic Stability Control		L	H	L	L		✓	✓	✓	✓	✓	
Vehicle Type (Unequal Size)		L	L	L	L							
Bumper Height		✓	✓	✓	L							
Graduated Licensing (Teenagers)		M	L	L	L	✓						
Use of Cell Phones and other electronics		L	M	M	M	✓	✓	✓	✓	✓	✓	✓
Miles Driven (Price of Gasoline)			L	L	L		✓	✓	✓	✓	✓	✓
Driving Under the Influence					M	✓						
Electronic Traffic Surveillance					M	✓						
Telematics					L	✓					✓	✓
Ride Sharing						✓					✓	✓
Autonomous Vehicles						✓						✓
Economy (Unemployment)	✓	L	M	L	✓	✓	✓	✓	✓	✓	✓	✓
Changing Demographics (Shift to urban)						✓				✓	✓	✓
Tort Reform	✓	✓	✓	✓	✓	✓						
Propensity to sue				L	L					✓	✓	✓
Fraud					L							
Climate Change			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Historical Perspective



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)

Loss Development and Reserve Runoff Testing



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								

3-Year

Commercial Auto – View at 2019

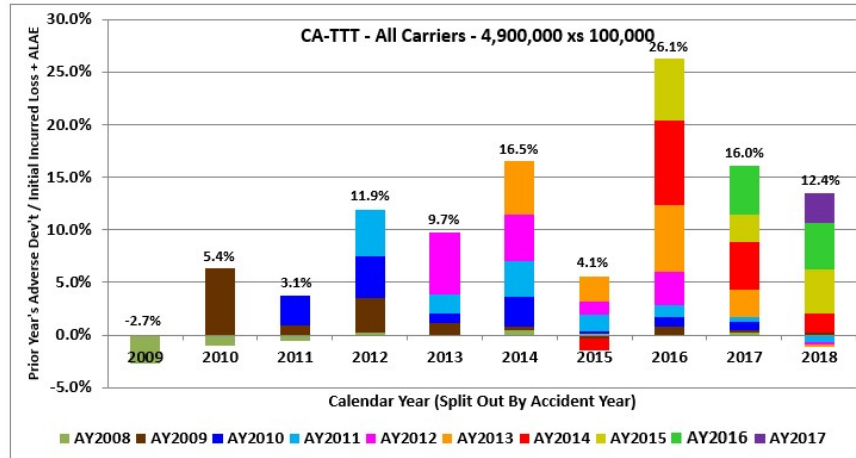


TTT – Reserve Run-off Test @12/31/2018 – 4.9M xs 100k

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
% Adv (Fav)	914,672,523	55,004,345	2000	(143,526)	(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	(8,528,933)	(14,752,487)	933,219	363,731	27,287,245	33,790,234
	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	(1,263,354)	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)	33,443,353	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%	54 Somewhat favorable
0.1%	2.7%	40 Within +0.1% of original estimate
2.7%	8.0%	21 Somewhat adverse
		Adverse development

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

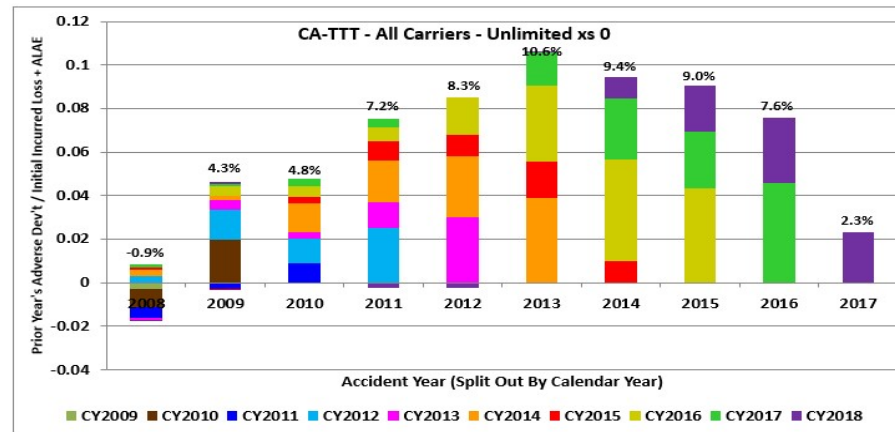
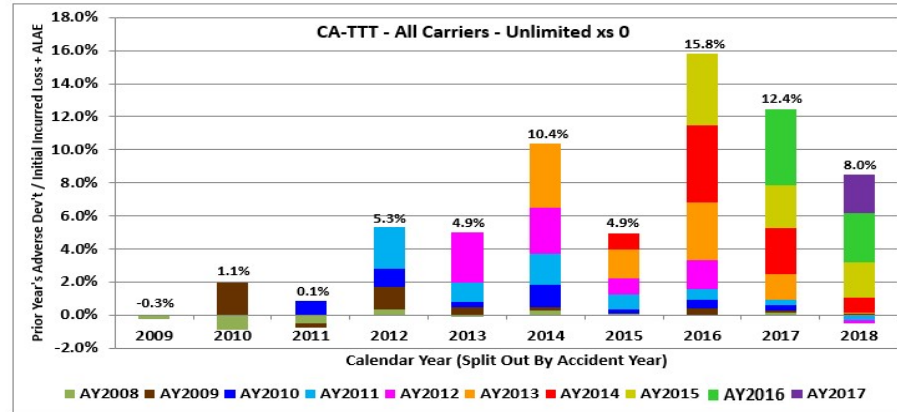


TTT - ERLI Warning through 12/31/2018

Illustrative

Calendar year 2018 shows adverse development with slight improvement over 2017 for TTT, with 2016 worse and 2015 a small lull.

Adverse development across all AYs.



Sources: Using pre-release SOLM 2019 v1 – mechanical selections of VWA (100% 7-year)

Commercial Auto – View at 2019

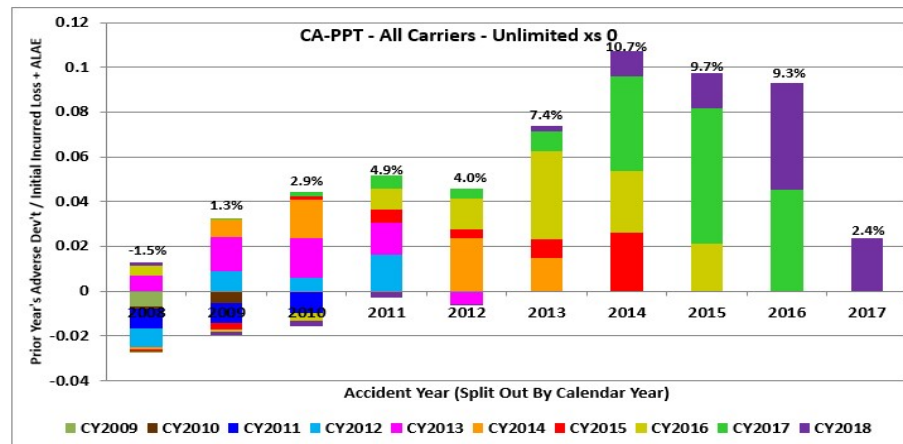
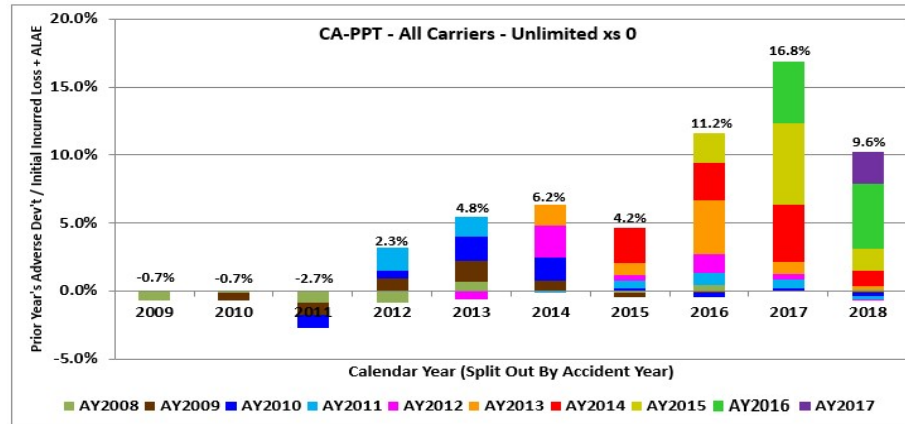


PPT - ERLI Warning through 12/31/2018

Illustrative

Calendar year 2018 second worst year for adverse development for PPT, continuing lag vs. TTT shown previously.

Adverse development across all AYs.



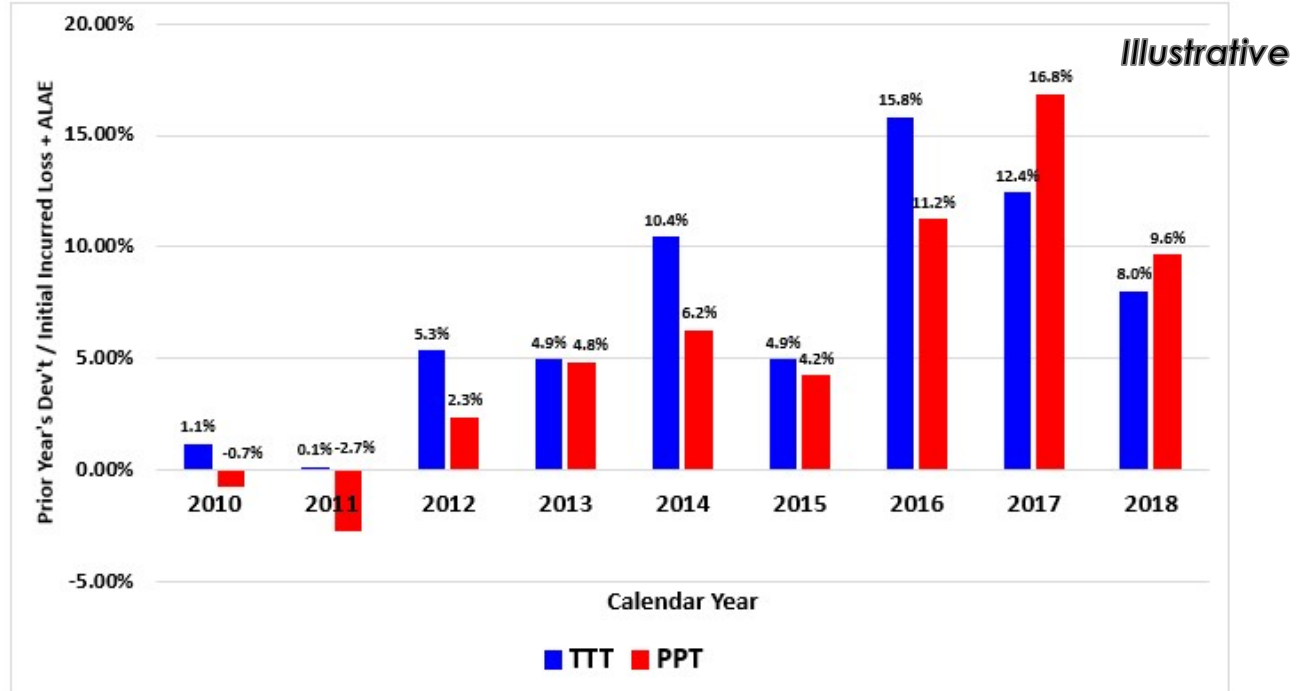
Sources: Using pre-release SOLM 2019 v1 – mechanical selections of VWA (100% 7-year)

Commercial Auto – View at 2019



Commercial Auto – Comparing TTT to PPT – Calendar Year

TTT had its deterioration show up earlier than PPT, with over two thirds appearing by 2016 for TTT, while PPT did not show its first meaningful deterioration until 2013.



Cumulative % Deterioration	2010	2011	2012	2013	2014	2015	2016	2017	2018
TTT	1.7%	1.9%	10.3%	18.1%	34.7%	42.4%	67.6%	87.3%	100.0%
PPT	-1.4%	-6.6%	-2.1%	7.2%	19.1%	27.3%	48.9%	81.0%	100.0%

Sources: Using pre-release SOLM 2019 v1 – mechanical selections of VWA (100% 7-year)

Commercial Auto – View at 2019

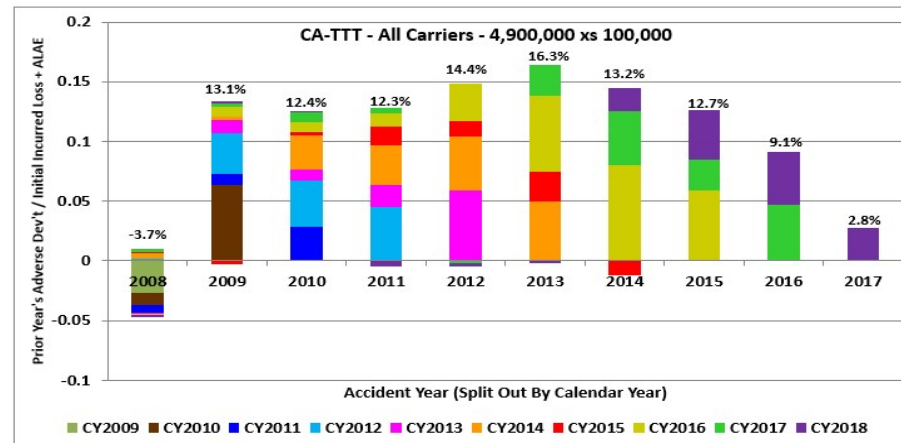
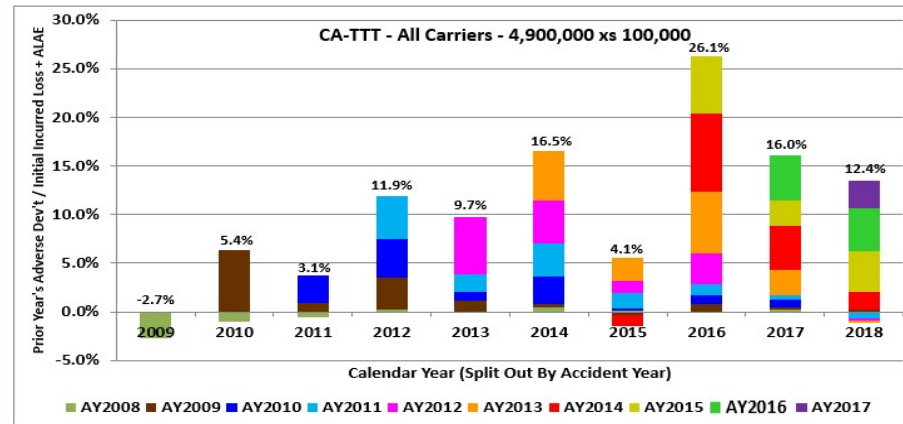


TTT XS - ERLI Warning through 12/31/2018

Illustrative

Excess TTT adverse development is higher than ground-up for 2018, continuing overall pattern of 2016 worse and 2015 a small lull.

Adverse development across all AYs.



Sources: Using pre-release SOLM 2019 v1 – mechanical selections of VWA (100% 7-year)

Commercial Auto – View at 2019

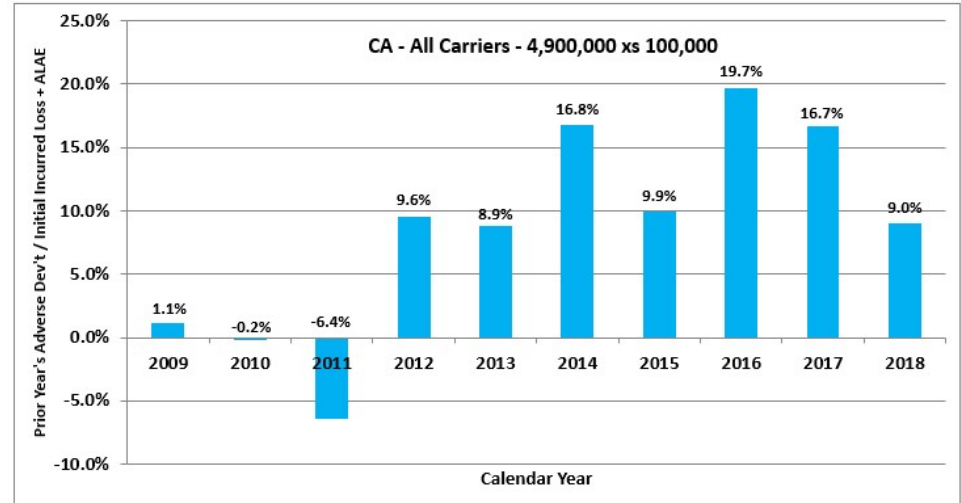


All CAU – Reserve Run-off Test @12/31/2018 – # xs 100k

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	AY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
3.9%	6,348	250	2000	-	(0)	(1)	(1)	(1)	1	(1)	2	4	8	(7)	2	(37)	(62)	(144)	(51)	85	456
1.2%	12,861	158	2001	1	(1)	-	1	0	(6)	(3)	(8)	5	(3)	(17)	(5)	(92)	(265)	85	(100)	565	
-4.4%	12,445	(553)	2002	2	1	4	(6)	4	(6)	(6)	19	(15)	(16)	4	80	(203)	(226)	(101)	(87)		
-2.9%	11,580	(331)	2003	(0)	2	0	(7)	0	4	8	12	(11)	(48)	(13)	(72)	(135)	(101)	24			
-5.6%	12,343	(697)	2004	4	2	(1)	(5)	1	(17)	8	2	(32)	(15)	(79)	(102)	(269)	(194)				
-6.6%	12,545	(830)	2005	1	(3)	2	(6)	(4)	(12)	14	22	(68)	(34)	(154)	(310)	(279)					
-7.3%	12,570	(914)	2006	5	1	5	(12)	13	(4)	34	11	(76)	(171)	(197)	(523)						
-4.1%	11,891	(489)	2007	11	2	3	3	10	4	96	(67)	(258)	(223)	(71)							
-3.5%	10,035	(349)	2008	9	(4)	6	(4)	47	(15)	68	(253)	(309)	112								
2.9%	8,140	235	2009	(3)	16	11	7	71	63	124	(289)	236									
5.4%	8,251	447	2010	3	17	52	(1)	147	107	140	(20)										
14.9%	7,918	1,181	2011	(4)	21	72	144	261	236	458											
12.8%	8,228	1,054	2012	(18)	14	132	153	446	324												
15.0%	8,407	1,265	2013	6	165	391	289	614													
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)

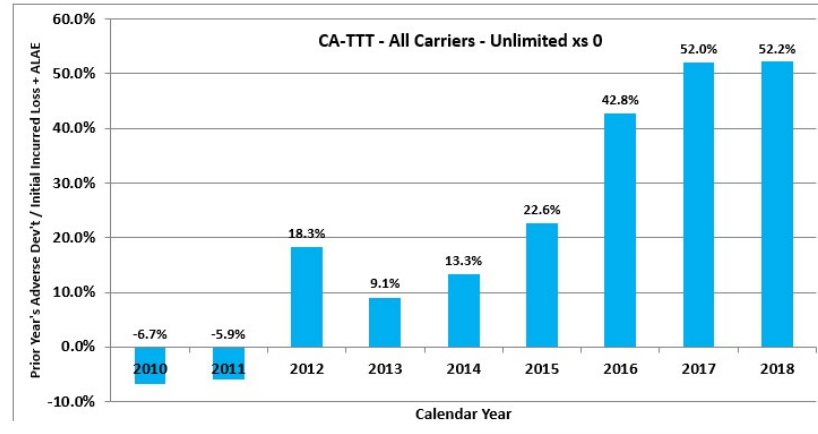
Commercial Auto – View at 2019



TTT Paid - ERLI Warning through 12/31/2017 - GU

Illustrative

A check of payment patterns, also shows continuing adverse development or a lengthening of the tail. In particular in CY 2016 to CY2018, so not just a case reserve issue. Why?



Paid \$ Indemnity+Alae (Prorata) Triangle

	24/12	36/24	48/36	60/48	72/60	84/72	96/84	108/96
AY 1997	2.028	1.409	1.189	1.101	1.049	1.017	1.008	1.005
AY 1998	1.993	1.430	1.208	1.097	1.038	1.018	1.007	1.004
AY 1999	2.042	1.424	1.216	1.090	1.041	1.020	1.007	1.003
AY 2000	1.993	1.426	1.207	1.106	1.040	1.015	1.007	1.004
AY 2001	1.989	1.440	1.208	1.103	1.040	1.015	1.007	1.003
AY 2002	2.001	1.438	1.212	1.092	1.036	1.019	1.005	1.003
AY 2003	2.085	1.455	1.241	1.109	1.037	1.014	1.005	1.004
AY 2004	2.120	1.454	1.210	1.094	1.043	1.015	1.006	1.004
AY 2005	2.092	1.415	1.223	1.096	1.038	1.015	1.007	1.004
AY 2006	2.026	1.451	1.218	1.100	1.043	1.016	1.007	1.003
AY 2007	2.071	1.398	1.210	1.103	1.039	1.016	1.005	1.004
AY 2008	2.066	1.410	1.222	1.097	1.040	1.017	1.007	1.005
AY 2009	1.991	1.410	1.238	1.107	1.042	1.018	1.010	1.005
AY 2010	2.020	1.451	1.228	1.115	1.043	1.019	1.011	1.004
AY 2011	2.096	1.419	1.227	1.119	1.053	1.022	1.009	
AY 2012	2.097	1.438	1.244	1.121	1.047	1.021		
AY 2013	2.069	1.451	1.277	1.131	1.048			
AY 2014	2.079	1.482	1.267	1.139				
AY 2015	2.092	1.506	1.288					
AY 2016	2.203	1.517						
AY 2017	2.158							

Sources: Using pre-release SOLM 2019 v1 – mechanical selections of VWA (50% all-year, 50% 5-year)

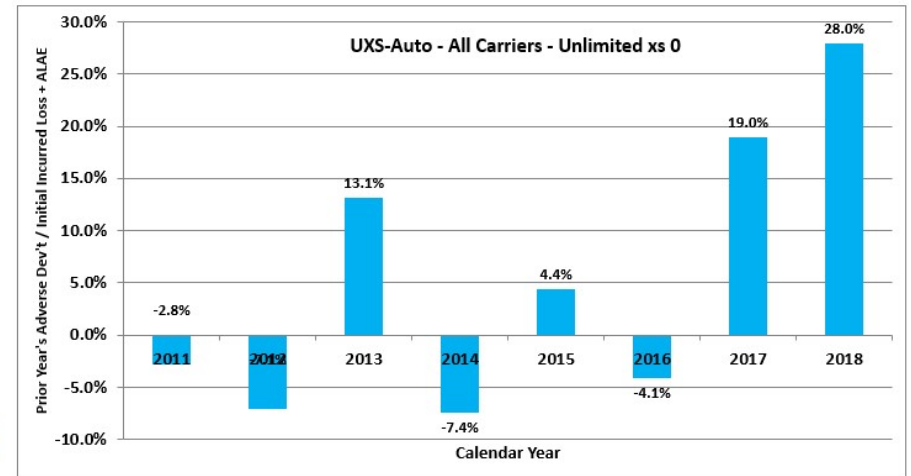
Commercial Umbrella – Auto – View at 2019



All CAu – Reserve Run-off Test @12/31/2018 – GU

Comparing to initial selected losses at 12 months using a mechanical 7-year average, produces significant CY2018 deterioration after high deterioration in 2017.

Illustrative



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

Market Analysis:

UXS-Auto - All Carriers

Assumptions:

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

Select Metric here:				CY2018	CY2017	CY2016	CY2015	CY2014	CY2013	CY2012	CY2011	CY2010
% Adv (Fav)	Estimated INCURRED Ultimate @12 mos	Adverse (Fav) Devt	AY	1	2	3	4	5	6	7	8	9
-73.7%	230,210,862	(169,722,486)	2009	(710)	2,532,801	810,765	(1,414,768)	2,356,989	6,333,567	(9,700,945)	(17,239,662)	(153,400,523)
21.6%	94,737,397	20,442,459	2010	9,125,038	1,059,538	(9,987,842)	(4,095,169)	(1,839,024)	12,009,676	9,758,908	4,411,274	
-21.6%	236,731,435	(51,127,524)	2011	(1,946,037)	(14,261,446)	13,883,207	12,372,749	(5,654,882)	(24,397,227)	(31,123,890)		
-2.5%	213,261,455	(5,289,341)	2012	(2,698,184)	(4,908,051)	(17,673,596)	9,274,371	(6,379,284)	17,095,402			
12.0%	246,877,450	29,622,613	2013	13,905,823	6,299,364	(16,784,871)	29,045,260	(2,842,964)				
-3.4%	427,603,083	(14,447,560)	2014	10,848,190	14,841,557	11,273,396	(51,410,703)					
41.6%	281,427,281	117,118,390	2015	32,316,874	49,140,312	35,661,204						
2.8%	587,153,270	16,408,668	2016	7,052,625	9,356,043							
-0.4%	403,745,084	(1,800,801)	2017	(1,800,801)								

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

Appendix

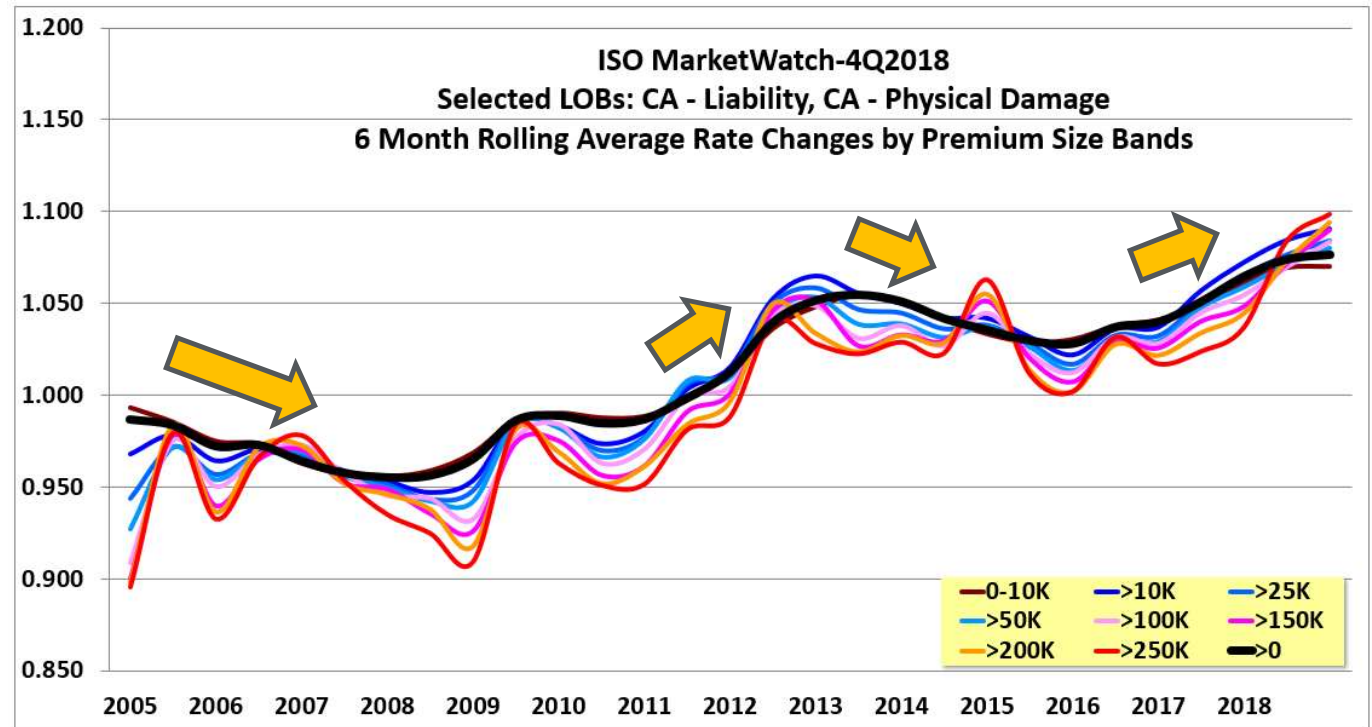
Commercial Auto – View at 2019



Incremental Rate Changes Through 12/31/2017 – Renewal Policies

Illustrative

Rates ride a roller coaster ride, but lagged by a few years compared to actual experience.



	Total Premium (previous)			
Total # of policies	All	>10K	>100k	>200k
143,701,224	51,444,469,945	15,360,796,094	4,271,290,060	2,427,528,087

Source: ISO MarketWatch – released 3/22/2018; further details in Commercial Actuarial Panel – December 2016

Commercial Auto – View at 2019

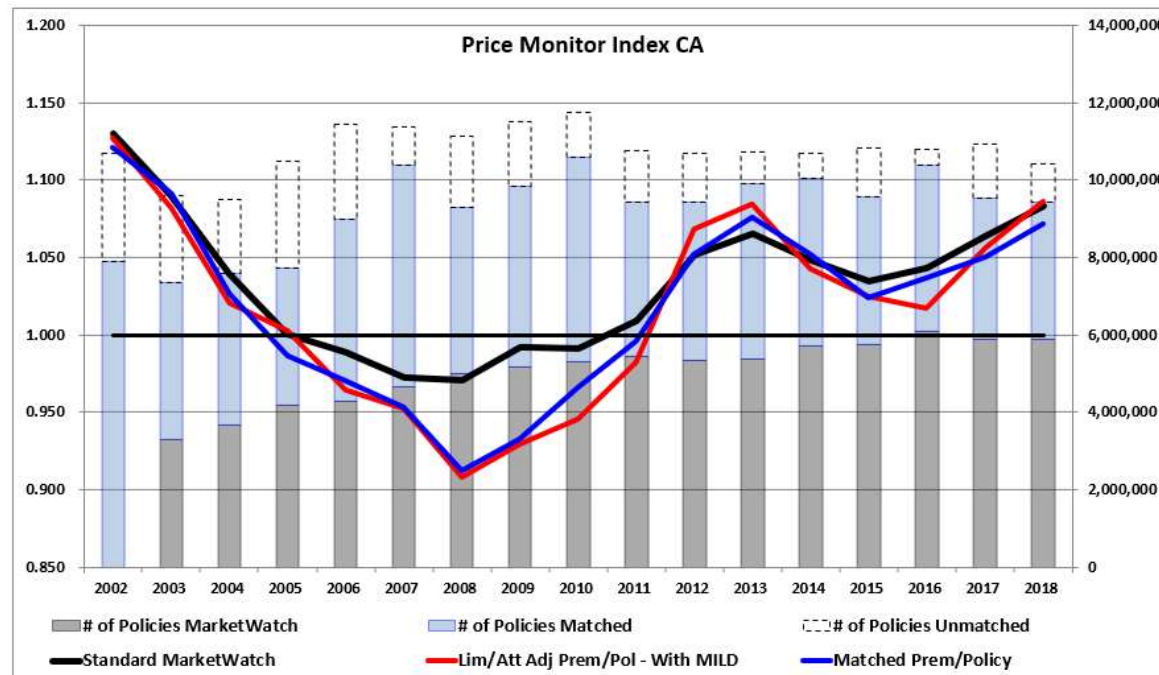


Sample Price Monitors - Commercial Auto Liability – New and Renewal Policies

Illustrative

Renewal vs. New and renewal rate changes show different patterns throughout the underwriting cycle.

For example, renewal policies show a reduction of about 2% in 2009 and 2010, while new and renewal (adjusted for different average attachment and limits offered), shows a reduction of closer to 7% and 5% (-8% in 2008).



Note: Renewal Policies (Standard MarketWatch) - the # of policies underlying this policy level method is shown by the height of the grey bar. The black line represents the incremental rate changes. This method analyzes policy level data, only including policies with a common footprint from year to year for limit, attachment, capping, etc.

New and Renewal Policies (Expanded MW) - the # of policies underlying this company level method is shown by the total height of the grey and blue bars. The blue line represents the incremental rate changes. This method analyzes company level data from year to year, excluding companies for a particular year that have significant changes. This method does not include impacts due to the average number or type of exposures underlying the policy counts.

Limit/Attachment Adjusted - includes adjustments for aggregated limit and attachment differences using MILD for casualty lines (no adjustment for property).

The total # of policies issued by line of business is the total height of all 3 bars (the bar height is the current year policy counts, rather than the prior year).

The largest reported exposure bases (by policy count) for this line are: Car Months 89%, Employee Months 7%, Cost of Hire 1%

Commercial Auto – View at 2019



Total Commercial Auto Industry – New and Renewal Policies

Illustrative

There are significant rate change differences by renewal vs new/renewal, state, month, year, premium size, aggregated peer groups such as regional/super-regional/national, line of business and market.

Year: 2002 2018

Year for Map: 2017 2018

State Name: (Multiple values)

Selected States: Alabama, Alaska, Arizona, Arkansas

Market: CAL

Selected Markets: CAL

Company Group: Total, Regional, Super Regional, National

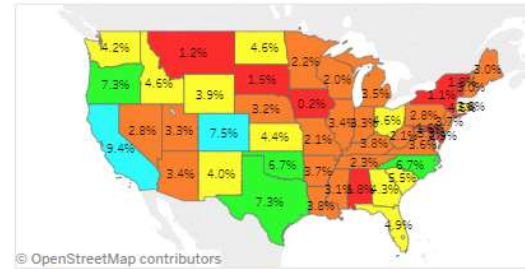
User: Industry

Cumulative Base Year: 2009

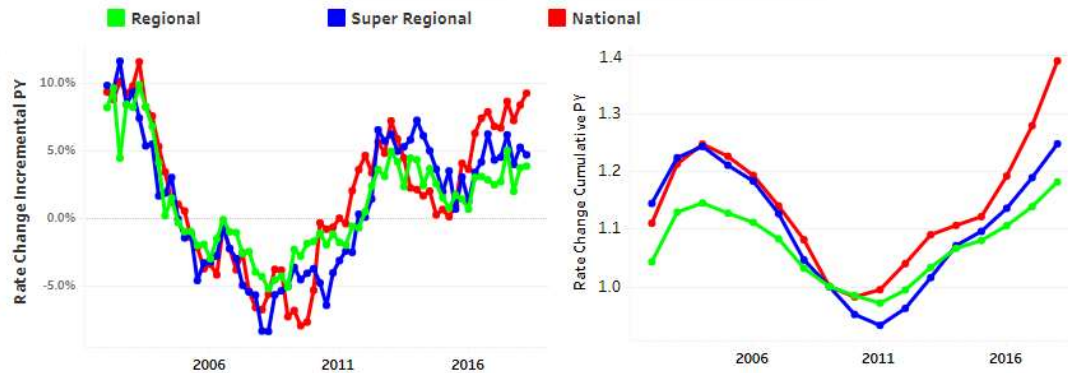
ISO MarketWatch - High Level Summary

Back

Selected Markets: CAL Selected States: Alabama, Alaska, Arizona and 47 more Company Group: Regional, Super Regional, National
2018, 2017: 5.2%, 4.4% All Year Premium: 68,137,381,831 Current Year Premium: 2,835,618,817 All Year Policy Count: 114,224,717 Current Year Policy Count: 3,882,518 All Year Avg Prem: 596 Current Year Avg Prem: 730



v1.0.9



Note: MarketWatch Dashboard (expected release 3Q2018); vlues shown may not match options selected

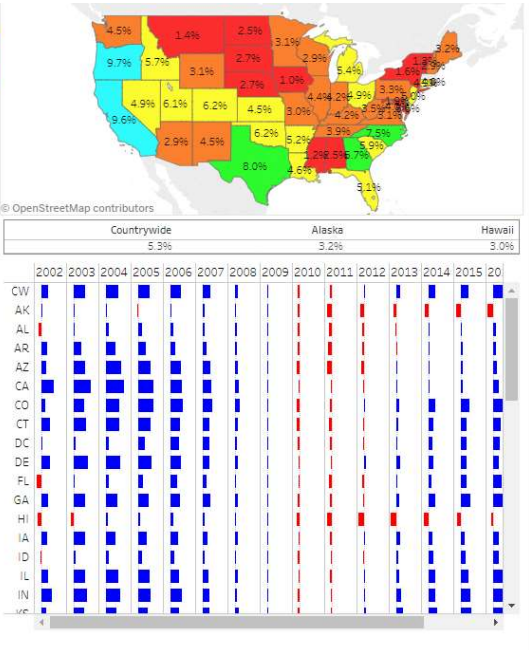
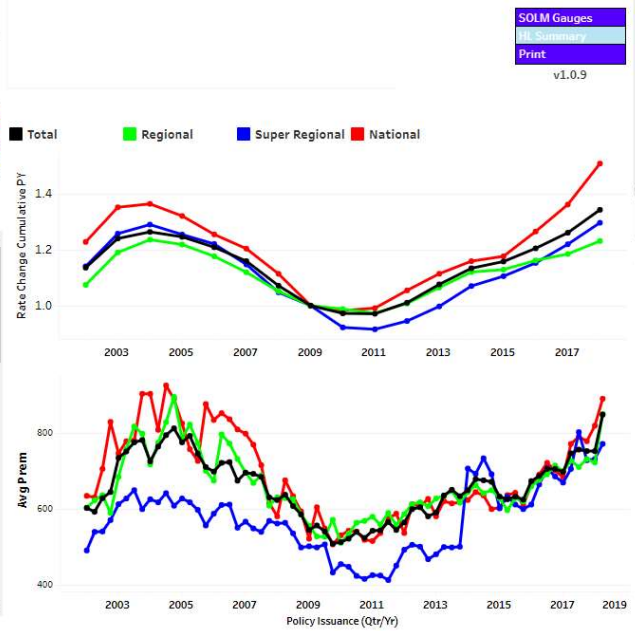
Commercial Auto – View at 2019



Total Commercial Auto Industry – New and Renewal Policies

Illustrative

There are significant rate change differences by renewal vs new/renewal, state, month, year, premium size, aggregated peer groups such as regional/super-regional/national, line of business and market.



Note: MarketWatch Dashboard (expected release 3Q2018); values shown may not match options selected

Commercial Auto – View at 2019

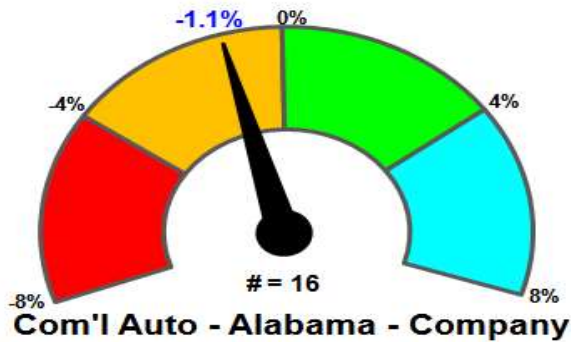


Industry Comparative Gauges – Hypothetical Sample: Alabama – July 2018 (Renewal only)

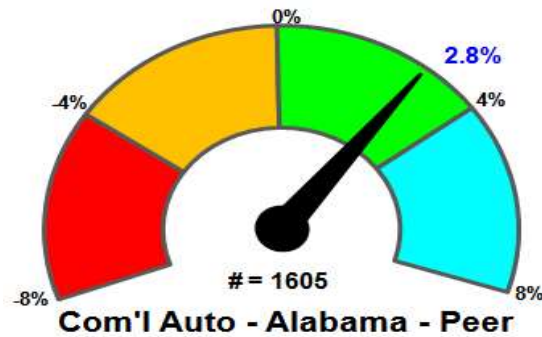
There are significant rate change differences by company, aggregated peer companies, and industry.

Illustrative

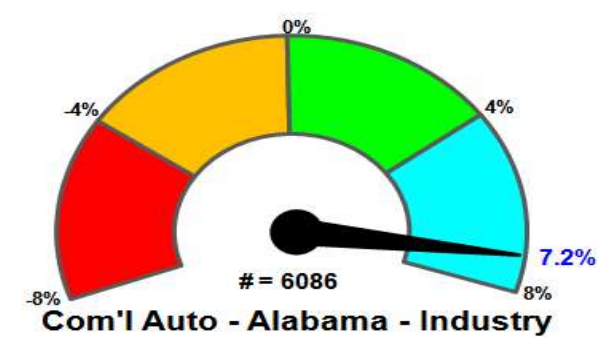
Company



Peer



Industry



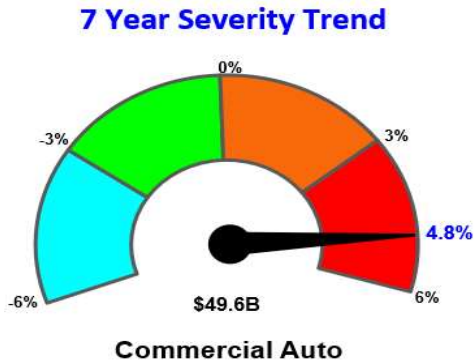
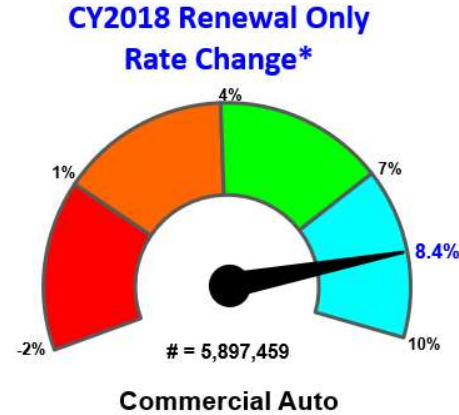
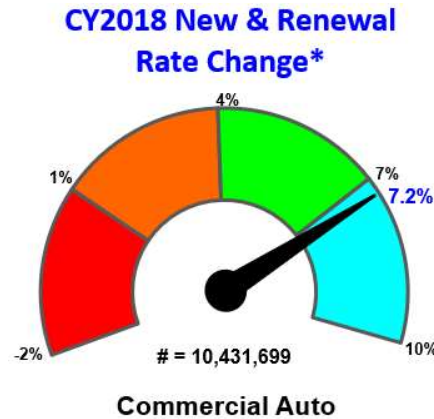
Commercial Auto – View at 2019



Holistic View of Rate Changes, Loss Trends and Loss Ratios

Illustrative

Combining rate changes, severity, frequency trends (including any exposure trends), will produce pressures on ultimate expected loss ratios.



Sources: ISO MarketWatch (* Preliminary through 4Q2018; not including aggregate changes in limits and attachment points)
SOLM (Using pre-release SOLM 2019 v1 data as of 12/31/2018, on-leveled using new and renewal rate changes for Commercial Auto through 12/31/2018)

Personal vs. Commercial Auto Emerging Issues Comparison



Frequency Trend Assessment Matrix – Overview and Steps Reconciling Expected Impacts on Historical Trend Indications

Overview: Apply knowledge from internal and external sources

- Assess qualitative impacts affecting individual lines of business
- Evaluate impacts on combinations of lines under an ERM framework; historical and emerging

1. Start with a survey list of potential historical issues or topics

- e.g. impact of seat belt laws for Personal Auto or MPL under various time frames

2. Assess whether each item would have a positive or negative impact

- e.g. expected to reduce (positive) or increase (negative) the frequency trend, no impact or unknown

3. Attempt to quantify impact of each item

- Low, medium, high, or unknown

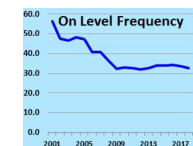
4. Reconcile various impact items, direction and magnitude, on historical frequency trend indications

- Eyeball axiom – do the two visuals line up across the time periods included?
- Perhaps more rigorous trend analysis confidence level tests can be applied

5. Do the same for:

- Across line impacts under ERM (e.g. economy, climate change, etc.)
- Severity impacts and other items in Benchmark Assessment Matrix
- Future emerging issues

ISSUE/TOPIC	2H 1990s	1H 2000s	2H 2000s	1H 2010s	2015-18
Seat Belt Laws	M	L	L		
Seat Belt Usage		L	L		
Airbags Laws/Technology	L	M	M	L	L
Automobile Design (Crash Avoidance Tech)	L	L	L	M	M
Auto Performance			L	L	L
Roadway Design	L	L	L		
Electronic Stability Control			H	L	L
Vehicle Type (Unequal Size)			L	L	L



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