August 19, 2022

Financial Services Regulatory Authority
5160 Yonge Street, 17th Floor
North York, ON M2N 6L9

Attention: Mr. Bruce Green, Director, Rates Operations, FSRA

RE: OW Preliminary Ontario Private Passenger Vehicle Annual Review (Based on Industry Data Through December 31, 2021) dated July 6, 2022

Dear Mr. Green,

Please find enclosed Facility Association's (FA) submission to the Financial Services Regulatory Authority of Ontario ("FSRA") Annual Review of Automobile Insurance Loss Experience. Our submission is in two parts. The first section provides FA's perspective on the current state of the insurance market in the province. The second section, addresses the draft Oliver Wyman ("OW") reports entitled "*Draft Ontario Private Passenger Vehicles Annual Review (Based on Industry Data Through December 31, 2021*" dated July 6, 2022 ("OW Report").

Any questions related to this submission may be directed to me by email at pgosselin@facilityassociation.com or by phone at 416-644-4968.

Best regards,

Philippe Gosselin, FCAS, FCIA
VP Actuarial & CRO

INTRODUCTION

FA's purpose is to ensure the availability of Automobile Insurance, and it is our continued position that this is best achieved through the availability of automobile insurance in the voluntary market in Ontario, providing consumers a choice in terms of both insurance provider and type and amount of coverage available[1]. We believe this corresponds with the Financial Services Regulatory Authority ("FSRA") mission of fostering a sustainable, competitive financial services sector and respond to market changes quickly.

Broadly speaking, we have some concern with potential availability issues in Ontario. We note that, except for 2020 and 2021 (impacted by COVID-19), the OW estimates of PPV loss ratios (indemnity, ALAE, and ULAE) have persisted at only a marginal improvement from their peak in 2016, and, since 2015, have remained well above the 67% level we estimate would be consistent with the proposed benchmarks as per the OW Report. The lower loss ratios of 2020 and 2021 cannot be expected to continue as the pandemic restrictions and their economic impact recede.

It is challenging to promote both fairness and predictability in automobile insurance rates at a time when the underlying costs of benefits provided by the insurance product are very difficult to predict, as stated in several passages of the OW Report. This is especially the case following significant reforms, and challenges in the understanding of changes in frequency of accidents and claims, and their associated severity, both in relation to injured parties and to vehicle damage. Nonetheless, we believe promoting fairness and insurers' ability to set and predict their rates will enhance availability and competition in the marketplace to the ultimate benefit of consumers.

In light of this, we believe it is important to reiterate our position that FSRA should use the benchmarking exercise to inform its considerations of rate filings, rather than to set specific targets, caps, or floors with respect to any one particular assumption. This approach opens the opportunity for insurers to reflect their own assessment of future costs in providing their product / service to the consumer, and allows them to set their rates based on their assessment of the competitive market in which they operate. This, we believe results in the greatest consumer choice in both providers and product, while maintaining fairness to all parties.

In contrast, setting specific values, floors or caps would adversely impact availability of voluntary automobile insurance in the province, to the extent that capital providers in the voluntary market take an adverse view of their ability to charge rates that they have assessed relative to the future costs and risk of providing insurance.

We believe it is important to lay the foundation for a flexible system, where insurers would be able to include their best estimates of future costs based on their own assumptions, judged by the FSRA on their own merit and the basis of reasonableness, considering prediction uncertainty.

[1]Consumers in Ontario are required to purchase $200,000 of third party liability protection. However, it is clear that consumers see value in broader insurance coverage to protect them and their financial wellbeing, as less than 0.04% of private passenger vehicles were insured for the required minimum third party liability limit, according to 2021 data found in GISA industry data (the AUTO7501). Further, 89% purchased protection for their vehicle against collision/upset, and 72% purchased protection for their vehicle against theft and non-collision damage. We believe these statistics show a clear consumer appetite in the province for automobile insurance across many of the perils to which owning or operating an automobile exposes consumers.

Our concern from a voluntary market availability standpoint, is that benchmarks based on the OW Draft Report may act to discourage insurers from filing for rate changes and pull back from the market, reducing competition and availability.

This being said, we commend FSRA's position that benchmarks are used to '***assist*** *FSRA in reviewing Private Passenger Automobile ("PPA") insurance rate filing applications based on statutory requirements*' as well as that '*benchmarks are developed based on the review of the industry data, which may not represent an individual insurer's business, insurers will no longer be permitted to directly adopt the Benchmarks without justification. FSRA requires that all actuarial assumptions be fully supported with an analysis of the insurers' own data, to the extent credible, regardless of whether FSRA Benchmarks are assumed.*'

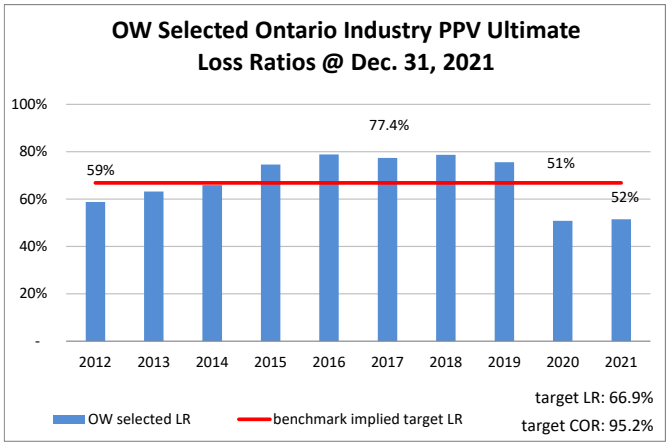
We would respectfully request the FSRA consider expanding the areas where it permits more flexibility for companies when selecting assumptions supporting their rate applications, including:

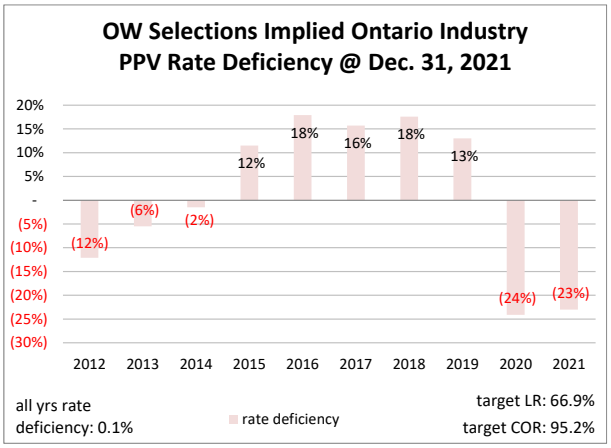
- Impact of Reform and COVID-19;
- Selection of industry ultimate claim counts and amounts supporting their analyses (including trend analyses);
- Selection of trend models (including the underlying methodology and approach) and associated estimates of trends or other changes to claims metrics;
- Operational expenses; and
- Profit provisions (in terms of both the metric to use, and the level to target).

In considering these areas of potential flexibility, it is important to recognize the extent of the current estimated rate deficiency in the province. Based on our interpretation, the draft benchmark assumptions would indicate a target indemnity and claims expense ratios of approximately 67% for PPV. The charts below summarize the estimated rate deficiencies for PPV, by accident year, relative to this target level.

It is important to note that these are not estimates of actual hindsight rate deficiencies, nor do they represent FA models of required profitability. This is rather the estimated rate deficiency when applying the OW benchmark assumptions per the current draft benchmark report. We have not attempted to put claims or premium amounts "on-level" (i.e. adjusted claims for trends/reforms over time; adjusted premium levels for premium trend and rate changes).

*Industry Ontario **PPV** @ December 31, 2021 - OW selected indemnity, ALAE, ULAE LRs and implied rate deficiencies on basis of OW selected current benchmarks*





For PPV, if we exclude 2020 and 2021, the estimated weighted average rate deficiency would be about 7.3% or **greater than $6.3 billion in PPV premium shortfall over that 8-year period**. If we were to include 2020 and 2021, the weighted average rate deficiency would decrease to 0.1% or **greater than $0.1 billion in PPV premium shortfall over that 10-year period.**

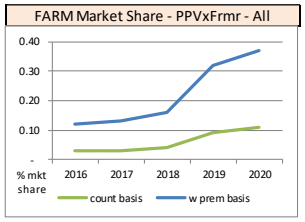
The Ontario industry PPV average premium deficiency over the decade is not significant (0.1%). However, the industry PPV loss ratios have been consistently higher than the target loss ratio of 67% since 2015, except 2020 and 2021 mainly due to impact of COVID-19.

In addition, FARM PPV written exposure and FARM PPV market share have been increasing steadily since 2016. Indeed, FARM market share has more than doubled in this time frame, increasing from 0.03% in 2016 to 0.11% in 2020 (2021 industry AIX data is not available at this time). The FARM PPV written exposure has continued to increase in 2021 to 9,370 from 8,918 in 2020. With the continued increase of the FARM PPV written exposure and FARM PPV market share since 2016, we are concerned for the FARM rates' competitiveness and that it could be an early indicator of some availability issue in Ontario for private passenger vehicles.

The chart below shows the Ontario PPV FARM market share since 2016. Please note that the 2021 industry data is not available at the time of this submission.

Written Premium is in $000s

Private Passenger Vehicles excluding Farmers	Year	FARM - PPVxFrmr - All: Written Exposure (excl	Written Premium	Average Written Premium	Industry - PPVxFrmr - All: Written Exposure (excl trailers)	Written Premium	Average Written Premium	FARM Market Share / AWP: FARM Market Share (veh	FARM Market Share (w prem)
PPVxFrmr	2016	1,969	12,635	6,418	7,535,595	10,825,732	1,437	0.03	0.12
PPVxFrmr	2017	2,354	14,457	6,142	7,586,837	10,972,642	1,446	0.03	0.13
PPVxFrmr	2018	3,127	18,349	5,869	7,767,054	11,694,149	1,506	0.04	0.16
PPVxFrmr	2019	6,958	41,111	5,909	7,906,359	12,965,934	1,640	0.09	0.32
PPVxFrmr	2020	8,918	48,880	5,481	7,941,216	13,206,358	1,663	0.11	0.37
	Total	23,324	135,432	5,806	38,737,061	59,664,816	1,540	0.06	0.23



SPECIFIC COMMENTS REGARDING THE ANNUAL REVIEW OF INDUSTRY EXPERIENCE

This document represents the Facility Association ("FA") written submission to the Financial Services Regulatory Authority ("FSRA") with respect to the Oliver Wyman reports entitled "*Draft Ontario Private Passenger Vehicles Annual Review (Based on Industry Data Through December 31, 2021)*" dated July 6, 2022 ("OW Report").

In the next few pages, specific to the trends outlined in the OW Report, we discuss the following issues and our views more broadly over the following pages:

- Selection of ultimates and valuation methodologies;
- Use of indemnity + ALAE + ULAE vs use of indemnity alone;
- Model complexity for reform parameters and reform impacts;
- Mobility parameter and COVID-19 loss adjustment factors; and
- Selection of loss trend rates and inflation.

Summary of Selection

For each coverage, there are many possible models for frequency, severity, and loss costs that are valid and reasonable. The ultimate selection of models by insurers in developing their rates is a matter of judgment and interpretation that can differ among actuaries even when modeling the same data. Differences should be expected and be seen as healthy in a competitive environment. It is the nature of the actuarial science.

Specifically, we feel it is important for FSRA to consider that valid differences in actuarial judgment and opinion can lead to differing selections of ultimates, and differing trend results. Indeed, differing models can fit actual results equally well, and yet, due to their structure (i.e. the selected parameters included in each), result in divergent forecasts.

We also believe FSRA should allow the filing insurer to set their prices and market share on their views of ultimates and their selections of models describing frequency/severity/loss costs over time and as projected into the future. The rate review process should focus on whether the filing insurer's process to arrive at their forecast was reasonable (and consistent with the insurer's previous views / process / approach unless an explanation is provided as to what has changed and why). If so satisfied, we believe FSRA should accept the filing insurer's view, even if it differs from the view of FSRA's actuary. Forcing all participants in the insurance market place to adopt a single view introduces systemic risk and potentially detracts from the competitive marketplace should certain participants reduce their risk appetite where they do not agree with the imposed view. This can lead to an overly prescriptive regulatory environment, which we believe is not the intention of FSRA.

1. Selection of ultimates and valuation methodologies

As a starting point, we appreciate that GISA selected estimate of the ultimate loss amounts and claims counts are now based on multiple valuation methodologies as indicated in the GISA exhibits[2]. Indeed, it

[2] Please refer to AUTO1005-ON_2021, it provides the implied loss development factors by coverage, where the implied loss development factors were based on the "Valuation of Ultimates Report on Implied Incurred Count and Loss Factors for Application in December 31, 2021 Exhibits to All-Industry Ontario Automobile Insurance Private Passenger (excluding Farmers) Class of Business as of the Valuation Data December 31, 2021" prepared by GISA's consultation actuary (Ernst & Young LLP).

has been and is still our position that it is uncommon practice in Canada for a valuation actuary to rely on a single valuation **methodology in completing a valuation** as this introduces significant model risk (the risk that the model employed is not appropriate or has significant shortcomings for the experience being projected). To minimize model risk it is common to employ different models. Considering that the selection of ultimates is a critical and foundational input of the loss trend analysis, we believe that it is a significant enhancement to the process.

We also commend OW for their use of these ultimates as stated on Page 1 of the OW Report: "*We have reviewed GISA's selected estimate of the ultimate loss amounts and claim counts. We find these estimates to be reasonable and have adopted them for use in the loss trend analysis.*"

2. Use of indemnity + ALAE + ULAE vs use of indemnity alone

OW uses indemnity plus allocated loss adjustment expense (ALAE) plus unallocated loss adjustment expense (ULAE) as the basis for loss amounts in their trend analysis.

Even though we understand that the combined indemnity and expense data is the norm in the industry, we would like to emphasize that the indemnity and expense data, as well as the underlying development and trend may be significantly different. Consequently, we should consider this if the analysis is based on the combination of both.

If the objective is to minimize any impacts or distortions in the data that may arise from insurers changing their mix of ULAE and ALAE over time, this can be achieved by modeling indemnity only data and recognizing that individual insurers are in a much better position to make direct adjustments for any shifts in their usage of ULAE vs ALAE over time, as they deem appropriate.

FA is analyzing the Ontario Industry PPV trends on an indemnity basis only and as explained above, this could result in different selections than those made by OW.

3. Model complexity for reform parameters

We appreciate that the OW Report includes the model design matrix with estimated coefficients for the parameters of the loss trend models. OW indicates that model complexity (or lack thereof, aka model parsimony) is considered in their model selection process[3].

We agree with this approach. FA similarly considers model complexity in its selection process, with a general preference of simple models over more complex models. We would also suggest that complexity reflects stakeholders' ability (ease or difficulty) to explain the model design and use the model output.

However, as mentioned in previous submissions, we believe that, unfortunately with respect to the Accident Benefits reform factor approach, we would assess the OW models as complex. The model design and output is, in our view, difficult to explain as both reform scalars and trends are modeled as changing over a period of time related to the most recent changes. In particular, the output moves the

[3] "*Our selected model is based on our holistic assessment of the statistical tests, historical data (changes in patterns and spikes) and model parsimony*." [page 34, OW Draft Report]

reform benchmarks from a single factor at a coverage level, to several scalars and several trend factors, as highlighted in table 21 from the OW Preliminary Report (page 53) and replicated below:

Table 21 from OW Preliminary Report

Table 21: Accident Benefits Total Medical & Rehabilitation including Attendant Care – Semi-Annual Loss Cost Trend and Reform Factors

Accident Semester	Semi-Annual Trend Rate	Trend Factor to 10/1/2021	Scalar Reform Factor
2015-01	3.6%	1.052	0.805
2015-02	3.5%	1.016	0.805
2016-01	2.2%	0.981	0.806
2016-02	0.2%	0.960	0.865
2017-01	-0.5%	0.958	0.963
2017-02	-0.5%	0.963	1.000
2018-01	-0.5%	0.967	1.000
2018-02	-0.5%	0.972	1.000
2019-01	-0.5%	0.977	1.000
2019-02	-0.5%	0.981	1.000
2020-01	-0.5%	0.986	1.000
2020-02	-0.5%	0.991	1.000
2021-01	-0.5%	0.995	1.000
2021-02		1.000	1.000

We believe the OW reform approach is overly complex in approach, and may lead to low variance / higher bias, resulting in future coefficient estimates that are at risk of significant change. We question whether the additional complexity is necessary. In particular, the OW ME and DI models introduced two complexities:

- **non-binary explanatory variables for the reform periods** – that is, fractional factors applied to accident half data to give weight over time to differentiate between claims arising that were subject to reforms and those that were not:
    - 0.00 for accident halfs 2015-H2 and prior
    - 0.01 for accident half 2016-H1
    - 0.33 for accident half 2016-H2
    - 0.83 for accident half 2017-H1
    - 1.00 for accident halfs 2017-H2 and subsequent

  The factors were determined to give weight over time to differentiate between claims arising that were subject to reforms / changes and those that were not. We have no general issue on the approach, but it does raise the question as to whether it results in "better" estimates than a simpler model that picks a single period as the point at which to determine the scalar change.

- **staggered (non-midpoint starting value (2/12^{ths}), and a non-half year first period (5/12^{ths})) variable for time related to the reform impacts** – we recognize that this was set to align with the effective date of the reform, but contend this approach has led to a fragile model:
    - 0.00 for accident halfs 2016-H1 and prior
    - 0.17 for accident half 2016-H2
    - 0.58 for accident half 2017-H1 (an increase of 0.41, rather than 0.50)
    - 1.08 for accident half 2017-H2 and increasing by 0.50 for each subsequent accident half

  For temporal spacing, the first two intervals are unusual, and we would ask whether this is necessary.

As discussed in our previous submission, due to constraints in attempting to pull the data together as used by OW, we instead applied the OW design matrix (OW Report Appendix F Page 1) to the FA ME data set[4]. The charts below show the model output of the OW ME design matrix applies to FA ME data set with different explanatory variables values for the 2016 reform.

Model 1 Output – OW ME Design Matrix applied to FA ME data set with OW explanatory variables for reform and OW mobility variables (OW Report Appendix F Page 1)

FITTED TREND STRUCTURE REGRESSION STATISTICS

Multiple R	R^2	Adjusted R^2	S.E. of Estimate	# of Obs. n	# of Obs. Excluded	# parameters p
0.9811	0.9626	0.9510	0.0394	22	18	6

Runs-Test Result: 2.7969 RESIDUALS RUNS NOT RANDOM, residuals normal

parameters with p-value >5%: 0 (intercept specifically not included)

	Coefficients	S.E.	t-Stat	p-value	C.I. Lower	95% Upper	Selected Coeff.	
	1	2						
Intercept	(133.131)	14.395	(9.249)	0.0%	(163.646)	(102.615)	(133.131)	6
Season	0.117	0.018	6.704	0.0%	0.080	0.155	0.117	5
All Years	0.069	0.007	9.619	0.0%	0.054	0.084	0.069	4
Scalar 1	(0.266)	0.044	(6.050)	0.0%	(0.359)	(0.173)	(0.266)	3
Trend 1	(0.058)	0.016	(3.619)	0.2%	(0.091)	(0.024)	(0.058)	2
Scalar 2	0.010	0.001	7.757	0.0%	0.007	0.012	0.010	1
Trend 2	-	-	-	n/a	-	-	-	0
Scalar 3	-	-	-	n/a	-	-	-	0
Trend 3	-	-	-	n/a	-	-	-	0
Scalar 4	-	-	-	n/a	-	-	-	0
Trend 4	-	-	-	n/a	-	-	-	0

SELECTED TREND STRUCTURE REGRESSION STATISTICS

Multiple R	R^2	Adjusted R^2	S.E. of Estimate	# of Obs. n	# of Obs. Excluded	# parameters p
0.9811	0.9626	0.9510	0.0394	22	18	6

Runs-Test Result: 2.7969 RESIDUALS RUNS NOT RANDOM, residuals normal

	Fitted Annual	Previous Selected	Selected Annual	selected = fitted	
past	7.1%	2.6%	7.1%	'21H2	=> last period in "past"
future	1.1%	2.6%	1.1%		

Cumulative Trends (summed coefficients)	fitted coeff	S.E.	t-Stat	p-value	C.I. Lower	95% Upper	Selected Coeff.
All Yrs or AY	0.069	0.007	9.619	0.0%	0.054	0.084	0.069
AY+1	0.011	0.015	0.750	46.4%	(0.021)	0.043	0.011
AY+1+2	n/a	n/a	n/a	n/a	n/a	n/a	n/a
AY+1+2+3	n/a	n/a	n/a	n/a	n/a	n/a	n/a
AY+1+2+3+4	n/a	n/a	n/a	n/a	n/a	n/a	n/a

[4] Please note that the same exercise has been made on DI with similar results, but for conciseness of our submission, we are limiting our example to ME.

Model 2 Output – OW ME Design Matrix applied to FA ME data set, change the explanatory variables at 2016-H1 from (0.01) to 0, no other changes

FITTED TREND STRUCTURE REGRESSION STATISTICS

Multiple R	R^2	Adjusted R^2	S.E. of Estimate	# of Obs. n	# of Obs. Excluded	# parameters p
0.9814	**0.9631**	**0.9515**	0.0391	22	18	6

Runs-Test Result: 2.7969 **RESIDUALS RUNS NOT RANDOM**; residuals normal

 # parameters with p-value >5% **0** (intercept specifically not included)

	Coefficients	S.E.	t-Stat	p-value	C.I. Lower	95% Upper	Selected Coeff.	
	1	2						
Intercept	(132.811)	14.277	(9.303)	0.0%	(163.076)	(102.546)	(132.811)	6
Season	0.118	0.017	6.758	0.0%	0.081	0.155	0.118	5
All Years	0.069	0.007	9.676	0.0%	0.054	0.084	0.069	4
Scalar 1	(0.265)	0.044	(6.098)	0.0%	(0.358)	(0.173)	(0.265)	3
Trend 1	(0.057)	0.016	(3.625)	0.2%	(0.091)	(0.024)	(0.057)	2
Scalar 2	0.010	0.001	7.803	0.0%	0.007	0.012	0.010	1
Trend 2	-	-	-	n/a	-	-	-	0
Scalar 3	-	-	-	n/a	-	-	-	0
Trend 3	-	-	-	n/a	-	-	-	0
Scalar 4	-	-	-	n/a	-	-	-	0
Trend 4	-	-	-	n/a	-	-	-	0

SELECTED TREND STRUCTURE REGRESSION STATISTICS

Multiple R	R^2	Adjusted R^2	S.E. of Estimate	# of Obs. n	# of Obs. Excluded	# parameters p
0.9814	**0.9631**	**0.9515**	0.0391	22	18	6

Runs-Test Result: 2.7969 **RESIDUALS RUNS NOT RANDOM**; residuals normal

	Fitted Annual	Previous Selected	Selected Annual	selected = fitted		
past	**7.1%**	**2.6%**	**7.1%**		**'21H2**	**=> last period in "past"**
future	**1.1%**	**2.6%**	**1.1%**			

Cumulative Trends (summed coefficients)	fitted coeff	S.E.	t-Stat	p-value	C.I. Lower	95% Upper	Selected Coeff.
All Yrs or AY	0.069	0.007	9.676	0.0%	0.054	0.084	0.069
AY+1	0.011	0.015	0.757	46.0%	(0.020)	0.043	0.011
AY+1+2	n/a	n/a	n/a	n/a	n/a	n/a	n/a
AY+1+2+3	n/a	n/a	n/a	n/a	n/a	n/a	n/a
AY+1+2+3+4	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Model 3 Output – OW ME Design Matrix applied to FA ME data set, change the explanatory variables at 2016-H1 from (0.01) to 0 and the stagger variables at 2016-H1 from (0.17, 0.58, 1.08, +0.5) to FA standard value (0.25, 0.75, 1.25, +0.5), no other changes

FITTED TREND STRUCTURE REGRESSION STATISTICS

Multiple R	R^2	Adjusted R^2	S.E. of Estimate	# of Obs. n	# of Obs. Excluded	# parameters p
0.9815	**0.9634**	**0.9519**	0.0390	22	18	6

Runs-Test Result: 2.7969 **RESIDUALS RUNS NOT RANDOM**; residuals normal

 # parameters with p-value >5% **0** (intercept specifically not included)

	Coefficients	S.E.	t-Stat	p-value	C.I. Lower	95% Upper	Selected Coeff.	
	1	2						
Intercept	(133.066)	14.231	(9.351)	0.0%	(163.234)	(102.898)	(133.066)	6
Season	0.118	0.017	6.792	0.0%	0.081	0.155	0.118	5
All Years	0.069	0.007	9.725	0.0%	0.054	0.084	0.069	4
Scalar 1	(0.255)	0.045	(5.694)	0.0%	(0.349)	(0.160)	(0.255)	3
Trend 1	(0.058)	0.016	(3.659)	0.2%	(0.092)	(0.024)	(0.058)	2
Scalar 2	0.010	0.001	7.797	0.0%	0.007	0.012	0.010	1
Trend 2	-	-	-	n/a	-	-	-	0
Scalar 3	-	-	-	n/a	-	-	-	0
Trend 3	-	-	-	n/a	-	-	-	0
Scalar 4	-	-	-	n/a	-	-	-	0
Trend 4	-	-	-	n/a	-	-	-	0

SELECTED TREND STRUCTURE REGRESSION STATISTICS

Multiple R	R^2	Adjusted R^2	S.E. of Estimate	# of Obs. n	# of Obs. Excluded	# parameters p
0.9815	**0.9634**	**0.9519**	0.0390	22	18	6

Runs-Test Result: 2.7969 **RESIDUALS RUNS NOT RANDOM**; residuals normal

	Fitted Annual	Previous Selected	Selected Annual	selected = fitted		
past	**7.1%**	**2.6%**	**7.1%**		**'21H2**	**=> last period in "past"**
future	**1.1%**	**2.6%**	**1.1%**			

Cumulative Trends (summed coefficients)	fitted coeff	S.E.	t-Stat	p-value	C.I. Lower	95% Upper	Selected Coeff.
All Yrs or AY	0.069	0.007	9.725	0.0%	0.054	0.084	0.069
AY+1	0.011	0.015	0.718	48.3%	(0.021)	0.042	0.011
AY+1+2	n/a	n/a	n/a	n/a	n/a	n/a	n/a
AY+1+2+3	n/a	n/a	n/a	n/a	n/a	n/a	n/a
AY+1+2+3+4	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Model 4 Output – OW ME Design Matrix applied to FA ME data set, change the explanatory variables at 2016-H1 from (0.01, 0.33, 0.83) to FA standard value (0, 1, 1) and the stagger variables at 2016-H1 from (0.17, 0.58, 1.08, +0.5) to FA standard value (0.25, 0.75, 1.25, +0.5), no other changes

FITTED TREND STRUCTURE REGRESSION STATISTICS

Multiple R	R^2	Adjusted R^2	S.E. of Estimate	# of Obs. n	# of Obs. Excluded	# parameters p
0.9810	**0.9623**	**0.9505**	0.0395	22	18	6

Runs-Test Result: 1.4419 **RESIDUALS RUNS RANDOM** ; resids NOT normal

 # parameters with p-value >5% **0** (intercept specifically not included)

	Coefficients	S.E.	t-Stat	p-value	C.I. Lower	95% Upper	Selected Coeff.	
	1	2						
Intercept	(140.352)	15.185	(9.243)	0.0%	(172.542)	(108.161)	(140.352)	6
Season	0.132	0.017	7.621	0.0%	0.095	0.169	0.132	5
All Years	0.072	0.008	9.593	0.0%	0.056	0.088	0.072	4
Scalar 1	(0.199)	0.036	(5.571)	0.0%	(0.275)	(0.123)	(0.199)	3
Trend 1	(0.086)	0.014	(6.072)	0.0%	(0.117)	(0.056)	(0.086)	2
Scalar 2	0.008	0.001	7.209	0.0%	0.006	0.011	0.008	1
Trend 2	-	-	-	n/a	-	-	-	0
Scalar 3	-	-	-	n/a	-	-	-	0
Trend 3	-	-	-	n/a	-	-	-	0
Scalar 4	-	-	-	n/a	-	-	-	0
Trend 4	-	-	-	n/a	-	-	-	0

SELECTED TREND STRUCTURE REGRESSION STATISTICS

Multiple R	R^2	Adjusted R^2	S.E. of Estimate	# of Obs. n	# of Obs. Excluded	# parameters p
0.9810	**0.9623**	**0.9505**	0.0395	22	18	6

Runs-Test Result: 1.4419 **RESIDUALS RUNS RANDOM** ; resids NOT normal

	Fitted Annual	Previous Selected	Selected Annual	selected = fitted		
past	**7.5%**	**2.6%**	**7.5%**		**'21H2**	**=> last period in "past"**
future	**(1.4%)**	**2.6%**	**(1.4%)**			

Cumulative Trends (summed coefficients)	fitted coeff	S.E.	t-Stat	p-value	C.I. Lower	95% Upper	Selected Coeff.
All Yrs or AY	0.072	0.008	9.593	0.0%	0.056	0.088	0.072
AY+1	(0.014)	0.012	(1.166)	26.1%	(0.040)	0.012	(0.014)
AY+1+2	n/a	n/a	n/a	n/a	n/a	n/a	n/a
AY+1+2+3	n/a	n/a	n/a	n/a	n/a	n/a	n/a
AY+1+2+3+4	n/a	n/a	n/a	n/a	n/a	n/a	n/a

The model 1, model 2 and model 3 are statically similar as the parameters coefficients are within one standard error of the each model. However, the model 4 is statistically different than the other models.

The comparison of the models outputs above show the explanatory variable at 2016-H1 (0.01) and the stagger variable at 2016-H1 (0.17, 0.58, 1.08, +0.5) do not have significant impact on the model results, but the explanatory variables at 2016-H1 (0.33, 0.83) have significant impact on the model results. In sum, we would view two takeaways:

1. the minor weight (0.01) given to 2016-H1 for scalar 1 do not appear to be necessary from a statistical standpoint (and, as such, we recommended replacing with 0);
2. the additional temporal differences introduced for trend do not appear to be necessary from a statistical standpoint (and, as such, we recommended replacing with standard values).

The OW Report estimates the impacts of the Bill 15 and Bill 91 reforms based on industry PPV data as December 31, 2021 is a 19.5% decrease in Medical & Rehabilitation including Attendant Care loss cost and a 12.9% decrease in Disability Income loss cost (Appendix F page 1 and page 2)[5].

FA selected models estimate Bill 15 and Bill 91 reform impact in medical & Rehabilitation including Attendant Care loss cost is a 20.1% decrease that is similar to OW Report estimated, however, FA estimates Bill 15 and Bill 91 reform impact in Disability Income loss cost is not significant.

4. Mobility Parameter and COVID-19 Loss Adjustment Factors

OW Report includes estimated COVID-19 Loss adjustment Factors for 2020-H1, 2020-H2, 2021-H1 and 2021-H2, and introduces Mobility Parameter in the loss trend models.

The OW models introduce non-binary explanatory variables for mobility parameter[6] as indicated below (as examples, we are using ME and DI, OW Report Appendix F Page 1 and 2):

- 0.00 for accident halfs 2019-H2 and prior
- -35.99 for accident half 2020-H1 for ME and DI
- -33.22 for accident half 2020-H2 for ME and DI
- -41.12 for accident half 2021-H1 for ME and DI
- -21.12 for accident half 2021-H2 for ME and DI

We appreciate the inclusion of COVID-19 Loss adjustment Factors[7], but we are not sure about the use of a Mobility parameter with COVID-19 Loss Adjustment Factors as temporal variables in the loss trend model. The model design and output is, in our view, difficult to explain and use. In the FA general approach, Scalars are introduced in models as dummy variables, taking values of 0 or 1.

The model results based on FA approach, with only replacing Scalar 2 temporal variables of COVID-19 Loss Adjustment Factors to 1, are summarized below:

[5] Reform coefficient of -0.218 in ME and -0.138 in DI from OW Report Appendix F page 1 & 2.

[6] The IHME's Ontario average mobility as measured by the mobility composite metric across accident semester.

[7] OW Report Appendix G provides analysis for COVID-19 loss adjustment factors.

Model Output – OW ME Design Matrix applied to FA ME data set, only change the mobility variables at 2020-H1 to 2021-H2 from (-35.99, -33.22, -41.12, and -21.12) to FA standard value 1, Trend 1 removed as not being statistical significant

FITTED TREND STRUCTURE REGRESSION STATISTICS

Multiple R	R^2	Adjusted R^2	S.E. of Estimate	# of Obs. n	# of Obs. Excluded	# parameters p
0.9524	0.9071	0.8853	0.0602	22	18	5

Runs-Test Result: 2.2779 RESIDUALS RUNS NOT RANDOM; residuals normal

parameters with p-value >5%: 0 (intercept specifically not included)

	Coefficients	S.E.	t-Stat	p-value	C.I. Lower	95% Upper	Selected Coeff.	
	1	2						
Intercept	(122.483)	21.178	(5.784)	0.0%	(167.165)	(77.802)	(122.483)	5
Season	0.130	0.026	5.029	0.0%	0.076	0.185	0.130	4
All Years	0.063	0.011	6.035	0.0%	0.041	0.086	0.063	3
Scalar 1	(0.354)	0.060	(5.865)	0.0%	(0.481)	(0.227)	(0.354)	2
Trend 1	-	-	-	n/a	-	-	-	0
Scalar 2	(0.441)	0.046	(9.613)	0.0%	(0.538)	(0.344)	(0.441)	1
Trend 2	-	-	-	n/a	-	-	-	0
Scalar 3	-	-	-	n/a	-	-	-	0
Trend 3	-	-	-	n/a	-	-	-	0
Scalar 4	-	-	-	n/a	-	-	-	0
Trend 4	-	-	-	n/a	-	-	-	0

SELECTED TREND STRUCTURE REGRESSION STATISTICS

Multiple R	R^2	Adjusted R^2	S.E. of Estimate	# of Obs. n	# of Obs. Excluded	# parameters p
0.9524	0.9071	0.8853	0.0602	22	18	5

Runs-Test Result: 2.2779 RESIDUALS RUNS NOT RANDOM; residuals normal

	Fitted Annual	Previous Selected	Selected Annual	selected = fitted	
past	6.6%	2.6%	6.6%	'19H2	=> last period in "past"
future	6.6%	2.6%	6.6%		

Cumulative Trends (summed coefficients)	fitted coeff	S.E.	t-Stat	p-value	C.I. Lower	95% Upper	Selected Coeff.
All Yrs or AY	0.063	0.011	6.035	0.0%	0.041	0.086	0.063
AY+1	n/a	n/a	n/a	n/a	n/a	n/a	n/a
AY+1+2	n/a	n/a	n/a	n/a	n/a	n/a	n/a
AY+1+2+3	n/a	n/a	n/a	n/a	n/a	n/a	n/a
AY+1+2+3+4	n/a	n/a	n/a	n/a	n/a	n/a	n/a

The model indicates Scalar 2 coefficient of -44.1%, and it is easy to explain that the estimated average annual COVID-19 impact based on the industry data as at December 31, 2021 is about -35.7% decreasing comparing to pre-pandemic. However, it is difficult to explain the OW model estimated mobility coefficient of 1.0%[8] with the COVID-19 Loss Adjustment Factors.

We conducted the same exercise in relation to DI and found that the temporal variables for mobility parameter were influential. The model results based on FA approach, with only replacing Scalar 2 temporal variables of COVID-19 Loss Adjustment Factors to 1, are summarized below:

Model Output – OW DI Design Matrix applied to FA DI data set, only change the mobility variables from (-35.99, -33.22, -41.12, and -21.12) to FA standard value 1, Trend 1 removed as not being statistical significant

FITTED TREND STRUCTURE REGRESSION STATISTICS

Multiple R	R^2	Adjusted R^2	S.E. of Estimate	# of Obs. n	# of Obs. Excluded	# parameters p
0.9497	0.9020	0.8789	0.0577	22	18	5

Runs-Test Result: 4.9764 RESIDUALS RUNS NOT RANDOM; residuals normal

parameters with p-value >5%: 0 (intercept specifically not included)

	Coefficients	S.E.	t-Stat	p-value	C.I. Lower	95% Upper	Selected Coeff.	
	1	2						
Intercept	(92.695)	20.290	(4.568)	0.0%	(135.504)	(49.885)	(92.695)	5
Season	0.120	0.025	4.840	0.0%	0.068	0.172	0.120	4
All Years	0.048	0.010	4.769	0.0%	0.027	0.069	0.048	3
Scalar 1	(0.229)	0.058	(3.951)	0.1%	(0.351)	(0.106)	(0.229)	2
Trend 1	-	-	-	n/a	-	-	-	0
Scalar 2	(0.439)	0.044	(9.987)	0.0%	(0.532)	(0.347)	(0.439)	1
Trend 2	-	-	-	n/a	-	-	-	0
Scalar 3	-	-	-	n/a	-	-	-	0
Trend 3	-	-	-	n/a	-	-	-	0
Scalar 4	-	-	-	n/a	-	-	-	0
Trend 4	-	-	-	n/a	-	-	-	0

SELECTED TREND STRUCTURE REGRESSION STATISTICS

Multiple R	R^2	Adjusted R^2	S.E. of Estimate	# of Obs. n	# of Obs. Excluded	# parameters p
0.9497	0.9020	0.8789	0.0577	22	18	5

Runs-Test Result: 4.9764 RESIDUALS RUNS NOT RANDOM; residuals normal

	Fitted Annual	Previous Selected	Selected Annual	selected = fitted	
past	4.9%	1.0%	4.9%	'19H2	=> last period in "past"
future	4.9%	1.0%	4.9%		

Cumulative Trends (summed coefficients)	fitted coeff	S.E.	t-Stat	p-value	C.I. Lower	95% Upper	Selected Coeff.
All Yrs or AY	0.048	0.010	4.769	0.0%	0.027	0.069	0.048
AY+1	n/a	n/a	n/a	n/a	n/a	n/a	n/a
AY+1+2	n/a	n/a	n/a	n/a	n/a	n/a	n/a
AY+1+2+3	n/a	n/a	n/a	n/a	n/a	n/a	n/a
AY+1+2+3+4	n/a	n/a	n/a	n/a	n/a	n/a	n/a

The model indicates Scalar 2 coefficient of -43.9%, and it is easy to explain that the estimated average annual COVID-19 impact based on the industry data as at December 31, 2021 is about -35.5% decreasing comparing to pre-pandemic. However, it is difficult to explain the OW model estimated mobility coefficient of 1.1%[9] with the COVID-19 Loss Adjustment Factors.

[8] OW model estimated mobility coefficient of 1.0% is from OW Report Appendix F Page 1.

[9] OW model estimated mobility coefficient of 1.1% is from OW Report Appendix F Page 2.

5. Selection of Trends Rates and Rising Inflation

As stated on Page 2 of the OW Report:

> *"The COVID-19 pandemic affected the loss costs for 2020 and 2021, mainly driven by a decline in the claim frequency rate. As return to a "new" normal in 2022 unfolds, there is uncertainty as to the lasting impacts of the pandemic with respect to future claim frequency rate. […] Our analysis and loss trend selections assume a return to pre-pandemic frequency levels for rate applications subject to the proposed benchmarks."*

We have completed our own loss trend analysis using Ontario PPV Industry Experience as of December 31, 2021 with the exclusion of 2020-H1, 2020-H2, 2021-H1 and 2021-H2 data points to remove the COVID-19 impacts, and we would like to provide FSRA with a summary of our selections of the past and future trends and how they compared with the preliminary selections from the OW Reports.

Ontario Industry Trends as at December 31, 2021

Coverage	Ontario PPV FA Loss Cost Trend as at:2021-12		Ontario PPV FSRA Loss Cost Trend as at:2021-12		Loss Cost Trend Change Between FA and FSRA	
	past	future	past	future	past	future
BI	1.3%	1.3%	1.4%	(4.6%)	(0.1%)	5.9%
PD	5.8%	5.8%	4.8%	4.8%	1.0%	1.0%
DCPD	9.7%	9.7%	0.6%	8.7%	9.1%	1.0%
ME	2.7%	2.7%	7.2%	(0.9%)	(4.5%)	3.6%
DI	1.1%	1.1%	5.4%	(0.4%)	(4.3%)	1.5%
DB	(2.1%)	(2.1%)	(1.3%)	(1.3%)	(0.8%)	(0.8%)
FE	(1.9%)	(1.9%)	(1.3%)	(1.3%)	(0.6%)	(0.6%)
UA	(3.1%)	(3.1%)	(8.8%)	(3.5%)	5.7%	0.4%
UM	-	-	1.4%	1.4%	(1.4%)	(1.4%)
CL	8.8%	8.8%	8.5%	8.5%	0.3%	0.3%
CM	9.5%	9.5%	7.1%	7.1%	2.4%	2.4%
SP	12.3%	12.3%	7.1%	7.1%	5.2%	5.2%
AP	6.9%	6.9%	8.9%	8.9%	(2.0%)	(2.0%)

Note: the past and future trends cut-off date between FA and FSRA may be different

We estimate that the OW future trend selections at the coverage level will translate to an overall loss cost future trend rate of 3.3% for private passenger vehicles, while the FA estimated overall loss cost future trend rate will be 6.1%.

The difference between FA estimated loss cost trend rates and benchmark loss cost trend rates would be due to many reasons such as: indemnity only or indemnity plus expenses, design matrix, using different values of the explanatory variables for the reform and mobility parameters, as well as data exclusion.

Finally, we appreciate the OW Reports' recommendation/mention regarding recent higher inflation:

> *"The recent rise in inflation, and uncertainty surrounding future inflation, adds uncertainty around selecting an appropriate future trend rate." (OW Report Page 3)*

> *"To recognize the expectation of higher than historical inflation we suggest that the insurers use the most recent CPI data for vehicle maintenance and repair costs in Ontario to calculate an adjustment to the selected past severity trend for physical damage coverages as a basis for the future trend rate. [...] We recommend that at the time of the rate application preparation, the future loss cost*

trend rate be calculated as above so as to take into consideration the higher inflation than is implicit in the past loss cost trend rate." (OW Report Page 38)

Supply chain issues, rise in catalytic converter theft and significant increase in the prices of used cars are just other indicators of pressure points affecting our industry.

The projection of future loss trend rate needs is subject to **considerable uncertainty** and FSRA should consider this when review individual rate filings.