North Carolina Rate Bureau
Private Passenger Automobile Insurance
PP Auto Review 2026 submitted 1/30/2026

Responses to DOI questions regarding ILF review

NOTE: The PP Auto Review 2026 submitted 1/30/2026 is, as noted in the filing, the rate review required by law to be submitted on or before February 1, 2026. The PP Auto Review 2026 included a review of increased limits factors as required by the Settlement Agreement and Consent Order entered June 6, 2025, in connection with the 2025 Private Passenger Automobile Rate Filing. The PP Auto Review 2026 did NOT include any proposed revisions to the current approved increased limits factors.

The increased limits review included in the PP Auto Review 2026 was performed for the North Carolina Rate Bureau by ISO, and the responses below to the DOI's questions regarding the increased limits factors review were prepared by ISO.

1. Regarding page 64, "Data for Estimating Indemnity", please provide the data used in the analysis in the following detail: for each of the nine accident years 2016-2023 and for each payment year 2019 through 2023, please provide for both Bodily Injury (BI) and Property Damage (PD) the number of paid indemnity claims and the total untrended paid indemnity amounts for North Carolina personal auto only. Exclude ALAE. Also provide the multistate data used in the same format. Provide these data sets separately by limit: For BI, 30/60; 50/100; 100/300; and 250/500. For PD, 25,000; 50,000; 100,000; and 250,000. The output from this request should populate 24 separate 8x5 grids.

The requested information is not available.

2. Please explain why BI ILFs can be constructed using NC only data, but PD ILF analysis requires data from 47 states plus the District of Columbia (see footnote b page 79).

We review Property Damage Liability (PD) increased limits data on a multistate basis because, historically, there is little variation in the severity of the PD increased limit factors (ILFs) by jurisdiction. Furthermore, by combining states, we bolster the volume of data available for analysis at higher policy limits where PD data is particularly sparse due to the relatively low level of the limited average severities for the coverage. This also increases the credibility of the analysis and renders it more stable.

3. Please show each individual claim indemnity amount (untrended) used in the analysis from Umbrella or Excess policies. For each, indicate accident year, state, BI or PD, and attachment point.

The requested information is not available.

4. Regarding pages 71 and 81, please show all detail supporting the calculation of R1, R2, and R3 for both BI and PD.

As described on page 71 of the review document, we determine the R1, R2, and R3 parameters to create the settlement lag distribution. The R1 parameter accounts for the ratio of claims (for Bodily Injury (BI)) or occurrences (for PD) settling in lag 2 to those settling in lag 1. Similarly, the R2 parameter accounts for the ratio of claims/occurrences that settle in lag 3 to those settling in lag 2. The R3 parameter, however, accounts for the lag 4:lag 3, lag 5:lag 4, lag 6:lag 5, lag 7:lag 6 and lag8:lag 7 settlement ratios. These parameters are fit using maximum likelihood, resulting in a smoothed settlement lag distribution with weights that add to 1.00 as shown on page 81 of the review document.

For comparison, we have calculated empirical estimates of these parameters. The estimate for the R1 parameter, for example, is calculated as the sum of claims/occurrences in lag 2 divided by the sum of accidents in lag 1, including only the accident years in common between the two lags (outlined with a solid line in Exhibit 4.BI and Exhibit 4.PD). Similarly, the R2 parameter is calculated as the sum of claims/occurrences in lag 3 divided by the sum of claims/occurrences in lag 2, again only using common accident years (outlined with a dashed line in Exhibit 4.BI and Exhibit 4.PD). The empirical value of the R1 ratio is approximately 0.39% lower than the maximum likelihood estimate (MLE) for BI and 0.07% greater than the MLE for PD. For the R2 parameter, the empirical ratio is approximately 3.91% lower than the MLE for BI and 8.16% greater than the MLE for PD. The empirical values for the R3 parameter (0.37746188 for BI and 0.26413601 for PD) can be similarly obtained by taking a weighted average of ratios of subsequent consecutive lags; again, these values are close to the MLEs of 0.34867493 and 0.25673082 for BI and PD, respectively.

5. Regarding page 76, please show all detail underlying the ALAE analysis described.

In Exhibit 5.BI and Exhibit 5.PD, we display the ALAE:total limit indemnity ratio triangles underlying the average ratios of 0.025 and 0.005 for North Carolina BI and multistate PD, respectively.

6. Please explain why the ratio of ALAE to loss on Page 85 averages 2.5% for BI whereas industry data from A.M. Best indicates via its aggregation of Schedule P Part 1B that this ratio is consistently near 6.0%.

We do not have the A.M. Best analysis available, but a possible reason for any differences might be attributable to the use of a different collection of companies in our database.

7. Regarding page 79, please expand these tables to include 12 additional points. Also, for each row, show the number of claims.

Please see Exhibit 7.

8. Regarding page 79, please show the same data requested in #7 for North Carolina only.

Please see Exhibit 8.

9. Please explain your BI trend selection of +8.5% per year when your table supports a range of +3.9% to +6.8%.

and

10. Please explain your BI future trend selection of +6.5% given the data shown on page 80.

In our Mixed Exponential Methodology for our Personal Automobile Liability increased limits reviews, we have introduced a two-step severity trend application. As discussed on page 66 of the review document, we select one trend factor to apply to the end of the experience period in the underlying review (12/31/2023 in the review) and a separate trend factor to apply from the end of the experience period to the assumed prospective trend date (7/1/2026 in the review).

These comprehensive annual trend selections for each coverage are unlimited trends applicable to data in all policy limits and accident years in the experience period. Given this requirement of unlimited trend factors, we therefore place an emphasis on examining total limits trend behavior in making the trend selections.

Because the total limits trend calculations naturally reflect losses that have been limited by various policy limits, the total limits trend indications generally will be lower than the actual underlying "unlimited" trends. As noted in the review document, the data used for increased limits analyses for Personal Automobile Liability spans eight accident years. We desire stable unlimited trends, suitable over this period.

In selecting the trend factor that we apply during the experience period, we also lean toward evaluating the longer-term trend fits in our paid trend data, since those fits more reflect trend conditions during the years in the experience period. For the prospective trend selection, we place relatively more emphasis on examining the shorter-term trend fits in our trend data, since those fits may indicate recent changes in severity patterns.

Given the considerations above, regarding the experience period trend selections in this review, our +8.5% selection for BI primarily emanates from the values of +8.2-8.5% for the 16-, 20- and 24-point longer-term trend fits in the multistate data. Our prospective trend selection of 6.5% for BI captures how the shorter-term fits for the coverage signal relatively smaller increases in future severities.

11. For page 77, please show the data supporting the basic limits premium weights for both BI and PD.

The requested information is not available.

12. Please update the data on page 80 to include years 2024 and 2025.

Please see Exhibit 12.2024 and Exhibit 12.2025.

13. Regarding page 84, please provide the raw data and a detailed description of the steps taken to estimate the parameters r and B.

Regarding the first part of this request, the information is not available.

The claims-per-occurrence distribution parameters were selected using maximum likelihood estimation and the Bayesian Information Criterion (BIC) statistic. In our analysis, we tested mixed zero-truncated negative binomial (ZTNB) distributions of 1, 2, 3, 4, and 5 components. For a given number of components n, we selected parameters that maximized the loglikelihood function of the empirical data. We then compared the different n-component mixed ZTNB distributions across the values n using the BIC statistic. BIC accounts for goodness-of-fit (via loglikelihood) but includes a penalty dependent on the number of parameters being fit and the sample size of the data. Thus, to justify the use of additional parameters (in this case, increased number of component distributions), the improvement in fit must be sizeable. The BIC analysis indicated that a one-term ZTNB distribution (with the parameters shown in the review document) was optimal for this state.

14. Please provide the formulas showing how the mean and variance are calculated from the parameters shown.

The formulas for the mean and variance of the mixed ZTNB distribution on page 84 are located on page 75 of the review document.

The formula for the mean, m_j, is:

$$m_j = \frac{r_j \times \beta_j}{1-(1+\beta_j)^{-r_j}}$$

The formula for the variance, v_j, is:

$$v_j = m_j\left(1 + \beta_j - \frac{m_j}{(1+\beta_j)^{r_j}}\right)$$