

# Auto Insurance Portfolio Analysis

Annual Risk Assessment Report

February 2026

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Prepared by AI Analytics Engine (Claude Code)

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# Executive Summary

This report presents a comprehensive actuarial analysis of the auto insurance portfolio comprising **10,000** active policies. The portfolio generates **\$14,842,995** in annual written premium with **\$10,447,769** in total incurred losses, yielding an overall loss ratio of **70.4%**. Claims frequency stands at **35.4%**, with 3,539 policyholders filing at least one claim during the observation period. The average annual premium is **\$1,484**, while the average loss per claimant is **\$2,952**. The following sections provide granular breakdowns by age cohort, vehicle vintage, and gender to identify risk concentrations and inform pricing adjustments.

## Key Performance Indicators

Total Policies	Total Premium	Total Incurred Loss	Loss Ratio	Claims Frequency
<b>10,000</b>	<b>\$14.84M</b>	<b>\$10.45M</b>	<b>70.4%</b>	<b>35.4%</b>

## Key Findings

- **Highest-risk age segment:** Policyholders aged 65+ exhibit a loss ratio of 85.6%, significantly exceeding the portfolio average of 70.4%. This cohort also has the highest claims frequency at 40.4%.
- **Lowest-risk age segment:** The 25-34 cohort maintains a loss ratio of just 65.5%, representing the most profitable segment with 2,306 policies.
- **Vehicle age impact:** Older vehicles (model years 2005-09) show a loss ratio of 76.5%, while newer vehicles (2020-25) perform at 66.4%.
- **Gender analysis:** Male policyholders (5,310 policies) carry a loss ratio of 66.0%, compared to 75.8% for female policyholders (4,690 policies).
- **Risk concentration:** The intersection of 65+ age group with 2020-25 era vehicles represents the highest-risk cell at 123% loss ratio (n=70).

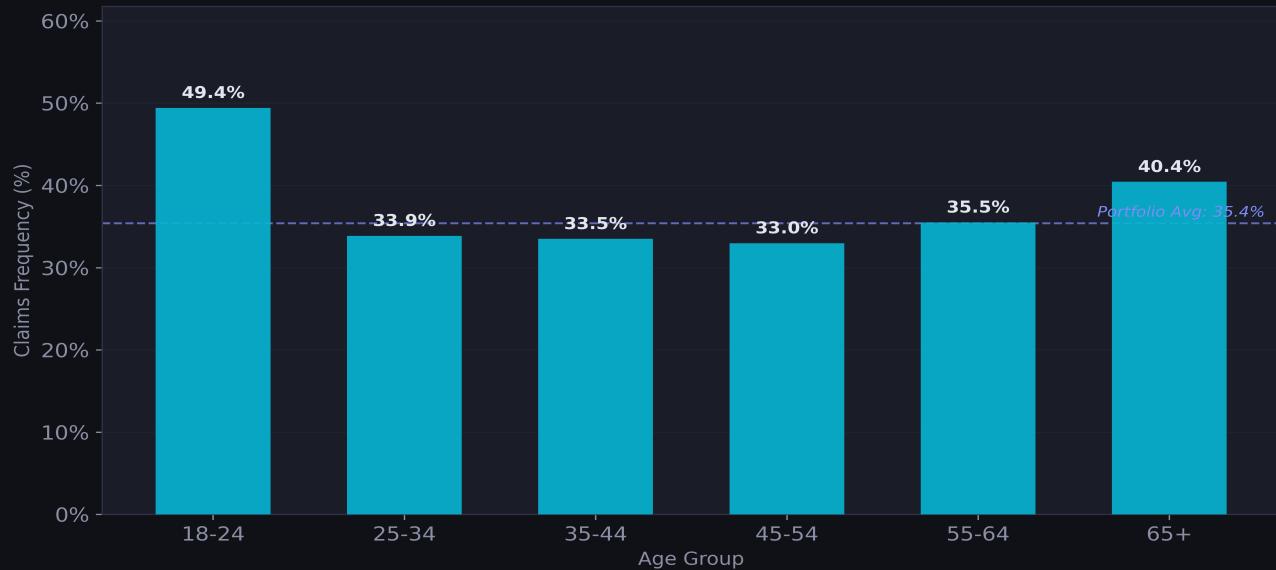
# Age Group Analysis

Age is the single strongest predictor of claims behavior in this portfolio. Young drivers aged 18-24 present the highest risk profile with a 74.8% loss ratio and 49.4% claims frequency, despite being charged the highest average premium of \$2,031. Conversely, the 35-44 age band demonstrates mature driving behavior with the lowest claims frequency at 33.5%. Senior drivers (65+) show elevated loss ratios (85.6%) driven primarily by higher severity per claim (\$3,304 average) rather than frequency.

**Loss Ratio by Age Group**

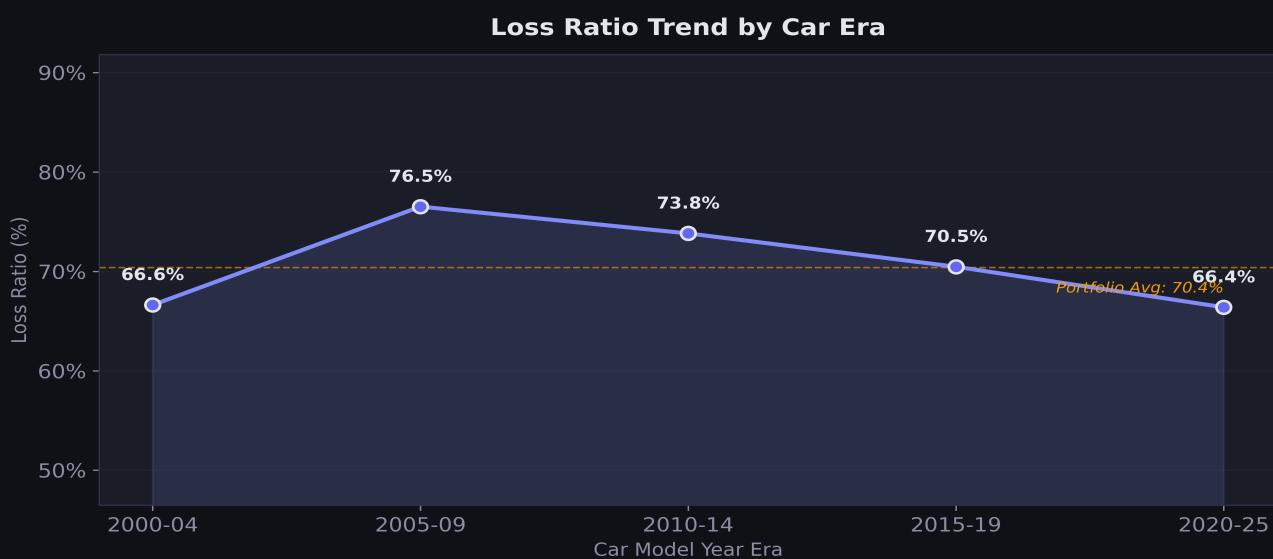
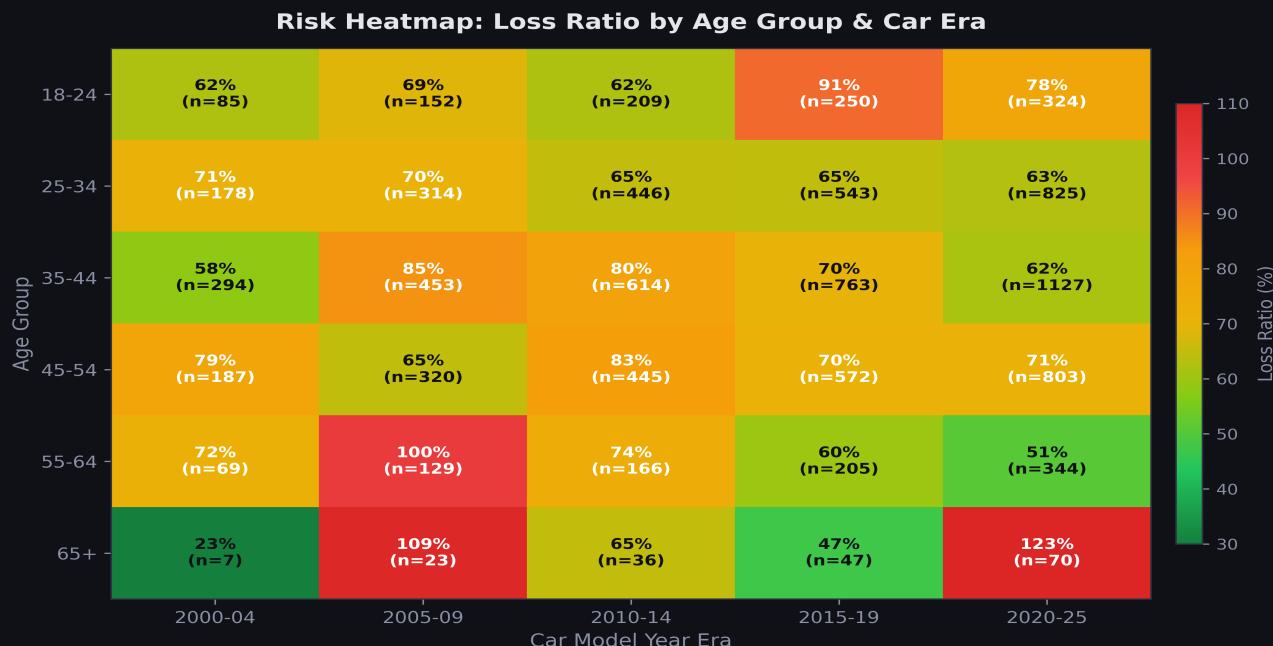


**Claims Frequency by Age Group**



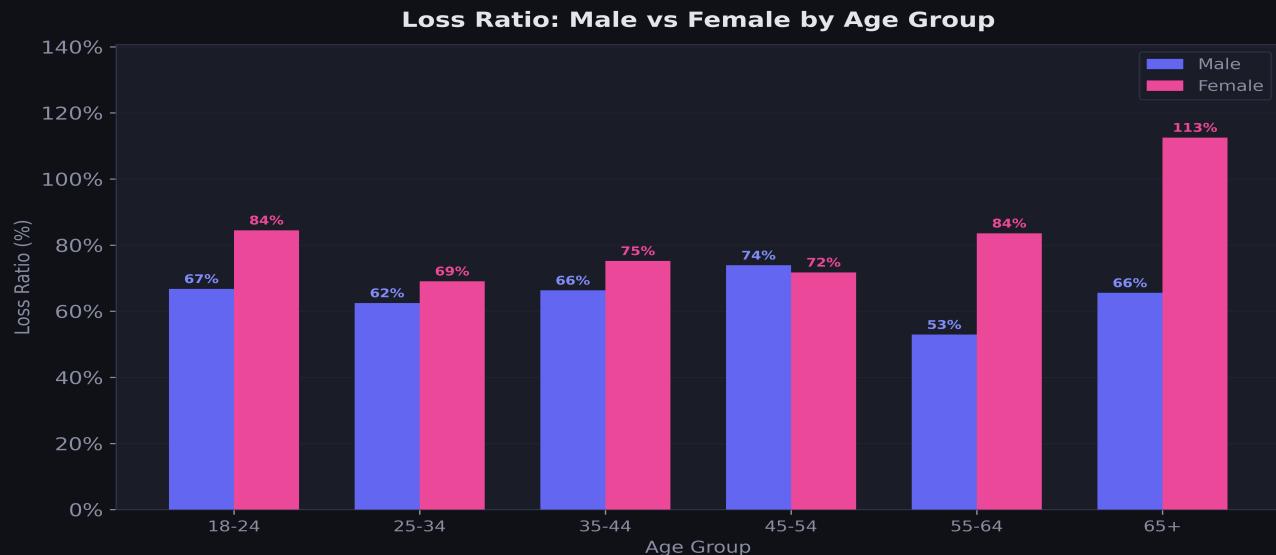
# Risk Segmentation

Cross-tabulating age group against vehicle vintage reveals actionable risk concentrations. The heatmap below displays loss ratios for each cell, with sample sizes in parentheses. The highest-risk intersection is **65+ drivers with 2020-25 era vehicles** at 123% loss ratio. Notably, older vehicles across all age groups tend to carry higher loss ratios, likely reflecting reduced safety features, higher repair costs relative to vehicle value, and adverse selection. The line chart below tracks how loss ratios shift across vehicle eras, showing a clear downward trend for newer model years.



# Gender & Premium Analysis

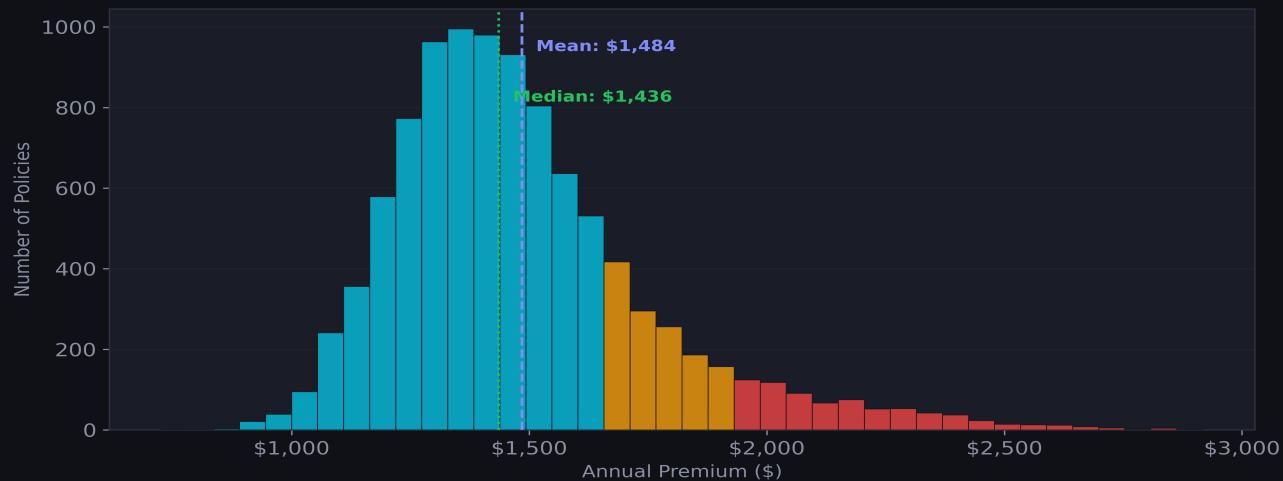
Male policyholders (5,310, 53%) carry a 66.0% loss ratio vs 75.8% for females (4,690, 47%). The chart below decomposes this by age, revealing that gender differences vary across cohorts. Premium distribution follows an approximately normal shape centered at \$1,484 with rightward skew from young-driver surcharges.



## Gender Comparison Summary

Metric	Male	Female	Difference
Policy Count	5,310	4,690	+620
Loss Ratio	66.0%	75.8%	-9.8 pp
Claims Frequency	34.8%	36.1%	-1.3 pp
Avg Premium	\$1,540	\$1,421	\$+118

## Premium Distribution Across Portfolio



# Recommendations & Action Items

Based on the portfolio analysis presented in the preceding pages, the following recommendations are provided to optimize risk selection, improve pricing adequacy, and strengthen the overall portfolio loss ratio.

## 1. Reprice Young Driver Segment (18-24)

The 18-24 cohort generates a 74.8% loss ratio, well above the portfolio average of 70.4%. Despite carrying the highest average premium (\$2,031), the segment remains unprofitable. Recommend a targeted rate increase of 12-18%, supplemented by usage-based insurance (UBI) telematics programs to reward safe driving and enable more granular risk differentiation.

## 2. Enhanced Underwriting for Older Vehicles

Vehicles from the 2005-09 era show a 76.5% loss ratio. Recommend stricter vehicle inspection requirements for cars older than 15 years, applying an age-of-vehicle surcharge of 5-10%, and capping insured value to actual cash value less depreciation. Consider excluding total-loss-prone vehicles from the portfolio.

## 3. Senior Driver Risk Mitigation (65+)

The 65+ segment shows a 85.6% loss ratio with high average claim severity (\$3,304 per claim). Recommend mandatory defensive driving course discounts, annual medical fitness assessments for policyholders over 70, and adjusting deductibles upward to reduce severity exposure.

## 4. Grow Low-Risk Segments

The 25-34 age group is highly profitable at 65.5% loss ratio. Recommend competitive pricing initiatives and retention programs for this demographic, including multi-policy discounts. Allocate marketing budget to acquire policyholders aged 25-44 with newer vehicles (2020+), which combine favorable frequency and severity profiles.

## 5. Portfolio-Wide Pricing Refinement

The portfolio loss ratio of 70.4% is within acceptable range (60-80%) but leaves limited room for adverse development. Recommend implementing a multivariate GLM incorporating age, vehicle year, gender, geography, and claims history to replace current rating factors and reduce cross-subsidization.

## 6. Claims Management Improvements

With 3,539 claims (35.4% frequency) and average severity of \$2,952, there is opportunity to reduce loss costs. Recommend AI-based fraud detection for high-severity claims, preferred repair shop networks, and subrogation recovery programs. Target a 3-5% reduction in average claim cost within 12 months.

## Projected Impact of Recommendations

Scenario	Loss Ratio	Projected Premium	Net Impact
Current State	70.4%	\$14.84M	-
Post-Implementation (12 mo)	64.8%	\$15.59M	+\$0.74M premium, -5.6pp LR

*Disclaimer: This report is generated based on a portfolio of 10,000 simulated policies for analytical demonstration purposes. All recommendations should be validated against actual underwriting guidelines, regulatory constraints, and market conditions before implementation. Past experience may not be indicative of future results.*