



The True Impact of Adaptive Driver Assistance Systems on Motor Insurance Costs

Singapore Actuarial Conference 2023

September 27, 2023

Roosevelt C. Mosley, Jr., FCAS, MAAA, CSPA

President – CAS, Principal & Consulting Actuary – Pinnacle

The True Impact of ADAS on Motor Insurance Costs

- ▶ Defining ADAS
- ▶ ADAS considerations
- ▶ Analyzing impacts on loss costs

Defining ADAS

What is ADAS



Advanced Driver Assistance Systems

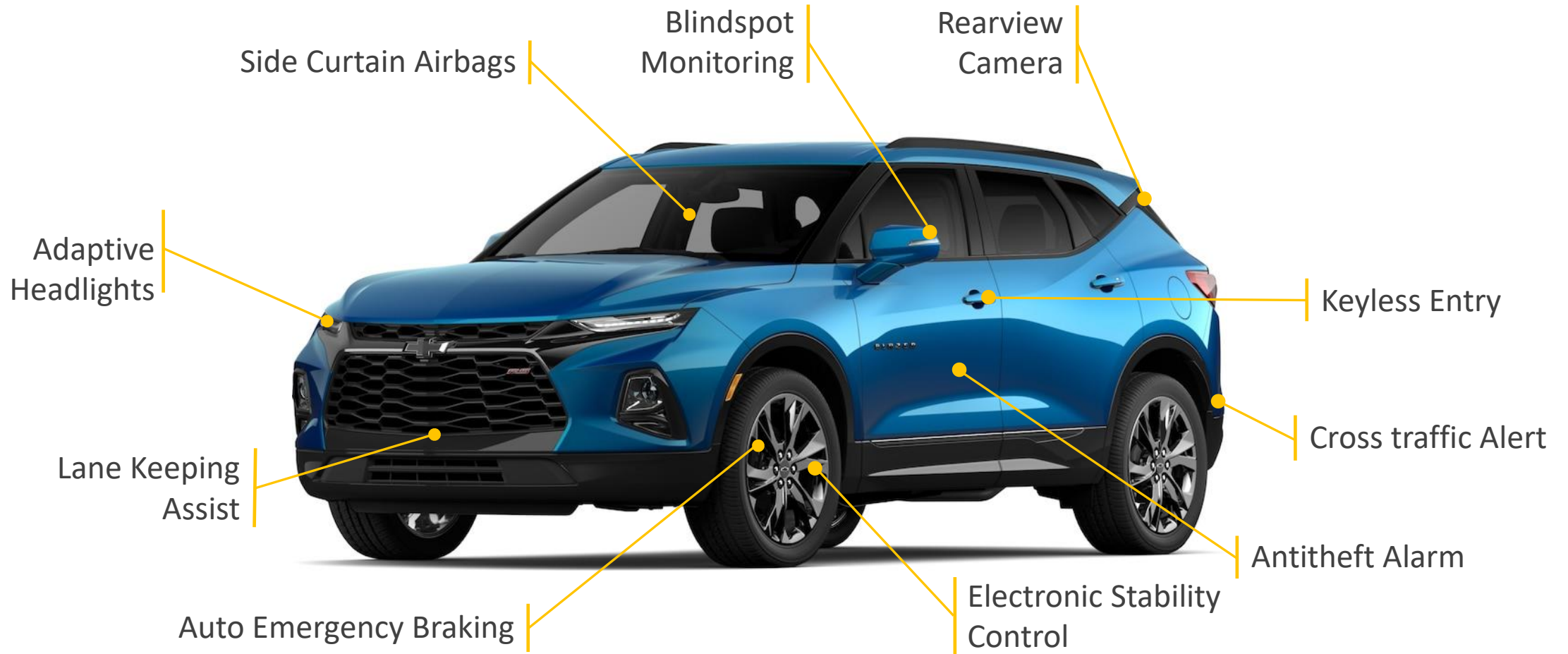


Electronic systems that help the vehicle driver while driving or parking



Develop to automate, adapt and enhance vehicle systems for safety and better driving

Safety and Security



Human Machine Interface



Heads-up display

Steering Wheel
Mounted Controls

Navigation with Traffic

Smartphone
Integration

Car Play or
Android Auto

Touch-sensitive
Controls

Vehicle Safety Features



2016 Buick Envision
MSRP \$42,380

Forward-Collision Warning
Low Speed Auto-braking
High Speed Auto-braking
Lane Departure Warning
Lane Keeping Assist
Blind-Spot Warning
Rear Cross Traffic Warning
Rearview Camera



2016 BMW X3
MSRP \$39,650

Forward-Collision Warning
Low Speed Auto-braking
High Speed Auto-braking

Blind-Spot Warning

Rearview Camera



2016 Ford Escape
MSRP \$31,745

Blind-Spot Warning
Rear Cross Traffic Warning
Rearview Camera



2016 VW Tiguan
MSRP \$30,645

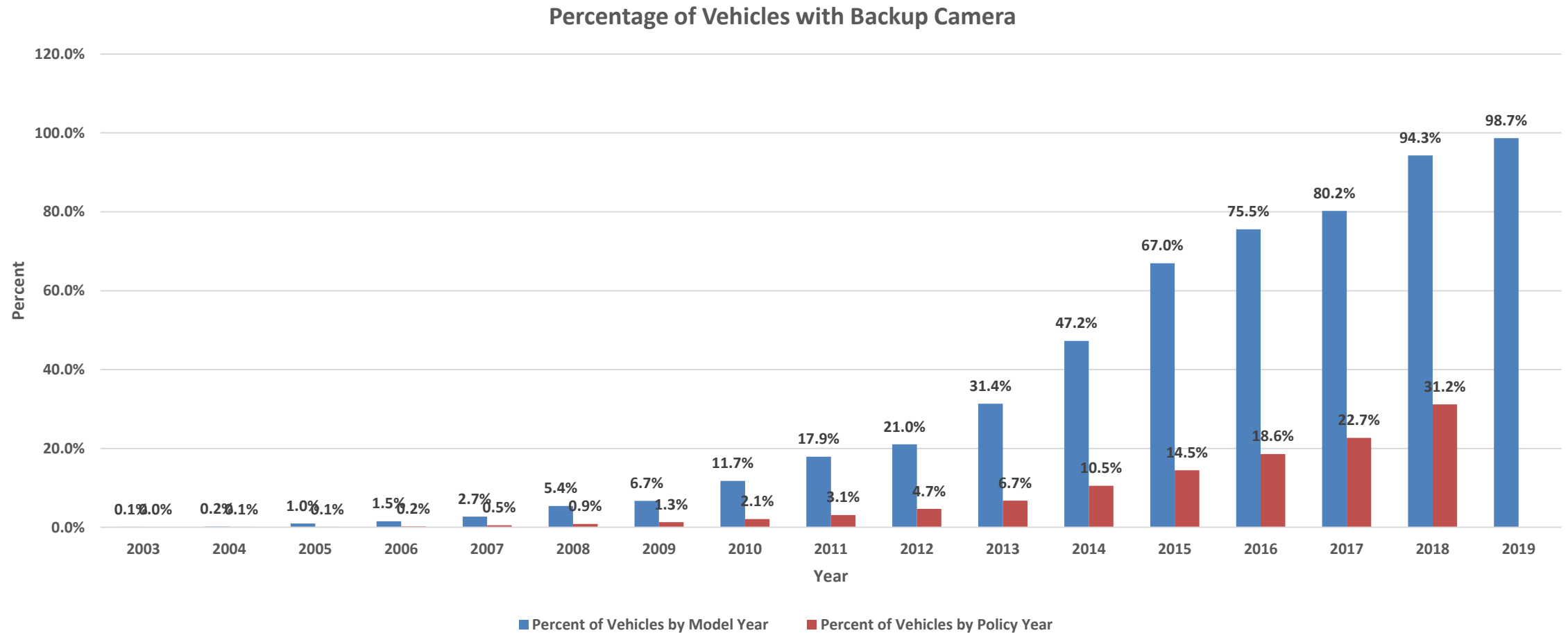
Rearview Camera

ADAS Considerations

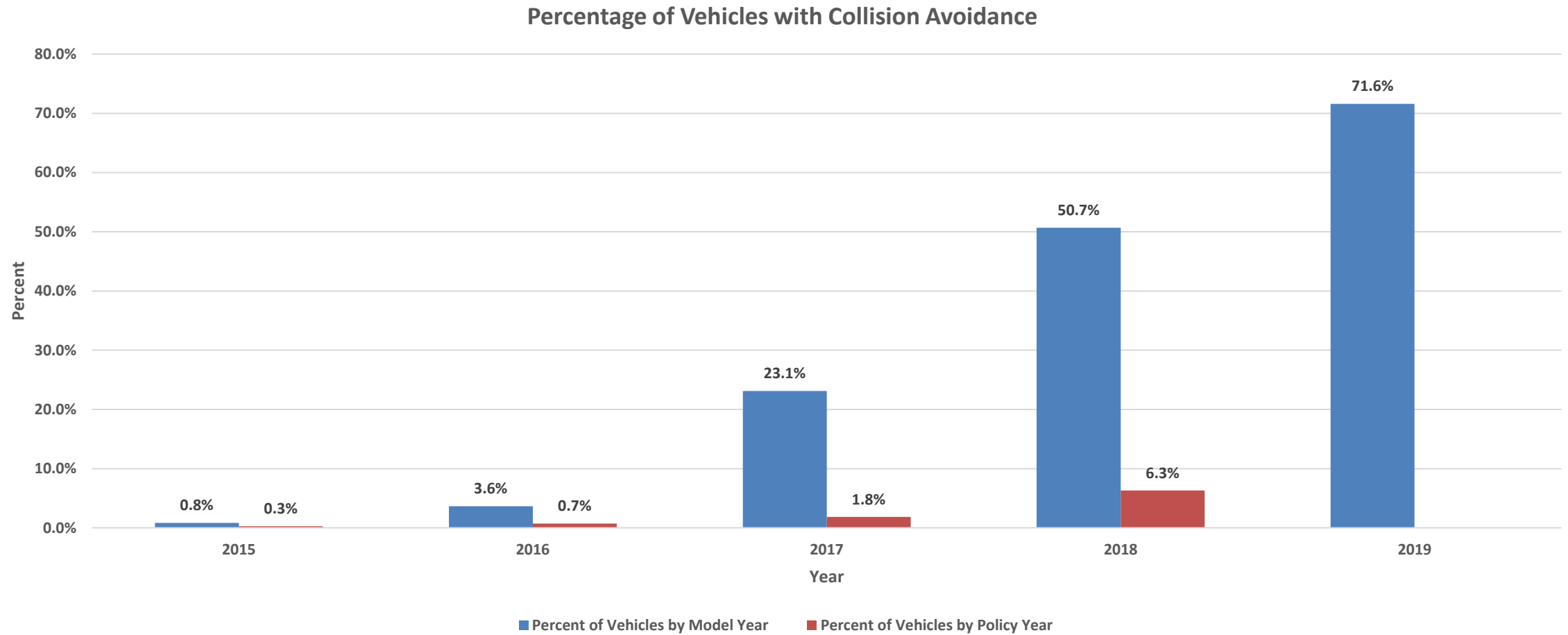
Increased Availability of ADAS Features

- The availability of ADAS features is increasing
 - Historically, available or standard on higher end vehicles, now it is moving to being available on lower priced vehicles
- However, the percentage of vehicles on the road with ADAS increases at a slower rate
 - It takes approximately 20 years to turn over the entire fleet of vehicles on the road
 - Average age of vehicles on the road is increasing
 - COVID-19?

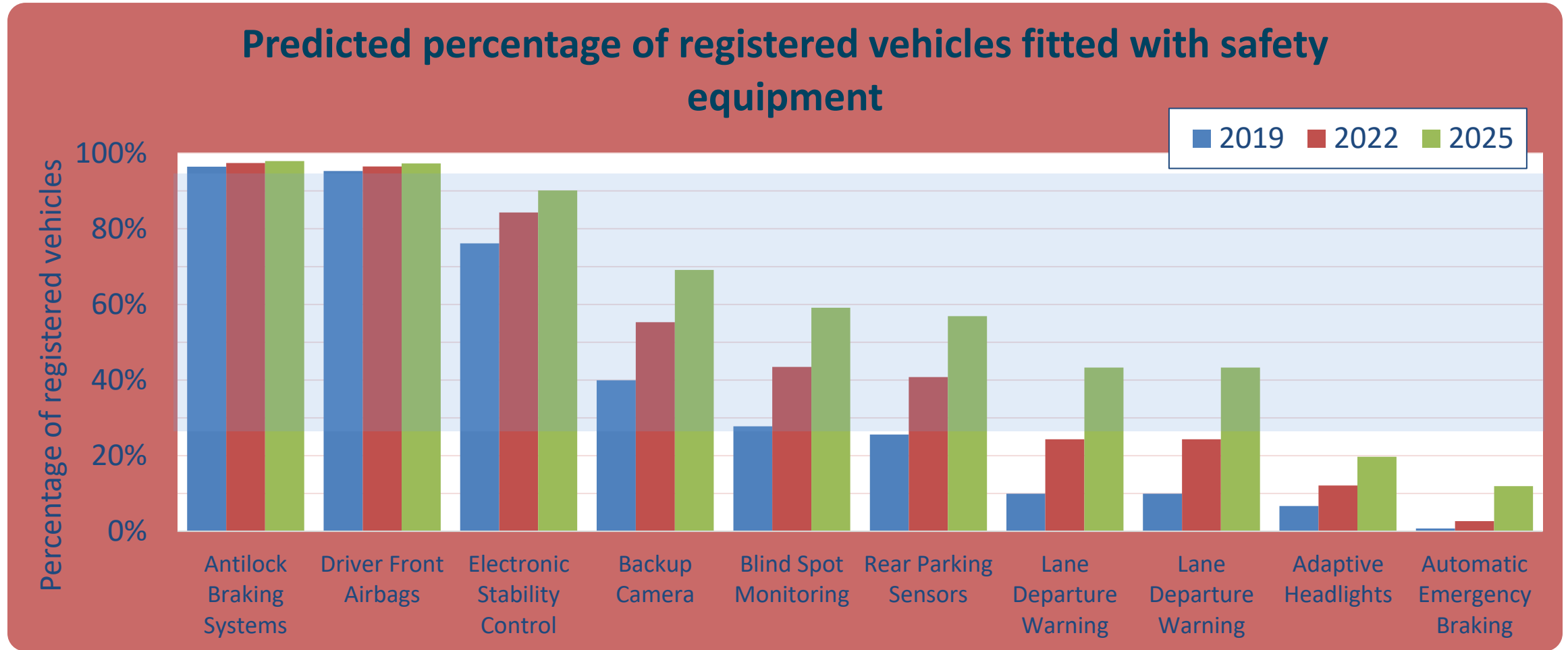
ADAS Adoption – Backup Camera



ADAS Adoption – Collision Avoidance



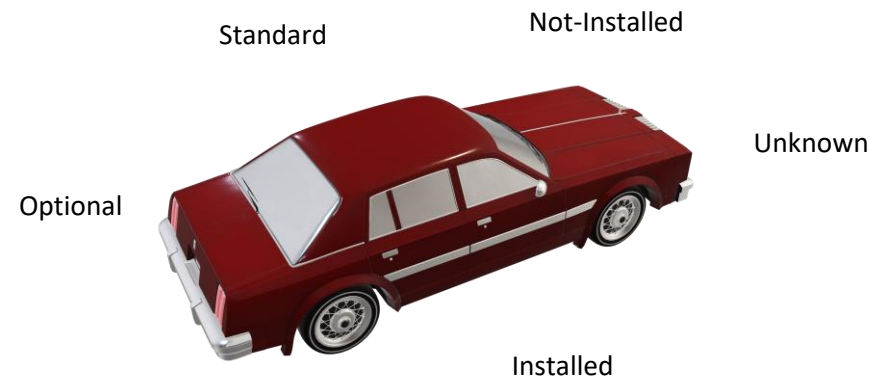
Vehicle Safety Equipment – Predicted Future Adoption



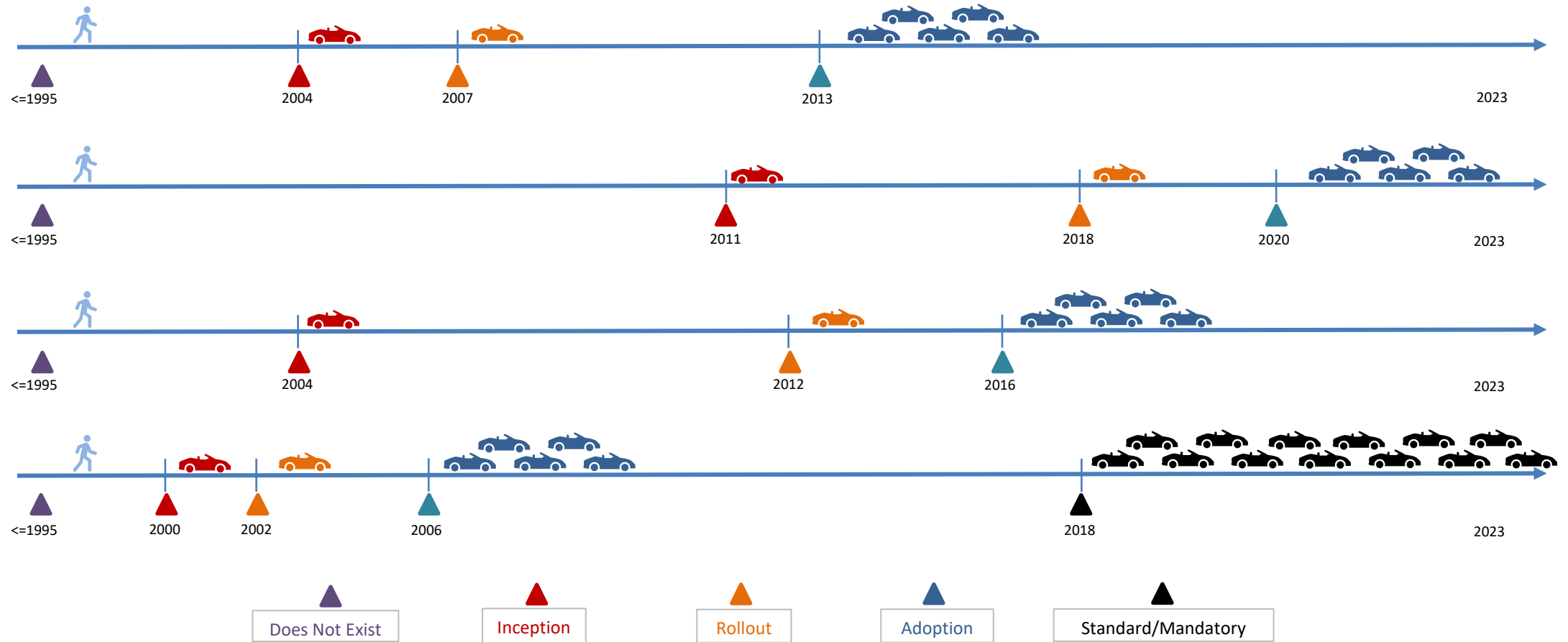
Analyzing Impact on Loss Costs

Data Challenges

- Acquiring data
 - Original Equipment Manufacturers (OEMs)
 - Data aggregators
 - Direct from the insured
- Feature differences
- Manufacturer differences
- Change over time
- Data sparsity
- New features
- Leading to autonomous vehicles



Difficulty in Modeling ADAS Features



Impacts of ADAS on Premiums – Competing Effects

Premium Decreases

- Decrease in accident frequency
- Increase in vehicle occupant safety
- Decrease in damage caused to other vehicles
- Increase in external occupant safety

Premium Increases

- Cost of vehicle repair
- Driver interaction
 - Confusion
 - Over-reliance

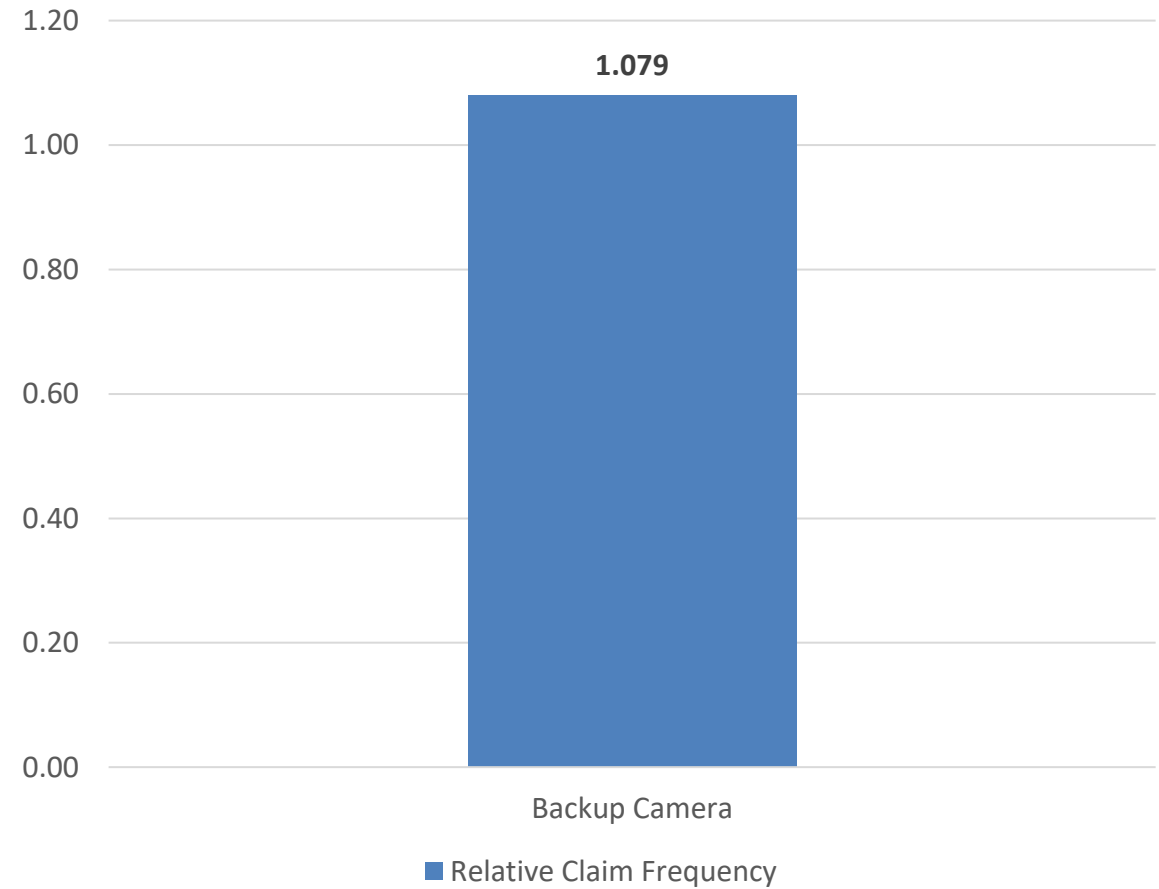
Challenges

- Reliability of information
- Projections of safety benefits

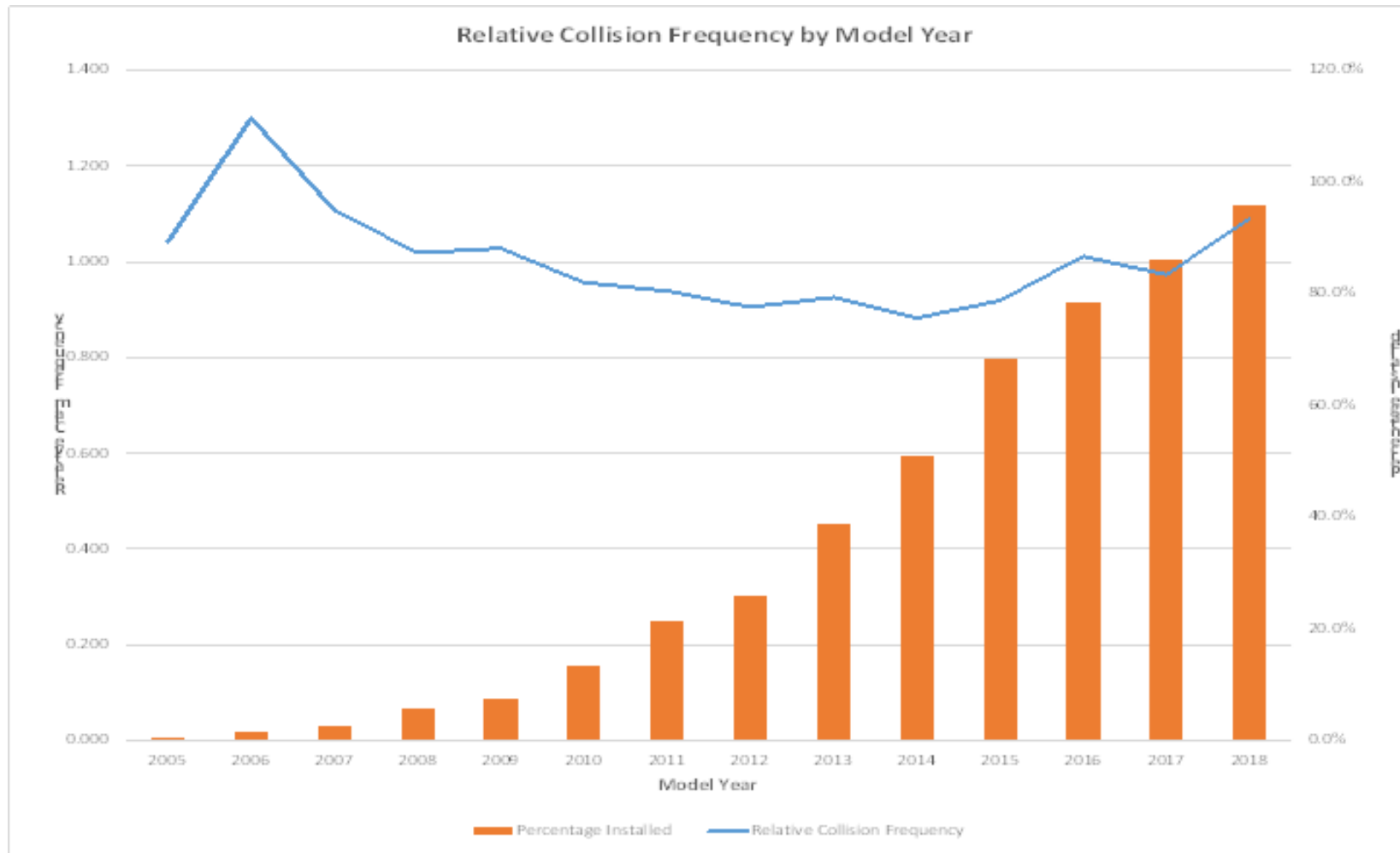
Backup Camera



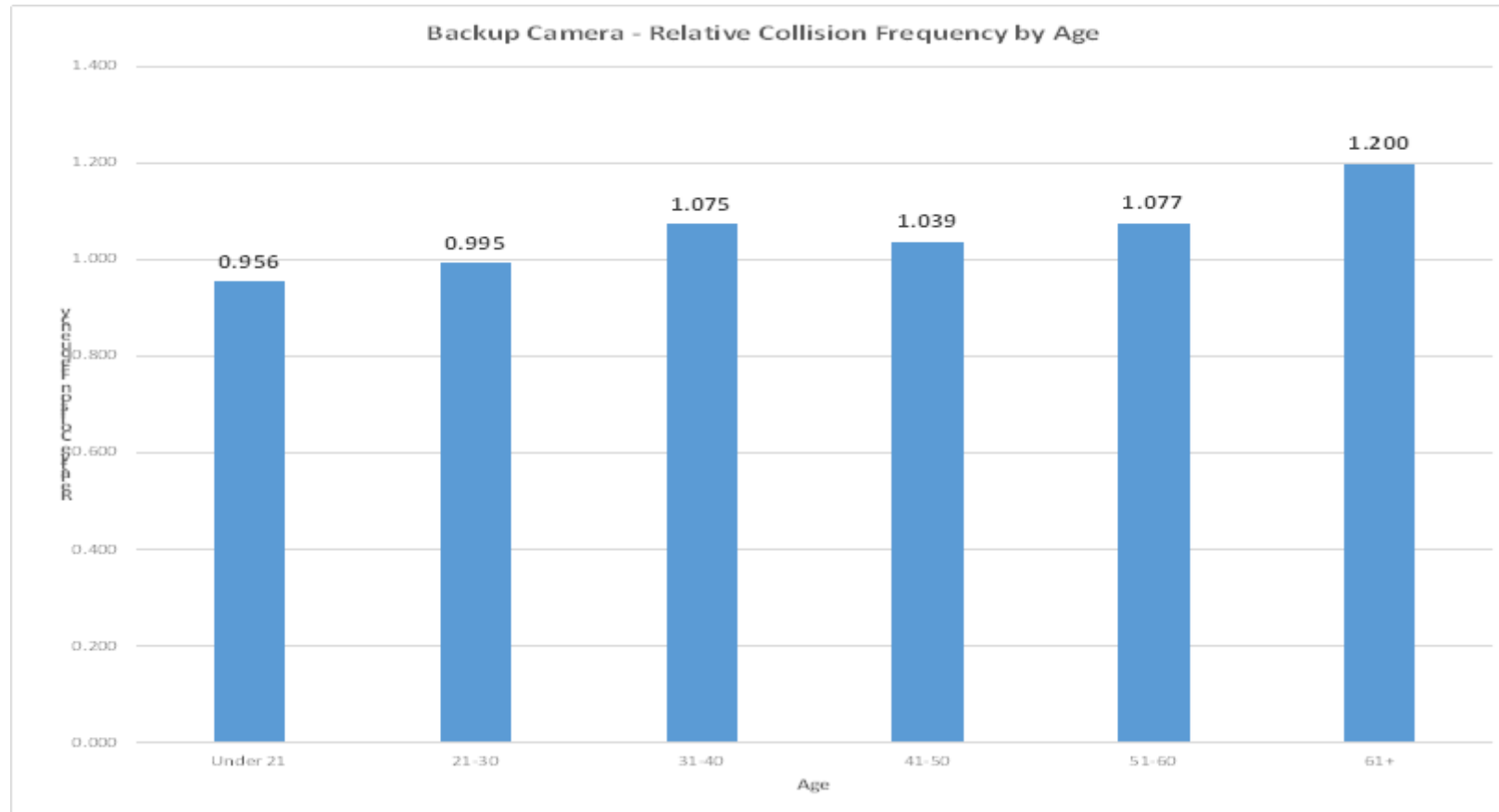
Relative Collision Frequency – Model Year 2005+



Backup Camera by Year

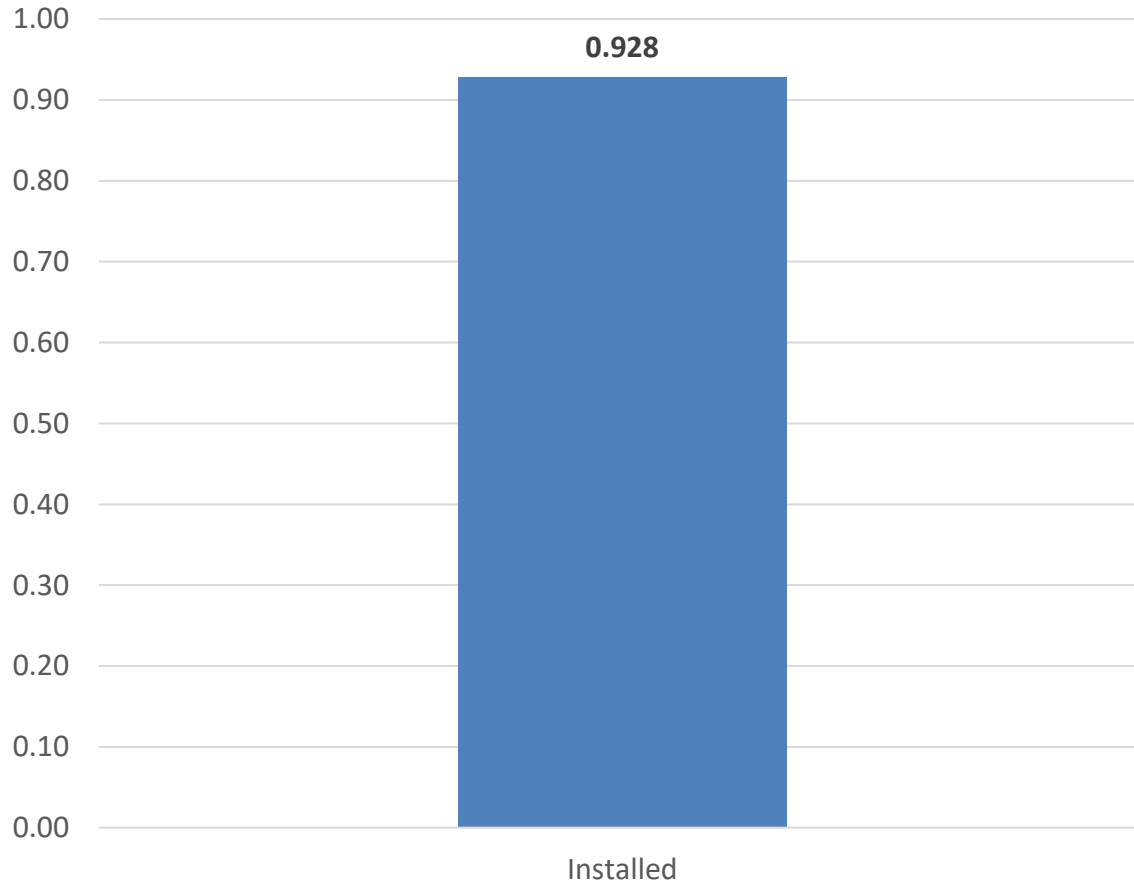


Backup Camera by Age

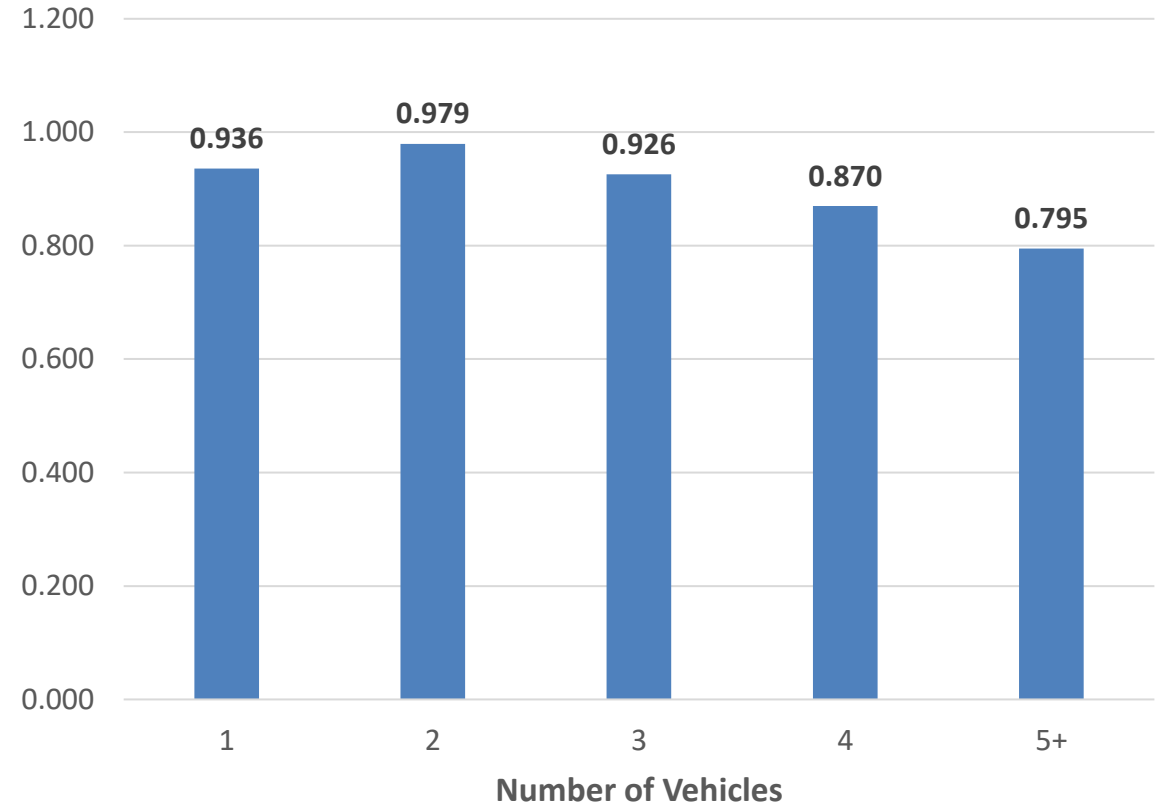


Rear Cross Traffic Alert by Number of Vehicles

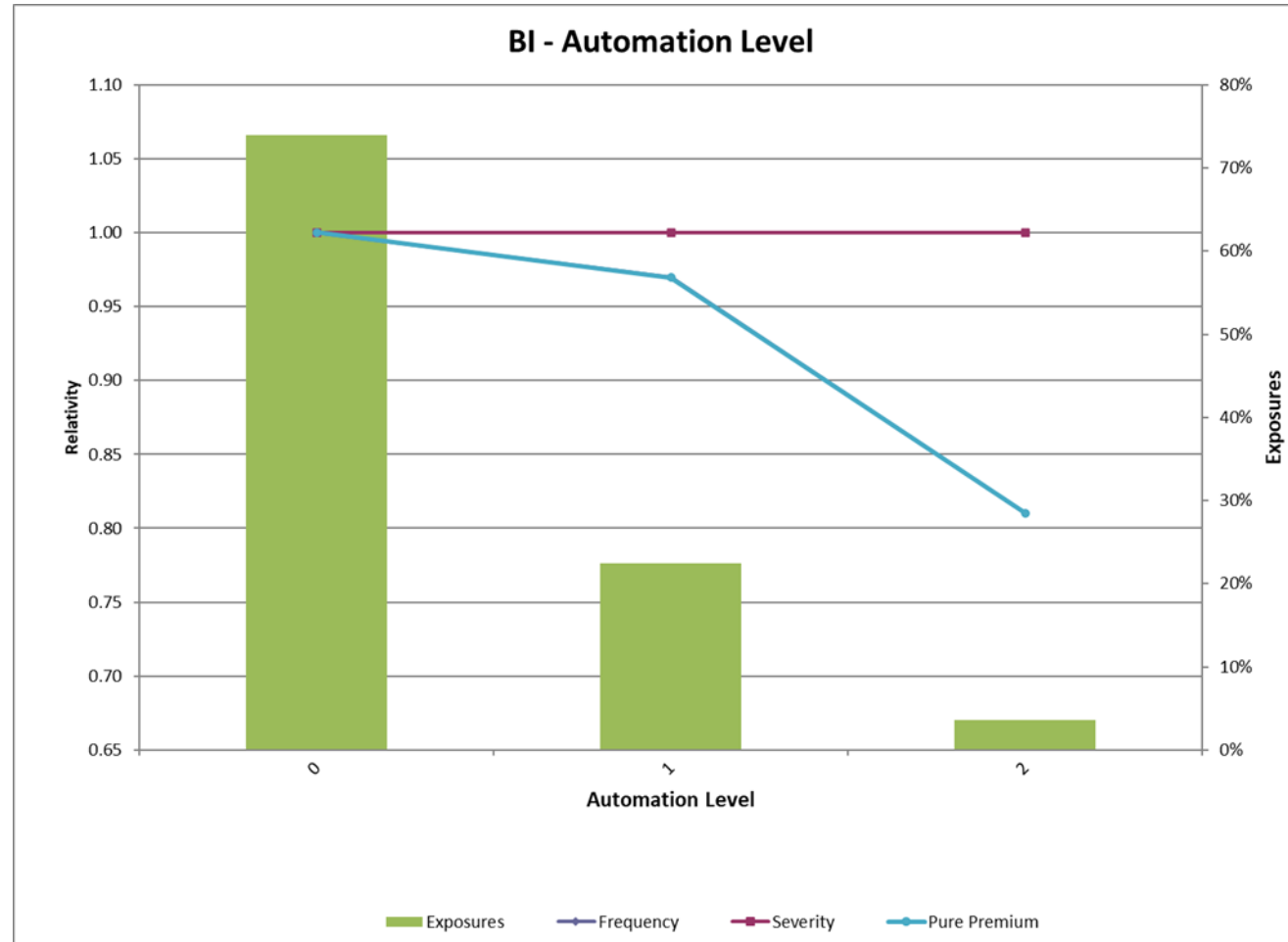
Collision Frequency - Rear Cross Traffic Alert



Collision Frequency – Rear Cross Traffic Alert by Number of Vehicles



Feature Synergy



Conclusions

- There are a variety of ADAS features available in the market today
- The adoption rate of ADAS features is going to happen over a long period of time
- Impact of ADAS can be determined, but careful data processing and feature engineering will be vitally important

Roosevelt C. Mosley, Jr., FCAS, MAAA, CSPA

309.807.2330

rmosley@pinnacleactuararies.com

