COVID-19 Impact on Auto Ratemaking

John Fong, FCAS
Sr. Actuarial Manager
# Executive Summary

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<th>Impact on personal auto usage</th>
<th>Impact on driving behaviors</th>
<th>Impact on personal auto insurance</th>
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1) Impact on personal auto usage
Driving destinations are different

Retail & recreation
-27%
compared to baseline

Mobility trends for places like restaurants, cafes, shopping centers, theme parks, museums, libraries, and movie theaters.

Grocery & pharmacy
-16%
compared to baseline

Mobility trends for places like grocery markets, food warehouses, farmers markets, specialty food shops, drug stores, and pharmacies.

Parks
-22%
compared to baseline

Mobility trends for places like national parks, public beaches, marinas, dog parks, plazas, and public gardens.

Source: Google COVID-19 Community Mobility Reports
Driving destinations are different

Transit stations
-39%
compared to baseline

Workplaces
-18%
compared to baseline

Residential
+7%
compared to baseline

Mobility trends for places like public transport hubs such as subway, bus, and train stations.

Mobility trends for places of work.

Mobility trends for places of residence.

Source: Google COVID-19 Community Mobility Reports
Fewer miles are being driven

Source: FRED Economic data
Fewer miles are being driven, but each mile is riskier.

H1 (Jan - Jun) Fatality Rates per 100M VMT

Source: NHTSA crash stats
2) Impact on driving behaviors
Telematics indicates riskier driving behaviors

Source: Zendrive collision report
More reckless driving on emptier roads

CORONAVIRUS CALIFORNIA
California Highway Patrol sees spike in 100-mph speeding tickets amid coronavirus shutdown

There's been an increase in citations for speeding while people have been staying home because of the novel coronavirus, according to CHP data.

Friday, May 22, 2020

U.S. | NEW YORK
New York City Traffic Deaths Rise During Covid-19 Pandemic
Reckless behavior on emptier roads spurs 69% increase in deaths among drivers and passengers
3) Impact on personal auto insurance
Fewer miles leads to lower premium under traditional policy

Coronavirus: Car insurers like Allstate, Geico and Farmers are issuing refunds or policy rate cuts to drivers
Usage-based insurance attracts more interest

Customers' demand for new insurance offerings (%), 2019-2020

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<th>2019</th>
<th>2020</th>
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<td>On-demand insurance</td>
<td>29%</td>
<td>31%</td>
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<tr>
<td>Usage-based insurance</td>
<td>35%</td>
<td>51%</td>
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Source: Capgemini Efma World Insurance Report 2020
UM/UIM coverage could be challenging

Warren Buffett: There will be more uninsured motorists driving after the coronavirus

May 2, 2020

Chart 1. Unemployment rate, seasonally adjusted, January 2019 – January 2021
Claims adjusters operates differently

COVID Impact

- Fewer claims reported
- More adequate claim staffing

Potential Outcome

- Accelerate digital transformation of claims handling & adjusting
  - Limited physical inspection
- Accelerate case reserves
- Proactively reaching out to claimants
Final Thoughts

Miles mix shift
- Less Traffic
- Fewer miles driven
- Different “Rush Hours”
- Fewer commute miles

Driver behavior shift
- More speeding
  - Avg speed also increases
- More phone usage
- More harsh events
- More uninsured motorist

Digital Transformation
- More Usage-based Insurance
  - Pay-as-you-drive
  - Pay-how-you-drive
- More adoption on telematics
- Changing claims adjustment practice
Scenario Testing COVID-19
Assumptions with Predictive Models

RPM 2021
Ralph Dweck, FCAS MAAA
ISO Risk Analyzer Environmental
Geographic risk landscape

Location-specific data to help you classify, segment, and price risk with laser precision
Examine the “environment” around a risk. For each risk’s garaging location, the Environmental module analyzes the interactive effects of hundreds of variables, such as:

- Traffic generators
- Traffic composition
- Traffic density and driving patterns
- Weather and terrain
- Experience and Trend
Counties with highest average traffic scores, by metro area
Risk Analyzer Estimated Loss Cost vs. Traffic Score
Commercial Auto TTT Property Damage
Relationship between RA Traffic Score and RA loss costs

The RA loss cost relationship is inherently defined such that the loss cost estimate in any one Census Block Group (CBG) is as follows:

$$\ln(LC_{CBG}) = \text{Traffic Score}_{CBG} + \text{Weather}_{CBG} + \text{Composition}_{CBG} + \text{Experience Score}_{CBG}$$

If we hone in on the relationship between Loss Cost and Traffic Score, we could reduce the relationship to

$$\ln(LC_{CBG}) = \text{Traffic Score}_{CBG} + \text{Other Effects}_{CBG}$$

To which we can fit our best ‘guess’ for each CBG loss cost, just knowing the Traffic Score

$$\ln(\hat{LC}_{CBG}) = \beta_1 \times \text{Traffic Score}_{CBG} + \beta_0 + e_{CBG}$$
Leveraging an economic indicator for more intuitive scenario testing
Traffic Score and ISO MarketStance Commercial Insight Data

A. Traffic Score vs. Num of Operating Locations  
B. Traffic Score vs. Ln(Num. of Operating Locations)
Scenario Testing

• Fit a relationship between the Traffic Score and the MarketStance operating location data

• Then scenario test different forecasts of number of operating locations

• The operating location forecast can be translated into an effect on traffic score, and cascade into an effect on loss cost using our established fits
Scenario Testing
Commercial Auto TTT

Scenario:

-5%  -10%  -15%  -20%
Scenario Testing
Commercial Auto PPT

Scenario:

-5%  -10%  -15%  -20%
Scenario Testing
Personal Auto

Scenario:
-5%  -10%  -15%  -20%
Questions?

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