COVID-19's Economic Impact on Driving Patterns and Automobile Insurance
Welcome – Housekeeping Items

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About Our Panel

Don Hendriks
• Predictive Modeler
• CARFAX

Matt Moore
• Senior Vice President
• Highway Loss Data Institute (HLDI)

Roosevelt C. Mosley Jr., FCAS, MAAA, CSPA
• Principal and Consulting Actuary
• Pinnacle Actuarial Resources, Inc.

Brian Sullivan (Moderator)
• Founder of Risk Information Inc.
• Editor of Auto Insurance Report and Property Insurance Report

Yiem Sunbhanich
• Co-Founder and CEO
• TNEDICCA®
U.S. motor vehicle crash deaths and deaths per billion vehicle miles traveled
1950-2016

- Iranian revolution (Jan 1980 – Nov 1982)
- Oil price shock (July 1990 – Mar 1991)
- Great recession (Dec 2007 – June 2009)
- OPEC oil crisis (Nov 1973 – Mar 1975)
Change in U.S. motor vehicle crash deaths per billion miles traveled and unemployment rate
1950-2016
Speed affects the risk of crash occurrence

Change in crash risk vs. change in speed

- Rural roads
- Urban roads

- 84% at 50%
- 183% at 100%
- 38% at 0%
- 74% at 50%
- 100% at 100%
Speed affects crash severity
Fatality risk for passenger vehicle occupant by impact speed

NHTSA, 2005
Higher speeds yield greater risk – it’s just physics
Higher speeds yield greater risk – it’s just physics
Auto sales vs. vehicle series
1982–2018 model years

auto sales (10,000)  HLDI vehicle series

auto sales (10,000)  HLDI vehicle series  auto sales per HLDI series
Vehicle use since CoViD-19 Lockdown

Service Events on Late-Model Vehicles
2018 - 2020, Seasonally adjusted

Source: CARFAX Vehicle History Database
Vehicle use since CoViD-19 Lockdown

Service Events on Late-Model Vehicles
2018 - 2020, Seasonally adjusted

55% drop in need for service

Source: CARFAX Vehicle History Database
Long-term impacts of Dot-Com Bubble and September 11 Attacks
Long-term impacts of Dot-Com Bubble and September 11 Attacks

Average Daily Miles by Vehicle
May 2000 to December 2004, Seasonally adjusted

Persistently lower mileage following September 11, 2001 terrorist attacks

Source: CARFAX Vehicle History Database
Long-term impacts of the Great Recession of 2007
Long-term impacts of the Great Recession of 2007

Average Daily Miles by Vehicle
January 2007 to December 2012, Seasonally adjusted

Lower mileage for about 24 months following recession onset

Source: CARFAX Vehicle History Database
Long-term impacts of the Great Recession of 2007

Average Daily Miles by Vehicle
January 2007 to December 2012, Seasonally adjusted

Lower mileage for about 24 months following recession onset

Return to pre-9/11 levels by end of 2011

Source: CARFAX Vehicle History Database
Possible long-term impact of CoViD-19 Lockdown on vehicle use

Service Events on Late-Model Vehicles
2018 - 2020, Seasonally adjusted

Source: CARFAX Vehicle History Database
Possible long-term impact of CoViD-19 Lockdown on vehicle use

Projected Average Daily Mileage
2020-2024
Possible long-term impact of CoViD-19 Lockdown on vehicle use

Projected Average Daily Mileage 2020-2024

Best case: Return to normal by year-end
Possible long-term impact of CoViD-19 Lockdown on vehicle use

Projected Average Daily Mileage
2020-2024

Best case: Return to normal by year-end

More Likely: Return to a new, lower normal by middle of 2021
TNEDICCA® works to improve traffic safety leveraging a proprietary crash location database from 39 states representing more than 91% of U.S. auto insurance premium. The company provides location risk score solutions based on more than 30 million crashes.

Key findings:

• Daily crash frequency continues its declining trend in April. April MTD is down by 49%.

• More populated counties experienced greater decline.

• Hourly crash data indicates drive time patterns have changed.

• The percentage of crashes resulting in an injury has not significantly changed.

• Vehicle speed at crash increased by 24% in April.
Daily Crash Frequency in Ohio

COVID-19 has significant impact on crash frequency

* Actual crash counts from 03/21/20 were adjusted for data report lag

Source: Crash frequency from TNEDICCA and Coronavirus confirmed cases from Ohio Department of Health
Daily Crash Frequency in Ohio 2019 vs. 2020

April month-to-date is down 49%

* Actual crash counts were adjusted for data report lag

Source: TNEDICCA  
Note: Data updated as of 04/26/2020
Percentage Change by County in Ohio 2020 vs. 2019**

More populated counties experienced greater decline

* Country population numbers are in logarithmic scale.

** For 2020, the data is from Friday 3/20 to Saturday 4/18. For 2019, the data is from Friday 3/22 to Saturday 4/20.

Source: TNEDICCA

Note: Data updated as of 04/26/2020
Hourly Crash Frequency During Week Days in Ohio 2020 vs. 2019*

Drive time patterns have changed

* For 2020, the data is from Friday 3/20 to Saturday 4/18. For 2019, the data is from Friday 3/22 to Saturday 4/20.

Source: TNEDICCA

Note: Data updated as of 04/26/2020
Daily Injury Crash Ratio in Ohio 2020 vs. 2019

Injury crashes have declined proportionately

* Daily injury ratio is based on 5-day moving average

Source: TNEDICCA  Note: Data updated as of 04/26/2020
Estimated Vehicle Speed 2020 vs. 2019
Vehicle speed at crash increased by 24% in April

Estimated Vehicle Speed in Ohio

* For April 2020, data is up to 04/28/2020
Fast Track Property Damage Claim Data

Property Damage Claim Counts

- **Oil embargo** – 1979
- **Mortgage crisis** – 2007
- **Dot com bubble** – 2000
- **COVID-19** – 2020
Fast Track Property Damage Paid Loss Data

Property Damage Paid Losses

- Oil embargo – 1979
- Mortgage crisis – 2007
- Dot com bubble – 2000
- COVID-19 – 2020
Fast Track Property Damage Exposure Data

- Oil embargo – 1979
- Mortgage crisis – 2007
- Dot com bubble – 2000
- COVID-19 – 2020
Economic Variables Used to Project Cost and Frequency Trends

- **Business**
  - Corporate profit
  - Industrial production
  - Small business optimism
  - GDP

- **Employment**
  - Total hours worked
  - Unemployment rates
  - Unemployment persistency

- **Transportation**
  - Fuel use
  - Fuel rate
  - New vehicle CPI
  - Petroleum demand
  - New vehicle sales

- **Housing**
  - Mortgage rate
  - New single family home sales

- **Consumer**
  - Retail sales
  - Consumer confidence

- **Economic**
  - Treasury rates
Number of Paid Claims vs. Number Unemployed Less Than 5 Weeks

\[ R^2 = 0.6563 \]
Economic Projections

Moody's Projections - Number Unemployed for 15 or More Weeks

Graph showing the number of unemployed for 15 or more weeks from 2019/1 to 2021/4 for different scenarios:
- Baseline
- Alternative 0
- Alternative 1
- Alternative 3
- Alternative 4
Moody's Projections - Number Unemployed for 15 or More Weeks

2010/2 – 8.98
Projections – Why the Future Will Not be Like the Past

• Drop in mileage driven is not the same across the board
  – Essential workers

• Rebound in mileage will be even more varied
  – Phased reopening plan
  – Individual companies are developing their own schedules
  – Work at home options
  – Concerns with public modes of travel

• Current and projected economic conditions are like nothing we have seen in the past 40 years
Projection – Expected Loss

Projected Property Damage Losses for Next Five Years

Estimated drop in losses: 30 – 35%
Length of recovery varies
New normal
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Thursday, May 14
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Registration is Open

Actuarial 101 for Self-Insured Entities
Final Notes

• We’d like your feedback and suggestions
  • Please complete our survey

• For copies of this APEX presentation
  • Visit the Resource Knowledge Center at Pinnacleactuaries.com
Thank You for Your Time and Attention

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