Pandemic Effects on Transportation

Where has it been?

Where is it going?

David Schrank
Why am I standing up here?

• 2021 Urban Mobility Report
• 2023 Urban Mobility Report (under development)
• 2022 Texas 100 Most Congested Road Sections
• 2022 Maryland 100 Most Congested Road Sections
• 2023 Freight Mobility Trends (FHWA)
• Numerous other efforts around the U.S.
Urban Mobility Report 1982-2008 (the early years)

- Highway Performance Monitoring System (1982 to present)
- Speeds estimated using Daily Traffic per Lane and Speed relationships from Bureau of Public Roads Functions
- Texas Cities Only

- By late 1980’s began to look beyond Texas
- 39 urban areas, then 50 urban areas
UMR 1982 to 2008 (cont.)

- Mid to Late 1990’s
- Traffic management centers brought new information
  - Better relationships between daily traffic volume per lane and speed
  - Many urban areas with different traffic and congestion levels
- Expanded to 101 areas
  - The extra ‘one’ was San Juan PR
- Estimated benefits from certain treatment types
  - Signals, ramp metering, incident management, HOV, and public transit
- Created FHWA Mobility Analysis Pooled Fund in 1998 (now called Support for Urban Mobility Analyses - SUMA, TxDOT is lead agency).
2021 Urban Mobility Report

• Evaluates areawide mobility conditions based on actual speed data
• Freeway and principal arterial street networks
• 101 urban areas from 1982 to 2020
• 393 <mostly smaller> urban areas from 2014 to 2020
• Uses a suite of performance measures
2020 (COVID-19) in the UMR

- 4 congestion years in one.
- A 18% reduction in travel led to a 51% reduction in delay for the year.
- Truck travel had a smaller decline than passenger cars.
- More of the delay is on streets, in the middle of the day, and on weekends than in typical years.
- A majority of truck delay happened in off-peak periods (53% in 2020 compared to 40% in 2019).
Congestion Levels

- Annual 2020 congestion costs and travel delays were half the 2019 levels

<table>
<thead>
<tr>
<th>Measure</th>
<th>2019</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual Delay Per Auto Commuter (hours)</td>
<td>54</td>
<td>27</td>
</tr>
<tr>
<td>Wasted Fuel Per Auto Commuter (Gallons)</td>
<td>22</td>
<td>11</td>
</tr>
<tr>
<td>Congestion Cost Per Auto Commuter (in 2020$)</td>
<td>$1,170</td>
<td>$605</td>
</tr>
</tbody>
</table>
Four Unique 2020s of Congestion

- Jan & Feb ~2019
- March to May, large declines
- June to August, back toward normal
- Sept to Dec, PM rush hour returning
We Sure Flattened the Congestion Curve!

Million Hours of Weekday Travel Delay by Hour of Day

- Morning peak period disappeared
- Evening peak period was less than half of 2019 levels
Flattened the Daily Congestion Curve

- % of delay during morning was much lower in 2020
- % of delay during midday hours were higher
- % of evening slightly lower in 2020

Percent of Delay by Hour of Day

![Graph showing percent of delay by hour of day with data points for 2019 and 2020.](image)
The Week Was Also Flatter

- Weekend delay hours in 2020 were more than 70 percent of 2019 delay, while Tuesday through Thursday delay were only about 45 percent of 2019

Million Hours of Delay for Each Day

<table>
<thead>
<tr>
<th>Day</th>
<th>2019</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mon</td>
<td>1,200</td>
<td>600</td>
</tr>
<tr>
<td>Tue</td>
<td>1,400</td>
<td>700</td>
</tr>
<tr>
<td>Wed</td>
<td>1,200</td>
<td>650</td>
</tr>
<tr>
<td>Thu</td>
<td>1,400</td>
<td>700</td>
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<tr>
<td>Fri</td>
<td>1,350</td>
<td>650</td>
</tr>
<tr>
<td>Sat</td>
<td>400</td>
<td>250</td>
</tr>
<tr>
<td>Sun</td>
<td>200</td>
<td>100</td>
</tr>
</tbody>
</table>
How Different Was 2020?

- West Loop in Houston
- Speeds were often 5-10 mph faster in 2020 than in 2019.
- The difference between 20 and 30 mph is 1 minute per mile; between 30 and 40 is a half minute per mile.
2023 Urban Mobility Report

• Adds 2021 and 2022 data in 494 urban areas
• Recently obtained 2021 Highway Performance Monitoring System Data
• Working on analysis and reviewing preliminary results
2023 Urban Mobility Report – Early Trends

- Decrease in percentage of weekly traffic on Mondays and Tuesdays, Thursdays on the rise
- Increase in percentage of weekly traffic on weekends
- In some urban areas 2022 VMT and/or delay is higher than 2019, especially smaller satellite urban areas
- 2022 truck delay increase from 2019 higher than all vehicle delay
Potential Long-Term Effects of Pandemic on Transportation

• More variance in delay by day of week due to hybrid work schedules, less reliable travel
• Greater percentage of travel during off-peak times
• More travel on shoulders of the peak periods and less travel in core of urban areas
• Transit ridership slower to return than auto travel, lots of anecdotal discussions on this
• Areas with larger truck movements more congested
How are we handling this in our mobility monitoring?

• Consistent methodology is important. Let the performance be the cause of changes
• More emphasis on changes in rankings rather than the actual performance results
• Speed profiles are going to be critical moving forward to help show WHY/HOW performance is changing
• Incorporating trip patterns as well
Congestion Management Process Analysis Tool (COMPAT)

- Quick access to roadways monitored annually by MPO for CMP
- Aggregates segment level statistics to monitored section level
- Includes speed profiles where available (not for estimated speed locations)
COMPAT (cont.)

• A speed profile for a CMP monitored section