The Eastern Transportation Coalition
Rebuilding the Causes of Congestion Pie Chart with Real-World Data
November 10, 2021
Question and Answer Summary

Q: **Grant Shirts (Regional Transportation Commission of Southern Nevada):** Can MPOs have access to Waze data? Did you purchase the Waze data for this study?

A: Mark Franz (University of Maryland CATT Lab): Certain cities and states are part of the Connected Partner Program - they're sharing data with Waze. For this particular project, the USDOT had an agreement with Waze where they're getting a national Waze data feed, which we were able to access for our analysis. Their agency's access to Waze data depends on whether the MPO is part of the Connected Partner Program.

C: **Christopher Parker (Pennsylvania Turnpike Commission):** We have set up several MPOs in Pennsylvania with the Waze Connected Partner Program.

A: Mark Franz (University of Maryland CATT Lab): That sounds consistent with my understanding of how DOTs are partnering with Waze to share data.

Q: **Paul Pisano (Paul Pisano LLC):** Can you please remind us what sort of analysis has been done to validate the Waze data?

A: Mark Franz (University of Maryland CATT Lab): We've done independent analysis that consolidates the Waze data. In this particular case, we're just looking for records of events that happened. The validation of those events wasn't part of this work; it was something we had done separately. We didn't validate every single event that we used for this particular project.

Q: **Harun Rashid (Northern Virginia Transportation Authority):** Bottleneck results, if not weighted by vehicle counts, can distort real-world conditions. Any thoughts?

A: Michael Pack (University of Maryland CATT Lab): We used the word bottleneck, but it is vehicle-weighted user-delay cost and vehicle hours of delay that we use.

Q: **Alan Warde (New York State DOT):** So, congestion does not have to have a specific physical cause (i.e., high V/C ratio) to be considered recurrent?

A: Michael Pack (University of Maryland CATT Lab): We defined recurrent purely on the temporal pattern of the congestion. It is typically a V/C issue, but could potentially be something else (though that would be odd).

Q: **Christian Matthews (Rockingham Planning Commission):** Will this analysis be done at the MPO boundary level? Or just down to state/county?

A: Mark Franz (University of Maryland CATT Lab): One thing that we're doing is a deep dive tool for our RITIS members so they can select custom roads and dates, which may include UZA boundaries. There may be additional funding through the Bureau of Transportation Statistics (BTS) which may include other geographies such as UZAs, but that's yet to be determined**.**

Q: **Alan Warde (New York State DOT):** Is it possible to segregate Interstate congestion from non-Interstate NHS congestion?

A: Mark Franz (University of Maryland CATT Lab): Not directly in this tool. Once we get to our deep-dive tool and potential improvements to this, BTS might include the filtering of other parameters such as the functional class of the roadway as well as AADT so users can filter for high volume or low volume roads. Those are all things that are being considered. We still need to discuss that with BTS to see if we can bring that to fruition.

Q: **Michael Iacono (Minnesota DOT):** Are the interaction categories (e.g., recurrent and incident) mutually exclusive? That is, would delay that is categorized as both recurrent and incident-related not be counted in the individual (recurrent, incident) categories?

A: Mark Franz (University of Maryland CATT Lab): When it's recurring causes paired with any other combination of the other factors, we subtract out the recurrent part. That's based on the historical pattern. What remains goes into the multiple cause category.

Q: **Julius Codjoe (Louisiana DOTD):** At this time, are we only able to do this for 2019?

A: Denise Markow (Eastern Transportation Coalition): Yes.

Q: **Julius Codjoe (Louisiana DOTD):** When will we be able to look at 2020 data?

A: Michael Pack (University of Maryland CATT Lab): USDOT BTS only funded 2019, and it isn't clear if they will or won't fund other years yet. We have a consortium of RITIS/PDA Suite users that are actively funding the build-out of a tool within RITIS that will allow agencies to query any time range and use agency work zone/event data (if available). That will be deployed around June 2022. Of course, you'll have to be a RITIS agency to get access to that.

Q: **Paul Pisano (Paul Pisano LLC):** Is there a reason why “weather and recurrent” wasn’t included?

A: Mark Franz (University of Maryland CATT Lab): When we were working with our Steering Committee, to determine which two-factor multiple causes to include, being mindful that we could not include all multiple causes. We sampled six states with different geographies and found out which two-factor multiple causes were the most frequent and prevalent in the database. Those are the ones that we ultimately presented here. Behind the scenes though we are calculating all of the multiple causes. It just gets too tricky to present all of them on one interface. Regarding recurrent plus weather, we have that is being folded into the “other multiple causes”.

Q: **Scott Benedict (Pennsylvania DOT):** Is all recurrent delay at a signalized intersection classified under signals?

A: Mark Franz (University of Maryland CATT Lab): No - we are also subtracting that out and putting it into the recurrent category. Only the congestion that remains is what's assigned to the signal category.

Q: **Andrew Meese (MWCOG):** Do you think the term "signal delay" is misleading? If signal timing at an intersection includes appropriate accommodation, for example, of pedestrian phases necessary for safety, this is not a "delay" that could theoretically be zeroed out. The changing of this definition may explain a lot of the difference between the 2004 and 2019 data for the signal delay.

A: Mark Franz (University of Maryland CATT Lab): That's a fair point and it's one that we went back and forth on. The original title was signal timing, but with the one-minute probe data, we can't discern if it's signal timing or over-saturation conditions. So, we use the general terms of signals. A future enhancement would be to tease out the definition of excessive delay at signalized intersections. As Andy mentioned you might not have the opportunity to change it due to things like accommodating pedestrians. If it's oversaturated you don't have any green time to reallocate. That's certainly an area that we hope to get funding to investigate a little bit more. The signals might have their own rules for what is defined as "excessive delay".

Q: **Julius Codjoe (Louisiana DOTD):** What rates were used to calculate the User Delay Cost?

A: Mark Franz (University of Maryland CATT Lab): We just use national-level standards for the user delay cost. They come from the Texas Transportation Institute Urban Mobility Report. We adopted them to scale up the vehicle hours and we assumed that the constant traffic flow on all the TMCs for this study was 90% passenger vehicles and 10% commercial vehicles. Then we use the value of time and occupancy rates for those two vehicle classes to get the user hours of delay.

Q: **Alan Warde (New York State DOT):** What is the difference between "Recurrent" and "Recurrent and Incident"? Are the two additives to produce a total "Recurrent" estimate?

A: Michael Pack (University of Maryland CATT Lab): "Recurrent" means there's usually delay at a particular location. "Recurrent and Incident" mean that an incident occurred where there was recurrent congestion and made conditions worse.

Q: **Greg Scott (Polk County TPO):** Is this measuring time in congestion or delay?

A: Mark Franz (University of Maryland CATT Lab): This is measuring time in delay.

Q: **Sai Gazula (Modern Mobility Partners):** Will there be a way to sort based on what is the proportion of counties within the state?

A: Mark Franz (University of Maryland CATT Lab): That's the one idea that we noticed that we didn't include when we had the sorting option. We have it by each of the

individual percentages but not the overall. That's certainly something we can do so that you can get the list by both state and county.

Q: **James Li (MWCOG):** Since there are questions on categories, I was wondering if the definitions of category, at least the 2019 version, could be published on the help page. How a combination, e.g., signal and weather, was defined is especially interbred.

A: Mark Franz (University of Maryland CATT Lab): I was talking to our developers about the need to put those definitions on the help page. That will be on the help page (https://congestion-causes.ritis.org/help).

Q: **Grant Shirts (Regional Transportation Commission of Southern Nevada):** What was the definition you used for recurrent and non-recurrent congestion? Can you point me to a resource with these definitions? Please consider including your definition on the help page.

A: Mark Franz (University of Maryland CATT Lab): We look at the hour of day and day of the week in historical pattern and if that is below 60% of the reference speed that becomes the definition of the recurrent. Then, how far below that sixty percent is what that pattern is. If it drops five miles per hour beyond what the normal pattern is, that's when we start to say it's recurrent plus something else. It's based on the historical pattern getting below the threshold of what a bottleneck is for that hour of the day and day of the week.

Q: **David Walker (Rockingham Planning Commission):** How does seasonal congestion fit into this analysis? Is it part of the unclassified, or incorporated into other categories? For instance, a coastal area where tourism-related traffic increases volumes and congestion and can shift the pattern of recurring congestion.

A: Mark Franz (University of Maryland CATT Lab): We've had that question before. That's a great example of a tourist area or beach area in the summertime. If it's significant enough, it'll show up in a recurrent pattern but if not, it might get washed out. We haven't had a great way of teasing that part of the pattern into the results. It's also worth noting that all of our volume estimations are based on the historical patterns that we get from the HPMS. It's the AADT and then we profile that based on the level of congestion and the hour of the day. It might not be appropriate to use the current methodology for seasonal impact analysis.

Q: **Denise Markow (The Eastern Transportation Coalition):** The links that you've provided (below) - whether you have RITIS or not this tool is live for every single state. Is that correct?

Tool Links

- For those who have access to RITIS - https://ritis.org/archive/congestion
- For those without access to RITIS - https://congestion-causes.ritis.org/
- Tutorial - https://ritis.org/tutorials/videos/634641555
- Help Page - https://congestion-causes.ritis.org/help

A: Mark Franz (University of Maryland CATT Lab): Anybody can go in and get this information based on their state and their counties. The second one is open to anyone go and see that but it's the same information.

Q: **Andrew Ludasi (New Jersey DOT):** I'm in RITIS and downloaded the CSV. What are the cell contents? If I convert to the percentage of the total for each cell it does not match the pie percentages. What are the cell contents in the CSV? They don't match vehicle hours of delay or cost per month. I will email offline.

A: Mark Franz (University of Maryland CATT Lab): It's a vehicle hour of delay for each category per month within each county. We can coordinate offline.

Q: **Alan Warde (New York State DOT):** Was there a minimum threshold level of sample 1 minute probe data that was used to include highway segments in the analysis? If not, is there a concern, especially in rural and other low volume areas that the speed data may not be representative of true conditions?

A: Mark Franz (University of Maryland CATT Lab): We didn't. When we got the data from INRIX for the national highway system, we had readings for every minute. It's a mix of whether it was observed versus observe plus historical only. We didn't filter out those confidence scores in this part of the study.

Q: **Mike Bruff (Capital Area MPO (Raleigh)):** For the current tool login through my RITIS account. When you click the download/save button, it downloads the entire master CSV file. Can you download just the charts or just a state's data?

A: Mark Franz (University of Maryland CATT Lab): Unfortunately, no. You get everything. We were considering including that functionality when people were drilled down to a specific state or geography. But it became difficult to support multiple counties and different resolutions. We decided just to give everybody everything and then they could just cut out the portions that they wanted.

Q: **Paul Pisano (Paul Pisano LLC):** NOAA radar data measures moisture in the atmosphere, which doesn't always translate to precipitation that hits the ground. Was the radar data further analyzed to confirm that it represents precipitation? Maybe the Waze data was used to validate?

A: Mark Franz (University of Maryland CATT Lab): No, we didn't validate that. It's a fair point. What we're getting are atmospheric readings which may or may not represent what exactly is going on at the road surface. We assumed that it was a close enough

approximation for this study. But it's a fair point; it could be different than what's going on at the road level.

Q: **Denise Markow (The Eastern Transportation Coalition):** Would be fair to say that part of the discussions moving forward with BTS would be to look at how we're going to continue with the data source?

A: Mark Franz (University of Maryland CATT Lab): That's certainly one of the paths I think that's on the table. The last 18 months have been strange in terms of traffic volumes and probably congestion patterns, but now that we have a 2019 baseline it's interesting to look at that. We will certainly have those discussions with BTS to see what enhancements go into the next phase of this and do we process more years of data to make it available so that agencies can start looking at how things have changed under the pandemic travel restrictions.