The Eastern Transportation Coalition
RITIS User Group Workshop
Integrating RITIS Probe Data Analytics and GIS for CMP Report Visualizations - February 25, 2025
Question and Answer Summary

Note: Results from polling questions asked during this workshop are at the bottom of the document.

Workshop Resources:

- RITIS Tutorials: https://ritis.org/tutorials/
- RITIS Best Practices Handbook: https://ritis.org/handbook.pdf
- Comparison of PDA Suite Tools: https://docs.google.com/spreadsheets/d/1HI8UJLqFaY3ae2nMtJEdk6am9wZonjH0/edit?gid=1166942902#gid=1166942902
- Top 10 Bottlenecks - Fairfax County 2024: https://uofmd.maps.arcgis.com/apps/instant/basic/index.html?appid=c9a77f63c6b741f2b3ee5360ac320171
- States Using CATT Lab Products: go.umd.edu/States
- Additional Links from Workshop Demo: https://drive.google.com/file/d/1JvdRBJy9QycRTQh2ITw1v3cs0OtyHuX7/view
- *Access to Shapefiles – Shapefiles for your agency's respective probe data street database can be obtained by reaching out to your agency's RITIS point of contact. If you need help in identifying who that individual is, please contact the RITIS support team at support@ritis.org.*

Q: **Subham Kharel (Lehigh Valley Planning Commission):** I am wondering how the loading speed of the data on PDA is.

A: Rick Ayers (University of Maryland CATT Lab): It's highly variable. The variability will be a component of space and the temporal parameters. If you're including more roads and a broad range of dates as part of your query, then your query will take a long time.

Q: **Chowdhury Siddiqui (South Carolina DOT):** What happens to the RITIS base map when the vendor changes their segment definition? Changing termini has been a problem in relating metrics from one year to the other.

A: Rick Ayers (University of Maryland CATT Lab): The CATT Lab works hard at maintaining the most recent probe data provider's street database. Typically, there is a biannual update to the base map by each of the vendors. CATT Lab updates the base maps and then begins to map speed data to the updated versions. Consequently, the old base maps and the old probe data get archived. In some cases, there are going to be segment IDs in the new base map that don't have a crosswalk to the old segment IDs. That's probably the issue that you're experiencing. There are some methods that we work through internally on the back end to try to resolve that. I suggest that if you're having trouble with missing segments that don't match up to the historical data in an extensive manner, just send an email to our support team at support@ritis.org.

Q: **Alec Paoni (Illinois DOT):** What is the difference between Probe Data Analytics and NPMRDS Analytics? Do they both have the same capabilities and are just utilizing different data sources?

A: Rick Ayers (University of Maryland CATT Lab): PDA and NPMRDS Analytics share some similar tools; the biggest differentiator is that NPMRDS Analytics is a national probe data and analytics suite that is hosted by FHWA. FHWA contracts with INRIX for the probe data (passenger vehicle and freight truck performance measures) and the CATT Lab for the analytics platform (NPMRDS Analytics).

PDA Suite: Your state needs a separate contract with the probe data provider (INRIX, HERE, or TomTom) and Probe Data Analytics suite (CATT Lab). The vendor licensing that data works directly with the CATT Lab to ingest that data. It is much richer in granularity from a temporal perspective because it's minute by minute.

NPMRDS Analytics: This has a more limited number of tools, and the probe data is from INRIX. This data is provided by FHWA and is just for the National Highway System (NHS). It's very limited in terms of spatial coverage (Interstates, State Routes, and US Routes) and is limited in TEMPORAL fidelity as it is only 5-minute increment probe data.

There are some very distinct differences between the two. Some states have access to both data sets. You could compare them to see where there may be some differences between the two data sets for the road segments.

Q: **Subham Kharel (Lehigh Valley Planning Commission**): What models are used for predicting congestion? Statistical or machine learning?

A: Rick Ayers (University of Maryland CATT Lab): Probe Data Analytics does not do any predictive assessment of congestion or speeds. We integrate and archive in RITIS/PDA probe data from your agency's probe data provider, your agency's authoritative event data (collisions, work zones, sensor data, etc.) plus some national data sets like Waze and wrap it with some easy-to-use query tools so that agencies can make informed decisions from mobility big data sets.

Q: **Nicole Katsikides (FMCSA):** Is it possible to get the safety event data spatially? This would be helpful to overlay with the congestion data from NPMRDS or probe data, especially during events like hurricanes, etc.

A: Rick Ayers (University of Maryland CATT Lab): For full RITIS licensed customers, we ingest your authoritative incident data that could be coming from your agency via ATMS, work zone data, sensor data, etc. We integrate all that authoritative data directly from your agency and archive that. One of the things that you could do with RITIS is you search for archive of incident data using the Event Query Tool (EQT). The EQT allows you to go back in time for any geography, roadway, or query incidents for any period that you'd like. You're easily able to overlay and map that on other mapping apps.

Note: Nicole Katsikides (FMCSA): If you're a federal or non-state user, you can see maps of the safety events, but you cannot download them spatially. And, if I am in a state and looking at a mega-region, I cannot download safety events spatially.

A: By default, the latitude and longitude fields are NOT VISIBLE after you query event data using the EQT. Once your query results have returned, you need to click the blue plus button in the upper left corner of the results table. From there, scroll through the list of available fields and turn the visibility of latitude and longitude on. Once the visibility of those fields is on, you can then export your results as a CSV file and integrate that table into ArcGIS Online or ArcGIS Pro.

Q: **David Metcalf (Volkert):** How can probe data be used as a proxy for traffic volume? Large volume roadway, such as I-495?

A: Rick Ayers (University of Maryland CATT Lab): State agencies are responsible for submitting AADT and volume data to the CATT Lab. The tools that use volume as part of their calculation, such as the Bottleneck Ranking. User Delay Cost is another. We always want the most current volume data for your state. If you have updated volumes for your state, you just email them to intake@ritis.org.

Q: **Mohammadmehdi Zoghifard (Transcend Engineers & Planners):** For bottlenecks, do we have historical data based on the time and date? For a particular date and time, for example.

A: Rick Ayers (the University of Maryland CATT Lab): As we archive the real-time speed data, we're also making assessments of where bottlenecks build up. If you're a Probe Data Analytics user, you could see that in real-time by using the Region Explorer, or if you're interested in looking at historic bottlenecks for one or more corridors in your state, you can use the PDA Bottleneck Ranking tool.

Q: Mohammadmehdi Zoghifard (Transcend Engineers & Planners): When I export the Bottleneck Ranking, based on a date range, it averages it. How can we get the unaggregated data? For a whole month, day by day and hour by hour.

A: Rick Ayers (University of Maryland CATT Lab): Different tools produce different output metrics. The Bottleneck Ranking report is largely a spatial representation of where queues and bottlenecks have built up over time for individual corridors for the specified period. If you're summarizing data for a segment of the roadway, it's got to be calculated over the harmonic mean for that roadway segment and its length for the period that you've analyzed. If you want to dig into it hour by hour by segment, there are a couple of different tools I would recommend. The Corridor Speed Bin Tool and the Trend Map Tool will allow you to look at those harmonic averages across the individual roadway segments. The corridor speed bin tool summarizes all speed readings. If you want to

get crazy, then you use the Massive Data Downloader, which lets you download the minute-by-minute data.

Q: **Jennifer Miller (Chicago Metropolitan Agency for Planning):** Can planning time and buffer time index be downloaded regionwide at a link level for analysis in GIS? We did not see those measures offered in the Massive Data Downloader.

A: Rick Ayers (University of Maryland CATT Lab): No, they are going to be in the Congestion Scan, Corridor Time Comparison, Trend Map, Performance Charts, and Performance Summaries. You should refer to the PDA Tools Matrix. If you need a specific performance measure for your visualization or storytelling, make sure you're using the right tool.

Q: **Gil Grodzinsky (Georgia Environmental Protection Division):** Can you do this with ArcGIS Pro instead of ArcGIS Online? Just a preference, or important to use it online?

A: Rick Ayers (the University of Maryland CATT Lab): You could do it with either. There tends to be more ubiquity of access and familiarity with ArcGIS Online. It's a lot easier to use for tabular integration efforts with spatial content. With ArcGIS Pro, you've got much richer capabilities out of the box to do this sort of work. In the end, you will likely be sharing your story online.

Q: **Barry Fradkin (Massachusetts Port Authority):** I tried to download tabular data to join GIS road segments in the past, but the XML table format is blocked by my agency's cybersecurity system. Is it possible to export data as a CSV, DBF, or some other format?

A: Rick Ayers (University of Maryland CATT Lab): Most of the exports from PDA Suite are XML. If you can't download XML files, you need to talk to your IT department about an exemption. If there are enough requests from agencies to our support team (support@ritis.org), we may try to find a solution.

Note: **Ed Stylc (Baltimore Metropolitan Council):** This has been great. It's given me some ideas for our online CMP tool in Baltimore.

Q: **Alejandro Ortega (Choice Engineering):** How far back in time can we pull data?

A: Rick Ayers (University of Maryland CATT Lab): The archive of probe speed data, or event data, is subject to when the CATT Lab contracted with your state agency. A good way to test how far back in time probe speed data has been archived for your state, run a Congestion Scan for a single month for several years in the past. You will see gray/no-data results in a Congestion Scan if we DO NOT have probe speed data for a particular month/year.

Q: **Victor Mendieta (Corpus Christi MPO):** Is there an SOP/tutorial for using Grok 3 to flatten the XML files? Or to summarize/analyze results? Where was the option to copy the HTML embed code for each module to be used in story maps/websites?

A: Rick Ayers (University of Maryland CATT Lab): Sorry, there is no tutorial for this procedure; it's largely a trial effort with the LLM of choice. The beauty of Large Language Model (LLM) natural language prompting platforms is that you can iterate through your testing efforts in flattening an XML/CSV file.

Every output report from Probe Data Analytics allows you to export the results. The export button can be found in the upper right corner of each output report from PDA (it looks like an old floppy disc).

Q: **Qing Tian (District DOT):** When downloading INRIX data from PDA, we also get a TMC_Identification.csv. We can use this file to create a shapefile. Would this shapefile be the same as the shapefile provided by INRIX?

A: Rick Ayers (University of Maryland CATT Lab): It sounds like you are performing a Massive Data Downloader data dump, of which, one of the files that's contained within the zip file of your final download is the TMC_Identification.csf file. This is NOT the shapefile. You will need to contact your agency's RITIS point of contact and request the INRIX shapefile from that individual. If you are not familiar with who your agency's point of contact is, please contact our support team at support@ritis.org and ask them for assistance.

Note: **Challa Bonja (Metro Trafix):** I think ESRI is retiring the ArcGIS desktop if I am not mistaken.

Q: **Nathan Masek (MRCOG):** Does the PDA Tools matrix accommodate additional data sources such as incidents? Those shown are related to speed.

A: Rick Ayers (University of Maryland CATT Lab): Queries performed using the RITIS Event Query Tool (EQT) will generate a table matrix of fields/variables that are shared in the feed that the CATT Lab receives from the respective agency. You can explore the full breadth of fields that are available for display/export for your agency's event data by clicking the blue plus button in the upper left corner of the EQT results page and clicking on the fields of interest for viewing or export.

Q: **Ayodele Fadoju (Omaha - Council Bluffs MAPA):** Is there a phone directory/ contact person page for the state RITIS administrators?

A: Rick Ayers (University of Maryland CATT Lab): If you are not familiar you're your state's administrator point of contact for RITIS, please contact our support team at support@ritis.org, and they can direct you from there.

Q: **Victor Mendieta (Corpus Christi MPO):** Is there a lookup table that shows TMC segment codes and the equivalent XD segment codes? Or are the segmentations for a TMC network and an XD network completely different?

A: Rick Ayers (University of Maryland CATT Lab): The road segment database is very different between XD segments and TMC segments. There is no lookup table for going between the two because the underlying road database has road segments with nodes (breaks in the segments) that do not align with the other. If you are interested in conflating attribute data from one road database to another, you will need specialized conflation software from third-party companies like 1Spatial.

Q: **Victor Mendieta (Corpus Christi MPO):** Where was the option to copy the HTML embed code for each module to be used in story maps/websites?

A: Rick Ayers (University of Maryland CATT Lab): The share/copy embed code is only available as an option from the results of running a PDA Trend Map. The share button can be found in the upper right corner of the resulting Trend Map report.

Q: **Rana Shams (Maryland DOT):** When you are trying to find the delta between one year to the next, will comparative speeds have the same baseline? Or would they potentially have different baselines?

A: Rick Ayers (University of Maryland CATT Lab): That's a great question, Rana. There are two ways to interpret your question. 1) If you are simply looking to compare average speeds year over year, then the backend algorithm is simply going to calculate the OBSERVED average speed differences for the temporal periods that you are comparing. 2) Regarding baselines, you may be asking about historical average speeds. The historical average speed for any segment of roadway is going to be updated at least twice per year, depending on who your state uses as their probe data provider. Regardless of probe speed data provider, when calculating "differences" year over year, the harmonic mean that is calculated for any segment of roadway is always going to be for THAT segment, for that time of day, that day of the week, and that week of the year.

Q: **Evan Koff (NC Capital Area Metropolitan Planning Organization):** Should the segment base map be free for MPO RITIS users through the TETC license?

A: Rick Ayers (University of Maryland CATT Lab): Your state agency RITIS point of contact should be able to tell you whether the XD/TMC shapefile is available to you for no cost or not. If you are not familiar with who your state agency RITIS POC is, please send a note to the RITIS support team at support@ritis.org.

Q: **Bharadwaj Bommanayakanahalli (HDR):** Who should we contact to obtain the GIS shapefile of the TMC or XD segments?

A: Rick Ayers (University of Maryland CATT Lab): Your state agency RITIS point of contact should be able to tell you whether or not the XD/TMC shapefile is available to you for no cost or not. If you are not familiar with who your state agency RITIS POC is, please send a note to the RITIS support team at support@ritis.org.

Note: Evan Koff (NC Capital Area Metropolitan Planning Organization): This was INCREDIBLE!!!

Note: Savitri Seetal Mantripragada (SSS, Inc.): This is excellent. Thank you so much for this great webinar.

Poll 1: How often do you use RITIS Probe Data Analytics for generating performance measures reports?

Weekly	Monthly	Quarterly
20	33	68

Poll 2: How familiar are you with Esri products, in particular ArcGIS Online?

None	I'm a casual user	I use this product regularly
10	57	70