The Eastern Transportation Coalition
Travel Information Summit - Taking A Deeper Dive into Work Zone Management, Waze, and Truck Alerts
March 16, 2023

Note: Results from polling questions asked during this web meeting are at the bottom of the document. Additional documents provided by Coalition members are also included at the end of this document.

PA Turnpike Commission Lane Configuration Feed for Waze

C: **Russell Holt (Rhode Island DOT):** Great work, thanks Pennsylvania Turnpike Commission/Arcadis/IBI for being a leader in getting quality/verified travel info out, and to all those many parties noted.

Q: **Denise Markow (The Eastern Transportation Coalition):** Looking at the Waze record, it seems like the most important factors are creation time, update time, start time, end time, location (lat/long), type of hazard, and description. At the bottom are four new lines labeled lanes, is that the new data required to get lane configuration added to a feed?

A: James Barbosa (IBI): Correct. The times defined are standard and the type and subtype are dictated by Waze. You select which ones most closely map to the type of activity you have on the roadway. The description is what you would want Waze to present to users who click the icon, so they should be clear and simple. The location defines the name of the roadway. You need to cleanly map and follow how Waze names its roadways. The polyline's latitude and longitude are intended to follow the geometry of the roadway. That must be a close match to Waze's internal mapping to avoid problems. Then you have the actual lane pattern, which defines the actual lane configuration across roadway geometry and the status of each lane across that roadway geometry.

C: Denise Markow (The Eastern Transportation Coalition): My question has to do with the polyline.

A: James Barbosa (IBI): Waze has a requirement that you provide a polyline with a maximum spacing between each of the coordinates. WZDx does not impose that requirement. That's why when you look at the coordinate set for the Waze feeds there are more points there out of necessity. You could optionally provide more for WZDx but it is mandatory on the Waze side.

Q: Denise Markow (The Eastern Transportation Coalition): Google Maps is saying that they are looking at the WZDx standard and adjusting the Waze feeds. How will that work if Waze requires a polyline, but WZDx doesn't?

A: James Barbosa (IBI): If you have a roadway, a direction, and a start and end point you can generate the polyline yourself. Google would have the ability to do without it. I suspect the reason Waze requires it is that's how their system was originally designed. In other words, the Waze app was designed to provide that information. When they created the partner program, I suspect they took the same data objects that they were getting from the app and imposed those requirements on states. But it isn't necessary from a conceptual perspective. Everyone is working against a base map that includes all roads.

Q: Denise Markow (The Eastern Transportation Coalition): A lot of state traffic management systems either use a point or a line system. I think Florida is one of the few states that has a polyline concept built. When you said that you can go from a line A to B and generate a polyline what do you mean by that?

A: James Barbosa (IBI): The question is whose roadway geometry and lane configuration base data are being used. You could look at the source ATMS platform as well as Waze or Google Maps and each has its own base map GIS referencing system. They have all the roadways defined in their systems (and presumably also lanes). Currently, Waze relies on you to send the geometry to them in terms of how they've defined that interface. WZDx does not require that geometry. If you're telling them the road, the direction of travel, and the start and the endpoints, they can map that to their base map data to draw the line. The same thing goes for the lane configuration. It's another attribute of the roadway and direction that's stored in each of the respective systems. It's not a technical limitation; it's a decision as to which end of the connection is going to be used as the basis for the roadway geometry in a lane configuration pattern.

C: **Sal Cowan (New Jersey DOT):** New Jersey follows our straight-line diagram and tenth-of-a-mile breakouts for recording incidents and construction lane closures.

A: James Barbosa (IBI): Some of this is subject to experimentation. Waze prescribes that the data points should be no farther than a certain length apart.

Sal Cowan (New Jersey DOT): Our current data entry platform is based on our straight-line diagram and we follow our mile marker system. Since mile markers are broken down by the 10th of a mile, we are specific. I don't see it as a deal breaker.

A: James Barbosa (IBI): We can take the start and end points and use our GIS map data to generate intermediate points to pass them on to Waze. From a technology perspective, even if you don't have polylines, that doesn't mean that it can't be generated after the fact.

C: **Crystal Underwood (Virginia DOT):** Our ATMS operates on an older base map (roughly 8-10 years old), and we're expecting that will be updated with the next release update in a year or so. Our WZDx feed is live with Waze but we are having to review some concerns about the work zone data. We're going to be reviewing our coordinates because they want six points past the decimal and we're not providing that with our current WZDx feed. We're working through some of those issues and plan to meet with Andrew.

C: Russell Holt (Rhode Island DOT): RIDOT is finally gearing up to implement a comprehensive Linear Referencing System (LRS), and while we plan/intend for it to be as 'easily interoperable' with the various needs/use cases as our agency has (one of which is TIS), we expect there will be challenges with

referencing/segmentation/conflation as others are mentioning. DOTs/TPKs appreciate 3rd parties being as open as they can with our LRSs.

C: William Welch (Ohio DOT): We're currently implementing a custom-built enterprise system for tracking planned work zones that will also lead to a WZDx feed. We set out from the beginning to link this against our LRS so that way we would be able to easily store and provide those polylines.

Q: **John Parker (Pennsylvania Turnpike Commission):** Is there any way we could sit down with somebody from Waze and get this ironed out? We are providing what we can but suddenly, we're down to the sixth decimal point.

C: Kelly Wells (North Carolina DOT): Every month for the last three months we've closed the wrong road at the wrong time. The system requires precision. I thought you could draw the line in any direction, but you must drop it incredibly precisely. For those of you who are wanting to do full closures, be careful. We've always assumed being close was good enough. When you get to this Waze closure feed, do what they say to do.

C: Denise Markow (The Eastern Transportation Coalition): When James said going from a point to drawing a polyline, it raised a flag for me because it must be precise.

C: Kelly Wells (North Carolina DOT): It depends on what map you draw it on. You can draw a line from A to B but if your base map isn't the same as their base map it might not map it to that same segment.

A: James Barbosa (IBI): We've had a lot of cases where the point or a line was assessed to be closer to the other direction of travel by Waze. Even though you tell them the direction, they will ignore that and move the closure to the other side. That's one thing we've seen happen several times. As a recommendation, Waze has a simple API in which you can pass a particular coordinate, and they'll send you back a list of roadways in its vicinity in the distance to those roadways or the nearest point on those roadways. What would be helpful here is if we had a way of querying certain roads from them. We could get their geometry and know what they're using to judge whether a given point or line is on this side of the road or not.

C: Garrett Popovich (Florida DOT): From the WAZE website "The start and end points of closure must be at least 30 meters apart. We cannot close a section longer than 5 km for one incident." This is most likely due to the Waze segment length requirements. Waze's editors can change the length of the roadway. We saw this when we were putting road ranger alerts in our district. For example, one section of the highway was I-95SB, and then another segment was named I-95 southbound spelled out. The problem is if you send a point to Waze they're going to geolocate it as close to where that segment is. It's like a flip of a coin to get it right. Currently, how the Waze system works there must be some type of business rules on the back end to say where it makes sense to geolocate it. The biggest thing is naming the segment correctly. I went through our area and

made sure that the interstates and all our primary roads were named the same thing to prevent issues. I know Waze is aware of that and they're working on solutions.

A: James Barbosa (IBI): Here's what we did to process roadway names - you can use that API I mentioned earlier to figure out what they named everything to match them. But if your coordinates are off by too much you still end up on the wrong road.

C: Michael Dente (Vermont AOT): I think the editors would be willing to normalize the names. I know in Vermont we have worked to match the Waze roadway names to the actual E911 names. In Vermont, we have a smaller number of roadways in our state and interstates. The editors are always willing to make changes and make it work. We have a meeting to try and work out some of these issues with them. If there's an issue with the interstate names identify the issue and then they'll get a group on it and fix it.

C: Garrett Popovich (Florida DOT): I agree with that. There's a conference happening in a few weeks that talks about partnering DOTs directly with the Waze editors. If you don't know who your state manager is I would strongly reach out to make that connection.

Q: **Kelly Wells (North Carolina DOT):** Waze map editors told us that if we have it wrong in the full closure feed, they can't go in and change it since it came from our feed. Is that right?

A: Garrett Popovich (Florida DOT): Yes. A Waze map editor can remove it completely but can't edit it. In some cases, deleting is better than having it be wrong. That's one of those catch-22s. When you delete it, if that feed doesn't resend the correct closure, the full closure may not be reported. To combat this, Waze allows users to say if there's a closure. If enough people report a closure the problem is corrected. But they don't know how long that's going to be closed until Waze starts to get GPS tracks through the closure to remove it.

Q: **Kelly Wells (North Carolina DOT):** If we put in a full closure and it's incorrect, and people started to drive through it, would the AI remove our incorrect closure?

A: Garrett Popovich (Florida DOT): That depends on the accuracy of previous submissions. The conversation I've also had with Waze is, for example, we have an all-out disaster on I-75 and we close 21 miles of a section of roadway because that's the next exit. But I also have 18 miles of people trapped in the queue which is going to show GPS points in there. It's one of those things that as a partner if you submit information to Waze no matter what they're going to treat you as the authoritative source. If we're shutting down the roadway but people are still trapped in the queue, we still want that roadway to remain closed. We don't want the closure to be lifted because GPS points are in there.

C: Michael Dente (Vermont AOT): The trust level is higher for the feed than it is for the editors. There is an option as an editor when you're entering a closure to ignore traffic. If traffic is going through the closure, it's open and Waze will ignore it and route people. If you put ignore traffic, it's going to be closed no matter what.

Q: **Kelly Wells (North Carolina DOT):** You said there's an audio alert – are there also visual alerts (such as icons)?

A: John Parker (Pennsylvania Turnpike Commission): It's only an audio alert.

C: Todd Smith (Pennsylvania Turnpike Commission): PTC's API from ATMS is indicated in alerts, you must click on the alert to see the full message. No text-to-speed (TTS) yet.

Transforming Work Zone Data: *Enhancing Safety by Connecting Work Crews To Road Users*

C: **Kelly Wells (North Carolina DOT):** For clarification, permit means a lane closure permit, meaning the TMC gives the contractor or even DOT staff "permission" to close a lane.

Q: **Sal Cowan (New Jersey DOT**): Google breaks up the road into segments. Do we know if those segments line up with any existing TMC links from TDM probe data partners?

A: Adam Graham (one.network): They do not. They are normally based on similar vehicle behavior. The segments will be longer on interstates and shorter on complicated intersections. The system assumes that all traffic will behave the same way.

Q: **Darragh Frye (Virginia DOT):** Besides work zones, are you able to use the same technology with weather emergencies, like evacuation if there's a hurricane, would you route all travelers along the evacuation route?

A: Adam Graham (one.network): We can do that, but making travelers follow the defined evacuation route is a bigger challenge. They would always be looking for the fastest route. We can install pre-planned evacuation zones and switch those on in your Google, Waze, or Tomtom. If somebody tries to navigate through an evacuation zone, they'll be routed around it. If an emergency vehicle tries to go through, the user gets an alert that says, "Are you sure you want to go through an evacuation route?" For major events we can communicate road/lane closures as an example – closing roads and lanes for any reason can be completed using the same technology and method.

Q: **Denise Markow (The Eastern Transportation Coalition):** Have you done this type of translation for any of our member states besides Florida?

A: Adam Graham (one.network): We've done North Carolina for WZDx and translated the data for one.network. We have 46 states covered with some form of data ingestion into the one.network map. We can ingest data and turn the feeds on very quickly. If you've got any data that's not publicly openly available that you'd like to share get in contact with me or Ken. We can get that data in for you and work out whether we're ready for the next steps.

Q: **Crystal Underwood (Virginia DOT):** Where is one.network pulling data from for VA?

A: Adam Graham (one.network): Information was pulled from the 511 statewide feed here: https://www.511virginia.org/mobile/data/RSS/statewideevent.xml. This covers both work zones and incidents. The feed contains point data only so we can generate a short route (30m) based on an OpenStreetMap (OSM) network model and then translate it onto partner network modes where required.

Q: Crystal Underwood (Virginia DOT): Thank you, Adam, we have some better options may be at https://www.smarterroads.org as an open data source for developers. Who in VA did one.network work with on the pilot or was that direct work with Waze?

A: Adam Graham (one.network): This was direct from Waze. We should catch up after the meeting and review what is in one.network today and make sure it is the best information possible.

C: Kelly Wells (North Carolina DOT): As seen here, one.network performs these services for TexasShare: https://txshare.org/available-contracts/roadway-workzone-data-reporting-services

Q: **Russell Holt (Rhode Island DOT):** Did you all see that red box on the slide that says they will do this for free? We're interested in this. Can you tell us more about that?

A: Adam Graham (one.network): First we look at how you collect your data. Our team will pull that information into the system, which includes a public-facing map and internal tools. We'll generate a WZDx feed and publish that to the agency. They can make sure they're happy with everything in there. We'll hand the submission to the FHWA and put it on their website. We maintain the feed. All we ask is to let us know if you plan on changing your systems. We can update our imports on our end to make sure that your feed is still compliant and ready to go. We'll keep that up to date with the WZDx standards.

C: Russell Holt (Rhode Island DOT): Rhode Island hasn't implemented this yet. We understand that data will never be perfect, but as a small agency, we don't have those internal processes yet. I'm sure other small states have this problem.

C: **John Parker (Pennsylvania Turnpike Commission):** The PA Turnpike is involved in TIMdx. *The document TIMDx One-Pager.pdf containing more information is provided at the end of this document.*

Virginia's Tools for Traffic & WZ Notifications

Q: **Denise Markow (The Eastern Transportation Coalition):** Have you had any discussions with Google relative to getting erroneous closure data off the map?

A: Darragh Frye (Virginia DOT): I've talked to Lillian Hester. She is Google's public affairs person for Virginia and North Carolina. We discussed what needs to happen during a large storm. An executive-level leader needs to call Google to close and reopen roads.

Q: **Sal Cowan (New Jersey DOT):** Apple is reaching out to the Department of Community Affairs for maps of upcoming construction projects. They don't seem to understand how construction projects interact with roads. If there is a standard that other Coalition agencies have provided to them in the past, that'd be great.

A: Garrett Popovich (Florida DOT): Apple wants nothing to do with the design plans. They don't have traffic engineers and traffic designers working for them. They want the simplest line plot possible. You only need to share with them the changes in configuration to a roadway if you want to alert them of closures. Apple doesn't have the same things that Google and Waze have when it comes to those specialized alerts. They are starting to implement them. I know Apple is considering some type of feed connections like Google and Waze have done.

C: Sal Cowan (New Jersey DOT): Hunter Hale from Apple contacted us. They're looking at the projects that affect highways or other major roads like state roads. The best information for our purposes would be a site plan/diagram that shows the changes that will be made to the roadway in their final positions. We have those engineering documents, but they don't take them. I don't know what else we would be able to provide them.

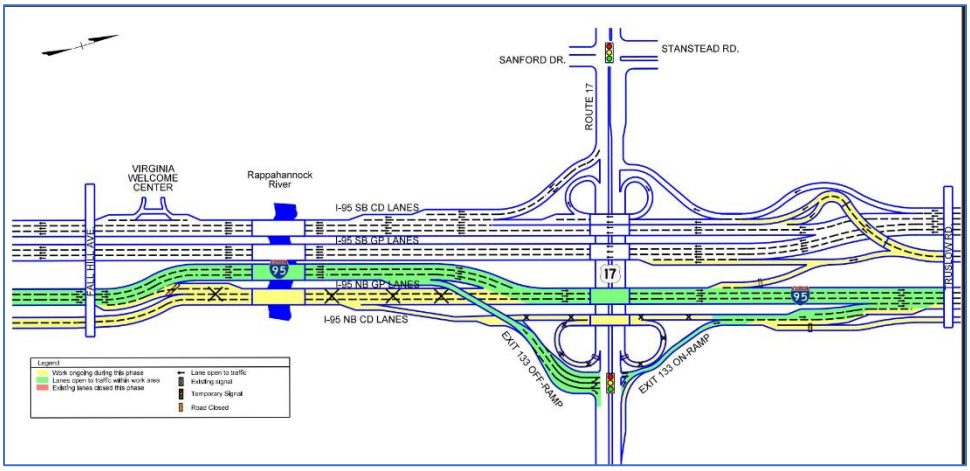
C: Garrett Popovich (Florida DOT): We now require a part of the construction plans to include a simple line diagram in ArcGIS or QGIS. That's specifically done so we can send them to these navigation systems. The best thing you can do is provide them with a simple line diagram.

C: Darragh Frye (Virginia DOT): We send private mapping providers the same traffic alert we send to the public. As part of the process, we streamline that map so we can explain the work zone on social media. Anybody can understand exactly what they're doing. I have found it best with Apple Maps to send a written summary of the work zone and timeline. We've streamlined the process so that I have one list of all the private mapping providers. I send them the traffic alert along with the map of the future traffic pattern or the work zone and bullet exactly what's going on. But we don't have an agency-wide process.

C: Johnathan Croft (Vermont AOT): A temporal road centerline and LRS that can be served out with future projects, expected opening dates, and alignments are a means of getting this information out there.

C: **Amy Getchell (Massachusetts DOT):** This is what we recently sent to all the mapping companies for a permanent closure we did a couple of weeks ago in Fall River, MA. *The document Route 79.pdf containing more information is provided as part of the follow-up from this summit.*

C: Darragh Frye (Virginia DOT): This is a visual we shared with Apple Maps.



C: **Marygrace Parker (The Eastern Transportation Coalition):** High-tech improvements are important, but the work you do in your district is important as well. Getting press notices to the trucking and independent driver associations about these alerts is a key issue. I appreciate the work you're doing to focus on those long closures. This helps trucking companies make decisions, particularly about overnight travel. That's something our committee wants to explore a little bit more.

Q: **Amy Getchell (Massachusetts DOT):** Has anyone gotten feedback based on what Darragh said with Google and requiring level leadership feedback or outreach to these mapping companies with a major closure? I haven't received any pushback before, but we have a major eight-week closure coming up this summer with a tunnel that goes from east Boston and Logan Airport into Boston. We're closing it for construction, and we've started our public outreach. I don't know if I should be elevating this to the governor's office to push our outreach to the mapping company, so they close it.

A: Denise Markow (The Eastern Transportation Coalition): Google has different departments. Three of them are Business Development, a Cloud platform (Google Maps), and Government Affairs. They tend to work in silos. You can go to the government affairs group which has their product team. That team may not be talking to the mapping team. The geomap team deals with putting the closures on the map. It's a two-pronged approach. You can certainly elevate it through the government Affairs office up to the governor's office if you want but you also must make sure that we get it to the geomap product team so they can put it on the map.

C: Amy Getchell (Massachusetts DOT): We've always struggled when updating information on Google. We have had great success with all the other mapping agencies. We're still struggling two years later for the exit renumbering project to get Google to update our exit numbers.

C: Denise Markow (The Eastern Transportation Coalition): A couple of weeks ago we were in a room with Google product managers and interrogated them about not putting data on the maps. Internally I was told that there's a lot of discussion going on. They're going to hand this responsibility to Waze. The idea is that we get that information to Waze and then Google takes it from Waze and put it on their map. Interrogation seems to help.

C: Kelly Wells (North Carolina DOT): About credibility with Google; I email our contact at Google, and I don't have to go to the governor's office. I try not to bother her unless the situation it's really bad. I'll ask if there's a contact for Massachusetts with the same responsiveness.

C: **Garrett Popovich (Florida DOT):** Here is what we upload (*zip file SR-808 and I-95 DDI 1.30.23. This zip file can be provided upon request to Coalition members by contacting Joanna Reagle (jreagle@kmjinc.com)*). We find that in this format it becomes live inside the maps very quickly.

Drivewyze – Georgia DOT

Q: **Bill Lobuzzetta (NITTEC):** Can this be used to send out weather-caused road closure notifications to commercial vehicles?

A: Ben Lempke (Georgia DOT): Yes, it can. Drivewyze allows our TMC operators to send some of those events. Whenever severe events happen, we'll send them location coordinates, polygon lines, wording for the messages, etc. They're able to get the alerts out fairly quickly.

Q: **Kelly Wells (North Carolina DOT):** Can anybody give a quick summary of how this was done in the Northeast last winter?

A: Sal Cowan (New Jersey DOT): The question was "Can the Drivewyze team get messages out that several states up and down the East Coast are going to be putting in commercial vehicle travel restrictions?". We asked the question at 3:00 PM and by 5:00 PM the alerts were active in New Jersey, Virginia, Maryland, Delaware, Pennsylvania, Connecticut, New York, Rhode Island, Massachusetts, New Hampshire, and Vermont. In some locations, they sent 500 alerts in 24 hours. It's one of those ad hoc things that I think was valuable.

C: **Russell Holt (Rhode Island DOT):** It's not easy to show benefit to cost as crash avoidance is hard to "prove." Praise to you/GDOT for trialing it out and sharing your findings.

Drivewyze – New Jersey DOT

Q: **Russell Holt (Rhode Island DOT):** Can you share Drivewyze's technology or business practices?

A: Sal Cowan (New Jersey DOT): Drivewyze can put up static notifications at certain points along the roadway. We're talking with them about that incline decline sharp curve warnings. We also want to continue to make sure that their real-time notifications are working properly.

Drivewyze – Ohio DOT

C: **Sal Cowan (New Jersey DOT):** There is something to say about "alert overload."

Q: **Kelly Wells (North Carolina DOT):** Will the work zone alerts be automatically sent through Drivewyze?

A: Stephanie Marik (Ohio DOT): Yes. In our current workflow, closure, and detour alerts will be provided. Once we get that WZDx component of it we're hoping Drivewyze will be able to ingest data and then automatically send alerts out as they're posted to the feed. We're in the very beginning stages of talking about doing this. We want to pilot this with a work zone with a large impact. Anybody who's going from or heading out toward West Virginia would have to go through this section. There are also going to be some lane width restrictions where we need to divert trucks off. We're going to pilot different locations and look at using these smart arrow boards.

Q: **Russell Holt (Rhode Island DOT):** How did the Drivewyze team respond when you asked for those changes? I think you said they were open and accommodating. I haven't worked with them yet and would love more insider knowledge.

C: Stephanie Marik (Ohio DOT): They were very receptive to the changes – just don't send too many at once. We don't want to oversaturate the alerts that the drivers are getting. Two weeks ago, I gave Drivewyze three changes. We didn't even have to jump on a call. They asked for coordinates and maps, and I got an email back that said they were in the system.

A: Russell Holt (Rhode Island DOT): It's less of a technical battle. It's more of a political or policy-type issue for the independent owner-operators as to how much you want to share. That's a harder question for DOTs to answer.

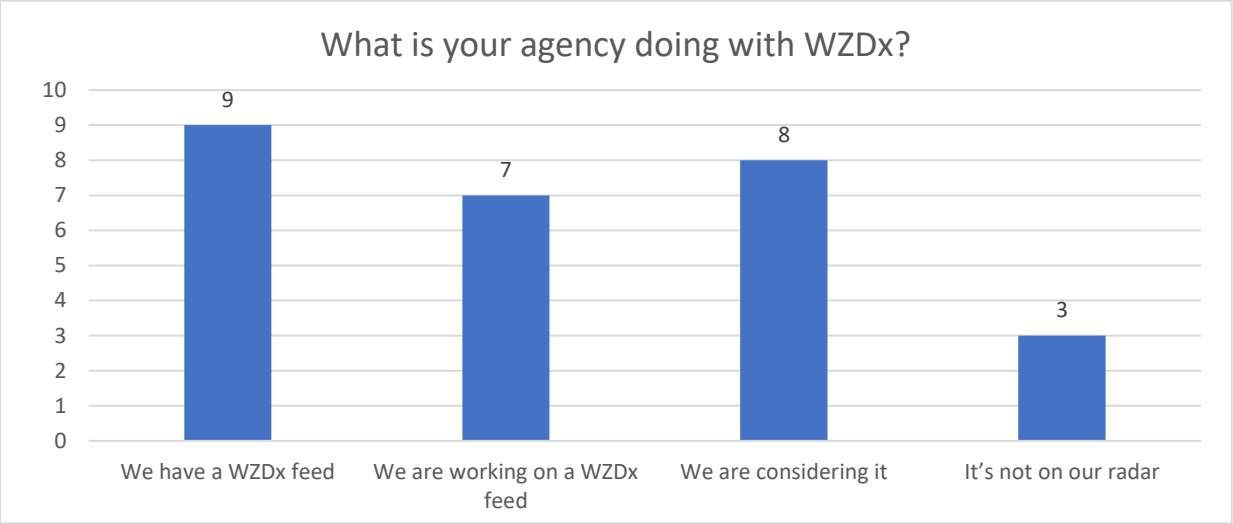
C: **Denise Markow (The Eastern Transportation Coalition):** VDOT is analyzing the effectiveness of truck alerts. At some point, you and the VDOT team (Mike Fontaine and Crystal Underwood) can connect. We'd be very interested to hear what Virginia's done.

C: Stephanie Marik (Ohio DOT): That sounds great. We don't have enough data yet to do a presentation. Hopefully, over the next six months, we should have enough data to talk more about our findings.

Drivewyze – North Carolina DOT

Q: **Marygrace Parker (The Eastern Transportation Coalition):** Is there any interest in trying to get a sense of Drivewzye use by drivers? Perhaps we can work with some industry partners for some survey work.

C: Stephanie Marik (Ohio DOT): I think it would be good information to hear from the drivers. It could be a way to expand the service to something even more useful.



January 2023

Announcing:

Data Exchanges for Managing Disruptions

Over the next five years, the USDOT ITS Joint Program Office intends to develop a series of data exchanges aimed at managing disruptions to roadway operations. Currently, the proposed topics for those exchanges include:

- incident management
- emergency response
- weather impacts

The data exchanges will be developed using a model similar to the open and iterative specification development model of the Work Zone Data Exchange (WZDx).

The first of these data exchanges will be focused on Incident Management. We want to hear about your role in the way data is transmitted between Traffic Management Centers, emergency response dispatch centers, and the public. Identifying current processes, and their shortcomings, will enable us to make improvements in safety and efficiency.

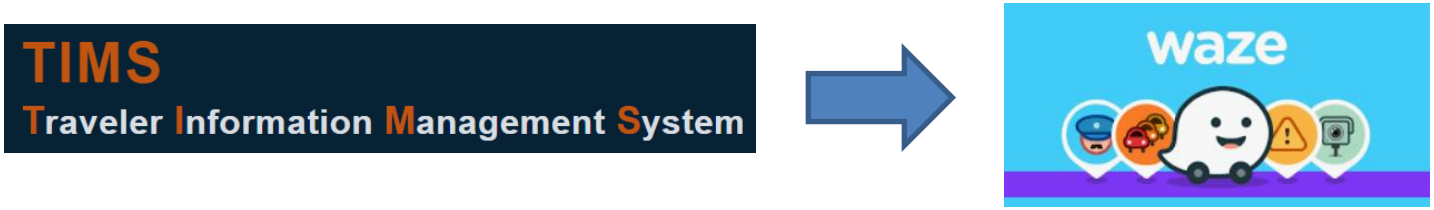
Participate

SHARE this information with relevant stakeholders within your organization and community.

JOIN our email list by sending this pre-filled email to AVDX@dot.gov to stay informed about upcoming meetings.

ATTEND our initial stakeholder meeting on February 23, 2023 at 1:00 pm ET to meet the community, share input, and help shape the development process. Everyone on the email list will receive an invitation.

Email AVDX@dot.gov with any questions.



TIMS-to-Waze Closure Feed

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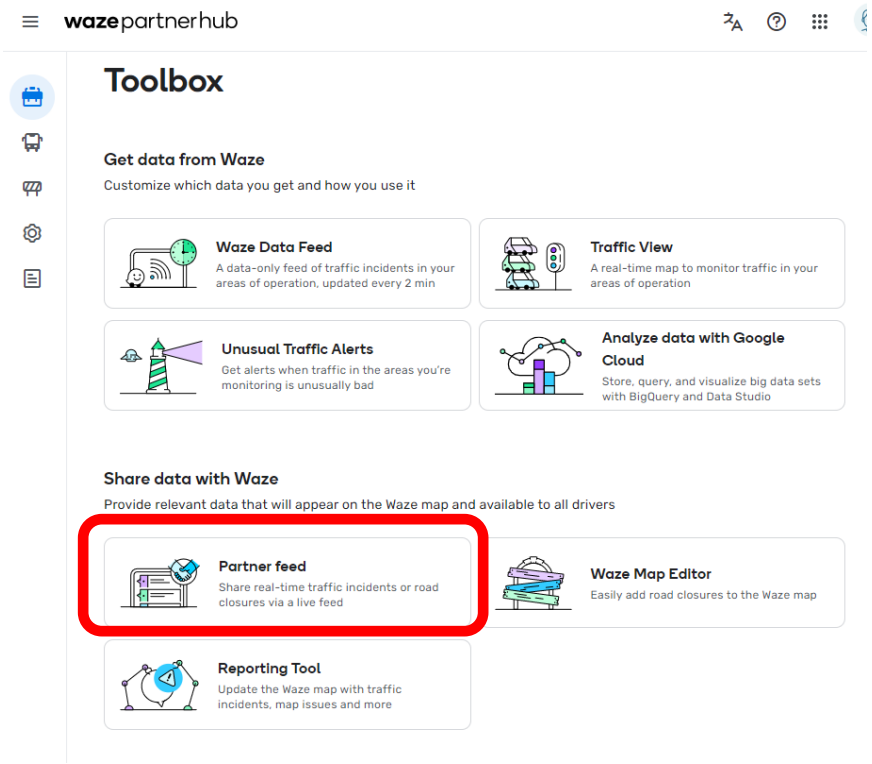
February 2023

TIMS-to-Waze Data Feeds

- NCDOT has been a Waze Connected Cities Partner (CCP) Program member (since mid-2010s)
  - Two-way data sharing agreement for public sector agencies
- Two types of feeds are possible:
  - 1. Incident feed
  - 2. Closure feed

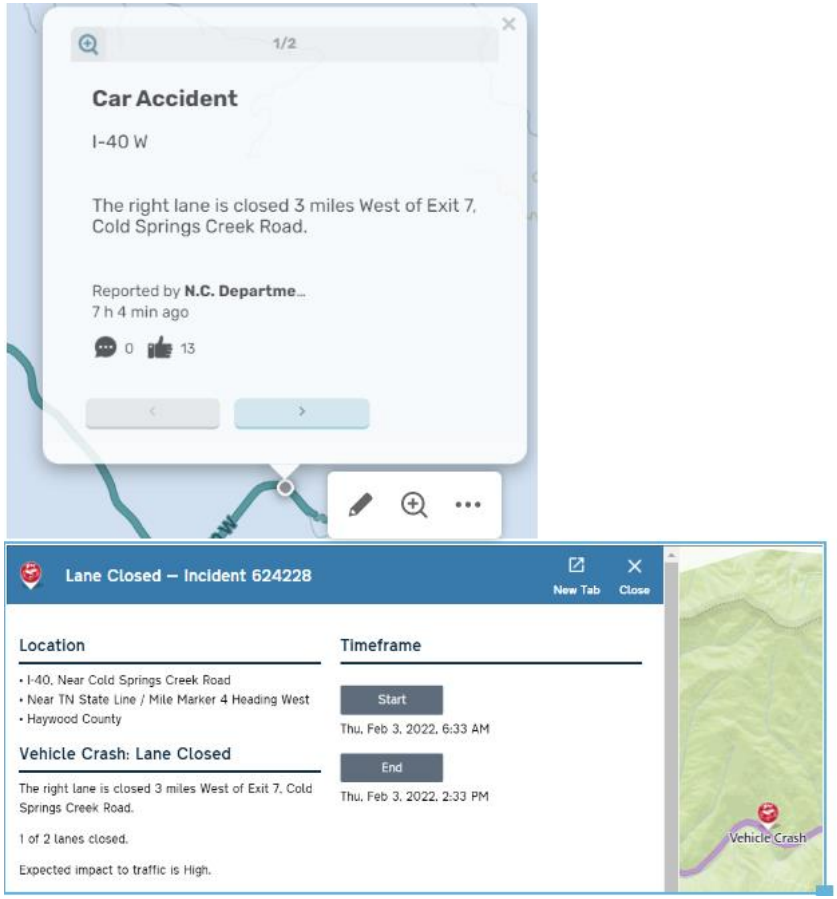


The Waze Partner Hub.
"Share data with Waze > Partner Feed" provides an interface for CCP member agencies to submit data feeds to Waze.

1. Incident Feed to Waze

- Waze consumes the TIMS Incidents API as-is
- Incidents in TIMS appear on the Waze app as “Road Hazards”

- ☑ This was completed in mid 2010s and continues to work.
- But they don’t cause traffic rerouting. For this, the closure feed is required



Example of a Road Hazard incident in Waze (top), which was sourced from TIMS (bottom)

2. Closure Feed to Waze

- This is the only data feed to Waze that can ensure motorists are diverted around closed roads
- Agency must host a dedicated feed with required fields
  - the polyline
  - road name
  - directionality of the closure
- Uses Waze CIFSv2 Feed Format
  - Closures must resemble the geometry of the road
  - Waze does not reveal its road network linework
  - It's ok if polyline covers only a portion of the Waze link

```
<incident>
  <id>22678699</id>
  <type>ROAD_CLOSED</type>
  <subtype>ROAD_CLOSED_CONSTRUCTION</subtype>
  <reference>one.network</reference>
  <starttime>2022-06-20T08:00:00+01:00</starttime>
  <endtime>2022-06-20T17:59:00+01:00</endtime>
  <description>Closed until 18:00 for roadworks. Ref #22678699</description>
  <location>
    <street>Pouchen End Ln</street>
    <location_description>Pouchen End Lane</location_description>
    <polyline>51.766060 -0.513720 51.765560 -0.513241
              51.765230 -0.512990 51.764570 -0.512540
              51.764210 -0.512330  51.763690 -0.512141
              51.763420 -0.512060 51.762680 -0.511971
              51.761740  -0.511960 51.761540 -0.511960
    </polyline>
    <direction>BOTH_DIRECTIONS</direction>
  </location>
</incident>
```

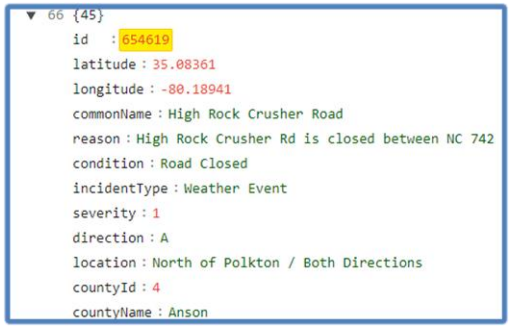
Closure Feed Example (xml)

Planning

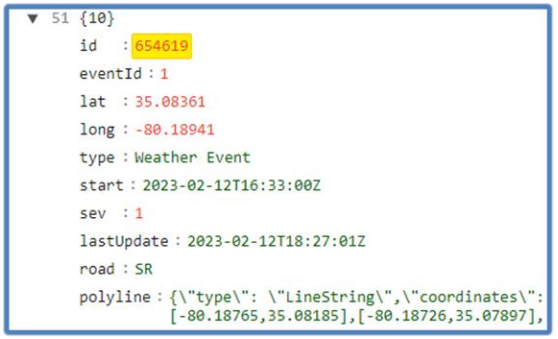
- STIC Grant: $60k
- NCDOT is using this funding to support an in-house development effort by NCDOT GIS Unit
  - Team Lead: Eric Wilson
  - Technical Lead: Eddy Shipman
- Initial draft completed: July 2022
- Approach:
  - Use manually-entered polylines for TIMS closure incidents
  - Use Waze Reverse Geocoding API to determine the road name
  - TIMS road and direction fields to determine the closure directionality
  - Host the feed
  - Submit the feed to Waze
- Challenges:
  - There is no “Dev” site in Waze. How to test closures without creating false incidents which show up on the app?
  - Unknown reasons for feed rejection

Development

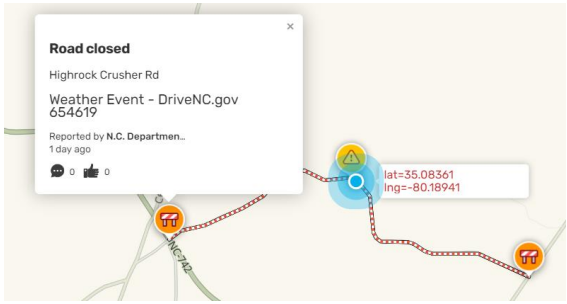
- First Release 12/9/2022
  - Basic display of closure incidents in the Waze Live Map and Waze App
  - Will reroute users around the closed links
- 2nd Release with improvements: 1/11/2023
  - Show road work closures only during the times they are active (i.e. show nighttime construction only at night)
  - Time stamp format improvements
  - More concise summary text of the incident
- Labor savings for TMC staff and Wazer Volunteers because no longer necessary to manually enter closures in Waze Map Editor (WME)



Closure entry in TIMS Incident API

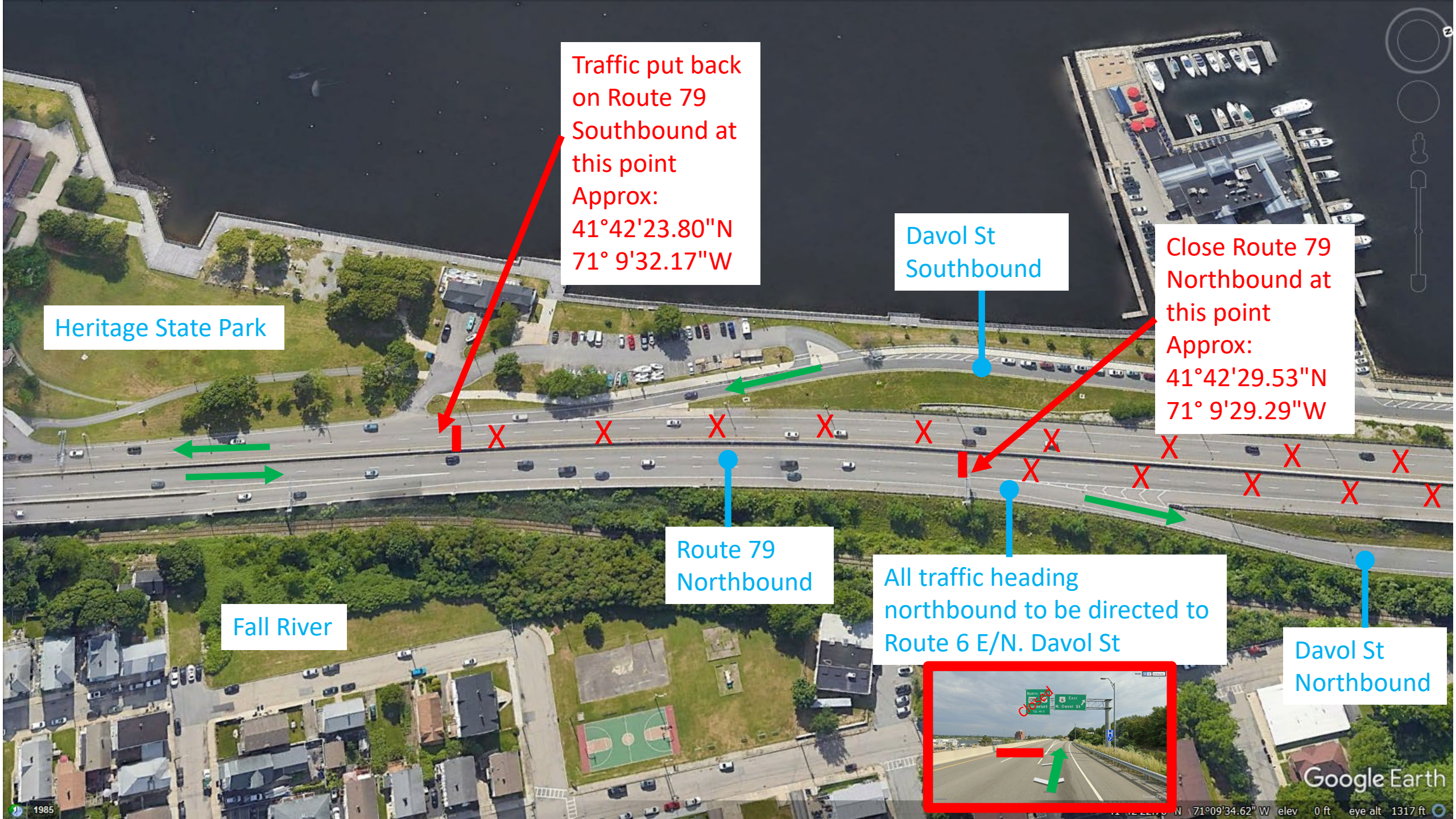


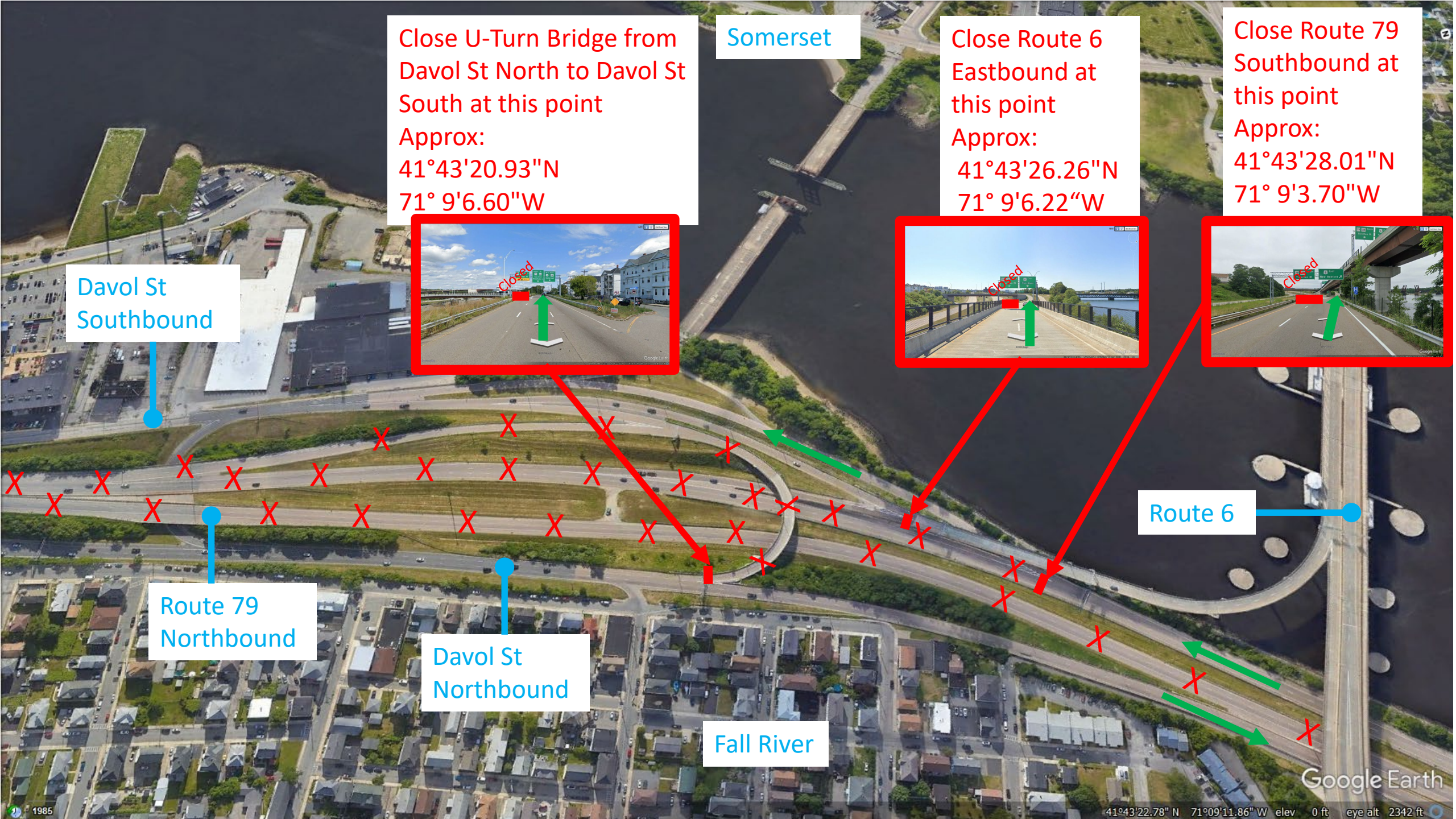
Closure entry in Closure feed to Waze

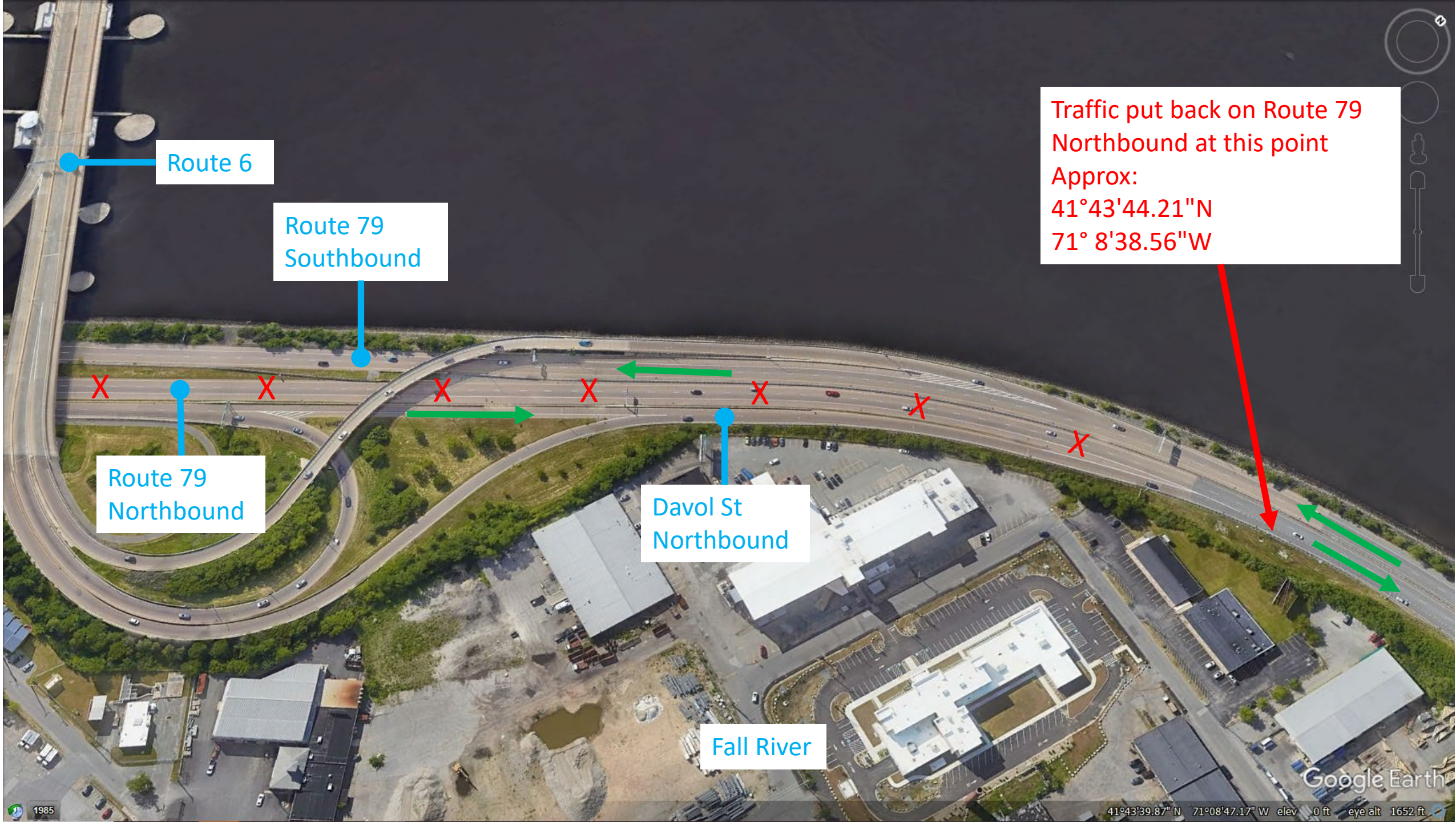


Closure on the Waze Live Map


I-195
Somerset
Davol St
Southbound
Route 6
Route 79
Davol St
Northbound
Fall River
Route 79
Google Earth
1985
41°42'54.76" N 71°09'25.09" W elev 0 ft eye alt 8108 ft


Traffic put back on Route 79 Southbound at this point Approx: 41°42'23.80"N 71° 9'32.17"W
Heritage State Park
Davol St Southbound
Close Route 79 Northbound at this point Approx: 41°42'29.53"N 71° 9'29.29"W
Route 79 Northbound
Fall River
All traffic heading northbound to be directed to Route 6 E/N. Davol St
Davol St Northbound
Google Earth
1985
71°09'34.62" W elev 0 ft eye alt 1317 ft


Close U-Turn Bridge from Davol St North to Davol St South at this point
Approx:
41°43'20.93"N
71° 9'6.60"W
Somerset
Close Route 6 Eastbound at this point
Approx:
41°43'26.26"N
71° 9'6.22“W
Close Route 79 Southbound at this point
Approx:
41°43'28.01"N
71° 9'3.70"W
Closed
Closed
Closed
Davol St Southbound
Route 79 Northbound
Davol St Northbound
Route 6
Fall River
Google Earth
1985
41°43'22.78" N 71°09'11.86" W elev 0 ft eye alt 2342 ft


Route 6
Route 79
Southbound
Route 79
Northbound
Davol St
Northbound
Fall River
Traffic put back on Route 79
Northbound at this point
Approx:
41°43'44.21"N
71° 8'38.56"W
X
X
X
X
X
X
X
Google Earth
1985
41°43'39.87" N 71°08'47.17" W elev 0 ft eye alt 1652 ft