



TRANSPORTATION PUBLIC WORKS

Autonomous Vehicle Program

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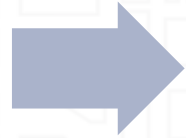


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Autonomous Vehicle Operation Phases

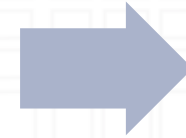
Mapping

- The vehicle is driven by a person across the intended area of operations, collecting data.
- Data compiled into a detailed map.



Testing

- The vehicle drives itself in AV mode.
- A safety driver may be present in tests as a precaution.



Deployment

- Vehicle accepts commercial passengers and operates on the roadway, fully autonomous.



Current AV Operations in Austin

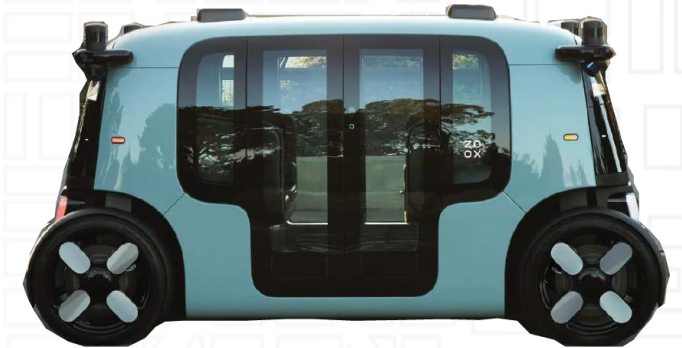
Deployed



Waymo
Jaguar i-Pace
300+



Zoox
Toyota Highlander
~20



Zoox
Robotaxi
1



Tesla
Model Y
~30



VW ADMT
ID. Buzz
~20



Avride
Hyundai IONIQ 5
~50



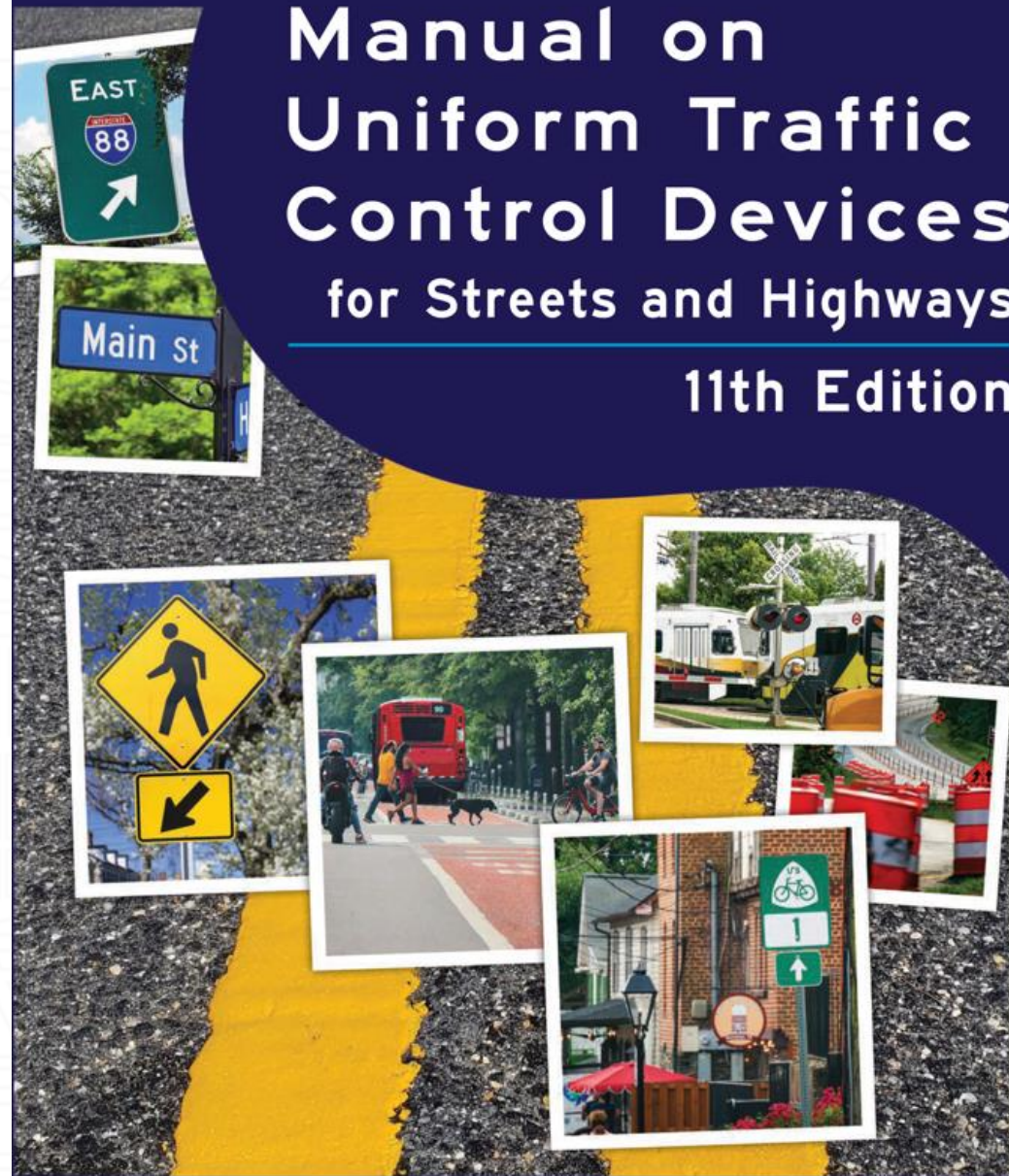
MUTCD Chapter 5

This is guidelines – **not a requirement**.

5A.04:

The interaction of traffic control devices with driving automation systems can create many challenges for agencies in determining traffic control device selection and application. The lack of tolerance of driving automation systems for non-uniformity in traffic control device design and application is a limiting factor of current driving automation system sophistication. This is because driving automation systems have a limited ability to interpolate across gaps in traffic control device cues to the vehicle.

Manual on Uniform Traffic Control Devices for Streets and Highways 11th Edition



U.S. Department of Transportation
Federal Highway Administration

December 2023

How can I prepare my infrastructure?

We made a checklist!

But remember – autonomous vehicles should know how to drive in any situation – including changes to traffic patterns, emergencies, where roadway striping is faded or inaccurate.

B-1-æ

Austin Transportation & Public Works - AV readiness assessment - to be used in locations with reported or suspected AV issues

TRINITY + CESAR CHAVEZ

Location: Trinity + Cesar Chavez

Assessor: [blank]

Road Functional Class: 6th

Posted Speed (mph): 10:27 AM

Date & Time: [blank]

Instructions:

- Visit the intersection
- Provide rating
- partial compliance

Instructions: 1- Not complaint, fail (need immediate action), 2- Marginal Compliant, poor (need fix on the short term), 3- acceptable (need maintenance), 4-full compliant, acceptable.

Item	Rating (1-4)
Signs are not cluttered in one area but are properly spread along the roadway	4
Refresh rate of LEDs in dynamic messaging sign	4
Longitudinal lines are at least 6 inches in width	4
Edge lines are at least 6 inches in width	unknown
Dotted edge line indicates and entrance, exit or taper with deceleration or an auxiliary lane	yes - lightly faded
No ghosted/old markings visible	NA
Markings exhibit uniform contrast and visibility	4
Chevron markings distinguish exits from travel lanes	contrast low due to
Raised pavement markers are present but not the only indication of lanes	N/A
High contrast markings are used on light-colored pavement	N/A
Gap length on broken lines is uniform	not in intersection
Signals are placed consistently - overhead vs. post mounting on the roadway	yes
Consistent number of signal faces along a roadway (is the signal set up relatively uniform in similar situations)	4
Appropriate number of faces per lane	4
Refresh rate of LED signals	unknown
Signal faces have backplates with retroreflective borders	non-
Yellow arrow is used for permissive turns	marked

AV-ready infrastructure



Signs

Signs at the correct angle for vehicles to perceive them. They adjacent to the location they regulate.



Striping

6 inch stripes, as reflective as possible and through intersections as well.



Temporary Traffic Control

Facing the vehicle; using standard signs with tight coning and properly stored when not in use.



AV Safety Working Group



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Austin-Bergstrom
International Airport

The City has been proactive by establishing the AV Safety Working Group to:

- Prepare and train for incidents,
- Facilitate communication,
- Collect data and standardize documentation.



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Data for Geofences

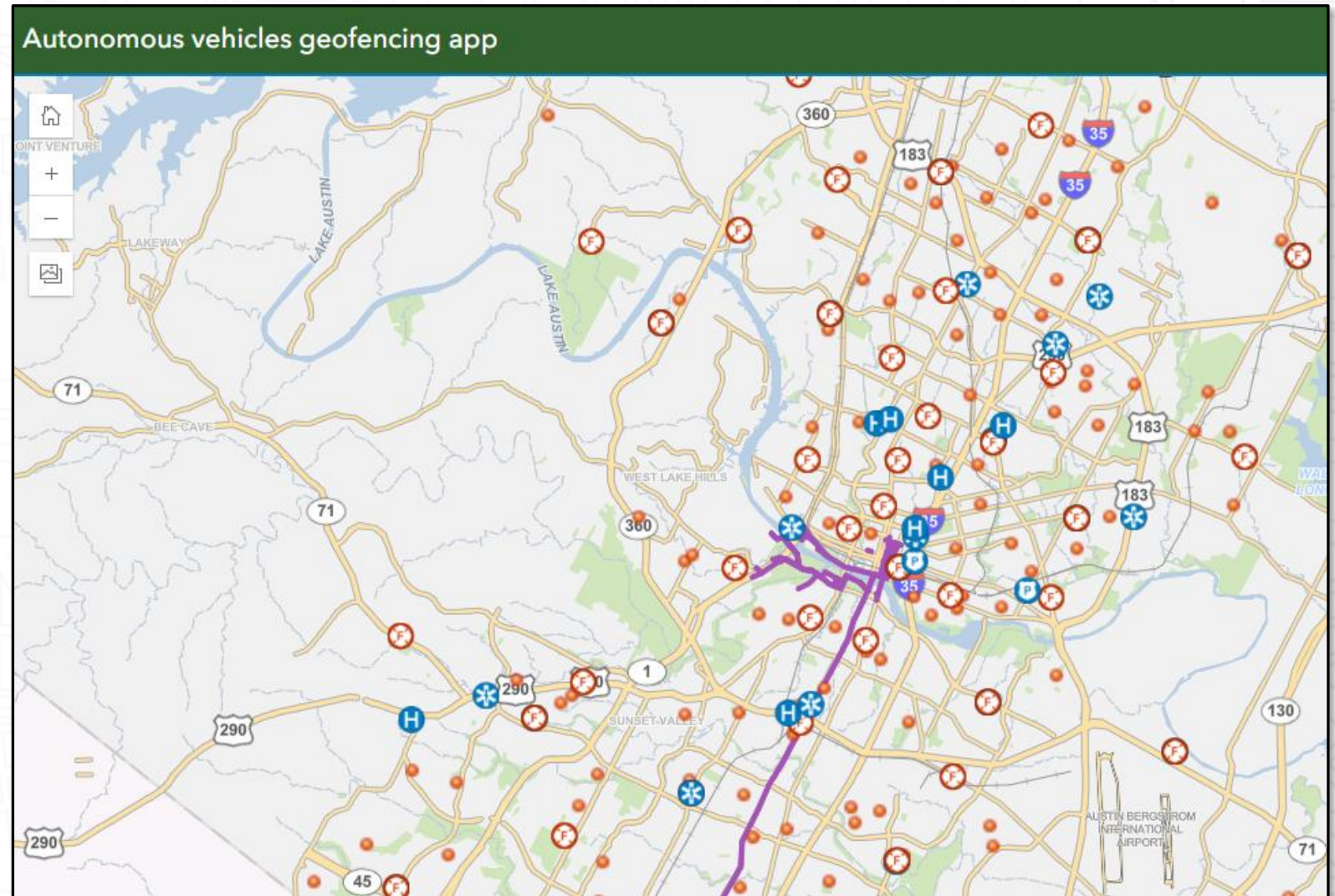
Infrastructure & Events

- Hospitals
- Fire Stations
- EMS Stations
- Police Stations
- Special Events
- Schools & School Zones

Emergencies

An email is **automatically** sent from our Computer-Aided Dispatch system.

Our expectation is an exclusion zone of 1,000 feet for one hour.



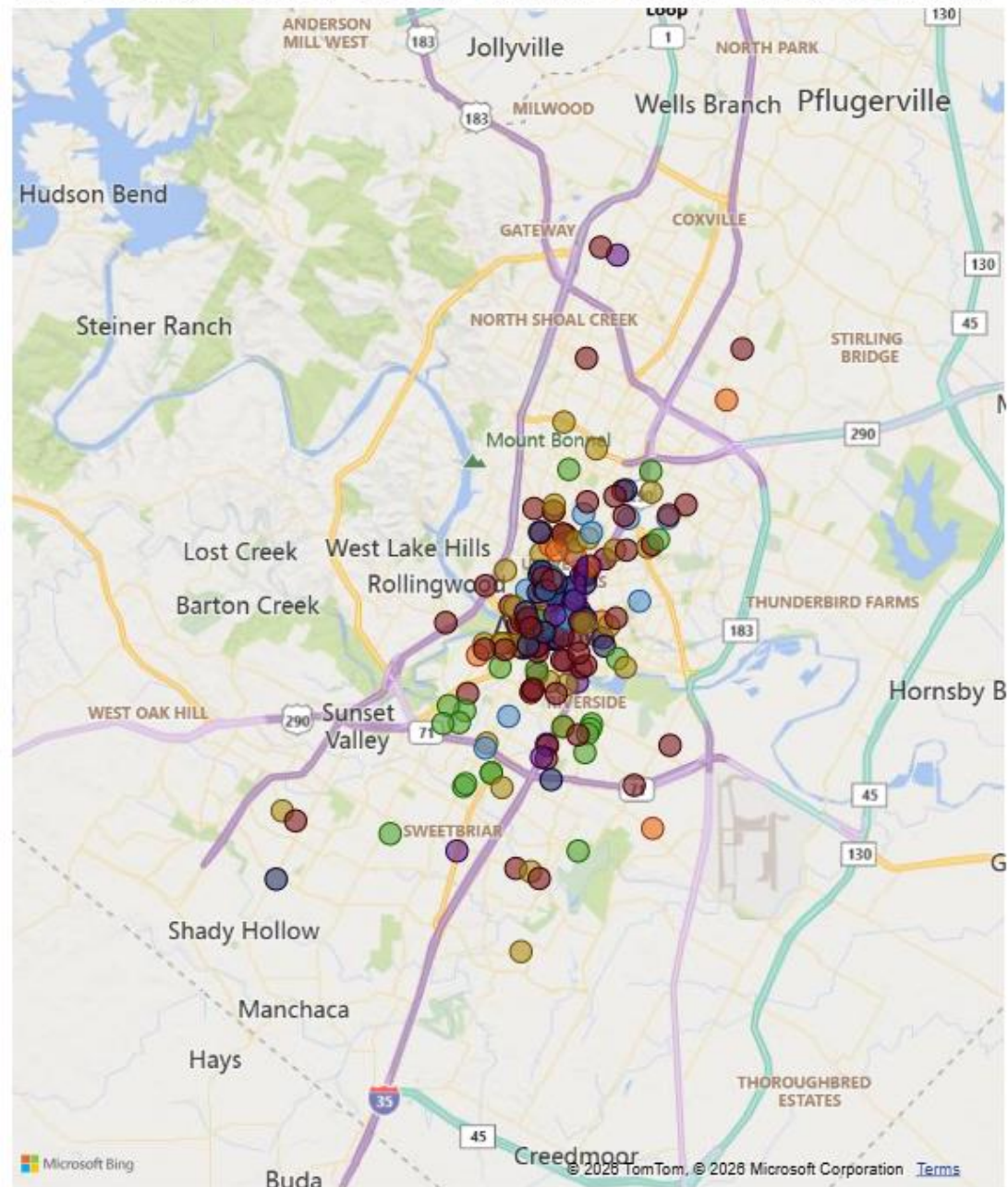
From -AFD -1Alarm /BOXL- Structure Fire | RAP -00-2202 @2425 E Riverside Dr , AUSTIN | XStreets:WILLOW CREEK DR TO RIVERSIDE TRN/E RIVERSIDE | On -AT FCOM S | Time:20:08:38 | Inc#23163009 | For - FTAC201,BAT04,ENG06,ENG22,ENG07,LAD22 Lat: 30235340 Lon: 97724702

Geofencing doesn't always work



Incident Date and AV Company by Location and Issue

Issue ● Blocking... ● Collision ● Ignore ... ● Near Miss ● Nuisance ● Safety C... ● School ...



Incidents over Time

AV Company

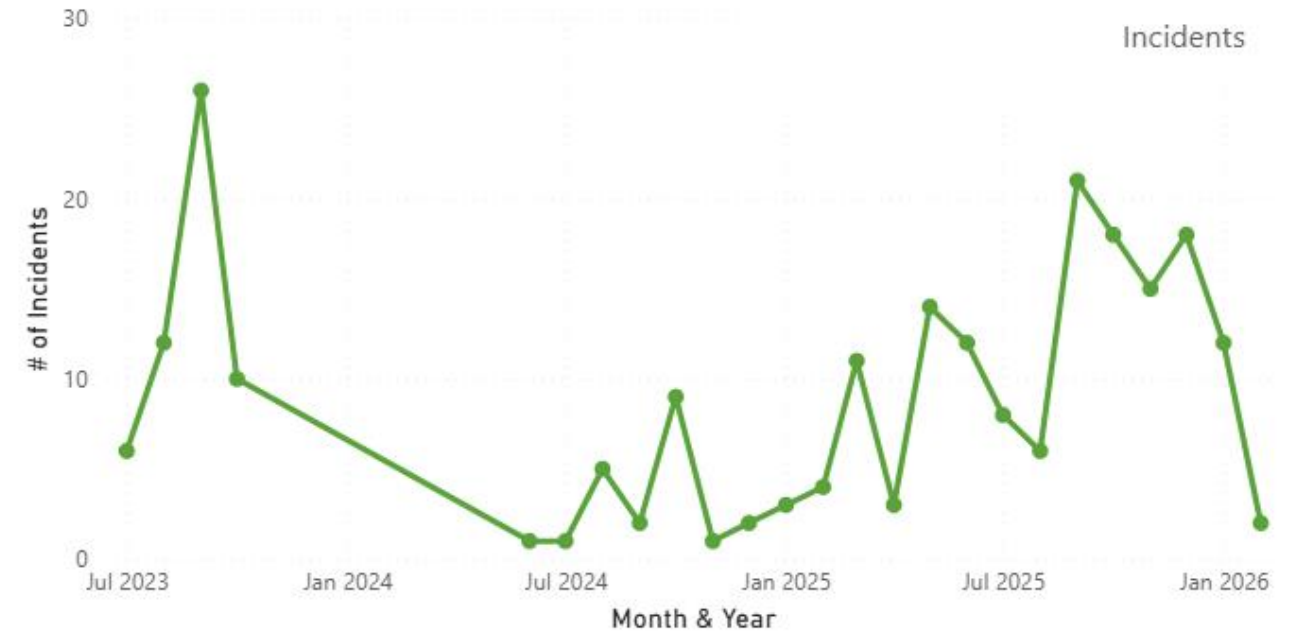
All

Year Filter

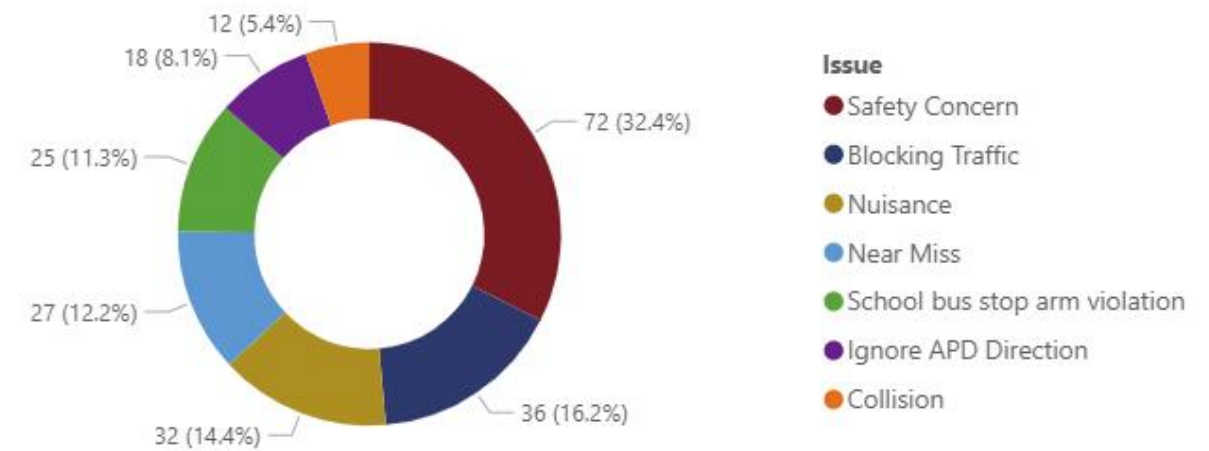
All

222

Incidents

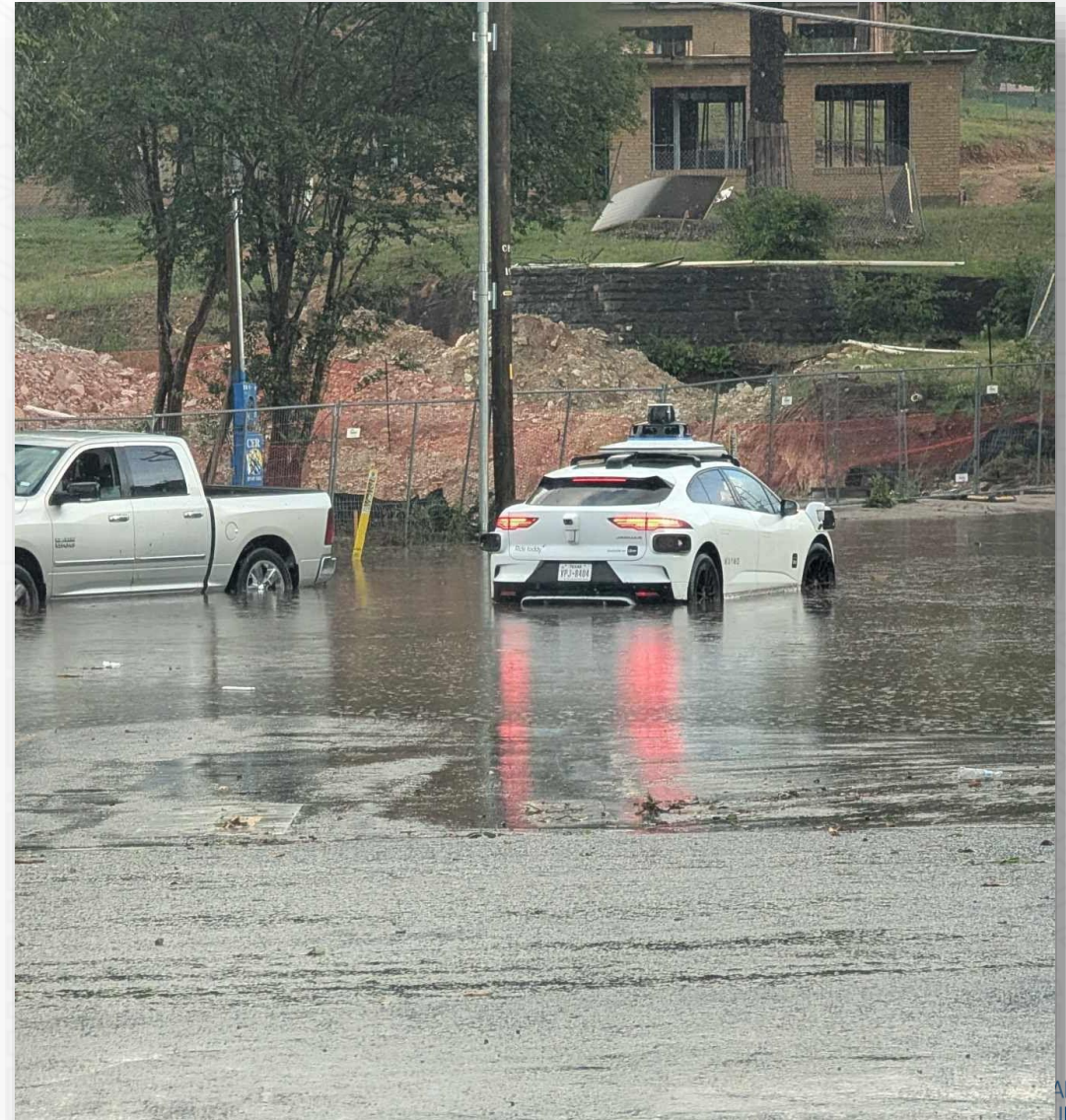


Incidents by Type



How We Use This Data

- Provide ongoing feedback to AV companies.
- Figure out where issues are occurring, and if there's a pattern.
- Determine appropriate infrastructure improvements.
- Collaborate with AV companies to resolve concerns.
- Share with Federal and State agencies.



Collaboration



- Annual AV Stakeholder meeting with AV petting zoo.
- Working with transit, schools, and universities on sharing procedures and information.
- Communicating with State and Federal partners.
- Participating in SAE and peer exchanges with other cities.



Thank You



Check out our website
and dashboard!

COAAVWorkingGroup@austintexas.gov
<https://www.austintexas.gov/page/autonomous-vehicles>



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