



Clint Hail,
Transportation
Planner

North Central
Texas Council of
Governments

Public Works
Round Up

21 May 2019

Asset Management and the Two Faces of Automated Vehicles



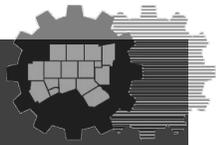
The Two Faces





Society-Changing Innovation

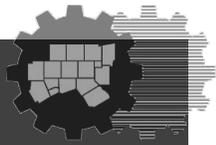
- New vehicle form factors
- New road types and geometries
- Safer and more efficient transportation
- Mobility-as-a-Service (MaaS) versus ownership
- Transportation opportunity cost approaches zero
- Digital cities built through vehicle sensing
- Major reduction in VMT and emissions
- Less parking assets and more urban infill+greenspace





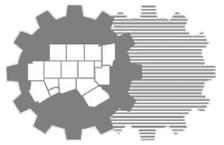
Today is Tomorrow

- AVs are high-maintenance versions of today's drivers
- What's good for drivers today, is good for AVs later
- Better and consistent striping
- Accurate signage
- Access to signal data
- Early warning for hazards
- Pinpointing workzones and other asset management activities
- Curbspace management





Philosophy of Asset Management



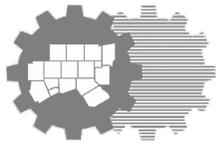
Standard Philosophy

Smart Roads talk to Dumb Cars.

Vehicles and drivers rely on IOO's to collect data and distribute information.

Infrastructure, rather than cars, viewed as the sensing technology.

Condition of roadway assets and furniture is detected and managed by IOO's.



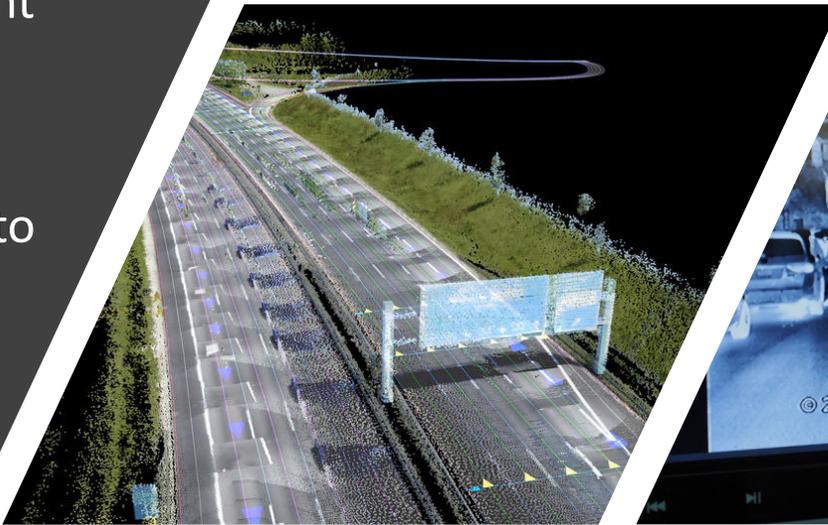
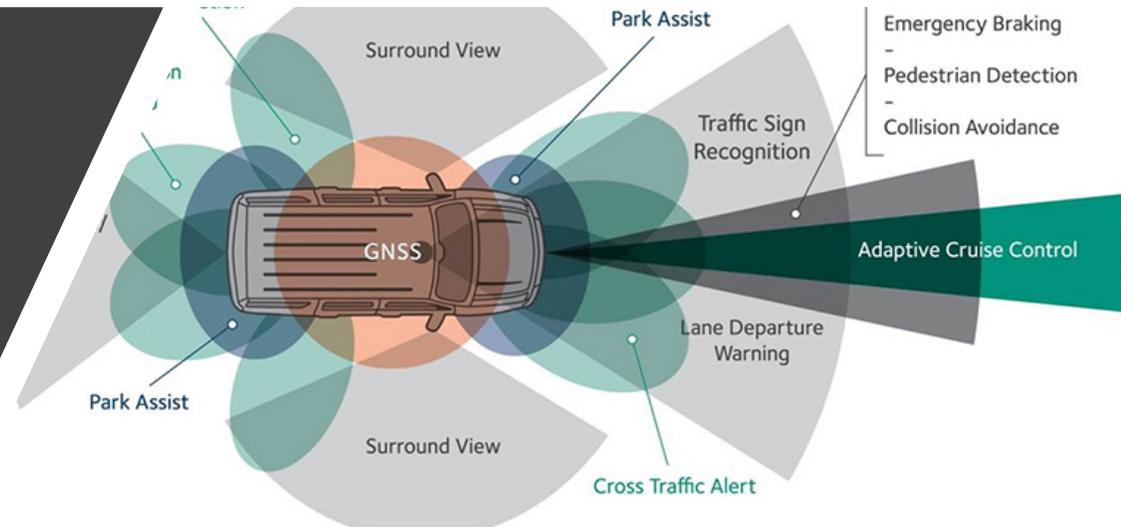
Emerging Philosophy

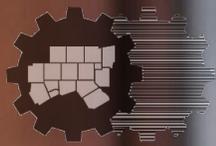
Smart Cars talk to Dumb Roads.

Connected and automated vehicles are rolling sensors producing massive amounts of rich data.

Digital infrastructure becoming as important as real infrastructure.

Leveraging new technologies and services to get comprehensive picture of roadway assets.

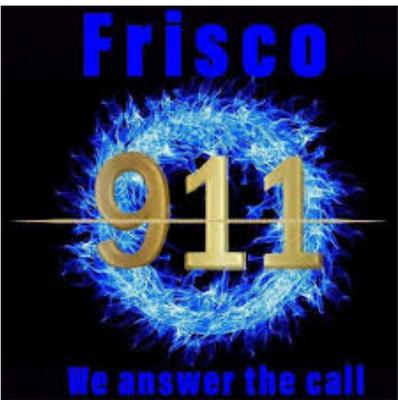
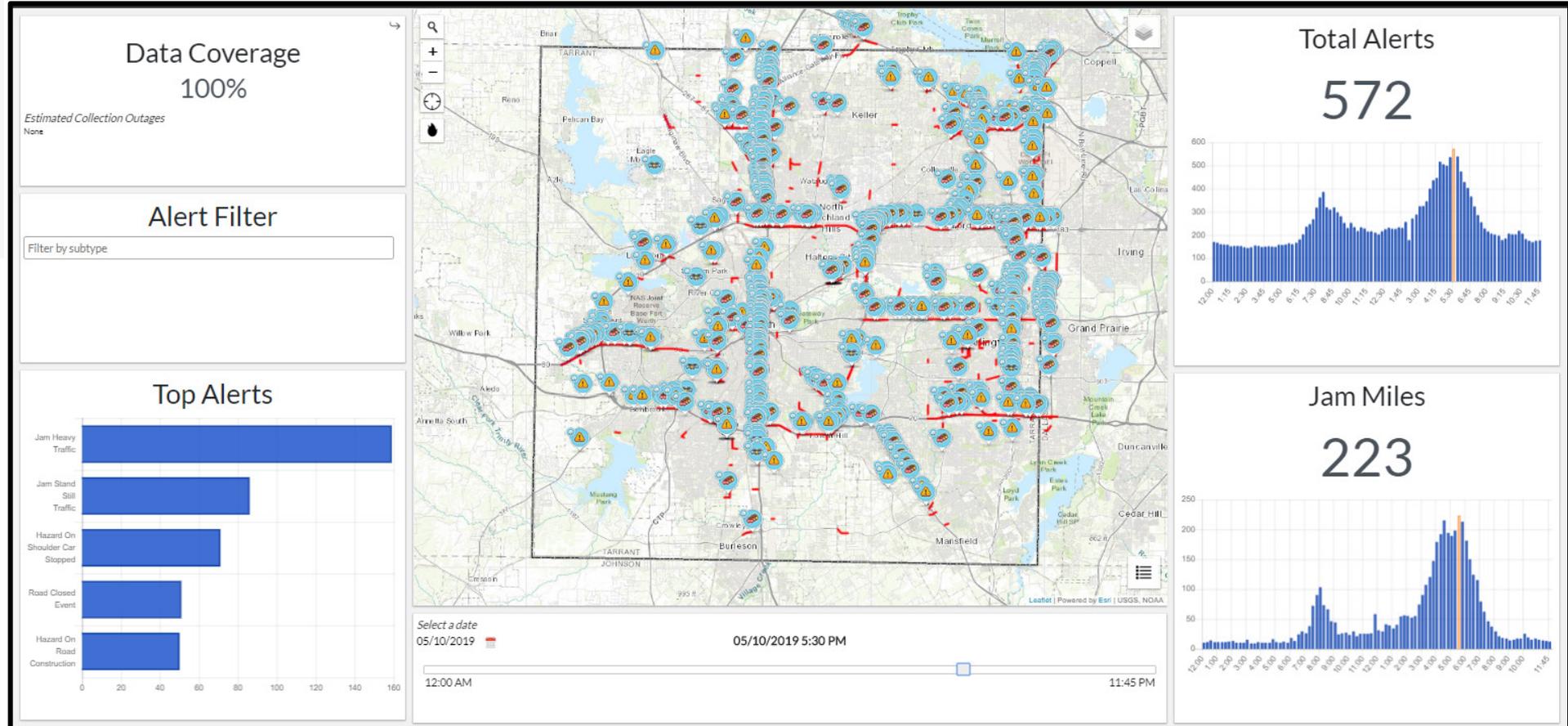
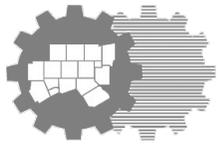


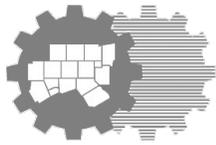


Asset Management Technologies



Open Source Tools





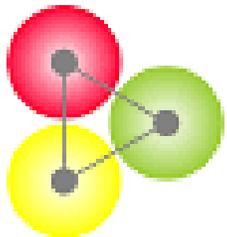
Traffic Signal Data Sharing/Connected Vehicles



applied
INFORMATION

Allen
Arlington
Frisco
Grapevine
McKinney
Plano

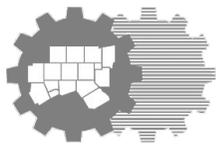
LIVE:TRAFFIC:DATA™



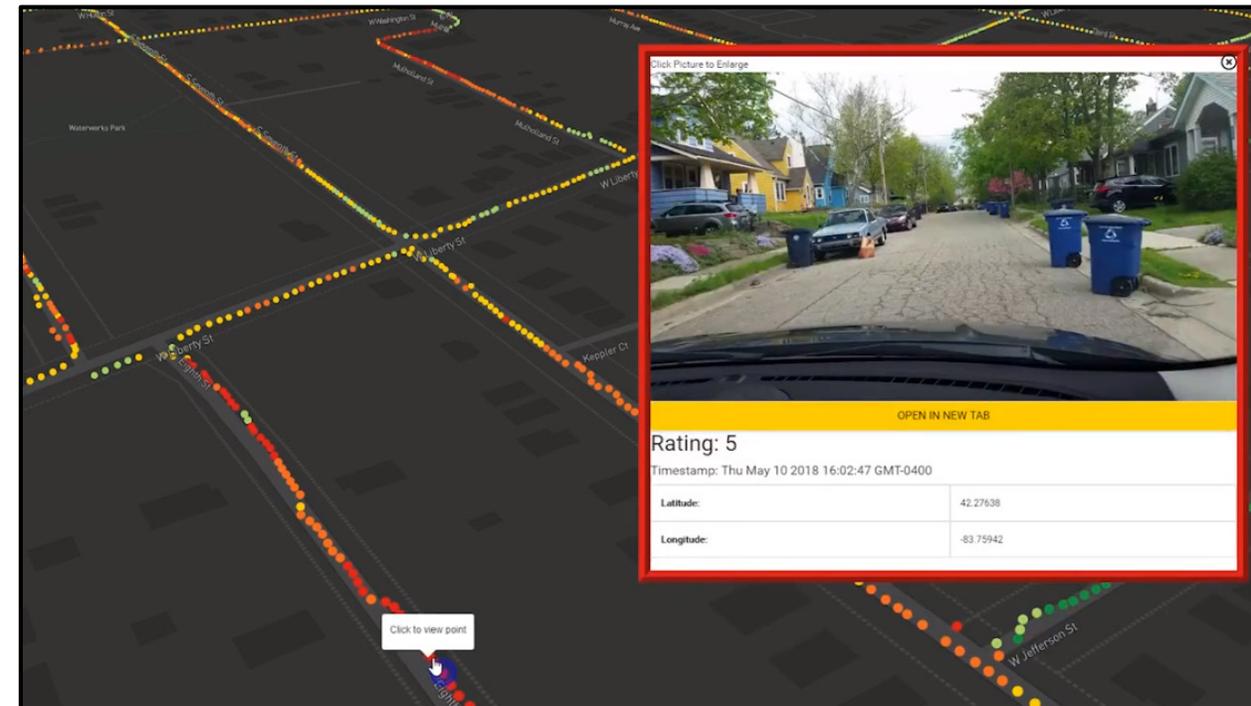
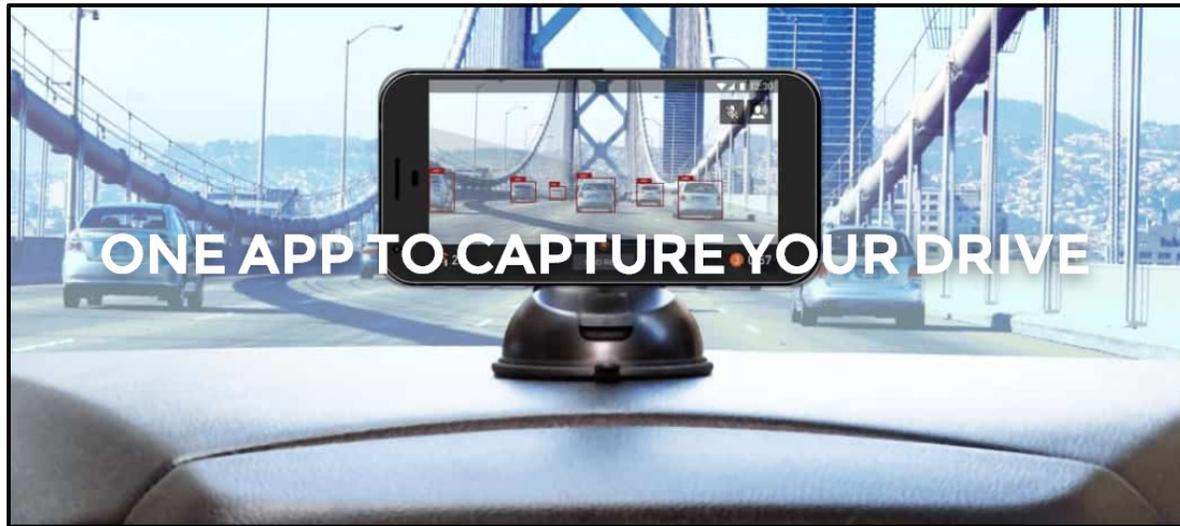
Connected
Signals

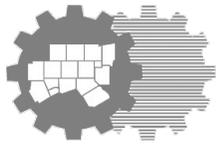


TRAFFIC
TECHNOLOGY
SERVICES

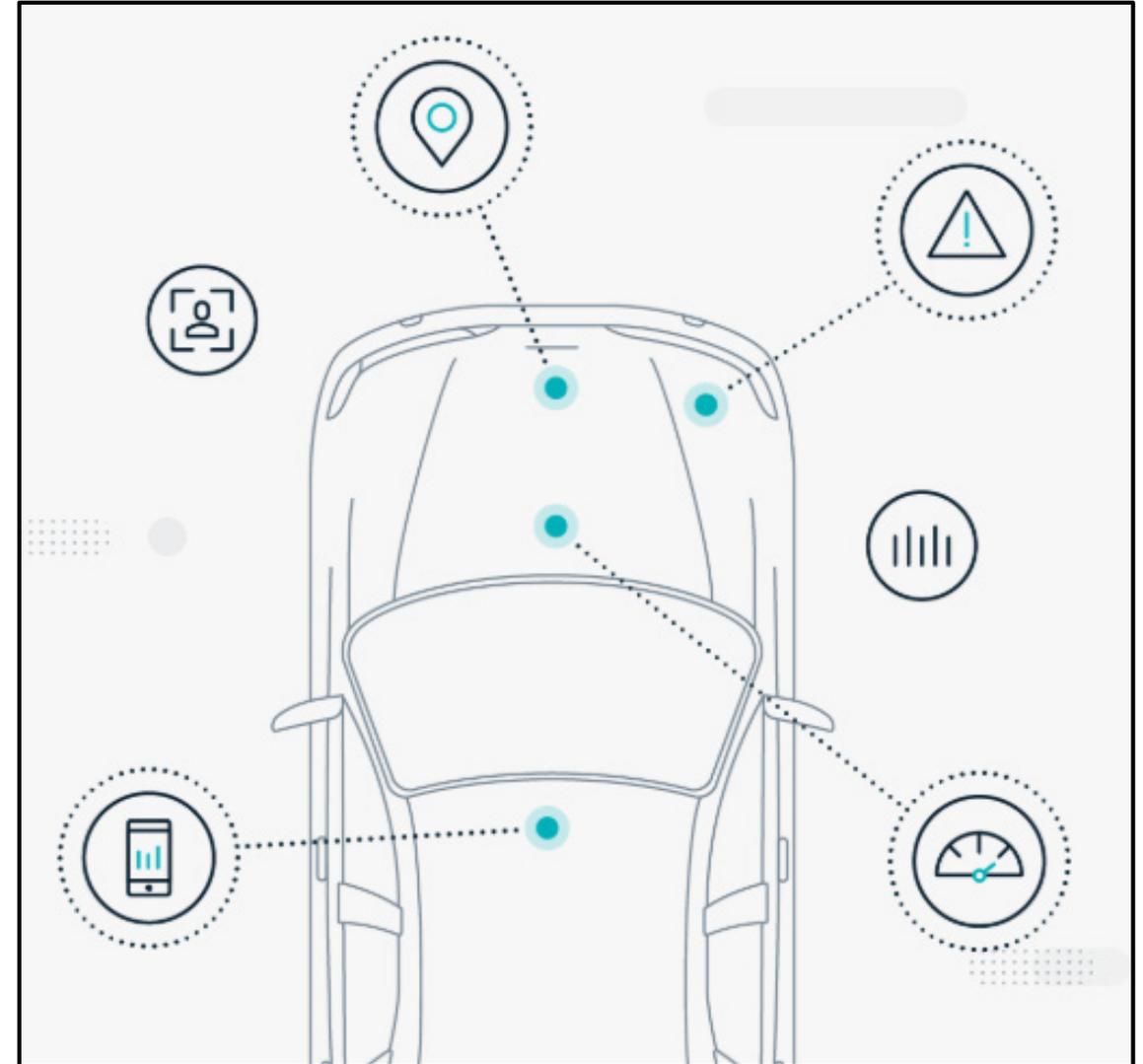
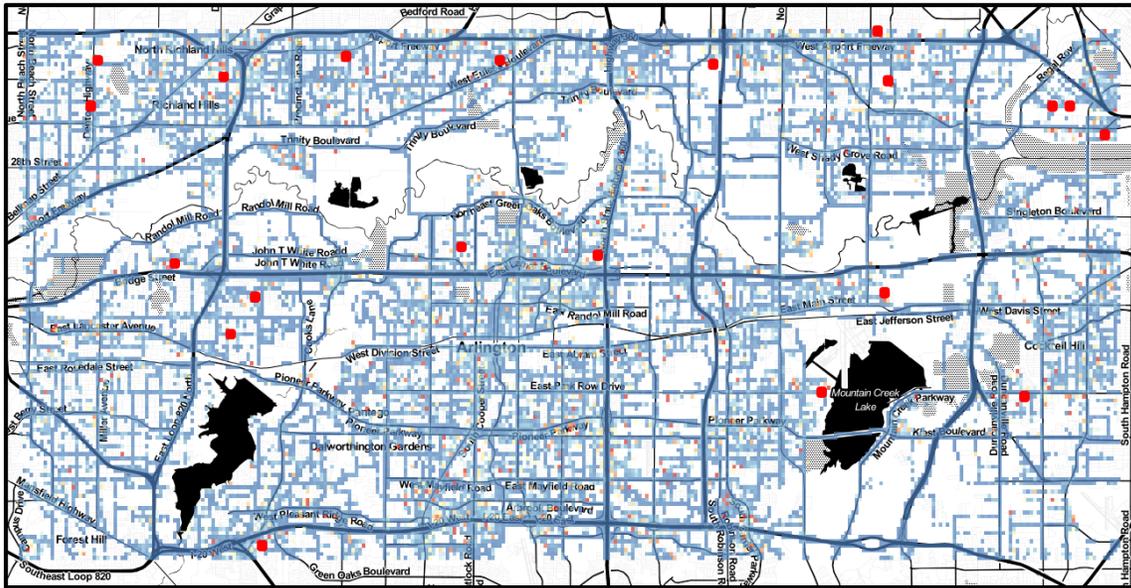


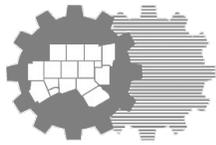
Dashcam Tools





In-Car Data Collection





Next-Gen TMS



- 1 **Waycare** alerts of required action



- 2 **DMS** updated with preliminary warning

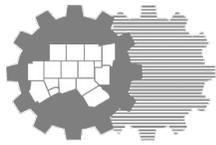


- 3 **Police** proactively positioned



- 4 **DMS** updated with preliminary warning





Volunteers for AV Road Rules?

How the INRIX AV Road Rules™ Platform Works



Rules of road
owned by
Road Authority

Road Authority
assigns attributes to
road segments

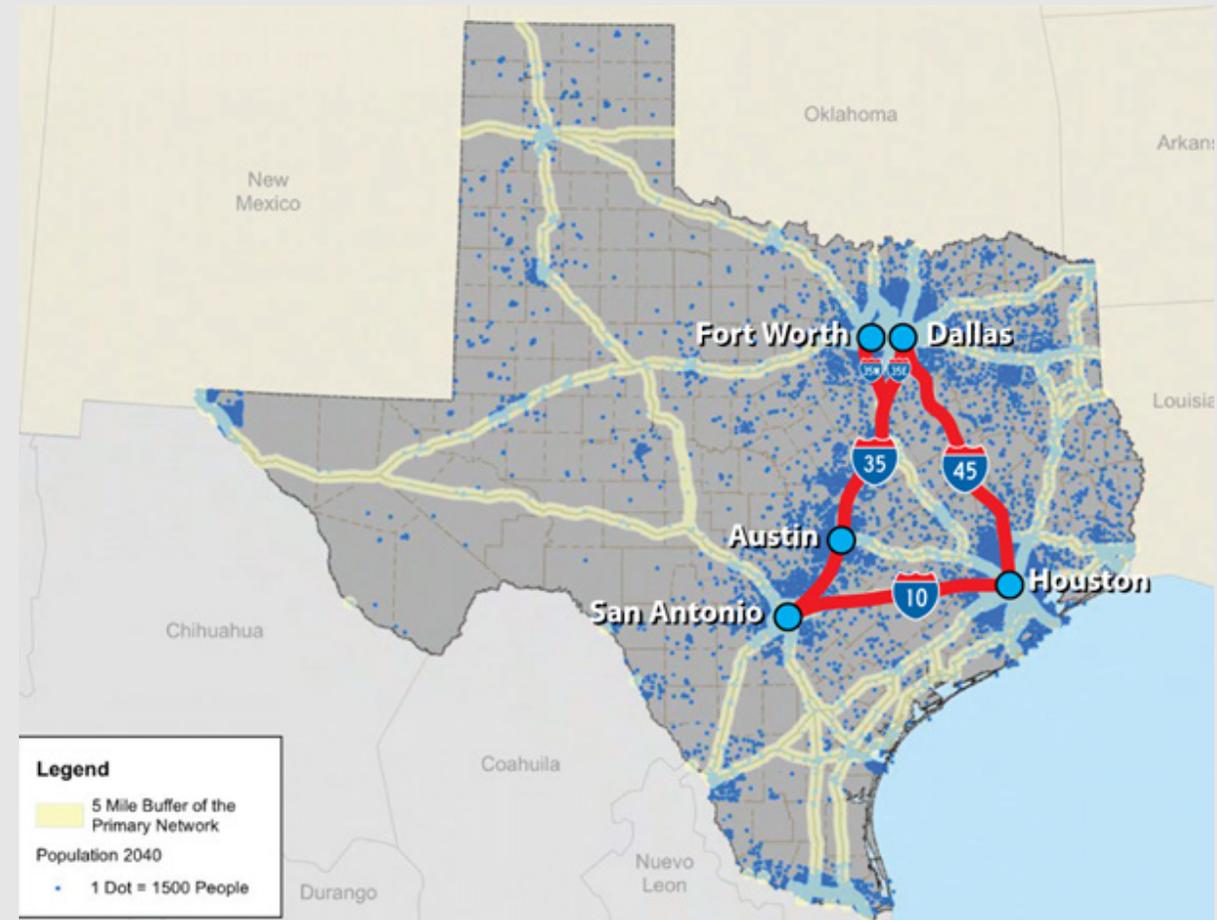
INRIX AV Road Rules
provides data to vehicle
based on position and
possible routes

Vehicle gets road info ahead of
sensor horizon allowing pre-
maneuver planning or validation
of sensor detected road info

The INRIX AV Road Rules™ Platform enables cities to easily digitize local rules such as speed limits, school zones, stop signs, and more. and by doing so influence the areas where HAVs are deployed and ensure operation in accordance with local rules of the road. Once these rules and restrictions are digitized, vehicle operators can leverage this data to ensure safety and compliance. The system also allows vehicles in operation to report infrastructure needs (potholes, inadequate lane striping or signage) for attention and review by the road authority.

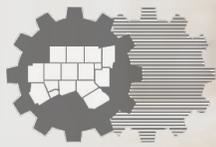
Texas Triangle Challenges

- Texas Triangle contains $\frac{3}{4}$ of Texas' 27 million population – growing to 39 million people in 2040
- Seven of top 25 national freight bottlenecks
- Eleven of top 20 most congested roadway sections in Texas
- Doubling of freight tonnage from 2010 to 2040 (2/3rd by truck)
- More cross border trade value than CA, MI, ND, and AZ combined



Proposed CV Deployment Locations

USDOT Focus Areas	Proposed Applications		Proposed Locations
Multimodal ICM	Advanced Traveler Information System	Mature	IH35/SL340, Waco IH35/SL363, Temple IH35/SH130, Austin IH30
	Eco-Dynamic Routing	New	
	Work Zone Warnings	Mature	
CV at Pedestrian Crossings	Pedestrian/Animal Warning	New	IH35 in Austin
	SPaT Corridor for Improved Ped/Bicycle Safety	New	Riverside Dr., Austin
Unified Fare Collection/Payment System	Truck Parking Availability/Reservation	New	Rest Areas, IH35
Freight Community System	Border Wait Times	Mature	IH35, Laredo
Connected Communities	Truck Signal Priority	Mature	IH35, San Antonio
Infrastructure Condition Assessment	Low Bridge Height Warnings	New	IH35, IH45
Rural Technologies	Traffic & Road Info for Truck Platooning	New	IH35, IH45
	EEBL Alerts from Trucks Ahead	Mature	Austin/ San Antonio
	Traffic Queue Warnings	Mature	IH35, IH45, IH10, IH30
	Road Weather Warnings	New	IH35
	Wrong Way Driving (WWD) Alerts	Mature	San Antonio



Contact Info

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For AV news:

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