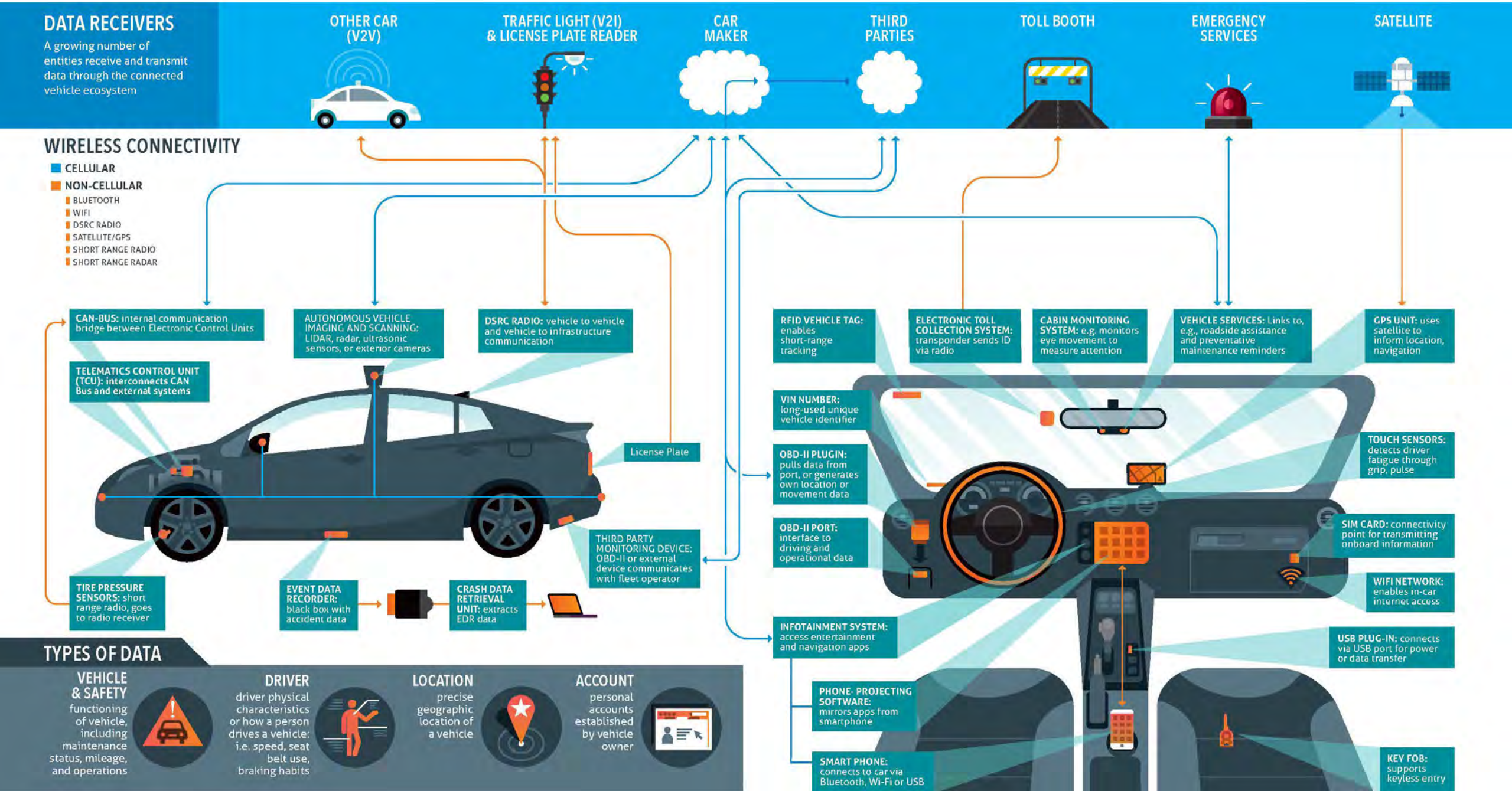
Current & Emerging CV Data:
Opportunities, Challenges, & Recommendations

Impetus for this Project



Impetus for this Project

- The transportation data market is constantly evolving.
- Investigate Current & Emerging Connected Vehicle:
  - Vendors / Aggregators
  - Business Practices
  - Data Types
  - Stability / Risks
- Vendor Willingness to Participate in Multi-state Demos (similar to the original 2008 speed data procurement)
- Agency willingness to join forces for multi-state procurements
- Impactful use-cases that would be worth proving & testing at scale

Work Items

Survey Members

- ✓ Conducted Summer 2024
- ✓ 20 responses from 16 agencies/states

Interview Vendors

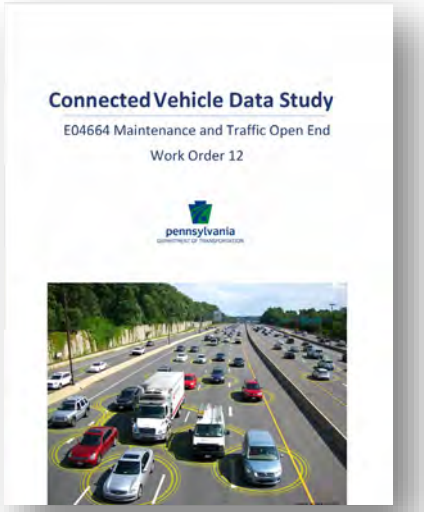
- ✓ Conducted late 2024/ early 2025
- ✓ ~ Dozen Vendors, old and new

Document Findings and Recommendations

- ✓ Report in Final Draft
- ✓ This Presentation

Special Thanks to PennDOT…

- Completed a complementary study in 2024
- Study purpose:
  - ID/analyze CV data types/sources…
  - For various use cases across planning, ops, maintenance
- Provided foundation to build upon for this SCOOP Project
- Overview included as Appendix

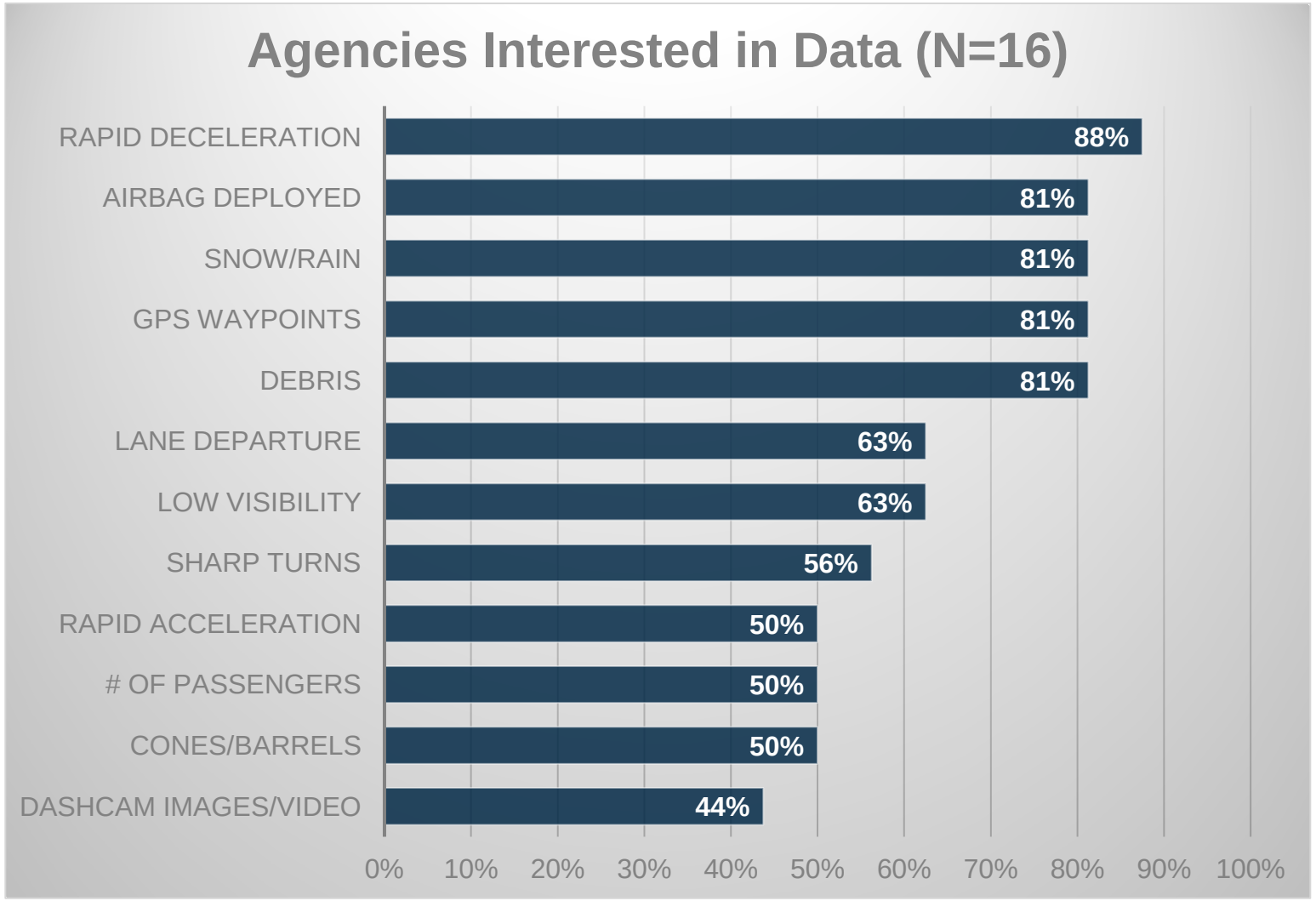


- PennDOT's Conclusions:
  - Despite remaining challenges accessing/utilizing CV data…
  - Promise is there – worth the effort
  - Focus on:
    - Strategic Partnerships
    - Targeted Pilot Projects
    - Data Infrastructure Investments

Agency Survey – Summary Results

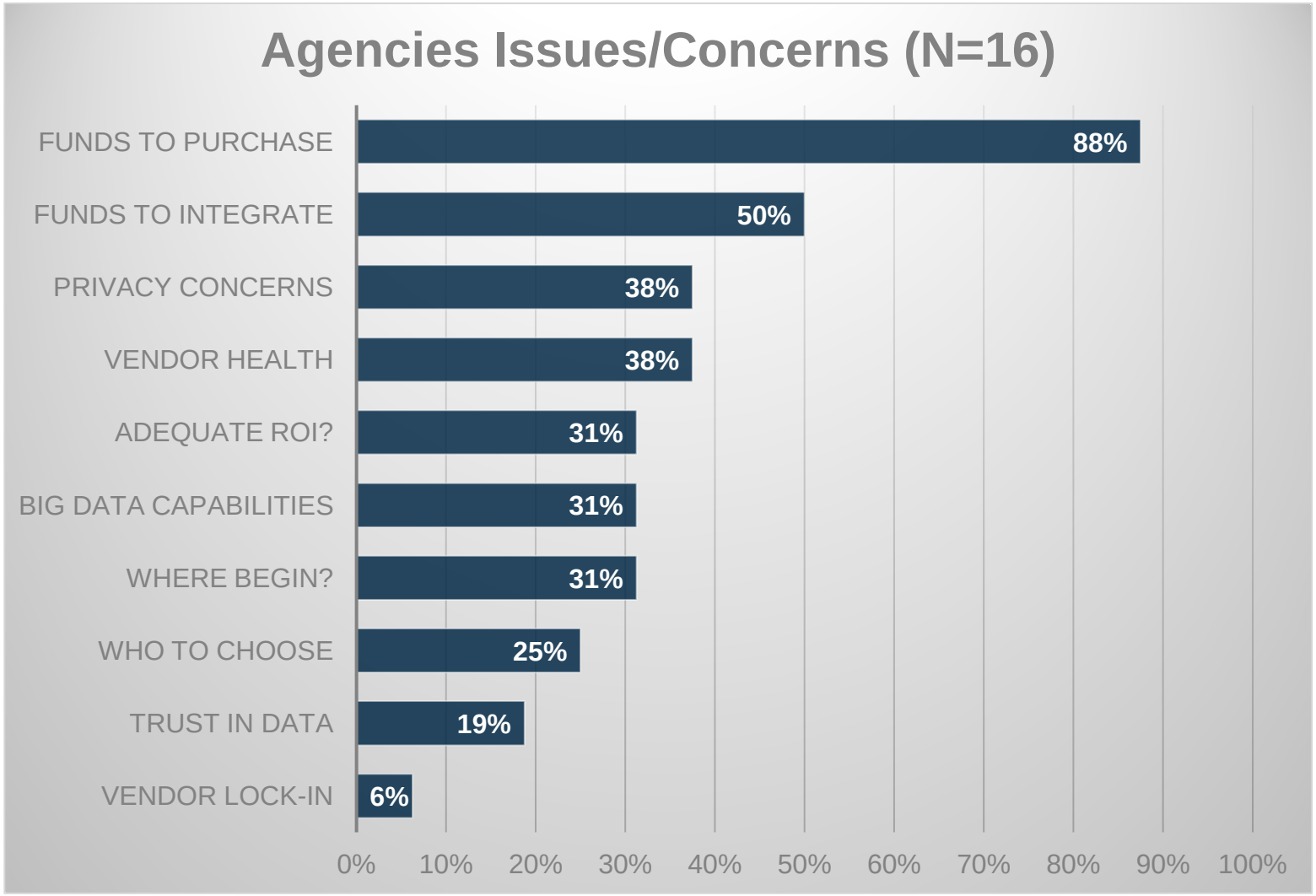
- Use-cases & data needs were proposed
- **EVERY** agency had an interest in 2+ use cases or data sets
- **Nearly half** of agencies interested in *every* use case
- Expected issues identified as potential barriers
- Uniform interest in Coalition collaboration in CV data for cost reduction reasons, budgets and procurement policies willing
- Recognition that support will be needed to build out and test use-cases

Agency Feedback – Desired Data



- Write-ins (one each)
  - Seat belts
  - Friction
  - Distracted Driving
  - Near Misses

Agency Feedback – Issues/Concerns



- Write-ins (one each)
  - Too much data in Ops
  - Need to cleanse data
  - Need business case

Industry Interviews Summary

- **Broader CV Data Market: 'OK' … not 'on fire'**
- Source CV Data Providers
  - CV data capable vehicles still growing … any vehicle can be connected now
  - Most CV data never leaves vehicle
  - Cost efficiencies may have peaked
  - Privacy/Brand concerns of data sharing real, and growing
- Data Aggregators
  - Continue to be important/needed
  - Will do what OEMs won't – combine data, contract w agencies, productize, etc.
  - Often desire to 'move up the stack' to tools/platforms – good and bad for agencies
  - Push towards aggregation and enhanced privacy protection may limit some use-cases
- Meaning for Agencies
  - Vendor interest to improve agency use of CV data, but massive investment inflows not occurring
  - Agencies are secondary stakeholders in broader CV data market – good and bad

Connected Vehicle Taxonomy

Data Type			
Telemetry/ Streaming Data			
Event Data			
Imagery/Video			

Connected Vehicle Taxonomy

Product Type	Source Data	Derivative Data	Tools/Platforms
Telemetry/ Streaming Data			
Event Data			
Imagery/Video			

Connected Vehicle Taxonomy and Examples

	Source Data	Derivative Data	Tools/Platforms
Telemetry/ Streaming Data	GPS Temps	Speeds/Congestion Volumes Trips	Real-Time Maps Congestion Analytics O/D Analytics Signal Analytics
Event Data	Airbags Skids/ABS Wipers	Crash/Hard Braking Log Truck Parking Events Weather Events	Safety Analytics
Imagery/Video	Dashcam LIDAR	Geo-fenced/Time-fenced/ Attribute Filter images or videos	Asset Management Analytics Work Zone Analytics Incident Analytics

Connected Vehicle Companies*

	Source Data	Derivative Data	Tools/Platforms
Telemetry/ Streaming Data	Streetlight Compass IoT Arity / CMT? Fleet MRMs	INRIX HERE TomTom Iteris	Many, Even Google now
Event Data	Compass IoT Arity? CMT?	Arity? CMT? Geotab (Fleets)? HERE?	GM/INRIX Michelin/Arity Geotab (Fleets) i-Probe/Honda? Nira Dynamics/Audi?
Imagery/Video	Nexar? Samsara (Fleets)	Vizzion (Fleets)	Michelin (Road Conditions) Bentley/Blyncsy

*Possible data/service providers, illustrative, not exhaustive

CV Data: Coalition Leadership for ~ 20 Years! Successfully Evolving as the Market Evolves

- Vehicle Probe Project (2008)
  - Speed Dataset – one vendor
  - Validation program created
  - Contract model/use terms established (!)
  - Probe Data Analytics launched
- Vehicle Probe Project II (2014)
  - Speed Dataset – three vendors
  - Optional datasets/services allowed
- Transportation Data Marketplace (2022)
  - Multiple Datasets – six vendors
  - Optional services proliferated
  - Validation expands – Volumes, O-D/Trips

THE WALL STREET JOURNAL.

Latest World Business U.S. Politics Economy Tech Markets & Finance Opinion Arts Lifestyle Rea

I-95 Panel Plans Satellite Traffic-Report Network

By Christopher Conkey
Jan. 29, 2008 11:59 pm ET

Share Resize

In one of the biggest rollouts yet for technology designed to help motorists avoid traffic jams, the I-95 Corridor Coalition will announce plans today to disseminate real-time data on traffic flows and accidents along the East Coast using a satellite network by Inrix Inc.

The rollout this summer will cover 2,500 miles, including many major roads and a continuous stretch of heavily congested Interstate Highway 95 between New Jersey

Evolution of Overall Market Drivers

2008: VPP Start

- **OEMs**
  - In-vehicle Navigation and Routing
- **Fleets**
  - Asset management
  - Route optimization
- **Public Sector**
  - Freeway speed detector alternative

2014: VPP 2 Start

- **OEMs**
  - Mobile Navigation
  - CarPlay/Android Auto
- **Fleets**
  - In-vehicle Navigation and Routing
  - Electronic Logs
- **Public Sector**
  - Network wide monitoring
  - Network wide performance assessment
  - Travel Times on DMS

2022: TDM Start

- **OEMs**
  - Monetizing CV Data
- **Fleets**
  - Performance Optimization
  - Cameras/Liability protection
- **Public Sector**
  - Federal reporting requirements
  - Network wide travel demand analysis
    - O/D + Routes
    - Volume weighting
  - Signal Performance

2025: Now

- **OEMs**
  - AV/EV Dev Support
- **Fleets**
  - ROI
  - Driver training/retention
- **Public Sector**
  - Safety
  - Critical event assistance
  - Reduce effort to gain benefits from CV data

Derivative Dataset Product Evolution

2008: VPP Start

- **Speed Datasets**
  - Still be proven
  - 5 minutes, major roads

2014: VPP 2 Start

- **Speed Datasets**
  - 1 minute, most roads
  - Road segmenting options
  - Congestion detection methods
- **Volume Datasets**
  - Experimentation, not productized
- **Trip Datasets**
  - Initially offered
  - Origins, Destinations, Routes
- **Signal Performance Measures Datasets**
  - ATSPM concepts defined
  - Initial analysis of CV data for ATSPM use underway

2022: TDM Start

- **Speed Datasets**
  - Robust multi-source market
  - Sub-segment resolution
  - Special use lanes
  - Queue warning methods
- **Volume Datasets**
  - AADT becoming productized
  - Other datasets emerging
- **Trip Datasets**
  - Robust multi-source market
  - O, D, and Route Path detail
- **Signal Performance Measures Datasets**
  - Multiple platforms offered and in use (Gen 1)

2025: Now*

- **Speed Datasets**
  - Stable market
- **Volume Datasets**
  - Multiple vendor offerings
  - Validations in some cases
- **Trip Datasets**
  - Trip truncation methods for many providers
- **Signal Performance Measures Datasets**
  - Robust multi-source platform market (Gen 2)

* Based on adequate GPS waypoint data continuing to be available

Source Data Evolution: Significant GPS Waypoint Generators

2008: VPP Start

- **Fleet Data**
  - Omnitracs

2014: VPP 2 Start

- **Fleet Data**
  - Omnitracs
  - Fleetmatics
  - Verizon
- **Mobile Phones**
  - Mapquest
  - Apple (TomTom only)*
  - Google (Not shared)
- **Connected Vehicles**
  - Starting but limited

2022: TDM Start

- **Fleet Data**
  - Geotab (Not shared)
  - Verizon (Fleetmatics)
  - Solara (Omnitracs)
- **Mobile Phones**
  - Life 360
  - Apple (TomTom only)*
  - Google (Not shared)
- **Connected Vehicles**
  - Wejo
  - Otonomo

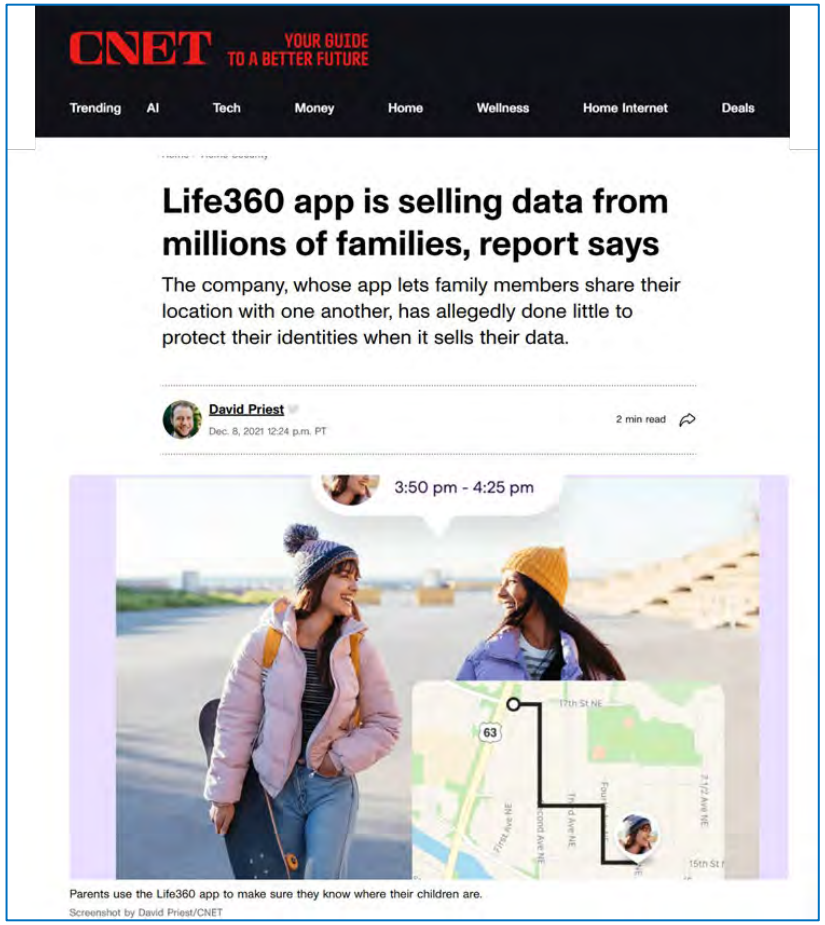
2025: Now

- **Fleet Data**
  - Geotab (Not shared)
  - Samsara
  - Verizon (Fleetmatics)
  - Solara (Omnitracs)
- **Mobile Phones**
  - Arity
  - CMT (Not shared)
  - Apple (TomTom only)*
  - Google (Not shared)
- **Connected Vehicles**
  - Streetlight Data
  - Compass IoT

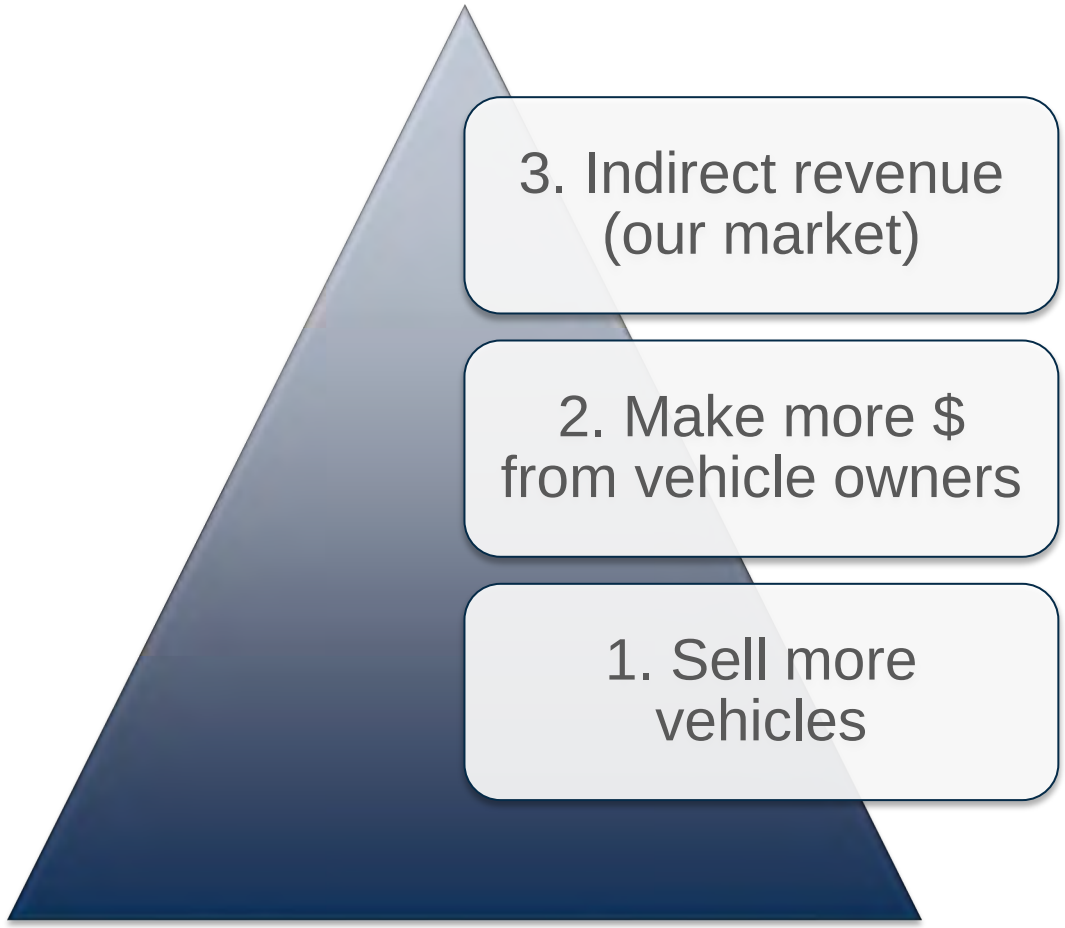
* Assumed: Neither Apple or TomTom have officially publicly confirmed

2025: CV Data Market at a Crossroads?

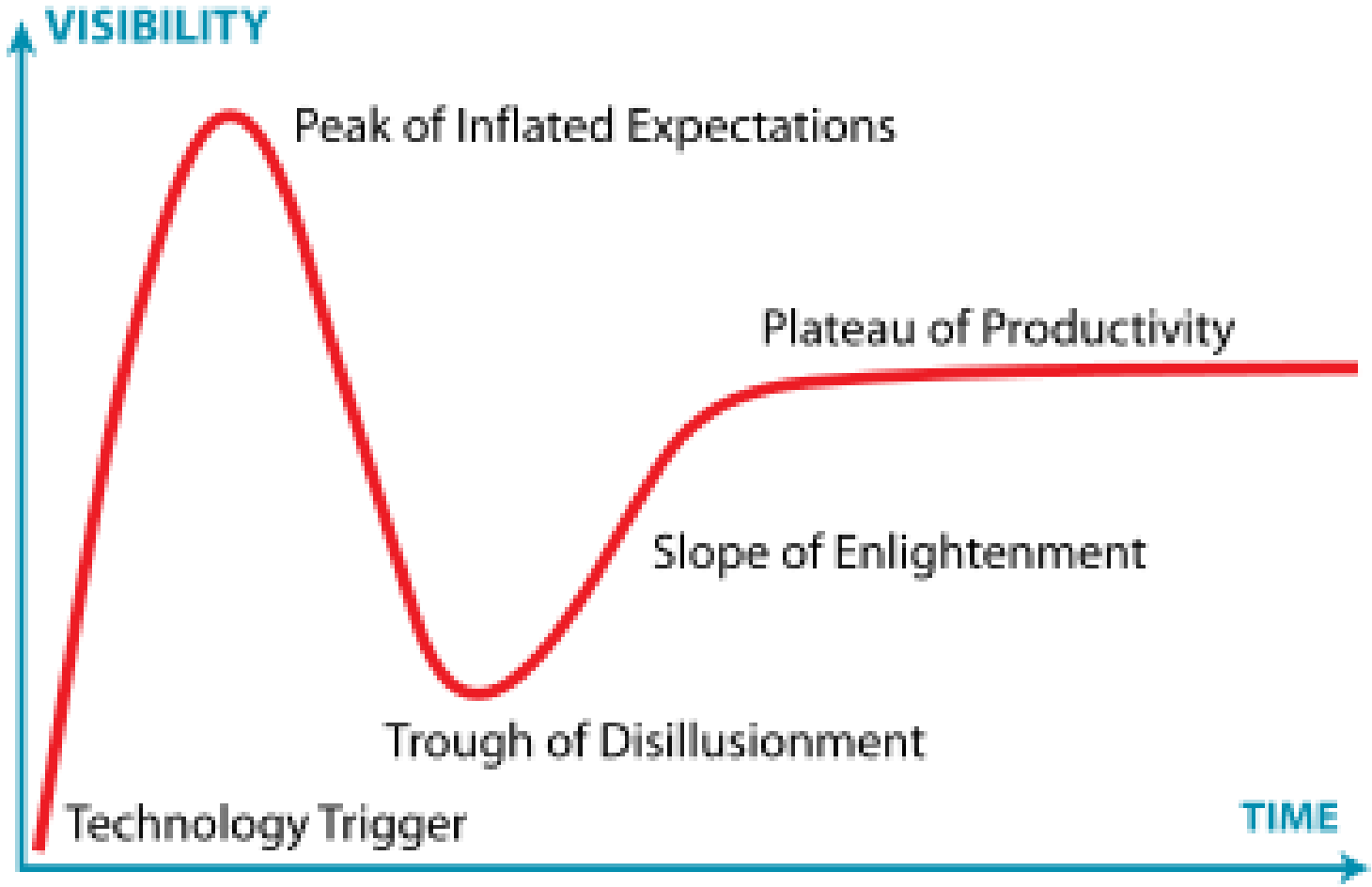
- Opportunities grow, so do market headwinds
- Privacy: First real cracks in 2021
  - $’s worth the trouble for suppliers?
- Business Models
  - SPACs great…until they weren’t
  - 2019: Wejo, Otonomo arrive
  - 2023: Wejo, Otonomo depart
- Market recalibration underway



Why Connected Vehicles at All?
OEM Perspective

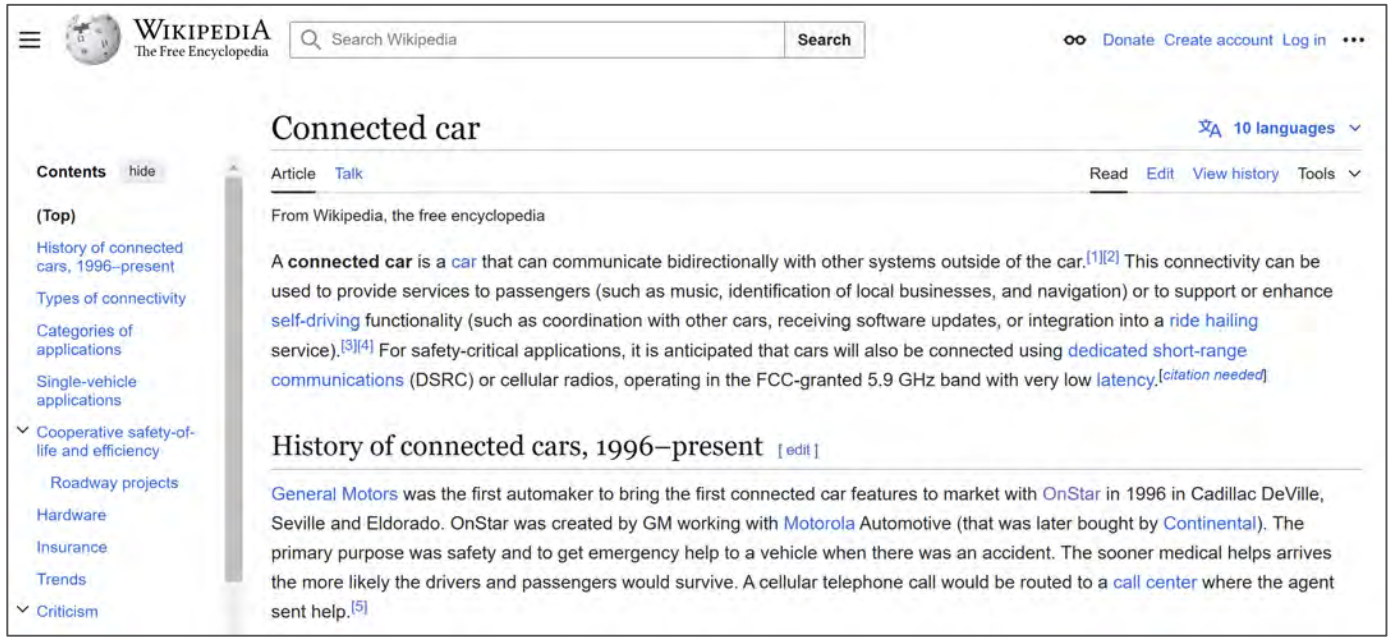


Connected Vehicles and GM: Case Study Using the 'Gartner Hype Cycle'



GM (Arguably) Started the Connected ‘Car’ Industry in the US …in 1996

“General Motors was the first automaker to bring the first connected car features to market with OnStar in 1996…”



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Connected car

10 languages

Contents hide

(Top)

History of connected cars, 1996–present

Types of connectivity

Categories of applications

Single-vehicle applications

Cooperative safety-of-life and efficiency

Roadway projects

Hardware

Insurance

Trends

Criticism

Article | Talk | Read | Edit | View history | Tools

From Wikipedia, the free encyclopedia

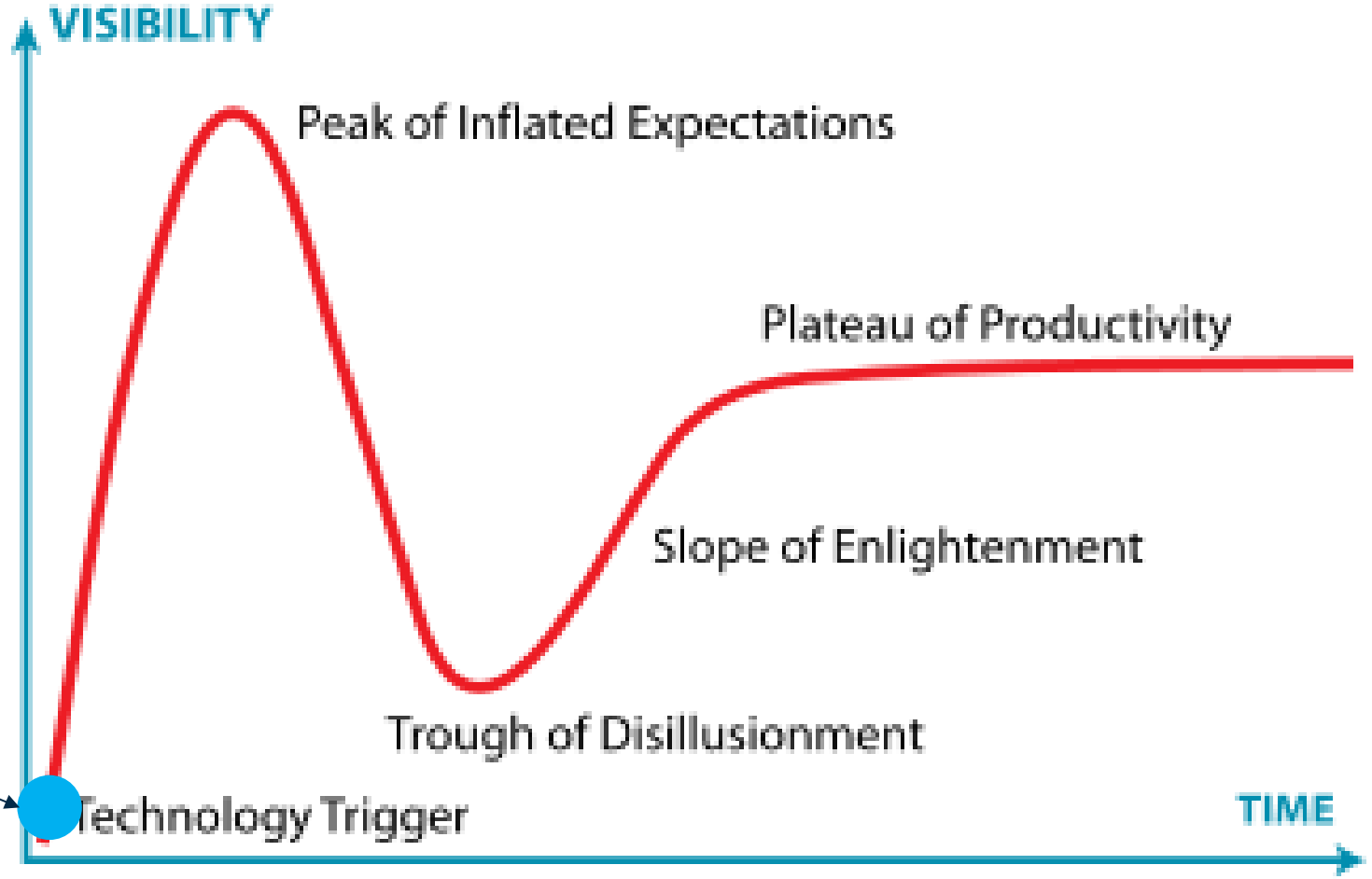
A **connected car** is a car that can communicate bidirectionally with other systems outside of the car.[1][2] This connectivity can be used to provide services to passengers (such as music, identification of local businesses, and navigation) or to support or enhance self-driving functionality (such as coordination with other cars, receiving software updates, or integration into a ride hailing service).[3][4] For safety-critical applications, it is anticipated that cars will also be connected using dedicated short-range communications (DSRC) or cellular radios, operating in the FCC-granted 5.9 GHz band with very low latency.[*citation needed*]

History of connected cars, 1996–present [edit]

General Motors was the first automaker to bring the first connected car features to market with OnStar in 1996 in Cadillac DeVille, Seville and Eldorado. OnStar was created by GM working with Motorola Automotive (that was later bought by Continental). The primary purpose was safety and to get emergency help to a vehicle when there was an accident. The sooner medical helps arrives the more likely the drivers and passengers would survive. A cellular telephone call would be routed to a call center where the agent sent help.[5]

https://en.wikipedia.org/wiki/Connected_car

1996



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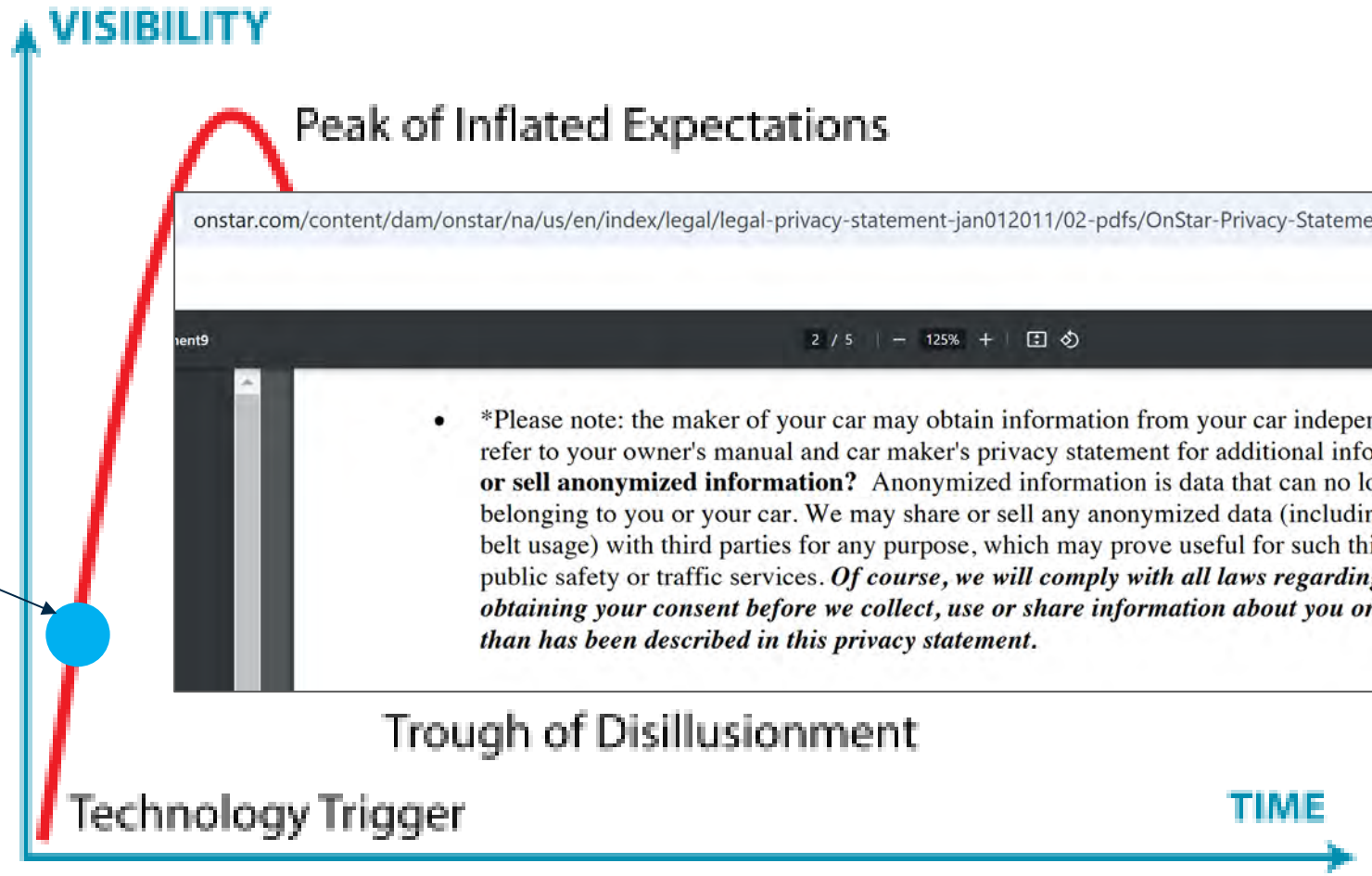
2011



"…OnStar has changed its terms and conditions to allow sale of vehicle location and speeds to interested third parties…"

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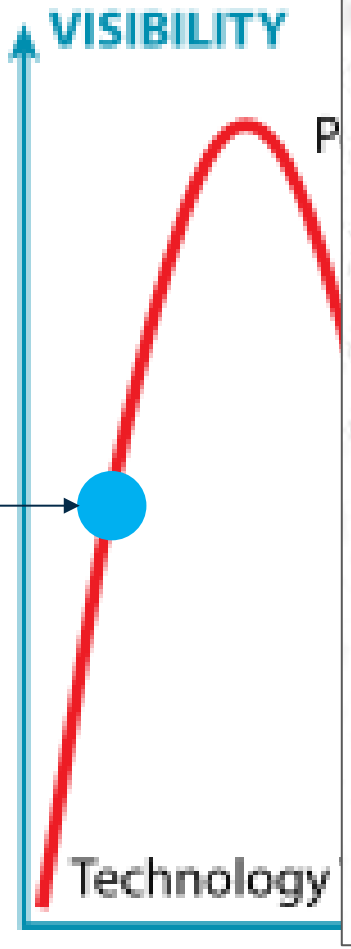
2019



Invests $25M for 35% of Wejo, with long term data supply agreement

wejo

sky news

General Motors revs up UK 'connected car' start-up wejo

General Motors is taking a 35% stake in wejo, a British-based 'connected car' start-up, Sky News can reveal.

By Mark Kleinman, City editor

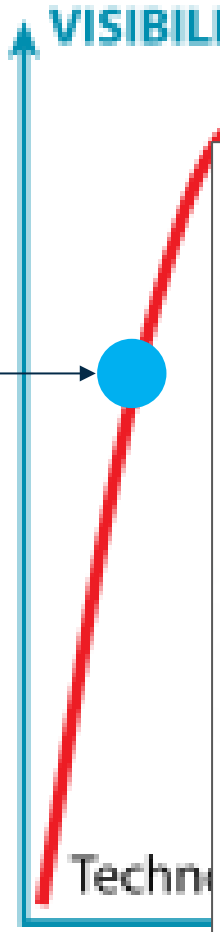
Tuesday 12 February 2019 18:44, UK

The American automotive icon General Motors (GM) is investing millions of pounds in a British technology start-up that is targeting a leading role in the impending revolution in driverless vehicles.

Sky News has learnt that Chester-based wejo has struck a landmark deal that includes a $25m (£19.4m) cash injection from GM alongside a long-term data-sharing agreement between the two companies.

2021
June

OnStar Guardian App launched – expands OnStar beyond GM vehicles



GM offers OnStar service to drivers of any vehicle in US, Canada

Jamie L. LaReau
Detroit Free Press

Published 10:00 a.m. ET June 7, 2021 | **Updated 4:38 p.m. ET June 7, 2021**

Drivers of vehicles other than those made by General Motors now have access to OnStar's emergency advisers and additional services.

OnStar, the GM subsidiary that offers subscription-based services such as communications with trained advisers, in-vehicle security, emergency and roadside help, is making its OnStar Guardian mobile app available to anyone in the United States and Canada with a compatible Apple or Android cellphone.

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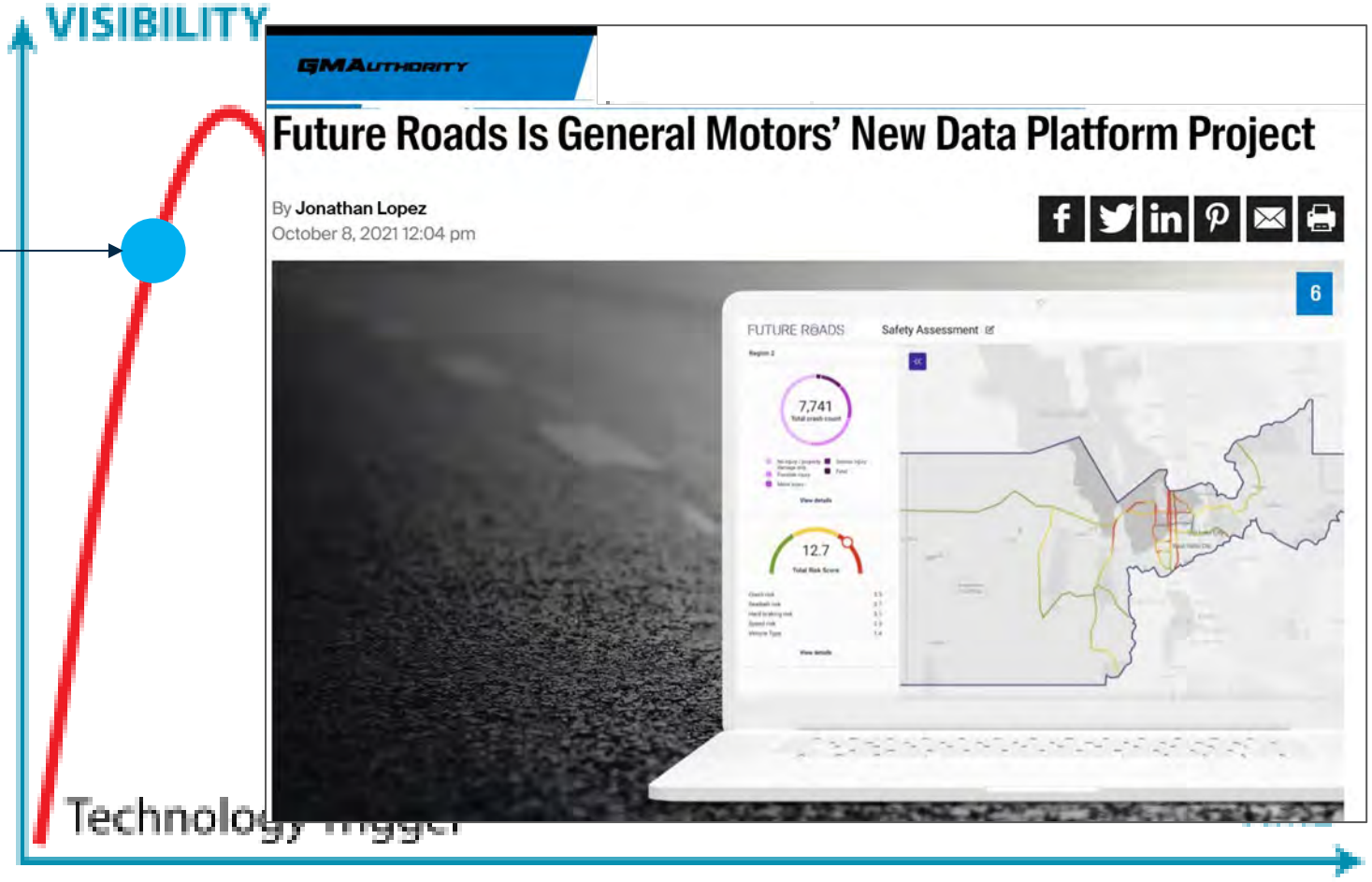
2021

October

Future Roads announced at GM Investor Day

FUTURE ROADS



2021

November

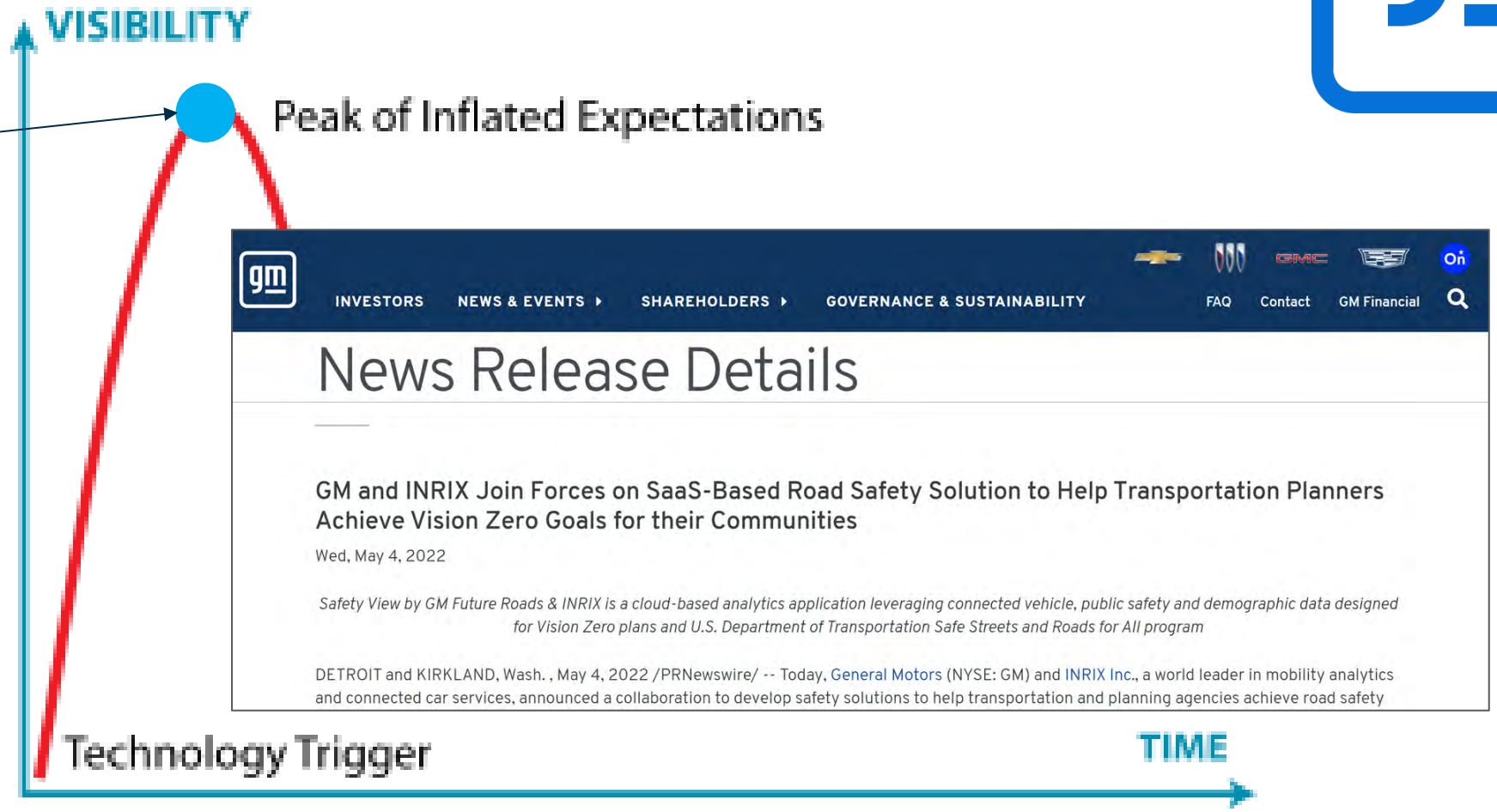
Wejo goes public, raises $225+ million

2022

GM and INRIX launch Safety View –
'Event' Data embedded

Safety View

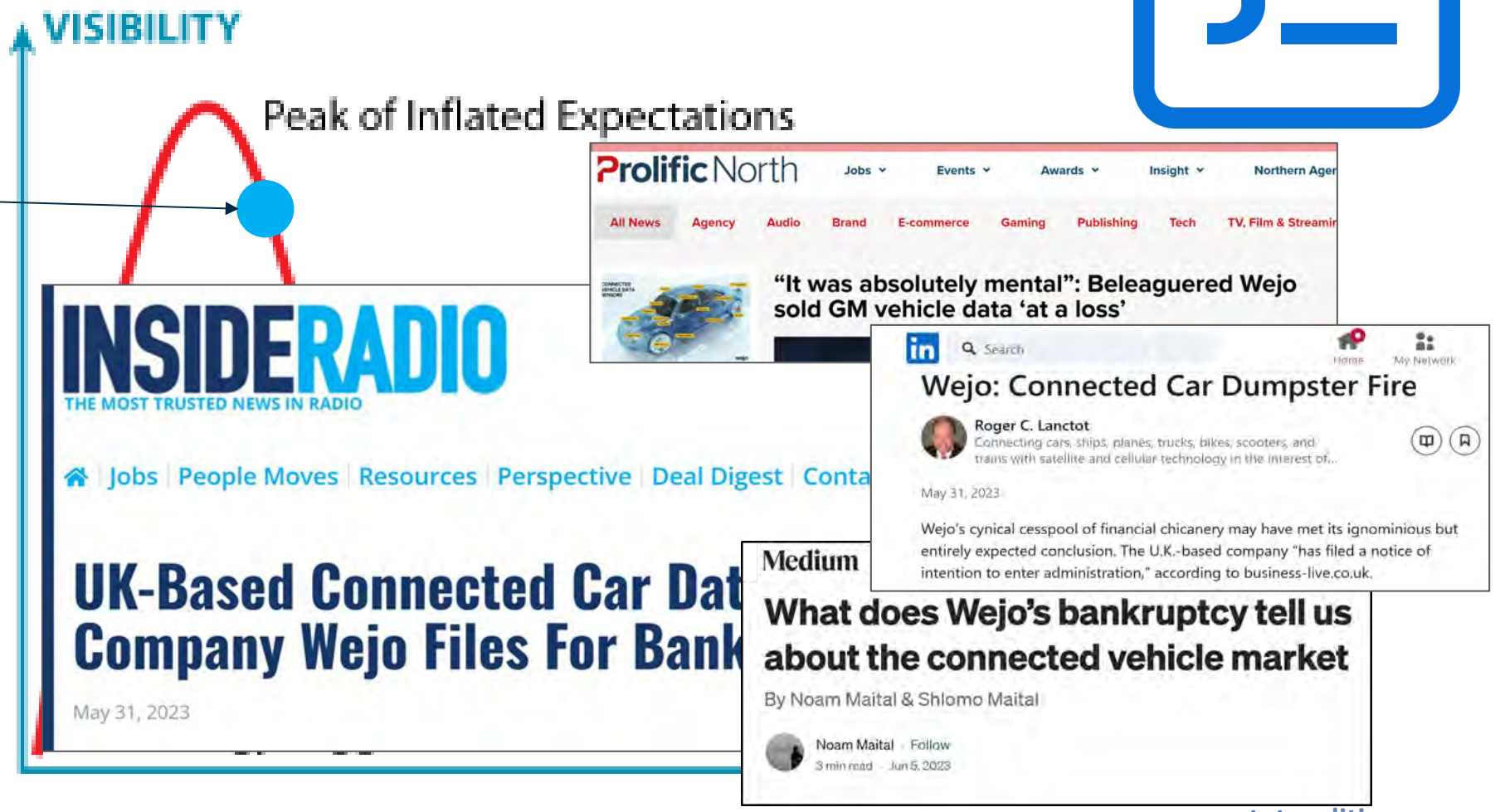
FUTURE ROADS | INRIX



2023

Wejo goes bankrupt, shuts down

wejo



Note: In 2024, Streetlight Data acquired Wejo assets, including GM data contract

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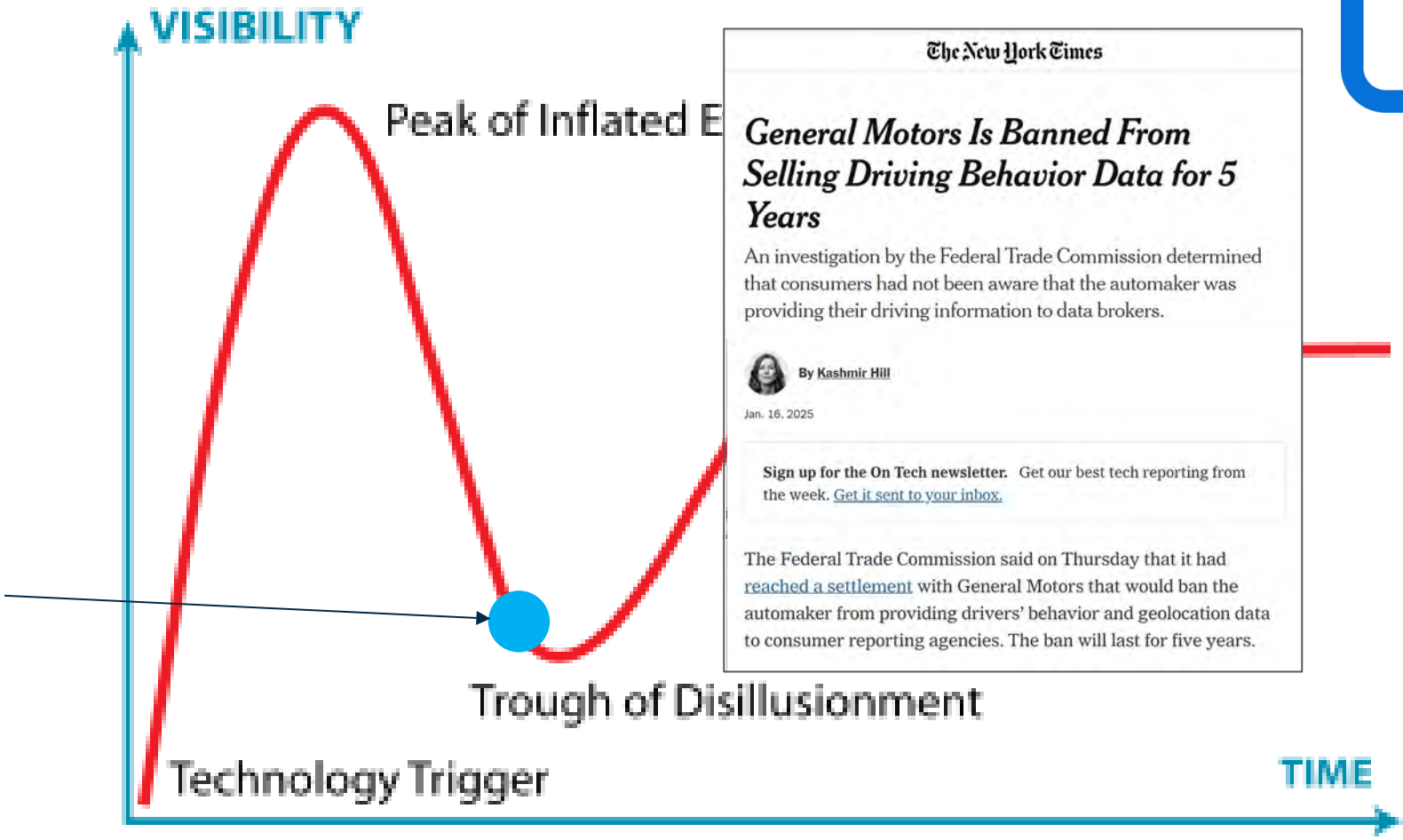
2024

New York Times reports questionable uses of data by 3rd parties

2025

January

GM settles with FTC
Does not affect GPS Data



The New York Times

General Motors Is Banned From Selling Driving Behavior Data for 5 Years

An investigation by the Federal Trade Commission determined that consumers had not been aware that the automaker was providing their driving information to data brokers.

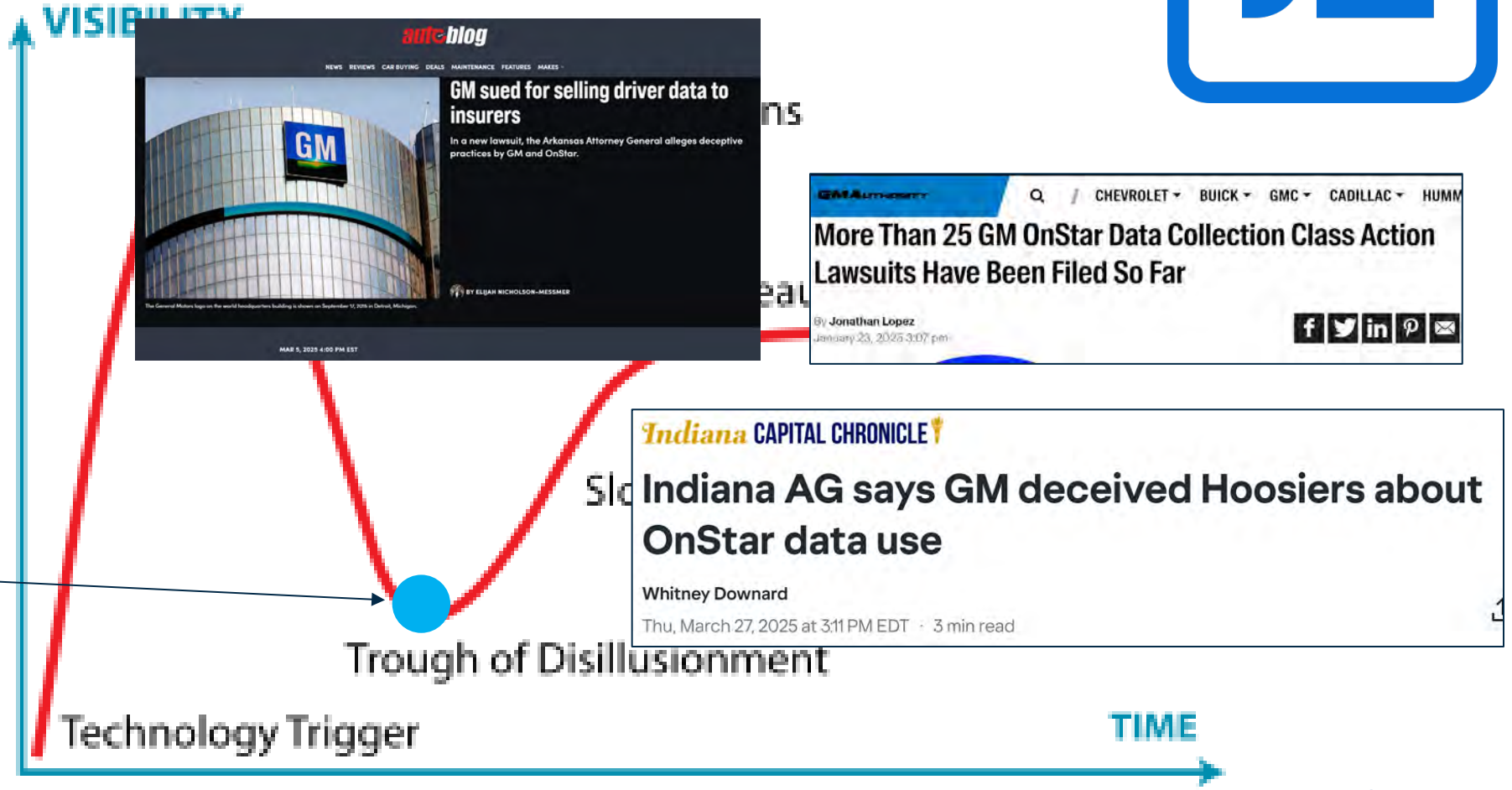
By Kashmir Hill

Jan. 16, 2025

Sign up for the On Tech newsletter. Get our best tech reporting from the week. Get it sent to your inbox.

The Federal Trade Commission said on Thursday that it had reached a settlement with General Motors that would ban the automaker from providing drivers' behavior and geolocation data to consumer reporting agencies. The ban will last for five years.

2025



Lawsuits Piling Up

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Observations

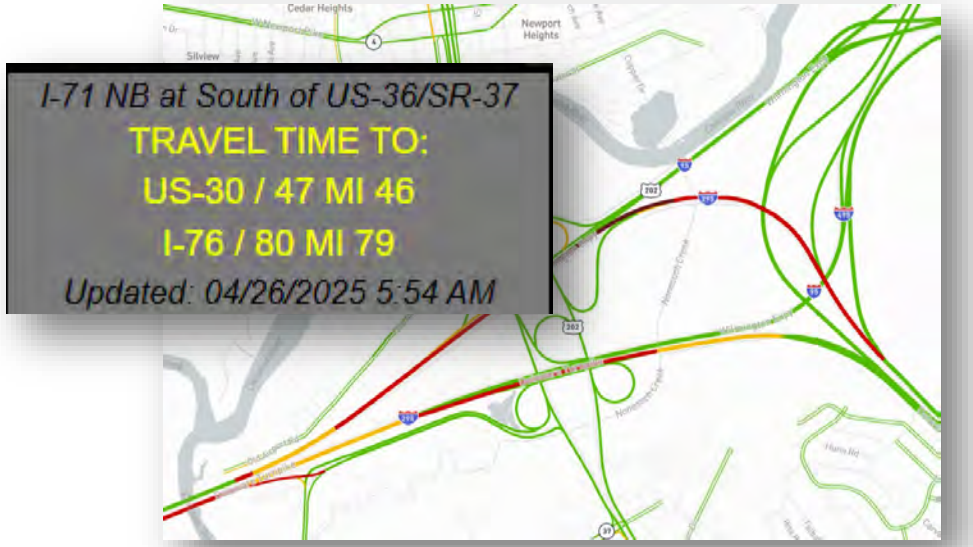
- "Worth Millions if risking Billions?"
  - GM CFO, October 2024: OnStar's 2024 revenues ~$2B with 'substantial margin'
- Any extra $'s worth the brand risk?
  - GM total 2024 Revenue: $48.8 Billion
  - GMs current market value: ~$45-50 Billion
- Has GM reached the 'Trough of Disillusionment' yet?
  - Worst case would be if GM withdraws GPS data from market in future
- Can we guide GM (and others like them) to enlightenment/productivity?
  - Are we willing to give up some data, e.g., truncated trips?

Dataset Evaluation Factors

- **Technical**
  - Density
  - Frequency
  - Latency
  - Completeness
  - Consistency
  - Accessibility
  - Filtering
  - Reliability
  - Representation
- **Commercial**
  - Data Use and Licensing Terms
  - Payment Terms
  - Transparency of Sources and Algorithms
  - Dataset Validation
  - Pricing Simplicity and Economies of Scale
  - Documentation, Support and Training
  - Business Stability

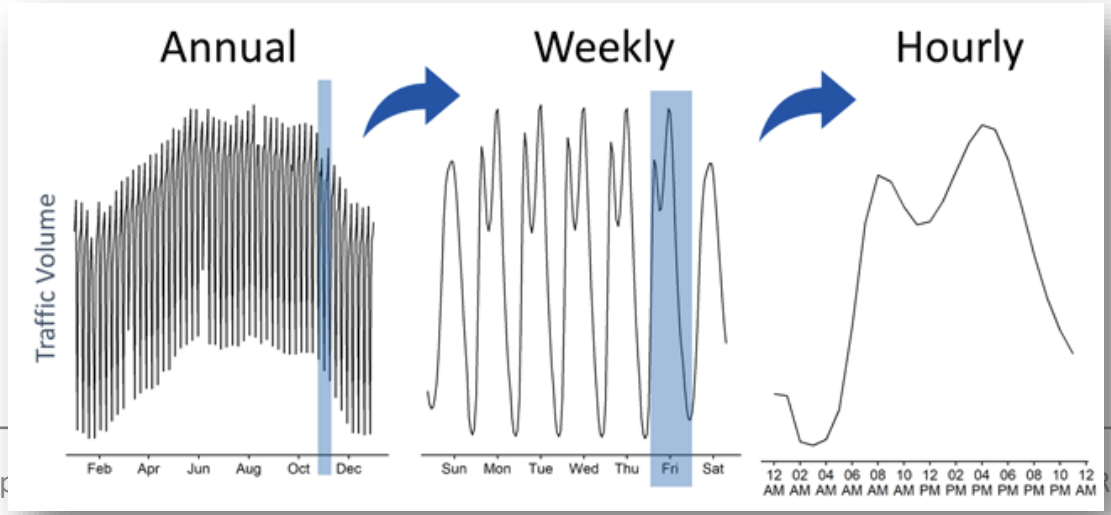
Datasets Status

Speeds

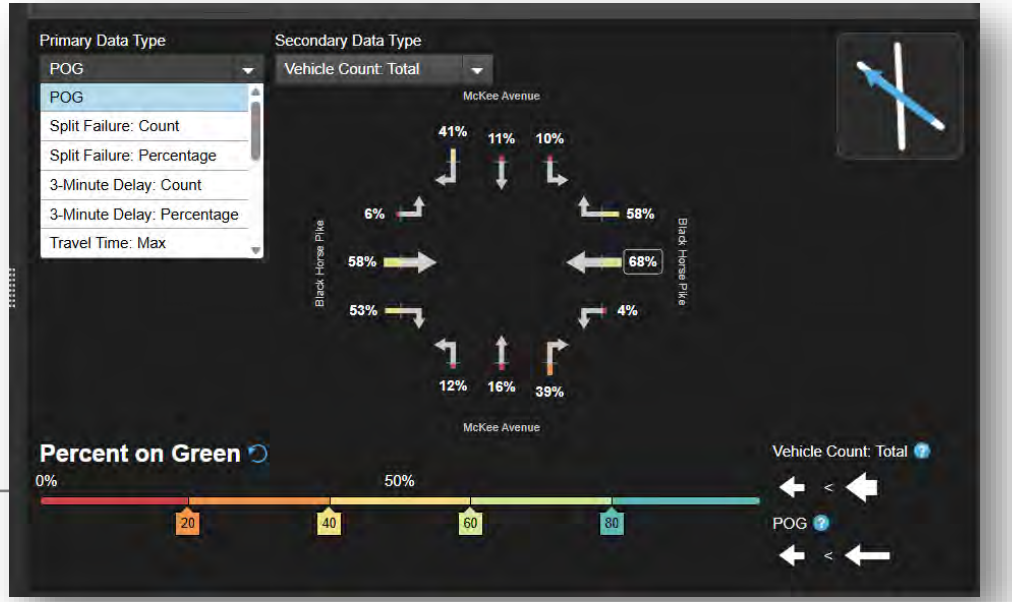


Trips (waypoints & O-Ds)

Volumes/Turning Movement Counts



Signal Performance Measures



Existing Datasets Status:

Speeds

Market Health	• Healthy, functioning market • Longest, most successful use of CV data by agencies
Pros	• Widely available via multiple vendors • Price competition, VPP/TDM has accelerated • Industry innovation – granularity, more/new roads, etc. • Validation • Multiple, mature analysis platforms
Cons	• Lack of road segment standardization • Lack of source data transparency (and changes)
Risks	• Requires adequate/stable GPS waypoint data

Existing Datasets Status:

Volumes/Turning Movement Counts

Market Health	• Emerging, promising market • Confusing, overlapping datasets offered
Pros	• Multiple vendors • Improving data quality, per TETC validations • Multiple vendors at/near FHWA AADT quality benchmarks • For some vendors, benefits from speed dataset investments
Cons	• Many more dataset types than speeds • Limited TMC validations to date • Reliant on GPS source data stability, agency count stations
Risks	• Too many dataset types hinders market development • Source data stability, Calibration Count Station dependency

Existing Datasets Status

Trips

Market Health	• Promising, but instability risk increasing • Trip truncation by source generators impacting utility
Pros	• Functioning market has been demonstrated • Multiple analytics platforms available
Cons	• ‘Quality’ trip data availability already peaked in 2023? • Source data rules leading to incomplete trip datasets • Often dataset is ONLY available via analytics platform • Results from platform not combinable or comparable
Risks	• Trip truncation renders analyses useless/inaccurate

Trip Dataset Truncation

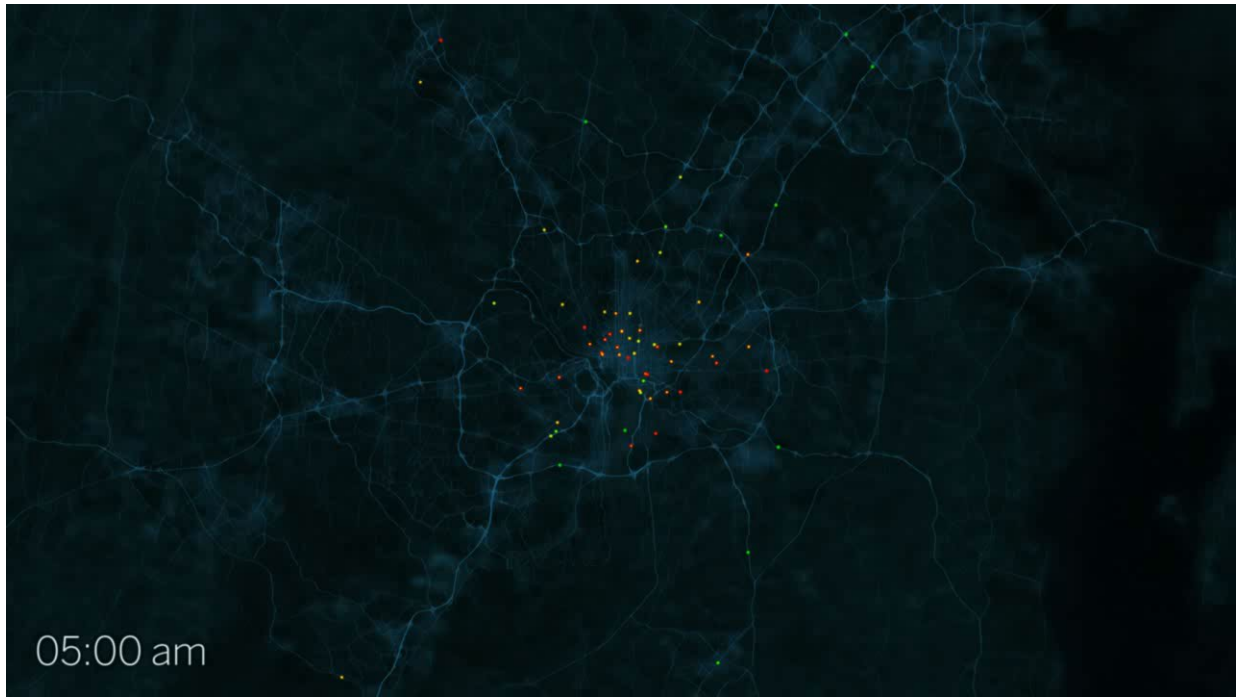
- Purest form of Trip Datasets include:
  - All possible trips provided
  - Consistent vehicle/device ID from trip to trip
  - Consistent trip ID for complete trip
  - Precise Origin/Destination (location and timestamp)
  - Precise Route: Route Path or Waypoints (location and timestamp)
- Trip Truncation is when any of the above are altered
- All vendors now truncating in some fashion – self defined, different
- Impacts vary – all degrade

Existing Datasets Status
Signal Performance Measures

Market Health	• Healthy, if nascent market • Positive case studies, provable benefits occurring
Pros	• Multiple vendors offering analytics platforms • Sufficient source data/methods employed, getting better • Potential to compare against ground truth aids trust
Cons	• No derivative datasets, limits flexibility/transparency • Modelling all intersections accurately at scale a challenge • Replicating HW-based SPMs leads to limitations (temporary?)
Risks	• Needs GPS waypoints in sufficient penetration, accuracy, and refresh rate

Emerging Datasets (three key groups)

Real-time & Archived GPS Waypoints (direct licensing)



Driving Events

Sharp Turning **Rapid Acceleration** **Hard Braking**

Imagery

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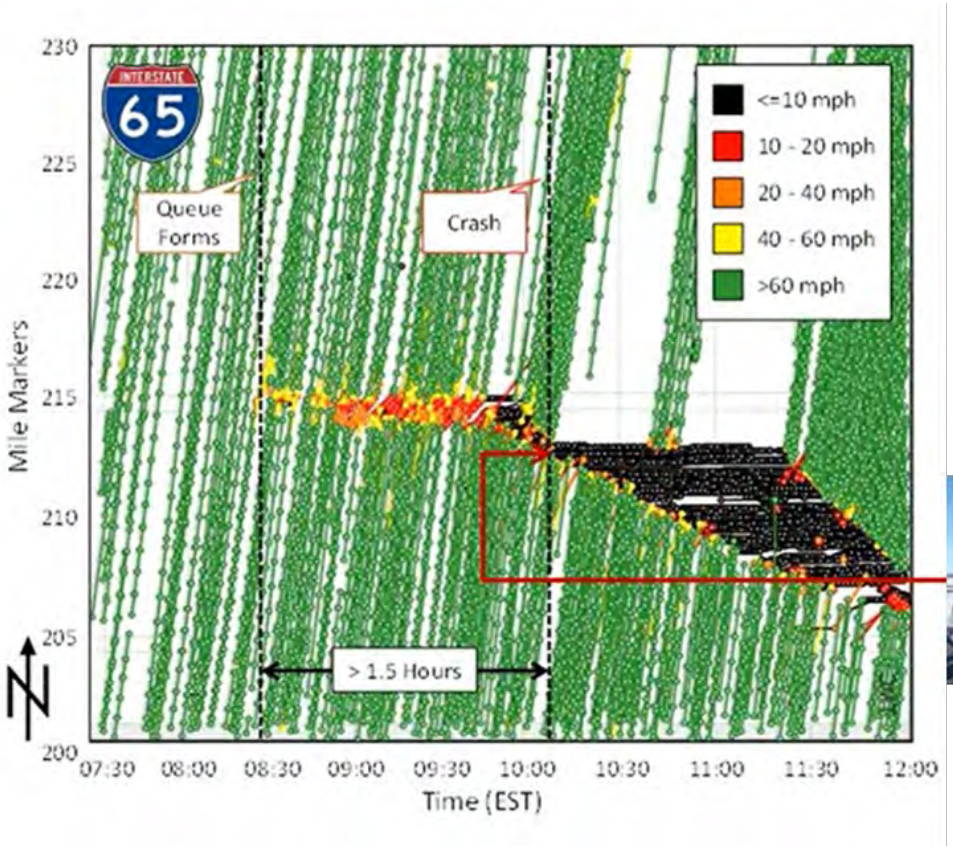
Emerging Datasets

GPS Waypoints Direct Licensing



Emerging Datasets

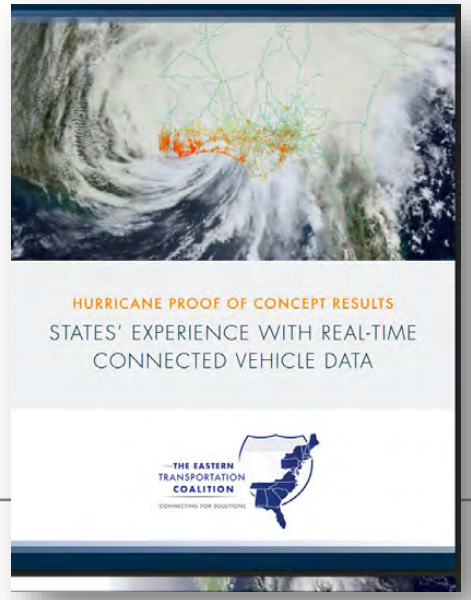
GPS Waypoints Direct Licensing

- More than just breadcrumbs
  - Engine type
  - Fuel consumption
  - Battery levels
  - Engine status
  - Sensor data
    - Blind spot monitoring
  - Odometer values
  - Lights
  - Tire pressure
- Seatbelt usage
- Transmission gear state
- Driving behavior mode
- More

Emerging Datasets

GPS Waypoints Direct Licensing (2)

- 2020-21 Coalition Project
  - Viewed a success
  - Follow-up actions identified
- Three vendors (at least) currently willing/able to license GPS waypoints scale
- Waypoints → Trajectories



- Things to Learn:
  - Value of historical datasets to assess network performance in new/innovative ways?
  - Trajectories for AI/ML training, e.g. queues, risk exposure, etc.?
  - Willingness to create scalable APIs for complexity/cost needs?
  - Actual penetration rates? Good enough, for what?
  - How close to 'real-time' possible?
  - Lane level detail?
  - Visualization vs. decision support?

Emerging Datasets
Driving Events

- Datasets have been available for evaluation for many years
- Operational licensing models yet to crystalize
- Some waypoint vendors also offer driving events
- Aggregation vs. Individual events
- Explore adding driving events to any waypoint license and proof of concept projects

- Things to Learn:
  - Value of hard braking/deceleration events?
  - What weather event data useful?
  - What requires event data vs. what can be derived via waypoints/trajectories?
  - Ability to obtain events in real-time at scale vs. historical bulk datasets?
  - How comparable or different is vendor logic for event generation?
  - Ability to compare/combine event data from different vendors?

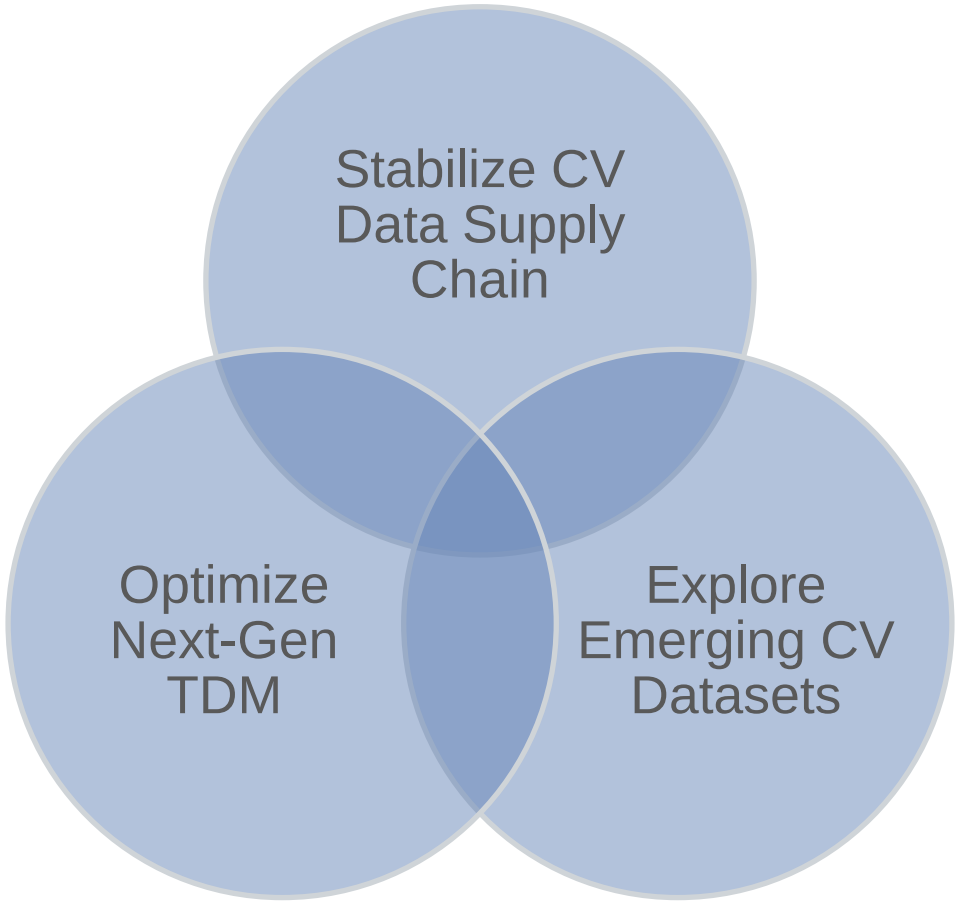
Emerging Datasets
Imagery

- Things to Learn:
  - Current penetration rate?
  - If or when the penetration rate of imagery datasets grows, what applications are enabled?
  - Suitable for real-time use?
  - Combine this data with other datasets, such as bottlenecks, queues, work zones, and the other emerging datasets (trajectories and events)?

SCOOP Project Motivation: "What More Can the Coalition Do?"

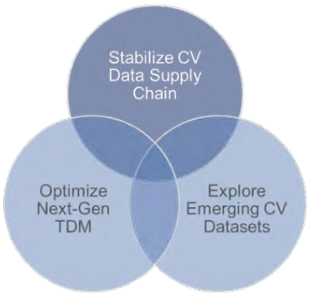
- VPP/TDM incredible foundation as an 'Enabler'
- Coalition Assets Today RE CV Data
  - Economics
  - Expertise
  - Flexibility/ (Relative) Speed
- Looking Forward
  - Expanded 'Enabling' for members
  - Get 'Pro-active' in some key areas (recognizing resource/mission constraints)

Actions for Consideration



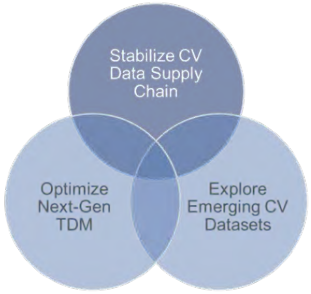
- **We Recognize:**
  - Reports like this often have long lists of to-do's
  - Resources in Coalition and Agencies are limited/busy
  - View these lists as possible actions
  - Feedback encouraged
  - Prioritization needed

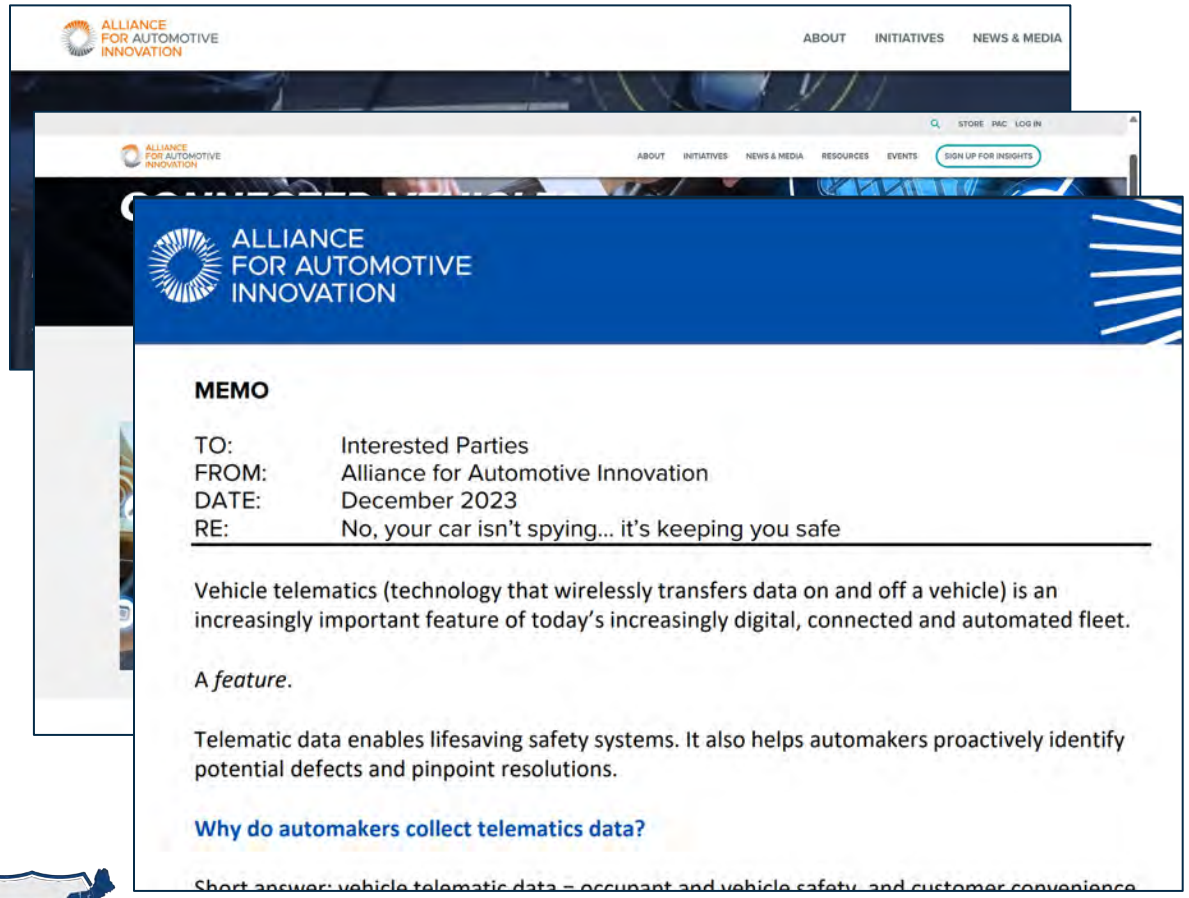
1. Stabilize CV Data Supply Chain

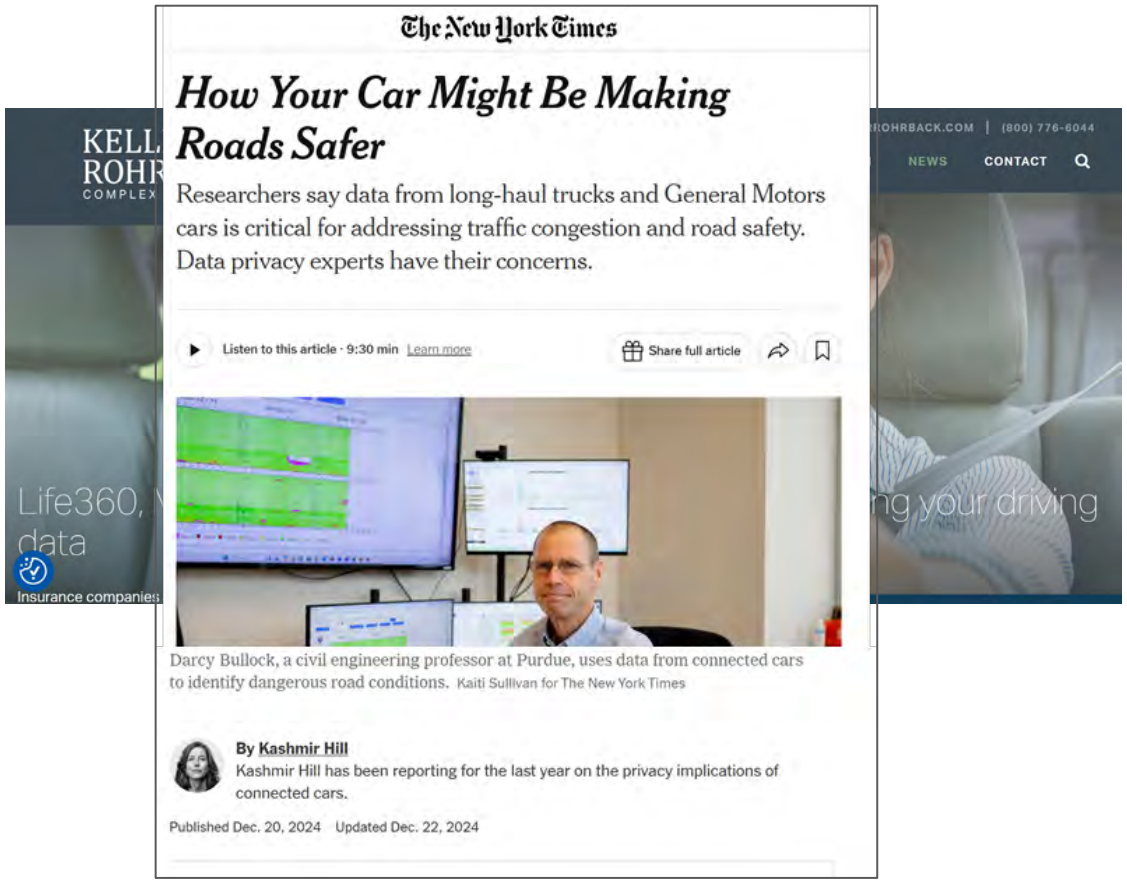


- Rationale:
  - Healthy Source Data Market, esp for GPS Waypoints, underpins all
  - More sources → more products, better quality products, better prices
  - As #1 'Buyer' Coalition has a voice…and should use it
- Potential Activities
  - Proactive Source data provider engagement…including RFI?
  - Facilitate agreement on methods to balance utility and privacy
    - GPS Waypoints
    - Trip Datasets
  - Success Stories to counter negative press/sentiment the risk supply
    - Messaging: Data for Good, Efficient Government, No Privacy Violations

What Consumers/Policy Makers See: "You are being tracked!"







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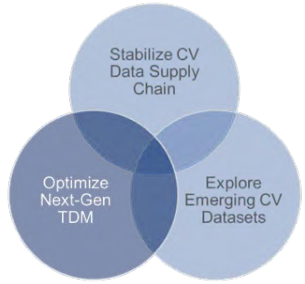
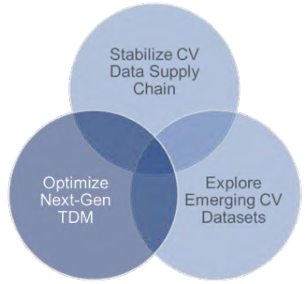
2. Optimize Next Generation TDM



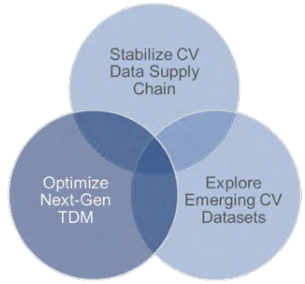
- Rationale
  - TDM and VPP have led/defined the market
  - TDM needs to evolve along with the broader CV Data market
  - Recognize Coalition's collective power, maximize it
- Themes
  - Increase Program Flexibility
  - Increase Purchasing Power
  - Facilitate cost-saving multi-state procurements
  - Maximize Transparency of Products Offered
  - Maximize acceptable use terms & conditions
  - Facilitate multi-state use-cases and product development

2. Optimize Next Generation TDM (2)



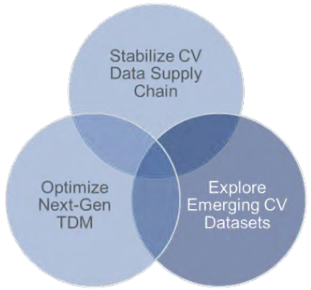
- Increase Program Flexibility
  - Shift to Qualified Products List or GSA Schedule Model
  - Increase ‘Call for Products’ frequency, annually if possible
- Increase Purchasing Power
  - Require transparent pricing models, cost reductions as purchase increases
  - Request (require) ‘most favored customer’ pricing – like GSA Schedule
  - Allow agencies outside Coalition to join
  - Encourage/enable agencies to sync purchases to unlock cost reductions
  - Clarify ‘pay for performance’ and clawback terms

2. Optimize Next Generation TDM (3)



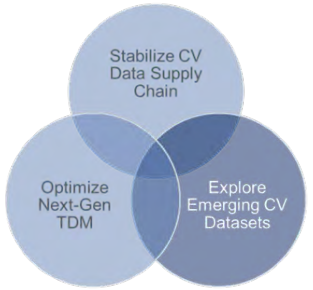
- Maximize Transparency of Products Offered
  - Continue Validation Program – critical value add in TDM
  - Require vendors to list products as validated, pre-validated, not validated
  - Require vendors to show ‘provenance’ of the underlying source data
    - Right to Use – ‘Provable Permission’
    - Stability of source(s) over master contract period duration
  - Reinforce TDM Data Use and Licensing Terms and Models
    - ‘Special Sauce’ of VPP and TDM from the beginning – DO NOT ERODE
    - Any deviations should be well documented, agreed, and communicated to agencies

3. Prove Emerging CV Datasets

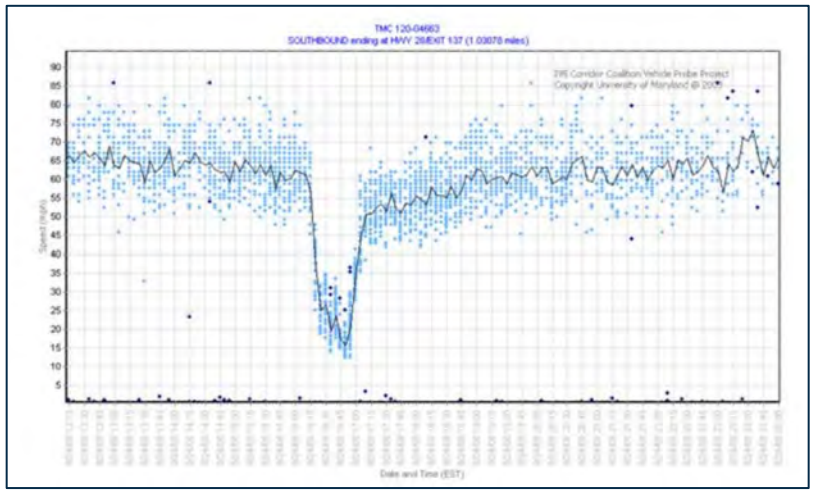


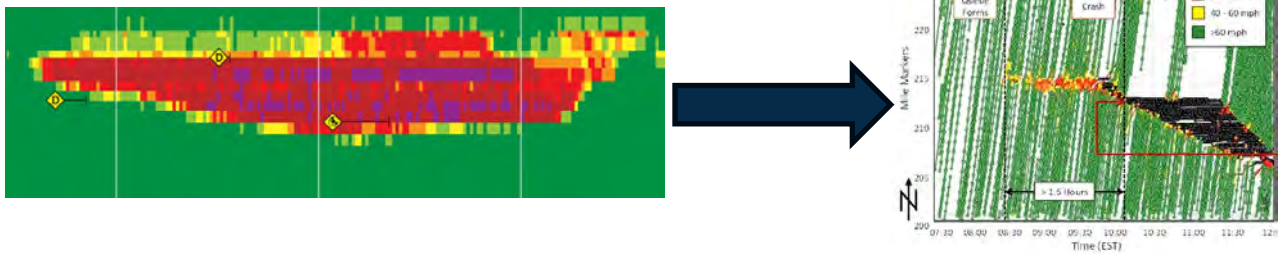
- Rationale:
  - Coalition member interest high
  - Direct source data licensing relatively new – benefits suspected, unproven
  - Ideal time in market development for collaborative experimentation
  - Could power next wave of innovation – high payoff potential
- Potential Activities
  - Waypoint/Trajectory pilots/proof of concepts (+ events if possible)
    - Historical bulk data → 'strategic road risk assessment' (next slide)
    - Create real-time simulator → build/trial new TSMO applications application development
  - Imagery
    - Monitor, support (expand upon?) NCDOT deployment

Potential New Safety Applications Esp Controlled Access Roads



- Strategic Road Risk Assessment
  - Ramp Spillback, Wrong Way Driving (?)
  - Excessive speeds/weaving
  - Speed variance (overall, by lane)
  - Illegal stopping/parking prevalence
  - Queue rates, deceleration risk
- Real-Time
  - “Virtual Drone”
- Blended
  - Queue Analytics/Predictions
  - Real-time risk exposure assessment





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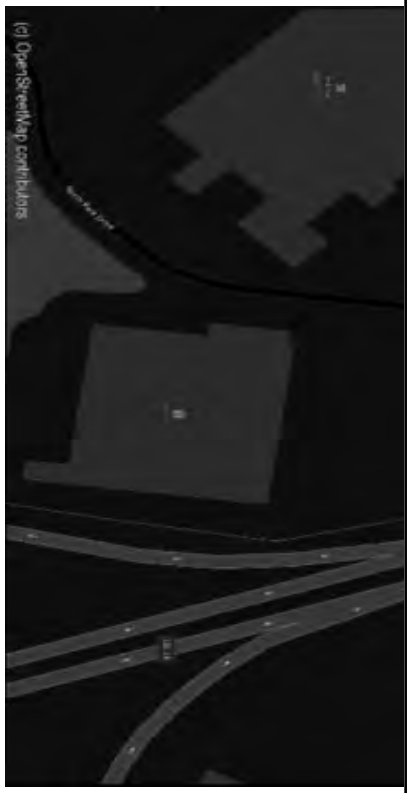
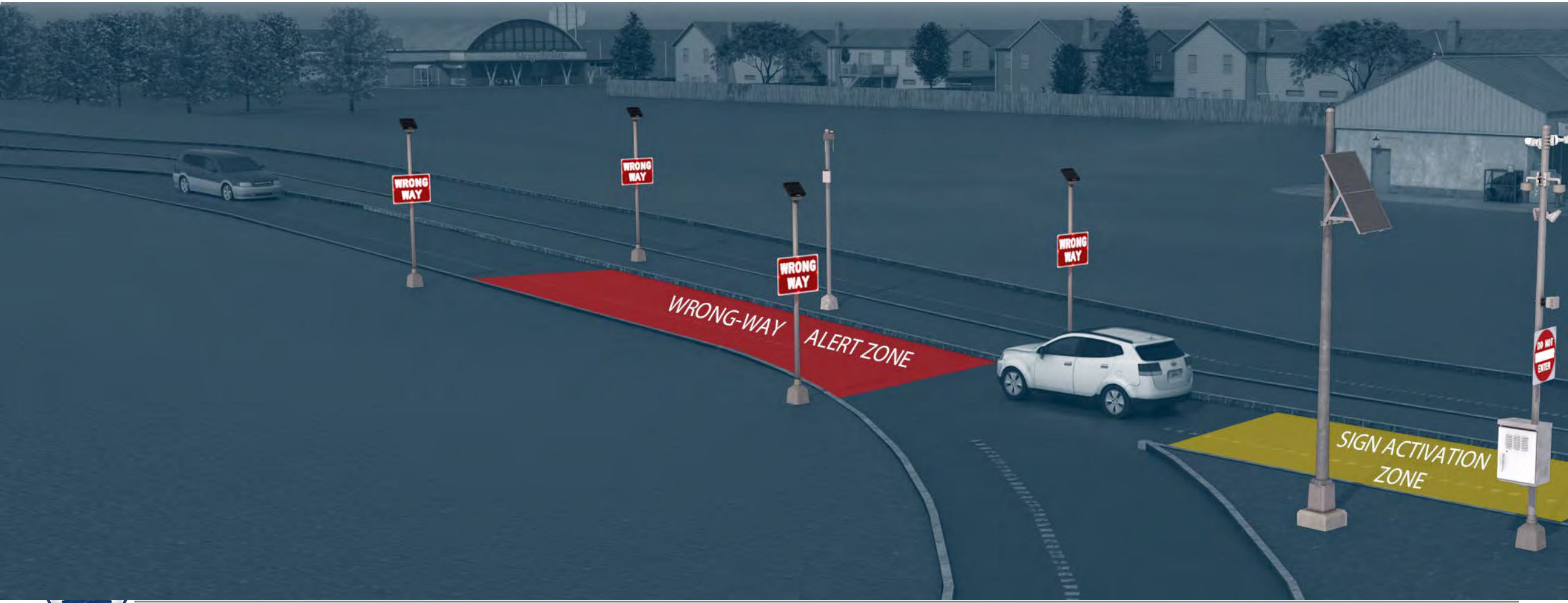
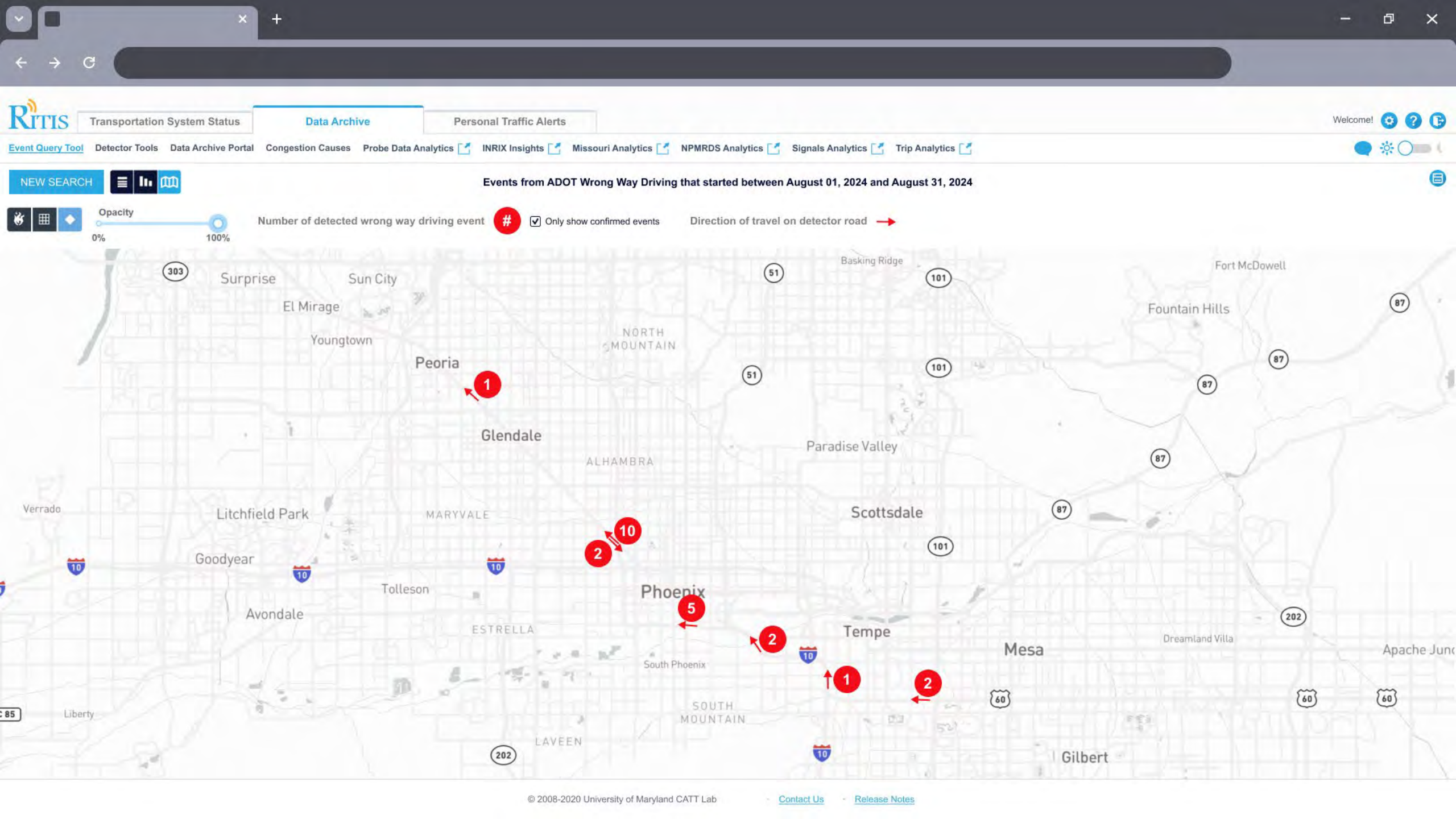
Trajectories: Real-time Mov tions

- Real-time detouring around
  - Work Zones
  - Crashes
  - Tolls
  - Enforcement
- Evacuation Monitoring
- Virtual Traffic Helicopter
- Real-time Signal Monitoring



Trajectories: Non-Infrastructure Wrong-way Driving Detection




RITIS
Transportation System Status
Data Archive
Personal Traffic Alerts
Welcome!
Event Query Tool
Detector Tools
Data Archive Portal
Congestion Causes
Probe Data Analytics
INRIX Insights
Missouri Analytics
NPMRDS Analytics
Signals Analytics
Trip Analytics
NEW SEARCH
Events from ADOT Wrong Way Driving that started between August 01, 2024 and August 31, 2024
Opacity
0%
100%
Number of detected wrong way driving event
#
Only show confirmed events
Direction of travel on detector road
Surprise
Sun City
El Mirage
Youngtown
Peoria
Glendale
NORTH MOUNTAIN
ALHAMBRA
MARYVALE
Litchfield Park
Verrado
Goodyear
Tolleson
Avondale
ESTRELLA
Phoenix
South Phoenix
SOUTH MOUNTAIN
LAVEEN
Liberty
Basking Ridge
Fort McDowell
Fountain Hills
Paradise Valley
Scottsdale
Tempe
Mesa
Dreamland Villa
Gilbert
Apache Junc
303
51
101
87
10
202
60
85
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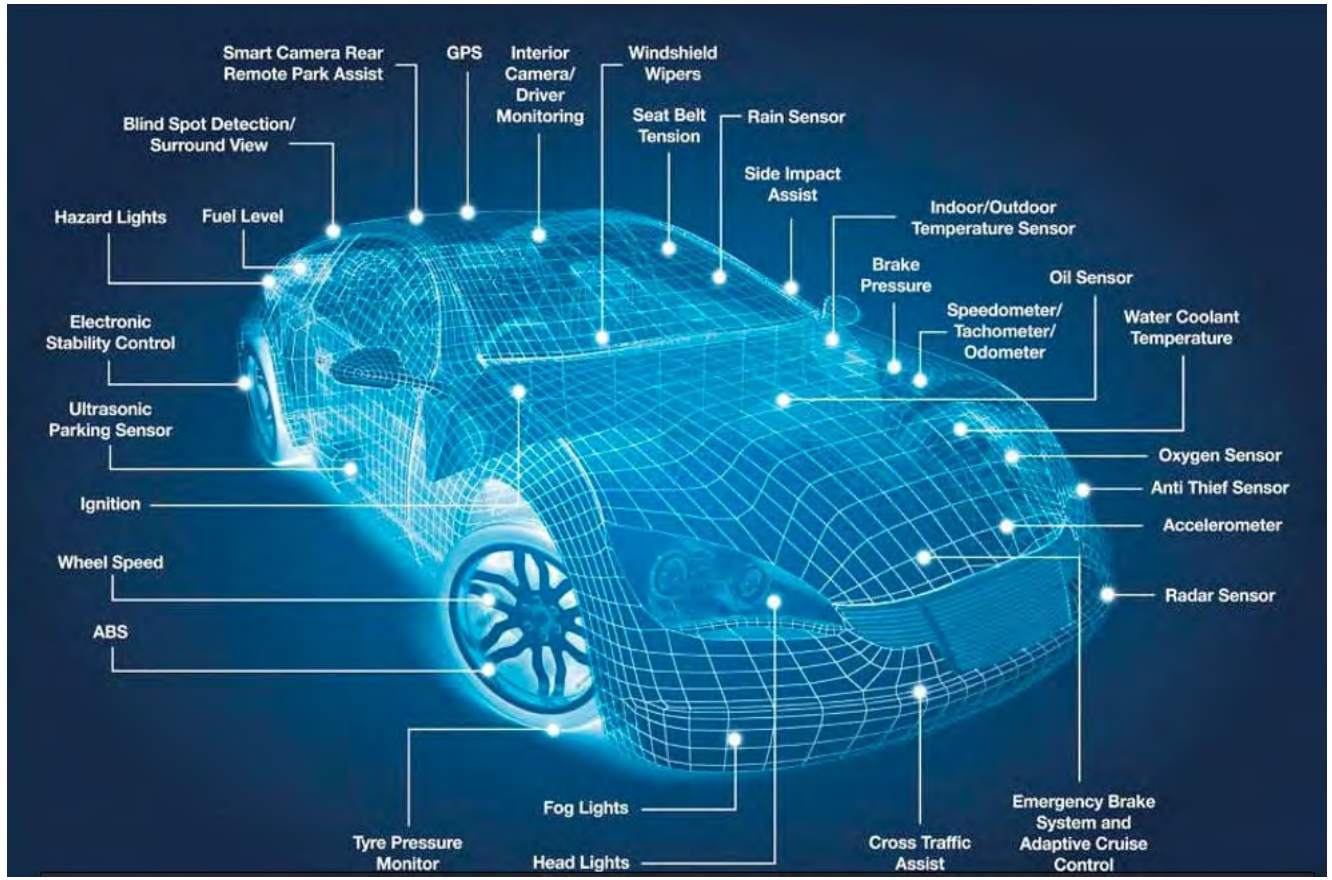
Release Notes

Trajectories: Real-time with vehicle specifics

- VIN & other vehicle characteristics
- Emissions & fuel consumption
- Predictive maintenance/safety
- Vehicle sensors (inside and out)
- Safety issues related to weather or geometries
- 150+ variables from some vendors

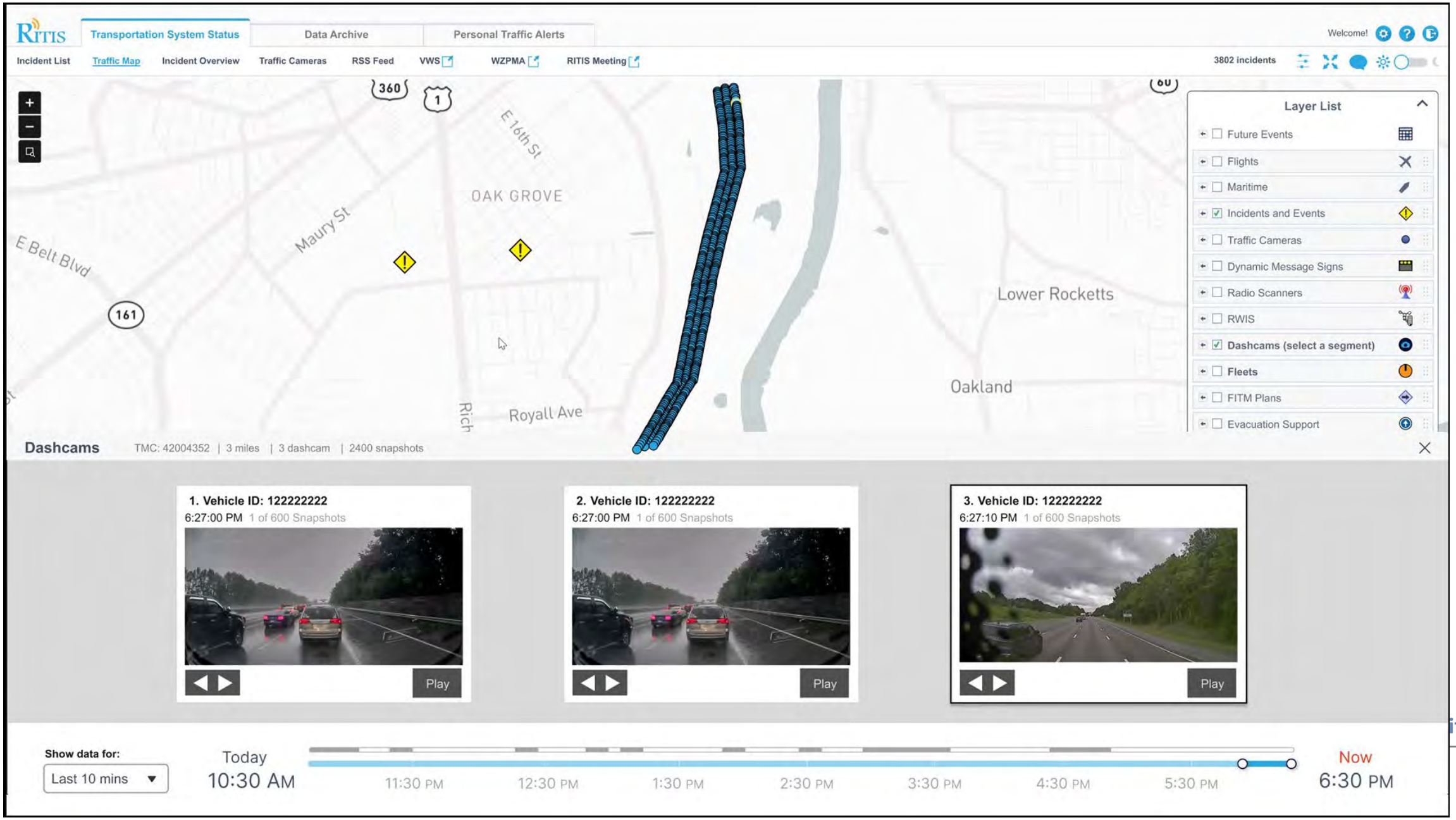


Trajectories: Safe / Unsafe Truck Parking + Locations

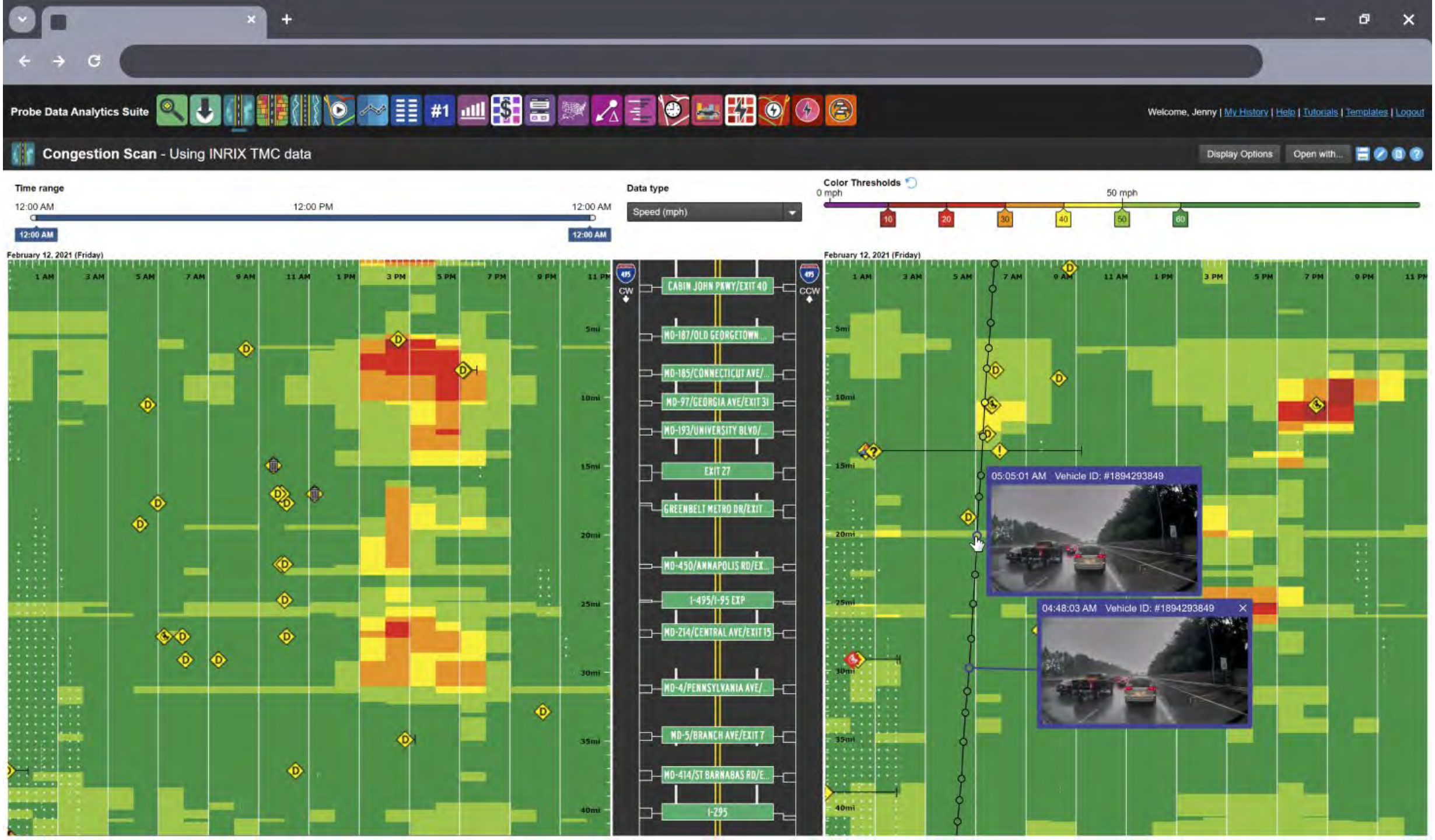
Imagery: Real-time Incident Detection or Confirmation

- Confirm remote incidents
- Confirm Waze events
- Automatically detect anomalies
  - Debris
  - Road surface conditions
  - Pedestrians
  - Crashes
- Work Zone Audits

Imagery: Real-time Incident Detection or Confirmation



Imagery: Road Condition Monitoring (near real-time and/or archived)


Probe Data Analytics Suite
Welcome, Jenny | My History | Help | Tutorials | Templates | Logout
Congestion Scan - Using INRIX TMC data
Display Options
Open with...
Time range
12:00 AM
12:00 PM
12:00 AM
12:00 AM
12:00 AM
Data type
Speed (mph)
Color Thresholds
0 mph
50 mph
10
20
30
40
50
60
February 12, 2021 (Friday)
1 AM
3 AM
5 AM
7 AM
9 AM
11 AM
1 PM
3 PM
5 PM
7 PM
9 PM
11 PM
5mi
10mi
15mi
20mi
25mi
30mi
35mi
40mi
CW
CCW
CABIN JOHN PKWY/EXIT 40
MD-187/OLD GEORGETOWN...
MD-185/CONNECTICUT AVE/...
MD-97/GEORGIA AVE/EXIT 31
MD-193/UNIVERSITY BLVD/...
EXIT 27
GREENBELT METRO DR/EXIT
MD-450/ANNAPOLIS RD/EX...
I-495/I-95 EXP
MD-214/CENTRAL AVE/EXIT 15
MD-4/PENNSYLVANIA AVE/...
MD-5/BRANCH AVE/EXIT 7
MD-414/ST BARNABAS RD/E...
I-295
February 12, 2021 (Friday)
05:05:01 AM Vehicle ID: #1894293849
04:48:03 AM Vehicle ID: #1894293849

Driving Events

- **Real-time**
  - Proactive maintenance (winter weather or dynamic speed control)
  - Faster emergency response
- **Archived / Aggregated**
  - Broader safety studies and audits

- Examples:
  - Hard Braking
  - Rapid Acceleration
  - Phone Handling
  - Lane Departures
  - Hard Cornering
  - Near Miss
  - Traction control engagement
  - Seatbelt use

Driving Events

RISKIEST ROAD SEGMENTS

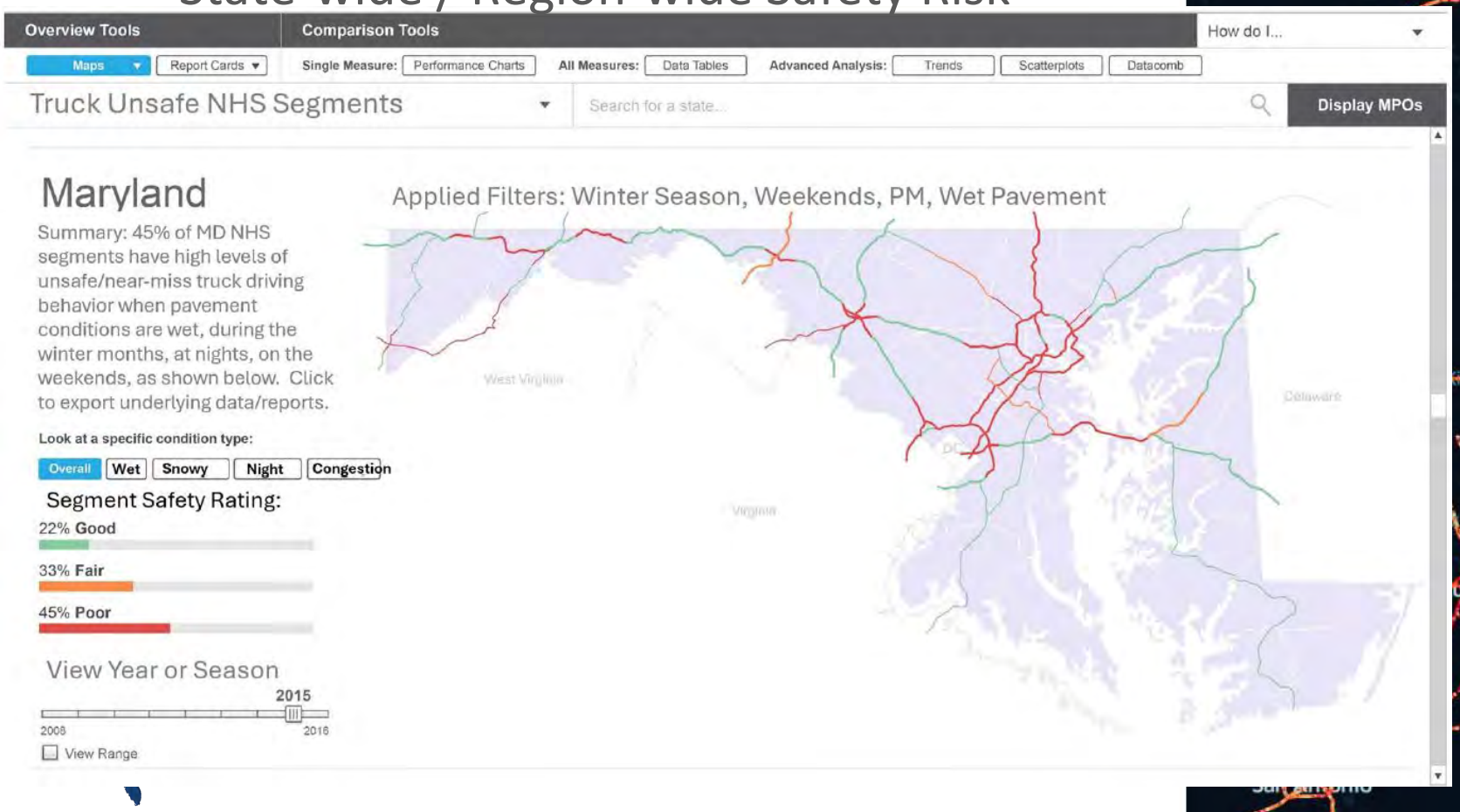
Corridor from 140th Avenue SE to 132nd Avenue SE *(South King County)*

	Braking Behavior Severity (Rank)	Acceleration Behavior Severity	Speeding	VRU Crash Risk	Crashes (Since 2020)	Total Risk Score:
BEFORE SE 158TH ST.	⚠⚠⚠	⚠⚠⚠	*(8-10 MPH)* ⚠⚠⚠⚠	⚠⚠⚠⚠⚠	⚠⚠⚠⚠	**19**
FAIRWOOD GOLF	⚠⚠⚠⚠⚠	⚠⚠⚠⚠	*(10+ MPH)* ⚠⚠⚠⚠⚠		✓	**15**
SE 192ND ST.	⚠⚠⚠⚠	⚠⚠⚠⚠⚠	*(8-10 MPH)* ⚠⚠⚠⚠		⚠⚠	**15**
SE 240TH ST.	⚠⚠⚠	⚠⚠⚠⚠⚠	*(5-7 MPH)* ⚠⚠		⚠⚠⚠⚠⚠	**15**
SE 272ND ST.	✓	✓	*(7-8 MPH)* ⚠⚠⚠	⚠⚠⚠⚠⚠	⚠⚠	12
NORTHERN CURVE	⚠⚠	⚠⚠⚠⚠	*(7 MPH)* ⚠⚠⚠		⚠⚠	11
SE 200TH ST.	⚠⚠⚠⚠⚠		*(4-5 MPH)* ✓		✓	7
SE 266TH ST.	⚠⚠⚠		*(7-8 MPH)* ⚠⚠⚠		✓	7

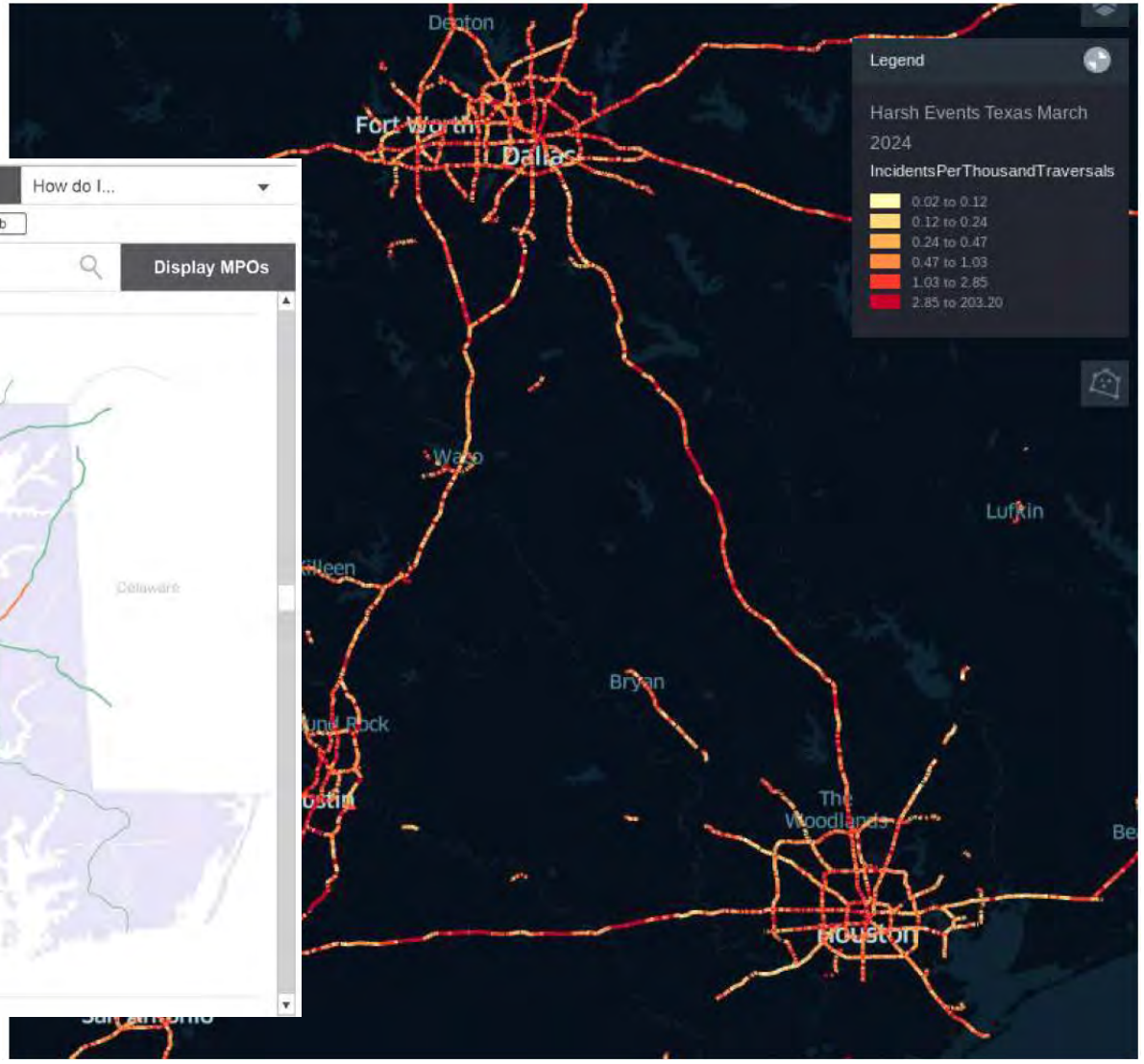
EVENTS — SPEED — CRASH RISK

Driving Events: Freight-only or Passenger Vehicles

State-wide / Region-wide Safety Risk



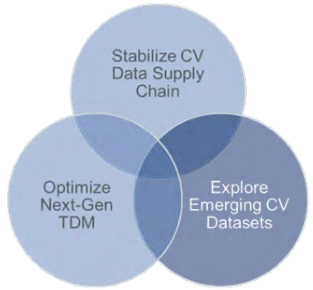
Frequency of Harsh Events in March



Promising Data Suppliers

- Real-time Trajectories
  - Compass IoT
  - Arity (with some caveats)
- Imagery = Vizzion
- Driving Events
  - Arity (with some caveats)
  - CMT
  - Compass IoT (certain OEMs only)

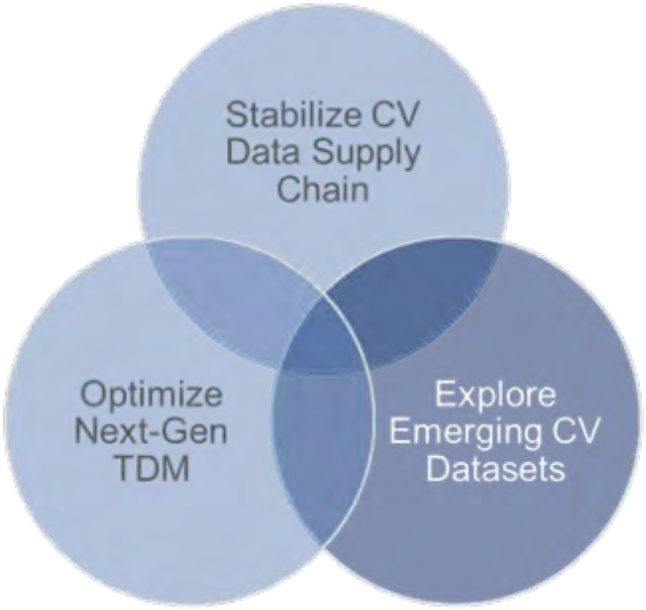
Summary: Focus on Limited Access Roads.



- High Volume Roads, Low Mileage
  - USA: 1.6% of Roads, 35%+ of VMT
  - Coalition: 1.8% of Roads, 33% of VMT
- Lowest Privacy Expectations
  - No Addresses
  - No Origins or Destinations
- Optimal Solutions Environment
  - Known expected performance characteristics
  - Cleanest data
  - Most data per mile

Summary:

- Focus on these untapped data sets
  - Vehicle Imagery
  - Real-time Telemetry
  - Driving Events
- Determine which use-cases are the most appealing from multiple agencies
- Push for the best terms of use
- Advocate & educate for safe, privacy-protected usage that benefits the public

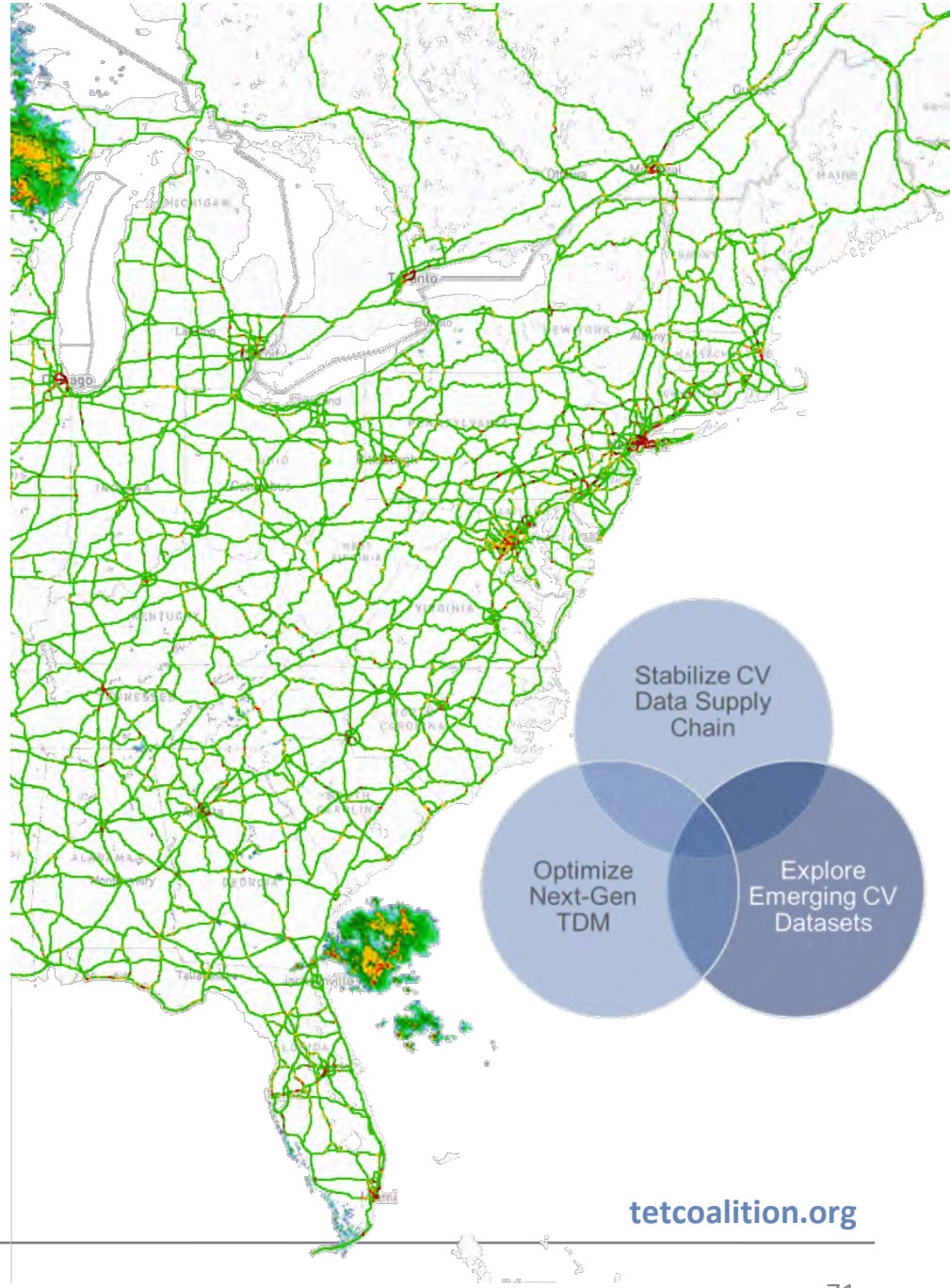


Summary:

- Replicate the Successes of 2008 Coalition Vehicle Probe Data Moonshot

- Bigger is better: why?
  - Strength in Numbers
  - Greater Change of Success with More Users, Brainpower, & Focus
  - Cost Savings in Data Purchase
  - Cost Savings in Use-Case Build-out

- Multi-state procurement / Pooled Fund
- Multi-state use-case(s)



THE EASTERN TRANSPORTATION COALITION

CONNECTING FOR SOLUTIONS

Open Discussion

Sheryl Bradley
TSMO Program Director

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