



National
Transportation
Safety Board
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Highway Investigations Involving Automotive Technologies

Leah Walton - Safety Advocate

Minnesota Toward Zero Deaths Conference

November 14, 2023

NTSB Mission

AVIATION



MARINE



HIGHWAY



RAILROAD



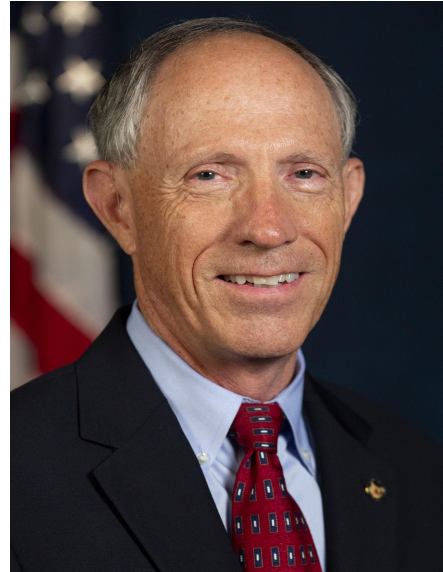
PIPELINE



NTSB Board Members



Honorable
Jennifer Homendy
Chair



Honorable
Bruce Landsberg



Honorable
Michael E. Graham



Honorable
Thomas B. Chapman

NTSB Focus on Safety

We focus solely on safety,

to make recommendations that could help to prevent the next accident.

- We do not determine blame or liability.
- We do not investigate intentional criminal acts.



NTSB Investigative Process

On-Scene



Go Team
Groups & Parties
Family Briefings
Media Briefings
News Releases

Fact Gathering



Preliminary Report
Investigative
Updates

Public Hearing



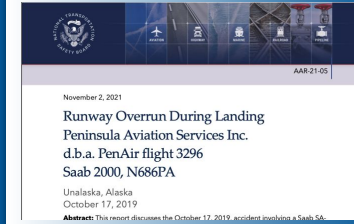
Depositions
Witnesses
Docket Opening
CVR Transcript

Board Meeting



Findings
Conclusions
Probable Cause
Safety Rec's

Final Report Release



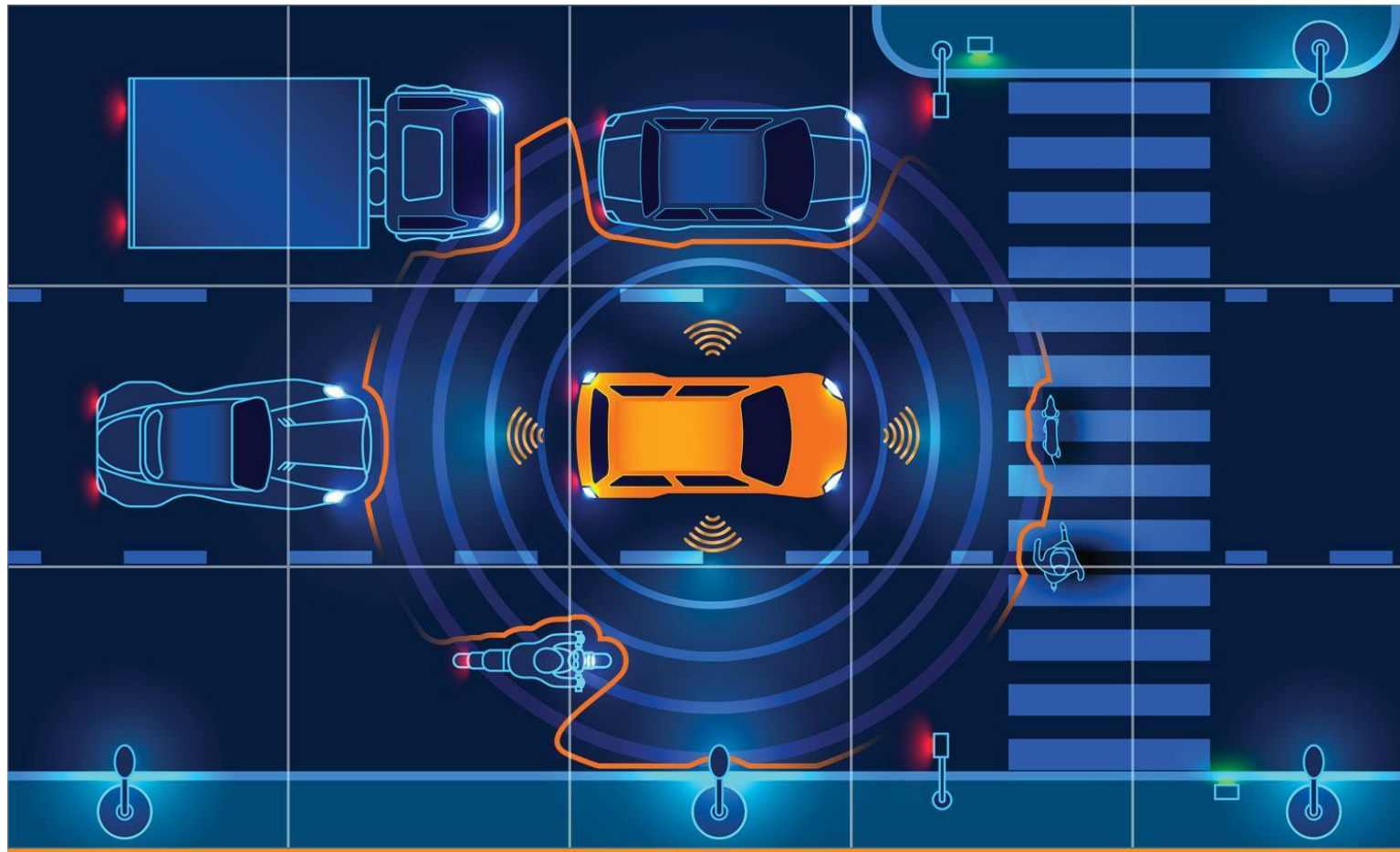
Published
2-4 Weeks After
Board Meeting

Beyond the Investigation



Track Progress
of Safety Rec's
Safety Advocacy

Investigation Timeline: 12-24 months



NTSB 2021-2022
MWL
MOST WANTED LIST

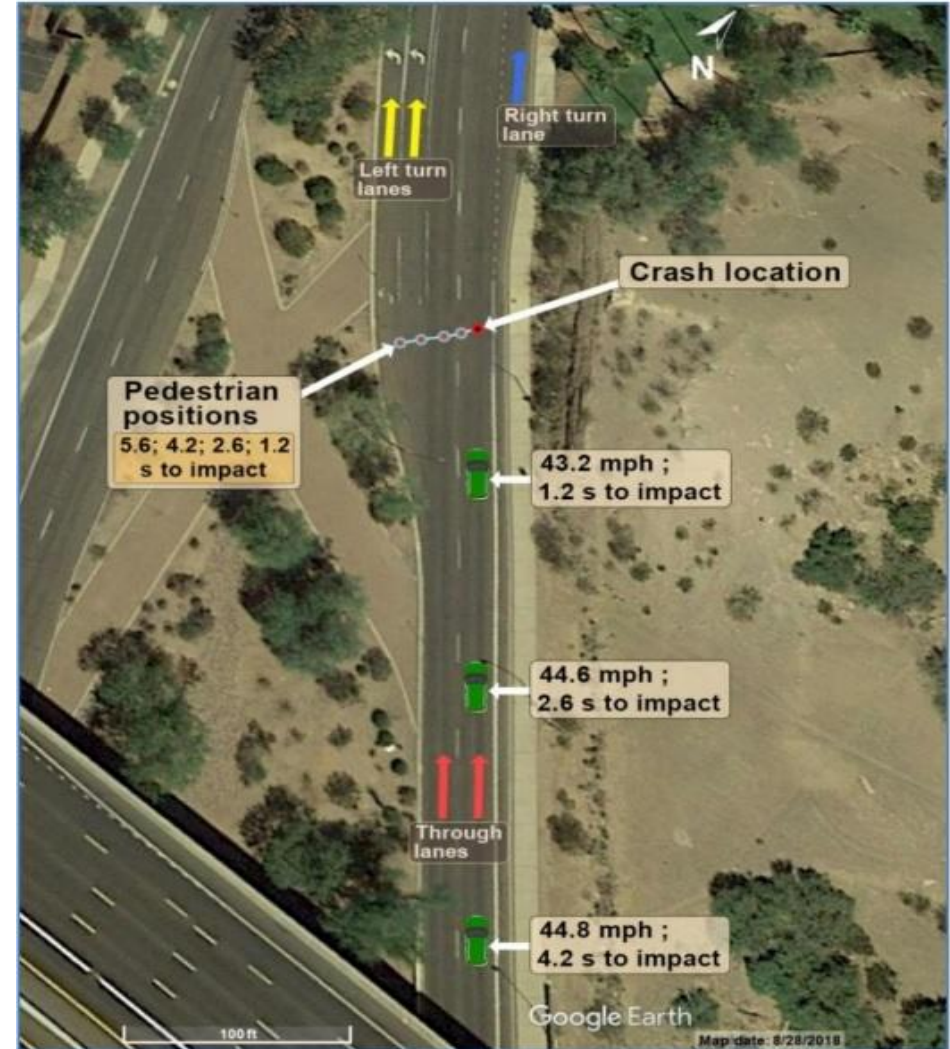
Require Collision-Avoidance and Connected-Vehicle Technologies on All Vehicles



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Tempe, Arizona
March 18, 2018

What Happened



Why it Happened: Safety Issues

- The failure of the vehicle operator to monitor the driving environment and the operation of the automated driving system because she was visually distracted throughout the trip by her personal cell phone.
- Uber Advanced Technologies Group's
 - (1) inadequate safety risk assessment procedures,
 - (2) ineffective oversight of vehicle operators, and
 - (3) lack of adequate mechanisms for addressing operator's automation complacency—all a consequence of its inadequate safety culture.

NTSB Safety Recommendations

To the State of Arizona

Require developers to submit an application for testing automated driving system (ADS)-equipped vehicles that, at a minimum, details a plan to manage the risk associated with crashes and operator inattentiveness and establishes countermeasures to prevent crashes or mitigate crash severity within the ADS testing parameters. (H-19-49)

Establish a task group of experts to evaluate applications for testing vehicles equipped with automated driving systems ... before granting a testing permit. (H-19-50)

To Uber Technologies, Inc., Advanced Technology Group (now Aurora)

Complete the implementation of a safety management system for automated driving system testing that, at a minimum, includes safety policy, safety risk management, safety assurance, and safety promotion. (H-19-52)

<https://www.nts.gov/investigations/accidentreports/reports/har1903.pdf>



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Mountain View, California March 23, 2018

What Happened



Figure 4. Northbound view of US-101 depicting Tesla postcrash fire. (Source: witness S. Engleman)

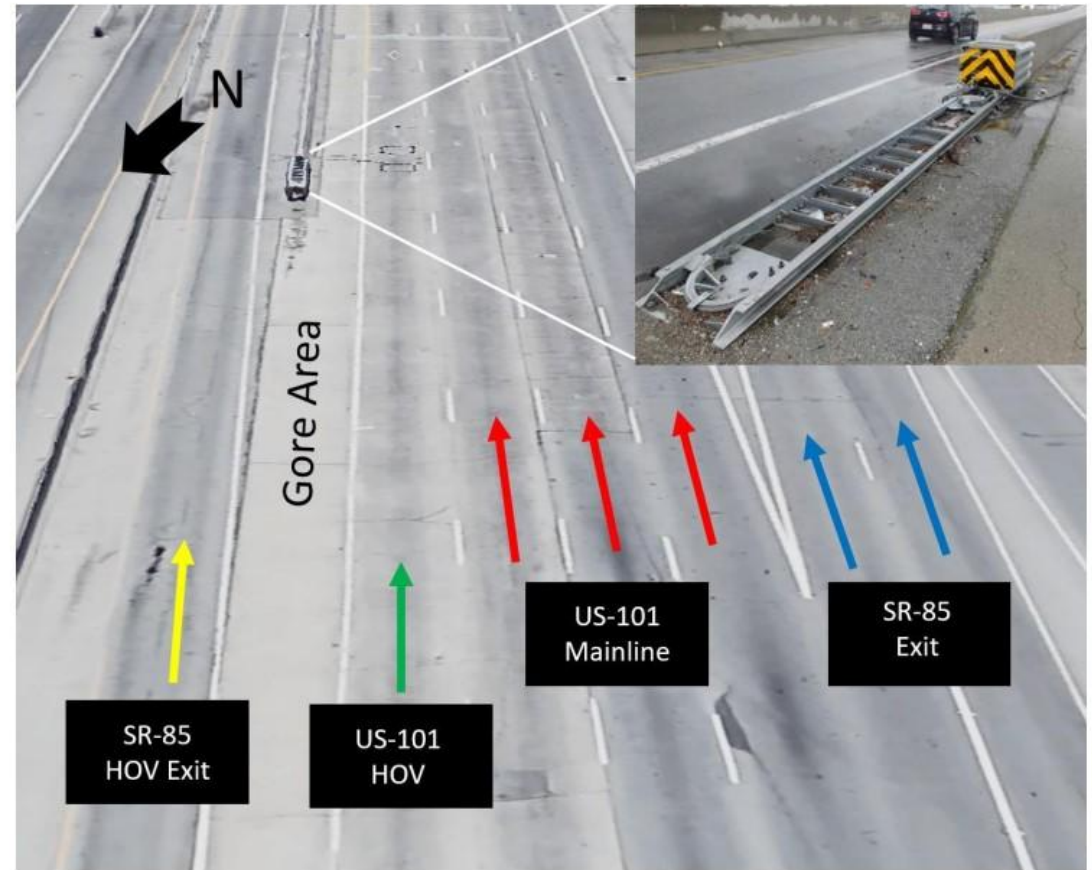


Figure 2. Depiction of travel lanes and gore area at the US-101–SR-85 southbound interchange. Inset photo depicts precrash damaged condition of the crash attenuator. (Source: Google Earth, image date March 2018. Inset photo provided by California Department of Transportation [Caltrans]; image date March 20, 2018).

Why it Happened: Safety Issues

- Driver distraction
- Risk mitigation pertaining to monitoring driver engagement
- Risk assessment pertaining to operational design domain
- **Limitations of collision avoidance systems**
- **Insufficient federal oversight of partial driving automation systems**
- Need for event data recording requirements for driving automation systems, and
- Highway infrastructure issues

NTSB Safety Recommendations

To NHTSA

Expand New Car Assessment Program testing of forward collision avoidance system performance... (H-20-1)

Evaluate Tesla Autopilot-equipped vehicles to determine ... unreasonable risk to safety... (H-20-2)

For vehicles equipped with Level 2 automation ... develop performance standards for driver monitoring systems... (H-20-3)

To OSHA

Review and revise your distracted driving initiatives to increase employers' awareness of the need to develop strong cell phone policy prohibiting the use of portable electronic devices while driving. (H-20-5)

<https://www.nts.gov/investigations/AccidentReports/Reports/HAR2001.pdf>



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Mt. Pleasant Township, Pennsylvania

January 5, 2020

What Happened



Why it Happened: Safety Issues

Speeding and Vehicle Technology

- Excessive speed for wet road conditions for the motorcoach and the two UPS trucks.
- Lack of standards for commercial vehicle collision avoidance and mitigation systems to enhance safety.
- Lack of onboard video event recorder systems on commercial motor vehicles.

NTSB Safety Recommendations

To the NHTSA:

Require that **all buses and trucks over 10,000 pounds** gross vehicle weight rating **be equipped with onboard video event recorders** ... (H-22-3)

Develop performance standards for advanced speed-limiting technology, such as variable speed limiters and intelligent speed adaptation devices, for heavy vehicles, including trucks, buses, and motorcoaches. (H-12-20)

To the FMCSA:

Provide guidance to motor carriers to proactively use the onboard video event recorder information to aid in driver training and ensure driver compliance with regulatory rules essential for safe operation. (H-22-4)

NTSB Safety Recommendations

To the American Trucking Association, the Owner-Operator Independent Drivers Association, the Commercial Vehicle Safety Alliance, the American Bus Association, the United Motorcoach Association, the Transport Workers Union of America, the Amalgamated Transit Union, and the International Brotherhood of Teamsters:

Inform your members about the importance of drivers reporting faults concerning advanced safety features, such as automatic emergency braking, in the optional section of the driver vehicle inspection report form (if they are not already identified on the form). (H-22-9)

To FedEx Ground Package System and United Parcel Service of America:

Require your drivers to report faults concerning advanced safety features, such as automatic emergency braking, in the optional section of the driver vehicle inspection report form (if they are not already identified on the form). (H-22-11)

NTSB Safety Recommendations

To the American Bus Association and the United Motorcoach Association:

Encourage your members to **ensure that any onboard video system in their vehicles provides visibility** of the driver and of each occupant seating location, visibility forward of the vehicle, optimized frame rate, and low-light recording capability. (H-15-2)

To the Commonwealth of Pennsylvania

Seek authority to allow speed safety cameras to be used on the Pennsylvania Turnpike outside of active work zones. (H-22-7)

To the Pennsylvania Turnpike Commission:

Implement the use of variable speed limit signs or other similar technology to adjust statutory speeds based on real-time information regarding weather and road conditions. (H-22-8)

[nts.gov/investigations/AccidentReports/Reports/HIR2201.pdf](https://www.nts.gov/investigations/AccidentReports/Reports/HIR2201.pdf)

So, Now What?

What You Can Do

- Promote usage of existing collision-avoidance and connected-vehicle technologies available now
- Use NTSB Safety Recommendations as best safety practices and implement them when possible
- Advocate for NTSB Safety Recommendations to improve legislation for road safety
- Share NTSB resources with decision-makers
- Stay connected with NTSB

How NTSB Can Help You

- Provide resources
- Support state coalitions
- Write Op-Eds or contribute to articles
- Monitoring impaired driving prevention legislation for changes
- Testify on behalf of legislation in line with safety recommendations
 - Or send written testimony



NTSB V2X Video Series



NTSB | MOST WANTED LIST VIDEO SERIES

V2X

Preserving the Future of Connected-Vehicle Technology

Connected-vehicle technology: where are we today and what does the future look like?

In our four-part video series, we talk with experts in government, industry, and academia about the safety benefits and the maturity level of V2X technology, the reasons for its scarce deployment, and the impact of the FCC's recent actions to limit the spectrum available for transportation safety.

Hosted by NTSB Board Member **Michael E. Graham**

Available on [ntsbt.gov/v2x](https://www.ntsbt.gov/v2x)



We can't wait any longer!

We must move toward the broad deployment of V2X technology to achieve significant safety benefits.

- FCC regulatory actions substantially limit the spectrum available for transportation safety and allow for harmful interference from unlicensed Wi-Fi devices.
- Regulatory uncertainty is the primary reason for the lack of V2X deployment.

NTSB | MOST WANTED LIST VIDEO SERIES V2X: Preserving the Future of Connected-Vehicle Technology

To learn more about the status of V2X deployment, watch our series:




- EPISODE 1: V2X Overview, Effectiveness Research, and Wi-Fi Interference
- EPISODE 2: Impact of FCC Actions and Global Advancements
- EPISODE 3: Infrastructure Deployment and State DOT Perspective
- EPISODE 4: Obstacles to Deployment – GM and Toyota Perspective




FEATURED ORGANIZATIONS

- US Department of Transportation, Intelligent Transportation Systems (ITS) Joint Program Office
- National Highway Traffic Safety Administration
- University of Michigan Transportation Research Institute
- American Association of State Highway and Transportation Officials
- ITS America
- Georgia DOT
- Toyota
- General Motors

AVAILABLE AT
[ntsbt.gov/v2x](https://www.ntsbt.gov/v2x)

The NTSB investigates aviation, marine, and rail accidents; highway crashes; and hazardous pipeline events and issues safety recommendations to save lives. www.ntsbt.gov

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Safety Compass

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