

What's Driving All This Change?

Connected and Automated Vehicles

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Think  Forward






Every week we hear a story in the news about **connected vehicles, automated vehicles, or self-driving cars** and how these vehicles will **transform mobility** in the United States.



Definitions

Automated Vehicle Technology

Automated Vehicle (AV) technology allows vehicles to operate with limited or no human involvement, using onboard sensors to gather information about their environment.

LEVEL	Description	
0	Driver guidance and assistance applications; human control required.	
1	Automation of individual driver functions; human performs other functions.	
2	Automation of multiple driver functions; human performs other functions.	
3	Limited self-driving capability; human drives in complex situations.	
4	Fully autonomous operation from origin to destination	

Explanation of the five levels of vehicle automation recognized by NHTSA

Ready or Not – Elements of Automated Vehicle Functionality Have Already Arrived



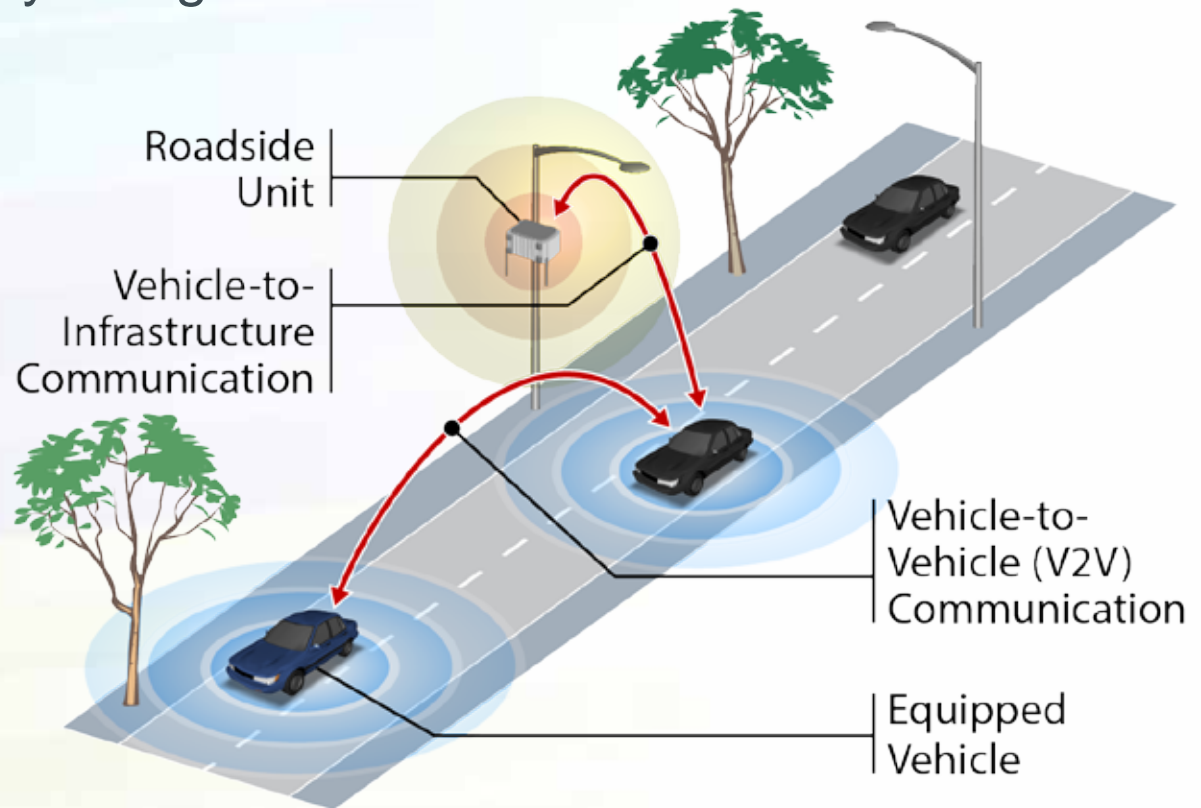
Joshua Neally was driving his week-old Tesla Model X electric utility vehicle home from work in Missouri. He began to suffer sudden heart attack symptoms of severe chest pain. He had pre-programmed the nearest Emergency Room into Tesla's Autopilot beta software, and by selecting that location, the car navigated 20 miles of highway for him, and he was able to re-take control near the exit, and make it to the ER.



Definitions

Connected Vehicle Technology

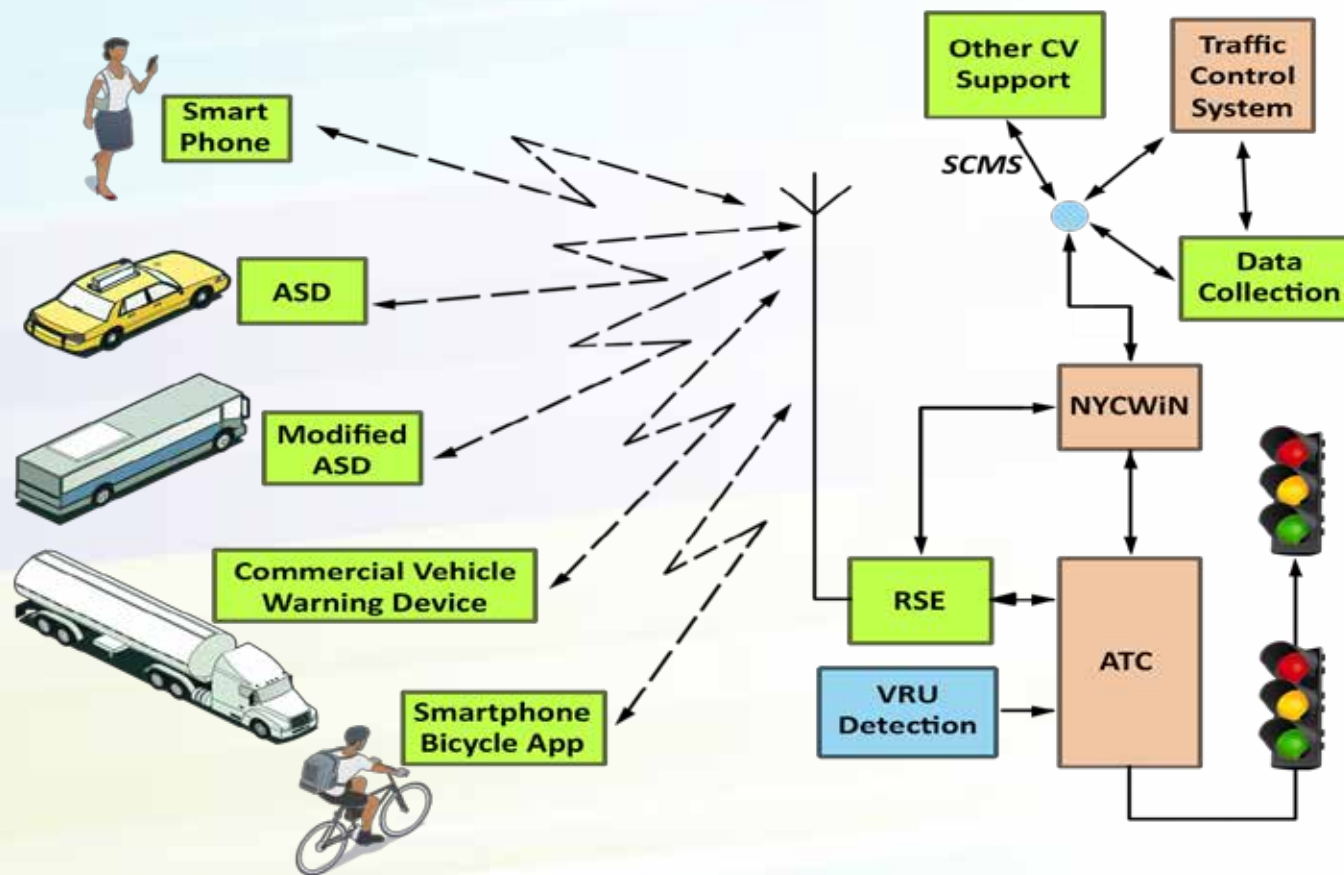
Connected Vehicles (CVs): technology that provides driver assistance functions by using wireless communications with other vehicles and infrastructure to gather information about their environment.



Overview of CV technology

USDOT is Leading the Development of Connected Vehicle Technology

NYC CV Pilot Deployment Concept



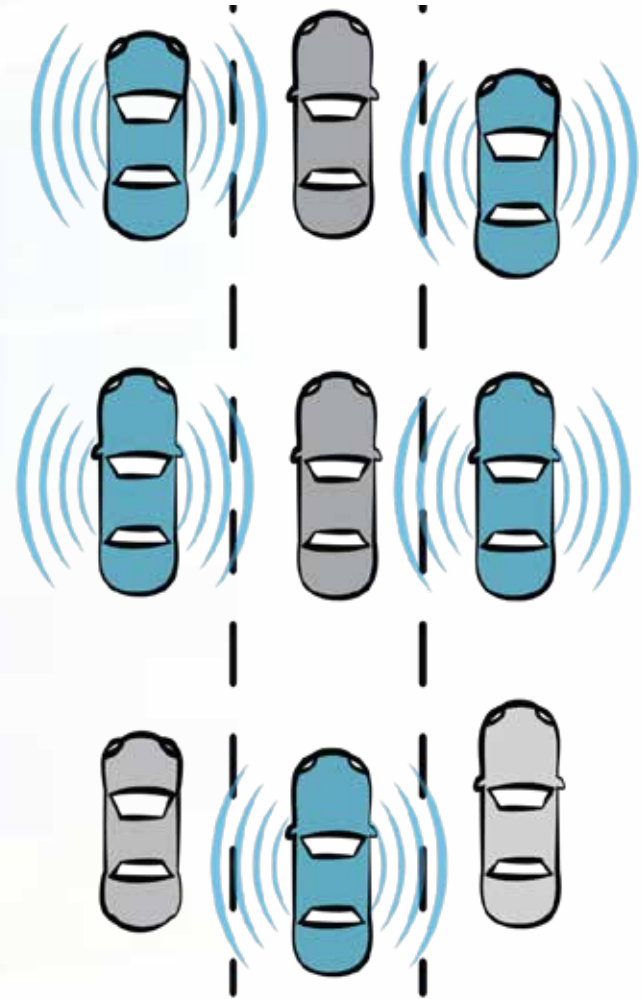
Don't get caught up in choosing sides
or thinking one way is better than another.

The Future will be
Connected
AND
Automated
(C/AV)



When the majority of the fleet is both **connected and automated**, there will be significant decreases in crashes, resulting in **significant increases in safety and reliability**.

Vehicle spacing on roadways will be safely reduced on a large scale



Capacity Expansion Could Be a Thing of the Past

Near-Term C/AV Technology Example: Truck Platooning



Truck Platooning Example

Planning for the I-710 Dedicated Truck Lanes

- Project Lead: LA Metro & Gateway Cities COG
- Connected Corridor from ports to downtown LA
- Regional mesoscopic model runs were developed which accounted for decreased truck spacing on the I-710 corridor
- ConOps and Corridor Plan
- Project list and long-term Implementation Plan

Truck Platooning
and the proposed I-710 Freight Corridor

PLATOONING BASICS
A platoon is a series of trucks following each other on the road, with accelerators and braking controlled automatically (steering is still manual). When one truck slows down, the others behind it also slow down, and when one truck accelerates, the others behind it also accelerate. This allows for much closer following distances, which reduces wind resistance and increases the number of trucks that can fit on the road at the same time, thereby increasing roadway capacity.

Without Platooning
Large gaps are needed around the trucks to allow for enough time to slow down or accelerate.

With Platooning
Automatic control means that trucks can follow each other much more closely, reducing the need for large gaps.

BENEFITS

- Less Congestion**
Capacity improvements result in less delay and faster travel time overall.
- Cost Savings**
Typical fuel savings average 5-15% for all trucks which platooning.
- Improved Safety**
Automated control of braking and accelerating reduces total stopping and starting time.
- Enhanced Driver Comfort**
Platooning technology takes much of the guesswork out of driving.

I-710 FREIGHT CORRIDOR
A dedicated four-lane freight corridor parallel to the I-710 freeway is currently proposed as part of the Gateway Cities Strategic Transportation Plan. Current estimates for the proposed truck-city facility would be completed by 2025. Key characteristics of the proposed system are indicated below.

- One proposed (and one existing) toll plaza
- Interchange with I-710
- Interchange with I-5
- Interchange with I-10
- Interchange with I-210
- Interchange with I-405
- Interchange with I-15
- Interchange with I-405
- Interchange with I-10
- Interchange with I-210
- Interchange with I-405
- Interchange with I-15

Your feedback is crucial to providing the most relevant and useful I-710 freight corridor possible.
Visit <https://www.surveymonkey.com/r/14-platooning> to fill out a survey today. (takes approx. 10-15 minutes)

Truck Platooning Example

Legislative Changes for C/AV

- Many states have “Anti-Convoy” laws that preclude truck platooning
- California’s Anti-Caravanning Law requires a minimum spacing of 100 feet.
 - » Law was recently amended to allow for shorter headways for testing purposes only

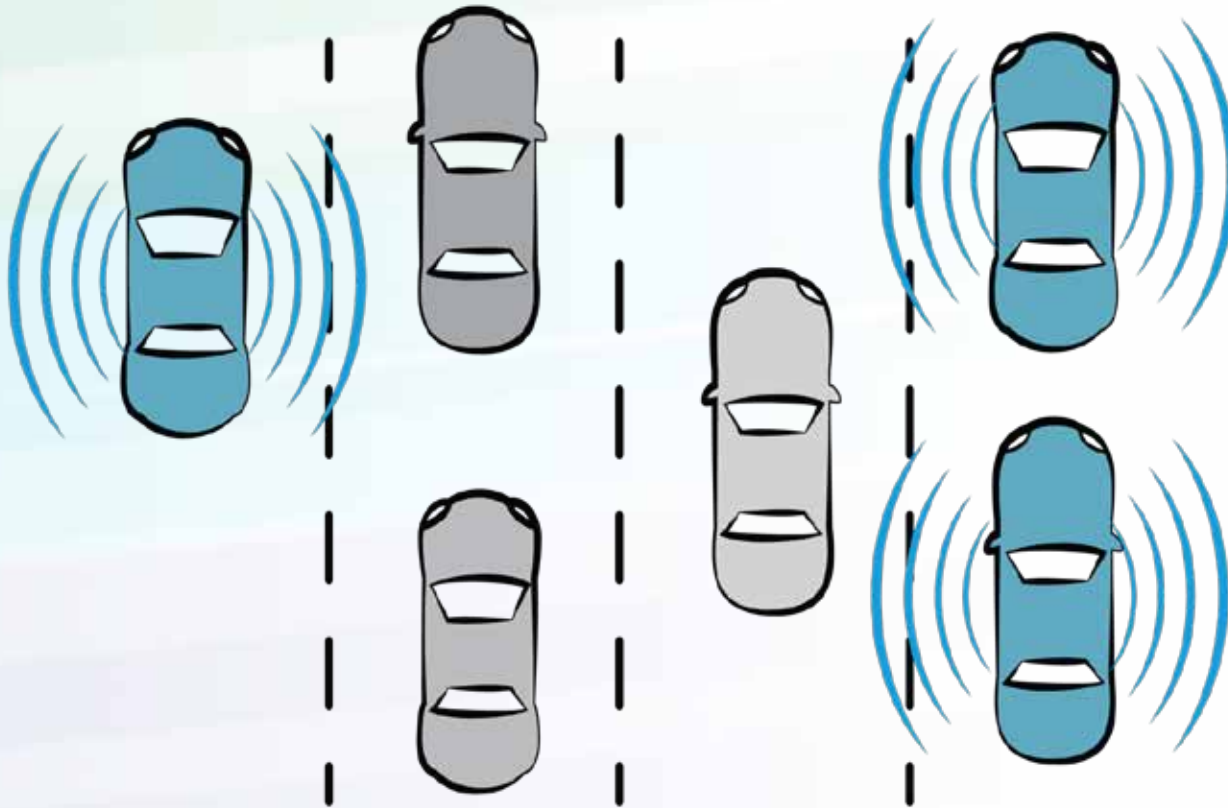


Source: Oshkosh Northwestern

What do we need to examine as we develop planning scenarios **today**...



about these vehicles of **tomorrow**.



Now is the time to start developing new forecasts
Based on these vehicles being in the fleet.

But there are conflicting predictions:



Some say
VMT will go up...



Some say
VMT will go down...



And some folks are now
talking about VMD...

Tomorrow:
VMT \neq VMD

And we need answers to several major questions:


How do we plan for
MIXED vehicles
in the mid-term

What happens
to
TRANSIT?

How will
**LAND
USE**
Change?

How do we need to
UPDATE our
modeling techniques to better
capture the **IMPACT** of
these **VEHICLES?**

And we must also take into account
the emerging **Shared Economy**



By combining C/AV
functionality with ride-
sharing flexibility, you have the
potential to radically change the way
people use our transportation system.

Additional C/AV Factors to Consider for Scenario Planning

- A wider range of “futures” will need to be considered
- Crash reductions could dramatically reduce the need for safety infrastructure
- Long-term significant reductions in roadway signage
- What roadside infrastructure will be required to support C/AV operations?
- Enhancements to transportation planning workforce development



Thank You !

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