



Preparing the Greater Charlotte Region for:

# Connected & Autonomous Vehicles

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Spring 2019



Centralina Council of Governments

# Why are Connected and Autonomous Vehicles Important to Your Community?

Connected and Autonomous Vehicles (CAVs) have the potential to transform our communities. Not just how people travel, but also how our communities grow and infrastructure is designed and built. To begin to understand how CAVs could impact the greater Charlotte region, Centralina Council of Governments (CCOG) held a workshop series with public and private sector stakeholders.

In the fall of 2017, public and private sector land use and transportation planners, elected officials and others participated in a workshop series to understand these new technologies and to develop the Charlotte Region ACV Roadmap which provides guidance to local jurisdictions and transportation planning organizations to prepare for CAVs.

Continuing this effort, the Charlotte Region CAV Task Force, a group of dedicated public and private sector representatives, have identified immediate actions. This document serves as an early action identified by the Task Force as an important first step for county and municipal governments: growing awareness of the issue and local role in preparing for ACVs.

**AVs could change lives. Driving isn't an option for many seniors and disabled Americans. As mobility increasingly represents accessibility, AVs could provide an essential service to many.**

## Definitions:

**Connected vehicles (CV)** are vehicles that use wireless communication technologies to communicate with the driver, other cars on the road (vehicle-to-vehicle [V2V]), roadside infrastructure (vehicle-to-infrastructure [V2I]), and with other devices, such as mobile phones carried by road users (V2X).

**Autonomous vehicles (AV)** (also known as self-driving or a driverless car) are vehicles that are capable of sensing their environment and navigating without human input. Many vehicles on the market today already include some level of automation, such as adaptive cruise control, lane-keeping assistance, and parking assist, with more features expected in the next year or two. There are 5 levels of Automation as defined by the Society of Automotive Engineers (SAE).

## Levels of Automation by the Society of Automotive Engineers (SAE)

Full Automation



0

### No Automation

Zero autonomy; the driver performs all driving tasks.



1

### Driver Assistance

Vehicle is controlled by the driver, but some driving assist features may be included in the vehicle design.



2

### Partial Automation

Vehicle has combined automated functions, like acceleration and steering, but the driver must remain engaged with the driving task and monitor the environment at all times.



3

### Conditional Automation

Driver is a necessity, but is not required to monitor the environment. The driver must be ready to take control of the vehicle at all times with notice.



4

### High Automation

The vehicle is capable of performing all driving functions under certain conditions. The driver may have the option to control the vehicle.



5

### Full Automation

The vehicle is capable of performing all driving functions under all conditions. The driver may have the option to control the vehicle.

# How CAVs Could Impact our Communities.

**Economic:** CAVs represent new economic opportunities, threatening some industries, and advancing others. There is a need to provide job training and workforce programs to ready employees for these transitions.

**Land Use and the Built Environment:** Local governments determine zoning and land use, design roadways, and invest in new infrastructure. CAVs will generate new trends and data for people to manage and implement policy decisions.

**Transportation Systems:** CAVs can increase lane and intersection capacity by reducing spacing between vehicles and anticipating traffic signal phases to better utilized space and time. This could reduce the need for adding lanes and building new roads.

**Transit:** The provision of transportation options is vital to our growing communities. Integration of private transportation services with transit systems can make the entire transportation system more efficient.

**Equity:** AVs represent improved access to transportation, with special consideration for disadvantaged populations.

**Data:** CAVs are essentially computers that are consuming and generating large quantities of data. All this data must be received, stored, protected, analyzed and retained.



## What are the Benefits of CAVs?

**Crash Reduction:** Crash-free driving and improved vehicle safety. A vehicle can monitor the environment continuously, making up for lapses in driver attention.

**Reduced Need for New Infrastructure:** By managing traffic flow, self-driving and connected vehicles can reduce the need for building new infrastructure and reduce maintenance costs.

**Travel Time Dependability:** V2V, V2I, and V2X can substantially reduce uncertainty in travel times via real-time, predictive assessment of travel times on all routes.

**Improved Energy Efficiency:** reduced energy consumption in at least three ways: more efficient driving; lighter, more fuel-efficient vehicles; and efficient infrastructure.

**New Models for Vehicle Ownership:** Self-driving vehicles could lead to a major redefinition of vehicle ownership and expand opportunities for vehicle sharing.



**In 2016, motor vehicle-related crashes on U.S. highways claimed 37,461 lives. Research shows that 94% of serious crashes were due to human error. CAVs have the potential to save lives.**

# Start Planning for Connected and Autonomous Vehicles Now.

Be informed and learn about these new disruptive transportation technologies through materials and publications such as this one.

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Understand the range of potential impacts and the level of uncertainty associated with the degree of impacts and timing.

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Begin to identify policy changes that your jurisdiction might proactively consider.

## Stay in the Know

For more information on CAVs, please visit:  
[www.centralina.org](http://www.centralina.org)

Greater Charlotte Region ACV Roadmap:  
<http://bit.ly/2DgCfyK>

Automated Vehicles Roadmap for NC  
<https://www.ncav.org/>

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