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MOBILITICS

Scenario Planning and Modeling
Connected & Automated Vehicles

June 12, 2018

Connected and Automated Vehicles are everywhere….

Light Duty (personal or shared)

Shuttles

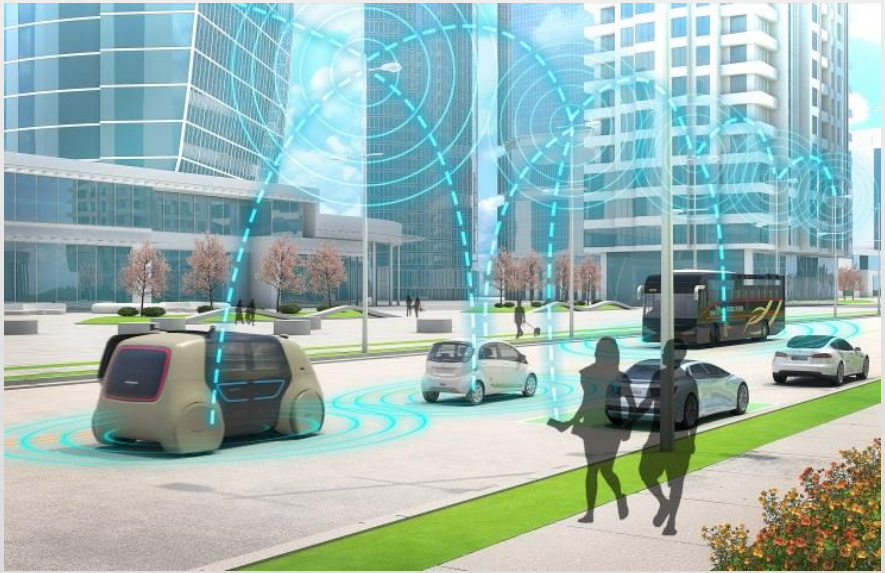
Bus

Freight

Parcel Delivery

Emerging Technologies and Trends

- Connected Vehicles
- Automated Vehicles
- Electric Vehicles
- On-demand mobility
- Sharing economy
- Mobility as a Service
- Virtual Presence, 3D-printing, and e-commerce
- Demographic shifts



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IMPACTS OF CV/AVs

Transit and CV/AVs

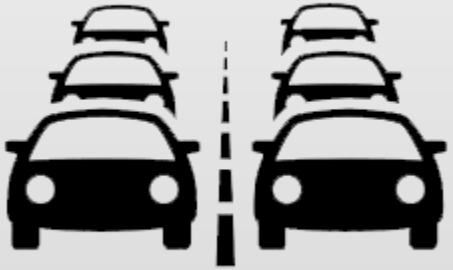
Competitors of Complements?

- Economies of operating driverless buses will encourage:
  - **smaller transit vehicles**
  - **higher frequencies**
- Operation in mixed traffic begins 2025-2030
- CV/AVs can help transit agencies solve first/last mile **station access** issues
- High capacity transit continues to be the most efficient way to move large numbers of people

How will CV/AVs impacts transit ridership?

Traffic Operations and CV/AVs

Increased speeds in congested conditions



Reduce delays caused by incidents (accounts for 25% of current congestion)

Increased vehicle capacity on existing roads and intersections

Parking and CV/AVs

1

billion parking spaces in the US

Parking in the US covers an area the size of Connecticut

30

percent of traffic in downtown areas is searching for parking

Reduce the Need for Parking

Fewer cars require fewer parking spaces

Unlink parking and activities

- Parking at destination can be replaced with pick-up/drop-off zones
- Remote parking garages could replace storage at home and work

Remote parking spaces can be 15% smaller

Reduce housing and construction costs without the need to build parking

Induced Demand and CV/AVs

Vehicle access for elderly, disabled, children leads to more car trips

Empty vehicles driving to parking, picking up passengers, making deliveries

Productive/enjoyable time in the car leads to more and longer car trips

Induced Demand and CV/AVs

Estimates of the increase in vehicle miles traveled vary

4-70%

Increases may be in off-peak directions/time periods

Important Considerations

- How will people view their time spent in a CV/AV?
- Where will parking be located?
- What portion of the vehicle fleet will be shared?
- Who will be allowed to ‘drive’ a fully automated CV/AV?

Land Use and CV/AVs

Vehicle-sharing spurs interest in dense, mixed use developments with transportation options

OR

Ease of ‘driving’ spurs interest in development in car-dependent suburban/exurban areas

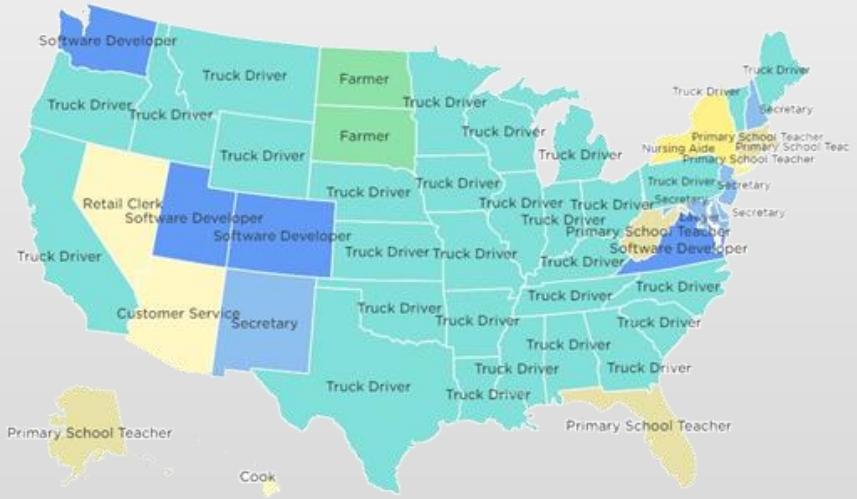
Other Affected Uses:

- Parking facilities
- Gas stations
- Car repair and service facilities
- Rest Stops, Truck Stops, Roadside Hotels

“Research shows the declining cost of distance has the potential to trigger a major lifestyle shift away from city centers”
- Bain & Company

Freight and CV/AVs

- Truck platooning and automation can almost eliminate labor costs for long distance freight
- Trucks even more competitive than rail for local and long-distance freight
- Truck Driver is the most common job in 29 states



Finance and CV/AVs

Financial Considerations:

- Who pays for connected/ autonomous infrastructure?
- Savings from not building additional roadway capacity
- Potential impacts of tolling and pricing strategies
  - Could limit impacts of VMT increases

Potential Loss of Income Sources:

- Violations (speeding, parking)
- Parking Fees
- Licensing Fees

$110

million annual revenues from violations in Washington, DC

Environment and CV/AVs

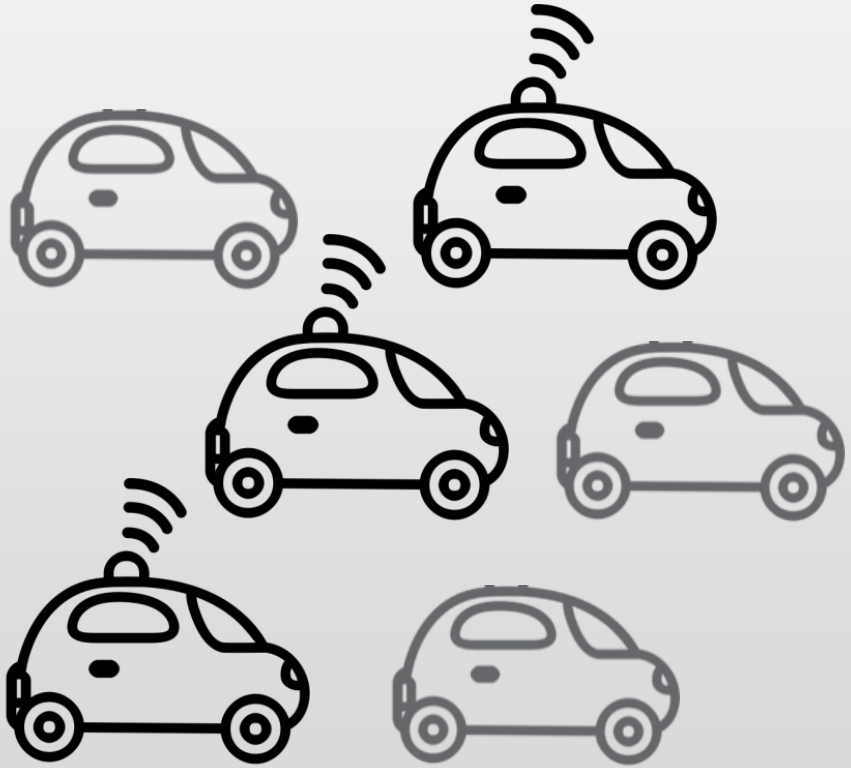
Electric vehicles more practical in a shared fleet

Percent decrease in fuel usage during eco-driving

20

A 5-truck platoon uses 17% less energy than five single trucks

The Transition



40+

years when CV/AVs will have to interact with human drivers

How long will these impacts take to be realized?

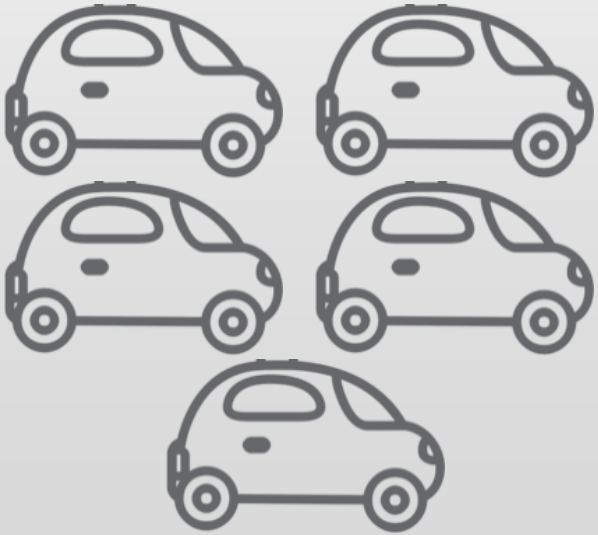
What are the impacts at lower levels of CV/AV penetration?

How well do CV/AVs work with traditional vehicles?

CV/AV Impacts

80%

fewer cars



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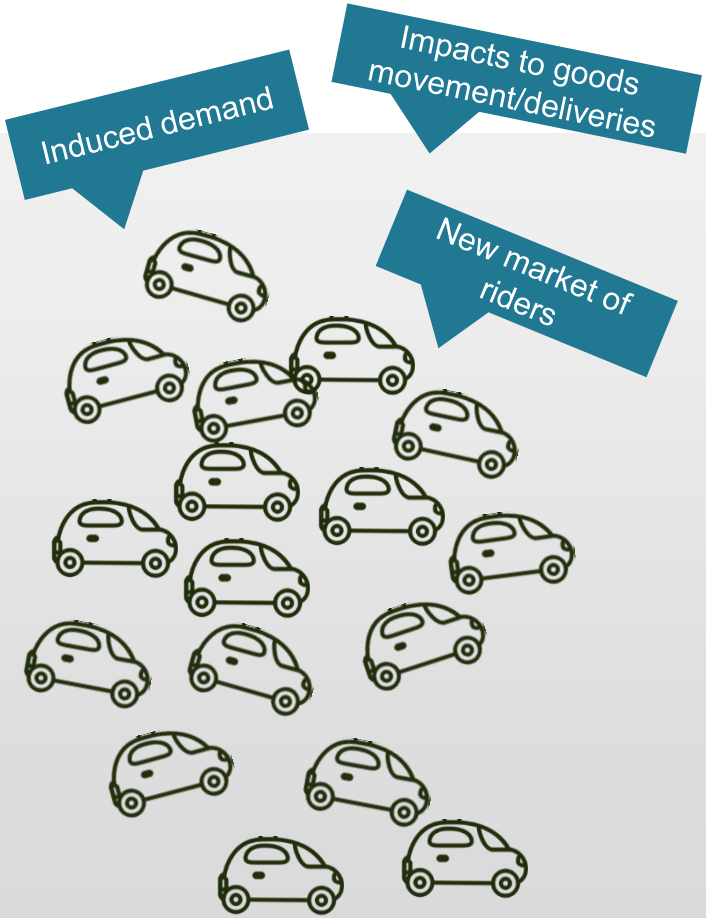

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How will roadway design standards accommodate connected vehicles and automated vehicles?

Will we still need parking? Where?

Will transit ridership go up or down?

Will fewer people commute to work?

Which regulatory or policy decisions will shape these impacts?

When will CV/AV volumes reach a tipping point in my region?

How will CV/AVs impact the transportation system?

How will the real estate market absorb these changes?

Which revenue streams will be impacted in my city?

How can equal access for low-income, elderly, and disabled users be ensured?

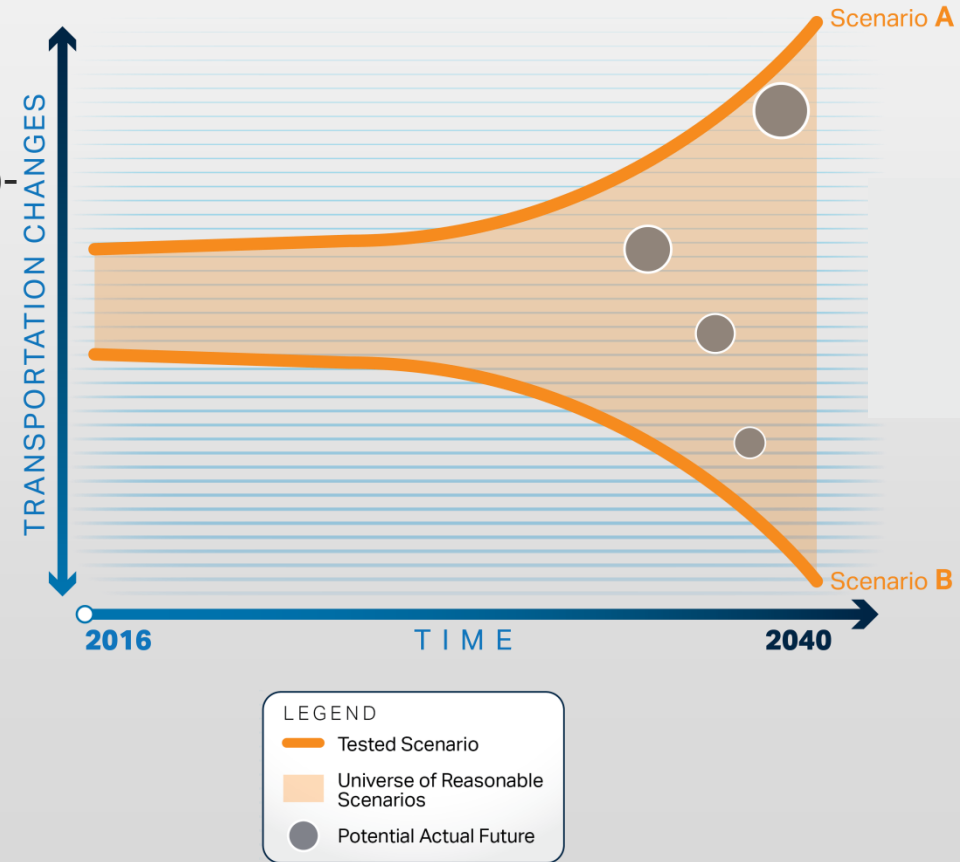
When and how will CV/AVs affect congestion and travel time reliability?

What is Mobilitics?

Based in travel demand forecasting theory

Incorporates uncertainty into a scenario-based planning tool

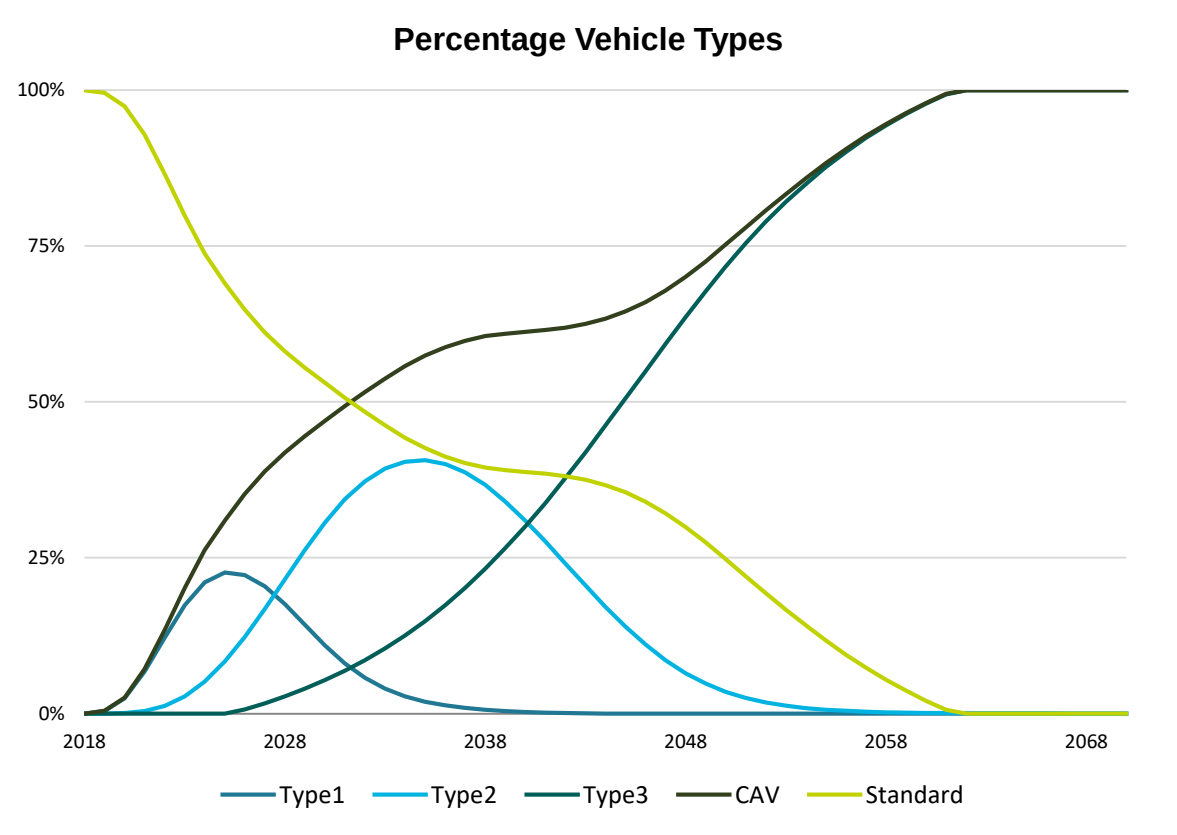
- Business Models
- Cost of Ownership
- Cost of Operation
- Regulatory Regime: Federal, State, and Local
- Evolving preferences
- Behavioral adaptations to new options



How does Mobilitics work?

Quantify the impacts of technologies and trends on performance:

- Test multiple scenarios
- See the impacts of interrelated variables:
  - Technology Adoption Rates
  - Policies
  - Business Models
  - Pricing Strategies
  - Etc.



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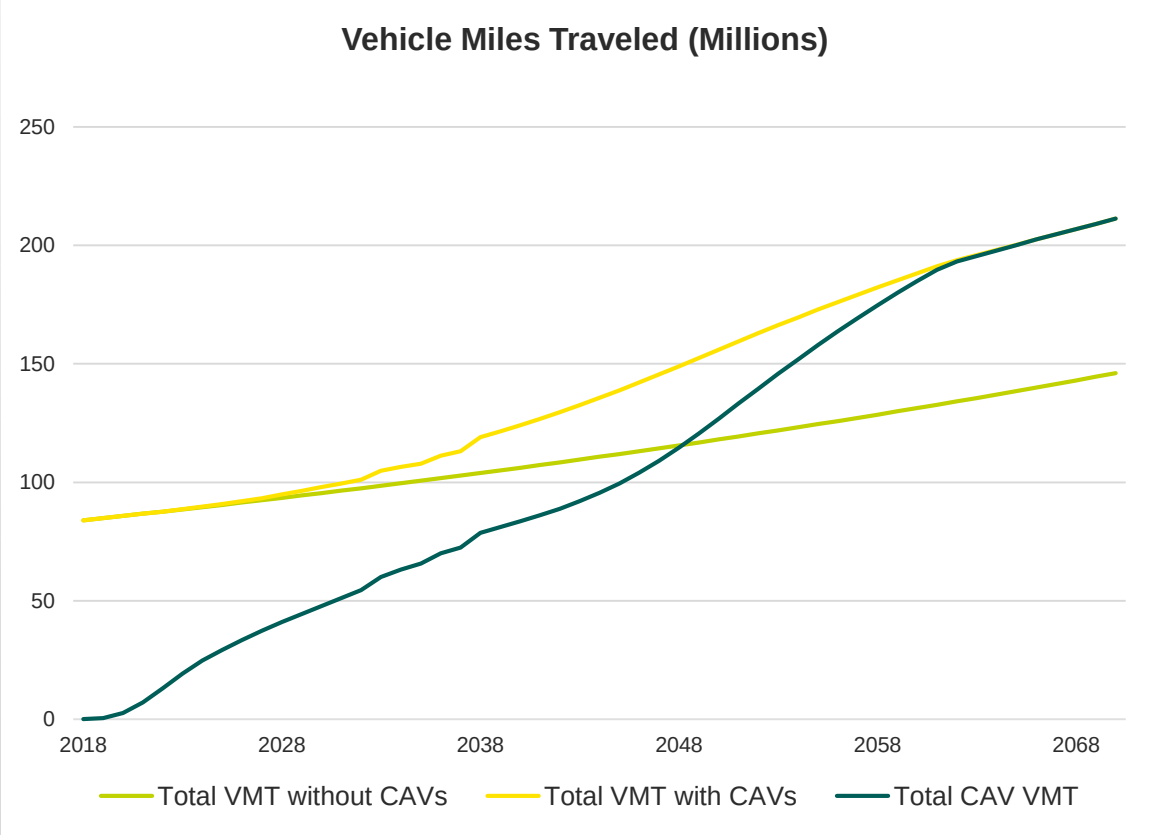

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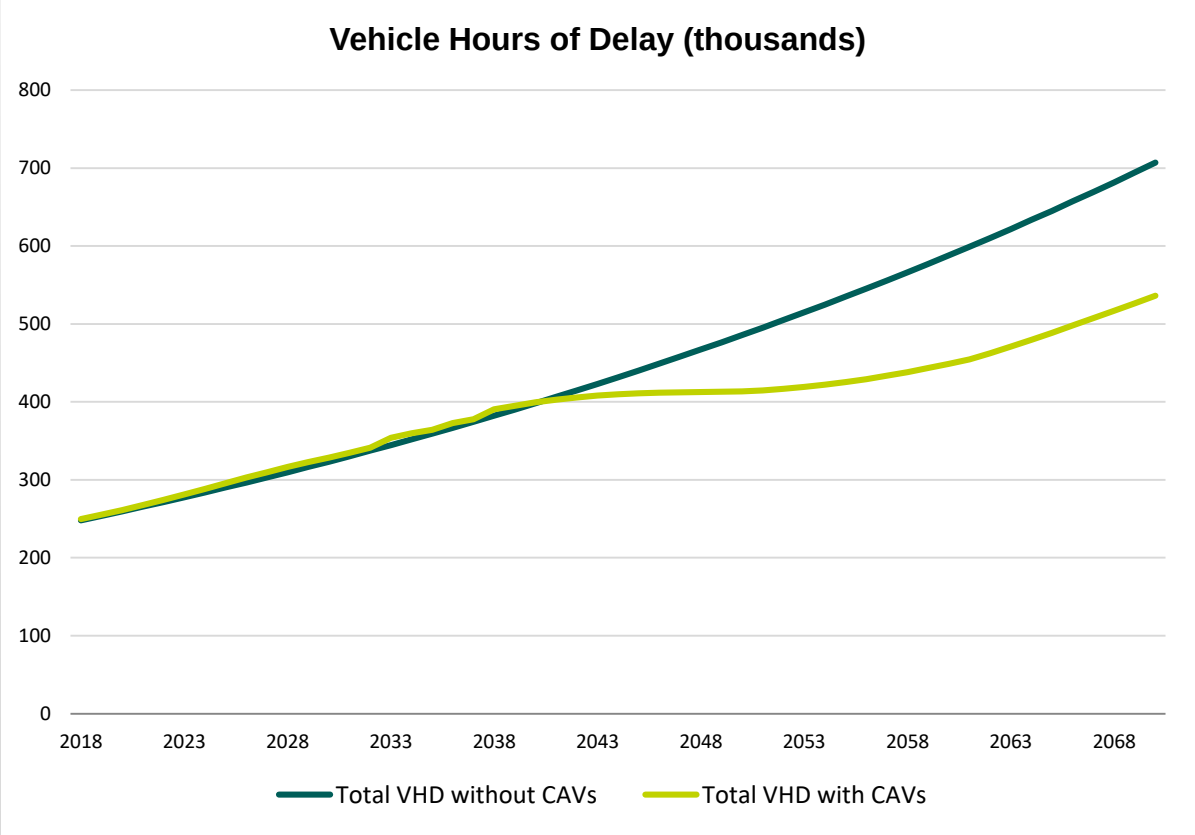

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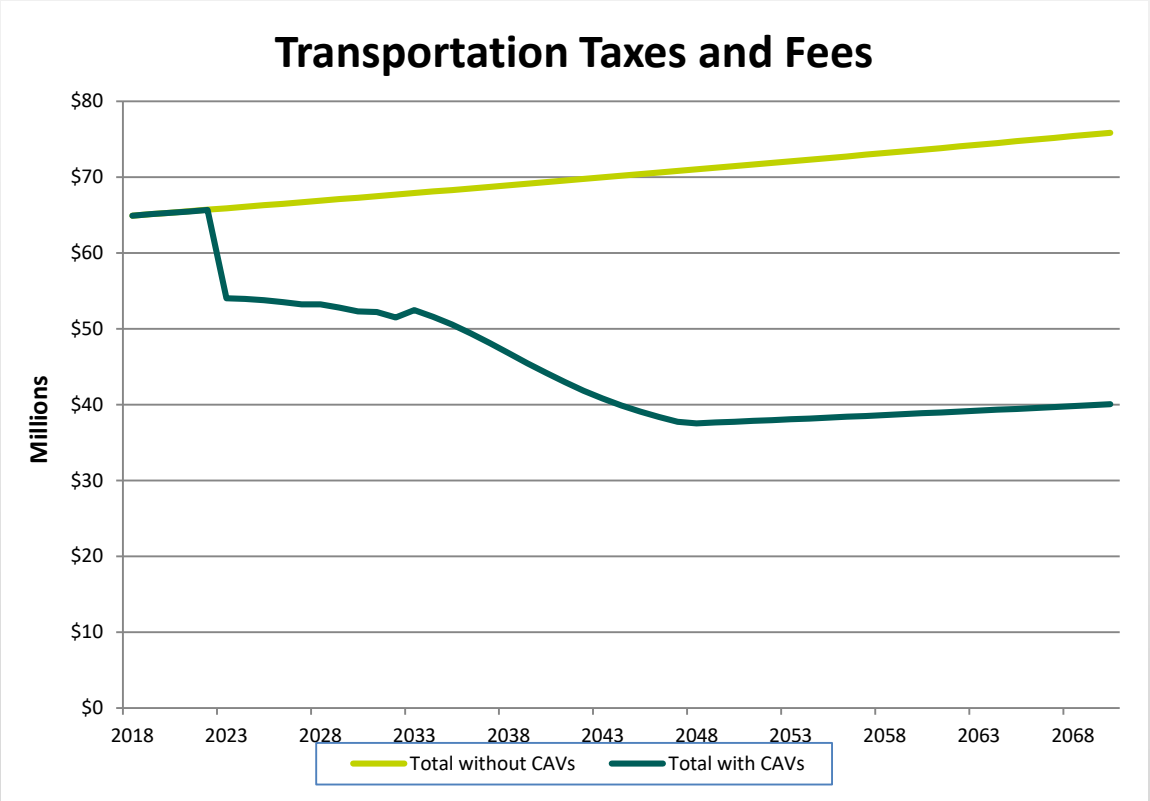
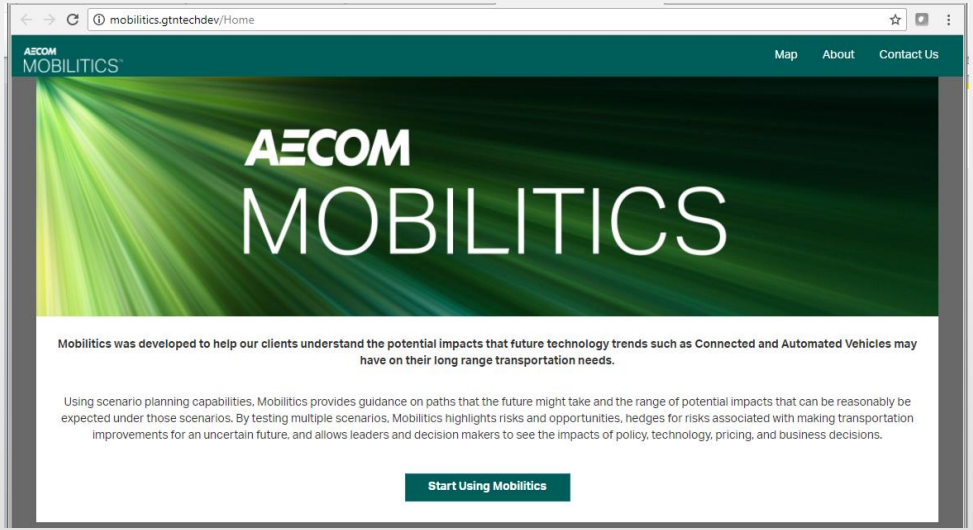
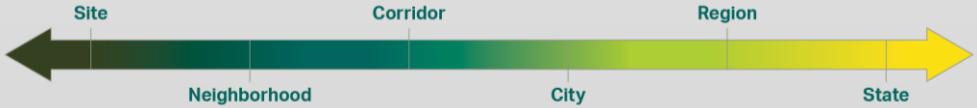


Use of Mobilitics

Part of our planning and forecasting services:

– Client specific assumptions
– Local validation
– Location specific geography and built-in GIS mapping
– Can be applied at almost any geographic scale
– More detailed results
– Customizable performance metrics
– Ability to save and compare multiple scenarios





– Long Range Transportation Plans
– Transportation Programming and Funding
– Policy Analysis
– Redevelopment Plans
– Corridor Studies
– Strategic Planning
– Economic Analysis

Mobilitics Preview

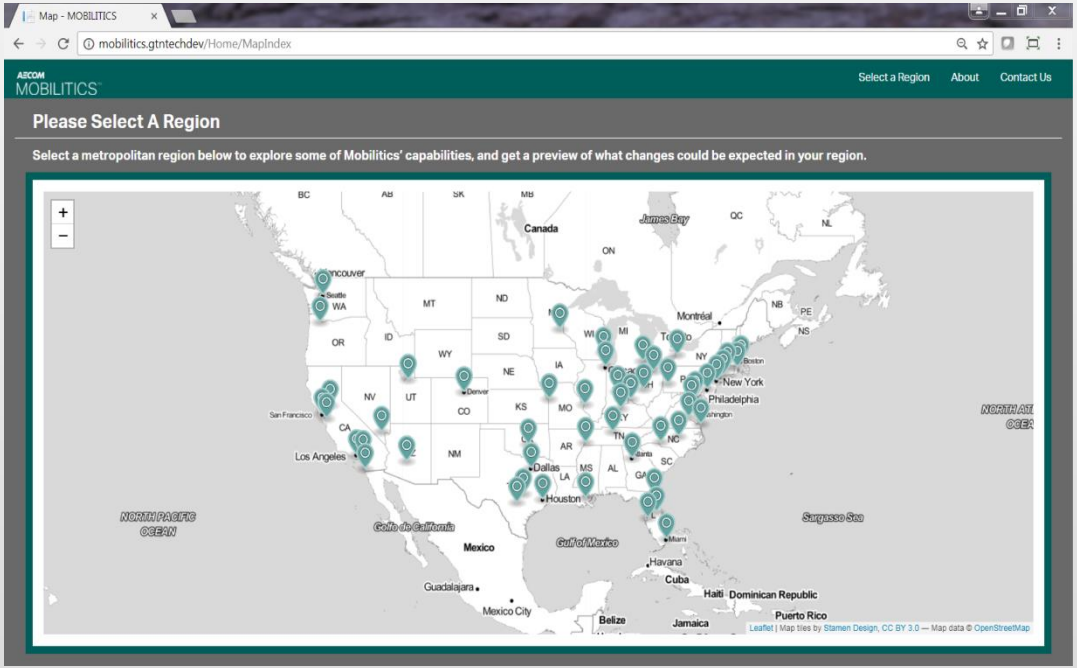
Web based

Free access

Data for the 50 largest metropolitan regions in the US

Scenario Variables:

– Technology Adoption
– Pricing Strategies
– Induced Demand
– Infrastructure dedication



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