

Planning/ Policy  
&  
Programming

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**Project Title:**

UTC - National Center for  
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## Automated Vehicles and Central Business District Parking: The Effects of Drop-Off-Travel on Traffic Flow and Vehicle Emissions

Researchers constructed four scenarios that tested answers to the four questions above through traffic model simulations to analyze impacts in downtown San Francisco.

### WHAT WAS THE NEED?

The potential for Automated Vehicles (AVs) to reduce parking to allow for the conversion of on-and off-street parking to new uses has sparked significant interest among urban planners.

This study used a road traffic model with local travel activity data to simulate vehicle travel in San Francisco's downtown Central Business District (CBD) to explore impacts of AVs.

### WHAT WAS OUR GOAL?

The goal of this research was to gain insights into the following transportation policy questions:

1. What are the impacts of more AVs drop-offs/pick-ups to parking demand as AV penetrates the vehicle market?
2. Can the conversion of on-street parking to AV drop-off/pick-up trips address the impacts to more AV drop-offs/pick ups?
3. What are the impacts of concentrating off-street parking in fewer parking facilities?
4. How might reduced traffic demand that may result from auto pricing policies impact the outcomes for scenarios that increase AV drop-offs/pick-ups, convert on-street parking to AV drop-off/pick-up spaces, and concentrating off-street parking?



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knowledge that improves  
California's transportation system

## WHAT DID WE DO?

Researchers constructed four scenarios that tested answers to the four questions above through traffic model simulations to analyze impacts in downtown San Francisco.

## WHAT WAS THE OUTCOME?

Results showed a shift from parking trips to AV drop off/pick up trips significantly reduced traffic delay, because motorists did not have to search for parking, and there was more efficient use of parking spaces. There was also an improved match between converted on-street parking to AV drop off/pick up to AV drop off/pick up demand. At the same time, if there was an increasing concentration of off-street parking in fewer locations, traffic congestion worsen. Finally, a 30% reduction in traffic demand in a central business district, which is similar to a result from an auto pricing policy, came close to eliminating traffic congestion.

## WHAT IS THE BENEFIT?

Caltrans is currently researching the relationship between vehicle miles traveled and its relationship to greenhouse gas emissions. It has been proposed that AVs could significantly impact these relationships. This study will assist Caltrans and local agencies in developing policies to provide a sustainable transportation system that includes improved mobility, with reduced environmental impacts.

## LEARN MORE

To view the complete report:  
<https://escholarship.org/uc/item/63m6k29n>.

## IMAGE

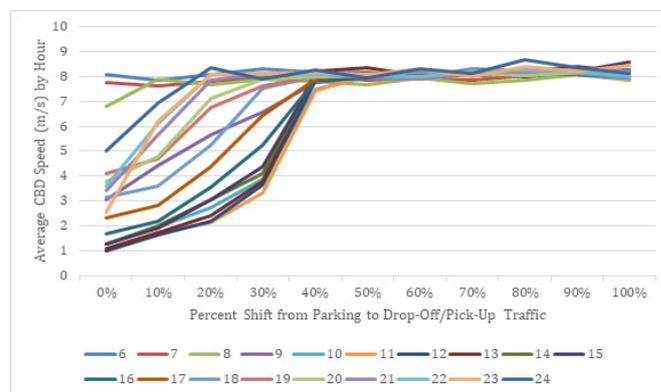


Image 1: Average CBD speed (m/s) by the hour of the day as the share of drop-off/pick-up traffic substitutes for parking traffic from 0% to 100% in 10% increments (Scenario Set 1).