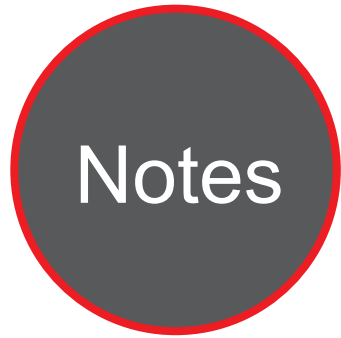




Caltrans Division of Research,  
Innovation and System Information

# Research



# Notes

Planning, Policy  
and  
Programming

## Accessing The Challenges And Opportunities For The Introduction Of Automation In Last Mile/Last Feet Delivery Operations

A study focuses on examining the advantages and disadvantages that the new transportation technology brings to the urban freight system.

### WHAT IS THE NEED?

The growing interest in autonomous, shared, and electrical vehicles, known as Three Revolutions (3Rs) in transportation, has mostly focused on light-duty vehicles and passenger transportation. Thus, the urban freight system (UFS) has been overlooked, which constitutes the next frontier for the penetration and development of such technologies.

UFS is constantly changing, adapting, and bringing new challenges to the sustainability of urban environments. Considering previous research findings about the differences among industry segments, this research will focus on the food and retail industries which comprise a significant share of the urban freight demand and traffic (both commercial and residential); and discuss the challenges and opportunities for automated last mile delivery operations.

It is important to evaluate the benefits and disbenefits of different technology improvements to the UFS, since rapid urbanization and growth in business-to-business and business-to-consumer transactions will increase urban freight traffic.

### WHAT ARE WE DOING?

The research team will conduct the following tasks and compile the research results into a white paper that will describe the challenges and opportunities for the introduction of automation in last mile/last feet delivery operations:

**Task 1: Comprehensive literature review on the freight system with emphasis on the retail and food industry sectors**

The researchers will study the literatures that describe the freight

January 2019

Project Title:  
Automation, Electrification, And Shared  
Mobility In Urban Freight: Opportunities  
And Challenges

Task Number: 3409

Start Date: February 01, 2019

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DRISI provides solutions and  
knowledge that improves  
California's transportation system

operations' key characteristics in the food and retail sectors which would be relevant to the 3Rs.

### **Task 2: Comprehensive review of sources related to the 3Rs**

The research analysts will review the sources that describe the technological characteristics of the innovations, existing case studies, and results from pilot tests.

### **Task 3: Selection and description of Case Studies**

The most relevant case studies will be selected considering the potential generalization of the findings and data availability.

### **Task 4: 3Rs analyses**

This task is critical as it involves conducting the comparative and critical analyses of the 3Rs to the case studies and the urban freight system in general. The research team will assess the challenges and opportunities, the benefits and unintended consequences. They will also identify the key characteristics of the UFS and the innovations.

### **Task 5: Compliance with the data management plan**

In this task, the research analysts will perform the required administrative and data safe guarding activities to guarantee compliance with the data management plan.

### **Task 6: White Paper**

The researchers will produce a white paper synthesizing all tasks.

## WHAT IS OUR GOAL?

The research analysts will be able to explore the way urban freight activities are performed in this project. They will conduct a descriptive and comparative assessment of the system's characteristics, its key needs, and how they relate to automation, sharing, and electrification.

## WHAT IS THE BENEFIT?

There is a high uncertainty about the impacts of the 3Rs in the movement of goods. Moreover, several mandates and plans request for the need of the benefits from such revolutions in California. For example, the California Sustainable Freight Action Plan calls for an improvement in freight efficiency, the use of zero emission or near zero emission vehicles and equipment, and economic competitiveness. Many of the expected characteristics of the 3Rs directly relate to these goals. Automation, where already implemented, has brought important efficiency gains, higher reliability, and safety environments.

This research will discuss the challenges and opportunities for the 3Rs in urban freight, and the benefits or unintended consequences of these revolutions. It is expected that changes brought by the 3Rs will reshape supply chains and affect travel beyond the urban cores.

## WHAT IS THE PROGRESS TO DATE?

The project is expected to begin in early February 2019.