

The logo graphic consists of three overlapping parallelogram shapes. The top one is green, the middle one is blue, and the bottom one is purple. They are arranged in a way that they appear to be part of a larger, abstract shape.

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# Data Collection to Understand Curb Usage and E-Commerce Impacts

*presented to*

*Innovations in Travel Modeling*

*presented by*

*Cambridge Systematics, Inc.*

*Arun Kuppam*

*Anurag Komanduri*

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# Objectives

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Mode of last mile freight delivery

Commercial vehicle type

Frequency of deliveries

Time of day distribution

Stop duration of vehicles

Parking location of delivery vehicles

Top 5 companies making deliveries

Major establishment types

Identify patterns and trends across different locations, time of day, establishment type, employment density, parking location, vehicle type

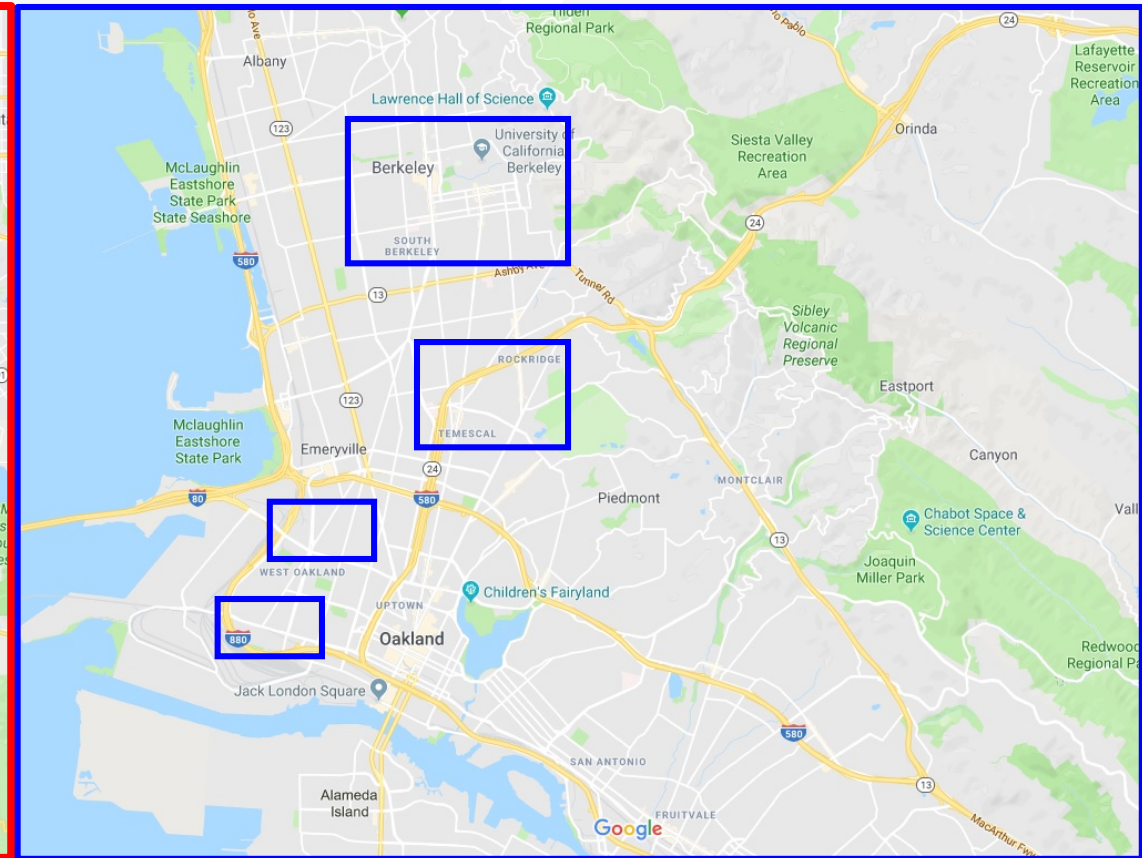
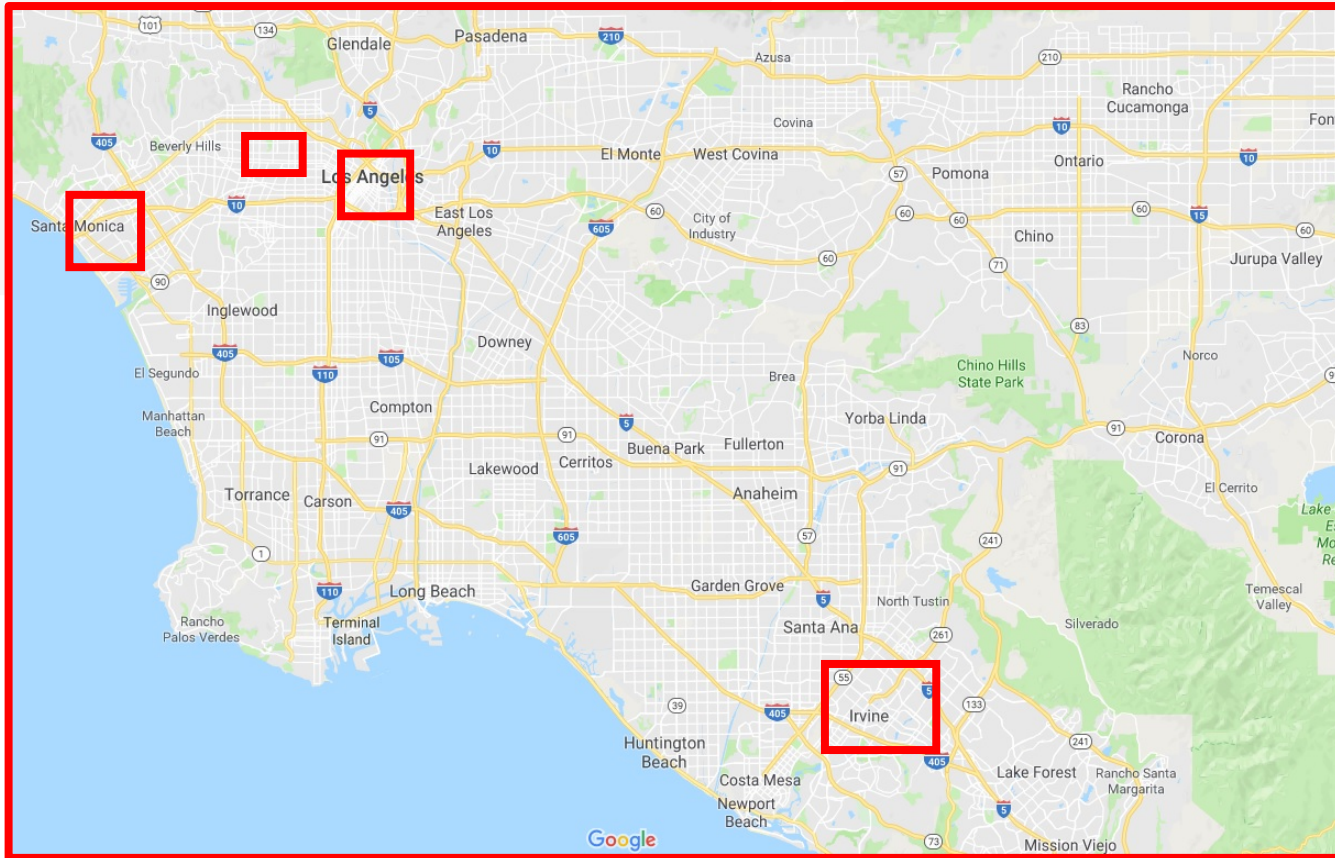
## Southern California

- Los Angeles Downtown
- Koreatown
- Santa Monica
- Irvine

# Study Area

## Northern California

- Oakland Downtown
- West Oakland
- Oakland Rockridge-Temescal
- Berkeley



# Data Collection

Traditional clipboard survey

Recorded data during working hours, weekdays



Closest store

Time of day

Commercial vehicle type (sedan, van, pickup, truck – single, combo)

Parking – legal, illegal, curb-side, median, alley

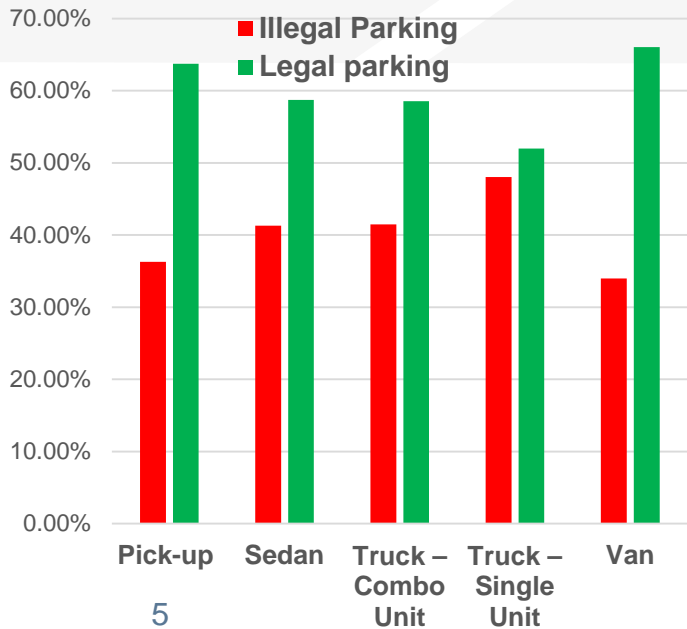
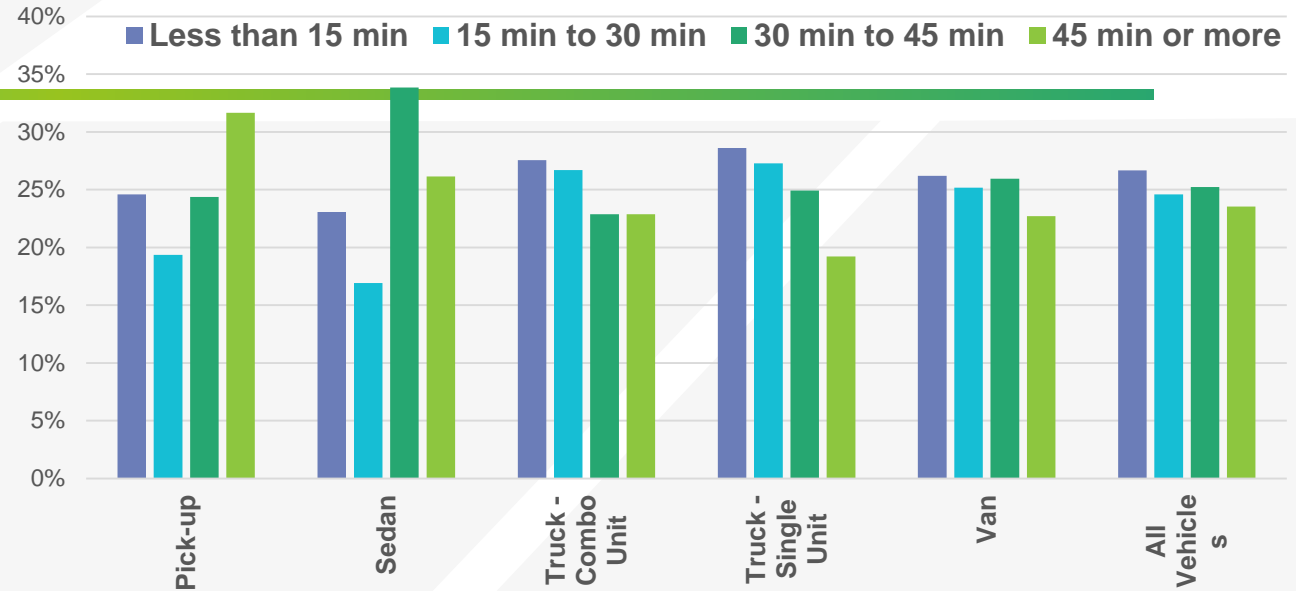
Company name / logo

1 Com. Veh. #	2 Closest Store	3 Time			4 Com. Veh. Type S, V, P, T	5 Truck types S, C	6 Com. Veh. Parking Location OP, OL, OI, OD, OM, AL	7 Name/Logo	8 Comments	
		Laps	Time 1	Time 2						Time 3
1	City National Bank	1	2:00	2:37	3:02	V	--	OI	USPS	
2	Westin	1	2:00	2:37		P	--	OI	Blank	
3	Mendocino Farms	1	2:03			T	S	OL	R&K Ramos	
4	Biltmore	1	2:07			T	S	OI	UPS	
5	Biltmore	1	2:08	2:43		P	--	OL	Blank	
6	Biltmore	1*	2:08			P	--	OL	Thyssen Krupp	
7	Biltmore	1	2:08	2:40	3:06	T	S	OL	USPS	
8	Torrey Bank	1	2:11	2:40	3:06	V	--	OL	AT&T	w/Cone
9	Torrey Bank	1	2:11	2:43	3:06	T	S	OL	Andersen	
10	Peets	1*	2:11			T	S	OI	USPS	
11	Torrey Bank	1*	2:13			T	S	OI	Security	Armored car
12	606 Olive	1	2:18	2:51	3:10	V	--	OI	USPS	
13	Neilhule	1	2:19	2:51	3:10	V	--	OI	USPS	
14	GNC	1	2:19	2:51	3:10	T	S	OL	UPS	
15	Drunk Dog	1	2:20			V	--	OI	FedEx	
16	640 Olive	1	2:20			T	S	OL	FedEx	In front of parking garage
17	Astro	1	2:23			T	S	OI	USPS	
18	Vacant Building	1	2:25	2:55	3:18	P	--	OL	Blackdog	
19	Vacant Building	1	2:25	2:55		V	--	OL	DHL	
20	Vacant Building	1	2:25	2:55	3:18	P	--	OL	Royal	

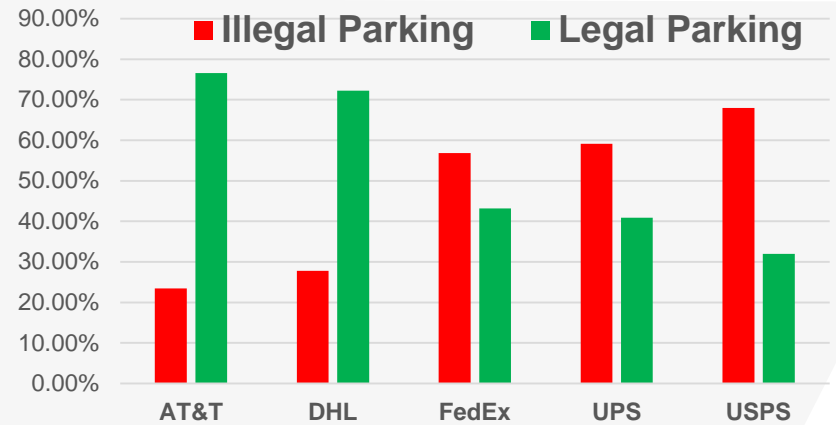
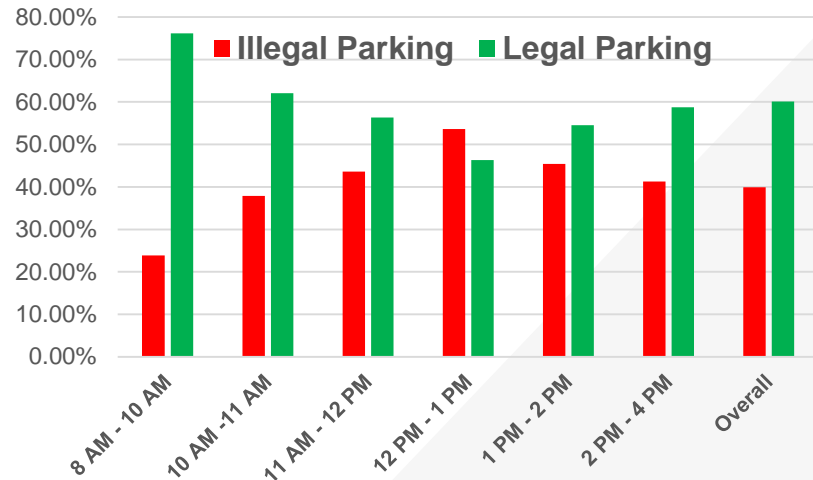
# Key Findings

## Stop Duration by Vehicle Type

Survey Area	Observations
Los Angeles Downtown	1,347
Irvine	37
Koreatown, Los Angeles	99
Santa Monica	67
Berkeley (North, South, Downtown)	236
Oakland Downtown	320
Oakland Rockridge-Temescal	87
<b>Total</b>	<b>2,193</b>



## Parking Location by CV Type, TOD & Company



# Major Companies

Southern California



USPS

FedEx

UPS

PG&E

AT&T

City of Oakland

Penske

XFINITY

U-Haul

USPS

FedEx

UPS

AT&T

DHL

LA Police

Penske

Spectrum

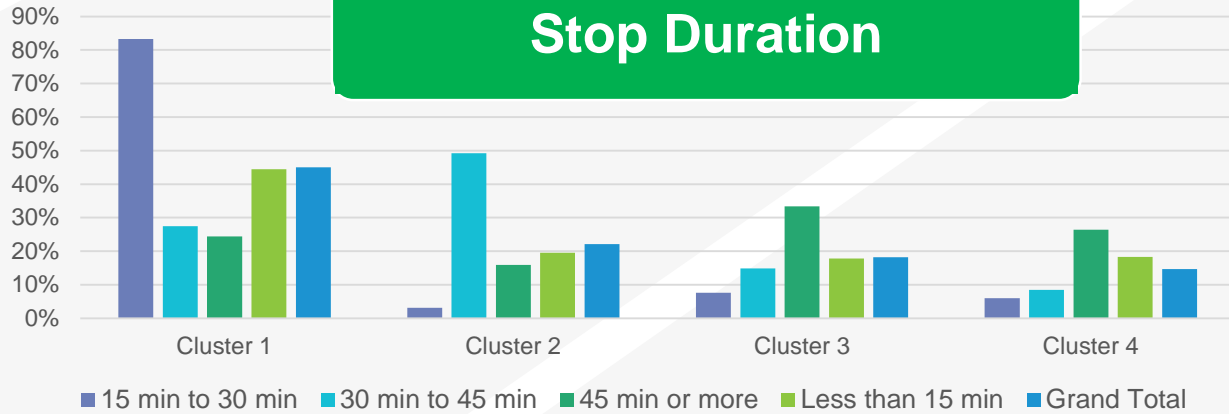
Enterprise

Northern California

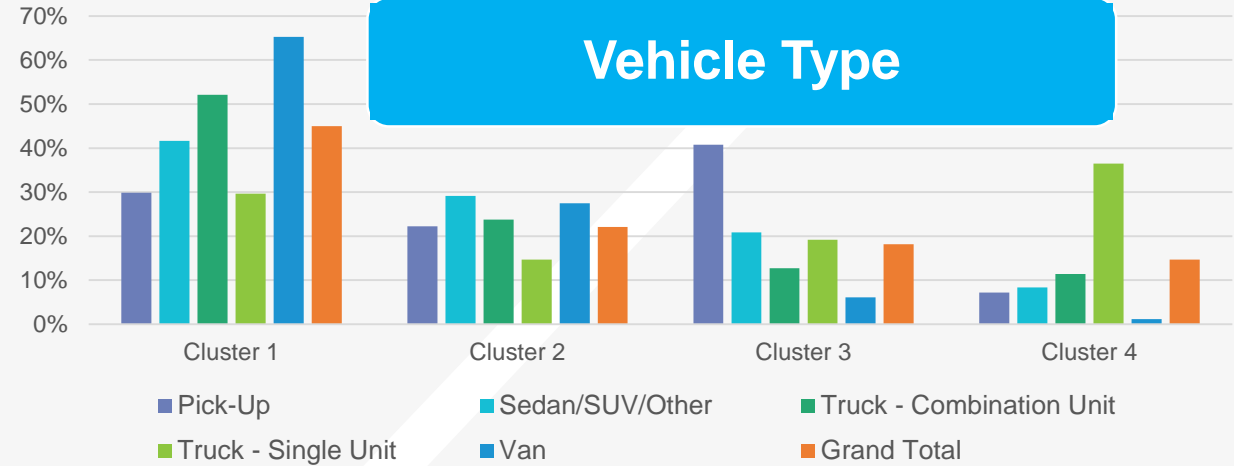


# Cluster Analysis

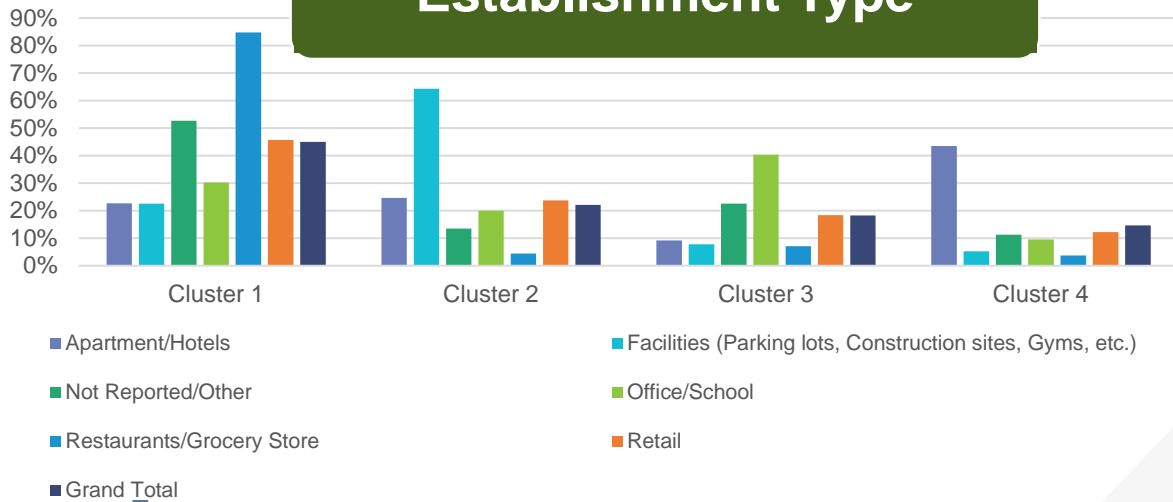
## Stop Duration



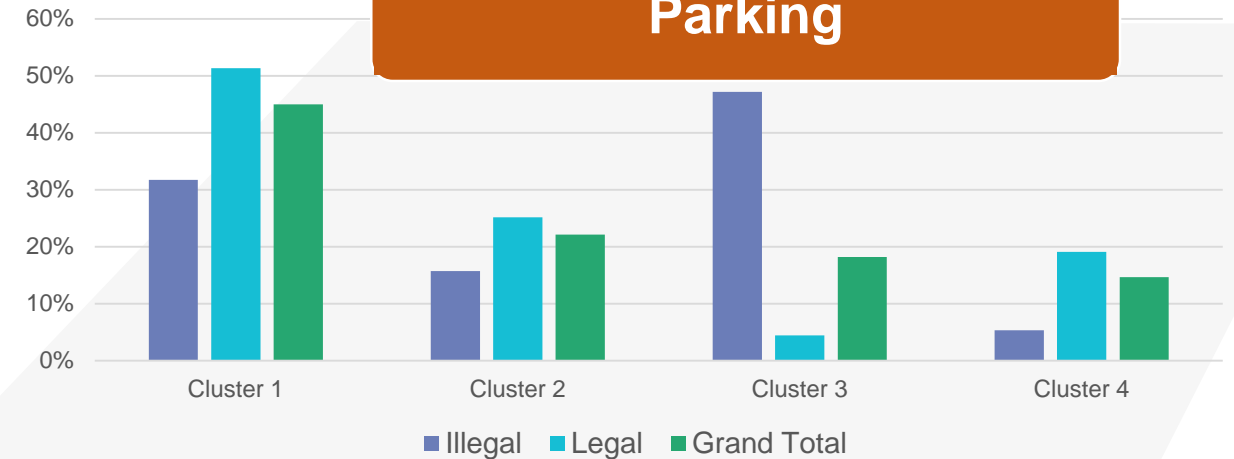
## Vehicle Type



## Establishment Type



## Parking



# Market Segments

Attribute	Cluster 1	Cluster 2	Cluster 3	Cluster 4
Area	Berkeley / Oakland / LA downtown	Oakland Rockridge - Temescal	Irvine	Koreatown LA, Santa Monica
Stop Duration	< 30 mins	30-45 mins	45 mins +	45 mins +
Time Period	12-1 PM	10-11 AM	11 AM - 12 PM	2-4 PM
Commercial Vehicle Type	Van	Sedan / SUV	Pick-Up	Truck - Single Unit
Establishment Type	Restaurants / Grocery Store	Facilities (Parking lots, Construction sites)	Office / School	Apartments / Hotels
Parking	Legal parking	Legal parking	Illegal parking	Legal parking
Company	DHL	AT&T	USPS	UPS, FedEx
Number of Observations	987	485	399	322
Market Segment	<b>High employment density</b>	<b>High population density</b>	<b>Business parks</b>	<b>High shopping activity</b>



# Uses of Data

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Infrastructure  
management

Parking  
management

Designated  
loading  
zones

Vehicle  
access  
restrictions

Time access  
restrictions

Lane  
management

Traffic  
control

Off-hour  
deliveries