SCAG Toolbox Tuesday

Curb Space Management Tools

January 17, 2023

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Agenda

1 Study Overview

2 Curb Space Management Toolbox

3 Data - CurbIQ

4 Case Studies

STUDY OVERVIEW

SCAG Curb Space Management Study – Project Team

SCAG™
SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS

Cityfi

FORWARD PROGRESS

ARCADIS | IBI GROUP

Sutra Research & Analytics

Consensus

SCAG Curb Space Management Strategy

- Provides curb space management strategies and recommendations for multiple cities within the SCAG region
- Develop a work plan for multiple pilot project concepts and/or analysis plans for pilot projects currently underway
- Study focused on 4 cities, but the tools developed are intended for broad use

SCAG Curb Space Management Strategy

- The CSMS sets up a blueprint for SCAG cities to undertake studies to further transform their curb space.
- Provides any municipality within the SCAG region with the tools and strategies to identify and prioritize solutions to current and potential future challenges at their curb

Toolbox:

- General Curb Space Workflow
- Themes and Best Practice Categories
- Menu of Options
- Curbside Typologies
- Workplan Template & Accompanying Step-by-Step Guidance
- Supporting material on specific topics (equity, preliminary cost estimates, and P3s)

POLL QUESTION

Poll Question

How familiar are you with curb space management concepts?

1. Extremely Familiar -> I have a thorough understanding and am up to speed on new innovations
2. Very familiar -> I have a good understanding and understand the general application within the industry
3. Familiar -> I understand the concept
4. Neutral -> I've heard the term, but that's it
5. Not familiar -> I've never heard of it

OVERVIEW OF CURB SPACE MANAGEMENT

What is Curb Management?

- Addressing the shared transitional space between the roadway and the sidewalk?
- Managing the shared space on a roadway?
- Where movement meets access?
- The nexus of transportation, land use, and economic development?

Curbside Management seeks to inventory, optimize, allocate, and manage the curb space to maximize mobility, safety, and access for the wide variety of curb demands.

TOOLBOX

What's in the Toolbox?

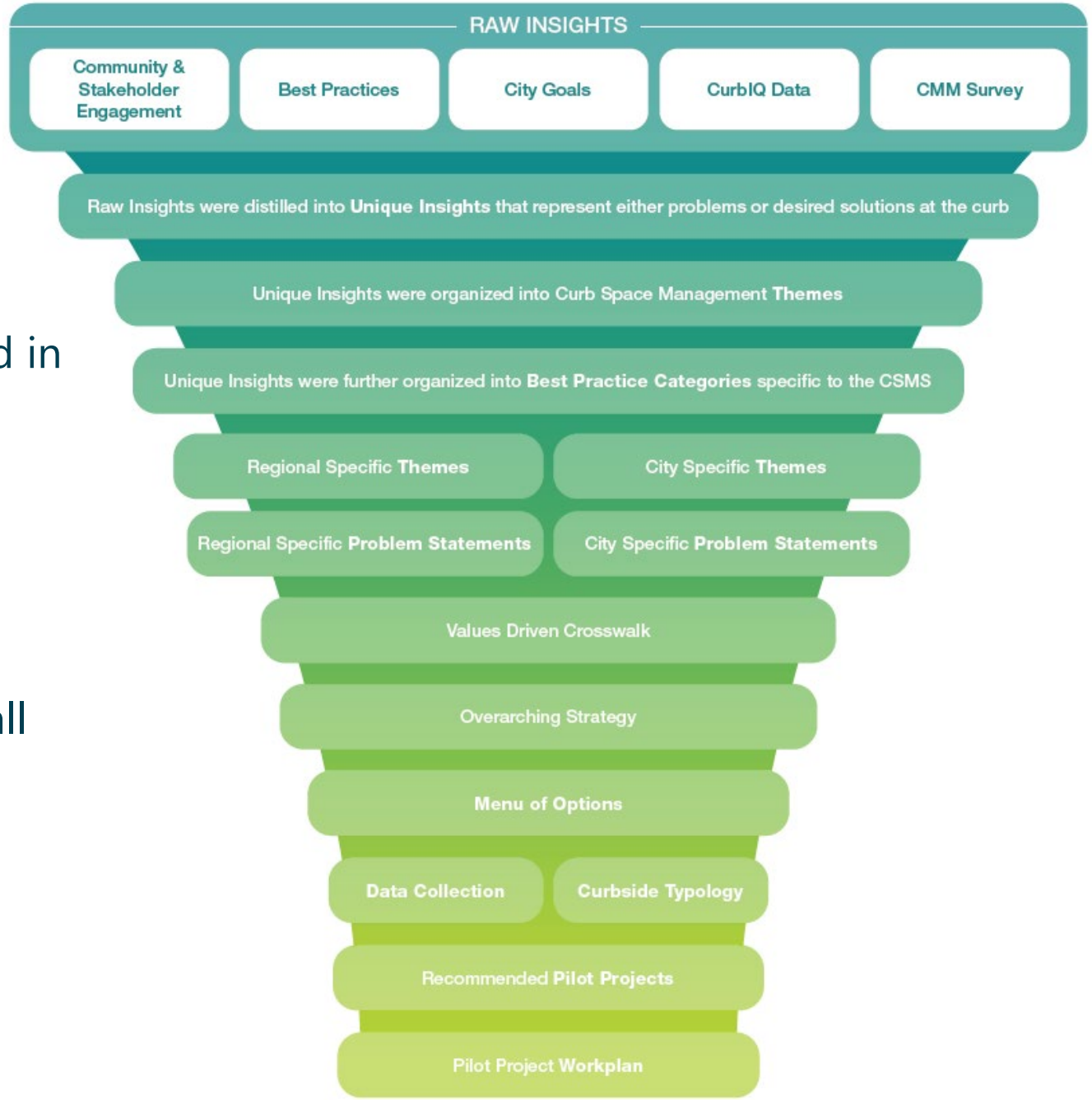
- General Curb Space Workflow
- Themes and Best Practice Categories
- Menu of Options
- Curbside Typologies
- Workplan Template & Accompanying Step-by-Step Guidance
- Supporting material on specific topics

GENERAL CURB SPACE WORKFLOW

General Curb Space Workflow

The overall approach to recommendations used in the CSMS can be followed for future curb management projects.

1. Gather existing conditions data and stakeholder insights
2. Systematically categorize and consolidate all inputs and insights until **manageable and logical recommendations** arise
3. Develop a pilot project workplan
4. Monitor and evaluate



THEMES & BEST PRACTICE CATEGORIES

Themes and Best Practice Categories

Demand

The amount of parking that would be used at a particular time, place, and price

Policy

The process, guidelines, regulations, and laws that guide curb management decisions and work to achieve intended outcomes

New + Changing Uses and Technology

Improving city preparedness to manage new mobility solutions and increased curb demand

Data + Privacy

How the City collects, utilizes, manages, shares, and secures the information that it collects to inform curb management

Themes and Best Practice Categories

Design

The way in which the street, including the curb space, is designed to accommodate access and serve city goals

Cost

Pricing the curb space to reflect its true value and to encourage intended use, using the resulting revenue to pay for public services

Agency Resources

The staff, budget, time, and capacity an agency has to dedicate to curb space management

Communications + Stakeholder Perceptions

Ensuring the public and stakeholders understand curb regulations and the reasoned policy rationales behind the regulations

Safety

Creating safer streets through the design, designation, and regulation of curb space

MENU OF OPTIONS

Menu of Options

Category	Problem Statement	Best Practice Area	Strategies	Menu of Options
Shared mobility	Shared micromobility was tried but failed	Policy, Demand	Alternative Micromobility Permitting	Single vendor concession
				Private property shared mobility
Short term parking	Pickup and drop off congestion	Policy, Cost	Parking Regulations	Flex zones
		Policy, Demand	Permitting	Fleet/commercial parking permits
				Reservation system
		Cost, Policy, Demand	Pricing	Price short term parking
				Graduated pricing structure
Long term parking	Long term parking demand increase with work from home	Policy, Demand	Parking Regulations	On-street parking time limits
				Neighborhood parking permits
EV charging	Want more electric vehicle charging	New + Changing Uses and Technology, Demand	EV charging	Curbside charging permits
				Ad-based curbside charging partnership
				Off-street charging concession
Enforcement	Lack of enforcement for short term parking	Safety, Data and Privacy, Agency Resources	Enforcement	Automated enforcement
				Real time sensors
				Artificial Intelligence (AI) driven enforcement
Enforcement	Concerned with privacy around using LPRs	Data and Privacy, Policy	Policy	Privacy policy
Pricing	Equity concerns with pricing	Cost, Policy	Equity	Transit pass parking rebates
				Fleet/commercial parking permits

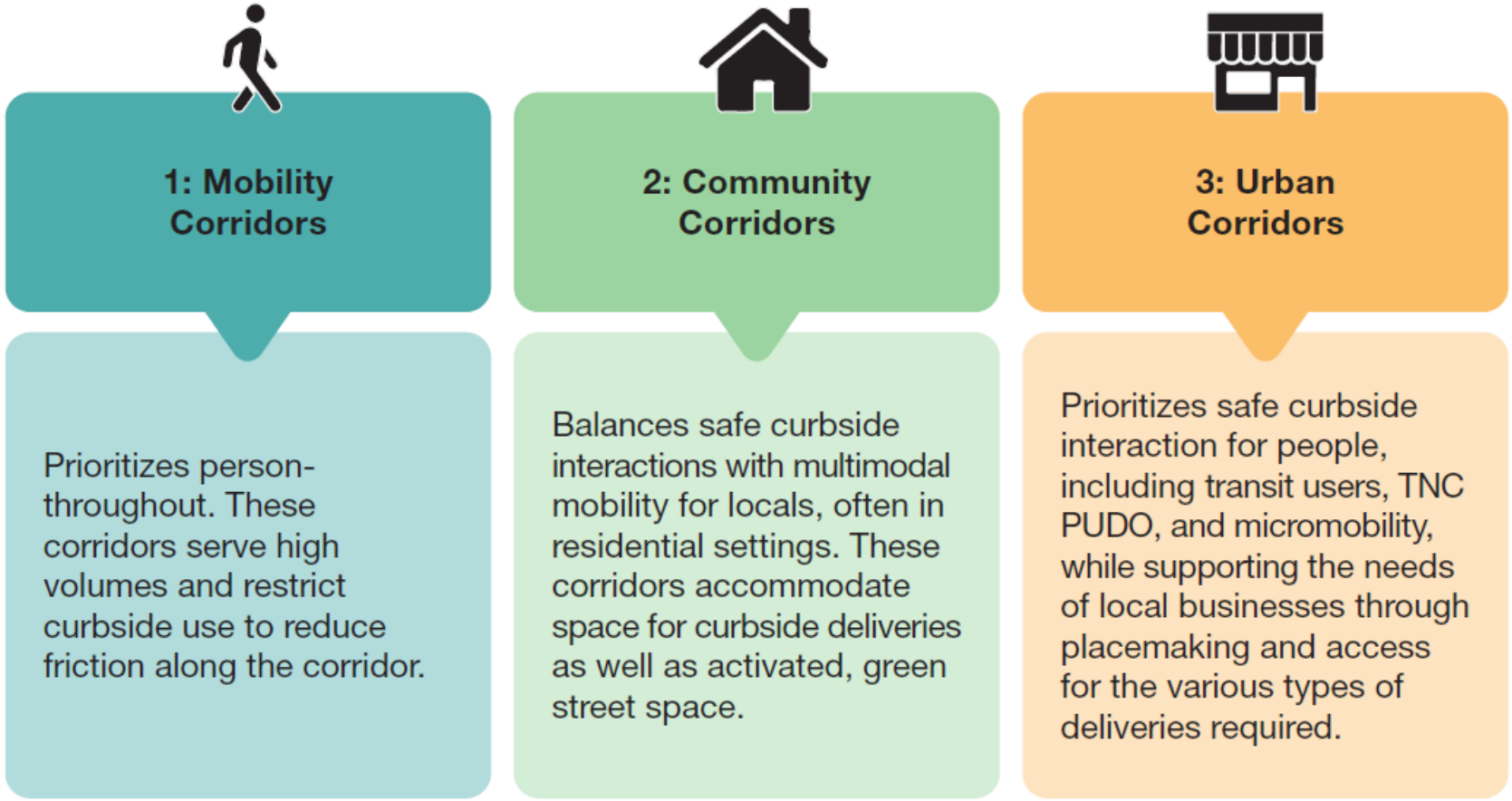
CURBSIDE TYPOLOGIES

Curbside Typologies

- Bridge the gap between high-level policy documents and detailed design work
- A starting point in the design process
- A guiding principle, not an iron clad or rigid rule
- Provide a common language to help decision makers, stakeholders, and the public alike better understand
  - The different ways the curb space can be used
  - How the current curb space can be improved
  - Transparency in why decisions are made

Curbside Typologies

10 typologies, broken down into 3 categories



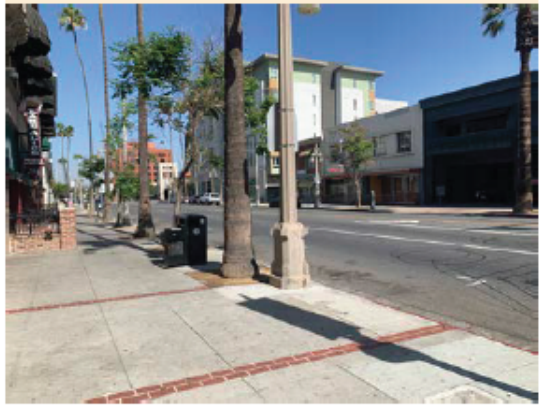
Curbside Typologies

- These are not intended to be fully inclusive
- Each City can add/modify as needed to fit their unique context
- Streets can change typologies based on time of day, day of week, season, etc.

9. MIXED-USE MAIN STREET

- This corridor type is the focal point of a downtown area and includes a mix of uses
- May provide access to public spaces where motorist access is prohibited

Below: *Looking eastbound on University Avenue in Riverside*



Primary purpose: Facilitate access for people and placemaking.

Key stakeholders: Pedestrians, couriers/goods movement, cyclists, micromobility, transit.

Main design consideration: Because Mixed-Use Main Streets also serve as destinations themselves, design considerations should accommodate access for people, including implementing pedestrian crossing improvements and public art installations.

Secondary design considerations: Allocate curb space to couriers/deliveries. People visiting this corridor type may also require curbside pick-up, and design consideration to mitigate conflicts between these two curbside stakeholders should be implemented. Similarly, allocated curb space for PUDO locations for TNCs, bike and scooter parking, and micromobility docking stations. Accommodate transit by providing dedicated transit lanes and bus bulbs. Relocate parking for personal vehicles to off-street parking to allow sufficient curb space for other curbside functions.

Access for People	Placemaking	Deliveries	Parking	Movement
1	2	2	4	5

WORKPLAN TEMPLATE

Workplan Template & Accompanying Step-by-Step Guidance

- Provides any City in the SCAG region with a tool to take a pilot from conception to completion
- Includes step-by-step guidance and supplementary cut sheets ("Extended Guidance")
- Designed as a checklist organized by 5 chronological pilot phases

Pilot Phases:

Phase 1: Conception

Phase 2: Planning

Phase 3: Launch

Phase 4: Pilot

Phase 5: Learn/Report and Scale

Workplan Template & Accompanying Step-by-Step Guidance

Pilot Profile

Pilot Profile details out the "proposal" of a curb pilot project. It ensures that city staff have identified a true purpose and need for the pilot (including a use case that identifies a place and population to test the intervention); have considered how that pilot connects to broader agency and city goals and values, and have reviewed critical go/no criteria like funding and staffing in order to ensure the pilot is executable.

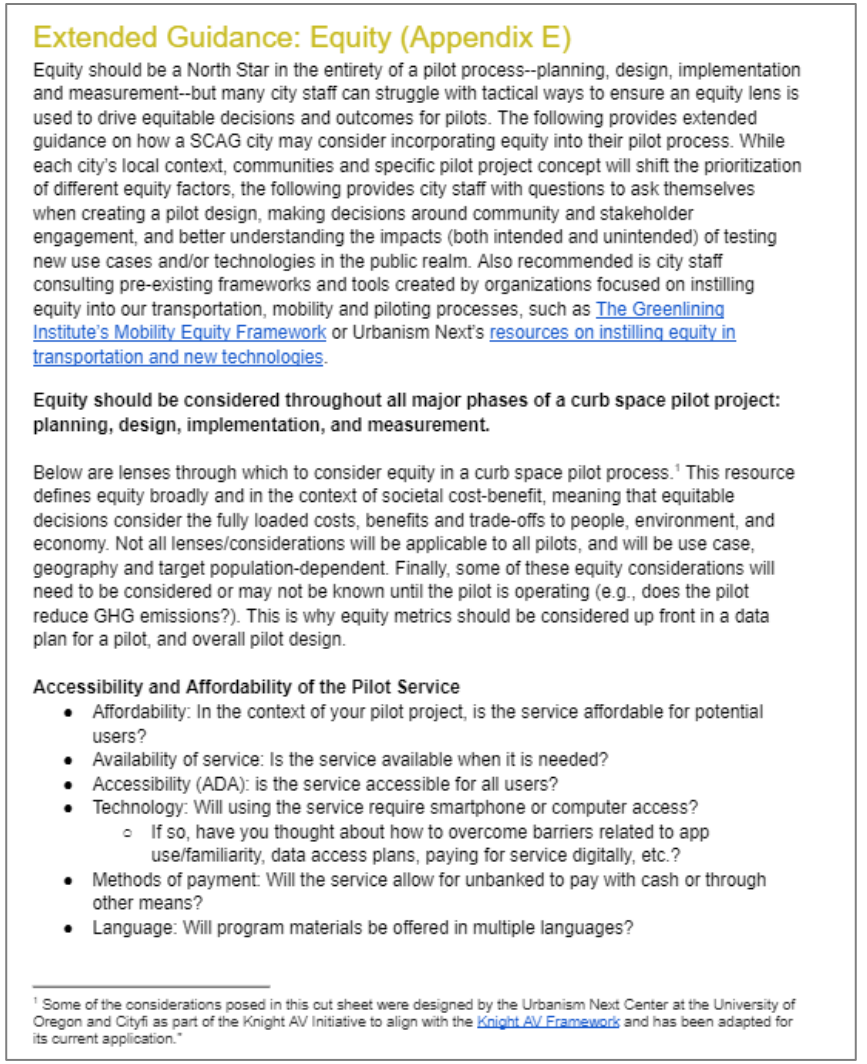
Phase(s) of Pilot: 1) Conception; 2) Planning; 3) Launch; 4) Pilot; 5) Learnings/Report and Scaling	Action	Progress: Completed? In Progress? Not Started?	Qualitative Notes/Inputs RE: Progress, Overall Task	Guidance	Other Pilot Phases or Extended Guidance Sheets to Reference for More Information
1	**Purpose** and **Need** of Pilot (can also be referred to as the "**Problem Statement**")			Identify what you are trying to test and how you know there needs to be an intervention. This avoids piloting technology for "technology's sake," and ensures that there is a true community challenge that could potentially be solved by the pilot. Identifying the purpose and need for the pilot can also be helpful when written as a hypothesis, i.e., "If X happens, then Y will happen."	
1,2	**Title** of Pilot			Make your pilot title easily understandable, by even the public and residents with minimal knowledge about the technology being tested (e.g., "Pick-Up Drop-Off Pilot to Ease Late Night Congestion at Event Venue").	
1,2	Brief **Summary** of Pilot			Provide high level, key points that are easily understandable, even by the public and residents (i.e., identify challenge, proposed intervention, timeframe and partners. Avoid jargon. If using technology in the pilot, describe what it is/does).	
1	Pilot Project **Goals**/Desired **Outcomes**			Identify what are you working toward with this pilot. Identify how you know if it is successful. There can be more than one desired outcome or goal per pilot. Consider making these goals SMART (Specific, Measurable, Achievable, Relevant, and Time-Bound), which increases accountability and clarity of goals.	

SUPPORTING MATERIALS

Supporting material on specific topics

"Extended Guidance Sheets"

- Equity
- Privacy Principles Local Government Best Practices
- Private Sector Partnership and Engagement



Extended Guidance: Equity (Appendix E)

Equity should be a North Star in the entirety of a pilot process--planning, design, implementation and measurement--but many city staff can struggle with tactical ways to ensure an equity lens is used to drive equitable decisions and outcomes for pilots. The following provides extended guidance on how a SCAG city may consider incorporating equity into their pilot process. While each city's local context, communities and specific pilot project concept will shift the prioritization of different equity factors, the following provides city staff with questions to ask themselves when creating a pilot design, making decisions around community and stakeholder engagement, and better understanding the impacts (both intended and unintended) of testing new use cases and/or technologies in the public realm. Also recommended is city staff consulting pre-existing frameworks and tools created by organizations focused on instilling equity into our transportation, mobility and piloting processes, such as The Greenlining Institute's Mobility Equity Framework or Urbanism Next's resources on instilling equity in transportation and new technologies.

Equity should be considered throughout all major phases of a curb space pilot project: planning, design, implementation, and measurement.

Below are lenses through which to consider equity in a curb space pilot process.[1] This resource defines equity broadly and in the context of societal cost-benefit, meaning that equitable decisions consider the fully loaded costs, benefits and trade-offs to people, environment, and economy. Not all lenses/considerations will be applicable to all pilots, and will be use case, geography and target population-dependent. Finally, some of these equity considerations will need to be considered or may not be known until the pilot is operating (e.g., does the pilot reduce GHG emissions?). This is why equity metrics should be considered up front in a data plan for a pilot, and overall pilot design.

Accessibility and Affordability of the Pilot Service

- Affordability: In the context of your pilot project, is the service affordable for potential users?
- Availability of service: Is the service available when it is needed?
- Accessibility (ADA): is the service accessible for all users?
- Technology: Will using the service require smartphone or computer access?
  - If so, have you thought about how to overcome barriers related to app use/familiarity, data access plans, paying for service digitally, etc.?
- Methods of payment: Will the service allow for unbanked to pay with cash or through other means?
- Language: Will program materials be offered in multiple languages?

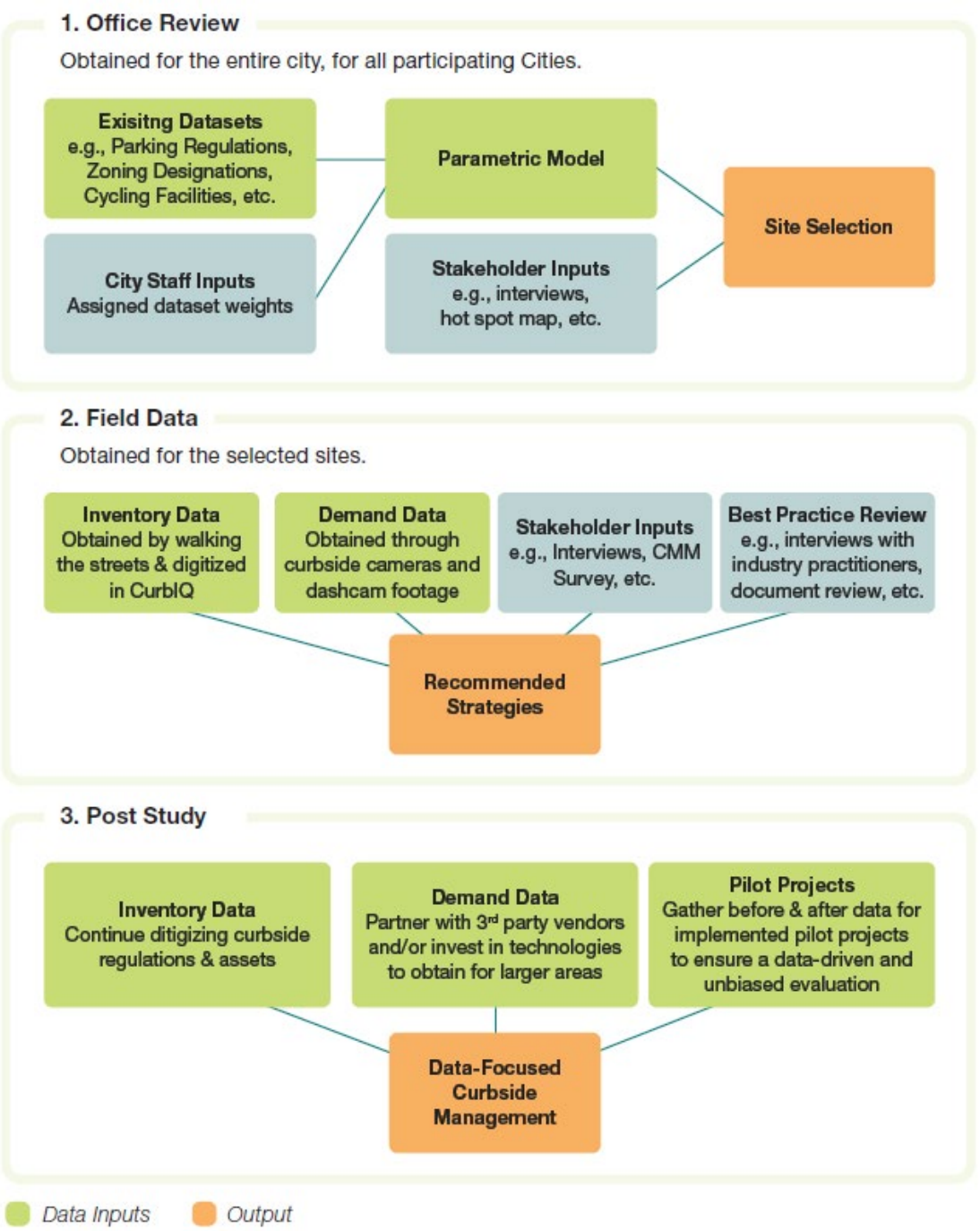
[1] Some of the considerations posed in this cut sheet were designed by the Urbanism Next Center at the University of Oregon and Cityfi as part of the Knight AV Initiative to align with the Knight AV Framework and has been adapted for its current application."

DATA

Data Overview

- Before the curb can be managed, it must be understood
- The level of detail of the various datasets can differ between steps to make the most of available resources

Data is a part of a larger process, not the entirety of the process



CURBIQ

CurbIQ is a SaaS solution to create, manage, and share curbside regulations in a visual and easy-to-navigate way.

Curb Manager

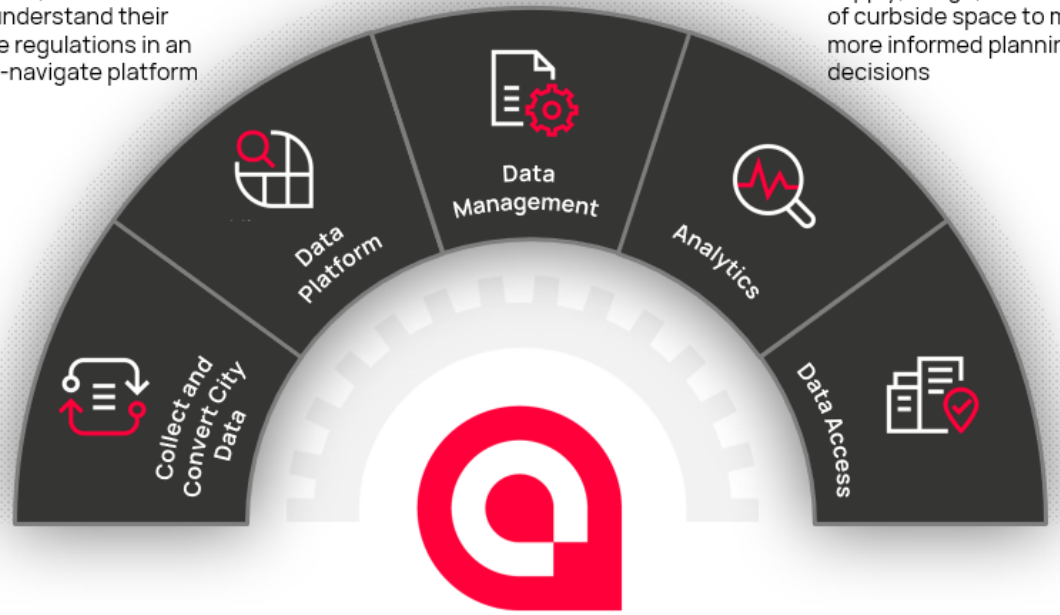
Helps municipal staff update regulations in a user-friendly interface and convey these changes effectively

Curb Viewer

Helps municipalities, businesses, and residents better understand their curbside regulations in an easy-to-navigate platform

Curb Analyzer

Lets users analyze the supply, usage, and revenues of curbside space to make more informed planning decisions



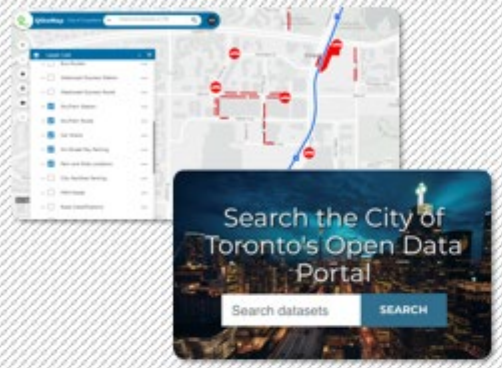
Curb Converter

Digitizes and standardizes city's regulations to align with an industry standard format (CurbLR or CDS) and to create **open regulation data**

Curb Rules API

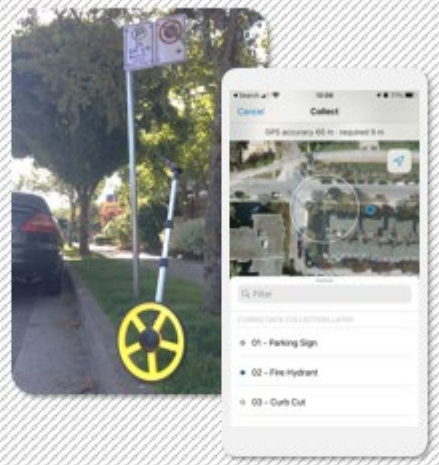
Disseminate curbside regulations to 3rd parties *(E.g. couriers, TNCs, navigation platforms, and CAVs)*

DATA COLLECTION METHODS



Open Data Automation

Convert existing, georeferenced data to digitized curb segments using patent-pending processes



Curb-Level Surveying (CLS)

Open-source measurement tools to survey streets with automated scripts to convert images into curb regulation data

Augmented Mobile Mapping (AMM)

A vehicle-based process to generate digital curb regulations from signage imagery using machine vision

DEMAND DATA

Camera / Sensor Data

Real-time data captured by cameras or sensors that can be in-ground, surface-mounted, or overhead.

Payment / Smart Meter Data

Real-time payment data captured whenever users pay on parking apps, websites, or smart meters.

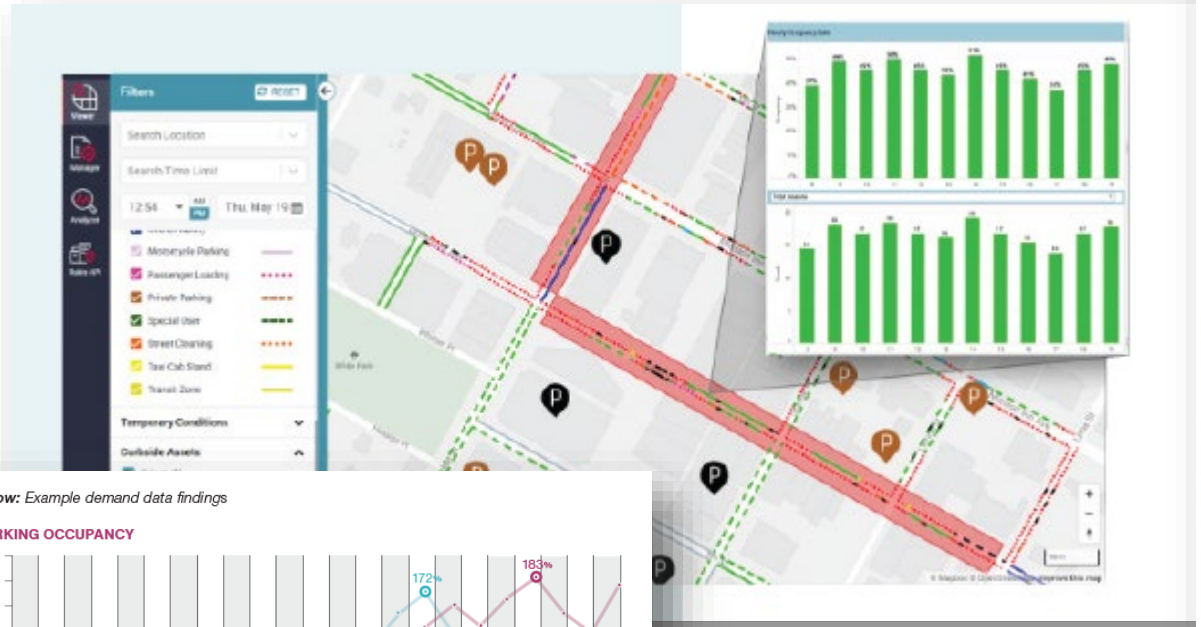
Parking Survey Data

Historical occupancy data captured during parking surveys, curbside studies, or traffic counts.

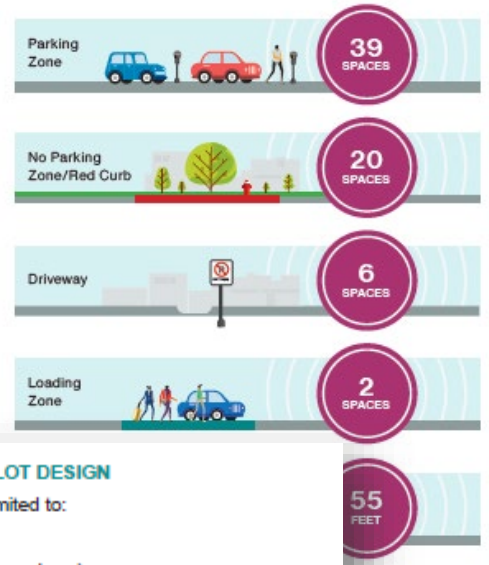
CURBIQ DEMO


Filters
RESET
Search Location
Search Time Limit
12:14
Mon, Apr 19
Parking Restrictions
Select All
Parking (Permit)
Parking (Paid)
Parking (Free)
No Stopping
No Parking
Special Designations
Special Event
Temporary Conditions
Construction Zone
Curbside Patio
Curbside Pick Up
Slow Street
Live Data
Off
Segment Information
Dunlop Street
Directions
Spaces: 10
Parking Time Limit: 2 hours
Price: $1.25 / hour
Source: Schedule G
Mon-Fri
Sat
Sun
Taxi Cab Stand
Parking (Free)
Parking (Paid)
Curbside Patio
Viewer
Manager
Analyzer
Rules API
CurbIQ
SUPPLY
COMPARISON
DEMAND
TURNOVER
SETTINGS
DOWNLOAD PDF
View:
Summary Stats
44 Spaces
Total Number of Spaces
29 Parking (Free) spaces at 00:00
Most Common Regulation on this day
47.1%
% of Revenue Generating Spaces for this Time Period
Target
50%
$725.00
Total Potential Revenue for this Time Period
$159
735 Users
Total Number of Users for this Time Period
100
Map
Front St W
© 2022 Mapbox © OpenStreetMap
Accessible Perm...
Parking (Paid)
No Parking
Taxi Cab Stand
Parking (Free)
Curbside Supply by RegulationType
Space-hours
Potential Revenue
Revenue ($)
$145.00
$0.00
Filters
Analysis Zone
Bus Terminal PUDO Zone
Date
06/09/2022 (Thursday)
Time Period
Scenario
Existing
Stats View
Metric Value

CURBIQ REPORTING

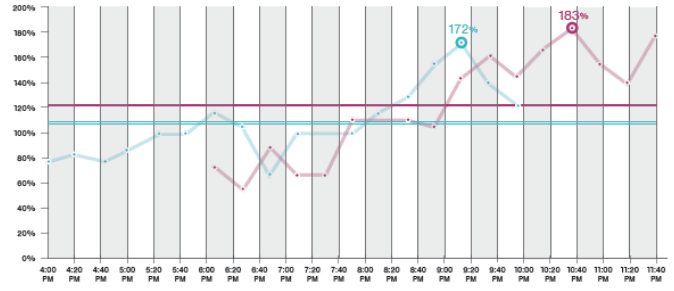


Curb Space Allocation

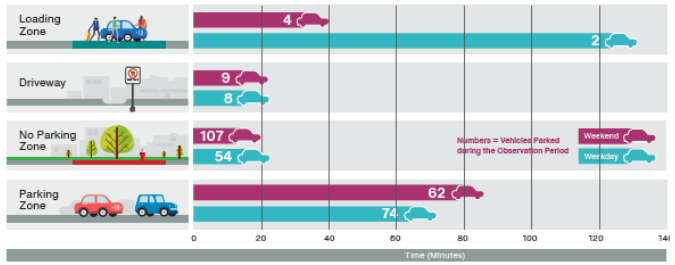


Below: *Example demand data findings*

PARKING OCCUPANCY



AVERAGE DWELL TIME



KEY CONSIDERATIONS AND ANALYSIS FOR PILOT DESIGN

On weekdays, the curb's uses include but are not limited to:

3am to 8am and 5pm to 7pm

- 3 transit zone spaces (serving up to 60 users per hour)
- 2 passenger loading zones (serving up to 36 users per hour)
- 39 free parking spaces (serving up to 93 users per hour)

9am to 4pm

- 3 transit zone spaces (serving up to 60 users per hour)
- 2 passenger loading zones (serving up to 36 users per hour)
- 10 paid parking spaces (serving up to 30 users per hour; generating up to $15 in revenue per hour)
- 28 free parking spaces (serving up to 63 users per hour)

8pm to 2am

- 3 transit zone spaces (serving up to 60 users per hour)
- 9 passenger loading zones (serving up to 108 users per hour)
- 25 free parking spaces (serving up to 75 users per hour)

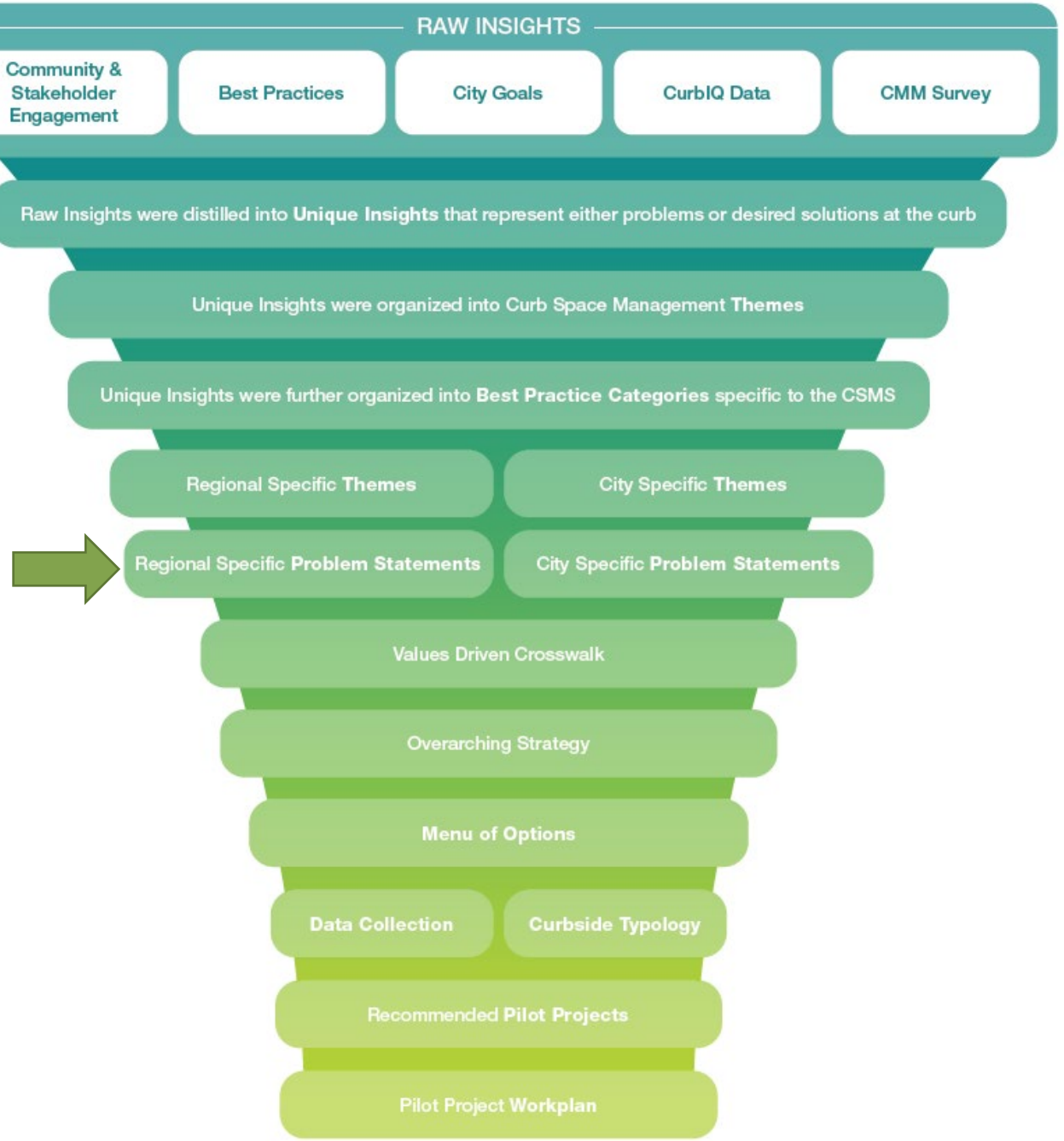
CASE STUDY #1

Santa Ana – Alternative Micromobility Permitting Pilot

Where to Start?

- Starting point depends on where you are in your curb space management journey
- Just beginning?
- Focus cities for the CSMS

A curb space management program should be flexible and updated on a consistent basis to reflect current priorities and initiatives within the city.



Problem Statement

There is no ordinance that prohibits or allows scooter share or bikeshare, but the previous shared mobility pilot failed because of street clutter.

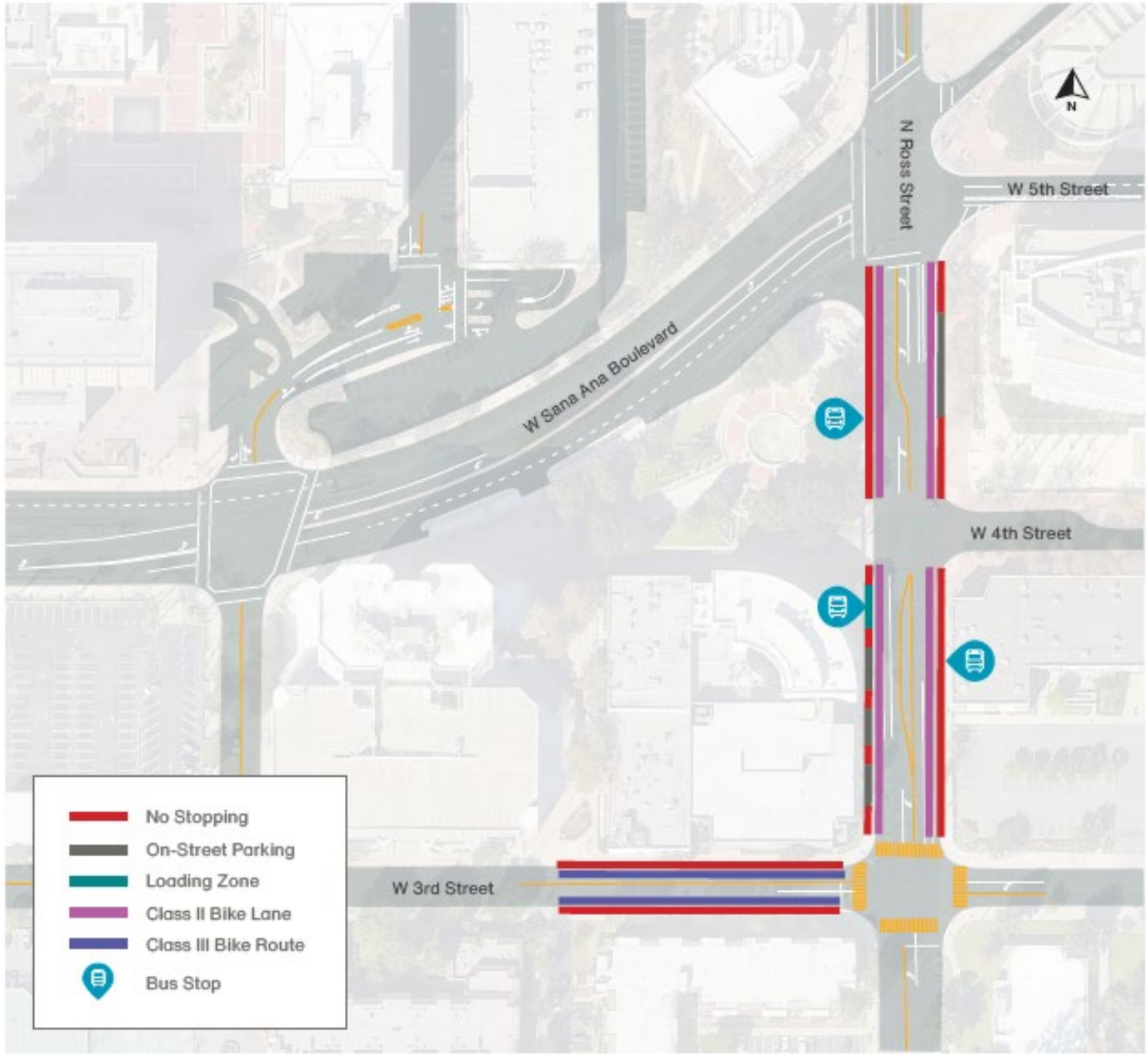
Study Area

- The problem statement may be specific to a study area, or it may be applicable to a wider area and a smaller pilot study area is required
- Parametric model
- Hotspot map
- Community input
- Other

Study Area

Santa Ana

3rd Street and Ross Street



Study Area - Existing

- High loading activity demand
- On-street parking, bus stops, and cyclist infrastructure present
- Inadequate parking and loading zone for parents and vendors at NOVA Academy
- Diverse land uses

Inventory Data

Curb Space Allocation

Site Characteristics

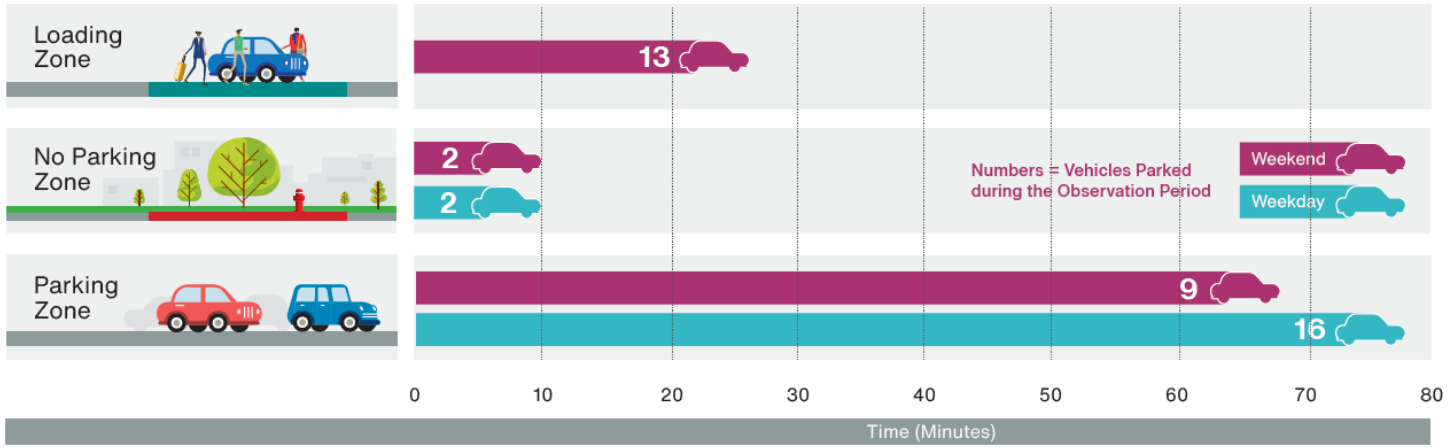
- 2 hour paid parking from 8:00 a.m. – 10:00 p.m.
- No parking between 2:00 a.m. – 6:00 p.m.
- Loading zones operate from 7:00 a.m. – 6:00 p.m.

CurbIQ

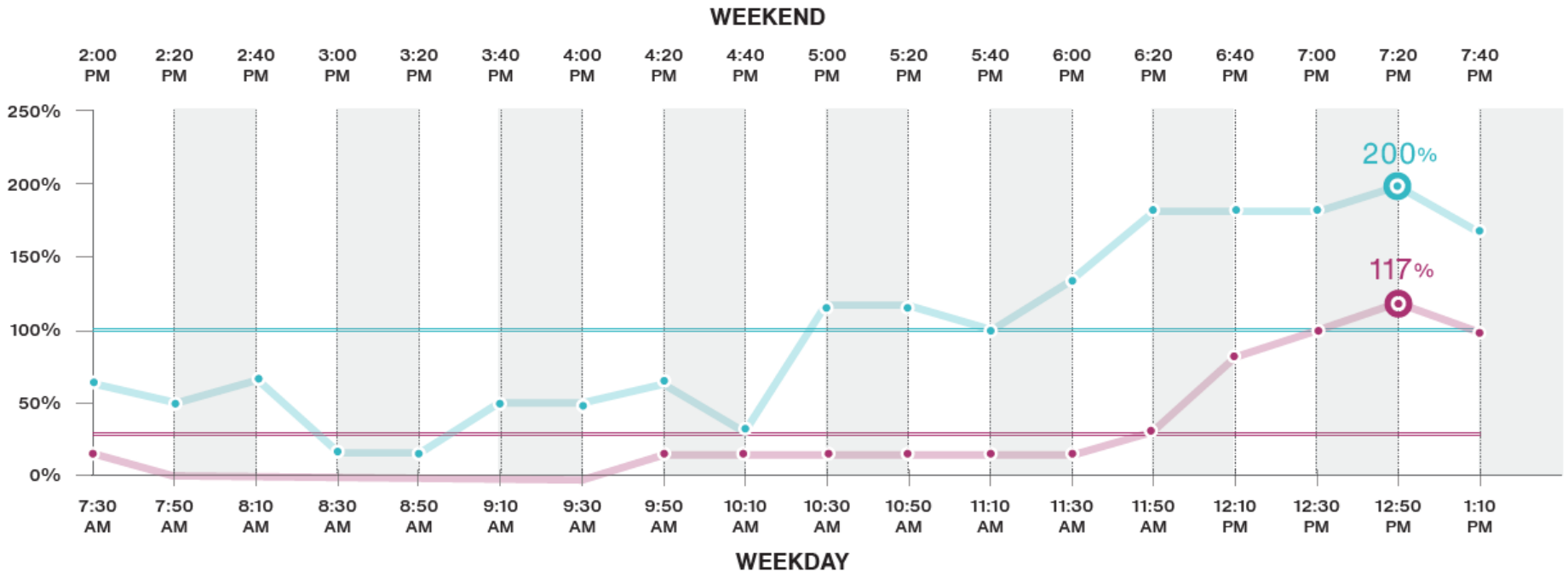
Demand Data

- Collected using curbside cameras

Average Dwell Time



Parking Occupancy



Key Data Findings

- Illegal PUDO activity was observed
- Most times curbside activity took place, bike lane and pedestrian activity was encroached upon
- A method that organizes the clutter of activity along the curbside while furthering the City's goals related to the curb, transportation, and sustainability could be an optimal solution.
- The site primarily facilitates movement for employees and access for people entering the workplace (seen in the high frequency of illegal PUDO activity).
- Improvements can be made to further improve multimodal access along the curb.

Curb Typology

- Desired Typology: Employee Access

3. Employee Access	• Promotes employee access to office space or government buildings & may be located near off-street parking	 Movement 1 · Access for People 2 · Deliveries 2 · Parking 3 · Placemaking 4

- Do the current designations align with the corridor type?
  - ➢ Designations are primarily no stopping with bike lanes
  - ➢ However, high volume of illegal activity is present, suggesting usage does not align

Menu of Options

Problem Statement	Best Practice Area	Recommendation Category (Strategy)	Recommendation (from Menu of Options)
There is no ordinance that prohibits or allows scooter share or bikeshare but previous shared mobility pilot failed because of street clutter	Policy	Alternative Micromobility Permitting	Single vendor concession
			Private property shared mobility
There is a lack of community education and appropriate signage at the curb to promote safety and offer information on curb changes	Community and Stakeholder Perceptions	Engagement	Public education programs
	Policy, New + Changing Uses and Technology, Data and Privacy	Technology	Digitization of parking regulations
There is a lack of clear regulations for food trucks and not enough resources for enforcement	Policy, New + Changing Uses and Technology, Data and Privacy	Permitting	Food truck permitting
			Digital permitting
	Demand, Policy	Parking Regulations	Food truck zones
	Policy, Data and		

Recommended Pilot

- Alternative Micromobility Permitting Pilot
- Reevaluate alternative permitting methods to micromobility. This will include evaluation of single vendor concession, with more rigorous service level agreements related to utilization, integration with transit, and enforcement mechanisms.
- Evaluate private property docked micromobility options that link major transportation hubs to sites such as employers and retailers. The docks would all be installed on private property and micromobility can only be dropped off at a dock.

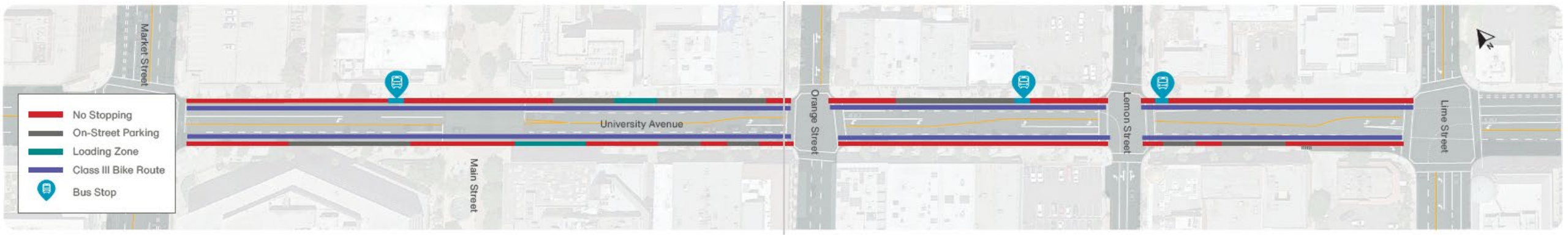
CASE STUDY #2

Riverside – Computer Vision Cameras + Lidar to Better Understand Curb Congestion Through Data

Study Area

Riverside

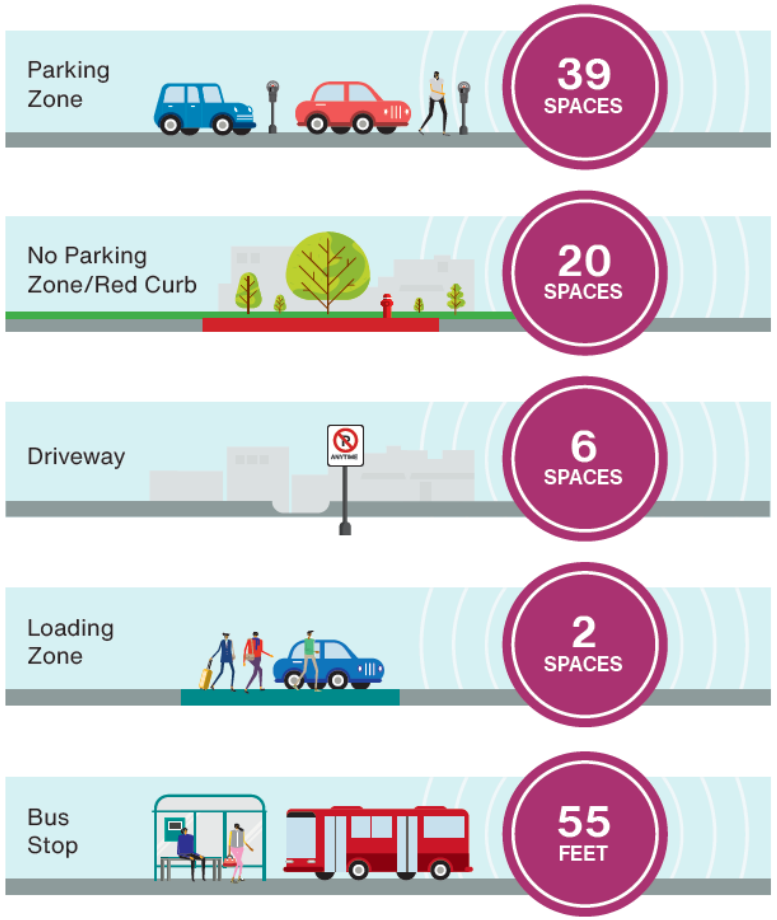
University Avenue between Market Street and Lime Street



Study Area - Existing

- High loading activity compete with on-street parking and loading for curb access
- High demand for loading/unloading
- 9 bus lines
- Access points for service vehicles
- Heavily commercialized area with restaurants and offices – Downtown Riverside

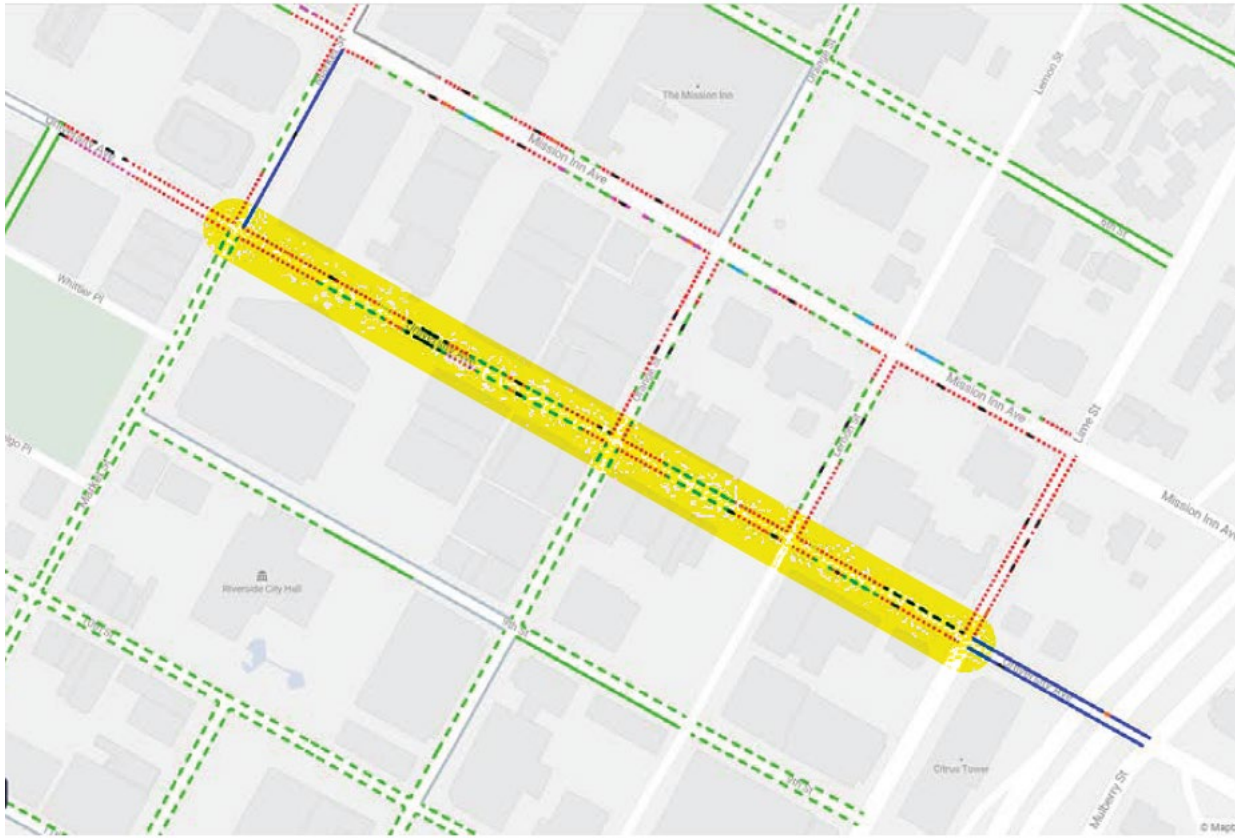
Inventory Data



Curb Space Allocation

Site Characteristics

- Paid parking operating 9:00 a.m. - 5:00 p.m. Monday through Friday.
- Free parking outside stated hours

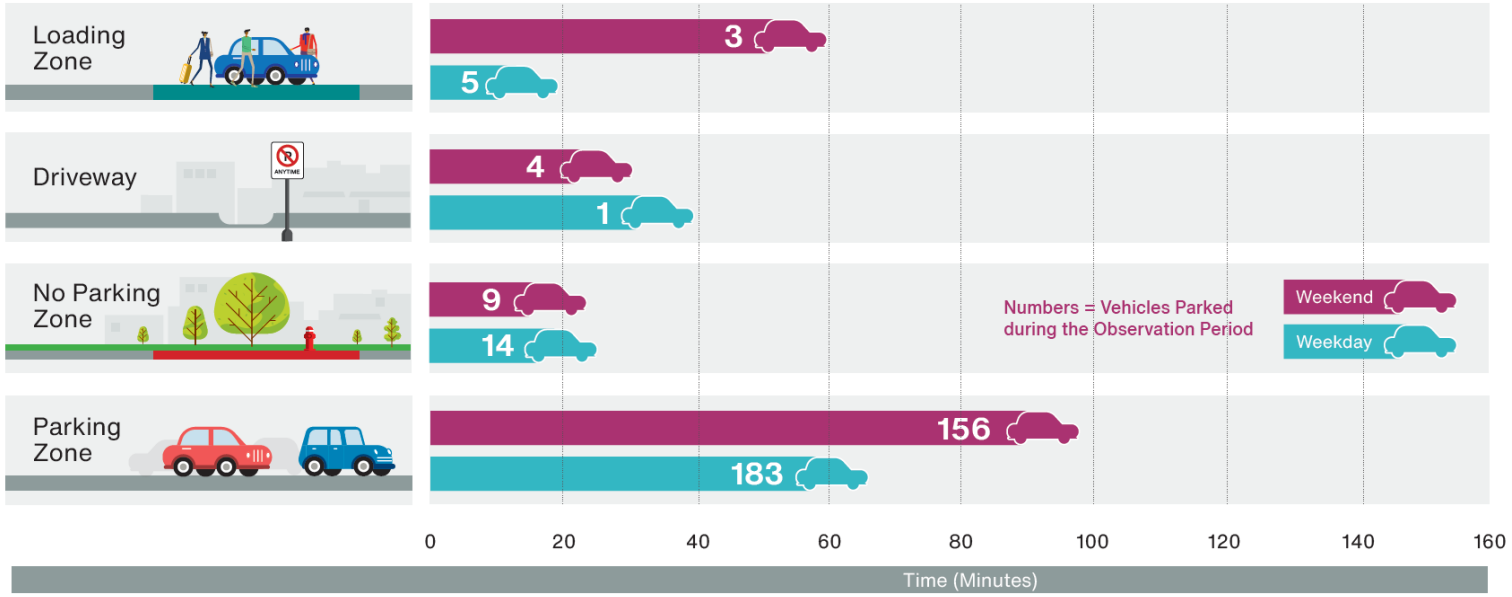


CurbIQ

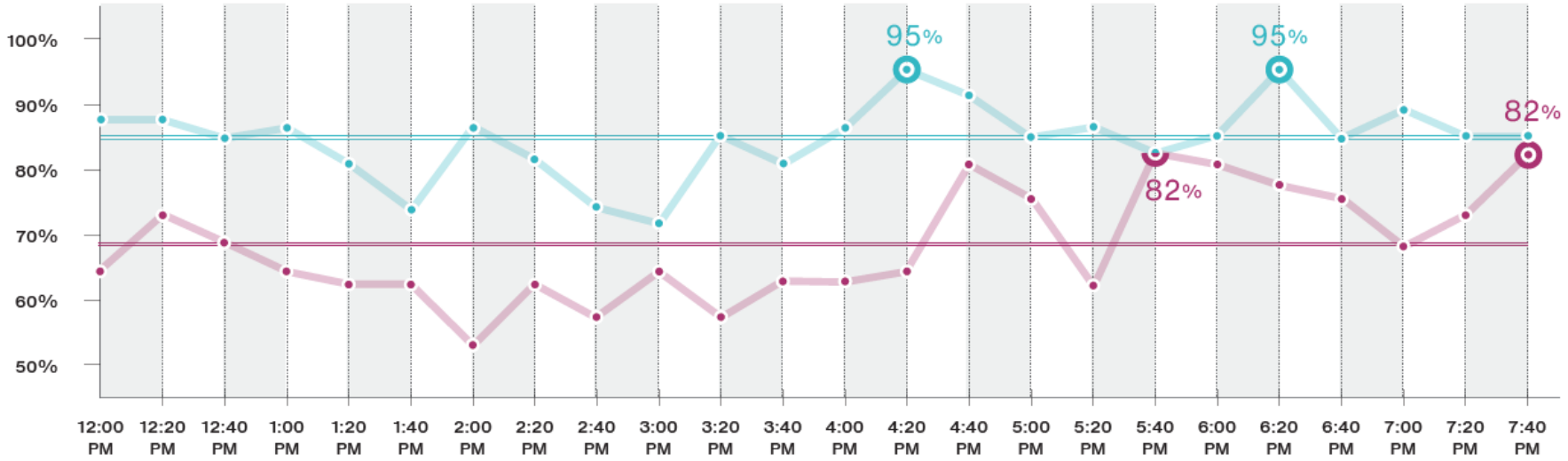
Demand Data

- Collected using dashcam footage

Average Dwell Time



Parking Occupancy



Key Data Findings

- Parking occupancy rates remain relatively consistent for both weekdays and weekends
- Vehicles were often parked in no parking zones for 25 minutes at a time
- On the weekend, vehicles parked in loading zones for >40 min
- Finding parking is challenging throughout the day (~95%)
- High occupancy percentage and frequency of illegal curbside activity indicate a high demand for on-street parking.
- A high occupancy percentage can indicate an opportunity to consider increasing parking fees or a progressive parking payment system

Curb Typology

- Desired Typology:

TYPOLOGY	DESCRIPTION	FUNCTIONS (RANKED IMPORTANCE)
Mixed-Use Main Street	• This corridor type is the focal point of a downtown area and includes a mix of uses • May provide access to public spaces where motorist access is prohibited	

- Do the current designations align with the corridor type?

➢ No – current designations favour drivers with lots of on-street parking provided, both paid and free.

➢ Recommended pilots should focus on better managing the use of on-street parking and ensuring curb space is available for the priority users.

Menu of Options

Problem Statement	Best Practice Area	Recommendation Category (Strategy)	Recommendation (from Menu of Options)
Major congestion caused by multiple modes competing for curb space (delivery, TNC PUDO, transit, parking, etc.)	Data, New + Changing Uses and Technology	Data Analysis	Computer vision cameras
			Lidar
	Policy, Demand	Parking Regulations	Flex zones
	Policy	Permitting	Fleet/commercial parking permits
			Reservation system
	Cost	Pricing	Price short term parking
			Graduated pricing structure
	Policy, Data and Privacy, Safety	Enforcement	Concession for bus lane enforcement
			Automated enforcement
			Real time sensors
			AI driven enforcement

Recommended Pilot

- Computer Vision Cameras + Lidar to Better Understand Curb Congestion Through Data
- Utilize low cost data collection methods (e.g., computer vision cameras or lidar) to collect curbside data on the entire corridor.
- Use this data to better understand total number and duration of short-term parking to develop time limit regulations, as well as implementation guidance, to determine the number of short term parking zones per block that are needed.
- Once the data is studied through this pilot, the City can implement a second pilot that tests short-term zones based on data analysis.

THANK YOU!

For more information, please visit:

https://scag.ca.gov/curb-space-management-study