Curb Space Management – Local Lessons

04/07/2026

Toolbox Tuesday

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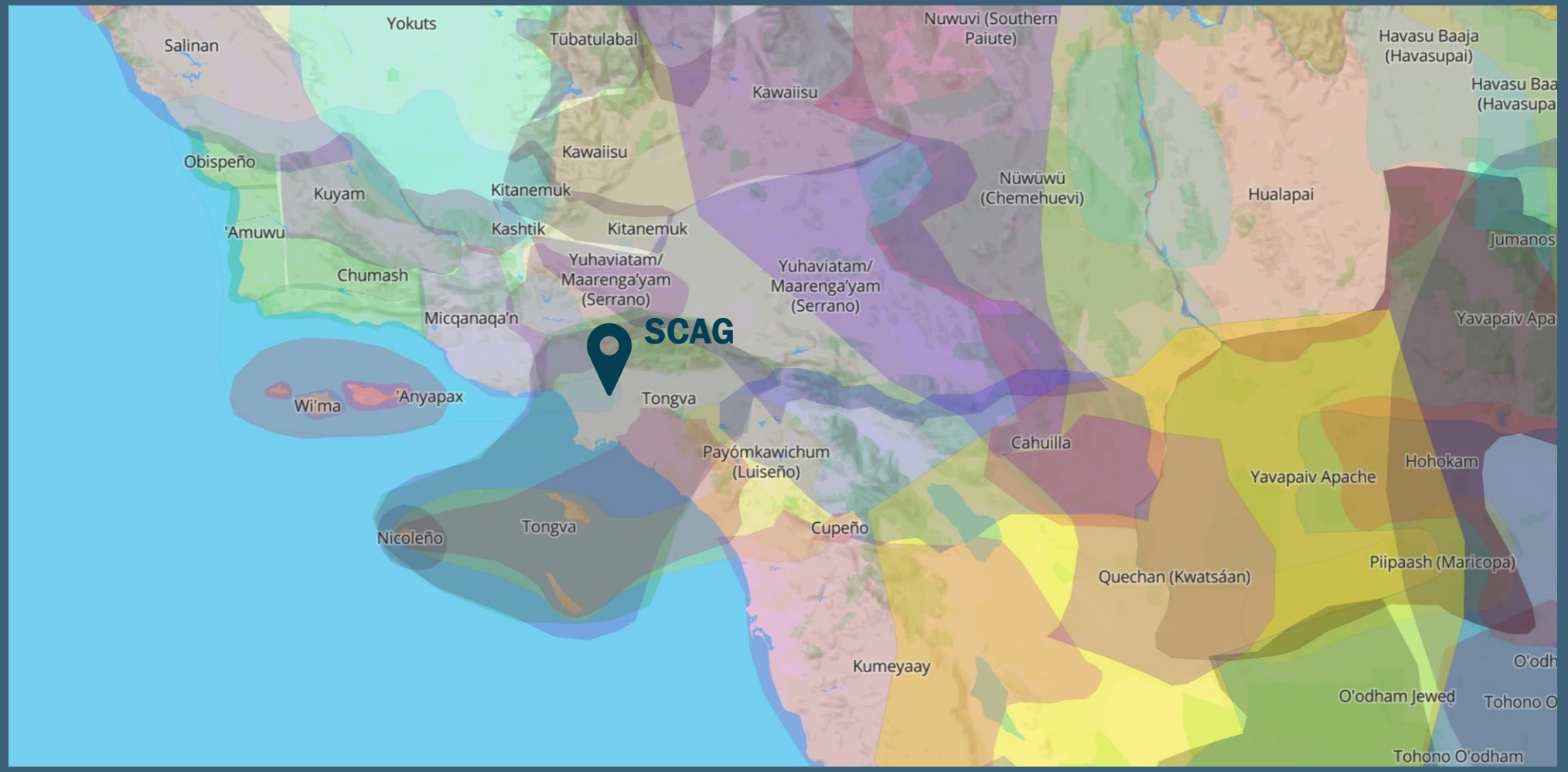
Housekeeping

1. Meeting length: 1.5 hour
2. This meeting is being recorded
3. All participant lines will be muted
4. At the end, there will be a Q&A session
5. If you have a question during the presentation, please type it into the chat box or press the "raise hand" function
6. We will log all questions and then voice a selection at the end of the presentation
7. Closed captioning can be turned on by clicking “Show captions” on the Zoom ribbon
8. A recording of this webinar and the PowerPoint slides will be available on the SCAG website. We will send a link to everyone who has registered after the event
9. Please fill out our survey at the end to help us improve future Toolbox Tuesdays!

Land Acknowledgement



Agenda

- Introduction / Background
- Challenges and Opportunities
- Curb Space Management Study and Toolbox
- Curb Space Data Collection and Inventory Study
- New Curbside Developments, Policies, Technologies, and Applications

What is Curb Space?

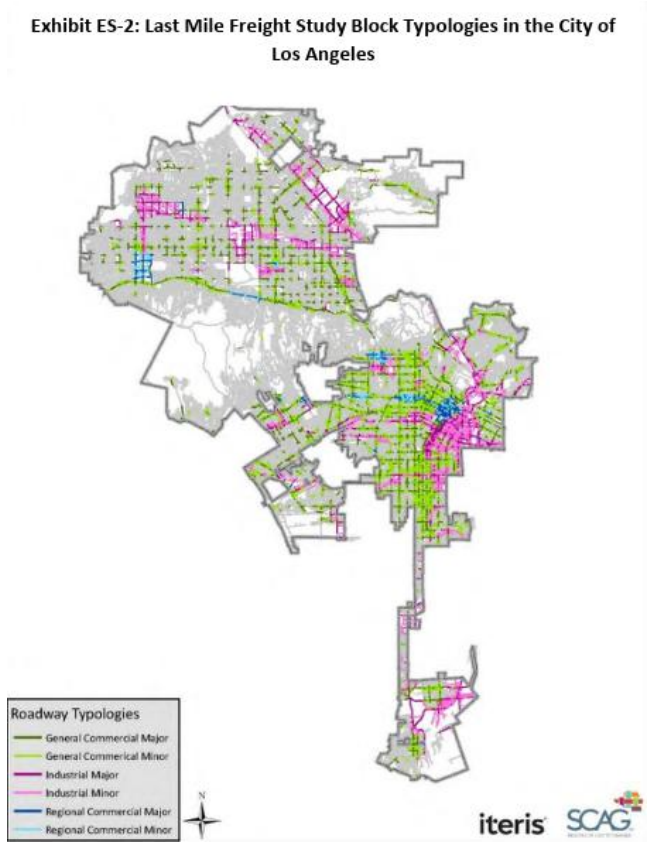
The **Curb Space**, also known as the curbside, is simply **the space on the street that is closest to the curb**.

Growth in e-commerce, on-demand delivery services, and shared mobility has made the curb a competitive environment. Strategically allocating and regulating curb space through **Curb Management** has emerged as a key policy and implementation **tool for advancing broader regional goals related to mobility, sustainability, and economic vitality**.

In response to these challenges, SCAG has undertaken a series of studies and partnerships aimed at improving understanding of curbside activity, identifying best practices, and supporting local jurisdictions in developing curb management strategies.

Last Mile Freight Delivery Study (2020)

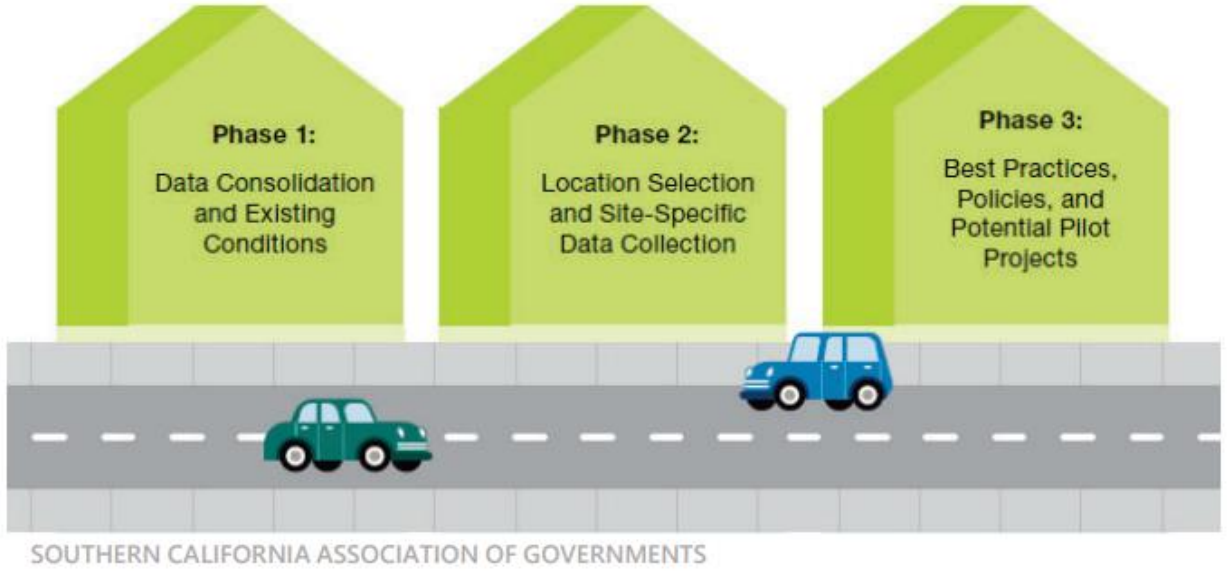
- Examined the relationship between last-mile access conditions, the delivery of goods, and the role of last-mile delivery
- Data collection effort focused on curbside activity at 35 blocks within 12 Los Angeles case study areas
- Findings were leveraged to inform LADOT in developing their Zero Emission Delivery Zones (ZEDZ) pilot



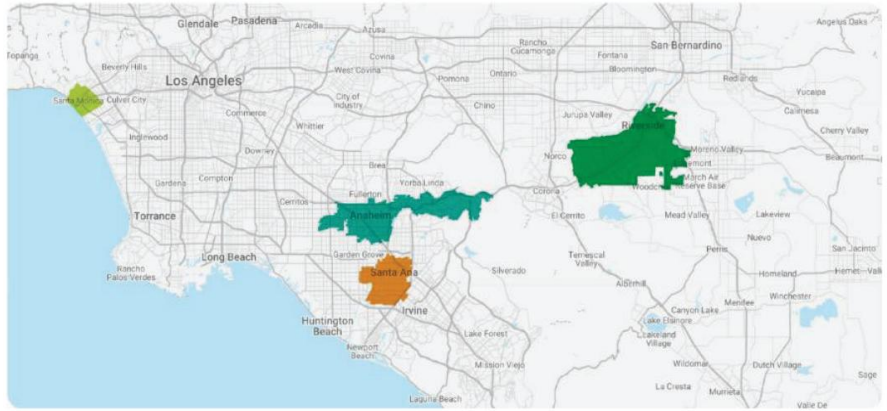
Location E under existing conditions as a red zone and recommended passenger loading. (Source: Google Streetview)

Curb Space Management Study (CSMS) - 2022

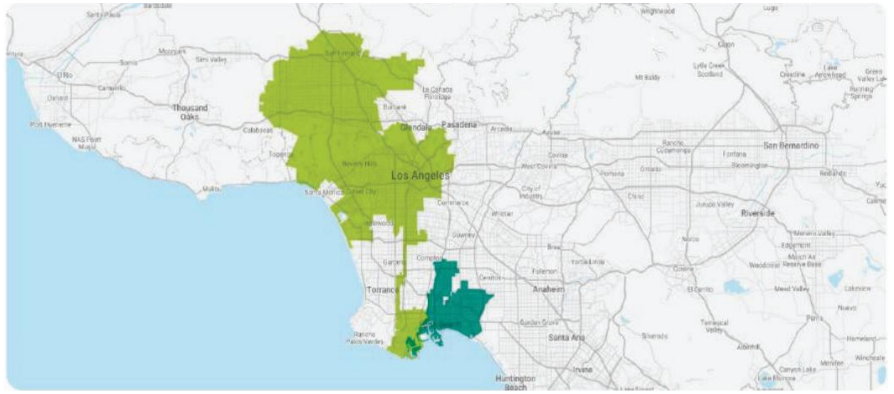
- Provided curb space management strategies and recommendations for multiple cities within the SCAG region.
- Developed work plans for multiple pilot project concepts and/or analysis plans for pilot projects.



Participating Cities – Data Collection and Pilots:
Anaheim, Riverside, Santa Ana, Santa Monica



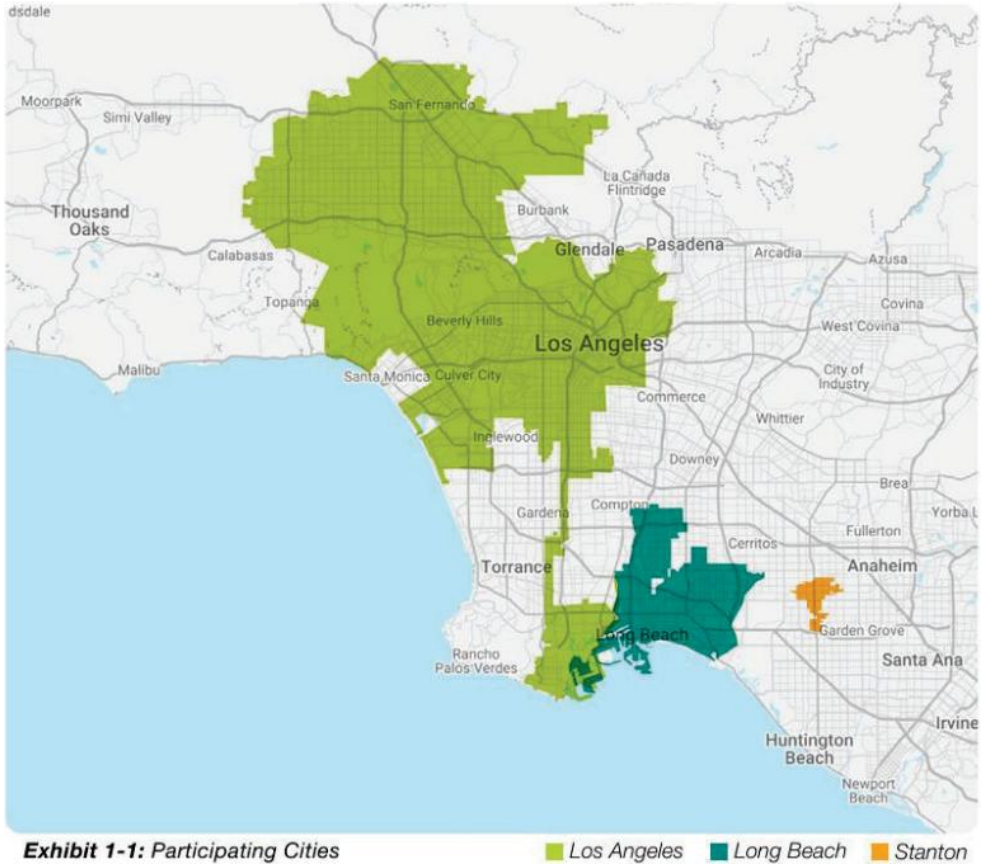
Participating Cities – Advisory / Peer Exchange:
Los Angeles, Long Beach



Curb Space Data Collection & Inventory Study (CSDI) - 2024

- Identified key policies, strategies, and technological solutions to address curb management issues.
- Strategies and pilot project concepts were developed collaboratively between SCAG and cities, with input from a range of stakeholders.
- Resulted in data-driven, real-world implementation plans maximizing technologies where appropriate.

Participating Cities:
Los Angeles, Long Beach, Stanton



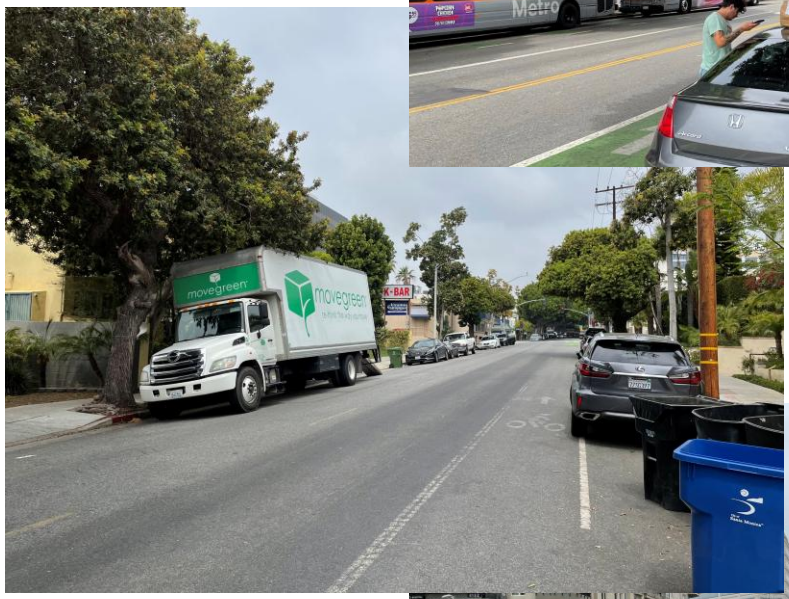
Zero-Emissions and Smart Delivery Zones Study (2025)

- Partnered with the Los Angeles Cleantech Incubator (LACI) on a U.S. Department of Energy-funded study
- West Coast pilot areas: Los Angeles & Santa Monica
  - Goal: Test curb management strategies to accelerate EV adoption among delivery fleets & ridehail drivers
- East Coast pilot area: Pittsburgh, PA
  - Goal: Successfully adopt an EV and smart loading zone policy leveraging Automated License Plate Reader (ALPR) technology for parking enforcement

What is Curb Space 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.

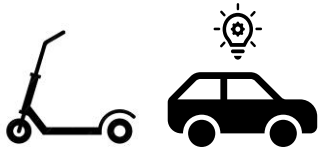


Poll Questions

Mobility Trends at the Curb Space

Growing mobility demands

- Rise in vehicle ownership
- E-commerce deliveries
- Multimodal planning efforts



Disruptive technologies

- Transportation network companies
- Dockless scooters
- Electric and autonomous vehicles

Post-pandemic shifts

- Surge in food/grocery deliveries
- Curbside eateries and sidewalk commerce

Challenges

Congestion and parking conflicts

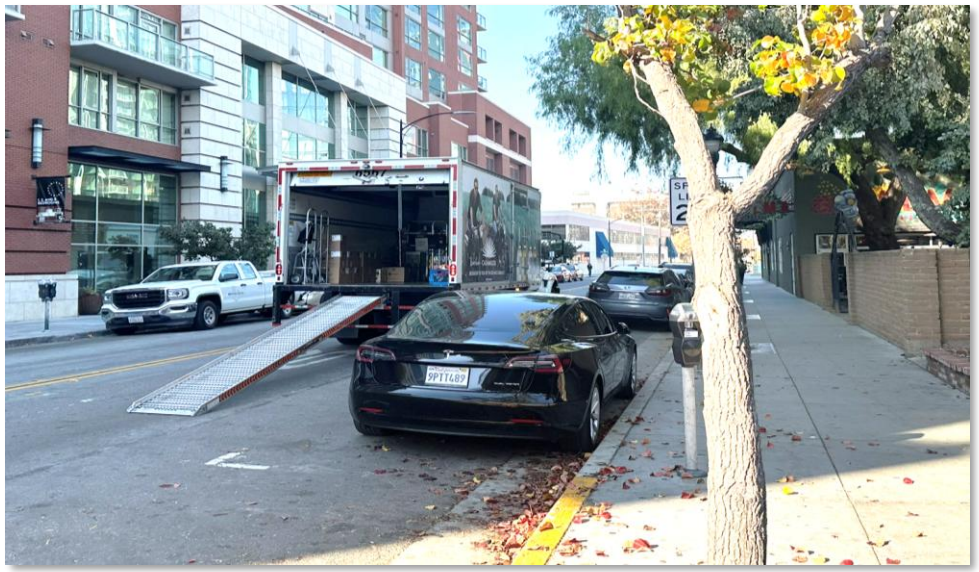
- On- and off-street parking conflicts
- First/last mile connectivity issues

Delivery and multimodal pressures

- Food/grocery deliveries
- Commercial loading
- Contested space for bus/bike/car/truck

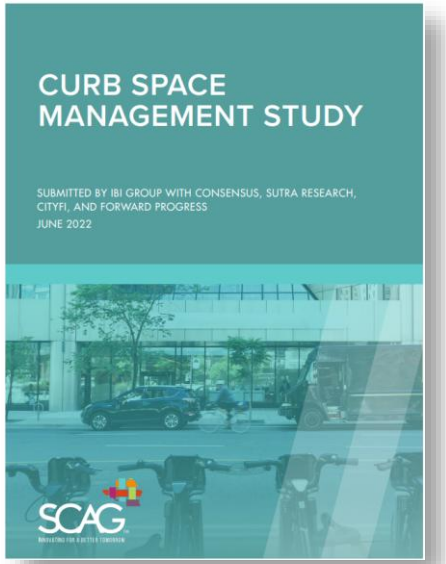
Curb space management hurdles

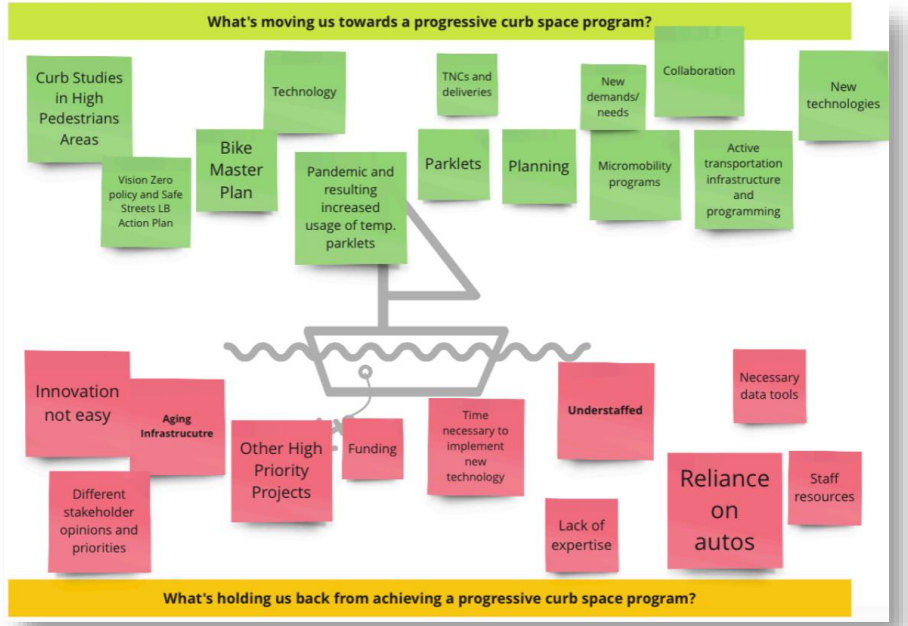
- Digital needs:
  - Data collection
  - Data integration
  - Continued monitoring (real-time updates) for dynamic zones
- Stakeholder buy-in
- Policy coordination
- No "one-size-fits-all" approach

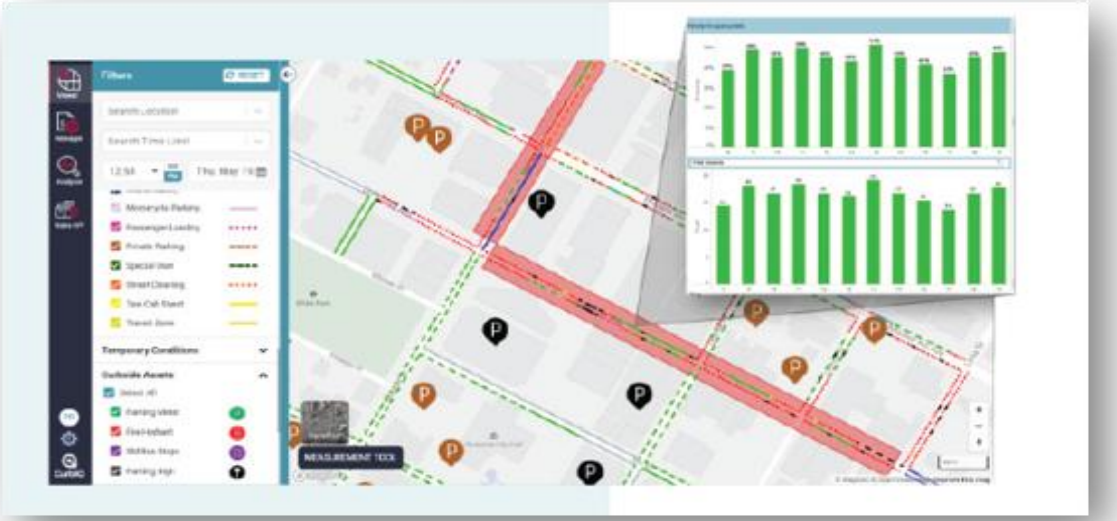


Opportunities

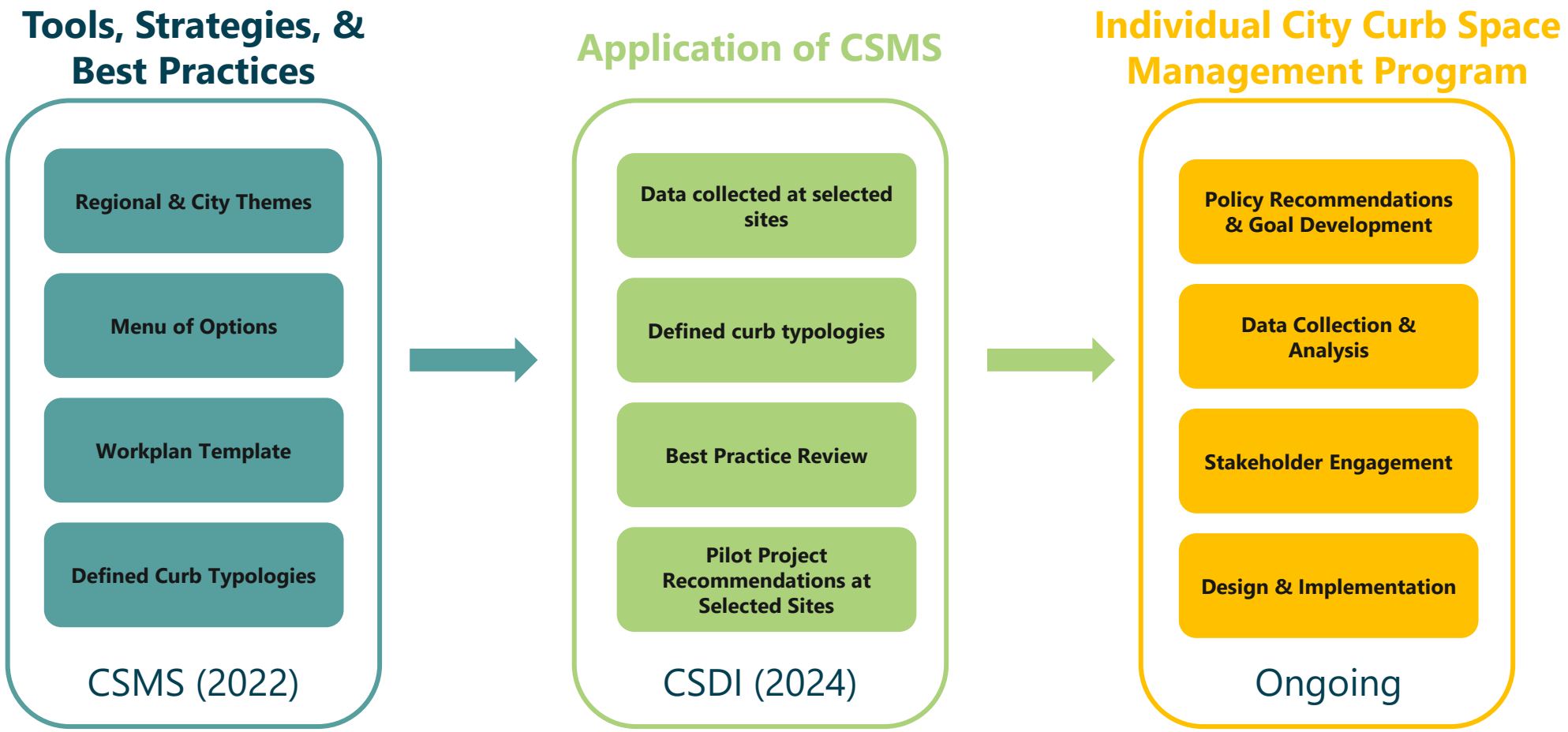
- Regional best practices and policy guidance
- Stakeholder collaboration
- Digital and policy innovations
- Local pilots and lessons learned







Roadmap


Tools, Strategies, & Best Practices
Regional & City Themes
Menu of Options
Workplan Template
Defined Curb Typologies
CSMS (2022)
Application of CSMS
Data collected at selected sites
Defined curb typologies
Best Practice Review
Pilot Project Recommendations at Selected Sites
CSDI (2024)
Individual City Curb Space Management Program
Policy Recommendations & Goal Development
Data Collection & Analysis
Stakeholder Engagement
Design & Implementation
Ongoing

Curb Space Management Study (2022)

Participating Cities

Data Collection and Pilots:
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Advisory / Peer Exchange:
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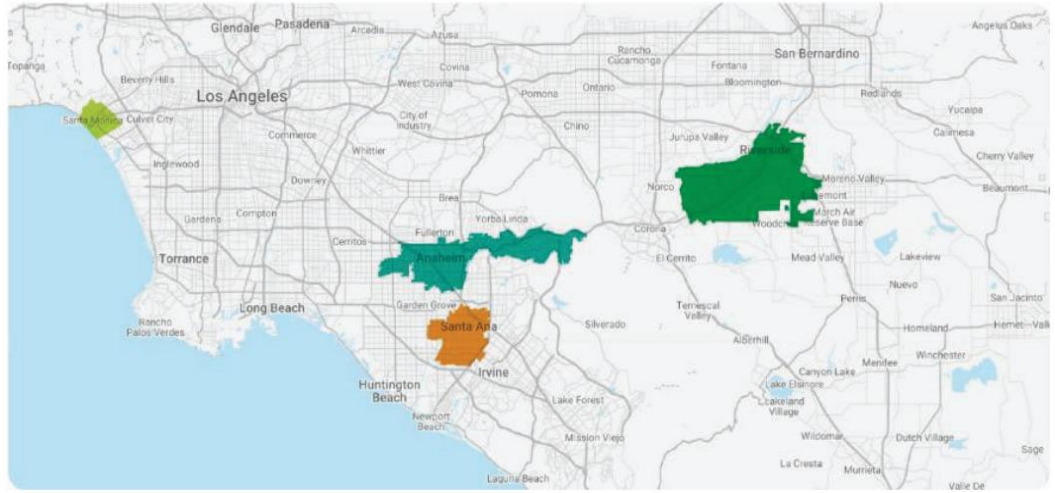
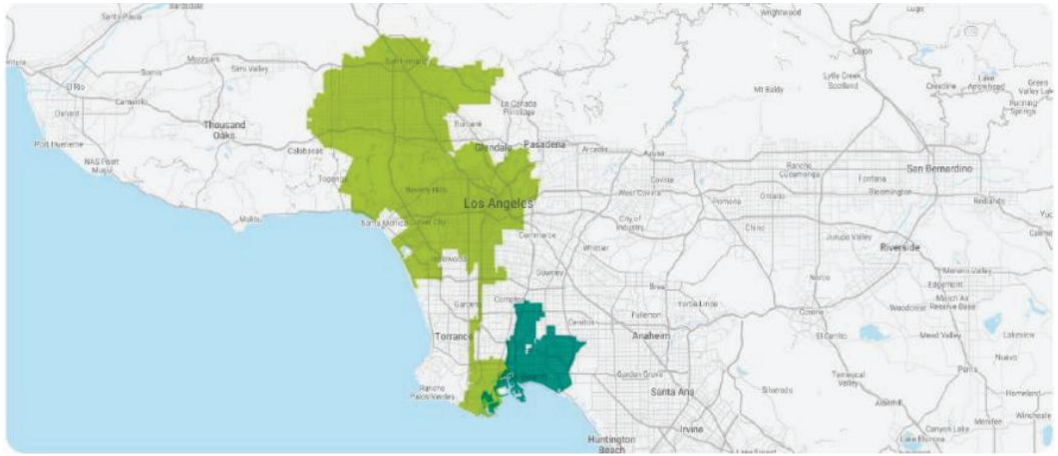




CSMS Toolbox

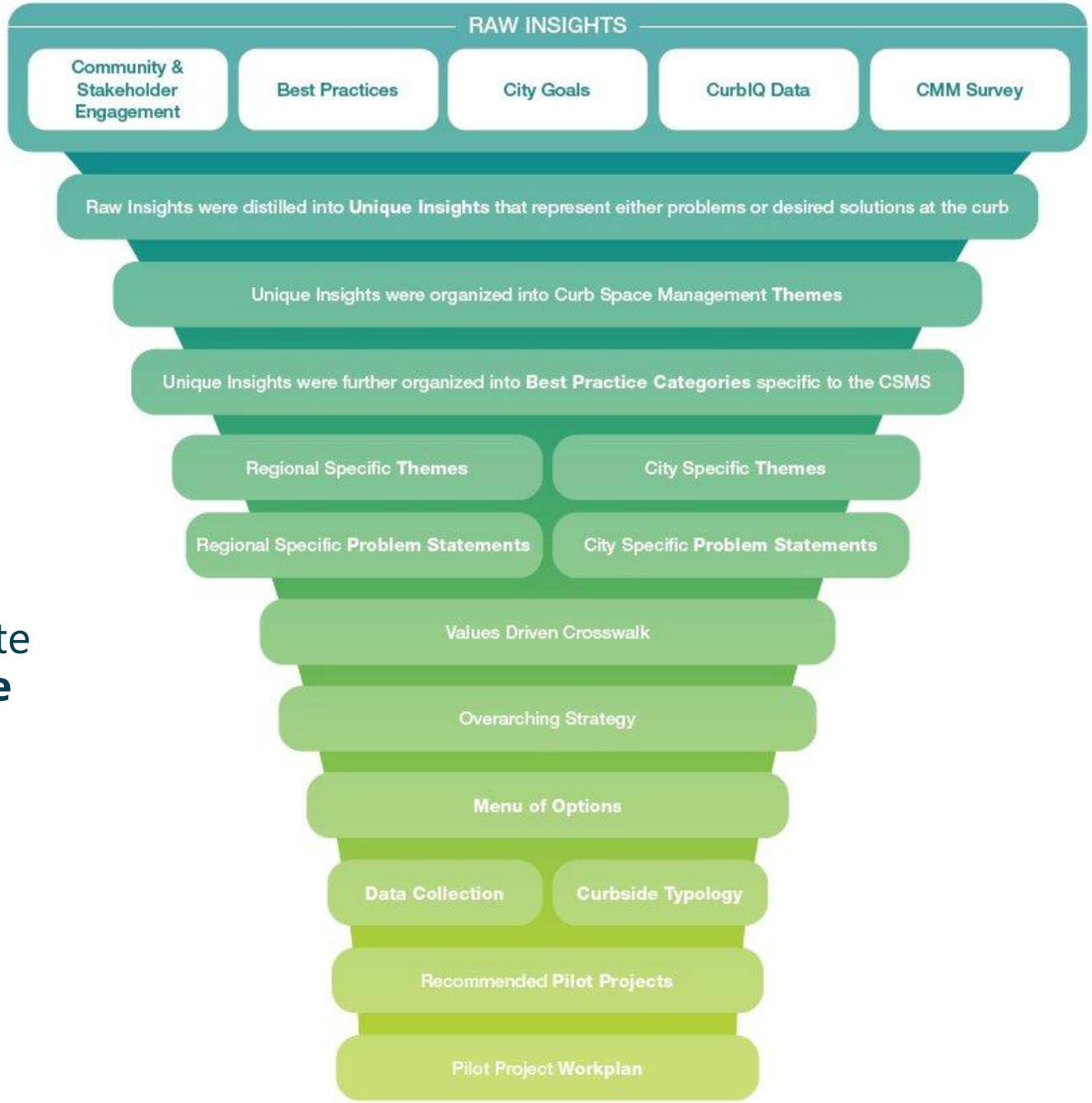
Toolbox:

- 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)

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 and Best Practice Categories

- **Demand**
- **Policy**
- **New + Changing Uses and Technology**
- **Data + Privacy**
- **Design**
- **Cost**
- **Agency Resources**
- **Safety**
- **Communications + Stakeholder Perceptions**

Menu of Options

Problem Statement	Best Practice Area	Strategies	Menu of Options	Does it Meet SCAG's Goals?	Regulatory Complexity	Effectiveness /Impact
There is a lack of sufficient loading and PUDO space, often resulting in illegal parking in bike lanes and loading zones	Policy	Parking Regulations	Flex Zones	Meets all 5 stated goals	1	2
	Policy, Communication and Stakeholder Perceptions	Permitting	Fleet/Commercial parking permits	Meets 4 out of 5 stated goals	4	3
			Reservation system	Meets all 5 stated goals	4	2
		Pricing	Price short term parking	Meets all 5 stated goals	2	4
			Graduated pricing structure	Meets all 5 stated goals	5	5

Curbside Typologies

Based on **stakeholder profiles** and **curbside functions**

Curbside Typologies

TYPOLOGY	DESCRIPTION	FUNCTIONS (RANKED IMPORTANCE)
1. Arterial	• High volume of vehicular travel • Vehicle throughput oriented • Higher speed limits • Roadway classification is a major, primary, principal, or secondary arterial	
2. Multimodal Mobility	• Prioritizes the movement of transit, micromobility users, bicyclists, and pedestrians • Requires clear separation of curbside space for all functions to avoid conflicts between stakeholders	
3. Employee Access	• Promotes employee access to office space or government buildings & may be located near off-street parking	
4. Mixed-Use Suburban	• Wide lane widths • High volume of vehicular traffic • Diverse modes of transportation • Commonly located in suburban areas • Prioritizes access to retail space or strip malls on one side of the corridor and access to single family homes on the other	
5. Neighborhood Street	• Is surrounded by a blend of single-family homes and multi-family residential buildings • Prioritizes people's access to their homes, access for couriers, and activated public spaces	
6. Multi-Family Residential	• High density of apartment homes • Higher density of people than on-street parking spaces available • This corridor type provides space for PUDO, courier deliveries • Provide activated common spaces for residents	
7. School Streets	• Promotes safe access to vulnerable road users • Two peak activity times: morning drop off & after school pick up • Prioritize pedestrian safety and allows sufficient space for PUDO activity • Lower speed limits	
8. Mixed-Use Urban	• Prioritizes access for people, order pick-up, retail space & space for outdoor dining • This corridor includes space for PUDO and safe pedestrian, bicyclist, and micromobility access • Parking provided should be exclusive to micromobility, and not vehicles	
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	
10. Entertainment Corridors	• High density with various entertainment options (e.g., theatres, sports arenas, movie theatres, retail/ dining locations, etc.) • Prioritize PUDO curb space and safe crossings for pedestrians, especially at night	

Mobility Corridors Community Corridors Urban Corridors

Workplan Template

For each city:

- Key problem statements were mapped to a series of pilot projects from larger Menu of Options
- A least one pilot project was selected
- At workplan was developed for the pilot project

City of Riverside Example

Site	Problem Statement	Curbside Typology	Data Findings	Category	Recommended Pilot
University Ave between Market St and Lime St	Major congestion caused by multiple modes competing for curb space (delivery, TNC, pick-up drop-off, transit, parking, etc)	9. Mixed-Use Main Street	• Parking occupancy can reach 95% during peak hours on a weekday. • Vehicles were often parked in no parking zones or blocking driveways for over 20 minutes at a time. • The high occupancy percentage and frequency of illegal curbside activity indicate a high demand for on-street parking.	Data Analysis	• Computer vision cameras and lidar to better understand curb congestion through data
Orchard St between Cortez St and Madison St	Parking from residents in high-density, multi-family developments overflowing into less dense, suburban residential and commercial areas	5. Neighborhood Street	• High average dwell times of 3-4 hours for free parking observed both during the week and on the weekend, likely due to residents in multi-family apartment buildings using on-street parking.	Parking Regulations	• Residential parking program pilot to regulate curb demand and access • Incentive programs, such as e-bike rebate or transit pass trade in programs to support mode shift and reduce on-street parking demand

Workplan Template & Step-by-Step Guidance

Phase 1: Conception

Pilot Profile

Pilot Feasibility & Foundations

Phase 2: Planning

Public Private Partnership Development

Engagement & Outreach

Implementation + Operations

Phase 3: Launch

Pilot Launch Event

Phase 4: Pilot

Evaluation & Measurement

Phase 5: Learn/Report & Scale

Scaling & Reporting

Curb Space Data Collection and Inventory Study (2024)

Participating Cities:

- Los Angeles
- Long Beach
- Stanton

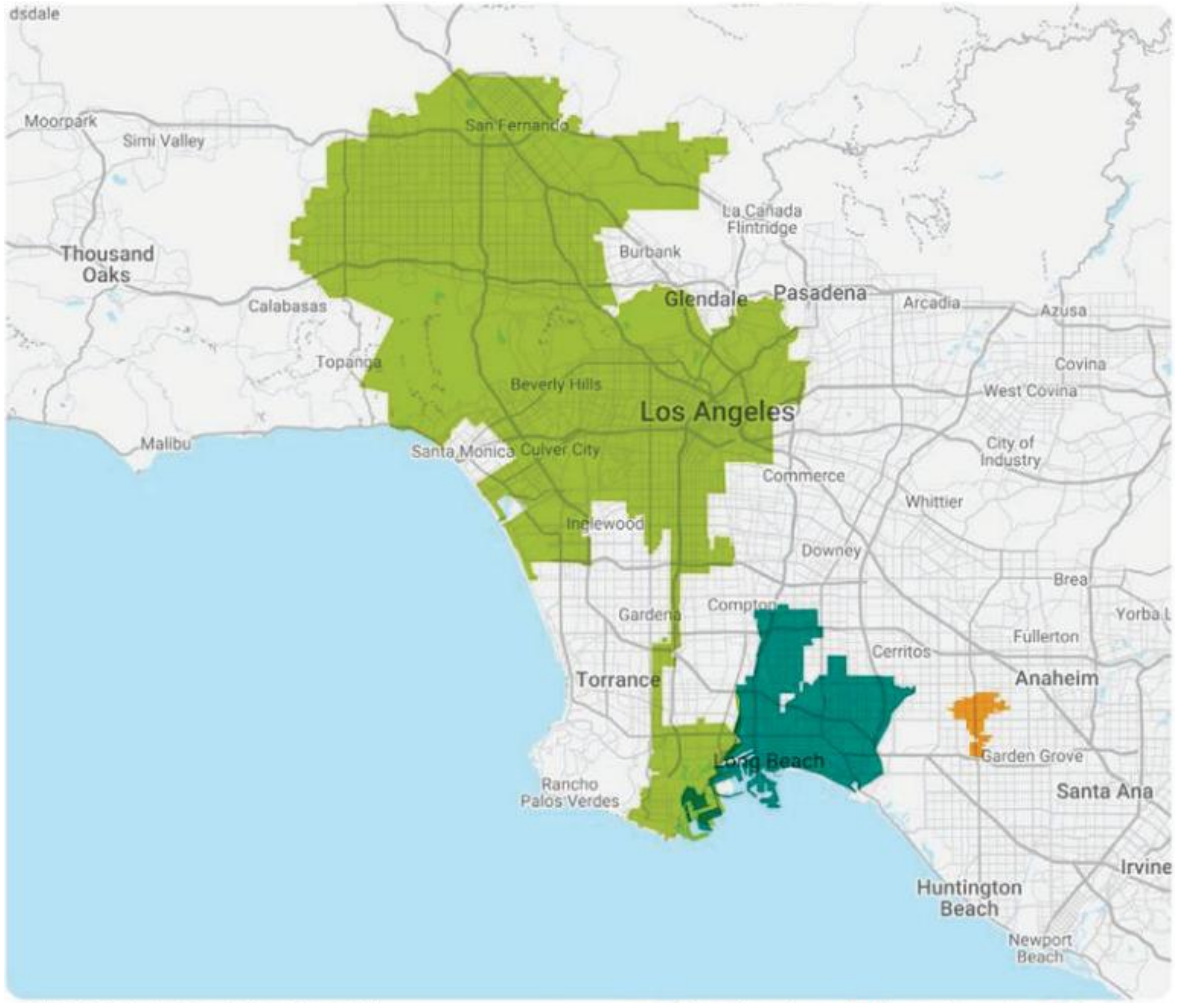
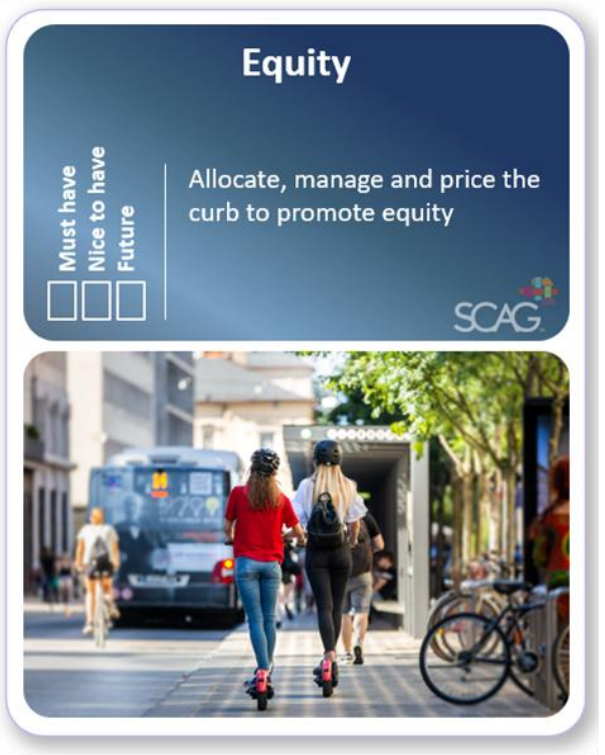


***Exhibit 1-1:** Participating Cities*

CSDI – LADOT Example: Vision & Values

Los Angeles DOT endeavors to develop a world class Curb Space Management Program that will optimize people and goods movement at the curb, provide access for all, and prioritize safety / emergency access with data-driven and context-sensitive projects and processes.

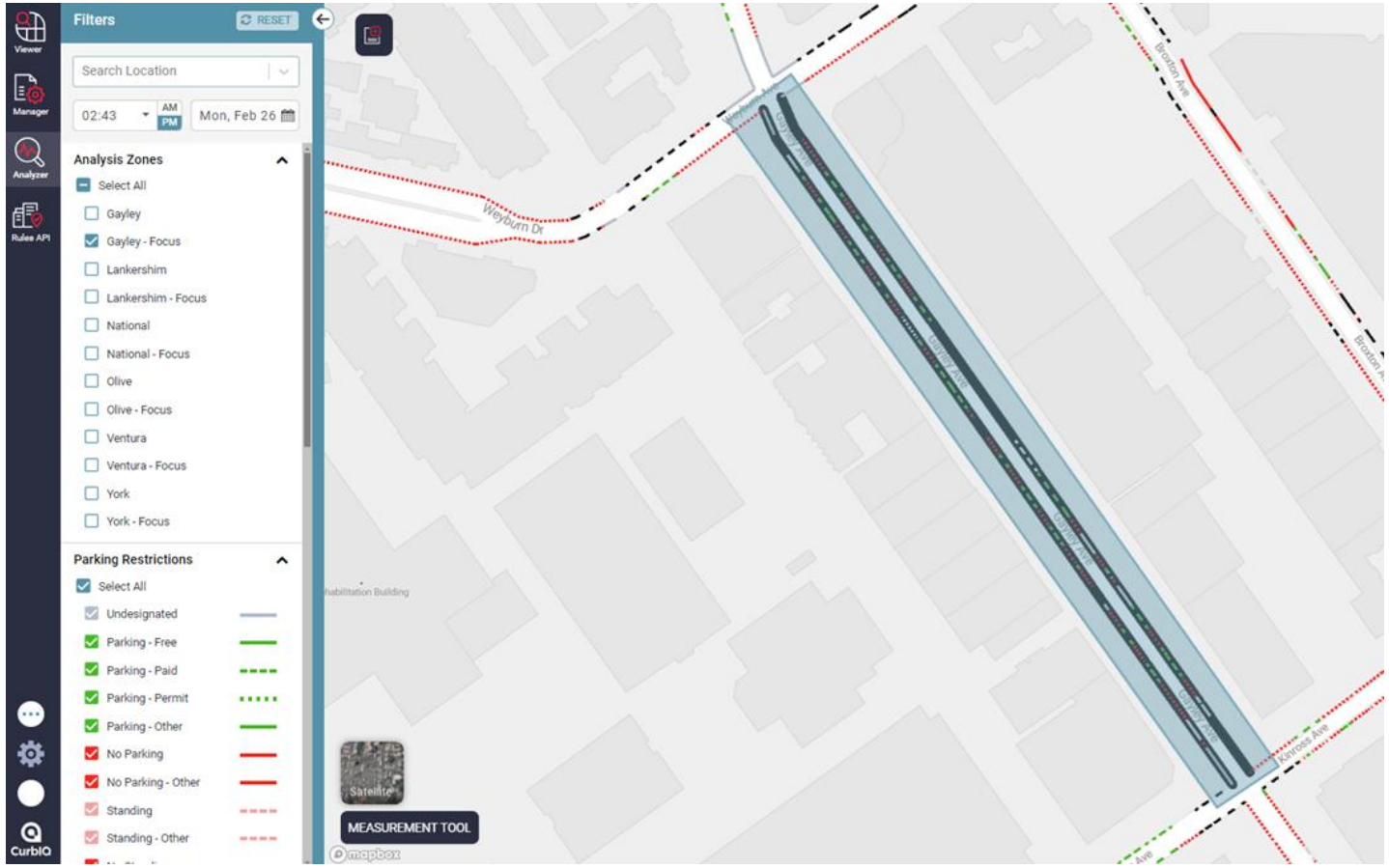


CSDI – LADOT Example: Site Selection

Street	From	To	Centerline Curb Length (ft)	Description
Gayley Ave (Westwood)	Weyburn	Kinross	700	Commercial area adjacent to hospital/ university w/ high loading demand Active micromobility/microtransit area
National Blvd (Palms)	Mentone Ave	Motor Ave	400	Neighborhood-serving commercial area Site of weekly street closure
Olive St (Downtown)	7th St	6th St	650	High-density commercial downtown street with new transit lanes Potential zero emission delivery pilot area
Ventura Blvd (Sherman Oaks)	Van Nuys Blvd	Vesper Ave	800	Parking impacted commercial district w/ in-lieu fee program Peak period parking restrictions
York Blvd (Highland Park)	Ave 50	Ave 51	600	Narrow, highly active streetscape w/ retail, restaurants, bike lanes, frequent film production activity
Lankershim Blvd (North Hollywood)	Oxnard St	Emilita St	1,000	Unique mix of land uses (educational, auto-oriented, park, commercial) Major transit corridor w/ bike lanes
Total Curb Length (Centerline)			4,150 ft	
Total Curb Length (Curb Footage)			8,300 ft	

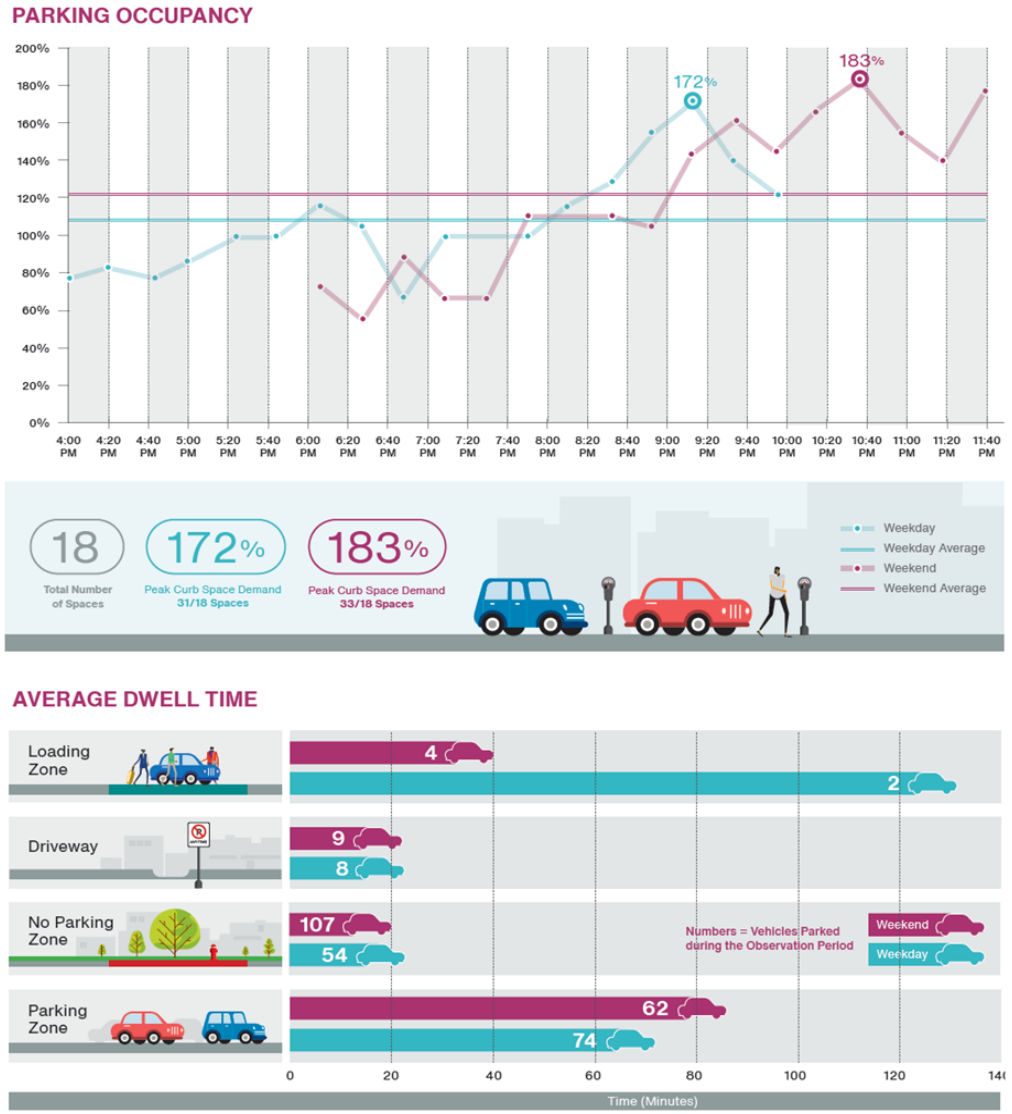
CSDI Data Collection - Inventory

- Collected by field surveyors and processed in CurbIQ
- **Curbside Assets:** fire hydrants, bicycle racks, curb cuts, bus stops, and parking meters
- **Curbside Regulations:** all curbside signage (such as parking and loading) and curb paint



CSDI Data Collection – Demand

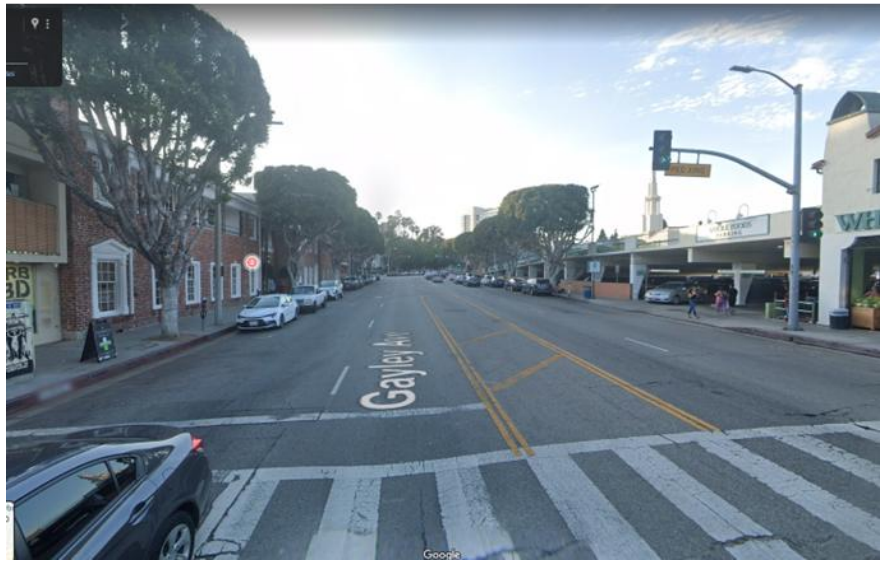
- Events that occur at the curbside
  - Parking session
  - Entering/exiting a specific area
  - Unpermitted activity
- Video footage – converted & digitized
- Challenges:
  - 3rd party partnerships
  - Cost
  - Lead-time for permits
  - Capturing metrics for non-auto users



CSDI – LADOT Selected Pilot Project Location

Gayley From Wayburn to Kinross (Westwood)

- Centerline: 700 ft
- Total Curb Footage: 1,400 ft
- Land Uses: Commercial, Medical
- On-street parking, high delivery volumes, parklets and outdoor dining
- Transit Access (Metro Micro, future Metro D Line (Purple) Station nearby)
- Identified in Hot Spot Mapping Exercise



CSDI – Recommended Flex Zones Pilot Concept

Location: Site 1 (Gayley Ave from Weyburn to Kinross)

Problem: Mismatch in supply/demand: Use of various modes and high demand for passenger and commercial loading with limited curb space in a commercial area.

Hypothesis: The lack of sufficient loading space results in illegal and unsafe short-term parking in red zones, in the center lane, travel lanes, or bus stops.

Concept: Flex Zones to enable multiple uses such as deliveries, passenger PUDOs, short-term parking, and on-street parking with flex zones. Prioritizing different curb uses at different times of day or week will allocate more curb space for deliveries while preserving parking, enabling the highest and best use of the curb.

CURB SPACE ALLOCATION INVENTORY

Regulation	Number of Spaces
Paid Parking (Daytime)	37
Free Parking (Evening)	37
Passenger Loading	1
No-Stopping	11
Fire Hydrant	1
Emergency Vehicle Access	1
Curbside Patio	1
Driveway/Curb Cut	12
Undesignated	3
TOTAL	67

CSDI – Site-Specific Pilot Implementation Plan

The Pilot Workplan is an actionable roadmap designed for the prioritized pilot concept to support implementation. It includes:

- Curb Policy and Pilot Design
  - Pilot hypothesis
  - Policy checklist
  - Proposed pilot design parameters
  - Deployment considerations
  - Key participating entities and roles
  - Pilot performance management and reporting
  - Path to permanence
- Action Agenda
  - Key actions to deliver policy changes and begin piloting
  - Organizational recommendations to support the pilot and pathway to permanence
  - Draft timeline

CSDI – Lessons Learned

- Data Collection Scheduling
  - Plan early for collecting supply and demand data.
  - Identify key contacts in the City's permitting department and project champions.
  - Budget time for vendor selection, potential delays due to permit approvals or scheduling conflicts, data processing, and QA/QC.
- Comprehensive Stakeholder Groups
  - Identifying key departments to include early on is critical.
- Right-sizing Solutions
  - For larger regions, identify local priorities. The needs of smaller cities are likely very different from larger ones.
- Future Implementation Considerations
  - Each and every site in every neighborhood and city needs to be independently reviewed for its own unique needs. The City of Los Angeles itself includes several neighborhoods with distinct characteristics, curbside needs, and stakeholders.

New Curbside Developments, Policies, Technologies, and Applications

LADOT – Code the Curb SMART Program

Expanding off work with SCAG, this project took a **data forward approach**, digitizing various aspects of the curbside in downtown LA.

This project aims to **reduce congestion and optimize curb use** in high-demand areas downtown, improving traffic flow and parking management.

This project supports LADOT's efforts to **prepare for large-scale events** like the 2026 World Cup and LA2028 Olympics.

Some key highlights:

- Over **200 miles** of curbside digitized
- Over **50 cameras** installed at various ZEDZ and high demand curbside locations
- Various curb data **demand sources integrated and overlaid** onto the curb inventory, including Taxi PUDOs, citation data, and transactions
- **CDS powered data feeds published and requested** by 20+ companies for use in their curb operations

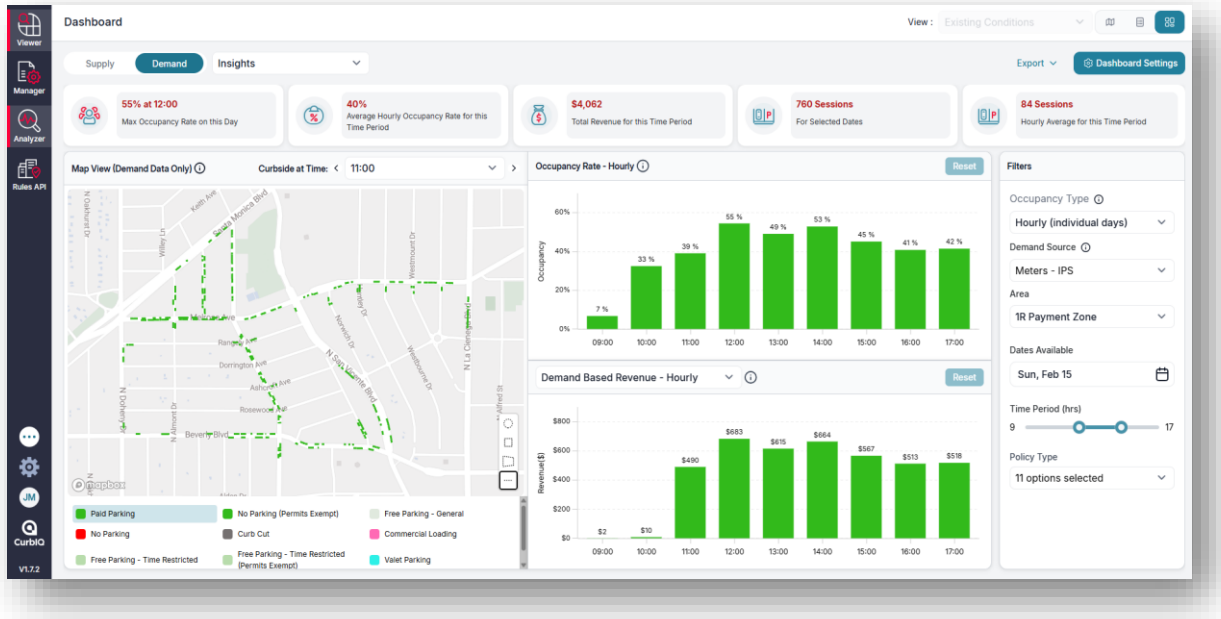
West Hollywood – Intelligent Curb Management System

This project focused on **digitizing curb regulations** and demand patterns in a dense, mixed-use environment with high pedestrian activity, nightlife, and frequent commercial loading needs.

This project aims to **improve curb efficiency,** better manage their various **permits at the curbside**, have a clearer understanding of curbside demand, and take a more **futuristic and holistic approach** to curbside management.

Some key highlights:

- **Comprehensive curb inventory** digitized across the entire city (100 miles)
- **Data-driven analysis** of curb demand tied to LPR, transaction, citation, and sensor data
- Various initiatives being explored to **share data** with permitting systems, sidewalk robots, and other vendors



And More!

Themes In the Region

- Expansion of Zero Emission Delivery Zones throughout major cities
- Adoption of AV technologies like Waymo, sidewalk robots, who interact with the curbside
- Continued expansion of bike share networks, other uses at the curb
- Major events occurring with proper congestion, roadway, and curbside management needed to ensure smooth operations

Other Projects Throughout the US

- Philadelphia: Right-of-Way Topology Schema and Mapping
- Boston Curb Lab: exploring various curb management processes and permits
- Portland, Seattle: Commercial Loading Zone Technology and Management
- Open Mobility Foundation: defining and growing the Curb Data Specification, Curb Collaborative 2.0

Thank you!

Contact Information

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Tell us how we did!

Take a quick 2-minute survey to help us improve future Toolbox Tuesdays!