



# 2020 SUSTAINABLE COMMUNITIES PROGRAM

Smart Cities & Mobility Innovations  
Final Report

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# Executive Summary

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## Overview

With the general rise in vehicle ownership, the emergence of disruptive technologies like transportation network companies (TNCs) and dockless electric scooters, and the growing demands of e-commerce, curb space has become some of the most contested space in a city. Cities have been struggling with related challenges, such as on- and off-street parking, congestion, and first- and last-mile connectivity, among others. The increased reliance on delivery services and the shift of commercial activities to sidewalks during the COVID-19 pandemic have further highlighted the need for effective curb management. Data and assessments of curb usage have become critical to addressing these growing challenges across the region.

However, mobility challenges extend beyond the curb. The increasing complexity of transportation systems and connected technologies calls for innovative methods and management practices to better inventory and understand the interconnected nature of smart city technologies, communication infrastructure, and mobility systems.

Since 2005, the Southern California Association of Governments' (SCAG) Sustainable Communities Program (SCP) has provided resources and direct technical assistance to jurisdictions to complete important local planning efforts that align with and support the implementation of the Connect SoCal Regional Transportation Plan/Sustainable Communities Strategy.

Building on SCAG's curb space management study, the SCP – Smart Cities & Mobility Innovations (SCMI) call aimed to establish best practices in curb space management that support sustainable mobility, enhance public space, and support small businesses and the local economy. The SCMI call prioritized addressing emerging equity issues, such as the relationships between transit use and TNCs (as evidenced by curb space activity within disadvantaged communities), improving transit and bike networks at the curb, and exploring the potential of optimizing curb space management through asset valuation.

Furthermore, the SCMI call sought to develop comprehensive technology assessments and adoption plans to address the growing complexity of transportation systems and connected technologies. These efforts focused on emerging topics such as connected vehicles, vehicle-to-everything communications, public rights-of-way management, dynamic parking, and curb space management.

The SCMI projects resulted in various benefits related to innovative solutions, multimodal mobility support and vehicle miles traveled (VMT) reduction, air quality improvements, healthy and equitable communities, shared modes, and mitigation of negative community impacts. The projects provide key takeaways that can inform and be applied to similar projects in the SCAG region.

# Introduction

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## Background

### SUSTAINABLE COMMUNITIES PROGRAM

By providing financial resources and technical assistance to address the diverse planning needs of local communities and support the implementation of regional planning policies and strategies, the Sustainable Communities Program (SCP) strengthens SCAG's partnerships with local agencies and strategic partners responsible for land use and transportation decisions. Projects selected through the SCP enable local agencies to facilitate coordination and integration of transportation planning with active transportation, housing production, safety, smart cities, mobility innovation, transportation demand management, green region initiatives and sustainability. Since 2016, SCAG has funded 110 projects totaling over \$21.6 million and is currently providing technical assistance to 57 local agencies.

The SCP also serves as SCAG's primary funding mechanism for partnering with local agencies to implement the goals, objectives, and strategies of Connect SoCal, supporting an integrated regional development pattern that reduces greenhouse gas (GHG) emissions. Following the adoption of Connect SoCal every four years, SCAG issues a call for applications through the SCP to provide local technical assistance for Connect SoCal implementation. SCAG develops funding categories that align with the goals and policies of Connect SoCal to support implementation of shared regional planning goals and meet the needs of local communities.

The goals of the SCP are to:

- Provide needed resources for local jurisdictions to advance the goals outlined in the four pillars of Connect SoCal 2024: mobility, communities, environment, and economy.
- Promote racial equity grounded in the recognition of the past and current harms of systemic racism and advance restorative justice.
- Integrate the region's development pattern and transportation network to improve air quality, reduce GHG emissions, and enable more sustainable energy and water use.
- Prioritize the most vulnerable populations and communities subject to climate hazards to help the people, places, and infrastructure most at risk for climate change impacts. In doing so, recognize that disadvantaged communities are often overburdened.
- Increase the region's competitiveness for federal and state funds, including the California Active Transportation Program and Greenhouse Gas Reduction Funds.

The SCP provides multiple opportunities for funding and resources to meet the needs of communities, address recovery and resiliency strategies, and support regional goals. The program has completed four calls associated with Connect SoCal 2020:

- Call 1: Active Transportation and Safety 2020 (closed Dec. 11, 2020): Provided funding for projects focused on active transportation and safety, quick builds, and network visioning and implementation.

- Call 2: Housing and Sustainable Development (closed Jan. 29, 2021): Provided funding for projects focused on advancing accessory dwelling unit implementation; housing sustainability districts, workforce housing opportunity zones, and housing supportive tax increment financing districts; and objective development standards for streamlined housing, prohousing designation program, and parking innovation.
- Call 3: Smart Cities and Mobility Innovations (closed on April 23, 2021): Provided funding for projects focused on curb space data collection and inventory, technology assessment or adoption, parking management, and permitting process evaluation.
- Call 4: Civic Engagement, Equity and Environmental Justice (closed on June 5, 2023): Provided funding for projects focused on developing housing and land use strategies and realizing multimodal communities.

Projects awarded under the most recent SCP – Active Transportation and Safety call for Connect SoCal 2024 are currently underway. Funding is provided for community plans, areawide plans, and quick-build projects.

### **CALL 3: SMART CITIES AND MOBILITY INNOVATIONS (SCMI) PROJECTS**

A total of eight projects were awarded under the SCMI call. Each project is introduced below.

#### **Cities of Los Angeles, Long Beach, and Stanton Curb Bundle**

Building off SCAG’s 2022 Curb Space Management Strategy, a study was conducted to collect, digitally manage, and assess curb space inventory and usage to address challenges and opportunities in three focus cities in the SCAG region. The cities of Los Angeles, Long Beach, and Stanton participated in the study; each was provided with a pilot project and associated workplan to implement within their jurisdictions based on the data and input collected for the study. Each city had its own unique curb space needs and was at different points in their curb space management strategy. Los Angeles’ project aimed to optimize commercial loading activities and advance digital stewardship, Long Beach’s project focused on underserved communities, and Stanton’s project aimed to improve safety and quality of life.

#### **San Gabriel Valley Council of Governments: GoSGV Engagement & Evaluation**

The San Gabriel Valley Council of Government’s project aimed to study, evaluate, and quantify vehicle miles traveled reductions and aggregated location-based data to identify opportunities for increasing participation in the GoSGV regional electric bike share program, particularly among low-income communities. The project also sought to develop tools and processes to measure the program’s impact on e-bike adoption and overall climate goals. Recommendations were provided to improve program operations and related community engagement efforts in the area.

## City of Desert Hot Springs: Downtown and Light Industrial Parking Plan

The city of Desert Hot Springs prepared a plan that analyzed current parking and access needs for the Downtown and Industrial Cannabis Area districts to plan for future growth. The plan examines parking supply and demand, land use patterns, and available shared mobility services. It also includes short- and long-term strategy recommendations to help shape parking demand and travel behavior to better align with the city's numerous goals for economic vitality, environmental sustainability, and community health and wellness.

## City of Garden Grove: Curb Data Parking Study

The city of Garden Grove prepared a study that analyzed and quantified current residential parking and access challenges, needs, and opportunities in six study areas. The study includes an overview of the existing planning context, residential street parking supply and demand quantification and observations, key stakeholder and community outreach, considerations for future growth, and a menu of planning and policy options that align with the city's goals to address existing and future parking issues.

## City of Laguna Woods: Mobility Technology Plan

The city of Laguna Woods prepared the Mobility Technology Plan to support a connected and autonomous vehicle (AV) future. The plan outlines steps to establish a new autonomous mobility service for city residents, businesses, and visitors while also serving as a roadmap for an AV pilot program that can be adapted by other municipalities. It identifies innovative technology to support lifelong mobility, particularly for older adults and persons with disabilities, and includes recommendations for transportation and communication infrastructure, key performance indicators, best practices, and information on communication and sensor attacks.

## City of Rialto: Smart Cities Plan for Warehousing and Logistics

The city of Rialto prepared the Smart Cities Plan for Warehousing and Logistics, to assess existing warehousing and logistics conditions, quantify costs and benefits, and evaluate technological and policy solutions. The plan focuses on the city's adopted truck routes, residential areas along those routes, and warehousing hubs. It also includes an implementation plan for a pilot project, outlining goals, policies, and programs for regulatory changes and investment in intelligent transportation infrastructure.

## Evaluation Summary Report

This Evaluation Summary Report summarizes the evaluation findings, research, and outcomes from all SCMI call awardees. The report provides the following:

- A detailed description of each project (see *Project Description and Work Performed*).
- Commentary on project benefits and issues that arose as part of the program (see *Project Benefits and Challenges*).
- An overview of the findings of the program and recommendations for expansion to a regional level (see *Summary and Conclusions*).

# Project Description and Work Performed

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## Background

### SCP – SMART CITIES & MOBILITY INNOVATIONS DEVELOPMENT

The Sustainable Communities Program (SCP) – Smart Cities & Mobility Innovations (SCMI) was released on Feb. 8, 2021. The call supported the implementation of three of SCAG’s Connect SoCal 2020 Key Connections: Smart Cities & Job Centers, Go Zones, and Shared Mobility/Mobility as a Service. These Key Connections focused on advancing expanded mobility ecosystems and management strategies using innovative policy or technology to realize regional planning goals. This call supported local jurisdictions in using technology and innovation to improve the efficiency and performance of the transportation system by implementing curb space management measures that encouraged shared modes, managed parking effectively, and supported commerce and the growth of housing and employment in job centers.

More details about each project type, program area goals, and the SCP overall can be found in the Sustainable Communities Program [Smart Cities & Mobility Innovations Guidelines](#).

The SCMI call had the following goals:

- Encourage jurisdictions to partner with SCAG to find innovative solutions to challenges associated with the ever-changing nature of parking, freight and last mile deliveries, and commerce at the curb.
- Create dynamic, connected, built environments that support multimodal mobility, reduce reliance on single-occupant vehicles, and reduce vehicle miles traveled (VMT).
- Reduce greenhouse gas emissions and improve air quality by reducing driving alone, idling, or searching for parking.
- Support healthy and equitable communities by allocating public resources like curb space more equitably.
- Encourage shared modes, manage parking effectively, and support commerce and the growth of housing and employment in job centers.
- Employ strategies to mitigate negative community impacts associated with congestion, GHGs and others, that stem from inflexible, inefficient, inequitable, or outdated parking systems.

Four project types that supported regional mobility and policy goals were included in the call:

1. Curb Space Data Collection & Inventory: Focused on expanding or updating the curb space data inventory through innovative data collection methods to advance plans, studies, and activities in the city and across the region.
2. Technology Assessment or Adoption Plan: Included technology frameworks and demonstrations related to curb space management, curb regulating, on-street and off-street parking management, last-mile delivery solutions, and other curb and mobility challenges.



3. Parking Management Plan: Focused on advancing parking management in a selected site or multiple sites within a city.
4. Permitting Process Evaluation: Looked at evaluating existing or developing new permitted uses for the curb space to improve safety and efficiency equitably for all users.

The SCMI call closed on April 23, 2021. Applications were evaluated and scored by SCAG staff, and the final project award list was approved at SCAG’s Regional Council meeting on July 1, 2021.

## FINAL SCP - SCMI PROJECTS

### City of Los Angeles: Curb Zone Data Inventory for Digital Curb Management

The city of Los Angeles collected data at six study areas within the city. Curb inventory data was collected between April and June 2023, while demand data was collected over three days in September 2023. Key findings included high demand for short-term parking (70 percent of parking demand observed occupied a space for less than one hour), consistent parking availability (occupancy never exceeded 75 percent during weekdays or 35 percent during weekend days), and low use of loading zones.

#### Exhibit 1 Los Angeles Study Area








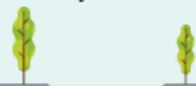
#	Centerline Length (ft)	Total Curb Length (ft)	Street	From	To
1	800	1,600	Ventura Boulevard	Van Nuys Boulevard	Cedros Avenue/Vesper Avenue
2	1,000	2,000	Lankershim Boulevard	Oxnard Street	Emilita Street
3	600	1,200	York Boulevard	Avenue 50	Avenue 51
4	650	1,300	Olive Street	7th Street	6th Street
5	400	800	National Boulevard	Mentone Avenue	Motor Avenue
6	700	1,400	Gayley Avenue	Weyburn Avenue	Kinross Avenue
<b>Total</b>	<b>4,150</b>	<b>8,300</b>			

Source: Curb Space Data Collection & Inventory Study, Arcadis. 2024.

Various stakeholder engagement activities were conducted throughout the project. Input received was combined with the demand and inventory data to determine a pilot project, strategies, and recommendations, and to ensure alignment with the project’s overall objectives. Key findings from stakeholder engagement included a strong desire for world class measures of success, interest in aligning curb space use with citywide sustainability and equity goals, need for a curb space prioritization process, desire to improve data quality to make informed decisions, and move from a traditional parking authority or program to a progressive curbside management program with organizational structure change.

Based on a review of background documents, existing datasets, and stakeholder feedback, the Westwood Neighborhood Flex Zone pilot project was recommended for Gayley Avenue between Kinross Avenue and Weyburn Avenue. The pilot proposed a more flexible use of curb space throughout the day to accommodate competing needs, including deliveries, passenger pickup and drop-off, short-term parking, and on-street parking. This approach would allocate more curb space for deliveries while preserving parking, ensuring the curb is used as efficiently as possible.

Exhibit 2 Curb Space Allocation Inventory: Westwood – Gayley Avenue

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
<b>TOTAL</b>	<b>67</b>

## City of Long Beach: Curb Space Management Study

The city of Long Beach collected data at five study areas within the city. Curb inventory data was collected between April and June 2023, while demand data was collected over three days in December 2023. Key findings included high demand for short-term parking (100 percent of parking demand observed during the week occupied a space for less than one hour, with an average of 78 percent occupying the same during the weekend), high activity during daytime lunch hours (parking demand peaked at over 90 percent by 2 p.m. on a weekend), and illegal parking for commercial deliveries.

### Exhibit 3 Long Beach Study Area




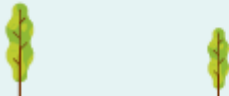
#	Centerline Length (ft)	Total Curb Length (ft)	Street	From	To
1	1,080	2,160	3rd Street	Solana Court	Long Beach Boulevard
2	930	1,860	4th Street	Cherry Avenue	Junipero Avenue
3	420	840	2nd Street	Granada Avenue	Corona Avenue
4	500	1,000	Atlantic Avenue	North of Market Street	56th Street
5	570	1,140	Broadway Avenue	Pacific Avenue	Tribune Court
<b>Total</b>	<b>3,500</b>	<b>7,000</b>			

Source: Curb Space Data Collection & Inventory Study, Arcadis. 2024.

Various stakeholder engagement activities were conducted throughout the project. Input received was combined with the demand and inventory data to determine a pilot project, strategies, and recommendations, and to ensure alignment with the project’s overall objectives. Key findings from stakeholder engagement included a strong desire for world class measures of success, interest in aligning curb space use with citywide sustainability and equity goals, need for a curb space prioritization process, desire to improve data quality to make informed decisions, and a move from a traditional parking authority or program to a progressive curbside management program with organizational structure change.

Based on a review of background documents, existing datasets, and stakeholder feedback, the Automated Enforcement Pilot Program project was recommended for 2nd Street between Granada Avenue to Corona Avenue. The pilot proposed automated enforcement to support and complement the newly installed loading zones. To further the Long Beach Public Works Department’s vision for curb management, the primary pilot objectives are to increase compliance with on-street parking regulations, increase safety related to loading, and set the foundation for a modern citywide enforcement program.

Exhibit 4 Curb Space Allocation Inventory: Belmont Shore – 2nd Street

Regulation	Number of Spaces	
	Daytime	Evening
Paid Parking 	21	0
Free Parking (Evening) 	0	21
No-Stopping 	14	14
Driveway/Curb Cut 	3	3
<b>TOTAL</b>	<b>38</b>	<b>38</b>

## City of Stanton: Citywide Curb Management Plan

Given that Stanton is a smaller city, city staff determined that analyzing several corridors in the city was less relevant to current needs. Instead, they focused on neighborhoods where curbside pressures were most immediate. Data was collected in an area with an active residential parking permit (RPP) program, including residential streets such as Lowden Street, Middlesex Drive, Hamden Avenue, Lowell Street, Thunderbird Lane, Idylwild Drive, Asbury Avenue, Courson Drive, and Ramblewood Drive. Demand data was collected over three days in September 2023.

### Exhibit 5 Stanton Selected Site

Key findings included consistent parking availability (occupancy never exceeded 35 percent during the periods surveyed), unevenly distributed demand (higher demand was observed adjacent to more dense multi-family housing), and low demand for short-term parking (the majority of vehicles were parked for longer than two hours).

Various stakeholder engagement activities were conducted throughout the project. Input received was combined with demand and inventory data to determine a pilot project, strategies, and recommendations, and to ensure alignment with the project's overall objectives. Key findings from stakeholder engagement included a need for focus on management of curb space within residential areas due to density of multi-family residential housing, gradual implementation of curb management that factors in city staff and funding availability, and phased improvements to existing residential permit parking programs that do not disrupt current administrative processes.


Based on a review of background documents, existing datasets, and stakeholder feedback, the Permit Parking Program Update pilot project was recommended for the RPP area located south of Cerritos Avenue and west of Western Avenue. The pilot proposed a three-phase approach to updating the city's RPP program.



**Exhibit 6 Curb Space Allocation Inventory: Stanton Selected Site**

Key lessons learned from these three projects include:

- Data Collection Scheduling: Collecting supply and demand data at appropriate times is essential to understanding curbside activity. Key contacts in the city’s permitting department and project champions should be identified to facilitate the process. Time should also be allocated for vendor selection, potential permit approval delays, scheduling conflicts, data processing, and quality assurance and quality and control.
- Comprehensive Stakeholder Groups: Several city departments should be consulted in any curb space management project to ensure all impacted staff have input and are involved at the appropriate stages.
- Right-Sizing Solutions: The SCAG region encompasses diverse cities with varying levels of resources, priorities, and characteristics. Some cities face more complex curb space challenges than others, and staff capacity and funding availability differ. For example, the city of Stanton’s curb space challenges were more locally focused compared to the other two focus cities, which required adapting the process to serve its needs. The approach that was customized for Stanton provides value to other cities in the region that are facing similar challenges.
- Future Implementation Considerations: While the process and framework are designed for replication and scaling, each site, neighborhood, and city needs to be independently reviewed for its own unique needs. For instance, the city of Los Angeles includes several neighborhoods with distinct characteristics, curbside needs, and stakeholders. Therefore, scaling and replicating projects will require a thorough study of each site’s particular needs.

Regulation	Number of Spaces
Parking Permit 	523
Undesignated	186
<b>TOTAL</b>	<b>709</b>

## San Gabriel Valley Council of Governments: GoSGV Engagement & Evaluation

The San Gabriel Valley Council of Governments (SGVCOG) prepared an Engagement & Evaluation Report for the GoSGV regional electric bike share program. The report explored ways in which SGVCOG could boost program participation, particularly among low-income communities, and develop tools and processes to quantify the program's impact on e-bike adoption and overall climate goals. The project included a literature and best practices review, existing conditions, community engagement plan, data collection and analysis, and VMT reduction efficacy analysis.

### Exhibit 7 Participants in the GoSGV Program

Key takeaways from the project include:

- Reported trips were spread throughout the region but clustered in Claremont and Pasadena. More data is needed to fully capture all trips.
- E-cargo bike users were more likely than standard e-bike users to make every type of trip on at least a weekly basis. They most frequently used their bikes for errands/shopping (88 percent) and dropping kids off at school or activities (81 percent). In contrast, standard e-bike users primarily used their bikes for fun (50 percent), though many also used them for errands (43 percent). Overall, the most common trip purpose reported was errands (35 percent).
- Biking to transit with a GoSGV e-bike was infrequent for both bike types. Members cited barriers such as limited bike parking and challenges bringing bikes on board.
- GoSGV bikes were ridden a median of 5.0 miles per week, with an average of 10.2 miles. E-cargo bikes had approximately 2.5 times the weekly mileage of standard e-bikes. Claremont users had the lowest average weekly mileage at 6.7 miles. Self-reported data suggested higher usage across all groups.
- E-cargo bike users were significantly more likely than standard e-bike users to replace car trips, especially for errands and school drop-offs. Compared to participants overall, Claremont residents were slightly more likely to drive less for appointments or school drop-offs but more likely to drive for commuting or social activities.
- The program has reduced VMT by approximately 5.9 miles per bike per month for standard e-bikes, and 23 miles per bike per month for e-cargo bikes. Claremont users rode less, resulting in a VMT reduction of 4.1 miles per bike per month.





**Exhibit 8 GoSGV Program Participant with the E-Cargo Bike**

Feedback gathered through community engagement helped SGVCOG and program partners improve the program to increase participation and overall e-bike adoption. A variety of methods were used to collect input from different audiences, including tabling events, a community survey, GoSGV ambassadors, and an exit survey.



**Exhibit 9 Tabling Event Promoting the GoSGV Program**

The GoSGV program conducted a community survey to gather feedback on current transportation patterns, barriers to walking, biking, and transit use, and interest in the program.

Key findings from the community survey included:

- Current Transportation Mode Use: Driving or riding in a personal vehicle was the most common mode among



respondents, followed by walking. While most respondents reported never riding a traditional bike (34 percent) or an e-bike (61 percent), those who did use bikes rode frequently—about 21 percent of respondents rode an e-bike at least three times per week.



- Barriers to Active Transportation Use: Key challenges included the absence of safe bike facilities separated from vehicular traffic, the need for secure and convenient bike storage at destinations, the need for cargo storage while riding, and unsafe routes to transit stops.
- Destinations: 75 percent of respondents currently visit or would like to visit business districts such as downtowns, and historic “old town” areas of the San Gabriel Valley, followed by grocery stores (72 percent). About 50 percent would consider walking, biking, or taking transit for commuting, while fewer than 30 percent would use these modes to travel to school.
- Interest in the GoSGV Program: About 11 percent of respondents were very interested, while 25 percent were interested but wanted more information on insurance, repair services, and theft policies. Existing bike owners (35 percent of respondents) were not interested in the program, and 20 percent of respondents cited other reasons for lack of interest.

Program participants completed an exit survey to share their experiences and suggest improvements.

Key findings from the exit survey included:

- Program Satisfaction: 84 percent of respondents were satisfied with the program.
- E-Cargo Bike Demand: E-cargo bikes were highly popular, allowing participants to run errands, transport children to school, and enjoy family bike rides.
- E-Bike Satisfaction: 13 percent of respondents found the program’s e-bike too heavy, making it difficult to operate or carry upstairs.
- Safe Bike Facilities: 10 percent of respondents cited the lack of safe bike infrastructure in the region as a barrier to riding their e-bike.
- E-Bike Purchase: 18 percent of participants left the program because they had purchased or planned to purchase their own e-bike, suggesting that GoSGV successfully encouraged e-bike adoption.

Recommendations to improve the program include:

- Program Design: Offer longer-term rentals at discounted rates, expand the e-cargo bike fleet, invest in lighter bikes with stronger motors, and provide secured bike parking at major San Gabriel Valley destinations.
- Local Coordination: Increase education on proper bike parking, update the San Gabriel Valley Regional Active Transportation Plan, improve and maintain existing bike corridors, continue to promote Slow Streets programs, and offer guidance on e-bike purchases.
- Engagement: Organize test rides at major San Gabriel Valley events, organize community rides, and promote a competition between cities to use the e-bikes.
- Partnerships: Foster existing personal and professional connections to build initial interest in strengthening partnerships.
- Equity: Conduct ongoing surveys and focus groups with income-qualified members and engage community leaders.
- Marketing and Communications: Boost program awareness through increased advertising and strategic partnerships, provide members with promotional materials, introduce referral incentives, and expand educational sessions on GoSGV e-bike operation through in-person orientations,

monthly meetups, and community rides. Marketing efforts should emphasize GoSGV as a solution for short trips.

- Program Evaluation: Invest in new tools to track GPS data for improved program assessment.

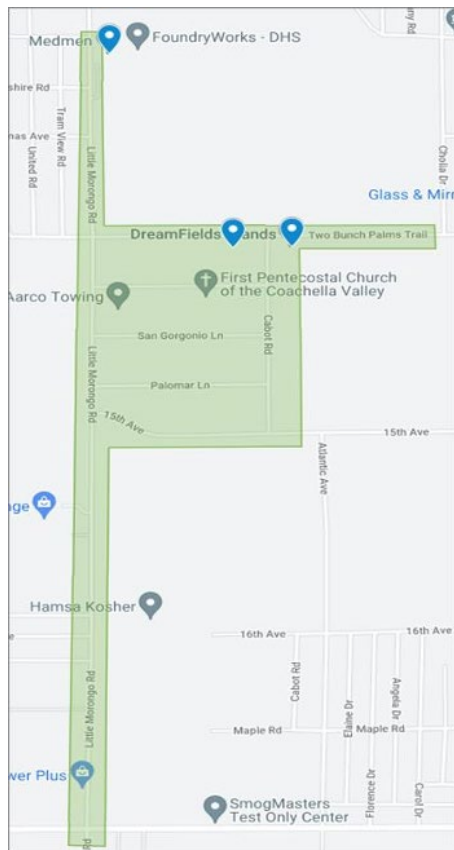
### City of Desert Hot Springs: Downtown and Light Industrial Parking Plan

The city of Desert Hot Springs conducted a Parking Management Study to assess current parking and access needs, as well as opportunities in the city’s downtown area and Industrial Cannabis Area, to support future growth. The study included an overview of the existing planning context, parking supply and demand observations and quantifications, key stakeholder and community outreach, and planning and policy recommendations that aligned with existing goals and policies outlined in the General Plan and SCAG’s goals for this engagement.

Exhibit 10 Downtown Study Area Boundaries



Exhibit 11 Industrial Cannabis Study Area Boundaries

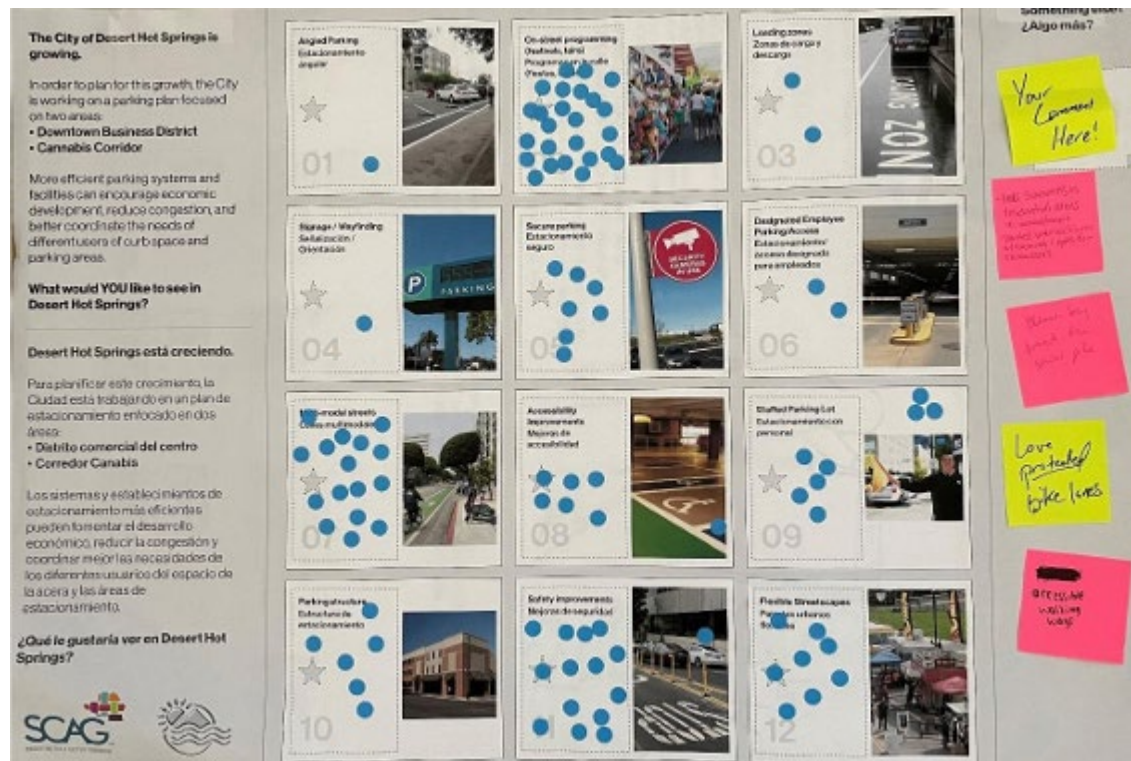


Project engagement and outreach efforts included coordination with relevant local and regional government agencies, outreach to civic and business organizations, interaction through community events and in-person engagement, virtual community meetings, and a parking survey.

**Exhibit 12 Photos of Project Booth at Holiday Parade Event**



**Exhibit 13 Input Received During Holiday Parade Outreach**



Key findings of the study include:

- The city of Desert Hot Springs’ General Plan contains goals related to parking management, including efficient land use patterns, innovative parking solutions, infill revitalization, prioritizing industrial development, streamlining the permit process, reducing VMT, and developing a multimodal approach to transportation.

- The Downtown Study Area has ample parking availability, with much of the area currently covered by surface parking lots. Most spaces remain empty at all times, and even during typical peak conditions, drivers rarely need to walk far to reach their destinations.
- In the Industrial Cannabis Study Area, most developments provide more than enough off-street parking to meet employee demand. Public on-street parking utilization is also low. However, one large work site experiences parking and access difficulties, primarily during shift changes.
- Outreach revealed that both key stakeholders and community members are interested in economic development, street safety improvements, and better multimodal transportation options throughout the city. Employees in the Industrial Cannabis Study Area were generally unaware of shared mobility services and regional commuter incentive programs, which could help improve parking availability and offer more sustainable and equitable transportation options.
- Based on existing and future conditions, as well as community priorities identified through outreach, this study provides recommendations for:
  - Short-term and ongoing strategies:
    - Repeal minimum parking requirements.
- Facilitate shared and public parking.
  - Discourage unshared parking.
  - Allow for mixed-use and infill developments.
  - Support walking, biking, and shared mobility solutions.
  - Potential long-term strategies:
    - Manage public parking based on demand.
    - Invest in new parking technologies.
    - Create a parking benefit district.
- Prepare to manage public parking with dedicated city or contract staff.

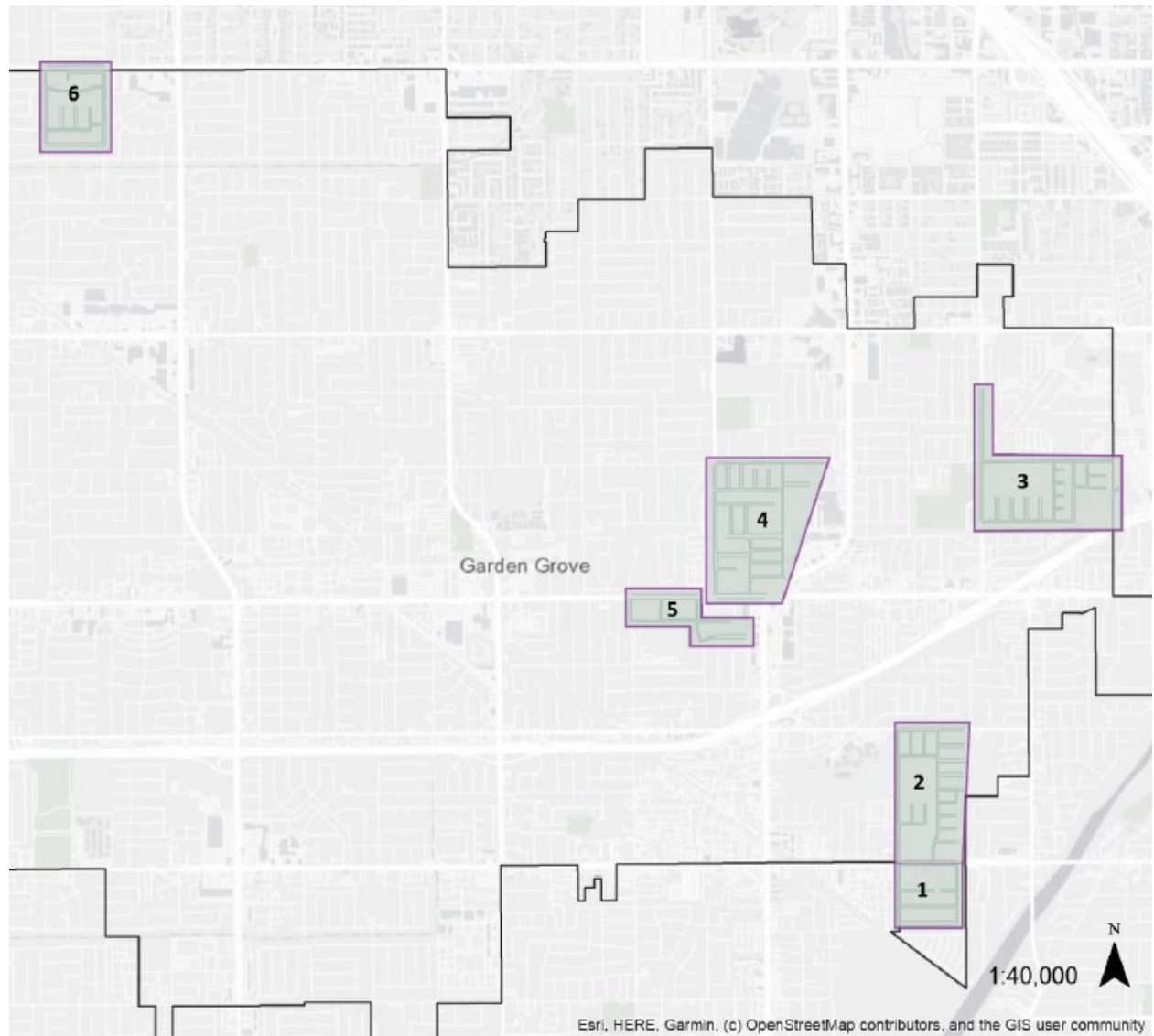
### City of Garden Grove: Curb Data Parking Study

The city of Garden Grove prepared a Parking Management Study to analyze and quantify current residential parking and access challenges, needs, and opportunities within six study areas:

- **Area 1:** Westminster Ave. – Clinton St – Buena St. – Morningside Ave.
- **Area 2:** Trask Ave. – Westminster Ave. – Clinton St. – City Limits
- **Area 3:** Allard St./Lampson Ave. – Blue Spruce Ave. – Lewis St. – Haster St.
- **Area 4:** Lampson Ave. – Garden Grove Blvd. – West St – Buaro St.
- **Area 5:** Garden Grove Blvd. – Stuart Dr. – Newhope St. – Percheron Rd. – Rockinghorse Dr.
- **Area 6:** Katella Ave. – Vons Dr. – Gilbert St. – Barclay Dr.

The areas were chosen as a representative sample of Garden Grove neighborhoods where residents have expressed concerns about street parking availability.

**Exhibit 14 Downtown Study Area Boundaries**



The study provided an overview of the existing planning context, assessed residential street parking supply and demand through quantification and observations, and incorporated key stakeholder and community outreach. It also considered future growth and presented a menu of planning and policy options aligned with the goals and policies of the city’s General Plan and supporting documents.

Project engagement and outreach efforts included coordination with relevant local and regional government agencies, outreach to civic and business organizations, interaction through community events and in-person engagement, virtual community meetings, and a parking survey.



**Exhibit 15 Project Team Engaging with Art in the Park Attendees**

Key findings from the study include:

- Many residents face parking challenges in their neighborhoods.
- In certain street segments and larger residential areas, street parking utilization exceeds 85 percent, indicating obstacles to vehicle access and suggesting a need for parking demand management strategies.
- As residential development increases, demand for street parking is expected to rise, making it even more difficult to find convenient parking unless measures are taken to balance supply and demand.
- The city has recently increased parking enforcement efforts, but staffing levels and resources remain a constraint.

Based on existing and projected future conditions, community priorities identified during public outreach, and broader policy goals, the following strategies were suggested to address current parking challenges and prevent future issues:

- Continuing efforts to increase enforcement of existing parking regulations.
- Unbundling the cost of parking from the cost of housing.
- Exploring a process for establishing RPP districts, but only after enforcing current regulations and defining realistic RPP goals and limitations.
- Facilitating shared parking agreements.
- Establishing transportation demand management requirements for new residential developments exceeding a certain size.
- Implementing a comprehensive Traffic Reduction and Transportation Improvement Fee for new developments.

## City of Laguna Woods: Mobility Technology Plan

The city of Laguna Woods prepared a Mobility Technology Plan to enhance mobility, eliminate accessibility barriers, introduce innovative transportation options, and elevate overall transportation quality. By assessing the community's mobility needs, technological interests, and the practical feasibility established through comprehensive public engagement and extensive industry research, the plan proposes solutions and strategies for a connected and autonomous vehicle (AV) future while also outlining steps to establish a new autonomous mobility service for city residents, businesses, and visitors.

The project team hosted a series of public engagement sessions around mobility and technology, learning that participants were cautiously optimistic about developing the Mobility Technology Plan. Participants from advocacy and resident stakeholder groups put forth the following sentiments:

- Plans should accommodate the needs of older adults and individuals with disabilities, including those with visual impairments, ensuring accessibility for all, regardless of their level of familiarity with technology or possession of smart devices.
- New deployments should prioritize reliability to create a positive first impression.
- Establishing a strong rapport between drivers and passengers is crucial for current Village transportation services.
- Discretionary travel often involves short trips for local shopping, but medical trips may require longer travel such as to the Tibor Rubin Veterans Administration Medical Center in Long Beach. Designing new mobility services should consider destinations outside the city.
- There is a need to ensure the sustainability of existing transit and mobility services, including the Orange County Transportation Authority's Access.
- There is a need to address local traffic congestion and parking challenges.
- Transit solutions should blend on-demand and fixed-route services and consider the challenges of accessing bus stops, particularly for the first and last mile.
- Introducing a local carshare program may benefit residents who no longer prefer car ownership.
- There is a need to ensure the accessibility of apps and technology platforms, including visual cues for the deaf community.

This feedback significantly shaped the proposed considerations and implementation strategies for Laguna Woods.

In coordination with stakeholders and based on research into best practices, a phased approach was developed to help guide the transition. This phased approach is summarized below.

**Exhibit 16 Summary of Phased Approach**

Phase	Description	Infrastructure Improvements	Target Groups
Phase 1	<p>Connected vehicle and AV preparedness, and groundwork for an AV pilot program within the city of Laguna Woods in the future. Improvements in this phase provide independent value regardless of city-approved AV pilot service through improved infrastructure and other mobility improvements that would interface with AV operations.</p>	<ul style="list-style-type: none"> <li>• Mobility hubs</li> <li>• Roadway alterations</li> <li>• Mobility on demand platform</li> <li>• Enhanced network connectivity</li> <li>• Signal controllers and detectors</li> </ul>	<ul style="list-style-type: none"> <li>• General road users</li> <li>• Future AV owners and operators</li> </ul>
Phase 2	<p>Operation of the city of Laguna Woods AV Pilot Program, which initiates small scale, replicable AV services. Implementation of AV service is limited to two main arterial roadways within the City of Laguna Woods—El Toro Road and Moulton Parkway.</p>	<ul style="list-style-type: none"> <li>• Additional traffic control devices</li> <li>• Roadside units</li> <li>• High occupancy vehicle and bus-only lanes</li> <li>• Transit signal priority</li> </ul>	<ul style="list-style-type: none"> <li>• Existing transit riders</li> <li>• Local residents</li> </ul>
Phase 3	<p>Expands the Phase 2 pilot to additional jurisdictions and use cases, including, but not limited to: first/last mile service within residential communities, expanded access to medical facilities, and integrated trip planning.</p>	<ul style="list-style-type: none"> <li>• Additional roadside units as needed</li> </ul>	<ul style="list-style-type: none"> <li>• Local residents</li> <li>• Visitors and tourists</li> <li>• Regional travelers</li> </ul>

Source: Mobility Technology Plan, Arcadis. 2023.



**Exhibit 17 Proposed Phase 2 Operational Area With Potential Destinations**

During the study's proposed Phase 2, also known as the "City of Laguna Woods AV Pilot Program," a comprehensive and replicable framework for AV service will be created to enable the successful piloting of AVs in the community. Phase 2 will emphasize implementation of the necessary systems, processes, and infrastructure for successful operation at a small scale. Implementation of AV service during this phase will be limited to two main thoroughfares, El Toro Road and Moulton Parkway, which will allow for the testing and refining of operations without significant disruption to ridership. The focus will be on proof of concept and ensuring that policies and operations are effective before expanding to other areas, as outlined in Phase 3.

Understanding that Phase 2 and Phase 3 of the plan would require system integration and data sharing across several platforms, the project team then created a detailed list of data needs and data flows between systems. Should the city pursue implementation of an AV pilot service, this should serve as a reference for what data would be involved in system operations and planning.

Additionally, the plan provides deployment cost estimates through market research and provides key technical and governance takeaways for the city of Laguna Woods. These takeaways include choosing vehicles that align with the specific operating environment, considering advanced partnerships with private operators if deploying more advanced vehicles, considering costs, the need to develop AV-specific regulations, including the city's legal department early in the process, and conducting community engagement early and consistently with a focus on safety and reliability.

The plan identifies several issues that should be considered when preparing for connected and autonomous vehicle readiness. Potential solutions to these issues include applying shoulder pavement markings where

they are missing, applying pedestrian crossing pavement markings where they are missing, updating stop bar widths, replacing faded signs, proper sign placements and heights to meet requirements, and using a refresh/flicker rate for LED signs and signals greater than 200 Hz to ensure that AVs are able to perceive and adjust to necessary information.

### City of Rialto: Smart Cities Plan for Warehousing and Logistics

The city of Rialto prepared a Smart Cities Plan to Mitigate Impacts of Warehousing and Logistics to analyze existing warehousing and logistics conditions, define and quantify costs and benefits, and evaluate technological and policy solutions. The plan focused on the city’s adopted truck routes, residential areas along those routes, and warehousing hubs, and aimed to address improvements in the first and last miles of trips. It also sought to promote a more sustainable and equitable transportation system while supporting economic vitality and included a pilot project concept with goals, policies, and programs for regulatory changes and investment in intelligent transportation infrastructure.

**Exhibit 18 Map of Warehouse Facilities (shown as black circles) in South Coast Air Basin and CalEnviroScreen Percentile of Each Census Tract**

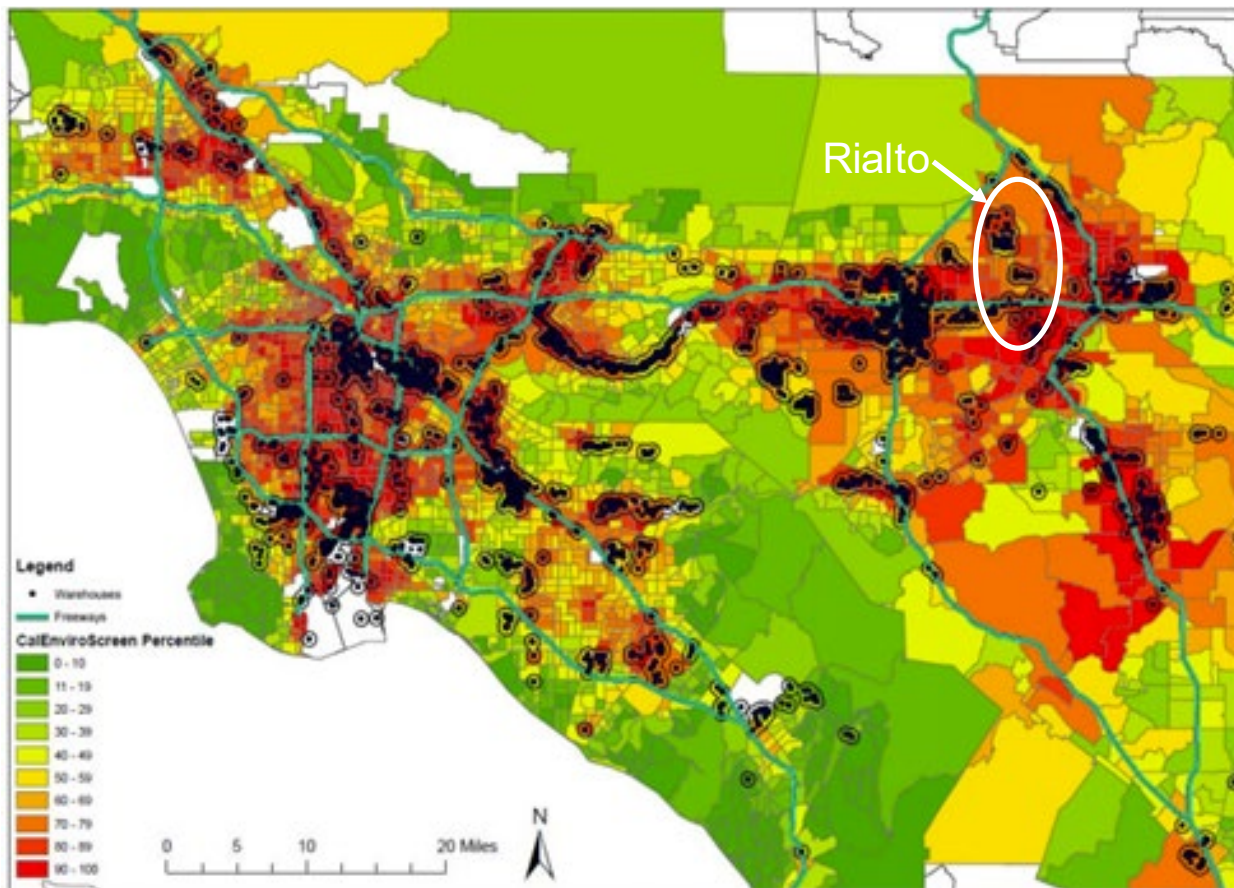
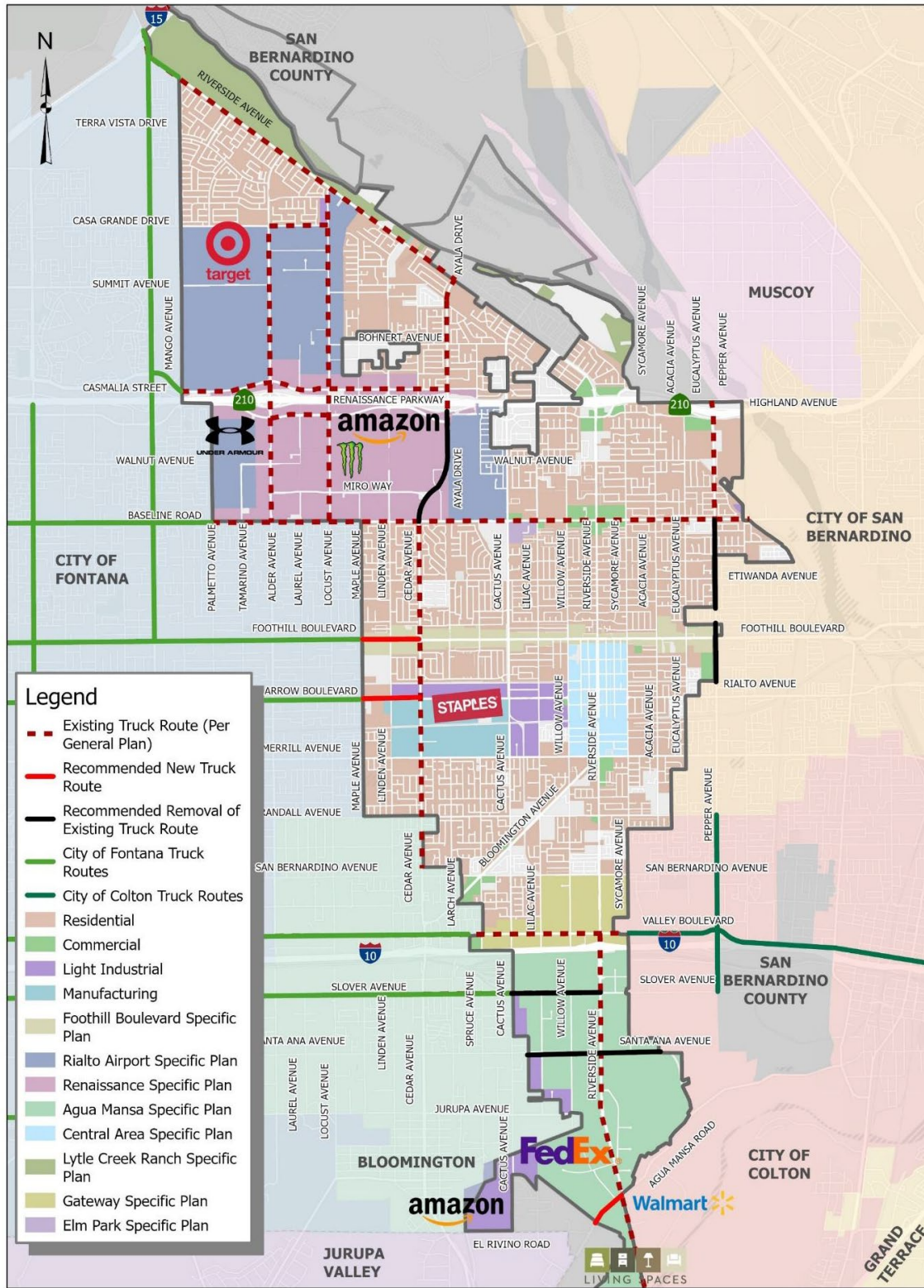




Exhibit 19 Map of Truck Routes in the City of Rialto



The plan provided several potential strategies for mitigating the various impacts of truck traffic associated with warehousing and logistics:

- Access Restriction and Pricing: Limiting excessive numbers of vehicles or restricting certain types of vehicles from entering a designated area.
- Active Transportation and Demand Management: Using intelligent transportation system technology to regulate traffic flow and influence travel behavior in real time.
- Pavement Design and Management: Long-lasting structural design, construction, and maintenance concept for hot mix asphalt pavements (also called long-life pavement or perpetual pavement).
- Emerging First-/Last-Mile Delivery Modes: Drones, local delivery robots, self-driving vehicles, cargo bikes, and shared delivery used as alternatives for door-to-door delivery.
- Eco-Driving: Use of driver input or automation to modify how the vehicle is operated.
- Zero and Near-Zero Emission Vehicles: Vehicles that use propulsion technology that do not produce, or limits, combustion engine exhaust.
- Speed Management: Street design elements and enforcement by police, radar, camera, or aircraft, particularly in geofenced areas to reduce excessive speed.
- Right-Sizing of Vehicles and Fleets: Consolidating loads and using smaller vehicles for delivery.

The project assessed these strategies to determine their impacts on mitigating truck traffic. Generally, all strategies resulted in one or more co-benefits, but the deployment of zero and near-zero emission vehicles strategy was the only one with a tradeoff. Although these vehicles would improve air quality and public health, their heavier weight could accelerate road degradation. As such, the plan determined that this strategy should be adopted in conjunction with the pavement design and management strategy.

**Exhibit 20 Qualitative Assessment of Strategies for Mitigating the Impacts of Truck Traffic**

Mitigation Strategy	Type of Impact				
	Traffic Congestion	Road Degradation	Air Pollution	Public Health	Traffic Safety
Access Restriction and Pricing	+++	++	++	++	++
Active Transportation and Demand Management	++	o	+	+	++
Pavement Design and Management	o	+++	+	+	+

Mitigation Strategy	Type of Impact				
	Traffic Congestion	Road Degradation	Air Pollution	Public Health	Traffic Safety
Emerging First-/Last-Mile Delivery Modes	+	++	+	+	+
Eco-Driving	o	+	++	++	+
Zero and Near-Zero Emission Vehicles	o	-	+++	++	o
Speed Management	+	o	+	+	++
Right-Sizing of Vehicles and Fleets	+	+	++	++	+++

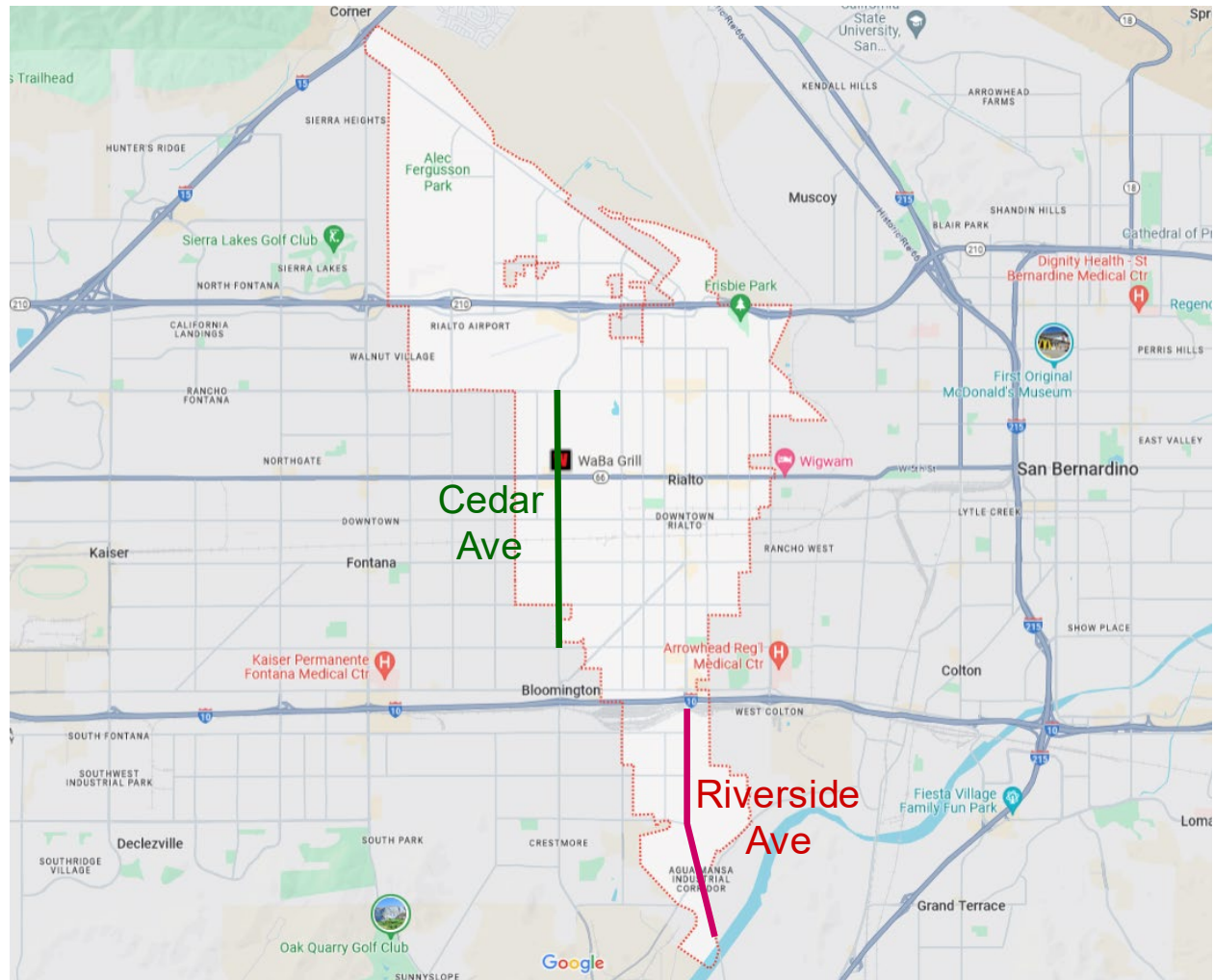
Source: City of Rialto: Smart Cities Plan to Mitigate Impacts of Warehousing and Logistic, College of Engineering - Center for Environmental Research and Technology School of Public Policy - Center for Social Innovation University of California at Riverside. 2024.

Stakeholder engagement was conducted over a two-month period in preparation of the plan. Engagement included surveys and interviews around several broad themes addressing truck traffic and some proposed technological solutions. Interviewees included truck drivers, government employees and contractors, industry association members and members of the public.

Survey and interview results indicated mixed opinions on the role and impact of truck traffic in the city. While some respondents were cautious of the impact of trucks due to traffic congestion and other impacts, others worried that interventions affecting truck traffic could harm the economy and local jobs. However, there was broad consensus on the need for improved road conditions, reduced traffic congestion, and increased traffic safety. Respondents also emphasized the importance of clear messaging about any actions taken, regardless of their visibility, so community members understand what is happening and why.

Based on the input received during stakeholder engagement, the project team proposed deploying freight signal priority (FSP) technology as a pilot project in the city. FSP adjusts traffic lights in real time to help approaching freight vehicles pass through signalized intersections without stopping. This can assist large trucks in avoiding unnecessary stops and idles, enhance traffic flow, improve roadway safety, save fuel, reduce emissions, and mitigate pavement degradation. Two main corridors were proposed for this pilot due to the significant amount of truck traffic they experienced: Cedar Avenue (eight signalized intersections between Baseline Road and San Bernardino Avenue) and Riverside Avenue (eight signalized intersections between Interstate 10 and the Santa Ana River).

Exhibit 21 Proposed Locations for FSP Deployment in Rialto



The plan provided a phased work plan for the pilot project, including comprehensive planning and design, implementation and integration, and monitoring, evaluation, and optimization. Barrier and feasibility analyses were conducted, and an enabling framework was established to provide a clear roadmap for implementing advanced technologies in the city.



# Project Benefits and Challenges

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All eight projects under the Sustainable Community Program – Smart Cities and Mobility Innovation call provided various project benefits, including innovative solutions, multimodal mobility support and vehicle miles traveled (VMT) reduction, air quality improvements, healthy and equitable communities, shared modes, and mitigation of negative community impacts.

## Innovative Solutions

### Cities of Los Angeles, Long Beach, and Stanton Curb Bundle

The Curb Bundle project employed an innovative approach of using technology to collect, digitally manage, and assess curbside inventory and usage, addressing curbside management challenges and opportunities in Los Angeles, Long Beach, and Stanton.

To streamline site selection, the project team used a parametric model tool to identify key curbside segments from thousands across the cities. The model incorporated various datasets influencing curbside conditions, including land use, socioeconomic factors, transportation data, parking operations, and public amenities and services. Custom weightings were applied to determine each dataset's impact on a segment's score. This analysis resulted in an interactive map highlighting areas for further study based on each city's goals.

Additionally, a hot spot mapping tool was developed to pinpoint curbside issues. Stakeholders identified specific points, segments, and areas with known curbside challenges, which were integrated into the site selection process.

CurblQ, a parking, curbside, and asset management software solution, played a key role in collecting and analyzing curbside inventory for the three cities. The platform enabled city staff to view existing infrastructure, analyze trends in demand and usage, monitor real-time data from smart infrastructure (such as cameras and meters), and implement changes based on local needs.

For Los Angeles and Long Beach, surveyors collected data on parking regulations (e.g., free and paid parking, no parking, no stopping) and curbside assets (e.g., fire hydrants, curbside patio/dining, micromobility parking). The team also observed curbside activities, such as ride share pick-ups and drop-offs, freight deliveries, app-based deliveries, and buses.

To capture demand data, cameras were installed across all six study areas at a sufficient density to record both sides of the street and a range of tracked activities. The recorded footage was then reviewed to count curbside activity, including deliveries, pick-ups and drop-offs, session start and end times, dwell times, vehicle locations, curbside zone locations, and vehicle types.

In Long Beach, due to permitting delays for video data collection, demand data was gathered manually by on-site technicians, who logged the same activity metrics, including session start and end times, dwell times, vehicle locations, curbside zone locations, and vehicle types.

With this curbside inventory, data about the number of spaces for all curbside uses was known on an hourly, daily, and weekly basis. Curbside trade-offs were analyzed alongside demand data to identify optimal solutions, such as evaluating walking distances from accessible parking to key destinations or assessing usage and revenue generated from high demand curbside spaces. This analysis helped cities maximize

and prioritize curb space to align with their goals. The platform also enabled the project team to identify shovel-ready pilot project concepts as part of the final deliverable.

### **San Gabriel Valley Council of Governments: GoSGV Engagement & Evaluation**

The San Gabriel Valley Council of Governments' GoSGV program offers an innovative approach to bike share. Unlike traditional bike share programs, GoSGV does not place e-bike stations in the public right-of-way. Instead, residents of eligible SGV communities can join the program through partner locations, such as community organizations, businesses, and colleges and universities. Participants can rent an e-bike for months at a time to meet their daily transportation needs. E-cargo bikes are also available but are limited to two-month rentals due to their limited supply. Monthly rental pricing varies by bike type, with discounts for students, seniors, and income-qualified participants. Additionally, to further promote e-bike adoption among San Gabriel Valley residents, the program offers a rent-to-own option, allowing standard participants to keep their e-bike after 36 consecutive months of rental.

As part of project engagement, a promotional partnership with Metrolink was established. Through this partnership, Metrolink provided free fares for new GoSGV members and incorporated co-branding on their trains. The GoSGV program served as an effective first- and last-mile solution for Metrolink riders in the San Gabriel Valley. Additionally, the Metrolink system enabled GoSGV users to travel much farther than transit options with Metro.

### **City of Desert Hot Springs: Downtown and Light Industrial Parking Plan**

The city of Desert Hot Springs parking plan provides a framework for deploying innovative practices to accommodate future development and mobility needs. This framework is guided by data collection, parking management, curb innovation, and complete streets strategies.

As mentioned in the "Project Description and Work Performed" chapter, the plan's short-term strategies include facilitating shared and public parking, discouraging private and reserved parking, incentivizing mixed-use and infill developments, and promoting walking, biking, and shared mobility solutions. In the long term, the city aims to invest in new parking technologies and establish parking benefit districts. These strategies are guided by insights from existing conditions, General Plan policies, and community and stakeholder feedback.

As a relatively new land use, industrial cannabis presents unique parking challenges. Unlike traditional commercial spaces, such as offices, retail, and food and beverage establishments, its demand patterns have not been well-documented. This research analyzed actual parking demand at nine industrial cannabis facilities, including nearby street parking, within the study area to help inform future demand calculations. The findings provide the city with data-driven insights and contribute to a more detailed understanding of parking needs for industrial cannabis developments.

### **City of Garden Grove: Curb Data Parking Study**

Based on local planning context, supply and demand findings, community feedback, and future growth expectations, several strategic and forward-thinking solutions were developed to address existing parking challenges and prevent future issues across the six study areas. These recommendations include:

- Continue efforts to increase enforcement of existing parking regulations.
- Facilitate shared parking agreements.



- Explore a process for establishing residential parking permit (RPP) districts only after current regulations are enforced and realistic RPP goals and limitations have been communicated and agreed to.
- Unbundle parking.
- Establish transportation demand management (TDM) requirements for new developments.
- Implement a Traffic Reduction and Transportation Improvement Fee for new developments.

### City of Laguna Woods: Mobility Technology Plan

The city of Laguna Woods Mobility Technology Plan presents a comprehensive strategy to harness innovative technology for the benefit of the community. Designed to serve older adults, transit-dependent riders, and individuals with limited mobility, the plan lays the groundwork for an autonomous vehicle (AV) pilot program that can transition from a proof-of-concept into a scalable, community-tailored mobility service.

As transportation shifts toward connected and autonomous technologies, AVs have the potential to provide a safer, more efficient alternative to human-operated trips by reducing accidents caused by human error and mitigating stop-and-go traffic congestion. This project offers the opportunity to explore a unique complement to other mobility services, such as traditional ride-share or taxi services, in a way that allows the city to leverage emerging technologies and place itself at the forefront of innovative transportation models. Beyond AVs, the digital infrastructure developed through this project has the potential to serve as a regional blueprint for SCAG and other municipalities for other services outside the scope of AVs.

### City of Rialto: Smart Cities Plan for Warehousing and Logistics

The city of Rialto's smart cities plan aims to increase the accessibility and mobility of people and goods with technology and innovative designs. Smart cities improve in multiple areas, including the economy, people, governance, mobility, environment, and overall living conditions. To achieve these goals, smart cities harness all accessible resources, monitor environmental conditions in real time, gather information through sensors and critical infrastructure, and process this data by leveraging information and communication technology to deliver the expected satisfaction to citizens.

Based on input gathered from project survey and interviews, the project team proposed deployment of freights signal priority (FSP) technology as a pilot initiative. FSP uses real-time data to adjust traffic signals, allowing freight vehicles to move more efficiently through intersections without unnecessary stops. This technology enhances commercial freight movement, reduces environmental impacts, and improves overall traffic operations.

The pilot project is designed to achieve the following key objectives:

- Reduce traffic congestion by minimizing stop-and-go maneuvers for freight trucks, leading to smoother overall traffic flow.
- Mitigate pavement degradation by reducing hard braking events, which contribute to wear and tear.
- Enhance intersection safety by preventing trucks from being caught in "dilemma zones" at yellow lights, reducing the risk of running a red light.
- Reduce air pollution by limiting truck idling and accelerating from stops, thereby decreasing tailpipe emissions.

- Lower fuel consumption and costs by minimizing unnecessary stops, helping truck operators save on fuel expenses while reducing overall emissions.

## Multimodal Mobility Support and VMT Reduction

### Cities of Los Angeles, Long Beach, and Stanton Curb Bundle

The three pilot projects outlined in the study aim to create curbside environments that support multimodal mobility, including cars, transportation network companies (TNCs), commercial trucks, buses, bicyclists, and pedestrians, while also reducing VMT.

The Los Angeles pilot focuses on commercial areas adjacent to the University of California, Los Angeles campus and the Ronald Reagan Medical Center. These areas accommodate various modes of transportation, including transit, micromobility, microtransit, and walking. However, high demand for passenger and commercial loading competes with limited curbside space, which is primarily allocated to vehicle parking. This supply-demand mismatch results in illegal loading in red zones and conflicts between pedestrians, delivery vehicles, and on-street parking. To address these issues, the plan proposes a more flexible use of the curbside space. By adjusting curbside usage based on time of day or week, the Los Angeles Department of Transportation can accommodate deliveries, passenger pick-ups and drop-offs, short-term parking, and on-street parking, ultimately optimizing curbside space for its highest and best use.

To support newly installed loading zones along 2nd Street between Granada Avenue and Corona Avenue, the study proposed an automated enforcement pilot for the city of Long Beach. This area features multimodal, pedestrian-oriented streets with high commercial activity, including dining and shopping destinations. To enhance safety and curbside efficiency, on-street parking was reallocated to loading zones, providing dedicated space for delivery drivers. This shift reduces unsafe parking and loading behaviors, improving overall pedestrian safety and curbside operations.

In Stanton, the plan proposes a three-phased approach to updating the RPP program. Curbside demand in RPP areas is largely the same, with residents requiring long-term parking at their homes alongside shorter-term needs for deliveries and services like landscaping and home maintenance. The proposed improvements would help the city streamline program management as both population and curbside demand increase.

By implementing time-based curbside prioritization, installing dedicated loading zones, and updating the RPP program, all three pilots aim to reduce street congestion and lower VMT caused by cars, TNCs, and commercial trucks circling the area in search of parking.

### San Gabriel Valley Council of Governments: GoSGV Engagement & Evaluation

Increasing multimodal mobility and VMT reduction through replacing car trips were primary goals for the GoSGV program. By providing residents with e-bikes, the program provided a low-emission alternative to driving to meet daily needs. Based on academic research and the program's survey results, the program estimated that for an average user, 30 percent of their e-bike trips replaced a car trip. It is estimated that the GoSGV program reduced VMT by 11,549 miles to date, the equivalent of 1.1 cars on the road for an entire year. Using the California Air Resources Board Emission Factors model, it is estimated that four tons of greenhouse gas (GHG) emissions (7,970 pounds) have been avoided as a direct result of the GoSGV program. This is the equivalent of about 70 percent of one home's electricity use for one year.

Overall, the most common trip reported among participants was errands, showing that Southern Californians are willing to replace car trips with bicycle trips. In particular, e-cargo bike users most frequently used their

bikes for errands/shopping (88 percent) and dropping kids off at school or activities (81 percent), demonstrating the unique potential of increasing e-cargo bike access for VMT and GHG reductions.

### **City of Desert Hot Springs: Downtown and Light Industrial Parking Plan**

As outlined in the plan, long-term strategic planning efforts will optimize parking to serve the city efficiently while providing residents and employees with real transportation choices. By balancing different transportation modes, more trips within the city can be shared or completed by walking, biking, or using neighborhood electric vehicles. Expanding multimodal transportation options is particularly relevant for Desert Hot Springs, as walkable and bike-friendly cities especially benefit children, who are too young to drive, and lower-income residents, for whom private vehicle ownership can be a financial burden.

Short-term strategies were recommended to improve parking and access opportunities in the Downtown and Industrial Cannabis study areas, including repealing minimum parking requirements, facilitating shared and public parking, discouraging unshared parking, allowing for mixed-use and infill development, and supporting walking, biking, and shared mobility solutions. Long-term strategies that may become relevant in the future, including managing public parking based on demand, were also recommended.

Reducing rigid parking requirements allows property owners and businesses greater flexibility in providing parking and access solutions, rather than simply adding more parking in areas like the downtown core, where empty spaces are already abundant. This approach ensures that parking is allocated more efficiently while also giving residents, households, and employees viable alternatives to driving and parking for every trip.

Increasing the share of parking that is publicly available or shared among various users can transform excess parking, and valuable land can be preserved as nature or used more efficiently. Traditional municipal parking regulations often require dedicated on-site parking for each land use, leading to inefficient land use and detracting from an area's visual character and environment, as many parking spaces remain empty.

Shared parking reduces the need for excessive construction, freeing up land for businesses, amenities, or public space while also encouraging pedestrian activity by consolidating small parking facilities into larger shared lots. More efficient use of off-street parking resources could also allow for the repurposing of street parking, improving safety for walking and biking. Additionally, minimizing unshared parking supports active transportation options, such as walking and biking.

Developing zoning standards to better support a mix of uses assists in reducing parking and transportation infrastructure demand, helping to facilitate multimodal access. Doing so can improve proximity and access to different places, reducing the distance and segregation between different types of places, making it possible for more trips to be taken without a car.

Planning for and investing in sustainable transportation and shared mobility will allow the city to align individual incentives with collective goals, including health, fiscal responsibility, environmental sustainability, economic vitality, and community. Given the city's warm climate, terrain, low residential density, and regional transportation needs, the plan recommends promoting electric bicycles, electric scooters, and car sharing opportunities. Additionally, enhancing public transit options, including SunLine Transit Agency's on-demand rideshare service SunRide, can improve transportation access.

For the Industrial Cannabis area, the plan suggests exploring commuter transportation opportunities, forming regional partnerships, and promoting regional commute planning and incentive programs, such as Sun Commute, IE Commuter, and SolVan Vanpool Program.

While existing conditions in the city do not demonstrate a need for demand-based parking management, having a plan and vision in place for what to do if demand patterns and utilization rates change in the future is important to ensure the sustainability and efficiency of future growth and development.

Implementing these recommendations will reduce vehicle trips and increase the share of trips taken by active and shared transportation, resulting in decreased congestion and VMT in the study area.

### **City of Garden Grove: Curb Data Parking Study**

The study identified strategies to encourage the use of active and shared mobility options, such as establishing TDM requirements for new residential development and implementing a comprehensive traffic reduction and transportation improvement fee.

TDM planning focuses on creating, improving, and promoting alternatives to driving alone, including active transportation and shared mobility services. By improving the viability of walking, biking, and transit, residents might choose to reduce vehicle ownership, helping to ease parking demand for those who still rely on private vehicles.

The effectiveness of alternative transportation options and the extent to which neighborhoods are protected from traffic and parking congestion depend on citywide investment in shared mobility services and active transportation infrastructure. A traffic reduction and transportation fee for new developments could fund projects that enhance connectivity and expand access to key destinations. While the city already has development fees for other public infrastructure, updating the ordinance to include a more comprehensive list of sustainable transportation projects, such as pedestrian and bikeway improvements, bicycle parking, transit enhancements, traffic calming, street reconfigurations, and wayfinding, would help ensure long-term mobility improvements.

Implementing these strategies will reduce vehicle trips and increase the share of trips taken by active and shared transportation, leading to lower congestion and VMT in the study area.

### **City of Laguna Woods: Mobility Technology Plan**

Objectives of the city's Mobility Technology Plan include introducing a spectrum of mobility options to meet current and future needs in Laguna Woods and enhancing resilience and quality of life by reducing VMT and mitigating traffic congestion.

The first phase of the proposed AV pilot project involves physical and digital modifications to prepare for AV service, including the establishment of mobility hubs. Mobility hubs serve as centralized locations where various transportation modes intersect, facilitating seamless transfers. They enhance accessibility and promote sustainable urban mobility by integrating transit stops, bike racks, micromobility services, carshare stations, pick-up and drop-off zones, and charging stations. By incorporating these elements, the city can improve connectivity and reduce reliance on personal vehicles, easing congestion and lowering VMT.

In the second phase, residents will have the option to use an AV instead of a private car. Studies suggest that AVs can help reduce stop-and-go traffic patterns, easing congestion. This phase also provides an opportunity to explore AVs as a complement to existing ride-share and taxi services.

The final phase seeks to expand mobility options, improve first-last mile transit connections, and enhance access to healthcare for residents. It will also explore how AV technology can serve specific groups, such as individuals with disabilities who may benefit from improved transportation options.

These strategies will encourage a shift toward active and shared transportation, reducing private vehicle trips, easing congestion, and lowering VMT in Laguna Woods.

### **City of Rialto: Smart Cities Plan for Warehousing and Logistics**

The plan recommended various strategies to mitigate truck traffic congestion while supporting multimodal mobility and reducing VMT. These strategies include access restriction and pricing, active transportation and demand management (ATDM), emerging first- and last-mile delivery modes, and vehicle right-sizing.

Access restriction and pricing can limit excessive vehicle volumes or restrict certain types of vehicles in designated areas to reduce congestion.

ATDM optimizes traffic flow and influences traveler behavior in real time to reduce congestion and encourage sustainable travel choices. By leveraging technology and dynamic management tools, the city can monitor, regulate, and adapt transportation demand across the entire system, improving efficiency and mobility.

Emerging first- and last-mile delivery modes, such as drones, autonomous delivery robots, cargo bikes, and shared delivery services, can reduce the number of delivery vans circulating within communities, mitigating congestion and freeing up space for active transportation users.

Vehicle right-sizing, which involves replacing oversized trucks with smaller, more maneuverable vehicles, improves visibility, enhances traffic safety, and reduces turn radii. This creates more opportunities for traffic calming measures and expands protected space for pedestrians and cyclists.

By implementing these strategies, the city can reduce the number of vehicles on the road, lower congestion, and promote active and shared transportation options, ultimately decreasing VMT and enhancing multimodal mobility.

## **Air Quality Improvements**

### **Cities of Los Angeles, Long Beach, and Stanton Curb Bundle**

By implementing time-based curb prioritization, installing dedicated loading zones, and updating the RPP program, all three pilots aim to reduce street congestion and decrease GHG emissions from cars, TNCs, and commercial trucks that would otherwise circle the area in search for parking. These strategies help streamline traffic flow, minimize idling emissions, and improve air quality in impacted neighborhoods.

### **San Gabriel Valley Council of Governments: GoSGV Engagement & Evaluation**

By encouraging mode shift and reducing VMT, even for short trips, bike share programs such as GoSGV can contribute to reducing emissions and improving air quality. Replacing short trips helps decrease the number of “cold starts,” which are a source of vehicle emissions.

### **City of Desert Hot Springs: Downtown and Light Industrial Parking Plan**

The plan includes several strategies to expand shared parking and mobility options for residents. By reducing reliance on single-occupancy vehicles, these strategies would lower the number of cars on the road, decrease VMT, and reduce GHG emissions, ultimately improving air quality.

## City of Garden Grove: Curb Data Parking Study

The study includes strategy recommendations aimed to prevent future parking challenges, such as establishing TDM requirements for new developments and implementing a comprehensive traffic reduction and transportation improvement fee for new development. TDM expands sustainable travel options, making it easier for residents to choose walking, biking, and transit instead of driving alone. Additionally, a traffic reduction and transportation improvement fee for new residential developments can help fund citywide projects, such as sidewalk improvements, bike parking, transit improvements, and new bicycle and transit lane striping, to improve connectivity and expand access to key destinations. By reducing vehicle trips, these measures help lower air pollution and GHG emissions, improving overall air quality and public health. Furthermore, active transportation options provide physical health benefits while ensuring equitable mobility for those who cannot afford a private vehicle.

## City of Laguna Woods: Mobility Technology Plan

Objectives of the city's Mobility Technology Plan include enhancing resilience and quality of life within the study area by reducing GHG emissions. Incorporating various elements into proposed mobility hubs that encourage alternative modes of transportation, such as AVs, micromobility, carshare, and transit, would improve connectivity and reduce reliance on personal vehicles, resulting in eased congestion, lower VMT, and a reduction in GHG emissions. Additionally, the pilot could utilize zero-emission AVs, which would provide further reductions in GHG emissions.

## City of Rialto: Smart Cities Plan for Warehousing and Logistics

The plan recommends multiple strategies to mitigate air pollution, including access restriction and pricing, ATDM, eco-driving, pavement design and management, emerging first- and last-mile delivery modes, zero and near-zero emission vehicles, speed management, and vehicle and fleet right-sizing.

Access restriction and pricing strategies, such as congestion pricing and low-emission zones (LEZs), can limit high-emission vehicles in designated areas. Congestion pricing charges vehicles a fee to enter specific zones, primarily to reduce traffic congestion, but it also improves air quality by discouraging unnecessary trips. LEZs further restrict or impose fees on high-emission vehicles to reduce pollution levels in targeted areas.

ATDM optimizes traffic flow and encourages sustainable travel choices by dynamically managing demand. By leveraging real-time monitoring and control technologies, the city can reduce congestion, lower VMT, and decrease vehicle emissions.

Eco-driving techniques, such as maintaining a steady speed, using cruise control, minimizing aggressive acceleration and braking, and avoiding unnecessary idling, help reduce fuel consumption and emissions. Additionally, eco-driving prevents pavement damage caused by excessive lateral force from abrupt maneuvers.

Emerging first- and last-mile delivery modes, such as drones, autonomous delivery robots, cargo bikes, and shared delivery services, can reduce the number of delivery vans circulating within communities, lowering emissions from freight movement.

Transitioning existing vehicle fleets to zero- and near-zero-emission vehicles is a key strategy to directly reduce transportation-related air pollution. Electrification of fleets can assist in cutting emissions from the transportation sector.

Speed management strategies, such as enforcement via police, radar, cameras, or aerial surveillance, can help regulate excessive speeds. Lower speeds contribute to improved fuel efficiency and reduced emissions, while also enhancing road safety.

Vehicle right-sizing replaces oversized trucks with smaller, more efficient vehicles, improving maneuverability, reducing delays in dense traffic, and enabling the use of alternative, narrower routes. Fleet right-sizing ensures optimal vehicle inventory, improves vehicle utilization, and reduces fuel consumption and maintenance costs, leading to lower emissions.

## Healthy and Equitable Communities

### Cities of Los Angeles, Long Beach, and Stanton Curb Bundle

The Los Angeles pilot project aims to develop a robust, forward-thinking curbside management program that aligns curb use with the city's broader sustainability and equity goals. The Los Angeles Department of Transportation (LADOT) actively manages and reallocates curb space to prioritize access for public transit, on-demand dockless mobility options, and people who walk and bike. Additionally, LADOT has conducted multiple studies and pilot programs related to curb space, while the city of Los Angeles has adopted policies, integrated active curb management into its strategic plans, and invested significantly in digital infrastructure. These efforts highlight the potential for technology to improve safety, efficiency, and equity. By adapting curb regulations to allow different uses at different times of day or week, the pilot would enhance access for various curb users.

The Long Beach pilot project seeks to establish a world-class curb management program that prioritizes safety, emergency access, and equitable curb access for all users. The Long Beach Public Works Department actively manages curb use and has a long-standing reputation for reallocating curb space to prioritize people, public transit operations, and active transportation. The city integrates multimodal mobility and curb management strategies into its planning efforts and has conducted multiple studies and pilot programs to enhance transportation options. Managing short-term on-street parking with automated enforcement would improve parking efficiency and increase equitable curb access, particularly during peak periods when parking scarcity disproportionately impacts those with limited mobility. Additionally, reallocating on-street parking to loading zones within the pilot area would enhance pedestrian and bicyclist safety while supporting additional curb uses.

In Stanton, updating and digitizing the RPP program would streamline parking demand management in the city's multigenerational neighborhoods and reduce permit abuse, ensuring a fairer distribution of curb space. The city aims to strategically prioritize all curb users, making curb space safer and more accessible for everyone.

As outlined above, all three pilots would contribute to improved air quality by reducing GHG emissions from cars, TNCs, and commercial trucks circling in search of parking.

### San Gabriel Valley Council of Governments: GoSGV Engagement & Evaluation

Equity is a core tenet of the GoSGV program, which offers reduced rates for participants in income-based support programs such as CalFresh and WIC.

To enhance engagement and evaluation efforts, ultimately increasing e-bike adoption in the San Gabriel Valley, the report recommends that the San Gabriel Valley Council of Governments (SGVCOG) and ActiveSGV conduct ongoing surveys of income-qualified members. Participation in these surveys could be a



requirement for receiving the reduced rate. Additionally, focus groups with income-qualified members are recommended to identify unique challenges, barriers, and opportunities for this population. Insights from these efforts can help improve the program and expand access for low-income San Gabriel Valley residents.

To further support equitable participation, the report also recommends engaging community leaders to strengthen trust with residents of low-income communities, particularly communities of color and non-English speakers.

### **City of Desert Hot Springs: Downtown and Light Industrial Parking Plan**

From an equity perspective, a transportation system that relies heavily on driving alone reinforces automobile dependency, which is costly both for individuals and society. Additionally, excess parking contributes to environmental harms such as stormwater runoff, habitat destruction, and urban heat island effects, while also undermining social equity, community, and public health.

The plan's recommended strategies would allow the city to accommodate private vehicles while also implementing innovative approaches to balance their prioritization and right-size parking for new development. Given the strong connection between parking policy, development patterns, and car dependency, the city has an opportunity to proactively shape growth and create a future where walking, biking, and shared mobility options are equally accessible, affordable, and appealing.

### **City of Garden Grove: Curb Data Parking Study**

The study includes strategy recommendations to prevent future parking challenges, such as unbundling parking from residences and establishing TDM requirements for new developments.

Unbundling parking from housing rentals creates a more efficient system by removing the implicit subsidy for car ownership, improving equity outcomes for households with low vehicle ownership, and increasing a neighborhood's effective parking capacity. By allowing residential off-street parking spaces to be allocated based on need and demand, this approach ensures that parking is used more efficiently while reducing unnecessary housing costs for those who do not require a parking space.

TDM requirements further support equity by expanding sustainable travel options, making it easier for residents to choose walking, biking, and transit instead of relying solely on private vehicles. In addition to improving transportation access for all, these strategies promote physical activity, contributing to better public health outcomes.

### **City of Laguna Woods: Mobility Technology Plan**

The plan aims to make Laguna Woods a more equitable and healthy community by eliminating accessibility barriers, reducing VMT, and lowering GHG emissions. The plan prioritizes lifelong mobility solutions for older adults and individuals with disabilities, ensuring they can travel safely and independently. By introducing a range of mobility options that address both current and future community needs, the plan enhances accessibility while promoting environmental sustainability. Additionally, by reducing congestion and vehicle emissions, the plan contributes to improved air quality and public health, supporting a more resilient and livable community.

### **City of Rialto: Smart Cities Plan for Warehousing and Logistics**

The plan recommends multiple strategies to promote public health and equity by improving air quality, enhancing transportation safety and expanding access to sustainable mobility options. These strategies



include access restriction and pricing, ATDM, eco-driving, emerging first- and last-mile delivery modes, zero and near-zero emission vehicles, speed management, and vehicle and fleet right-sizing.

Access restriction and pricing strategies, such as congestion pricing and LEZs, can reduce air pollution by limiting high-emission vehicles in designated areas.

ATDM optimizes traffic flow and promotes sustainable travel choices by dynamically managing demand. Real-time monitoring and control technologies help reduce congestion, lower VMT, and decrease vehicle emissions, improving overall public health.

Emerging first- and last-mile delivery modes, such as drones, autonomous delivery robots, cargo bikes, and shared delivery services, reduce delivery van traffic and emissions. Additionally, drones can minimize physical contact between couriers and customers, reducing the risk of virus transmission—a crucial benefit in public health emergencies.

Eco-driving techniques, including maintaining a steady speed, using cruise control, minimizing aggressive acceleration and braking, and avoiding unnecessary idling, help lower fuel consumption and emissions, leading to improved air quality.

Transitioning existing vehicle fleets to zero- and near-zero-emission vehicles directly reduces transportation-related air pollution. Electrification of fleets, combined with designated truck routes that avoid residential neighborhoods, can mitigate and protect the community from transportation emissions.

Speed management strategies, including enforcement via police, radar, cameras, or aerial surveillance, enhance road safety by reducing excessive speeds. Lower speeds contribute to reduced emissions, while also enhancing road safety.

Vehicle right-sizing, replacing oversized trucks with smaller, more maneuverable vehicles, improves visibility, enhances traffic safety, and allows for more traffic-calming measures. Expanding protected pedestrian and cycling spaces fosters active transportation, improving physical health and accessibility. Additionally, fleet right-sizing optimizes vehicle use and reduces fuel consumption, lowering emissions and benefiting air quality.

## Shared Modes and Effective Parking Management

### Cities of Los Angeles, Long Beach, and Stanton Curb Bundle

The proposed Los Angeles pilot improves curbside management by prioritizing different curb uses at various times of the day or week. This approach would reduce illegal loading in red zones, minimize conflicts between pedestrians, delivery vehicles, and on-street parking, and allocate more curb space for deliveries while preserving parking, ensuring the highest and best use of the curb.

The Long Beach pilot enhances parking management through automated enforcement, increasing compliance with on-street parking regulations. The pilot will focus on monitoring compliance with designated parking areas, including two-hour parking spaces, short-term 10- to 30-minute parking zones, and two-minute passenger loading spaces. Additionally, automated enforcement will detect illegal stopping in no-parking zones—such as in front of fire stations or bus stops—and redirect delivery drivers to the newly installed loading zones on 2nd Street. Given the limited parking enforcement capacity of the Long Beach Police Department, automated enforcement will also assist in identifying and addressing parking and curb use violations.

The Stanton pilot proposes a three-phased approach to improve parking management by digitizing the RPP program, allowing for more efficient demand management in residential neighborhoods.

- **Near Term:** The city will engage the public to understand community perspectives on RPP updates, research and test parking management systems, reassess existing RPP districts, and identify opportunities for program expansion.
- **Medium Term:** The city will clean and organize existing RPP data in preparation for migration to a new software platform. Other key actions include developing an online application process to streamline staff workload and simplify the application process for residents, educating the public on the rationale for program updates, summarizing and reporting public input, conducting a community survey on parking issues and potential solutions, collecting baseline data within RPP zones, and deploying enforcement officers to areas with the highest volume of violations.
- **Long Term:** The city will prohibit permit holders from transferring permits between vehicles, procure a digital parking permit system, integrate the RPP database with the parking enforcement platform, conduct an RPP pricing study, continue community engagement, phase out physical permits, research explore automated monitoring and enforcement technology, and establish a long-term technology partnership agreement.

### **San Gabriel Valley Council of Governments: GoSGV Engagement & Evaluation**

GoSGV promotes the increase of shared modes by expanding accessibility to bicycles in lieu of car dependence. In addition to increasing bicycle use as a mode of transportation in the San Gabriel Valley, the report illuminates structural challenges to increased mode share. In GoSGV's exit survey, one out of ten exit survey respondents said that the lack of safe bike facilities in the region was a barrier to riding their e-bike. SGVCOG also learned that some participants were concerned with the weight of e-bikes and that bike parking or bringing bikes on board transit were barriers to biking to transit. Identifying hurdles toward adoption is essential to bringing attention to possible improvements that can encourage more people to use alternative modes of transportation.

### **City of Desert Hot Springs: Downtown and Light Industrial Parking Plan**

The plan recommends short-term strategies for the Downtown and Industrial Cannabis areas to encourage shared modes and optimize parking management, including repealing minimum parking requirements, facilitating shared and public parking, discouraging unshared parking, allowing mixed-use and infill development, and supporting walking, biking, and shared mobility.

These strategies complement one another to reduce unnecessary parking expansion, consolidate parking supply, and make space available for a variety of users. While still accommodating vehicle travel, they help transition toward a balanced transportation system and more sustainable land use patterns over time.

### **City of Garden Grove: Curb Data Parking Study**

The study recommends several strategies to address current and future parking challenges, including increasing enforcement of existing parking regulations, facilitating shared parking agreements, unbundling parking, establishing TDM requirements for new developments, and implementing a traffic reduction and transportation improvement fee for new developments.

Enforcement serves as the foundation for effective parking management, ensuring that regulations prevent traffic hazards and keep parking spaces available for legal use. Strengthening enforcement efforts can improve parking efficiency while laying the groundwork for additional management strategies.

To increase the effective parking supply, the city can facilitate and promote shared use agreements that allow property owners to lease private parking spaces during hours when they would otherwise go unused. At multi-family housing developments with limited off-street parking, property managers or city staff could assist residents in securing shared parking agreements with nearby property owners. Businesses with underutilized parking may also benefit from monetizing their spaces. Additionally, encouraging residents with excess driveway space or businesses with surplus off-street parking to lease their spaces via online platforms can further optimize parking resources while making more affordable options available.

Unbundling parking from housing rentals creates a more efficient system by removing the implicit subsidy for car ownership, improving equity for households with low vehicle ownership, and increasing the availability of parking where it is most needed. By allocating residential off-street parking based on actual demand, this approach ensures that spaces are used efficiently while lowering housing costs for those who do not require parking.

TDM strategies support shared mobility and alternative transportation by improving the viability of walking, biking, and transit. When sustainable travel options become more accessible and reliable, residents may opt to reduce vehicle ownership, helping ease parking demand for those who still rely on private vehicles.

Implementing a traffic reduction and transportation fee for new developments can fund projects that enhance connectivity and expand access to key destinations. While the city already requires development fees for other types of public infrastructure, updating the ordinance to support a broader range of sustainable transportation projects, such as pedestrian and bikeway improvements, bicycle parking, transit enhancements, traffic calming, street reconfigurations, and wayfinding, would help ensure long-term mobility improvements and better integrate shared modes into the transportation system.

### **City of Laguna Woods: Mobility Technology Plan**

As part of Phase 1, mobility hubs could include carshare stations, allowing residents to rent vehicles for short trips and return them to designated locations. Carsharing can serve as a first- and last-mile solution within the connected and autonomous vehicle (CAV) pilot, helping residents complete trips beyond CAV routes and filling transit service gaps. By integrating transit stops, micromobility services, carshare stations, and pick-up and drop-off zones, mobility hubs can further promote shared modes and reduce dependence on private vehicles.

### **City of Rialto: Smart Cities Plan for Warehousing and Logistics**

Adopting emerging first-and last-mile delivery modes, such as shared delivery services, can reduce the number of delivery vans circulating within communities and promote shared transportation options. By bundling deliveries from nearby locations, shared delivery enhances operational efficiency, reduces emissions, and supports environmental sustainability through optimized logistics.

## Strategies to Mitigate Negative Community Impacts

### Cities of Los Angeles, Long Beach, and Stanton Curb Bundle

Implementing innovative curbside management programs and modernizing Stanton’s RPP program will help reduce congestion and GHG emissions by decreasing the number of cars, TNCs, and commercial trucks circling in search of parking. Additionally, enforcing dedicated loading zones will improve pedestrian and bicyclist safety by preventing commercial trucks and delivery drivers from illegally stopping in turning lanes for loading and unloading.

### San Gabriel Valley Council of Governments: GoSGV Engagement & Evaluation

The GoSGV program promotes multimodal mobility and VMT reduction by replacing short car trips with e-bikes. Reducing these trips helps decrease the number of “cold starts,” a source of vehicle emissions, thereby improving air quality and mitigating negative environmental impacts in the SGV.

### City of Desert Hot Springs: Downtown and Light Industrial Parking Plan

Updating parking management and allocation in the study areas will help mitigate negative community impacts caused by inefficient land use. In the city’s downtown area, nearly 2,000 parking spaces remained vacant during the observed peak demand period, highlighting the need for a more efficient and balanced approach. Implementing the plan’s strategies will reduce vehicle trips, encourage active and shared transportation, and lead to lower congestion, GHG emissions, and VMT in the study area.

### City of Garden Grove: Curb Data Parking Study

The strategies outlined in the study would modernize the city’s parking management system while mitigating negative community impacts, such as congestion and GHG emissions. Measures such as increasing parking enforcement, facilitating shared parking agreements, unbundling parking, establishing TDM requirements for new developments, and implementing a traffic reduction and transportation improvement fee will promote the efficient use of parking and encourage alternative transportation options. By reducing vehicle trips and increasing the use of active and shared transportation, these strategies will help lower congestion, GHG emissions, and VMT in the study area.

### City of Laguna Woods: Mobility Technology Plan

To mitigate negative community impacts such as congestion, air pollution, and accessibility gaps, the plan emphasizes early and consistent public engagement to build trust and address concerns. While engaged participants expressed cautious optimism, their feedback underscored the importance of ensuring safety, reliability, and clear community benefits. Identifying specific mobility needs and demonstrating how AVs can address those needs is essential for successful public engagement.

Additionally, integrating alternative transportation options into proposed mobility hubs, such as AVs, micromobility, carshare, and transit, would enhance connectivity, reduce congestion, and lower VMT and GHG emissions. Expanding these sustainable mobility choices decreases reliance on personal vehicles, easing traffic burdens and improving air quality. Furthermore, utilizing zero-emission AVs in the pilot would amplify environmental benefits, supporting the city’s broader sustainability goals.

## City of Rialto: Smart Cities Plan for Warehousing and Logistics

The plan outlines several strategies to manage freight trucks and delivery vehicles, including access restriction and pricing, ATDM, emerging first- and last-mile delivery modes, zero and near-zero emission vehicles, speed management, and vehicle and fleet right-sizing. These measures would reduce congestion, lower emissions, and minimize negative impacts on the community.

## Challenges Encountered

### Cities of Los Angeles, Long Beach, and Stanton Curb Bundle

The study noted challenges for curbside permitted uses data collection methodologies and vehicle parking demand data collection methodologies.

**Exhibit 22 Challenges for Curbside Permitted Uses Data Collection Methodologies**

Methodology	Challenges
On-Street Surveying	<ul style="list-style-type: none"> <li>• Low scalability.</li> <li>• Can be expensive.</li> </ul>
ArcGIS Field Maps	<ul style="list-style-type: none"> <li>• Can be expensive at large scale.</li> </ul>
CurbWheel	<ul style="list-style-type: none"> <li>• Can be expensive at large scale.</li> <li>• Not necessarily easy for everyone to build.</li> </ul>
Vehicle Mounted Cameras	<ul style="list-style-type: none"> <li>• Can have reduced accuracy in dense urban areas.</li> <li>• Efficiency only fully realized at larger scales (larger than this study area).</li> </ul>
Vehicle Mounted LIDAR	<ul style="list-style-type: none"> <li>• Can have reduced accuracy in dense urban areas.</li> <li>• Efficiency only fully realized at larger scales (larger than this study area).</li> </ul>
Inter-Agency Data	<ul style="list-style-type: none"> <li>• Data might be of different file types and varying levels of detail.</li> <li>• Limited to what data already exists.</li> </ul>
Third-Party Data Providers	<ul style="list-style-type: none"> <li>• Data might be of different file types and varying levels of detail.</li> <li>• Potential complexity to establish contacts.</li> <li>• Potential inability or unwillingness to share data (e.g., goods carriers)</li> </ul>
Computer Vision Systems	<ul style="list-style-type: none"> <li>• Privacy concerns.</li> <li>• Need for continuous power source and cellular connection can limit some segments.</li> <li>• Potentially high costs if several cameras or viewpoints needed.</li> </ul>

Source: *Curb Space Data Collection & Inventory Study*, Arcadis, 2024.

**Exhibit 23 Challenges for Vehicle Parking Demand Data Collection Methodologies**

Methodology	Challenges
On-Street Surveying	<ul style="list-style-type: none"> <li>• Low scalability.</li> <li>• Can be expensive.</li> <li>• Data collection periods limited.</li> </ul>
Parking Payment System	<ul style="list-style-type: none"> <li>• Low scalability.</li> <li>• Can not cover all curb uses (e.g., loading).</li> </ul>
Aerial Photography	<ul style="list-style-type: none"> <li>• Low detail on types of curb uses.</li> <li>• Potential administrative issues.</li> <li>• Aggregation of data into time periods.</li> <li>• Environmental concerns (e.g., emissions).</li> </ul>
In Ground Sensors	<ul style="list-style-type: none"> <li>• Can be costly at scale.</li> <li>• Might not provide data on type of curb use.</li> <li>• One sensor collects data for only one curbside space.</li> </ul>
Time-Lapse Cameras	<ul style="list-style-type: none"> <li>• Might require manual inspection of data or use of computer vision for analysis.</li> <li>• Privacy concerns.</li> </ul>
Vehicle Ultrasonic Sensors	<ul style="list-style-type: none"> <li>• Does not provide data on curb use.</li> <li>• Environmental concerns (emissions).</li> </ul>
Transportation Network Companies (TNC)	<ul style="list-style-type: none"> <li>• Trips not directly observed.</li> <li>• Might have insufficient data granularity for parking purposes.</li> </ul>
Fleet Telematics	<ul style="list-style-type: none"> <li>• Requires cooperation of individual firms.</li> <li>• Private data providers (ex. INRIX) use fleet telematics in their data, but it is not available separately.</li> </ul>
Crowdsourced Vehicle Ultrasonic Sensors	<ul style="list-style-type: none"> <li>• Technology has not yet been implemented in proven case studies.</li> <li>• Research does not provide clear indication how crowdsourced data would be collected.</li> </ul>
Camera Vision Systems	<ul style="list-style-type: none"> <li>• Privacy concerns.</li> <li>• Limited cost information available, can be costly to scale.</li> <li>• Data types collected dependent on video quality.</li> </ul>
Impact Sensors/Tubes	<ul style="list-style-type: none"> <li>• Expensive to install.</li> <li>• Only collect data in limited area.</li> </ul>
Pneumatic Tubes	<ul style="list-style-type: none"> <li>• Bicycle counts only.</li> <li>• Cannot be used in winter, snowy conditions.</li> <li>• Only collect data where they are placed.</li> </ul>
Inductive Loop	<ul style="list-style-type: none"> <li>• Bicycle counts only.</li> <li>• Only collect data where they are placed.</li> </ul>
Active Infrared Sensors	<ul style="list-style-type: none"> <li>• Cannot differentiate between pedestrians and cyclists.</li> <li>• Potential errors for larger groups.</li> </ul>
Micro-Mobility Providers	<ul style="list-style-type: none"> <li>• Potential complexity if several operators to contact if no current cooperation.</li> <li>• Does not capture trips not using these services.</li> </ul>
Derived Collection	<ul style="list-style-type: none"> <li>• Data may be of different file types and varying levels of detail.</li> <li>• Potential complexity if several operators to contact.</li> <li>• May not provide data for specific curb spaces.</li> </ul>
Wi-Fi/Bluetooth Detectors	<ul style="list-style-type: none"> <li>• Might miss users without Wi-Fi/Bluetooth enabled devices.</li> <li>• At high densities more difficult to differentiate between cyclists and pedestrians.</li> </ul>
Computer Vision Systems	<ul style="list-style-type: none"> <li>• Privacy concerns.</li> <li>• Can be expensive.</li> </ul>

Source: *Curb Space Data Collection & Inventory Study*, Arcadis. 2024.

While the project’s technical team worked to identify and screen corridors for analysis in Stanton, the city’s needs and priorities shifted. As a smaller city compared to Long Beach and Los Angeles, Stanton found that



the initial approach of conducting further analysis on several corridors was less relevant to current needs. Like many largely residential suburban Southern California cities, Stanton’s most immediate curbside pressures were occurring in neighborhoods. In response, the technical team and city staff collaborated to redesign the approach, focusing on a residential area with existing parking impacts where a more active residential parking management strategy could be piloted.

### **San Gabriel Valley Council of Governments: GoSGV Engagement & Evaluation**

SGVCOG faced limitations with the tracking technology used to collect GPS data. New tracking devices with expanded data collection functionality would be a major upgrade from the current Tile devices deployed on the GoSGV fleet, which capture location information passively only when the bike is stopped, generating a trail of GPS “breadcrumbs” showing where each participant has traveled. The analysis potential with GPS data, collected passively on an ongoing basis while the bike is in motion, is vast. These tools, in combination with existing data sources such as odometer readings and surveys, could be used to paint a fuller picture of travel behavior, trip replacement, and GHG reduction. The cost of such devices may be prohibitively high and may not be feasible to install on all program bikes.

### **City of Desert Hot Springs: Downtown and Light Industrial Parking Plan**

Like any model, the city of Desert Hot Springs had to rely on a set of assumptions that influences projections. For example, the shared parking model used in this study assumes suburban contexts with a driving ratio, or share of people driving to the site, at or near 100 percent. By default, it does not account for potential interventions that encourage people to travel downtown via non-driving modes.

Additionally, a main challenge faced while developing this study is that industrial cannabis is a relatively new land use, and the parking demand associated with this kind of development has not been well studied. Given the uncertainties related to the parking demand for industrial cannabis land uses, the city of Desert Hot Springs overcame this knowledge gap through their own observational research paired with square footage data of nine sampled industrial cannabis facilities.

### **City of Garden Grove: Curb Data Parking Study**

Feedback from project stakeholders highlighted several parking-related challenges:

- Limited city resources and staffing hindered efforts to address parking concerns.
- Misuse and over-issuance of handicap placards had increased.
- Using school parking lots for public parking raises concerns about security, vandalism, liability, and enforcement.

Commercial property owners also expressed concerns about potential shared parking agreements:

- Increased security risks, such as a higher likelihood of break-ins.
- Unauthorized use, as residents with access might invite guests to park.
- Legal liability, with towed vehicle owners potentially filing lawsuits.
- Trash accumulation in shared parking areas.
- Existing shared-use arrangements, as many already share parking with other users.

- Limited excess parking, since many businesses operate late into the evening.
- Financial feasibility concerns, as compensation might not justify the risks and inconvenience.

Additionally, general public feedback noted widespread parking difficulties, particularly for apartment renters, who struggle to find parking near their homes, making their daily activities more challenging.

It was also noted that the proposed strategy to explore a process for implementing RPP districts could pose potential challenges, such as:

- A strong parking enforcement foundation needed for effective implementation.
- Significant staff time required for administration and enforcement.
- No established precedent for balancing RPP regulations with equity considerations.
- Potential for spillover parking in nearby unregulated areas.
- Market-rate or cost-recovery pricing could be seen as inequitable, as some drivers might prefer the chance to find free parking rather than pay for a permit.

### City of Laguna Woods: Mobility Technology Plan

The regulatory landscape for AVs is evolving rapidly as policymakers adapt to technological advancements. Jurisdictions should regularly update their understanding of the AV landscape to stay current with new innovations. While community engagement during this process was positive, the study recommends early and consistent public outreach to build support and address concerns. If community engagement and safety aren't prioritized, public buy-in could be a significant challenge.

The plan also highlights limitations of the AV pilot program in Phase 2, including low anticipated ridership due to its exclusive operation along two main thoroughfares and limited potential origins and destinations, reducing the service's overall utility. Additionally, the success of the AV service depends on available automation levels—if higher levels of automation are not achieved, costs could rise, and public interest may decline.

Another key challenge is cybersecurity, as CAVs rely on advanced software and communication infrastructure, making them particularly vulnerable to cyber threats. Cybersecurity risks not only threaten the safety and functionality of AVs but could also impact public trust and adoption.

Types of cybersecurity risks include:

- Communications Attacks: Target the wireless network and protocols CAVs use to exchange data with other elements (i.e., vehicle-to-everything (V2X) communications). These attacks, such as unauthorized access, man-in-the-middle attacks, denial of service, spoofing, and data tampering, can disrupt vehicle coordination and decision-making.
- Sensor Attacks: Target CAV sensors, including radar, lidar, cameras, GPS, to manipulate or corrupt data, leading to unsafe vehicle decisions. Examples include spoofing, jamming, data injection, sensor deactivation, and privacy attacks.

The plan noted the following best practices for cybersecurity:

- Proactive Measures: Preventative actions before an attack to protect CAVs and related infrastructure. Includes cryptography, physical security, and privacy preservation.

- **Reactive Measures:** Response actions after a breach to mitigate the impact and respond effectively. Includes signature-based, anomaly-based, and context-based security protocols.

When implementing the AV pilot program, the city should prioritize proactive cybersecurity measures while also training relevant staff on reactive strategies to respond effectively to potential threats.

### City of Rialto: Smart Cities Plan for Warehousing and Logistics

A few potential challenges were identified for the proposed pilot project, including ensuring compatibility and seamless integration of FSP technology with existing infrastructure, overcoming stakeholder resistance, and addressing funding constraints. To mitigate these challenges, it was recommended to partner with experienced technology providers to conduct thorough integration testing, engage stakeholders early to address concerns, actively communicate the pilot's benefits, and collaborate closely with the city to pursue multiple funding sources.

Several other barriers to adopting innovative transportation technologies were identified:

- **Legal Barriers:** Existing traffic regulations and zoning laws might not accommodate the deployment of new technologies such as battery electric and hydrogen fuel cell trucks, automated driving features, and advanced roadside sensors. Addressing this barrier will require collaboration with City planners to update zoning regulations to accommodate the new technology.
- **Institutional Barriers:** City institutions might lack the technical expertise, resources, and coordination needed to adopt and manage new transportation technologies. To address this, the city could collaborate with technology providers to offer specialized training programs for staff, ensuring they are equipped to manage new systems. Regular interdepartmental meetings and joint projects can also help align goals, ensuring a unified approach to technology adoption.
- **Financial Barriers:** High upfront costs for deploying new technologies such as hydrogen fuel cell trucks, 5G connectivity infrastructure, and advanced traffic management systems can be prohibitive. The city could explore grants and subsidies from state and federal programs, establish partnerships with private companies interested in investing in emerging technologies, and seek funding from initiatives like the Federal Highway Administration's Congestion Mitigation and Air Quality Improvement Program.
- **Social Barriers:** Community resistance due to a lack of understanding or distrust of new technologies can impede adoption. To address this, the city could organize public forums, workshops, and information sessions to highlight the benefits and address concerns. Additionally, developing policies that prioritize investment in underserved areas can help ensure equitable access to new technologies.
- **Economic Barriers:** Variability in economic conditions across regions can impact the feasibility of uniform technology adoption. The city could commission studies to assess the potential economic impact of new technologies, including job creation, increased economic activity, and long-term cost savings. Piloting new technologies in select areas before citywide implementation would also allow for refinements based on initial results and feedback.

# Summary and Conclusions

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## Summary

The conclusion of Sustainable Community Program (SCP) – Smart Cities and Mobility Innovations (SCMI) projects has provided key takeaways that can inform and be applied to similar projects in the SCAG region:

- Bikeshare and parking programs have the potential to significantly reduce vehicle miles traveled (VMT).
- Curb use demand continues to rise, making it critical to understand existing needs.
- Technology remains an effective tool for managing parking, improving accessibility, and inventorying assets.
- SCAG, vendors, and consultants are navigating a new procurement landscape for emerging technologies.
- Stakeholder engagement is crucial to ensuring that those affected by the project have a voice and are involved at appropriate stages.

Additionally, these projects have successfully addressed the goals of the SCMI call and have generally advanced SCP goals, providing valuable insights into the benefits and challenges of each technology. The final project products complement the release of Connect SoCal 2024 and support preparations for the next SCP funding cycle.

## Recommendations for Regional Implementation

Regional governance plays a crucial role in facilitating the successful implementation and scalability of pilot projects across Southern California. A coordinated approach allows for testing these technologies in diverse communities, exploring opportunities to expand multimodal support, reduce VMT, improve air quality, promote equity, enhance parking management, and mitigate negative community impacts.

The eight SCMI projects offer scalable models for broader regional implementation:

- Cities of Los Angeles, Long Beach, and Stanton Curb Bundle: Designed for replication and scaling, this framework emphasizes the need for site-specific studies to address varying resources, priorities, and local conditions across SCAG's diverse geography.
- SGVCOG's GoSGV Engagement & Evaluation Project: The program structure and implementation plan for this e-bike sharing initiative can serve as a model for other jurisdictions. Key recommendations cover program design, local coordination, engagement, equity, marketing, communications, and evaluation.
- City of Desert Hot Springs' Downtown Light Industrial Parking Plan: This plan offers short- and long-term strategies to enhance parking and access in the study areas, which could be applicable citywide and in other municipalities facing similar challenges.

- City of Garden Grove’s Curb Data Parking Study: This study outlines strategies to address existing and future parking concerns. Cities with comparable characteristics or shared objectives can leverage these findings to improve parking and access.
- City of Laguna Woods’ Mobility Technology Plan: Focused on connected and autonomous vehicle readiness and autonomous vehicle pilot operations, this plan serves as a model for SCAG to support other jurisdictions in launching similar mobility technology initiatives.
- City of Rialto’s Smart Cities Plan: This plan includes a pilot for deploying FSP technology, along with a barrier analysis, feasibility assessment, and an enabling framework. Other cities can reference these findings to navigate challenges in implementing innovative transportation technologies.

By fostering regional collaboration and innovation, Southern California can lead the way in advancing smart mobility solutions. To support the evolving transportation needs of the region, partner agencies should assess the feasibility of SCMI call technologies for replication, scalability, and financing.

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