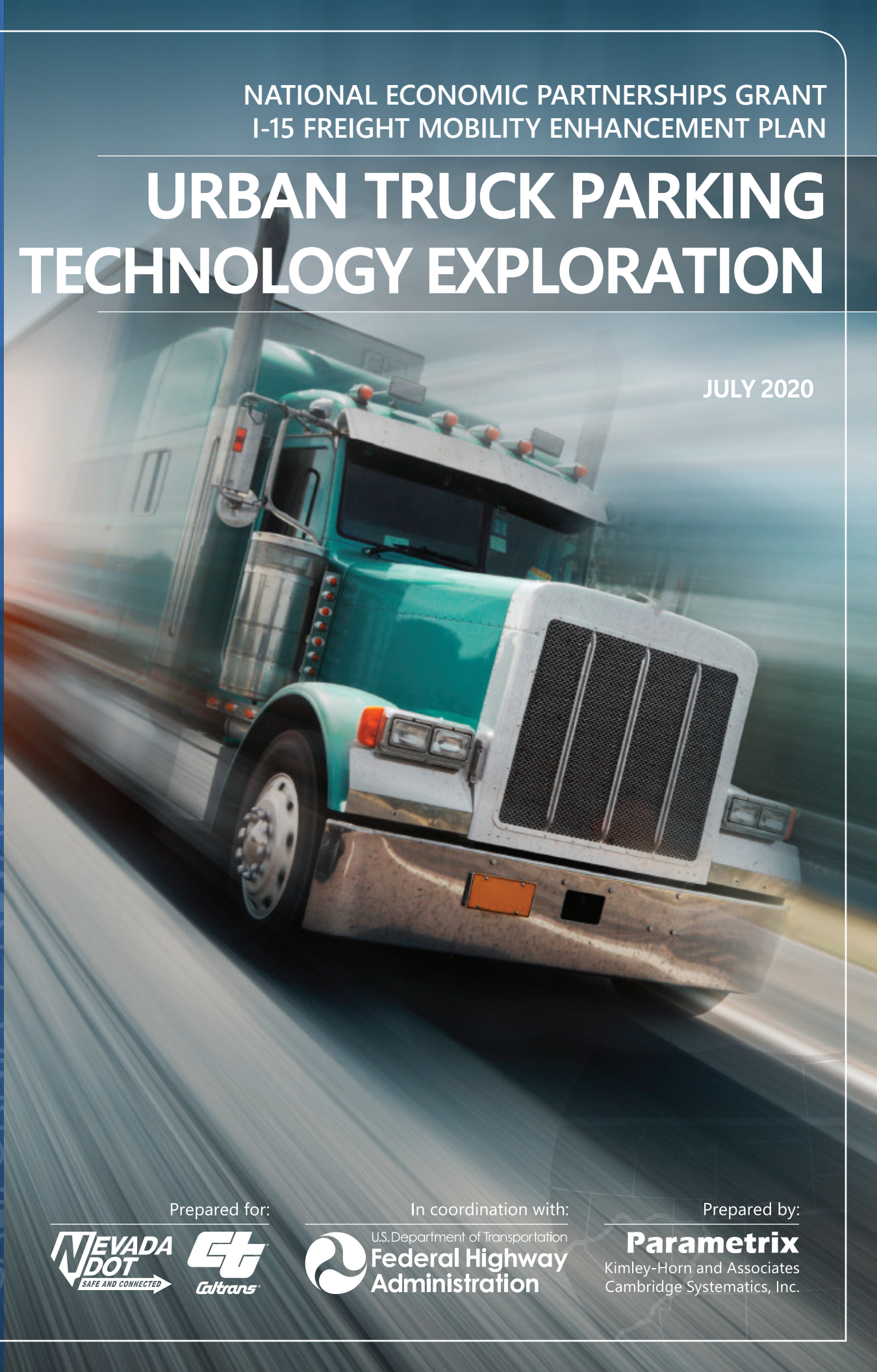
NATIONAL ECONOMIC PARTNERSHIPS GRANT
I-15 FREIGHT MOBILITY ENHANCEMENT PLAN

URBAN TRUCK PARKING TECHNOLOGY EXPLORATION



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CALIFORNIA | NEVADA

Prepared for:

Nevada DOT Safe and Connected

Caltrans

In coordination with:

U.S. Department of Transportation
Federal Highway Administration

Prepared by:

Parametrix
Kimley-Horn and Associates
Cambridge Systematics, Inc.

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Acronyms

ABPS	Application-Based Parking Solutions
API	Application Programming Interface
Caltrans	California Department of Transportation
CCTV	Closed-Circuit Television
CoE-SUFS	Center of Excellence for Sustainable Urban Freight Systems
ConOps	Concept of Operations
FHWA	Federal Highway Administration
iOS	Apple operating system
MAASTO	Mid-America Association of State Transportation Officials
MEP	Mobility Enhancement Plan
NATSO	National Association of Truck Stop Operators
NDOT	Nevada Department of Transportation
P3	Public-Private Partnership
RFI	Request for Information
ROW	Right-of-Way
TIGER	Transportation Investment Generating Economic Recovery
TPAS	Truck Parking Availability System
TPIMS	Truck Parking Information Management System
VREF	Volvo Research and Educational Foundations

1 Overview

1.1 Study Background

The California Department of Transportation (Caltrans) and the Nevada Department of Transportation (NDOT) were awarded a National Economic Partnerships grant by the Federal Highway Administration (FHWA) in June 2019 to develop an I-15 Freight Mobility Enhancement Plan (I-15 MEP). The National Economic Partnerships initiative promotes efficiency and regional cooperation by identifying best transportation planning practices that can be implemented across jurisdictional boundaries. The program is specifically focused on cooperation at the megaregion level.

Megaregions are characterized as agglomerations of urban centers and their surrounding areas, connected by existing environmental, economic, cultural, and infrastructure relationships. Transportation provides the critical link between metropolitan areas within and between megaregions.

Planning challenges such as air quality, freight mobility, and road safety do not stop at State and MPO boundaries, where planning often does. Planning at the megaregional scale provides an approach to address new emerging challenges, allowing key stakeholders to seize advantages across jurisdictional boundaries; share best practices; promote the collection, sharing, and use of data and information; and address projects or services that enhance the mobility of people and goods across a broad area.

Only four projects were selected nationwide as part of the National Economic Partnerships initiative to deliver innovative approaches to megaregional and multi-jurisdictional coordination. Of these four, the I-15 MEP is one of two that is led solely by state DOTs, taking initiative for actions and coordinating with a diverse base of actionable stakeholders.

The I-15 MEP builds on the Nevada State Freight Plan 2017 and the California Freight Mobility Plan 2014 (2020 update underway), and complements the ongoing work associated with current truck parking efforts in both Nevada and California, concentrating on specific issues related to urban truck parking that impact the entire region.

1.2 Study Area

The study area for the I-15 MEP is located in Southern California and Southern Nevada roughly 10 to 30 miles on either side of the I-15 corridor within the metropolitan areas in the following counties: San Diego, CA, Riverside, CA, San Bernardino, CA, and Clark, NV. The study area is shown in Figure 1-1.

Figure 1-1: I-15 MEP Study Area

1.3 Task Objectives

Addressing truck parking needs in urban areas will require a combination of strategies – including land use policies, zoning, and active participation of agencies and landowners – to test and pilot various approaches to providing safe and legal parking areas for trucks. There are a range of parking needs to be considered, such as short-term staging areas while truckers wait for pick up or drop off windows to be available, or parking options near key amenities while drivers wait for delivery instructions or available bays to load or unload at their pick-up points. The impacts of COVID-19 have put a spotlight on the importance of precise supply chain logistics, and there has been an unprecedented level of importance placed on regional freight operations to support additional critical deliveries. Having the designated space to enable trucks to park is one part of the equation. The other part of the challenge is the ability to identify available places to park, notify truck drivers of these parking options, and monitor availability of parking throughout the day.

Technology can play an important role in addressing at least part of the urban truck parking challenge for the I-15 Corridor. Many states, including Nevada and California, are implementing truck parking systems on interstates that cater to drivers needing to find areas to park to remain legal with hours of service requirements, and these systems are encouraging partnerships and new business models with public and private partners to provide the space for trucks to be able to park. Systems are also being implemented that can detect the number of available spaces and notify truckers of space availability, either through roadside dynamic message signs or through mobile applications. Recent emphasis on curbside management, particularly in urban areas, could also provide some potential strategies that could be adapted to unique needs of truck parking in industrial areas.

The NDOT and its partners recognize that technology can play an important role in connecting drivers to parking options, support monitoring and enforcement of designated parking areas, and support the necessary data collection to continue to build a robust, data-driven truck parking program along the I-15 Corridor.

The purpose of this task is to explore potential technologies that can support urban truck parking programs and strategies. Technology solutions could include infrastructure-based options such as sensors, cameras, and monitoring capabilities to support analytics or enforcement. Mobile applications can facilitate a range of functions, including guiding trucks to available spaces, reserving spaces, and even monitoring occupancy of designated truck parking areas. Mobile applications can also be a distraction and safety hazard if used while driving and should only be used when the vehicle is stopped, as addressed in Section 5.3. Technology can be a tool in the truck parking toolbox, but successful implementation and sustaining operations of a technology-enabled truck parking strategy will also require supporting policies, processes and partnerships. Appropriate business models, which could include varying levels of public sector involvement, will need to consider the full life cycle of a truck parking program, including planning, procurement, implementation or installation, operations, enforcement, and maintenance. Promoting availability of the truck parking strategy and marketing to prospective partners (including land owners and freight operator participants) are also important elements of the business model to consider.

1.4 Aligning Technology Options with I-15 MEP Goals and Needs

The project partners defined the following purpose of the I-15 Freight Mobility Enhancement Plan:

> ***Identify strategies for providing effective urban truck parking along the I-15 Corridor. Effective urban truck parking can be defined as reliable, secure, affordable, with the amenities drivers need, and supported by the surrounding community. Develop an actionable implementation plan that defines the partnerships, technology, policy, and funding frameworks needed for successful implementation, collaboration, and economic partnership.***

This vision and purpose helped to guide the Technology Exploration task to focus on potential solutions that would help to address the need for reliable and available short-term truck parking in urban areas, and identify ways that technology could help to facilitate connecting drivers with available truck parking locations and options.

Several additional needs provided an important foundational element to the team's exploration of various technology options. These are documented in the Truck Parking Goals and Needs Working Paper, and include:

- Provide real-time information on truck parking locations, availability and amenities,
- Help drivers locate available, legal and safe parking areas in close proximity to their loading or delivery locations,
- Support capability for space-booking and other reservation systems, and
- Help to maximize available truck parking options to support the parking needs in areas along the I-15 Corridor.

Another important need is to identify unique business models that would promote collaboration and public/private partnerships (P3s) for solutions, and many of the findings in this task point to emerging partnering opportunities that leverage both technology and land use strategies that can help to address truck parking needs in urban and industrial areas.

2 Methodology

2.1 Research on Emerging Technologies

Research into freight and truck parking applications yielded some promising information about the current state of the practice as it pertains to interstate truck parking approaches, how and where truckers access information through mobile applications, and the types of applications that are most prevalent in the freight industry. Many trucking companies are already actively using a wide range of technologies to support driver safety, electronic credentialing, navigation support, fuel management and other key functions. Freight is often an early adopter of technology because this is an industry that recognizes the cost/benefit and return on investment (in terms of efficiency and time savings) that technology can provide.

This section briefly describes some of the research activities that were completed as part of this task. Many of the key technology concepts are described in more detail in Section 3.

2.1.1 Existing Freight Mobile Applications

Our research found a range of applications that are downloaded by a user to a mobile device (apps) available which are relevant to the wider public, such as location-based weather notifications or gas prices, as well as freight-specific concerns, such as truck stop amenities, load matching, and parking availability. There are a wide range of apps tailored to the freight and trucking community, including apps that help to provide traffic conditions information, finding services and capabilities that help drivers locate amenities such as truck stops, available restaurant/food options, fuel locations and prices, and several that offer information on truck parking. These truck parking options are typically for interstate-based truck parking locations, typically at travel plazas or truck stops, and not for locations in urban areas. Other apps help to connect truckers with companies that are hiring.

Current truck parking reservation systems, such as through TA Petro's "Reserve It" system, are advertised for essentially full day periods, with a small gap between check-out time and check-in time. This reservation system would not be efficient for the more frequent turnover associated with short term urban freight parking.

Some of the more popular freight-specific apps are presented in Table 2-1. In Android apps, this was measured by download numbers. The Apple App Store does not report download numbers, so iOS apps were

evaluated by the number of user ratings. Apps in this table indicate that mobile apps are a popular choice for connecting truckers with information that will help them make decisions on their routes.

Table 2-1: Freight Mobile Applications

App Name	Features	Android Downloads*	Android Rating*	iOS Rating*
Trucker Path	Directions, parking availability, work-matching, finding services	> 1 Million	4.0 46K ratings	4.7 50.9K ratings
Keep Truckin	Electronic logbook for Hours of Service documentation	> 1 Million	4.3 23K ratings	4.5 5.12K ratings
Truck Smart (TA Petro)	Fuel prices, service requests, parking reservations	> 500,000	2.4 4K ratings	1.5 41 ratings
Trucker Tools	Fuel prices, directions and live traffic, finding services	> 100,000	3.2 1K ratings	3.2 79 ratings
Pilot Flying J	Directions, amenities, parking availability and reservations, finding services	> 1 Million	4.6 24K ratings	4.8 24.2K ratings
Love's Connect	Travel stop locator, mobile pay, real-time fuel prices	> 1 Million	4.2 23K ratings	4.0 1.5K ratings
Truck Parking USA	Crowdsourced app for truck parking spaces	> 100,000	4.0 554 ratings	4.0 5 ratings

*data as of March 2020

2.1.2 Studies and Current Programs

Many of the current technology applications in Truck Parking Availability Systems (TPAS) are oriented around interstates and long-haul routes. While there are some concepts and elements that could translate to urban area truck parking strategies, there were not any examples that were available in the literature reviewed.

- The FHWA Primer for Improved Urban Freight Mobility and Delivery Operations, Logistics, and Technology Strategies (FHWA-HOP-18-020, dated May 2018) references issues with parking and urban freight; the project addressing these concerns is publicizing parking availability along the interstate system.
- A 2018 National Coalition on Truck Parking, Technology and Data Working Group report on Best Practices for Truck Parking Availability Detection and Information Dissemination revealed 14 states

which are working on TPAS along interstate corridors; no states were mentioned working on TPAS in urban settings.

- A 2015 Transportation Investment Generating Economic Recovery (TIGER) discretionary grant was awarded to the Mid-America Association of State Transportation Officials (MAASTO) Truck Parking Information Management System (TPIMS), an eight-state partnership looking to address truck parking needs along several key interstate routes in IN, IA, KS, KY, MI, MN, OH and WI. This project launched in January 2019 in several of the partner states. The MAASTO TPIMS equipment was focused around interstates and rest areas, the project was also expected to make strides in the digital arena by standardizing electronic communication of parking information across the eight-state region.
- A 2020 Shared Truck Parking Concepts document prepared by CPCS identified various national and international examples of different approaches for truck parking reservation systems as well as shared parking and staging areas. Reservation systems could help to address the need for shorter-term wait locations by truckers along the I-15 corridor, and there are technology approaches that are currently supporting reservation capabilities for interstate facilities where overnight or longer-term parking needs are desired. Shared space models could be applied to I-15 where there are public-private or private partnership models that could leverage available land or available industrial land uses. This document is included as Attachment A. The next reference also points to the need for developing staging areas to improve efficiency of freight operations.
- The Center of Excellence for Sustainable Urban Freight Systems (CoE-SUFS) is a research center funded by Volvo Research and Educational Foundations (VREF) Center of Excellence through its Future Urban Transport research program. CoE-SUFS research is focused on investigating new ways of infusing sustainability and efficiency into the way businesses send and receive goods. The current research suggests improved staging areas as one initiative for addressing current challenges in the freight system. Changes to building and zoning codes are recommended to require provision of staging areas, and private companies may help fill this need. Chicago has one such example, run by the Urban Investment Research Corporation, which provides "last mile" staging areas.

2.2 Industry Request for Information

In February 2020, the NDOT published a Request for Information (RFI) seeking input from a wide range of technology providers and developers, implementing agencies, research and academia and trucking associations. This RFI was designed to obtain input about emerging technologies and concepts that could be considered as part of the Mobility Enhancement Plan, and potentially offer cost-effective options or partnering opportunities. While there is information available through literature and planning documents, the team felt that an industry RFI process would provide information about recent implementations and emerging capabilities that might not be widely available in published literature. While technology alone is not envisioned to solve the truck parking need, it can be a valuable platform to enable a suite of capabilities aimed at improving accessibility to safe and legal parking options for truckers on the I-15 Corridor.

The RFI was published on NDOT's procurement web site, and the team was able to notify interested parties about its availability. Notice of the RFI was posted through national association channels, including the National Operations Center of Excellence electronic newsletter, the Transportation Communications Newsletter daily email blast, and two Transportation Research Board urban freight-focused committees. The

RFI posting also was picked up by several lead-sharing services, which is where several of the respondents indicated they were made aware of its availability. Stakeholders who had participated in interviews and prior project webinars and workshops were also notified of the RFI.

Prospective responders were asked to share information about emerging technologies, technology applications, successful implementations and other information that could assist the team and partner states in evaluating potential options to consider. A total of eight responses were received through the RFI process. A select number of responders also participated in follow-up phone meetings to obtain clarifications and additional information on what they provided through the RFI.

A copy of the RFI that the NDOT published is included as Attachment B.

3 Technology Options

This section provides an overview of the current and emerging urban truck parking systems and their supporting technologies. A summary of this information was also provided to stakeholders at a webinar held on May 6, 2020 (see Attachment C). This section is organized across the following three subsections, the first two of which cover the two primary "system-level solutions" technology areas of focus for urban truck parking solutions, with the third subsection providing a comparison of the key deployment factors between the two system approaches.

- Section 3.1: Lot-Based TPAS
- Section 3.2: Dynamic Mobile Application-Based Parking Solutions
- Section 3.3: Technology Deployment Factors High-Level Comparative Analysis

Note that any references to any commercial technology providers are based on information that is available publicly over the internet.

3.1 Lot-Based Truck Parking Availability Systems (Lot-Based TPAS)

The two primary categories of Lot-Based TPAS are the Entry/Exit Counting approach and the Space-by-Space Counting approach. Both methods can support real-time trucking availability information for truck parking lots, and the space-by-space approach can support upgrades to provide reservation capabilities. An overview of these two system approaches and their supporting technologies and information dissemination methods are provided below. This discussion is informed by the recently finalized NDOT TPAS Concept of Operations (ConOps) (March 2020).

3.1.1 TPAS Entry/Exit Counting Approach

The entry/exit counting approach is a simple method for estimating the number of vehicles present within a parking lot. This approach requires counting detections to be installed at the entry and exit points of the parking lot. Additionally, this approach needs an estimated number of known parking places within the lot (not necessarily defined by striped parking stalls) to be provided to the system. When a vehicle enters the parking lot, the detector notifies the system that one less parking stall is available. When a vehicle exits the

parking lot, the detector notifies the system that one additional parking stall is now available. Vehicles are free to park anywhere that is permissible within the lot.

This approach is viewed as advantageous because it requires far less TPAS infrastructure than other alternatives. By monitoring only the entry and exit points, two detector sites are typically necessary, which can reduce the cost substantially on larger parking lots over an alternative that monitors every stall. This approach does come with disadvantages:

- Since the vehicle passes a single detector point for a limited amount of time, there is a higher risk of the detector miscounting the vehicle.
- Expected accuracies are typically in the low-80% to mid-90% range, and this is impacted by how often operations personnel are able to visually count trucks parked in the lot to re-calibrate the count totals for the system. Given this level of accuracy, along with the inability to poll available spaces in real time, the entry/exit TPAS approach is not considered accurate enough to support advanced parking reservations.

The primary supporting technologies to deploy the entry-exit counting approach include:

Magnetometers. Magnetometers detect the presence of vehicles through the disruption of the earth's magnetic field. For TPAS, these devices are small battery-powered "pucks" that are mounted in the roadway pavement in each parking space, flush with the surface of the road, and which transmit their detection data wirelessly to an adjacent wireless access point. For larger lots, wireless repeaters are often used as well to link the detection with the access point. An equipment cabinet that is typically ground-mounted or mounted on the access point's pole. Their installation requires a small core from the pavement surface to place the device flush with the road surface, but this is far less disruptive than a loop detector.

Side-Fired Microwave Radar. Side-fire microwave radar is a detection device that is commonly used for traffic monitoring and traffic signal operations applications. Unlike the in-pavement detectors, this device is non-intrusive to the concrete or asphalt. Typically mounted on a pole, this device generates radar beams and monitors how those beams are reflected back in order to determine if a vehicle is present. These beams can differentiate volumes, occupancies, speeds, and classifications on a lane-by-lane basis. Use of a side-fire microwave radar device for TPAS could be done for the entry/exit count method, as that generally falls with the intended design of these devices. There are geometry and reflection issues with these devices that requires special engineering attention to ensure proper placement and orientation. This technology is similar to thousands of devices deployed nationally for traffic monitoring on freight routes, which does not have history of disrupting onboard truck systems.

Video Detection. This option relies on a high-quality closed-circuit television (CCTV) camera that is often set to monitor a specific road segment or parking lot. A video analytics software evaluates the data feed provided by the CCTV camera and, if certain criteria are met, detects a vehicle that is within the designated area. Depending on the camera vendor, its mounting height and location, and whether it has low-light or active infrared capabilities, the camera can detect the presence of a vehicle in day/night situations and in some inclement weather conditions. Implementation will typically include a CCTV camera, a mounting pole, cabling between the device and the cabinet, and a pole-mounted equipment cabinet. These devices generally require a high-speed, high-bandwidth communications backhaul to send a quality video feed between the camera

and the software. For the entry/exit count method, the video detection would monitor the travel lanes and detect not only if a vehicle is passing by, but also determine if that vehicle is classified as a truck.

3.1.2 TPAS Space-by-Space Counting Approach

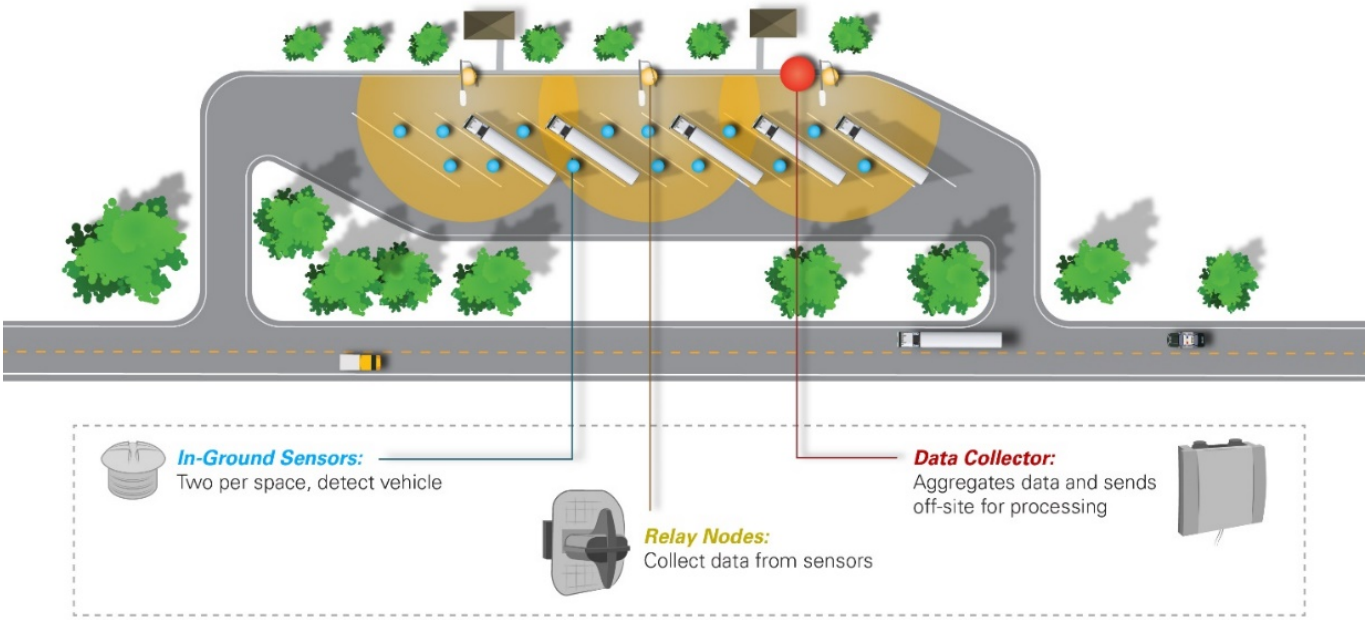
The space-by-space counting approach is a more thorough and accurate approach for determining the number of occupied parking spaces in a parking lot. This approach requires detection infrastructure to be installed in a manner that can monitor each potential (and typically striped) parking space. This can either be done through detection that is imbedded in the pavement or through a visual monitoring device that has an unobstructed view of the parking spaces. When a vehicle parks in the space, the detector notifies the system that the space is occupied. The system—which knows how many parking spaces are being monitored—can then report the amount that is available. While vehicles can park in locations that are not striped, these unstriped locations are generally not monitored and thus are not reported as available.

This approach is advantageous because it directly assesses the occupancy of all available spaces, providing a very accurate assessment of parking availability. This level of accuracy regarding the availability of a given space qualifies this version of TPAS to be considered "reservation system ready" should a future advance registration capability be desired. A disadvantage for this approach is that more TPAS infrastructure is necessary to monitor all these parking stalls, especially at larger or irregularly-shaped parking lots.

Figure 3-1 shows a high-level design example for a conventional urban truck parking lot—as opposed to a traditional rest area—that is equipped with sensors that monitor on a space-by-space basis. Since access to these types of parking lots is not limited to the direction of travel, trucks may enter or exit the lot at various access points and maneuver in manners that accommodate their turning radius as opposed to following the striped travel lane. Although most trucks will likely follow the channelized pavement markings, it is more difficult to correctly count entry to and exit from this lot than those with geometric constraints that force truckers to follow one path.

Accuracies in truck counts for this type of system are typically in the mid-90% to high-90% range, with one factor being the number of detector "pucks" installed in each parking spot. Three pucks per spot typically lead to the higher accuracies then when using two pucks per spot. It is important to consider that, compared to the entry/exit counting method, the miscounted lots with a space-by-space counting method would not result in cascading errors over time if left uncorrected, but rather the error would remain isolated to the stall that was not correctly reporting availability.

Figure 3-1: Example Implementation of a Space-By-Space Approach in a Conventional Parking Lot



Source: Nevada TPAS Concept of Operations, NDOT, March 2020

The primary supporting technologies to deploy the entry-exit counting approach include:

- Ground-Based Microradar. Ground-based microradar share similar characteristics as the magnetometers discussed above. These microradar devices are small remote devices, or "pucks", that are embedded in the pavement. However, unlike a magnetometer that detects disruptions in the earth's magnetic field, these radar devices emit high frequency RF pulses that are measured in terms of how they returned. The microradar is a better application for parking applications than equivalent magnetometers because the microradar—through pulses—will constantly verify that a vehicle is present. These devices require their respective device(s), a wireless access point, potentially a wireless repeater or repeaters, and an equipment cabinet that is typically ground-mounted or mounted on the access point's pole. Their installation requires a small core from the pavement surface to place the device flush with the road surface. With multiple remote devices being able to connect to a single access point or repeater, these sensors can be deployed over a larger parking lot with ease. This technology operates on low power batteries and is not known to disrupt onboard truck systems.
- Video Detection. This option relies on a high-quality CCTV camera that is often set to monitor a specific road segment or parking lot. A video analytics software evaluates the data feed provided by the CCTV camera and, if certain criteria are met, detects a vehicle that is within the designated area. Depending on the camera vendor, its mounting height and location, and whether it has low-light or active infrared capabilities, the camera can detect the presence of a vehicle in day/night situations and in some inclement weather conditions. Implementation will typically include a CCTV camera, a mounting pole, cabling between the device and the cabinet, and a pole-mounted equipment cabinet.

These devices generally require a high-speed, high-bandwidth communications backhaul to send a quality video feed between the camera and the software. For the space-by-space count method, the video detection would monitor the marked parking stalls to determine if a vehicle was present. The camera would need to be mounted in a location that can see all of the parking stalls without obstruction, or several cameras would be required.

3.1.3 TPAS Application and Information Dissemination Approaches

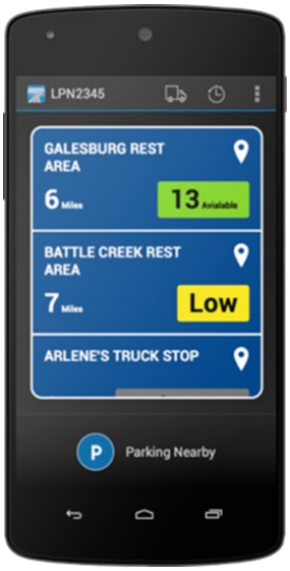
The application approach for both types of Lot-Based TPAS systems covered above encompasses back-office data integration and information dissemination. With data collected from the truck parking lots, the next step is for that data to be processed into useable information. This is typically done with a back-office system, including integration with traffic management systems in the public sector, and through implementation of truck parking management systems that have been developed by several vendors in the private sector. Vendor-specific software packages can also be tailored to develop a public-sector facing TPAS; this usually is accomplished through software offered by the vendor who installs the TPAS field assets.

For distributing parking information to the truckers, available options tend to fall into categories of either roadside signing or mobile traveler information. Among these categories, three options include:

- Static Blue Services Sign with Matrix Panel
- Dynamic Message Signs
- Website/Mobile Application

Figure 3-2 provides examples of the matrix panel sign and a deployed truck parking mobile application by the private sector.

Figure 3-2: Example Dissemination Methods (IIS Drivewyze App and Matrix Panel Sign)



Source: Traffic Technology Today, March 22, 2019

Source: Cambridge Systematics

3.1.4 TPAS Maintenance

Sensors in the field will need to be recalibrated and replaced as part of normal equipment lifecycle, and routine cabinet maintenance that is similar to maintenance for other ITS assets will be necessary as well. Sensors typically need to be replaced every five to seven years. Daily calibration is an activity that should be conducted, regardless of the type of counting strategy that is used. Staff should be trained on the new equipment to help increase familiarity with these devices.

3.2 Dynamic Mobile Application-Based Parking Solutions (Dynamic Mobile ABPS)

The three primary categories of Dynamic Mobile ABPS are the Smart Urban Parking Zone approach, the Truck Parking Marketplace approach and the Parking Availability Crowdsourcing approach. The first two of these methods can support real-time trucking availability information, and both have the ability to support either advance reservation or near-term space booking capabilities; the third type of these methods focuses on a more basic level of parking availability information based on crowdsourcing information. An overview of these three system approaches and their supporting technologies and information dissemination methods are provided below.

3.2.1 Smart Urban Parking Zone Approach

This approach is centered on leveraging mobile technologies to direct truck drivers to available curb spaces in urban settings. Initially developed for city delivery trucks to find curb space for loading and unloading, this technology has been expanded for use by over-the-road drivers to find a place to park overnight or for a short period while waiting access to a customer's facility. This approach allows for curb spaces in urban industrial areas to be dynamically used throughout the day and week based on time of day, and duration of parking; additionally this approach has the potential to create non-traditional truck parking zones on the fly, with cooperation from local jurisdictions.

From the driver perspective, the smart phone app (which the driver has previously downloaded) automatically notifies the truck driver through and audible alert of nearby curbside available parking. The driver can then accept a real-time booking, and then complete the trip and park in the curbside spot. Bluetooth- or WiFi-equipped signs at the parking area capture that the spot has been used by the assigned driver, and this information can then allow for a wireless payment to be made to the local jurisdiction for the parking spot.

For local jurisdictions, a separate public facing app can be utilized to control access, duration and time of day usage of the curbside spots. Additionally, their law enforcement personnel can use the app to check on parking compliancy. The local jurisdiction would also need to deploy wireless signs in the desired curbside areas that will be associated with this system. Figure 3-3 provides an example of the typical components and operational approach necessary to field this type of system.

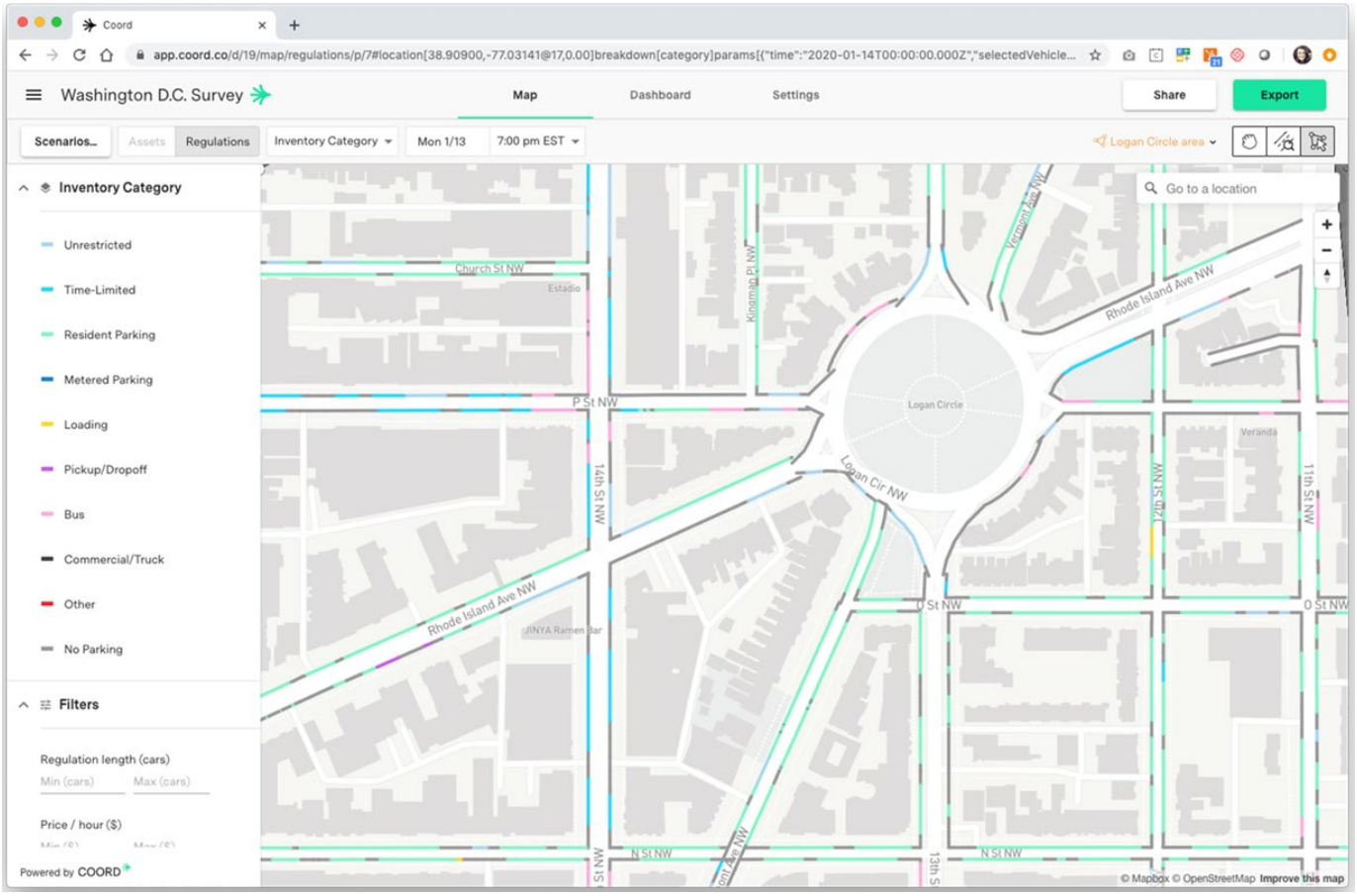
Figure 3-3: Example Components of a Smart Urban Parking Zone (PARKUNLOAD)

Source: www.parkunload.com/en/platform/

Supporting technologies for this approach can include Smart Road Signs (with WiFi or Bluetooth), a Driver Mobile App, a Public Sector Monitoring/Enforcement App, and Web-Based Back Office. The software architecture is typically application programming interface (API) -based, which supports ease of integration with public sector and trucking company management applications.

Another supporting technology for the Smart Urban Parking Zone Approach that may be necessary is to develop a digital parking map of an urban region. This map would provide all parking information that can support the back-office software for the app, while also support the local jurisdictions parking zone asset management. An example of this type of a map is provided in Figure 3-4.

Figure 3-4: Example Urban Digital Curbside Parking Mapping – Washington DC (COORD)



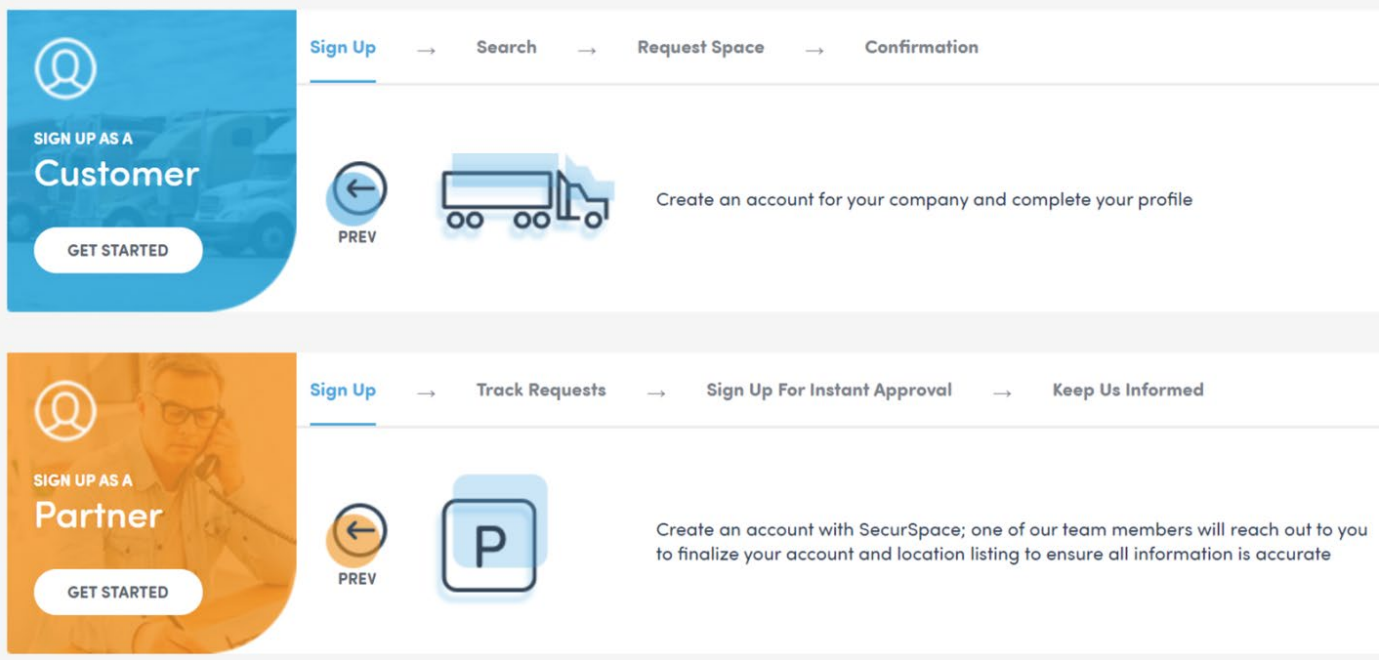
Source: www.COORD.com

3.2.2 Truck Parking Marketplace Approach

The Truck Parking Marketplace Approach is centered on matching up parking providers with truck drivers though an online marketplace. This could be considered analogous to applying the Air BnB approach to truck parking. In many cases this approach can lead to creating new markets for truck parking by providing for parking reservations for non-traditional lots, medium size lots in urban areas, and "mom and pop" smaller lots that can be in urban locations (or "staged" near urban areas) where truck parking options are typically scarce.

More specifically this approach focuses on development of an app that facilitates converting available private parking lots into paid truck parking. It creates an online marketplace that connects companies looking for parking and storage options to those with dedicated or excess capacity. The land owner may choose to allow truck parking for a fee as a way to earn some revenue from otherwise dormant property. The challenge here is getting information about the parking availability to those who need parking. The mobile app thus serves as the mechanism for connecting the land owner with truckers in need of parking near or in urban areas. Figure 3-5 provides an example of both a truck driver facing app and a truck parking provider/landowner facing app that would be used by each to participate in the online marketplace.

Figure 3-5: Example Truck Parking Marketplace Web Sign-Up (SecurSpace)



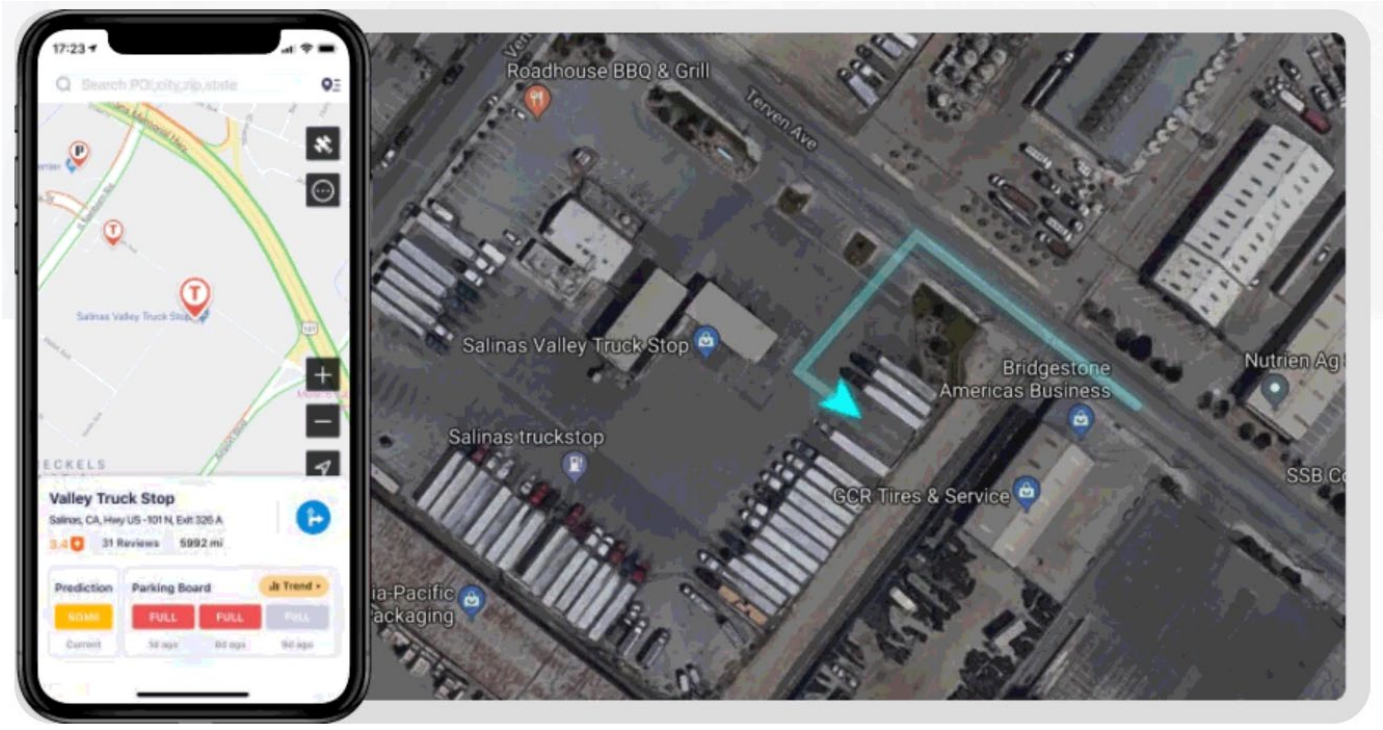
Source: www.secur.space/how-it-works

The primary supporting technologies to deploy this approach are back office software and mobile apps. A more critical operational supporting need is to develop the marketplace for this in a given region. For example, when this is deployed in a given region, it can be expected that the system developers will need to engage in significant outreach to potential landlords and non-traditional lot providers to build up the parking space supply side of the marketplace. Additional outreach to the truck industry may also be necessary to make truckers aware of the system and promote use of the mobile app. There is typically limited infrastructure to be able to monitor or enforce parking areas, but through the mobile app, the back office system can identify where truckers have requested spaces and can geo-locate these vehicles to determine where they are parked, thus identifying an occupied space as 'unavailable' if another trucker tries to reserve it.

3.2.3 Parking Availability Crowdsourcing approach

The Parking Availability Crowdsourcing Approach uses crowdsourcing or reporting by private lot owners to provide parking availability to truckers via a mobile app. Some of these systems focus on a crowdsourcing application which relies on drivers to report the number of spaces available at a parking location using a scale; for example, ranging from "Lots of Spots" to "Some Spots" to "Lot is Full." These types of systems, while low cost, rely on each driver's interpretation of capacity and the updates can be infrequent. An example of this type of system is highlighted in Figure 3-6.

Figure 3-6: Example Truck Parking Availability Crowdsourcing App (TRUCKER PATH)



Source: https://vip.truckerpath.com/vipland?utm_source=tp_website&utm_medium=parkprediction

Additionally, there is a trade industry implementation of a crowdsourcing truck parking application. The Park My Truck application run by National Association of Truck Stop Operators (NATSO) shows the total number of spaces at each of its member facilities (e.g. major national private truck stops) and the number of open spaces based on time-stamped inputs from the truck stop operators. This owner-reported information typically relies on staff to check availability at their truck stop and enter the information manually, which at best is done hourly, but in some cases may be updated, thus causing data accuracy issues. This was one of the first crowdsourced mobile apps for truck parking (2016), and it does not appear to be actively supported. Other crowdsourced apps, such as the Truck Parking USA app (referenced previously in Table 2-1) have broader industry use.

3.3 Technology Deployment Factors High-Level Comparative Analysis

Table 3-1 provides a high-level comparison of the technology deployment factors of Lot-Based TPAS and Dynamic Mobile ABPS technology approaches to urban truck parking.

Table 3-1: Comparison of Lot-Based TPAS and Dynamic Mobile ABPS

Technology Characteristic	Lot-Based Truck Parking Availability Systems	Dynamic Mobile Application-Based Parking Solutions
Costs (capital and maintenance)	Modest - requires installation of sensors, and ongoing calibration and maintenance	Low - some require posting signs with a secure wireless device, others may be nominal fee or ad supported
Flexibility	Low - best used in large lots with controlled access and require significant deployment of technology	High - Lot owner can typically change when to allow parking at any time and as often as they like
Universality	Yes - system only recognizes the presence of a vehicle	No - While open to all, typically requires simple registration
Reservations	Sometimes - the space-by-space systems can be upgraded to support advance reservations; this is not advisable for the less accurate entry/exit systems	Sometimes – some systems can provide advance reservations, while other systems can do near term booking, and others just provide estimated availability
Truck Driver Technology Experience	Easy - Driver can see dynamic road signs in advance of parking lot, and then simply park based on that info; however, the spot may be used by the time he/she arrives	Moderate - Driver needs to download and learn to use mobile app
Parking Lot Owner (or Public Sector) Technology Experience	Significant - these systems are typically deployed at designated truck parking facilities owned by public sector agencies. These agencies either run the TPAS system and software or contract it out to vendor	Moderate - The parking providers can usually enter a profile of their facility for drivers to see on the app

It is important to note that while none of the truck parking system approaches considered here offers the ultimate solution, they all have interesting components and applications for providing truck parking information that assists in addressing truck parking and staging needs without adding capacity. And it's also important to consider that this is not a one-size-fits-all proposition, as elements of each of these technologies

should be considered for different environments, and they can be expected to complement each other in a given region.

In summary, the following provide some key takeaways regarding the direction that truck parking technology may take in the near future:

- Lower cost entry-exits TPAS technologies could be combined with crowdsourcing applications to improve the accuracy of those systems;
- Truck parking is allowed in commercial and industrial areas at certain locations and specified times – an application could indicate to drivers where curbside parking is allowed, at what times of the day, and for what duration—and allow the urban jurisdiction to change those restrictions at any time and easily enforce non-compliance;
- Business models continue to emerge in this area. Cost and revenue models are still somewhat experimental at this stage. Adapting similar models (such as urban area curb management or interstate rest area/truck stop parking lots) to urban/industrial short-term parking scenarios will continue to drive the need to explore unique partnerships and identify methods for sustaining private sector interest;
- Private property owners with excess space could also make their space available at the dates, times and durations they desire, and use a private application to communicate those details and availability and facilitate payment. This would enable them to generate revenue from unused space while helping drivers find available parking; and
- Transportation agencies, state and regional trucking associations, truck stop operators, and truck parking technology vendors might consider cooperating on developing a common truck parking data set with accompanying definitions that can make it easier to support common data exchange on truck parking availability via in the future.

4 Potential Business Models

Each technology provider that responded to the RFI has a different business model, which can be grouped and generalized as either public agency led or a fully privatized model. The variations of each as well as the pros and cons are described in this chapter.

4.1 Public Agency Led

4.1.1 Agency-owned land/lots partnering with technology supplier

In this scenario, a public agency may own a parcel of land and desire to construct, operate, and maintain a truck parking facility on the site. A private technology partner could provide a range of support services listed below, and would provide the capital to implement and operate the system, receiving compensation through a profit-sharing agreement:

- Install, operate and maintain and operate a TPAS for notifying truck drivers of parking availability at the site. This would include installing and maintaining sensors for detecting the presences of trucks, and then disseminating that information via an app and/or roadside signs;
- Develop and operate an app-based reservation system;
- Develop and operate an app-based payment system if a fee is charged for parking; and
- Provide a gate management system—an automated system for logging entries/departures, checking inventory in and out. This more comprehensive approach could include managing reservations and processing payments.

It should be noted that some technology providers also own and operate urban truck parking facilities and are interested in entering into full partnerships with public agencies whereby they provide the capital to design, build, operate, and maintain a truck parking facility on a publicly-owned parcel.

4.1.2 Public agency responsible for enabling technology infrastructure

TPAS systems currently being deployed in various states, including pilot projects in Nevada and California, fall under this scenario in which the technology provider is paid a fee to install, and possibly operate and maintain

the system for a period of time. The public agency owns the land, and all or most of the equipment, however there may be some cases where equipment is leased.

Another example is technology commonly used for curb space management in which the public agency "owns" the curb space and pays a technology provider to install Bluetooth- or WiFi-equipped signs or other infrastructure needed to interface with an app for notifying drivers of curb space availability, restrictions, and fee payment if applicable. The provider also provides a separate app for code enforcement to enforce compliance. The technology provider is contracted to provide a service to the public agency for managing curb space.

All of the services noted under Section 4.1.1 could also apply here if the public agency paid a fee to the provider in lieu of profit sharing—a more common arrangement when truck parking is provided free of charge.

4.1.3 Private entity responsible for enabling technology infrastructure

There are some technology providers that do not require any physical infrastructure for their system to operate, and so do not require public or private partners. This group includes apps that connect public or private property owners with unused space, to truck drivers or trucking companies needing a place to park. Both the property owners and the truck drivers create profiles on the app. The property owner uses the app to notify drivers of available space, the amenities offered on site, and the fee they wish to charge. The truck driver uses the app to locate and pay for parking.

The entire system functions within the app, and without the need for a public partner. A public agency with an available parcel could also use the app to attract truck drivers if they so desire. The property owner would be responsible for ensuring that their property is appropriately zoned, if required, for truck parking.

4.2 Pros and Cons of Different Business Models

Table 4-1 provides a summary of the pros and cons of the various business models described in this chapter, as seen through the lens of public agencies.

Table 4-1: Pros and Cons of Different Business Models

Business Model	Pros	Cons
Agency-owned land/lots partnering with technology supplier	• Spread the implementation costs among both parties • Public agency maintains some control • Access to innovation and expertise of private industry	• Requires some level of investment • Not available in locations where state DOTs are not allowed to charge for parking, such as within the Interstate right-of-way (ROW)
Public agency responsible for enabling technology infrastructure	• Technology costs are typically significantly lower than costs for adding capacity • Public agency maintains full control. • Available in locations where state DOTs are not allowed to charge for parking, such as within the Interstate ROW	• Public agency responsible for all capital and maintenance costs
Private entity responsible for enabling technology infrastructure	• No cost to public agency • This model is based on adding truck parking capacity by tapping in to unused space, not just for managing existing capacity • Extremely flexible and can adjust quickly to market demands	• Public agency has no control

5 Policy Considerations

The prior sections have outlined several potential technology applications and business models that could enable a truck-parking strategy for urban areas. Whether adapting a suite of existing technologies (similar to what is being applied to interstate truck parking programs) to meet urban truck parking needs or implementing mobile-based reservation or crowd-sourced models to connect truckers with available spaces, there will need to be some policy changes and new policies enacted for a successful, sustaining urban truck parking model.

5.1 Zoning and Land Use Requirements

Agencies recognize that one of the primary policy elements that would need to be addressed involves local land use and zoning regulations. These requirements could vary between the different regions along the corridor and will need to be explored in partnership with local and regional agencies. Many of the truck parking applications being explored for parking would likely be considering parking areas within or near areas already zoned for industrial uses. Any zoning changes would not likely be affected, but if a parking strategy seeks to leverage curb space or other areas within public rights of way, truck parking considerations might require additional zoning, curb space designations, signage or paint to identify where trucks are allowed to park. Additional policy considerations could be to designate truck parking areas in public facilities after hours.

Although beyond the scope of this technology exploration effort, future zoning considerations could include number of truck parking spaces that might be required for certain industrial or commercial uses to ensure that warehouses have adequate parking (and turning radius space) for trucks that need to wait.

5.2 Revenue and Cost Share Models

Traditionally, public agencies have been prohibited from implementing revenue-generating programs, and this would also apply to any urban truck parking strategies. While agencies might not be able to benefit from any cost models that involve pay-per-space or reservation fees if such a model was implemented, there are potentially some ways that agencies could offset costs for implementing a parking model that involves subscription or other types of fees. Elements that could be considered here include:

Sponsorships, which have been demonstrated for services like 511, “blue sign” sponsors (usually seen on highways, and highlight services such as hotel, restaurants, gas and other amenities), or similar models. This

would allow revenue to be generated to directly offset any operations or maintenance costs that might be required for technology procurement or equipment maintenance.

Cost share models, where the agency agrees to maintain technology and equipment and the private sector is allowed to generate revenue through subscriptions or fees that are passed on to either land owners or trucker-subscribers. This would keep the private sector motivated and provide a revenue path for technology developers, while still allowing the public sector to benefit from truck parking needs being addressed.

5.3 Safety Policies for Mobile Communications

As with any mobile technology, safety and limiting driver distraction is a paramount concern. There are already regulations in place at the local, state and national levels that limit driver use of mobile technologies while driving, and in particular these apply to freight. The Federal Motor Carrier Safety Administration (FMCSA) has implemented rules that restrict commercial vehicle drivers from texting or even using a hand-held mobile device while driving. This would limit any activity to seek out parking information or reserve parking spaces to be done only when the vehicle is stopped or to enable voice-only commands. Freight operators could also engage dispatch and communications centers to be able to identify and reserve parking and then communicate that information to their drivers in a safe manner.

Many elements of crowd-sourced applications would rely on passive location data from mobile devices to be exchanged with the technology provider. This would utilize location information embedded within the mobile app's GPS location rather than rely on a driver to manually indicate where they are. There are similar safeguards that could be implemented within a mobile technology, such as not allowing app functionality while driving, to promote safe compliance with local, state and federal laws.

5.4 Federal Policies and Regulations

As noted in Section 5.2 public agencies have been prohibited from implementing revenue-generating programs to help offset the cost of building and maintaining truck parking facilities. A Federal restriction on commercial activities within the Interstate right-of-way under 23 U.S.C. § 111(b) prevents the sale of goods and services at rest areas and other DOT facilities. 23 U.S.C. § 111(c) does allow for the use of vending machines in rest areas as an exception to the above rule.

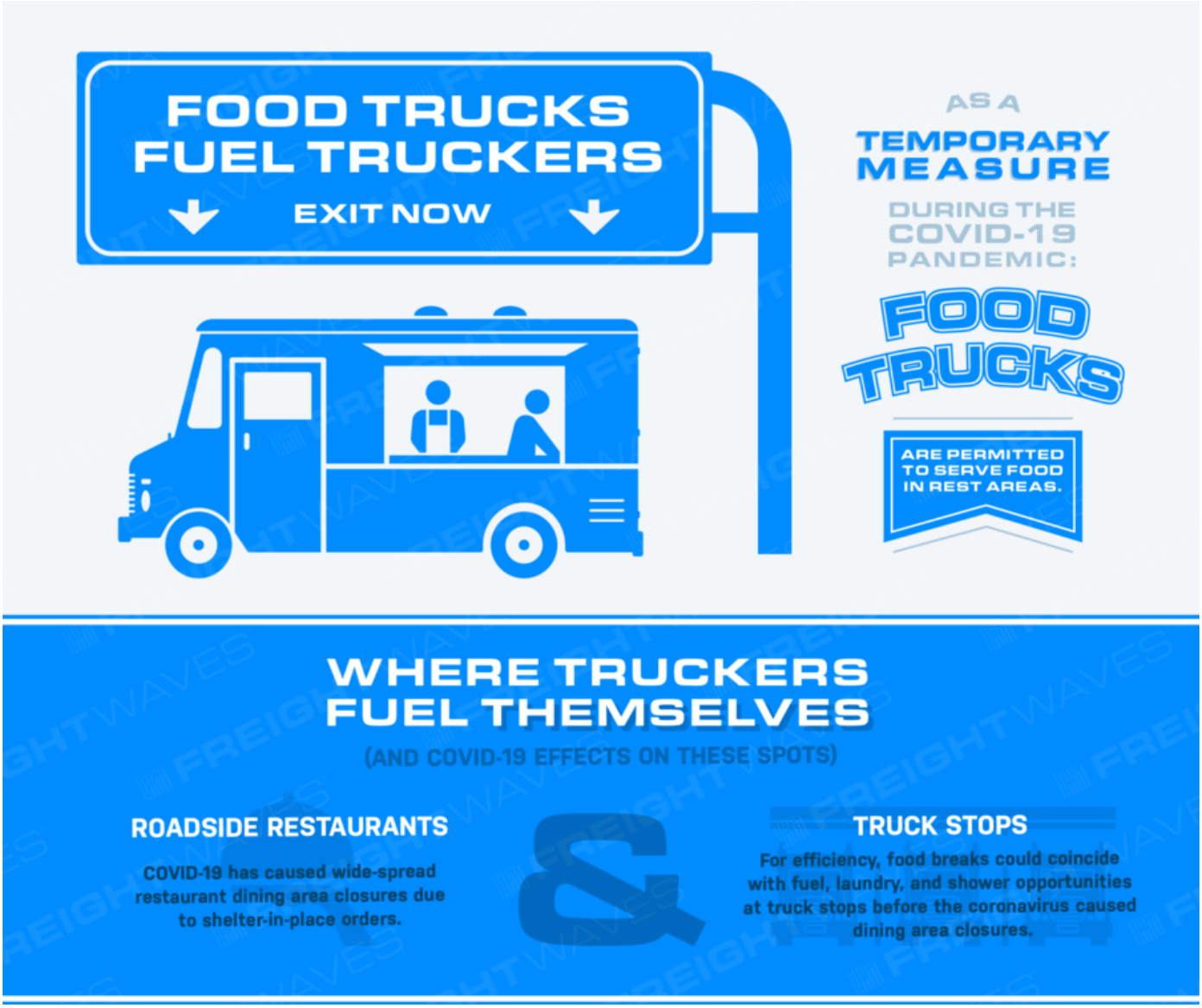
Due to the unprecedented impacts of COVID-19 national public health emergency restaurants around the country only offer take-out or drive through which is difficult, if not impossible, for truck drivers to access. FHWA recognizing that vending machines may not be adequate to provide the necessary sustenance to truck drivers, on April 3, 2020 announced that food trucks would temporarily be allowed to service rest areas[1] (see Figure 5-1 infographic).

Once the Presidentially-declared emergency ends and food trucks are no longer allowed to service truck drivers at rest areas, their need for nutritious sustenance will not go away. This is a daily challenge for drivers in the best of times. Recognizing this critical need, several technology providers are investigating how to build

[1] FHWA. Notice of Enforcement Discretion. https://www.fhwa.dot.gov/media/noe.cfm

food availability into their apps to inform drivers of the proximity of stores and restaurants to each publicized parking location. Others are considering partnering with food delivery services.

Figure 5-1: Food Trucks Temporarily Allowed at Rest Areas



Source: FreightWaves Infographic. https://www.freightwaves.com/news/food-trucks-fuel-truckers?utm_campaign=Daily%20Newsletter&utm_source=hs_email&utm_medium=email&utm_content=86136990&_hsenc=p2ANqtz-8flWwhJYEwDiGSkH42uZwAT5cYR3iS1tERLtwOWmqNWcWbdsF-Oa0NnIy8A2wAJqZdWfJzhgqDfu0KNB9l7dfjQ-hFDA&_hsmi=86136990

6 Recommendations

6.1 Toolbox of Strategies

Providing sufficient truck parking where it is needed and with the amenities and services truck drivers need will require numerous strategies customized to specific situations and needs in each region of the I-15 Corridor. There are no silver bullets or perfect solutions. New capacity will be needed with supporting technologies and policies. The more common strategies that states are currently pursuing include the following:

- Add physical capacity
  - Expand existing public truck parking facilities
  - Build new facilities on publicly owned parcels
  - Acquire new ROW to build new facilities
- Deploy technologies that better utilize existing infrastructure
  - Truck parking availability systems
  - Reservation systems
  - Curb space management systems
  - Gate management systems
- Deploy technologies that add capacity
  - Apps that connect property owners with space to truck drivers needing parking
- Policies
  - Encourage and support private sector expansion of existing truck stops and development of new facilities
  - Require shippers/receivers to provide parking or contribute to a shared lot
  - Allow truck parking in auto-designated areas at public facilities during off-hours
  - Develop a public education campaign to inform the public on the importance of truck parking

6.2 Immediate Actions

The above toolbox of strategies includes some low cost, high yield opportunities that should be advanced in the short-term within the I-15 Corridor. The lowest (or no) cost, high yield strategy is the **Truck Parking Marketplace Approach** described in Section 3.2.2. This includes an app that connects property owners with space to truck drivers needing parking. Agencies struggling with unauthorized truck parking in their region should open a dialogue with these technology providers to discuss any support they might need that the agency could provide. For instance, a high level of market saturation is needed for these apps to truly make a difference. A local municipality might be able to facilitate that saturation through outreach to industrial property owners in target areas.

Another low cost, high yield strategy that could be implemented in the short-term is the **Smart Urban Parking Zone** approach to help manage curb space. A pilot project in a key industrial area could be implemented fairly quickly and with minimal investment.

A third low cost option with the potential for future yield would be to develop a ConOps for an **I-15 Corridor TPAS pilot project**, even if funding is not currently in place to implement the system. With a ConOps in place Caltrans and NDOT stand ready to apply for grants, such as through the Advanced Transportation Congestion Management and Technology Deployment program, an INFRA or BUILD grant during the next cycle they are available. Multistate, lower cost, technology projects tend to score well under the current criteria for these grants. A Multistate TPAS is more likely to receive Federal funding support than if each state competed against each other for the same grant. Either the TPAS ConOps developed for Nevada's pilot project, or the ConOps under development for the I-10 Corridor Coalition could serve as the foundation for efficiently developing an I-15 Corridor ConOps.

Attachment A

CPCS Memo: Shared Truck Parking Concepts

February 18, 2020 CPCS Ref: 16560

TO: Bardia Nezhati and Vern Keesler, Parametrix

FROM: Dike Ahanotu, CPCS Transcom

RE: Shared Truck Parking Concepts

This memorandum describes shared truck parking concepts that have presented in research that has occurred over the past 20 years in various locations around the world. This information is designed to provide alternatives that can be considered for incorporation into the I-15 Freight Mobility Enhancement Plan as part of the National Economic Partnerships Grant. The specific conepts that are discussed in this memorandum are: vehicle parking reservation systems and shared parking/staging areas.

Vehicle Parking Reservation Systems. Several urban freight delivery improvement systems were documented as part of NCFRP 33 – Improving Freight System Performance in Metropolitan Areas: Planning Guide. Vehicle parking reservation systems are defined as an initiative that allows drivers to schedule or reserve curbside parking space. The primary objective of these systems is to improve the efficiency of urban parking infrastructure. The key elements of these systems include the following features:

- Administrative and management coordination with freight carriers, shippers, and receivers
- Intelligent transportation systems, including web-cam monitoring
- Infrastructure to allow for reservations to be made, likely a web-based mobile application
- Adjusted parking policies at the municipal level
- Appropriate signage at reservation locations
- Law enforcement for vehicles that park without a reservation or exceed time allocated for the reservation

The NCFRP 33 report describes several advantages of truck parking reservation systems. This includes less truck VMT expended looking for parking spaces and associated reductions in congestion, air quality emissions and GHG emissions. Increased safety is another advantage that comes from reduced truck VMT and reductions in the amount of double parked trucks in urban areas. The report also describes a low probability of unintended consequences from this strategy. The disadvantages of truck parking reservation systems are described in the report as the requirement for enforcement of the system, ned for private-sector acceptance, and the potential need to require additional parking spaces during high truck parking demand periods.

The examples of of vehicle parking reservation systems described in the report include:

- The I-5 Corridor in California
- Toyota City, Japan
- Bordeau, France

The I-5 corridor shared parking reservation system was described conceptually in a 2010 report by the Institute of Transportation Studies at the University of California at Berkeley[1]. However, it does not appear to be currently in operation.

The pilot study for the Toyota City, Japan shared parking reservation system was described in a 2012 report by the World Road Association (PIARC)[2]. This report describes that the system was designed to address illegally parked freight vehicles during unloading and loading operations in Toyota City which deteriorated air quality, generated vehicle emissions, increased traffic, and in some instances caused traffic collisions. A preliminary survey identified 88 freight vehicles parked in the city center and was used to estimated 25,000 vehicle parking spaces were needed over the course of a year. The pilot program was off-street parking for three vehicles with reservations arranged by cell phone. The results of the pilot program identified the number of freight vehicles was reduced by 56% near the new parking lot and that 6 spaces were needed to meet carriers' demand.

Shared Parking/Staging Areas. The Best urban Freight Systems (BESTUFS) Policy and Research Recommendations Report identified shared truck parking/staging areas, referred to as urban consolidation centers (UCCs) as a last-mile solution to improve truck parking in the urban environment[3]. As part of a 2005 workshop on this topic, the experience of UCCs throughuth Europe were discussed. In the United Kingom, operational UCCs include the Heathrow Airport Rerail Consolidation Centre, the Heathrow Airport Consolidation Centre, the Broradmead Consolidation Centre, and the Meadowhall Consolidation Centre. All of these UCCs support retail land uses. These UCCs are similar in that they are operated by a single, major logistics operator. This operator is responsible for running the center, making final deliveries, and providing a range of value-added services. These operators have been entirely from the private sector with public sector authorities being supportive, but not intervening in their operation. This is in contrast to earlier UCCs that have been led by the public sector.

UCCs in Germany, France, Hungary, and the Netherlands have been much more challenging. The BESTUFS reports that these challenges are due to the cost of setting up and operating UCCs and identifying the appropriate stakeholder to establish the UCC and recruit customers to use it.

The BESTUFS report also identifies several diferent types of UCCs, including the following classification types:

- Public distribution depot
- Central goods sorting point
- Urban transhipment centre
- Shared-user urban transhipment depot
- Freight platforms
- Cooperative delivery system
- Consolidation centre (sometimes specific, e.g. retail, construction)
- Urban distribution centre
- City logistics (or city logistik) schemes
- Logistics centre

[1] California PATH Research Report, Institute of Transportatin Studies, Commercial Vehicle Parking in California: Exploratory Evaluation of the Problem and Solutions, 2010.

[2] PIARC Technical Committee on Freight Transport and Inter-Mobility, Public Sector Goverance on Urban Freight Transport, 2012.

[3] Best Urban Freight Solutions (BESTUFS) II, Policy and research Recommentationss I: Urban Consolidation centers, Last Mile Solutions, 2005.

- Pick-up, drop-off location
- Offsite logistics support concept

The primary advantages of UCCs include the environmental and social benefits from more efficient truck operations, improved planning and information availability for urban freight systems, better inventory control, and more adaptable to "pull" logistics through improved visibility and control of the supply chain. Additionally, there is the potential to link with wider policy and regulatory initiatives, the benefits of outsourcing the last mile to a specialty operations, public relations benefits for participants, land use benefits at delivery locations of more efficient truck shipments, opportunity to carry out a wider range of value-added activities.

The primary disadvantages of UCCs are potentially high costs associated with setup (and sometimes operations). This is also related to the potential to create monopoly situations which can also drive up costs and create legal issues. There is also the potential overlap and sometimes conflict with existing parcel delivery logistics chains and the increased complexity of adding an additional step in supply chain for many shippers. Additionally, there is a loss of the direct interface between shippers and receivers which can create customer service issues. UCCs also increase orgnanizational and contractual complexity to accompany custody chain and liability issues. The UCCs are also a potentially less resilient operation as poor performance by a single actor has the potential to negatively impact the shipment of all goods in an uran environment. Additionally, there is a need for the enforcement of regulations for vehicles not included in the consolidation concept.

The BESTUFS report also describes the traffic impacts, supply chain impacts, and economic/environmental impacts of operating UCCs. The report further describes organizational and funding issues associated with their operation along with other generalized issues to consider. The report includes the following recommendations that are related to the implementation of UCCs:

- UCCs take time to establish the scheme and sign up users. The gradual build up of goods throughput affects the financial viability and the traffic and environmental impacts of the UCC. It is important to have sufficient support and funding to run for a suitable period of time over which to measure and analyse the results.
- Public funding may be needed for research work and pilot studies for any form of UCC that is not related to a major new property / commercial development. Without this funding such UCC research and trials are unlikely to proceed.
- For UCCs to be attractive to companies and to be successful, they should be led and operated by one or several key commercial players that have identified the potential benefits of being involved. Prospective UCC operators need to be able to demonstrate their ability and willingness to adopt stock receipt, inspection and control procedures and take responsibility for the "last mile" of a delivery thereby relieving logistics companies delivering goods to the UCC of any concerns they may have in that respect.
- There is a need for awareness raising amongst local authorities, retailers, and transport operators to enable them to add the UCC concept to their set of possible policy measures for consideration. The public sector should actively support this awareness building process as well as support training measures for urban freight planners.
- Local governments should issue guidance to local authorities as to where consideration should be given to the establishment of UCCs when major development proposals are being considered and when town centres are being restructured.
- Discuss the wider implications of UCC schemes with the trucking industry and retailers, and to demonstrate that, by using such centres, costs in other parts of their operation could be reduced. Such reductions could be achieved through less time being spent on (expensive) town deliveries, shorter journey times and increased vehicle utilisation, and the possibility of night-time deliveries (UCCs could be open when their customers are closed).

- One key financial consideration is how to allocate the costs and benefits resulting from a UCC scheme as a whole and not solely the cost impact in one part of the supply chain or a single player. This may need to be the subject of a more comprehensive and detailed study and ideally one based on a fully measured pilot project.
- There is a need for the detailed measurement of traffic and goods flows in the prospective location(s). This should be followed by a period of consultation about the precise nature of the UCC scheme to be tested, and then an extended pilot that is managed and scrutinised by representatives of all the potential players – the local authority, logistics companies, retailers and other users (at both a local and national level), potential UCC operators, and environmentalists.
- Carry out consistent and thorough evaluation of existing and future UCCs. Strengthening the evaluation methodology used for UCC assessment is important as it helps build a case for the situations in which UCCs are most appropriate.

A 2012 report by the World Road Association (PIARC)[4] described a shared truck parking system in operation in Yokohama, Japan. The shared parking system took the form of a joint delivery system where local retail shoppers consolidated shipments to a single facility and the operator of the facility was responsible for final delivery. The joint delivery system consisted of approximately 300 shops and it was initially designed to improve air quality and noise, increase space for pedestrians, and reduce vehicle collisions. Distribution companies pay 150 JPY for delivery of each parcel. The steps taken to enact the joint delivery system occurred over six years and included the following steps:

- Year 1 - A traffic study on improving the traffic environment at the Mtomachi Shopping Street, including traffic counts, a questionnaire, and a list of potential improvement measures
- Year 2 - A later adjustments to the improvement measures to identify ideas suitable for experimental implementation
- Year 3 - Experimental implementation of a joint delivery system using a sample of companies, including measuring the effects of the system
- Years 4, 5 - Adjustments of related organizations for the full-scale introduction of the joint delivery system
- Year 6 - Introduction of the joint delivery system

The results of the experiemental implementation indicated that trucks trips from a combined 11 companies was reduced from 100 to 29 over a 10-day period.

[4] PIARC Technical Committee on Freight Transport and Inter-Mobility, Public Sector Goverance on Urban Freight Transport, 2012.

Attachment B

Nevada DOT Request for Information

NEVADA DEPARTMENT OF TRANSPORTATION
VENDOR BULLETIN

February 19, 2020

The Nevada Department of Transportation (Department) is soliciting information from qualified Service Providers.

Upon release of the Request for Information, contact with Department personnel, other than Agreement Services, regarding these services is expressly prohibited. Agreement Services can be reached at agreeservices@dot.nv.gov.

Issuance of this RFI shall in no way constitute a commitment by the DEPARTMENT to issue a Request for Proposal (RFP) or execute an agreement. The DEPARTMENT reserves the right to reject any or all submittals received in response to this RFI, or to cancel this RFI if it is deemed in the best interest of the State to do so.

If you wish to subscribe to this vendor bulletin, register as a vendor, review current/past procurements, or login to the vendor portal you may do so by going to Vendor Opportunities.

REQUEST FOR INFORMATION ADVERTISED FOR SUBMITTALS

Request for Information (RFI) 036-20-804 – Urban Truck Parking Technology

DESCRIPTION OF WORK: The Nevada Department of Transportation (Department), in partnership with the California Department of Transportation (Caltrans), is seeking information on available technologies for managing urban truck parking, specifically technologies that can be employed to maximize existing publicly- and/or privately-owned infrastructure that is or could be used for truck parking, and minimize the costs associated with developing and operating new truck parking facilities – within urban/metropolitan regions along the I-15 Corridor in Nevada and California. Additionally, the Department is seeking input from regions, cities, or facilities that have implemented technologies to support routing, reservations, or similar applications for short-term truck parking in urban areas.

This RFI will be used as a vehicle to educate the DEPARTMENT about current solutions, and/or practices, and to help identify potential Service Providers. This RFI and any future Proposer presentations do not imply any form of an agreement with Proposers, and do not imply that a Request for Proposal (RFP) will be solicited.

Please refer to the RFI for the complete submission criteria and response format.

SUBMITTAL DUE DATE: March 11, 2020, 11:00 a.m. PT

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

REQUEST FOR INFORMATION

036-20-804

Specifications, Instructions, and
Submittal Information for

Urban Truck Parking Technology

I-15 Corridor Urban Areas (Nevada and California)

Due: **March 11, 2020**
No later than 11:00 A.M. PT

Kristina L. Swallow, P.E., Director
DEPARTMENT of Transportation

Table of Contents

1. General Information

1.1. Introduction

The purpose of this Request for Information (RFI) is to allow all interested Proposers an opportunity to present information to address the specifications within this RFI. The Nevada Department of Transportation, herein "DEPARTMENT", in partnership with the California Department of Transportation (Caltrans), is seeking information on technologies for managing urban truck parking. In the urban areas of Southern Nevada and Southern California, heavy commercial vehicles are parking in unauthorized and undesirable locations due to numerous contributing factors including: a shortage of authorized parking spaces near pick-up and delivery points, lack of information about available parking, congestion, Federal regulations governing maximum operating times, appointment times and delays, community opposition, etc. The DEPARTMENT is seeking information on available technologies that can be employed to maximize existing publicly- and/or privately-owned infrastructure that is or could be used for truck parking, and minimize the costs associated with developing and operating new truck parking facilities.

This RFI will be used as a vehicle to educate the DEPARTMENT about current solutions, and/or practices, and to help identify potential Service Providers. This RFI and any future Proposer presentations do not imply any form of an agreement with Proposers, and do not imply that a Request for Proposal (RFP) will be solicited.

This RFI seeks input from a wide range of sources, including:

- Technology developers with unique solutions to support urban truck parking;
- Regions, cities or facilities that have implemented truck parking solutions in urban areas that allow trucks to park safely and legally while waiting to make their pick-up or delivery; and
- Available or emerging research on technologies for urban truck parking solutions.

1.2. Submission of Questions

Any irregularities or lack of clarity in the RFI must be brought to Agreement Service's attention, in writing, as soon as possible, so that corrective addenda may be furnished by the DEPARTMENT in a timely manner to all Proposers.

Any questions raised by Proposers must be submitted in writing to Agreement Services, emailed to agreeservices@dot.nv.gov no later than **11:00 A.M. PT, on February 26, 2020**. The DEPARTMENT will respond to questions regarding the RFI, including requests for clarification and requests to correct errors, on or before **March 4, 2020**. Only requests submitted through email will be considered. No requests for additional information or clarification to any other department office, consultant, employee, or the Federal Highway Administration (FHWA) will be considered.

1.3. Submissions

Responses are due by **11:00 A.M. PT, March 11, 2020**.

Each Proposer **must** submit its Proposal in a searchable PDF format through the DEPARTMENT's Vendor Portal website, located at www.nevadadot.com/doing-business/vendor-opportunities/vendor-portal-login. In order to submit Proposals, Proposers must initially register with the DEPARTMENT at www.nevadadot.com/doing-business/vendor-opportunities/vendor-registration. After submitting the online registration application, the Proposer will receive an email containing a unique registration number, which will allow the Proposer to proceed through the Proposal submittal process.

Any Proposal received prior to the date and time specified above for receipt of Proposals may be withdrawn or modified; Proposals can be modified through the Vendor Portal webpage any time prior to the date and time specified above. The modified Proposal must be received before the time and date specified above for receipt of Proposals.

Proposals received after the specified deadline **will not** be considered and will be disposed of in an appropriate manner suitable to the DEPARTMENT, in its sole discretion.

If a Proposer has multiple solutions, each solution must be submitted separately.

Confidential Information, Trade Secrets, and/or Proprietary Information must be marked as such in the Response. The failure to mark this information as per NRS 333.020 and 333.333 shall constitute a complete waiver of any and all claims for damages caused by release of the information by the DEPARTMENT. If the DEPARTMENT reviews the confidential information and determines that the information is not considered confidential pursuant to NRS Chapter 333, the DEPARTMENT will contact the Vendor. The Proposers must advise the DEPARTMENT as to whether it either accepts the DEPARTMENT's determination that the information is not confidential or withdraws the information. The Proposer will not be allowed to alter the Response after the date and time set for receipt of Responses shown above. Notwithstanding the provisions in NRS Chapter 333, the DEPARTMENT retains its immunity pursuant to the provisions of NRS 239.012 for any "good faith" release of information, and the immunities from liability provided to it pursuant to NRS Chapter 41.

1.4. RFI Schedule

Description	Timeline
Release of RFI	02/19/2020
Submission of Questions	**02/26/2020 by 11:00 A.M. PT**
Responses to Submitted Questions	03/04/2020
Vendor Submissions	**03/11/2020 by 11:00 A.M. PT**

1.5. RFI Coordinator

The following rules of contact shall apply during this RFI:

After release of the RFI through completion of presentations, if applicable, Proposers shall ONLY correspond with the DEPARTMENT regarding this RFI through the DEPARTMENT's designated representative as per NAC 333.155. The designated representative's contact information is:

RFI Coordinator	Procurement Person
Name	Melissa DeMattei
Address	Nevada Department of Transportation Administrative Services Division 1263 S. Stewart Street, # 102 Carson City, NV 89712
Phone	(775) 888-7070, ext. 2139

E-mail	agreeservices@dot.nv.gov

Proposers shall not contact the DEPARTMENT's employees, including DEPARTMENT heads and/or any official who will participate in the review of Responses, except through the process identified above. Any official information regarding the RFI will be disseminated by the DEPARTMENT. Specific information necessary for the preparation of Responses will be disclosed to all Proposers. The DEPARTMENT will not be responsible for any oral exchange or any other information or exchange that occurs outside the official process specified herein. Failure to comply with these rules of contact may result in a Response being rejected in the DEPARTMENT's sole discretion.

1.6. Response Format

The responses shall be submitted in the following format, with maximum pages identified below (see Section 1.3):

- Section 1 – Firm/agency information and contact details (must not exceed one [1] page)
- Section 2 – Proposed solution and high-level concept of operations (must not exceed five [5] pages; must include a system diagram or similar graphic outlining technology solution or application)
- Section 3 – High-level costs and implementation requirements (Include ranges of implementation costs per site and ranges of annual operating and maintenance costs per site desired, discuss how technology will be deployed, address implementation challenges, assumptions and constraints, and provide information on the implementation timeline.) (must not exceed four [4] pages)
- Section 4 – Past performance and/or results to date (must not exceed [5] pages)

The total page limited for the four (4) sections will be fifteen (15) pages, not including a cover page. The system diagram (or technology/ app concept figure) page may be done in 11" x 17" format if needed to include all necessary information (this page will count as only one page).

1.7. Vendor Presentation

Proposers may be invited to give a presentation, at the sole discretion of the DEPARTMENT, at a time and date to be determined after review of the responses. In the event such presentations are deemed necessary, the DEPARTMENT anticipates that vendor demonstrations will be scheduled between **March 23, 2020 and March 27, 2020 via a web meeting**. The DEPARTMENT reserves the right to change these dates.

1.8. Cost of Preparing Response

The DEPARTMENT assumes no financial responsibility in connection with the Proposers' costs incurred in the preparation and submission of the RFI response, or by attending the presentation, if such presentations are conducted by the DEPARTMENT in its sole discretion.

1.9. General Terms and Conditions

Issuance of this RFI shall in no way constitute a commitment by the DEPARTMENT to issue a Request for Proposal (RFP) or execute an agreement. The DEPARTMENT reserves the right to

reject any or all submittals received in response to this RFI, or to cancel this RFI if it is deemed in the best interest of the State to do so.

Information submitted in response to this RFI will become the property of the DEPARTMENT. The DEPARTMENT will not pay for any information herein requested, nor will it be liable for any other costs incurred by any respondent related to the preparation or delivery of the response to this RFI or any subsequent presentation.

The DEPARTMENT reserves the right to issue addenda to this RFI prior to the closing due date. It is the Proposer's responsibility to check for any addenda at www.nevadadot.com prior to Proposal submission. Submission of a Proposal constitutes acknowledgement of this RFI and all subsequent addenda.

By submitting a response, the vendor agrees that the DEPARTMENT may copy the response information for purposes of facilitating review or to respond to requests for public records. The vendor consents to such copy by submitting a response and warrants that such copying will not violate the rights of any third party. The DEPARTMENT will have the right to use ideas or adaptations presented in the responses.

The DEPARTMENT reserves the right to reject any and all responses to the RFI, in whole and in part, at any time. This RFI is designed to provide Proposers with the information necessary for the preparation of informative response proposals and demonstrations of product. This RFI process is for DEPARTMENT's benefit and is intended to provide future selection of goods and services. The RFI is not intended to be comprehensive and each vendor is responsible for determining all factors necessary for submission of comprehensive response and complete product capability demonstration. The RFI response and demonstration will not be subject to an RFP type evaluation but only to a review of suggested product performance, cost of processes offered, and abilities to perform services that may be of use to the DEPARTMENT. Cost shall be estimated by the vendor. When the estimated cost is submitted, the vendor shall state that it is an estimated or approximate cost.

The DEPARTMENT will not be responsible for any oral exchange or any other information or exchange that occurs outside the official process specified herein.

1.10. Request for Confidential Treatment

Responses to this RFI shall remain confidential until after award of a corresponding RFP, if an RFP is issued. At that time, the DEPARTMENT will treat all information submitted by a vendor as public information unless the vendor properly requests that the information be treated as confidential at the time of submitting the response. Any requests for confidential treatment of information must be included in a cover letter with the vendor's RFI response. The request must also include the name, address, and telephone number of the person authorized by the vendor to respond to any inquiries concerning the confidential status of the materials.

A single confidential page in the document will not classify the whole document as being confidential. Each page shall be marked as containing confidential information. The confidential information must be clearly identifiable to the reader on the outside of the document, cover letter, and on each page of the document.

2. Background

On August 22, 2019 the DEPARTMENT completed and posted on its website the ***Truck Parking Implementation Plan*** (https://www.nevadadot.com/doing-business/about-ndot/ndot-divisions/planning/freight-planning) that describes the challenges and needs associated with urban truck parking. The report documents that the largest gaps in truck parking occur in the two (2) major urban areas in Nevada—Las Vegas, and Reno/Sparks. Clark County has a gap of more than five hundred fifty (550) truck parking spaces. Urban areas in Southern California with a high concentration of shippers and receivers, and near seaports and international border crossings, also have a shortage of truck parking.

A key reason for this gap is the demand for short-term staging parking, which is different from long-haul demand, in that trucks are parking while waiting to make a pickup or delivery instead of resting for a long period of time to satisfy Federal Motor Carrier Safety Administration (FMCSA) rest requirements. Therefore, trucks typically try to park as close to the loading/delivery location as possible, and the short parking duration leads to more turnover at any single location. Many commercial businesses have specific time windows during which trucks can be on site to load or unload their goods. If drivers arrive before that time to guard against delays or other disruptions, they typically are not allowed to park and wait on site. Without adequate short-term parking options near these industrial and commercial areas, trucks often park in unauthorized locations or on the street, leading to safety and maintenance issues.

Building new truck parking facilities in the industrial and commercial areas where parking is needed, and where land values are high, is typically cost prohibitive. Private truck stops may not realize the return on investment to build a new, or expand, an existing facility, and public agencies are often unable to develop public lands for this purpose because a truck parking facility is not deemed to be the best use of the parcel.

To help advance discussions and planning efforts to address these urban truck parking needs, the Nevada Department of Transportation and partner agencies submitted and secured a federal grant through the National Economic Partnerships for Innovative Approaches to Multi-Jurisdictional Coordination. This grant is funded by the FHWA, Office of Planning, and Environment and Realty.

3. Information to be provided by submitting Proposers

Agencies recognize that technology can play a valuable role in meeting some of the challenges identified in Section 2. The following Needs Statement describes the information the DEPARTMENT is requesting under this RFI from responding vendors and agencies. Submitting Proposers should present information on technologies for managing urban truck parking to the DEPARTMENT based upon the Needs Statement below:

NDOT and Caltrans are seeking information on available technologies that can be employed to maximize existing publicly- and/or privately-owned infrastructure that is or could be used for truck parking, and minimize the costs associated with developing and operating new truck parking facilities – within urban/metropolitan regions along the I-15 Corridor in Nevada and California.

The following provides a list of potential technological areas that are being considered. This is not intended to be exhaustive. The DEPARTMENT encourages responders to provide information on any available or emerging technologies that can address the needs provided in the Needs

Statement above. Furthermore, the DEPARTMENT is seeking input from regions, cities, or facilities that have implemented technologies to support routing, reservations, or similar applications for short-term truck parking in urban areas.

- Truck Parking Availability Systems
- Truck Parking Reservation Systems
- Freight Traveler Information Systems – focused on truck parking (staging and trip planning) and tailored information exchange with trucking fleet dispatchers and drivers
- Smart Parking Zone and Curbside Management Technologies that can be applied to long-haul trucks
- Applications that connect property owners with available space to truck drivers needing parking

4. Additional Information

Please see Attachment A that provides the results and slides from the 10 January 2020, I-15 Urban Truck Parking Workshop. Respondents are encouraged to review this entire document but focus on the portion of the slides on pages twelve (12) to twenty-one (21) (slides twenty-four through forty-one [24-41]) that show examples of how the technologies listed above in Section 3 could potentially be applied to improved urban truck parking conditions.

ATTACHMENT

Attachment A – I-15 Urban Truck Parking Workshops Summary

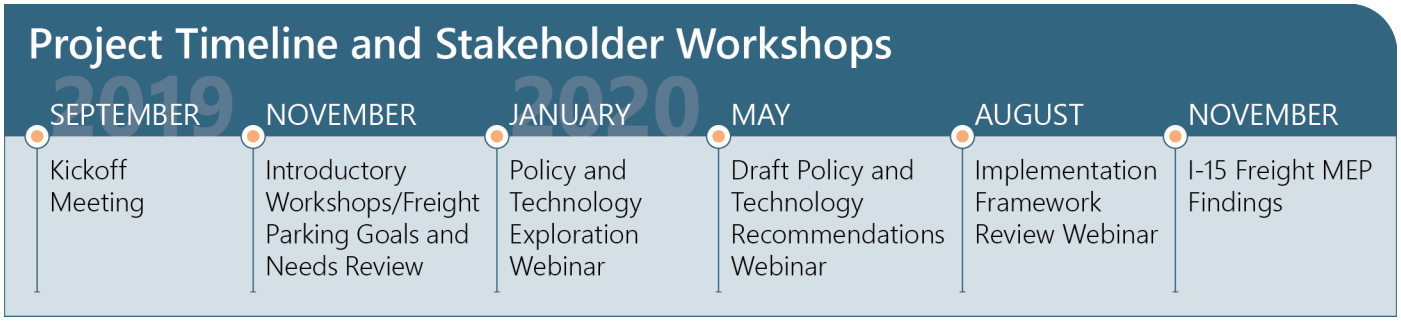
I-15 Urban Truck Parking Workshops
Summary

Subject:	Summary of I-15 Urban Truck Parking Technology and Policy Exploration Webinar
Prepared for:	Nevada Department of Transportation, Caltrans, and Partner Agencies
Prepared by:	Jenny Roberts/Parametrix and Dan Andersen/Cambridge Systematics
Date:	January 27, 2020

Introduction and Overview

The California Department of Transportation (Caltrans) and Nevada Department of Transportation (NDOT) were recently awarded a National Economic Partnerships (NEP) Grant by the Federal Highway Administration (FHWA) to develop an I-15 Freight Mobility Enhancement Plan (MEP) that can serve as a framework for more coordinated freight planning within the megaregion. As part of this plan, the project team is conducting a series of workshops/webinars with partner agencies and regional stakeholders over the course of the project (see Figure 1).

Figure 1: I-15 Freight MEP Stakeholder Meetings



These meetings provide opportunities to discuss the challenges and solutions surrounding urban truck parking along the I-15 Corridor between San Diego, California and Las Vegas, Nevada. The date, time, and locations of the meetings completed to date are provided in Table 1. This document provides a summary of the Technology and Policy Exploration Webinar conducted on January 8, 2020, and a copy of the presentation is attached along with the list of attendees.

Table 1: I-15 Freight MEP Stakeholder Meetings to Date

MEETING	DATE	TIME	LOCATION
Introductory Workshop – San Diego Region	November 13, 2019	2:30 – 4:30 p.m.	Caltrans District 11 4050 Taylor Street San Diego, CA
Introductory Workshop – Southern Nevada Region	November 19, 2019	1:00 – 3:00 p.m.	RTC of Southern Nevada 600 S Grand Central Parkway Las Vegas, NV
Introductory Workshop – Inland Empire Region	December 11, 2019	1:00 – 3:00 p.m.	SCAG Riverside County Regional Office 3403 10th Street, Suite 805 Riverside, CA
Technology and Policy Exploration	**January 8, 2020**	**1:00 – 2:30 p.m.**	**Webinar**

Note: For those unable to attend the three introductory workshops in person, a webinar link was provided allowing stakeholders to participate remotely

Meeting Summary

The meeting started with an overview of the National Economic Partnerships program and this I-15 Freight MEP project. Project team members then summarized the goals and needs that came out of the three introductory workshops and a literature review and the project's draft problem statement was presented. Policy and technology considerations for addressing urban truck parking needs were shared as well as potential technology solutions for truck parking along the I-15 corridor. Polling questions were asked throughout the meeting with discussions following each major item presented. The polling questions and responses are included in the presentation attached to this summary. The following sections summarize the discussions that took place over the course of the meeting.

Purpose Statement

- Safety needs to be included in the purpose statement.
- There is an opportunity for mutual partnerships between states/cities/counties to work with private companies. Truck Parking LLC is working with some east coast states that are shutting down their rest stops so private companies can lease the space and make it a more safe and secure environment for truck drivers.
- Are there examples of successful public private partnerships?
    - Post Meeting Note: Several years ago a private truck stop leased a parcel of land adjacent to their truck stop to NDOT for $1/month. NDOT constructed a truck parking lot on that parcel and maintained it for two years. At the end of two years it was beneficial for both parties to

terminate the lease. The private truck stop was purchased by a national chain which now maintains the lot as part of their facility, and it is full most nights.

- What was the purpose of the urban focus for this project?
    - Facilitator: This is currently the highest need. Numerous studies have shown that truck parking facilities in rural rest areas rarely fill up. However, once you get in an urban area with more destination points, parking is limited and the costs to address the issue are much higher than in rural areas.

Policies

- Does anyone know the typical cost for parking at a private truck parking facility?
    - Truck parking is rarely charged by the hour. Costs can vary, more dense/urbanized areas can have higher costs. Costs typically range from $12 to $25 for a night.
- Are there examples of partnering or incentivizing malls/stadiums to allow truck parking during off-hours?
    - Facilitator: The only one I'm aware of is a fairground off I-80 on the west side of Donner Pass that Caltrans can use for truck parking during temporary winter closures of I-80. I believe Colorado DOT also has some similar arrangements for truck parking during winter closures. I'm not aware of a large car parking area routinely used for truck parking during off hours.
    - The state of Maryland opens up park and ride lots for truck parking during severe winter storms.
    - Sometimes public facilities are used for emergency parking.
    - A model of how it would work would be helpful for municipalities to have so they can negotiate through some of the implementation details, such as liability.
- Is covered parking something that is attractive for truckers in the region?
    - A former truck driver responded that covered docks are important for loading and unloading, but not necessary for parking. Parking is already costly, and this would make it more expensive. In addition, the structure could be damaged by trucks—it's better to have few obstructions in truck parking lots.
    - Truck Parking LLC has partnered with an engineering firm on the possible creation of a truck exclusive 5-story parking garage that could be used in dense urban areas where land is unavailable or at a premium.
- Has there been a discussion on using air bases that are now airfields.
    - Truck Depot LLC tried to partner with Washington DOT to utilize abandoned air strips, but Federal laws prohibited them from moving forward as a truck parking facility.

- In urban environments what hours of the day have the highest demand for parking? overnight or during the day?
    - Historically it is overnight parking between 4 pm and 7 am, that peaks between 9 pm and 3 am. However, urban environments can peak through the entire day at dense locations - sometimes never clearing out.

Technology

- I-15 Dynamic Mobility Project conducted a pilot test with a small number of freight operators to test a Freight Information Application that provide real-time transportation alerts to truck company participants via email and text.
    - Truline Corporation (a trucking and transport company) was part of this pilot and commented that the fleet managers liked the functionality and some of the notifications are very helpful with making the drives more efficient.
- There was good discussion during the San Diego Introductory Workshop about the need to better understand the demand for truck parking in urban areas. Is the need for daytime spots to wait for loading times? Is the need for longer sleep breaks? This seems like a key difference between urban and rural parking needs.
    - Facilitator: Other truck parking studies have revealed that the mix of long- and short-term parking is about the same at both rural and urban truck parking facilities. Urban lots have a slightly higher mix of short-term parking, and a much higher demand overall. Ideally, urban truck parking facilities should accommodate both long- and short-term parking needs. However, if development costs or community opposition are obstacles to a facility that serves both needs, a partial solution might be to allow short-term parking only at designated locations inside the urban areas, near shippers and receivers, during normal business hours; and move long-term (overnight) parking to larger facilities outside of the urban area.
- Some communities, including Clark County, have 24-hour workers so there is not a designation between day time hours and evening hours. Our most significant issue are the truck drivers parking within or near residential communities. And, while private parcel owners may have availability for truck parking, they need to ensure that they have appropriate land use approval to do so. Therefore, they need to make sure that proper designations are approved in advance.
- Does Richard Greer at Truck Depot have any history on parking solutions within communities versus only on a corridor?
    - The facilitator asked Richard to contact the questioner following the meeting.
    - There are a small but growing number of truck parking facilities off the Interstate system and closer to shippers and receivers.
- Do we need to be mindful of any restrictions on technologies that drivers are limited to use? What should we consider for future technology solutions?

- A former truck driver responded that the trucks already have a lot of technology in them and the cabs have been connected for decades. Hands free systems that can read out information to drivers are preferred, as there are heavy fines for drivers caught looking at mobile devices while driving.
- Truline Corporation posted a response: We have a very firm policy on no hand-held devices while the truck is in operation. As an industry, we are hypersensitive to distracted driving. Our in-cab computers only work when the truck is parked to discourage a driver from reading messages while driving. All of the drivers must have their cell phones mounted and can only use a Bluetooth device while driving. Otherwise, they get one warning and then are terminated.

Attachment 1: Workshop Attendees

I-15 Freight MEP Technology and Exploration Webinar - January 8, 2020

Organization	First Name	Last Name	Email	Attendance
California Highway Patrol	Napoleon	Salais	Nasalais@chp.ca.gov	Webinar
California Trucking Association	Taylor	Collison	tcollison@caltrux.org	Webinar
Caltrans	Kelly	Eagan	kelly.eagan@dot.ca.gov	Webinar
Caltrans	Jose	Marquez	jose.marquez@dot.ca.gov	Webinar
Caltrans	Barby	Valentine	Barby.valentine@gmail.com	Webinar
Caltrans - District 11	Rob	Owen	rowen@dot.ca.gov	Webinar
Caltrans - District 8	Kwasi	Agyakwa	kwasi.agyakwa@dot.ca.gov	Webinar
Caltrans - District 8	Danny	Arellano	daniel.arellano@dot.ca.gov	Webinar
Caltrans - District 8	Reyna	Baeza-Oregel	reyna.baeza-oregel@dot.ca.gov	Webinar
Caltrans - District 8	Thanya	Espericueta	thanya.espericueta@dot.ca.gov	Webinar
Cambridge Systematics	Dan	Andersen	dandersen@camsys.com	Webinar
Cambridge Systematics	Mark	Jensen	mjensen@camsys.com	Webinar
City of Las Vegas	Maria Jose	Norero	mnorero@lasvegasnevada.gov	Webinar
City of Las Vegas	Rick	Schroder	rschroder@lasvegasnevada.gov	Webinar
City of Ontario	Jay	Bautista	jbautista@ontarioca.gov	Webinar
City of Rancho Cucamonga	Ian	Tai	Ian.Tai@cityofrc.us	Webinar
Clark County	Jim	Andersen	james.andersen@clarkcountynv.gov	Webinar
Clark County	Jeanine	D'Errico	jeanine.d'errico@clarkcountynv.gov	Webinar
Clark County	Kathleen	Walpole	kathleen.walpole@clarkcountynv.gov	Webinar
CPCS	Alex	Marach	amarach@cpcstrans.com	Webinar
Drivewyze	Enrique	Cramer	ecramer@drivewyze.com	Webinar
Hickory Ridge Group LLC, Nevada	Heather	Monteiro	heather@hickoryridgegroup.org	Webinar
Convoy Solutions LLC d/b/a IdleAir	Yale	Klat	yale.klat@idleair.com	Webinar
Kimley-Horn	Lisa	Burgess	Lisa.Burgess@kimley-horn.com	Webinar
KKW Trucking Inc	Tim	Abbott	tabbott@kkwtrucks.com	Webinar
Maritime Administration, USDOT	Eric	Shen	eric.shen@dot.gov	Webinar
National Association of Truck Stop Operators (NATSO)	Tiffany	Wlazlowski Neuman	twlazlowski@natso.com	Webinar
NDOT	Jason	Love	jlove@dot.nv.gov	Webinar
NDOT	Bill	Thompson	bthompson@dot.nv.gov	Webinar
NDOT	Kevin	Verre	kverre@dot.nv.gov	Webinar
Parametrix	Vern	Keeslar	vkeeslar@gmail.com	Webinar
Parametrix	Jaclyn	Kuechenmeister	jkuechenmeister@parametrix.com	Webinar
Parametrix	Jenny	Roberts	jmroberts@parametrix.com	Webinar
RC Willey Home Furnishings	Brad	Miller	brad.miller@rcwilley.com	Webinar
RCTC	Jenny	Chan	jchan@rctc.org	Webinar
SANDAG	Zach	Hernandez	zhe@sandag.org	Webinar
SANDAG	April	Petonak	ade@sandag.org	Webinar
SCAG	Stephen	Yoon	yoon@scag.ca.gov	Webinar
The Truck Depot lLC	Richard	Greer	rrg1107@gmail.com	Webinar
Truck Specialized Parking Services (TSPS)	Scott	Grenerth	sgrenerth@tsps.io	Webinar
Truline Corporation	Paul	Truman	ptruman@trulinecorp.com	Webinar
Wendy J. Strack Consulting LLC	Wendy	Strack	wendy@wjsconsult.com	Webinar
WSP USA	Virginia	Lingham	virginia.lingham@wsp.com	Webinar

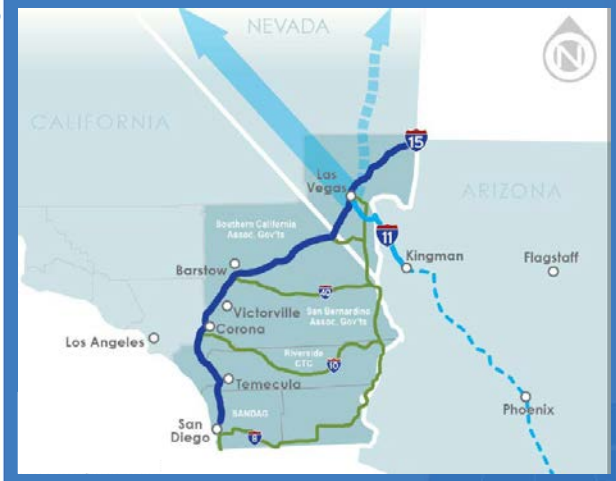
Attachment 2: Webinar Presentation

Grant Purpose

National Economic Partnerships Initiative promotes efficiency and regional cooperation by identifying best transportation planning practices that can be implemented by jurisdictions who want to work across their boundaries.

I-15 Freight Mobility Enhancement Plan Goals

- Identify strategies, best practices and templates for providing effective urban truck parking along I-15
- Establish new partnerships and a successful multi-state coalition
- Advance important near-term corridor improvement opportunities
- Advance key freight planning efforts in both California and Nevada for I-15
- Better coordinate local and megaregional corridor planning efforts
- Elevate engagement with local and regional planning agencies who have a vital role in mobility and safety planning and programming for I-15



Project Timeline

Project Timeline and Stakeholder Workshops

2019 SEPTEMBER	NOVEMBER	2020 JANUARY	MAY	AUGUST	NOVEMBER
Kickoff Meeting	Introductory Workshops/Freight Parking Goals and Needs Review	Policy and Technology Exploration Webinar	Draft Policy and Technology Recommendations Webinar	Implementation Framework Review Webinar	I-15 Freight MEP Findings

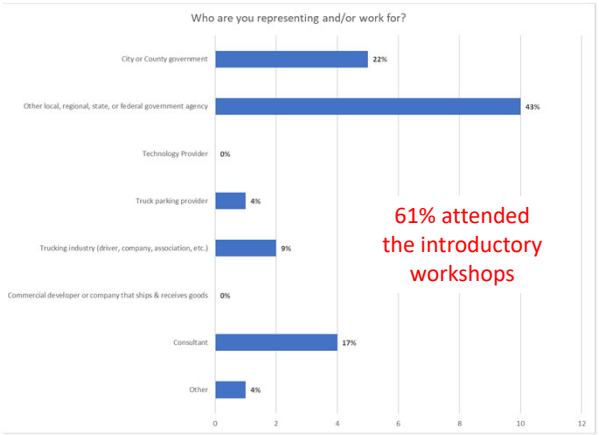
- Purpose of this Webinar
  - Agree on Goals & Needs
  - Explore a range of policy & technology solutions
- Immediate Next Steps
  - Freight Truck Parking Technology RFI
  - Policy interviews with select stakeholders
  - May Webinar: Draft policy & technology recommendations

Poll 1: Attendees & Goals

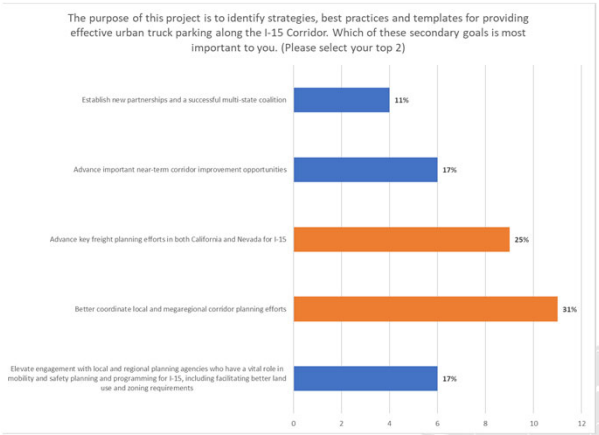
Polling Round 1

1. Who are you representing and/or work for?
   a. City or County government
   b. Other local, regional, state, or federal government agency
   c. Technology provider
   d. Truck parking provider
   e. Trucking industry (driver, company, association, etc.)
   f. Commercial developer or company that ships & receives goods
   g. Consultant
   h. Other
2. Did you attend one of the introductory workshops?
   a. Yes
   b. No
3. The purpose of this project is to identify strategies, best practices and templates for providing effective urban truck parking along the I-15 Corridor. Which of these secondary goals is most important to you? (Please select your top 2)
   a. Establish new partnerships and a successful multi-state coalition
   b. Advance important near-term corridor improvement opportunities
   c. Advance key freight planning efforts in both California and Nevada for I-15
   d. Better coordinate local and megaregional corridor planning efforts
   e. Elevate engagement with local and regional planning agencies who have a vital role in mobility and safety planning and programming for I-15, including facilitating better land use and zoning requirements

Polling Round 1 - Results



61% attended the introductory workshops

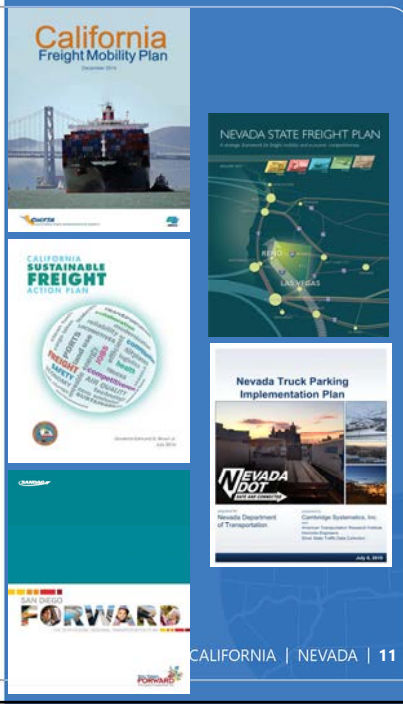


Goals and Needs

Presenter:
Vern Keeslar, Parametrix
Dan Andersen, Cambridge Systematics

Common Themes: Literature Review

- Maximize truck parking in dense urban areas where parking spaces are limited
- Utilize technology that can make finding parking easier and reduce the impacts of idling
- Increase number of truck parking spaces and facilities and supportive intelligent transportation system (ITS) improvements
- Require facilities that receive and dispatch large numbers of trucks to provide parking onsite and/or contribute to the construction, operations, and maintenance of common staging/parking areas
- Construct truck parking areas adjacent to commercial truck stops and travel plazas
- Provide truck staging at the border



Common Themes: Workshops

- The high cost of land makes it cost prohibitive to build new/independent truck parking facilities, especially in urban areas
  - Facilitate better land use and zoning requirements to:
    - Allow truck parking at underutilized parking locations, such as stadiums, particularly at night when not in use
    - Coordinate truck parking policies and technologies among adjacent jurisdictions to improve economic partnerships and benefits
  - Establish land use policies that require shippers/receivers to provide truck parking
- Relax the Federal law that prohibits commercialization of rest areas or DOT properties

Common Themes: Workshops (cont.)

- Foster collaboration between different levels of government and public/private partnerships to collaborate on solutions; involve policymakers
- Provide real-time information on truck parking locations, availability, and amenities
- Identify champions in each region to continue the momentum and carry out recommendations
- Quantify where and how much truck parking is available and needed

Draft Purpose Statement

Identify strategies for providing effective urban truck parking along the I-15 Corridor. Effective urban truck parking can be defined as reliable, secure, affordable, with the amenities drivers need, and supported by the surrounding community. Develop an actionable implementation plan that defines the partnerships, technology, policy, and funding frameworks needed for successful implementation, collaboration, and economic partnership.

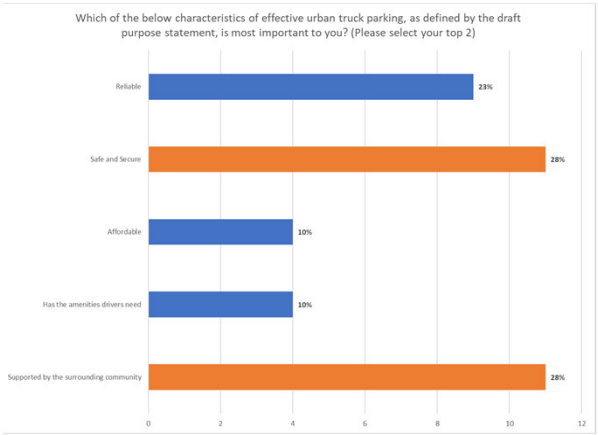
Note: The recommendations resulting from this study are intended to provide state, metropolitan, and local planning agencies with the tools they need, in the form of best practices and templates, to address the needs for urban truck parking within their jurisdiction. Actual implementation of study recommendations will be at their discretion.

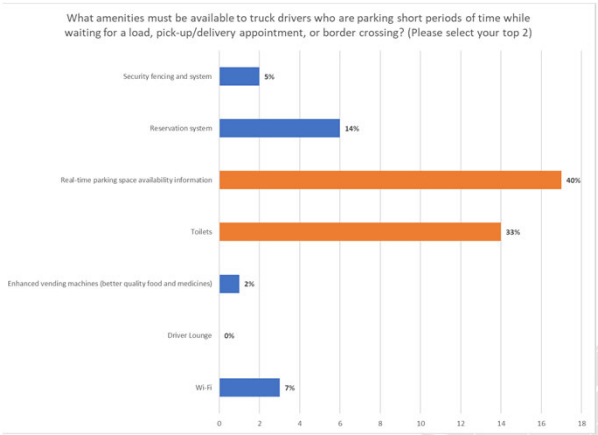
Poll 2: Truck Parking Needs

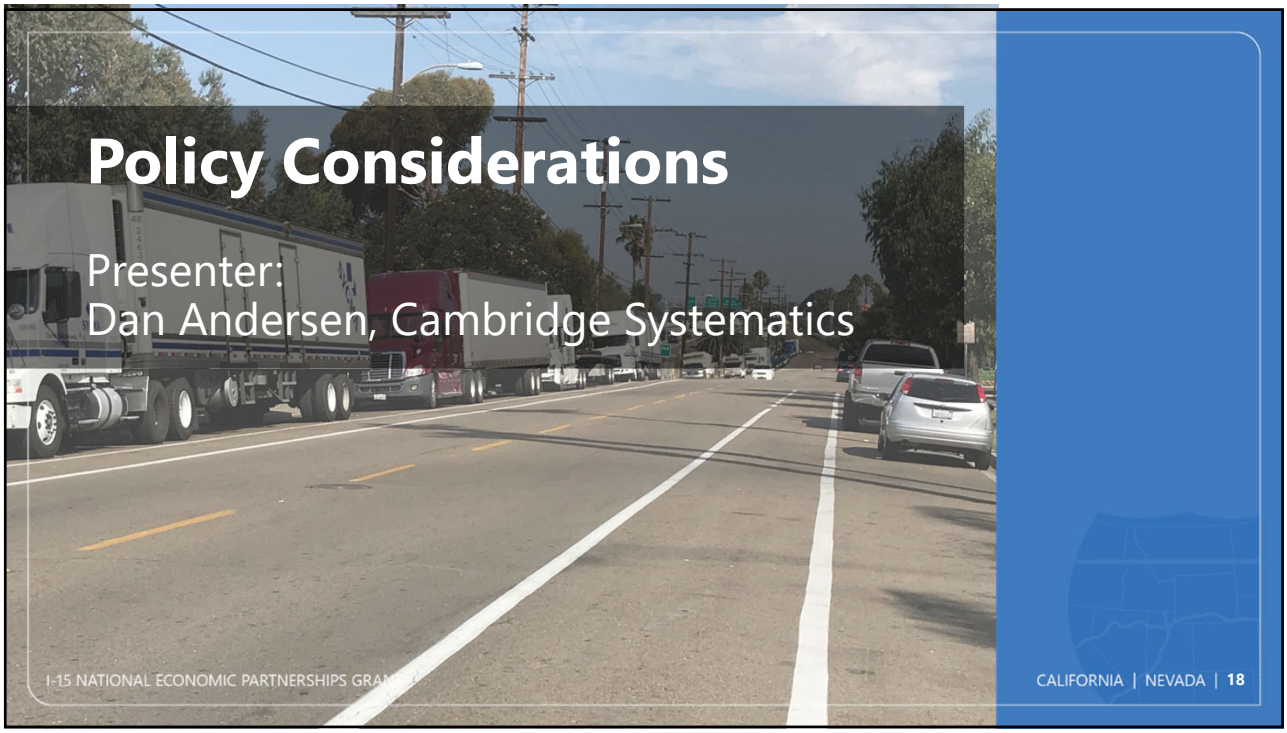
Polling Round 2

1. Which of the below characteristics of effective urban truck parking, as defined by the draft purpose statement, is most important to you? (Please select your top 2)
   a. Reliable
   b. Safe and Secure
   c. Affordable
   d. Has the amenities drivers need
   e. Supported by the surrounding community
2. What amenities must be available to truck drivers who are parking short periods of time while waiting for a load, pick-up/delivery appointment, or border crossing? (Please select your top 2)
   a. Security fencing and system
   b. Reservation system
   c. Real-time parking space availability information
   d. Toilets
   e. Enhanced vending machines (better quality food and medicines)
   f. Driver Lounge
   g. Wi-Fi

Polling Round 2 - Results







Policy Considerations

Presenter:
Dan Andersen, Cambridge Systematics

Policy Considerations

- Require shippers/receivers to provide on-site parking, or contribute to common staging lot
  - Include truck parking and queuing demand as part of Traffic Impact Analyses for new developments
- Allow truck parking in publicly-owned spaces
  - Along designated curbs – smart parking zones
  - At public facilities during off hours (park and ride lots, bus depots, maintenance lots, etc.)
- Partner with or provide incentives to privately-owned facilities (such as malls, stadiums, commercial centers, industrial properties) to allow truck parking during specified hours
- Partner with or provide incentives to private truck parking providers to build new lots in areas of high need
- Increase enforcement of unauthorized parking in areas with a surplus of spaces

The Township of Upper Macungie, Pennsylvania passed a zoning ordinance which requires new warehouse or distribution facilities provide off-street truck parking and staging.

The new zoning requirement specifies that **"the applicant shall present credible evidence that the number of oversized off-street parking spaces provided for trucks will be adequate to accommodate the expected demand generated by the warehouse activities."**

Implementation Champions

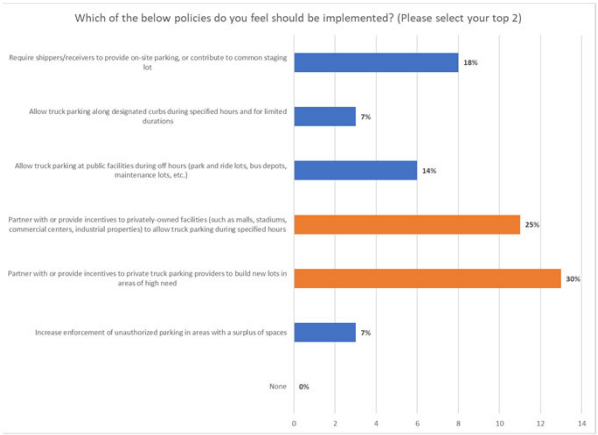
Policy	Champions
Require shippers/receivers to provide on-site parking, or contribute to common staging lot	• Local agencies • Public land owner • Private land owner • Private company • Law enforcement • Code enforcement
Allow truck parking in publicly-owned spaces	
Partner with or provide incentives to privately-owned facilities to allow truck parking during specified hours	
Partner with or provide incentives to private truck parking providers to build new lots in areas of high need	
Increase enforcement of unauthorized parking in areas with a surplus of spaces	

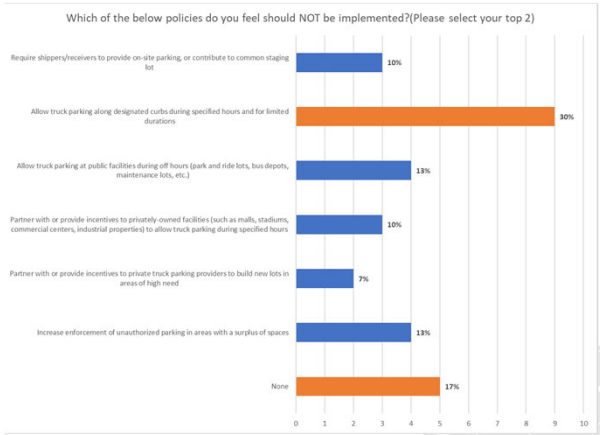
Poll 3: Policies

Polling Round 3

1. Which of the below policies do you feel should be implemented? (Please select your top 2)
   a. Require shippers/receivers to provide on-site parking, or contribute to common staging lot
   b. Allow truck parking along designated curbs during specified hours and for limited durations
   c. Allow truck parking at public facilities during off hours (park and ride lots, bus depots, maintenance lots, etc.)
   d. Partner with or provide incentives to privately-owned facilities (such as malls, stadiums, commercial centers, industrial properties) to allow truck parking during specified hours
   e. Partner with or provide incentives to private truck parking providers to build new lots in areas of high need
   f. Increase enforcement of unauthorized parking in areas with a surplus of spaces
   g. None
2. Which of the above policies do you feel should NOT be implemented?

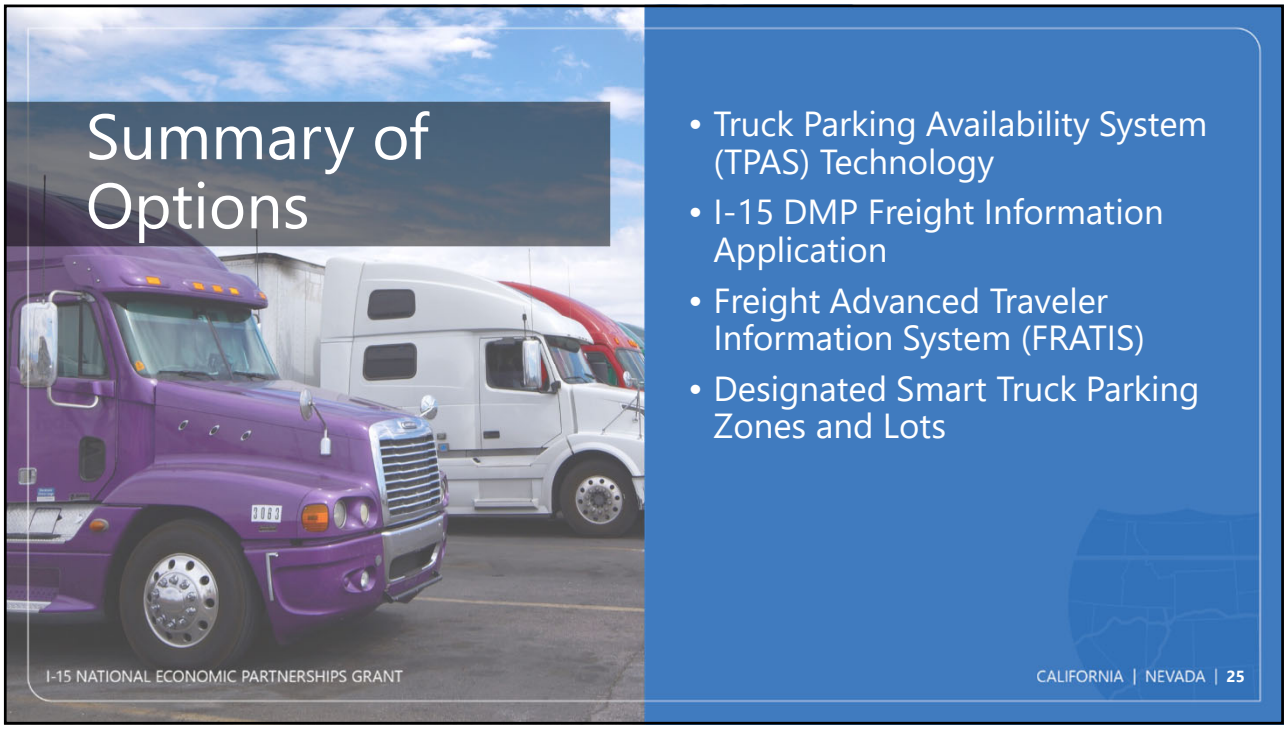
Polling Round 3 - Results

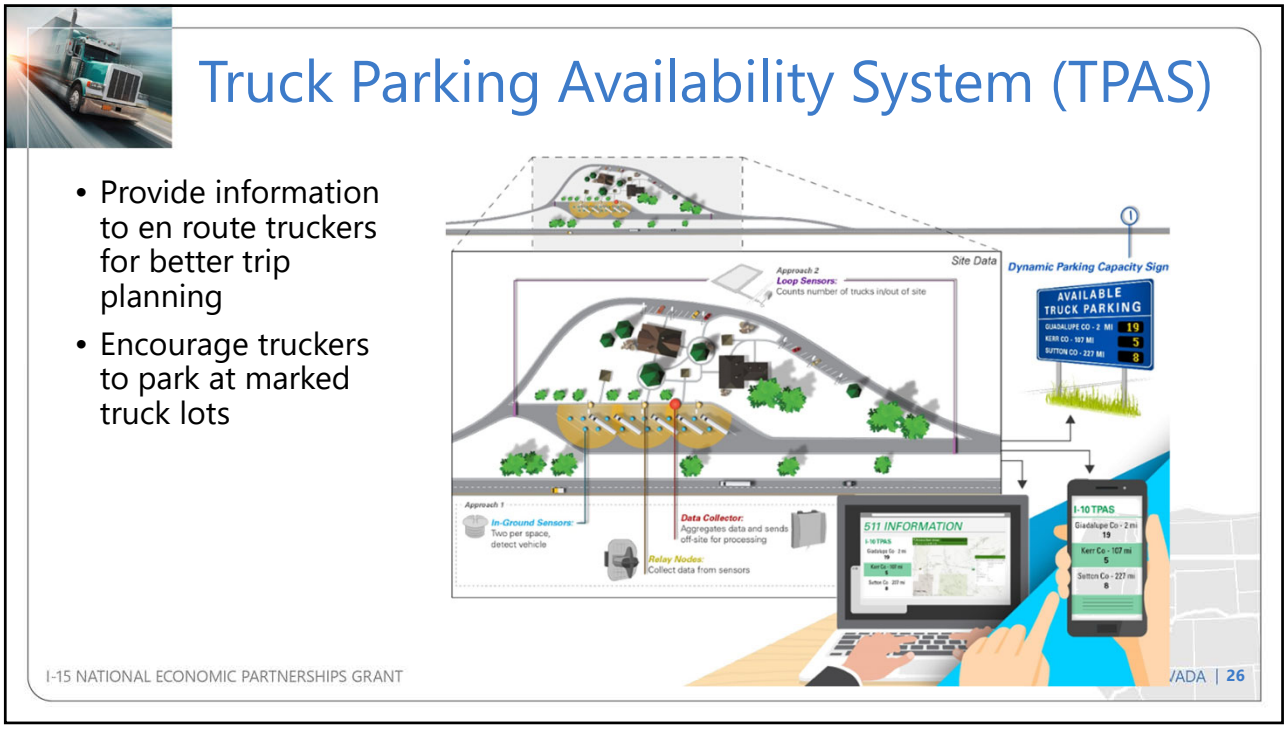




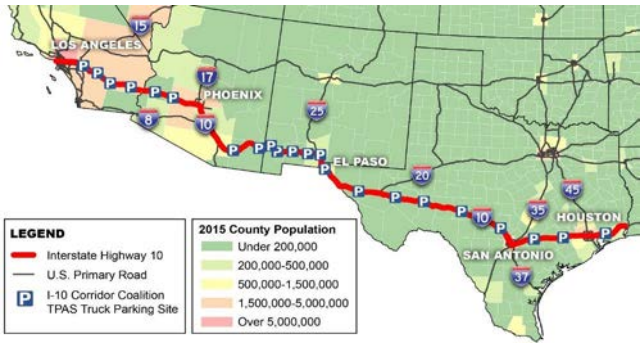
Technology Considerations

Presenter:
Mark Jensen, Cambridge Systematics
Lisa Burgess, Kimley-Horn


Summary of Options
• Truck Parking Availability System (TPAS) Technology
• I-15 DMP Freight Information Application
• Freight Advanced Traveler Information System (FRATIS)
• Designated Smart Truck Parking Zones and Lots
I-15 NATIONAL ECONOMIC PARTNERSHIPS GRANT
CALIFORNIA | NEVADA | 25


Truck Parking Availability System (TPAS)
• Provide information to en route truckers for better trip planning
• Encourage truckers to park at marked truck lots
Site Data
Dynamic Parking Capacity Sign
AVAILABLE TRUCK PARKING
Approach 2
Loop Sensors:
Counts number of trucks in/out of site
Approach 1
In-Ground Sensors:
Two per space, detect vehicle
Data Collector:
Aggregates data and sends off-site for processing
Relay Nodes:
Collect data from sensors
511 INFORMATION
I-10 TPAS
I-15 NATIONAL ECONOMIC PARTNERSHIPS GRANT
VADA | 26

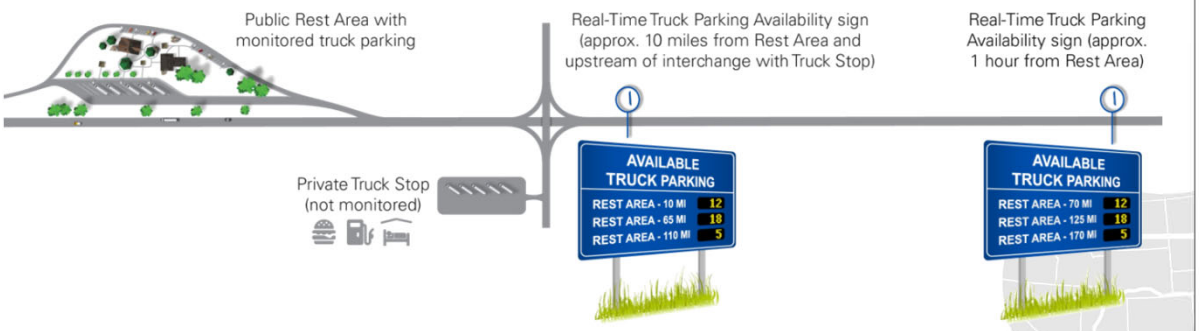
I-10 Corridor Coalition TPAS



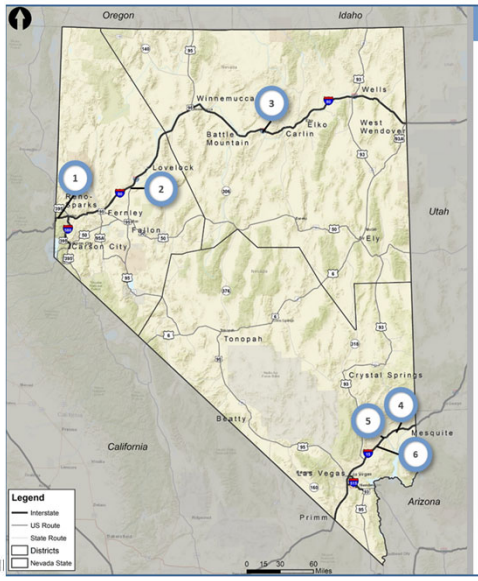
- The I-10 Corridor Coalition includes four state DOTs (CA, AZ, NM, and TX) that are organized under a charter and operating agreement.
- The I-10 Corridor Coalition developed a ConOps and was awarded a 2018 ATCMTD Grant to support TPAS Deployment

Nevada TPAS Project

- NDOT is currently developing a TPAS Concept of Operations
- Based on FHWA systems engineering best practices



Nevada TPAS Pilot Sites



TPAS Implementation Projects

1. Mogul Truck Parking (EB and WB)
2. Trinity/Fallon Rest Area
3. Beowawe Rest Area (EB and WB)
4. I-15 MP 110 Truck Parking (Expansion)
5. I-15 MP 96 Truck Parking (Expansion)
6. I-15 MP 88 Truck Parking

NDOT TPAS

Potential Technology Elements

Wireless Magnetometer or Ground-Fired Radar

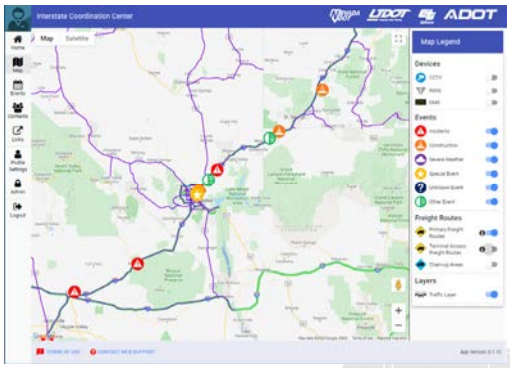
Side-Fire Microwave Radar

Video Analytics

Video Detection

I-15 Dynamic Mobility Project (DMP)

- I-15 Alliance (CA, NV, UT) developed a web-based tool to support better situational awareness and coordination along I-15
  - Incidents
  - Work zones
  - CCTV views
  - Alerts
  - Weather events
  - Other corridor restrictions
- Customized information available:
  - Users select parts of I-15 for alerts
  - Types of alerts
  - Email or text
  - Weekly summary of upcoming construction and other events
- Leverages existing agency data and devices



I-15 DMP

Helpful Features for Freight

- ***Freight Information Application*** pilot test with small number of freight operators
  - Real-time transportation alerts provided to trucking company participants via email and text
    - Primary freight routes
    - Terminal access freight routes
    - Chain up areas
  - A simple registration web site
    - Truckers/Dispatchers can enter alert notifications and geographic preferences to customize their user experience

Future Considerations:

- Support for truck parking, truck parking locations
- Potential for information on local area truck routes or restrictions
- Link to additional freight-related resources
- Expand freight users of the I-15 system

Freight Advanced Traveler Information System (FRATIS)

- Real-time data integration (TMS, TOS, appointments)
- Truck trip route optimization based on real-time data
- Port container pickup and delivery metrics and analytics
- Leverage regional traveler information data (RIITS)
- Ability to integrate CV/AERIS applications
- API-based open architecture

Smart Parking Zones for Curbside Management

Smart road signs

Extremely quick, energy-saver and precise method to identify and locate smart loading zones.

Mobile app for drivers

To easily register their parking operations and gather occupancy information (free parking slots).

Mobile app for parking agents

To efficiently control the status of the vehicles in the smart loading zones of the city.

Web-based BackOffice

To set-up the platform, define particular parking permit and time-limit per zone and consult statistics.

Conceptualizing a Technology Solution for I-15 Urban Truck Parking

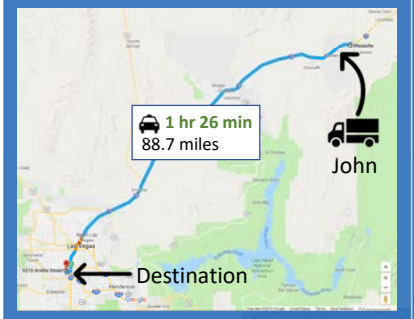
Presenter:
Mark Jensen, Cambridge Systematics
Lisa Burgess, Kimley-Horn

Combining Technologies into Operational Scenarios

- Truck Parking Availability Technology
  - Real-time parking availability at all public rest stops; integrate private truck parking info where available
  - Dissemination through mobile app, web app and dynamic parking capacity signs
- I-15 DMP Freight Information Application
  - Deploy as basis for traveler information and alert information to be provided to the trucking fleets through the truck parking application
- FRATIS
  - Use the geofencing of freight terminals concept and develop geofences around all warehouses, DC's and other freight facilities that do not provide for truck parking
  - Add TPAS technology to truck parking facilities near these facilities, if not already deployed
- Designated Smart Truck Parking Zones and Lots

Potential Operational Scenario

1. John is driving south on I-15 and needs to arrive at Good Buys DC in Las Vegas before 9:00 PM closing, and find parking before HOS run out
2. His hands-free Truck and Parking Information (TPI) app alerts him of substantial congestion and reroutes him
3. John arrives at Good Buys DC at 8:45 PM in time to make his delivery, but with only 45 minutes left on his HOS
4. The TPI knows John's location and gives him an automated audible alert, "*overnight parking available after Good Buys delivery at 7000 S Decatur Blvd.*"
5. John arrives at 9:20 PM, enters a 4-digit code at the lot gate that the TPI app has texted him, and parks with 5 minutes to spare on his HOS limit.
6. TPI bills Good Buys DC $25 for John's use of the overnight facility



Potential Operational Scenarios

Long-term parking at large lot on outskirts of urban area with amenities and no time restrictions

Short-term parking at small, public smart parking zones inside urban area with restrictions on time and duration of parking, and limited amenities

New Public Truck Staging Lot

Short-term parking at private parking areas inside urban area with restrictions on time and duration of parking, and limited amenities

Source: Truck Depot LLC

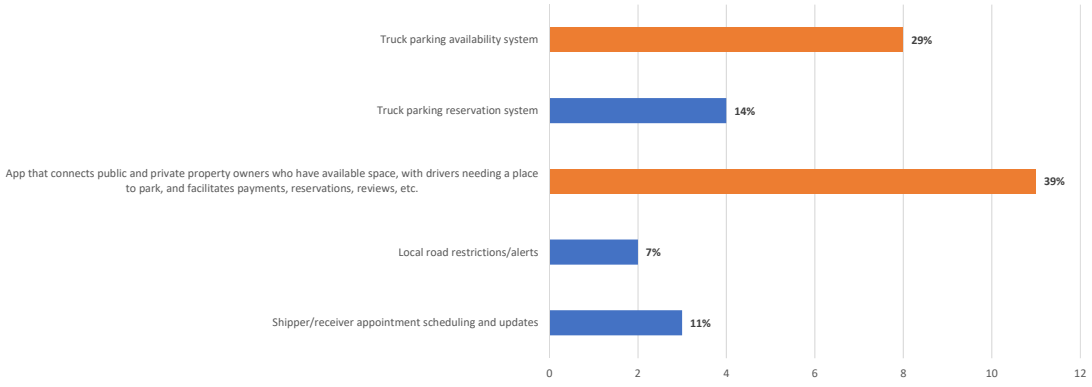
Poll 4: Technologies

Polling Round 4

1. Which of the below technologies do you feel would most effectively address the needs for urban truck parking? (Please select your top 2)
   a. Truck parking availability system
   b. Truck parking reservation system
   c. App that connects public and private property owners who have available space, with drivers needing a place to park, and facilitates payments, reservations, reviews, etc.
   d. Local road restrictions/alerts
   e. Shipper/receiver appointment scheduling and updates

Polling Round 4 - Results

Which of the below technologies do you feel would most effectively address the needs for urban truck parking?
(Please select your top 2)

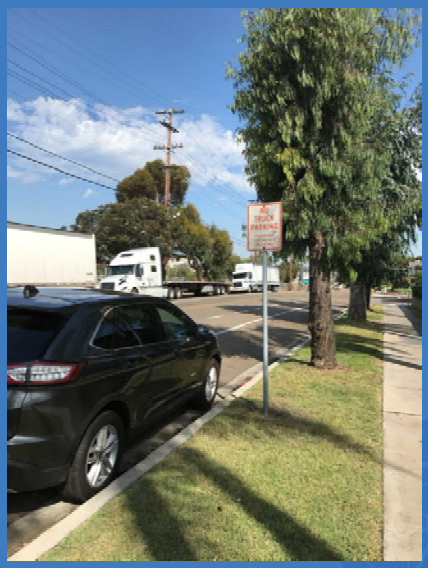


Open Discussion and Next Steps

Presenter:
Dan Andersen, Cambridge Systematics
Jason Love, NDOT

Next Steps

- Freight Truck Parking Technology RFI
- Policy interviews with select stakeholders
- May Webinar: Draft policy & technology recommendations



THANK YOU

CONTACTS

Jason Love/NDOT
702-730-3311
JLove@dot.nv.gov

Vern Keeslar/PMX
385-419-2681
vkeeslar@parametrix.com

Attachment C

Stakeholder Webinar – Truck Parking Technologies

I-15 Urban Truck Parking Technology Webinar Summary

Subject:	Summary of I-15 Urban Truck Parking Policy and Technology Recommendations Webinar
Prepared for:	Nevada Department of Transportation, Caltrans, and Partner Agencies
Prepared by:	Parametrix
Date:	May 6, 2020

Introduction and Overview

The California Department of Transportation (Caltrans) and Nevada Department of Transportation (NDOT) were awarded a National Economic Partnerships (NEP) Grant by the Federal Highway Administration (FHWA) to develop an I-15 Freight Mobility Enhancement Plan (MEP) that can serve as a framework for more coordinated freight planning within the megaregion. As part of this plan, the project team is conducting a series of workshops/webinars with partner agencies and regional stakeholders over the course of the project (see Figure 1).

Figure 1: I-15 Freight MEP Stakeholder Meetings

These meetings provide opportunities to discuss the challenges and solutions surrounding urban truck parking along the I-15 Corridor between San Diego, California and Las Vegas, Nevada. The date, time, and locations of the meetings completed to date are provided in Table 1. This document provides a summary of the Technology Exploration Webinar conducted on May 6, 2020, and a copy of the presentation is attached along with the list of attendees.

Table 1: I-15 Freight MEP Stakeholder Meetings to Date

MEETING	DATE	TIME	LOCATION
Introductory Workshop – San Diego Region	November 13, 2019	2:30 – 4:30 p.m.	Caltrans District 11 4050 Taylor Street San Diego, CA
Introductory Workshop – Southern Nevada Region	November 19, 2019	1:00 – 3:00 p.m.	RTC of Southern Nevada 600 S Grand Central Parkway Las Vegas, NV
Introductory Workshop – Inland Empire Region	December 11, 2019	1:00 – 3:00 p.m.	SCAG Riverside County Regional Office 3403 10th Street, Suite 805 Riverside, CA
Technology and Policy Exploration	January 8, 2020	1:00 – 2:30 p.m.	Webinar
Policy and Technology Recommendations	**May 6, 2020**	**10:00 – 11:30 a.m.**	**Webinar**

Note: For those unable to attend the three introductory workshops in person, a webinar link was provided allowing stakeholders to participate remotely

Meeting Summary

The meeting started with an overview of the National Economic Partnerships program and this I-15 Freight MEP project. This is the second in a two-part series of webinars on technology and policy options to help alleviate issues with urban truck parking. Project team members summarized the Request for Information (RFI) solicitation that was made as part of this project to learn about new and innovative technology urban truck parking programs and strategies. Solutions included those relating to lot-based truck parking availability systems (lot-based TPAS) and dynamic mobile application-based parking solutions. In addition, a series of business models were proffered, including P3 agreements, public agency-led models, and private-entity led models. Responses also presented considerations regarding policy implications, such as zoning and land use, revenue and cost sharing, safety policies for mobile communications, and federal policies and regulations. Lastly, a summary of COVID-19 short-term impacts on the supply chain were provided, to understand potential longer-term shifts that should be considered.

Polling questions were asked throughout the meeting with discussions following each major item presented. The polling questions and responses are included in the presentation attached to this summary. The following sections summarize the discussions that took place over the course of the meeting.

RFI Responses: Technology Options

- What happens if the technology fails for the Truck Parking Marketplace? Do drivers get compensated if they breach hours of service (HOS) because there are no spaces available?

  - The implications of this were not discussed in recent conversations with the vendor, however, this concept is similar to an AirB&B, with the risk mostly sitting with the truck driver. However, each provider would receive ratings based on the performance and operations of their facility and after many poor reviews, the community would essentially "self-police" or make it known which providers are more reliable than others.

- The overwhelming majority of responses to Poll #2 (technology options most likely to improve truck parking/most feasible to implement) was for lot-based TPAS. This is surprising, as it does not increase capacity as much as other options, but it does increase knowledge of available parking locations.
  - True; this works particularly well for logistics planning outside urban areas where parking choices are much more limited. Other solutions may be more dynamic in urban cores.

RFI Responses: Business Models

- It was noted that a P3 business model helps spread the costs of implementation/operations, but is most applicable at a facility that imposes a fee. So, who sets the parking fee/rate?
  - This depends on who has the primary control, where the facility is located, what the market can bear, etc. In some cases, charging a fee is not allowed (e.g., TPAS at rest areas – state DOT usually pays for implementation, and pays provider for operations and maintenance, but no fee is passed on to drivers).
  - Follow-up: P3 lease agreements should put controls in place to minimize fees.
- Do you know of any examples where a DOT built an urban truck parking lot and the private sector maintained it?
  - There are a handful of examples across the country.
  - Florida did this with Section 1305 funds (Tom Kearny/FHWA, Rickey Fitzgerald, Florida DOT).
  - Preliminary planning was done for truck parking lots as part of I-81 study 5-10 years ago in Virginia; P3s were explored as part of that study.
  - It seems as if this has occurred with mixed results – in addition to the benefits, there are the costs of trash pick-up, lighting, branding, etc. And who is liable in the case of incidents (public vs. private).

RFI Responses: Policy Considerations

- There seems to be a lot of confusion in the public regarding this pandemic and the availability of food and other amenities for truck drivers, especially regarding truck stops and rest areas. Truck stops are not closed. Restaurants have not stopped offering food, they just offer it differently (e.g., curbside). Truckers rely on many other amenities at truck stops, like laundry, showers, and overnight parking. Before you start offering other solutions that compete with truck stops, consider what else truck drivers need.

  - True, in our research, most truck drivers PREFER truck stops. This is the best solution to meet their needs. However, in many urban areas, there just is not enough truck parking consistently available at truck stop and other solutions are needed.
  - It's great that food trucks are able to offer food options at rest areas during this pandemic (usually not legal). There are not yet any food trucks along I-15 in California.
- When food trucks are allowed, do they need permitting from the state DOT? How is this advertised?
  - Unsure of this answer, but would assume that yes, the state DOT would issue the permitting.
  - In Ohio, the DOT is issuing at no cost to the food trucks.
- Zoning policies regarding shipping/receiving yards to require onsite parking must be done on a regional level. If one city/county requires the onsite parking and the neighboring jurisdiction does not, new business will build where parking is not required to save money.
  - Agree! Partners along the I-15 corridor should work together to implement consistent policies.
- Facilitator question: to cities and agencies, what is the downside of requiring shippers/receivers to provide parking?
  - Difficulty in determining an honest/fair and accurate formula for how many spaces are needed. Many shippers/receivers have seasonal ebbs/flows.
  - Having a common parking lot that can service various shippers can help even out the demand.
  - Convincing the decisionmakers that the issue is more important than the objections of the commercial developers. To a large degree, inertia. If the issue is perceived as a draw, no action will be taken.

Meeting Recording

- The link below provides access to the webinar.
- https://parametrix.zoom.us/rec/share/xZRPKfLiq0xISK_X9xD_ZqwKD67AT6a8gCMer6FZz0uYr0OfvwFUkfAh8IiDDfDY

Attachment 1: Workshop Attendees

I-15 Freight MEP Draft Technology and Policy Recommendations Webinar - May 6, 2020

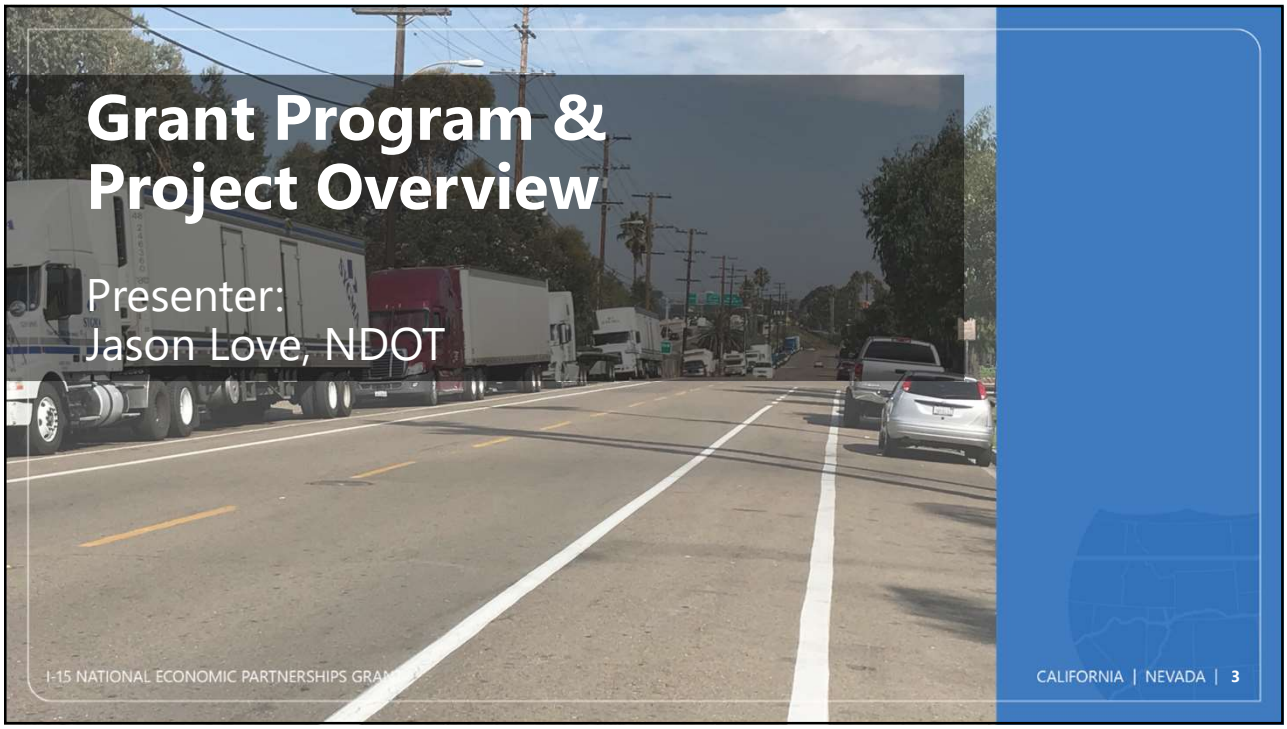
Organization	First Name	Last Name	Email	Attendance
American Transportation Research Institute	Dan	Murray	dmurray@trucking.org	Webinar
American Transportation Research Institute	Mike	Tunnell	mtunnell@trucking.org	Webinar
Caltrans	Kelly	Eagan	kelly.eagan@dot.ca.gov	Webinar
Caltrans	Eric	Fredericks	ERIC.FREDERICKS@DOT.CA.GOV	Webinar
Caltrans	Brian	Hadley	brian.hadley@dot.ca.gov	Webinar
Caltrans	Patrick	Lee	patrick.lee@dot.ca.gov	Webinar
Caltrans	Jose	Marquez	jose.marquez@dot.ca.gov	Webinar
Caltrans	Barby	Valentine	barby.valentine@dot.ca.gov	Webinar
Caltrans - District 11	Rob	owen	rowen@dot.ca.gov	Webinar
Caltrans - District 8	Kwasi	Agyakwa	kwasi.agyakwa@dot.ca.gov	Webinar
Caltrans - District 8	Danny	Arellano	daniel.arellano@dot.ca.gov	Webinar
Cambridge Systematics	Dan	Andersen	dandersen@camsys.com	Webinar
Cambridge Systematics	Mark	Jensen	mjensen@camsys.com	Webinar
City of Las Vegas	Rick	Schroder	rschroder@lasvegasnevada.gov	Webinar
City of Rancho Cucamonga	Ian	Tai	ian.tai@cityofrc.us	Webinar
City of San Diego	Emanuel	Alforja	ealforja@sandiego.gov	Webinar
City of San Diego	Maureen	Gardiner	mgardiner@sandiego.gov	Webinar
Clark County	Jim	Andersen	james.andersen@clarkcountynv.gov	Webinar
Clark County, NV	Kathleen	Walpole	kathleen.walpole@clarkcountynv.gov	Webinar
CPCS	Dike	Ahanotu	dahanotu@cpcstrans.com	Webinar
FHWA	Enos	Han	enos.han@dot.gov	Webinar
FHWA Headquarters	James	Garland	james.garland@dot.gov	Webinar
Hickory Ridge Group LLC	Heather	Monteiro	heather@hickoryridgegroup.org	Webinar
Kimley Horn	Lisa	Burgess	Lisa.Burgess@kimley-horn.com	Webinar
KKW Trucking Inc	Tim	Abbott	tabbott@kkwtrucks.com	Webinar
Lacuna Technologies	Jessica	Davis	jessica.davis@lacuna.ai	Webinar
Lacuna Technologies	Anil	Merchant	anil.merchant@lacuna.ai	Webinar
Las Vegas Convention and Visitors Authority	Wendy	Strack	wendy@wjsconsult.com	Webinar
Maritime Administration, USDOT	Eric	Shen MARAD	eric.shen@dot.gov	Webinar
National Association of Truck Stop Operators	Tiffany	Wlazlowski Neuman	twlazlowski@natso.com	Webinar
Navy	Dave	Zajac	david.j.zajac6@gmail.com	Webinar
NDOT	Jason	Love	jlove@dot.nv.gov	Webinar
NDOT	Bill	Thompson	bthompson@dot.nv.gov	Webinar
Nevada Highway Patrol	John	Arias	jarias@dps.state.nv.us	Webinar
Nevada Highway Patrol	Don	Plowman	dplowman@dps.state.nv.us	Webinar
Parametrix	Michael	Baker	mbaker@parametrix.com	Webinar
Parametrix	Vern	Keeslar	vkeeslar@parametrix.com	Webinar
Parametrix	Jackie	Kuechenmeister	jkuechenmeister@parametrix.com	Webinar
Parametrix	Bardia	Nezhati	bnezhati@parametrix.com	Webinar
Parkunload	Roger	Vilanou	rvilanou@parkunload.com	Webinar
Port of San Diego	Laura	Wagner	lwagner@portofsandiego.org	Webinar
SANDAG	Zach	Hernandez	zhe@sandag.org	Webinar
TrAvel centers of america	Ray	De La Luz	Rdelaluz@ta-petro.com	Webinar
Truck Specialized Parking Services	Scott	Grenerth	sgrenerth@tsps.io	Webinar
Truline Corporation	Paul	Truman	ptruman@trulinecorp.com	Webinar
WSP USA	Virginia	Lingham	virginia.lingham@wsp.com	Webinar

Other Attended (11)

Attachment 2: Workshop Presentation

1

2


Grant Program &
Project Overview
Presenter:
Jason Love, NDOT
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Grant Purpose
National Economic Partnerships Initiative promotes efficiency and regional cooperation by identifying best transportation planning practices that can be implemented by jurisdictions who want to work across their boundaries.
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I-15 Freight Mobility Enhancement Plan Purpose

- Identify strategies for providing effective urban truck parking along the I-15 Corridor.
  - Reliable, secure, affordable, with the amenities drivers need, and supported by the surrounding community
- Develop an actionable implementation plan
  - Defines the partnerships, technology, policy, and funding frameworks needed for successful implementation, collaboration, and economic partnership

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Project Timeline

Project Timeline and Stakeholder Workshops

2019 SEPTEMBER	NOVEMBER	2020 JANUARY	MAY	AUGUST	NOVEMBER
Kickoff Meeting	Introductory Workshops/Freight Parking Goals and Needs Review	Policy and Technology Exploration Webinar	Draft Policy and Technology Recommendations Webinar	Implementation Framework Review Webinar	I-15 Freight MEP Findings

- Purpose of this Webinar
  - Findings from the Truck Parking Technology RFI
  - Technology strategies
  - Supporting policies
- Immediate Next Steps
  - Prepare draft Implementation Framework
  - August Webinar: Review and Discuss Implementation Framework

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Poll & Discussion 1: Attendees

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Polling Round 1

1. Who are you representing and/or work for?
   a. City or County government
   b. Other local, regional, state, or federal government agency
   c. Technology provider
   d. Truck parking provider
   e. Trucking industry (driver, company, association, etc.)
   f. Commercial developer or company that ships & receives goods
   g. Consultant
   h. Other
2. Have you attended any of the previous workshops or webinar?
   a. Yes
   b. No

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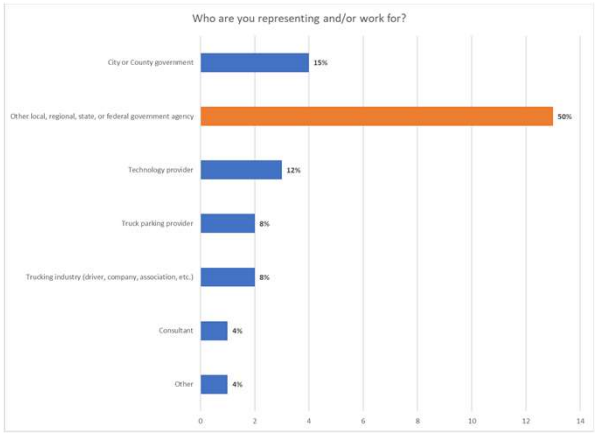
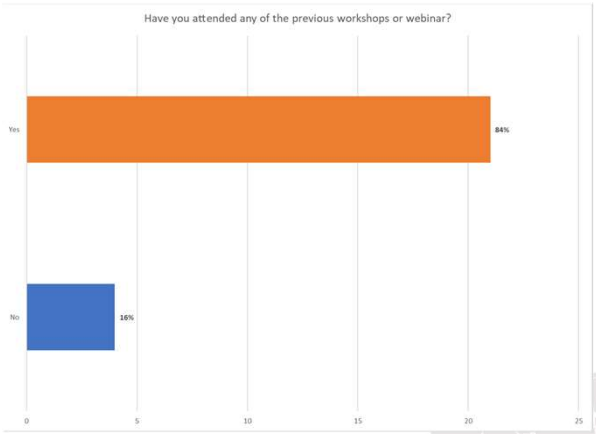
Polling Round 1 - Results





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RFI Technology Exploration Introduction

Presenter:
Lisa Burgess, Kimley-Horn

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Technology Exploration Objective

- Explore potential technologies that can support urban truck parking programs and strategies
- Identify supporting policies, processes and partnerships needed
- Evaluate the various business models and levels of public sector involvement:
  - Planning
  - Procurement
  - Implementation or installation
  - Operations
  - Enforcement
  - Maintenance
  - Promoting availability and marketing to prospective partners

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Research on Emerging Technologies: Mobile Applications

App Name	Features	Android Downloads*	Android Rating*	iOS Rating*
Trucker Path	Directions, parking availability, work-matching, finding services	> 1 Million	4.0 46K ratings	4.7 50.9K ratings
Keep Truckin	Electronic logbook for Hours of Service documentation	> 1 Million	4.3 23K ratings	4.5 5.12K ratings
Truck Smart (TA Petro)	Fuel prices, service requests, parking reservations	> 500,000	2.4 4K ratings	1.5 41 ratings
Trucker Tools	Fuel prices, directions and live traffic, finding services	> 100,000	3.2 1K ratings	3.2 79 ratings
Pilot Flying J	Directions, amenities, parking availability and reservations, finding services	> 1 Million	4.6 24K ratings	4.8 24.2K ratings
Love's Connect	Travel stop locator, mobile pay, real-time fuel prices	> 1 Million	4.2 23K ratings	4.0 1.5K ratings
Truck Parking USA	Crowdsourced app for truck parking spaces	> 100,000	4.0 554 ratings	4.0 5 ratings

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Research on Emerging Technologies: Studies and Current Programs

- Improved Urban Freight Mobility and Delivery Operations, Logistics, and Technology Strategies (FHWA-HOP-18-020, May 2018)
- Best Practices for Truck Parking Availability Detection and Information Dissemination
- MAASTO Truck Parking Information Management System (TPIMS)
- The Center of Excellence for Sustainable Urban Freight Systems (CoE-SUFS)
- Shared Truck Parking Concepts (prepared by CPCS for this study)

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Shared Truck Parking Concepts

Urban Consolidation Centers

- Carriers delivering to same area transfer loads at a terminal for consolidation
- Last mile delivery made by a single truck
- Reduce freight traffic circulating within a target area

Comparable Long-haul Truck Parking and Consolidation Yard

- Target area: Logistic centers and border crossings in Laredo, TX
- Yard operator will shunt trailers to final destination
  - Large trucking companies can drop trailers
  - Owner-operators who can't drop trailers can transfer (cross-dock) loads
- Offer overnight parking, reservation system, trailer repair

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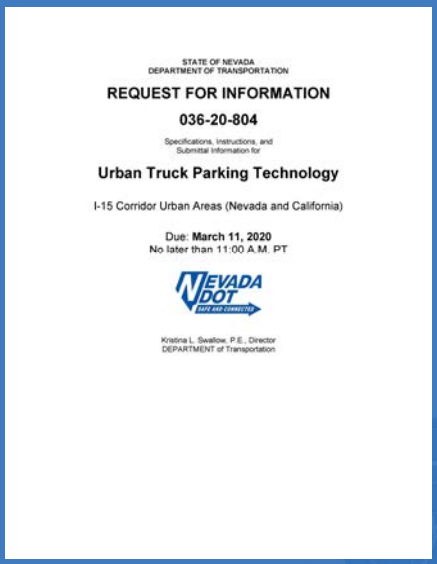
Industry Request for Information

- Technology providers and developers, implementing agencies, research and academia and trucking associations
- Emerging technologies and concepts, potential partnering opportunities
- Distribution
  - NDOT's procurement web site
  - National association channels
    - National Operations Center of Excellence electronic newsletter
    - Industry daily email blast
    - TRB urban freight-focused committees
    - Lead-sharing services
- Eight responses received



STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

REQUEST FOR INFORMATION

036-20-804

Specifications, Instructions, and Submittal Information for

Urban Truck Parking Technology

I-15 Corridor Urban Areas (Nevada and California)

Due: **March 11, 2020**
No later than 11:00 A.M. PT

NEVADA DOT

Kristina L. Swallow, P.E., Director
DEPARTMENT of Transportation

RFI Responses: Technology Options

Mark Jensen, Cambridge Systematics

Two System-level Technology Areas of Focus for Urban Truck Parking

- Lot-Based Truck Parking Availability Systems (Lot-Based TPAS)
  - Better utilization of existing truck parking capacity
  - Use case: Demand equals supply
    - Unauthorized parking reasonably close to underutilized parking lots
    - App redistributes demand
- Dynamic Mobile Application-Based Parking Solutions
  - Some apps generate additional truck parking capacity
  - Use case: Demand exceeds supply
    - Unauthorized parking because all parking lots are maxed out
    - App generates additional supply

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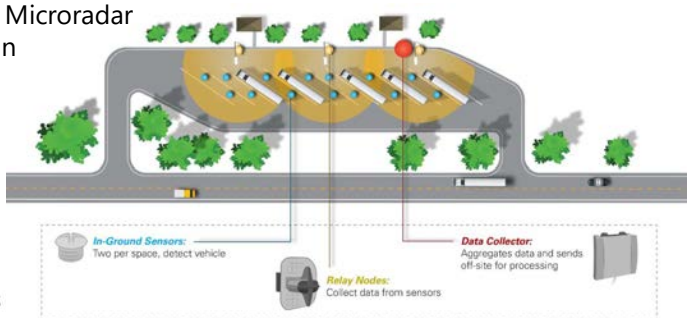
Lot-Based Truck Parking Availability Systems (Lot-Based TPAS)

- TPAS Entry/Exit Counting Approach
  - Magnetometers
  - Side-Fired Microwave Radar
  - Video Detection
- TPAS Space-by-Space Counting Approach
  - Ground-Based Microradar
  - Video Detection
  - Radar



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Lot-Based TPAS

- Application and Information Dissemination
  - Static Blue Services Sign with Matrix Panel
  - Dynamic Message Signs
  - Website/Mobile Application

Example Dissemination Methods

(IIS Drivewyze App and Matrix Panel Sign)

Source: Traffic Technology Today, March 22, 2019

Source: Cambridge Systematics

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Dynamic Mobile Application-Based Parking Solutions (Dynamic Mobile ABPS)

- Smart Urban Parking Zone
- Truck Parking Marketplace
- Parking Availability Crowdsourcing

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Smart Urban Parking Zone

- Application
  - Direct truck drivers to available curb spaces in urban settings
  - Initially developed for city delivery trucks for loading and unloading
  - Expanded for use by over-the-road drivers to find short-term staging (or overnight parking)
  - Allows curb space in urban industrial areas to be dynamically used throughout the day and week
- From driver perspective
  - Notification of nearby curbside available parking
  - Bluetooth- or WiFi-equipped signs at the parking area capture when the spot is occupied
  - Informs driver of any time limits or fee
  - Facilitates wireless payment to be made to the local jurisdiction
- From local jurisdiction perspective
  - Designate (and change at will) parking duration by vehicle type, time of day, day of week
  - Law/code enforcement use the app to check on parking compliancy
  - Charge fee if desired

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• Example Components from PARKUNLOAD

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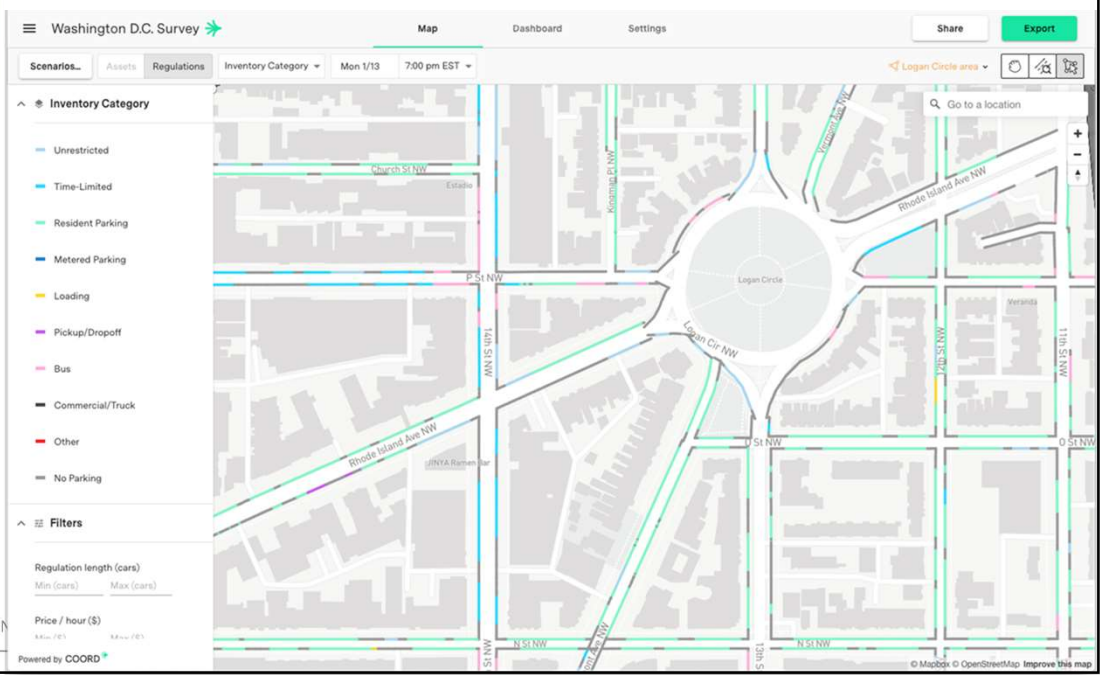
Example Urban Digital Curbside Parking Mapping – Washington DC (COORD)



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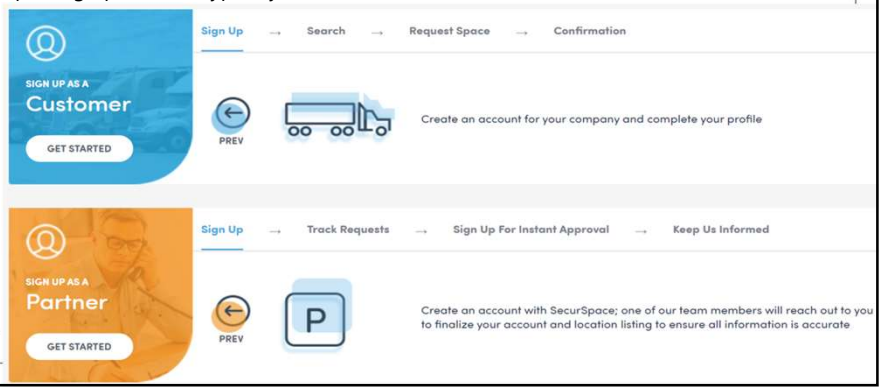
Truck Parking Marketplace

- Air BnB approach to truck parking
  - Match up parking providers with truck drivers though an online marketplace
- Creates new supply of truck parking
  - Converts available private and public parking lots into paid truck parking
  - In urban locations where truck parking options are typically scarce
- Reservation system provides security and predictability for drivers (Customers)
  - Maximize HOS (and profits)
- The landowner (Partner) earns revenue from otherwise dormant property



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Comparison of Lot-Based TPAS and Dynamic Mobile ABPS

Technology Characteristic	Lot-Based Truck Parking Availability Systems	Dynamic Mobile Application-Based Parking Solutions
Costs (capital and maintenance)	**Modest** - requires installation of sensors, and ongoing calibration and maintenance	**Low** - some require posting signs with a secure wireless device, others may be nominal fee or ad supported
Flexibility	**Low** - best used in large lots with controlled access and require significant deployment of technology	**High** - Lot owner can typically change when to allow parking at any time and as often as they like
Universality	**Yes** - system only recognizes the presence of a vehicle	**No** - While open to all, typically requires simple registration
Reservations	**Sometimes** - the space-by-space systems can be upgraded to support advance reservations	**Sometimes** – varies by system
Truck Driver Technology Experience	**Easy** - Driver can see dynamic road signs in advance of parking lot, and then simply park based on that info	**Moderate** - Driver needs to download and learn to use mobile app
Parking Lot Owner (or Public Sector) Technology Experience	**Significant** - these systems are typically deployed at designated truck parking facilities owned by public sector agencies. These agencies either run the TPAS system and software or contract it out to vendor	**Moderate** - The parking providers can usually enter a profile of their facility for drivers to see on the app

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Poll & Discussion 2: Technology Options

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Polling Round 2

1. Which of the following technologies would improve truck parking in the I-15 Corridor the most? (select up to 2)
    1. Lot-Based Truck Parking Availability Systems
    2. Dynamic Mobile ABPS: Smart Urban Parking Zone
    3. Dynamic Mobile ABPS: Truck Parking Marketplace
    4. Dynamic Mobile ABPS: Parking Availability Crowdsourcing
2. Which of the following technologies would be the most feasible to implement in the I-15 Corridor? (select up to 2)
    1. Lot-Based Truck Parking Availability Systems
    2. Dynamic Mobile ABPS: Smart Urban Parking Zone
    3. Dynamic Mobile ABPS: Truck Parking Marketplace
    4. Dynamic Mobile ABPS: Parking Availability Crowdsourcing

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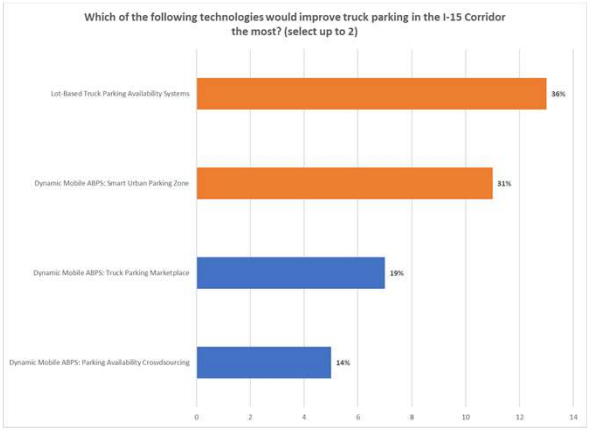
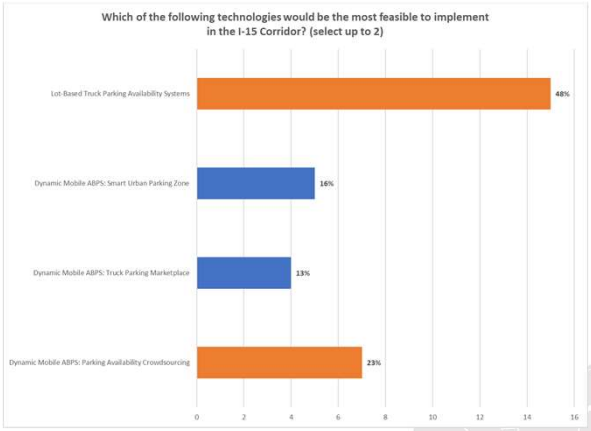
Polling Round 2 - Results





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RFI Responses: Business Models

Dan Andersen, Cambridge Systematics

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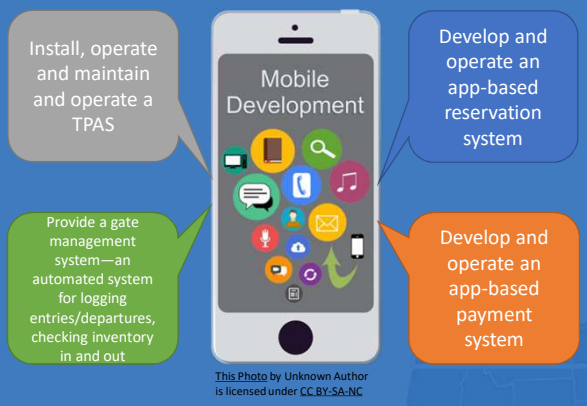
P3 Agreement between Public Agency and Technology Supplier

- Public agency
  - Owns land for truck parking facility
- Private technology partner
  - Provides a range of support services
  - Provides capital to implement and operate the system
  - Receives compensation through a profit-sharing agreement



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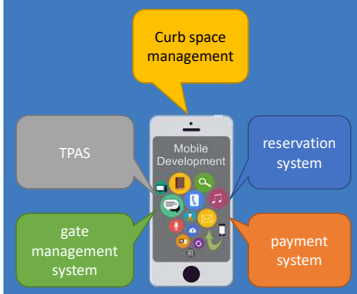
Public Agency Responsible for Enabling Technology Infrastructure

- Public agency
  - Owns land for truck parking facility
- Private technology partner is paid a fee for:
  - Providing a range of support services



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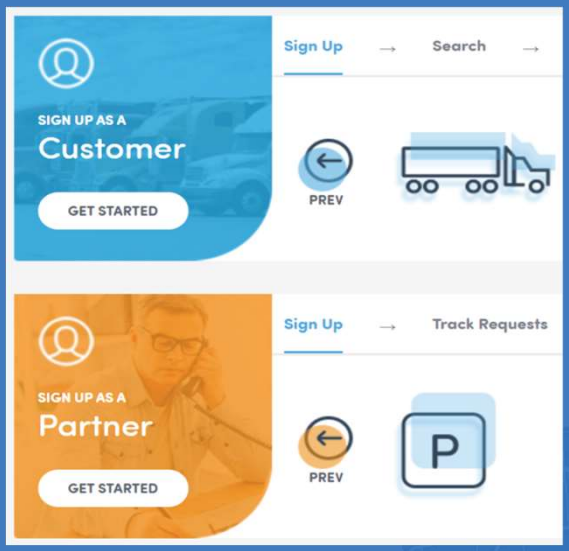
Private Entity Responsible for Enabling Technology Infrastructure

- Truck Parking Marketplace
- Does not require public or private partners
  - The entire system functions within the app
  - Does not require any physical infrastructure
- Public agencies could support by:
  - Promoting to help achieve market saturation
  - Implementing supportive policies

- Note: The property owner is responsible for ensuring their property is appropriately zoned, if required, for truck parking



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Pros and Cons of Business Models (as seen through the lens of public agencies)

Business Model	Pros	Cons
P3 Agreement between Public Agency and Technology Supplier	· Spread the implementation costs among both parties · Public agency maintains some control · Access to innovation and expertise of private industry	· Requires some level of investment · Not available in locations where state DOTs are not allowed to charge for parking, such as within the Interstate ROW
Public agency responsible for enabling technology infrastructure	· Technology costs are typically significantly lower than costs for adding capacity · Public agency maintains full control · Available in locations where state DOTs are not allowed to charge for parking, such as within the Interstate ROW	· Public agency responsible for all capital and maintenance costs
Private entity responsible for enabling technology infrastructure	· No cost to public agency · This model is based on adding truck parking capacity by tapping into unused space, not just for managing existing capacity · Extremely flexible and can adjust quickly to market demands	· Public agency has no control

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Poll & Discussion 3: Business Models

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Polling Round 3

1. Which of the following business models would you most support? (select up to 2)
   a. P3 Agreement between Public Agency and Technology Supplier
   b. Public Agency Responsible for Enabling Technology Infrastructure
   c. Private Entity Responsible for Enabling Technology Infrastructure

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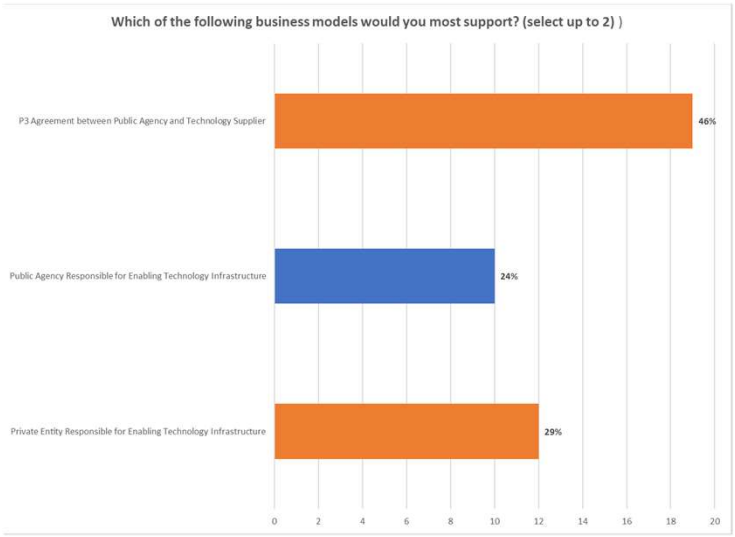
Polling Round 3 - Results



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RFI Responses: Policy Considerations

Dan Andersen, Cambridge Systematics

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Policy Considerations

- Zoning and Land Use Requirements
  - Most apps are for parking areas already zoned for industrial use
  - Policies needed to designate truck parking in public facilities after hours
  - Policies needed to require shippers/receivers to provide on-site parking
- Revenue and Cost Share Models
  - Revenue-generating programs off-set costs
  - Where prohibited, agencies could consider sponsorships
- Safety Policies for Mobile Communications
  - Regulations in place at the local, state and national levels that limit driver use of mobile technologies while driving
  - Safeguards could be implemented within apps, not allowing functionality while driving
- Federal Policies and Regulations (next slide)

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Policy Considerations

- 23 U.S.C. § 111(b) prevents the sale of goods and services at rest areas and other DOT facilities
  - Only allows for vending machines
- Food trucks now allowed due to COVID-19
- Post COVID-19 drivers will still need food and services
  - Tech providers investigating how to build food availability into their apps
  - Others considering partnering with food delivery services

Source: FreightWaves Infographic. https://www.freightwaves.com/news/food-trucks-fuel-truckers?utm_campaign=Daily%20Newsletter&utm_source=hs_email&utm_medium=email&utm_content=86136990&_hsenc=p2ANqtz-8flWwhJYEwDiGSkH42uZwAT5cYR3iS1tERLtwOWmqNWcWbdsF-Oa0Nn1y8A2wAJqZdWfJzhgqDfu0KNB9I7dfjQ-hFDA&_hsmi=86136990

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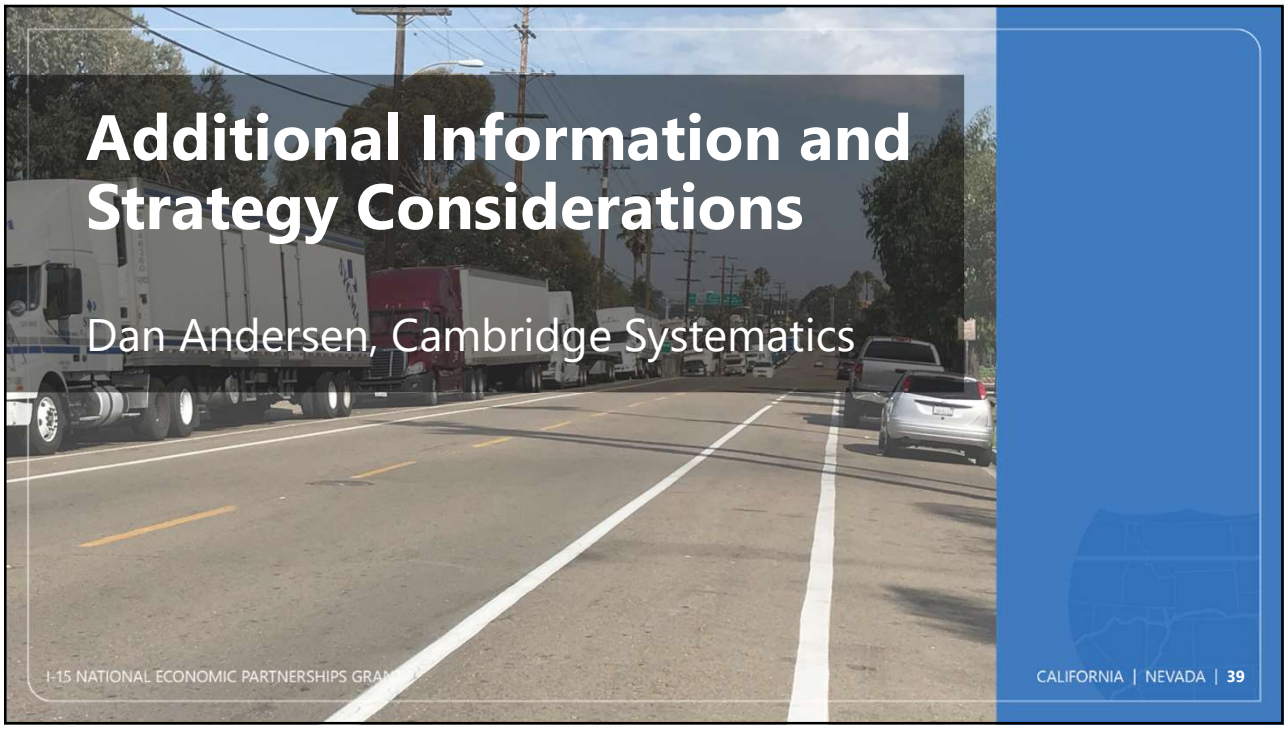
Additional Information and Strategy Considerations
Dan Andersen, Cambridge Systematics
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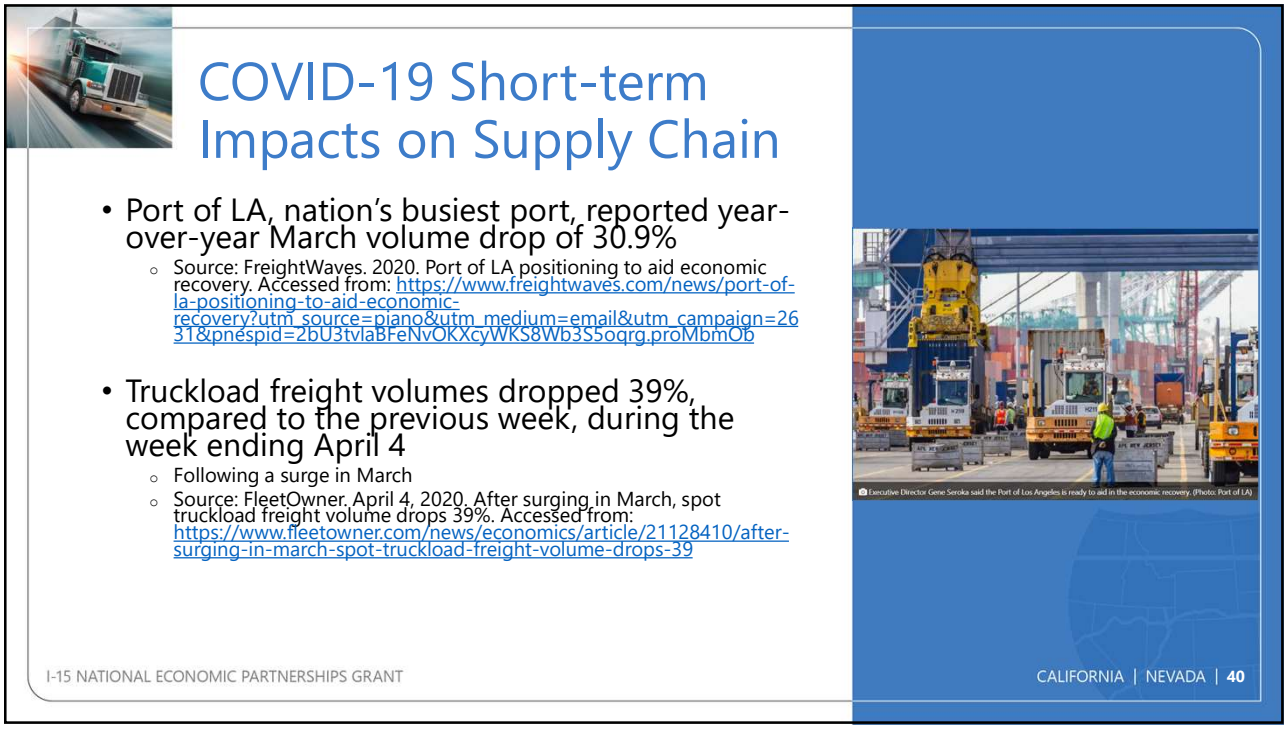
COVID-19 Short-term Impacts on Supply Chain
• Port of LA, nation's busiest port, reported year-over-year March volume drop of 30.9%
◦ Source: FreightWaves. 2020. Port of LA positioning to aid economic recovery. Accessed from: https://www.freightwaves.com/news/port-of-la-positioning-to-aid-economic-recovery?utm_source=piano&utm_medium=email&utm_campaign=2631&pnespid=2bU3tvIaBFeNvOKXcyWKS8Wb3S5oqrg.proMbmOb
• Truckload freight volumes dropped 39%, compared to the previous week, during the week ending April 4
◦ Following a surge in March
◦ Source: FleetOwner. April 4, 2020. After surging in March, spot truckload freight volume drops 39%. Accessed from: https://www.fleetowner.com/news/economics/article/21128410/after-surging-in-march-spot-truckload-freight-volume-drops-39
Executive Director Gene Seroka said the Port of Los Angeles is ready to aid in the economic recovery. (Photo: Port of LA)
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COVID-19 Induced Longer-term Shifts in Supply Chain

- e-Commerce way up
  - Some estimate that Amazon is up 35% from the same period last year
  - Amazon stock trading at $2,315, up from $1,689 one month ago
    - Source: FreightWaves. 2020. Amid a pandemic, Amazon pivots – and profits. Accessed from: https://freightwaves.com/news/amid-a-pandemic-amazon-pivots-and-profits?utm_source=piano&utm_medium=email&utm_campaign=3010&pnespid=0vE2tqUHXwiNR3laTIPm4MD1FfKagS3.OPNfMdyP
- "Shift from just-in-time supply chains to just-in-case supply chains"
  - Warehouse more goods to better respond when portions of the global supply chain collapse
    - Source: FreightWaves. 2020. Contract logistics pays off for Gebrüder Weiss in US. Accessed from: https://www.freightwaves.com/news/contract-logistics-pays-off-for-gebruder-weiss-in-us?utm_source=piano&utm_medium=email&utm_campaign=2631&pnespid=mfBs8OZTHAKNwIVSQSzba6y_gADsQQ4ZIp6RWkLk
- COVID-19 has "accelerated the factors of change that were already underway [such as supply-chain diversification and the move toward e-commerce]" (Paul Bingham, director of transportation consulting at IHS Markit).
    - Source: FreightWaves. 2020. Q&A: Transport economist on pandemic pain, lasting fallout. Accessed from: https://www.freightwaves.com/news/qa-top-economist-on-pandemic-pain-lasting-fallout?utm_source=piano&utm_medium=email&utm_campaign=2631&pnespid=g7F.o.IFWBGNXXxq_w9aXezBYKZikxpalRINxojD

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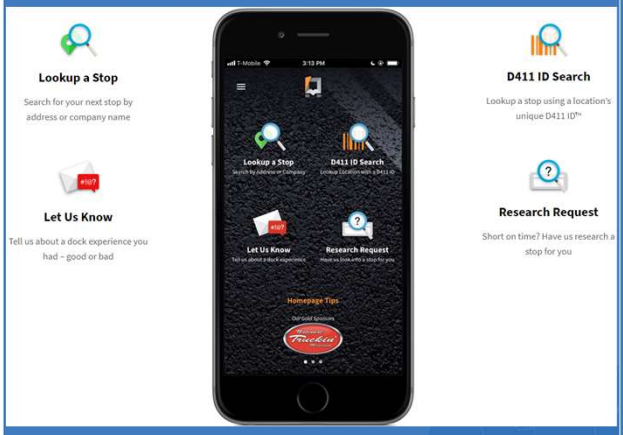
Warehouse Related Apps

- **Opendock** warehouse appointment scheduling software
  - "During the height of COVID-19 panic-buying, some warehouses were seeing lines of 50 trucks or more…."
    - Drivers not allowed to use warehouse facilities
  - Source: FreightWaves. 2020. Dock appointment scheduling software cuts driver wait times, optimizes warehouse workforce. Accessed from: https://www.freightwaves.com/news/dock-appointment-scheduling-software-cuts-driver-wait-times-optimizes-warehouse-workforce?utm_source=piano&utm_medium=email&utm_campaign=2997&pnespid=meN3s.lEFAyN7wM9p0RyR2Z5tIeT0S7Jeof50hjP
- **Dock411**
  - Shippers enter information about their facility so drivers and carriers can get in and out quickly
    - Hours of operation, loading times, yard hazards, backing situations, pallet restrictions, etc.
  - Drivers rate the shippers and post information about:
    - Availability of bathrooms, wait times, driver's lounge, dogs allowed, overnight parking, etc.
  - Source: https://dock411.com/



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Discussion: What COVID-19 impacts to truck parking have you noticed?

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Strategy Considerations

Type	Strategy	Implementation Role		
		State DOT	Local Agencies	Private Sector
Add Capacity	New or expanded facilities within DOT ROW	Fund & Implement		
	New facilities in/near logistic centers	Support	P3	P3
	*Deploy truck parking marketplace apps	Support	Support	Fund & Implement
Better Utilize Existing Infrastructure	*Truck parking availability systems	Fund		Implement
	*Reservation systems		Fund	Implement
	*Curb space management systems		Fund	Implement
	*Gate management systems		Fund (or P3)	Implement (or P3)
	*Warehouse management apps	Support	Support	Fund & Implement
Supportive Policies & Programs	Require shippers/receivers to provide parking	Support	Implement	
	Allow truck parking at public facilities during off-hours	Implement	Implement	
	Develop public education campaign on importance of trucking	Implement	Support	
	*Note: Technology considerations included in RFI and associated research			

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Poll & Discussion 4: Strategy Considerations

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Polling Round 4

1. Which of the following strategies that ADD CAPACITY would you most support? (select up to 2)
   1. New or expanded facilities within DOT ROW
   2. New facilities in/near logistic centers
   3. Deploy truck parking marketplace apps
2. Which of the following strategies that BETTER UTILIZE EXISTING INFRASTRUCTURE would you most support? (select up to 3)
   1. Truck parking availability systems
   2. Reservation systems
   3. Curb space management systems
   4. Gate management systems
   5. Warehouse management apps
3. Which of the following POLICIES & PROGRAMS would you most support? (select up to 2)
   1. Require shippers/receivers to provide parking
   2. Allow truck parking at public facilities during off-hours
   3. Develop public educations campaign on the importance of trucking

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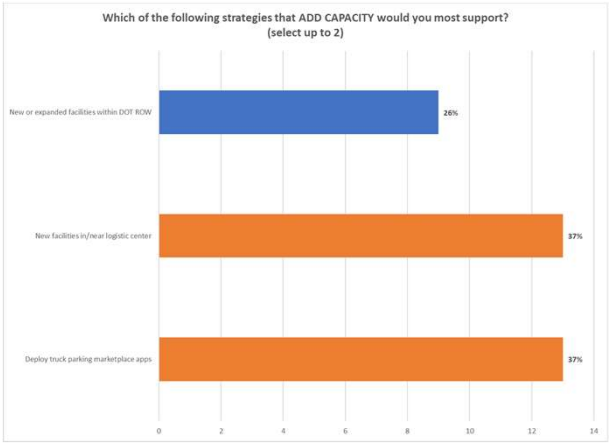
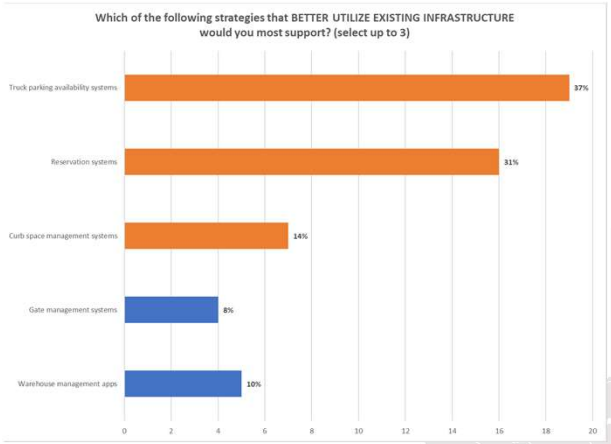
Polling Round 4 - Results





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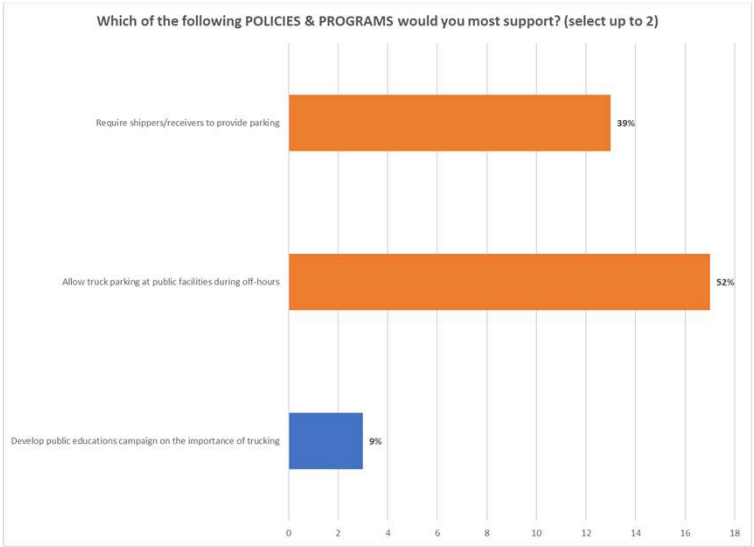
Polling Round 4 – Results (cont.)



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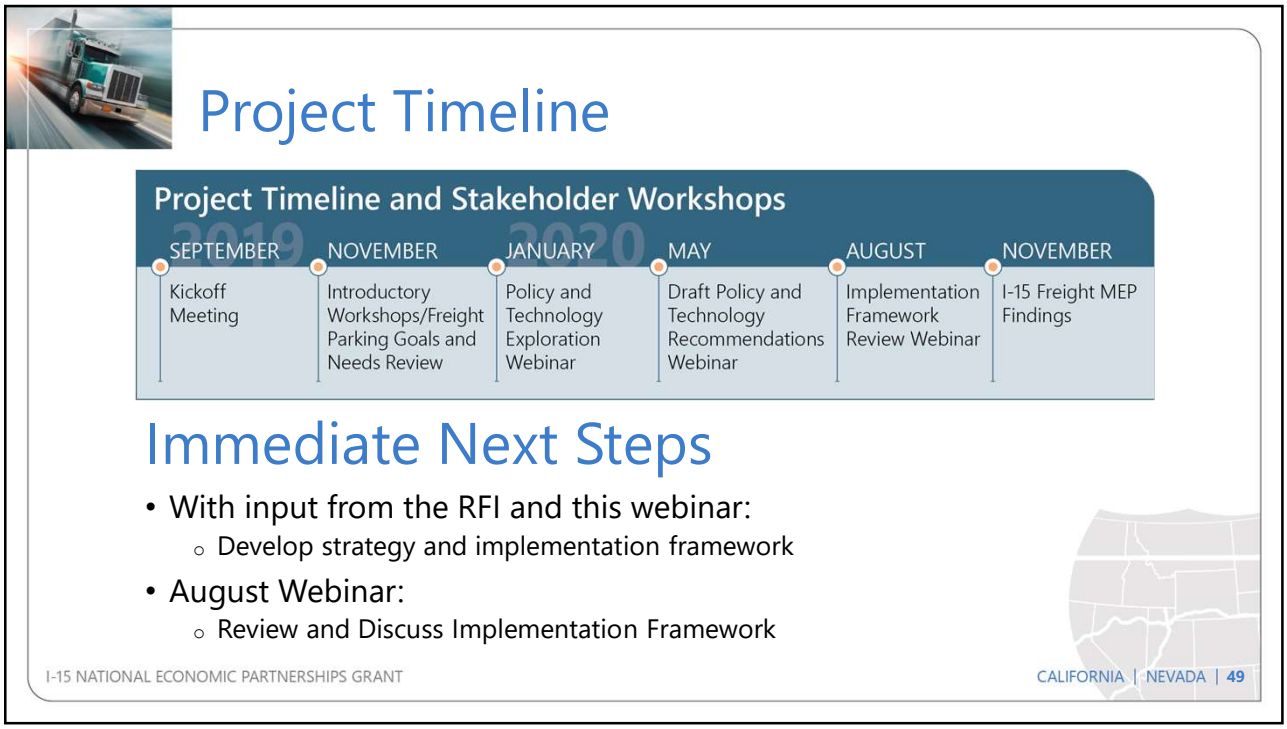
Project Timeline
Project Timeline and Stakeholder Workshops
2019
SEPTEMBER
Kickoff Meeting
NOVEMBER
Introductory Workshops/Freight Parking Goals and Needs Review
2020
JANUARY
Policy and Technology Exploration Webinar
MAY
Draft Policy and Technology Recommendations Webinar
AUGUST
Implementation Framework Review Webinar
NOVEMBER
I-15 Freight MEP Findings
Immediate Next Steps
• With input from the RFI and this webinar:
○ Develop strategy and implementation framework
• August Webinar:
○ Review and Discuss Implementation Framework
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THANK YOU
CONTACTS
Jason Love/NDOT
702-730-3311
JLove@dot.nv.gov
Vern Keeslar/PMX
385-419-2681
vkeeslar@parametrix.com
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