Customer Based Ridesharing and Transit Interconnectivity Study

June 2018

Customer-Focused, Technology-Enabled Multi-Modalism
VOLUME 3: MULTIMODAL STRATEGIES

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Customer-Focused, Technology-Enabled Multi-Modalism: Multimodal Strategies

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

1. UNDERSTANDING MULTI-MODALISM

1.1 Introduction to This Document

This document represents almost a year of exploration and early-strategy development focused on better orienting the San Bernardino Valley's transportation network to its customers and thereby increasing alternate transportation mode use and ridership. The study's primary market research work establishing the basis for these strategies is summarized here and then 15 strategies, some of which are already partially underway and others that are still to be piloted, are detailed.

The strategies themselves are collected in the following chapters:

Chapter 2 — Making It Easy and Reliable includes three first-and-last-mile strategies of Ontario Airport-based ride hailing, a downtown San Bernardino flex service and tripper service into large warehouse distribution centers.

Making it easy and reliable also includes expanded use of "modern apps" and presents two examples of customer-facing technology: a fare payment app of Token Transit, recently adopted by Omnitrans, and GoSwiftly, a high-quality multimodal transit app for consumers that also provides a deep data mining tool for public transportation providers.

Chapter 3 — Addressing Speed, Connectivity and Safety presents a transit network analysis for improving north-south travel on "feeder" routes to increase connections to the planned high-speed, high-quality West Valley connector. This chapter also details a bikeshare and bike-and-bus pilot program to improve connectivity along the Redlands-to-Loma Linda corridor, growing both transit and active transportation use and addressing infrastructure improvements. Finally, improving the experience and perception of safety on public transportation is examined as this was a persistent concern expressed by stakeholders in the market research phase.

Chapter 4 —Making It Accessible and Engaging involves information strategies of way-finding and of multimodal information portals. This chapter explores how to improve engagement by commuters, including encouraging and supporting alternate mode users through incentives and challenges and through a stronger guaranteed-ride-home program.

Chapter 5 — Promoting Agency Coordination is the final, and perhaps the most critical, set of strategies. Information strategies are discussed in terms of promoting existing transit apps and re-conceptualizing the role of Employee Transportation Coordinators as multimodal coordinators. Coordinating data and ensuring interoperable data are critical institutional

concerns, necessary to provide high-quality information across modes and services for travelers and for potential alternate mode users. Importantly, this discussion identifies procurement strategies to guide technology procurements in a fast-paced, rapidly evolving marketplace. Finally, topics of institutional leadership and organizational authority are addressed. These will be key to moving forward some or many of the strategies described to realize a customer-focused mobility experience for residents of the San Bernardino Valley.

1.2 Reframing Study Purposes

This study, the CUSTOMER-BASED RIDESHARING AND TRANSIT INTERCONNECTIVITY STUDY, began with the motivation of realizing a greater return on public investment of recent years in the San Bernardino Valley's transportation network. Fundamentally, the study seeks strategies to find new users and more continuing users of a multimodal network of rail, bus, demand response services, rideshare, vanpool and active transportation opportunities serving 15 cities and county areas of the San Bernardino Valley.

However, during a period of declining public transportation ridership, both nationally and in this region, the underlying customer focus central to this study has become of evermore critical importance. The study offers an opportunity to redefine how to ***invite new riders and retain existing riders*** on this multimodal transportation network, particularly in the face of declining use. Public transportation ridership changes are influenced by low gas prices and higher-than-ever private automobile ownership. But at the same time, travelers report stressful commutes and both the personal and automobile wear-and-tear of increasing congestion, particularly in a region where long commutes are typical.

In study interviews, surveys and focus groups, some travelers sought less stressful travel choices and/or lower cost transportation. Individuals expressed a degree of willingness to use an array of alternative and shared-ride transportation services. But for most potential new users, this interest is frequently coupled with uncertainty, apprehension and a lack of knowledge.

Encouraging interest in alternate mode transportation involves identifying strategies that communicate choices, inviting people to consider alternate mode transportation and helping develop sufficient confidence that they try these services. This involves unpacking factors related to service design, the accessibility of information about services, ease of use and perceptions about safety.

This MULTIMODAL STRATEGIES WORKING PAPER describes 15 specific strategies that address both concerns and opportunities identified through the study process. These strategies are by no means all those that have relevance to developing a customer-focused transportation network, but they do reflect the strongest prospects by which to encourage increased mobility within the San Bernardino Valley on shared and active transportation modes.

1.3 Mobility On Demand, FTA's Approach to Multi-Modalism

The Federal Transit Administration (FTA) is embracing concepts of multi-modalism — that is the consideration of multiple modes to transportation *as a network and an opportunity* — through its Mobility on Demand (MOD) Demonstration Projects. These propose funding strategies that seek to integrate public transportation and to strengthen a network approach to mobility. Specifically, the goal of FTA's 2016 funding cycle was to "support transit agencies and communities as they navigate the dynamic, evolving landscape of personal mobility and integrated multimodal transportation networks" [July 5, 2016, Notice of Funding Availability).

The MOD Sandbox project awarded $8 million under FTA's Research, Development, Demonstration and Deployment Program authority to conduct research on new service options that enable and support *traveler-centric approaches.*

The MOD vision is this network of transportation options that are user-focused, system-optimized, data and technology driven and advance larger social goals of equity and accessibility. The funded MOD Sandbox demonstrations are to:

- *Improve transportation efficiency* by promoting agile, responsive, accessible and seamless multimodal service, inclusive of transit through enabling technologies and innovative partnerships.
- *Increase transportation effectiveness* by ensuring that transit is fully integrated and a vital element of a regional transport network that provides consistent, reliable and accessible service to every traveler.
- *Enhance the customer experience* by providing each individual with equitable, accessible, traveler-centric service leveraging public transportation's long-standing capability and traditional role in this respect.

The 11 2016-funded projects reflect various strategy areas and a mix of modes and services:

- Multimodal Applications;
- TNCs [transportation network companies] First-Mile/Last-Mile Initiatives;
- Incentive Strategies; and
- Carpooling and Ridesharing.

FTA administrators indicate that even in these early days, key challenges are emerging around ensuring equity and accessibility to different neighborhoods and individuals. These challenges exist in how to adapt use cases to a wide range of geographies and communities. Other challenges include how to measure success across such a breadth of strategies and how to support the existing public transportation network, even as new technologies and services are embraced.

Figure 1 represents the 11 MOD-funded projects in relation to strategy areas of interest to FTA.

Figure 1, Federal Transit Administration Mobility On Demand (MOD) Projects
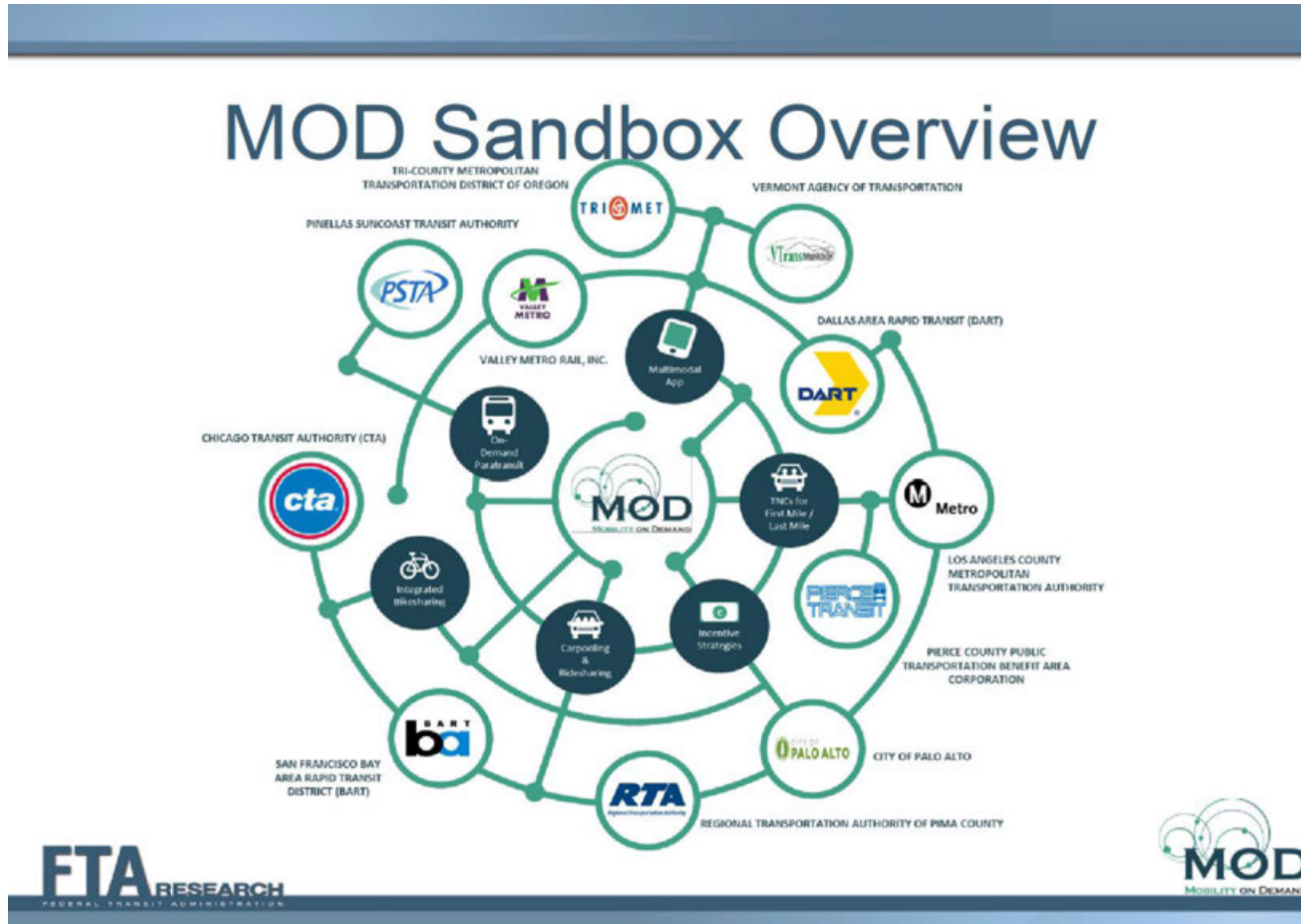
1.4 Multi-Modalism in the San Bernardino Valley

This study's EXISTING CONDITIONS WORKING PAPER explored characteristics, challenges and the use of the network available to San Bernardino Valley travelers and residents. Multimodal transportation choices abound.

Figure 2, Customer-Focused Multi-Modalism

The network choices include three ***regional commuter rail*** lines. ***Public transit*** services lead with a state-of-the-art bus rapid transit line, the sbX, and also include two express routes, 25 local fixed-route, community circulators in five communities and a region-wide demand response program for persons with disabilities.

Five ***other transit providers*** from adjacent regions and counties provide transportation to the region's travelers.

Rideshare and vanpool services are an important and expanding shared-ride mode for this region with 196 vanpools administered by the Victor Valley Transit Authority and a new San Bernardino County Transportation Authority (SBCTA) - administered vanpool program.

Web-based information tools include IE Commuter's ridematch portal; Google Transit, on which data for all of the region's transit routes are kept current; the developing RideAmigos portal; and trip planner information on Omnitrans and on most of the other public transportation providers.

Bicycle infrastructure development now includes 77 miles of Class I completely separated right-of-way, such as the Pacific Electric Inland Empire and Santa Ana River trails. Southern California Association of Governments (SCAG) has also documented 276 miles of Class II, striped one-lane travel on streets and 150 miles of signed, shared roadways within the San Bernardino Valley. ***Park-and-ride lots***, including 21 Caltrans-owned lots, dot the region.

Hail-ride services include private-sector existing taxi cab companies and expanding Uber and Lyft services, showing a continuing and growing presence, while ***car share services*** have yet to present.

This extensive array of services, however, is not consistently a network. Customers must navigate varying fare payment methods, multiple information access portals, poorly timed transfers between some modes and breaks in the paths of travel, particularly for bicyclists and pedestrians, all of which represent significant gaps for users. This study's assessment of the environment, through the EXISTING CONDITIONS WORKING PAPER and the original research into markets for shared and active transportation

use, informs the selection and characteristics of the strategies described in this MULTIMODAL STRATEGIES WORKING PAPER.

1.5 Market Research Messages

The Market Research phase of this study sought to identify those perceptions and the potential by which to attract current drive-alone commuters to the San Bernardino Valley shared and active transportation network. To understand commute behaviors, interest and opportunities, we undertook a three-tiered market research effort that included interviews with 14 of the region's largest employers, an e-survey of 5,769 employees and 1,446 students, and a series of nine focus groups involving in-depth conversation with 77 commuters. Key findings from the study's MARKET RESEARCH REPORT (July 2018) are summarized here.

Drive-Alone Commuters' Viewpoints

Commuting to work and to school via a private automobile is the current mode of choice for 78% of the 15-city region's workers, according to the 2009-2015 American Community Survey. Alternatives to driving alone are a difficult sell to many travelers within the San Bernardino Valley, however not necessarily to all. Among these "drive-alone" respondents, fully *one-quarter (25%) had used an alternate mode transportation* at least once in the past year, with at least one in 10 during the past 30 days. And among these same drive-alone commuters, *43% saw circumstances under which they would consider an alternate mode* transport choice. Figure 3 ranks these potentially favorable conditions.

Figure 3, Conditions for Use of an Alternate Mode

Conditions Under Which Drive Alone Commuters Might Use an Alt Mode
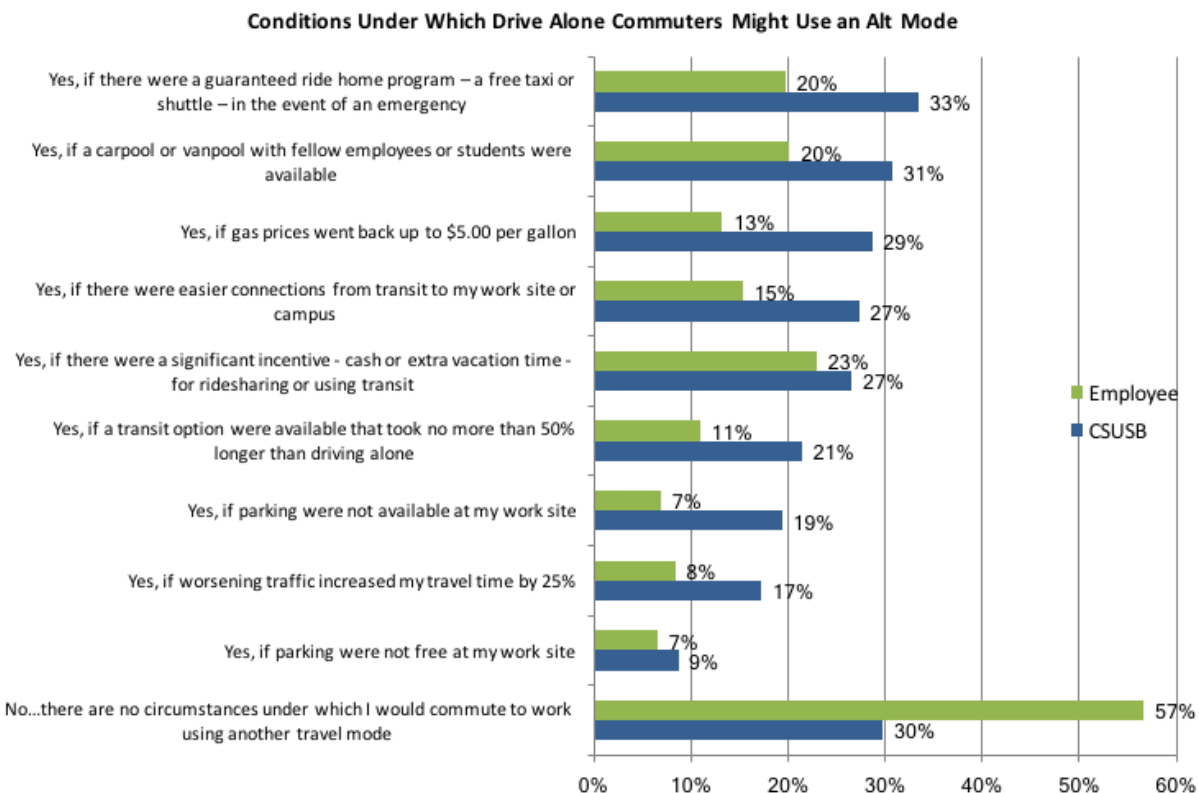
Current Alternative Mode Commuters' Viewpoints

Multiple reasons not to drive alone were reported. Of those currently commuting by a mode other than driving alone, Figure 4 shows ranked reasons. Most common among these is "**to save money on commute costs**" (60%), followed by "**I enjoy the company of**

Figure 4, Reasons for Use of Non-SOV Mode

Reasons Respondents Use a Non-SOV Mode

To save money on commute costs	60%
I enjoy the company of other people I ride with	41%
It's good for the environment, less polluting	39%
It's less stressful than driving alone	29%
I can work, read, sleep or text during the trip	24%
I don't have a vehicle available or I share a vehicle with other household members	19%
It is faster than driving alone	17%
My travel time is more predictable than driving alone	15%
I don't drive	5%

other people I ride with" (41%), reflecting the large number of carpool and vanpool users among this group. Third-ranked was "**it's good for the environment, less polluting**" (39%).

Commuters' reasons for driving alone were also numerous with the top three reported as "**driving [alone] is much faster than using public transit**" (63%), followed by "**I need my car for other commitments before or after work**" (59%) and "**I need my car during the day**" (54%).

Concerns or Negative Experiences of Alternate Mode Commuters

There are specific challenges to using alternate modes that are often cited as reasons not to consider commuting this way. Determining how "real" these challenges are led us to ask users about the specific modes if they had experienced various negative occurrences. Figure 5 shows the challenges tested with each mode group and how current users responded. As questions were asked only of those who reported use of a specific mode, the sample sizes for transit users and for walkers/bikers are quite small.

Figure 5, Challenges of Alternative Modes

Challenges of Alternative Modes

CARPOOL/VANPOOL

	Have experienced	Have not experienced
My carpool or vanpool has dissolved due to loss of participants, changes in schedules or other factors	8%	92%
My car has been broken into or vandalized in a park and ride lot, at a train station or a transit center	4%	96%

BUS/TRAIN

	Have experienced	Have not experienced
Have been delayed due to missed connections between buses or between bus and train	67%	33%
Have felt unsafe waiting at a bus stop	49%	51%
Have felt unsafe while on the bus	40%	60%
Have felt unsafe when waiting at a Metrolink station or transit center	25%	75%
Have felt unsafe while on the train	12%	88%
My car has been broken into or vandalized in a park and ride lot	9%	91%

WALKING/BIKING

	Have experienced	Have not experienced
Have felt unsafe from traffic when biking or walking between my home and work	38%	63%
Have been delayed because bike racks on the bus were full	9%	91%
Have been involved in a crash as a bicyclist or a pedestrian while commuting	5%	95%
Have had my bicycle stolen/damaged while at work	4%	96%

■ Have experienced ■ Have not experienced

Among ***carpool/vanpoolers,*** only a small percentage had seen their group dissolve because of a loss of participants (8%) or have had their car vandalized at a Park-and-Ride lot (4%).

Not surprisingly, most ***transit riders*** (67%) have been delayed due to missed train or bus connections. More concerning, some did report feeling unsafe at some point in their transit trip — waiting at a bus stop (49%), while on the bus (40%), at the train station or transit center (25%), or on the train (12%). Notably, in the focus groups, those who were steady users of public transit indicated that while they acknowledge the sometimes "colorful" or "challenging" people on the bus, they also believe their experience falls short of fear, and simply reflects the realities of dealing with a diverse population.

During this study period, Omnitrans did further focus group work on this topic and identified significant differences by gender, in perceptions of safety among its ridership. Women were very likely to report feeling unsafe at some point during their trip while men were far less likely to do so.[1]

Only 9% say their car has been vandalized at a *Park-and-Ride lot*.

Among *active transportation commuters*, only a small number have been involved in an accident (5%) or had their bicycle damaged or stolen (4%). However, 38% reported feeling unsafe from traffic during their commute. Nine percent have been delayed because the bike racks on the bus were full, meaning they either had to wait for the next bus or bike a longer distance.

Key Factors in Mode Choice Decisions

The survey examined respondents' motivational factors in making their modal choice decision, asking them to identify the top three reasons behind their current mode choice. The overall top three items reflected flexibility (48%), accommodates my work hours (42%) and access to a vehicle during work hours (38%), all elements of being able to "come and go when I want."   The next two travel factors of travel time (34%) and privacy/time alone (23%) are factors that tend to encourage driving alone.

Smaller groups prioritized cost (22%), wear and tear on one's vehicle (17%) and the stress of driving in traffic (12%), all factors that encourage alternate mode use. The smallest groups prioritized the environment and exercise as among their top three factors.

Figure 6 combines these choice factors to reflect a continuum of choice, a motivational continuum.

Figure 6, Motivational Continuum for Mode Choice

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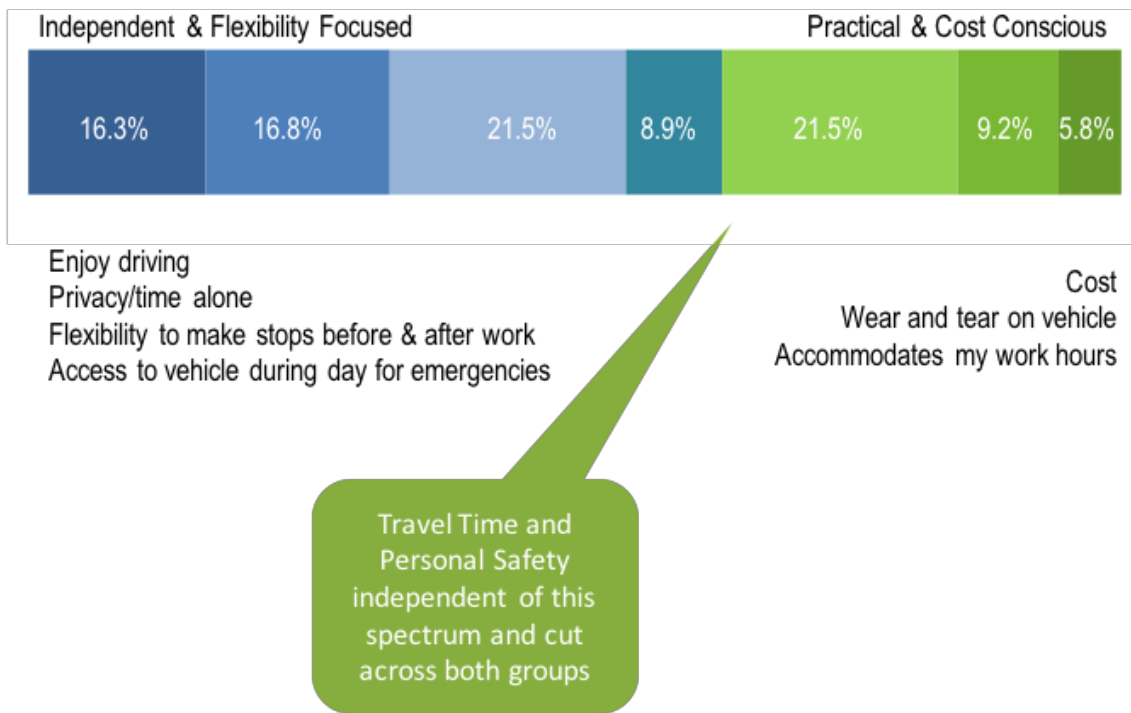
[1] CalAct Conference Presentation. Jeremiah Bryant. "Transforming Culture and Mindset in Public Transportation: An Exploration of Safety Topics" November 3, 2017, Monterey, CA.

This continuum suggests how individuals' motivations impact their willingness to consider an alternative to driving alone to travel to work.   Using a correlation and factor analysis, this continuum accounts for 86% of all respondents and reflects those most unwilling to reduce their independence and flexibility, on the left, to those more practical and cost conscious, on the right who under certain circumstances will consider alternatives to driving alone.

- At the left end of the continuum are those who prioritize independence and flexibility. Their key motivations are: enjoy driving, enjoy privacy/time alone, want the flexibility to make stops before and after work and want access to a vehicle during the day for emergencies.
- At the right end of the continuum are individuals who prioritize cost and their vehicle's wear and tear, but also the ability to accommodate work hours.

Importantly, factors of travel time and personal safety are independent of this continuum. They cut across both groups and are important to all. A mode must be safe and offer a reasonable travel time to be considered by these commuters.

Motivational Continuum and Alternative Mode Potential

Of greatest import to defining this study's strategies was to determine who might be a potential alternative mode user and how best we can design strategies that will appeal to these individuals. Figure 7 demonstrates a very direct relationship between one's motivational mindset and the use of or willingness to consider an alternative mode. Each column breaks down the individuals in the corresponding point on the continuum based upon the segmentation of "Single Occupancy Only," "Potential Alt Mode User," "Potential/Has Used Alt Mode" or "Current Alt Mode User."

Figure 7, Motivational Continuum and Alternative Mode Potential
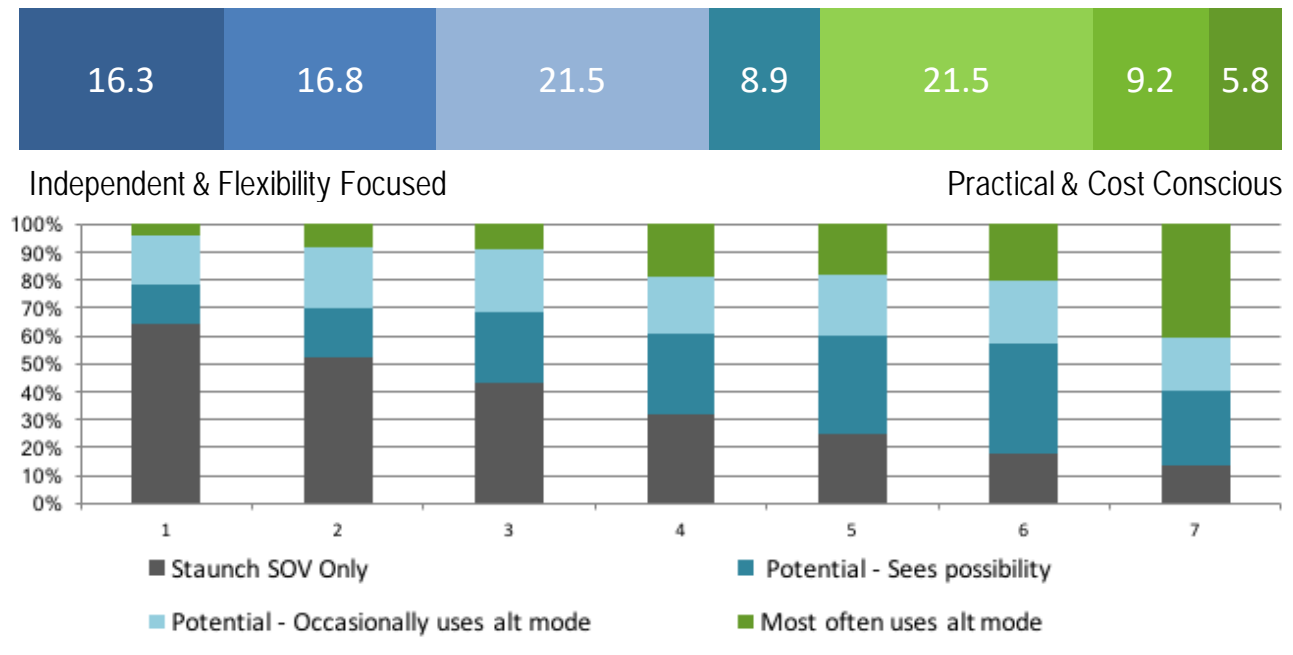
Those least likely to consider alternative modes are those with a strong ***Independence/Flexibility*** focus, and will likely remain staunch single-occupancy-only travelers. Those who are more oriented to the ***Practical/Cost Conscious*** represent individuals who are our targets to consider alternative mode transportation, either because they are already current users or because there are conditions under which they will consider an alternative mode.

The ***Practical/Cost Conscious*** — at the green end of the spectrum above — represents 36.5% of persons in this survey group. And if we include those 8.9% in the teal group who share characteristics of both the ***Practical/Cost Conscious*** and the ***Independent/Flexibility*** groups, that rises to 45% of the commuters represented in this study's survey process.

1.6 Principles for Promoting Customer-Focused Multi-Modalism for the San Bernardino Valley

Defining an Approach

The preceding discussion of this study's market research identifies where there is potential to attract new users to alternate mode transportation, to work and to school and potentially for other trips.

Between 37% and 45% of commuters surveyed were among those for whom alternate mode transportation has merit — in other words, potential users. The challenge then is how to attract these persons for some or all of their commute trips? And further, how to hold them as alternate mode users?   This study's market research work encompassed employer interviews, commuter surveys and in-depth focus groups, in combination with the EXISTING CONDITIONS WORKING PAPER analysis. Together, these suggest both a general focus and key principles by which to attract these "potential users" to alternate mode transport.

Going forward, we propose:

Customer-Focused, Technology-Enabled Multi-Modalism

The adage of "the customer first" is an old one, yet it remains fundamentally important. The strategies laid out in the following sections detail just what that ***customer-focus*** can mean.   And ***technology-enabled*** is critical, at this time in the evolution of alternate mode transportation and in the face of what Uber and Lyft experiences have shown us about customer preferences — namely immediate, reliable and comprehensive information that is readily accessible. Finally, ***multi-modalism*** reflects the importance of choice, presenting to travelers the full array of options available to them — and the cost and timing of those — in getting from here to there.

Principles proposed by which to realize this are presented in Table 1, characterized in terms of those related to the individual traveler, ***customer-focused***, and those related to the organizations and institutions***, institutionally focused principles***.

Table 1, Proposed Principles for Customer-Focused, Technology Enables Multi-Modalism

Customer-Focused, Technology-Enabled Multi-Modalism	
Customer-Focused Principles	Institutionally-Focused Principles

Customer-Focused Principles

1. Provide transportation options to meet varying needs and motivations that are:
- Easy to use
- Accessible
- Reliable
- Immediate
- Engaging

2. Promote cost savings, fast travel times and safety:
- Fast travel time – strives for no more than 1 ½ times drive-alone
- Cost-efficient over drive-alone
- Safe

3. Enable easy multimodal choices:
- Allows comparison of time, cost, travel factors
- Ensures complete, reliable information

4. Promote incentives and challenges:
- Inducements to encourage new behavior, reward sustained use of alternate modes

5. Support the environment and promote healthy lifestyles
- Identifying calories spent/reduced CO_2 by mode choice

Institutionally-Focused Principles

1. Organize and collaborate on:
- Multimodal technology platforms
- Open-source, interoperable data platforms
- Data sufficiently standardized that it can be shared across institutions
- Promotion of Transit/Transportation Data Stack standards
- Potential for integrated fare payment, across modes

2. Encourage flexibility and nimbleness in relation of technology's fast-paced change:
- Embracing of *Software as a Service* approaches

3. Promote operations planning across modes and across agencies:
- Multimodal orientation to infrastructure planning (carpool/vanpool, train, bus, bicycle, pedestrian safety and ease of use)
- Multimodal orientation to services
- Fare payment coordination
- Transfer coordination
- Information coordination (e.g., at times of service changes or new services)
- Coordinated funding requests that bundle projects
- Use advisory and technical review groups to ensure inclusion of agency stakeholders in appropriate phases of project planning, such as employers and jurisdictions along with transit operators.

2. MAKING IT EASY AND RELIABLE

*This first group of strategies focuses on making it easy for travelers, a requirement we often heard from focus group discussants. Three strategies consider **first-mile/last-mile options** between Metrolink and the Ontario Airport, in downtown San Bernardino or at a major distribution center.   A fourth strategy describes an **easy, new fare payment technology,** currently available to Omnitrans riders.*

2.1 Strategy: Subsidized Ride-Hailing Trips — Metrolink Stations to Ontario Airport

Problem and Opportunity

The Ontario International Airport (ONT) is located in the west end of the San Bernardino Valley, operating under new management through a Joint Powers Authority between the City of Ontario and the County of San Bernardino. ONT serves more than 4 million passengers per year, down from a peak of 7.2 million in 2007. It is home to six airlines. As a result of management changes, ONT has begun to institute changes to increase the usage of the airport and make it easier for passengers to travel to and from its terminals.

Figure 8, Omnitrans Route 61 Service – Fontana Metrolink to Ontario Airport

Of concern to the ONT management, SBCTA and Omnitrans is the potential difficulty of airport travelers using Metrolink in getting to and from the airport and the potential opportunity to attract more bus and rail users.

As of September 2017, the local fixed-route provider Omnitrans expanded service to the airport between the Fontana Metrolink station and the airport, increasing Route 61 service to 15-minute frequency on weekdays between 4:45 a.m. and 10:45 p.m.   The travel time between the Metrolink Fontana station and the airport is about 40 minutes.

In addition to increased bus service, in July 2017, the Ontario

International Airport Authority (OIAA) approved the addition of Transportation Network Companies (TNCs) to the airport's authorized transportation provider's permit program. Uber and Lyft were the first TNCs to be approved for ground transportation, which requires a $3 per-trip surcharge that is then passed along to the rider. TNCs are allowed to pick up passengers at designated locations at each of the two terminals or the United Service Organizations (USO) Lounge.

Objectives

SBCTA is interested in exploring faster service opportunities between the airport and the four Metrolink stations within a three- to eight-mile proximity of ONT. The stations are located in Upland, Rancho Cucamonga and Fontana along the San Bernardino line with 19 daily trains in each direction on weekdays. If sufficient demand can be demonstrated, there may be opportunity for faster, more direct bus or shuttle service links between the rail stations and the airport. SBCTA's main objective is to assess the volume of trip making between the Metrolink stations and ONT and to determine the best service model to support travel between these locations. Using a low-cost TNC subsidy pilot would allow SBCTA to track trip demand by day of the week and time of day and determine whether a ride-hailing service model meets a traveler's needs or whether an opportunity exists for Omnitrans to operate a dedicated service.

Target Markets

Travelers wishing to avoid parking costs at the Ontario Airport, which have recently risen, are among the target markets. TNC or ride-hailing programs provide the ease of a chauffeured ride and the smartphone app provides a simple way to predict and pay for the cost of travel, making it easy to travel to the airport. However, a first leg by rail can enable travelers to come from longer distances. While the appreciation of these characteristics is often associated with millennials and younger adults, the ease and security of the program could also be attractive to older adults needing to access the Ontario Airport.

A new multi-city survey on ride-hailing service use by University of California, Davis researchers, "*Disruptive Transportation: The Adoption, Utilization and Impacts of Ride-Hailing in the United States*" (Clewclow and Shankar Mishra, October 2017) found that women were slightly more likely than men to use ride-hailing services (23% to 20%) and that younger persons ride at much higher rates —

How can TNC Programs be Helpful to Public Transit?

Partnerships between public transit agencies and TNC companies have the potential to benefit public transit and its users in many ways:

- First-/Last-mile solutions for travel from origin to transit and from transit to final destination.
- An economical solution for filling mobility gaps in underserved areas, during off-peak time periods and in place of expensive and unproductive traditional demand response service.
- Fare integration for existing transit agencies and traditional taxi cab providers into the revolutionary booking and payment platforms of TNCs.
- Easier method of payment for riders with smartphones or access to the internet than traditional methods of purchasing fare media.
- Access to existing rideshare and carpool networks.

persons 18 to 29 comprised 36% of adoptees while those age 65 and older were only 4%. Adoptees with college degrees (25%) or graduate degrees (28%), or even some college (14%), were more likely than those of high school or less education levels who reported just 11% adoption rates in this study. Finally, income levels were also a significant attribute in adoption, with those of higher income showing increasingly higher rates of adoption: with 15% at the lowest income level of less than $35,000 annual income and up to 33% at the highest reported income level of $150,000 or more.

These markets, including female, more educated and higher-income individuals, are the potential Metrolink users who might travel to or from Ontario Airport but will likely require solid, targeted marketing in order to inform and attract them to this subsidized ride-hailing, TNC opportunity.

Background Experience on TNC Services

Regulatory Requirements and TNC Issues

Experience with TNC services in the public sector have raised numerous concerns related to social equity issues and regarding compliance with regulatory requirements. A Federal Highway Administration (FHWA) white paper "***Mobility on Demand Concept Development: Mobility on Demand and Social Equity"*** (Booz Allen Hamilton, University of California, Berkeley — Transportation Sustainability Research Center, 2016) identified four challenges in this area:

- ***Applicability of Existing Laws and Regulations*** that prohibit discrimination, specifically Title VI of the Civil Rights Act of 1964, which requires, among other features, that services be equitably distributed across the service area and not reserved for the wealthier or more affluent areas.
- ***Accessibility for People with Disabilities,*** under the Americans with Disabilities Act of 1990, requires that public transportation programs provide for a complementary paratransit service to provide trips to those unable to use fixed-route services.
- ***Economic Accessibility*** involves providing for those who are "unbanked" and pay for services with cash, making it difficult to use these services.
- ***Digital Poverty*** — No access to a smartphone makes it impossible to participate in a ride-hailing service opportunity. These are low-income individuals without data plans that can access apps.

In addition to these regulatory and policy concerns, there are regulations associated with operational services contracts that are complicated to apply to the Ride Hailing operators. These include the drug and alcohol testing regulations (49 CFR 655) and driver fingerprinting and criminal history background checks. In contrast with taxi operators and their dedicated work force, these can be difficult to enforce with the driver pools of Uber and Lyft.

Pinellas, Florida

The Pinellas Suncoast Transit Authority (PSTA) is the public transit provider in Pinellas County, Florida, which includes the cities of St. Petersburg and Clearwater and is part of the Metropolitan Statistical Area that includes Tampa. A local tax measure referendum loss and agency budget constraints led to the elimination of the county's lowest performing fixed routes. These service modifications prompted the

need for service alternatives to fill the gaps identified for the affected riders. PSTA began to explore different on-demand partnership models as a replacement for lost service.

The PSTA Direct Connect service is a first-/last-mile solution within the PSTA fixed-route service area to provide trips within two geographic zones between designated bus stops. The service is provided by either Uber, United Taxi or Care Ride and is accessed by customers through the phone app or by telephone, usually within 20 minutes of the request. PSTA subsidizes the first $5 of the cost of the trip and St. Petersburg College students can receive a free trip by using their student U-Pass. Rides can be hailed seven days per week between the hours of 6 a.m. and 11 p.m.

PSTA has implemented a unique marketing approach in its partnership with Uber where a PSTA advertisement pops up within the Uber mobile app whenever a rider is within the PSTA service area. Uber ambassadors visit the transfer center and educate potential riders on the benefits of the Direct Connect service.

The early implementation of the Direct Connect program prompted the Florida Commission for the Transportation Disadvantaged to develop a similar model to get evening and night shift, lowest wage workers to their places of employment when buses are not available and for some day trips with urgent needs. The Transportation Disadvantaged Late Shift Pilot requires registration from regular bus riders that have a job or life sustaining activity that ends or begins between 9 p.m. and 6 a.m.

As experienced with many TNC partnerships, obtaining adequate performance data for the service provided continues to be a challenge. Early ridership numbers were low but currently, ridership is averaging about 750 one-way trips per month.

GoDublin TNC Rideshare

The city of Dublin is located about 35 miles east of San Francisco and is the one of the fastest growing cities in California. Population increased by 24% between 2010 and 2016, from 46,000 to 57,000 persons, but the city is still considered a low-density environment. The Livermore Amador Valley Transit Authority (LAVTA), the local transit agency, has partnered with Uber, Lyft and DeSoto Cabs to promote ride-sharing activities within its city limits. LAVTA has developed a pilot project that subsidizes shared ride trips using the UberPool, Lyft Line and DeSoto Share mobile applications. LAVTA pays up to 50% of the fare, capped at $5 per trip, within the city limits and focusing on trips to and from the transit center and two BART rail stations. A rider only needs to enter the promotional code "GODUBLIN" in to the phone application to receive the subsidy. Riders must pay the full cost of the trip if the rider chooses to take a non-shared TNC trip. The DeSoto Cab company plays a vital role in providing wheelchair accessible vehicles and offering an option to pay for individuals that are unbanked.

The motivation to create this pilot developed from the idea that the more people use shared modes, the more likely they are to use public transit. The program was developed after a comprehensive review of the Wheels fixed-route service in 2016 resulted in elimination of an unproductive route and realignment of remaining routes service hours to focus on improving the most productive corridors. LAVTA explored

the possibility of operating its own ride-hailing program with dedicated vehicles but determined that the capital investment would be too costly.

GoDublin launched in January 2017 with an initial 6-month schedule that has been extended to operate through December 2017, with funding from a combination of state Transportation Development Act (TDA) and Alameda County Transportation Commission (ACTC) Measure BB funds. As of October 2017, the program is providing approximately 1,500 trips per month. An early assessment of the program shows that passenger trips have been very short in length. Customers enjoy the freedom to go where they want and appreciate the promo code's ease of use, but there have been some concerns about fare equity where similar length trips cost different amounts depending on the provider used. To understand how Go Dublin has impacted travel behavior in its service area, a study will be conducted in the Fall of 2017 to review the program's net costs and net fuel consumption over the course of its deployment. The review will evaluate the impacts of the GoDublin program on user mobility, user costs, system costs, as well as overall fuel consumption and emissions. One of the biggest challenges has been in the effectiveness of the marketing campaigns.

While LAVTA conducted its own promotional paper, internet, media and social campaigns, the TNC companies initially ran their own advertisements within their mobile applications. While the TNC marketing helped to grow the program it also shifted some of the cost burden from existing TNC users on to the transit agency, effectively forcing LAVTA to pay for trips that would otherwise have been paid for and were already being taken.

Kansas City, Ride KC On-Demand Experience

Ride KC Freedom On-Demand is a ride-hailing, curb-to-curb program that operates very similarly to the TNC programs like Uber and Lyft but works with a pool of vehicles and drivers from two taxi companies and zTrip's taxi or black car service, as well as sedans and cutaway vehicles from the Kansas City Area Transportation Authority's (KCATA) paratransit fleet. The On-Demand mobile application interface allows ride-hailing in the same manner as the Uber and Lyft platforms but with the inclusion of taxi cabs that are dedicated to the service area. The rider can be assured that a vehicle will be available, rather than hoping a TNC vehicle might be close enough to their origination point to provide a trip.

Freedom On-Demand provides a subsidy demand responsive passenger trips that can be accessed from any location in the program's service area and is not geographically bound by a fixed-route framework. Trips are facilitated through a mobile application, available on both Apple IOS and Android platforms, and are available to book trips 24 hours per day. The application allows customers to build a profile that links customer accounts to the phone application including existing ADA passengers. The application can store credit card information to make the payment transaction easier and can also store preferred driver information. Once the pick-up and drop-off information is selected, the customer can select the type of vehicle they need and whether it needs to have wheelchair accessibility.

The mobile application was developed by a third party but includes a full data-sharing agreement and the ability to interface across applications. The cost of the software development was shared as a part of

an MOD Sandbox grant. The next phase of this program will include additional TNC companies to allow more mobility options for the program's participants.

The program fare is offered on a sliding scale beginning with a $3 charge for ADA riders and $5 for seniors, which is subsidized by KCATA to be the same as KCATA's existing paratransit service. The general public pays $10 and the fare covers the first 5 miles of travel. All passengers pay an additional $2 per mile after the base mileage allotment and seniors and persons with disabilities are allowed up to four subsidized trips per day. The unique customer benefit of the Freedom On-Demand program is that multiple guests can ride at no additional fare. Based on the compensation agreement with the taxi companies and zTrip, up to 5% of the general public fare revenue is returned to KCATA creating a new revenue stream for the agency.

The Ride KC program delivered 11,000 trips in its first four months of operation, increasing from 1,134 trips in the first month to 4,368 trips in the fourth month. Seventy-five percent of the program's users reported that the On-Demand service has impacted their mode choice and favorably approved of how well the mobile application and scheduling process functioned.

While RideKC customers enjoy the program's origin-to-destination freedom and the convenience of electronic payment, it has not come without some challenges. Taxi drivers are not held to the same program and sensitivity training as transit agency drivers, which has led to some confusion in the communication of the program's functions. There is also a lack of wheelchair accessible vehicles, which results in longer wait times for persons with disabilities, sometimes up to an hour. This is of particular concern for service provided within a ¾-mile proximity and service hour span of the fixed-route, which could have ADA-compliance implications.

Denver Area Centennial Experience

The City of Centennial, Colorado, launched its Go Centennial service in conjunction with Lyft to provide first-and-last mile trips between the Dry Creek Station and major employers. Operated between August 2016 and February 2017, the service sought to match the existing Denver RT Call-n-Ride service, providing trips to riders at no cost to the users and requiring riders to go from or to the Dry Creek Station within an area of about 3.75 square miles.

An early demand analysis suggested that residents and employees could generate as many as 303 trips per day, an estimate considered to be very high by local planners. However, the early experience of Go Centennial realized about 12 one-way trips per day and proposed a goal of increasing that to about 25 passenger trips per day.

The City voted to allocate funding to the program, about $200,000 to match the $200,000 awarded to the City in specific grant projects. Lower than expected ridership suggests that funds remain available to continue the pilot program. At the conclusion of the pilot, only a total of $129,717 was expended, including just $60,770 on service provision and other funds on app development and administration. The average cost of Lyft Line rides during the pilot was $4.70. Via provided Go Centennial Access service at a cost of $26.50 per hour to ensure program accessibility.

Program marketing included news stories in most Denver news outlets, Ambassadors at the Dry Creek Station, outreach to major employers' human resource directors, and outreach to homeowners associations as well as postcards to local businesses. These activities were heightened during the low-ridership months of the early pilot period.

Strategy Description

The San Bernardino County Transportation Authority (SBCTA) plans to take advantage of the TNC opportunity at ONT by introducing a subsidy for passengers travelling between the airport and any one of three San Bernardino Line Metrolink stations of Rancho Cucamonga, Montclair or Ontario. This pilot program provides a way to address the first-/last-mile dilemma that travelers inclined to use Metrolink usually encounter. SBCTA has set aside $426,000, predominantly comprised of state Local Transportation Fund (LTF) dollars but augmented by a portion of Measure I local sales tax funding to support trips the program would facilitate.

The subsidy will support up to $24 per trip and will require an Omnitrans or Metrolink ticket to activate the subsidy. The program budget and per trip subsidy limits will ensure that a minimum of 17,750 trips will be provided. SBCTA plans to release a Request for Information (RFI) in the spring of 2018 that will solicit the services of available TNC and taxi companies. Contracts with the service providers are anticipated for Summer 2018 with program launch immediately following. The RFI will outline the required operational and performance data needed to perform the desired trip demand analysis.

Relationships with local taxi cab companies will be developed to serve as a further mechanism for travelers that do not have smartphones to request rides via the phone applications Uber and Lyft have in place. A phone call can be placed to identified taxi programs to schedule the trip between the airport and the Metrolink station with the taxi company, and SBCTA will still subsidize the trip. The pilot program anticipates its launch in December 2017 and will provide service as designed until the allotted funding has been expended. At that point, SBCTA will have had time to assess the program and determine its future.

It is anticipated that the pilot program will provide SBCTA with trip data between the program locations, including the total number of trips taken, by time of day and day of the week. This data will serve as a planning tool to explore the feasibility of creating additional or more frequent Omnitrans routes or dedicated shuttles to otherwise provide these target trips. It may also support the continuation of a TNC-based program after considerations are made on utilization, customer satisfaction, operating cost and available funding.

Implementation Topics

Marketing

An effective marketing program will likely be an important component to advising prospective riders of the opportunity and attracting them both to Metrolink and to connect with the ride-hailing service. Some TNC-based services have experienced slow build-ups in ridership. Presumably some advertising could be placed at key locations at Ontario Airport, Metrolink station and Omnitrans bus stops.   Other "electronic ads" could be promoted on each partners' websites, ticketing platforms and social media accounts. The GoDublin program invested a lot into marketing, as did the Go Centennial program but with mixed results, difficulties in getting to the targeted consumers. Ridership numbers have been lower than projected in multiple programs.

Institutional Coordination

The current pilot is being initiated by SBCTA. Coordination with Omnitrans, as well as Metrolink, to assess the number of boardings at the program's locations during the same time-period could shed light on whether or not the subsidy is impacting bus and rail ridership. Program data from the TNC and taxi providers could be coupled with user or intercept surveying to recognize what elements of the program are most appealing and understand what alternative modes, fares or configurations might also be acceptable. This assessment does require cooperation around provision of data from the TNCs.

Barriers

The operational mechanics of requiring a Metrolink and Omnitrans purchased fare to receive the subsidy will have to be furthered examined prior to the release of the RFI. Metrolink now allows for fare purchase through its mobile application and Omnitrans fares can now be purchased electronically on its website and by phone through its partnership with Transit Token. The program's success will be determined by whether or not TNC programs can educate their drivers on the pilot program's features and grant them the ability to validate a purchased fare medium and apply the subsidy on a trip-by-trip basis. Since TNC drivers can place themselves "in-service" in any geographic location, it will be difficult to educate the entire fleet on a pilot program within comparatively small service zones. A solution for participation might be to institute a promotional code for each TNC that will trigger the trip subsidy when presented in their respective mobile applications.

> ### *What are the Challenges in Implementing TNC Partnerships with Public Transit?*
>
> Some of the greatest challenges of using TNC programs to augment and support public transit systems are in the TNC's ability to comply with the flow-down regulations and policies of the federal, state and local entities that regulate the public transit industry.
>
> These include: ADA requirements for wheelchair-accessible vehicles and on-time windows; drug and alcohol testing for new hires and random testing throughout driver tenure; Title VI implications regarding vehicle coverage in impoverished neighborhoods or difficulty of program access due to lack of technology devices or being unbanked; and driver background checks in terms of the third-party name-only searches conducted by TNCs as opposed to the fingerprint search conducted by transit/government agencies.
>
> Securing timely rider origin and destination information has been another area of difficulty in working with the TNCs.

The pilot program was initially designed to allow the TNC companies to bill SBCTA using geo-fence technology that would identify eligible program trips by origin and destination location. This technology would have eliminated the need for rider registrations, vouchers or tickets as it would have billed for all trips traveling between the airport and the three designated Metrolink stations based on TNC vehicle GPS. It has been determined that a geo-fenced payment structure could allow travel that does not support the Metrolink or Omnitrans transit systems and could also allow free trips that do not support local air travel, rail or bus. As such, the geo-fence mechanism will be explored further after pilot launch, once an early assessment of trip patterns can be conducted to determine how the technology could be used effectively. Riders on a return trip from the airport who plan to purchase their Metrolink or Omnitrans fare with cash will not yet have fare media to present to the driver, so this leg of the trip might be best coordinated by the geo-fencing technology. Another option would be to tie a promotional code capability with geo-fencing technology that would make it easy to apply the subsidy but be able to exclude trips that do not begin or end at one of the program locations.

Finally, securing data from the ride-hailing services is important to both evaluating this program and to making determinations about its future. Data availability from TNCs in other settings has been spotty, if available at all. Realizing that this project is an attempt at data gathering, reporting standards must be agreed upon between all partners in contract, prior to program launch. In a particular northern California environment, Lyft has been able to provide more comprehensive data than its Uber counterpart.

Accessibility

Ensuring comparability of service to persons with disabilities will be important to maintain ADA compliance. This has proven difficult in some settings. Effective arrangements with the local taxi companies and/or with Omnitrans' own Access program will mean establishing some sort of comparable response times for passengers requiring accessible service as for those who can board regular, non-lift-equipped vans.

Funding

Whether or not this program continues will be related to the levels of use in this initial phase and the extent to which the various policy and regulatory issues can be resolved. At present, no additional funding has been identified for sustainability.

2.2 Strategy: Flexible, Microtransit for Downtown San Bernardino, with Electric Vehicles

Problem

Downtown San Bernardino is among the highest density employment areas in the San Bernardino Valley and brings together a convergence of bus and rail services. An estimated 28,000 persons work in the Traffic Analysis Zone that encompasses downtown San Bernardino, an area of approximately 1.5 square

miles per the American Community Survey. Approximately 16 bus routes from four transit providers come into the San Bernardino Transit Center and as of October 2017, Metrolink trains will arrive multiple times a day in downtown San Bernardino. This confluence of work trips and transit services would seem to be the perfect opportunity for high transit use. The San Bernardino Transit Center (SBTC) currently sees an estimated 5,200 bus boardings and 5,700 bus alightings on a typical weekday.

But ***use of transit by employees is very low***, at 1.9% of commuters among the San Bernardino Valley. During the Market Research phase, interviewed commuters to downtown San Bernardino fell into three groups: 1) those adamant that they could see no scenario that would get them out of their car; 2) those who saw some potential/some circumstances where they would consider using shared-use transportation to commute; and 3) those — few — who were already using rail and transit and were extremely comfortable doing so. With the new Metrolink service coupled with Omnitrans investment in the sbX, increasing transit use in the downtown area is an important goal.

In study focus groups, we heard concern about walking in the downtown San Bernardino area. Participants conveyed that they don't feel safe walking, ironically because the streets were often empty and there weren't others out walking. Others commented that there were so many bus routes, they were uncertain as to which to take, didn't want to "sort out" which bus to take and that they did not want to wait at SBTC for a bus to carry them that last mile to their specific work site.

Opportunity and Objectives

This strategy seeks to attract new transit users with a last-mile downtown San Bernardino Flex service, including a circulator component, designed to carry riders directly between SBTC and employment sites.

Target Markets: San Bernardino Potential Service Based on Employment Location

Downtown San Bernardino is a major employment destination in the San Bernardino Valley. Moreover, a substantial amount of service, such as local fixed-route, commuter bus and commuter rail provides service into the downtown area. While transit service is abundant in the area, many employees still choose to drive to work. During focus group sessions with people that worked in downtown San Bernardino, a concept of a flexible downtown service serving major employment destinations was presented to the focus group participants. Participants were asked if they would be willing to use a flexible downtown transit service. Some of the focus group participants said that they would be willing to try a flexible, on-demand service if it were ready to pick them up when buses and trains arrive at the Transit Center, sbX stop or other bus stop.

Evidence suggests that people working in downtown use public transportation service. A substantial amount of ridership activity occurs at SBTC and the two downtown stops of the sbX line. In fact, the sbX station at Rialto and E, adjacent to the Transit Center, is the most heavily used stop along the sbX. The high ridership activity in this area indicates that at least some downtown employees are most likely already using public transportation services.

Using Omnitrans' ridership data, it is possible to obtain an understanding of the market for transit service in downtown San Bernardino. Table 2 shows the boardings and alightings — per weekday — for the collection of Omnitrans routes that serve downtown San Bernardino. While it is possible that there is double counting of passengers transferring at the Transit Center (an alighting passenger transferring from Route A to Route B is counted as a boarding passenger on Route B), it is nonetheless clear that there is significant transit usage in the downtown area. Daily averages of 5,171 passenger boardings (ons) and 5,276 passenger alightings (offs) were tabulated in recent counts.

Table 2, Omnitrans Daily Ridership in Downtown San Bernardino

	Early AM	AM Peak	MidDay	PM Peak	Evening	All Day
Downtown Stops	Before 6 AM	6-9 AM	9AM-3 PM	3-6 PM	6-12 PM	
On	19	97	392	149	64	**721**
Off	16	209	500	200	114	**1039**
Transit Center						
On	99	583	1552	816	580	**3630**
Off	191	700	1484	724	383	**3482**
sbX						
Civic Center--On						**170**
Civic Center--Off						**135**
Rialto & E--On						**650**
Rialto & E--Off						**620**
All Downtown						
On	**118**	**680**	**1944**	**965**	**644**	**5171**
Off	**207**	**909**	**1984**	**924**	**497**	**5276**

Assuming that 50% of the peak period Transit Center ridership is origin or destination trips and that 40% of sbX trips are in the peak periods (comparable to the regular route ridership profile for the downtown routes), and that 67% of the sbX Rialto and E passengers represent origin or destination trips, there *could be as many as approximately 700 morning peak period trips terminating in the downtown area and 700 evening peak period trips leaving from downtown*. These would be downtown origin or destination trips, not transfer trips at SBTC. In addition, once Metrolink service begins traveling to SBTC, there may be as many as another 50 to 100 daily Metrolink commuters who would be candidates for a downtown distribution service.

This market research, combined with employment statistics from the census data, suggested several potential stop locations that could be served by a flexible downtown service. Another element to consider is the location of the entrances of these buildings and whether these entrances can be served by a vehicle in a way that allows for safe access from the moment a customer steps off a transit vehicle to their workplace. A further consideration is the nature of the street network (i.e., one-way streets that limit a vehicle's ability to maneuver from one "check point" or bus stop to the next). Combining all these considerations on the demand side with the layout of the street network, Figure 9 and Table 3 illustrate some of the more promising potential stop locations.

Figure 9, Proposed Checkpoint Locations to Serve Key Employers
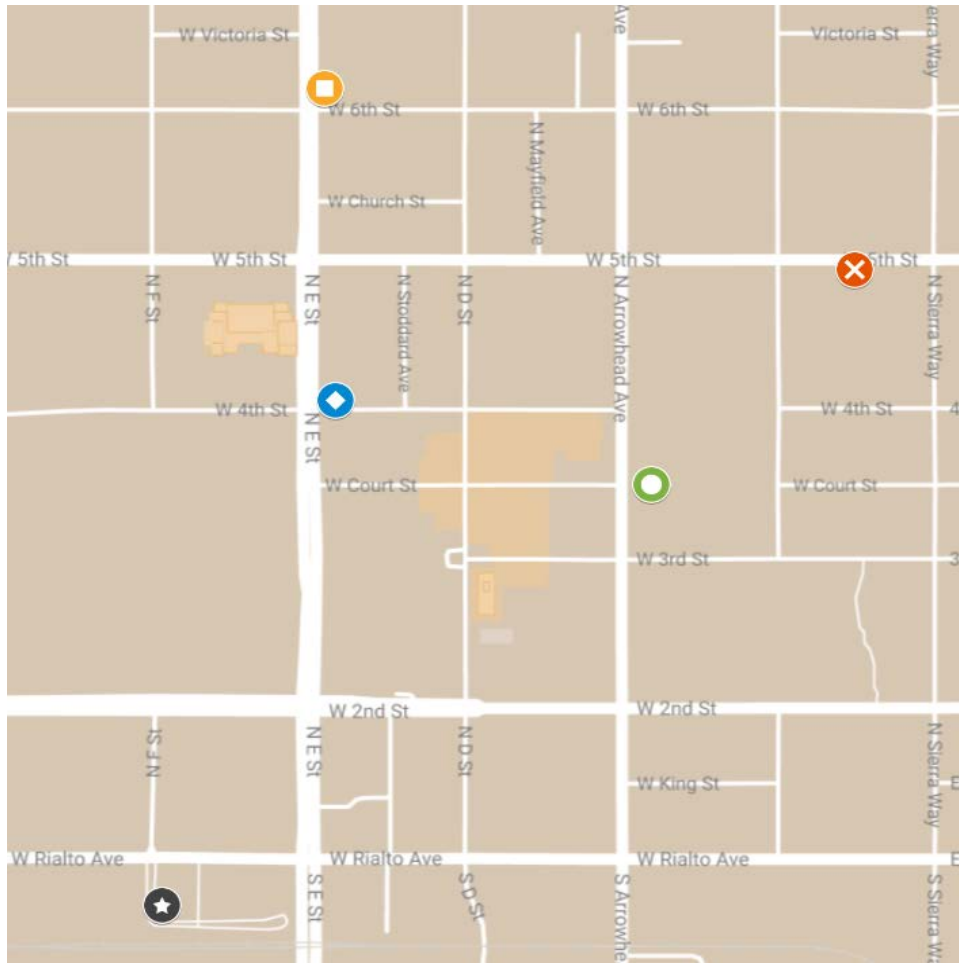
Table 3, Attributes of Proposed Stop Locations and Description

Location Marker	Orange Square	Blue Diamond	Green Circle	Red "X"	Gray Star
Approximate Address of Bus Stop	601 N E St.	464 W 4th St	351 N Arrowhead Ave	150 W 5th St	599 W Rialto Ave
Latitude, Longitude	34.110452, -	34.106575, -	34.105514, -	34.108198, -	34.100256, -
Office Spaces served	San Bernardino County Superintendent and Verizon (6th and E) and Arrowhead United Way (6th and	State Government Center(s) - California Department of Transportation, Rehabilitation Department,	San Bernardino County Courthouse (south block entrance)	San Bernardino County Human Resources, San Bernardino Sheriff Crt Sv, San Bernardino Veterans Affairs; San	San Bernardino Transit Center
Estimated Employment for the	1272-2140	1272-2140	200-300	4446-8331	n/a
If 1% Employees become daily riders...	12 to 22	12 to 22	2 to 3	44 to 83	1% of train alightings?
Note	Stop near 6th and E, but bus should not go north of 6th Street. These 3 employers take up much of the southern half of the block	Strong candidate as these buildings have the same entrance at 464 W 4th St.	Employment numbers may be misleading as employees might work remotely, at multiple locations, or do field work for some of these employers. Results from the market research effort	Strong candidate as these employers are effectively in same building with different entrances.	Several vehicles could serve different service zones
Distance, Walking Time from Transit	0.8 mile, 17 minutes	0.6 mile, 13 minutes	0.7 mile, 15 minute walk	1.1 mile, 23 minute walk	n/a
Other Nearby Routes	Bus 2; Bus 11	Bus 2, sbX; 11 & 14	Route 4, Big Bear OTM, Rim OTM	Routes 1 and 7	Many
Distance from Other Nearby Existing Routes	Bus 2 serves E street and is 70 meters from entrance of Superintendent building; Bus 11 serves D Street and is	Bus 2 is 100 meters away, sbX is 175 meters away from entrance, both to the west on E St. Buses 11 and 14 serve D	140 yards in either direction from Route 4 (to south) and Big Bear and Rim OTM (to north)	75 yards from 5th Street and Sierra Way	Less than 100 yards from all routes serving the SBTC

From Table 3, Omnitrans daily boardings, we assume 1% of employees in the given blocks might be potential customers of this new service in order to estimate the number of vehicles that would be needed to meet demand. The values shown in the table suggest that as many as 140 individuals might become daily users of the service. If 75% of these users made two trips a day, this would be a daily ridership of 245 passengers when estimated in this fashion.

Previously, it has been estimated that there are currently about 700 origin/destination transit trips in each peak period in the downtown area and about 1,000 origin/destination trips during the mid-day, or as many as 2,400 total boardings per day. The estimated ridership for the flexible services based on the number of employees in the downtown service area is less than 10% of the current transit ridership in the downtown area, so this ridership projection appears somewhat plausible. It also bears noting that a daily ridership of approximately 250 passenger trips has been achieved in three of the DRT services zones in Denver, none of which have transit trip generation characteristics as strong as those of downtown San Bernardino.

It also bears emphasizing that a flexible service would not only provide excellent service to the downtown area, but would also facilitate trips to and from SBTC, which is a relatively long walk from many of the key employment sites in the downtown. The benefit to a flexible, on-demand service in this regard:

> *The service can wait at the SBTC until precisely the time that trains and/or buses arrive. If trains are delayed, real-time travel data on both vehicles can be updated to communicate that the vehicle needs to hold. When a service is designed explicitly to shuttle customers from SBTC to key employment destinations, it is easier to make the case to riders that the vehicle should hold. In contrast, for vehicles with a regular headway, downstream customers (e.g., those waiting several stops downstream of the SBTC to get to an even further downstream destination), this kind of holding behavior is not desirable.*

Strategy Description: Potential Zones of Flexible Service

There are many potential configurations of an on-demand service. The figures and discussion in this section propose three scenarios: two zone scenarios (*Scenarios 1* and *2*) with flexible service and one scenario (*Scenario 3*) fixed-route loop, which allows for route deviation that serves major employment destinations. These zones are hypothetical, and a final design would depend on some degree of stakeholder and customer feedback, as well as operations simulation, in order to determine the proper shape, size and checkpoint locations. Figure 10 illustrates the two zone scenarios.

1. *Scenario 1: Blue Zone* — This alternative serves the key employment destinations identified in Figure 8 and Table 3 of the previous section. The Blue Zone encompasses less than 0.5 square mile.
2. *Scenario 2: Red Zone* — This alternative extends the zonal boundaries significantly to an area approximately 1.5 square miles.

Based on the demand discussion in the previous section, we make assumptions regarding the number of vehicles that would be needed to serve the ridership effectively in both *Scenarios 1* and *2*.

A third service alternative, *Scenario 3: Deviation Service*, is also discussed here.

Figure 10, Potential Service Zones
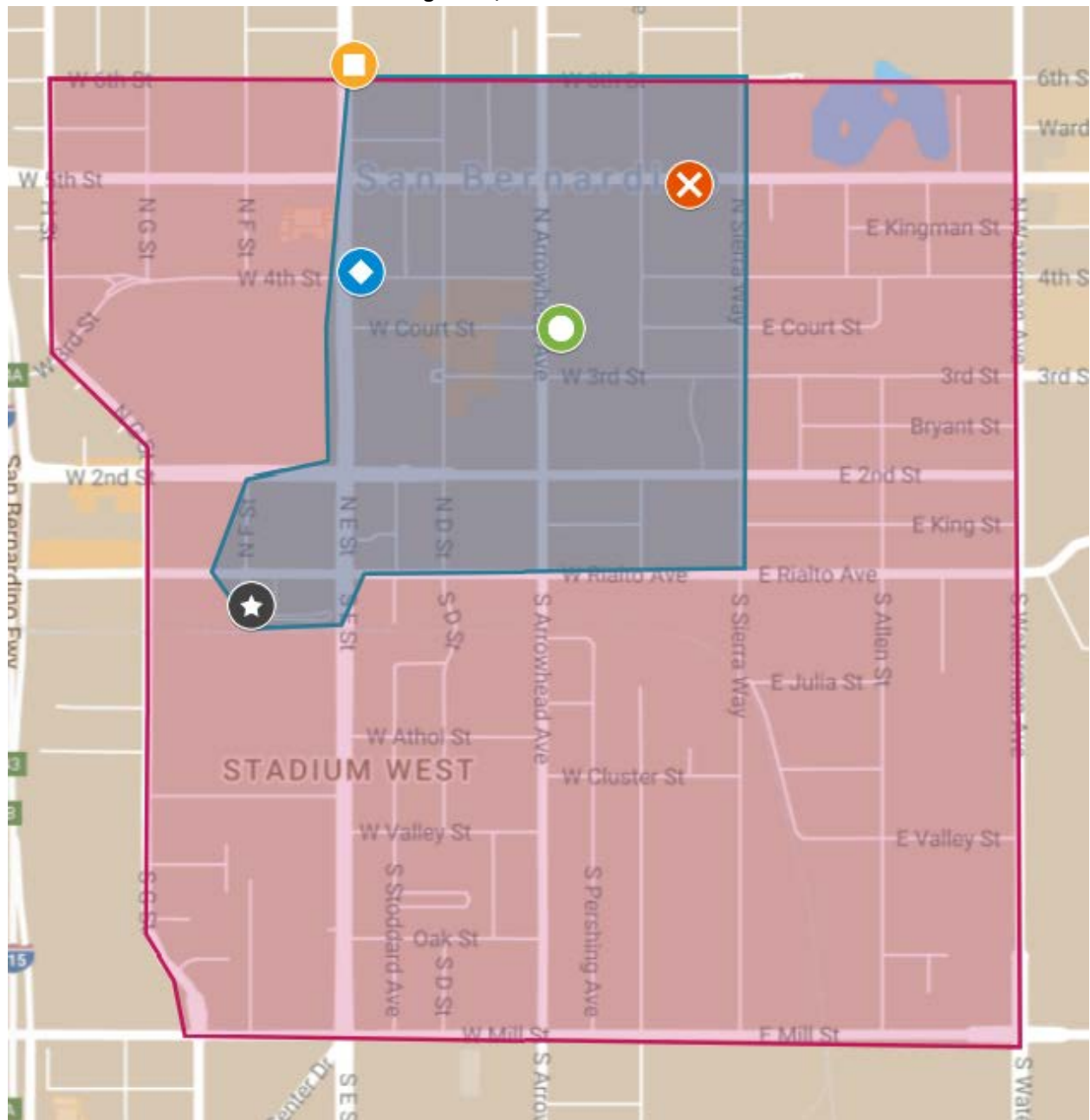
Scenario 1 covers the key employers identified using census data. *Scenario 2* covers an area from H Street to Waterman Avenue (east to west) and from 6th Street to Mill Street (north to south). We suspect demand south of Rialto Avenue would be slightly lower due to the employment characteristics, but this is still a very compact and reasonable sized zone for DRT/Flexible service.

Interest in providing a deviated fixed-route system is also examined under this strategy as *Scenario 3.* This scenario evolves naturally from serving major employment destinations identified in the Blue Zone *Scenario 1.* While this scenario naturally creates a fixed-route, allowing for route deviations will allow for pick-up or drop-off of passengers on demand. Depending on the length of the nominal route, it may be possible to achieve 15-minute headways — or even less — to serve the "stops" adjacent to the major employers.

Figure 11 shows the potential route configurations for **Scenario 3**. Note, that at point D, the vehicle would need to turn around in a parking lot in order to travel west on 5th Street and turn south onto Arrowhead Avenue. For this reason, it might be preferable to have two vehicles moving in opposite directions around this loop, as shown in Figure 12. This would enable the drivers to avoid U-turns or other maneuvers that would be complicated and time consuming for the proposed 14-passenger cutaway vehicle.

Figure 11, Scenario 3: Fixed-Route Loop to Serve Employers
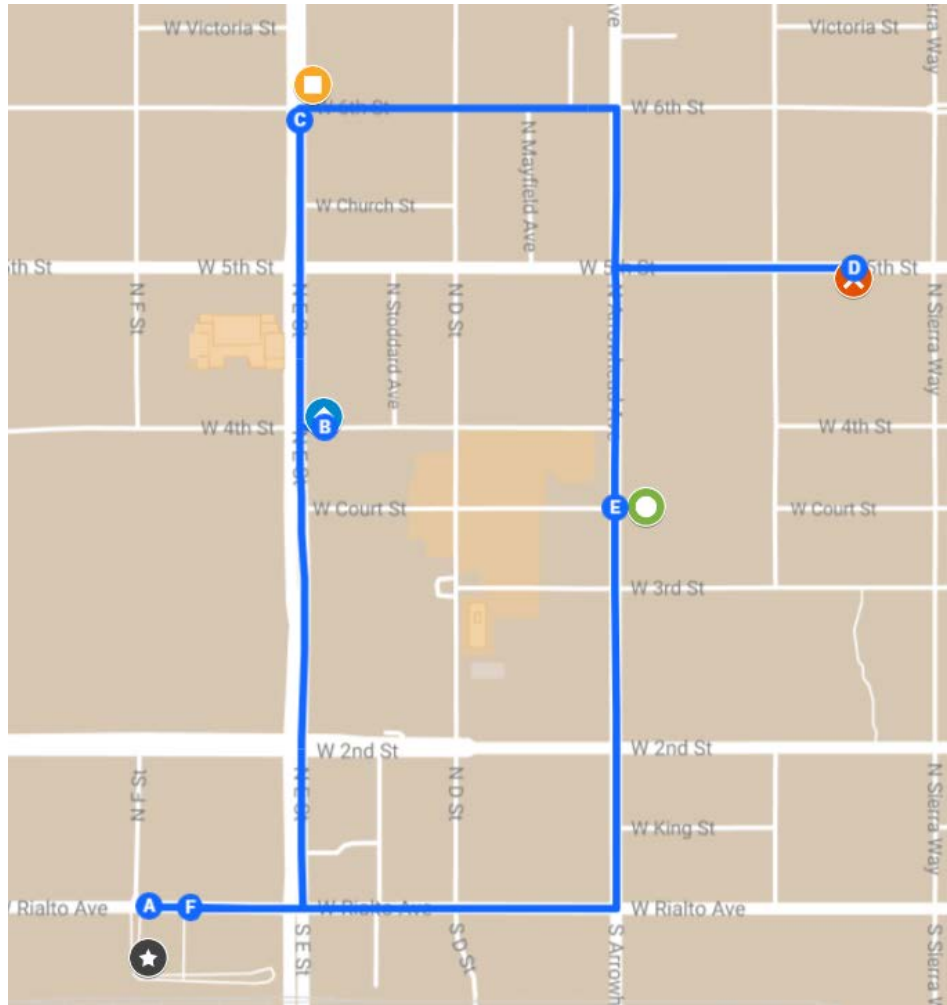
Figure 12, Scenario 3: Two Loop, Two Vehicle Service Configuration (One Vehicle per 15-minute Loop During Peak)
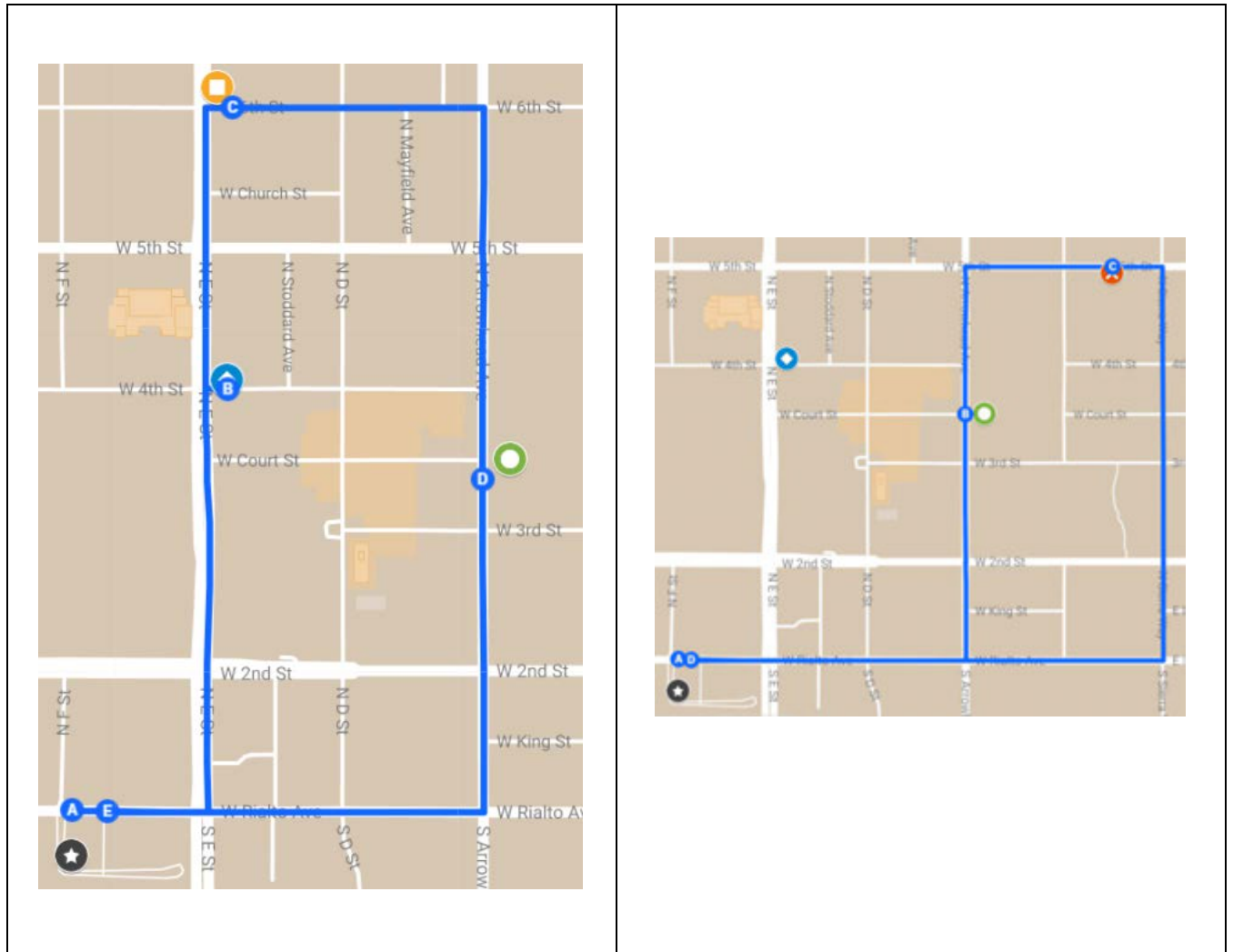
Table 4, Attributes of Potential Service Zones

Potential Service	Scenario 1 Blue Zone	Scenario 2 Red Zone	Scenario 3 Flex Route
Zone Description	Smaller zone to serve key employers in area north of Rialto Avenue with higher anticipated demand.	A zone encompassing key downtown destinations, generally within 1 mile north, south and east of transit center.	Clockwise route which could serve most promising destinations during peak periods or during the entire day. Another vehicle could move in counterclockwise direction so the level of service is higher for stops in the other direction, or the loop could be split in two.
Area	0.383 square mile (245 acres)	1.5 square miles	N/A
Route Length	Perimeter of zone: 2.7 miles	Perimeter of zone: 5 miles	2.44 mile loop to be completed in 15-20 minutes
Peak Coverage	7:00-9:00, 16:00- 18:00 (4 hours)		
Offpeak Coverage	6:30- 7:00; 9:00-16:00, 18:00-20:00 (9.5 hours)		
Number of Vehicles Peak (to provide 10-minute "headway")	2	3	2
Number of Vehicles Off-Peak (to provide 20-30-minute "headway")	1	2	1
Vehicle Service Hours per weekday, Mon-Fri (based on four previous values)	17.5	31	17.5

For *Scenarios 1* and *2,* the headway at the transit center is defined by how often either vehicle can get to the transit center. For *Scenario 1* or *Scenario 3,* the expected travel time to all points is roughly 15 minutes, assuming 1 minute dwell time at each drop-off point and 10 minutes to travel the approximately 2.5-mile loop (average speed of 15 mph, to account for traffic signals and potential need to use parking lots to turn around).

Comparing the deviated flex routes in *Scenario 3* (the last column in Table 4 and illustrated in Figures 11 and 12), a flexible zone is more attractive because it can go only where there is demand, as opposed to serving a predetermined route for which there may be no demand. *Scenario 1* also requires the same number of vehicles and service hours to achieve a similar level of service given the demand and travel time assumptions. The number of vehicles could also be increased if the service is very popular and vehicle capacity becomes a constraint. The precise configuration, timing and coverage area could all be adapted over time as demand is observed and as it changes with changes to the scheduled train service.

Operating Plan: Cost Assumptions and Discussion

The potential operating cost and subsidies can be calculated in several ways. Two ways are presented below, and further refinement of these calculations could be conducted if demand and service parameters were agreed upon by the client.

The first calculation approach is based on ridership, assuming roughly 1% of employees would use the service during peaks. The second approach uses productivity per vehicle service hour (based on observed productivity of other systems in Denver, CO, and Oakland, CA). In both approaches, the level of subsidy ranges from $20 to $35 per vehicle service hour depending on zone configuration and $3-5 per passenger depending on ridership and productivity estimates. Since the number of vehicles needed would depend on both the expected ridership and preferred level of service (i.e., a shorter headway means more vehicles are needed), these calculations are approximate.

Another consideration is what might happen if autonomous shuttles were deployed, since these technological considerations will change the operating costs significantly. Finally, if electric vehicles are used, the portion of the operating cost subject to fuel fluctuations becomes relevant. We assumed a $55 per vehicle service hour operating cost based on nationwide averages for contracted service; with electric or autonomous vehicles, this cost could be lower, potentially much lower for autonomous vehicles.

As Table 5 illustrates, the blue flexible route in *Scenario 3* offers the lowest subsidy in both Average Subsidy per Rider and Vehicle Service Hour. This is attributed to the fact that the flexible route can attract more riders at the same operating costs per vehicle service hour than the Blue Zone service presented in *Scenario 1*. However, given the nature of this new service, one can begin a pilot program utilizing the flexible zone service of *Scenario 1,* allowing the vehicle to go to areas where there is demand in the downtown area. This scenario can improve the customer experience by providing almost direct service to a destination. The success of *Scenario 1* is driven by the scenario's ability to attract and retain riders by providing a quicker alternative to reaching a work site on a mode that removes the perception of sitting on a vehicle traveling on a fixed-route. In time, as passenger utilization grows, efforts can be taken to reduce passenger and vehicle service hour subsidies for *Scenario 1*.

The Red Zone in *Scenario 2* needs more vehicles to offer a similar level of service, since it is larger, but the relatively lower expected demand in areas south of the SBTC means the subsidy per passenger or vehicle would be greater. The client could start with service in only the Blue or in the entire Red Zone and observe how demand changes over time. After a 6- or 12-month pilot period, a final determination could be made regarding where service is most effective and reinforces the overall mission and objectives of the *complete* transit network.

Based on the services described in Tables 4 and 5, the total operating and revenue hours are estimated for each potential scenario. These hours are converted to costs using the NTD data for Omnitrans ($6.03 per revenue mile, which might be lower if electric vehicles were used or $81.09 per vehicle revenue hour, which would be lower if autonomous vehicles reduce the number of FTE drivers required). The greater of these two costs was used to estimate a per rider cost for the final row in Table 5. Again, the flexible blue zone is expected to have the lowest per rider cost since the zone is smaller and has a high ridership per vehicle

service hour. Selection of which scenario to implement should be driven by improving the customer experience and promoting a service that provides faster service to key destinations.

Table 5, Operating Cost and Productivity Assumptions for Various Flexible Services

Parameter/Assumption	Blue Zone	Red Zone	Clockwise Route (blue line)
Anticipated Ridership	40 per hour peak, 10 per hour off peak	50 per hour peak, 15 per hour off peak	45 per hour peak, 10 per hour off peak
Operating Cost per Weekday Vehicle Service Hour	$55		
Total Weekday Ridership	255	343	275
Average Fare Per Rider	$2.00	$2.00	$2.00
Daily Operating Cost	$962.50	$1,705.00	$962.50
Annual Operating Cost (250 weekdays per year)	$240,625.00	$426,250.00	$240,625.00
Annual Fare Revenue (daily Ridership * Average Fare for expected market * 250 days per year)	$127,500.00	$171,500.00	$137,500.00
Annual Riders	63750	85750	68750
Average subsidy per rider [(ops cost - fare)/ridership]	$1.77	$2.97	$1.50
Weekday Vehicle Service Hours	17.5	31	17.5
Operating Cost	$240,625.00	$426,250.00	$240,625.00
Fare Revenue	$127,500.00	$171,500.00	$137,500.00
Annual subsidy for service	$113,125.00	$254,750.00	$103,125.00
Assumed Passenger productivity per VSH[a]	12.50	10.00	13.50
Calculated Passengers (hours * productivity * 250 weekdays)	54687.5	77500	59062.5
Subsidy per passenger (using total weekly passenger calculations)	$1.77	$2.97	$1.50
Subsidy per VSH	**$25.86**	**$32.87**	**$23.57**

Implementation Factors

It bears emphasizing that the DRT/Flex service proposed for downtown San Bernardino is similar to other types of operationally proven and successful first-mile/last-mile services. Of particular relevance are the general public DRT services of the Denver Regional Transportation District (RTD), of which 15 such services are focused on first-mile/last-mile connections to LRT or express bus services. Some of these services attract up to 250 riders per day. Most use some structuring elements, such as checkpoints or flex-routes or limiting pick-up/drop-off points during peak periods, in order to maximize productivity and service to users during times of the day when demand is robust. The same principles have been used in planning the proposed downtown San Bernardino service.

Customer Access to the DRT/Flex Service

A detailed marketing plan will be important to provide the customer-facing communication tools that most clearly convey how to use this service, how to book a trip or get a trip and where it goes.

It is anticipated that customers would access the proposed downtown San Bernardino DRT/Flex service in several ways:

- An app would be available for customers to book a trip, with the customer specifying where they wish to be picked up and delivered. This app could even be a *Mobility as a Service* — MaaS-enabled app that would also provide the user with the feasible options for making their trip and could recommend the "best" option if the customer desires. If there are only a limited number of checkpoints where riders are picked up, the app will direct the passenger to the appropriate location — they will only be able book rides to and from the checkpoint locations served at the time of their trip. It may be the case that during peak periods only the major checkpoints will be served, whereas during the off-peak virtually any address in the downtown will become an eligible pickup or drop-off location. Decisions about which locations will be served at different times of day will be made in the detailed operational planning phase of the project prior to implementation.
- Alternatively, or in addition to an app, customers can access the service as "walk-on" passengers at SBTC (and at the adjacent sbX stop on Rialto and E streets). Such passengers would simply tell the driver what their destination is and that would be registered in an on-board tablet computer that would provide the driver with an optimized vehicle tour prior to leaving the SBTC. As with customers using the app, the walk-on passengers can only be delivered to locations that the vehicle is serving at the time they board the vehicle. A passenger wanting to go to Court Street and Arrowhead Avenue might be actually booked to 3rd and Arrowhead as the Court Street location is not being served directly during peak periods.
- It is also possible for customers to book trips using their telephone by contacting the Omnitrans call center (such as ADA paratransit passengers do) if Omnitrans wants to implement agent booking functionality. Most passengers will prefer the convenience of booking via smartphone or simply being a walk-on passenger, but some people may prefer interacting with a human agent to make a trip booking. This can be easily accommodated.

It should also be emphasized that the DRT/Flex services envisioned for downtown San Bernardino are based on fully automated vehicle scheduling and routing technologies, and do not require human schedulers or dispatchers. Similar services have been operating in Denver since 2009 with no dispatchers, carrying over 2,000 trips per day in more than 40 vehicles. Automated technologies handle customer booking, trip scheduling, assignment of trips to vehicles, generation of the dynamic routes of the vehicles and passenger notification of when the vehicle will soon arrive. This is "business as usual" in Denver for the more than 20 general public DRT services operating there. Integration with mobile ticketing solutions such as those Omnitrans may acquire can also be readily accomplished.

Use of Electric Vehicles

Another consideration for implementation is the use of electric buses. This will require a different vehicle type for DRT service from SBTC to major destinations in downtown San Bernardino. The advantage of using an electric vehicle will include the ability to leverage additional discretionary funding for the purpose of

reducing greenhouse gas emissions. Moreover, a different vehicle type can be more readily branded as a separate service type outside of the traditional family of Omnitrans service (i.e., fixed-route, sbX and OmniGo).

Funding programs under the FTA and the State of California's cap-and-trade programs provide opportunities for Omnitrans to secure funding under these programs for the acquisition and operation of electric vehicle technology and service. Operating electric vehicles also support statewide initiatives that support the use of no-emission vehicles in the near future. This strategy can be a first step toward utilizing an electric vehicle serving a small operating environment. Moreover, a pilot project utilizing an electric vehicle can help leverage additional discretionary dollars and serve as a model to transport commuters from a single-point origin, such as a train station, to many destinations within a relatively small area.

Discussions with an electric vehicle manufacturer, Phoenix Motor Cars, provide a basis for the estimated capital costs associated with an electric vehicle and charging stations presented below. Table 6 provides an estimate of the vehicle and charging station unit costs and estimated total capital costs required for the different operating scenarios. The vehicle costs include incentives through the California Air Resources Board (CARB), in association with CALSTART, through the Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project (HVIP). These incentives can help reduce the capital costs of the vehicle but are subject to availability. Many transit agencies moving to a very low/no-emission fleet are taking advantage of these incentives, thereby reducing the amount of available funding to transit properties moving forward with purchasing these vehicles.

Capital costs range from $287,000 at the low end of the operating scenario to as much as $410,000 for the purchase of revenue vehicles, one spare vehicle and the optimal charging station. Again, these cost parameters serve as an estimate of the potential capital costs associated of vehicles and applicable incentives offered by the state.

The vehicle selected for this example is a 16-seat, Ford E450 Shuttle Bus vehicle with two wheelchair positions and wheelchair lift. The vehicle operates on a Phoenix Electric Drive System with a 105 kWh Lithium Ion Battery Pack with a driving range of 100 miles.

Table 6 also presents two chargers. The first charger is a Clipper Creek Level II charger, which has an estimated charge time of nine hours. The second option is an Aerovironment EV50 DC Fast Charger with an estimated charge time of three hours.

Further research will be needed to identify additional vehicle types and capital improvements associated with the utilization of electric vehicles. Moreover, it allows the agency to satisfy procurement requirements and develop a capital improvement plan and schedule for this new vehicle type.

Table 6, Capital Cost – Electric Vehicles and Charging Stations

Parameter/Assumption	Blue Zone	Red Zone	Clockwise Route (blue line)
Maximum Number of Vehicles in Service (to provide 10 minute "headway")	2	3	2
Number of Spares	1	1	1
Total Number of Vehicles	3	4	3
Baseline Vehicle Price - Ford E450 Chassis with Shuttle Bus Body and ADA Lift, powered with a Phoenix Electric Drive System	$195,000	$195,000	$195,000
California Air Resources Board (CARB) Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project (HVIP) incentive [1]	$80,000	$80,000	$80,000
Additional HVIP Incentive for First Three Shuttle Buses Purchased	$10,000	$10,000	$10,000
HVIP Incentive (Disadvantaged Community) [1]	$10,000	$10,000	$10,000
Price per vehicle	$95,000	$95,000	$95,000
Total cost for all vehicles	$285,000	$390,000	$285,000
Option 1 (Level II Charging - Clipper Creek Level II CS-100) per unit	$1,995	$1,995	$1,995
Option 2 (Level III DC Fast Charging) per unit	$19,750	$19,750	$19,750
Total Capital Costs			
Total number of vehicles + Option 1 Charging	$286,995	$391,995	$286,995
Total number of vehicles + Option 2 Charging	$304,750	$409,750	$304,750

[1] Dependent on HVIP Funding availability

Institutional Arrangements

Omnitrans as the operator of this service — as an initial pilot for a defined period of time — is the obvious choice. It will be useful to integrate this service with the other downtown routes, in the near term or in the longer term, and Omnitrans stands in the best position to do so.   To monitor utilization rates and operational experience, from the outset, will help to determine the ongoing success of this flex service. Whether this is operated through the contracted demand-response program of ACCESS operations, or separately through Omnitrans fixed-route operations, will need to be an internal decision.

Potential Funding Sources for This Strategy

It would be valuable to have a pilot or "entrepreneurial" funding source by which to test this effort in its first year of operations.

Marketing Plan and Strategies

Strategy 2.2 calls for the establishment of a new type of transportation service in downtown San Bernardino. The Flexible Microtransit service is intended to attract downtown employees who are resistant to using Metrolink, sbX or Express buses because of the need to walk or transfer to a local bus in order to reach their work site in downtown San Bernardino. By providing a direct and immediate link from the Metrolink station/San Bernardino Transit Center, the Microtransit will address the fear and confusion that were expressed by employees in study focus groups. By being timed to meet Metrolink trains and allowing riders to request a ride using a smartphone app, the service will offer a level of convenience that commuters' desire.

If this new type of service is to be successful, however, commuters must know about it and understand how it works. They must perceive it as addressing their transportation needs and concerns, something they do not believe existing transit services do. Therefore, effective marketing and communications will be as important as appropriate service design in insuring the success of the new service.

The introductory marketing program for the microtransit service must address several key areas of communication:

- Branding,
- Signage/Way-finding,
- Passenger Information and Education,
- Marketing through Downtown Employers,
- Cooperative marketing with Metrolink, and
- Social Media.

In addition, targeted advertising using social media and geographically focused channels, such as bus shelter panels would be appropriate if budget allows.

Branding

There are a wide variety of transit vehicles operating in downtown San Bernardino — Omnitrans, sbX, Mountain Transit, VVTA, Pass Transit and Riverside Transit Agency. In addition, there are numerous paratransit and social service vehicles. The new Flexible Microtransit service will enter this mix and can easily become invisible.

Branding is marketing at its most basic — how we identify a product and everything associated with it. The branding for the Microtransit service must accomplish three things:

- Clearly distinguish this service from the myriad of existing transportation services.
- Distinctly communicate the purpose of the service — to provide a connection between Metrolink/SBTC and employment locations within the downtown area.
- Present an attractive, user-friendly image that will appeal to downtown employees.

Elements of the brand include:

- Name/Logo,
- Slogan or Tagline, and
- Vehicle Color and Graphics.

Name/Logo

The name for the new service should be short, memorable and distinctive. Ideally, it should also clearly communicate the nature of the service — a connection between Metrolink and the workplace.

One approach would be to build off of the work LINK in Metrolink:

- LINK^2
- LINK*2
- SB LINK

Slogan or Tagline

A slogan or tagline used in conjunction with the name can serve to clarify the nature and purpose of the service.

- Your on-demand LINK to Metrolink
- A quick LINK to Metrolink
- The quickest way to Metrolink
- Downtown SB's Metrolink*link

Vehicle Color and Graphics

The microtransit vehicles will be a critical element of the marketing mix. They will be seen by thousands of potential users each day both at the Transit Center and within the downtown area. Bold colors and graphics should attract attention, communicate the nature of the service and present an image that will appeal to commuters — attractive, safe, fast, reliable and high tech. (The use of electric vehicles should be a positive element of the vehicle appeal.)

In addition, the graphics on the vehicle should tell the potential user how to access the service by providing an easy to remember web address where they can find out how the microtransit service works and download the app.

Signage/Way-finding

An element of the marketing that is closely related to the branding is signage and way-finding. This will be critical in guiding potential riders to the service and giving them the confidence to use it.

- When a passenger steps off the Metrolink train, they should see a branded sign directing them to the Microtransit service.
- Similar signage should direct riders exiting the sbX at the San Bernardino Transit Center stop.
- The signs should communicate a clear path of travel from the primary mode to the point where they Microtransit vehicle will be waiting.

For return trips, primary boarding locations within the downtown San Bernardino area should also be clearly signed. The signs should include a web address or QR code that will allow the user to access the app and request a ride back to the transit center. This will serve both as a means to tell riders where to catch the vehicle, as well as permanent on-street advertising for the service.

Examples of Downtown Shuttle Names

- DASH – Los Angeles (and numerous others)
- LOOP – Las Vegas
- D-LINK – Dallas
- THE B – Oakland (Broadway Shuttle)
- SUN LINK – Tucson Streetcar
- PHLASH – Philadelphia

Passenger Information and Education

Everything about the microtransit service needs to be clear and easy. Users will be comparing it to using Lyft or Uber and will expect a similar level of user friendliness.

Passenger information needs to communicate:

- Service area, hours and frequency — where you can go and when;
- Where/how to catch the vehicle at the San Bernardino Transit Center (and the fact that it will be waiting for the train);
- How to request a return trip using the app (or calling); and
- How much it costs or if you can ride with your Metrolink ticket.

This information needs to be provided on a mobile-friendly website, as a small handout, a display at the transit center and a poster for use at destinations throughout the downtown area.

Marketing Through Downtown Employers

The downtown employers, particularly the County and City who employ large numbers of persons in the downtown area, must play a critical role in marketing the new service. Through their ETCs and their alternate mode programs, they can provide direct access to the target market. Information about the microtransit service should be bundled with information about Metrolink and potentially sbX and express bus services to downtown. This can show commuters who have not tried transit for various reasons, that they now have a fast and safe option for getting all the way to their work site.

The ideal strategy would be to create customized messaging based on a commuter's home ZIP code.

- Individuals residing in communities along the San Bernardino Metrolink line would receive information (via email or inter-office mail) about using Metrolink and Microtransit.
- Individuals residing in communities along the sbX line would receive information about using sbX and Microtransit.
- Individuals residing in communities with express bus service to downtown San Bernardino (Riverside, Redlands, Yucaipa) would receive information about the appropriate route and the connection to Microtransit.

Cooperative Marketing with Metrolink

A marketing partnership should also be established with Metrolink. The microtransit project's objective is to make using transit easier, particularly to the new Metrolink station. Hence, the two should work in tandem to make current and potential Metrolink riders aware of both the new station and the first-mile/last-mile option for downtown San Bernardino.

This can be accomplished through a variety of channels:

- Inclusion of info about the Microtransit service in Metrolink's printed guide for the San Bernardino line;
- Inclusion of info about the Microtransit service on the Transit Connection page of the Metrolink website;
- Reference to the Microtransit connection in any special promotions that Metrolink does for the new San Bernardino station;

- Posting of information about the new downtown San Bernardino connection on Metrolink's social media pages (Facebook, Twitter, Instagram and YouTube); and
- Signage in trains serving the San Bernardino line.

Social Media

As downtown commuters discover the new services, it will be desirable to have them share the information with their coworkers. Use of social media — particularly Facebook and LinkedIn – can allow riders to easily share information about the service. In addition, Metrolink, Omnitrans and other transit operators that serve the San Bernardino Transit Center can repost social media posts to share the information with their own riders and followers.

Targeted Advertising

An additional, but more costly, channel for communicating with downtown workers is to use paid, geographically targeted advertising. This might include:

- Advertising panels on bus shelters in the Microtransit service area
- Facebook and LinkedIn advertising, targeting people who work in downtown San Bernardino

2.3 Strategy: Distribution Center Tripper Service at Amazon Locations

Problem

The Amazon distribution locations, now in two areas of San Bernardino and providing for several thousand jobs each, are like many large warehouse and distribution centers in the Greater San Bernardino Valley set on large, multi-acre lots and are neither pedestrian nor transit friendly. Bus stops in the vicinity are often at considerable distances from where employees enter or leave building, making transit a very undesirable option.

Opportunity and Objectives

Omnitrans opened dialogue with the Amazon human resources department to explore service that might better meet the regular and seasonal employee transportation needs. Amazon provided Omnitrans with ZIP code information of its existing employees and some analysis showed that potential markets existed and that a public transit option might work well for a reasonable number of employees.

Target Market

Target markets were two-fold: 1) among 3,000 to 4,000 existing employees are those who live within the Omnitrans service foot print and who were likely transportation disadvantaged individuals, and 2) seasonal employees where Amazon shifts increase by up to 50% during the Christmas shopping period and for whom transportation difficulties may well be present.

Strategy Description

Omnitrans chose to test the market with the introduction this past fall of a 2017 "tripper service" that would leave the scheduled Route 8 on Tippecanoe and come onto the Amazon complex, stopping by the employee parking lot near the warehouse to the north, a building that is itself almost ½-mile in length.

Figure 13, Omnitrans Route 8 Amazon Tripper Service Route Map

The tripper service (Figures 13, 14 and 15) travels almost a mile off the route to the employee parking lot and warehouse.
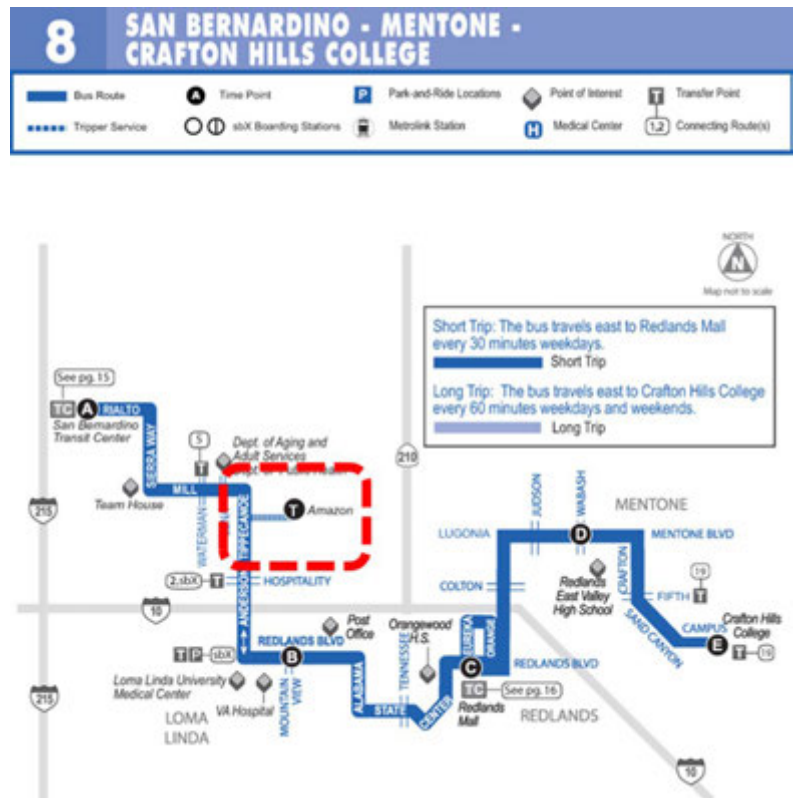
Figure 14, Omnitrans Route 8 Path in Amazon Parking Lot

Figure 15, Amazon Bus Stop Location Detail

Figure 16 shows the Omnitrans Route 8 schedule. There are four stops in each direction, twice daily: two runs for the a.m. shift, eastbound at 5:19 and 6:38 a.m., westbound at 5:20 and 6:30 a.m., and an additional two runs, westbound at 5:45 and 6:34 p.m. and eastbound 5:31 and 6:30 p.m. Both coordinated with shift changes at Amazon.

Omnitrans undertook the fall 2017 initiative as a pilot, to test response and rider interest in advance of the Christmas shopping season and is averaging 25.9 ons and 20.3 offs per weekday, which represents a very successful start.

Implementation Factors

Marketing

Distributing information about the new bus stop and Route 8 times has been important. In the initial three months since start-of-service, Omnitrans marketing staff have hosted three information tables, both to promote the service and provide information about additional Omnitrans' connections at its nearby transit centers, in downtown San Bernardino and at the Redlands Mall. The new service flyer is shown as Figure 17.

Figure 16, Omnitrans Route 8 Tripper Service Schedule

ROUTE 8: MONDAY – FRIDAY

WESTBOUND

E Crafton Hills	D Mentone & Wabash	C Redlands Mall	B Redlands & Mountain View	T Central & Mountain View	A San Bernardino Transit Center
		4:53	5:06		5:36
	5:09	5:22	5:35	5:19	5:57
		5:56	6:09		6:31
5:48	5:59	6:12	6:25	6:38	6:55
		7:04	7:19		7:41
6:58	7:09	7:22	7:37		7:59
		7:55	8:10		8:32
7:58	8:09	8:22	8:37		8:59
		8:58	9:13		9:35
8:58	9:09	9:22	9:37		9:59
		9:58	10:13		10:35
9:58	10:09	10:22	10:37		10:59
		10:58	11:13		11:38
11:00	11:11	11:24	11:40		12:05
		11:58	12:13		12:38
11:57	12:08	12:21	12:37		1:02
		12:58	1:13		1:38
12:57	1:08	1:21	1:37		2:02
		1:58	2:13		2:38
1:57	2:08	2:21	2:37		3:02
		2:58	3:13		3:38
2:57	3:08	3:21	3:37		4:02
		3:58	4:13		4:38
3:57	4:08	4:21	4:37		5:02
		4:58	5:13		5:38
4:51	5:02	5:15	5:31	5:45	6:05
		6:05	6:20	6:34	6:54
5:58	6:09	6:22	6:37		7:02
		7:03	7:18		7:40
7:03	7:14	7:25	7:40		8:02
		7:56	8:11		8:33
8:03	8:14	8:25	8:40		9:02
9:05	9:16	9:27	9:42		10:04
		10:04	10:17		10:39

EASTBOUND

A San Bernardino Transit Center	T Central & Mountain View	B Redlands & Mountain View	C Redlands Mall	D Mentone & Wabash	E Crafton Hills
5:04	5:20	5:35	5:50		
6:14	6:30				
5:45		6:10	6:23	6:36	6:47
6:45		6:46	7:04		
		7:10	7:23	7:36	7:47
7:12		7:37	7:55		
7:45		8:10	8:25	8:38	8:49
8:15		8:40	8:58		
8:45		9:10	9:25	9:38	9:49
9:15		9:40	9:58		
9:45		10:10	10:25	10:38	10:49
10:15		10:40	10:58		
10:45		11:10	11:25	11:38	11:49
11:15		11:40	11:58		
11:45		12:10	12:25	12:38	12:49
12:15		12:40	12:58		
12:45		1:10	1:25	1:38	1:49
1:15		1:40	1:58		
1:45		2:10	2:25	2:38	2:49
2:15		2:40	2:58		
2:45		3:10	3:25	3:38	3:49
3:15		3:40	3:58		
3:45		4:10	4:25	4:38	4:49
4:15		4:40	4:58		
4:45		5:10	5:25	5:38	5:49
5:15	5:31	5:47	6:05		
5:45		6:10	6:25	6:38	6:49
6:15	6:30	6:45	7:03		
6:59		7:22	7:34	7:45	7:56
7:15		7:38	7:56		
7:52		8:15	8:27	8:38	8:49
8:45		9:08	9:20	9:31	9:42
9:22		9:43	9:59		

ROUTE 8: SATURDAY

WESTBOUND

E Crafton Hills	D Mentone & Wabash	C Redlands Mall	B Redlands & Mountain View	A San Bernardino Transit Center
		6:17	6:32	6:58
6:52	7:03	7:15	7:30	7:56
7:52	8:03	8:15	8:30	8:56
8:52	9:03	9:15	9:30	9:56
9:52	10:03	10:15	10:30	10:56
10:52	11:03	11:17	11:32	11:58
11:52	12:03	12:17	12:32	12:58
12:52	1:03	1:17	1:32	1:58
1:52	2:03	2:17	2:32	2:58
2:52	3:03	3:15	3:30	3:56
3:52	4:03	4:15	4:30	4:56
4:52	5:03	5:15	5:30	5:56
5:52	6:03	6:15	6:30	6:56

EASTBOUND

A San Bernardino Transit Center	B Redlands & Mountain View	C Redlands Mall	D Mentone & Wabash	E Crafton Hills
7:22	7:45	8:00	8:12	8:23
8:22	8:45	9:00	9:12	9:23
9:22	9:45	10:00	10:12	10:23
10:22	10:46	11:01	11:13	11:24
11:22	11:46	12:01	12:13	12:24
12:22	12:46	1:01	1:13	1:24
1:22	1:46	2:01	2:13	2:24
2:22	2:46	3:01	3:13	3:24
3:22	3:46	4:01	4:13	4:24
4:22	4:46	5:01	5:13	5:24
5:22	5:46	6:01	6:13	6:24
6:22	6:46	7:01	7:13	7:24

ROUTE 8: SUNDAY

WESTBOUND

E Crafton Hills	D Mentone & Wabash	C Redlands Mall	B Redlands & Mountain View	A San Bernardino Transit Center
8:55	9:06	9:18	9:33	9:56
9:55	10:06	10:18	10:33	10:56
10:55	11:06	11:18	11:33	11:56
11:55	12:06	12:18	12:33	12:56
12:55	1:06	1:18	1:33	1:56
1:55	2:06	2:18	2:33	2:56
2:55	3:06	3:18	3:33	3:56
3:55	4:06	4:18	4:33	4:56
4:55	5:06	5:18	5:33	5:56
5:55	6:06	6:18	6:33	6:56

EASTBOUND

A San Bernardino Transit Center	B Redlands & Mountain View	C Redlands Mall	D Mentone & Wabash	E Crafton Hills
7:22	7:45	8:00	8:12	8:23
8:22	8:45	9:00	9:12	9:23
9:22	9:45	10:00	10:12	10:23
10:22	10:45	11:00	11:12	11:23
11:22	11:45	12:00	12:12	12:23
12:22	12:45	1:00	1:12	1:23
1:22	1:45	2:00	2:12	2:23
2:22	2:45	3:00	3:12	3:23
3:22	3:45	4:00	4:12	4:23
4:22	4:45	5:00	5:12	5:23
5:22	5:45	6:00	6:12	6:23

Figure 17, Route 8 Tripper Service Promotional Flyer
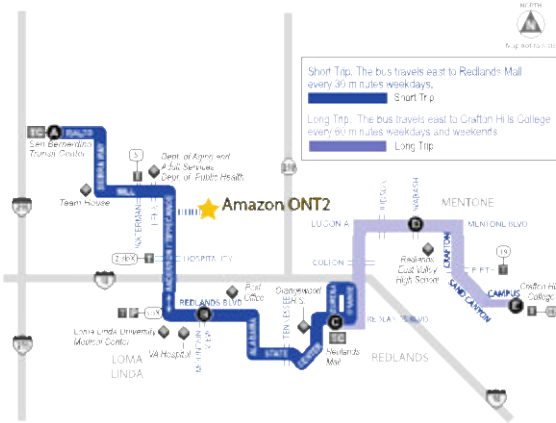
Future Possibilities

Omnitrans hopes to arrange a bus pass purchase program with Amazon, as the utility of the tripper service is demonstrated. The Amazon human resources department appears to be recognizing the viability of this service and has expressed interest in providing a similar tripper service to another Amazon location. There are additional warehouse complexes — in Ontario and in Eastvale — where similar service modes could have value in providing a last-mile transit solution to commute trips.

2.4 Strategy: Customer-Facing Technology Innovations

Problem

Increasingly, persons of all ages are looking to the tools in their smartphones to guide them through any number of daily activities.   While there are still members of the general public who do not use or do not have access to smart-phones, the increasing majority of persons do. A recent Sacramento region-wide on-board survey reported that 59% of riders had a smartphone and these proportions are only increasing throughout the country.

Multimodal transportation tools available are numerous, and transit operators, regional agencies and local jurisdictions will do well to embrace and promote these. A strategy later in this discussion will explore the role of trip-planning, trip-discovery apps. This discussion considers other customer-facing technology tools that help to make a trip easier, faster and more reliable.

Opportunity and Objectives

Engaging and effective apps are increasingly available to transit users.   These "modern apps" are characterized by several qualities:

- High-quality app, rated highly by consumers, at four points and above on five-point scales;
- Engaging and interactive, using current best practices to keep users happy, returning to the app with easy-to-use interface with features that interact with the user;
- Accurate, reliable information; and
- Works across multiple regions and areas.

Discussed here is one fare payment technology, Token Transit, and one real-time transit app, Swiftly-. Each of these applications is representative of other apps, providing straightforward user screens that readily engages and communicates. On the back end, various transactional activities are enabled, data maintained and made accessible to the consumer at the micro level and to the client agency at more summarized macro levels. Two exemplary software packages with significant customer-facing features are considered here:

1. **Token Transit** — Enabling smartphone purchase of bus passes for one-time and multi-trip passes and providing "point of sale" information;
2. **Swiftly TransitTime** — Enabling real-time bus information to improve service quality, efficiency and reliability and providing deep data analyses to improve operating experience.

Mobile Phone Usage Among Transit Riders

- Sacramento Region (2014)

  59% have smartphones

- El Dorado County, CA (2015)

  45% have smartphones

  41% have traditional cell phones

- Brownsville, TX (2015)

  31% have smartphones

  49% have traditional cell phones

- Eugene, OR (2016)

  69% have smartphones

- Ann Arbor, MI (2106)

  82% have smartphones

- Triangle Transit, NC (2016)

  90% have smartphones

  Courtesy of Transit Marketing

Target Markets

There are two target markets of interest here. The first obviously is the consumer who will organize trips through his or her smartphone and needs the latest in tools to do so. The second is the transit agencies themselves, their planning and operations departments, for whom powerful information becomes available through the "big" data that these apps make accessible.

Strategy Description

Two customer-facing apps are described here, one newly instituted by Omnitrans and one available in the marketplace, both as examples of "modern apps."

1. Token Transit – Bus Passes on Your Phone

Token Transit (Figure 18) provides a mobile app that enables passengers to purchase a bus pass or bus ticket, in advance of their ride or even as they are boarding the bus. Token Transit allows riders to pay for their ride with a mobile phone app through a "mobile digital fare outlet," a mechanism that is akin to the physical pass outlets that Omnitrans has historically utilized but exists in the digital sphere.

Figure 18, Token Transit App for Omnitrans, Sample Screens
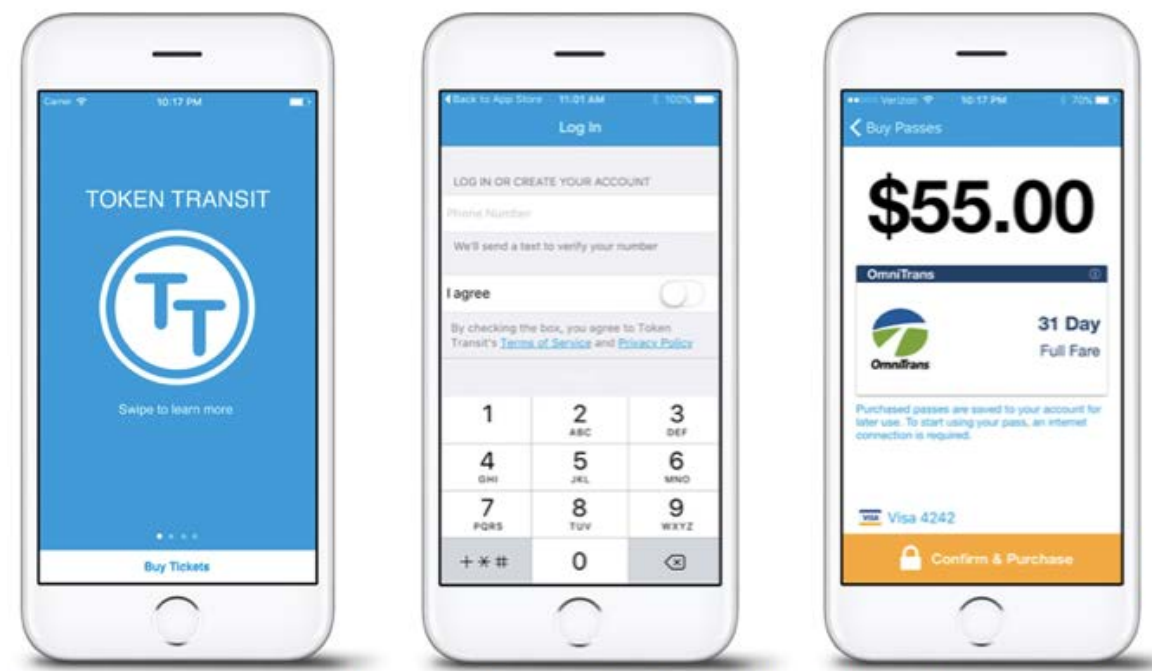
In this mobile digital fare outlet, there is no initial capital, software or licensing costs. The costs of the mobile digital fare outlet are in the sales commission on each digital fare transacted. Transactions with this mobile digital fare outlet will have the following attributes, customer-focused and administratively focused.

Customer-Focused:

- All transactions involve credit cards that will be absorbed by the mobile digital pass outlet;

- There are no printing, shipping, returns, accounts receivable costs associated with mobile digital pass sales outlets, which result in cost aversion reduction for Omnitrans;
- The digital outlet sells all Omnitrans Fixed Route fares via a mobile application with the ability to easily distinguish between full fare and discounted fares;
- Provide comprehensive customer support for the mobile app;
- Offer a multi-part visual validation acceptable to Omnitrans in order to ensure that only valid passes are accepted onboard;
- Have a readily available path to automated validation on board, to supply visual validation to the drivers;
- Provide pass sales data to Omnitrans, including the number of fares sold by exact fare type, time of day and location of: 1) purchase, b) initial activation, and c) each subsequent activation, number of customers, reorder history and similar data.

Administratively Focused:

- Absorb transactional costs associated with the sales of digital fares;
- Automatically deposit on a daily basis fare revenue minus commission into an account of Omnitrans choosing;
- Report to Omnitrans the full value of all fares sold prior to the outlet taking the commission;
- Be willing to be one of many mobile data sales outlets should additional outlets emerge.

Omnitrans has existing pass sales outlets and pass distributors. It amended agency policy in June 2017 to include a Mobile Digital Pass Sales Outlet as a third category of pass sale outlets and to enter into an agreement with Token Transit.   Per the agreement, Token Transit will receive 10% of each transit pass. The gross cost of the fares remains the total collected fare in terms of calculating fare box recovery.

Additional advantages of the Token Transit app capability include the opportunity to enroll — and track — groups of persons. Also anticipated is the ability to convert a user's individual trip payments to a monthly pass payment, when they reach that level-of-use within a given monthly cycle. This feature is very advantageous to lower-income users who find it difficult to put together at one time the funds for a monthly pass.

In September 2017, Token Transit was up and running on the Omnitrans system and drivers were accepting this form of payment. Some early anecdotal information suggests that seniors are an unexpected but pleased user group because they do not have to travel to a physical location in order to purchase their passes and can do so conveniently from their phones.

2. Go Swiftly – Harness the Power of Your Transit Data

In place in 25 cities as of mid-2017, including San Francisco, San Joaquin and Boston and smaller systems, such as Tahoe Area Transit and Eastern Sierra Transit, this app serves two audiences:

- *For travelers* — **Swiftly Transit Time** provides high-quality screens and real-time information for fixed-route and rail services, enabling the rider to make quick decisions about approaching buses and travel schedules.

- *For administrators* — **Swiftly Transit Insights** provides deep data analysis that provide real-time feedback on operational changes and modifications, enabling improvements in punctuality and reducing operating inefficiencies in public transit operations.

Swiftly (Figure 19)attributes include:

- Multimodal trip planner with <u>focus on real-time</u> transit information;
- Riders can report and see service problems;
- Customized real-time arrival estimates — Swiftly TransitTime;
- Data capture for transit planning for historical and real-time experience — Swiftly Analytics; and
- Mobile platform only.

Figure 19, Swiftly User Sample Screens
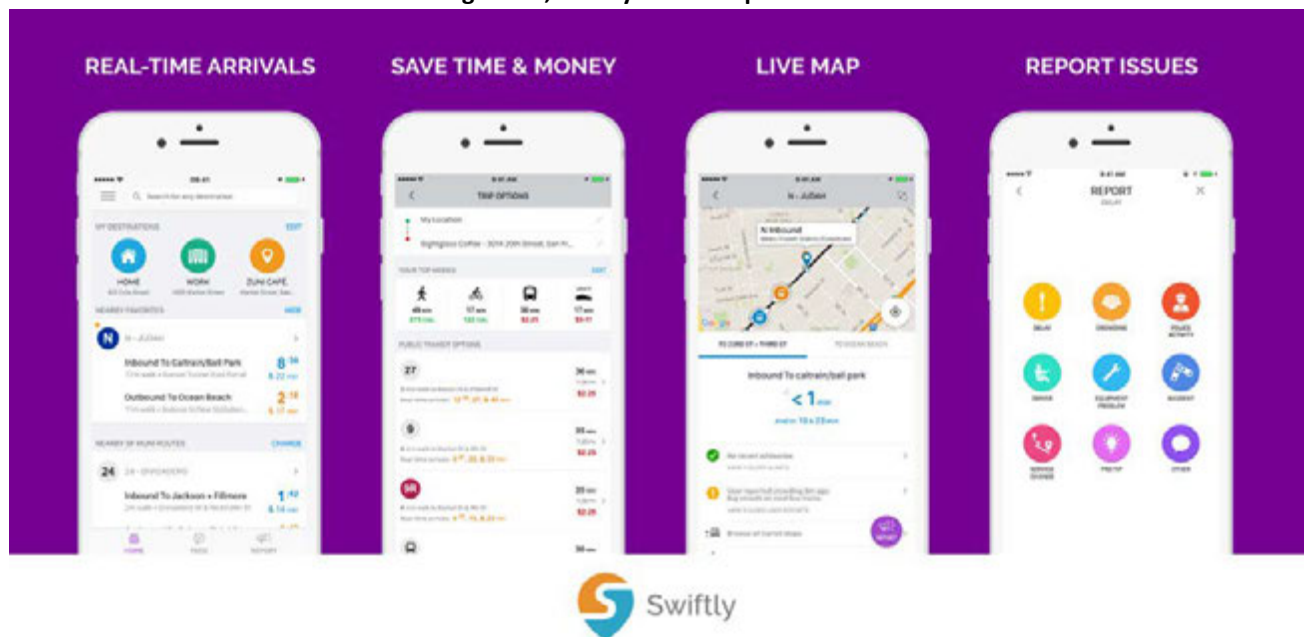
Providing highly reliable data is one of the most important features of Swiftly, both for its consumer app and for the deep data mining used by administrators. This is partly a result of the fast refresh rates and low latency rates. The refresh rate is every two seconds, rather than every 30 seconds or even every 10 minutes, which is common with other real-time apps. The latency rate is how quickly new information gets back to the user and the polling rates for Swiftly are every 10 seconds. The AVL positioning, to advise the system of the vehicle location is approximately every 10 seconds. These all contribute to improved reliability of real-time information. As a "modern app," the Swiftly software can be deployed in a matter of weeks, not months. It is maintained through the master server and its algorithms and coding updated system-wide. This means that an improvement added for a particular setting or to address an issue in another property immediately becomes available to all users.

Implementation Topics

Token Transit Usage

In the first three months of implementation, Token Transit adoption has grown steadily each week and is currently in use in about 5.5% of all Omnitrans boardings, shown in Figure 20. Use by individuals is plotted in Figure 21 and shows a steadily increasing number of unique users during this initial 12-week introduction of Token Transit.

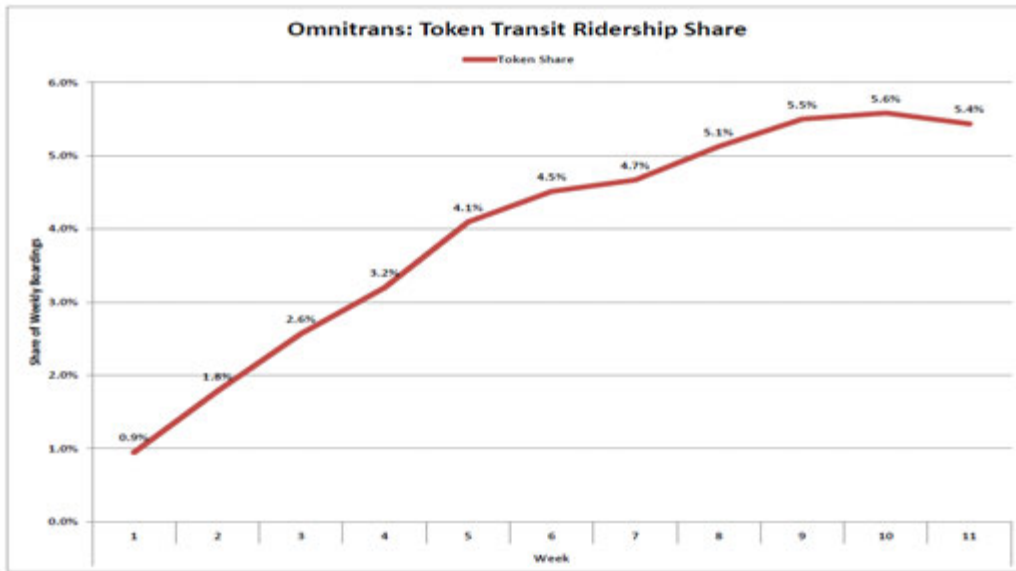**Figure 20, Token Transit Payments as Percent of Boardings**

Figure 21, Token Transit Trend in Unique Users
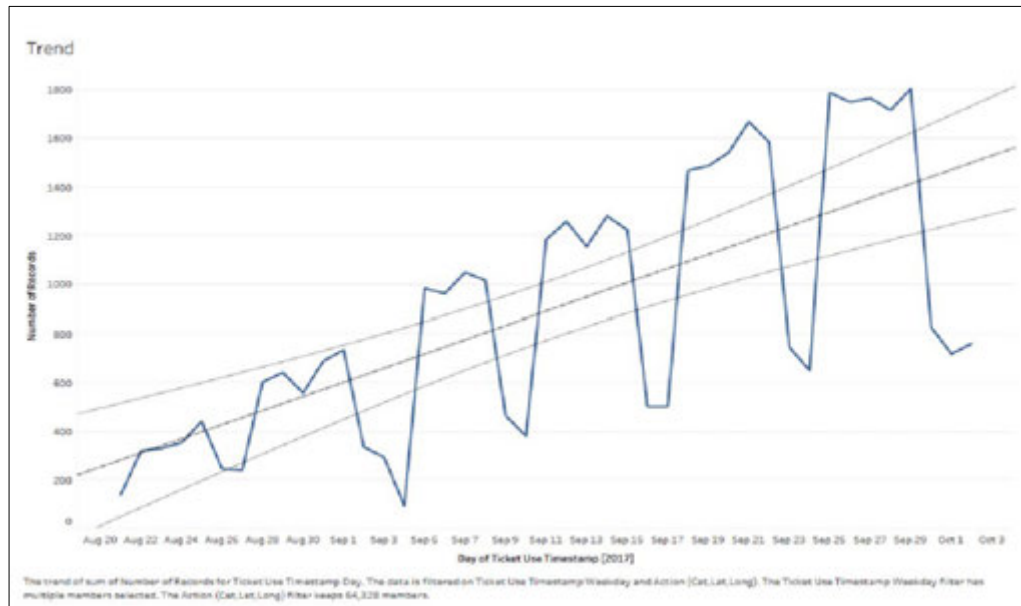
In addition to increases in the rate of use and in the number of unique users, there is also encouraging data showing that adoption is evidenced throughout the Omnitrans service area, as shown in Figure 22.

Figure 22, Token Transit Use by Fare Type and Point of Sale

Map based on Long and Lat. Color shows details about Cat. Size shows sum of Number of Records. The view is filtered on Lat, which ranges from 9.000 to 38.000.
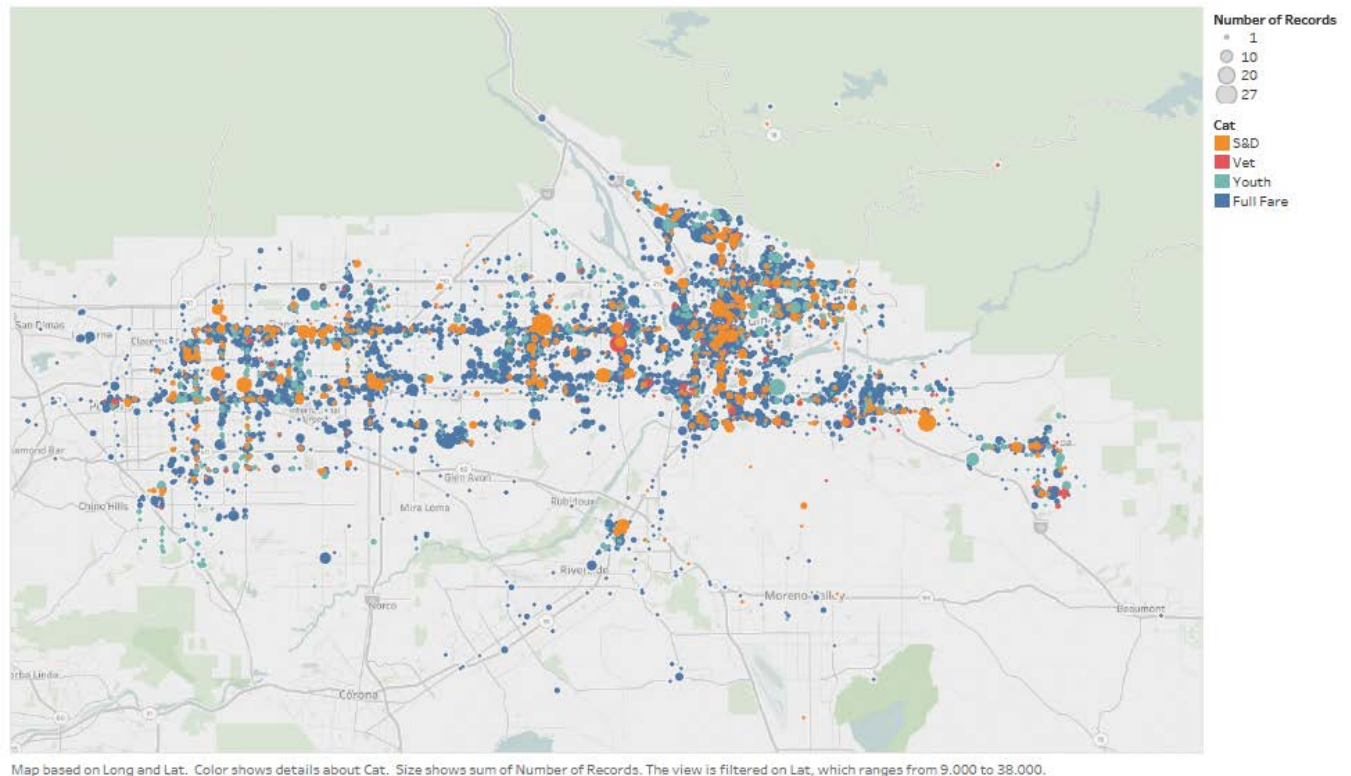
Software as a Service Approaches to "Modern Apps"

As discussed in a later institutional strategy, software as a service is an important dimension of modern apps. ***Software-as-a-Service*** (SaaS) is a license model where a vendor commits to delivering not a particular application, but rather a particular result. Generally, license fees (or hosting and maintenance fees) are paid on a recurring basis. There is usually a limited or no start-up fee, as fees continue to be paid through the use of the platform. The SaaS model often allows less customization of software features, but has strong benefits for the agencies that need to be sure the software delivered will continue to fulfill a particular purpose for an extended time period. Upgrades to maintain a system that meets modern specifications are typically included within the terms of service for a SaaS license. That means, for example, that if a company might commit to providing software that provides GTFS data, in a SaaS model that company would likely include in their terms of service that the platform delivered would be upgraded to include any new fields that were adopted by the GTFS data specification. In a traditional software procurement model, the agency may have to pay for the software to be adapted if such a change were needed.

3. ADDRESSING SPEED, CONNECTIVITY AND SAFETY

*All travelers want a safe and reliable transportation service that will get them to their destination with a reasonable travel time. The factors of speed and safety were variables independent of all others among commuters' motivations. They were important to all. Three strategies explored here consider the network through actions to **improve speed, grow connections and improve safety in a multimodal environment**.*

3.1 Strategy: Fixed-Route/ First- and Last-Mile – West Valley Connector

WEST VALLEY CONNECTOR

The West Valley Connector is a two-phase, 35-mile-long proposed BRT service. The first phase is expected to begin service in 2022. The West Valley Connector will operate on Holt Boulevard west of Ontario Airport, crossing the county line into the Pomona Transit Center.

Problem

Attracting new riders to this new service is impeded by the infrequent north-south routes in Western San Bernardino County, as shown in Table 7.

Table 7, **North-South Omnitrans Bus Routes in Western San Bernardino County**

Route	Street	Frequency-Peak	Frequency-Midday
81	Haven	30 at Foothill 60 at Ontario Mills	60
80	Vineyard/Carnelian	60	60
83	Euclid	60	60
84	Mountain	60	60
85	Central	30	30
88	Ramona	60	60

Successful BRT routes are successful not only because they reduce travel time on the bus, operate frequently and provide a more attractive environment at BRT stops. Provision of timed-transfer connections at major cross-streets broadens the market for any BRT service beyond the corridor in which it operates. This is especially true in a low-density area such as the West Valley. It is difficult to provide a seamless transfer from a 15-minute corridor service to a 60-minute north-south route; the customer may be faced with a wait of up to 45 minutes for the connecting route.

Opportunity and Objectives

The opportunity is to use the implementation of the West Valley Connector to begin to build a frequent or (given current densities) at least a semi-frequent transit network in western San Bernardino County. The objectives are to create an easier-to-use transit network around the West Valley Connector and to maximize the benefits of this significant investment in transit.

A focus on frequency is the single most effective strategy to increase ridership. Every transit agency grapples with the decision regarding coverage versus frequency, especially because of the need to provide some level of service across all geographic areas. The decision involves what percentage of resources is devoted to coverage and what percentage to frequency. Two examples are:

- In the late 1990s, stakeholders in Charlotte, NC, opted for a 60% frequency/40% coverage split in deciding how to allocate funds from a newly passed sales tax. Of the additional funds, 60% would go toward improved frequency on major routes while 40% would be dedicated to new or extended routes in unserved portions of the service area.
- In the more recent Houston Reimagining project, the Board of Directors first asked for an 80/20 split between frequency and coverage and later requested a draft network based on an 85/15 split. The Reimagined network was designed as a reallocation of existing resources in a bus network where ridership has been falling for a generation.

The difference between these two examples is instructive. When new money is available, there is a greater willingness to spend on coverage. A zero-sum situation, on the other hand, seems to encourage reallocating resources where they will be most productive.

The West Valley Connector combines elements of both examples. It is a new type of frequent service in an existing corridor that can benefit from increased frequency, but the north-south routes in the West Valley are generally coverage routes. The dilemma is how to encourage connections to the new frequent service in an area with low transit orientation.

The real opportunity is to maximize the return on investment in the new West Valley Connector through a demonstration project that increases frequency on one or more North-South corridors. What are the most promising target markets?

Target Markets

A review of the origin-destination data for the West Valley reveals that Chaffey College is the primary destination that will not be directly served by the new West Valley Connector. Omnitrans serves the Transit Center at Chaffey College with four routes today. Haven Avenue provides the most direct access to Chaffey College. The West Valley Connector currently has two routing options between Foothill and Holt boulevards: Milliken Avenue or Haven Avenue. Route 81 on Haven is a particularly attractive option for increased frequency if the Milliken routing (which would directly serve Ontario Mills Mall) is selected for the West Valley Connector.

Another target market, in keeping with the multimodal nature of this study, is Metrolink riders. Holt Boulevard is between the San Bernardino and Riverside Metrolink lines. Existing north-south bus routes serve the Rancho Cucamonga, Upland, Montclair and Ontario Metrolink stations. Like most riders,

Metrolink customers would be more likely to use a frequent local bus service for access to and from the station.

Finally, there is an opportunity to enhance the transit network through one or more of the West Valley communities. Route 85-Central Avenue is an example, operating 30-minute service all day on weekdays between the Transit Centers in Montclair and Chino.

The most promising options for more frequent north-south service in the West Valley include:

- **Haven Avenue**. Route 81 currently provides direct service to Chaffey College every 30 minutes on the route segment between Chaffey College and Foothill Boulevard during the morning and afternoon peak periods and every 60 minutes along the remaining segments and at other times. One option is to provide service every 15 minutes north of Holt Boulevard during peak periods and every 30 minutes in the midday. In addition, 15-minute service could be extended south during peak hours to the East Ontario Metrolink station. As noted earlier, Haven Avenue is more compelling if the final routing of the West Valley Connector is via Milliken Avenue. Buses enter and leave Chaffey College via Haven, making it the most direct route.
- **Milliken Avenue**. There is no through bus route along Milliken Avenue. Route 85 operates along Milliken north of Foothill Boulevard, and Route 82 operates along Milliken south of Foothill Boulevard. A new through route could be established between Ontario Mills Mall and Chaffey College (also serving the Rancho Cucamonga Metrolink Station) operating every 30 minutes. This route could be intertimed with Route 85 to provide 15-minute frequency north of Foothill Boulevard. Milliken Avenue is a more logical choice if the final routing of the West Valley Connector is via Haven Avenue.
- **Vineyard Avenue/Carnelian Street**. Route 80 currently operates along these streets every 60 minutes, providing a connection from points west to Chaffey College. Route 80 also serves Ontario Airport.
- **Euclid Avenue**. Currently served by Route 83 every 60 minutes, Euclid offers bus and Metrolink connections at the Ontario Transit Center and also serves the Upland Metrolink Station. Future plans envision a BRT corridor north to Foothill Boulevard and south to Corona.
- **Central Avenue**. Route 85 is currently the only 30-minute north-south service in the West Valley, with connections at the Montclair Transit Center and Metrolink Station and the Chino Transit Center. Route 85 continues east via Arrow Highway to Chaffey College, but this connection via Route 85 to Chaffey College would be slower than a connection between the West Valley Connector along Haven or Milliken Avenue.

Strategy Description

The ideal transit network in terms of legibility and ease of use is a grid of frequent routes (15 minutes or better) that make transferring less onerous and allow access to multiple destinations. The West Valley will not be able to support such a network within (and probably beyond) the foreseeable future. As described above and summarized here, the strategy is to maximize the benefits of the high-speed BRT West Valley Connector by providing connectors at decent frequencies. This will extend the market served by the West Valley Connector beyond walking distance from Holt Boulevard.

We propose two demonstration projects. The first will **improve frequency of service on Route 81 along Haven Avenue between Holt Boulevard and Chaffey College to every 15 minutes during peak periods and every 30 minutes in the midday**. This improved frequency can be carried further south to the East Ontario Metrolink station if so desired. This will enhance service to the major trip destination in the West Valley that is not directly served by the West Valley Connector.

The second will **improve frequency of service on Route 83 along Euclid Avenue to every 30 minutes on weekdays**. This will enhance network connectivity with the West Valley Connector through Upland, Ontario and Chino.

Euclid Avenue is proposed for frequency improvements instead of Central Avenue because Central Avenue already has 30-minute service all day on weekdays between Montclair and Chino. It seems more logical to establish a second reasonably frequent connection instead of one very frequent connection.

Customer-Focused Principles

These proposals support numerous customer-focused principles that guide this project:

- Provide transportation options that meet varying needs and motivations and are easy to use, accessible and reliable. The more frequent north-south services will be timed to meet the West Valley Connector at key transfer points.
- Promote cost savings, fast travel times and safety. The connecting routes extend the market of potential users of the new high-speed BRT service.
- Conduct operations planning across modes and across agencies; multimodal orientation to service, infrastructure planning and transfer coordination.
- Provide first- and last-mile service.

Implementation Topics – How Do We Achieve This?

Funding and Resources

Funding is the key to implementation of more frequent connections in the West Valley. A preliminary estimate of the annual cost of implementing the two north-south proposals is between $2 and $2.5 million. Capital costs for bus acquisition and stop enhancements must also be included.

Near-term transit funding is in a state of flux, making it difficult to identify a specific funding source. The West Valley Connector is a potential game-changer in western San Bernardino County. The multimodal nature of these proposals, which is intended to enhance the overall effectiveness of a major capital/operating improvement at a fraction of the cost, can be a strong argument in favor of funding. The proposals can be designated as demonstration projects that will be continued beyond the pilot period only if they meet established performance standards guards against long-term funding for unsuccessful endeavors.

Title VI of the 1964 Civil Rights Act requires transit agencies that receive federal funding to ensure that no person shall be excluded from participation in or be denied benefits of its services, programs or activities on the basis of race, color, national origin, gender, age, economic status or language proficiency. Title VI requirements can be met by funding targeted bus service improvements, such as those proposed here that impact the populations most in need of the mobility provided by transit. An added advantage of more

frequent north-south feeder routes to the West Valley Connector is that it expands access for lower income neighborhoods that are not within walking distance of the proposed BRT route. Connections to educational and employment opportunities are critical for these populations.

Institutional Coordination

Omnitrans and SBCTA must work together to identify and pursue federal, state and local grants in support of these proposals for expanding the service network that will feed the anticipated West Valley Connector.

3.2 Strategy: Bikeshare/Bike and Bus – Redlands to Loma Linda Corridors

Problem

Trip distances are too long in the San Bernardino region for bicycling to realistically replace driving for many trips. At the same time, low-density land uses mean that relatively few people can easily walk to and from transit. Strategies that connect bicycling and transit are a natural way to make both modes work better and be more appealing. One option is to pilot a transit-oriented bikeshare program. This strategy explores such a concept along the Loma Linda and Redlands Corridors.

Opportunity and Objectives

The Loma Linda and Redlands Corridors offer many of the components that support commuter mode shifts away from single-occupancy vehicles. Fixed-route transit experiences relatively high ridership and new investments in transit options are being made. The area offers a balance of residential density with significant major employers, including ESRI, Loma Linda University Medical Center, the Loma Linda Veterans Administration Hospital and others. Healthy lifestyles and roadway safety are priorities for the community.

Given a regional interest in further leveraging this area's transit network, a strong local interest in increasing bicycling opportunities and the potential to partner with engaged and interested private-sector employers, the CUSTOMER-BASED RIDESHARING AND TRANSIT INTERCONNECTIVITY STUDY explored a potential bike + bus pilot bikeshare program. Plan objectives included:

- Convene key stakeholders of the Loma Linda and Redlands Corridors;
- Facilitate a work session that defines bike + bus pilot program concepts and seeks consensus around a workable strategy to move forward;
- Identify opportunities and challenges related to successful implementation of the chosen strategy; and
- Develop a framework for implementation that is supported by local stakeholders.

On September 21, 2017, the project team hosted a work session at the ESRI campus with over a dozen attendees. The meeting agenda centered on the following topics specific to a potential pilot project for the Loma Linda and Redlands Corridors that would support regional transportation connectivity goals:

- Where are we?

- o Summarizing relevant findings of the CUSTOMER-BASED RIDESHARING AND TRANSIT INTERCONNECTIVITY STUDY that identified Loma Linda and Redlands Corridors as targets for bike + bus pilot program
  - o Summarizing bikeshare and its role as a potential bike + bus pilot strategy
- What do we want?
  - o Crafting program goals
  - o Identifying measures of success
- How do we get there?
  - o Developing an approach
  - o Strategizing implementation
- What's next?
  - o Cataloging work to be done
  - o Assigning roles and responsibilities

Target Markets

Based on the corridor's land use context, employees at Loma Linda University Medical Center and ESRI were quickly identified as the primary market for a bike + bus program. Employees commute regionally as well as locally. Through discussion at the September work session, a broader categorization of the area's target market was identified:

- *Existing transit users*: through increased availability of bicycles and prioritizing first-/last-mile presence for bikeshare.
- *New transit users*: through increased visibility of and access to bikeshare as a first-/last-mile transit opportunity; through expanding transit catchment areas beyond walk-shed to bike-shed.
- *Local bicyclists*: through increased convenience of shared bicycles and prioritizing local centers of activity and destinations for bikeshare presence.
- *New bicyclists*: through increased availability of bicycles and bikeshare's accessibility for "interested but concerned" bicyclists that comprise an estimated 60% of community members.

> ***How does bikeshare improve access to transit?***
>
> Bikeshare solves many of the challenges that commuters face when making their day-to-day decisions about accessing transit. When considering bike access to a bus stop, commuters may be intimidated by unfamiliarity with using a bike-on-bus rack or with policies around bringing bikes onto transit. Owning a bike at all presents a hurdle through uncertainty about what to buy, how to maintain a bike, how to keep it secure from theft or basic affordability. Additionally, there is often inconsistency in the availability of bike parking and specifically, long-term bicycle parking versus short-term parking, at transit stops or at final destinations. Even the commitment to use the bike round trip rather than one-way can be a hurdle, in cases where a commuter is best served by one mode (or route) in the morning, and a different mode (or route) in the evening; for example, stopping by the grocery store or the gym or to pick up children on the way home. How does bikeshare solve this? The solution is by providing a shared bike that does not require personal ownership, does not require personal maintenance, does not require bike parking and is available for round trip without the commitment of having to be used round trip.

These target markets offer distinct characteristics but may also be overlapping with one another. Additionally, they represent a range of trip types and trip purposes for the users, such as work commute, school commute, regional access, local access, recreation, exercise and similar activities. Identifying target markets is important for:

- Evaluating the potential scale and reach of a pilot program,

- Ensuring consistency between customer-focused principles and program goals,
- Establishing tools for measuring program impact, and
- Considering implications for program design and promotion.

Strategy Description

Overview — What Is It?

Bikeshare is the term used to describe a fleet of shared, publicly accessible bicycles available for short-term, one-way use, often described as "transit by bike." Bikeshare has gained prominence across the U.S. and the world in the last 10 years with over 1,000 cities worldwide offering a system. Systems range in type, size, equipment, and operations and ownership model.

Bikeshare is part of a larger shared-use mobility trend (e.g., carshare, rideshare etc.) that is possible as a result of technological advancements and the prevalence of smartphone usage, specifically for real-time transportation information and for payment transactions. The provision of bikeshare (Figure 23) has evolved significantly since its inception and has recently come to include new, modified and expanded versions that offer one or more of the following features:

- Equity-driven features that increase access for low-income and minority community members;
- Hybrid or dockless systems that do not require physical docking stations and allow bicycles to be parked at almost any location within the service area (increasing user convenience and access);
- Electric or pedal-assist bicycles within the bikeshare fleet;
- Private bikeshare providers offering complete program funding in certain large markets;
- Payment integration with transit or other mobility providers;
- Smartphone application (or "app") integration with other mobility apps;
- Pilot applications or demonstration projects of small or experimental systems.

Figure 23, Examples of "Docking" and "Dockless" Bikeshare Locations

Based on the findings of the CUSTOMER-BASED RIDESHARING AND TRANSIT INTERCONNECTIVITY STUDY, the goals of a pilot program identified by Loma Linda and Redlands Corridor stakeholders, and the characteristics of bikeshare as a mobility tool for increasing access to transit, the group confirmed support for developing a bikeshare pilot program that would provide a temporary testing ground for advancing local and regional mobility goals.

Core Principles – What Are We Trying to Achieve?

The core principles of a bike + bus bikeshare pilot program in the Loma Linda and Redlands Corridor are aligned with the customer-focused principles and institutionally focused principles of the CUSTOMER-BASED RIDESHARING AND TRANSIT INTERCONNECTIVITY STUDY. Stakeholders in the study area, specifically outlined the following parameters for a pilot program:

- Smart investment —
  - Cost-benefit: what's the difference in value of bikeshare versus striping a bike lane?
  - Based on a sound analysis and business model
  - Attract new money to local economy
- Leveraging assets —
  - Utilize trail system
  - Link to transit hubs
  - Link with Complete Streets investments
- Minimizing risk —
  - Liability control (e.g., the City of Loma Linda does not want any liability)
  - No public-sector cash investment
  - Customer satisfaction standards
  - Self-sustaining politically and monetarily
- Improving mobility —
  - Grow bicycle ridership (new users)
  - Travel demand management options for employers/employees
  - Increased transit use
  - Increased exposure to transit, especially for non-traditional users
  - Mode shift
  - Supported with safe, accessible bike facilities
- Furthering regional transportation goals —
  - Reduced traffic congestion
  - Reduced need/demand for parking
  - Reduce VMT and greenhouse gas emissions

Performance Measurement – How Do We Know We Are Having An Impact?

The pilot program will serve as a basis for proving value and justifying further investment or, alternately, identifying shortfalls. For that reason, collecting quantifiable data that can be used to objectively evaluate the program is critical. The bike + bus bikeshare program can be evaluated based on the following performance measures that are data points automatically collected through a bikeshare provider's anonymized transaction logs and GPS usage data:

> **Want to know more about tactical urbanism?**
>
> SCAG offers a national model for supporting tactical urbanism projects. The Go Human campaign offers tools, resources, technical assistance and funding for safety pop-up events. They showcase redesigned streets with safety in mind and provide community members an opportunity to experience for themselves what potential, or planned infrastructure changes can look and feel like, and to share feedback with decision-makers. Find out more at:
> http://gohumansocal.org/Pages/MoreToCome.aspx

Customer-Focused (Usage-based)

- Members
- Trips Taken (and trips per bike per day)
- Miles Ridden
- Estimated Calories Burned
- Estimated GHG Emissions Reduction
- Estimated % Transit-linked Trips (based on pick-up/drop-off at transit stops)

Beyond the data collected by the program software, several institutionally focused data points can be collected by the program's managers and partners either through manual tracking (such as logging media mentions) or through a community-wide or bikeshare member survey (e.g., for understanding user profiles):

Institutionally Focused (System-based)

- Resources generated (cash and in-kind)
- New partnerships formed
- Media mentions
- Percentage of users who are new to bicycling
- Percentage of users who are new to transit

Strategy Approach – How Do We Achieve it?

Implementation and Operations

Using the Core Principles as a guide, the stakeholders developed a framework for moving forward toward an implementable bikeshare program. As a pilot project, the bikeshare program is intended to be temporary and available for a limited timeframe. It follows the model of "tactical urbanism," an urban planning strategy that refers to low-cost, temporary changes to the built environment, often as a means of testing community-driven changes outside of the slower-moving bureaucratic process required for permanent investments. Pilot projects test strategies in a real-world scenario, allowing for evaluation of impacts, measuring results, and using that data to develop a sound analytical and strategic approach to a permanent investment.

The framework includes the following "package" of considerations:

Has this been done before?

Many bikeshare programs begin as a pilot program aimed at testing the market. One recent example of a temporary bikeshare program that became permanent is CDPHP Cycle! The program is led by the regional transit agency, the Capital District Transportation Authority (CDTA), in partnership with the program's major funder, CDPHP. CDPHP is a physician-founded not-for-profit health insurance provider available in 24 counties throughout New York. The pilot was offered in Albany, Schenecdtady, Troy and Saratoga, NY, for two weeks in each city in 2015. The pilot was considered a success and helped to build momentum for a summer 2017 launch. When launched, the permanent program offered 160 bikes and 38 locations across CDTA's four county service area. Find out more here: https://www.cdphpcycle.com/

Led by Major Employers

Given the reticence of local government to own or operate a bikeshare program (specifically a temporary one), the group identified a need for private funding. This could come in the form of a private bikeshare operator providing a system at no cost in exchange for both sponsorship and usage revenues, or could come in the form of a local major partner signing on as title sponsor to support capital costs and any subsidies of operations required. The former option is generally limited to larger markets. With the willingness of major employers in the Loma Linda and Redlands Corridor to invest in commuter options, the group identified a title-sponsor model as a potentially viable strategy.

Coordinated with a Bike Facility Investment

The stakeholders identified a critical need to bolster bicycle network safety, accessibility and connectivity in conjunction with the launch of a pilot bikeshare program. For bikeshare to be successful, bicyclists (from the novice to the experienced) need to identify the mode as generally practical, safe and convenient. Without facilities to link users to/from origins and destinations, the impact of the bikeshare pilot program application would be limited. The bikeshare pilot program should be implemented in conjunction with a demonstration bike facility. One example would be the use of removable materials to temporarily narrow travel lanes on Barton Road to create a longer, more consistent bike facility and to elevate it to a protected bike lane design.

Promoted by Local Partners

Beyond the program's design, implementation and management, it will be critical to develop an outreach and promotional component. The Inland Empire Bike Alliance and other partners which already support bicycling activity and travel demand management (TDM) programs are likely well-suited to lead this role. Through their existing networks in the community, these partners can generate awareness of the pilot program and its purpose and promote usage.

Funding and Resources

Funding for the pilot program would ideally be locally or regionally sourced and available within a short timeframe. Bikeshare programs generally require sponsorship or advertising dollars to support capital costs and/or subsidize operations and management. This type of private-sector funding is well-suited for a temporary installation that offers broad media and brand exposure and is often more flexible (regarding reporting requirements, timeline and fiduciary obligations) than transportation-related grants or line item funding.

In the Loma Linda and Redlands Corridor, ESRI and LLUMC are promising potential title sponsors and merit further discussions to explore the idea. If the entities are interested and willing to sign-on as major funding and/or organizational leaders, it is important to recognize their voice in program design, scale, branding and the structure of management and oversight for the program.

Institutional Coordination

The following steps outline a strategy for developing the institutional structure needed to launch a pilot bike + bus bikeshare program.

Identify a Leader

Within the group of stakeholders assembled for the September work session, identify a single agency or entity that is well-positioned and willing to be the lead convener. The entity does not need to commit to a leading role in funding and management of the system, but to serve as a logical facilitator of the process that will move these ideas forward and convener of the partners that can provide the funding and management needs. This step is already well on its way with follow-up coordination that indicated:

Josh Lee, SBCTA's Chief of Planning, will convene a next-discussion, in partnership with Jarb Thaiper, Loma Linda City Manager, who would host the conversation.

Build the Network

Identify the many stakeholders and partners that will help to develop and implement the program, as well as those who can serve as cheerleaders. The stakeholders who attended the September work session serve as the starting point. Others could include such groups as the San Bernardino County Active Transportation Network, University of Redlands student groups, neighborhood associations, and environmental groups.

Empower the Decision-makers

Beyond identifying the lead convener and the broader network, establish a core team that is reflective of the program's decision-makers. This should include the program's major funders, as well as the public entities that will provide access to rights-of-way and other essential services. This core team will establish a work plan for moving forward and will communicate important milestones to the broader network. Additionally, this team will be empowered to make important decisions about program size, bikeshare equipment type and/or operational partners, and procurement or contract negotiations.

Focus on Action

The greatest value that a pilot program brings is its capacity to bring an idea to life. While designing a pilot program requires important decision-making that will set it up for success, it is also important to keep the program simple, implementable and appropriate for the context. Set clear deadlines for decisions and steps to implementation as a means of maintaining momentum to move forward and to build excitement for demonstrating the bike potential of the Loma Linda and Redlands Corridor communities.

3.3 Strategy: Addressing Bus and Rail Rider Safety Concerns

Problem

During this study's early data-gathering phase, interviews with large employers brought back recurring messages of concern about the safety of employees who might use alternative transportation. These related largely, but not exclusively, to the use of public transit and included uncertainty about waiting at stops or stations, about fellow riders and about walking to and from bus stops.   Such safety concerns had been heard in other settings and Omnitrans decided to do further work to better understand the nature of

these and, importantly, to develop a methodology for identifying "high-priority" bus stops where safety-related investment could be made.

Background and Opportunity

Other Documentation on Safety Concerns

Omnitrans is a part of the Imperial College of London, Benchmarking project, one of about 16 U.S. public transit agencies who have agreed to share key operating and performance data in a secure and confidential environment over time, to arrive at meaningful and truly comparative data sets. Within this environment, Omnitrans has consistently scored well below the mean in rider "perception" of safety, sometimes in the lowest ranked position. In terms of actual accidents or incidents, Omnitrans has scored at or above the mean in relation to specific safety-related events. Clearly though, rider perception is a persistent and continuing concern.

Sharp Focus Group Differences

Omnitrans planning staff decided to undertake formalized focus groups, with existing riders, to explore topics related to passenger safety. Recruited and conducted by an outside consulting firm, two groups each of male riders and of female riders were convened. The gender-based differences in perception of safety were striking. Both male focus groups were dismissive of safety-related concerns and expressed no greater or lesser concern about safety when using public transportation. Both groups reported it was not something to which they gave much thought or attention, beyond that of regular street-smart awareness when moving about in public spaces.

In sharp contrast, female riders in both focus groups described numerous safety worries and observations, in waiting at bus stops, at rail stations and on-board busses and trains. Several described, even presented, the weapons they carried in their purses. These discussions helped to focus the target markets, more explicitly to females, in relation to safety enhancements.

Target Populations

Safety perceptions have a long-standing history in San Bernardino, pre-dating the 2015 terrorist event and often focused specifically on the City of San Bernardino. Following the departure of Norton Air Force Base in 1995 and then in the wake of the 2007/2008 economic downturn, there were high vacancy rates that often bred higher crime activity. When the City of San Bernardino filed for Chapter 9 municipal bankruptcy in 2012, there was further loss of businesses and this contributed to a sense of an urban wasteland with limited pedestrian traffic and legitimate safety concerns.

Omnitrans' focus group work suggested though that women public transportation users were more attuned to these concerns than were men and should be the target of both interventions and messages about safety ameliorations that could be instituted.

Strategy Description

Seeking to improve safety and address rider perceptions of safety leads directly to passenger waiting locations for buses and trains. Bus stops and Metrolink stations are generally the property of and

responsibility of local jurisdictions, the cities. As such, the cities secure funding for the installation of amenities and improvements. Omnitrans often works with the cities to ensure standardized stop enhancements — benches or shelters — but with 2,900 stops throughout its service area, Omnitrans typically leaves stop improvements to the local jurisdictions.

However, with these more delineated safety concerns, there was a desire to do more, specifically providing better lighting and even emergency call boxes, in selected locations. But where were those locations and what could Omnitrans do to narrow the list of 2,900 potential stops to a more manageable list?

Omnitrans rider survey information was used to plot those stops where riders most frequently reported safety concerns. Riders were asked "How would you rate safety while waiting for THIS bus…" on a scale of 1 to 7, where 1 is very poor and 7 is excellent. Figure 24 depicts those stop-areas within the Omnitrans service area where stops rated 3 or less on safety ratings (work prepared by the Redhill Group).

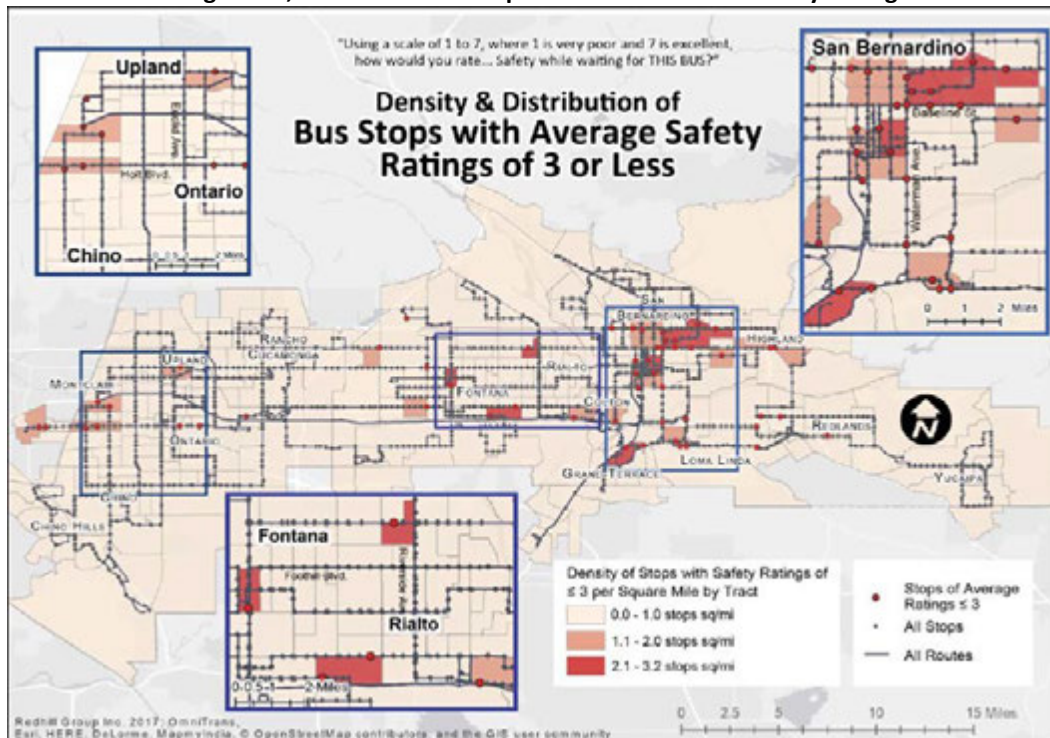**Figure 24, Omnitrans Bus Stop Locations with Poor Safety Ratings**

Figure 24 includes stops in the north San Bernardino area, the Fontana Metrolink station and stops along Foothill Boulevard, as well as selected areas in Ontario and in Upland where passenger perception of safety concerns was identified. An example of one of these stops is presented in Figure 25.

Figure 25, Typical Omnitrans Bus Stop with a Low Safety Rating

This analysis of low Average Safety Ratings led to a listing of the "top 100 stops" with poor safety ratings for which funding was sought and additional lighting and other stop enhancements were made. This targeting of resources enabled Omnitrans to break down that too-large list of 2,900 stops to a prioritized list and then to proceed with making improvements.

Implementation Topics

Solar Lighting and Project Funding

Figure 26, Omnitrans Enhanced Lighting

Omnitrans secured new solar lighting for these top 100 stops, providing a greatly enhanced nighttime experience for riders. These units, from Urban Solar, are in the range of $500 per unit, and they will be coupled with new shelters to give the stops a more secure look and feel. Omnitrans used local funds and Proposition 1B funds to pay for the solar lighting and bus stops.

Marketing

To help get the word out about enhanced safety features all around, Omnitrans' marketing team developed a campaign around themes of safety that helped to convey a variety of messages. Presented as Figure 27, these included images and messages related to drivers, to lighting and to stations and stops.

Figure 27, Omnitrans 2017 Safety Campaign Messaging

4. MAKING IT ACCESSIBLE AND ENGAGING

Attracting commuters and others to alternative mode transportation requires that information is easy to find and accessible in a variety of ways. One strategy considers on-the-ground information, way-finding tools at bus stops, transit centers and train stations to help individuals know where they are and where they are going. A second strategy examines online information tools, focused on web-based information that is multimodal and doesn't require individuals to search across multiple websites to plan a trip. Finally, having fun and making alternative mode travel engaging is an important strategic effort, particularly for younger, millennial and other new alternative mode commuters.

4.1 Strategy: Way-Finding to Facilitate Multi-Modalism

Problem

Travelers making their first trip on public transportation commonly express uncertainty about many aspects of the trip that become second-nature to recurring transit users. *"Where do I stand to board the bus? How do I know where to go when I leave the bus? Which track should I stand on to catch the right train? Which way do I walk when I leave the bus or train to get to my destination?"* What to expect in the physical world of public transportation and not knowing is a great inhibitor to the first-time user. Everything that can help to inform, reassure and smooth the way for the first-time user will encourage use.

Way-finding Background and Principles

Transit centers, rail stations and even bus stops can be confusing locations for travelers, particularly first-time transit users. Way-finding within and around transit facilities has an important role to play in encouraging use of public transportation and facilitating multimodal trips. The design of way-finding signage and tools for transit stops and stations should be guided by the following principles:

User-Focused

Way-finding tools need to be designed with a clear understanding of how users travel to, from and within transit facilities.

Design for the First-time Rider

Way-finding assistance is most critical the first time that a passenger travels to or through a particular facility, when everything is unfamiliar and they are likely to be disoriented. If we design way-finding to meet the needs of the first time rider, everyone else also will be well served.

Place Signage Where Visible When Exiting a Mode

Way-finding signage is most needed at the moment a traveler exits a transit mode or enters a facility. It is at this point that the question, "Where do I go from here?" is most relevant. The answer to this question needs to be immediately visible, not requiring the transit user to search for the information, likely becoming more disoriented.

Provide Orientation Aids

Way-finding signage and maps should include elements that help the user orient themselves both within the facility and to the outside environment. Maps should include "You Are Here" indicators and should be oriented in a way that allows the user (who is often unaware of where north is) to see how the map relates to the locale.

Multimodal

As travelers use public transit for a greater diversity of trips, multimodal trips will become increasingly prevalent. Trips that require the user to transfer between vehicles and modes introduce a new level of complexity and makes way-finding even more relevant.

Provide Directional Signage for Traveling to and Between Modes

Directional signage needs to aid the user in:

- Finding their way into the Transit Station from neighboring streets, and
- Finding their way to and between specific modes within the station: Rail, bus, BRT, taxi, TNC, bike parking and pedestrian ways.

Provide Local Area Orientation Maps

These can encourage transit users to walk or bike to destinations proximate to the transit station. Maps should be clear and easy to read, should show key walking and biking streets and highlight key destinations. They should always include a "You are Here" symbol and possibly show distances or walking times to popular locations.

Avoid Cognitive Overload

When entering a busy, unfamiliar environment such as a transit station, travelers are having to quickly assimilate a great deal of new information, which can result in cognitive overload and confusion. Way-finding tools need to communicate quickly, clearly and simply in order to avoid cognitive overload.

- Include relevant information only.

Way-finding signage should include only the information relevant to the user at a particular point in their trip. "Tell them what they need to know now, not everything they will ever need to know."

- Use immediately recognizable symbols.

The use of universally recognized symbols, rather than text, on way-finding signs, can both speed communication and reduce language barriers.

Elements of Way-finding with Potential to Enhance the Transit User Experience

When designing way-finding systems within and around transit facilities, four types of tools should be considered:

Directional Signage

This signage allows the user to find their way:

- To and between modes,
- To specific bus bays/train platforms, and
- To information, fare machines, bike parking, etc.

Orientation Maps

These aid the user in understanding where they are relevant to the local environment:

- Clearly orienting the user to the surrounding area;
- Showing adjacent street, walkways, bike paths and landmarks; and
- Showing path of travel and travel time to key landmarks/destinations.

Hardscape/Pathways

Design elements or symbols embedded in the hardscape can help to provide a clear line of travel:

- Between modes,
- To exits, and
- To other key features, such as fare machines or bike parking.

Streetscape (Beyond Transit Station)

The built environment outside of the transit facility can have a significant impact on the willingness of travelers to use public transportation. The comfort or discomfort of walking the last few blocks of the trip may be the deciding factor in whether to drive or use transit. Key factors include:

- Clear pedestrian access and directional signage to transit station;
- Sidewalks, curbs and ramps;
- Lighting;
- Landscaping, street furniture, shelter and public art; and
- Security elements such as cameras and security personnel.

Opportunity and Objectives

The objectives of the way-finding strategy are first and foremost to encourage open dialogue with multiple agencies, including SBCTA, Omnitrans, Metrolink and the local jurisdictions. Each agency plays a role in ensuring that way-finding signage is consistent and communicates to the user how best to navigate within the facility, and an understanding of major destinations outside of the transit center.

Field visits to Metrolink's seven commuter rail stations and Omnitrans' six transit centers informed this study of the extent of way-finding from the customer viewpoint as well as provided areas of improvement. Metrolink stations that were surveyed are located in the cities of Fontana, Montclair, Ontario, Rancho

Cucamonga, Rialto, San Bernardino (Santa Fe Deport) and Upland. The Omnitrans Transit Centers visited include Chaffey College, Chino, Fontana, Montclair, San Bernardino (Downtown) and Yucaipa. Note that both Metrolink and Omnitrans share both the Fontana and Montclair stations, thus allowing inter-modal connection between rail and bus. The three critical items examined through this field-work include signage, multimodal indicators and area orientation.

Signage

Signage is the most important facet of way-finding as this provides the user information on where they need to go to board a bus or a train. Both Metrolink and Omnitrans are responsible for including signage at its facilities.

Figure 28, New Metrolink Station Directional Signage

Metrolink Stations

Signage at Metrolink stations (Figure 28) is fairly consistent throughout the service area. Information that Metrolink communicates to the public includes:

- Direction of inbound and outbound trains,
- Pay/ticketing machine locations,
- Station identification visible from both the street and onboard trains,
- Passenger information telephone,
- Kiosks with Metrolink system information and fares.

The most important information to communicate to the public is the direction a train is traveling. The following examples illustrate clearly which direction trains are traveling (i.e., inbound to Los Angeles or outbound to San Bernardino or Riverside).

Ticketing machines are also clearly visible and signed at Metrolink stations. This allows passengers an opportunity to quickly identify where they would need to go if purchasing a ticket at the station.

At the time of the field observations, the Rancho Cucamonga Metrolink station was the only station that charges a fee for parking. Signs clearly indicate where passengers will need to purchase a parking permit. However, the signs do not indicate the enforcement time. According to Metrolink's website, paid parking is only enforced on weekdays from 5:00 a.m. to 7:00 p.m.

Passenger information telephones are also clearly marked and visible to train passengers. The color schemes of the passenger information telephones are different from the original color schemes of Metrolink signage.

Finally, large information kiosks are available at each station and provide system information, such as passenger fares, system map information and train schedules for the respective commuter rail lines. Three

commuter rail lines operate in the San Bernardino Valley: the San Bernardino Line, the Riverside Line and the Inland Empire-Orange County Line.

Omnitrans Transit Centers

Signage at the Omnitrans transit centers (Figure 29) communicates the following information:

- Bus stop locations,
- Route and schedule information, and
- Omnitrans system information.

Figure 29, Omnitrans San Bernardino Transit Center Bus Bay Signage

Being able to identify where the bus routes are located is critical for first-time users of bus services. Bus stop signs must be visible from different points of the transit center. Currently, Omnitrans utilizes three different sign types at each of the transit centers: 1) standard bus stop signs and poles, 2) shelter-mounted signs, and 3) route markers specific to the San Bernardino Transit Center (SBTC). Each style of sign provides a visible option for bus passengers. Bus stop signs and poles are used at most of the transit centers, which include Chaffey College, Fontana and Montclair. Both the Chino and Yucaipa transit centers have signs mounted on the shelter.

Route information is also communicated through a variety of means at each of the transit centers. This can include basic information cassettes attached to bus stop poles. For the transit centers with shelter-mounted signs, information kiosks are located inside the shelter and provide not only route information but also schedule information. SBTC will receive information kiosks at each of the transit shelters in the near future, which can provide the same level of information as the information kiosks.

Large information kiosks are also placed at strategic locations within the transit center. These information kiosks provide system-level information and general Omnitrans announcements. Not all facilities have such large information kiosks. Only the Fontana, Montclair and SBTC have such kiosks due to the volume of passengers at these locations.

Multimodal Connections

Multimodal connections are important for all stations. Bus-and-rail connections are available at the Fontana and Montclair stations and, in the near future, at SBTC. Biking to the facilities is also an option for commuters wishing to travel to and from a transit station by bicycle. Amenities such as bicycle lockers and hoods are available at almost all Metrolink stations and Omnitrans transit centers.

Field surveys indicate way-finding between bus and/or rail is nonexistent. While both agencies communicate how to use its individual system, there is no mention on how one can transfer between bus and train. A comprehensive approach to way-finding that includes intermodal connectivity needs to be included so as not to isolate bus and train users, but to support connectivity between all public transportation modes.

Another multimodal connection in which way-finding is lacking is the connection between local, fixed-route buses and Omnitrans bus rapid transit (BRT) line, sbX. Discussions with Omnitrans indicated that the agency is developing way-finding indicators that will provide users with a clear understanding of where the sbX station is located at SBTC. Omnitrans is exploring opportunities to better communicate and enhance way-finding at SBTC.

Links between public transportation and bicycle is another important facet of improving multimodal connections. Metrolink stations and Omnitrans transit centers provide a number of amenities that allow users to park a bicycle in a safe location. Bicycle lockers and lids are available at almost all facilities. During the field survey, it was noted that these amenities were in use and available.

During the field surveys, it was noted that a few Metrolink stations include a passenger drop-off and pick-up area near the station train platform. Such facilities encourage Metrolink users to travel to and from a station through taxis, TNCs or a shared ride with a family or friend.

Because Metrolink facilities have a number of parking spaces, carpool and vanpool opportunities exist where commuters traveling from long distances can share a ride to a Metrolink station and transfer onto the commuter rail service. A few participants of the focus groups indicated that this occurs for people living as far as the high desert areas. In addition, vanpool vehicles were observed at a few Metrolink stations during the field surveys.

Area Orientation

Understanding where a transit center or rail station is located in relation to its surrounding environment is important for those exiting a public transportation mode. Many facilities are located within a downtown area. This includes the Chino Transit Center, San Bernardino Transit Center and Upland Metrolink Station. Walking around these facilities, it was difficult to understand where major points of interest are outside of the facility. This lack of area orientation is a missed opportunity to promote some of the destinations located within the local jurisdiction, especially if there are commercial, retail and recreational activities that can benefit from the foot-traffic that public transportation can generate. In addition, civic institutions such as City Hall, public libraries and courthouses are located near the public transportation facilities and should be communicated to both new and current passengers.

Target Markets

The primary target market for the way-finding strategy is the first-time user. Having a comprehensive way-finding strategy that is easy to understand and consistent throughout the service area can help alleviate the anxiety that first-time transit users face when using the transit system for the first time. Way-finding can help direct people on where to go to board a bus/train or where to go to get information. Another target market that can benefit from improved way-finding is the current transit user. Providing information about places that exist beyond the transit center or train station can encourage transit users to explore the area

surrounding a facility. Area orientation maps can promote the diversity of retail and recreational opportunities outside within walking distance of a facility thereby generating additional foot traffic in downtown areas and major destinations.

Strategy Description

Implementation of this strategy is dependent on a two-phase, multi-agency cooperative approach.

Phase I:

Develop a cooperative group between Metrolink, Omnitrans and SBCTA to develop goals, policies and standards of way-finding for the Metrolink stations and Omnitrans transit centers. SBCTA staff will facilitate meetings between both agencies with the understanding that each agency will have unique goals and standards that must be taken into consideration. This initial coordinated effort will ensure that way-finding messages are consistent throughout the service area and eliminate a hodgepodge of design elements from one facility to the next. The policy outcomes and standards from this effort should be included as part of each agency's design guidelines, such as Omnitrans' Bus Stop Design Guidelines.

Phase II:

With the cooperative group, work with local jurisdictions to identify major destinations near a transportation facility that should be highlighted in the area orientation maps. This will ensure that all agencies are in agreement as to what should be on the orientation maps.

Implementation Topics (Cost, Institutional Factors, Funding)

Current practice involves tackling hardscape and way-finding design in relation to specific projects and at project points where funding has been secured to pursue way-finding tools. This "project" orientation means that sometimes a variety of players, across agencies, are brought together to consider relevant planning and design factors. It can also mean that project design proceeds in an isolated sort of bubble, without integrating with the larger environment and particularly, with other modes that interact with any given project.

For example, in planning the Arrow services into the San Bernardino Transit Center, there is considerable need for an integrated approach to way-finding in relation to the train platform and the bus bays. Opportunity for such coordination happens informally, at the staff level, between agencies, but is critically important from a customer point-of-view.   This "project" focus is valuable but may only happen in an ad hoc, spontaneous kind of way and that may not be sufficient.

A multimodal focus that is based at the system level, and not at the project level, will promote consistency throughout the service area. This eliminates a hodgepodge approach to way-finding that can be disjointed. A consistent way-finding approach at the system level will allow a transit user to adapt quickly and identify the key elements of any facility that he or she is traveling through.

Funding for way-finding improvements is available at the federal and state level. Under the Federal Transit Administration's (FTA) section 5307, 5337, and 5339 programs, associated transit improvements and passenger stations and terminals are eligible expenses under these programs. However, Metrolink and

Omnitrans may have other funding priorities that limit the amount of federal dollars available to way-finding.

Another source of funding could be through state discretionary programs such as the Affordable Housing and Sustainable Communities (AHSC) grant program. Projects consistent with SBCTA's ARRIVE Corridor plan, a plan that supports transit-oriented development next to rail stations along the San Bernardino Line, may be eligible for funds under the AHSC if local jurisdictions build higher density housing along the commuter rail line. Way-finding elements identified through the Phase II of this strategy should be incorporated into the project proposals of an AHSC grant application thereby strengthening the project sponsor's project application.

4.2 Strategy: Piloting A Multimodal Rideshare Information Portal – Loma Linda University Medical Center

Problem

SBCTA, through a partnership with the Riverside County Transportation Commission (RCTC), offers a ridesharing platform/software (branded as IE Commuter) that provides basic carpool matching, as well as the ability to search for transit and active transportation uses. The primary focus of the software platform is to assist employers to comply with South Coast Air Quality Management District's (SCAQMD) Rule 2202. The current platform is owned by RCTC and even with near-term enhancements planned, the platform has limitations and does not provide many of the features that are widely available in other ridematching platforms currently available. In addition, other San Bernardino county employers utilize RidePro (a software product by the company Trapeze) for their ridematching and SCAQMD's Rule 2202 compliance. RidePro has similar limitations as the IE Commuter platform, and as of this date, does not offer a mobile version of its software for users.

One way for SBCTA to demonstrate additional ridesharing/ridematching platforms is through a pilot project with large employers with sufficient employees to test platform functionality. The study conducted focus groups and interviews with Employee Transportation Coordinators (ETCs). During these efforts, Loma Linda University Medical Center (LLUMC) ETCs expressed interest in exploring a rideshare platform that provides innovative and interactive features above and beyond the features available in the IE Commuter ridematching product. LLUMC utilizes RidePro as its ridematching/Rule 2202 compliance platform, and LLUMC is motivated to test new software to increase their rideshare mode split for SCAQMD Rule 2202 compliance. A demonstration project would also assist LLUMC in reducing the need for parking spaces at their campuses for their 25,000 employees and students.

LLUMC's immediate parking issues and their long-term goal to improve their rideshare participation are two motivating factors to participate in a rideshare pilot project. SBCTA staff has sought SBCTA Board approval to support LLUMC's efforts through this study's efforts.

Participation in this pilot is a low-cost opportunity for SBCTA to evaluate a cutting-edge, integrated application with the county's major employers. Results from the pilot may be applicable throughout the county and may have an impact as SBCTA moves forward to enhance their offering of ridesharing services for the county. SBCTA is investing over $600 million in transit capital improvements within a 10-year period, and it is important that these investments be supported by proactive trip information and marketing, integrated with ridesharing, active transportation, and other first-/last-mile strategies.

Opportunity and Objectives

The travel corridor in the LLUMC has many components to support commuter mode shifts away from single-occupancy vehicles (Figure 30). Fixed-route transit is widely available and their recent investments in expanded transit options (Omnitrans' sbX), as well as Redlands Passenger rail service (anticipated launch in late 2020) will also provide connectivity to Loma Linda. The LLUMC campus and surrounding area offers a balance of residential density with significant major employers,

Figure 30, Ride Amigos Multimodal Transportation Discovery Platform

including Loma Linda University Medical Center, the Loma Linda Veterans Administration Hospital and others. Healthy lifestyles and roadway safety are priorities for the community.

The objectives of this demonstration program are to:

- Increase rideshare participation, which will improve LLUMC's Average Vehicle Ridership (AVR) ratio, a required measurement imposed by the SCAQMD for Rule 2202 compliance;
- Reduce the need to provide employee and student parking;
- Encourage use of public transit, including Omnitrans fixed-route services and Omnitrans bus rapid transit line (sbX); and
- Provide SBCTA staff an opportunity to test, demonstrate and study the impact and results of a new rideshare/ridematching platform.

LLUMC and SBCTA are interested in a demonstration that offers:

- An easy-to-use, engaging and interactive website and smartphone application,
- Multimodal trip planning,
- Advanced rideshare matching,
- Gamification, challenges and incentives,
- Automatic commute logging,
- Personalized and interactive commuter dashboard, and

- Easy-to-use administrative dashboard, data analysis and reporting.

Target Markets

LLUMC has been selected as a targeted employer, primarily due to their interest and company objectives to increase their rideshare mode and reduce employee/student dependency on parking. LLUMC has a large enough employment base that a demonstration will be likely successful. Since LLUMC has previously utilized the RidePro software platform, it is recommended that SBCTA select another large employer who is utilizing the IE Commuter ridematching tool, so that SBCTA can evaluate the RideAmigos tool against two widely used ridematching platforms in the county.

Strategy and Demonstration Program Overview

This strategy provides a ridematching platform that offers features above and beyond the ridematching and surveying services currently offered through IE Commuter and/or RidePro. These additional tools and features will assist employers to increase their rideshare mode, allows a mobile platform experience, provides a multimodal connectivity experience and offerings, and provides incentives and a gamification component to increase the rideshare modal split. The commuter would be able compare the cost, estimated commute time and greenhouse gas emissions of the relevant commute choices.

Desired Platform Features

The RideAmigos web-based platform (Figure 31) will include these features:

Figure 31, Ride Amigos Commuter Tool Kit Features

1. **Trip Planner**:
- To integrate and provide options for all available ridesharing modes (carpool, vanpool, transit, biking and walking);
- To provide detailed directions and compare all travel modes by travel time, cost, health benefits and environmental savings; and
- To provide bike locker management, bike parking and available bikeshare stations.

2. **Trip Logging Calendar and Reporting** — Users log their trip activity via the web platform or the mobile app, activity appears on users' dashboard calendar and are aggregated into high-level statistics that a user may track.
3. **Management and Reporting** — Allows LLUMC and SBCTA staff to manage and facilitate networks, create customizable reports for users that may be exported into a comma separated value (CSV) report.
4. **Gamification, Competitions, Challenges and Leaderboards** — Allows LLUMC to manage and institute challenges, to facilitate user engagement and encourage ridesharing.

5. **Drag'n'Drop Survey Administration, Templates and Reporting (AQMD-certified)** — This customizable survey feature allows LLUMC to gather data on users' travel behavior and platform usage.

6. **Event Travel Planning and Ridesharing Tools for External Website Use** — Rideshare matching for specific events with a customizable widget that can be shared on external websites.

7. **GIS Cluster Map Analysis and Marketing Tools** — Allows LLUMC to identify clusters of commuters to promote and match vanpools, shuttles, bikepools, etc.

8. **Unlimited Networks, Sub-networks and Network Administration** — Ability to segment user population into networks and subnetworks to leverage gamification and provide targeted marketing and engagement activities.

9. **Vanpool Features** — Tracks vanpool routes, number of empty seats by van so commuters may search for and join an available vanpool; LLUMC can track vanpool usage and import vanpool information.

10. **Custom Home Page** — Web platform home page is customizable with ability to incorporate LLUMC branding, LLUMC transportation information and relevant information about ongoing incentives and challenges.

11. **Incentive and Prize Claim Tracking and Management** — Ability for LLUMC to set up, administer and track incentive participation, track claimed prizes and export CSV reports to aid in prize distribution.

12. **Custom Location Management for Trip Planner Points of Interest** — Ability for commuters to save favorite trips to enable easy trip-logging for common trips, with mapping of custom locations (bike lockers bus stops, car share locations, Park-and-Ride locations and other geographic data).

13. **User Profile Management** — The initial sign-up requires minimal user information and allows for the user to manage his/her full profile.

14. **Foreign Language Support** — The web platform is available over 50 languages.

Contract Provisions with RideAmigos

Per the agreement between RideAmigos and LLUMC, to which SBCTA is also a party, the RideAmigos platform will provide the following support features:

- 220 hours per year of RideAmigos direct support,
- Web/app system enhancements and upgrades,
- Software hosting with backup management, 99.9% uptime service level agreement, and
- User support guaranteed within 48 hours of support ticket submission with mobile access to RideAmigos Basic Consulting assistance (where LLUMC may schedule time with RideAmigos staff to consult on the project, and receive guidance on marketing, strategies for challenges and incentives, recommended prizes/rewards, program structure and email templates).

The RideAmigos Academy will provide LLUMC the opportunity to collaborate with other transportation professionals to share ideas and materials, solve common problems, create solutions and develop new initiatives through webinars, user groups' events/discussions, newsletter and partner highlights.

Implementation Topics

Funding and Resources

On Sept. 6, 2017, the SBCTA Board approved an agreement with LLUMC for the RideAmigos Pilot Project. The project will continue through June 30, 2019, and requires a $30,000 contract between LLUMC and RideAmigos, of which SBCTA and LLUMC will contribute 50% of the project costs or $15,000 each. It is recommended that SBCTA enter into a similar agreement with a county large employer that is using the IE Commuter platform, for an additional demonstration. Using the SBCTA/LLUMC model, an additional $15,000 would be required from SBCTA to participate in an additional demonstration.

Institutional Coordination

SBCTA and LLUMC have agreed to the following administration and coordination activities:

1. SBCTA and LLUMC have executed an agreement for SBCTA to contribute a lump sum amount of $15,000 toward the project.
2. LLUMC will enter into an agreement directly with RideAmigos as the online rideshare platform provider.
3. LLUMC will be the primary project administrator and will conduct the marketing campaigns and challenges.
4. LLUMC will fund the incentives and prizes for the gamification and challenges portion of the project.
5. SBCTA will assist LLUMC during the project period and will have access to the data resulting from the project.
6. SBCTA will continue to provide the IE Commuter rideshare program's $2/day gift card incentive and Rideshare Plus rewards program to eligible rideshare participants.
7. SBCTA and LLUMC staff will have quarterly coordination meetings through the term of this agreement to discuss the progress of the project.
8. SBCTA and LLUMC will conduct an e-survey for employees and students to gather feedback on their use and interaction with the RideAmigos platform.
9. SBCTA and LLUMC will conduct focus groups with employees to receive detailed feedback on the project and user experience.
10. At the conclusion of the project, SBCTA and LLUMC will meet to discuss the project outcome and provide feedback on the administration and the project's user experience.

Performance Measurements

The pilot projects will serve as a basis for proving value and justifying further investment in an alternative ridematching platform, or for identifying shortfalls. For that reason, collecting quantifiable data that can be used to objectively evaluate the program is critical. The impact of the RideAmigos platform on LLUMC employees and students can be evaluated based on the following performance measures that are data points collected through the RideAmigos platform and can be compared to prior results from the IE Commuter platform.

These data points include, but are not limited to:

- Registered rideshare users,
- Trips taken,
- Percentage of users who were prior single-occupant vehicle commuters,
- Vehicles eliminated from the work site (which results in parking spaces reduced),
- Vehicle miles of travel reduced, and
- Air emission reduction.

Beyond the data collected by the program software, several institutionally focused data points can be collected by the program's managers and partners either through manual tracking or through surveys and focus groups. A community-wide or bikeshare member survey (e.g., for understanding user profiles) may include:

- Administrators' ease with the platform and system,
- Staff resources needed to manage/administer the program,
- Commuter ease of platform/mobile app use, and
- Media mentions.

4.3 Strategy: Generating Engagement for Commute Alternatives for Regular Work and School Trips

Problem

This study has documented that ridesharing, carpool and vanpooling, has the largest mode share in the journey-to-work among San Bernardino Valley alternative mode users at 14%, according to the 2010-2014 ACS 5-Year Estimates. This is well above the almost 2% who use transit, 1.5% who walk, 0.8% who take taxis or motorcycles to work and the 0.5% who bicycle to work. Vanpool and rideshare are a very important choice for San Bernardino Valley commuters, many of whom are making long-distance trips to work.

As noted in the preceding strategy discussion, SBCTA historically recognized this through its long-standing partnership with RCTC to offer a ridesharing platform/software that provides basic carpool and vanpool matching and is accessed through www.IECommuter.org. However, study focus group participants and the employee survey reported limited utility of this resource, some indicating they tried it once but couldn't find any matches. Others reported difficulties accessing the IE Commuter rideshare databases. Many were simply unaware of this resource, including some who were already carpooling.

Limitations of the existing IE Commuter platform include:

- IE Commuter requires separate searches for transit and active transportation uses with presentation of multimodal options limited to individual searches.
- Enhanced technology (smartphone applications with multimodal trip planning or rideshare matching), which could expand commuter participation in alternatives to driving alone although a smartphone application is apparently under development.

- The IE Commuter portal is not customized to individual employers, to present the "face" or "screen" with employer-specific information that supports employee engagement and participation.

- Challenges, incentives, prizes and "gamification" opportunities are not components of this platform and have been shown to increase participant engagement.

- For employers, as reported in study interviews by large employers, a primary focus of IE Commuter has been to assist employers comply with SCAQMD's Rule 2202 but with limited attention to other aspects of encouraging alternate mode use by employees.

- This platform is being constructed specifically for the purposes of the IE Commuter application and as such, does not necessarily address some of the "modern application" characteristics discussed elsewhere in this document, including open-source coding, data interoperability to "talk" with other relevant data sets and systems, and user-friendly interface.

Target Markets

This strategy addresses three target market groups: 1) commuters to work or school, 2) employers at small, medium and large work sites, and 3) regional stakeholders that include SBCTA, Omnitrans, Metrolink and the other public transportation providers who will benefit from a multimodal ridematching platform.

Commuters considering alternatives to driving alone to work or school expressed interest in *exploring and comparing* a range of commute modes, to determine whether a carpool, vanpool, transit, bicycling, walking or multimodal combination is both feasible and cost-effective for their regular commute. Commutes can be multimodal during any given week, with a mix of driving alone or alternative modes that reflects the requirements at work or after work for any given day. While the existing IE Commuter site has this information available, it requires the commuter to compile the information across multiple locations in the portal and with a menu of choices not provided in a user-friendly format.

Employers want the flexibility to tailor commuter alternative program features, communication and incentives for their own employees. The existing IE Commuter site does not provide that flexibility. The current focus is on the large employers who are reporting under the South Coast Air Quality Management District Rule 2022. The utility to small-to-medium sized employers with fewer than 250 employees is more limited.

Regional stakeholders, particularly SBCTA, need to be able to reliably report on carshare and vanpool trips, as it seeks to move the dial on alternate commute mode use. Such regional data becomes available in some of the more modern software platforms. Its reliability is enhanced where commuters are more engaged, participating in diaries and trip recording — some of it even automatically through their cell phone GPS positioning — and in the incentives and challenges such platforms offer.

Opportunity/Objective

This strategy's primary objective is to provide a software platform that will:

1. Provide *comparative multimodal information* to commuters, and
2. Enable small, medium and large employers and schools or universities to *tailor a commute alternatives program* to meet the needs of their employees or students.

The software platform should also enable commuters or students to explore multimodal commute options whether or not their employer or educational institutions have adopted a formal commute alternatives program.

This strategy should ensure a multimodal presentation of trip choices, so that travelers can weigh the best option for this particular trip. The software platform should enable the commuter to determine how special promotions, such as challenges or contests, vanpool subsidies or employers that offer pre-tax commuter benefit program, affect the commuters' out-of-pocket costs.

While the focus of the software platform should be on regular commute trip discovery for multimodal commute options, it should provide support options that help the commuter to sustain their alternate mode commute. This includes information about contests and challenges. This might include alerting vanpool drivers if a commuter with a new job is searching for a vanpool that matches the vanpool route. Another support example is providing real-time transit information within the platform, in mobile app or desktop formats.

Rule 2202 compliance tools should be available for applicable employers, those with more than 250 employees. Finally, the regional commute alternative program framework should be able to adapt to technology enhancements as they evolve, requiring inter-operable data formats and some degree of open source coding.
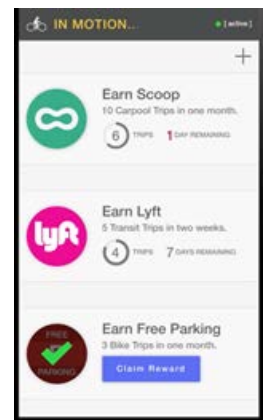
Strategy Overview

This strategy proposes to provide a "modern app," multimodal ridematching platform — through a pilot demonstration — that can be used successfully by commuters to school and work, by employers of the San Bernardino region of different sizes and that provides additional features above and beyond the traditional ridematching and surveying services. In addition to providing possible matches for carpooling and vanpooling, the trip planner should also provide travel information and other assistance to promote transit, bicycling and/or walking options for the commuter. The commuter is then able to compare the alternative mode costs, estimate and compare commute times, and provide greenhouse gas emissions of the relevant commute choices (Figure 32).

A pilot demonstration of such a platform must also include an employer portal to customize the branding and introduction to its employees, and be able to adapt the games and incentives to the employer's specific employee market and work site. Individual employers would have the flexibility to brand their individual site, and customize messages for their employees for various incentives and campaigns the employer wishes to offer.

Figure 32, Sample Screen of Commuter's Multimodal Trip Discovery Pages
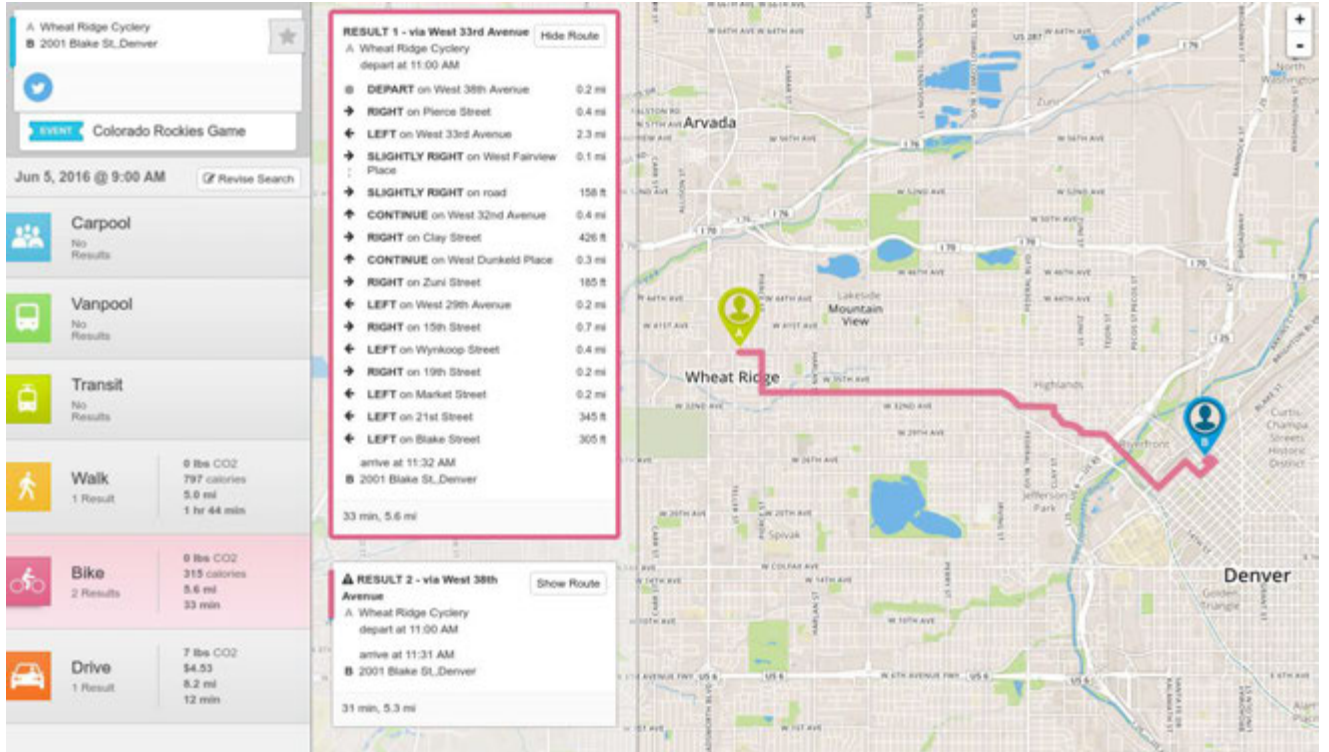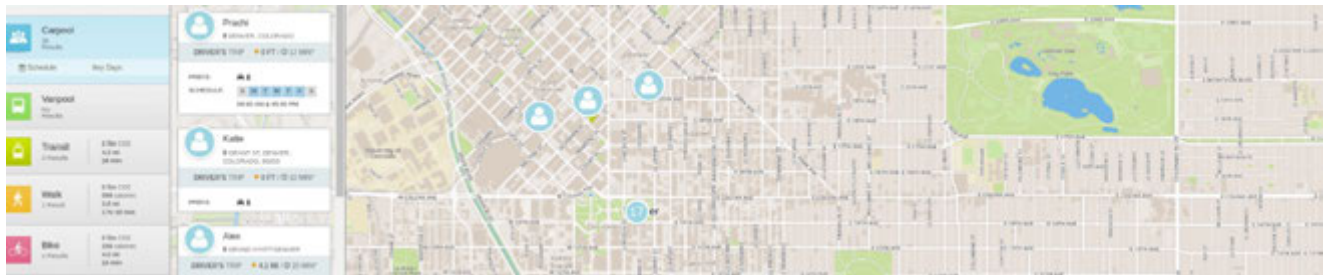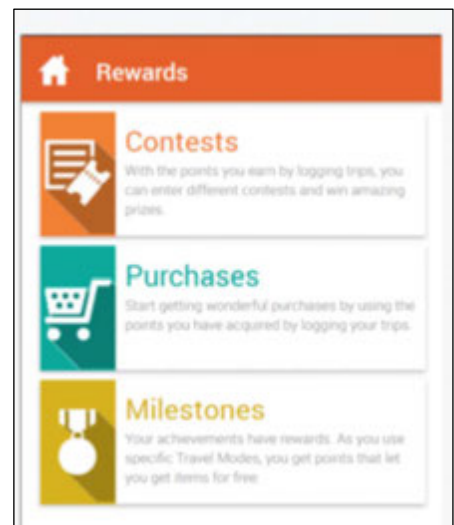

Figure 33, Commuter Rewards Messages

Employer-developed incentives and special challenges (Figure 33) can be further incorporated into the comparison of mode choices for commuter-specified origins and destinations. Trip diaries would enable individual employees to track participation in commute alternatives and would be utilized for employer-sponsored prizes for participation. At the discretion of the employer, the software platform would provide Rule 2202 compliance reports.

Overall, the objective of a "modern app" multimodal rideshare platform is to **provide flexibility** to meet varying commuter needs by week and by trip and to address an array of different employer needs in implementing commute alternatives programs.

Background on Incentives, Gamification and Challenges

Since the 1990s, SBCTA and RCTC have provided various incentives ($2 a day), rewards (coupon books) and contests (primarily through the annual Rideshare Week promotions) to encourage commuters to try and stay with a rideshare mode. A relatively new strategy that employers and rideshare agencies are increasingly using is to employ "gamification" or specific challenges to increase engagement in ridesharing.

Gamification is the application of game-design elements and game principles in non-game contexts. Game elements (like points and badges) have been used for years to motivate members in organizations (such as in the Boy Scouts and Girl Scouts). With the onset of mobile applications and devices that "synch" and upload data to smartphones, gamification has become an important incentive in health challenges (with devices like Fitbit), or receiving "badges/awards" for frequent purchases at stores or restaurants (Figure 34). The ability of a software platform to announce and then track challenges, incentives and campaigns heightens user engagement.

Figure 34, Commuter Challenge Sample Reporting Screen

Required Platform Features

1. State-of-the-art privacy and security to ensure that user address, phone number and email address are 100% secure. Secured login/password-protected sites for both users and administrators.

2. High-quality user interface that is engaging and easy-to-use.

3. Sufficient data interoperability that the platform can work with GTFS-provided data to present accurate and reliable transit service information.

4. Compliance with key confidentiality protections, since public agencies must follow a state statute to protect the confidentiality of information gathered during rideshare services, agreement to comply with California Penal Code 637.

Desired User Features

1. The platform will incorporate a variety of customizable games, rewards and challenges, such as:

   - **Commuter Challenges:** Provide unique challenges to departments or business units, for a specific period of time to determine which group has the highest rideshare mode split.

- *Giveaways:* Users who log in a minimum number of days during a timeframe may earn a chance to win prizes (e.g., gift cards, prizes).

- *Points Programs:* Users accrue points based on customizable criteria, which then can be redeemed at the users' discretion for administrator-defined benefits (e.g., gift cards, commuter swag, days off work).

- *Employee Perks:* Offer your users cash incentives for non-single-occupancy commutes on a daily or on-average monthly basis.

- *Event Discounts*: Attendees to rideshare-related events earn discounts on ticket prices by signing up for carpools, transit or other alternative options.

- *Recognition:* Stimulate competition through social media or employer intranets, where top performers can take to social media to post their point totals and badge earnings, which, in turn, helps spread the word even further.

- *SBCTA Incentives and Rewards:* Incorporate SBCTA-provided incentives and rewards (such as the $2-a-day incentive and the Rideshare Plus reward program).

2. Provide a surveying mechanism to measure users' perspectives on the platform, seek feedback and information to improve upon the experience.

3. Multimodal trip planning and commute options based on origin and destination, and other criteria (e.g., landmarks, bus routes, other schedule parameters), with the ability for the user to select modes that are not applicable or of little interest.

4. The multimodal commute options have a comparison of travel times, estimated costs and greenhouse gas emissions from the trip being taken for each of the modes selected.

5. Provide a diary feature where the commuter can "track" their commute and easily provide to the public agency results of the publicly funded reward/ incentive. Automatic trip logging/tracking is very desirable and offered on several platforms.

6. Provide the ability to schedule a trip in advance or the day of (which will assist the more "casual or occasional" carpooling/ vanpooling opportunities.

Desired Employer "Backend" Features ("Administrators")

An important dimension of the RideAmigos platform is its ability to provide the Administrator organization, with real-time, summarized information about how its employees, faculty and students are commuting. Figure 35 shows a sample screen of this summarized information, available for various time periods. These are invaluable both in obtaining an understanding of current practices and in tracking changes over time.

Figure 35, RideAmigos Sample Administrator Summary Screen on Current Commute Modes
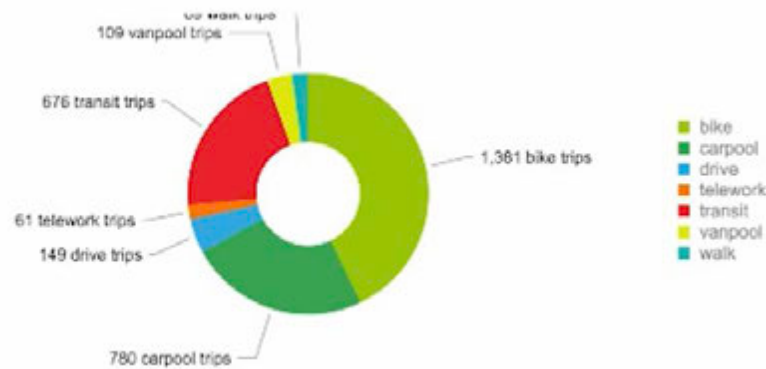
MODE	USERS	TRIPS	MILES	DOLLARSSAVINGS	CO2SAVINGS	CALORIES
bike	87	1,381	16,830	9,526	6,193,462	841,503
carpool	54	780	16,733	4,735	3,078,835	0
transit	55	676	18,976	2,201	4,402,339	0
drive	30	149	3,494	0	0	0
vanpool	14	109	3,671	1,729	994,787	0
walk	11	69	272	154	100,170	27,220
telework	10	61	924	523	340,106	0

Other features of the administrative function include:

1. Capability for a customized employer portal that enables the Administrator to take full advantage of the platform and allows the employer to customize communications, branding, games/challenges, incentives, trip tracking and awards.

2. Access to regional or employer members to search and assist with matching.

3. Data analysis tools so that ETC can evaluate employer database opportunities of trip origins and destinations and target campaigns for mode shift to specific market segments.

4. Capability to extract reports for Rule 2202 compliance and compliance options, as available. Ability to obtain individual and summary data from diaries and trip activity.

5. Provide templates and sample communications for special campaigns, as well as employer options for special event challenges and prize/awards fulfillment.

Desired Support Features

1. Provides a mobile application that is easy to use and encourages commuters to rideshare.

2. Incorporates and/or provides links to third-party ridematching programs for infrequent or on-demand trips (e.g., Scoop, CarZac and/or Duet, to name a few).

3. Supports options for car or bike sharing opportunities for commuters who regularly commute by not using a private auto, but need a car for occasional trips (such as ZipCar).

4. A "wait list" feature, so a user can "sign up" and be notified should an empty seat in a carpool or vanpool become available.

Software Platform Availability

The available ridematching software platforms that offer multimodal ridematching features discussed here AND gamification on a mobile platform, are far and few between. Some platforms focus on carpooling only; others do all the modes but may not offer a mobile platform or AVR surveying. In addition, some may or may not have the employer access/backend reporting that many of the SBCTA clients need or require to comply with Rule 2202. It is recommended that this demonstration be in addition to the current IE Commuter tools offered to demonstrate the additional markets that can be impacted, as described in the program objectives above.

The following platforms provide ridematching and provide AQMD AVR surveying. However, they DO NOT currently provide a mobile application, are not open-source and easily integrated with other data sets that are built from GTFS data formats, do not include challenge and gamification component to their platforms, and cannot be readily tailored to the needs of individual employers. Therefore, it is not recommended that SBCTA pursue their platforms in a demonstration:

1. Ridelinks https://www.ridelinks.com/tools.htm

2. Trapeze/RidePro/TripSpark http://www.tripspark.com

3. IE Commuter https://www.ie511.org/iecommuter/ (developed by RCTC and the software provider is MediaBeef)

Although these platforms provide mobile applications and websites and are primarily on carpool and vanpool matching, they are not multimodal and therefore, it is not recommended that SBCTA pursue their platforms in a demonstration:

1. Zimride (owned by Enterprise) https://zimride.com/ Is very popular with colleges and universities with social media login. Sample client: University of California, Riverside.

2. Scoop https://www.takescoop.com/ Scheduled morning and afternoon carpool matching, both regular and occasional carpools. Provides an employer portal/offering. Charges $.20 per mile and Scoop retains 10%. Provides routing and mapping and schedules a.m. and p.m. routes/trips separately. Provides guaranteed ride home. Sample client: Stanford Research Park.

3. Carzac http://www.carzac.com/ Scheduled and real-time carpool matching. Provides employer portals/opportunities, but website does not list sample clients.

4. Waze carpool (Google) https://www.waze.com/carpool. Builds on popular auto trip planning site. Drivers download "Waze" and riders download "Waze Riders." The cost is never greater than the federal limit of $.54 per mile. Only available for two rides each day and only provides a 1:1 match. Does not allow dropping off children at day care and only offered in the Bay area in its current Beta testing mode. Employers have been recruited, but website does not have sample Beta clients.

5. Duet http://duetinc.com Ability to schedule existing day and next-day commute options, for the a.m. and then the p.m. Can create or join an existing carpool, communicate via the mobile application, call the driver/ride and must schedule at least two hours in advance.

6. Müv http://Muv2work.com   Provides profiles of riders and drivers and allows user to select available options. Provides an "in app" calendar. Designed for individual commuter and no employer portal.

There are two known <u>multimodal software solutions</u> that provide the majority of the required and desired features described above and therefore, we encourage SBCGTA to consider pursuing their platforms in demonstration environments, as with the current Loma Linda University Medical Center pilot with RideAmigos that is just commencing:

1. RideAmigos https://rideamigos.com/ (certified to and does provide SCAQMD AVR surveys); and

2. RideShark https://www.rideshark.com/ (not certified to provide SCAQMD AVR surveys).

Implementation Topics and Demonstration Approach

Short-Term Actions:

1. In addition to the current pilot at Loma Linda University Medical Center, select one or two more employer partners (as suggested in the Target Market section) to demonstrate easy-to-use mobile applications and gamification strategies that will suit individual employers' objectives.

2. Develop specifications for employer features, providing employers with vendor demonstrations and assist with vendor selection process. It is recommended that a nonregulated employer or an employer that does not utilize the rideshare option to comply with Rule 2202, may prefer to demonstrate the RideShark platform (which does not have an AQMD AVR surveying option).

3. Develop various gamification strategies to incentivize the employees to try an alternative mode. Provide a combination of those that provide drawings, financial incentives, non-financial rewards and recognition, to test which gamification strategies prove the most successful.

4. Assist the selected employers through the implementation process for the first six months.

5. Determine the means in which to measure if the demonstration is or is not a success, and how the selected platforms can provide those measurements. Discuss with each employer current documented average vehicle ridership and/or modal split, and the ability to survey and document the results from the program. Outline survey questions and mechanism to ascertain the user's perspective and experience from the demonstration.

6. Provide analysis support to determine the weaknesses and successes of the demonstration program, and recommended next steps for an expanded implementation throughout the county.

Medium-Term Actions:

1. Develop a strategic plan for the San Bernardino Valley to take advantage of new technology opportunities that effectively address multi-modalism, provide for interoperable data capabilities and incorporate user strategies that promote engagement, such as challenges and easy user interfaces to incorporate gamification and other new strategies into the software platform.

2. Incorporate the results of the short-term employer demonstration program into the strategic plan objectives and program design features.

If successful, it may be necessary to move away from the IE Commuter program and to proceed independently on a strategic plan for San Bernardino County, working with local employers to use a new software platform that incorporates gamification, a mobile application and multimodal trip planning.

4.4 Strategy: Guaranteed Ride Home Refresh

Problem

An often cited reason as to why a commuter may not rideshare is the concern of a sudden home/family emergency or having to work late. A solution is the provision of a Guaranteed Ride Home (GRH) program. Most GRH program models provide a free benefit offered to enrolled employers and their employees who carpool, vanpool, take transit, bicycle or walk to work. A ride home (via taxi, car rental, transportation network company (TNC), carsharing, or public transit) will be available to qualified emergencies and to participating ridesharing employees. Emergency circumstances that qualify for a reimbursable ride home under the GRH program include: personal illness/emergency, unexpected illness/emergency of an immediate family member, carpool/vanpool driver has an emergency or unexpected overtime, and/or a supervisor requires employee to work unscheduled overtime.

In early 2017, the study team worked with 14 of the largest employers in the San Bernardino Valley to introduce surveys and focus groups to gather information about commuter behaviors, preferences and transportation demand management topics. There were several survey and focus group questions relating to the provision of a GRH program. In general, the responses to those questions revealed that most commuters were unaware of a GRH program; however, commuters tend to rank the provision of a GRH program as a primary motivation to rideshare. The results were as follows:

- Commuters were asked "Under what conditions would you consider using an alternative mode?" and of those that were currently driving alone to work, 20% said they would consider ridesharing if there were a GRH program and/or a free taxi or shuttle in the event of an emergency.
- When asked about awareness of various rideshare program features, of all the features provided the lowest awareness was for the GRH program (even though most of these employees work at an employer that provide a GRH program or GRH benefits are available through IE Commuter). Of those surveyed, 61% were not aware that a GRH benefit was available through their employer for ridesharing commuters.
- When survey participants were asked to identify potential benefits/offerings that could influence their decision to rideshare, 28% selected "A GRH Program that would pay for an Uber, Lyft or Taxi if you had an emergency." Of all of the carpooling/vanpooling benefits/offerings, the GRH program received the highest mean score of 3.19.
- The study also conducted commuter focus groups with many of the focus group participants that work for the county or other employers who offer a GRH benefit. Many of the focus group commuters were unaware of their employers providing a GRH program. When the current IE Commuter GRH reimbursement program was described to them, they found it only somewhat appealing. Their concerns centered around the cost of the ride and how long it would take to arrange a GRH in an "emergency." However, when the concept of a prepaid Uber/Lyft/taxi ride that could be requested at their work site was floated as an alternative, the commuters felt that a prepaid trip would greatly increase their likelihood of considering ridesharing or transit.

Based on the survey and focus group results, the Team believes the current GRH program design contributed to some employees not trying or considering a rideshare mode. To consider any "revamp," it is important to understand the background and design of the current SBCTA GRH program.

GRH Background

The five county transportation commissions in Southern California work as a region to provide a regional GRH Program. The Los Angeles County Metropolitan Transportation Authority (LA Metro) is the lead on the GRH program, where LA Metro contracts with a private consultant to oversee the regional GRH program. LA Metro manages the GRH program on behalf of the participating CTCs who then reimburse LA Metro for their share of the GRH program expenses.

The GRH program kicked off in July 2002 and has gone through several programmatic revisions over the past 15 years. The provision of a GRH benefit is included in the IE Commuter SBCTA/Employer Partnership Agreement and upon approval, all employees of participating employers that rideshare to work are eligible for the GRH benefit. In 2012, the CTCs agreed to make changes to the program and those parameters remain in place today, and include:

- Allows each ridesharing employee to receive the GRH reimbursement up to two times in a 12-month period, based on the employer's program enrollment or re-enrollment date.
- The employee is reimbursed for trip home/expenses incurred — as a result of this action, the CTC administrative costs and required employer administration has been greatly reduced.
- A one-way taxi ride shall not to exceed $3 per mile and includes up to a 15% tip.
- A one-day economy-class rental car is provided; note that the employee is responsible to provide a credit card and meet rental car company requirements.
- A TNC ride may not to exceed $3.50 per mile.
- The employee may also choose as their GRH a carsharing or transit ticket (public bus or Metrolink) to deliver them to their destination.
- Depending on each employer's internal GRH policy, either the employer or the employee will pay up-front for the employee's selected emergency ride. A valid receipt from the GRH service provider (taxi/rental car/Metrolink, TNC, carsharing or transit agency) and a GRH Reimbursement Claim Form must be provided to the consultant GRH office within 30 days of the GRH usage date. Upon approval, the GRH office will send the reimbursement check to the employer, who will then pass the reimbursement on to the appropriate party.

Opportunity and Objectives

The primary objective is to provide background information and a recommendation outline to SBCTA, which will assist SBCTA in working with the CTCs to consider revamping the GRH program. Many of the CTCs are working with or are entering into partnerships with TNCs, and these newfound relationships can be used to broker CTC-paid TNC trips as a primary ride home in the event of an emergency. Based on the survey results, as well as the high level of unawareness of a GRH program, a revamped program could be a key incentive in encouraging single drivers to try a rideshare mode.

Target Markets

A revamped GRH program will benefit employers that sign a Partnership Agreement through the IE Commuter program, and may also be an incentive for non-IE Commuter employers to sign a Partnership Agreement with IE Commuter and consider other rideshare offerings through SBCTA.

Strategy Overview

Provide an outline of GRH components that SBCTA may introduce to the partner CTCs. As a result of these changes, evaluate cost and consultant impacts to the current program. The strategy may also evaluate if any of the online ridematching systems or applications can manage or handle GRH tracking, provider reimbursements and other analysis. Should the CTCs agree to revamp the program, creating outreach materials to ETCs and commuters may assist in raising GRH awareness and convincing single-occupant commuters to try a rideshare mode.

Desired GRH Components

- Increase allowable uses from two to four times during a 12-month period.
- Introduce TNC trips that may be billed directly to the program and therefore, the ridesharing commuter does not need to pay out of pocket.
- Given new technologies and emerging partnerships with taxi, TNCs and rental car companies (Enterprise is the primary provider of Southern California vanpools), create new arrangements and partnerships to have the CTCs pay for the GRH trip (and not the ridesharing commuter or employer).
- Consider additional ways to streamline/simplify the program, given emerging technologies and partnerships. Continue to minimize ETC involvement/paperwork.
- Promote the program to both ETCs and single occupant commuters. In the promotional materials, address simplicity, fast response from the GRH providers, no out-of-pocket costs for the ridesharing commuter or employer and minimal impact to employers/ETCs.

Implementation Topics

Short-Term Actions:

1. Potentially with consultant support, seek feedback from five to seven employers to better understand the features that will improve the regional GRH program.
2. Based on the information gathered, draft an outline of the desired features to an improved program and evaluate the incremental costs and labor impacts to implement the new program.
3. Approach the CTCs with the results from the survey, the rationale for changing the program, relevant research and recommended changes to the program.

Medium-Term Actions:

1. Upon CTC review, discussion and recommendations, incorporate the programmatic changes to the regional GRH program and promote the revamped program to commuters and ETCs.
2. As technology changes and new applications/tools are introduced, consider incorporating the program into the software tools and platforms.

5. PROMOTING AGENCY COORDINATION

*This final group of strategies considers various institutional factors that impact a successful multimodal environment and that will contribute to an improved customer experience. One strategy recognizes the **proliferation of multimodal traveler apps** and considers how to help both travelers and the agencies providing these services navigate these. A second strategy considers how to **expand network understanding** by employers and their representatives, key gatekeepers who can assist in growing the use of multimodal travel options. Finally, two strategies consider **inter-agency coordination** around data and around project and programming that will help to build a seamless and easy-to-use multimodal network.*

5.1 Strategy: Facilitating and Promoting the Profusion of Multimodal Apps

Problem

There are a variety of modes which commuters and other travelers can use to get around San Bernardino County. They vary widely in terms of travel time, cost, convenience and environmental impact. The "best" option will be different for each individual and perhaps for each trip or time of day. Without an easy way to compare the various modes at the moment that a trip is desired, most travelers use the default mode — driving alone.

Currently, there are several, readily available apps that can aid the commuter in making informed decisions about the "best" mode for a particular trip. These include Google Maps, the GoLA app and the Transit app. However, these apps are not well known or utilized by most San Bernardino County commuters. Even the ETCs charged with promoting alternate mode use at major employment sites are generally unaware of these tools.

Opportunity and Objectives

In order to get travelers to consider modes other than the default, we must make it easy and fast to make informed, real-time decisions about the best mode for a specific trip based on various factors, including travel time, cost, environmental impact and ease. The most immediate way to accomplish this is to promote apps that already exist and to facilitate the ongoing development of state-of-the-art trip planning apps.

Target Markets

This strategy has the potential to impact every individual who travels to, from or within San Bernardino County. It is relevant to commuters and non-commuters alike.

A particular target for promotional efforts is Employee Transportation Coordinators who have the potential to share information with thousands of commuters.

Strategy Description

The transit agencies serving San Bernardino County and neighboring areas, including Omnitrans, Metrolink, Foothill Transit, Riverside Transit and LA Metro, all currently publish GTFS data, which is utilized by Google Maps and other apps to provide travelers with automated multimodal trip planning and real-time transit information.

This strategy involves capitalizing on these free, customer-focused tools by promoting their use by commuters to make mode decisions based on which mode is faster, costs less and/or is most environmentally friendly.

Figure 36, Google Trip Planner Sample Screen

Existing Apps and Web Portals – Already Functional in San Bernardino County

There are a number of existing mobile apps that offer San Bernardino travelers multimodal trip planning and/or real-time traffic and transit travel time information. Three of these appear to offer the greatest opportunity for immediate promotion — Google Maps, GoLA and the Transit App.

Google Maps www.googlemaps.com

Google Maps — desktop and mobile versions — is already used by the vast majority of commuters to get driving directions and locate nearby businesses. However, many Google Maps users have never noticed the transit icon or realized that they can get detailed transit directions. In focus groups, when individuals are shown this feature, they say that it makes them more likely to at least consider transit since the information is right at hand.
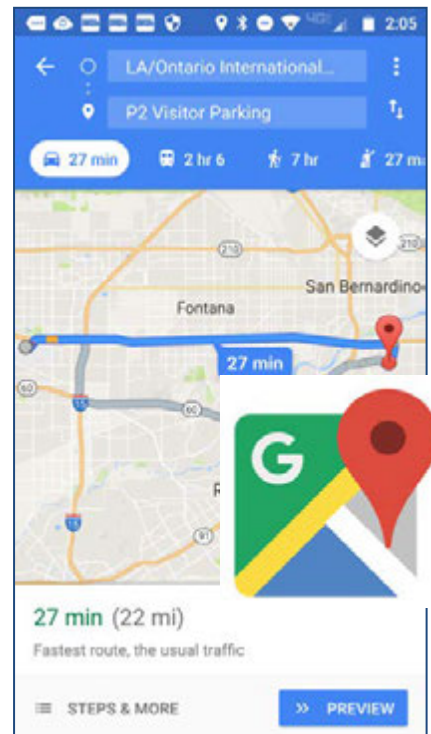
Features of Google Maps (Figure 36) include:

- Multimodal Trip Planner — Available on desktop or via a mobile app for Android or iPhone;
- Provides directions for driving, transit, walking, biking or Uber/Lyft/taxi. User can click between modes and between transit options to compare travel times, walking distance and cost;
- Includes all area transit agencies that provide GTFS:
  - Omnitrans
  - Metrolink
  - Riverside Transit Agency
  - Foothills Transit
  - LA Metro
- Provides real-time information where agencies have published real-time GTFS;
- Provides fare information where agencies have included fares in their GTFS; and
- Zoomable map allows user to see exact transit stop locations.

GoLA – Xerox   http://golaapp.com

GoLA is a mobile app and web portal designed specifically for the Greater Los Angeles area (Figure 37). It utilizes the same GTFS data used by other apps to include transit directions. It should be noted that this is a product created by Xerox as a for-profit venture and its long-term viability is not assured.

Figure 37, GoLA Sample Screens
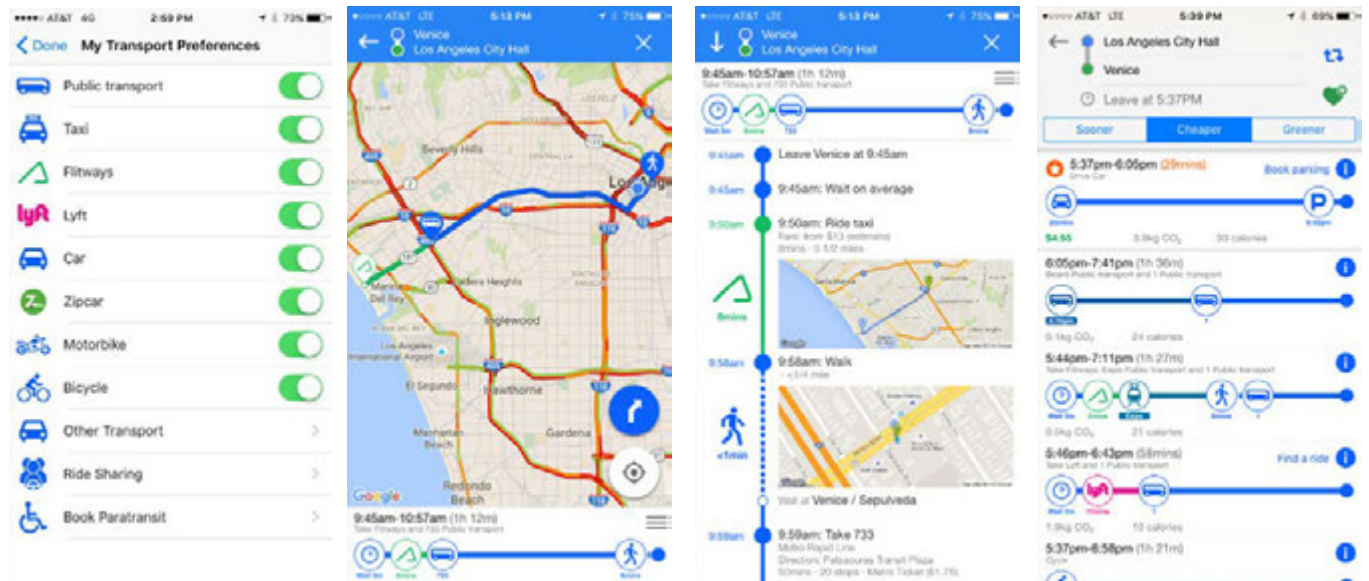
Features of GoLA include:

- Multimodal Trip Planner — Mobile and website;
- Provides directions for Public Transit, Taxi, Flitways, Lyft, Car, Zipcar, Motorbike, Bicycle, Bikeshare;
- Combines modes for multimodal trip options;
- Allows the user to turn off modes that are not of interest to them;
- Does not use real-time information for transit;
- Sorts by Faster, Cheaper, Greener;
- Shows Cost, CO_2 emissions and Calories Burned;
- For transit trips, the user can click to see schedule for alternate times; shows fares where this info has been included in GTFS;
- Includes click through to bikeshare app, parking app; and
- Zoomable map allows user to pinpoint bus stop location.

Transit App https://transitapp.com/region/los-angeles

Unlike Google Maps and GoLA, the Transit App is primarily for those using alternate modes — transit, TNCs, biking or walking. Its focus is on providing real-time information based on your current location. Simply opening the app brings up the bus stop location and the departure time for the closest transit services. While it does not compare transit to driving, it greatly increases the ease of using transit in a multi-system environment.

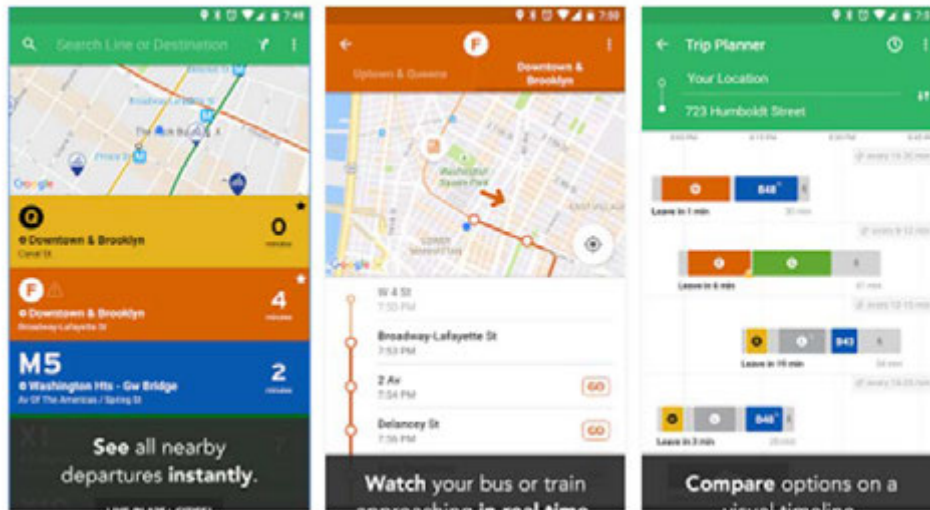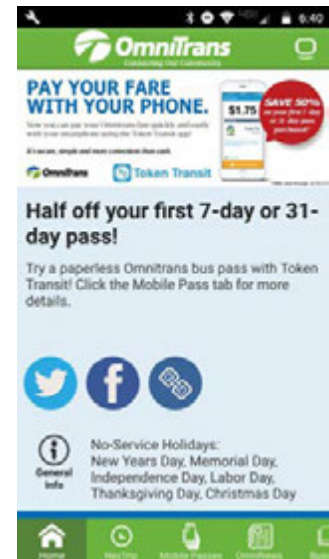**Figure 38, Transit App Sample Screens**   **Figure 39, Omnitrans Token Transit Sample Screen**

Features of the Transit App (Figure 38) include:

- Mobile app only — Provides information based on your current location;
- Real-time focus — Provides scheduled information where real-time GTFS is not provided;
- Trip Planner — Includes transit, biking and Uber;
- Includes all area transit agencies (except VVTA);
- Go Transit Companion — Tracks you and tells you when to leave, if you need to walk faster, when to get off vehicle and whether you will reach your destination on time;
- Click through to bikeshare payment/unlock;
- Potential to click through to a simple fare payment app (such as Token Transit).

In addition to these multimodal, multi-system apps, Omnitrans (Figure 39) also offers its own real-time information app — NextTrip, as well as a mobile fare payment app — Token Transit. While these are specific to Omnitrans services, they, like the apps described above, have the potential to make using transit within San Bernardino County easier if they are widely known and utilized.

Promotional Opportunities

While these apps exist and are often used by current transit users, they are largely unused among commuters who currently drive alone or rideshare. Even most Employee Transportation Coordinators interviewed during the early stages of this project were unfamiliar with multimodal trip planning apps.

Promoting the use of already available trip planning and real-time information apps is a low-cost strategy for making transit more user-friendly and promoting trial or occasional usage among potential riders. Channels for communicating about these apps include many that are already used for other messages.

Figure 40, TriMet App Center Example

Employee Transportation Coordinators

As has been discussed elsewhere in this report, the ETC network appears to offer unrealized potential for promoting transit to commuters. The availability of multimodal trip planning apps to compare alternative commute modes should be an important part of their message to employees.

To facilitate this, they need to be trained in how to use the available apps and provided with tools for promoting them as part of a broader effort to promote transit as a commute alternative.

Transit Agency Websites

Each agency's website promotes its own app — the Omnitrans NextTrip App, the Metrolink Ticket App and so on. They might consider the addition of an "App Center" on their websites to promote third-party and multimodal apps, such as those discussed here. This would give current riders more tools to use not only the individual system, but transit more broadly. At the right is a screenshot from TriMet's App Center.
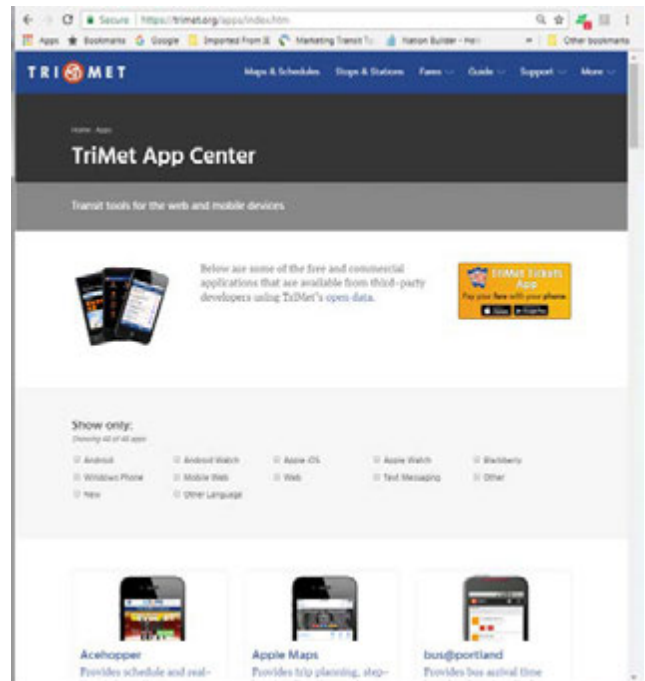
Transit Agency Advertising and Promotional Efforts

Most potential transit users find the idea of planning a trip on transit confusing and intimidating. As a result, they simply never find out if transit would be a good option for them. Advertising and targeted marketing efforts to promote transit use should prominently feature the availability of apps that make trip planning easier while allowing the user compare the travel time and cost of different modes.

For the new SBCTA vanpool program that is launching, promoting the apps that reflect the multimodal choices available to riders is important. While the Transit App and Google Transit include a transit-specific focus, there may be linkages that are important to promote. Similarly, if bikeshare and bike-and-bus share programs develop, the app promotion supporting these may also be promoted through transit agency advertising.

Implementation Topics

Cost and Funding

Promoting existing multimodal apps does not necessarily involve any additional cost and may well contribute to increased ridership and use of alternate mode transportation.   Google Transit is already in place, supported by the GTFS data collected from each of the county's public transit operators and provided to Google. The GTFS data is made available to other app developers and "sits behind" the GoLA app and the Transit app. For Omnitrans, preparation of the GTFS data is an ongoing budgeted item, part of current and recurring operating expense.

Institutional Coordination

The change in current practice is more one of orientation than of budget. It is important to use all available opportunities to promote these apps, at least Google Transit and the Transit app — as the GoLA app may have a shorter lifespan. Supporting multiple ways in which to put these apps continuously before the public are suggested by the strategy elements of:

- Involving employers' Employee Transportation Coordinators,
- Highlighting on transit agency websites, and
- Promoting apps through transit agencies' advertising, including rideshare, vanpool and bikeshare, where feasible.

Mechanisms by which to support these strategy elements must include an orientation to ***a multimodal focus within each, now siloed, transportation mode.***   Bus transit services are operated by Omnitrans, and by the adjacent services of Foothill Transit, Riverside Transit Agency, Pass Transit, Victor Valley Transit and Mountain Transit. Informal coordination exists among these organizations in relation to particular projects and the initiation of new services. Rail services, operated by Metrolink, coordinate with bus programs infrequently.   Other modes, such as carpool, vanpool and bikeshare, that could use transit for one leg rarely coordinate.

No one in the current organizational arrangements is tasked with thinking in a multimodal way to ensure that these apps are out there and promoted to the public. This is necessary in order to help encourage this multimodal orientation, providing travelers with readily available information about buses, trains, carpool and vanpool options, and bikeshare. Some points of access include:

- ***Marketing department staff and public information officers*** are first-in-line to promote existing apps through agency advertising, newsletters and on agency websites, for Omnitrans and SBCTA and for the region's other public transit providers serving the San Bernardino Valley. These individuals carry the ongoing responsibility for their agency's respective marketing efforts and should be encouraged to strongly embrace promotion of transit apps for trip discovery and trip planning.
- ***SBCTA's rideshare and vanpool program ETC coordinator*** can be tasked with ETC outreach to the region's employers, to introduce and train them in the use of Google Transit and the Transit app. Preceding strategies on rideshare portals explored how to embrace multimodal messaging to the ETCs and an emphasis on existing transit apps could piggy-back onto these.
- ***IT staff at partner agencies*** may also be important partners in this effort to ensure that websites promote existing Transit apps and trip planner tools.

Finally, Mobility Management is the concept useful in other arenas of transportation coordination. The Mobility Manager establishes a human interface to help bring together disparate parts of the transportation network in order to improve the mobility of individuals. A multimodal Mobility Manager function is considered in the final strategy, "Breaking Down Institutional Barriers to Multimodal Coordination."

5.2 Strategy: Introducing Employee Transportation Coordinators (ETCs) to Multi-modalism

Problem

Current multimodal transportation information resources available to employee transportation coordinators (ETCs) are under-utilized or not visible to ETCs. SBCTA (through a partnership with the Riverside County Transportation Commission, or RCTC) offers a ridesharing platform/software (branded as IE Commuter) that provides basic carpool matching, as well as the ability to search for transit and active transportation uses. A primary focus of the software has been to assist employers in complying with SCAQMD's Rule 2202. The platform does not currently have a mobile application, although the mobile application and other feature upgrades are planned to be launched in early 2018.

One key perception and theme throughout the study's surveys, focus groups and ETC interviews, was the lack of knowledge and/or understanding of available mobile applications, websites and information technology to assist commuters and ETCs with placing commuters into more multimodal rideshare modes. For example, most respondents are aware of how to use Google Maps for driving directions and many are aware that you can also get transit directions; however, for those that had more complicated commutes with two or more transit connections, or required to drive to a Park-and-Ride lot and then connect to another rideshare mode, the respondents found the planning effort difficult.

In addition, most of the ETCs dismiss transit outright as not available for their employees, not safe for their employees or not convenient and therefore, have not taken the time to learn about the tools available to assist in multimodal trip planning. As Omnitrans and SBCTA embark on implementing additional transit services for the San Bernardino Valley (such as Omnitrans sbX and Redlands Rail), providing tools and techniques to ETCs to promote multimodal trip planning should be a high priority for the agencies and may assist in placing riders into those modes and ensure their success.

Opportunity and Objectives

The primary objective is to create a "tool kit" and ETC support to raise ETC awareness of the various multimodal services and tools available. Within this study, there are various recommendations to introduce new ridematching platforms, as well as expand the offerings and availability of multimodal trip planning applications and websites. Based on those demonstrations and integration of those applications into the SBCTA rideshare offerings, SBCTA should consider developing a tool kit that provides tips and tricks and information targeted to ETCs to assist them on the use of these and other tools available.

A second objective is to establish a Mobility Manager, a "face" that regularly interacts with the ETCs, much as is currently in place through SBCTA's Rideshare group, but to expand this to actively incorporate a multimodal focus. This rideshare Mobility Manager would be tasked with monitoring high-level transit and rail service changes and in technology enhancements for trip planning, mode comparisons, fare payment and more, to communicate these new service dimensions to ETCs through regular contact and face-to-face interaction. This individual will also introduce and promote the multimodal tool kit to ETCs.

Target Markets

The benefit of an ETC tool kit is that the targeted market can be any employer in the county. We recommend that SBCTA work with a few employers in the development of the tool kit, to ensure that a variety of employer needs are addressed. We recommend that SBCTA seek input from:

- Employers of all sizes and industry types, regulated and unregulated;
- Employers with a variety of transit, rail and TNCs available (so as to demonstrate multi-modalism through the technological tools); and
- Employers that have little or no transit available to them.

Strategy Overview

Through the technological tools, and based on feedback from the survey and employer input, create a tool kit that assists employers with navigating through multimodal trip planning. There is a reason that SBCTA has focused on employer rideshare programs over the past 25 years, in that the employer rideshare representative IS the driving force behind a successful employer rideshare program. By providing an easy-to-use tool kit and training materials for ETCs, it is anticipated that an employer representative can assist and communicate the varying ridesharing options to their employees, which, in turn, will increase their rideshare modal split.

Not only will the ETCs learn how to utilize trip planning tools for transit and rail, but also connecting carpooling to transit/rail, bicycling to transit and rail and/or connecting other active transportation modes to a carpool and/or vanpool. Many of the available mobile applications allow the commuter to be able to compare the cost, estimated commute time and greenhouse gas emissions of the relevant commute choices, and these features can be emphasized and clarified to the ETC.

The tool kit should be designed in such a manner so that the employer can customize their branding into the materials and adapt the materials to their employees. Upon introduction of the tool kit, SBCTA may create a competition or incentive to employers to try out the tool kit and seek feedback and results.

Overall, the objective is to provide additional tools and information for an ETC to make their job easier as they implement their commute alternatives programs, which will result in more ridesharing employees.

Desired Tool Kit Components

1. Create materials in a hard copy/packet format, as well as in electronic formats (Microsoft Word, Adobe Acrobat PDFs and/or Microsoft PowerPoint) so that ETCs can easily review, retrieve, reproduce and pass on the materials to their employees or fellow rideshare staff.
2. Due to the ever-changing world of ridesharing/multimodal platforms, suggest that the approach be to provide screenshots and examples of navigating through a multimodal trip planning, decision-making process and how to communicate that process to an employee.
3. Create a matrix of readily available applications, as well as ridematching platforms and tools, with links and application icon names and directions for download.
4. Include a simple survey template that ETCs can use to gauge their employees' understanding and acceptance of the tool kit, as well as if the tools changed their employees' behavior to try or stay in a ridesharing mode.

5. Provide tools and techniques that are common to most — if not all — of the platforms, such as:
   - Trip planning on origin and destination, landmarks, known transit providers and schedule parameters.
   - User ability to select modes that are not applicable or of little interest.
   - Ability to compare travel times, change travel parameters, estimate costs and environment impact and results of the planning efforts.
   - Ability to schedule trips in advance or select a day/time of travel — demonstrate how adjusting travel times may result in a faster or preferable commute option.
   - Availability of data analysis tools so that ETC can evaluate employer database opportunities of trip origins and destinations and target campaigns for mode shift to specific market segments.
   - Capability to extract reports for Rule 2202 compliance and compliance options, and how to obtain individual and summary data from diaries and trip activity.

Software Platform Availability

The universe of ridesharing/multimodal platforms is evolving and changing. Some of the newer startup application and platform developers introduce features and customization on a regular basis. Other more mature platforms roll out new features on a regularly scheduled basis. Nonetheless, the universe of platforms is ever-expanding, and may include the following platforms in the tool kit as an introduction to ETCs to the world of multimodal trip planning and the technology that can support those modes:

- IE Commuter https://www.ie511.org/iecommuter/ (current SBCTA ride matching platform, developed by RCTC and the software provider is MediaBeef) — Mobile application to launch in early 2018; provides Rule 2202 surveying.
- RideAmigos https://rideamigos.com/ — Multimodal, mobile application and provides Rule 2202 surveying.
- RideShark https://www.rideshark.com/ — Multimodal and provides a mobile application.
- Ridelinks https://www.ridelinks.com/tools.htm — No mobile application and provides Rule 2202 surveying.
- Trapeze/RidePro/TripSpark http://www.tripspark.com — No mobile application but provides Rule 2202 surveying.
- Zimride (owned by Enterprise) https://zimride.com/ — Provides a mobile application and website; however, carpool/vanpool focus only.
- Scoop https://www.takescoop.com/ — Provides a mobile application and website; however, carpool/vanpool focus only.
- Carzac http://www.carzac.com/ — Provides a mobile application and website; however, carpool/vanpool focus only.
- Waze carpool (Google) https://www.waze.com/carpool — Provides a mobile application and website; however, carpool/vanpool focus only.
- Duet http://duetinc.com — Provides a mobile application and website; however, carpool/vanpool focus only.
- Müv http://Muv2work.com — Provides a mobile application and website; however, carpool/vanpool focus only.

Implementation Topics

Short-Term Actions:

- Seek feedback from five to seven employers to better understand what types of tools and information would be of most assistance in better understanding the world of multi-modalism and the technology to support placing commuters into a rideshare mode.
- Based on the information gathered, draft a scope of work and a procurement mechanism to hire a consultant to develop a tool kit and to provide training and outreach to ETCs during this information blitz.
- Develop the tool kit and materials. Conduct ETC meetings 1:1 and/or in small groups to present the materials and information. Create a competition and/or incentive among the participating ETCs to promote tool kit use.
- Determine the means in which to measure if the tool kit is or is not a success. Provide a survey mechanism or other means to calculate and document the results from the program. Outline survey questions and mechanism to ascertain the user's perspective and experience from the demonstration.
- Provide analysis support to determine the weaknesses and successes of the tool kit, and recommended next steps for updating the tool kit (based on new software introduced or feedback from the surveys/analysis) and whether to expand and continue to provide the materials and the ETC support.

Medium-Term Actions:

1. Incorporate the tool kit and strategies into the IE Commuter staff and program.
2. Consider incorporating the information into the annual Rideshare Week event and challenges.
3. Incorporate the results of the short-term employer demonstration program into the strategic plan objectives and program design features.

5.3 Strategy: Agency Technology Coordination to Support Multi-Modalism – Data Interoperability

Problem

Need for coordination of technology exists in three areas: 1) institutionally in relation to the modal silos that work against multi-modalism, 2) around customer needs to simplify and make a complex system accessible, and 3) around service providers and agency needs that will enable them to work effectively together around technology. These are summarized here.

Removing Silos from Multimodal Transportation

The multimodal transportation network is complex, with many (and an increasing number of) mode choices that each serve different trip needs. San Bernardino desires a transportation network that integrates various transportation modes into integrated information systems:

- Fixed-Route network (including regional and local services, including bus and rail);
- On-demand first- and last-mile services;
- Downtown SB on-demand service;
- Other Micro Transit solutions (ONT); TNC-subsidized trips around Metrolink stations, connections to Ontario Airport;
- Vanpool;
- Carpool;
- Active transportation;
- Walking;
- Biking; and
- Bikeshare.

We observe that travelers might use a variety of transportation modes to serve diverse needs. In order to offer a multimodal transportation network that is responsive to the needs of customers, information tools need to consolidate travel options (see **"Customer Needs"** below). In order to plan for, and make sense of traveler behavior across modes, planning agencies and service providers need tools and data that is cross modal (**"Service Provider and Planning Agency Needs"** below).

Customer Needs

Factors that make driving alone convenient include the opportunity to use this single mode for a variety of trip purposes, and the omnipresence of maps, apps and tools for street network navigation. In contrast, effective use of non-SOV travel options often involves the use of *various* transportation modes, with information siloed in different systems.

The term "Mobility as a Service" (or MaaS) describes "a scenario in which people can travel via a wide variety of mobility options that seamlessly get them where they want, when they want and how they want, at a lower cost to both them and the environment."[1] Consolidation of multimodal transportation information is key to enable MaaS — to make the variety of options easier to discover, compare, request and pay for.

One possible response to the need for consolidated information would be to offer a single app or information tool. But travelers already use a variety of information tools, and they exercise choice in the marketplace of tools. For example, Google Maps and Transit[2] [a mobile app] both offer transit directions and real-time arrival predictions for select transit agencies, but offer different features and user experiences. Worldwide, there are at least hundreds, if not thousands of transportation applications[3] that provide various features and focus on different regions.

This explosion of choices can be confusing, but on the whole has been a good thing for the transportation service providers and travelers. The marketplace of transportation apps enables innovation and

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[1] Crane, Jackson and Rucks, Greg. *A Consortium Approach to Transit Data Interoperability.* Rocky Mountain Institute, 2016. www.rmi.org/Consortium_Approach_ITD

[2] transitapp.com

[3] TransitWiki's category "GTFS-consuming applications" shows some of these tools: https://www.transitwiki.org/TransitWiki/index.php/Category:GTFS-consuming_applications

responsiveness to user needs through rapid experimentation. A "marketplace of apps" approach also responds to niche customer demands.

Customer choice in the transportation app marketplace is here to stay. Acknowledging this trend and pursuing a strategy to make information available to various systems and apps will best align with current trends and serve travelers' needs.

These are the distinct parts of the user's journey through planning, use, and discovery phases, which are useful for us to consider as we develop a strategy and information architecture to support this[4]:

- **Static information** (transit network and schedule information): Standard public transit timetables and stop locations, taxi stand locations, carshare parking spaces or zones, etc.
- **Real-time information**: Real-time bus and rail location and arrival times, wait times for taxis/TNCs, carshare/bikeshare vehicle/bike locations, exception information (e.g., service advisories, detours), etc.
- **Predictive information**: Probability of on-time departures, predicted wait times or availability for taxis/TNCs, predicted carshare/bikeshare locations, etc. This data can be based on past performance and modeling of future service.
- **Integrated booking and payment**: Ability to buy a ticket for public transit, or to book a carshare vehicle, shared bike or TNC ride from a single integrated interface.

Service Provider and Planning Agency Needs

Service providers and planning and management agencies need to be able to:

1. Effectively and accurately communicate all transportation service options (see Customer Needs above);
2. Share (sell) capacity amongst partner transportation providers; and
3. Understand traveler needs, desires, and behavior across the transportation system in order to provide more efficient and abundant service that responds to user demand.

Opportunities and the Strategic Fundamentals

Transportation Stack

The consultant team recommends a "transportation stack" of modular technologies (software and hardware) to serve the needs of customers, service providers and planning agencies above.

A modular "transit stack" or system of transit technologies will enable the region to:

- Leverage emerging technologies and respond more quickly to changing needs and emerging opportunities;
- Provide multimodal information more seamlessly through web-applications and mobile apps;
- Facilitate interoperability across vendors and partner agencies' installed information systems; and
- Prevent expensive or risky vendor lock-in.

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[4] *A Consortium Approach to Transit Data Interoperability.* (See earlier citations)

Definition of Relevant Terms and Technologies

Below are a few concepts that are foundational to the concept of the Transportation Stack:

Open data is data in a format that anyone may use, shared in a way that anyone may access. Generally, open data is created in the form of an open data specification — a mutually agreed upon data format that is publicly and collaboratively defined. But data in the form of an open data specification is not truly "open data" unless it is also publicly shared in a place where anyone may download, examine and use that data in their own applications.

Open source software is a software application under a license that states that any party may use and adapt the software source code for their own purposes. There are a variety of open source licenses, for example, some of which prevent or explicitly allow the adaptation of the software for commercial purposes.

Software license models can vary in two main categories. These categories apply both to open source software and also to proprietary software.

Traditionally, software applications have been purchased as an *asset* — a license fee or development fees are paid for a copy of an application that is then hosted either by the vendor or purchasing agency. That application in the delivered version is an asset that the agency owns (though perhaps only under a restricted license). Support and maintenance costs can then be managed through a variety of forms, but generally are low relative to the up-front cost of the initial expenditure, and meant only to keep the software application running in the delivered state. In this model, the software application fits into the agency's system in a manner that is defined at the time of installation. Changes to the integration may be possible, but also might not be practical.

Software-as-a-Service (SaaS) is a license model where a vendor commits to delivering not a particular application, but rather a particular result. Generally, license fees (or hosting and maintenance fees) are paid on a recurring basis. There is usually a limited or no start-up fee, as fees continue to be paid through the use of the platform. The SaaS model often allows less customization of software features, but has strong benefits for the agencies that need to be sure the software delivered will continue to fulfill a particular purpose for an extended time period. Upgrades to maintain a system that meets modern specifications are typically included within the terms of service for a SaaS license. That means, for example, that if a company might commit to providing software that provides GTFS data, in a SaaS model that company would likely include in their terms of service that the platform delivered would be upgraded to include any new fields that were adopted by the GTFS data specification. In a traditional software procurement model, the agency may have to pay for the software to be adapted if such a change were needed.

Interoperable Data

Interoperable data allows various information systems to work together, either implemented as one system and/or including third-party components, like Google Maps. Figure 41 presents a conceptual diagram of a "Transportation Stack" that shows various components, focusing mainly on the fixed-route public transportation system (but also including some other modes).

Definitions Related to the Multimodal Transportation Stack:

Established: Require import and/or export in the desired data format(s) or compatibility with the Application Program Interface (API), and provide a URL to specification and/or best practices documentation within contracts and procurement documents. If there are specific applications of interest with regard to interoperability, request that vendors can demonstrate or promise successful integration with those applications.

Emerging: Similar to above, but data specifications may be rapidly evolving and in a draft state, which should be acknowledged in any procurement or contract. The service provider should be asked to participate actively in the drafting of the specifications, to account for particular data and application needs.

Does Not Exist: Propose and develop new data specifications, identify existing practices or data exchange formats that could be borrowed and developed on top of, and identify industry experts and partners to help develop these specifications.
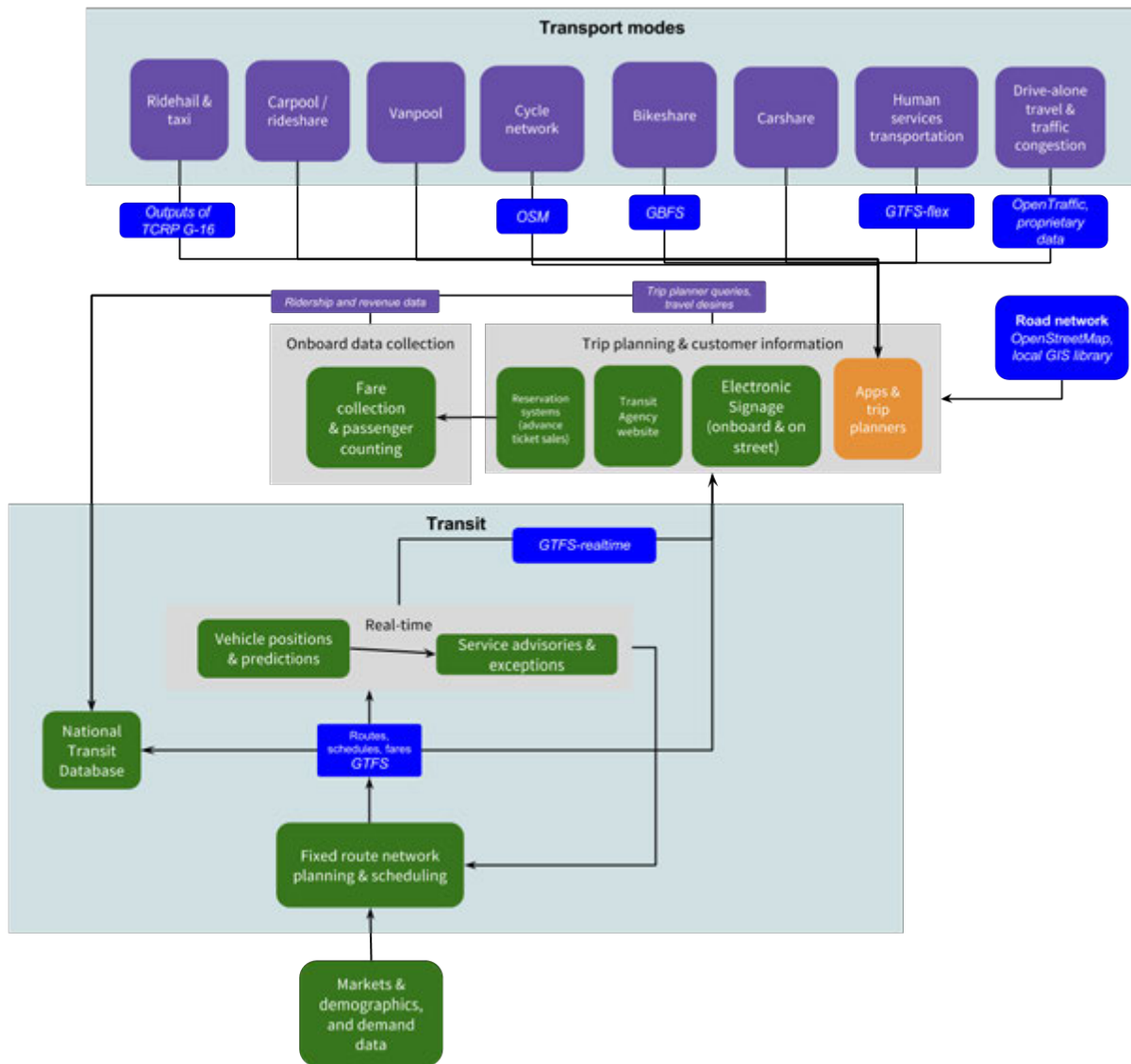
Note that each line in the Figure 42 diagram represents an interface between information systems.

Table 8 presents a table of data specifications in terms of ***established, emerging and nonexisting data specifications*** for various modes and functions.

Figure 41, Multimodal Transportation Stack

MULTIMODAL TRANSPORTATION STACK

Table 8, **Data Specifications**

Status			Mode / function	Data spec name	Notes	More information
Established	Emerging	Doesn't exist				
X			**Fixed-route transit (static/ scheduled)**	**GTFS**	Static stops, routes, schedules and fares for transit	gtfs.org
X			**Fixed-route real-time information**	**GTFS-realtime**	Vehicle positions, arrival estimates, service advisories	gtfs.org
	X		**Demand-responsive transit (DRT)**	**GTFS-flex**	Discovery (service area & hours information only): Zone-based dial-a-ride, deviated fixed, hail-and-ride, other services	gtfsflex.org
	X		**Transit booking, reservations and payment**	**n/a**	TCRP G-16, "Development of Transactional Data Specifications for Demand-Responsive Transportation"	[TRB page]
	X		**Transit ridership and traveler behavior data**	**GTFS-ride & TIDES**	GTFS-ride and TIDES are research projects undertaken by ODOT (Oregon) and Metro Transit (Minneapolis/St. Paul, MN), respectively	TIDES[5] GTFS-ride[6]
X			**Bikeshare**	**GBFS (General Bikeshare Feed Spec)**		GBFS[7]
X			**Bike network**	**OSM (OpenStreetMap)**	OSM is used for cycle data in OpenTripPlanner and other applications	OSM[8]
	X		**Pedestrian network**	**OSM/ OpenSidewalks**	OpenSidewalks is an active proposal to better represent pedestrian infrastructure in OSM	OpenSidewalks[9]

[5] https://groups.google.com/forum/#!forum/tidesproject
[6] https://github.com/ODOT-PTS/GTFS-ride
[7] https://github.com/NABSA/gbfs
[8] http://wiki.openstreetmap.org/wiki/Bicycle
[9] https://www.opensidewalks.com/

Status			Mode / function	Data spec name	Notes	More information
Established	Emerging	Doesn't exist				
X			**Driving (road) network**	**OSM**	Open (wiki-like) map for maintaining road network data	OSM[10]
	X		**Parking availability & curb facilities**	**SharedStreets**		SharedStreets[11]
	X		**Traffic**	**SharedStreets**		SharedStreets[12]
		X	**Vanpool**	**n/a**	No known published data/API specifications	
		X	**Carpool**	**n/a**	Various efforts have been made to define a specification, but so far no data specification has gained any wide adoption	
	X	X	**Carshare**	**n/a**	No industry-standard spec. ZipCar and Car2go both offer APIs.	ZipCar API
X		X	**Ride hail/ Taxi**	**n/a**	TCRP G-16, "Development of Transactional Data Specifications for Demand-Responsive Transportation" might become useful for this purpose. Proprietary specifications are in use.	Lyft API[13] Uber API[14]
X			**Road events**	**Open511**	The MTC and other organizations have collaborated on Open511. Extent of implementation unknown.	open511.org

Strategy Description to Promote Interoperable Technology

Below are guidelines for selecting vendors to work with interoperable data specifications and to hold them accountable for interoperable data requirements.

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[10] https://www.openstreetmap.org/
[11] https://www.sharedstreets.io/
[12] https://www.sharedstreets.io/
[13] https://www.lyft.com/developers
[14] https://developer.uber.com/

Specific Initiatives/Discussion

Below are seven specific opportunities by which to work toward interoperable data specifications.

1. Make real-time information available for transit through industry-standard formats.

Currently, area transit agencies do not appear to be providing [GTFS-realtime feeds][15], a necessary interoperable data format for real-time transit. GTFS-realtime makes it possible for Google Maps and other applications[16] to show real-time arrival estimates.

We recommend that local transit agencies ***should be educated*** to understand the benefits and opportunities of GTFS-realtime, which enables:

- o   https://medium.com/@sjbarbeau/whats-new-in-gtfs-realtime-v2-0-cd45e6a861e9

Currently, transit providers make use of the following real-time information vendors, which are not currently known to provide GTFS-realtime feeds:

- o   Using DoubleMap:
- o   Beaumont Pass Transit
- o   Mountain Transit
- o   Using Syncromatics:
- o   VVTA

2. Upgrade or supplement VetLink with new demand-responsive transit (DRT) trip planning features*.*

This would require GTFS-flex data and software that supports DRT and fixed-route trip planning. OpenTripPlanner is currently being adapted for this functionality.[17] Figure 42 shows an example of a screenshot.) VetLink provides an example of the usefulness of interoperable transit because the existing GTFS data allowed the fast incorporation of fixed-route transit into the VetLink trip planner. The current VetLink trip planner shows fixed-route and DRT modes, but does not combine them into one itinerary.

As examples, of this Figure 42 is a mockup of a flag stop (or hail and ride service) in OpenTripPlanner interface. Figure 43 shows a mockup of a deviated fixed-route service in OpenTripPlanner interface.

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[15] https://www.transitwiki.org/TransitWiki/index.php/GTFS-realtime

[16] *Transit* (transitapp.com), uses GTFS-realtime to include real-time information and also uses some other proprietary data real-time data specifications, such as the Syncromatics API

[17] https://trilliumtransit.com/2017/03/10/flexible-trip-planner-update-project-kick-off/

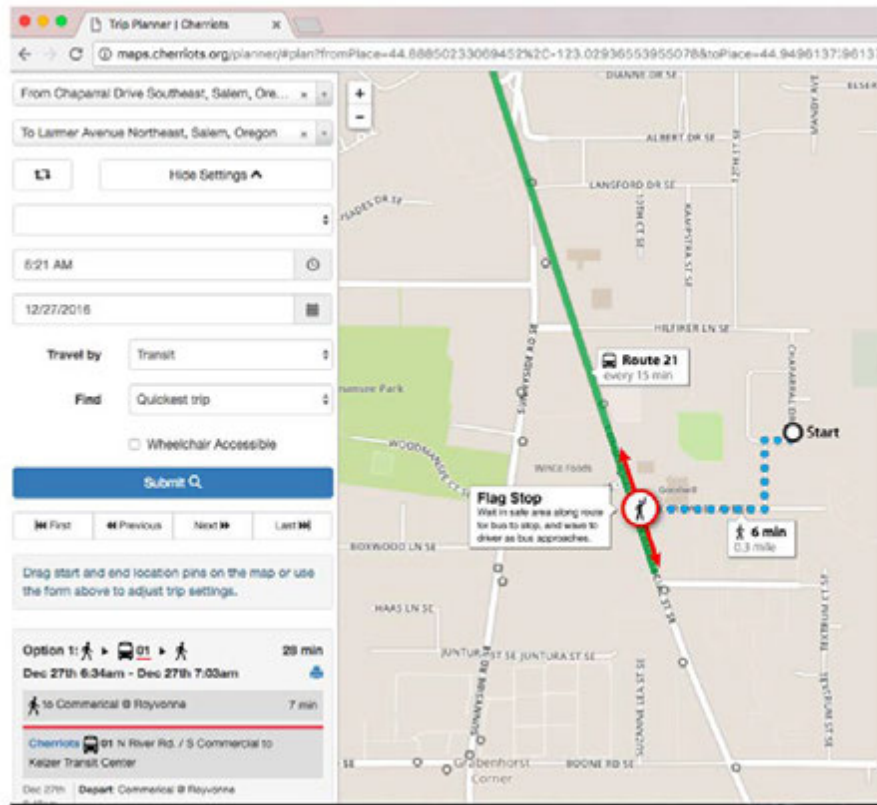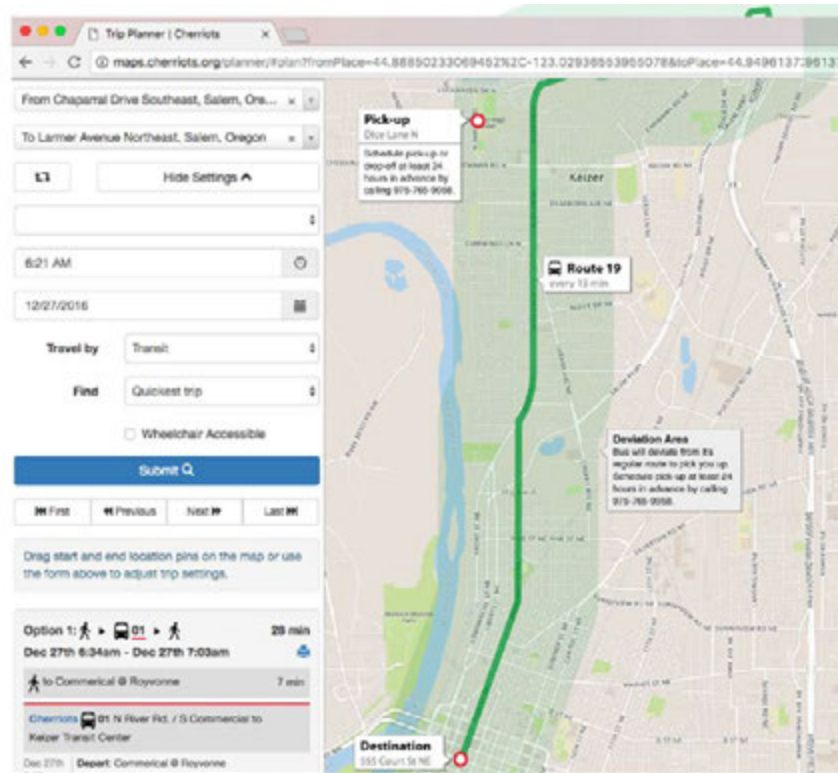**Figure 42, Hail and Ride Service OpenTripPlanner Mockup**

Figure 43, Deviated Fixed-Route Mockup in OpenTripPlanner

3. **Implement a next generation of OpenTripPlanner (OTP***) to show additional modes, such as TNC.*

- OpenTripPlanner is open-source software that plans bike, transit and walking itineraries (including combined itineraries). The software is currently being improved to enable it to show additional modes.
- Example of current production implementation: maps.trimet.org
- Commute trip planner in Washington, D.C.: carfreeatoz.com
- TriMet's MOD Sandbox grant to improve OpenTripPlanner: https://trimet.org/mod/

4. **Implement carpool ride-matching software**

- RideAmigos offers a popular TDM portal and carpool matching system. If this is implemented, it is recommended to "nudge" RideAmigos toward using interoperable data, perhaps requesting engagement with or development of data specifications for vanpool and carpool.
- The San Francisco Bay Area MTC provides an app center for third-party rideshare apps. They released a "Request for Partnerships" to list these apps. The Vermont Agency of Transportation is considering a similar approach.
- Various approaches of Mobile app based carpool:

  o Carzac
  o Müv
  o Scoop
  o Carma

If carpool/ride-matching applications are implemented, establish interoperable data to solve the silo/critical mass issue with rideshare. The MTC originally considered requiring data sharing from official carpool apps, but did not ultimately pursue this idea. The best lessons to borrow from right now will likely be from Europe. There have been a number of efforts to create rideshare/carpool APIs, but none have gained traction. Privacy issues are one of the challenges to rideshare APIs. Here are three example APIs:

- Carma API. (See news story on TechCrunch)
- Carpoolworld API
- OpenTrip (a.k.a. TripML) — No longer in development, but was briefly implemented in 511.org in 2009.

5. **Vanpool**

There are no known standardized formats or interfaces for vanpool. Vanpool needs both discovery and transactional data formats, and so could use GTFS and GTFS-flex, or modified versions, for "discovery" data (to allow people to find available vanpools).

6. **Transit [app]**

This app provides an excellent free mobile transit app and programs to gather usage data (to analyze trip planner queries and travel behavior). These are some of the features of Transit:

- Trip planner[18];
- Arrival estimates and nearby transit stops/lines[19];
- Transit network map[20]
- Service advisories, including subscriptions[21];
- "GO" feature[22] ("transit navigation" tells riders when to get off, transfer and hurry up to catch a bus or train);
- Integrated on-demand transportation options[23]:

  o Uber payment is handled in Transit.

- Integrated transit ticketing:

  o Example: Masabi's ticketing system allows customers to purchase tickets in *Transit[24]*.

- Partnership option for transit agencies to see A-B trips and app usage data[25].

7. Integrating fare payment systems

Fare systems today are becoming more complex. This is a significant topic in itself.

Among the options and needs that might be considered when implementing new fare systems technology:

- Mobile ticketing;
- Integration with mobile apps and trip planners;
- Validation, collection and reporting systems and methods;
- Fare payment card system (e.g., contactless);
- Sponsored ticketing features (e.g., by employers or social service providers); and
- Mobility as a Service and productization options: Does a fare payment system allow transportation services to be sold and bundled with other options?

Figure 44 following depicts a diagram that shows components in fare payment systems. Some potential interaction points and emerging interoperable data specifications are identified.

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[18] https://transit.helpscoutdocs.com/category/16-trip-planner

[19] https://transit.helpscoutdocs.com/category/12-nearby-screen

[20] https://medium.com/transit-app/transit-maps-apple-vs-google-vs-us-cb3d7cd2c362

[21] https://transit.helpscoutdocs.com/category/14-service-alerts-and-live

[22] https://transit.helpscoutdocs.com/category/13-go

[23] https://transitapp.com/partners/rideshare

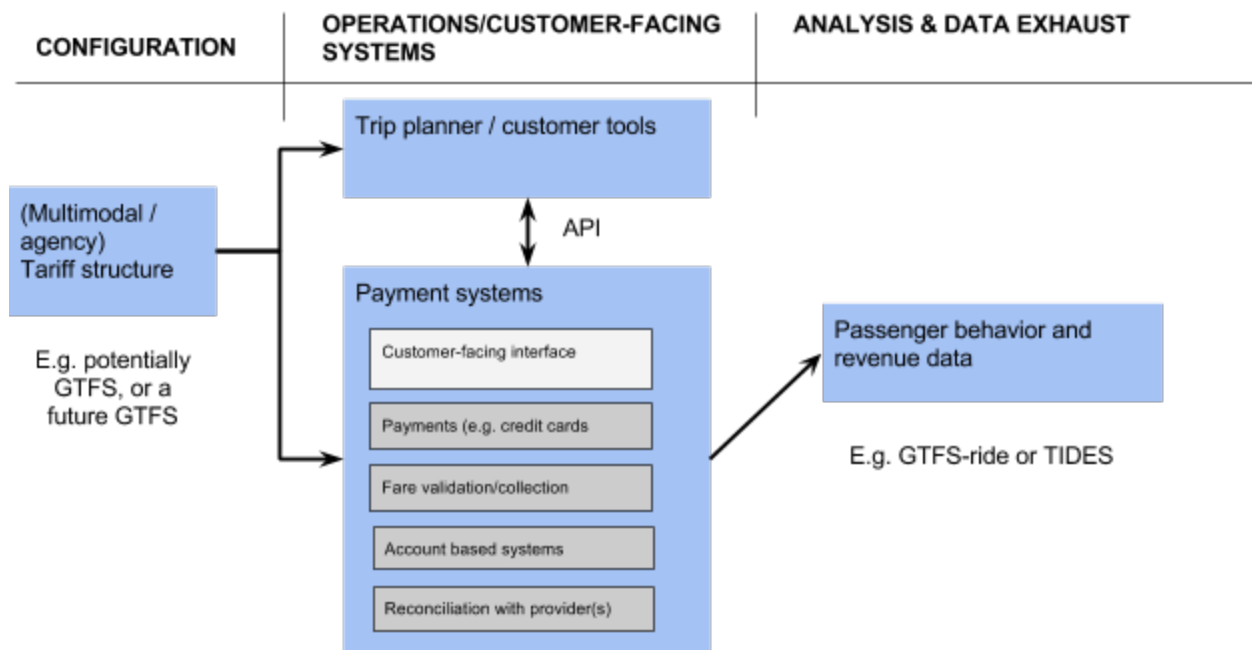[24] http://www.masabi.com/2017/10/09/transit-app-integrate-masabis-justride-sdk-to-offer-integrated-ticketing-to-agencies-in-north-america/

[25] https://transitapp.com/partners/transit

Figure 44, Components of Fare Payment Systems

Creating a Supportive Institutional Framework

1. Recommendations by which to build the institutional framework supporting the best use of modern and emerging technologies that will support a multimodal environment include:

2. Where appropriate, ***empower organizations to purchase their own systems*** (rather than top-down regionally purchased systems) and provide tools and resources to enable and encourage interoperability and standards-compliance in these separately procured systems.

3. Maintain a ***regional transportation information systems guidelines or flexible architecture*** that outline regional interoperability goals, strategies and tactics.

4. Follow a ***procurement model that promotes the use of interoperable standards*** and responds to the state of the industry by embracing software-as-a service, where appropriate. This is an outline of a **draft proposed process** (repeatable cycle) to procure and implement technologies that leverage interoperable data and remains current with the state of the art:

    a) Identify feature/functionality needs and desires: Develop a prioritized list. Not everything in the list will be possible to achieve immediately or simultaneously.

    b) Market survey (RFI/surveys): Conduct an RFI or informal survey (Trillium can provide an example survey conducted to understand available rideshare systems for the State of Vermont) to understand what is currently available on the market, conducted by mailing list and online survey, direct interviews and directories of software and information, such as www.transitwiki.org.

    c) Survey data specifications: Inventory data specifications that are available to implement transportation information systems and integrate systems together. In particular, identify

any common or shared industry-standard data specifications that would be useful as an input or interface in software system.

d) Choose priorities: Based on current practice and available solutions (See *"market survey"* and *"survey data specifications"*), choose which priorities are most feasible to implement and will provide great benefit.

e) Procure/implement/pilot: Implement software either by purchasing proprietary software, hiring a software developer for open-source software development and maintenance, or by requesting pilot demonstrations to test approaches.

f) After implementation of a new component, return to the overall system vision and update the map of implemented systems.

g) Repeat: Implement components of the system iteratively, returning to step 1 to identify and reprioritize feature/functionality needs and desires.

5.4 Strategy: SBCTA Leadership to Break Down Agency Barriers to Multimodal Coordination

Problem

The SBCTA mission statement has a very multimodal orientation, but there are institutional organization and resources barriers that are restraining forces to full realization of the multimodal mission statement vision.

The SBCTA mission statement specifically includes the language: "Develop an accessible, efficient, multimodal transportation system." The 2015 San Bernardino Countywide Transportation Plan has guiding principles that are relevant to our current effort on Customer-Focused, Technology-Enabled Multi-Modalism, including:

"Customer-focus – SBCTA and other public agencies exist to serve their traveling 'customers.'" Customers extend across all auto, transit, truck and nonmotorized modes.

Partnership-building – SBCTA is part of a multi-agency team to deliver mobility and safety improvements to our customers. Other important parts of the team include Caltrans, transit agencies, local jurisdictions, SCAG and air quality management districts. Good communication and collaboration is essential for each agency to accomplish its part of the overall mission."

These guiding principles are relevant to multimodal strategies and projects presented in this MULTIMODAL STRATEGIES WORKING PAPER. A key question being asked here is whether or not SBCTA and its partners have the institutional structure, resources and leadership to carry forward and successfully implement the multimodal strategies presented in this MULTIMODAL STRATEGIES WORKING PAPER.

Focusing on SBCTA's opportunity and challenges in addressing institutional barriers to multi-modalism is proposed in order to better coordinate region-wide responses in a complex, multi-stakeholder environment.

Background

While an exhaustive evaluation has not been conducted on SBCTA institutional capabilities, there are typically three important barriers to fully realizing the mission statement vision of an accessible, efficient, multimodal transportation system with a focus on the customer.

- Organizational barriers
- Interjurisdictional barriers
- Resource barriers

Organizational Barriers

The SBCTA functions as a county transportation commission and regional transportation planning authority with a very traditional organizational structure segregated modal responsibilities. Figure 45 presents the current SBCTA table of organization and highlights those departments with a function or responsibility of interest to this study effort. The Transit and Rail Department is leading the efforts on Arrow and Metrolink. Fund Administration includes a significant role in bus transit funding coordination. Planning has responsibilities for active transportation. Air Quality and Mobility Programs have the responsibility for vanpools and carpools. For the most part, modes are segregated into more traditional modal and programming departments similar to that of an MPO.

Intra-SBCTA multimodal efforts are typically only handled on a project-by-project basis by the Project Manager. At present, there is no place organizationally where multimodal needs of the customer that came out strongly in the e-survey for this study are discussed on any regular basis. There are no known inter-departmental working groups that have a specific charge of addressing multimodal opportunities. Staff responsibilities are typically assigned to the individual modes bus, rail, active transportation or highway projects. There are no dedicated staff who have a multimodal lens to seek multimodal solutions.

Interjurisdictional Barriers

The second major category of barriers are interjurisdictional barriers. While the City Managers have a working group, there is no agency working group that brings together traffic engineers, transportation and transit planners to discuss multimodal strategies and solutions. Typically, the barrier is different views about priorities, authority and responsibility. Overall, there can be reluctance to form formal partnerships to advance the customer-based multimodal strategies. Arrow could be an opportunity where customer needs for multimodal options access are addressed in a comprehensive manner.   First-and-last mile connections will need a customer-based multimodal ethos to attract overall ridership goals.

Additionally, there are various SBCTA advisory groups, including public works directors' TAC, the Bike Alliance Network and the Public and Specialized Transportation Coordination Advisory Council- PASTACC, with overlapping portfolios with topics of this MULTIMODAL STRATEGIES WORKING PAPER. These groups are not necessarily integrated in any meaningful way into multimodal decision-making or strategic planning.

Resource Barriers

The third major category of barriers is resource barriers. There currently are no dedicated funding sources that enable technological and multimodal innovation. Technologies that enable a wider choice of multi-

options with real-time information about those choices are available on the increasingly ubiquitous smartphone. Providing the financial resources to enable technology to reach existing and potential customers of multimodal options has been demonstrated in numerous strategies that have preceded this discussion on institutional capabilities.

Resource barriers also include necessary staffing to fully consider multimodal efforts to improve mobility of the San Bernardino Valley residents and employees.   Who organizationally will be responsible for moving forward the recommended strategies in this MULTIMODAL STRATEGIES WORKING PAPER? Are there sufficient staffing resources necessary to move the multimodal needle? Is there traction on a multimodal app in the San Bernardino Valley? Are there sufficient information technology resources available for successful implementation of a multimodal app and for maintenance and upgrading as modal options improve?

Figure 45, SBCTA Organization Chart as of September 2017
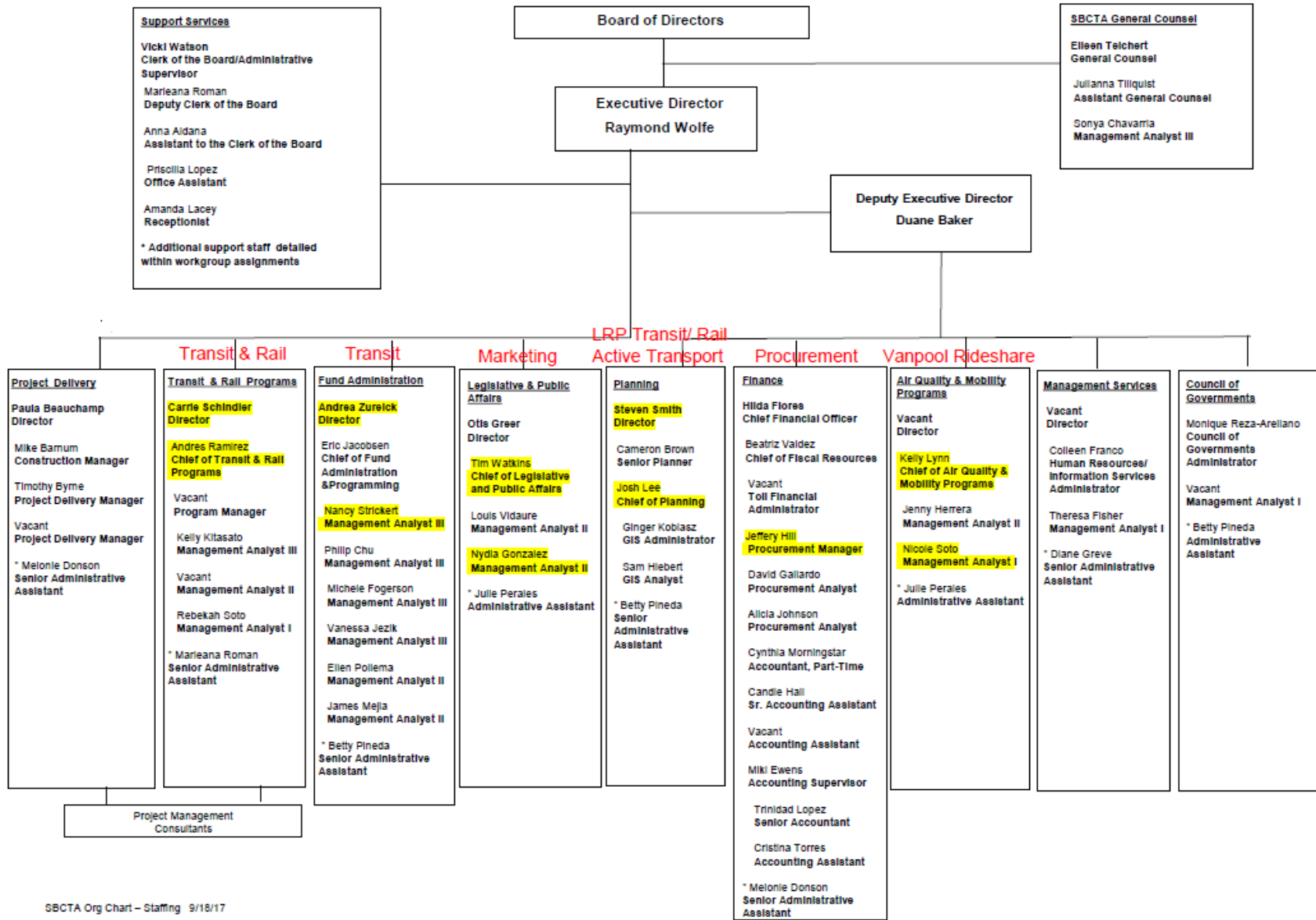
Opportunity and Objectives

The primary objective here is to ensure that the multimodal strategies recommended in this MULTIMODAL STRATEGIES WORKING PAPER have the institutional attention necessary in order to facilitate the processes that enable strategies to be implemented and to build a ***customer-focused, technology-enabled, multimodal environment.***

During the study process for this CUSTOMER-BASED RIDESHARING AND TRANSIT INTERCONNECTIVITY STUDY, team members were able to facilitate a number of meetings and actions to move forward consideration of multimodal approaches. For example, in Strategy 4.2, based on stakeholder interviews with Loma Linda University Medical Center, severe parking issues and the plan for charging for parking by LLUMC provided the need to explore more robust commute alternatives for the 25,000 employees and students at this major activity center. The stakeholder interviews identifying the need led to discussions between the consulting team, LLUMC and RideAmigos, a multimodal software platform that provides information on a full range of commute alternatives for an employee's commute to work. This led to approval on Sept. 6, 2017, of an agreement between SBCTA and LLUMC for a RideAmigos Pilot project, where SBCTA and LLUMC both contribute 50% of the $30,000 project costs for licensing the RideAmigos multimodal software, or $15,000 each.   This is an example of an exemplary public-private partnership facilitated by the consulting team to engender multimodal commute choices at a major activity center in the San Bernardino Valley.

In a similar fashion, the consulting team saw potential in the Loma Linda and Redland Corridors to support commuter shifts away from single-occupancy vehicles.   The area provides a balance of low-density residential with significant major employers, including ESRI, Loma Linda University Medical Center, the Loma Linda Veterans Administration Hospital and others. Given a regional interest in further leveraging this area's transit network, a strong local interest in increasing bicycling opportunities and the potential to partner with engaged and interested private-sector employers, the CUSTOMER-BASED RIDESHARING AND TRANSIT INTERCONNECTIVITY STUDY explored a potential bike + bus pilot bikeshare program. On Sept. 21, 2017, the project team hosted a work session at the ESRI campus with more than a dozen key stakeholders, including both municipalities, ESRI, LLUMC and the University of Redlands.

Given the reticence of local government to own or operate a bikeshare program (specifically a temporary one), the group identified a need for private, kick-start funding. This could come in the form of a private bikeshare operator providing a system at no cost in exchange for both sponsorship and usage revenues, or could come in the form of a local major partner signing on as title sponsor to support capital costs and any subsidies of operations required. This is a second example of how the consulting team facilitated bringing public- and private-sector players together to explore and possibly implement multimodal solutions to improve the commuter environment in San Bernardino Valley.

The previous descriptions of strategies in this working paper present a need to facilitate bringing existing new players together to facilitate consideration, funding and implementation of multimodal strategies. The consulting team has formulated the strategies that can move forward a ***customer-focused, technology-enabled*** set of strategies to encourage more multimodal trips in the San Bernardino Valley compared to the prevalence of single-occupant modes of travel. Once the consulting assignment is

completed, how can such facilitation of implementation among the various private- and public-sector agencies be best continued?

Target Market

The target markets for this strategy are the potential public- and private-sector agencies and employers, universities and the local jurisdictions that can collaborate in facilitating multimodal opportunities.   In most of the strategies described above, institutional coordination is necessary to move the strategy forward.   In Strategy 5.1: "Facilitating and Promoting the Profusion of Multimodal Apps," the target markets of institutional coordination are succinctly presented and repeated here:

> *"The change in current practice is more one of orientation than of budget. It is important to use all available opportunities to promote these apps, at least Google Transit and the Transit app — as the GoLA app may have a shorter lifespan. Supporting multiple ways in which to put these apps continuously before the public are suggested by the strategy elements of:*
>
> - *Involving employers' Employee Transportation Coordinators,*
> - *Highlighting on transit agency websites, and*
> - *Promoting apps through transit agencies advertising, including rideshare, vanpool and bikeshare, where feasible.*
>
> *Mechanisms by which to support these strategy elements must include an orientation to **a multimodal focus within each, now siloed, transportation mode.**   Bus transit services are operated by Omnitrans, and by the adjacent services of Foothill Transit, Riverside Transit Agency, Pass Transit, Victor Valley Transit Authority and Mountain Transit. Informal coordination exists among these organizations in relation to particular projects and the initiation of new services. Rail services, operated by Metrolink, coordinate with bus programs infrequently.   Other modes, such as carpool, vanpool and bikeshare, that could use transit for one leg rarely coordinate.*
>
> *No one in the current organizational arrangements is tasked with thinking in a multimodal way to ensure that these apps are out there and promoted to the public. This is necessary in order to help encourage this multimodal orientation, providing travelers with readily available information about buses, trains, carpool/vanpool options and bikeshare."*

This is just one strategy. Strategy 4.1 "Way-Finding to Facilitate Multi-Modalism" has the same target market for making sure both the traditional (transportation mode agencies) and nontraditional (local business attractions) are brought to the table to ensure the multimodal ethos takes full advantage of the significant investments made in such modes as the new Arrow service. The benefits of empowering this multimodal ethos are ***increased ridership, reduced single-occupant vehicle use, improved local economic development and improved air quality.***

The challenge of this strategy is to have the various players involved with a single mode, whether it be highways, bicycle, bus, rail or pedestrians, to begin and to continue to think with a ***multimodal opportunity lens***. After this project is done, there will be a need within SBCTA to have a staff position that conveys, facilitates and explores multimodal opportunities.

Strategy Overview

The primary strategy being recommended is directed to the SBCTA organization, which is as best positioned to provide leadership to multi-modalism and already has the organizational mandate to do so. We propose that SBCTA assign a high-level staff person within SBCTA to the position of Multimodal Manager or some equivalent title. An important way of thinking about this position is to maximize the opportunities for return-on-investment in existing transportation infrastructure in a cost- effective manner. Sometimes consideration of doing business in different ways needs to be considered and facilitated by the SBCTA Multimodal Manager. Overall, as noted previously , there are three institutionally focused principles that should guide the efforts of this recommended staff position, including: :

"1. Organize and collaborate on:

- o Multimodal technology platforms
- o Open-source, interoperable data platforms
- o Data sufficiently standardized that it can be shared across institutions
- o Promotion of Transit/Transportation Data Stack standards
- o Potential for integrated fare payment, across modes

2. Encourage flexibility and nimbleness in relation of technology's fast-paced change:

- o Embracing of *Software as a Service* approaches

3. Promote operations planning across modes and across agencies:

- o Multimodal orientation to infrastructure planning (carpool/ vanpool, train, bus, bicycle, pedestrian safety and ease of use)
- o Multimodal orientation to services
- o Fare payment coordination
- o Transfer coordination and improved connectivity between transportation modes
- o Information coordination (e.g., at times of service changes or new services)
- o Coordinated funding requests that bundle projects
- o Use advisory and technical review groups to ensure inclusion of agency stakeholders in appropriate phases of project planning, such as employers and jurisdictions along with transit operators."

As stated earlier, multi-modalism is part of the SBCTA mission statement. In order to facilitate increased implementation of multimodal options, it is important that the Multimodal Manager has several important job responsibilities in order to facilitate implementation of the above institutional principles: He or she should be a(n):

- Convener and a facilitator among both private- and public-sector players seeking implementation of multimodal opportunities.
- Mobility planner that matches modes to market needs seeking cost-effective mobility solutions without a bias to a particular mode.

- Financial bundler who takes advantage of existing and new funding opportunities to provide the seed and sustainable funding to make multimodal opportunities possible.
- Communicator of the benefits of multimodal efforts internally to SBCTA staff, to the SBCTA advisory committees, SBCTA Board and to external government agencies and private-sector partners.
- Technology enabler taking advantage of rapidly changing mobility technology to provide more mobility choice and better information on those multimodal choices to the consumer.
- Entrepreneur willing to try and experiment with new ideas, with expectations and has a desire for success, but is accepting the potential for some failures.

It is not up to the consulting team to recommend where organizationally this position should be or whether it should be an existing position that takes on the above functions or a new position. The important strategy recommendation is that a lead person be assigned as the enabler of these functions to consistently and persistently think of and pursue multimodal opportunities.

Implementation Considerations

Leadership is Necessary to Empower the Multimodal Manager

In order for SBCTA to achieve the multimodal components of its mission statement, there needs to be strong leadership from SBCTA management to ensure that the Multimodal Manager has the resources and management support to provide the necessary authority to make multi-modalism a prevalent component of its planning, coordination and funding functions as a county transportation authority. The position needs to be at a high enough level that provides sufficient visibility to the SBCTA's advisory committees and the SBCTA Board.

This Multimodal Strategies Working Paper Provides Two-year Plus Work Plan

The strategies presented in this MULTIMODAL STRATEGIES WORKING PAPER provide an excellent work plan for the Multimodal Manager to facilitate and implement over the next couple of years. The strategies presented above may need to be prioritized for implementation consideration, with the Multimodal Manager addressing five to six strategies at any one time. After the first two years, the list of priorities can be updated based on changing circumstances.

Annual Customer-Focused Multimodal Summit

As discussed previously, implementation of the multimodal strategies discussed in this MULTIMODAL STRATEGIES WORKING PAPER will involve a number of both existing and new players. It will be important to recognize and acknowledge the progress made in expanding the multimodal choices for the San Bernardino Valley residents and employees. Bringing existing and new players together on an annual basis can provide leverage in considering next step and future opportunities.

6. ACHIEVING CUSTOMER-BASED MULTI-MODALISM

This final chapter establishes the vision of customer-focused, technology-enhanced multi-modalism for the San Bernardino Valley within the context of Mobility as a Service, a transformative approach to public transport policy. It reiterates the core elements of this vision, including the motivational findings developed through the study's primary research that support the 15 strategies previously presented. It sets the stage for the forthcoming ACTION PLAN document, the final product of this CUSTOMER-BASED RIDESHARING AND TRANSIT INTERCONNECTIVITY STUDY.

6.1 Mobility as a Service – MaaS

This is a period of dynamic change in the field of transportation, although public transportation is late in participating. The role of technology is central. Customer response to the Uber and Lyft disruptive service models reflects the high interest in individualized and flexible transportation services. And the powerful capabilities of the smartphone for trip discovery, ordering and payment all reinforce that travelers increasingly wish to use tools readily available to them to discover their mobility options and to use them.

Mobility-as-a-Service (MaaS) characterize these changes and is a concept developed in Finland that has been embraced internationally to describe the shift away from personally owned modes of transportation and toward *mobility* solutions that are consumed as a *service*.   One of the major Finnish MaaS developers further describes it as:

> *Mobility as a Service brings every kind of transport together into a single intuitive mobile app. It seamlessly combines transport options from different providers, handling everything from travel planning to payments. Whether you prefer to buy journeys on demand or subscribe to an affordable monthly package, MaaS manages your travel needs in the smartest way possible.*

> *MaaS is a hassle-free and environmentally sound alternative to private car ownership. It makes worries about route planning, parking and car maintenance a thing of the past, helping you go places easier and more efficiently than ever before.*

> *A Finnish concept going global — The MaaS concept was born in Finland, where it already plays a key role in the national transport policy. It is widely recognized as a disruptive innovation, which will change the entire transportation universe through digitalization and combining the best of existing apps. Sampo Hietanen, the founder of the MaaS concept, has been leading the way globally to deliver the service to the mainstream.*

> **MaaS Global, Helsinki**

MaaS then is about "servicing" in order to better meet customer needs. This is distinguished from the traditional mass transportation approach that has emphasized movement, putting service on the streets and placing the onus on the customer to adapt to its service structure and requirements. MaaS is about creating access to services through technology in order to match the right service with the particular trip need, consistent with findings that travelers find the mode most appropriate for each trip or each occasion.

Seminal work in Finland by Sonja Heikkilä[27] identifies the drivers of transformation in transportation that underlie the development of MaaS. These include:

- A paradigm change — Shifting from movement to access.
- Servicing — Addressing the individualized needs of travelers for flexible, responsive service.
- Scarcity of resources — Federal, state and local resources are never sufficient to "build" society's way out of growing congestion and detrimental impacts on the environment.
- Poor satisfaction of some citizens with current urban public transport — With the result that many public transportation program's primary markets are the transportation disadvantaged who have little choice.
- Development of technology — The increasingly powerful tools made possibly by interoperable data systems that enable individuals to seek and use multiple mobility options.

Finally, Ms. Heikkila, supported by earlier work by Upham, Kivimaa and Virkamäki[28] argues that public transportation policy ***must move toward both technological change and behavior change***. Technological innovation alone cannot achieve the shifts in transportation use that will benefit individuals and society. Reducing the need to travel because of substitution, namely telecommunications, is one dimension of this. Changes in land use policy that contribute to reducing travel distances are another. Finally, and central to this study, is the need to encourage modal shifts that can reduce the use of the private car. MaaS can play a key role in supporting modal shifts in transforming public-sector mobility services.

These factors underlying MaaS and the need to embrace both technology and behavior change are consistent with the experiences of travelers, stakeholders and local governments within the San Bernardino Valley. The strategies in this document address <u>both</u> the centrality of technology and its potential for influencing travelers' behavior change. The strategies presented provide a beginning road map for MaaS principles of shifting the focus from simply putting services-on-the-street to proactive consideration of how customers access those services. These strategies recognize that public transit perceptions are not always positive and that in the low-density service area of the San Bernardino Valley, resources are always too scarce to establish high-quality transit throughout Omnitrans service area that could more easily attract ridership. MaaS principles then provide a long-range vision for achieving customer-focused multi-modalism.

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[27] Heikkilä, Sonja. 2014. Mobility as a Service – A Proposal for Action for the Public Administration: Case Helsinki. Aalto University School of Engineering, Helsinki, Finland.

[28] Upham, P. & Kivimaa, P. & Virkamäki, V. 2013. Path Dependence and Technological Expectations in Transport Policy: The Case of Finland and the U.K. Journal of Transport Geography. Elsevier Ltd., Vol. 32:12-22.

# 6.2 Centrality of Study Findings Regarding Traveler Motivations

Understanding San Bernardino Valley travelers' motivations and therefore the possibilities for influencing behavior change toward increased use of alternate mode transportation was a key objective of this study. To do so, the study undertook a three-tiered primary data collection effort. This involved first, interviews with the 14 largest employers in the San Bernardino Valley; secondly, an extensive survey of almost 5,800 employees still to be augmented by an additional 1,500 student survey responses; and finally, 10 in-depth focus group discussions with 90 participants. These activities brought back important understandings about **opportunity** — how to invite, attract, encourage and retain travelers' use of alternatives to driving alone for San Bernardino travelers.

The findings related to motivation, presented in the study's MARKET RESEARCH WORKING PAPER and summarized in Chapter 1 of this document, are useful to reiterate here. Challenges in using alternate mode transport varied by mode, not surprisingly. Top challenges included dissolving rideshare or vanpools due to loss of participants or schedule changes. Bus and train riders top-reported challenges included delayed trips due to missed connections and feeling unsafe at bus stops or on the bus. Walking and biking travelers reported feeling unsafe from traffic when walking or biking between home and work.

Study survey respondents' motivations in making a mode choice other than driving alone identified three top motivations of flexibility (48%), accommodation of work hours (42%) and access to a vehicle for emergency use (38%), all related to being able to "come and go when I want" and of which, tend to encourage driving alone. Smaller groups prioritized cost (22%), wear and tear on one's vehicle (17%) and the stress of driving in traffic (12%). These are factors that tend to encourage alternate mode use.

To explore willingness to consider an alternate mode, a correlation matrix and factor analysis generated a motivational continuum that accounted for 86% of survey respondents, also discussed in Chapter 1. Figure 46 again presents this continuum, showing in teal those on the "Independent and Flexibility Focused" end of the spectrum who are most likely to continue driving alone. Those at the green end of the spectrum "Practical and Cost Conscious" are those who are potentially most open to alternate mode use.
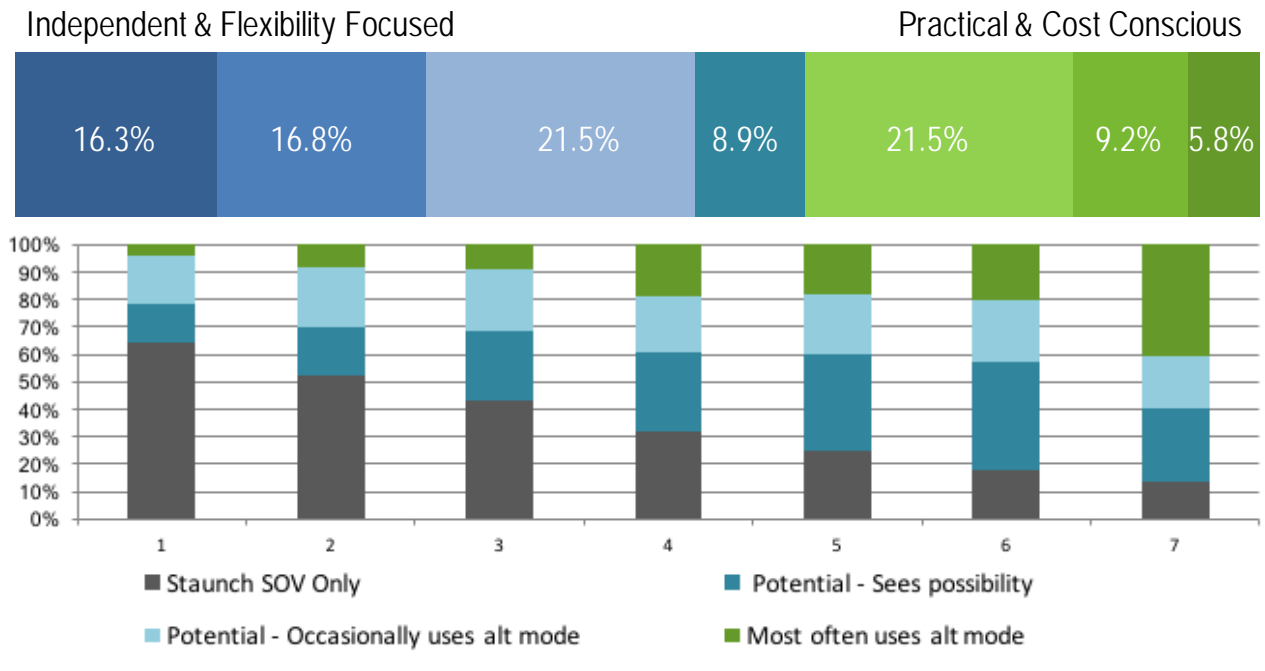
Figure 46, Motivational Continuum
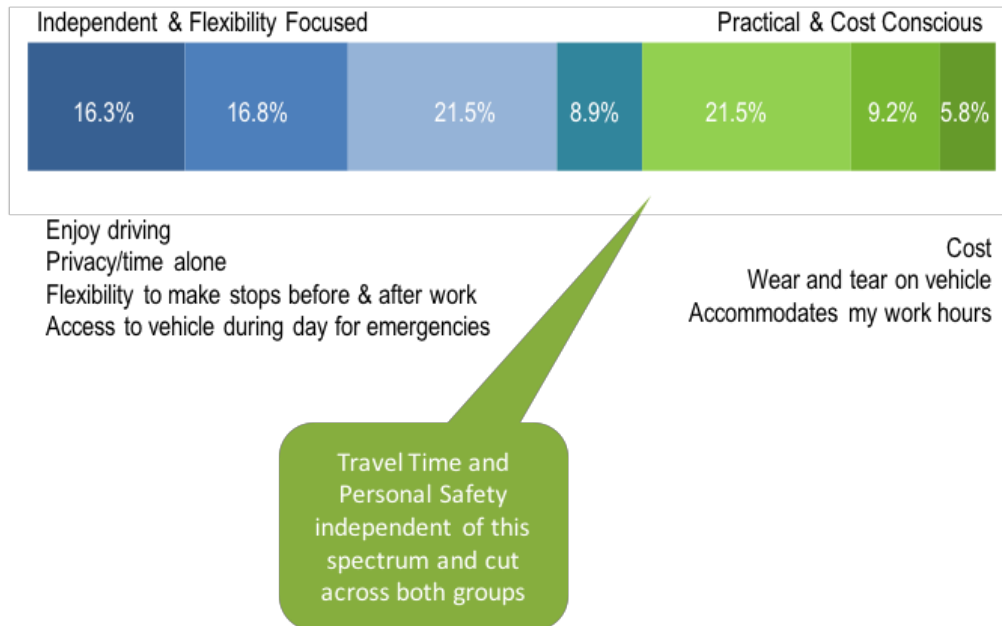
Those in the "Practical and Cost Conscious" groups represent 36.5% of respondents, more than one-third. Coupled with the teal group, 8.9% of respondents with some characteristics of both groups, this raises to 45.4% the respondents that have some willingness to consider alternate mode transportation, including carpool, vanpool, bus, rail, bicycling and walking. This is more than four-in-10 persons among this group of surveyed, higher-income and fully-employed individuals who could use an alternative to driving alone for some trips, on some occasions — a significant number of persons. And as noted previously, travel time and personal safety concerns cut across both groups and are independent of the continuum — a mode must be safe and reasonable in travel time for anyone to consider using it.   There is a very sizable market segment potentially open to customer focus multi-modalism.

Finally, arraying the motivational continuum in relation to current use or willingness to consider using an alternate mode further demonstrates the direct relationship between motivational mindset and openness to alternatives. Figure 47 shows the high number of staunch single-occupancy vehicle users on the teal end, "Independent & Flexibility Focused.".   Those towards the green end, "Practical & Cost Conscious," are far more likely to be already occasionally or most often using alternate modes or see some possibility of doing so. Again, this is a group that represents 45% of these survey respondents. These findings coupled with what we heard from large employers and from employees themselves undergird the selection of strategies described in this document. The 15 strategies discussed are meant to begin the pathway to increased adoption of multi-modalism in the San Bernardino Valley.

**Figure 47, Motivational Continuum and Alternate Mode Potential**

6.3 From the Motivational Continuum to Strategies

The 15 strategies presented in this MULTIMODAL STRATEGIES WORKING PAPER are responsive to the needs of travelers in the San Bernardino Valley who could use alternate mode transportation. They are also consistent with the Federal Transit Administration *Mobility on Demand* (MOD) initiatives and the internationally recognized *Mobility as a Service* (MaaS) principles. These strategies incorporate customer-focused concerns and address institutional considerations, with both dimensions critical to success. Important to the success of these are the concept of pilot projects and the opportunity to test strategies, to identify successful experiences and to tolerate some failure..

In considering these strategies in totality and as a vision for **Customer-Based, Technology-Enhanced Multi-Modalism,** Figure 48 depicts these in relation to four groups of strategies and sets the stage for an Action Plan:

- Rider support strategies
- First- and last-mile strategies
- Informational strategies
- Institutional strategies

Figure 48, Customer-Based, Technology-Enhanced Multi-Modalism for the San Bernardino Valley
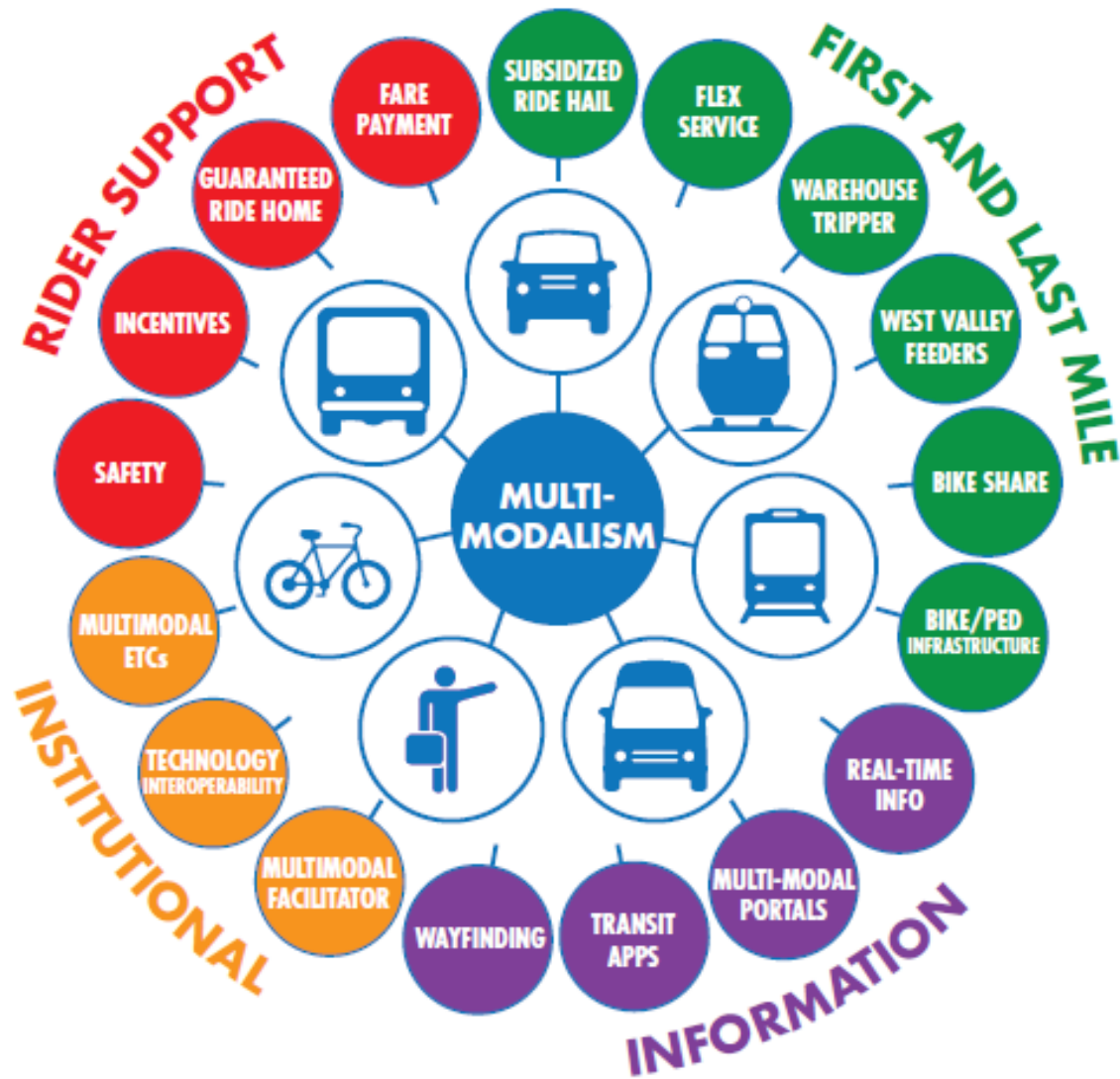
6.4 Moving to an ACTION PLAN

The anticipated ACTION PLAN, the final product of this study, must provide a policy-level road map for realizing the vision of **San Bernardino Valley Customer-Focused, Technology-Enabled Multi-Modalism**. The ACTION PLAN will need to define those organizing principles around which consensus develops among key stakeholders, including SBCTA and Omnitrans, the region's other public transportation providers and its local jurisdictions.

Single-page "Profiles" of the selected strategies are anticipated to present the strategy concepts and the opportunities that each addresses to attract those "potential alternate mode transportation users." These representative strategies — which are by no means the *only* strategies appropriate to push

forward — will include both some already implemented, in part or in whole, and others to be considered. Pilot project opportunities by which to test these strategies are identified throughout.

Key partners' roles are also identified, which will be included in the Profiles to recognize the many stakeholders with important responsibilities in moving forward customer-focused, technology-enabled multi-modalism in the San Bernardino Valley. Institutional coordination was explored in detail in the preceding chapter and focused primarily on SBCTA, establishing it as the lead agency for strategic implementation. However, some prioritization of the 15 strategies and direction to SBCTA's partners, including study partners Omnitrans and SCAG, is critical to concentrate and focus implementation activities. There is the potential for further workshop discussions near the study's end with SCAG with SCAG, Omnitrans, Metrolink, other regional transit providers, the local jurisdictions, major employers, and agency technical and advisory bodies can contribute to prioritization of these strategies.

Funding opportunities and policy are obviously also critical to strategy implementation. Some high-level review of funding will be included in the ACTION PLAN. This is likely to consider some redirecting of existing funding sources toward pilot initiatives. In addition, it will certainly address the opportunities available through various discretionary and grant-based regional, state and federal funding sources, including how to approach the bundling of strategies in order to successfully secure funds.

Measures of success are the final component of the ACTION PLAN. These will become the tools by which agency staff, policy makers and especially San Bernardino travelers determine whether one year, five years and 10 years from now we are in fact realizing the vision of **Customer-Focused, Technology-Enhanced Multi-Modalism.** This envisions expanded mobility and better mobility choices for more individuals, improvements in information and data-sharing that help to realize this, increased quality of the public transportation network and hopefully, attendant reductions in congestion and support to grave environmental concerns.

In sum, this represents a tall order but with policy focus, leadership and hard work there is great possibility for realizing these aims in whole or in part.