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# CUSTOMER-FOCUSED, TECHNOLOGY-ENABLED MULTI-MODALISM FOR THE SAN BERNARDINO VALLEY: AN ACTION PLAN

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# CUSTOMER-FOCUSED, TECHNOLOGY-ENABLED MULTI-MODALISM FOR THE SAN BERNARDINO VALLEY: AN ACTION PLAN

## INTRODUCTION

### Why This Study Now?

The CUSTOMER-BASED RIDESHARING AND TRANSIT INTERCONNECTIVITY STUDY was initiated by the San Bernardino County Transportation Authority (SBCTA) with its partners, the Southern California Association of Governments (SCAG) and Omintrans, for several reasons:

- *To ensure that residents, businesses, workers and visitors can make optimum use of the ongoing substantial public investment in the San Bernardino Valley’s transportation network.*
- *To attract new users, and more continuing users, to the multimodal network of rail, bus, demand response services, carpool, vanpool and active transportation facilities serving 15 cities and unincorporated areas of the San Bernardino Valley.*
- *To determine how SBCTA and its transportation partner agencies should respond to and take advantage of the revolutions occurring in transportation technology, communications and big data. Are there additional efficiencies to be gained? What adjustments to current services should be made? How do we reach transportation “customers” who were heretofore unavailable?*

A project of regional significance to improve shared and active transportation for San Bernardino Valley travelers, prepared for the:

- Southern California Association of Governments
- San Bernardino County Transportation Authority
- Omintrans

This study comes at a time of great change and opportunity, but also a time of uncertainty, with recent years’ decline in public transit ridership both nationally and in this region. This brings increased attention to bear on **how to invite new riders to and retain existing riders** on the regional multimodal transportation network.

SCAG undertook a region-wide analysis of the downturn in transit ridership in order to help answer this question. The University of California, Los Angeles, authors identify influences that include dramatically increased car ownership. Given this and other factors, they conclude that getting traditional transit riders back is unlikely. Of greater potential, they conclude, is to “convince the vast

majority of people who rarely or never use transit to begin riding occasionally instead of driving.”<sup>1</sup>

With the SCAG losing 72 million in transit rides between 2012 and 2026, by getting just one in every four nonriders to take a transit trip just once every two weeks, “annual ridership would grow by 96 million — more than compensating for the losses of recent years” (p. 11). Finding our way to these riders is the focus of this ACTION PLAN.

This is coupled with early evidence that the ridership trends in the San Bernardino Valley are already reversing. And carpooling and vanpooling use remains steady, which is of continuing importance to San Bernardino County commuters. Still, travelers report stressful commutes and both the personal and automobile wear-and-tear of increasing congestion in a region where long commutes are common.

In study interviews, surveys and focus groups, some travelers reported that they have already sought less stressful travel choices and/or lower cost transportation. Other individuals expressed some willingness to consider alternative modes and shared-ride transportation. But for most potential new users, this interest is frequently coupled with uncertainty, apprehension and a lack of knowledge. **“Why should I leave the comfort, predictability and safety of my drive-alone car to try something new?”** This ACTION PLAN seeks to answer this and other questions.

## A Transformative Time in Transportation

This period of fundamental change is in part a consequence of powerful technology in the hands of most individuals, of new service delivery concepts such as Uber and Lyft, and of an expanding array of transit and ridesharing trip planning and information systems. These and other developments open new opportunities and change expectations. Further and profound changes are coming through electrification and automation of private and public vehicles. All of these impact the role and opportunities of public transportation and shared-ride systems. **What should these systems be doing in light of such forces of change?** This ACTION PLAN leverages these changes towards improved mobility for the region.

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<sup>1</sup> Manville, P. Taylor, B. Bluemenberg, E. *Falling Transit Ridership: California and Southern California*. Prepared for the Southern California Association of Governments, January 2018, page 10.

## Three Revolutions in Transportation

The University of California, Davis, Institute of Transportation Studies characterizes this period as one of three revolutions: **automation, electrification and shared mobility**. Researchers describe us as at a crossroads in transportation. Can we identify the public policies and courses of action that move us towards increased access, mobility and reduced vehicle emissions and an improved quality of life? What if we see increasing congestion as the result of more vehicle trips taken with privately owned autonomous vehicles — even more trips and longer trips than we have now? What are the policies that could move us towards a less congested future, with more walkable city centers and neighborhoods, and improved mobility for our citizens, businesses and visitors?



The *Three Revolutions*<sup>2</sup> researchers believe that “pooling” — using shared mobility to fill trains, buses, carpools and vanpools with passengers — will help move us, collectively, towards a better mobility future. At the same time, there is no “one-size-fits-all” solution. Though San Bernardino County is becoming more dense, and transportation agencies are investing heavily in transit and rail service improvements, we are not Los Angeles. Local jurisdictions are encouraging development around our current and future transit stations, but the market does not yet support the scale of transit-oriented development (TOD) in San Bernardino County that is feasible in the cities to the west.

Although these circumstances may limit what San Bernardino County can expect in terms of transit ridership, bicycle/pedestrian activity and “pooling” in general, the opportunities are growing through technology, communications and new transportation modalities to serve our transportation customers more efficiently and effectively. This ACTION PLAN describes specific strategies to leverage these opportunities for our transportation customers, creating better information, more integrated services and better choices for making trips.

It is clear that many San Bernardino County travelers will continue to choose private automobiles for most or all of their trips. The personal automobile is the ultimate in convenience for point-to-point transportation. Individuals and families live extremely busy lives and often have little margin for error in being where they need to be, when they need to be there. But such mobility also comes at a cost, and depending on the destination and time of day, may not even be the fastest way to travel (e.g., to Los Angeles or Orange County employment centers). It is certainly not the least expensive. The transportation customer must juggle many factors on how and when to travel. This study explores in-depth the motivations of customers in making travel mode choices

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<sup>2</sup> Sperling, Daniel. *Three Revolutions: Steering Automated, Shared and Electric Vehicles to a Better Future*. Island Press, Washington, D.C., March 2018.  
[www.3Revs.ucd.edu](http://www.3Revs.ucd.edu)

and decisions, examining where potential exists to **invite some customers to consider an alternative way of travel for some trips.**

This ACTION PLAN seeks to identify where opportunities lie for San Bernardino County travelers to choose options other than the single-occupant automobile to make that trip — whether by rail, bus (fixed-route or demand response), vanpool, carpool, another form of shared ride, bicycle, walking or any combination of these. This could include portions of trips made through Transportation Network Companies (TNCs, like Uber and Lyft), conventional taxis or, in the future, even with autonomous vehicles. The point is that customers will each make a trip choice based on their personal circumstances, needs and motivations. It is the role of transportation agencies to plan and implement transportation systems and services in an integrated, efficient manner that is ***understandable to the public so that their choices are well-informed and their riding experience is reliable, positive and self-reinforcing.*** This ACTION PLAN identifies concrete, specific strategies for the San Bernardino Valley by which to realize such a vision.



### **Opportunity of Mobility-as-a-Service**

One way to think about the transit customers’ point-of-view is to borrow from the European innovation of **Mobility-as-a-Service**. This sees transportation as a “customer service” by which to better meet travelers’ needs, rather than simply putting buses and trains out there for travelers’ use. The Mobility-as-a-Service concept best characterizes the customer focus that this study’s authors believe will increase the use of alternate modes in the San Bernardino Valley. Termed “MaaS” in some arenas, it is distinguished from traditional mass transportation that puts service on the street and expects travelers to find and adapt to service structures and requirements. Instead, Mobility-as-a-Service *supports access to transportation through technology to match the right service with a traveler’s particular trip need.* It also thinks more in terms of trip origins and destinations, rather than just publicly provided “systems.” In other words, how do travelers get to and from “the system”? This requires agencies to think about the proverbial “first-mile/last-mile” dilemma, access to and from the system, and not just what happens on the system itself.

In its European form, Mobility-as-a-Service incorporates the ability to purchase multiple transport modes through a single-payment mechanism, in addition to providing trip-making information on the system components. Adapting the Mobility-as-a-Service concept of “servicing” the traveler’s needs in the San Bernardino Valley leads to consideration of smaller and larger network components by which to better “serve” the customer. Central among these are its information elements. In turn, this attracts new users, while retaining existing ones.

Adapting Mobility-as-a-Service concepts to this region can be characterized as **customer-focused, technology-enabled multi-modalism** for San Bernardino Valley travelers. This transition will take time and will require coordination across multiple agencies, including transportation agencies outside San Bernardino County. Travelers, however, do not care so much about whether they are crossing a city or county boundary as much as they care about getting to their destination as quickly and efficiently as possible. In the long run, the customer focus must extend beyond jurisdictional boundaries, even though the systems may be organized and funded by geographically defined entities. This ACTION PLAN addresses the challenge of **not “if” but “how”** we approach this time of profound change in mobility choices to build a **customer-focused, technology-enabled multimodal system**.

## Constructing 16 ACTION PLAN Strategies

This ACTION PLAN provides a road map of strategies by which to operationalize Mobility-as-a-Service — strategies that communicate choice, invite people to consider alternatives to driving alone and help them develop sufficient confidence to try new modes. This involves unpacking factors related to service design, the accessibility of information, ease of use and safety perceptions.

The work of this project, over almost two years, was characterized by its project managers as one of “discovery.” A phased effort, it included documenting existing conditions of the current network, reviewing relevant best practices and conducting extensive market research. This entailed a primary data collection e-survey of almost 7,000 commuters about their behaviors and commute perceptions, 15 large employer interviews and nine in-depth focus groups, with almost 80 individuals, to further understand commute challenges and motivations. This all contributed to rich, nuanced information about commuters’ experiences and the circumstances under which they will consider a commute alternative to driving alone (Figure 1).

The resultant ACTION PLAN presents 16 mobility strategies — customer-focused, responsive to market findings and seeking to:

1. *Grow use of alternate mode transportation;*
2. *Find new users for and keep existing users of modes that are alternatives to driving alone; and*
3. *Help users navigate a complex transportation network in which the region has heavily invested.*

Attracting and retaining users to San Bernardino Valley’s alternate mode transportation network of rail, bus, car and vanpool, bicycle and walking require **a deep and thoughtful focus on the customer**. Previously such attention was,

Figure 1, A Phased Work Approach



and often still is, brought to a single mode or service. Funding partners, planners and policy makers can focus on the mode and on the service but not on the multitude of ways customers find and use available transportation choices.

Presenting the customer vantage point to inform regional mobility choices and policy decision-making, this ACTION PLAN is supported by three technical volumes. These can be found on San Bernardino County Transportation Authority's (SBCTA) website at: [www.GoSBCTA.com](http://www.GoSBCTA.com), under the tab "Plans, Projects and Funding."

## A MULTIMODAL SETTING

### Transportation Resources

There exists already within the San Bernardino Valley a multimodal network of rail, bus, demand response services, rideshare, vanpool and active transportation opportunities, coupled with some information tools. This medium-density Southern California region of 545 square miles has a population of 1,932,666 persons dispersed across 15 cities and some county areas. Significant public investment includes support to new downtown San Bernardino train service, the sbX bus rapid transit and anticipated trains from Redlands.

Residents and commuters have multiple transportation choices, other than driving alone. Specifically, these include:

- **Regional commuter rail lines** of the Metrolink San Bernardino Line, the Riverside Line and the Inland Empire/Orange County Line are the spine of this multimodal network, providing 29 weekday trips combined, 12 Saturday and nine Sunday round trips. The San Bernardino and Inland Empire/Orange County Line trains newly arrive in downtown San Bernardino, with the opening of the San Bernardino Transit Center to Metrolink service in December 2017. The nine-mile Arrow service, the Redlands hybrid rail to downtown San Bernardino, is moving forward towards implementation in the early 2020s.
- **Omnitrans public transit bus services, including sbX**, a state-of-the-art bus rapid transit line, two express routes, 25 local fixed-route, community circulators in five communities and a region-wide demand response program for persons with disabilities, all serving the San Bernardino Valley.
- **Five other public transit providers** provide significant regional connections, including: Foothill Transit (six routes), Riverside Transit Agency (two routes), Mountain Transit (two routes), Victor Valley Transit Authority (one route), and PASS Transit (two routes).

#### A RICH ARRAY OF SERVICES BUT NOT A CUSTOMER- FOCUSED NETWORK

A complex transportation network serves the San Bernardino Valley — with regional rail, bus rapid transit, local bus services, rideshare, accessible ADA services, vanpool and carpool programs, and active transportation infrastructure.

However, this network does not work smoothly or easily from a customer viewpoint. It does not provide consistent connections, easy payment across systems or trip-planning tools across modes. It does not easily reveal new travel choices or enable comparisons of travel options.

- **Carpool and vanpool services** are a critical and expanding shared-ride mode for this region, with 196 vanpools administered by Victor Valley Transit Authority and a brand new SBCTA-administered vanpool program commencing support to San Bernardino Valley travelers during 2018.
- **Web-based information tools** include ICommuter.org and its 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, Orange Blossom and Santa Ana River Trails. Additionally, SBCTA has documented 261.46 miles of Class II, striped one-lane travel on streets and Class III 75.04 miles of signed, shared roadways within this Valley. Also, bikeshare projects are of significant interest in some areas.
- **Pedestrian improvements**, including sidewalks, islands and curb cuts, continue at the discretion of each jurisdiction but are supported regionally through a biennial call for projects from SBCTA.
- **Park-and-ride lots** dot the region and include 19 lots, a combination of Caltrans- and Omnitrans-owned and SBCTA-leased, and many informal lots at shopping centers, fast food locations and churches.
- **Hail-ride services** include the private sector’s existing taxicab companies and expanding Uber and Lyft services, showing a continuing and growing presence, while **car share services** have yet to present within the San Bernardino Valley.

This extensive array of services, however, is not consistently a network, particularly as customers experience it. 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.

#### TRANSIT TRIPS PROVIDED

Rail and bus services provided over 16.1 million one-way trips in FY 15 in the San Bernardino Valley. The decline in transit use observed nationally is beginning to turn around within this region as Omnitrans observed increases in bus boardings early in 2018.

Trips per capita for the San Bernardino Valley is 10.6, publicly subsidized trips per capita for FY 15, which includes Metrolink boardings and Omnitrans fixed and paratransit trips. This baseline doesn’t yet include vanpool, carpool or active transportation trips, which together comprise alternate mode transportation use.

# Envisioning a Customer-Focused, Multimodal Environment

This ACTION PLAN addresses these and other customer challenges that are barriers to effective multi-modalism. From the customer’s point-of-view, the San Bernardino Valley multimodal network should support all needed choices and connections, and as presented in Figure 2, should work cohesively to support individuals’ mobility requirements that vary each day and for each trip.

Figure 2, A Customer-Focused, Multimodal Environment



## Corridors of Travel

Supporting travelers’ choices for any given trip — to work, to school or to other destinations — involves an understanding of travel patterns. In many instances, the quality of those choices will be greater where more people have similar patterns of origin and destination. Identifying common corridors of travel helps policy makers determine priorities — where to use scarce resources to benefit the greatest number of persons or where to ensure some level of service in the equitable distribution of resources.

This project examined corridors of travel in the San Bernardino Valley from multiple perspectives and data sets to identify common travel patterns, to then use that information both in the Market Research and in development of mobility strategies. Reported in VOLUME I: EXISTING CONDITIONS, distinct corridors of travel were identified: for example, commute travel in the East San Bernardino Valley reveals that many people living in the East Valley also work in the East Valley, resulting in shorter trips than some. Other East Valley

commuters are traveling in from the Victor Valley with relatively long commutes. By contrast, workers in the West Valley tend to live in areas of neighboring counties or outside of the West Valley. Their commutes require inter-county travel choices and are often long trips.

These varying travel patterns suggest multiple travel modes and strategies will be responsive to needs of individual travelers. The study’s Market Research was structured to reflect these corridors and the geography, work environments and trip needs of the region’s commuters. ACTION PLAN strategies must respond in precise and targeted ways to address San Bernardino Valley commuters’ travel requirements, working within the current network presented in Figure 3.

Figure 3, Existing San Bernardino Valley Multimodal Network



## MOTIVATIONS FOR TRAVELERS TO USE ALTERNATE MODE TRANSPORTATION

### Baselines on Current Commute Modes

The study’s primary Market Research sought to better define commute behaviors, interests and opportunities of San Bernardino Valley travelers. Baselines for current travel modes are established by the American Community Survey (ACS) 2010-2014 for almost 610,000 San Bernardino Valley workers aged 16 and older.

#### PRIMARY COMMUTE MODE

San Bernardino Valley commuters are far more likely to travel in a carpool or vanpool: 13.8% of workers in contrast with a statewide average of just 11.1% of commuters carpooling or vanpooling. Transit use at 1.9% of commute trips has been well below the statewide mean of 5.2% of trips.

Carpool and vanpool use at 13.8% in the San Bernardino Valley is significantly higher than the comparable State of California mean of just 11.1%, while bus and rail use is substantially lower — 1.9% versus the 5.2% state average.

**Table 1, Commute Modes of San Bernardino Valley Commuters**

Mode*	Employees	Students	AQMD Surveys	ACS (2014)
Drive Alone	86.00%	70.75%	76.71%	78.00%
Carpool/Vanpool	13.20%	15.50%	13.08%	13.80%
Bus/Train	0.60%	8.40%	1.22%	1.90%
Walk	0.20%	5.60%	0.89%	N/A
Bicycle	0.10%	0.40%	0.53%	N/A
Telecommute	0.20%	0.60%	0.40%	N/A
Other	1.05%	1.00%	7.62%	N/A

\* Individual modes include those who use a mix of modes

Two groups responded to this study’s e-survey: 5,769 employee commuters from a dozen large employers and 1,446 student commuters, all of whom were enrolled students at California State University, San Bernardino (CSUSB). Table 1 compares the current mode usage of these e-survey respondents to ACS data and to Air Quality Management District (AQMD) employee commute data also analyzed during the study process.

The e-survey findings on commuters' **current mode, mode choice motivations and potential for alternate mode use** show interesting similarities and differences between commuting workers and students. Among surveyed workers, the 5,769 employees reported higher rates of 86% drive-alone, while the 1,446 CSUSB students reported lower rates of 70.8% drive-alone, closer to the statewide average of 73% drive-alone commuters. Carpool/vanpool use among employees was 13.2%, similar to the ACS rate of 13.8%. Student carpool/vanpool use reported as slightly higher at 15.5%. Overall, local carpool/vanpool use among both traveler groups is well above the statewide mode share, which is 11.1% for carpool and vanpool.

CSUSB student transit use of 8.4% mode share was considerably higher than for the employee commuters of just 0.6%. This reflects in part students’ typically higher levels of transit dependency, but also their proximity to and willingness to use Omnitrans sbX service that provides high-quality transit directly to the CSUSB campus. This rate, which is eight times that of employee commuters, is also a success story, reflecting student use of the Omnitrans **GoSmart Student Pass**, paid for in part through student fees and enabling their free use of the sbX and other Omnitrans services.

## Potential for Alternate Mode Use

For most San Bernardino commuters, driving alone is the norm and alternate mode use is a hard sell. However, the e-survey found that there are “circumstances” under which many commuters will consider use of an alternate transportation mode.

### LARGE EMPLOYER ETCs’ MESSAGES

Key themes emerged from the large employer interviews and the perceptions of employee transportation coordinators (ETCs):

- Most employees drive alone and many have little interest in doing otherwise.
- Carpooling is the primary alternate mode used and promoted by employers.
- Transit is perceived as only for those with no choice and frequently described by ETCs as “not safe.”
- Bicycle commuters are a small group but generally very enthusiastic.

For example, 20% of employee commuters and 33% of students who now drive alone said that they would consider an alternate mode if there was a “guaranteed ride home.” Ironically, SBCTA has such a program already in place to provide a free-trip home for the carpool/vanpool user under certain circumstances, part of a regional consortium through the Los Angeles Metro. While this program is available to many commuters, awareness of it is low.

For the employee commuters, other motivating conditions included an incentive of cash or vacation time (27%), the availability of a carpool/vanpool with fellow employees (20%) and “easier transit connections to my work site” (15%).

For students, other motivating circumstances included “the availability of a carpool/vanpool with other students” (31%) and “if gas prices rise above \$5 per gallon” (29%).

The survey also found that many commuters who currently drive alone (16% of employees and 24% of students, respectively) have tried an alternate mode or use one occasionally, indicating a willingness to consider another way.

Figures 4 and 5 summarize mode use and potential use segments among the two survey populations, workers and students, considering four commute groups:

1. *Single-occupancy Vehicle (SOV) only drivers who will not consider an alternate mode;*
2. *Potential users who drive alone now but can envision circumstances under which they would use an alternate mode;*
3. *Potential users who have tried or occasionally use an alternate mode; and*
4. *Those who are already commuting by carpool/vanpool, transit or active transportation.*

Exploring **potential to use** other modes revealed interesting differences between the employee and CSUSB student commuter e-survey respondents (Figures 4 and 5).

**Figure 4, Mode Use and Potential Use for Employees**

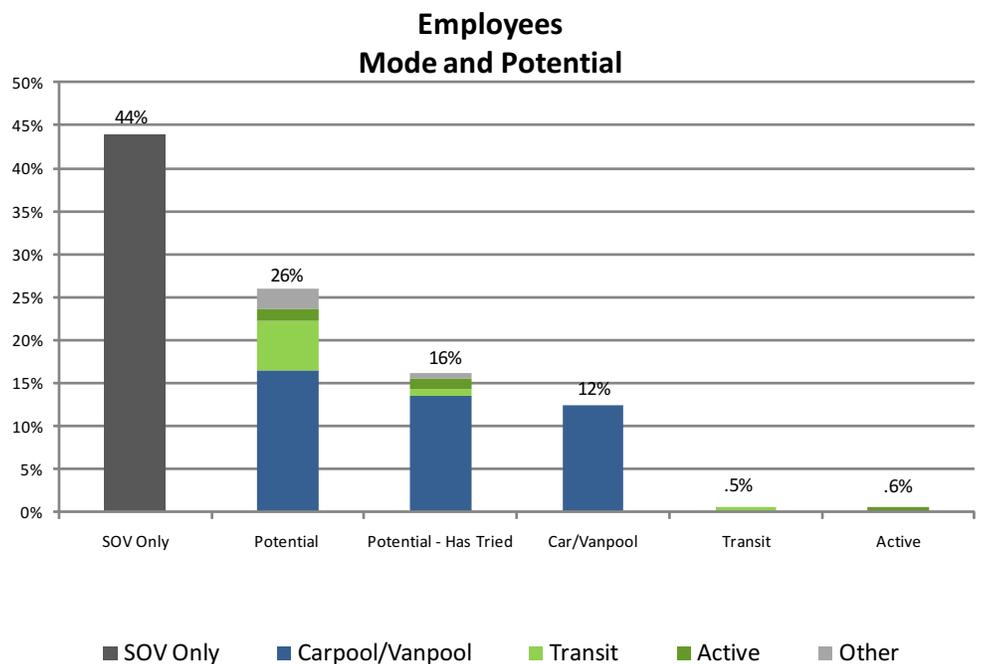
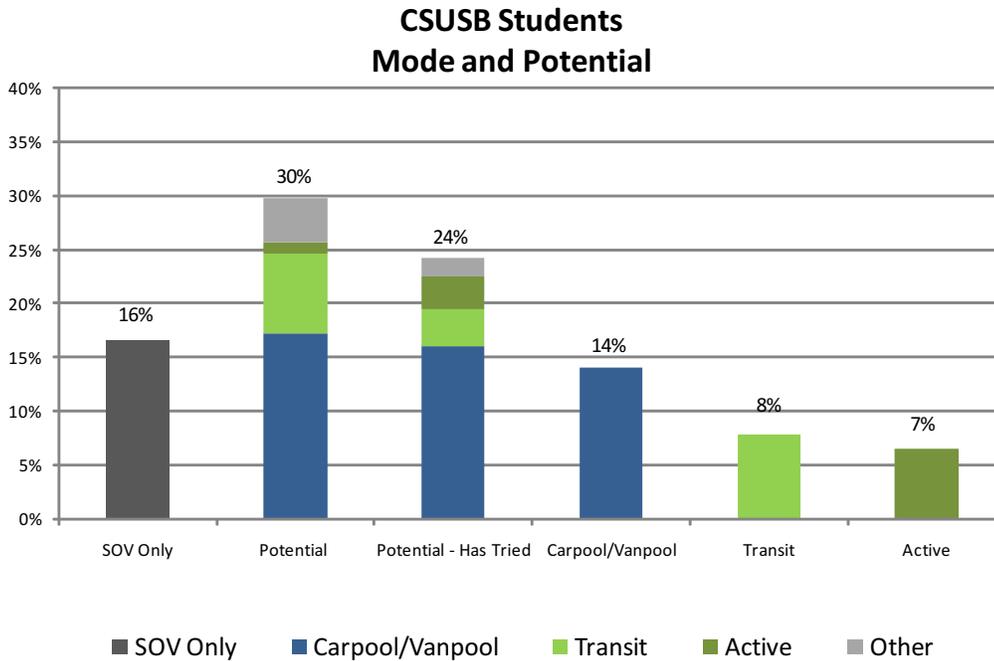


Figure 5, Mode Use and Potential Use for CSUSB Students



Not surprisingly, **SOV-only commuters** unwilling to try any alternative were a much larger proportion of employees (44%) than students (16%). Drive-alone commuters expressing **potential willingness to try an alternate mode** — as assessed through a number of e-survey questions — were one-quarter of the employee commuters (26%) and one-third of the student commuters (30%). Drive-alone commuters who have

tried an alternate mode and may offer future potential for some form of alternate mode transport were 18% of employee commuters and one-quarter (24%) of student commuters.

**Existing alternate mode users** were only 14% of employee commuters (13% vanpool or carpool; about a half percent each for transit and bicycle/active transportation) (Figure 4). Among student commuters, existing alternate mode users were nearly three out of 10 respondents (29%), breaking down to: 14%, carpool or vanpool; 8%, transit; and 7%, bicycle/active transportation.

Among those already using an alternate mode, “saving money on commute costs” was the top reason for both employees (60%) and students (58%), in almost six out of 10 instances. For employees, this was followed by “I enjoy the company of the people I ride with” (41%), “it’s good for the environment” (39%) and “it’s less stressful than driving alone” (29%). For students, “I don’t have a vehicle available” (45%) and “I don’t drive” (34%) were second- and third-rated reasons for using alternate mode transportation.

Challenges in using alternate mode transportation were reported by existing users. These challenges begin to set up strategies for retaining and attracting new users. Top concerns reported by the commute mode group were:

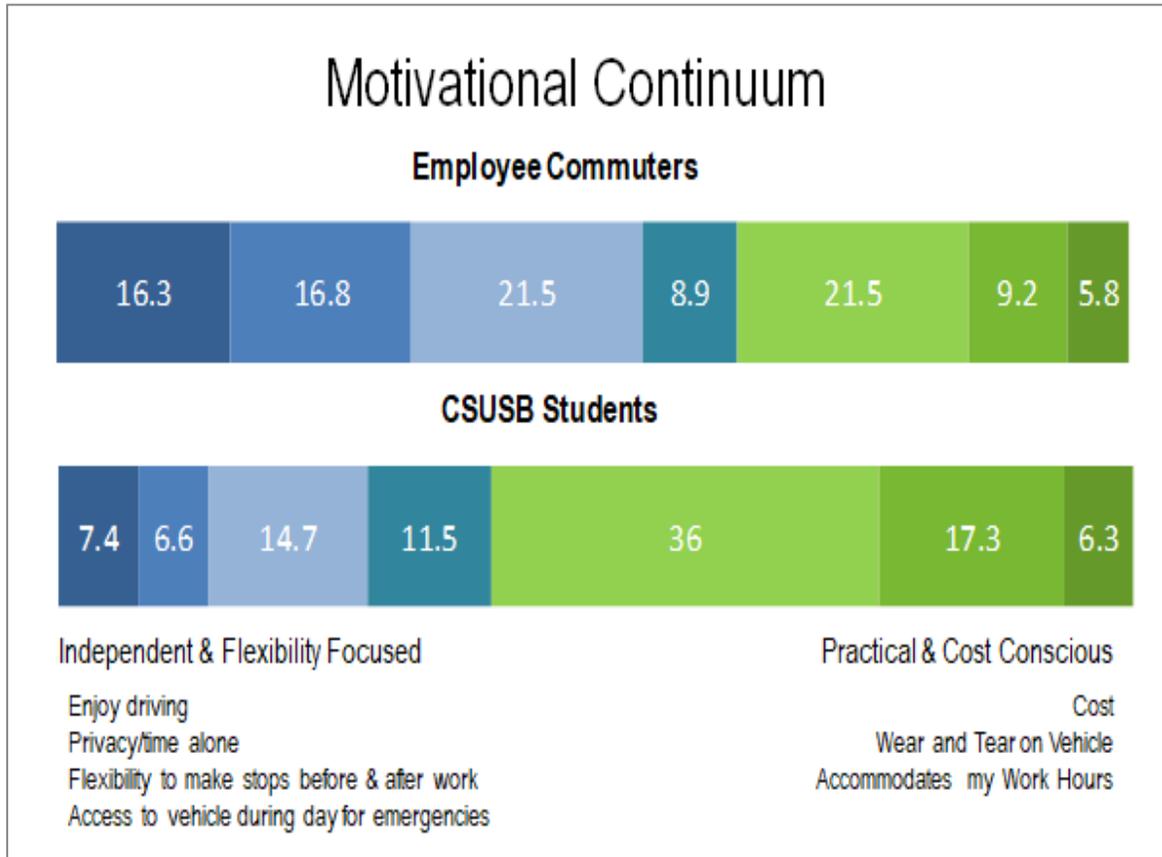
1. **Bus or Train Commuters** “have been delayed due to missed connections between buses or between bus and train” — 83% of students and 68% of employees.

2. **Bus or Train Commuters** “have felt unsafe while waiting at a Metrolink station or transit center” — 45% of students and 26% of employees.
3. **Bus Commuters** “have felt unsafe while waiting at a bus stop” — 59% of students and 48% of employees.
4. **Bicyclists or Pedestrians** “have felt unsafe from traffic biking or walking between my home and college or work site” — 52% of students and 39% of employees.
5. **Carpool or Vanpool commuters** “my carpool or vanpool has dissolved due to various factors” — 22% of students and 7% of employees.

## Motivational Continuum to Identify Mode Choice Factors

To define strategies to aid in retaining and growing the use of public, shared-ride and active transportation requires a deeper understanding of what will motivate individuals to become alternate mode users. The e-survey explored this issue by asking respondents to select the factors most important to them in making a mode choice. Figure 6 presents a motivational “continuum” developed through a series of correlation analyses of the e-survey data.

Figure 6, Motivational Continuum for Alternative Mode Use



## POTENTIAL TO USE ALTERNATE MODE TRANSPORTATION

Over 45% of employee commuters and 71% of student commuters report some motivations that characterize them as **Practical/Cost Conscious** — *the green end of the commute motivation continuum*.

These individuals prioritize costs and their vehicle's wear and tear, but also the ability of a commute mode to accommodate their work hours.

Commuters fall into one of two primary mind-sets relating to mode choice decisions: one which prioritizes independence and flexibility and another which is more cost conscious and practical. The continuum, which accounts for 86% of all respondents, shows the extent to which individuals represent these mind-sets with blue relating to independence and flexibility and green to cost consciousness and practicality.

Note that travel time and safety were important considerations to all commuters and are outside of this continuum. If a trip is of unreasonable length or if an individual too frequently feels unsafe, the mode is a nonstarter. Reasonable length was explored in both the e-surveys and the focus groups, and while varying by individual, it is generally not more than 1 ½ to 2 times as long as driving alone.

When we compare motivational mind-set to an individual's reported use of or potential to use an alternate mode, we find a strong relationship. This relationship is illustrated in Figures 7 and 8.

Considering first the employee commuters in Figure 7: those with a strong **Independence/Flexibility** focus are least likely to consider alternate modes. These commuters on the blue end of the spectrum will likely remain staunch single-occupancy only travelers. They prioritize their independence and flexibility with key motivations that include enjoying driving, enjoying time alone and privacy, wanting flexibility to make stops before and after work, and access to a vehicle during the work day for various trip purposes.

Those individuals who are more oriented to **Practical/Cost Conscious** issues are also more likely to consider alternate mode transportation, either because they are already occasional or regular users or because there are conditions under which they can see themselves using an alternate mode. These are the commuters on the green end of the spectrum. They prioritize costs and their vehicle's wear and tear but also the ability of a commute mode to accommodate their work hours.

Those with a **Practical/Cost Conscious** mind-set represent 36.5% of this group of employee commuters. When we add in those who share characteristics of both the **Practical/Cost Conscious** and the **Independent/Flexibility** group, the 8.9% in the teal-colored bar, the group with some motivations that favor alternate mode use grows to 45% of employee commuters.

Contrasting the employee continuum with student commuter responses, presented in Figure 8, reveals a large proportion of students that are **Practical/Cost Conscious**, six in 10 (59.6%). Adding those with characteristics on both ends of the spectrum — the teal group — this rises to 71.1%, or solidly seven in 10 student respondents that have some motivations that favor alternate mode usage. Those whose motivations are dominated by **Independent/Flexibility** — characteristics that make them less likely to consider an alternate mode — are a much smaller group, or 28.7% of student commuters.

As with the employees, there is a strong relationship between the motivations of students and their use of or potential to use alternate modes of transportation. This is clearly illustrated in Figure 8 where we see that individuals on the green end of the continuum are much more likely to be current or potential users and less likely to be SOV-only drivers.

Differences between the employee commuters

(Figure 7) and the student commuters (Figure 8) underscore the relationship between motivational mind-sets and behavior when it comes to mode choice decisions.

Figure 8, Employees' Motivations and Potential to Use Alternative Modes

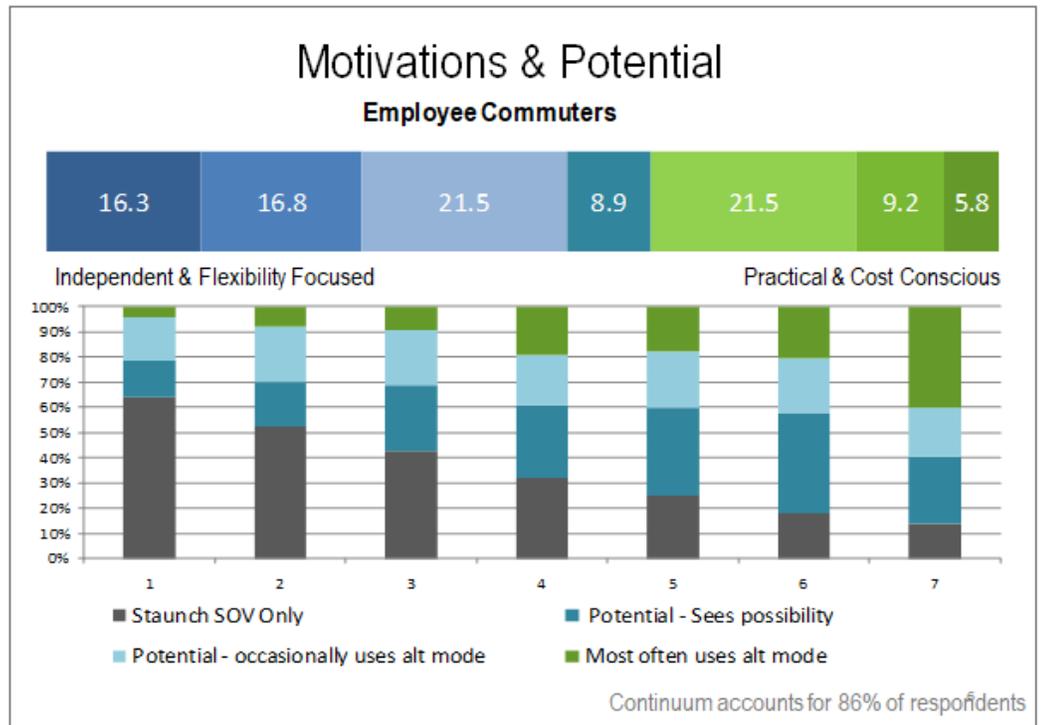
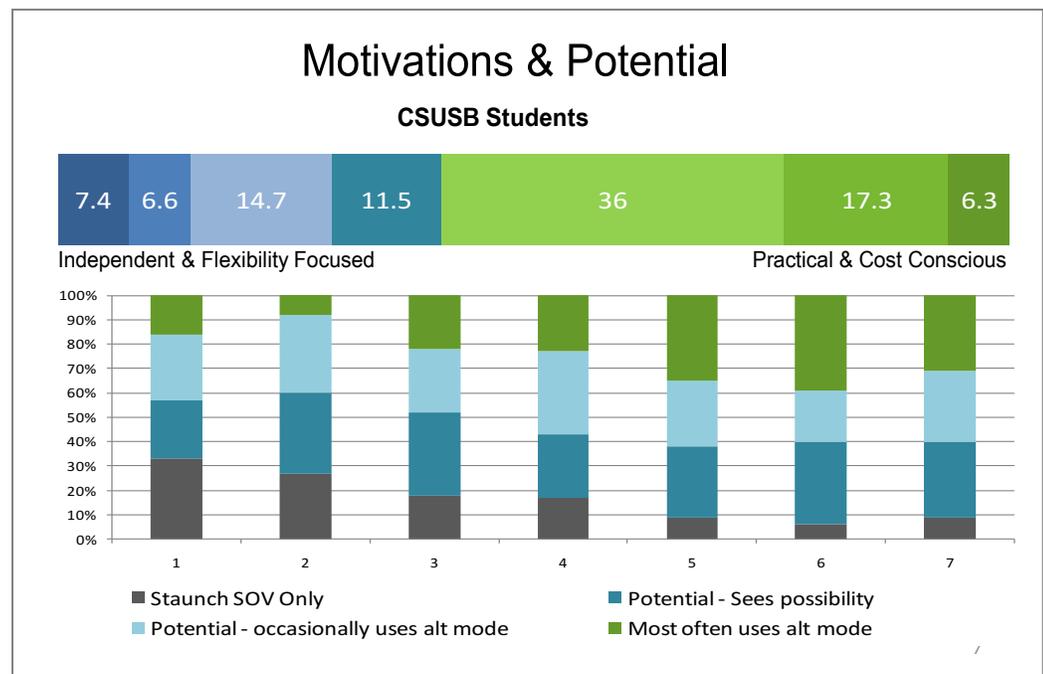


Figure 8, CSUSB Students' Motivations and Potential to Use Alternative Modes



The potential user groups identified by these surveys — and their relevant motivations — represent the target groups and messages showing the greatest promise for increasing usage of alternate modes. This analysis provides direction to types of strategies and messaging by which to reach potential users. How can alternate modes capitalize on their cost efficiency while also increasing the level of flexibility and independence they offer (for example, through a better guaranteed ride home program)? What demographic segments are most open to the appeals of various alternate mode options? And how can the promotion of multimodal options build trial and occasional alternate mode usage among drive-alone commuters?

## PRINCIPLES TO SUPPORT USE OF A MULTIMODAL NETWORK

### Principles as an Outgrowth of Study Findings

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

Between 45% of employee commuters and 71% of student commuters surveyed report that alternate mode transportation has merit for them — they are potential users. The challenge then is how to attract these users for some or all of their commute trips and how to hold them as alternate mode users? This study’s VOLUME 2: MARKET RESEARCH work, which reports on employer interviews, commuter surveys and in-depth focus groups, explored these questions, in combination with the VOLUME 1: EXISTING CONDITIONS analysis. Together, these findings suggest both a general focus and key principles by which to attract these “potential users” to alternate mode transportation. This is characterized as:

#### **Customer-Focused, Technology-Enabled Multi-Modalism**

The adage of “the customer first” is an old one, yet it remains fundamentally sound. The strategies in the following sections detail just what that **customer-focus** can mean. And **technology-enabled** is critical. Technology is driving the evolution of transportation and, as Uber and Lyft experiences have shown us about customer preferences, it provides the immediacy and comprehensive information about transportation services customers want. Finally, **multi-modalism** reflects the importance of choice. Providing travelers with the full array of options available to them — including the costs, timing and benefits of each choice — characterizes what multi-modalism can mean to the customer.

## Focus on Customers and Institutions

Principles proposed by which to realize customer-focused, technology-enabled multi-modalism are presented in Table 2. These principles are presented on two dimensions:

- ▶ First, characterized in terms of those related to the individual traveler, **customer-focused principles**.
- ▶ Secondly, those related to the organizations and institutions, **institutionally-focused principles**, for the design, operation and management of the services that comprise the mobility network for San Bernardino residents and travelers.

These principles grow from — and are in direct response to — this project’s Market Research findings, summarized previously and detailed in VOLUME 2: MARKET RESEARCH. They form the basis for the 16 strategies described in the subsequent ACTION PLAN sections, which comprise the road map forward.

Table 2, Principles for Customer-Focused, Technology-Enabled Multi-Modalism

<b>Customer-Focused, Technology-Enabled Multi-Modalism</b>	
<b>Customer-Focused Principles</b>	<b>Institutionally-Focused Principles</b>
<ul style="list-style-type: none"> <li>■ <b>Provide transportation options to meet varying needs and motivations that are:</b> <ul style="list-style-type: none"> <li>▪ Easy to use</li> <li>▪ Engaging</li> <li>▪ Accessible</li> <li>▪ Reliable</li> <li>▪ Immediate</li> <li>▪ Fun</li> </ul> </li> <li>■ <b>Promote cost savings, fast travel times and safety:</b> <ul style="list-style-type: none"> <li>▪ Fast travel times – strive for no more than 1 ½ times drive-alone</li> <li>▪ Cost efficient over drive alone</li> <li>▪ Safety throughout the trip</li> </ul> </li> <li>■ <b>Enable easy multi-modal choices:</b> <ul style="list-style-type: none"> <li>▪ Allow comparisons of time, cost, travel factors</li> <li>▪ Ensure complete, reliable information</li> </ul> </li> <li>■ <b>Promote incentives and challenges:</b> <ul style="list-style-type: none"> <li>▪ Inducements to encourage new behavior</li> <li>▪ Reward sustained use of alternate modes</li> </ul> </li> <li>■ <b>Support the environment and support healthy lifestyles:</b> <ul style="list-style-type: none"> <li>▪ Identify and increase calories spent</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>■ <b>Organize and collaborate on:</b> <ul style="list-style-type: none"> <li>▪ Multimodal planning tools</li> <li>▪ Coordinating standardized, interoperable data to enable data sharing and multimodal platforms</li> <li>▪ Promoting Transit/ Transportation Data Stack standards</li> <li>▪ Integrating fare payment, across modes</li> </ul> </li> <li>■ <b>Encourage flexibility and nimbleness in response to technology’s fast-paced change:</b> <ul style="list-style-type: none"> <li>▪ Embrace open-source software options</li> <li>▪ Provide procurement education for purchasing modern technologies.</li> </ul> </li> <li>■ <b>Promote operations planning across modes and across agencies:</b> <ul style="list-style-type: none"> <li>▪ Multi-modal orientation to infrastructure planning (carpool/ vanpool, train, bus, bicycle, pedestrian safety &amp; ease of use)</li> <li>▪ Multi-modal orientation to services:                             <ul style="list-style-type: none"> <li>▪ Fare payment coordination</li> <li>▪ Transfer coordination</li> <li>▪ Information coordination (e.g. at times of service changes)</li> </ul> </li> <li>▪ Coordinated funding requests that bundle projects</li> </ul> </li> <li>■ <b>Use advisory and technical review bodies to include agency stakeholders:</b> <ul style="list-style-type: none"> <li>○ At appropriate phases of project planning - employers, jurisdictions, transit operators</li> </ul> </li> </ul>

# STRATEGIES RESPONSIVE TO THESE PRINCIPLES

Recognizing principles that are customer-focused and institutionally focused, this ACTION PLAN presents 16 strategies. They are by no means all that have relevance to developing a customer-focused transportation network. However, they do reflect the strongest places by which to move forward with implementation or pilot demonstration in the San Bernardino Valley.

Organized into four categories, the strategies of this ACTION PLAN are graphically presented in Figure 9. A number of strategies are proposed as pilots, to test experience and value. Some have commenced implementation, given the almost two-year period of this study. Others must receive institutional support and a funding base to move forward.

### 1. Informational Strategies

Attracting commuters and others to alternate mode transportation requires that information is easy to find and accessible; three strategies are presented to build up and extend information tools.

### 2. First-and-Last Mile Strategies

All travelers want a safe and reliable transportation service that gets them to their destination within a reasonable travel time. The factors of speed and safety were variables independent of all others among commuters' motivations. The six strategies explored consider the network and propose actions to improve speed, grow connections and improve safety in a multimodal environment.

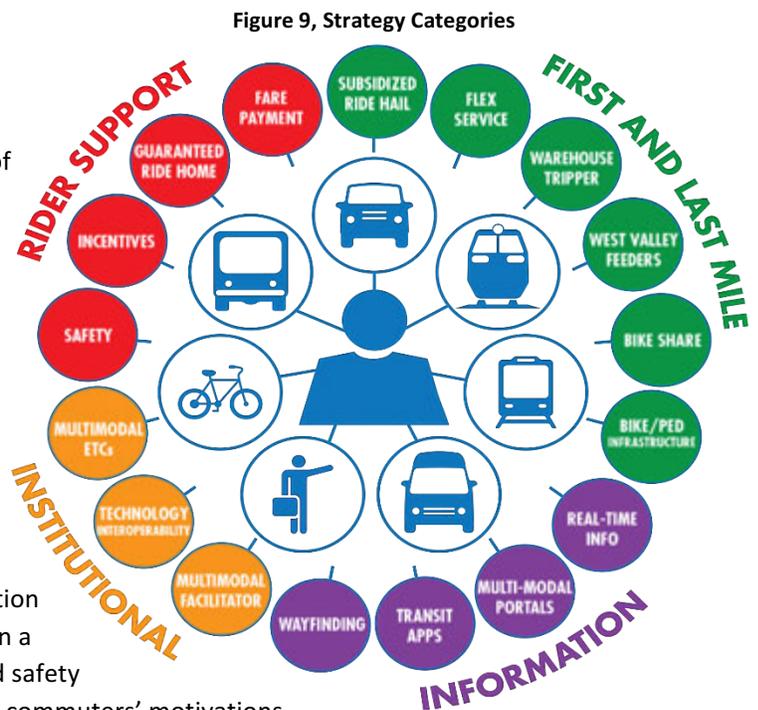
### 3. Rider-Support Strategies

This group of strategies focuses on making it easy for travelers, a requirement often heard from focus group participants. Four strategies are discussed.

### 4. Institutionally Based Strategies

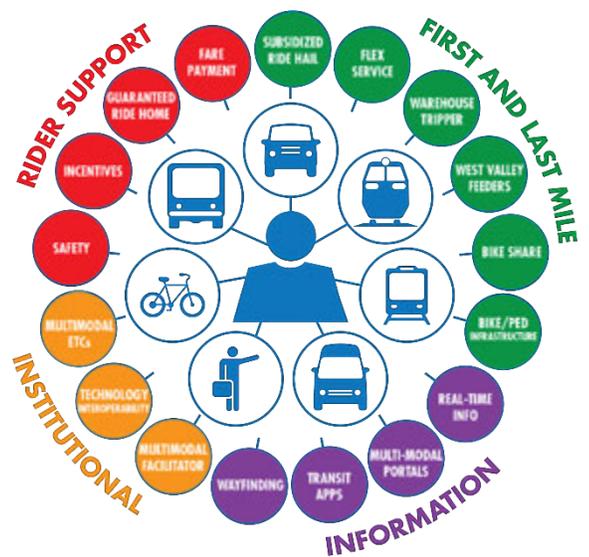
These strategies consider various institutional factors that are critical to building a successful multimodal environment, one that contributes to improved customer experiences. Three strategies are discussed.

Beyond the summaries presented in this ACTION PLAN, additional information can be found in this study's VOLUME 3: MULTIMODAL STRATEGIES.





# 1. Informational Strategies



# 1.1 PROMOTING EXISTING TRANSIT MULTIMODAL APPS TO THE GENERAL PUBLIC

## Problem

There are a variety of modes that commuters and other travelers can use to get around San Bernardino County. They vary 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. With **no easy way to compare the various modes at the moment that a trip is desired**, most travelers use the default mode — driving alone.

There are currently several, readily available apps that can aid the commuter in making informed decisions about the “best” mode for a trip. These include Google Maps, the GoLA app and the Transit app. However, in study focus groups, it was evident that these apps are not well-known or utilized by most San Bernardino Valley commuters. Even the ETCs charged with promoting alternate mode use at major employment sites are generally unaware of these existing trip-planning tools.

## Opportunity and Objective

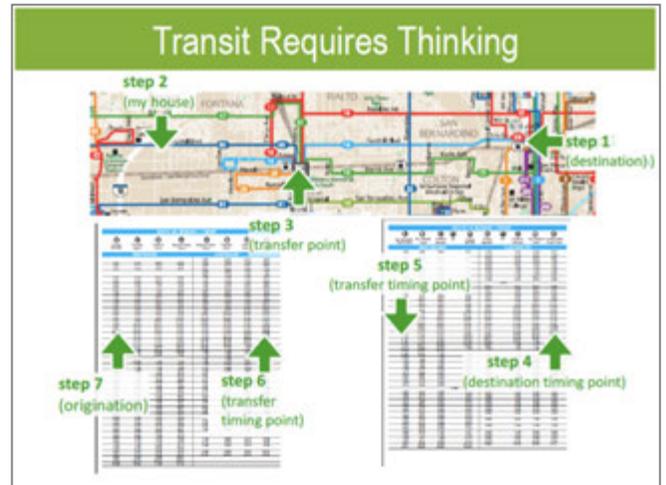
- ▶ This strategy’s objective is to promote multimodal information apps that already exist in order to encourage trial and occasional use of non-drive-alone modes — especially transit.

In order to get travelers to consider modes other than driving alone, it must be easy and fast to make informed, real-time decisions about the best mode for a specific trip on factors of travel time, cost and environmental impact.

Transit requires thinking and planning in a way that driving alone does not. Historically, planning a transit trip has been a difficult, multi-step process as shown in the graphic at the right. Technology can automate this process, making it simple to view options, compare trips and make an informed trip plan. Promoting these **already existing multimodal apps**, and making sure these apps have access to the accurate and complete data, is a critical step in attracting new transit users.

## Strategy Description

The transit agencies serving the San Bernardino Valley all currently publish General Transit Feed Specification (GTFS) schedule data. Some transit agencies publish GTFS-real-time data (e.g., arrival predictions, vehicle positions and service advisories). When available, this data is utilized by Google Maps and other apps to provide travelers with transit trip planning and information. This strategy encourages capitalizing on these existing **free, customer-focused tools**



## Target Markets

This strategy has potential to impact every individual who travels to, from or within San Bernardino County.

It is relevant to **commuters and non-commuters** alike. Employee Transportation Coordinators are a particular market.

by promoting their use by commuters to make mode decisions based on which mode is faster, costs less and/or is most environmentally friendly.



**Google Maps** — [www.googlemaps.com](http://www.googlemaps.com)

Google Maps — desktop and mobile versions — is already used by the majority of the population. 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.



**GoLA – Xerox** — <http://golaapp.com>

GoLA is a mobile app and web portal designed specifically for the Greater Los Angeles area. 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.



**Transit App** — <http://transitapp.com/region/los-angeles>

Unlike Google Maps and GoLA, the Transit App is primarily for those using alternate modes — transit, Transportation Network Companies (TNCs), biking or walking. 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.

## Implementation Topics

Study partners should actively encourage use of existing communication channels:

- **Employee Transportation Coordinators** — provide regular training and tools to promote the apps;
- **Transit Agency Websites** — highlight the fact that their route/schedule information is easily available through these multimodal apps. Transit agencies such as TriMet and LA Metro list third-party apps on their websites<sup>3</sup>; and
- **Transit Agency Advertising and Promotional Efforts** — promote ease of transit trip planning and convenience of real-time information through apps.

The primary change is not in the channels of communication **but in the orientation to a multimodal view**. Agencies must not only promote their individual services, but transit in general and, more broadly, **all alternate modes of travel**. Staff at every level must embrace a multimodal orientation, providing travelers with readily available information about **all** options. Points of access include: marketing department and public information staff, SBCTA’s carpool and vanpool coordinators, and IT staff at partner agencies.

### COSTS & FUNDING

#### **Cost Range:** Low

No additional costs, beyond what is already in place to develop and publish the GTFS data. All these apps are currently free to users.

#### **Funding and Grant Sources:**

The creation and publication of GTFS data is an ongoing budgeted item for Omnitrans and, through SBCTA, for the mountain/desert public transportation programs, with Mountain Transit and VVTA both traveling into the San Bernardino Valley.

<sup>3</sup> LA Metro “Mobile App & Resources”: <https://www.metro.net/riding/mobile-resources/>  
TriMet “App Center”: <https://trimet.org/apps/index.htm>

## 1.2 “MODERN APPS” REAL-TIME, CUSTOMER-FACING TECHNOLOGY

### Problem

Increasingly consumers rely upon smartphone apps to inform and organize every aspect of their lives. While it is true that not everyone has adopted or has access to a smartphone, the percentage who have is growing rapidly, including among transit users.

A profusion of apps has evolved to provide transit trip planning, real-time information and fare payment — all functions that consumers value highly. However, not all apps are created equal. Some are difficult to use. Some work only for a specific transit agency or provide only some of the information the customer needs to make informed travel decisions.

Study findings make it clear that most potential customers have limited awareness of what transit options exist or how to find them. In considering customer-facing technology to support and grow transit use, policy makers and transit agencies should focus on technology tools that are easy, reliable and inclusive.

### Objective and Opportunity

► This strategy’s objective is to introduce and expand the use of “**modern apps**” to make it easy for travelers to find and retain new users.

“Modern apps” are characterized by several qualities:

- Easy to use;
- Highly rated by consumers (at four points and above on five-point scales);
- Accurate, reliable information (depends on data supplied by agencies);
- Works across multiple regions and transit agencies; and
- Straightforward user screens.

A critical feature of a modern app in the transit arena is its **ability to work across modes and transit agencies**, facilitating trips that often involve multiple modes (e.g., driving to a park-and-ride to catch the train) and/or multiple transit providers (e.g., Omnitrans to Metrolink to Metro).

### Target Markets

**The consumer** who will organize trips through his or her smartphone and needs the latest tools to do so.

**Transit agencies** who can publish GTFIS data for schedules, with its companion GTFIS-real-time data to funnel information to useful apps, and then can utilize the back-end, “big data” components of these applications to improve their services.

### MOBILE PHONE USE AMONG TRANSIT RIDERS

From recent on-board surveys:

- Sacramento region (2014)  
59% have smartphones
- Eugene, OR (2016)  
69% have smartphones
- Ann Arbor, MI (2016)  
82% have smartphones
- Triangle Transit, N.C. (2016)  
90% have smartphones

### MODERN APPS

Engaging, interactive, can be rated by users, very reliable, used across multiple settings.

The Transit app, Token Transit, and RideAmigos are other examples of modern apps.

## Strategy Description

Google Maps, discussed in Strategy 1.1, is a prime example of a modern app. It can be used throughout the world to get accurate (within bounds) directions for driving, transit, walking, biking or ride hailing. This strategy's intent is for agencies within the San Bernardino region to embrace and support the development and implementation of additional modern apps that will meet the needs of consumers for immediate and inclusive transportation options. Some of these apps already exist; others will evolve over time. Following are two examples of modern apps that have been implemented in other U.S. regions:



The app *Transit* is one example of a real-time *modern app* that is user-focused and provides important back-end information to the transit agency. Already available for trip discovery for some agencies<sup>4</sup> in San Bernardino County, it is in place with additional features in more than 140 cities, including Los Angeles, New York, San Francisco, Chicago, Boston and smaller systems, such as Eastern Sierra Transit, Humboldt County and Lake Tahoe. This app **serves travelers** by providing real-time bus and train information and dynamic information about approaching transit. It **serves administrators** by providing trip search demand (A-to-B trip plans) and enables pushing messages out to users. Transit app's primary features include:

- Multimodal trip planner with public transit, TNC, carshare and bikeshare (where modes are available);
- Real-time arrival estimates (where data in supported formats is available);
- "GO" transit navigation feature that provides step-by-step directions to get on, get off and transfer during the transit journey; and
- Data capture for transit planning for historical and real-time analytics.



### TRANSIT SCREEN

*Transit Screen* is the second real-time application with a focus on multi-modalism. Where real-time transit information is included in published, open-source GTFS, the Transit Screen can be deployed on kiosks.

Both applications, Transit and Transit Screen, use standard GTFS real-time data and can be deployed rapidly. Like all customer-facing transit information applications, they depend on complete and accurate transit schedule and real-time information.

## Implementation Topics

- Actively promote the adoption of region-wide real-time information, using "modern app" technology.
- Ensure that all transit providers continue to publish and maintain their GTFS data, including any newly adopted GTFS data fields, for use by such apps.

### COSTS & FUNDING

#### Cost Range: Medium

Agency software fees vary by the size of the operator and the type of application. An estimate of \$100 per vehicle per year is useful for real-time information software, inclusive of wireless data fees.

#### Funding and Grant Sources:

Omnitrans already has a line-item budget for real-time information.

<sup>4</sup> <https://transitapp.com/region/los-angeles>

## 1.3 WAY-FINDING MESSAGES AND TOOLS

### Problem

Focus group participants in this study’s Market Research phase voiced apprehension at using alternate modes of transportation, including transit, due to unfamiliarity with the transit system and the local terrain to traverse to their destinations. Way-finding tools can help address apprehension about the “unknowns” of using public transportation for the first time, but are often not consistent or immediately evident (see Figure 10). The lack of clear, concise and graphical messages makes it difficult for first-time users at the physical locations at which they board or disembark trains and buses. Finding one’s way, particularly at busy, multimodal transit centers, can be daunting and confusing for new transit users.

### Opportunity and Objectives

- ▶ The objectives of this strategy are two-fold: 1) to use improved “way-finding” to ease use of public transportation for the first time; and
- 2) to open dialogue between multiple agencies towards designing and installing consistent way-finding tools that aid travelers.

As Omnitrans and Metrolink are the primary service providers for the San Bernardino Valley, this strategy focuses on improving way-finding messages for those agencies. An opportunity exists to improve the physical way-finding messages in multimodal transit facilities to aid the new users. Moreover, providing clear, concise and ideally consistent messages supports all users, ensuring they are well-informed and can move confidently towards their train or bus during busy times and when connections are tight.

Opening dialogue between SBCTA, Metrolink and Omnitrans, as well as with the local jurisdictions on whose property way-finding signage may be needed, can provide the opportunity to establish consistent, region-wide messaging standards that communicate multimodal connections. Its central aim is the development and installation of area orientation maps at multimodal transit centers. These maps will illustrate major destinations in the immediate area in relation to where travelers stand as they disembark trains and buses.

### Strategy Description

This strategy proposes a two-phased approach reliant upon agency coordination. Phase one involves SBCTA, Metrolink and Omnitrans forming a cooperative group responsible for developing policies and standards for communicating way-finding messages at multimodal transit centers. This coordinated effort ensures the creation of a unified set of regional standards that eliminate disjointed messaging at individual transit centers. A region-wide effort will aim for development and application of common messaging standards, included in Metrolink’s and Omnitrans’ relevant design standards.

Figure 10, Existing Way-finding Signage



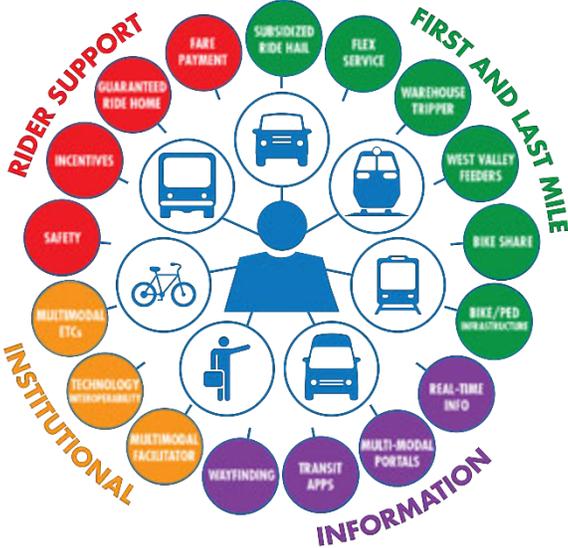
### USER EXPERIENCE

Field surveys indicate way-finding between bus and/or rail is nonexistent. While both Metrolink and Omnitrans communicate how to use their individual systems, 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.





## 2. First-and-Last Mile Strategies



## 2.1 WEST VALLEY CONNECTOR AND FEEDER SERVICE



### Problem

The West Valley Connector Corridor is a two-phase, 35-mile-long proposed bus rapid transit (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 and then proceeding north on Milliken Avenue to the Rancho Cucamonga Metrolink station. The second phase will extend along Foothill Boulevard to the Fontana Metrolink station.

The success of the West Valley Connector will rely heavily on high-quality routes feeding passengers to the corridor. Therefore, improving services in the West Valley is imperative to the success of the West Valley Connector.

### Objective and Opportunity

- ▶ The objective of this strategy is to create an easier-to-use transit network around the West Valley Connector to maximize the benefits of this significant transit investment, improving the frequency on key north-south routes.

The Market Research explored a number of transit strategies with San Bernardino Valley commuters. Of the strategies tested on both potential alternate mode users and current transit users, “bus routes on major travel corridors that run every 15 minutes” rated high compared to other choices. For those that use transit occasionally, 67% of the respondents favored this strategy. The enthusiastic response to this transit strategy in the study’s Market Research suggests that there is indeed a market of potential transit users, should higher frequency bus service exist.

Omnitrans’ West Valley service area is a unique combination of a grid-network and hub-and-spoke system with major transfer points throughout the area. With the implementation of the West Valley Connector Corridor, an opportunity exists to improve the frequency on north-south routes, thereby creating true feeder service to this new corridor. Improving service frequency can attract **potential transit users**, as well as improve the quality of service for current transit users, thereby keeping them as users and possibly increasing their transit usage.

The number of transfers onto the West Valley Connector is one measure by which to assess the success of this initiative. In addition, measuring changes in ridership on the individual routes with improved frequency also can help determine this north-south strategy’s success over time.

### Target markets

Omnitrans’ existing and potential **transit users**, specifically in the West Valley service area, including the cities of Upland, Ontario and Rancho Cucamonga.

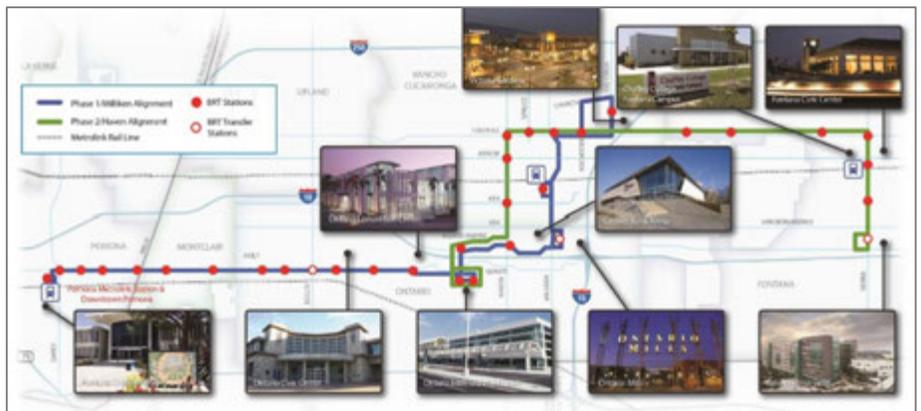
## Strategy Description

This study examined which north-south routes have the greatest potential as feeder service for the West Valley Corridor. Of the six possible north-south routes, two potential demonstration projects were identified.

- Improve frequency on Route 81 on Haven Avenue between Holt Boulevard and Chaffey College to 15-minutes during peak periods and 30-minutes midday.
- Improve frequency of service on Route 83 along Euclid Avenue to 30-minutes on weekdays.

Route 81 operates at 30- to 60-minute frequencies and provides direct service to Chaffey College. Improving this route to 15-minute service upon completion of the West Valley Connector (Figure 12) will enable passengers to transfer between the routes and provide better connectivity in this part of the service area. Improving Route 83 to 30-minute frequencies will enable Omnitrans to extend to the cities of Chino and Upland without significant costs and slowly grow ridership as the area in Chino's Agricultural Preserve continues to grow.

Figure 12, West Valley Connector Corridor Proposed Alignment, June 2017



## Implementation Topics

### Funding

Funding is the key to implementation for the West Valley Connector Feeder service. A preliminary estimate for the annual operating cost for implementing 15-minute service on Route 81 and 30-minute service on Route 83, the two north-south routes identified for improved connections to the West Valley Connector, would be between \$2 and \$2.5 million.

Capital costs for buses and stop enhancements are also necessary for service expansion. Omnitrans will need to determine what additional revenue vehicles must be purchased and update their Capital Plan in their Short Range Transit Plan accordingly.

Both Omnitrans and SBCTA are directed to work together to identify and pursue federal, state and local funds to implement the West Valley Connector Feeder service. Both agencies must also determine if such service improvements will be implemented as a pilot project or as a future service improvement included as part of Omnitrans' planning process. As the Market Research suggests, 15-minute service is highly desirable, especially for those that use public transit, making the case that these north-south corridors will improve network service.

### COSTS & FUNDING

**Cost Range:** High

**Operating Cost:**

\$2-2.5 million

**Funding Sources for Operations:**

Federal: Congestion Mitigation and Air Quality (CMAQ) Improvement Program

State: Low Carbon Transit Operations Program (LCTOP)

Capital Cost

To be determined by Omnitrans

**Funding Sources for Capital Improvements:**

Federal: FTA 5307, 5339, CMAQ

State: SB1, Transit and Intercity Rail Capital Program

## 2.2 SUBSIDIZED RIDE HAIL PILOT FOR ONTARIO AIRPORT-METROLINK TRIPS

### Problem

The Ontario International Airport (ONT), located in the west end of the San Bernardino Valley, is now operating under new, local 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.

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

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 to be paid to the OIAA and that is 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.

Figure 13, Omnitrans Route 61 Service - Fontana Metrolink to Ontario Airport



### HOW CAN TNC PROGRAMS HELP 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
- An economical solution for filling mobility gaps
- Fare integration for existing services
- Easier method of electronic payment
- Access to existing rideshare and carpool networks

### Objective and Opportunity

- ▶ This strategy's objective is to test rider demand for trips — faster trips — between Metrolink stations and the airport to inform Omnitrans about potential demand levels for dedicated airport shuttles to and from Metrolink stations.

In 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. (Figure 13). However, travel time between the Metrolink Fontana station and the airport is about 40 minutes by bus. A TNC ride is expected to be faster, about 25 minutes, assuming about a 5-minute wait for the vehicle.

### 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 four San Bernardino County Metrolink stations in Montclair, Upland, Ontario and Rancho Cucamonga. This pilot program provides a way to address some of the first-/last-mile barriers that travelers inclined to use Metrolink might encounter. SBCTA has set aside \$426,000 of funding through Board approval 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. A bid process and contracts with the service providers are anticipated for summer 2018, with program launch immediately following.

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. The pilot program will provide service as designed until the allotted funding has been expended.

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**

### ***Promote Institutional Coordination in the Planning Phase***

Develop coordination between the project partners to survey existing ridership and potential riders at the program's locations during the design phase. This is critical to determining the program's effectiveness. Program data from the TNC and taxi providers could be coupled with user or intercept surveying to identify program elements that are most appealing and understand what alternate modes, fares or configurations might also be acceptable.

### ***Address Fare Payment Barriers***

A critical element of the programs' early success will be to establish workable payment solutions. Metrolink now allows for fare purchase through its mobile application. Omnitrans' fares can be purchased electronically on its website and by phone through its partnership with Transit Token.

The success of this program's subsidized ride hail fares will require development and execution of agreements with TNC companies, potentially including taxi companies, to validate given trip origin-destination pairs and apply the subsidy on a trip-by-trip basis. This has been done using geo-fencing technology in other Uber and Lyft settings. An alternative solution is to institute

## **Target markets**

Groups impacted include: **Airline travelers** wishing to avoid ONT parking costs that recently increased; **Metrolink users** traveling to or from ONT. Target markets also include those **groups that are more likely to use ride hailing services**, such as: women: (23% to 20%) more likely than men to use these services; persons aged 18 to 29; persons with higher education (college or graduate degree); and individuals with higher incomes.

## IMPLEMENTATION CHALLENGES

- TNC's ability to comply with the flow-down regulations
- Policies of the federal, state and local entities that regulate the public transit industry
- 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
- Difficulty of program access due to lack of technology devices or being unbanked
- Driver background checks in terms of third-party name-only searches as opposed to fingerprint searches
- Securing timely rider origin and destination information from TNCs
- Success will require a robust marketing program

a promotional code used by the passenger on a TNC trip that will trigger the trip subsidy through their respective mobile applications for particular, eligible trips.

Riders on a return trip from the airport who may purchase their Metrolink or Omnitrans fare with cash will lack fare media to present to the driver, so this leg of the trip might be best coordinated by using a form of 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 also allow trips to be excluded that do not begin or end at one of the program locations.

### ***Address Physical Accessibility***

Ensuring the accessibility of this service for persons with disabilities will be important to maintain Americans with Disabilities Act (ADA) compliance. This has proven difficult in some settings as the clear majority of TNC, privately owned vehicles are not accessible to persons in wheelchairs or other mobility devices. Effective arrangements with local taxi companies and/or with Omnitrans' own Access program will be necessary, establishing comparable response times for passengers requiring accessible service. Microtransit programs similar to, and in conjunction with, this pilot could be developed, in partnership with demand-response technology providers, such as Via and TransLoc, using agency-owned vehicles and operators if trip volumes grow.

### ***Marketing First-and-Last Mile Solutions***

Developing an effective marketing campaign to present the service to the public is critical to the program's successful implementation. Otherwise, it risks becoming lost in the "sea" of information that confronts travelers. Components of a first-and-last mile marketing campaign are highlighted in Strategy 2.3, On-Demand, Flex Service Pilot for Downtown San Bernardino. Marketing approaches are further detailed in this study's VOLUME 3: STRATEGIES. Broadly promoting the service to increase its visibility and inform riders and potential riders of how to connect with these new services will contribute to a successful pilot.

### ***Testing Fixed-Schedule First-and-Last Mile Solution***

Information from this pilot could lead Omnitrans to establish express service from the Metrolink stations with improved travel times on Route 61 by use of limited stops between the Metrolink station and the airport.

# 2.3 ON-DEMAND, FLEX SERVICE PILOT FOR DOWNTOWN SAN BERNARDINO

## Problem

Addressing the first-and-last mile trip is key to attracting users to the high-quality, regional transit that serves longer commute trips between home and work.

Downtown San Bernardino is potentially an ideal setting for testing the technology-based, first-and-last mile solutions that are popping up around the country, termed “MicroTransit” in neighboring Los Angeles County. The downtown area is the major employment center of the San Bernardino Valley. American Community Survey 2010-2014, 5-Year estimates identified more than 28,000 commuters travel into the downtown San Bernardino area for work.

In response, both Omnitrans and SBCTA have invested heavily in the transit infrastructure to provide quality public transportation service to downtown. Yet with significant investment, including 16 bus routes serving the downtown area, transit use remains stagnant and single-occupant vehicles remain as the primary commute mode. Transit use by commuters is low at 1.9% of commuters among the San Bernardino Valley overall and only 0.8% transit use by surveyed employee commuters, the majority of whom worked downtown.

Employees interviewed during the study’s Market Research phase fell into three groups: 1) those adamant that they could see no scenario that would get them out of their cars; 2) those who saw some potential, or some circumstances, where they would consider using shared-use transportation to commute; and 3) those who were already using rail and transit and were extremely comfortable doing so. With Metrolink serving downtown along with Omnitrans sbX rapid transit and additional rail service on the horizon, increasing the number of “potentials,” to grow transit use in the downtown area, is critically important.

## Objective and Opportunity

- ▶ This strategy’s objective is to attract new and potential transit users by providing a flexible, on-demand solution with a smartphone app component, for service directly between the San Bernardino Transit Center (SBTC) and downtown work sites.

Elsewhere called MicroTransit, benefits and defining characteristics include:

1. *Removing the need for scheduled, timed-transfer connections between commuter rail/bus and local fixed routes;*
2. *Providing direct service to major employment centers;*
3. *Waiting for the trains, oriented to Metrolink train arrivals; and*
4. *Shortening travel time, compared to existing Omnitrans bus lines.*



## Target Markets

**Commuters** who see some “potential” in using transit and would consider using bus and rail to commute to Downtown San Bernardino for some trips, at some times.

**ABOUT THE POTENTIAL USERS**

The study's Market Research uncovered that drive-alone commuters would consider an alternate mode "if there were easier connections from transit to my work site"; 15% of those surveyed report considering using transit if easy connections exist. Furthermore, 45% of employees and 71% of students surveyed were identified as "potential" users of alternate mode transportation, including transit, under a variety of circumstances.

Analysis of existing Omnitrans downtown ridership suggests that 20% of all alightings during the weekday occur during the morning peak (6:00 a.m. to 8:59 a.m.). Moreover, 20% of all boardings occur during the p.m. peak (3:00 p.m. to 5:59 p.m.) around the downtown area. This suggests that these are downtown origin/destination trips and not necessarily transfer trips at SBTC. This analysis omitted stops at SBTC for the purpose of excluding transfer activity. While it is difficult to determine if these peak period trips are solely work-related trips, it is reasonable to believe that some are potential work commute trips. In fact, according to Omnitrans' recent Fixed-Route Onboard study, work commute trips rank second as the primary trip purpose.

As part of this strategy, the study team examined the number of workers at major employment destinations in the downtown area. The team found that **attracting at least 1% of workers at major employment centers could yield more than 400 to 500 passengers per weekday**, depending on the service configuration.

With Metrolink now stopping in downtown San Bernardino, a new opportunity exists to provide enhanced first-and-last mile connections with the proposed flex service. **The ability of this flex service to wait for trains**, until precisely the time that trains and/or buses arrive, as well as to **take them directly to their work locations** are both features critical to attracting new users. 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 unlike with traditional fixed-route service in which buses waiting for a train can impact passengers waiting for a bus downstream.

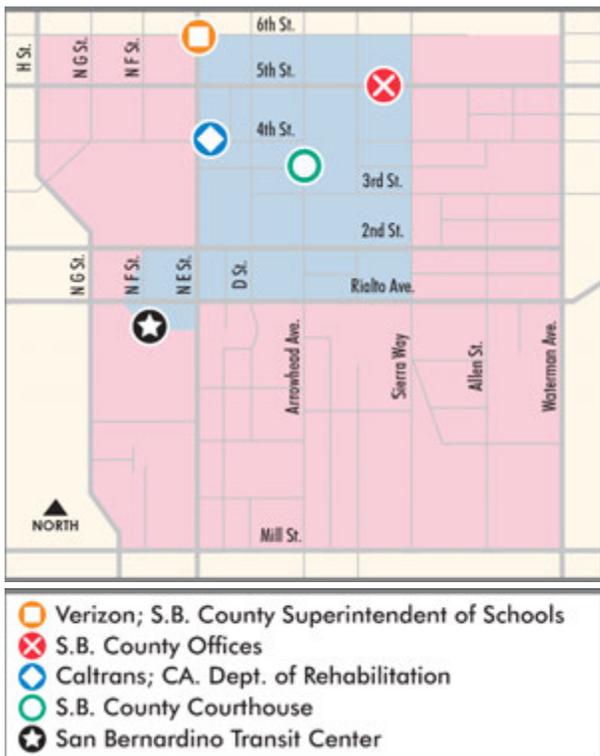
**Strategy Description**

This strategy provides an initial concept that **transports people between SBTC directly to their work sites in downtown**, within an area as small as 0.4-square miles to as large as 1.5-square miles. Three distinct service scenarios are described in the strategy's operating plan.

Two scenarios are zone-based — a 0.4-square-mile Blue Zone or 1.5-square mile Red Zone (Figures 14, 15 and Table 3). Vehicles will transport passengers directly between the SBTC and their employment locations in areas of high demand. In Scenario 3, as service grows, it can incorporate elements of a flex route with semi-scheduled time points, or service may simply continue as the zone approach scenario. In each scenario, **waiting for the trains and running service during periods when trains are operating** are key design features.

Depending on the potential service configuration, between two and three vehicles are required to operate during peak

Figure 14, Downtown San Bernardino On-Demand Service Area



periods and between one and two during non-peak periods. Service is proposed to operate during the same periods as Omnitrans fixed-route and Metrolink service to accommodate individuals working in the early morning or late evening.

The strategy includes a minimum passenger trip per vehicle service hour goal to estimate the annual ridership. The goal was established using passenger trip goals and productivity figures for flex services across the nation and varies by the different service scenarios. For example, Denver’s Regional Transit District (RTD) call-and-ride goal is 3.5 passengers per revenue hour. Currently, AC Transit’s Flex Service averages three passengers per service hour during the entire day. Most use the service during peak periods in which the Flex service averages seven passengers per peak hour. Providing a passenger trip per vehicle service hour goal for this strategy will allow Omnitrans to evaluate and assess the potential of a flex service pilot program implemented for downtown San Bernardino.

It is important to note that the Flex Service will not supplant existing fixed-route service. Instead, the Flex Service will provide a first-/last-mile solution that specifically targets “potential” transit users — a new market — by providing a direct point-to-point service between work locations and SBTC, as illustrated in Figure 14.

The three scenarios proposed use individual trip per hour goals due to the varying size and expectations of each service. The on-demand flex service for both the Blue and Red zones includes a higher minimum trip per hour goal similar to the RTD experience while the Flex Route service’s minimum trip per hour goal is lower due to its similarities to traditional fixed-route service, and possible overlap with existing Omnitrans fixed-route services.

Central to this strategy is the technology that enables customers to book a trip. The flex services envisioned are based on **fully automated vehicle scheduling and routing technologies** and do not require human schedulers or dispatchers. Riders who arrive at the SBTC can “walk on,” or can book a trip through their

**Table 3, On-Demand, Flex Service for Downtown — Three Scenarios**

Potential Service	Blue Zone	Red Zone	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
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	7:30 - 10:00; 16:00- 18:00 (4.5 hours)		
Offpeak Coverage	5:00- 7:30; 10:00-16:00, 18:00-20:00 (10.5 hours)		
Number of Vehicles Peak	2	3	2
Number of Vehicles Off-Peak	1	2	1
Vehicle Service Hours per weekday	19.5	34.5	19.5
Minimum Passenger Trip per VSH goal	3.5	4.5	3.0
Estimated Annual Ridership	17,063	38,813	14,625

phone app. Alternatively, a telephone dispatch capability can be developed through Omnitrans' Access call center for those still desiring a telephone reservationist. Fare payment can be integrated into Omnitrans' Token Transit arrangements.

This strategy **proposes electric vehicles** as part of its service design, anticipating

Figure 15, Transit in Flex Service Area



several benefits and opportunities, including the fact that electric buses are now locally manufactured within the San Bernardino Valley. Use of electric vehicles — in this relatively circumscribed area — enables Omnitrans and SBCTA to leverage new and existing discretionary funds, thereby removing the need to depend on traditional formula funds to pay for this demonstration project. This provides a unique geographic laboratory, relatively small in size, to test electric vehicle use and unpack the operational considerations they present. Moreover, a different vehicle type can have a distinct Omnitrans' brand outside of the traditional family of service.

### Implementation Topics

A successful on-demand, flexible service pilot will depend upon effective finalizing of the operations plan, procurement of

technology and capital equipment, as well as securing buy-in from local businesses and major employers, all coupled with a strong marketing effort.

### Finalize Operating Plan to Initiate and Later Evaluate the Pilot

Three service scenarios analyzed for this strategy are examined in some detail in this study's VOLUME 3: MULTIMODAL STRATEGIES, which proposes to commence with a zone-based service and possibly evolve to a flex service with some scheduled timepoints. This initial service plan will need finalizing of operational decisions of service area, key pick-up locations and vehicle types. Fare decisions, including whether or not there is a fare, will need to be made. Performance goals, proposed to assess outcomes, are also to be finalized. Omnitrans may use its extensive in-house expertise from its Access on-demand services department in refining the plan and potentially in operations.

### Secure Technology for On-Demand Scheduling, App-Based Platform

Scheduling technology by which to receive and schedule trips — and the related capabilities — in a customer smartphone app must be obtained. Omnitrans will need to determine whether a procurement is required for this pilot or whether existing software, such as is in place in Oakland, CA, Denver, CO, and Nashville, TN, can be adapted to and utilized for this downtown San Bernardino pilot.

### **Seek Out Partnerships**

It is strongly recommended that major employers in the downtown area be consulted during the pilot operations' planning phase, to inform them, secure their engagement and generate enthusiasm for the new service promotion. Omnitrans should seek out partnerships with the city and county entities, as many public employees will benefit. Partnerships with local jurisdictions may support new funding opportunities through the Mobile Source Air Pollution Reduction Review Committee (MSRC). Other discretionary funding programs, which require working with funding agencies, include the FTA's Low or No-Emission Bus Program and the State of California's Transit and Intercity Rail Capital and Operations Program.

### **Market This First-and-Last Mile Strategy**

Communicating to commuters about this new service and how it works is critical if this pilot is to be successful. Commuters must perceive that the service is 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 to the success of the new service.

Introductory marketing program elements must address all channels of communication: branding, signage and way-finding, passenger information and education, marketing through downtown employers, and cooperative marketing with Metrolink and social media.

Among these avenues of communication, branding this new service is marketing at its most basic. With the wide variety of transit vehicles operating in and around downtown San Bernardino — Omnitrans, sbX, Mountain Transit, Victor Valley Transit, Pass Transit and Riverside Transit — **the new flexible, on-demand transit service will enter this mix and can easily become invisible.**

The branding of the on-demand, flex service must accomplish three objectives:

1. *Clearly distinguish this service from the myriad of existing transit services;*
2. *Distantly communicate the service purpose — a faster connection between Metrolink/SBTC and employment locations within the downtown; and*
3. *Present an attractive, user-friendly image appealing to downtown employees.*

Brand elements will include a name or logo, slogan or tagline, vehicle color and graphics. Finalizing way-finding signage, developing effective passenger information, marketing to downtown employers and creating cooperative marketing with Metrolink, including effective use of social media and targeted marketing, are all critically important to incorporate into this on-demand pilot.

### **BRANDING THIS FLEXIBLE, ON-DEMAND SERVICE**

The brand should help customers identify this service and everything associated with it. The name should clearly communicate the connection between Metrolink and the workplace, so example names could be LINK<sup>2</sup> LINK\*2 or SB LINK with tag lines of "Your on-demand LINK to Metrolink" or "A Quick Link to Metrolink," modifying to incorporate Arrow service when it commences.

### **COSTS & FUNDING**

**Cost Range:** Medium

**Capital Cost:**

\$287,000 – \$410,000

Includes three 16-seat revenue electric vehicles (including spare) and charging station

**Annual Operating Cost:**

\$301,000 (does not include maintenance of electric vehicle) A proportional marketing budget of \$20,000 for new service startup includes website, some way-finding signage and branding.

**Funding and Grant Sources:**

Federal: FTA Low or No-Emission Bus Program

State: Low Carbon Transit Operations Program; Transit and Intercity Rail Capital and Operations Program; Air Research Board Grant Programs; Energy Commission Grant Programs

## 2.4 WAREHOUSE TRIPPER PILOTS

### Target Markets

**Employees** working at large, multi-acre complexes for large employers, such as Amazon, Stater Bros. Supermarkets and others.

### Problem

Within the Greater San Bernardino Valley there has been a proliferation of large-scale, distribution facilities that are difficult to serve by traditional public transit. Amazon distribution locations, now in two areas of San Bernardino and providing for several thousand jobs, are among these substantial warehouse and distribution centers set on large, multi-acre lots that are neither pedestrian nor transit friendly. Bus stops in the vicinity are often at considerable distances from where employees enter or leave the building, making transit very undesirable. Tripper service solutions, where the bus deviates from the standard route to come closer to where employees enter and leave the work site, hold potential to address distances that discourage transit use.

During the period of this study process, Omnitrans with the Amazon ONT2 Center successfully initiated new tripper service as a pilot program to test response and rider interest (Figure 16). As of February 2018, the tripper service is averaging 40 passenger trips per day. Presently, both Omnitrans and Amazon are exploring funding to sustain this service. Similar partnerships with warehouse or distribution center pickups are likely to exist.

### Objective and Opportunity

- ▶ The objective of this strategy is to extend this distribution center tripper service model to more warehouse locations, generating additional ridership on the transit network within the Valley.

The San Bernardino Valley functions as an inland port with distribution centers and warehouses built throughout the area. While such land uses tend to be in low-density employment areas, growing transit use at other similar work sites through tripper services holds promise. Broadly speaking, **tripper service, which is provided only during peak travel periods**, represents a highly efficient and top-rated market strategy: low-cost, on-demand services from bus stops to work sites.

Opportunities exist to develop fixed-route tripper service to major employment centers that transport employees closer to their place of employment. During the study period, Omnitrans initiated its tripper service to the Amazon Fulfillment Center in San Bernardino. Beginning in fall 2017, tripper service from Omnitrans Route 8 traveled to this Amazon facility four times a day with two early morning and two evening trips to accommodate shift times.

Amazon is considering developing additional fulfillment centers throughout the region. In addition, there are other major employers, such as Stater Bros. Supermarkets, with corporate offices and distribution centers located in the San Bernardino Valley, with similar facility and plant design limiting transit access. Working with such major employers who rely upon large

Figure 16, Omnitrans Amazon Tripper Service Flyer



physical facilities that are difficult for traditional transit to serve can lead to additional, peak period tripper service opportunities.

### Strategy Description

This strategy builds upon the tripper service to the Amazon Fulfillment Center in San Bernardino implemented in September 2017. Figure 17 illustrates the current tripper service on Route 8, denoted in red. These trips accommodate shift changes at the facility. Early ridership has exceeded expectations. The success of this strategy is due to coordinated efforts between Amazon and Omnitrans.

Expansion of this strategy to other settings will rely upon coordination between major employers and Omnitrans. Moreover, additional coordination between local jurisdictions and Omnitrans may help identify other opportunities for tripper service into major public agency employment centers.

### Implementation Topics

#### Identify Additional Locations and Coordinate

Coordination between major employers and Omnitrans is imperative to success. Additional large employers should be identified, potentially for those distribution centers that ramp up employees during the extended winter holiday shopping season. Omnitrans must take proactive steps to work with local jurisdictions and other major employers to open further opportunities.

#### Develop Funding Partners

Establish financial participation guidelines, to identify appropriate levels of financial participation of employers or groups of employees. For Northern California peninsula Caltrans shuttles, these levels have changed over time, but employer financial participation is typically 25% of the cost. To get employers to try the feasibility, the policy might have to be 100% public subsidy the first year, as has been with the Amazon tripper, and then 25% thereafter. Regardless, a clear action item is to develop a financial participation policy.

With the Route 8 tripper service adding 40 passenger trips per day on the route, it currently meets or exceeds Omnitrans' performance standards. This is the reason why both Amazon and Omnitrans are exploring mutual funding opportunities by which to continue the service.

#### Promote the Service

Equally important is marketing and outreach to introduce the new service. Staff-attended employee gatherings to explain the tripper service and educate them on the connections it makes possible to the broader network.

Figure 17, Amazon Fulfillment Center Tripper



#### COSTS & FUNDING

**Cost Range:** Low

**Operating Cost:** Where trippers are adjacent to existing bus lines, costs will be \$90 per revenue service hour for about 4 hours per day when the trippers are running, from \$92 for weekdays only or about \$130 for weekdays plus weekend service.

#### Funding and Grant Sources:

- Federal: Congestion Mitigation and Air Quality (CMAQ) Improvement Program
- State: Low Carbon Transit Operations Program (LCTOP)
- TDA Local Transit Funds
- Existing operating revenue
- Special dedicated grant funding from SB 1 for multiple sites

## 2.5 BIKESHARE-BUS PILOT PROGRAM

### Problem

Trip distances are too long for bicycling in the San Bernardino region to realistically replace driving for many trips. At the same time, low-density land uses and the sprawling nature of San Bernardino County mean that relatively few people can easily walk to and from transit stops.

Strategies that connect bicycling and transit and increase bike trips 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 where Omnitrans Routes 19 and 8 operate.

### Objective and Opportunity

- ▶ This pilot’s objective is to test the corridor with the greatest potential for a successful bikeshare program, a corridor with good quality transit service and strong trip generators at either end.

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 on existing routes, and new investments in transit options are being made. The area offers a balance of residential density with significant major employers or activity centers, 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. Additionally, there is strong local interest in increasing bicycling opportunities.

A successfully designed bikeshare program provides an opportunity to leverage existing assets of trail systems, transit hubs and complete streets investments; to improve mobility through growing bicycle and transit ridership, encourage mode shift; to increase exposure to transit; and to further regional transportation goals of reduced traffic congestion, reduced need/demand for parking and reduced Vehicle Miles Traveled (VMT) and greenhouse gas emissions.

### Strategy Description

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.” It is part of a larger shared-use mobility trend (e.g., carshare, rideshare and similar programs) that is possible as a result of technological advancements and the prevalence of smartphone use, specifically for real-time transportation information and for payment transactions.

Part of this rapidly evolving trend, the provision of bikeshare continues to evolve, but includes one or more of the following features:



### Target Markets

Employees at Loma Linda University Medical Center and ESRI were identified as the primary market for a bike + bus program. These users are anticipated to be early adopters and advocates. Additional target markets include:

#### **Existing transit users:**

Attracted through increased availability of bicycles and prioritizing first-/last-mile presence for bikeshare.

**New transit users:** Attracted 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:** Attracted through increased convenience of shared bicycles and prioritizing local centers of activity and destinations for bikeshare presence.

**New bicyclists:** Attracted through increased availability of bicycles and bikeshare’s accessibility for “interested but concerned” bicyclists that comprise an estimated 60% of community members.

- 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) (Figures 18 and 19);
- 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 (“app”) integration with other mobility apps; and
- Pilot applications or demonstration projects of small or experimental systems.

Figure 19, Dockless Bikeshare



Figure 19, Bikeshare with Docking Station



### Implementation Topics

Based on stakeholder input, the following framework, or “package” of considerations, is suggested for implementing a bikeshare program.

#### **Lead by Major Employers**

Private funding could come in the form of a local major partner, such as major employers in the corridor, signing on as a title sponsor to support capital costs and any subsidies of operations required.

#### **Coordinate with a Bike Facility Investment**

For bikeshare to be successful, bicyclists 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.

#### **Promote by Local Partners**

It will be critical to develop an outreach and promotional component. Partners, such as the Inland Empire Bike Alliance, can generate awareness of the pilot program and its purpose and promote usage.

#### COSTS & FUNDING

**Cost Range:** Medium to High

**Capital Cost:** \$15,000 to \$100,000. On-street bike facilities cost \$15,000 per mile to implement (including design and striping/signing plan before installation).

**Funding and Grant Sources:**

Grant programs that support Active Transportation include:  
 SCAG’s Go Human Campaign  
 SBCTA Article 3 Program  
 Caltrans Active Transportation Program

## 2.6 BIKE/PEDESTRIAN INFRASTRUCTURE

### INJURIES AND FATALITIES AT 64 SB COUNTY MAJOR TRANSIT FACILITIES NODES BETWEEN 2013 AND 2015

Within ½ Mile of Facility:

- Total Injuries: 361
- Total Fatalities: 26

Within 3 Miles of Facility:

- Total Injuries: 12,425
- Total Fatalities: 449

### EXISTING INFRASTRUCTURE

As of April 2018, there are 415 miles of existing bike lanes and 955 miles of planned bike lanes in the San Bernardino Valley. However, the bicycle network is more developed in the West Valley versus the East Valley, with more bike lane miles overall and more Class I bike lanes (Figure 20).

### Problem

A critical need exists to bolster bicycle network safety, accessibility and connectivity in conjunction with the launch of a pilot bikeshare program. Injuries and fatalities of pedestrians at or near transit facilities across the San Bernardino Valley are significant. Within the Loma Linda and Redlands Corridors, identified for a bikeshare program, there are road segments that have not benefitted from infrastructure investment that will translate to increased safety. And within the San Bernardino Valley overall, completing streets for safe pedestrian use and installing safe, accessible bike facilities remains a work-in-progress.

Successful bikeshare is also contingent on safe pedestrian access to available bikes. Sidewalks and crosswalks support the “walk-up” traffic needed in a bikeshare service area. One solution is to couple temporary bicycle and pedestrian investments with the launch of the bikeshare pilot program as a means of better leveraging both programs. Each will improve the success of the other.

### Objective and Opportunity

- ▶ This strategy’s objective is to ensure continued attention to street safety by ensuring high priority to street and sidewalk improvements that support the safety and accessibility of the bicycle network and pedestrians, with a focus on multimodal nodes and furthering Vision Zero goals.

Vision Zero is a multinational road traffic safety project that aims to achieve a highway system with no fatalities or serious injuries involving road traffic.

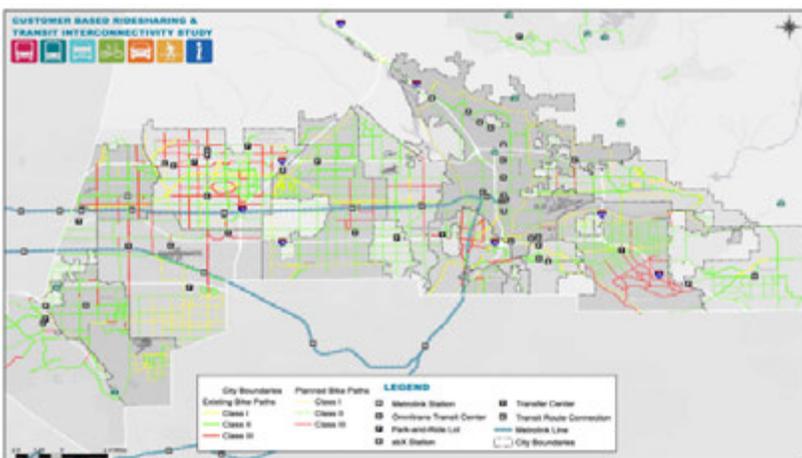
While the Loma Linda and Redlands Corridors are challenged with high-speed and multi-lane roadways that are barriers to bicycling and walking, the corridors also benefit from wide rights-of-way, hubs of activity and an existing transit network. In some cases, space within an existing curb-to-curb width can be cost-effectively reclaimed for bicycling and pedestrian access. Hubs of activity

and existing transit stops provide opportunities to align temporary investments with high potential demand areas for active transportation and with preferred routes for first-/last-mile access.

### Target Markets

The primary markets are **existing transit users, new transit users and likely users of a new pilot bikeshare program**. Every transit user engages in bicycling or walking in accessing transit. Temporary infrastructure investments will improve that

Figure 20, Map of Existing and Planned Bike Paths



access along a key route (or routes). The increased safety, visibility and awareness will increase exposure to transit and active transportation, attracting new and non-traditional users. Additionally, by connecting temporary investments with the bikeshare stations, this reinforces the use of bikeshare as a transit connector, a local choice.

### Strategy Description

This recommendation 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 ideas. Demonstration projects showcase re-designed 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.

One example of a demonstration bike facility (Figure 21) is installing 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.

A demonstration pedestrian facility could include temporary curb bulb-outs (Figure 22) at an intersection to shorten crossing distances, slow vehicle turning speeds and create space for landscaping through the use of paint, traffic cones and potted plants.

### Implementation Topics

#### ***Design for Comfort and Safety***

Installations instituted by the local jurisdictions can improve safety through implementation of evidence-based countermeasures. These countermeasures can include modest-to-significant roadway improvements that increase drivers’ awareness of pedestrians and cyclists, reduce fatal and injury crashes, and increase pedestrian and bicyclist comfort and safety perceptions.

#### ***Identify Relevant Demonstration Sites***

Specific streets and intersections chosen for temporary installations should directly relate to the pilot bikeshare station locations and improved access to transit along the Loma Linda and Redlands Corridors. These sites are aligned with key destinations and reflect areas of latent active transportation demand.

#### ***Evaluation Strategy***

Clearly defined performance measures and an evaluation strategy should be established prior to implementing the demonstration project. Metrics could include pre- and post-counts of bicyclists and pedestrians and transit ridership data. Quantifiable data should be coupled with qualitative input through community feedback. Input is often gathered through intercept surveys, comment forms and public chalkboards (for concise, anonymous feedback).

Figure 21, Example of a Demonstration Bike Facility



Figure 22, Example of a Temporary Curb Bulb-Out



#### **COSTS & FUNDING**

**Cost Range:** Medium to High

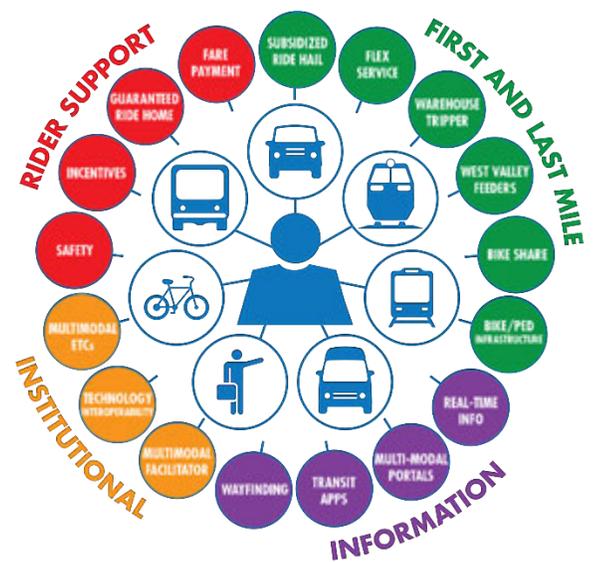
**Capital Cost:** Improvement projects can range from \$200,000 to \$1,000,000 +

**Funding and Grant Sources:**

Grant programs that support Active Transportation include:  
SCAG’s Go Human Campaign  
SBCTA Article 3 Program  
Caltrans Active Transportation Program



### 3. Rider Support Strategies



## 3.1 ELECTRONIC FARE PAYMENT

### Problem

An ever-increasing majority of persons use their smartphones to guide them through any number of daily activities. Multimodal transportation tools available are numerous, and transit operators, regional agencies and local jurisdictions must embrace and promote these — and their functionality — to capture new riders and support existing riders. This strategy recognizes that it is absolutely critical to implement and promote customer-facing electronic fare payment tools that help to make a transit trip easier.

Omnitrans has adopted and implemented such technology but it hasn't yet been fully embraced by the five transit operators in the region who transport passengers in or out of the San Bernardino Valley. Challenges in coordinating with Metrolink fare payment technology, on behalf of passengers, remain. Promoting these to the public should become an ongoing effort.

### Objectives and Opportunity

- ▶ This strategy's objective is to promote the use of electronic fare payment apps, particularly Token Transit adopted by Omnitrans, to other regional transit providers, while continuing to monitor fare payment coordination between the bus operators in the region and Metrolink and ensuring that public promotion (Strategy 1.1) continues as well.

A customer-facing fare payment app is one that enables smartphone purchase of bus passes for one-time and multi-trip passes and provides “point of sale” information that will make transit “easy” for users. User-focused design makes electronic fare payment systems and apps approachable even to the non-tech-savvy. Exemplary, modern apps provide straightforward user screens that readily engage and communicate. On the back end, various transactional activities are enabled, data is maintained and made accessible to the consumer at the micro-level and more summarized macro-level information provided to the agency client.

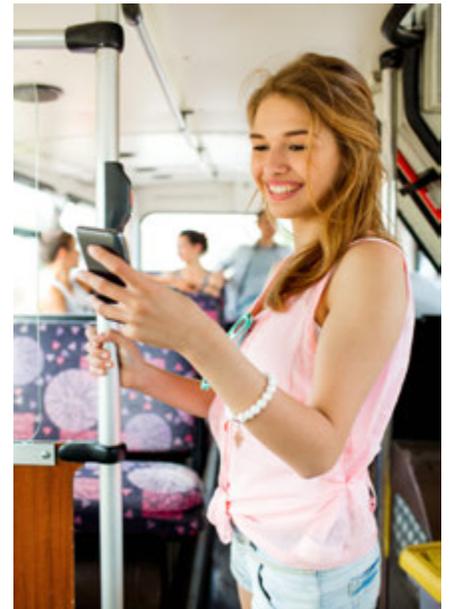
### Target Markets

**The consumer** who will organize trips through his or her smartphone and needs the latest tools to do so.

**Transit agencies:** Powerful information becomes available to planning and operations departments through the “big” data that these apps make accessible. For example, the Transit Token app includes the opportunity for administrators to enroll — and track — groups of persons.

### Strategy Description: Token Transit

During the period of this study, Omnitrans adopted use of Token Transit to provide its riders with a mobile app to purchase a bus pass or bus ticket, in

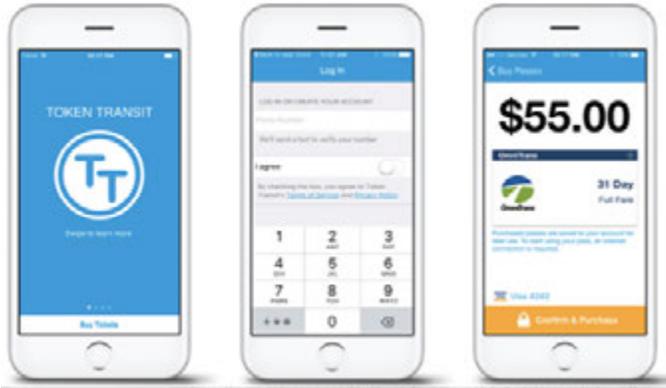


#### TOKEN TRANSIT IN ACTION

Omnitrans launched Token Transit as an accepted fare payment in September 2017. In the first three months since implementation, Token Transit adoption has grown steadily each week and is currently in use in about 5.5% of all Omnitrans boardings.

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.

Figure 23, Token Transit Screens for Omnitrans Fare Payment



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,**” (Figure 23) a mechanism that is akin to the physical pass outlets that transit agencies such as Omnitrans have historically utilized but exists in the digital sphere.

In this mobile digital fare outlet, there are no initial capital, software or ongoing licensing costs. Costs of the mobile digital fare outlet are included in the sales commission on each digital fare transacted. For example, per Omnitrans’ agreement with Token Transit, Token Transit will receive 10% of each transit pass. The gross cost of the fares remains the total collected fare for calculating fare box recovery.

### Implementation Topics

#### **Promote Omnitrans’ Token Transit Success to Area Transit Providers**

Omnitrans addressed two significant challenges through adoption of Token Transit that should be communicated to its regional transit partners:

First, they found a procurement solution — the mobile digital fare outlet — that enabled them to move forward expeditiously with a highly rated, modern app and to avail themselves of a platform that will be continuously upgraded, updated without additional investment by Omnitrans, other than the agreed-upon commission from each fare transaction.

Secondly, this fare media appears to be popular with riders young and old and may be contributing to increasing ridership. These messages should be “packaged” and conveyed to regional transit partners, including Mountain Transit, Riverside Transit Agency and Pass Transit. Foothill Transit is on the TAP system but conceivably could develop some sort of partnership with Token Transit for San Bernardino Valley travelers. Victor Valley Transit Agency is developing its own electronic fare payment mechanisms.

#### **Monitor Metrolink’s Fare Payment App**

The opportunities for coordination on behalf of the rider may yet develop, given the fast pace with which technology changes. While the Metrolink app has been successful with riders, there may be back-end opportunities to coordinate with Token Transit. Any and all efforts to coordinate seamless fare payment will benefit riders and make it easier to travel between modes and across jurisdictional boundaries.

#### **COSTS & FUNDING**

##### **Cost Range: Low**

Token Transit derives 10% from each fare transaction, functioning as an “outlet.” This is a low-cost, no capital, no start-up approach of Software-as-a-Service.

##### **Funding and Grant Sources:**

Rider fares, a 10% portion of existing fares with the fare structure not changing and this expense not impacting farebox recovery.

## 3.2 RIDESHARE ENGAGEMENT AND INCENTIVE PLATFORMS

### Problem

While carpooling and vanpooling with volunteer drivers have the largest mode share in the journey-to-work among San Bernardino Valley shared-ride modes (14%, according to the 2010 ACS 5-Year Estimates), the existing IE Commuter ridematching platform is not working effectively to encourage, incentivize or facilitate easy ridesharing or use of other alternate modes, as reported in stakeholder interviews.

Limitations of the IE Platform include:

1. *Does not have a mobile interface, although working on mobile responsiveness.*
2. *Does not support multimodal comparisons in the “trip discovery” phase. Commuters expressed interest in easily exploring and comparing a range of commute modes.*
3. *Does not currently include challenges, incentives, prizes and “gamification” opportunities.*
4. *Focuses on assisting large employers to comply with SCAQMD’s Rule 2202; it neglects other aspects of encouraging alternate mode use by employees and it does not serve medium or smaller employer information needs.*
5. *Does not address some of the “modern application” characteristics important to this study, including a user-friendly interface, or open-source coding and data interoperability to “talk” with other relevant data systems.*
6. *Cannot be customized to individual employers. Large employers value flexibility to tailor commuter alternative program features, communication and incentives for their own employees.*

A new platform that encompasses modern technology innovations is needed.

### Objective and Opportunity

- ▶ This strategy’s objective is to expand an existing pilot partnership between SBCTA and Loma Linda University Medical Center (LLUMC) to include additional employers on this new flexible, multimodal ridematching software platform. Its central features include:
  - providing readily accessible, comparative multimodal information to commuters;
  - enabling small, medium and large employers, as well as schools or universities, to tailor a commute alternatives program to meet the needs of their own employees or students;
  - gamification features, including challenges and incentives.



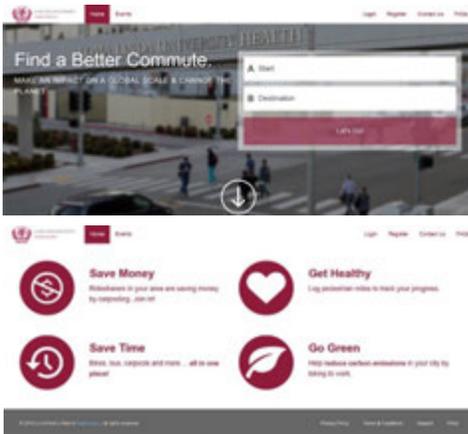
### IE COMMUTER IN PRACTICE

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 already carpooling.

### Target Markets

- **Commuters** to work or school;
- **Employers** of large, medium and small scale;
- **Regional stakeholders**, including: SBCTA, Omnitrans, Metrolink and the other public transportation providers who can benefit from a well-utilized, multimodal ridematching platform.

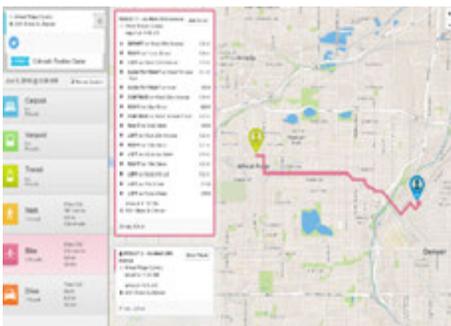
Figure 24, LLUMC Tailored “Face”



In response to both findings from the Market Research and technology’s evolution in this area, this study’s authors recommend moving away from the locally developed IE Commuter program and that SBCTA proceed independently towards a strategic plan specific to the San Bernardino Valley. Critical to this study effort is the importance of accessing new, emerging technology opportunities that embrace multi-modalism and are platforms widely in use elsewhere, with local entities not solely responsible for development and upgrading.

During the period of this project, a pilot ridesharing platform was introduced at the LLUMC for its 22,000 employees, faculty and students. LLUMC is interested in a new paid-parking policy in the near future and this, coupled with existing congestion around LLUMC facilities, led to a partnership with SBCTA to test a new rideshare platform. The pilot uses the RideAmigos multimodal portal with a LLUMC “face” that is oriented to LLUMC employees, faculty and students (Figure 24). Monitoring and expanding this pilot will provide critical feedback about the use of multimodal, technology-driven rideshare tools. Importantly, establishing a “modern app” environment with characteristics described in Strategy 1.1 will further promote and expand ridematching in the San Bernardino Valley.

Figure 25, Sample Multimodal Trip Discovery



Monitoring and expanding this pilot will provide critical feedback about the use of multimodal, technology-driven rideshare tools. Importantly, establishing a “modern app” environment with characteristics described in Strategy 1.1 will further promote and expand ridematching in the San Bernardino Valley.

### Strategy Description

This strategy proposes to utilize “modern app” capabilities within a multimodal ridematching platform — building upon the LLUMC pilot demonstration — for use by additional commuters and employers of the San Bernardino region. Proposed are features that go above and beyond the existing Los Angeles Metro’s RideMatch or the IE Commuter program. As well as providing potential 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 can then compare the alternate mode costs; estimate and compare commute times; and provide greenhouse gas emissions of the relevant commute choices. Local employers should be able to put their own “face” on their employees’ mobility program.

### GAMIFICATION

A relatively new strategy that employers and rideshare agencies are using to increase engagement in ridesharing is to employ “gamification” or specific challenges. Gamification is the application of game-design elements and game principles in non-game contexts.

With the onset of mobile applications and devices that “synch” and upload data to smartphones, gamification has become an important incentive in health challenges or receiving “badges/awards” for frequent purchases at stores or restaurants.

The ability of a software platform to announce and then track challenges, incentives and campaigns heightens user engagement.

#### **For the customer, rideshare app features should include:**

- A mobile platform of high-quality, engaging and easy-to-use interface.
- The ability to enable commuters or students to explore multimodal commute options whether or not their employer or educational institution has adopted a formal commute alternatives program (Figure 25).
- The ability to provide information about commuter challenges, giveaway and point programs, employee perks, event discounts, incentives and rewards.
- The ability to provide rider diary, auto-logging tracking capabilities and advance scheduling options.

### **For employers, rideshare app features should include:**

- An employer-centric portal to enable employers to customize the branding and introduction to its own employees, and to adapt games and incentives to the employer’s specific employees and work site.
- Provision of templates for campaign messages is desirable.
- User-friendly accessible administrative portal; multi-user access and log-ins.
- Advanced management and reporting capabilities for commuter/ employer data.
- Rule 2202 compliance tools, data analysis and advanced reporting capabilities for large employers.
- Portal access for medium and small employers whose employees can explore potential rideshare matches and other travel modes.
- State-of-the-art privacy and security for individual users. Secured log-in/password-protected sites for both users and administrators.
- Sufficient data inter-operability that the platform can work with GTFS-provided data to present accurate and reliable transit information.
- Compliance with key confidentiality protections, as public agencies must comply with California Penal Code 637 and protect the confidentiality of information gathered during rideshare services.

### **Implementation Topics**

The following actions, directed largely to SBCTA, are recommended:

1. *In addition to the current LLUMC pilot, select one or two more employer partners, such as the County of San Bernardino or another hospital.*
2. *Explore large employer willingness and ability to participate as a funding partner at modest levels, as LLUMC has done.*
3. *Develop specifications for employer features, providing employers with vendor demonstrations; assist with vendor selection process.*
4. *Explore SBCTA procurement options to undertake a second or third pilot and provide funding support directly to the large employer.*
5. *Encourage development of gamification and challenge strategies to incentivize employees to try alternate modes. Provide a combination of those, including drawings, financial incentives, non-financial rewards and recognition to test gamification strategy experience.*
6. *Assist selected employers through implementation of the first 6 months.*
7. *Conduct an evaluation of the three pilot demonstration projects to provide input to a strategic planning process for the San Bernardino Valley. The goal is to establish a new paradigm for employer-based, multimodal applications for commuters and employers of all sizes.*
8. *SBCTA may wish to monitor the experience of **Transportation Demand Management ordinances** that were reframed in the cities of Santa Monica, Glendale and Los Angeles to encourage and promote ridesharing.*

### **MULTIMODAL SOFTWARE SOLUTIONS**

Two multimodal software solutions provide most of the required and desired features described, although other platforms are available. SBCTA is encouraged to pursue platforms incorporating the “modern app” features in demonstration environments:

- RideAmigos  
<https://rideamigos.com/> — certified to and does provide SCAQMD AVR surveys; and
- RideShark  
<https://www.rideshark.com/> — not certified to provide SCAQMD AVR surveys.

### **COSTS & FUNDING**

#### **Cost Range:** Medium

The LLUMC pilot commenced with a \$30,000 annual price tag that included initial set-up, development of the employer-screens and hosting. This cost is shared equally by SBCTA and LLUMC. The employer puts additional funds into challenges and incentives, presumably soon offset by its parking fees.

#### **Funding and Grant Sources:**

Public/private partnership opportunities must be nurtured and developed.

**Staffing:** SBCTA staff support to develop one or two more pilots and monitor for six months at 6 hours per week.

## 3.3 GUARANTEED RIDE HOME REFRESH



### STUDY FINDINGS ON GRH

- Of those surveyed, 61% were not aware that a GRH benefit was available through their employer for ridesharing commuters.
- When 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.”
- Many focus group commuters were unaware of their employers providing a GRH program. When the current IE Commuter GRH program was described, they found it only somewhat appealing.

### Problem

An often-cited reason as to why a commuter may not rideshare is the concern for a sudden home/family emergency or having to work late. Guaranteed Ride Home (GRH) programs address this fear by providing 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 for qualified emergencies and to participating ridesharing employees.

This study’s Market Research revealed that many commuters were unaware of the region’s existing GRH, a reimbursement-based program for emergency rides home. Current policy provides for two such trips a year, meeting certain criteria. In the study focus groups, those familiar with it professed their wariness of its reimbursement nature. Once described, nonetheless, many found it was an important safety net to commuting on alternative modes.

### Objective and Opportunity

- ▶ This strategy’s objective is to revamp the Guaranteed Ride Home Program to make it more accessible, more visible and with an up-front payment mechanism for those traveling by vanpool or carpool to commute to work or school.

SBCTA will need to explore through SCAQMD (South Coast Air Quality Management District) how up-front payments are allowed for larger Rule 2202 employers. Additionally, SBCTA will need to collaborate with its five County Transportation Commission (CTC) and transportation authority partners to effect change. Fortunately, many of the CTCs are working with or are entering into partnerships with TNCs, and these new-found relationships can be used to broker CTC-paid TNC trips as a primary ride home in the event of an emergency.

As this negotiation with partners may prove lengthy, a phased approach is recommended:

1. *Short-term: Incorporate a new, local GRH Pilot Program that allows for provision of a promo code to area TNC vendors.*
2. *Refresh the five-county GRH Program in collaboration with CTC partners, according to the principles described here.*

### Target Markets

- **Employers** that sign a Partnership Agreement through the IE Commuter program;
- **Non-IE Commuter employers** may be incentivized to sign a Partnership Agreement and consider other rideshare offerings through SBCTA; and
- **Single drivers** unaffiliated with a vanpool may be encouraged to try a new rideshare mode.

## Strategy Description

A revamped GRH program should include the following components:

- Increase allowable uses from two to four times during a 12-month period;
- Payment should be up-front instead of reimbursement, while still allowing verification and trip documentation;
- Introduce a capability for a TNC trip that can 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, 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. Continue to minimize ETC involvement/paperwork; and
- Promote the program to both ETCs and SOV 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

A short-term local fix for the San Bernardino Valley could incorporate this policy into an expansion of the Loma Linda University Medical Center/RideAmigos rideshare platform pilot, described in Strategy 3.2.

Long-term, the following steps are recommended in pursuing a revamped GRH program to the regional CTC partners and for its implementation:

### **Short-Term Actions:**

1. 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. Create outreach materials to ETCs and commuters to raise GRH awareness and convince single- occupant commuters to try a rideshare mode.
3. As technology changes, new applications/tools can be introduced.

### **COSTS & FUNDING**

#### **Cost Range:** Low

An estimate of a 10% increase in the current budget allocation is proposed. SBCTA is billed based upon actual use from the regional program. An estimate of \$10,000 to \$25,000 is offered.

#### **Funding and Grant Sources:**

Current budget line items could presumably cover these relatively modest sums.

**Staffing:** For the short-term, local fix, there would be some negligible time to administer.

## 3.4 TARGETED SAFETY ENHANCEMENTS

Figure 26, Sample Enhanced Lighting



### Problem

During this study’s early data-gathering phase, interviews with large employers brought back familiar but strong messages of concern about the safety of employees who might use alternate mode transportation. These related largely, but not exclusively, to public transit and included uncertainty about waiting at stops or stations, about fellow riders and about walking to and from bus stops.

Bus stop improvements are typically the responsibility of the individual jurisdictions and with 2,900 stops spread across the 15 cities and the county, Omnitrans has limited its role in stop improvements to signage, benches and sometimes shelters.

### Objective and Opportunity

- ▶ This strategy’s objective is to establish a continuing program of bus stop safety enhancements, implementing a piloted methodology for identifying “high priority” stops where safety-related improvements can be targeted to improve riders’ perceptions and experience of safety (Figure 26).

### ***Other Documentation on Safety Concerns***

Omnitrans is among 16 U.S. public transit agencies working with the Imperial College of London on its Benchmarking project to share key operating and performance data in a confidential environment over time. Its goal is to arrive at meaningful, truly comparative data sets. Omnitrans has consistently **scored well below the mean in rider “perceptions” of safety**, sometimes in the lowest ranked position among its Benchmarking peers (Figure 27). In terms of actual accidents or incidents, Omnitrans has **scored at or above the mean on specific safety-related events**. Rider perception though is a persistent and continuing concern, impacting transit use.

### ***Sharp Focus Group Differences***

Omnitrans planning staff undertook formalized focus groups with existing riders to explore passenger safety topics. Recruited and conducted by The Redhill Consulting Group, two groups each of male riders and of female riders were convened. The gender-based differences in perceptions of safety were striking.

In both male focus groups, participants were dismissive of safety-related concerns, expressing no greater or lesser concern about safety when using public transportation.

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 buses and trains. Several individuals described, even presented, the weapons they carried in their purses. These discussions helped to focus safety

enhancements and the accompanying marketing messages targeted quite explicitly towards female audiences.

## Target Markets

Safety concerns have a long history in San Bernardino, pre-dating the 2015 terrorist event. Following the departure of Norton Air Force Base in 1995 and intensified in the wake of the 2007/2008 economic downturn, high-vacancy rates developed and often bred higher crime activity. When the City of San Bernardino filed for Chapter 9 municipal bankruptcy in 2012, further loss of businesses contributed to a sense of an urban wasteland with limited pedestrian traffic and the public expressing legitimate safety concerns. Omnitrans focus groups did indicate that **women public transportation users** are much more attuned to these concerns and should be the target of both interventions and messages about safety ameliorations that are 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 cities to ensure standardized stop enhancements — benches or shelters — but typically leaves other 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. But where were those locations and could the list of 2,900 stops be narrowed?

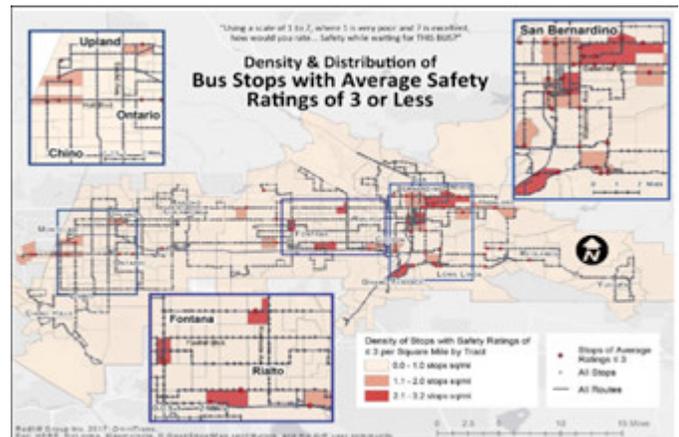
Omnitrans rider survey information was used to plot stops where riders most frequently reported safety concerns. Riders rated stops: “How would you rate safety while waiting for THIS bus...” on a scale of 1 to 7 where 7 is excellent. Stop areas within the Omnitrans service area **where stops rated low, at 3 or less on the safety rating**, were identified as safety concern stops.

This analysis of low **Average Safety Ratings** helped identify the “top 100 stops” with poor safety ratings from among the 2,900 total. Funding was sought and additional lighting and other stop enhancements were made.

## Implementation Topics

1. *Identify additional locations, for a working list of the top 300 stops needing safety enhancements, using the Average Safety Rating strategy.*
2. *Develop a collaborative working group of local jurisdictions with Omnitrans to address these stop locations and to secure funding.*
3. *Budget for continued agency marketing of safety-related messages.*

Figure 27, Plotted Omnitrans Stops with Low Safety Ratings



### COSTS & FUNDING

**Cost Range:** Low

**Capital Cost:**

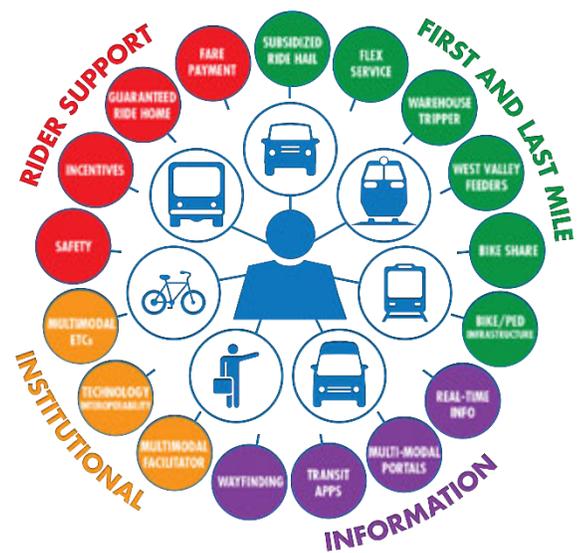
- About \$1,000 per solar light fixture.
- \$100,000 for 100 lights

**Funding and Grant Sources:**

Balance of Prop 1B funds and any other safety-targeted funds



## 4. Institutionally-Based Strategies



# 4.1 SBCTA LEADERSHIP TO CUSTOMER-FOCUSED, TECHNOLOGY-ENABLED MULTI-MODALISM

## Problem

As this study documents, an extensive, multimodal network exists in the San Bernardino Valley. It is, however, **modally focused** and is likely to continue to be so, given funding streams and organizational structures. More importantly, while the network’s individual services strive to be focused on the customer — designing to travel corridors often after in-depth research into travel needs — that customer orientation can get lost in putting service out on the streets.

The San Bernardino Valley’s public transportation and shared trip travel choices are nowhere brought together in an intuitive way. They do not work as an integrated system. They require the user to do the hard work of connecting dots, services, time points and choices. The region is a long way from Mobility-as-a-Service (MaaS) in any guise. Moving to a customer focus in service provision requires actions large and small, but cannot happen without leadership and continuing organizational attention.

## Objective and Opportunity

- ▶ This strategy’s objective is to establish SBCTA leadership to realize customer-focused, technology-enabled multi-modalism by naming a **Customer-Focused Multimodal Coordinator** within the SBCTA organization.

SBCTA, as the regional transportation authority, with its partners, Omnitrans and SCAG, provided leadership through this study to discover and envision a multimodal network that is customer-focused. Identified strategies provide starting points **but require continued leadership to implement these and to realize this vision of customer-focused multi-modalism.**

In this period of transformative change in the transportation arena, San Bernardino County with its Valley jurisdictions are poised to be on the leading edge of Mobility-as-a-Service. MaaS in its technological forms and in non-technological tools of service design and coordination, customer information and promotion can be realized in the San Bernardino Valley. Engaging a broad range of partners — already part of SBCTA’s mission — will require, however, both leadership and some level of oversight.

## Multiple Stakeholders Must Invest in the Plan Vision

Implementing this ACTION PLAN is possible only through an array of engaged partners. **Multiple stakeholders must be invited to invest in this vision of MaaS multi-modalism for the San Bernardino Valley;** organizations that include:

- SBCTA Board Policy members and Executive Management;



## COSTS & FUNDING

### Cost Range: Low

No additional staffing expense is proposed but the realignment of responsibilities, assigning this function to an existing position within the SBCTA organization. A small fund reserve to support attendance at national conferences, to bring back the most current information on the array of technology and multimodal topics is recommended.

### Funding and Grant Sources:

SBCTA operating funds can support this position and its activities.

Discretionary grant funding can be sought on a strategy-by-strategy basis.

**Staffing:** 8-10 hours per week.

- **At least six of SBCTA's nine departments:** Fund Administration, Transit, Legislative/Public Affairs, Planning, Air Quality/Mobility Programs and Procurement departments;
- **Omnitrans Executive management**, board leaders and department heads;
- **Metrolink** and the other transit operators serving the region;
- **Jurisdictions'** city managers, public works directors and city councils;
- **SBCTA advisory bodies**, including its Public Works, PASTACC, active transportation and other technical groups in which SBCTA participates;
- **Large employers** with more than 200 employees;
- **Medium and smaller employers** within the region; and
- **Education leadership** at university, colleges and secondary schools.

## Strategy and Implementation Topics

The following actions are recommended to establish SBCTA leadership:

- Name **Customer-Focused, Multimodal Coordinator**, a function that can potentially be appended to an existing position, is proposed within SBCTA's Transit Department.
- Provide **sufficient authority to this position**, likely through the office of the SBCTA Executive Director, to ensure that this individual: 1) has authority to convene key stakeholder representatives, and 2) can contribute to and help shape agency policy in moving forward the vision of customer-focused, technology-enabled multi-modalism.
- Use ACTION PLAN strategies as the **preliminary workplan**, providing for the Coordinator to monitor activity and report on strategy progress.
- Monitor and build upon the **ACTION PLAN multimodal principles**.
- Convene at least **quarterly meetings** with invited stakeholder organizations and their named representatives to meet at rotated locations for multi-agency dialogue about progress and barriers.
- Establish a **quarterly multimodal agenda** to invite agency reports on multimodal activities in the four areas of: 1) information, 2) rider support, 3) first-and-last mile, and 4) institutional strategies.
- Coordinate **support to bundled grant-writing requests** through encouragement of multi-agency partnerships, letters of support and the leveraging of local funds to pursue discretionary grant opportunities.
- Convene special workshops and propose an **initial technology procurement workshop** during the first year to educate and build capacity of those tasked with shaping MaaS multi-modalism.
- Ensure that the SBCTA Customer-Focused, Multimodal Coordinator can participate in regional, state and national conferences, forums and seminars to **build institutional capacity** and keep San Bernardino County abreast of this fast-paced, rapidly changing environment.
- Establish reporting tools and an **annual State of Multi-Modalism report** to describe progress towards integrated and customer-focused systems.

# 4.2 MULTIMODAL EMPLOYEE TRANSPORTATION COORDINATORS

## Problem

Current multimodal transportation information resources available to employee transportation coordinators are under-utilized or not visible to employee transportation coordinators (ETCs). One key perception and theme throughout the Market Research was the lack of knowledge and/or understanding of available mobile applications, websites and information technology to assist commuters and ETCs in placing commuters into more multimodal, rideshare modes. In addition, most of the ETCs dismiss transit outright as “not available to my employees” or “not safe” or “inconvenient.” Most therefore have taken little time to discover the tools available to assist in multimodal trip planning.

**Supporting ETCs in promoting multimodal trip planning should be a high priority** for Omnitrans and SBCTA.

## Objective and Opportunity

- ▶ This strategy’s objective is to make life easier for the ETCs through an SBCTA Rideshare Mobility Manager function that supports ETCs’ awareness of multimodal choices and related employer benefits, working to make the ETC job easier and more successful.

Positioned at the management analyst level within the Air Quality and Mobility Programs department, this rideshare mobility manager would monitor high-level transit and rail service changes and promote information through technology tools to ETCs that expand their capabilities.

## Target Markets

- **ETCs** at large and medium employers; and
- **SBCTA and its transit provider partners**, to bring back employer information.

## Strategy Description

The Rideshare Mobility Manager is an added function to an existing position, envisioned to include:

- Increased focus on technology to assist ETCs and their employee base.
- Conducting outreach to large and medium employers to support and educate ETCs about the full multimodal network through regular, face-to-face meetings, individualized or in small groups.
- Partnering with Omnitrans on new pilots and programs to help promote these, such as the trippers described in Strategy 2.4.
- Actively promoting existing “modern apps,” such as Google Transit and the Transit app, detailed in Strategy 1.1.
- Developing an annual report of ridesharing metrics, to contribute to greater understanding of these modes by SBCTA and its partners.



## Implementation

### Topics

This strategy builds upon but expands activities already in place to bring a multimodal focus to employers. This responsibility includes educating those dealing directly with employees on the changes in the San Bernardino Valley landscape.

This multimodal ETC coordinator will need to stay current on changes to the network, for both bus and rail services. This includes tracking information about new transit services, about changes in fares and importantly, about fare payment and trip planning technology readily available employees, to potential alternate mode users.

### COSTS & FUNDING

**Cost Range:** Low  
**Funding and Grant Sources:**

This strategy recommends expanding an existing position to include this function. Any associated costs would be minimal.

**Staffing:** SBCTA staffing estimated at 8-10 hours per week to enable a different level of engagement and interaction with employers.

## 4.3 TECHNOLOGY INTEROPERABILITY

### Problem

Technology coordination problems exist 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'** planning and capacity needs. Each is summarized here.

### ***Removing Silos from Multimodal Transportation***

The multimodal transportation network is complex from the perspective of regional management, with an increasing number of modes and diversity of services. The San Bernardino transportation network is challenged to integrate various transportation modes into combined, integrated information systems responsive to: fixed-route network (regional and local, bus and rail services); on-demand first-and-last mile service (downtown San Bernardino on-demand service); other MicroTransit solutions (Ontario airport TNC-subsidized trips); vanpool; carpool; and active transportation, including bikeshare, biking and walking.

### ***Customer Needs***

The multimodal transportation network is also complex from the traveler perspective. Travelers use a variety of transportation modes to serve diverse trip needs, daily or episodically as such needs present. To offer a multimodal transportation network that is responsive, information tools must consolidate travel options and enable comparisons between choices. Driving alone is convenient because this single mode can serve a variety of trip purposes. In contrast, making effective use of non-SOV travel options can involve multiple transportation modes, with information about each siloed in different systems.

### ***Service Provider and Planning Agency Needs***

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

- Share (or sell) capacity among partner transportation providers;
- Understand traveler behaviors across the transportation system in order to provide service that responds to user demand;
- Understand latent demand to design and deliver successful and needed transportation services;
- Break down data silos, within and between organizations, that prevent a whole-network planning approach;
- Support data warehousing and archiving of network and service changes, transportation system events, and system performance;
- Prevent expensive technology vendor lock-in limits future choices; and
- Leverage emerging technologies and respond more quickly to changing needs and emerging opportunities.

## Objective and Opportunity

- ▶ This strategy’s objective is to facilitate the ongoing build out of a “Transportation Stack” of modular technologies (software and hardware) that will serve the needs of customers, service providers and planning agencies, with SBCTA providing leadership across agencies and modes.

The multimodal transportation network is the sum of many parts. The information systems for the multimodal network also are the sum of many parts, which are sometimes siloed or incompatible with each other.

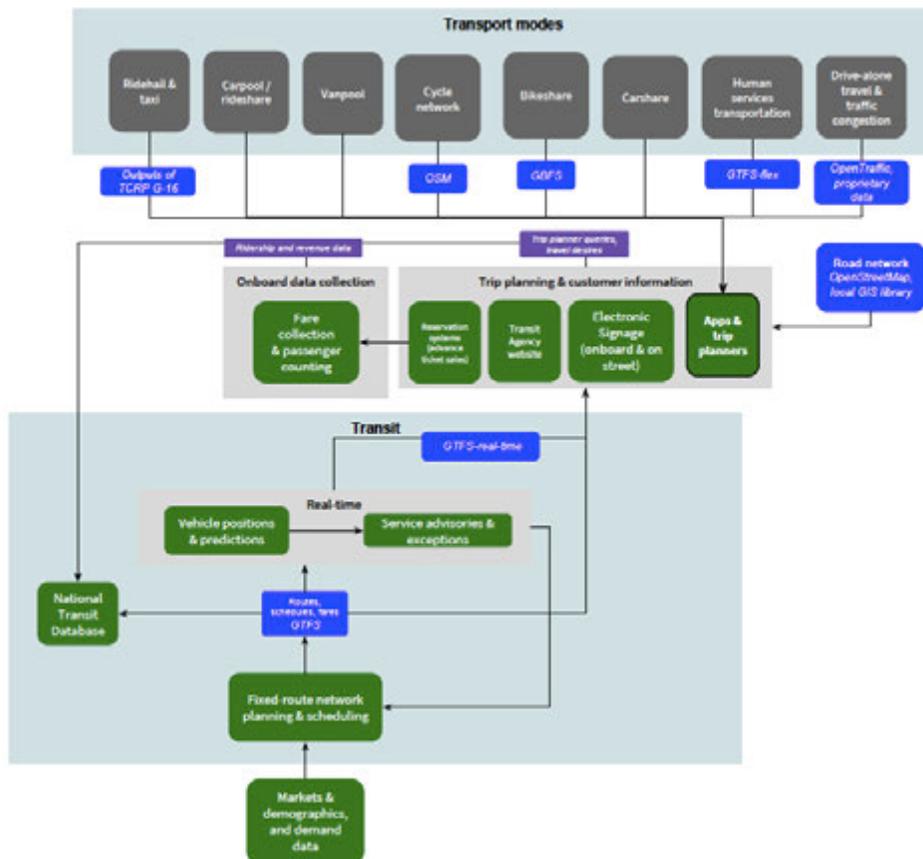
**Interoperability** means that systems can communicate with each other to work as a system instead of as individual parts.

A modular system of transit interoperable technologies will support the region’s ability to serve customer needs and service provider and planning agency needs listed above.

### Interoperable Data

Interoperable data allows various information systems to work together, either implemented as one system and/or including third-party components, such as Google Maps. Figure 28 presents a conceptual diagram of a “Transportation Stack” to highlight its various components. Focused mainly on the fixed-route, the Transportation Stack also includes some other modes. See this study’s VOLUME 3: MULTIMODAL STRATEGIES REPORT for more detailed information.

Figure 28, Transportation Multimodal Stack



### **Explanations/Notes:**

**Green boxes** indicate components within the transit information system.

**Blue boxes** indicate data formats or interchange mechanisms for which there are defined or emerging interoperable standards.

**Purple boxes** indicate needed interchange points where there is no defined interoperable standard.

Selected Definitions:

- **OSM:** OpenStreetMap.org is a wiki-style public map that is used for trip planners and mapping applications. OSM includes cycle, pedestrian and roadway data.
- **TCRP G-16:** “Development of Transactional Data Specifications for Demand-Responsive Transportation,” a federally funded project to interchange formats to request and book rides.
- **GBFS:** General Bikeshare Feed Specification to describe bikeshare docking locations.
- **GTFS:** General Transit Feed Specification for fixed-routes, stops, schedules and fares
- **GTFS-real-time:** GTFS extension for up-to-the-second transit updates, including vehicle positions, service advisories and arrival time predictions.
- **GTFS-flex:** Experimental extension to GTFS to describe demand-responsive transit (DRT) availability and parameters, including deviated-fixed, hail-and-ride (flag stops), zone-based dial-a-ride and point deviation services.

### **Strategy Description**

**Make real-time information available for transit through industry-standard formats** — Currently, not all area transit agencies appear to be providing **GTFS-real-time feeds**<sup>5</sup>, a necessary interoperable data format for real-time transit. GTFS-real-time makes it possible for Google Maps and other applications<sup>6</sup> to show real-time arrival estimates. This strategy recommends that local transit agencies **should be educated** to understand the benefits and opportunities of GTFS-real-time<sup>7</sup>. Several transit providers make use of real-time information vendors that are not currently known to provide GTFS-real-time feeds:

- Using Double Map: Beaumont Pass Transit and Mountain Transit.
- Using Syncromatics: Victor Valley Transit<sup>8</sup>.

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<sup>5</sup> <https://www.transitwiki.org/TransitWiki/index.php/GTFS-realtime>

<sup>6</sup> Transit (transitapp.com), uses GTFS-real-time to include real-time information and uses other proprietary data real-time data specifications, such as the Syncromatics API.

<sup>7</sup> For a description of GTFS real-time benefits, see: <https://medium.com/@sjbarbeau/whats-new-in-gtfs-realtime-v2-0-cd45e6a861e9>

<sup>8</sup> Syncromatics software can provide GTFS-realtime trip updates and vehicle positions (<http://gtfs.org/realtime/>). In these cases, GTFS static (<http://gtfs.org/reference/>) data needs

We recommend these agencies request for their vendor to make GTFS-real-time available, and, if this is not possible, seek to transition to a vendor that publishes GTFS-real-time. Agencies that do not have a real-time system should seek to procure one that publishes GTFS-real-time.

**Adopt the Transit [app] regionally**, which provides an excellent free mobile transit app and programs to gather usage data (to analyze trip planner queries and travel behavior). Implement **Transit** for all transit agencies in the region and enter into a partnership to gather usage data. Transit offers a free partnership program for transit agencies:

<https://transitapp.com/partners/transit>

**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](https://maps.trimet.org)
- Commute trip planner in Washington, D.C.: [carfreeatoz.com](https://carfreeatoz.com)
- TriMet’s MOD Sandbox grant to improve OpenTripPlanner: <https://trimet.org/mod/>

**Implement carpool ridematching software** — 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 software include: RideAmigos, Carzac, Müv, Scoop and Carma. Where carpool/ridematching applications are implemented, establish interoperable data to solve the silo/critical mass issue with rideshare. There have been a number of efforts to create rideshare/carpool APIs, but none has gained traction. Privacy issues are one of the challenges to rideshare APIs.

**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.

## Costs and Funding

This strategy has largely, only staff time costs associated with it. Individual strategies discussed here, related to real-time software and ridematching software, do have some direct costs. But the approach to the Transportation Stack simply requires some investment of staff time. Like any SBCTA responsibility, thought should be given as to where in the agency to house responsibility and oversight for data standards and data-related procurement practices and procedures.

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to also be provided by Syncromatics so that ID values match between the static and real-time datasets.

## Implementation

### Topics

To create an institutional environment supportive of multi-modalism, the following actions are recommended to make best use of modern and emerging technologies:

- Where appropriate, **empower organizations to choose and purchase their own systems** (rather than insist on top-down regionally purchased systems in every case) and provide tools and resources to enable and encourage interoperability and standards-compliance in these separately procured systems.
- Maintain a **regional transportation information systems guidelines or flexible architecture** that outlines regional interoperability goals, strategies and tactics. One possible collaboration tool might be a non-public wiki shared among transportation agencies. Such a site can function as an “intranet” to share technology documentation, interfaces and plans, allowing transportation agencies to coordinate the construction of a system with interoperable components over time.
- 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. A **draft proposed process**, as a repeatable cycle, is described in the study’s VOLUME 3: STRATEGIES REPORT to implement current technologies that leverage interoperable data.

# A CALL TO ACTION

## Creating a Tipping Point



Transit ridership around the country and in the region has been steadily declining for some time; although there are indications that Omnitrans is beginning to turn the tide with small monthly ridership gains, after years of decline. This study's primary goal is to realize greater use of the existing transportation network. This entails encouraging people who never take transit to do so occasionally or for some trip types, encouraging new uses to try alternate mode transportation and spurring more persons out of single-occupancy only vehicle trips. The customer-focused principles articulated at the beginning of this ACTION PLAN and the strategies described here provide pathways to this end.

Creating a tipping point — where a series of small changes become significant enough to cause larger, more important change — is an underlying intention of this ACTION PLAN. Some of the 16 strategies in this ACTION PLAN use very targeted tools to introduce and encourage new mobility choices. They address a particular geographic or service problem, such as the bikeshare pilot in the Loma Linda Corridor or the Amazon warehouse Omnitrans' tripper service. Others enable greater reach across multiple modes and to larger numbers of persons. All the information strategies will expose more people to more mobility choices.

Taken together — addressing information tools, first-and-last mile services, rider support and institutional needs to embrace Mobility-as-a-Service — this ACTION PLAN seeks to build to a tipping point within the San Bernardino Valley to establish a truly **customer-focused, technology-enabled multimodal** environment. While not all of the strategies may be implemented, or be implemented to their fullest extent, moving towards a mobility tipping point for the region absolutely requires leadership, attention to the principles set forth here and concerted action by key stakeholders. These include SBCTA, Omnitrans, Metrolink, the jurisdictions, employers of all sizes and educational institutions from the secondary to the university level.

This ACTION PLAN **has the potential to improve lives** in the region's most vulnerable households. Mobility enhancements that help those who cannot afford cars, or who cannot drive for reasons of age or infirmity, will be better able to meet their basic needs. They will be able to access more job opportunities, will see benefits to household transportation budgets, and are likely to increase their physical activity — and thus their physical and mental health. In addition, studies have shown that people who use shared and active modes of transportation feel happier and more connected to their communities.

This ACTION PLAN **describes the places in which to start**, anticipating that these individual actions will collectively build to one or more tipping points to realize increased use of alternate mode transportation by customers, improvements in services and choices, and the establishment of supportive mobility policies.

## Messages from the Three Revolutions

An urgency exists to realizing this vision of customer-focused, technology-enabled multi-modalism. During this current period of profound change in the transportation arena, as noted at the outset of this ACTION PLAN, the University of California, Davis, Institute of Transportation Studies has described **Three Revolutions in Urban Transportation** of electrification, autonomous vehicles and shared-use transportation, where potential outcomes vary tremendously and represent very different futures (Figure 29). They report *“As the transportation trends of passenger vehicle automation and electrification continue, new research concludes that adding extensive ridesharing to the mix could reduce CO<sub>2</sub> emissions from all transportation sources around the globe by more than 80 percent.”*<sup>9</sup>

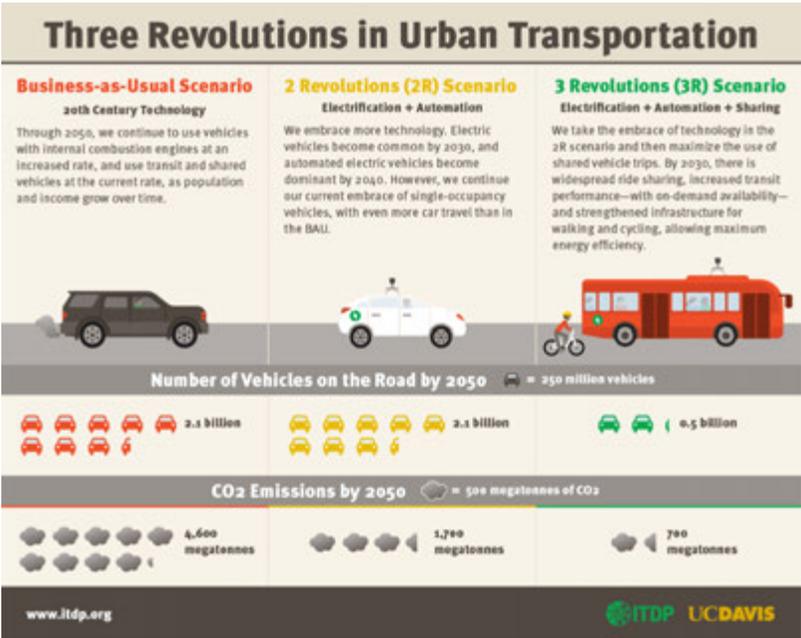
Their three scenarios each embrace change differently, characterized as:

- Business-as-Usual — 20<sup>th</sup> Century Technology
- 2 Revolutions (2R) — Electrification + Automation
- 3 Revolutions (3R) — Electrification + Automation + Sharing

Even as these researchers identify the great potential of electrification technology and autonomous vehicles, married with shared use transportation, to realize substantially reduced CO<sub>2</sub> emissions and increased mobility, they also contrast this with starkly different urban experiences, including greatly increased congestion with longer delays and travel times. The three revolutions envisioned have the potential to improve mobility and improve the quality of life, but these researchers warn that without *“policy intervention, negative or disruptive impacts are less likely to be mitigated.”*

In the 3R scenario, the researchers envision an ecosystem of shared vehicle trips, public transportation and active travel use that supports high-quality and sufficient urban

Figure 29, Three Revolutions Illustrated



<sup>9</sup> Fulton, L., Marson, J., Meroux, D. “Three Revolutions in Urban Transportation,” Institute of Transportation Studies,” University of California at Davis, 2017. <https://www.itdp.org/wp-content/uploads/2017/04/UCD-ITDP-3R-Report-FINAL.pdf>

mobility with far fewer vehicles, which, in turn, cuts traffic congestion and leads to large safety benefits.<sup>10</sup>

However, within these Three Revolution scenarios, and particularly within the 2R and 3R scenarios, the role and responsibilities of public transportation — and the traditional modes of rail and fixed-schedule bus service — must be redefined.<sup>11</sup> While researchers see potential by which to complement traditional public transportation services, they identify areas where change must be embraced. This includes redefining public transportation to be more oriented to customer needs, much as this ACTION PLAN directs. They propose that service concepts broaden, again as this ACTION PLAN proposes. And they see as critical changing roles for the public, private sector and government to develop more flexible frameworks for “delivering mobility.”

Without this, existing services risk becoming “legacy” services with decreasing vehicle loads and declining utility, but ever-increasing public-sector costs.

## Policy Changes Will Reinforce This ACTION PLAN

Policy changes are needed to realize and integrate public transportation into a new vision of mobility, similar to the Three Revolutions’ vision, but one that directly parallels the messages of this ACTION PLAN. Taken directly from its “Synergies with Transit Policy Brief,” these include:<sup>12</sup>

1. *Refining transit agency missions and policies to open opportunities for models beyond public ownership and operation.*

This may include elements related to developing new standards in contracting related to confidentiality, public records and insurance; new procurement processes; greater distinction between planning, oversight and operations; restructured performance metrics that become agnostic to provider or technology, but focus on the customer; and integration of central resources to aid customer trip planning, trip scheduling and revenue collection.

2. *Initiating policy actions to ensure mobility opportunities are available for traditional transit customers.*

This may include defining policies and actions to ensure that mobility remains affordable for these customers, including persons with disabilities, persons of low-income and older adults; ensuring accessibility of new services to persons with disabilities; and ensuring that new services are

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<sup>10</sup> Fulton, L. et al. “Three Revolutions in Urban Transportation”, et al. op cit., page 36.

<sup>11</sup> Polzin, S. “Three Transportation Revolutions: Synergies with Transit,” Center for Urban Transportation, University of South Florida, February 2017.  
[https://3rev.ucdavis.edu/wp-content/uploads/2017/06/3R.Transit.Final\\_-1.pdf](https://3rev.ucdavis.edu/wp-content/uploads/2017/06/3R.Transit.Final_-1.pdf)

<sup>12</sup> Polzin, S. Three Transportation Revolutions: Synergies with Transit, op cit., page 3.

equitably distributed across regions, not disadvantaging persons based upon geography, race and ethnicity, income or other characteristics.

3. *Utilizing policy and resource programming to incentivize behaviors that improve the overall efficiency and effectiveness of transportation services.*

This may include seeking opportunities to standardize and integrate key systems of customer information, fare payment, customer eligibility, data and information to enhance connectivity; using incentives to prioritize shared, high-load and resource efficient services; and considering third-party data brokers — such as universities — to aggregate and analyze privately generated data without compromising intellectual property or competitiveness.

## Bundling Projects to Find New Funding

Funding opportunities were identified for most of the strategies examined in this ACTION PLAN. Appendix A to this document summarizes these. Securing discretionary funding will most likely be realized where these strategies are bundled into a package that addresses the goals of this ACTION PLAN, while recognizing the objectives of particular funding sources.

With SB 1, additional funding is available with the potential for supporting some of these strategies. And with the new two-year budget passed by Congress in early February 2017, funding appropriations may offer limited support in the form of public-private partnerships. The recent Congressional increase in TIGER funding appropriations suggests that a bundling of projects from this ACTION PLAN could comprise a successful application to move the San Bernardino Valley forward with customer-focused, technology-enabled multi-modalism.

SBCTA leadership should encourage such bundling of funding requests, addressing multiple strategies in each funding “ask,” involving new partners. To some extent, this will require working across traditional organizational and modal boundaries. As with this study brought together by the three partners of SCAG, SBCTA and Omnitrans, there is a need to create similar partnerships in pursuing certain discretionary funds. Other partners may include cities and counties and large employers, including universities or colleges.

## Promoting Innovation with Seed Funding

During the almost two years of this study effort, several initiatives commenced using small sums of existing funding to do so. As just two examples, this included the \$15,000 grant from SBCTA to match Loma Linda University Medical Center’s funding to pilot a multimodal transportation portal. It also included Omnitrans’ designation of



funds to pursue safety topics in special focus groups and is now underwriting a small procurement using available TDA Article 3 and Prop1B funding to obtain lighting and other safety amenities for targeted bus stops.

SBCTA may consider supporting a small **Multimodal Innovation Call-for-Projects Fund** through its Customer-Focused Multimodal Coordinator to make available sums of \$20,000 to \$40,000 to help jump start multimodal innovation. SBCTA manages various similar grant offerings, including its TDA Article 3 Call and its Measure I Specialized Transportation Call and others.

Small sums of money directed to small-scale projects that address the principles set forth in this ACTION PLAN and requested by the jurisdictions, by employers and by transportation providers can contribute to a tipping point in alternate mode use. Notably, a number of this ACTION PLAN's strategies were of low to medium cost.

Additionally, small sums set aside for education opportunities will have great value. In this period of fast-paced change, it is difficult for public employees to keep up. A small fund could support special workshops or an annual summit. For example, a workshop on technology procurement will help grow local capacity and enable staff to confidently tackle the complexity of the "technology-enabled" components of multi-modalism. Funds can bring nationally known and content-rich speakers to the region for a multimodal summit that includes employers, university and college representatives, jurisdictions and other public agency personnel, alongside public transportation professionals. A precedent is the Inland Empire Economic Partnership's annual conference with John Husing's reports on the economic trends of this region to numerous stakeholders within San Bernardino and Riverside counties.



Testing new ideas by exploring pilot opportunities to promote innovation and providing education to build local capacity are both **critical to the long-term success of growing utilization of the region's public and shared ride transportation network**. Providing an environment in which success can be tested and failure can be tolerated and learned from will provide great value. Not all ideas, nor all strategies will work but creating space for the exploration of these will benefit travelers, their employers and the communities of the San Bernardino Valley alike.

## Measuring Impact

The final element of this ACTION PLAN is ensuring the ability to report on change, on the collective and individual impacts of these strategies towards realizing customer-focused, technology-enabled multi-modalism. Reporting must be designed to measure the success of each of these, often creative and experimental, initiatives. Reporting should answer the question: "So what difference is this all making?"

The approach to reporting should be holistic and broad. Just as these multimodal strategies are unique to the problem and market they address, the

mechanism for measuring their success should follow suit. This means using performance metrics to tell the story of each project:

- Research what data is attainable and available from project partners.
- Identify measurable outcome metrics and goals specific to the mode or project: Metrics should be context-sensitive.
- Report in phases: Identifying short-term and long-term milestones or targets based on the project type and data availability.
- Report over time to demonstrate change: Compare each individual mode over time, but do not compare different modes as they are solving different problems and may require different metrics.
- Use quantitative and qualitative data.

Reporting along two dimensions is recommended:

1. *Establish an Annual Report on the State of Customer-Focused, Technology-Enabled Multi-Modalism in the San Bernardino Valley.*

With the quarterly meetings envisioned, as convened by the proposed Customer-Focused, Multimodal Coordinator, some initial and potentially simple year-end reporting is recommended. This can start with the inventory elements of this Study's VOLUME 1: EXISTING CONDITIONS, included here as Appendix B.

Annual reporting should incorporate an inclusive **trips per capita measure**, currently at 10.6 transit and alternate mode trips per capita for rail, bus and paratransit trips, as well as vanpool trips. This could include counting non-auto and non-SOV trips. Methods for counting modes of rideshare and bikeshare trips can be explored to demonstrate percent mode share that is bike or pedestrian, or **mode shift**.

This report should measure **improvements in mobility** with information drawn from employer, intercept and transit agency surveying. Metrics may include:

- Improvements in distance traveled and time it took (journey time improvement).
- Improvements in access: Are people accessing where they want to go? Is access easy?; how many transfers are required?
- Trip purpose: Has access to jobs improved?

The annual report should measure improvements in **health outcomes**:

- Improvements in access to health care;
- Increased walking and biking trips;
- Reductions in emissions; and
- Increased minutes of daily physical activity (once this number is identified, it can be entered as an input in the [Integrated Transport and Health Impact Modeling Tool \(ITHIM\)](#) to obtain a monetized figure for the benefits of improved health.

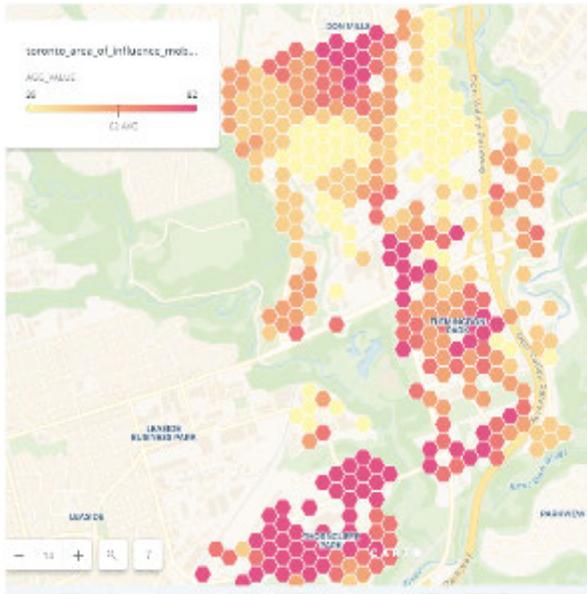
Annual reporting of **infrastructure topics** could include:

- Improvements to the pedestrian and bike ways that enhance safety: Fatalities per pedestrian/bicyclist mile
- Addition of amenities at bus stops, train and transit centers that address customer safety, comfort and convenience.

Annual reporting should **address technology** enhancements, specifically in relation to the Transportation Stack, with attention to procurement policies, introduction of more “modern apps” and policy decisions that promote open-source, open-data applications in as many settings as feasible.

2. *Develop and utilize tools that can meaningfully describe the multimodal environment and changes within it.*

**Figure 30, Transit Screen’s Example of Mobility Score™ Heat Map**



The technology application Transit Screen, highlighted in Figure 30 and Table 4, has developed a tool to “measure” the multimodal choices available to consumers and to display those for the consumer in a heat map and in a score at a fairly discrete neighborhood level. Its grading system, on a 100-point basis, is provided in Table 4.

This is an excellent example of the power of big data to provide customer-facing tools that inform the consumer. Just as school ratings and walk scores help inform persons who are considering where to live, this kind of mobility score tool can add to that picture of a neighborhood or employment location for individual consumers. This tool can also inform public agency personnel and policy makers to help make decisions about directing and prioritizing scarce resources.

Some regions are developing **mobility scorecards** to measure progress on the shared mobility plans. These can use simple

**Table 4, Transit Screen’s Mobility Score™**

Mobility Score™	Category	Meaning
80 - 100	Excellent	You have your pick of available transportation choices.
60 - 80	Excellent Mobility	Plenty of transportation choices are available.
40 - 60	Fair Mobility	You have a choice of transportation.
0 - 40	Minimal	Transportation choices are few and far between.

visuals, such as a progress meter; plus, or negative signs; or thumbs up or down to demonstrate growth and improvement by mode or project. Metrics reported on include: number of modes available, change since their plan was implemented, and amount remaining to reach their goal. These scorecards can demonstrate project benefits to partners or return-on-investment to policy makers.

# APPENDICES

For more information and to view additional Study documentation, please visit the SBCTA website at <http://www.gosbcta.com/plans-projects/plans-rideshare-transit>.

VOLUME 1: EXISTING CONDITIONS

VOLUME 2: MARKET RESEARCH

VOLUME 3: STRATEGIES FOR SAN BERNARDINO VALLEY CUSTOMER-FOCUSED,  
TECHNOLOGY-ENABLED MULTI-MODALISM

Appendix A — Funding Source Matrix

Appendix B — Inventory of Public and Shared-Ride Transportation in the San Bernardino Valley, January 2017

# Appendix A — Funding Source Matrix

The following matrix provides a list of funding programs available at the federal, state and local level, as of spring 2018. In addition, the matrix includes the customer-focused strategies identified as part of the Customer-Focused Study. This matrix can guide the reader to the different funding programs available to help plan, design and implement each specific strategy. In no way should the reader treat this as an exhaustive list, as new programs and funding agency priorities can change or emerge. Finally, San Bernardino County’s half-cent sales tax measure, Measure I, is not included as part of this funding matrix, as funding priorities have already been identified through SBCTA.

The reader should note that statutory requirements for these programs are subject to change. Moreover, not all programs provide funding for all phases of a project (i.e., planning, design, construction, implementation, etc.). For example, State Partnership Planning grants typically fund projects in the planning phase whereas Solutions for Congested Corridors provides funding for project implementation and/or construction.

		Customer-Focused Strategies (1.1 - 2.6)								
Funding Programs		1.1 Promoting Transit Multimodal Apps to the General Public	1.2 "Modern App" Real Time, Customer-Facing Technology	1.3 Transit Center Way-Finding	2.1 West Valley Connector Feeder Service	2.2 Subsidized Ride Hail Pilot	2.3 Microtransit Pilot for Downtown San Bernardino	2.4 Warehouse Tripper Pilots	2.5 Bike Share Pilot Program	2.6 Bike/Pedestrian Infrastructure
Federal	Congestion Mitigation Air Quality Program									
	Surface Transportation Block Grant Program									
	FTA 5307									
	FTA 5337									
	FTA 5339									
State	Affordable Housing and Sustainable Communities									
	Low Carbon Transit Operations Program									
	Transit Intercity Rail Capital									
	SB1 Solutions for Congested									
	SB1 Local Partnership Competitive Funds									
	SB1 Local Partnership Formula									
	SB1 Local Streets and Roads									
	State Partnership Planning Grant									
Active Transportation Program										
TDA	Article 3 - Pedestrian and Bicycle Allocation									
	State Transit Assistance Fund									
	Local Transportation Fund									
Misc. State	California Air Resources Board - Air Quality Improvement Program (Various) <sup>1</sup>									
	California Environmental Commission (Various) <sup>1</sup>									
	Mobile Source Air Pollution Reduction Review Committee (MSRC) Local Government									

<sup>1</sup> Various programs under this agency can fund several strategies.

Customer-Focused Strategies (3.1 - 4.3)								
Funding Programs		3.1 Electronic Fare Payment	3.2 Rideshare Engagement and Incentive Platforms	Guaranteed Ride Home Refresh	3.4 Targeted Safety Enhancements	4.1 Multimodal Employee Transportation Coordinators	4.2 Technology Interoperability	4.3 SBCTA Leadership to Customer-focused, Technology-Enabled Multimodalism
Federal	Congestion Mitigation Air Quality Program							
	Surface Transportation Block Grant Program							
	FTA 5307							
	FTA 5337							
	FTA 5339							
State	Affordable Housing and Sustainable Communities							
	Low Carbon Transit Operations Program							
	Transit Intercity Rail Capital							
	SB1 Solutions for Congested							
	SB1 Local Partnership Competitive Funds							
	SB1 Local Partnership Formula							
	SB1 Local Streets and Roads							
	State Partnership Planning Grant Active Transportation Program							
TDA	Article 3 - Pedestrian and Bicycle Allocation							
	State Transit Assistance Fund							
	Local Transportation Fund							
Misc. State	California Air Resources Board - Air Quality Improvement Program (Various) <sup>1</sup>							
	California Environmental Commission (Various) <sup>1</sup>							
	Mobile Source Air Pollution Reduction Review Committee (MSRC) Local Government							

<sup>1</sup> Various programs under this agency can fund several strategies.

# Appendix B — Inventory of Public and Shared-Ride Transportation in the San Bernardino Valley, January 2017

Transportation Mode/ Agency		Transportation Mode Connecting Within the San Bernardino Valley	Transportation Service Area(s)	1. Agency Website 2. Trip Planning Portal, if applicable
<b>Transit Bus Services</b>	<b>Omnitrans</b>	25 local fixed routes 2 express routes 1 Bus Rapid Transit (BRT) corridor 5 Community circulators 1 ADA complementary paratransit	San Bernardino Valley	1. <a href="http://www.omnitrans.org">www.omnitrans.org</a> 2. <a href="http://www.omnitrans.org/getting-around/plan-a-trip/trip-planner">www.omnitrans.org/getting-around/plan-a-trip/trip-planner</a>
	<b>Foothill Transit</b>	4 local fixed routes 4 commuter express routes	Chino, Montclair	1. <a href="http://www.foothilltransit.org">www.foothilltransit.org</a> 2. trip planner on all web pages
	<b>RTA</b>	2 commuter express routes	Montclair, Ontario, San Bernardino	1. <a href="http://www.riversidetransit.com">www.riversidetransit.com</a> 2. <a href="http://www.riversidetransit.com/index.php/riding-the-bus/plan-my-trip">www.riversidetransit.com/index.php/riding-the-bus/plan-my-trip</a>
	<b>Mountain Transit</b>	2 commuter routes	San Bernardino, Arrowhead, Big Bear	1. <a href="http://www.mountaintransit.org">www.mountaintransit.org</a> 2. <a href="http://www.mountaintransit.org">www.mountaintransit.org</a>
	<b>VVTA</b>	2 commuter routes	San Bernardino, Victorville, Barstow	1. <a href="http://www.vvta.org">www.vvta.org</a> 2. <a href="http://www.realtime.vvta.org/InfoPoint">www.realtime.vvta.org/InfoPoint</a>
	<b>Pass Transit</b>	1 local fixed route 1 commuter express route	Beaumont, Banning	1. <a href="http://www.ci.beaumont.ca.us/index.aspx?NID=90">www.ci.beaumont.ca.us/index.aspx?NID=90</a> OR <a href="http://www.ci.banning.ca.us/351/Bus-Schedules">www.ci.banning.ca.us/351/Bus-Schedules</a> 2. not available
<b>Rail</b>	<b>Metrolink</b>	3 commuter rail lines: <b>San Bernardino Line</b> (19 weekday round-trips, 10 Sat. round-trips, 7 Sunday round-trips) <b>Riverside Line</b> (6 weekday round-trips) <b>Inland Empire/Orange County Line</b> (4 weekday round-trips; 2 weekend round-trips)	San Bernardino, Los Angeles, Orange	1. <a href="http://www.metroinktrains.com">www.metroinktrains.com</a> 2. <a href="http://www.metroinktrains.com">www.metroinktrains.com</a>
<b>Active Transport</b>	<b>Bicycle</b>	77 miles Class I 261.46 miles Class II 75.04 miles Class III	Countywide (SCAG figures)	<a href="http://www.mapmyride.com/us/san-bernardino-ca/">www.mapmyride.com/us/san-bernardino-ca/</a>
<b>Rideshare</b>	<b>Carpool</b>	2 carpool incentive programs, Guaranteed Ride Home; confidential database tool by IE511	Countywide	<a href="http://www.ie511.org/rideshare/incentives">www.ie511.org/rideshare/incentives</a>
	<b>CarShare</b>	<i>Car2Go and ZipCar, among others, do not yet have a presence in the San Bernardino Valley.</i>		
	<b>Vanpool – VVTA and SBCTA</b>	Organized vanpool programs	Countywide	<a href="http://www.enterpriserideshare.com/vanpool/en/AboutUs.html">www.enterpriserideshare.com/vanpool/en/AboutUs.html</a> <a href="http://www.vride.com">www.vride.com</a>
	<b>Park-and-Ride lots</b>	21 agency owned park-and-ride lots listed by IE511; does not include informal park-and-ride lots.	Countywide	<a href="http://www.ie511.org/rideshare/park-and-ride">www.ie511.org/rideshare/park-and-ride</a>
<b>Ride Hailing Services</b>	<b>Transportation Network Companies (TNCs)</b>	Uber and LYFT both have a growing presence in the San Bernardino Valley.	Region-wide	<a href="http://www.uber.com/cities/inland-empire/">www.uber.com/cities/inland-empire/</a> <a href="https://www.lyft.com/cities/inland-empire">https://www.lyft.com/cities/inland-empire</a>
	<b>Taxis</b>	Local taxi operations exist; the largest is Yellow and Bell Cab San Bernardino.	San Bernardino Valley	<a href="http://www.sbycab.com/">www.sbycab.com/</a>