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What is "First and Last Mile"

First and last mile is the experience that links people to and from transit and connects their origins and destinations. Whether it’s a trip to work, shopping, or a lift home, public transportation rarely stops directly in front of a passenger’s origin or destination. That’s why transit users often rely on other ways to get to and from their bus stop or train – like walking, biking or using a wheelchair or skateboard, among other things. These types of connections are referred to as “first and last mile” methods of travel, although actual distances are of course different for every person. Most importantly, this study is not about the transit service experience itself.

While the emphasis is on improving the pedestrian and bicycling environment around bus and transit stations, there are numerous other strategies that can close this first and last mile gap. These various strategies are discussed in Chapter 3.
Purpose of the Plan

This regional First and Last Mile Mobility Plan (Plan) is a collaboration between Riverside Transit Agency (RTA), Southern California Association of Governments (SCAG), and Caltrans. The goal of the plan is to increase transit ridership through developing strategies that address first and last mile barriers to transit use.

This plan:

- Summarizes RTA’s existing ridership characteristics
- Highlights the future needs of RTA’s customers
- Develops a set of Station Typologies to characterize all 2,500+ stations
- Identifies various strategies to improve First and Last Mile access
- Identifies Pilot Projects for each Station Typology
- Develops recommendations and templates for each Station Typology
- Provides an Implementation Plan

It is believed that more people would take transit if it were more convenient, safe, and attractive to ride. The objective of the Plan is to provide improved access to transit to both retain existing and add potential new transit users. This will be achieved by identifying real or perceived barriers from residential and commercial areas to transit origins and destinations, and designing cost-effective improvements to reduce or remove these barriers.

The first and last mile strategies developed in this study will be applied as templates to a small number of pilot locations (representative station types) that can then be replicated in other similar locations throughout the RTA service area.

The term station is used throughout this plan to cover the range of transit stops from basic bus stops to transit centers (mobility hubs).
Station Network Strategy

Identifying the footprint of each station is based on Southern California and national level best practices for first and last mile accessibility. Since the actual distance of a transit user’s first and last mile will vary, catchment areas are developed to provide a study area footprint for first and last mile strategies. Pedestrian access and improvements are established using a half-mile or a 10-minute walking distance from a bus, train or transit stop. For bicycle access and improvements, a three-mile or a 15-minute bicycling distance is used. The bicycle catchment area becomes the overall footprint for station analysis due to its larger footprint and options for transit users who may walk farther than the half-mile. Figure 1-1 depicts how the catchment area is developed.

While it’s safe to say that a radius of the catchment area will encompass a large area, it’s not indicative of a street network that pedestrians and bicycles traverse. There are often barriers within this catchment area that may not allow the full half-mile or three-mile access to a bus stop, train or transit station to exist. Many cities in Riverside County have a curvilinear street network that forces pedestrian and bicyclists onto major arterials which may not have the best walking and bicycling environments. In many cases, it makes their trip to a transit stop even longer (See Figure 1-2).

The analysis for this plan used Geographic Information Systems (GIS) and the street network to accurately reflect the walking and bicycling access to these various transit stops. This methodology also allows before and after analysis based on recommended improvements. Figure 1-3 shows the differences in the catchment area coverage using the street network versus a standard radial buffer.

Figure 1-1: Development of a Catchment Area

Figure 1-2: Curvilinear Network vs Traditional Street Grid

Figure 1-3: Comparison of Catchment Area Coverage
Figure 1-3: Radial Buffer vs Street Network
Bicycle and Pedestrian Related Collision Analysis

A goal for this plan is to assist in reducing the number of bicycle and pedestrian related collisions near transit stations and bus stops. As more people choose walking and bicycling as a mode of transportation, or in some cases, have no option to drive, it is important to address the barriers that could make their trips safer. A collision analysis was performed to provide a snapshot of the collisions occurring within the pedestrian and bicycle catchment area. Data from the California Highway Patrol’s 2011-2015 Statewide Integrated Traffic Records System (SWITRS) was used for this analysis.

Pedestrian collisions were collected within the half-mile catchment area and bicycle related collisions were collected within the three-mile catchment area, respectively. As the data and corresponding maps show, collisions are higher in the cities that also have higher transit usage, such as Riverside, Corona, Moreno Valley and Hemet. Overall, this highlights the need to improve first and last mile connectivity in the more transit-dependent cities. However, to improve safety and access overall, first and last mile improvements should be made around all transit stations and bus stops.

<table>
<thead>
<tr>
<th>CITY NAME</th>
<th>HALF-MILE PEDESTRIAN CATCHMENT AREA</th>
<th>THREE-MILE BICYCLE CATCHMENT AREA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PEDESTRIANS INJURED</td>
<td>PEDESTRIAN FATALITIES</td>
</tr>
<tr>
<td>Banning</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Beaumont</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Canyon Lake</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Corona</td>
<td>35</td>
<td>4</td>
</tr>
<tr>
<td>Eastvale</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Hemet</td>
<td>96</td>
<td>9</td>
</tr>
<tr>
<td>Jurupa Valley</td>
<td>66</td>
<td>9</td>
</tr>
<tr>
<td>Lake Elsinore</td>
<td>29</td>
<td>4</td>
</tr>
<tr>
<td>Menifee</td>
<td>17</td>
<td>2</td>
</tr>
<tr>
<td>Moreno Valley</td>
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<td>8</td>
</tr>
<tr>
<td>Murrieta</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>Norco</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Perris</td>
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<td>3</td>
</tr>
<tr>
<td>Riverside</td>
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<tr>
<td>San Jacinto</td>
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</tr>
<tr>
<td>Temecula</td>
<td>39</td>
<td>3</td>
</tr>
<tr>
<td>Wildomar</td>
<td>9</td>
<td>1</td>
</tr>
<tr>
<td>Grand Total</td>
<td>863</td>
<td>74</td>
</tr>
</tbody>
</table>
Figure 1-4: Bicycle and Pedestrian Collision Heat Map

Source: County of Riverside GIS, SWITRS
RTA Ridership Characteristics

RTA’s Comprehensive Operational Analysis (COA), a detailed study of RTA transit services completed in January 2015, included surveys that provided valuable insight into the needs and behaviors of RTA’s diverse customer base. Compared with the general population of Riverside County, the COA identified RTA riders as younger and having slightly lower household incomes, with the majority of RTA passengers (66%) being under the age of 35. In addition, 74% of riders reported using RTA buses at least three days per week, and the majority of RTA passengers (80%) access transit by foot. These rider characteristics indicate that many RTA riders are dependent on transit service and further necessitate the need for first and last mile facilities.

Factors influencing these demographic data, particularly the preponderance of young and lower income customers, are unclear. One reason might be the nation-wide trend among young people (those under 35) of reduced automobile use and ownership, and increased attraction to compact urban environments offered by city and town centers. Another reason might be RTA’s transit pass programs for major colleges and other employers. Whatever the cause of these trends, first and last mile mobility options are required for those who cannot afford, cannot operate, or choose to forgo vehicle ownership. Demand for these mobility options will only increase with population and employment growth projected for the service area.

2/3 of riders have access to only one vehicle at home or none at all

80% of riders walk or bike to and from their bus stop

74% of riders use RTA buses at least three days a week

46% of ridership consists of students

35% College Students

11% High School Students
RTA COA Market Assessment

RTA's COA Market Assessment used demographic and land use patterns to identify existing transit markets and the need for additional transit service in the RTA service area in the future. As part of this effort, RTA identified employment patterns in RTA's service area and specific locations with high employment density.

According to this report, more than one third of the 1.7 million residents and quarter million jobs in western Riverside County are located in the cities of Riverside, Corona, and Moreno Valley. These three cities have more diverse land uses, higher development densities, and more locally-based employment opportunities when compared to the rest of RTA's service area.

The RTA COA Market Assessment also pointed out several locations within communities that are key employment centers. Key commercial developments in the service area with substantial employment include Moreno Valley Mall, Hemet Valley Mall, the Galleria at Tyler, and the Promenade Mall in Temecula. Important industrial and business parks include the Temecula Business Park and the industrial business parks between Perris and Moreno Valley. Downtown Corona, Downtown Riverside, and Downtown Hemet also have significant employment.

Future employment growth in Western Riverside County is projected to largely remain within community centers and schools. Growth in the undeveloped areas between community centers should be minimal. However, the rate of employment growth will be highest in suburban areas. Key future employment centers include the area around the Riverside County Regional Medical Center and Murrieta along I-15 and I-215.

As both population and employment growth come to RTA's service area, increased transit service and first and last mile strategies will be needed throughout; transportation networks focused solely or even primarily on automobile travel will no longer suffice. Similar to regional connections, strategies will likely differ based on context (i.e. land use, demographics, population density, and employment density).

Figure 1-5: RTA Service Area and Key Employment Centers

Source: RTA Market Assessment
RCTC Strategic Assessment

Riverside County Transportation Commission (RCTC) published its Strategic Assessment in January 2016. The purpose of this Assessment is to examine Riverside County’s needs for transportation investments considering factors such as changing socioeconomic trends, local funding, evolving state and federal policies, and public and stakeholder needs. Among its findings, the Assessment contains research on regional travel and employment patterns in Riverside County.

Riverside County has the lowest jobs-housing ratio in the Southern California Association of Governments (SCAG) region which means many County residents are required to commute outside of the County for employment. This current imbalance in jobs and housing further necessitates the need for first and last mile solutions at Metrolink stations, which provide the majority of transit access outside of Riverside County to the employment-rich areas of Los Angeles and Orange Counties.

In the future, the Perris Valley Line may relieve parking demands and increase capacity at the Downtown Riverside station; the station will also be affected by the City of Riverside’s upcoming specific plan for the area and a potential RTA transit center in the vicinity. Furthermore, La Sierra Station will be expanded by mid-2017 and will include an adjacent transit-oriented development (TOD) which can increase demand at the station.

Figure 1-6 highlights the changes between existing and future commute trips within and from Riverside County.

Figure 1-6: Percent of Trips (All Modes) made entirely within Riverside County

Source: RCTC Strategic Assessment Metrolink
Bicycling and Walking Benefits

Numerous environmental, health, and economic benefits are attributable to bicycling and walking, especially as a substitute for driving a vehicle. This section summarizes these benefits from research by the Pedestrian and Bicycle Information Center (PBIC).

Environmental Benefits

Increased bicycling and walking reduces fossil fuel emissions. In California, 40% of carbon dioxide (CO₂) emissions are produced by the transportation sector. While CO₂ is not the most harmful greenhouse gas, it is the most abundant. Even after accounting for the global warming potentials of other greenhouse gases (comparing them in terms of CO₂), 95% to 99% of vehicle emissions are CO₂.

Health Benefits

Despite dramatic strides in recent decades through regulations and technological improvements, vehicle emissions still pose a significant threat to human health. Vehicle generated air pollution contains harmful greenhouse gas emissions including carbon dioxide, carbon monoxide, methane, nitrous oxide and volatile organic compounds. These pollutants and irritants can cause asthma, bronchitis, pneumonia and decreased resistance to respiratory infections. Taking steps to reduce these emissions is particularly important in the United States, which leads the world in petroleum consumption. The conversion of driving to bicycling or walking offers a great opportunity to reduce emissions and improve public health.

In addition to the universal public health benefit, such as improved air quality, bicycling and walking has the potential to positively impact personal health. A significant percentage of Americans are overweight or obese and projections indicate 42% of the population will be obese by 2030. To combat this trend and prevent a variety of diseases and their associated societal costs, the Center for Disease Control (CDC) suggests a minimum of 30 minutes of moderate intensity physical activity five days per week. Not only does bicycling and brisk walking qualify as “moderate intensity activities,” they can also be seamlessly integrated into daily routine, especially if chosen for utilitarian purposes like accessing transit or running errands.

Other health benefits associated with moderate activity like bicycling or walking include improved strength and stamina through better heart and lung function. Regular exercise reduces the risk of high blood pressure, heart attacks and strokes. In addition to heart disease, regular exercise can also help to prevent other health problems such as non-insulin dependent diabetes, osteoarthritis and osteoporosis. Lastly, exercise has been shown to improve mental health by relieving depression, anxiety and stress.

Active commuters lose an average of 13 lbs in their first year of cycling to work.
Economic Benefits

Bicycling infrastructure and programs have increasingly been shown to deliver economic benefit to both individuals and society at large. The benefits of bicycling may in fact outweigh its costs. Bicycling and utilitarian bicycling in particular, offers obvious cost savings to individuals. Beyond the up-front cost of operating a vehicle are additional maintenance, insurance, and often parking expenses.

Converting even a fraction of automobile trips to bicycling, walking or transit trips can create significant transportation-related savings, including reduced vehicle traffic congestion. Increased bicycling and walking also translates to health-related savings, for both individuals and taxpayers, in the form of less need for preventative care. More bicycling and walking has also been tied to increases in commercial and residential property values and retail sales. Shoppers who reach their destination by bicycle have been shown to make smaller purchases, but shop more often and spend more money overall. Shoppers who arrive by bicycle or on foot, by virtue of their more limited range, are more likely to support local businesses, and do not require a vehicle parking spot.

Perhaps more compelling than reducing GHG emissions or combating the obesity epidemic is the benefits bicycling has to offer in terms of quality of life. Bicycling, and especially utilitarian bicycling, is increasingly seen as a fun, low-cost, healthy, and sustainable way of getting around. How can we make it easier for people to choose a bicycle for his or her daily trips?

In an effort to re-position bicycling as a safe and common mode of transportation and increasing the number of people bicycling, especially to access transit, attention needs to be shifted away from creating “cyclists” and toward making it easier for any person to choose bicycling for their everyday trips. Research shows a strong latent interest in bicycling among those who identify as “interested, but concerned.” These individuals do not identify themselves as “cyclists,” but they do not necessarily need to do so to benefit from programs to encourage bicycling. While all segments of the population may be encouraged to ride, it is through the encouragement of this “interested, but concerned” segment of the population the greatest gains in mode share will be made.

Houses in areas with above levels of walkability command a $4,000 to $34,000 premium over houses in average areas.

The annual cost of owning a car and driving 15,000 miles a year is over $9,000.

Source: American Automobile Association
Pedestrian - Bicycle Barriers and Solutions

There are a number of physical and institutional barriers that prevent safe walking and bicycling to transit. Common situations include a lack of safe and comfortable sidewalks, crossings, and bicycle facilities, as well as deficient policies and coordination. In most cases, many roadways and signal systems were designed to accommodate high volume, high speed vehicular traffic, without considering the needs of all roadway users.²

**Pedestrian Barriers**

In general, pedestrians are at risk whenever they cross the roadway. However, these risks depend on the complexity of the vehicular and pedestrian traffic patterns and the effectiveness of supplementary information provided regarding the crossing location, direction, and duration.³ In addition to the physical design of roadways and intersections, the information available to pedestrians also has an impact on their safety. Complex crossings need to have accessible information about their location, direction, and duration. Physical or movement barriers are anything that restricts a person’s ability to physically move along the sidewalk and crosswalk environments. Common movement barriers for pedestrians include:

- Long crossing distances
- Short signal timing
- Medians and islands without ramps or cut-throughs
- Curbs without curb ramps
- Curbs without level landing
- Pedestrian actuated signal devices that are difficult to activate or reach
- Lack of information during pedestrian signal phase

Pedestrian safety can be improved by providing adequate access at intersections and crossings. Strategies that can help improve pedestrian conditions include increasing crossing times, reducing crossing distances and visibility with curb extensions, installing curb ramps and pedestrian refuges, as well as clarifying pedestrian areas with truncated domes and reducing traffic speed. Traffic and pedestrian signal devices that provide accessible information are also important to eliminate any information barriers.

Figure 1-7: Common Pedestrian Barriers
Bicycle Barriers

Most bicyclists feel high levels of stress while riding on busy streets, which makes them less desirable and may discourage people from biking on them. Building bicycle facilities is key to encouraging more bicycling and reducing the number of serious bicycling crashes and injuries. Traditionally, bicyclists have been seen as pedestrians, which has led to undesirable situations where bicyclists were being underserved by inadequate facilities. Many roadway designs, whether constructed decades ago or quite recently, have prioritized driver comfort and safety over pedestrian and bicyclist comfort and safety. Observed characteristics of disconnected networks for non-motorists included:

- Wide, multi-lane roads without high-quality bicycle facilities
- Lack of marked crossings at intersections or mid-block crossings
- Gaps in sidewalks and bicycle facilities that create risk and limit ability for users to safely travel to and from destinations
- Constrained rights of way preventing construction and development of bike facilities
- Intersection designs that may not account for pedestrian and bicyclists, making it difficult to cross
- Roadways with an excessive number of driveways, creating potential conflict points, and poor visibility

Creating a safer bicycling environment involves more than striping a bike lane or building a separated path. A safe bicycling network involves all aspects of safety, from signage and mapping that alerts riders to the level of skill necessary on a facility to the details of the design.

Cities that have adopted bicycle master plans can prioritize bicycle improvements to transit stations or bus stops to provide first and last mile connectivity.

Figure 1-8: Common Bicycle Barriers
Summary of Existing Plans

This First and Last Mile Mobility Plan finds support for its facilities and program recommendations in existing adopted plans. The following plans below summarize the main research most relevant to this plan.

**Riverside Transit Agency (RTA)**
- Comprehensive Operational Analysis (COA) including RTA Market Assessment

**Western Riverside Council of Governments (WRCOG)**
- Sustainability Framework (2012)
- Non-Motorized Active Transportation Plan (ongoing)

**Riverside County**
- Riverside County Integrated Project (RCIP)

**Los Angeles County Metropolitan Transportation Commission (Metro)**
- First Mile Last Mile Strategic Plan & Planning Guidelines

**Orange County Transportation Authority (OCTA)**
- Nonmotorized Metrolink Accessibility Strategy

**OmniTrans**
- Transit Design Guidelines

**San Diego Association of Governments (SANDAG)**
- Safe Routes to Transit Initiative
Applicable Legislation

Several pieces of legislation support increased bicycling and walking in the State of California. Much of the legislation addresses greenhouse gas (GHG) reduction and employs bicycling and walking as means to achieve reduction targets. Other legislation highlights the intrinsic worth of bicycling and walking and treats the safe and convenient accommodation of cyclists and walkers as a matter of equity. The most relevant legislation concerning bicycle and pedestrian policy, planning, infrastructure, and programs are described in Appendix B.

Notes

Introduction

Introduction
What We Heard
Public Outreach

Public input is a central component to identify barriers to walking, bicycling, and use of other non-motorized modes to and from transit stations and bus stops. In order to create a successful plan, RTA engaged a range of project stakeholders and residents, particularly those who drive alone to work and those currently using transit. Stakeholder and resident feedback is essential in identifying solutions that will be effective and appealing to existing and potential transit users. The public outreach process included the following meetings and events:

- Three (3) steering committee meetings
- Four (4) public workshops/events
- Six (6) Station Surveys
- Three (3) RTA Board meetings (progress, updates, and final plan)
- Survey (hard copy and online)

The meetings were in two general phases:
1. Introducing the project/gathering input
2. Share draft strategies
3. Review draft recommendations

Figure 2-1: Meeting Schedule
Steering Committee Meetings

Steering committee meetings include stakeholders from cities in the RTA service area including RCTC, RTA, and WRCOG. The goal of these meetings was to gather focused input from stakeholders on the project approach, and identify issues and concerns. These meetings were held in two parts, using the existing WRCOG committees that meet on the same day each month:

- Planning Directors Committee
- Public Works Directors Committee

The following outlines the steering committee meetings and the First and Last Mile Mobility Plan topics presented.

- April 14, 2016: Introduce the project and gather any initial input on scope of work, schedule, and outreach events
- July 14, 2016: Share analysis, outreach summary, and receive input on draft strategies and pilot study stations
- October 13, 2016: Share pilot study station analysis and gather input

Survey

To gather input, a survey was developed for hard copy and online distribution. In order to engage the most participation, the survey was brief with photo samples to guide the questions. A $100 gift card raffle was used to encourage participation. To accompany the survey, an online mapping survey was also made available for those that wanted to provide additional input, especially geographically located opportunities and constraints.

The survey consisted of questions aimed at identifying the most common physical barriers that prevent people from using transit. Photos of a barrier were accompanied by photos of improvements to clearly depict issues and possible solutions. The survey was intended to be short and concise so participation could be quick and simple. There were a total number of 928 respondents to the survey during the five months it was available.

Survey Results

The following briefly summarizes the results of the survey. See Appendix B to review all the comments collected from the survey.

Figure 2-2: Common Issues

<table>
<thead>
<tr>
<th>Issue</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Missing Sidewalks</td>
<td>55%</td>
</tr>
<tr>
<td>Personal Safety</td>
<td>47%</td>
</tr>
<tr>
<td>Poor Connectivity</td>
<td>38%</td>
</tr>
<tr>
<td>Automobile Traffic</td>
<td>37%</td>
</tr>
<tr>
<td>Unsafe Crossings</td>
<td>33%</td>
</tr>
</tbody>
</table>

“Do you experience any problems walking, cycling or accessing transit at a particular location or along a particular route?”

- Yes: 64%
- No: 36%
Outreach Events

Community Events

Four community events were held between Spring 2016 and Winter 2017. At these events, RTA’s presence included hosting a booth to collect surveys, hand out fact sheets and discuss any concerns transit users have accessing their bus stop or transit stations. As part of these events, snacks, giveaways and bus information was handed out to encourage participation.

• June 15, 2016, Riverside Summerfest, Arlington Park, Riverside, CA
• July 30, 2016, Backpack Giveaway, Sky View Elementary School, Perris, CA
• December 10, 2016, Breakfast with Santa, Fire Station 61, Wildomar, CA

Station Surveys

Additional outreach was conducted at various stations to hand out surveys and generally discuss barriers to public transit. Station Surveys were conducted at the following locations:

July 27, 2016

• Riverside City College bus stops, 4800 Magnolia Avenue, Riverside, CA 92506
• Riverside Downtown Terminal, 4066 Vine St, Riverside, CA 92507-4223

July 29, 2016

• Galleria at Tyler Mall, 1299 Galleria at Tyler, Riverside, CA 92503
• Corona Transit Center, 51 E Grand Blvd, Corona, CA 92879

August 2, 2016

• Perris Transit Center, South C Street, Perris, CA
• Moreno Valley Mall Transit Center, 22500 Town Cir, Moreno Valley, CA 92553
Figure 2-3: Survey Response Density Map

Source: County of Riverside GIS, RTA First and Last Mile Mobility Plan
"Install bike racks that hold 3 or more bikes. I have had issues not being able to ride the bus home when the 2 bike rack is full."

"Place closer stops to where one lives. For example, I get drop off at Van Buren when I need to get to Harold."

"Need more sidewalks and bike lanes, especially on the busy/main streets."

"More curb-side parking areas or parking in general around bus stops would probably be helpful for those who get picked up, take Uber, etc. to their final destination."

"Please improve waiting areas here. People are literally standing on the street while waiting for a bus."

"Add more bus shelters for shade."

"Need more benches at the stops."

"The distances between stops can be really really far! I now know but wow and I walk 3+ miles daily. More stops please."

"There's a lot of areas where the bike lane ends and then it continues a few blocks down. I feel it would be beneficial to fill in those gaps and connect the bike lanes."

"...many clients express their concerns of the homeless and individuals drinking at many of these stops. They have also mentioned that this is one of the main reasons they have not ridden the bus..."

"I have noticed several bus stops around my town that are located in areas with no sidewalk, just dirt. Makes it difficult for people in wheelchairs to use these stops."

"If there is a bus stop, please put benches for the riders; especially with the elderly who are unable to stand for any length of time. Protective covers over the benches will help with the summer exposure (heat)...."
First & Last Mile
Typologies and Strategies
Station Typology Development

This chapter provides a brief description of the development of station typologies and the data-driven process used to select stations for pilot studies. To better understand pedestrian and bicycle issues throughout RTA’s system, all stations were organized into six categories corresponding to six common environments for walking and bicycling to and from stations and bus stops. These categories were based primarily on the existing land-use and transportation characteristics of the areas surrounding the stations. Due to the size of the catchment area and data limitations, analysis was performed with datasets that were readily available.

Categorizing the stations into typologies allows an understanding of the range of conditions that exist throughout RTA’s service area. These typologies will assist in developing the various treatments and strategies (or “tools”) for each station type that will provide guidance on improving first and last mile conditions around stations and bus stops.

The steps for typology development and classification were:

1. Regional data collection
2. GIS analysis
3. Typology Development
4. Station Ranking

Grouping Analysis

To enable the assessment of each station’s surroundings, the three-mile catchment area was used. Once catchment areas were fully matched with demographic and transportation characteristics, a GIS-based grouping analysis was performed in an attempt to identify natural clusters in the data and group features with similar attributes. This process separates the data into a specified number of natural groups by first selecting a random point, then selecting the remaining points that are farthest in the data from the initial point as well as from each other. Groups are then developed around these initial points with the goal of maximizing similarities within groups, and maximizing differences between groups. The grouping analysis was used to inform initial transit stop typology categories.
Typology Development

Transit stop typologies were assigned to stations based on guidance from the 2014 RTA Market Assessment document as well as spatial analysis. Stations explicitly called out in these documents were classified into their respective typology. For stations not referenced in either document, land use and population density were used for typology classification.

Results of the grouping analysis were also used in dealing with unclassified stations as the patterns in several of the groups closely mirrored RTA typologies. This allowed the classification of remaining stations. Due to the complexity of the analysis performed in testing and identifying data driven characteristics, general typology characteristics were eventually developed using a combination of the data and typical attributes from each station type, such as transit supported land use, population and employment densities, vehicle ownership, transit service and total ridership. Table 3-1 displays the various datasets available for typology development.

While not every station will match every general characteristic, they will tend to share most of them. Following RTA’s review of the station typologies several small areas were reanalyzed by re-running the grouping analysis, updating available land use datasets and input from RTA. Descriptions of station typologies can be found in Table 3-2 and distribution of each typology can be seen in Figure 3-2.

The data collected through this process was also used for pilot project prioritization.
<table>
<thead>
<tr>
<th>DATASET</th>
<th>SOURCE</th>
<th>PROCESSING NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boardings</td>
<td>TMD, Received Jan 2016</td>
<td>Toted for each catchment area</td>
</tr>
<tr>
<td>Alightings</td>
<td>TMD, Received Jan 2016</td>
<td>Toted for each catchment area</td>
</tr>
<tr>
<td>Average Route Frequency</td>
<td>Riverside Transit Authority, 2015</td>
<td>For routes with no frequency information, route schedules were consulted and averaged for each catchment area</td>
</tr>
<tr>
<td>Land Use Mix</td>
<td>Riverside County RCIT-GIS 2016, General Plan Land Use</td>
<td>Land use data was generalized and restricted to transportation supportive uses</td>
</tr>
<tr>
<td>% No Car</td>
<td>US Census Block Groups, 2014 American Community Survey. Means of Transportation to Work, Workers 16 Years and Over (B08301)</td>
<td>Census data was allocated based on the percentage of the block group intersecting the catchment area</td>
</tr>
<tr>
<td>% Bicycle to Work</td>
<td>US Census Block Groups, 2014 American Community Survey. Means of Transportation to Work, Workers 16 Years and Over (B08301)</td>
<td>Census data was allocated based on the percentage of the block group intersecting the catchment area</td>
</tr>
<tr>
<td>% Walk to Work</td>
<td>US Census Block Groups, 2014 American Community Survey. Means of Transportation to Work, Workers 16 Years and Over (B08301)</td>
<td>Census data was allocated based on the percentage of the block group intersecting the catchment area</td>
</tr>
<tr>
<td>% Public Transit to Work</td>
<td>US Census Block Groups, 2014 American Community Survey. Means of Transportation to Work, Workers 16 Years and Over (B08301)</td>
<td>Census data was allocated based on the percentage of the block group intersecting the catchment area</td>
</tr>
<tr>
<td>% Students</td>
<td>US Census Block Groups, 2014 American Community Survey. School Enrollment by Detailed Level of school for the Population 3 Years and Over (B14007)</td>
<td>Census data was allocated based on the percentage of the block group intersecting the catchment area</td>
</tr>
<tr>
<td>Population Density</td>
<td>US Census Block Groups, 2014 American Community Survey. Total Population (B01003)</td>
<td>Census data was allocated based on the percentage of the block group intersecting the catchment area</td>
</tr>
<tr>
<td>Major Employers: # Employees</td>
<td>RCTC, Received Jan 2016</td>
<td>Toted for each catchment area</td>
</tr>
<tr>
<td>Intersections per Mile</td>
<td>Riverside County RCIT-GIS, 2016</td>
<td>GIS geo-processing tools were used to generate points for each intersecting vertex. Vertices were then totaled and divided by the total road segment length (per mile) per catchment area</td>
</tr>
<tr>
<td>Average Segment Length</td>
<td>Riverside County RCIT-GIS, 2016</td>
<td>Averaged for each catchment area</td>
</tr>
</tbody>
</table>
Station Typologies

This next step identifies transit stations and bus stops for further study and analysis that are representative of each typology. While not every station was identical within each typology, most shared a majority of the characteristics. This section briefly highlights the process used for selecting top ranked stations for each typology.

One station from each typology was selected as a pilot study location, addressing access issues and possible solutions. These pilot studies aim to provide jurisdictions in RTA's service area a template and process for improving first and last mile connections in the various representative conditions across the RTA service area. These templates, found in Chapter 4, can be used if adjacent development or redevelopment occurs in the future, or if a city's capital improvements project is identified near transit stations and bus stops. The following are the descriptions for each of the six typologies.

**Urban Core**

The urban core typology is represented by a station that has the highest number of activity centers and highest population and employment densities within its catchment area. In addition, a low auto-centric grid street system and mixed land use in conjunction with higher transit frequencies and more routes are common features for this typology. Within the grid street system, short block lengths and connected walking and bicycling facilities are also common. Similar to most urban areas, it has the highest rates of transit ridership and high use of alternative modes of transportation.

**Core**

Just outside the Urban Core, the Core typology is defined with having moderate levels of activity centers, with high densities of population and employment. While some areas within the catchment area may have a grid street pattern with short block lengths, there are more curvi-linear, high speed arterial connections. Development patterns are more auto-centric with less mixed use. While transit ridership may still be high, average transit frequencies are lower than Urban Core and there are less route options. There also tends to be high bicycle and walking rates as a form of transportation.

**Suburban**

The Suburban typology is commonly defined by moderate to low density single family residential with non-linear street patterns and very little land use mix. Demographically, it consists of low-to-moderate population and employment densities and low commuter transit ridership. Due to the nature of the street network, many pedestrian and bicycle facilities are either poorly or not connected. This auto-centric typology overall supports moderate transit ridership, transit frequency rates, and route options.

**Rural**

Rural stations (bus stops) are defined as being remote or in an underdeveloped area outside a city. These rural stations have minimal to non-existent bicycle and pedestrian infrastructure and are surrounded by low density development patterns, mostly residential. Transit frequencies and transit use are fairly low along with non-motorized commuting trips and population and employment densities.

**Commercial**

The Commercial typology is typical of Southern California commercial developments. They're distributed along major corridors or concentrated within one particular area, with large quantities of parking and minimal to non-existent bicycle connectivity. Some of these commercial areas may also include community services, such as recreation centers and even municipal buildings. These stations have moderate levels of population and employment densities. There is very low land use mix, with low-density residential or industrial land uses typically adjacent to these commercial centers.

**Industrial and Business Parks**

The Industrial and Business Park typology typically utilizes large areas of land which limits the diversity of land uses. Stations (bus stops) along this typology have low boarding and alighting levels due to the longer block lengths, larger arterial roads, higher truck volumes and low to non-existent pedestrian scale lighting. There are moderate levels of non-motorized commute trips with moderate to high levels of population and employment densities.
### Table 3-2: Station Typologies

<table>
<thead>
<tr>
<th>Description</th>
<th>URBAN CORE</th>
<th>CORE DISTRICT</th>
<th>SUBURBAN</th>
<th>RURAL</th>
<th>COMMERCIAL DISTRICT</th>
<th>INDUSTRIAL AND BUSINESS PARK</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Highest number of activity centers</td>
<td>Located just outside of urban core</td>
<td>Moderate to low density single family residential development</td>
<td>Remote or underdeveloped area outside of the city or town</td>
<td>Commercial development distributed along a major corridor or concentrated within an area</td>
<td>Facilities typically utilize large areas of land which limits the diversity of land uses</td>
</tr>
<tr>
<td></td>
<td>Highest population &amp; employment densities</td>
<td>Moderate densities</td>
<td>Non-linear street patterns</td>
<td>Minimal or non-existent pedestrian facilities</td>
<td>Low density development patterns</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Low auto-centric development patterns</td>
<td>More auto-centric development connected by high speed arterials / highways</td>
<td>Disjointed pedestrian facilities</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Existing walking facilities</td>
<td>Grid street network</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Typical Transit Service:**

- **URBAN CORE:** Metrolink / Sub-regional, Community, CommuterLink
- **CORE DISTRICT:** Metrolink / Sub-regional, Community, CommuterLink
- **SUBURBAN:** Sub-regional, Commercial
- **RURAL:** Sub-regional, Community
- **COMMERCIAL DISTRICT:** Sub-regional, Community
- **INDUSTRIAL AND BUSINESS PARK:** Regional, Community

### General Characteristics

<table>
<thead>
<tr>
<th>Frequency of Transit:</th>
<th>10-30 min</th>
<th>30-45 min</th>
<th>45-120 min</th>
<th>30-45 min</th>
<th>30-45 min</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boarding / Alighting Levels:</td>
<td>Very High</td>
<td>High</td>
<td>Moderate</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Land Use Mix. Number of transit supportive land uses within 3-mile network. Can include Mixed-use, Multi-Family, Office, Commercial, Schools, Institutional or Industrial</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very High</td>
<td>High</td>
<td>Moderate (3-4)</td>
<td>Low (1-2)</td>
<td>Low (1-2)</td>
<td>Moderate (3-4)</td>
</tr>
</tbody>
</table>

### Commuting Characteristics

<table>
<thead>
<tr>
<th>Lack of Vehicle Ownership:</th>
<th>High</th>
<th>High</th>
<th>Moderate</th>
<th>Low</th>
<th>Moderate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-Motorized Commuter Trips: Walking and bicycling to work</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High to Moderate</td>
<td>High to Moderate</td>
<td>Moderate</td>
<td>Low</td>
<td>Low</td>
<td>Moderate</td>
</tr>
<tr>
<td>Public Transit to Work:</td>
<td>Moderate (&gt;2%)</td>
<td>Moderate (&gt;2%)</td>
<td>Low (1-2%)</td>
<td>Low (1-2%)</td>
<td>Moderate (&gt;2%)</td>
</tr>
<tr>
<td>Percentage of Students: (High School &amp; College)</td>
<td>High</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
<td>High</td>
</tr>
</tbody>
</table>

### Population Characteristics

<table>
<thead>
<tr>
<th>Employment and Population Densities:</th>
<th>Very High</th>
<th>High</th>
<th>Low to Moderate</th>
<th>Low</th>
<th>Moderate</th>
<th>Moderate to High</th>
</tr>
</thead>
</table>

### Street Network Characteristics (Averages)

<table>
<thead>
<tr>
<th>Block Length (Feet):</th>
<th>Short</th>
<th>Short</th>
<th>Moderate</th>
<th>Long</th>
<th>Moderate</th>
<th>Moderate</th>
</tr>
</thead>
</table>

### Average Station Characteristics

<table>
<thead>
<tr>
<th>Sample Stations:</th>
<th>Downtown Riverside, Perris Transit Station, Florida Corridor (Hemet), Riverside</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Beumont, Banning, Hemet, San Jacinto, Murrieta, Lake Elsinore, Menifee, Sun City, Wildomar, Perris, Corona, Eastvale, Jurupa Valley</td>
</tr>
<tr>
<td></td>
<td>Mead Valley, North Beaumont, Gilman Springs Road, Perris (South)</td>
</tr>
<tr>
<td></td>
<td>Moreno Valley Mall, Hemet Valley Mall, Temecula Town Center, Old Town Temecula</td>
</tr>
<tr>
<td></td>
<td>March JPA, Temecula City Office &amp; Business Park, Perris Blvd (Perris/Moreno Valley), Arlington Ave Riverside Airport, Hunter Park Riverside</td>
</tr>
</tbody>
</table>

| Number of Stations: | 14 | 201 | 882 | 87 | 229 | 158 |
Figure 3-2: Station Typologies Map

Source: County of Riverside GIS, RTA
Pilot Study Station Ranking

A GIS analysis was performed to rank each station as to how well they represent the characteristics of each typology. Using station characteristics data processed in the previous typology exercise, metrics from each characteristic (boardings, means of transportation, demographics, etc.) were ranked and scored from 1-5, with five (5) having the best representation of that characteristic. As part of this process, bicycle and pedestrian collisions were also included as a criteria to highlight the safety needs of first and last mile access. The three-mile bike shed and half-mile walk shed were used to quantify the number of collisions around each station by their respective mode. Stations were only compared to those in each typology, not against all other stations.

Table 3-3 depicts an example of the scoring process using the Urban Core typology as an example. Although Public Transit to Work has a higher range than the 2.55%-2.64% highlighted, the metric for this characteristic is Moderate, therefore the middle ranges were given a high score of five.

Table 3-4 shows another example of a High characteristic for percentage of high school and college students around the station. In this example, any range that falls in the high range of the breaks was given a score of five.

This process continued with all the characteristics and concluded with a creation of a composite score. This scoring method provided station rankings for each typology. Many stations that scored high tended to be very close to each other since they fall within each other’s catchment area of three-miles. In these cases, the next highest ranking stations were then selected to provide a distribution of sample stations across RTA’s service area.

The selection process used prioritized rankings along with input from RTA staff and the Steering Committee, to narrow down the large number of stations to just one recommended station per typology category. Table 3-5 shows a summary of the top stations from the ranking process, their score and area served. The complete list can be found in Appendix E.

<table>
<thead>
<tr>
<th>RANGE: % PUBLIC TRANSIT</th>
<th>CLASSIFICATION WITH % PUBLIC TRANSIT</th>
<th>RANK / POINTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Low</td>
<td>2</td>
</tr>
<tr>
<td>2.17%</td>
<td>2.47%</td>
<td>Low</td>
</tr>
<tr>
<td>2.48%</td>
<td>2.54%</td>
<td>Low-Moderate</td>
</tr>
<tr>
<td>2.55%</td>
<td>2.64%</td>
<td>Moderate</td>
</tr>
<tr>
<td>2.65%</td>
<td>2.73%</td>
<td>Moderate-High</td>
</tr>
<tr>
<td>2.74%</td>
<td>2.75%</td>
<td>High</td>
</tr>
</tbody>
</table>

Table 3-3: Use of Public Transit to Work (Moderate)
Table 3-4: Percentage of High School and College Students (High)

<table>
<thead>
<tr>
<th>RANGE: % STUDENTS</th>
<th>CLASSIFICATION WITH % OF STUDENTS</th>
<th>RANK / POINTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>High</td>
<td></td>
</tr>
<tr>
<td>0.00%</td>
<td>19.10%</td>
<td>Low</td>
</tr>
<tr>
<td>19.11%</td>
<td>19.76%</td>
<td>Low-Moderate</td>
</tr>
<tr>
<td>19.77%</td>
<td>19.87%</td>
<td>Moderate</td>
</tr>
<tr>
<td>19.89%</td>
<td>20.51%</td>
<td>Moderate-High</td>
</tr>
<tr>
<td>20.52%</td>
<td>20.52%</td>
<td>High</td>
</tr>
</tbody>
</table>

COMMUTING CHARACTERISTICS

- Lack of Vehicle Ownership: HIGH
- Non-Motorized Commuter Trips: Walking and bicycling to work: HIGH TO MODERATE
- Public Transit to Work: MODERATE (>2%)
- Percentage of Students (High School & College): HIGH

Figure 3-3: Station Ranking Process Flow Chart

1. Isolation of each Station Characteristic
2. Classification of Values Using Natural Breaks
3. Ranking of Natural Classes
4. Natural Breaks Optimization
5. 1-5; Dependent on Which Class Best Represents the Characteristic
6. Steering Committee Input & Aerial Assessment
7. Final Pilot Study Stations

Repeat for each Station Characteristic
Table 3-5: Candidate Pilot Study Stations

<table>
<thead>
<tr>
<th>STATION NAME</th>
<th>JURISDICTION</th>
<th>AREA SERVED</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>URBAN CORE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>East University NS Lemon</td>
<td>Riverside</td>
<td>Downtown Riverside</td>
</tr>
<tr>
<td>Downtown Terminal Designated Stop</td>
<td>Riverside</td>
<td>Downtown Riverside</td>
</tr>
<tr>
<td>Market NS Tenth</td>
<td>Riverside</td>
<td>Downtown Riverside</td>
</tr>
<tr>
<td>Orange NS Tenth</td>
<td>Riverside</td>
<td>Downtown Riverside</td>
</tr>
<tr>
<td>University FS Lime</td>
<td>Riverside</td>
<td>Downtown Riverside</td>
</tr>
<tr>
<td><strong>CORE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>University FS Iowa</td>
<td>Riverside</td>
<td>UCR</td>
</tr>
<tr>
<td>Olivewood FS Ramona</td>
<td>Riverside</td>
<td>Riverside City College</td>
</tr>
<tr>
<td>Mission Inn FS Brockton</td>
<td>Riverside</td>
<td>Downtown Riverside</td>
</tr>
<tr>
<td>Perris Transit Center</td>
<td>Perris</td>
<td>Downtown Perris</td>
</tr>
<tr>
<td>Magnolia FS Adams</td>
<td>Riverside</td>
<td>Magnolia Corridor</td>
</tr>
<tr>
<td><strong>SUBURBAN</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Magnolia FS Larchwood</td>
<td>Riverside</td>
<td>City of Riverside</td>
</tr>
<tr>
<td>Winchester NS Nicolas</td>
<td>Temecula</td>
<td>City of Temecula</td>
</tr>
<tr>
<td>Perris FS Brodiaea</td>
<td>Moreno Valley</td>
<td>City of Moreno Valley</td>
</tr>
<tr>
<td>Sixth/ Magnolia FS Byron</td>
<td>Riverside County</td>
<td>Corona Area</td>
</tr>
<tr>
<td>Cottonwood NS Frederick</td>
<td>Moreno Valley</td>
<td>City of Moreno Valley</td>
</tr>
<tr>
<td><strong>RURAL</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hwy 74 FS Hwy 74 Market</td>
<td>Riverside County</td>
<td>South Perris, SR-74 Corridor</td>
</tr>
<tr>
<td>Temescal @ Tom’s Farms</td>
<td>Riverside County</td>
<td>Temescal Valley</td>
</tr>
<tr>
<td>Van Buren FS Sutles</td>
<td>Riverside County</td>
<td>Woodcrest</td>
</tr>
<tr>
<td>Cajalco FS Brown</td>
<td>Riverside County</td>
<td>Mead Valley</td>
</tr>
<tr>
<td>Hwy 74 FS Juniper Flats</td>
<td>Riverside County</td>
<td>Hemet, Menifee, SR-74 Corridor</td>
</tr>
<tr>
<td>Simpson FS Winchester</td>
<td>Riverside County</td>
<td>Winchester</td>
</tr>
<tr>
<td><strong>COMMERCIAL</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sunnymead 23346 FS Graham</td>
<td>Moreno Valley</td>
<td>Sunnymead Boulevard</td>
</tr>
<tr>
<td>Eucalyptus FS Memorial Way</td>
<td>Moreno Valley</td>
<td>Moreno Valley Mall</td>
</tr>
<tr>
<td>Rubidoux NS Molino</td>
<td>Jurupa Valley</td>
<td>Mission Boulevard</td>
</tr>
<tr>
<td>La Piedra Entrance @ MSJC Menifee</td>
<td>Menifee</td>
<td>Menifee Countryside Marketplace</td>
</tr>
<tr>
<td>Hamner NS Auto Mall Dr.</td>
<td>Norco</td>
<td>2nd Street</td>
</tr>
<tr>
<td>Hidden Springs FS Catt (Stater Bros)</td>
<td>Wildomar</td>
<td>Bear Creek Village Center</td>
</tr>
<tr>
<td>Madison 25080 at Best Buy</td>
<td>Murrieta</td>
<td>Murrieta Sports Plaza</td>
</tr>
<tr>
<td>Limonite FS Pats Ranch</td>
<td>Jurupa Valley</td>
<td>Vernola Marketplace</td>
</tr>
<tr>
<td><strong>INDUSTRIAL AND BUSINESS PARKS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Market NS Fourth</td>
<td>Riverside</td>
<td>Downtown Riverside</td>
</tr>
<tr>
<td>Frederick FS Brodiaea</td>
<td>Moreno Valley</td>
<td>March JPA</td>
</tr>
<tr>
<td>La Cadena FS Chase</td>
<td>Riverside</td>
<td>Hunter Park</td>
</tr>
<tr>
<td>Van Buren NS Jackson</td>
<td>Riverside</td>
<td>Arlington Ave/Riverside Airport</td>
</tr>
<tr>
<td>State at Americana Mobile Park</td>
<td>Hemet</td>
<td>North Hemet</td>
</tr>
<tr>
<td>Indiana FS Tyler</td>
<td>Riverside</td>
<td>Indiana Avenue</td>
</tr>
<tr>
<td>Main FS River</td>
<td>Corona</td>
<td>Main Street</td>
</tr>
<tr>
<td>Perris FS Rivard</td>
<td>Moreno Valley</td>
<td>Perris Boulevard</td>
</tr>
</tbody>
</table>
Figure 3-4: Candidate Pilot Study Locations

Source: County of Riverside GIS, RTA
Final Pilot Study Stations

The list of stations for pilot study consideration were presented at the WRCOG Steering Committee Meetings for comments and suggestions. After steering committee and RTA board review, the final list of stations were based on the following criteria:

- Final ranking
- Geographic distribution
- Three-mile catchment area overlap from nearby high ranking stations
- Potential for project development and recommendations as pilot studies

The pilot studies analyze both far-side and near-side stations together, if applicable. Figure 3-5 illustrates the final six pilot study locations and their three-mile catchment area.

Table 3-6: Final Pilot Study Stations

<table>
<thead>
<tr>
<th>STATION</th>
<th>LOCATION</th>
<th>CATCHMENT AREA COVERAGE</th>
<th>STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>URBAN CORE</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>East University Avenue and</td>
<td>City of Riverside</td>
<td>City of Riverside, Jurupa Valley</td>
<td>Highest ranking Urban Core station</td>
</tr>
<tr>
<td>Lemon Street</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>CORE</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perris Transit Center</td>
<td>City of Perris</td>
<td>City of Perris, Riverside County, RCTC</td>
<td>Highest ranking Core station outside City of Riverside. Opportunity to assess non-motorized access to the new Metrolink line.</td>
</tr>
<tr>
<td><strong>SUBURBAN</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Winchester Road and Nicolas</td>
<td>City of Temecula, City of Murrieta,</td>
<td>City of Temecula, City of Murrieta, Riverside County</td>
<td>Highest ranking and southern most suburban station outside City of Riverside.</td>
</tr>
<tr>
<td>Road</td>
<td>Riverside County</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>RURAL</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Winchester Road and Simpson</td>
<td>Riverside County</td>
<td>Riverside County - Winchester</td>
<td>High ranking rural station, low density residential, less stops and somewhat isolated, and typical of rural development patterns in RTA’s service area.</td>
</tr>
<tr>
<td>Road</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>COMMERCIAL</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Limonite Avenue and Pats</td>
<td>Jurupa Valley</td>
<td>Eastvale, Jurupa Valley</td>
<td>High ranking commercial station, mix of rural and single family residential, large shopping centers and arterial roads. Geographically, this station is the northwesternmost pilot study. There are freeway constraints and connectivity to the Santa Ana River Trail. The residential development has typical curvilinear/cul-de-sac street patterns.</td>
</tr>
<tr>
<td>Ranch Road</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>INDUSTRIAL &amp; BUSINESS PARKS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perris Blvd and Rivard Road</td>
<td>City of Moreno Valley</td>
<td>Moreno Valley, Perris</td>
<td>Site is typical for large business park and industrial sites in the San Bernardino/Riverside region, with military facility and residential to the north.</td>
</tr>
</tbody>
</table>
Figure 3-5: Final Pilot Study Locations

Source: County of Riverside GIS, RTA
First and Last Mile Strategies Toolbox / Best Practices

In order to identify a recommended toolbox of first and last mile strategies, the following studies completed throughout Southern California were reviewed for current best practices in first and last mile improvements:

- Los Angeles County Metropolitan Transportation Authority (Metro) First Mile Last Mile Strategic Plan & Planning Guidelines
- Orange County Transportation Authority (OCTA) Nonmotorized Metrolink Accessibility Strategy
- OmniTrans Transit Design Guidelines
- WRCOG Active Transportation Plan (ATP)
- San Diego Association of Governments (SANDAG) Safe Routes to Transit Initiative

First and last mile strategies can be classified into six category types: Bicycle, Pedestrian, Transit, Auto, Transportation Demand, and Land Use. However, this plan focuses primarily on bicycle and pedestrian strategies consistent with survey findings on key issues. The First and Last Mile Strategies Toolbox (see Appendix A), provides brief descriptions of the wide range of first and last mile solutions considered best practices and emerging trends. Within this toolbox of First and Last Mile strategies there is a great deal of variation on the target user type and where they are appropriate. No one strategy fully addresses first and last mile gaps. Implementing these solutions is part of building an ecosystem of supportive options, information, and technologies. This ecosystem increases both the accessibility and attractiveness of transit and helps build a culture of transit use over time; an example of such a network is shown in Figure 3-7.

Figure 3-6: First and Last Mile Basic Strategies Examples

- Missing Sidewalk
- Complete Sidewalk
- No Bike Facilities
- Bike Lane
- No Bike Parking
- Secure Bike Parking
First & Last Mile Typologies Strategies

Figure 3-7: First and Last Mile Strategies Network
Application of Strategies based on Regional and Local Conditions

The recommended first and last mile strategies were also reviewed for their applicability among each of the six different station area typologies. These recommendations were developed based on high level review which considered the typical characteristics of each typology and the degree to which those characteristics required improvements.

For instance, stations within the Urban Core typology are primarily located within Downtown Riverside, where street connectivity is significantly better than elsewhere in the region and most streets have sidewalks on both sides. Therefore, access connections and pedestrian network improvements are not considered “high priority” for implementation because those conditions are already generally acceptable. In addition, while bicycle facilities exist within the three-mile catchment areas, enhancing these bicycle facilities and making connections to transit stops are additional strategies.

It should be noted that although only certain strategies are listed as recommended strategies, this does not mean other strategies are not also important- it only means that coordinating agencies should prioritize items that provide the best “bang for the buck.” Basic strategies are provided in Table 3-7.

There are numerous other strategies found in Appendix A that can also be applied.
### Table 3-7: Basic Strategies

<table>
<thead>
<tr>
<th>STRATEGY</th>
<th>DESCRIPTION</th>
<th>EXAMPLE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PEDESTRIAN NETWORK IMPROVEMENTS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sidewalks and Crosswalks</td>
<td>Improves safety and increases pedestrian mobility by providing access to all types of pedestrian travel. Crosswalks provide additional visibility for pedestrians at intersections and mid-block crossings.</td>
<td></td>
</tr>
<tr>
<td>Curb Extensions</td>
<td>Reduces pedestrian crossing distances and improves their visibility, while slowing turning vehicles by reducing the corner radius.</td>
<td></td>
</tr>
<tr>
<td>Mid-block Crossings</td>
<td>Provides crossings at non-standard locations where drivers will be less likely to yield to the pedestrian. It alerts drivers of the presence of pedestrians, which improves and reduces overall risk and accidents.</td>
<td></td>
</tr>
<tr>
<td><strong>BICYCLE NETWORK IMPROVEMENTS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bike Facilities</td>
<td>Improves mobility for bicyclists by either providing dedicated bicycle space on the roadway or by allowing them to share the road with motor vehicles.</td>
<td></td>
</tr>
<tr>
<td>Bike Parking</td>
<td>Encourages bicycle use and provides bicycle/transit commuters an alternative to bringing their bikes onboard. May be good for both short and long-term use.</td>
<td></td>
</tr>
<tr>
<td>Bikesharing</td>
<td>Improves mobility options and encourages bicycle use by providing bicycle rental options. It may reduce single occupancy trips.</td>
<td></td>
</tr>
<tr>
<td>STRATEGY</td>
<td>DESCRIPTION</td>
<td>EXAMPLE</td>
</tr>
<tr>
<td>------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>Ridesharing / Ridehailing</td>
<td>Private companies such as Uber and Lyft provide valuable on-demand first and last mile connection to transit stations.</td>
<td></td>
</tr>
<tr>
<td>Carsharing</td>
<td>Allows individuals to gain access to vehicles by joining and organization that maintains a fleet of cars, helping bridge the first and last mile gap between transit and the user’s destination. As a result, it enhances mobility and may help reduce vehicle miles traveled.</td>
<td></td>
</tr>
<tr>
<td>Wayfinding and Signage</td>
<td>Provides more comprehensive information at transit centers, which enhances the customer experience, improves safety, and encourages transit use.</td>
<td></td>
</tr>
<tr>
<td>Mobility Hubs</td>
<td>Offers an integrated suite of mobility options that serve as a critical function in the regional transportation system as the origin, destination, or transfer point for a significant share of transit trips.</td>
<td></td>
</tr>
<tr>
<td>Lighting</td>
<td>Improved lighting enhances the feeling of personal safety and may eliminate some barriers to transit use. It improves visibility and safety and can reduce overall risk.</td>
<td></td>
</tr>
<tr>
<td>Bus Stop Enhancements</td>
<td>Sheltered waiting areas provide protection from rain and sun, which improves user satisfaction and may encourage increased transit use.</td>
<td></td>
</tr>
</tbody>
</table>

Table 3-7: Basic Strategies (Cont.)
| STRATEGY                        | DESCRIPTION                                                                                                                                                                                                                                                                                                                                 | EXAMPLE                                                                                                                                                                                                
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Kiss &amp; Ride</td>
<td>Provides vehicle parking or drop off lanes at transit stations and bus stops to facilitate transit and ride-share use. May improve user satisfaction, encourage increased transit use, and reduce vehicle miles traveled.</td>
<td><img src="image1" alt="Kiss &amp; Ride Example" /></td>
</tr>
<tr>
<td>Shared Parking</td>
<td>Allows parking to be shared during different peak periods. Parking arrangements can be used to meet parking requirements and to give preferential parking for transit via reduced parking rates.</td>
<td><img src="image2" alt="Shared Parking Example" /></td>
</tr>
<tr>
<td>Transit-Oriented Development (TOD)</td>
<td>Integrates transportation infrastructure and land use to support increased transit ridership, as well as social, economic and environmental co-benefits. It creates more sustainable communities by encouraging transit use, walking, and bicycling.</td>
<td><img src="image3" alt="TOD Example" /></td>
</tr>
<tr>
<td>Pedestrian Friendly Projects</td>
<td>Compact development that reduces the distance required for travel between residences, employment, commercial and retail establishments, and services. The combination of density and mixed-use creates a built environment that is more conducive to walking, biking, and using public transit.</td>
<td><img src="image4" alt="Pedestrian Friendly Projects Example" /></td>
</tr>
<tr>
<td>Placemaking</td>
<td>Provides usable space for all ages by including urban elements such as parklets, gardens, and public art that encourage walking. These urban elements may help transform downtowns and neighborhoods into destinations.</td>
<td><img src="image5" alt="Placemaking Example" /></td>
</tr>
</tbody>
</table>
First & Last Mile Templates
Steps to Assess First and Last Mile Opportunities

This chapter summarizes the steps used in assessing first and last mile opportunities, deficiencies and analysis for the six selected pilot locations. Once these six stations (or bus stops) were selected, the next steps included data collection and field work. Data used in the Station Typology and Station Ranking exercises was used for analysis such as bus stop location, bicycle and pedestrian related collisions, land use mix and population and employment densities. The following are the general steps followed from data collection to recommended strategies.

Figure 4-1: First and Last Mile Assessment Process Flow Chart
Data Collection and Existing Conditions Mapping

1. Coordinate with cities/agencies to collect the following datasets:
   - Recent aerial photographs
   - Existing and Proposed Bicycle Facilities
   - Existing and Proposed Pedestrian Facilities (typically sidewalk data)
   - Road network
   - Land Use
   - Existing planning documents, CIP project list and specific plans

2. Develop half-mile and three-mile catchment areas from the study station. For best results, use a GIS-based network analysis tool to define a detailed study area using the existing road network. While radial buffers will work, they will cover more than the half-mile that is realistic on the ground. This may also increase the area which will need to be assessed.

3. Use GIS software, or equivalent, to compile the data into maps that can be used in the field. Create two separate maps, one each for the pedestrian and bicycle assessments.

4. From existing planning documents or CIP project list, identify any land use and transportation changes (new roads, road diets), or bicycle and pedestrian improvements and incorporate them into the maps. This may provide additional area to investigate in case these developments did not take pedestrian and bicycle infrastructure into account.

Figure 4-2: Sample Pedestrian Assessment Map
Conduct Field Work

5. Using the data on the maps, and collision history, prioritize the field work by assessing areas where there is a history of collisions, public concern or near activity centers, such as retail, employment centers, and schools.

6. Conduct field work using the station Physical Deficiencies Checklist provided in this plan and the field maps. Use the Physical Deficiencies Checklist as a guide to assess the various environments and check any deficiencies that are identified. Mark on the map where that particular deficiency is located for analysis and recommendations. Keep in mind where opportunities can be available, such as a connection to a multi-use trail, access to nearby retail or restaurants, schools and recreation.

Figure 4-3: Sample Physical Deficiencies Checklist
Analysis

7. Compile the data collected for bicycle and pedestrian opportunities and deficiencies and summarize in a map. This summary will provide:
   • A spatial overview of the study area to get a sense of deficiencies and opportunities
   • Overall connectivity, or lack of bicycle and pedestrian networks to activity centers or residential land use
   • Jurisdictional responsibilities
   • Preliminary metrics for quantities of deficiencies

Once the deficiencies and opportunities have been summarized, analyze and identify the various strategies applicable to improving the pedestrian and bicycling environment. Utilize the strategies in Appendix A as a starting point for recommendations.

8. Develop a series of recommendations for addressing bicycle and pedestrian station access deficiencies. Examples include adding sidewalks where they are missing, adding wayfinding at decision points, implementing proposed bicycle facilities, or recommending new ones leading to the study area.

9. Coordinate with cities/city departments/agencies on these recommendations. Applicable jurisdictions should identify other CIP projects and planning efforts within the catchment area to add the recommendations. Jurisdictional review may also consist of modifying the recommendations to reflect existing local or regional standards and plans.

Public Outreach/Stakeholder Input

10. Once recommendations have been vetted with the proper agencies and city departments, present these to the public through meetings, online surveys, or at community events, etc.

11. Present to stakeholders, advisory committees, working groups and/or business owners the preliminary recommendations. Involving stakeholders and committees in the process will likely depend on the location of the station. Some stations that are within city centers that already have adequate accessibility or others that have very little ridership may not raise much interest. It’s best to keep these groups in the loop since any input is valuable. The most input will be received when recommendations are made and there is information to review.

Final Station Recommendations

12. Address comments and modifications from the various outreach events and meetings. Compile the exhibits that highlight the various recommendations and provide cost estimates.

13. These recommendations can now be submitted to agencies, city staff and developers to incorporate into existing and future CIP and planning projects around the pilot stations. With the need to improve transit access and increase the mode shift away from single-occupancy vehicles, including these recommendations into projects may afford additional points if applying for state and federal active transportation funding.

14. Agencies, jurisdictions and RTA should work together to apply for funding and coordinate on implementation.

First and last mile and active transportation improvements frequently receive very limited funding, and it is the intent of this evaluation to help participating agencies focus on the items representing the highest possible benefit. Common strategy recommendations by station typology are provided in Table 4-1.
Table 4-1: First and Last Mile Strategy Recommendations

<table>
<thead>
<tr>
<th>Urban Core</th>
<th>Core District</th>
<th>Suburban</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description</strong></td>
<td>* Highest number of activity centers&lt;br&gt; * Highest population &amp; employment densities&lt;br&gt; * Low auto-centric street patterns&lt;br&gt; * Existing walking facilities&lt;br&gt; * Grid street network</td>
<td>* Located just outside of urban core&lt;br&gt; * Moderate densities&lt;br&gt; * More auto-centric development connected by high speed arterials/highways</td>
</tr>
<tr>
<td><strong>Recommendations</strong></td>
<td>* Wayfinding and information&lt;br&gt; * Bicycle network improvements&lt;br&gt; * Bikesharing&lt;br&gt; * Ridesharing/carsharing&lt;br&gt; * Bus and/or rail stop enhancements&lt;br&gt; * Placemaking&lt;br&gt; * Mobility Hub&lt;br&gt; * Pedestrian friendly projects</td>
<td>* Wayfinding and information&lt;br&gt; * Bicycle network improvements&lt;br&gt; * Access connections&lt;br&gt; * Pedestrian network improvements&lt;br&gt; * Bus and/or rail stop enhancements&lt;br&gt; * Ridesharing/carsharing&lt;br&gt; * Mobility Hub&lt;br&gt; * Transit Oriented Development (TOD)&lt;br&gt; * Pedestrian friendly projects</td>
</tr>
<tr>
<td><strong>Station Locations</strong></td>
<td>Downtown Riverside</td>
<td>Downtown Corona, Perris Transit Station, Florida Avenue Connector, Riverside</td>
</tr>
</tbody>
</table>
### Rural

**Description**
- Remote or underdeveloped area outside of the city or town
- Minimal or non-existent pedestrian facilities
- Low density development patterns

**Recommendations**
- Wayfinding and information
- Bicycle network improvements
- Access connections
- Pedestrian network improvements
- Crossing treatments
- Bus stop enhancements

**Station Locations**
Mead Valley, North Beaumont, Winchester, Gilman Springs Road, Perris (South)

### Commercial District

**Description**
- Commercial development distributed along a major corridor or concentrated within an area
- Includes employment, shopping and community services
- Destinations surrounded by high quantities of parking

**Recommendations**
- Wayfinding and information
- Bicycle network improvements
- Pedestrian network improvements
- Crossing treatments
- Ridesharing
- Bus stop enhancements
- Transit Oriented Development (TOD)

**Station Locations**
Moreno Valley Mall, Hemet Valley Mall, Temecula Town Center, Jurupa Valley, Eastvale, Old Town Temecula

### Industrial & Business Park

**Description**
- Facilities typically utilize large areas of land which limits the diversity of land uses network

**Recommendations**
- Bicycle network improvements
- Ridesharing
- Bikesharing
- Bus stop enhancements
- Transportation Demand Management (TDM) options
- Transit Oriented Development (TOD)

**Station Locations**
March JPA, Temecula City Office & Business Park, Perris Blvd., Arlington Ave, Riverside Airport, Hunter Park Riverside
URBAN CORE

Downtown Riverside

The Downtown Riverside station was selected due to its high ranking and proximity to cultural, historic, and social resources. The station (bus stop) lies on the corner of University Avenue and Lemon Street in Downtown Riverside. Many of the City’s historic buildings that contribute to its unique urban fabric and historic character can be found here. The area surrounding the station includes multiple commercial and professional offices, retail establishments, restaurants, a postal office, and a fire station. The Riverside City Hall and Riverside County Superior Court are approximately 0.3 miles away.

Selection Results

The University Avenue and Lemon Street station ranked as the highest Urban Core station with its close proximity to civic facilities, the Riverside-Downtown Metrolink Station and number of transit connections.

Transit Service

- Local Bus Routes 1, 10, 14, 15, 22, 54
- Bus Frequency: 5-12 minutes (Weekdays and Weekends)
- CommuterLink Routes: 200, 204, 208, 210, 212, 216, SunLine 220
- CommuterLink Frequency: 13-20 minutes (Weekday peak periods only)
- Average Weekday Boardings: 169, Alightings: 181

Transit Connections

- Bus Connections: Downtown Riverside, UC Riverside, Downtown Riverside Metrolink, Corona Metrolink, Galleria at Tyler, Loma Linda VA Hospital, Moreno Valley Mall, Perris Transit Center, Lake Elsinore Outlet Center
- CommuterLink Connections: Montclair Transcenter, Palm Desert, Morongo Casino, Banning, Beaumont, Moreno Valley, Hemet, Perris Station Transit Center, Orange

Attributes

- Sense of place – Built environment that offers a historic and urban experience
- Density – Higher population and employment densities
- Amenities – High concentration of civic uses, retail, dining and residential
- Accessibility – The Downtown Riverside Metrolink Station is located 0.35 miles away
- Pedestrian-friendly configuration – Short blocks and grid street pattern encourages walking

Existing Plans, Programs and Projects

- Downtown Riverside
- City of Riverside Bicycle Master Plan
- Riverside Marketplace
- University Avenue

Opportunities

- Connection between the Metrolink station and downtown Riverside commercial and residential area
- Within close proximity of Riverside City Hall and other downtown amenities
- Main Street Pedestrian Mall is an attractive pedestrian-friendly destination
- Proposed Class II bicycle facility along University Avenue will provide connection between downtown Riverside and UCR
- Shelter with seating

Constraints

- State Route 91 can be a barrier to pedestrians and bicycle connectivity
- Limited existing bike facilities
- Some streets lack pedestrian amenities such as shade, trees, and street furniture
- Eastern portion of University Avenue has narrow sidewalks
First & Last Mile Templates

Riverside City Hall located at close proximity to East University at Lemon Station (bus stop)

Main Street Pedestrian Mall is an attractive pedestrian-friendly destination

Proposed Class III bike facility along University Avenue

Not enough shade trees

Freeway on-off ramp

SR-91 can be a barrier for pedestrians and bicyclists

Existing buffered bike lanes

Grid street pattern is ideal for walking

Downtown Riverside Metrolink Station

Recently installed Shared Lane Markings for bicyclists

Old rail line protruding from street surface

Narrow sidewalks

Opportunities

Constraints

1" = 520'

Existing buffered bike lanes

Mission Inn Avenue

University Avenue

Lemon Street

Lime Street

Vine Street

SR-91 can be a barrier for pedestrians and bicyclists

Downtown Riverside Metrolink Station

Opportunities

Constraints

1" = 520'
Figure 4-4: Downtown Riverside Land Use

Source: SCAG 2008, County of Riverside GIS
Figure 4-5: Downtown Riverside Proposed Bicycle Facilities

Source: County of Riverside GIS, City of Riverside, WRCOG ATP (on-going)
Figure 4-7: Checklist of Tasks
Figure 4-8: Downtown Riverside Pedestrian Recommendations

1. Pedestrian Hybrid Beacon (PHB)
2. Accessible Pedestrian System
3. Walking and Biking Kiosk
4. Install continental crosswalk
5. Reduce curb radii & continental crosswalks
6. Install high visibility crosswalk

Source: County of Riverside GIS, City of Riverside, RTA, KTU+A
<table>
<thead>
<tr>
<th>ITEM #</th>
<th>RECOMMENDED PEDESTRIAN IMPROVEMENTS</th>
<th>APPLICABLE STRATEGIES</th>
<th>ESTIMATED COST</th>
<th>STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Add pedestrian hybrid beacon to allow protected pedestrian crossing</td>
<td>Pedestrian improvements, Placemaking, Traffic Calming</td>
<td>$288,000</td>
<td>In planning and design phase</td>
</tr>
<tr>
<td>2</td>
<td>Install accessible pedestrian system that provides real-time pedestrian signal information accessible to pedestrians who are visually impaired</td>
<td>Placemaking</td>
<td>$4,400</td>
<td>In planning and design phase</td>
</tr>
<tr>
<td>3</td>
<td>Install walking and biking kiosk</td>
<td>Placemaking</td>
<td>$1,200</td>
<td>In planning and design phase</td>
</tr>
<tr>
<td>4</td>
<td>Provide continental crosswalk to increase visibility and reduce traffic speed</td>
<td>Pedestrian improvements, Placemaking, Traffic Calming</td>
<td>$3,500</td>
<td>RTA First &amp; Last Mile Mobility Plan Recommendation</td>
</tr>
<tr>
<td>5</td>
<td>Reduce curb radii to decrease pedestrian crossing distance and improve visibility</td>
<td>Pedestrian improvements</td>
<td>$62,840</td>
<td>RTA First &amp; Last Mile Mobility Plan Recommendation</td>
</tr>
<tr>
<td>6</td>
<td>Provide crosswalk to define space for crossing and draw pedestrians to the appropriate crossing point to access Metrolink station</td>
<td>Pedestrian improvements, Placemaking, Traffic Calming</td>
<td>$3,500</td>
<td>RTA First &amp; Last Mile Mobility Plan Recommendation</td>
</tr>
</tbody>
</table>
Figure 4-9: Downtown Riverside Bicycle Recommendations

1. Widen bike lanes
2. Bike Share Station
3. Bike Share Station
4. Bike Corral
5. Bike Share Station
6. Bike Share Station
7. Add bike route with Shared Lane Markings
8. Remove/Cover rails on road
9. Add bike lanes
10. Add bike lanes

Source: County of Riverside GIS, RTA, WRCOG ATP (on-going)
<table>
<thead>
<tr>
<th>ITEM #</th>
<th>RECOMMENDED BICYCLE IMPROVEMENTS</th>
<th>APPLICABLE STRATEGIES</th>
<th>ESTIMATED COST</th>
<th>STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Widen existing bike lanes on 3rd Street</td>
<td>Bicycle improvements</td>
<td>$29,000</td>
<td>RTA First &amp; Last Mile Mobility Plan Recommendation</td>
</tr>
<tr>
<td>2</td>
<td>Install bike share station at the corner of 6th Street and Main Street</td>
<td>Bicycle improvements, Wayfinding</td>
<td>$50,000</td>
<td>In planning and design phase</td>
</tr>
<tr>
<td>3</td>
<td>Install bike share station at the corner of Market Street and 10th Street</td>
<td>Bicycle improvements, Wayfinding</td>
<td>$50,000</td>
<td>In planning and design phase</td>
</tr>
<tr>
<td>4</td>
<td>Install bike corrals to provide bike parking and promote accessibility on University Avenue</td>
<td>Bicycle improvements, Wayfinding</td>
<td>$2,000</td>
<td>In planning and design phase</td>
</tr>
<tr>
<td>5</td>
<td>Install bike share station on Lime Street between 10th Street and 12th Street</td>
<td>Bicycle improvements, Wayfinding</td>
<td>$50,000</td>
<td>In planning and design phase</td>
</tr>
<tr>
<td>6</td>
<td>Install bike share station on Vine Street between 10th Street and 12th Street</td>
<td>Bicycle improvements, Wayfinding</td>
<td>$50,000</td>
<td>In planning and design phase</td>
</tr>
<tr>
<td>7</td>
<td>Add bike route with Shared Lane Markings on Vine Street south of Mission Inn Avenue</td>
<td>Bicycle improvements, Wayfinding</td>
<td>$6,600</td>
<td>RTA First &amp; Last Mile Mobility Plan Recommendation</td>
</tr>
<tr>
<td>8</td>
<td>Remove or cover rails on Vine Street</td>
<td>Bicycle improvements</td>
<td>Varies</td>
<td>RTA First &amp; Last Mile Mobility Plan Recommendation</td>
</tr>
<tr>
<td>9</td>
<td>Add bike lanes on Vine Street north of Mission Inn Avenue</td>
<td>Bicycle improvements, Wayfinding</td>
<td>$4,000</td>
<td>RTA First &amp; Last Mile Mobility Plan Recommendation</td>
</tr>
<tr>
<td>10</td>
<td>Add proposed bike lane on Main Street to provide bicycle connectivity to the station from</td>
<td>Bicycle improvements, Wayfinding</td>
<td>$103,295*</td>
<td>Recommended as part of Riverside Bicycle Master Plan</td>
</tr>
<tr>
<td></td>
<td>northern neighborhoods</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Source: Riverside Bicycle Master Plan
**CORE DISTRICT**

**Downtown Perris**

The Perris Station Transit Center is located in downtown Perris at 121 C Street, and is well-connected to the adjacent pedestrian network. This station was chosen because it offers connections to a wide range of RTA route services, as well as commuter rail service. The station is mainly surrounded by commercial and professional offices, as well as single family residential uses. Additional uses near the station include the City of Perris Senior Center and the Perris City Hall.

In June 2016, the new 91/Perris Valley Line was opened for service, making it the first extension of Metrolink service in 22 years. This commuter rail line transports riders from the Perris Station Transit Center to Moreno Valley, Riverside and downtown Los Angeles.

**Selection Results**

The Perris Station Transit Center is the highest ranking Core station not within the City of Riverside. This station also provides the opportunity to assess non-motorized access to the newest Metrolink line and station.

**Transit Service**

- Local Bus Routes 19, 22, 27, 30, 74
- Bus Frequency: 5-20 minutes (Weekdays and Weekends)
- CommuterLink Routes: 208, 212, Metrolink
- CommuterLink Frequency: 15-25 minutes (Weekdays only)
- Metrolink: 91/Perris Valley Line
- Metrolink Frequency: 30-min - 1.5-hrs (Weekdays and Weekends)
- Weekday Boardings: 729, Alightings: 677

**Transit Connections**

- Bus Connections: Downtown Riverside, Galleria at Tyler, Sun City, Moreno Valley Mall, Lake Elsinore Outlet Center, May Ranch, Winchester, Menifee
- CommuterLink Connections: San Jacinto, Moreno Valley, Hemet, Downtown Riverside Metrolink, Temecula, Murrieta
- Metrolink Connections: Los Angeles County, Orange County, City of Riverside, Corona, Moreno Valley

**Attributes**

- Mix of uses – Existing land uses in Downtown Perris include a mixture of civic, cultural, public space, commercial, office, residential, and industrial
- Access to commuter rail service – The Perris Station Transit Center is part of Metrolink 91/Perris Valley Line
- Density – Downtown Perris has higher population and employment densities
- Pedestrian-friendly configuration – Grid street pattern may encourage walking

**Existing Plans, Programs and Projects**

- Perris Trail Master Plan
- Perris Downtown Specific Plan

**Opportunities**

- Metrolink 91/Perris Valley Line provides connections to Moreno Valley, Riverside and Los Angeles
- Connections to a wide range of RTA local fixed-route services and CommuterLink express bus routes
- Vacancy around the station may provide future attractive development
- Ample vehicle parking available

**Constraints**

- Minimal connection between station area and D Street, a pedestrian/bicycle-oriented street
- No designated pedestrian crossings at 1st Street, 2nd Street and 3rd Street
- Surrounding streets lack adequate lighting, landscaping and trees
First & Last Mile Templates

Opportunities

Metrolink provides connections to Moreno Valley, Riverside and Los Angeles

Vacancy around station may provide future attractive development

Grid street pattern may be conducive for walking and biking

Constraints

No connection between station and D Street

No pedestrian crossing

No shade trees

Minimal pedestrian lighting in neighborhoods

Station has ample vehicle parking

No sidewalk or crosswalks

Lack of bicycle facilities

Lack of bicycle facilities

Lack of bicycle facilities

Lack of bicycle facilities

Opportunities
Figure 4-10: Downtown Perris Land Use

Source: SCAG 2008, County of Riverside GIS
Figure 4-11: Downtown Perris Proposed Bicycle Facilities

Source: County of Riverside GIS, City of Perris, WRCOG ATP (on-going)
Figure 4-12: Downtown Perris Transit Routes

Source: SCAG 2008, County of Riverside GIS, RTA 2015
Figure 4-13: Checklist of Tasks
Figure 4-14: Downtown Perris Pedestrian Recommendations

1. Install continental crosswalks
2. Install continental crosswalks
3. Install sidewalks
4. Maintenance needed
5. Install continental crosswalk
6. Install sidewalks
7. Add additional lighting in neighborhoods
8. Install sidewalks
### Table 4-4: Downtown Perris Recommended Pedestrian Improvements

<table>
<thead>
<tr>
<th>ITEM #</th>
<th>RECOMMENDED PEDESTRIAN IMPROVEMENTS</th>
<th>APPLICABLE STRATEGIES</th>
<th>ESTIMATED COST</th>
<th>STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Install stop sign and crosswalk to improve pedestrian safety, increase visibility, and reduce traffic speed</td>
<td>Pedestrian improvements, Wayfinding, Traffic Calming</td>
<td>$10,900</td>
<td>Coordination with RCTC Metrolink First and Last Mile Mobility Strategy</td>
</tr>
<tr>
<td>2</td>
<td>Provide crosswalk to define space for crossing and draw pedestrians to the appropriate crossing point</td>
<td>Pedestrian improvements, Wayfinding, Traffic Calming</td>
<td>$14,000</td>
<td>Coordination with RCTC Metrolink First and Last Mile Mobility Strategy</td>
</tr>
<tr>
<td>3</td>
<td>Install sidewalks to improve pedestrian safety and access</td>
<td>Pedestrian improvements, Wayfinding</td>
<td>$57,865</td>
<td>Coordination with RCTC Metrolink First and Last Mile Mobility Strategy</td>
</tr>
<tr>
<td>4</td>
<td>Clear sidewalks of overgrowth</td>
<td>Pedestrian improvements</td>
<td>Varies</td>
<td>RTA First &amp; Last Mile Mobility Plan Recommendation</td>
</tr>
<tr>
<td>5</td>
<td>Install continental crosswalk on north side of 4th Street</td>
<td>Pedestrian improvements, Wayfinding</td>
<td>$3,500</td>
<td>Coordination with RCTC Metrolink First and Last Mile Mobility Strategy</td>
</tr>
<tr>
<td>6</td>
<td>Install sidewalks for access to Perris Station Transit Center</td>
<td>Pedestrian improvements, Wayfinding</td>
<td>$97,625</td>
<td>Coordination with RCTC Metrolink First and Last Mile Mobility Strategy</td>
</tr>
<tr>
<td>7</td>
<td>Install additional lighting along A Street, 1st Street, 2nd Street and 3rd Street</td>
<td>Pedestrian improvements, Lighting</td>
<td>$315,900</td>
<td>RTA First &amp; Last Mile Mobility Plan Recommendation</td>
</tr>
<tr>
<td>8</td>
<td>Install sidewalks to improve pedestrian safety and access</td>
<td>Pedestrian improvements, Wayfinding</td>
<td>$292,520</td>
<td>RTA First &amp; Last Mile Mobility Plan Recommendation</td>
</tr>
</tbody>
</table>
Figure 4-15: Downtown Perris Bicycle Recommendations

1. Add bike route
2. Add Shared Lane Markings and Signage to proposed bike route
3. Add bike lanes
4. Add bike lanes
5. Add bike lanes
6. Add bike lanes
Table 4-5: Downtown Perris Recommended Bicycle Improvements

<table>
<thead>
<tr>
<th>ITEM #</th>
<th>RECOMMENDED BICYCLE IMPROVEMENTS</th>
<th>METRICS AFFECTED</th>
<th>ESTIMATED COST</th>
<th>STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Install bike route on 2nd Street to create connection between G Street and A Street. Direct bicyclists to the pedestrian crossing over the railroad tracks</td>
<td>Bicycle improvements, Wayfinding, Placemaking</td>
<td>$11,635*</td>
<td>RTA First &amp; Last Mile Mobility Plan Recommendation</td>
</tr>
<tr>
<td>2</td>
<td>Install Shared Lane Markings and signage to help reinforce the presence of bicyclists on the road</td>
<td>Bicycle improvements, Wayfinding, Placemaking</td>
<td>$32,460*</td>
<td>Perris Trails Master Plan Recommendation</td>
</tr>
<tr>
<td>3</td>
<td>Install proposed bike lanes on Perris Boulevard</td>
<td>Bicycle improvements, Wayfinding, Regional Connectivity</td>
<td>$156,479*</td>
<td>Perris Trails Master Plan Recommendation</td>
</tr>
<tr>
<td>4</td>
<td>Install proposed bike lanes on 4th Street</td>
<td>Bicycle improvements, Wayfinding, Regional Connectivity</td>
<td>$51,211*</td>
<td>Perris Trails Master Plan Recommendation</td>
</tr>
<tr>
<td>5</td>
<td>Install proposed bike lanes on A Street</td>
<td>Bicycle improvements, Wayfinding, Regional Connectivity</td>
<td>$34,218*</td>
<td>Perris Trails Master Plan Recommendation</td>
</tr>
<tr>
<td>6</td>
<td>Install proposed bike lanes on San Jacinto Avenue</td>
<td>Bicycle improvements, Wayfinding, Placemaking</td>
<td>$16,718*</td>
<td>Perris Trails Master Plan Recommendation</td>
</tr>
</tbody>
</table>

* Source: Perris Trails Master Plan

Additional strategies may be recommended due to the location, land use and transportation characteristics of this pilot station. Since this station provides access to adjacent counties, long term travel may be prevalent where ridesharing could be an option to and from the station. Table 4-5 identifies non-infrastructure projects that may be implementable.

Table 4-6: Downtown Perris Recommended Transportation Demand Management (TDM) Strategies

<table>
<thead>
<tr>
<th>ITEM #</th>
<th>RECOMMENDED TDM STRATEGIES</th>
<th>APPLICABLE STRATEGIES</th>
<th>ESTIMATED COST</th>
<th>STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Coordinate with rideshare companies to provide access to local bus stops</td>
<td>Rideshare, carpooling</td>
<td>Varies</td>
<td>RTA First &amp; Last Mile Mobility Plan Recommendation</td>
</tr>
<tr>
<td>2</td>
<td>Provide transit discounts</td>
<td>TDM</td>
<td>Varies</td>
<td>RTA First &amp; Last Mile Mobility Plan Recommendation</td>
</tr>
</tbody>
</table>
Figure 4-16: Perris Station Transit Center Site Recommendations

1. Add secure bike parking
2. Provide areas for ridesharing & kiss-and-ride drop off
3. Provide adequate lighting and wayfinding
4. Provide areas potential car sharing parking

Source: RCTC Metrolink First and Last Mile Mobility Strategy, WSP|Parsons Brinkerhoff, 2016
Table 4-7: Perris Station Transit Center Recommended Station Improvements

<table>
<thead>
<tr>
<th>ITEM #</th>
<th>RECOMMENDED STATION IMPROVEMENTS</th>
<th>APPLICABLE STRATEGIES</th>
<th>ESTIMATED COST</th>
<th>STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Proposed Bike Hut</td>
<td>Long and short term secured bicycle parking</td>
<td>$35-$50K*</td>
<td>In planning and design phase</td>
</tr>
<tr>
<td>2</td>
<td>Provide areas for ridesharing and kiss-and-ride drop off or parking, Add signs to indicate spots</td>
<td>Ridesharing, carpooling</td>
<td>$400-$1200</td>
<td>Recommended as part of RCTC Metrolink First and Last Mile Mobility Strategy</td>
</tr>
<tr>
<td>3</td>
<td>Provide adequate access lighting and station lighting for security and wayfinding</td>
<td>Wayfinding, Lighting, Pedestrian improvements</td>
<td>$14,400 each</td>
<td>Recommended as part of RCTC Metrolink First and Last Mile Mobility Strategy</td>
</tr>
<tr>
<td>4</td>
<td>Provide spaces for potential car share parking. Add signs to indicate spots</td>
<td>Carsharing, carpooling</td>
<td>$400-$1200</td>
<td>RTA First &amp; Last Mile Mobility Plan Recommendation</td>
</tr>
</tbody>
</table>

* Source: RCTC Metrolink First and Last Mile Mobility Strategy
SUBURBAN
Temecula

The Winchester at Nicolas station (bus stop) is located at the corner of Winchester Road and Nicolas Road in the City of Temecula, approximately 1.5 miles north of Interstate 15. This station was selected due to its high ranking and suburban patterns with various land uses. It is located directly west of Roripaugh Estates, a mixed-use development consisting of commercial, residential, open space and park areas. The station is surrounded by a multi-family residential development to the west and Chaparral High School to the south. The Santa Gertrudis Creek Trail, a 3-mile multi-use path connecting the Promenade Mall, Chaparral High School and the Rancho Temecula Town Center, is located just to the north.

Selection Results

This station (bus stop) in Temecula scored the highest ranking and is the southernmost suburban station not within the City of Riverside. The curvilinear street patterns are typical of southern California developments and the adjacent high school provides opportunities to identify transit and school access improvements.

Transit Service

- Bus Routes 23, 55, 79
- Bus Frequency: 7-10 minutes during weekdays, 30 minutes on Saturdays, 60 minutes on Sunday
- Boardings: 128, Alightings: 53

Transit Connections

- Bus Connections: Inland Valley Medical Center, Rancho Springs Medical Center, Murrieta, Wildomar, Chaparral High School, Promenade Mall, Hemet, Winchester

Attributes

- Mix of uses – Various land uses, including residential and commercial uses, a high school, and open space
- Access to multi-use path – The San Gertrudis Creek Trail is located approximately 0.18 miles west of the station

Existing Plans, Programs and Projects

- Campos Verdes
- Harveston
- Roripaugh Estates
- Temecula Regional Center
- Uptown Temecula
- Temecula Multi-use Trails and Bikeways Master Plan

Opportunities

- Close proximity to different uses, including retail establishments, restaurants, a high school and residential developments
- Within walking distance of the Santa Gertrudis Creek Trail, a 3-mile paved trail that serves as both as a recreational amenity and an active transportation alternative for residents
- High visibility crossing located at intersection of Winchester Road and Nicolas Road
- Served by 3 local fixed bus routes
- Shelter with seating, lighting and access to adjacent shopping center

Constraints

- Suburban development pattern limits pedestrian connectivity in and around station area
- Auto-oriented, super-block development pattern is well established
- High-speed, high-volume Winchester Road lacks bicycle facilities
- Most streets have sidewalks, however lack shade trees
First & Last Mile Templates

Nicolas Road
Winchester Road
Santa Gertrudis Creek Trail
Margarita Road

Opportunities
- Numerous residential developments located at close proximity
- High-visibility crosswalk
- Chaparral High School located across the street from station
- Large multi-lane arterial crossings
- Existing pedestrian bridge to connect adjacent neighborhoods

Constraints
- Suburban development limits direct pedestrian connectivity
- High-speed multi-lane road without bicycle facilities
- Curvilinear street development may discourage people from walking or biking
- Lack of shade trees
- Lack of connectivity to Santa Gertrudis Creek Trail
- Numerous commercial/retail establishments around the station
- Existing wide bike lanes
- Large multi-lane arterial crossings
- High-speed multi-lane road
- Existing pedestrian bridge to connect adjacent neighborhoods
- Numerous residential developments located at close proximity
Figure 4-17: Temecula / Murrieta Land Use

Source: SCAG 2008, County of Riverside GIS
Figure 4-18: Temecula / Murrieta Proposed Bicycle Facilities

Source: County of Riverside GIS, City of Temecula, WRCOG ATP (on-going)
Figure 4-19: Temecula / Murrieta Transit Routes

Source: SCAG 2008, County of Riverside GIS, RTA 2015
Physical Deficiencies Checklist

Instructions: Use this checklist to identify common bicycle and pedestrian deficiencies while conducting field investigations. Mark the location of the deficiency on a map for further analysis.

1. Pedestrian Deficiencies
   - Missing Sidewalks
   - Missing Curb Ramps
   - Lighting
   - Shade
   - Poor Connectivity
   - Walking Impediments
   - Wayfinding
   - Crosswalks

2. Bicycle Deficiencies
   - Lack of Bike Facilities
   - Roadway Speed
   - High Volume Traffic
   - Bike Detection
   - Wayfinding
   - Poor Road Conditions

3. Bus Stop Deficiencies
   - Lack of Shelter
   - Poor Lighting
   - Signage/Route Info
   - No Benches
   - ADA Accessibility

Notes

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Figure 4-20: Checklist of Tasks
Wayfinding/Signage

1. Install pedestrian refuge island with pedestrian signal

2. Provide connectivity to Santa Gertrudis Creek Trail

3. Provide connectivity between Santa Gertrudis Creek Trail and Silver Hawk Walking Path

4. Provide connectivity between cul-de-sacs

5. Provide connectivity between cul-de-sacs

Figure 4-21: Temecula / Murrieta Pedestrian Facility Recommendations
Table 4-8: Temecula Recommended Pedestrian Improvements

<table>
<thead>
<tr>
<th>ITEM #</th>
<th>RECOMMENDED PEDESTRIAN IMPROVEMENTS</th>
<th>APPLICABLE STRATEGIES</th>
<th>ESTIMATED COST</th>
<th>STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Install pedestrian refuge with pedestrian signal</td>
<td>Pedestrian improvements</td>
<td>$8,000</td>
<td>RTA First &amp; Last Mile Mobility Plan Recommendation</td>
</tr>
<tr>
<td>2</td>
<td>Provide wayfinding/signage for the Santa Gertrudis Creek Trail</td>
<td>Information/Wayfinding</td>
<td>$1,200 - $3,600</td>
<td>Recommended as part of Temecula Trails and Bikeways Master Plan</td>
</tr>
<tr>
<td>3</td>
<td>Provide access to the Santa Gertrudis Creek Trail</td>
<td>Pedestrian improvements, Bicycle improvements</td>
<td>$5,325</td>
<td>RTA First &amp; Last Mile Mobility Plan Recommendation</td>
</tr>
<tr>
<td>4</td>
<td>Provide connectivity between the Shadow View Court and Canyon Rim Circle cul-de-sacs</td>
<td>Pedestrian improvements, Bicycle improvements, wayfinding</td>
<td>$44,238</td>
<td>RTA First &amp; Last Mile Mobility Plan Recommendation</td>
</tr>
<tr>
<td>5</td>
<td>Provide connectivity between the Santa Gertrudis Creek Trail and Silver Hawk Walking Path. Likely a prefabricated bridge.</td>
<td>Pedestrian improvements, Bicycle improvements, wayfinding</td>
<td>Varies</td>
<td>RTA First &amp; Last Mile Mobility Plan Recommendation</td>
</tr>
</tbody>
</table>
Figure 4-22: Temecula / Murrieta Bicycle Recommendations

1. Add buffered bike lanes
2. Add buffered bike lanes
3. Complete Santa Gertrudis Creek Interconnect
4. Add buffered bike lane
5. Install continental crosswalks for increased bike crossing visibility
### Table 4-9: Temecula Recommended Bicycle Facility Improvements

<table>
<thead>
<tr>
<th>ITEM #</th>
<th>RECOMMENDED BICYCLE IMPROVEMENTS</th>
<th>APPLICABLE STRATEGIES</th>
<th>ESTIMATED COST</th>
<th>STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Add bike lanes and buffered bike lanes on Winchester Road / SR-79. Coordinate with Caltrans on improvements.</td>
<td>Bicycle improvements, Wayfinding</td>
<td>$197,472</td>
<td>RTA First &amp; Last Mile Mobility Plan Recommendation</td>
</tr>
<tr>
<td>2</td>
<td>Add buffered bike lanes on Murrieta Hot Springs Road</td>
<td>Bicycle improvements, Wayfinding</td>
<td>$238,128</td>
<td>RTA First &amp; Last Mile Mobility Plan Recommendation</td>
</tr>
<tr>
<td>3</td>
<td>Complete the proposed Santa Gertrudis Creek Interconnect</td>
<td>Bicycle improvements, Wayfinding</td>
<td>$4M</td>
<td>Temecula Trails and Bikeways Master Plan</td>
</tr>
<tr>
<td>4</td>
<td>Upgrade to buffered bike lanes and complete proposed bike lanes along Nicolas Road</td>
<td>Bicycle improvements, Wayfinding</td>
<td>$116,160</td>
<td>RTA First &amp; Last Mile Mobility Plan and Temecula Trails and Bikeways Master Plan Recommendation</td>
</tr>
<tr>
<td>5</td>
<td>Install continental crosswalks to improve trail crossing visibility</td>
<td>Bicycle improvements, Wayfinding</td>
<td>$14,000</td>
<td>RTA First &amp; Last Mile Mobility Plan Recommendation</td>
</tr>
</tbody>
</table>
**RURAL**

**Winchester**
The Simpson Road and Winchester Road station (bus stop) is located at the intersection of Simpson Road and Winchester Road (Highway 79) in Winchester, California. Situated in rural Riverside County, the station is surrounded primarily by low density single-family residential uses, as well as some low density commercial uses.

**Selection Results**
This station (bus stop) is the highest ranking rural station and is isolated from any nearby station. This station lacks sidewalks around the bus stop, with Winchester School a few blocks away. Geographically, it covers more of RTA’s eastern service area and incorporates State Route 79.

**Transit Service**
- Bus Routes: 74, 79
- Bus Frequency: 10-30 minutes Weekdays, 30 minutes Saturdays, No Service Sundays
- Boardings: 46, Alightings: 41

**Transit Connections**
- Bus Connections: Mt San Jacinto College, Perris Station Transit Center, South Perris Metrolink Station, Hemet Valley Mall, Mt San Jacinto College/Menifee

**Attributes**
- Potential development – Surrounding vacant parcels have potential for development

**Existing Plans, Programs and Projects**
- Harvest Valley/Winchester Area Plan
- Community of Winchester Land Use Study

**Opportunities**
- Vacancy around the area may provide future development
- Limited existing development around the area creates an opportunity for station-area improvements
- Station located at close proximity of Winchester’s small western-themed commercial core
- Shelter with seating and lighting

**Constraints**
- Most streets are missing sidewalks
- Existing sidewalks are generally narrow with no landscaping or street trees
- Lack of pedestrian scale lighting outside the commercial core
- Lack of bike facilities
- Several unpaved residential streets in the area
Opportunities:

- Vacancy around station may provide future attractive development
- Station located at close proximity of the small western-themed commercial core
- Limited development creates opportunity for station-area improvements

Constraints:

- Unpaved residential streets
- Lack of sidewalks to Winchester School
- Lack of sidewalks
- No street lights

Station located at Simpson at Winchester Station

1” = 450’
Figure 4-23: Winchester / Riverside County Land Use

Source: SCAG 2008, County of Riverside GIS
Figure 4-24: Winchester / Riverside County Proposed Bicycle Facilities

Source: County of Riverside GIS, RCTLMA, WRCOG ATP (on-going)
Figure 4-25: Winchester / Riverside County Transit Routes

Source: SCAG 2008, County of Riverside GIS, RTA 2015
Figure 4-26: Checklist of Tasks

1. Pedestrian Deficiencies
   - Missing Sidewalks
   - Missing Curb Ramps
   - Lighting
   - Shade
   - Poor Connectivity
   - Walking Impediments
   - Wayfinding
   - Crosswalks

2. Bicycle Deficiencies
   - Lack of Bike Facilities
   - Roadway Speed
   - High Volume Traffic
   - Bike Detection
   - Wayfinding
   - Wide Intersections to Cross
   - Poor Road Conditions

3. Bus Stop Deficiencies
   - Lack of Shelter
   - Poor Lighting
   - Signage/Route Info
   - No Benches
   - ADA Accessibility

Notes

[Blank space for notes]
Figure 4-27: Winchester / Riverside County Pedestrian Facility Recommendations
Table 4-10: Winchester Recommended Pedestrian Improvements

<table>
<thead>
<tr>
<th>ITEM #</th>
<th>RECOMMENDED PEDESTRIAN IMPROVEMENTS</th>
<th>APPLICABLE STRATEGIES</th>
<th>ESTIMATED COST</th>
<th>STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Complete sidewalks on Winchester Road to provide connectivity along commercial corridor. Install pedestrian scale lighting</td>
<td>Pedestrian improvements, Lighting</td>
<td>$315,950</td>
<td>RTA First &amp; Last Mile Mobility Plan Recommendation</td>
</tr>
<tr>
<td>2</td>
<td>Install continental crosswalk to increase visibility and improve pedestrian safety</td>
<td>Pedestrian improvements</td>
<td>$14,000</td>
<td>RTA First &amp; Last Mile Mobility Plan Recommendation</td>
</tr>
<tr>
<td>3</td>
<td>Complete sidewalks to Winchester School to improve pedestrian safety. Add lighting along Winchester Road</td>
<td>Pedestrian improvements, Lighting</td>
<td>$771,060</td>
<td>RTA First &amp; Last Mile Mobility Plan Recommendation</td>
</tr>
<tr>
<td>4</td>
<td>Provide sidewalks for ADA accessibility to the bus stop</td>
<td>Pedestrian improvements</td>
<td>$1.7M</td>
<td>RTA First &amp; Last Mile Mobility Plan Recommendation</td>
</tr>
</tbody>
</table>
Figure 4-28: Winchester / Riverside County Bicycle Recommendations
Table 4-11: Winchester Recommended Bicycle Facility Improvements

<table>
<thead>
<tr>
<th>ITEM #</th>
<th>RECOMMENDED BICYCLE IMPROVEMENTS</th>
<th>APPLICABLE STRATEGIES</th>
<th>ESTIMATED COST</th>
<th>STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Add bike lanes on Winchester Road / SR-79. Coordinate with Caltrans on improvements.</td>
<td>Bicycle improvements, Wayfinding</td>
<td>$16,914</td>
<td>RTA First &amp; Last Mile Mobility Plan</td>
</tr>
<tr>
<td>2</td>
<td>Add bike lanes on Simpson Road between Patterson Avenue and Leon Road.</td>
<td>Bicycle improvements, Wayfinding</td>
<td>$145,200</td>
<td>RTA First &amp; Last Mile Mobility Plan</td>
</tr>
<tr>
<td>3</td>
<td>Add signed bike route on Patterson Avenue. Connects proposed Salt Creek Multi-use Path with Winchester Road.</td>
<td>Bicycle improvements, Wayfinding</td>
<td>$14,520</td>
<td>RTA First &amp; Last Mile Mobility Plan</td>
</tr>
<tr>
<td>4</td>
<td>Add bike lanes on Leon Road. Connects Simpson Road to Salt Creek Multi-use Path and Domenigoni Parkway.</td>
<td>Bicycle improvements, Wayfinding</td>
<td>$58,080</td>
<td>RTA First &amp; Last Mile Mobility Plan</td>
</tr>
<tr>
<td>5</td>
<td>Add bike lanes on Domenigoni Parkway for a continuous bicycle facility</td>
<td>Bicycle improvements, Wayfinding</td>
<td>$180,048</td>
<td>RTA First &amp; Last Mile Mobility Plan</td>
</tr>
<tr>
<td>6</td>
<td>Complete Salt Creek Multi-Use Path. Provides a separated multi-use path for both bicyclists and pedestrians</td>
<td>Bicycle improvements, Pedestrian improvements, Wayfinding</td>
<td>$6.4M*</td>
<td>In planning and design phase from Riverside County Transportation and Land Use Management Agency</td>
</tr>
</tbody>
</table>

*Source: Riverside County Transportation and Land Use Management Agency

Additional strategies may be recommended due to the rural nature and lack of transportation options of this pilot station. Table 4-11 identifies non-infrastructure projects that may be implementable.

Table 4-12: Winchester Recommended Transportation Demand Management (TDM) Strategies

<table>
<thead>
<tr>
<th>ITEM #</th>
<th>RECOMMENDED PEDESTRIAN IMPROVEMENTS</th>
<th>APPLICABLE STRATEGIES</th>
<th>ESTIMATED COST</th>
<th>STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Coordinate with rideshare companies to provide access to local bus stops</td>
<td>Rideshare, carpooling</td>
<td>Varies</td>
<td>RTA First &amp; Last Mile Mobility Plan</td>
</tr>
<tr>
<td>2</td>
<td>Provide transit discounts</td>
<td>TDM</td>
<td>Varies</td>
<td>RTA First &amp; Last Mile Mobility Plan</td>
</tr>
</tbody>
</table>
COMMERCIAL DISTRICT

Jurupa Valley

The Limonite Avenue at Pats Ranch Road station is located at the intersection of Limonite Avenue and Pats Ranch Road in the City of Jurupa Valley. The station lies in a suburban area, approximately 0.3 miles east of Interstate 15. This station was selected because it is surrounded by a mix of uses including single family residential developments, open/undeveloped land and large shopping centers located directly on Limonite Avenue. This site is also typical of commercial development being adjacent to high-volume, high-speed roadway and freeway.

Selection Results

This high ranking commercial station has a mix of rural and single family residential, large shopping centers and arterial roads. Geographically, this station is the westernmost pilot study and adequate distance from the City of Riverside. Within the transitshed, there are freeway constraints, however there is opportunity to connect to the Santa Ana River Trail. The residential development has typical curvilinear/cul-de-sac street patterns.

Transit Service

- Bus Routes: 3, 29
- Bus Frequency: 20-30 minutes (Weekdays and Weekends)
- Boardings: 8, Alightings: 1 (Note: Stop only available westbound currently)

Transit Connections

- Bus Connections: Corona Transit Center, Norco Senior Center, Eastvale Gateway, Vernola Marketplace, North Main Plaza (Corona), Norco College, Downtown Rubidoux

Attributes

- Mix of uses – Variety of uses around the station, which includes residential development, open space, and a large shopping center
- Potential development – Surrounding vacant parcels have potential for attractive development

Existing Plans, Programs and Projects

- Goodman Commerce Centre
- Leal Master Plan
- Thoroughbred Farms
- Eastvale Bicycle Master Plan
- On-going

Opportunities

- Close proximity to different uses, including retail establishments and commercial developments
- Large areas of residential development
- Open/undeveloped land east of the Interstate 15 can be developed with higher-intensity uses
- Sidewalks are in good condition near the station
- Potential eastbound stop

Constraints

- Suburban development pattern limits pedestrian connectivity in and around station area
- Auto-oriented, super-block development pattern is well established
- Arterials with landscaped medians often lack mid-block crossings for cyclists and pedestrians
- Bus stop has no shelter
- Most streets have sidewalks; however there is a lack of shade trees
- Lack of bicycle facilities
First & Last Mile Templates

Limonite at Pats Ranch Station

Opportunities

- Numerous retail and commercial establishments
- Vacant land can be developed with higher intensity uses
- Large areas of residential development
- Interchange identified for future improvements. Opportunity to improve bike & pedestrian facilities
- Bridge over I-15 without interchange

Constraints

- Lack of shade trees
- No bicycle facilities
- Curvilinear street development may discourage people from walking or biking
- Suburban development limits pedestrian connectivity
- Future widening of Limonite Avenue
- Bridge over I-15 without interchange
Figure 4-29: Eastvale / Jurupa Valley Land Use

Source: SCAG 2008, County of Riverside GIS
Figure 4-30: Eastvale / Jurupa Valley Proposed Bicycle Facilities

Source: County of Riverside GIS, City of Eastvale, City of Jurupa Valley WRCOG ATP (on-going)
Figure 4-31: Eastvale / Jurupa Valley Transit Routes

Source: SCAG 2008, County of Riverside GIS, RTA 2015
First & Last Mile Templates

Figure 4-32: Checklist of Tasks

Physical Deficiencies Checklist

Bus Stop: Limonite & Pats Ranch / Commercial - Jurupa Valley

Instructions: Use this checklist to identify common bicycle and pedestrian deficiencies while conducting field investigations. Mark the location of the deficiency on a map for further analysis.

1. Pedestrian Deficiencies
   - Missing Sidewalks
   - Missing Curb Ramps
   - Lighting
   - Poor Connectivity
   - Wayfinding
   - Walking Impediments

2. Bicycle Deficiencies
   - Lack of Bike Facilities
   - Roadway Speed
   - High Volume Traffic
   - Bike Detection
   - Wayfinding
   - Poor Road Conditions

3. Bus Stop Deficiencies
   - Lack of Shelter
   - Poor Lighting
   - Signage/Route Info
   - No Benches
   - ADA Accessibility

Notes

[Blank space for notes]
First & Last Mile Mobility Plan

Install continental crosswalks

Install sidewalks

Install continental crosswalks

Install multi-use path

Require developer to install sidewalks

Planned installation of sidewalks

Figure 4-33: Eastvale / Jurupa Valley Pedestrian Facility Recommendations
Table 4-13: Jurupa Valley Recommended Pedestrian Improvements

<table>
<thead>
<tr>
<th>ITEM #</th>
<th>RECOMMENDED PEDESTRIAN IMPROVEMENTS</th>
<th>APPLICABLE STRATEGIES</th>
<th>ESTIMATED COST</th>
<th>STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Replace standard crosswalks with continental crosswalks</td>
<td>Pedestrian improvements</td>
<td>$24,500</td>
<td>RTA First &amp; Last Mile Mobility Plan Recommendation</td>
</tr>
<tr>
<td>2</td>
<td>Install continental crosswalks</td>
<td>Pedestrian improvements, Traffic Calming</td>
<td>$7,000</td>
<td>RTA First &amp; Last Mile Mobility Plan Recommendation</td>
</tr>
<tr>
<td>3</td>
<td>Install sidewalks on the north side of Limonite Avenue. Curb ramps exist but lack sidewalk connectivity. Foot paths are present indicating pedestrian use between Eastvale Gateway Mall and Vernola Marketplace</td>
<td>Pedestrian improvements</td>
<td>$684,085</td>
<td>RTA First &amp; Last Mile Mobility Plan Recommendation</td>
</tr>
<tr>
<td>4</td>
<td>Being developed for additional residential homes. Require development to install sidewalks to provide connectivity along south side of Limonite Avenue</td>
<td>Pedestrian improvements</td>
<td>$576,875</td>
<td>RTA First &amp; Last Mile Mobility Plan Recommendation</td>
</tr>
<tr>
<td>5</td>
<td>Utilize available right-of-way on north side of Limonite Avenue for a multi-use path</td>
<td>Pedestrian improvements, Bicycle improvements</td>
<td>$1.6M</td>
<td>Jurupa Valley Bicycle and Pedestrian Master Plan Recommendation</td>
</tr>
<tr>
<td>6</td>
<td>Install multi-use path along east side of Wineville Avenue. With sidewalks already present on the west side, a multi-use path will allow additional bicycle and equestrian infrastructure to access the Santa Ana River Trail</td>
<td>Pedestrian improvements, Bicycle improvements</td>
<td>$1.2M</td>
<td>Jurupa Valley Bicycle and Pedestrian Master Plan Recommendation</td>
</tr>
<tr>
<td>7</td>
<td>Hamner Widening and installation of sidewalks along east side of Hamner Avenue</td>
<td>Pedestrian improvements, Traffic Calming</td>
<td>$2 M*</td>
<td>Estimated Completion 2017</td>
</tr>
</tbody>
</table>

*Source: City of Eastvale
Continue a bicycle facility between proposed multi-use path and protected bike lanes

Add bike lanes on Pats Ranch Rd and Wineville Ave to 68th Street

Continue bike lanes on Etiwanda Avenue

Add bike route with Shared Lane Markings on 68th Street

Figure 4-34: Winchester / Riverside County Bicycle Recommendations
<table>
<thead>
<tr>
<th>ITEM #</th>
<th>RECOMMENDED BICYCLE IMPROVEMENTS</th>
<th>APPLICABLE STRATEGIES</th>
<th>ESTIMATED COST</th>
<th>STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Continue a bicycle facility between the proposed multi-use path in Jurupa Valley to the proposed separated bikeways in Eastvale. Provides a connection over I-15. Consider a bicycle facility on Limonite over I-15 with the planned interchange redesign</td>
<td>Bicycle improvements, Pedestrian improvements, Wayfinding</td>
<td>$2.25M*</td>
<td>RTA First &amp; Last Mile Mobility Plan &amp; Eastvale Bicycle Master Plan Recommendation</td>
</tr>
<tr>
<td>2</td>
<td>Continue proposed bike lanes on Pats Ranch Road and Wineville Avenue to 68th Street. 68th Street provides access between Eastvale and Jurupa Valley, over I-15, without a freeway interchange</td>
<td>Bicycle improvements, Pedestrian improvements, Wayfinding</td>
<td>$86,500</td>
<td>RTA First &amp; Last Mile Mobility Plan Recommendation</td>
</tr>
<tr>
<td>3</td>
<td>Continue bike lanes on Etiwanda Avenue to access Santa Ana River Trail, proposed multi-use path on Limonite Avenue</td>
<td>Bicycle improvements, Wayfinding</td>
<td>$28,700</td>
<td>RTA First &amp; Last Mile Mobility Plan Recommendation</td>
</tr>
<tr>
<td>4</td>
<td>Add bike route with Shared Lane Markings on 68th Street to provide a connection between Eastvale and Jurupa Valley</td>
<td>Bicycle improvements, Wayfinding</td>
<td>$356,895*</td>
<td>RTA First &amp; Last Mile Mobility Plan &amp; Eastvale Bicycle Master Plan Recommendation</td>
</tr>
</tbody>
</table>

*Source: Includes proposed bicycle facilities from Eastvale Bicycle Master Plan*
INDUSTRIAL AND BUSINESS PARK

Moreno Valley

The Perris and Rivard station (bus stop) is located at the corner of N. Perris Boulevard and Rivard Road in the City of Moreno Valley. The station was selected due to its high ranking and primarily industrial area surrounded by large distribution centers for Walgreens, Ross Stores, and O’Reilly Auto Parts, as well as Amazon Fulfillment Centers. Large single family residential developments can be found just north of the station. Additionally, there are several undeveloped parcels around the station.

Selection Results

This is a high ranking site and is typical for large business park and industrial sites in the San Bernardino/Riverside region. There are opportunities for development with adjacent vacant land and single-family residential to the north. In addition, the new Amazon Fulfillment Centers are nearby, providing additional opportunities for first and last mile improvements.

Transit Service

• Bus Routes: 19
• Bus Frequency: 30 minutes (Weekdays and Weekends)
• Boardings: 0, Alightings: 2

Transit Connections:

• Bus Connections: Moreno Valley College, Perris High School, Moreno Valley Mall, Perris Station Transit Center, Valley Plaza Hospital

Attributes

• Potential development – vacant parcels have potential for development
• Employment center – large distribution centers in the area provide employment opportunities

Existing Plans, Programs and Projects

• Industrial Area Specific Plan
• Perris Valley Commerce
• Moreno Valley Bicycle Master Plan

Opportunities

• Transit signal priority proposed on Perris Blvd to improve on-time performance
• Perris Blvd is a proposed future RTA Rapid Link route
• Large residential development just north of the station
• Numerous distribution and fulfillment centers providing jobs in close proximity to the station
• Open/undeveloped land around the station can be developed with higher-intensity uses
• Limited existing development around the area creates an opportunity for station-area improvements and appropriate design guidelines
• Existing sidewalks have landscaping or street trees
• Multi-use trail connectivity

Constraints

• Auto-oriented, super-block development pattern is well established
• Suburban development pattern limits pedestrian connectivity in and around station area
• Streets adjacent to undeveloped parcels are missing sidewalks
• Existing sidewalks have little or no shade
• Lack of bike facilities
• Arterials with landscaped medians often lack mid-block crossings for bicyclists and pedestrians
• Bus stop has no shelter
**Opportunities**

- Curvilinear street development may discourage people from walking or biking.
- Large areas of residential development.
- Potential multi-use path connection.
- Undeveloped parcels can be developed to include sidewalks, bicycle facilities and mixed-use.
- Potential multi-use path connection.

**Constraints**

- Suburban development limits pedestrian connectivity.
- Lack of bicycle facilities on Perris Blvd.
- Connectivity to the Juan Bautista De Anza Trail.

**Other Noted Points**

- Suburban development.
- Large areas of residential development.
- Curvilinear street development may discourage people from walking or biking.
- Lack of bicycle facilities on Perris Blvd.
- Connectivity to the Juan Bautista De Anza Trail.

**Proposed Projects**

- Proposed Pedestrian Hybrid Beacon (PHB).
- Rideshare / Carpool programs.
- Potential multi-use path connection.

**Locations**

- Perris Boulevard
- Globe Street
- Grove View Road
- Lasselle Street
- Amazon
- Iris Avenue
- Perris and Rivard Station (Bus Stop)
Figure 4-35: Moreno Valley / Perris Land Use

Source: SCAG 2008, County of Riverside GIS
Figure 4-36: Moreno Valley / Perris Proposed Bicycle Facilities

Source: County of Riverside GIS, City of Moreno Valley, WRCOG ATP (on-going)
Source: SCAG 2008, County of Riverside GIS, RTA 2015

Figure 4-37: Moreno Valley / Perris Transit Routes

Source: SCAG 2008, County of Riverside GIS, RTA 2015
Figure 4-38: Checklist of Tasks

Physical Deficiencies Checklist

Instructions: Use this checklist to identify common bicycle and pedestrian deficiencies while conducting field investigations. Mark the location of the deficiency on a map for further analysis.

1. Pedestrian Deficiencies
   - Missing Sidewalks
   - Missing Curb Ramps
   - Lighting
   - Shade
   - Poor Connectivity
   - Walking Impediments
   - Wayfinding
   - Crosswalks

2. Bicycle Deficiencies
   - Lack of Bike Facilities
   - Roadway Speed
   - High Volume Traffic
   - Bike Detection
   - Wayfinding
   - Wide Intersections to Cross
   - Poor Road Conditions

3. Bus Stop Deficiencies
   - Lack of Shelter
   - Poor Lighting
   - Signage/Route Info
   - No Benches
   - ADA Accessibility

Notes:

[Blank space for notes]
Figure 4-39: Moreno Valley Pedestrian Facility Recommendations
### Table 4-15: Moreno Valley Recommended Pedestrian Improvements

<table>
<thead>
<tr>
<th>ITEM #</th>
<th>RECOMMENDED PEDESTRIAN IMPROVEMENTS</th>
<th>APPLICABLE STRATEGIES</th>
<th>ESTIMATED COST</th>
<th>STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Complete sidewalks as part of development</td>
<td>Pedestrian improvements</td>
<td>$1.5M</td>
<td>RTA First &amp; Last Mile Mobility Plan Recommendation</td>
</tr>
<tr>
<td>2</td>
<td>Install a protected trail crossing. If possible, provide an undercrossing to avoid an at grade crossing. If an at-grade crossing, install RRFB or PHB</td>
<td>Pedestrian improvements, Bicycle improvements</td>
<td>$144,000</td>
<td>RTA First &amp; Last Mile Mobility Plan Recommendation</td>
</tr>
<tr>
<td>3</td>
<td>Install continental crosswalks</td>
<td>Pedestrian improvements</td>
<td>$14,000</td>
<td>RTA First &amp; Last Mile Mobility Plan Recommendation</td>
</tr>
<tr>
<td>4</td>
<td>Provide connectivity to the proposed multi-use path along flood control channel on Perris Boulevard and Indian Street</td>
<td>Pedestrian improvements, Bicycle improvements</td>
<td>$135,441</td>
<td>RTA First &amp; Last Mile Mobility Plan Recommendation</td>
</tr>
<tr>
<td>5</td>
<td>Install pedestrian lighting</td>
<td>Pedestrian improvements, Bicycle improvements</td>
<td>$35,100</td>
<td>RTA First &amp; Last Mile Mobility Plan Recommendation</td>
</tr>
</tbody>
</table>

### Table 4-16: Moreno Valley Bus Stop Recommended Improvements

<table>
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<tr>
<th>ITEM #</th>
<th>RECOMMENDED STATION IMPROVEMENTS</th>
<th>APPLICABLE STRATEGIES</th>
<th>ESTIMATED COST</th>
<th>STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Install shelters to allow visibility and easy access to the bus. Lengthen bus bay if ridership increases. Include solar lighting</td>
<td>Bus Stop Amenity</td>
<td>$80-$112K</td>
<td>City of Moreno Valley Recommendation</td>
</tr>
</tbody>
</table>
Figure 4-40: Moreno Valley / Perris Bicycle Recommendations

1. Add combination Bus / Bike Lane Only lane
2. Add buffered bike lanes
3. Upgrade to bike lanes
4. Complete South City Aqueduct Path
5. Complete the Juan Bautista De Anza Trail segment
6. Complete the Kitching Aqueduct Path
7. Complete the Perris Valley Channel Path
8. Complete the Harley Knox Channel Path
Table 4-17: Moreno Valley Recommended Bicycle Facility Improvements

<table>
<thead>
<tr>
<th>ITEM #</th>
<th>RECOMMENDED BICYCLE IMPROVEMENTS</th>
<th>APPLICABLE STRATEGIES</th>
<th>ESTIMATED COST</th>
<th>STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Add Bus / Bike Lane combination on Perris Boulevard to accommodate future BRT route</td>
<td>Bicycle improvements, Transit Infrastructure</td>
<td>$250,000</td>
<td>RTA First &amp; Last Mile Mobility Plan Recommendation</td>
</tr>
<tr>
<td>2</td>
<td>Add buffered bike lanes on San Michele Road</td>
<td>Bicycle improvements, Wayfinding</td>
<td>$59,000</td>
<td>RTA First &amp; Last Mile Mobility Plan Recommendation</td>
</tr>
<tr>
<td>3</td>
<td>Upgrade proposed bike route to bike lanes on Indian Street</td>
<td>Bicycle improvements, Wayfinding</td>
<td>$13,338*</td>
<td>RTA First &amp; Last Mile Mobility Plan and Moreno Valley Bicycle Master Plan Recommendation</td>
</tr>
<tr>
<td>4</td>
<td>Complete the South City Aqueduct Path</td>
<td>Bicycle improvement, Pedestrian improvements, Wayfinding</td>
<td>$4.3M*</td>
<td>RTA First &amp; Last Mile Mobility Plan and Moreno Valley Bicycle Master Plan Recommendation</td>
</tr>
<tr>
<td>5</td>
<td>Complete the Juan Bautista De Anza Trail segment</td>
<td>Bicycle improvement, Pedestrian improvements, Wayfinding</td>
<td>$5.1M*</td>
<td>Caltrans ATP Cycle 2 approved funding for design and construction</td>
</tr>
<tr>
<td>6</td>
<td>Complete the Kitching Aqueduct Path</td>
<td>Bicycle improvement, Pedestrian improvements, Wayfinding</td>
<td>$7.2*</td>
<td>Moreno Valley Bicycle Master Plan Recommendation</td>
</tr>
<tr>
<td>7</td>
<td>Complete the Perris Valley Channel Path</td>
<td>Bicycle improvement, Pedestrian improvements, Wayfinding</td>
<td>$236,263**</td>
<td>Caltrans ATP Cycle 3 approved funding for design and construction</td>
</tr>
<tr>
<td>8</td>
<td>Complete the Harley Knox Channel Path</td>
<td>Bicycle improvement, Pedestrian improvements, Wayfinding</td>
<td>$1.4M**</td>
<td>Caltrans ATP Cycle 1 approved funding for design and construction</td>
</tr>
</tbody>
</table>

Source: * Moreno Valley Bicycle Master Plan, ** Perris Trails Master Plan
Additional strategies may be recommended due to the development, land use and transportation characteristics of this pilot station. Due to the industrial land use and varying shifts of work, some employees may be working beyond the standard service hours and likely would not benefit from transit stop shuttles or discounts. Table 4-18 identifies non-infrastructure projects that may be implementable.

Table 4-18: Moreno Valley Recommended Transportation Demand Management (TDM) Strategies

<table>
<thead>
<tr>
<th>ITEM #</th>
<th>RECOMMENDED PEDESTRIAN IMPROVEMENTS</th>
<th>APPLICABLE STRATEGIES</th>
<th>COST</th>
<th>STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Coordinate shuttle service to nearby transit stops</td>
<td>Rideshare, carpooling</td>
<td>Varies</td>
<td>RTA First &amp; Last Mile Mobility Plan Recommendation</td>
</tr>
<tr>
<td>2</td>
<td>Coordinate bike share or bike rental program for employees</td>
<td>Bicycle program</td>
<td>Varies</td>
<td>RTA First &amp; Last Mile Mobility Plan Recommendation</td>
</tr>
<tr>
<td>3</td>
<td>Provide transit discounts</td>
<td>TDM</td>
<td>Varies</td>
<td>RTA First &amp; Last Mile Mobility Plan Recommendation</td>
</tr>
<tr>
<td>4</td>
<td>Guaranteed Ride Home Program</td>
<td>TDM</td>
<td>Varies</td>
<td>RTA First &amp; Last Mile Mobility Plan Recommendation</td>
</tr>
</tbody>
</table>
Cost Estimates

For jurisdictions that have developed bicycle and pedestrian master plans, the costs associated with the recommended projects were used to provide consistency between planning efforts.

Bicycle and pedestrian cost estimates will vary between cities and even contractors. The following describes the general order of magnitude costs for projects associated with the pilot study recommendations. As each project moves into design and engineering phases, detailed cost estimates will need to be adjusted based on final design, utilities and other right-of-way factors.

The planning level and unit costs for the bicycle and pedestrian projects represent a 2016 database of prevailing construction costs per unit typically observed in Riverside and San Bernardino County, as validated by information from local jurisdictions and through the results of recent of bid documents.

Pedestrian Facility Costs

Costs for pedestrian facilities are based on current planning level unit costs. Below are pedestrian recommendation cost estimates used for this plan which have contingencies and design costs built in.

Pedestrian Infrastructure

Sidewalk Linear Foot (LF): $355 per LF (assumes 6 ft. width and includes curb). $27 per square foot (SF) with no curb
Curb ramps: $6,500 each
Continental crosswalks (LF): $85 or $3,500 per crosswalk
Curb extension (each): Raised: $55,840 per curb, Painted: $5,225 per curb

Enhanced Pedestrian Countermeasures

Pedestrian Hybrid Beacon: $144,000 each
Rectangular Rapid Flashing Beacon (RRFB): $45,000 per intersection
Pedestrian signal actuator (in median refuge): $2,200 each

Lighting

Pedestrian scale lighting: $14,400 or $315 per LF
Roadway lighting: $11,700 or $144 per LF (Roadway lighting may be more cost effective per LF due to longer spacing between lights)
Bicycle Facility Costs

Multi-use Path (Class I)

Unlike Class 2 and 3 facilities, Class 1 paths are separate from roadways, meaning that planning level cost estimation requires an average per-mile cost to be applied based on local conditions. Depending on a number of factors, Class 1 path costs in the last few years have ranged between $750,000 and $2,800,000 per mile. For this plan, an average per-mile cost of $1,600,000 was used.

Bicycle Lane (Class II)

Class 2 bicycle lane cost can fall within a range of potential conditions. At the low end, it assumes that adequate space exists within the roadway to simply add bicycle lane striping and markings without modifying the roadway further, and that the roadway is in good condition and does not require maintenance or rehabilitation as part of the striping project, and no modifications to intersection signal equipment are assumed.

Proposed bicycle lanes were assigned an average per-mile cost of $58,080.

Bicycle Route (Class III)

This category assumes signage and shared-use pavement markings ("Sharrows") only along the length of the route at intervals of 0.25 miles in each direction and at intersections, and that the roadway does not require rehabilitation or pre-construction maintenance. Bicycle routes were assigned an average per-mile cost of $13,200.

Cycle Tracks/Protected Bike Lane (Class V)

Cycle tracks can vary in costs due to the various segment and intersection treatments associated with them. Segment protection can range from raised curbs to simple treatments such as striping with on-street parking or reflective bollards. If curbs are built, stormwater utilities would also need to be considered.

At intersections, additional striping, paint and in some cases, dedicated bicycle signals are needed. For planning costs, the assigned per-mile cost for cycle tracks is $520,000.

Bicycle Boulevard Costs (Class IV)

Bicycle boulevards are essentially bicycle route facilities that may feature physical roadway modifications such as traffic calming measures or changes in intersection priority or access. Bicycle boulevard projects can therefore vary widely in cost, primarily due to the level of physical construction designed into them.

Because bicycle boulevards need to be evaluated in more detail to determine the extent of desired modification, this plan assumes that their costs are equivalent to those of typical bicycle route facilities employing signage and pavement markings only, to be revised as needed in final design prior to implementation.
Planning for the Future
Planning for the Future

Riverside County is the second fastest growing county in California and is ranked fourth statewide for housing growth. In light of significant anticipated development, RTA may employ a range of funding mechanisms that rely on contributions from developers and the private sector in the form of: Developer Conditions of Approval (COA), Public-Private Partnerships and the Transportation Uniform Mitigation Fee (TUMF).

The pilot study process in Chapter 4 laid the groundwork for coordination between cities and RTA to identify deficiencies and develop recommendations. Those planning efforts will eventually need to be funded and implemented. This chapter highlights some of the additional strategies to obtain funding to improve first and last mile connectivity. The funding section provides a list of the various funding sources available for planning and implementation involving bicycle and pedestrian improvements. RTA and coordinating cities may go after many of these funding sources as a joint effort to improve their chances of success. It is recommended that bicycle and pedestrian improvements to transit, and their benefits, be included in the applications to strengthen the chances of being awarded.

Developer Conditions of Approval (COA)

Developer COAs are perhaps the most common of the three mechanisms, wherein cities and counties typically assess the projected impacts of development and require the developers to either build or finance infrastructure (e.g. sidewalks, bike lanes, etc.). RTA may coordinate with member agencies to incorporate first and last mile projects in developer COAs. As a regional agency, RTA is in a position to both coordinate with local jurisdictions and RCTC and WRCOG, and facilitate coordination between them. This regional perspective may help mitigate disconnected development patterns (e.g. sidewalks that lead to nowhere) that often result from stand alone developments.

Transportation Uniform Mitigation Fee (TUMF)

The Western Riverside Council of Governments (WRCOG) has instituted a Transportation Uniform Mitigation Fee (TUMF): “a program that ensures that new development pays its fair share for the increased traffic it creates.” According to WRCOG, the TUMF will raise over $5 billion for transportation projects in Western Riverside County over the next twenty-five years.

Public-Private Partnerships

Public-private partnerships (PPP or P3) is another means in which developers may contribute to first and last mile solutions within a catchment area. While traditional transportation revenue sources such as gas taxes continue to decline as operating costs increase, RTA and local jurisdictions may look into new revenue sources to fund and improve projects. Currently, there are various opportunities in which the private sector can engage first and last mile connectivity. While there are many items and risks to consider in private-public partnerships, this section will focus on the coordination of first and last mile improvements and ridesharing, a growing trend throughout the US.

P3s in transit are distinguished from other public-private collaboration since they are not procurements but instead are mechanisms to provide capital to fund transit related projects. In the case of first and last mile solutions, RTA may partner with the private sector in order to promote transit oriented development. These partnerships provide access to additional capital and operating revenues for transit agencies through the receipt of lease payments, access fees, and increased fare revenues, as well as direct private sector funding of capital facilities that promote access between transit and private development.

In terms of planning for first and last mile improvements, RTA, local jurisdictions and private entities can work together to identify the gaps and deficiencies within the study's catchment area, recommend improvements within the property and condition additional access improvements as it affects access to a new station or bus stop. If these deficiencies are identified, they can be built into the planning and design process to provide efficiency and another avenue for funding and implementation.

With Senate Bill 375 (SB 375), Metropolitan Planning Organizations (MPOs) must work with their local cities and communities to reduce greenhouse gas emissions. One GHG reduction strategy is to reduce the number of single occupant vehicles by providing alternative modes of transportation, such as transit, walking and bicycling. Projects to improve non-motorized access to transit also have access to additional funding sources for planning and construction through statewide and regional active transportation funding.
Benefits of Public-Private Partnerships in First and Last Mile Infrastructure Projects

Below is a summary of the benefits and constraints to public-private partnerships as it relates to first and last mile projects.

1. New Sources of Capital

   Shifting responsibility for arranging the financing to a private partner can help deliver needed infrastructure in instances where the governing agency is facing shortages in infrastructure funding.

2. Better First and Last Mile Coordination

   Improving access to transit, or project site, can be incorporated while in the planning and design phase. Improvements can be identified prior to the procurement of funds, rather than costly retrofits after the project has been constructed, which cannot be funded by a developer.

3. Faster Completion of Projects

   Conventional procurements usually require the public sector to provide significant upfront capital for project construction. Securing private financing allows the public sector to spread the public’s cost of infrastructure investment over the lifetime of the asset. Typically, the private contractor also has a strong incentive to complete the project as quickly as possible to begin collecting the stream of revenues needed to recapture its capital costs.

4. Shifting Construction and Maintenance Risks from Taxpayers to Private Partners

   The ability to shift the risks a contractor can best manage to the private sector is an important benefit of the public-private partnership concept. The private entity is allowed to earn a financial return commensurate with the risks it assumes on the project.

   Some partnership agreements require the private sector to maintain the assets over the full term of the concession. Early intervention costs about 20% less than maintenance postponed to the latter quarter of a facility’s life. Continual maintenance deferral can result in more safety problems, a shorter infrastructure lifespan and reduced quality of services.

5. Construction Savings

   Experience from several countries has demonstrated that public-private ventures cost comparatively less during the construction phase thanks to innovations in design and construction methodologies.

6. Increased Value

   Increased value of land, building sales or leasing value when improvements are done and paid for upfront by private partners.
Partnerships with State and Regional Agencies

Local jurisdictions should continue to pursue state level grant programs such as Caltrans’ Active Transportation Planning (ATP) and Sustainable Transportation Planning grants, the Strategic Growth Council’s Sustainable Community Planning Grants, Urban Greening Grants and the California Air Resources Board Cap and Trade program. Southern California Association of Governments (SCAG), the regional Metropolitan Planning Organization, also has funding mechanisms through mini-grants and their Sustainable Planning Grant Program which includes programs for Active Transportation, Green Region Initiatives and Integrated Land Use. Projects not funded through SCAG can then be administered through the Western Riverside Council of Governments (WRCOG). Other regional programs such as Smart Growth Incentive Program planning and construction grants should also be considered. While these programs support the implementation of capital projects, they do not cover maintenance costs; maintenance costs must be assumed by local organizations.

One noteworthy recent example of such a public-private partnership is the City of Seattle/Amazon-funded 7th Avenue cycle track project in Seattle, WA. Specifically, this partnership stipulated that Amazon fund the project’s design and the segment through their campus; the City is to fund the remaining project construction. RTA may work with relevant developers within its service area to identify first and last mile projects appropriate to the site and the scale of the development.
Implementation Strategies

Most cities in Riverside County are faced with budget challenges and it’s critical that cities use multiple funding sources for both project planning and implementation. Funding sources can also combine locally-derived assessments with corporate and philanthropic donations to increase community benefits and first and last mile improvements. Establishing public-private partnerships between sectors (government, business, non-profit) and community organizations could enhance the opportunities for identifying various ways to fund projects.

Table 5-1 provides a list of potential steps needed to implement first and last mile improvements.

<table>
<thead>
<tr>
<th>NO.</th>
<th>ACTIONS</th>
<th>LEAD</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Identify items on the city’s CIP list that can incorporate recommended first and last mile improvements</td>
<td>City</td>
<td>Capital Improvement Projects are defined as a street reconfiguration of lanes, geometry, curbs, drainage systems or other major utility improvements requiring a substantial percentage of the pavement to be removed and/or replaced. During these improvements, first and last mile recommendations can be integrated into the project for efficiency and cost savings.</td>
</tr>
<tr>
<td>2</td>
<td>Integrate the first and last mile recommendations into all applicable grant applications</td>
<td>City, Coordinating agencies</td>
<td>In some cases, grants could be pursued specifically for only first and last mile improvements, while in others, they can be used to strengthen benefits for other projects.</td>
</tr>
<tr>
<td>3</td>
<td>Analyze if an environmental review is needed for each project to determine level of impact</td>
<td>City</td>
<td>Projects classified as maintenance or replacement can be considered categorical exemptions under CEQA. Major projects affecting traffic, natural areas or ROW acquisitions may require full environmental review. Most first and last mile improvements are primarily retrofits to existing infrastructure and/or re-striping.</td>
</tr>
<tr>
<td>4</td>
<td>Develop design and engineering documents and obtain appropriate permits for each project</td>
<td>City, Coordinating agencies</td>
<td>At this stage, wayfinding and signage can be incorporated into the designs to assure the fixtures needed are integrated into the project.</td>
</tr>
<tr>
<td>5</td>
<td>Identify sources of funding for ongoing maintenance of street enhancements</td>
<td>City</td>
<td>Ongoing maintenance responsibilities will likely need to be identified prior to implementation.</td>
</tr>
<tr>
<td>6</td>
<td>Identify alternate sources of funding, including assessment programs</td>
<td>City</td>
<td>Consider additional assessment districts, including Maintenance Assessment Districts, lighting districts, Business Improvement Districts or other funding sources applied to those who will benefit from the increased first and last mile improvements.</td>
</tr>
<tr>
<td>7</td>
<td>Identify opportunities to incorporate first and last mile recommendations into proposed redevelopment projects</td>
<td>City, Coordinating agencies</td>
<td>For major projects, the improvements may go beyond the immediate project boundaries.</td>
</tr>
</tbody>
</table>
Potential Infrastructure Funding Sources

Federal, state and local government agencies invest billions of dollars every year in the nation’s transportation system. Only a fraction of that funding is used to develop policies, plans and projects to improve conditions for bicyclists and pedestrians. Even though appropriate funds are available, they are limited and often hard to find. Desirable projects sometimes go unfunded because communities may be unaware of a fund’s existence or may apply for the wrong type of grant. In addition, there is competition between municipalities for the limited available funds.

Whenever federal funds are used for bicycle and pedestrian projects, a certain level of state and/or local matching funding is generally required. State funds are often available to local governments on similar terms. Almost every implemented active transportation or complete street program and facility in the United States has had more than one funding source and it often takes a good deal of coordination to pull the various sources together.

According to the publication by the Federal Highway Administration (FHWA), *An Analysis of Current Funding Mechanisms for Bicycle and Pedestrian Programs at the Federal, State and Local Levels*, where successful local bicycle facility programs exist, there is usually an active transportation coordinator with extensive understanding of funding sources. Cities such as Seattle, Portland, and Tucson are prime examples. City staff are often in a position to develop a competitive project and detailed proposal that can be used to improve conditions for cyclists within their jurisdictions. Some of the following information on federal and state funding sources was derived from the previously mentioned FHWA publication.

Table 5-2 identifies potential funding opportunities that may be used from design to maintenance phases of projects. Due to trends in Low Impact Development (LID) and stormwater retention street designs, funding sources for these improvements not only increase the chances for first and last mile improvements, but can also be incorporated into streetscape and development projects. The sources are arranged by federal, state, local, and private, and the uses that the funds may address.
## Table 5-2: Funding Sources

<table>
<thead>
<tr>
<th>Funding Source</th>
<th>Funding Origin</th>
<th>Typical Approaches</th>
<th>Atypical Approaches</th>
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<tbody>
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<td><strong>Federal Funding Sources</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Land and Water Conservation Fund (LCWF)</td>
<td>U.S. National Park Service/ California Dept. of Parks and Recreation</td>
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<td>✔</td>
</tr>
<tr>
<td>Urban Community Forestry Program</td>
<td>U.S. National Park Service</td>
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<td>✔</td>
</tr>
<tr>
<td>Surface Transportation Program</td>
<td>Federal Highway Administration (FHWA) / Caltrans</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Transportation Alternative Program</td>
<td>Federal Highway Administration (FHWA) / SANDAG</td>
<td>✔</td>
<td>✔</td>
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<tr>
<td>Recreational Trails Program</td>
<td>Federal Highway Administration (FHWA) / Regional agency may also contribute</td>
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<td>✔</td>
</tr>
<tr>
<td>Highway Safety Improvement Program</td>
<td>Federal Highway Administration (FHWA) / Caltrans</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>EPA Brownfields Clean Up &amp; Assessments</td>
<td>U.S. Environmental Protection Agency</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Sustainable Communities Planning Grant and Incentive Program</td>
<td>U.S. Dept. of Housing and Urban Development (HUD)</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>Urban Revitalization &amp; Livable Communities Act</td>
<td>U.S. Dept. of Housing and Urban Development (HUD)</td>
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<tr>
<td>Community Development Block Grants</td>
<td>U.S. Dept. of Housing and Urban Development (HUD)</td>
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<td>Achieve, Communities Putting Prevention to Work, Pioneering Communities</td>
<td>Center for Disease Control &amp; Prevention</td>
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<td>Urban and Community Forest Program</td>
<td>Department of Agriculture, Forest Service</td>
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<tr>
<td>Community Forest and Open Space Conservation</td>
<td>Department of Agriculture, Forest Service</td>
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### Table 5-2: Funding Sources (Cont.)

<table>
<thead>
<tr>
<th>FINDING, FRAMING AND FUNDING A PROJECT</th>
<th>FUNDING USES</th>
<th>Typical Approaches</th>
<th>ATYPICAL APPROACHES</th>
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<tbody>
<tr>
<td><strong>FUNDING SOURCE</strong></td>
<td><strong>FUNDING ORIGIN</strong></td>
<td><strong>CIP Development</strong></td>
<td><strong>Maint &amp; Operations</strong></td>
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<tr>
<td>Choice Neighborhoods Implementation Grants</td>
<td>Department of Housing and Urban Development, Office of Public and Indian Housing</td>
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<tr>
<td>Safe Routes to School, Mini-grants</td>
<td>National Center for Safe Routes to School &amp; Caltrans</td>
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<tr>
<td>Metropolitan &amp; Statewide and Nonmetropolitan Transportation Planning</td>
<td>Federal Transit Administration (FTA)</td>
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<td>Urbanized Area Formula Grants</td>
<td>Federal Transit Administration (FTA)</td>
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<td>Bus and Bus Facilities Formula Grants</td>
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<td>Enhanced Mobility of Seniors and Individuals with Disabilities</td>
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<tr>
<td>Formula Grants for Rural Areas</td>
<td>Federal Transit Administration (FTA)</td>
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<tr>
<td>TOD Planning Pilot Grants</td>
<td>Federal Transit Administration (FTA)</td>
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</tbody>
</table>

**State Funding Sources**

<p>| <strong>LAND AND WATER CONSERVATION FUND (LCWF)</strong> | <strong>CA Dept. of Parks &amp; Rec</strong> | ✓ | ✓ | ✓ | ✓ |
| <strong>STATEWIDE PARK PROGRAM PROP 84 ROUND 2</strong> | <strong>CA Dept. of Parks &amp; Rec</strong> | ✓ | ✓ |
| <strong>RECREATIONAL TRAILS PROGRAM</strong> | <strong>CA Dept. of Parks &amp; Rec</strong> | ✓ | ✓ | ✓ | ✓ |
| <strong>PROPOSITION 117 - HABITAT CONSERVATION</strong> | <strong>CA Dept. of Parks &amp; Rec</strong> | ✓ | ✓ | ✓ | ✓ |
| <strong>NATURE EDUCATION FACILITIES</strong> | <strong>CA Dept. of Parks &amp; Rec</strong> | ✓ | ✓ | ✓ | ✓ |</p>
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<thead>
<tr>
<th>FINDING, FRAMING AND FUNDING A PROJECT</th>
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<th>Typical Approaches</th>
<th>ATYPICAL APPROACHES</th>
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<td>Community Based Transportation Planning, Environmental Justice &amp; Transit Planning</td>
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<td>Non-point Source Pollution, Watershed Plans, Water Conservation (Props 13, 40, 50 &amp; 84)</td>
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<td>Sustainable Communities Planning, Regional SB 375</td>
<td>Strategic Growth Council/ Dept of Conservation</td>
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<td>Environmental Enhancement &amp; Mitigation (EEMP)</td>
<td>California Natural Resourc- es Agency &amp; Caltrans</td>
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<td>California River Parkways and Urban Streams Restoration Grant</td>
<td>CA Natural Resources Agency /Dept of Water Resources</td>
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<td>California Cap and Trade Program</td>
<td>Cal EPA, Air Resources Board</td>
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<td>Urban Forestry Program (Leafing Out, Leading Edge and Green Trees Grants)</td>
<td>California Department of Forestry and Fire Protection (CAL FIRE)</td>
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### Table 5-2: Funding Sources (Cont.)

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<tr>
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<td>Special Habitat Conservation Programs</td>
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<td>Sustainable Planning Grants: Integrated Land Use</td>
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<td>Business Improvement (BID) Maint. Districts (MAD)</td>
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<td>Property Based Improvement Districts (PBID) Landscape Maint. District (LMD)</td>
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Table 5-2: Funding Sources (Cont.)

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<tr>
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<th>FUNDING ORIGIN</th>
<th>CIP Development</th>
<th>Maint. &amp; Operations</th>
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<th>BACK TO NATURE</th>
<th>LOW IMPACT DEVELOPMENT</th>
<th>CULTURE AND HISTORY</th>
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<td>FIRST &amp; LAST MILE</td>
<td>URBAN FORESTRY</td>
<td>BACK TO NATURE</td>
<td>LOW IMPACT DEVELOPMENT</td>
<td>CULTURE AND HISTORY</td>
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Public-Private Partnerships in Ridesharing

An emerging trend not only in transportation, but in first and last mile access is ridesharing, primarily using companies like Lyft and Uber. These ridesharing companies have been at the forefront of ridesharing throughout the country and have begun working with transit agencies, cities and private companies to provide first and last mile connectivity.

Ridesharing incentives and subsidies are being experimented with through the various entities to encourage more transit and carpool use, reduce parking demand and to provide an option where transit service is not accessible or very limited. The following are some examples of experimental rideshare partnership programs. Table 5-3 summarizes some of the ridesharing pilot studies that include first and last mile options.

- Discounts or full subsidies for travel to and from a bus stop/hub/transit center within:
  - A service zone
  - During special events
  - During commute hours
- Free rides for economically disadvantaged riders
- Employee credits to and from a bus stop/transit center
- Mobile application (app) integration - integrate with transit ticketing apps to offer passengers a seamless multi-modal experience
- Subsidize in Transit Deserts - Partner with transit providers and institutions to deliver targeted credit benefits
- Right-sized paratransit - provide paratransit rides
- Co-Marketing - work with transit agencies to market rideshare and transit use

More than 20% of Lyft rides in LA County start or end at a train station.

Lyft

1 in 4 Uber trips started or ended within a quarter mile of a public transit station (in Portland, OR).

Uber NewsRoom
Table 5-3: Examples of Rideshare Partnerships

<table>
<thead>
<tr>
<th>CITY/AGENCIES</th>
<th>RIDESHARE COMPANY/PROGRAM</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arlington County, TX</td>
<td>Uber &amp; Lyft</td>
<td>Proposal to use rideshare to replace low use (15 pass/hour) bus routes and connect riders with transit centers</td>
</tr>
<tr>
<td>Altamonte Springs, FL</td>
<td>Uber</td>
<td>Discount on rides within Altamonte Springs and to and from commuter train station</td>
</tr>
<tr>
<td>Centennial, CO</td>
<td>Lyft</td>
<td>Fully subsidized Lyft Line rides to/from the city’s light rail station during commuting hours</td>
</tr>
<tr>
<td>Summit, NJ</td>
<td>Uber</td>
<td>100-person pilot program in which the city is subsidizing Uber rides to and from its transit station in order to reduce parking demand</td>
</tr>
</tbody>
</table>

**TRANSIT AGENCIES**

- **Dallas Area Rapid Transit (DART)**
  - Uber
  - Uber is provided $20 off to first time users to and from rail stations and anywhere else they need to travel during St Patrick’s Day events, Can now access Uber through Dart’s mobile ticketing app

- **Livermore Amador Valley Transit Authority (LAVTA)**
  - Uber & Lyft
  - Subsidized fares for ridesharing rather than riding a bus. Talks are ongoing to include taxis

- **Massachusetts Bay Transportation Authority (MBTA)**
  - Uber & Lyft
  - Subsidized rides for disabled passengers

- **Metropolitan Atlanta Rapid Transit Authority (MARTA)**
  - Uber “Last Mile Campaign”
  - Insert Code: MARTAGuide and receive $20 off your first ride

- **Orange County Transportation Authority (OCTA)**
  - Lyft
  - A rider will pay $2, and rest of Lyft’s fare will be subsidized up to $9. Two year $900,000 grant program funded by OCTA

- **Pinellas Suncoast Transit Authority (PSTA)**
  - Uber Free/Discounted Ride Program
  - Six-month trial subsidizing an Uber rider’s trip up to $3 to or from a transit stop in a small, underserved part of its system

- **San Diego Metropolitan Transit System (MTS)**
  - Uber
  - $5 discount for UberPool rides to and from MTS transit centers during special events such as Comic-Con and the MLB All Star Game

- **Southeastern Pennsylvania Transportation Authority (SEPTA)**
  - Uber
  - 40% discount on Uber rides to and from a rail station

- **Washington DC Emergency Services**
  - Uber
  - Proposal (to use Uber to transport non-critical 911 callers)

- **North Carolina’s Go Triangle**
  - Uber & TransLoc
  - Promote the idea of using a smartphone app to order an Uber to either take riders to the bus station or pick them up when they arrive

- **Metropolitan Atlanta Rapid Transit Authority**
  - Uber
  - Allows commuters to easily hail a ride when they reach their final public transit destinations when this is too far from a public transit node to comfortably walk

- **Transportation Authority of Marin**
  - Lyft
  - Commuters on the SMART train will be able to get discounted rides between the rail station and work through a subsidy for the Lyft service

**PRIVATE COMPANIES**

- **Xerox and the City of Los Angeles**
  - Lyft
  - Integrated mobility app that combines public transportation and Lyft routing options

- **Irvine Company, Santa Clara, CA**
  - Lyft
  - Offers office customers with Lyft credits to get to and from Caltrain and Amtrak Stations
Benefits and Drawbacks for Rideshare Partnerships

Benefits

The biggest benefit for the smaller transit agencies to partner with rideshare companies could be the potential for monetary savings while improving the customers’ overall and first and last mile experience. For smaller transit agencies and even jurisdictions that don’t have the same budget as larger agencies such as Los Angeles Metro or MARTA, replacing just a single low-use bus route with a rideshare service could have an impact.

An example of testing out the monetary savings and accessibility of eliminating low-use routes, Pinellas Suncoast Transit Authority (PSTA) ran a six-month trial where PSTA supplemented half the cost of an Uber rider’s trip up to $3 from a transit stop in an underserved part of its system. The program saved the authority money because it eliminated two little-used routes in the area that cost about $140,000 a year. The Uber subsidy cost $40,000, a $100,000 savings.

Another example of PSTA’s partnership with Uber is to provide rides after 11 p.m. This meant that public transit is no longer available after that time. To implement this program, PSTA received a $300,000 federal grant for 23 free rides a month between 9 p.m. and 6 a.m. with Uber or United Taxi.

In Southern California, Orange County Transportation Authority (OCTA) has eliminated two bus routes in San Clemente and is shifting their resources to other parts of the county where demand is higher. To help the existing riders along routes 191 and 193, OCTA has partnered with Lyft to subsidize rides. A rider will pay $2, and rest of Lyft’s fare will be subsidized up to $9. Riders must download Lyft’s mobile app onto their smartphone and order a ride, using a valid form of electronic payment. This program is a two-year, $900,000 contract with Lyft, funded by an OCTA grant. Anyone can ride and can take advantage of the subsidies as long as the rides are within San Clemente and correspond to the discontinued bus routes.

Drawbacks

The cheaper fares get, the more rides people tend to take, whether it’s public transit or a rideshare company. A significant discount could effectively be incentivizing taking an Uber or Lyft over other modes of transportation like bicycling and walking. This would go against the mission of these partnerships in the first place, which is to reduce congestion, increase transit ridership, and improve first and last mile accessibility.

Eliminating low-use routes may lead to issues regarding accessibility and equity. If there are no wheelchair accessible vehicles on Uber, they would be discriminating against people with disabilities. The use of a smartphone also has its limitations in areas where people can’t afford them; they would be left out by a partnership with an Uber or Lyft. This would then be putting people on the lower socioeconomic scale at a disadvantage.

RTA will have to explore the pros and cons of replacing low-use routes with rideshare. While it may be tempting financially, details will still need to be figured out. It will be critical to continue to provide a form of service to the disadvantaged communities and low-use areas that may not have access to a smartphone, before starting to eliminate bus routes.

The challenge of these partnerships rely on the details of the type and scale of service provided. A fully subsidized first and last mile incentive in a small town may work, but that model could convert all the people who were bicycling or walking to stations into rideshare users. In larger cities, this could lead to an opposite effect, with increases in congestion since there would now be more cars on the road.
Best Practices: Identifying Potential Mobility Hubs

This section provides a brief synopsis of mobility hubs that will help increase transit ridership and provide other modes of transportation throughout the RTA region. Since mobility hubs will vary in transit service, amenities and first and last mile connectivity, overarching characteristics are identified to provide general guidance on planning for mobility hubs.

A mobility hub consists of a major transit station that provides other transportation options to and from the station and surrounding area. They serve an important function in the regional transportation system as an origin, destination, or transfer point for a significant number of trips. Mobility hubs provide connectivity where different modes of transportation, such as biking, ride sharing or car sharing, all come together seamlessly and where there is a concentration of land uses that support work, live and play.

Mobility hubs may result in a number of benefits:

- Increased first and last mile improvements within the catchment area
- Increased transportation choices for residents, employees, and visitors
- Increased transportation choices for residents in disadvantaged communities
- Decreased dependence on single occupancy vehicles
- Reduced traffic congestion and vehicle miles traveled
- Reduced transportation costs

Mobility hubs are well-established facilities around the world, where land use, transportation and human interaction come together. Mobility hubs can evolve so that transportation becomes an integrated component of city building, increasing density, reducing GHG and vehicle miles traveled, providing various modes of transportation and place-making. Successful mobility hubs are places which have the six elements illustrated in Figure 5-2. Not all hubs are alike in scale and function or will contain each of these elements to the same degree, but all will have some of the elements. This is likely the case for potential mobility hubs in Riverside County, where intense land use mix and density is only prevalent in the cities of Riverside and Corona. However, mobility hubs can still be successful if a smaller degree of land use mix and density exists, along with varying degree of the other elements. Planning for mobility hubs in Riverside County will be very context-sensitive and will rely on a case-by-case analysis, but the potential exists.
Mobility Hub Challenges

There are many opportunities to improve the planning and design of potential mobility hubs in the RTA service area. For example, a mobility hub is being planned in Hemet as part of their downtown redevelopment. Mobility hubs provide attractiveness to transit users through more seamless interfaces between other modes, greater convenience to riders, pedestrians and bicyclists, and better connections to within their catchment areas.

However, challenges can be found regarding the land use within their catchment areas. Within Riverside County, there are many well-located, potential mobility hubs but they are located in suburban areas, undeveloped areas or have been stalled due to their inability to achieve the desired land use mix and intensity. In addition, the modal splits, connections to important destinations and lack of frequent transit service may continue to hinder their development. Even with the potential of population and employment growth, not all developing centers or high-volume transit stations can readily become full-scale mobility hubs. It is important to understand what the primary constraints are to their successful development.

Table 5-4 is derived from the Mobility Hub Guidelines and is modified to provide an overview of the challenges of developing a mobility hub in Riverside County.

<table>
<thead>
<tr>
<th>CHALLENGES</th>
<th>DESCRIPTIONS</th>
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<tbody>
<tr>
<td>Transit service level and integration</td>
<td>Infrequent service, peak hour only, lack of fare integration and schedule coordination</td>
</tr>
<tr>
<td>Parking</td>
<td>Extensive, free or very inexpensive, single-use, market-essential for development</td>
</tr>
<tr>
<td>Non-cohesive land use patterns</td>
<td>Small, separated sites; industrial, agriculture, primarily single-family residential</td>
</tr>
<tr>
<td>Lack of access to transit</td>
<td>Lack of safe and connected first and last mile access to transit</td>
</tr>
<tr>
<td>Large Infrastructure</td>
<td>Major barriers to access transit, warehouses, industrial, freeways, large arterial roads</td>
</tr>
<tr>
<td>Lack of transit market</td>
<td>Low employment, low density residential, high vehicle ownership</td>
</tr>
<tr>
<td>Difficulty of development</td>
<td>Fractured ownership, local opposition, non-proven market</td>
</tr>
<tr>
<td>External Partners</td>
<td>Relying on external partners, such as bikeshare or carshare</td>
</tr>
</tbody>
</table>
Defining and Creating Successful Mobility Hubs

Planning for mobility hubs will typically begin around an existing transit station with planned improvements to these amenities to include multimodal enhancements and access to that station. In some cases, new transit lines are being planned and where to locate mobility hubs is a project in itself.

Once the location of potential mobility hubs is determined, criteria can be established for the optimal character and structure of the hubs themselves. Those characteristics could include:

- Employment space, a key determinant of local transit demand. Obtaining the necessary residential densities in growth centers, while challenging, is less difficult than encouraging the concentration of new offices.
- A combination of major retail, civic, cultural, entertainment and health center destinations within their basic employment and housing mix.
- Plan station parking strategy in the most space- and cost-efficient way.
- High transit use and overlapping networks of connections with the surrounding area, including local transit routes feeding into the hub, bicycle facilities, trails and pedestrian routes all providing first and last mile connectivity to the mobility hub.
- An environment that creates a convenient and pleasurable experience, as opposed to merely functioning as a transit station. The immediate area around the station can be designed and developed to provide a heightened sense of arrival and departure.
- A compact design, allowing the concentration of a range of uses and destinations readily accessible on foot or bicycle.
- All aspects designed with care and attention that reflects well on the quality of the brand and addresses user needs. Information technology can play a key role, facilitating a compelling transit experience through regional transit integration, real time information, variable fare pricing and branding.
- Overcoming infrastructure barriers such as freeways, hydrological features, high-speed and/or high-volume roadways, and lack of first and last mile connectivity.
- Connectivity to regional destinations such as large employment centers, universities and colleges, regional shopping centers, hospitals and even art districts or downtowns.
- Provide space for car share, bike share, bike parking and kiss and ride.

The design of mobility hubs, the seamless integration of the station, multimodal amenities, the street network, public spaces, pathways and trails, the sense of place, and the comfort and convenience of the transit user can contribute to attracting transit users and providing an alternative to private cars.

Mobility Hub Typologies

Transit stations vary in size, amenities, and context in areas as broad and diverse as the areas serviced by RTA. Mobility hubs can be separated into different categories depending on the needs of transit users, transit types and the existing built environment. For the purposes of this study, mobility hub concepts are separated into three categories: Urban Transit Center, Transit/Transfer Station, and Enhanced Bus Stop. These concepts are meant to provide ideas and strategies as more of these mobility hubs are being planned.

**Urban Transit Center**

Urban Transit Centers are the largest stations and are located in dense urban areas. These stations offer most amenities including secure bike parking, changing stations, enhanced transit shelters, vehicle charging stations, etc. Urban Transit Centers are concepts that can be found in the Urban Core and Core typologies.

**Transit/Transfer Station**

Transit/Transfer Station are larger than enhanced bus stops and are located in a more urban context. They offer a range of amenities, in addition to enhanced transit shelters, which may include a train stop, bikeshare, rideshare, vehicle charging stations, etc. Transit/Transfer Stations are concepts for the Urban Core, Core, Suburban, Commercial, and Industrial typologies.

**Enhanced Bus Stop**

Enhanced Bus Stops are the smallest mobility hubs and their location may range from urban centers to lower density neighborhoods. In contrast with traditional bus stops, they offer additional amenities that include enhanced transit shelters, secure bike parking, information kiosks, and next bus information monitors. Enhanced Bus Stops can found in all typologies.
### Table 5-5: Design Guidelines for Mobility Hub Elements

<table>
<thead>
<tr>
<th>MOBILITY HUB AMENITIES</th>
<th>ENHANCED BUS STOP</th>
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<td>●</td>
</tr>
<tr>
<td>Vanpool / Carpool Parking</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Public Restrooms / Changing Stations</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Bicycling Facilities</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Bike Parking</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Bike share</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
</tbody>
</table>

**LEGEND**  
- ● Essential  
- ● Recommended  
- ● Optional
Figure 5-3: Urban Transit Center Mobility Hub
Figure 5-4: Transit/Transfer Station Mobility Hub
Planning for the Future

MOBILITY HUB 2
Transit/Transfer Station

1. Light/Heavy Rail Stop (If Applicable)
2. Enhanced Transit Shelters
3. Bicycle Lockers
4. Bikeshare
5. Next Bus/Train Information Monitors
6. Information Kiosk /Tickets
7. Kiss and Ride/Rideshare Drop Off
8. Vehicle Charging Stations
9. Motorcycle Parking
10. Carshare
11. Rideshare/Shuttles
12. Enhanced Pedestrian Access
Figure 5-5: Enhanced Bus Stop Mobility Hub
MOBILITY HUB 3
Enhanced Bus Stop

- 1. Enhanced Transit Shelter
- 2. Information Kiosk/Tickets
- 3. Next Bus Information Monitor
- 4. Bicycle Lockers
- 5. Kiss and Ride/ Rideshare Drop Off
- 6. Transitional Bike Lane
- 7. Enhanced Pedestrian Access

All Typologies
The following case studies provide examples of successful mobility hubs throughout the country.

**Case Study 1: Oakland, CA**

The City of Oakland has a variety of transportation options, however, its transportation system has been lacking first and last mile connections serving the existing public transit network. Recently, several new transportation options have emerged in the San Francisco Bay Area (e.g. Uber, Lyft, Bay Area Bike Share, etc.) to supplement the existing transit network. These new modes of transportation represent an opportunity to create mobility hubs in the City of Oakland, where several modes of transportation can come together in the same place. Mobility hubs have the potential to address several deficiencies in Oakland’s current transportation system, such as poor access to key bus and rail transit stations. In order to determine optimal hub location and modal distribution, a suitability analysis was implemented. A total of 77 mobility hub locations were identified throughout Oakland, most of which were located in close proximity to key transportation infrastructure. The themes of social equity and environmental resiliency were central to this analysis.
Case Study 2: Newark, Ohio

In 2011, the City of Newark, Ohio performed an intermodal hub study as an initiative to improve the mobility in and around its downtown area. The study focused on developing a hub of existing and proposed transit services in Downtown Newark to maximize the operability of transit service. This intermodal hub will serve as a focal point for the city’s growing bike network, as well as potential improvements to the downtown parking system and vehicular network. Additionally, the study intends to place the intermodal hub in a location that could integrate a future passenger rail station along a major rail line that runs through the south end of the downtown area. One of the key planning considerations for this project is the design and location of the mobility hub itself, and its potential to generate economic development in the community.
Case Study 3: Broward, FL

The Broward 2035 Long Range Transportation Plan (LRTP) intends to integrate transportation and land use planning in Broward County, Florida. This integration has resulted in the development of a “mobility hub concept,” which is envisioned as a place where people would interact with a proposed multi-modal system. The LRTP identified University Drive as one of the most critical north-south transportation corridors in the county. A total of 15 preliminary locations of mobility hubs along University Avenue have been identified that provide for basic framework of land use and transportation as identified in the LRTP. In 2014, the University Drive Mobility Improvements Study was undertaken to evaluate and refine the mobility hubs on University Drive through the integration of socio-economic conditions, land use, and transportation analysis.

Proposed gateway mobility hub. Source: Broward Metropolitan Planning Organization
Best Practices: Identifying Potential Transit Locations

Transit centers and mobility hubs allow riders the opportunity to change buses or transfer to other modes of transportation, making them major activity centers and destination points. As a result, the placement of these transit centers has a major impact on transit performance. Not only do transit centers enhance the experience of waiting for and boarding transit vehicles, but they also link local pedestrian networks, and provide connections to residential areas, major employment centers, major retail centers, education centers, and major medical facilities. Many factors need to be considered when conducting planning for a potential transit center or mobility hub, including:

- Passenger volume
- Number of buses on the site at one time
- Local auto and pedestrian levels
- Universal access

The geographic scope of a transit center can be defined to be an area within a 10-minute walk. Nonetheless, the planning area for a potential transit center should be more carefully determined based on the local context, such as:

- Physical features
  » Practical walking routes
  » Existing environmental features
  » Infrastructure barriers
- Existing policy and planning framework
  » Boundaries of existing plans and studies
- Existing land uses
  » Sites that are suitable for redevelopment versus developed areas
  » Regional destinations

Notes

1. LA Metro Benefits of Public-Private Partnerships
2. Lyft and the Future of Transit: The Role for Ridesharing Partnerships in Los Angeles
4. Safe Routes to Transit Initiative
5. Mobility Hubs: Development of a Regional Transportation Plan
6. Mobility Hub Guidelines et. al.