SUBJECT: ADOPT FIRST/LAST MILE STRATEGIC PLAN AND PILOT PROJECT STATION AREAS

ACTION: ADOPT STAFF RECOMMENDATIONS

RECOMMENDATION

A. Adopt First/Last Mile Strategic Plan (Plan)
B. Approve staff recommendation for first/last mile pilot station locations
C. Direct staff to seek Active Transportation Program funds for pilot station implementation
D. Direct staff to develop a multi-year plan for consideration in future years' budgets.

ISSUE

Over the last 18 months, the Ad Hoc Sustainability Committee has provided guidance and direction on the development of the Metro/SCAG funded Plan (Attachment A). Staff presented a draft of the Plan to the Ad Hoc Sustainability Committee in November 2013 and subsequently released it for stakeholder review and comments. The attached Plan reflects additional input provided by sub-regional agencies, local governments, non-profit organizations, and other community stakeholders. A summary of the meetings attended as well as stakeholder input and staff's responses is provided in the Public Review Comment and Response Matrix (Attachment B).

In addition, at the November Ad Hoc Sustainability Committee meeting, the Committee passed a motion (Attachment C) directing staff to identify two stations on the Exposition Light Rail Line Phase 2 and Gold Line Foothill Extension Phase 2A which would benefit from first/last mile improvements. Staff recommends the following stations based on prior programming commitments, per Board motion, and the specific stations' readiness to implement First/Last Mile Strategies, per Active Transportation Plan (ATP) funding requirements:

- Exposition Light Rail Line Phase 2
  - Exposition/Bundy Station
  - 17th Street/Santa Monica City College

- Gold Line Foothill Extension Phase 2A
  - Arcadia Station
  - Duarte Station
The Board motion also requested “further development of design concepts to prototype a seamless regional First/Last Mile vision for potential implementation at other transit line stations including Crenshaw, Regional Connector and the Westside Subway.” The motion was further amended to direct inclusion of existing and planned rail line stations.

Approval of staff recommendations will be consistent with the Board adopted Countywide Sustainability Planning Policy, Metro/SCAG Joint-Work Plan and respond to the Board Motion and Amendment.

DISCUSSION

Metro is developing a world-class rail system with stations that will be a short distance (three miles or less) from the homes of 7.8 million Los Angeles County residents. Over time, this number of accessible residents will continue to grow as cities modify their land-use plans to provide more housing and jobs near stations, consistent with market demand and regional goals for more sustainable communities. To maximize the mobility benefits of the transit system, Metro seeks to attract new patrons to the expanding rail system and improve the transit experience for existing customers. Bridging the first/last mile gap by making it easy, safe, and efficient to get to and from stations is critical to meeting this goal.

The Plan is intended to serve as a resource for Metro, local agencies, and private sector partners seeking to align transportation plans, funding programs, land-use policies, and/or business models with Metro’s investments in public transit. It also provides a compelling vision for systematically addressing the first/last mile challenge, which will support Metro and its partners when seeking grant funding for bus and rail station area improvements.

Adopt First/Last Mile Strategic Plan

The planning process for this effort has included a technical advisory committee composed of Metro staff from various departments with expertise in all modes of station access (bus, bicycle, pedestrian, auto) as well as planners, engineers, designers, communicators, and advocates from local agencies, non-profit groups, and academic institutions (Attachment B). The draft planning guidelines were reviewed and endorsed by the project technical advisory committee on October 30, 2013.

Following the Plan’s technical advisory committee’s endorsement, staff presented the Plan to the Ad Hoc Sustainability Committee as well as Metro’s Streets and Freeways, Local Transit Systems (LTSS) and TDM/Sustainability Subcommittees, Metro’s Technical Advisory Committee (TAC) and interested Councils of Governments (COGs). The primary concerns raised at these meetings were availability of funding for the recommended improvements as well as their applicability to suburban areas. In response to these comments, staff developed a series of strategies for Plan application which are contained in the final plan.
First/Last Mile Pilot Stations

In identifying the Pilot stations, staff relied on two factors; namely, prior programming commitments (i.e. the Call for Projects) and the readiness of the station to secure ATP funding in this cycle. In developing this list, staff met with representatives from all Exposition Light Rail Line Phase 2 and Gold Line Foothill Phase 2A cities to explain the rationale in choosing the pilot stations and obtain their concurrence. These four stations either have successful Call for Projects applications (Arcadia and Duarte Stations) or have well-developed scopes of work due to a prior submission to the Call for Projects (Exposition/Bundy Station and 17th Street/Santa Monica City College Station).

Attachment D shows the four stations, a preliminary estimate of cost, and recommended primary and secondary funding sources. Since Arcadia and Duarte were successful in the Call, Metro is providing application writing services for those cities to apply for ATP funds. In addition, Metro staff will provide technical assistance to the Cities of Los Angeles and Santa Monica as they prepare the ATP applications for their pilot stations. It should be noted that in the SCAG regional competition, the County Transportation Commissions can award 10 points for a project’s conformance with active transportation plans and policies. As such, Board adoption of the Plan will vastly improve the applications’ competitiveness as they would be awarded the full 10 points.

In terms of secondary funding options, there are federal grants which may be used for these projects. Potentially eligible Federal grants include Job Access and Reverse Commute (JARC), New Freedom, and Transportation Investments Generating Economic Recovery (TIGER). Given the timing of the funding availability, these grants are not available this fiscal year. However, in the next funding cycle, cities could submit applications for these projects should no ATP or other local funding be identified.

Per the Motion in Attachment C, the Board also directed allowing “sub-regional funding’ to be an eligible local source of funding for projects that are eligible under sub-regional fund guidelines and meet the first/last mile funding eligibility criteria.” These sub-regional funds are only available once a project is deemed complete by the Board. Presently, the Long Range Transportation Plans assumes these funds are available in the third decade of Measure R. Sub-regional funds would also require Board action for allocation.

Determination of Safety Impacts

The adoption of the First/Last Mile Strategic Plan will not have any adverse safety impact on Metro employees or our customers.

Financial Impact

There is no financial impact.
Impact to Budget

There is no impact to the budget.

Alternatives Considered

The Board could decide to delay or forgo adoption of the Plan. This alternative is not recommended. Through the 18-month guideline development process, staff engaged and received support internally and from countywide stakeholders on the content of the Plan. There is tremendous support for first/last mile projects throughout the county from a variety of stakeholders. Additionally, delay of the Plan would place our region behind other regions which are actively pursuing first/last mile projects. Lastly, given the rapid expansion of our rail system and increasing ridership, there is a significant need for Metro to have a comprehensive policy to identify and address potential barriers to accessing transit.

The Board’s endorsement of the Plan will provide clarity and direction for Metro’s planning efforts as well as spur the collective action necessary to meet greenhouse gas reduction mandates and achieve a safer and sustainable transportation system.

NEXT STEPS

Once the Board adopts the Plan staff will set about completing the implementation steps identified in the Plan. These steps include identification of funding; provision of technical support; and working with local, state and federal officials to support first/last mile solutions.

Staff will also continue to refine the pilot station projects to implement additional first/last mile elements. Once the projects are better defined, staff will work with the jurisdictions to develop their ATP applications to be ready for the May 21, 2014 deadline.

ATTACHMENTS

A. Draft First/Last Mile Strategic Plan
B. Public Review and Comment Matrix
C. First/Last Mile Pilot Station Motion and Amendment
D. Proposed Pilot Stations
E. Project Technical Advisory Committee Membership

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In 2012, the Metro Board adopted the Countywide Sustainability Planning Policy and Implementation Plan and the Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) Joint Work Program, both of which direct the development of a First Last Mile Strategic Plan. The goal of this plan is to better coordinate infrastructure investments in station areas to extend the reach of transit, with the ultimate goal of increasing ridership. These guidelines help facilitate the integration of mobility solutions in a complex, multi-modal environment. Strategies will need to be flexibly deployed to contend with widely varying environments throughout the county; yet will aim to improve the user experience by supporting intuitive, safe and recognizable routes to and from transit stations. This effort will require coordination among the many cities and authorities who have jurisdiction over the public realm throughout the county.

The purpose of these Planning Guidelines is to:

1. Provide a coordination tool and resource for Metro, LA County, municipal organizations, community groups, and private institutions.
2. Serve as a key source of direction for LA Metro when undertaking planning and design efforts aimed at improving first and last mile connections to transit.
3. Clearly articulate the 'Pathway' concept including objectives, characteristics, and the role 'pathways' play in supporting transit access and regional planning goals.
The guidelines are structured around the following sections:

1. **First-Last Mile Access**
   - The introduction provides an overview of these guidelines, strategic goals and project purpose.

2. **First and Last Mile Access**
   - Chapter 2 defines the first and last mile access challenge in transportation planning, provides guiding policy context, and reviews challenges specific to transit access in Los Angeles County.

3. **The Pathway**
   - The Pathway is introduced in chapter 3 as a strategic response to the first and last mile challenge. Pathway goals, policy context and guiding principles are reviewed. Pathway users, both today and in the future, are discussed.

4. **Pathway Network Design**
   - This chapter provides a methodology and approach for the layout of Pathway networks within station areas. Site area definition, existing conditions analysis, network component & layout are all covered.

5. **Pathway Improvements**
   - This chapter outlines possible improvements that may occur along identified Pathway network routes. Each individual improvement includes a visual example, discussion of goals, and guidance on how to integrate the specific improvement with the overall Pathway system.

Pathway networks and component design scenarios are developed utilizing the strategies and tools set forth in these guidelines at three selected stations areas around Metro Rail and BRT stops. This has been done for illustrative purposes only, and is intended to demonstrate key ideas of the Pathway concept.

An Implementation Table and ridership targets are presented to guide “next step” efforts.
An individual's 'trip' is understood as the entire journey from origin to destination. Individuals may use a number of modes of transport to complete the journey; they may walk, drive, ride a bicycle, take a train, or in many cases combine a number of modes. Public transportation agencies typically provide bus and rail services that may frame the core of such trips, but users must complete the first and last portion on their own; they must first walk, drive or roll themselves to the nearest station. This is referred to as the 'first and last mile' of the user's trip, or 'first last mile' for short, even though actual distances vary by users.

Though the streets and infrastructure that comprise the first last mile fall outside the boundaries of Metro’s jurisdiction and control, they remain critical components of an effective public transportation system. Simply put, all Metro riders must contend with the first-last mile challenge, and the easier it is to access the system, the more likely people are to use it.
Greenhouse Gas Emissions Per Person Per Trip

3,600 grams of CO₂

1,700 grams of CO₂

Single Occupancy Vehicle (SOV) Trip

SOV + Light Rail Trip

Bus + Light Rail Trip

Bike + Light Rail Trip

Units are approximate grams of CO₂ equivalents from life-cycle assessment based on long-term emissions projections.

Transit trips are based on average emissions over peak and off-peak times.

Los Angeles County Metropolitan Transportation Authority - Metro
Southern California Association of Governments - SCAG
Federal, state, regional and local policies support increased use of public transportation as a means to ease roadway congestion, reduce greenhouse gas emissions, and support economic and physical health in communities. The 2012-2035 Southern California Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) reflects significant progress within Los Angeles County to achieve this policy vision both through transit investment and local land-use planning. By 2035, Metro's fixed guideway system will have nearly doubled in size. More than half the new housing provided in the region over the next twenty years will be in areas served by high-quality transit (with service every 15 minutes or less).

In 2012, Metro adopted a Countywide Sustainability Planning Policy (CSPP) as a complement to regional planning efforts and to provide the foundation for achieving further greenhouse gas reductions in the 2016 RTP/SCS. The CSPP is particularly notable in the context of first last mile planning, because it highlights the need to focus on integrated planning and partnerships to optimize the benefits of Metro's investments. Key concepts include "bundling strategies for greatest impact" which encourages Metro to think beyond a single mode or project in its planning efforts, and "act regionally and locally" which recognizes that local connectivity is paramount to securing the social, economic and environmental benefits associated with the expansion of transit. These guidelines were created in accordance with the principles and priorities outlined in the CSPP.

These guidelines were also developed in consideration of California's Complete Street law, which requires cities and counties to consider the needs of all users in the circulation element of municipal general plans. In addition to accommodating the efficient flow of vehicles, streets must accommodate safe and efficient multi-modal transfer activity and support a wide range of mobility options. Federal transit law explicitly recognizes the need to ensure that active transportation networks connect with public transit. Under Federal Transit Law, pedestrian improvements located within one-half mile and all bicycle improvements located within three miles of a public transportation stop have a de facto physical relationship to public transportation.

**Mobility & Employment**

- **855,000 Jobs**
- **485,000 New Jobs**

"Aligning a high-quality transit network with new housing and jobs offers Southern Californians more communities with a variety of transportation and housing choices, while reducing the negative impacts of automobile use on public health and the environment."

RTP/SCS outlines a broad and ambitious strategy for sustainably managing regional growth. Mobility, land-use and health at an integrated approach to achieving regional policy goals related to clean air and economic vitality.
The fact that the vast majority of transit users are already walking or rolling themselves to stations or to complete multi-modal connections demands a careful consideration of the inherent relationship between active transportation and the regional transportation system. A number of questions must be asked: What are the conditions of the active transportation networks in Los Angeles County? Is the network designed to support modern modes of active mobility? Do existing networks seamlessly integrate transit users with transit stations? What part of active transportation networks are integral components of the county-wide "transportation system"? The First Last Mile Strategic Plan responds to these questions, and proposes a transit access strategy built on rationally developed active transportation networks located around Metro Rail and BRT stations.
There are a number of challenges associated with improving first last mile connections throughout the County. In many situations, especially along higher traveled corridors, right-of-way (ROW) is limited and already overburdened. Providing more robust access facilities could potentially put strain on other complementary travel modes. For example, providing protected bike lanes on a heavily used transit access route may affect vehicular throughput and bus operations in some situations.

Coordination is a challenge; there are many custodians of the public realm throughout the County. Metro is committed to the "continuous improvement of an efficient and effective transportation system for Los Angeles County" but Metro does not own or have jurisdictional control over transit access routes beyond the immediate confines of station facilities.

Funding is limited; there are numerous competing demands on public funds throughout the county. From a user perspective cost is a challenge; pay-for-service access solutions can be promising, but do not help those already struggling to pay for basic transit services.

There are a range of site specific physical challenges faced by individual transit users. For some, stations remain too far to access in a reasonable amount of time. Others don’t move fast or nimbly enough to comfortably contend with broken sidewalks and hazardous street crossings, most notably the elderly and access impaired. Some are afraid to make the short walk from stations in the dark. All of these challenges can be addressed through thoughtful consideration, strategic planning, engineering, design and most importantly - active coordination.

Metro goes to great lengths to better understand county transit riders in order to improve operations and service. Metro conducts on-board passenger surveys as part of this effort. A review of the Metro 2011 System Wide On-Board Origin-Destination Study provides insights into transit users at a demographic level, some key findings include:

- 75% of transit riders belong to households earning less than $25,000.
- Half of all transit riders are transit-dependent, i.e., they belong to households that do not own any vehicles.
- Transit dependency increases as age increases, and/or as income decreases.
- Active transportation modes (walking/biking/wheelchair/etc.) are the dominant access and egress modes for all riders; representing 85% of system access/egress at Rail/BRT stations and over 95% total system access.
- Nearly 64% of riders make at least one transfer to complete their one-way trip.

One of the more surprising findings from the Metro survey data is the small number of transit riders parking at stations. Though highly visible in communities, parking facilities support only 6.2% of Metro Rail users, and only 3.8% of Metro BRT users. Of this relatively small user group half live close enough to walk or bike to stations.

The Metro system is witness to a significant amount of transfer activity; nearly 64% of riders make at least one transfer to complete their one-way trip. Transfer activity, when not happening within a station is reliant on active transportation networks in the immediate vicinity of the subject stations. Active transportation networks are comprised of sidewalks, bike lanes where existing, street crossings, signals, signs, curb returns, lighting, furnishings and landscaped elements. These networks support multi-modal access and transfer activity.

Mobility Choice

1/2 of transit users who drive and park at the station live close enough to walk or bike.

50% of 1/2 of transit users who drive and park at the station are transit dependent.
Transit users need safe and efficient routes when accessing stations and while making multi-modal transfers. They rely on existing active transportation networks. A review of recent collision statistics for both pedestrians and bicyclists in LA County suggests there are significant challenges in terms of safety.

The provision of a safe transportation system is a cornerstone of Metro's Vision, and given the fact that most transit users are pedestrians during the first, last and transfer components of their trips, pedestrian safety is a major concern. Pedestrians are at risk within environments surrounding transit stations, primarily from automobile traffic. LA County has an alarming incidence of fatality rates, especially among some of the more transit dependent populations (the very young and very old). Risks can be significantly mitigated through design and vehicular speed control measures, and should be done so along prioritized access routes within station catchment areas.

### Pedestrian Safety

Pedestrian fatality rates are double the national standard.

Pedestrian fatalities represented **36.8%** of all traffic fatalities between 1994 & 2000 in L.A. *(LADOT)*

39% of pedestrian collisions between 1994 and 2000 occurred mid-block *(LADOT)*

5% of pedestrians die when hit by a vehicle moving at 20 mph or less *(LADOT)*

80% of pedestrians die when hit by a vehicle moving at 40 mph *(LADOT)*
Knowing that active transportation networks play such a significant role in enabling transit access and transfer activity, a deeper understanding of existing active transportation networks is required to better address challenges currently faced by users. As part of the First Last Mile Strategic Plan study, project team members selected 12 station sites throughout the County and reviewed the existing transit access conditions within these sites. It was observed that current active transportation networks serving access routes to Metro stations present a number of access challenges to transit riders.

In some cases sidewalks were physically constrained or literally broken and heaved, or even more surprisingly, discontinuous. Long blocks and large parking lots create circuitous access routes for pedestrians. Lack of adequate lighting, dark freeway underpasses and general neglect all challenge users' sense of personal security. In some areas of the county, the existing right-of-way is severely constrained. Transit rider wayfinding is often impeded just a few blocks from transit stations due to the lack of, or in other areas the confusing overabundance of, street signage.

All of these noted existing conditions represent challenges to transit system access, system efficiency, user experience and safety. A strategy that addresses these issues directly will increase transit ridership, improve user experience, and contribute to meeting Metro, regional and state policy goals relating to sustainability, clean air, and health.

Top 6 L.A. County Transit Access Barriers
Metro survey data tells us that the vast majority of transit users in the county are utilizing active transportation networks to access the overall system, and field observation confirms that there are a number of obvious challenges being faced by current users of existing networks. These challenges reduce overall system ridership in two important ways; they artificially decrease the size of transit access sheds around stations, and they reduce discretionary use within current access sheds.

Access sheds are defined by the distance people travel in a set duration of time. For example, if pedestrians are willing to walk up to fifteen minutes to a given station, and they walk at four miles per hour, the access shed can be defined by a half mile radial circle centered on the station. In reality, this access shed is compromised by the street grid, breaks in the access network, location and number of street crossings, and fluctuations in average speed of pedestrians due to crossing characteristics and sidewalk conditions. An effective strategy will work to increase the size of access sheds around transit stations while improving access conditions within those sheds.
There are a wide range of approaches to addressing the first last mile challenge, ranging from high level policies (for example supporting mixed-use density in station areas) to specific infrastructure investments (for example providing additional bike racks at stations). Metro's plan can allow for the "coordinated bundling" of first last mile strategies by identifying access networks that partner agencies and alternative transportation providers can build from and/or plug into.

The Pathway is a proposed county-wide, transit access network designed to reduce the distance and time it takes people to travel from their origins to stations and from stations to destinations, while simultaneously improving the user experience. At its core, the Pathway is a series of active transportation improvements that extend to and from Metro Rail and BRT stations. The Pathway is proposed along specific access routes selected to shorten trip length and seamlessly connect transit riders with intermodal facilities. Intermodal facilities may include bus stops, bike hubs, bike share, car share, parking lots, or regional bikeways, depending upon the location and context of the station.

The Pathway is envisioned to include standard elements that support an association with the overall transit experience, and more flexible elements that respond to the context and character of varying communities and site specific challenges.

The Pathway aims to broaden the reach of transit and improve the transit experience by increasing the size of transit access sheds and by improving access conditions within station areas. The Pathway extends the positive experience of the transit user. It is intuitive, safe, efficient, universally accessible and fun.

The Pathway helps integrate the various modes provided by Metro (i.e. Bus and Rail) and also allows the integration of non-Metro provided solutions into a more seamless user experience. In so doing, the Pathway aims to support broader policy directives related to clean air, health, and economic sustainability. By improving transit access and effectiveness, more people will likely opt into public transportation which in turn will reduce vehicle miles traveled (VMT's) and green house gas emissions (GHG's), integrate physical activity into daily commute patterns, and improve economic vitality by connecting people to regional markets.
The Pathway expands transit user access sheds by:

1. Increasing the average speed of active transportation users – This is achieved by decreasing wait times at intersections and by increasing speed and capacity along walking/rolling routes. Pedestrian prioritized Signal timing improvements decrease waiting times for pedestrians; reduced crossing distances reduce average street crossing time; and the provision of improved walking and rolling facilities that cater to a growing range of mobility devices increases the average speed of users.

2. Decreasing point to point distances – This is achieved through the utilization of strategic short-cuts and increased crossing opportunities. Diagonal routes through large parking lots or parks and mid-block crossings can be used to significantly reduce point to point distances.

3. Supporting multi-modal transfer activity - The Pathway strengthens links between modal access points (i.e. bus stops and stations, or bike share kiosks and stations) by providing easily identifiable safe and efficient access routes between modes. Furthermore, the Pathway allows for strategic integration of mobility solutions (i.e. car share) into an existing network.

Access Sheds

The proliferation of personal mobility devices by all age groups, from skateboards to bicycles to electric mobility scooters, presents a tremendous opportunity to extend the reach of public transit investments. It is well known that the time it takes to walk to a station is the metric by which access sheds are realized. Supporting personal mobility devices that allow an aggregate increase in average personal mobility speeds can dramatically increase regional access sheds. Better policies, new infrastructure and a careful look at mode integration is needed when assessing how best to realize the potential offered by the growing range of mobility devices. A Taxonomy of Mobility Devices is provided in the Appendix.
In addition to expanding access sheds for transit users, the Pathway supports overall ridership by improving the quality of access conditions within access sheds. Personal sense of safety, security, and comfort along access routes all play a role in an individual’s choice to utilize public transportation. A dark, unlit sidewalk is a deterrent to many when considering a short walk to or from a station after dark, and can be improved utilizing a number of design strategies. The lack of pedestrian facilities at street crossings poses undue risks to transit users, and can be mitigated by improved signaling strategies and painted crossings. For transit riders wanting to use, or requiring the use of, any form of wheeled access device something as simple as a broken sidewalk or missing curb ramp is a significant barrier; maintenance and provision of well designed sidewalks and curb ramps improves the experience for these users.

Pathway users are understood as being broadly representative of county transit users, who in turn are broadly representative of county residents. Various demographic and social trends give good insight into future pathway users. Demographic trends suggest the population is aging, and as average age increases, transit dependency increases. Many people are choosing to “age-in-place” and have an opportunity to do so within dense mixed-use station areas where amenities and services are easily accessible. This is a good sustainable model and relies on the existence of universally accessible mobility options. In the future there will be many more senior aged Pathway users, thus planning for senior aged mobility and access is critical.

Another trend witnessed over the last ten years is the reduction in automobile use and ownership by the Millennial Generation (those born between 1982 and 2004). There are many hypotheses presented to explain this trend, including the recent recession which has reduced the number of commuter trips.

Others argue that there is a structural shift occurring with regards to lifestyle, and the allure of suburban living is not as strong for a young demographic that shows preference for more compact, amenity-rich urban environments offered by city and town centers. The costs of vehicle ownership may also be affecting consumer behavior, especially in regions with viable mobility options. Whatever the cause of these trends, mobility solutions are required for those who cannot afford, cannot operate, or choose to forego vehicular ownership. The Pathway, by expanding the reach of transit and by improving the user experience, helps discretionary transit users opt into multi-modal transit solutions.
These guidelines outline an approach for planning Pathway networks at Metro Rail and BRT stations and present a toolbox of strategies that can be considered when implementing Pathway networks.

The following values define the Pathway and provide a basis for design:

To see how Jeff and three others use the Pathway to complete their trips, refer to the appendix...
This chapter outlines a methodology for planning Pathway networks at transit stations. The three steps include:

1. **Determining the Location and Limits of the Network**
   - The first step in planning for the Pathway in any given station area is to determine the location and limits of the network. There are current active transportation networks throughout the county, comprised of sidewalks, roadways, street lights, signage, stripping, signals and a number of other elements. The Pathway can build upon these existing conditions within pre-determined zones and along specific routes, which emanate from Metro Rail and BRT stations.

2. **Focus of the Site Area**
   - The focus of the site area where the Pathway network will be located is the transit station itself, Metro Rail or BRT. Maintaining consistency with FTA policy, one-half mile and three mile circles can be drawn around the station which will correspond to important thresholds of the Pathway. The first threshold occurs at the half mile mark, measured as the crow flies, and corresponds to how far a person will walk to access transit. The second three mile threshold corresponds to how far an individual will bike to access transit. The three mile shed, gives a good limit for all other active transportation users (i.e. skateboarders, mobility scooter riders) as bicycles operate at the upper range of observed speeds among active transportation devices. These thresholds correspond to a number of funding mechanisms given FTA's stated policy.

3. **Potential Thresholds**
   - The focus of the site area where the Pathway network will be located is the transit station itself, Metro Rail or BRT. Maintaining consistency with FTA policy, one-half mile and three mile (pedestrian and bicycle) circles can be drawn around the station which will correspond to important thresholds of the Pathway. The first threshold occurs at the half mile mark, measured as the crow flies, and corresponds to how far a person will walk to access transit. The second three mile threshold corresponds to how far an individual will bike to access transit. The three mile shed, gives a good limit for all other active transportation users (i.e. skateboarders, mobility scooter riders) as bicycles operate at the upper range of observed speeds among active transportation devices. These thresholds correspond to a number of funding mechanisms given FTA's stated policy.
FTA Policy

"For purposes of determining whether a pedestrian or bicycle improvement has a physical or functional relationship to public transportation, regardless of whether it is funded as a capital project or public transportation enhancement,

New FTA Bicycle and Pedestrian Catchment Areas for Los Angeles County MTA
Existing and Proposed BRT and Rail Facilities

Los Angeles County

Legend
- Silver Line
- Gold Line
- Red Line
- Orange Line
- Green Line
- Blue Line
- 1/2 Mile Walking Radius
- 3 Mile Bicycle Radius

Los Angeles County Metropolitan Transportation Authority - Metro Southern California Association of Governments - SCAG
To better understand the unique challenges of an individual station area chosen for Pathway network development, the subject site should be reviewed at both a macro and micro level. The intent of the analysis is to evaluate the existing condition and characteristics of the station area, and inform the layout of Pathway network routes. The analysis includes mapping, compiling, and overlaying various layers of station-specific data that together highlight conditions within half mile of the station portal, and regional planning context and adjacent station area improvements to three miles of the station portal. The analysis steps include:

Station Analysis

Walking Route

Overlay Maps

Site Visit (Station Survey)
A. Preliminary Station Analysis

The following access-related station area characteristics can be analyzed utilizing data available to Metro:

The Points of Interest map highlights key sites located within the ½-mile radius of the station and infers logical routes between the station area and these interest points. Analyzing these routes better defines potential transit users. Key points of interest included schools, event centers, public institutions, parks, and any other local attractions to the transit catchment area. These maps should also include a review of the three mile access shed.

The Street Grid map presents the street and block network surrounding station areas. This grid shows areas that lack connectivity, logical pathways, and/or create obstacles for site navigation. The map also doubles as a base map for the station analysis that follows.

The Pedestrian Shed map graphically displays the level of pedestrian accessibility for each station area. With the transit station as a starting point, all ½-mile routes based on the street grid were mapped and then consolidated into a larger catchment shape. The pedestrian shed begins to reveal limitations to access as a result of each station’s unique street grid.

The High Vehicular Speeds map shows potential areas that would cause safety concerns for pedestrians and bicyclists. Posted speeds greater than 35 mph are shown.

Key Transit Access Corridors are graphic depictions of Metro’s Origin/Destination study. These maps graphically represent the most frequently used transit access routes.

This map begins to show key intersections and locations where high rates of pedestrian and bicycle collisions with automobiles exist.
Recreational fields occupy large area and prevent pedestrians cut-through.

Magnolia

East Valley High School breaks up the

Lankershim without pedestrian crossings.

The Land Use Map depicts concentrations of land use within each 1/2-mile radius. The land use map highlights the types and characteristics of users that are able to comfortably access the locations surrounding the station. Existing maps should be reviewed in conjunction with planned changes captured in associated specific/general plans or other policies guiding future land use changes.

All infrastructure dedicated to bicycles in the roadway are shown in the Bicycle Connections map. This generally includes: existing bike lanes, sharrows, separated bike facilities, bike 'friendly streets' (in some areas where cities have defined this as a category), future bike routes, etc. These maps should also include a review of the three mile access shed map.

Using Metro and other transit agency data, routes of all transit modes are mapped within the 1/2-mile radius. This includes: all bus lines, light and heavy rail, and any other transit lines serving the station area. These maps should also include a review of the three mile access shed.

The following statistics can be extracted from each station area to provide an overview of the site: average block length, intersection density, walk score, overlay zones, density, employment, and journey to work.

B. Access Barriers Overlay Map

After compiling the information collected during the macro-level station area analysis, the maps described above can be overlaid to show potential areas of intervention. The overlays described below provide substantial information that inform on-the-ground analysis.

To begin, the station land use map can be overlaid with the pedestrian shed map. Here, any holes that exist within the 1/2-mile radius that would provide a logical origin/destination route for potential users can be highlighted. For example, where heavy residential land uses on an area of the map do not connect to the 1/2 mile pedestrian shed, a note can be made, and the area highlighted.

The second step is to overlay the station land use map with the bicycle connections map. The holes shown in these maps are for areas that are missing connections for bike riders.
A number of other overlays should be reviewed using the approach described above to gain a better perspective of access volumes relative to safety and traffic speed, access routes relative to feeder bus services and stop locations, and access shed relative to street grids, to name a few examples.

All highlighted areas can then be synthesized. These maps inform the basis for routing site visits for on-the-ground evaluation and Pathway network layout.

C. Determine walking route

Pulling from all highlighted areas from the overlay maps described above, walking routes can be drawn that address potential improvement areas. As such, the walking route directly responds to potential problems or opportunity areas seen in the macro-level analysis and allows for a more detailed on-the-ground analysis.

D. Site Visit - Station Survey

The site visit offers the opportunity to begin micro-level analysis, and to begin to assess areas of intervention.

For station specific analysis, a set of evaluation criteria and questions can be written to consider current and future access needs and opportunities at each representative station/stop area. These questions can be written as a survey checklist form. Mainly qualitative, these checklists measure performance of each station/stop area. With the end goal of increasing transit ridership and user comfort, urban design elements that are most important for rider comfort and system function were added to the survey tool.

The sample checklist (see Station Area Checklist in the Appendix) was prepared as a guide for on-the-ground analysis at each station area. While initially prepared for the case sites selected for the First Last Mile Strategic Plan as an evaluation tool, the format of the checklist is broad, and touches upon a range of issues faced by most station areas in the study region. As such, this checklist can be used to evaluate a wide range of stations in the county.

The checklist is designed to broadly assess: 1) safety elements, 2) aesthetics, and 3) accessibility within a station area. Each of these categories account for multi-modal experiences for all types of transit users. The results are keyed to a scoring tool that allows for comparison between stations. The scoring matrix below outlines the ranking system for each station area.

In addition to assessing the physical conditions of the environment, overall observations can also be made that record how people move to and from the stations themselves. This analysis is supplemented by photo documentation, and an open-answer area for additional information gathered during the site visit.

**Scoring Matrix**

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<th>Score</th>
<th>Description</th>
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<tr>
<td>1-1.99</td>
<td>Poor</td>
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<tr>
<td>2-2.99</td>
<td>Fair</td>
</tr>
<tr>
<td>3-3.99</td>
<td>Good</td>
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<tr>
<td>4-5</td>
<td>Excellent</td>
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**Checklist (see Appendix)**
Network Components

The Pathway includes a hierarchy of routes that extend out from the transit station. These routes take into consideration the existing street network, key destinations, feeder transit services, the existing and planned bike network, pedestrian/bike access volumes and surrounding land uses. These items are augmented by additional findings in the field such as opportunities to provide active transportation shortcuts, or to fill breaks in the network (physical or qualitative) not made apparent in maps. The network is defined by main branches (Pathway Arterials) and feeder routes (Pathway Collectors), each having the following characteristics:

Pathway Arterials – Pathway arterials are the main branch lines that extend from stations and support maximized throughput and efficiency for active transportation users. Pathway arterials accommodate the highest use active transportation corridors that lead to station portals, and are designed to accommodate a broad range of users. It is useful to organize Pathway users by their functional speed:

- Slow (0-5 mph) – Slow moving, predominantly pedestrian based modes, including slower moving wheelchair and cart/stroller push/pull users. Universal access is a critical concern, and accommodation of small wheeled access assist devices (i.e. wheeled push walkers) must be considered.

- Medium (5-15 mph) – Broad range of users that move faster than pedestrians but still require physical separation from vehicles. Children on push-scooters, senior citizens using mobility scooters, skateboarders, casual bike riders and joggers all fall into this group.

- Fast (15-35 mph) – Fast moving, aggressive bicyclists and drivers of neighborhood electric vehicles (NEVs) form this user group. Bikes and NEVs can mix with vehicular traffic when supported by specific design elements and vehicular speed controls.

Pathway Arterials aim to provide improved facilities for all three of these primary groups. Phased approaches may be required to realize this goal due to constrained right-of-way (ROW). Separated active transportation lanes, signal and crossing improvements, way-finding and plug-in component (i.e. bike share) integration are important considerations in the design of Pathway Arterials.

Pathway Collectors – Pathway collectors include streets and routes within the station zone that both feed into arterials, and support crossing movements and general station area permeability. Collectors also consider the three primary active transportation groups noted above, but are more focused on supporting station area permeability on feeder routes, that will allow people access to the main arterials. Pathway Collectors work to reduce travel distances for non-motorized users by focusing on crossing movements and support Pathway Arterial function by providing efficient access to Arterial routes. Collectors frame the lesser traveled routes along the network, and help bridge gaps caused by high traveled and/or high speed vehicular roadways within station areas. Improved street crossing opportunities are essential to Collectors, including improved intersection function and the provision of mid-block crossings.
Network Layout

To plan a Pathway Network around a Metro Rail or BRT Station, the following steps should be taken:

1. **Locate Pathway Arterials** – Arterials should radiate out from the station portal in at least 4 directions, and should correspond to the highest volume of pedestrian and rolling access to the station. Arterials must extend out at a minimum ½ mile from the station, to an upper limit of 3 miles from the station. Pathway arterials should integrate into the regional bike network at opportune points beyond the ½ mile access shed. Coordination with other station Pathway networks within 3 mile shed is required.

   *Access Volumes, Key Destinations, Land Use, Bike Routes*

2. **Locate Pathway Collectors** – Pathway collectors include streets within the ½ mile access shed that run perpendicular to station access desire lines, or feed into the main branch lines of Arterials.

   *Feeder transit lines, access sheds*

3. **Identify Site Specific Opportunities and Constraints** – Identify opportunities to provide 'cut-throughs' (i.e. across parking lots or through parks, where such cut-throughs shorten access routes). Also identify specific constraints that will require special attention (i.e. freeway underpasses). Focus on area within 1 mile of transit station.

   *Aerial imagery + Site Evaluation (Aesthetics, Safety, Accessibility)*

4. **Evaluate Network** – Review Pathway network relative to qualitative and quantitative inputs.

   *Collision data, Access Sheds, High Speed Roads + Site Evaluation (Aesthetics, Safety, Accessibility)*

5. **Review and Refine Pathway Network** – Review network with key agency stakeholders and local representatives. This process will help inform design team of ongoing local efforts, strengthen knowledge of key local destinations and concerns, and inform the public of access improvement efforts.

   *Stakeholder and public outreach*
A Prototype Pathway Network Map...

This map illustrates a potential Pathway network at the North Hollywood Metro Station, developed utilizing the process outlined in this chapter. The fifteen minute walk equates to a one-half mile radius around the station portal. The map is depicted in the style of a transit map, to suggest that for the user, the Pathway would be understood as an extension of the transit experience. Certain access components, such as bike share, car share, parking, and location of wayfinding stations are presented to illustrate the concept that a range of access and mobility solutions could be strategically bundled around Pathway networks.
The planning components presented in this chapter focus on improving access to and from Metro stations, in particular Metro Rail and fixed route BRT stations throughout Los Angeles County along identified Pathway networks and within the confines of defined station areas. The Pathway aims to overcome critical access barriers through flexible deployment of a number of design components, while following the Metro Pathway Guiding Principles noted in the first chapter.

The components focus on five categories of improvements as part of the Pathway:

Components do not all directly relate to one another, but they work in concert to support the overall goals and guidelines of the Pathway. For example, traffic calming and curb extensions are very different tools with respect to planning, design and implementation, but utilized together they enhance transit user safety, comfort and access ability.

Components presented in this chapter aim to:

- Expand the station's sphere of influence and improve the transit rider experience
- Contribute to a hierarchy of improvements that are more concentrated, visible, and frequent as transit users approach transit stations
- Be flexible in order to fit into diverse settings around stations

Components presented in this chapter were developed with the recognition that Pathway Networks need to be responsive to local context and variations that exist both across and within station areas. The following are intended to support local jurisdictions in selecting treatments along Pathway networks:

The types and intensity of components deployed along Pathway Networks will differ depending on proximity to station. The "Extended Station Zone" is defined as roughly 1/4 mile radius from the station portal. The larger "Transit-Friendly Zone" extends out to an approximate 1/2 mile radius; this area would include active transportation infrastructure, but to a lesser extent than in the Extended Station Zone. Pathway Arterials may extend out farther still and link up with regional bike and pedestrian networks. The goals for these different spheres are noted in the graphic and provide guidance for prioritizing improvements.
Paramount to a clear and navigable transit environment is a system of cues that help the transit rider intuit which direction the station is, how best to get there, and how long it will take. The frequency of access improvements should increase and be made more prominent as the transit rider approaches a station. For example, farther from the station within the Transit-Friendly Zone, crosswalks may be designed with a simpler and more traditional double stripe. In the Extended Station Zone, closer to the transit station, crosswalks should become more visible, prominent, and frequent, with continental or “zebra” stripes, colored paint, and increased width.

The contextual diversity of Los Angeles warrants a place-specific approach that does not stifle the individual identity of each location, allows for a flexible approach in design of the Pathway, and simultaneously provides a legible and intuitive system-wide strategy. Each component can be applied where appropriate depending on the urban condition. Illustrative examples of how Pathway components may be realized in different locations are presented in the “Illustrations” chapter.

The Pathway, whether named or not, will be most effective if it is recognizable and visually consistent, both within station areas and across communities served by Metro. For example, some Pathway elements could use standard consistent messages, font, style, placement, material and colors while others may be informed by the identity of community in which they are located. The intent is to support seamless system navigation for the user, while allowing for the expression of local identity. These considerations should be made as part of further design development. Development of standard components would rely both on inter-jurisdictional coordination throughout the Metro region and coordination with state and federal standards.

Expanding the Sphere of Influence

- Pathways are more visible
- Enhanced safety features
- Larger, more prominent Pathway signage
- Directional markers with time-to-station signage
- Frequent crossings
- Train time arrival/departure digital displays

10-Minute Walk / 5-Minute Bike

- Less overt, more passive wayfinding & Pathway markers
- Address the most pressing safety & access improvements, such as:
  - New crossings
  - Curb ramps
  - Maintenance
  - Lighting & landscaping
Labels each Component with one of the six categories: Crossing Enhancements and Connections; Signage and Wayfinding; Safety & Comfort; Allocation of the Streetspace; and integrated Transit Access Solutions.

Name of Component.

Describes what the Component should aim to do and who it should serve.

Defines the Component.
Guidelines presented focus on those aspects of design and planning that are particularly transit-supportive, rather than describing the full universe of good design standards or common best practices. References are included for other design and planning guidance. See the end of this chapter for a full list of references.

Identifies elements that can be used to identify or "brand" the Component as part of the Metro System, recognizable to the transit rider.

Identifies relevance of Tool by pathway type (Collector, Arterial, or Cut-Through), and by sphere of influence (Area 1, the "Extended Station Zone" or Area 2, the "Transit Friendly Zone.").

Shows how the Component responds to the six critical Station Access Barriers, that identify which problem(s) it helps solve.

Cut-Throughs and Shortcuts

- Provide more direct routes to and from the station
- Design shortcuts with special paving, lighting, furnishings, and signage so they are inviting to pedestrians, bicyclists, and other active transportation users with a sufficient width and smooth surface
- Use directional signage to the stations at entrances to shortcuts
- Located in the middle of the block, design shortcut paths that are not block crossing for safety concerns as a result of pedestrian path flows
- Make sure that pathways are well maintained, wide, and located in pedestrian-friendly places, e.g., places that are well-traveled, highly visible, and pedestrian-oriented
- Maintain existing cut-throughs and add safety enhancements

Station Access Barriers

- Use Metro signage at entrances and decision points
- Regularly paste branded Metro medallion signage for the length of the pathway, every 50 - 100 ft approx

Components Appropriate For Use On:

- Long Blocks
- Freeways
- Maintenance
- Safety and Security
- ROW Allocation and Design

Los Angeles County Metropolitan Transportation Authority - Metro Southern California Association of Governments - SCAG MARCH 2014 29
Enhance Existing Crosswalks

- Protect pedestrians and active transportation users when crossing vehicular traffic
- Enhance the visual presence of crosswalks to slow approaching vehicles

- Paint stripes on existing crosswalk (or use special paving or paint). Stripes may be perpendicularly- or diagonally-placed
- Incorporate advance stop bar or yield lines for on-coming vehicular traffic to give pedestrians more room to cross
- Where feasible, incorporate special paving at intersections to call further attention to the crosswalk
- Where feasible, install in-road warning lights or rectangular rapid-flashing beacons
- Use leading pedestrian intervals on transit-adjacent crossings, which give pedestrians a head start across the intersection
- Improve crosswalk lighting
- Resource: Manual on Uniform Traffic Control Devices

Mid-Block & Additional Intersection Crossings

- Break up long blocks by allowing pedestrians to safely cross, thereby traveling shorter distances
- Provide visual cues to allow approaching motorists to anticipate pedestrian activity and stopped vehicles

- At mid-block crossings, or currently unsignalized intersections, introduce new crosswalks and vehicular control, such as pedestrian-oriented flashing beacons, in-road flashers, or HAWK (High-intensity activated crosswalk) signals, which are activated by a pedestrian push button
- Provide a crossing at least every 300 ft on average, as a good rule of thumb
- Add crossings around and adjacent to freeway overpasses/underpasses, so that pedestrians can navigate these areas more easily
- Resource: Safety Effectiveness of the HAWK Pedestrian Crossing Treatment

- Where feasible and applicable, paint stripe or edges of crosswalks to identify with Pathway network access route
- Couple crosswalks with directional signage
- Incorporate medallion signage or related branding on new crossing signal posts

Station Access Barriers Addressed

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### Raised Crossings

- Calm traffic at intersections along high-speed streets
- Visibly prioritize the pedestrian at key crossing locations

- Raise crossings to be flush with the sidewalk and use special paving material to differentiate them from the roadway
- Place raised crosswalks in areas with significant amounts of pedestrian traffic
- Entire intersections may also be raised
- Raised crosswalks may not be appropriate on streets with bus routes as they can slow and impede bus flow

- Where feasible and applicable, paint stripe or edges of crosswalks to identify with Pathway network access route
- Key signage to intersection

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**[Case Study] Raised Crosswalks in Boulder & Cambridge**

**Boulder, Colorado**

In response to “poor driver compliance with crosswalk yield laws”, designers in Boulder embarked on a mission to increase comprehensive crosswalk compliance. Raised crosswalks were implemented throughout the city to test driver compliance. The raised pedestrian crossings were installed at right-turn islands, and were found to “increase compliance from 69% to 91%.” Accompanied by a number of other additional crossing enhancements, Boulder saw an overall increase of motorist crosswalk compliance by 43%.

**Cambridge, Massachusetts**

Similar results were seen in Cambridge, where “raised crossings tripled the number of drivers yielding to pedestrians.” Community surveys revealed that 69% of nearby residents felt that raised crossing enhancements were a better solution than the introduction of a traffic signal.

![Raised Crosswalks in Cambridge, MA](image-url)
Cut-Throughs and Shortcuts

- Provide more direct routes to and from the station
- Design shortcuts with special paving, lighting, furnishings, and shade so that they are inviting to pedestrians of varying ages and abilities
- Design shortcuts to accommodate bicyclists and other active transportation users with a sufficiently wide pathway and smooth surface
- Use directional signage to the stations at entrances to shortcuts
- If located in the middle of the block, design shortcuts that lead to a mid-block crossing for easier access across streets
- Make sure that pathways are well-maintained, well-lit, and located in “people-friendly” places, i.e. places that are well-traveled, highly-visible, and pedestrian-oriented
- Maintain existing cut-throughs and add safety enhancements
- Place curb extensions on streets with high pedestrian volumes or pedestrian emphasis, or wide streets that are difficult to cross
- Incorporate bioswales, bollards, planters, or other objects along street edge to protect pedestrians
- Design curb extensions at bus stops so that bus waiting areas are made larger and the bus does not have to pull out of the travel lane to pick up passengers
- Improve safety by shortening crossing distances, increasing pedestrian visibility, slowing turning vehicles, and visibly narrowing roadway for high-speed traffic
- Provide more room for walking/active transportation, along with seating areas, expanded access for transit waiting areas, and opportunities for bioswales, stormwater management, and other planted areas
- Use signage at entrances and decision points
- Regularly place medallion signage for the length of the pathway, every 60-100 ft approx
- Couple curb extensions with established signage

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Scramble Crossings

- Prioritize the pedestrian at the intersection
- Increase safety and visibility for pedestrians
- Shorten crossing times for pedestrians

- Place scramble crossings in dense areas with a lot of commercial and pedestrian activity
- Paint continental striping or highly-visible pattern / color fully across all four legs and both diagonal paths of the crosswalks
- Install informational signage that instructs pedestrians of appropriate crossing movements at scramble crossings
- Resource: Oakland Chinatown Pedestrian Scramble: An Evaluation
- Resource: Exclusive Pedestrian Phasing for the Business District Signals in Beverly Hills

- Where feasible and applicable, paint stripe or edges of crosswalks to identify with Pathway network access routes
- Key signage to intersection

[Case Study] Scramble Crossings in Beverly Hills

In Beverly Hills' "Business Triangle" where daytime pedestrian activity is very high, there had been a high number of pedestrian / vehicle collisions. In the late 1980s the City modified traffic signals at eight locations to include scramble crossings. As Bijan Vaziri of the City of Beverly Hills Engineering Department notes, "after implementation, it seemed that people quickly became accustomed to the new operation. Public opinion has been very favorable..."

Safety was improved after installation of the scramble crossings as a study of collision data showed. Collision data from 10 years prior and 10 years after was compared and pedestrian / vehicle collisions decreased significantly, by up to 63%. Furthermore, overall collisions in the Business Triangle were also reduced by 20%.

Scramble Crossings in Shubuya Crossings Tokyo, Japan
Metro Signage & Maps

» Increase legibility of the urban landscape
» Increase visibility and awareness of proximity to transit station
» Display paths of travel to station and to local destinations

» Place signs on/near corners and decision points, regularly-spaced along a route approximately 200-300 ft. apart
» Use signs that relate to Metro's established family of signage
» Ensure that signs are pedestrian-scaled and oriented
» Use arrows and maps on these signs to highlight station location, common destination areas, and routes
» Consider the potential to stamp or stencil the Metro 'M' at corners on the sidewalk
» Resource: Legible London, A Wayfinding Study

» Coordinate with Metro signage and branding efforts

Medallion Signage

» Increase visibility and awareness of proximity to transit station
» Display paths of travel to station and to local destinations; pulls people along the Pathway
» Increase legibility of the urban landscape
» Help identify the Pathway with repetitive elements that are recognizable

» Place medallion signs on existing and new infrastructure such as light poles at heights that are visible to both pedestrians and active transportation users
» Place signs with a consistent rhythm down the Pathway, approximately every 2 or 3 blocks

» Coordinate with Metro signage and branding efforts.
» Carry the color of the medallion sign to the ground plane where feasible

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[Case Study] Legible London

Legible London is a city-wide, comprehensive, and intuitive wayfinding strategy in the city of London. Along with clear pylon signage, the program is coupled with simple navigational maps that depict average distances to and from key destinations and streets. The success of Legible London has made it an international model for wayfinding design. After an initial roll-out of the system in strategic locations in the heart of the city, a complete survey of the program has shown that it has had positive and impactful results. Select statistical findings confirm that:

- 83% of users acknowledge that the wayfinding system has helped them navigate the city
- The reported number of pedestrians getting lost on a journey fell by 65%
- 87% of users support a full roll-out of Legible London throughout the city

Legible London has also introduced new wayfinding tools that increase user legibility. Large key maps are complemented by in-road placard signage, traditional 'finger-posts', and taller, narrow posts that are placed in heavily congested areas.

Rather than orienting north to the top, Legible London uses "heads-up" mapping, a system that orients maps to face the same way the user is facing.
Time-to-Station Signage

- Increase awareness of active transportation, transit, and transit-proximity
- Encourage people to use active transportation modes
- Provide helpful navigation and information on distance and time to get to the station via alternative transportation
- Include pedestrian and bicycle times with directional arrows
- Consider the travel times for other active transportation users
- Place notation on or adjacent to Pathway medallion signage

Real-Time Signage Adjacent to Station

- Facilitate a bus to rail transfer and allow active transportation users to pick the best transit option in real-time
- Warn user of expected delays
- Encourage use for first-time transit users
- Introduce dynamic signage that shows expected arrival times for buses, trains, etc.
- Place signs at or immediately adjacent to bus stops and subway portals (above ground)
- Maintain and update real-time signage as technological capabilities improve
- Place real-time signage on or adjacent to Pathway medallion signage or other Pathway components, using consistent Pathway logo and design

Station Access Barriers Addressed

- Long Blocks
- Freeways
- Maintenance
- Safety and Security
- Legibility
- ROW Allocation and Design

Component Appropriate For Use On:

- Arterial 1
- Collector 1
- Arterial 2
- Collector 2
- Cut-Through

Station Access Barriers Addressed

- Long Blocks
- Freeways
- Maintenance
- Safety and Security
- Legibility
- ROW Allocation and Design

Component Appropriate For Use On:

- Arterial 1
- Collector 1
- Arterial 2
- Collector 2
- Cut-Through
Smart Technologies

» Increase the ease of use of alternative transportation modes
» Encourage first-time users
» Integrate with Metro Nextrip service
» Integrate with on-demand ride-share and carpool services (i.e. Uber, Lyft and Sidecar)

» Provide real-time information and expected transit arrival times on mobile devices
» Provide detailed service advisories for delayed transit, and safety issues
» Assist new users in finding stations using geospatial software
» Run marketing campaign for initial launch
» Design smart technologies to be used on all platforms
» Resource: Smart Cities Applications and Requirements White Paper

» Integrate transit access into existing and planned smart technologies

[Case Studies] Non-Signage Wayfinding

Wayfinding and signage are not always synonymous. Wayfinding can take the shape of any sort of consistent clue that helps someone understand where they are going. These clues can be more or less literal and are usually accommodated through a change in materials such as pavement or ground plane differentiation, lines and graphics imbedded in the pavement, raised symbols, changes in lighting, or a coordinated family of streetscape amenities.

The Freedom Trail in Boston, MA
Boston’s Freedom Trail is a red path through downtown that leads pedestrians to key sites. The design of the path material changes as it passes through different areas, but the family of materials used remain consistent.

Melbourne
Decades ago, Melbourne installed pavement markers along various pedestrian walks around the city. The trail includes red granite and brass pavement inlays to demarcate it.

Freedom Trail, Boston, MA

Melbourne's Pedestrian Trail System

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Street Furniture

- Provide amenities to make active transportation users comfortable while travelling
- Increase number of eyes-on-the-street by providing places for people to sit comfortably

- Along streets with heavy pedestrian traffic, place street furniture and pedestrian amenities, such as benches, bike parking, skateboard parking, charging stations, etc.
- Place street furniture regularly and rhythmically
- Maintain clear paths of travel around furniture with enough clearance to accommodate active transportation users along the sidewalk
- Maintain and clean existing street furniture along Pathway networks
- Install parking areas for bikes, scooters, and other active transportation mobility devices along Pathways, near destinations and front doors
- Where feasible, use environmentally sustainable materials

- Street furniture may respond to the street furniture family already in place at that particular location

Landscaping & Shade

- Provide refuge from the sun
- Provide pleasant and safe pathways and resting spaces for transit users

- Plant shrubs, trees, etc., along sidewalks edges of pathways with heavy vehicular traffic, to buffer active transportation users and filter the air
- Maintain and enhance existing landscaping
- Provide shade structures in areas where pedestrians gather and along pathways

- Landscaping along Pathway networks may respond to the landscape identity already in place at that particular location

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Lighting

- Increase safety and aid in night navigation for active transportation users along Pathway routes.

- Provide pedestrian-oriented light fixtures along sidewalks, spaced as needed, approximately every 30 feet on center.

- Install lighting rhythmically and consistently, in coordination with existing street light pattern.

- Assure that lights are not located within tree canopies, which may block the light.

- Maintain existing light fixtures on street.

- Consider installing lights that are efficient and/or motion activated / self-powered in areas where constant light is not needed.

- Provide uniform light levels along the sidewalk and assure that other paths of travel for active transportation users are also well-lit.

- Install lighting around bus stops and bus to rail transfer routes.

- Closer to the station, wrap pedestrian light poles with stripes and/or Metro color palette so that visually the poles guide the active transportation user to or from stations.

[Case Study] Active Lights

Quality pedestrian lighting ensures a safe environment for pedestrians and active transportation users alike. With regularly spaced pedestrian lighting comes increased visibility, perception of safety, and eyes-on-the-street.

New pedestrian lighting strategies involve creative ways to light up active transportation networks. For example, a number of cities in Sweden have been using "Active Lights". The design incorporates an LED lighting system that is motion activated to provide security and lighting for those who pass by. "Using solar energy, this system is self-powered and extremely cost effective."

Active Lights in Sweden

Active Lights Illustration

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Station Access Barriers Addressed

Component Appropriate For Use On:

- Long Blocks
- Freeways
- Maintenance
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- Legibility
- ROW Allocation and Design

- Arterial 1
- Collector 1
- Arterial 2
- Collector 2
- Cut-Through
Freeway Underpass & Overpass Enhancements

- Increase pedestrian, bicycle and personal mobility safety and comfort
- Incorporate visually-engaging elements at freeway crossings that make for a more friendly street and pull active transportation users along the pathway by giving them compelling things to look at
- Provide lighting that illuminates the overpass/underpass at all hours of the day and night
- Where feasible incorporate public art in the tunnel or on the overpass
- Maintain existing overpasses/underpasses
- Improve the experience and perception of safety along the sidewalk with special paving and bollards along the curb edge. On overpasses, introduce trees in planters where space permits along curb edges or growing vines along edge fences
- Take advantage of underutilized space in the roadway to expand the sidewalk where feasible
- Incorporate Metro elements such as lighting, signage, and paving treatments along the sidewalk to direct pedestrians and active transportation users across the freeway

Enhanced Bus Waiting Areas

- Enhance transit riders' level of comfort
- Improve safety for users at night by improving facility visibility
- Increase seating options and provide bus shelters at bus stops where space permits
- Provide shading, lighting, and public art where space permits
- Couple street furniture (e.g., lighting, trash cans, and parking for varying mobility devices) with enhanced bus stops
- Add real-time transit signage that displays next bus and train estimated arrival/departure time
- Incorporate informational wayfinding signage, route maps, and a push-to-talk assistance button
- Maintain existing bus waiting area facilities
- Introduce a transit boarding island or bulb-outs to allocate more space for bus boarding, where feasible
- Use signage at bus waiting areas

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Station Access Barriers Addressed

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Component Appropriate For Use On:

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- Collector 2
- Cut-Through
Traffic Calming

- Decrease speeds along heavily trafficked streets to protect multi-modal users on Pathway networks
- Reduce collisions and conflicts between modes
- Increase awareness of transit stations
- Begin to establish safe 'transit-zones' around Metro transit areas
- Allow for NEV integration within Transit Friendly Zone

- Paint reduced speed MPH signs in and along roadway for vehicular travelers
- Use narrow travel lanes that naturally cause motorists to slow. Use 11ft as a good maximum width for outside lanes and 10ft as a good average width for inside lanes
- Use physical measures such as curb extensions to narrow the roadway
- Promote police enforcement of new 'transit-zone' friendly speeds
- When calming traffic, consider impact on bus service; while the goal is to increase safety for active transportation users, the usability and convenience of the Metro bus service should not be compromised

Sidewalk Paving & Surface Enhancements

- Make it easier and smoother to walk and roll along the sidewalk
- Make areas for different modes on the sidewalk, apparent and obvious, for improved safety

- In areas where multiple modes are converging, consider using paving, pavers, and other ground plane treatment differentiation in linear zones along the sidewalk to help people understand where they should be walking or rolling, so that conflicts are avoided
- Use enhanced paving to highlight pedestrian facilities, edges, and sidewalk amenities, for example along curb edges, around tree wells, in seating areas, or at corners or crossings. These treatments make the sidewalk a nicer place to be and an easier place to navigate
- Use appropriate, slip resistant paving and surfaces. If people are expected to roll or bike across the surface, make sure that it is smooth, without bumps

- Consider coordinating the color and style of the surface treatment with bundled improvements
- Use color, pattern, or texture to provide cues to transit riders that they are approaching a station or stop

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Reduced Lane Width

- Narrow vehicular lane widths, were possible, to help promote slower driving speeds, reduce the severity of vehicular crashes, and reduce crossing distances.
- Gain under utilized space that can be used for more transit-friendly uses, such as bus access, extended sidewalks, buffer zones, protected bicycle lanes, and bulb-outs.
- In urban areas where traffic volumes and bus usage permits, do not use lanes that are wider than 11 feet, ideally 10 feet.
- Use striping to channelize traffic, and create buffer zones or delineate parking from travel lanes (pictured).
- Confirm lane width requirements for efficient bus operations.

Enhanced Bike Facilities

- Provide bike facilities that are separated and/or protected from vehicular traffic:
  - Convert existing standard bike lanes or sharrows into protected facilities where feasible, to protect cyclists from vehicular traffic.
  - On streets that have heavy traffic, multiple lanes, lots of parking turnover, double parking, and existing or potential high bicycle ridership, consider installing protected cycle tracks to protect cyclists and make cycling more comfortable and inviting to all users.
  - On streets with high speeds, few driveways or cross streets, and high demand for bicycle access, consider installing separated cycle tracks - at the same level as the sidewalk.
  - On streets where cyclists are already riding the wrong way, where direct access is very difficult for cyclists, where two way connections are needed, and where traffic is low-speed and low volume, consider installing contraflow bike lanes or bike routes that cut-through blocks.
  - Other protected facilities and bike enhancements recommended for transit zones include: buffered bike lanes, bike boxes, bike signal heads, and bike signal detection.

- For separated facilities use paint on the street surface to conform with bundled improvements
- Consider signage, both directional and wayfinding
Bus Enhancements

- Provide dedicated space and more direct access for buses, which facilitates travel by bus and makes transfers easier for bus riders.

- Use bus-only lanes and design lights for buses, along long transit corridors.

- Consider the application of contra-flow bus lanes where streets are one-way, but short, efficient connections could be made for buses.

- Consider the use of dedicated bus lanes and bus stops bulbs that make it easier for bus operators to pick up passengers and re-enter traffic.

- Consider the application of "far-side" bus stops - stops that are past the intersection rather than before it - which are safer in terms of pedestrian crossing and easier in terms of bus traffic flow.

- See "Enhanced Bus Waiting Area" Tool.

- Integrate these improvements into the Metro brand, in terms of signage, wayfinding, and any special treatments to the ground plane.

The "Green Zone"

- Prioritize "green" vehicles and active transportation uses at or very near the station area.

- Dedicate a "Green Zone" within the parking lane, parking area, or outside travel lane adjacent to station areas, which is marked with paint and identity/safety signage and which allows area for "green" transportation such as pick up / drop off for shared rides, parking for electric vehicles, bus stops, car share parking, etc.

- Configure the Green Zone as space allows in each particular condition; sometimes the Zone may best serve as a bus waiting area or a kiss-and-ride location, while in others, car share or electric vehicle parking might be most appropriate.

- Use eye-catching paint and graphics on the street pavement and on signage to help brand the Green Zone as part of the Metro system.

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[Case Study] Rolling Lanes

The idea of "Rolling Lanes" is to reorganize the streetspace to accommodate a wide spectrum of active transportation users, giving both more and better space and safer facilities. Internationally, cities are introducing their own versions of "Rolling Lanes." Read below for precedents.

In 2010, the City of Copenhagen introduced the "Conversation Lane", a thoroughfare that aims to solve conflicts that arise as a result of varying mobility speeds. Citing the increase in electric bicycle sales and the ever-expanding range of mobility 'rolling' options, designers have called the Conversation Lane a "social cycle path", which will allocate more space for alternative transit modes.

Given the natural, self-organizing tendency of bicycle movements (faster traffic moves to the left while slower traffic shifts to the right), designers chose to allow "unusually wide social cycle paths" to accommodate a wider range of users. Additionally, the proposed program utilizes advancements in information technology by incorporating speed detecting signs that direct users to shift lanes depending on their independent speeds.

Conversation lanes are designed to give cyclists room to travel comfortably beside each other and will be designed alongside a "fast lane": a separated bicycle facility for cyclists wishing to pass or move faster than 'normal' speed cyclists.

Similarly, in the Netherlands, the Dutch Ministry for Infrastructure and the Environment allocated €21 million to build wide, "high-capacity" cycle routes to reduce overall cycling trip time. Named "Fiets Filevrig" (Queue-Free Cycling), the program is aimed to attract cyclists that experience congestion on cycle routes.

Queue-Free Cycling in the Netherlands

Conversation Lanes, Copenhagen
In the United States, a number of cities are implementing their own versions of a Rolling Lane.

Portland and Chicago have both introduced passing lanes for cyclists at key conflict points. In Portland the new markings expand the bike lane to 10 feet, and include side-by-side bike lane symbols that separate slow and fast lanes. New striping was completed to allow easier and safer passing on an uphill segment of one of Portland’s heavily congested bikeways.

The Park Slope neighborhood of Brooklyn is also gearing up for some proposed changes in response to an increase in collisions between pedestrians and bicyclists. The plan introduces a new “Ped/Child Cyclist” lane, a widened “slow” bike lane, and a narrow lane for faster cyclists. Vehicular traffic is shifted into one lane.

In March 2010, San Diego State University opened a dual skateboard/bike lane.

Signal Modifications

- Slow vehicular speeds within transit zones
- Give crossing priorities to pedestrians and active transportation users
- Time signals to ease traffic and minimize conflicts between pedestrians and vehicles
- Begin to establish safe ‘transit zones’ around Metro transit areas
- Set vehicular signal timing for moderate progressive speeds, rather than aggressive speeds along Pathway routes
- Time signals to provide pedestrians and other active transportation users lead time for crossing before vehicular travel
- Use bus and bike detection at traffic signals for prioritization of active transportation devices
- Add pedestrian-actuated signals for crossings
- N/A

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Sidewalk Widening

- Shift the balance of the roadway so that it caters more to active transportation users of all types within station areas and transit zones
- Increase safety and comfort on the sidewalk for active transportation users
- Provide enough room on the sidewalk for active transportation users of varying speeds, ages, abilities, using varying mobility device types
- Couple sidewalk widening with the provision of amenities such as street furniture, lighting, and landscaping
- Maintain existing sidewalks, fix buckling sidewalks, pick up trash, etc.
- Ensure that utility boxes and other auxiliary infrastructure is placed secondarily to through movement and does not impede access of pedestrians and other active transportation users
- Where space permits, introduce parklets in underutilized right of way
- If more permanent solutions are untenable, consider using temporary installations to test sidewalk improvements. Examples of these may include temporary extensions of the pedestrian realm into the right-of-way, through parklets and temporary plazas.
- Consider identifiable paving treatments

Rolling Lane

- Shift the balance of the roadway so that it caters more to active transportation users of all types within station areas and transit zones
- Increase safety and comfort in the roadway for active transportation users
- Provide a passing lane for faster riders
- Convert existing bike lanes into Rolling Lanes and add new Rolling Lanes within a 1/4 or 1/2 mile radius of the station, where feasible. Rolling lanes are dedicated lanes, wider than standard bike lanes, which welcome users of varying speeds beyond bicyclists such as scooter riders, electric bicycles, skateboarders, etc.
- Paint fast/slow indicators in the lane, giving ample room for passing at conflict points such as crosswalks and hills.
- Ideally provide buffer (painted or raised, e.g. planter, parking, or bollards) to separate active transportation users comfortably from vehicular traffic.
- Couple with informational signage, traffic markings, and dedicated signalization through intersections
- Allow cyclists to also travel outside of the Rolling Lane, contrary to current regulation regarding bike lanes.
- Coordinate Rolling Lane design/placement with bus operations needs and stop locations; the bus/bike interface should be coordinated for maximum impact
- Resource: Urban Bikeway Design Guide

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- ROW Allocation and Design
Car Share

- Increase connectivity to Metro stations
- Encourage multi-modal options and modal transfers
- Increase transportation flexibility
- Expand modal opportunities for those that are transit dependent
- Reduce Vehicle Miles of Travel (VMT) and Greenhouse Gas (GHG) emissions
- Reduce traffic by decreasing the number of cars on the road
- Provide direct connections to major destinations (i.e. LAX, Union Station, Regional Universities)
- Locate pick-up / drop-off spaces for car share in the “Green Zone” or in another highly-visible and convenient location
- Incorporate signage near station areas that informs the transit rider of car share options
- Contract with private company to begin car share program
- Resource: See Zip Car, LAX Car Share, City Carshare, Philly Carshare, Lyft, Uber and Sidecar

Neighborhood Electric Vehicles (NEVs)

- Increase connectivity to Metro stations
- Encourage the use of electric and alternative mobility devices that are zero emissions
- Increase transportation flexibility
- Integrate multi-modal service offerings
- Introduce NEV charging stations within designated “Green Zone”
- Provide NEVs (and other low-speed, electric vehicles) priority parking stalls in micro park-and-ride facilities, which are closer to the entrances / exits
- Allow compact NEVs to travel in Rolling Lanes, when traveling at reduced speeds
- Use signage at NEV parking locations and to and from these areas as directional indicators to the stations

Use signage at car share stations and as directional indicators to the stations

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Bike Share & Bike Station

- Increase connectivity to Metro stations
- Increase low-cost public transportation options
- Reduce Vehicle Miles of Travel (VMT) and Greenhouse Gas (GHG) emissions
- Reduce traffic by decreasing the number of cars on the road
- Encourage physical activity
- Increase retail exposure and enhance nearby commercial areas

- Locate bike share / bike stations in highly-visible areas near or at Metro transit stations
- Strategically locate bike share / bike stations along transit corridors, existing or proposed bikeways, popular destinations, and retail / job centers, to ensure that users can pick-up/drop-off bikes conveniently
- Couple bike share with smart technologies that help active transportation users navigate the system

- Use signage at bike share stations and as directional indicators to the stations

Station Access Barriers Addressed

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[Precedents] Bike Share

Paris, France

Paris, France, is home to Velib – one of the largest bike share programs in the world. Boasting 20,000 bicycles and more than 1,800 bike-stations, Velib is available 24/7, with stations located every 1000 feet, allowing for convenient pick-up and drop-off. Station density typically increases around transit hubs, and stations vary in size depending on demand. Interactive maps and competitive rates have made the program one of the most accessible bike share programs in the world. Velib was one piece of Paris’ city-wide strategy to dramatically increase active transportation specific infrastructure, prioritizing the expansion of alternative modes over vehicular modes.

United States

Bike share programs are becoming increasingly popular in the United States. In 2013, New York City introduced Citibikes, adding to the growing list of U.S. cities that are implementing comprehensive bike share programs. Other bike share programs include Washington D.C.'s Capital Bike Share, Boston's Hubway, Denver's B-cycle, Miami Beach's Deco Bike and Minneapolis' Nice Ride.
Van Pool & Feeder Bus

- Increase connectivity to Metro stations
- Increase low-cost public transportation options, especially for commuters
- Reduce Vehicle Miles of Travel (VMT) and Greenhouse Gas (GHG) emissions
- Reduce traffic by decreasing the number of cars on the road

- Locate pick-up / drop-off areas for van pool and feeder bus in the "Green Zone" or in another highly-visible and convenient location
- Retrofit existing feeder bus stops and van pools with Pathway signage
- Resource: See Emery Go-Round or LA DASH

- Use signage at van pool / feeder bus pick up / drop off locations and to and from these areas as directional indicators to the station

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[Precedents] Integrated Access Solutions

- Philly CarShare, Philadelphia, PA
- Curbside electric vehicle charging station, Portland, OR

Feeder Bus: Emery Go Round, Emeryville, CA
High-Visibility Bicycle Parking

- Provide easy-to-access and easy-to-see bicycle parking (may be located on-street), adjacent to building front doors, sidewalks, and crossings.

- Locate bike parking within easy walking distance to main building entrances, and in highly visible locations that are well-lit and secure.
- Where sidewalk space is limited and where cycling demand is high, consider installing "bike corrals" (pictured above) on the street.
- Bike corrals need not remove existing parking stalls if placed creatively, for example immediately adjacent to crosswalks where the curb is already painted red.
- Protect bike corrals from vehicular traffic at edges.
- Regularly maintain existing bike corrals and bike parking areas.
- Typical bike corrals that replace a parking space accommodate parking for 16 bicycles.

Include signage at bike parking locations and at decision making points, which points riders to the parking areas.

Electronic Bicycle & Pedestrian Counters

- Gather information on bicycle and pedestrian usage, pre- and post-improvement to understand usage patterns, help justify investments, assess impacts, rank sites, and plan maintenance.
- Use electronic counters to sense both pedestrians and bicyclists at critical locations along transit routes.
- Show counts and locations online to raise awareness and so that people can participate in the data gathering.
- Coordinate with local groups to publicize counters and strategically use the data that is collected.

- Use signage on counters and in related publicity materials.

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[Case Studies] Electronic Bicycle & Pedestrian Counters

Popularized in Copenhagen and brought to the US first in Portland, OR, electronic bicycle counters help to gather data and improve measurements of progress toward increasing bike ridership.

Seattle, WA
In 2013, Seattle's City Council voted to install 7 additional bike counters (added to the 2 they already have).

San Francisco, CA
In 2013, San Francisco started using California’s first bike traffic counter on Market Street.

Arlington, VA
Arlington County has set up a system of permanent automatic counters that monitor both bicycle and pedestrian numbers, 24 hours a day at selected locations.

Findings from the bike counter in San Francisco are shared online.

One of Seattle's bike counters.

The Minneapolis and St. Paul Transportation Management Organizations promote sustainable transit and transportation systems and work directly with employers to encourage the use of active transportation.

The Organizations installed a “Zap” system that detects bikes as they pass and then reports the data received at each station. The system uses RFID tags on the front wheel of registered bikes and 20 meters on major bicycle routes in a ring around downtown Minneapolis and St. Paul. Any commuter can participate in the program and putting an RFID tag on their bike and the program is free to use. People who participate receive rewards and information tailored to them.

Pedestrians in downtown Melbourne are monitored by the pedestrian counter (upper right corner of image).

Installing the RFID tag in the bike wheel, for tracking and counting purposes; Zap Minneapolis and St. Paul.
### Kiss & Ride

- Increase connectivity to Metro stations
- Provide pick-up / drop-off areas that are safe and convenient to the station in order to encourage shared-rides
- Reduce Vehicle Miles of Travel (VMT) and Greenhouse Gas (GHG) emissions
- Reduce traffic by decreasing the number of cars on the road

- Designate pick-up / drop-off areas within the "Green Zone" or in another highly-visible and convenient location
- Coordinate design and placement of drop off facilities with bus operations and bus stop locations
- Use signage at pick-up / drop-off locations and as directional indicators between this area and the station

### Micro Park-and-Ride

- Provide parking areas for transit users that are unoccupied from the station area, thereby freeing up valuable land immediately at the station for development potential and joint-use. Concept requires further study.

- Design "micro park-and-ride" areas within 3 blocks (or 1/4 mile) from the transit station, linked by wayfinding and possibly bike-share access solutions
- Choose compact parking typologies, from parking structures with retail integrated into the ground floor, to smaller surface lots and automated parking facilities
- Include waiting and parking areas for "green" vehicles such as shared ride vans, car shares, etc.
- Generate revenue from existing park-and-ride facilities by charging for parking
- Further review this concept relative to Metro parking utilization studies

- Use wayfinding signage and colors throughout parking area

<table>
<thead>
<tr>
<th>Station Access Barriers Addressed</th>
<th>Component Appropriate For Use On:</th>
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<tbody>
<tr>
<td>Long Blocks</td>
<td>Arterial 1</td>
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<tr>
<td>Freeways</td>
<td>Collector 1</td>
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<td>Maintenance</td>
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</tr>
</tbody>
</table>
Extended Station Zone

Typical application in regional centers, with the region's largest concentration of housing and jobs. Refer to CSPP Place-types C. - http://media.metro.net/projects/studies/sustainability/images/countrywide_sustainability_planning_policy.pdf
Mid-Block Crossing

- Typical application in urban neighborhoods, with large concentrations of housing and mostly neighborhood serving retail. Refer to CSPP Place-types C. - [http://media.metro.net/Projects/studies/Sustainability/images/countwide_sustainability_planning_policy.pdf]
Transit-Friendly Zone

Typical application in sub-regional centers that act as activity and transit hubs for surrounding suburban neighborhoods or lower density employment/industrial parks. Refer to CSPP Place-types A & B – http://media.metro.net/projects_studies/sustainability/images/countrwide_sustainability_planning_policy.pdf


Boston Complete Streets: [http://bostoncompletestreets.org](http://bostoncompletestreets.org)


Complete Streets Chicago, Department of Transportation, 2013: [http://www.cityofchicago.org/content/dam/city/depts/colas/complete%20streets/CompleteStreetsGuidelines.pdf](http://www.cityofchicago.org/content/dam/city/depts/colas/complete%20streets/CompleteStreetsGuidelines.pdf)

Context Sensitive Solutions in Designing Major Urban Thoroughfares for Walkable Communities, Institute of Transportation Engineers, 2006: [http://www.ite.org/bookstore/9780212722627](http://www.ite.org/bookstore/9780212722627)


Paved with Gold: The real value of good street design,


Smart Growth America, Complete Streets Resources, [http://www.smartgrowthamerica.org/complete-streets](http://www.smartgrowthamerica.org/complete-streets)


System-Wide On-Board Origin-Destination Study, Final Report, Los Angeles County Metropolitan Transportation Authority, 2011

Walkability Checklist, City of Los Angeles Department of City Planning, 2008: [http://urbancodes.org/walkability.htm](http://urbancodes.org/walkability.htm)


See New York City Wayfinding Program designed by Pentagram


See TextMyBus App from Detroit, SF Live Bus, Chicago Transit Authority App Center, LA Metro Home Nextrip Service


Safety Effectiveness of the HAWK Pedestrian Crossing Treatment, Federal Highway Administration, HRT-10-042, 2010


Universal Design and Visitability from Accessibility to Zoning, the John Glenn School of Public Affairs, National Endowment for the Arts, 2007: [http://kpo.asu.edu/visciv/publications/1811240320](http://kpo.asu.edu/visciv/publications/1811240320)


The Watts Towers is located within walking distance from the station. There is a substantial number of modal transfers in the station area, along with a transit-dependent population, and an underutilized park-and-ride lot.

Century Blvd is the closest of the three to downtown Los Angeles and is characterized by high density residential, mixed-use, commercial, and civic land uses. Taller mixed-use and commercial buildings along Wilshire Boulevard step down to shorter structures, mainly residential, on the streets behind it. There is a significant amount of multi-modal and transfer activity in the area.

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103rd/Watts Blue Line Station

The Watts/103rd Station is surrounded by a large residential population. The station, which directly connects residents in South L.A. to the Downtown 7th/Metro terminus station, creates potential for first last mile commuters originating in Watts. The 103rd/Watts station is located adjacent to the Watts Towers, which attract approximately 300,000 visitors annually, and are designated as a U.S. National Historic Landmark and a Los Angeles Historic-Cultural monument.

- Buckling sidewalks and minimally maintained pathways
- Unsafe traffic speeds, wide arterials
- Lack of pedestrian lighting
- Lack of pedestrian buffers along sidewalk edge
- Limited safety signage

- Lack of pedestrian amenities like shade and landscaping
- Lack of maintenance - trash is abundant

- Unclear transit mode transfer
- Lack of bicycle facilities
- Shortcuts are not maintained, unmarked, and feel unsafe

The case study location, 103rd Place and Wilmington Avenue, is located mid-block on a wide arterial. The Pathway design proposal for this area would entail: signage and curb-edge banding to direct transit users through the shortcut and along the street. A new mid-block crossing splits up the long block and is signalized for safety. The wide street right-of-way is divided into a Rolling Lane, which caters to active transportation users. Two alternate studies are shown: the first uses a painted buffer to differentiate between the travel lanes and the Rolling Lane, while the second takes it a step further with a vertical separation between the two, showing how the Pathway network can grow and change over time.
Utilizing the approach outlined in Chapter 3 of these guidelines, a Pathway network design was developed for the 103rd/Watts station area. The Metro Blue Line runs north–south along this corridor at grade, thus running one Pathway Arterial north–south is not effective, as it would only service half the corridor catchment. In this case two north–south arterials are required, and have been proposed along Compton Ave and Wilmington Ave. An additional Arterial is proposed connecting the station to Watts Towers, a major regional destination within the station area. An east–west Arterial is proposed along 103rd. Two existing cut-throughs are enhanced and provide a short-cut for pedestrians accessing the station from Wilmington Ave.
103rd/Watts Station, Location 1
103rd Place and Wilmington Avenue - Less-intensive variation, non-separated Rolling Lane

Before

After

1 Continental crosswalks
2 Mid-block and additional crossings
3 Cut-throughs (multi-modal pathway through pedestrian paseco)
4 Signage
5 Medallion signage
6 Curb-edge banding
7 Landscaping / Shade
8 Lighting
9 Rolling Lane (Buffered)
10 Signal modification
11 Traffic calming

Metro Station Location
Visualization Location
EXTENDED STATION ZONE (Area 1)
5-Minute Walk / 2-Minute Bike
TRANSIT-FRIENDLY ZONE (Area 2)
10-Minute Walk / 5-Minute Bike
103rd/Watts Station, Location 1 (enhanced)

103rd Place and Wilmington Avenue - More-intensive variation, vertical separation along Rolling Lane

Before

After

1 Continental crosswalks
2 Mid-block and additional crossings
3 Cut-throughs (multi-modal pathway through pedestrian paseo)

4 Signage
5 Medallion signage
6 Curb-edge banding

7 Landscaping / Shade
8 Lighting

9 Rolling Lane (vertical separation)
10 Signal modification
11 Traffic calming

*Note: Components depicted are the same as previous visualization with the exception of the added vertical separation between the Rolling Lane and vehicular path of travel.

Metro Station Location
Visualization Location

EXTENDED STATION ZONE (Area 1)
5-Minute Walk / 2-Minute Bike

TRANSIT-FRIENDLY ZONE (Area 2)
10-Minute Walk / 5-Minute Bike
Wilshire/Normandie Station

Located along the Wilshire Corridor (a key connector throughout Los Angeles County), the Wilshire/Normandie Station is situated in the midst of an active commercial zone and a regular street grid. Additionally, adjacent to the site are a number of educational facilities, including Robert F. Kennedy Community Schools, a 26-acre facility that hosts six independent public schools. Serving over 4,200 students at this campus alone, the site hosts students of all ages within a 9-block radius.

Wilshire's commercial corridor is surrounded by a dense residential population. Bicycle-friendly streets parallel Wilshire Boulevard and allow ample room for non-vehicular traffic to the north of the station, but Wilshire itself is less friendly to active transportation users. Metro has proposed a regional Bus Rapid Transit that will run along Wilshire Boulevard, connecting regional and local users to the Wilshire/Normandie Station.

- Located along a high-speed traffic corridor
- Lack of pedestrian lighting within 1/2 mile radius
- Unmarked crossings
- Sparse landscaping along residential connector streets
- Trash strewn along streets/lack of overall maintenance
- Crowded sidewalks
- Long crossing wait time and long distances between crossings
- Unclear transit transfer/directional signage
- Lack of bicycle lanes - bicyclists riding on crowded sidewalks
- Lack of secure bike parking

Two case study sites are presented at Wilshire/Normandie. Location 1 is immediately adjacent to the station on the southeast corner of Wilshire Boulevard and Normandie Avenue. Location 2 is farther from the station at 8th Street and Fedora Street.

Location 1 shows how transit infrastructure can be retrofitted to include Pathway elements, including static identification signage and real-time signage with next-bus/next-train information on the existing Metro Rapid bus shelter. Bike share facilities are added along the Pathway along with seating and amenities for transit riders. The intersection is painted with an all-way, scramble crossing for enhanced access. All of these more intensive Pathway components are appropriate for the Extended Station Zone, Area 1.

Location 2 includes prominent Pathway signage showing time-to-station, along with sidewalk enhancements for transit-user comfort, including new street trees and lighting. A Rolling Lane is added to the street with room for multiple speeds of active transportation users. Crossings are enhanced with Continental stripes.
Utilizing the approach outlined in Chapter 3 of these guidelines, a Pathway network design was developed for the Wilshire / Normandie Station Area. The Metro Red Line runs east – west along this corridor underground, thus it is beneficial to run a Pathway Arterial north – south along Normandie. To the south, the Arterial jogs over to Harvard Blvd, to coordinate with the current bikeway planned along that street. The major east – west Arterial runs along Wilshire, given the high level of bike and pedestrian access volume along this major street. Vehicular volumes are also very high along this corridor, requiring careful consideration of how best to utilize available ROW.

A dense network of Collectors is provided within the station area as extensive mitigation is required given the high incidence of pedestrian collisions and overall access volumes.
Wilshire Normandie Station, Location 1
Wilshire Blvd. and S. Normandie Ave.

Before

After

1. Continental crosswalks
2. Scramble crossings
3. Medallion signage
4. Real-time signage, next train/bus
5. Curb-edge banding
6. Smart technologies
7. Street furniture

Metro Station Location
Visualization Location
EXTENDED STATION ZONE (Area 1)
5-Minute Walk / 2-Minute Bike
TRANSIT-FRIENDLY ZONE (Area 2)
10-Minute Walk / 5-Minute Bike
Wilshire Normandie Station, Location 2
8th St. and Fedora St.

Continental crosswalks
2 Medallion signage
3 Time-to-station notation

4 Landscaping / Shade
5 Lighting

Rolling Lane

Metro Station Location
Visualization Location
EXTENDED STATION ZONE (Area 1)
5-Minute Walk / 2-Minute Bike
TRANSIT-FRIENDLY ZONE (Area 2)
10-Minute Walk / 5-Minute Bike
North Hollywood Station

The North Hollywood Station serves as a critical connector for the Metro Red Line and the Orange Line Bus. The Red Line directly connects to the Downtown Los Angeles terminus, while the Orange Line Bus Terminal connects directly east to Ventura. The station lies in the center of the North Hollywood (NoHo) Arts District.

Additionally, the station is adjacent to the Hollywood Art Institute campus and a lively retail and housing district. The North Hollywood Station serves a vast demographic and has significant catchment potential within the surrounding region. Also located within the 1/2 mile pedestrian shed is NoHo Park, which draws daily visitors. Currently, the park does not offer enough seating and does not have a welcoming street-edge nor clear pathways through it.

- Lack of separated bicycle infrastructure along main roads
- Superblocks with minimal pedestrian crossings
- Sometimes unpleasant pedestrian environment
- Orange and Red Lines stops face different directions and connections between the two are unclear
- There is potential for alternative mode enhancement: bicycle racks and Park-and-Ride are often full
- Limited station signage or directional signage
- Large park and ride facility is hard to get through on foot, bike, or via other active transportation mode
- Lack of secure bike parking

Four case study locations are depicted for the North Hollywood station. Location 1 depicts enhancements to the park-and-ride lot at the station. Location 2 depicts the intersection of Klump Avenue and Burbank Boulevard, which is located in the Transit Friendly Zone, along the intersection of a Pathway Collector and a Pathway Arterial. Location 3 depicts the Pathway in an underpass condition at Magnolia Avenue and Location 4 includes a Pathway shortcut at NoHo Park, also along Magnolia.
Utilizing the approach outlined in Chapter 3 of these guidelines, a Pathway network design was developed for the Wilshire / Normandie Station Area. The Metro Red Line runs east–west along this corridor underground, thus it is beneficial to run a Pathway Arterial north–south along Normandie. To the south, the Arterial jogs over to Harvard Blvd, to coordinate with the current bikeway planned along that street. The major east–west Arterial runs along Wilshire, given the high level of bike and pedestrian access volume along this major street. A dense network of Collectors is provided within the station area as extensive mitigation is required to address the high incidence of pedestrian collisions and overall access volumes.
is the closest to the station itself and illustrates how an existing park-and-ride lot can be made more friendly to active transportation users, with the addition of pedestrian and active transportation cut-throughs that allow people to come in to the facility at multiple entrances, whereas currently access is limited to the vehicular entrance on the north and east sides only. The cut-throughs are designed with trees and lighting for safety and comfort, and special paving to demarcate the active transportation space. A new crossing at Klump Avenue facilitates pedestrian movement into the station from the neighborhood.

Along Burbank Boulevard illustrates an enhanced intersection with bulb-outs at corners and new signalized crossing. Currently the space between crossings along this stretch of Burbank Boulevard is over 1,700 feet while a comfortable distance between crossings is around 300 feet. Adding crossings in this area will help to expand the reach of transit for the neighborhoods immediately to the north. Pathway signage directs transit riders down Klump Avenue, which connects directly to the station.

The freeway underpass is fairly typical of current conditions around Los Angeles; narrow sidewalks and a wide street are dimly-lit and no pedestrian amenities are provided. The Pathway would improve this situation, providing a widened sidewalk and bollards along the curb edge for an enhanced perception of safety. Public art, new lighting, and special paving are also added, along with Pathway signage with time-to-station notation.

- depicts an area of NoHo Park that has a short-cut to the Metro station, which is currently un-signed. The Pathway enhancements chosen for this area include easily-visible signage directing people through the park toward the station, new lighting for nighttime safety, and repairs to the sidewalk.

**Visualization Locations:**

1. Park and Ride Lot
2. Burbank Blvd and Klump Ave
3. NoHo Park
4. Magnolia Ave
North Hollywood Station, Location 1
Park and Ride Lot

1. Continental crosswalks
2. Mid-block and additional crossings
3. Cut-throughs (multi-modal pathways through existing parking lot)

4. Landscaping / Shade
5. Lighting

6. Sidewalk widening (through parking lot)

Metro Station Location
Visualization Location
EXTENDED STATION ZONE (Area 1)
5-Minute Walk / 2-Minute Bike

TRANSIT-FRIENDLY ZONE (Area 2)
10-Minute Walk / 5-Minute Bike
North Hollywood Station, Location 2
Burbank Blvd. and Klump Ave.

Before

After

1 Continental crosswalks
2 Bulb-outs

3 Medallion signage

4 Landscaping / Shade
5 Dual curb ramps

6 Car share
7 Signal modification

Metro Station Location
Visualization Location

EXTENDED STATION ZONE (Area 1)
5-Minute Walk / 2-Minute Bike

TRANSIT-FRIENDLY ZONE (Area 2)
10-Minute Walk / 5-Minute Bike
North Hollywood Station, Location 3
Magnolia Ave. Underpass

1. Continental crosswalks
2. Signage
3. Medallion signage
4. Time to station notation
5. Curb-edge banding
6. Lighting
7. Enhanced freeway underpass

Metro Station Location
Visualization Location

EXTENDED STATION ZONE (Area 1)
5-Minute Walk / 2-Minute Bike

TRANSIT-FRIENDLY ZONE (Area 2)
10-Minute Walk / 5-Minute Bike
North Hollywood Station, Location 4
NoHo Park at Magnolia Avenue

1 Continental crosswalks
2 Cut-through and shortcuts
3 Signage
4 Medallion signage
5 Time-to-station notation
6 Street furniture
7 Landscaping
8 Lighting
9 Sidewalk widening
10 Car share
11 Park-and-Ride

Metro Station Location
Visualization Location
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5-Minute Walk / 2-Minute Bike
TRANSIT-FRIENDLY ZONE (Area 2)
10-Minute Walk / 5-Minute Bike
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<tr>
<th>LOS ANGELES METRO FIRST LAST MILE STRATEGIC PLAN</th>
<th>INITIATION TIMEFRAME</th>
<th>PARTICIPANTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Concept Refinement &amp; Technical Assistance</td>
<td></td>
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</tr>
<tr>
<td>1.1 Review and respond to comments collected during Nov 2013 - Feb 2014 public review period.</td>
<td>Apr-14</td>
<td>Metro / SCAG</td>
</tr>
<tr>
<td>1.2 Per Metro Board regarding Gold Line Foothill 2A and Expo 2: &quot;[identify] two stations for each line which would benefit from implementation of First/Last Mile improvements based on recommendations outlined in Metro's First/Last Mile Study.&quot;</td>
<td>Apr-14</td>
<td>Metro</td>
</tr>
<tr>
<td>1.3 Temporary Improvements - Prepare temporary Pathway improvements as part of Bike to Work week to assess efficacy.</td>
<td>0-2 Years</td>
<td>Metro / SCAG / Local Jurisdiction(s)</td>
</tr>
<tr>
<td>1.4 Pursue additional analysis and testing of non-standard components included in the strategy for example; Micro Park &amp; Ride, Green Zone, Rolling Lanes.</td>
<td>0-2 Years</td>
<td>Metro/SCAG</td>
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<tr>
<td>2. Coordination &amp; Outreach</td>
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<tr>
<td>2.1 Encourage local jurisdictions to incorporate planning concepts in first-last mile and TOD planning or capital programs funded by Metro and SCAG.</td>
<td>Annual</td>
<td>Metro</td>
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<tr>
<td>2.2 Proactively seek countywide and statewide legislative support for plan goals.</td>
<td>0-2 Years</td>
<td>SCAG/Metro</td>
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<tr>
<td>3. Plan Integration</td>
<td></td>
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<tr>
<td>3.1 Coordinate with General Plan and Mobility Element renewals.</td>
<td>Ongoing</td>
<td>Local Jurisdictions / Metro</td>
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<tr>
<td>3.2 Integrate Plan with Metro SRTP and LRTP.</td>
<td>0-5 Years</td>
<td>Metro</td>
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<tr>
<td>4. Funding</td>
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<tr>
<td>4.1 Identify potential funding for project sponsors (i.e. ATP, Cap &amp; Trade, TIGER, etc.) to implement Plan improvements and by working with jurisdictions.</td>
<td>Ongoing</td>
<td>Metro</td>
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<tr>
<td>5. Measurement and Monitoring</td>
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<tr>
<td>5.1 Develop pre-project baseline indicators for access mode splits, station ridership, demographics, and access sheds.</td>
<td>0-3 Years</td>
<td>SCAG/Metro</td>
</tr>
<tr>
<td>5.2 Review on-going Metro survey activities and on-board passenger survey questionnaires to improve data collection efforts relative to first last mile planning efforts.</td>
<td>Ongoing</td>
<td>Metro</td>
</tr>
<tr>
<td>5.3 Review available transit access monitoring technology.</td>
<td>0-1 Years</td>
<td>Metro</td>
</tr>
<tr>
<td>5.4 Prepare post-improvement ridership report, study relationships between first last mile improvements and ridership characteristics, health, safety and local economic indicators.</td>
<td>2-5 Years</td>
<td>Metro</td>
</tr>
</tbody>
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THE WORKS

We’re building a better future for LA County.

The setting of evaluation targets helps guide resource allocation with respect to meeting strategic goals, and provides a rationalized benchmark against which improvements can be evaluated. This Strategic Plan states a set of specific goals which include:

1. **Expand the reach of transit through infrastructure improvements.**

2. **Maximize multi-modal benefits & efficiencies.**

3. **Build on the RTP/SCS & Countywide Sustainable Planning Policy (multi-modal, green, equitable and smart).**

Realization of the first goal noted above can be evaluated based on changes to metrics related to ridership. This data is tracked by Metro on a monthly basis, is readily available, and easy to comprehend, making it an ideal data-set for measuring improvement performance.

The second strategic goal reinforces the use of ridership as a key metric. Trips in the county are inherently multi-modal in nature, focusing too carefully on singular modes (i.e. bike / pedestrian / bus mode splits) discounts the fact that most Metro riders are using multiple modes to complete their journeys.

The third goal helps focus strategies relative to broader policy efforts. Implementation strategies have third party affects, referred to as ‘externalities’. These externalities may be positive or negative in nature relative to regional and state policy goals, of which Metro is a custodian.

The Pathway aims to increase ridership by improving access conditions, and uses strategies that also support the development of transit supportive land uses (through the place making attributes of improvements), quality of service (through better multi-modal integration), human health and wellness (by focusing on active transportation improvements strategies) and equitable investment (by focusing on improvements that support the transit dependant population). As noted in chapter 3, the Pathway does so by expanding access user sheds, and by improving the transit user experience. Implementation of Pathway networks in Metro Rail and BRT station areas will directly and indirectly increase ridership both at individual stations and system-wide.

Setting targets for ridership can be based in part on predictive modeling, however, travel behavior affected by qualitative environmental changes are much more difficult to predict using quantitative tools. For example, though it logically follows that pedestrians may be more willing to walk along a sidewalk that feels ‘safe’ at night, there are no tools available to transportation planners that allow for the accurate prediction of just how many more potential transit riders in a given neighborhood will walk to stations past dark if pedestrian lights are installed along primary access routes. Pilot project programming should include a process for pre and post project evaluation of such improvements to provide planners better predictive modeling tools for qualitative improvements.
A detailed mapping and modeling exercise was undertaken for the three case study sites presented in this report. The process included the modeling of existing active transportation network routes in the station areas, including sidewalks and street crossings. The limits of existing access sheds based on how far people could walk in a given time frame were mapped. Proposed Pathway improvements including new sidewalks, cut-through routes, mid-block or new crossings and pedestrian prioritized signals were modeled providing a larger revised access shed. A multiplier was factored with the population falling within the added shed areas thus providing a rational prediction of ridership changes. Predictive ridership increases associated with these improvements ranged from 1.5 to 4% at the stations reviewed. **Target 3%**

Predictive modeling is not sufficient on its own to analyze critical factors that would each play an important role in increasing ridership. These additional considerations include:

- The estimation of transit use by discretionary riders within transit access sheds resultant from qualitative environmental access improvements. This could potentially equal or even surpass those ridership increases suggested by the quantitative modeling. **Target 3%**

- The capture of ridership increases resultant from the support of much more geographically significant non-pedestrian active transportation users (i.e. bicyclists, skateboarders, scooter riders, electric assisted devices). Currently the mode share of such users remains small, but the concerted effort to provide facilities that support the use of these devices could dramatically extend the access shed's geographic reach due to the relative high speeds of these mobility devices. **Target 1%**

- Increases in ridership due to the improvements made to multi-modal transfer operations and efficiencies. The provision of Pathway routes that would allow for plug-in mobility solutions (i.e. mobility hubs) and increased efficiencies of bus to rail transfers, would contribute to measurable ridership increases. **Target 1%**

- Finally, long term increases to ridership resultant from additional development that would naturally occur around Pathway networks. Pathway networks suggested in these planning guidelines are by their nature 'place-making', and would improve conditions for development wherever implemented. These marginal place-making improvements would build on regional efforts that aim to support development within station areas. **Target 4% (20 Year)**

A preliminary Metro Rail and BRT ridership increase target resultant from Pathway improvements for the short term (3-5 years) and the long term (20 year) time horizons can be developed by adding together the above noted targets:

3-5 year target - 8% increase in Rail and BRT ridership

20 year target - 12% increase in Rail and BRT ridership

For perspective, the Expo Line which cost approximately $800 million has increased system Rail and BRT ridership by approximately 2.5%. A high level review of potential costs of Pathway improvements at the case study sites indicated costs of implementation ranging from $5 to $12 million per station. From a dollar/rider perspective, implementation of this plan represents a cost effective means to increase the reach of transit as measured by ridership. Of further note, these increases would largely come from active transportation modes that by their nature support human health and wellness, clean air, place-making and equitable access.
CONTENTS:

STATION AREA CHECKLIST(S)

GRAPHIC NOVEL
In sunny downtown LA, we join Jeff in the middle of making plans to catch up with his long-time friend Bret...

Sounds good, I haven't been to LACMA in a while...the hmm...I'll check it out. See you soon!

A short and speedy metro ride later...

And with a quick look at the Metropylon to find the nearest bike share program...
THE TEAM TRIP!

After being named the new junior soccer league champions, the team decides to celebrate with a treat: ice cream!

Though their attempt to walk a safer route ended a bit later, the boys still can't stop talking about their.

Meanwhile, Coach declared car share reservations. Metro was looming.

Did you see that goal?! The goalie didn't stand a chance!

Hope they have rocky road!

...or thinking about which flavor they want...

They pick up their car... and get their sweet treats!
A HARD-HITTING STORY has just been received at LA Weekly, and Julia won't be able to pick up her kids on time.

But she knows WHO TO CALL...

I'm on my way!

Mom! Can you pick up the kids?

Can you pick up the kids?
It's breakfast at the Lim's, and Kate received an urgent call from the office...

I need to be in the office in 20 minutes. Can you drop me off at the Metro station?

Kate has extra time to prepare for her meeting.

Kate, you made it!
First/Last Mile Cost Estimates

Introduction

The goal of this section is to provide an overview of high-level planning cost estimates for proposed first/last mile improvements at three case study sites within Metro Rail and Bus Rapid Transit (BRT) station areas. The three stations selected for analysis include Wilshire/Normandie (Metro Purple Line), 103rd / Watts (Metro Blue Line) and North Hollywood (Metro Red and Orange Lines). Network and design improvements follow guidelines set forth in the First/Last Mile Strategic Plan.

Development of the Metro Pathway concept is an ongoing process. Pathway components proposed as part of the Plan have been largely accounted for in this cost estimate, however added components and refinements that will take place as part of concept development are not accounted for in this time. This estimate frames a baseline that can be refined in concert with concept development. Furthermore, when reviewed against projected ridership changes resulting from Metro Pathway improvements, future evaluation should be undertaken to review the effectiveness of the strategy from ridership/cost as well as congestion mitigation perspective.

This section presents key findings from the analysis, the methodology used to develop cost estimates, a high-level cost estimate for each of the three stations (including a network map and cost summary tables), and source cost data used to generate quantity estimates. Contingencies have been applied to account for potential unknown cost factors given the current limited level of design.

Key Findings

- Cost estimates assume that work is being done specifically to implement Pathway improvements. If improvements are made during normal street re-construction as part of routine roadway maintenance, cost savings could be achieved.
- Any improvement that involves curb and gutter re-configuration and re-construction is relatively expensive. Examples include bulb-outs at intersections and protected rolling lanes that utilize permanent curbs. These improvements can be achieved as short term low-cost improvements utilizing temporary barriers and street paint. These low-cost solutions have been accounted for in our low-cost estimate for each scenario.
- The low-cost variations suggest as much as 40% savings over more permanent options, but naturally lack the same degree of permanence.
- Three sample sites are insufficient to generate a system-wide cost estimate with any form of accuracy. Important variables include level of intervention at different place-types, overlap (some facilities accounted for in one station area overlap with adjacent station areas), and economies of scale. The second two points noted suggest measurable reduction in costs if implementing along entire corridors or system-wide.
- The range of employment and residential centrality in the three case study sites reviewed suggests that higher densities equate to a denser network of improvements within similar extension and length of Pathway Arterials.

Methodology

High level cost estimates for the Metro Pathway at the three stations were developed by multiplying bundled groups of improvements by either linear or quantity measures. Measurements and quantities were taken and aggregated working off of Pathway network maps, and developed utilizing the methodology outlined in the Metro Pathway Planning Guidelines.

Groups of improvements were structured around intersections and street segments and included:
FIRST LAST MILE STRATEGIC PLAN

- **Type 1 Intersection** - Intersection improvements where Pathway Arterials cross other Pathway Arterials at or adjacent to subject station portals. Scramble intersections utilized.
- **Type 2 Intersection** – Intersections where Pathway Arterials cross Pathway Collectors.
- **Type 3 Intersection** – Intersections along Pathway Collectors (crossing other Collectors or non-Pathway network streets).
- **Mid-Block Crossings** – Can occur along any long block Pathway Arterial or Collector.
- **Type 1 Arterial** (250’ segment) – Occurs within 1/2 mile of the station portal.
- **Type 2 Arterial** (250’ segment) – Extends beyond 1/2 mile of the station portal some distance not to exceed 3 miles.
- **Collector** (250’ segment) – Occurs within the one half mile of stations along identified routes.

The high level cost of each of the elements noted above was prepared by aggregating the various component costs that together formed the subject unit. Using the Metro Pathway Planning Guidelines as a reference, assumptions were made about what components would most likely be included in each element. The Metro Pathway has been planned as a flexible structure that can be applied in varying forms to respond to local conditions, funding availability and local inputs, therefore what is proposed here may in truth be affected by inputs not known at this time.

For each site, a high-cost and a low-cost estimate is provided (‘Complete Pathway’ and ‘Pathway Lite’ respectively). Differences between the two are attributed to the permanence of improvements (i.e. fixed bollards vs. paint buffers along Path Arterials) or the level of security and comfort of components (i.e. provision of in street LED flashers or street furniture). Items are tabulated for each site.

For each site, a network map is presented that visually highlights the different cost units noted above along with summary cost tables. Cost Assumptions follow these as back-up reference.
Wilshire / Normandie Cost Estimate

Complete Pathway Station Cost Table

<table>
<thead>
<tr>
<th>Wilshire Normandie Station</th>
<th>Linear Feet</th>
<th>Qnt.</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type I Arterial</td>
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<td>$2,904,071</td>
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<tr>
<td>Type II Arterial</td>
<td>24,035</td>
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<td>$2,631,833</td>
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<tr>
<td>Collector</td>
<td>28,089</td>
<td></td>
<td>$1,315,380</td>
</tr>
<tr>
<td>Mid Block Crossing</td>
<td>5</td>
<td>$962,140</td>
<td></td>
</tr>
<tr>
<td>Intersection Type I</td>
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<td>$218,342</td>
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Pathway Lite Station Cost Table

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<th>Cost</th>
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### Complete Pathway Station Cost Table

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<th>103rd/Watts Station</th>
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<td>13,006</td>
<td>$</td>
<td>609,058</td>
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<td>Intersection Type III</td>
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### Pathway Lite Station Cost Table

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<th>Cost</th>
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<td>Intersection Type III</td>
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<td><strong>Pathway Lite Station Total</strong></td>
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<td><strong>4,955,071</strong></td>
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### North Hollywood Cost Estimate

#### Complete Pathway Station Cost Table

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<th>Cost</th>
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<tr>
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<td><strong>$12,904,620</strong></td>
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#### Pathway Lite Station Cost Table

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<thead>
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<th>North Hollywood Station</th>
<th>Linear Feet</th>
<th>Qnt.</th>
<th>Cost</th>
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<tbody>
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<td>$2,011,289</td>
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<td>5</td>
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<td>2</td>
<td>$48,256</td>
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<td>Intersection Type II</td>
<td></td>
<td>14</td>
<td>$19,302</td>
</tr>
<tr>
<td>Intersection Type III</td>
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<tr>
<td><strong>Pathway Lite Station Total</strong></td>
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<td><strong>$5,869,828</strong></td>
</tr>
</tbody>
</table>
Cost Assumptions

These cost estimates provided are based on previous public cost estimates for similar roadway and streetscape enhancements. This estimate is high level and includes the following assumptions in total costs of all components:

- **Contingency** - All cost estimates include a contingency for unforeseen incurred costs. This contingency is assumed to be 15% for planning purposes.

- **Engineering and Design** - 30% cost is included in each item for Engineering and Design of the elements; this covers additional design development and final design and engineering services.

- **Public Art** - A 1% cost is assumed for inclusion of art treatments that will increase aesthetics and enhance local community identity along the Path network.

As noted above in the Methodology section, improvements were bundled in the following units, source material is shown in the appendix;
**FIRST LAST MILE STRATEGIC PLAN**

*Type 1 Intersection*

| Legend | Complete Pathway Type I Intersection - Arterial&Arterial (Scramble) | Total Cost | Pathway Lite Type I Intersection - Arterial&Arterial (Scramble) | Total Cost | Source*
|--------|-------------------------------------------------|------------|-------------------------------------------------|------------|--------
| A      | Bulbouts (Curb reconstruction, dual curb ramps) | $146,000   | Paint and Landscape Bulbouts                    | $9,860     | 21     |
| B      | Crosswalks                                     | $3,728     | Crosswalks                                      | $3,728     | 12     |
| C      | LED Flashers                                   | $24,480    | LED Flashers (Not Included in Path Lite)         | $-         | 13     |
| D      | Ped Detection padding                          | $5,440     | Ped Detection Padding (Not Included in Path Lite)| $-         | 17     |
| E      | Resignalize Signal for Pedestrians             | $40,800    | Resignalize Signal for Pedestrians (Not Included in Path Lite) | $-     | 18     |
| F      | Ped buttons and Audio Chirp                    | $14,144    | Ped buttons and Audio Chirp                     | $14,144    | 19     |
| G      | Medallion Signage                              | $2,176     | Medallion Signage                               | $2,176     | 15     |
| H      | Information Kiosk (1 per Metro Stop)           | $4,080     | Information Kiosk (1 per Metro Stop)            | $4,080     | 20     |

| **Total**          | **$240,848** | **Total** | **$33,988** |

*For Source information, Refer to Planning Context Review*
**Type 2 & 3 Intersection**

<table>
<thead>
<tr>
<th>Legend</th>
<th>Complete Pathway Type II Intersection - Arterial&amp;Collector</th>
<th>Total Cost</th>
<th>Pathway Lite Type II Intersection - Arterial&amp;Collector</th>
<th>Total Cost</th>
<th>Source*</th>
</tr>
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<tr>
<td>A</td>
<td>Bulbouts (curb reconstruction, dual curb ramps)</td>
<td>$ 146,000</td>
<td>Bulbouts <em>(Not Included in Path Lite)</em></td>
<td>$ -</td>
<td>16</td>
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<tr>
<td>B</td>
<td>Crosswalks</td>
<td>$ 2,982</td>
<td>Crosswalks</td>
<td>$ 2,982</td>
<td>12</td>
</tr>
<tr>
<td>C</td>
<td>LED Flashers</td>
<td>$ 12,240</td>
<td>LED Flashers <em>(Not Included in Path Lite)</em></td>
<td>$ -</td>
<td>13</td>
</tr>
<tr>
<td>D</td>
<td>Resignalize Signal for Pedestrians</td>
<td>$ 40,800</td>
<td>Resignalize Signal for Pedestrians <em>(Not Included in Path Lite)</em></td>
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<td>18</td>
</tr>
<tr>
<td>E</td>
<td>Ped buttons and Audio Chirp</td>
<td>$ 14,144</td>
<td>Ped buttons and Audio Chirp</td>
<td>$ 14,144</td>
<td>19</td>
</tr>
<tr>
<td>F</td>
<td>Medallion Signage</td>
<td>$ 2,176</td>
<td>Medallion Signage</td>
<td>$ 2,176</td>
<td>15</td>
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<td></td>
<td><strong>Total</strong></td>
<td><strong>$ 218,342</strong></td>
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<td><strong>$ 19,302</strong></td>
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</table>

<table>
<thead>
<tr>
<th>Legend</th>
<th>Complete Pathway Intersection Type III - Collector</th>
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<th>Source*</th>
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<tbody>
<tr>
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<td>Crosswalks</td>
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<tr>
<td>F</td>
<td>Medallion Signage</td>
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<td>15</td>
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<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>$ 5,378</strong></td>
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</tbody>
</table>

*For Source information, Refer to Planning Context Review
**FIRST LAST MILE STRATEGIC PLAN**

*Mid-Block Crossing*

<table>
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<tr>
<th>Legend</th>
<th>Complete Pathway Midblock Crossing</th>
<th>Total Cost</th>
<th>Pathway Lite Midblock Crossing</th>
<th>Total Cost</th>
<th>Source*</th>
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<td>HAWK Signal</td>
<td>$146,000</td>
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<td>B</td>
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<td>Crosswalk Paint (50')</td>
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<tr>
<td>C</td>
<td>LED Flashers</td>
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<td>LED Flashers (Not Included in Path Lite)</td>
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<tr>
<td>D</td>
<td>Safety Signage</td>
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<td>Safety Signage</td>
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*For Source information, Refer to Planning Context Review*
FIRST LAST MILE STRATEGIC PLAN

Type 1 & 2 Arterial

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<tr>
<th>Legend</th>
<th>Complete Pathway Arterial Type I (250')</th>
<th>Total Cost</th>
<th>Pathway Lite Arterial Type I (250')</th>
<th>Total Cost</th>
<th>Source*</th>
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<td>$876</td>
<td>Bike Racks (every 500')</td>
<td>$876</td>
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<tr>
<td>C</td>
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<td>D</td>
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<td>G</td>
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<table>
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<th>Legend</th>
<th>Complete Pathway Arterial Type II (250')</th>
<th>Total Cost</th>
<th>Pathway Lite Arterial Type II (250')</th>
<th>Total Cost</th>
<th>Source*</th>
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<tbody>
<tr>
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<td>B</td>
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<td>C</td>
<td>Benches (every 1000')</td>
<td>$1,095</td>
<td>Benches (Not Included in Path Lite)</td>
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<td>10</td>
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<tr>
<td>D</td>
<td>Signage (every 1000')</td>
<td>$146</td>
<td>Signage (every 1000')</td>
<td>$146</td>
<td>6</td>
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*For Source information, Refer to Planning Context Review
Collector

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<th>Complete Pathway Collector (250')</th>
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<th>Source*</th>
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<tr>
<td>C</td>
<td>Benches (every 2500')</td>
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<tr>
<td>D</td>
<td>Signage (every 500')</td>
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</tr>
<tr>
<td>E</td>
<td>Lighting (every 150')</td>
<td>$ 8,857</td>
<td>7</td>
</tr>
<tr>
<td>F</td>
<td>Garbage Cans (every 2500')</td>
<td>$ 219</td>
<td>8</td>
</tr>
<tr>
<td>G</td>
<td>Landscaping (every 2500')</td>
<td>$ 266</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>$ 11,707</strong></td>
<td></td>
</tr>
</tbody>
</table>

*For Source information, Refer to Planning Context Review*
Description & Trends

Walking is not only one of the best forms of exercise, but the most common mode of transportation. Urban planners have focused recent efforts on creating a built environment that allows people to walk; communities with pedestrian-friendly areas, and in some cases partially car-free, allow commuting, shopping, and recreation to be done by walking. Walking, alone, may not meet the needs of all trips, but it is easily combined with other active modes and public transit because it requires no additional facilities or amenities to transition into/out of.

As wheeled active and electric devices grow in popularity, maintaining a safe and comfortable environment for all types of walkers (leisurely shoppers, exercisers, commuters, etc.) will be increasingly important, as many of these other devices utilize sidewalks.

Multi-Modal Access

Walking is an integral part of most trips, and as the base mode of human movement will remain so. The infrastructure that supports this mode includes a range of associated facilities including: sidewalks, street crossings, lighting, signage, technology, landscaping and canopies to name a few. People are more likely to utilize transit if the urban environment is conducive to walking.

Opportunities and Constraints

GREEN MODE-HUMAN POWERED-PEDESTRIAN-WALKING

Average Speed

<table>
<thead>
<tr>
<th>Range</th>
<th>Dynamic Envelope</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 - 4 MPH</td>
<td>(Minimum width)</td>
</tr>
</tbody>
</table>

Average Ten Minute Access Shed

Energy Requirements

Human powered:

Observed Street Use

Multi-Use Traffic Bike Parking Sidewalk

Presented observed use, policies governing use vary by municipality.

Demographics

---

Based on the National Center for Health Statistics average weight for adult males, in the United States, of 175 lbs. http://walking.about.com/library/cal/uccalc1.htm

http://walking.about.com/library/cal/uccalc1.htm
Description & Trends

Typically, jogging/running is a competitive or fitness related activity, that can take place on popular pedestrian and bicycle routes, and therefore should be considered in the design of first/last mile connections. Theoretically, jogging/running for transportation is within the reach of more people than driving a car. It is cheaper than public transit, or purchasing a bicycle, but it is difficult to translate into a reality in some circumstances.

Multi-Modal Access

Like walking, transitioning between jogging/running and other modes of public transit is easy, due to the lack of equipment and facilities required; however, to make it feasible as a transportation option, commuters often have to identify alternative solutions, such as amenities (shower, lockers, etc.) at or near their destination.

Supporting third party programmatic elements such as fitness centers can help commuters fold their exercise routines into their commute and should be explored where possible. Some locations (such as remote low density commuter nodes) could even support integrated shower and changing facilities into the stations themselves.

Average Speed:

- Range = 5 - 12 mph

Dynamic Envelope

(Minimum width)

Average Ten Minute Access Shed

Energy Requirements:

Human powered:

Observed Street Use

Presents observed use, policies governing use vary by municipality.

Demographics

Secondary: Adults/Seniors > 45 yrs.

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* National Council on Strength & Fitness

** Based on the National Center for Health Statistics average weight for adults males, in the United States, of 175 lbs. http://www.healthstatus.com/calculate/cbc
Description & Trends

Carts, strollers, and wheelchairs are common on today's sidewalks in urban and suburban environments. These devices are typically associated with critical daily functions, such as transporting groceries, babies, or the disabled. As these devices are wheeled, they require smooth and even rolling surfaces to be effectively used. As sidewalks become more crowded with new mobility devices, these devices which typically require larger spaces to operate become difficult to maneuver efficiently.

Multi-Modal Access

Wheelchairs, when being assisted by an individual, have been accounted for in the design of light rail and bus transit; however, the minimum clearance requirements at boarding and alighting points are not always met. Furthermore, the varying sizes of strollers and hand carts (for groceries, laundry, freight, etc.) are a challenge to accommodate on buses and trains comfortably, alongside other commuters. Station access routes should be designed to accommodate the use of such devices and elevators, lifts, and low incline ramps must be provided to assure easy access to platforms.

Average Speed

Range = 2 - 4 MPH

Average Ten Minute Access Shed

Presents observed use, policies governing use vary by municipality.

Dynamic Envelope

(Minimum width)

Energy Requirements

Human powered:

Observed Street Use

Demographics

Opportunities and Constraints

GREEN MODE—HUMAN POWERED—ACTIVE TRANSPORTATION—ADULT BICYCLES

Description & Trends

There is a vast range of bicycles including: mountain, BMX, utility, folding, road/race, recumbent, and hybrids that are utilized for commuter trips.

Bicyclists can achieve significant commute lengths in reasonable time frames, and if opportunities for showers, changing, and storage facilities are leveraged, that length can be increased even more. Bicycles are becoming an increasingly popular form of urban transportation. A survey of 55 major metropolitan areas in the U.S. found that bicycle commuting rates increased, on average, 70 percent between 2000 and 2009.

Multi-Modal Access

Bicycle transportation has received significant attention in recent years due to its potential to increase mobility, alleviate traffic congestion, reduce negative environmental impacts, and combat public health issues, but bicycle commuting still represents a small percentage of overall commuters. Better bicycle facilities are needed most notably on routes leading to transit nodes. Bike storage solutions are important as are strategies that allow bicyclists to bring their bikes with them on buses and trains. Ramps and lifts that can accommodate bikes are critical when making vertical transitions within stations.

Average Speed:

Range = 9 - 20 mph

Dynamic Envelope

(Minimum width varies from bicycle - tricycles)

Average Ten Minute Access Shed

Energy Requirements:

Human powered:

Observed Street Use

Presents observed use, policies governing use vary by municipality.

Demographics

Secondary: Seniors > 65 yrs.

* The average bicycle speed used in commuter bike lanes, according to "Transportation Infrastructure and Engineering", by Lester A. Hoel.
* Based on the National Center for Health Statistics average weight for adults, in the United States, of 175 lbs. http://www.healthstatus.com/calculate
Opportunities and Constraints

GREEN MODE-HUMAN POWERED-ACTIVE TRANSPORTATION-CHILD BICYCLES

Description & Trends

Children's bicycles and tricycles are made of both steel and plastic frames. While typically used in suburban communities, children on bicycles and tricycles have become more common on sidewalks in urban environments, often commuting alongside parents and adults. The age of users being young, requires additional safety precautions, especially given the number of devices also used on sidewalks, and the range of speeds they will be mixed with.

Multi-Modal Access

The most important consideration to make when considering mobility infrastructure for children riding bikes, is they should not be expected to utilize bike facilities that are integrated with the vehicular roadway. Children’s bicycles have the same functional requirements when considering access to transit as their adult counterparts, though they are typically too small (or the riders are too small) to be effectively mounted on bus racks. Accommodations should be made to allow the easy transition onto busses and trains especially when considering public transit offers a safe route to schools, and bikes help extend the associated access shed of students.

Average Speed

<table>
<thead>
<tr>
<th>Range</th>
<th>(Minimum width)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 - 10  mph</td>
<td></td>
</tr>
</tbody>
</table>

Average Ten Minute Access Shed

Energy Requirements

Human powered:

Multi-Use Traffic Traffic Bike Parking Sidewalk

Demographics

The average bicycle speed, according to "Transportation Infrastructure and Engineering", by Lester A. Hoel.

Based on the maximum pediatric recommendations for weight of 10 year old, in the United States, of 100 lbs. This number reflects the high end of the demographics that typically use this device. http://www.healthstatus.com/calculate
**GREEN MODE—HUMAN POWERED—ACTIVE TRANSPORTATION—FREIGHT BICYCLES**

### Description & Trends

The modern evolution of the cargo-bike as personal transport began in Europe in the 1980s, with Holland and Denmark as epicenters; kid-and-grocery-carrying bakfiets ("box bike") caught on with families. Urbanites and suburban dwellers are swept up in the cargo-bike cult, integrating bicycles into their daily lives. In Brooklyn, cargo-bikes have become the most fashionable means of delivering kids to school.

Freight bicycles come in many varieties including tricycle and tandem style, and store cargo on open platforms, built-in cargo cases, open buckets, and often times homemade contraptions for securing freight.

### Multi-Modal Access

While freight bicycles are not typically used as a part of a longer commute, they are a growing trend used for both residents (running errands, transporting children) and businesses (delivering food, mail, and other goods) that will require special consideration to fit into the larger mobility puzzle. Their larger spatial requirements may need special bicycles lockers and parking to keep from over capacitating existing bicycle infrastructure.

### Average Speed:

- Range = 9 - 20 mph

### Dynamic Envelope

- (Minimum width)

### Average Ten Minute Access Shed

### Energy Requirements

Human powered:

### Observed Street Use

Present observed use, policies governing use vary by municipality.

<table>
<thead>
<tr>
<th>Multi-Use Traffic</th>
<th>Traffic</th>
<th>Bike Parking</th>
<th>Sidewalk</th>
</tr>
</thead>
</table>

### Demographics

Secondary: Teens/Young Adults 12-25 yrs.

---

1. Based on the National Center for Health Statistics average weight for adults, in the United States, of 175 lbs., weight was multiplied by a factor of 1.5 to account for freight. [http://www.healthstatus.com/calculate](http://www.healthstatus.com/calculate)
Opportunities and Constraints

Description & Trends
Heely's were patented in late 2000, and are the most common brand of roller shoes sold in the U.S. (followed by Street Gliders, a similar product that attaches to regular shoes). After becoming popular in Korea, Singapore, and Europe, Heely's, Inc. shipped over 10 million pairs to the U.S. between 2000 and 2007, with sales tripling from 2005-2006. In 2007 sales fell drastically, and roller shoes remain a blip in the market of alternative mobility devices.

An important aspect to consider when considering this mobility device, is the fact that the millions of pairs that have been sold in the U.S. have almost exclusively been sold to today's youth. This suggests a demographic that is being exposed to an alternative mobility device at a young age, and reflects a desire and willingness to use such new devices. As this demographic group ages, it is expected they will continue to do so.

Multi-Modal Access
If Heely style devices became a larger part of the market, they could contribute to pedestrians' commuters' ease and time efficiency, and expand the distance that can be covered comfortably. And as a device that is integrated with shoes, they essentially have no spatial impact on existing infrastructure.

Average Speed·

Dynamic Envelope

Range = 3 - 6 mph

(Minimum width varies from bicycle - tricycles)

Average Ten Minute Access Shed

Energy Requirements

Human powered:

Observed Street Use

Presents observed use, policies governing use vary by municipality.

Multi-Use Traffic Bike Parking Sidewalk

Demographics

Secondary: Young Adults 16-20 yrs.

Recommended safe speeds from manufacturers: Heely

Based on the maximum pediatric recommendations for weight of 14-15 year old, in the United States, of 125 lbs. This number reflects the high end of the demographics that typically use this device. http://www.healthstatus.com/calculate
**Opportunities and Constraints**

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**GREEN MODE—HUMAN POWERED—ACTIVE TRANSPORTATION—ROLLER SKATES**

### Description & Trends

First patented in 1760, and later reinvented in 1863, Roller skates hit its popularity peak during the disco era, later tapering off in the 1980s and 90s. From speed skating, to roller derby, to Roller skating even making an appearance in the Olympics in 2012, Roller skates are enjoyed today both as a pastime and in competitive sports.

Roller skates are not typically used for commuting, partially due to the speed limitations they face when not on perfectly smooth surfaces, such as new pavement. The width required to build up proper momentum, through the skating motion, is larger than roller blades, because of the larger 4-wheeled base, causing more conflicts on sidewalks where pedestrians and others modes are operating as well.

### Multi-Modal Access

The restrictions of roller skates have been addressed through inline skates and roller blades, making them a less likely choice for urban commuters. If utilized as a part of a longer commute, their size makes them easily transported on and off of buses and light rail.

---

### Average Speed

<table>
<thead>
<tr>
<th>Range</th>
<th>Average Ten Minute Access Shed</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-6 mph</td>
<td>(Minimum width/skate-like motion)</td>
</tr>
</tbody>
</table>

### Dynamic Envelope

Energy Requirements - Human powered:

---

### Observed Street Use

Presents observed use, policies governing use vary by municipality:

<table>
<thead>
<tr>
<th>Multi-Use</th>
<th>Traffic</th>
<th>Bike</th>
<th>Parking</th>
<th>Sidewalk</th>
</tr>
</thead>
</table>

### Demographics

Secondary: Adults 18-35 yrs.

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* http://www.livestrong.com/

**Based on the National Center for Health Statistics average weight for adults, in the United States, of 175 lbs. http://www.livestrong.com/
Opportunities and Constraints

GREEN MODE-HUMAN POWERED-ACTIVE TRANSPORTATION-ROLLER BLADES

Description & Trends
From the beginning of Roller blade, Inc. in 1984, the inline skating industry has grown to encompass over 30 million participants (as of 1996) and several hundred companies that manufacture a wide variety of skates, safety gear, and other inline merchandise.

According to the International Inline Skating Association (IISA), inline skating participation has increased 630% since 1989, and was the fastest growing sport in the United States in 1996. Although the rate of increase declined slightly in 1997, the sport itself continues to spread and diversify. Manufacturers offer an increasing range of specialized skates, including inline hockey skates, speed skates, aggressive skates, and skates designed specifically for women and fitness skaters.

Multi-Modal Access
Aside from weather conditions, roller blades, while not currently an extremely common choice, do not face many challenges as a commuter mode. They are able to negotiate most surface conditions, except for major potholes, and have a quick breaking/reaction time for maneuvering crowded sidewalks. Expert skaters can utilize them in bike lanes and on multi-use paths at speeds similar to commuter bicyclists. Their size makes them easy to transport on and off of light rail and buses as part of a larger commute length.

### Average Speed

| Range               | 10-20 mph |

### Dynamic Envelope

(Minimum width/skate-like motion)

### Average Ten Minute Access Shed

<table>
<thead>
<tr>
<th>Energy Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human powered:</td>
</tr>
</tbody>
</table>

### Observed Street Use

| Multi-Use Traffic | Traffic | Bike | Parking | Sidewalk |

### Demographics

Secondary: Teens/Young Adults 12-15 yrs.

---

*Based on the National Center for Health Statistics average weight for adults, in the United States, of 175 lbs. [http://www.livestrong.com/](http://www.livestrong.com/)*
Description & Trends
The foldable aluminum scooter that uses inline skate wheels was created in 1996 by Wim Ouboter, in Switzerland. The first Razor scooter was distributed by The Sharper Image in 1999 (Japan) and became extremely popular in 2000 in the U.S. It was designed as a portable transporter, but is primarily used as a toy for children.

The U.S. marketers of Razor scooter, in California, sell more than 3 million scooters each year. The wheels of kick-scooters are small and they have very low clearances, making sidewalks with potholes, and high curbs difficult to maneuver. Some brands provide limited breaking capabilities; however, many require foot breaking, or dismounting to fully stop.

Multi-Modal Access
Much like children's' bicycles, kick scooters are often used in suburban neighborhoods, where vehicle traffic is slower and there are fewer pedestrians, and they are often observed on routes to school, or alongside parent/adult commuters. Kick scooters low cost and ability to fold up quickly make them a seamless device when transferring between transit modes.

The greatly increased speed of kick-scooters can cause safety concerns on sidewalks, and the young age of most riders precludes the notion of relegating their use to roadway located bike facilities.

Average Speed:
Range = 10 mph

Dynamic Envelope
(Minimum width)

Average Ten Minute Access Shed

Energy Requirements
Human powered:

Observed Street Use

Demographics
Secondary: Teens/Young Adults 13-22 yrs.

http://www.nycewheels.com/
Based on the maximum pediatric recommendations for weight of 10 year old, in the United States, of 100 lbs. This number reflects the high end of the demographics that typically use this device. http://www.healthstatus.com/calculate
Opportunities and Constraints

Description & Trends
Push scooters for adults have become popular in the last several years, as active transportation is on the rise in urban environments. They are marketed as "opportunistic" devices that can be used on both roads and footpaths depending on traffic conditions. In 2010 sales in New York City made up 45% of all sales for Xootr, one of the largest manufacturers of adult scooters, up from 35% in 2009. As the trend of adults riding scooters continues to grow with more adults commuting to work, parents scooting with their kids, and college students riding to class, Razor scooter, the popular children's brand, has introduced scooters for adult riders with larger wheels, deck and weight limits. As a market that grew out of a children's device, they are most commonly used on sidewalks; however, the adult versions can reach much faster speeds and interfere with pedestrian traffic and slower modes that require sidewalks.

Multi-Modal Access
While the folding children's and smaller adult scooters can be carried on and off transit, the larger models require little additional infrastructure such as bicycle locking racks or lockers for storage.

Average Speed
Range = 5-20 mph

Dynamic Envelope
(Minimum width)

Average Ten Minute Access Shed

Energy Requirements
Human powered:

Observed Street Use
Presents observed use, policies governing use vary by municipality.

Demographics
Secondary: Adults 35-50 yrs.

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http://www.nycewheels.com/

Based on the National Center for Health Statistics average weight for adults, in the United States, of 175 lbs. http://www.livestrong.com/
Opportunities and Constraints

GREEN MODE-HUMAN POWERED-ACTIVE TRANSPORTATION-SKATEBOARD

Description & Trends
Skateboarding started in the 1950's when Californian surfers got the idea of trying to surf the streets. It reached the peak of popularity in 1963, but crashed in 1965 and disappeared like many fads. When the urethane skateboard wheels used today were invented in 1972, new interest in skateboarding amongst surfers and other youth took an evolutionary step toward the sport we see today. It took several ups and downs in popularity through the 80's, but remained an underground sport until its inception into the mainstream in the early 90's.

Since 2000, skateboarding has become commercialized and sold as a commuter alternative, with many variations and styles on the market. For commuters, long-boarding is the style most common, because of the greater stability, traction, and durability. Long-boards include features that allow easier lifting to maneuver over bumps, cracks, and obstacles.

Multi-Modal Access
Skateboards and long-boards can achieve relatively high speeds, while being small enough to easily carry on and off transit, and store without additional infrastructure such as locking racks. This mode also requires less effort to operate, making shower and changing facilities less necessary for commuters.

Average Speed:
Range = 6-18 mph

Dynamic Envelope

Average Ten Minute Access Shed

Energy Requirements:
Human powered:

Observed Street Use
Presents observed use, policies governing use vary by municipality.

Demographics
Secondary: Young Adults 18-30 yrs.

* http://www.livestrong.com/
** Based on the National Center for Health Statistics average weight for adults, in the United States, of 175 lbs. http://www.livestrong.com/
Description & Trends

The Elliptigo is a derivative of both a stationary elliptical trainer and a bicycle. While reducing the amount of impact your body sustains, everyday fitness enthusiasts have turned to the elliptigo in place of bicycles and running for exercise, recreation, and small trips. The elliptigo offers a commute option for those uncomfortable with bicycling; the standing position provides added safety with less resistance to stop and go, being at eye level with pedestrians, and less balance required to operate.

The Trikke is a new mobility device, very similar to the Elliptigo with a few varying features. Trikkes do not use two inline wheels, rather 3-wheels, hinged like a tricycle. The Trikke can fold small enough to fit in a car or under a desk, making it a practical option for commuting or as part of a larger commute trip (to be carried). Unlike the elliptigo, trikkes require more balance and skill to learn to operate, and cannot function on unsmooth surfaces. They attain similar speeds, with low impact.

Multi-Modal Access

Both of these emerging innovations are bulky and would be difficult to integrate directly on rolling stock (bus or train) but could be accommodated at stations through provision of lockable storage. These devices reflect an on-going interest in new modes of active transportation that combine exercise with commuting.

Average Speed:

- Range = 10 - 17 mph
- Average Ten Minute Access Shed

Dynamic Envelope

- (Minimum width)
- Energy Requirements: Human powered:

Demographics

Secondary: Teens/Young Adults 12-25 yrs.

Average Speed - Range: 10 - 17 mph
Average Ten Minute Access Shed

Optional Street Use

Presents observed use, policies governing use vary by municipality.

Multi-Use
Traffic
Trail
Bike
Parking
Sidewalk

www.commutetobike.com

Based on the National Center for Health Statistics average weight for adults, in the United States, of 175 lbs. http://www.trikketampastore.com
Description & Trends

A cane (or walking stick) is a device most commonly used to help a person with a disability balance while walking, similar to a crutch. They are typically used as a mobility or stability aide, in the opposite hand of the injury or weakness.

Canes help redistribute weight from the lower leg that is weak or painful, improve stability by increasing the base of support, and provide tactile information about the ground to improve balance. Ten percent of adults older than 65 use canes, a much larger group than those using walkers.

Multi-Modal Access

Along with the demographic of users requiring additional safety precautions, especially amongst faster mobility devices being operated on sidewalks, facilities such as drop off sites, and ADA compliant designs at transit stations should be updated to accommodate the growing population of those using canes.

Mobility infrastructure must consider the slower speeds of pedestrians using canes, especially at street crossings. Tiered signalization programs that allow for longer crossing times should be considered along transit access routes.

Average Speed

Range = 1-3 mph

Dynamic Envelope

(Minimum width)

Average Ten Minute Access Shed

Energy Requirements

Human powered:

Observed Street Use

Presents observed use, policies governing use vary by municipality.

Demographics

Secondary: All ages with injuries or disabilities.
Opportunities and Constraints

GREEN MODE-HUMAN POWERED-UNIVERSAL ACCESS DEVICE-CRUTCHES

Description & Trends

Crutches are used as a mobility aid when a person has an injury or impairment to a leg(s) and cannot fully support one's weight. They come in several types; such as forearm, underarm, strutters, platform, and leg support, and have more load bearing capacity than canes or lift walkers.

Crutches offer a larger variation of gait patterns for movement; however, they require more work to utilize and are typically used for younger people with mobility needs. Facilities such as drop off sites should be provided for those temporarily bound to crutches during their commute.

Multi-Modal Access

ADA compliant transit facilities and appropriate seating on light rail and bus transit should be provided to ensure efficient commuting. Those using crutches typically make up a younger population than canes and wheelchairs, but there are still challenges for long commutes as the energy requirements are quite high.

Tiered signalization programs that allow for longer crossing times should be considered along transit access routes.

Average Speed:

Range = 1-2 mph

Dynamic Envelope

(Minimum width)

Average Ten Minute Access Shed

Energy Requirements

Human powered:

Observed Street Use

Presents observed use, policies governing use vary by municipality.

Demographics

-- Based on the National Center for Health Statistics average weight for adults, in the United States, of 175 lbs. www.livestrong.com

www.livestrong.com
**Description & Trends**

The wheelchair originated from England in the 1670s to assist in transporting people with walking disabilities. The standard wheelchair has a seat, a back, two small front wheels, two large wheels, and a footrest. Recently, various accessories have become available for wheelchairs, such as seat belts, adjustable back rests, pouches, and cup holders to offer more freedom to the users.

Many still prefer to use manual wheelchairs, even with the advent of electric powered devices. Many wheelchair users are only temporarily in need of assistance and can get around easily in a manual wheelchair for a short period of time; however, the main factor in determining to use manual chairs for most people is cost.

**Multi-Modal Access**

Most public transportation stations, trains, and buses are accommodating to manual wheelchair users; however, they have historically been treated as an isolated group, with limited number of spaces on buses. As the population ages and more manual and electric wheelchair users ride public transit, new seating configurations and storage may be required.

Sidewalks and routes to transit nodes must maintain smooth and clear rolling surfaces, accessible curb ramps, and signal times conducive to safe street crossings.

---

**Average Speed**

<table>
<thead>
<tr>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-4 mph</td>
</tr>
</tbody>
</table>

**Dynamic Envelope**

(Minimum width)

**Average Ten Minute Access Shed**

**Energy Requirements**

Human Powered: 120 cal/mi

**Observed Street Use**

Presents observed use, policies governing use vary by municipality.

**Demographics**

Secondary: All ages with injuries or disabilities.

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**SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS**

Contract PS-4010-2178-01-08
Task/Revision No. PS-4010-2178-01-08-01

IBI Group July 2013 31
Description & Trends

First appearing in the 1950s and later patented in the U.S. in 1953, a walker, or "Zimmer Frame," is a tool designed to support disabled or elderly people while walking. Both easy to use and easy to store, the walker is the alternative choice to a cane when a person needs assistance keeping balance while walking.

While having few disadvantages, the walker does require the patient lift the walker every step, thus slowing down a patient's stride.

Multi-Modal Access

Along with the facilities provided for other access devices, such as drop-off sites and ADA compliant transit stations, the lift walker takes up additional space on light rail and bus transit, additional storage may be required. As the population of those requiring assisted devices grows, the lift walker remains one of the slower modes.

Tiered signalization programs that allow for longer crossing times should be considered along transit access routes.

Average Speed

Range = 1-4 mph

Average Ten Minute Access Shed

Energy Requirements

Human powered:

Observed Street Use

Presents observed use. Policies governing use vary by municipality.

Demographics

Secondary: All ages with injuries or disabilities.

www.livestrong.com

Opportunities and Constraints

GREEN MODE-HUMAN POWERED-UNIVERSAL ACCESS DEVICE—WHEELED WALKER

Description & Trends
Serving as an alternative to a traditional walker, the rolling walker is easier to operate and provides additional comfort to the user; however, the small wheels are not suited for use on grass or paved surfaces with obstructions. The small wheels can also cause the wheeled walkers to be less stable than lift walkers, but alleviate the lifting for those with additional disabilities/needs.

The wheeled walker comes in several variations. The front-wheeled walker is most similar to the lift walker, with two small wheels to make movement smoother. The rollators, are a later variation of wheeled walkers, with four wheels, hand brakes, and a built-in seat (often a basket is also included). Rollators allow the user to stop and rest when needed, and have more adjustable features such as height. Braking on the handlebars allows for immediate stopping and for maneuvering the rollator by braking one side making the turning radius much tighter.

Multi-Modal Access
Similar drop off, ADA compliant, and storage facilities are required in transit stations and on light rail and bus transit, as for typical walkers.

Sidewalks and routes to transit nodes must maintain smooth and clear rolling surfaces, accessible curb ramps, and signal times conducive to safe street crossings.

Average Speed:
- Range = 1-5 mph

Dynamic Envelope (Minimum width)

Average Ten Minute Access Shed

Energy Requirements:
- Human powered:

Observe Street Use

Presents observed use, policies governing use vary by municipality.

Demographics
Secondary: All ages with injuries or disabilities.

1 www.livestrong.com
Opportunities and Constraints

GREEN MODE-HUMAN POWERED-UNIVERSAL ACCESS DEVICE-WHITE CANE

Description & Trends
White canes are used by those who are blind or visually impaired as a mobility tool. There are several variations and lengths of white canes, but the primary purpose of each is to scan for curbs and steps, make others aware of the bearer's visual impairment, and offer balance, support or stability.

Techniques used to navigate with a white cane include synchronized tapping and stepping, and two-point touch techniques, which traditionally have provided enough information to the user about the immediate environment to make safe move decisions.

The use of a white cane does not account for abruptly approaching devices and erratic movements, a concern given the growing number of faster moving mobility devices observed on sidewalks.

Multi-Modal Access
Alterations to traffic signals and transit facilities, such as bus arrival notifications, require noise enhancements to account for the visually impaired. Routes to transit nodes will benefit from the use of tactile wayfinding strategies.

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<table>
<thead>
<tr>
<th>Average Speed</th>
<th>Dynamic Envelope</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range = 1-3 mph</td>
<td>(Minimum width)</td>
</tr>
</tbody>
</table>

Average Ten Minute Access Shed

Energy Requirements
Human powered:

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Observed Street Use

Presents observed use, policies governing use vary by municipality.

<table>
<thead>
<tr>
<th>Multi-Use</th>
<th>Traffic</th>
<th>Traffic</th>
<th>Bike</th>
<th>Parking</th>
<th>Sidewalk</th>
</tr>
</thead>
</table>

Demographics

(All Ages)

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http://www.nfbnj.org/mobility.php
GREEN MODE–ELECTRIC–NEIGHBORHOOD ELECTRIC VEHICLES

### Description & Trends

Neighborhood electric vehicles (NEVs), refer to battery electric vehicles that are operated on roads that have speed limits up to 35 mph. In the United States, they fall under the legal categorization of low-speed vehicles.

Golf carts are a sub-category of NEVs, originally built to carry 2 golfers and their clubs, but with the price of gasoline skyrocketing, electric golf carts have become a green and convenient alternative mode of transportation for short trips.

Whole communities have been built around golf cart and NEV transportation. With more of them hitting the market for transportation use each year, the safety concerns have encouraged many cities to begin introducing golf carts and NEVs into their vehicle codes.

### Multi-Modal Access

Transit stations/hubs and urban infrastructure will need to re-evaluate design guidelines for parking and charging stations as NEVs continue to grow as a commuter device due to rising gas prices, an aging population, and their low priced batteries, when compared to other electric devices on the market.

<table>
<thead>
<tr>
<th>Average Speed</th>
<th>Dynamic Envelope</th>
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</thead>
<tbody>
<tr>
<td>Maximum = 45 mph</td>
<td>(Minimum width)</td>
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</table>

<table>
<thead>
<tr>
<th>Average Ten Minute Access Shed</th>
<th>Energy Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Battery powered: Approximately 30 miles/charge (varies)</td>
</tr>
</tbody>
</table>

**Energy Requirements**

* Battery powered: Approximately 30 miles/charge (varies)

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**Demographics**

* [http://www.pikeresearch.com/research/neighborhood-electric-vehicles](http://www.pikeresearch.com/research/neighborhood-electric-vehicles)
Description & Trends

The Power-Assisted Bicycle is an emerging form of transportation that attempts to merge the health and environmental benefits of a bicycle with the convenience of a motorized vehicle. The environmental impact of an electric bike is more favorable than cars, buses, or other forms of urban transit.

Electric bicycle usage worldwide has experienced rapid growth since 1998. It is estimated that there were roughly 120 million e-bikes in China as of early 2010 and over 700,000 electric bicycles were sold in Europe in the same year.

Multi-Modal Access

E-bikes are not considered motor vehicles by the federal government and are subject to the same consumer safety laws as unassisted bicycles; because of this, they often operated on sidewalks and in bike lanes, even though they achieve speeds similar to car traffic on many urban roadways. They have similar dimensions as regular commuter bikes, and can be stored at transit facilities with basic bicycle lockers and locking racks. Charging facilities could be added at stations to help strengthen the link between their use to access transit.

Opportunities and Constraints

GREEN MODE—ELECTRIC—ELECTRIC BICYCLE

<table>
<thead>
<tr>
<th>Average Speed</th>
<th>Dynamic Envelope</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum = 25 mph</td>
<td>(Minimum width)</td>
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</tbody>
</table>

| Average Ten Minute Access Shed |
| Energy Requirements |
| Battery powered: |
| 1 amp hour/mile |
| (10-20 miles/charge) |

Observed Street Use

Presents observed use, policies governing use vary by municipality.

Demographics

Secondary: Teens/Young Adults 12-18 yrs.

http://www.electric-bicycle-guide.com/
Description & Trends

Electric kick scooters have small platforms with two wheels, and are propelled by an electric motor, alongside human propulsion (pushing off the ground). The most common, have two hard small wheels, and are aluminum folding scooters much like the popular Razor kick scooters for children.

While they can attain similar speeds to electric bicycles and urban area car traffic, they are less safe to operate in the vehicle right of way, especially given the assisted propelling method of achieving such speeds.

Multi-Modal Access

E-scooters are amongst newly popular mobility devices that do not have a safe operating area, as they are too fast for sidewalks and have limited breaking/maneuvering around pedestrians. They also have rather small wheels, which makes them difficult to operate on surfaces with any obstructions. They can be locked to bicycles racks and stored in lockers at transit stations, but charging may be required as they have limited battery life.

Opportunities and Constraints

GREEN MODE—ELECTRIC—ELECTRIC SCOOTER

Average Speed

Maximum = 20 mph

Dynamic Envelope

(Minimum width)

Average Ten Minute Access Shed

Energy Requirements

Battery powered:
17 watt/mile
(Assisted propelling)

Observed Street Use

Presents observed use, policies governing use vary by municipality.

Multi-Use Traffic
Traffic
Bike Parking

Demographics

Secondary: Children/Young Adults 6-25 yrs.
Description & Trends

Electric skateboards are modified to be propelled by an electric engine, controlled by a remote that the user holds in their hand. Originally designed for local transport, there are versions with larger wheels that allow for traversing grass, gravel, dirt, and sand to make them functional in many environments.

Unlike scooters, they do require the skills for operating a skateboard (turning, foot breaking, etc.) and are more difficult to learn to operate. They reach higher speeds than is safe to be operated on sidewalks amongst pedestrians, but only experienced riders should utilize them on bicycle paths and shared roadways.

Electric skateboards are a reflection of the increased efficiency and reduced price of electric motors, and the fact that just about all human powered electric devices can be electrified.

Multi-Modal Access

Much like typical skateboards, they are lightweight and easy to store, making them a good device to transition between transit modes.

Opportunities and Constraints

GREEN MODE—ELECTRIC—ELECTRIC SKATEBOARD

Average Speed

- Maximum = 25 mph

Dynamic Envelope

(Minimum width)

Average Ten Minute Access Shed

- Energy Requirements
  - Battery powered:
  - 800 watt/mile (9-12 miles per charge)

Observed Street Use

- Presents observed use, policies governing use vary by municipality.

Demographics

- Secondary: Teens/Young Adults 25-40 yrs.

www.electricskateboardreview.com
Description & Trends

The electric Segway (the most common brand of gyroscopic devices) is a personal transporter (PT), designed to be used by an individual as an eco-friendly mode of transportation. The self-balancing nature of gyroscopic devices makes them easy to learn to operate and generally more safe than many other wheeled devices. Segways decrease risks additionally, by slowing and stopping when the operator is not on the devices.

Segways are used for a variety of purposes; tourists, police forces, postal service, and other small delivery companies began the trend of Segway use in the United States. The company that created Segways has challenged sidewalk bans throughout the United States, and have won in all but few municipalities to allow their use on sidewalks and in public transportation because of their classification as a medical device.

Multi-Modal Access

More popular for recreation currently, they are beginning to grow in use by commuters. As part of a larger commute, new designs for charging stations, lockers, or storage may be needed to accommodate the larger size and shape of gyroscopic devices.

Green Mode - Electric - Gyroscopic Devices

<table>
<thead>
<tr>
<th>Average Speed:</th>
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</thead>
<tbody>
<tr>
<td>Dynamic Envelope</td>
</tr>
<tr>
<td>Range = 3-12 mph</td>
</tr>
<tr>
<td>(Minimum width)</td>
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</tbody>
</table>

| Average Ten Minute Access Shed |
| Energy Requirements |
| Battery powered: |
| 12 miles/charge |

Observed Street Use

Presents observed use, policies governing use vary by municipality.

Demographics

www.segway.com/support/FAQs
Description & Trends
Since 1990 the number of people using wheeled mobility devices has increased specifically in the mobility scooter sector; however, the unmet need for assisted technology devices is still substantial. The cost of mobility scooters (ranging from $1000-$20,000) is quite high given that only 18% of users ages 16-64 are employed.

Relying on mobility scooters for transportation is a growing trend, because the benefits outweigh those of electric wheelchairs. For instance, they can travel over more challenging ground and are easier to navigate, removing the need for assistance from a nursing aid. The sportier aesthetic of mobility scooters is considered a psychological advantage for people who don't want to look like they are reliant on medical equipment.

Multi-Modal Access
Mobility scooters and their users require large turning radius, ramps and transition zones, and lifts to transition between light rail and bus transit. They are constantly evolving; they are gaining power, speed, range and stability. New design guidelines to facilitate the changing device should be considered, including charging stations and access to stations.

Opportunities and Constraints

GREEN MODE-ELECTRIC-MOBILITY SCOOTER

Average Speed:  Dynamic Envelope

Maximum = 15 mph (Minimum width)

Average Ten Minute Access Shed

Energy Requirements
Battery powered:
45 miles/charge

Observed Street Use

Presents observed use, policies governing use vary by municipality. Multi-Use Trail Traffic Traffic Bike Parking Sidewalk

Demographics
Secondary: All ages with injuries or disabilities.

www.activeforever.com
Description & Trends

Devices such as the Puma, Uni-Cub, and Solowheel follow the trend of mobility devices with an environmental commitment; however, they offer more interesting and portable alternatives than many forms of electric transportation (such as NEVs).

As more devices such as these become popular amongst commuters, who are the main audience they are designed for, more frequent charging stations and new parking types will need to be designed to accommodate them.

Cost is a main concern for these devices, which are cheap to operate, but have initially high prices to purchase; the transportation network could benefit from the inclusion of personal transport devices such as these by utilizing a bike share or car model.

The Puma, in particular, is a modification to an existing device (Segway/Gyroscopic) that will aims to serve a population as the baby boomer generation begins to require assisted access devices; it is the beginning of a trend of customizing personal transportation for mobility without sacrificing speed and function.

Multi-Modal Access

New design guidelines to facilitate these evolving devices should be considered, including charging stations and access to stations.

Opportunities and Constraints

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**Average Speed**

- **Dynamic Envelope**
  - Maximum = 20 mph
  - (Minimum width)

**Average Ten Minute Access Shed**

**Energy Requirements**

- Battery powered:
  - Varies

**Observed Street Use**

Presents observed use, policies governing use vary by municipality.

- Multi-Use
- Trail
- Traffic
- Traffic
- Bike
- Parking
- Sidewalk

**Demographics**

(These are relatively new devices aimed at commuter populations)

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- www.solowheel.com
- www.inhabitat.com
- www.segway.com
Executive Summary

California’s Assembly Bill 32, The Global Warming Solutions Act of 2006, was the first statewide plan enacted to mandate reductions of greenhouse gas emissions. The legislation requires the State to reduce greenhouse gas emissions to 1990 levels by or before 2020. It also directs the California Air Resources Board (CARB) to develop discrete early actions to reduce greenhouse gases and to prepare a scoping plan to identify how best to reach the 2020 limit.

Senate Bill 375, California’s Sustainable Communities and Climate Protection Act, was enacted in 2008 in response to Assembly Bill 32 as the legal mechanism to achieve greenhouse gas emission reduction targets. Senate Bill 375 is a state law that requires the metropolitan regions of the state to reduce greenhouse gas emissions through their planning process, most notably by making explicit the link between land use and transportation planning policies.

The Southern California Association of Governments (SCAG) is the planning authority for six counties: Imperial, Los Angeles, Orange, Riverside, San Bernardino, and Ventura; and is the lead agency in facilitating the development of the Regional Transportation Plan (RTP). SCAG’s RTP is a comprehensive long-range transportation plan that identifies transportation strategies that address the mobility needs of Southern California. The RTP must be updated every four years in order to qualify the region’s transportation projects for federal and state funding. In 2012, SCAG updated the RTP and included a Sustainable Community Strategy (SCS) to facilitate the requirements of SB 375. Combined with the RTP, the SCS is a vision for growth based on mobility, economy, and sustainability.

The 2012 RTP/SCS provides the foundation for an effective First Last Mile Strategy. Chapter 01 outlines a vision for the region and includes a clear definition of mobility:

A successful transportation plan allows the residents of the region to access daily needs, including work, school, shopping, and recreation, without undue burdens of cost, time, or physical danger. This includes the pressing need to preserve and maintain our infrastructure at adequate levels. Residents should be able to rely on their ability to get from one place in the region to another in a safe and timely manner. They should be able to choose from a variety of transportation modes that suit their preferences and needs, including active, non-motorized modes such as biking and walking that allow for physical activity and greater health.

This passage begins to outline an attitude about “active transportation”, a concept that broadens the understanding of mobility from one focused on time/place efficiency to a vision that includes notions of safety and health. This is a critical breakthrough, as it begins to combine the discourses of active living and transportation planning. Many see the explicit link between land use and transportation planning as the largest breakthrough of the 2012 RTP/SCS; it
is very possible that this is a more significant breakthrough when considering general human health and wellness in our region. The recently adopted Active Design Guidelines in New York City touches on the importance of these concepts with respect to the physical design of our communities:

In the 19th and early 20th centuries, architects and urban reformers in New York City and elsewhere helped defeat infectious diseases like cholera and tuberculosis by improving buildings, streets, neighborhoods, clean water systems, and parks. In the 21st century, designers can again play a crucial role in combating the biggest public health epidemics of our time: obesity and related chronic diseases such as diabetes, heart disease, and some cancers. Today, physical inactivity and unhealthy diet are second only to tobacco as the main causes of premature death in the United States. A growing body of research suggests that evidence-based architectural and urban design strategies can increase regular physical activity and healthy eating.

Active Design Guidelines, p.6

SCAG’s 2012 RTP/SCS has resulted in a new policy direction which goes beyond cleaner air and includes environmental design linked to mobility that directly affects human health and wellness. The SCAG region is supportive of active transportation based on the notions of mobility, health, safety, and energy efficiency with new ideas about transportation planning that include spatial and accessibility policies more specific to the diverse communities of the region. The six counties within the SCAG region have developed individual bicycle and pedestrian plans, which are included in the RTP/SCS 2012 to incentivize safety, education, and funding with an increased priority on active transportation and its benefits to the overall health, safety, and welfare of all Los Angeles residents and commuters.

The Active Transportation Appendix of the 2012 RTP/SCS outlines goals and policy recommendations in more detail. The beginning of the second paragraph of the document defines the concept:

Active Transportation refers to transportation such as walking or using a bicycle, tri-cycle, velomobile, wheelchair, scooter, skates, skateboard, push scooter, trailer, hand cart, shopping car, or similar electrical devices.

Active Transportation Appendix to the 2012 RTP/SCS, p.1.

This definition is in line with broader active living discourse as it recognizes that active transportation modes are surprisingly diverse. However, the very next sentence in the appendix goes on to limit further analysis of the full spectrum of non-motorized mobility devices:

For the purposes of this report, Active Transportation will generally refer to bicycling and walking, the two most common methods.

Active Transportation Appendix to the 2012 RTP/SCS, p.1.

Our time is witness to an explosion of human-powered and electric mobility devices. Razor Scooter, a maker of children’s kick scooters, sells more than 3 million scooters in California each year. Children all over the state are riding these devices to school and around the communities they inhabit. They are burning calories, having fun, and expanding their own personal access sheds due to their increased speed. However, they are riding on sidewalks designed for pedestrians as the bike lanes (if present) are not fit for their use from a safety perspective; surprisingly enough, in some regional communities doing so is in violation of local by-laws that prohibit their use!
Metro's 2011 On-Board Passenger Survey paints a picture of certain demographics (e.g., elderly or low income) that are more reliant on transportation than other groups and may benefit immensely from a careful consideration of mobility devices beyond bicycles. Though it is true, as noted in the RTP/SCS, that bicycling and walking are the two most common non-motorized modes of travel in our region today, they are not the only active modes. A First Last Mile Strategic Plan must consider the full range of human-powered and electric mobility devices, as the needs for such devices are as diverse as their riders. Furthermore, latent opportunities exist to support a number of mobility options that together can work to help achieve the visionary goals of the RTP/SCS.

Following this introduction is a summary of a number of important planning documents starting with a more detailed look at the 2012 RTP/SCS. A First Last Mile Strategy exists in a context of on-going planning efforts, and the ability to build on ideas that have already been put forward and reviewed will only strengthen the work. Also, given that the regional transportation network relates to so many different jurisdictions having authority over environmental conditions throughout the county, it is important to consider how such a strategy fits within a regulatory and/or approval process.
Regional Transportation Plan (RTP)/Sustainable Community Strategy (SCS)

The Regional Transportation Plan (RTP) is a long-range transportation plan that is developed and updated by the Southern California Association of Governments (SCAG) every four years. The RTP provides a vision for transportation investments throughout the region. The Sustainable Communities Strategy (SCS) is a newly required element of the Regional Transportation Plan (RTP). The SCS will integrate land use and transportation strategies that will achieve ARB emissions reduction targets.

Utilizing local general plans, recent planning assumptions, and the two subregional Sustainable Communities Strategies prepared by the Gateway Cities Council of Governments (GCCOG), the SCS was developed around four key building blocks - land use, transportation networks, transportation demand management, and transportation system management programs and policies - that all depend on an active transportation network in order to achieve the greenhouse gas emission reduction targets issued by CARB. Components of the RTP/SCS important to consider as part of a First Last Mile Strategic Plan include:
• **Pedestrian-Oriented Transit Zones (POTs)** - A First Last Mile Strategy should consider expanding the definition of POTs beyond "pedestrians" to include all forms of non-motorized mobility devices that support active living, as well as clean energy (i.e., electric) mobility devices. "Pedestrian-Oriented Transit Zone" can be broadened for the purposes of the First Last Mile Strategy and labeled "Active Transportation Zones" (ATZs). This move is consistent with the overall intent of the 2012 RTP/SCS. A key component in the development of land use patterns for ATZs and POTs is High-Quality Transit Areas (HQTA), where jobs and housing are within a walkable distance to a transit village, within a half-mile of a well-serviced transit stop, and which include transit corridors with frequent service during peak commute hours. It is worth noting that First Last Mile planning is concerned primarily with mobility in the public realm, most importantly the linkages between origins and destinations that rely on public transportation network infrastructure (rails, roads, walkways, etc.), and as such, is concerned with the connections to and from various land uses, not the visioning of land uses themselves.

• **Active Transportation Networks** - Active transportation networks are an essential part of the regional transportation system; they are low cost, reduce roadway congestion, and increase health and quality of life. The RTP/SCS calls for an expansion of the public transportation network and transit services (i.e., public transit, highways, local streets, bikeways, and walkways) on new and existing routes to create greater accessibility and connectivity throughout the Los Angeles region. Active transportation will receive a total of $6.7 billion in available revenues - an increase of more than 200% over the 2008 RTP.

• **Transportation Demand Management (TDM) Strategies** - Extensive TDM strategies that support the expected land use development patterns will increase the usability and effectiveness of the active transportation system. TDM strategies will receive a total of $4.5 billion in available revenues - an increase of more than 200% over the 2008 RTP - in order to close gaps in the regional bikeway network, bring the majority of the sidewalks and intersections in the region into American with Disabilities Act (ADA) compliance, expand parking cash-out programs in urban areas, and promote Guaranteed Ride Home programs. Employment of strategies, such as incentives to reduce solo driving, increasing the usability and effectiveness of the active transportation system, and First Last Mile amenities will allow travelers to easily connect to transit service at their origins and destinations. TDM funding can be used to develop mobility hubs around major transit stations, and integrate bicycle and transit by providing bicycle racks on buses and dedicated bicycle racks on light and heavy rail vehicles.

• **Transportation System Management (TSM)** - The transportation system management (TSM) measures maximize the efficiency of the transportation network and support the land use patterns of the RTP/SCS by increasing capacity and improving operation efficiency of the transit network with strategies such as universal transit fare cards, traffic signal synchronization, transit automatic vehicle locations (AVL), and advanced traveler information. System accessibility and safety are addressed by TSM measures, as are traffic flow and air quality.

SCAG's RTP/SCS also includes an Active Transportation Appendix focused on developing a more comprehensive and interconnected network of bicycle and pedestrian facilities. Primary goals are addressed by the inclusion of the following strategies:

• **Increased funding for pedestrian and bicycle infrastructure and accommodations, as well as increased transportation options from trips less than three miles.** Increasing the use of active modes of transportation will require bicycle and pedestrian facility maintenance, easy access to transit facilities, and safety improvements. Dedicated bicycle facilities require expansion in the region (7,154 miles planned), and established sidewalks will undergo streetscape improvements to improve pedestrian environments.

• **Significantly decreased bicycle and pedestrian fatalities and injuries.** Safety is a main priority in active
transportation networks especially with cyclists; cyclists range from “vehicular cyclists” that are fully confident on most surfaces and in traffic flows to “no way, no how” cyclists that are not interested in bicycling for transportation and may not ride at all. This broad range of rider types makes filling in the bikeway network gaps very important to ensure all levels of cyclists can safely and comfortably navigate to and from their destinations.

Pedestrian safety is also a concern, with emphasis on access between schools and nearby neighborhoods. Clear crosswalks, signal timing, and crossing guard implementation can work alongside speed limit control zones to improve the safety of environments for pedestrians. Programs like Safe Routes to Schools help fund these connections. Also, the Americans with Disabilities Act (ADA) plays a far-reaching role in accomplishing pedestrian accessibility and safety goals through mandatory standards.

- **Ongoing data collection** - Comprehensive user statistics, demographics, bicycle travel patterns, accident mapping, and project funding needs are types of ongoing data collection that will be needed to help plan for increases in active transportation investments. All transportation planning projects will need to consider an increase in bicycle and pedestrian accommodations, multi-modal planning, programming, and design. The accommodation by all transportation planning efforts should, in effect, increase active transportation use and safety, while accomplishing the environmental and congestion reduction goals that concern the entire region.
Countywide Sustainability Planning Policy (CSPP)

This document was prepared by Los Angeles County Metropolitan Transportation Authority (Metro) for the citizens of Los Angeles County.

The Countywide Sustainable Planning Policy (CSPP) uses SCAG's Regional Transportation Plan (RTP)/Sustainable Community Strategy (SCS) 2012 as its foundation to create a more sustainable and active transportation system; compliance with state climate change law is also promoted to implement the regionally adopted land use and transportation vision. The Countywide Sustainable Planning approach integrates land use and transportation design, such as pedestrian-oriented transit zones (POTs), transit-oriented developments (TODs), and complete-streets that incorporates local modes of access, and promotes "green mode" (walking, biking, rideshare, transit, and clean-fueled vehicles) trips. Complete streets and transit-oriented development policies are consistent with the RTP/SCS and should be promoted at the local level through policy incentive programs.

The CSPP applies place-based policies to activity clusters in order to delineate appropriate active transportation strategies based on existing densities, activity levels, and zoning typologies:

- **Cluster A** includes areas with moderate to high residential density, but limited access to major job centers, and long commutes to work. Cluster A should have access to alternative commute options such as rail and bus; active transportation options are limited due to nearby auto-oriented corridors and suburban block patterns. Policies applicable to Cluster A support the growing use of active transportation through facilities development and promotion of safety. Transit-oriented development should be planned at select locations, with a focus on mixed-use centers, and transit services should be provided to employment centers, corridors, and feeder services. Projects that utilize existing capacity of streets, by all modes, should be prioritized.

- **Cluster B** includes two sub-types, both with low housing densities, of suburban/rural communities and special use areas such as large industrial zones. Cluster B requires diverse transportation strategies for residents, workers, and goods. For the suburban/rural communities auto-oriented travel is the most efficient requiring new policies and investments to promote more efficient travel and fewer trips. In special use areas the addition of transportation alternatives for commuters is important for job access, as well as the efficient operation of major freeway and freight corridors.
Cluster B policies encourage active transportation networks, but the local government planning policies are focused on improving the efficiency and safety of goods movement along with passenger travel. Cluster B place types' transit services focus on creating sub-regional transit hubs and feeder services. Special use areas support sustainable transportation through the promotion of clean-fuel vehicles and other green transit modes. Where greater development is desired, strategies that limit congestion should be considered.

- Cluster C defines sub-regional centers, neighborhoods, and districts where housing is dense enough to support local employment centers. Short trip lengths allow for active modes and transit to serve as the primary commute methods.

- Cluster D covers areas with significant urban office centers, major destinations, and cultural activity. These areas are mixed-use horizontally and vertically and have high capacity transit stops and corridors throughout. They allow for multimodal connectivity at the local, regional, and statewide scale. Clusters C and D are the place types that best suit mobility options that support car-free and one-car living through extensive pedestrian, bicycle, and transit facilities. Mixed use corridors with local transit coverage, and prioritization of active modes of transportation are encouraged.

The four place-based topics: sustainable transportation, local government planning, transit services, and street operations, are used as general guides for policy making, but each activity cluster has a set of specific policies within these guides that best addresses their transportation needs.

Accessibility of each place type is analyzed through the Policy’s Accessibility Index. The Index is used as a secondary characterization of place types in Los Angeles County, and assigns context to current planning and investment projects. Accessibility Clusters correspond with the placement of specific types of Measure R projects; roadway capacity improvements typically occur in mixed and moderate clusters, while operational improvements are located in strong and very strong areas with major rail projects. In all place types street grids that support local access around transit hubs are encouraged to reduce trip lengths, including the breaking up of superblocks.
Metro’s Long Range Transportation Plan (LRTP)

This document was prepared by the Los Angeles County Metropolitan Transportation Authority (Metro) for the citizens of Los Angeles County.

Metro’s Long Range Transportation Plan aims to improve mobility over the next thirty years by enhancing public transit and reducing greenhouse gas emissions by funding expansion to public transit throughout the region. The LRTP will play a key role in implementing the 2006 Bicycle Transportation Strategic Plan (BTSP), and is focused on improving bicycle and pedestrian access to encourage ridership of new and existing transit. It acknowledges that coordination between transit and users’ final destinations, including linkages to bus centers and rail stations, is vital to sustainability of the regional transportation system.

Along with the BTSP, this plan will improve bicycling as a viable transportation mode by shifting the focus from long arterial bikeways to routes under three miles and improving access to bike-transit hubs. Filling gaps in the bikeway system and improving parking at transit stations are essential to encourage the use of bicycles with transit. In addition to bicycling, pedestrian improvements are a priority in the non-motorized component of the transportation network. All motorized and non-motorized modes of transportation should connect to an efficient and safe pedestrian system at the beginning and end of trips, as well as secondary destinations and links into the public transit systems. Improvements to wayfinding, signage, sidewalks, and street crossings should be made alongside installation of physically attractive features and amenities. Metro’s approach to improving the pedestrian environment focuses on the development of public policy, adoptions of regulatory standards, and targeted funding.
Short Range Transportation Plan (SRTP)

This document was prepared by Los Angeles County Metropolitan Transportation Authority (Metro) with Mobility 21 Coalition for the citizens of Los Angeles County.

The Short Range Transportation Plan is a master plan to protect funding sources for Los Angeles County's transportation needs and assess options for additional and future funding. Metro will work with subregional organizations to fund and implement priority projects that improve local bus services, expand the Metro Rapid program, expand the light rail system, and introduce Metro Rapid Transitways to create better connectivity throughout the County.

The Mobility 21 Coalition, a contributor to this document, incentivizes better land use and transportation planning interaction and the Short Range Transportation Plan's land use initiative to grow more efficiently. Enhancing non-motorized forms of transportation that provide compliments to transit use supports the land use initiative, as well as the Congestion Management Program (CMP).

The land use initiative encourages infill development near transit stations and along major transit corridors, and promotes land use programs that create self-sustaining urban centers. Minimizing the need for intraregional car travel and increasing the use of active transportation, the plan explores opportunities to construct transit-oriented developments. Initiatives such as creating smart growth enterprise zones, market-based incentives, and traffic impact fees will ensure the impact of growth on the regional transportation network is better addressed. The Land Use Initiative Action Plan calls for coordination between the partnership programs with SCAG's growth visioning process. The bicycle and pedestrian programs are expected to be implemented in the short-term to enhance non-motorized forms of transportation. Creating environments that are comfortable and safe will encourage pedestrians to walk longer distances or take public transportation in exchange for short auto-trips. The SRTP Bicycle and Pedestrian Program Action Plan calls for implementation of programs that complete gaps in countywide networks, encourage access to transit services, and improve mobility and safety. The Action Plan also promotes programs that enhance pedestrian travel, such as expansion of the transit system and redevelopment of urban centers around transit. (Insert SRTP Table of Improvements)
Bicycle Transportation Strategic Plan (BTS)

This document was prepared by the Los Angeles County Metropolitan Transportation Authority with Alta Planning + Design, Inc., Transight Limited, and Leslie Scott Consulting for use by the Cities of Los Angeles County.

The Bicycle Transportation Strategic Plan is a collaborative document utilizing the Metro Bicycle Transportation Strategic Plan and the Bicycle Transportation Account Compliance Document, both prepared to improve mobility in the region through the use of bicycles. The BTS establishes regional planning policy and tools for local agencies promoting bicycling as a viable transportation mode. The purpose of the BTS is to identify strategies that increase the use of bicycles in place of automobiles for trips to work, errands, recreational destinations, and transit. The BTS includes a policy objective to encourage high quality end-of-trip facilities at transit locations and destinations. The countywide incorporation of bicycle parking will help create a network of bike-transit centers, and more seamless linkages for users from their origin to their destination. The bikes-to-transit policy objective encourages transit hub access plans to ensure that bicycle access is addressed in the design of new and existing transit stations.
Creating Successful Transit-Oriented Districts in Los Angeles: A Citywide Toolkit for Achieving Regional Goals

This document was prepared by The Center for Transit-Oriented Development (CTOD) for Caltrans and the Los Angeles County Metropolitan Transportation Authority (Metro).

The Center for Transit-Oriented Development identifies strategies that could help station areas achieve high transit ridership, lower VMT, provide housing, creating healthy neighborhoods, and provide a multitude of travel options. This TOD study explores the opportunities and challenges of achieving TODs in Los Angeles County. One of the TOD study’s strategies for expanding TOD in Los Angeles is supporting the SCS and its implementation of SB 375, which will require a significant change in density and development where transit station areas will be designated as regional priority areas for growth. The study breaks down benefits of TOD into four categories: public health, economic development, affordable housing, and climate change; and assesses each strategy’s impact on those benefits. While many strategies address individual benefits offering high quality transit options, increasing housing near transit, improving walkability, and enhancing access between transit and job centers all positively impact at least three of the four strategies. The CTOD’s report supports the sentiment that coordination and linkages between transit hubs and destinations are vital to a sustainable transit network throughout the region. The CTOD studied 71 existing and under-construction transit stations in Los Angeles and categorized them into nine station area place types based on existing intensity of each station area and the proportion of residents to employees. The “station area typologies” are categorized as residential, balanced, and employment; and are ranked from lowest to highest VMT to determine appropriate strategies that create high-performing TOD projects.
Transportation Demand Management Strategies Report (TDMS)

This document was prepared by Transportation Management Services (TMS) with Eric Schreffler Transportation Consultants, LDA Consulting, and The Rifkin Transportation Planning Group for the City of Los Angeles Department of Transportation and the Southern California Association of Governments (SCAG).

The Transportation Demand Management Strategies report summarizes a study to identify actions the City should consider maintaining, enhancing, and/or adopting to reduce the demand for automobile traffic. This TDMS report recognizes how strategies can balance demand for travel by supplying transportation facilities and re-configure an auto-dominated physical environment to promote connectivity. The report ranks existing strategies/actions used to promote transit ridership, giving high rankings to strategies that promote access and ease of transition at transit facilities. Giving higher priority to TDM in LADOT Traffic Study Policies and multi-modal measurements is ranked in the high category as well. Along with positive reinforcement for non-vehicular modes of transportation, such as filling gaps in bicycle networks and creating safer pedestrian walkways, the TDMS has recommendations for decreasing the ease of access for automobiles in transit-oriented developments, such as increased density with decreased parking requirements. While TDM initiatives are pursued by City departments independently, this report offers tools for coordination with multiple departments which will be beneficial for funding larger projects and providing greater improvements.
Metro Eastside Access Project

This document was prepared by the Los Angeles County Metropolitan Transportation Authority (Metro) with the Community Advisory Committee for residents on the Eastside of Los Angeles County.

In 2009, the Metro Eastside Access Project identified ways to improve access and safety while reflecting local communities surrounding stations on the Eastside expansion. The priorities were on creative landscape solutions, public art, and lighting and signage on City-owned streets and sidewalks. The street improvements in the Metro Eastside Access Project provide additional benefits to pedestrians' and bikers' experiences. Land use and transportation integration planning is not a component of the project; however, the recommendations identify existing urban centers and work to create linkages between them and transit. These linkages include enhanced wayfinding, pedestrian connections through public plazas, and bicycle improvements such as bike lanes and sharrows. (Insert Eastside Access Project Boards or just the tables from the boards)
Main Streets for Travelers and Communities

This document was prepared by Caltrans for the public.

Main Streets for Travelers and Communities addresses the overlap of main streets’ roles as transportation facilities and public places, and how planning and design of main streets impacts travelers, communities, and the environment. Multimodal travel, livability, and sustainability are key components to main street strategic planning. Design flexibility is a standard principle outlined by Caltrans allowing for design exceptions that take the context into consideration; however, Caltrans still calls for the evaluation of multi-modality, livability, and sustainability before deviation from the design standards outlined in the Highway Design Manual when highways are functioning as main streets. Maximizing multimodal transportation networks is a main principle of Main Streets for Travelers and Communities. Emphasis on mobility, access, options, and connections (such as providing pedestrian access to transit stops) is a strategy for maintaining main streets that respond to the needs of local communities. Multimodal networks must address the users that participate in several modes of travel within a single trip (such as from a bus stop to a parked car) to fill the gaps in the transportation network. Caltrans recommends implementation of “complete streets” to incorporate multimodal principles into the physical configuration of roadways and facilities and best address the needs of travelers.
Metro Station Design Review

This document was prepared by the design team of Johnson Fain, Sussman Prejza, Melendrez, and Lea Elliot, for the Los Angeles County Metropolitan Transportation Authority (Metro).

The Metro Station Design Review was commissioned to review the diversity of existing station designs and make recommendations to correct deficiencies and inconsistencies. The review contains recommendations for a "kit of parts" that can be applied to a variety of station area types and provide connectivity through visual identity. The main concerns for cohesive station design are legibility, maintainability, and flexibility. Cost effective strategies were given priority, but not where they hinder security, functionality, and accessibility of transit stations. Connectivity is a priority in station area design; the Metro Station Design Review promotes neighborhood linkages by establishing a minimum sphere of influence of improvements and station area branding; encourages pedestrian circulation over vehicular traffic in transit zones by emphasizing physical pedestrian and bike connections; and utilizes signage to assure local destinations, bicycle infrastructure, and street names are clearly identified.
Compass Blueprint: Framework of Sustainable Transit Communities

This document was prepared by a team of consultants: Design, Community & Environment (DC&E), Bay Area Economics (BAE), Arellano Associates, and Christopher B. Leinberger, for the City of Los Angeles, with funding from the Southern California Association of Governments' (SCAG) Compass Blueprint Program and grants from the Federal Highway Administration (FHWA) and Federal Transit Administration (FTA), U.S. Department of Transportation (DOT).

This Compass Blueprint project provides a framework within which the City of Los Angeles and private developers can work for new construction and rehabilitation projects to create balanced Sustainable Transit Communities (STCs). STCs include a mix of housing and employment-generating uses such as offices and clean tech enterprises. This document identifies strategies for sustainable TOD near Metro rail and BRT stations and prioritizes investments. Using a scorecard developed for rating individual station areas, the study selected station areas with the highest potential to become STCs. The station areas were rated based on their existing qualities and availability of opportunity sites, as well as market conditions for creating job centers. When an STC has all of the qualities outlined in this framework it becomes a vibrant place with a strong local economy that encourages further investment in the station area. A major component of the framework is multimodal transportation systems; pedestrian friendly streets, walkability, connectivity, complete streets, and bicycle facilities are highly weighted qualities that impact other components of STCs as well.

The framework uses station place types (defined by the Center for Transit Oriented Development, CTOD), each with a distinct architectural character, mix of businesses and potential for economic success, and shared qualities that are used to inform efforts to transform them into Sustainable Transit Communities. For each of the nine place types defined by the CTOD - suburban neighborhood, neighborhood center, office/industrial district, transit neighborhood, mixed-use center, business district, urban neighborhood, urban center, and central business district/special district - components of the framework are given priority to best balance the given place types' intensity. This framework expands upon the CTOD's work by describing specific built character, mix of uses, and pedestrian and bicycle network improvements needed for each place type to move towards an STC standard. The Compass Blueprint is a model for integrating land use and transportation planning that has been incorporated in the 2012-2035 RTP/SCS and local partners.
Los Angeles County Model Design Manual for Living Streets

This document was prepared by the Los Angeles County Department of Public Health.

This document serves a manual for creating walkable and bicycle neighborhoods, cities that are conducive to transit use, and livable communities. Experts from traffic engineering, transportation planning, land use planning, architecture, landscape architecture, and public health teamed to produce this set of guidelines that create opportunities for active transportation networks and living streets. Living streets are designed for people of all ages and physical abilities whether they walk, bicycle, ride transit, or drive; and integrate connectivity and traffic calming with pedestrian-oriented site and building design to create safe environments. To assist in meeting the goals of living streets, this manual outlines benchmarks and performance measures for communities to adopt. The benchmarks ensure that every street and neighborhood is comfortable to walk and bicycle in, it is safe for children to use active transportation modes to get to school, all streets provide safe and comfortable crossings, active lifestyles are available to all, and traffic fatalities are reduced or eliminated. Performance measures are put in place to decrease fatalities and injuries in streets, increase active transportation trips and decrease motorized transportation trips, slow vehicle speeds on local streets, increase retail sales and tourism, and improve resident satisfaction in communities.

Sustainable street networks increase the number of people walking and bicycling and reduce vehicle miles traveled. To create a well designed street network the manual identifies seven zone types - natural, rural, sub-urban, general urban, urban center, urban core, and special district - and their associated street networks to assign design standards that will increase connectivity and improve street function. Within each zone type, improvements to intersections, pedestrian access and crossings, bikeway design, transit accommodations, traffic calming measures, streetscape design, and land use policy are identified to promote the engagement of communities along streets and in an active transportation network.
Active Design Guidelines: Promoting Physical Activity and Health in Design

This document was prepared by New York City's Departments of Design and Construction (DDC), Health and Mental Hygiene, Transportation (DOT), and City Planning with the Mayor's Office of Management and Budget for designers, architects, and local agencies that play a role in the design and construction of the built environment.

The goal of the Active Design Guidelines is to create an environment that enables all city residents to incorporate healthy activity into their daily lives throughout New York City. The guidelines address neighborhoods, streets, and outdoor spaces that encourage active modes of transportation, including walking and bicycling. To create an active city access to transit and transit facilities, plazas, parks, open spaces, recreational facilities, and services needs to be improved through designing pedestrian friendly streets and bicycle facilities and expanding the active transportation network. The document outlines specific planning and design strategies that promote physical activity through recreation and active transportation. The "three Ds" that define the relationship between urban design and travel patterns: density, diversity, and design are supplemented by The Active Design Guidelines with destination accessibility and distance to transit to fill important gaps in the urban design process for active transportation networks. The strategies related to land use mix and transit address the design of the city's streets and public spaces in addition to strategies for enhancing the walkability and bicycle facilities on city streets. The strategies outlined in the Active Design Guidelines are based on current best practices and emerging ideas that will be tested and refined in the coming years. This document makes recommendations for land use, transit and parking, parks, open space and recreational facilities, public plazas, access to services, street connectivity, traffic calming, pedestrian pathways, programming streetscapes, bicycle networks and connectivity, bikeways, and bicycle infrastructure based on research that correlates the population's behavior with the built environment.

Strategies that increase physical activity by improving access to destinations such as parks and services from places of residence and work include: locating transit stops along well-connected streets and building entrances, providing a mix of land uses in walkable areas; designing facilities that make pedestrian and bicycle access to transit convenient; adding open spaces to large-scale developments; and encouraging the use of pathways, tracks, and open spaces through signage. Maintaining well connected streets with sidewalks that provide direct routes between destinations to increase pedestrianism should be combined with traffic calming strategies that promote walking by improving the pedestrian experience. Equally as important as providing pedestrian routes is creating attractive street environments that encourage walking with destinations such as art installations, outdoor cafes, and street closures for special programming. Bicycle networks and connectivity should be encouraged alongside pedestrian improvements by creating continuous networks of bikeways, signage, and links between bicycling and transit. Addition of bicycle infrastructure such as parking, specific crossings, rails along outdoor stairways, and share programs can enhance the bikeway networks and provide more organized movements of pedestrians, cyclists, and motorists.
Walkable and Livable Communities Institute: Walkability Workbook

This document was prepared by the Walkable and Livable Communities Institute for community walkability workshops by local agencies. www.walklive.org

Walkability in communities promotes physical health, lowers traffic injury and death rates, and provides better access for people while reducing greenhouse gas emissions. This workbook provides principles of walkability that must be addressed to ensure accessible, welcoming, convenient, and safe pedestrian environments. Sidewalks, bike lanes, vehicle travel lanes, driveways, and parking can all be incorporated on streets with buffers of plantings, medians, striping, and sidewalks that make drivers, bicyclists, and pedestrians more comfortable traveling. Complete streets are designed and operated to enable safe access for pedestrians, bicyclists, motorists and transit riders. To accommodate a diversity of uses, sidewalks require space for street furniture, bike racks, trees, and room for building access that does not disrupt pedestrian flow. Proper bicycle facilities not only promote active transportation through bicycling, but improve pedestrian environments as well. When bicyclists are forced onto sidewalks due to lack of bike lanes, or lack of bike racks cause locking to signage and trees, they impede walkability. Through implementation of phased improvements over time, streets that are void of pedestrian safety and access can promote walkability with sidewalks, crosswalks, parks, seating, signage, and orientation of new developments.
Active Living by Design (ALBD)

Active Living by Design is a founding program in the Active Living Initiative of the Robert Wood Johnson Foundation. It creates community-led change by working with local and national partners to build a culture of active living. [http://www.activelivingbydesign.org/events-resources/essentials/transportation](http://www.activelivingbydesign.org/events-resources/essentials/transportation)

Active Living by Design promotes physical activity by increasing transportation choices and expanding opportunities for active transportation. The organization looks at land use patterns and transportation infrastructure that can promote active transportation and increase health while reducing safety risks. A balance of transportation and land use goals can support walking, biking, transit, and alternative forms of travel to help make healthy lifestyles more attainable for communities. The Active Living by Design organization provides links to existing resources, guidelines, enhancement projects, and events that facilitate work on active living projects.

In Santa Ana, Sacramento, and Oakland California, Active Living by Design has contributed to recreation opportunities by implementing physical improvement projects, establishing advisory groups and partnerships, and securing grants and funding for local projects. ALBD has identified five strategies as an approach to increasing physical activity in a community. Preparation, promotions, programs, policies, and physical projects each comprise specific tactics to create more active communities. They develop and maintain partnerships to conduct neighborhood assessments of barriers and opportunities, and evaluate master plans and ordinances that affect active living. After creating initiatives and programs for active living in community events and outreach, they establish policies that are consistent with land use and transportation plans that promote active living; update road policies, standards, and parking requirements; and secure funding for pedestrian and cycling-oriented capital improvements. ABLD works to successfully integrate physical infrastructure such as sidewalks, bike lanes, and trails with traffic calming measures to ensure safer and more comfortable walking and bicycling environments.
<table>
<thead>
<tr>
<th>DATE</th>
<th>TIME</th>
<th>ORGANIZATION</th>
<th>MEETING</th>
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<tbody>
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<td>6/26/13</td>
<td>10:00 AM</td>
<td>Metro</td>
<td>Ad Hoc Sustainability Meeting</td>
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<td>7/18/13</td>
<td>9:30 AM</td>
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<td>Streets &amp; Freeways Subcommittee</td>
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<td>LA County Board Deputy</td>
<td>Briefing</td>
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<td>8:00 AM</td>
<td>North County</td>
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<td>South Bay</td>
<td>Infrastructure Working Group</td>
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<td>1/15/14</td>
<td>2:30 PM - 4:30 PM</td>
<td>South Bay</td>
<td>Liveable Communities</td>
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<td>1/16/14</td>
<td>4:00 PM</td>
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<td>1/23/14</td>
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<td>Public Works Officer's</td>
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<td>Gateway Cities Council of Governments</td>
<td>PATH is currently being used as the acronym to identify the Los Angeles County based organization, People Assisting the Homeless.</td>
<td>After careful consideration, we have modified the document to rename this transit access network Pathway so as to avoid any confusion and misrepresentation.</td>
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<td>South Bay Cities Council of Governments</td>
<td>The plan indicates that very few people access the system by car but there has been no parking analysis done so it is not clear whether there is sufficient parking on the system which would also attract more riders who want to use the system to ‘intercept' their longer trip. (Page 8) Page 9 states that the parking facilities are ‘highly visible' but those from outside the area may not agree.</td>
<td>Parking analyses were outside of the purview of this effort. Assessment and determination of adequate parking is conducted on a line by line basis as part of the development of rail lines. This effort's primary focus has been on active transportation-type enhancements to the catchment areas.</td>
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<td>Additionally, way finding signage is addressed but for vehicle access, it should extend to freeway off ramps and other locations that may be farther than the radius in this plan.</td>
<td>The scope of this Plan was focused on first/last mile active transportation improvements within FTA's 1/2 mile and 3 mile radius for pedestrians and bicyclists, respectively.</td>
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<td>Another barrier that isn't addressed in the report at all is what happens to the personal mobility devices when you get to transit. Buses can't take unlimited numbers of bikes and Segways are very heavy to lift onto a bus. Storage facilities should be mentioned for those mobility devices that need to be prepared to stay at the station or buses and rail systems need to be able to accommodate not just more people, but also more equipment.</td>
<td>Provision of bike facilities (bike rooms, lockers and racks) is currently part of the Metro Station design guidelines. Additionally, Metro has been working on the implementation of a bikeshare system to provide additional services and mitigate the need for additional bike storage or transport of bikes on transit. Additionally, as a point of clarification, Segways are not currently allowed on Metro buses. If necessary, storage areas for other types of mobility devices should be evaluated as part of another study.</td>
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<td>If a jurisdiction were to improve the First/Last Mile, is there any possible there would be sufficient service to cover the increased ridership? OR, what is the capacity on the system? What is success and what would overload the transit system?</td>
<td>The appendix discusses the potential impact to ridership. As part of these improvements, we recommend before and after studies that could evaluate the impact to ridership and would inform. These studies will inform potential needed service modifications.</td>
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<td>What is the definition of high quality transit?</td>
<td>High quality transit is defined as transit service every 15 minutes or less. The suggested change has been made to page 7.</td>
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<td>According to sources on the internet – &quot;On average, women walk at 3 miles per hour and men walk a little quicker at 3.5 miles per hour.&quot; I don’t think it is appropriate to use 4 miles/hour as the speed that people will be walking to the stations.</td>
<td>These calculations are based on the 2011 Federal Transit Administration (FTA) policy which establishes transit station or stop accessibility within half-mile pedestrian and three-mile bicycle radii. The examples used were for illustrative purposes only.</td>
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<td>Page 14 – There are boxes for different types of mobility devices shown on this page. I think that you should replace the 2nd from the bottom on the left (bike with big and small wheel) with a senior type tricycle.</td>
<td>The suggested change has been made.</td>
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<td>Page 21 – On this analysis, there is no mention of other modes besides pedestrian or bike. This is the case throughout the report. It would be helpful if in each chapter, you addressed the different speeds of the access devices as you have done on Page 23 so that you are expressing how this guidebook applies in each case to Slow, Medium and Fast user speeds.</td>
<td>To address this comment, we developed a Taxonomy of Mobility Devices, attached as an appendix to the Plan.</td>
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<td>Page 23 – For Fast moving vehicles – this report can address using the street, not just the Path. There should be something in the guidelines that addresses their use of the street system.</td>
<td>The Pathway includes use of the street. On page 10, one of the Guiding Principles of the Plan is &quot;vehicular speed mitigation.&quot; Specifically, the Station Analysis Maps in Chapter 4 display high vehicular speeds, juxtaposed with pedestrian and bicycle access, and Key Transit Access Corridors. Many of the toolkit components of the Plan include traffic calming mechanisms as well as improved amenities and access for active transportation users.</td>
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<td>Page 42 – Reduced Lane Width on streets should include NEV use.</td>
<td>NEV use is currently determined by posted speeds. Any changes to make it consistent with the suggestion require legislative actions.</td>
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<td>Page 44 – If they are using information technology in Copenhagen to incorporate speed detecting signs that direct users to shift lanes in their 'Conversation Lanes', then this would be an ideal strategy for a Rolling Lane with multiple and various personal mobility devices.</td>
<td>We agree. We will be looking at ways to evaluate the impacts of First/Last Mile improvements as projects are implemented.</td>
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<td>Page 47- Guidelines for car share say that an agency can contract with a private company to begin a car share program. This is not necessary. Car sharing should be non-exclusive and the agency or Metro should create car share spaces that any car share company should be able to use.</td>
<td>Per your comments, this requires a shift in policy which was not within the purview of the Plan. However, as a next step, it can be considered on a case-by-case basis in our station planning study.</td>
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<td>Page 50- Can these counters somehow be used to inform bicyclists if there is room on the transit system for their bike?</td>
<td>The current counters and system do not possess this capacity.</td>
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Page 42 - I am not sure that I understand why Micro Park and Ride lots are an improvement. While they allow for more development around a station, they would require additional way finding signage and another transfer to get to the transit trip. Is this done anywhere and if so, is it successful?

They can work in areas with low land availability in lieu of larger park & ride lots. This may require additional signage in some cases. They potentially free up high valued station adjacent land for development. They may also serve stations where no park and ride lot is available. Micro park and ride lots occur anywhere private parking is utilized for transit transfers (i.e. when users park at grocery store lots near rail stations, or private pay for park lots to access rail). Concept requires further study as noted in the report.

City of Long Beach

Path Users and Page 37 — Smart Technologies. In addition the Nextrip and other transit passenger information apps or services, a variety of new mobility technologies, such as on-demand car services such as Uber, and casual carpool hubs, including on-demand ridesharing such as Lyft and Sidecar, are growing in popularity and effectiveness in many metropolitan regions. This section of the plan should at least recognize this technology and the types of on-demand service that the technology enables for first last mile gap closures and support for existing major transit station infrastructure. The case studies referenced should go beyond trail or pavement markers to reflect this aspect of smart mobility to include technological enhancements to the transit system. These are the types of technology that the Millennial Generation and many others will expect to use to access the system in the future.

The suggested services have been incorporated on pages 37 and 47 of the final draft of the Plan in order to be more inclusive of emerging mobility alternatives. Addressing the point regarding the "Smart Technologies" section on page 37, these particular strategies are in reference to providing real time safety, transit, and geospatial information to Pathway users. This real time availability of information certainly can, and should be integrated with car share systems, and therefore has been included as a broader goal on page 37. The Care-Share section on page 47, however, more clearly aligns with the need for on-demand services as a component of the First/Last Mile Strategic Plan.
Page 47 -- Plug-in Components and Section 6. There are several pilot projects in the works to provide modular multi-modal transportation hubs for the region. These facilities seek to use a common customer access or payment system, and offer varied modes of travel, from carshare to short-term bicycle rental to best suit the needs of the traveler to the mode of travel for their first last mile. For instance, in Downtown Long Beach at 1st Street and the Promenade, there is ample rail and bus service, bicycle rental facilities via the Bikestation, along with taxi stands located nearby at hotels. If a carshare or NEV fleet were added into this mix, a full range of options would be available for a passenger arriving in this one location of Downtown to make it to their final destination. This level of integration is suggested in the station case studies in Section 6, where the facilities are located in proximity to each other, but the more streamlined or integrated user experience is not discussed as part of the goals in the Path planning guidelines.

Page 49 -- Feeder Buses. This particular assessment was outside of the purview of the Plan scope. Typically, the need for feeder services is evaluated as part of the rail line development. The integrated user experience is an overarching goal for the Plan, as stipulated on page 3 of the document. "2. Maximize multi-modal benefits & efficiencies."
<p>| LA River Revitalization Corporation | The only concerns that the LA River Revitalization Corporation has with the First-Last Draft Plan is that this Plan is only a &quot;tool&quot; and &quot;resource.&quot; We hope that this Plan becomes more than a &quot;direction&quot; when entities undertake the planning and designing of the concepts, and incentives are provided not only to the agencies looking to implement the Plan but to members of the community to join in the effort as supporters. We are also concerned that the &quot;path toolbox&quot; does not look beyond the ½ mile &quot;transit-friendly zone,&quot; given the impact of the 3-mile stretch from and to the public transit hub. | In response to this and similar comments, we developed an implementation component, entitled: Strategies for Plan Application. This document, along with future phases of the Plan, will provide more direction and further address these concerns. In reference to the 3-mile radius, the Plan captures the 3-mile bicycle and 1/2 mile pedestrian radii as prescribed in the 2011 FTA policy. As stated on page 17, site areas are defined with these parameters. Please see Network Layout on Page 24. |
| County of Los Angeles Department of Regional Planning | The methodology to plan Path networks, described in section 4, seems to focus solely on existing land uses, rather than future, planned land uses established by zoning and General Plan land use policy. It makes sense to consider both. Also, the land use map description on page p. 21 is very confusing (how does a land use map highlight &quot;types and characteristics of users that are able to comfortably access the locations surrounding the station&quot;?) | The suggested changes have been made with regard to existing land use and planning changes, as demonstrated on page 21. |
| | Consider the role that the private sector (BIDs, property owners, affordable housing and special needs housing developers e.g., senior citizen housing) can play in planning and implementing the Path. | This could be considered in future phases of the Plan. |
| | On p. 7, please note that the Complete Streets Act applies to counties as well. | The suggested change has been made to page 7. |</p>
<table>
<thead>
<tr>
<th>Westside Cities Council of Governments</th>
<th>The draft does not discuss how Metro proposes to use these guidelines. Without an explanation, we see little difference from the comprehensive station area planning that already accompanies planning for light rail stops or the recently completed Bus Rapid Transit streetscape study.</th>
<th>In response to this and similar comments, we added a segment entitled: Strategies for Plan Application to identify next steps. This document, along with future phases of the Plan, will provide more direction and further address these concerns.</th>
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<td>The draft focuses on connectivity to major transportation projects (e.g., Subway, Light Rail and Bus Rapid Transit). With high ridership bus lines on the Westside, a primary focus is basic improvements to transit stops and transfer points. An additional toolbox of options for design for smaller transit nodes and transfer points would be helpful.</td>
<td>Many of the tools can apply to non-fixed guideway stations.</td>
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<tr>
<td></td>
<td>There is no discussion regarding who is responsible for implementing the improvements, other than to state that the purpose of the guidelines are to provide a “coordination tool and resource” for Metro and the region.</td>
<td>The jurisdictions within which these improvements occur are responsible for obtaining approvals, designing and implementing the noted improvements. Funding for these improvements and general branding of the concept could be pursued collaboratively among the impacted jurisdictions, Metro, Construction Authority, etc. Please see Strategies for Plan application.</td>
</tr>
<tr>
<td></td>
<td>There is no discussion on potential funding. As these are termed &quot;guidelines&quot;, it is not known if these would be potential requirements for obtaining future grant funding for projects in the designated station areas. Metro should identify whether these guidelines should be used in the Metro Call for Projects for these types of projects. Will projects be scored based on the adherence to these guidelines?</td>
<td>Board action/ adoption is required in order for Metro to determine next steps such as whether these requirements will apply to the Call.</td>
</tr>
<tr>
<td>LADOT</td>
<td>The plan lists several separate first last mile elements but the importance of integration should be further highlighted. A menu of mobility options for the user should be the ultimate goal. Such a menu can be expandable as new solutions are developed - the menu should not be limited to just the strategies (car share, bike share, bike parking) identified in the plan. For example, taxi service, pedi-cab, jitney shuttle, etc. could all be viable first last mile solutions for some transit users. More mobility options at and near transit stations can provide the user with compelling reasons to leave their car at home.</td>
<td>The importance of mode integration is highlighted in the &quot;First/Last Mile Strategic Plan Goals&quot; section on page 3 of the document. To address more mobility option, we have added a Taxonomy of Mobility Devices as an appendix to the Plan.</td>
</tr>
<tr>
<td>---</td>
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<tr>
<td></td>
<td>Smart phone technologies should be an important aspect in the vision plan - a smart phone app that allows transit riders to easily reserve a shared car or bike, to hail a taxi, or to view their menu of mobility options should be explored.</td>
<td>Smart phone integration is included as part of the Smart Technologies section on page 37.</td>
</tr>
<tr>
<td></td>
<td>The plan should stress the need for cities to break up long blocks by encouraging developers to accommodate public paseos, green allies or other pedestrian/bike friendly crossings. This is especially relevant now as most cities are seeing an increase in the number of building permit applications particularly in transit rich areas.</td>
<td>As part of the Pathway Toolbox there is a Crossing and Connections category from pages 30-33, that specifically encompasses crossing enhancement and improvement strategies. Additionally, Long Blocks are also addressed as part of the six crucial Station Access Barriers checklist included for each component in the Pathway Toolbox.</td>
</tr>
<tr>
<td>Since the purpose of the plan is to provide policy guidance, the plan should stress the vital need to allow for integration between future bike or car systems in the County. The goal should be ease of use for the user - seamless integration can accomplish this. A common platform should be pursued by the different agencies. Perhaps, &quot;integration&quot; or &quot;common platform&quot; can be a stated goal in the &quot;Path Toolbox&quot; section of the plan for the car-share and bike-share strategies.</td>
<td>The importance of mode integration is highlighted in the &quot;First/Last Mile Strategic Plan Goals&quot; section on page 3 of the document. Integration with transit via signage and directional indicators is included as part of the Bike Share and Car Share components.</td>
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</tr>
<tr>
<td>The plan should consider signage consistency when directing potential users from Metro stations to bike parking, car-share, bike share, NEV stations, etc.</td>
<td>Within the Pathway Toolbox, each of the components includes the integration of transit signage from Metro stations. Provision of consistent signs--branding--is included as a concept but was not within the purview of this effort.</td>
<td></td>
</tr>
<tr>
<td>The plan should stress the importance to establish a universal payment system ad should consider TAP integration. Since services such as bike parking and vehicle sharing are meant to serve as an extension of the transit system, then payment integration and user convenience should also be a plan goal.</td>
<td>This is being considered as part of the TAP program.</td>
<td></td>
</tr>
<tr>
<td>The plan should stress the need to provide better accommodations for bike on trains; and more secure bike parking at stations. It should be noted that secure bike parking at stations is preferable over simply providing more bike racks.</td>
<td>The suggested changes have been included. The Metro Bike Program also assists with providing secure bike facilities at Metro stations. Additionally, Metro also supports bike facilities which cater to more casual, or non-member, users.</td>
<td></td>
</tr>
</tbody>
</table>
On page 10, the study indicates that a review of recent collision statistics involving both pedestrians and bicyclists suggests that there are challenges in terms of safety. Based on what? Rate of collisions?

<table>
<thead>
<tr>
<th>This is based on number of collisions.</th>
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<tbody>
<tr>
<td></td>
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<tr>
<td>Also on page 10, the study points to</td>
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<tr>
<td>a rise in bicycle collisions - is there</td>
</tr>
<tr>
<td>any data on how many more bicyclists</td>
</tr>
<tr>
<td>are on the road?</td>
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<td>U.S. Census- American Community Survey</td>
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<tr>
<td>On page 23, we suggest that the</td>
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<tr>
<td>speeds for path arterials to be</td>
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<tr>
<td>revised to: Medium (5-12 MPH) and</td>
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<tr>
<td>Fast (12-35 MPH).</td>
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<tr>
<td>Comment taken under advisement.</td>
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<tr>
<td>On page 24, per the LA Municipal</td>
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<tr>
<td>Code, there may be some</td>
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<tr>
<td>limitations in allowing or</td>
</tr>
<tr>
<td>encouraging cyclists to ride through</td>
</tr>
<tr>
<td>parks. (LAMC 63.44 B 16. No person</td>
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<tr>
<td>shall drive or ride any cycle</td>
</tr>
<tr>
<td>or vehicle, whether powered by a</td>
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<tr>
<td>motor or human power, except on paths,</td>
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<tr>
<td>roads or drives designed and</td>
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<td>provided for such purposes.)</td>
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<tr>
<td>The Plan is a countywide effort;</td>
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<tr>
<td>therefore implementation of</td>
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<tr>
<td>strategies and elements is</td>
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<tr>
<td>contingent upon codes and regulations</td>
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<tr>
<td>in effect for each jurisdiction.</td>
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<tr>
<td>On page 31, &quot;raised crossings&quot; are</td>
</tr>
<tr>
<td>also referred to as &quot;speed tables.&quot;</td>
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<td></td>
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<tr>
<td>Thank you for the clarification.</td>
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<tr>
<td>On page 37, the study should</td>
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<tr>
<td>reference the California MUTCD section</td>
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<tr>
<td>on bike wayfinding.</td>
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<tr>
<td>This is a valid suggestion that can be</td>
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<td>incorporated in the implementation</td>
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<tr>
<td>phases of the Plan.</td>
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<tr>
<td>On page 40, when listing the goals,</td>
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<tr>
<td>the study should also list the need</td>
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<tr>
<td>to increase safety for bicyclists - not</td>
</tr>
<tr>
<td>just pedestrians. Should also stress</td>
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<td>width, visibility and lighting.</td>
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<tr>
<td>The suggested changes have been made</td>
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<tr>
<td>to the Plan.</td>
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<td>On page 42, for the second bullet</td>
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<tr>
<td>under &quot;Guidelines &amp; Resources&quot; the</td>
</tr>
<tr>
<td>statement should end as follows: &quot;....and make cycling more comfortable and inviting to all users.&quot; Also, under the 3rd bullet, we disagree that the cycle track should be the same level as the sidewalk.</td>
</tr>
<tr>
<td>The suggested changes have been made</td>
</tr>
<tr>
<td>to the second bullet. We will take the</td>
</tr>
<tr>
<td>comment regarding cycle tracks and</td>
</tr>
<tr>
<td>sidewalks under advisement.</td>
</tr>
<tr>
<td>On page 43, please consider adding another bullet under &quot;Guidelines &amp; Resources&quot; as follows: &quot;Recognize that state law requires that bicyclists be allowed to ride to the right of the roadway.&quot;</td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td>On page 46, the plan should refer to rolling lanes and cycle tracks.</td>
</tr>
<tr>
<td>On page 50, please note that even more important than high-visibility bike parking is the need to provide bicyclists with better access to Metro stations, safe/secure bike parking, and improved accommodations on trains. Should also reference the recent work by UCLA and SCAG on the Bike Data Clearinghouse.</td>
</tr>
<tr>
<td>On page 60, under &quot;Accessibility&quot; the 2nd bullet should read as follows: &quot;Lack of bicycle facilities and secure bike parking&quot;</td>
</tr>
<tr>
<td>On pages 64 and 68, under &quot;Accessibility&quot; the study should add a 5th bullet: &quot;Lack of secure bike parking&quot;</td>
</tr>
</tbody>
</table>
First/Last Mile Pilot Station Motion and Amendment

7. AD-HOC SUSTAINABILITY COMMITTEE RECOMMENDED (5-0) as amended approval of Motion by Directors Fasana, O’Connor and Bonin that the Metro Board directs the CEO to report back in February 2014 with the following:

A. identification of two stations for each line which would benefit from implementation of First/Last improvements based on recommendations outlined in Metro’s First/Last Mile Study.

B. identification of funding to implement the improvements including working with jurisdictions to utilize and/or supplement existing Call funding without impact to other transit lines.

C. coordination and further development of design concepts to prototype a seamless regional First/Last Mile vision for potential implementation at other transit line stations including Crenshaw, Regional Connector and the Westside Subway.

O’CONNOR AND DUBOIS AMENDMENT:

A. include jurisdictions with rail lines already authorized for construction or presently in operation; and

B. allow "sub-regional funding" to be an eligible local source of funding for projects that are eligible under sub-regional fund guidelines and meet the first/last mile funding eligibility criteria.
Proposed First/Last Mile Pilot Stations

<table>
<thead>
<tr>
<th>Exposition Light Rail Line Phase II</th>
<th>Total Estimated Cost ($ in thousands)</th>
<th>Primary Funding Source</th>
<th>Secondary Source(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>17th St. Station First/Last Mile Pedestrian Enhancements</td>
<td>$2,200</td>
<td>ATP</td>
<td>Measure R Sub-regional Equity; federal grants</td>
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<tr>
<td>Expo/Bundy Station Multi-modal Connectivity Enhancements</td>
<td>$2,432</td>
<td>ATP</td>
<td>Measure R Sub-regional Equity; federal grants</td>
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</table>

<table>
<thead>
<tr>
<th>Gold Line Foothill Extension 2A</th>
<th>Total Cost ($ in thousands)</th>
<th>Primary Funding Source</th>
<th>Secondary Source(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arcadia Gold Line Station Pedestrian Linkage Project and Bicycle Facility Improvements</td>
<td>$3,002</td>
<td>ATP</td>
<td>Measure R Sub-regional Equity; federal grants</td>
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<tr>
<td>Duarte Gold Line Station Pedestrian Improvements</td>
<td>$1,534</td>
<td>ATP</td>
<td>Measure R Sub-regional Equity; federal grants</td>
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<tr>
<td>Name</td>
<td>Membership</td>
<td>Affiliation</td>
<td>Phone</td>
</tr>
<tr>
<td>--------------------</td>
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<td>------------</td>
</tr>
<tr>
<td>Cory Wilkerson</td>
<td>City of Burbank</td>
<td>City of Santa</td>
<td>(818) 238-5206</td>
</tr>
<tr>
<td>Michelle Glickert</td>
<td>Monica</td>
<td></td>
<td>(310) 428-4301</td>
</tr>
<tr>
<td>Deborah Murphy</td>
<td>LA Walks</td>
<td></td>
<td>(323) 661-3173</td>
</tr>
<tr>
<td>Eric Bruins</td>
<td>LACBC</td>
<td></td>
<td>(213) 629-2142</td>
</tr>
<tr>
<td>Samuel Moon</td>
<td>LACBC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rye Baerg</td>
<td>SRTSNP</td>
<td></td>
<td>(310) 268-8381</td>
</tr>
<tr>
<td>Jessica Meaney</td>
<td>SRTSNP</td>
<td></td>
<td>(213) 221-7179</td>
</tr>
<tr>
<td>Mark Nitti</td>
<td>Metrolink</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hilary Norton</td>
<td>FAST</td>
<td></td>
<td>(213) 448-2900</td>
</tr>
<tr>
<td>Ryan Lehman</td>
<td>LA</td>
<td></td>
<td>(213) 598-0800</td>
</tr>
<tr>
<td>Gloria Ohland</td>
<td>Move LA</td>
<td></td>
<td>(310) 310-2390</td>
</tr>
<tr>
<td>Walker Wells</td>
<td>Global Green</td>
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<td>(310) 581-2700</td>
</tr>
<tr>
<td>Ellen Blackman</td>
<td>Adv. Com.</td>
<td></td>
<td>(310) 721-3731</td>
</tr>
<tr>
<td>Jay Kim</td>
<td>City of LA</td>
<td></td>
<td>(213) 972-8438</td>
</tr>
<tr>
<td>Simon Pastucha</td>
<td>City of LA</td>
<td></td>
<td>(213) 978-1475</td>
</tr>
<tr>
<td>Troy Evangelho</td>
<td>LA County</td>
<td></td>
<td>(213) 974-6417</td>
</tr>
<tr>
<td>Kristen Eberhard</td>
<td>NRDC</td>
<td></td>
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<tr>
<td>Rufina Juarez</td>
<td>Metro</td>
<td></td>
<td>(213) 922-7405</td>
</tr>
<tr>
<td>Lori Abrishami</td>
<td>Metro</td>
<td></td>
<td>(213) 922-4210</td>
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<tr>
<td>Todd Mitsuhata</td>
<td>Metro</td>
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<td>(213) 922-5656</td>
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<tr>
<td>Alex Oster</td>
<td>Metro</td>
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<td>(213) 922-4825</td>
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<tr>
<td>Neha Chawla</td>
<td>Metro</td>
<td></td>
<td>(213) 922-3984</td>
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<tr>
<td>Maggie Derk</td>
<td>Metro</td>
<td></td>
<td>(213) 922-2842</td>
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<tr>
<td>Desiree Portillo-Rabinov</td>
<td>Metro</td>
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<td>(213) 922-3039</td>
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<tr>
<td>Adela Felix</td>
<td>Metro</td>
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<td>(213) 922-4333</td>
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<tr>
<td>Diana Gonzalez</td>
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<td></td>
<td>(213) 922-2203</td>
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<tr>
<td>Tham Nguyen</td>
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<td>(213) 922-2606</td>
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<tr>
<td>Chris Haskell</td>
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<td>(213) 922-6908</td>
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<tr>
<td>Janna Smith</td>
<td>Metro</td>
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<td>(213) 922-4008</td>
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<tr>
<td>Yvonne Price</td>
<td>Metro</td>
<td></td>
<td>(213) 922-4308</td>
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<tr>
<td>Lynne Goldsmith</td>
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<td>(213) 922-3068</td>
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<tr>
<td>Alan Thompson</td>
<td>Metro</td>
<td></td>
<td>(213) 236-1940</td>
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<tr>
<td>Matt Gleason</td>
<td>SCAG</td>
<td></td>
<td>(213) 236-1800</td>
</tr>
<tr>
<td>Dylan Jones</td>
<td>SCAG</td>
<td></td>
<td>(949) 833-5588</td>
</tr>
<tr>
<td>Bill Delo</td>
<td>IBI Group</td>
<td></td>
<td>(949) 833-5588</td>
</tr>
</tbody>
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