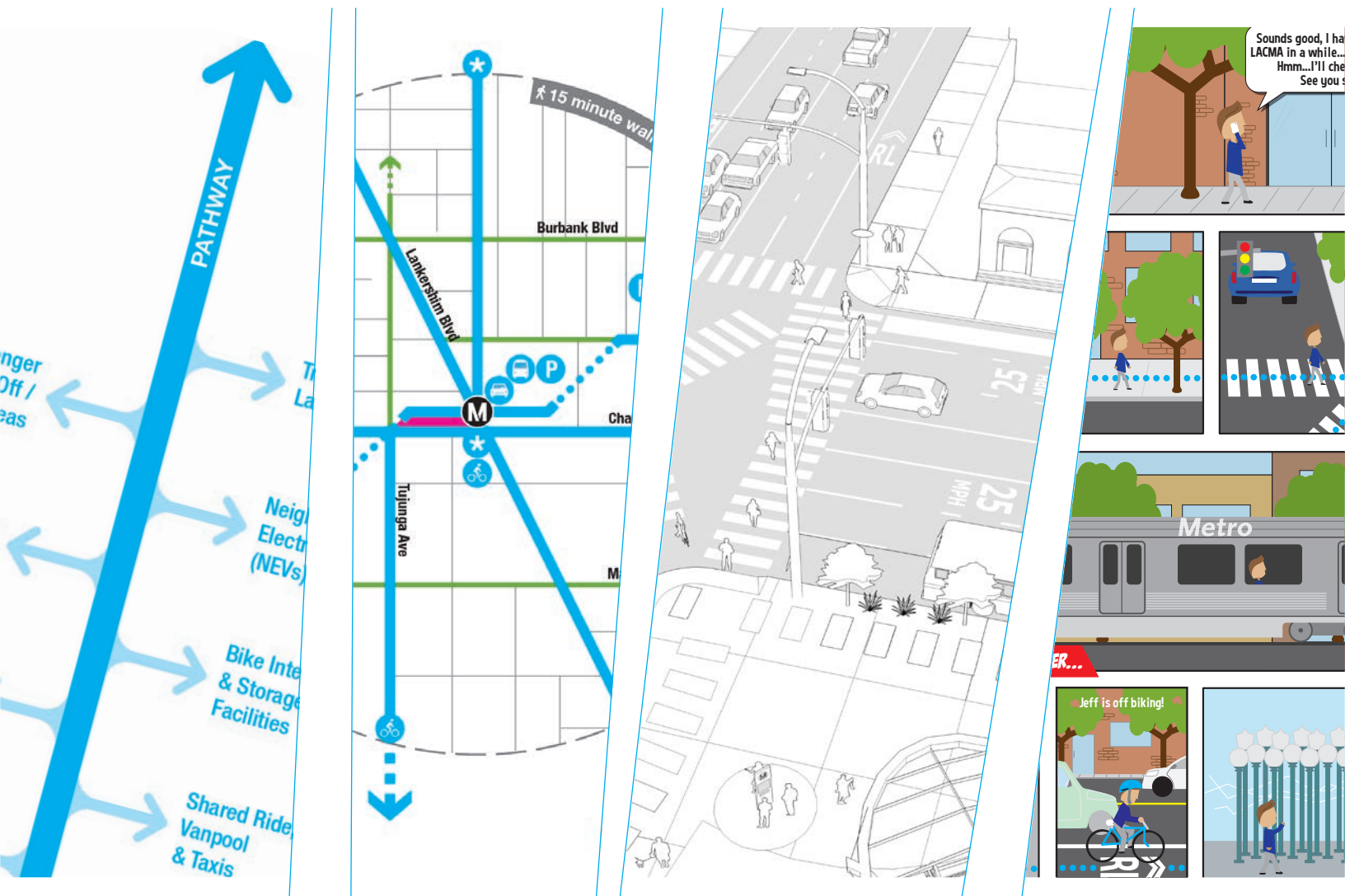


# First Last Mile Strategic Plan

## & PLANNING GUIDELINES







# ACKNOWLEDGMENTS

## The Los Angeles County Metropolitan Transportation Authority (Metro)

Diego Cardoso, Metro  
Shahrazad Amiri, Metro  
Neha Chawla, Metro  
Steven Mateer, Metro  
Alexandra Oster, Metro

## Southern California Association of Governments (SCAG)

Sarah Jepson, SCAG  
Alan Thompson, SCAG  
Matt Gleason, SCAG

## Consultants (IBI Group Team)

Dylan Jones, IBI Group  
Bill Delo, IBI Group  
Christina de Frietes, IBI Group  
Matt Redmond, IBI Group  
Avery Carrig, IBI Group  
Lissette Valenzuela, IBI Group  
Nadim Kurani, IBI Group  
Melani Smith, Meléndrez  
Amber Hawkes, Meléndrez  
Shannon Davis, Meléndrez  
David Koo, Meléndrez  
Brian Gaze, Alta Planning  
Ryan Johnson, Alta Planning

## First Last Mile Technical Advisory Committee (Project TAC)

Rye Baerg, Safe Routes to School  
Ellen Blackman, Accessibility Advisory Committee  
Robert Boardman, City of Redondo Beach  
Maddie Brozen, UCLA Luskin School of Public Affairs  
Eric Bruins, Los Angeles County Bicycle Coalition  
Connie Chung, County of Los Angeles  
Allan Crawford, City of Long Beach  
Troy Evangelho, County of Los Angeles  
Michelle Glickert, City of Santa Monica  
Jay Kim, City of Los Angeles  
Alexis Lantz, LA County Department of Public Health  
Brian Ludicke, City of Lancaster  
Ryan Lehman, Living Streets LA  
Jessica Meaney, Safe Routes to School  
Deborah Murphy, LA Walks  
Mark Nitti, Metrolink  
Hilary Norton, Fixing Angelenos Stuck in Traffic (FAST)  
Ghloria Ohland, Move LA  
Simon Pastucha, Los Angeles Department of City Planning  
Katherine Sims, SCRRA  
Walker Wells, Global Green  
Cory Wilkerson, City of Burbank  
Mark Yamerone, City of Pasadena  
Lori Abrishami, Metro  
Stewart Chesler, Metro  
Maggie Derk, Metro  
Adela Felix, Metro  
Lynne Goldsmith, Metro  
Diana Gonzalez, Metro  
Rufina Juarez, Metro  
Todd Mitsuhata, Metro  
Tham Nguyen, Metro  
Desiree Portillo-Rabinov, Metro  
Yvonne Price, Metro  
Janna Smith, Metro  
Cory Zelmer, Metro

**Notes:**

***This page intentionally left blank.***





# First Last Mile Strategic Plan

## & PLANNING GUIDELINES

### TABLE OF CONTENTS

<b>1</b>	INTRODUCTION	3
<b>2</b>	FIRST LAST MILE PLANNING	5
<b>3</b>	THE PATHWAY	12
<b>4</b>	NETWORK IDENTIFICATION, DESIGN, AND IMPLEMENTATION	17
<b>5</b>	PATHWAY TOOLBOX	27
<b>6</b>	ILLUSTRATIONS	59
<b>7</b>	STRATEGIES FOR PLAN APPLICATION	76
<b>A</b>	APPENDIX	APPENDIX



**Notes:**

***This page intentionally left blank.***

# 1 INTRODUCTION

- ✳ Los Angeles County Metropolitan Transportation Authority (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 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. These planning guidelines outline a specific infrastructure improvement strategy designed to facilitate easy, safe, and efficient access to the Metro system. They introduce a concept herein referred to as ‘the Pathway’, and provide direction on the layout of transit access networks and components within Metro Rail and fixed route Bus Rapid Transit (BRT) station areas. They serve as a resource for Metro and the many public and private organizations throughout the region working to update programs, land-use plans, planning guidelines, business models, entitlement processes, and other tools that take advantage of LA County’s significant investment in the public transportation network.

## Metro First Last Mile Strategic Plan Goals

- 1 *Expand the reach of transit through infrastructure improvements.*
- 2 *Maximize multi-modal benefits and efficiencies.*
- 3 *Build on the RTP/SCS and Countywide Sustainable Planning Policy (multi-modal, green, equitable and smart).*

## First Last Mile Strategic Plan Goals

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 the Planning Guidelines

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 the Pathway plays in supporting transit access and regional planning goals.*

## How to use these Guidelines

The guidelines are structured around the following sections:



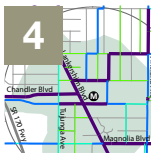
**Introduction** The introduction provides an overview of these guidelines, strategic goals and project purpose.



**First Last Mile Planning** 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.



**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.



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



**Pathway Toolbox** 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.



**Illustrations** 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.

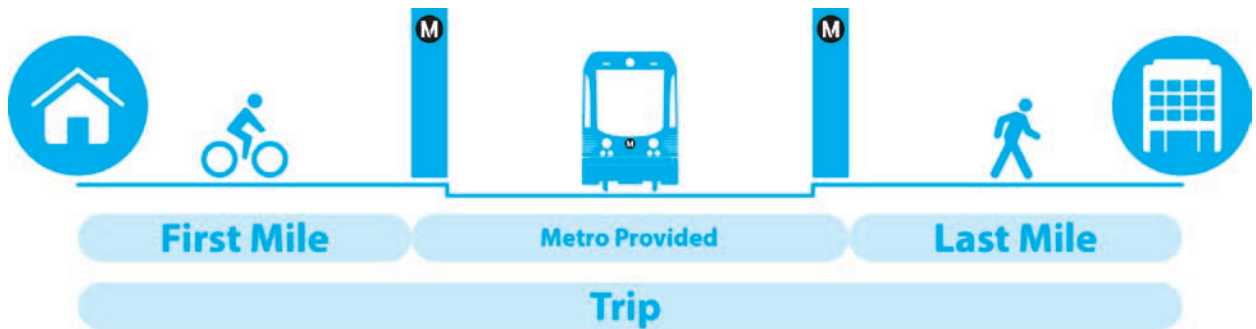


**Strategies for Plan Application** An Implementation Table and ridership targets are presented to guide next step efforts.



**Appendix**

# 2 FIRST LAST MILE PLANNING



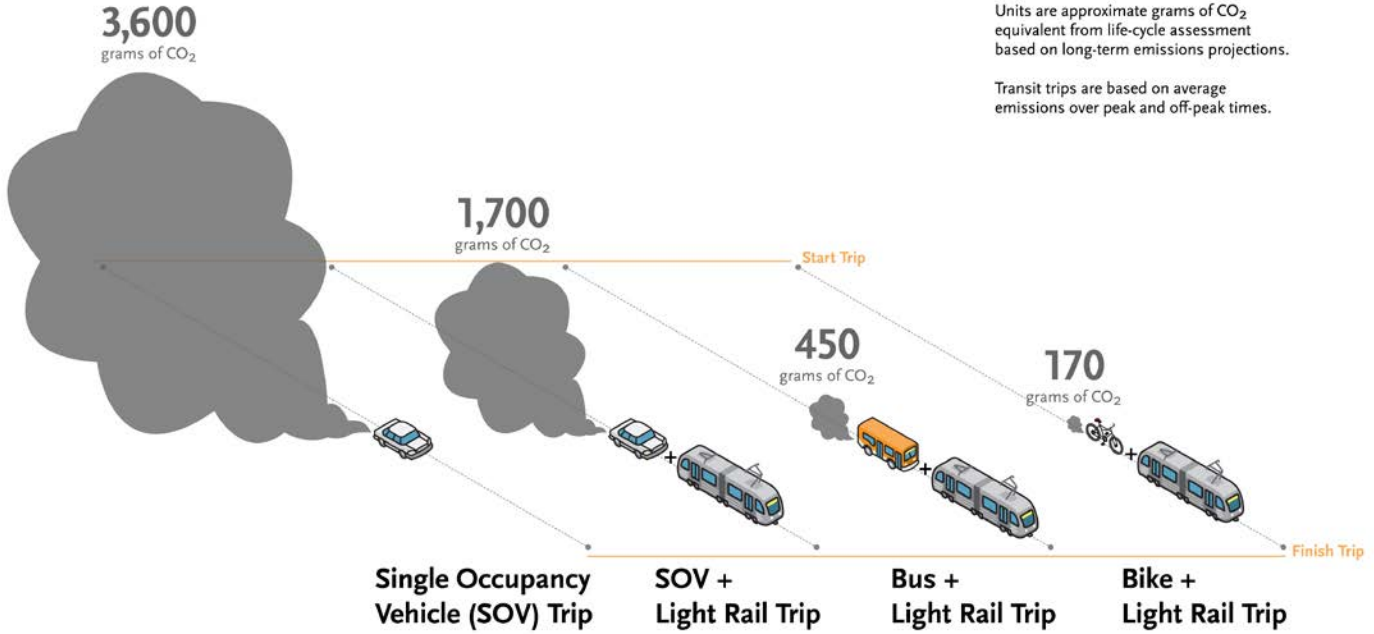
## First Last Mile Definition

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 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



Units are approximate grams of CO<sub>2</sub> equivalent from life-cycle assessment based on long-term emissions projections.

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



Mikhail Chester et al, "Infrastructure and Automobile Shifts: Positioning Transit to Reduce Life-Cycle Environmental Impacts for Urban Sustainability Goals", *Environmental Research Letters* 8, no.1 (2013). doi:10.1088/1748-9326/8/1/015041

## Policy Context

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

**51%** of New Housing Developed Between 2008 and 2035 Will Be Within HQTAs, Along With...

**53%** of New Employment Growth.

**855,000 Jobs** Currently Connected to Metro's Fixed-Guideway System

**485,000 New Jobs** Will Be Linked With Measure R Lines

*"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."*

2012 RTP/SCS

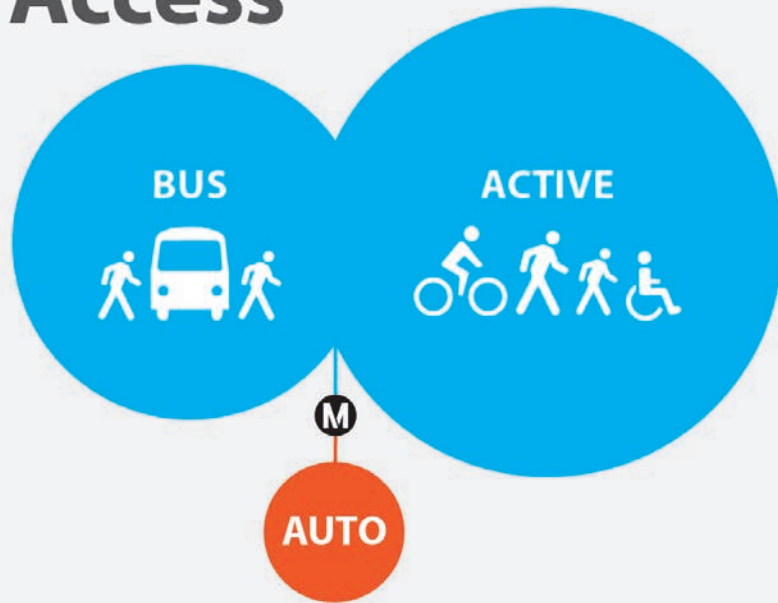
Southern California Association of Governments  
ADOPTED APRIL 2012

REGIONAL TRANSPORTATION PLAN  
2012-2035 RTP

*The 2012 RTP/SCS outlines a broad and ambitious strategy for sustainably managing regional growth. Mobility, land-use and health inform an integrated approach to achieving regional policy goals related to clean air and economic vitality.*



# Metro Rail/BRT Access



**91%**  
**Walk, Bike, Roll,**  
**and Take Buses to Stations**  
 Active Transportation Networks  
 2011 Metro On-Board Survey



**9%**  
**Drive & Park**  
**or Dropped-Off at Stations**  
 Roads & Parking Facilities

	Access Distance	VMT	GHG	Calories Burned	Cost
	High	High	High	Low	High
	Low	Low	Low	High	Low

*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.*



## Challenges

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 Users

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:

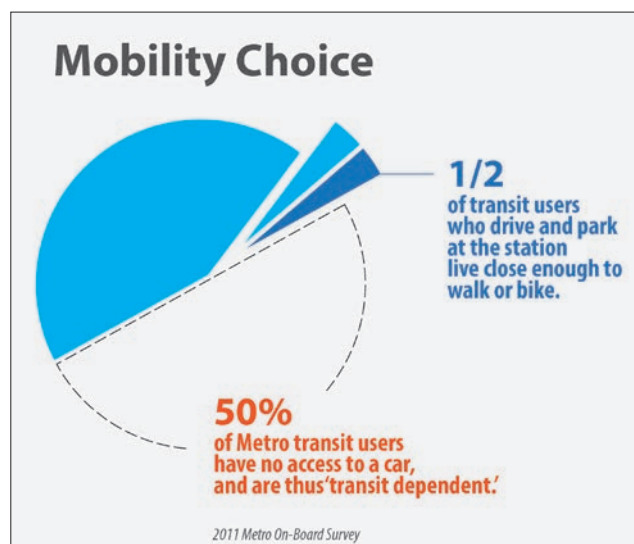
- **75% of transit riders belong to households earning less than \$25,000.**
- **Half of all transit riders are transit-dependent, i.e., they belong to households that do not own any vehicles.**

- **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.

## Transfer Activity

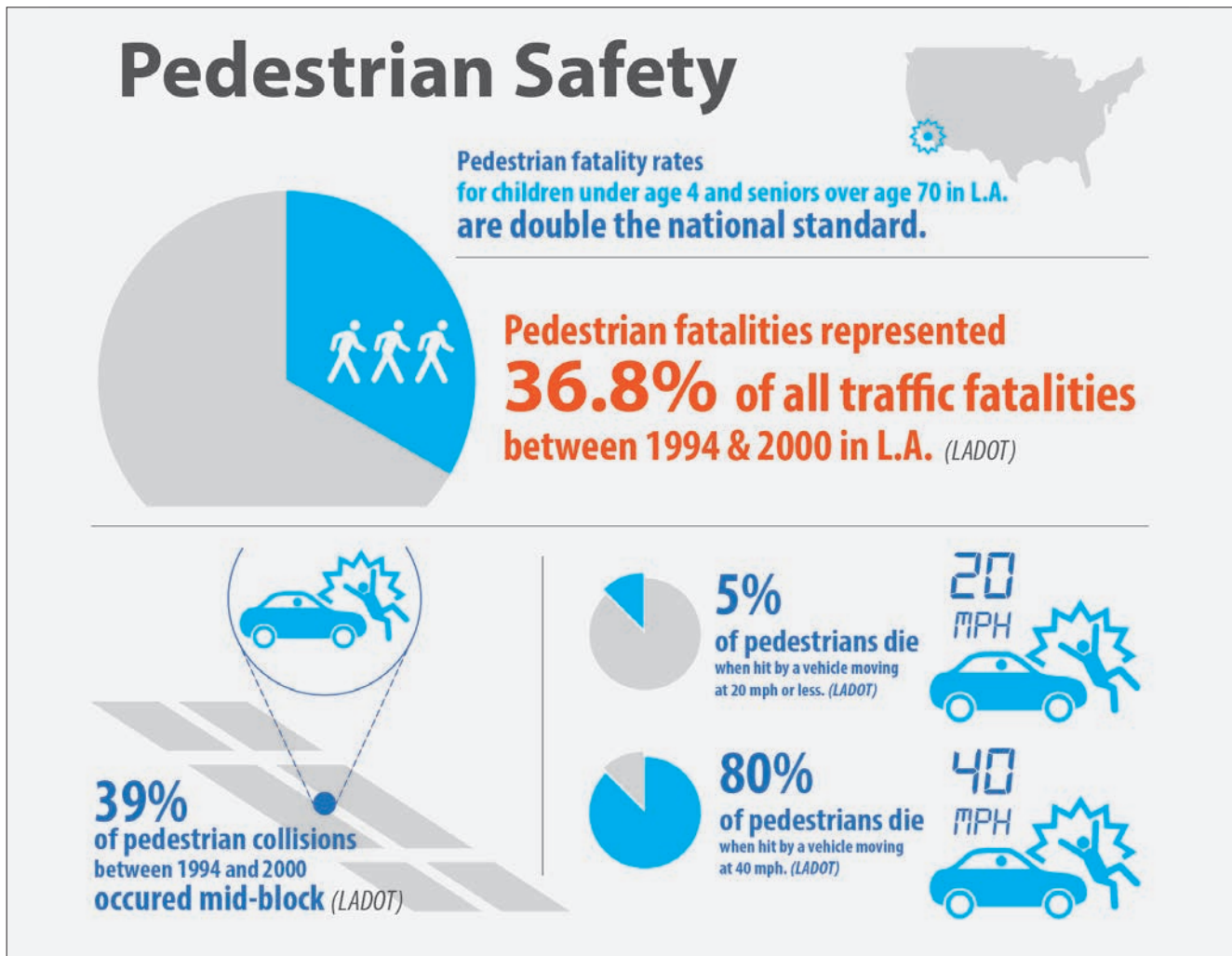
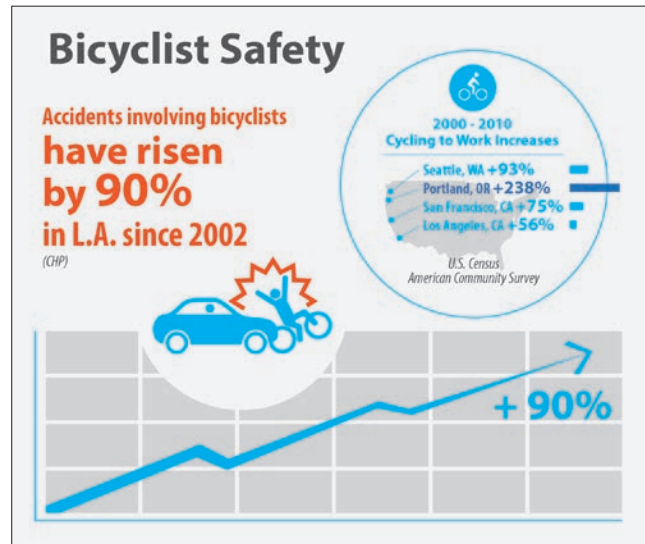
The Metro system is witness to a significant amount of transfer activity; nearly 64% of riders make at least one transfer to complete their one-way trip. Transfer activity, when not happening within a station is reliant on active transportation networks in the immediate vicinity of the subject stations. 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.



## User Safety along Access Routes

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.



## Existing Conditions

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



**1** ***Long Blocks** – Transit riders prefer direct routes to their destination. Long blocks often equate to unnecessarily long routes, or unsafe crossing activity.*



**2** ***Freeways** – Freeways carve our region into a number of 'pedestrian islands'. Links between these islands are effectively broken by dark and unpleasant underpasses or equally challenging overpasses.*



**3** ***Maintenance** – Many of our basic walking and rolling surfaces are buckled, broken and generally impassable to all but the nimble footed.*



**4** ***Safety and Security** – Pedestrians in LA County are victim to some of the highest pedestrian fatality rates in the country. The neglect of infrastructure also adds to concerns over personal security.*



**5** ***Legibility** – It is too easy to get lost in LA County. Effective transit systems utilize sophisticated yet simple signage and wayfinding strategies. These strategies do not currently extend much beyond station boundaries*



**6** ***ROW Allocation and Design** – Traffic congestion along some streets crowd out all but the most fearless bike riders – on other streets wide roads are underutilized, and all active modes are relegated to a 4 foot wide broken strip of concrete. A more holistic and integrated approach is needed to provide equitable mobility along access routes.*



### 3 The Pathway

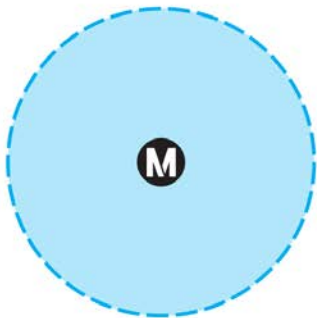


#### Metro First Last Mile Strategy

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.

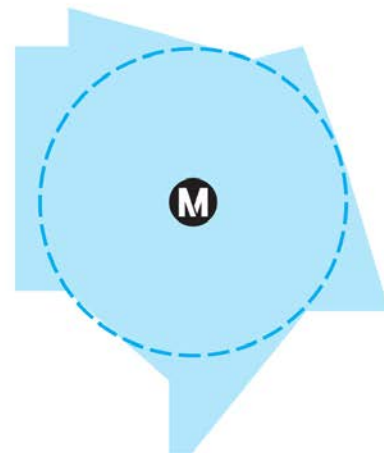
#### Policy:



#### Reality:



#### Goal:



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

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.

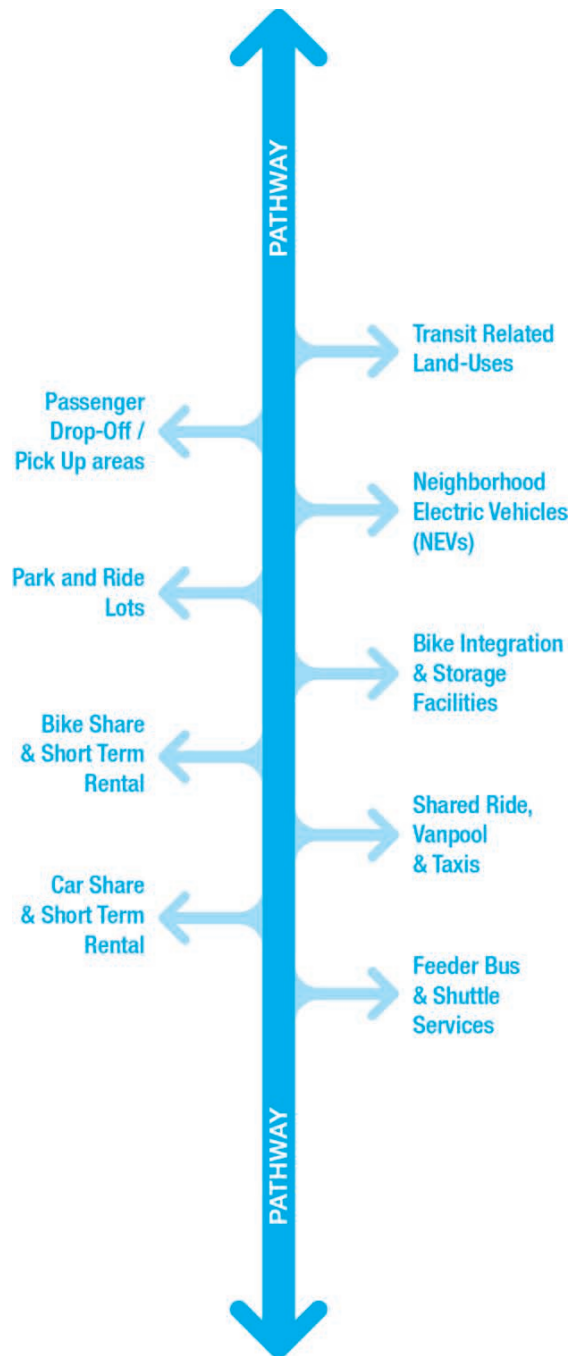
The Pathway is envisioned to include standard elements that support an association with the overall transit experience, and more flexible elements that respond to the context and character of varying communities and site specific challenges.

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 and Regional Policy

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 (VMTs) and green house gas emissions (GHGs), integrate physical activity into daily commute patterns, and improve economic vitality by connecting people to regional markets.

The Pathway is a bold concept that takes into consideration the pressing need for mobility solutions against a backdrop of population growth, demographic shifts, increased concern and awareness of human health and safety, environmental concerns and a rapidly expanding public transportation system.



## The Pathway – Expanding User Access Sheds

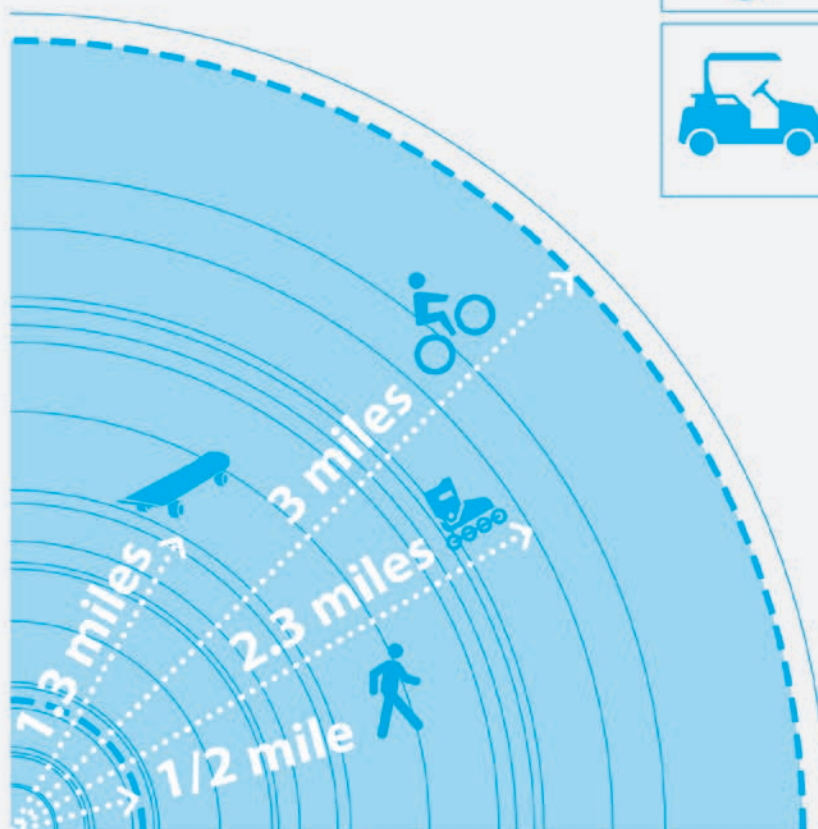
The Pathway expands transit user access sheds by:

**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.*

## The Pathway – Improving the User Experience

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.

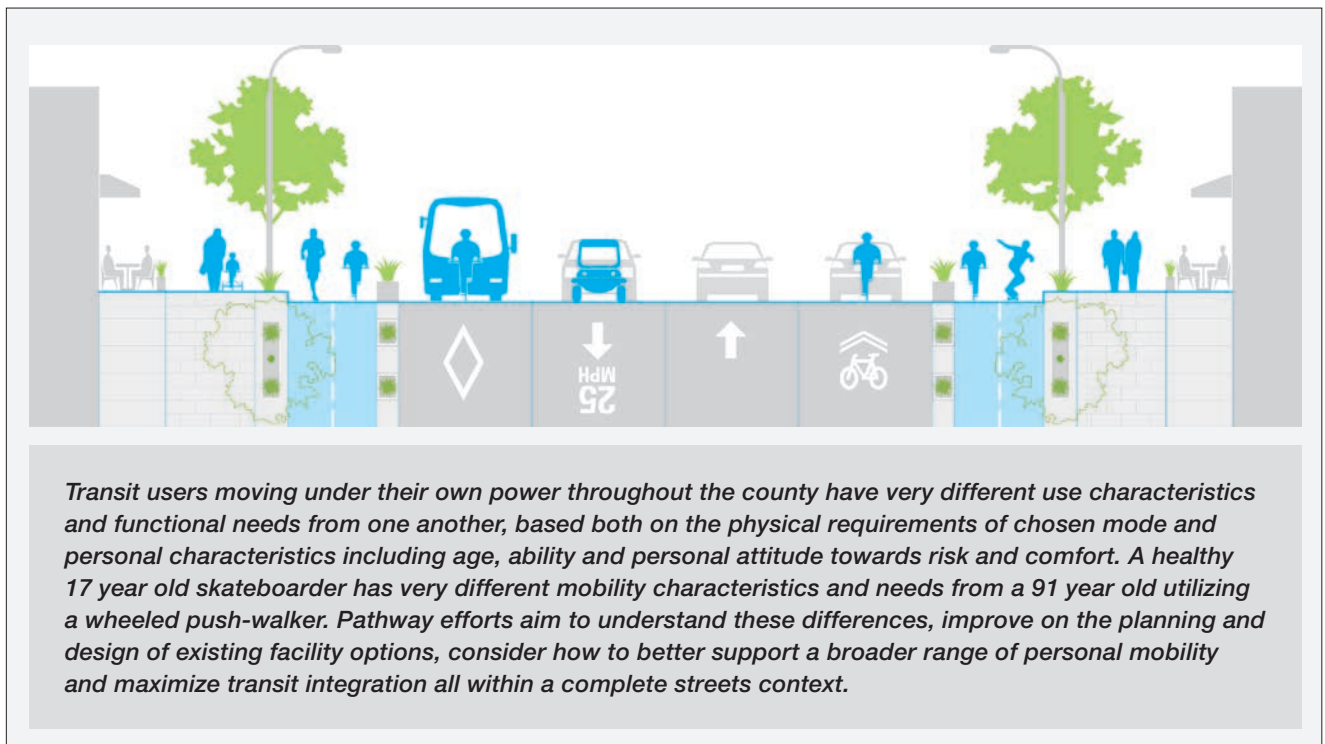
## Pathway Users – Today and Tomorrow

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.



## Pathway – Guiding Principles

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:

- 1 The Pathway is **Safe** – Safety is a key concern, and is supported by protected facilities, improved street crossings, strategic lighting and vehicular speed mitigation.
- 2 The Pathway is **Intuitive** – Traveling along the Pathway is an extension of the transit user's experience, and their ability to navigate to and from destinations is assisted by wayfinding strategies that support seamless multi-modal journeys.
- 3 The Pathway is **Universally Accessible** – The Pathway supports all modes of active transportation and remains accessible to individuals dependent on mobility support devices – from white-canes to wheeled push walkers and electric mobility scooters.
- 4 The Pathway is **Efficient** – Greater distances are traveled in a given amount of time along the Pathway. Rolling and walking surfaces are smooth and free of obstacles, routes are direct, and signals reduce wait times at street crossings.
- 5 The Pathway is **Fun** – People opt out of cars, and hop on scooters, skateboards and bikes to get to where they want to go, save money, burn calories and along the way, have fun.



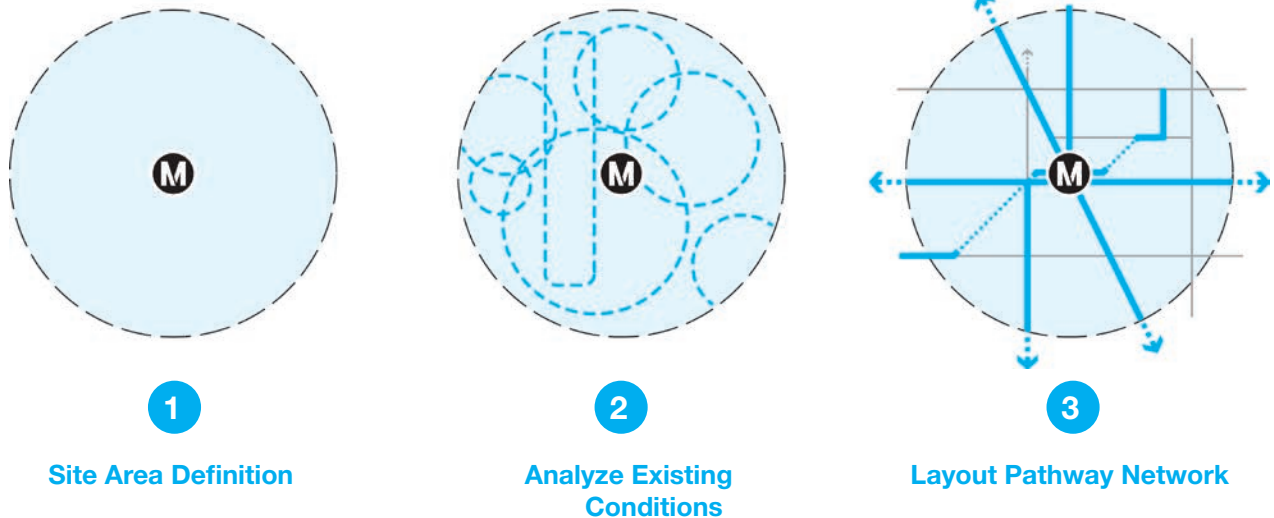
To see how Jeff and three others use the Pathway to complete their trips, refer to the appendix...



## 4

## NETWORK IDENTIFICATION, DESIGN &amp; IMPLEMENTATION

This chapter outlines a methodology for planning Pathway networks at transit stations. The three steps include:



- \* As stated in the introduction, the Pathway aims to extend the reach of transit in a number of ways. The Pathway consists of physical active transportation network improvements that allow the bundling of a broad range of first last mile strategic efforts. At its core, the Pathway aims to address the challenge of the vast majority of transit users accessing the station, namely their ability to physically do so in an efficient and safe manner. The vast majority of transit users are either rolling or walking themselves to stations, and they are limited by the distance they can realistically walk or roll. Furthermore, many make discretionary choices based on qualitative decisions, such as comfort and safety. The Pathway aims to expand the transit access shed, and to improve the quality of access within the shed.

### Site Area Definition (Step 1)

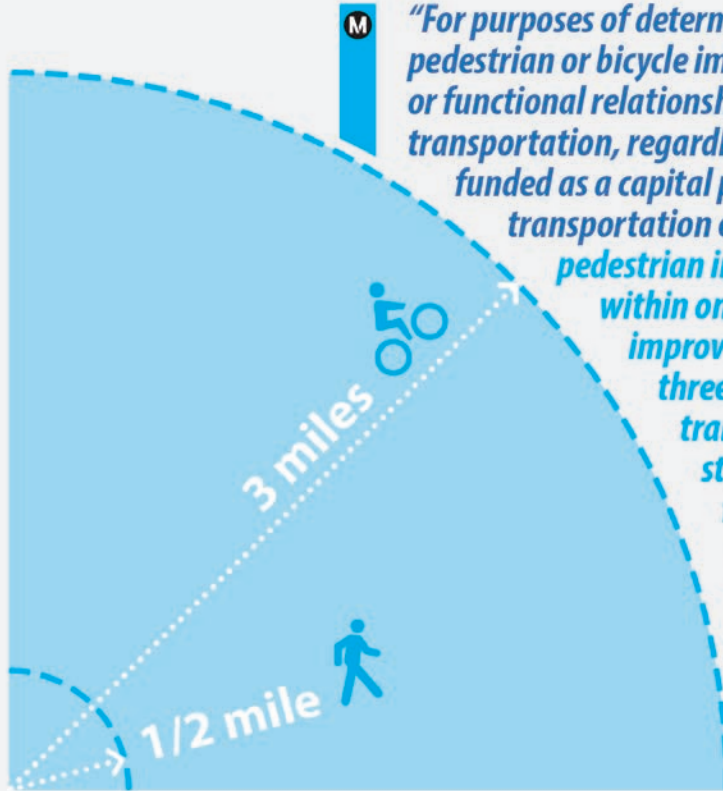
The first step in planning for the Pathway in any given station area is to determine the location and limits of the network. There are current active transportation networks throughout the county, comprised of sidewalks, roadways, street lights, signage, striping, signals and a number of other elements.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

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

potential 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

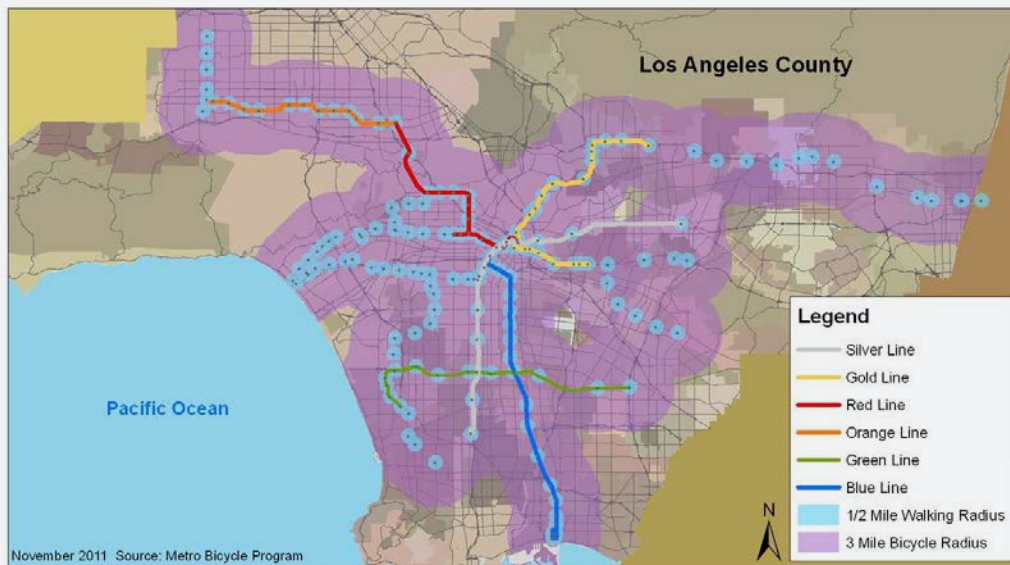
*\*Final Policy Statement on the Eligibility of Pedestrian and Bicycle Improvements Under Federal Transit Law*



**“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, all pedestrian improvements located within one-half mile and all bicycle improvements located within three miles of a public transportation stop or station shall have a de facto physical and functional relationship to public transportation.”**

*FTA - August 15, 2011*

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

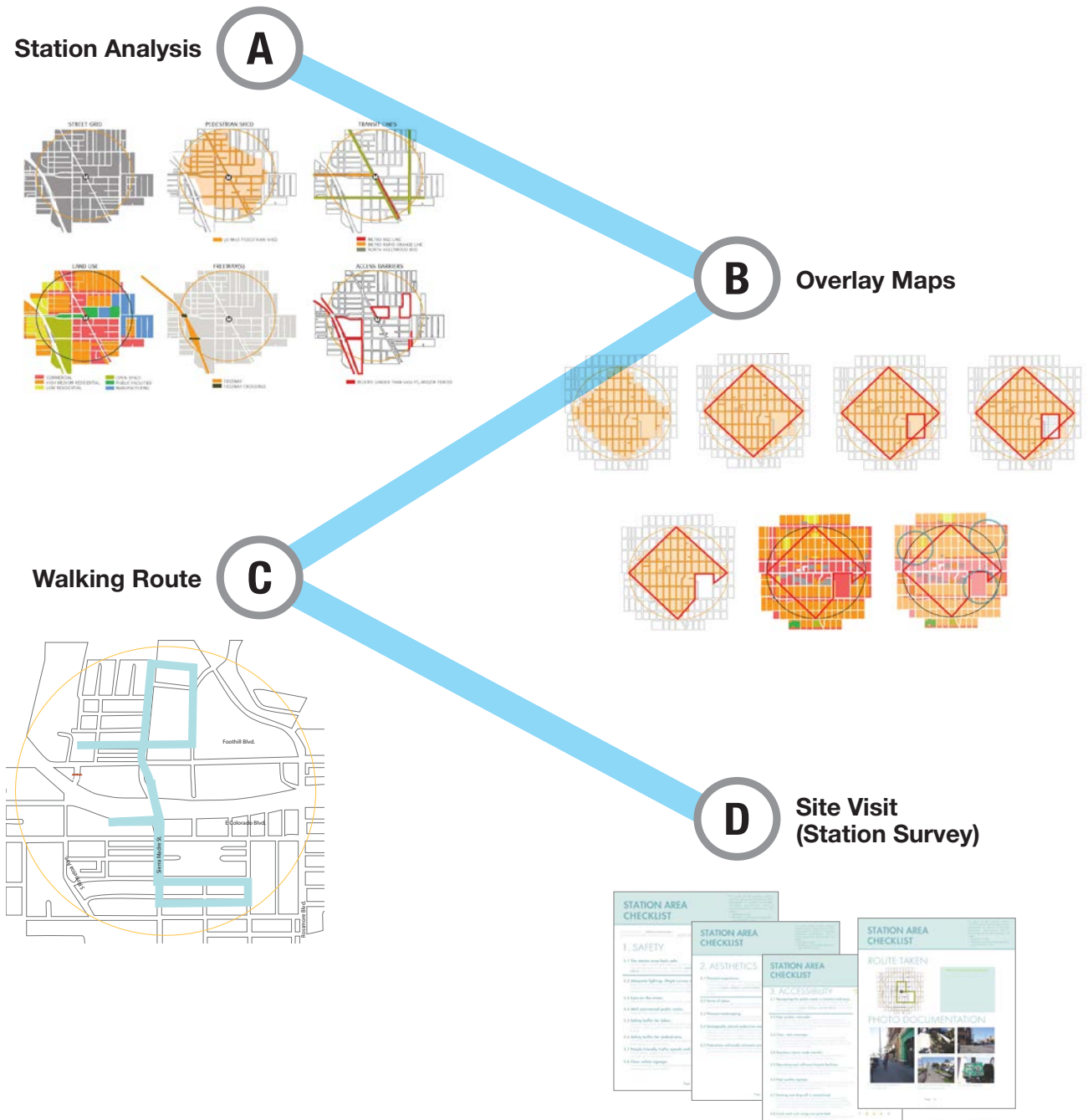


November 2011 Source: Metro Bicycle Program

## Analyze Existing Conditions (Step 2)

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, along with regional planning context and adjacent station area improvements to three miles of the station portal. The analysis steps include:



## A. Preliminary Station Analysis



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

### *Points of Interest*

The Points of Interest map highlights key sites located within the one-half 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.



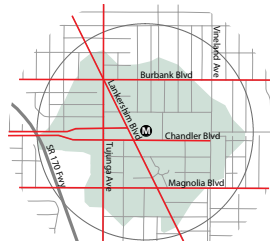
### *Street Grid*

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.



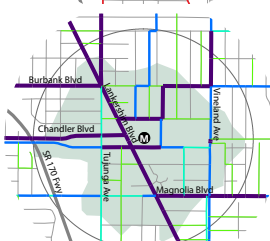
### *Pedestrian Shed*

The Pedestrian Shed map graphically displays the level of pedestrian accessibility for each station area. With the transit station as a starting point, all one-half 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.



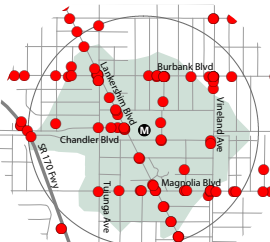
### *High Vehicular Speeds*

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*

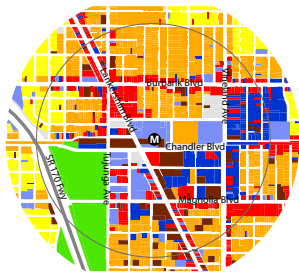
Key Transit Access Corridors are graphic depictions of Metro's Origin/Destination study. These maps graphically represent the most frequently used transit access routes.



### *Bike or Pedestrian Collisions with Automobiles*

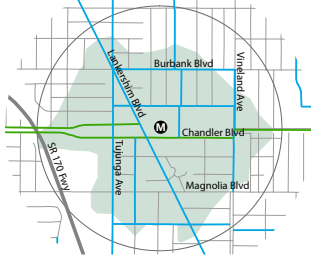
This map begins to show key intersections and locations where high rates of pedestrian and bicycle collisions with automobiles exist.





**Land Use Map**

The Land Use Map depicts concentrations of land use within each one-half 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.



**Bicycle Connections**

All infrastructure dedicated to bicycles in the roadway are shown in the Bicycle Connections map. This generally includes: existing bike lanes, sharrow, 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.



**Transit Connections**

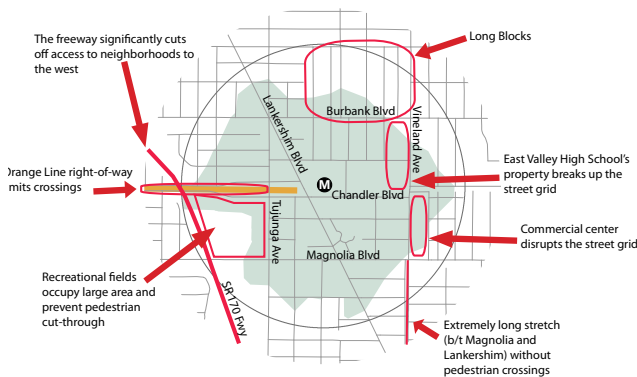
Using Metro and other transit agency data, routes of all transit modes are mapped within the one-half mile radius. This includes: all bus lines, light and heavy rail, and any other transit lines serving the station area. These maps should also include a review of the three mile access shed.

**Statistics**

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.



**Overlay of land use map with pedestrian shed map**

To begin, the station land use map can be overlaid with the pedestrian shed map. Here, any holes that exist within the one-half 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 ½ mile pedestrian shed, a note can be made, and the area highlighted.

**Overlay land use map with bike connections map**

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.

**Additional Overlays**

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**

1-1.99	Poor
2-2.99	Fair
3-3.99	Good
4-5	Excellent

**Checklist (see Appendix)**



## Layout Pathway Network (Step 3)

### Network Components

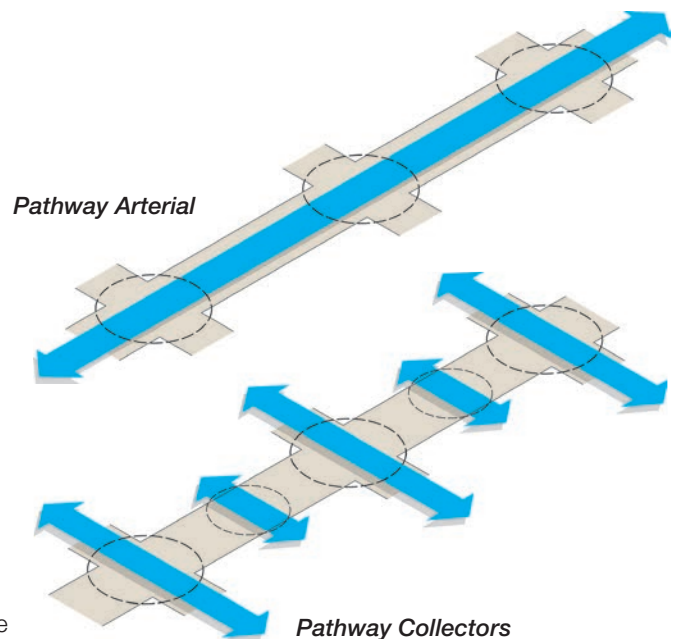
The Pathway includes a hierarchy of routes that extend out from the transit station. These routes take into consideration the existing street network, key destinations, feeder transit services, the existing and planned bike network, pedestrian/ bike access volumes and surrounding land uses. These items 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 neighbourhood 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 approach may be required to realize this goal due to constrained right-of-way (ROW). Separated active transportation lanes, signal and crossing improvements, wayfinding 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 four directions, and should correspond to the highest volume of pedestrian and rolling access to the station. Arterials must extend out at a minimum one-half mile from the station, to an upper limit of three miles from the station. Pathway arterials should integrate into the regional bike network at opportune points beyond the one-half mile access shed. Coordination with other station Pathway networks within three-mile shed is required.

### Key Mapping Inputs

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

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

### Key Mapping Inputs

*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.

### Key Mapping Inputs

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

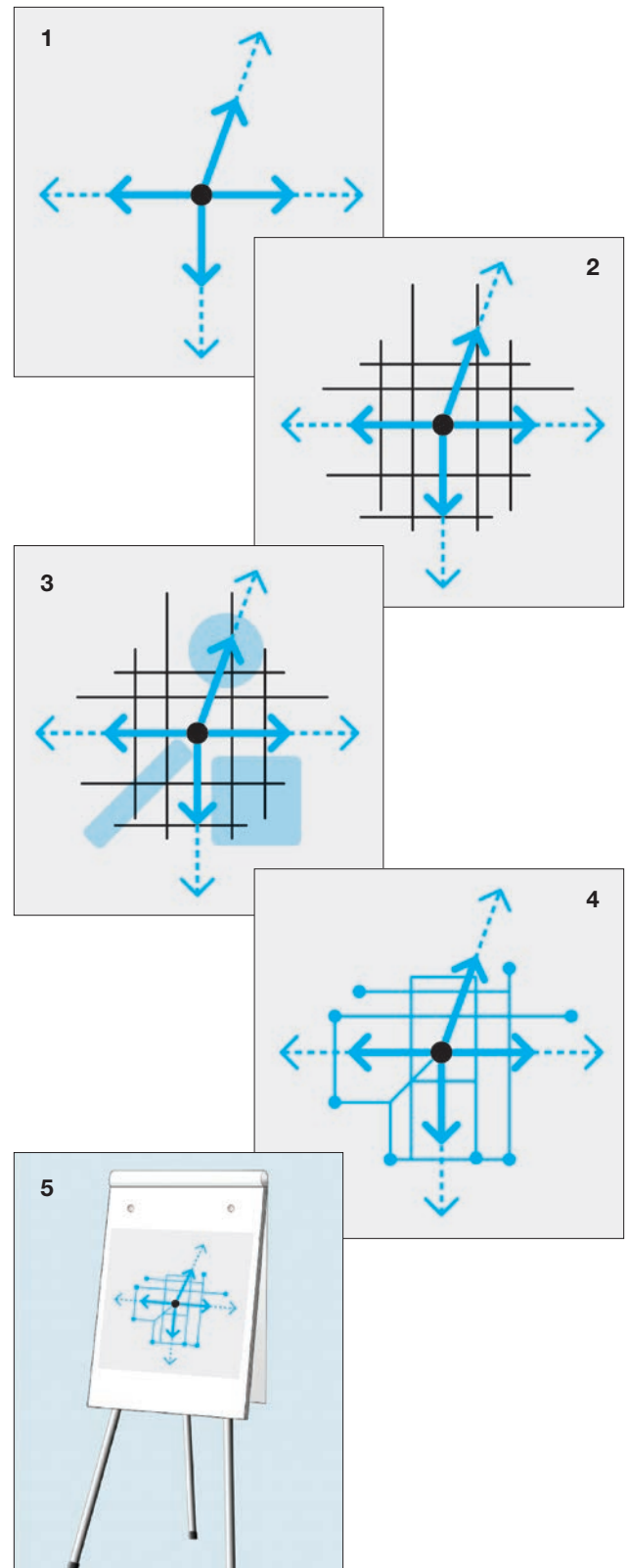
4. **Evaluate Network** – Review Pathway network relative to qualitative and quantitative inputs.

### Key Mapping Inputs

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

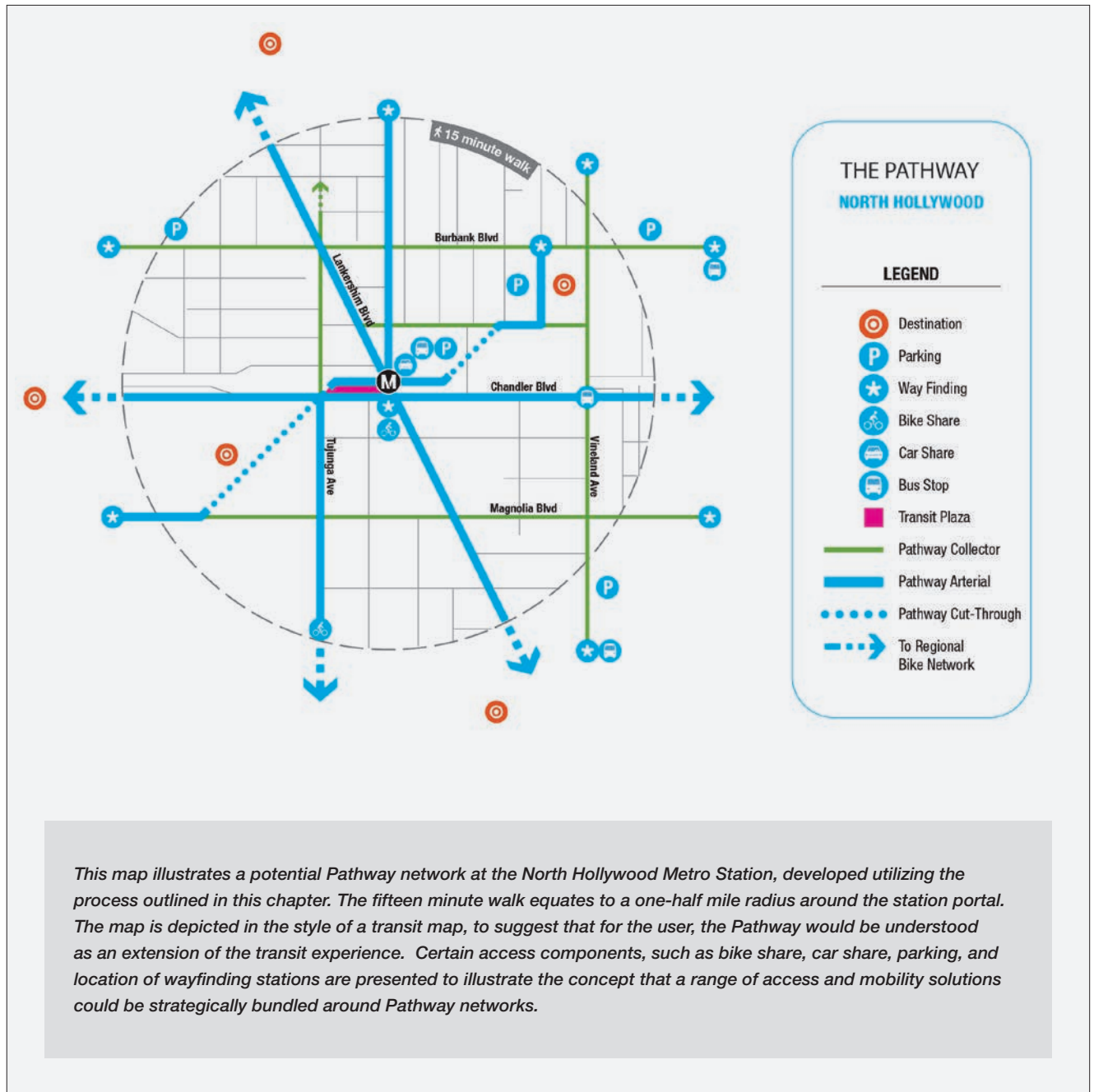
5. **Review and Refine Pathway Network** – Review network with key agency stakeholders and local representatives. This process will help inform design team of ongoing local efforts, strengthen knowledge of key local destinations and concerns, and inform the public of access improvement efforts.

*Stakeholder and public outreach*





**A Prototype Pathway Network Map...**



**Notes:**

***This page intentionally left blank.***

## 5 PATHWAY TOOLBOX

- ★ This Chapter presents a set of components that directly relate to the development of the Pathway concept. This is not an exhaustive list of what makes for a great public realm, and more components may be added on to this list as this concept is developed. The components chosen respond to our specific challenges here and now, and how we can make a more dignified transit-to-destination link, one that is safer and better maintained, more intuitive, efficient, and inviting, effectively expanding the transit station outward.

### Introduction

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:

1. *Crossing Enhancements and Connections*
2. *Signage and Wayfinding*
3. *Safety and Comfort*
4. *Allocation of Streetspace*
5. *Plug-in Components*

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.

### Applying the Toolbox to Real Places

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 **key considerations** are intended to support local jurisdictions in selecting treatments along Pathway networks:

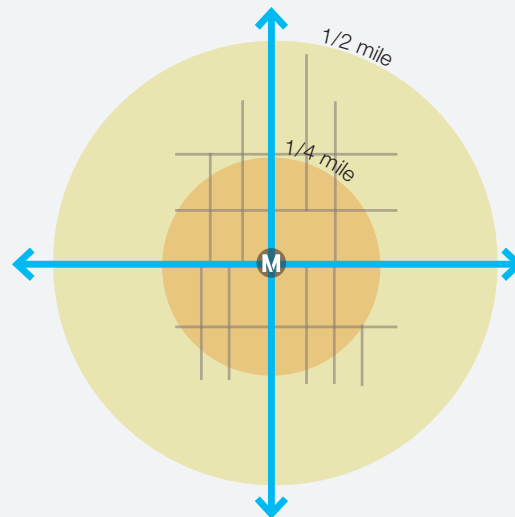
**Sphere of Influence:** The types and intensity of components deployed along Pathway Networks will differ depending on proximity to station. The “Extended Station Zone” is defined as roughly one-quarter mile radius from the station portal. The larger “Transit-Friendly Zone” extends out to an approximate one-half 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.



**A Hierarchy of 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.

**Flexibility in Design:** 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.

**Branding and Identity Building:** 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



-  Metro Station
-  Pathway Collector
-  Pathway Arterial

### EXTENDED STATION ZONE (AREA 1)

5-Minute Walk/2-Minute Bike

- 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

### TRANSIT-FRIENDLY ZONE (AREA 2)

10-Minute Walk/5-Minute Bike

- Less overt, more passive wayfinding and Pathway markers
- Address the most pressing safety and access improvements, such as:
  - New crossings
  - Curb ramps
  - Maintenance
  - Lighting and landscaping

## How to Use this Guide

**Category** Labels each Component with one of the six categories: Crossing Enhancements and Connections; Signage and Wayfinding, Safety and Comfort, Allocation of the Streetspace, and Integrated Transit Access Solutions.

**Component** Name of Component.

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

**Guidelines and Resources** 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.

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

**Pathway Network Compatibility** 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.).

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

### CROSSINGS AND CONNECTIONS

#### Cut-Throughs and Shortcuts



#### Goals

- » Provide more direct routes to and from the station

#### Guidelines and Resources

- » 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 shortcut paths 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

#### Transit Integration

- » Use Metro signage at entrances and decision points
- » Regularly place branded Metro medallion signage for the length of the pathway, every 60-100 ft approx

#### Station Access Barriers Addressed:

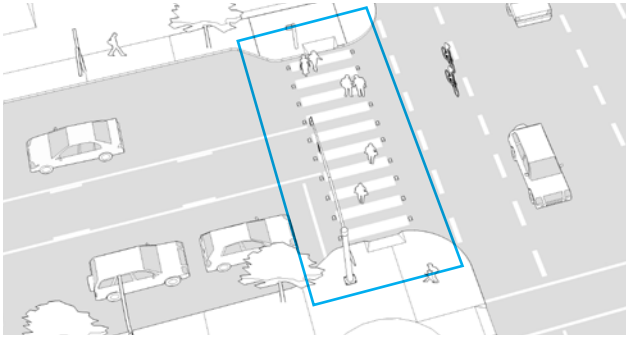
- Long Blocks
- Freeways
- Maintenance
- Safety and Security
- Legibility
- ROW Allocation and Design

#### Component Appropriate For Use On:

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

# CROSSINGS AND CONNECTIONS

## Enhance Existing Crosswalks



### Goals

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

### Guidelines and Resources

- » 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 Best Practices

### Transit Integration

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

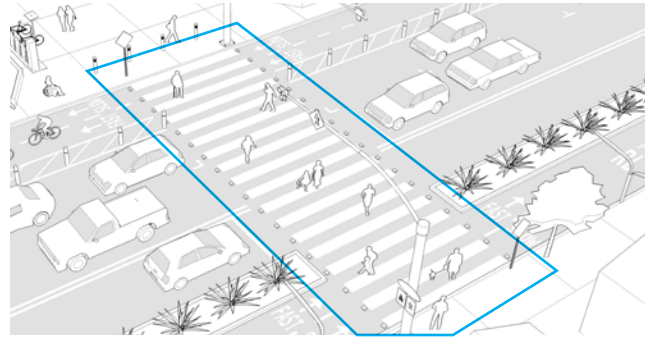
#### Station Access Barriers Addressed

- 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

## Mid-Block and Additional Intersection Crossings



### Goals

- » 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

### Guidelines and Resources

- » 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

### Transit Integration

- » 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

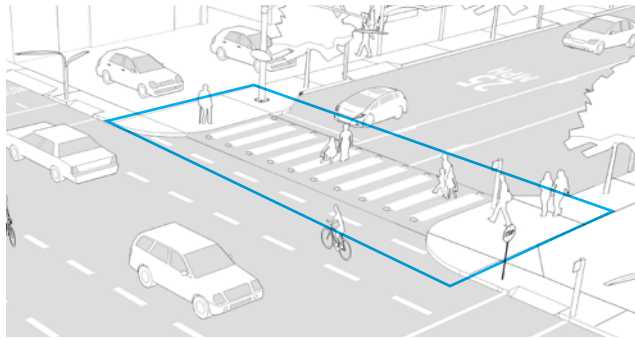
- Long Blocks
- Freeways
- Maintenance
- Safety and Security
- Legibility
- ROW Allocation and Design

#### Component Appropriate For Use On:

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

# CROSSINGS AND CONNECTIONS

## Raised Crossings



### Goals

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

### Guidelines and Resources

- » 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

### Transit Integration

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

#### 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

## [Case Study] Raised Crosswalks in Boulder and Cambridge

### Raised Crossings Aid in Pedestrian Safety

#### Boulder, Colorado<sup>1</sup>

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<sup>2</sup>

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.



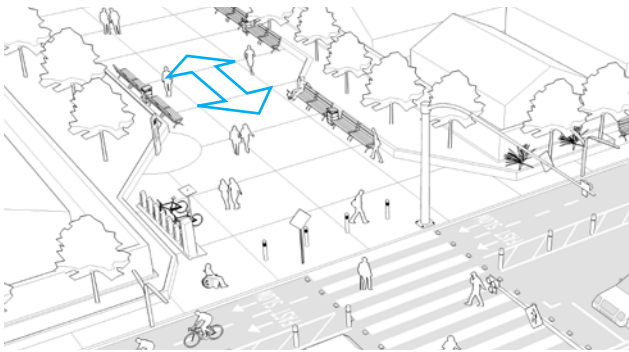
Cambridge, MA

**On one street in Cambridge, MA, motorists yielding to pedestrians crossing at the raised devices went from approximately 10% before installation to 55% after.**



# CROSSINGS AND CONNECTIONS

## Cut-Throughs and Shortcuts



### Goals

- » Provide more direct routes to and from the station

### Guidelines and Resources

- » 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

### Transit Integration

- » Use signage at entrances and decision points
- » Regularly place medallion signage for the length of the pathway, every 60-100 ft approx

#### 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

## Curb Extensions at Intersections



### Goals

- » 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

### Guidelines and Resources

- » 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
- » Resource: Designing Sidewalks and Trails for Access, Best Practices Design Guide
- » 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

### Transit Integration

- » Couple curb extensions with established signage

#### Station Access Barriers Addressed

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

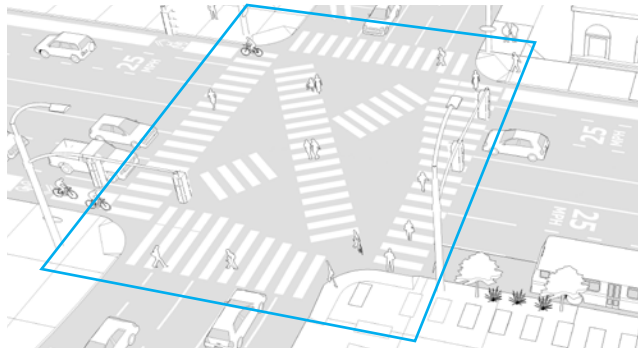
#### Component Appropriate For Use On:

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



# CROSSINGS AND CONNECTIONS

## Scramble Crossings



### Goals

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

### Guidelines and Resources

- » 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

### Transit Integration

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

#### 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

## [Case Study] Scramble Crossings in Beverly Hills<sup>3</sup>

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%.

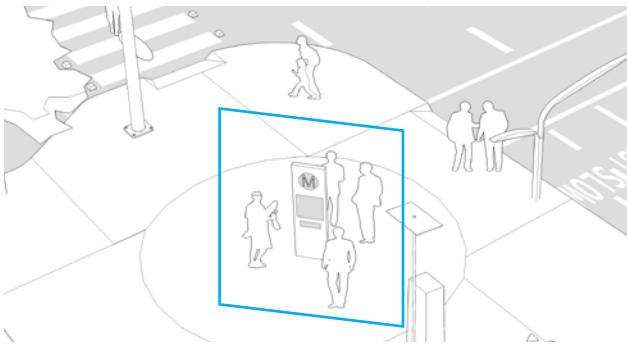


Scramble Crossings in Shabuya Crossings Tokyo, Japan

***Beverly Hills saw an overall decrease in pedestrian/vehicle collisions by as much as 63% after a series of scramble crossings were installed.***

# SIGNAGE AND WAYFINDING

## Metro Signage and Maps



### Goals

- » 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

### Guidelines and Resources

- » 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

### Transit Integration

- » Coordinate with Metro signage and branding efforts

#### Station Access Barriers Addressed

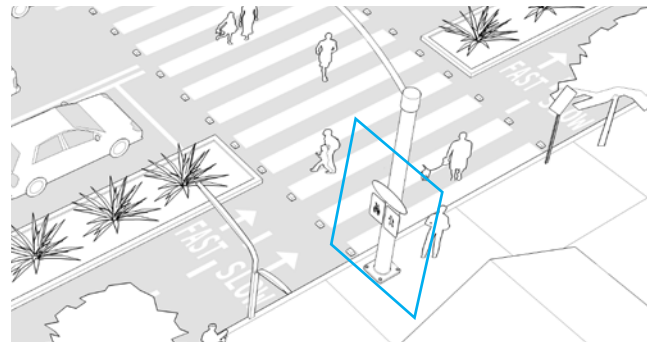
- Long Blocks
- Freeways
- Maintenance
- Safety and Security
- Legibility
- ROW Allocation and Design

#### Component Appropriate For Use On:

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

## Medallion Signage

4



### Goals

- » 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

### Guidelines and Resources

- » 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 two or three blocks

### Transit Integration

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

#### 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

# SIGNAGE AND WAYFINDING

## [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.

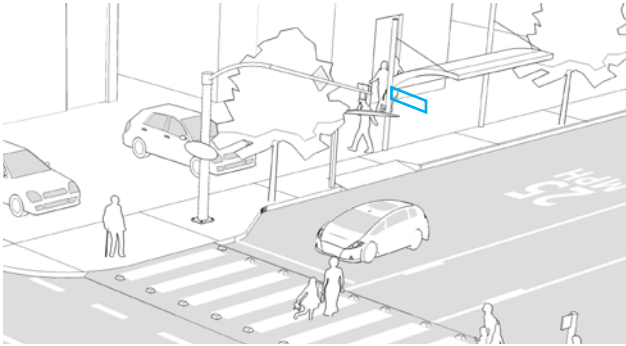


Simple and intuitive, the Legible London mapping and wayfinding program has reduced peak hour congestion on the tube by helping pedestrians navigate the street network.



# SIGNAGE AND WAYFINDING

## Time-to-Station Signage



### Goals

- » 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

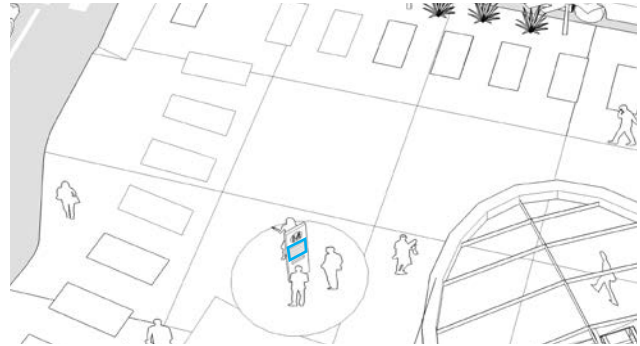
### Guidelines and Resources

- » Include pedestrian and bicycle times with directional arrows
- » Consider the travel times for other active transportation users

### Transit Integration

- » Place notation on or adjacent to Pathway medallion signage

## Real-Time Signage Adjacent to Station



### Goals

- » 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

### Guidelines and Resources

- » 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

### Transit Integration

- » 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

# SIGNAGE AND WAYFINDING

## Smart Technologies



### Goals

- » 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)

### Guidelines and Resources

- » 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

### Transit Integration

- » Integrate transit access into existing and planned smart technologies

#### 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

N/A

## [Case Studies] Non-Signage Wayfinding

### In-Pavement Trails and Markings

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

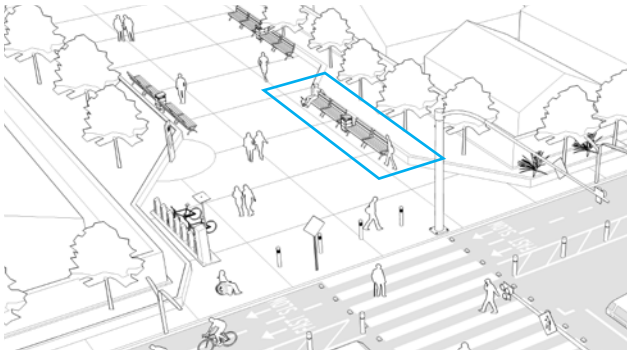


Melbourne's Pedestrian Trail System



# SAFETY AND COMFORT

## Street Furniture



### Goals

- » 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

### Guidelines and Resources

- » 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

### Transit Integration

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

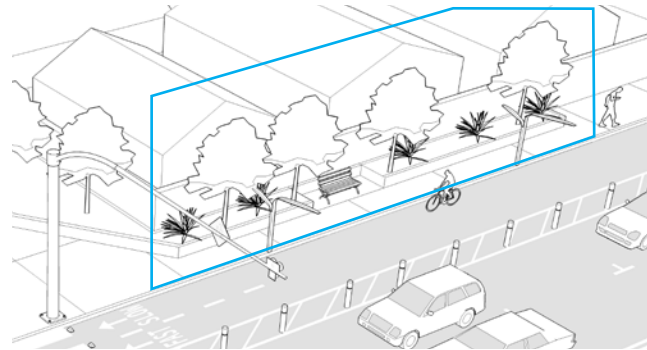
#### Station Access Barriers Addressed

- 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

## Landscaping and Shade



### Goals

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

### Guidelines and Resources

- » Plant shrubs, trees, etc. along sidewalk 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

### Transit Integration

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

#### Station Access Barriers Addressed

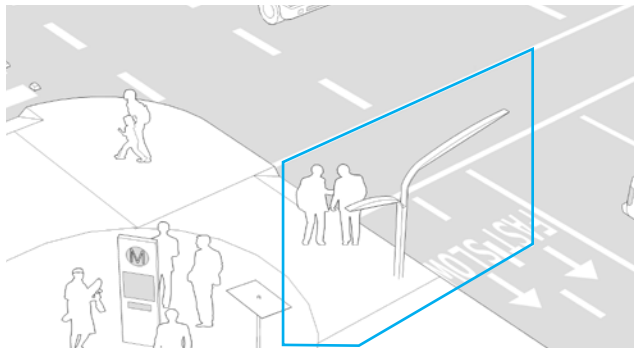
- Long Blocks
- Freeways
- Maintenance
- Safety and Security
- Legibility
- ROW Allocation and Design

#### Component Appropriate For Use On:

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

# SAFETY AND COMFORT

## Lighting



### Goals

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

### Guidelines and Resources

- » 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

### Transit Integration

- » 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

#### Station Access Barriers Addressed

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

#### Component Appropriate For Use On:

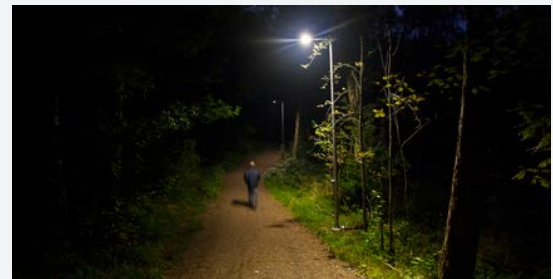
- Arterial 1
- Collector 1
- Arterial 2
- Collector 2
- Cut-Through

## [Case Study] Active Lights<sup>10</sup>

### Motion Activated, Solar Pedestrian Lighting

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

**Studies of the Active Lights show a 65% reduction in nighttime fatal accidents, a 30% reduction in nighttime injury accidents, and a 15% reduction in nighttime property-damage-only accidents.**

# SAFETY AND COMFORT

## Freeway Underpass & Overpass Enhancements



### Goals

- » 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

### Guidelines and Resources

- » 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

### Transit Integration

- » Incorporate Metro elements such as lighting, signage, and paving treatments along the sidewalk to direct pedestrians and active transportation users across the freeway

#### 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

## Enhanced Bus Waiting Areas



### Goals

- » Enhance transit riders' level of comfort
- » Improve safety for users at night by improving facility visibility

### Guidelines and Resources

- » 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

### Transit Integration

- » Use signage at bus waiting areas

#### Station Access Barriers Addressed

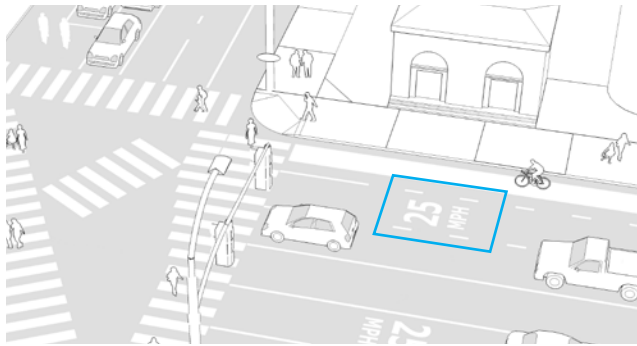
- Long Blocks
- Freeways
- Maintenance
- Safety and Security
- Legibility
- ROW Allocation and Design

#### Component Appropriate For Use On:

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

# SAFETY AND COMFORT

## Traffic Calming



### Goals

- » 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

### Guidelines and Resources

- » Paint reduced speed MPH signs in and along roadway for vehicular travellers
- » Use narrow travel lanes that naturally cause motorists to slow. Use 11 feet as a good maximum width for outside lanes and 10 feet 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

### Transit Integration

- » N/A

#### 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

## Sidewalk Paving & Surface Enhancements



### Goals

- » 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

### Guidelines and Resources

- » 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.

### Transit Integration

- » 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

#### 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



# ALLOCATION OF STREETSPACE

## Reduced Lane Width



### Goals

- » Narrow vehicular lane widths, where 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

### Guidelines and Resources

- » 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)

### Transit Integration

- » Confirm Lane width requirements for efficient bus operations

#### 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

## Enhanced Bike Facilities



### Goals

- » Provide bike facilities that are separated and/or protected from vehicular traffic

### Guidelines and Resources

- » Convert existing standard bike lanes or sharrows into protected facilities where feasible
- » On streets that have heavy traffic, multiple lanes, lots of parking turnover, and existing or potential high bicycle ridership, consider installing separated 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 raised cycle tracks
- » 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

### Transit Integration

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

#### 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



# ALLOCATION OF STREETSPACE

## Bus Enhancements



### Goals

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

### Guidelines and Resources

- » 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

### Transit Integration

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

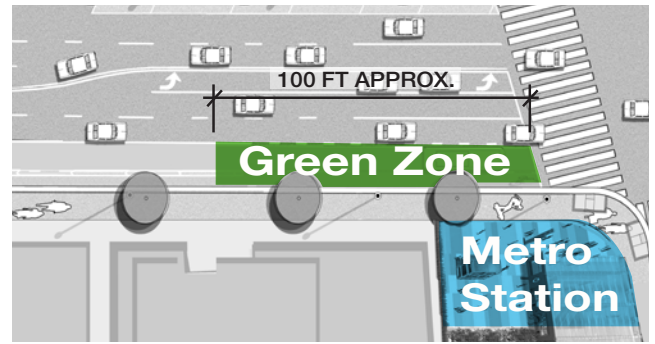
#### Station Access Barriers Addressed

- 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

## The Green Zone



### Goals

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

### Guidelines and Resources

- » 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

### Transit Integration

- » 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

#### 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

# ALLOCATION OF STREETSPACE

## [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.

### Copenhagen<sup>11</sup>

In 2010, the City of Copenhagen introduced the Conversation Lane, a throughway 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.



Conversation Lanes, Copenhagen

### The Netherlands<sup>12</sup>

Similarly, in the Netherlands, the Dutch Ministry for Infrastructure and the Environment allocated €21million 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

***Copenhagen has committed to the goal of providing conversation lanes alongside 80% of their already established cycle routes, ultimately encouraging riders of all speeds and levels to embrace the city's cycling culture.***

# ALLOCATION OF STREETSPACE

## United States <sup>13,14</sup>

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

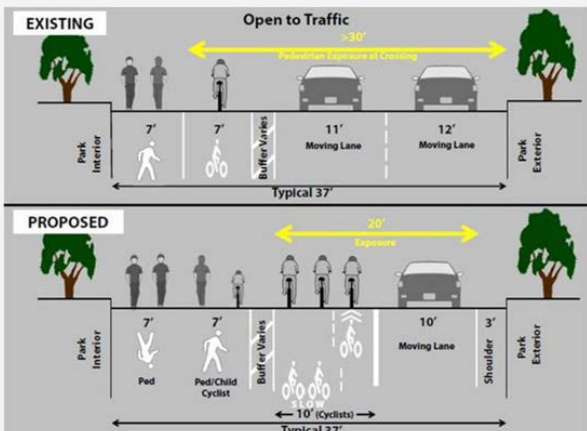
Portland and Chicago have both introduced passing lanes for cyclists at key conflict points. In Portland the new markings expand the bike lane to 10 feet, and include side-by-side bike lane symbols that separate slow and fast lanes. New striping was completed to allow easier and safer passing on an uphill 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 sharrow lane for faster cyclists. Vehicular traffic is shifted into one lane.

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

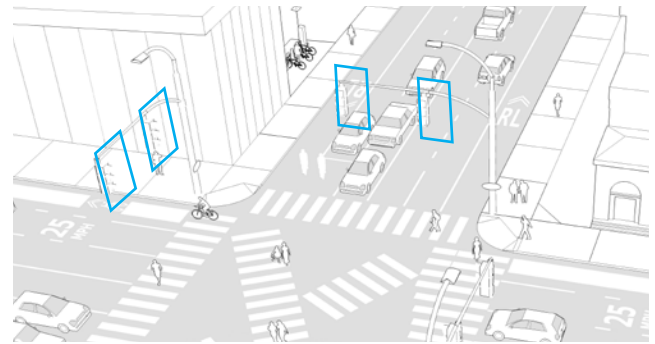


Portland, Oregon's Passing Lanes



Proposed Configuration of Prospect Park Loop, Park Slope, Brooklyn

## Signal Modifications



### Goals

- » 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

### Guidelines and Resources

- » 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

### Transit Integration

- » N/A

### Station Access Barriers Addressed

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

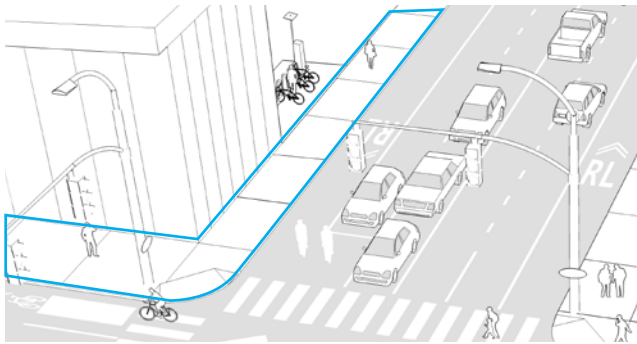
### Component Appropriate For Use On:

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



# ALLOCATION OF STREETSPACE

## Sidewalk Widening



### Goals

- » 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

### Guidelines and Resources

- » 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.
- » Assure 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.

### Transit Integration

- » Consider identifiable paving treatments

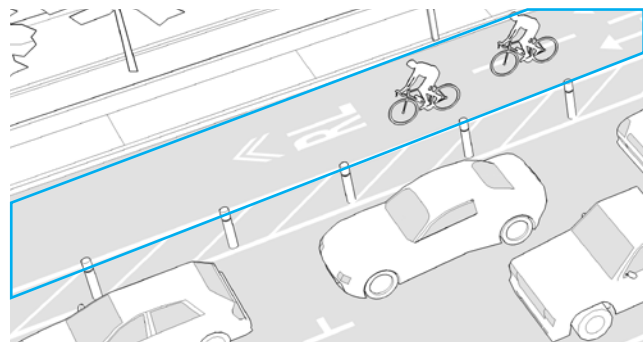
#### Station Access Barriers Addressed

- 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

## Rolling Lane



### Goals

- » 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

### Guidelines and Resources

- » 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

### Transit Integration

- » At conflict zones, apply paint on street

#### Station Access Barriers Addressed

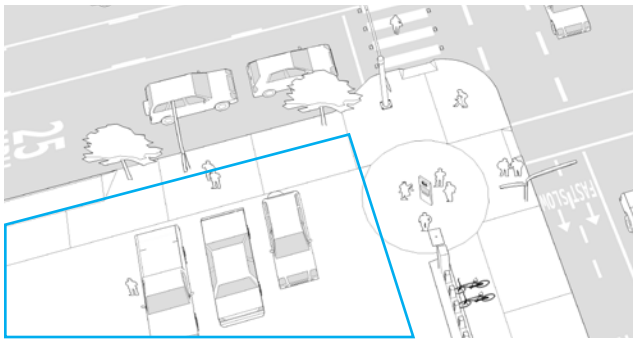
- Long Blocks
- Freeways
- Maintenance
- Safety and Security
- Legibility
- ROW Allocation and Design

#### Component Appropriate For Use On:

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

# PLUG-IN COMPONENTS

## Car Share



### Goals

- » 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
- » Provide direct connections to major destinations (i.e. LAX, Union Station, Regional Universities)

### Guidelines and Resources

- » 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

### Transit Integration

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

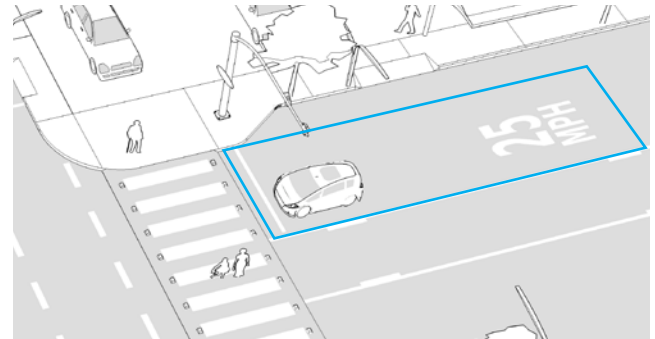
#### Station Access Barriers Addressed

- 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

## Neighborhood Electric Vehicles (NEVs)



### Goals

- » 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

### Guidelines and Resources

- » 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

### Transit Integration

- » Use signage at NEV parking locations and to and from these areas as directional indicators to the stations

#### Station Access Barriers Addressed

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

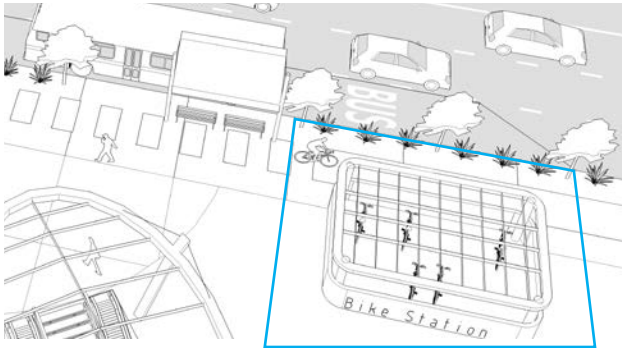
#### Component Appropriate For Use On:

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



# PLUG-IN COMPONENTS

## Bike Share and Bike Station



### Goals

- » 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

### Guidelines and Resources

- » 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

### Transit Integration

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

#### 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

## [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.



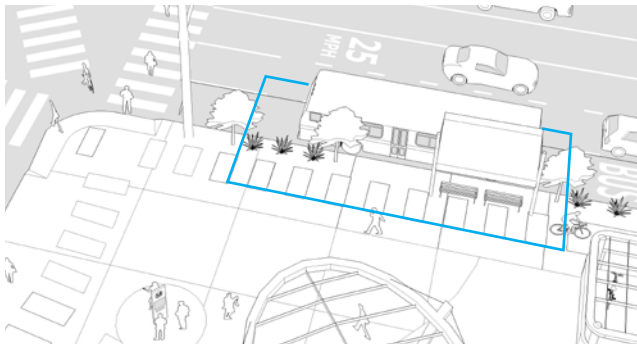
Paris Velib Bike Share



New York City Citibike Share

# PLUG-IN COMPONENTS

## Van Pool and Feeder Bus



### Goals

- » 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

### Guidelines and Resources

- » 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

### Transit Integration

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

### 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

## [Precedents] Integrated Access Solutions



Philly CarShare, Philadelphia, PA



Curbside electric Vehicle charging station, Portland, OR



Feeder Bus: Emery Go-Round, Emeryville, CA

# PLUG-IN COMPONENTS

## High-Visibility Bicycle Parking



### Goals

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

### Guidelines and Resources

- » 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

### Transit Integration

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

#### 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

## Electronic Bicycle & Pedestrian Counters



### Goals

- » 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

### Guidelines and Resources

- » 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

### Transit Integration

- » Use signage on counters and in related publicity materials

#### 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



# PLUG-IN COMPONENTS

## [Case Studies] Electronic Bicycle and Pedestrian Counters

### Make the Need Visible with Electronic Bicycle 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

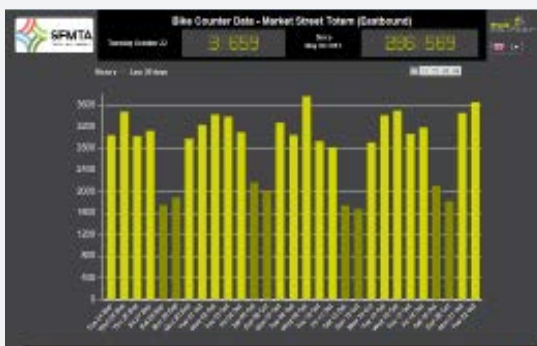
In 2013, Seattle’s City Council voted to install seven additional bike counters (added to the two they already have).

#### 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

### Reward System – Zap Readers

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.

### Pedestrian Counting in Melbourne

The City of Melbourne has a website that depicts the information gathered from 18 pedestrian counting sensors located around the central business district. The system is giving the City a better understanding of how people use the streets and how they can be better managed to cater to pedestrian needs.



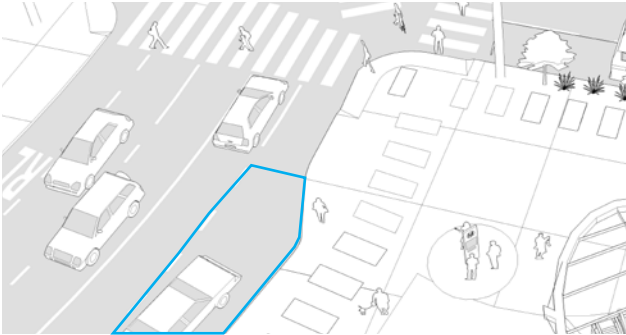
Pedestrians in downtown Melbourne are monitored by the pedestrian counter (upper right corner of image)



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

# PLUG-IN COMPONENTS

## Kiss and Ride



### Goals

- » Increase connectivity to Metro stations
- » Provide 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

### Guidelines and Resources

- » 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

### Transit Integration

- » Use signage at pick-up/drop-off locations and as directional indicators between this area and the station

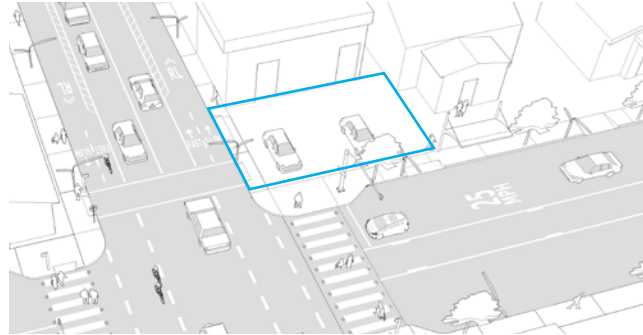
#### Station Access Barriers Addressed

- 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

## Micro Park-and-Ride



### Goals

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

### Guidelines and Resources

- » Design micro park-and-ride areas within three 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

### Transit Integration

- » Use wayfinding signage and colors throughout parking area

#### Station Access Barriers Addressed

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

#### Component Appropriate For Use On:

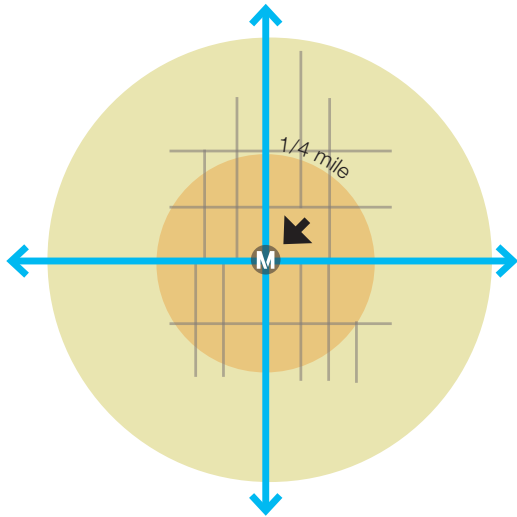
- Arterial 1
- Collector 1
- Arterial 2
- Collector 2
- Cut-Through



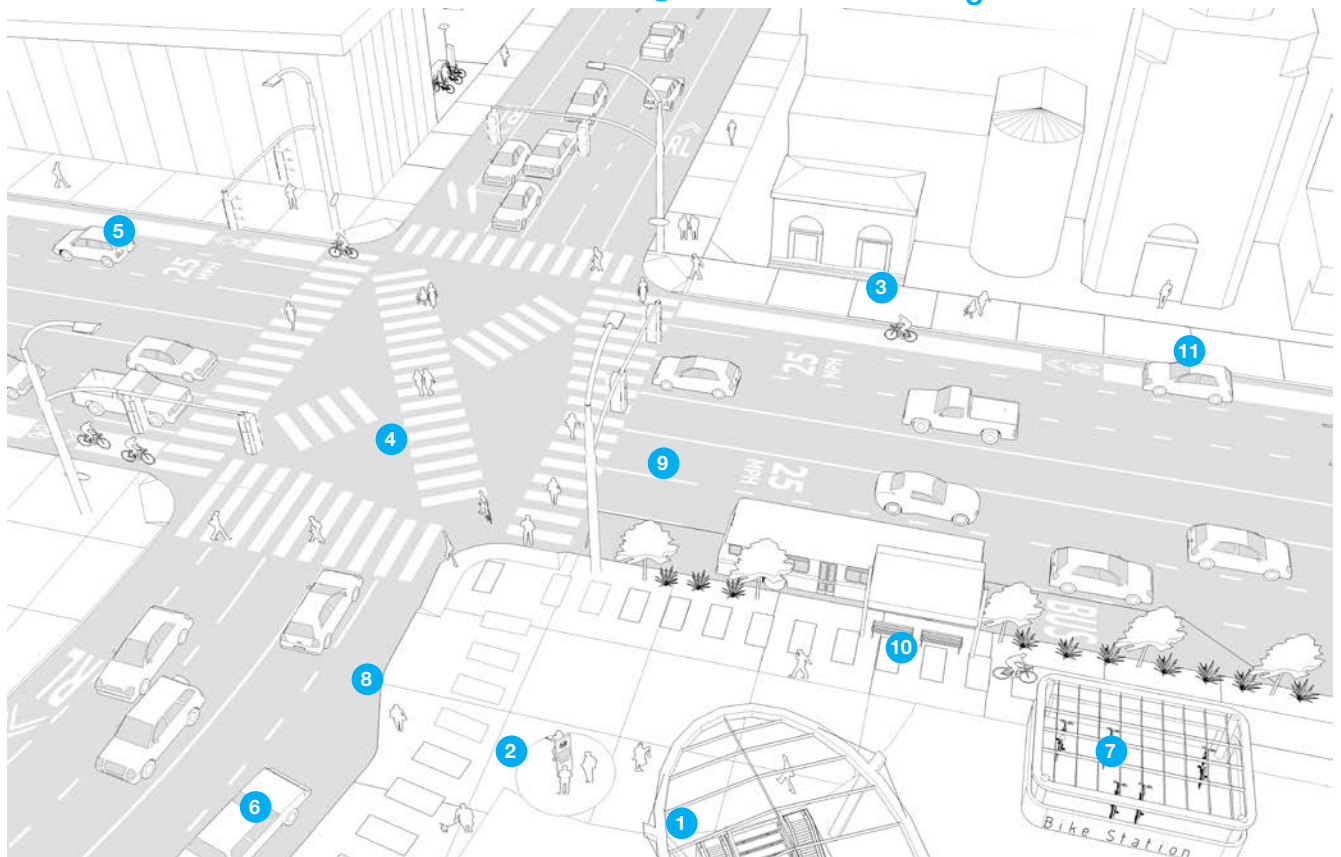
# PUTTING IT TOGETHER - ILLUSTRATION

## Extended Station Zone

» Typical application in regional centers, with the region's largest concentration of housing and jobs. Refer to CSPP Place-types D. - [http://media.metro.net/projects\\_studies/sustainability/images/countywide\\_sustainability\\_planning\\_policy.pdf](http://media.metro.net/projects_studies/sustainability/images/countywide_sustainability_planning_policy.pdf)



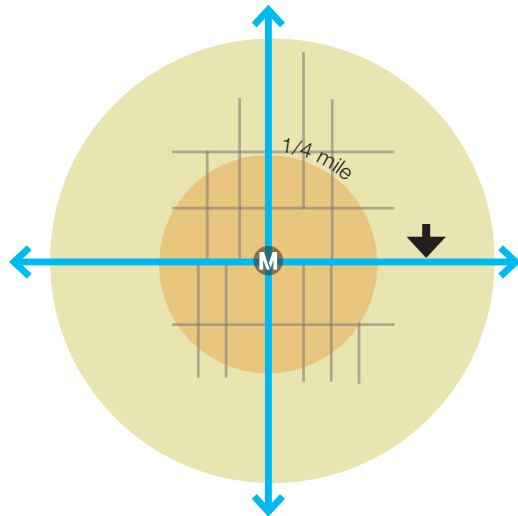
- 1 Metro Station Portal and Plaza
- 2 Signage with Real-Time Transit Information
- 3 Medallion Signage and Curb-Edge Banding
- 4 Colored Scramble Crossings
- 5 Advisory Bike Lane (see Rolling Lane)
- 6 Green Zone and Kiss-and-Ride
- 7 Bike Share/Bike Station
- 8 Bulb-Outs at Intersections
- 9 Traffic Calming
- 10 Enhanced Bus Facilities
- 11 Sidewalk Widening



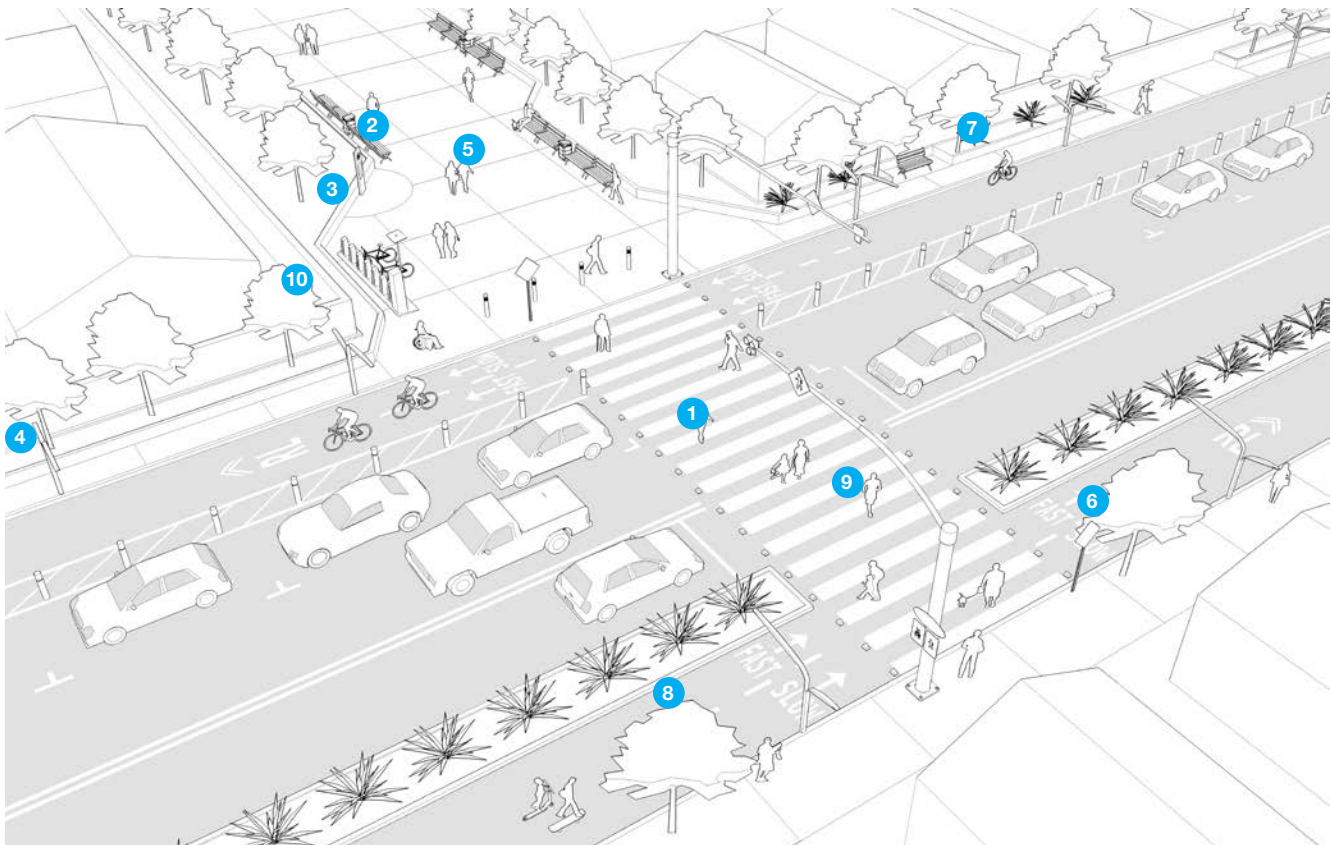
# PUTTING IT TOGETHER - ILLUSTRATION

## 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/countywide\\_sustainability\\_planning\\_policy.pdf](http://media.metro.net/projects_studies/sustainability/images/countywide_sustainability_planning_policy.pdf)



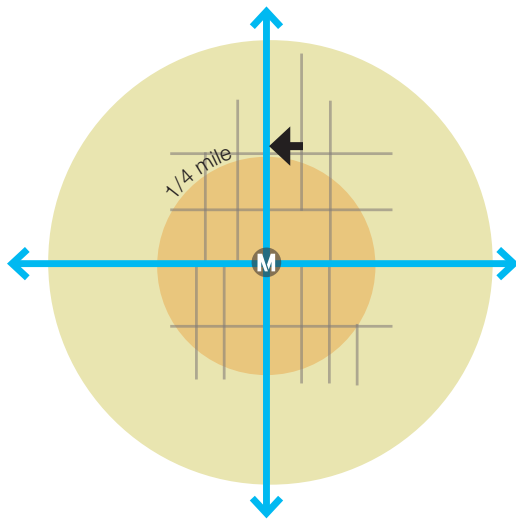
- 1 Added Mid-Block Crossing
- 2 Cut-Through/Shortcut
- 3 Signage with Directional Arrows
- 4 Medallion Signage and Paved Treatments
- 5 Street Furniture
- 6 Landscaping
- 7 Lighting
- 8 Rolling Lane/Protected Bike Lane
- 9 Signal Modifications
- 10 Bike Share



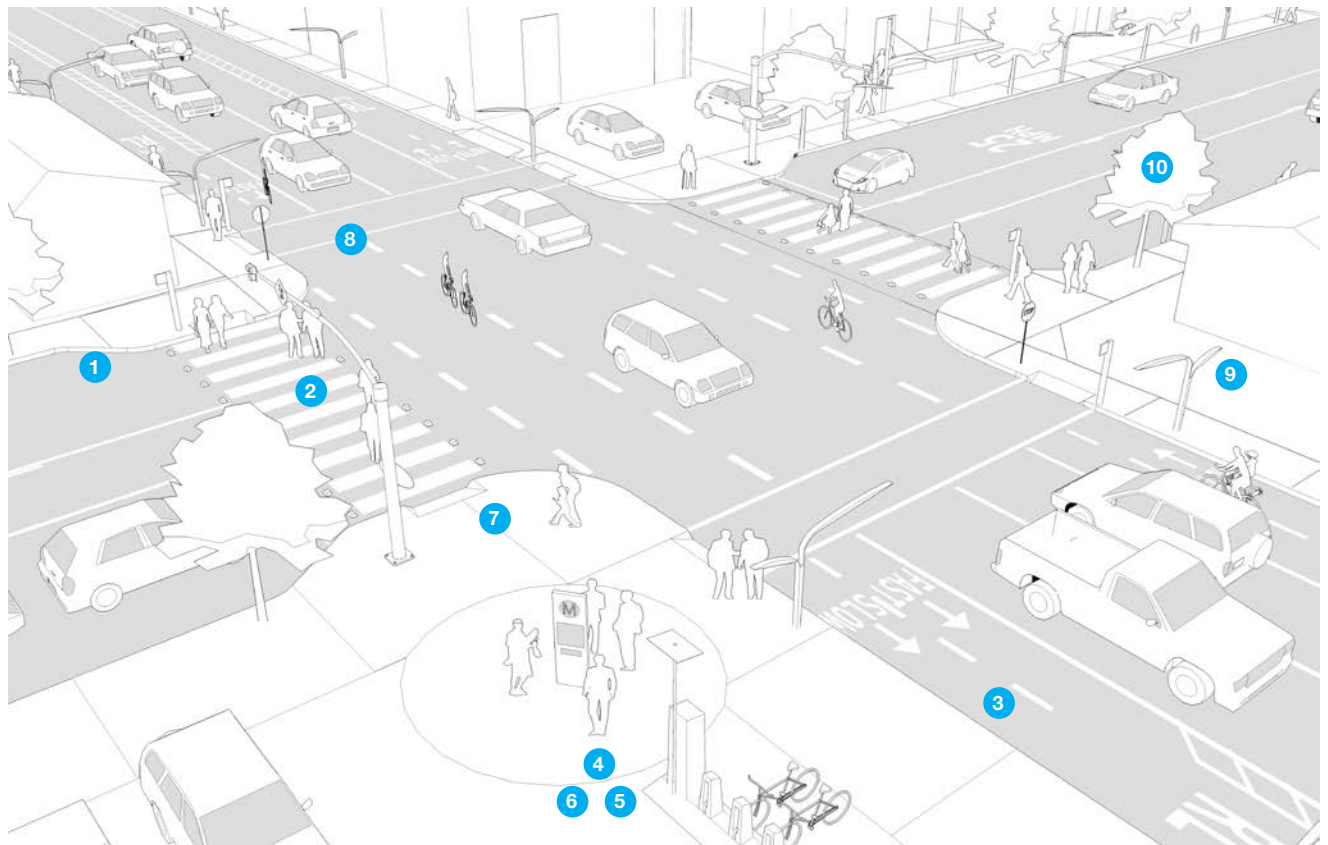
# PUTTING IT TOGETHER - ILLUSTRATION

## 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/countywide\\_sustainability\\_planning\\_policy.pdf](http://media.metro.net/projects_studies/sustainability/images/countywide_sustainability_planning_policy.pdf)



- 1 Medallion Signage
- 2 Continental Crosswalks
- 3 Rolling Lane
- 4 Car Share
- 5 Micro Park-and-Ride
- 6 Van Pool
- 7 Dual Curb Ramps
- 8 Signal Modifications
- 9 Pedestrian Lighting
- 10 Landscaping



# RESOURCES

## General and Best Practices

- » Active Design Guidelines: Promoting Physical Activity and Health in Design, City of New York, 2010: [http://www.nyc.gov/html/ddc/html/design/active\\_design.shtml](http://www.nyc.gov/html/ddc/html/design/active_design.shtml)
- » Are We There Yet? Creating Complete Communities for 21st Century America, Reconnecting America, 2012: <http://www.reconnectingamerica.org/resource-center/books-and-reports/2012/reconnecting-america-releases-are-we-there-yet-creating-complete-communities-for-21st-century-america/>
- » Beautiful Places: The Role of Perceived Aesthetic Beauty in Community Satisfaction, Working Paper Series, Martin Prosperity Research, Richard Florida, University of Toronto; Charlotta Mellander, Jönköping International Business School; Kevin Stolarick, University of Toronto, 2009: <http://www.creativeclass.com/rfcgdb/articles/Beautiful%20places.pdf>
- » Boston Complete Streets: <http://bostoncompletestreets.org>
- » Case Study Compendium, Pedestrian and Bicycle Information Center, 2009: [http://www.bicyclinginfo.org/case\\_studies/](http://www.bicyclinginfo.org/case_studies/)
- » Complete Street Design Guidelines, Tennessee Department of Transportation, 2009: <http://www.tdot.state.tn.us/bikeped/CompleteStreets.pdf>
- » Complete Streets Chicago, Department of Transportation, 2013: <http://www.cityofchicago.org/content/dam/city/depts/cdot/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/RP036.pdf>
- » Designing Sidewalks and Trails for Access, Best Practices Design Guide, Federal Highway Administration, Part II of II, 2001: [http://www.fhwa.dot.gov/environment/bicycle\\_pedestrian/publications/sidewalk2/contents.cfm](http://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/sidewalk2/contents.cfm)
- » Good Design: The Fundamentals, Commission for Architecture and the Built Environment, 2008: [http://www.rudi.net/files/paper/optional\\_file/good-design.pdf](http://www.rudi.net/files/paper/optional_file/good-design.pdf)
- » Inclusion by Design: Equality, diversity, and the built environment, Commission for Architecture and the Built Environment, 2008: [http://www.humancenterreddesign.org/sites/default/files/ABX2012/CABE\\_inclusion\\_by\\_design.pdf](http://www.humancenterreddesign.org/sites/default/files/ABX2012/CABE_inclusion_by_design.pdf)
- » Manual for Streets, Department for Transport, London, 2007
- » Manual on Uniform Traffic Control Devices, Best Practices, 2012
- » Measuring the Street: New Metrics for 21st Century Streets, New York Department of Transportation, 2012: <http://www.nyc.gov/html/dot/downloads/pdf/2012-10-measuring-the-street.pdf>
- » Paved with Gold: The real value of good street design,

- Design Better Streets, Commission for Architecture and the Built Environment, 2007: <http://webarchive.nationalarchives.gov.uk/20110118095356/http://www.cabe.org.uk/publications/paved-with-gold>
- » Paving the Way: How we achieve clean, safe and attractive streets, Commission for Architecture and the Built Environment, 2002: <http://webarchive.nationalarchives.gov.uk/20110118095356/http://www.cabe.org.uk/files/paving-the-way.pdf>
- » San Francisco Better Streets Plan, City of San Francisco, 2011: <http://www.sf-planning.org/ftp/BetterStreets/index.htm>
- » Street Design Manual, New York City Department of Transportation, 2009: <http://www.nyc.gov/html/dot/html/pedestrians/streetdesignmanual.shtml>
- » Smart Growth America, Complete Streets Resources, <http://www.smartgrowthamerica.org/complete-streets/complete-streets-fundamentals/resources>
- » The Value of Urban Design, Commission for Architecture and the Built Environment, Department of the Environment, Transport and the Regions, 2001: <http://www.designcouncil.org.uk/Documents/Documents/Publications/CABE/the-value-of-urban-design.pdf>
- » Urban Street Design Guide, National Association of City Transportation Officials (NACTO), forthcoming in summer 2013: [http://nacto.org/wp-content/uploads/2012/10/NACTOUrbanStreetDesignGuide\\_Highrez.pdf](http://nacto.org/wp-content/uploads/2012/10/NACTOUrbanStreetDesignGuide_Highrez.pdf)
- » Walking the Walk: How Walkability Raises Home Values in U.S. Cities, CEO for Cities, 2009: <http://www.ceosforcities.org/research/walking-the-walk/>

## First Last Mile Best Practices

- » Mobility Hub Guidelines: For the Greater Toronto and Hamilton Area, Metrolinx, Ontario, 2011: [http://www.metrolinx.com/en/projectsandprograms/mobilityhubs/mobility\\_hub\\_guidelines.aspx](http://www.metrolinx.com/en/projectsandprograms/mobilityhubs/mobility_hub_guidelines.aspx)

## Los Angeles-Specific Resources

- » Downtown Design Guide, City of Los Angeles, 2009: [http://urbandesignla.com/downtown\\_guidelines.htm](http://urbandesignla.com/downtown_guidelines.htm)
- » Final Report: Recommended TDM Strategies and Actions for the City of Los Angeles, Transportation Demand Strategies, Southern California Association of Governments and Los Angeles Department of Transportation, 2011: [http://www.scag.ca.gov/publications/pdf/2011/cityofla\\_tdmstrategies\\_finalreport.pdf](http://www.scag.ca.gov/publications/pdf/2011/cityofla_tdmstrategies_finalreport.pdf)
- » Maximizing Mobility in Los Angeles- First and Last Mile Strategies Final Report, City of Los Angeles and Southern California Association of Governments, 2009: <http://www.scag.ca.gov/nonmotorized/pdfs/LA-Maximizing-Mobility-Final-Vol1.pdf>



- » Model Design Manual for Living Streets, University of California Los Angeles, Luskin Center for Innovation, 2011: <http://www.modelstreetdesignmanual.com/>
- » Short Range Transportation Plan for Los Angeles County, Los Angeles County Metropolitan Transportation Authority, 2003: [http://ebb.metro.net/projects\\_studies/images/2003\\_S RTP.pdf](http://ebb.metro.net/projects_studies/images/2003_S RTP.pdf)
- » 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://urbandesignla.com/walkability.htm>
- » Safety Effectiveness of the HAWK Pedestrian Crossing Treatment, Federal Highway Administration, HRT-10-042, 2010
- » Safety Effects of Marked Versus Unmarked Crosswalks at Uncontrolled Locations, Final Report and, Recommended Guidelines, Federal Highway Administration, HRT-04-100, 2005: <http://www.fhwa.dot.gov/publications/research/safety/10042/10042.pdf>

## Universal Design

- » Universal Design and Visitability from Accessibility to Zoning, the John Glenn School of Public Affairs, National Endowment for the Arts, 2007: <https://kb.osu.edu/dspace/bitstream/1811/24833/2/>

## Branding, Signage, and Wayfinding

- » Legible London Wayfinding Study Report - Transport for London, AIG, Central London Partnership, 2006: [http://www.tfl.gov.uk/assets/downloads/businessandpartners/Legible\\_London\\_report.pdf](http://www.tfl.gov.uk/assets/downloads/businessandpartners/Legible_London_report.pdf)
- » See New York City Wayfinding Program designed by Pentagram

## Smart Technologies in the City

- » Smart Cities Applications and Requirements White Paper, Net!Works European Technology Platform, 2011: [http://www.networks-etp.eu/fileadmin/user\\_upload/Publications/Position\\_White\\_Papers/White\\_Paper\\_Smart\\_Cities\\_Applications.pdf](http://www.networks-etp.eu/fileadmin/user_upload/Publications/Position_White_Papers/White_Paper_Smart_Cities_Applications.pdf)
- » See TextMyBus App from Detroit, SF Live Bus, Chicago Transit Authority App Center, LA Metro Home Nextrip Service

## Bike Share Programs

- » The Case for Bike Share in NYC, 2009: [http://www.nyc.gov/html/dcp/pdf/transportation/bike\\_share\\_part2.pdf](http://www.nyc.gov/html/dcp/pdf/transportation/bike_share_part2.pdf)

## Bikeways

- » Fundamentals of Bicycle Boulevard Planning and Design, Initiative for Bicycle and Pedestrian Innovation, 2009: <http://ashlandtsp.com/system/datas/51/original/BicycleBoulevardGuidebook.pdf>
- » Urban Bikeway Design Guide, National Association of City Transportation Officials (NACTO), 2011: <http://nacto.org/cities-for-cycling/design-guide/>

## Crossings

- » Analyzing Raised Crosswalks Dimensions Influence on Speed Reduction in Urban Streets, 3rd Urban Street Symposium, June 2007: <http://trid.trb.org/view.aspx?id=850990>
- » Oakland Chinatown Pedestrian Scramble: An Evaluation, Safe Transportation Research & Education Center, Institute of Transportation Studies, UC Berkeley, 2003: <http://www.escholarship.org/uc/item/3fh5q4dk>

## End Notes

1. Tuttle, Steve. City of Boulder Crosswalk Compliance Studies & Treatment Implementation. PBIC, n.d. Web. 25 July 2013
2. Watkins, Katherine. Cambridge's Traffic Calming Program Pedestrians are the Focus: Institute of Transportation Engineers, 2006. Web. 25 July 2013
3. Vaziri, Bijan. "Exclusive Pedestrian Phase for the Business District Signals in Beverly Hills, 10 Years Later: City of Beverly Hills, California", 1996
4. Central London Partnership. Legible London: A Wayfinding Study. London N.p., 2006. Web. 25 July 2013
5. Net!Works European Technology Platform. "Smart Cities Applications and Requirements White Paper", 2011. Web. 25 July 2013
6. SF Live Bus. Live map of SF MUNI. N.p., n.d. Web. 25 July 2013
7. Chicago Transit Authority. "App Center." Chicago Transit Authority. N.p., n.d. Web. 30 July 2013
8. City of Detroit. City of Detroit | Official City of Detroit Web site | www.detroitmi.gov. N.p., n.d. Web. 19 July 2013
9. "LA Metro Home | Nextrip Service." LA Metro Home | Getting Started. N.p. Web. 25 July 2013
10. Active Lights - Leading the way. N.p., Web. 25 July 2013
11. Bendiks, Stefan, Aglaée Degros, Marie Goyens, and Nick Lakides. Fietsinfrastructuur: Cycle Infrastructure. Rotterdam: nai010 uitgevers/publishers, 2013. Print
12. Shahan, Zachary. "Dutch Improving Cycle Networks, Building Fast Cycle Lanes." EcoLocalizer. N.p., 31 Jan. 2011. Web. 25 July 2013
13. Masoner, Richard. "Cyclelicious » Bike lane passing lane." Cyclelicious. N.p., 6 Sept. 2000. Web. 25 July 2013
14. Goodman, David. "Changes Planned for Prospect Park Loop - NYTimes.com." The New York Times - Breaking News, World News & Multimedia. N.p., 27 Feb. 2012. Web. 25 July 2013
15. NYC Dept. of City Planning. "Bike Share Opportunities in New York City." New York N.p., 2009. Web. 25 July 2013



**Notes:**

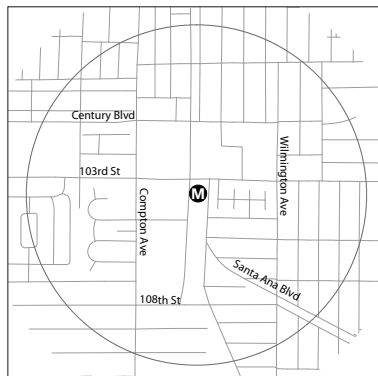
***This page intentionally left blank.***

# 6 ILLUSTRATIONS

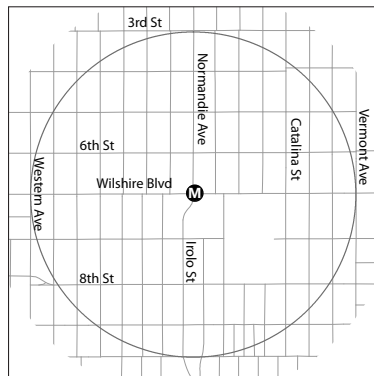
★ This section applies the Pathway concept to three case study sites, Wilshire/Normandie (Metro Purple Line), North Hollywood (Metro Red Line/Orange Line), and 103rd/Watts (Metro Blue Line). The intent of this section is to explain from a planning perspective, how Pathway networks can be developed and how components can be selected and applied in different urban settings. Final route maps and images are meant for illustrative purposes only.

## The Case Study Sites

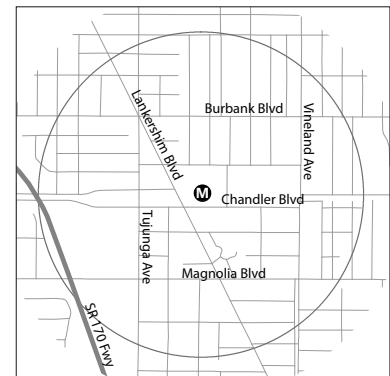
**The 103rd/Watts station area** is characterized by low to mid-residential density, wide arterials, and long blocks, with minimal pedestrian or multi-modal amenities. The Watts Towers is located within walking distance from the station. There is a substantial number of modal-transfers in the station area, along with a transit-dependent population, and an underutilized park-and-ride lot.



**The Wilshire/Normandie station area** 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.



**The North Hollywood station area** is a dense urbanized and mixed-use transit node, adjacent to the NoHo Arts District, an active commercial area to the south of the station, and mid-to high-density residential areas closer to the station with residential density decreasing away from the station. Long blocks without crossings, an at-grade bus transit way, and an adjacent freeway pose challenges for active transportation users' station access. There is a significant amount of multi-modal and transfer activity in the area.



## 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.

### Station Access Barriers

#### Safety

- 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

#### Aesthetics

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

#### Accessibility

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

### Overview of Proposed Pathway Network

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.



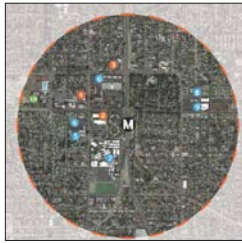
Wide arterials prioritize the vehicle



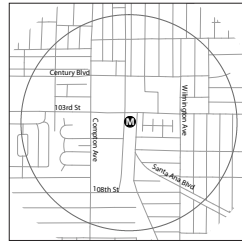
Park and Ride Station is underutilized



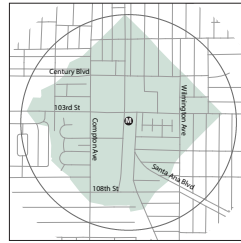
Narrow sidewalks with few pedestrian amenities



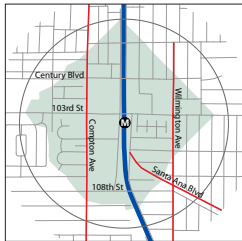
Points of Interest



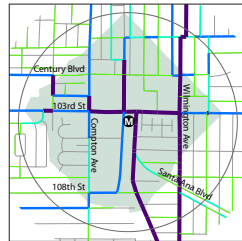
Street Grid



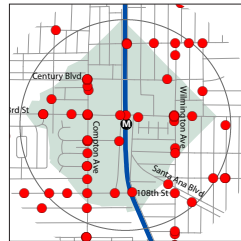
Pedestrian Shed



High Vehicular Speeds



Key Transit Access Corridors



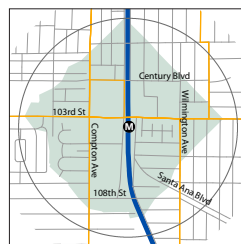
Collision Severity and Location



Land-Use Map



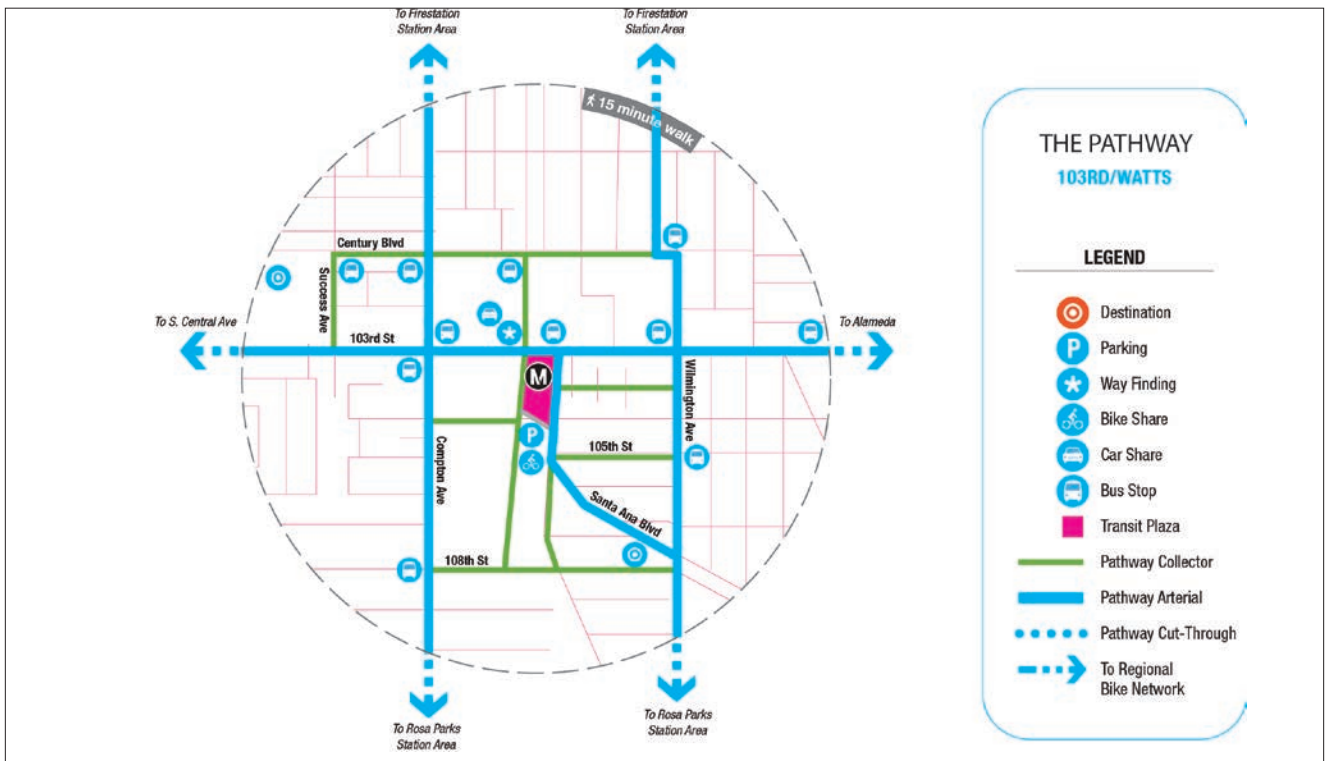
Bicycle Connections



Transit Connections

## 103rd/Watts Station Network Design

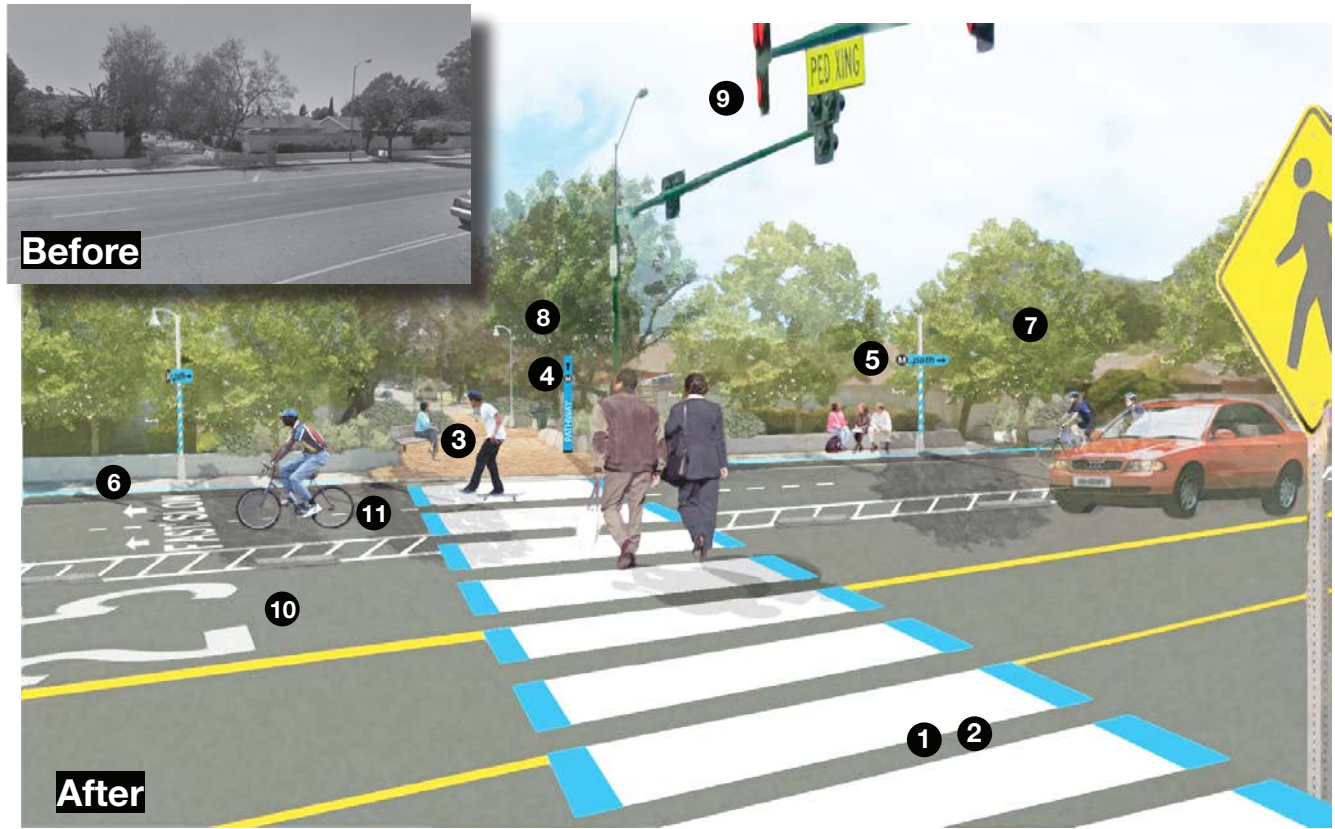
Utilizing the approach outlined in Chapter 3 of these guidelines, a Pathway network design was developed for the 103rd/Watts station area. The Metro Blue Line runs north-south along this corridor at grade, thus running one Pathway Arterial north-south is not effective, as it would only service half the 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-seperated Rolling Lane



## Components Used at Case Study Site

### Crossings Enhancements and Connections

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

### Signage and Wayfinding

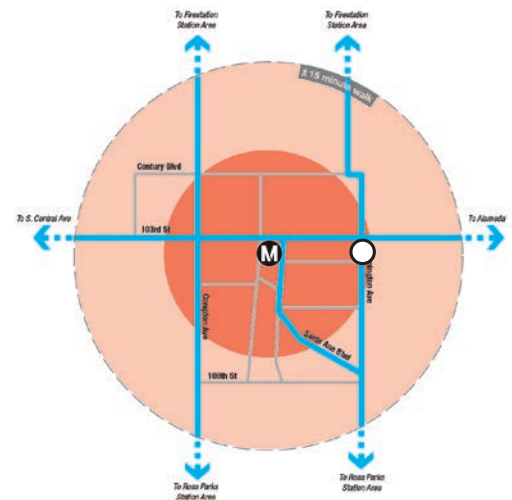
- 4 Signage
- 5 Medallion signage
- 6 Curb-edge banding

### Safety and Comfort

- 7 Landscaping/Shade
- 8 Lighting

### Allocation of the Streetspace

- 9 Signal modification
- 10 Traffic calming
- 11 Rolling Lane (Buffered)

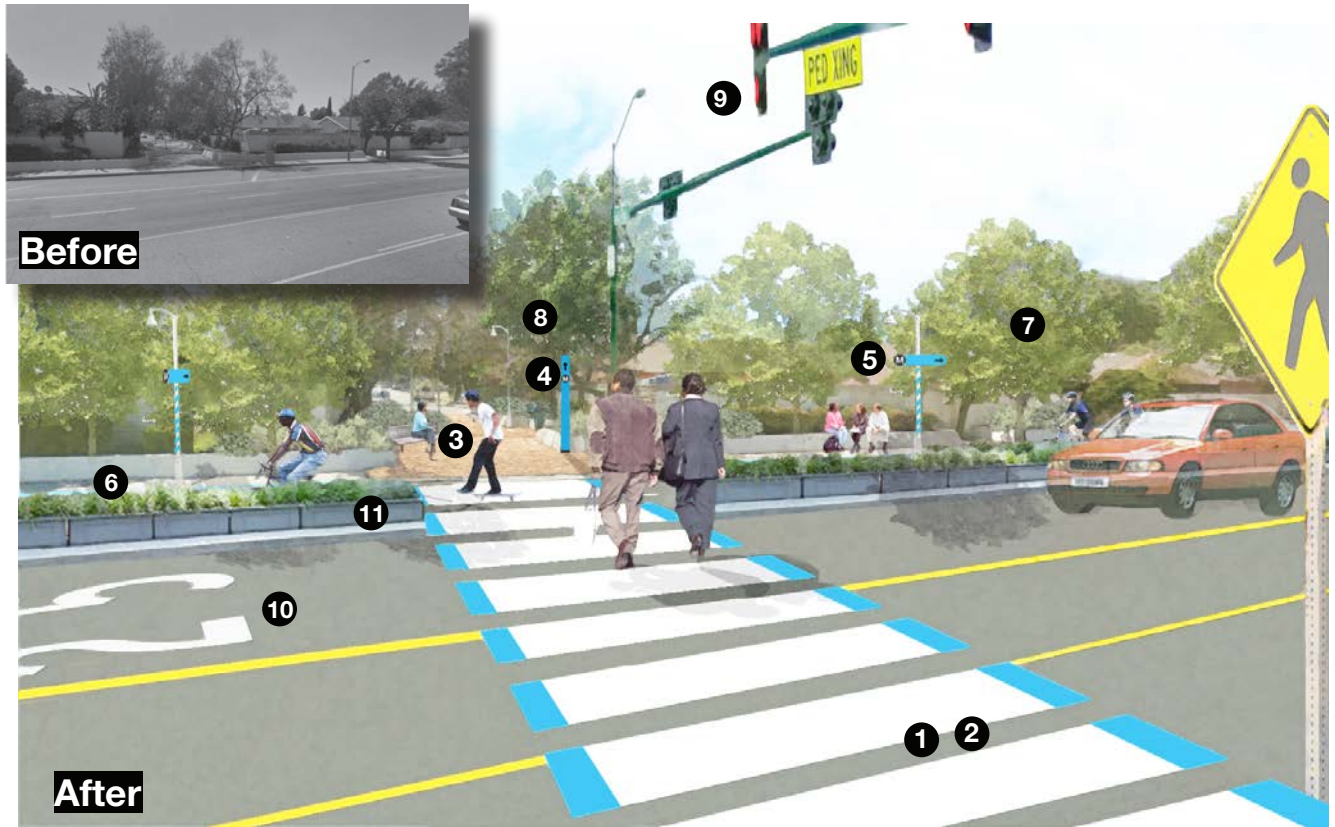


- M** Metro Station Location
- Visualization Location
- EXTENDED STATION ZONE (Area 1)  
5-Minute Walk / 2-Minute Bike
- TRANSIT-FRIENDLY ZONE (Area 2)  
10-Minute Walk / 5-Minute Bike



### 103rd/Watts Station, Location 1 (enhanced)

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



#### Components Used at Case Study Site

##### Crossings Enhancements and Connections

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

##### Signage and Wayfinding

- 4 Signage
- 5 Medallion signage
- 6 Curb-edge banding

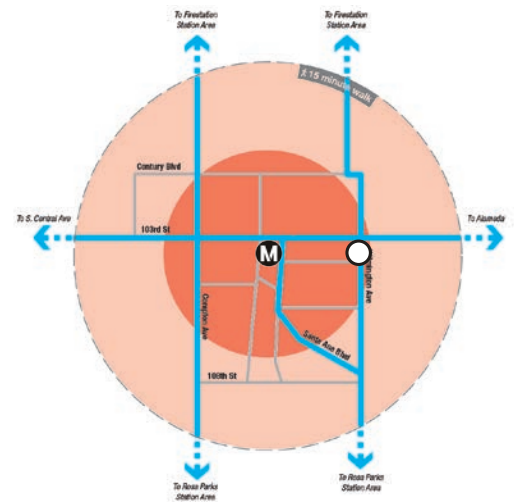
##### Safety and Comfort

- 7 Landscaping/Shade
- 8 Lighting

##### Allocation of the Streetspace

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

\*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.



- M** Metro Station Location
- O** 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.

### Station Access Barriers

#### Safety

- Located along a high-speed traffic corridor
- Lack of pedestrian lighting within one-half mile radius
- Unmarked crossings

#### Aesthetics

- Sparse landscaping along residential connector streets
- Trash strewn along streets/lack of overall maintenance

#### Accessibility

- 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

## Overview of Proposed Pathway Network

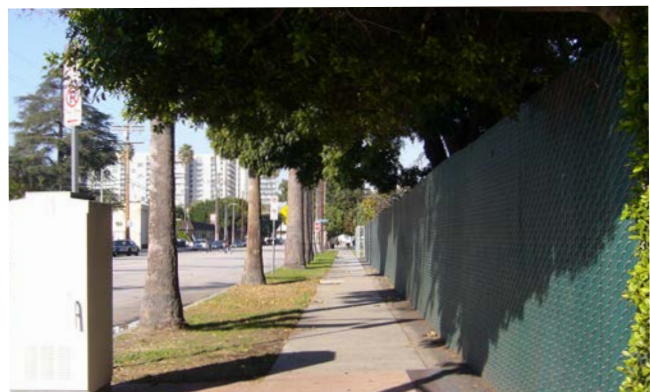
Two case study sites are presented at Wilshire/Normandie. Location 1 is immediately adjacent to the station on the southeast corner of Wilshire Boulevard and Normandie Avenue. Location 2 is farther from the station at 8th Street and Fedora Street.

**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.

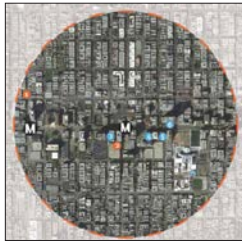
**Location 2** includes prominent Pathway signage showing time-to-station, along with sidewalk enhancements for transit-user comfort, including new street trees and lighting. A Rolling Lane is added to the street with room for multiple speeds of active transportation users. Crossings are enhanced with Continental stripes.



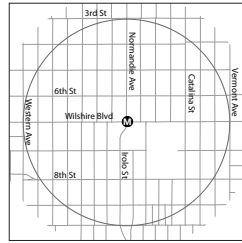
Lack of bicycle facilities



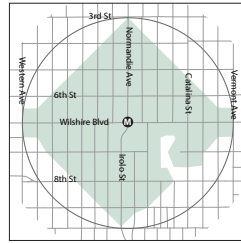
Narrow sidewalks



Points of Interest



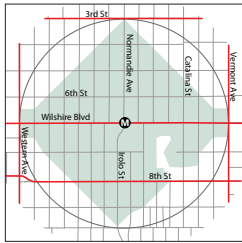
Street Grid



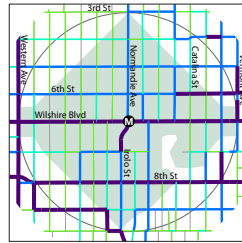
Pedestrian Shed

## Wilshire/Normandie Station Network Design

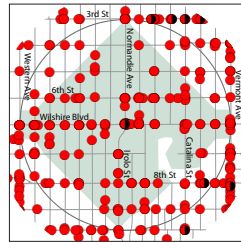
Utilizing the approach outlined in Chapter 3 of these guidelines, a Pathway network design was developed for the Wilshire/Normandie Station Area. The Metro Red Line runs east–west along this corridor underground, thus it is beneficial to run a Pathway Arterial north–south along Normandie. To the south, 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.



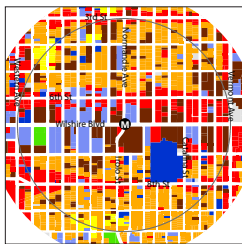
High Vehicular Speeds



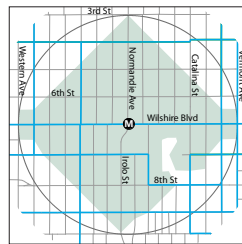
Key Transit Access Corridors



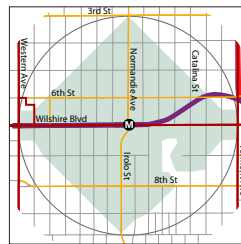
Collision Severity and Location



Land-Use Map

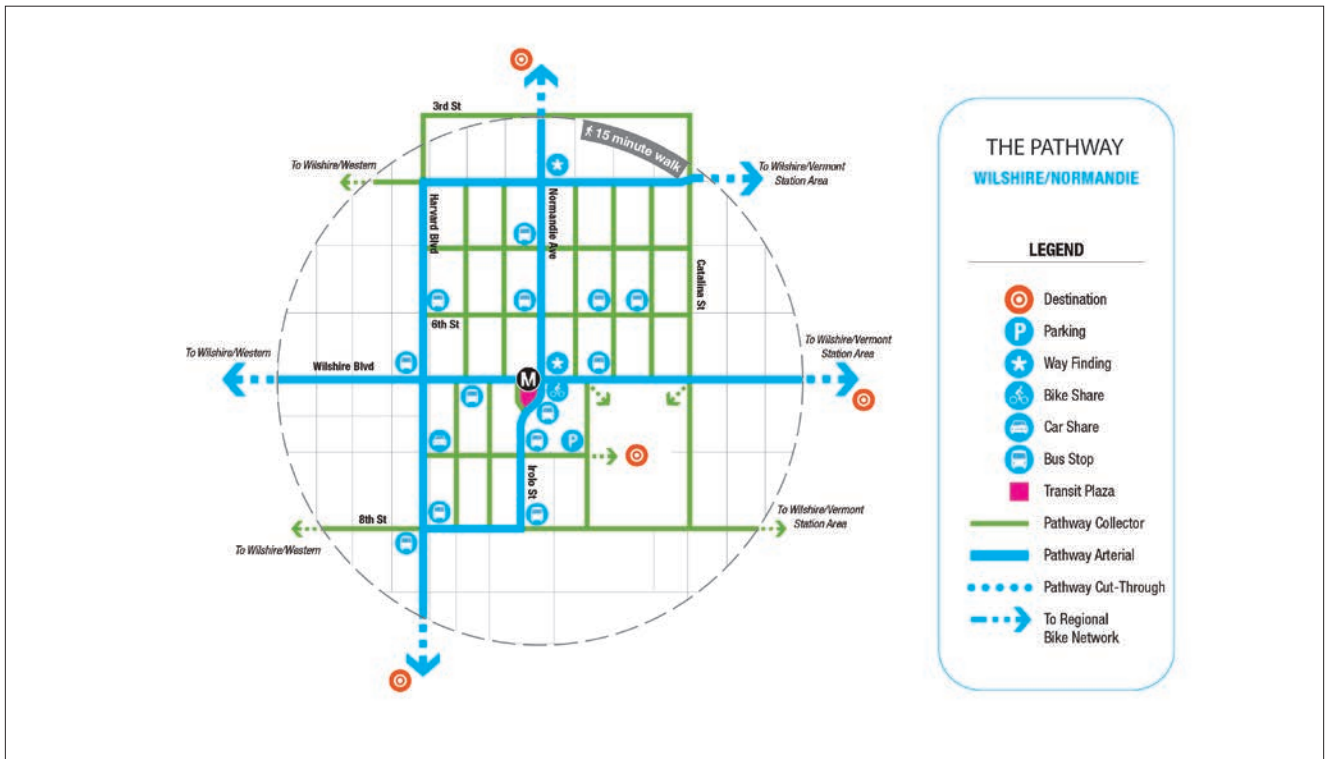


Bicycle Connections



Transit Connections

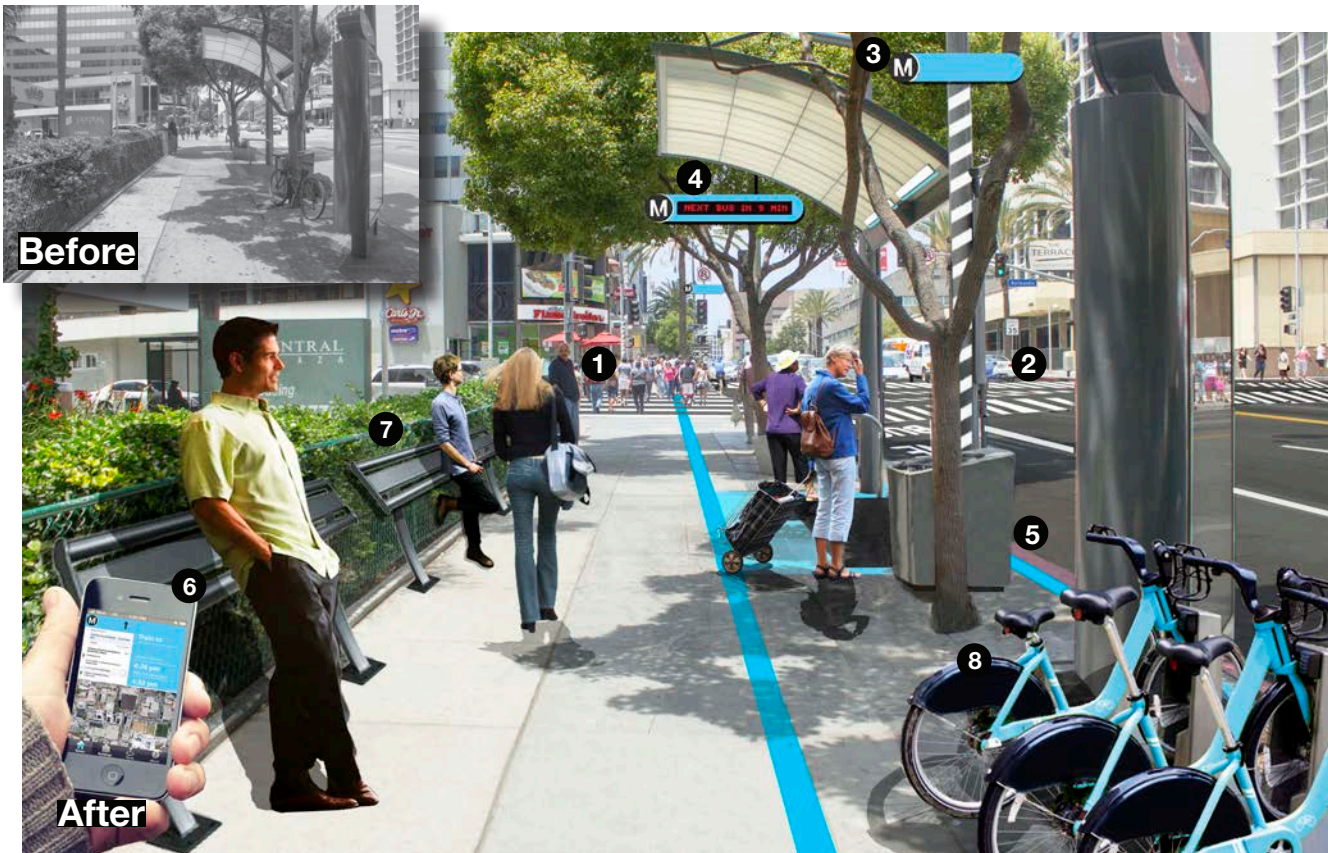
A dense network of Collectors is provided within the station area as extensive mitigation is required given the high incidence of pedestrian collisions and overall access volumes.





## Wilshire Normandie Station, Location 1

Wilshire Blvd. and S. Normandie Ave.



### Components Used at Case Study Site

#### Crossings Enhancements and Connections

- 1 Continental crosswalks
- 2 Scramble crossings

#### Signage and Wayfinding

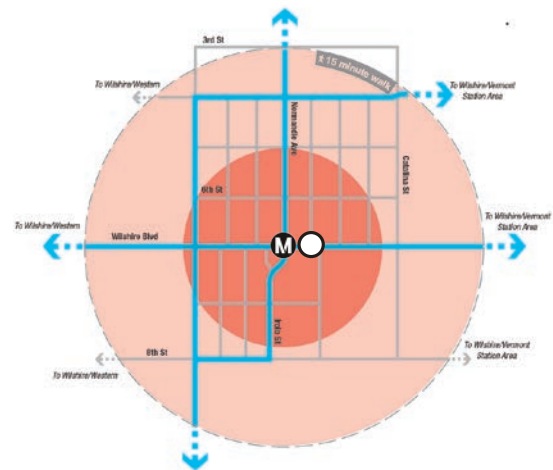
- 3 Medallion signage
- 4 Real-time signage, next train/bus
- 5 Curb-edge banding
- 6 Smart technologies

#### Safety and Comfort

- 7 Street furniture

#### Integrated Transit Access Solutions

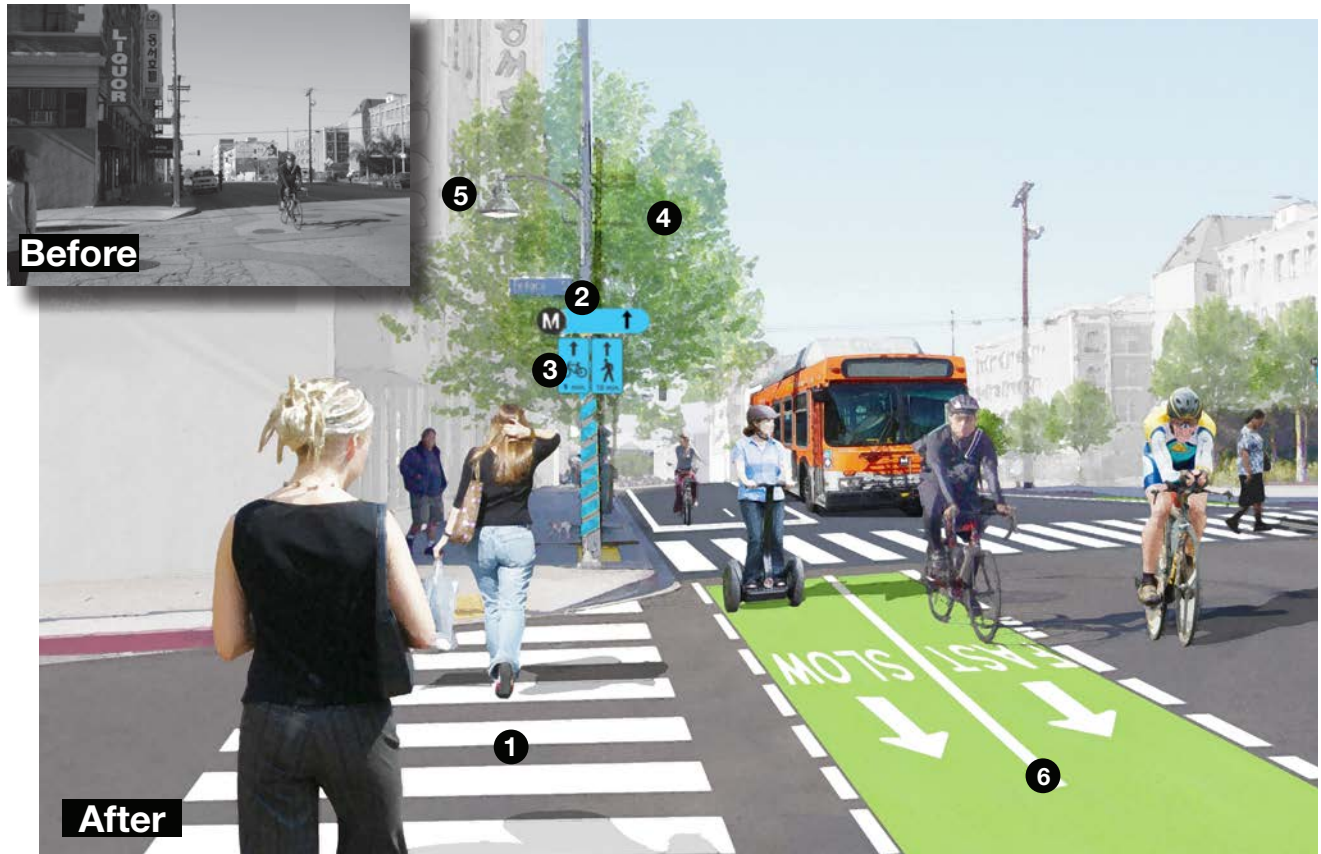
- 8 Bike Share



- M** 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.



### Components Used at Case Study Site

#### Crossings Enhancements and Connections

- 1 Continental crosswalks

#### Signage and Wayfinding

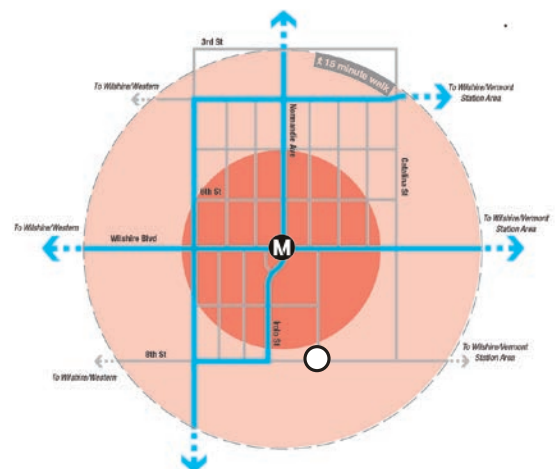
- 2 Medallion signage
- 3 Time-to-station notation

#### Safety and Comfort

- 4 Landscaping/Shade
- 5 Lighting

#### Allocation of the Streetspace

- 6 Rolling Lane



- M** 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 one-half 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.

### Station Access Barriers

#### Safety

- Lack of separated bicycle infrastructure along main roads
- Superblocks with minimal pedestrian crossings

#### Aesthetics

- Sometimes unpleasant pedestrian environment

#### Accessibility

- 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-Rides 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

### Overview of Proposed Pathway Network

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.



No cut through/direct access to station from adjacent neighborhoods



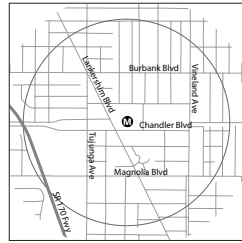
Lack of crossings along superblocks and bike facility without special markings or enhancements



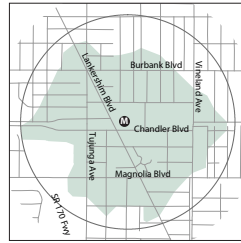
No station signage or directional cues



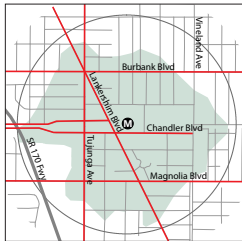
Points of Interest



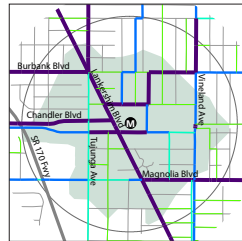
Street Grid



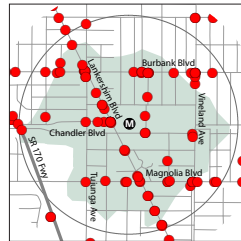
Pedestrian Shed



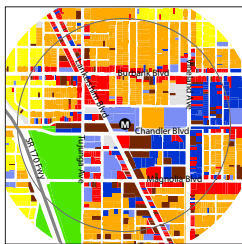
High Vehicular Speeds



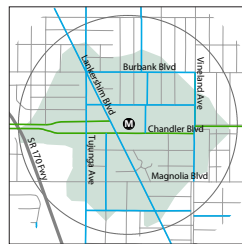
Key Transit Access Corridors



Collision Severity and Location



Land-Use Map



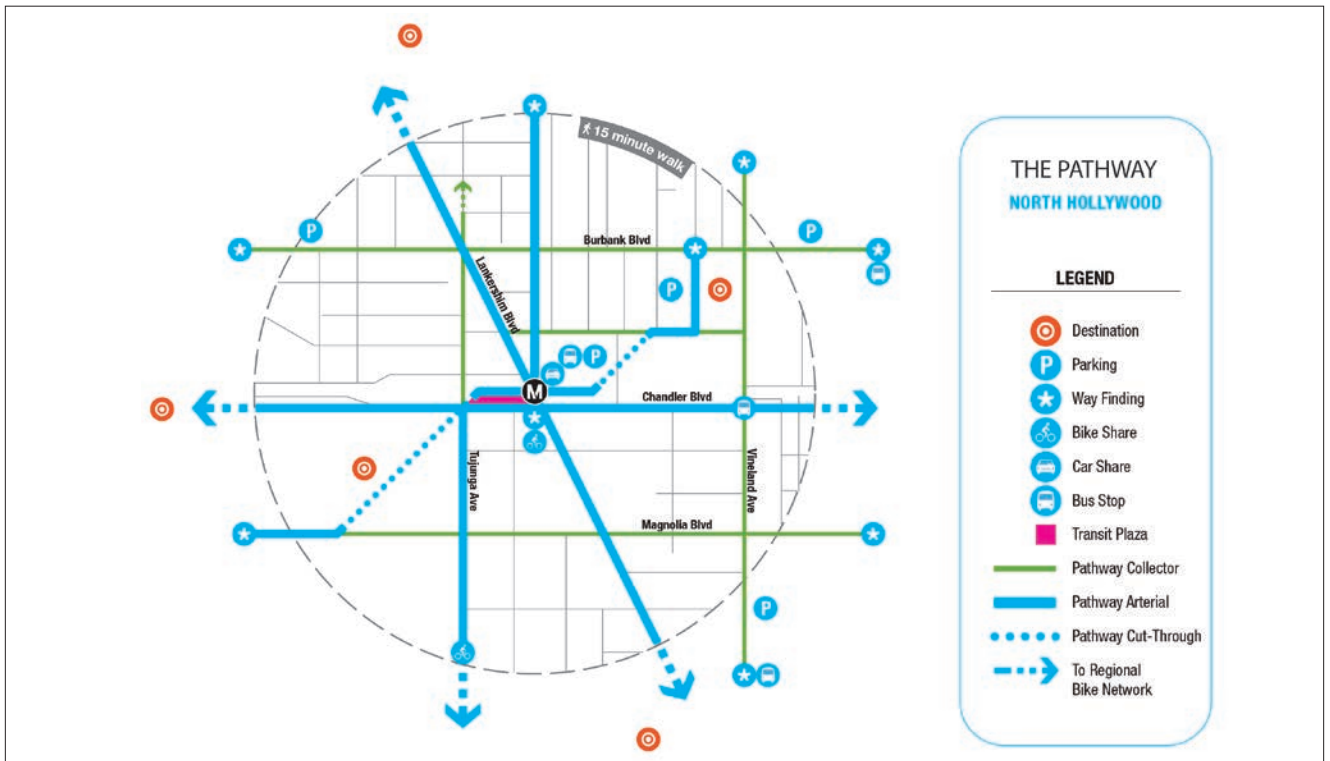
Bicycle Connections



Transit Connections

## North Hollywood Station Network Design

Utilizing the approach outlined in Chapter 3 of these guidelines, a Pathway network design was developed for the North Hollywood Station Area. The Metro Red Line comes in from the east and terminates at this station underground; the Orange line also terminates here, arriving at grade from the west. Pathway arterials run east – west along Chandler, north through the Metro parking lot linking to Elmer, south along Tujunga, and cutting through North Hollywood Park to the southwest and the Metro Parking lot to the northeast. Cut-throughs (refer to p. 32) provide critical time saving improvements for these heavily utilized stations.

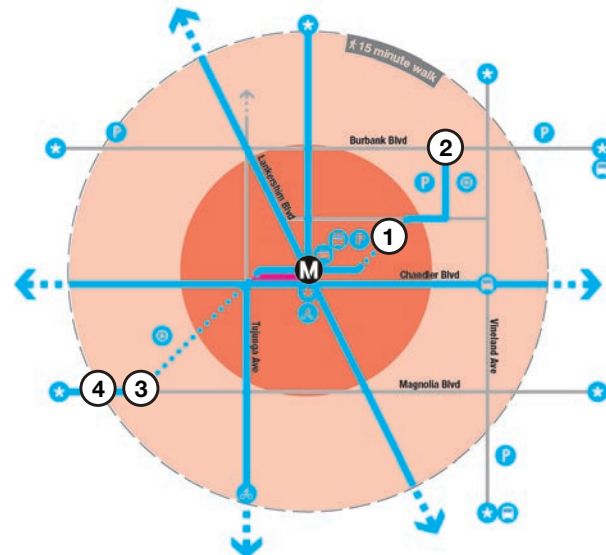


**Location 1** is the closest to the station itself and illustrates how an existing Park-and-Ride lot can be made more friendly to active transportation users, with the addition of pedestrian and active transportation cut-throughs that allow people to come in to the facility at multiple entrances, whereas 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.

**Location 2** 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.

**At Location 3**, 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.

**Location 4** 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



## Components Used at Case Study Site

### Crossings and Connections

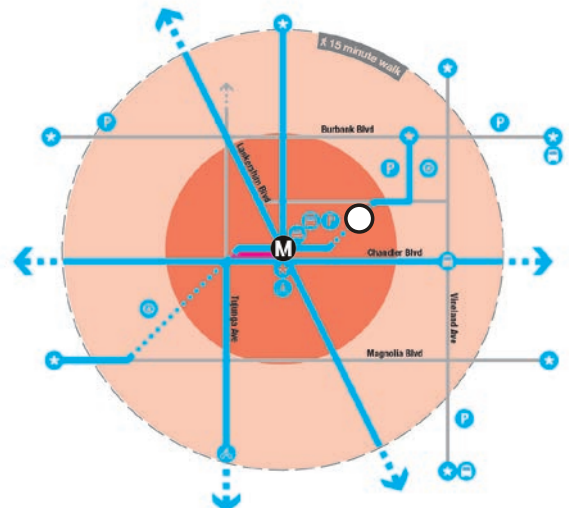
- 1 Continental crosswalks
- 2 Mid-block and additional crossings
- 3 Cut-throughs (multi-modal pathways through existing parking lot)

### Safety and Comfort

- 4 Landscaping/Shade
- 5 Lighting

### Allocation of the Streetspace

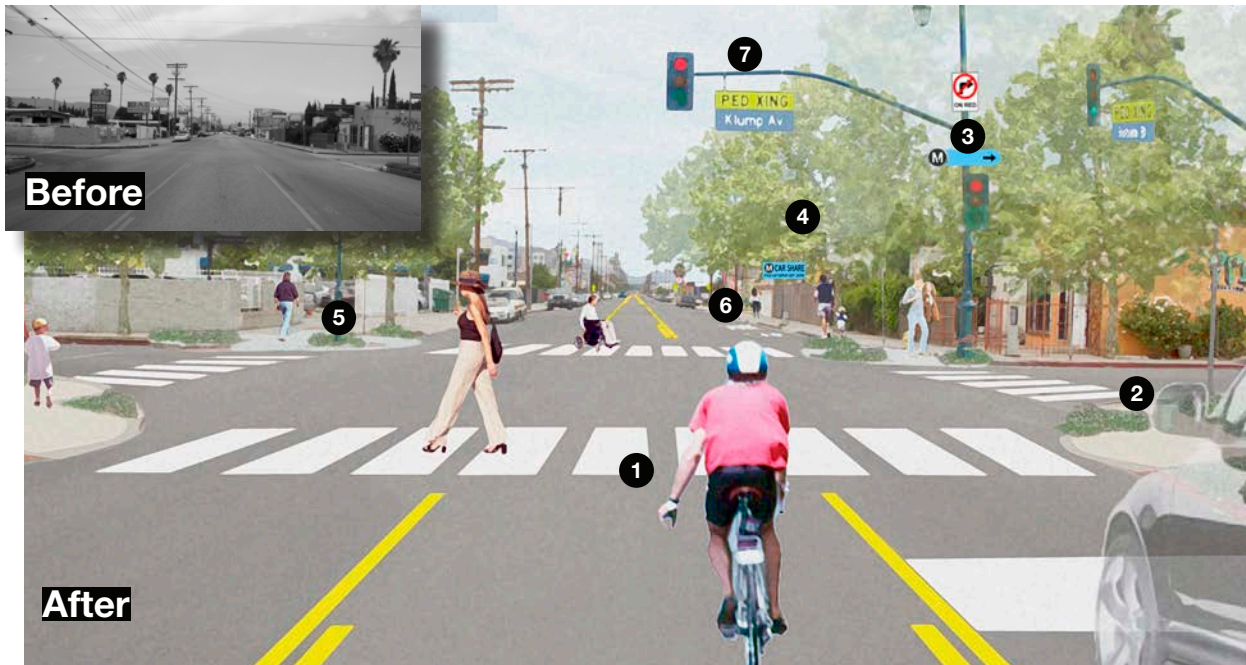
- 6 Sidewalk widening (through parking lot)



- M** 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.



### Components Used at Case Study Site

#### Crossings and Connections

- 1 Continental crosswalks
- 2 Bulb-Outs

#### Signage and Wayfinding

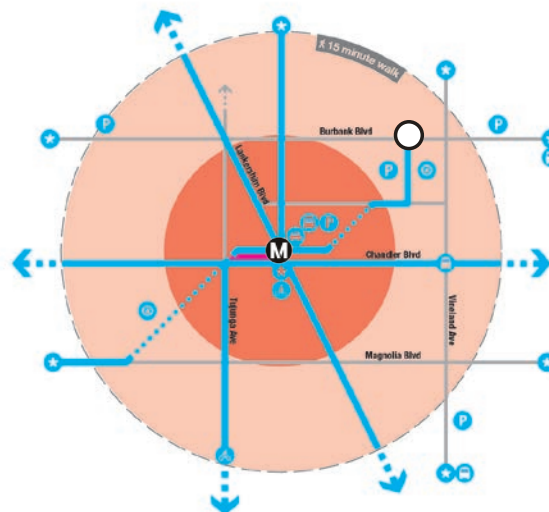
- 3 Medallion signage

#### Safety and Comfort

- 4 Landscaping/Shade
- 5 Dual curb ramps

#### Integrated Transit Access Solutions

- 6 Car share
- 7 Signal modification

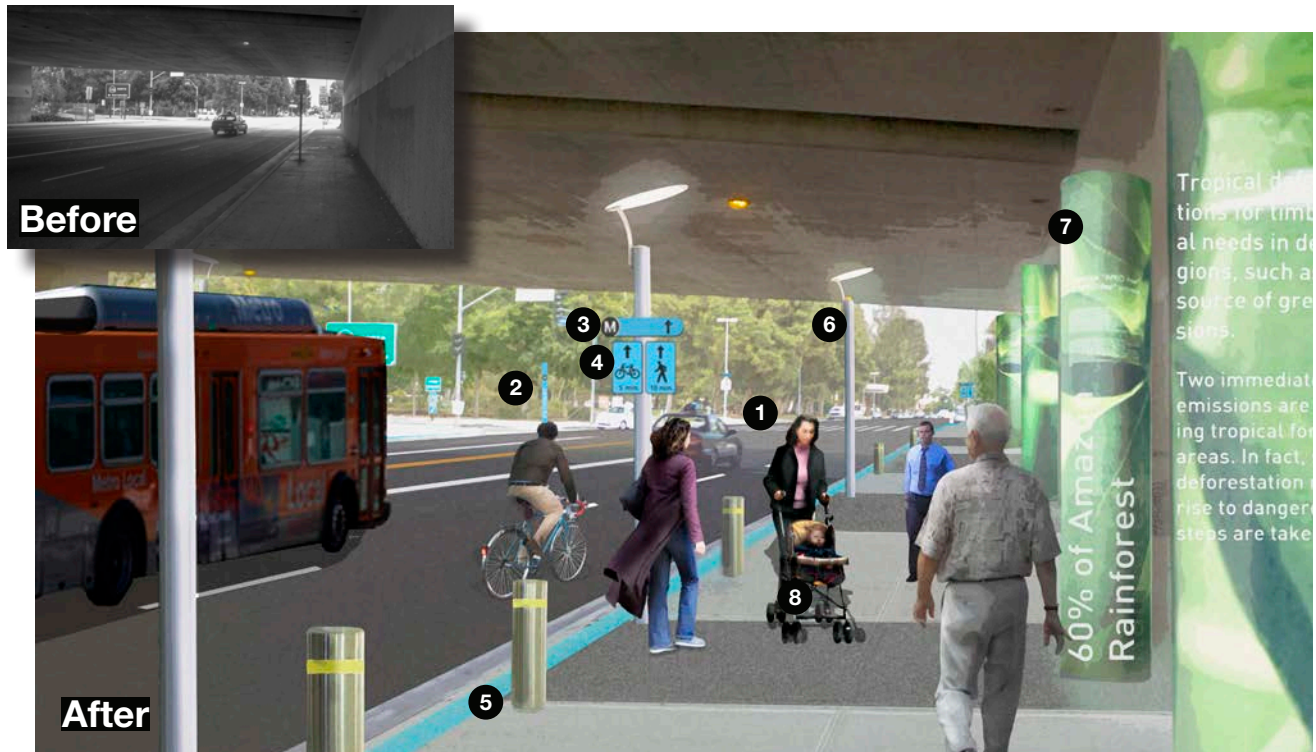


- M** Metro Station Location
- Visualization Location
- EXTENDED STATION ZONE (Area 1)  
5-Minute Walk/2-Minute Bike
- TRANSIT-FRIENDLY ZONE (Area 2)  
10-Minute Walk/5-Minute Bike



# North Hollywood Station, Location 3

Magnolia Ave. Underpass



## Components Used at Case Study Site

### Crossings and Connections

- 1 Continental crosswalks

### Signage and Wayfinding

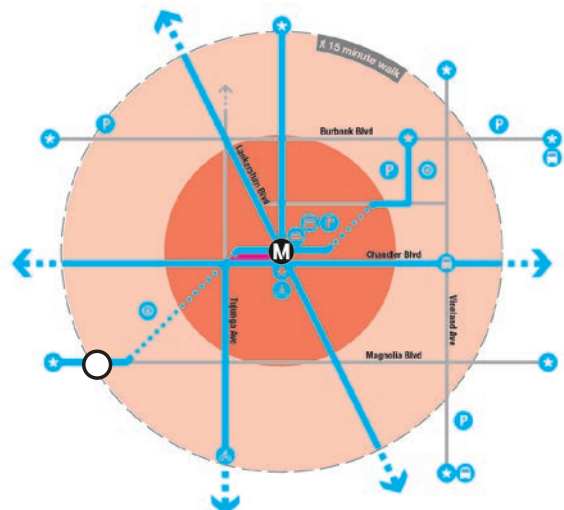
- 2 Signage
- 3 Medallion signage
- 4 Time to station notation
- 5 Curb-edge banding

### Safety and Comfort

- 6 Lighting
- 7 Enhanced freeway underpass

### Allocation of the Streetscape

- 8 Sidewalk widening



- M** Metro Station Location
- O** 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



**Before**



**After**

### Components Used at Case Study Site

#### Crossings and Connections

- 1 Continental crosswalks
- 2 Cut-through and shortcuts

#### Signage and Wayfinding

- 3 Signage
- 4 Medallion signage
- 5 Time-to-station notation

#### Safety and comfort

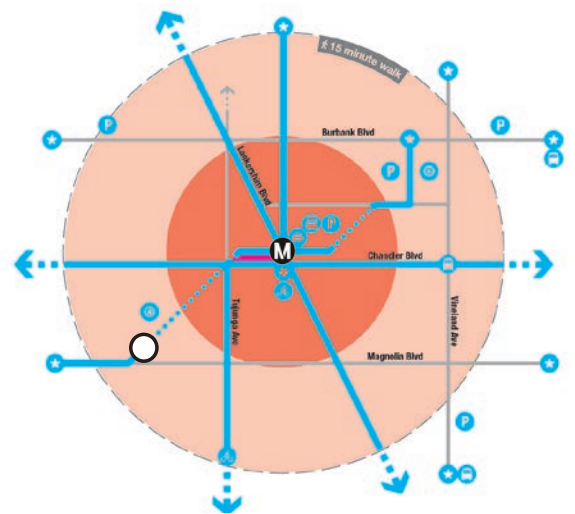
- 6 Street furniture
- 7 Landscaping
- 8 Lighting

#### Allocation of the Streetspace

- 9 Sidewalk widening

#### Integrated Transit Access Solutions

- 10 Car share
- 11 Park-and-Ride



- M** 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

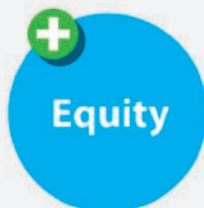
**Notes:**

***This page intentionally left blank.***

## STRATEGIES FOR PLAN APPLICATION

- \* Sustainability is a core business value of Metro and touches all transportation efforts undertaken by the agency. Metro's sustainability policy has been formally articulated and adopted as part of the *Metro Countywide Sustainability Policy & Implementation Plan (CSPP)*. This First Last Mile Strategy has been developed in conformance with that policy, and furthers implementation efforts outlined as part of that document. This chapter includes an Implementation Table that outlines next-step efforts that will foster collaboration among Metro and partner agencies in furthering stated plan goals and objectives. Also included are Pathway targets that can be used to evaluate the effectiveness of strategies as they are considered, designed and implemented.

**M** + **Pathway** =





**Implementation Table:**

LOS ANGELES METRO FIRST LAST MILE STRATEGIC PLAN	INITIATION TIMEFRAME	PARTICIPANTS
<b>1. Concept Refinement &amp; Technical Assistance</b>		
1.1 Review and respond to comments collected during Nov 2013 - Feb 2014 public review period.	Apr-14	Metro / SCAG
1.2 Per Metro Board regarding Gold Line Foothill 2A and Expo 2 ; "[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."	Apr-14	Metro
1.3 Temporary Improvements - Prepare temporary Pathway improvements as part of Bike to Work week to assess efficacy.	0-2 Years	Metro / SCAG / Local Jurisdiction(s)
1.4 Pursue additional analysis and testing of non-standard components included in the strategy for example; Micro Park & Ride, Green Zone, Rolling Lanes.	0-2 Years	Metro/SCAG
<b>2. Coordination &amp; Outreach</b>		
2.1 Encourage local jurisdictions to incorporate planning concepts in first-last mile and TOD planning or capital programs funded by Metro and SCAG.	Annual	Metro
2.2 Complete draft Pathway maps for all current and planned Metro Rail and BRT Stations to meet the board directive to; "Coordinate and further develop 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."	0-2 Years	Metro
2.3 Proactively seek countywide and statewide legislative support for plan goals.	0-2 Years	SCAG/Metro
<b>3. Plan Integration</b>		
3.1 Coordinate with General Plan and Mobility Element renewals.	Ongoing	Local Jurisdictions / Metro
3.2 Integrate Plan with Metro SRTP and LRTP.	0-5 Years	Metro
<b>4. Funding</b>		
4.1 Identify potential funding (i.e. ATP, Cap and Trade, TIGER, etc.) to implement Plan improvements and by working with jurisdictions.	Ongoing	Metro
<b>5. Measurement and Monitoring</b>		
5.1 Develop pre-project baseline indicators for access mode splits, station ridership, demographics, and access sheds.	0-3 Years	SCAG/Metro
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.	Ongoing	Metro
5.3 Review available transit access monitoring technology.	0-1 Years	Metro
5.4 Prepare post-improvement ridership report, study relationships between first-last mile improvements and ridership characteristics, health, safety and local economic indicators.	2-5 Years	Metro



## Evaluating Goals

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 and efficiencies.**
- 3. Build on the RTP/SCS and 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.

## Metro Ridership

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.

## Targets

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:

### Metro First Last Mile Strategic Plan Goals

**3- to 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.

**Notes:**

***This page intentionally left blank. Appendix follows this page.***