

7 BEST PRACTICES

Bicycle Access to Transit

The quality of bicycle amenities, facilities, and environment affect access to transit service. Improving bicycle access to transit supports existing ridership levels and attracts new transit passengers by providing additional connectivity to other modes and enhancing the overall travel experience. Enhancing bicycle access to transit can be a cost-effective way to affect a mode shift. Targeted coordination of policies, programs, and implementation among agencies and private entities is required to successfully integrate these modes of travel.

A high-quality pedestrian environment is also critical for a healthy bicycle environment. Such amenities and design features as lighting, shelters, wayfinding, traffic calming, and road diets support both walking and bicycling (See Pedestrian Access to Transit). Studies have found that neighborhoods with high degrees of walking have higher levels of bicycling and transit use than those that don't. This is because there is a virtuous cycle involving land use density, system transit service quality, multimodal transit options, and system integration.



Enhancing bike access to transit can be a cost-effective way to promote transit ridership.

Source: Todd Mecklem

WHAT IS IT AND WHY DO IT?

Creating a bicycling environment that is safe and comfortable for people with a broad range of skills and for all ages requires a range of bicycle programs, policies, and facilities. Careful street design is needed to provide cyclists sufficient space and visibility for safe riding; this must be balanced effectively with other street users and done in a way that navigation is clear and simple.

Improving bicycle access to transit increases urban mobility and fosters multimodal travel and can be done using relatively low levels of capital investment. Improving bicycle facilities and parking in transit corridors and at stations can bring new riders to the transit system.

HOW WELL DOES IT WORK?

Transit agencies are finding that bicyclists are more willing to take transit when the systems provide bicycle amenities and market their services directly to them. The Portland Bureau of Transportation's Bicycle Program estimates that providing improved access for bicyclists increases the capture area of transit investments twelve-fold.

Working together, transit agencies and local jurisdictions that develop a comprehensive approach to improving bicycling conditions and amenities can attract additional transit riders and decrease single occupancy vehicle trip rates at relatively minimal cost. The following sections present best practices in bicycle amenities, programs, and infrastructure in a variety of U.S. and European cities.

There are a number of street design features that cities can use to improve cycling safety and comfort, including: bicycle lanes, bicycle boulevards, cycle tracks, improved crossing treatments, signage, and traffic calming features. Additionally, education and safety training programs can help to get more people on bikes. Ultimately, getting more bicyclists on the streets is the best way to improve driver awareness and rider safety. Bicycle parking and end-of-trip facilities, such as lockers and showers, are also important to bicycle riders.

IMPROVEMENTS THAT ENCOURAGE BICYCLING TO TRANSIT

To increase the number of people bicycling to transit it is necessary to improve both perceived and actual safety of the overall bicycle network. Since the city controls street design, this is an area where it has direct influence in improving access to transit. This section presents a variety of bicycle infrastructure improvements that support system-wide bicycling connectivity and access to transit.

Bicycle Boulevards

Bicycle boulevards are low-traffic streets that have been optimized for use by cyclists. A variety of traffic calming elements and signage are used to reduce car volumes and speeds, fostering a safe bicycling environment. Bicycle boulevards often include features that allow cyclists to travel farther without stop controls or intersection treatments that allow cyclists to continue through intersections, while cars are forced to turn. Bike boulevards often make use of

sharrows or shared-lane markings that communicate the presence of bicyclists to drivers.

Bicycle Lanes and Boxes

Bicycle lanes are another technique to provide dedicated space in the street for cyclists and to increase driver awareness to the presence of cyclists. Increasingly, cities are using colored pavement treatments to designate bike lanes, either by coloring the beginning of the lane or the entire lane. In a number of European countries, such as Belgium, it is customary for bike lanes to be differentiated from traffic lanes with colored pavement treatments. Colored lanes further discourage drivers from entering the portion of the right-of-way dedicated for cyclists.

Colored markings can also be used at key spots such as intersections and turn zones where cars need to cross a bike lane. Bike boxes, as shown below, allow bicyclists to wait ahead of vehicular traffic, have been implemented in Portland, Oregon.



Bicycle boulevards use a variety of traffic calming techniques and shared-lane markings to increase safety for bicyclists.

Source: Flickr user Payton Chung



Bike boxes allow cyclists to move in front of the travel lane in order to be more visible to cars and avoid turning conflicts. Politicians in Portland began advocating for an increase in bike box construction as a safety measure in the wake of cyclists fatalities at intersections.

Flickr user: Rich and Cheryl

Cycle Tracks in Portland, Oregon

In Portland, federal stimulus funds are being used to improve bicycle access to transit by establishing cycle tracks and buffered bicycle lanes on streets that feed MAX Green Line light rail stations. The development of high-quality feeder facilities is intended to bring new users directly to the transit system, while simultaneously allowing for improved conditions at locations where bicyclists cross the rail lines.

Portland's cycle tracks use a row of parked cars to separate bicyclists from auto traffic, but other cycle track designs often use a physical barrier such as a curb or a narrow median, which can be more expensive to implement.

A report prepared by Alta Planning + Design, called "Cycle Tracks: Lessons Learned", presents findings from the Portland pilot project. It found that cycle tracks have a number of advantages over conventional bicycle lanes: they reduce auto-cyclist accident rates, remove the danger of "car-dooring", and increase bicycle ridership. According to the report, cycle tracks can also present a number of potential complications, including conflicts between cyclists



In Portland, parked cars are used as a buffer between the cycle tracks and travel lanes.

Source: Nelson\Nygaard

and pedestrians and bus passengers. Notably, since cyclists are not traveling alongside automobiles, "motorists may not be aware of their presence, leading to increased vulnerability at intersections." The report suggests that some accidents may be prevented by moving the stop line back at intersections, using protected phases at signals, and prohibiting cars from turning right on red. Portland has used bike boxes on the street to facilitate left turns for cyclists out of the cycle track.



Cycle tracks, as shown in Amsterdam, are bicycle lanes that are separated, but adjacent, to traffic and transit.

Sources: Nelson\Nygaard and SvR Design

Cycle Tracks

Cycle tracks are bicycle lanes that are physically separated from traffic, but are located in the roadway. Cycle tracks are common throughout parts of Europe, but only a few cities in the United States have them, including Bend and Portland, Oregon, Cambridge, Massachusetts, and New York, New York. They provide a buffer from traffic that creates a much greater level of comfort and sense of protection for cyclists. Cycle track facilities generally take two forms: paired one-way facilities on each side of the street, or two-way wider facilities on one side of the street.



External bike racks allow bicyclists to transport their bikes while traveling by bus.

Source: Flickr user RichardMasoner

USING A BICYCLE TO ACCESS TRANSIT

Once cyclists reach a transit stop or station, they are typically faced with a decision to store their bicycle or bring it with them on transit. For many, weather protected and secured parking that provides confidence that the bike is safe for an extended time is a critical system design feature. Some riders also want or need to bring their bike on the transit trip to complete the other end of the journey. If a traveler is uncertain about the presence of bicycle parking facilities at the station or whether transit can accommodate their bike on board, they are far less likely to chose a bike-to-transit journey.

King County Metro was the first transit agency in the nation to use front-loading bicycle racks on buses. Today, Metro passengers load over 10,000 bicycles per week on buses.



Caltrain accommodates large numbers of bike commuters using cars dedicated to bike storage.

Source: Flickr User Richard Masoner



Light rail can accommodate bikes with vertical bicycle racks.

Source: Sound Transit

Compared to commuter trains, light rail transit (LRT) and streetcars have less space to accommodate large numbers of bicycles. However, they can still accommodate bicyclists by providing onboard bicycle racks or designated spaces for bicyclists to stand with their bikes. Some U.S. light rail trains, including Link, use racks that hold bikes vertically, while some European systems use fold-up seats with a rack underneath.

Most regular transit buses don't have onboard space for bicycles given narrow aisles, but bus rapid transit vehicles may have more room to accommodate bicycles. For example, Community Transit's new SWIFT BRT vehicles have three doors and bicycles can be rolled onto the bus and stored in onboard bike racks. Installation of onboard racks protects other riders by securing bikes, provides a more comfortable ride, and possibly results in shorter dwell times at stops.

Bicycles Racks on Vehicles

External Bike Racks

Most transit agencies provide external bike racks on buses. Bike racks mounted on buses are most frequently located in the front of the bus. They typically flip up against the bus when they are not carrying any bikes.

Onboard Bike Racks

Commuter trains are often well-equipped to store bikes. Caltrain in the San Francisco Bay Area has multiple cars dedicated to carrying approximately 50 bikes each. The Utah Transit Authority is looking to redesign its commuter rail cars to increase bicycle capacity after finding that cars designed for hold two bikes have regularly been carrying 15 bicycles or more.



Community Transit's Swift BRT vehicles have onboard space for bicycles.

Source: Flickr user Oran Viriyincy



In Portland, the City has begun to remove on-street parking in strategic locations to provide higher-capacity bicycle parking opportunities that provide good access to local businesses and, in some cases, are located on high frequency bus stops.

Source: left, Flickr user ITDP; right, Nelson\Nygaard

Bicycle Amenities at Stations and Stops

Bike Parking

Providing bicycle parking at transit facilities is a critical element in achieving high levels of bicycle access to transit. National studies show that a lack of adequate bike parking and other related services is a major deterrent to commuting by bike. Parking that is convenient, secure, weather-protected, and plentiful provides a measure of predictability and comfort for those who want to travel by bike and transit. Wherever possible, bicycle parking should be conveniently located near bus stops; high quality bicycle storage is a must at rail stations and major transit transfer facilities.

Sheltered bike parking provides protection from the heat, snow, and rain. Where there is not adequate curb space and more plentiful parking, parking spaces can be removed to install stalls for on-street bike corrals such as the one shown below.

Secure bike parking provides an additional level of comfort and assurance to bike riders. TriMet's Bike and Ride facilities offer secure, enclosed bike parking that is accessed with a BikeLink keycard. In Long Beach, secure staffed bike parking can be found at the BikeStation, along with other amenities such as repair services, transit information, and electric vehicle recharging.

End-of-trip Facilities

Weather, be it too hot, too cold, too humid or too rainy, is a frequently cited reason people chose not to cycle. However, the problem is often not the lack of willingness to cycle in inclement weather, but the condition people end up in after biking through a rain or snow storm. Developing facilities that allow people to store bikes out of the weather and to shower and change at workplaces can help overcome this barrier.

A good way to encourage commuting in rainy areas is to provide spaces where cyclists have access to facilities at the end of their commute where they can dry off, store clothes, and shower. Ideally, such facilities will provide secure bike parking, protected from the weather. Using regulations or incentive programs, cities can play a part in encouraging or mandating the inclusion of these resources in all new office buildings.

End-of-trip Facilities

Shower and storage facilities can be established for employees of several companies located in close proximity. Examples of this type of arrangement have been organized by Transportation Management Associations in Vancouver, BC and Portland, Oregon. The City of Portland has established a public/private partnership with local fitness centers to provide local area commuters with off-site permanent clothes storage, shower facilities, and secure bike parking. Cyclists can purchase day or monthly passes and access any of the fitness centers. Public/private partnerships reduce the infrastructure investment by the city and allow for a greater geographic network of facilities available to cyclists. Portland's experience indicates that these programs require regular advertising to maintain users.



Although bicycle and rail integration extends bicycle access to transit, it does present potential safety issues that need to be addressed through education, signage and design.

Source: J.Maus

ENHANCING BICYCLE AND RAIL INTEGRATION

Bicycle corridors, be it cycle tracks, bike lanes, or trails, can be installed in or adjacent to rail rights-of-way. In Vancouver, B.C., development of the elevated Skytrain allowed for the development of trails underneath, which have subsequently been linked to a growing network of trails, bicycle boulevards and bike lanes. Installing bicycle corridors alongside rail helps to provide greater integration of bicycling with transit use; however, the systems have to be designed carefully to minimize collisions and accidents.

One potential complication of integrating bicycling with railways is that bicycle wheels can become caught in the flange gap of rail tracks. An Alta Planning and Design report, “Bicycle Interactions and Streetcars: Lessons Learned and Recommendations”, stated that “bike-track crashes are a major and underreported problem for Portland-area bicyclists.”

This has also been an issue in Seattle as a number of bicyclists have been injured while crossing the tracks of the South Lake Union Streetcar.

The risk of bicycle accidents associated with the flange gap can be reduced by designing the track and cycle alignments to avoid difficult crossing angles. Designing perpendicular crossings, as close as possible to 90 degrees, can be an effective approach. Another way to address this is through good signage and public education for cyclists to make them aware of the tracks and safe practices for crossing the tracks.

Other approaches to reducing potential bicycle accidents associated with bicycle and rail integration include:

- **Center Median Platforms:** Running streetcar and light rail systems along a center median allows curb lanes to be used by bicyclists. Such designs require that stations be located near signalized intersections to reduce conflicts with

riders accessing the station. Center platforms also allow consolidated station designs that serve both directions of travel.

- **Expanded Bike Lane:** Expanding the bike lane and space to maneuver at angled crossings improves safety conditions for bicyclists. In Seattle, crossings of the South Lake Union Streetcar line at Westlake and Seventh avenues are aided by a widened bike lane with graphics showing how a bicycle can be maneuvered across the tracks.
- **Bridges:** As new bicycle facilities are developed along transit corridors, the use of dedicated bridges to move bikes and pedestrians across barriers (e.g., rail lines, freeways, topographic obstacles) can increase safety and comfort. However, these improvements can come at a significant cost.



Signage is important for notifying bicyclists about the dangers of riding near tracks.

Source: BikePortland.org



Designing bike paths so that they cross at perpendicular angles to rail tracks increases bicycling safety.



The City of Portland’s “See and Be Seen Campaign” encourages greater awareness of the dangers of limited visibility during winter months.

Source: www.bikeportland.org

PROGRAMS THAT PROMOTE SYSTEMWIDE BICYCLING

Developing a healthy bicycling environment and culture is an important part of supporting good bicycle access and integration with transit. Building a strong and lasting bicycling constituency requires a multi-faceted approach that not only provides required infrastructure, but makes cyclists feel they are part of a broad and growing community. There are a variety of programs and activities that can engender this community spirit toward cycling.

Conducting a Safety Campaign

Cities have limited influence on cyclist and driver behavior at night and in wet weather but some municipal programs have been established to increase awareness and education in this area. The City of Portland and community organizations initiated a public awareness campaign entitled See & Be Seen: Light the Bike. See the Bike to bring greater awareness to the dangers of cycling without proper lighting. The campaign is complemented by the local Community Center providing free lights to needy cyclists through its Get Lit! initiative. Other cities have worked to train truck drivers to look out for bikers when they turn right at intersections.

Celebrating Cycling

Great cycling communities have numerous events that celebrate those that ride, allow families to ride safely together or to pay homage to dedicated cyclists. Some common events include: organized and supported rides, Sunday Parkways activities where

local streets are closed to cars and cyclists are free to ride, bike commute month (or week) where local companies can compete for the highest cycling rates, bicycle carnivals or events that showcase numerous types of cycling. All these events can help to build a cycling culture.

Bikeshare Programs

Another program that has proved to be very popular in European cities (Paris, Barcelona, Lyon, Nice, Rome and others) is a “bike share” program in which

subscribers can access bicycles at parking stands throughout a city. Often, these systems are paid for, installed and maintained by private entities in exchange for a franchise (such as advertising at transit stops) throughout the project area. American cities such as Denver, Washington DC and Minneapolis are also implementing bike share programs. A primary advantage of the system is that it is flexible for the user, and can be funded privately if the appropriate franchise agreement can be reached with a provider.



Street closures, such as Sunday Streets in San Francisco, help to build a healthy bicycle culture.

Source: Flickr user dustinj



Bikesharing programs allow subscribers to access bicycles at parking stands throughout the city.

Source: Flickr, user Sletvet

