Non-Motorized Access to Transit

Recommended Strategies for Improving Access to Transit in the Denver Region
Introduction

Land development practices have often not given consideration to people who use transit services. For example, barriers that separate neighborhoods from nearby transit stops, and shopping centers makes accessing transit routes and stops inconvenient. The lack of bicycle storage at transit stops has tended to discourage people from using bicycles in conjunction with transit. The Denver Regional Council of Governments (DRCOG) believed it would be of value to make recommendations to local governments and the private sector on improving access to transit.

This paper, prepared with the assistance of DRCOG’s Pedestrian and Bicycle Advisory Committee, provides recommendations for improving pedestrian and bicycle accessibility to transit facilities. These include physical improvements to transit access corridors, and transit stops.

To improve non-motorized access to transit, two primary activities are recommended. First, barriers to transit access must be removed that discourage individuals from accessing transit. These include structural, psychological, and economic barriers. For example, RTD’s bike-n-Ride program eliminates a barrier to carrying bikes on transit and has resulted in increased access to transit by bicycle as well as increased transit ridership.

In addition, amenities that would encourage transit access by non-motorized modes should be identified and put into place.

All transit users are pedestrians or bicyclists at the beginning or end of their transit trip. As the walking and bicycling environment to transit facilities is improved, individuals may be encouraged to take non-motorized modes in lieu of driving. For existing transit users who do not own an automobile, accessing transit by a non-motorized mode will become less of an effort and more convenient.

As improvements are made, individuals will have greater choice in their transportation options. As a result, more individuals may leave their cars at home and access transit by non-motorized modes resulting in reduced traffic and air quality improvements. Improving the bicycle and pedestrian environment is a desirable method for realizing this goal because it is a relatively inexpensive and environmentally friendly strategy.

Finally, one of the six core elements of DRCOG’s Metro Vision 2020 plan is the development of a balanced, multimodal transportation system. The recommendations highlighted in this brochure will contribute to realizing this goal.
Identifying Improvements

To encourage non-motorized access to transit, local governments and RTD are encouraged to make two types of improvements:

Improvements to access corridors leading to transit facilities, and

site-level improvements at transit facilities.

Access Corridor Improvements

This process would start with identifying areas from which transit users begin their trips. This should include single-family and multi-family residential areas (see Figure 1).

In addition, the areas to which individuals are going must also be identified including retail and commercial areas, schools, universities, hospitals, government offices and libraries.

Planners should begin their search using a one-half mile radius for pedestrian trips and a one mile radius for bicycle trips from the transit site.

The DRCOG Travel Models for Regional and Subregional Planning in the Denver Region identifies one-quarter mile as the average walking distance for pedestrians using transit. A larger planning area is suggested here to further encourage pedestrian trip making. The bicycle planning area takes into account the greater distances cyclists are willing to travel. Because large planning areas are difficult to manage, a one mile radius from the transit site is recommended for the bicycle planning area. Because bicyclists may be willing to ride farther than one mile, flexibility in defining project area limits is encouraged.

Figure 1: Access Corridor Identification

The most direct corridors up to one mile in distance to and from the transit facility should be identified. The corridors that most directly connect transit facilities to trip origins and destinations should be prioritized for improvement.

Once the corridors have been identified, make an inventory of missing pedestrian and bicycle facilities, poorly designed facilities, and those requiring maintenance should be developed. When considering pedestrian improvements, gaps and deficiencies in the system should be identified including:

- missing sidewalks
- curb cuts
- crosswalks
- pedestrian bridges or underpasses
- walk signals, raised medians and other traffic calming strategies such as bulb-outs and speed humps.

A bicycle inventory should identify gaps that can be filled with appropriate facilities including:

- off-street bike paths
- shoulders
- striped bike lanes, and
- signed routes.

The type of bicycle facility to be included in the improvement will depend on the characteristics of the corridor along which it is to be built. For example, if the only direct route to a transit facility is a high-speed corridor with a narrow curb lane, then a detached off-street bicycle path may be the most appropriate improvement. If an access corridor has very little traffic, however, signage, lane striping, or shoulders might be the most appropriate strategy.

Bicycle and pedestrian amenities along residential and commercial streets should be provided by developers. Planners and developers should work together early in the process to ensure that bicycle and pedestrian...
infrastructure and treatments are included in the development plans.

Developments with cul-de-sacs and curvilinear streets do not facilitate direct access to areas outside the development. Indeed, these types of developments have a negative impact on walking because the distances between a potential transit rider’s home and the transit site are unnecessarily long.

In existing developments the inclusion of cut-through pathways would significantly increase accessibility to transit and would reduce the barriers that discourage individuals from walking or bicycling to transit sites. Cut-through paths should be constructed where practicable.

In new developments, cut-through paths should be included at every cul-de-sac to provide direct access to transit sites and other destinations. Figure 2 is an example of what a subdivision block might look like that includes the appropriate cut-through pathways. Imagine the walking distance to the transit site if the cut-through pathway had not been provided.

**Figure 2: Cul-de-sac with Cut-Through Pathway**

Shopping center designs are generally unfriendly to pedestrians. A typical shopping center is set back from the street with large parking lots between transit stops and the building entrances. Individuals who access these sites by non-motorized modes and transit must make their way through a sea of cars to reach their final destination. By reducing set backs and orienting the building entrances to the street, individuals will find transit a far more convenient option. Figure 3 shows what this design might look like.

**Figure 3: Transit-Accessible Shopping Center**

A prioritized list of recommended improvements similar to those highlighted above could be included in the local capital improvement plan or the city’s comprehensive plan.

**Site-Level Transit Facility Improvements**

The demand for automobile parking at many transit facilities, especially park-n-Rides, has exceeded the supply. Improving on-site and off-site bicycle and pedestrian amenities can help reduce automobile parking demand at many sites. This is especially true where there is a lack of pedestrian and bicycle amenities that would encourage bicycling and walking to the site.

The following are specific recommendations for site-level improvements that would encourage bicycling and walking to transit facilities.

**Bike Parking**

Provide inverted “U” type bicycle racks at all light rail and bus stations, and park-n-Rides. Grid (wheel benders), wave racks, Rack III’s and other bicycle racks that are not comparable to the inverted “U” design and function should not be used.

The DRCOG Pedestrian and Bicycle Advisory Committee recommended the inverted “U” rack as the preferred bicycle parking standard for the region. For additional bicycle parking information see the DRCOG brochure “A Guide to Bicycle Parking”.

**Figure 4: Transit Facility Bicycle Parking**
In addition to bicycle racks, bike lockers or covered bicycle parking should be provided at each station and park-n-Ride. Lockers and racks should be located as close to the boarding area as possible for the highest level of visibility, security, and convenience. The level of bicycle parking should be based on estimated demand and will differ significantly for remote rural sites compared to dense urban transit sites.

Pedestrian Circulation

Walkways on the periphery of the transit site should be built along with direct connections to the transit boarding areas. Walkways should be designed to minimize conflict between pedestrians and automobiles. Special care must be taken to ensure that both pedestrian walkways and ramps meet Americans with Disabilities Act (ADA) width and slope requirements.

Traffic calming measures on the transit facility grounds and at the facility periphery will make for a friendlier pedestrian and bicycling environment. These strategies are specifically designed to slow automobile speeds in specific locations where a high degree of foot traffic is anticipated or desired. In the process, individuals will feel less intimidated by automobile traffic and should be more likely to walk or bicycle to transit facilities.

Examples of traffic calming include raised crosswalks and intersections, speed humps and tables, bulbouts, and chokers.

Shelters

In Colorado, the potential for stormy summer afternoons and cold, snowy winter days make it necessary to provide adequate shelters for transit riders who get to transit by non-motorized modes.

Transit patrons that access transit facilities by car have the security and comfort of their own private shelter to protect them from foul weather. Those that access transit by non-motorized modes, however, do not have the benefit of a comfortable and dry waiting area unless it is provided. Providing clean, dry and comfortable waiting areas with adequate seating is an important feature to encourage individuals to access transit by non-motorized modes.

Convenience Services & Amenities

Accessing transit by non-motorized modes will be easier if it’s possible for individuals to take care of errands at the transit site. Making allowances at major transit sites for for-profit services such as day care, shoe repair and dry cleaning will reduce the need for making additional trips. Where significant bicycle use is identified, a bicycle repair station may be a helpful amenity at transit stations.

Security

Fear of crime plays a role in the decision to access transit. Because constant human presence is an important factor in discouraging crime, the provision of convenience services will foster greater feelings of security for transit patrons. It is also recommended that transit facilities provide adequate lighting, security cameras and emergency telephones.

Bus Stop Improvements

Many bus stops are ignored with respect to pedestrian and bicycle accessibility design treatments. At a minimum, bus stops should include the following:
- bus stop pole and sign
- 5 x 25' concrete boarding pad, and
- bench (at in-bound stops).

At bus stops that generate 40 or more boardings per day, shelters should be provided. At a minimum, shelters should be roofed structures to provide protection from precipitation. Ideally, shelters should be
enclosed units to protect passengers from the cold, wind, rain and snow.

Bicycle parking should be provided at bus stops where field inspections demonstrate a demand. Bikes locked to poles, parking meters, trees and other objects near the bus stop indicate that the demand for this amenity exists.

All too often, bus stops are located on uneven, unpaved surfaces making accessibility difficult for wheelchair-bound individuals. Pedestrian walkways leading to the bus stop are strongly encouraged and the connection from the walkway to the concrete boarding pad should be seamless.

**Figure 6: Bus Stop (Before Improvement)**

The bus stop depicted above leaves much to be desired. A ditch at the edge of the roadway acts as a barrier for passengers who would board at this location. What might happen if a wheelchair-bound individual tried to board a bus at this location? What would happen to all transit riders during a snow storm or wet weather conditions? At the very least, a concrete boarding pad should be included in the improvement.

**Figure 7: Bus Stop (After Improvement)**

### Improving Bus Transfers

Transfers should be as seamless as possible. This not only includes timing the transfers so a connecting bus comes within a few minutes of the patron being dropped off at the transfer point, but it also includes minimizing walking distances to the connecting ride. Figure 8 shows a bus stop configuration that would require a transferring passenger to cross two streets in order to make their connection.

**Figure 8: Undesirable Bus Stop Placement**

As noted above, a desirable configuration should minimize walking times and distances between transfer points. Figure 9 shows the appropriate location of the bus stops. Both stops are located on the “far” side of the intersection. Thus, transferring passengers need not wait through two light phases, nor would they have more than a single street to cross.

**Figure 9: Desirable Bus Stop Placement**
The latter bus stop configuration is especially beneficial to mobility-impaired individuals because of the additional time needed to exit the bus and the additional ambulatory time required to travel between transfer points.

**Maintenance**

Transit stop improvements and maintenance should be an ongoing effort. Maintenance activities should include regular snow removal at bus stops and nearby sidewalks. In addition, trash should be picked up and hauled away regularly. Local governments can assist the RTD in upkeep efforts by participating in the RTD Adopt-A-Stop program in which individuals will be provided with trash cans and bags in exchange for a bus stop sign identifying the adopter of the bus stop.

Local governments should offer assistance in transit stop improvement efforts by providing additional amenities that are needed to facilitate bicycle and pedestrian access to transit. Assistance in transit stop improvements might include closing the missing gaps in the pedestrian and bicycle system such as extending pedestrian walkways to a transit stop or the provision of bicycle racks and other amenities at transit stops.

**Partnerships**

Bike and pedestrian access is too often dropped during the budgeting of projects as cost constraints arise. Yet bicycle and pedestrian access is an instrumental component in making transit a viable transportation option. A partnership approach can be utilized to address funding difficulties.

Indeed, partnerships are critical in addressing the magnitude of the work needed to facilitate non-motorized accessibility to transit because no single organization is capable of funding, planning, and maintaining all of the needed improvements recommended in this brochure.

It is recommended that agencies, homeowners associations, developers, property managers and local governments work together with each performing one of the necessary roles—funding agent, builder, and maintainer.

Organizations and local governments should work together to plan, secure the necessary funding, acquire easements and right of way, construct improvements and perform maintenance.

For example, local government capital improvements can be coordinated with the Colorado Department of Transportation road projects or RTD transit improvement projects. Local governments are also encouraged to submit subdivision plats to the RTD for their review in order to ensure transit accessibility needs are met prior to construction.

Finally, partnerships are also beneficial to secure the necessary funds. Local capital improvement projects funded with local dollars can be leveraged against TEA-21 federal dollars, state or RTD sources of revenue.

For additional copies of this brochure, contact the DRCOG Public Affairs division at (303) 455-1000.

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1 For more information on traffic calming strategies, see the ITE manual Traffic Calming State of Practice, by Reid Ewing prepared for the U.S. Department of Transportation Federal Highway Administration, 1999.

2 For maintenance reasons, the RTD will not install benches without a shelter. In order to provide benches only, it is necessary to secure local or private funding.