Guidelines
for Successful Pedestrian and Bicycle Facilities in the Denver Region
July 2010
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INTRODUCTION

Bicycling and walking are an important means of travel for thousands of people each day in the Denver region. On typical nice days throughout the year, about 18,000 people bicycle to work; as many as 36,000 ride per day in the summer. The benefits of providing bicycle and pedestrian facilities include enhancing personal mobility options; reducing the amount of motor vehicle travel; reducing air pollution and fuel consumption; and improving overall health with increased physical activity.

The purpose of this document is to present key points of the Pedestrian and Bicycle Element of the 2035 MVRTP in a concise summary.

PEDESTRIAN AND BICYCLE USE IN THE DENVER REGION

Many factors influence bicycle and pedestrian travel in the Denver region, including the type and design of bicycle and pedestrian facilities, and the continued maintenance of these facilities.

DRCOG conducted a survey (2007 DRCOG Study) of the most important factors that influence how much people walk or ride a bicycle.

For pedestrians aged 65 and over (the fastest-growing segment of the population) and for those with impairments (mobility, seeing, hearing, and/or cognitive impairments), the most significant transportation system factors were the signal crossing times provided to cross roadways, adequate lighting, and maintenance of facilities. The four most important factors to all pedestrians from the survey responses were:

- Crossing freeways/rivers,
- Sidewalk too close to road,
- Crossing signal time too short, and
- Not enough sidewalks.

For bicyclists, the provision of on-street bicycle routes and lane width on roadways where bicycles and motor vehicles share the same travel lane were most important. For those who ride infrequently, the lack of off-street multi-use trails was a more important factor. In addition, bicyclists with impairments (mobility, seeing, hearing, and/or cognitive impairments) considered ease of crossing major barriers such as freeways and rivers to be important. The four most important factors to all bicyclists surveyed were:

- Not enough on-street bicycle routes,
- Narrow roadway lanes,
- Number and speed of motor vehicles, and
- Not enough trails.
Metro Vision 2035 Plan

The Metro Vision 2035 Plan provides a vision for the region of an integrated multimodal transportation system. From this vision, transportation goals were developed to support access to mode choices and system linkages, including safe and efficient pedestrian and bicycle facilities.

**Metro Vision 2035 Plan Transportation Vision and Goals**

**Vision:** A balanced multimodal transportation system will include rapid transit, a regional bus system, a regional roadway system, local streets, bicycle and pedestrian facilities and associated system and travel demand management services. This system will provide reliable mobility choices to all its users: residents and visitors of all ages, incomes and physical abilities, as well as businesses that provide services and produce or sell goods. Users will find the transportation system easy to access, safe and secure, and it will permit efficient state and nationwide connections for people and freight.

**Transportation Goals:** Provide safe, environmentally sensitive and efficient mobility choices for people and goods; and integrate with and support the social, economic and physical land-use development of the region and state.

**Recommended Policies for Local Governments and Other Agencies**

The following policies from the 2035 Pedestrian and Bicycle Element cover facility planning, design, and land development principles. Local governments, DRCOG, CDOT, RTD, and other agencies are strongly encouraged to adopt these policies as transportation and development projects and programs are implemented. Federal, state or local guidelines should be followed for all applicable policies.

**Pedestrian Planning Policies**

1. In all urban and suburban areas, continuous sidewalks should be provided on both sides of all streets and roadways (except freeways), and where possible, detached from the roadway (preferred). Connections through developments and to the entrances of businesses, stores, schools, parks and other activity centers should be established and maintained.

2. In rural areas, where pedestrian volumes tend to be low, paved shoulders should be provided along arterials with adequate width (in accordance with local, state and national guidelines) to buffer the pedestrian from the traveled roadway.

**Bicycle Planning Policies**

3. The existing and planned street system should be designed to accommodate bicycles and motor vehicles to the maximum extent possible for safe bicycle travel.

**DID YOU KNOW?**

RTD estimates that over 682,000 bicycles travel on the racks of RTD’s fixed-route buses annually and more than 11,000 passengers are passed by annually because of full bike racks. *(Bike-on-Bus Survey 2007)*
4. Where street improvement and drainage projects coincide with desired bikeways, provisions for bicycle and pedestrian travel should be explicitly addressed before the project proceeds and upheld throughout project development, construction, and operation.

**Pedestrian Design Policies**

5. New or reconstructed sidewalks detached from the curb along major regional and principal arterials should be a minimum unobstructed width of six feet. Planting or hard landscape strips between the curb and sidewalk should be no less than three feet wide.

6. New or reconstructed sidewalks attached to the curb along major regional and principal arterials should be a minimum unobstructed width of eight feet.

7. Sidewalks and multi-use trails should be built to accommodate the needs of all pedestrians and shall adhere to all Americans with Disabilities Act (ADA) design and accessibility guidelines.

8. Roadway lighting should be provided at pedestrian crossings and other locations where conflicts could arise between drivers and pedestrians.

**Bicycle Design Policies**

9. In rural areas, paved shoulders at least four feet in width should be provided along major regional and principal arterials, county highways, and state highways to accommodate bicycle and pedestrian travel.

10. In urban and suburban areas, as roadways and bridges on the regional roadway system are constructed, reconstructed, surfaced, or re-striped, curb lanes should be widened to provide space for bicyclists.

11. Bicycle lanes designed to national standards are encouraged on collector and arterial roadways and along streets in areas where the construction of such a facility could improve the safety and/or connectivity of the regional bicycle system.

12. The use of “sharrow” pavement markings is encouraged where bicycles and vehicles share the traveled lane.

13. Bicycle parking facilities should be provided at major employment, retail, entertainment, commercial, and/or other activity centers in the region. Local governments should establish an off-street bicycle parking policy, which considers security, placement, quality of facilities, and provision of signs directing bicyclists to the parking facilities.

14. At actuated traffic signal locations, provision should be made to allow bicycles to be detected or to easily allow a bicyclist to activate a green signal.

**Multi-use Trails Policies**

15. Multi-use facilities should have connections to the local street system and with residential, employment, commercial, recreational, and school sites; explicit signage regarding proper use of the facilities; a minimum width of 10 feet to meet national standards; and adequate lighting in underpasses and other dark areas.
Overall Policies

16. Limited-access highways can create barriers to bicycle and pedestrian travel. Bicycling and walking should be accommodated near or adjacent to limited-access highways through the provision of facilities along parallel roadways or within the highway right-of-way.

17. Overpasses and underpasses to accommodate pedestrian and bicycle travel should be constructed to cross major obstacles such as freeways, rivers, or railways. As roadway overpasses and underpasses are constructed or reconstructed, accommodations should be made for pedestrians and bicyclists.

18. Pedestrian and bicycle connections should be explicitly addressed as communities plan for RTD FasTracks rapid transit stations as well as other transit services. In addition, bicycle access and short-term and long-term bicycle parking facilities should be provided at all park-n-Rides, carpool lots, rail and bus stations and other transit facilities as appropriate with the potential market.

19. No federal funding should be provided for any pedestrian or bicycle capital project unless the recipient agrees to provide regular maintenance as outlined in a plan, ordinance, or agreement. Maintenance activities should include:

- Keeping the facility smooth and free of debris such as sand, gravel, leaves, and trash;
- Repairing cracks and other damage;
- Leveling grade differences between bridge decks and approaches;
- Leveling manholes with the street surface;
- Replacing drainage gates having longitudinal spacing with those having lateral spacing;
- Removing snow, ice and overgrown vegetation;
- Replacing faulty lighting; and,
- Maintaining safe operating conditions during construction or other temporary events.

20. Traffic calming techniques should be considered where appropriate to improve safety for pedestrian and bicycle travel.

DID YOU KNOW?
BikeDenver reported that over 1,600 bicycles were parked at the “Taste of Colorado” event in 2009. (BikeDenver)
Land Development Policies

21. Local governments should require the provision of pedestrian and bicycle facilities in all new and redeveloped areas.

22. Building and zoning ordinances should require bicycle parking at all major trip attractors.

23. Communities are encouraged to maintain existing pedestrian and bicycle linkages within development areas and provide new ones where appropriate and feasible. For example, cut-through sidewalks/trails at the end of cul-de-sacs are viable components of the transportation system.

24. Local governments and CDOT should consider pedestrian and bicycle facilities when designing, rebuilding, or re-stripping streets based on the context of the existing and planned land development and the function of the street using principles of context-sensitive design solutions.

Federal and State Policies

The guidance contained in this document goes hand-in-hand with recent policy statements and recommendations from the United States Department of Transportation (USDOT) and CDOT. Key policies on bicycle and pedestrian accommodations for all transportation projects are as follows:

United States Department of Transportation Policy Statement on Bicycle and Pedestrian Accommodation Regulations and Recommendations (March 2010)

“The DOT policy is to incorporate safe and convenient walking and bicycling facilities into transportation projects. Every transportation agency, including DOT, has the responsibility to improve conditions and opportunities for walking and bicycling and to integrate walking and bicycling into their transportation systems. Because of the numerous individual and community benefits that walking and bicycling provide— including health, safety, environmental, transportation, and quality of life — transportation agencies are encouraged to go beyond minimum standards to provide safe and convenient facilities for these modes.” “The DOT encourages States, local governments, professional associations, community organizations, public transportation agencies, and other government agencies, to adopt similar policy statements.”

Colorado Department of Transportation (CDOT) Policy Directive (October 2009)

“It is the policy of the Colorado Transportation Commission to provide transportation infrastructure that accommodates bicycle and pedestrian use of the highways in a manner that is safe and reliable for all highway users. The needs of bicyclists and pedestrians shall be included in the planning, design, and operation of transportation facilities, as a matter of routine. A decision to not accommodate them shall be documented based on the exemption criteria in the procedural directive.”
**DESIGN CONSIDERATIONS**

Pedestrian and bicycle facilities must be safely designed to provide for a wide variety of users and mobility needs (from young children to individuals with disabilities to the elderly). This document presents many design aspects to consider when building and maintaining on-street bicycle facilities, off-street multi-use trails, and sidewalks. Also described are special considerations for pedestrians and bicyclists at intersections, traffic signals, overpasses and underpasses, and transit connections.

**Pedestrian Sidewalks**

Two primary types of off-street facilities are typically built to accommodate pedestrians. These are sidewalks attached to the curb, and detached sidewalks separated from the curb by a buffer. Both facilities have unique design considerations.

**Attached**

Attached sidewalks are connected to the curb or motor vehicle travel lane edge. The minimum ADA required accessibility guideline pavement width is as follows:

- Five feet unobstructed (enables wheelchairs to pass side by side), and if an accessible route has less than six feet clear width, then parking/passing areas (pads) along the sidewalk at least five feet by five feet shall be located at reasonable intervals not to exceed 200 feet.

**Detached**

This type of sidewalk is separated from vehicle travel lanes using a planting strip or other appropriate buffer treatment. The ADA guidance is as follows:

- Five feet unobstructed minimum pavement width,

- Minimum planting strip/buffer width of three feet along collector streets or other roadways with low speeds, and

- Six to eight feet along arterials and other major streets with high speeds.

**Off-street Multi-use Trails**

Off-street multi-use or shared-use facilities are physically separated from the road and open to a variety of non-vehicular modes of travel, including walking, in-line skating, equestrian riding, strollers, wheelchairs, etc. They can be paved or unpaved and are typically located adjacent to roadways or along waterways, abandoned railroads, utility corridors, or through parks and open space. American Association of State Highway and Transportation Officials (AASHTO) guidance notes that, “Shared-use paths should not be used to preclude on-road bicycle facilities,” and recommends:

- A width of 10 feet for multi-use facilities,

- In some circumstances, width of a facility may be increased depending on anticipated use, and
In rare circumstances, an eight-foot width may be allowed provided there is good horizontal and vertical alignment, bicycle and pedestrian traffic is low, and unique restrictions make a wider trail technically infeasible.

**Wayfinding and Warning Signage**

Wayfinding and warning signage is critical to promote proper use of off-street multi-use trails.

- Wayfinding signs should include directional arrows, maps, destinations, and distances to key locations, and
- Warning signs can alert users of other modes (pedestrians, bicyclists, in-line skating, horses, wheelchairs, etc.) and constraints like narrowing widths, sharp turns, restricted visibility, etc.

**On-Street Bicycle Facilities**

Roadways should accommodate a variety of bicyclists with varying experience and skill levels as different rider types can greatly influence facility design.

**Paved Shoulders**

Paved shoulders offer an effective way to provide bicycle facilities along roadways in rural or less developed areas. AASHTO and Federal Highway Administration (FHWA) recommendations are as follows:

- Four-foot minimum rideable area (six-foot minimum width preferred where feasible),
- Six to eight feet on roads with traffic volumes greater than 2,000 vehicles per day and a speed limit greater than 40 miles per hour (mph),
- Six feet on roads with traffic volumes greater than 10,000 vehicles per day, and
- In some cases, the minimum four-foot width can be technically infeasible and/or cost prohibitive. In those circumstances, Share the Road signage can be provided to alert motorists and bicyclists of decreasing shoulder widths.

**Rumble Strips**

Rumble strips are installed predominantly on rural paved roadways to alert drivers when their vehicle strays on to the shoulder or over the center line. AASHTO recommends:

- A five-foot width on the shoulder beyond the rumble strip as a minimum for safe bicycling, and
- Rumble strips should not be installed on shoulders less than six feet wide, especially where a guardrail is installed.
**Wide Curb Lane**

A wide curb lane is a wide vehicle travel lane on the far right side of a roadway built to provide maneuvering room for bicyclists and other users. AASHTO recommends:

- Fourteen-foot lane width plus the width of gutter pan or curb,
- On roads with traffic speeds greater than 30 mph, limited sight distance, frequent heavy truck traffic, or other factors impacting bicycling space, 15-feet lane width, and
- Striping a bicycle lane on vehicle-traveled lanes wider than 15 feet.

**Sharrow Pavement Markings**

Sharrow lane markings are encouraged on bike routes along roadways classified as collector or higher in areas where there is need for bicycle connectivity, but not enough right-of-way to provide bike lanes. The sharrow marking consists of a symbol of a bicycle with two dart arrows above it. It is placed approximately three feet into the travel lane from the parking lane, adjacent right-turn lane or curb. The symbol is designed to encourage all roadway users to share the road by showing the recommended position for bicyclists in the lane.

**Bicycle Lanes**

Bicycle lanes are on-street lanes striped for exclusive or preferential use by bicyclists. Lanes can be striped on each side of a two-way street, one side of a one-way street, or in special circumstances as a contra-flow lane separated from vehicle lanes with a median or barrier. These lanes are designated with signs and pavement markings.

This facility is typically applied in urban or suburban settings where a designated lane reserved for bicyclists will aid in a predictable and orderly flow for both motorist and bicycle traffic. AASHTO recommends:

- Roadway width with no curb or gutter: four feet wide (five feet preferred),
- Roadway width with curb or gutter: five feet wide, to include the one-to two-foot gutter pan (seven feet preferred),
- If motor vehicle parking is permitted, bike lanes should be a minimum of five feet wide (eight feet preferred) and placed between the parked area and the travel lane,
- If there is a bus stop or high right-turn volume at an intersection, solid line striping should be replaced with dotted lines 50 to 200 feet before the intersection, depending on the size of the right-turn lane and/or bus stop, and
- At non-signalized, low-volume intersections with a small number of right-turning motor vehicles, solid bicycle lane striping can continue all the way to the crosswalk on the near side of the intersection.
Bicycle Boulevards

Bicycle boulevards may be appropriate on local streets that parallel busy arterial roadways. They are optimized for bicycle traffic by discouraging long-distance motor vehicle travel on the street.

In a typical grid-street situation, cars are prohibited from traveling more than two or three continuous blocks at a time. Also structures are constructed at periodic intersections that force cars to turn while allowing bicyclists to proceed straight through.

Bicycle Route Signage

Bicycle route signs indicate to bicyclists that a community has identified a preferred route for bicycle travel. Several criteria should be considered before a roadway is signed as a bicycle route. Adapted from AASHTO, these criteria are:

- Route provides through and direct travel in corridors with high bicycle demand (e.g. traffic signal detection),
- Route connects discontinuous segments of bicycle facilities,
- Traffic control devices give greater priority to bicyclists on the route,
- Street parking has been removed or restricted in areas of critical width,
- A smooth, well-maintained surface is provided,
- Wider curb lanes or shoulders are provided that meet or exceed the AASHTO minimum widths, and
- Route contains adequate lighting.

Bike route sign type, size and location should be selected in accordance with FHWA's Manual of Uniform Traffic Control Devices (MUTCD, 2009). Communities should also consider adding destination information signs under the bike route signs (e.g., distance to major locations and directional arrows).

Share the Road Signage

CDOT's policy, as an example, considers the following factors for installing Share the Road signs on state-maintained roadways:

- A relatively high number of bicyclists is expected on the roadway,
- The road narrows for a short distance and a motorist and bicyclist may unexpectedly find themselves in the same travel lane (such as at the end of a bike lane or a bridge approach), and/or,
- There has been a significant history of bicycle crashes.
Other Design Considerations

Intersections and Crossings

Intersections with roadways, driveways, and other facilities used by motor vehicles should be designed to safely accommodate pedestrians and bicyclists. Intersection crossing distances for pedestrians and bicyclists have increased as streets have become wider. Design considerations for pedestrians and bicyclists at intersections include the following:

- **Large Curb Radii**
  Intersections constructed with a larger turning radius along the curb to accommodate trucks result in increased crosswalk distances, which must be accounted for when traffic signal timing is implemented.

- **Center (Mid-street) Islands**
  Center island treatments are appropriate at intersections or at mid-block crossings on wide arterial streets or streets with heavy traffic flow. Preferably, they are built with raised islands with hardscape/landscaping. Islands can provide a “refuge” for pedestrians (especially those who have difficulty crossing streets such as the elderly, persons with disabilities, or children) as well as an area for traffic signals and other roadway hardware.

- **Mid-block Crossings**
  Mid-block crossings are typically suggested along roadway segments where a pedestrian or bicycle crossing is needed and there is a distance of 300 feet or more between intersections with crosswalks. Communities generally use a combination of center islands and striping to indicate these crossings, depending on items such as the width of the roadway and traffic volume and/or speed. Some more-advanced applications to enhance the safety of these crossings have been used in the region, including the use of flashing beacons.

- **Crosswalks**
  Crosswalks provide a defined space where pedestrians and bicycles can cross a roadway and alert motorists of their potential presence. Typically, they are delineated with white painted markings to provide a visual contrast between the roadway and crosswalk. Crosswalks made from materials of different textures other than the roadway, such as brick or stone, not only differentiate crosswalks from traveled portions of the street but also provide a tactile guide for persons with visual disabilities.
Traffic Signals

Traffic signals are an important element associated with pedestrian and bicycle roadway crossing safety. The duration of the “walk” and the flashing “don’t walk” signal intervals are critical, as are the locations of push buttons to activate these signals.

- **Duration of Crossing Interval**
  The Manual on Uniform Traffic Control Devices (MUTCD) (2009) recommends, “the pedestrian clearance time should be sufficient to allow a pedestrian crossing in the crosswalk who left the curb or shoulder at the end of the WALKING PERSON (symbolizing WALK) signal indication to travel at a walking speed of 3.5 feet per second to at least the far side of the traveled way or to a median of sufficient width for pedestrians to wait.” A slower walking speed may be used in special circumstances (e.g. routine wheelchair use).

- **Location of Push-Buttons for Signal Activation**
  The location of push buttons should accommodate both pedestrians and bicyclists at intersections where an alternate bicycle-signal activation device has not been provided. In addition, ADA requirements apply to the location for the push buttons used by persons with disabilities.

- **Bicycle Signal Activation**
  There is a need to improve signal activation devices for bicyclists at intersections and mid-block crossings. The 2009 MUTCD states that, “On bikeways, signal timing and actuation shall be reviewed and adjusted to consider the needs of bicyclists.”

- **Pedestrian Signal Designs**
  Several designs exist for pedestrian crossing signals. The MUTCD (2009) contains two pedestrian signal types: countdown signals and signal heads. Countdown signals, a relatively new technology, provide information on how much time is left to cross an intersection safely. Many communities throughout the Denver region have installed countdown signals at key locations.

Overpasses and Underpasses

As the region continues to build or reconstruct bridges and underpasses for the exclusive use of non-motorized modes, there are several design elements to consider such as lighting, width, slope, and access ramps. As roadway bridges and underpasses are constructed or reconstructed, bicycle and pedestrian accommodations should be incorporated into the designs in accordance with FHWA’s Policy Statement on Accommodating Bicyclists and Pedestrians in Transportation Projects.

Transit Connectivity

There are multiple design elements to consider when integrating pedestrian and bicycle modes of travel with transit services. These elements include bicycle accommodation on transit vehicles, bicycle parking at transit facilities, and pedestrian and bicycle facility connections between activity areas and transit facilities. The success of transit-oriented developments (TODs) depends on effective pedestrian and bicycling connections.
**Pedestrian and Bicycle Connections**

Local governments and transit providers can coordinate to ensure adequate sidewalks provide access to bus stops and stations. Shelters and waiting space treatments should be considered where appropriate. Bicycle parking facilities should be installed in convenient locations.

**Facility Maintenance**

Proper maintenance requirements for both bicycle and pedestrian facilities include these treatments:

**Debris, Snow, and Standing Water**

Local maintenance efforts to clear roadways and multi-use paved trails of snow and debris, particularly leaves, branches, trash, and sand applied during snowstorms should be encouraged. In addition, facilities should be designed to drain water away from bicycle and/or pedestrian throughways. Particular maintenance attention needs to be given to clearing bicycle lanes of debris.

**Poor Surface Conditions**

Sunken manhole covers, potholes, and pavement cracks in roadways or paved pedestrian/bicycle facilities are examples of poor surface conditions that can affect a pedestrian or bicyclist. These conditions can create unsafe operating environments for users, especially bicycles, wheelchairs, and other wheel-based forms of transportation, and persons with visual impairments.

**Inadequate Lighting**

Proper lighting is necessary as a lack of quality lighting can prevent pedestrians and bicyclists from seeing surface conditions or debris at night, which could lead to serious injury. For many individuals, insufficient lighting is also a significant personal safety concern, especially in underpasses.

**Orientation of Stormwater Drainage Grates**

Stormwater drainage grates are required to drain water from a roadway and can be a serious hazard to bicyclists if designed improperly. A honeycomb grate design with no greater than four-inch spacing between grates can still efficiently drain water from the roadway without impacting the bicyclist.

**Vegetation**

Local governments should inform property owners of their responsibilities to clear sidewalks of vegetation and enforce ordinances when necessary. Local governments or special districts should also maintain the vegetation along publicly owned multi-use trails, roadways, and other infrastructure used by pedestrians and bicyclists.

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**DID YOU KNOW?**

The average distance of walk trips in 1997 was 0.75 miles and the average distance of bicycle trips surveyed was 2.1 miles. *(1997 DRCOG Travel Behavior Survey)*
LAND DEVELOPMENT PRINCIPLES

Land development review and the land use-planning process provide tools for building more efficient pedestrian and bicycle-friendly communities. The following section describes planning concepts and land use controls that promote bicycle and pedestrian modes with some examples from communities in the region. The benefits of each method increase when combined.

Mixed-Use Development

The concept of incorporating mixed-use zoning into local ordinances enables developments that combine different land-use types (such as residential and commercial) into a pre-defined area. A variety of uses allows individuals to fulfill needs within the development, thus decreasing the need to drive. These areas vary in size (uses can be mixed over an entire neighborhood, street corridor, or in just one parcel) and in how they accommodate pedestrian and bicycle travel.

Motor Vehicle Parking

Pedestrian and bicycle accessibility in the design of motor vehicle parking lots is very important to consider in the local development review process. Communities can ensure pedestrian and bicycle accommodations in parking lot designs, particularly for large retail stores.

Parking Lot Design

Placing motor vehicle parking facilities in back of commercial developments can reduce the walking distance to storefronts from the street. Typically, this allows storefronts to be located closer to the sidewalk, allowing pedestrians to access the development more easily.

In many situations, large office or retail areas have parking lots between the building entrance and the roadway sidewalk. Several communities, such as the cities of Aurora and Boulder, have required sidewalks to be built through the spine of the parking lot to help pedestrians avoid vehicles backing out of parking spaces.

Pedestrian and Bicycle Connections

It is common today for many local governments to require pedestrian and bicycle connections to be built in new developments through the development review process, particularly in suburban planned unit development (PUD) areas.

Cul-de-sac Cut-through Paths

Dead end cul-de-sacs in residential developments should be required to have cut-through paths. Such “live-end cul-de-sacs” allow convenient and continuous connections to adjacent residential areas, parks, schools, stores, transit and other land uses.

DID YOU KNOW?

In April, 2010, Denver Bike Sharing (DBS) launched its B-Cycle program that includes 500 bicycles for rent with 40 – 50 bike stations located throughout the city to promote bicycling. (BikeDenver)
REFERENCES

American Association of State Highway and Transportation Officials (AASHTO)  
https://bookstore.transportation.org  

Colorado Department of Transportation (CDOT)  
http://www.coloradodot.info/programs/bikeped/documents/  
- CDOT Bike and Pedestrian Policy Directive, 2009

United States Access Board  
www.access-board.gov/ada-aba/  
- ADA Standards for Transportation Facilities 2006  
- ADA Accessibility Guidelines for Buildings and Facilities, 2005  

Federal Highway Administration (FHWA)  
www.fhwa.dot.gov/environment/bikeped/guidance.htm#Access  
- Manual on Uniform Traffic Control Devices, 2009  
- Designing Sidewalks and Trails for Access, 1999  
- Implementing Pedestrian Improvements at the Local Level, 1999

United States Department of Transportation (USDOT)  
www.fhwa.dot.gov/environment/bikeped/design.htm  
Policy Statement on Bicycle and Pedestrian Accommodation - Regulations and Recommendations, 2010

Institute of Transportation Engineers (ITE)  
www.ite.org/default.asp  
- Improving the Pedestrian Environment Through Innovative Transportation Design, 2005  
- Context Sensitive Solutions in Designing Major Urban Thoroughfares for Walkable Communities: An ITE Proposed Recommended Practice, 2005  
- Designing Sidewalks and Trails for Access, 2001

Denver Regional Council of Governments (DRCOG)  
http://www.drcog.org/index.cfm?page=BicycleandPedestrianPlan  
- Pedestrian & Bicycle Element of the 2035 MVRTP, 2009  

Please contact Steve Cook, Transportation Planner at DRCOG, with any questions regarding this brochure at scook@drcog.org or 303-480-6749.