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9. COMPLETE STREETS DESIGN POLICY

9.1. Overview

It is the policy of the Georgia Department of Transportation (GDOT) to routinely incorporate bicycle, pedestrian, and transit (user and transit vehicle) accommodations into transportation infrastructure projects as a means for improving mobility, access, and safety for the traveling public. Accordingly, GDOT coordinates with local governments and regional planning agencies to ensure that bicycle, pedestrian, and transit needs are addressed beginning with system planning and continuing through design, construction, and maintenance and operations. This is the “Complete Streets” approach for promoting pedestrian, bicycle, and transit modes of travel in the State of Georgia.

The concept of Complete Streets emphasizes safety, mobility, and accessibility for all modes of travel (including pedestrians, bicyclists, transit riders, and motorists) and individuals of all ages and abilities. The design of transportation projects for multiple modes of travel requires the balancing of the needs of each mode. This “balance” must be accomplished in a context sensitive manner appropriate to the type of roadway and conditions within the project and surrounding areas.

This policy is consistent with the following policy statement from the U.S. Department of Transportation, [Policy Statement on Bicycle and Pedestrian Accommodation](#):

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.

GDOT’s primary strategy for implementing Complete Streets is to incorporate bicycle, pedestrian, and transit accommodations into roadway construction and reconstruction projects. Local government and regional planning agencies can also implement Complete Streets by partnering with GDOT and by initiating and managing their own locally-funded projects and programs. GDOT assists local governments and MPOs by administering special programs such as [Safe Routes to School](#) (SRTS), [Transportation Enhancement](#) (TE), and the [Livable Centers Initiative](#) (LCI) – these programs will be updated with implementation of [MAP-21](#). In addition, GDOT administers transit and passenger rail programs¹ to promote motorized transit alternatives such as bus, van-pool, and rail travel.

Overall the above efforts advance an incremental approach for developing local, regional, and statewide transportation networks for multimodal use. This approach also supports an objective of the [Statewide Strategic Transportation Plan](#) to increase the overall health and prosperity of citizens and businesses that use and depend on Georgia’s transportation system.

¹ The GDOT [Transit Program](#) administers state and federal funds which provide capital and operating assistance for bus and van-pools as well as providing planning assistance to all 15 MPOs in Georgia. The GDOT [Georgia Rail Passenger Program](#) (GRPP) provides a comprehensive plan for both commuter and intercity train travel within Georgia.

9.1.1. Principles

The following principles form a basis for the policies presented in the remainder of this chapter relating to bicycle and pedestrian accommodations.

- Accommodations for bicycles and pedestrians should be integrated into roadway new construction and reconstruction projects through design features appropriate to the context and function of the transportation facility.
- The design and construction of new facilities should anticipate likely demand for bicycling and pedestrian facilities within the design life of the facility.
- The design of intersections and interchanges should accommodate bicyclists and pedestrians in a manner that addresses the need for bicyclists and pedestrians to safely cross roadways, as well as travel along them.
- The design of new and reconstructed roadways should not preclude the future accommodation of bicycle and pedestrian access along and across corridors.
- While it is not the intent of preventive maintenance (PM) or Resurfacing, Restoration, and Rehabilitation (3R) projects to expand existing facilities, opportunities to provide or enhance safety for pedestrians and bicyclists should be considered during the programming phase of these projects.

The following principles form a basis for the policies presented in the remainder of this chapter relating to transit accommodations.

- Accommodations for transit should be integrated into roadway new construction and reconstruction projects through design features appropriate for the context and function of the roadway, and the associated transit facility (e.g., transit stops/stations, or park-and-ride lots).
- The design of roadways and intersections near transit facilities should accommodate pedestrians in a manner that addresses the needs for pedestrians walking along or across roadways to safely access the transit facility.
- The design of new and reconstructed roadways should not preclude the accommodation of transit facilities (e.g., light rail, street cars, and bus rapid transit) planned and funded for construction within the design life of the roadway project.

9.1.2. References

Primary References

Refer to the most current edition of the following publications for planning considerations related to pedestrian, bicycle, and transit facilities, as well as information on specific accommodations:

- [Context Sensitive Design Manual](#), GDOT, ROADS web page.
- [Designing Walkable Urban Thoroughfares: A Context Sensitive Approach](#), Institute of Transportation Engineers (ITE) and Congress for the New Urbanization (CNU), 2010.
- FHWA Bicycle & Pedestrian Program - Design Guidelines web page, FHWA.
http://www.fhwa.dot.gov/environment/bicycle_pedestrian/guidance/design_guidance/
- [Georgia Guidebook for Pedestrian Planning](#), GDOT, ROADS web page.
- [Georgia Bicycle and Pedestrian Safety Action Plan](#), GDOT, Governor's Office of Highway Safety (GOHS).
- [Guide for the Planning, Design, and Operation of Pedestrian Facilities](#), AASHTO, 2004.

- [Multimodal Level of Service Analysis for Urban Streets \(NCHRP Report 616\)](#), National Cooperative Highway Research Program (NCHRP), 2008.
- [Pedestrian and Streetscape Guide](#), GDOT, ROADS web page.
- [Transit Capacity and Quality of Service Manual \(TCRP Report 100\)](#), TCRP, 2003.

Refer to the most current edition of the following publications for the design of pedestrian, bicycle, and transit accommodations:

- [Accessible Public Rights-of-Way, Planning and Designing for Alterations](#), Public Rights-of-Way Access Advisory Committee, 2007.
- [Designing Sidewalks and Trails for Access, Part II of II: Best Practices Design Guide](#), FHWA, 2001. (Note: web HMTL version incorporates corrections in the [errata sheet](#).)
- [Geometric Design of Highways and Streets](#), American Association of State Highway and Transportation Officials (AASHTO), 2011.
- [Guide for High-Occupancy Vehicle \(HOV\) Facilities](#), AASHTO, 2004.
- [Guide for the Development of Bicycle Facilities](#), AASHTO, 2012.
- [Guidelines for the Location and Design of Bus Stops \(TCRP Report 19\)](#), TCRP, 1996.
- [Highway Capacity Manual 2010 \(HCM2010\)](#), TRB, 2010.
- [Manual on Uniform Traffic Control Devices \(MUTCD\)](#), Federal Highway Association (FHWA), 2009.
- [Proposed Guidelines for Public Rights-of-Way \(PROWAG\)²](#), United States Access Board, 2011.

Consult adopted state, regional, and local [planning documents](#) to help identify existing and planned pedestrian, bicycle, and transit facilities. Below are the major types of planning documents commonly adopted by local governments, [MPOs, and regional commissions](#).

- State and regional long range transportation plans.
- City/County comprehensive transportation plans.
- City/County bicycle master plans.
- City/County pedestrian master plans.

Where used to evaluate warrants (refer to **Section 9.4 Warrants for Accommodation** of this manual), information from the above planning documents should be verified with the organization originating the document. The GDOT State Bicycle and Pedestrian Coordinator should be consulted in the event that planning documents show conflicting information about a specific facility and to verify that information shown is current and correct. Corridor or facility planning studies may also be considered.

² The Americans with Disabilities Act (ADA) was enacted by the U.S. Congress and signed into law on July 26, 1990, and later amended with changes effective January 1, 2009. ADA design guidelines for accessible buildings and facilities are published in the ADA Accessibility Guidelines (ADAAG). ADA design guidelines for accessible public rights-of-way are published in the U.S. Access Board [Proposed Accessibility Guidelines for Pedestrian Facilities in the Public Right-of-Way](#) (PROWAG).

Additional References

The following publications may also be helpful references:

- [Improving Pedestrian Safety at Unsignalized Crossings \(TCRP 112/NCHRP 562\)](#), Transit Cooperative Research program (TCRP) and National Cooperative Research Program (NCHRP), 2006.
- Local Street Design Guides³ (where applicable).
- [Management and Design Guidelines for the Regional Thoroughfare Network](#), Atlanta Regional Commission (ARC).
- [Urban Bikeway Design Guide](#), National Association of City Transportation Officials (NATCO), 2011. (Refer to the FHWA document [Bicycle Facilities and the Manual on Uniform Traffic Control Devices](#) for the status of specific bicycle facilities in FHWA's MUTCD.)

9.1.3. Definition of Accommodation

An accommodation is here defined as any facility, design feature, operational change, or maintenance activity that improves either non-motorized or transit travel (or both). The type of accommodation will vary by location and the needs of typical users, but the safety and accessibility of all modes should be considered in every applicable situation.

Commonly applied non-motorized user accommodations include sidewalks, curb ramps, pedestrian crossings, bicycle lanes (or wide, paved shoulders), shared-use paths, and midblock treatments such as marked crosswalks, median islands, signs, lighting, and accessibility features; and/or other treatments as necessary.

Transit accommodations include accommodations for user access to transit stops/stations (by pedestrians and bicyclists) as well as accommodations for transit vehicles accessing bus stops and traveling along the corridor. Examples of transit user accommodations include sidewalks, crosswalks, pedestrian push-buttons and signal heads etc... Examples of transit vehicle accommodations for bus stops include bus loading pads and bus pull-outs. A wide range of transit accommodations are described in Toolkit 9 of the *GDOT Pedestrian Streetscape Guide*, Chapter 9 of the ITE publication *Designing Walkable Urban Thoroughfares: A Context Sensitive Approach*, and Chapter 3 of the *ARC Management and Design Guidelines for the Regional Thoroughfare Network*.

9.2. Typical Users & Needs

The selection and design of appropriate accommodations requires a clear understanding of the users that are to be benefited. Organizations in Georgia which [promote pedestrian, bicycle and transit modes of travel](#) are helpful resources for understanding these users and their needs.

Pedestrians and bicyclists are often grouped together when referring to non-motorized users. Both users generally travel at the far right or outside the roadway, are generally slower than adjacent motor vehicles, and are more influenced by their immediate surroundings. Since both non-motorized modes travel under their own power and are more exposed to the elements, both often prefer direct routes or shortcuts to minimize their effort and time.

³ Examples of local street design guides include: *Move Atlanta: A Design Manual for Active, Balanced and Complete Streets*, City of Atlanta, GA.; and [Urban Street Design Guidelines](#), City of Charlotte, NC.

Transit users often access transit facilities as pedestrians and so have needs that are very similar to those of non-motorized users.

9.2.1. Pedestrians

Most transportation trips begin or end with walking. Many pedestrians choose to walk for convenience, personal health, or out of necessity. They often prefer greater separation from the roadway, require additional time to cross roadways, and are the most vulnerable of all roadway users. In addition, pedestrians will often seek to minimize travel distance, choosing direct routes and shortcuts even when facilities are not provided. Walking trips are often combined with transit for traveling longer distances, making accessibility to transit stops and stations an important consideration.

In urban areas, walking trips are often also combined with private motor vehicle trips. In this case, people often park once and then walk between stores, restaurants and other facilities/services.

A pedestrian is defined as a person afoot. This also includes individuals in wheel chairs (motorized or non-motorized) and on skates and skateboards. Pedestrians include children, senior citizens, and people with physical disabilities; these groups may require additional considerations.

9.2.2. Bicyclists

Bicyclists utilize public roadways for most trips and are therefore subject to vehicular laws. Therefore, the bicycle facility should be designed to encourage bicycling behavior that is as predictable as possible when interacting with motor vehicle traffic.

Bicycling trips serve both utilitarian and recreational purposes, often in the same trip. Utilitarian trips are trips that are needed as part of a persons daily activities such as commuting to work, shopping or errands, or taking a child to school. Recreational trips are usually discretionary trips made for exercise and/or leisure.

Rider age and skill level vary considerably. Utilitarian bicyclists are generally more experienced and confident and will typically choose whichever roadway (or off-road facility) provides for the most direct, safe and comfortable travel to their destinations. Recreational bicyclists are generally younger and/or less experienced and will typically choose routes for comfort or scenery, feel more comfortable on lower-speed and lower-volume roadways, and prefer separated or delineated bicycle facilities. Children have a wide range of skills and cognitive capability and will typically travel only on separated paths and very low-volume and low-speed residential streets. Where allowed by local government ordinance or resolution, children below the age of 12 may also ride on sidewalks.

Bicycle facilities should be context sensitive⁴ and should be selected based on the expected needs of typical users, the characteristics of the roadway corridor, the accessibility of the facility to area destinations, and other considerations. Bicycle facilities (or bikeways) may be either on-road or off-road bikeways: common on-road bikeways include bicycle lanes and shared lanes, common off-road bikeways include shared-use paths and cycle tracks. On-road bikeways allow bicyclists to circulate with traffic, allow easier access to destinations, and help bicyclists behave more predictably. Off-road

⁴ Context sensitive design may be defined as a collaborative, interdisciplinary process which involves all stakeholders to design a transportation facility that fits its applicable setting and preserves scenic, aesthetic, historic and environmental resources while maintaining safety and mobility. This process balances design objectives for safety, efficiency, capacity and maintenance while integrating community objectives relating to compatibility, livability, sense of place, urban design, cost and environmental impacts.

bikeways may allow greater separation from high-speed traffic but need careful consideration at driveways, intersections, and constrained areas. These two types of bikeways are not interchangeable (or mutually exclusive) and careful examination of their application should be conducted on a case-by-case basis.

Refer to Chapter 2 of AASHTO publication [Guide for the Development of Bicycle Facilities](#) (AASHTO Guide) for information on the various types of on-road and off-road bikeways. Additional information can be found in the NATCO publication [Urban Bikeway Design Guide](#).

9.2.3. Transit Users

Transit serves a vital transportation function by providing people with mobility and access to employment, schools, community and recreational facilities, medical care, shopping centers, and to other communities. Transit directly benefits those who choose this form of travel, as well as those who have no other choice or means of travel. Transit also benefits motor vehicle users by helping to reduce congestion on roadway networks.

The success of a transit system depends on the availability of safe and easy access to transit stations/stops and park-and-ride facilities. Accordingly, transit user accommodations along and across streets served by transit (and on streets that lead to transit corridors) should provide safe and convenient pedestrian access to and from those facilities. Users also commonly access transit by bicycle, car and taxi, as well as other modes of transit.

One of the most important considerations for ensuring safe and convenient access to transit stops is to provide accommodations that allow users to cross the road to access these facilities. This is of particular concern as a disproportionately high number of pedestrian crossing crashes occur at transit stops. Accordingly, each transit stop should be evaluated to ensure that adequate crossing opportunities are provided. This may include relocation of the bus stop where safe access cannot be otherwise provided.

Along with accessibility, other accommodations may need to be considered. Examples include bus pullouts, lane and signal prioritization, and signage, and space for transit stop amenities.

9.2.4. Needs and Volumes

The degree of non-motorized/transit use and their needs should be determined during the project planning or concept development phase. Defining these will often require local input and for most projects can be accomplished during the initial concept meeting, reconnaissance of the project area, and meetings with local officials and stakeholders. Public Information Open House (PIOH) meetings are also a useful venue for obtaining this information.

Planning studies for bicycle, pedestrian, and transit travel normally consider the number of users, their typical needs, and significant barriers to travel. This includes measuring current and projecting future travel, evaluating existing conditions, and identifying constraints and opportunities. For bicycle and pedestrian travel (i.e., non-motorized), typical planning tools may include non-motorized traffic counts, Bicycle, Pedestrian and Transit Level of Service formulas (refer to HCM2010), Latent Demand (i.e., potential demand) Scores, user surveys, information from transit service providers, and public input. These tools all help establish user levels, destinations, and facility needs above the most basic routine project accommodations.

For transit within urbanized areas; applicable MPOs, regional commissions, and local governments should be contacted to identify specific transit agency(s) providing services on or near the project

corridor. Transit agencies identified through this coordination should then be contacted to verify the location of facilities and routes.

The findings of investigations and decisions relating to non-motorized and transit users should be documented in the concept report. This information may be qualitative in nature but must be sufficient for use by the design phase leader to evaluate the bicycle, pedestrian and transit warrants presented in Section 9.4 of this chapter. The evaluation of warrants should be included under a separate heading in the concept report. If the project is expected to adversely impact existing bicycle, pedestrian or transit accommodations, this should also be noted.

9.3. User Networks

9.3.1. Pedestrian Networks

Pedestrian networks and associated facilities provide access between local destinations within neighborhoods, towns, and cities. Individual pedestrian networks are interconnected by means of transit and motor vehicle networks to allow for travel between these areas. Facilities that comprise these networks commonly include: sidewalks (with curb ramps), crosswalks (with necessary traffic control devices), shared-use paths, recreational paths and trails, pedestrian underpasses and overpasses, and wide shoulders or sidewalks in rural areas.

Well-developed pedestrian networks provide continuous direct routes and convenient connections between destinations, such as homes, schools, shopping areas, public services, recreational opportunities, and transit. These types of destinations are more densely distributed in urban areas due to there relatively high population.

Urban areas are defined as either “urbanized areas” or “urban cluster areas” (i.e., urban areas), as designated by the US Bureau of Census. Urbanized areas have populations of more than 49,999 and are represented by 15 Georgia [MPOs](#). Urban areas have populations of 5,000 to 49,999 and are represented by 12 [regional commissions](#). The boundaries for urbanized and urban areas are shown on Urban Area Boundary Maps on the GDOT web page [Statewide Functional Classification & Urban Area Boundary Update](#). Rural areas are defined by a population of less than 5,000 and make up of areas outside of urbanized and urban areas.

Many regional planning commissions, MPOs, and local governments have adopted plans for pedestrian networks. An example is provided as [Figure 9.1 Pedestrian Network Map for Gainesville – Hall MPO \(2006\)](#). Refer to the [Gainesville–Hall MPO Bicycle and Pedestrian Plan](#) for more information on this network. Where available, such maps should be consulted in order to evaluate the pedestrian warrants presented in **Section 9.4.1 Pedestrian Warrants** of this Manual. The applicable local government, MPO or regional planning commission which prepared the map may be contacted to verify the location and intended types of pedestrian accommodation. For most urban areas maps will not be available. Consequently, the need for pedestrian accommodations should always consider local conditions along and near the corridor being improved.

The GDOT State Bicycle and Pedestrian Coordinator (within the Safety Unit of the GDOT Office of Traffic Operations) may be consulted with any questions.

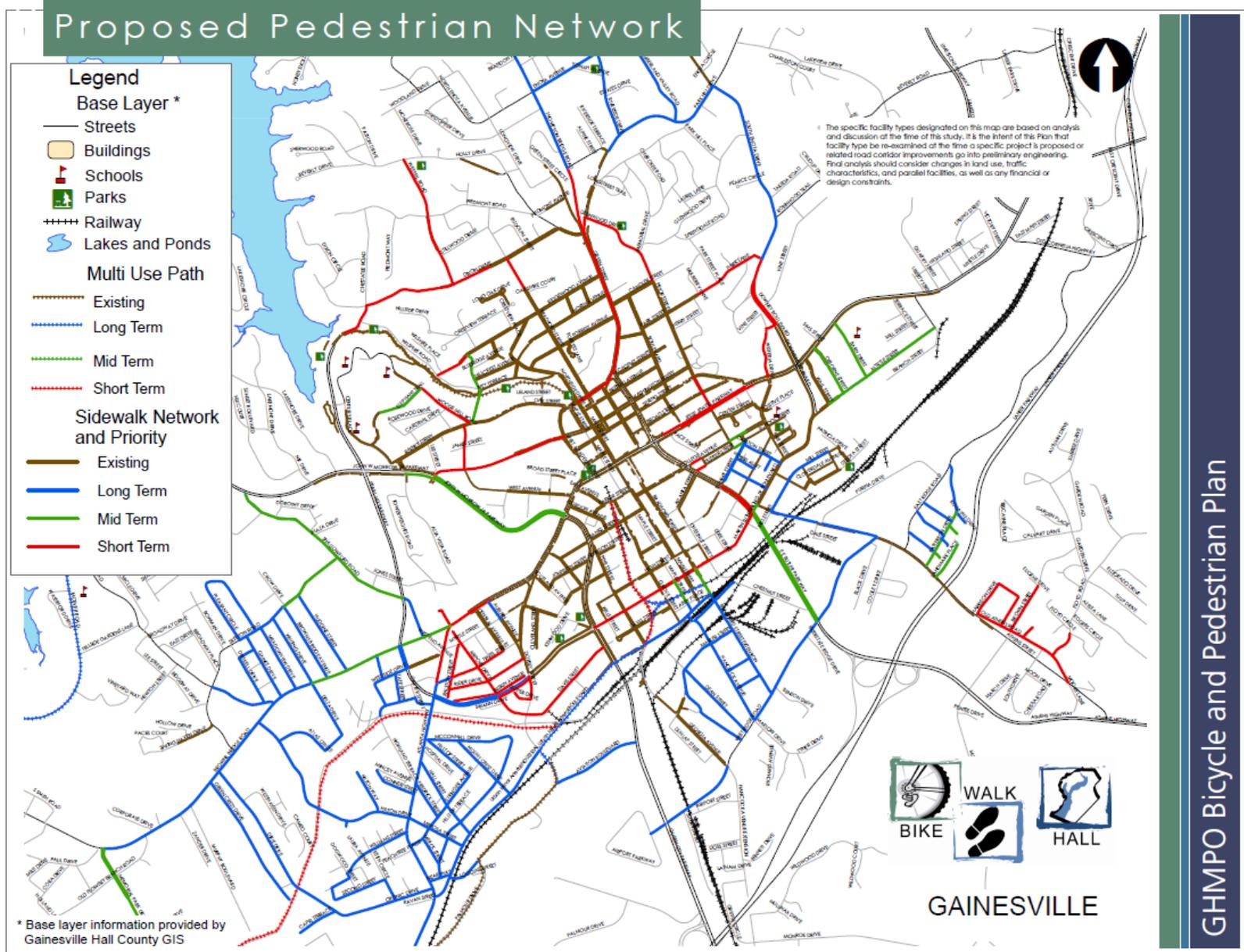


Figure 9.1. Pedestrian Network Map for Gainesville-Hall MPO (2006).

9.3.2. Bicycle Networks

Bicycle networks include nearly every roadway within Georgia, with the exception of those routes – such as interstate highways and other limited access facilities – on which bicycles are specifically not allowed. This network includes roads of all functional classes (which may or may not currently have bicycle accommodations) as well as off-road routes (e.g., shared-use paths), .

Individual networks have been defined by the GDOT, local governments, MPOs and regional planning commissions to facilitate bicycle travel within urban and rural areas, and by connecting metropolitan areas or regional destinations. Metropolitan and regional destinations include those of important scenic, historic, cultural, recreational, commercial, educational, and employment value as well as to transit facilities. These individual bicycle networks are often comprised of many individual bicycle routes.

An overall state-wide network is formed by linking together local/regional bicycle routes/networks with the Georgia Bicycle Route network. This overall state-wide bicycle network is illustrated on **Figure 9.3 Local, Regional, State and U.S. Bicycle Routes in Georgia**. The Georgia Bicycle Route Network is shown in **Figure 9.4 Georgia State Bicycle Network**.

Bicycle Routes

A bicycle route is any road, street, path or way which in some manner is specifically designated (i.e., adopted) by a jurisdictional authority to be prioritized for bicycle travel, regardless of whether or not bicycle facilities are present. Although these routes are designated as preferred routes for bicyclists, bicyclists are allowed to ride on any road legally open to bicycles - regardless of the presence or absence of specific bicycle accommodations or designations. Photographs showing examples of designated bicycle routes are provided in **Figure 9.2 Examples of Designated Bicycle Routes**.



Shared-Lane, Scenic Byway, N. Georgia; Bicycle Lane, Sugarloaf Parkway, Gwinnett County
Figure 9.2. Examples of Designated Bicycle Routes.

Georgia Statewide Bicycle Route Network
DRAFT April 2011

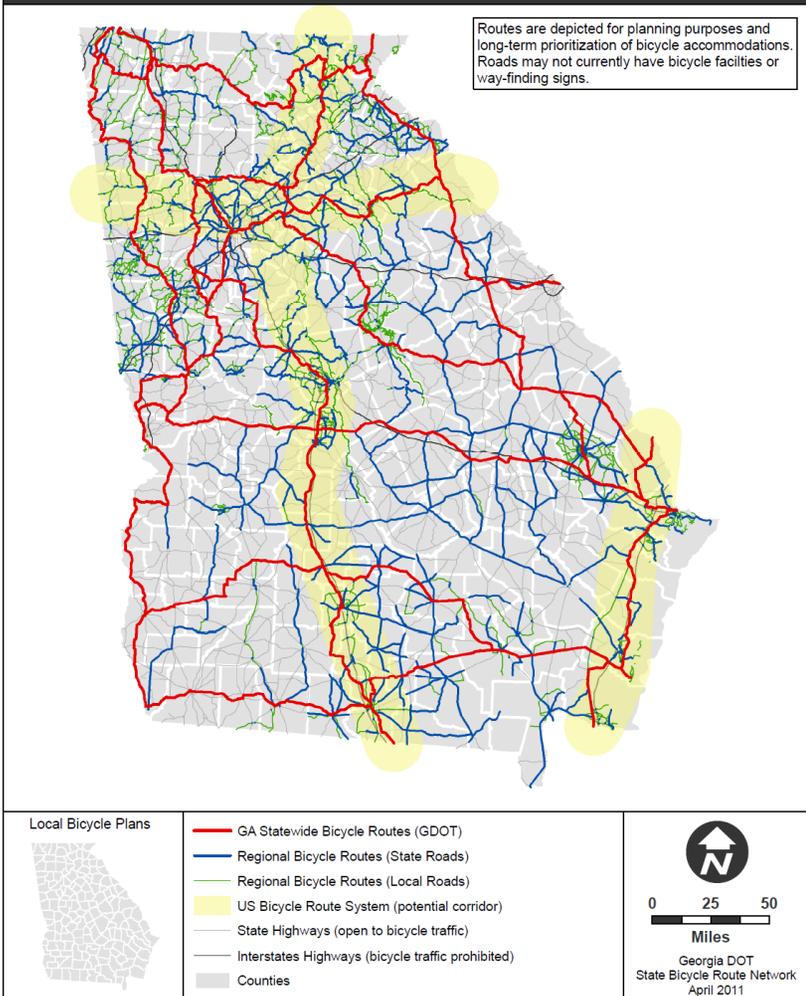


Figure 9.3. Local, Regional, State and U.S. Bicycle Routes in Georgia

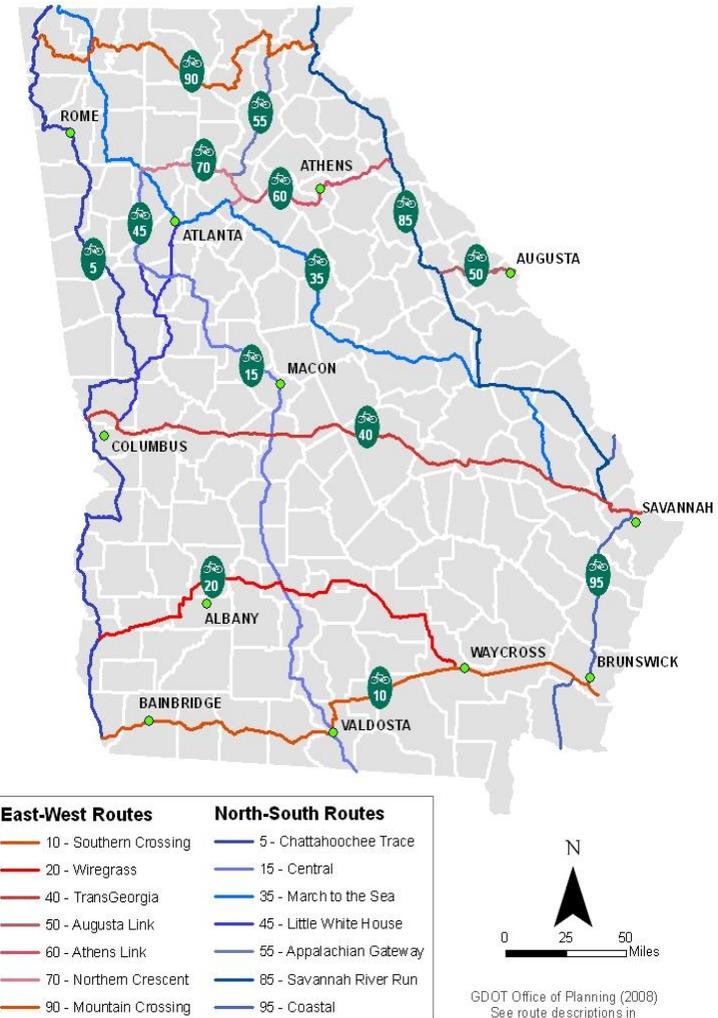


Figure 9.4. Georgia Bicycle Route Network (1997).

Local and Regional Bicycle Networks

Many regional planning commissions, MPOs, and local governments have developed bicycle networks based on regional or local planning studies. An example of a regional planning commission network (which includes existing and planned routes) is provided in **Figure 9.5 Atlanta Regional Commission (ARC) Bicycle Network Recommendations**. Refer to the ARC planning document, [Atlanta Region Bicycle Transportation and Pedestrian Walkways Plan](#) for more information on this network. Many cities and counties have also adopted bicycle or comprehensive transportation plans: these plans often include one or more bicycle network maps.

[Maps showing bicycle routes](#) are commonly available on web sites for these organizations. These maps where available must be consulted to evaluate the bicycle warrants presented in **Section 9.4.2 Bicycle Warrants** of this manual. Prior to the selection and design of accommodations for a bicycle route, the local government, MPO or regional planning commission which prepared the map should be contacted to verify that the map is current and correctly shows the route alignment. The GDOT State Bicycle and Pedestrian Coordinator can be consulted with any questions, and should be consulted if maps show conflicting information.

State of Georgia Bicycle Network

The GDOT has developed a network of cross-state bicycle routes to facilitate long-distance bicycle travel in Georgia (see **Figure 9.3., State of Georgia Bicycle Network**). These routes consist primarily (where facilities are present) of on-road facilities, such as paved shoulders and bicycle lanes, and wayfinding or cautionary signs. Route selection considers the population of the areas connected rather than populations along the actual route. They support natural connections between adjoining states; links metropolitan areas, transportation hubs, or major attractions; and provide access to scenic, cultural, historical, and recreational destinations. Detailed maps for these routes are available at the following URL: <http://www.dot.ga.gov/travelingingeorgia/bikepedestrian/Pages/Maps.aspx>.

Routes identified as part of the State of Georgia Bicycle Network shall, at a minimum, comply with the basic bicycle accommodations outlined below:

- All long-distance bicycle routes will meet the criteria for an approved numbered bicycle route system established by the American Association of State Highway and Transportation Officials (AASHTO), Manual on Uniform Traffic Control Devices (MUTCD), and GDOT guidelines;
- Georgia state bicycle routes will be coordinated with neighboring states to ensure consistency with regional or U.S. Bicycle Route networks and allow for interstate bicycle travel; and
- The addition of accommodations along long-distance bicycle routes should include the installation of bicycle route number signs and wayfinding or cautionary signs at appropriate locations.

U.S. Bicycle Route System

The goal of the [U.S. Bicycle Route System](#) is to facilitate travel between the states through a network of numbered interstate bicycle routes (refer to the AASHTO [Purpose and Policy, U.S. Numbered Bicycle Routes](#)). This initiative will help achieve two goals identified in the [Georgia Bicycle and Pedestrian Plan](#), to:

- develop a transportation network of primary bicycle routes throughout the state to provide connectivity for intrastate and interstate bicycle travel;
- promote establishment of U.S. numbered bicycle routes in Georgia as part of a national network of bicycle routes.

Three initial 50-mile wide corridors are being considered for establishment of U.S. Bicycle Routes in Georgia, which are the following:

- USBR 1, which travels from Camden County (Florida Border) to Chatham County (South Carolina border) along the coast;
- USBR 15, which travels from Lowndes County (Florida border) to the North Carolina border through the center of the state;
- USBR 84, which travels from the South Carolina border to the Alabama border through the Piedmont Region and Atlanta area;

Detailed routes (turn-by-turn) within these three corridors have yet to be defined. Accordingly, GDOT encourages other state agencies, regional planning commissions, MPOs, local governments, bicycling interest groups, and managers of bicycle facilities to contribute towards the assessment and identification of detailed routes along these corridors.

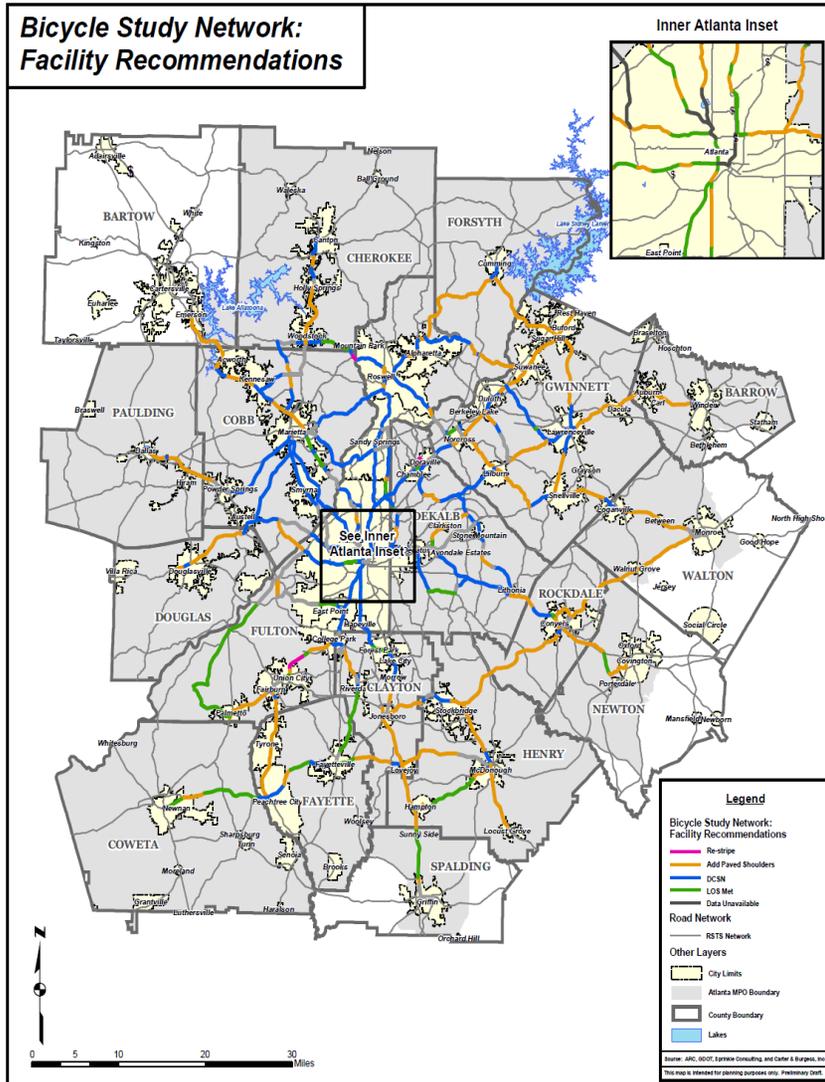


Figure 9.5. Atlanta Regional Commission (ARC) Bicycle Network Recommendations.

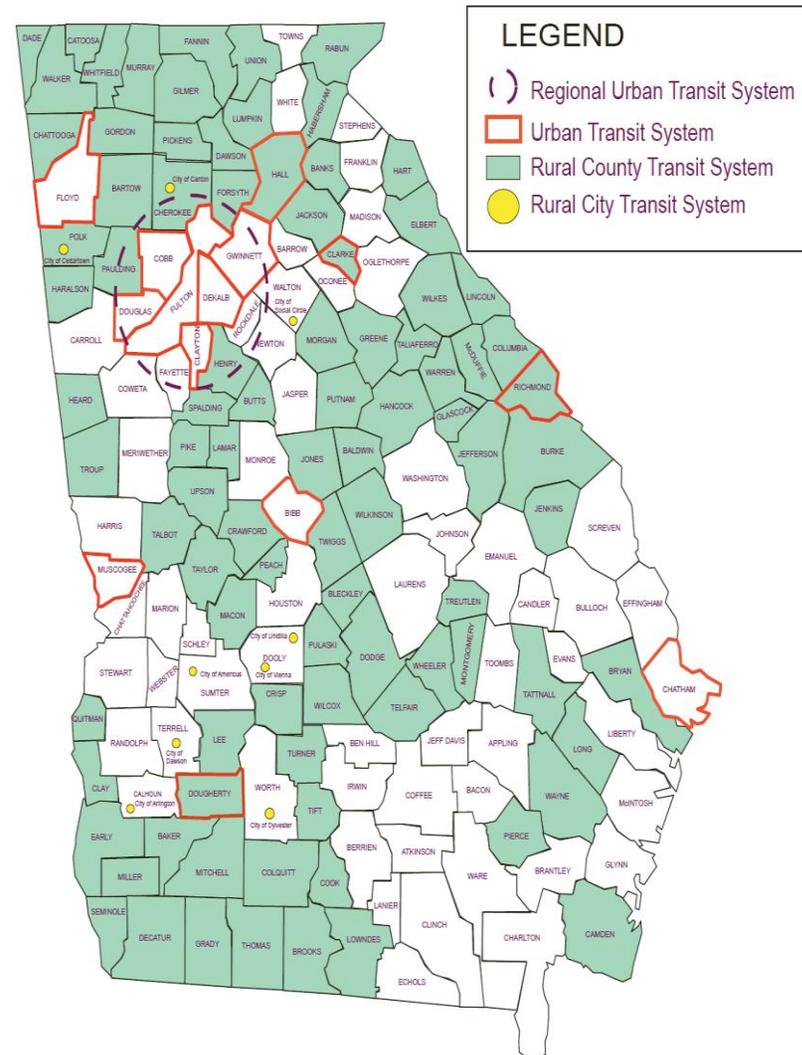


Figure 9.6. Georgia Map Showing Counties with Fixed-Route Transit Systems.

9.3.3. Transit Networks

There is a large number of transit agencies in Georgia which connect together to form a broad network of fixed route bus, paratransit, and rail services. This network includes several types of transit service (see below) as part of 15 urban networks and 110 public transportation programs which covers more than half of Georgia counties and all 15 MPOs.

Types of Transit Service

Six basic types of transit service commonly found in urban and rural transit systems are defined below, the last three of which are high-capacity type transit systems.

Paratransit – an alternative mode of transportation which largely provides demand response type services. As this form of transit inherently does not follow fixed routes or schedules and utilizes smaller vehicles such as vans and small buses, accommodations for paratransit are not normally considered during the design of roadway infrastructure projects.

Local Bus – bus service operating at a fixed frequency that serves designated stops along a fixed route. Local bus service usually operates in the normal travel lanes of the urban roadway network. [MARTA](#), [Cobb County Community Transit](#), and [Chatham Area Transit](#) are examples of transit agencies which provide local bus route services. Although classified as fixed-route transit, local and express bus routes are more frequently subject to change than other forms of transit.

Express (or Rapid) Bus – similar to local bus but with fewer stops than local service. Express buses normally operate during peak travel periods and include few but longer routes than local bus. MARTA, Cobb Community Transit, [Gwinnett County Transit](#), and [GRTA](#) are examples of transit agencies which provide express bus route services.

Bus Rapid Transit (BRT) – enhanced bus service with limited stops and technology, which helps speed up travel. BRT operates in shared (i.e., designated lanes) or exclusive right-of-way along urban roadways and freeways.

Heavy Rail Transit (HRT) – A passenger transit service which utilizes separate right-of-way rail lines either below or above ground, such as MARTA's rail system. The term "heavy" refers to the number of passengers the trains can carry, and not the weight. Heavy rail trains typically carry more passengers than light rail but fewer than commuter rail. MARTA is an example of a transit agency which provides HRT.

Light Rail/Streetcar – Light Rail/Streetcar is also a fixed guideway transit system and operates in a variety of operating environments. These environments include: in an exclusive right-of-way, in a shared right-of-way (including a median or parallel to a roadway), or in-street operation with other vehicles (i.e., streetcars). Vehicles lengths can range from short rail cars similar to a bus or multiple car trains. Because of their design, light rail systems typically operate at lower speeds and feature closely spaced stops.

Urban Transit Networks

Urban transit networks are more likely to require user accommodations, most fixed-route system are located in urban areas. **Figure 9.5 [Georgia Map Showing Counties with Fixed Transit Systems](#)** is available from the GDOT Intermodal Office and can be used to identify counties which have fixed-route transit systems. Maps showing existing and planned transit networks should be available from [transit service providers](#), local governments, MPOs, and regional planning commissions. The [Transit Unit](#) of the GDOT Intermodal Office can be contacted to help locate maps which apply to a specific project corridor. For the Atlanta region, refer to the [ARC Strategic Regional Thoroughfare Plan](#) for planned transit routes.

9.4. Warrants for Accommodation

The Georgia Department of Transportation has established the following standard and guideline warrants to ensure that appropriate pedestrian and bicycle accommodations are included in transportation infrastructure projects where pedestrians and bicyclists are permitted to travel. In a similar manner, warrants for transit accommodations are presented. Warrants for pedestrian, bicycle, and transit (both user and vehicle) accommodations must be evaluated as part of project concept development, and documented in the concept report.

If it is not practical to include appropriate accommodations where a criterion denoted below as “Standard” is met, then agency approval and documentation will be required by formal Design Variance before the necessary accommodation can be excluded from the project. To obtain a Design Variance, a comprehensive study and formal request shall be submitted using the format and procedures outlined in Chapter 8 of the GDOT Project Development Process (PDP). Refer also to Section 2.2 of this Manual.

Local Governments are encouraged to apply Complete Streets principals wherever it is practical to do so. Since the Local Maintenance and Improvement Grant Program (LMIG) is a state-funded grant program, GDOT oversight after the application process is normally limited. Therefore, it is not the intention of the Department to monitor application of Complete Streets policies for LMIG projects. Complete Streets policies do apply to all TE and LCI projects, and the application of these policies is monitored as part of GDOT’s normal oversight of these programs.

9.4.1. Pedestrian Warrants

Standards – Pedestrian accommodations shall be considered in all planning studies, and be included in all reconstruction, new construction, and capacity-adding projects which include curb and gutter as part of an urban border area (See Figure 9.7) or are located in areas with any of the following conditions:

- along corridors with pedestrian travel generators and destinations (i.e. residential neighborhoods, commercial areas, schools, public parks, transit stops and stations, etc), or areas where such generators and destinations can be expected prior to the design year of the project;
- where there is evidence of pedestrian traffic (e.g., a worn path along roadside);
- where pedestrian crashes equal or exceed a rate of ten for a ½-mile segment of roadway, over the most recent three years for which crash data is available; and
- where a need is identified by a local government, MPO or regional commission through an adopted planning study.

Guidelines – Pedestrian accommodations should be considered on projects that are located in areas with any of the following conditions:

- within close proximity (i.e., 1 mile) of a school, college, university, or major public institution (e.g., hospital, major park, etc,...);
- within an urbanized area; or area projected to be urbanized by an MPO, regional commission, or local government prior to the design year of the project;
- where there is an occurrence of pedestrian crashes; and
- any location where engineering judgment, planning analysis, or the public involvement process indicates a need.

The need for pedestrian accommodations for access to transit facilities should be evaluated as part of **Section 9.4.3 Transit Warrants**.

As part of PM projects and 3R projects, improvements and/or repairs to curb ramps will be assessed on a case-by-case basis. The Office of Maintenance will decide whether or not improvements and/or repairs to curb ramps are required at a formal field plan review.

9.4.2. Bicycle Warrants

Standards – Bicycle accommodations shall be considered in all planning studies and be included in all reconstruction, new construction, and capacity-adding projects that are located in areas with any of the following conditions:

- if the project is on a designated (i.e., adopted) U.S., State, regional, or local bicycle route;
- where there is an existing bikeway along or linking to the end of the project corridor (e.g., shared lane, paved shoulder, bike lane, bike boulevard, or shared-use path);
- along corridors with bicycle travel generators and destinations (i.e. residential neighborhoods, commercial centers, schools, colleges, scenic byways, public parks, transit stops/stations, etc.);
- on projects where a *bridge deck* is being replaced or rehabilitated and the existing bridge width allows for the addition of a bikeway without eliminating (or precluding) needed pedestrian accommodations – reference [Title 23 United States Code, Chapter 2, Section 217, Part \(e\)](#); and
- where there is an occurrence of reported bicycle crashes which equals or exceeds a rate of five for a 1-mile segment of roadway, over the most recent three years for which crash data is available.

Guidelines – Bicycle accommodations should be considered on projects that are located in areas with any of the following conditions:

- within close proximity (i.e., 3 miles) of a school, college, university, or major public institution (e.g., hospital, major park, etc,...);
- where a project will provide connectivity between two or more existing bikeways or connects to an existing bikeway;
- where there is an occurrence of bicycle crashes;
- along a corridor where bicycle travel generators and destinations can be expected prior to the design year of the project;
- any location where engineering judgment, planning analysis, or the public involvement process indicates a need.

The need for bicycle accommodations for access to transit facilities should be evaluated as part of **Section 9.4.3 Transit Warrants**.

On resurfacing projects in urban areas, GDOT will consider requests from local governments to restripe the roadway and narrow travel lanes, to add bicycle lanes. A shared lane may be considered if sufficient width is not available for a bicycle lane. Restriping that includes narrowing of the travel lanes will be considered where space is available and where the motor vehicle crash rate for sideswipe crashes (for the most recent three years for which data is available) does not exceed the statewide average for the same functional classification.

9.4.3. Transit Warrants

Standards – Transit accommodations shall be considered in all planning studies and be included in all reconstruction, new construction, and capacity-adding projects that are located in areas with any of the following conditions:

- for transit vehicles: on corridors served by fixed-route transit; and
- for pedestrian transit users: within the ½-mile pedestrian catchment area of an existing fixed-route transit facility (i.e., stop/station, or park-and-ride lot). A catchment area is defined by a radial distance from a transit facility per Federal Transit Administration (FTA) guidelines - this includes crossing and intersecting streets.

Guidelines – Transit accommodations should be considered on projects that are located in areas with any of the following conditions:

- for bicycle transit users: within the 3-mile bicycle catchment area of an existing fixed-route transit facility;
- along a corridor programmed (and funded) to begin construction of high-capacity transit before the roadway project design year; and
- for all transit users: between transit stops/stations and local destinations.

Where a warrant is met, the need for accommodations should be validated through coordination with the transit service provider (and MPO, regional planning commission and/or local government, where applicable). This coordination is necessary for existing as well as planned transit facilities. It should be recognized that although classified as fixed- route transit, local and express bus routes are periodically changed in order to improve services to riders.

9.4.4. Exclusions

The consideration of bicycle and pedestrian warrants may be excluded from roadways with any of the following conditions:

- for very low speed (i.e., < 35mph) residential roadways where pedestrians and bicyclists can safely share the roadway with motor vehicles;
- on side road tie-ins where there is no existing sidewalk or bicycle accommodation and widening of construction limits for sidewalk or bicycle accommodation would result in disproportionate impacts to adjacent property (as decided by the project development team on a case-by-case basis); and
- sidewalks are not required in rural areas where curb and gutter is placed at the back of the useable shoulder solely for the purpose of reducing construction limits.

Required accommodations (i.e., where a Standard Warrant is met) may only be omitted, after approval of a Design Variance, where the cost of providing the required accommodations is excessively disproportionate to the need or probable use. Excessively disproportionate may be defined as exceeding 20% of the total project cost. This cost should consider construction, required right-of-way, environmental impacts, and in some cases operation and maintenance. Where accommodations provide safety benefits to address bicycle and/or pedestrian crash history, these benefits must be considered. Refer to **Section 2.2.2 Design Variance** of this Manual) for requirements relating to Design Variances.

9.5. Design of Accommodations

9.5.1. Pedestrian Accommodation Design

The Georgia DOT has compiled the following design criteria as recommended dimensions when designing pedestrian accommodations in Georgia. These criteria were developed with reference to the PROWAG developed under the umbrella of the United States Access Board to meet ADA requirements. In some cases, GDOT provides more specific and selective criteria (e.g., relating to the design of sidewalks). If it is not practical to comply with the following GDOT criteria, then the designer shall, at a minimum, comply with the criteria published in the PROWAG.

If an engineer determines that the nature of an existing or proposed facility makes it technically infeasible to comply fully with the accessibility standards published in the PROWAG, then the design or alteration shall provide accessibility to the “maximum extent feasible.” **The approval of a Design Variance from the GDOT Chief Engineer will be required before a design or alteration can be retained or incorporated into a project that does not comply with the criteria published in the PROWAG.**

For design of pedestrian accommodations in urban areas, GDOT recommends the report “Accessible Public Rights-of-Way Planning and Design for Alterations,” published by the Public Rights-of-Way Access Advisory Committee (PROWAAC). The report is located on-line at: <http://www.access-board.gov/prowac/alterations/guide.htm>.

Location of Sidewalk

Sidewalks are typically provided along urban shoulders, wherever curb and gutter is utilized along the outside edges of pavement of the mainline. See **Chapter 6.7 Border Area (urban shoulder)** of this Manual for a more complete definition of an urban shoulder. Sidewalks are also provided along some rural shoulders. The design of sidewalks along urban and rural shoulders is illustrated in **Figures 9.7 and 9.8**, respectively.

Width of Sidewalk

GDOT recommends the minimum width of sidewalk be 5-ft of clear unobstructed space which should allow adequate space for two wheelchairs to pass. Higher pedestrian usage may warrant the use of wider sidewalks. Sidewalks wider than 5-ft may be appropriate to accommodate higher pedestrian flows, refer to Toolkit 5 of the GDOT Pedestrian and Streetscape Guide. When right-of-way is limited at intersections, the designer should be careful not to violate this requirement by placing a sign post, signal mast arm, signal cabinet, strain pole, pedestrian signal pedestal, or any other fixed object in a way that would reduce this width.

The PROWAG specifies that “*Where the clear width of pedestrian access routes is less than 1.5 meters (5 feet), passing spaces must be provided at intervals of 61 meters (200 feet) maximum. Passing spaces must be 1.5 meters (5 feet) minimum by 1.5 meters (5 feet) minimum. Passing spaces are permitted to overlap pedestrian access routes.*”

Pedestrian Buffer Area

A pedestrian buffer area (often referred to as a buffer or landscaping strip) separates the sidewalk and the vehicle traveled way, as the physical area between the back of curb and the roadside edge of sidewalk. The buffer strip allows room to place utilities, bus stops, landscaping, street furniture, signs, and mail boxes without obstructing the pedestrian travel way, as well as providing comfort and safety benefits for walkers.

GDOT recommends a 6-ft wide buffer strip between the back of curb and the sidewalk. If a roadway has multiple driveways, a 6-ft buffer strip will provide the offset required to connect the sidewalk along the back of a standard concrete valley gutter driveway, without a shift in the sidewalk alignment. A buffer strip also provides some protection from overhanging objects from vehicles, and also creates a psychological barrier, enhancing pedestrian comfort. Grassing or pavers for the buffer strip are preferred, to provide a color contrast which may assist visually impaired pedestrians to better distinguish between the sidewalk and roadway.

The buffer strip width should be no less than 2-ft. This reduced width may be appropriate where the separation between travel lanes and the sidewalk is increased by the inclusion of on-street parking or bicycle lanes.

Where right-of-way constraints will not permit a 2-ft buffer width, sidewalk may be constructed adjacent to the back of curb. For example, this may occur in Central Business Districts or where buildings are adjacent to the right-of-way.

Bus Stops

Along corridors where a fixed-route local bus service is provided, the applicable transit service provider should be consulted to ensure that all bus stops have an ADA compliant bus loading pad to allow for the safe deployment of wheel chair ramps.

Cross-Slope

The maximum allowable sidewalk cross-slope is 2.0%.

Longitudinal Slope

The longitudinal slope (grade) of a sidewalk shall not exceed the general grade established for the adjacent street or roadway. In cases where sidewalk alignment deviates from the adjacent roadway, the longitudinal slope of the sidewalk should not exceed 5%. Where the longitudinal slope exceeds 5% additional requirements apply (refer to the PROWAG).

Curb Ramps

The ADA requires that accessible curb ramps be included at crosswalks.

- The ramp profile shall have a running slope between 5 percent minimum and 8.3 percent maximum.
- The ramp should be placed in line with pedestrian flow and crosswalks, where practical.
- Perpendicular ramps are preferred, where appropriate.
- The bottom of diagonal curb ramps shall have 48 in. minimum clear space between the curb line and the vehicle traveled way line. Also, the right and left edges of the ramp must be perpendicular to the curb.

Refer to GDOT *Construction Standards and Details*, Construction Details A-1, A-2, A-3, and A-4 for additional information regarding the typical location and design of curb ramps.

Sidewalk Surface

The surface of the pedestrian access route shall be firm, stable and slip resistant. Surface discontinuities shall not exceed 1/4 in. vertical or horizontal.

In situations where existing sidewalk will be retained, vertical discontinuities between ¼ in. and ½ in shall be beveled at 1V:2H minimum. The bevel shall be applied across the entire level change. In situations where existing sidewalk will be retained, the project must repair/replace areas of sidewalk that have heaved (vertical) more than ½ in., or if there are more than ½ in. gaps (horizontal) in the sidewalk.

Detectable Items for the Impaired

Detectable warnings are devices that alert visually impaired persons that they are entering or exiting a potentially hazardous area. All ramps shall incorporate a detectable warning surface (see GDOT Construction Detail A-4). The minimum width of the detectable warning surface is the width of the curb ramp exclusive of flared sides. Detectable warnings should also be used at locations where a need has been determined.

Crosswalks

Crosswalk design, placement, and the selection of additional safety treatments (where necessary) should meet GDOT's most recent guidance located in Section 12.2.3 of the GDOT [Signing and Marking Design Guidelines](#) and in GDOT Construction Detail T-11A. Refer to the [Draft Crosswalk Guidance](#) mentioned in Section 12.2.3.

Bridges

A typical sidewalk width across a bridge in an urban area is 5'-6" without a buffer strip between the back of curb and sidewalk. Therefore, the width of the sidewalk should transition from the roadway cross section to the bridge cross section before the approach slab. This should include eliminating the buffer strip in advance of the bridge.

Tapering down a sidewalk to match the bridge shoulder is typically done in a space between 50-ft to 100-ft in advance of the bridge. Where guardrail is used on the bridge approaches, the sidewalk transition should follow the guardrail offset transition.

Work Zones

For pedestrian accessibility requirements during construction see **GDOT Special Provision, Section 150.02 – K. Pedestrian Considerations**. The current **GDOT SP 150 – Traffic Control** is located on GDOT's website at the following address:

http://www.dot.ga.gov/doingbusiness/theSource/special_provisions/shelf/sp150.pdf

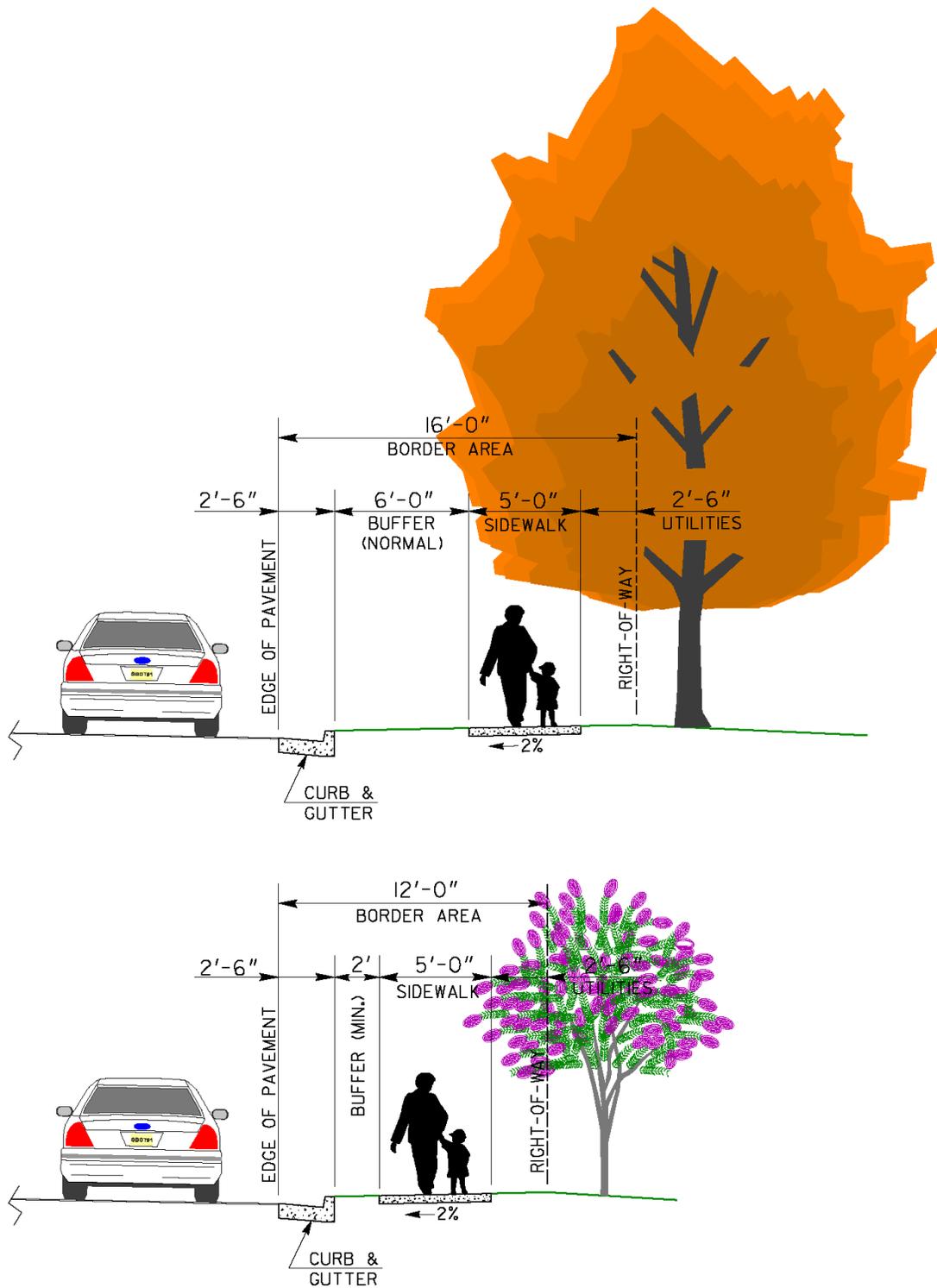


Figure 9.7. Illustrations of Pedestrian Facility Design – Urban Border Area.

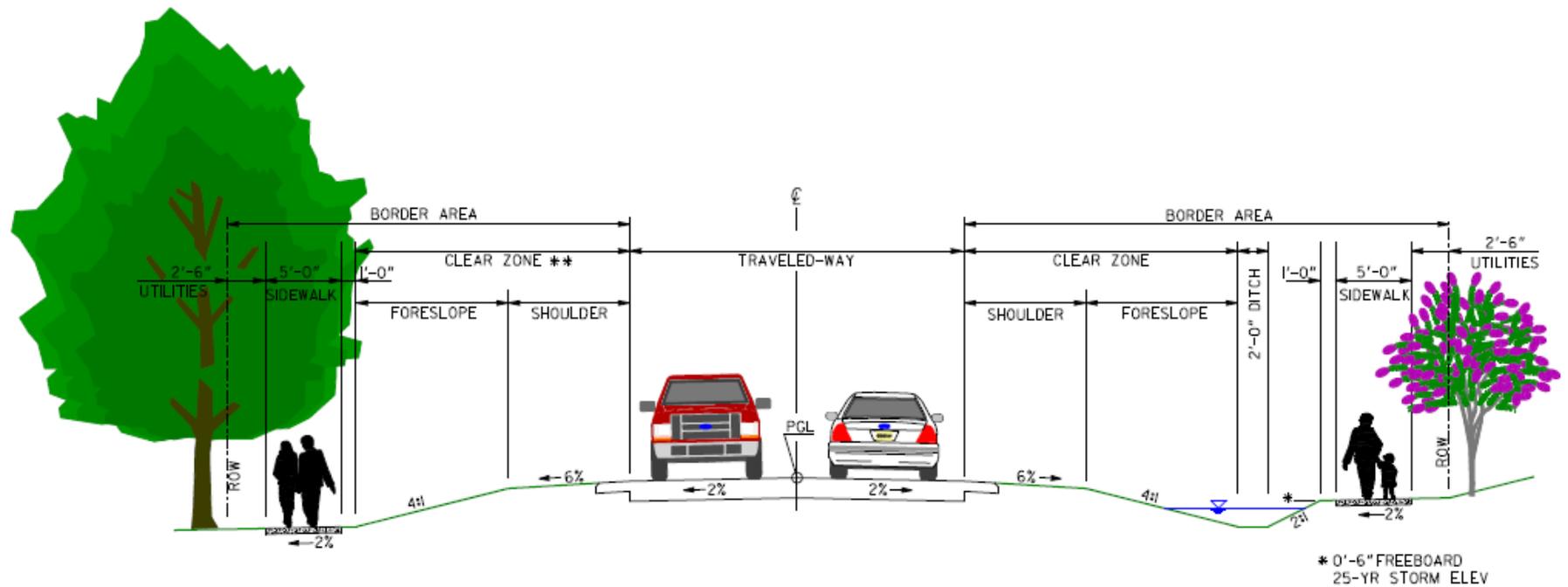


Figure 9.8. Illustrations of Pedestrian Facility Design – Rural Border Area.

9.5.2. Bicycle Accommodation Design

GDOT adopts the guidance published in the [2012 AASHTO Guide for the Development of Bicycle Facilities](#) (AASHTO Guide) for the selection and design of bicycle accommodations. Design consistency with local or regional bicycle design guidelines should be considered where these guidelines are consistent with the AASHTO Guide.

GDOT recognizes the eight types of bikeways presented in Table 2-3 of the AASHTO Guide. An appropriate bikeway type should be selected from this table based on the type and conditions of the street or corridor involved. For on-road bikeways urban areas, bicycle lanes are generally preferred over shared lanes because they provide a separate and more visible network of bikeways which increases user safety and comfort. If an existing bicycle facility is present in the form of a shared lane, consideration should be given to upgrading the facility to a bicycle lane.

1. **Bicycle Lanes (including paved shoulders)** – a bicycle lane is preferred by GDOT, where appropriate in accordance with Table 2-3 of the AASHTO Guide. A bicycle lane consists of an on-road bikeway commonly designated for one-way travel, in the same direction as the adjacent travel lane, for preferential or exclusive use by bicyclists. GDOT has defined 4-ft as the minimum width for bicycle lanes for both rural and urban type roadways (refer to **Figure 9.8 Illustration of Bicycle Lane Design Along Rural and Urban Roadways**). A width greater than 4-ft may be appropriate in some cases, such as where on-street parking is permitted (refer to Section 4.6.4 and 4.6.5 of the AASHTO Guide).

- *Rural Roadways:* the 4-ft bicycle lane (or “paved shoulder”) is incorporated into the overall width of a 6.5-ft wide paved shoulder which includes a 16-in rumble strip offset 12-in from the traveled way. The shoulders are designed with a skip pattern rumble strip to allow bicyclists to smoothly enter and exit the bicycle lane. Refer to [Georgia Construction Detail](#) S-8 for additional information regarding the design of bicycle lanes and rumble strips on paved shoulders.
- *Urban Roadways (with curb & gutter):* the 4-ft bicycle lane is developed between the traveled way and gutter. The bicycle lane does not include the gutter width. A 2-ft additional width should be provided for bicycle lanes located adjacent to on-street parking, where practical. The designer should note, if the space to the right of the traveled way stripe is less than 4-ft wide, the route cannot be signed or marked as a “bicycle lane”.

A 2-ft to 4-ft wide pavement marking buffer (i.e., buffered bicycle lane – refer to the NATCO [Urban Bikeway Design Guide](#)) between the travel lanes and the bicycle lane may be considered for roadways with posted or operating speeds of greater than 35 mph.

Bicycle safe drop-inlet grates are required for all urban roadways (i.e., curb and gutter) with on-road bicycle facilities.

2. **Shared Lanes** – shared lanes should be used where space constraints or other limitations do not allow for the width required for a bicycle lane. A shared lane bikeway requires that motorized vehicles and bicycles share the outside travel lane of the roadway. Shared lanes may take the form of either a wide outside lane or a marked shared lane (refer to Table 2-3 of the AASHTO Guide for the Development of Bicycle Facilities).

The minimum width for a wide outside lane is 14-ft. This allows motor vehicles to pass a bicyclist with a 3-ft clearance between the bicycle and the motor vehicle. This 14-ft width does not include the width of a gutter pan and generally is appropriate for use on arterials and collectors with traffic volumes which exceed 3,000 vehicles per day – a bicycle lane is still preferred where adequate width is available. Shared lanes should be signed in accordance with the 2009 MUTCD.

Where posted speeds do not exceed 35 mph and it is desirable to provide a higher level of guidance to bicyclists and motorists, shared lanes may be marked with a shared-lane marking symbol – i.e., “marked shared lanes” (refer to the 2009 MUTCD Section 9C.07). Marked shared lanes should be used along a corridor where bicycle lanes are the prevailing facility, but space constraints or other limitations do not permit continuous bicycle lanes. Proper striping transitions should be provided between the two types of bikeways.

3. Shared-Use Paths – a bikeway within an independent right-of-way or that is physically separated from motor vehicle traffic by an open space or barrier, located within the roadway right-of-way (i.e., a sidepath). Most shared-use paths are designated for two-way travel and are designed for both transportation and recreation purposes. Shared-use paths are intended to supplement a network of on-road bicycle facilities and should not be used as an alternate for an on-road bikeway. Also, shared-use path design is similar to roadway design, but on a smaller scale and with typically lower design speeds (refer to Chapter 5 of the AASHTO Guide).

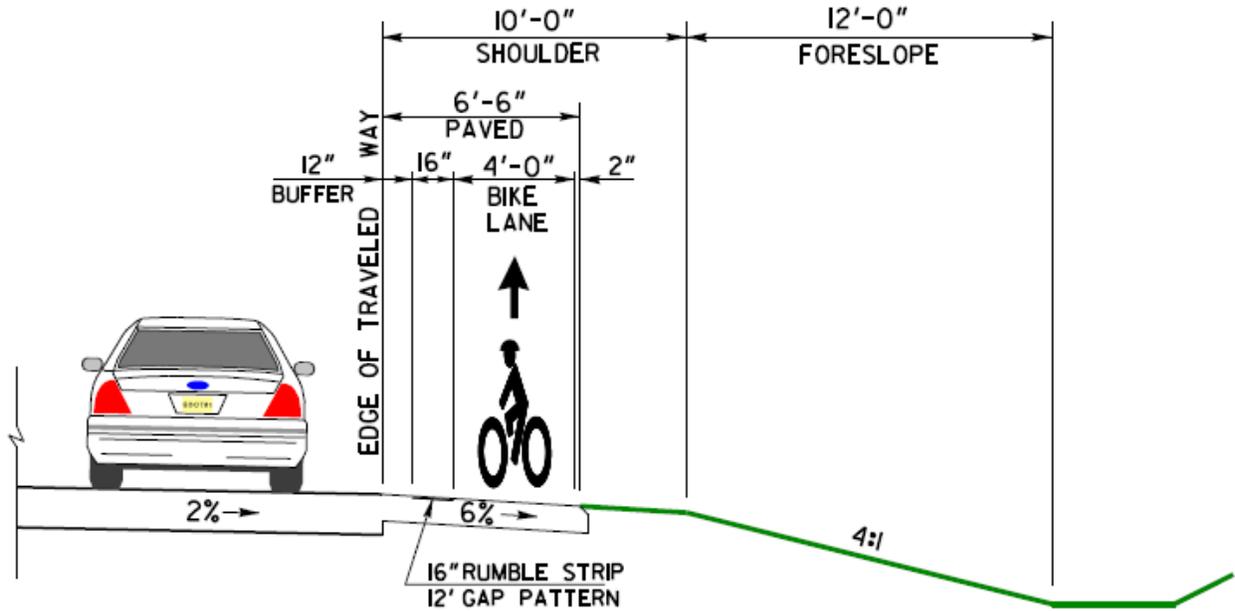
Shared-use paths may also be used by pedestrians, skaters, equestrians, and other non-motorized users and should be designed accordingly. Since nearly all shared use paths are used by pedestrians, these facilities must meet all applicable ADA requirements (refer to Section 5.1.1 of the AASHTO Guide).

Sidepaths are a specific type of shared-use path that run adjacent to the roadway and should only be used after considering potential conflicts associated with sidepaths (refer to Section 5.2.2 of the AASHTO Guide). Sidepaths may be considered where one or more of the following conditions exist (Page 5-10 of the AASHTO Guide):

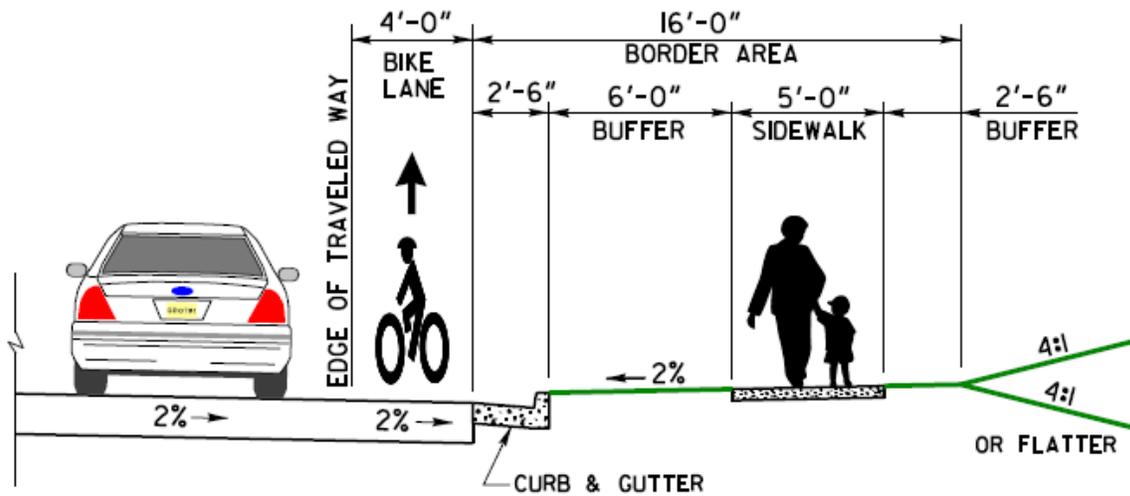
- The adjacent roadway has relatively high-volume and high-speed motor vehicle traffic that might discourage bicyclists from riding on the roadway, potentially increasing sidewalk riding, and there are no practical alternatives for either improving the roadway or accommodating bicyclists on nearby parallel streets.
- The sidepath is used for a short distance to provide continuity between sections of path in independent rights-of-way, or to connect local streets that are used as bicycle routes.
- The sidepath can be built where there are few roadway and driveway crossings. (A pair of sidepaths – one on each side of the roadway - may be considered for roadways with frequent cross-streets and driveways. Each sidepath would be signed for one-way bicycle traffic.)
- The sidepath can be terminated (at each end) onto streets that accommodate bicyclists, onto another path, or in a location that is otherwise bicycle compatible.

The design of bikeways should give particular attention to providing connections between on-road and off-road bikeways and reducing bicyclist/motorized vehicle conflicts at cross-streets, driveways and other intersections (refer to Sections 4.8 and 5.3 of the AASHTO Guide).

Refer to the MUTCD and the GDOT [Signing and Marking Design Guidelines](#) for guidance related to bicycle facilities.



BIKE LANE ON RURAL ROADWAY



BIKE LANE ON URBAN ROADWAY

Figure 9.9. Illustration of Bicycle Lane Design along Rural and Urban Roadways.

9.5.3. Transit Accommodation Design

Transit user accommodations commonly include pedestrian/bicycle accommodations that provide safe and convenient access to a transit facility. For the design of accommodations which address user access to a transit facility refer to **Sections 9.5.1 Pedestrian Facility Design** and **9.5.2 Bicycle Facility Design** of this Manual.

For transit user accommodations at a transit facility (e.g., most commonly a concrete bus loading pad for a transit stop) and for transit vehicle accommodations refer to the following publications:

- [Geometric Design of Highways and Streets](#), AASHTO, 2011;
- [Guide for High-Occupancy Vehicle \(HOV\) Facilities](#), AASHTO, 2004;
- [Guide for the Design of Park-and-Ride Facilities](#), AASHTO, 2004; and
- [Guidelines for the Location and Design of Bus Stops \(TCRP Report 19\)](#), TCRP, 1996.

In most cases, high capacity transit vehicle accommodations (e.g., traffic signal preemption, queue-jumper lanes) would be included as part of a transit-focused project. Preservation of right-of-way may be considered as part of a roadway project.

The location, selection, and design of accommodations at a transit facility and for transit vehicles should be coordinated with the affected transit service provider and local government, where applicable.

9.6. Acknowledgements

The GDOT Complete Streets Design Policy was developed by the GDOT Division of Engineering in coordination with the Divisions of Operations and Permits, Planning, and Intermodal. The Division of Engineering acknowledges and appreciates the efforts of Byron Rushing for his part in helping develop the original GDOT Bicycle and Pedestrian policy and for his assistance with expanding that policy to its present form, as a Complete Streets policy.

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- - [Georgia Municipal Association](#)
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